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PLANT SCHEDULE

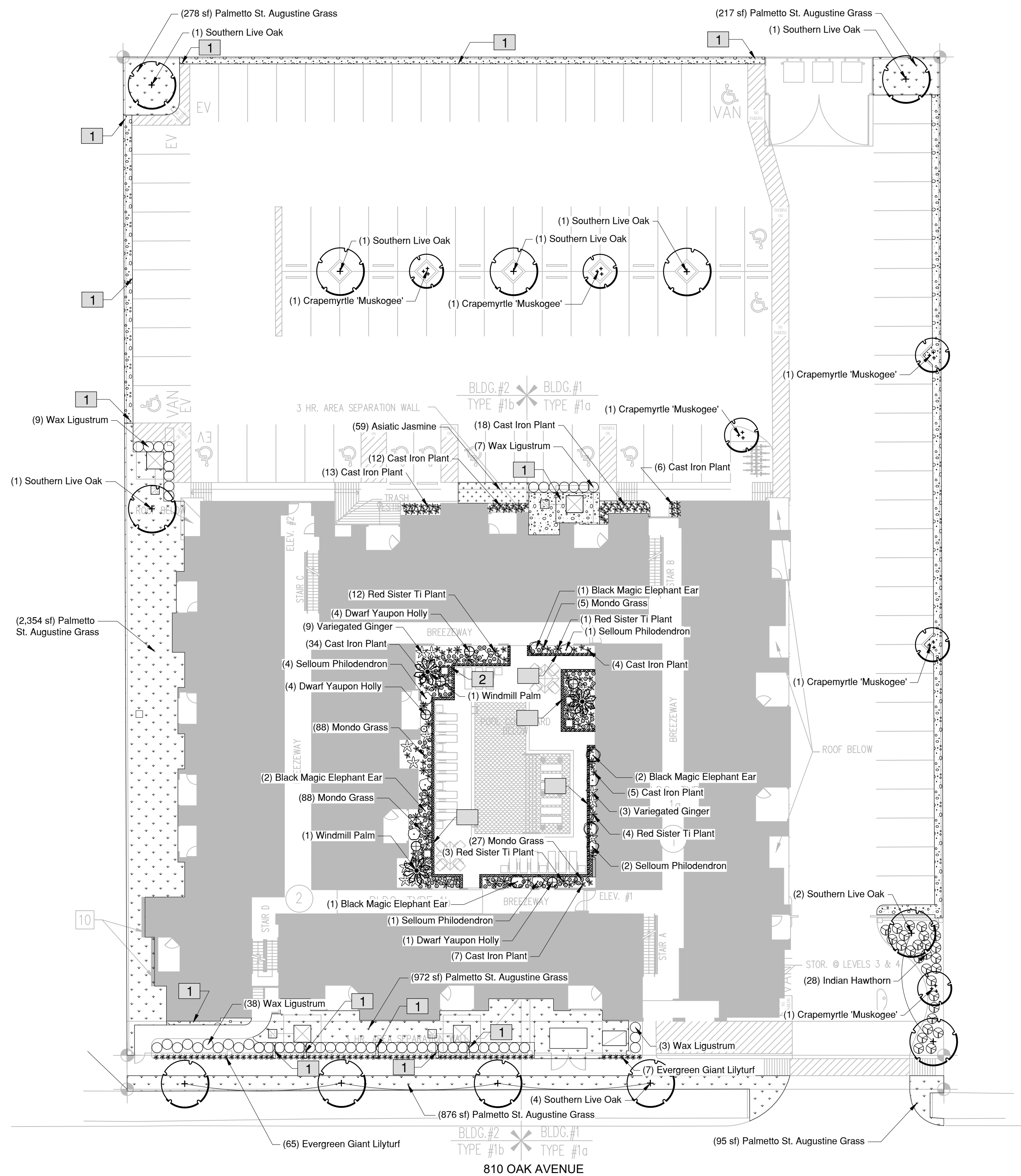
SYMBOL	QTY	COMMON NAME	BOTANICAL NAME	SIZE	REMARKS
TREES					
	6	Crapemyrtle 'Muskogee'	Lagerstroemia indica 'Muskogee'	30 gal.	
	12	Live Oak45g	Quercus virginiana	45 gal.	
	8	Sylvester Palm	Phoenix sylvestris	12' Trunk	
	3	Windmill Palm	Trachycarpus fortunei	8' Trunk	
SHRUBS					
	6	Black Magic Elephant Ear	Colocasia esculenta 'Black Magic'	3 gal.	
	109	Cast Iron Plant	Aspidistra elatior	1 gal.	
	72	Giant Liriope	Liriope gigantea	1 gal.	
	28	Indian Hawthorn	Raphiolepis indica 'Clara'	3 gal.	
	151	Mondo Grass	Ophiopogon japonicus	1 gal.	
	6	Needlepoint Holly	Ilex cornuta 'Needlepoint'	7 gal.	
	23	Red Sister Ti Plant	Cordyline fruticosa 'Red Sister'	5 gal.	
	15	Variegated Ginger	Alpinia zerumbet 'Variegata'	3 gal.	
	57	Wax Ligustrum	Ligustrum japonicum	3 gal.	
GROUND COVERS					
	59	Asiatic Jasmine	Trachelospermum asiaticum	1 gal.	
MEDIUM GROUND COVERS					
	1,248	Purple Heart	Setcreasea pallida	1 gal.	

REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION	QTY	DETAIL
	BULLROCK 3'-6" River Wash Gravel	1,467 sf	
	DRAINAGE BULLROCK Surround pool paving, includes 4" SDR35 & 4" Atrium Grates as shown	183 sf	

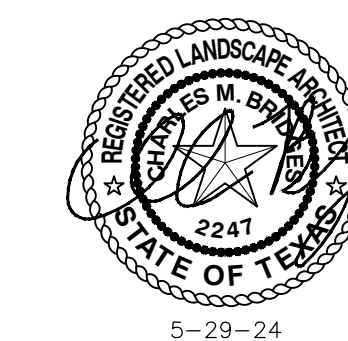
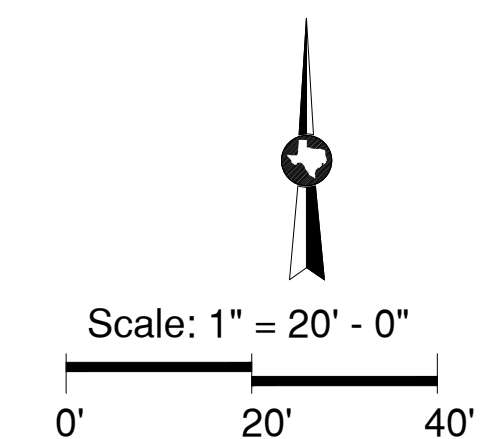
NOTES:

- LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING LANDSCAPE UNTIL FINAL ACCEPTANCE OF ALL WORK ON JOB SITE. CONTRACTOR SHALL MAINTAIN CONDITIONS OF LAWN, BEDS AND PLANT MATERIAL THROUGHOUT CONSTRUCTION UNTIL FINAL ACCEPTANCE.
- WORK SCHEDULING: CONTRACTOR SHALL SCHEDULE A PRECONSTRUCTION MEETING WITH LANDSCAPE ARCHITECT BEFORE PROCEEDING WITH ANY LANDSCAPING OR IRRIGATION WORK. IN THE EVENT THIS NOTIFICATION IS NOT PERFORMED, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY REVISIONS NECESSARY.
- CONTRACTOR SHALL APPLY FOR AND PROCURE ALL REQUIRED PERMITS PRIOR TO COMMENCING WORK.
- CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES PRIOR TO COMMENCING WORK. CONTACT ALL UTILITY COMPANIES MINIMUM 48 HOURS PRIOR TO ANY WORK. CONTRACTOR SHALL BE RESPONSIBLE FOR BECOMING FAMILIAR WITH ALL UNDERGROUND UTILITIES, PIPES, STRUCTURES, ETC. CONTRACTOR SHALL TAKE SOLE RESPONSIBILITY FOR ANY COST INCURRED DUE TO DAMAGE OF THESE UTILITIES.
- CONTRACTOR SHALL NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHEN IT IS OBVIOUS THAT UNKNOWN OBSTRUCTIONS AND/OR GRADE DIFFERENCES EXIST THAT MAY NOT HAVE BEEN FORESEEN IN THE DESIGN. SUCH CONDITIONS SHALL BE BROUGHT UP TO THE OWNER'S REPRESENTATIVE. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY NECESSARY CHANGES DUE TO FAILURE TO GIVE SUCH NOTIFICATION.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER SUBCONTRACTORS ON THE JOBSITE AS REQUIRED TO COMPLETE CONSTRUCTION.
- CONTRACTOR TO PROVIDE SAMPLES OF EACH SHRUB AND GROUND COVER SPECIES OR NURSERY SOURCE FOR APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION. ALL PLANTS ARE TO BE SPECIMEN QUALITY, FULL POT AND HEAD, SYMMETRICAL FOLIAGE AND BRANCHING STRUCTURE. SHRUBS SHALL BE FULL TO GROUND. PLANT MATERIAL OF THE SAME SPECIES SHALL BE OBTAINED FROM THE SAME SOURCE. MATERIAL SHALL BE SHIPPED DIRECTLY FROM NURSERY AND NOT FROM CONTRACTOR'S HOLDING YARD AFTER AN EXTENDED PERIOD. THERE SHALL BE NO SUBSTITUTIONS WITHOUT WRITTEN CONSENT. LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY AND ALL PLANT MATERIAL THAT DOES NOT MEET SATISFACTORY EXPECTATIONS OF LANDSCAPE ARCHITECT.
- ALL LANDSCAPE DEVIATIONS, INCLUDING SPECIES SUBSTITUTION, NOT APPROVED ON THIS PLAN MUST BE APPROVED BY THE CITY THROUGH PLAN SUBMITTAL.

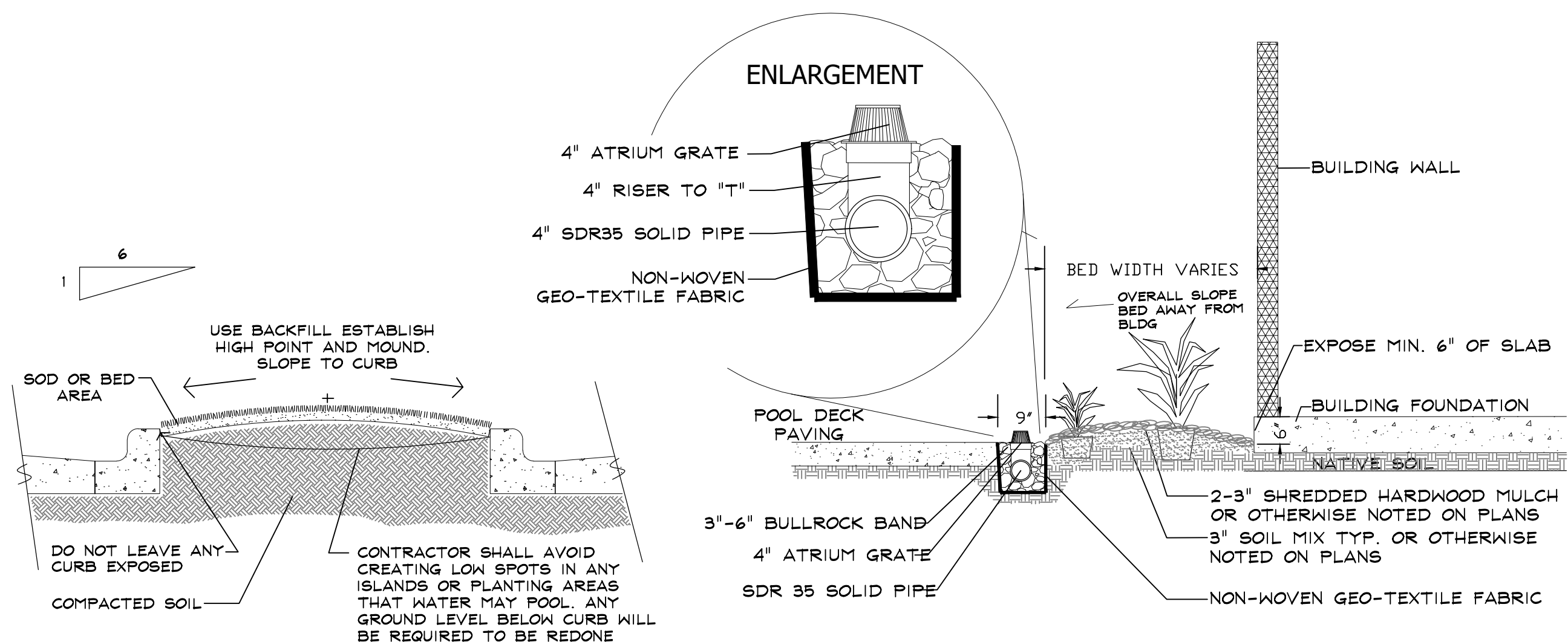


Landscape Requirement Calculations:

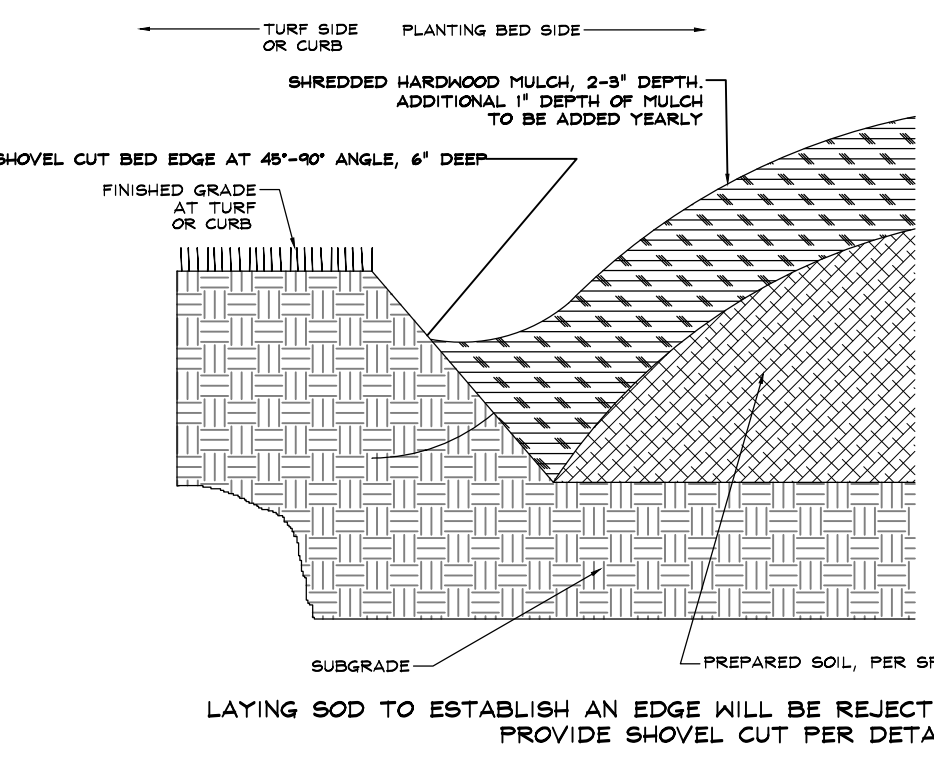
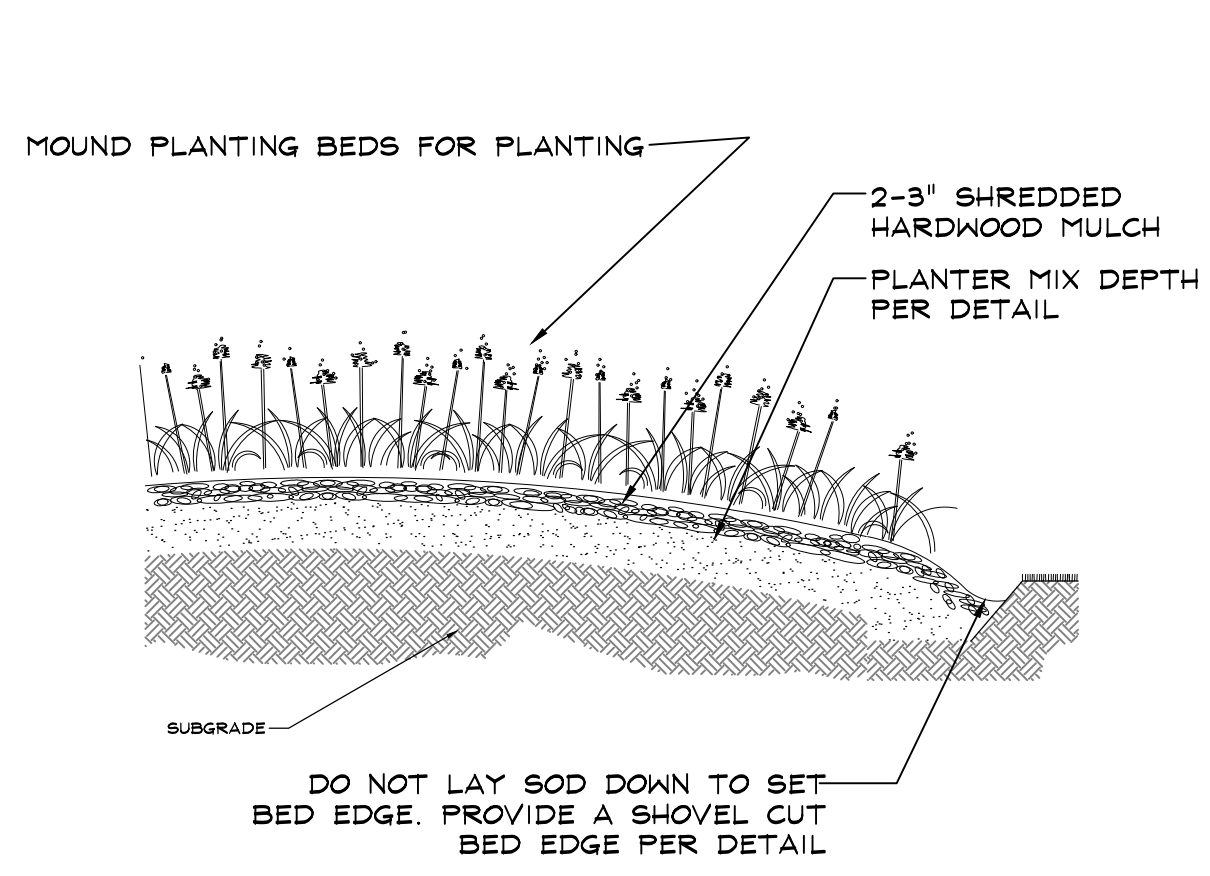
	LF/30	TREES REQUIRED	TREES PROVIDED
A. STREET TREES OAK AVENUE - 240' /30	8	8	4 @ 4" Cal.
B. PARKING LOT TREES (GUEST SURFACE PARKING ONLY)	SPACES/10 125/10	12.5	TREES PROVIDED 6 (2" Cal.) 8 (4" Cal.)
C. SHRUBS REQUIRED (REQUIRED STREET TREES x 10)	ST. TREES X 10 8 X 10	SHRUBS REQUIRED 80	SHRUBS PROVIDED 141



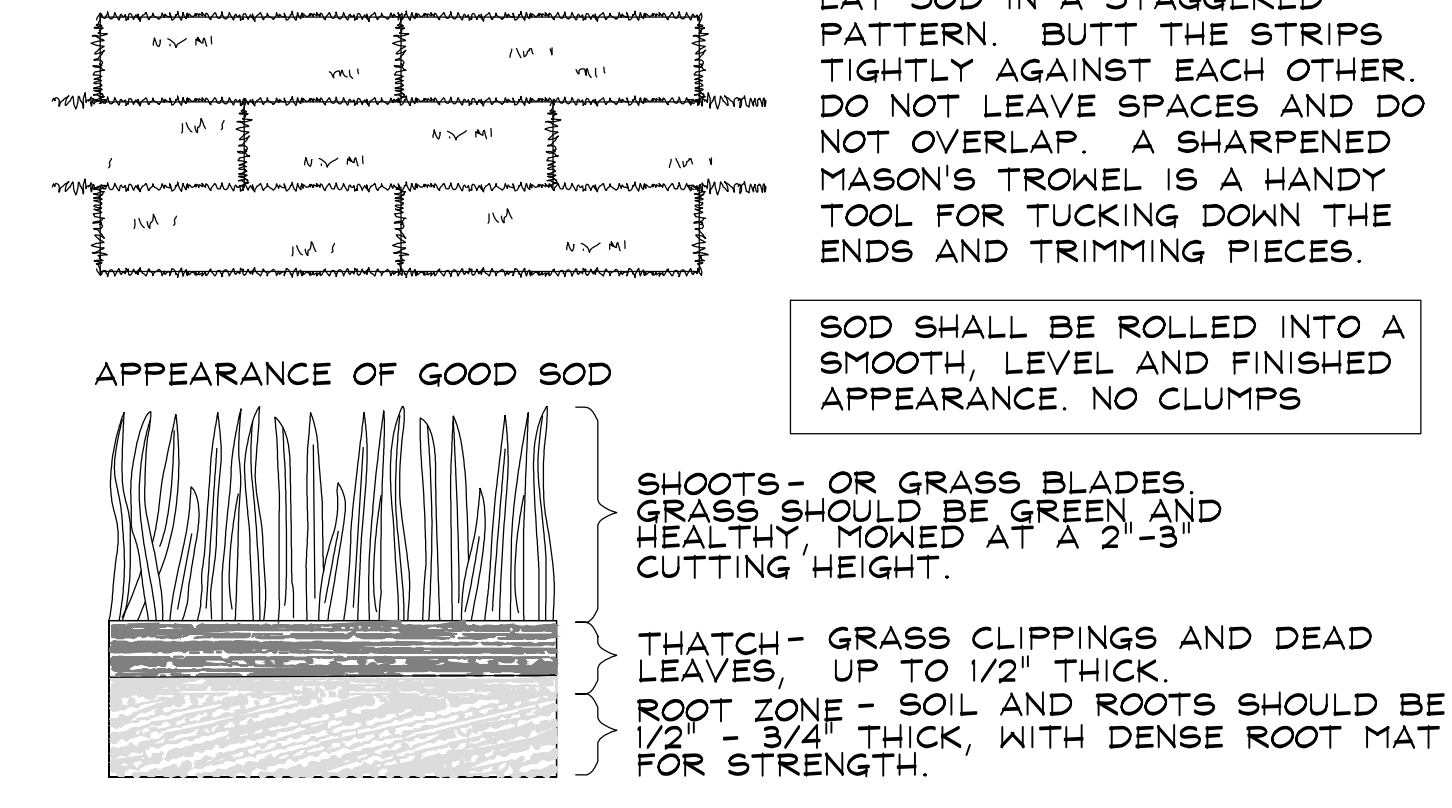
Job No.: 166-04-016
Scale: 1" = 20' - 0"
Date: May 29, 2024
Revised:



A - ISLAND PLANTING PREP
SCALE: NTS

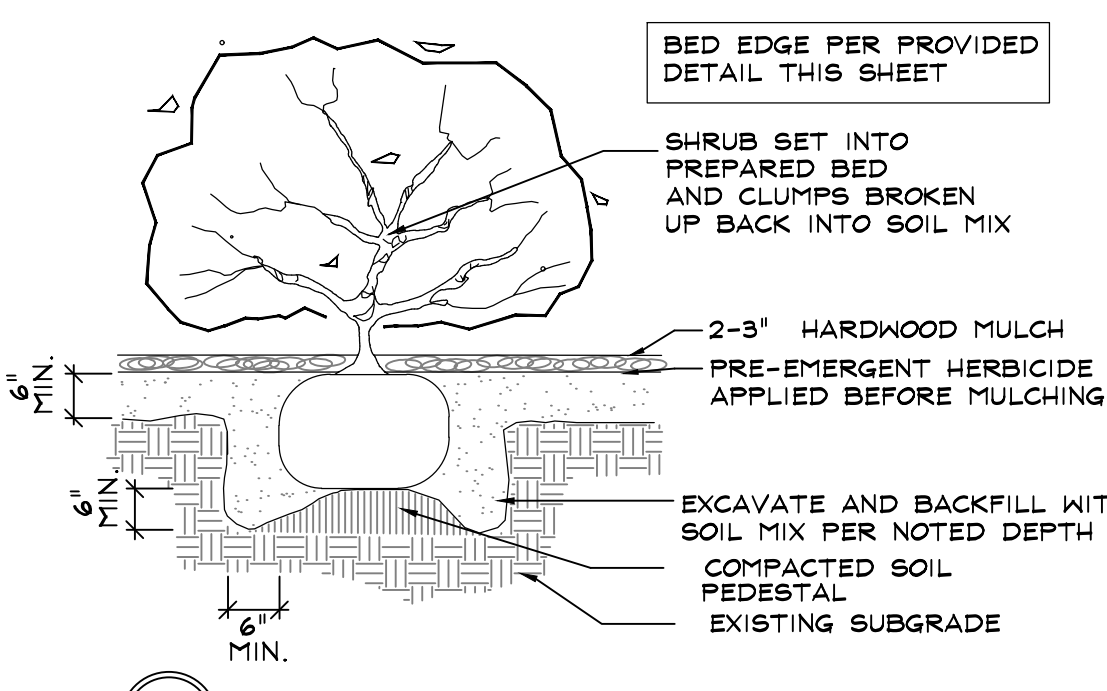


B - SHOVEL CUT BED EDGE
SCALE: NTS

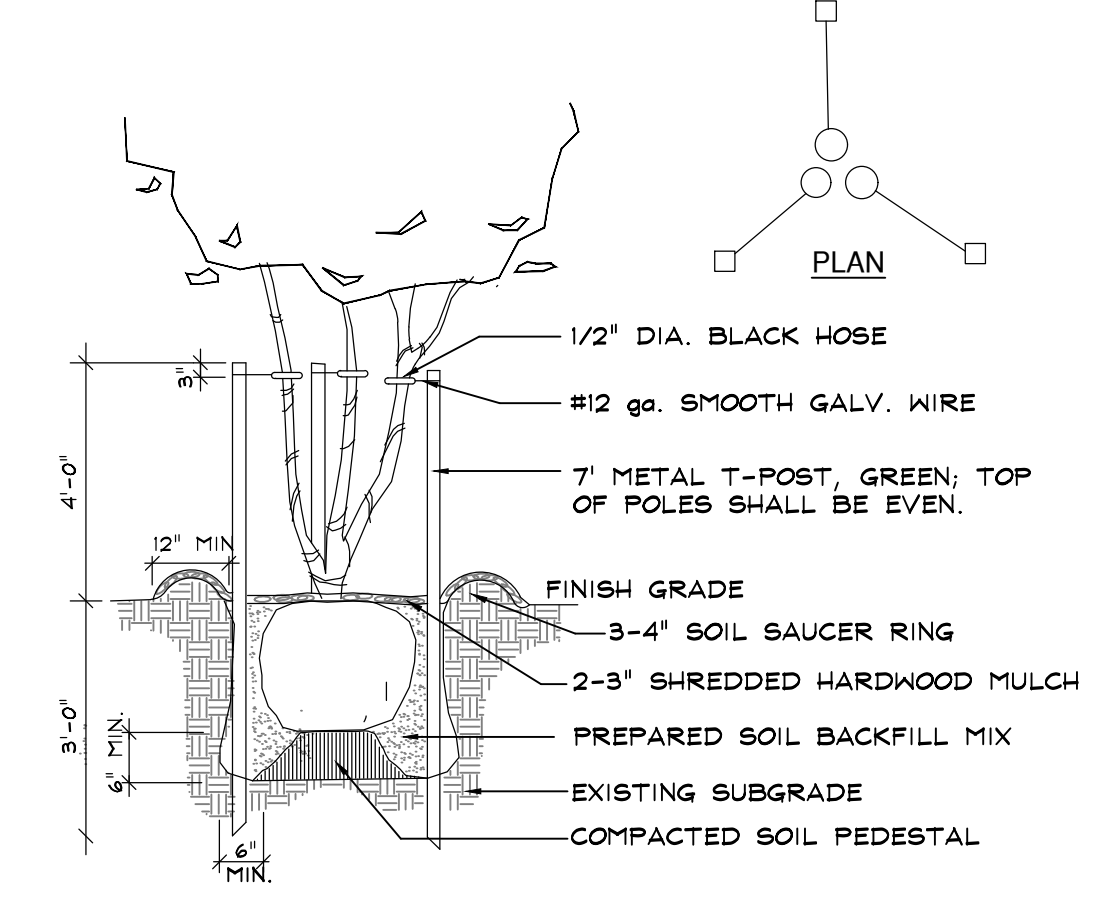


C - SOOD PLANTING
SCALE: NTS

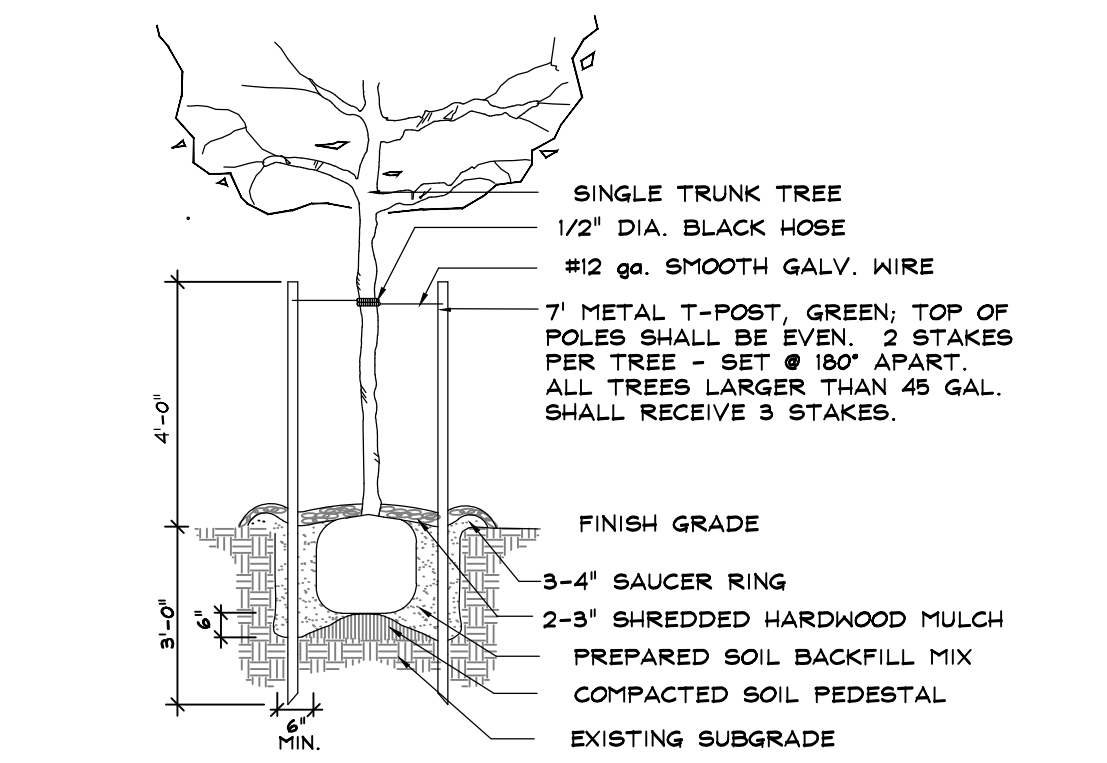
D - BULLROCK 3\"/>



E - SHRUB PLANTING
SCALE: NTS



F - MULTI-STEM TREE PLANTING
SCALE: NTS



G - TREE PLANTING
SCALE: NTS

PLANTING

1.01 RELATED DOCUMENTS
A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and all applicable specification sections, apply to this section.

1.02 DESCRIPTION OF WORK
A. This Section specifies the requirements for providing planting materials and their installation as indicated and scheduled. For grass installation refer to Section 02487 - Turf.

1.03 QUALITY ASSURANCE
A. Installer: Installation of planting work shall be performed by a single firm specializing in landscape and planting work. Contractor shall be licensed by the Texas Association of Nurserymen, shall possess an agricultural certificate, shall be a licensed pest applicator, and shall have not less than 5 years of experience in this type of work.

B. Quality Control
1. Trees, Shrubs, and Groundcovers:
a. Provide plants of quantity, size, genus, species and variety shown and scheduled for planting work and complying with recommendations and requirements of ANSI Z601.1 "American Standard for Nursery Stock."
b. 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 distortion.
c. Label each plant with securely attached waterproof tag bearing legible designation of botanical and common name.
d. Compliance: Ship planting materials with Certificates of Inspection as required by governing authorities. Comply with all applicable local, state, and federal requirements regarding materials, methods of work, and disposal of excess and waste materials.
e. Substitutions: Do not make substitutions unless approved in writing by Landscape Architect. If specified planting material is not obtainable, submit proof of non-availability to Landscape Architect together with proposal for use of equivalent material. Contractor shall submit proposal in a timely manner so as to impact project completion or installation of other work.
f. Analysis and Standards: All packaged products shall be delivered in original manufacturer's sealed containers. For unpackaged materials, submit analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
g. Inspection: Notify Landscape Architect at least 2 weeks prior to installation, of location where materials that have been selected for planting may be inspected, either at place of growth or the site prior to planting. Plant material will be inspected for compliance with requirements for genus, species, variety, size and quality. Landscape Architect retains right to further inspect trees for size and conditions of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Contractor shall remove rejected trees immediately from site and replace with specified materials. Plant material not installed in accordance with Contract will be rejected.
C. Reference standards applicable to this section:
1. ANSI: American National Standards Institute
2. Z601: Nursery Stock
2. Association of Official Agriculture Chemists
3. FS: Federal Specifications and Standards
a. Q-P-166E: Peat, Moss; Peat, Humus; and Peat, Reed-Sedge
4. NBS: National Bureau of Standards
a. PS24: Fertilizer Product Standard

1.04 SUBMITTALS
A. Work Schedule: Contractor shall submit a work schedule for all planting work prior to purchase and installation of plant material.
B. Certification:
1. Submit, for Landscape Architect's review and approval, manufacturer's or vendor's certified analysis of soil amendments. Submit other data substantiating that materials comply with specified and indicated requirements.
2. Fertilizer certification shall be submitted for Landscape Architect's review and approval as to the chemical analysis of the fertilizer, a listing of the elements contained therein and their percentages.
C. Maintenance Instructions: Submit typewritten instructions, including manufacturer's recommendations and instructions recommending procedures to be established by Owner for maintenance of planting work. Submit instructions prior to expiration of contractor's required maintenance period.
D. Submittals: Contractor shall submit in writing materials used on jobsite. Provide company name of product or nursery.

1.05 DELIVERY, STORAGE AND HANDLING
A. Packaging Materials: Deliver packaged materials in fully labeled original containers showing weight, analysis and names of manufacturer. Protect materials from deterioration during delivery, and while stored on site.
B. Plants:
1. Do not drop stock during delivery.
2. Materials shall not be pruned prior to installation unless otherwise approved by Landscape Architect in writing. Do not bend or bind-tie trees and shrubs in such a manner as to damage bark, break branches or destroy natural shape. Provide protective covering during delivery.
3. Deliver plants after preparation for planting has been completed and plant immediately. If planting is delayed more than 7 hours after delivery, set plants in shade, protect from weather and mechanical damage. Keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture, and water as needed.
4. Do not remove container grown stock from containers before time of planting and water immediately after delivery and prior to planting.

1.06 JOB CONDITIONS
A. Work Scheduling: Proceed with and complete planting work in a timely manner, working within seasonal limitations for each kind of planting work required.
B. Planting time
1. Coordinate planting with specified maintenance periods to provide maintenance from date of Substantial Completion.
2. Plant to frost-tender trees only after danger of frost is past or sufficiently before frost season to allow for establishment before first frost. Do not plant in frozen ground.
3. Plant trees, shrubs and groundcover after final grades are established and prior to planting of lawns, unless otherwise directed by Landscape Architect in writing. If planting occurs after lawn work, protect lawn areas and promptly repair damage to areas resulting from planting operations.
C. Utilities: Refer to engineering drawings and coordinate with Utility Contractor for location of utilities. Contractor shall be responsible for damage to existing utilities and structures.
D. Security: The Owner will not assume any responsibility for security of any materials, equipment, etc. during construction of the project until project acceptance.
E. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions beyond the scope of this contract, or obstructions, notify Landscape Architect of such conditions, immediately and before planting.
F. Pollution Control: Control dust caused by planting operations. Dampen surfaces as necessary. Comply with pollution control regulations of governing authorities.

1.07 SUBSTANTIAL COMPLETION AND FINAL ACCEPTANCE
A. Substantial Completion notice for planting work will be issued by Landscape Architect only for entire planting and landscape work.
B. Substantial Completion notice will be issued only after Owner and Landscape Architect inspect and approve all required planted materials and grassed areas.
C. Final acceptance will be determined after the maintenance period and when all plant materials are alive and healthy and grass areas are established.
D. Final acceptance notice will be issued only after Owner and Landscape Architect inspect and approve all planting work as in accordance with the Contract Documents.

1.08 SPECIAL PROJECT WARRANTY
A. Contractor shall furnish warranty of trees, shrubs and groundcover for 12 months after date of final acceptance, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner or abuse or damage by others.
B. Remove and replace shrubs and groundcover found to be dead or in unhealthy condition during warranty period. Replace shrubs and groundcover which are in doubtful condition at end of warranty period. However, if in the opinion of Owner, such doubtful material may survive, Contractor shall extend the warranty period for a full growing season. Owner will determine which items are in doubtful condition.
C. Another inspection will be conducted by Owner, at end of extended warranty period to determine acceptance or rejection.

PART 2 PRODUCTS
2.01 MATERIALS
A. Fertilizer
1. Granular fertilizer shall be a commercial fertilizer, uniform in composition, free flowing, and suitable for application with approved equipment. Fertilizer which has been exposed to high humidity and moisture, has become caked or otherwise damaged making it unsuitable for use, will not be acceptable. Application shall be Granocote 13, 13, 13 + iron by Sierra Chemical, 1-800-492-8225, 1001 Yosemite Dr., Milpitas, CA 95035, or approved equal. Broadcast rotol fertilizer at the rate of 3 lbs. Actual nitrogen per 1000 square feet into prepared planting soil.

2.02 PLANT MATERIALS
A. Shrubs and Groundcover: Provide specimen quality plant material as described in Construction Documents. All individual species of plant material shall be obtained and provided from a single source.
PART 3 EXECUTION
3.01 PREPARATION
A. Grading
1. Strip existing vegetation and soil in areas to receive planting and grass to depth shown on drawings.
2. Prepare beds to ensure plant material is not planted in ponding water and avoid "wet feet."
3. Perform grading within Contract limits, including adjacent transition areas, where required, to new elevations, levels, and contours indicated. Provide subgrade surfaces parallel to finished surface grades. Provide uniform levels and slopes.
4. Grade surface to ensure areas drain away from structures and to prevent ponding and pockets of surface drainage. Provide subgrade surfaces free from irregular surface changes. Provide finished surface grades. Provide uniform levels and slopes.
5. Fine grade topsoil eliminating rough and low areas to ensure positive drainage. Maintain reference points, and contours as shown on drawings.
6. Remove stones, roots, weeds, and debris while raking topsoil. Rake surface clean of stones 1 inch or larger in any dimension and of all debris. Place planting backfill mix to depth specified on drawings.
7. All finished grades shall meet line and grade of pavement. Finished grades (top of soil prior to hydromulch) shall be maximum of 1 inch below roadway pavement surface. Grade all slopes from rear of landscape easement or center of medians to walkways and curbs at a minimum of 2 percent slope.
B. Plant Layout: Layout individual tree locations of trees to be machine moved by others and areas for multiple plantings as shown on drawings. In case of conflicts or non-contract conditions, notify Landscape Architect before proceeding with the work.
C. Preparation of Planting Backfill Mix
1. Mix specified soil amendments and fertilizers with topsoil at rates indicated. Delay mixing of fertilizer if planting will not follow placing of planting soil within 48 hours, unless otherwise directed. Amendments into soil shall be a part of the soil preparation process prior to fine grading, fertilizing, and planting. Each amendment material shall be broadcast or spread evenly at the specified rate over the planting area.
2. Amendments shall be thoroughly incorporated into the topsoil until amendments are pulverized and have become a homogeneous layer of soil ready for planting.
3. Incorporation and mixing shall be accomplished by mechanical means.
4. For planting beds, mix planting soil prior to backfilling.
5. Fine grade topsoil shall be applied at a rate of 1-1/2 inches per acre. Apply after dew has dried and when no rain is expected for 6 hours.
6. Perform grading and planting work as indicated on drawings. Apply to entire area of planting/grading.

3.02 PLANTING
A. Excavation for Shrubs
1. Excavate pits, beds and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.
2. Make excavations at least half again as wide as the ball diameter and equal to the ball depth, plus allowance for root ball and soil in layers of compacted backfill.
3. Dispose of subsoil removed from planting excavations. Do not mix with planting soil or use on site.
B. Planting Large Shrubs
1. Stack on layer of compacted planting soil mixture, plumb and in center of pit or excavation as indicated on planting grades. Place fertilizer tablets evenly spaced in hole at specified rate. Place additional backfill mix around base, and sides of ball and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3 full, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed. Do not top dress with mulch. Remove and replace excessively pruned or misshapen stock resulting from improper pruning.
C. Planting Shrubs, Groundcover and Seasonals
1. Excavate hole as necessary to accommodate root ball. Place fertilizer tablet(s) or granular fertilizer in hole according to recommended rate. Backfill hole with planting backfill mix.
2. Water after planting to remove voids and place additional prepared soil to cover root ball if necessary.

3.03 MAINTENANCE
A. Contractor shall correctly maintain the sodded areas throughout the installation process and throughout the landscape maintenance period as specified in Section 02483, Exterior Landscape Maintenance.
B. While planting work is completed and at the completion of maintenance period, Owner will make an inspection to determine acceptability.
C. When inspected planting work does not comply with the Contract Document requirements, replace rejected work and continue specified maintenance until inspected by Owner and found to be acceptable. Contractor shall remove rejected plants and materials promptly from site.
END OF SECTION

SODDING
PART 1 GENERAL
1.01 RELATED DOCUMENTS
A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and all applicable specification sections, apply to this section.
1.02 DESCRIPTION OF WORK
A. Provide sodding as specified and as indicated.
1.03 SUBMITTALS
A. Sod Certification: Certification shall be submitted from the sod nursery as to the grass species, location of the field from which the sod has been stripped and the date of stripping. Certification shall accompany the delivery of the sod.
B. Fertilizer Certification: Certification shall be submitted from the fertilizer manufacturer as to the chemical analysis of the fertilizer, a listing of the elements contained therein and their percentages. Certification shall also indicate that the fertilizer is in accordance with the requirements of the Texas Association of Nurserymen.
1.04 PRODUCT HANDLING
A. Sod Delivery: Sod shall be delivered on pallets with the root system protected from exposure to wind and sun. Stripping and delivery shall be timed so that sod will be placed within 48 hours of stripping.
B. Fertilizer Delivery: Fertilizer shall be delivered in the manufacturer's unopened containers, labeled to indicate the manufacturer's name and product identification. Containers shall be stored protected from ground contact and from the elements.
1.05 JOB CONDITIONS
A. Sod shall be placed during the period between the last freeze in the spring and 6 weeks prior to the average date for the first freeze in the fall according to the National Weather Service for the area in which the work is located.
1.06 GUARANTEE
A. A written guarantee shall be provided guaranteeing the sodded areas are in a healthy, vigorous, undamaged condition for a period of 90 days beginning on the date of final acceptance. Guarantee shall provide for filling, leveling, and repairing eroded areas, or resodding areas exhibiting lack of healthy growth.

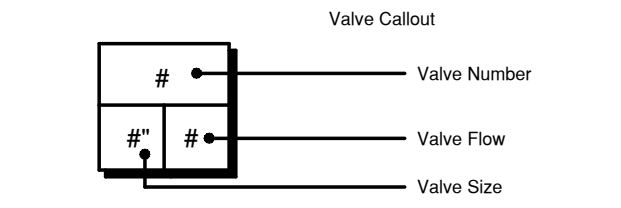
2.02 PLANT MATERIALS
A. Sod: Provide sod of nursery grown Common Bermuda sod having a healthy, white root system of dense, thickly matted roots throughout the soil of the sod for a minimum thickness of 1 inch. Sod shall be free of noxious weeds and undesirable native grasses. Soil attached to the sod shall be free of stones and debris.
B. Sod shall have been mowed within 7 days of being stripped. Sod shall be provided in rectangular pads of not less than 12 inches nor more than 24 inches. Dry sod will be rejected.
2.03 TOPSOIL
A. Provide topsoil which is fertile, friable, natural loam, surface soil, free of subsoil, clay lumps, brush, weeds and other litter, and free of roots, stumps, stones larger than 2 inches in any dimension and other extraneous or toxic matter harmful to plant growth.
B. Obtain topsoil only from naturally well-drained sites where topsoil occurs in a depth of not less than 4 inches. Topsoil shall not be collected from sites that are infested with growth of or the reproductive parts of noxious weeds, especially nut grass. Topsoil shall not be stripped, collected or deposited while wet. Topsoil shall not be excessively acid or alkaline or contain toxic substances which may be harmful to plant growth. Topsoil shall be without admixture of subsoil.
2.03 FERTILIZER
A. Fertilizer shall be granulated fertilizer with an analysis of 16-8-8 + iron, unless otherwise indicated. The figures in the analysis represent the percent of nitrogen, phosphoric acid and potash nutrients respectively.
B. Fertilizer shall be uniform in composition and dry. Fertilizer shall be furnished in unopened containers, labeled to indicate the analysis of the contents. Caked or otherwise damaged material will be rejected.
PART 3 EXECUTION
3.01 INSPECTION
A. Surfaces indicated to be sodded shall be inspected to verify that all preceding work in the area has been completed. Sodding shall not start until all preceding work has been completed.
3.02 SODDING
A. Preparation
1. Strip existing vegetation and 1 inch of existing soil from all areas to receive sod not stripped and graded under previous work or contract.
2. After stripping, loosen soil to a depth of 1-1/2 inches prior to laying sod. Remove all stones, roots, vegetation, rubbish, debris and other foreign matter 1/2 inch in diameter or larger from the top 2 inches of soil. No foreign matter may be buried on site. Hand rake to achieve smooth grade.
3. Fertilizer shall be uniformly spread over the topsoil at the average rate of 400 lbs. per acre and shall be raked into the topsoil to a full 2-inch depth.
4. Immediately prior to placing sod, the fertilized topsoil substrate shall be lightly misted.
B. Installation
1. All sod shall be carefully laid in parallel rows in a smooth manner, alternating odd joints.
2. Fit sod strips tightly together so that no joints are visible and tamper firmly. Cut pieces of sod to fill any voids in the sod.
3. Water sod immediately after planting, slowly but thoroughly, to secure at least six (6) inches penetration into the soil below the sod. Do not allow the blades of grass to will. The sodded area shall be rolled to form a thoroughly even, solid mat. Any voids left in block sodding shall be filled with cut sod pieces and/or topsoil.
4. Treat entire area with Durban as per manufacturer's instructions.
3.03 MAINTENANCE OF SODDED AREAS
A. Contractor shall correctly maintain the sodded areas throughout the installation.
B. Contractor shall be responsible for care and maintenance of entire project.
END OF SECTION

H - GROUNDCOVER PLANTING
SCALE: NTS

Job No.:	162-04-016
Scale:	NTS
Date:	May 29, 2024
Revised:	

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
	Rain Bird 1804 15 Strip Series	12	30
	Turf Spray 4.0" Pop-Up Sprinkler with Co-Molded Wiper Seal. 1/2" NPT Female Threaded Inlet.	59	30
	Rain Bird 1812 5 Series MPR Shrub Spray 12" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet.	40	30
	Rain Bird 1812 ADJ Shrub Spray 12" Pop-Up Sprinkler with Co-Molded Wiper Seal. Side and Bottom Inlet. 1/2" NPT Female Threaded Inlet.	36	30
	Rain Bird 1804-1400 Flood Flood Bubbler 4.0in. popup, install w/ PA-80 adapter.	34	30
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
	Rain Bird XZCZ-100-IVMQ 1" Wide Flow IVM Drip Control Kit for Commercial Applications. 1in. Ball Valve with 1in. PESBIVM Smart Valve w/ factory installed IVM-SOL 0.3-20 gpm and 1in. Pressure Regulating 40psi Quick-Check Basket Filter 0.3-20 gpm	2	
	Pipe Transition Point above grade Pipe transition point from PVC lateral to drip tubing with riser to above grade installation.	14	
	Area to Receive Dripline Rain Bird XFD-06-12 XFD On-Surface Pressure Compensating Landscape Dripline. 0.6 GPH emitters at 12" O.C. Dripline laterals spaced at 12" apart, with emitters offset for triangular pattern. UV Resistant. Specify XF insert fittings.	696.8 l.f.	30
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY	PSI
	Rain Bird PEB 1" 1", 1-1/2", 2" Plastic Industrial Valves. Low Flow Operating Capability, Globe Configuration.	7	
	Febc 765 1" Pressure Vacuum Breaker, brass with ball valve SOV. Install 12in. above highest downstream outlet and the highest point in the downstream piping.	1	
	Water Meter 1"	1	
	Irrigation Lateral Line: PVC Class 200 SDR 21	3,244 l.f.	
	Irrigation Mainline: PVC Schedule 40	611.5 l.f.	
	Pipe Sleeve: PVC Schedule 40	255.8 l.f.	



VALVE SCHEDULE

NUMBER	MODEL	SIZE	TYPE	GPM	HEADS	PIPE	WIRE	DESIGN PSI
1	Rain Bird PEB	1"	Shrub Spray	2.86	5	33.7	386.1	30
2	Rain Bird PEB	1"	Turf Spray	17.8	17	328.0	331.2	30
3	Rain Bird PEB	1"	Turf Spray	15.73	12	163.3	254.1	30
4	Rain Bird PEB	1"	Bubbler	17	34	1,176	97.2	30
5	Rain Bird PEB	1"	Turf Spray	21.36	22	232.4	86.9	30
6	Rain Bird PEB	1"	Shrub Spray	18.35	49	454.6	82.1	30
7	Rain Bird PEB	1"	Turf Spray	19.53	20	824.8	71.9	30
8	Rain Bird PEB	1"	Shrub Spray	17.51	22	164.9	124.3	30
9	Rain Bird XZCZ-100-IVMQ	1"	Area for Dripline	3.59	359.4 l.f.	97.1	74.9	30
10	Rain Bird XZCZ-100-IVMQ	1"	Area for Dripline	3.38	337.4 l.f.	90.5	239.2	30
	Common Wire						611.5	

CRITICAL ANALYSIS

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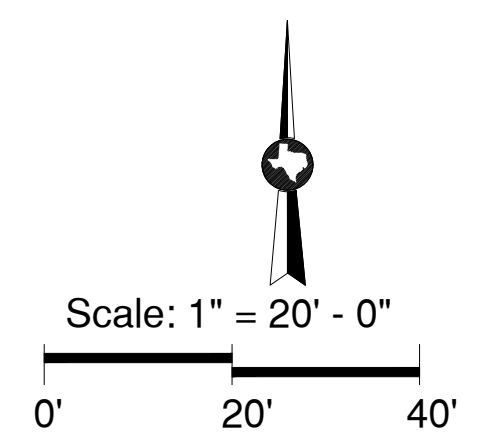
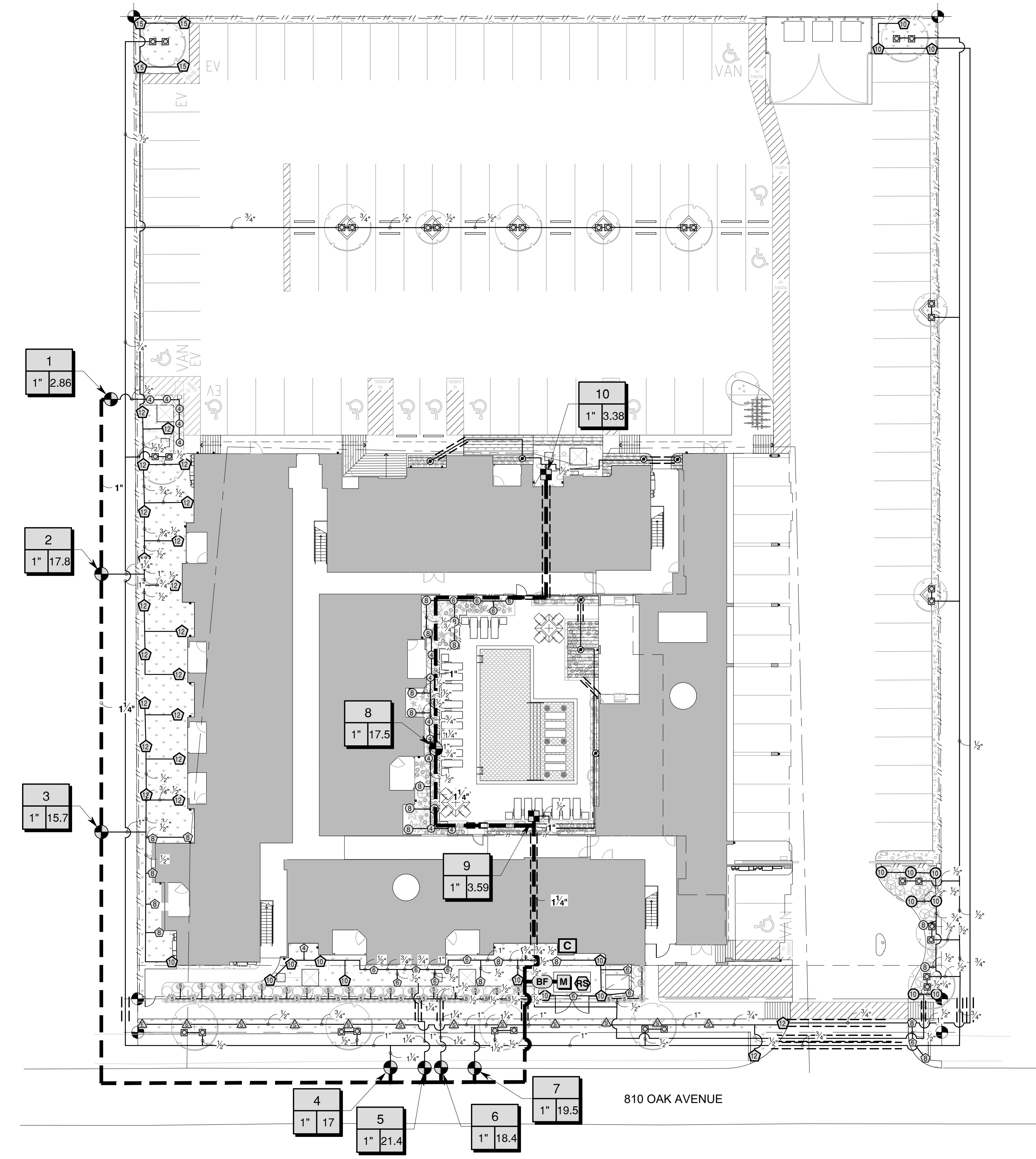
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Water Source Information:

FLOW AVAILABLE
Water Meter Size: 1"
Flow Available: 37.5 GPM

PRESSURE AVAILABLE
Static Pressure at POC: 60 PSI
Elevation Change: 5.00 ft
Service Line Size: 3"
Length of Service Line: 20 ft
Pressure Available: 58 PSI

DESIGN ANALYSIS
Maximum Station Flow: 37.5 GPM
Flow Available at POC: 37.5 GPM
Residual Flow Available: 0 GPM

Pressure Req. at Critical Station: 0 PSI
Loss for Fittings: 0 PSI
Loss for Main Line: 0 PSI
Loss for POC to Valve Elevation: 0 PSI
Loss for Backflow: 0 PSI
Critical Station Pressure at POC: 0 PSI
Pressure Available: 58 PSI
Residual Pressure Available: 58 PSI



LOST OAKS
Oak Avenue
Houston, TX
Landscape Improvements

Job No.: 162-04-008

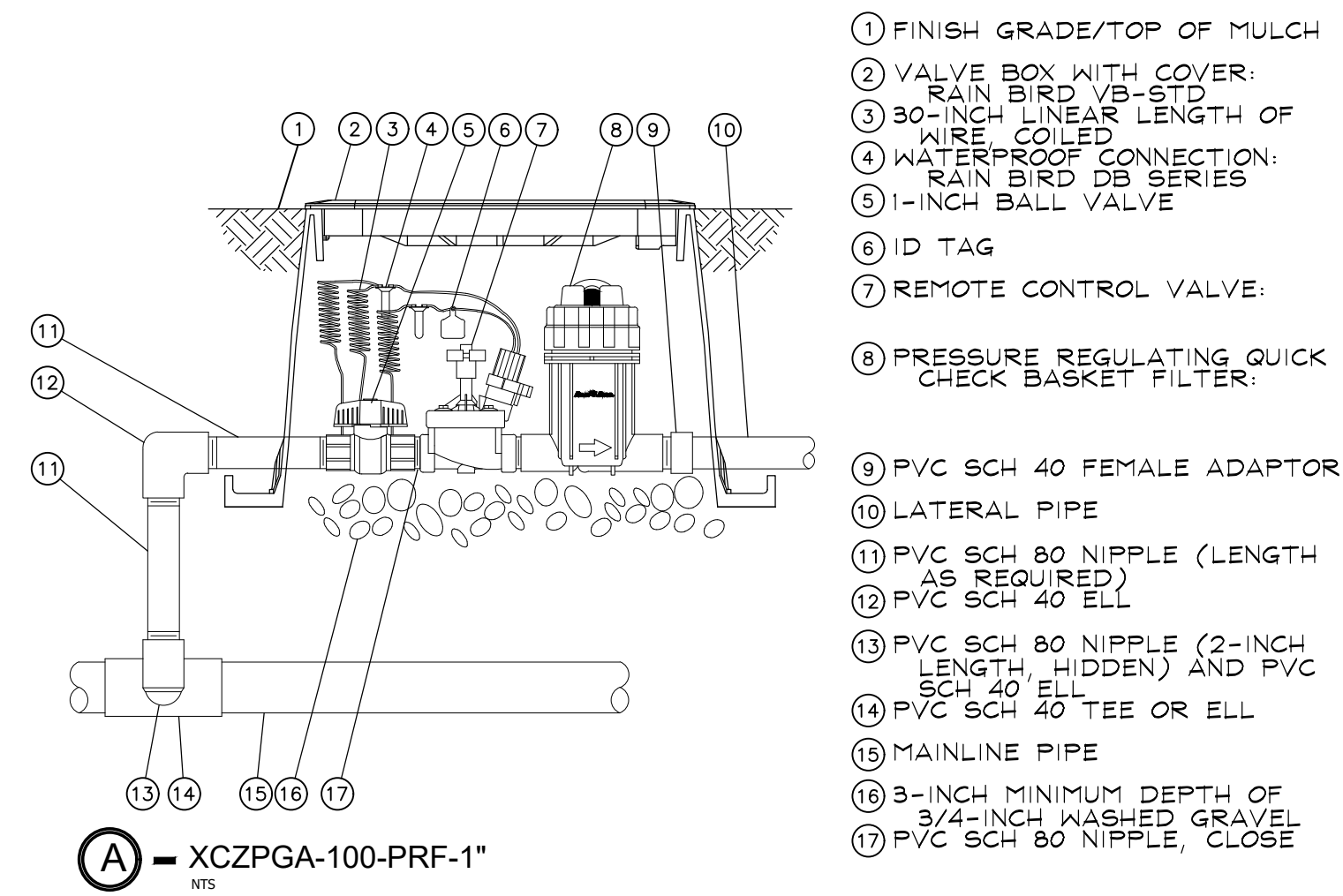
Scale: 1" = 20' - 0"

Date: May 29, 2024

Revised:

Irrigation Plan

L2.01

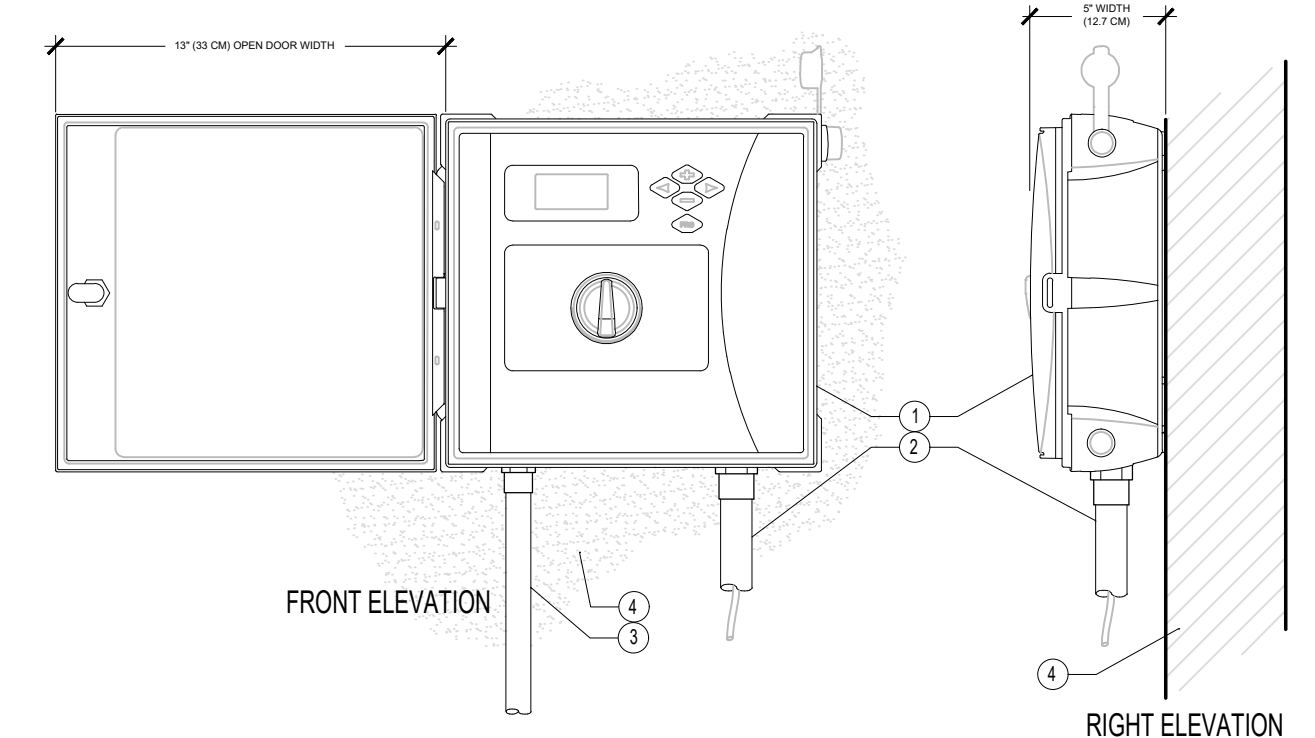


A - XCZPGA-100-PRF-1*
NTS

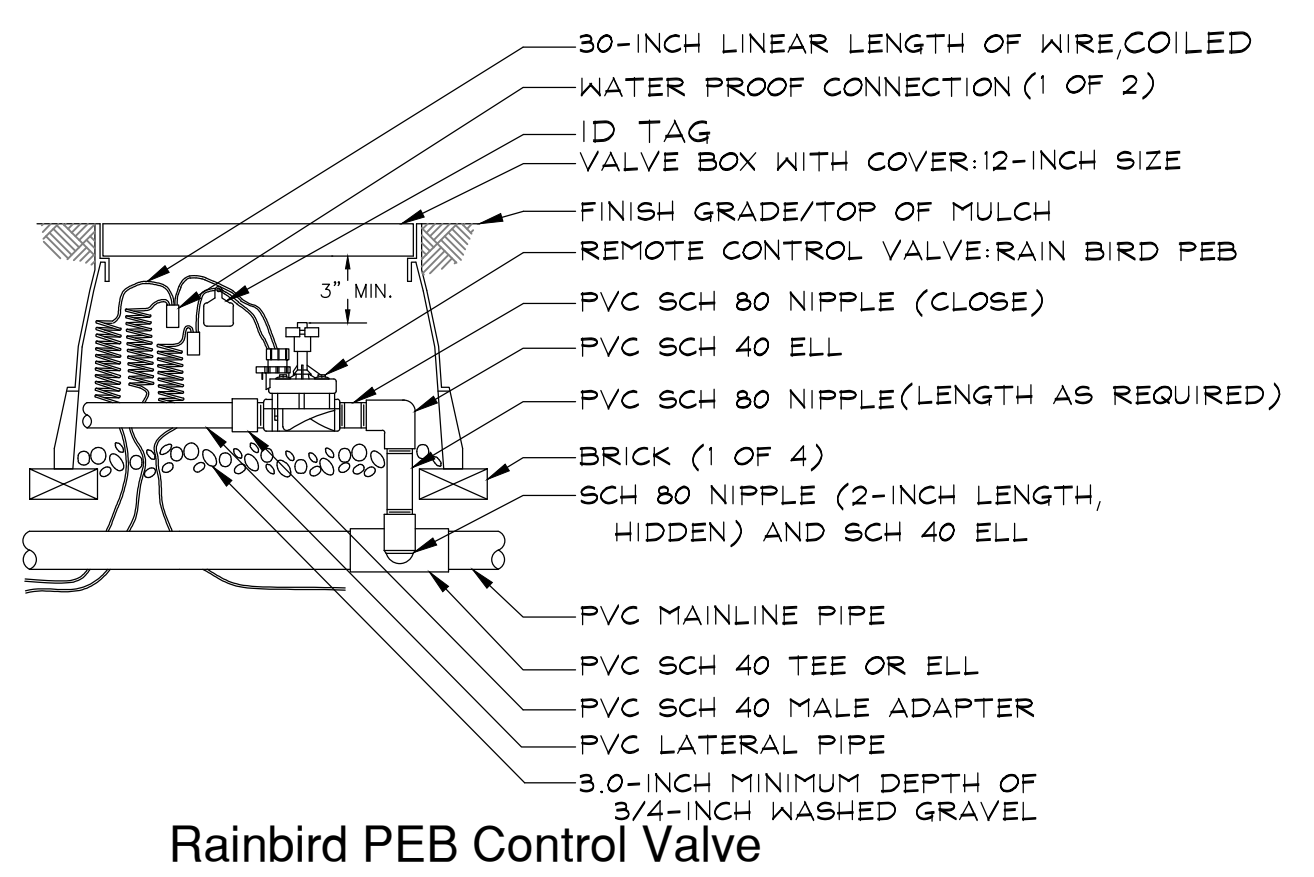
- 1 FINISH GRADE/TOP OF MULCH
- 2 VALVE BOX WITH COVER: RAIN BIRD VB-STD
- 3 30-INCH LINEAR LENGTH OF WIRE COILED
- 4 WATERPROOF CONNECTION: RAIN BIRD DB SERIES
- 5 1-INCH BALL VALVE
- 6 ID TAG
- 7 REMOTE CONTROL VALVE:
- 8 PRESSURE REGULATING QUICK CHECK BASKET FILTER:
- 9 PVC SCH 40 FEMALE ADAPTOR
- 10 LATERAL PIPE
- 11 PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
- 12 PVC SCH 40 ELL
- 13 PVC SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND PVC SCH 40 ELL
- 14 PVC SCH 40 TEE OR ELL
- 15 MAINLINE PIPE
- 16 3-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL
- 17 PVC SCH 80 NIPPLE, CLOSE

- 1 IRRIGATION CONTROLLER: HUNTER ICC2-PL (SIZE PER ZONES)
- 2 IRRIGATION CONTROL WIRE IN CONDUIT (SIZE AND TYPE PER LOCAL CODES)
- 3 ELECTRICAL SUPPLY CONDUIT (CONNECT TO POWER SOURCE, J-BOX INSIDE CONTROLLER)
- 4 ADJACENT SURFACE TO MOUNT CONTROLLER PER PLAN

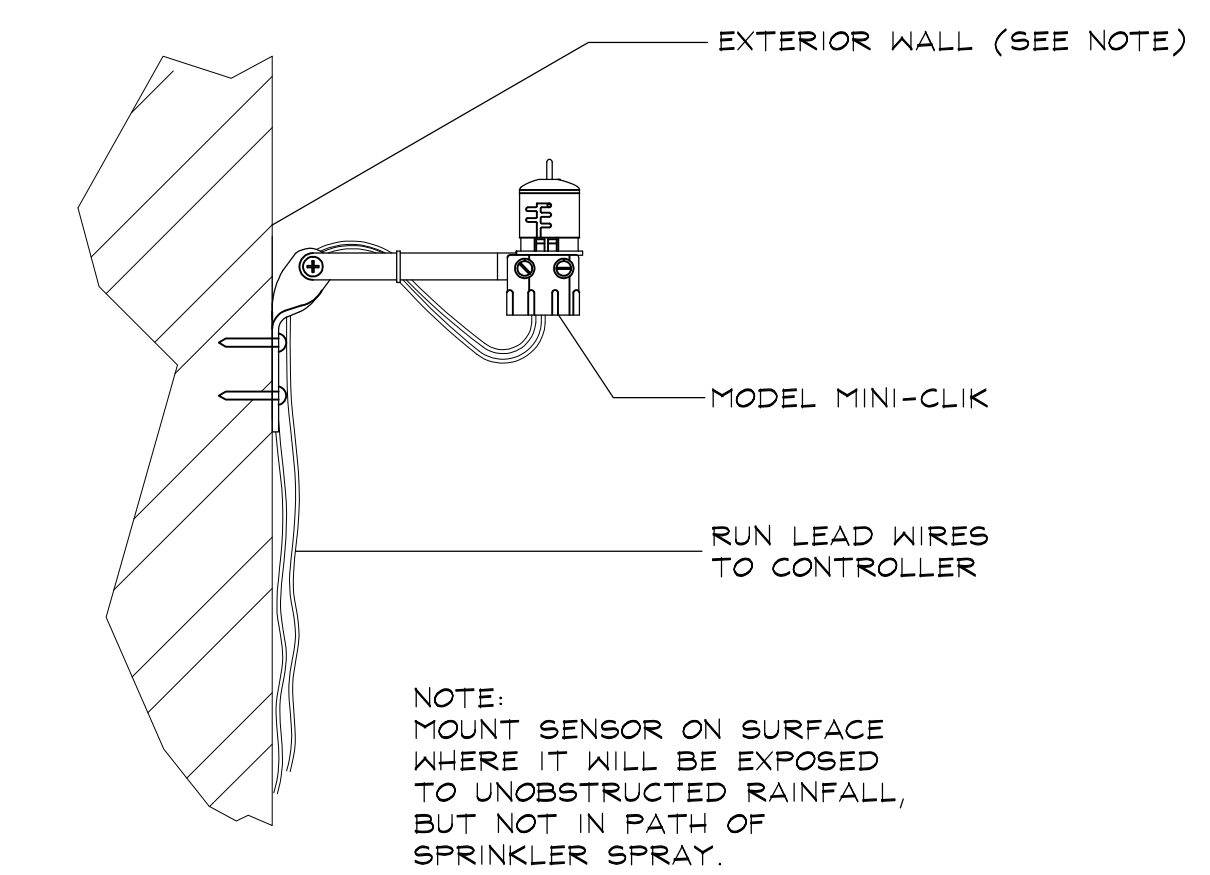
NOTE:
MOUNT CONTROLLER LCD SCREEN AT EYE LEVEL, CONTROLLER SHALL BE HARD-WIRED TO GROUNDED 110 VAC POWER SOURCE



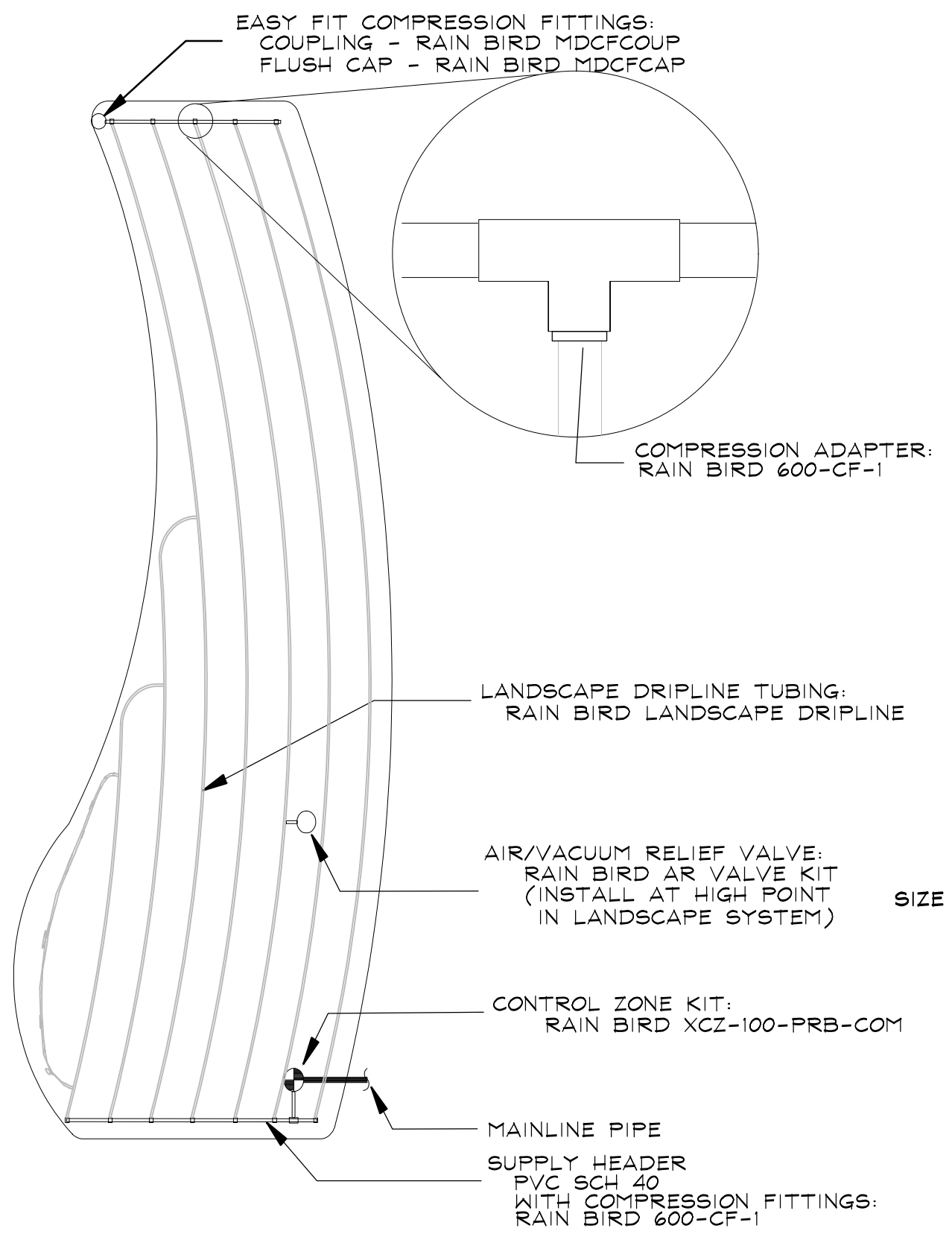
C - IRRIGATION CONTROLLER - HUNTER ICC2-PL
NTS



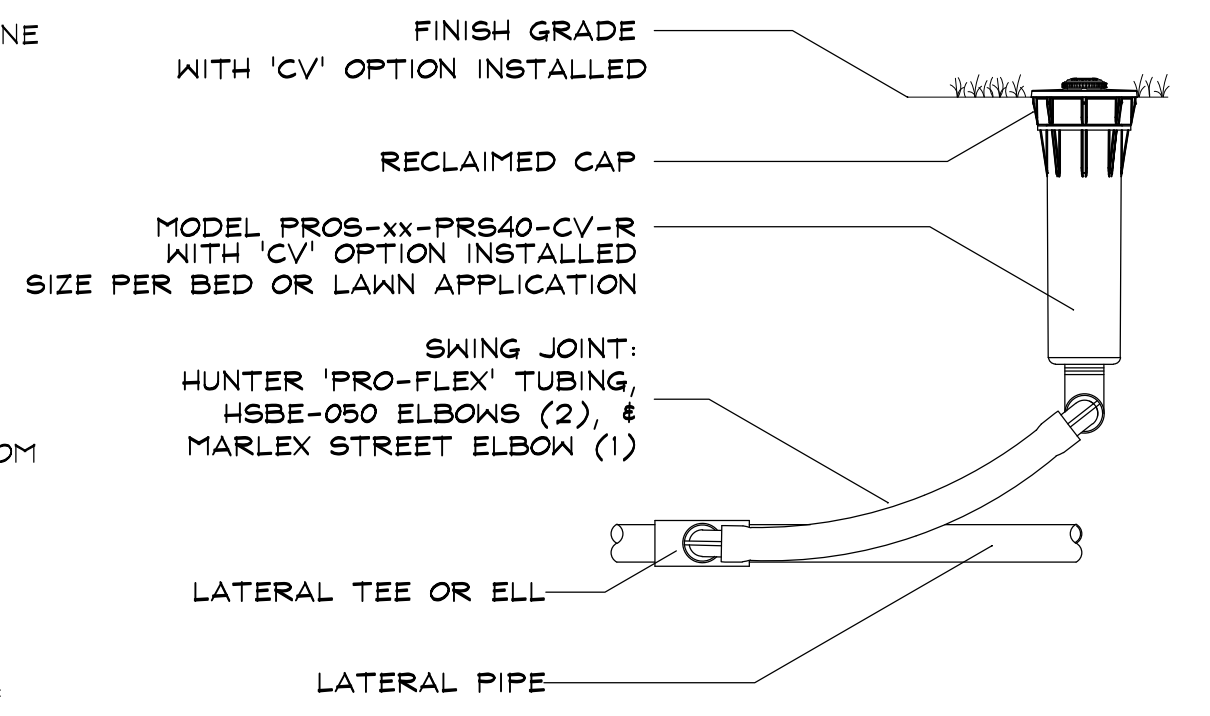
B - IRRIGATION CONTROL VALVE
NTS



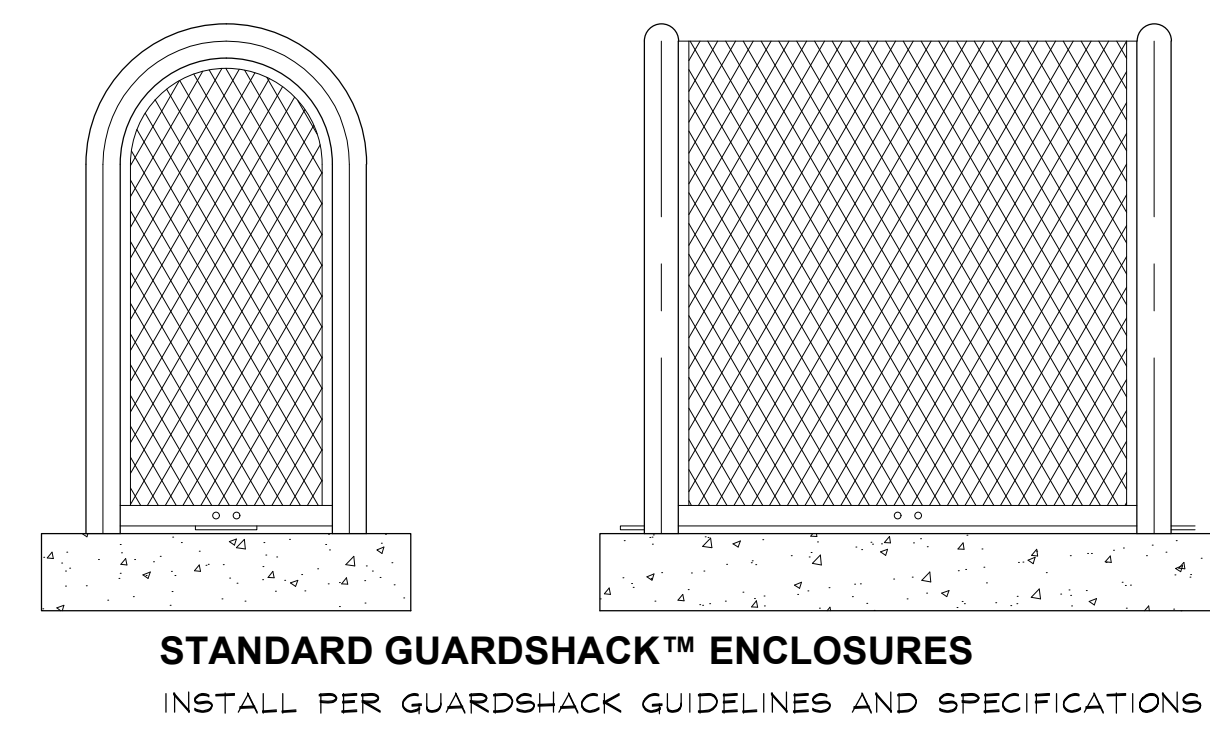
D - HUNTER MINI-CLIK
NTS



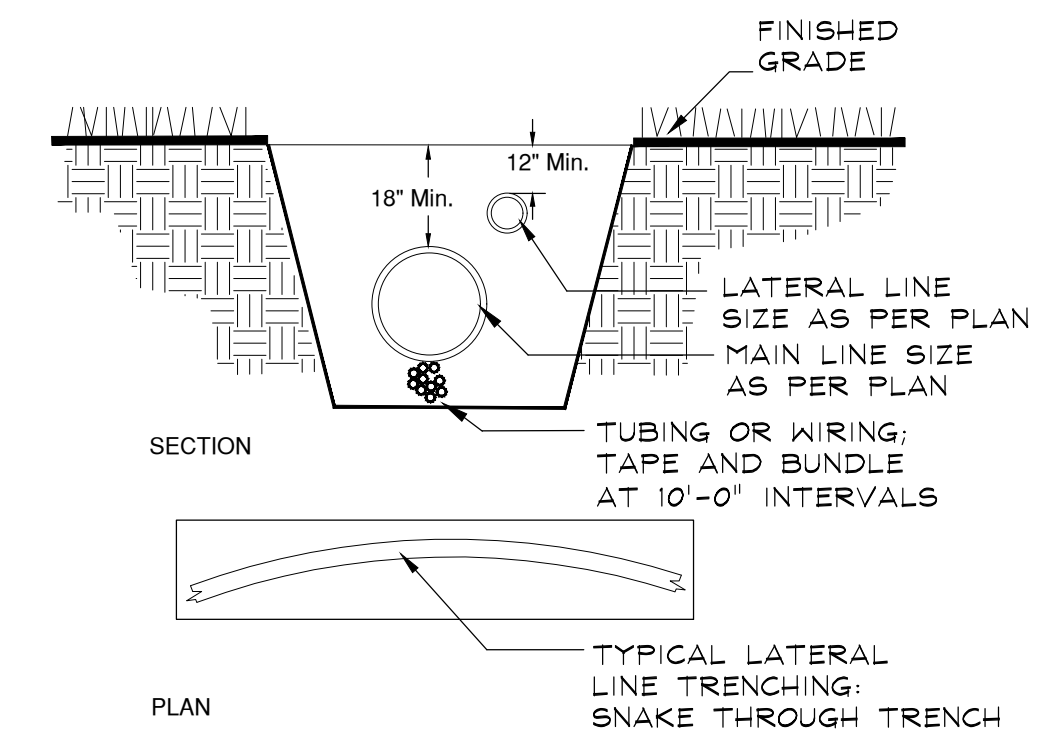
E - DRIPLINE LAYOUT, TYP.
NTS



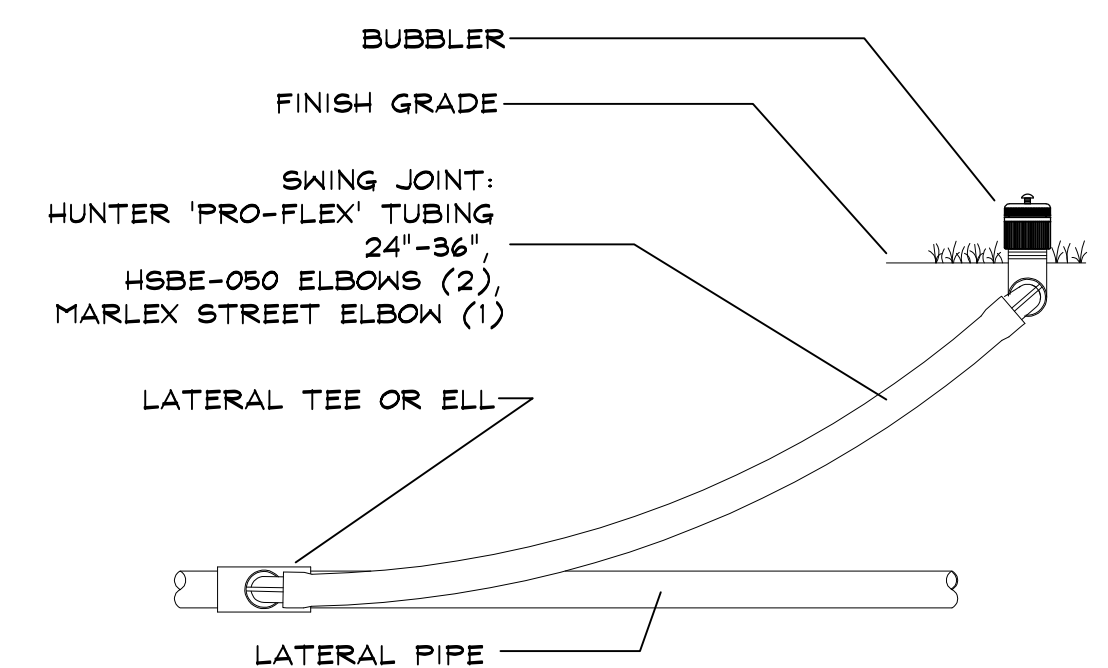
F - HUNTER POP-UP SPRAY /W MP ROTATOR
NTS



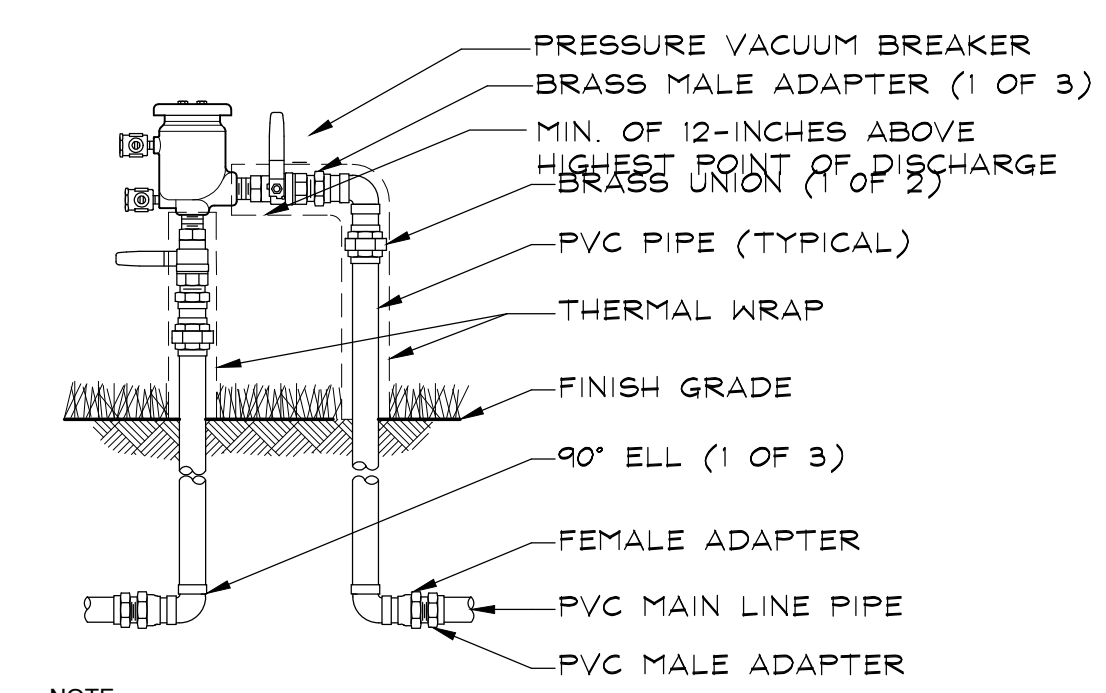
G - BACKFLOW ENCLOSURE
NTS



H - TRENCH DETAIL
NTS

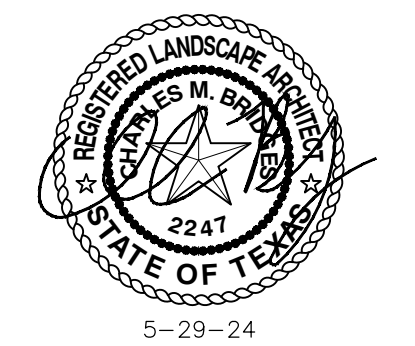


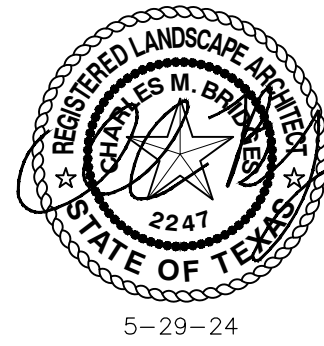
I - HUNTER AFB TREE BUBBLER
NTS



J - FEBCO #765 PVB (PRESSURE VACUUM BREAKER)
NTS

NOTE:
1. INSTALL BACK FLOW PREVENTER AS REQUIRED BY LOCAL CODES AND HEALTH DEPARTMENT. VERIFY LOCAL REQUIREMENTS PRIOR TO INSTALLATION. DOUBLE CHECK VALVE ASSEMBLY MAY BE REQUIRED





LOST OAKS
Oak Avenue
Houston, TX
Landscape Improvements

Job No.:	162-04-008
Scale:	NTS
Date:	May 29, 2024
Revised:	

Irrigation Specifications

L2.03

IRRIGATION SYSTEM

PART 1 GENERAL

1.01 RELATED DOCUMENTS
A. Drawings and General Provisions of Contract, including General and Supplementary
Conditions and all applicable specification sections, apply to this section.

1.02 DESCRIPTION
A. This Section specifies the requirements for providing the irrigation system as indicated on the Drawings.
B. Contractor shall provide irrigation system as a complete system including but not limited to: heads, valves, valve boxes, control wire splice boxes, control wiring, electric controller, piping circuits, vacuum breaker, water meters and all accessories,
including electric power source coordination and installation.

1.03 QUALITY ASSURANCE
A. Available Manufacturers: Subject to compliance with specified requirements, manufacturers offering products which may be incorporated in the Work are included in the specifications or denoted on the Drawings.
B. Installer: Installation of Irrigation System shall be performed under the direction of a State of Texas licensed irrigator with not less than 5 years experience in this type of work.
C. Reference Standards Applicable to this Section:

- 1. ANSI: American National Standards Institute
 - a. Z55.1: Gray Finishes for Industrial Apparatus and Equipment
- 2. ASTM: American Society for Testing and Materials
 - a. B88: Specifications or Seamless Copper water tube.
 - b. D 1785: Specifications for Poly Vinyl Chloride (PVC) Plastic Pipe, Schedules 40, 80 and 120.
 - c. D 2241: Specification for Poly Vinyl Chloride (PVC) Pressure Rated Pipe (SDR Series)
 - d. D 2466: Specification for Poly Vinyl Chloride (PVC) Plastic Pipe Fittings, Schedule 80.
 - e. D 2564: Specification for Solvent Cements for Poly Vinyl Chloride (PVC) Plastic Pipe and Fittings.
 - f. F 690: Practice for Underground Installation of Thermoplastic Pressure Piping Irrigation Systems.

- 3. AWWA: American Water Works Association
 - a. C 500: Gate Valves, 3 inches through 48 inches NPS, for Water
 - b. C 506: Backflow Prevention Devices, Reduced Pressure Principle and Double Check Valve Types.
- 4. IAMP0: International Association of Plumbing Mechanical Officials
- 5. NEMA: National Electrical Manufacturer's Association
 - a. 250: Enclosures for Electrical Equipment (1000 Volts Maximum)
- 6. NFPA: National Fire Protection Association
 - a. NFPA 70 (NEC): National Electrical Code
- 7. NSF: National Sanitation Foundation
 - a. No. 14 Plastic Piping System Components and Related Materials

1.04 SUBMITTALS

A. Product Data
1. Submit manufacturer's technical data, specifications, shop drawings, and installation instructions for sprinkler heads, automatic valves, controllers, backflow preventers, connections, details, and related items.
2. Submit manufacturer's operating instructions and a schedule indicating length of time each valve is to be open to produce a given amount of precipitation.
3. Submit maintenance instructions on all items requiring manufacturer's standard detail submittal.

B. Spare and Special Tools: Provide tinner with four (4) spare sprinkler heads of each size and type, two (2) wrenches for each type of head cover and two (2) wrenches for removal and installation of each type of head. In addition, see Section 2.17E
C. Water: potable water to be supplied by Owner. Contractor shall make provisions for all connections required.

1.05 PRODUCT DELIVERY AND HANDLING
A. Materials shall be delivered in manufacturer's unopened packaging labeled to indicate manufacturer's name and product identification. Insure that packaging and labeling remain intact until installation. Materials shall be stored protected from the elements, including direct sunlight.
B. Pipes shall be handled so as to prevent being damaged and to maintain their straightness. Pipe ends shall be wrapped. Pipes shall be stored on beds the full length of the pipes. Damaged or dented pipes or fittings shall not be used.

1.06 DEFINITIONS

A. Irrigation Main: Irrigation main is the piping from the water source to control valves. Irrigation main is that pipe which is on the pressure side of irrigation control valves.
B. Irrigation Lateral Lines: Irrigation lateral line is the piping from the control valves to the irrigation heads. Lateral line is that pipe which is on the non-pressure side of irrigation control valves.

PART 2 PRODUCTS

2.01 PIPES
A. Markings: Thermoplastic pipes should be marked in accordance with ASTM D 1785 and ASTM D 2241 as applicable and shall bear the NSF mark in accordance with NSF 14.
B. Irrigation Main Pipe: ASTM D 2231, PVC, 1120 or 1220, Schedule 40.
C. Irrigation Lateral Line Pipe

- 1. Pipes ¼ inch diameter and larger: ASTM D 2231, PVC, 1120 or 1220, Schedule 40.
- 2. Pipes ½ inch diameter: ASTM D 2231, PVC, 1120 or 1220, Schedule 40.

2.02 SETTINGS FOR THREADED JOINTS
A. ASTM D 2466, PVC, Schedule 80.
2.03 SEALANT FOR THREADED JOINTS
A. Rector Seal Liquid Teflon by Rector Seal Corp., 2830 Produce Row,

Houston, Texas 77023, (713) 928-6423, or approved equal.
2.04 SLEEVES UNDER PAVING FOR CONTROL WIRE AND IRRIGATION LINES
A. ASTM D 2466, PVC, Schedule 40, sized as shown on drawings.

2.05 IRRIGATION SPRINKLERS

A. Pop-Up Spray Sprinklers as specified on drawings.
1. Shall be heavy-duty plastic pop-up to specified height with appropriate nozzle as indicated on Drawings.
2. Irrigation head body, stem, nozzle, and screen shall be constructed of heavy duty plastic.
3. Head shall have wiper seal for cleaning debris as it retracts into case.
4. Plastic nozzles shall have matched precipitation rate with an adjusting screw capable of regulating the radius and flow.
5. Head shall have stainless steel retroactive spring.
6. Head shall have filter screen under nozzle.
7. Head shall have side and bottom inlet on racking system for easy alignment to pattern on 6 inch and 12 inch pop-ups.
8. The nozzles on pop-up spray head body shall be as shown on Drawings and shall be capable of covering the radius as designated on Drawings. Nozzles in same series shall have matched precipitation rates.
9. Heads shall be connected to irrigation lateral lines by swing joints as indicated. Flexible PVC cont be accepted as a swing joint with permission from Landscape Architect.

B. Gear Driven Sprinklers as specified on drawings.
1. The pop-up sprinklers shall be a gear driven sprinkler. The part circle sprinklers shall have an infinitely adjustable arc of coverage from 40 to 360.
2. The sprinkler case and internal assembly, except for the arm spring, bearing spring, wiper seal and bearing washers, shall be constructed of durable plastic.
3. The sprinkler shall have an adjustable nozzle-retainer/range adjustment screw for distance and distribution control and shall be capable of full or part circle operation as noted on Drawings.
4. The sprinkler shall have a 4" pop-up stroke, turbine bypass valve, fine mesh filter screen, and the gear drive shall be sealed in oil.
5. Plastic nozzles shall be as per irrigation legend.

2.06 ELECTRIC REMOTE CONTROL VALVES
A. Electric remote control valves shall be as specified on Drawings.
1. Remote control valves shall be normally closed, 24 volt AC 60 Cycle, solenoid actuated glove pattern diaphragm. Valve pressure rating shall be 200 psi minimum.
2. Valve body and bonnet shall be constructed a heavy-duty glass-filled nylon. Diaphragm shall be nylon reinforced rubber. Solenoid coil shall be encapsulated in molded epoxy.
3. Valve shall be actuated by a low power, 2.0 watt 24 volt AC Solenoid.
4. Valve shall have a flow control stem with wheel handle for regulating or shutting off flow of water and a bleed plug for manual operation.
5. All valve integral parts shall be removable from top of valve without disturbing the valve installation.

2.07 REMOTE CONTROL VALVE TIES

A. Remote control valve ties shall be plastic tags with wire to attach numbered tag to valve.

2.08 VALVE BOXES
A. Valve boxes shall be heavy duty plastic 17 inch by 11-¼ inch by 12-inch depth, black with green cover. Valve box shall be Series 1419, non-hinged, non-bolt cover, by Carson Industries, Inc., 1925 Street, La Verne, CA 91750, (213) 732-6265, or approved equal.

2.09 CONTROL WIRE SPLICE BOXES
A. Control wire splice boxes shall be heavy duty plastic 10 inch diameter by 10 ¼ inch deep, black with black cover, No. 910-12B, by Carson Industries, Inc. or approved equal.

2.10 GRAVEL BACKFILL

A. Gravel backfill for valve boxes and control wire splice boxes shall be 3/8-inch diameter pea gravel.

2.11 IRRIGATION CONTROL WIRE
A. Wire: Solid copper wire, NEC type UF, UL listed for direct burial in ground. Minimum size: No. 14 AWG.

B. Splicing Material: Scotchlok connector with No. 3570/Scotchlok Connector Sealing Packs by Electro-Products Division/3M, Minneapolis, Minnesota, Rain Bird Snap-Tites by Rain Bird Sprinkler Manufacturing Corporation, or approved equal. Use separate packs for each splice.

2.12 GATE VALVES
A. Gate Valves shall be PVC Ball Valves, size as noted on drawings.

2.13 QUICK COUPLING VALVES
A. Quick coupling valves shall have heavy-duty brass construction, durable thermoplastic rubber cover, stainless steel internal valve springs, one-piece body design, as indicated on drawings.

B. Provide four valve keys with ¼ inch swivel hose ends.

2.14 BACKFLOW PREVENTER
A. Backflow Preventers shall be bronze and copper, pressure vacuum breaker assembly Febco No. 765 by Febco Sales, Inc. (CMB Industries), P.O. Box 8070, Fresno, CA 93747 (209) 252-0791, or approved equal. Size as per drawings.

2.15 CONTROLLER
A. Controller shall be as indicated on drawings.

2.16 CONTROLLER ENCLOSURE

A. Controller enclosure shall be painted, galvanized NEMA enclosure as provided by Lemuer or approved equal. Enclosure to be vented, lockable with accessible bottom, panel.

PART 3 EXECUTION

3.01 SYSTEM DESIGN

A. Design Pressures: Pressure shall be as indicated on Drawings, and as measured at last head in circuit.
B. Location of Heads: Design location is represented as accurately as possible. Make minor adjustments on site with approval of Landscape Architect as necessary to ensure consistent and even spacing where applicable. Set all heads minimum 6" from back of curb and 4" from edge of concrete walls.

3.02 TRENCHING AND BACKFILLING
A. General: Contractor shall comply with Section 02221 Trenching & Trench Backfill and Section 02200 Earthwork of these Specifications. Excavate straight and true with bottom uniformly sloped to low points. Protect existing lawns and plantings. Remove and replant as necessary to complete installation. Replace damaged lawn areas and plants with new products to restore to existing installation's original condition.

B. Minimum Cover: provide 18-inch minimum cover over top of installed irrigation main piping. Provide 12-inch minimum cover over top of installed irrigation later line piping. Provide 2 inches of earth between parallels and wire. Parallels shall be laid side-by-side, not stacked.

C. Backfill: Backfill with clean material from excavation after obtaining landscape Architect's approval. Remove organic material, as well as rocks and debris larger than 1 inch in diameter. Place acceptable backfill in 6 inch lifts, compacting each lift.

D. Existing Lawns: Where trenching is required across existing lawns, (or in event of changes or repairs after new lawn has been established), uniformly cut strips o sod 6 inches wider than trench. Remove sod in rolls of suitable size for handling and keep moistened until replanted.

1. Backfill trench to with 6 inches of finished grade and compact. Continue fill with acceptable topsoil; and compact to bring sod even with existing lawn.
2. Replant sod within 2 days after removal, roll and water generously.
3. Resod and restore to original condition all sod areas not in healthy condition equal to adjoining lawns 30 days after replanting.

3.03 INSTALLATION

A. General: Unless otherwise indicated, Contractor shall comply with requirements of local municipal regulations and ASTM F 690.

B. Pipes
1. Piping Mains and Laterals: Lay out sprinkler mainlines and perform line adjustments and site modifications to laterals prior to excavation. Lay pipe on solid subbase, uniformly sloped without humps or depressions.
2. PVC Pipe Assembly

- a. Cut PVC pipe square and de-burr. Clean pipe and fittings using primer and cleaner as recommended by the PVC pipe manufacturer. Use tinted primer to aid in visual inspection.
- b. Apply a thin even flow coat of PVC solvent cement to inside of the fitting and pipe mating surfaces. Cure joints as recommended by the manufacturer and keep pipe and fitting out of service during curing period. Construct watertight joints equal or greater in strength than the pipe. Do not tap pipe at fittings.

3. Install plastic pipe in dry weather, when temperature is above 40 degrees F. and in accordance with manufacturer's written instructions. Allow joint to cure at least 24 hours at temperature above 40 degrees F. before testing.
4. Plastic pipe shall be snaked in the trenches in a manner to provide for expansion and contraction as recommended by pipe manufacturer.

C. Sleeves Under Paving: The majority of sleeves under paving are existing as shown on drawings. Where boring is required for new sleeves (refer to drawings), it shall be a "wet bore." Install sleeves 12" beyond edge of pavement. Perform trench and backfill in accordance with these specifications.

D. Irrigation Heads
1. Flush irrigation lines with full head of water and install heads after hydrostatic test is completed.
2. Install heads at manufacturer's recommended heights.
3. Locate part-circle heads to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries, unless otherwise indicated.
4. Check for uniformity of coverage and pattern correctness. Adjust for 100% coverage where required.

E. Electric Remote Control Valves
1. Adjust automatic control valves to provide flow rate at rated operating pressure required for each irrigation section.

2. Install valves in valve boxes, arranged for easy adjustment and removal. Locate valves to ensure ease of access for maintenance such that no physical interference with other elements of the project exist.
F. Remote Control Valve Tags: One Remote Control Valve Tag shall be attached to stem of each electric remote control valve. Tags shall be numbered sequentially. Numbers shall correspond to station numbers in electric controller. Provide tags and corresponding numbers for wires pulled for future valves.

G. Valve Boxes: Install valve boxes to cover electric remote control valves. Install two valves maximum in valve box where possible. Top of Valve box shall be flush with finished grade. Bury minimum 2 bricks under base of each box as support.

H. Control Wire Splice Boxes: Install control wire splice box to cover any splice in control wire. Top of valve box shall be flush with finished grade. Bury minimum 2 bricks under base of each box as support. Install control wire splice box to cover wires pulled for future valves.

I. Gravel Backfill: Backfill valve boxes and control wire splice boxes with gravel, minimum 6-inch depth.

J. Irrigation Control Wires
1. Provide 24-volt system for control of automatic circuit-section valves of underground irrigation system. Provide unit capacity to suit number of circuits indicated.

2. Install control wires with irrigation mains and laterals in common trench where possible. Lay control wire to side of pipe. Provide looped slack at valves and snake wire in trench to allow for contraction. Tie wires in bundles at 10-foot intervals. Line Splices will be allowed on runs of 500 Ft. or more. Splices shall be made and placed on control wire splice boxes.

3. Common ground wire shall be white. No other wires shall be white.

4. Supply one extra wire, for each direction of run, to valve, which is located the greatest distance from the controller. Extra wire shall be green. Leave two loops of wire at each valve location.

5. Color of wire from controller to control valve shall be consistent to each valve.

6. Solder splices and protect with splicing material specified. Provide 12 inch long expansion loop within 3 feet of each wire connection and splice on runs of wire 100 feet or longer.

K. Quick Coupling Valves
1. Connect quick coupling valves to irrigation mains by installing a Schedule 40 galvanized joint as per drawing.

2. Swing joints at quick couplers shall have threaded fittings with liquid Teflon sealant.

L. Backflow Preventers
1. Make required connection to water supply according to local codes and manufacturer's written instructions.

2. Install pressure type backflow devices at required grade in accordance with the local code. Exposed mainline and mainline risers above PVC pipe main elevation shall be copper. Install one brass union in riser downstream of device.

M. Irrigation Controller
1. Install controllers within lockable NEMA enclosure, Re: drawings. Wire complete and operable.

3.04 TESTING

A. General: Notify Landscape Architect 48 hours in advance when testing will be conducted. Conduct tests in presence of Landscape Architect.

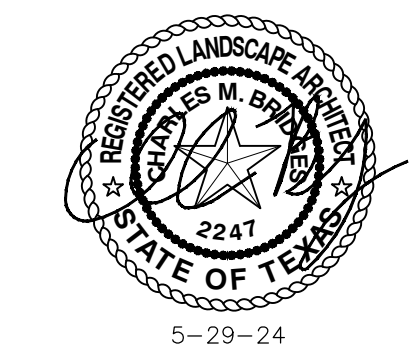
B. Hydrostatic Test: Test irrigation main line, before backfilling trenches, to a hydrostatic pressure of not less than 100 psi for 1 hour. Piping may be tested in sections to expedite water remove and repair or replace piping and connections which do not pass hydrostatic testing. System shall not lose more than 1 ½ gallons of water in 1 hour.

C. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place and Irrigation heads are adjusted to final position.

1. Demonstrate to Landscape Architect that system meets coverage requirements, is a specified and indicated, and that automatic controls function properly.
2. Coverage requirements are based on operation of one circuit at a time. After completion of grading, sodding and rolling of grass areas, carefully adjust lawn sprinkler heads so they will be flush with or not more than ½ inch above finished grade. Set shrub sprinkler heads no more than ¼ inch above top of mulch.

3.05 MAINTENANCE

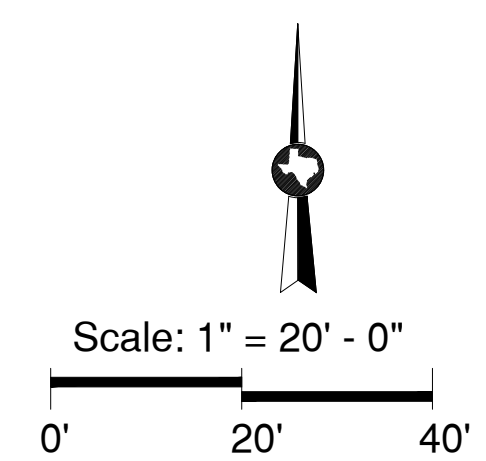
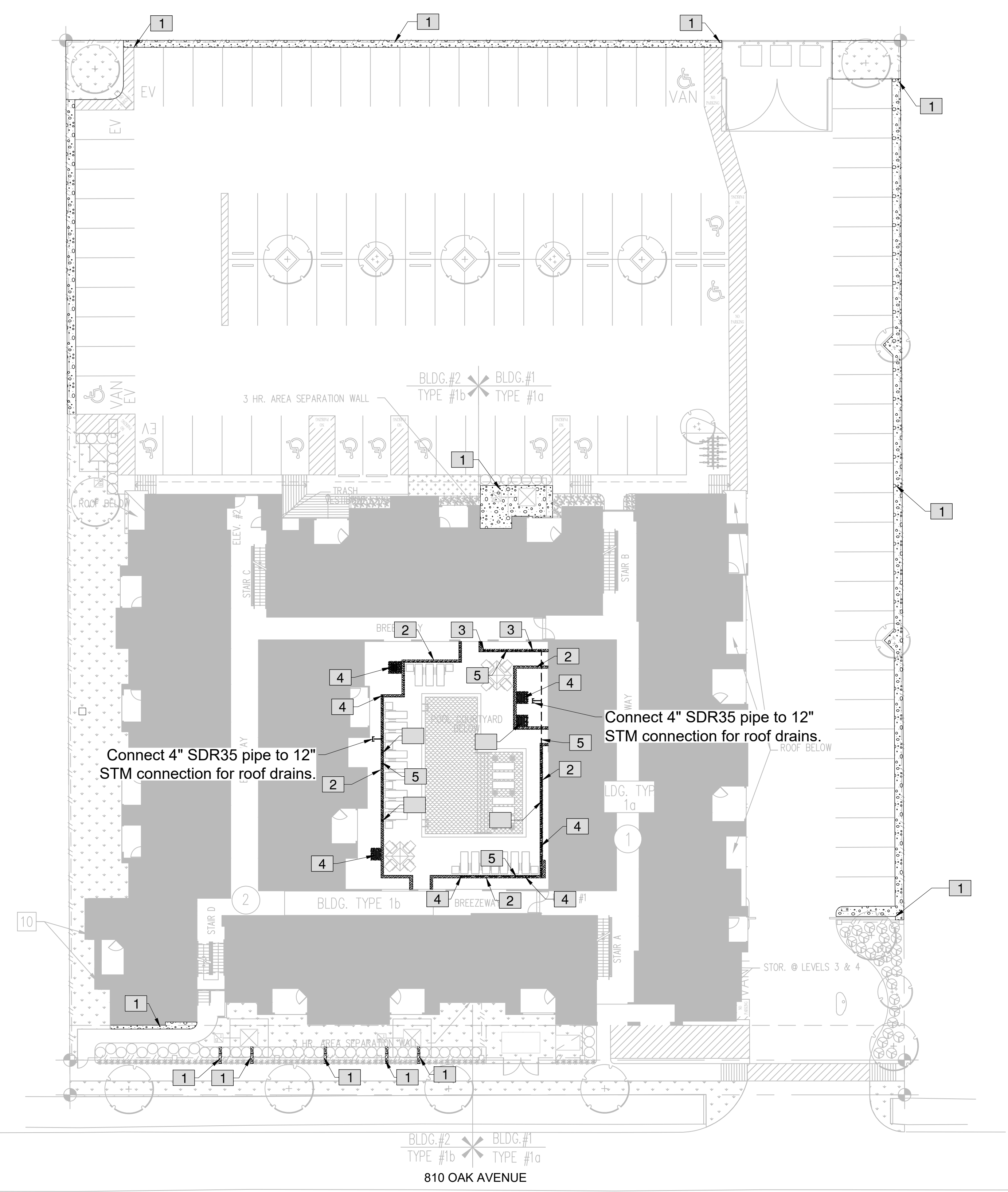
A. Contractor shall correctly maintain the irrigation system during the installation process and throughout the landscaping maintenance service period. Contractor shall provide "As Built" Drawings showing dimensioned location of valves, meters, vacuum breakers, controllers, and mainline. Contractor shall request reproducible mylars form the Landscape Architect in preparation of "As Built" Drawings.



LOST OAKS
Oak Avenue
Houston, TX
Landscape Improvements

REFERENCE NOTES SCHEDULE

SYMBOL	DESCRIPTION	QTY	DETAIL
1	BULLROCK 3'-6" River Wash Gravel	1,485 sf	
2	DRAINAGE BULLROCK 9" Width located at pool paving edge as shown,	183 sf	
3	ATRIUM GRATE 4" Connect to storm drain with SDR35 solid pipe	2 sf	
4	STORM DRAIN 24"	16 sf	
5	SDR35 4" Solid Pipe	231 lf	



Job No.: 166-04-016

Scale: 1" = 40' - 0"

Date: May 29, 2024

Revised:

Drainage Plan

L3.01