

DOCUMENT 00 9113

**ADDENDUM NO. 1
12/11/2025**

SPECIFICATION NO. 26-11768-C

CITY OF BERKELEY

ADELINE STREET LANDSCAPING IMPROVEMENTS

ADELINE STREET, BERKELEY, CA 94703

The following clarifications are hereby made to the project documents:

Additional References

1. The following reference is available for download [here](#).
 - a. City of Berkeley Pollution Prevention Guidelines (BMPs)

Project Plans

1. Replace the following sheets with updated sheets:
 - a. Sheet G0.00 Cover Sheet – Updated sheet titles
 - b. Sheet L1.01 Materials, Layout and Soils Plan – Updated materials schedule
 - c. Sheet L2.02 Planting and Soils Details – Clarifications
 - d. Sheet L3.00 Irrigation Notes and Water Use Calcs – Updated water use calcs and notes
 - e. Sheet L3.01 Irrigation Plan – Updated irrigation plan
 - f. Sheet L3.02 Irrigation Details – Updated details
 - g. Sheet L4.00 Irrigation and Construction Details – Updated controller details and boulder schedule

Project Manual

1. Replace the following sections:
 - a. Section 32 8400 Irrigation
 - b. Section 32 9113 Soil Preparation
 - c. Section 00 1113 Notice Inviting Bids, 2.01, replace:
“Required Contractor’s License(s): A California **“A”** contractor’s license is required to bid this contract. Joint ventures must secure a joint venture license prior to award of this Contract. Specialty work may require a specialty contractor’s license, held by Bidder or a listed subcontractor.”

With

“Required Contractor’s License(s): A California **“A”** OR **“C-27”** contractor’s license is required to bid this contract. Joint ventures must secure a joint venture license prior to award of this Contract. Specialty work may require a specialty contractor’s license, held by Bidder or a listed subcontractor.”

Questions and Responses:

1. Can the Contractor's license requirement be updated to allow a Class C-27 – Landscaping Contractor?
Response: Yes, the project requirements have been updated to allow a California Contractor License of Class A - General Engineering Contractor OR Class C-27 – Landscaping Contractor.
2. What permits are required for this project?
Response: No additional permits have been identified for the Contractor to secure.
3. Are there any restrictions on traffic lane closures on MLK and Adeline?
Response: Yes, refer to Section 01 5526 (Traffic Control) for details.
4. Is an encroachment permit required?
Response: No.
5. What are acceptable work hours? Is Saturday work allowed?
Response: Refer to Section 01 1100 (Summary of Work) Subsection 1.09 for work hours, and keep in mind requirements set forth in Section 01 5526 (Traffic Control) for lane closure restrictions, as well as noise restrictions set forth in Section 01 5700 (Temporary Controls) Subsection 1.05. Should the Contractor want to work outside the stated hours or on a Saturday, the request will be reviewed weekly and approved on a case-by-case basis. The Contractor shall request approval to work on a Saturday at least 3 days prior to the weekend, and at a minimum, provide information about the work to be done, hours of work, number of workers, and equipment to be used.
6. Please provide the engineer's estimate of the project.
Response: The engineer's estimate for the project is \$322,000.
7. Please provide the extent of SWPPP BMP's to be included in the bid.
Response: The Contractor is responsible for providing a site-specific Stormwater Pollution Prevention Plan and implementing BMPs. Refer to Section 01 5700 (Temporary Controls) Subsection 1.11 (Stormwater Pollution Control).
8. Will the Contractor be allowed to stage equipment and materials on site?
Response: Yes, the Contractor may stage equipment and materials on-site. In addition, the area below the BART tracks, outside the BART fence and to the east of the tracks may be utilized for additional staging.
9. Clarify if temporary fencing is installed with on-ground posts or set in concrete footings.
Response: Existing temporary fencing is installed with on-ground footings.
10. Can the Contractor use the existing temporary fencing?
Response: The Contractor may utilize the existing temporary fencing. The Contractor shall maintain the fence and furnish their own locks in accordance with Section 01 5700 (Temporary Controls). The Contractor shall coordinate the removal and pick up of the fence by the City's vendor at the conclusion of the project at a time mutually agreed upon by Contractor and City.
11. Direct where to place existing temporary fencing after it is removed.
Response: The Contractor may stack the panels on the east side of the BART tracks adjacent to MLK Jr. Way.

12. Will a permit be required for tree removal?
Response: No.
13. For the two trees to be removed, is stump removal required?
Response: Yes, refer to Section 31 1000 (Site Clearing). Both trees are considered to be in accessible areas, and stump grinding is required.
14. Please provide the geotechnical report.
Response: There is no geotechnical report available for the project.
15. Please provide as-built drawings for existing utilities.
Response: There are no accurate as-built drawings available. Utilities known to the City are shown on the plans.
16. Please confirm whether any hazardous waste or materials will be present on the job site.
Response: Hazardous materials are not anticipated. If they are encountered on site Contractor is responsible for following provisions set forth in Section 00 7200 (General Conditions) Subsection 13.04 (Notice of Hazardous Waste or Materials Conditions).
17. Please confirm the Maintenance Period.
Response: Maintenance period for newly installed planting and irrigation shall be 120 days from date of Substantial Completion as approved or established by the City.
18. Will the City allow substitution requests after contract award?
Response: Substitution requests may be submitted after contract award. City may or may not grant substitution requests so bids must be submitted considering specified materials only.
19. Can you provide an approved equivalent supplier for the boulders?
Response: "Or approved equal" has been added to the materials schedule for the boulders. Contractor can propose an approved equal for the specified boulders. The City has granted substitutions in the past for materials that were not available during the contract time, which is typical for plants.
20. Can you provide length, width, depth dimensions for boulders?
Response: See updated boulder schedule on Sheet L4.00.
21. Please confirm that these scope items are not included in this project: 1.) Stripping of topsoil; 2.) Removing of above-grade site improvements, except trees; 3.) Disconnecting, capping, sealing, or removing abandoned site utilities.
Response: 1.) See response 23 below. 2.) Confirmed. 3.) Any abandoned utilities exposed during construction shall be capped and removed.
22. Please confirm that the native soil is suitable and sufficient for planting; no imported topsoil is necessary.
Response: The native soil requires testing to confirm its suitability for planting and whether any amendments are required to bring it to up to spec. The project does not call for imported topsoil.
23. Should Contractor remove and dispose of any of the top weeds or existing grass? What should the Contractor do with any potential excess of soil? Is off-hauling of soil anticipated?
Response: Existing planting is to be cleared and grubbed per Sheet L0.01, and Section 02 4119.1 Landscape Selective Demolition. We do not anticipate the need to off-haul excess soil. Excess soil can be gently mounded in the center of the planting areas per Detail 4/L2.02.

24. The documents do not specify the soil amendment ratios. Please provide this information for bidding purposes.
Response: Soil testing is required for the existing site soils. Soil testing results will dictate the required ratios for amendments. See soil testing location on Sheet L1.01.
25. Detail 3 on sheet L2.02 shows wood chip mulch then corrugated cardboard sheet mulch & amend existing soils with compost to 6". However, detail 4 on the same sheet shows the top layer is amended site soil & sheet mulching. Please clarify.
Response: Please refer to Detail 3/L2.02 for the soil amendments, ripping, sheet mulching, and mulching depths.
26. Please clarify the type of mulch for bidding purposes.
Response: Wood chip mulch shall be used, not bark mulch. See Section 32 9300 (Plants) Subsection 2.07 (Mulch) for details.
27. Please clarify the depth of mulch required.
Response: Finish grades of soil in planting areas should be 7" below adjacent pavement to allow for sheet mulch and 6" of wood chip mulch. Refer to Detail 4/L2.02 and updated Section 32 9113 (Soil Preparation) Subsection 3.08 (Finish Grading).
28. Please confirm if excavated site soil can be used for backfilling the plants, per Detail 1/L2.02.
Response: Yes, excavated and amended site soil can be used for backfilling plants.
29. Will reclaimed water be used for irrigation?
Response: No.
30. Please identify the location where existing controller wires are stubbed-in and provide scaled drawing of controller location.
Response: See updated Sheet L3.01 Irrigation Plan for updated control valve locations and controller models.
31. Please confirm that drip emitter line does not need to be trenched in because it is under sheet mulching.
Response: Confirmed. Drip emitter lines can be laid under sheet mulching and do not need to be trenched in.
32. Is irrigation conventional or 2-wire system?
Response: The irrigation is a conventional system.
33. Please clarify the material of mainline & lateral line for bidding purposes.
Response: Mainline and lateral pipes to be SCH 40 PVC. Please see updated schedule on irrigation sheet L3.01.
34. Please clarify the minimum spacing between pipes.
Response: Maintain minimum 6" clearance between pipes. Please see updated detail 2/L3.02.
35. Please confirm that there are existing sleeves under the sidewalks and it is not anticipated that there would be a need to do any concrete cutting across sidewalks or parking lot areas. What schedule and size are the existing sleeves?
Response: A pipe sleeve shall be installed at the location indicated on Sheet L3.01. Existing pipe sleeves may or may not exist under the sidewalk and parking lot along the existing main line. Per the original irrigation design drawing set, existing sleeves are SCH 40 PVC pipe and 6" diameter. No work is anticipated in the parking lot area.

The Bid Opening time and date remains Tuesday, December 16, 2025 at 2:00 P.M. The location of opening will be at the courtyard of 2180 Milvia Street. All other requirements of the contract remain the same. Bidder shall acknowledge receipt of this Addendum on the Bid Form.

The location of opening at the courtyard may change as needed to accommodate the number of attendees. Staff will be present to direct the bidders to the bid opening. Bidders shall allow sufficient time to deliver their bids by the deadline and check the city's website: <https://berkeleyca.gov/doing-business/working-city/bid-proposal-opportunities/adeline-street-landscaping-improvements> for the most up to date information about where to deliver their bids.

THE ADDENDA MUST BE ACKNOWLEDGED BY SIGNATURE WITH SUBMISSION OF DOCUMENT 00 4113 "BID FORM". FAILURE TO DO SO MAY RESULT IN REJECTION OF THE BID.

Sincerely,

Csilla Kenny
Assistant Civil Engineer
Department of Parks, Recreation and Waterfront

END OF DOCUMENT

ADELINE STREET LANDSCAPING IMPROVEMENTS

CITY OF BERKELEY -- PARKS, RECREATION & WATERFRONT DEPARTMENT

SPEC NO. 26-11768-C

PLAN NO. 8303

FILE NO. 406-227

PROJECT TEAM

LANDSCAPE ARCHITECT
BASE LANDSCAPE ARCHITECTURE
145 A LOWER TERRACE
SAN FRANCISCO, CA 94114

PROJECT

ADELINE LANDSCAPING IMPROVEMENTS
ADELINE STREET, BERKELEY, CA 96703

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100% BID SET

REVISION

#	Date	Description
1	12-10-2025	Addendum 1

STAMP



SHEET TITLE

COVER SHEET

Scale: N/A
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

G0.00

CODE COMPLIANCE

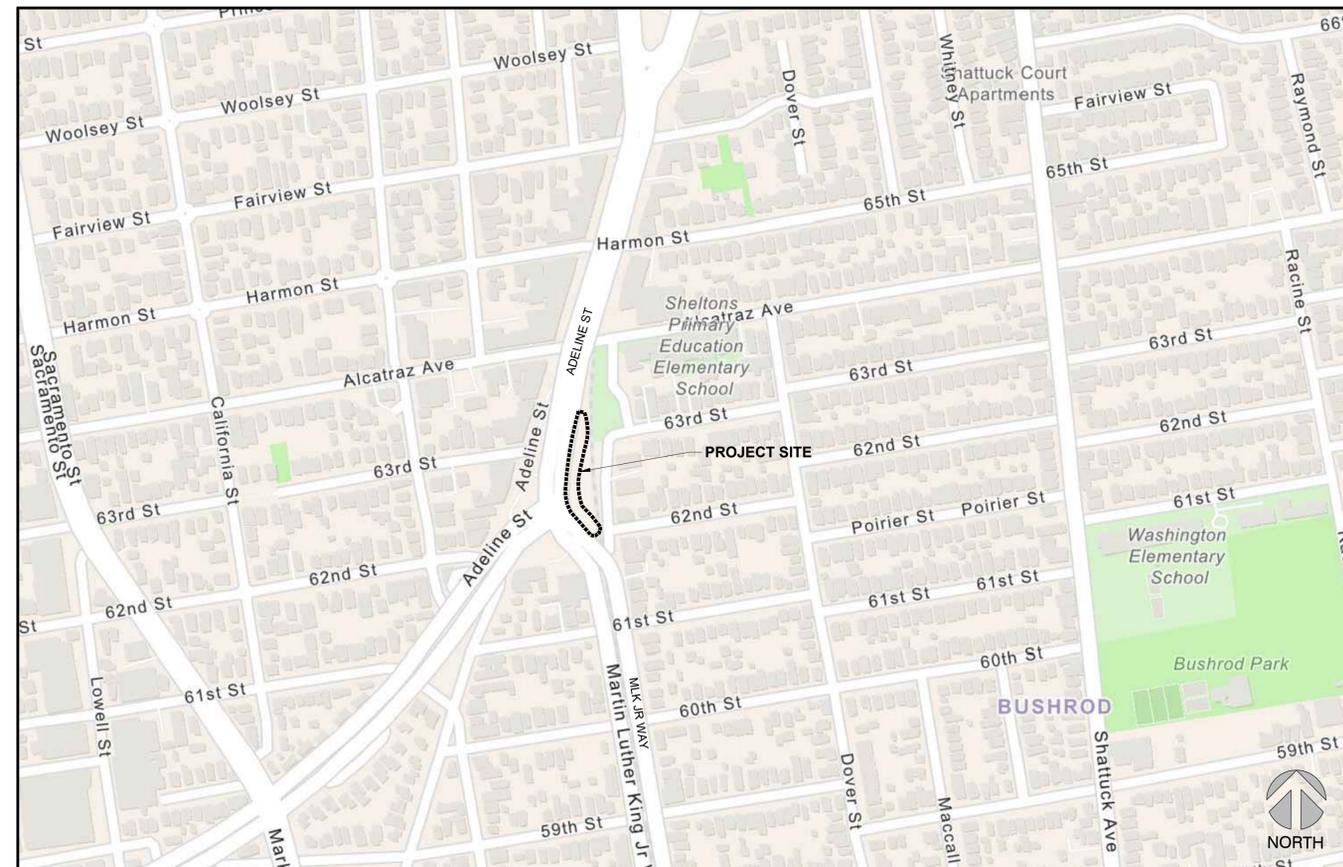
PARTIAL LIST OF APPLICABLE CODES

ALL WORK SHALL CONFORM TO 2022 TITLE 24 CALIFORNIA CODE OF REGULATIONS (CCR)

GRADING PLANS, DRAINAGE IMPROVEMENTS, ACCESS REQUIREMENTS AND ENVIRONMENTAL HEALTH CONSIDERATIONS SHALL COMPLY WITH ALL LOCAL ORDINANCES

- 2022 CALIFORNIA ADMINISTRATIVE CODE (CAC), PART 1, TITLE 24, C.C.R.
- 2022 CALIFORNIA BUILDING CODE (CBC), PART 2, TITLE 24, C.C.R.
(2021 INTERNATIONAL BUILDING CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA ELECTRIC CODE (CEC), PART 3, TITLE 24, C.C.R.
(2020 NATIONAL ELECTRIC CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA MECHANICAL CODE (CMC), PART 4, TITLE 24, C.C.R.
(2021 IAPMO UNIFORM MECHANICAL CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA PLUMBING CODE (CPC), PART 5, TITLE 24, C.C.R.
(2021 IAPMO UNIFORM PLUMBING CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA ENERGY CODE (CENC), PART 6, TITLE 24, C.C.R.
- 2022 CALIFORNIA FIRE CODE (CFC), PART 9, TITLE 24, C.C.R.
(2021 INTERNATIONAL FIRE CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2022 CALIFORNIA EXISTING BUILDING CODE (CEBC), PART 10, TITLE 24, C.C.R.
(2021 INTERNATIONAL EXISTING BUILDING CODE AND 2022 CALIFORNIA AMENDMENTS)
- 2019 TITLE 19, C.C.R., REGULATIONS OF THE STATE FIRE MARSHAL
- 2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (CALGREEN), PART 11, TITLE 24, C.C.R.
- 2022 CALIFORNIA REFERENCED STANDARDS CODE, PART 12, TITLE 24, C.C.R.

CONTEXT MAP - BERKELEY, CA



PROJECT SUMMARY

PROJECT ADDRESS:
ADELINE STREET & MARTIN LUTHER KING JR. WAY, BERKELEY, CA 94703

PROJECT SCOPE:
THE PROJECT COMPRISES APPROXIMATELY 9,000 SQUARE FEET OF LANDSCAPE IMPROVEMENTS ALONG THE 3300 BLOCK OF ADELINE STREET AND MARTIN LUTHER KING JR. WAY BETWEEN THE EAST SIDE OF THE STREET AND THE SIDEWALK. IMPROVEMENTS INCLUDE GRADING AND SOIL AMENDMENT, PLANTING, INSTALLATION OF NEW IRRIGATION, FENCING, TREE REMOVAL, AND INSTALLATION OF DECORATIVE BOULDERS.

PROJECT TEAM

PROJECT MANAGER
CITY OF BERKELEY -- PARKS, RECREATION & WATERFRONT DEPARTMENT
1947 CENTER ST, 5TH FLOOR
BERKELEY, CA 94704

LANDSCAPE ARCHITECT
BASE LANDSCAPE ARCHITECTURE
145 A LOWER TERRACE
SAN FRANCISCO, CA 94114

DRAWING SET INDEX

- G0.00 COVER SHEET
- G0.01 GENERAL NOTES
- L0.01 EXISTING CONDITIONS AND DEMO PLAN
- L1.01 MATERIALS, LAYOUT AND SOILS PLAN
- L2.01 PLANTING PLAN
- L2.02 PLANTING AND SOILS DETAILS
- L3.00 IRRIGATION NOTES AND WATER USE CALCS
- L3.01 IRRIGATION PLAN
- L3.02 IRRIGATION DETAILS
- L4.00 IRRIGATION AND CONSTRUCTION DETAILS

ABBREVIATIONS

- S.C.D. SEE CIVIL DRAWINGS
- S.E.D. SEE ELECTRICAL DRAWINGS
- S.S.D. SEE STRUCTURAL DRAWINGS
- C.L. CENTERLINE
- CLR CLEAR
- EOR ENGINEER OF RECORD
- EQ EQUAL DISTANCE
- (E) EXISTING
- L.O.W. LIMIT OF WORK
- (N) NEW
- N.I.C. NOT IN CONTRACT
- O.C. ON CENTER
- PA PLANTING AREA
- P.O. POINT OF ORIGIN
- P.O.C. POINT OF CONNECTION
- SIM SIMILAR
- STD STANDARD
- TYP. TYPICAL
- U.O.N. UNLESS OTHERWISE NOTED
- VIF VERIFY IN FIELD

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1	12/10/2025	ADDENDUM 1

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SHEET TITLE

MATERIALS, LAYOUT AND SOILS PLAN

Scale: 1/16" = 1'-0"
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

L1.01

MATERIALS SCHEDULE		DETAIL	MODEL	MANUFACTURER	MATERIAL	COLOR	FINISH	SPEC SECTION	PROD SBMTL	SHOP DWGS	MOCK-UP	NOTES
FENCES & GATES												
F-101	3' HIGH CHAIN LINK FENCE	1/L4.00		MASTER HALCO OR APPROVED EQUAL	STEEL POSTS, 9 GAUGE MESH	BLACK	10 MIL PVC COATING	32 31 13	X	X		
SITE FURNISHING												
S-101	BOULDERS	2/L4.00	BOUQUET CANYON	LYNGSO OR APPROVED EQUAL	SANDSTONE	RUST/GREY	NATURAL	32 93 00	X			SEE DETAIL FOR SCHEDULE

SOILS LEGEND

AMENDED SITE SOILS:
RIP EXISTING SOILS TO 12". INCORPORATE COMPOST AMENDMENT INTO TOP 6" OF SOIL. ALL AMENDED SITE SOILS TO BE SHEET-MULCHED. SEE PLANTING AND SOILS DETAILS.
6" OF WOOD CHIP MULCH, SEE SOILS SPECIFICATIONS



SOIL TESTING NOTES:

CONTRACTOR IS RESPONSIBLE TO PROVIDE PROFESSIONAL SOIL TESTING REPORT FOR HORTICULTURAL SUITABILITY FOR ALL SOILS AMENDED AND IMPORTED TO THE SITE, AND FOR ORGANIC COMPOST.

APPROVED, SUITABLE SITE TOPSOIL CAN BE STOCKPILED AND USED FOR NEW PLANTING.

EXISTING SITE SOIL SHALL BE COLLECTED AND TESTED PER THE DESCRIBED METHODOLOGY:
SOIL SAMPLING METHODOLOGY:

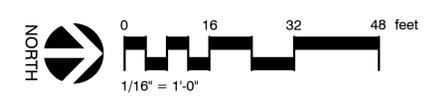
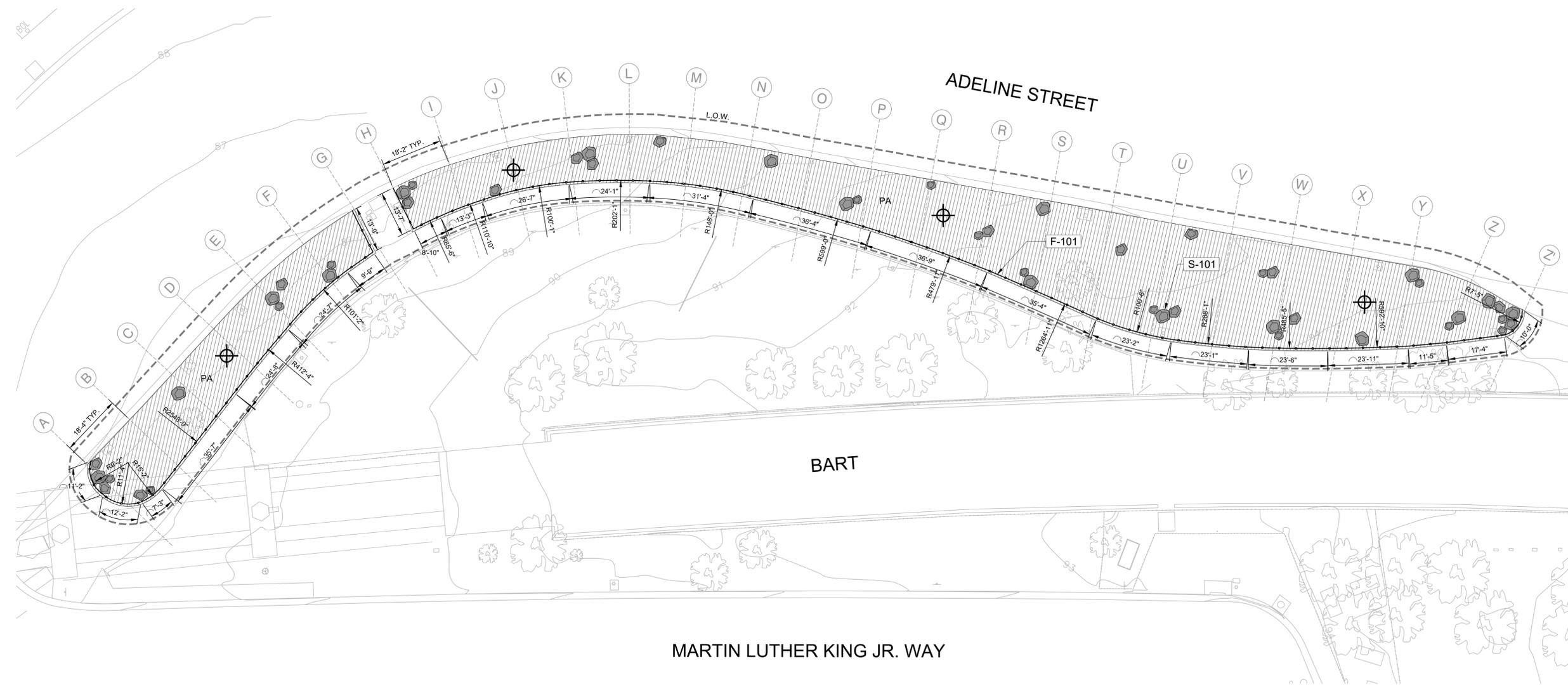
- COLLECT SOIL SAMPLES FROM EACH LOCATION SHOWN ON PLAN. THE AREA IS TO BE UNIFORM IN COLOR, TEXTURE, DEPTH, AND DRAINAGE WITH THE SAME FERTILIZING PROGRAM AND TYPE OF USE. TEST INDIVIDUALLY AREAS FOR TREES, PERENNIALS, AND CUT AND FILL AREAS. AN AREA CONTAINING MULTIPLE TREES AND SHRUBS CAN BE GROUPED INTO ONE AREA IF THE PLANT APPEARANCE IS THE SAME.
- TAKE THREE TO FIVE SAMPLINGS FROM ANY ONE OF THE LOCATIONS NOTED AND COMBINE THEM FOR SUBMITTAL TO SOIL TESTING LAB. DO NOT SAMPLE UNUSUAL AREAS SUCH AS BURNED SPOTS OR EXTRA LUSH GROWTH. REMOVE SURFACE LITTER.

3. TAKE SAMPLES FROM THE SURFACE EXTENDING AS DEEP AS THE SOIL WILL BE AMENDED, REFER TO LEGEND, AND AT LEAST TO 3' DEEP IN TREE PLANTING AREAS. DO NOT DISTURB ROOTS OF EXISTING TREES.

4. USE A SOIL PROBE OR SOIL AUGER TO REMOVE A CORE SAMPLE. OTHERWISE USE A SHOVEL TO DIG A HOLE TO THE DESIRED DEPTH. SAMPLE THE SOIL FROM THE SIDE OF THE HOLE BY SCRAPING IT WITH A TROWEL. USE ONLY CLEAN TOOLS WITHOUT RUST. AVOID SAMPLING WHEN SOIL IS TOO WET.

5. PLACE SOIL FROM THE VARIOUS HOLES TAKEN FROM EACH SAMPLED AREA INTO A CLEAN PLASTIC BUCKET. MIX TOGETHER HOMOGENEOUSLY. PLACE TWO TO THREE CUPS OF THE COMPOSITE SAMPLE INTO A LOCK PLASTIC BAG, FOR FIVE BAGS TOTAL.

6. REMOVE EXCESS AIR FROM THE BAG, ZIP LOCK IT, FOLD IT A FEW TIMES. SECURE WITH A RUBBER BAND AND PLACE IT IN A SUITABLE MAILER. ASSIGN EACH BAG A LABEL AND SEND THE SAMPLES TO SOIL TESTING LAB BY MAIL, UPS OR OVERNIGHT CARRIER ALONG WITH A BRIEF DESCRIPTION OF THE SAMPLE AND FUTURE USE OF THE PROVIDE NAME, PHONE NUMBER, ADDRESS AND EMAIL ADDRESS. SEE SPECIFICATIONS FOR A LIST OF APPROVED SOIL TESTING LABS.



PROJECT TEAM

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145 A LOWER TERRACE
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PROJECT

ADELINE LANDSCAPING
IMPROVEMENTS
ADELINE STREET, BERKELEY, CA 96703

SPEC NO. 26-11768-C
PLAN NO. 8303
FILE NO. 406-227

100% BID SET

REVISION

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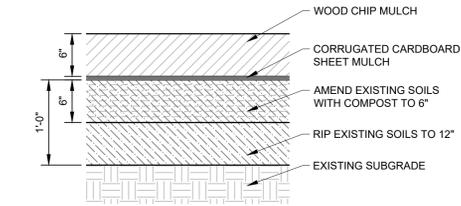
SHEET TITLE

PLANTING AND SOILS
DETAILS

Scale: SEE DETAILS
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

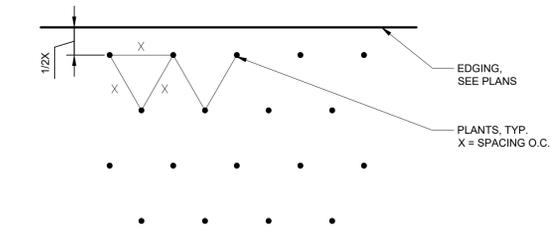
L2.02

- NOTES:
1. INSTALL SHEET MULCH AND WOOD CHIP MULCH PRIOR TO PLANTING.
 2. TO INSTALL PLANTING, PULL BACK WOOD CHIP MULCH AT LOCATION OF PLANT, CUT OR PUNCH THROUGH CARDBOARD TO MAKE ROOM FOR PLANT ROOTBALL.
 3. SEE PLANTING SPECIFICATIONS

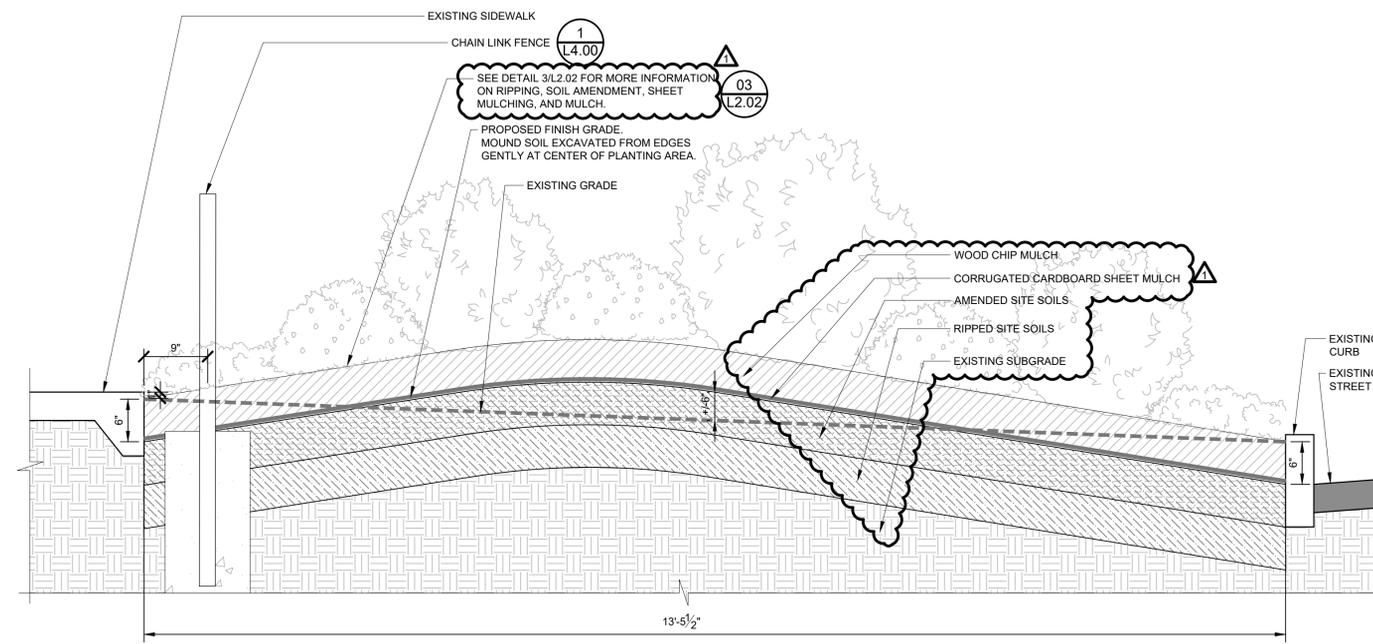


03 AMENDED SITE SOIL AND SHEET MULCHING
1" = 1'-0" P-AD-PLA-34

NOTE:
PLANTS TO BE SPACED IN TRIANGULAR PATTERN UNLESS OTHERWISE SHOWN ON PLANS

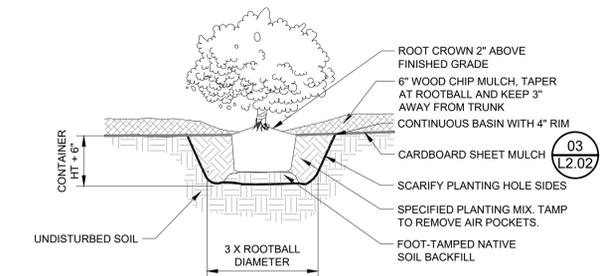


02 GROUNDCOVER SPACING
NTS



04 TYPICAL SITE SOIL SECTION
1" = 1'-0"

P-AD-PLA-35



01 SHRUB PLANTING
NTS

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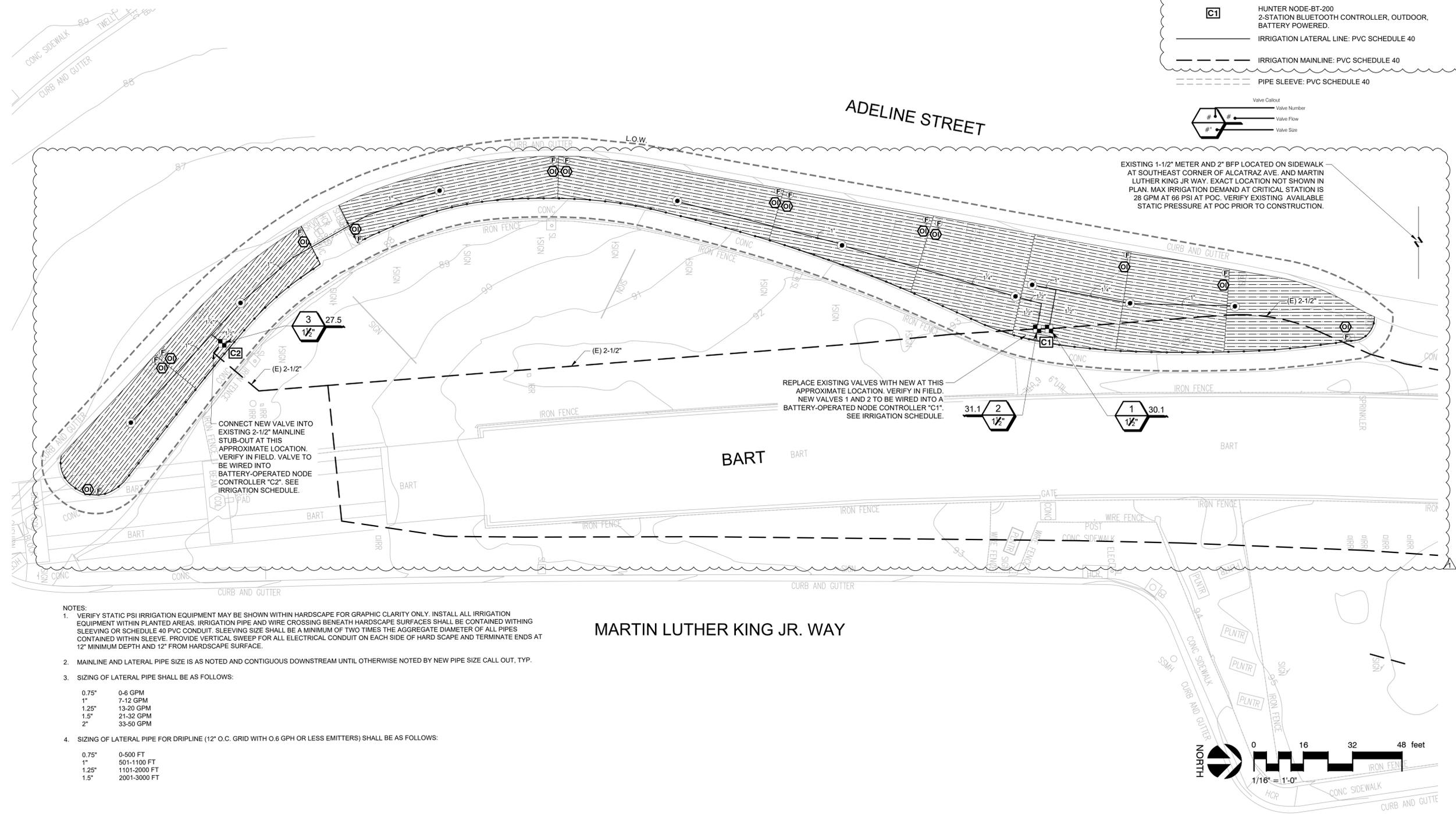
IRRIGATION PLAN

Scale: 1/16" = 1'-0"
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

L3.01

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
☐	RAIN BIRD 150 EFB-CP VALVE FOR DRIP ZONE RAIN BIRD 150 EFB-CP BRASS VALVE WITH 1-1/2 IN. RAINBIRD LARGE CAPACITY DISC FILTER AND 1-1/2 IN. HIGH FLOW PRESSURE REGULATOR FIXED AT 40PSI. FLOW RANGE: 20 - 62 GPM.
○	PIPE TRANSITION POINT IN DRIP BOX PIPE TRANSITION POINT FROM PVC LATERAL TO DRIP TUBING WITH RISER IN 6IN. DRIP BOX.
F	HUNTER PLD-BV MANUAL FLUSH/SHUT OFF VALVE, BARBED INSERT. TYPICALLY INSTALLED IN 10IN. BOX, WITH ADEQUATE BLANK TUBING TO EXTEND VALVE OUT OF VALVE BOX. USE WITH HDL OR OTHER 3/4IN. DRIPLINE.
⊕	HUNTER ECO-ID-12 ECO-ID: 1/2IN. FPT CONNECTION WITH 15 PSI - 100 PSI OPERATING PRESSURE. SPECIFY WITH HUNTER SJ SWING JOINT.
[Hatched Box]	AREA TO RECEIVE DRIPLINE RAIN BIRD XFCV-06-12 XFCV XON-SURFACE LANDSCAPE DRIPLINE WITH A HEAVY-DUTY 3.5 PSI CHECK VALVE, 0.6 GPH EMITTERS AT 12" O.C. DRIPLINE LATERALS SPACED AT 12" APART, WITH EMITTERS OFFSET FOR TRIANGULAR PATTERN. GREAT FOR ELEVATION CHANGE. SPECIFY XF INSERT FITTINGS.
SYMBOL	MANUFACTURER/MODEL/DESCRIPTION
C2	HUNTER NODE-BT-100 1-STATION BLUETOOTH CONTROLLER, OUTDOOR, BATTERY POWERED WITH DC LATCHING SOLENOID INCLUDED.
C1	HUNTER NODE-BT-200 2-STATION BLUETOOTH CONTROLLER, OUTDOOR, BATTERY POWERED.
---	IRRIGATION LATERAL LINE: PVC SCHEDULE 40
---	IRRIGATION MAINLINE: PVC SCHEDULE 40
---	PIPE SLEEVE: PVC SCHEDULE 40



- NOTES:
- VERIFY STATIC PSI IRRIGATION EQUIPMENT MAY BE SHOWN WITHIN HARDSCAPE FOR GRAPHIC CLARITY ONLY. INSTALL ALL IRRIGATION EQUIPMENT WITHIN PLANTED AREAS. IRRIGATION PIPE AND WIRE CROSSING BENEATH HARDSCAPE SURFACES SHALL BE CONTAINED WITHIN SLEEVING OR SCHEDULE 40 PVC CONDUIT. SLEEVING SIZE SHALL BE A MINIMUM OF TWO TIMES THE AGGREGATE DIAMETER OF ALL PIPES CONTAINED WITHIN SLEEVE. PROVIDE VERTICAL SWEEP FOR ALL ELECTRICAL CONDUIT ON EACH SIDE OF HARD SCAPED AND TERMINATE ENDS AT 12" MINIMUM DEPTH AND 12" FROM HARDSCAPE SURFACE.
 - MAINLINE AND LATERAL PIPE SIZE IS AS NOTED AND CONTIGUOUS DOWNSTREAM UNTIL OTHERWISE NOTED BY NEW PIPE SIZE CALL OUT, TYP.
 - SIZING OF LATERAL PIPE SHALL BE AS FOLLOWS:

0.75"	0-6 GPM
1"	7-12 GPM
1.25"	13-20 GPM
1.5"	21-32 GPM
2"	33-50 GPM
 - SIZING OF LATERAL PIPE FOR DRIPLINE (12" O.C. GRID WITH 0.6 GPH OR LESS EMITTERS) SHALL BE AS FOLLOWS:

0.75"	0-500 FT
1"	501-1100 FT
1.25"	1101-2000 FT
1.5"	2001-3000 FT

MARTIN LUTHER KING JR. WAY

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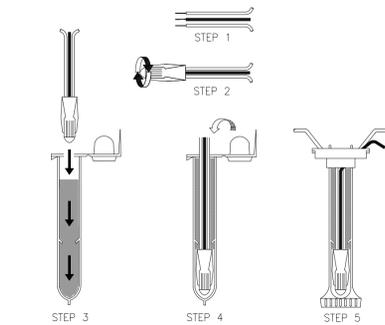


SHEET TITLE

IRRIGATION DETAILS

Scale: SEE DETAILS
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

L3.02

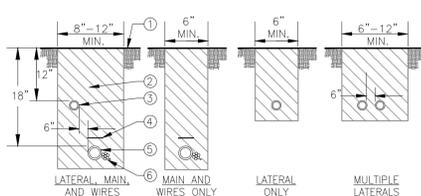


NOTE:
MAXIMUM # OF WIRES PER CONNECTOR:
• 3-#14 GAUGE
• 2-#12 GAUGE

INSTRUCTIONS:
1. STRIP WIRES APPROXIMATELY 1/2" FROM ENDS TO EXPOSE WIRE.
2. TWIST CONNECTOR AROUND WIRES CLOCKWISE UNTIL HAND TIGHT, DO NOT OVERTIGHTEN.
3. INSERT WIRE ASSEMBLY TO BOTTOM OF GEL-FILLED TUBE. CHECK TO MAKE SURE CONNECTOR HAS BEEN PUSHED PAST LOCKING FINGERS AND IS SEATED AT THE BOTTOM OF THE TUBE.
4. PLACE WIRES WHICH EXIT TUBE IN WIRE EXIT HOLES AND CLOSE CAP UNTIL IT SNAPS.
5. INSPECT FINAL SPLICE ASSEMBLY THAT IT IS SECURED.

3 WEATHERPROOF WIRE SPLICE ASSEMBLY

1" = 1'-0" P-AD-IRR-08

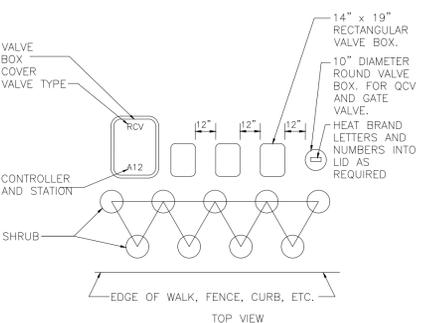


NOTES:
1. ALL MAIN SUPPLY LINES AND LATERAL LINES SHALL BE PLACED IN SLEEVES UNDER PAVED SURFACES. INSTALL LOW VOLTAGE WIRES WITHIN A SEPARATE CONDUIT UNDER PAVED SURFACES. DO NOT TAPE WIRES WITHIN CONDUIT. BACKFILL MATERIAL SHALL BE THE EARTH EXCAVATED FROM THE TRENCHES, FREE FROM ROCKS (ANYTHING LARGER THAN 2"), CONCRETE CHUNKS, AND OTHER FOREIGN OR COARSE MATERIALS.
2. REUSE SALVAGED EXCAVATED FILL AND COMPACT TO ORIGINAL DENSITY IN LANDSCAPE AREAS. ALL OTHER AREAS SHALL BE AT 95% COMPACTION.
3. WHEN 12" POP-UP SPRINKLER HEADS ARE USED, INCREASE THE DEPTH OF LATERAL TO 18" AT THE SPRINKLER LOCATION ONLY.

1 FINISH GRADE.
2 CLEAN BACKFILL MATERIAL.
3 LATERAL LINE.
4 3" DETECTABLE WARNING TAPE OVER MAIN LINE. INSTALL 3" ABOVE MAIN LINE.
5 MAIN LINE.
6 LOW VOLTAGE CONTROL WIRES, TWO-WIRE CABLE, OR CONDUIT WITH WIRES. FOR MULTIPLE WIRES, TAPE AND BUNDLE WIRES AT 10' FT. INTERVALS. WIRING SHALL BE LAID OUT LOOSELY IN THE TRENCH.

2 TRENCHING

1" = 1'-0" P-AD-IRR-10



INSTRUCTIONS:
1. CENTER VALVE BOX OVER REMOTE CONTROL VALVE TO FACILITATE SERVICING VALVE.
2. SET BOXES 1" ABOVE FINISH GRADE OR MULCH COVER IN GROUND COVER/SHRUB AREA AND FLUSH WITH FINISH GRADE IN TURF AREA.
3. SET RCV AND VALVE BOX ASSEMBLY IN GROUND COVER/SHRUB AREA. PLACE BEHIND SECOND ROW OF SHRUBS (TYPICAL).
4. SET BOXES PARALLEL TO EACH OTHER AND PERPENDICULAR TO EDGE OF LAWN, WALK, FENCE, CURB, ETC.
5. AVOID HEAVILY COMPACTING SOIL AROUND VALVE BOXES TO PREVENT COLLAPSE AND DEFORMATION OF VALVE BOX SIDES.
6. INSTALL EXTENSION BY VALVE BOX MANUFACTURER AS REQUIRED TO COMPLETELY ENCLOSE ASSEMBLY FOR EASY ACCESS.

1 VALVE BOX INSTALLATION

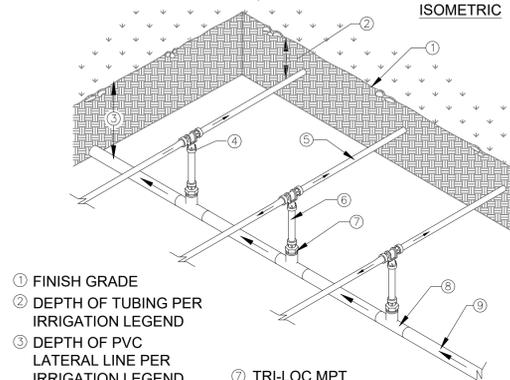
1" = 1'-0" P-AD-IRR-08



NOTE:
USE ONLY WHEN THE TOTAL LENGTH OF DRIP LINE SERVICED FROM THIS PVC CONNECTION IS LESS THAN 300 FT.

8 PIPE TRANSITION, DRIPLINE TO PVC CONNECTION

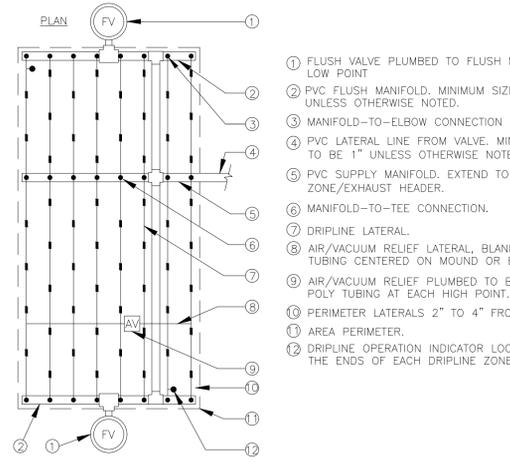
1" = 1'-0" P-AD-IRR-18



1 FINISH GRADE
2 DEPTH OF TUBING PER IRRIGATION LEGEND
3 DEPTH OF PVC LATERAL LINE PER IRRIGATION LEGEND
4 TRI-LOC TEE
5 DRIPLINE TUBING
6 BLANK 5/8" POLY TUBING, LENGTH AS NECESSARY.
7 TRI-LOC MPT ADAPTER
8 PVC TEE WITH 1/2" FPT OUTLET.
9 PVC LATERAL LINE FROM REMOTE CONTROL VALVE

7 DRIPLINE CENTER FEED MANIFOLD

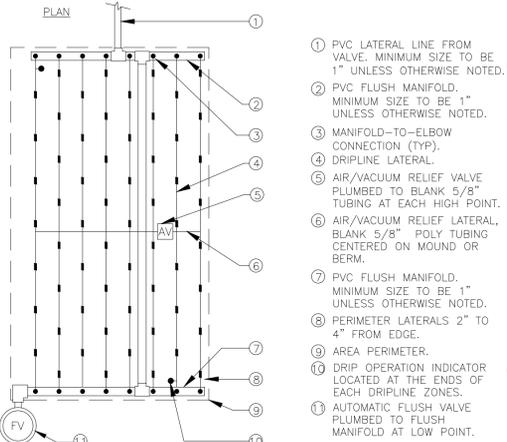
1" = 1'-0" P-AD-IRR-17



NOTE:
1. THE TOTAL LENGTH OF ALL INTERCONNECTED DRIP LINE OFF A SINGLE PVC SUPPLY LINE CONNECTION OR A SINGLE RUN OF DRIPLINE SHALL NOT EXCEED 300 FT.
2. INSTALL DRIPLINE 2-4" BELOW GRADE AND STAKE DOWN EVERY 4' OR AS REQUIRED.

6 DRIPLINE CENTER FEED LAYOUT

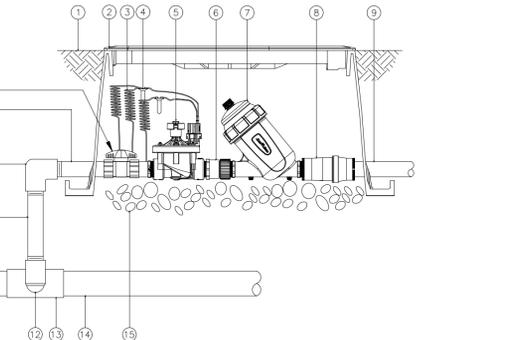
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NOTE:
1. THE TOTAL LENGTH OF ALL INTERCONNECTED DRIP LINE OFF A SINGLE PVC SUPPLY LINE CONNECTION OR A SINGLE RUN OF DRIPLINE SHALL NOT EXCEED 300 FT.
2. INSTALL DRIPLINE 4" BELOW GRADE AND STAKE DOWN EVERY 4' OR AS REQUIRED.

5 DRIPLINE END FEED LAYOUT

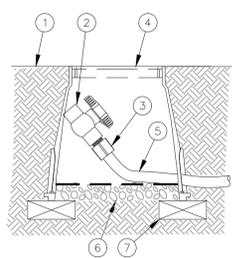
1" = 1'-0" P-AD-IRR-12



1 FINISH GRADE/TOP OF MULCH
2 JUMBO VALVE BOX: CARSON OR APPROVED EQUAL
3 30-INCH LINEAR LENGTH OF WIRE, COILED
4 WATERPROOF CONNECTION: RAIN BIRD DB SERIES
5 1 1/2" RAINBIRD EFP-CP VALVE
6 1 1/2" SCH 40 ADAPTER (MALE X FEMALE)
7 1 1/2" FILTER - WILKINS 500YSBR
8 1 1/2" HIGH FLOW PRESSURE REGULATOR - WILKINS 500YSBR
9 LATERAL PIPE
10 PVC SCH 80 NIPPLE 1 1/2"
11 PVC SCH 40 ELBOW
12 PVC SCH 80 NIPPLE (2" LENGTH, HIDDEN) AND PVC 40 ELBOW
13 PVC SCH 40 TEE OR ELBOW
14 MAINLINE PIPE
15 3" MINIMUM DEPTH OF 3/4" WASHED GRAVEL
16 SCHEDULE 80 PVC UNION BALL VALVE (ONE PER VALVE)

4 DRIP VALVE WITH FILTER AND PRESSURE REG

NTS P-AD-IRR-05

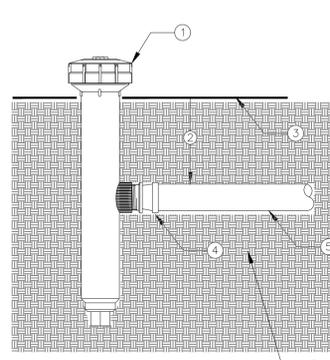


NOTE:
ALLOW A 12" MINIMUM OF PVC HOSE IN VALVE BOX IN ORDER TO DIRECT FLUSHED WATER OUTSIDE VALVE BOX.

1 FINISH GRADE
2 1/2" SCH 40 THREADED BALL VALVE.
3 1/2" SCH 40 MALE ADAPTER.
4 6" ROUND PLASTIC VALVE BOX.
5 1" IPS PVC HOSE FROM EXHAUST HEADER OR BLANK DRIP TUBING.
6 PEA GRAVEL SUMP (6" DEEP).
7 BRICK (1 OF 2)

11 DRIPLINE - FLUSH POINT

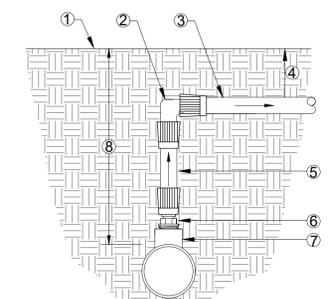
1" = 1'-0" P-AD-IRR-24



1 DRIPLINE INDICATOR. USE A MINIMUM OF ONE PER ZONE AND LOCATED AT END OF ZONE.
2 DEPTH OF DRIPLINE. REFER TO IRRIGATION LEGEND.
3 FINISH GRADE.
4 TRI-LOC X 1/2" MPT ADAPTER
5 DRIPLINE.
6 SOIL BACKFILL.

10 DRIPLINE OPERATION INDICATOR

1" = 1'-0" P-AD-IRR-21



1 FINISH GRADE
2 TRI-LOC ELBOW
3 DRIPLINE TUBING
4 DEPTH OF TUBING PER IRRIGATION LEGEND.
5 BLANK 5/8" POLY TUBING, LENGTH AS NECESSARY.
6 TRI-LOC MPT ADAPTER
7 SCH 40 PVC TEE WITH 1/2" FPT OUTLET.
8 DEPTH OF PVC LATERAL LINE PER IRRIGATION LEGEND

9 DRIPLINE MANIFOLD TO ELBOW CONNECTION

NOT TO SCALE P-AD-IRR-20

PROJECT TEAM

LANDSCAPE ARCHITECT
BASE LANDSCAPE ARCHITECTURE
145 A LOWER TERRACE
SAN FRANCISCO, CA 94114

PROJECT

ADELINE LANDSCAPING
IMPROVEMENTS
ADELINE STREET, BERKELEY, CA 96703

SPEC NO. 26-11768-C
PLAN NO. 8303
FILE NO. 406-227

100% BID SET

REVISION

#	Date	Description
1	12-10-2025	Addendum 1

STAMP

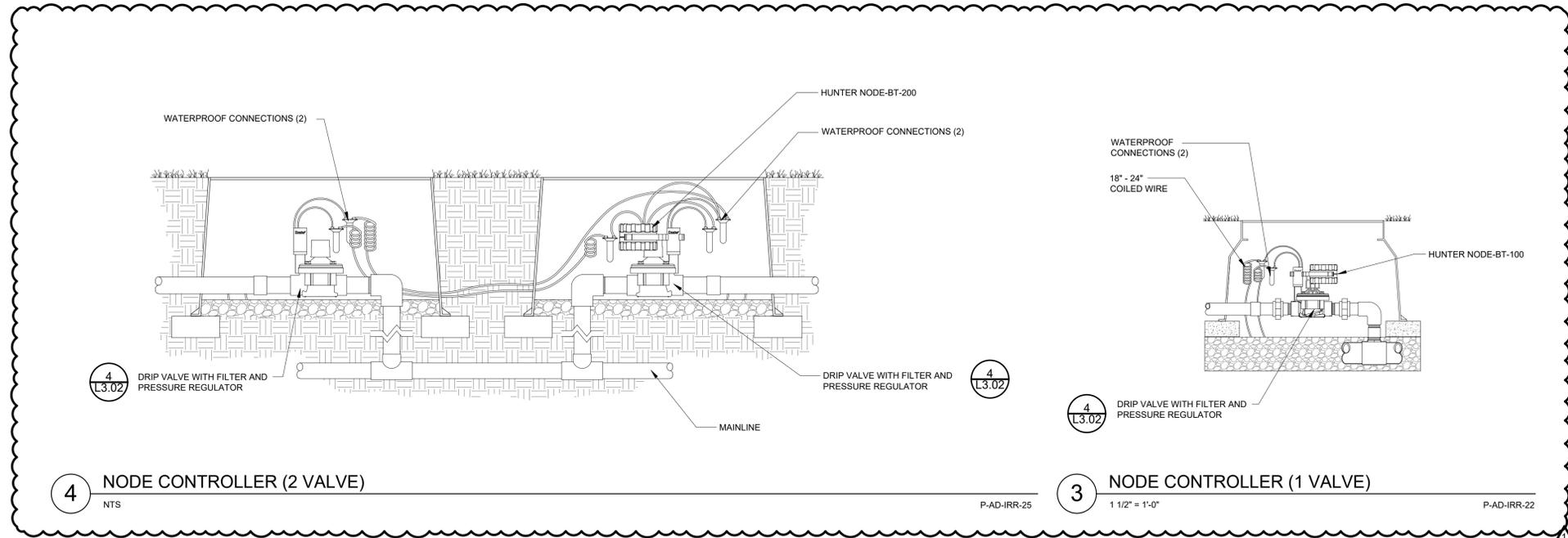


SHEET TITLE

IRRIGATION AND
CONSTRUCTION DETAILS

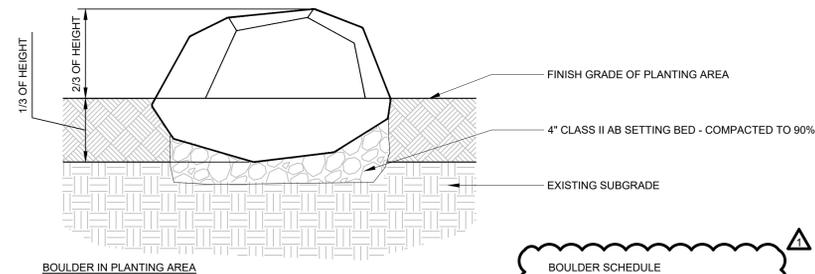
Scale: SEE DETAILS
Date: 8/29/25
Drawn by:
Checked by: MC
Project No.: 2509

L4.00



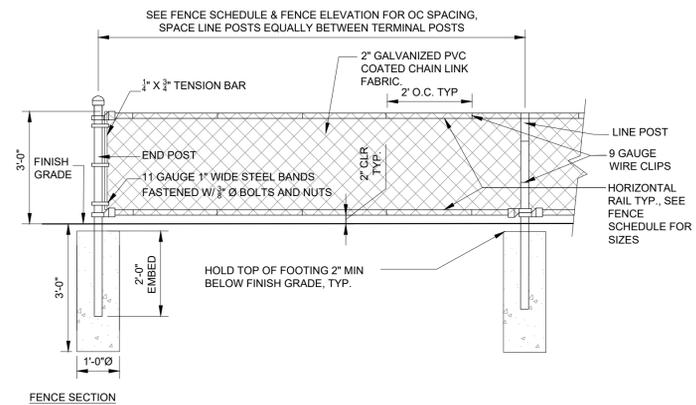
4 NODE CONTROLLER (2 VALVE)
NTS

3 NODE CONTROLLER (1 VALVE)
1 1/2" = 1'-0"



NOTE:
1. ALL BOULDERS SHALL BE SELECTED AND FIELD TAGGED BY LANDSCAPE ARCHITECT. CONTRACTOR IS RESPONSIBLE FOR TRANSPORTING BOULDERS TO THE PROJECT LOCATION.

2 BOULDERS
1" = 1'-0"



FENCE SCHEDULE

4" MAX HEIGHT ABOVE FINISH GRADE	DIAMETER AND WEIGHT, TERMINAL & CORNER POSTS	DIAMETER AND WEIGHT OF LINE POST	FENCE HORIZONTAL RAILS	MAXIMUM POST SPACING	MINIMUM FENCE POST FOOTING SIZE	NOTES
3'-0"	2 3/8" OD SCH 40 TERMINAL AND CORNER POSTS	1-7/8" OD SCH 40	1-5/8" OD SCH 40 TOP AND BOTTOM RAIL	8'-0" OC	12" Ø X 3'-0" DEEP	CONCRETE TO HAVE FC = 3000 PSI MIN

1 CHAINLINK FENCE AND SCHEDULE
1/2" = 1'-0"

SECTION 32 8400

IRRIGATION

PART 1 GENERAL

1.01 SUMMARY

- A. The CONTRACTOR shall provide all labor, materials, supplies, tools, and transportation and perform all operations in connection with and reasonably incidental to complete the installation of the automatic sprinkler irrigation systems as shown on the drawings. Items hereinafter are included as an aid to take off, and are not necessarily a complete list of work items.
 - 1. Keep existing valves operational as required.
 - 2. Relocate and adjust existing sprinkler heads to achieve and maintain head-to-head coverage as required.
 - 3. Trenching, stockpiling, excavation, materials, and refilling trenches.
 - 4. Furnishing materials and installation for complete system including piping, valves, fittings, sprinkler heads, dripline and fittings, automatic controls, and final adjustment of heads to insure complete coverage.
 - 5. Line voltage connections to the irrigation controllers and low voltage control wiring from controllers to remote control valves.
 - 6. Replacement of unsatisfactory materials.
 - 7. Re-sod or seed all irrigation trenches through existing sod areas.
 - 8. Clean-up, inspection and approval.
 - 9. All work of every description mentioned in the specification and/or addenda thereto, all other labor, and materials reasonably incidental to the satisfactory completion of the work, including clean-up of the site, as directed by the Owner's representative.
 - 10. Tests.
 - 11. As-built record drawings.



1.02 SUBMITTALS

- A. Product Data: Submit manufacturer catalog information on all material to be used on the project as specified on the legend, notes, details and plans. Redline or highlight exact items on page to be submitted. Complete material list shall be submitted prior to performing any work.
- B. Substitutions: No substitution will be permitted without prior written approval by the Owner's representative. If the product is approved and, in the opinion of the Owner's representative, the substituted product does not perform as well as the specified product, the Contractor shall replace it with the specified product at no additional cost to the Owner's representative.
- C. All equipment or materials installed or furnished without prior approval of the Owner's representative may be rejected and the Contractor may be required to remove the equipment or material at their own expense.

1.03 CLOSEOUT SUBMITTALS

A. Project As-built Record Documents:

1. The Contractor shall maintain in good order in the field office, one complete set of black line prints of all sprinkler drawings which form a part of the contract, showing all water lines, electrical, sprinklers, valves, stub-outs. In the event any work is not installed as indicated on the drawings, such work shall be corrected and documented accurately on the working drawings.
2. Dimension from two permanent points of reference, such as building corners, sidewalks, road intersections or monuments, the following items:

ADD

- a. Connections to existing mainline
- b. Gate valves
- c. Routing of pressurized mainlines and lateral lines
- d. Remote control valves
- e. Quick coupling valves
- f. Irrigation controllers

3. Deliverables shall be one full size colored hard copy of the contract drawings with redlines and dimensions or a full sized colored scanned PDF version.

B. Controller Chart:

ADD

1. Provide one laminated (hermetically sealed between two pieces of 10 mil. plastic) controller chart showing the area covered by controller for each node controller supplied at the maximum size valve box will allow. Chart shall be a reduced drawing of the actual "as-built" system.
2. Controller chart shall be a blackline print with a different color used to show area of coverage for each station. Charts must be completed and approved by the Owner's representative prior to final inspection of the irrigation system.
3. Locate all dripline flush valves and dripline indicators on colored plans if the locations differ from design plans.

C. Controller Cloud Based Communication and Flow Sensor installation confirmation:

1. Provide written confirmation that the cloud-based communications are set up and operational between controller(s) and cloud-based server.
2. If controller is a two-wire type controller. Provide confirmation that the controller is communicating with each decoder valve on system and there are no error messages logged on the cloud-based communication system. Provide a printout of information to Landscape Architect or Irrigation Consultant

ADD

D. Maintenance and Operating Instructions and Manuals:

1. Contractor shall prepare an Operation and Maintenance Manual, organized in a 3-ring binder, containing the following information.
 - a. Contractor's name, address, and telephone number. Duration of guarantee, periods as specified herein, list of equipment with names and addresses of local manufacturer's representatives with duration of written warranties. Complete operating and maintenance instructions on all equipment spare parts lists and related manufacturer's information.
2. Submit the Operation and Maintenance Manual to the Owner's representative within 10 Calendar Days of completion of work of this Section and as a condition of project acceptance.

E. Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis:

1. All landscape irrigation audits shall be conducted by a local agency landscape irrigation auditor or a third party certified landscape irrigation auditor. Landscape audits shall not be conducted by the person

who design the landscape or installed landscape.

2. In large projects or projects with multiple landscape installations (i.e. production home developments) an audit rate of 1 to 7 lots or approximately 15% will satisfy this requirement.
3. For new construction and rehabilitated landscape projects installed after December 1, 2015, as described in Section 490.1:
 - a. The project applicant shall submit an irrigation audit report with the Certificate of Completion to the local agency that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule, including configuring irrigation controllers with application rate, soil types, plant factor, slope, exposure and any other factors necessary for accurate programming.

1.04 QUALITY ASSURANCE & GENERAL REQUIREMENTS

- A. **Qualifications:** The Contractor, personally or through an authorized and competent representative, shall supervise the work constantly, and shall as far as possible keep the same foreman and workmen on the job from commencement to completion. The workmanship of the entire job must in every way be first class, and only experienced and competent workmen will be allowed on the job. A minimum of five years' experience of installing irrigation systems of similar scope, size and complexity as the system being installed under this scope of work is required for all on-site job superintendents.
- B. **Manufacturer's installation instructions and best practices:** Manufacturer's installation instructions shall be followed in all cases when not shown in the Drawings or Specifications.
- C. **O.S.H.A. Compliance:** All articles and services covered by this specification shall meet or exceed the safety standards established under the Federal Occupational Safety and Health Act of 1970, together with all amendments in effect as of the date of this specification.
- D. All irrigation systems shall be installed to meet or exceed the requirements set forth in the California Department of Water Resources Model Water Efficient Landscape Ordinance.
- E. All materials supplied for this Project shall be new and free from any defects. All defective materials shall be replaced immediately at no additional cost to City.
- F. **Codes and Standards:** Comply with all applicable codes and standards.
 1. All work and materials shall be in full accordance with the latest rules and regulations of the National Electric Code; published by the Western Plumbing Officials Association; California Code of Regulations, Title 23, Division 2. Department of Water Resources, Chapter 2.7. Model Water Efficient Landscape Ordinance; and other State or local laws regulations. Nothing in these drawings or specifications is to be construed as to permit work not conforming to these codes.
 2. When the specifications call for materials or construction of a better quality or larger size than required by the above mentioned rules and regulations, the provision of the specifications shall take precedence over the requirements of said rules and regulations.
 3. Contractor shall furnish, without extra charge, any additional material and labor when required by the compliance with these rules and regulations, though the work be not mentioned in these particular specifications or shown on the drawings.
 4. The Contractor shall erect and maintain barricades, guards, warning signs, and lights as necessary or required by O.S.H.A. regulations for the protection of the public or workmen.
 5. Any existing buildings, equipment, piping, pipe covering sewers, etc., damaged by the Contractor during the course of his work shall be replaced or repaired by the Contractor in a manner satisfactory to the Owner's representative and at Contractor's own expense, before final payment is made. The Contractor shall be responsible for damage caused by leaks in the piping systems being installed or having been installed under this contract. He/she shall repair, at his/her own expense, all damage so caused, in a manner satisfactory to the Owner's representative.

6. The Contractor shall secure the required licenses and permits including payments of charges and fees, give required notices to public authorities, verify permits secured or arrangements made by others affecting the Work of this section.

1.05 EXISTING CONDITIONS

A. Protection of Existing Structures and Utilities

1. The Drawings show, if applicable, existing above and below grade structures and utilities that are known to the Owner's representative. Locate known existing installations before proceeding with construction operations that may cause damage to such installations. Existing installations shall be kept in service where possible and damage to them shall be repaired with no adjustment of Contract Sum. Verify with Owner's representative if As Built drawings are available.
2. If other structures or utilities are encountered, request Owner's representative to provide direction on how to proceed with the Work. If a structure or utility is damaged, take appropriate action to ensure the safety of persons and property.

B. Trench Interference with Existing Tree Root Systems: Prior to trenching, layout main and lateral line locations within drip Line of trees and review locations with Owner's representative. Relocate any lines that may interfere with existing root systems to avoid or reduce damage to root systems as accepted by Owner's representative.

C. Provide barricades, coverings, warning signs, lights and other protection required by local code or OSHA to prevent damage to existing improvements to remain and to protect the public.

1.06 DELIVERY, STORAGE AND HANDLING:

A. Protection: Use all means necessary to protect irrigation system materials before, during and after installation and the installed work and materials of all other trades.

B. Replacement: In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Owner's representative and at no additional cost to the project.

1. Exercise care in handling, loading, unloading and storing plastic pipe and fittings under cover until ready to install; transport plastic pipe only on a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending and concentrated external load. Protect pipe from sunlight.
2. Repair all dented and damaged pipe by cutting out the dented or damaged section and rejoining with a coupling.

1.07 LAYOUT OF WORK

A. The Contractor shall stake out the irrigation system as shown on the drawings. These areas shall be checked by the Contractor and Owner's representative before construction is started. Any changes, deletions or additions shall be determined at this check.

B. Due to the scale of the Drawings, it is not possible to indicate all piping offsets, fittings, sleeves, etc., which may be required. Carefully investigate the conditions affected all of the work and plan accordingly, and furnish all required fittings. Install system in such a manner to avoid conflicts with planting, utilities and architectural features.

C. Do not install the irrigation system as shown on the Drawings when it is obvious in the field that obstructions, grade differences or discrepancies in arc dimensions exist that might not have been considered. Bring such obstruction or differences to the attention of the Owner's representative. Notify and coordinate irrigation Work with applicable contractors for location and installation of piping and sleeves through or under walls,

pavement and structures. In the event this notification is not given, the Contractor shall assume full responsibility for any revision necessary.

1.08 SEQUENCING AND SCHEDULING

- A. Acceptance: Do not install main line trenching prior to acceptance by Owner's representative of rough grades completed under another Section.
- B. Coordination: Coordinate with all the other trades the sleeving, power requirements of the project, prior to the start of construction.

1.09 INSTRUCTION

- A. After the system has been installed and approved, the Contractor shall instruct the Owner's representative and or Maintenance Contractor, in complete operation and maintenance of the irrigation system.

PART 2 MATERIALS

2.01 PIPE AND FITTINGS

- A. PVC Pressure Mainline pipe and fittings.
 - 1. Pressure mainline piping:
 - a. 2.5" and smaller: Shall be PVC 1120-Schedule 40 plastic pipe. Pipe shall be made from NSF approved Type 1, Grade 1 PVC compound conforming to ASTM D1785-86.
 - 2. Schedule 40 pipe shall be manufactured in strict compliance to ASTM D1785 and D2665 (where applicable), consistently meeting and/or exceeding the Quality Assurance test requirements of these standards with regard to material, workmanship, burst pressure, flattening, and extrusion quality.
 - 3. All PVC pipe shall bear the following markings:
 - a. Manufacturer's name
 - b. Nominal pipe size
 - c. Class or Schedule
 - d. Pressure rating in PSI
 - e. NSF
 - f. Date of extrusion
 - 4. Use solvent weld pipe for mainline pipe with a nominal diameter less than 3-inches or where a pipe connection occurs in a sleeve. Use Schedule 40, Type 1, PVC solvent weld fittings conforming to ASTM Standards D2466 and D1784 at changes in direction or branch mains. Use primer approved by the pipe manufacturer. Solvent cement to conform to ASTM Standard D2564.
 - 5. Connections between main lines and RCV's shall be of Schedule 80 PVC (threaded both ends) nipples and fittings.
 - 6. All fittings shall bear the manufacturer's name or trademark, material designation, size, applicable I.P.D. schedule and NSF Seal of approval.
 - 7. Inside diameter of pipe shall be the same size as iron pipe.
 - 8. PVC Type I shall not be threaded.

9. All PVC pipes and fittings for swing joints shall conform to all requirements of ASTM D3139. No threaded PVC nipples of any kind are allowed in swing joint fabrications. All swing joints shall be threaded into **Schedule 80** PVC tees or **Schedule 80** PVC 90-degree ells. Caution shall be utilized in handling Type I pipe due to the possibility of cracking or splitting.
 10. All PVC fittings shall be of the solvent weld type except where risers, valves, etc., require threaded transition fittings. All threaded PVC tees, fittings, adaptors and nipples shall be **Schedule 80** or better. All fittings shall conform to the requirements of ASTM D2466-78.
 11. When connection is plastic to metal, male adapters shall be used unless otherwise noted or detailed. The Male adapter shall be hand tightened, plus one turn with a strap wrench. Joint compound shall be non-lead base (Teflon paste or equal).
 12. Threaded Nipples – ASTM D2464, Schedule 80 with molded threads.
 13. Use Teflon tape on all threaded fittings.
 14. All PVC pipes shall be delivered in at least twenty foot (20') lengths.
- B. PVC Non-pressure lateral line and fittings
1. Lateral lines (non-pressure): 3/4" and larger shall be Schedule 40 PVC plastic pipe, Type I, 1120, bell end, solvent-welded, per ASTM D-1785 or ASTM D2672. Reuse existing lateral pipe, if applicable.
 2. Manufactured from virgin polyvinyl chloride (PVC) compound in accordance with ASTM D2241 and ASTM D1784; cell classification 12245-B, Type 1, Grade 1.
 3. Fittings – All lateral lines shall be connected with Schedule 40, Type I, Grade I, Cell classification 12454-B, per ASTM D2464 and ASTM D2466 PVC threaded and solvent weld fittings.
 4. Threads – Injection molded type (where required).
 5. Tees and ells – Side gated.
 6. Threaded Nipples – ASTM D2464, Schedule 80 with molded threads.
 7. Refer to "trenching and backfilling" elsewhere in these specifications for minimum depths.
- C. Solvent for all PVC pipe shall be #711 Gray, along with purple #P-70 primer, NSF approved as manufactured by Industrial Polychemical Service, Gardena, California, or approved equal. Solvent shall be per ASTM D2564.
- D. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying pipe. Performance shall be same as RectorSeal #5.
- E. PVC Flexible Pipe: Extruded from flexible vinyl chloride compound.
1. ½ inch pipe: 0.50 inch inside diameter, 0.090 inch wall thickness
 2. Material shall conform to ASTM designation D-2287.
- F. Swing joints shall be as shown on construction details.

2.02 SLEEVES

- A. Sleeves required for main and lateral lines located under paving shall be **Schedule 40** PVC, with the inside diameter (I.D.) of sleeve to be twice the outside diameter (O.D.) of the insert pipe, maximum 1 insert pipe per sleeve. All wiring shall be in its own separate **Schedule 40** PVC sleeve, independent from piping sleeves.
- B. Sleeves under roadways (street rights-of-way, boulevards or parkways) where heavy vehicular traffic is anticipated shall be ductile iron pipe, with the inside diameter (I.D.) of the sleeve shall be at least 1

inch greater than the outside diameter (O.D.) of the total inserted pipes. All wiring shall be in separate conduit sleeve within the iron pipe.

2.03 BACKFLOW PREVENTION DEVICE

- A. Backflow prevention device shall be the reduced pressure type with gate valves, check valves, test cocks, reduced pressure chamber and air vent.
- B. Provide a freeze preventative blanket around backflow assembly. Blanket shall be green.
- C. All metallic pipe and fittings installed below grade shall be wrapped with an approved asphaltic tape.
- D. Backflow prevention device model and size shall be as shown on the drawings.

2.04 BACKFLOW PREVENTION DEVICE ENCLOSURE

- A. Enclosure shall be sized to completely enclose backflow device.
- B. Install enclosure device as detailed.

2.05 MASTER CONTROL VALVE

- A. Master control valve shall be a normally open 24 VAC solenoid actuated globe pattern valve.
- B. Valves shall be made of brass with a minimum pressure rating of 150 PSI
- C. Valve shall have external and internal bleed for manual operation.
- D. Master valve model shall be Griswold #2160.

2.06 FLOW SENSORS

- A. Inline flow sensors shall be installed in accordance with the manufacturer's installation instructions. Contractor is responsible for the installation, all required materials and connections of the flow sensors for complete operation with the irrigation controller.
- B. Flow sensor model shall be Calsense.

2.07 FLOW SENSOR CABLE AND CONDUIT

- A. Flow sensor wire shall be shielded cable Paige model 7171D or approved equal.
- B. Maximum cable distance from controller to flow sensor shall be 2000 ft.
- C. Install flow sensor cable in a 1" grey SCH 40 PVC conduit with long sweep elbows.
- D. Conduit and flow sensor cable shall be routed with mainline wherever possible. Provide a minimum 6" separation between conduit and pressure main line.
- E. Provide 10" round gray electrical pull boxes a minimum of every 200 ft, at each change in direction and adjacent to each controller. Heat brand lid of pull box "FSB".

2.08 GATE VALVES

- A. Gate valves 2.5" and smaller shall meet the following requirements:
 - 1. Valves shall be of stainless steel (304 or higher) or bronze/brass construction with non-rising stem, cross handle and threaded connections.
 - 2. Valves shall be Nibco brass model T113-K or approved equal. Size as shown on the drawings
 - 3. Install in 10" diameter plastic valve box as detailed.

2.09 QUICK COUPLING VALVES

- A. Quick coupling valves shall be Rain Bird 33LVC or Rain Bird 44LVC. Locate all quick couplers within 24" of irrigation valve.
- B. Install in 10" diameter plastic valve box as detailed. Box lid to be labeled "QC."

2.10 CONTROLLER



- A. Controller shall be Hunter Node-BT model (refer to drawings) and applied in the following assemblies:
 - 1. Single-station with DC-latching solenoid
 - a. The controller shall be Hunter Industries model NODE-BT-100.
 - b. The preassembled controller shall have a height of 3¼" (8 cm) and a diameter of 3½" (9 cm).
 - c. The controller shall be furnished in an outdoor, weather-resistant enclosure.
 - d. The controller shall provide one station.
 - e. The enclosure shall be IP68 rated.
 - f. The controller shall use a DC-latching solenoid.
 - 2. Two-station
 - a. The controller shall be Hunter Industries model NODE-BT-200.
 - b. The preassembled controller shall have a height of 3¼" (8 cm) and a diameter of 3½" (9 cm).
 - c. The controller shall be furnished in an outdoor, weather-resistant enclosure.
 - d. The controller shall provide two stations.
 - e. The enclosure shall be IP68 rated.
 - f. The controller shall use a DC-latching solenoid.

2.11 CONTROL WIRE

- A. Irrigation Low Voltage Control Wire: All wiring to be used for connecting the node controller to the electric solenoid actuated remote control valve shall be Type UF-600V, solid copper, PVC insulation, single conductor, UL approved underground feeder cable, approved for direct burial.
- B. Control wire: Size #14-1 wire with an insulating jacket of color other than white or yellow. Runs over 2,000 lineal feet shall be size #12-1.
- C. Common ground wire: Size #12-1 wire with a white insulating jacket.
- D. Spare wires: Size #14-1 wire with a yellow insulating jacket. Provide a minimum of two spare control wires into each RCV box for future.
- E. Provide different color (not yellow) control wires for each controller and a separate ground wire for each

controller.

- F. Splices shall be made with 3M-DBY seal packs.

2.12 ELECTRIC REMOTE CONTROL VALVES

- A. Electric remote control valves sizes shall be shown on drawings.
- B. Electric remote control valve shall be a normally closed 24 VAC solenoid actuated globe pattern valve.
- C. Valves shall be Rain Bird EFP-CP Brass model.
- D. For drip irrigation, valves shall be Rain Bird EFP-CP valve with Wilkins 500YSBR filter and pressure regulator.
- E. Where shown on details, all valves shall have one Schedule 80 PVC FIPT threaded true union ball valve with EPDM O-rings on the upstream side of valve and one Schedule 80 union on the downstream side of valve. Ball valve shall be IPEX VXE series, Asahi Type 21 or equal. Match valve size when sizing ball valve and union.
- F. All valves that service dripline or drip systems shall include a plastic wye filter and pressure regulator on the valve or a solid set 40 PSI plastic regulator downstream of the valve. Filters shall be rated to 120 psi, includes a 150 mesh disk or stainless steel screen.

2.13 IDENTIFICATION TAG

- A. Identification tags for all electric control valves shall be manufactured by Christy. Tag numbers shall match stationing in controller and as shown on as-built drawings. Provide one yellow station number tag for each electric control valve as follows:
 1. Potable water systems: Christy ID.STD.Y1

2.14 VALVES BOXES

- A. ELECTRIC REMOTE CONTROL VALVE BOXES:
 1. All electric remote control valve boxes that service non-drip systems shall be installed within a Carson model 1419 (14"x19") or 1220 (13" x 20") plastic valve box with bolt down plastic lid or approved equal. Size of box is dependent on the size of valve. Lid shall be marked: "Irrigation Control Valve."
 2. All electric remote control valve boxes that service dripline or drip systems shall be installed within a Carson model 1220 plastic valve box with bolt down plastic lid or approved equal. Lid shall be marked: "Irrigation Control Valve."
 3. Use black colored boxes in shrub and groundcover areas and green in turf areas.
 4. Heat brand controller letter and numbers into lid. Minimum text height to be 2".
- B. GATE VALVE AND QUICK COUPLING VALVE BOXES:
 1. All gate valve and quick coupling valve shall be installed within a Carson Model 910-18" depth plastic valve box with plastic lid or approved equal. Use 8" or 10" sleeve to encase gate valve.
 2. Use black colored boxes in shrub and groundcover areas and green in turf areas.
 3. Heat brand the letters "GV" into lid. Minimum text height to be 2".

C. DRIP COMPONENT BOXES:

1. All drip components shall be installed within a 6" round black plastic valve box with plastic lid. Carson Model 708 plastic valve box with plastic lid or approved

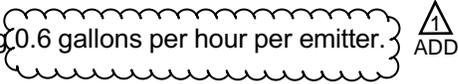
2.15 SPRINKLER HEADS

- A. All sprinkler heads shall be as listed on the drawings.
- B. Pop-up spray sprinklers shall include a built in check valve in the body to hold up to 14 feet of head.
- C. Pop-up spray sprinklers shall include built in pressure regulation in the body.
- D. Use 30 psi regulators for all spray nozzles and 45 psi regulators for all rotating nozzles. Use 12" pop-ups in shrub and ground cover areas and 6" pop-ups in turf areas.
- E. Riser units and nipples shall be the same size as the inlet to the sprinkler body.

2.16 BUBBLERS

- A. Bubblers shall be as listed on the drawings.
- B. Bubblers shall be pressure compensating from 20 psi to 60 psi.
- C. The bubbler body shall be manufactured with UV Stabilizers and have 1/2" FIPT threads for connection to 1/2" MNPT male adaptor or nipple.
- D. Flow rate molded onto the bubbler for easy identification
- E. Where low head drainage occurs, each bubbler shall have a check valve installed. Hunter HC-50F-50M or approved equal.

2.17 DRIPLINE & DRIPLINE COMPONENTS

- A. Dripline shall be as listed on the drawings.
- B. Tubing shall be low density, UV resistant, polyethylene tubing with internal pressure-compensating, drip emitters impregnated into the tubing spaced at 12 or 18 inches
- C. The built-in emitters shall be capable of delivering 0.6 gallons per hour per emitter. 
- D. All dripline systems shall have a manual flush valve at each isolated zone within the systems. Multiple flush valves may be required per drip zone.
- E. All dripline systems shall have air relief valve(s) at the highest elevation point(s) within each isolated zone. Install one air relief valve for every 500 linear feet of dripline.

2.18 MISCELLANEOUS INSTALLATION MATERIALS

- A. Solvent cement and primer for solvent weld joints shall be of make and type approved by manufacturer(s) of pipe and fittings. Cement shall be maintained at proper consistency throughout use.
- B. Pipe joint compound shall be non-hardening, non-toxic materials designed specifically for use on threaded connections in water carrying pipe. Performance shall be same as RectorSeal #5.

2.19 MISCELLANEOUS EQUIPMENT

- A. Provide all equipment called for by the drawings.
- B. Provide to the Owner's representative at completion of the maintenance period, three (3) each of all operating and servicing keys and wrenches required for complete maintenance and operation of all heads and valve. Include all wrenches necessary for complete disassembly of all heads and valves.

PART 3 INSTALLATION**3.01 PREPARATION**

- A. Schedule and coordinate placement of materials and equipment in a manner to effect the earliest completion of work in conformance with construction and progress schedule.

3.02 HANDLING AND STORAGE

- A. Protect work and materials from damage during construction and storage as directed by the Owner's representative.
- B. Handle plastic pipe carefully; especially protect it from prolonged exposure to sunlight. Any section of pipe that has been damaged will be discarded and removed and replaced if installed.

3.03 LAYOUT

- A. Lay out work as accurately as possible in accordance with diagrammatic drawings.
- B. Where site conditions do not permit location of piping, valves and heads where shown, notify Owner's representative immediately and determine relocation in joint conference.
- C. Prior to installation, the Contractor shall stake out the routing of all pressurized main lines and sprinkler heads for approval by Owner's representative.
- D. Run pipelines and automatic control wiring in common trenches wherever practical.

3.04 EXCAVATING AND TRENCHING

- A. Work shall be performed when soils are reasonably dry and not saturated.
- B. Trenching
 - 1. Excavations shall be open vertical construction sufficiently wide to provide free working space around the work installed and to provide ample space for backfilling and compacting.
 - 2. In existing turf areas remove sod with sod cutter. Roll and set aside. Replace immediately after installing conduit (three days maximum), backfilling and compacting.
 - 3. Depth of trenches shall be pipelines deep enough to provide minimum cover from finish grade as follows.
 - a. 18" minimum cover over main lines to control valves and quick coupling valves. Refer to legend for depth requirements.
 - b. 18" minimum cover over control wires from controller to valves. Refer to legend for depth requirements.

- c. 12" minimum cover over RCV controlled lateral lines to sprinkler heads. 18" depth will be required at all 12" pop-up sprinklers. Refer to legend for depth requirements.
4. Trenches shall be excavated to such depths as will permit the pipe to be laid at the elevations, slopes, or depths of cover indicated on the drawings, and at uniform slopes between indicated elevations.
5. Whenever cobbles larger than 2 inches in size are present in earthen subgrade, the trench section shall be excavated to the lines required. Every effort shall be made to keep the sides of the trenches firm and undisturbed until backfilling has been completed and consolidated. Trenches shall be excavated with approximately vertical sides between the elevation of the bottom of the pipe and an elevation one foot above the top of the pipe.
6. When two pipes are to be placed in the same trench, maintain a six-inch space between pipes as minimum.
7. Where other utilities interfere with irrigation trenching and pipe work, adjust the trench depth as instructed by the Owner's representative.
8. Restore surfaces, existing underground installations, etc., damaged or cut as a result of excavations, to original conditions in a manner approved by the Owner's representative.

C. Backfilling:

1. Backfill materials shall be approved native soil in all landscaped areas. Unsuitable material, including clods and rocks over 2 inches in size shall be removed from the premises by Contractor and disposed of legally at no cost to the Owner's representative.
2. Backfill only after piping has been tested, inspected and approved.
3. Place backfill materials in 6" layers and compact by jetting or tamping to a minimum compaction of 90 percent of original soil density.
4. Dress off areas to finish grades and remove excess soil, rocks or debris remaining after backfill is completed.
5. All backfilling shall be properly compacted so as to avoid future settlement.
6. If settlement occurs along trenches, and adjustments in pipes, valves and sprinkler heads, soil, sod or paving are necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, the Contractor, as part of the work under this contract, shall make all adjustments without extra cost to the project.

D. Re-sod Turf Areas

1. The contractor shall sod cut all existing turf areas that require trenching. Keep existing sod cuts moist and relay rolls as quickly as possible to prevent loss and stress.
2. If sod cut turf does not survive, Contractor shall re-sod any turf areas damaged due to trenching, excavation, or equipment damage such as tire tracks, to the satisfaction of the Owner's representative. If approved by Owner's representative re-seeding of damaged areas may be allowed.
3. Contractor shall furnish topsoil approved by the Owner's representative in sufficient quantities needed to perform the work and feather in all edges to eliminate any lips.
4. Sod shall be placed over the top of all excavations through grass areas. Backfill of trenches should be held short of adjacent finished grade by 1/2 inch, minimum, to accommodate sod. Roll sod with a roller to eliminate any lips where existing and new sod transition.
5. If necessary, the edge of new sod and existing turf shall be blended by using a topsoil on the turf surface to eliminate the lip. The topsoil shall be placed and blended until the lip has been blended to the satisfaction of the Owner's representative.
6. Roll sod after installation, a minimum of 3 passes, to remove air pockets and promote establishment of sod.

3.05 INSTALLATION OF SLEEVING UNDER ASPHALT OR CONCRETE

- A. General: Layout of the piping system shall be per the drawings and to the depth specified above.
- B. Under Existing Pavement:
 - 1. Piping under existing pavement may be installed by jacking, boring or hydraulic driving, except that no hydraulic driving will be permitted under asphaltic concrete pavement.
 - 2. Where cutting of existing pavement is necessary, provide alternate routes for vehicular traffic. After placement of pipes, backfill trench and compact to 95%. Replace entire section of base rock and hardscape to match existing conditions.
- C. Inspection of Pipe and Fittings: Carefully inspect all pipe fittings before installation, removing all dirt, scale and burrs; ream as required. Install all pipe with all markings up for visual inspection and verification.
- D. Installation of Sleeving:
 - 1. Sleeving shall be installed a minimum of 24 inches below grade.
 - 2. Sleeving shall extend 24 inches beyond the edge of finished concrete surface.
 - 3. Trenches containing sleeves shall be backfilled with material that consists of unwashed creek or bank gravel, crushed grave, crushed rock, sand or a mixture of these materials. It must be free from roots, vegetable matter or other deleterious substance and shall be of such nature and so graded that it will bind readily when watered and compacted. Backfill with such material to the bottom of the concrete or hardscape section and compacted to a minimum of 90%. Where the sleeve extends beyond the edge of the hardscape or concrete, the sleeve shall be backfilled with native soil or imported topsoil, whichever is specified. If nothing is specified, use previously excavated native soil.
 - 4. Prior to placement of concrete, the ends of the sleeves shall be marked with a stake that shall be exposed approximately 2"-3" above rough, or finished grade to identify sleeve locations. On all street crossing, the location shall be marked at the edge of concrete or hardscape with a chiseled line or "x", and the stake removed.

3.06 ASSEMBLING PIPELINES

- A. PVC pipe shall be installed in a manner which will provide for expansion and contraction as recommended by the pipe manufacturer. Pipe routing is diagrammatic and shall be installed in such a manner as to conform with the details.
- B. In joining, use only the specified solvent and make all joints in strict accordance with the manufacturer's recommended methods. Give solvent welds at least 16 minutes set-up time before moving or handling and 24 hours curing time before filling with water.
- C. All pipe shall be assembled free from dirt and pipe scale. Field cut ends shall be reamed only to full pipe diameter with rough edges and burrs removed.
- D. Install 3" wide detectable warning tape above all pressurized main lines as shown in the details. Use Christy model #TA-DT-3-BIRR for potable irrigation systems.
- E. Solvent Weld Joint:
 - 1. Prepare joint by first making sure the pipe end is square. Then, de-burring the pipe end, and clean pipe and fitting of dirt, dust and moisture.
 - 2. Dry insert pipe into fitting to check for proper sizing. Pipe should enter fitting 1/3 to 2/3 depth of socket.
 - 3. Coat the inside socket surface of the fitting and the male end of the pipe with P-70 primer (manufactured by Weld-On). Then without delay, apply Weld-On 711 cement liberally to the male end of the pipe and also apply 711 cement lightly to the inside of the socket. At this time, apply a second coat of cement to

the pipe end.

4. Insert pipe immediately into fitting and turn 1/4 turn to distribute cement and remove air bubbles. The pipe must seat to the bottom of the socket and fitting. Check alignment of the fitting. Pipe and fitting shall be aligned properly without strain to either.
5. Hold joint still for approximately thirty (30) seconds and then wipe the excess cement from the pipe and fitting.
6. Cure joint a minimum of thirty (30) minutes before handling, at least six (6) hours before allowing water in the pipe.

F. Threaded Joint:

1. Field threading of plastic pipe or fittings is not permitted. Only factory formed threads will be permitted.
2. Factory made nipples shall be used wherever possible. Field cut threads in metallic pipe will be permitted only where absolutely necessary. When field threading, cut threads accurately on axis with sharp dies.
3. All threaded joints shall be made up with pipe joint compound. Apply compound to male threads only.
4. Where assembling metallic pipe to metallic fitting or valve, not more than three (3) full threads shall show when joint is made up.
5. Where assembling to threaded plastic fitting, take up joint no more than one full turn beyond hand tight.
6. Where assembling plastic pipe, use strap type friction wrench only; do not use metal-jawed wrench.

G. Cap or plug openings as pipeline is assembled to prevent entrance of dirt or obstructions. Remove caps or plugs only when necessary to continue assembly.

H. Where pipes or control wires pass through sleeves, provide removable non-decaying plug at ends of sleeve to prevent entrance of earth.

I. For plastic-to-steel connections, work the steel connections first; use a non-hardening non-lead base pipe dope on all threaded plastic-to-steel connections and use only light wrench pressure. All plastic-to-steel connections shall be made with SCH 80 PVC nipple or plastic male adapters.

3.07 REMOTE CONTROL VALVES

A. Install where shown on drawings and group together where practical. Limit one remote control valve per box.

B. Locate valve boxes 12" from and perpendicular to walk edges, buildings and walls. Provide 12" between valve boxes where valves are grouped together.

C. Thoroughly flush main line before installing valves.

D. Install in shrub or groundcover areas where possible.

E. Label control line wire at each valve with an I.D. tag, indicating identification number of valve (controller and station number). Attach label to control wire.

F. Flow control stems shall be adjusted or tuned per manufacturer recommendations.

G. Install 18GA 1/2" x 1/2" square stainless-steel Type 304 wire mesh under all valve boxes and wrap up the sides of the valves. Adhere wire mesh to sides of box with stainless-steel screws and washers as required. Refer to details for more information.

3.08 AUTOMATIC CONTROL WIRE

- A. Run lines along mains wherever practical. Tie wires in bundles with pipe wrapping tape at 10' intervals and allow slack for contraction between strappings.
- B. Loop a minimum of three (3) feet of extra wire in each valve box; both control wire and ground wire.
- C. Connections shall be made by crimping bare wires with brass connectors and sealing with watertight resin sealer packs.
- D. Splicing will be permitted only on runs exceeding 2500'. Locate all splices at valve locations within valve boxes.
- E. Where control lines pass under paving, they shall pass through Schedule 40 electrical PVC conduit. Do not tape wire in bundles inside conduit.

3.09 AUTOMATIC CONTROLLER

ADD

- A. The controller shall be installed in accordance with the manufacturer's published instructions. The controller shall carry a conditional two-year exchange warranty. The automatic controller(s) shall be the NODE-BT Series Controller as manufactured for Hunter Industries Incorporated, San Marcos, California.
- B. Controller Hardware
 - 1. Control display
 - a. All programming, manual station, manual program, and manual run operation shall be accomplished by a smartphone app via Bluetooth® connection.
 - b. Manual station operation and battery status buttons shall be located on the controller.
 - c. A protective rubber cover shall protect the buttons and LEDs from dirt and moisture.
 - 2. Control panel
 - a. The controller shall be equipped with non-volatile memory that retains current time, date, and program data.
 - 3. Controller power
 - a. The controller shall be powered by one or two 9 V alkaline batteries or a solar panel with a 750 mAh charging cell.
 - b. Each station output shall supply 11 VDC with a capacity of up to 1.5 mA.
 - c. The valves attached to the controller shall have only DC-latching solenoids P/N: 458200.

3.10 SPRINKLERS AND BUBBLERS

- A. All sprinkler heads shall be set perpendicular to finish grade of the area to be irrigated unless otherwise designated on the plans.
- B. In lawn areas, all sprinkler heads shall be offset a minimum of 3 inches and a maximum of 6 inches from the edge of adjacent hardscape.
- C. Flush and adjust irrigation outlets, bubblers and nozzles for optimum performance and to prevent overspray onto field, walks, roadways, and/or buildings as much as possible. This shall include selecting the best degree of arc and radius to fit the existing site conditions and throttle the flow control at each valve to obtain the optimum operating pressure for each control zone.
- D. Install lawn heads 1" above grade in seeded lawn area at time of installation. Lower to finished grade after turf is well established and as directed by Owner's representative.

3.11 QUICK COUPLING VALVES

- A. Thoroughly flush lines before installing quick coupling valves.
- B. Locate quick coupling valves as shown in the drawings and details.
- C. Locate valve boxes 12" from and perpendicular to walk edges, buildings and walls. Provide 12" between other valve boxes where valves are grouped together.

3.12 DRIPLINE AND DRIPLINE COMPONENTS

- A. Thoroughly flush all driplines.
- B. Install dripline a minimum of 12" away from all buildings and 6" off hardscapes for shrubs and groundcover. 2" of paving for all no-mow or sod type grasses.
- C. Space driplines equally throughout the planting area as detailed. Refer to legend for emitter and row spacing of dripline. Adjust alternate rows so emitters are spaced in a triangular pattern.
- D. All dripline tubing shall be buried 4" below finish grade and stapled down every 4' and at each change in direction with a 6" tubing stake.
- E. For slopes greater than 10:1, modify dripline row spacing on the bottom 1/3 of the slope to be 25% greater at the bottom of the slope.
- F. Install flush valves at the low end of each drip zone minimum of 2 valves are required for each valve. Refer to manufacturer details for installation instructions.
- G. Install air vacuum relief valve(s) at high point(s) of each planting area. Refer to drawings for approximate locations. Revise locations in field based on actual grades of the site. Locate 1 valve per every 500' of dripline. Refer to manufacturer details for installation instructions.
- H. Thoroughly saturate soil prior to planting. Provide additional surface watering as required to keep plant root systems moist during planting establishment period.

3.13 FIELD QUALITY CONTROL

- A. Coverage Tests:
 - 1. Perform coverage tests in the presence of Owner's representative, after sprinkler or drip system is completed. Test system to assure that all areas are irrigated completely and uniformly.
 - 2. Do not spray onto pavement or structures. Adjust arc nozzles as needed to provide full coverage without over spray.
- B. Adjusting and Cleaning:
 - 1. System adjustment:
 - a. Valves: Adjust flow for proper operation.
 - b. Heads: Adjust for alignment and coverage.
 - c. If it is determined that coverage could be improved by adding additional driplines or a nozzle change, make such changes as required to provide adequate coverage to all plant material.
 - d. Perform final cleaning of all risers, dripline, heads, and equipment for proper operation. Demonstrate operation and uniform coverage in the presence of the Owner's representative prior before final acceptance.

3.14 TESTING

- A. General
 - 1. Notify the Owner's representative at least three (3) days in advance of testing.
 - 2. Furnish all necessary testing equipment and personnel.
 - 3. Correct all leaks and retest until acceptance by the Owner's representative.
- B. Closing uninspected work: Do not allow or cause any of the work of this section to be covered up or enclosed until it has been inspected, tested and approved by the Owner's representative and other authorized agencies.
- C. Flushing: Before backfilling the main line, and with all control valves in place but before lateral pipes are connected, completely flush and test the main line and repair all leaks. Flush out each section of lateral pipe before sprinkler heads are attached.
- D. Perform test as specified below. Remake any faulty joints with all new materials. Use of cement or caulking to seal leaks is absolutely prohibited.
- E. Pressure Testing Procedure:
 - 1. Apply the following tests after welded plastic pipe joints have cured at least twenty-four (24) hours.
 - a. Solvent Weld Mainline: Remove all the air from the piping system then test live (constant pressure) and QCV lines hydrostatically at 125 PSI minimum. Lines will be approved if test pressure is maintained for six (6) hours. The lines shall be restored to the original test pressure. The Contractor shall make tests and repairs as necessary until test conditions are met.
 - b. Test RCV controlled lateral lines with water at line pressure and visually inspect for leaks. Retest after correcting defects.
- F. Final Inspection
 - 1. Thoroughly clean, adjust and balance all systems.
 - 2. Demonstrate the entire system to the Irrigation Consultant and/or, if required, authorized agent and other governing agencies providing that all remote control valves are properly balanced, that all heads are properly adjusted for radius and arc of coverage, and that the installed system is workable, clean and sufficient.

3.15 GUARANTEE

- A. It shall be the responsibility of the Contractor to fill and repair all depressions and replace all necessary lawn and planting due to the settlement of irrigation trenches for one year following completion and acceptance of the job.
- B. The Contractor shall also guarantee all materials, equipment and workmanship furnished by him to be free of all defects of workmanship and materials, and shall agree to replace at his expense, at any time within one year after installation is accepted, any and all defective parts that may be found.

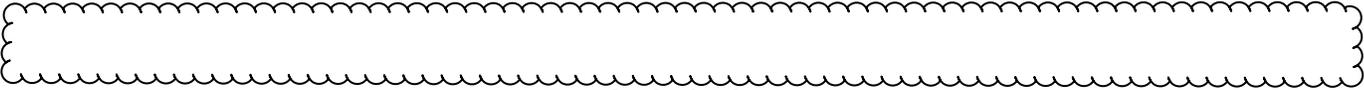
3.16 MAINTENANCE

- A. Continuously maintain irrigation system in areas indicated in the Contract during the progress of work and for a period of 90 days after substantial completion.
- B. It is Contractor's responsibility to turn over the irrigation in a first-class condition at the end of the maintenance period.

- C. Maintenance Schedule: Contractor shall submit schedule of maintenance tasks to be performed for Owner's representative review and approval. At a minimum, maintenance staff shall be on-site two times per month. It is not the intention of these Specifications to allow a "quick cleanup" at the end of the maintenance period, but rather that the work be continuous and ongoing.
- D. Proper irrigation system maintenance includes the overall supervision of the system, controller scheduling, routine adjustments and necessary repairs.
- E. Maintain irrigation system for optimum performance, as per manufacturer's specifications, by inspecting the entire system on an on-going basis. This includes cleaning and adjusting all bubbler heads, dripline and valves for proper coverage.

3.17 CLEAN-UP

- A. Preservation and Cleaning: The Contractor shall clean up the work as it progresses. At frequent intervals, and at all times when directed by the Owner's representative, the Contractor shall remove and dispose of accumulations of rubbish and debris of all kinds. At the time of completion, the entire site shall be cleared of tools, equipment, rubbish, etc., all of which shall be removed from the site; and the entire project, including surrounding premises, shall be left in proper, clean condition ready for acceptance.



END OF SECTION

SECTION 32 9113

SOIL PREPARATION

PART 1 GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all planting area soil preparation and related work as shown on the Drawings and/or specified herein.
- B. The general extent of the preparation of planting areas is shown on the drawings and includes, but is not necessarily limited to the following:
 - 1. Planting soil.
 - 2. Organic soil amendments.

1.02 RELATED WORK

- A. Section 31 1000 – Site Clearing, for site topsoil stripping and stockpiling
- B. Section 32 8400 – Irrigation
- C. Section 32 9300 – Plants

1.03 DEFINITIONS

- A. AAPFCO: Association of American Plant Food Control Officials.
- B. Amendment: Organic materials added to imported or native soil to produce planting soil mix suitable to plant growth. Amendments include general soil additives, fertilizers, biological and pH amendments.
- C. Backfill: For the purposes of planting, excavated or stockpiled native soil mixed with top soil and/or approved soil amendments. Backfill soil shall be clean and free of large stones and roots, plants, sod, clods, clay lumps, pockets of coarse sand, and of suitable moisture content and granular texture for placing around tree rootball. For non-planting related purposes, see Section 31 2333 – Utility Trenching and Backfill for backfill requirements at utility trenches.
- D. Biological Amendment: Mycorrhizal additives, compost tea, or other products intended to modify the soil biology.
- E. CCQC: California Compost Quality Council, verifies that compost producers are in compliance with state compost regulations and standards. www.crra.com
- F. CEC: Cation exchange capacity.
- G. Compacted Soil: Soil with density greater than the threshold for root limiting.
- H. Compost: The product resulting from the controlled biological decomposition of organic material that has been sanitized through the generation of heat and stabilized to the point that it is beneficial to plant growth.

- I. Drainage: The rate at which soil water moves through the soil transitioning the soil from saturated condition to field capacity, in inches per hour, or expressed as hydraulic conductivity.
- J. Duff Layer: A surface layer of soil, typical of forested areas, that is composed of mostly decayed leaves, twigs, and detritus.
- K. Existing Soil or Native soil: Mineral soil existing at the locations of proposed planting after the majority of construction within and around the planting site is completed and just prior to the start of work to prepare the planting area for soil modification and planting.
- L. Fertilizer: Amendment used to adjust soil nutrient composition and balance.
- M. Fine Grading: The final grading of soil to achieve exact spot elevations and positive drainage.
- N. Imported Soil: Soil that is transported to Project site for use.
- O. Layered Soil Assembly: A designed series of planting soils, layered on each other, that together produce an environment for plant growth.
- P. Manufactured Soil: Soil produced by blending soils, sand, stabilized organic soil amendments, and other materials to produce planting soil.
- Q. Minor Disturbance: Minor grading as part of agricultural work that only adjusts the A soil horizon, minor surface compaction in the top 6 inches of soil, applications of fertilizers.
- R. NAPT: North American Proficiency Testing Program. An SSSA program to assist soil-, plant-, and water-testing laboratories through interlaboratory sample exchanges and statistical evaluation of analytical data.
- S. OMRI: Organic Materials Research Institute, assures product compliance with regulations of the National Organic Program for organically approved products. www.omri.org
- T. Organic Matter: The total of organic materials in soil exclusive of undecayed plant and animal tissues, their partial decomposition products, and the soil biomass; also called "humus" or "soil organic matter."
- U. Planting Soil: Existing on-site soil, topsoil, imported soil, or manufactured soil that has been modified as specified with soil amendments and/or fertilizers to produce a soil mixture best for plant growth.
- V. RCRA Metals: Hazardous metals identified by the EPA under the Resource Conservation and Recovery Act.
- W. Scarify: Loosening and roughening the surface of soil and subsoil prior to planting.
- X. Soil Horizons: As defined in the USDA National Soil Survey Handbook.
- Y. SSSA: Soil Science Society of America.
- Z. STA: US Composting Council STA Program, assures that compost producers have regularly tested compost for chemical, physical and biological properties. www.compostingcouncil.org
- AA. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.
- BB. Subsoil: Soil beneath the level of subgrade; soil beneath the topsoil layers of a naturally occurring soil profile, typified by less than 1 percent organic matter and few soil organisms.
- CC. Surface Soil: Soil that is present at the top layer of the existing soil profile. In undisturbed areas, surface soil is typically called "topsoil;" in disturbed areas such as urban environments, the

surface soil can be subsoil.

DD. Topsoil: naturally produced and harvested soil from the A horizon or upper layers of the soil.

EE. USCC: U.S. Composting Council.

1.04 REFERENCES

- A. Applicable ASTM Specifications.
- B. TMECC (Test Methods for the Examination of Composting and Compost), from USCC (US Composting Council)
- C. Organic Materials Review Institute (OMRI), www.omri.org

1.05 SUBMITTALS, TESTS, AND INSPECTIONS

- A. Prior to commencing soil preparation operations, request a review by the City's Representative to verify specified limits and grades of work completed. If additional inspections or observations by the City's Representative are required as a result of Contractor's non-compliance with these Specifications, Contractor shall pay for such additional inspections or observations at no increase in contract sum.
- B. Product Data: For each type of product.
 - 1. Include recommendations for application and use.
 - 2. Include test data substantiating that products comply with requirements.
 - 3. Include sieve analyses for aggregate materials.
 - 4. Material Certificates: For each type of imported soil, soil amendment and organic fertilizer before delivery to the site, according to the following:
 - a. Manufacturer's qualified testing agency's certified analysis of standard products.
 - b. Analysis of fertilizers, by a qualified testing agency, made according to AAPFCO methods for testing and labeling and according to AAPFCO's SUIP #25.
- C. Soil Fertility Analysis:
 - 1. For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; salinity, nitrate, ammonium, phosphate, potassium, calcium, magnesium, boron, sodium absorption ratio (SAR); deleterious material; pH; agricultural suitability, infiltration rate, and mineral and plant-nutrient content of the soil
 - 2. The Contractor shall obtain soil fertility tests for all of the following:
 - a. Existing in-place soils, native surface topsoil.
 - b. Organic soil amendments.
 - 3. The tests shall be performed at Contractor's expense. The results of these tests shall be submitted to the City's Representative for review by the Landscape Architect to decide whether to accept the soil.
 - 4. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed, as listed but not limited to:
 - a. For soil testing: Wallace Laboratory, Inc, El Segundo (310) 615-0116
 - b. For compost testing: Soil Control Lab, Watsonville (831) 761-7273

5. Laboratory soil testing report shall be no older than 6 months from the date of Landscape Architect's review, and shall represent the product delivered to the project site.
 6. Laboratory compost testing report shall be no older than 3 months from the date of Landscape Architect's review, and shall represent the product delivered to the project site.
 7. Soil testing laboratory to provide recommendations for organic soil amendments, including the use of Greenwaste compost. Request that lab state the amount of compost that is required to bring soil organic matter content to a minimum of 5%.
 - a. Recommendations for synthetic amendments and fertilizers will be rejected.
 8. Lab shall report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, lab shall provide additional recommendations for corrective action.
- D. Soil sampling requirements:
1. General: Extract soil samples according to requirements in this article.
 2. Sample Collection and Labeling: Contractor to collect and label soil samples per directions described by soil testing laboratory.
 - a. Number and Location of Samples: Representative soil samples from locations shown on Drawings for each soil to be used or amended for planting.
 - b. Procedures and Depth of Samples: Per soil testing laboratory standards.
 - c. Labeling: Label each sample with the date, location keyed to a site plan or other location system, visible soil condition, and sampling depth.
- E. Certifications:
1. Certifications must be provided as a submittal for soil amendment and mulch from an approved testing agency.
 2. Organic Soil Amendments: Organic Materials Review Institute (OMRI) listed soil amendments only. Submit Manufacturer's certificate.
- F. Testing:
1. All imported materials, including soil, mulch, and amendments, must certify that they do not exceed lead levels greater than or equal to 80 ppm.
- G. Samples:
1. The Contractor shall submit to the Landscape Architect at least three weeks prior to installation Samples of materials for approval. For standard products, also submit the manufacturer's certified analysis. For other materials, submit an analysis by a recognized laboratory made in accordance with the current methods established by the Association of Official Agricultural Chemists. Each Sample shall be typical of the material to be furnished; provide an accurate representation of color, texture, and organic makeup
 2. Samples to be submitted to Landscape Architect for approval:
 - a. One-quart sample of compost in zip-lock bag with product name, composition of materials by percentage of weight and source, and manufacturer contact info marked on bag.
- H. Contractor shall submit to the Landscape Architect written certification stating quantity, type, composition, weight and origin of all amendments and chemicals delivered to the site for soil preparation work.
- I. Verification of Material: The Contractor shall, upon demand, produce records to verify the ordering and delivery of specified quantities and types of material for this job.

1.06 DELIVERY, STORAGE, STOCKPILING, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.
- B. Bulk Materials:
 - 1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing plants or under tree canopies.
 - 2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
 - 3. Accompany each delivery of bulk organic soil amendments with appropriate certificates.
- C. Soil and Compost:
 - 1. Compost shall be delivered to site at least three weeks prior to commencement of work, and sample submitted to Landscape Architect for approval.
 - 2. Compost that is warm to the touch will be rejected as not fully mature and not suitable for application.
 - 3. Compost that is to be stockpiled for longer than two weeks shall not be placed in mounds higher than 6 feet.
 - 4. Soil and compost that is stockpiled shall be covered at least two weeks prior to installation to prevent excess moisture from saturating the soil stockpile. Check moisture content at least two days prior to soil installation.
 - 5. Soil materials shall not be handled or hauled, placed, or compacted when it is wet, as during or after rain, nor when frozen.

1.07 QUALITY ASSURANCE

- A. All local, municipal and state laws, rules and regulations governing or relating to any portion of this work are hereby incorporated into and made a part of these specifications, and their provisions shall be carried out by the Contractor. Anything in these specifications shall not be constructed as conflicting with any such rules and regulations, or the requirements of the same. However, when these specifications and drawings call for or describe materials, workmanship or construction of a better quality, higher standard, or larger size than is required by such rules and regulations, the provisions of these specifications and drawings shall take precedence.
- B. Contractor shall exercise caution and provide necessary safeguards to prevent injury to, or defacement of, existing site improvements, including planting and underground utilities. Contractor shall repair or replace, at no increase in contract sum, property damaged as a result of his work.
- C. Before commencing site work, locate underground utilities to preclude any possible damage. Do not use heavy equipment which may cause damage to existing facilities. Use hand excavation as required to minimize possibility of damage to underground utilities.
- D. Protect existing utilities, paving, irrigation and other facilities from damage caused by landscape operations.
- E. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by the City unless permitted under the following conditions and then only after

arranging to provide temporary services or utilities according to requirements indicated.

1. Notify Owner's Representative no fewer than five business days in advance of proposed interruption of each service or utility.
 2. Do not proceed with interruption of services or utilities without City's written permission.
- F. Equip internal combustion motors and compressors with mufflers. Do not leave such equipment running under trees.
- G. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of planting areas and construction contiguous by field measurements before proceeding with soil work.
- H. Areas to be planted shall be graded by Contractor to finish grades indicated on Drawings. Contractor shall grade landscape areas in such a manner as to direct drainage away from buildings and walkways. Contractor shall grade all landscape areas as not to allow standing water. Minimum percentage of slope to all landscape areas shall be two percent (2%). Contractor shall notify Landscape Architect prior to start of construction if he anticipates any drainage problems.
- I. Before Proceeding With The Work: Contractor shall check rough-graded areas and verify all dimensions and quantities. Contractor shall immediately inform the City's Representative of any discrepancy between the Drawings and Specifications and actual conditions. Contractor shall perform no work in any area where there is such a discrepancy until approval has been given by the City's Representative.
- J. Weather Limitations: Apply soil amendments during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Planting Soils:
1. All planting areas shall provide a minimum depth of twelve inches of uncompacted soil except where tree roots or bedrock limit the depth.
 2. Native Topsoil
 - a. Shall be on-site existing topsoil after all rocks over two inches and all foreign debris have been removed. Native topsoil shall be free of any substance harmful to plant growth and shall have organic material and soil characteristics capable of sustaining healthy plant life. Heavy clay soil shall not be considered for use as topsoil. Suitable native topsoil shall be stockpiled for re-use where required to replace existing topsoil.
 - b. Topsoil shall be tested in accordance with Section "Soil Fertility Testing".
 3. Import Soil
 - a. Imported soil shall be loam, sandy loam, or loamy sand.
 - 1) General Landscape Amended Topsoil – "General Landscape" by American Soil & Stone, www.americansoil.com or approved equal.
 4. All imported topsoil shall have an agricultural suitability test, dated within thirty (30) days of delivery and indicating compliance with these specifications, by a qualified soils laboratory prior to delivery to the job site.

5. Fertility: Follow all recommendations of the Testing Lab Report based on the Soil Fertility Test results.
- B. Organic Soil Amendments and Fertilizers:
1. Organic Soil Amendments shall be first quality organic agricultural products approved for use in organic crop production by OMRI (Organic Materials Review Institute), see www.OMRI.org. Soil amendments that are not approved or are restricted for use shall be applied only after review and written approval by the Owner's representative. The Owner's representative shall determine appropriate amendments for the species of plants to be established following review of the submittal of the soil fertility test results and recommendations for amendment.
 - a. Synthetic fertilizers and amendments are prohibited on this Project.
 2. Organic Compost: Compost shall be a well decomposed, fully stabilized, weed free organic matter source. The product shall be certified through the US Composting Council's (USCC) Seal of Testing Assurance Program (STA) Program (a compost testing and information disclosure program). It shall be derived from agricultural or food waste or yard trimmings. The product shall contain no substances toxic to plants, will possess no objectionable odors and shall not resemble the feedstock (the original materials from which it was derived).
 - a. The submitted lab report shall verify:
 - 1) Feedstock Materials shall be specified and include one or more of the following: landscape/yard trimmings, grass clippings, food scraps, and agricultural crop residues.
 - 2) Organic Matter Content: 50% - 65% by dry wt. preferred, 35-70% acceptable
 - 3) Carbon and Nitrogen Ratio: C:N < 25:1 plus at least one measure of stability and at least one measure of toxicity.
 - 4) Maturity/Stability: shall have a dark brown color and a soil-like odor. Compost exhibiting a sour or putrid smell, containing recognizable grass or leaves, or is hot (120F) upon delivery or rewetting is not acceptable. In addition any one of the following is required to indicate stability
 - (a) < 1.3 O₂ / unit TS / hr
 - (b) < 1.5 O₂ / unit BVS / hr
 - (c) < 8 C / unit VS / day
 - (d) < 20 Temp. rise (oC)
 - (e) > 5 Index value
 - 5) Toxicity: any one of the following measures is sufficient to indicate non-toxicity.
 - (a) < 3
 - (b) < 500 ppm, dry basis
 - (c) > 80 % of control
 - (d) > 80% of control
 - 6) Nutrient Content: provide analysis detailing nutrient content including N-P-K, Ca, Na, Mg, S, and B.
 - (a) Total Nitrogen content 0.9% or above preferred.
 - (b) Boron: Total shall be <80 ppm; Soluble shall be <2.5 ppm
 - 7) Salinity: Must be reported; may vary but < 4.0 mmhos/cm preferred. Soil should also be tested: <2.5 mmhos/cm is preferred for soil/compost blend but may vary with plant species.
 - 8) pH: pH shall be between 6.5 and 8. May vary with plant species.
 - 9) Particle size: 95% passing a 1/2" screen.

- 10) Bulk density: shall be between 500 and 1100 dry lbs/cubic yard
 - 11) Moisture Content shall be between 35% - 55% of dry solids.
 - 12) Inerts: compost shall be relatively free of inert ingredients, including glass, plastic and paper, < 0.1 % by weight or volume.
 - 13) Weed seed/pathogen destruction: provide proof of process to further reduce pathogens (PFRP). For example, turned windrows must reach min. 55C for 15 days with at least 5 turnings during that period.
 - 14) Select Pathogens: Salmonella <3 MPN/4grams of TS, or Coliform Bacteria <10000 MPN/gram.
 - 15) Trace Contaminants Metals (Lead, Mercury, Etc.) Product must meet US EPA, 40 CFR 503 regulations.
- b. Compost shall contain biological activity as follows (per gram of compost):
- 1) 15 to 30 or more μg active bacteria
 - 2) 150 μg to 300 or more μg total bacteria
 - 3) 2 to 10 μg or more active fungi
 - 4) 150 to 500 or more (fungal compost) μg total fungal biomass
 - 5) 50,000 or more protozoa
 - 6) 25,000 or more flagellates
 - 7) 25,000 or more amoebae
 - 8) 50 - 100 ciliates
 - 9) 20-100 beneficial nematodes
 - 10) No root-feeding nematodes
3. Additional amendments and/or fertilizers as required in the soils report.
- a. Additional amendments and fertilizers that are approved for use by the Organics Materials Research Institute (OMRI) for use in crop production may be approved for use by the Landscape Architect. See www.omri.org. Fertilizers that are not approved or are restricted for use by OMRI shall be applied only after review and written approval by the Landscape Architect.
4. Soil Amendment Application Rates: Rates shown are for bidding purposes only. The Landscape Architect shall approve amendment application rates that are appropriate for the plant species to be established after review of the soil test results and amendment recommendations. For estimating purposes, assume the listed rates of application:
- a. Azomite - 6 pounds per 1000 square feet
 - b. Compost - 1 cubic yard/ 1000 square feet
 - c. Compost Tea (AACT) – 30 Gallons per acre (spray at less than 100 psi)
 - d. Humic Acid – TurfPro: Apply 6-8 ounces of Turf and Garden Pro product per 1000 square feet of lawn
 - e. VermaPlex Liquid Inoculant – 5 Gallons per acre
 - f. Solu-PLKS – 2 Gallons per acre (may be added to AACT)
 - g. Worm castings – $\frac{1}{2}$ Cubic Yard per 2500 square feet
- C. Pesticides: No synthetic or chemical pesticides will be allowed.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Examine areas to receive soil and mulch for compliance with requirements and conditions

affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area. If foreign or deleterious material is found remove the soil and contamination as directed by Owner's representative and replace with new planting soil.
 2. Do not mix or place soils and soil amendments in wet, rainy, or muddy conditions.
 3. Suspend soil spreading and grading operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PROTECTION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by soil and mulch placement operations.
- B. Install erosion-control measures as needed to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkway.

3.03 CLEARING

- A. In all areas to be planted, remove stones larger than 2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off the property.
- B. In all planting areas, remove concrete and plaster debris larger than 1 inch in any dimension.
- C. In all areas to be planted, remove any noxious or invasive weeds and dispose offsite.



~~3.04 PREPARATION OF SUBSOIL~~

- ~~A. Prepare subsoil to eliminate uneven areas. Make changes in grade gradual, blend slopes smoothly into level areas.~~
- ~~B. Remove contaminated subsoil, foreign materials, weeds and undesirable plants and roots.~~
- ~~C. Subgrade Scarification: All areas to be planted shall be cross-ripped and scarified to a minimum depth as specified on the Drawings. Break down large clods, remove rocks over two inches in any dimension, gravel, and miscellaneous debris. Any areas which, subsequent to initial ripping, become recompactd as a result of having been subjected to vehicular traffic shall be re-ripped before placement of topsoil.~~
- ~~D. Dig pits and beds larger than plant root system as shown on Drawings.~~

3.05 SOIL PREPARATION

- A. Soil Moisture Content: Do not work soil when moisture content is so great that excessive compaction will occur, or when the soil is so dry that clods will not break readily or dust will form in the air. Apply water as required to prevent the formation of an airborne dust nuisance and to provide ideal soil moisture content for tilling.
- B. Planting areas where soil must be loosened to alleviate compaction:
 1. Planting area is to be prepared with as little tilling as possible.

2. Scarify or till soil to depth needed to achieve a total depth of 12 inches of uncompacted soil after organic amendments are added.
 3. Do not scarify or till within drip line of existing trees to be retained.
 4. If planting area soil will be loosened prior to planting, incorporate organic soil amendments to the soil depth specified on drawings while soil is being loosened.
- C. Planting areas that will receive imported soil:
1. Before adding imported topsoil, scarify subsoils to a depth of six inches.
 2. Do not scarify or till within drip line of existing trees to be retained.
 3. Place topsoil during dry weather and on dry subgrade.
 4. Place first lift of three inches of imported topsoil on scarified surface and till into subsoil.
 5. Place second lift of three inches or more of imported topsoil on surface to achieve a minimum depth of twelve inches of friable soil.
 6. Grade planting beds smooth, eliminate rough, low or soft areas, and to ensure positive drainage.
 7. Top of tamped soil adjacent to hardscape to be 1" below curbs and paving.
- D. Verify that all planting beds shall have a minimum depth of twelve inches of uncompacted soil except where tree roots or bedrock limit the depth. Soil compaction shall be measured using a soil cone penetrometer.
- E. Incorporate soil amendments as specified, cultivate soil to depth indicated on Drawings in all areas, and remove all sticks, stones over one inch (1-inch) in any dimension, roots, weeds and other foreign material. Topsoil shall be placed as needed to bring existing grades to finish grades shown in the Drawings, and all areas shall be hand graded and smoothed.
- F. Placement of blended soil – Place per Drawings.

3.06 ORGANIC SOIL AMENDMENT APPLICATION

- A. Apply organic soil amendments directly to surface of planting area after removing weeds and tilling soil. Cover with layer of compost. Till soil amendments into soil.

3.07 AMENDMENT REQUIREMENTS FOR PLANTED AREAS

- A. Shaping and finish grading to be finished and approved by Landscape Architect prior to planting area preparation.
- B. Amendment Application:
1. The Contractor shall obtain horticultural soils reports for the existing site soil planted area and for the imported sandy loam or loamy sand topsoil from Soil testing laboratory. The reports shall indicate the required soil preparation, and amendments materials and quantities necessary to insure establishment of healthy and vigorous turf, groundcover, shrubs, and trees.

3.08 FINISH GRADING

- A. After completion of pavements and structures, areas to be planted shall be graded and shaped by blading, dragging, and other means. Finished surfaces shall be uniform and smooth and shall conform to slopes and finish grades indicated on the Drawings after soil preparation, settlement, and planting have occurred. Minor adjustments to finish grades shall be made at the direction of the Landscape Architect if required.

- B. Finish grades shall provide for surface drainage of planting areas. Contractor shall correct drainage condition which may be detrimental to the growth of plants or which result in retention of water in tree pits.
- C. Finish grades of soil in planting areas shall be ~~four~~ ^{seven} inches below adjacent pavement or tops of curbs after settlement to allow for mulch placement. 
- D. Tops and toes of all slopes shall be rounded to produce a smooth, continuous, and natural-appearing transition between slopes and relatively level areas.
- E. Finish grading shall direct water away from all structures and walks.
- F. Contractor shall obtain approval by Owner's representative for finish grades before any seeding or planting begins.

3.09 CLEANUP AND PROTECTION

- A. During soil installation, keep adjacent paving and construction clean and work area in an orderly condition.
- B. Disposal: Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash and debris and dispose of them off Owner's representative property.

END OF SECTION