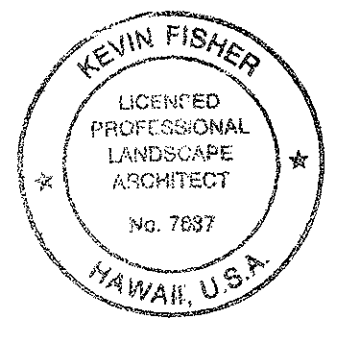
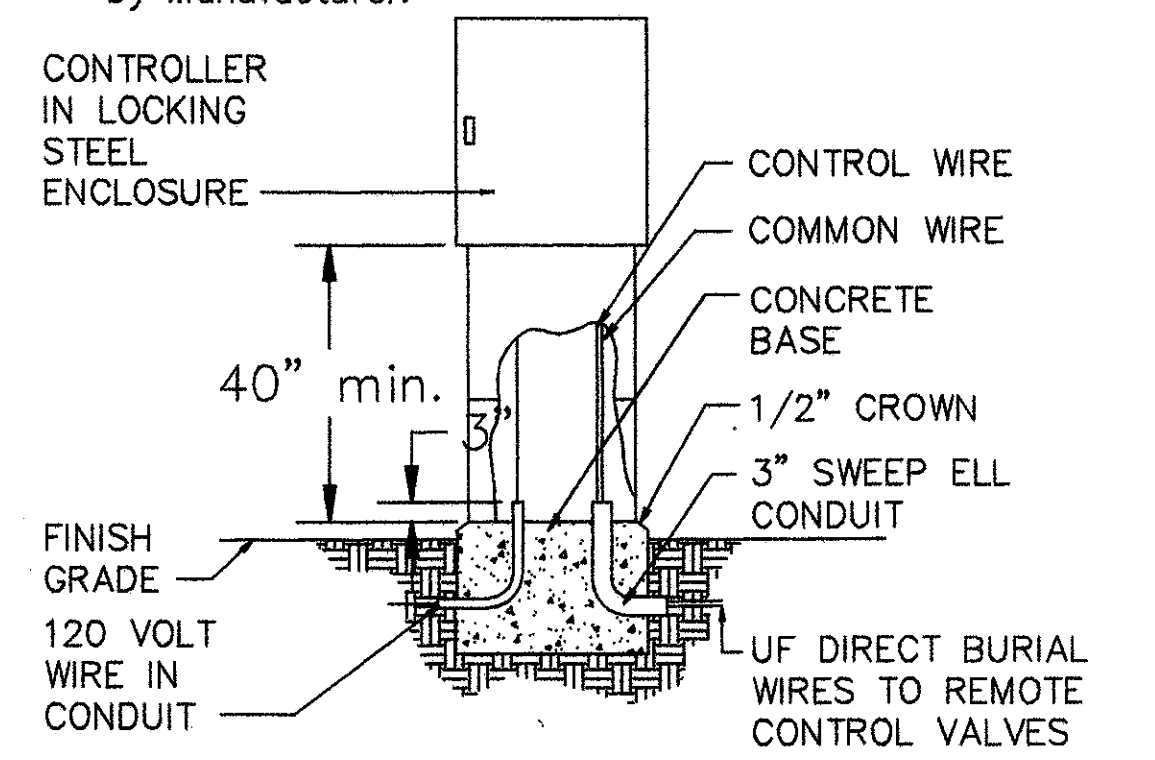
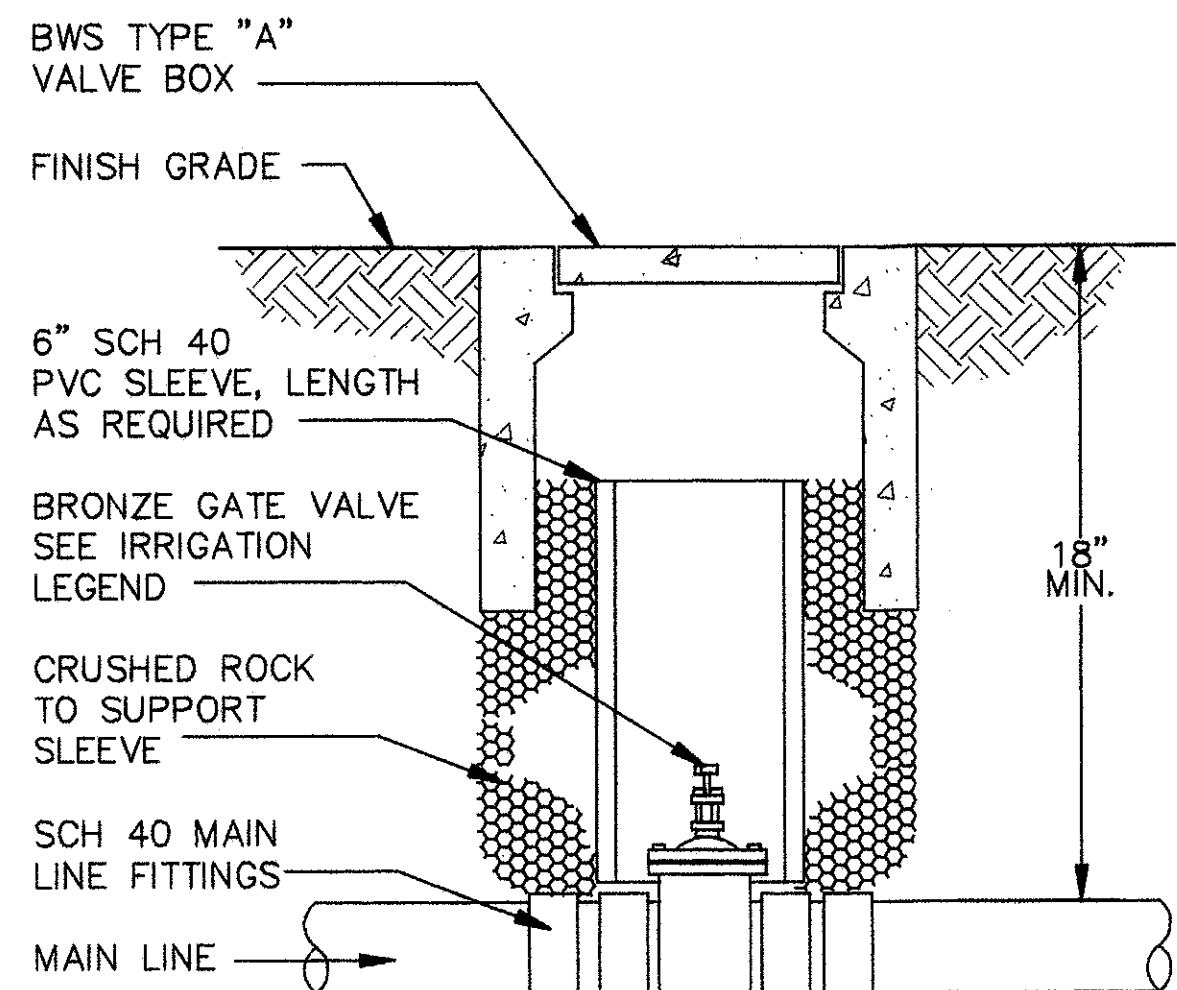


ENGINEER <i>LI</i>	REVISION	DATE	BRIEF	BY	APPROVED
DRAFTSMAN <i>KF</i>					
CHECKED BY <i>LI</i>					
 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. <i>Kevin Fisher</i> 5/27/98 SIGNATURE DATE	R. M. TOWILL CORPORATION ENGINEERS • PLANNERS • SURVEYORS • PHOTOGRAMMETRISTS CONSTRUCTION MANAGERS 420 Waiakamilo Road Honolulu, Hawaii 96817-4941				
	THE ESTATE OF JAMES CAMPBELL, FINANCE REALTY COMPANY, AND HOUSING FINANCE AND DEVELOPMENT CORPORATION, STATE OF HAWAII				
	FARRINGTON HIGHWAY IMPROVEMENTS EWA, OAHU, HAWAII TMK : (1ST DIVISION) PORTION OF 9-1-18				
	IRRIGATION PLAN 1				
HPDC JOB NO. DEV 93-41	SCALE AS SHOWN	DATE MAY 1998			

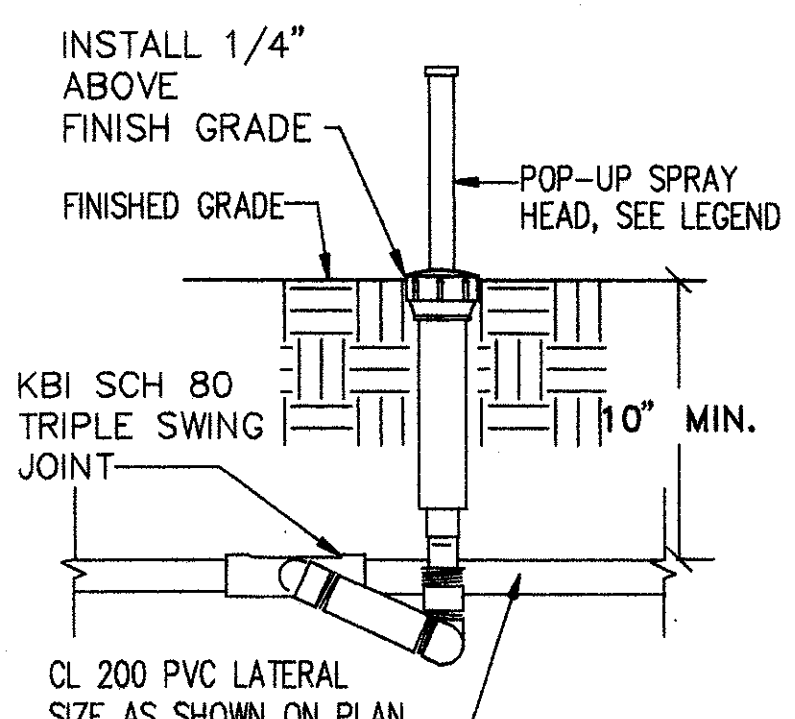
- NOTES:
1. Install controller per manufacturer instructions.
 2. Install all wiring as per local code.
 3. Pedestal shall be anchored to concrete base as recommended by Manufacturer.
 4. Concrete base size shall be as recommended by Manufacturer.



PEDESTAL MOUNT CONTROLLER
NOT TO SCALE

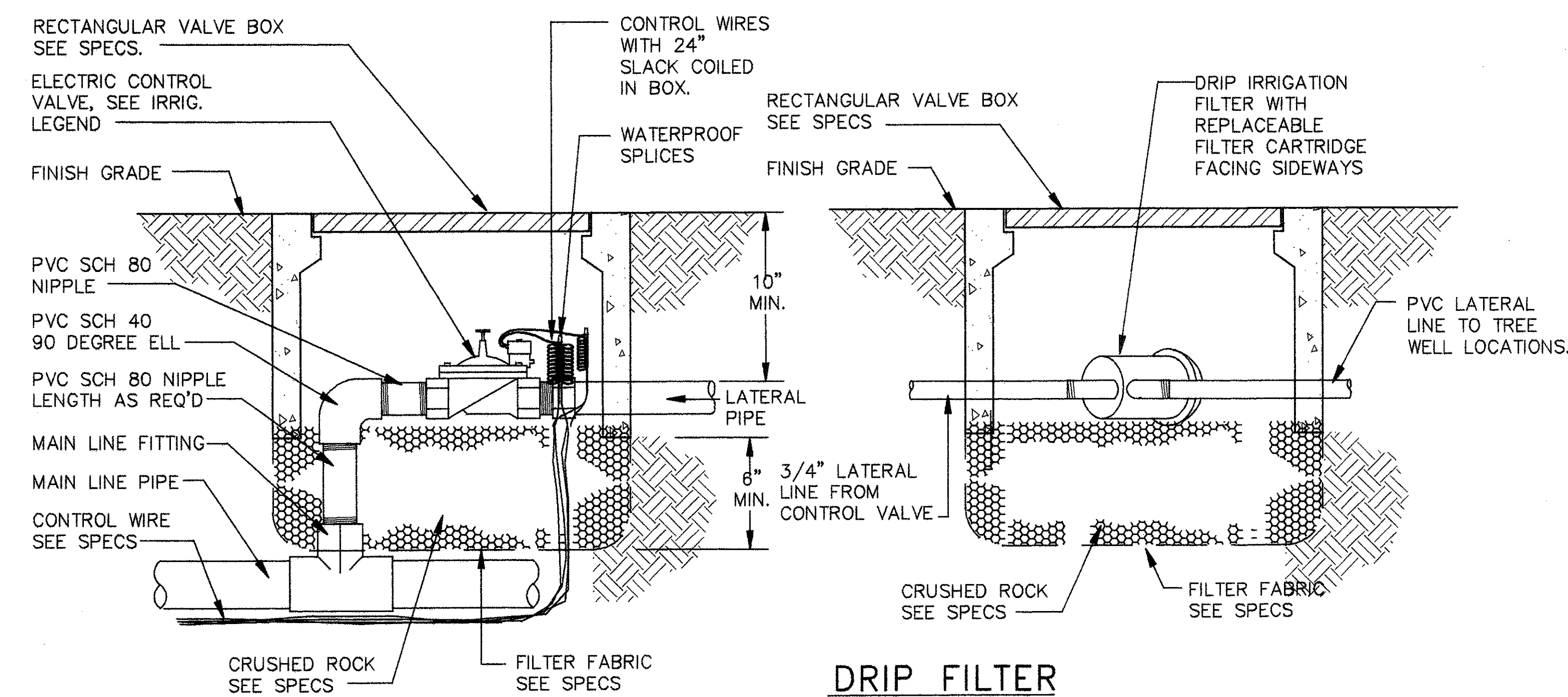


GATE VALVE
NOT TO SCALE



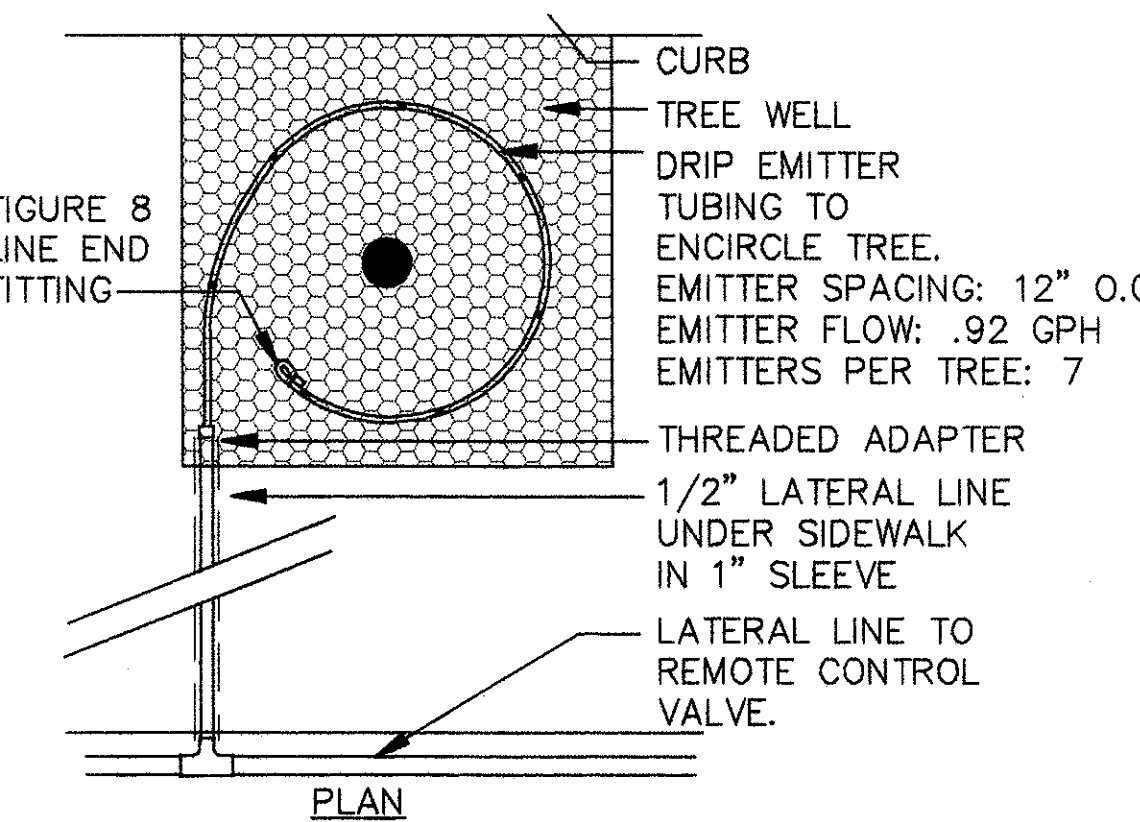
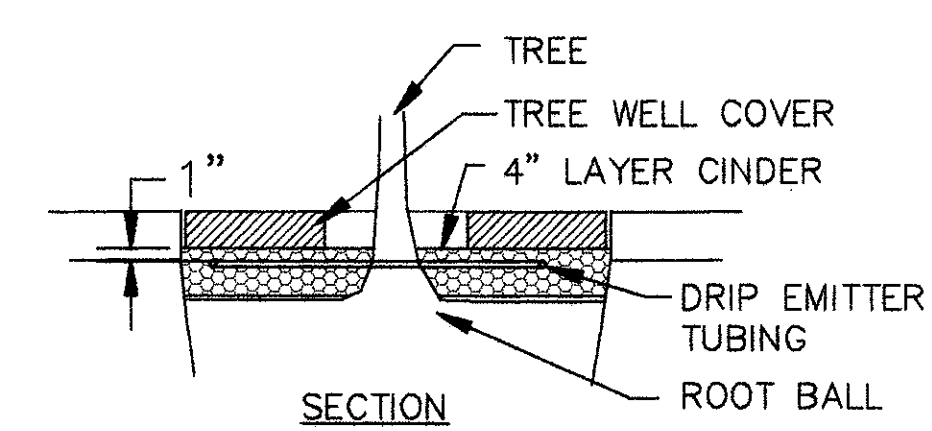
NOTE: CONTRACTOR TO FOLLOW MANUF. INSTRUCTIONS FOR INSTALLING AND ADJUSTING IRRIGATION HEADS.

POP-UP SPRAY HEAD
NOT TO SCALE


















CONTROL VALVE
NOT TO SCALE

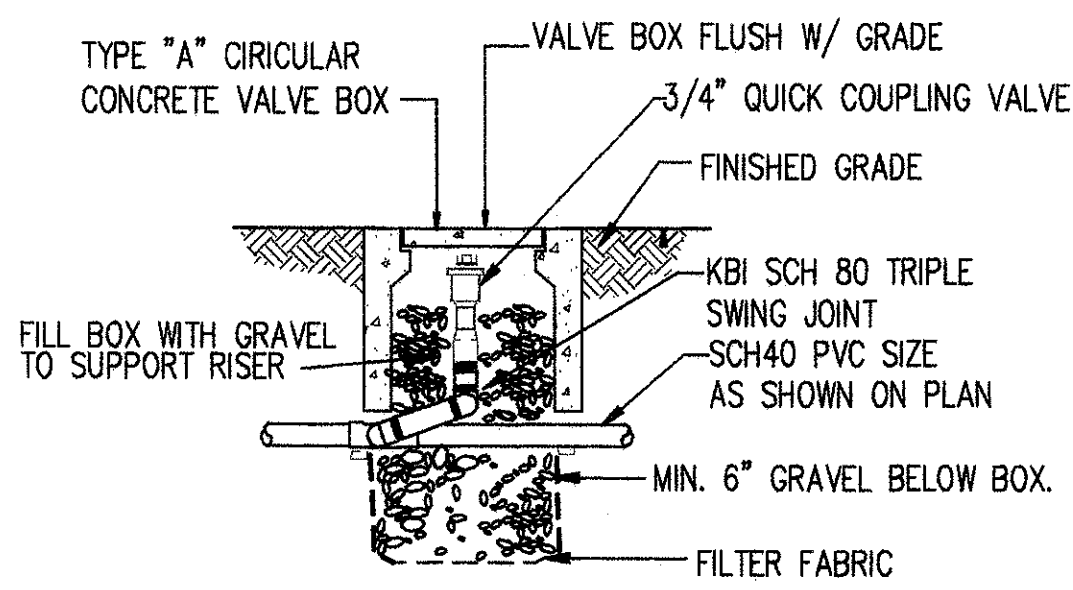
DRIP FILTER
NOT TO SCALE



TREE WELL IRRIGATION
NOT TO SCALE

IRRIGATION LEGEND

SYMBOL	DESCRIPTION	MANUF.	MODEL NO.	RAD	GPM	PSI	SEE SHEET / DETAIL
	15' SPRAY NOZZLE	TORO	570Z-6P				L-9 / POP-UP HEAD
	6" POP-UP BODY	TORO	15-Q-PC	15'	.81	40	
	Quarter Circle	TORO	15-H-PC	15'	1.65	40	
	Full Circle	TORO	15-F-PC	15'	3.30	40	
	8' SPRAY NOZZLE	TORO	570Z-6P				L-9 / POP-UP HEAD
	6" POP-UP BODY	TORO	8-Q-PC	8'	.22	40	
	Quarter Circle	TORO	8-H-PC	8'	.44	40	
	5' SPRAY NOZZLE	TORO	570Z-6P				L-9 / POP-UP HEAD
	6" POP-UP BODY	TORO	5-H-PC	5'	.18	40	
SYMBOL	DESCRIPTION		MANUF./MODEL NO.				SEE DETAIL
	CONTROLLER 24 - STATION ON STEEL PEDESTAL	BUCKNER	M-24DD-SS PED-1				L-9 / CONTROLLER
	GATE VALVE BRASS, (size per plan)	HAMMOND	HV-667				L-9 / GATE VALVE
	PRESSURE REGULATING REMOTE CONTROL VALVE	BUCKNER	SERIES-BPRV				L-9 / CONTROL VALVE
	DRIP FILTER (3/4")	TECHLINE	AVAILABLE FROM WAI ENGINEERING				L-9 / DRIP FILTER
	QUICK COUPLER VALVE BRASS, 3/4" size	RAIN BIRD	33DRC				L-9 / QUICK COUPLER
	PRESSURE COMPENSATING DRIP EMITTER TUBING LOOP AT EACH TREE	TECHLINE	.9 GPH, 12" SPACING AVAILABLE FROM WAI ENGINEERING				L-9 / TREE WELL
1/2	PVC LATERAL LINE	CLASS 200 PVC					
1 1/4	PVC MAIN LINE	SCH 40 PVC					
=====	SLEEVE UNDER PAVING	SCH 80 PVC					
-----	LOW VOLT CONTROL WIRE	DIRECT BURIAL					



QUICK COUPLER VALVE
NOT TO SCALE

VALVE LEGEND

A1	CONTROLLER/STATION
1" 1/8"	GPM THROUGH VALVE VALVE SIZE

CONDUIT SIZING CHART

maximum number of wires in conduit

1/2"	4	1 1/2"	25
3/4"	6	2"	40
1"	10	2 1/2"	56
1 1/4"	18	3"	88

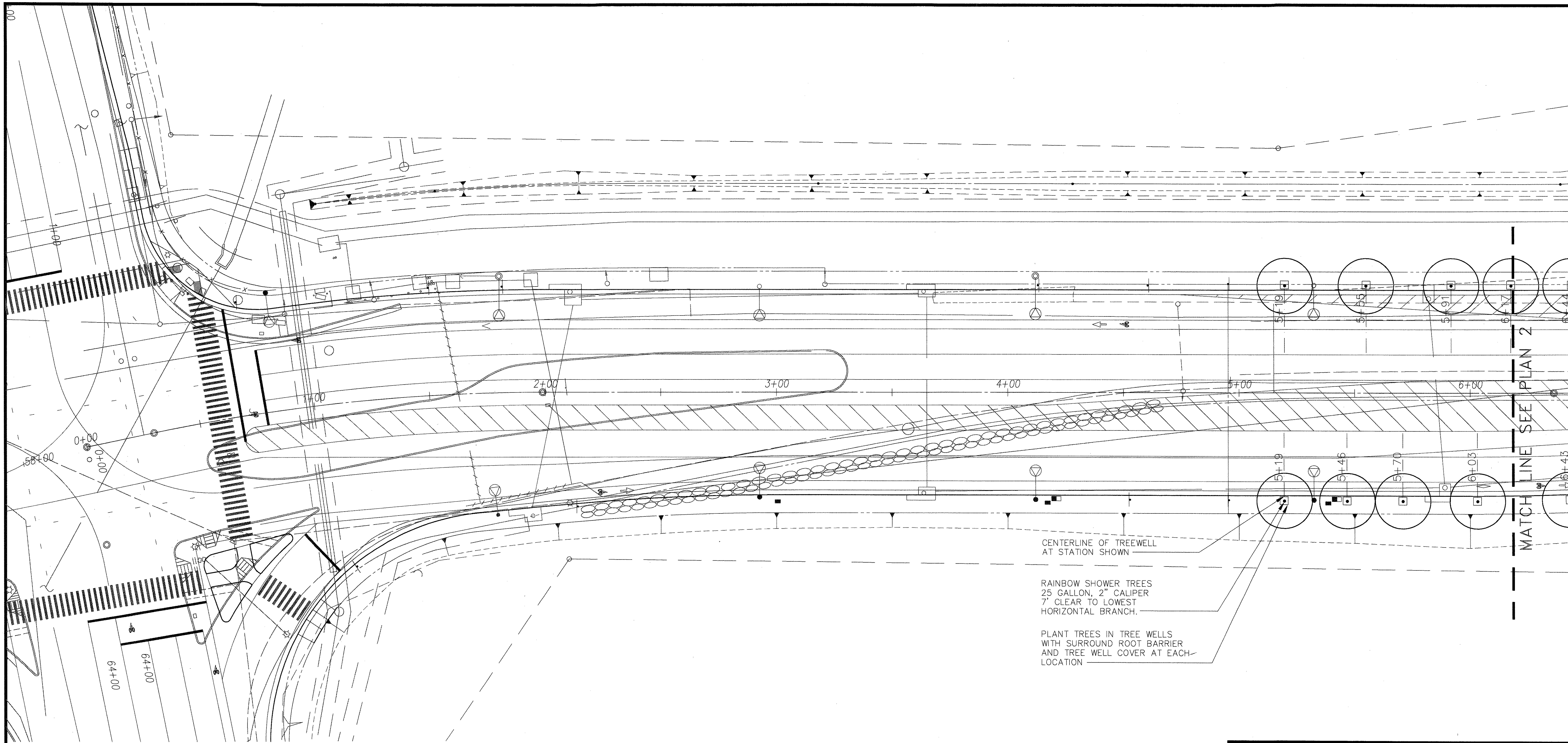
IRRIGATION NOTES

1. The Contractor shall inspect the site conditions prior to commencing with the work. Any discrepancies or unusual conditions shall be brought to the attention of the Engineer. By commencing with the work, the Contractor accepts existing conditions and responsibility for maintaining those conditions.
2. The irrigation system shown on the plans is diagrammatic and subject to minor adjustments due to unanticipated field conditions. Adjust all systems to assure proper coverage and to avoid any conflicts between irrigation systems, planting, utilities and architectural elements.
3. Test and Verify the adequacy of the working pressure (PSI) at the point of connection. Any discrepancies shall be brought to the immediate attention of the Engineer.

MINIMUM PRESSURE SHALL BE 60 PSI

4. The irrigation systems are designed to operate at the pressure listed for the head types in the Legend. The Contractor shall adjust all valves to ensure that the furthest sprinkler on each circuit operates at the pressure shown.
5. The Contractor shall be responsible for coordinating the irrigation work with the Officer -in-Charge, General contractor and other sub-contractors or trades, especially sleeves, conduits, electrical lines, and water connections.
6. The Contractor shall install all equipment according to local codes and per manufacturer's specifications.
7. Flush and clean out all circuits prior to installation of nozzles. The Contractor shall select the most suitable nozzle or arc to maximize effective coverage.
8. Controller shall be installed in a stainless steel enclosure.
9. Install adjacent parallel piping/conduit in common trench wherever practical. All piping under paved areas shall be installed in sleeves. All sleeves shall extend a minimum 12" beyond the edge of paving.

ENGINEER	U				
DRAFTSMAN	KF				
CHECKED BY	U				
REVISION	DATE	BRIEF	BY	APPROVED	
R. M. TOWILL CORPORATION ENGINEERS • PLANNERS • SURVEYORS • PHOTOGRAMMETRISTS CONSTRUCTION MANAGERS 420 Waiakamilo Road, Honolulu, Hawaii 96817-4941					
THE ESTATE OF JAMES CAMPBELL, HOUSING FINANCE AND DEVELOPMENT CORPORATION, STATE OF HAWAII					
FARRINGTON HIGHWAY IMPROVEMENTS EWA, OAHU, HAWAII TMK : (1ST DIVISION) PORTION OF 9-1-18					
IRRIGATION LEGEND NOTES AND DETAILS					
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. SIGNATURE: <i>[Signature]</i> DATE: 5/2/98					
HFDG JOB NO. DEV 93-41 SCALE AS SHOWN DATE MAY 1998					



CENTERLINE OF TREEWELL
AT STATION SHOWN

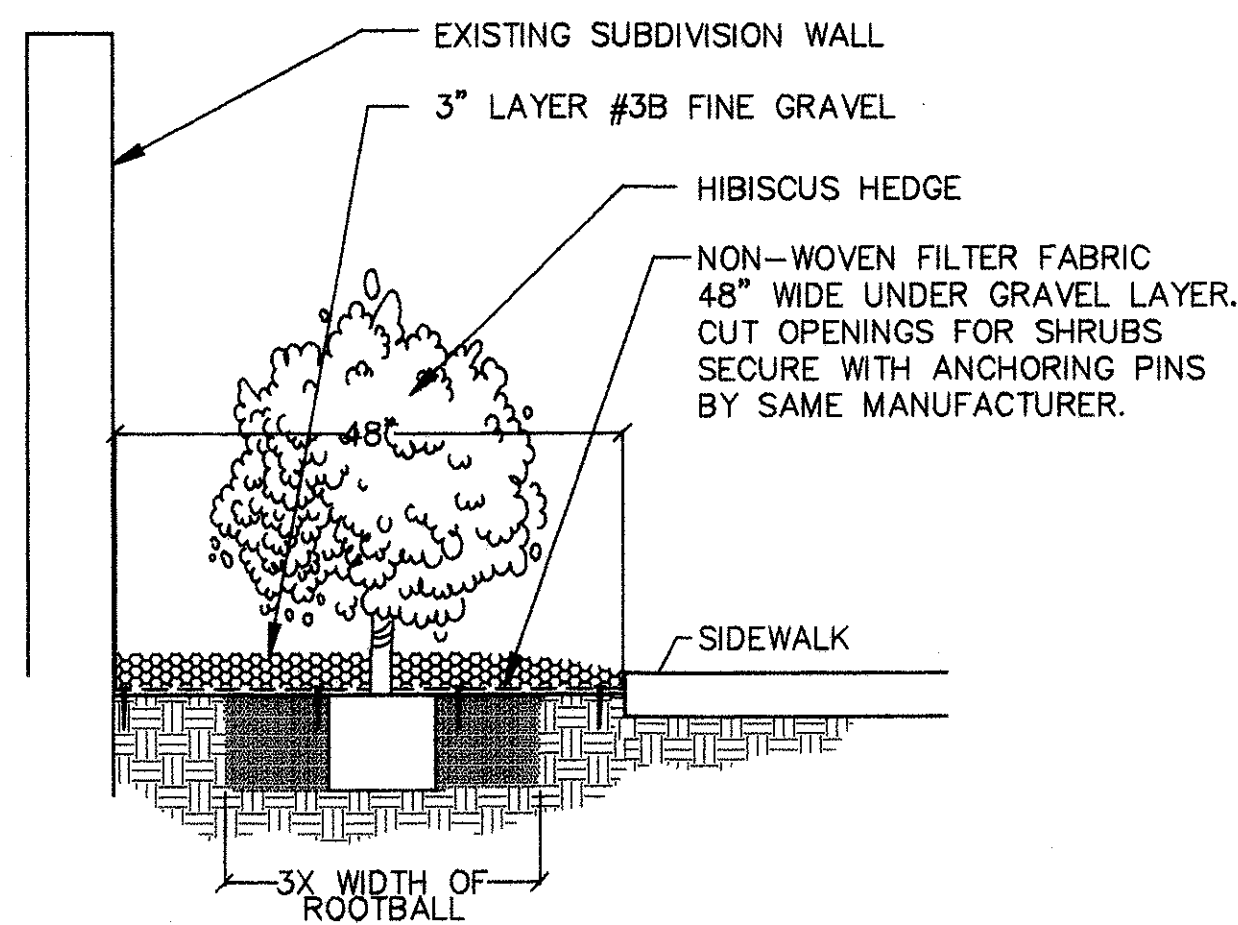
RAINBOW SHOWER TREES
25 GALLON, 2" CALIPER
7' CLEAR TO LOWEST
HORIZONTAL BRANCH.

PLANT TREES IN TREE WELLS
WITH SURROUND ROOT BARRIER
AND TREE WELL COVER AT EACH
LOCATION

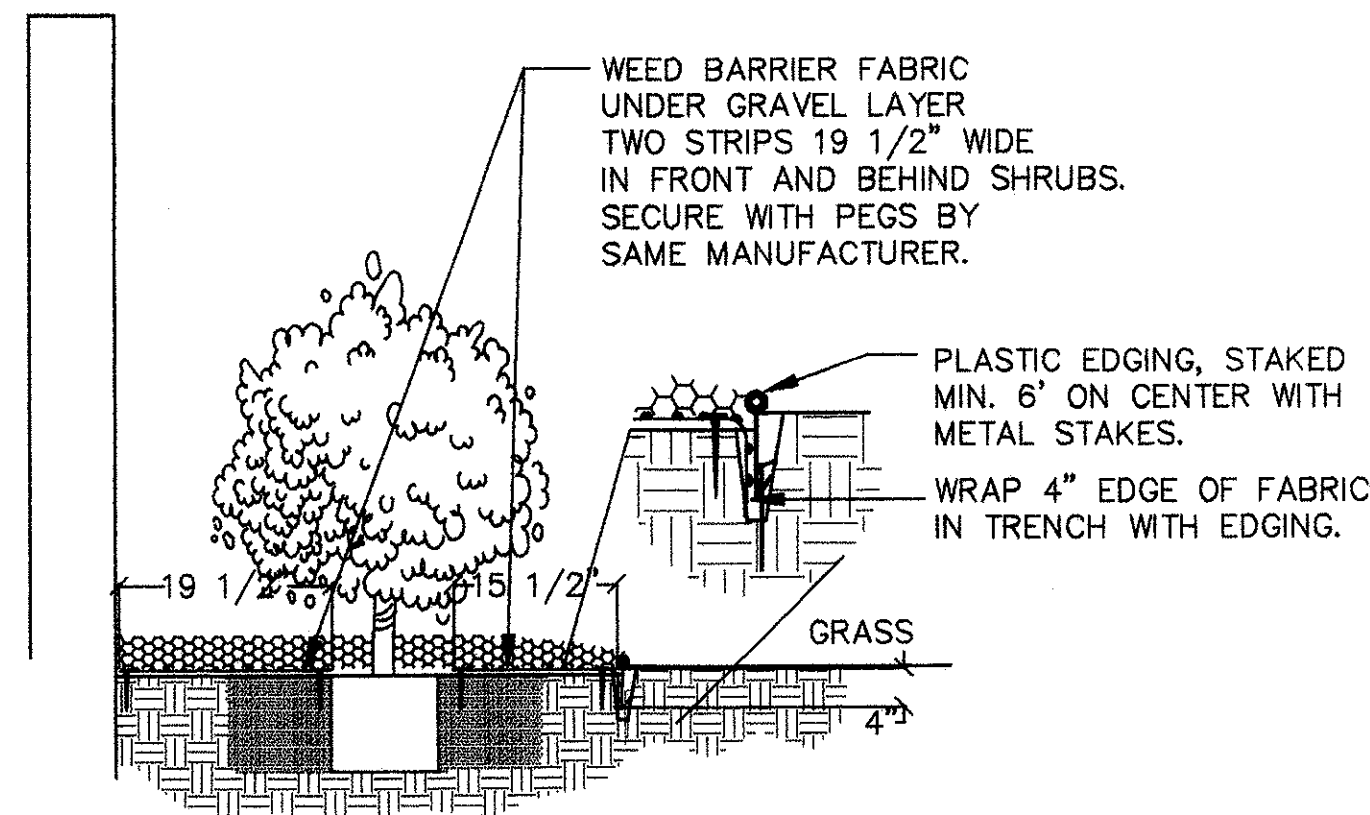
APPROVED

Pat Segant
CHIEF, URBAN DESIGN BRANCH, DPP
DIRECTOR, DEPARTMENT OF PARKS AND RECREATION DATE
CITY AND COUNTY OF HONOLULU,
(for street trees within the city right of way)

ENGINEER	LI					
DRAFTSMAN	KF					
CHECKED BY	LI					
		REVISION	DATE	BRIEF	BY	APPROVED
		R. M. TOWILL CORPORATION ENGINEERS • PLANNERS • SURVEYORS • PHOTOGRAMMETRISTS CONSTRUCTION MANAGERS 420 Waiakamilo Road Honolulu, Hawaii 96817-4941				
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		PLANTING PLAN 1				
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. SIGNATURE DATE 7/4/98		HFDG JOB NO. DEV 93-41	SCALE NONE	DATE MAY 1998		



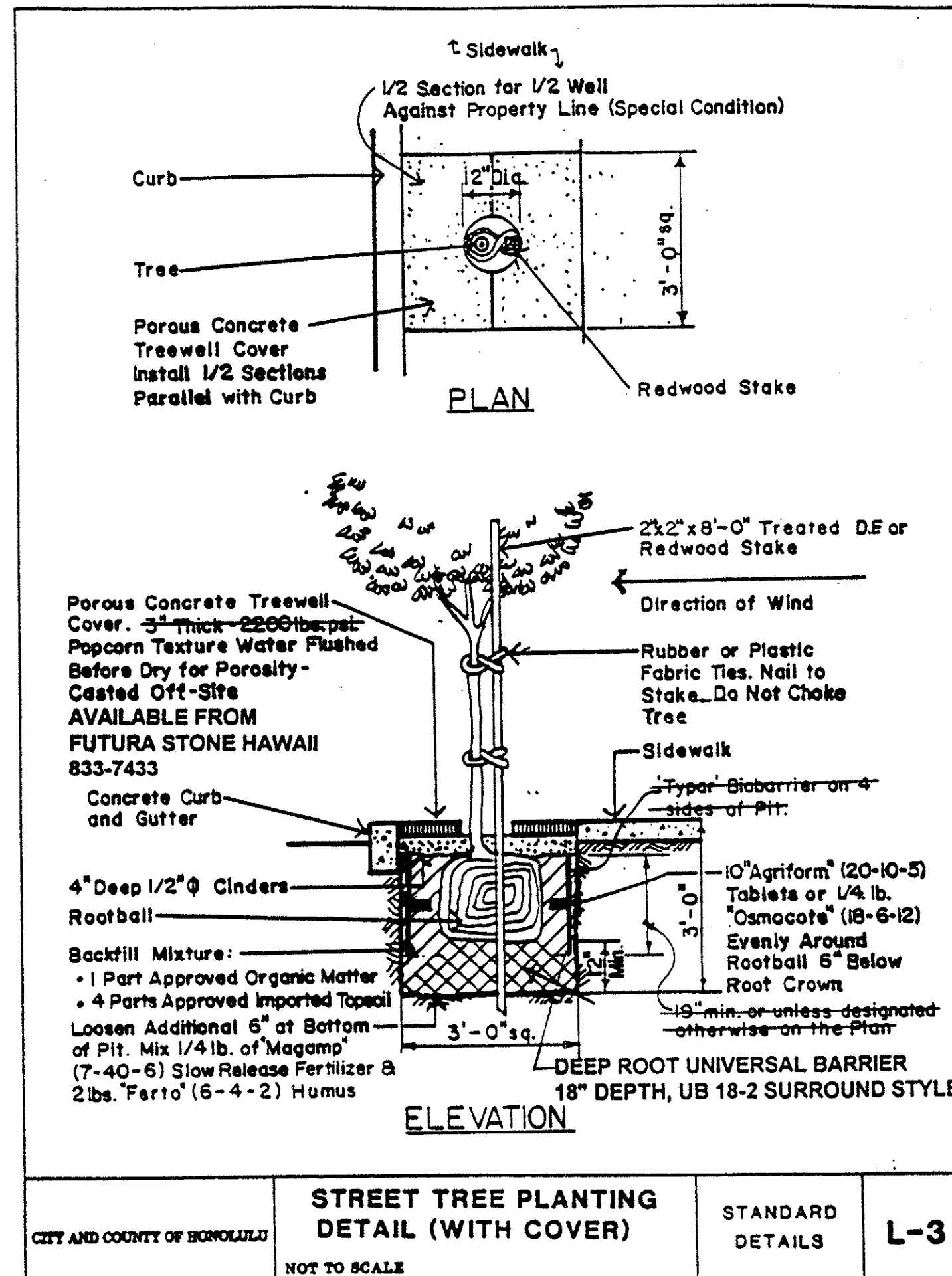
HEDGE NEXT TO SIDEWALK



HEDGE NEXT TO GRASS

SHRUB PLANTING DETAIL

NOT TO SCALE



PLANT LEGEND

QTY	UNIT	DESCRIPTION	BOTANICAL/PRODUCT NAME	REMARKS
247	ea	RAINBOW SHOWER	Cassia javanica x. fistula	25 gallon, 12' height, 4" caliper 7' clear to lowest horizontal branch
247	ea	ROOT BARRIER	Deep Root - Universal Barrier 18" depth UB 18-2 surround style (4 panels per tree)	
27	cy	CINDER (1/2" dia.)		4" layer in each tree well
247	lf	TREE WELL COVER	Futura Stone, precast 3'x3' tree well covers (brown) available from Futura Stone 833-7433 allow 10 weeks for manufacture and delivery.	
1409	ea	RED HIBISCUS	Hibiscus rosa-sinensis	3 gallon, 30" height
5900	sf	EL TORO ZOYSIA	Zoysia japonica, 'El Toro'	rooted sprigs, 1 bushel/100 sf with hydromulch cover
1550	lf	PLASTIC EDGING	see Specifications	
105	cy	#3B FINE GRAVEL	see Specifications	
5500	sf	FILTER FABRIC	DeWitt non woven Filter Fabric under gravel next to sidewalk	
4800	sf	WEED BARRIER FABRIC	Biobarrier II (19 1/2" width) under gravel next to grass	

Quantities indicated on the Plant Legend are approximate. Planting Plans shall have precedence over the Plant Legend. Contractor to furnish adequate quantities to complete work shown on the Planting Plans.

STREET TREE NOTES

- The Contractor shall notify the Beautification Administrator, Department of Parks and Recreation, phone 971-7159 at least seven days prior to pre-maintenance and final inspections.
- Maintenance of street trees shall be for sixty calendar days or until project is completed, whichever is longer.
- The Standard City and County of Honolulu, Department of Parks and Recreation Specifications for street tree planting and landscaping shall be made part of the construction documents.
- Street Tree plans that have been revised or haven't started construction within two years of the date of Director's approval will be subject to re-approval.
- When substitution of tree types is requested by the developer or contractor due to unavailability, the plans shall be revised after notification of tree selection and the plans submitted for re-approval.
- The street tree consultant is required to submit reproductions of as-built plans provided by the contractor to the Department of Parks and Recreation immediately following Notice of Acceptance (Project Completion Notice) of the street tree planting. (Attn: Chief, Facilities Development).

GENERAL PLANTING NOTES

- All work shall be performed by persons familiar with planting work and under the supervision of a qualified planting foreman. Work in progress is to be coordinated with the Owner's representative as areas become available for planting.
- The contractor is to verify the location of all on-site utilities (including irrigation piping and wiring) before commencing with the work. The contractor shall also be responsible for the repair of any damaged utilities.
- Plant material locations shown on plans are diagrammatic and will be subject to adjustment in the field by the Landscape Architect.
- Quantities shown on the landscape legend are for the convenience of the Contractor. It is the responsibility of the Contractor to provide and install the necessary landscape materials in quantities sufficient to fulfill the design at the spacing/depth specified and in the locations shown on the Planting Plans.
- The Landscape Contractor shall stake all tree locations in the field for approval by the Landscape Architect.
- Tree and shrub pits shall be dug prior to moving plants to their respective locations. All tree pits shall be water tested prior to planting to assure that water will drain. Notify Landscape Architect in writing of all soil or drainage conditions encountered during planting operations which the Contractor considers detrimental to growth of plant material.
- The Landscape Contractor shall take all reasonable precautions to coordinate work and to minimize damage to completed grading, irrigation, and related work.

APPROVED

CHEF, URBAN DESIGN BRANCH, DPP
DIRECTOR, DEPARTMENT OF PARKS AND RECREATION
CITY AND COUNTY OF HONOLULU,
(for street trees within the city right of way)

ENGINEER	LI	REVISION	DATE	BRIEF	BY	APPROVED
DRAFTSMAN	KF					
CHECKED BY	LI					
		R. M. TOWILL CORPORATION ENGINEERS • PLANNERS • SURVEYORS • PHOTOGRAMMETRISTS CONSTRUCTION MANAGERS 420 Waiakamilo Road Honolulu, Hawaii 96817-4941				
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		FARRINGTON HIGHWAY IMPROVEMENTS EWA, OAHU, HAWAII TMS : (1ST DIVISION) PORTION OF 8-1-16				
		PLANTING LEGEND NOTES AND DETAILS				
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION SIGNATURE: <i>Kevin Fisher</i> DATE: <i>5/22/98</i>		HFDG JOB NO. DEV 93-41 SCALE AS SHOWN DATE MAY 1998				