IRRIGATION NOTES:

1. Contractor shall install controllers, lines, wires, valves and heads per specifications. Existing gate valves, point of connection, etc. are derived from the best available information and on-site inspection. The Contractor shall verify those points of connection noted and report any discrepancies to the Engineer.

2. This plan is diagrammatic. Irrigation system is subject to field adjustments due to unanticipated site conditions. Locate all mainlines, laterals, valves and sprinkler heads within planting areas, unless otherwise noted. Place mainline in planting areas where no sleeves are shown. Avoid any conflict between underground utilities, structures and plantings. The Contractor shall be responsible for locating and protecting all existing utilities.

3. This irrigation system was designed with a minimum static water pressure of 75 psi at the point of connection. Notify the Project Engineer if water pressure is less than 50 psi or greater than 100 psi.

4. Contractor shall secure all necessary permits and observe all local codes and regulations. The Contractor shall confirm all site's dimensions and conditions, and report any discrepancies to the Engineer.

5. Contractor shall coordinate the installation of all sleeves, conduits, mainlines and laterals under pavement and through walls. Contractor shall assure that these items are laid prior to placement of pavement or wall structures.

6. Locate and install all sprinkler heads 6" from sidewalks, curbs, driveways, building and wall unless otherwise noted. Adjust all sprinkler heads and flow control for maximum coverage and minimum overthrow and misting. Operate only one valve at a time per controller.

7. Within 30 days after award of the contract, submit for the Engineer's acceptance six (6) copies of detailed scaled drawings and wiring diagrams for permanent. No proposed deviations from the contract. Include samples of materials, if required by contract.

8. Perform hydrostatic test by applying continuous static pressure of 60 psi for one (1) hour. Notify the Engineer at least three (3) days in advance of test. Repair leaks that develop and repeat test. Do not backfill until there is no further sign of leakage.

9. Perform operability test by opening remote control valve and test circuits for leaks around barbed and threaded PVC fittings. Repair leaks and repeat tests. Notify the Engineer at least three (3) days in advance of test. Do not backfill until there is no further sign of leakage.

10. Perform coverage test. Before planting period, run automatic controller through all its cycles. Check watering for coverage and uniformity in company of the Engineer. Run system until there are puddles or there is sheet flow to determine initial irrigation time and number of cycles per week needed to water requirements of plants.

11. If plans do not specify depth of excavation, provide minimum cover to finish grade as follows:
    a. 18 inches for irrigation main.
    b. 10 inches for irrigation lateral.
    c. for controller wires and conduits in unpaved areas, depth equal to that of pressure irrigation pipe.

(3) (2) 12. All valve boxes shall be plastic rectangular Valve Boxes with cover.

13. Contractor at final acceptance to program all controllers with 3 programs for maximum water conservation - Dry Season Program, Wet Season Program, and Transition Season Program.

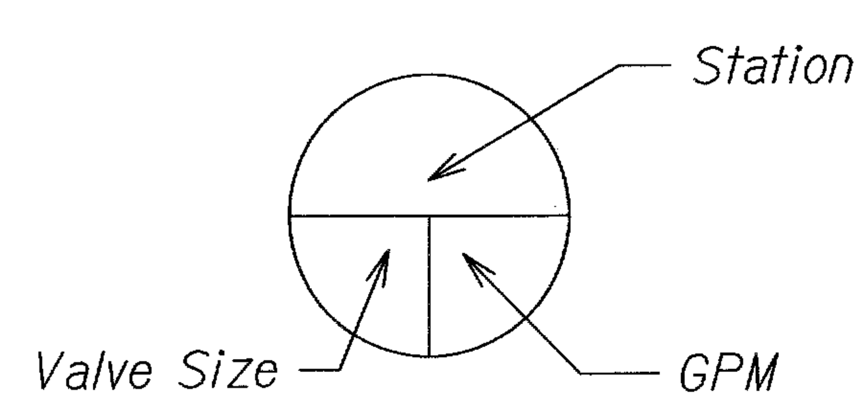
(1) 14. The new trees should be watered with water bag system in areas where there is no new irrigation.

(1) 15. Contractor shall abandon and remove all existing controlers, lines, wires, valves and heads within the median prior to installing new irrigation system.

IRRIGATION SCHEDULE:

SYMBOL	QUANTITY	DESCRIPTION	P.S.I.	RADIUS	G.P.M.
	~~152~~	~~Rainbird 6" Pop-Up 1806-SAM-PRS-U10H~~ (1)	30	10'	0.82
	~~14~~	~~Rainbird 6" Pop-Up 1812-SAM-PRS-5H-B~~ (1)	50	5'	1.0
	~~143~~	~~Rainbird 6" Pop-Up 1806-SAM-PRS-U12H~~ (1)	30	12'	1.30
	~~54~~	~~Rainbird 12" Pop-Up 1812SAM-PRS-U8H~~ (1)	30	8'	0.52
	~~3~~	~~Rainbird 100-GB-PRS-D w/actuator and plastic adapter (1")~~ (1)			
	~~3~~	~~Rainbird 125-GB-PRS-D w/actuator and plastic adapter (1¼")~~ (1)			
	~~1~~	~~Rainbird 150-GB-PRS-D w/actuator and plastic adapter (1½")~~ (1)			
(1)	(1) ~~3~~ 11	Drip Irrigation Valve Rainbird XCZ-LF-100-PRF, or approved equal (1)		(1)	
	3	Rainbird 44-RC 1" quick coupler valve w/Leemco Stabilizer LS-120. Provide a minimum of one per median island			
	2	2" Reduced pressure principle backflow preventer Wilkins model 975XL-2 with Wilkins model 600 pressure reducing valve on downpipe in security enclosure Strongbox SBBC-45SS			
	(1) 2	2" U.S. Bronze Nibco T-113-2" Gate Valve			
	3	DIG LEIT 4 Station Solar Controller Model 4004 in Stainless Steel Security Enclosure ENC 4000 with Rain Sensor Hunter Model Miniclik in Stainless Steel Security Enclosure with Sensor Kit Skit882I. Controller on Mounting Column MCOL4000.			
		Main Line PVC Irrigation Type, 2" schedule 40 (1)			
		Dripper Line Netafim TLCV4-1800 0.4 gph emitter, 18" Spacing (1)			
	(1) 11	Manual Flush Valve - Netafim TLSOV (1)			
		6" Soil Staples installed every 3' - 5' of tubing, plus two on each tee, elbows or cross			

LEGEND:



	DATE	REVISION
(1)	9/26/14	Corrected Note # 14 and Added Note #15. Made Corrections to Irrigation schedule.
(3)	2/25/13	Revised Irrigation Note No. 12.
(2)	1/29/13	Revised Irrigation Note No. 12.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

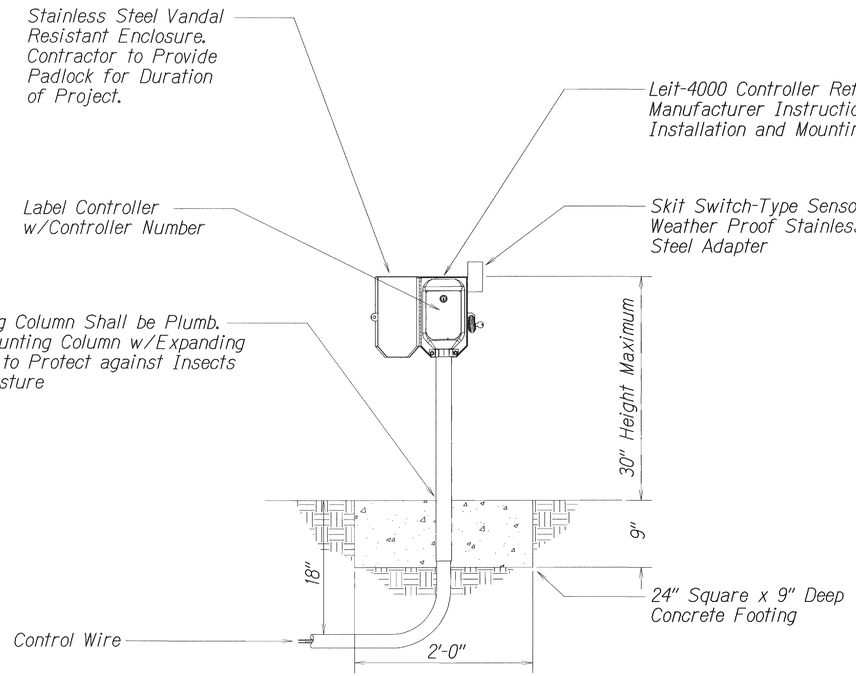
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

Not to Scale — Date: November, 2012

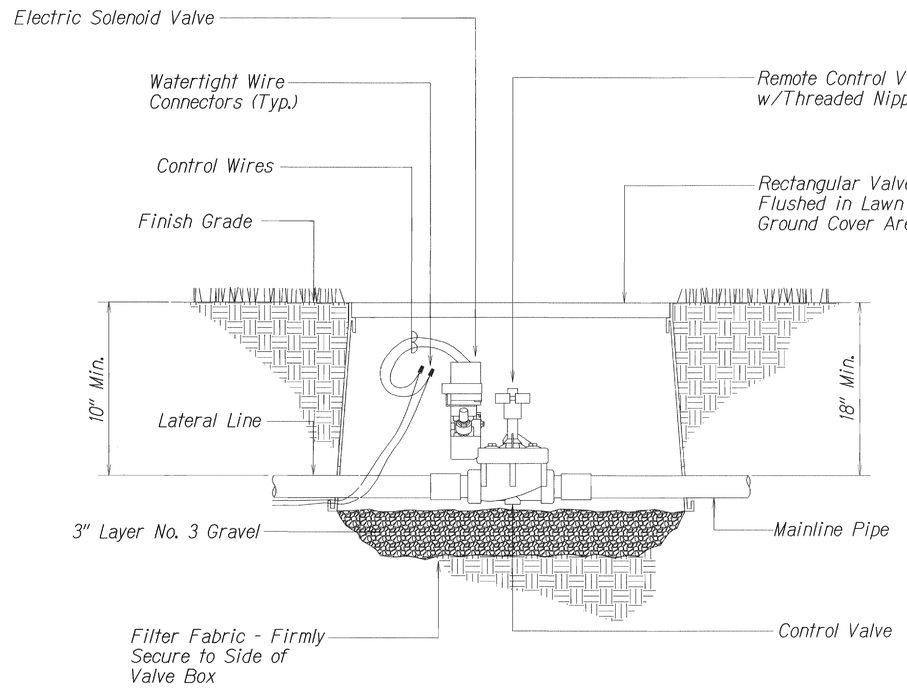
ORIGINAL PLAN / NOTE BOOK / No. / SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY / DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	53	64



Note:
Controller location shall be located in an area well protected from vehicles. If the Controller is located in an unprotected area, then four (4) 6" Pipe Bollards filled w/Concrete shall surround Controller. Provide one (1) Leit Key per Controller.

22 SOLAR POWERED CONTROLLER DETAIL



Note:
All Valve Box Covers shall be labeled Recycled Water [if applicable], Valve Type, Zone Number and Controller Number.

25 REMOTE CONTROL VALVE DETAIL

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

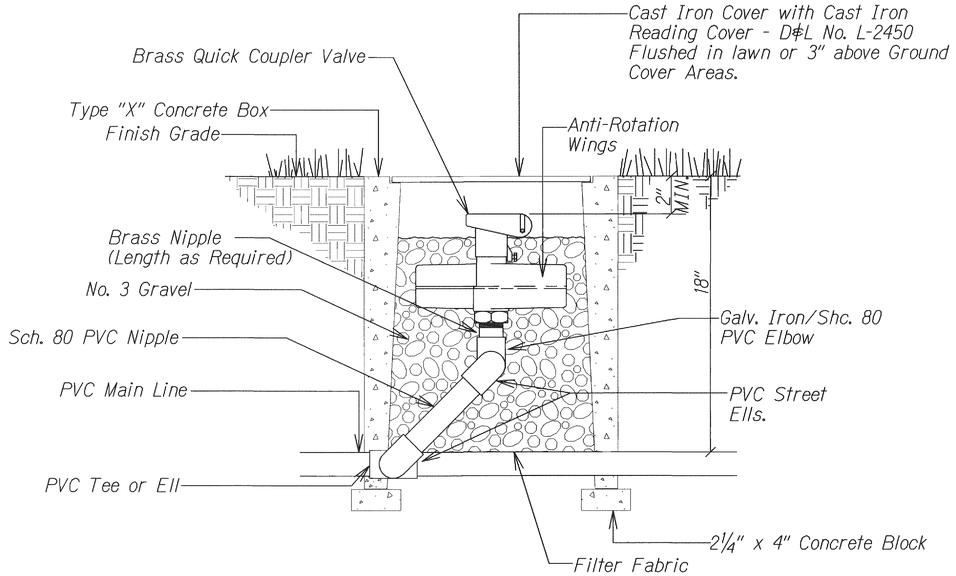
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

Not to Scale Date: November, 2012

SHEET No. 2 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	54	64



NOTES:

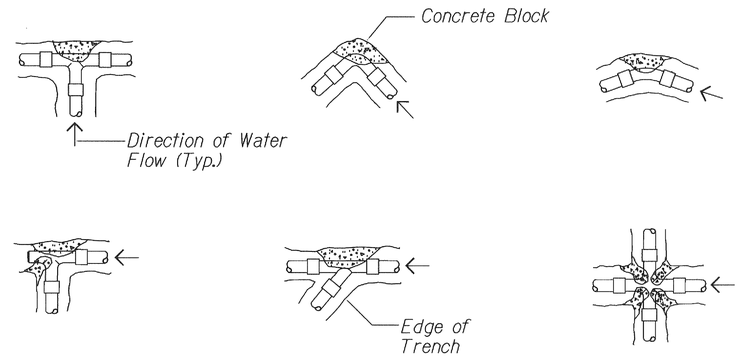
1. KBI or Lasco Swing Joints upon approval by Engineer.
2. All Valve Box Cover Shall be Labeled Valve Type, Zone Number, and Controller Number.
3. Controller shall Provide one (1) Quick Coupler Key and one (1) Hose Ell for each Quick Coupler Valve.
4. Minimum one Quick Coupler Valve per Point of Connection.

41 QUICK COUPLER VALVE DETAIL

THRUST BLOCK BEARING AREA (SQ. FT.)				
PIPE SIZE	1 1/4" - 2 1/2"	3"	4"	6"
Tees/Ells	1.00	1.00	1.25	3.2
90 Bends	1.00	1.25	2.00	4.5
45 Bends	1.00	1.00	1.00	2.4

NOTES:

1. Install Thrust Block at all Machine Bends, Tees or Ells as shown below. Thrust Blocks shall be minimum of (1) cu. ft. Redi-Mix Concrete or 2500 PSI 28 Day Concrete.
2. Set all Thrust Blocks against Undisturbed Soil.



42 THRUST BLOCK DETAIL

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
No. Waterline	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

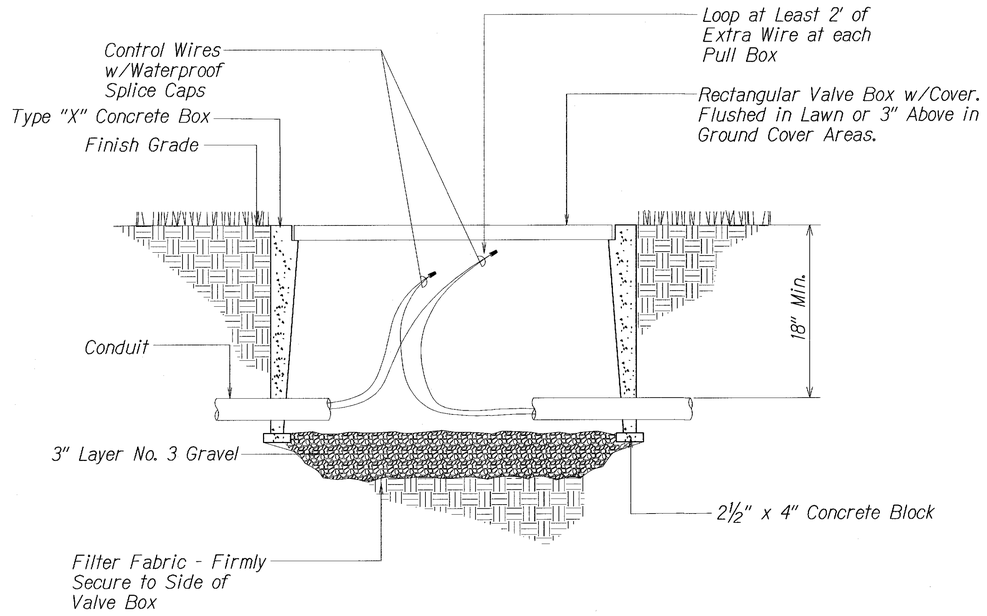
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

Not to Scale Date: November, 2012

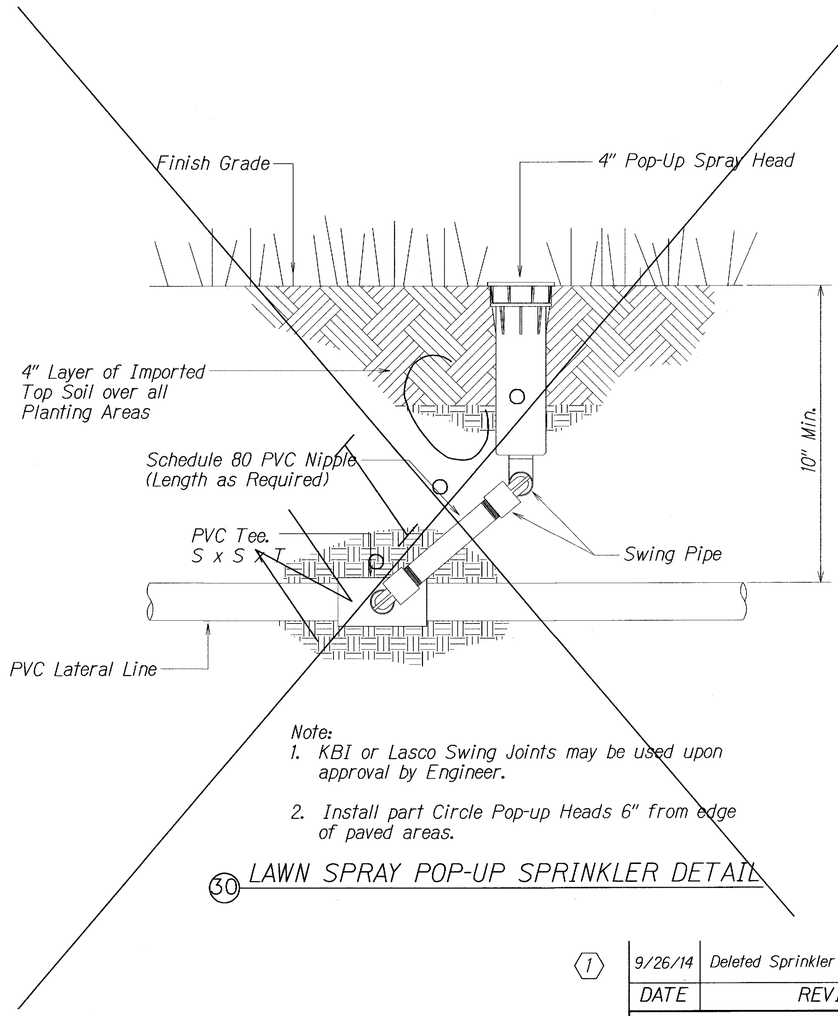
SHEET No. 3 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	C.O. 55	64



Notes:
1. All Valve Box Covers shall be labeled Valve Type, Zone Number and, Controller Number.
2. Provide minimum of one Pull Box for every 250 linear feet of Controller Wire and at each grouping of Valves and, prior to all Road Pavement Crossings.
3. Do not splice wires except in Valve Boxes and Pull Boxes.

29 PULL BOX DETAIL



Note:
1. KBI or Lasco Swing Joints may be used upon approval by Engineer.
2. Install part Circle Pop-up Heads 6" from edge of paved areas.

30 LAWN SPRAY POP-UP SPRINKLER DETAIL

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

ORIGINAL PLAN

NOTE BOOK

1	9/26/14	Deleted Sprinkler Detail
	DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

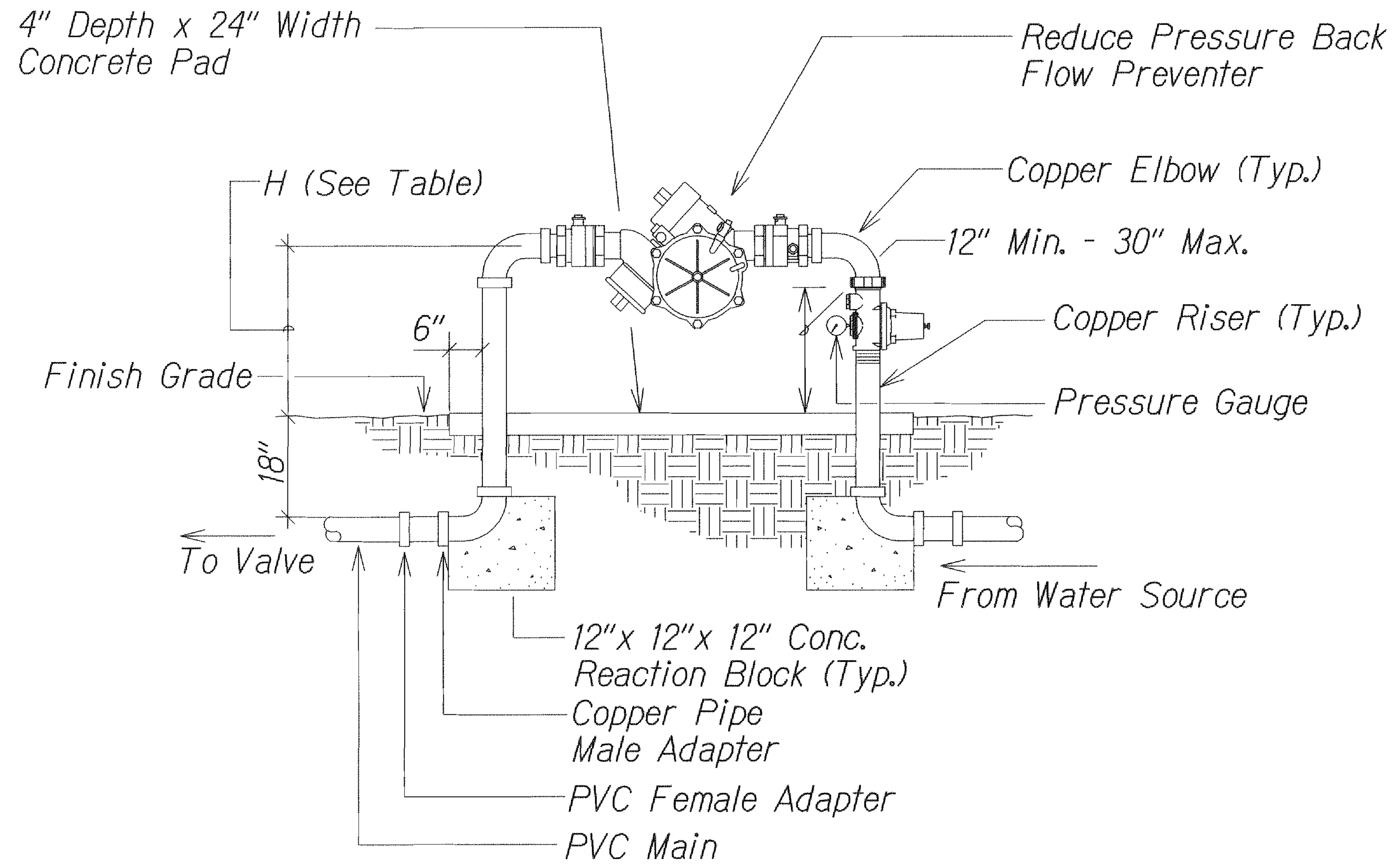
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

Not to Scale — Date: November, 2012

SHEET No. 4 OF 8 SHEETS

C.O. 55



Size (Inches)	H (Inches)
3/4 to 1-1/2	18
2 to 3	24

Notes:
1. All pipes and fittings installed above grade shall be either Copper or Bronze only.

2. Back Flow Preventer shall plumb.

3. Back Flow Preventer shall be located in an area well protected from vehicles (Clear Zone). If the Back Flow Preventor is located in an unprotected area, then four (4) 6" Pipe Bollards filled with concrete shall surround the Back Flow Preventer.

(39) REDUCED PRESSURE BACKFLOW PREVENTION DEVICE DETAIL

ORIGINAL PLAN
NOTE BOOK
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

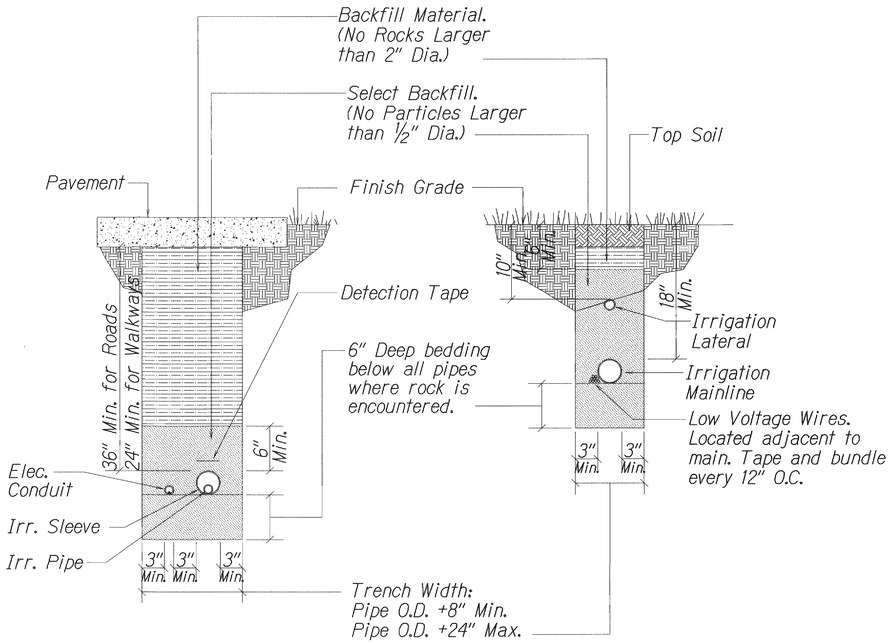
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

IRRIGATION DETAILS & NOTES

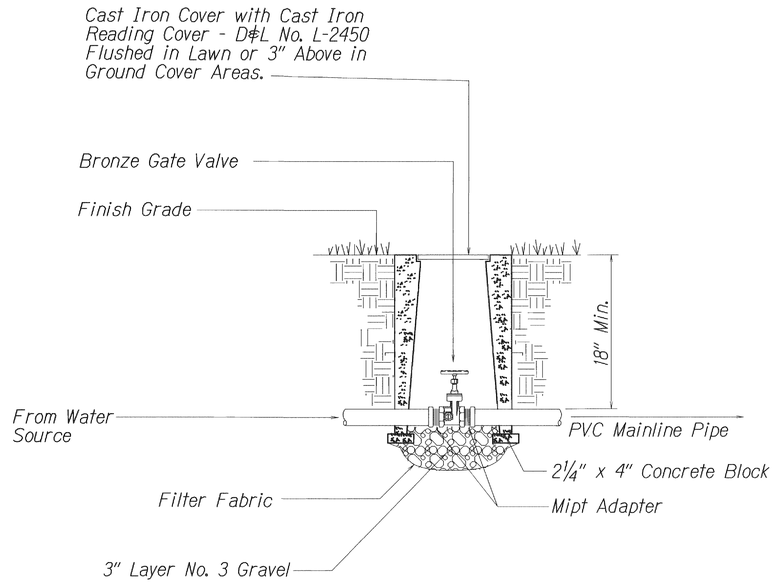
VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

Not to Scale   Date: November, 2012

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	57	64



43 IRRIGATION TRENCH & WIRING DETAIL



Note:
All Valve Box Covers shall be labeled Valve Type, Zone Number and, Controller Number.

44 GATE VALVE DETAIL

ORIGINAL PLAT	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

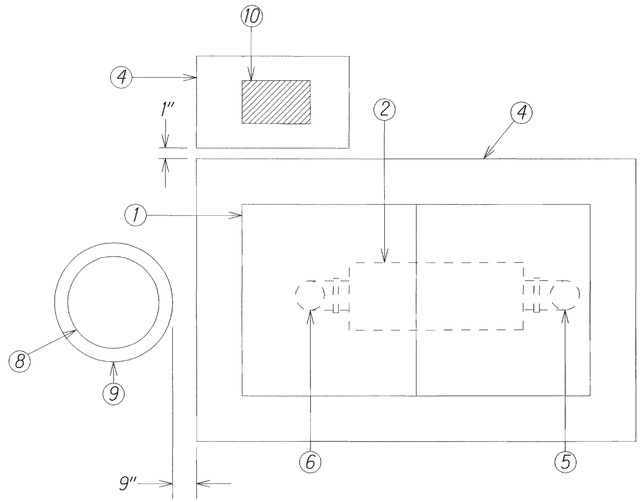
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

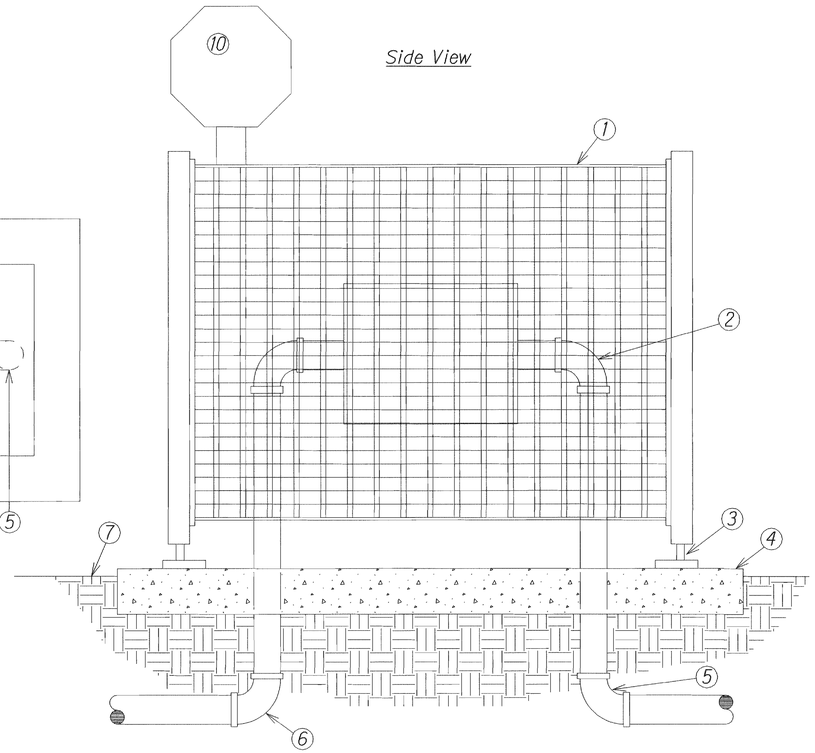
Not to Scale Date: November, 2012

SHEET No. 6 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	58	64



Top View



Side View

Legend

1. *Aluminum Back Flow Preventer Enclosure, w/"DOT Irrigation Back Flow Preventor" manner acceptable to Engineer.*
2. *Back Flow Preventer*
3. *Anchor Rod (Typ.)*
4. *Poured Concrete Base - 6" Min. Thickness Extend 4" beyond outside dimensions of enclosure*
5. *Water Service Inlet Piping.*
6. *Water Service Outlet Piping*
7. *Finish Grade*
8. *Cast Iron Cover*
9. *Gate Valve in Concrete Valve Box*
10. *Irrigation Controller*

Notes:

1. *Contractor shall provide padlock for duration of the project.*
2. *Back Flow Preventer shall be located in an area well protected from vehicles (Clear Zone). If the Back Flow Preventor is located in an unprotected area, then four (4) 6" Pipe Bollards filled with concrete shall surround the Back Flow Preventer*

(40) BACKFLOW PREVENTION DEVICE DETAIL

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
	QUANTITIES BY	
No.	CHECKED BY	

STATE OF HAWAII
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HIGHWAYS DIVISION

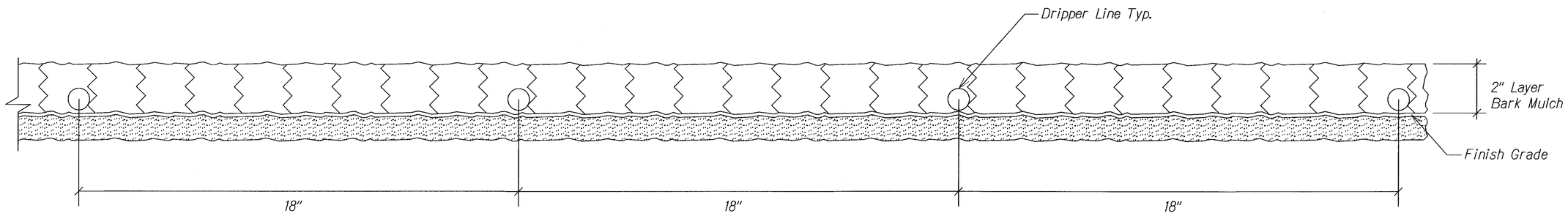
IRRIGATION DETAILS & NOTES

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama Street to End of H-1 On-and-off Ramp
Federal-Aid Project No. STP-098-1(011)

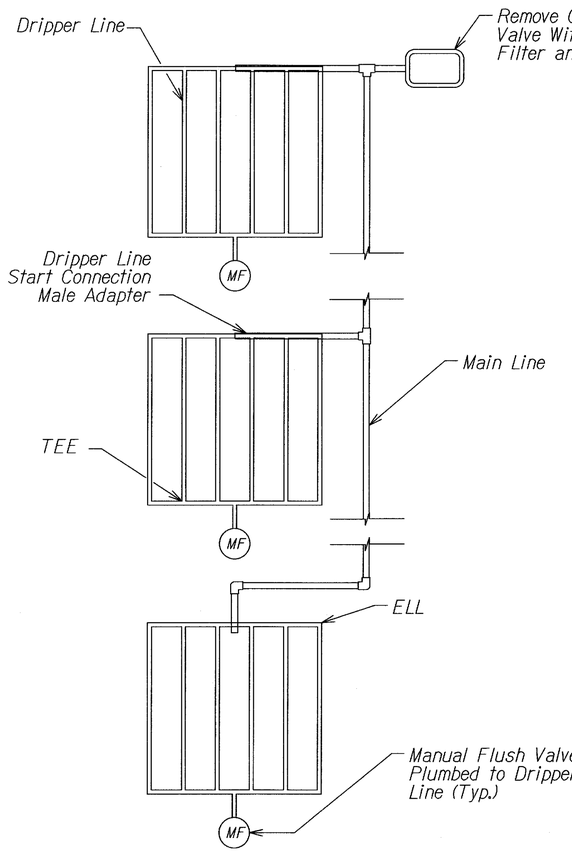
Not to Scale Date: November, 2012

SHEET No. 7 OF 8 SHEETS

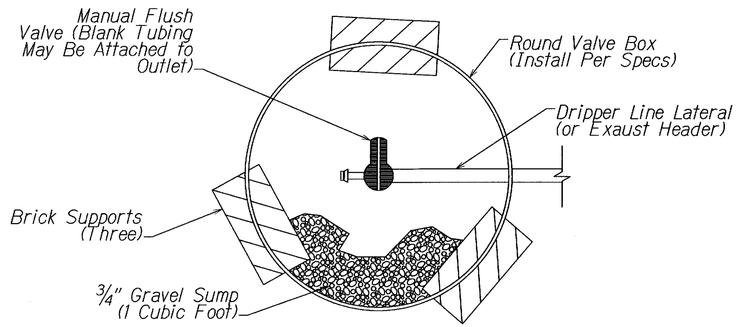
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-098-1(011)	2012	C.O. 59	64



Dripper Line Above Grade Installation
Not to Scale



Dripper Line Layout
Not to Scale



Dripper Line Manual Line Flush Valve
Not to Scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

	DATE	REVISION
1	10/1/14	Replace Sprinkler to Drip Irrigation Detail

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

IRRIGATION DETAILS

VINEYARD BOULEVARD RESURFACING
Vicinity of Palama St. to End of H-1 On-and-Off Ramp
Federal-Aid Project No. STP-098-1(011)

Scale: 1"=40' Date: November, 2012

SHEET No. 0 OF 0 SHEETS

C.O. 59