FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(010)	2011	44	52

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 sprinklers 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. The backflow preventer location to b e approved in the field by the Engineer.
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 sites 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 and temporary irrigation systems. Note 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 back fill until there is no further sign of leakage.
10. Perform coverage test. Before planting period, run automatic controller through all it's 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 comduits in unpaved areas, depth equal to that of pressure irrigation pipe.
12. All valve boxes shall be concrete type 'x'. All valve box covers shall be Cast Iron covers. Plastic valve boxes will not be utilized.

SYMBOL	QUANTITY	DESCRIPTION	P.S.I.	RADIUS	G.P.M.
▭	65	4" Pop-up Matched Precipitation Rate SPRAY NOZZLE w/ Pressure Regulating Stem & Check Valve 9' width x 18' length strip 180° arc.	30	9'x18' (W x L)	1.73
◠	4	4" Pop-up Matched Precipitation Rate SPRAY NOZZLE w/ Pressure Regulating Stem & Check Valve 180° arc.	30	12'	1.30
◓	23	4" Pop-up Matched Precipitation Rate SPRAY NOZZLE w/ Pressure Regulating Stem & Check Valve 180° arc.	30	10'	0.79
●	10	4" Pop-up Matched Precipitation Rate SPRAY NOZZLE w/ Pressure Regulating Stem & Check Valve 360° arc.	30	10'	1.58
◎	58	4" Pop-up Matched Precipitation Rate SPRAY NOZZLE w/ Pressure Regulating Stem & Check Valve 180° arc.	30	5'	1.00
◒	2	1½" Remote Control Valve w/ Actuator and Plastic Mounting Adaptor			
⊕	4	1¼" Remote Control Valve w/ Actuator and Plastic Mounting Adaptor			
◑	2	¾" Quick Coupler Valve w/¾" Ductile Iron Stabilizer			
⌀⌀	2	1½" BWS Approved Reduced Pressure Backflow Preventer in Stainless Steel Security Enclosure.			
⊠	2	1½" Bronze Gate Valve			
◪	2	4 Station Solar Irrigation Controller with LEXAN protective lens and Rain Sensor in Stainless Steel Security Enclosures. Controller mounted on 48" mounting column.			
	12	Concrete box Type 'X' & Cast Iron Cover			
- - - - - -		Mainline Sch. 40 PVC Irrigation Pipe.			
———		Lateral Line Sch. 40 PVC Irrigation Pipe.			

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

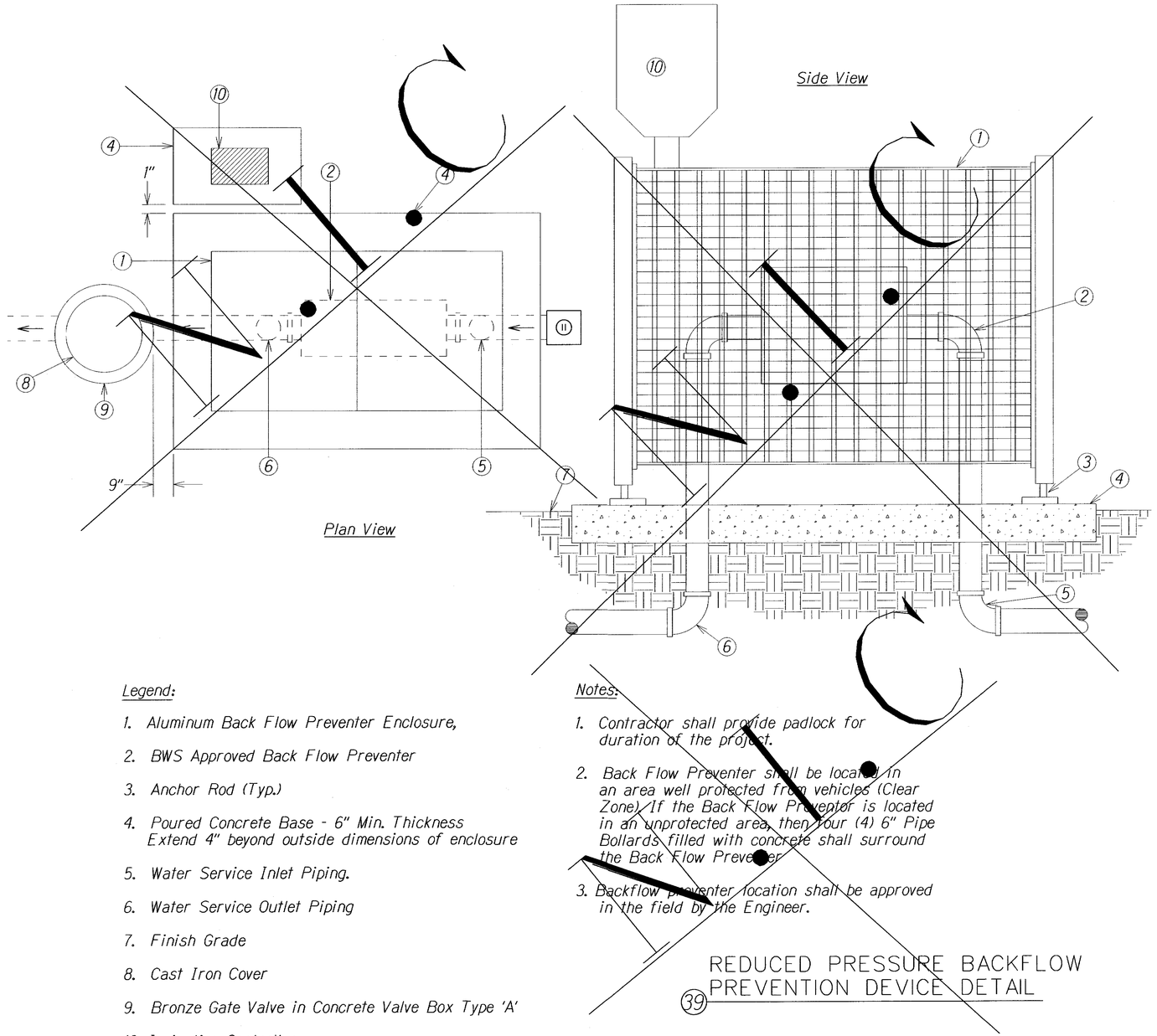
IRRIGATION NOTES & DETAIL

MOKAPU SADDLE ROAD and
MOKAPU BOULEVARD RESURFACING
Kapaa Quarry Road to North Kalaheo Avenue
M.P. 2.97 to M.P. 4.15
Federal Aid Project No. STP-065-1(010)

Scale: Not to Scale Date: April, 2011

SHEET No. 1 OF 1 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(010)	2011	45	52



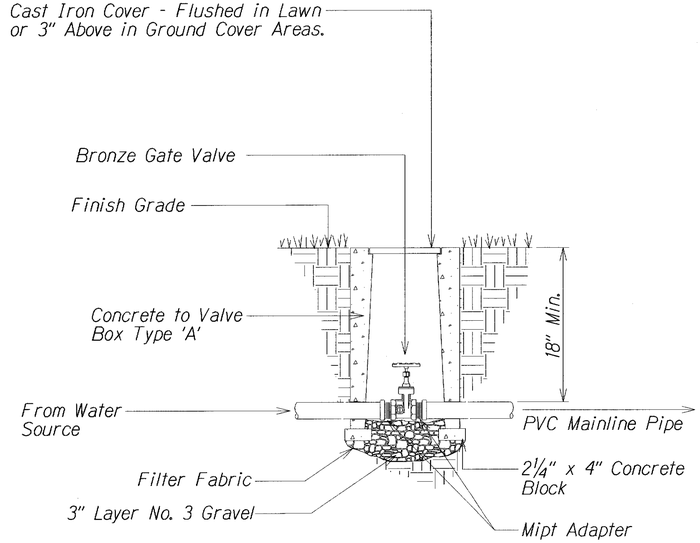
Legend:

1. Aluminum Back Flow Preventer Enclosure,
2. BWS Approved 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. Bronze Gate Valve in Concrete Valve Box Type 'A'
10. Irrigation Controller
11. BWS Water Meter

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 Preventer is located in an unprotected area, then four (4) 6" Pipe Bollards filled with concrete shall surround the Back Flow Preventer.
3. Backflow preventer location shall be approved in the field by the Engineer.

REDUCED PRESSURE BACKFLOW PREVENTION DEVICE DETAIL
(39)



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

GATE VALVE DETAIL
(44)

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

LEGEND FOR AS-BUILT POSTINGS

~~	Squiggly line for as-built deletion
~~100.00~~	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

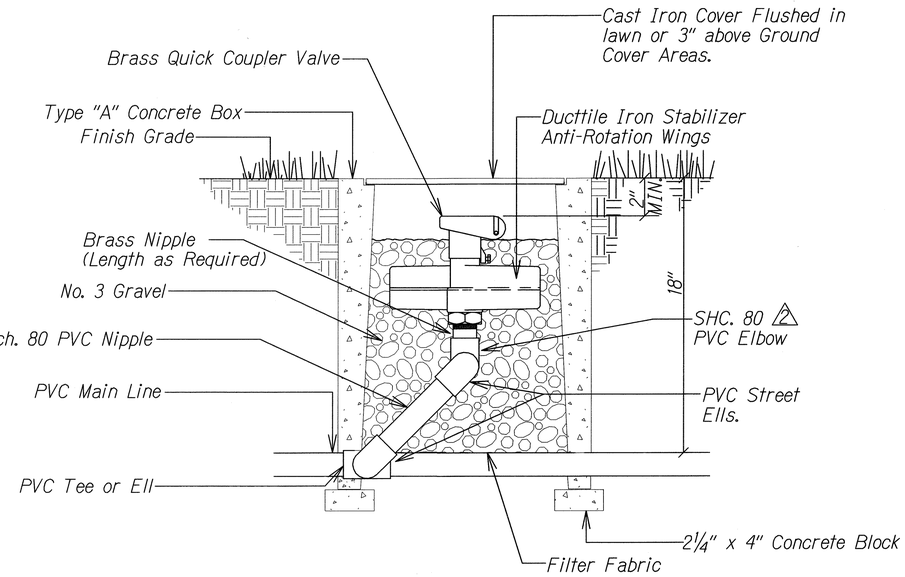
IRRIGATION DETAILS
MOKAPU SADDLE ROAD and
MOKAPU BOULEVARD RESURFACING
Kapaa Quarry Road to North Kalaheo Avenue
M.P 2.97 to M.P. 4.15
Federal Aid Project No. STP-065-1(010)

Scale: NTS Date: April, 2011

SHEET No. 1 OF 2 SHEETS

"AS-BUILT"

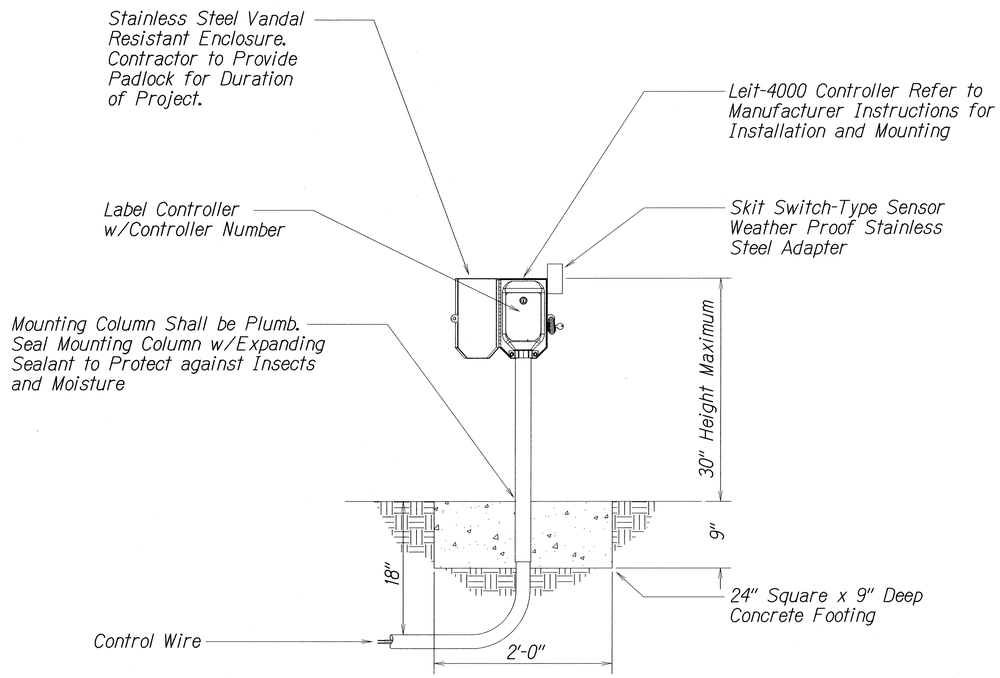
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(010)	2011	ADD.46	52



NOTES:

1. Swing Joints subject to 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



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

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DATE	REVISION
1/17/12	(2) Revised Note.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

IRRIGATION DETAIL

MOKAPU SADDLE ROAD and
MOKAPU BOULEVARD RESURFACING
Kapaa Quarry Road to North Kalaheo Avenue
M.P 2.97 to M.P. 4.15
Federal Aid Project No. STP-065-1(010)

Scale: NTS Date: April, 2011

SHEET No. 2 OF 2 SHEETS

ADD.46

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(010)	2011	47	52

TRENCH NOTES:

1. Sawcutting & Repairing of Existing A.C. and Concrete Pavements and Providing Topsoil will not be Paid for Separately, but Considered Incidental to the Various Contract items.

2. Pavement Structure shall be Equal or Better Than Existing Pavement in Thickness and Quality.

3. Conditions Where Trench Runs Perpendicular or Skew to the Travel Way Direction and/or Longitudinal Trenches Less Than Ten Feet in Length shall be Repaved A Minimum of Four Feet Wide with Trench Centered Within the Paved Width (T-Section) or the Paved Area shall be the Trench Width Plus an Additional One Foot on Each Side of the Trench (T-Section), Whichever is Greater. The Length of the Repaved Trench shall be Repaved A Recommended Two Feet in Added Length to Each End of the Trench.

4. Trenches Running Longitudinally to the Travel Way on Roadways Where the Paved Travel Way is 36 Feet or Less shall be Repaved to the Trench Width Plus an Additional One Foot on Each Side of the Trench (T-Section) with a Recommended Two Feet in Added Length to Each End of the Longitudinal Trench. The Replaced Pavement shall have a Minimum Thickness of Four Inches of Asphalt Concrete or Match the Existing Pavement Thickness, Whichever is Greater.

5. Trenches Running Longitudinally to the Travel Way on Roadways Where the Paved Travel Way is 36 Feet shall be Cold Planned a Minimum of Two Inches and Repaved to the Original Grade. The Paving shall be a Minimum Width of One Lane Not Exceeding 15 Feet in Width with a Minimum of Two Feet in Added Length to Each End of the Longitudinal Trench. The Replacement Pavement Within the Trench Limits, Plus an Additional One Foot on Each Side of the Trench (T-Section), shall have a Minimum Thickness of Four Inches of Asphalt Concrete or Match the Existing Pavement Thickness, Whichever is Greater.

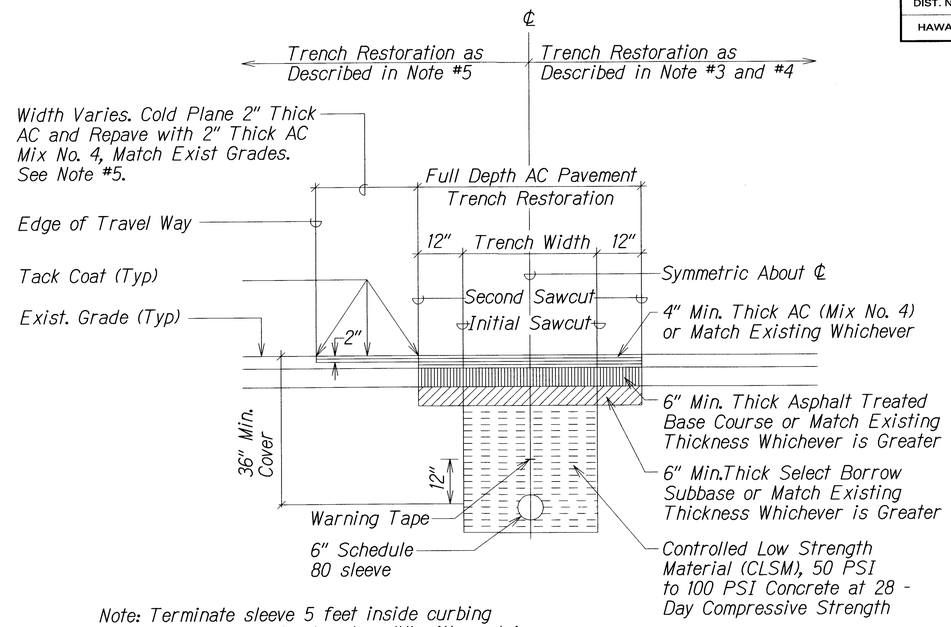
6. Pavement Markings
   Restore Pavement Strippings, Raised Pavement Markers and Pavement Markings Whether Shown or Not on the Plans Within the Repaved Areas as Defined Above.

   For Lane and Edge Strippings Restoration, Extend 12" From the Limit of Work.

   Contractor to Match Width (Whichever is Greater) and Color of Striping, Type of Raised Pavement Markers, Pavement Words, and Pavement Directional Arrow.

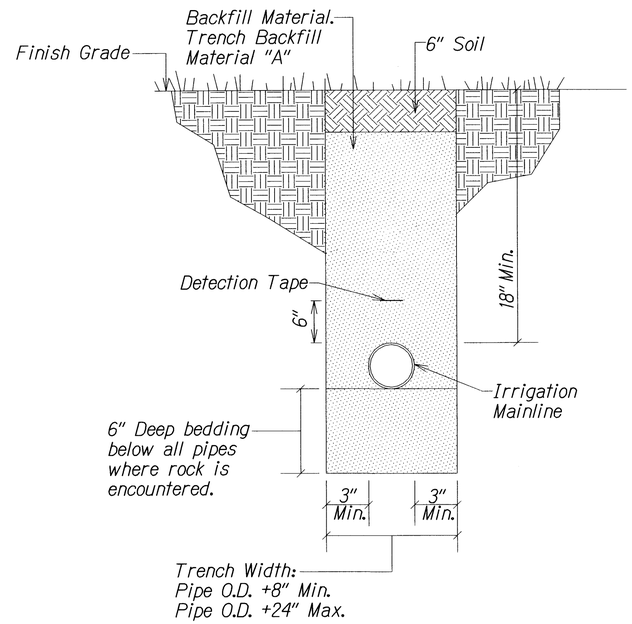
   Restoration of Pavement Markings will not be Paid for Separately, but Considered Incidental to the Various Contract Items.

7. All roadway trench work shall be paid under Pay Item 616.2000 - Roadway Trench. Trench excavation, irrigation sleeve, backfill, pavement replacement and pavement markings shall be considered incidental to Pay Item 616.2000 - Roadway Trench.



Note: Terminate sleeve 5 feet inside curbing in concrete valve box type 'X' with cast iron cover.

① BACKFILL SECTION UNDER EXISTING ROADWAY
Scale: N.T.S.



② BACKFILL SECTION UNDER EXISTING MEDIAN
Scale: N.T.S.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRENCH DETAILS & NOTES

MOKAPU SADDLE ROAD
MOKAPU BOULEVARD RESURFACING
Kapaa Quarry Road to North Kalaheo Avenue
M.P. 2.97 to M.P. 4.15
Federal Aid Project No. STP-065-1(010)

Scale: N.T.S. Date: May, 2011

SHEET No. 1 OF 1 SHEETS