STATE OF HAWAI'I
DEPARTMENT OF HAWAIIAN HOME LANDS
LAND DEVELOPMENT DIVISION

July 10, 2018
Date

ADDENDUM NO. 2
TO
INVITATION FOR BIDS

IFB-18-HHL-008
HO'OLEHUA WATER SYSTEM IMPROVEMENTS (PWS 230)
BID PACKAGE 1 - HO'OLEHUA

NOTICE TO ALL PROSPECTIVE BIDDERS

This Addendum is hereby made a part of the Contract Documents for **IFB-18-HHL-008**, and it shall amend the said contract documents as detailed within this Addendum document.

APPROVED:

N Sakamoto
Norman L. Sakamoto, Acting Administrator
Land Development Division
Department of Hawaiian Home Lands

Date: 10 Jul 18

Please execute and immediately return the receipt below to the Department of Hawaiian Home Lands via facsimile to: **(808) 620-9299, Attention: James C. Richardson, Project Manager, Land Development Division.**

Receipt of Addendum No. 2 for the **IFB-18-HHL-008**, is hereby acknowledged.

Signed	Date
Print Name	Title
Name of Firm/Company	

ADDENDUM NO. 2

IFB-18-HHL-008
HOʻOLEHUA WATER SYSTEM IMPROVEMENTS (PWS 230)
BID PACKAGE 1 - HOʻOLEHUA
HOʻOLEHUA, MOLOKAʻI, HAWAIʻI

General

1. CONTRACTOR'S BID SUBMITTAL
    a. Replace BID OFFER FORM in its entirety with attached revision.
2. DHHL CONTRACT: ATTACHMENT S-2 COMPENSATION AND PAYMENT SCHEDULE
    a. Replace ATTACHMENT S-2 COMPENSATION AND PAYMENT SCHEDULE in its entirety with attached revision.
3. DHHL CONTRACT: ATTACHMENT S-5 SPECIAL CONDITIONS
    a. SC-11 WATER CHARGES AND REQUIREMENTS – Revised the statement: "Contractor shall furnish, install, and maintain a temporary flow meter at the supply point as accepted by the Project Manager" to "DHHL shall furnish, install, and maintain a temporary flow meter at the supply point as accepted by the Project Manager."
    b. SC-13 NPDES PERMITS – Added the following statement: "NPDES Permit has been obtained for this project and the approval letter is attached. The Contractor shall comply with all requirements of the Permit."
    c. SC-19 CONTRACTOR'S DAILY REPORT – Added Item 9: Contractor shall provide at least six (6) photos depicting that day's work. Photos should show progress of work.
    d. SC-27 INADVERTANT DISCOVERY OF HUMAN BURIALS – Replaced first sentence of the fourth paragraph with: "A total allowance of $100,000 for required mitigation of inadvertent discovery of human burials is included in the payment provisions of the contract ($85,000 for Bid Package No. 1 and $15,000 for Bid Package No. 2), for CONTRACTOR'S time and materials as needed."
    e. SC-40 CONSTRUCTION YARD AND RIGHT-OF-ENTRY – Added the following statement: "The Contractor shall not perform any work that adversely impacts any DHHL lessee without the prior approval of the Construction Manager and the DHHL Project Manager."
    f. SC-43 CONSTRUCTION PHASING – Revised first sentence of second paragraph to read: "The CONTRACTOR shall perform all excavation, earthwork, demolition and clearing or grubbing, or any other land disturbing

activities within a six (6) week continuous period to be identified by the CONTRACTOR and approved by the Project Manager."

g. SC-51 CONSTRUCTION MANAGER AND ENGINEER INSPECTIONS – Replace this Special Condition in its entirety.

h. SC-53 CONNECTION TO EXISTING WATER MAIN – Replace this Special Condition in its entirety.

i. SC-54 KALAE HIGHWAY RESURFACING (BY OTHERS) – Added Special Condition.

j. Attached: Revised ATTACHMENT S-5 SPECIAL CONDITIONS

k. Attached: NPGC NPDES Permit R10F560 approval letter dated June 12, 2108.

4. REQUESTS FOR INFORMATION: See attached Summary of Questions and Responses.

a. Response to Question #26 by Okahara and Associates is attached.

b. Response to Questions #30-35 by Ronald N.S. Ho and Associates is attached.

Specifications

Civil

1. SPECIFICATIONS: Replace SECTION 02640 – VALVES AND COCKS in its entirety with attached revision.

Mechanical

1. SPECIFICATIONS: Add SECTION 15131 – Motor for Deep Well Pump

Plans

General

1. Replace Construction Plans for HOOLEHUA WATER SYSTEM IMPROVEMENTS, EMERGENCY REPAIRS DUE TO VANDALISM AT HOOLEHUA 2x3.5 MG RESERVOIR with attached revised Plans.

Civil

1. PLANS: DRAWING T001 – Addition of approval signatures from DHHL and DOT-HWY.
2. PLANS: DRAWING T002 – Revised Sheet Index
3. PLAN: DRAWING T005 – Removed PR B1 and Proposed PV System callouts.

4. PLANS: DRAWING T007 – Revised Best Management (BMP) note.
5. PLANS: DRAWING C101 – Revised pipe size and callouts in schematic water connection detail.
6. PLANS: DRAWING C101 – Revised length of removal for existing chain link fence.
7. PLANS: DRAWING C101 – Added relocation of Irrigation control box.
8. PLANS: DRAWING C101 – Added concrete block to cut and plug callout
9. PLANS: DRAWING C101 – Added replacement of existing 8" gate valve for existing booster pump.
10. PLANS: DRAWING C101 – Added callout for the adjustment of existing storm drain manhole.
11. PLANS: DRAWING C102 –Added azimuth and distance from Temp benchmark to proposed easement for new water tank.
12. PLANS: DRAWING C102 – Revised callout to refer to DPW Standard Details R-9, R-10, and R-11.
13. PLANS: DRAWING C102 – Added demolition of existing concrete along proposed retaining wall.
14. PLANS: DRAWING C102 – Added grade adjustment wall along north side of existing access road.
15. PLANS: DRAWING C102 – Specified end treatment for traffic barrier.
16. PLANS: DRAWING C102 –Added sampling line, chlorination line, and exterior ladder to new water tank.
17. PLANS: DRAWING C103 – Revised Slope.
18. PLANS: DRAWING C104 – Revised grade along Water Tank Access Road 1.
19. PLANS: DRAWING C104 – Revised grading along grade adjustment wall at north side of existing access road.
20. PLANS: DRAWING C105 – Added contour labels.
21. PLANS: DRAWING C107 – Revised Grading Sections.
22. PLANS: DRAWING C108 – Added minimum cover callouts to waterline profiles.
23. PLANS: DRAWING C108 – Added Hose Bibb Detail.
24. PLANS: DRAWING C300 to C319 – Revised Sheet titles
25. PLANS: DRAWING C302 – Revised 20" Butterfly Valve Schematic detail
26. PLANS: DRAWING C302 – Added note.

27. PLANS: DRAWING C302 – Revised waterline connection to tank.
28. PLANS: DRAWING C302 – Added meter size.
29. PLANS: DRAWING C303 – Revised waterline profile at inflow control valve.
30. PLANS: DRAWING C302 – Removed proposed ARV.
31. PLANS: DRAWING C302 – Added testing information at tank site.
32. PLANS: DRAWING C305 – Revised Water Line “B” from station 19+80 to 20+05.
33. PLANS: DRAWING C308 – Revised reinforced concrete jacket length.
34. PLANS: DRAWING C312 – Revised callouts for Water Line “B”.
35. PLANS: DRAWING C312 – Revised reinforced concrete jacket length.
36. PLANS: DRAWING C315 – Added connection for existing standpipe
37. PLANS: DRAWING C316 – Added connection for existing standpipes and water meters.
38. PLANS: DRAWING C317 – Added connection for existing standpipes and water meters.
39. PLANS: DRAWING C317 – Removed 1-6” 1/8 bend from water main connection.
40. PLANS: DRAWING C318 – Removed Insertion valve on the tank Influent/Effluent line.
41. PLANS: DRAWING C318 – Revised waterline testing detail.
42. PLANS: DRAWING C319 – Revised Inflow Control Valve detail.
43. PLANS: DRAWING C319 – Revised 20” Butterfly Valve Replacement detail.
44. PLANS: DRAWING C400 – Revised Excavation and Embankment Earthwork Summary.
45. PLANS: DRAWING C402 – Revised sections.
46. PLANS: DRAWING C405 – Revised callout for replacement of butterfly valve.
47. PLANS: DRAWING C406 – Revised callout for replacement of butterfly valve.
48. PLANS: DRAWING C502 – Updated Service Connection Schedule
49. PLANS: DRAWING C600 – Revised Excavation and Embankment Earthwork Summary.
50. PLANS: DRAWING C603 – Revised Sections.
51. PLANS: DRAWING C604 – Revised alignment and grading of access road.

52. PLANS: DRAWING C604 – Added replacement of existing butterfly valve.

53. PLANS: DRAWING C605 – Revised alignment and grading of access road.

54. PLANS: DRAWING C606 – Revised alignment of access road. Added replacement of existing butterfly valve.

55. PLANS: DRAWING C607 – Revised alignment of access road. Added replacement of existing butterfly valve.

56. PLANS: DRAWING C608 – Revised alignment of access road. Added replacement of existing butterfly valve.

57. PLANS: DRAWING C701 –Revised Site Plan.

58. PLANS: DRAWING C702 –Revised Driveway and silt sock.

Electrical

1. PLANS: DRAWINGS E-005, E-101, E-102, E-104 – Addition of chlorination shed power and controls duct lines.

2. PLANS: DRAWINGS E-004, E-101, E103, E-106 – Removed connection to MECO utility pole and rerouted power from existing panel board.

3. PLANS: DRAWING E-104 – Added background of building.

Mechanical

1. PLANS: DRAWING M-1 – Revisions include showing the location of the deep well pump motor installation and adding construction notes pertaining to the installation of the deep well pump motor.

2. PLANS: DRAWING M130 – Added callout for removal of the existing fuel level switch on the base tank and installation of a new multi-float switch in the same tank port. Added detail diagram of multi-float switch.

3. PLANS: Add DRAWING: M721 – Plumbing Floor Plans

4. PLANS: Add DRAWING: M740 – Piping Diagrams

5. PLANS: Add DRAWING: M750 – Mechanical Details

Structural

1. PLANS: DRAWINGS ST201, ST202 and ST203 – Rotate Column and Pedestal Location within Water Tank so that water lines and roof openings do not interfere with footings and roof beams.

2. PLANS: DRAWING ST201 – Relocate Ladder location

3. PLANS: DRAWING ST301 – Change note regarding 6” 3B fine fill to 1’-0” aggregate sub base. This matches the Soils report for this project.

4. PLANS: DRAWING ST403 – Remove detail regarding water level indicator and change Access Hatch detail to Letter C, from D. The Water level indicator will not be shown on the drawings.

STATE OF HAWAIʻI
DEPARTMENT OF HAWAIIAN HOME LANDS

BID OFFER FORM FOR

HOʻOLEHUA WATER SYSTEM IMPROVEMENTS

HOʻOLEHUA, MOLOKAʻI, HAWAIʻI

TAX MAP KEYS:
Portions of: (2) 5-2-002, (2) 5-2-004, (2) 5-2-005, (2) 5-2-006, (2) 5-2-007, (2) 5-2-010, (2) 5-2-012, (2) 5-2-13, 5-2-21, (2) 5-2-023, (2) 5-2-024 & (2) 5-2-025

IFB No.: IFB-18-HHL-008

Chairman
Hawaiian Homes Commission
Department of Hawaiian Home Lands
91-5420 Kapolei Parkway
Kapolei, Hawaiʻi 96707

The undersigned has carefully examined, read, and understands the terms and conditions in the Plans and Specifications, Special Conditions attached hereto, DHHL Construction General Conditions, and General Conditions specified in the Invitation for Bids (IFB) No. IFB-18-HHL-008. The State of Hawaiʻi's (State) Contract for Goods and Services Based on Competitive Sealed Bids AG-003 Rev. 6/22/2009, AG-008 103D General Conditions, are included by reference and made part hereof and available upon written request to the Procurement Officer. The undersigned herby submits the following offer to perform the work for IFB No. IFB-18-HHL-008 as specified herein, all in accordance with the true intent and meaning thereof.

The undersigned understands and agrees that:

1. The State reserves the right to reject any and all offers and to waive any items that are defective when, in the State's opinion, such rejection or waiver will be in the best interest of the State. A solicitation may be rejected in whole or part when in the best interest of the State.

2. If awarded the contract, all services will be in accordance with Hawaiʻi Revised Statutes (HRS) § 103-55.5.

3. In submitting this offer, the Offeror is not in violation of HRS Chapter 84, concerning prohibited State contracts.

4. By submitting this offer, the Offeror certifies that the offer was independently arrived at without collusion and the Offeror did not participate in any practices to restrict competition.

5. It is understood that the failure to receive any addendum shall not relieve the Offeror from any obligation under this IFB.

Date:_____

The undersigned represents that it is: **(Check ✓ one only)**

□ A **Hawai'i business** incorporated or organized under the laws of the State of Hawai'i; **OR**

□ A **Compliant Non-Hawai'i business** not incorporated or organized under the laws of the State of Hawai'i, is or shall be registered at the State of Hawai'i Department of Commerce and Consumer Affairs Business Registration Division (DCCA-BREG) to do business in the State of Hawai'i.

State of incorporation: _____

Offeror is:

□ Sole Proprietor □ Partnership □ Corporation □ Joint Venture □ Other: _____

Federal ID No.:_____

Hawai'i General Excise Tax ID No.:_____

Telephone No.:_____

Fax No.:_____

E-Mail Address.:_____

Payment address (other than street address below)

_____

(Street Address, City, State, Zip Code)

Business address

_____

(Street Address, City, State, Zip Code)

Respectfully submitted:

_____

Authorized (Original) Signature

_____

Name and Title (Please Type or Print)

*_____

Exact Legal Name of Company (Offeror)

*If Offeror shown above is a "dba" or a "division" of a corporation, furnish the exact legal name of the corporation under which the awarded contract will be executed:

_____

The following bid is hereby submitted for the Hoolehua Water System Improvements to the Department of Hawaiian Home Lands.

SITE 1 – KAULUWAI WELL SITE

0.2 MG RESERVOIR SITE WORK

1.	L.S.	200,000-gallon reservoir, including Portland cement concrete, base course, subbase, structural fill, inclusive of hauling, forming, and finishing; reinforcing, liners, piping and fittings to exterior face of footing, ladders and security gate, landings, railings, hatches, manholes, vents, finishes and all appurtenances and incidentals; installation of chain link fence and gates, concrete footings, excavation and backfill, in place, complete.	
		Lump Sum	$_____
2.	L.S.	Grading and drainage, including clearing and grubbing of new reservoir site; unclassified excavation and embankments (fill and backfill) for reservoir; excavation for new access road and grade adjustment walls inclusive of structural excavation, crushed rock base, subbase and backfill; demolition and removal of existing drain headwall, construction of new drain headwalls, new drain inlets inclusive of excavation and structural backfill; all appurtenant and incidental materials.	
		Lump Sum	$_____
3.	L.S.	Paving, including asphaltic concrete pavement, base course and subbase, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; guardrails; all incidentals.	
.			
		Lump Sum	$_____

4.	L.S.	Site piping work, including influent/effluent line, overflow line, washout line, perimeter drains, sampling line, copper pressure line, connection to existing influent/effluent line, inclusive of fittings, valves, valve boxes, manholes, concrete blocks, structural struts, concrete anchor blocks, trench excavation, cushion and backfill, testing, disinfection and sterilization, all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____

ABOVE-GROUND DIESEL FUEL STORAGE TANK

5.	L.S.	Grading, paving and fencing, including roadway excavation, embankment and backfill; asphaltic concrete pavement, base course and subbase, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; removal of existing fence, posts and footings, installation of new chain link fence and gates, concrete footings, excavation and backfill; relocation and reconnection of irrigation control valve; inclusive of all appurtenant and incidental items.	
		Lump Sum	$_____
6.	L.S.	Installation of diesel fuel storage tank, piping and appurtenances, including all equipment on fuel tank per manufacturer's recommendations; fuel transfer system; fuel polishing system; site grading; concrete foundation and bollards per manufacturer's recommendations; fuel system testing and all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____

7.	L.S.	Fuel oil piping, including all fittings, valves, trench excavation and backfill, containment, connection to existing generator set fuel line, all appurtenant and incidental items.	
		Lump Sum	$_____
8.	L.S.	Electrical system, including preliminary site investigation, electrical power and controls including alarm circuit input into existing SCADA system, all appurtenant components and incidental items; booster pump and deep well pump controls replacement; MECO interconnection; fuel system interconnection; concrete; concrete pad; duct line trench excavation and backfill; and motor control center system.	
		Lump Sum	$_____
		BOOSTER PUMP REPLACEMENT	
9.	L.S.	Booster pump motor removal and replacement, including delivery, installation and testing of two (2) new booster pump motor units and discharge heads; removal and disposal of existing pump discharge and suction piping components; interconnection to electrical and water system; replacement of deep well pump motor, in place, complete.	
		Lump Sum	$_____
		MISCELLANEOUS ITEMS	
10.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____

11.	ALLOW	Field Office, including installation and removal, in place complete.		
		Allowance		$ 14,875.00
12.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.		
		Per Each	$_____	$_____
13.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
14.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____
15.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.		
		Lump Sum		$_____
16.	L.S.	Demobilization, including removal and disposal of excess materials and equipment, and site clean-up.		
		Lump Sum		$_____

17.	ALLOW	Archaeological Monitoring.	
		Allowance	$ 81,460.00
18.	ALLOW	Implementation of the Historic Preservation Plan.	
		Allowance	$ 20,000.00

SITE 3 – KAULUWAI 1.0 MG RESRVOIR

INSTALL CONTROL VALVES

19.	L.S.	Install new site water system piping, including clearing and grubbing, trench excavation, cushion and backfill, fittings, concrete blocks, concrete beams, concrete anchor blocks, cutting and plugging of existing pipes, connection to existing pipes, and all appurtenant and incidental items, in place, complete.		
		Lump Sum		$_____
20.	12,300	Lin. Ft., Install new 6-inch water line, including clearing and grubbing, trench excavation, cushion and backfill, valves, valve boxes, manholes, fittings, concrete blocks, concrete anchor blocks, concrete beams, reinforced concrete jackets; reconnection to existing water system fixtures; cutting, plugging and removal of existing water lines; connection to existing site water system; removal and disposal of existing water meter(s) and meter box(es); testing, disinfection and sterilization of new water system; restoration of pavement and guardrail in Kalae Highway; Traffic Control; inclusive of all appurtenant and incidental items, in place, complete.		
		Per Lin. Ft.	$_____	$_____

MISCELLANEOUS ITEMS

21.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.		
		Lump Sum		$_____

22.	ALLOW	Field Office, including installation and removal, in place complete.		
		Allowance		$ 5,950.00
23.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.		
		Per Each	$_____	$_____
24.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
25.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____
26.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.		
		Lump Sum		$_____
27.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.		
		Lump Sum		$_____
28.	ALLOW	Archaeological Monitoring.		
		Allowance		$ 89,370.00

SITE 4 – HOOLEHUA 2x3.5 MG RESRVOIR

REPLACE FLOW CONTROL VALVES AND INFLUENT PIPING

29.	L.S.	Installation of inflow control valve, including clearing and grubbing, structural excavation and backfill, concrete pad, reinforcing, masonry, steel plates, miscellaneous metal, all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____
30.	L.S.	Installation of 6-inch compound meter and meter box, including structural excavation and backfill, piping, fittings, copper piping inclusive of connecting to existing copper pipe, cutting and removal of a portion of existing piping, removal and replacing of a portion of copper piping and existing pressure gauge, concrete blocks and pedestals, all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____
31.	L.S.	Installation of new influent water line, including trench excavation, cushion and backfill; gate valves, fittings, pipe straps, concrete blocks concrete support blocks and concrete pipe supports at tank; reinforcing, masonry, steel plates, miscellaneous metal; connection to existing water system at reservoirs; and all appurtenant and incidental items, in place complete.	
		Lump Sum	$_____

32.	L.S.	Install new exterior galvanized steel vertical ladder, including security cage and all appurtenant and incidental items for the safe and proper installation of new ladder, inclusive of removal and disposal of existing ladder.	
		Lump Sum	$_____

HOOLEHUA 2x3.5 MG TANK REPAIRS

33.	L.S.	Tank repair, including replacement of reinforcing, resurface of tank exterior, installation of ancillary equipment, excavation and disposal of construction debris.	
		Lump Sum	$_____
34.	L.S.	Fencing, 8-foot high chain-link fence with gates around both tanks and portion of new access road, including concrete footings, excavation and backfill, in place, complete.	
		Lump Sum	$_____
35.	L.S.	Roadway grading and paving, 5,200 linear feet including clearing and grubbing, roadway excavation, embankment and backfill, asphaltic concrete pavement, base course, subbase and gravel shoulder, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; removal of existing wire fence, installation of new wire fence; cattle gate; and traffic control, in place, complete.	
		Lump Sum	$_____

36.	4	Each, Butterfly valve replacement, including trench excavation, structural excavation, cushion and backfill, new water line piping, gate valves, manholes, reinforcing concrete blocks, bleeder assemblies, testing, disinfection and sterilization, in place, complete.		
			Per Each	$_____ $_____
37.	L.S.	Emergency repairs due to vandalism, including tank repairs, replacement of reinforcing, resurface of tank exterior, hatch replacement, installation of pipe railing on tank roof, repair of tank roof, installation of a security system, security cameras and lighting, and interconnection with Kanakaloloa Cemetery.		
			Lump Sum	$_____
		MISCELLANEOUS ITEMS		
38.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.		
			Lump Sum	$_____
39.	ALLOW	Field Office, including installation and removal, in place complete.		
			Allowance	$ 5,950.00
40.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.		
			Per Each	$_____ $_____

41.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
42.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____
43.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.		
		Lump Sum		$_____
44.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.		
		Lump Sum		$_____
45.	ALLOW	Archaeological Monitoring.		
		Allowance		$ 89,370.00

SITE 5 – PUU HELEAKALA IMPROVEMENTS

NEW 8" TRANSMISSION MAIN AND FIRE HYDRANTS

46.	3,500	Linear Feet, Installation of new 8-inch water main, including clearing and grubbing, trench excavation, pipe cushion and backfill, pavement restoration, gate valves, valve boxes, manholes, fittings, concrete blocks, concrete beams, concrete anchor blocks, structural struts, interconnection to existing water system, cutting and plugging of existing main and service connections, service lateral reconnections, testing, disinfection and sterilization, traffic control, and all appurtenant and incidental items, in place, complete.		
		Per Linear Foot	$_____	$_____
47.	7	Each, Installation of 6-inch gate valve for fire hydrant connection, including excavation and backfill, valve box, concrete anchor blocks, all appurtenant and incidental items.		
		Per Each	$_____	$_____
48.	7	Each, Install Fire Hydrant Assembly (fire hydrant, riser and extension piece), including 6-inch water line, concrete pad, reflector post and pavement marker, concrete block, and all appurtenant and incidental items, in place complete.		
		Per Each	$_____	$_____

MISCELLANEOUS ITEMS

49.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.		
		Lump Sum		$_____
50.	ALLOW	Field Office, including installation and removal, in place complete.		
		Allowance		$ 5,950.00
51.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.		
		Per Each	$_____	$_____
52.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
53.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____

54.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.	
		Lump Sum	$_____
55.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.	
		Lump Sum	$_____
56.	ALLOW	Archaeological Monitoring.	
		Allowance	$ 66,200.00

SITE 6 – HOOLEHUA PRESSURE BREAKER TANK ROADWAY

12-FOOT WIDE ACCESS ROAD

57.	L.S.	Replace ancillary equipment, including replacement of butterfly valves, all appurtenant and incidental items, excavation and disposal of demolition/construction debris.		
			Lump Sum	$ N.I.C.
58.	4,100	Linear Feet, Roadway grading and paving, including clearing and grubbing, roadway excavation, embankment and backfill, asphaltic concrete pavement, base course, subbase and gravel shoulder, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; removal of existing fence and gates; removal of existing paddocks; and traffic control, in place, complete.		
			Per Linear Foot $_____	$_____
59.	4	Each, Butterfly valve replacement, including trench excavation, structural excavation, cushion and backfill, new water line piping, gate valves, manholes, reinforcing, concrete blocks, bleeder assemblies, testing, disinfection and sterilization, in place, complete.		
			Per Each $_____	$_____

MISCELLANEOUS ITEMS

60.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.		
		Lump Sum		$_____
61.	ALLOW	Field Office, including installation and removal, in place complete.		
		Allowance		$ 5,950.00
62.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.		
		Per Each	$_____	$_____
63.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
64.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____

65.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.	
		Lump Sum	$_____
66.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.	
		Lump Sum	$_____
67.	ALLOW	Archaeological Monitoring.	
		Allowance	$ 66,200.00

SITE 7 – HOOLEHUA VARIOUS IMPROVEMENTS

VALVE REPLACEMENT

68.	0	Each, Pressure Reducing Valve Replacement, including replacement of 12-inch gate valves, realigning manholes, excavation and debris disposal.		
		Per Each	$ N.I.C	$ N.I.C.
69.	2	Each, Pressure Reducing Valve Station Replacement, including new Pressure Reducing Valve assembly, clearing and grubbing, excavation, embankment and backfill, pavement restoration, manhole, reinforcing, concrete blocks, concrete beams, concrete anchors, structural struts, fittings, all appurtenant and incidental items, testing, disinfection and sterilization, traffic control; and removal of existing valve; in place, complete.		
		Per Each	$_____	$_____
70.	11	Each, Air Relief Valve Replacement in Puu Kapele Avenue, including new air relief valve assembly, remove and dispose of existing air relief valve and traffic control, in place, complete.		
		Per Each	$_____	$_____

INVENTORY STORAGE

71.	L.S.	Maintenance Yard Improvements, including clearing and grubbing, demolition of existing structure, expansion of existing concrete pad, design and construction of new structure, structural excavation, embankment and backfill, site infrastructure, inclusive of domestic water service, fire hydrant, Individual Wastewater System (septic tank, leech field, distribution box, manholes and laterals), reconnection of existing building service to new facilities, electrical power connections, lighting, relocation of chain-link fence and ancillary equipment; and all plans, specifications and permits necessary to construct the new maintenance building, special inspections (as required) and as-built drawings, in place, complete.	
		Lump Sum	$_____

MISCELLANEOUS ITEMS

72.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____
73.	ALLOW	Field Office, including installation and removal, in place complete.	
		Allowance	$ 5,950.00
74.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.	
		Per Each $_____	$_____

75.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.		
		Per Each	$_____	$_____
76.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).		
		Lump Sum		$_____
77.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.		
		Lump Sum		$_____
78.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.		
		Lump Sum		$_____
79.	ALLOW	Archaeological Monitoring.		
		Allowance		$ 89,370.00
		ALL SITES		
80.	ALLOW	Required mitigation for the inadvertent discovery of human burials within the project areas.		
		Allowance		$ 85,000.00

TOTAL BID AMOUNT = _____

_____ **Dollars** ($_____**).**

The prices herein for the above items shall include all materials, labor, tools, equipment, machinery and all incidentals necessary, inclusive of general excise tax to install or to construct these items in place complete and in accordance with the plans and specifications contained in this IFB.

The CONTRACTOR shall complete all work as specified or indicated in the Contract Documents on or before **Seven Hundred Thirty (730)** calendar days after receiving written Notice to Proceed, subject to extensions, as may be granted.

APPRENTICESHIP AGREEMENT PREFERENCE

Hawai‘i Revised Statutes §103-55.6 (ACT 17, SLH 2009) provides for a Hawai’i Apprenticeship Preference for public works contracts having an estimated value of $250,000.00 or more. The preference shall be in the form of a 5% bid adjustment applied to the Bidder’s amount for bidders that are parties to apprenticeship agreements. The estimated value of this public works contract is $250,000.00 or more and the apprenticeship agreement preference **shall** apply.

To be eligible for the preference, the Bidder shall:

1. Be a party to an apprenticeship agreement registered with the DLIR at the time the bid is made for each apprenticeable trade the Bidder will employ to construct the public works project for which the bid is being made.

    a. The apprenticeship agreement shall be registered and conform to the requirements of HRS Chapter 372.

    b. Subcontractors do not have to be a party to an apprenticeship agreement for the Bidder to obtain the preference.

    c. The Bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.

    d. If a Bidder’s employee is multi-skilled and able to perform work in more than one trade (for example, a project requires a carpenter and a laborer, and the employee is a carpenter, but is also able to perform the work of a laborer), the Bidder need only be a party to the carpenter’s apprenticeship agreement and does not need to be a party to the laborer’s apprenticeship agreement in order to qualify for the preference. The Bidder is not “employing” a laborer, only a carpenter, and so only needs to be a party to the carpenter’s apprenticeship agreement.

    e. Qualification for the preference is given on a project-by-project basis and depends upon the specific offer for a specific project. A Bidder’s employees may vary from project to project and may qualify for the preference on one project but may not qualify on another project. For example, on one project, if the Bidder only employs carpenters to perform work in the carpentry and labor trades, then the Bidder only needs to be a party to the carpenter’s apprenticeship agreement in order to qualify for the preference. However, on another project if the same Bidder employs both carpenters and laborers, then the Bidder will not qualify for the preference if the Bidder is only a party to the carpenter’s apprenticeship agreement and not the laborer’s apprenticeship agreement.

2. State the trades the Bidder will employ to perform the work;

3. For each trade to be employed to perform the work, the Bidder shall submit a completed signed original *CERTIFICATION OF BIDDER'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17* (*Certification Form 1)* verifying the participation in an apprenticeship program registered with the State Department of Labor and Industrial Relations (DLIR);

4. The *Certification Form 1* shall be authorized by an apprenticeship sponsor of the DLIR list of registered apprenticeship programs. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor; and

5. The completed *Certification Form 1* for each trade must be submitted by the Bidder with the offer. A facsimile or copy is acceptable to be submitted with the offer; however, the completed **signed original** must be submitted within five (5) working days of the due date of the offer. If the signed original is not received within this timeframe, the preference may be denied. Previous certifications shall not apply.

Failure to comply with ALL of the conditions noted above, without exception, shall disqualify the Bidder from qualifying for, and thus receiving, benefit of the Hawai'i Apprenticeship Preference.

The *Certification Form 1* and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: http://labor.hawaii.gov/wdd/.

Upon receiving *Certification Form 1*, the DHHL will verify with DLIR that the apprenticeship program is on the list of apprenticeship programs registered with the DLIR. If the program(s) are not confirmed by the DLIR, the Bidder will not qualify for the preference.

If the Bidder is certified to participate in an apprenticeship program for each trade which will be employed by the Bidder for the project, a preference will be applied to decrease the Bidder's total bid amount by five per cent (5%) for evaluation purposes.

Should the Bidder qualify for other preferences, all applicable preferences shall be applied to the bid amount.

While preference for Hawai'i Apprenticeship will be taken into consideration to determine the low Bidder, the contract awarded shall be the original bid amount, exclusive of any preferences. The preference is only for evaluation purposes.

The Bidder hereby certifies that it will employ the following apprenticeable trades to perform the work for this project:

LIST OF APPRENTICEABLE TRADES TO BE EMPLOYED

TRADE	APPRENTICESHIP PROGRAM SPONSOR

(Add additional sheets if necessary)

ALL JOINT CONTRACTORS OR SUBCONTRACTORS TO BE ENGAGED ON THIS PROJECT

The Bidder certifies that the following is a complete listing of all joint Contractors or Subcontractors covered under Chapter 444, Hawai‘i Revised Statutes, who will be engaged by the Bidder on this project to perform the nature and scope of work indicated pursuant to Section 103D-302, Hawai‘i Revised Statutes, and understands that failure to comply with this requirement shall be just cause for rejection of the bid.

The Bidder further understands that only those joint Contractors or Subcontractors listed shall be allowed to perform work on this project and that all other work necessary shall be performed by the Bidder with his own employees. If no joint Contractor or Subcontractor is listed, it shall be construed that all of the work shall be performed by the Bidder with his own employees.

The Bidders must be sure that they possess and that the Subcontractors listed in the bid possess all the necessary licenses needed to perform the work for this project. The Bidder shall be solely responsible for assuring that all the specialty licenses required to perform the work are covered in his bid.

The Bidder shall include the license number of the joint Contractors or Subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractor’s Licensing Board may cause rejection of the bid submitted.

Complete Firm Name of Joint Contractor or Subcontractor	License Number	Hawai‘i Tax ID Number	Nature and Scope of Work to be Performed

(Add additional sheets if necessary)

METHOD OF AWARD

The Bidder is required to bid on the entire project. The low Bidder shall be determined by the procedures outlined in items 1) through 4) below:

1. Prior to opening of bids, the State will determine the amount of funds available for the project. This amount will be designated the "control amount". The control amount shall be announced at, and prior to the opening of bids.

2. The Base Bid and Alternate, if any, of each Bidder will be adjusted to reflect the applicable preferences in accordance with Chapter 103D, HRS. The Alternate, if any, will then be added to the Base Bid and compared with the control amount.

3. The low Bidder shall be the Bidder having the lowest aggregate amount, within the control amount (after application of the various preferences), for the Base Bid plus the Alternate, if any.

4. If adding the Alternate, if any, would make the aggregate amount exceed the control amount for all Bidders, the low Bidder shall be the Bidder having the lowest Base Bid after application of the various preferences.

   It is further understood and agreed that:

5. The Chairman reserves the right to reject any and/or all bids and waive any defects when, in his opinion, such rejection or waiver will be in the best interest of the State.

6. After determining the low Bidder, an award may be made either on the amount of the Base Bid alone, or including the Alternate (exclusive of preferences), if:

   a. It is in the best interest of the State;

   b. Funds are available at time of the award; and

   c. The combination of the Base Bid plus Alternate does not change the apparent low Bidder.

7. In the event the Base Bid for all Bidders exceed the control amount, the Chairman reserves the right to negotiate with the lowest responsible and responsive Bidder to award a contract within available funds.

8. In the event the award is made for the Base Bid alone, the Chairman reserves the right to amend the contract at a later date to include the Alternate should funds subsequently become available.

OTHER CONDITIONS

1. The liquidated damages per working day for failure to complete the work on time have been determined and are noted in the Special Conditions of the sample contract.

2. By submitting this bid, the undersigned is declaring that his firm has not been assisted or represented on this matter by an individual who has, in a State capacity, been involved in the subject matter of this contract in the past one (1) year.

3. By submitting this bid, the undersigned is declaring that Bidder's own organization will perform at least 20% of the contractor's work. For the purposes of this section, the Contractor's work is defined as: direct cost labor for contractor's forces; direct cost materials installed by the contractor's direct cost labor force; direct cost equipment, either owned or leased, used by the contractor's direct cost labor force; and field overhead cost to include: field supervision, field office trailer (if any), field office equipment and supplies, etc.

4. Upon the acceptance of the bid by the Chairman, the undersigned must enter into and execute a contract for the same and furnish a Performance and Payment Bond, as required by law. These bonds shall conform to the provisions of Sections 103D-324 and 325, Hawai‘i Revised Statutes, and any law applicable thereto.

5. The quantities given herewith are approximate only and are subject to increase or decrease.

6. The estimated quantities shown for items for which a UNIT PRICE is asked in this bid are only for the purpose of comparing on a uniform basis bids offered for the work under this contract. No claim shall be filed for anticipated profit or loss because of any difference between the quantities of the various classes of work done or the materials and equipment actually installed and the said estimated quantities. Payment on UNIT PRICE items will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.

7. If the product of the UNIT PRICE BID and the number of units does not equal the total amount stated by the undersigned in the Bid for any item, it will be assumed that the error was made in computing the total amount. For the purpose of determining the lowest Bidder, the stated UNIT PRICE alone will be considered as representing the Bidder's intention and the total amount bid on such items shall be considered to be the amount arrived at by multiplying the UNIT PRICE by the number of units.

8. Certification for Safety and Health Programs for Bids in Excess of $100,000. In accordance with Sections 103D-327 and 396-18, Hawai‘i Revised Statutes, by submitting this bid, the undersigned certifies that his firm will have a written Safety and Health Plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational, Safety and Health Division.

9. Any contract arising out of this offer is subject to the approval of the Department of the Attorney General as to form, and to all further approvals, including the approval of the Governor, required by statute, regulation, rule, order, or other directive.

Receipt of the following addenda issued by the Department is acknowledged by the date(s) of receipt indicated below:

	Date		Date
Addendum No. 1	_____	Addendum No. 5	_____
Addendum No. 2	_____	Addendum No. 6	_____
Addendum No. 3	_____	Addendum No. 7	_____
Addendum No. 4	_____	Addendum No. 8	_____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this IFB as submitted.

Bid Security in the amount of:_____

_____ DOLLARS ($_____)

as required by law, is enclosed herewith in the form of:

(____) Surety Bond (*1)
(____) Legal Tender (*2)
(____) Cashier's Check (*3)
(____) Certificate of Deposit (*3)
(____) Certified Check (*3)
(____) Official Check (*3)
(____) Share Certificate (*3)
(____) Teller's Check (*3)
(____) Treasurer's Check (*3)

Respectfully submitted,

Name of Company, Joint Venture or Partnership

License No.

By
Signature (*4)

Title:

Date:

Address:

Telephone No.:

(IF A CORPORATION, AFFIX CORPORATE SEAL TO SIGNATURE, BE SURE TO FILL IN ATTACHED LIST OF SUBCONTRACTORS. THIS BID FORM MAY NOT BE ALTERED AND BIDDERS MAY NOT QUALIFY OR CONDITION THEIR BIDS IN ANY WAY.)

PLEASE FILL OUT THE ATTACHED CERTIFICATE OF RESOLUTION GIVING EVIDENCE OF THE AUTHORITY OF THIS OFFICER TO SUBMIT BIDS ON BEHALF OF THE COMPANY.

NOTES:

*1. Surety bond underwritten by a company licensed to issue bonds in this State;

*2. Legal tender; or

*3. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's, or official check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation of the National Credit Union Administration.

a. These instruments may be utilized only to a maximum of $100,000.

b. If the required security or bond amount totals over $100,000, more than one instrument not exceeding $100,000 each and issued by different financial institutions shall be accepted.

*4. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company, and also the names and residence addresses of all officers of the Company.

*5. Fill in all blank spaces with information asked for or bid may be invalidated. BID MUST BE INTACT; MISSING PAGES MAY INVALIDATE YOUR BID.

CERTIFICATE OF RESOLUTION

I, _____, Secretary of _____, a Hawai‘i Corporation, do hereby certify that the following is a full, true and correct copy of a resolution duly adopted by the Board of Directors of said Corporation, at its meeting duly called and held at the office of the Corporation _____, Hawai‘i, on _____ day of _____, 20_____, at which a quorum was present and acting throughout; and that said resolution has not been modified, amended or rescinded and continues in full force and effect.

> “RESOLVED that any individual at the time holding the position(s) of _____, be, and each of them hereby is, authorized to execute on behalf of the Corporation any bid, proposal or contract for the sale or rental of the products of the Corporation or for the services to be performed by the Corporation and to execute any bond required by any such bid, proposal or contract with the United States Government or the State of Hawai‘i or the City and County of Honolulu, or any County of Municipal Government of said State, or any department or subdivision of any of them.”
>
> IN WITNESS THEREOF, I have hereunto set my hand and affixed the corporate seal of said

_____ this _____ day of _____, 20___.____.

_____
Secretary

END OF BID

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

Project: **Hoolehua Water System Improvements Package 1 – Hoolehua**
Location: **Hoolehua, Molokai, Hawaii**
Contractor: **TBD**

The State shall pay the CONTRACTOR a sum not to exceed _____ **AND __/100 DOLLARS (**$_____**)** for the satisfactory completion of the work under this contract.

SITE 1 – KAULUWAI WELL SITE

0.2 MG RESERVOIR SITE WORK

1.	L.S.	200,000-gallon reservoir, including Portland cement concrete, base course, subbase, structural fill, inclusive of hauling, forming, and finishing; reinforcing, liners, piping and fittings to exterior face of footing, ladders and security gate, landings, railings, hatches, manholes, vents, finishes and all appurtenances and incidentals; installation of chain link fence and gates, concrete footings, excavation and backfill, in place, complete.	
		Lump Sum	**$**_____
2.	L.S.	Grading and drainage, including clearing and grubbing of new reservoir site; unclassified excavation and embankments (fill and backfill) for reservoir; excavation for new access road and grade adjustment walls inclusive of structural excavation, crushed rock base, subbase and backfill; demolition and removal of existing drain headwall, construction of new drain headwalls, new drain inlets inclusive of excavation and structural backfill; all appurtenant and incidental materials.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

3.	L.S.	Paving, including asphaltic concrete pavement, base course and subbase, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; guardrails; all incidentals. Lump Sum	$_____
4.	L.S.	Site piping work, including influent/effluent line, overflow line, washout line, perimeter drains, sampling line, copper pressure line, connection to existing influent/effluent line, inclusive of fittings, valves, valve boxes, manholes, concrete blocks, structural struts, concrete anchor blocks, trench excavation, cushion and backfill, testing, disinfection and sterilization, all appurtenant and incidental items, in place, complete. Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

ABOVE-GROUND DIESEL FUEL STORAGE TANK

5.	L.S.	Grading, paving and fencing, including roadway excavation, embankment and backfill; asphaltic concrete pavement, base course and subbase, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; removal of existing fence, posts and footings, installation of new chain link fence and gates, concrete footings, excavation and backfill; relocation and reconnection of irrigation control valve; inclusive of all appurtenant and incidental items.	
		Lump Sum	$_____
6.	L.S.	Installation of diesel fuel storage tank, piping and appurtenances, including all equipment on fuel tank per manufacturer's recommendations; fuel transfer system; fuel polishing system; site grading; concrete foundation and bollards per manufacturer's recommendations; fuel system testing and all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____
7.	L.S.	Fuel oil piping, including all fittings, valves, trench excavation and backfill, containment, connection to existing generator set fuel line, all appurtenant and incidental items.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

8.	L.S.	Electrical system, including preliminary site investigation, electrical power and controls including alarm circuit input into existing SCADA system, all appurtenant components and incidental items; booster pump and deep well pump controls replacement; MECO interconnection; fuel system interconnection; concrete; concrete pad; duct line trench excavation and backfill; and motor control center system. Lump Sum	$_____

BOOSTER PUMP REPLACEMENT

9.	L.S.	Booster pump motor removal and replacement, including delivery, installation and testing of two (2) new booster pump motor units and discharge heads; removal and disposal of existing pump discharge and suction piping components; interconnection to electrical and water system; replacement of deep well pump motor, in place, complete. Lump Sum	$_____

MISCELLANEOUS ITEMS

10.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract. Lump Sum	$_____
11.	ALLOW	Field Office, including installation and removal, in place complete. Allowance	$_____
12.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete. Per Each	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

13.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.	
		Per Each	$_____
14.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).	
		Lump Sum	$_____
15.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals, and other activities to mobilize for project.	
		Lump Sum	$_____
16.	L.S.	Demobilization, including removal and disposal of excess materials and equipment, and site clean-up.	
		Lump Sum	$_____
17.	ALLOW	Archaeological Monitoring	
		Lump Sum	$_____
18.	ALLOW	Implementation of the Historic Preservation Plan	
		Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SITE 3 – KAULUWAI 1.0 MG RESERVOIR

INSTALL CONTROL VALVES

19.	L.S.	Install new site water system piping, including clearing and grubbing, trench excavation, cushion and backfill, fittings, concrete blocks, concrete beams, concrete anchor blocks, cutting and plugging of existing pipes, connection to existing pipes, and all appurtenant and incidental items, in place, complete.	
		Lump Sum	$_____
20.	12,300	Lin. Ft., Install new 6-inch water line, including clearing and grubbing, trench excavation, cushion and backfill, valves, valve boxes, manholes, fittings, concrete blocks, concrete anchor blocks, concrete beams, reinforced concrete jackets; reconnection to existing water system fixtures; cutting, plugging and removal of existing water lines; connection to existing site water system; removal and disposal of existing water meter(s) and meter box(es); testing, disinfection and sterilization of new water system; restoration of pavement and guardrail in Kalae Highway; Traffic Control; inclusive of all appurtenant and incidental items, in place, complete.	
		Per Lin. Ft.	$_____

MISCELLANEOUS ITEMS

21.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

22.	ALLOW	Field Office, including installation and removal, in place complete. Allowance	$_____
23.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete. Per Each	$_____
24.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete. Per Each	$_____
25.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning). Lump Sum	$_____
26.	L.S.	Mobilization, including obtaining insurance bonds, grading/permits, scheduling, submittals and other activities to mobilize for project. Lump Sum	$_____
27.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up. Lump Sum	$_____
28.	ALLOW	Archaeological Monitoring Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SITE 4 – HOOLEHUA 2 X 3.5 MG RESRVOIR

REPLACE FLOW CONTROL VALVES AND INFLUENT PIPING

29.	L.S.	Installation of inflow control valve, including clearing and grubbing, structural excavation and backfill, concrete pad, reinforcing, masonry, steel plates, miscellaneous metal, all appurtenant and incidental items, in place, complete. Lump Sum	$_____
30.	L.S.	Installation of 6-inch compound meter and meter box, including structural excavation and backfill, piping, fittings, copper piping inclusive of connecting to existing copper pipe, cutting and removal of a portion of existing piping, removal and replacing of a portion of copper piping and existing pressure gauge, concrete blocks and pedestals, all appurtenant and incidental items, in place, complete. Lump Sum	$_____
31.	L.S.	Installation of new influent water line, including trench excavation, cushion and backfill; gate valves, fittings, pipe straps, concrete blocks concrete support blocks and concrete pipe supports at tank; reinforcing, masonry, steel plates, miscellaneous metal; connection to existing water system at reservoirs; and all appurtenant and incidental items, in place complete. Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

32.	L.S.	Install new exterior galvanized steel vertical ladder, including security cage and all appurtenant and incidental items for the safe and proper installation of new ladder, inclusive of removal and disposal of existing ladder.	
		Lump Sum	$_____

HOOLEHUA 2x3.5 MG TANK REPAIRS

33.	L.S.	Tank repair, including replacement of reinforcing, resurface of tank exterior, installation of ancillary equipment, excavation and disposal of construction debris	
		Lump Sum	$_____
34.	L.S.	Fencing, 8-foot high chain-link fence with gates around both tanks and portion of new access road, including concrete footings, excavation and backfill, in place, complete.	
		Lump Sum	$_____
35.	L.S.	Roadway grading and paving, 5,200 linear feet including clearing and grubbing, roadway excavation, embankment and backfill, asphaltic concrete pavement, base course, subbase and gravel shoulder, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; removal of existing wire fence, installation of new wire fence; cattle gate; and traffic control, in place, complete.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

36.	4	Each, Butterfly valve replacement, including trench excavation, structural excavation, cushion and backfill, new water line piping, gate valves, manholes, reinforcing concrete blocks, bleeder assemblies, testing, disinfection and sterilization, in place, complete. Per Each	$_____
37.	L.S.	Emergency repairs due to vandalism, including tank repairs, replacement of reinforcing, resurface of tank exterior, hatch replacement, installation of pipe railing on tank roof, repair of tank roof, installation of a security system, security cameras and lighting, and interconnection with Kanakaloloa Cemetery. Lump Sum	$_____

MISCELLANEOUS ITEMS

38.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract. Lump Sum	$_____
39.	ALLOW	Field Office, including installation and removal, in place complete. Allowance	$_____
40.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete. Per Each	$_____
41.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete. Per Each	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

42.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).	
		Lump Sum	$_____
43.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.	
		Lump Sum	$_____
44.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.	
		Lump Sum	$_____
45.	ALLOW	Archaeological Monitoring.	
		Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SITE 5 PUU HELEAKALA IMPROVEMENTS

NEW 8" TRANSMISSION MAIN AND FIRE HYDRANTS

46.	3,500	Linear Feet, Installation of new 8-inch water main, including clearing and grubbing, trench excavation, pipe cushion and backfill, pavement restoration, gate valves, valve boxes, manholes, fittings, concrete blocks, concrete beams, concrete anchor blocks, structural struts, interconnection to existing water system, cutting and plugging of existing main and service connections, service lateral reconnections, testing, disinfection and sterilization, traffic control, and all appurtenant and incidental items, in place, complete.	
		Per Linear Foot	$_____
47.	7	Each, Installation of 6-inch gate valve for fire hydrant connection, including excavation and backfill, valve box, concrete anchor blocks, all appurtenant and incidental items.	
		Per Each	$_____
48.	7	Each, Install Fire Hydrant Assembly (fire hydrant, riser and extension piece), including 6-inch water line, concrete pad, reflector post and pavement marker, concrete block, and all appurtenant and incidental items, in place complete.	
		Per Each	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

MISCELLANEOUS ITEMS

49.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____
50.	ALLOW	Field Office, including installation and removal, in place complete.	
		Allowance	$_____
51.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.	
		Per Each	$_____
52.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.	
		Per Each	$_____
53.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).	
		Lump Sum	$_____
54.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

55.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.	
		Lump Sum	$_____
56.	ALLOW	Archaeological Monitoring.	
		Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SITE 6 – HOOLEHUA PRESSURE BREAKER TANK ROADWAY

12-FOOT WIDE ACCESS ROAD

57.	L.S.	Replace ancillary equipment, including replacement of butterfly valves, all appurtenant and incidental items, excavation and disposal of demolition/construction debris.	Lump Sum	$ N.I.C.
58.	4,100	Linear Feet, Roadway grading and paving, including clearing and grubbing, roadway excavation, embankment and backfill, asphaltic concrete pavement, base course, subbase and gravel shoulder, inclusive of hauling, spreading, laying, rolling and compacting; provide smooth-riding connection to existing and/or new pavement; Portland cement concrete pavement and subbase, inclusive of hauling, forming, spreading, laying and finishing; provide smooth-riding connection to existing and/or new pavement; removal of existing fence and gates; removal of existing paddocks; and traffic control, in place, complete.	Per Linear Foot	$_____
59.	4	Each, Butterfly valve replacement, including trench excavation, structural excavation, cushion and backfill, new water line piping, gate valves, manholes, reinforcing, concrete blocks, bleeder assemblies, testing, disinfection and sterilization, in place, complete	Per Each	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

MISCELLANEOUS ITEMS

60.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____
61.	ALLOW	Field Office, including installation and removal, in place complete.	
		Allowance	$_____
62.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete.	
		Per Each	$_____
63.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete.	
		Per Each	$_____
64.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning).	
		Lump Sum	$_____
65.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project.	
		Lump Sum	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

66.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up.	
		Lump Sum	$_____
67.	ALLOW	Archaeological Monitoring.	
		Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

SITE 7 – HOOLEHUA VARIOUS IMPROVEMENTS

VALVE REPLACEMENT

68.	0	Each, Pressure Reducing Valve Replacement, including replacement of 12-inch gate valves, realigning manholes, excavation and debris disposal.	Per Each	$ N.I.C.
69.	2	Each, Pressure Reducing Valve Station Replacement, including new Pressure Reducing Valve assembly, clearing and grubbing, excavation, embankment and backfill, pavement restoration, manhole, reinforcing, concrete blocks, concrete beams, concrete anchors, structural struts, fittings, all appurtenant and incidental items, testing, disinfection and sterilization, traffic control; and removal of existing valve; in place, complete.	Per Each	$_____
70.	11	Each, Air Relief Valve Replacement in Puu Kapele Avenue, including new air relief valve assembly, remove and dispose of existing air relief valve and traffic control, in place, complete.	Per Each	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

INVENTORY STORAGE

71.	L.S.	Maintenance Yard Improvements, including demolition of existing structure, expansion of existing concrete pad, construction of new structure, grading, excavation, installation of a fire Maintenance Yard Improvements, including clearing and grubbing, demolition of existing structure, expansion of existing concrete pad, design and construction of new structure, structural excavation, embankment and backfill, site infrastructure, inclusive of domestic water service, fire hydrant, Individual Wastewater System (septic tank, leech field, distribution box, manholes and laterals), reconnection of existing building service to new facilities, electrical power connections, lighting, relocation of chain-link fence and ancillary equipment; and all plans, specifications and permits necessary to construct the new maintenance building, special inspections (as required) and as-built drawings, in place, complete.	
		Lump Sum	$_____

MISCELLANEOUS ITEMS

72.	L.S.	Fire Contingency Plan, including preparation, submittal and processing for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the entire contract.	
		Lump Sum	$_____
73.	ALLOW	Field Office, including installation and removal, in place complete.	
		Allowance	$_____

STATE OF HAWAII

COMPENSATION AND PAYMENT SCHEDULE

74.	1	Each, Project Sign for Department of Hawaiian Home Lands (DHHL) in place complete. Per Each	$_____
75.	1	Each, Project Sign for United States Department of Agriculture (USDA) in place complete. Per Each	$_____
76.	L.S.	Temporary Erosion Control Measures and compliance with the National Pollution Discharge Elimination System (NPDES) Permit, including submittals to the State Department of Health (inclusive of, but not limited to, renewing the permit, installation and removal of silt fences, BMPs, watering and roadway cleaning). Lump Sum	$_____
77.	L.S.	Mobilization, including obtaining insurance, bonds, grading/permits, scheduling, submittals and other activities to mobilize for project. Lump Sum	$_____
78.	L.S.	Demobilization, including removal and disposal of excess materials, debris and equipment, and site clean-up. Lump Sum	$_____
79.	ALLOW	Archaeological Monitoring. Allowance	$_____
		ALL SITES	
80.	ALLOW	Required mitigation for the inadvertent discovery of human burials with the project area. Allowance	$_____
		TOTAL SUM BID	$_____

STATE OF HAWAII

SPECIAL CONDITIONS

Project: **Hoolehua Water System Improvements**
Location: **Hoolehua, Molokai, Hawaii**
Contractor: **TBD**

SC-01 INTERCHANGEABLE TERMS

The following terms are one and the same:

a. "Contract" and "Agreement".
b. "Department of Hawaiian Home Lands" "Department" "DHHL" and "STATE".
c. "Project Manager" and "DHHL Project Manager"

SC-02 INSURANCE COVERAGE

The CONTRACTOR shall obtain separate insurance coverage for this project that complies with the requirements set forth in the DHHL Construction General Conditions, Article 7, Section 7.3, as amended. Payment for all work required to comply with this item will not be paid for separately but shall be considered incidental to the various contract items.

CONTRACTOR shall maintain insurance acceptable to the STATE in full force and effect throughout the term of this Contract. The policies of insurance maintained by CONTRACTOR shall provide the following minimum coverage:

Coverage	Limit
General Liability Insurance (occurrence form)	Bodily Injury and Property Damage (combined single limit): $1,000,000 per occurrence and $2,000,000 aggregate Personal Injury: $1,000,000 per occurrence and $2,000,000 aggregate
Automobile Insurance (covering all owned, non-owned and hired automobiles)	Bodily Injury: $1,000,000 per person and $1,000,000 per occurrence. Property Damage: $1,000,000 per accident or combined single limit of $2,000,000.
Workers Compensation (statutory limit is required by laws of the State of Hawaii)	Insurance to include Employer's Liability. Both such coverages shall apply to all employees of the CONTRACTOR and, in case any sub-contractor fails to provide adequate similar protection for all his employees, to all employees of subcontractors.
Builder's Risk covering the CONTRACTOR and all subcontractors	100% Replacement Value
Fire and extended coverage	100% Replacement Value

STATE OF HAWAII

SPECIAL CONDITIONS

Malicious Mischief	100% Replacement Value
Flood Insurance, if applicable	Maximum Coverage available

a. The State of Hawaii, Department of Hawaiian Home Lands, its elected and appointed officials, officers, employees, and agents shall be named as additional insured with respect to operations, services or products provided to the State of Hawaii. CONTRACTOR agrees to provide to the DHHL, before the effective date of the Contract, certificate(s) of insurance necessary to evidence compliance with insurance provisions of this Contract. CONTRACTOR shall keep such insurance in effect and the certificate(s) on deposit with DHHL during the entire term of this Contract. Upon request by the STATE, CONTRACTOR shall furnish a copy of the policy or policies.

b. Failure of CONTRACTOR to provide and keep in force such insurance shall be regarded as a material default under this Contract. The STATE shall be entitled to exercise any or all of the remedies provided in this Contract for default of CONTRACTOR.

c. The procuring of such required policy or policies of insurance shall not be construed to limit CONTRACTOR's liability under this Contract or to fulfill the indemnification provisions and requirements of this Contract. Notwithstanding said policy or policies of insurance, CONTRACTOR shall be obliged for the full and total amount of any damage, injury, or loss caused by negligence or neglect connected with this Contract.

d. CONTRACTOR shall immediately provide written notice to the contracting department or agency should any of the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

e. DHHL is a self-insured State agency. CONTRACTOR's insurance shall be primary. Any insurance maintained by the State of Hawaii shall apply in excess of, and shall not contribute with, insurance provided by CONTRACTOR.

f. The CONTRACTOR shall require all subcontractors to have in full force and effect the same insurance coverage as required of the CONTRACTOR. Such insurance shall name the State of Hawaii, Department of Hawaiian Home Lands, its elected and appointed officials, officers, employees, and agents as additional insured with respect to operations, services or products provided to the State of Hawaii. The CONTRACTOR shall be responsible to enforce its subcontractors' compliance with these insurance requirements and CONTRACTOR shall, upon request, provide the STATE a copy of the policy or policies of insurance for any subcontractor.

SC-03 COMPLETION SCHEDULE AND LIQUIDATED DAMAGES

The CONTRACTOR shall complete all work as specified or indicated in the Contract Documents on or before **Seven Hundred Thirty (730)** calendar days after receiving written Notice to Proceed, subject to extensions, as may be granted.

In case of failure on the part of the CONTRACTOR to complete the work within the time specified, the CONTRACTOR shall pay to DHHL as liquidated damages, and not as a penalty, **$1,000.00** per calendar day for each day that the project, in its entirety, remains incomplete.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-04 PROCESS THROUGH DHHL

Until Notice to Proceed (NTP) is issued, any and all submittals, reports, request claims, and notices under the contract pertaining to work for this project shall be processed through the Land Development Division Project Manager, at Hale Kalanianaole, 91-5420 Kapolei Parkway, Kapolei, Hawaii 96707.

After Notice to Proceed has been issued, any and all submittals, reports, requests, claims, and notices under the contract that pertain to this project shall be processed through the Construction Manager (CM) with copies submitted to DHHL and the above Consultant as applicable. The CM contract person and number will be identified at the pre-construction meeting.

SC-05 SURVEYING SERVICES

Refer to DHHL Interim General Condition 5.9.3.

The CONTRACTOR shall submit the name of the surveyor, who shall be licensed in the State of Hawaii and will be doing this work for it throughout the course of the project, to DHHL prior to beginning work at the site.

Upon request, DHHL shall provide subdivision plat maps to the CONTRACTOR to enable its surveyor to stake out the various work.

Property pins for the existing lots adjacent to the project site may remain intact and may be visible. However, DHHL makes no warranty that these existing pins are accurate or have not been disturbed.

The CONTRACTOR shall not disturb any existing property pins and is solely responsible for their replacement. The CONTRACTOR shall accurately replace any existing property pins disturbed or removed by it and shall certify that they have been re-installed in the correct locations at no cost to DHHL.

The CONTRACTOR and CONTRACTOR's Licensed Professional Land Surveyor shall provide a letter jointly certifying that all work, including the grading, were built to the lines and grades shown on the record drawings.

Except where specifically provided for in the proposal, all work necessary for, or related to surveying services shall be considered incidental to the various contract items.

Any surveying services required shall be the responsibility of the CONTRACTOR and considered incidental to the scope of work under this contract and therefore covered under the terms of this Contract. No separate payment shall be made.

Upon completion, the CONTRACTOR shall prepare an as-built plan for the project site in which the finished grades are certified by a Hawaii Licensed Professional Land Surveyor. Six (6) copies of the as-built plan shall be submitted to the Construction Manager and Project Manager. The cost of the as-built plan shall be incidental to the Contract. No separate payment shall be made.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-06 ALLOWANCES

The proposal may contain payment items designated as allowances (i.e. mitigation of any inadvertent discovery of human remains). Funds listed in allowance items are to be spent at the direction of DHHL. The allowance is an estimate only and is subject to increase or decrease depending on the actual cost of the item. The funds are for the direct costs of an item and all pricing, submittal and review, overhead, installation, profit, insurance, surety, processing of the issuance of checks for payment to other parties, and all other costs will be included. No payment will be made for incidental costs.

Allowances specifically set aside for construction work and materials will be negotiated when the scope of work is determined. Any unspent allowance costs will be deducted from the Contract by change order prior to final payment.

SC-07 SCHEDULE OF PRICES

The CONTRACTOR shall submit a schedule of values in accordance with DHHL Construction General Conditions, Article 7.2.4 Schedule of Prices within 14 calendar days of the Notice to Proceed. The format and breakdown of the schedule of values shall be acceptable to DHHL.

The schedule of values shall show the work of each subcontractor and shall be based on installed work. No payment will be made until the CONTRACTOR has presented an acceptable schedule of values to DHHL. Performance and Payment Bonds costs shall be a separate line item and the cost shall be authenticated by surety invoice. All overhead and profit shall be prorated across all payment line items.

SC-08 PERMITS AND FEES

The CONTRACTOR shall apply and pay for all permits and inspection fees as required by all governmental agencies having jurisdiction over this project.

All work necessary to comply with this item will not be paid for separately but shall be considered incidental to the various contract items. No separate payment will be made.

SC-09 COORDINATION WITH OTHER PARTIES

The CONTRACTOR shall coordinate all the necessary work for temporary utility services, permanent service and appurtenances with the appropriate agencies, including but not limited to the State Department of Transportation, the State Department of Health, the County of Maui (County) and Maui Electric Company (MECO).

The CONTRACTOR shall coordinate all the necessary work for maintaining water service to include disruption or restriction to water service, temporary utility services, permanent service and appurtenances with the Project Manager and appropriate agencies, including but not limited to DHHL for potable water, and the Molokai Fire Department for fire protection.

The CONTRACTOR shall request, coordinate and schedule all inspections during construction, including but not limited to preliminary, pre-final, and final inspections, by

all necessary government agencies having jurisdiction or vested interests over or in any and all elements of the project.

All work necessary to comply with this item shall be considered incidental to the various contract items. No separate payment will be made.

SC-10 CONTRACTOR'S LICENSING

It is the CONTRACTOR's sole responsibility to review the requirements of this project and determine the appropriate contractor's licenses that are required to complete the project. If the CONTRACTOR does not hold all of the licenses required to perform a particular item of work on this project with its own workers, when bidding, he must list subcontractors that hold the appropriate licenses in its proposal.

SC-11 WATER CHARGES AND REQUIREMENTS

DHHL will make reasonable quantities of potable water available for the CONTRACTOR use at no cost to the CONTRACTOR. CONTRACTOR shall coordinate and obtain authorization for the water supply point(s) and amounts of water required with the Project Manager. DHHL shall furnish, install, and maintain a temporary flow meter at the supply point as accepted by the Project Manager. Flow meter shall be calibrated as accepted by the Project Manager. Contractor shall provide weekly reports of water usage to the Project Manager.

SC-12 SOIL AND DUST CONTROL

To control the dust during construction, the CONTRACTOR shall have an adequate supply of water for dust control and if necessary, moisture conditioning of fill material at all times. The CONTRACTOR shall institute an erosion control program and dust control program to minimize soil erosion and wind erosion and airborne fugitive dust nuisance, respectively for the entire duration of this project.

SC-13 NPDES PERMITS

DHHL will submit an NPDES Permit application to the Department of Health. Authorization to proceed with clearing, grubbing or grading work will not be granted until the permit is approved.

The CONTRACTOR agrees to schedule and sequence his operations to take all of the foregoing into account along with the requirements of DHHL General Condition 7.21.4 shall govern in the event of any delay(s) in DHHL obtaining approvals for these NPDES permits.

The CONTRACTOR shall provide the Consultant with the additional pertinent information required for preparation of the site-specific Best Management Practices (BMPs) Plan, and the Solid Waste Disclosure Form for Construction Sites for this project.

NPDES Permit has been obtained for this project and the approval letter is attached. The Contractor shall comply with all requirements of the Permit.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-14 NOTIFICATION OF WORK

The CONTRACTOR shall notify the Project Manager, and give a minimum of five (5) working days' notice before starting any work. The CONTRACTOR shall notify the Project Manager a minimum of five (5) working days prior to start of any critical activities including, but not limited to, activities impacting noise, access, and air quality.

SC-15 EXISTING OCCUPIED LOTS

The CONTRACTOR shall provide and maintain continuous vehicular access and utility service (water, telephone and electrical) to the various occupied lots within and surrounding the project for the duration of construction and to the satisfaction of the Project Manager. The CONTRACTOR shall identify, locate and protect all utility services to these lots prior to any construction activity.

The CONTRACTOR shall provide safe and convenient access to these lots at all times to the satisfaction of the Project Manager. The CONTRACTOR shall also coordinate any temporary utility services with the proper utility companies. The CONTRACTOR shall pay all utility installation charges and fees to any utility company for any temporary utility connections.

SC-16 FINAL INSPECTION

Throughout the construction period, the work may be subject to periodic inspection by DHHL, the Construction Management (CM) Inspector, the Department of Health, the County and other applicable government agencies. Once work has been satisfactorily completed, the County, accompanied by DHHL and CM Inspector, will make the final inspection of the work to determine whether all work has been done in complete compliance with the requirements of the plans and these specifications.

The CONTRACTOR shall therefore schedule the final inspection with the County, Department of Health, Department of Transportation and the CM Inspector, and notify the DHHL Project Manager one week prior to the final inspection.

Neither the scheduling nor the conduct of the aforementioned final inspection shall be deemed a waiver of DHHL's right to subsequently require CONTRACTOR to complete all unfinished or defective work to the satisfaction of DHHL.

SC-17 GENERAL CONDITIONS

In the event of conflicts and/or discrepancies, the DHHL Construction General Conditions shall govern over Form AG-008, 103D General Conditions (eff. 10/17/13).

STATE OF HAWAII

SPECIAL CONDITIONS

SC-18 CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS

CONTRACTORS are hereby notified of the applicability of Section 11-355, HRS, which states that campaign contributions from specified State or County government contractors during the term of the Contract if the contractors are paid with funds appropriated by a legislative body.

SC-19 CONTRACTOR'S DAILY REPORT

The CONTRACTOR shall submit a daily report electronically, for DHHL review. The report shall include:

1. Date
2. Weather
3. Activity at the site for the CONTRACTOR
    a. Labor – who and what classification, i.e., carpenter, laborer, supervisor, etc.
    b. Equipment
    c. Materials delivered
    d. Work performed
4. Activity at the site for subcontractors
    a. Labor – who and what classification, i.e., carpenter, laborer, supervisor, etc.
    b. Equipment
    c. Materials delivered
    d. Work performed
5. Visitors to the site – Construction Manager, Inspectors, etc.
6. Problems or Questions (including suggested resolutions, if any)
7. Safety report status
8. Quality control report status
9. Contractor shall provide at least six (6) photos depicting that day's work. Photos should show progress of work.

SC-20 APPRENTICESHIP AGREEMENT PREFERENCE – CONTRACTOR'S RESPONSIBILITY

1. For the duration of the contract awarded utilizing the Hawai‘i Apprenticeship Preference, the CONTRACTOR shall certify each month that work is being conducted on the project, that it continues to be a participant in the relevant apprenticeship program for each trade it employs.

2. Monthly certification shall be made on *MONTHLY REPORT OF CONTRACTOR'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17 (Monthly Certification Form 2)* prepared and made available by the DLIR. *Monthly Certification Form 2* shall be a signed original by the respective apprenticeship program sponsor's authorized official, and submitted by the CONTRACTOR with its monthly payment requests. *Monthly Certification Form 2* is available on the DLIR website at: http://hawaii.gov/labor/wdd

3. Should the CONTRACTOR fail or refuse to submit its monthly certification forms, or at any time during the construction of the project, cease to be a party to a registered apprenticeship agreement for each apprenticeable trade the CONTRACTOR employs, the CONTRACTOR will be subject to the following sanctions:
   a. Withholding of the requested payment until the required form(s) are submitted;
   b. Temporary or permanent cessation of work on the project, without recourse to breach of contract claims by the CONTRACTOR; provided the DHHL shall be entitled to restitution for nonperformance or liquidated damages claims; or
   c. Proceed to debar pursuant to HRS §103D-702.
4. If events such as "acts of God," acts of a public enemy, acts of the State or any other governmental body in its sovereign or contractual capacity, fires, floods, epidemics, freight embargoes, unusually severe weather, or strikes or other labor disputes prevent the CONTRACTOR from submitting the certification forms, the CONTRACTOR shall not be penalized as provided herein, provided the CONTRACTOR completely and expeditiously complies with the certification process when the event is over.

SC-21 FEDERAL LABOR STANDARDS

The CONTRACTOR and its subcontractors shall comply with the Davis-Bacon Act (40 U.S.C. 3141-3144, and 3146-3148) as supplemented by Department of Labor regulations (29 CFR Part 5, "Labor Standards Provisions Applicable to Contracts Covering Federally Financed and Assisted Construction"). CONTRACTOR and its subcontractors shall pay wages to laborers and mechanics at a rate not less than the prevailing wages specified in the wage determination made by the Secretary of Labor. CONTRACTOR and its contractors shall also pay wages not less than once a week.

SC-22 ENERGY EFFICIENCY

The CONTRACTOR and its subcontractors shall comply with the Energy Policy and Conservation Act (P.L. 94-163) and all mandatory State and County standards and policies relating to energy efficiency.

SC-23 COPELAND "ANTI-KICKBACK" ACT

The CONTRACTOR shall comply with the Copeland Anti-Kickback Act (18 USC 874 and 40 USC 276c) as supplemented by Department of Labor regulations (29 CFR Part 3, "Contractors and Subcontractors on Public Buildings or Public Works Financed in Whole or in Part by Loans or Grants of the United States"). The Act provides that CONTRACTOR or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public facilities, to give up any part of the compensation to which they are otherwise entitled.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-24 CLEAN AIR ACT AND FEDERAL WATER POLLUTION CONTROL ACT

Developer and its subcontractors shall to comply with all applicable standards, orders or regulations issued pursuant to the Clean Air Act (42 U.S.C. 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. 1251-1387).

SC-25 CONTRACT WORK HOURS AND SAFETY STANDARDS

Developer and its subcontractors shall comply with 40 U.S.C. 3702 and 3704, as supplemented by Department of Labor regulations (29 CFR Part 5).

SC-26 EQUAL EMPLOYMENT OPPORTUNITY

Developer and its subcontractors shall comply with the equal opportunity clause provided under 41 CFR 60-1.4(b), in accordance with Executive Order 11246, "Equal Employment Opportunity" (30 FR 12319, 12935, 3 CFR Part, 1964-1965 Comp., p. 339), as amended by Executive Order 11375, "Amending Executive Order 11246 Relating to Equal Employment Opportunity," and implementing regulations at 41 CFR part 60, "Office of Federal Contract Compliance Programs, Equal Employment Opportunity, Department of Labor," incorporated herein by reference.

SC-27 INADVERTENT DISCOVERY OF HUMAN BURIALS

Although not expected, in the event human burials are inadvertently discovered, the CONTRACTOR shall immediately stop work in the vicinity of the burial and contact the following parties and agencies immediately: State Historic Preservation Division (SHPD), DHHL, Office of Hawaiian Affairs (OHA) and the Maui - Lanai Islands Burial Council.

The discovery of human remains should not prevent the contractor from working on other areas at the work site.

DHHL may provide the CONTRACTOR with a Supplemental Agreement for additional time added to the CONTRACTOR's performance schedule for the mitigation of any inadvertent discovery of human remains per the DHHL Construction General Conditions, sections 7.21.5 through 7.21.5.4.

A total allowance of $100,000 for required mitigation of inadvertent discovery of human burials is included in the payment provisions of the contract ($85,000 for Bid Package No. 1 and $15,000 for Bid Package No. 2), for CONTRACTOR'S time and materials as needed. Funds listed in allowance items are to be spent at the direction of DHHL. The allowance is an estimate only and is subject to increase or decrease depending on the actual cost of the item. The funds are for the direct costs of an item and all pricing, submittal and review, overhead, installation, profit, insurance, surety, processing of the issuance of checks for payment to other parties, and all other costs will be included. No payment will be made for incidental costs.

The CONTRACTOR shall provide unit cost prices for the mitigation work, and time and materials will be negotiated when the scope of work is determined. No work shall be performed by the CONTRACTOR without prior written authorization from DHHL. Any unspent allowance costs will be deducted from the Contract by change order prior to final payment.

STATE OF HAWAII

SPECIAL CONDITIONS

SC–28 ARCHEOLOGICAL MONITORING PLAN, ARCHEOLOGICAL MONITOR, ARCHEOLOGICAL MONITORING REPORT AND HISTORIC PRESERVATION PLAN

An Archaeological Inventory Survey (AIS), an Archaeological Monitoring Plan (AMP) and a Historic Preservation Plan (HPP) have been prepared for the project and are attached. Archaeological sites within the vicinity of the project area have been identified and the CONTRACTOR shall comply with all requirements contained within the AMP and HPP. The CONTRACTOR should be aware that additional archaeological sites may be encountered during the construction of this project. If the CONTRACTOR encounters a potential archaeological site during construction, he shall immediately cease all operations in the area and contact the Project Manager

Pacific Legacy prepared the Project's Archaeological Inventory Survey (AIS) and has been secured to prepare an Archeological Monitoring Plan (AMP) and a Historic Preservation Plan (HPP) to be implemented, referenced, and enforced during construction activities.

The CONTRACTOR is responsible for implementing the plan, conducting all work in accordance with the AMP and HPP. The CONTRACTOR shall also be responsible for contracting with an approved and licensed/certified archeological consulting firm to conduct the fieldwork and monitoring required as part of the plan. Such firm will fulfill the role of the Archeological Monitor as required by the AMP. The Archeological Monitor shall have the ability and authority to halt work if necessary, should the presence of human burials be discovered or may be reasonably expected or anticipated by the Archeological Monitor. Work shall not resume until conditions are satisfactory to the Archeological Monitor, if human burials are sufficiently avoided or protected.

The CONTRACTOR, however, will be completely responsible for their own, and their subcontractor's, work, and ensure that the requests of the Archeological Monitor are met in a timely and efficient manner.

The CONTRACTOR is also responsible for ensuring that the Archeological Monitor prepares and submits an Archeological Monitoring Report (AMR) to DHHL and the appropriate agencies, including but not limited to State Historic Preservation Division (SHPD), the Office of Hawaiian Affairs (OHA), and the Maui - Lanai Islands Burial Council. The AMR will be prepared to the satisfaction of DHHL and the other approving agencies.

The cost for the Archeological Monitor to perform the required fieldwork and monitoring, as well as the cost to prepare, submit, and process the AMR, will be the responsibility of the CONTRACTOR and will be considered incidental to the contract cost and scope of work. This cost shall be in the contract bid amount. No separate payment shall be made.

SC-29 CERTIFICATION

The CONTRACTOR and CONTRACTOR's Hawaii Licensed Professional Land Surveyor shall jointly certify the finish elevation(s) of any new work, referenced to mean sea level (MSL).

STATE OF HAWAII

SPECIAL CONDITIONS

SC-30 GEOTECHNICAL ENGINEER

The services of a geotechnical engineering firm will be retained by CONTRACTOR. The CONTRACTOR shall notify the Project Manager and the Construction Manager whenever the geotechnical engineering firm's presence is needed at the site. The geotechnical engineer shall be present to observe site grading and other work concerning excavation, placing and compacting soil materials, and to take field density tests. Also, the geotechnical engineer shall perform laboratory testing of all imported soils or on-site soils to determine its acceptability for its intended use as select material or general fill material. The geotechnical engineer shall compile the daily observations, test data, test results and recommendations into a weekly submittal to the Construction Manager. The geotechnical engineer shall ensure that the geotechnical work complies with the specifications and drawings.

Upon completion of the grading operation, the geotechnical engineer shall provide the information needed to complete the "Grading Report" as required by the Maui County Code Section 20.08.250. As a minimum, six (6) copies of compaction data with 11"x17" location map, moisture content at the time of compaction, and certification letter (stamped and signed by a licensed engineer in the State of Hawaii) that the work was done in conformity to the specifications.

SC-31 STRUCTURAL ENGINEER

The services of a Hawaii Licensed Professional Structural Engineer will be retained by CONTRACTOR. The CONTRACTOR shall notify the Project Manager and the Construction Manager whenever the Structural Engineer's presence is needed at the site. The Structural Engineer shall be present to observe foundation work, construction of the new water tank and retaining walls. The Structural Engineer shall compile the daily observations, test data, test results and recommendations into a weekly submittal to the Construction Manager. The geotechnical engineer shall ensure that the structural work complies with the specifications and drawings.

SC–32 SAMPLING AND TESTING

The CONTRACTOR shall retain the services of a geotechnical engineering firm and/or certified testing laboratory to perform sampling and testing as called for by this Contract. Testing for water quality shall be by a State Department of Health certified laboratory. Sampling and testing shall include materials testing and field testing as required. Sampling and testing shall be as required by the Contract to include but not limited to the following:

1. Concrete compressive strength and slump in laboratory and field tests per the Water System Standards
2. Microbiological tests for pipeline and tank disinfection

Cost for this work shall be considered included in the contract bid amount. No separate payment shall be made.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-33 FIRE PREVENTION PLAN

The site is dry and subject to fires. As such, the CONTRACTOR shall prepare a Comprehensive Fire Prevention Plan, post the regulations clearly at the site and enforce the plan.

Prior to the start of any work, the CONTRACTOR shall prepare and file written fire contingency plans with the Project Manager for review and acceptance.

A Fire Contingency Plan shall be prepared for the work. The Plan shall incorporate the following features as a minimum:

1. Communication System. Prior to any on-site actions the CONTRACTOR shall establish a communications system capable of reaching local emergency services. The job supervisor or his designee must carry a cellular telephone at all times. Communications linkages must be maintained with all emergency services until completion and acceptance of the work covered by this contract.
2. Development of a Firefighting Plan. The CONTRACTOR will be responsible to maintain fire control at all times. The CONTRACTOR shall establish an organization for firefighting, to include personnel training, equipment, and procedures. Elements of the plan will include, as a minimum:
   a. Providing two trained personnel to operate a water tanker. These personnel will be given work assignments that always place them in the immediate area of construction and with immediate access to the tanker upon notice of suspicion of fire.
   b. Ensuring that the tanker personnel receive, and certify in the Fire Contingency Plan that they have received, the following:
      - Training in Tanker Operation Instruction in priority contact with Hawaii County Fire Department, the CONTRACTOR's job supervisor, the Hawaii County Office of Civil Defense, DLNR-DOFAW (Hilo Office) and the Project Manager.
      - Identification and knowledge of the location(s) of nearest water source(s) for filling tanker.
      - Training in the recognition, prevention and correction of fire hazards.

The CONTRACTOR shall not commence with any clearing and grubbing until DHHL has accepted the Fire Contingency Plan and notified the CONTRACTOR that he may proceed. This work, including preparation, submittal, filing, and processing the Fire Contingency Plan for DHHL acceptance, and all labor, materials and equipment necessary for its implementation throughout the duration of the contract shall be paid for under the lump sum item indicated in the proposal.

SC-34 FIELD OFFICE

The CONTRACTOR shall provide a field office for exclusive use and entry of the Construction Manager and DHHL personnel, or their representatives, at a location

approved by the Project Manager within the Project limits. It shall be available within thirty (30) calendar days after the Notice to Proceed date of the Contract.

The field office shall:

1. Be separated by a soundproof wall if it adjoins the CONTRACTOR'S office.
2. Have security measures (i. e., window bars) to discourage illegal entry into the field office and theft and vandalism of the contents.
3. Be weatherproof.
4. Have a minimum gross floor area of 45 feet by 12 feet.
5. Have a monitored wireless security alarm system.
6. Have an aggregate window area not less than 10 percent of the floor area.
7. Have two exterior doors with a keyed cylinder type lock.
8. Be furnished with a conference room table with sufficient chairs, one plan rack holding a minimum of 10 sets of plans, two new executive desks of minimum 36 inch x 72 inch size, two new executive type black chairs, one new 3-tier shelf with each tier a minimum of 13 inches high and 12 inches deep, one broom, telephone service, electric lighting, one new 4-drawer (legal size) file cabinet, one facsimile machine with automatic document feeder, hot/cold bottled drinking water dispenser unit, bottled water delivery service, and sewer system (as necessary).
9. Window-type air conditioning unit(s) capable of keeping the field office at 76ºF. or cooler.
10. Have three telephone exchange lines to the field office. One line shall be dedicated for a facsimile machine. One exchange line for telephone, complete with 2-line handsets with touch-tone and call forwarding capability. The third telephone exchange line shall be dedicated to modem/e-mail.
11. Have a high-speed cable or DSL modem with wireless capability compatible with the internet service account. CONTRACTOR to pay for internet services.
12. Be provided with potable water service, water closet, lavatory, paper towels, toilet paper, paper cups, and soap. If the office cannot be equipped with a water closet and lavatory, the CONTRACTOR shall make other arrangements to provide such facilities for the Construction Management personnel as approved by the Project Manager.
13. Be provided with electrical service and lighting.

At the discretion of the Project Manager: 1) the field office may be located outside of the Project limits; and 2) the above requirements for the field office may be reduced.

The CONTRACTOR shall maintain the field office in good repair and clean and sanitary condition and shall provide disposable items (paper towels, toilet paper, paper cups, soap, etc.) to the satisfaction of the Project Manager throughout the duration of the Project. Should the Project Manager, in his judgment, feel that the office is not being adequately

maintained, operated or repaired, partial or full retention of the CONTRACTOR'S monthly progress payment may be enforced until such inadequacies are corrected.

The field office, equipment, and telephone shall be maintained in good repair and in a clean and sanitary condition by the CONTRACTOR until final payment or an earlier date as determined by the Project Manager. The ownership of the field office and equipment shall remain with the CONTRACTOR and shall not be removed until instructed by the Project Manager.

Payment for furnishing and maintaining the Project field office, equipment, furnishings, supplies, and all appurtenances shall be made at the lump sum price bid as provided for in the Proposal Schedule.

SC-35 STANDARD SPECIFICATIONS

The "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005, State of Hawaii and all applicable updates is by reference incorporated herein and made a part of these specifications. The term "Standard Specifications" used hereinafter refers to this "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005." Copies of the Standard Specifications are available for purchase from State of Hawaii, Department of Transportation, Highways Division.

SC-36 STANDARD DETAILS

The "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, September 1984", as amended of the Departments of Public Works, County of Kauai, County of Maui, County of Hawaii and City and County of Honolulu, of the State of Hawaii, is by reference incorporated herein and made a part of these specifications. The term "Standard Details" used hereinafter refers to this "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, September 1984."Copies of the Standard Details are on file and may be inspected at the Division of Purchasing during regular business hours of the City and County of Honolulu.

The work embraced herein shall be done in accordance with the Standard Details insofar as they may apply.

SC-37 WATER SYSTEM SPECIFICATIONS

The “WATER SYSTEM STANDARDS,” State of Hawaii, dated 2002, and all subsequent amendments and additions, are by reference incorporated herein and made a part of these contract documents. The work embraced herein shall be performed by the CONTRACTOR in accordance with the “WATER SYSTEM STANDARDS,” and the various sections of the Special Conditions.

The term “Water System Standards” used in these contract documents refers to the “WATER SYSTEM STANDARDS” State of Hawaii, dated 2002, and all subsequent amendments and additions.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-38 CONTINGENT ITEMS

Depending upon the site and soil conditions, and other factors, the Project Manager may decide to delete the contingent items in its entirety. A Change Order may be issued to delete the work and the contract amount shall be reduced by subtracting the entire corresponding bid amount. If part of the work is done, or if the work exceeds the estimated quantities, payment shall be made on the actual number of units incorporated in the work at the unit price bid.

SC-39 EARTHWORK QUANTITIES

Prior to any grading operations, the CONTRACTOR shall submit to the Project Manager a list of estimated quantities for excavation and embankment. The CONTRACTOR shall also estimate a reasonable percentage for loss/shrinkage and percentage of unsuitable excavated materials. The percentages shall be updated as the grading work progresses. The CONTRACTOR is responsible for disposal of all excavated material offsite. Borrow material shall not be imported until all excavation work is completed and authorized by the Project Manager.

SC-40 CONSTRUCTION YARD AND RIGHT-OF-ENTRY

CONTRACTOR'S staging area may be located on-site, within the designated project area, and within the DHHL Right-of-Way, as approved by the Construction Manager. Should the staging area measure more than 1 acre, the CONTRACTOR will be responsible to apply for and obtain a National General Permit Coverage (NGPC) for Storm Water Associated with Construction Activities from the State Department of Health, Clean Water Branch, including associated fees, before starting any work.

Access to the project site will be specified by the DHHL Project Manager and the Construction Manager.

The Contractor shall not perform any work that adversely impacts any DHHL lessee without the prior approval of the Construction Manager and the DHHL Project Manager.

SC-41 COUNTY OF MAUI INSPECTION

All work within the proposed well site and any County maintained easements and roadways shall be inspected and approved by the applicable agencies of the County of Maui. The CONTRACTOR shall make arrangements directly with the appropriate agencies to arrange for inspection of work. All work and/or fees necessary to comply with this item shall be considered incidental to the various Contract items. No separate payment shall be made.

SC-42 STATE GENERAL EXCISE TAX

This project is not exempt from the State of Hawaii General Excise Tax. The CONTRACTOR's prices shall include the General Excise Tax for all work.

STATE OF HAWAII

SPECIAL CONDITIONS

SC-43 CONSTRUCTION PHASING

The CONTRACTOR shall prepare and submit to the Project Manager, prior to start of field construction work, a construction phasing plan that outlines and describes the work scope and sequence, in order to maintain public access with minimal interruption and restriction to usage. Plan shall describe all planned phases of work to include estimated times and durations. Measures to maintain access may include and are not limited to: creating separate areas of work and sequencing and phasing work on specific areas in lieu of closing off the entire site, and construction fencing.

Notification to include lead times for notification to public and governmental service agencies shall be identified and scheduled.

The CONTRACTOR shall perform all excavation, earthwork, demolition and clearing or grubbing, or any other land disturbing activities within a six (6) week continuous period to be identified by the CONTRACTOR and approved by the Project Manager. Should land disturbing activities require additional time, the CONTRACTOR shall be responsible for any additional costs incurred for the Archeological Monitor, fieldwork and reporting for the AMR. This cost shall be considered part of the contract bid amount. No separate payment shall be made.

DHHL will not provide additional time to the CONTRACTOR or the CONTRACTOR's performance schedule should land disturbing activities exceed the time duration identified in this condition.

The CONTRACTOR shall coordinate the construction plans as well as the development of the construction phasing plan with the Project Manager.

The CONTRACTOR shall ensure that all materials, equipment, labor and incidentals are on-site as needed to ensure rapid and continuous work to minimize or avoid water service disruptions to the DHHL water system and its service customers.

SC-44 DELETED ITEMS

Depending on the site conditions, soil conditions and other factors, the Project Manager may decide to delete a portion or all of a proposal item in its entirety. A change order shall be issued to delete the work and the contract amount shall be reduced by subtracting the corresponding proposal item amount.

No claim shall be filed for anticipated profit or loss resulting from deletion of all or part of the proposal item except as indicated in DHHL Construction General Condition 4.6.

SC-45 RESTORATION OF DHHL PROPERTY

Any areas cleared or graded by the CONTRACTOR for field office(s), staging or storage operations located in DHHL lots shall be backfilled to the original (or finished) elevations, slopes and grades (shown on the plans) and/or graded to provide proper drainage prior to the completion of the project. The backfilled areas shall be covered with a 2-inch layer of topsoil and immediately grassed.

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SPECIAL CONDITIONS

SC-46 FINAL SETTLEMENT OF CONTRACT

The following shall be made additional conditions of compliance with DHHL Construction General Condition 7.33:

1. The CONTRACTOR shall coordinate with all government agencies and utility companies on behalf of DHHL to obtain letter(s) from each respective government agency or utility company indicating that acceptance of the contract work for the project has been granted to DHHL. Copies of the letters shall be submitted to DHHL.
2. Signature, execution, and return of the "Record Drawing" Title tracings.

Payment for all work required to comply with the above items will not be paid for separately but shall be considered incidental to the various contract items.

SC-47 SHOP DRAWINGS AND OTHER SUBMITTALS

The CONTRACTOR is required to submit a complete list of shop drawings and other submittals to the Construction Manager, for DHHL and the consultant team's review, by one week after the notice to proceed (NTP) is given, or at the pre-construction meeting, whichever comes first.

The CONTRACTOR is then required to submit all submittals and shop drawings that are listed within ONE MONTH after the notice to proceed is given. The CONTRACTOR will not be given schedule or cost considerations for delay of materials if shop drawings or submittals are not submitted by this time.

SC-48 PROJECT SIGNS

The CONTRACTOR shall furnish, erect, maintain and remove one project sign each, for DHHL and USDA.

The project signboard shall be 3/4 inch thick, "AC" exterior grade fir plywood, 4 feet in height and 7 feet long each. All lettering type and size and color selection shall be as specified by DHHL and USDA (refer to Exhibit A).

All paints used shall be exterior enamel paints manufactured either by Ameritone-Devoe, Boysen, DuPont, Dutch Boy Fuller-O'Brien, Glidden, Pittsburg, Sherwin—Williams, Sinclair, or approved equal, and made primarily for the purpose for which they are used, and shall be prepared and applied strictly in accordance with the manufacturer's directions. Signs shall be painted with one prime coat and two finish coats.

Final layout shall be based upon sign plans submitted by the CONTRACTOR and approved by the DHHL.

The Project Sign shall be erected at a location directed by the DHHL and shall be adequately braced in such a way that does not interfere with the viewing of the signs. The sign shall be maintained in good condition throughout the progress of the work until final completion of the project. The project sign shall be erected within five (5) days after approval of the sign layout. After the final approval of the construction work by the DHHL,

the project sign shall be removed from the site and shall become the property of the CONTRACTOR.

Payment will be made for one project sign painted, with lettering specified by DHHL, in place complete (see attachment). Payment for sign removal shall be incidental to said item.

SC-49 COMPLIANCE WITH THE USDA LETTER OF CONDITIONS

The CONTRACTOR shall comply with all conditions prescribed in the USDA Letter of Conditions to the extent allowed by law. Including, but not limited to, the following:

Excerpted from the USDA Letter of Conditions (LOC), dated: August 26, 2016:

"At the conclusion of the proposal's environmental review process, specific action(s) were determined necessary to avoid or minimize adverse environmental impacts. As outlined in the Environmental Report dated February 2016, the following actions are required for successful completion of the project and must be adhered to during project design and construction:

1. **Historic and Cultural Resources:**

   The pohaku in Kalama'ula is located in the middle of the roadway. Many years ago, construction workers attempted to remove it to build Kalaniana'ole Avenue. They were unsuccessful and built the road around the stone. While construction is not proposed near the pohaku, increased traffic can be expected on the roadway when construction vehicles must pass it to get to DHHL Water System facilities. Contractors shall be advised to avoid the pohaku.

   As espoused by various mo'olelo, the area, in general, has a mystical past and retains some supernatural qualities. To respect the spiritual connections that people have with the 'aina, any major event or construction related activity shall be preceded by traditional Hawaiian blessing ceremony performed by a kahuna (priest or priestess) or kahu pule (minister/preacher).

   The sites that were identified will be recorded and mitigation measures shall be approved by the State Historic Preservation Officer (SHPO) and shall be implemented. The historic properties (particularly those in Kalama'ula) will be marked prior to construction to ensure disturbance does not occur. For inadvertent finds during construction, the construction documents shall include a provision that, should any remains such as artifacts, burials, or concentrations of shell or charcoal be encountered during construction activities, work will cease immediately in the immediate vicinity of the find, and the find will be protected. The contractor shall immediately contact the State Historic Preservation Division, which will assess the significance of the find and recommend appropriate mitigation measures, if necessary.

   - Record the 17 sites that have been identified in the Archaeological Inventory Survey.
   - Avoid archeological sites. The exact location of the roadways and water line will be adjusted during the design and construction phases to avoid impacting archaeological sites identified for preservation.

- Mark archaeological sites identified for preservation prior to construction to ensure disturbance does not occur.
- Stop work and notify SHPO if previously unidentified cultural and archaeological resources are discovered during construction activities for significance assessment of the find and for recommendation of appropriate mitigation measures.
- Major events or construction related activities will be preceded by traditional Hawaiian blessing ceremony in respect to the spiritual connections between the 'aina and its people.
- Avoid the large, naturally occurring pohaku (boulder) located within Kalama'ula along Kalaniana'ole Avenue.

2. Biological Resources:

To ensure that threatened and endangered species are not likely to be adversely affected by the proposed action, the following mitigation measures shall be included in the letter of conditions for financial assistance.

3. Transport of New Terrestrial Invasive Plant Species Minimization Measures:

To avoid the unintentional introduction or transport of new terrestrial invasive plant species to Moloka'i during this Project, all construction equipment and vehicles arriving from outside of Moloka'i shall be washed and inspected, and, when possible, raw materials (e.g., gravel, rock, and soli) shall be purchased from a local supplier on Moloka'i to avoid Introducing non-native plant species not present on the Island.

4. Hawaiian hoary bat:

The Hawaiian hoary bat is known to occur across a broad range of habitats throughout the State of Hawaii. This bat roosts in both exotic and native woody vegetation and, while foraging, leaves young unattended in "nursery" trees and shrubs. If trees or shrubs suitable for bat roosting are cleared during the Hawaiian hoary bat breeding season (June 1 to September 15), there is a risk that young bats that cannot yet fly on their own could inadvertently be harmed or killed. Woody plants greater than 15 feet tall shall not be removed or trimmed during the bat breeding season.

Additionally, Hawaiian hoary bats forage for insects from as low as three feet to higher than 500 feet above the ground. When barbed wire is used in fencing, Hawaiian hoary bats can become entangled. Barbed wire shall not be used for fencing.

- There shall be no clearing or grubbing of vegetation over 15 feet tall during the breeding season (June 1 through September I 5).
- Barbed wire shall not be used for any fencing (temporary or permanent) and if a bat arrives in the construction area after work begins, work shall cease until the bat leaves the on its own accord.

5. Nene:

Nene are known to occupy various habitat and vegetation community types ranging from coastal dune vegetation and nonnative grasslands (such as golf courses, pastures, and rural areas) to sparsely vegetated low- and high-elevation lava flows, mid-elevation

native and non-native shrubland, cinder deserts, native alpine grasslands and shrublands, and nonnative alpine shrubland-woodland community habitats. There is the potential for disturbance activities, including noise, to reduce the reproductive success or survival of nene. Nene have an extended breeding season with eggs reported from all months except May, June, and July, although the majority of nene in the wild nest during the wet (winter) season between October and March. Nesting peaks in December and most goslings hatch from December to January. Nene nest on the ground in a shallow scrape in the dense shade of a shrub or other vegetation. In order to avoid impacts to nene, a qualified biologist shall survey the project area prior to the initiation of any work and conduct nest searches for nene if the project will occur during the breeding season. If a nest is discovered, work should cease immediately and our office be contacted for further guidance. A 100-foot (30m) buffer should be established and maintained around all active nests and broods until the goslings have fledged. No disruptive activities shall occur within this buffer. If a nene appears during ongoing work, all activity shall be temporarily suspended until the animal leaves on its own accord.

- A survey shall be conducted by a qualified biologist around the construction sites prior to the initiation of any work or after any subsequent delay of work for three or more days once foraging/loafing nene have been observed at the project site. If a nest is discovered within a radius of 100 feet of the project area, all work will cease immediately and the U.S. Fish and Wildlife Service shall be contacted within 24 hours.
- Projects shall be temporarily suspended if a nene appears within 100 feet of ongoing work and will not resume until the nene has left on Its own accord.

6. Seabirds:

Hawaiian petrels and Newell's shearwaters (collectively known as seabirds) may transit over the project area when flying between the ocean and nesting sites in the mountains during their breeding season (March through November). Seabird fatalities resulting from collisions with artificial structures that extend above the surrounding vegetation have been documented in Hawaii where high densities of transiting seabirds occur. Additionally, artificial lighting such as flood lighting or for construction work and site security, can adversely impact seabirds by causing disorientation which may result in collision with utility lines, buildings, fences and vehicles. Fledging seabirds are especially affected by artificial lighting and may exhaust themselves while circling the light sources and become grounded. Too weak to fly, these birds become vulnerable to depredation by feral predators such as small Indian mongoose (Herpestres auropunctatus), cats (Fells catus), and dogs (Canlsfamillaris). Night work requiring artificial illumination shall be avoided during the seabird fledging season (approximately September 15 through December 15).

- No nighttime construction shall occur during the seabird fledging period (September 15 through December 15) and outdoor lighting installations shall be designed to minimize glare and constructed in a manner that fully shields lighting sources and directs light downwards. The U.S. Fish and Wildlife

Service shall be consulted for additional minimization measures regarding seabirds and lights if night work is proposed after the fledging season (December 16 through September 14).

7. Blackburn's sphinx moth:

The Blackburn's sphinx moth may be in the vicinity of the proposed project area. Adult moths feed on nectar from native plants, including beach morning glory (Ipomoea pes-caprae), lliee (Plumbago zeylanica), and malapllo (Capparis sandwichlana); larvae feed upon non-native tree tobacco (Nicotiana glauca) and native aiea (Nothocestrum latifolium). To pupate, the larvae burrow into the soil and can remain in a state of torpor for up to a year {or more) before emerging from the soli. Soil disturbance can result in death of the pupae. A qualified biologist shall survey areas of proposed construction activities for Blackburn's sphinx moth and its host plants prior to work initiation. Surveys shall be conducted during the wettest portion of the year (usually November-April or several weeks after a significant rain) and immediately prior to construction. Surveys should Include searches for eggs, larvae, and signs of larval feeding (chewed stems, frass, or leaf damage). Any host plants of Blackburn's sphinx moth identified should not be cut or disturbed without further discussions with the U.S Fish and Wildlife Service. If moths or their host plants are found during the survey, the U.S Fish and Wildlife Service shall be contacted for additional guidance to avoid take.

- A biologist shall survey the project area for the presence of larval host plants. If larval host plants are discovered, the U.S Fish and Wildlife Service shall be contacted for further guidance prior to construction activities.
- Once an area has been cleared as part of the project construction, the area shall be kept clear of non-native species until construction activities are complete.

8. Guidance for Solar Facilities:

Please note that some photovoltaic systems on the United States mainland are resulting in impacts to migratory waterfowl and shorebirds. This source of mortality has been described previously (Mccrary et. al. 1986), and recent impacts are being observed at solar facilities in California, including the Desert Sunlight Solar Farm and Genesis Solar Energy Project. Birds have been inadvertently attracted to these sites due to solar panels' resemblance to water and their proximity to important migratory flyways (Donnelly-Shores 2013 and Clarke 2013). Once attracted, collisions with the solar arrays have resulted in injuries and mortalities; once grounded, birds are also subject to predation (Kagan et. at. 2014). While attraction to solar arrays has not yet been documented in Hawaii, the State harbors a significant diversity of water bird and shorebird species, including the federally endangered Hawaiian coot (Fulica alai), Hawaiian stilt (Himantopus mexicanus knudseni), Hawaiian moorhen (Gallinula chloropus), Hawaiian duck (Anas wyvilliana), and Hawaiian goose. Personnel at the solar site be educated about the potential for birds to be attracted and Inadvertently harmed. If monitoring indicates that species are occurring at the photovoltaic system, or additional information about the facility's impacts to native Hawaiian species

becomes available. the U.S Fish and Wildlife Service shall be contacted for further guidance regarding minimizing impacts.

9. Fugitive Dust Mitigation:

During construction a dust control measure shall be implemented. Frequent water sprinkling may be the most effective dust control measure given the size of the sites and the type and scale of proposed improvements. Additional measures could include:

- Landscaping and rapid covering of bare areas;
- Disturbing only the areas of construction that are in the immediate zone of construction to limit the amount of time that the areas will be subject to erosion:
- Provisions for adequate dust control measures during weekends, after hours, and before daily start of construction activities:
- Installation of appropriate structural controls in areas of disturbance; and/or
- Siting of staging areas on impervious surface when possible.

Pollution control measures shall comply with Hawai'i Administrative Rules, Title 11, Chapter 60.1, Air Pollution Control regulations of the DOH.

10. Asbestos Containing Materials (ACM) Mitigation:

Certified contractors shall be involved in the inspection, project design, and abatement of ACM. The Asbestos Abatement Office of the DOH-Indoor and Radiological Health Branch shall be kept apprised of the Project and shall be engaged as necessary once the Project reaches the design phase."

SC-50 AS-BUILT DRAWINGS / RECORD DRAWINGS

As-Built Drawings:

The CONTRACTOR shall provide as-built drawings. The As-Built drawings shall show the actual construction so that any future renovations or tie-ins can be anticipated accurately.

The CONTRACTOR shall record all deviations from the drawings that were authorized by the Project Manager onto the copy of the field plans. The changes shall be recorded immediately after they have been constructed in place to assure they are recorded before they are forgotten.

The CONTRACTOR shall record the changes onto the field office plans using a red pencil. The CONTRACTOR shall stamp, sign and date each sheet of the field office plans. The stamp shall contain the words: "AS-BUILT DRAWINGS' and include a statement signed by the CONTRACTOR certifying that the drawings on the sheet accurately and completely reflect and show the actual as-built construction. The stamp format and wording shall be submitted to the Project Manager for prior approval.

The CONTRACTOR shall submit the marked-up field office plans for the project, stamped, signed and dated, to the Project Manager after the improvements for each respective portion of the project have been completed.

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SPECIAL CONDITIONS

Record Drawings:

All changes shown on the As-Built drawings will be recorded om the original tracings, which will then become the Record Drawings. The Consultant(s) shall be responsible for preparing the Record Drawings. The Consultant(s) shall stamp, sign and date the Title Sheet tracing of the Record Drawings. The stamp shall contain the words "Record Drawings."

The CONTRACTOR shall review the changes made and certify the Record Drawings by signing and dating the Record Drawing Title Sheet tracing where indicated. Any deviations from the plans determined by the Project Manager to missing from, incomplete, or inaccurately drawn on the As-Built Drawings shall be corrected on the Record Drawing tracings by the State and the CONTRACTOR shall be charged for the services. The State will keep a record of the associated cost impacts and deduct them from the Contract price.

Payment for all work required to comply with this item will not be paid for separately but shall be considered incidental to the various Contract items.

SC-51 CONSTRUCTION MANAGER AND ENGINEER INSPECTIONS

The DHHL will engage the Engineer and the Construction Manager (CM) for limited construction observation and/or full observation to supplement the inspections performed or required by the State and/or the County.

CM's and Engineer's authority shall be as described in DHHL Construction General Condition 5.4.

SC-52 COMPENSATION FOR REMOVAL OF ABANDONED VEHICLES, TRASH OR DUMPED ITEMS

Any and all abandoned vehicles, boats or other means of transportation and all appliances and discards of every description found within 5-feet of the actual work limits during the duration of this contract shall be promptly and totally removed from the site. The cost shall be considered incidental to the various Contract items.

The CONTRACTOR is solely responsible for taking precautions to prevent unauthorized access during working and non-working hours to eliminate illegal dumping within these areas during the entire duration of the project. Refer to DHHL Construction General Conditions 4.9.1.2, 7.30 and 7.34.

SC-53 CONNECTION TO EXISTING WATER MAIN

The CONTRACTOR shall coordinate and meet with DHHL and the Department of Water Supply (DWS), County of Maui (when affecting the County water supply) to schedule and minimize water system shut down(s). The CONTRACTOR shall coordinate all scheduling of shut downs with the DHHL. Shut down times shall be limited to a maximum of 6-hour durations; however, this duration may be reduced by DHHL subject to water service continuity requirements and if so the CONTRACTOR shall comply at no additional cost to the State.

STATE OF HAWAII

SPECIAL CONDITIONS

The CONTRACTOR shall notify all users affected by the disruption in water service in writing a minimum of two (2) weeks prior to any shut down and provide copies of the notification(s) to the Project Manager.

Payment for all work required to comply with the above items will not be paid for separately but shall be considered incidental to the various contract items for water system construction.

SC-54 KALAE HIGHWAY RESURFACING (BY OTHERS)

State of Hawaii, Department of Transportation, Highways Division, Maui District has contracted to have Kalae Highway resurfaced. The Contractor shall prioritize his schedule to perform work affecting Kalae Highway prior to the State's resurfacing work. Once resurfaced, there will be a one (1) year moratorium where disturbance to the Kalae Highway pavement will not be permitted.

DAVID Y. IGE
GOVERNOR OF HAWAII

BRUCE S. ANDERSON, Ph.D.
DIRECTOR OF HEALTH

STATE OF HAWAII
DEPARTMENT OF HEALTH
P. O. BOX 3378
HONOLULU, HI 96801-3378

In reply, please refer to:
File:

R10F560.FNL.18

June 12, 2018

The Honorable Jobie Masagatani
Chairman
Department of Hawaiian Home Lands
P.O. Box 1879
Honolulu, Hawaii 96805

Attention: Mr. James Richardson
Project Manager

Dear Ms. Masagatani:

Subject: NOTICE OF GENERAL PERMIT COVERAGE (NGPC)
National Pollutant Discharge Elimination System (NPDES)
Hoolehua Water System Improvements Sites No. 1, 3, 4, 5, 6, & 7
Hoolehua and Kualapuu, Island of Molokai, State of Hawaii
File No. HI R10F560

This letter is to notify you that the **DEPARTMENT OF HAWAIIAN HOME LANDS** (hereinafter PERMITTEE) is now covered under the NPDES General Permit authorizing discharges of storm water associated with construction activities. Coverage under this general permit authorizes you to discharge only storm water to the receiving State waters discharge point(s) from the project location(s) identified in the revised Notice of Intent (NOI), dated May 28, 2018, **provided that you comply with Hawaii Administrative Rules (HAR) 11-54; HAR 11-55; HAR 11-55, Appendix A; HAR 11-55, Appendix C; and the information submitted in the Notice of Intent (NOI).** Discharges of non-storm water, toxics, and other water pollutants to State waters are not authorized by this NPDES General Permit. HAR 11-54 and 11-55 are available on the Department of Health (DOH), Clean Water Branch (CWB) website at: http://health.hawaii.gov/cwb/.

This NGPC will take effect on the date of this notice. This NGPC will expire at midnight, December 5, 2018, or when amendments to HAR, Chapter 11-55, Appendix C, are adopted, whichever occurs first. Failure to comply with HAR 11-54; HAR 11-55; HAR 11-55, Appendix A; HAR 11-55, Appendix C; and information provided in the NOI is an enforceable violation and your NGPC may be terminated. If you violate Hawaii Revised Statutes (HRS), Chapter 342D, you may be subject to penalties of up to $25,000 per violation per day and up to two (2) years in jail.

Falsification of information, including providing information in the NOI that does not match what is actually occurring at the project site/facility and failure to prepare the Storm Water Pollution Prevention Plan (SWPPP) prior to NOI submission, may result in criminal penalties for the Permittee and their authorized representative as provided in Clean Water Act, Section 309 and HRS, Section 342D-35.

As a reminder, this general permit requires the Permittee to:

1. Notify DOH of the construction start date within seven (7) calendar days before the start of construction activities.
2. Complete and submit the Solid Waste Disclosure Form for Construction Sites to the DOH, Solid and Hazardous Waste Branch, Solid Waste Section, as specified on the form at least 30 calendar days before the start of the construction activities. The form can be downloaded at: https://health.hawaii.gov/shwb/files/2018/04/swdiscformapr2018.pdf.
3. Implement the SWPPP in accordance with HAR 11-55, Appendix C. The Director of Health reserves the right to require the Permittee to modify the SWPPP.
4. Submit a new NOI with filing fee and obtain a new NGPC for any revisions to the information submitted in the NOI (with the exception of changes to contact person information for non-transfer of ownerships and changes to the SWPPP). This NGPC cannot be modified.
5. Complete and submit the Notice of Cessation (NOC) within seven (7) calendar days after the end of the month that the subject project was completed.

All NGPC compliance submittals, including the NOC shall be submitted on the CWB Compliance Submittal Form for Individual NPDES Permits and NGPCs. This form shall be completed on the e-Permitting Portal located at: https://eha-cloud.doh.hawaii.gov/epermit.

The Permittee is responsible for obtaining other Federal, State, or local authorizations as required by law.

Please complete the DOH Customer Satisfaction Survey regarding your request for General Permit coverage. This brief survey is available on the e-Permitting Portal located at: https://eha-cloud.doh.hawaii.gov/epermit. Please use the Application Finder button and search for the "Customer Satisfaction Survey."

If you have any questions, please contact the Enforcement Section or Mr. Darryl Lum of the Engineering Section, CWB, at (808) 586-4309.

Sincerely,

for

BRUCE S. ANDERSON, Ph.D.
Director of Health

c: Mr. James Richardson, DHHL [via e-mail james.c.richardson@hawaii.gov only]
Mr. E. Halealoha Ayau, DHHL [via e-mail e.halealoha.ayau@hawaii.gov only]
Mr. Aaron Couch, G70
[via e-mail aaronc@g70.design only]
(w/Receipt No. 51944 for $500 Filing Fee only)
CWB, Maui District Health Office [via e-mail only]

State of Hawaii
Department of Hawaiian Home Lands

IFB-18-HHL-008
HOOLEHUA WATER SYSTEM IMPROVEMENTS (PWS 230)
BID PACKAGE 1 - HOOLEHUA

ITEM	PROSPECTIVE BIDDER					RESPONSE		
	DATE	NAME	COMPANY	BID PACKAGE	QUESTION	DATE	BY	DETAIL
1	06/11/18	John N. Fermiza	ConstructConnect	Both	Is there a pre-bid meeting scheduled prior? Mandatory/Non-Mandatory?	06/14/18	DHHL	Non-mandatory Pre-Bid Conf. on 6/18/18.
2	06/11/18	John N. Fermiza	ConstructConnect	Both	How much is the estimate value of this project?	06/14/18	DHHL	Total value of planning, design, construction and inspection is $22.3M.
3	06/11/18	John N. Fermiza	ConstructConnect	Both	Is there an addendum issued?	06/14/18	DHHL	Not yet, but addendum date listed in bid documents.
4	06/11/18	John N. Fermiza	ConstructConnect	Both	Can I request a copy of the plan holders list?	06/14/18	DHHL	Not available, potential bidders just go to our DHHL website and download the bid docs.
5	06/11/18	John N. Fermiza	ConstructConnect	Both	May I know the exact site location or address?	06/14/18	DHHL	See bid documents at our Department of Hawaiian Home Lands website and the plans shows where the sites are located on Molokai. These are water facilities in the mountains and therfore have no formal addresses.
6	06/11/18	John N. Fermiza	ConstructConnect	Both	Do you require union for all of your projects?	06/14/18	DHHL	No union workers are required in order to bid for these projects. However, the contractor needs to follow the State and Federal prevailing wage rates and (verify) that certain workers have their license in their respective fields, i.e. electrical, plumbing, etc.
7	06/19/18	Keil Kamaile Alcon	Hi Built, LLC	1	On Site 4 and 6 there are 10 butterfly valve replacements can those be closed completely so that the new assembly can function correctly?			Yes, it is assumed that they can be.
8	06/19/18	Keil Kamaile Alcon	Hi Built, LLC	1	If butterfly valves cannot close completely can we substitute your tapping tee and valve assembly and install an inline valve assembly into the 20" line for those 10 valves?			No.
9	06/19/18	Keil Kamaile Alcon	Hi Built, LLC	1	Will DHHL do the tapping of the 20" line for the new valve assembly?			No, Contractor is responsible for all work.
10	06/21/18	Rod Ueunten / Kade Dustin	Keiwit Infrastructure West Co.	1	Technical Specification Section 02202 - Structural Excavation, Backfill and Compaction, paragraph 1.03 states that "A copy of the complete soils report is available on the DHHL website or the bid compact disc." However, the soils report was not included with the rest of bid documents. Please make provide a copy of the soils report to the bidders.	06/21/18	G70 / DHHL	Geotechnical Report for Sites 1 and 7 by Geolabs and Percolation Test for Site 7 by Hirata & Assoc. provided to Kade Dustin, KIWC via e-mail; Also attached as part of Addendum No. 1 dated 06/26/18 for all prospective bidders.

11	06/26/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	The Soils Report provided only covered Site No. 1 and Site No. 7. Please provide soils report for Sites No. 2, 3, 4, 5 and 6. This will allow the contractors to quantify the amount of rock excavation required for the waterline work.		G70 / DHHL	No Geotechnical studies were done for Site 2, 3, 4, 5 or 6
12	06/26/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	On plan sheet ST301, Detail A show 6" of 3B Fine below the concrete slab, and Detail B shows 1'-0" of Aggregate Sub Base below the concrete slab. Please clarify the type and thickness of the material that goes under the concrete slab for the 0.2 MG Kauluwai Reservoir.		G70	1'-0" Aggregate Subbase
13	06/27/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	The Bid Offer Form, for Site 4 - Hoolehua 2x3.5 MG Reservoir, lists Bid Item 33 "Tank Repair, including replacement of rebar, resurface tank exterior, installation of ancillary equipment, excavation and disposal of construction debris." The Construction Plans do not provide locations and details for the required tank repairs. Please provide this information In order to quantify the work for this lump sum bid item.		G70 / DHHL	The Prospective Bidders were given access to Site 4 - Hoolehua 2x3.5 MG Tanks site on June 28, 2018 for the purpose of evaluating this work.
14	06/27/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	Plan sheet C302 has call outs for "Remove Exist Inflow Control Valve Located on Roof Tank" and "Replace Existing 1/2" Copper Pipe and Pressure Gauge Located in Wooden Box on Concrete Walkway Column See Mech Dwgs". In order to quantify this work, please provide details for the existing control valves and existing 1/2" copper pipe and pressure gage. In addition please provide details for the replacement of the existing 1/2" copper pipe and pressure gauge.		G70 / DHHL	See revised plans.
15	06/27/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	The description for Bid Item 9 describes the work as "Inclusive of deep well pump replacement", however there are no details for this work. If this part of the project scope, please provide details for deep well pump replacement.		G70 / DHHL	See revised plans.
16	06/27/18	Roy Kaululaau	R&M Painting	1	Is there a specification section for painting?		G70 / DHHL	No Specification for painting; The building is "Design-Build"; Contractor will be responsible for providing specifications.
17	06/27/18	Roy Kaululaau	R&M Painting	1	The paint schedule within the plans show Benjamin Moore. However, we would like to request to submit our proposal using Sherwin Williams		G70 / DHHL	Refer to PLAN Note: "All Manufacturers listed are allowed to be substituted with equal material or better"; Substitution is allowed.

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HOOLEHUA WATER SYSTEM IMPROVEMENTS (PWS 230)
BID PACKAGE 1 - HOOLEHUA

18	06/28/18	Paul Scott	Engineered Systems	1	Substitution Request: Flow Control Valve; CAL-VAL to Singer; Pinned cover, Non-magnestic 316 SS Stem		G70 / HDR / DHHL	Substitution request denied.
19	06/28/18	Paul Scott	Engineered Systems	1	Substitution Request: Pressure Reducing and Sustaining Valve; CAL-VAL to Singer; Pinned cover, Non-magnestic 316 SS Stem		G70 / HDR / DHHL	Substitution request denied.
20	06/28/18	Paul Scott	Engineered Systems	1	Substitution Request: Pressure Reducing Valve Valve; CAL-VAL to Singer; Pinned cover, Non-magnetic 316 SS Stem		G70 / HDR / DHHL	Substitution request denied.
21	07/02/18	Rod Ueunten	Keiwit Infrastructure West Co.	Both	Please provide Engineer's Estimate for this Project		G70 / DHHL	Bid Package 1 - $ 13.7 M Bid Package 2 - $ 2.6 M
22	07/02/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	Plan sheets C502, C503 and C505 for Site 5 have call-outs to "Cut and Plug existing lateral after transfer of service". The Service Lateral Connection Schedule on those plan sheets are blank. Please provide completed schedules.		G70 / DHHL	See revised Plans.
23	07/02/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	The description for Bid Item 58 describes the work as "5 Each, Butterfly replacement, including replacement of 20" butterfly valves, realigning manholes, excavation and debris disposal." Please identify which valves are to be replaced and details for the replacement work.		G70 / DHHL	Revised Count = 4; See revised Plans
24	07/02/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	Plan sheet C701 shows the footprint of the proposed 5,800 SF Maintenance Building and the new 20' wide AC driveway. Please provide grading plans for the building site and driveway.		G70 / DHHL	See revised Plans
25	07/02/18	Keil Kamaile Alcon	Hi Built, LLC	1	On the plans page 97-107 are we doing the electrical for the Kanakaloloa Cemetery?		G70 / DHHL	The security system at Site 4 is interconnected to the Kanakaloloa Cemetery site.
26	07/02/18	Paul Scott	Engineered Systems	1	In accordance with the requirements of the Special Provisions, we hereby submit three (3) sets of technical specifications, brochures, variances, and other information so as to compare quality and suitability of the following alternativeequipment: Section 15130 - Booster Pump: Goulds - Substitute: Sulzer; Variance: Slight variation in flow & head		G70 / Okahara / DHHL	See attached Response from Okahara and Associates.

27	07/03/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	Water System Standards 2002, Section 104.04 THRUST BLOCKS AND BEAMS states that "Due to the various types and sizes of vertical bends and field conditions, the size dimensions and reinforcing for the blocks will vary. The design engineer shall be responsible for the design and details of all concrete thrust blocks." Please provide design and details for thrust blocks and beams for the new waterlines.		G70 / DHHL	Per Note 1 on Water System Standard Details B3, B4, B5, B6, B15 and B18: "*Actual field conditions shall be verified in the field. The schedule, dimensions and details as shown are provided as a guide only. The Contractor or Engineer who prepared the plans shall submit the final design and details to the Manager for review and approval after field verification and prior to installation* ." The Contractor shall provide the design of the Thrust Blocks, Thrust Beams and Gate Valve Blocks based on the actual field conditions and make the cost of the design incidental to the cost of those items.
28	07/03/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	On plan sheet ST001, Probing and Grouting Note 3. states "If subsurface voids are encountered or suspected, the contractor shall drill additional probes as directed by the project geotechnical engineer to determine the extent of the subsurface void." Please consider making Probing and Grouting as unit priced bid items (paid by the feet for probing and paid by the cubic yard for grouting) to cover the cost of additional work required if voids are encountered.		G70 / DHHL	The cost of Probing, Grouting and any additional work shall be considered incidental to the cost of the new tank work.
29	07/03/18	Rod Ueunten	Keiwit Infrastructure West Co.	1	Plan sheet C701 shows the proposed waterline, sewerline, and septic system for the maintenance building site. Please provide profiles with invert elevations for these lines and the structures for the septic system.		G70 / DHHL	Profiles are not provided for water lines less than 4" in diameter; IWS structures are detailed on DWG C711; Sewer profiles cannot be established until determination of the new building Finish Floor is established.
30	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type A, Specified: Columbia/LXEW Series. Substitution: Lithonia Lighting/FHE-15000LM-Acrylic Lens Distribution Mvolt GZ10-40K-CRI		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.
31	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type B, Specified: Columbia/LXEW Series. Substitution: Lithonia Lighting/FHE-20000LM-Acrylic Lens Distribution Mvolt GZ10-40K-CRI		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.
32	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type C, Specified: Columbia/LXEW Series. Substitution: Lithonia Lighting/FEM-L48-10000LM-Acrylic Lens MD Mvolt GZ10-40K-80CRI		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.
33	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type D, Specified: Columbia/LCL Series. Substitution: Lithonia Lighting/CLX-L48-3000LM-HEF-RDL-Mvolt-GZ10-40K-WH		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.

34	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type E, Specified: Hubbell/LNC-9L. Substitution: Lithonia Lighting/OLWX1-LED-20W-40K		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.
35	07/03/18	Daryl Diamond	Solid State Lighting Hawaii, LLC	1	E-104/E-105 Fixture Schedule, Type E, Specified: Hubbell/LNC-9L. Substitution: Lithonia Lighting/DSXW1-LED-10C-530-30K-Distribution-Mvolt-DDBXD		G70 / RHA / DHHL	See attached Response from Ronald N.S. Ho and Associates.

IFB-18-HHL-008
ADDENDUM NO. 2 / JULY 10, 2018
RESPONSE TO QUESTION #16

Okahara and Associates, Inc.
ENGINEERING CONSULTANTS

REVIEW OF SUBSTITUTION REQUEST

(Page 1 of 1)

PROJECT: USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS – SITE 1 KAULUWAI WELL SITE

JOB NO: N/A

SUBMITTAL: Substitution Request for Booster Pump Units

SPEC NO: SECTION 15130 – BOOSTER PUMP UNITS

Reviewed By: Terrance Nago Date: J u l y 5, 2018

- ☐ Reviewed, No Exceptions Noted
- ☒ Reviewed, Exceptions Noted
- ☐ Submit Specified Item(s)
- ☐ Resubmit
- ☐ Do Not Resubmit
- ☐ Rejected

Reviewed only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Contractor's responsibility includes but is not limited to: dimensions, which shall be confirmed and correlated at the jobsite, fabrication processes, techniques of construction, coordination of his work with all other trades, safety precautions, and the satisfactory performance of his work.

Comments: Although the bowl efficiency is a little lower than specified, the manufacturer has indicated the Sulzer pump units will meet the specified 75% overall efficiency at the design point. As such, it is recommended to accept the Sulzer Pump alternative as submitted by the manufacturer.

200 Kohola Street ● Hilo, HI 96720-4323 ● (808) 961-5527● fax (808) 961-5529 ● email: hilo@okahara.com
677 Ala Moana Blvd., Suite 703 ● Honolulu, HI 96813-5415 ● (808) 524-1224 ● fax (808)521-3151 ● email: oahu@okahara.com

Ronald N. S. Ho & Associates, Inc. electrical engineers

Sean K. Sugai, P.E. • Steven H. Sakai, P.E. • Dennis I. Toba, P.E. • Ronald N. S. Ho, P.E. • Gary I. Funasaki, P.E . • Andrew I. Miyasato, P.E.

IFB-18-HHL-008
ADDENDUM NO. 2 / JULY 10, 2018
RESPONSE TO QUESTIONS #30-35

July 9, 2018 218017

Molokai Hoolehua Water System Improvements

General Contractor:
Electrical Supplier: Solid State Lighting Hawaii, LLC
Submittal Date: 07-03-18

The substitution request for light fixtures was reviewed as indicated below:

- Type “A” and “B” light fixture shall have a “Wide Distribution”. Please provide substitution type “A” and “B” based on “Wide Distribution” (Approved as modified).
- Note: Type “A” and “B” light fixture mounting was intended to be unistrut mounted.
- Type “C” approved.
- OLWX1 not acceptable. Provide outdoor light fixture with 3000K color temperature. (Rejected)
- Type “D” approved based on Type II distribution.

EQUIPMENT PREQUALIFICATION

___ Approved x Rejected

x Approved as modified ___ Submit sample

“Approval is subject to all requirements of the contract documents being met and shall not in any circumstances be construed as an approval for deviations from the contract documents unless the entity seeking such approval has, in writing, specifically called attention to each such deviation at the time of submission. Said entity and/or Contractor shall be responsible for coordination of the work pertinent to affected materials, equipment and labor to insure proper execution of the work as per the intent of the contract documents.”

By: Kraig K. Otani Date: July 9, 2018
RONALD N. S. Ho & ASSOC. INC.

2153 North King Street, Suite 201 • Honolulu, Hawaii 96819 • Tel (808) 941-0577 • Fax (808) 945-2646 • E-mail: postmaster@rnsha.com

SECTION 02640 – VALVES AND COCKS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS: The General Conditions and Special Conditions preceding these specifications shall govern this section of the work.

1.02 REFERENCED DOCUMENTS: Work shall be governed by The Water System Standards, 2002, The Approved Material List and Standard Details for Water System Construction, 2002 and Water System Exterior Corrosion Control Standard, 1991, for the Department of Water Supply (DWS), County of Maui and all subsequent amendments, hereinafter referred to as the DWS Standards, and the Uniform Plumbing Code.

RELATED WORK IN OTHER SECTIONS:

Pipe and Fittings……Section 02610

Potable Water System……..Section 02713

1.03 DESCRIPTION OF WORK: This Section includes the furnishing and installation of a pressure reducing valve station which consists of a combination pressure reducing and pressure sustaining valve, pressure reducing valve, pressure relief valve, gate valves, ball valves, necessary piping, fittings and appurtenances as shown on the plans.

The equipment package shall include, but not limited to the following:

A. Pressure Reducing Valve:

1. Number and size required:	1 – 6 inches 1 – 4 inches
2. Main valve trim:	Bronze
3. End detail:	S.E.
4. Pressure rating:	400 psi
5. Temperature range:	180° F
6. Rubber material:	Buna-N
7. Coating:	Fusion bonded epoxy
8. Desired Options:	A: Flow Clean Strainer B: Pilot System Isolation cocks S: Opening Speed Control

D. Pilot Control System for Pressure Reducing Valve:

1. Pressure rating:	300 psi
2. Trim:	Monel, Stainless Steel
3. Rubber material:	Buna-N
4. Tubing and Fittings:	Brass, Bronze, Copper

5. Operating Fluids: Water
6. Pressure reducing adjustment range: CRD: 15-75 psi

1.04 SUBMITTALS

A. Shop Drawings and Catalog Cuts: six (6) copies of dimensioned shop drawings of the valves and piping layout of the pressure reducing station.

B. Manufacturer's Installation, Operation and Maintenance Manual including spare parts list and ordering instructions.

PART 2 - PRODUCTS

2.01 PRESSURE REDUCING VALVE

A. This valve shall maintain a constant downstream pressure regardless of changing flow rate and/or inlet pressure.

B. The valve shall be hydraulically operated, single diaphragm-actuated and globe pattern. The valve shall consist of three major components: the body with seat installed, the cover with bearings installed and the diaphragm assembly. The diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the main valve or pilot controls.

C. No separate chambers shall be allowed between the main valve cover and body. Valve body and cover shall be of cast material. No fabrication or welding shall be used in the manufacturing process.

D. The valve shall contain a resilient, synthetic rubber disc, with a rectangular cross-section contained on three and one-half sides by a disc retainer, forming a tight seal against a single removable seat insert. No O-ring type disc (circular, square or quad type) shall be permitted as the seating surface.

The disc guide shall be of the contoured type to permit smooth transition of flow and shall hold the disc firmly in place. The disc retainer shall be of a sturdy one-piece design capable of withstanding opening and closing shocks.

It must have straight edge sides and a radius at the top edge to prevent excessive diaphragm wear as the diaphragm flexes across this surface. No hourglass-shaped disc retainers shall be permitted and no V-type or slotted type disc guides shall be used.

E. The diaphragm assembly containing a non-magnetic 303 stainless steel stem of sufficient diameter to withstand high hydraulic pressures, shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. No center guides shall be permitted. The stem shall be drilled and tapped in the cover end to receive and affix such accessories as may be deemed necessary. The diaphragm assembly shall be the only moving part

and shall form a sealed chamber in the upper portion of the valve separating operating pressure from line pressure.

F. The diaphragm shall consist of nylon fabric bonded with synthetic rubber compatible with the operating fluid. The center hole for the main valve stem must be sealed by the vulcanized process or a rubber grommet sealing the center stem hole from the operating pressure. The diaphragm must withstand a Mullins Burst Test of a minimum of 600 psi per layer of nylon fabric and shall be cycle tested 100,000 times to insure longevity. The diaphragm shall not be used as the seating surface. The diaphragm shall be fully supported in the valve body and cover by machined surfaces which support no less than one-half of the total surface area of the diaphragm in either the fully open or fully closed position.

G. The main valve seat and the stem bearing in the valve cover shall be removable. The cover bearing and seat shall be threaded into the cover and body. The lower bearing of the valve stem shall be contained concentrically within the seat and shall be exposed to the flow on all sides to avoid deposits.

   To insure proper alignment of the valve stem, the valve body and cover shall be machined with a locating lip. No “pinned” covers to the valve body shall be permitted.

   Cover bearing, disc retainer and seat shall be made of the same material. All necessary repairs and/or modifications other than replacement of the main valve body shall be possible without removing the valve from the pipeline. Packing glands and/or stuffing boxes shall not be permitted and components including cast material shall be of North American manufacture.

H. The valve manufacturer shall be able to supply a complete line of equipment from 1 1/4” through 24” sizes and a complete selection of complementary equipment. The valve manufacturer shall also provide a computerized cavitation chart which shows flow rate, differential pressure, percentage of valve opening, Cv factor, system velocity and if there will be cavitation damage.

I. The valve shall be a Cla-Val Model No. 90-01 ABS KCX X101 Pressure Reducing Valve as manufactured by Cla-Val Co. or approved equal.

2.04 PILOT CONTROL SYSTEM

A. The pressure reducing pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve designed to permit flow when controlled pressure is less than the spring setting. The pilot control is held open by the force of the compression on the spring above the diaphragm and it closes when the delivery pressure acting on the underside of the diaphragm exceeds the spring setting. The pilot control system shall include a fixed orifice. No variable orifices shall be permitted. The pilot system shall include an opening speed control.

B. The pilot control shall have a second downstream sensing port which can be utilized to install a pressure gauge.

C. A full range of spring settings shall be available in ranges of 0 to 450 psi.

D. A direct factory representative shall be made available for start-up service, inspection and necessary adjustments.

PART 3 - EXECUTION

3.01 Construction and installations shall conform to the applicable sections of the Water System Standards, Department of Water Supply, County of Maui, State of Hawaii, 2002, as amended.

END OF SECTION

SECTION 15131 – MOTOR FOR DEEP WELL PUMP

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

A. The following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.

1. "Water System Standards", dated 2002 of the Department of Water Supply, County of Maui, as amended. Paragraphs relating to Measurement and Payment in the Sections are not applicable to the project.

B. Scope: The work in this section shall include furnishing of all labor, materials, tools, and equipment necessary to install, in place tested and complete, the vertical electric motor for the existing deep well pumping unit as shown on the plans.

PART 2 – PRODUCTS

2.1 MOTOR

The motor shall be a vertical hollow shaft, 200 horsepower, 1800 rpm, 3-phase, 60 hertz, 460-volt, cast iron, normal torque, premium efficiency, low starting current, squirrel cage induction motor with Weather Protected Type 1 enclosure and shall conform to the standards of the National Electrical Manufactures Association and the American Institute of Electrical Engineers. Motor shall be General Electric, US Motors, or approved equal.

The motor shall be designed to operate at an ambient temperature of 40° C with a temperature rise of not more than 90° C at the rated horsepower of the motor.

Insulation shall be NEMA class B with an added process for improved weather protection. Motor windings shall be encapsulated or sealed with epoxy according to NEMA standards by an insulation system such as General Electric “Custom Polyseal” or approved equal. Trade name for added process shall be stamped on the motor nameplate. The motor shall be “high efficiency” rated.

All openings shall be furnished with corrosion-resistant, stainless steel screens. Each motor shall be furnished with 120-volt space heaters which shall operate only when the motor is not running.

Motor shall have a 1.15 service factor. The motor rating shall be such that the nameplate horsepower will not be exceeded for any pump load for the entire pump head range from atmospheric pressure at the discharge head to shut-off head and at no place on the pump curve shall the loading exceed the service factor.

Motor shall be provided with an extra heavy thrust bearing. Bearing shall be sized to support a thrust load equal to calculated thrust at shut-off head or 1.5 times calculated thrust at design head, whichever is larger, with a minimum life of

one (1) year (8,760 hours). The Contractor shall submit thrust load calculations for approval by the DHHL prior to ordering the motor.

Motor shall be supplied with non-reverse coupling designed to prevent reverse rotation when the unit is shut down.

PART 3 – EXECUTION

3.1 GENERAL

A. Preliminary Submittals:

The Contractor shall submit six (6) copies of the following to the Engineer for review. The DHHL shall review and approve prior to ordering of the motor unit:

1. Thrust Load Calculations.

   The contractor shall submit calculations of the thrust load for shut-off head. The rating of the thrust bearing being furnished with the motor shall be greater than the calculated load.

2. Motor Unit Specifications.

   The Contractor shall submit complete specifications for the motor he proposes to furnish.

3. Data Sheets.

   The Contractor shall complete a copy of the attached motor data sheet.

B. Inspection of Motor Unit:

Immediately upon the arrival of the motor unit at the job site, the Contractor shall make a careful inspection of the motor and all incidental items including motor compatibility with the existing discharge head. All defects and or parts not conforming to these specifications shall be replaced without delay.

C. Test of Motor Unit:

1. Field Test: After installation of the motor unit and before the field test is conducted, the pump shall be operated continuously for a period of eight (8) hours or as directed by the DHHL.

   Throughout the operation test, the motor unit shall run smoothly, within the vibration limits specified. If any defect with the motor develops during the test, or as a result of the test, the DHHL reserves the right to reject the motor unit and demand a replacement motor. All costs to satisfy the replacement, including removal, reinstallation, freight, and handling shall be paid for by the Contractor.

   a) Vibration: Under normal operating conditions, the motor unit shall run smoothly, within the vibration limits stated below. The limiting peak-to-peak amplitude, as recognized by the Vertical Turbine Pump Association shall be as follows:

Pump Speed (RPM)	Limiting Peak-to-Peak Amplitude (Inches)
3,600	0.002
1,800	0.004
1,200	0.006
900	0.008
720	0.008
600	0.008

The amplitude shall be measured with a vibration meter at three points, 120° apart, at the top of the motor frame.

2. Material and Equipment for Field Test: The Contractor shall furnish all material, instruments, and equipment required to properly perform the field test of the motor unit after installation. All instruments furnished under this paragraph shall be properly calibrated and checked to the satisfaction by the DHHL. All items in this paragraph shall be furnished at no cost to the DHHL and shall remain the property of the Contractor.

MOTOR DATA SHEET

MANUFACTURER: _____

COUPLING: _____

TYPE: _____

TYPE OF ENCLOSURE: _____

NAMEPLATE HORSEPOWER: _____ H.P.

RPM AT FULL LOAD: _____ RPM

PHASE: _____ PHASE

FREQUENCY: _____ HERTZ

VOLTAGE: _____ VOLTS

FULL LOAD AMPERES: _____ AMPS

LOCKED ROTOR CURRENT: _____ AMPS

POWER FACTOR:

-100% LOAD: _____

- 75% LOAD: _____

- 50% LOAD: _____

EFFICIENCY:

-100% LOAD: _____ PERCENT

- 75% LOAD: _____ PERCENT

- 50% LOAD: _____ PERCENT

NEMA CODE LETTER: _____

FRAME DESIGNATION: _____

WEIGHT: _____ LBS

LENGTH: _____ INCHES

SERVICE FACTOR: _____

NAMEPLATE TEMPERATURE RISE °C / AMBIENT TEMPERATURE °C: _____

INSULATION CLASS AND ADDED PROCESS: _____

THRUST BEARING:

SLEEVE OR BALL: _____

TYPE OF LUBRICATION: _____

CAPACITY:

- UP _____ LBS

- DOWN _____ LBS

SPACE HEATERS:

NO: _____

VOLTS: _____

WATTS: _____

GUARDS - MATERIALS: _____

END OF SECTION 15131

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

PREFINAL PLANS (03/08/2018)

HOOLEHUA WATER SYSTEM IMPROVEMENTS

TASK ORDER No. 11 - EMERGENCY REPAIRS DUE TO VANDALISM AT HOOLEHUA 2-3.5 MG RESERVOIR

HOOLEHUA, MOLOKAI, HAWAII

TAX MAP KEY: (2) 5-2-007:029, 5-2-007:030, & 5-2-007:090

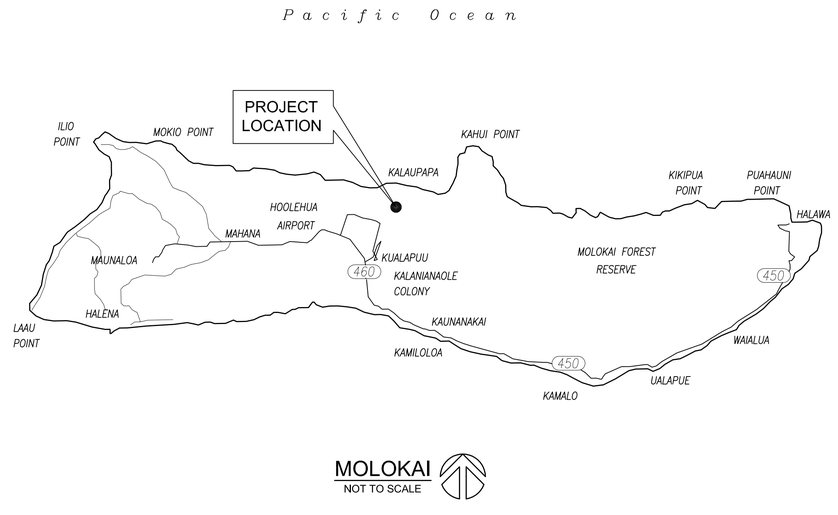
PREPARED BY:

GROUP 70 INTERNATIONAL, INC.

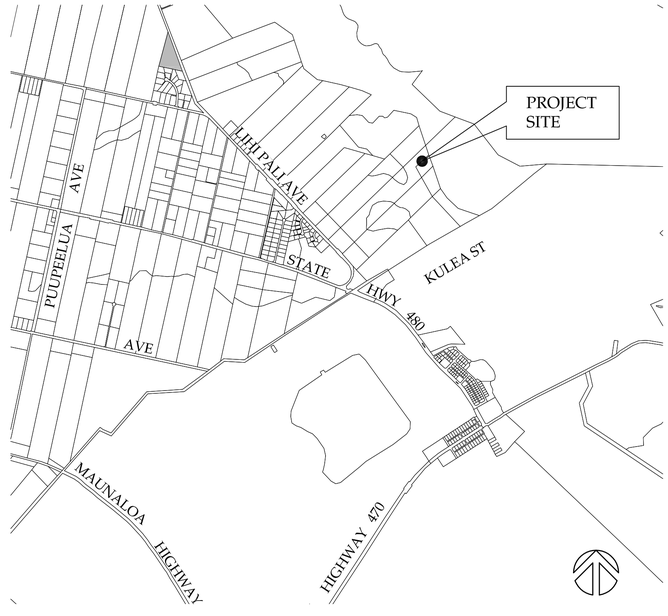
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398

808-523-5866
WWW.G70.DESIGN

LOCATION MAP



VICINITY MAP



APPROVALS

CHAIRMAN, HAWAIIAN HOMES COMMISION — DATE
STATE OF HAWAII

DIRECTOR, DEPARTMENT OF PUBLIC WORKS — DATE
COUNTY OF MAUI
(FOR WORK WITHIN COUNTY RIGHT-OF-WAY ONLY)

CHIEF, HIGHWAYS DIVISION — DATE
DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII
(APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY,
ID _-__-__, LETTER OF APPROVAL NO. HWY-T _-____, DATED
__/__/__)

CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION, — DATE
STATE DEPARTMENT OF HEALTH

DEPARTMENT OF WATER SUPPLY — DATE
COUNTY OF MAUI

DWG. NO.
T001
SHEET 1 OF 24

FILE	POCKET	FOLDER	NO.

DRAWING INDEX

ABBREVIATIONS

∠	ANGLE
A	AREA
AC	ASPHALT CONCRETE OR ACRE
ACS	ACRES
A/C	AIR CONDITIONING
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
ARV	AIR RELEASE VALVE
ATT	AT&T CABLE
AVE	AVENUE
℄	BASELINE
BC	BOTTOM OF CURB
BFP	BACK FLOW PREVENTER ASSEMBLY
BLDG	BUILDING
BOT	BOTTOM
BW	BOTTOM OF WALL
C&C	CITY AND COUNTY
℄	CENTERLINE
C	CHORD
CATV	CABLE TELEVISION
CB	CATCH BASIN
CHWS	CHILL WATER SERVICE
CHWR	CHILL WATER RETURN
CF	CURB FACE
C.L.	CHAIN LINK
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
COMM	COMMUNICATION
CONC	CONCRETE
CONN	CONNECTION
CRM	CONCRETE RUBBLE MASONRY
CW	COLD WATER
COTG	CLEAN OUT TO GRADE
D	DIAMETER, DEPTH OR DRAIN
DI	DRAIN INLET
DIA, ø	DIAMETER
DCV	DETECTOR CHECK VALVE
DEFL	DEFLECTION
DET	DETAIL
DMH	DRAIN MANHOLE
D.P.P	DEPT OF PLANNING AND PERMITTING
DS	DOWNSPOUT
DSP	DRY STAND PIPE
DHHL	DEPARTMENT OF HAWAIIAN HOME LANDS
DWGS	DRAWINGS
DWS	DEPARTMENT OF WATER SUPPLY
DWY	DRIVEWAY
E,ELEC	ELECTRIC
ELEV, EL	ELEVATION
EG	EXISTING GROUND
EOP	EDGE OF PAVEMENT
EP	ELECTRICAL POLE
EX, EXIST, (E)	EXISTING
FA	FIRE ALARM
FDC	FIRE DEPT CONNECTION
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOW LINE
FM	FORCE MAIN
FS	FINISH SURFACE
FT	FEET
G	GAS
GB	GRADE BREAK
GI	GRATED INLET
GMH	GAS MANHOLE
GND	GROUND
GP	GUARD POST/GUY POLE/GATE POST
GV	GATE VALVE
GW	GUY WIRE
H, HT	HEIGHT
HB	HOSE BIBB
HECO	HAWAIIAN ELECTRIC COMPANY
HDPE	HIGH DENSITY POLYETHYLENE
HP	HIGH POINT
HW	HOT WATER
ICV	IRRIGATION CONTROL VALVE
INV	INVERT
IRR	IRRIGATION
JTS	JOINT TRUNKING SYSTEM
JKT	JACKET
L	LENGTH OR LENGTH OF CURVE
LID	LOW IMPACT DEVELOPMENT
LP	LAMP OR LIGHT POLE
LPT	LOW POINT
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL, ELECTRICAL AND PLUMBING
MB	MAILBOX OR METER BOX
MH	MANHOLE
MIN	MINIMUM
MON	MONUMENT
M/N	METER NUMBER
NO.	NUMBER
NON-POT	NON-POTABLE
O.C.	ON CENTER
OH, O/H	OVERHEAD
PAVT	PAVEMENT
PC	POINT OF CURVATURE
PCC	POINT OF COMPOUND CURVE
PERF	PERFORATED
PI	POINT OF INTERSECTION
PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
PL, ℄	PROPERTY LINE
PM	PARKING METER
POC	POINT ON CURVE
POT	POTABLE
PP	POWER POLE
PRC	POINT OF REVERSE CURVE
PRV	PRESSURE REDUCING VALVE
PSL	PEDESTRIAN SIGNAL LIGHT
PT	POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE OR POINT OF VERTICAL CURVE
PVI	POINT OF VERTICAL INTERSECTION
PVT	POINT OF VERTICAL TANGENCY
R	RADIUS
REF, REFL	REFLECTOR
ROW, R/W	RIGHT-OF-WAY
S	SEWER, SLOPE OR SPREAD
SC	SIGNAL CORPS
SCH 40	SCHEDULE 40
SCH 80	SCHEDULE 80
SCMH	SIGNAL CORPS MANHOLE
SDMH	STORM DRAIN MANHOLE
SF	SQUARE FOOT, SQUARE FEET
SL	STREET LIGHT
SLB	STREET LIGHT BOX
SMH	SEWER MANHOLE
SPR	SPRINKLER
ST	STREET
STA	STATION
STD	STANDARD
STRUCT	STRUCTURAL
SW, S/W	SIDEWALK
TC	TOP OF CURB
TDC	TOP OF DROPCURB
T	TANGENT OR TELEPHONE
TEL	TELEPHONE
TG	TOP OF GRATE
THRU	THROUGH
TMK	TAX MAP KEY
TP	TOP OF PIPE
TRC	TOP OF ROLLED CURB
TS	TOP OF STEM
TSL	TRAFFIC SIGNAL LIGHT
TSLB	TRAFFIC SIGNAL LIGHT BOX
TV	TOP OF VALVE
TW	TOP OF WALL
TYP	TYPICAL
UP	UTILITY POLE
UP/SL	UTILITY POLE WITH STREET LIGHT
VAR	VARIES OR VARIABLE
VB	VALVE BOX
W	WATER
WL	WATER LINE
WM	WATER METER
WMB	WATER METER BOX
WMH	WATER MANHOLE
WSE	WATER SERVICE ELEVATION
WV	WATER VALVE
X-WALK	CROSSWALK

LEGEND

- PROPERTY LINE
- LOT LINE
- EASEMENT
- LIMITS OF GRADING
- O/H — EXISTING OVERHEAD ELECTRIC LINE
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- W8 — EXISTING WATER LINE
- S6 — EXISTING SEWER LINE
- W8 — NEW WATER LINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — EXISTING DRAINAGE FLOW
- CONCRETE PAVEMENT
- GRAVEL

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2018

DWG. NO.
T002
SHEET 2 OF 24

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

DESIGNED BY: PLM CHECKED BY: RMKC DRAWN BY: CKM

GROUP 70 INTERNATIONAL, INC.
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398
808.523.5866
WWW.G70.DESIGN

MARCH 2018

FILE	POCKET	FOLDER	NO.

FILE: 214041-11 T002 INDEX.dwg
DATE REV.: 09/07/2018

GENERAL NOTES

1. LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE BASED ON AVAILABLE "AS-BUILT" OF RECORD CONSTRUCTION PLANS AND ARE APPROXIMATE ONLY AND THEIR ACCURACY IS NOT GUARANTEED.

2. EXISTING CONTOURS AND FEATURES ARE BASED ON "TOPOGRAPHIC SURVEY MAP MOLOKAI DHHL WATERLINE IMPROVEMENTS" PREPARED BY CONTROL POINT SURVEYING INC. DATED APRIL 12, 2017, AS AMENDED

3. ELEVATIONS SHOWN WERE ESTABLISHED ONSITE USING GPS OBSERVATIONS AND ARE BASED HORIZONTAL DATUM: NAD 83 HI ZONE 2 STATE PLANE COORDINATES, U.S. FEET.

4. EXISTING GRADES SHALL BE VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH GRADING WORK. SHOULD ANY DISCREPANCIES BE DISCOVERED IN THE EXISTING GRADES OR DIMENSIONS GIVEN ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER BEFORE PROCEEDING ANY FURTHER WITH THE WORK, OTHERWISE HE WILL BE HELD RESPONSIBLE FOR ANY COST INVOLVED IN THE CORRECTION OF CONSTRUCTION PLACED DUE TO SUCH DISCREPANCIES.

5. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF EXISTING UTILITIES WITHIN PROJECT LIMITS BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.

6. THE CONTRACTOR SHALL REPORT ANY INCONSISTENCIES WITH THE PROPOSED PLAN TO THE OWNER'S REPRESENTATIVE AND SHALL DEMOLISH, REMOVE, OR RELOCATE ALL EXISTING UTILITIES, IMPROVEMENTS, ETC. INCONSISTENT WITH THE PROPOSED PLAN AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND AT THE CONTRACTOR'S EXPENSE.

7. THE LATEST REVISIONS OF THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION," SEPTEMBER 1984 AND THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," 2005 SHALL BE INCLUDED AS PART OF THESE CONSTRUCTION PLANS. THE CONTRACTOR SHALL OBTAIN THE LATEST REVISIONS BEFORE COMMENCING CONSTRUCTION.

8. SHOULD HISTORIC SITES SUCH AS WALLS, PLATFORMS, PAVEMENTS AND MOUNDS, OR REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF CHARCOAL OR SHELLS BE ENCOUNTERED DURING CONSTRUCTION WORK, WORK SHALL CEASE IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE STATE HISTORIC PRESERVATION DIVISION (PH: 243-1285 OR 243-4640), WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND MITIGATION MEASURES, IF NECESSARY.

9. PURSUANT TO CHAPTER 6E OF THE HAWAII REVISED STATUTES, ALL CONTRACTORS SHALL ENSURE THAT IN THE EVENT THAT ANY HUMAN SKELETAL REMAINS ARE INADVERTENTLY DISCOVERED DURING CONSTRUCTION, THE REMAINS SHALL NOT BE MOVED AND ANY ACTIVITY IN THE IMMEDIATE AREA THAT COULD DAMAGE THE REMAINS OR THE POTENTIAL HISTORIC SITE SHALL CEASE AND THE DEPARTMENT OF LAND AND NATURAL RESOURCES' HISTORIC PRESERVATION DIVISION (PH: 243-1285 OR 243-4640), THE APPROPRIATE MEDICAL EXAMINER OR CORONER, AND THE POLICE DEPARTMENT (TELEPHONE: 244-6400), SHALL BE CONTACTED. ALL LESSEES USING EXISTING DIRT ROADS TO ACCESS THEIR PROPERTY SHALL CONTINUE TO BE PROVIDED ACCESS TO THEIR PROPERTY AT ALL TIMES DURING CONSTRUCTION ACTIVITIES BY THE CONTRACTOR.

CONSTRUCTION NOTES WITHIN COUNTY RIGHT-OF-WAY

1. CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK ON COUNTY HIGHWAYS FROM THE DEVELOPMENT SERVICES ADMINISTRATION TWO WEEKS PRIOR TO THE COMMENCEMENT OF WORK.

2. STANDARD DETAIL DRAWINGS AND STANDARD SPECIFICATIONS OF THE DEPARTMENT OF PUBLIC WORKS SHALL BE INCLUDED AS PART OF THE CONSTRUCTION PLANS.

3. ALL CONSTRUCTION WORK SHALL STRICTLY CONFORM TO THE LATEST VERSION OF THE HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE PUBLIC WORKS CONSTRUCTION, AND THE SEPTEMBER 1984 "STANDARD DETAILS" FOR PUBLIC WORKS CONSTRUCTION OF THE DEPARTMENT OF PUBLIC WORKS, AS AMENDED, OR THE REQUIREMENTS FOR WORK WITHIN STATE RIGHT-OF-WAY AS COVERED IN THE CONTRACT DOCUMENTS AS APPROVED BY THE DIRECTOR OF PUBLIC WORKS.

4. IF EXISTING UTILITIES, WHETHER OR NOT SHOWN ON PLANS, ARE DAMAGED DURING CONSTRUCTION, THE CONTRACTOR SHALL AT HIS OWN EXPENSE BE REQUIRED TO REPAIR SUCH UTILITIES.

5. CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, AND OTHER PROTECTIVE DEVICES FOR THE PROTECTION, SAFETY AND CONVENIENCE OF THE PUBLIC, ACCORDING TO THE LATEST VERSION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICE FOR STREETS AND HIGHWAYS", AND TO THE RULES AND REGULATIONS GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORKSITES AND/OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS ADOPTED BY THE HIGHWAY SAFETY COORDINATOR AND THE U.S. FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".

6. THE DIRECTOR OF PUBLIC WORKS AND/OR THE DIRECTOR OF THE DEPARTMENT OF WATER SUPPLY HAS THE RIGHT TO STOP CONSTRUCTION SHOULD ANY WORK BE FOUND CONTRARY TO THE APPROVED CONSTRUCTION PLAN OR DETRIMENTAL TO THE PUBLIC'S INTEREST.

7. THE CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE DEVELOPMENT SERVICES ADMINISTRATION FIVE (5) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION.

8. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH AND COUNTY GRADING ORDINANCE.

9. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION ORDERED BY THE DIRECTOR OF PUBLIC WORKS SHALL BE PAID BY THE CONTRACTOR.

10. CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE WORK SITE. THE CONTRACTOR SHALL INFORM THE DIRECTOR OF PUBLIC WORKS OF THE LOCATION OF THE DISPOSAL SITES. THE DISPOSAL SITE MUST FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.

CONSTRUCTION NOTES WITHIN COUNTY RIGHT-OF-WAY CONT'D.

10. CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE WORK SITE. THE CONTRACTOR SHALL INFORM THE DIRECTOR OF PUBLIC WORKS OF THE LOCATION OF THE DISPOSAL SITES. THE DISPOSAL SITE MUST FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.

11. THE CONTRACTOR SHALL SUBMIT A TIFF AND FIVE (5) COPIES OF THE "AS-BUILT" DRAWINGS PRIOR TO THE FINAL APPROVAL OF THE IMPROVEMENTS.

12. IF THE CLEARANCE BETWEEN A WASTEWATER LINE AND A NEW OR EXISTING WATERLINE IS EIGHTEEN INCHES (18") OR LESS, THE WASTEWATER LINE SHALL BE CONCRETE-JACKETED IN ACCORDANCE WITH THE STANDARD DETAILS OF PUBLIC WORKS CONSTRUCTION DATED SEPTEMBER 1984, AS AMENDED.

13. SHOULD HISTORIC SITES SUCH AS WALLS, PLATFORMS, PAVEMENTS OR MOUNDS, OR REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF SHELL OR CHARCOAL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES, WORK SHALL CEASE IMMEDIATELY IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR AND/OR LANDOWNER SHALL IMMEDIATELY CONTACT THE STATE HISTORIC PRESERVATION DIVISION (PH: 243-1285 OR 243-4640), WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND AN APPROPRIATE MITIGATION MEASURE, IF NECESSARY.

14. PURSUANT TO MAUI COUNTY CODE SECTION 3.44.015(C), THE COUNTY OF MAUI IS NOT RESPONSIBLE FOR ANY PARK, ROADWAY, EASEMENT (INCLUDING BUT NOT LIMITED TO DRAINAGE, SEWER, ACCESS, RECLAIMED WATER, OR AVIGATION EASEMENT), OR ANY OTHER INTEREST IN REAL PROPERTY SHOWN ON THIS MAP OR SHOWN ON THESE PLANS, UNLESS THE MAUI COUNTY COUNCIL HAS ACCEPTED ITS DEDICATION BY A RESOLUTION APPROVED BY A MAJORITY OF A COUNCIL'S MEMBERS AT A REGULAR OR SPECIAL MEETING OF THE MAUI COUNTY COUNCIL.

15. STEEL PLATE WARNING SIGNS ARE REQUIRED FOR ALL STEEL PLATES IN THE RIGHT-OF-WAY.

16. WHEELCHAIR RAMP INSPECTION/CERTIFICATION FORMS SHALL BE REQUIRED FOR ALL NEWLY CONSTRUCTED RAMPS.

17. ALL STRIPING AND PAVEMENT MARKINGS SHALL BE OF THERMOPLASTIC MATERIAL.

18. COMPACTION REQUIREMENTS

A. TESTING OF MATERIALS SHALL BE CONDUCTED BY AN APPROVED INDEPENDENT TESTING AGENCY IN ACCORDANCE WITH ASTM STANDARD METHODS OR AS SPECIFIED BY THE DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION, AS FOLLOWS:

I. EMBANKMENT/SELECT BORROW AND SUBGRADE MATERIALS: ONE (1) COMPACTION TEST PER 600 SQUARE YARDS PER LIFT;

II. AGGREGATE SUBBASE COURSE: ONE (1) COMPACTION TEST PER 400 SQUARE YARDS; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER LIFT PER PROJECT;

III. AGGREGATE BASE COURSE: ONE (1) COMPACTION TEST PER 300 SQUARE YARDS PER LIFT OF MATERIAL; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER PROJECT;

IV. ASPHALT CONCRETE PAVEMENT OR ASPHALT TREATED BASE COURSE; THREE (3) A.C. CORES FOR THICKNESS AND DENSITY TESTS PER PROJECT;

V. TRENCH BACKFILL MATERIAL: ONE (1) TEST FOR EACH 300 LINEAL FEET OF TRENCH PER LIFT OF MATERIAL.

B. CONTRACTOR SHALL SUBMIT ALL TESTING REPORTS INCLUDING RESULTS TO THE COUNTY'S INSPECTION AGENCY FOR REVIEW AND APPROVAL PRIOR TO COUNTY'S ACCEPTANCE OF WORK.

C. THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE COUNTY OF ANY TESTING FAILURES AND CORRECT EACH FAILURE PRIOR TO PROCEEDING TO THE NEXT PHASE OF CONSTRUCTION.

DEPARTMENT OF PUBLIC WORKS NOTES

1. THE CONTRACTOR SHALL ALLOW FOUR WEEKS TO OBTAIN A GRADING PERMIT FROM THE DEVELOPMENT SERVICES ADMINISTRATION PRIOR TO COMMENCEMENT OF ANY CLEARING AND GRUBBING. A SATISFACTORY DRAINAGE AND EROSION CONTROL PLAN SHALL BE SUBMITTED IN THE EVENT THE GRUBBING AREA EXCEEDS ONE ACRE OR THE PROPOSED CUT OR FILL IS GREATER THAN 15 FEET IN HEIGHT. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL BEST MANAGEMENT PRACTICE MEASURES.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, AND OTHER PROTECTIVE DEVICES FOR THE PROTECTION, SAFETY AND CONVENIENCE OF THE PUBLIC AND IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAY, 2003 EDITION WITH REVISION No. 1 INCORPORATED, DATED NOVEMBER 2004", THE CONTRACTOR SHALL PREPARE AND OBTAIN NECESSARY APPROVALS OF TRAFFIC CONTROL PLANS IF REQUIRED BY THE DEVELOPMENT SERVICES ADMINISTRATION.

3. STANDARD DETAIL DRAWINGS OF THE DEPARTMENT OF PUBLIC WORKS AND THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION (1994) SHALL BE INCLUDED AS PART OF THE CONSTRUCTION PLANS.

4. ALL CONSTRUCTION WORK SHALL STRICTLY CONFORM TO THE APPLICABLE SECTIONS OF THE 2005 HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SEPTEMBER 1984 "STANDARD DETAILS" FOR PUBLIC WORKS CONSTRUCTION OF THE DEPARTMENT OF PUBLIC WORKS, AS AMENDED.

5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH AND COUNTY GRADING ORDINANCE.

6. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION ORDERED BY THE DIRECTOR OF PUBLIC WORKS SHALL BE PAID BY THE CONTRACTOR.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND COUNTY LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE COUNTY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.

3. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

GRADING NOTES

1. FINISH SPOT ELEVATIONS AND FINISH CONTOURS, AS SHOWN ON PLAN REPRESENTS FINISH GRADING. THE SITE WORK CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER THE LOCATION AND DEPTH OF TOPSOIL THE FINISH SUBGRADE SHALL REFLECT THE FINISH GRADE LESS SPECIFIED TOPSOIL DEPTH.

2. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE MEASURES OF THE BEST MANAGEMENT PRACTICE (BMP) PLAN. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, ON WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS.

3. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS, AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE STATE DEPARTMENT OF HEALTH SHALL BE PAYABLE BY THE CONTRACTOR.

4. THE CONTRACTOR, AT HIS EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE OF DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

5. CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE SITE. THE CONTRACTOR SHALL INFORM THE ENGINEER OF THE LOCATION OF DISPOSAL SITES. THE DISPOSAL SITE MUST ALSO FULFILL REQUIREMENTS OF THE GRADING ORDINANCES.

6. THE CONTRACTOR SHALL NOT DEMOLISH OR CLEAR ANY STRUCTURE, SITE OR VACANT LOT WITHOUT FIRST ASCERTAINING THE PRESENCE OR ABSENCE OF RODENTS WHICH MAY ENDANGER THE PUBLIC HEALTH BY DISPERSAL FROM SUCH PREMISES. SHOULD SUCH INSPECTION REVEAL THE PRESENCE OF SUCH RODENTS, THE CONTRACTOR SHALL ERADICATE SUCH RODENTS BEFORE DEMOLISHING OR CLEARING SAID STRUCTURE, SITE OR VACANT LOT.

7. THE FOLLOWING MEASURES SHALL BE TAKEN TO CONTROL DUST AND EROSION DURING THE SITE DEVELOPMENT PERIOD:

A. MINIMIZE TIME OF CONSTRUCTION.

B. RETAIN EXISTING GROUND COVER UNTIL THE LATEST DATE TO COMPLETE CONSTRUCTION.

C. CONSTRUCT REMAINING PERMANENT EROSION AND DRAINAGE CONTROL FEATURES AS EARLY AS POSSIBLE.

D. USE TEMPORARY AREA SPRINKLERS IN NON-ACTIVE CONSTRUCTION AREAS WHEN GROUND COVER IS REMOVED.

E. STATION WATER TRUCK ON-SITE DURING CONSTRUCTION PERIOD TO PROVIDE FOR IMMEDIATE SPRINKLING, AS NEEDED, IN ACTIVE CONSTRUCTION AREAS (WEEKENDS AND HOLIDAYS INCLUDED).

F. USE TEMPORARY BERMS AND CUT-OFF DITCHES, WHERE NEEDED, FOR CONTROL OF EROSION. IMPLEMENT AND MAINTAIN THE MEASURES OF THE BMP PLAN.

G. GRADED AREAS SHALL BE THOROUGHLY WATERED AFTER CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY AND ON WEEKENDS.

H. ALL CUT AND FILL SLOPES SHALL BE SODDED OR PLANTED IMMEDIATELY AFTER GRADING WORK HAS BEEN COMPLETED.

COMPACTION REQUIREMENTS

1. TESTING OF MATERIALS SHALL BE CONDUCTED BY AN APPROVED INDEPENDENT TESTING AGENCY IN ACCORDANCE WITH ASTM STANDARD METHODS OR AS SPECIFIED BY THE DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION, AS FOLLOWS:

A. EMBANKMENT/SELECT BORROW AND SUBGRADE MATERIALS: ONE (1) COMPACTION TEST PER 600 SQUARE YARDS PER LIFT;

B. AGGREGATE SUBBASE COURSE: ONE (1) COMPACTION TEST PER 400 SQUARE YARDS; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER LIFT PER PROJECT;

C. AGGREGATE BASE COURSE: ONE (1) COMPACTION TEST PER 300 SQUARE YARDS PER LIFT OF MATERIAL; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER PROJECT;

D. ASPHALT CONCRETE PAVEMENT OR ASPHALT TREATED BASE COURSE; THREE (3) A.C. CORES FOR THICKNESS AND DENSITY TESTS PER PROJECT;

E. TRENCH BACKFILL MATERIAL: ONE (1) TEST FOR EACH 300 LINEAL FEET OF TRENCH PER LIFT OF MATERIAL.

2. CONTRACTOR SHALL SUBMIT ALL TESTING REPORTS INCLUDING RESULTS TO THE COUNTY'S INSPECTION AGENCY FOR REVIEW AND APPROVAL PRIOR TO COUNTY'S ACCEPTANCE OF WORK.

3. THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE COUNTY OF ANY TESTING FAILURES AND CORRECT EACH FAILURE PRIOR TO PROCEEDING TO THE NEXT PHASE OF CONSTRUCTION.

ARCHAEOLOGICAL NOTE

IN THE EVENT THAT ANY HISTORICAL RESOURCES, INCLUDING HUMAN SKELETAL REMAINS, STRUCTURAL REMAINS, CULTURAL DEPOSITS, OR LAVA TUBES ARE IDENTIFIED DURING CONSTRUCTION ACTIVITIES, CEASE WORK IN THE IMMEDIATE VICINITY OF THE FIND, PROTECT THE FIND FROM DISTURBANCE, AND CONTACT THE STATE HISTORIC PRESERVATION DIVISION AT (808) 243-1285.

EROSION CONTROL NOTES

1. DURING CONSTRUCTION, PREVENTIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS WORK PROGRESSES.

2. FUGITIVE DUST AND SOLID WASTE DISPOSAL DURING GRUBBING AND GRADING ACTIVITIES SHALL MEET THE REQUIREMENTS OF STATE OF HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60, AIR POLLUTION CONTROL AND CHAPTER 56, SOLID WASTE MANAGEMENT CONTROL.

3. ALL AREAS WHICH ARE AT FINAL GRADE SHALL BE IMMEDIATELY HYDROMULCHED AND SEEDED WITH NATIVE AKIAKI GRASS AT A RATE OF 5 POUNDS PER 1000 SQUARE FEET OR PERMINENTLY LANDSCAPED.

4. REGRASS ALL EXPOSED AREAS.

EFFECTIVE AUGUST 10, 1998, THE MAUI COUNTY CODE GRADING ORDINANCE HAS BEEN REVISED. ALL GROUND DISTURBING ACTIVITIES IN MAUI COUNTY WILL NOW BE MORE CLOSELY MONITORED. ALL GRADING, GRUBBING, STOCKPILING, EXCAVATIONS ETC., SHALL PROVIDE MEASURES TO THE MAXIMUM EXTENT POSSIBLE TO PREVENT DAMAGE TO THE ENVIRONMENT BY CONTAINING POLLUTANTS, INCLUDING SEDIMENT, DUST, AND OTHER CONTAMINANTS FROM DISCHARGING OFF A CONSTRUCTION SITE.

THEREFORE, CONTRACTOR SHALL CONTROL DUST AND OTHER SEDIMENT FROM THE PROJECT SITE, EVEN WHEN A GRADING PERMIT IS NOT REQUIRED.

A GRADING PERMIT WILL BE REQUIRED IF ANY OF THE FOLLOWING APPLY TO THE PROPOSED CONSTRUCTION:

A. THE GENERAL DRAINAGE PATTERNS ARE TO BE ALTERED.

B. THE EXCAVATION, FILL OR STOCKPILING IS MORE THAN 100 CY OF MATERIAL (50 CY IN SPECIAL MANAGEMENT AREA).

C. THE EXISTING GROUND ELEVATION IS TO BE CHANGED BY MORE THAN 4 FEET AT ANY LOCATION (2 FEET IN SPECIAL MANAGEMENT AREAS).

D. AN AREA LARGER THAN 1 ACRE IS TO BE GRUBBED (CLEARED).

A GRADING PERMIT WILL NOT BE REQUIRED FOR EXCAVATION AND BACKFILL FOR STRUCTURES THAT HAVE BEEN ISSUED A BUILDING PERMIT OR FOR CESSPOOLS AND SEPTIC TANKS AUTHORIZED BY THE STATE DEPARTMENT OF HEALTH.

FOR MORE DETAILED INFORMATION, REFER TO THE MAUI COUNTY CODE CHAPTER 20.08, "SOIL EROSION AND SEDIMENT CONTROL".

MINIMUM BEST MANAGEMENT PRACTICES

1. DRAINAGE:
HANDLE DRAINAGE TO CONTROL EROSION, PREVENT DAMAGE TO DOWNSTREAM PROPERTIES AND RETURN WATERS TO THE NATURAL DRAINAGE COURSE IN A MANNER WHICH MINIMIZES SEDIMENTATION OR OTHER POLLUTION TO THE MAXIMUM EXTENT PRACTICABLE.

2. DUST CONTROL:
CONTROL DUST EMISSIONS TO THE MAXIMUM EXTENT PRACTICABLE THROUGH BMPS SUCH AS WATER SPRINKLING, DUST FENCES, LIMITING AREA OF DISTURBANCE AND TIMELY GRASSING OF FINISHED AREAS.

3. VEGETATION:
RETAIN NATURAL VEGETATION, ESPECIALLY GRASSES, WHENEVER FEASIBLE. AVOID STORAGE OF GRUBBED MATERIAL NEAR WATER COURSES.

4. EROSION CONTROL:
STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MEASURES SUCH AS VEGETATION, RUNOFF DIVERSION, CHECK DAMS, MULCHING, BLANKETS, BONDED FIBER MATRICES AND VEHICLE WHEEL WASH FACILITIES.

5. SEDIMENT CONTROL:
CAPTURE SEDIMENT TRANSPORTED IN RUNOFF TO MINIMIZE THE SEDIMENT FROM LEAVING THE SITE WITH METHODS SUCH AS SEDIMENT BASINS, SEDIMENT TRAPS, SILT FENCES, SAND BAGS, AND VEGETATED FILTER STRIPS.

6. MATERIAL AND WASTE MANAGEMENT:
PROPERLY STORE TOXIC MATERIALS AND PREVENT THE DISCHARGE OF POLLUTANTS ASSOCIATED WITH CONSTRUCTION MATERIALS.

7. TIMING OF CONTROL MEASURE IMPLEMENTATION:
TIMING OF CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION CONTROL PLAN. DISTURBED AREAS OF CONSTRUCTION SITES THAT WILL NOT BE RE-DISTURBED FOR TWENTY-ONE (21) DAYS OR MORE WILL BE STABILIZED (GRASSED OR GRAVELED) BY NO LATER THAN THE FOURTEENTH (14TH) DAY AFTER THE LAST DISTURBANCE.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP., DATE: APRIL 30, 2018

DWG. NO.
T003
SHEET 3 OF 24

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

NOTES 1

DESIGNED BY: PLM CHECKED BY: RMKC DRAWN BY: CKM

GROUP 70 INTERNATIONAL, INC.
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398
808 523 5866
WWW.G70.DESIGN

MARCH 2018

FILE: 21404-11 T003 NOTES.dwg
DATE REV.: 09/07/2018

FILE	POCKET	FOLDER	NO.

NOTES FOR CONSTRUCTION WITHIN STATE HIGHWAYS RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK UPON STATE HIGHWAYS FROM THE STATE HIGHWAYS' DISTRICT ENGINEER, AT 650 PALAPALA DRIVE, KAHULUI, MAUI, PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE'S HIGHWAY RIGHT–OF–WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN THE STATE'S RIGHT–OF–WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. WORK MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. AND 3:00 P.M., MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS, UNLESS OTHERWISE PERMITTED BY THE DISTRICT ENGINEER.

   DURING WORK HOURS, ONLY ONE LANE OF TRAFFIC SHALL BE CLOSED, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT ENGINEER. ALL LANE CLOSURES MUST BE APPROVED BY HDOT FIFTEEN (15) WORKING DAYS IN ADVANCE. ALL LANE CLOSURES AND DETOURS SHALL REQUIRE ADVISORY SIGNS AND AN ADVERTISEMENT PER SECTION 645.03 OF THE STANDARD SPECIFICATIONS.

   AT CERTAIN LOCATIONS, "NO LANE CLOSURE" WILL BE ALLOWED DURING THE "BACK TO SCHOOL JAM", THANKSGIVING WEEKEND, CHRISTMAS / NEW YEAR PERIOD AND AT OTHER TIMES AS DIRECTED BY THE HIGHWAYS DIVISION.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORKSITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS", ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAYS ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI– STANDARDS AND GUIDES FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND INCIDENT MANAGEMENT OPERATIONS". IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION, A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO THE CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.

5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:

   A. RESIDENTIAL DRIVEWAYS, ON MINOR HIGHWAYS:

      (1) 2–1/2" HOT MIX ASPHALT (HMA) PAVEMENT (MIX IV), 8" AGGREGATE BASE COURSE OR 2–1/2" HMA PAVEMENT AND 8" HMA BASE COURSE OR HMA PAVEMENT.

      (2) 4" CLASS "A" CONCRETE REINFORCED WITH 6" x 6" – W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   B. COMMERCIAL DRIVEWAYS, SIDE ROADS, AND UTILITY INSTALLATIONS ON MINOR HIGHWAYS

      (1) 4" HMA PAVEMENT (MIX IV), 8" AGGREGATE BASE COURSE AND 12" SUBBASE, OR 4" HMA PAVEMENT (MIX IV) AND 8" HMA BASE COURSE OR HMA PAVEMENT.

      (2) 6" OF CLASS "A" CONCRETE REINFORCED WITH 6" x 6" – W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   C. CHANNELIZED INTERSECTIONS AND UTILITY INSTALLATIONS ON MAJOR HIGHWAYS

      4" HMA PAVEMENT (MIX IV), 8" HMA PAVEMENT BASE COURSE AND 12" AGGREGATE SUBBASE, OR 4" ASPHALT CONCRETE (MIX IV) AND 12" ASPHALT CONCRETE BASE COURSE OR ASPHALT CONCRETE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.

6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHT–OF–WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

   A. SUBBASE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.

   B. BASE COURSE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET PF ROADWAY.

   C. ONE (1) COMPACTION TEST PER LIFT PER 300 LINEAL FEET OF TRENCH.

   D. A COPY OF THE TEST RESULTS SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE CENTERLINE OF PROPOSED UTILITY TRENCH. THIS INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

9. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND SAFE NON–SKID BRIDGING MATERIAL, INCLUDING SHORING, OVER TRENCHES IN PAVEMENT AREAS. THE BRIDGING SHALL BE ABLE TO SUPPORT ALL TYPES OF VEHICULAR TRAFFIC. BRIDGING MATERIALS SHALL NOT BE USED ON HIGH SPEED ROADWAYS, WHICH ARE ROADS WITH A DESIGN SPEED OF 50 MPH OR HIGHER. SMOOTH RIDING CONNECTION BETWEEN ROADWAY SURFACES AND BRIDGING MATERIAL SHALL BE PROVIDED. SHOULD COMPLAINTS BE RECEIVED DUE TO NOISE GENERATING FRO THIS WORK, THE CONTRACTOR SHALL IMMEDIATELY ADDRESS THOSE COMPLAINTS.

10. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MINIMIZE THE USE AND DURATION OF USE OF STEEL PLATES. THE STATE MAY REQUIRE THE BACKFILLING AND PATCHES OF TRENCHES DUE TO THE EXCESSIVE USAGE OF STEEL PLATES.

11. UNLESS OTHERWISE NOTED, NO TRENCH SHALL BE OPENED MORE THAN 300 FEET IN ADVANCE OF INSTALLED AND TESTED PIPELINE AND/OR DUCTLINE.

12. EXISTING DRAINAGE SYSTEMS SHALL BE FUNCTIONAL AT ALL TIMES.

13. THE CONTRACTOR SHALL EXERCISE CARE TO MINIMIZE DAMAGES TO EXISTING HIGHWAY IMPROVEMENTS. ALL DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR, AT HIS EXPENSE, TO THE SATISFACTION OF THE DISTRICT ENGINEER.

14. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE–YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT THE CONSTRUCTION PLANS FOR DIVISION'S REVIEW AND REAPPROVAL.

15. ALL REGULATORY, GUIDE, AND CONSTRUCTION SIGNS AND BARRICADES SHALL HAVE A HIGH–INTENSITY REFLECTIVE BACKGROUND.

16. THE CONTRACTOR SHALL INFORM THE STATE HIGHWAYS' PERMIT OFFICE (PH: 873–3535) AT LEAST TWO (2) DAYS PRIOR TO CLOSING ANY LANES.

17. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTIES USING THESE RIGHTS–OF–WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

18. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN A SAFE AND PASSABLE CONDITION, OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGES BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.

19. THE CONTRACTOR SHALL REFERENCE TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL EXISTING TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES, AT HIS EXPENSE, UNLESS DIRECTED OTHERWISE BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

20. THE PERMIT TO PERFORM WORK UPON STATE HIGHWAY MAY BE REVOKED BECAUSE OF DEFAULT IN ANY OF THE FOLLOWING, BUT NOT LIMITED TO, CONDITIONS:
    a. WORK PERFORMED BEFORE OR AFTER PERMITTED HOURS.
    b. FAILURE TO MAINTAIN ROADWAY SURFACES IN A SMOOTH AND SAFE CONDITION.
    c. FAILURE TO CLEAN UP CONSTRUCTION DEBRIS GENERATED FROM PROJECT WORK.
    d. FAILURE TO PROVIDE PROPER TRAFFIC CONTROL.
    e. FAILURE TO REPLACE DAMAGED PAVEMENT MARKINGS AND SIGNS.
    f. FAILURE TO MAINTAIN HIGHWAY LIGHTS AND TRAFFIC SIGNAL SYSTEMS.
    g. FAILURE TO ADDRESS PUBLIC COMPLAINTS TO THE SATISFACTION OF THE DISTRICT ENGINEER.

21. THE CONTRACTOR SHALL NOTIFY THE STATE HIGHWAYS PERMIT OFFICE (873–3535) AT LEAST TWO WORKING DAYS PRIOR TO PERFORMING ANY TRENCH RESTORATION WORK. THIS WORK SHALL INCLUDE ANY BACKFILLING AND COMPACTING OF TRENCH MATERIAL; ANY PLACING AND COMPACTING OF BASE COURSE MATERIAL; AND ANY PAVING OPERATIONS. ANY TRENCH RESTORATION WORK PREFORMED BY THE CONTRACTOR THAT IS NOT WITNESSED BY A STATE REPRESENTATIVE WILL BE REQUIRES TO BE REMOVED AND RESTORED WITH A STATE REPRESENTATIVE PRESENT. ALL RESTORATION WORK WILL BE AT THE CONTRACTOR'S EXPENSE.

22. TEMPORARY COLD MIX TRENCH PATCHES WILL BE PERMITTED IN ANY GIVEN AREA FOR A MAXIMUM DURATION OF TWO WEEKS, AND SHALL BE A MINIMUM OF 2 INCHES THICK. ALL TEMPORARY PATCHES SHALL BE PLACED OVER PROPERLY PLACED AND COMPACTED BACKFILL AND BASE COURSE LAYERS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY PATCHES AND TO MAKE REPAIRS TO UNSATISFACTORY PATCHES WITHIN 24 HOURS.

23. THE CONTRACTOR WILL MAKE EVERY EFFORT TO MINIMIZE THE USE AND THE DURATION OF USE OF STEEL PLATES. THE STATE MAY REQUIRE THE BACKFILLING AND PATCHES OF TRENCHES DUE TO THE EXCESSIVE USAGE OF STEEL PLATES.

24. PLASTIC MARKING TAPE. PROVIDE PLASTIC MARKING TAPE THAT IS ACID AND ALKALI RESISTANT POLYETHYLENE FILM 6 INCHES WIDE WITH MINIMUM THICKNESS OF 0.004 INCH. PROVIDE APE WITH MINIMUM STRENGTH OF 1750 PSI LENGTHWISE AND 1500 PSI CROSSWISE. MANUFACTURE TAPE WITH INTEGRAL WIRES, FOIL BACKING OR OTHER MEANS TO ENABLE DETECTION BY METAL DETECTOR WHEN THE TAPE IS BURIED UP TO 3 FEET DEEP. MANUFACTURE TAPE SPECIFICALLY FOR MARKING AND LOCATING UNDERGROUND UTILITIES. PROVIDE THE METALLIC CORE OF THE TAPE ENCSED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. CONFIRM TO THE FOLLOWING TAPE COLOR AND BEAR A CONTINUOUS PRINTED INSCRIPTION DESCRIBING THE SPECIFIC UTILITY.

    RED: ELECTRIC
    YELLOW: GAS, OIL, DANGEROUS MATERIALS
    ORANGE: TELEPHONE, TELEGRAPH, TELEVISION, POLICE, AND FIRE COMMUNICATIONS
    BLUE: WATER SYSTEMS
    GREEN: SEWER SYSTEM

28. THE CONTRACTOR SHALL PROVIDE THE DISTRICT ENGINEER WITH AS–BUILT PLANS UPON COMPLETION OF THE WORK DONE IN THE STATE RIGHT–OF–WAY. THIS SHALL BE DONE PRIOR TO THE DEPARTMENT'S RELEASE OF THE PERFORMANCE BOND.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR PERMIT PROJECTS WITHIN STATE HIGHWAY RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR OAHU DISTRICT PERMIT PROJECTS". THIS IS AVAILABLE AT THE OAHU DISTRUCT OFFICE AT 727 KAKOI STREET (PH. 831–6793). DUE TO POTENTIAL COST IMPACTS, THE CONTRACTOR NEEDS TO BE AWARE OF THESE REQUIREMENTS.

2. THE CONTRACTOR SHALL COMPLETE AND SUBMIT A CONTRACTOR'S CERTIFICATION OF NPDES COMPLIANCE, INCLUDING COMPLETION OF THE BEST MANAGEMENT PRACTICE (BMP) CHECKLIST AND SUBMITTAL OF A WRITTEN BMP PLAN AND DRAWINGS, PRIOR TO ISSUANCE OF THE PERMIT TO PERFORM WORK UPON STATE HIGHWAYS. DUE TO POTENTIAL TIME IMPACTS ON REVIEWING BMPS, THE CONTRACTOR NEEDS TO ALLOW ENOUGH TIME FOR THE APPROVAL PROCESS.

3. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE HIGHWAYS DIVISION'S "CONSTRUCTION BEST MANAGEMENT PRACTICES FIELD MANUAL" IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMPS) FOR THE PROJECT.

4. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE CITY AND COUNTY OF HONOLULU'S "RULES FOR SOIL EROSION STANDARDS AND GUIDELINES" FOR THE PROJECT.

WATER SYSTEM

1. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER SUPPLY (DWS), IN WRITING, ONE (1) WEEK PRIOR TO COMMENCEMENT OF WORK.

2. ALL MATERIALS USED AND METHOD OF CONSTRUCTION OF WATER SYSTEM FACILITIES SHALL BE IN ACCORDANCE WITH THE LATEST REVISIONS OF DWS STANDARDS. CONTRACTOR SHALL OBTAIN THE LATEST REVISIONS OF THE DWS STANDARD DETAILS BEFORE COMMENCING CONSTRUCTION.

3. ALL WATER SYSTEM WORK SHALL BE PERFORMED BY CONTRACTORS POSSESSING VALID STATE OF HAWAII CONTRACTOR'S LICENSES, REGARDLESS OF THE VALUE OF THE WORK.

4. THE EXACT DEPTH AND LOCATION OF EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES ARE NOT KNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SAME PRIOR TO TRENCHING FOR THE NEW WATERLINE. THE COST OF LOWERING, RELOCATING OR ADJUSTING EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE NEW WATERLINE, UNLESS NOTED OTHERWISE, AND WILL NOT BE PAID FOR SEPARATELY.

5. CONCRETE FOR REACTION BLOCKS AND ANCHOR BLOCKS SHALL BE DWS CLASS 2500.

6. THE MAXIMUM DISTANCE BETWEEN VALVE NUT AND TOP OF VALVE MANHOLE COVER SHALL BE THREE (3) FEET.

7. THE CONTRACTOR SHALL SUBMIT A MATERIALS LIST TO DWS FOR APPROVAL PRIOR TO CONSTRUCTION.

8. CONNECTION TO DWS SYSTEM:

   A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL NECESSARY FITTINGS AND OTHER MATERIALS AND EQUIPMENT REQUIRED FOR THE HOOK–UP. HE SHALL VERIFY THE EXACT LOCATION, DEPTH, TYPE, AND CONDITION OF THE EXISTING LINE BEFORE ORDERING MATERIALS FOR THE HOOK–UP. HE SHALL, HOWEVER, CHECK WITH DWS BEFORE EXCAVATING FOR VERIFICATION PURPOSES.

   B. WHENEVER FEASIBLE, MECHANICAL JOINT FITTINGS SHALL BE USED FOR BURIED APPLICATIONS, AND FLANGED JOINT FITTINGS SHALL BE USED FOR EXPOSED APPLICATIONS.

   C. AUTHORIZED DWS PERSONNEL MAY BE REQUIRED TO MAKE THE FINAL CONNECTION TO THE EXISTING LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED BY DWS FOR SAID WORK, INCLUDING THE COST OF PRESSURE TESTING AND DISINFECTION.

   D. IF THE DWS PROVIDES ONLY INSPECTION AND SUPERVISING OPERATORS, AND DOES NOT PROVIDE PERSONNEL FOR THE ACTUAL CONNECTION, THE CONTRACTOR SHALL PROVIDE ALL PIPEFITTERS AND LABORS TO MAKE THE CONNECTION.

   E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR FOR TRENCH EXCAVATION, BACKFILLING, CLEANING AND CHLORINATION, PAVING, AND OTHER WORK NECESSARY TO COMPLETE THE HOOK–UP, AS DIRECTED BY AND TO THE SATISFACTION OF DWS.

9. MINIMUM COVER OVER WATER MAIN, 6" DIAMETER OR LARGER, SHALL BE 3'–0". MINIMUM COVER FOR 4" DIAMETER SHALL BE 2'–6". MINIMUM COVER FOR DIAMETERS LESS THAN 4" SHALL BE 1'–6".

10. BOLTS FOR EXPOSED FLANGED DUCTILE IRON PIPE JOINTS SHALL BE EITHER SILICON BRONZE BOLTS AND NUTS OR 316 STAINLESS STEEL BOLTING WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI–SEIZE SHALL NOT BE USED. T–BOLTS FOR DUCTILE IRON MECHANICAL JOINT (MJ) PIPE AND FITTING CONNECTIONS IN UNDERGROUND SITUATIONS SHALL BE ONE OF THE FOLLOWING SYSTEMS:

    A. 316 STAINLESS STEEL T–BOLTS WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI–SEIZE SHALL NOT BE USED.

    B. COR–TEN T–BOLTS AND NUTS WITH HIGH GRADE ZINC SACRIFICIAL ANODES, EQUIVALENT TO "DURATRON" SACRIFICIAL "SAC–NUT" MODULES, INSTALLED ON THE NUTS FOR ALL STANDARD COR–TEN T–BOLTS.

    C. COR–TEN T–BOLTS AND NUTS BOTH FACTORY COATED WITH TRIPAC 2000 BLUE COATING SYSTEM BY "TRIPAC FASTENERS".

11. ALL BURIED METALS SHALL BE WRAPPED WITH POLY–WRAP. FOR ALL BURIED INSTALLATIONS OF DUCTILE IRON PIPE AND FITTINGS, POLY–WRAP IS REQUIRED EXCEPT WITHIN CONCRETE JACKETS.

12. LUBRICATE HYDRANT NOZZLE THREADS WITH NON–TOXIC GREASE.

13. THE CONTRACTOR SHALL PAINT AND NUMBER THE FIRE HYDRANT. NUMBERING TO BE FURNISHED BY DWS.

14. WATER MAINS AND APPURTENANCES SHALL BE SUBJECT TO HYDROSTATIC TESTING IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C600, UNDER THE "HYDROSTATIC TESTING" SECTION, TO A PRESSURE OF AT LEAST 1.5 TIMES THE WORKING PRESSURE. UNLESS OTHERWISE STATED IN THE CONSTRUCTION DOCUMENTS OR LIMITED BY THE PRESSURE RATING OF EQUIPMENT, THE PRESSURE TEST AND LEAKAGE TEST SHALL BE PERFORMED AT 225 POUNDS PER SQUARE INCH PRESSURE.

15. THE DEVELOPER SHALL SUBMIT A COST LIST ALONG WITH AN AFFIDAVIT FOR THE WATER SYSTEM PRIOR TO ACCEPTANCE.

16. THE CONTRACTOR SHALL SUBMIT TWO SETS OF RECORD DRAWINGS VIA A CONSULTANT PRIOR TO ACCEPTANCE OF THE WATER SYSTEM. AN ELECTRONIC IMAGE FILE IN TIFF FORMAT SHALL BE PROVIDED TO THE DWS FOR ALL PROJECTS.

ADDITIONAL WATER SYSTEM NOTES

WATER SERVICE LATERAL CONNECTIONS:

1. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, EQUIPMENT, AND LABOR FOR RE–CONNECTION OF CONSUMER'S PIPE TO NEW SERVICE LATERAL WITH COPPER PIPING AT THE CONTRACTOR'S EXPENSE. THE SIZE OF COPPER PIPE AND FITTINGS SHALL BE DETERMINED BY DWS OR AS SPECIFIED ON PLANS. THE USE OF PLASTIC MATERIALS IS PROHIBITED.

   A. ALL WATER METER INSTALLATIONS/RELOCATIONS SHALL BE COORDINATED WITH DWS PERSONNEL. ONLY DWS PERSONNEL IS AUTHORIZED TO REMOVE AND RELOCATE WATER METER.

   B. IF CONSUMER'S PIPE IS COPPER OR PVC, USE BRONZE PACK JOINT COUPLING. IF CONSUMER'S PIPE IS ANY OTHER MATERIAL, USE APPROPRIATE DI–ELECTRIC COUPLING.

   C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING WATER SERVICE TO CONSUMERS AT ALL TIMES. IF WATER SERVICE DISRUPTION IS NECESSARY, THE CONTRACTOR SHALL COORDINATE ALL DISRUPTIONS OF SERVICE WITH CONSUMERS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL DUCTILE IRON NIPPLES WHETHER OR NOT SPECIFIED ON THE CONSTRUCTION PLANS FOR COMPLETE INSTALLATION OF THE WATERLINE AT THE CONTRACTOR'S EXPENSE.

3. THE CONTRACTOR SHALL FURNISH TEMPORARY CLEANOUTS WHEN NECESSARY TO TEST, FLUSH, AND CHLORINATE THE WATERLINE AT THE CONTRACTOR'S EXPENSE.

4. THE CONTRACTOR SHALL CONCRETE PLUG ALL OPEN ENDS OF ABANDONED WATERLINES AT THE CONTRACTOR'S EXPENSE, WHETHER OR NOT SHOWN ON THE CONSTRUCTION PLANS.

5. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL PORTIONS OF ABANDONED WATERLINES THAT ARE EXPOSED OR WITHIN 12–INCHES OF THE GROUND SURFACE AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL ADJUST TO FINISHED PAVEMENT GRADES, ALL EXISTING VALVE BOXES AND MANHOLES, INCLUDING FRAME AND COVERS FOR ALL UTILITIES (I.E., WATER, SEWER, DRAIN, ETC.) AFFECTED BY PAVEMENT RESTORATION AT THE CONTRACTOR'S EXPENSE, WHETHER SHOWN OR NOT SHOWN ON THE CONSTRUCTION PLANS.

7. THE CONTRACTOR SHALL RESTORE ALL ROAD IMPROVEMENTS, DISTURBED OR DAMAGED DURING CONSTRUCTION IN ACCORDANCE WITH THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, 1994," AS AMENDED, TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS AND WASTE MANAGEMENT. ROAD IMPROVEMENTS INCLUDE, BUT ARE NOT LIMITED TO, PAVEMENT, PAVEMENT MARKERS, STRIPING, SPEED HUMPS.

8. THE CONTRACTOR SHALL MAINTAIN FOUR FEET OF CLEARANCE WHEN TRENCHING OR EXCAVATING NEAR ANY UTILITY POLES. CONSTRUCTION EQUIPMENT SHALL SHALL MAINTAIN A TEN FOOT RADIAL CLEARANCE AROUND ANY OVERHEAD CONDUCTOR.

9. THE CONTRACTOR SHALL ADEQUATELY BRACE UTILITY POLES DURING TRENCHING AND BACKFILLING OPERATIONS. AFFECTED UTILITY COMPANIES SHALL BE NOTIFIED 72 HOURS IN ADVANCE OF WORK NEAR UTILITY POLES.

CHLORINATION OF WATER SYSTEMS

1. WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD FOR DISINFECTING WATER MAINS, ANSI/AWWA C651–99, SECTION 4.4.3, CONTINUOUS FEED METHOD.

2. THE STORAGE TANK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD FOR DISINFECTING WATER STORAGE FACILITIES, ANSI/AWWA C652–92, SECTION 4.1, CHLORINATION METHOD 1.

3. LIQUID CHLORINE OR CALCIUM HYPOCHLORITE THAT HAS BEEN TESTED AND CERTIFIED AS MEETING THE SPECIFICATIONS OF ANSI/NSF STANDARD 60, DRINKING WATER TREATMENT CHEMICALS–HEALTH EFFECTS, SHALL BE USED FOR THE CHLORINATION OF THE WATER MAINS AND STORAGE TANK.

4. PRIOR TO CHLORINATION, THE WATER MAINS AND STORAGE TANK SHALL BE THOROUGHLY FLUSHED.

5. THE INTERIOR SURFACES OF THE WATER MAINS AND STORAGE TANK SHALL BE EXPOSED TO THE CHLORINATING SOLUTION, BY COMPLETELY FILLING THE MAIN TO REMOVE ALL AIR POCKETS, FOR A MINIMUM OF 24 HOURS AND THE FREE CHLORINE RESIDUAL SHALL NOT BE LESS THAN 10 PPM AFTER SUCH TIME.

6. SHOULD CALCIUM HYPOCHLORITE BE USED, NO SOLID AND/OR UNDISSOLVED PORTION OF THE COMPOUND SHALL BE INTRODUCED INTO ANY SECTION OF THE WATER MAINS AND STORAGE TANK TO BE CHLORINATED.

7. AT THE END OF THE 24 HOUR DISINFECTION PERIOD, REPRESENTATIVE SAMPLES SHALL BE TAKEN AND ANALYZED TO ASSURE A FREE CHLORINE RESIDUAL OF AT LEAST 10 PPM.

8. SHOULD THE FREE CHLORINE RESIDUAL RESULTS INDICATE ADEQUATE CHLORINATION, THE WATER MAINS AND STORAGE TANK SHALL BE THOROUGHLY FLUSHED AND FILLED WITH WATER FROM THE EXISTING SYSTEM AND AGAIN TESTED FOR FREE CHLORINE RESIDUAL. THE FLUSHING SHALL BE CONSIDERED ADEQUATE IF THE FREE CHLORINE RESIDUAL TEST RESULTS INDICATE THAT THE WATER IN THE WATER MAINS AND STORAGE TANK HAS A COMPARABLE CHLORINE RESIDUAL AS THE WATER IN THE EXISTING SYSTEM.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE STATE DEPARTMENT OF HEALTH REQUIREMENTS. A NEUTRALIZING CHEMICAL SHALL BE APPLIED TO THE WATER TO BE WASTED TO THOROUGHLY NEUTRALIZE THE CHLORINE RESIDUAL REMAINING IN THE WATER IN ACCORDANCE WITH AWWA C651–99, SECTION 4.5.2, AND APPENDIX C.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH, PRIOR TO THE START OF CONSTRUCTION FOR THE DISPOSAL OF WATER USED FOR HYDROTESTING AND CHLORINATION.

11. FOLLOWING THE ACCEPTABLE FLUSHING OF THE WATER MAINS AND STORAGE TANK, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES, TAKEN AT LEAST 24 HOURS APART FROM REPRESENTATIVE POINTS, SHALL BE SUBJECTED TO MICROBIOLOGICAL TESTS (TOTAL AND FECAL COLIFORM). FOR WATERLINES, AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED FROM EVERY 1,200 FEET OF THE NEW WATER MAIN, PLUS ONE FROM THE END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH. FOR THE STORAGE TANK, THE SAMPLE SHALL BE COLLECTED FROM THE TANK'S EFFLUENT LINE SAMPLE TAP. POSITIVE OR INVALID TEST RESULTS WILL NOT BE ACCEPTABLE AND THE PROCESS WILL BE REPEATED.

12. ALL MEASUREMENTS FOR CHLORINE RESIDUAL SHALL BE ANALYZED USING E.P.A. APPROVED METHODS FOR DRINKING WATER.

13. ALL MICROBIOLOGICAL TEST SHALL BE PERFORMED BY A LABORATORY APPROVED BY THE DEPARTMENT OF HEALTH, STATE OF HAWAII.

14. THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ALL OF THE FOREGOING.

15. SEE ANSI/AWWA C651–99, SECTION 4.3.6 FOR SWABBING CHLORINATION PROCEDURES.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS (NPDES) AND OTHER AUTHORIZATIONS

THE GENERAL CONTRACTOR/DEVELOPER/OWNER OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

1. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
2. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATION ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11– 54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT: http://health.hawaii.gov/cwb/

THE GENERAL CONTRACTOR/DEVELOPER/OWNER IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

OTHER

1. ALL MATERIALS (PIPE, PIPE LUBRICANTS, PAINTS, SEALANTS, FORM OIL, CONCRETE ADMIXTURES, ETC.) IN DIRECT CONTACT WITH THE POTABLE WATER SHALL HAVE NATIONAL SANITATION FOUNDATIONS (NSF) APPROVALS. THE CONTRACTOR SHALL SUBMIT THESE APPROVALS TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ITS APPLICATION.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16–115–2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2018

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

NOTES 2

DESIGNED BY: PLM
CHECKED BY: RMKC
DRAWN BY: CKM

GROUP 70 INTERNATIONAL, INC.
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398
808–523–5866
WWW.G70.DESIGN

MARCH 2018

DWG. NO.
T004
SHEET 4 OF 24

FILE	POCKET	FOLDER	NO.

FILE: 214041–11 T004 NOTES 2.dwg
DATE REV.: 09/07/2018

AREA OF WORK
TMK(2) 5-2-7: 90
DEPARTMENT OF HAWAIIAN HOMELANDS
LEASE: JAMES LINDSEY
WATER TANK
3.5 MG RESERVOIR
FINISH FLOOR ELEVATION=1017'
(AS-BUILT DRAWINGS)
PROPOSED STRUCTURAL REPAIR WORK
SEE DWGS
CHAIN LINK FENCE, H=6'
TOP OF TANK
ELEV.=1039.27
TOP OF TANK
ELEV.=1039.32
UTL. BOX
TOP=1016.35
2-PANEL BOX
UTL. MH
TOP=1017.70
IV=1017.11
BOT.=1016.0
GATE
EDGE BUSH
TMK(2) 5-2-7: 29
DEPARTMENT OF HAWAIIAN HOMELANDS
LEASE: MELODY-LYNN L. ALCON
TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASE: BRETT WAIPA
WV
TOP=1016.60
WMH
TOP=1016.56
4" RISER
EXPOSED 4" PIPE
TP=1016.49
UTL. COVER
TOP=1016.32
(BOLTED)
WV BOX
TOP=1015.72
WV
TOP=1016.53
WV BOX
TOP=1015.57
UTL. COVER
TOP=1016.02
(BOLTED)
WV
TOP=1016.21
UTL. BOX
TOP=1013.27
TP=1010.86(4")
DIRT ROAD
BOT. BANK
TOP BANK
TONED LINE
D=2.5'
TONED LINE
D=2.8'
TONED LINE
D=2.1'
1010
1012
1014
1016
1018
1020
W6
W20
W3

GENERAL PLAN

20 10 0 20 40

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

HOOLEHUA WATER SYSTEM

TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

GENERAL PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2018

DESIGNED BY: PLM   CHECKED BY: RMKC   DRAWN BY: CKM

G70
GROUP 70 INTERNATIONAL, INC.
925 BETHEL STREET, 5TH FLOOR
HONOLULU, HAWAII 96813-4398
808 523 5866
WWW.G70DESIGN

MARCH 2018

DWG. NO.
T005
SHEET 5 OF 24

FILE: 216065-01 T005 GENERAL PLAN.dwg
DATE REV.: 09/07/2018

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE BUILDING CODE OF THE COUNTY OF MAUI (LATEST).

2. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS.

3. THE GENERAL NOTES AND TYPICAL DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN.

4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.

6. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF THE JOB AND NOTIFY ALL DISCREPANCIES TO THE ARCHITECT.

7. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.

8. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND THE PROTECTION OF ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY

9. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA

10. THE CONTRACTOR SHALL NOTIFY TANIMURA & ASSOCIATES (PH. 536-7692) TWO (2) WORKING DAYS PRIOR TO BEGINNING ANY WORK WHICH WILL CONCEAL STRUCTURAL ELEMENT SUCH AS POURING CONCRETE (CONCEALING REINFORCING) OR SHEATHING WALLS (CONCEALING HOLD DOWN ANCHORS).

STRUCTURAL STEEL

1. ALL STRUCTURAL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STEEL PIPES AND STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B. CHANNELS, ANGLES, PLATES, BARS AND MISCELLANEOUS STEEL SHAPES SHALL CONFORM TO ASTM A-36. FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, LATEST EDITION. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

2. ALL BOLTS SHALL CONFORM TO ASTM A307.

3. WELDING: ALL WELDING IS TO COMPLY WITH A.W.S. SPECIFICATIONS AND IS TO BE DONE BY CERTIFIED WELDERS. ALL WELDING IS TO BE DONE BY ELECTRIC ARC PROCESS AND SHALL BE PERFORMED WITH APPROVED ELECTRODES AS REQUIRED BY I.B.C. WELDS ARE DESIGNED AT FULL STRESS AND MUST BE DONE IN THE SHOP OF A LICENSED FABRICATOR.

4. ALL WELDS NOT SHOWN SHALL BE FULL PENETRATION WELDS CAPABLE OF DEVELOPING THE FULL STRENGTH OF THE CONNECTING MEMBERS.

5. THE CONTRACTOR SHALL DETAIL ALL MEMBERS AND CONNECTIONS NOT SHOWN AND SHALL SUBMIT THEM TO THE ENGINEER FOR REVIEW AND APPROVAL. COST OF THESE MEMBERS AND CONNECTIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

6. HOT DIP GALVANIZE ALL STRUCTURAL STEEL SHAPES, PLATES, BOLTS AND ACCESSORIES EXPOSED TO WEATHER.

REINFORCED CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318-05.

2. ALL CONCRETE SHALL BE NORMAL WEIGHT (150 PCF) WITH AGGREGATES CONFORMING TO ASTM C-33. UNLESS OTHERWISE NOTED, THE COMPRESSIVE STRENGTHS OF CONCRETE AT 28 DAYS AND MAXIMUM AGGREGATE SIZES SHALL BE AS FOLLOWS:

	STRENGTH	AGGREGATE SIZE
FOOTING	2,500 PSI	1"
WALL AND CURBS	2,500 PSI	3/4"

3. MAXIMUM WATER-CEMENT RATIO SHALL NOT EXCEED 0.55.

4. ALL REINFORCING STEEL EXCEPT TIES AND STIRRUPS SHALL CONFORM TO ASTM A615 GRADE 60. TIES, STIRRUPS AND REBARS TO BE WELDED SHALL BE ASTM A615 GRADE 40.

5. UNLESS OTHERWISE NOTED, SPLICES, LAPS, DOWEL EXTENSIONS AND EMBEDMENTS SHALL BE 48 BAR DIAMETERS BUT NOT LESS THAN 24" MINIMUM.

6. ALL REINFORCING BARS MARKED CONTINUOUS (CONT.) ON THE PLANS SHALL BE LAPPED 48 BAR DIAMETERS MINIMUM.

7. STAGGER ALL SPLICES WHERE POSSIBLE.

8. ALL WELDING OF REINFORCING SHALL CONFORM TO "STRUCTURAL WELDING CODE - REINFORCING STEEL" (AWS D1.4).

9. REBARS SHALL BE SUPPORTED, BENT AND PLACED AS PER "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES" ACI 315 (LATEST).

10. MINIMUM COVER IN INCHES FOR REBARS FOR CAST-IN-PLACE CONCRETE:

CONCRETE CAST AGAINST EARTH 3"

FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:
- #5 AND SMALLER 1-1/2"
- #6 AND LARGER 2"

11. UNLESS OTHERWISE SHOWN LAP OUTERMOST CROSS WIRES OF EACH SHEET OF WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2" MINIMUM.

12. AT TIME CONCRETE IS PLACED, REINFORCING SHALL BE FREE FROM MUD, OIL, LAITANCE OR OTHER COATINGS ADVERSELY AFFECTING BOND CAPACITY.

13. REINFORCEMENT, ANCHOR BOLTS, SIMPSON CONNECTORS, DOWELS AND ALL OTHER EMBEDDED ITEMS SHALL BE POSITIVELY SECURED BEFORE POURING.

CONCRETE REPAIR NOTES

1. REMOVE ALL DETERIORATED CONCRETE UNTIL ONLY SOUND CONCRETE REMAINS.

2. WHERE REINFORCING IS EXPOSED, CHIP CONCRETE AROUND THE BAR SUCH THAT THERE IS A MINIMUM OF ONE INCH BETWEEN THE BAR AND THE SURROUNDING CONCRETE.

3. CLEAN EXPOSED REINFORCING TO BARE METAL.

4. PERIMETER OF ALL SPALLED AREAS SHALL BE PROVIDED WITH AN EDGE CHIPPED OR SAW CUT ONE INCH MINIMUM DEEP INTO THE EXISTING CONCRETE.

5. THE CONTACT SURFACE SHALL BE ROUGHENED TO APPROXIMATELY 1/4 INCH OF DEPTH. AN APPROPRIATE PROCESS SHALL BE SELECTED SUCH THAT NO COARSE AGGREGATE IS ALLOWED TO BE POLISHED OR ROUNDED. THE CONTACT SURFACE SHALL NOT BE LIMITED TO THE DAMAGED CHIPPED OUT AREA BUT SHALL INCLUDE ALL EXISTING CONCRETE SURFACES TO RECEIVE NEW CONCRETE.

6. IMMEDIATELY PRIOR TO PLACING CONCRETE, AN APPROVED BONDING AGENT SHALL BE APPLIED TO THE PREPARED CONCRETE CONTACT SURFACE.

9. NEW CONCRETE SHALL BE NORMAL WEIGHT ACRYLIC MODIFIED MIX HAVING A MINIMUM COMPRESSIVE STRENGTH OF 6,000 PSI AT 28 DAYS AND A MAXIMUM AGGREGATE SIZE OF 3/4 INCH.

DESIGN CRITERIA

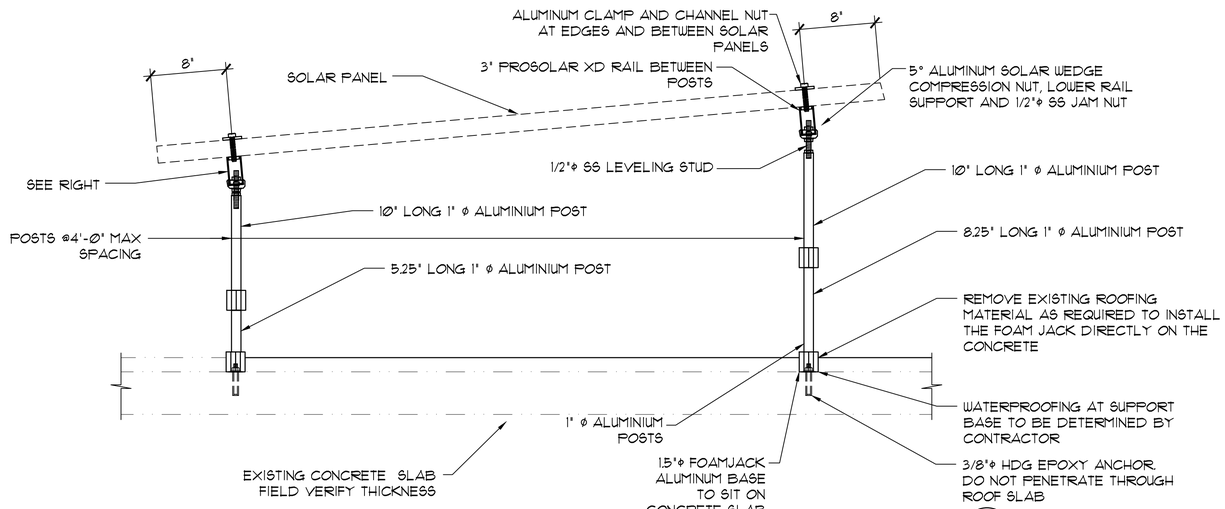
1. CODES: 2006 INTERNATIONAL BUILDING CODE
2. LATERAL FORCES

WIND
- BASIC WIND SPEED (3 SECOND GUST) 105 MPH
- WIND IMPORTANCE FACTOR I 1.15
- WIND EXPOSURE B
- Kzt TOPOGRAPHIC FACTOR 1.3
- Kd 0.80

3. LIVE LOADS
   - HANDRAIL 200 LB CONCENTRATED OR 50LB PER FOOT HORIZONTAL

SPECIAL INSPECTION

1. SPECIAL INSPECTION REQUIRED FOR
   - EPOXY DOWELS (CONTINUOUS)
   - WELDING OF REBARS (2006 IBC TABLE 1704.4)
   - WELDING OF STRUCTURAL STEEL (2006 IBC TABLE 1704.3)

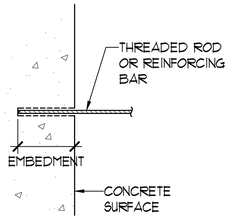


NOTES:
1. CONTRACTOR SHALL VERIFY THAT THE 3/8"ø THREADED ROD WILL FIT IN THE HOLE OF THE 1½" DIAMETER BASE.
2. CONTRACTOR SHALL VERIFY THAT THE EXISTING CONCRETE ROOF IS STRUCTURALLY SOUND TO RECEIVE THE NEW ANCHORS AND DEVELOP THE ULTIMATE PULLOUT LOADS
3. ALL HARDWARE COMPONENTS (EXCEPT ANCHORS) MANUFACTURED BY PRO SOLAR

SECTION AT PANEL SUPPORT

SC: 1 1/2"=1'-0"

A
SE001



THREADED ROD (REBAR	DRILL BIT DIAMETER	MINIMUM EMBEDMENT
3/8"ø (#3)	1/2"	4 1/2"
1/2"ø (#4)	5/8"	6"
5/8"ø (#5)	3/4"	6"
3/4"ø (#6)	7/8"	7"
7/8"ø (#7)	1"	8"

NOTES:
- A. PRE APPROVAL FOR SIMPSON STRONG TIE SET-XP EPOXY TIE ADHESIVE. ALL SUBSTITUTION REQUEST SHALL BE SUBMITTED WITH CURRENT ER REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
- B. THREADED ROD SHALL BE ASTM A307 HOT DIP GALVANIZED. REINFORCING BAR SHALL BE ASTM A615 GRADE 60.
- C. PRE DRILL HOLE WITH DRILL BIT COMPLYING WITH ANSI B212.15-1994.
- D. CLEAN HOLE WITH OIL FREE COMPRESSED AIR AND NYLON BRUSH.
- E. FILL HOLE HALF FULL WITH ADHESIVE THEN INSERT ANCHOR TO BOTTOM OF HOLE AND TWIST CLOCKWISE TO ENSURE ADHESIVE COVERS ANCHOR SURFACE. ADHESIVE MUST BE LEVEL WITH CONCRETE SURFACE AFTER INSERTION OF ANCHOR.

EPOXY ANCHOR DETAIL

NO SCALE

B
SE001

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Adrian Lee

SE001
6 24

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

GENERAL NOTES & TYP. DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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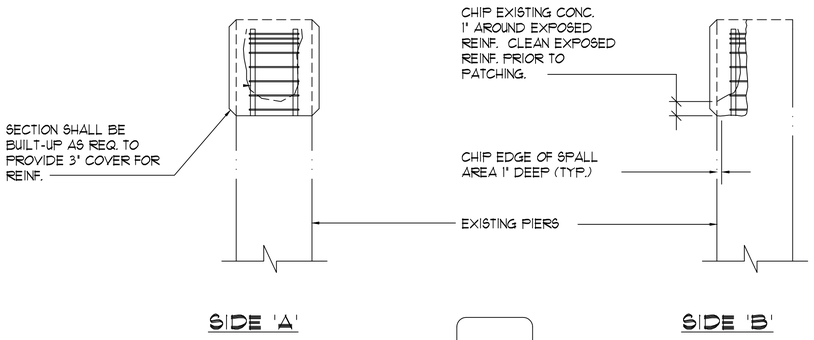
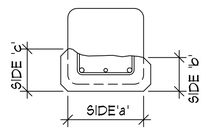


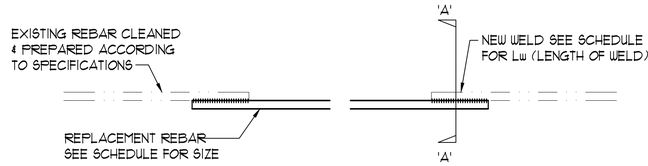


SECTION

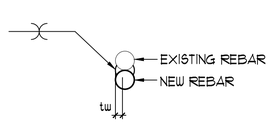
TYP. REPAIRED COND.

REINF. WELD LENGTH TABLE	
BAR SIZE	lw MIN. WELD LENGTH (EACH SIDE)
#8	6"
#7	5"
#6	4"
#5	3"
#4	2"
#3	2"

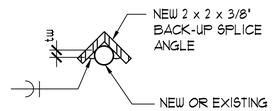
*TO BE WELDED TO L2 x 2 x 3/8"



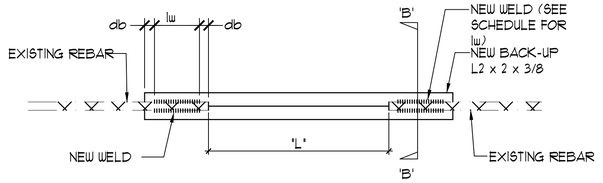
LAP SPLICE FOR #5 BARS & SMALLER



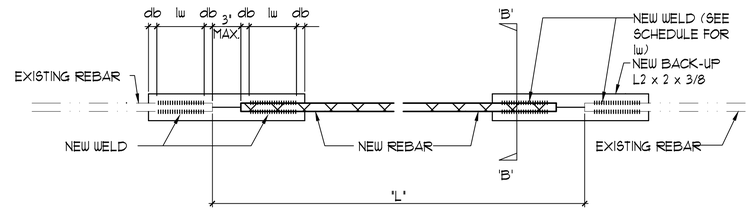
SECTION 'A-A'



SECTION 'B-B'



SPLICE WHEN 'L' IS 24" OR LESS



SPLICE WHEN 'L' IS GREATER THAN 24"

ANGLE SPLICE FOR #6 BARS & GREATER

tw = db/3
db = BAR DIAMETER
lw = LENGTH OF WELD (SEE SCHED.)

SPALL REPAIR - COLUMN

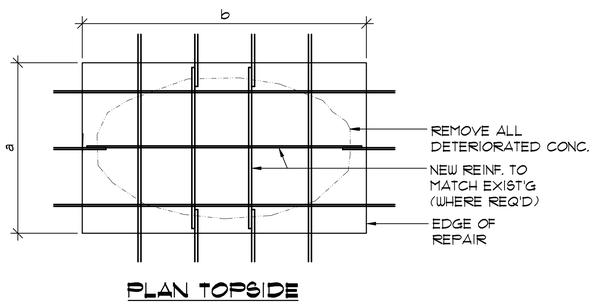
NO SCALE

A
SE101

REBAR REPLACEMENT DETAIL

SCALE: 3/4" = 1'-0"

B
SE101



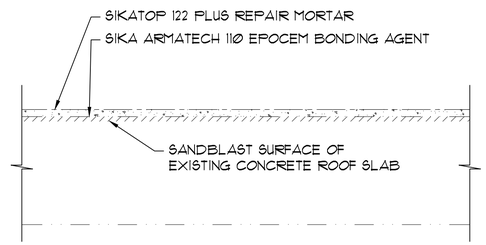
PLAN TOPSIDE

PAYMENT QUANTITY = a x b

TOP SIDE SLAB REPAIR DETAIL

SC: 3/4" = 1'-0"

C
SE101



PREPARATION OF REINFORCING STEEL:

1. REMOVE WALL HEAVY RUST AND SCALE FROM THE REINFORCING STEEL BY MECHANICAL MEANS TO ACHIEVE A CLEAN STEEL SUBSTRATE CONFORMING TO SSPC-SP6, COMMERCIAL BLAST CLEANING OR BETTER.
2. IF THE REMAINING REINFORCING IS A MINIMUM OF 80% OF THE ORIGINAL REINFORCING BAR, THEN COAT REBARS with SIKA ARMATECH 110 EPOCEM FOR ANTI CORROSION PROTECTION.
3. IF THE REMAINING REINFORCING IS LESS THAN 80% OF THE ORIGINAL REINFORCING BAR THEN THE EXISTING REINFORCING BAR WILL NEED TO BE REPAIRED. SEE DETAIL C/SR101.

NOTES:

1. SANDBLAST CONCRETE TO REMOVE ALL UNSOUND (LOOSE) MATERIAL.
2. REPAIR AREA SHOULD BE AT LEAST 1/4" IN DEPTH AND THE SURFACE SHALL BE ROUGHENED TO A MINIMUM OF 1/16" PROFILE. THIS INCLUDES THE VERTICAL EDGES OF SAW CUTS. PERIMETER OF REPAIRS SHALL BE CUT IN STRAIGHT LINES AT 90 DEGREE ANGLES.
3. IF ANY REBARS ARE EXPOSED, SEE PREPARATION OF REINFORCING STEEL NOTES AT RIGHT.
4. CLEAN CONCRETE SURFACE. CONCRETE SURFACE SHALL BE SATURATED SURFACE DRY with NO STANDING WATER.
5. APPLY SIKA ARMATECH 110 EPOCEM TO THE CONCRETE SUBSTRATE AS A BONDING AGENT. APPLY THE REPAIR MORTAR BEFORE THE BONDING AGENT BECOMES TACK-FREE TO THE TOUCH.
6. APPLY SIKATOP 122 PLUS POLYMER MODIFIED TROWEL GRADE MORTAR ON THE ROOF SURFACE TO MATCH THE TOP OF THE EXISTING SLAB. REBUILD THE EXISTING CURBS TO THE ORIGINAL HEIGHT.
7. CURE REPAIR MORTAR PER MANUFACTURER'S RECOMMENDATION.

ROOF SURFACE REPAIR DETAIL

NO SCALE

D
SE101

0' 1' 2' 3' 4'
3/4" = 1'-0"

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

TYP. DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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SE101
7 24

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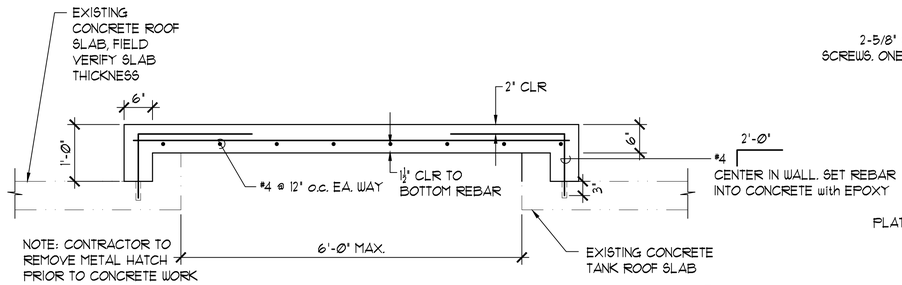
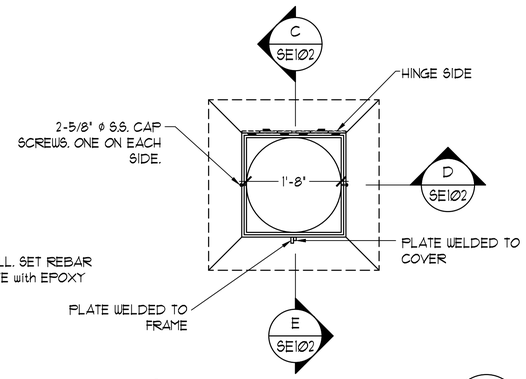


PERMANENT CLOSURE OVER LARGE HATCH

A / SE102

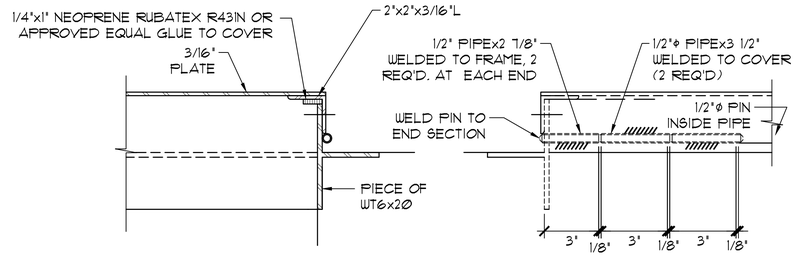
SCALE: 3/4" = 1'-0"



PLAN - NEW SMALL HATCH COVER

B / SE102

SCALE: 3/4" = 1'-0"



SECTION

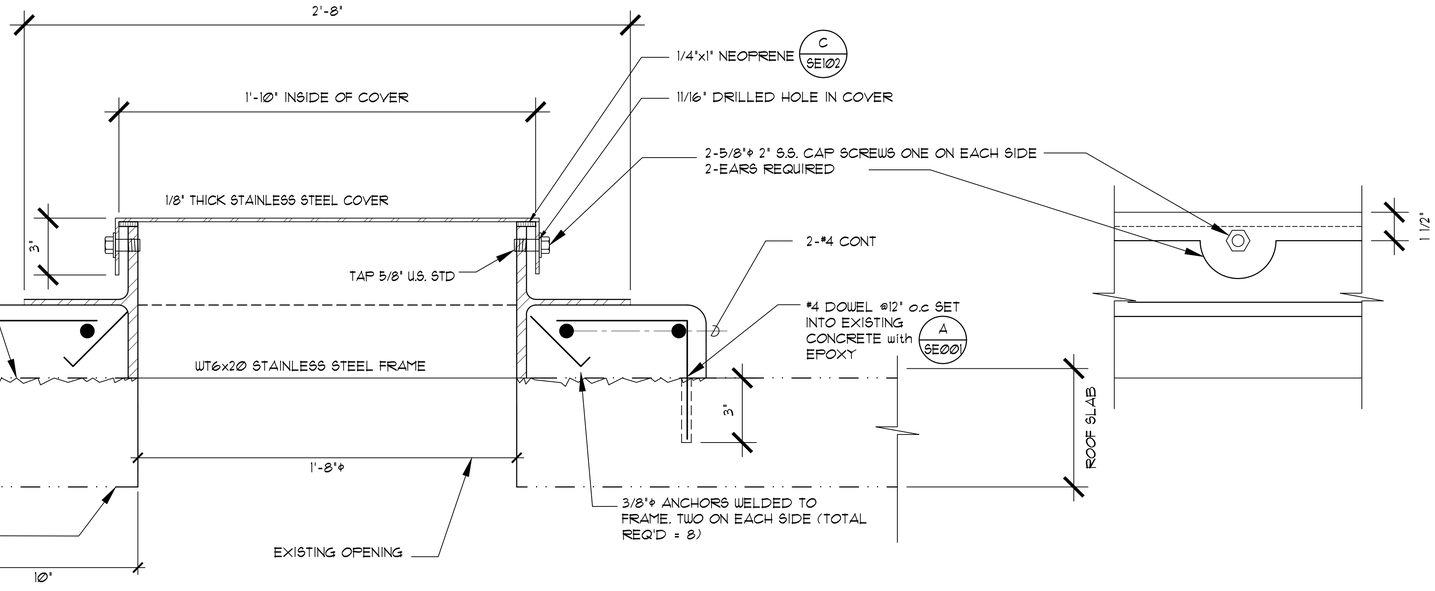
ELEVATION

* ALL STEEL TO BE STAINLESS.

NEW HATCH HINGE DETAIL

C / SE102

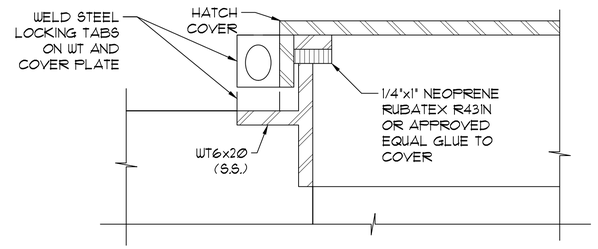
SC: 3" = 1'-0"



DETAIL OF NEW SMALL HATCH SQUARE COVER AND CURB

D / SE102

SC: 3"=1'-0"



GASKET DETAIL AT NEW HATCH

E / SE102

SC: 3" = 1'-0"

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 3" 6" 1'
3" = 1'-0"

SE102
8 24

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

HATCH DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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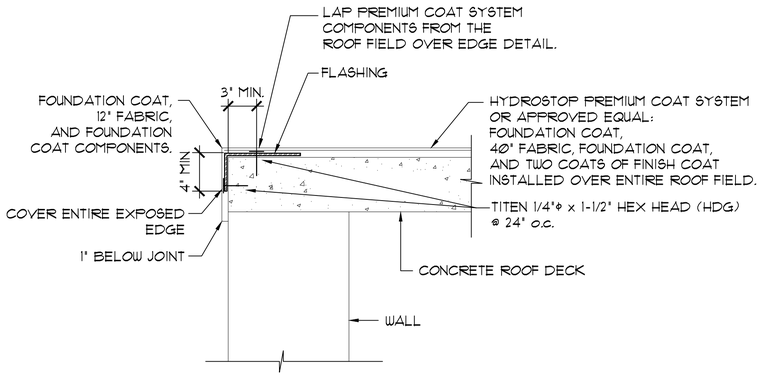


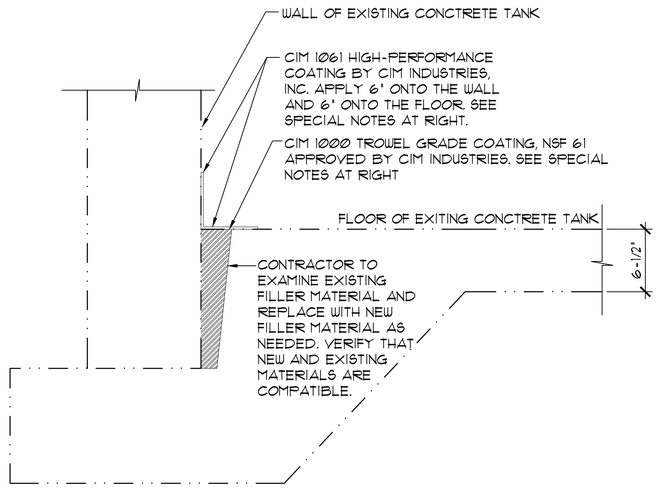
NOTES:

1. ALL FLASHING SHALL BE DESIGNED FOR THE APPLICABLE CONDITIONS. METAL THICKNESS, FASTENERS AND ALL LAPPING SHALL BE AS SPECIFIED BY THE ROOF DESIGNER.
2. REFER TO THE SPECIFICATIONS FOR SPECIFIC EXECUTION REQUIREMENTS
3. FREMIUM COAT SYSTEM- FOUNDATION, COAT, FABRIC, FOUNDATION COAT, AND FINISH COAT COMPONENTS.
4. FOUNDATION COAT - COMBINED COVERAGE (2COATS) AT MINIMUM RATE OF 40 SF/GALLON.
5. FINISH COAT- COMBINED COVERAGE (2COATS) AT MINIMUM RATE OF 70 SF/GALLON.
6. PRIMING- REFER TO HYDROSTOP SPECIFICATIONS FOR DECK PRIMING REQUIREMENTS.
7. ALL METAL FLASHING SEGMENTS SHOULD BE SOLDERED.
8. OVER BARE CONCRETE COVER WITH 'BARRIERGUARD' SLURRY @ RATE OF 200 SF/GAL.

FLASHING AND ROOF COATING DETAIL

A — SE103

SC: 1 1/2"=1'-0"



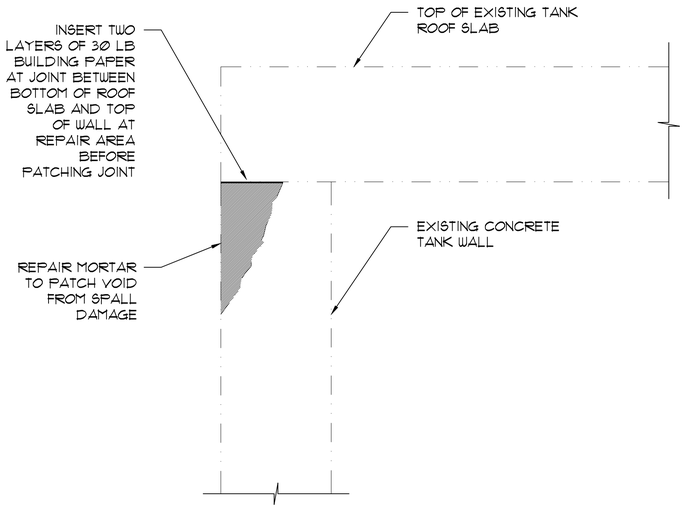
SPECIAL NOTES FOR CIM 1000 AND CIM 1061:

1. PREPARE THE CONCRETE, ROUGHEN SURFACE, AND APPLY PRIMER AND BOND AGENT IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
2. FILL THE 2" BY 3" WIDE TAPERED GAP WITH THE CIM 1000 TROWEL GRADE.
3. ALLOW THE CIM 1000 TROWEL GRADE TO CURE A MINIMUM OF 12 HOURS (AT 70 DEGREES F) BEFORE APPLYING THE 60 ML CIM 1061, 6 INCHES ONTO THE WALL AND 6 INCHES ONTO THE FLOOR.
4. REFER TO THE MANUFACTURER'S WRITTEN INSTRUCTIONS FOR MORE DETAILED SURFACE PREPARATION, MIXING, INSTALLATION, AND CURING INFORMATION.
5. CONTRACTOR SHALL BE AWARE OF THE POT LIFE OF THE PRODUCTS AND APPLICATION SHALL NOT BE PERFORMED IN DIRECT SUNLIGHT OR DURING INCREASED TEMPERATURES.

WATERPROOFING AT TANK FLOOR BOTTOM JOINT

B — SE103

SC: 1 1/2"=1'-0"



NOTES:

1. CONTRACTOR TO SOUND EXISTING CONCRETE WALL TO IDENTIFY EXTENT OF DAMAGED CONCRETE THEN REMOVE LOOSE/ UNSOUND CONCRETE with A 15 POUND CHIPPING HAMMER.
2. FOLLOW ITEMS 2 THROUGH 5 OF DETAIL D/SR101.
3. ADD TWO LAYERS OF 30 LB BUILDING PAPER UNDER THE EXISTING ROOF SLAB AND ABOVE THE TOP OF WALL TO BE PATCHED.
4. APPLY SIKATOP 123 PLUS NON SAG REPAIR MORTARS TO THE AREAS TO BE REPAIRED. PATCH SHALL BE FLUSH TO THE ADJACENT UNDAMAGED WALLS.
5. CURE REPAIR MORTAR PER MANUFACTURER'S RECOMMENDATION.

REPAIR OF TANK WALL AT ROOF SLAB

C — SE103

SC: 1 1/2"=1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

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ADRIAN C.M. LEE — LICENSED PROFESSIONAL ENGINEER — No. 9164-S — HAWAII, U.S.A.

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SE103
9 24

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

WATERPROOF AND SUPPORT DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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COVER EXISTING LARGE HATCH

A SE102

NEW RAILING

B SE302

12"-0" MIN BEYOND HATCH

FOR BALANCE OF RESERVOIR ROOF PLAN SEE SE202

EXISTING STRUCTURE BELOW TO REMAIN

EXISTING FENCE TO REMAIN

A SE301

NEW RAILING

A SE301

EXISTING LADDER TO BE REPLACED BY OTHERS

AT INSIDE BOTTOM OF TANK

B SE103

A SE103

FOR BALANCE OF RESERVOIR ROOF PLAN SEE SE202

NEW RAILING

B SE302

12"-0" MIN BEYOND HATCH

COVER EXISTING LARGE HATCH

A SE102

A SE001

REPAIR TOP OF EXISTING CONCRETE ROOF SLAB

D SE101

NORTH

NEW CONCRETE CURB AND STAINLESS STEEL COVER OVER EXISTING OPENING

B SE102

PARTIAL STRUCTURAL PLAN - EXISTING RESERVOIR ROOF

SC: 1/4"=1'-0"

0' 2' 4' 8' 12'

1/4" = 1'-0"

SE201

10 24

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STATE OF HAWAII

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TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

PARTIAL STRUCTURAL PLAN
EXISTING RESERVOIR ROOF

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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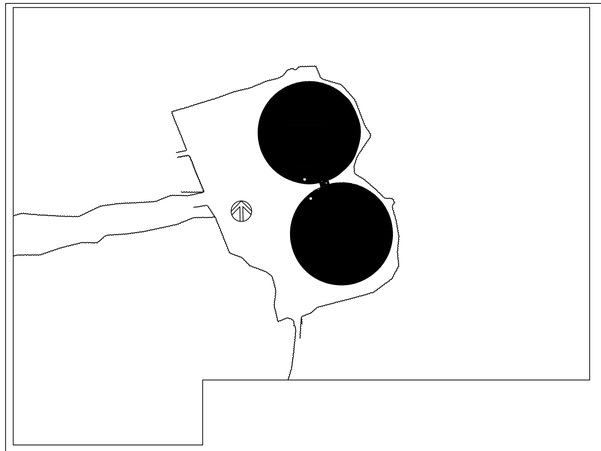

NEW CONCRETE CURB AND STAINLESS STEEL COVER OVER EXISTING OPENING

B / SE102

REPAIR TOP OF EXISTING CONCRETE ROOF SLAB

D / SE101

NORTH

FOR BALANCE OF RESERVOIR ROOF PLAN SEE SE201

PARTIAL STRUCTURAL PLAN - EXISTING RESERVOIR ROOF

SC: 1/4"=1'-0"

AT INSIDE BOTTOM OF TANK

B / SE103

A / SE103

COVER EXISTING LARGE HATCH

A / SE102

NEW RAILING

B / SE302

12'-0" MIN BEYOND HATCH

NEW RAILING

EXISTING STRUCTURE BELOW TO REMAIN

EXISTING FENCE TO REMAIN

A / SE301

NEW RAILING

A / SE301

EXISTING LADDER TO BE REPLACED BY OTHERS

0' 2' 4' 8' 12'

1/4" = 1'-0"

SE202

11 24

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EXISTING RESERVOIR ROOF

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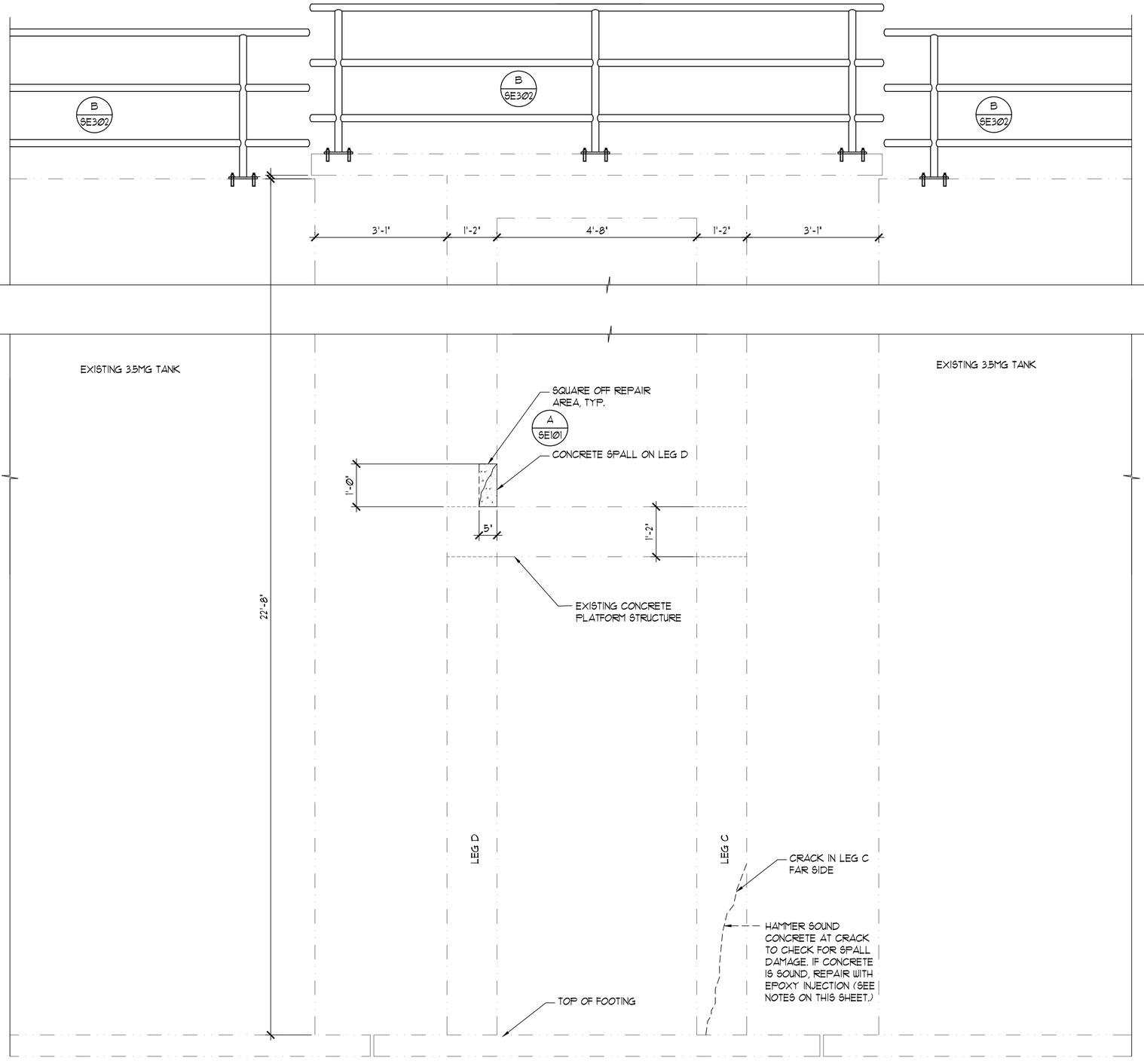


CONCRETE STRUCTURE REPAIR ELEVATION

SCALE: 3/4" = 1'-0"

A
SE301

EPOXY INJECTION OF CONCRETE CRACKS

Comply with the requirements of ACI 503R, ACI 503.2, ACI 501.4 for epoxy resin systems. Fill concrete cracks by pumping an epoxy resin system of the appropriate viscosity for the applicable crack width under pressure into the cracks. Install valves into position along the cracks by bonding in concrete with high viscosity, non-sagging epoxy resin paste mixture. Cracks shall be filled by pumping the epoxy system through the valves. Repair procedures shall be as follows:

1. Rout out each crack along its entire length to a depth of 1/4-inch and a width of 3/8-inch. Vacuum or blow off all dust and particles in the area of the groove.
2. Injection Ports: At intervals of not more than 16 to 20 inches or as recommended by the manufacturer, insert non-corrosive valves at each interval.
3. Crack Sealer: The groove between valves shall be sealed flush with Pro-Poxy 300, or approved equal.
4. Epoxy Injection: After the crack sealer has cured, a tube from a pressure pot containing the low viscosity resin mixture shall be attached to the first lowest valve and the resin mixture pumped into the crack. Use a maximum pressure of 60 psi or less to protect the existing concrete.
5. Injection Progress: As the resin mixture appears in the second highest valve, pinch close the first valve, and attach the tube from the pressure pot to the second valve and commence pumping. Avoid delays in the pumping operation.
1. Injection Completion: After the epoxy mixture has been pumped through all of the valves and the mixture has hardened, remove the valves by cutting/grinding off the valves to 1/8 inch below concrete surface. Coat the areas of the valves flush with Pro-Poxy 300, or approved equal.
2. Finish surfaces to closely match immediately adjacent existing surface texture. Apply cement wash to vertical and overhead surfaces. Allow finish to cure and recoat if necessary.

CONCRETE REPAIR NOTES:

1. REMOVE ALL DETERIORATED CONCRETE UNTIL ONLY SOUND CONCRETE REMAINS.
2. WHERE REINFORCING IS EXPOSED, CHIP CONCRETE AROUND THE BAR SUCH THAT THERE IS A MINIMUM OF ONE INCH BETWEEN THE BAR AND THE SURROUNDING CONCRETE.
3. CLEAN EXPOSED REINFORCING TO BARE METAL.

DAMAGE CHART FOR BRIDGE STRUCTURE

ITEM	LOCATION	VOL (FT^3)	DESCRIPTION
1	D	0.5	SPALL DAMAGE

0' 1' 2' 3' 4'
3/4" = 1'-0"

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

Adrian Lee

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

CONCRETE STRUCTURE REPAIR ELEV.

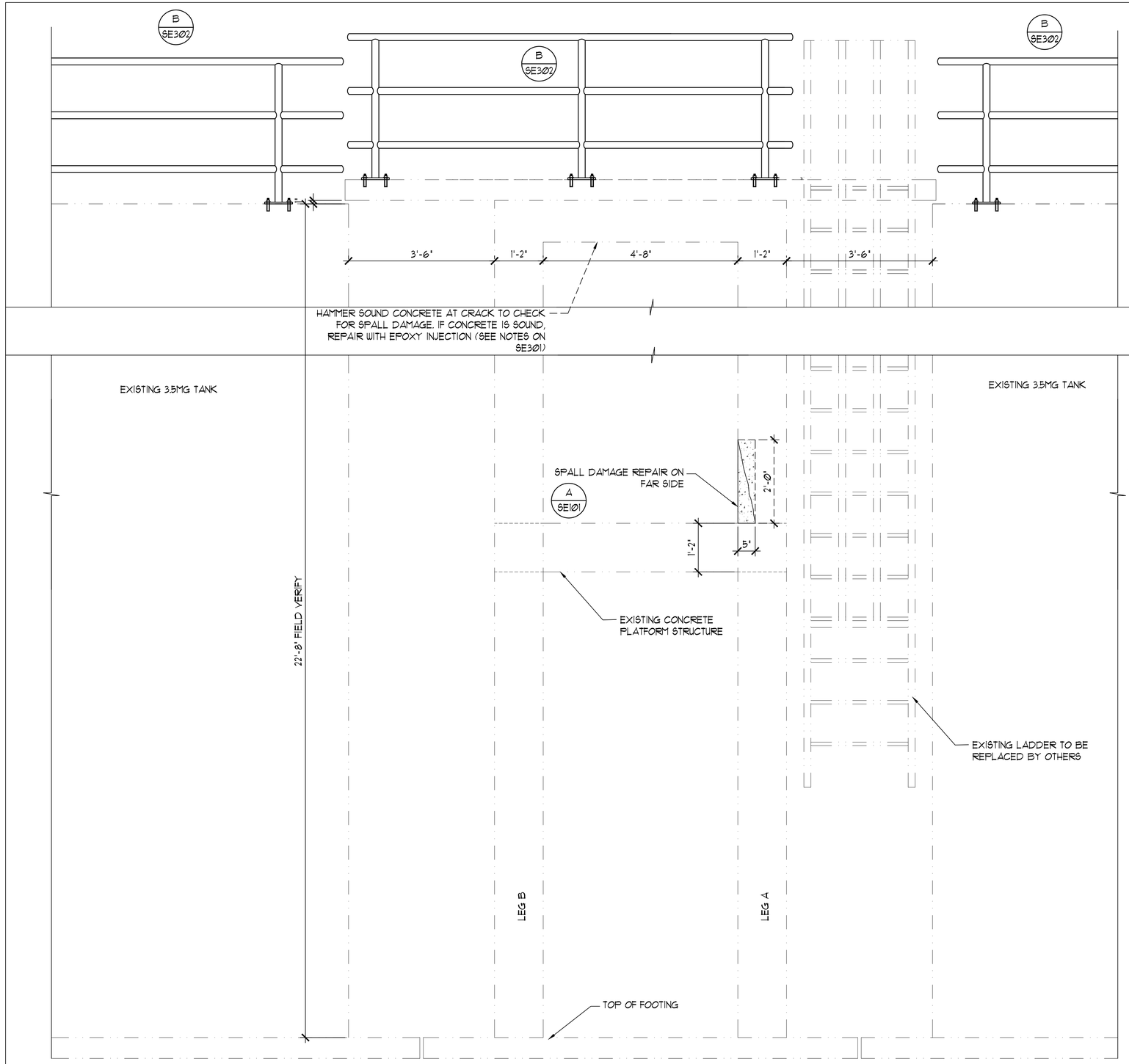
DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 300 Phone (808) 536-7986 email alee@tanimuraeng.com
Honolulu, Hawaii 96813 Fax: (808) 537-9022

FEBRUARY 2018

SE301
12 24

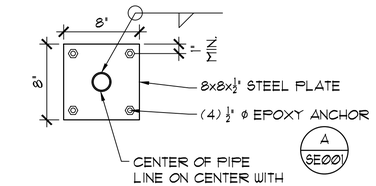
FILE: Site 4 EMERGENCY Repairs Structural.dwg
DATE REV.: 22/05/2018



CONCRETE STRUCTURE REPAIR ELEVATION

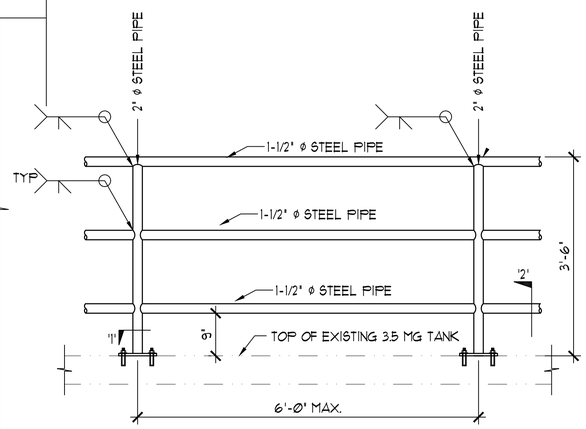
SCALE: 3/4" = 1'-0"

A
SE302

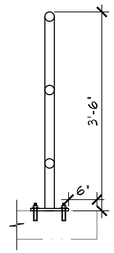


'1' BASE PLATE DETAIL

SC: 1 1/2"=1'-0"



HOT DIP GALVANIZE ALL STEEL SHAPES AND PLATES



'2' SECTION AT NEW RAILING

SC: 3/4"=1'-0"

NEW RAILING ELEVATION

SCALE: 3/4" = 1'-0"

B
SE302

DAMAGE CHART FOR BRIDGE STRUCTURE

ITEM	LOCATION	VOL. (FT^3)	DESCRIPTION
1	A	0.5	SPALL DAMAGE

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

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Adrian Lee

SE302
13 24

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

CONCRETE STURCTURE REPAIR ELEV.

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
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Honolulu, Hawaii 96813 Fax: (808) 537-9022

FEBRUARY 2018

FILE: Site 4 EMERGENCY Repairs Structural.dwg
DATE REV.: 22/05/2018

GENERAL NOTES

1. PROVIDE POLYOLEFIN 200LB TEST PULLCORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.

2. ALL ELECTRICAL EQUIPMENT ENCLOSURES AND EQUIPMENT MOUNTING HARDWARE FOR OUTDOOR INSTALLATION SHALL BE TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.

3. WHERE POSSIBLE CONCEAL ALL RACEWAYS IN WALL OR ABOVE CEILINGS. GROUT, PATCH AND PAINT AFFECTED AREAS TO MATCH ADJACENT FINISH. WHERE RACEWAYS AND BOXES ARE EXPOSED, PAINT RACEWAYS AND BOXES TO MATCH ADJACENT FINISH.

4. EXPOSED CONDUITS SHALL BE ROUTED ALONG THE EDGES OF WALLS AND CEILINGS WHERE POSSIBLE TO MINIMIZE WALL SPACE OCCUPIED BY CONDUITS.

5. PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. CONTRACTOR SHALL VISIT JOBSITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF DEMOLITION AND NEW WORK PRIOR TO THE START OF CONSTRUCTION.

6. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL VISIT JOBSITE AND REPORT ANY DISCREPANCIES AND/OR DIFFERENCE IN DRAWINGS, WITH RESPECT TO EXISTING CONDITIONS, TO THE OWNER.

7. CONTRACTOR SHALL RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY CONTRACTOR'S FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.

8. BEFORE ANY ELECTRICAL OR TELECOM WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT SERVICES ARE NOT DISCONTINUED TO OTHER SPACES.

9. REMOVE ALL EXISTING EXPOSED CONDUIT AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CUT, CAPPED AND ABANDONED IN PLACE WITH ALL WIRES REMOVED.

10. PROVIDE METAL SEALS FOR ALL ABANDONED RACEWAY OPENINGS IN BOXES, CABINETS, AND EQUIPMENT ENCLOSURES; SEALS SHALL RETAIN NEMA RATING OF REMAINING BOXES, CABINETS, AND EQUIPMENT ENCLOSURES.

11. FOR EXISTING CIRCUITS WHERE SOME ELECTRICAL ITEMS ARE REMOVED, CONTRACTOR SHALL PROVIDE ALL NECESSARY RACEWAYS, WIRES, BOXES, ETC., PER NEC REQUIREMENTS, TO ENSURE ELECTRICAL CONTINUITY AND PROPER OPERATION OF REMAINING CIRCUIT COMPONENTS.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	FLEXIBLE CONDUIT, LIQUIDTIGHT
	CONDUIT OR DUCTLINE BELOW REF. FL. OR GROUND
	STUB, CAP & MARK CONDUITS WITH CONCRETE MARKER
E-OH	NEW OVERHEAD UTILITY LINES BY MECO
NOH	NEW OVERHEAD ELECTRICAL LINES
A C 2-4E 1-2T	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE, WITH DUCT COMPLEMENTS NOTED BELOW (TYPE "A" DUCT INDICATED WITH 2-4"E DUCTS, AND TYPE "C" DUCT WITH 1-2"T DUCT; E=ELECTRIC, T=TELEPHONE, A=ANTENNA CABLE C=CONTROLS, I=INSTRUMENTATION); SEE SHEET E-4 FOR DUCT SECTION DETAILS AND REQUIREMENTS
	ELECTRICAL PANELBOARD
J	JUNCTION BOX, CEIL. MTD., 4-11/16" NOM.
J	JUNCTION BOX, WALL MTD., 4-11/16" NOM.
C	OUTDOOR SECURITY CAMERA, FIXTURE TYPE AS INDICATED.
	OUTDOOR LIGHT FIXTURE, WALL MTD. FIXTURE TYPE AS INDICATED.
LA-25W	LIGHT FIXTURE DESIGNATIOR, INDICATES TYPE "LA" WITH 55W LAMP, SEE LIGHT FIXTURE SCHEDULE
CA-25W	CAMERA DESIGNATIOR, INDICATES TYPE "CA" WITH 25W CAMERA, SEE LIGHT FIXTURE SCHEDULE
E	EQUIPMENT CONNECTION
	2'X4' MECO CONCRETE HANDHOLE PER MECO REQUIREMENTS AND APPROVAL
	13" X 24" PULLBOX PER SANDWICH ISLES COMMUNICATION REQUIREMENTS AND APPROVAL
	12" X 20" ELECTRICAL PULLBOX SIMILAR TO MECO STANDARD PULLBOX REQUIREMENTS
WP	DENOTES "WEATHERPROOF"
SS	DENOTES "TYPE 316 STAINLESS STEEL"
DL	DENOTES "DAMP LOCATION"

NOTE:
NO HASH MARKS ON CONDUITS INDICATE 2 WIRES; -//- INDICATES 3 WIRES; -///- INDICATES 4 WIRES, ETC.

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

2018.03.20
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2018

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

GENERAL NOTES AND ELECTRICAL SYMBOLS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

OCTOBER 2017

DWG. NO.
E-1
SHEET 14 OF 24

SANDWICH ISLES COMMUNICATIONS' CONSTRUCTION NOTES
DECEMBER 9, 2016

GENERAL:

ALL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) AND SANDWICH ISLES COMMUNICATIONS (SIC), WHICH COMPLIES WITH ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL REQUIREMENTS.

ALL MATERIALS USED MUST BE APPROVED AND (OR) ACCEPTED BY SANDWICH ISLES COMMUNICATIONS, INC..

CONTRACTOR MAY REFER TO THE RUS WEBSITE (HTTP://WWW.RURDEV.USDA.GOV/RUSTELECOMPROGRAMS.HTML) FOR REGULATIONS, BULLETINS, FORMS, ETC.

CONTACT THE HAWAII ONE CALL CENTER AT (866) 423-7287 FOR LOCATING EXISTING UNDERGROUND FACILITIES PRIOR TO BEGINNING ANY EXCAVATION.

THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY FOR PROSECUTION OF THE WORK.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WORK SCHEDULES WITH ALL UTILITY COMPANIES, COUNTY, OR STATE AGENCIES REQUIRED FOR THIS PROJECT. THIS IS TO INCLUDE COORDINATION OF ANY INSPECTION AND SPECIFICATIONS BY THOSE UTILITY COMPANIES, COUNTY, OR STATE AGENCIES.

THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS RELATING TO THIS PROJECT BEFORE COMMENCING THE REQUIRED WORK.

THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES AND/OR CONDITIONS WHICH WOULD PREVENT HIM FROM FULFILLING THE TERMS OF THIS CONTRACT.

ALL SIC PULLBOXES THAT THE CONTRACTOR ENTERS FOR INSTALLATION OF FACILITIES MUST BE CLEARED OF STANDING WATER AND DEBRIS. CONTRACTOR SHALL ORGANIZE EXISTING CABLE FACILITIES, TO INCLUDE ADDING CABLE RACKS AND TYING DOWN EXISTING CABLE, IN ORDER TO ACCOMMODATE NEW FACILITIES BEING PLACED. CLEANING AND ORGANIZING OF PULLBOXES SHALL BE DONE TO THE SATISFACTION OF THE PROJECT MANAGER.

THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE OWNER AT COMPLETION OF THE PROJECT. AS-BUILT DRAWINGS REFER TO DOCUMENTS MAINTAINED AND ANNOTATED BY THE CONTRACTOR DURING CONSTRUCTION AND INCLUDE ANY CHANGES OR NEW INFORMATION FOUND OR ADDED THROUGHOUT CONSTRUCTION OF THE PROJECT.

CONDUITS:

1. ALL UNDERGROUND PVC CONDUITS, SWEEPS, COUPLINGS, ADAPTERS AND BELL ENDS SHALL BE SCHEDULE 40, UNLESS OTHERWISE SPECIFIED.

2. ALL HIGH DENSITY POLYETHYLENE CONDUITS SHALL BE SDR 11. TYPICAL 3-PACK UNIT INCLUDES THREE 1.5-INCH SDR 11 RATED CONDUITS IN THE COLORS OF BLACK, RED, AND ORANGE, UNLESS OTHERWISE SPECIFIED. ALL CONDUITS TO BE PRESSURE TESTED AT 120 PSI. FUSION SPLICING OF THE CONDUIT SHALL BE ACCEPTABLE ONLY WHEN PULLING JOINTS THROUGH BORES. ALL COUPLINGS SHALL BE DOUBLE "E-LOC" MANUFACTURED BY ETOC SPECIALTY PRODUCTS, INC.

3. MAIN CONDUIT RUNS, EXCEPT RISER CONDUITS, SHALL BE CONSTRUCTED WITH MINIMUM 6-FOOT RADIUS CURVES, UNLESS OTHERWISE APPROVED BY THE PROJECT MANAGER.

4. AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID MANDREL NOT LESS THAN 12-INCHES IN LENGTH AND HAVING A DIAMETER OF 1/4-INCH LESS THAN THE INSIDE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT. THE SIC PROJECT MANAGER SHALL BE PRESENT DURING ALL MANDREL TESTING. SUFFIXES LISTED IN RUS 515B FOR CONDUITS ARE APPLICABLE.

5. INSTALL MULETAPE IN ALL PVC CONDUITS TWO (2) INCH DIAMETER AND LARGER. THE NEPTCO MULETAPE (OR APPROVED EQUAL) IS AVAILABLE IN 3,000FT., 6,500FT., AND 10,000FT. REELS FROM WESTINGHOUSE ELECTRIC SUPPLY COMPANY (WESCO), THE NEPTCO MULETAPE IS PRE-LUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS. PVC CONDUITS WITH A DIAMETER OF 1.5-INCH OR LESS SHALL HAVE A POLY-LINE (P-LINE) INSTALLED. ALL DUCTS SHALL BE SEALED AFTER MULETAPE/P-LINE HAS BEEN INSTALLED, FOLLOWING THE SPECIFICATIONS BELOW.

6. ALL CONDUITS AND DUCTS SHALL BE PROPERLY SEALED USING COMMSCOPE, JACKMOON DUCT SEALS, APPLICABLE BUSHING SLEEVES AND BLANK DUCT PLUGS. THE CONDUIT DIAMETER, INSIDE DIAMETER AND CABLE SIZE(S) SHALL BE TAKEN INTO CONSIDERATION WHEN ORDERING AND INSTALLING "JACKMOON" DUCT SEALS.

   COMMSCOPE JACKMOON SEALS SHALL BE:
   2-INCH CONDUIT: TRIPLEX DUCT SEALS, SERIES 70
   3-INCH CONDUIT: TRIPLEX DUCT SEALS, SERIES 136
   3.5-INCH AND LARGER CONDUIT: QUADPLEX DUCT SEALS, SERIES 136

   ALL OTHER DUCTS SHALL HAVE COMMSCOPE, BLANK JACKMOON PLUGS TO KEEP THEM FREE OF WATER AND DEBRIS.

7. CONDUIT STUBS FROM HANDHOLES TO INDIVIDUAL RESIDENTIAL LOTS SHALL BE SCHEDULE 40 PVC, 1-INCH DIAMETER AND EXTENDED 5-FEET BEYOND PROPERTY LINE. CAP AND SEAL END AND MARK LOCATIONS WITH ABOVE GROUND MARKER.

8. ALL CONDUITS SHALL ENTER MANHOLES AT A 90 DEGREE ANGLE AND SHALL EXTEND INTO THE MANHOLE AS FOLLOWS: CONDUITS DESIGNATED FOR FIBER SHALL EXTEND 12-INCHES INTO THE MANHOLE. ALL OTHER CONDUITS SHALL BE FLUSH WITH THE INSIDE WALL AND INCLUDE BELL ENDS. ANY EXCEPTIONS SHALL ONLY BE PERMITTED WHEN SPECIFIED BY THE PROJECT MANAGER.

9. ALL CONDUITS ENTERING MANHOLES OR HANDHOLES SHALL BE GROUTED BETWEEN THE CONDUITS AND SIDEWALL, INSIDE AND OUT. ALL CONDUITS WILL ENTER THE MANHOLES AND HANDHOLES ON THE PROPERTY SIDE AT ALL TIMES UNLESS OTHERWISE SPECIFIED BY THE PROJECT MANAGER.

10. BACKFILL AND COMPACTION FOR DUCTLINE TRENCHES, MANHOLES AND HANDHOLES, SHALL BE IN ACCORDANCE WITH:

    A. STATE HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION WITH LATEST AMENDMENTS, IF CONSTRUCTION IS LOCATED UNDER A STATE STREET OR ROAD, OR LOCATED IN PRIVATE PROPERTY.

    B. THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 1994, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, WITH LATEST AMENDMENTS; COUNTY OF KAUAI, MAUI, OR HAWAII, AS THE CASE MAY BE, IF CONSTRUCTION IS LOCATED UNDER COUNTY STREETS AND ROADS.

11. BACKFILLING SHALL BE SUBJECT TO THE APPROVAL OF THE SIC PROJECT MANAGER, THE AUTHORIZED REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII AND/OR DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, COUNTY OF KAUAI, MAUI OR HAWAII, AS THE CASE MAY BE.

12. A THIRD PARTY GEOTECHNICAL ENGINEER, LICENSED AND INSURED IN THE STATE OF HAWAII, MUST CERTIFY THAT THE EXCAVATED AREA MEETS THE GOVERNING AGENCIES AND/OR OWNERS STANDARDS FOR BACKFILL AND COMPACTION.

13. EXCAVATED MATERIAL MAY BE REUSED AS BACKFILL, PROVIDING THAT IT CONFORMS TO REQUIREMENTS OF TYPE "TA" AND TYPE "TB" BACKFILL, AS REQUIRED WITHIN THE STANDARD SPECIFICATIONS. A WRITTEN SOILS REPORT OF CONFORMANCE BY A LICENSED THIRD PARTY GEOTECHNICAL ENGINEER IS NEEDED PRIOR TO BACKFILL USING THE EXCAVATED MATERIAL.

    A. TYPE A BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

    B. TYPE B BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1/2-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

14. ALL CONDUIT RUNS SHALL HAVE A 3-INCH NON-METALLIC WARNING TAPE PLACED 12-INCHES ABOVE THE CONDUIT RUN. THE TAPE SHALL READ "CAUTION BURIED FIBER OPTIC CABLE BELOW".

MANHOLES AND HANDHOLES:

1. ALL MANHOLES SHALL HAVE HS20-44 TRAFFIC LOADING COVERS (UNLESS OTHERWISE NOTED). HANDHOLES SHALL HAVE 20K TRAFFIC LOAD RATED COVERS.

2. ALL MANHOLE AND HANDHOLE COVERS SHALL HAVE COVER LOGO TO READ "SIC".

3. ALL MANHOLE AND HANDHOLE COVER BOLTS SHALL BE STAINLESS STEEL 3/4-INCH PENTAHEAD, UNLESS OTHERWISE NOTED.

4. ALL MANHOLES AND HANDHOLES ARE SPECIFIED AS FOLLOWS:

    A. UM35 AND UM46 MANHOLE - CONSISTS OF A REINFORCED CONCRETE MANHOLE WITH CAST IRON LID AND RISERS (IF REQUIRED). ALL MANHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

    B. UH35 AND UH46 HANDHOLE - CONSISTS OF A REINFORCED CONCRETE HANDHOLE WITH TRAFFIC RATED HINGED COVERS (UH35) OR SIX TRAFFIC RATED SLIP-NOT COVERS (UH46) AND RISERS (IF REQUIRED). ALL HANDHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

    C. UHC30X48X33 HANDHOLE (PULLBOX) - CONSISTS OF A TWO-TIER ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001430TA-SIC4).

    D. UHC13X24X30 HANDHOLE (PULLBOX) - CONSISTS OF AN ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001946TA-SIC1).

5. ALL MANHOLES AND HANDHOLES TO BE ORDERED WITH ALL HARDWARE, INCLUDING CABLE RACKS, STEPS AND LOCKS.

6. SET MANHOLE OR HANDHOLE ON A LEVEL AREA, IN THE BOTTOM OF THE EXCAVATION, ON A 4-INCH LAYER OF CRUSHED ROCK, FOR DRAINAGE PURPOSES.

7. THE BASE OF ALL MANHOLES AND HANDHOLES WILL BE PLACED LEVEL. SOME MANHOLES HAVE ADJUSTABLE FRAMES. ALL VOIDS CREATED DURING INSTALLATION MUST BE FILLED WITH MORTAR MIX OR CONCRETE. THIS IS ESPECIALLY TRUE FOR MANHOLES AND HANDHOLES SET IN ROADWAYS.

8. BEFORE BACKFILLING AND COMPACTING, MAKE SURE COVERS ARE IN PLACE AND SECURE. LAYER 6-INCHES TO 8-INCHES OF BACKFILL MATERIAL AROUND THE MANHOLE OR HANDHOLE. "TAMP" EACH INDIVIDUAL LAYER OF BACKFILL MATERIAL. CONTINUE THE LAYERING AND "TAMPING" UNTIL FINAL GRADE IS ACHIEVED.

9. THE TOPS OF ALL MANHOLES AND HANDHOLES SHALL BE FLUSH TO GRADE IN PAVED AREAS OR 1-INCH ABOVE FINISH GRADE IN NON-PAVED AREAS, UNLESS OTHERWISE SPECIFIED BY PROJECT MANAGER.

10. PROVIDE A 5/8-INCH DIAMETER X 8-FOOT COPPER CLAD GROUND ROD AT HANDHOLES AND MANHOLES AS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER.

11. FIELD MODIFICATIONS ARE ACCOMPLISHED BY USING A FINE TOOTHED SAW. RACKS OR OTHER EQUIPMENT MAY BE SECURED TO THE SIDE OF THE VAULT BY USE OF TOGGLE BOLTS, MOLLY BOLTS, ETC. AND MUST BE APPROVED BY THE PROJECT MANAGER.

SIC CONSTRUCTION NOTES
UTILITY POLE INSTALLATION:

1. ALL AERIAL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) BULLETIN 1753F-152.

2. UTILITY POLES SHALL BE PRESERVED UTILIZING THE PENTACHLOROPHENOL (PENTA) TYPE TREATMENT.

3. UTILITY POLES SHALL BE TERMITE PROTECTED UTILIZING TERMIMESH POLESOCK'S OR EQUIVALENT. POLESOCK'S SHALL EXTEND NO MORE THAN EIGHT INCHES ABOVE GROUND AND BE SECURED WITH STAINLESS STRAPPING. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.

4. THE POLE HOLE SHALL BE OF SUFFICIENT DIAMETER TO PERMIT THE POLE TO SETTLE FREELY TO THE BOTTOM OF THE HOLE WITHOUT TRIMMING THE BUTT AND STILL HAVE SUFFICIENT SPACE BETWEEN THE POLE AND THE SIDE OF THE HOLE TO PERMIT PROPER TAMPING OF THE BACKFILL AT EVERY POINT AROUND THE POLE, AND THROUGHOUT THE ENTIRE DEPTH OF THE HOLE.

5. THE POLE HOLE SHALL NOT EXCEED TWO TIMES THE DIAMETER OF THE POLES BUTT DIAMETER.

6. BACKFILL SHALL BE THOROUGHLY TAMPED THE FULL DEPTH OF THE POLE HOLE. EARTH MUST BE BANKED AROUND THE POLE TO A MINIMUM HEIGHT OF SIX INCHES ABOVE GROUND LEVEL.

7. POLES SHALL BE SET PLUMB EXCEPT AT CORNERS WHERE THEY SHALL BE SET AND RAKED AGAINST THE LOAD SO THAT THE POLE TOP WILL BE IN LINE AFTER THE LOAD IS APPLIED. THE RAKE POLE SHALL NOT EXCEED SIX INCHES FOR EACH TEN FEET OF POLE LENGTH AFTER THE CONDUCTORS ARE INSTALLED AT THE REQUIRED TENSION. DEADEND SHALL BE SET SO AS TO BE PLUMB AND IN LINE AFTER THE LOAD IS APPLIED.

8. POLE LIGHTNING PROTECTION SHALL BE A #6 AWG BARE COPPER WIRE IN ACCORDANCE WITH SIC/RUS CONSTRUCTION PRACTICES.

9. SUSPENSION STRAND / HARDWARE SHALL BE CLASS C GALVANIZED STEEL UTILITY GRADE FOR CORROSION AREAS.

10. GUY GUARDS, YELLOW IN COLOR SHALL BE PLACED ON ALL DOWN GUYS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

SANDWICH ISLES COMMUNICATIONS NOTES

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

2018.03.20
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2018

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
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Phone: (808)941-0577 Fax: (808)945-2646

OCTOBER 2017

DWG. NO. E-2
SHEET 15 OF 24

LAST_EDIT
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OVERALL ELECTRICAL SITE PLAN

SCALE: 1"=300'

NORTH

300' 150' 0 300' 600' 900'

SCALE: 1"=300'

GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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LICENSE EXP. DATE: APRIL 30, 2018

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

OVERALL ELECTRICAL SITE PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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OCTOBER 2017

DWG. NO. E-3

SHEET 16 OF 24

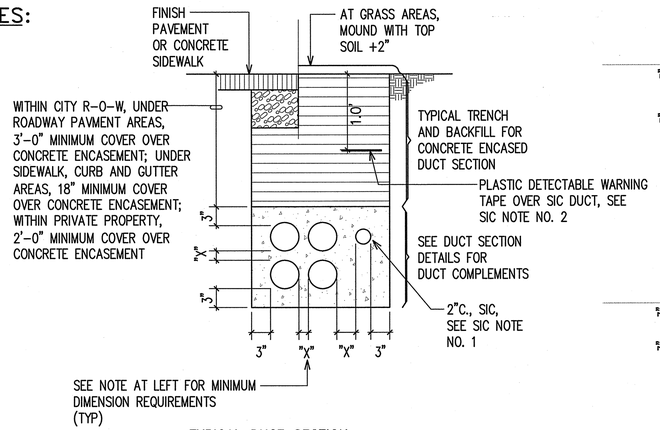
DUCT SECTION BACKFILL NOTES:

TYPE "A" BACKFILL – EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX. & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

TYPE "B" BACKFILL – EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

NOTE – IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.

CONCRETE – 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.



TYPICAL DUCT SECTION

DESIGNATION DESCRIPTIONS

ELEC = UTILITY CO. PRIMARY OR SECONDARY ELECTRIC
TEL = UTILITY CO. TELEPHONE
PWR = PRIMARY OR SECONDARY ELECTRIC
CTL = CONTROL
SIG = INSTRUMENTATION OR ANTENNA CABLE

MINIMUM "X" DIMENSION
DUCT SEPARATION REQUIREMENTS

ELEC – ELEC = 1 1/2"

ELEC – TEL = 3"

TEL – TEL = 1 1/2"

ELEC – CTL/SIG = 3"

TEL – CTL/SIG = 1 1/2"

PWR – CTL/SIG = 3"

ELEC – PWR = 1 1/2"

TEL – PWR = 3"

PWR – PWR = 1 1/2"

CTL/SIG – CTL/SIG = 1 1/2"

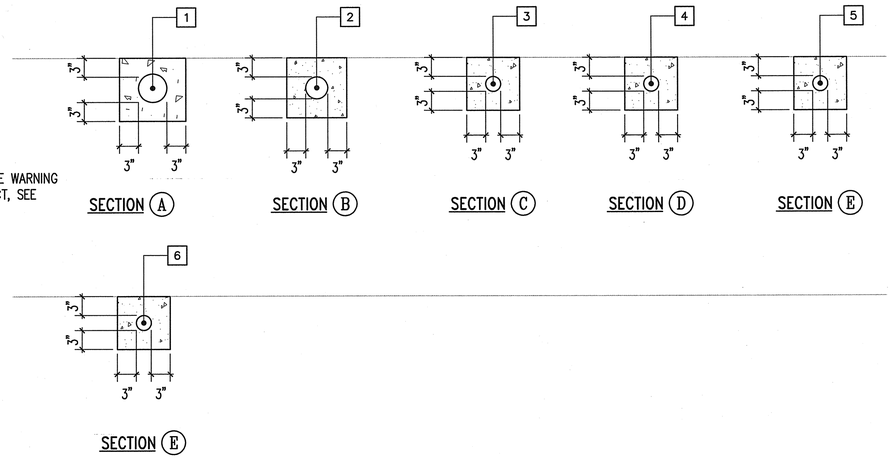
MINIMUM OF 3" CONCRETE ENCASEMENT AROUND DUCTBANK

WHERE DUCTLINE CROSSES OVER WATER LINE, PROVIDE THE FOLLOWING:

1. 6" MINIMUM SEPARATION BETWEEN DUCTLINES AND WATER LINE.
2. PROVIDE CONCRETE JACKET AROUND DUCTLINES.
3. PROVIDE ONLY TYPE "B" BACKFILL AROUND WATER LINE.

SANDWICH ISLES COMMUNICATION (SIC) DUCTLINE NOTES:

1. CONTRACTOR SHALL PLACE NEPTCO WP 1800P MULETAPE, OR APPROVED EQUAL, IN EACH DUCT THROUGHOUT ITS ENTIRE LENGTH WITH PROTRUSIONS OF 2 FEET IN MANHOLES AND HANDHOLES AT EACH END, AND 1 FOOT IN PULLBOXES. MULETAPE IS RATED FOR 1800 LB PULL AND HAS FOOTAGE MARKINGS FOR MEASURING DUCT LENGTHS.
2. CONTRACTOR SHALL PLACE 8-MIL ORANGE COLORED PLASTIC WARNING TAPE, NOT LESS THAN 4" WIDE, ENTIRE LENGTH OF TRENCH FOR ALL UNDERGROUND INSTALLATIONS. TAPE SHOULD READ "WARNING–STOP DIGGING–CALL SIC, COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION".



DUCT SECTION DETAILS AND REQUIREMENTS

NOT TO SCALE

DUCT AND WIRE SCHEDULE

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	3"	SEE ONE-LINE DIAGRAM	SECONDARY POWER FROM MECO POLEMOUNTED TRANSFORMER TO NEW METER
2	2"	PC (SEE SIC NOTE NO. 1)	TELEPHONE CABLES BY SIC
3	1"	2#12, 1#12 GND	POWER TO POLE MOUNTED LIGHT
4	1"	6#12, 1#12 GND	POWER TO ELECTRICAL PULLBOX
5	1"	CAT6 CABLE	CAMERA VIDEO STREAM CABLE BACK TO TELEPHONE CABINET
6	1"	CAT6 CABLE	ANTENNA CABLE
7			
8			

NOTES:
1. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
2. PC INDICATED PROVIDE PULLCORD.

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

DUCT SECTION DETAILS AND REQUIREMENTS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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OCTOBER 2017

DWG. NO.
E-4
SHEET 17 OF 24

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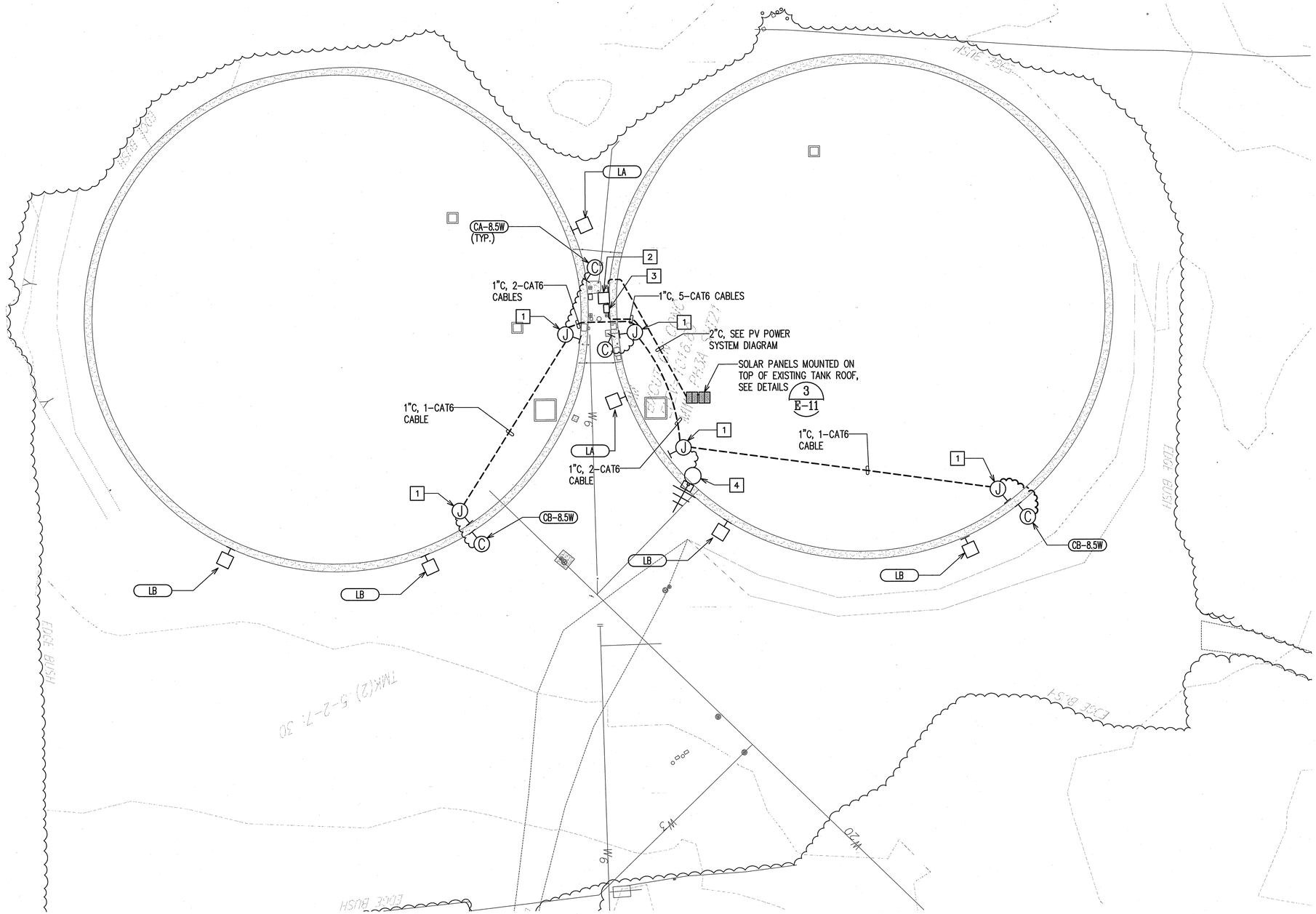

NOTES:

1. 6"SQ X 6"D NEMA 4XSS JUNCTION BOX CHANNEL MOUNTED.
2. BATTERY ENCLOSURE SECURED TO CONCRETE PAD WITH STAINLESS STEEL HARDWARE; AS REQUIRED. ENCLOSURE DMENSIONS SHALL BE SIZED TO ACCOMODATE THE BATTERIES BEING PROVIDED.
3. CONTROLS CABINET SECURED TO CONCRETE PAD WITH STAINLESS STEEL HARDWARE; AS REQUIRED. ENCLOSURE DIMENSIONS SHALL BE SIZED TO ACCOMODATE THE PV SYSTEM CONTROLS BEING PROVIDED.
4. RADIO ANTENNA MOUNTED TO TANK. UBIQUITY PBE-5AC-500 WIRELESS BRIDGE OR PRE-APPROVED EQUAL. CONTRACTOR TO ADJUST IN FIELD TO CONNECT WITH KANAKALOLOA CEMETERY SITE
5. CAMERAS TO BE MTD. 15' AFF.
6. LIGHT FIXTURES TO BE MTD. AT TOP OF TANK.
7. CONDUIT SHALL BE SUPPORTED BY TYPE 316 UNISTRUT CHANNELS THAT ARE MOUNTED TO THE TANK. PROVIDE STAINLESS STEEL MOUNTING HARDWARE AS NECESSARY. UNISTRUT SHALL BE MIRO 16-BASE STRUT-12 OR APPROVED EQUAL..

1 HOOLEHUA RESERVOIR ELECTRICAL SITE PLAN

E-5 SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

DWG. NO. E-5

SHEET 18 OF 24

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

HOOLEHUA RESERVOIR ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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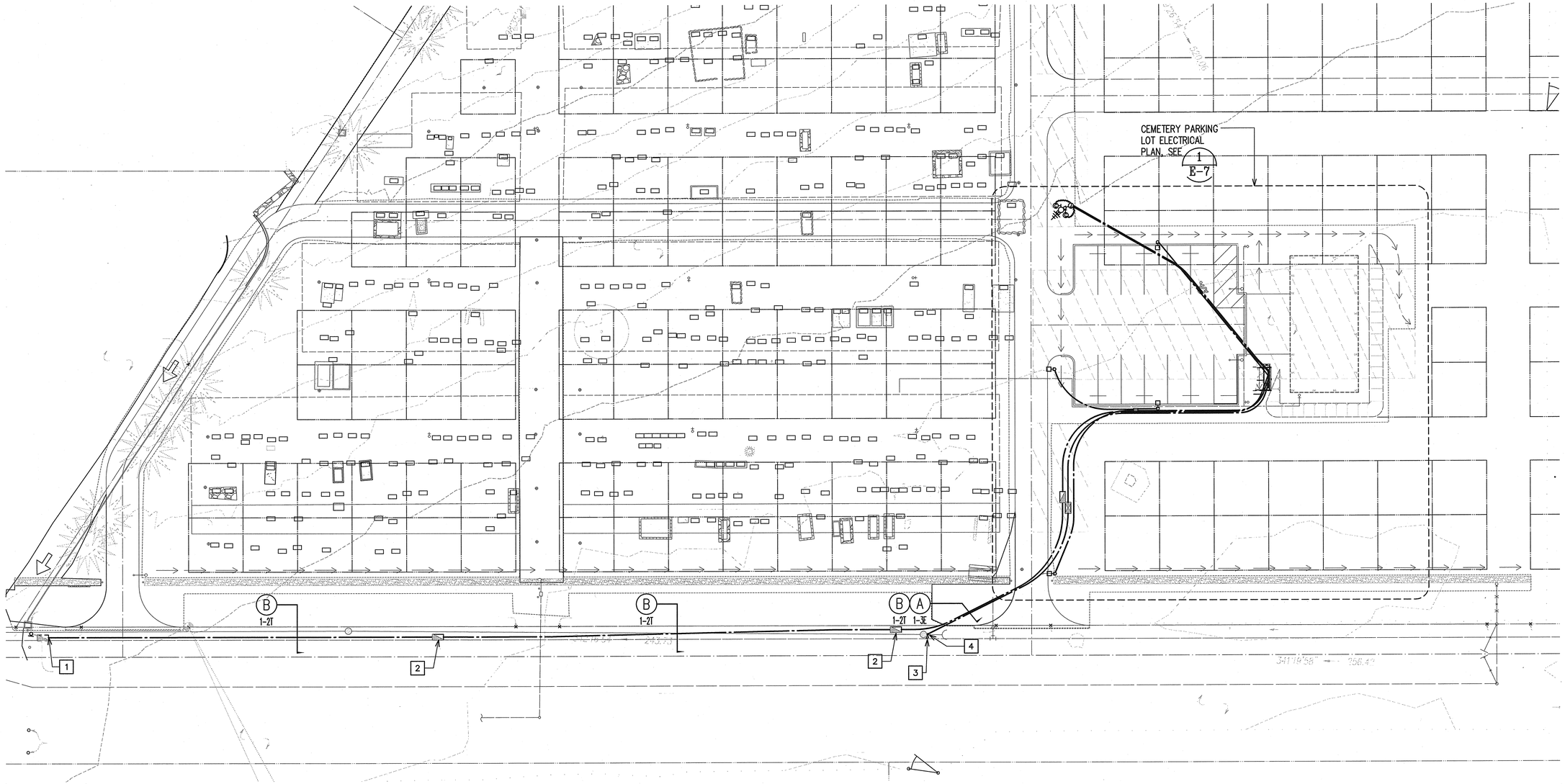

1 / E-6 KANAKALOLOA CEMETERY SITE PLAN

SCALE: 1"=20'

NORTH

NOTES:

1. BREAK AND PATCH EXISTING SIC PULLBOX AND EXTEND SIC DUCTLINES AS INDICATED.
2. NEW 2'X4' SIC PULLBOX.
3. EXISTING MECO UTILITY POLE WITH PROPOSED POLE TOP TRANSFORMER (BY MECO).
4. LONG RADIUS BEND CONDUIT RISER UP POLE PER MECO REQUIREMENTS AND APPROVAL.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

DWG. NO. E-6
SHEET 19 OF 24

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STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

KANAKALOLOA CEMETERY SITE PLAN

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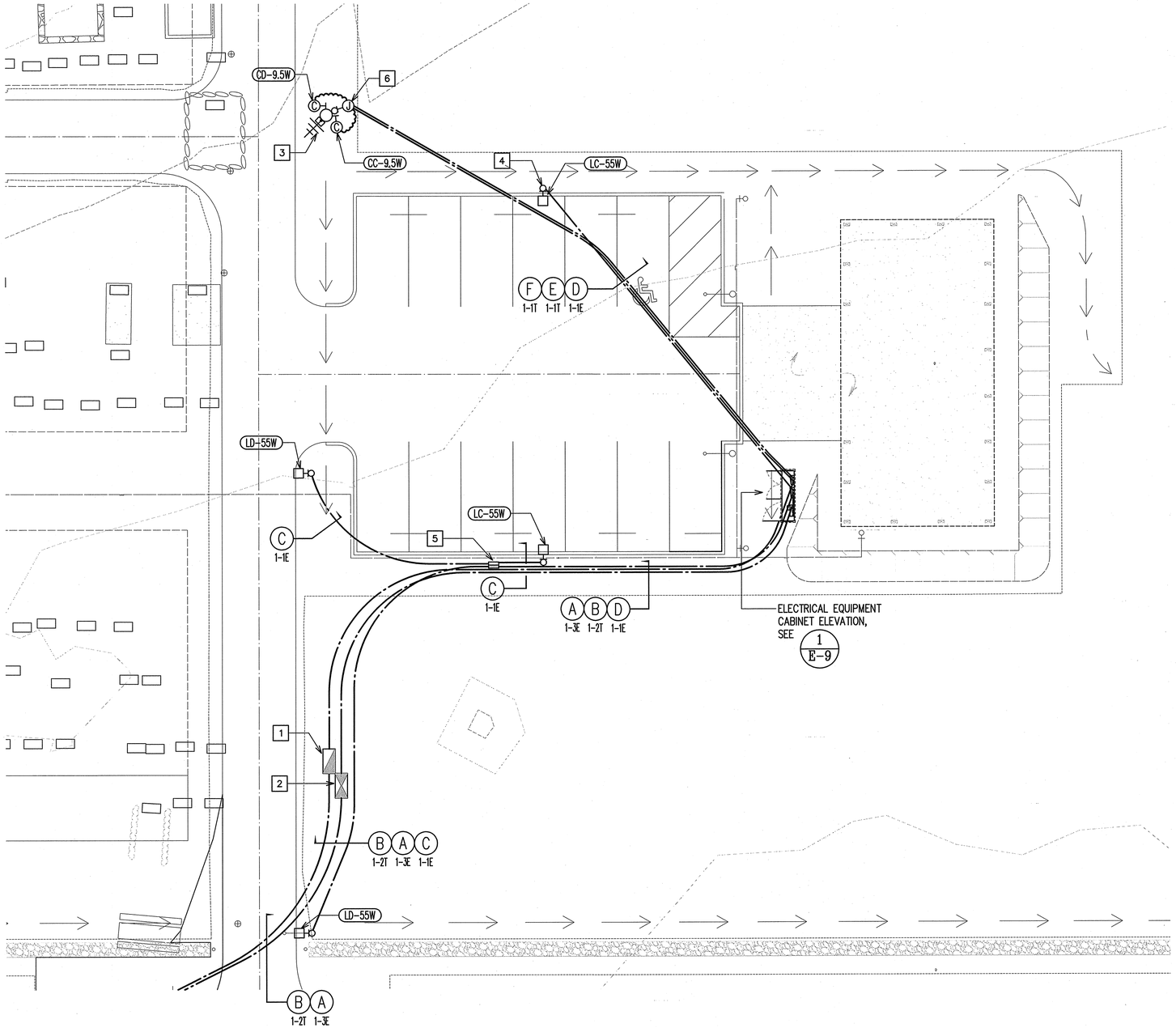

NOTES:

1. NEW 2'X4' SIC PULLBOX.
2. NEW 2'X4' MECO PULLBOX.
3. NEW RADIO ANTENNA MOUNTED TO POLE. UBIQUITY PBE-5AC-500 WIRELESS BRIDGE OR PRE-APPROVED EQUAL. CONTRACTOR TO ADJUST IN FIELD TO CONNECT WITH HOOLEHUA RESERVOIR.
4. SEE POLE DETAIL ON SHEET 1/E-11. TYPICAL OF ALL LIGHT AND CAMERA POLES.
5. NEW 12" X 20" ELECTRICAL PULLBOX.
6. NEW POLE MOUNTED NEMA 4X 12"SQ X 6"D JUNCTION BOX FOR CAMERA AND RADIO NETWORK SWITCH.

7. NEW NETWORK VIDEO RECORDER TO BE INSTALLED IN THE MAIN OFFICE AT THE DHHL BASEYARD. CONTRACTOR TO COORDINATE INSTALLATION WITH DEPARTMENT OF HAWAIIAN HOME LANDS. NETWORK VIDEO RECORDER TO BE PELCO DSSRV2-160-US OR APPROVED EQUAL. CONTRACTOR TO PROVIDE NECESSARY ETHERNET AND POWER CONNECTIONS TO LOCATION OF VIDEO RECORDER.

1/E-7 KANAKALOLOA CEMETERY ELECTRICAL PLAN

SCALE: 1"=10'

NORTH

10' 5' 0 10' 20' 30'

SCALE: 1"=10'

GRAPHIC SCALE

DWG. NO. E-7
SHEET 20 OF 24

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STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

KANAKALOLOA CEMETERY ELECTRICAL PLAN

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LIGHT FIXTURE SCHEDULE

TYPE	LAMP/ WATTS	DESCRIPTION	MANUFACTURER OR PRE-APPROVED EQUAL
LA	LED 3000°K	4.4"H X 16.1"W X 23.6"D LED ENCLOSED, LOW COPPER ALUMINUM ENCLOSURE AND MOUNTING ARM, ARCHITECTURAL GRADE TGIC POWDER COAT, STAINLESS FASTENERS, SOLAR POWRED, 100,000 HRS AT L70, TYPE II DISTRIBUTION	FIRST LIGHT SCL2 SERIES, OR PRE-APPROVED EQUAL
LB	LED 3000°K	SAME FIXTURE AS TYPE LA BUT WITH TYPE IV DISTRIBUTION	FIRST LIGHT SCL2 SERIES, OR PRE-APPROVED EQUAL
LC	55W LED 3000°K	4.125"H X 11.25"W X 16.75"D LED ENCLOSED, DIE CAST ALUMINUM HOUSING, CORROSION RESISTANT POLYESTER FINISH, TYPE II DISTRIBUTION, 120V	BEACON VPS-24L-55-3K7-3, OR PRE-APPROVED EQUAL
LD	55W LED 3000°K	SAME FIXTURE AS TYPE LC BUT WITH TYPE III DISTRIBUTION	BEACON VPS-24L-55-3K7-3, OR PRE-APPROVED EQUAL

CAMERA SCHEDULE

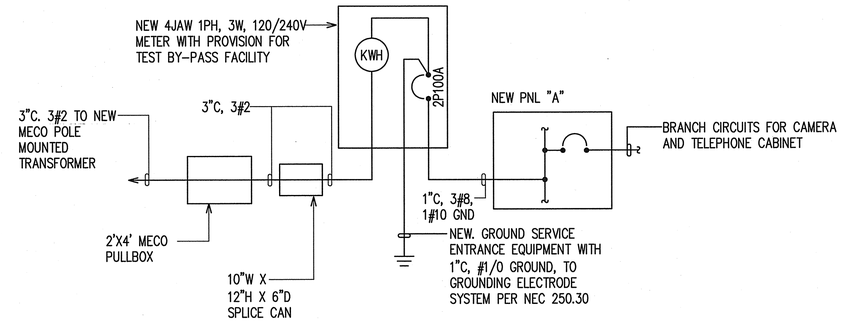
TYPE	WATTS	DESCRIPTION	MANUFACTURER OR PRE-APPROVED EQUAL
CA	8.5W	3MP RESOLUTION AT 12 FPS, DAY & NIGHT FUNCTIONALITY, 3-9.8MM LENS , 3-YEAR WARRANTY, WALL MOUNTING BRACKET, IP66 ENCLOSURE	SARIX IBE329-IR, OR PRE-APPROVED EQUAL
CB	8.5W	3MP RESOLUTION AT 12 FPS, DAY & NIGHT FUNCTIONALITY, 3-9.8MM LENS , 3-YEAR WARRANTY, WALL MOUNTING BRACKET, IP66 ENCLOSURE, ADDITIONAL IR LED	SARIX IBE329-IR, OR PRE-APPROVED EQUAL PELCO IR-940S-30 INFRARED ILLUMINATOR, OR PRE-APPROVED EQUAL
CC	9.5W	5MP RESOLUTION AT 20 FPS, DAY & NIGHT FUNCTIONALITY, 75 DEGREE HORIZONTAL VIEW, POLE MOUNTING BRACKET, IP67 ENCLOSURE	HIKVISION DS-2CD2T55FWD-I5, OR PRE-APPROVED EQUAL
CD	9.5W	5MP RESOLUTION AT 20 FPS, DAY & NIGHT FUNCTIONALITY, 30 DEGREE HORIZONTAL VIEW, POLE MOUNTING BRACKET, IP67 ENCLOSURE	HIKVISION DS-2CD2T55FWD-I5, OR PRE-APPROVED EQUAL

NEW PANEL "A"

100 A MAIN LUGS ONLY
240/ 120 VOLTS, 1-PHASE, 4-WIRE
10,000 A.I.C. INDUSTRIAL-BOLTED TYPE, CHANNEL MOUNTED

CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER POLE	BREAKER AMPS	WIRE SIZE	KVA ON BUSSES L1	KVA ON BUSSES L1	KVA ON BUSSES L2	KVA ON BUSSES L2	WIRE SIZE	BREAKER POLE	BREAKER AMPS	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.
1	CAMERA	1	20	12	0.1	0.1				1	20	TELEPHONE CABINET	2
3	AREA LIGHT	1	20	12			0.3	0.0				PFB	4
5	PFB				0.0	0.0						PFB	6
	CONNECTED LOAD PER PHASE					0.2		0.3					
	DEMAND LOAD PER PHASE					0.2		0.3					

TOTAL CONNECTED LOAD (KVA)	0.5
DEMAND FACTOR	100%
TOTAL DEMAND LOAD (KVA)	0.5
HIGH LEG (AMPS)	2.5



1/E-8 ONE-LINE DIAGRAM

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

SCHEDULES AND ONE-LINE DIAGRAM

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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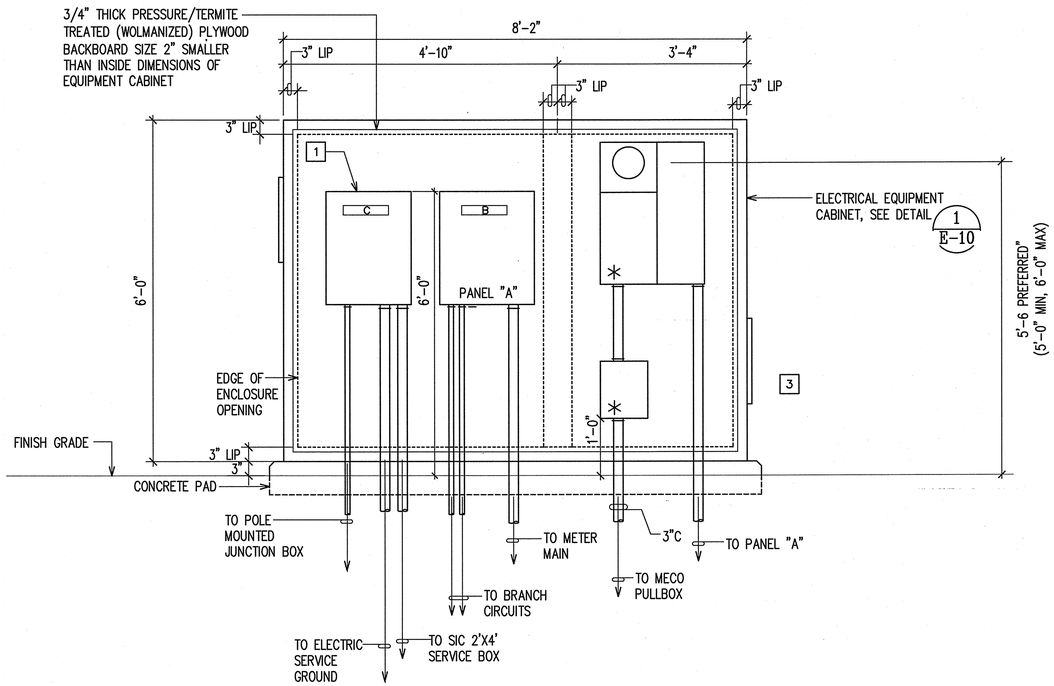
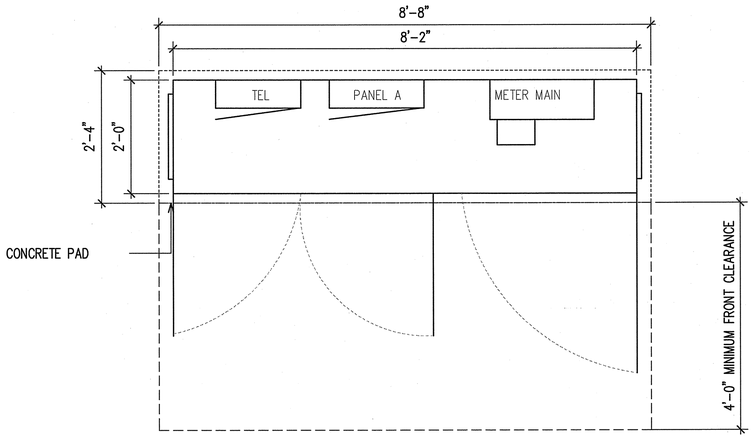
DWG. NO. E-8
SHEET 21 OF 24



ELEVATION



PLAN

1 ELECTRICAL EQUIPMENT CABINET ELEVATION
E-9 NOT TO SCALE

NAMEPLATES

ITEM	DESCRIPTION
A	
B	PANEL "A"
C	TELEPHONE CABINET
D	
E	
F	
G	
H	
J	
K	
L	
M	
N	
P	
Q	
R	
S	

ABOVE NAMEPLATES TO BE 9" X 2 1/4" X 1/8" DILECTO WITH 5/8" WHITE LETTERING & BEVELED EDGES

NOTES:

1. 18"W X 24"H X 6"D NEMA 1 TELEPHONE CABINET WITH 3/4" THICK TERMITE TREATED PLYWOOD BACKBOARD AND 3/4"C, 1#6 GND. TO ELEC. SERVICE GND ROD. PROVIDE MIN. 3'-0" SLACK ON GND CONDUCTOR AFTER BONDING GND. CONDUCTOR TO TEL. CAB. CONDUITS SHALL ENTER THE CABINET AT THE BOTTOM RIGHT AND LEFT AS SHOWN. OBTAIN SIC APPROVAL
2. COMBINATION METER SOCKET, MAIN CIRCUIT BREAKER, NEMA 1 (120/240V, 1ø, 3W SERVICE)
3. PULLBOX, SEALABLE, 10"W X 12"H X 6"D, NEMA 1
4. ALL EQUIPMENT ENCLOSURES IN EQUIPMENT CABINET SHALL BE NEMA 1 TYPE.
5. CONTRACTOR SHALL VERIFY EQUIPMENT ENCLOSURE SIZE WITH ACTUAL EQUIPMENT BEING PROVIDED.
6. PROVIDE A MINIMUM OF 4 FEET CLEAR AND LEVEL WORKSPACE CLEARANCE IN FRONT OF ELECTRICAL EQUIPMENT CABINET.
7. "*" INDICATES PROVISION FOR HECO SEALS.
8. OBTAIN HECO SHOP DRAWING APPROVAL FOR PULLBOX AND METER SOCKETS.

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STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM AT HOOLEHUA 2-3.5 MG RESERVOIR SITE

JOB NO.

ELECTRICAL EQUIPMENT CABINET ELEVATION

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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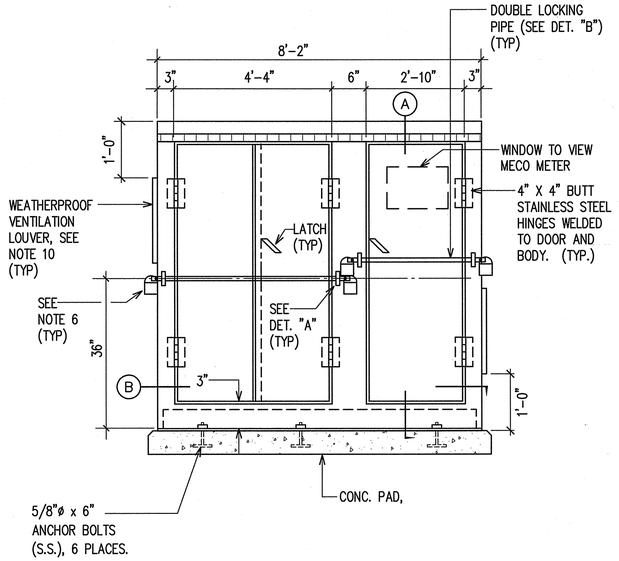
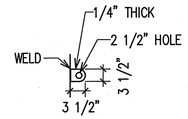
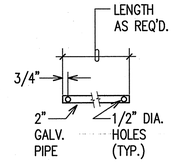
DWG. NO. E-9
SHEET 22 OF 24



ELEVATION OF CABINET

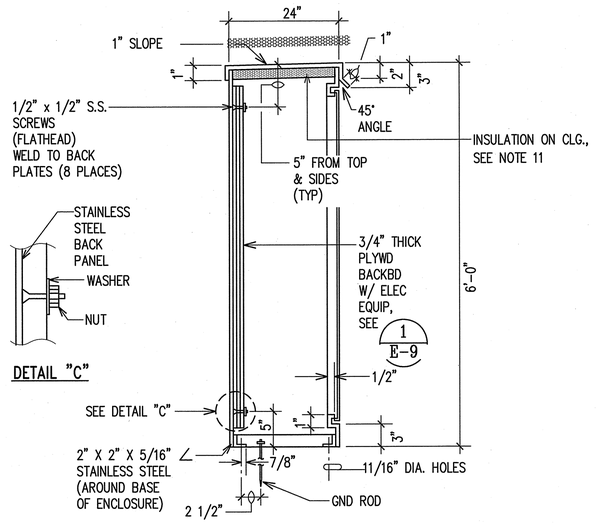


DETAIL "A"
SIDE VIEW



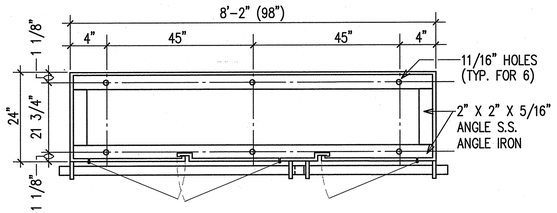
DETAIL "B"

EQUIPMENT CABINET DETAILS

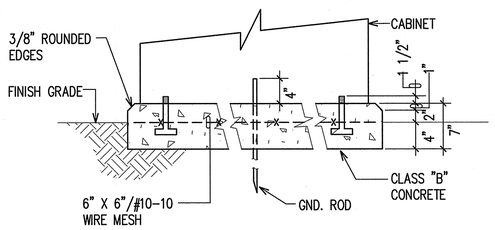


DETAIL "C"

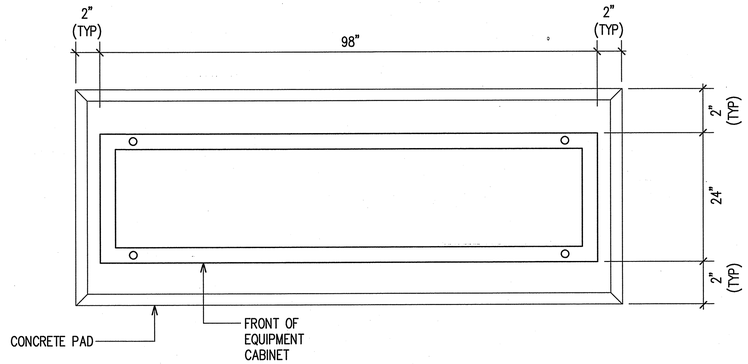
SECTION "A" THROUGH CABINET



SECTION "B"
(ANGLE FRAME)



SECTION THROUGH PAD



PLAN OF PAD

CONCRETE PAD DETAIL

EQUIPMENT ENCLOSURE NOTES:

1. CABINET TO BE PRIMED WITH ONE COAT SHOP PRIMER.
2. PLYWOOD TO BE TREATED (WOLMANIZED) PLYWOOD, EXTERIOR GRADE, 3/4" THICK.
3. CABINET SHALL BE MADE FROM 10 GAUGE TYPE 316 STAINLESS STEEL.
4. PROVIDE TWO COATS OF ACRYLIC, OUTSIDE, COLOR SHALL BE WHITE OR AS SELECTED BY THE OWNER.
5. ENCLOSURE SHALL BE NEMA 3R CONSTRUCTED WITH NEOPRENE GASKETING.
6. PADLOCKS:

   5 – CONTRACTOR FURNISHED. BRASS CORBIN SESAME COMBINATION.
7. SHOP FABRICATION DRAWINGS SHALL BE SUBMITTED FOR APPROVAL. CONTRACTOR SHALL PROVIDE HEIGHT AND WIDTH OF CABINET AS REQUIRED ACCORDING TO SIZES OF EQUIPMENT BEING INSTALLED IN CABINET. WITH EXTERIOR DOORS FULLY OPEN, ALL EQUIPMENT SHALL HAVE FRONT CLEARANCES PER N.E.C.
8. WASH CHANNEL WITH SOLUTION OF CHEMICAL PHOSPHORIC METAL ETCH & ALLOW TO DRY. APPLY 2 COATS OF GALVANIZED METAL PRIMER AND 2 COATS OF ENAMEL TO MATCH CABINET.
9. MOUNT EQUIPMENT SECURELY TO PLYWOOD BACKBOARD.
10. WEATHERPROOF VENTILATION LOUVER, 18"H X 18"W WITH REMOVABLE STAINLESS STEEL INSECT SCREEN ON THE INSIDE.
11. PROVIDE MINIMUM 1" THICK RUBATEX INSULATION WITH RUBATEX 374 COATING ON ENTIRE INTERIOR CEILING OF THE EQUIPMENT CABINET. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.

1 E-10 ELECTRICAL EQUIPMENT CABINET AND CONCRETE PAD DETAILS

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

ELECTRICAL EQUIPMENT CABINET AND CONCRETE PAD DETAILS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

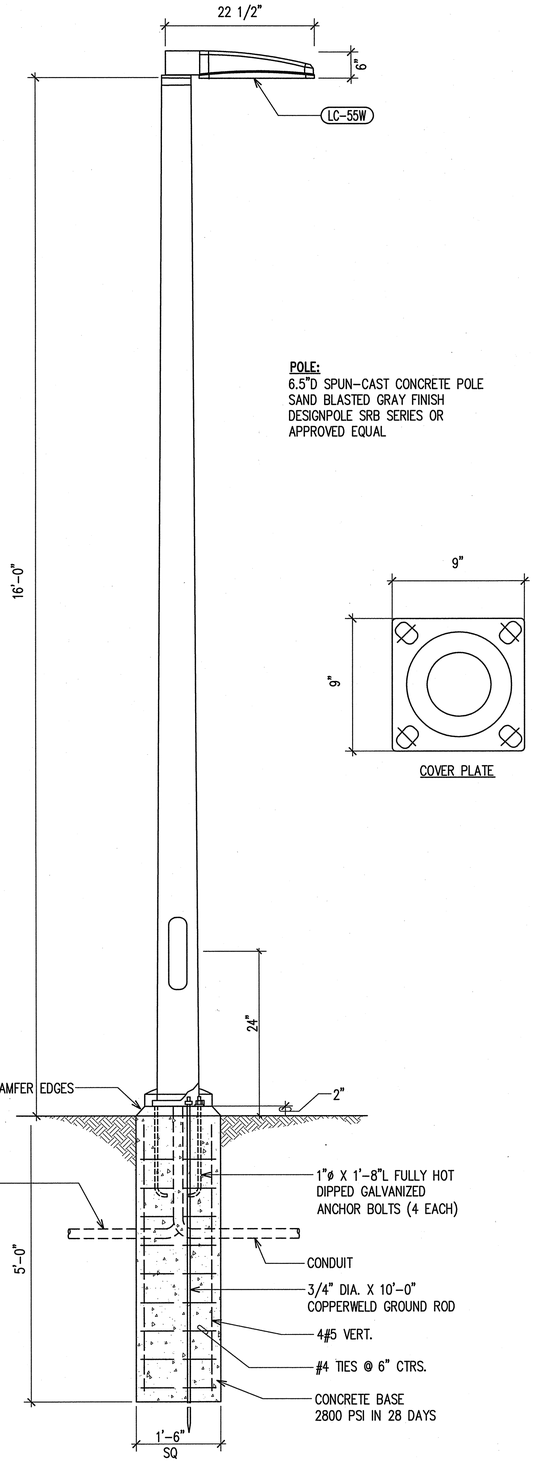
SIGNATURE 2018.03.20
LICENSE EXP. DATE: APRIL 30, 2018

DWG. NO. E-10
SHEET 23 OF 24

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

OCTOBER 2017

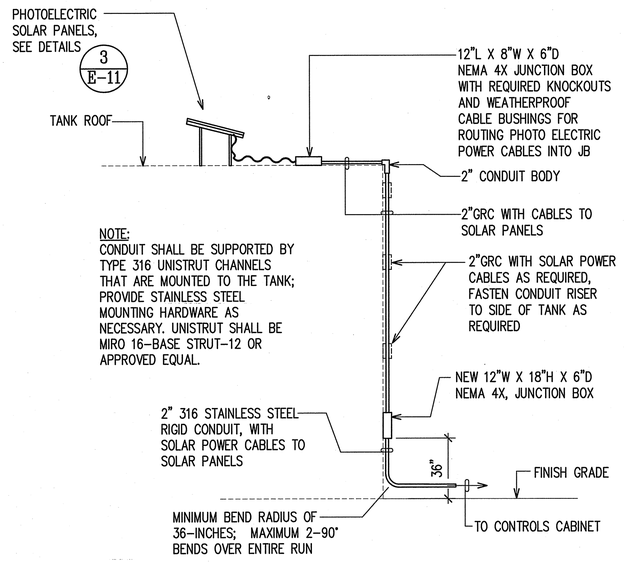
LAST_EDIT
Z:\CAD\PROJECTS\21753\E09-ELECTRICAL CABINET ELEVATION XREFS: KKO-STAMP=Z:\CAD\PROJECTS_PE_ STAMP\KKO-STAMP



POLE:
6.5"D SPUN-CAST CONCRETE POLE
SAND BLASTED GRAY FINISH
DESIGNPOLE SRB SERIES OR
APPROVED EQUAL

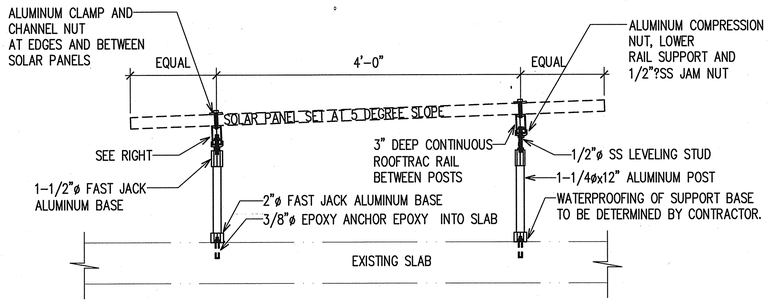
COVER PLATE

1 / E-11 **POLE DETAIL**
NOT TO SCALE



CONDUIT FOR SOLAR POWER CABLES

2 / E-11 **CONDUIT MOUNTING DETAILS ON EXISTING TANK**
NOT TO SCALE



NOTE: CONTRACTOR SHALL VERIFY THAT THE 3/8" EPOXY ANCHOR WILL FIT IN THE HOLE OF THE 2" DIAMETER BASE.

3 / E-11 **PV PANEL SUPPORT DETAIL**
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

HOOLEHUA WATER SYSTEM
TASK ORDER #11 - EMERGENCY REPAIRS DUE TO VANDALISM
AT HOOLEHUA 2-3.5 MG RESERVOIR SITE
JOB NO.

MISCELLANEOUS ELECTRICAL DETAILS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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2018.03.20
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LICENSE EXP. DATE: APRIL 30, 2018

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OCTOBER 2017

DWG. NO. E-11
SHEET 24 OF 24

LAST_EDIT
Z:\CAD\PROJECTS\21731\E001-ELECTRICAL SYMBOLS XREFS: KKO-STAMP=Z:\CAD\PROJECTS_PE_ STAMP\KKO-STAMP _X216172-SYMBOLS=.\XREF_X216172-SYMBOLS

STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

CONSTRUCTION PLANS FOR

HOOLEHUA WATER SYSTEM IMPROVEMENTS

SITES NO. 1, 3, 4, 5, 6, & 7

HOOLEHUA, MOLOKAI, HAWAII

TAX MAP KEYS: (2)5-2-002:999, (2)5-2-004:999, (2)5-2-005:999, (2)-5-2-006:063, 999, (2)5-2-007:028, 029, 030, 055, 076, 090, 999 (2)5-2-010:002, 003, 007 (2)5-2-012:004, 999, (2)5-2-013:010, 020, (2)5-2-021:999, (2)5-2-023:009, (2)5-2-024:999, (2)5-2-025:999

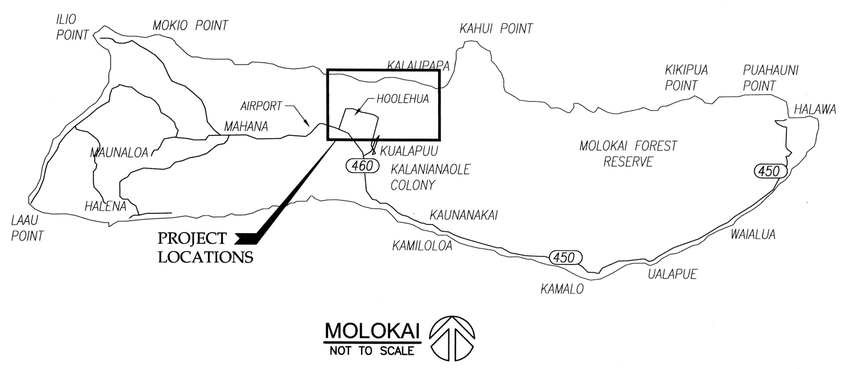
PREPARED BY:

G70

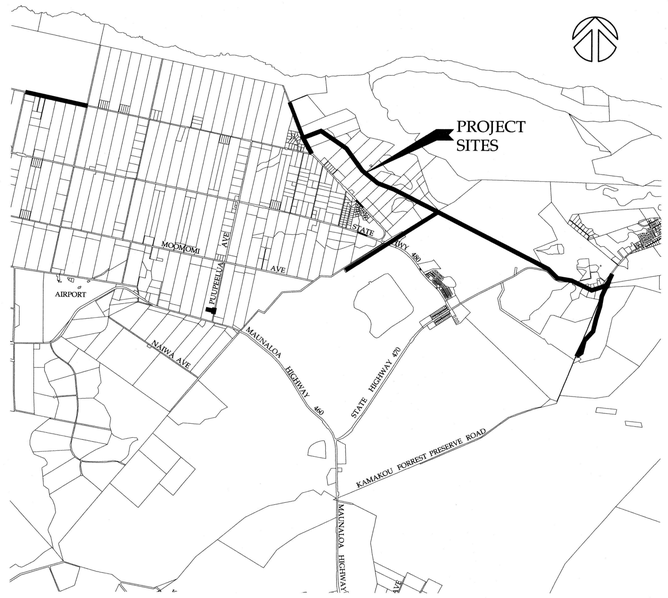
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

REVISION	DATE	DESCRIPTION	BY	APPROVED
1	07/6/18	OBTAINED SIGNATURES	G70	

LOCATION MAP



VICINITY MAP



APPROVALS

CHAIRMAN, HAWAIIAN HOMES COMMISSION
STATE OF HAWAII — DATE 6/11/18

DIRECTOR, DEPARTMENT OF PUBLIC WORKS
COUNTY OF MAUI
(FOR WORK WITHIN COUNTY RIGHT-OF-WAY ONLY) — DATE

CHIEF, HIGHWAYS DIVISION — DATE 6/25/18
DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII
(APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY)

CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION
STATE DEPARTMENT OF HEALTH — DATE

DEPARTMENT OF WATER SUPPLY
COUNTY OF MAUI — DATE

DWG. NO.
T001
SHEET 1 OF 149

FILE	POCKET	FOLDER	NO.

DRAWING INDEX

SHT NO.	DWG NO.	DESCRIPTION
CIVIL		
		GENERAL SHEETS
1	T001	TITLE SHEET, LOCATION AND VICNITY MAP
2	T002	DRAWING INDEX, ABBREVATIONS, AND LEGEND
3	T003	NOTES 1
4	T004	NOTES 2
5	~~T006~~ T005	GENERAL PLAN
6	~~T007~~ T006	STANDARD DETAILS 1
7	~~T008~~ T007	STANDARD DETAILS 2
8	~~T009~~ T008	TYPICAL TRAFFIC CONTROL PLAN
		SITE 1
9	C100	GENERAL PLAN
10	C101	SITE AND UTILITY PLAN 1
11	C102	SITE AND UTILITY PLAN 2
12	C103	GRADING PLAN 1
13	C104	GRADING PLAN 2
14	C105	EROSION CONTROL PLAN
15	C106	WATER TANK ACCESS ROAD 1 PROFILE
16	C107	TYPICAL SECTIONS
17	C108	WL PROFILES AND HOSE BID DETAIL
		SITE 3
18	C300	GENERAL PLAN
19	C301	EROSION CONTROL PLAN
20	C302	2 – 3.5 MG RESERVOIR SITE AND UTILITY PLAN
21	C303	PLAN AND PROFILE 0+00 TO 8+00
22	C304	PLAN AND PROFILE 0+800 TO 16+00
23	C305	PLAN AND PROFILE 16+00 TO 25+00
24	C306	PLAN AND PROFILE 25+00 TO 33+00
25	C307	PLAN AND PROFILE 33+00 TO 41+00
26	C308	PLAN AND PROFILE 41+00 TO 49+00
27	C309	PLAN AND PROFILE 49+00 TO 57+00
28	C310	PLAN AND PROFILE 57+00 TO 66+00
29	C311	PLAN AND PROFILE 66+00 TO 74+00
30	C312	PLAN AND PROFILE 74+00 TO 82+00
31	C313	PLAN AND PROFILE 82+00 TO 90+00
32	C314	PLAN AND PROFILE 90+00 TO 98+00
33	C315	PLAN AND PROFILE 98+00 TO 106+00
34	C316	PLAN AND PROFILE 106+00 TO 114+00
35	C317	PLAN AND PROFILE 114+00 TO 122+49
36	C318	KAULUWAI 1.0 MG RESERVOIR SITE AND UTILITY PLAN
37	C319	2 – 3.5 MG RESERVOIR SITE DETAILS
		SITE 4
38	C400	GENERAL PLAN
39	C401	EROSION CONTROL PLAN
40	C402	TYPICAL SECTIONS
41	C403	PLAN AND PROFILE 0+00 TO 10+00
42	C404	PLAN AND PROFILE 10+00 TO 20+00
43	C405	PLAN AND PROFILE 20+00 TO 30+00
44	C406	PLAN AND PROFILE 30+00 TO 37+00
45	C407	PLAN AND PROFILE 37+00 TO 45+00
46	C408	PLAN AND PROFILE 45+00 TO END
		SITE 5
47	C500	GENERAL PLAN
48	C501	EROSION CONTROL PLAN
49	C502	PLAN AND PROFILE 0+00 TO 8+00
50	C503	PLAN AND PROFILE 8+00 TO 16+00
51	C504	PLAN AND PROFILE 16+00 TO 25+00
52	C505	PLAN AND PROFILE 25+00 TO END
53	C506	CONNECTION DETAILS AND FH PROFILES
		SITE 6
54	C600	GENERAL PLAN
55	C601	SITE AND UTILITY PLAN
56	C602	EROSION CONTROL PLAN
57	C603	TYPICAL SECTIONS AND DETAILS
58	~~C603~~ C604	PLAN AND PROFILE 0+00 TO 8+00
59	~~C604~~ C605	PLAN AND PROFILE 8+00 TO 16+00
60	~~C605~~ C606	PLAN AND PROFILE 16+00 TO 24+00
61	~~C606~~ C607	PLAN AND PROFILE 24+00 TO 32+00
62	~~C607~~ C608	PLAN AND PROFILE 32+00 TO END
		SITE 7
63	C700	GENERAL PLAN
64	C701	MAINTENANCE BUILDING SITE PLAN
65	C702	EROSION CONTROL PLAN
66	C703	FARRINGTON AVE PRV REPLACEMENT SITE PLAN
67	C704	LAHI PALI AVE PRV REPLACMENT SITE PLAN
68	C705	ARV REPLACEMENT PLAN
69	C710	DETAILS 1
70	C711	DETAILS 2
ARCHITECTURAL		
		SITE 7
71	T-101	PROJECT INFORMATION CODES AND CODE DIAGRAMS
72	T-102	PROJECT INFORMATION CODES AND CODE DIAGRAMS, SYMBOLS, ABBREVIATIONS AND NOTES
73	A-100	SITE PLAN
74	A-101	FLOOR PLAN
75	A-102	REFLECTED CEILING PLAN
76	A-201	ENLARGED PLAN, INTERIOR ELEVATIONS, SECTIONS

SHT NO.	DWG NO.	DESCRIPTION
ARCHITECTURAL (CONTINUED)		
		SITE 7
77	A-301	EXTERIOR ELEVATIONS
78	A-401	BUILDING SECTIONS
79	A-601	PARTITION TYPES, FIXTURE MOUNTING HEIGHTS, MISCELLANEOUS DETAILS
80	A-701	DOOR SCHEDULE, DOOR DETAILS, WINDOW SCHEDULE, WINDOW DETAILS, FINISH SCHEDULE AND LEGEND
81	A-702	COLOR AND MATERIAL FINISH SCHEDULE, ROOM FINISH SCHEDULE
STRUCTURAL		
		SITE 1
82	ST001	GENERAL NOTES
83	ST101	NOTES AND TYPICAL DETAILS
84	ST102	TYPICAL DETAILS
85	ST201	FLOOR AND ROOF PLANS
86	ST202	FOUNDATION PLANS
87	ST203	ROOF SLAB REINFORCING PLANS
88	ST301	SECTIONS AND DETAILS
89	ST302	CONCRETE ROOF BEAM DETAILS
90	ST401	SECTIONS AND DETAILS
91	ST402	DETAILS
92	ST403	DETAILS
		SITE 3
93	SW001	GENERAL NOTES AND TYPICAL DETAILS
94	SW201	RETAINING WALL PLAN AND TYPICAL DETAILS
95	SW202	RETAINING WALL PROFILE
96	SW301	RETAINING WALL SECTIONS
		SITE 4
97	SR001	GENERAL NOTES AND TYPICAL DETAILS
98	SR201	PLAN VIEW – GROUND LEVEL
99	SR202	PLAN VIEW – ROOF LEVEL
100	SR301	DETAILS
		SITE 7
101	SB001	GENERAL NOTES
102	SB101	TYPICAL DETAILS
103	SB201	FOUNDATION PLAN
104	SB202	ROOF FRAMING PLAN
105	SB301	SECTION AND DETAILS
106	SB302	SECTIONS
107	SV001	GENERAL NOTES AND TYPICAL DETAILS
108	SV101	VAULT A1 AND A2 PLANS AND SECTIONS
MECHANICAL		
		SITE 1
109	M110	MECHANICAL LEGEND AND NOTES
110	M120	MECHANICAL SITE PLAN FUEL SYSTEM IMPROVEMENTS
111	M130	DETAIL MECHANICAL PLAN
112	M140	MECHANICAL DETAILS
113	M141	MECHANICAL DETAILS
114	M-1	MECHANICAL SITE PLAN FOR BOOSTER PUMP REPLACEMENT
115	M-2	BOOSTER PUMP DEMOLITION AND REPLACEMENT ELEVATIONS
116	M710	MECHANICAL LEGEND, NOTES AND SCHEDULES
117	M720	VENTILATION FLOOR PLANS
118	M721	PLUMBING FLOOR PLANS
119	M730	MECHANICAL SECTIONS
120	M740	PIPING DIAGRAMS
121	M750	MECHANICAL DETAILS
ELECTRICAL		
		SITE 1
122	E-001	GENERAL NOTES AND ELECTRICAL SYMBOLS
123	E-002	OVERALL ELECTRICAL SITE PLAN
124	E-003	MISCELLANEOUS ELECTRICAL DETAILS I
125	E-004	MISCELLANEOUS ELECTRICAL DETAILS II
126	E-005	DUCT SECTION DETAILS AND REQUIREMENTS
127	E-101	SITE 1 ELECTRICAL PLAN
128	E-102	BOOSTER PUMP AND WELL PUMP NO. 2 ELECTRICAL PLAN
129	E-103	WELL PUMP NO. 1 ELECTRICAL PLAN
130	E-104	MCC AND STEP-UP TRANSFORMER ELECTRICAL PLAN
131	E-105	ABOVE GROUND STORAGE TANK, SERVICE SWITCHBOARD, AND GENERATOR ELECTRICAL PLAN
132	E-106	ONE-LINE DIAGRAM-DEMO
133	E-107	ONE-LINE DIAGRAM-NEW
134	E-108	ONE-LINE DIAGRAM SCHEDULE
135	E-109	MOTOR CONTROL CENTER DETAILS
136	E-110	SITE NO. 1 WELL PUMP CONTROL DIAGRAMS
137	E-111	SITE NO. 1 BOOSTER PUMP CONTROL DIAGRAMS
138	E-112	SITE NO. 1 RESERVOIR LEVEL VALVE CONTROLS
139	E-113	SITE NO. 1 SCADA DIAGRAM
		SITE 7
140	E-001	GENERAL NOTES AND ELECTRICAL SYMBOLS
141	E-002	SIC NOTES
142	E-003	OVERALL ELECTRICAL SITE PLAN
143	E-004	DUCT SECTION DETAILS AND REQUIREMENTS
144	E-101	SITE 7 ELECTRICAL PLAN
145	E-102	VEHICLE/EQUIPMENT STORAGE ELECTRICAL PLAN
146	E-103	PIPE FITTING WORKSPACE ELECTRICAL PLAN
147	E-104	VEHICLE/EQUIPMENT STORAGE LIGHTING PLAN
148	E-105	PIPE FITTING WORKPLACE LIGHTING PLAN
149	E-106	ELECTRICAL EQUIPMENT ELEVATIONS AND ONE-LINE DIAGRAM

LEGEND

- PROPERTY LINE
- LOT LINE
- EASEMENT
- LIMITS OF GRADING
- O/H — EXISTING OVERHEAD ELECTRIC LINE
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- S6 — EXISTING SEWER LINE
- W8 — NEW WATER LINE
- D18 — NEW DRAIN LINE
- S6 — NEW SEWER LINE
- F — NEW FUEL LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- GRADE ADJUSTMENT/RETAINING WALL
- CONCRETE PAVEMENT
- GRAVEL
- NEW STORM DRAIN INLET
- NEW CONCRETE BEAM
- CLOSED GATE VALVE
- OPEN GATE VALVE
- MANHOLE
- BACKFLOW PREVENTER ASSEMBLY
- 1/32 BEND
- 1/16 BEND
- 1/8 BEND
- 1/4 BEND
- TEE
- CROSS
- REDUCER
- FIRE HYDRANT
- PRESSURE REDUCING VALVE
- AIR RELIEF VALVE
- CONCRETE BLOCK
- SLEEVE
- CUT AND PLUG
- SEWER CLEANOUT
- CHAIN LINK/WIRE FENCE
- GUARD RAIL
- CATTLE GATE

ABBREVIATIONS

∠	ANGLE	MAX	MAXIMUM
A	AREA	MECH	MECHANICAL
AC	ASPHALT CONCRETE OR ACRE	MEP	MECHANICAL, ELECTRICAL AND PLUMBING
ACS	ACRES		
A/C	AIR CONDITIONING	MB	MAILBOX OR METER BOX
APPROX	APPROXIMATE	MH	MANHOLE
ARCH	ARCHITECTURAL	MIN	MINIMUM
ARV	AIR RELEASE VALVE	MON	MONUMENT
ATT	AT&T CABLE	M/N	METER NUMBER
AVE	AVENUE	NO.	NUMBER
℄	BASELINE	NON-POT	NON-POTABLE
BC	BOTTOM OF CURB	O.C.	ON CENTER
BFP	BACK FLOW PREVENTER ASSEMBLY	OH, O/H	OVERHEAD
BLDG	BUILDING	PAVT	PAVEMENT
BOT	BOTTOM	PC	POINT OF CURVATURE
BW	BOTTOM OF WALL	PCC	POINT OF COMPOUND CURVE
C&C	CITY AND COUNTY	PERF	PERFORATED
℄	CENTERLINE	PI	POINT OF INTERSECTION
C	CHORD	PIVC	POINT OF INTERSECTION ON VERTICAL CURVE
CATV	CABLE TELEVISION		
CB	CATCH BASIN	PL, ℄	PROPERTY LINE
CHWS	CHILL WATER SERVICE	PM	PARKING METER
CHWR	CHILL WATER RETURN	POC	POINT ON CURVE
CF	CURB FACE	POT	POTABLE
A.L.	CHAIN LINK	PP	POWER POLE
CMU	CONCRETE MASONRY UNIT	PRC	POINT OF REVERSE CURVE
CO	CLEAN OUT	PRV	PRESSURE REDUCING VALVE
COL	COLUMN	PSL	PEDESTRIAN SIGNAL LIGHT
COMM	COMMUNICATION	PT	POINT OF TANGENCY
CONC	CONCRETE	PVC	POLYVINYL CHLORIDE OR POINT OF VERTICAL CURVE
CONN	CONNECTION		
CRM	CONCRETE RUBBLE MASONRY	PVI	POINT OF VERTICAL INTERSECTION
CW	COLD WATER	PVT	POINT OF VERTICAL TANGENCY
COTG	CLEAN OUT TO GRADE	R	RADIUS
D	DIAMETER, DEPTH OR DRAIN	REF, REFL	REFLECTOR
DI	DRAIN INLET	ROW, R/W	RIGHT-OF-WAY
DIA, ø	DIAMETER	S	SEWER, SLOPE OR SPREAD
DCV	DETECTOR CHECK VALVE	SC	SIGNAL CORPS
DEFL	DEFLECTION	SCH 40	SCHEDULE 40
DET	DETAIL	SCH 80	SCHEDULE 80
DMH	DRAIN MANHOLE	SCMH	SIGNAL CORPS MANHOLE
D.P.P	DEPT OF PLANNING AND PERMITTING	SDMH	STORM DRAIN MANHOLE
DS	DOWNSPOUT	SF	SQUARE FOOT, SQUARE FEET
DSP	DRY STAND PIPE	SL	STREET LIGHT
DHHL	DEPARTMENT OF HAWAIIAN HOME LANDS	SLB	STREET LIGHT BOX
DWGS	DRAWINGS	SMH	SEWER MANHOLE
DWS	DEPARTMENT OF WATER SUPPLY	SPR	SPRINKLER
DWY	DRIVEWAY	ST	STREET
E,ELEC	ELECTRIC	STA	STATION
ELEV, EL	ELEVATION	STD	STANDARD
EG	EXISTING GROUND	STRUCT	STRUCTURAL
EOP	EDGE OF PAVEMENT	SW, S/W	SIDEWALK
EP	ELECTRICAL POLE	TC	TOP OF CURB
EX, EXIST, (E)	EXISTING	TDC	TOP OF DROPCURB
FA	FIRE ALARM	T	TANGENT OR TELEPHONE
FDC	FIRE DEPT CONNECTION	TEL	TELEPHONE
FG	FINISH GRADE	TG	TOP OF GRATE
FH	FIRE HYDRANT	THRU	THROUGH
FL	FLOW LINE	TMK	TAX MAP KEY
FM	FORCE MAIN	TP	TOP OF PIPE
FS	FINISH SURFACE	TRC	TOP OF ROLLED CURB
FT	FEET	TS	TOP OF STEM
G	GAS	TSL	TRAFFIC SIGNAL LIGHT
GB	GRADE BREAK	TSLB	TRAFFIC SIGNAL LIGHT BOX
GI	GRATED INLET	TV	TOP OF VALVE
GMH	GAS MANHOLE	TW	TOP OF WALL
GND	GROUND	TYP	TYPICAL
GP	GUARD POST/GUY POLE/GATE POST	UP	UTILITY POLE
GV	GATE VALVE	UP/SL	UTILITY POLE WITH STREET LIGHT
GW	GUY WIRE		
H, HT	HEIGHT	VAR	VARIES OR VARIABLE
HB	HOSE BIBB	VB	VALVE BOX
HECO	HAWAIIAN ELECTRIC COMPANY	W	WATER
HDPE	HIGH DENSITY POLYETHYLENE	WL	WATER LINE
HP	HIGH POINT	WM	WATER METER
HW	HOT WATER	WMB	WATER METER BOX
ICV	IRRIGATION CONTROL VALVE	WMH	WATER MANHOLE
INV	INVERT	WSE	WATER SERVICE ELEVATION
IRR	IRRIGATION	WV	WATER VALVE
JTS	JOINT TRUNKING SYSTEM	X-WALK	CROSSWALK
JKT	JACKET		
L	LENGTH OR LENGTH OF CURVE		
LID	LOW IMPACT DEVELOPMENT		
LP	LAMP OR LIGHT POLE		
LPT	LOW POINT		

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED DRAWING INDEX AND ABBREVIATIONS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T002
SHEET 2 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITES 1 AND 3-7 HOOLEHUA WATER SYSTEM
JOB NO.

DRAWING INDEX, ABBREVIATIONS, AND LEGEND

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

GENERAL NOTES

1. LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE BASED ON AVAILABLE "AS-BUILT" OF RECORD CONSTRUCTION PLANS AND ARE APPROXIMATE ONLY AND THEIR ACCURACY IS NOT GUARANTEED.

2. EXISTING CONTOURS AND FEATURES ARE BASED ON "TOPOGRAPHIC SURVEY MAP MOLOKAI DHHL WATERLINE IMPROVEMENTS" PREPARED BY CONTROL POINT SURVEYING INC. DATED APRIL 12, 2017, AS AMENDED

3. ELEVATIONS SHOWN WERE ESTABLISHED ONSITE USING GPS OBSERVATIONS AND ARE BASED HORIZONTAL DATUM: NAD 83 HI ZONE 2 STATE PLANE COORDINATES, U.S. FEET.

4. EXISTING GRADES SHALL BE VERIFIED BY THE CONTRACTOR BEFORE PROCEEDING WITH GRADING WORK. SHOULD ANY DISCREPANCIES BE DISCOVERED IN THE EXISTING GRADES OR DIMENSIONS GIVEN ON THE PLANS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER BEFORE PROCEEDING ANY FURTHER WITH THE WORK, OTHERWISE HE WILL BE HELD RESPONSIBLE FOR ANY COST INVOLVED IN THE CORRECTION OF CONSTRUCTION PLACED DUE TO SUCH DISCREPANCIES.

5. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF EXISTING UTILITIES WITHIN PROJECT LIMITS BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ALL UNDERGROUND UTILITIES.

6. THE CONTRACTOR SHALL REPORT ANY INCONSISTENCIES WITH THE PROPOSED PLAN TO THE OWNER'S REPRESENTATIVE AND SHALL DEMOLISH, REMOVE, OR RELOCATE ALL EXISTING UTILITIES, IMPROVEMENTS, ETC. INCONSISTENT WITH THE PROPOSED PLAN AS DIRECTED BY THE OWNER'S REPRESENTATIVE AND AT THE CONTRACTOR'S EXPENSE.

7. THE LATEST REVISIONS OF THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION," SEPTEMBER 1984 AND THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," 2005 SHALL BE INCLUDED AS PART OF THESE CONSTRUCTION PLANS. THE CONTRACTOR SHALL OBTAIN THE LATEST REVISIONS BEFORE COMMENCING CONSTRUCTION.

8. SHOULD HISTORIC SITES SUCH AS WALLS, PLATFORMS, PAVEMENTS AND MOUNDS, OR REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF CHARCOAL OR SHELLS BE ENCOUNTERED DURING CONSTRUCTION WORK, WORK SHALL CEASE IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY CONTACT THE STATE HISTORIC PRESERVATION DIVISION (PH: 243–1285 OR 243–4640), WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND MITIGATION MEASURES, IF NECESSARY.

9. PURSUANT TO CHAPTER 6E OF THE HAWAII REVISED STATUTES, ALL CONTRACTORS SHALL ENSURE THAT IN THE EVENT THAT ANY HUMAN SKELETAL REMAINS ARE INADVERTENTLY DISCOVERED DURING CONSTRUCTION, THE REMAINS SHALL NOT BE MOVED AND ANY ACTIVITY IN THE IMMEDIATE AREA THAT COULD DAMAGE THE REMAINS OR THE POTENTIAL HISTORIC SITE SHALL CEASE AND THE DEPARTMENT OF LAND AND NATURAL RESOURCES' HISTORIC PRESERVATION DIVISION (PH: 243–1285 OR 243–4640), THE APPROPRIATE MEDICAL EXAMINER OR CORONER, AND THE POLICE DEPARTMENT (TELEPHONE: 244–6400), SHALL BE CONTACTED. ALL LESSEES USING EXISTING DIRT ROADS TO ACCESS THEIR PROPERTY SHALL CONTINUE TO BE PROVIDED ACCESS TO THEIR PROPERTY AT ALL TIMES DURING CONSTRUCTION ACTIVITIES BY THE CONTRACTOR.

DEPARTMENT OF PUBLIC WORKS NOTES

1. THE CONTRACTOR SHALL ALLOW FOUR WEEKS TO OBTAIN A GRADING PERMIT FROM THE DEVELOPMENT SERVICES ADMINISTRATION PRIOR TO COMMENCEMENT OF ANY CLEARING AND GRUBBING. A SATISFACTORY DRAINAGE AND EROSION CONTROL PLAN SHALL BE SUBMITTED IN THE EVENT THE GRUBBING AREA EXCEEDS ONE ACRE OR THE PROPOSED CUT OR FILL IS GREATER THAN 15 FEET IN HEIGHT. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL BEST MANAGEMENT PRACTICE MEASURES.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, AND OTHER PROTECTIVE DEVICES FOR THE PROTECTION, SAFETY AND CONVENIENCE OF THE PUBLIC AND IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAY, 2003 EDITION WITH REVISION No. 1 INCORPORATED, DATED NOVEMBER 2004". THE CONTRACTOR SHALL PREPARE AND OBTAIN NECESSARY APPROVALS OF TRAFFIC CONTROL PLANS IF REQUIRED BY THE DEVELOPMENT SERVICES ADMINISTRATION.

3. STANDARD DETAIL DRAWINGS OF THE DEPARTMENT OF PUBLIC WORKS AND THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION (1994) SHALL BE INCLUDED AS PART OF THE CONSTRUCTION PLANS.

4. ALL CONSTRUCTION WORK SHALL STRICTLY CONFORM TO THE APPLICABLE SECTIONS OF THE 2005 HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SEPTEMBER 1984 "STANDARD DETAILS" FOR PUBLIC WORKS CONSTRUCTION OF THE DEPARTMENT OF PUBLIC WORKS, AS AMENDED.

5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH AND COUNTY GRADING ORDINANCE.

6. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION ORDERED BY THE DIRECTOR OF PUBLIC WORKS SHALL BE PAID BY THE CONTRACTOR.

ARCHAEOLOGICAL NOTE

IN THE EVENT THAT ANY HISTORICAL RESOURCES, INCLUDING HUMAN SKELETAL REMAINS, STRUCTURAL REMAINS, CULTURAL DEPOSITS, OR LAVA TUBES ARE IDENTIFIED DURING CONSTRUCTION ACTIVITIES, CEASE WORK IN THE IMMEDIATE VICINITY OF THE FIND, PROTECT THE FIND FROM DISTURBANCE, AND CONTACT THE STATE HISTORIC PRESERVATION DIVISION AT (808) 243–1285.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND COUNTY LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE COUNTY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.

3. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

NOTES FOR CONSTRUCTION WITHIN STATE HIGHWAYS RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A PERMIT TO PERFORM WORK UPON STATE HIGHWAYS FROM THE STATE HIGHWAYS' DISTRICT ENGINEER, AT 650 PALAPALA DRIVE, KAHULUI, MAUI, PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE'S HIGHWAY RIGHT–OF–WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN THE STATE'S RIGHT–OF–WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. WORK MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. AND 3:00 P.M., MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS, UNLESS OTHERWISE PERMITTED BY THE DISTRICT ENGINEER.

   DURING WORK HOURS, ONLY ONE LANE OF TRAFFIC SHALL BE CLOSED, UNLESS OTHERWISE APPROVED IN WRITING BY THE DISTRICT ENGINEER. ALL LANE CLOSURES MUST BE APPROVED BY HDOT FIFTEEN (15) WORKING DAYS IN ADVANCE. ALL LANE CLOSURES AND DETOURS SHALL REQUIRE ADVISORY SIGNS AND AN ADVERTISEMENT PER SECTION 645.03 OF THE STANDARD SPECIFICATIONS.

   AT CERTAIN LOCATIONS, "NO LANE CLOSURE" WILL BE ALLOWED DURING THE "BACK TO SCHOOL JAM", THANKSGIVING WEEKEND, CHRISTMAS / NEW YEAR PERIOD AND AT OTHER TIMES AS DIRECTED BY THE HIGHWAYS DIVISION.

4. THE CONTRACTOR SHALL PROVIDE, INSTALL, AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE, AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORKSITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS", ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAYS ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI– STANDARDS AND GUIDES FOR TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION, MAINTENANCE, UTILITY AND INCIDENT MANAGEMENT OPERATIONS". IF LANE CLOSURES ARE REQUIRED DURING CONSTRUCTION, A TRAFFIC CONTROL PLAN SHALL BE INCORPORATED INTO THE CONSTRUCTION PLANS AND MUST BE APPROVED BY THE DIVISION PRIOR TO THE ISSUANCE OF THE PERMIT.

5. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:

   A. RESIDENTIAL DRIVEWAYS, ON MINOR HIGHWAYS:

      (1) 2–1/2" HOT MIX ASPHALT (HMA) PAVEMENT (MIX IV), 8" AGGREGATE BASE COURSE OR 2–1/2" HMA PAVEMENT AND 8" HMA BASE COURSE OR HMA PAVEMENT.

      (2) 4" CLASS "A" CONCRETE REINFORCED WITH 6" x 6" – W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   B. COMMERCIAL DRIVEWAYS, SIDE ROADS, AND UTILITY INSTALLATIONS ON MINOR HIGHWAYS

      (1) 4" HMA PAVEMENT (MIX IV), 8" AGGREGATE BASE COURSE AND 12" SUBBASE, OR 4" HMA PAVEMENT (MIX IV) AND 8" HMA BASE COURSE OR HMA PAVEMENT.

      (2) 6" OF CLASS "A" CONCRETE REINFORCED WITH 6" x 6" – W2.9 x W2.9 WIRE MESH ON 12" AGGREGATE SUBBASE, IF DEEMED NECESSARY BY THE ENGINEER.

   C. CHANNELIZED INTERSECTIONS AND UTILITY INSTALLATIONS ON MAJOR HIGHWAYS

      4" HMA PAVEMENT (MIX IV), 8" HMA PAVEMENT BASE COURSE AND 12" AGGREGATE SUBBASE, OR 4" ASPHALT CONCRETE (MIX IV) AND 12" ASPHALT CONCRETE BASE COURSE OR ASPHALT CONCRETE, OR MATCH EXISTING PAVEMENT STRUCTURE, WHICHEVER IS GREATER.

6. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHT–OF–WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

7. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

   A. SUBBASE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET OF ROADWAY.

   B. BASE COURSE: ONE (1) COMPACTION TEST PER LIFT PER 200 LINEAL FEET PF ROADWAY.

   C. ONE (1) COMPACTION TEST PER LIFT PER 300 LINEAL FEET OF TRENCH.

   D. A COPY OF THE TEST RESULTS SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

8. PRIOR TO COMMENCING TRENCH EXCAVATION WORK, THE CONTRACTOR SHALL TAKE A PROFILE ALONG THE CENTERLINE OF PROPOSED UTILITY TRENCH. THIS INFORMATION SHALL BE USED IN THE VERIFICATION OF RESTORING THE ROADWAY TO ITS ORIGINAL CONDITION. A COPY OF THE THE PROFILE SHALL BE SUBMITTED TO THE DISTRICT ENGINEER.

9. THE CONTRACTOR SHALL PROVIDE ADEQUATE AND SAFE NON–SKID BRIDGING MATERIAL, INCLUDING SHORING, OVER TRENCHES IN PAVEMENT AREAS. THE BRIDGING SHALL BE ABLE TO SUPPORT ALL TYPES OF VEHICULAR TRAFFIC. BRIDGING MATERIALS SHALL NOT BE USED ON HIGH SPEED ROADWAYS, WHICH ARE ROADS WITH A DESIGN SPEED OF 50 MPH OR HIGHER. SMOOTH RIDING CONNECTION BETWEEN ROADWAY SURFACES AND BRIDGING MATERIAL SHALL BE PROVIDED. SHOULD COMPLAINTS BE RECEIVED DUE TO NOISE GENERATING FRO THIS WORK, THE CONTRACTOR SHALL IMMEDIATELY ADDRESS THOSE COMPLAINTS.

10. THE CONTRACTOR SHALL MAKE EVERY EFFORT TO MINIMIZE THE USE AND DURATION OF USE OF STEEL PLATES. THE STATE MAY REQUIRE THE BACKFILLING AND PATCHES OF TRENCHES DUE TO THE EXCESSIVE USAGE OF STEEL PLATES.

11. UNLESS OTHERWISE NOTED, NO TRENCH SHALL BE OPENED MORE THAN 300 FEET IN ADVANCE OF INSTALLED AND TESTED PIPELINE AND/OR DUCTLINE.

12. EXISTING DRAINAGE SYSTEMS SHALL BE FUNCTIONAL AT ALL TIMES.

13. THE CONTRACTOR SHALL EXERCISE CARE TO MINIMIZE DAMAGES TO EXISTING HIGHWAY IMPROVEMENTS. ALL DAMAGES SHALL BE REPAIRED BY THE CONTRACTOR, AT HIS EXPENSE, TO THE SATISFACTION OF THE DISTRICT ENGINEER.

14. APPROVAL OF PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE–YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT THE CONSTRUCTION PLANS FOR DIVISION'S REVIEW AND REAPPROVAL.

15. ALL REGULATORY, GUIDE, AND CONSTRUCTION SIGNS AND BARRICADES SHALL HAVE A HIGH–INTENSITY REFLECTIVE BACKGROUND.

16. THE CONTRACTOR SHALL INFORM THE STATE HIGHWAYS' PERMIT OFFICE (PH: 873–3535) AT LEAST TWO (2) DAYS PRIOR TO CLOSING ANY LANES.

17. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTIES USING THESE RIGHTS–OF–WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

18. WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN A SAFE AND PASSABLE CONDITION, OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGES BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.

19. THE CONTRACTOR SHALL REFERENCE TO THE SATISFACTION OF THE DISTRICT ENGINEER, ALL EXISTING TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS, AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES, AT HIS EXPENSE, UNLESS DIRECTED OTHERWISE BY THE DISTRICT ENGINEER OR HIS REPRESENTATIVE.

20. THE PERMIT TO PERFORM WORK UPON STATE HIGHWAY MAY BE REVOKED BECAUSE OF DEFAULT IN ANY OF THE FOLLOWING, BUT NOT LIMITED TO, CONDITIONS:
    a. WORK PERFORMED BEFORE OR AFTER PERMITTED HOURS.
    b. FAILURE TO MAINTAIN ROADWAY SURFACES IN A SMOOTH AND SAFE CONDITION.
    c. FAILURE TO CLEAN UP CONSTRUCTION DEBRIS GENERATED FROM PROJECT WORK.
    d. FAILURE TO PROVIDE PROPER TRAFFIC CONTROL.
    e. FAILURE TO REPLACE DAMAGED PAVEMENT MARKINGS AND SIGNS.
    f. FAILURE TO MAINTAIN HIGHWAY LIGHTS AND TRAFFIC SIGNAL SYSTEMS.
    g. FAILURE TO ADDRESS PUBLIC COMPLAINTS TO THE SATISFACTION OF THE DISTRICT ENGINEER.

21. THE CONTRACTOR SHALL NOTIFY THE STATE HIGHWAYS PERMIT OFFICE (873–3535) AT LEAST TWO WORKING DAYS PRIOR TO PERFORMING ANY TRENCH RESTORATION WORK. THIS WORK SHALL INCLUDE ANY BACKFILLING AND COMPACTING OF TRENCH MATERIAL; ANY PLACING AND COMPACTING OF BASE COURSE MATERIAL; AND ANY PAVING OPERATIONS. ANY TRENCH RESTORATION WORK PREFORMED BY THE CONTRACTOR THAT IS NOT WITNESSED BY A STATE REPRESENTATIVE WILL BE REQUIRES TO BE REMOVED AND RESTORED WITH A STATE REPRESENTATIVE PRESENT. ALL RESTORATION WORK WILL BE AT THE CONTRACTOR'S EXPENSE.

22. TEMPORARY COLD MIX TRENCH PATCHES WILL BE PERMITTED IN ANY GIVEN AREA FOR A MAXIMUM DURATION OF TWO WEEKS, AND SHALL BE A MINIMUM OF 2 INCHES THICK. ALL TEMPORARY PATCHES SHALL BE PLACED OVER PROPERLY PLACED AND COMPACTED BACKFILL AND BASE COURSE LAYERS. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL TEMPORARY PATCHES AND TO MAKE REPAIRS TO UNSATISFACTORY PATCHES WITHIN 24 HOURS.

23. THE CONTRACTOR WILL MAKE EVERY EFFORT TO MINIMIZE THE USE AND THE DURATION OF USE OF STEEL PLATES. THE STATE MAY REQUIRE THE BACKFILLING AND PATCHES OF TRENCHES DUE TO THE EXCESSIVE USAGE OF STEEL PLATES.

24. PLASTIC MARKING TAPE. PROVIDE PLASTIC MARKING TAPE THAT IS ACID AND ALKALI RESISTANT POLYETHYLENE FILM 6 INCHES WIDE WITH MINIMUM THICKNESS OF 0.004 INCH. PROVIDE APE WITH MINIMUM STRENGTH OF 1750 PSI LENGTHWISE AND 1500 PSI CROSSWISE. MANUFACTURE TAPE WITH INTEGRAL WIRES, FOIL BACKING OR OTHER MEANS TO ENABLE DETECTION BY METAL DETECTOR WHEN THE TAPE IS BURIED UP TO 3 FEET DEEP. MANUFACTURE TAPE SPECIFICALLY FOR MARKING AND LOCATING UNDERGROUND UTILITIES. PROVIDE THE METALLIC CORE OF THE TAPE ENCSED IN A PROTECTIVE JACKET OR PROVIDED WITH OTHER MEANS TO PROTECT IT FROM CORROSION. CONFIRM TO THE FOLLOWING TAPE COLOR AND BEAR A CONTINUOUS PRINTED INSCRIPTION DESCRIBING THE SPECIFIC UTILITY.

    RED: ELECTRIC
    YELLOW: GAS, OIL, DANGEROUS MATERIALS
    ORANGE: TELEPHONE, TELEGRAPH, TELEVISION, POLICE, AND FIRE COMMUNICATIONS
    BLUE: WATER SYSTEMS
    GREEN: SEWER SYSTEM

28. THE CONTRACTOR SHALL PROVIDE THE DISTRICT ENGINEER WITH AS–BUILT PLANS UPON COMPLETION OF THE WORK DONE IN THE STATE RIGHT–OF–WAY. THIS SHALL BE DONE PRIOR TO THE DEPARTMENT'S RELEASE OF THE PERFORMANCE BOND.

MINIMUM BEST MANAGEMENT PRACTICES

1. DRAINAGE:
   HANDLE DRAINAGE TO CONTROL EROSION, PREVENT DAMAGE TO DOWNSTREAM PROPERTIES AND RETURN WATERS TO THE NATURAL DRAINAGE COURSE IN A MANNER WHICH MINIMIZES SEDIMENTATION OR OTHER POLLUTION TO THE MAXIMUM EXTENT PRACTICABLE.

2. DUST CONTROL:
   CONTROL DUST EMISSIONS TO THE MAXIMUM EXTENT PRACTICABLE THROUGH BMPS SUCH AS WATER SPRINKLING, DUST FENCES, LIMITING AREA OF DISTURBANCE AND TIMELY GRASSING OF FINISHED AREAS.

3. VEGETATION:
   RETAIN NATURAL VEGETATION, ESPECIALLY GRASSES, WHENEVER FEASIBLE. AVOID STORAGE OF GRUBBED MATERIAL NEAR WATER COURSES.

4. EROSION CONTROL:
   STABILIZE ALL DISTURBED AREAS WITH EROSION CONTROL MEASURES SUCH AS VEGETATION, RUNOFF DIVERSION, CHECK DAMS, MULCHING, BLANKETS, BONDED FIBER MATRICES AND VEHICLE WHEEL WASH FACILITIES.

5. SEDIMENT CONTROL:
   CAPTURE SEDIMENT TRANSPORTED IN RUNOFF TO MINIMIZE THE SEDIMENT FROM LEAVING THE SITE WITH METHODS SUCH AS SEDIMENT BASINS, SEDIMENT TRAPS, SILT FENCES, SAND BAGS, AND VEGETATED FILTER STRIPS.

6. MATERIAL AND WASTE MANAGEMENT:
   PROPERLY STORE TOXIC MATERIALS AND PREVENT THE DISCHARGE OF POLLUTANTS ASSOCIATED WITH CONSTRUCTION MATERIALS.

7. TIMING OF CONTROL MEASURE IMPLEMENTATION:
   TIMING OF CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE APPROVED EROSION CONTROL PLAN. DISTURBED AREAS OF CONSTRUCTION SITES THAT WILL NOT BE RE–DISTURBED FOR TWENTY–ONE (21) DAYS OR MORE WILL BE STABILIZED (GRASSED OR GRAVELED) BY NO LATER THAN THE FOURTEENTH (14TH) DAY AFTER THE LAST DISTURBANCE.

GRADING NOTES

1. FINISH SPOT ELEVATIONS AND FINISH CONTOURS, AS SHOWN ON PLAN REPRESENTS FINISH GRADING. THE SITE WORK CONTRACTOR SHALL COORDINATE WITH THE GEOTECHNICAL ENGINEER THE LOCATION AND DEPTH OF TOPSOIL THE FINISH SUBGRADE SHALL REFLECT THE FINISH GRADE LESS SPECIFIED TOPSOIL DEPTH.

2. THE CONTRACTOR SHALL IMPLEMENT AND MAINTAIN THE MEASURES OF THE BEST MANAGEMENT PRACTICE (BMP) PLAN. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, ON WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS.

3. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS, AND OTHER AREAS. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE STATE DEPARTMENT OF HEALTH SHALL BE PAYABLE BY THE CONTRACTOR.

4. THE CONTRACTOR, AT HIS EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE OF DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

5. CONSTRUCTION DEBRIS AND WASTES SHALL BE DEPOSITED AT AN APPROPRIATE SITE. THE CONTRACTOR SHALL INFORM THE ENGINEER OF THE LOCATION OF DISPOSAL SITES. THE DISPOSAL SITE MUST ALSO FULFILL REQUIREMENTS OF THE GRADING ORDINANCES.

6. THE CONTRACTOR SHALL NOT DEMOLISH OR CLEAR ANY STRUCTURE, SITE OR VACANT LOT WITHOUT FIRST ASCERTAINING THE PRESENCE OR ABSENCE OF RODENTS WHICH MAY ENDANGER THE PUBLIC HEALTH BY DISPERSAL FROM SUCH PREMISES. SHOULD SUCH INSPECTION REVEAL THE PRESENCE OF SUCH RODENTS, THE CONTRACTOR SHALL ERADICATE SUCH RODENTS BEFORE DEMOLISHING OR CLEARING SAID STRUCTURE, SITE OR VACANT LOT.

7. THE FOLLOWING MEASURES SHALL BE TAKEN TO CONTROL DUST AND EROSION DURING THE SITE DEVELOPMENT PERIOD:

   A. MINIMIZE TIME OF CONSTRUCTION.

   B. RETAIN EXISTING GROUND COVER UNTIL THE LATEST DATE TO COMPLETE CONSTRUCTION.

   C. CONSTRUCT REMAINING PERMANENT EROSION AND DRAINAGE CONTROL FEATURES AS EARLY AS POSSIBLE.

   D. USE TEMPORARY AREA SPRINKLERS IN NON–ACTIVE CONSTRUCTION AREAS WHEN GROUND COVER IS REMOVED.

   E. STATION WATER TRUCK ON–SITE DURING CONSTRUCTION PERIOD TO PROVIDE FOR IMMEDIATE SPRINKLING, AS NEEDED, IN ACTIVE CONSTRUCTION AREAS (WEEKENDS AND HOLIDAYS INCLUDED).

   F. USE TEMPORARY BERMS AND CUT–OFF DITCHES, WHERE NEEDED, FOR CONTROL OF EROSION. IMPLEMENT AND MAINTAIN THE MEASURES OF THE BMP PLAN.

   G. GRADED AREAS SHALL BE THOROUGHLY WATERED AFTER CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY AND ON WEEKENDS.

   H. ALL CUT AND FILL SLOPES SHALL BE SODDED OR PLANTED IMMEDIATELY AFTER GRADING WORK HAS BEEN COMPLETED.

COMPACTION REQUIREMENTS

1. TESTING OF MATERIALS SHALL BE CONDUCTED BY AN APPROVED INDEPENDENT TESTING AGENCY IN ACCORDANCE WITH ASTM STANDARD METHODS OR AS SPECIFIED BY THE DEPARTMENT OF PUBLIC WORKS, ENGINEERING DIVISION, AS FOLLOWS:

   A. EMBANKMENT/SELECT BORROW AND SUBGRADE MATERIALS: ONE (1) COMPACTION TEST PER 600 SQUARE YARDS PER LIFT;

   B. AGGREGATE SUBBASE COURSE: ONE (1) COMPACTION TEST PER 400 SQUARE YARDS; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER LIFT PER PROJECT;

   C. AGGREGATE BASE COURSE: ONE (1) COMPACTION TEST PER 300 SQUARE YARDS PER LIFT OF MATERIAL; ONE (1) GRADATION AND SAND EQUIVALENT TEST PER PROJECT;

   D. ASPHALT CONCRETE PAVEMENT OR ASPHALT TREATED BASE COURSE; THREE (3) A.C. CORES FOR THICKNESS AND DENSITY TESTS PER PROJECT;

   E. TRENCH BACKFILL MATERIAL: ONE (1) TEST FOR EACH 300 LINEAL FEET OF TRENCH PER LIFT OF MATERIAL.

2. CONTRACTOR SHALL SUBMIT ALL TESTING REPORTS INCLUDING RESULTS TO THE COUNTY'S INSPECTION AGENCY FOR REVIEW AND APPROVAL PRIOR TO COUNTY'S ACCEPTANCE OF WORK.

3. THE CONTRACTOR SHALL BE REQUIRED TO NOTIFY THE COUNTY OF ANY TESTING FAILURES AND CORRECT EACH FAILURE PRIOR TO PROCEEDING TO THE NEXT PHASE OF CONSTRUCTION.

EROSION CONTROL NOTES

1. DURING CONSTRUCTION, PREVENTIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS WORK PROGRESSES.

2. FUGITIVE DUST AND SOLID WASTE DISPOSAL DURING GRUBBING AND GRADING ACTIVITIES SHALL MEET THE REQUIREMENTS OF STATE OF HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60, AIR POLLUTION CONTROL AND CHAPTER 56, SOLID WASTE MANAGEMENT CONTROL.

3. ALL AREAS WHICH ARE AT FINAL GRADE SHALL BE IMMEDIATELY HYDROMULCHED AND SEEDED WITH NATIVE AKIAKI GRASS AT A RATE OF 5 POUNDS PER 1000 SQUARE FEET OR PERMINENTLY LANDSCAPED.

4. REGRASS ALL EXPOSED AREAS.

   EFFECTIVE AUGUST 10, 1998, THE MAUI COUNTY CODE GRADING ORDINANCE HAS BEEN REVISED. ALL GROUND DISTURBING ACTIVITIES IN MAUI COUNTY WILL NOW BE MORE CLOSELY MONITORED. ALL GRADING, GRUBBING, STOCKPILING, EXCAVATIONS ETC., SHALL PROVIDE MEASURES TO THE MAXIMUM EXTENT POSSIBLE TO PREVENT DAMAGE TO THE ENVIRONMENT BY CONTAINING POLLUTANTS, INCLUDING SEDIMENT, DUST, AND OTHER CONTAMINANTS FROM DISCHARGING OFF A CONSTRUCTION SITE.

THEREFORE, CONTRACTOR SHALL CONTROL DUST AND OTHER SEDIMENT FROM THE PROJECT SITE, EVEN WHEN A GRADING PERMIT IS NOT REQUIRED.

A GRADING PERMIT WILL BE REQUIRED IF ANY OF THE FOLLOWING APPLY TO THE PROPOSED CONSTRUCTION:

A. THE GENERAL DRAINAGE PATTERNS ARE TO BE ALTERED.

B. THE EXCAVATION, FILL OR STOCKPILING IS MORE THAN 100 CY OF MATERIAL (50 CY IN SPECIAL MANAGEMENT AREA).

C. THE EXISTING GROUND ELEVATION IS TO BE CHANGED BY MORE THAN 4 FEET AT ANY LOCATION (2 FEET IN SPECIAL MANAGEMENT AREAS).

D. AN AREA LARGER THAN 1 ACRE IS TO BE GRUBBED (CLEARED).

A GRADING PERMIT WILL NOT BE REQUIRED FOR EXCAVATION AND BACKFILL FOR STRUCTURES THAT HAVE BEEN ISSUED A BUILDING PERMIT OR FOR CESSPOOLS AND SEPTIC TANKS AUTHORIZED BY THE STATE DEPARMENT OF HEALTH.

FOR MORE DETAILED INFORMATION, REFER TO THE MAUI COUNTY CODE CHAPTER 20.08, "SOIL EROSION AND SEDIMENT CONTROL".

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR PERMIT PROJECTS WITHIN STATE HIGHWAY RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH THE "NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR OAHU DISTRICT PERMIT PROJECTS". THIS IS AVAILABLE AT THE OAHU DISTRUCT OFFICE AT 727 KAKOI STREET (PH. 831–6793). DUE TO POTENTIAL COST IMPACTS, THE CONTRACTOR NEEDS TO BE AWARE OF THESE REQUIREMENTS.

2. THE CONTRACTOR SHALL COMPLETE AND SUBMIT A CONTRACTOR'S CERTIFICATION OF NPDES COMPLIANCE, INCLUDING COMPLETION OF THE BEST MANAGEMENT PRACTICE (BMP) CHECKLIST AND SUBMITTAL OF A WRITTEN BMP PLAN AND DRAWINGS, PRIOR TO ISSUANCE OF THE PERMIT TO PERFORM WORK UPON STATE HIGHWAYS. DUE TO POTENTIAL TIME IMPACTS ON REVIEWING BMPS, THE CONTRACTOR NEEDS TO ALLOW ENOUGH TIME FOR THE APPROVAL PROCESS.

3. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE HIGHWAYS DIVISION'S "CONSTRUCTION BEST MANAGEMENT PRACTICES FIELD MANUAL" IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMPS) FOR THE PROJECT.

4. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE CITY AND COUNTY OF HONOLULU'S "RULES FOR SOIL EROSION STANDARDS AND GUIDELINES" FOR THE PROJECT.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16–115–2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITES 1 AND 3-7 HOOLEHUA WATER SYSTEM
JOB NO.

NOTES 1

DESIGNED BY: PLM
CHECKED BY: PTM
DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
T003
SHEET 3 OF 149

FILE	POCKET	FOLDER	NO.

WATER SYSTEM

1. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER SUPPLY (DWS), IN WRITING, ONE (1) WEEK PRIOR TO COMMENCEMENT OF WORK.

2. ALL MATERIALS USED AND METHOD OF CONSTRUCTION OF WATER SYSTEM FACILITIES SHALL BE IN ACCORDANCE WITH THE LATEST REVISIONS OF DWS STANDARDS. CONTRACTOR SHALL OBTAIN THE LATEST REVISIONS OF THE DWS STANDARD DETAILS BEFORE COMMENCING CONSTRUCTION.

3. ALL WATER SYSTEM WORK SHALL BE PERFORMED BY CONTRACTORS POSSESSING VALID STATE OF HAWAII CONTRACTOR'S LICENSES, REGARDLESS OF THE VALUE OF THE WORK.

4. THE EXACT DEPTH AND LOCATION OF EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES ARE NOT KNOWN. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE SAME PRIOR TO TRENCHING FOR THE NEW WATERLINE. THE COST OF LOWERING, RELOCATING OR ADJUSTING EXISTING WATERLINES, SERVICE LATERALS AND OTHER UTILITIES SHALL BE CONSIDERED INCIDENTAL TO THE COST OF THE NEW WATERLINE, UNLESS NOTED OTHERWISE, AND WILL NOT BE PAID FOR SEPARATELY.

5. CONCRETE FOR REACTION BLOCKS AND ANCHOR BLOCKS SHALL BE DWS CLASS 2500.

6. THE MAXIMUM DISTANCE BETWEEN VALVE NUT AND TOP OF VALVE MANHOLE COVER SHALL BE THREE (3) FEET.

7. THE CONTRACTOR SHALL SUBMIT A MATERIALS LIST TO DWS FOR APPROVAL PRIOR TO CONSTRUCTION.

8. CONNECTION TO DWS SYSTEM:

   A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL NECESSARY FITTINGS AND OTHER MATERIALS AND EQUIPMENT REQUIRED FOR THE HOOK-UP. HE SHALL VERIFY THE EXACT LOCATION, DEPTH, TYPE, AND CONDITION OF THE EXISTING LINE BEFORE ORDERING MATERIALS FOR THE HOOK-UP. HE SHALL, HOWEVER, CHECK WITH DWS BEFORE EXCAVATING FOR VERIFICATION PURPOSES.

   B. WHENEVER FEASIBLE, MECHANICAL JOINT FITTINGS SHALL BE USED FOR BURIED APPLICATIONS, AND FLANGED JOINT FITTINGS SHALL BE USED FOR EXPOSED APPLICATIONS.

   C. AUTHORIZED DWS PERSONNEL MAY BE REQUIRED TO MAKE THE FINAL CONNECTION TO THE EXISTING LINE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS INCURRED BY DWS FOR SAID WORK, INCLUDING THE COST OF PRESSURE TESTING AND DISINFECTION.

   D. IF THE DWS PROVIDES ONLY INSPECTION AND SUPERVISING OPERATORS, AND DOES NOT PROVIDE PERSONNEL FOR THE ACTUAL CONNECTION, THE CONTRACTOR SHALL PROVIDE ALL PIPEFITTERS AND LABORS TO MAKE THE CONNECTION.

   E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING ALL MATERIAL, EQUIPMENT AND LABOR FOR TRENCH EXCAVATION, BACKFILLING, CLEANING AND CHLORINATION, PAVING, AND OTHER WORK NECESSARY TO COMPLETE THE HOOK-UP, AS DIRECTED BY AND TO THE SATISFACTION OF DWS.

9. MINIMUM COVER OVER WATER MAIN, 6" DIAMETER OR LARGER, SHALL BE 3'-0". MINIMUM COVER FOR 4" DIAMETER SHALL BE 2'-6". MINIMUM COVER FOR DIAMETERS LESS THAN 4" SHALL BE 1'-6".

10. BOLTS FOR EXPOSED FLANGED DUCTILE IRON PIPE JOINTS SHALL BE EITHER SILICON BRONZE BOLTS AND NUTS OR 316 STAINLESS STEEL BOLTING WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI-SEIZE SHALL NOT BE USED. T-BOLTS FOR DUCTILE IRON MECHANICAL JOINT (MJ) PIPE AND FITTING CONNECTIONS IN UNDERGROUND SITUATIONS SHALL BE ONE OF THE FOLLOWING SYSTEMS:

    A. 316 STAINLESS STEEL T-BOLTS WITH THE HEAVY DUTY STAINLESS STEEL NUTS (ONLY) FURNISHED WITH TRIPAC 2000 BLUE COATING SYSTEM. ANTI-SEIZE SHALL NOT BE USED.

    B. COR-TEN T-BOLTS AND NUTS WITH HIGH GRADE ZINC SACRIFICIAL ANODES, EQUIVALENT TO "DURATRON" SACRIFICIAL "SAC-NUT" MODULES, INSTALLED ON THE NUTS FOR ALL STANDARD COR-TEN T-BOLTS.

    C. COR-TEN T-BOLTS AND NUTS BOTH FACTORY COATED WITH TRIPAC 2000 BLUE COATING SYSTEM BY "TRIPAC FASTENERS".

11. ALL BURIED METALS SHALL BE WRAPPED WITH POLY-WRAP. FOR ALL BURIED INSTALLATIONS OF DUCTILE IRON PIPE AND FITTINGS, POLY-WRAP IS REQUIRED EXCEPT WITHIN CONCRETE JACKETS.

12. LUBRICATE HYDRANT NOZZLE THREADS WITH NON-TOXIC GREASE.

13. THE CONTRACTOR SHALL PAINT AND NUMBER THE FIRE HYDRANT. NUMBERING TO BE FURNISHED BY DWS.

14. WATER MAINS AND APPURTENANCES SHALL BE SUBJECT TO HYDROSTATIC TESTING IN ACCORDANCE WITH THE LATEST REVISION OF AWWA C600, UNDER THE "HYDROSTATIC TESTING" SECTION, TO A PRESSURE OF AT LEAST 1.5 TIMES THE WORKING PRESSURE. UNLESS OTHERWISE STATED IN THE CONSTRUCTION DOCUMENTS OR LIMITED BY THE PRESSURE RATING OF EQUIPMENT, THE PRESSURE TEST AND LEAKAGE TEST SHALL BE PERFORMED AT 225 POUNDS PER SQUARE INCH PRESSURE.

15. THE DEVELOPER SHALL SUBMIT A COST LIST ALONG WITH AN AFFIDAVIT FOR THE WATER SYSTEM PRIOR TO ACCEPTANCE.

16. THE CONTRACTOR SHALL SUBMIT TWO SETS OF RECORD DRAWINGS VIA A CONSULTANT PRIOR TO ACCEPTANCE OF THE WATER SYSTEM. AN ELECTRONIC IMAGE FILE IN TIFF FORMAT SHALL BE PROVIDED TO THE DWS FOR ALL PROJECTS.

ADDITIONAL WATER SYSTEM NOTES

WATER SERVICE LATERAL CONNECTIONS:

1. THE CONTRACTOR SHALL FURNISH ALL MATERIAL, EQUIPMENT, AND LABOR FOR RE-CONNECTION OF CONSUMER'S PIPE TO NEW SERVICE LATERAL WITH COPPER PIPING AT THE CONTRACTOR'S EXPENSE. THE SIZE OF COPPER PIPE AND FITTINGS SHALL BE DETERMINED BY DWS OR AS SPECIFIED ON PLANS. THE USE OF PLASTIC MATERIALS IS PROHIBITED.

   A. ALL WATER METER INSTALLATIONS/RELOCATIONS SHALL BE COORDINATED WITH DWS PERSONNEL. ONLY DWS PERSONNEL IS AUTHORIZED TO REMOVE AND RELOCATE WATER METER.

   B. IF CONSUMER'S PIPE IS COPPER OR PVC, USE BRONZE PACK JOINT COUPLING. IF CONSUMER'S PIPE IS ANY OTHER MATERIAL, USE APPROPRIATE DI-ELECTRIC COUPLING.

   C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING WATER SERVICE TO CONSUMERS AT ALL TIMES. IF WATER SERVICE DISRUPTION IS NECESSARY, THE CONTRACTOR SHALL COORDINATE ALL DISRUPTIONS OF SERVICE WITH CONSUMERS.

2. THE CONTRACTOR SHALL FURNISH AND INSTALL DUCTILE IRON NIPPLES WHETHER OR NOT SPECIFIED ON THE CONSTRUCTION PLANS FOR COMPLETE INSTALLATION OF THE WATERLINE AT THE CONTRACTOR'S EXPENSE.

3. THE CONTRACTOR SHALL FURNISH TEMPORARY CLEANOUTS WHEN NECESSARY TO TEST, FLUSH, AND CHLORINATE THE WATERLINE AT THE CONTRACTOR'S EXPENSE.

4. THE CONTRACTOR SHALL CONCRETE PLUG ALL OPEN ENDS OF ABANDONED WATERLINES AT THE CONTRACTOR'S EXPENSE, WHETHER OR NOT SHOWN ON THE CONSTRUCTION PLANS.

5. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF ALL PORTIONS OF ABANDONED WATERLINES THAT ARE EXPOSED OR WITHIN 12-INCHES OF THE GROUND SURFACE AT THE CONTRACTOR'S EXPENSE.

6. THE CONTRACTOR SHALL ADJUST TO FINISHED PAVEMENT GRADES, ALL EXISTING VALVE BOXES AND MANHOLES, INCLUDING FRAME AND COVERS FOR ALL UTILITIES (I.E., WATER, SEWER, DRAIN, ETC.) AFFECTED BY PAVEMENT RESTORATION AT THE CONTRACTOR'S EXPENSE, WHETHER SHOWN OR NOT SHOWN ON THE CONSTRUCTION PLANS.

7. THE CONTRACTOR SHALL RESTORE ALL ROAD IMPROVEMENTS, DISTURBED OR DAMAGED DURING CONSTRUCTION IN ACCORDANCE WITH THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, 1994," AS AMENDED, TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS AND WASTE MANAGEMENT. ROAD IMPROVEMENTS INCLUDE, BUT ARE NOT LIMITED TO, PAVEMENT, PAVEMENT MARKERS, STRIPING, SPEED HUMPS.

8. THE CONTRACTOR SHALL MAINTAIN FOUR FEET OF CLEARANCE WHEN TRENCHING OR EXCAVATING NEAR ANY UTILITY POLES. CONSTRUCTION EQUIPMENT SHALL SHALL MAINTAIN A TEN FOOT RADIAL CLEARANCE AROUND ANY OVERHEAD CONDUCTOR.

9. THE CONTRACTOR SHALL ADEQUATELY BRACE UTILITY POLES DURING TRENCHING AND BACKFILLING OPERATIONS. AFFECTED UTILITY COMPANIES SHALL BE NOTIFIED 72 HOURS IN ADVANCE OF WORK NEAR UTILITY POLES.

PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL NOTES

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.

2. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

3. THE CONTRACTOR, AT HIS/HER OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY SHALL REQUIRE SUPPLEMENTARY MEASURES AS REQUIRED.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS" AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU 1990, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.

5. THE CONTRACTOR'S ATTENTION IS DIRECTED TO HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, "COMMUNITY NOISE CONTROL" IN WHICH MAXIMUM ALLOWABLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION ACTIVITIES FOR THIS PROJECT WILL EXCEED THE ALLOWABLE NOISE LEVELS, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A PERMIT FROM THE DIRECTOR OF THE DEPARTMENT OF HEALTH. THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR CONSTRUCTION ACTIVITIES. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE AT THE ENVIRONMENTAL HEALTH SERVICES DIVISION, 591 ALA MOANA BOULEVARD, HONOLULU, HAWAII 96813 OR BY TELEPHONE (586-4700).

CHLORINATION OF WATER SYSTEMS

1. WATER MAINS SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD FOR DISINFECTING WATER MAINS, ANSI/AWWA C651-99, SECTION 4.4.3, CONTINUOUS FEED METHOD.

2. THE STORAGE TANK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA STANDARD FOR DISINFECTING WATER STORAGE FACILITIES, ANSI/AWWA C652-92, SECTION 4.1, CHLORINATION METHOD 1.

3. LIQUID CHLORINE OR CALCIUM HYPOCHLORITE THAT HAS BEEN TESTED AND CERTIFIED AS MEETING THE SPECIFICATIONS OF ANSI/NSF STANDARD 60, DRINKING WATER TREATMENT CHEMICALS-HEALTH EFFECTS, SHALL BE USED FOR THE CHLORINATION OF THE WATER MAINS AND STORAGE TANK.

4. PRIOR TO CHLORINATION, THE WATER MAINS AND STORAGE TANK SHALL BE THOROUGHLY FLUSHED.

5. THE INTERIOR SURFACES OF THE WATER MAINS AND STORAGE TANK SHALL BE EXPOSED TO THE CHLORINATING SOLUTION, BY COMPLETELY FILLING THE MAIN TO REMOVE ALL AIR POCKETS, FOR A MINIMUM OF 24 HOURS AND THE FREE CHLORINE RESIDUAL SHALL NOT BE LESS THAN 10 PPM AFTER SUCH TIME.

6. SHOULD CALCIUM HYPOCHLORITE BE USED, NO SOLID AND/OR UNDISSOLVED PORTION OF THE COMPOUND SHALL BE INTRODUCED INTO ANY SECTION OF THE WATER MAINS AND STORAGE TANK TO BE CHLORINATED.

7. AT THE END OF THE 24 HOUR DISINFECTION PERIOD, REPRESENTATIVE SAMPLES SHALL BE TAKEN AND ANALYZED TO ASSURE A FREE CHLORINE RESIDUAL OF AT LEAST 10 PPM.

8. SHOULD THE FREE CHLORINE RESIDUAL RESULTS INDICATE ADEQUATE CHLORINATION, THE WATER MAINS AND STORAGE TANK SHALL BE THOROUGHLY FLUSHED AND FILLED WITH WATER FROM THE EXISTING SYSTEM AND AGAIN TESTED FOR FREE CHLORINE RESIDUAL. THE FLUSHING SHALL BE CONSIDERED ADEQUATE IF THE FREE CHLORINE RESIDUAL TEST RESULTS INDICATE THAT THE WATER IN THE WATER MAINS AND STORAGE TANK HAS A COMPARABLE CHLORINE RESIDUAL AS THE WATER IN THE EXISTING SYSTEM.

9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF CHLORINATED WATER TO SAFEGUARD PUBLIC HEALTH AND ENVIRONMENT IN ACCORDANCE WITH APPLICABLE STATE DEPARTMENT OF HEALTH REQUIREMENTS. A NEUTRALIZING CHEMICAL SHALL BE APPLIED TO THE WATER TO BE WASTED TO THOROUGHLY NEUTRALIZE THE CHLORINE RESIDUAL REMAINING IN THE WATER IN ACCORDANCE WITH AWWA C651-99, SECTION 4.5.2, AND APPENDIX C.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH, PRIOR TO THE START OF CONSTRUCTION FOR THE DISPOSAL OF WATER USED FOR HYDROTESTING AND CHLORINATION.

11. FOLLOWING THE ACCEPTABLE FLUSHING OF THE WATER MAINS AND STORAGE TANK, TWO CONSECUTIVE SETS OF ACCEPTABLE SAMPLES, TAKEN AT LEAST 24 HOURS APART FROM REPRESENTATIVE POINTS, SHALL BE SUBJECTED TO MICROBIOLOGICAL TESTS (TOTAL AND FECAL COLIFORM). FOR WATERLINES, AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED FROM EVERY 1,200 FEET OF THE NEW WATER MAIN, PLUS ONE FROM THE END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH. FOR THE STORAGE TANK, THE SAMPLE SHALL BE COLLECTED FROM THE TANK'S EFFLUENT LINE SAMPLE TAP. POSITIVE OR INVALID TEST RESULTS WILL NOT BE ACCEPTABLE AND THE PROCESS WILL BE REPEATED.

12. ALL MEASUREMENTS FOR CHLORINE RESIDUAL SHALL BE ANALYZED USING E.P.A. APPROVED METHODS FOR DRINKING WATER.

13. ALL MICROBIOLOGICAL TEST SHALL BE PERFORMED BY A LABORATORY APPROVED BY THE DEPARTMENT OF HEALTH, STATE OF HAWAII.

14. THE DEVELOPER/CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH ALL OF THE FOREGOING.

15. SEE ANSI/AWWA C651-99, SECTION 4.3.6 FOR SWABBING CHLORINATION PROCEDURES.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS (NPDES) AND OTHER AUTHORIZATIONS

THE GENERAL CONTRACTOR/DEVELOPER/OWNER OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:

1. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
2. DISCHARGES OF HYDROTESTING EFFLUENT, DEWATERING EFFLUENT, AND WELL DRILLING EFFLUENT TO STATE WATERS.

IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATION ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11- 54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT: http://health.hawaii.gov/cwb/

THE GENERAL CONTRACTOR/DEVELOPER/OWNER IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

OTHER

1. ALL MATERIALS (PIPE, PIPE LUBRICANTS, PAINTS, SEALANTS, FORM OIL, CONCRETE ADMIXTURES, ETC.) IN DIRECT CONTACT WITH THE POTABLE WATER SHALL HAVE NATIONAL SANITATION FOUNDATIONS (NSF) APPROVALS. THE CONTRACTOR SHALL SUBMIT THESE APPROVALS TO THE OWNER/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ITS APPLICATION.

WASTEWATER NOTES

1. ALL WASTEWATER LINES AND APPURTENANCES SHALL CONFORM TO THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DATED SEPTEMBER 1984, OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF MAUI.

2. ALL SEWERLINE AND APPURTENANCES SHALL FOLLOW THE DESIGN STANDARDS OF THE WASTEWATER RECLAMATION DIVISION, CITY AND COUNTY OF HONOLULU, VOLUMES 1 & 2, DATED JULY 1993 AND JULY 1984 RESPECTIVELY, UNLESS OTHERWISE NOTED.

3. BEFORE CONSTRUCTION COMMENCES, THE CONTRACTOR SHALL SCHEDULE AND DOCUMENT A PRE-CONSTRUCTION MEETING WITH ALL AGENCIES HAVING UTILITIES AFFECTED BY THE WORK.

4. THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, WASTEWATER RECLAMATION DIVISION, HAS THE RIGHT TO STOP CONSTRUCTION, SHOULD ANY WORK BE FOUND CONTRARY TO THE APPROVED PLANS AND SPECIFICATIONS, OR DETRIMENTAL TO THE PUBLIC INTEREST.

5. ALL EXISTING WASTEWATER LINES, WHETHER OR NOT SHOWN ON THE PLANS, IF DAMAGED DURING CONSTRUCTION, SHALL BE REPAIRED BY THE CONTRACTOR AND THE CONTRACTOR SHALL PAY ALL EXPENSES.

6. THE CONTRACTOR SHALL NOTIFY THE WASTEWATER RECLAMATION DIVISION ONE (1) WEEK PRIOR TO CONNECTION TO ANY EXISTING WASTEWATER LINES.

7. SHOULD THE CONTRACTOR EXCAVATE BEYOND THE TRENCH PAY-WIDTH, AS SPECIFIED IN THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DATED SEPTEMBER 1984, AND SUCH ACTION RESULTS IN A GREATER LOAD TO THE PIPE, THE CONTRACTOR SHALL PROVIDE, AT THE CONTRACTOR'S EXPENSE, A HIGHER CLASS OF BEDDING MATERIAL THAT WILL WITHSTAND THE ADDED LOAD.

8. WASTEWATER LATERALS SHALL BE SIX (6) INCHES IN DIAMETER AT A MINIMUM OF 2% SLOPE, UNLESS APPROVED OTHERWISE.

9. AN ADVANCE RISER CONNECTION SHALL BE INSTALLED AT EACH NEW WASTEWATER LATERAL.

10. WHERE THE CLEARANCE BETWEEN A WASTEWATER LINE AND A NEW OR EXISTING UTILITY LINE IS EIGHTEEN (18) INCHES OR LESS, THE WASTEWATER LINE SHALL BE CONCRETE JACKETED IN ACCORDANCE WITH THE STANDARD DETAILS OF PUBLIC WORKS CONSTRUCTION, DATED SEPTEMBER 1984.

11. WHEN THE WASTEWATER MAINS ARE OF A DIFFERENT MATERIAL THAN THE LATERALS, THE CONTRACTOR SHALL INSTALL APPROVED ADAPTERS.

12. ALL BACKFILL FOR WASTEWATER TRENCHES SHALL BE COMPACTED IN ONE (1) FOOT LIFTS TO A MINIMUM OF 95% OF ITS MAXIMUM DENSITY.

13. WHERE CONSTRUCTION IS TO BE DONE IN PHASES OR INCREMENTS, EACH PHASE OR INCREMENT SHALL BE APPROVED BY WASTEWATER RECLAMATION DIVISION BEFORE THE NEXT PHASE OR INCREMENT IS STARTED.

14. ALL WASTEWATER MAINS SHALL PASS A MANDREL TEST AS A CONDITION OF ACCEPTANCE 30 DAYS AFTER COMPLETION AND BACKFILL. THE MANDREL DIAMETER SHALL BE 95% OR MORE OF THE INSIDE DIAMETER OF THE PIPE BEING TESTED. A CERTIFICATION LETTER FROM THE CONTRACTOR, SIGNED BY THE DSA INSPECTOR, WILL BE FORWARDED TO THE WASTEWATER RECLAMATION DIVISION.

15. PRIOR TO INSPECTION BY CLOSED CIRCUIT TELEVISION (CCTV), ALL WASTEWATER LINES INSTALLED, INCLUDING LATERALS, SHALL BE FLUSHED WITH WATER AND ANY ACCUMULATED CONSTRUCTION DEBRIS AND OTHER FOREIGN MATERIALS SHALL BE REMOVED.

16. "AS-BUILT" DRAWINGS SHALL BE SUBMITTED AS A CONDITION FOR THE FINAL ACCEPTANCE OF THE PROJECT. IF MAIN TRANSMISSION LINES WILL BE DEDICATED TO THE COUNTY, THE CONTRACTOR SHALL ALSO SUBMIT GIS SHAPE FILE LAYER FILES (SHAPEFILE DATA IN NAD83 STATE PLANE ZONE 2 METERS) TO THE WASTEWATER RECLAMATION DIVISION.

17. ALL MAIN WASTEWATER LINES WHICH WILL BE DEDICATED TO THE COUNTY OF MAUI SHALL BE INSPECTED BY CCTV IN STRICT ACCORDANCE WITH DEPARTMENT OF PUBLIC WORKS CCTV POLICY, EFFECTIVE DATE JULY 15, 2001. FINAL ACCEPTANCE OF THE SYSTEM SHALL BE CONTINGENT UPON THE PASSING OF ALL REQUIREMENTS OF THIS POLICY. CCTV RESULTS SHOULD BE SUBMITTED ON DVD PER MEMO DATED OCTOBER 1,2006.

18. ANY CONNECTION MADE UNDER THE WATER TABLE WILL REQUIRE CCTV AT HIGH TIDE TO DETERMINE WATER TIGHTNESS, IN ACCORDANCE WITH DEPARTMENT OF PUBLIC WORKS CCTV POLICY, EFFECTIVE DATE JULY 15, 2001. FINAL ACCEPTANCE OF THE SYSTEM SHALL BE CONTINGENT UPON THE PASSING OF ALL REQUIREMENTS OF THIS POLICY.

19. CONTRACTOR MUST HAVE A SITE SPECIFIC SPILL PREVENTION PLAN (SSSPP) APPROVED BY WWRD PRIOR TO SEWER LINE CONSTRUCTION AND/OR SEWER LATERAL CONNECTION TO EXISTING FACILITIES, OR ANY WORK WITHIN FIVE (5) FEET OF WASTEWATER SYSTEM IMPROVEMENTS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T004
SHEET 4 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITES 1 AND 3-7 HOOLEHUA WATER SYSTEM
JOB NO.

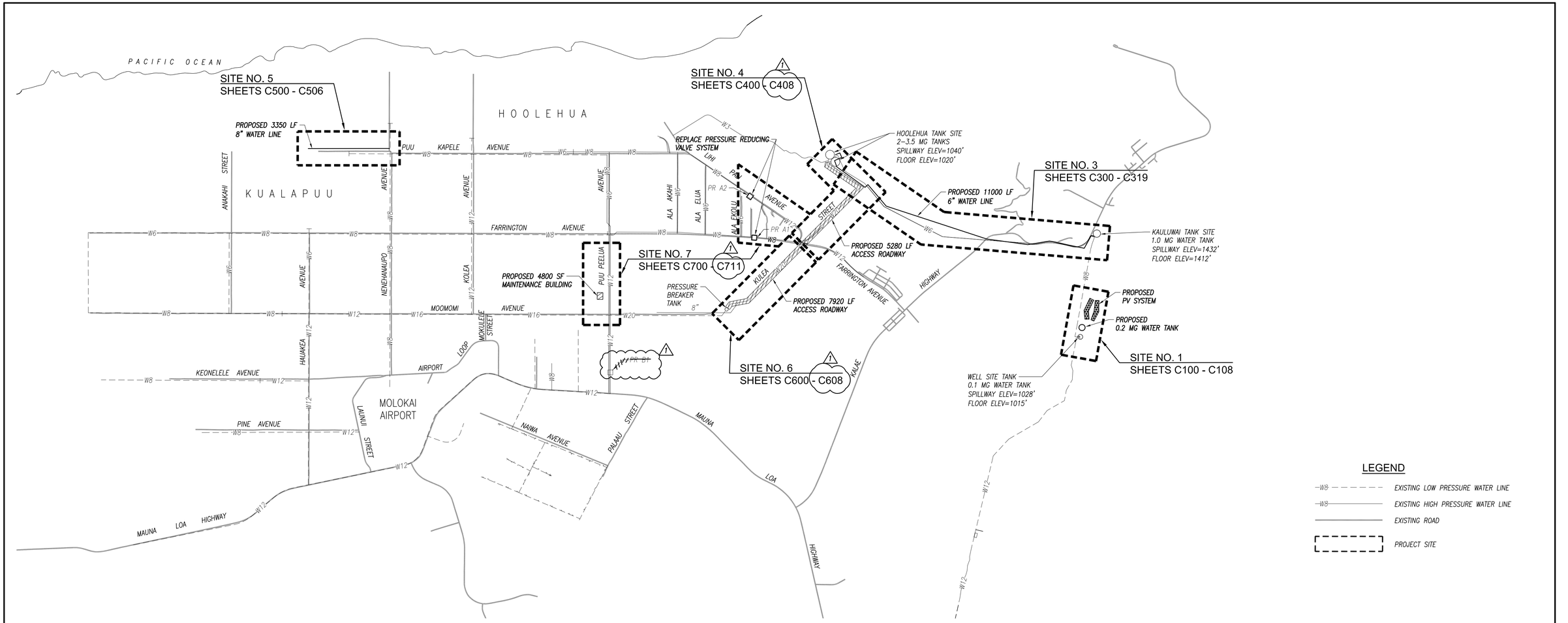
NOTES 2

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



GENERAL PLAN

2000 0 2000 4000

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUT	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITES 1 AND 3-7 HOOLEHUA WATER SYSTEM
JOB NO.

GENERAL PLAN
HOOLEHUA WATER SYSTEM

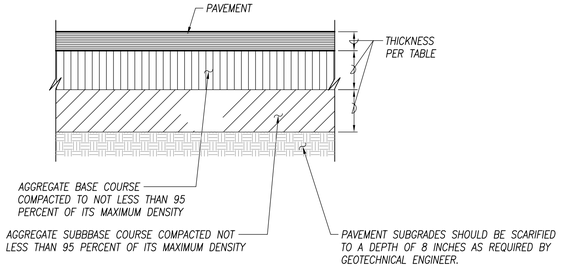
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
T005
SHEET 5 OF 149

FILE	POCKET	FOLDER	NO.



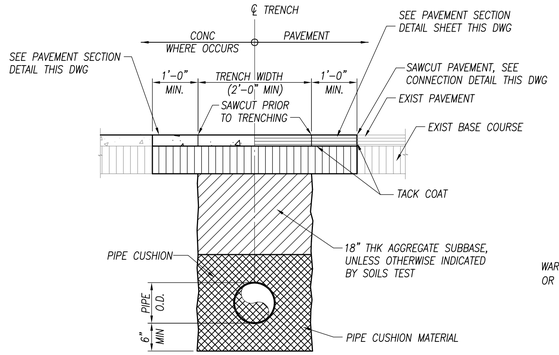
FLEXIBLE PAVEMENT

MATERIAL	ACCESS ROADS	WATER TANK PERIMETER ROADS	STATE HWYS
ASPHALT PAVEMENT	3"	2"	4"
AGGREGATE BASE COURSE	6"	6"	8"
AGGREGATE SUBBASE COURSE	12"	12"	12"

NOTES:

1. UNLESS SPECIFIED OTHERWISE, ALL CONSTRUCTION SHALL BE PURSUANT TO THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION AS REVISED BY THE CITY AND COUNTY OF MAUI. SEE ENGINEERING AND POLICY MEMORANDUM NO. CEB-1-12, DATED OCTOBER 12, 2012, TITLED "AMENDING THE STANDARD SPECIFICATIONS ON ASPHALT TREATED BASE, ASPHALT SURFACE TREATMENT, AND ASPHALT CONCRETE PAVEMENT."
2. SEE PLAN FOR PAVEMENT TYPE LOCATIONS.

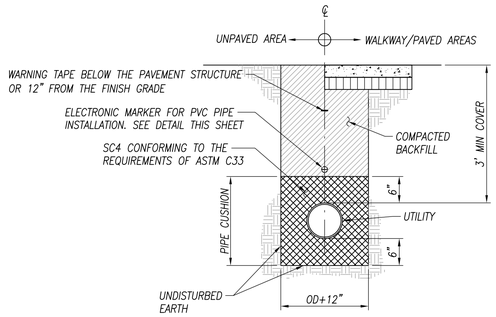
FLEXIBLE PAVEMENT SECTION
NOT TO SCALE



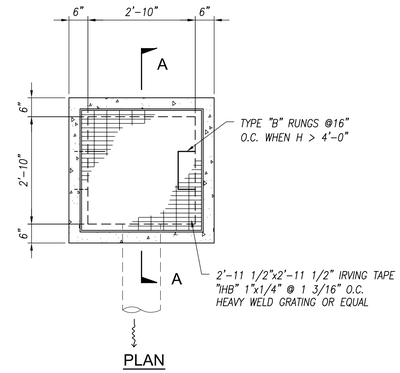
NOTES:

1. PAVEMENT STRUCTURES, INCLUDING A.C. PAVEMENT, CONCETE PAVEMENT, BASE COURSE AND SUBBASE, SHALL BE EQUAL TO OR BETTER IN THICKNESS AND QUALITY.
2. ROADWAY SHALL BE PAVED TO THE TRENCH WIDTH PLUS AN ADDITIONAL ONE FOOT ON EACH SIDE OF THE TRENCH.
3. THE ROADWAY SHALL BE PAVED AN ADDITIONAL TWO FEET IN LENGTH AT EACH END OF THE TRENCH.
4. ALL DISTURBED PAVEMENT MARKINGS SHALL BE REPLACED AND ALL REQUIRED UTILITY ADJUSTMENTS SUCH AS MANHOLE COVERS, ETC., SHALL BE DONE BY THE CONTRACTOR.

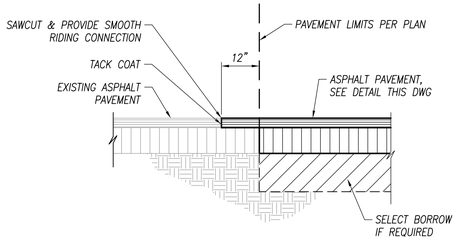
TYPICAL TRENCH RESTORATION
NOT TO SCALE



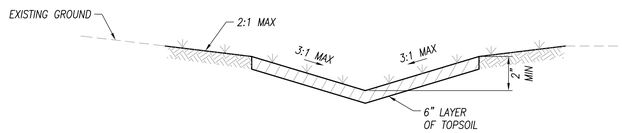
WATER TRENCH DETAIL
NOT TO SCALE



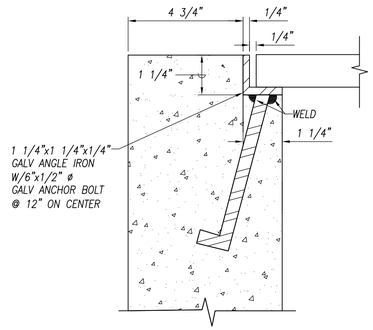
DRAIN INLET
NOT TO SCALE



AC PAVEMENT CONNECTION
NOT TO SCALE

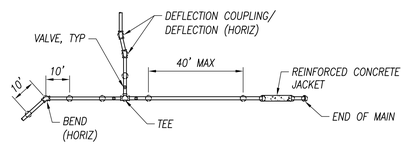


VEGETATED SWALE (PRIVATE)
NOT TO SCALE

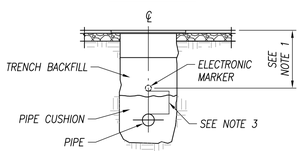


TYPE "D" INLET ANCHOR BOLT
NOT TO SCALE

NOTE:
⬠ ELECTRONIC MARKER



PLAN VIEW

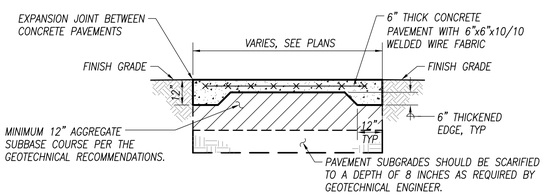


SECTION VIEW

NOTES:

1. INSTALL ELECTRONIC MARKER OVER CENTER LINE OF PIPE AT A MINIMUM DEPTH OF 2 FEET AND A MAXIMUM DEPTH OF 3 FEET FROM FINISH GRADE.
2. INSTALL TRENCH BACKFILL AND PIPE CUSHION MATERIAL IN ACCORDANCE TO THE PLANS AND SPECIFICATIONS.
3. INSTALL ELECTRONIC MARKER AT A MINIMUM CLEARANCE OF 6-INCHES, WHERE POSSIBLE. INSTALL MARKERS ON OR ABOVE CONCRETE JACKETS.

ELECTRONIC MARKER INSTALLATION
NOT TO SCALE



NOTE:

1. ALL CONCRETE PAVEMENT (PRIVATE) SHALL BE CONSTRUCTED PURSUANT TO "SECTION 37 - PORTLAND CEMENT CONCRETE PAVEMENT" OF STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION. THICKENED PAVEMENT EDGES SHALL BE PLACED ADJACENT TO UNPAVED AREAS AND SHOULD BE EMBEDDED AT LEAST 12 INCHES BELOW THE LOWEST ADJACENT GRADE.

VEHICULAR CONCRETE PAVEMENT
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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SITES 1 AND 3-7 HOOLEHUA WATER SYSTEM
JOB NO.

STANDARD DETAILS 1

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T006
SHEET 6 OF 149

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

NATIONAL POLLUTANT DISCHARGE ELIMINATION AND BEST MANAGEMENT PRACTICE (BMP) NOTES:

1. PERIMETER RUNOFF CONTROL
   A. 12" ϕ FILTER SOCKS: CONTRACTOR TO INSTALL PERPENDICULAR TO THE DIRECTION OF FLOW AND ALONG THE DOWNHILL SIDE OF THE OPEN GRADING AREAS. LOCATION SHALL BE ADJUSTED DURING THE GRADING OPERATIONS. TEMPORARY SILT FENCE MAY BE USED IN LIEU OF FILTER SOCK AT CONTRACTOR'S DISCRETION.

2. STABILIZATION CONTROL
   A. TEMPORARY – ALL SLOPES AND EXPOSED AREAS SHALL BE IMMEDIATELY MULCHED OR PLANTED WHEN FINAL GRADES ARE ESTABLISHED OR WHEN GRADING WORK WILL BE DELAYED FOR MORE THAN TWO WEEKS AND BEFORE THE REMOVAL OF THE PROJECT'S TEMPORARY BMP.

   B. PERMANENT – ALL SLOPES AND EXPOSED AREAS SHALL BE LANDSCAPED WHEN FINAL GRADES ARE ESTABLISHED.

3. STABILIZED CONSTRUCTION ENTRANCE FOR INGRESS/EGRESS WITH AMOCO SERIES 2000 GEOTEXTILE FABRIC OR APPROVED EQUAL, 20' x 50' x 8" THICK, 1" TO 3" COARSE AGGREGATE OR LARGER (7" MAX.)

4. THE CONTRACTOR SHALL ENSURE THAT ALL TIRES OF CONSTRUCTION VEHICLES ARE SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKED OFF THE CONSTRUCTION SITE. WASHING OFF TIRES WITH WATER WILL NOT BE ACCEPTABLE UNLESS RUNOFF IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM OR ONTO THE PUBLIC RIGHT-OF-WAY.

5. TEMPORARY EROSION CONTROLS SHALL BE IN PLACE PRIOR TO ANY GRADING OR GRUBBING WORK.

6. MAINTAIN EROSION AND SEDIMENT CONTROL MEASURES AS REQUIRED THROUGHOUT DURATION OF PROJECT.

7. BMP PROVIDED HEREIN ARE MINIMUM REQUIREMENTS. CONTRACTOR SHALL USE DISCRETION WHETHER ADDITIONAL BMP MEASURES ARE NECESSARY FOR CONTROLLING SEDIMENT RUNOFF FROM THE PROJECT SITE.

8. EROSION CONTROL MEASURES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.

9. FILTER SOCKS, SILT FENCES, AND TEMPORARY CONSTRUCTION ENTRANCES WILL REMAIN IN-PLACE UNTIL PERMANENT BMP ARE INSTALLED. CONTRACTOR SHALL MAINTAIN ALL EXISTING BMP MEASURES AND ENSURE THAT IT REMAINS OPERABLE AT ALL TIMES.

10. THE FINAL LIFT OF EACH DAYS WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIAL.

11. THE CONTRACTOR SHALL HAVE A COPY OF CURRENT NPDES AND GRADING PERMIT(S) ON SITE AT ALL TIMES. THE CONTRACTOR SHALL ALSO PROVIDE A COMPLETED BMP CHECKLIST AT TIME OF OBTAINING THE GRADING PERMIT AND MAINTAIN AN UPDATED RECORD OF SITE INSPECTIONS ON SITE THROUGH THE USE OF BMP CHECKLISTS.

12. THE CONTRACTOR SHALL NOT PERFORM EARTHWORK DURING INCLEMENT WEATHER.

13. THE EXISTING PAVED ROADWAYS INCLUDING SIDEWALKS AND GUTTERS SHALL BE CLEANED ON A DAILY BASIS TO BE FREE OF DEBRIS AND SEDIMENT RESULTING FROM THE GRADING OPERATIONS. FLUSHING INTO THE DRAIN STRUCTURES IS PROHIBITED.

14. STOCKPILING CONSTRUCTION MATERIAL IN THE EXISTING ROAD RIGHT-OF-WAY AREA OR ADJACENT LOT(S) ARE PROHIBITED.

15. IF ANY EXPOSED GRADED AREAS THAT ARE NOT BEING WORKED ON OR WHOSE FINAL GRADES HAVE BEEN ESTABLISHED FOR MORE THAN 14 DAYS, THE CONTRACTOR SHALL MULCH THE AREA.

16. AT THE CONCLUSION OF GRADING OPERATIONS AND PRIOR TO PROJECT COMPLETION, ALL DRAINAGE STRUCTURES WITHIN LIMITS OF DISTURBED AREA SHALL BE INSPECTED AND CLEANED OF ACCUMULATED DEBRIS AND SEDIMENT. THE ACCUMULATED SEDIMENT AND DEBRIS SHALL BE REMOVED FROM THE CATCH BASINS (FLUSHING INTO DRAIN STRUCTURES IS PROHIBITED).

17. WASH WATER SHALL NOT DRAIN INTO EXISTING CATCH BASINS.

18. DURING CONSTRUCTION, INLET PROTECTION SHALL BE APPLIED TO ALL DRAIN INLET STRUCTURES IMMEDIATELY FOLLOWING INSTALLATION.

19. THE CONTRACTOR SHALL ADHERE TO ALL OTHER REQUIREMENTS AS DETAILED IN THE STORMWATER POLLUTION PLAN (SWPPP).

20. ALL OTHER REQUIREMENTS PER NPDES FILE NO. HI R10F358.FNL.17.

BEST MANAGEMENT PRACTICES (BMP) NOTES:

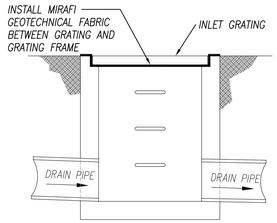
1. REFER TO NPDES AND BMP NOTES AND EROSION CONTROL DETAILS ON ~~SHEET C302~~ THIS DRAWING. (1)
2. THE BMP FACILITIES SHOWN ON THIS PLAN ARE THE MINIMUM REQUIREMENTS FOR ANTICIPATED SITE CONDITIONS AND SHALL BE UPGRADED DURING THE CONSTRUCTION PERIOD AS NEEDED FOR UNEXPECTED STORM EVENTS AND TO ENSURE THAT SEDIMENT AND SEDIMENT-LADEN RUNOFF DOES NOT LEAVE THE WORK SITE.
3. ALL POINTS OF INGRESS AND EGRESS TO THE SITE SHALL BE PROTECTED WITH A STABILIZED CONSTRUCTION ENTRANCE.
4. PROVIDE INLET FILTER (TRUE DAM @ INLET PROTECTION OR APPROVED EQUAL) FOR ALL CATCH BASIN OPENINGS.
5. DUST CONTROL SHOULD BE APPLIED TO REDUCE DUST EMISSIONS. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES: CHAPTER 11-60, "AIR POLLUTION CONTROL".
6. SEDIMENT FENCES OR BARRIERS (FILTER SOCKS) SHALL BE USED DOWN SLOPE OF ALL DISTURBED AREAS AND ALONG THE PERIMETER OF THE PROJECT AREA.
7. ALL STORM DRAIN INLETS ON SITE AND THOSE OFFSITE WHICH MAY RECEIVE RUNOFF FOR THE SITE SHALL USE AN INLET PROTECTION DEVICE.
8. CONSTRUCTION VEHICLES AND/OR EQUIPMENT UTILIZED DURING THE GRADING WORK WILL BE KEPT ONSITE OR LOADED TO A TRAILER TO BE TRANSPORTED OFFSITE.

DUST CONTROL NOTE:

1. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE MEASURES IT WILL TAKE FOR THE CONTROL OF FUGITIVE DUST FROM THE WORK SITE. THE MEASURES MAY INCLUDE BUT NOT BE LIMITED TO THE INSTALLATION OF DUST SCREENS, WATERING OF THE SITE, FILL MATERIAL BEING PLACED, AND DELAYING WORK IN THE WEEK THAT PREVAILING WIND DIRECTION SHOULD SHIFT.

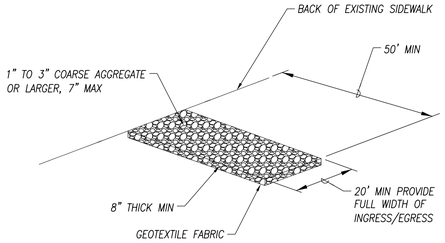
MAINTENANCE NOTE:

1. EROSION CONTROL MEASURES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.



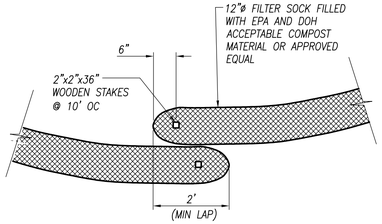
NOTE:
MIRAFI GEOTECHNICAL FABRIC SHALL BE INSTALLED UNDER ALL NEW PRIVATE DRAIN INLET GRATES WITHIN THE PROJECT SITE AND EXISTING DRAIN INLETS SURROUNDING THE PROJECT.

SEDIMENT CONTROL FILTER AT PRIVATE DRAIN INTLET DETAIL
NOT TO SCALE

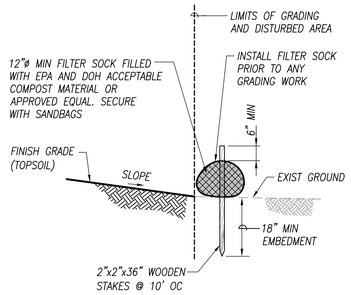


NOTE:
1. ANY SEDIMENT CARRIED FROM THE SITE ONTO THE STREET SHALL BE CLEANED UP IMMEDIATELY.

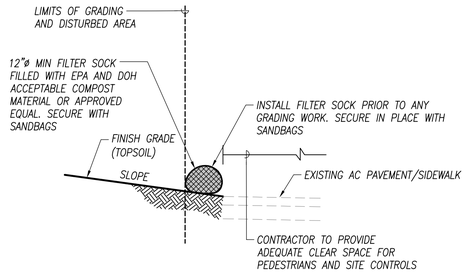
GRAVEL CONSTRUCTION ENTRANCE DETAIL
NOT TO SCALE



PLAN



TYPICAL SECTION



SECTION
(ALONG EXISTING SIDEWALK OR AC PAVEMENT)

NOTES:
1. WHEN JOINING TWO SECTIONS OF FILTER SOCK, A MINIMUM OF 2 FEET SHOULD BE MADE SO THAT FILTER SOCK SIT SIDE BY SIDE.
2. CONTRACTOR SHALL REMOVE ANY DEBRIS IN PATH OF FILTER SOCK TO ENSURE GOOD GROUND CONTACT.
3. COMPOST SHALL NOT CONTAIN BIOSOLIDS AND SHOULD BE CONSISTENT WITH EPA GUIDELINES.
4. SHOULD THE FILTER FABRIC DECOMPOSE OR BECOME INEFFECTIVE PRIOR TO THE END OF THE EXPECTED USABLE LIFE AND THE FILTER SOCK STILL BE NECESSARY, THE FILTER SOCK SHALL BE REPLACED PROMPTLY.
5. CONTRACTOR SHALL USE 2"x2"x36 WOODEN STAKES WITH 18" MINIMUM EMBEDMENT AND 6" HEIGHT OVER TOP OF FILTER SOCK @ 10' O.C. IN LIEU OF SAND BAGS TO SECURE SOCKS WHEN INSTALLED ON DIRT OR EARTH.
6. CONTRACTOR TO PROVIDE 4' MINIMUM CLEARANCE AT ALL SIDEWALKS.

FILTER SOCK/FILTRATION TUBE DETAIL
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED NOTE	G70	

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

EROSION CONTROL DETAILS

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
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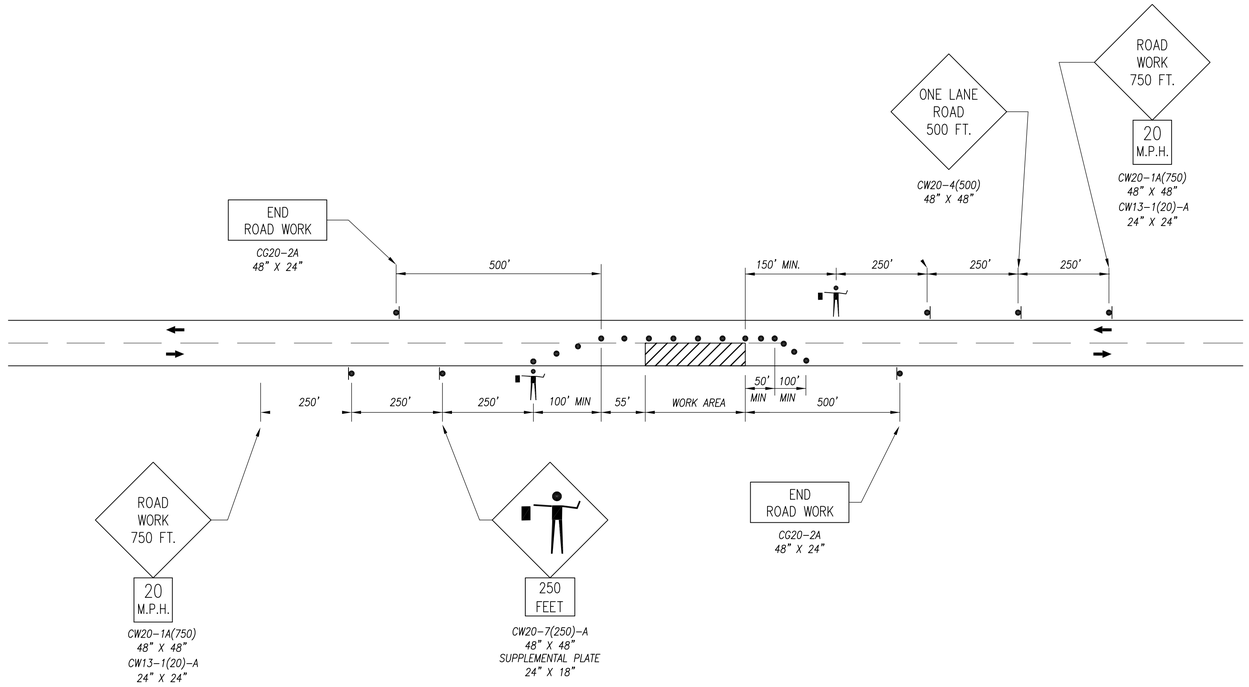
JUNE 2018

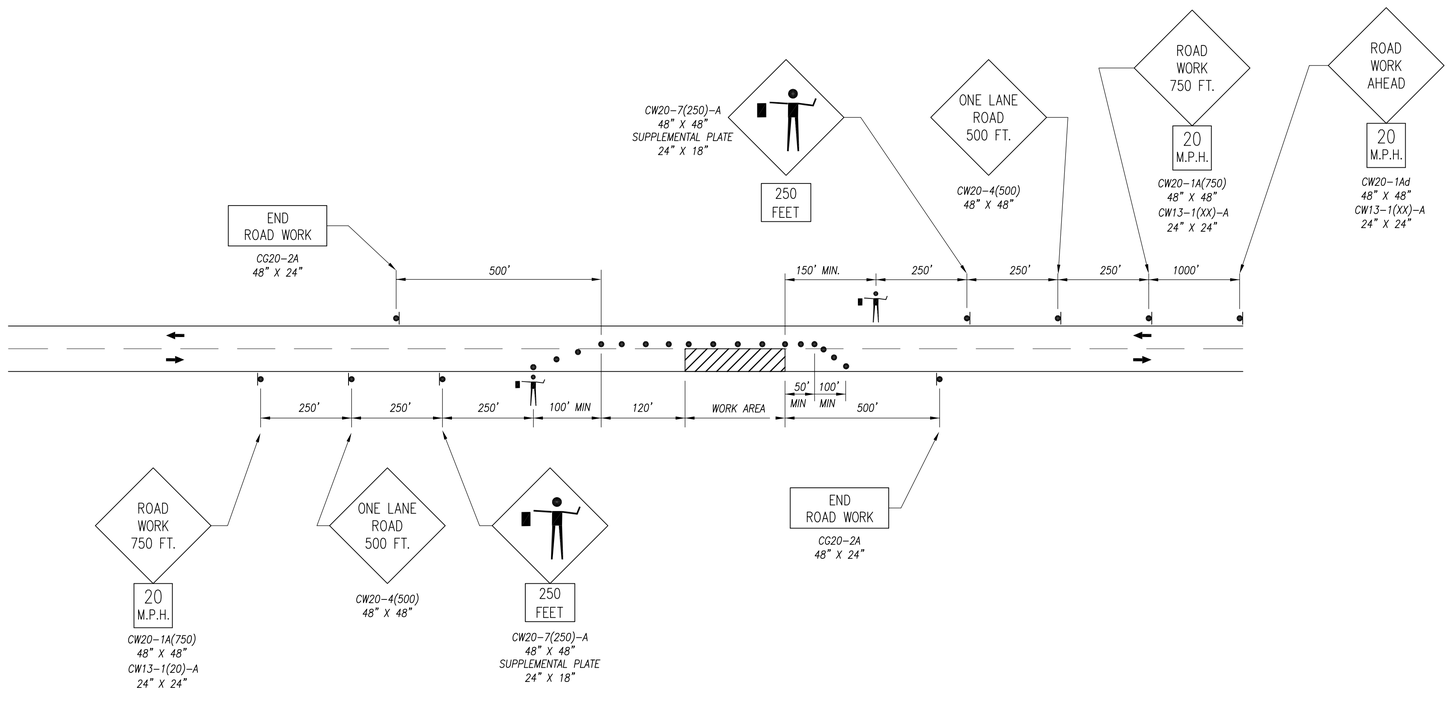
DWG. NO.
T007
SHEET 7 OF 149

FILE	POCKET	FOLDER	NO.



TYPICAL ONE LANE CLOSED FOR 25 MPH

NOT TO SCALE



TYPICAL ONE LANE CLOSED FOR 35 MPH

NOT TO SCALE

LEGEND

- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- POLICE OFFICER/ FLAGMAN
- WORK AREA

TRAFFIC CONTROL PLAN NOTES:

1. CONES OR DELINEATORS SHALL BE INSTALLED AT 25' O.C. MAX ON TAPERS.
2. CONES OR DELINEATORS SHALL BE INSTALLED AT 10' O.C. MAX AT ALL OTHER LOCATIONS
3. THE PERMITEE SHALL MAKE MINOR ADJUSTMENTS AT INTERSECTIONS, DRIVEWAYS, BRIDGES, STRUCTURES, ETC., TO FIT FIELD CONDITIONS.
4. TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SUCH THAT THE SIGN OR DEVICE FARTHEST FROM THE WORK AREA IS PLACED FIRST. THE OTHERS SHALL THEN BE PLACED PROGRESSIVELY TOWARD THE WORK AREA.
5. REGULATORY AND WARNING SIGNS WITHIN THE CONSTRUCTION ZONE THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED.
6. FLAGGERS AND/OR POLICE OFFICERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
7. ALL TRAFFIC LANES SHALL BE A MINIMUM OF 10 FEET WIDE.
8. ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE.
9. THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PRELUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (I.E. WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
10. LANE CLOSURE SHALL BE LIMITED TO THE EXTENT OF ACCOMPLISHING EACH DAY'S WORK. AS SOON A EACH DAY'S WORK IS COMPLETED. THE PERMITEE SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC. REMOVAL SHALL BE IN THE REVERSE ORDER OF INSTALLATION. EXISTING FADED OR OBLITERATED PAVEMENT MARKINGS THAT ARE NECESSARY FOR SAFE TRAFFIC FLOW IN THE CONSTRUCTION AREA SHALL BE REPLACED WITH TEMPORARY OR PERMANENT MARKINGS BEFORE OPENING THE ROADWAY TO PUBLIC TRAFFIC EACH DAY.
11. PERMANENT PAVEMENT MARKINGS AND TRAFFIC SIGNS SHALL BE REPLACED UPON COMPLETION OF EACH PHASE OF WORK.
12. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THE RIGHT-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY. FURTHER, THE PERMITEE SHALL CONTROL TRAFFIC GOING IN AND OUT OF DRIVEWAYS.
13. BUFFER AND TAPER AREAS ON APPROACH TO ANY WORK AREA SHALL BE KEPT CLEAR OF VEHICLES AND EQUIPMENT.
14. "NO PARKING" SIGNS SHALL BE POSTED WITHIN ANY WORK AREA AND FOR THE BUFFER AND TAPER AREAS APPROACHING THE WORK AREA.
15. THE CONTRACTOR SHALL BE FULLY FAMILIAR WITH THE PROJECT SITE, SURROUNDING TRANSPORTATION SYSTEM, AND THE TRAFFIC CONTROL REQUIREMENTS THAT ARE NECESSARY TO CONSTRUCT THE PROJECT COMPLETE IN PLACE AND OPERATIONAL. IT IS THE CONTRACTOR'S RESPONSIBILITY TO IMPLEMENT THE TRAFFIC CONTROL PLAN FOR THE PROTECTION OF ROAD USERS, WORKERS AND RESPONDERS THROUGH ANY AND ALL PORTIONS OF THE CONSTRUCTION OPERATIONS IN ACCORDANCE WITH THE MUTCD AND HAWAII ADMINISTRATIVE RULES. IN ADDITION, THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR THE CONTINUOUS AND EXPEDITIOUS OPERATION AND MAINTENANCE OF ALL CONSTRUCTION WARNING SIGNS. BARRICADES, LIGHTS, FLAGGERS, AND OTHER TRAFFIC CONTROL MEASURES AND/OR DEVICES REQUIRED BY THE TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONTINUOUSLY REVIEWING AND MAINTAINING ALL TRAFFIC CONTROL MEASURES.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T008
SHEET 8 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

JOB NO.

TRAFFIC CONTROL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

TMK(2) 5-2-12: 29
MOLOKAI PROPERTIES LIMITED

EASEMENT 39 (MAP 17) FOR ELECTRICAL PURPOSE

TMK(2) 5-2-12: 25 POR. 15 MOLOKAI PROPERTIES LIMITED
DEPARTMENT OF HAWAIIAN HOMELANDS

TO KALAE HIGHWAY

ROADWAY EASEMENT 2

ROADWAY EASEMENT 3

ROADWAY EASEMENT 1

EASEMENT 151 (MAP 36)
FOR WATER PURPOSES

℄ EASEMENT 152 (MAP 36)
FOR WATER PURPOSES

℄ EASEMENT 153 (MAP 36)
FOR WATER PURPOSES

TMK(2) 5-2-12: 22
KUALAPUU RANCH, LLC

MAUNAHUI ROAD (DHHL)

DHHL KAULAWAI
WELL SITE

TMK(2) 5-2-10: 7
DEPARTMENT OF
HAWAIIAN HOME LANDS

SITE NO. 1

TMK(2) 5-2-10: 3
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: HENRY K. PALI, JR.

R/W

R/W

TMK(2) 5-2-14: 2
MIALA, INC.
& R.W. MEYER, LTD.

WAIAKALAE GULCH

GENERAL PLAN

100 0 100 200

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C100
SHEET 9 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE AND PV FARM
JOB NO.

GENERAL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
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JUNE 2018

FILE	POCKET	FOLDER	NO.

0+00 WL "B"
CONNECT TO EXIST 12" DI PIPE AND CUT AND PLUG EXISTING 12" EAST OF CONNECTION
1 – 12" TAPPING TEE
1 – 12" TAPPING VALVE
1 – 12" CAP
1 – 12" SLEEVE, 12" LONG
5 LF OF 12" PIPE
2 – CONCRETE BLOCKS W/ STRUCT STRUTS
TEMP FOR TESTING:
1 – 12" CAP TAPPED FOR 4" IPT
1 – 4" CLEANOUT
1 – CONCRETE BLOCK
CONTRACTOR TO VERIFY EXACT LOCATION AND INVERT IN FIELD PRIOR TO CONNECTION.
SEE SCHEMATIC CONNECTION DIAGRAM THIS DWG.

EXISTING 12" WATER MAIN TO SITE 2 0.2 MG KALAMAULA TANK

EXISTING 8" WATER MAIN TO SITE 3 KAULUWAI 1.0 MG RESERVOIR

EXIST 100 HP DEEP WELL PUMP

CUT AND PLUG EXISTING 12" WATER LINE AT CONNECTION
REMOVE EXISTING 12" AFTER SERVICE HAS BEEN TRANSFERRED
1 – 12" PLUG
1 – CONCRETE BLOCK

EXIST 8" DI PIPE

NEW 1,000 GALLON DIESEL STORAGE TANK AND CONCRETE PAD
SEE MECH DWGS

NEW ABOVE GROUND DIESEL FUEL LINE
SEE MECHANICAL DWGS

EMERGENCY GENERATOR AND FUEL BASE
SEE MECHANICAL DWGS

0+14 WL "B"
1–12" 1/4 BEND
1–CONC BLK

CONNECT NEW FENCE TO EXISTING CHAIN LINK FENCE

STA 269
HUB
ELEV 1006.54

REMOVE 80± LF EXISTING CHAIN LINK FENCE AND GATE

NEW 6' CHAIN LINK FENCE
SEE STD DETAIL R-19

NEW ASPHALT PAVEMENT

0+83 WL "B"
1 – 12" 1/32 BEND
1 – CONCRETE BLOCK

WL "B"
NEW 12" PIPE

RELOCATE ICV BOX OUTSIDE OF PAVED AREA

EDGE OF PAVEMENT

DEMOLISH EXISTING AC PAVEMENT AND INSTALL NEW ACCESS ROAD
SEE PAVEMENT SECTION DETAIL DWG T006

CONNECT NEW FENCE TO EXISTING CHAIN LINK FENCE

TEMP BENCHMARK
STA 268
"V" CUT
ELEV 1012.82

EXISTING STORAGE SHED TO REMAIN

PROPOSED EASEMENT FOR NEW WATER TANK
SEE DWG C102

0+06.50 WL "C"
REMOVE APPROX 11 LF EXISTING 6" DI PIPE
INSTALL:
1 – 6" 1/4 BEND
1 – 6" SLEEVE, 12" LONG
7 LF OF 6" PIPE
1 – CONCRETE BLOCKS W/ STRUCT STRUTS
TEMP FOR TESTING:
1 – 6" CAP TAPPED FOR 2 1/2" IPT
1 – 2" 1/2" CLEANOUT
1 – CONCRETE BLOCK
CONTRACTOR TO VERIFY EXACT LOCATION AND INVERT IN FIELD PRIOR TO CONNECTION
SEE SCHEMATIC CONNECTION DETAIL THIS DWG

REPLACE 2 EXIST 100 HP BOOSTER PUMP MOTORS IN PLACE
SEE MECHANICAL DWGS

REPLACE EXISTING FROZEN 8" GATE VALVE
1 – 8" GATE VALVE
1 – VALVE BOX
2 – 8" SLEEVES
10 LF 8" PIPE

EXIST 12" DI PIPE

0+00 WL "C"
CONNECT TO EXIST 12" DI PIPE
1 – 12"x6" TAPPING TEE
1 – 6" TAPPING VALVE
1 – 6" SLEEVE, 12" LONG
1 – CONCRETE BLOCK W/ STRUCT STRUCTS
CONTRACTOR TO VERIFY EXACT LOCATION AND INVERT IN FIELD PRIOR TO CONNECTION
SEE SCHEMATIC CONNECTION DETAIL THIS DWG

EXIST 200HP DEEP WELL PUMP

0+36 WL "A"
1 – 12" 1/16 BEND
1 – CONCRETE BLOCK

0+42.52 WL "A"
=1+66.55 WL "B"
1 – 12" TEE
1 – 12" GATE VALVE
1 – VALVE BOXES
1 – CONCRETE BLOCK

ADJUST EXISTING SDMH TO GRADE

NEW 12" DI PIPE

TMK(2) 5-2-10: 7
DEPARTMENT OF HAWAIIAN HOME LANDS

CUT AND PLUG

ABANDON 16 LF EXISTING 6" DI PIPE

INSTALL NEW 12" INSERTION VALVE

0+00 WL "A"
CONNECT TO EXIST 12" DI PIPE AT TANK
1 – 12" TAPPING TEE
1 – 12" TAPPING VALVE
1 – VALVE BOX
16 LF 12" PIPE
1 – 12" SLEEVE, 12" LONG
1 – CONCRETE BLOCK W/ STRUCT STRUTS
CONTRACTOR TO VERIFY EXACT LOCATION AND INVERT IN FIELD PRIOR TO CONNECTION
SEE SCHEMATIC CONNECTION DETAIL THIS DWG

TANK FF=1015 (REC.)
=1016.7 (TOPO)
TANK HT. = +16'
WATER LEVEL = +14.5'
(RECORD)

REMOVE EXIST TEE
CONNECT EXISTING 12" WL TO NEW 12" TEE AT 0+00 WL "A"
1 – 12" SLEEVE, 12" LONG
5 LF 12" PIPE

0+10 WL "A"
1 – 12" 1/16 BEND
1 – CONCRETE BLOCK

WL "A"
NEW 12" PIPE

PROVIDE SMOOTH-RIDING CONNECTION TO EXISTING AC PAVEMENT
SEE DETAIL DWG T006

NEW CONCRETE DRIVEWAY
SEE DWG C102

NEW ASPHALT PAVEMENT

2+20 WL "B"
1 – 12" 1/32 BEND
1 – CONCRETE BLOCK

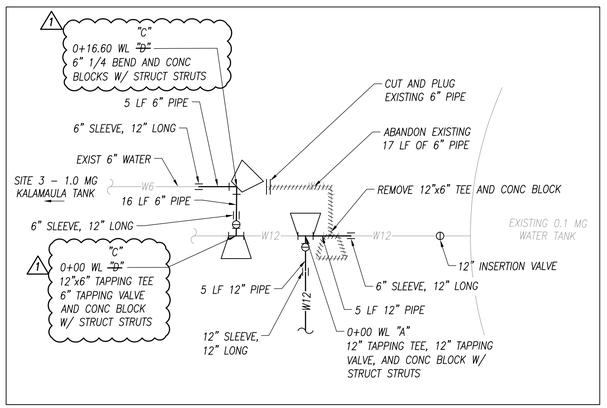
2+54.60 WL "B"
CONNECT TO NEW 0.2 MG RESERVOIR
1 – 12" GATE VALVE
1 – VALVE BOX
INV=1011.1
SEE MECHANICAL AND STRUCTURAL DWGS

TANK FF=1016.7
(PROPOSED – MATCH EXIST. TANK)
TOP FTG=1016.0
EOP=1015.8
SEE STRUCTURAL DWGS

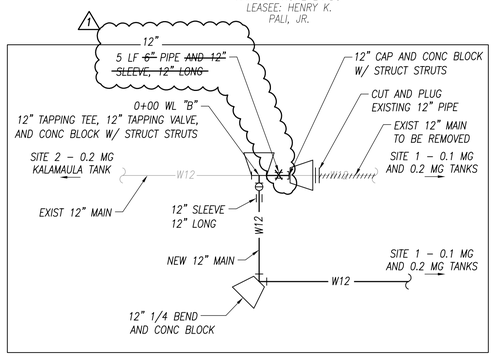
TMK(2) 5-2-14: 2
MIALA, INC.
& R.W. MEYER, LTD.

TMK(2) 5-2-10: 3
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: HENRY K. PALI, JR.

CONNECTIONS 0+00 WL "A" AND 0+00 WL "C"
NOT TO SCALE



CONNECTION 0+00 WL "B"
NOT TO SCALE



SITE AND UTILITY PLAN 1
10 5 0 10 20
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS AND DETAILS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

SITE AND UTILITY PLAN 1

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

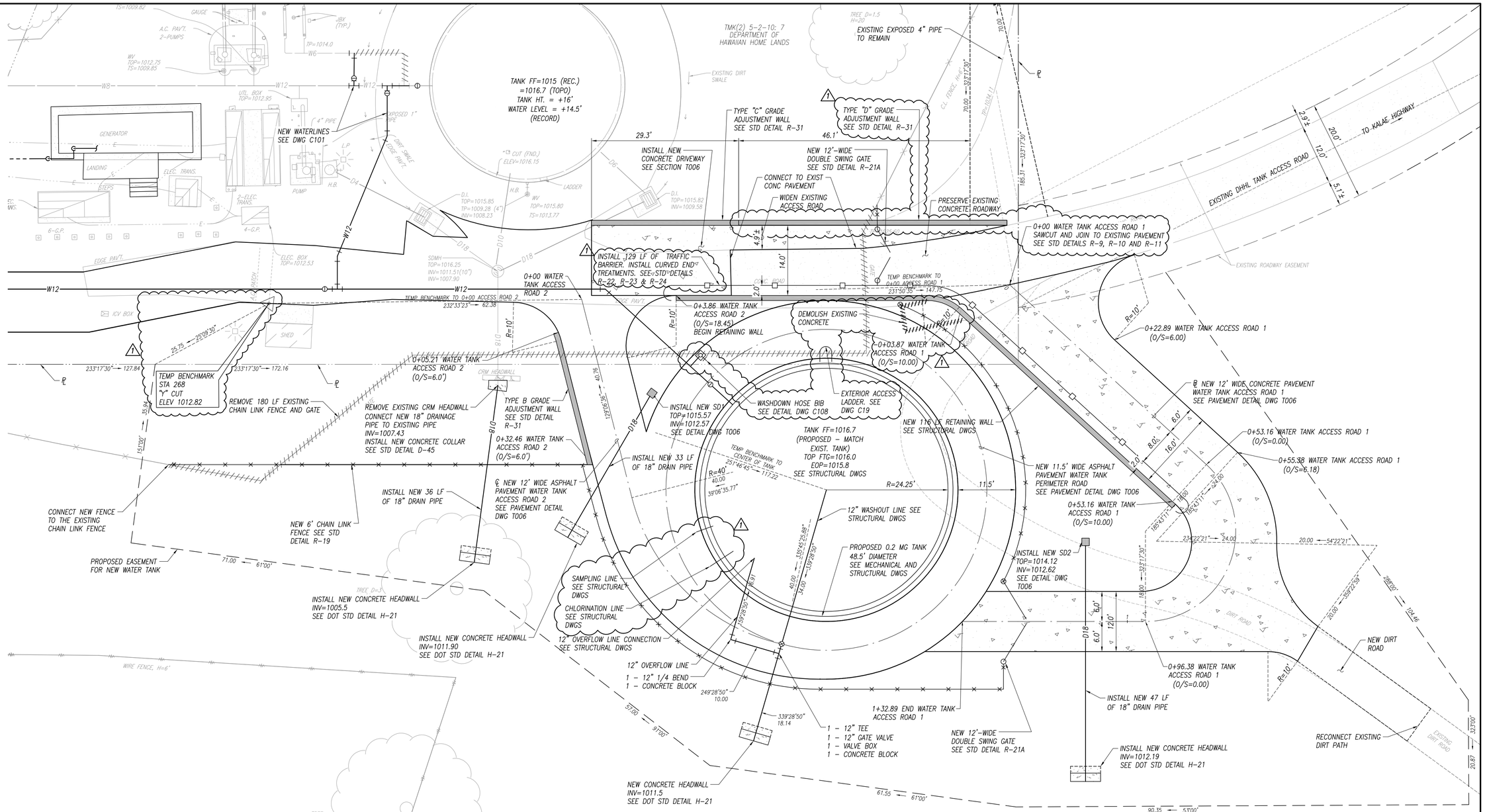
DESIGNED BY: PLM/RE/AC CHECKED BY: PTM DRAWN BY: CKM/RE/AC

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C101
SHEET 10 OF 149

FILE	POCKET	FOLDER	NO.



SITE AND UTILITY PLAN 2

10 5 0 10 20

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS	G70	

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C102
SHEET 11 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

SITE AND UTILITY PLAN 2

DESIGNED BY: PLM/RE/AC CHECKED BY: PTM DRAWN BY: CKM/RE/AC

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
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JUNE 2018

FILE	POCKET	FOLDER	NO.

INSTALL NEW WATERLINE "C" SEE DWG C101

INSTALL NEW WATERLINE "A" SEE DWG C101

EXISTING KAULUWAI 0.1 MG TANK
FF=1015 (REC.)
=1016.7 (TOPO)
TANK HT. = +16'
WATER LEVEL = +14.5'
(RECORD)

EXISTING DRAIN INLET
TOP=1015.82
INV=1009.58

TANK FF=1016.7
(PROPOSED – MATCH EXIST. TANK)
TOP FTG=1016.0
EOP=1015.8

LIMIT OF GRADING

PROPOSED EASEMENT FOR NEW WATER TANK SEE DWG C102

SITE 1 EARTHWORK SUMMARY

* AREA OF DISTURBANCE	18,317 SQ FT (0.42 ACRES)
WATER TANK FOOT PRINT AREA	2,165 SQ FT (0.05 ACRES)
GRADED AREA	18,317 SQ FT (0.42 ACRES)

* INCLUDING, BUT NOT LIMITED TO, EXCAVATION, GRADING, EQUIPMENT STAGING AND STORAGE AREAS, AS DEFINED BY THE STATE OF HAWAII, DEPARTMENT OF HEALTH CLEAN WATER BRANCH GUIDELINES FOR NOTICE OF INTENT, FORM G.

EXCAVATION = 1,080 CY
EMBANKMENT = 330 CY

GRADING PLAN 1

10 5 0 10 20
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

GRADING PLAN 1

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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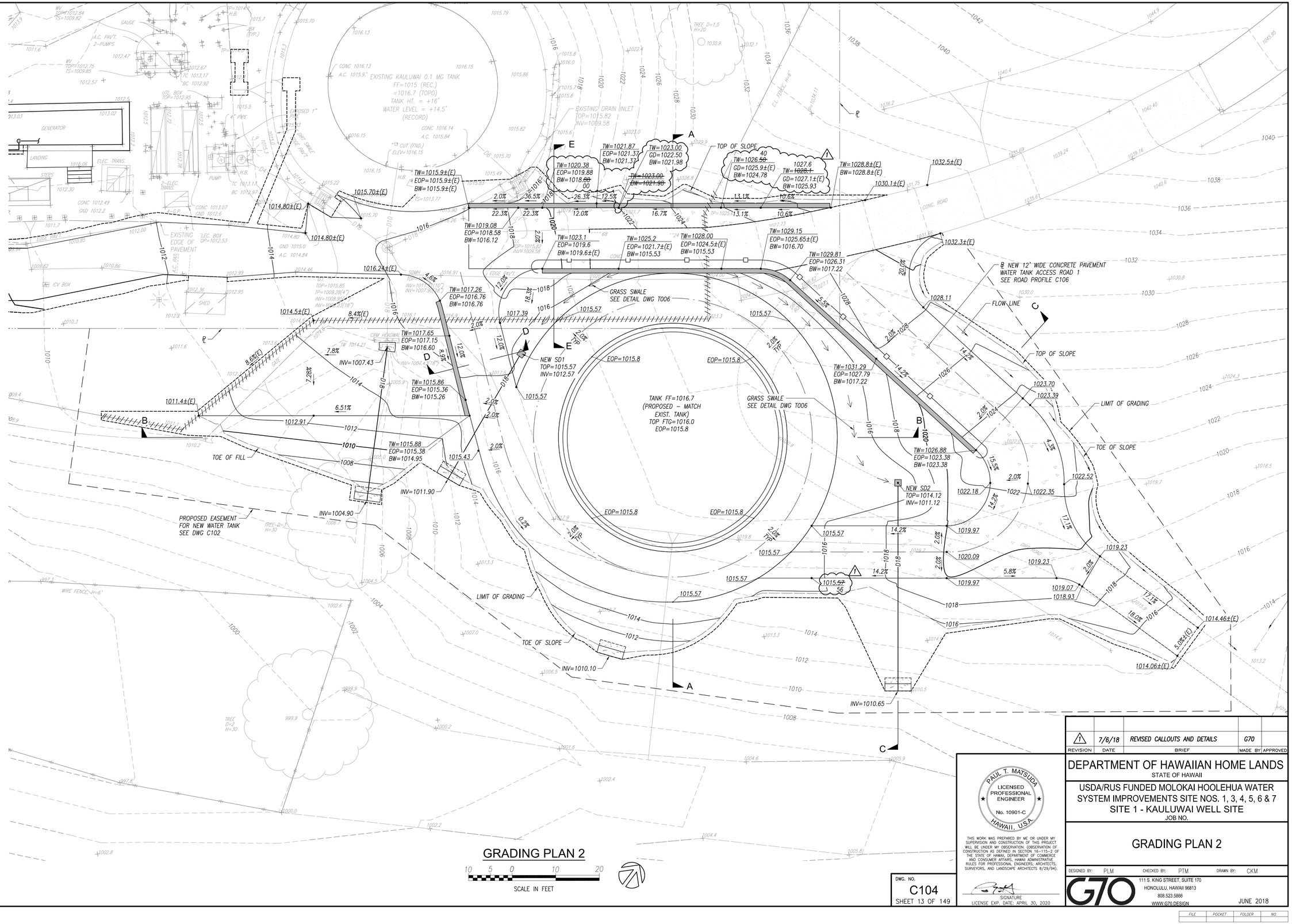
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C103
SHEET 12 OF 149

FILE	POCKET	FOLDER	NO.



REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS AND DETAILS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

GRADING PLAN 2

PAUL T. MATSUDA
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No. 10901-C
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HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C104
SHEET 13 OF 149

FILE	POCKET	FOLDER	NO.

TMK(2) 5-2-10: 7

TMK(2) 5-2-10: 3

LIMIT OF WORK

EXISTING KAULUWAI 0.1 MG TANK
FF=1015 (REC.)
1007 (TOPO)
TANK HT. = +16'
WATER LEVEL = +14.5'
(RECORD)
ELEV=1016.15

LIMIT OF WORK

LIMIT OF GRADING

CONSTRUCT 20' x 50'
CONSTRUCTION ENTRANCE
SEE DETAIL DWG T007

LIMIT OF GRADING

INSTALL TEMPORARY SILT SOCK
SEE DETAIL DWG T007

LIMIT OF GRADING

LIMIT OF GRADING

INSTALL TEMPORARY SILT
SOCK AT LIMITS OF GRADING
SEE DETAIL DWG T007

LIMIT OF GRADING

EXISTING GULLEY

LIMIT OF GRADING

INSTALL TEMPORARY SILT
SOCK AT LIMITS OF GRADING
SEE DETAIL DWG T007

TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- EXISTING WATER LINE
- EXISTING DRAINLINE
- NEW DRAIN LINE
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

EROSION CONTROL PLAN

20 10 0 20 40

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	LABELED CONTOURS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

EROSION CONTROL PLAN

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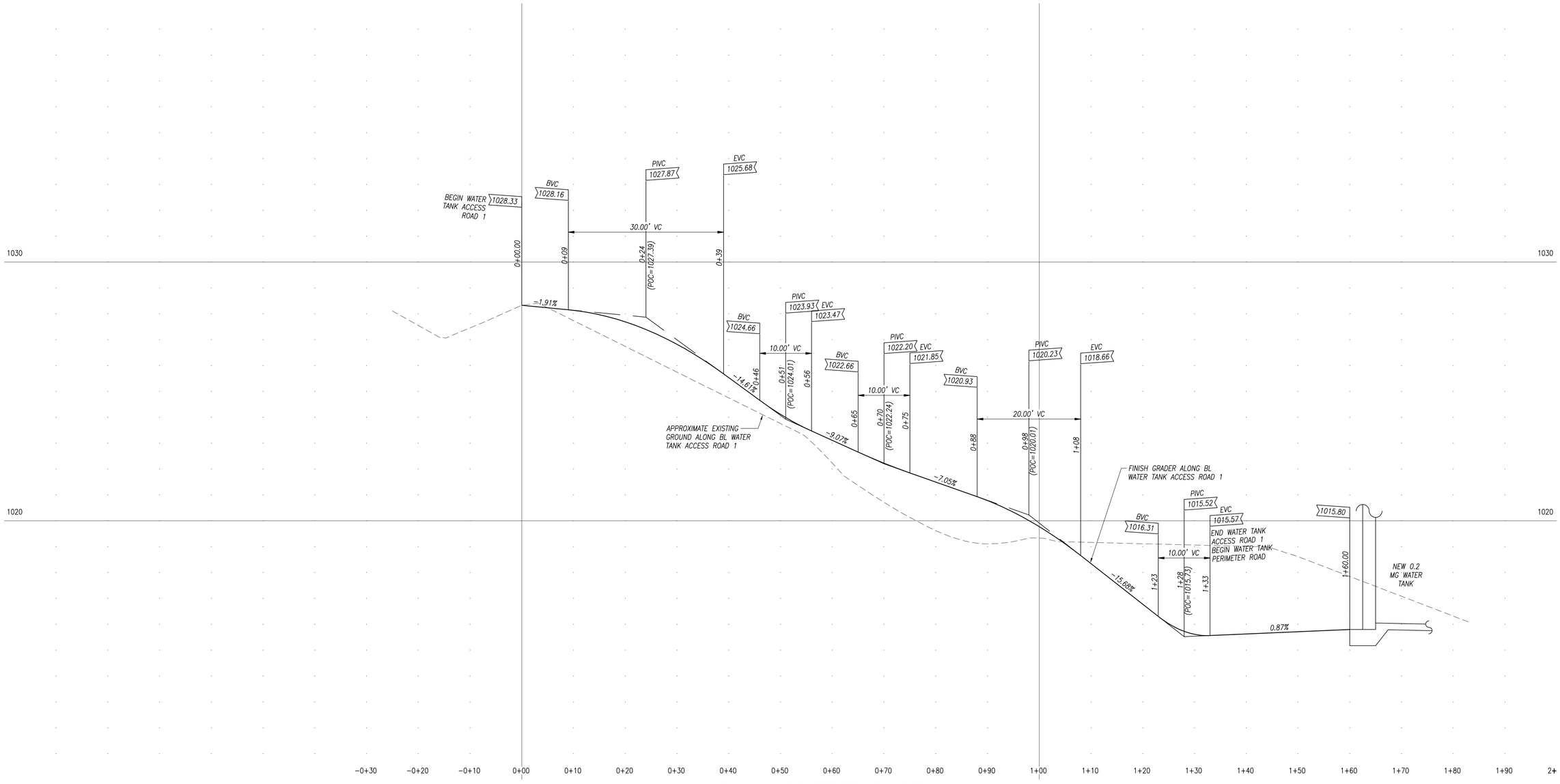
JUNE 2018

DWG. NO.
C105
SHEET 14 OF 149

FILE	POCKET	FOLDER	NO.



WATER TANK ACCESS ROAD 1 PROFILE

HORIZ 20 10 0 20 40
VERT 8 0 8 16
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

WATER TANK ACCESS ROAD 1 PROFILE

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HONOLULU, HAWAII 96813
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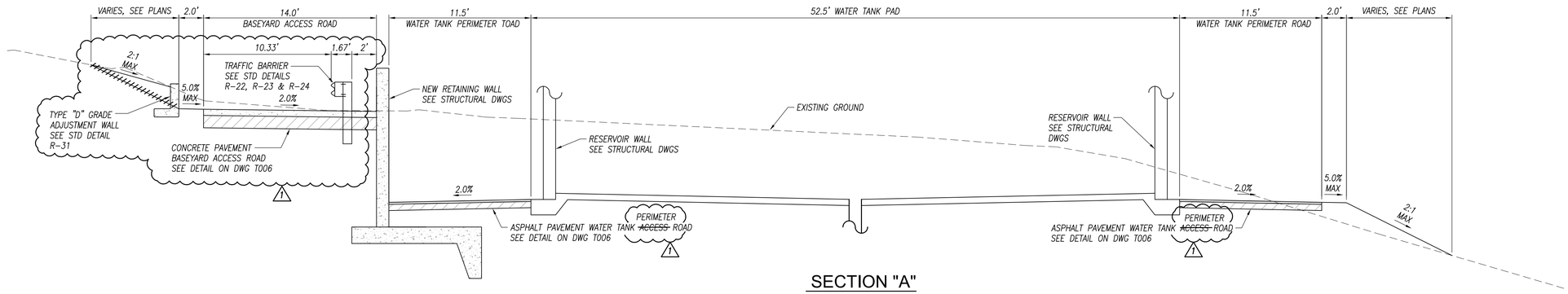
JUNE 2018

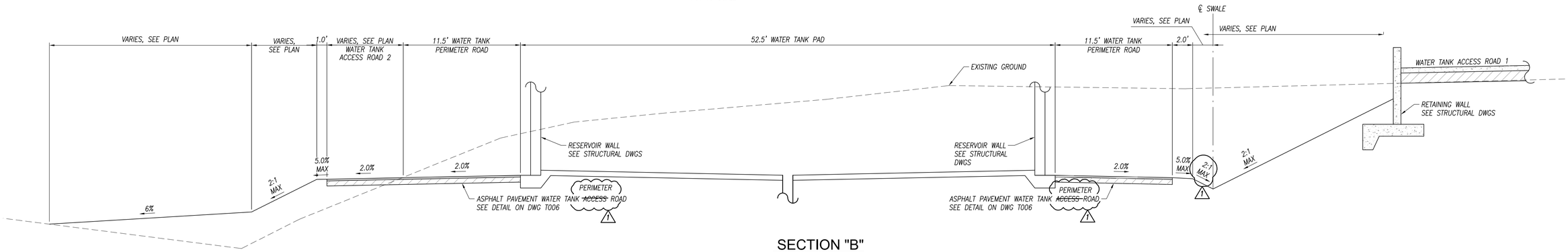
DWG. NO.
C106
SHEET 15 OF 149

FILE	POCKET	FOLDER	NO.



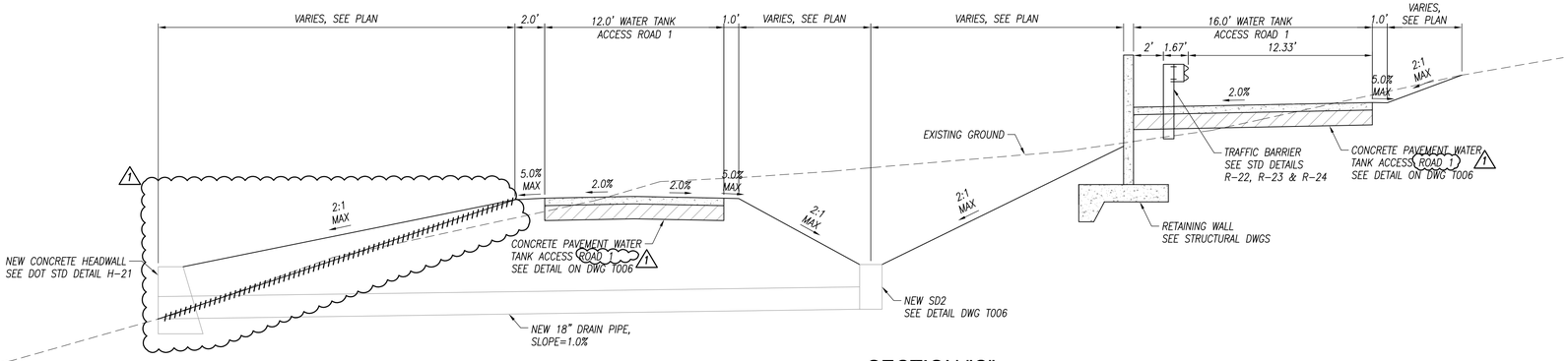
SECTION "A"

NOT TO SCALE



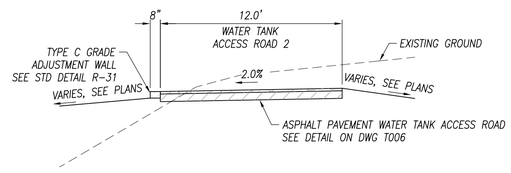
SECTION "B"

NOT TO SCALE



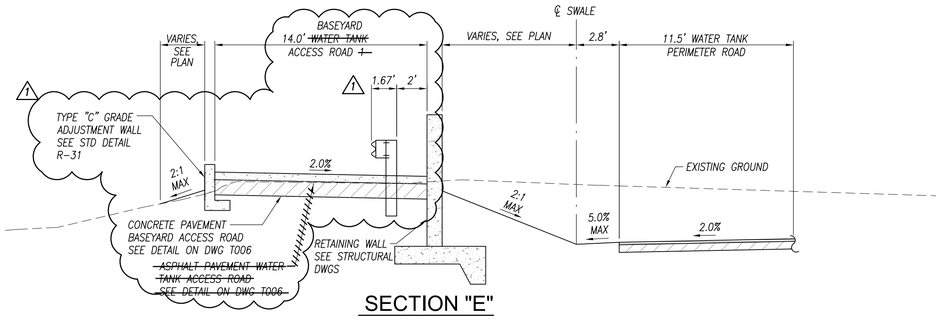
SECTION "C"

NOT TO SCALE



SECTION "D"

NOT TO SCALE



SECTION "E"

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED SECTIONS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

TYPICAL SECTIONS

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

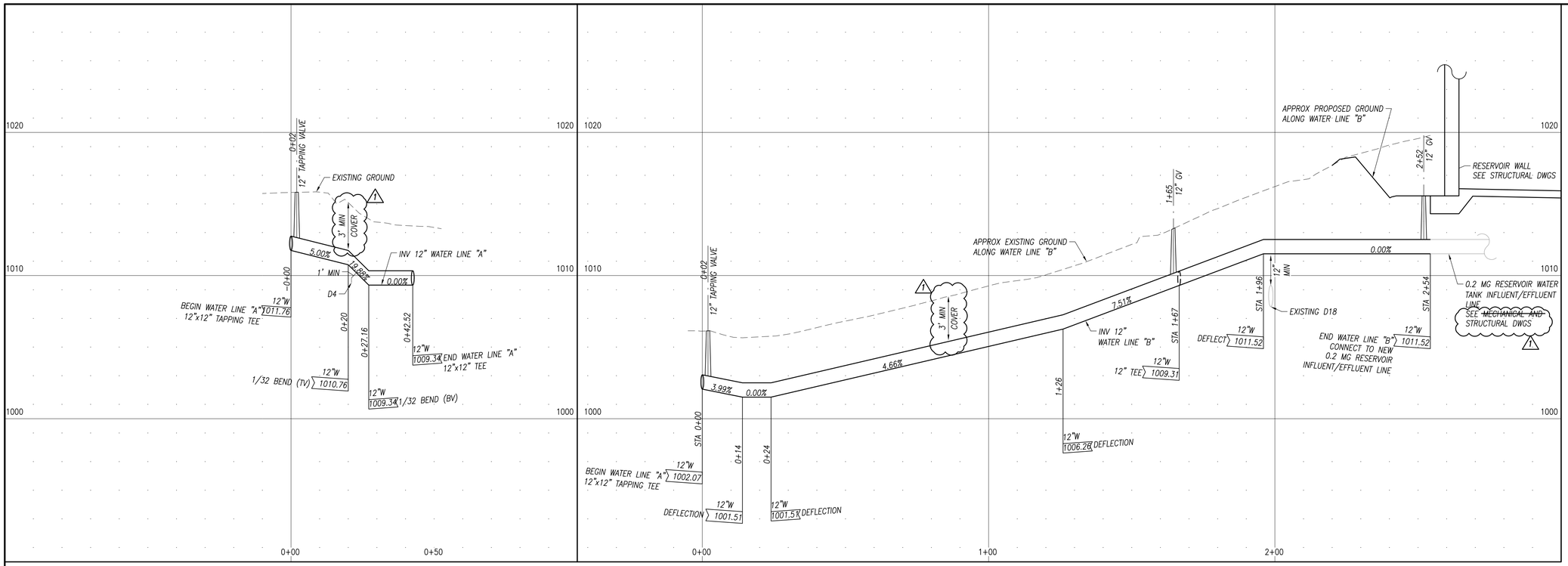
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C107
SHEET 16 OF 149

FILE	POCKET	FOLDER	NO.

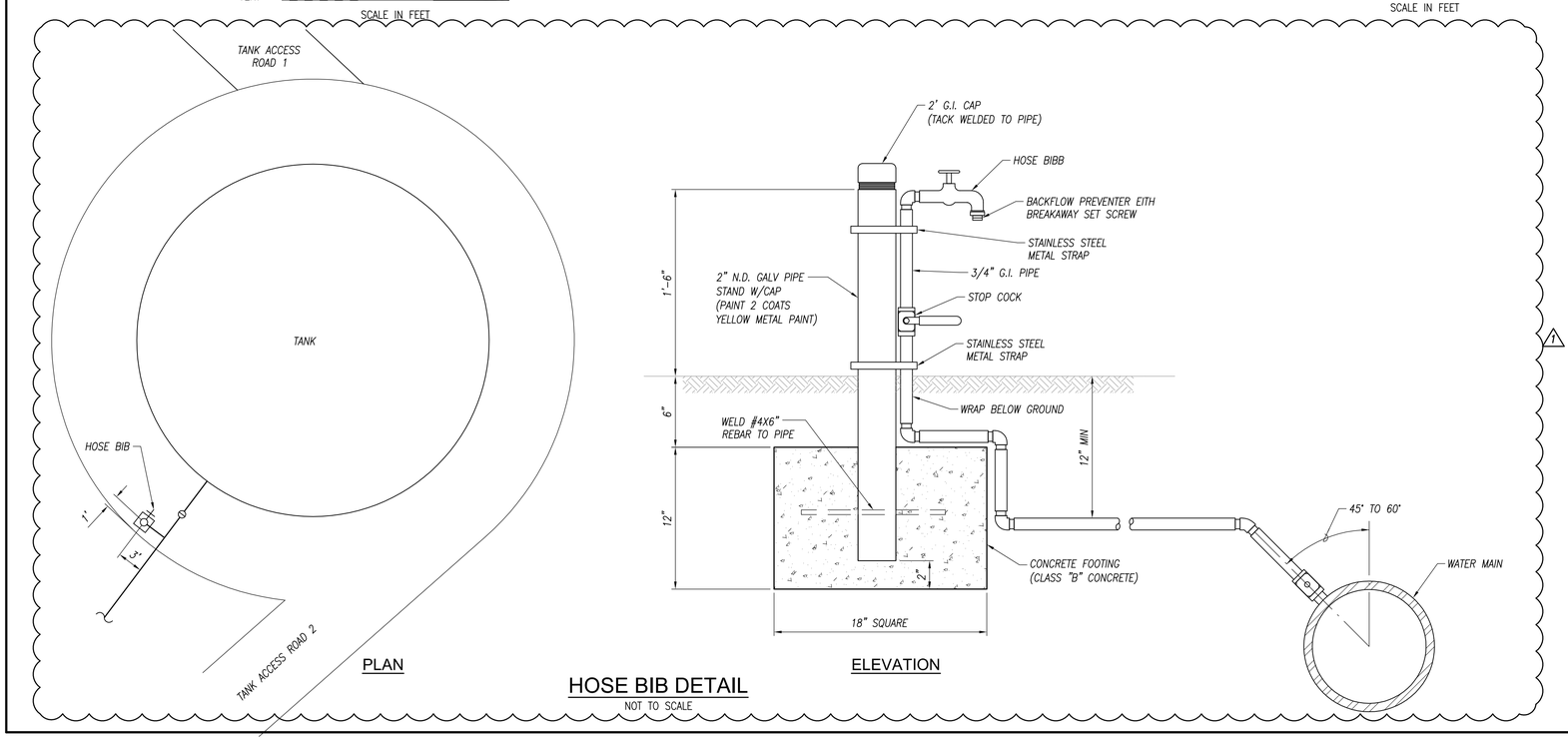


WL "A" PROFILE

HORIZ 20 10 0 20 40
VERT 4 0 4 8
SCALE IN FEET

WL "B" PROFILE

HORIZ 20 10 0 20 40
VERT 4 0 4 8
SCALE IN FEET



HOSE BIB DETAIL

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED TITLE, CALLOUTS AND ADDED DETAIL	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

1 WL PROFILES AND HOSE BIB DETAILS

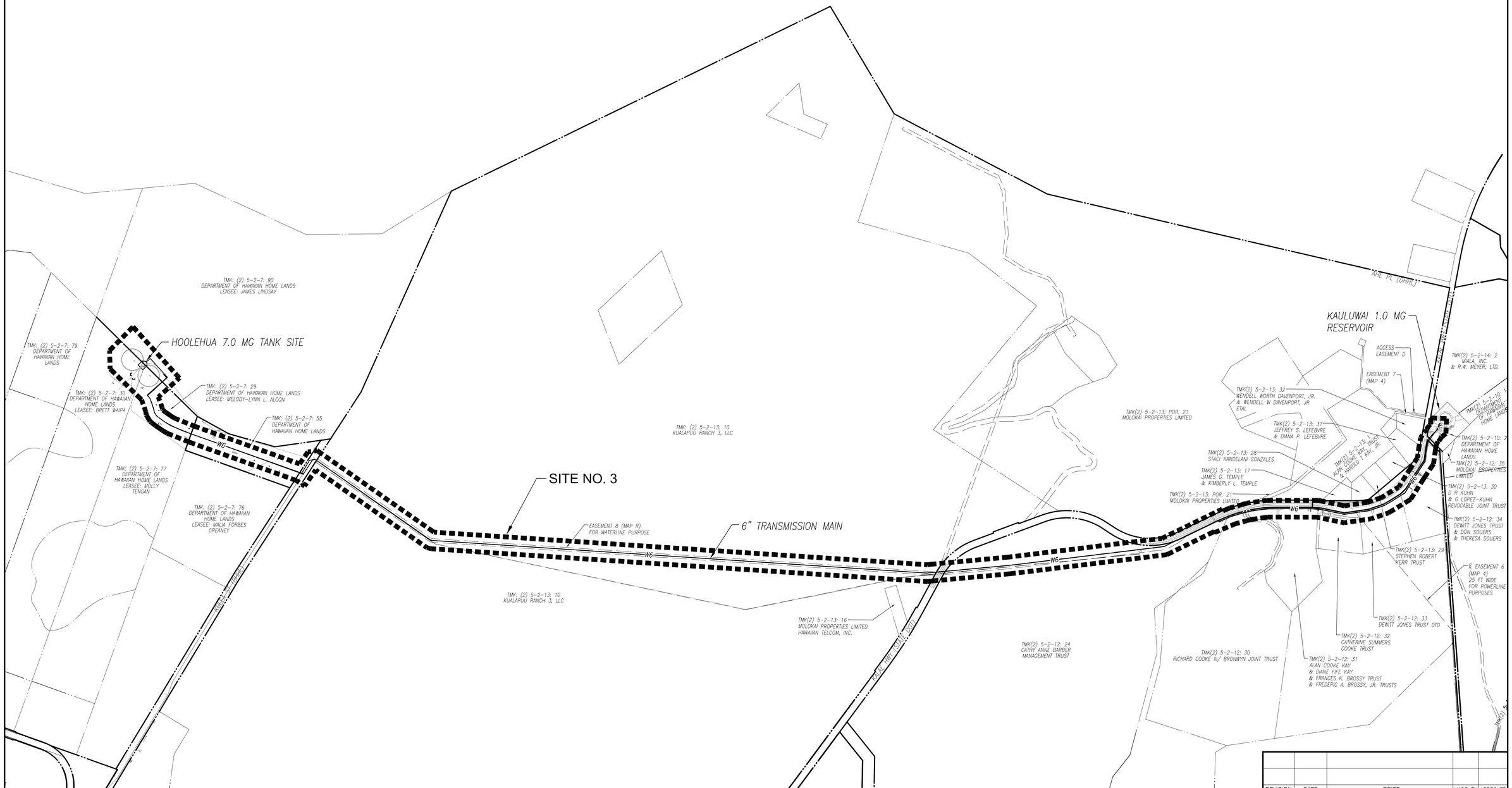
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C108
SHEET 17 OF 149

FILE	POCKET	FOLDER	NO.



GENERAL PLAN

400 0 400 800

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
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No. 10901-C
HAWAII, U.S.A.

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C300
SHEET 18 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT

JOB NO.

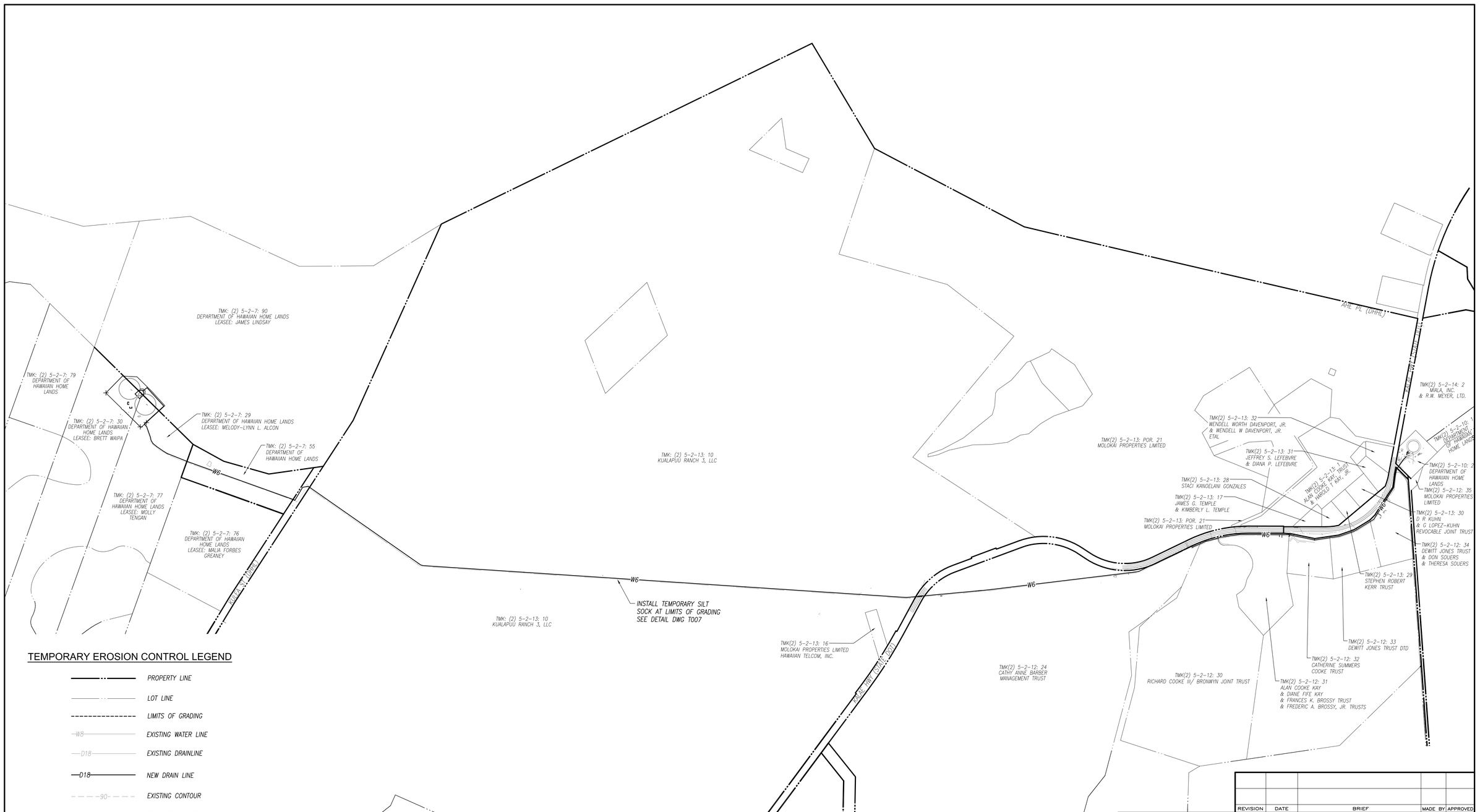
GENERAL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

EROSION CONTROL PLAN

400 0 400 800

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

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No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C301
SHEET 19 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

EROSION CONTROL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

NEW 6" PIPE
SEE PLAN AND
PROFILE DWGS C303

TMK(2) 5-2-7: 90
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASE: JAMES LINDSEY

INSTALL NEW ABOVE
GROUND INTAKE
CONTROL VALVE AND
CONCRETE PAD
SEE DETAIL DWG C319

NEW 6" COMPOUND METER
SEE DWS STD DETAIL M26, M27, M28, M29, MH13

INSTALL NEW 8' CHAIN LINK FENCE
SEE DWS STD DTL F1, F2, AND F3

10 LF 6" PIPE

0+00 WATER LINE "B"

1 - 6" 1/8 BEND, FL

20 LF 6" PIPE

2 - 6" 1/4 BEND, FL (VERTICAL)
SEE SCHEMATIC PIPE DIAGRAM THIS DWG
AND STRUCTURAL DWGS

1 - 6" 1/8 BEND, FL

10 LF 6" PIPE

1 - 6" 1/8 BEND, FL

20 LF 6" PIPE

2 - 6" 1/4 BEND, FL (VERTICAL)
SEE SCHEMATIC PIPE DIAGRAM THIS DWG
AND STRUCTURAL DWGS

1 - 6" 1/8 BEND, FL

EXISTING 6" WATER LINE

DHHL R/W

46 LF OF 6" PIPE
SEE STRUCTURAL DWGS FOR
ROOF SUPPORT DETAILS

CUT AND PLUG EXISTING 6" WATER LINE
ABANDON EXISTING WATERLINE IN PLACE

REMOVE EXISTING 1/4 BEND
REMOVE EXISTING 6" WATER LINE

REMOVE EXISTING 6' CHAIN LINK FENCE

1 - 6" 1/4 BEND, FL

46 LF OF 6" PIPE
SEE STRUCTURAL DWGS FOR ROOF SUPPORT DETAILS

REMOVE EXISTING 1/4 BEND
REMOVE EXISTING 6" WATER LINE

1 - 6" 1/4 BEND, FL

27 LF OF 6" PIPE
SEE STRUCTURAL DWGS FOR
ROOF SUPPORT DETAILS

3.5 MG RESERVOIR
FINISH FLOOR ELEVATION=1017'
(AS-BUILT DRAWINGS)

REMOVE EXIST INFLOW CONTROL VALVE
LOCATED ON ROOF OF TANK
NEW 6" 1/4 BEND, FL (TV)
SEE STRUCTURAL DWG FOR ROOF
SUPPORT DETAILS

REPLACE EXISTING 1/2" COPPER
PIPE AND PRESSURE GAUGE
LOCATED IN WOODEN BOX ON
CONCRETE WALKWAY COLUMN
SEE DWG C319

27 LF OF 6" PIPE
SEE STRUCTURAL DWGS FOR ROOF SUPPORT DETAILS

REMOVE EXIST INFLOW CONTROL VALVE LOCATED
ON ROOF OF TANK
NEW 6" 1/4 BEND, FL (TV)
SEE STRUCTURAL DWG FOR ROOF SUPPORT DETAILS

REPLACE EXISTING TANK LADDER
SEE DWG C319

EXISTING 6" OVERFLOW
LINE CONNECTIONS

EXISTING 6"
OVERFLOW LINE

EXISTING 20"
EFFLUENT LINES

REPLACE EXIST 20"
BUTTERFLY VALVE
ASSEMBLY
SEE SCHEMATIC CONNECTION
DIAGRAM THIS SHEET
SEE DETAIL SHEET C319

REPLACE EXIST
20" BUTTERFLY
VALVE ASSEMBLY
SEE SCHEMATIC CONNECTION
DIAGRAM THIS SHEET
SEE DETAIL SHEET C319

TEMP BENCHMARK
STA 34
REBAR
ELEV=1016.07

TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASE: BRETT WAIPA

NEW 12' WIDE DOUBLE SWING
GATE SEE STD DETAIL R-21A

TMK(2) 5-2-7: 29
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASE: MELODY-LYNN L. ALCON

NEW 1330 LF OF
8' CHAIN LINK FENCE
SEE DWS STD DTL F1, F2,
AND F3

NEW 12' WIDE DOUBLE SWING
GATE SEE STD DETAIL R-21A

STA 39
REBAR
ELEV=1017.18

330°24'29.74" — 202.00
(TEMP BENCHMARK TO STA 39)

215.60
(TEMP BENCHMARK TO STA 0+00 WL 8)

EDGE BUSH

DIRT ROAD

APPROX. LOC.

WIRE FENCE, H=4'

BOT. BANK

TOP BANK

WATER TANK

SITE AND UTILITY PLAN

20 10 0 20 40

SCALE IN FEET

10 LF OF 16" PIPE
6" 1/4 BEND WITH CONCRETE BLOCK
16" TAPPING SLEEVE
16" TAPPING GATE VALVE
1 - 20"x16" TAPPING TEE
1 - CONCRETE BLOCK
20 LF OF 16" PIPE
W16
6" 1/4 BEND WITH CONCRETE BLOCK
10 LF OF 16" PIPE
INSTALL TEMPORARY PLUG
16" TAPPING SLEEVE
HOOLEHUA
W20
W20
CONCRETE MANHOLE
SEE DWS STD DETAIL
MH6 AND MH7
INSTALL BLEEDER ASSEMBLY
EXISTING 20" BUTTERFLY VALVE
ABANDON IN THE CLOSED POSITION
INSTALL BLEEDER
ASSEMBLY
EXISTING VAULT
ABANDON IN PLACE
20"x16" TAPPING TEE WITH
CONCRETE BLOCK

20" BUTTERFLY REPLACEMENT SCHEMATIC CONNECTION DIAGRAM

NOT TO SCALE

SEE STRUCTURAL DWGS
FOR ROOF SUPPORTS
WATER TANK ROOF
NEW 6" 1/4 BEND, FL
PIPE ABOVE SOIL SUPPORT,
SEE STRUCTURAL DWGS
PIPE SUPPORT
SEE STRUCTURAL DWGS
NEW 6" WATER LINE
NEW 6" 1/4 BEND, FL
EXISTING
GROUND
WATER
TANK

VERTICAL INFLOW SCHEMATIC PIPE DIAGRAM

NOT TO SCALE

NOTE:

ALL ABOVE GROUND WATER PIPE JOINTS AND FITTINGS
TO BE RESTRAINED.

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS AND DETAILS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER
SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - HOOLEHUA 2 - 3.5 MG RESERVOIRS
JOB NO.

SITE AND UTILITY PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

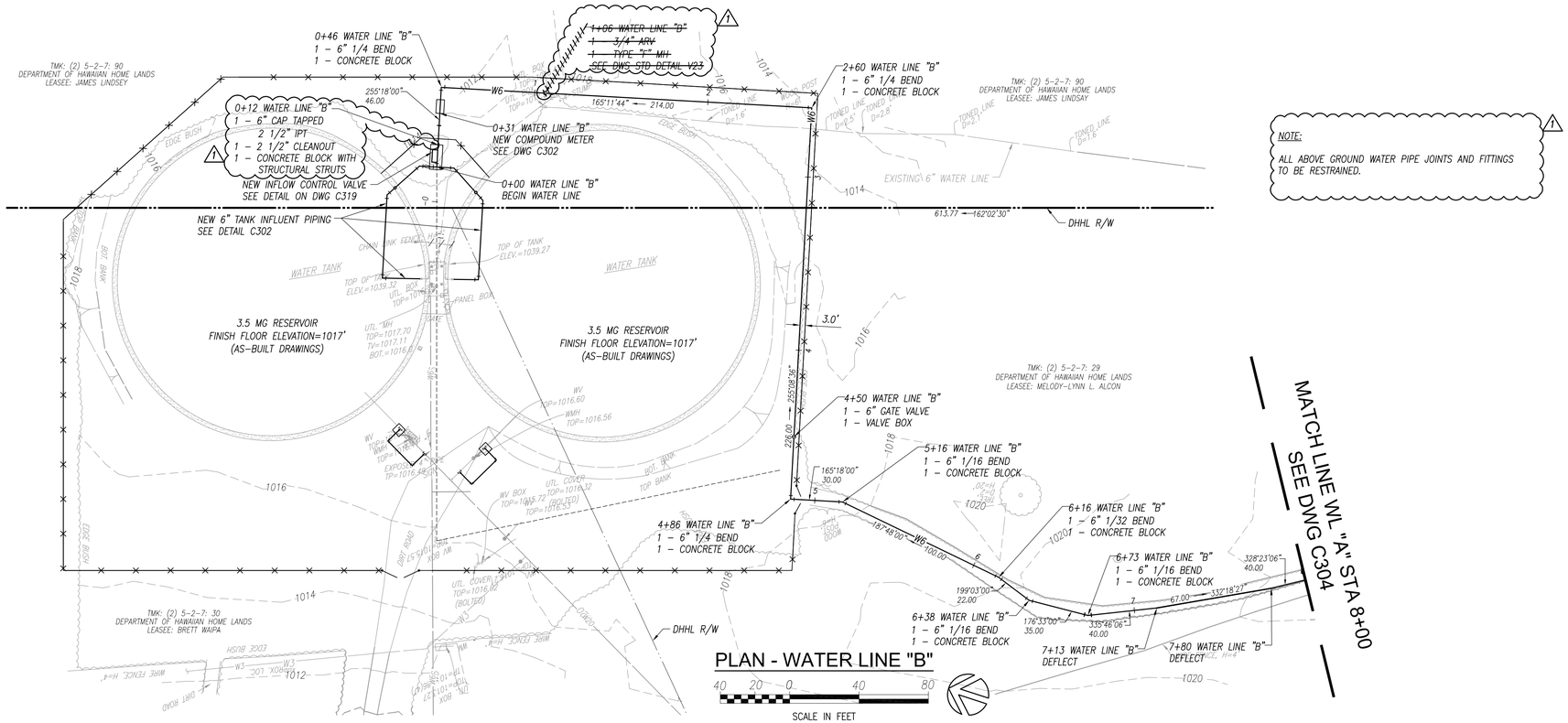
DWG. NO.
C302
SHEET 20 OF 149

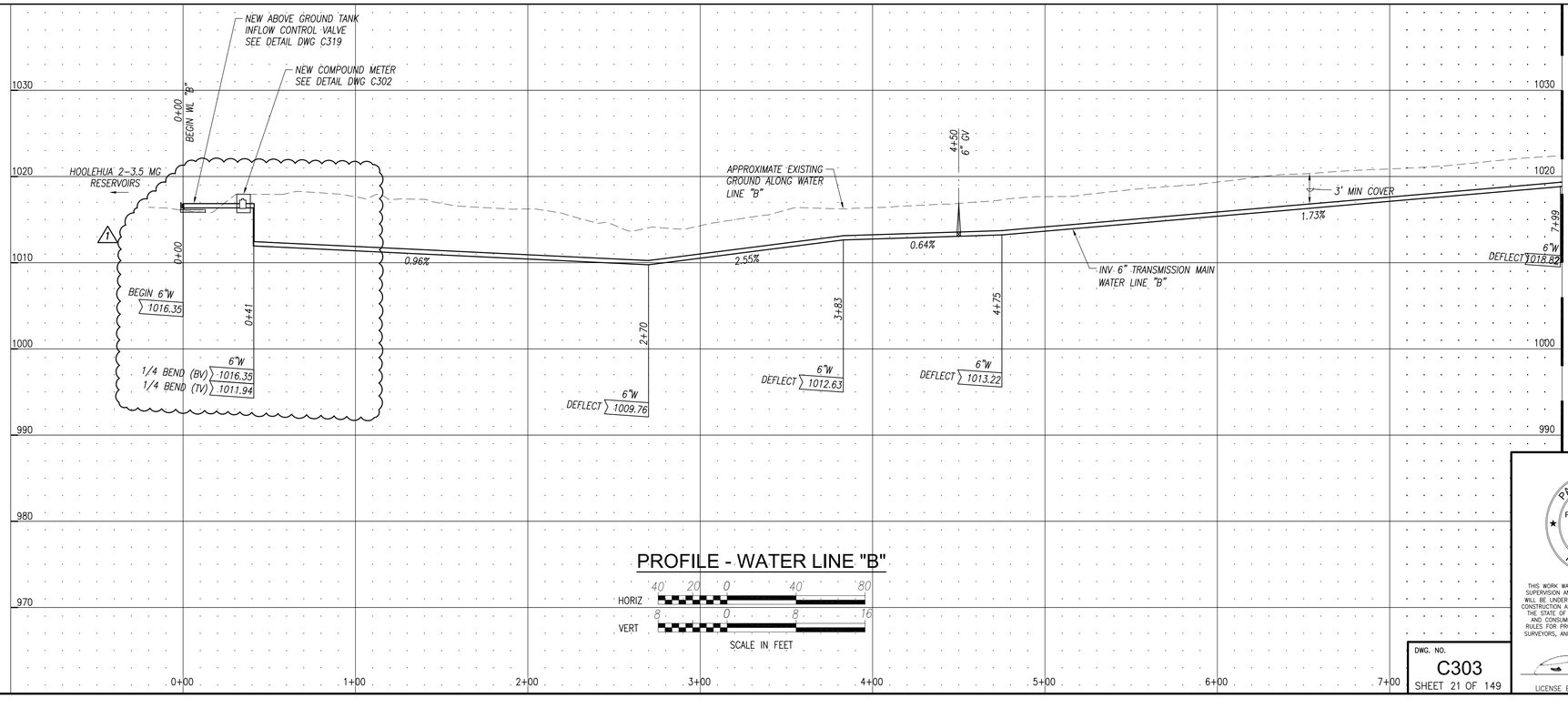
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.





REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE AND CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 0+00 TO 8+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

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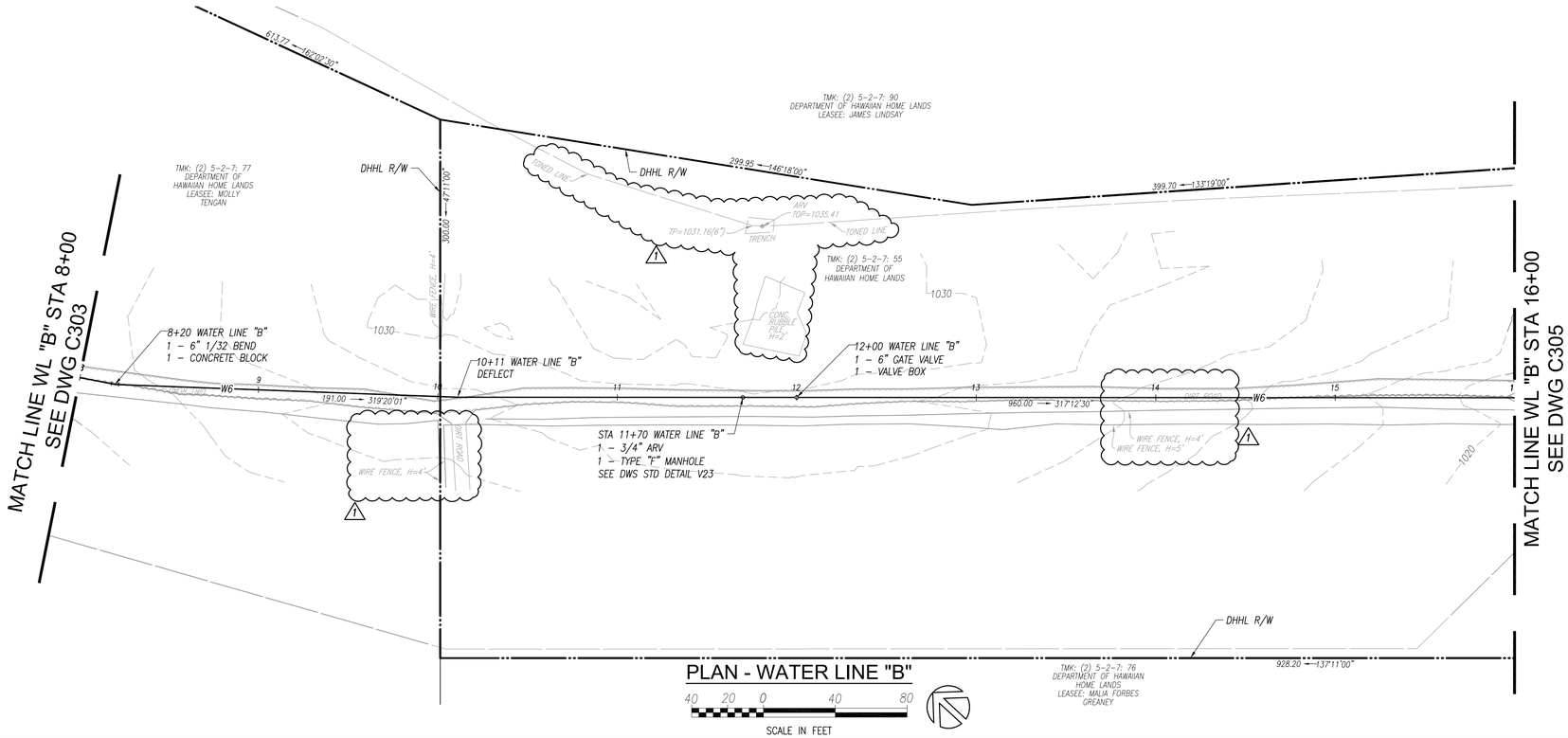
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C303
SHEET 21 OF 149

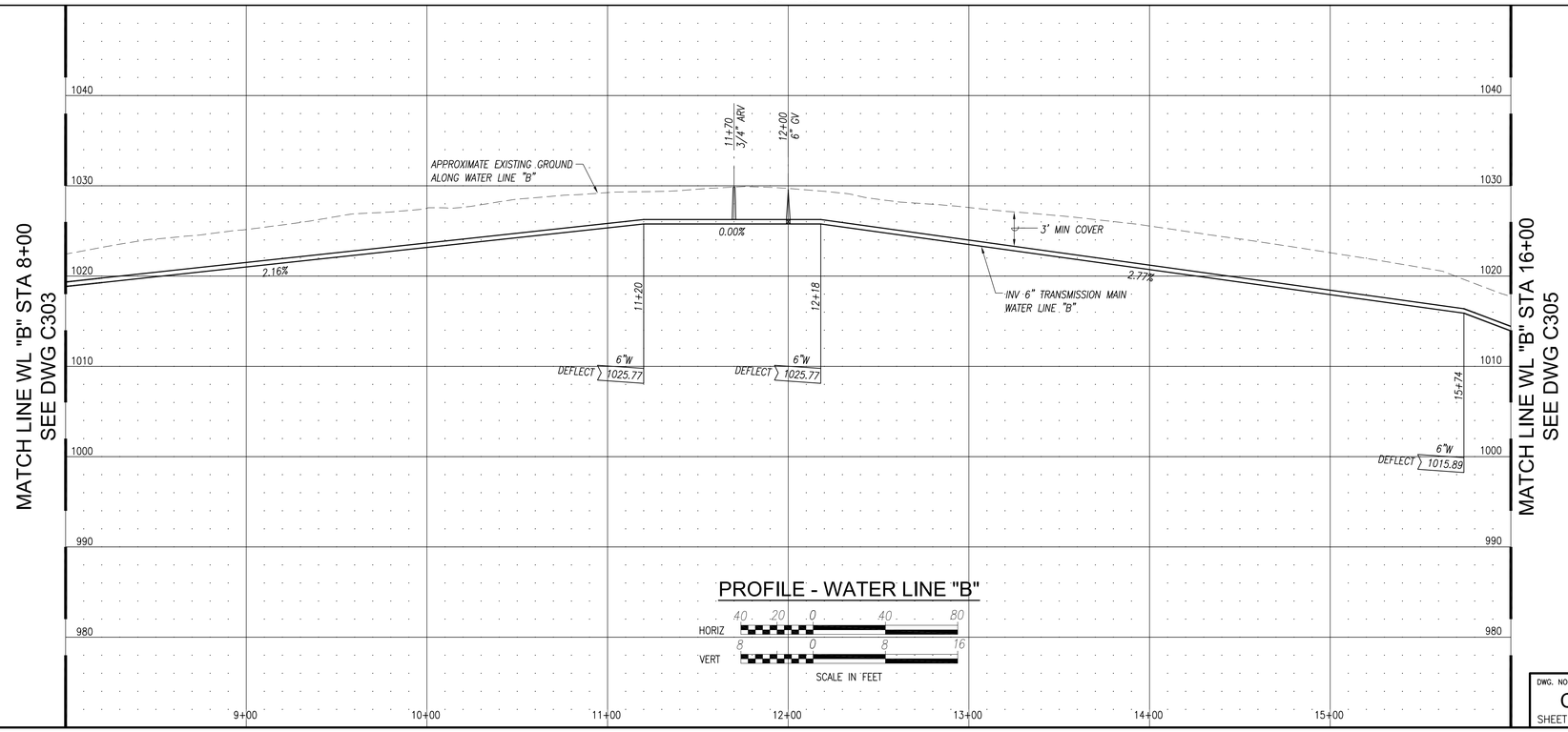
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED TOPO CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 8+00 TO 16+00

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LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

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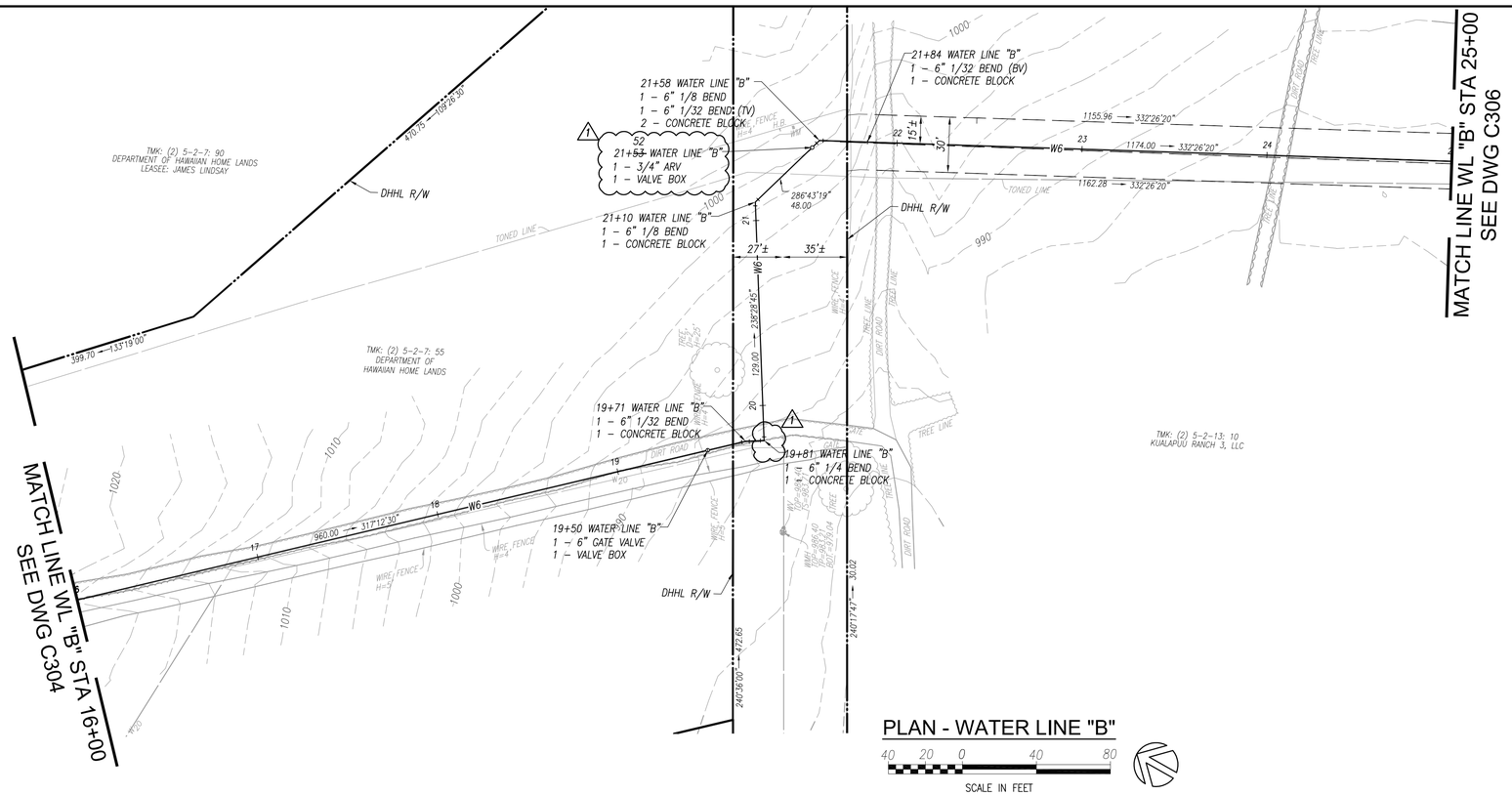
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C304
SHEET 22 OF 149

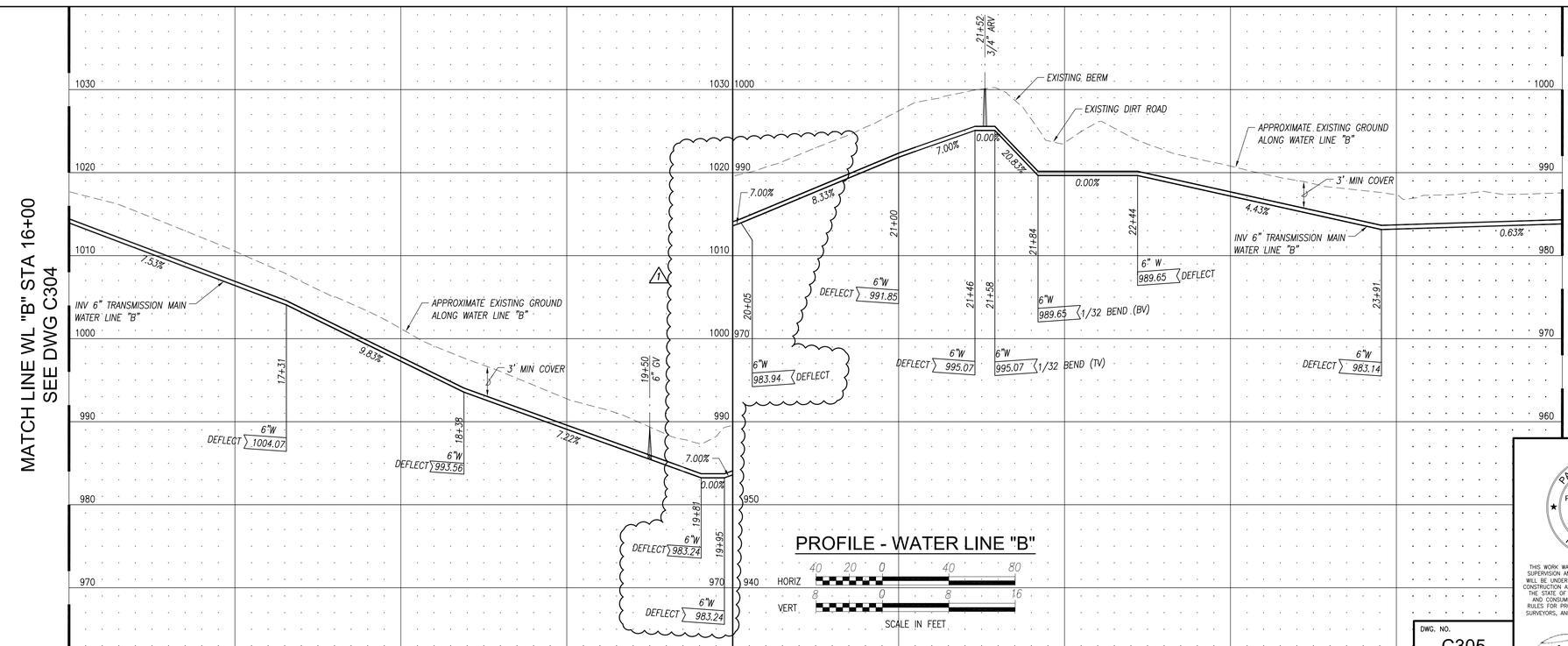
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

40 20 0 40 80

HORIZ

8 0 8 16

VERT

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE AND CALLOUTS	G70	

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No. 10901-C
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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C305
SHEET 23 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

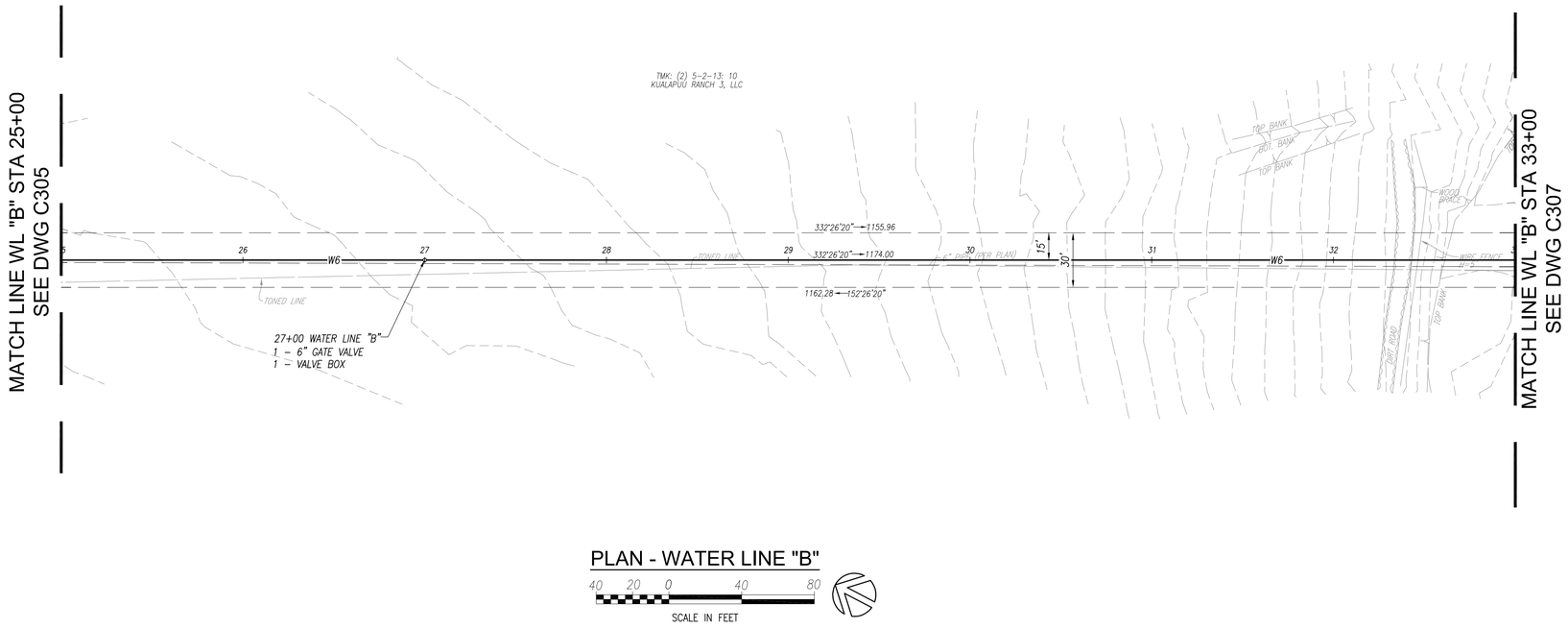
PLAN AND PROFILE
WATER LINE "B" 16+00 TO 25+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

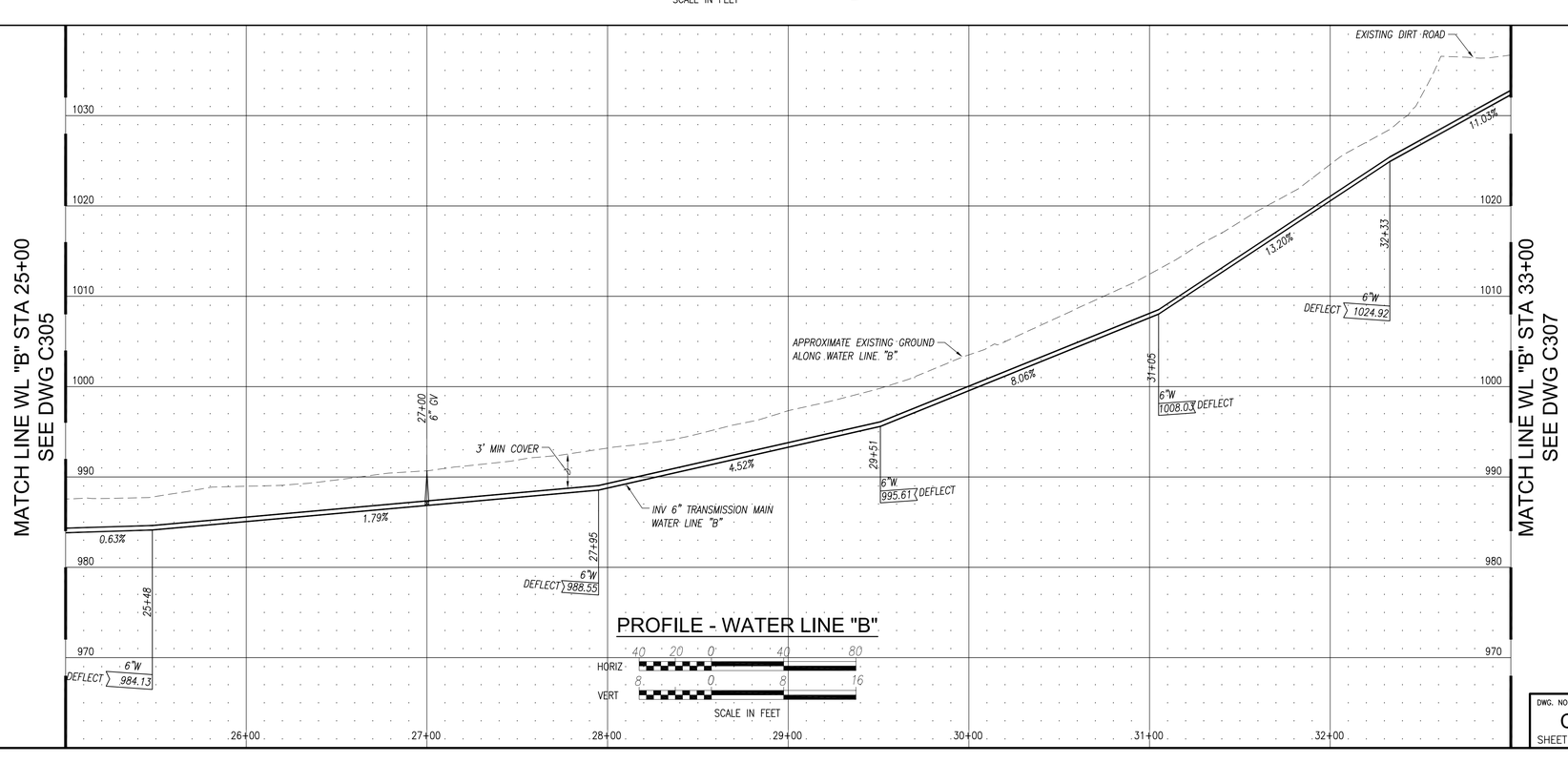
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

40 20 0 40 80

HORIZ

8 0 8 16

VERT

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 25+00 TO 33+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

DWG. NO.
C306
SHEET 24 OF 149

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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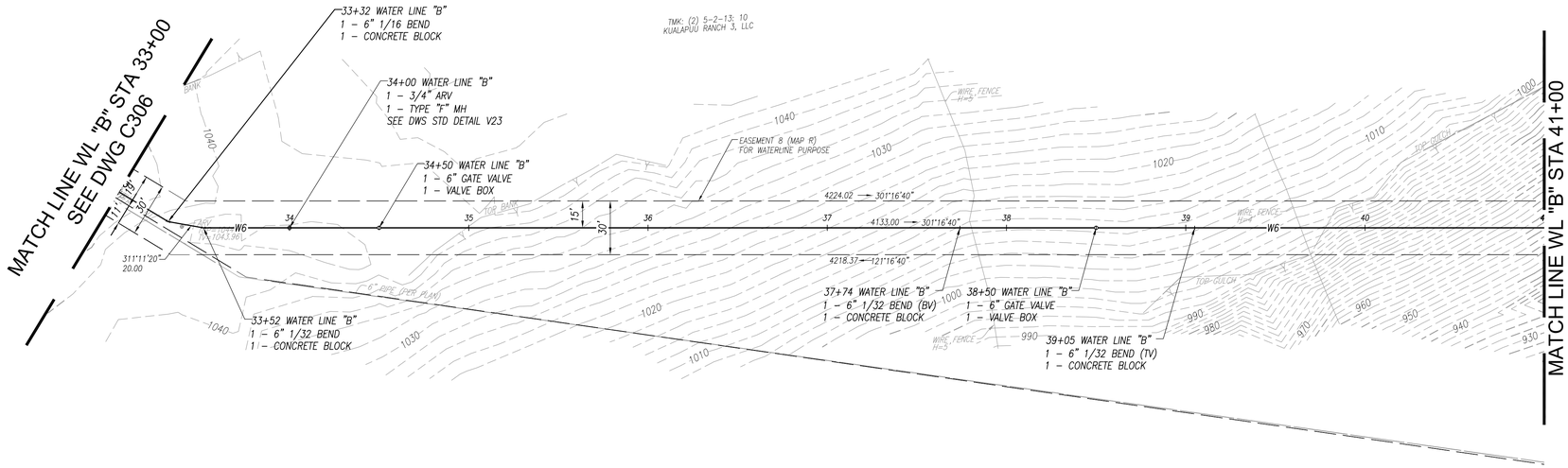
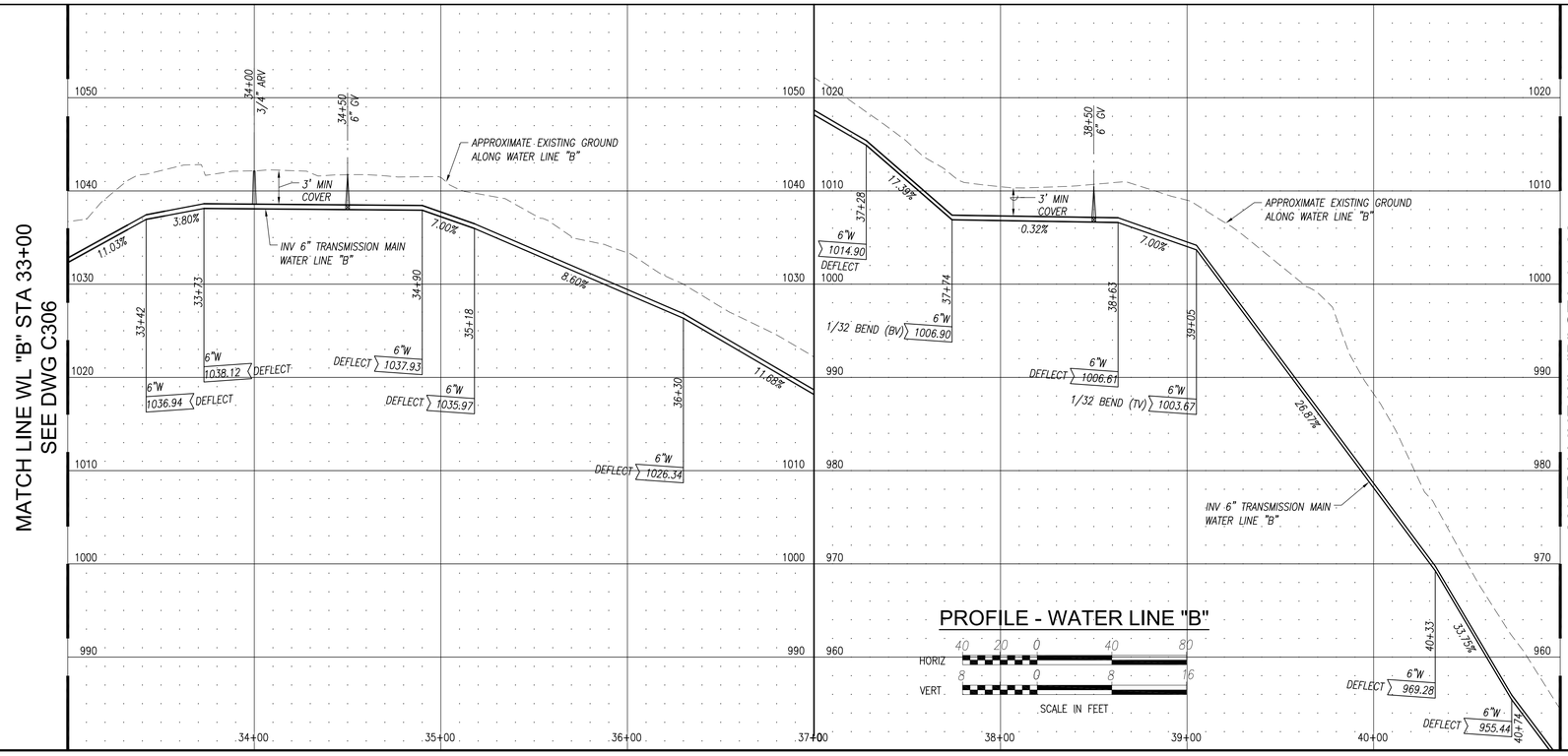
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

40 20 0 40 80

HORIZ

8 0 8 16

VERT

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 33+00 TO 41+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

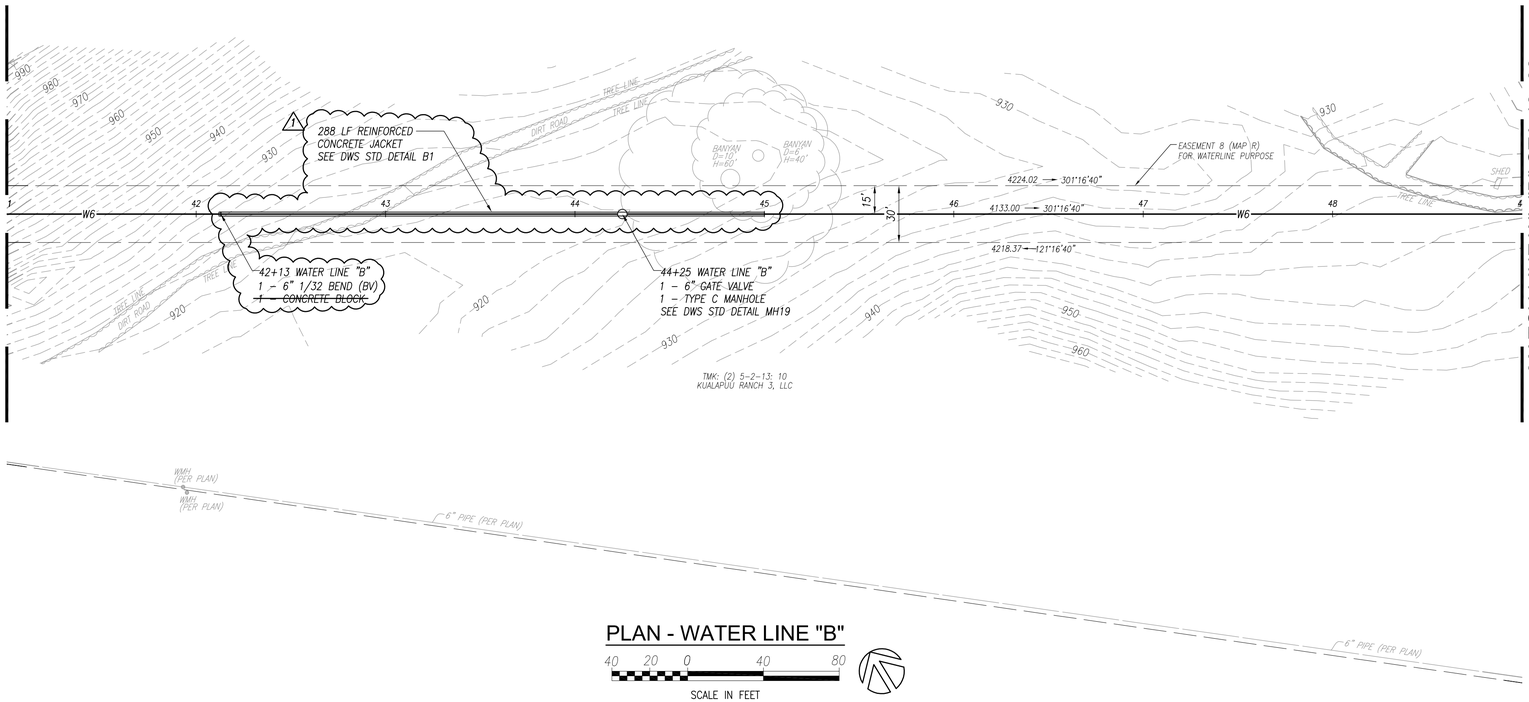
JUNE 2018

DWG. NO.
C307
SHEET 25 OF 149

FILE	POCKET	FOLDER	NO.

MATCH LINE WL "B" STA 41+00
SEE DWG C307

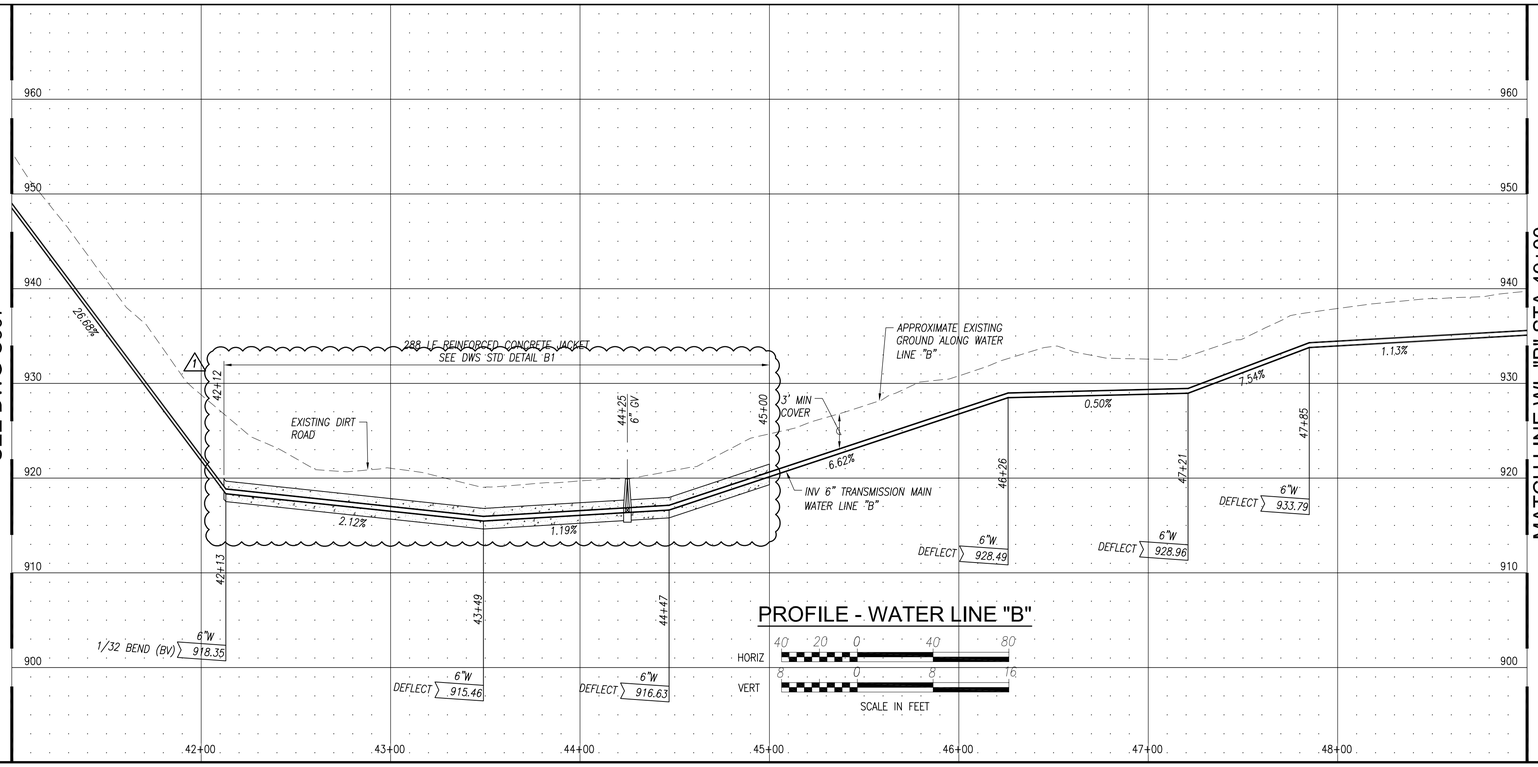
MATCH LINE WL "B" STA 49+00
SEE DWG C309



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE AND CALLOUTS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C308
SHEET 26 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

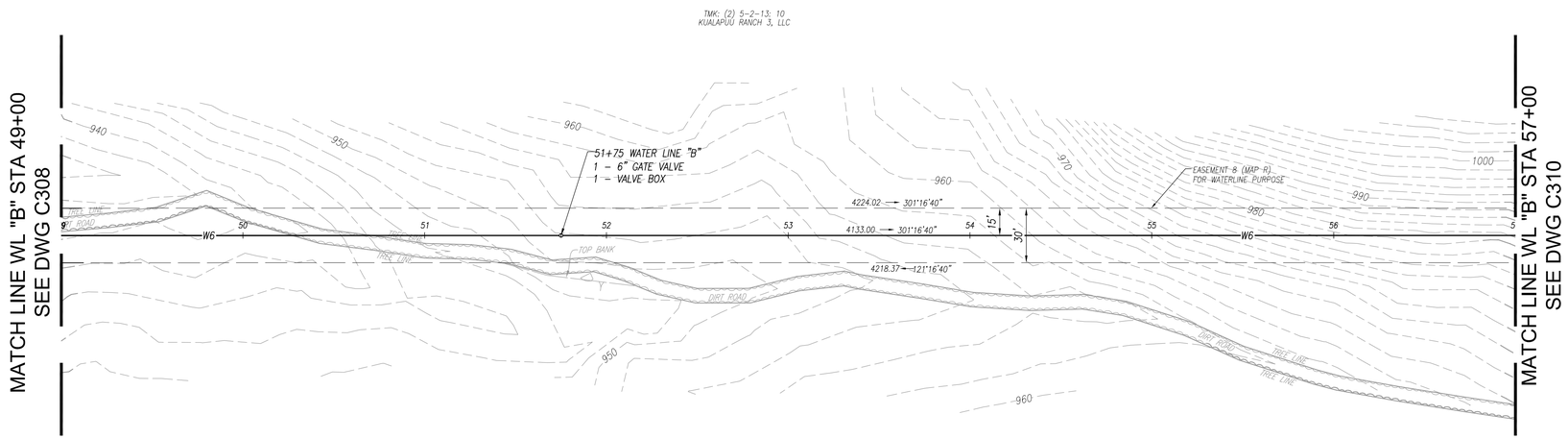
PLAN AND PROFILE
WATER LINE "B" 41+00 TO 49+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

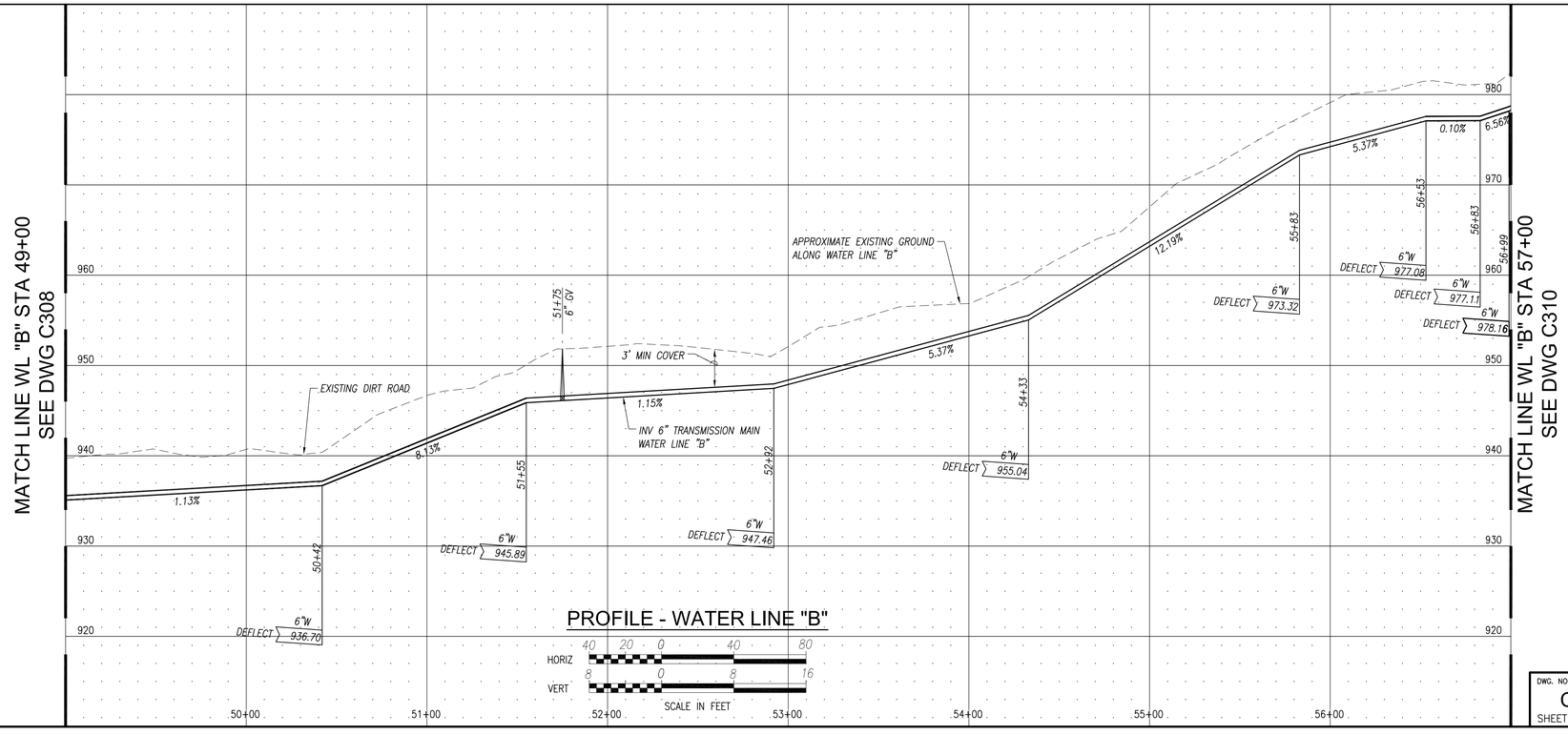
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

40 20 0 40 80

HORIZ

8 0 8 16

VERT

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 49+00 TO 57+00

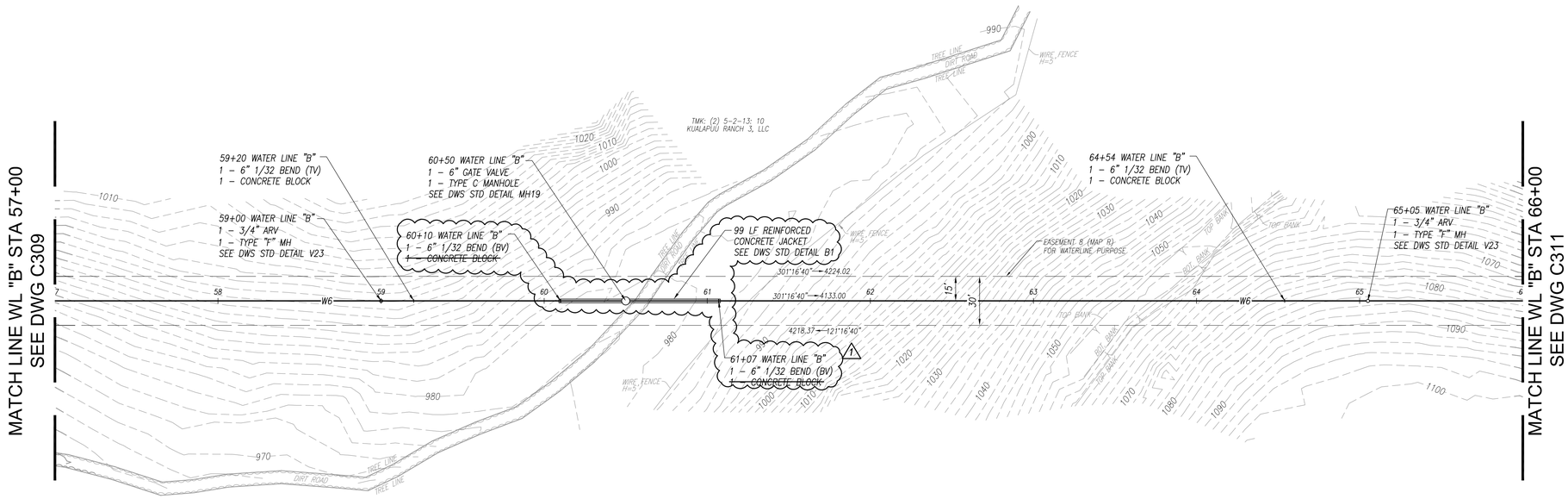
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

DWG. NO.
C309
SHEET 27 OF 149

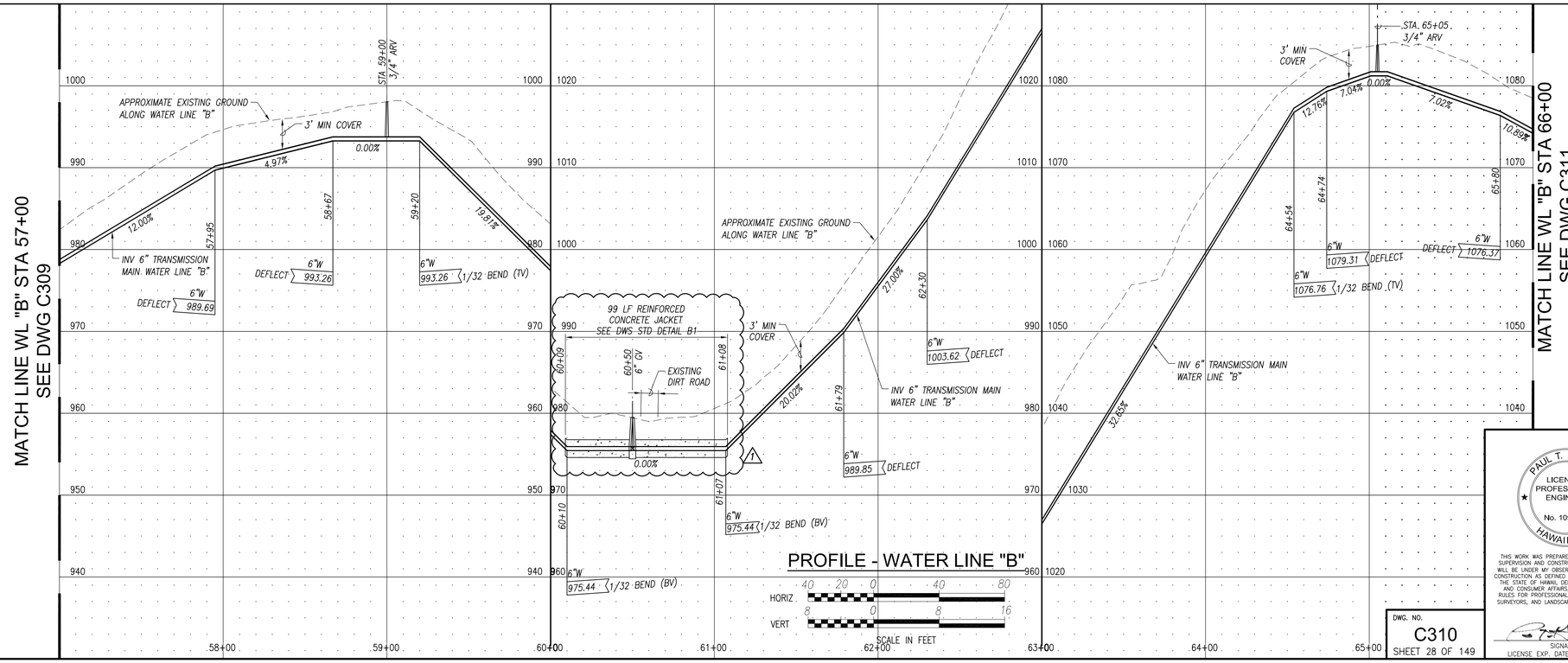
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED TOPO CALLOUTS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 57+00 TO 66+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

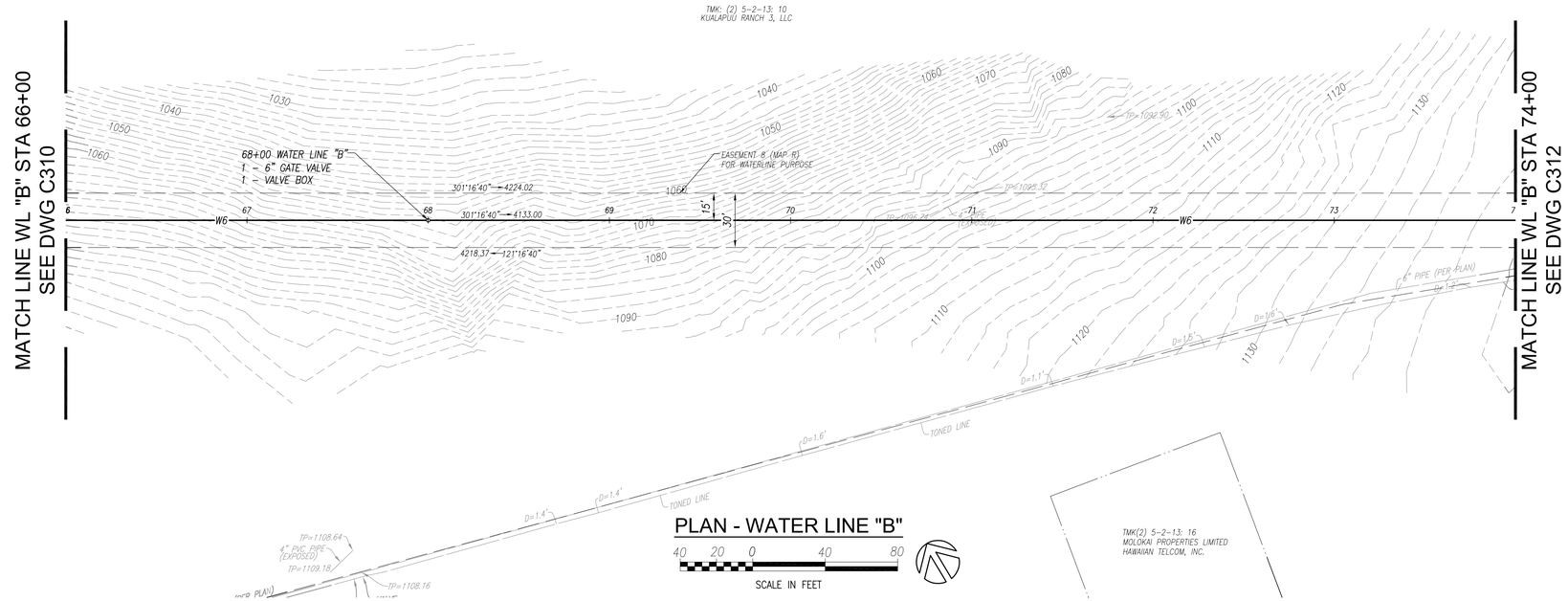
JUNE 2018

DWG. NO. C310
SHEET 28 OF 149

FILE	POCKET	FOLDER	NO.

MATCH LINE WL "B" STA 66+00
SEE DWG C310

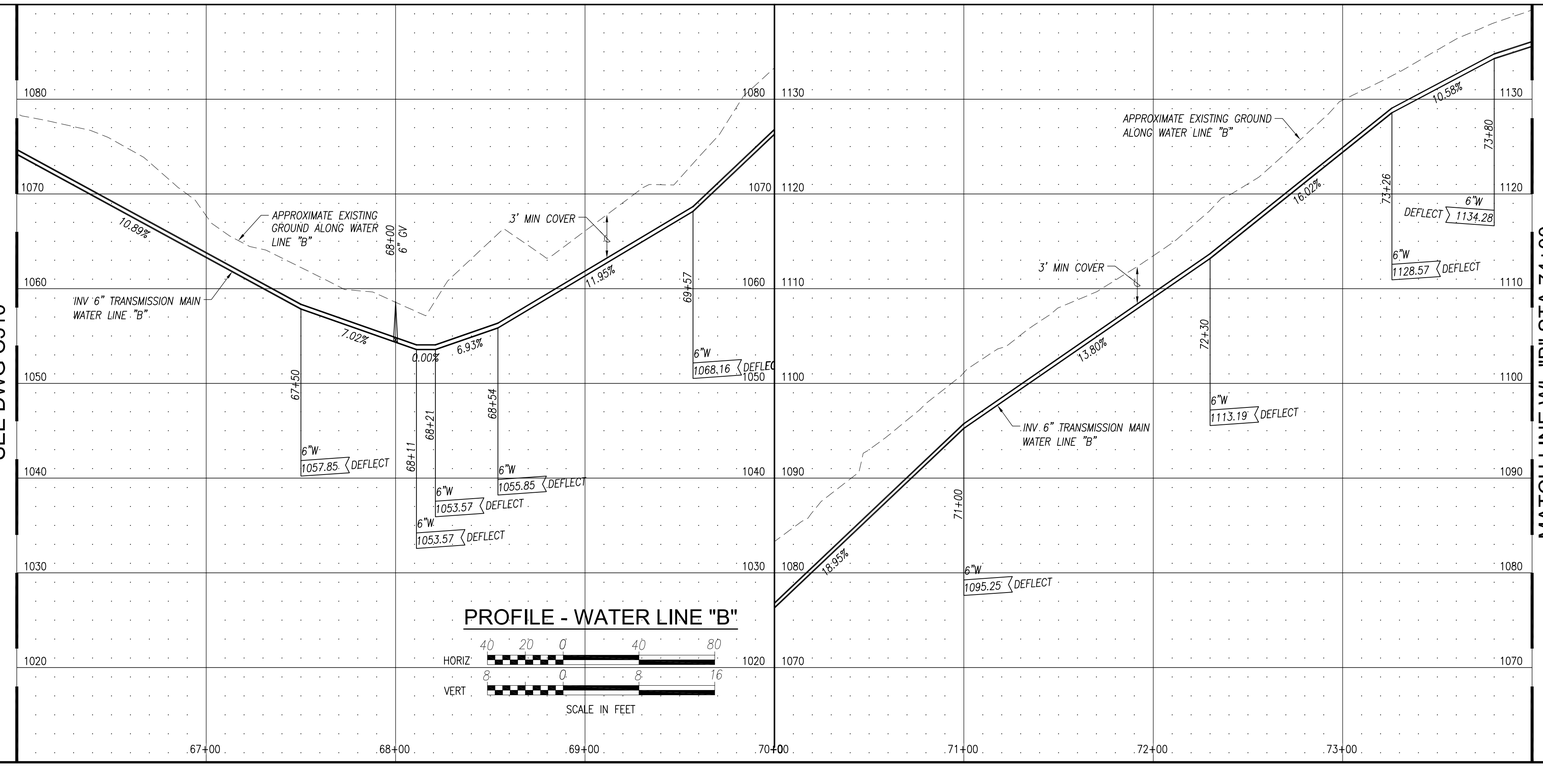
MATCH LINE WL "B" STA 74+00
SEE DWG C312



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 66+00 TO 74+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

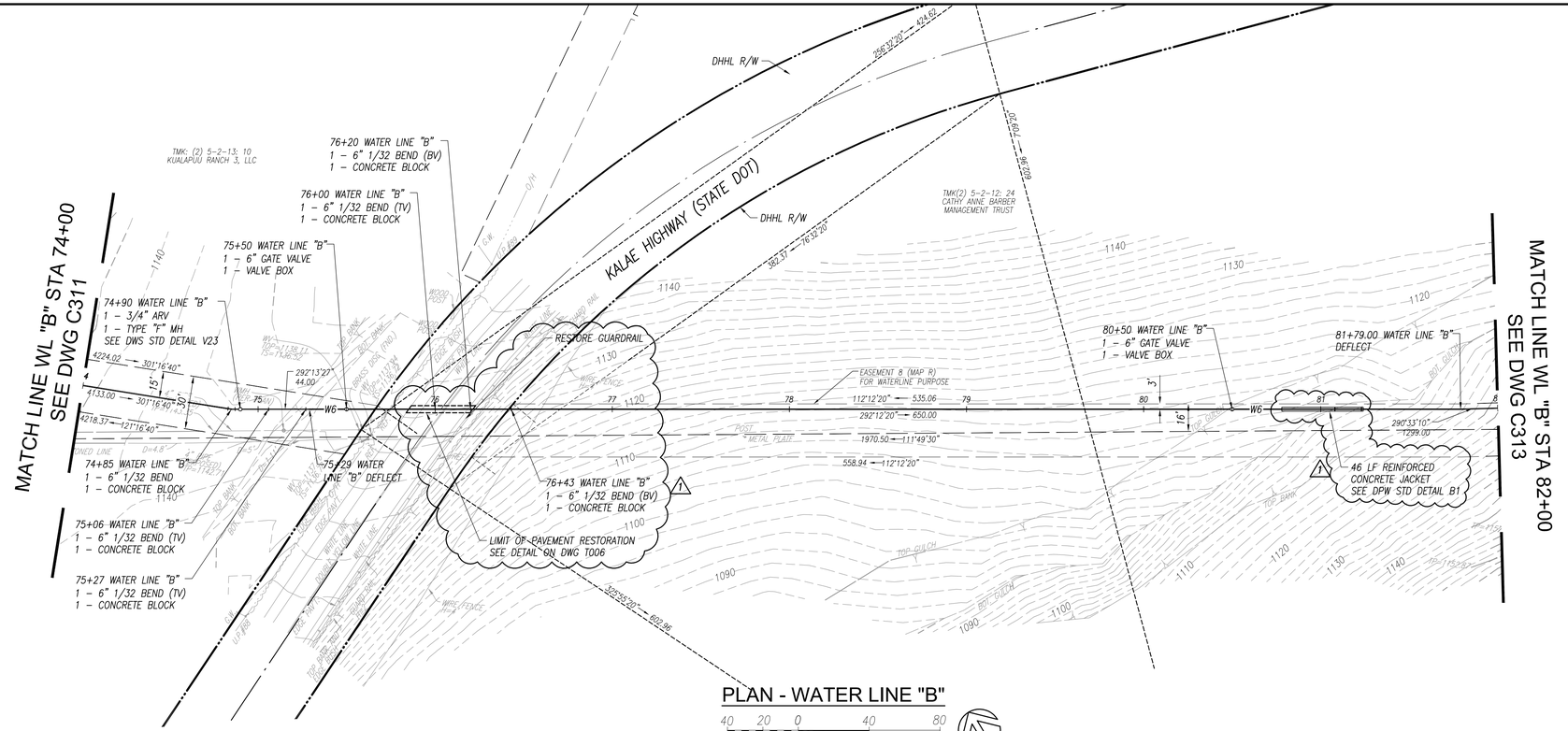
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

DWG. NO.
C311
SHEET 29 OF 149

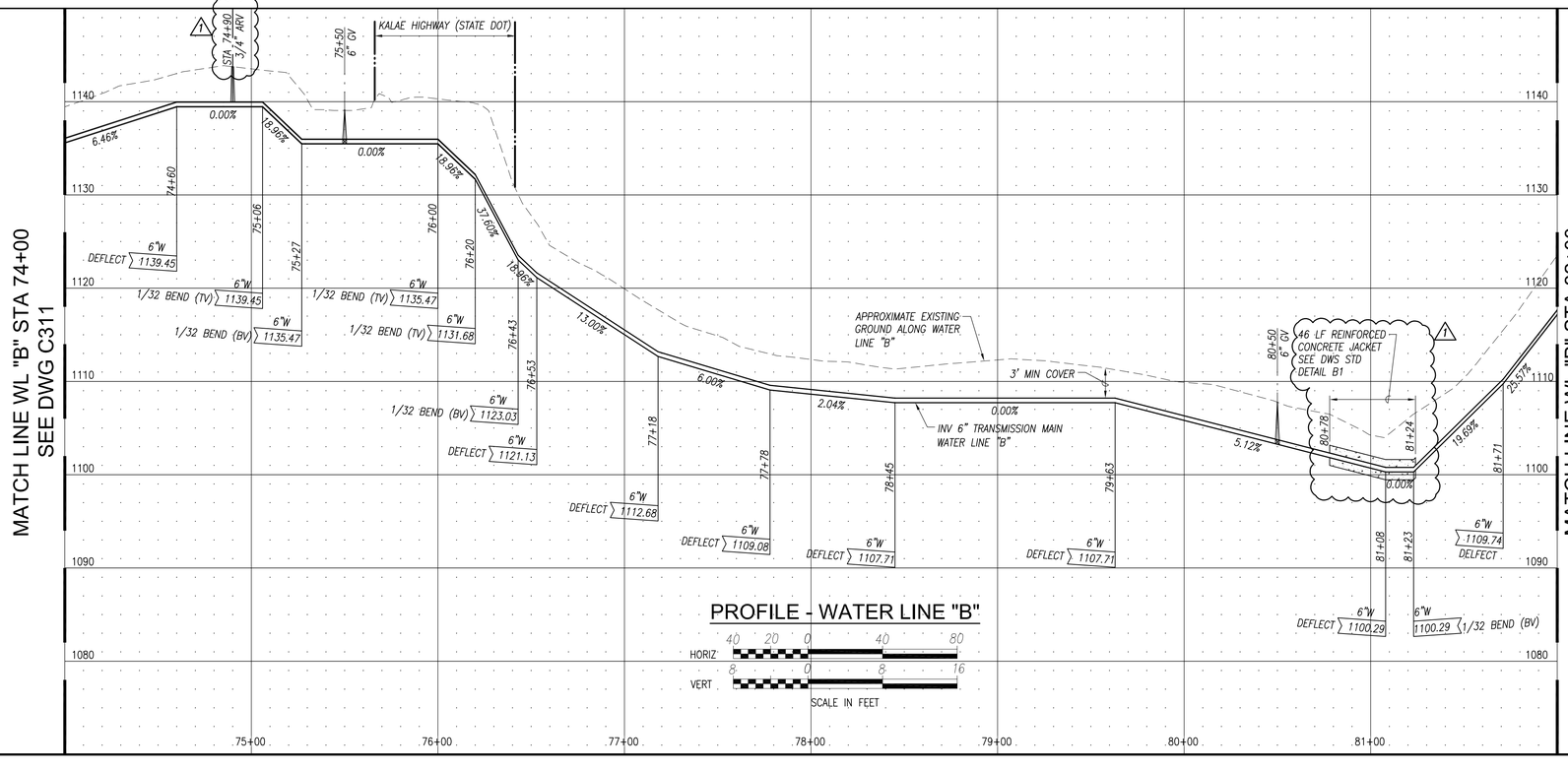
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE CALLOUT	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 74+00 TO 82+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

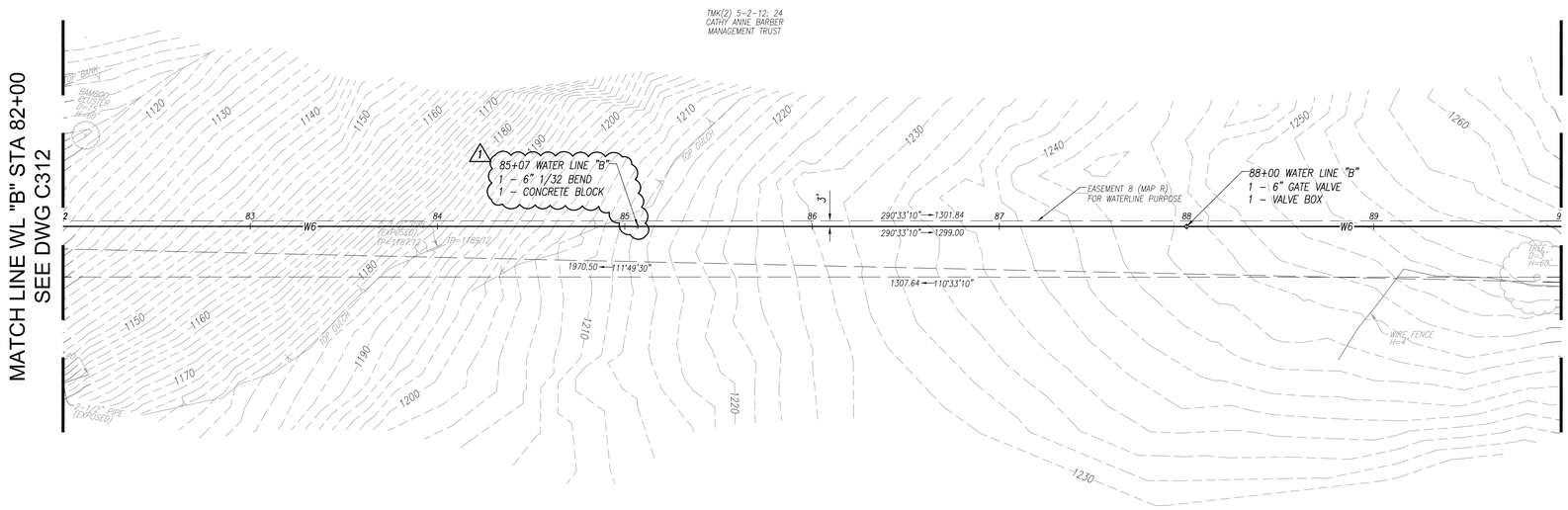
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C312
SHEET 30 OF 149

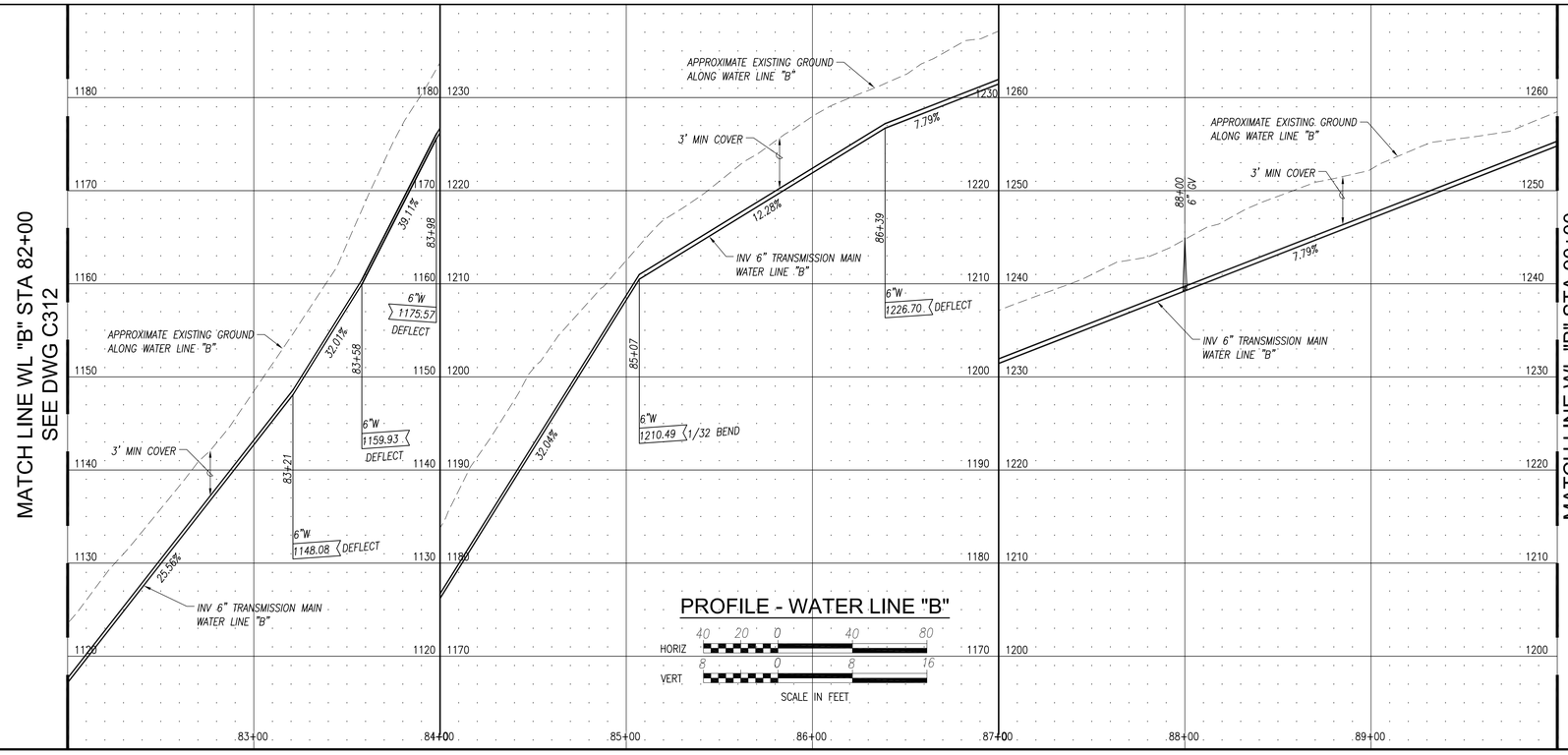
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 82+00 TO 90+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

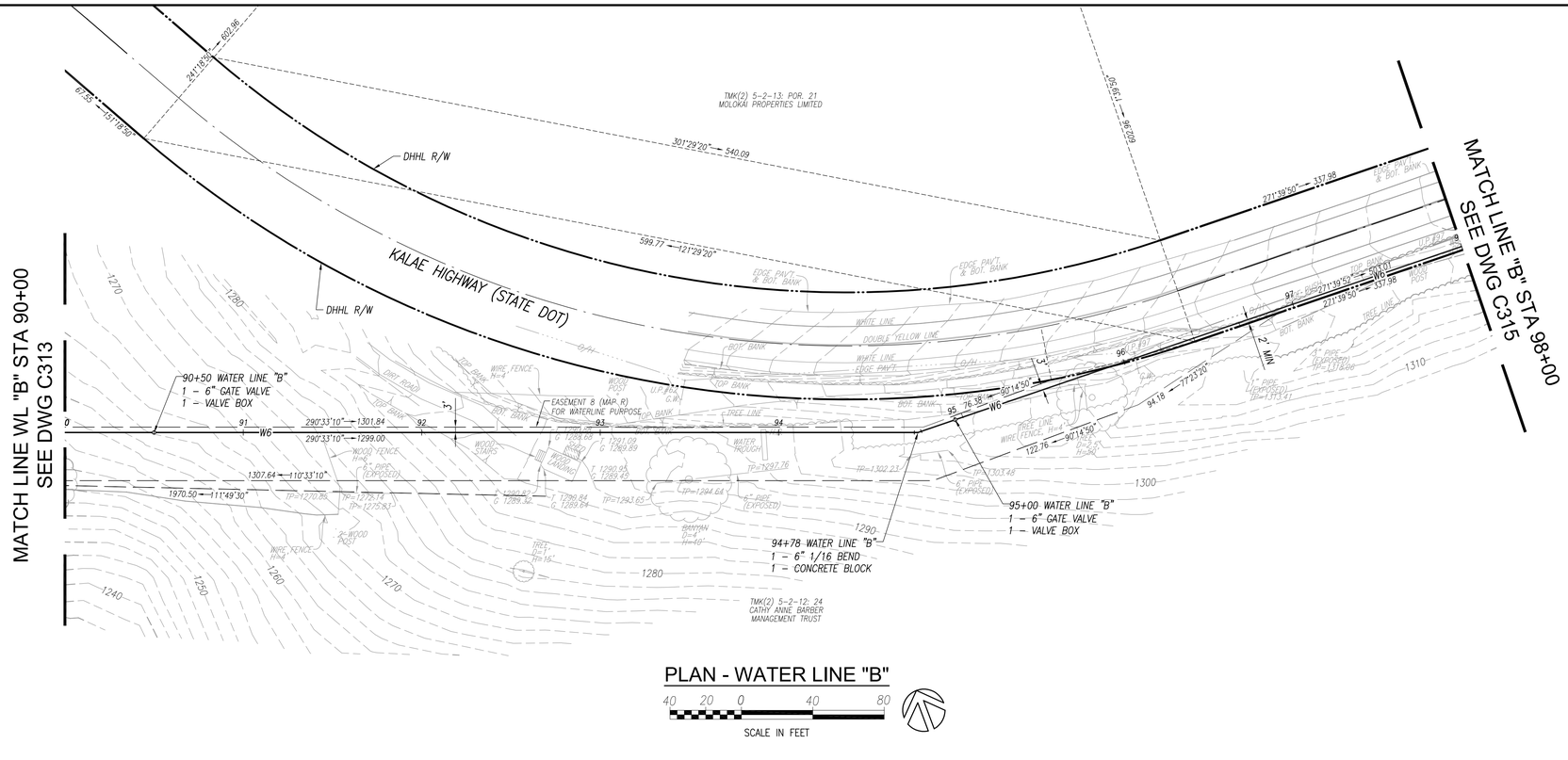
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C313
SHEET 31 OF 149

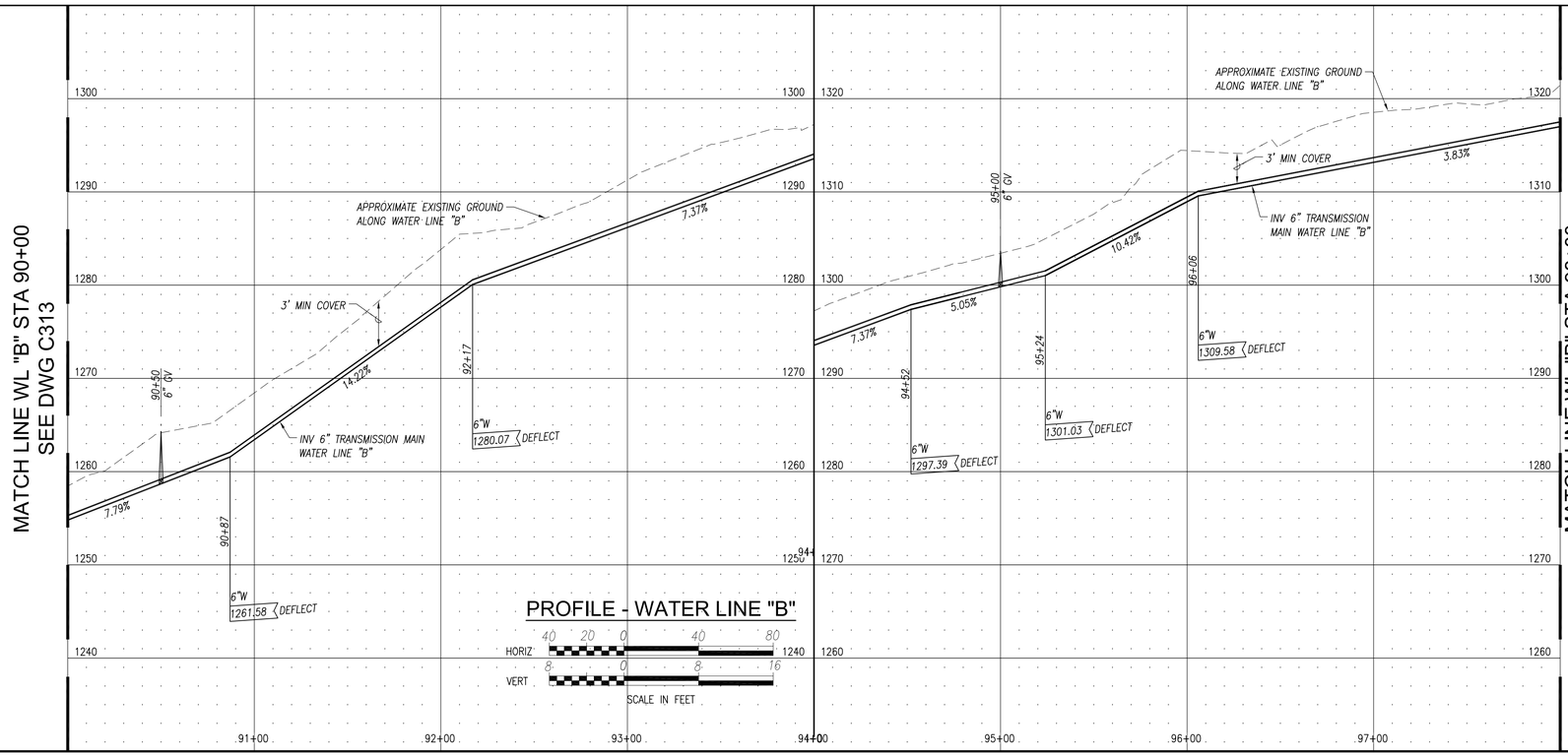
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "B"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "B"

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 90+00 TO 98+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

DWG. NO.
C314
SHEET 32 OF 149

FILE	POCKET	FOLDER	NO.

MATCH LINE WL "B" STA 98+00
SEE SHEET C314

TMK(2) 5-2-13: POR. 21
MOLOKAI PROPERTIES LIMITED

99+81 WATER LINE "B"
1 – 6" 1/4 BEND
1 – CONCRETE BLOCK

101+20 WATER LINE "B"
1 – 6" 1/32 BEND
1 – CONCRETE BLOCK

102+53 WATER LINE "B"
1 – 6" 1/32 BEND
1 – CONCRETE BLOCK

DHHL R/W

KALAE HIGHWAY (STATE DOT)

99+94 WATER LINE "B"
1 – 6" 1/4 BEND
1 – CONCRETE BLOCK

100+00 WATER LINE "B"
CONNECT EXISTING STANDPIPE TO NEW 6" WATER LINE
CONTRACTOR TO VERIFY EXACT LOCATION OF INVERT IN FIELD
SEE DWS STD DETAIL FH1

100+10 WATER LINE "B"
1 – 6" 1/32 BEND (BV)
1 – CONCRETE BLOCK

102+00 WATER LINE "B"
1 – 6" GATE VALVE
1 – VALVE BOX

102+20 WATER LINE "B"
DEFLECT

104+13 WATER LINE "B"
1 – 6" 1/32 BEND
1 – CONCRETE BLOCK

TMK(2) 5-2-12: 24
CATHY ANNE BARBER
MANAGEMENT TRUST

TMK(2) 5-2-12: 30
RICHARD COOKE III/ BRONWYN JOINT TRUST

TMK(2) 5-2-12: 31
ALAN COOKE KAY,
& DIANE FIFE KAY,
& FRANCES K. BROSSY TRUST
& FREDERIC A. BROSSY, JR. TRUSTS

TMK(2) 5-2-13: 1
ALAN COOKE KAY, TRUST
& HAROLD T KAY, JR.

EASEMENT 145 (DOC. 36)
FOR WATERLINE PURPOSES

MATCH LINE WL "B" STA 106+00
SEE SHEET C316

PLAN - WATER LINE "B"
40 20 0 40 80
SCALE IN FEET

MATCH LINE WL "B" STA 98+00
SEE SHEET C314

APPROXIMATE EXISTING GROUND
ALONG WATER LINE "B"

3' MIN COVER

INV 6" TRANSMISSION MAIN
WATER LINE "B"

RECONNECT EXISTING STANDPIPE
CONTRACTOR TO VERIFY EXACT LOCATION OF INVERT IN FIELD

PROFILE - WATER LINE "B"
HORIZ 40 20 0 40 80
VERT 8 0 8 16
SCALE IN FEET

MATCH LINE WL "B" STA 106+00
SEE SHEET C316

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE AND CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 98+00 TO 106+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C315
SHEET 33 OF 149

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

MATCH LINE WL "B" STA 106+00
SEE SHEET C315

MATCH LINE WL "B" STA 114+00
SEE SHEET C317

TMK(2) 5-2-13: 1
ALAN COOKE KAY, TRUST
& HAROLD T KAY, JR.

TMK(2) 5-2-13: 17
JAMES G. TEMPLE
& KIMBERLY L. TEMPLE

TMK(2) 5-2-13: 28
STACI KANOELANI GONZALES

TMK(2) 5-2-12: 31
ALAN COOKE KAY
& DIANE FIFE KAY
& FRANCES K. BROSSY TRUST
& FREDERIC A. BROSSY, JR. TRUSTS

TMK(2) 5-2-12: 32
CATHERINE SUMMERS
COOKE TRUST

TMK(2) 5-2-12: 33
DEWITT JONES TRUST DTD

KALAE HIGHWAY (STATE DOT)

107+78 WATER LINE "B"
RECONNECT EXISTING
STANDPIPE. CONTRACTOR
TO VERIFY EXACT LOCATION
OF INVERT IN FIELD
SEE DWS STD DTL FH1

107+56 WATER LINE "B"
RECONNECT EXISTING
WATER LATERAL

108+34 WATER LINE "B"
1 – 6" 1/32 BEND
1 – CONCRETE BLOCK

108+40 WATER LINE "B"
RECONNECT EXISTING
WATER LATERAL

108+46 WATER LINE "B"
RECONNECT EXISTING
WATER LATERAL

109+04 WATER LINE "B"
1 – 3/4" ARV
1 – TYPE "F" MH
SEE DWS STD DETAIL V23

109+50 WATER LINE "B"
1 – 6" GATE VALVE
1 – VALVE BOX

110+56 WATER LINE "B"
RECONNECT EXISTING
STANDPIPE. CONTRACTOR
TO VERIFY EXACT LOCATION
OF INVERT IN FIELD
SEE DWS STD DTL FH1

110+59 WATER LINE "B"
RECONNECT EXISTING
WATER LATERAL

110+63 WATER LINE "B"
1 – 6" 1/16 BEND
1 – CONCRETE BLOCK

112+20 WATER LINE "B"
1 – 3/4" ARV
1 – TYPE "F" MH
SEE DWS STD DETAIL V23

112+72 WATER LINE "B"
1 – 6" 1/32 BEND
1 – CONCRETE BLOCK

℄ EASEMENT 6
(MAP 4)
25 FT WIDE
FOR POWERLINE
PURPOSES

EASEMENT 145

DHHL R/W

PLAN - WATER LINE "B"

40 20 0 40 80
SCALE IN FEET

RECONNECT EXISTING WATER LATERL
RECONNECT EXISTING WATER LATERAL
RECONNECT EXISTING WATER LATERAL
RECONNECT EXISTING STANDPIPE CONTRACTOR TO VERIFY EXACT LOCATION OF INVERT IN FIELD
RECONNECT EXISTING WATER LATERAL
RECONNECT EXISTING STANDPIPE CONTRACTOR TO VERIFY EXACT LOCATION OF INVERT IN FIELD
APPROXIMATE EXISTING GROUND ALONG WATER LINE "B"
3' MIN COVER
INV 6" TRANSMISSION MAIN WATER LINE "B"
109+04 3/4" ARV
109+50 6" GV
112+20 3/4" ARV
106+64
107+78
108+84
109+24
110+56
110+80
112+17
112+22
113+37
6"W 1368.86 DEFLECT
6"W 1365.03 DEFLECT
6"W 1372.43 DEFLECT
6"W 1372.43 DEFLECT
6"W 1370.56
6"W 1370.22 DEFLECT
6"W 1372.55 DEFLECT
6"W 1372.55 DEFLECT
6"W 1371.52 DEFLECT
0.00%
1.41%
1.70%
0.90%
7.19%
4.72%
3.36%

PROFILE - WATER LINE "B"

HORIZ 40 20 0 40 80
VERT 8 0 8 16
SCALE IN FEET

107+00. 108+00. 109+00. 110+00. 111+00. 112+00. 113+00.

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED PROFILE AND CALLOUTS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT
JOB NO.

PLAN AND PROFILE
WATER LINE "B" 106+00 TO 114+00

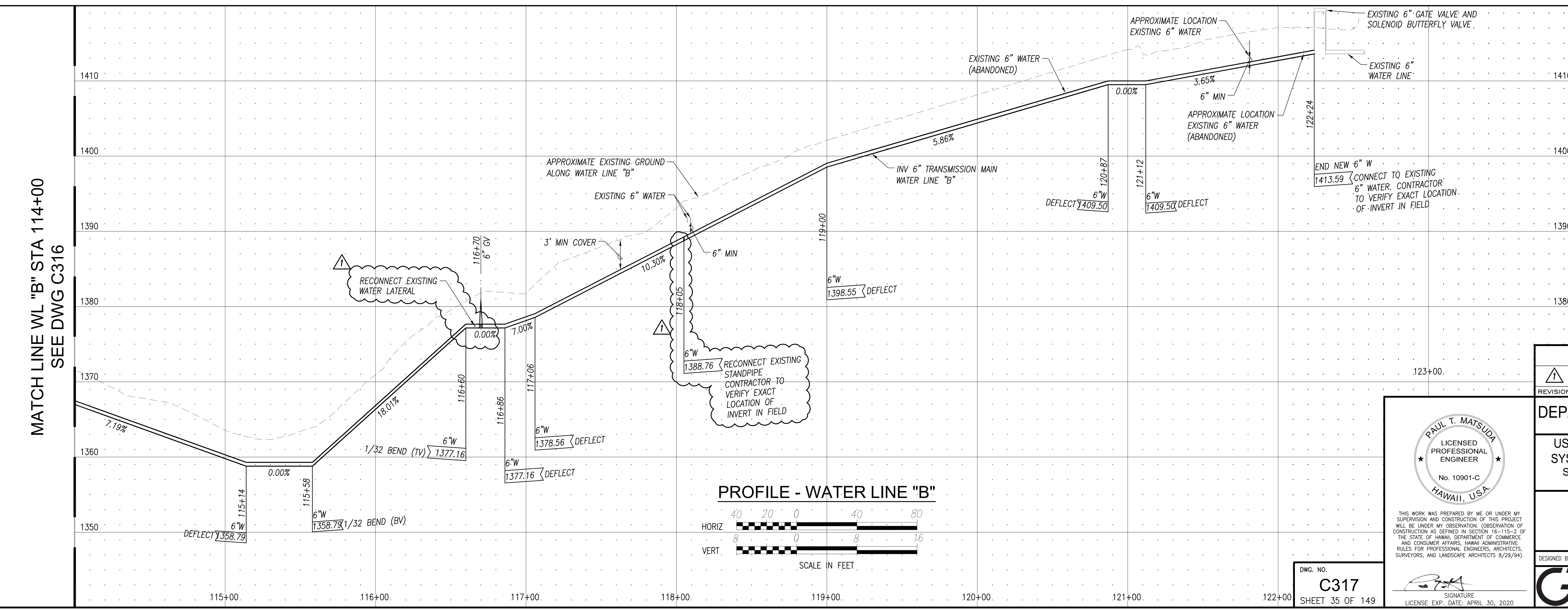
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C316
SHEET 34 OF 149

FILE	POCKET	FOLDER	NO.



⚠	7/6/18	REVISED PROFILE AND CALLOUTS	G70
REVISION	DATE	BRIEF	MADE BY / APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 3 - 6" TRANSIT WATERLINE REPLACEMENT

JOB NO.

PLAN AND PROFILE
WATER LINE "B" 114+00 TO 122+49

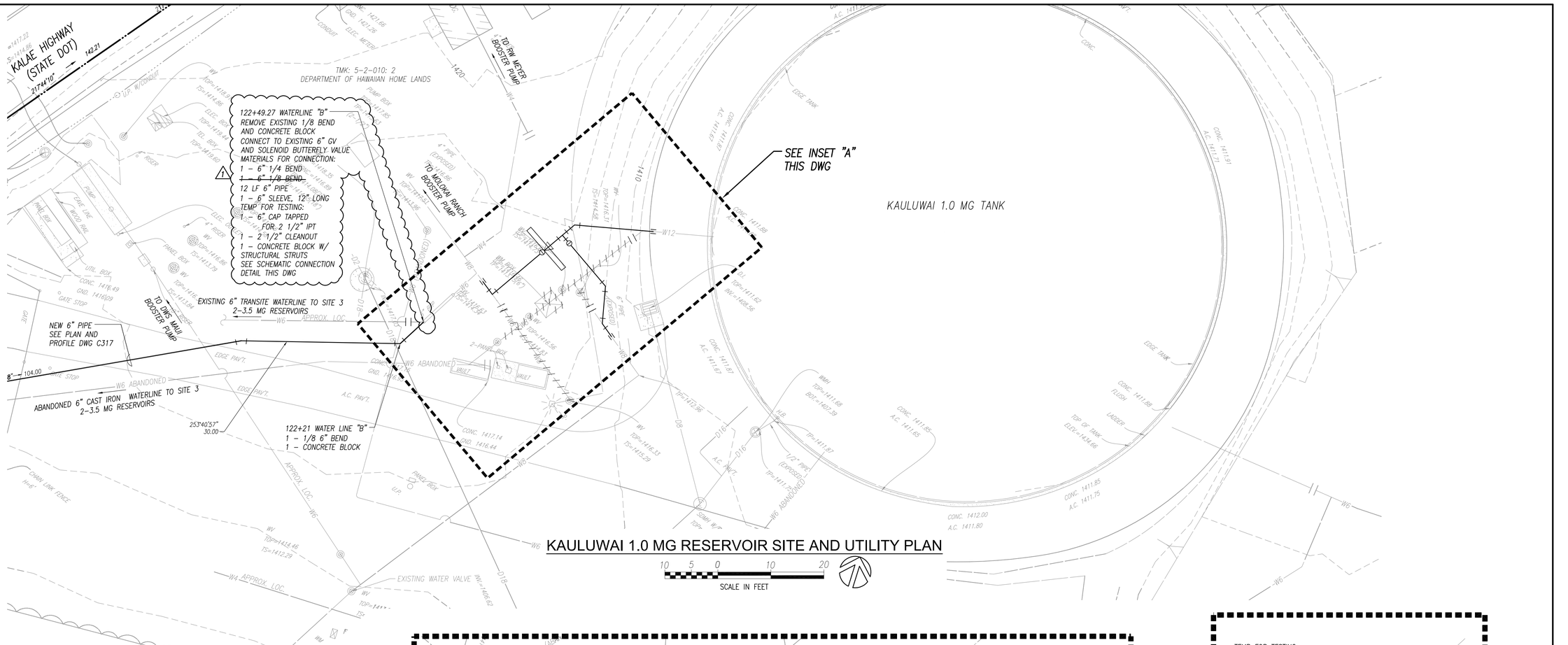
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

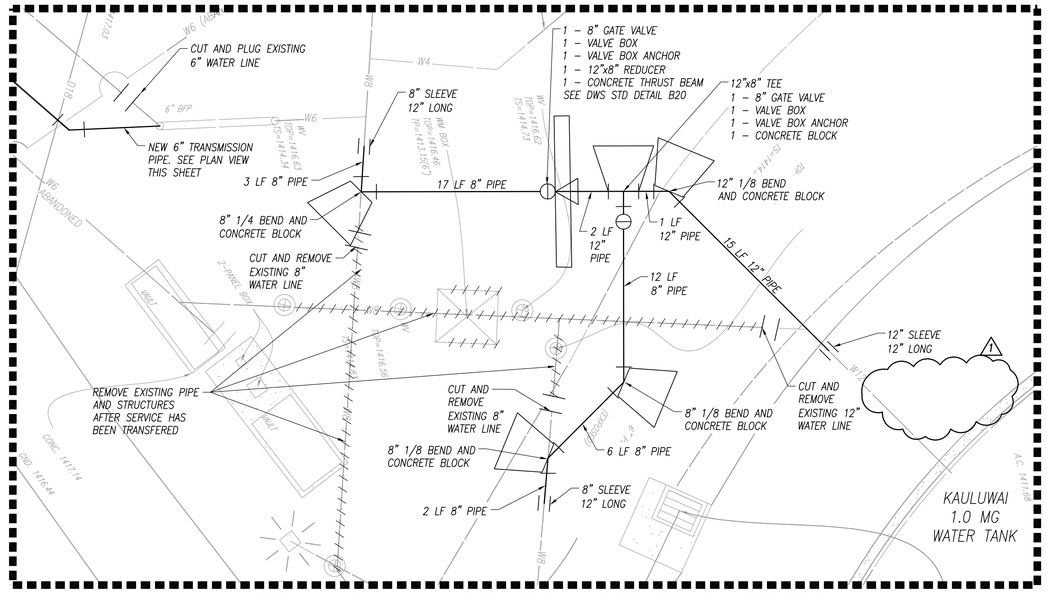
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

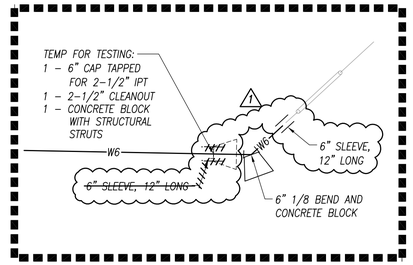
DWG. NO. C317
SHEET 35 OF 149

FILE | POCKET | FOLDER | NO.





INSET "A" - KAULUWAI 1.0 MG TANK SITE SCHEMATIC DETAIL



SCHEMATIC CONNECTION DIAGRAM
AT 122+16 WATER LINE "B"
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS AND DETAILS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 3 - KAULUWAI 1.0 MG TANK SITE
JOB NO.

KAULUWAI 1.0 MG RESERVOIR
SITE AND UTILITY PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

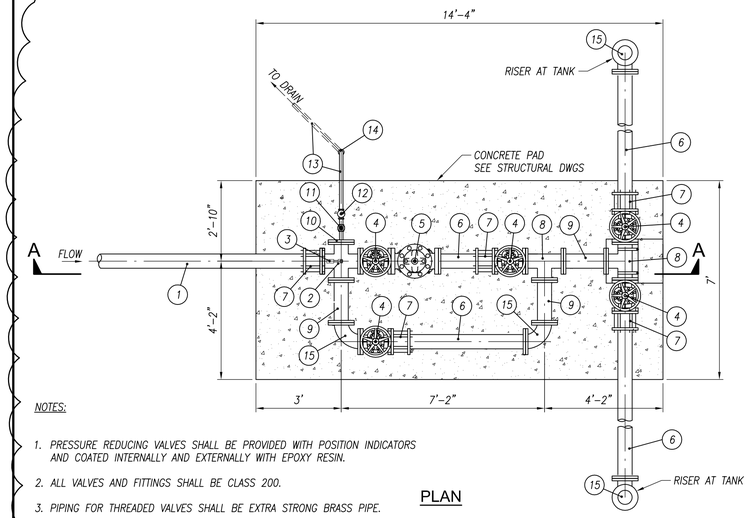
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C318
SHEET 36 OF 149

FILE	POCKET	FOLDER	NO.

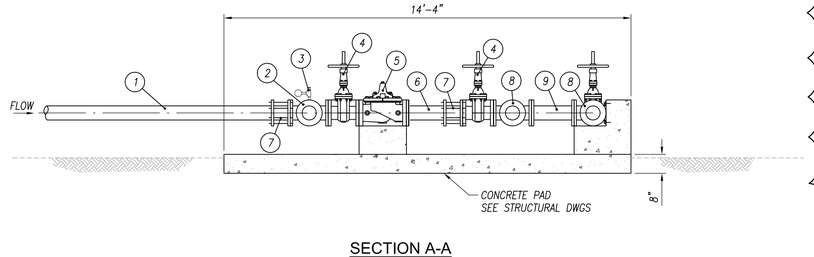


NOTES:

1. PRESSURE REDUCING VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND COATED INTERNALLY AND EXTERNALLY WITH EPOXY RESIN.
2. ALL VALVES AND FITTINGS SHALL BE CLASS 200.
3. PIPING FOR THREADED VALVES SHALL BE EXTRA STRONG BRASS PIPE.
4. CONCRETE SHALL BE DWS 3500
5. REINFORCING BARS SHALL BE A615, GRADE 60.

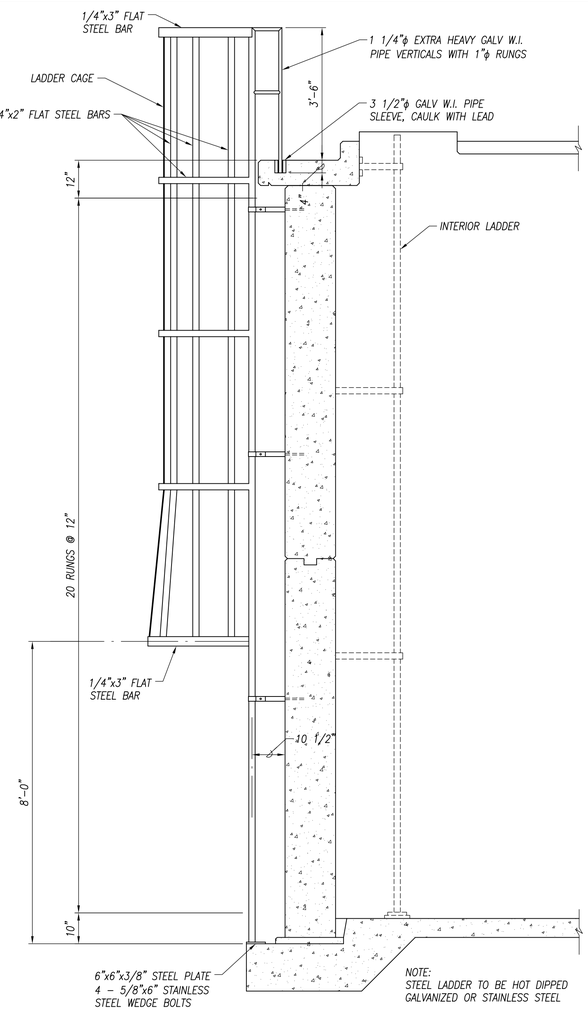
PLAN

MATERIALS LIST	
1	6" DI PIPE, CUT TO FIT
2	6" CROSS TAPPED WITH 3/4" IPT AND 3/4" BALL COCK
3	PRESSURE GAGE AND AIR RELIEF WITH 3/4" IPT TAP
4	6" GATE VALVE, FE
5	6" FLOW CONTROL VALVE, CLA-VAL MODEL NO 124-18, FE
6	6" DI PIPE, FE x PE
7	6" RESTRAINED FLANGED COUPLING ADAPTER
8	6" TEE, FE
9	6" SPOOL PIECE, 18" LONG
10	6" BLIND FLANGE TAPPED WITH 1 1/2" IPT
11	1 1/2" GATE VALVE, SE
12	1 1/2" PRESSURE RELIEF VALVE, SE
13	1 1/2" PIPE
14	1 1/2" 90° BEND, THREADED, TOP AND BOTTOM
15	6" 1/4 BEND, FE

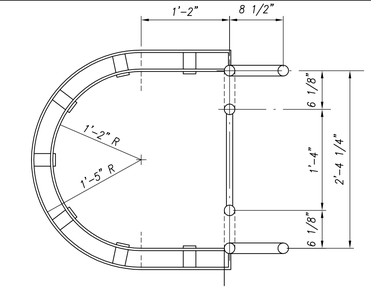


SECTION A-A

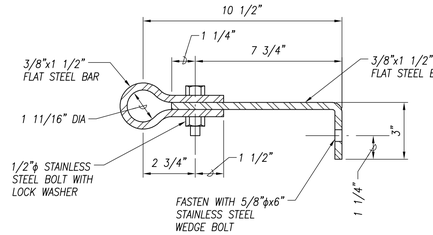
TANK INFLOW CONTROL VALVE
3/8" = 1'-0"



EXTERIOR LADDER DETAIL
1/2" = 1'-0"



PLAN - EXTERIOR LADDER
1" = 1'-0"



EXTERIOR LADDER SUPPORT
3" = 1'-0"

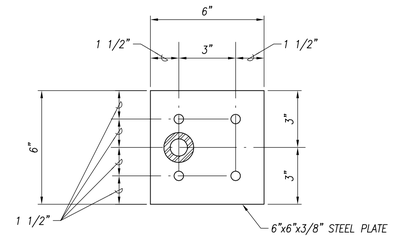
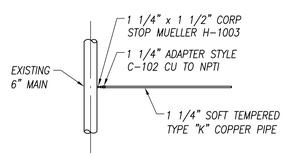
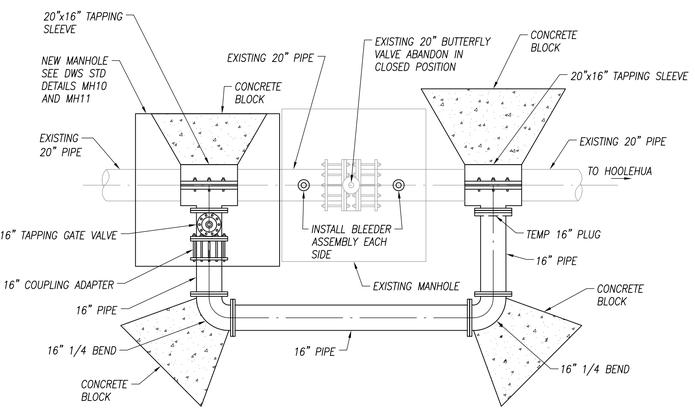


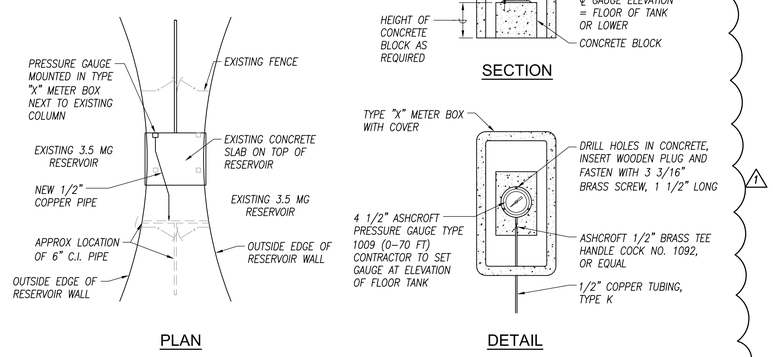
PLATE DETAIL
3" = 1'-0"



COPPER PIPE CONNECTION TO EXISTING 6" OUTFLOW PIPE
NOT TO SCALE



20" BUTTERLY VALVE REPLACEMENT
NOT TO SCALE



PRESSURE GAUGE DETAILS
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED AND ADDED DETAILS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7 DETAILS
JOB NO.

2 - 3.5 MG RESERVOIR SITE DETAILS

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C319
SHEET 37 OF 149

FILE	POCKET	FOLDER	NO.

TMK: (2) 5-2-7: 79
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN
HOME LANDS
LEASEE: BRETT WAIPA

HOOLEHUA TANK SITE
2-3.5 MG TANKS
SPILLWAY ELEV=1040'
FLOOR ELEV=1020'

TMK: (2) 5-2-7: 29
DEPARTMENT OF HAWAIIAN
HOME LANDS
LEASEE: MELODY-LYNN L. ALCON

TMK: (2) 5-2-7: 90
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: JAMES LINDSAY

TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN
HOME LANDS
LEASEE: BRETT WAIPA

TMK: (2) 5-2-7: 78
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: BRETT WAIPA

TMK: (2) 5-2-7: 77
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MOLLY TENGAN

TMK: (2) 5-2-7: 76
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MALIA FORBES GREANEY

TMK: (2) 5-2-7: 75
DEPARTMENT OF HAWAIIAN HOME LANDS

EASEMENT B (MAP 4)
FOR WATERLINE PURPOSE

SITE NO. 4

PROPOSED 5280 LF
ACCESS ROADWAY

TMK: (2) 5-2-7: 28
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MALIA FORBES GREANEY

UHI PALI AVENUE (OHHL)

TMK: (2) 5-2-15: 1
STATE OF HAWAII
MOLOKAI HIGH SCHOOL

TMK: (2) 5-2-7: 13
DEPARTMENT OF HAWAIIAN
HOME LANDS
LEASEE: RAY H.K. WALLACE

FARRINGTON AVENUE (STATE DOT)

TMK: (2) 5-2-7: 1
STATE OF HAWAII
DEPARTMENT OF EDUCATION

TMK: (2) 5-2-13: 20
RUSSELL ALLAN DECOITE
& LYNN PUALANI DECOITE

TMK: (2) 5-2-13: 10
KUALAPUU RANCH 3, LLC

KULEA STREET (OHHL)

TMK: (2) 5-2-7: 93
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: JAMIE F. MAIOHO

TMK: (2) 5-2-12: 04
MONSANTO HAWAII PRODUCTION CO, LLC
LEASEE: MONSANTO COMPANY

GENERAL PLAN

200 0 200 400
SCALE IN FEET

SITE 4 EARTHWORK SUMMARY

* AREA OF DISTURBANCE 86,363 SQ FT (1.98 ACRES)

GRADED AREA 86,363 SQ FT (1.98 ACRES)

* INCLUDING, BUT NOT LIMITED TO, EXCAVATION, GRADING, EQUIPMENT STAGING AND STORAGE AREAS, AS DEFINED BY THE STATE OF HAWAII, DEPARTMENT OF HEALTH CLEAN WATER BRANCH GUIDELINES FOR NOTICE OF INTENT, FORM G.

EXCAVATION = 556 CY
EMBANKMENT = 414 CY

1

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED EXCAVATION AND EMBANKMENT	G70	

PAUL T. MATSUDA
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HAWAII, U.S.A.

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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

GENERAL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C400
SHEET 38 OF 149

FILE	POCKET	FOLDER	NO.

TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

TMK: (2) 5-2-7: 79
DEPARTMENT OF HAWAIIAN HOME LANDS

HOOLEHUA TANK SITE
2-3.5 MG TANKS
SPILLWAY ELEV=1040'
FLOOR ELEV=1020'

TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: BRETT WAIPA

INSTALL TEMPORARY SILT SOCK AT LIMITS OF GRADING SEE DETAIL DWG T007

TMK: (2) 5-2-7: 30
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: BRETT WAIPA

INSTALL TEMPORARY SILT SOCK AT LIMITS OF GRADING SEE DETAIL DWG T007

TMK: (2) 5-2-7: 29
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MELODY LYNN L. ALCON

TMK: (2) 5-2-7: 90
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: JAMES LINDSAY

TMK: (2) 5-2-7: 78
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: BRETT WAIPA

TMK: (2) 5-2-7: 77
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MOLLY TENGAN

INSTALL TEMPORARY SILT SOCK AT LIMITS OF GRADING SEE DETAIL DWG T007

TMK: (2) 5-2-7: 58
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK: (2) 5-2-7: 76
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MALIA FORBES GREANEY

UHU PALI AVENUE (DHHL)

TMK: (2) 5-2-15: 1
STATE OF HAWAII
MOLOKAI HIGH SCHOOL

INSTALL TEMPORARY SILT SOCK AT LIMITS OF GRADING SEE DETAIL DWG T007

TMK: (2) 5-2-7: 28
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MALIA FORBES GREANEY

TMK: (2) 5-2-13: 10
KUALAPUU RANCH 3, LLC

CONSTRUCT 20' x 50' CONSTRUCTION ENTRANCE SEE DETAIL DWG T007

TMK: (2) 5-2-7: 13
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: RAY H.K. WALLACE

FARRINGTON AVENUE (STATE DOT)

TMK: (2) 5-2-7: 1
STATE OF HAWAII
DEPARTMENT OF EDUCATION

TMK: (2) 5-2-13: 20
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LEASEE: JAMIE F. MAIOHO

KULEA STREET (DHHL)

TMK: (2) 5-2-12: 04
MONSANTO HAWAII PRODUCTION CO, LLC
LEASEE: MONSANTO COMPANY

EROSION CONTROL PLAN

200 0 200 400
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

EROSION CONTROL PLAN

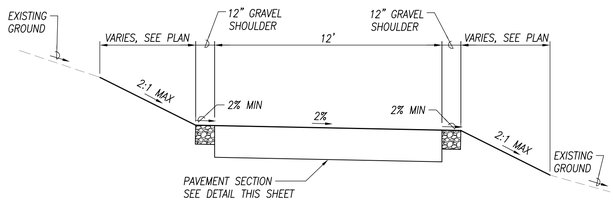
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

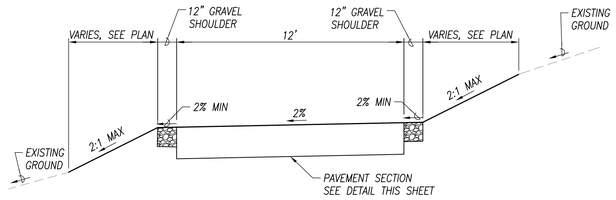
DWG. NO.
C401
SHEET 39 OF 149

FILE	POCKET	FOLDER	NO.



0+00 TO 35+08

NOT TO SCALE



35+08 TO 51+75

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED SECTIONS	G70	

PAUL T. MATSUDA
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SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

TYPICAL SECTIONS

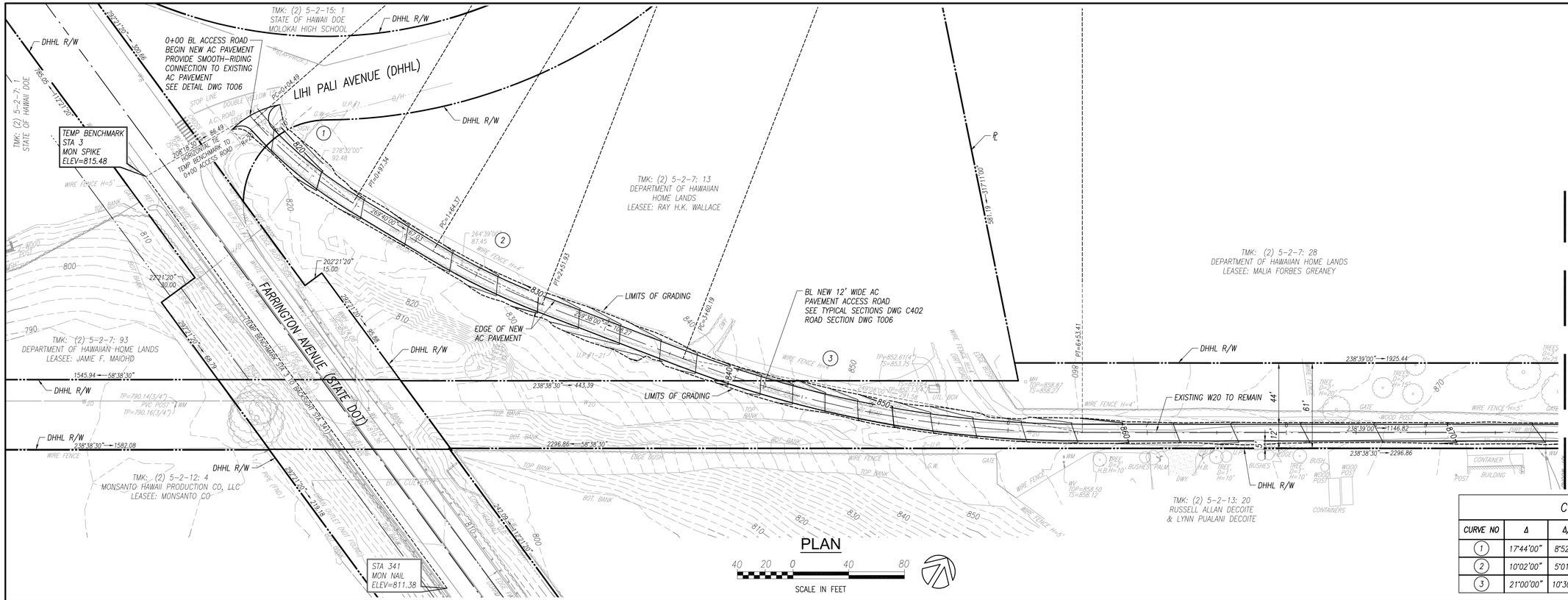
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

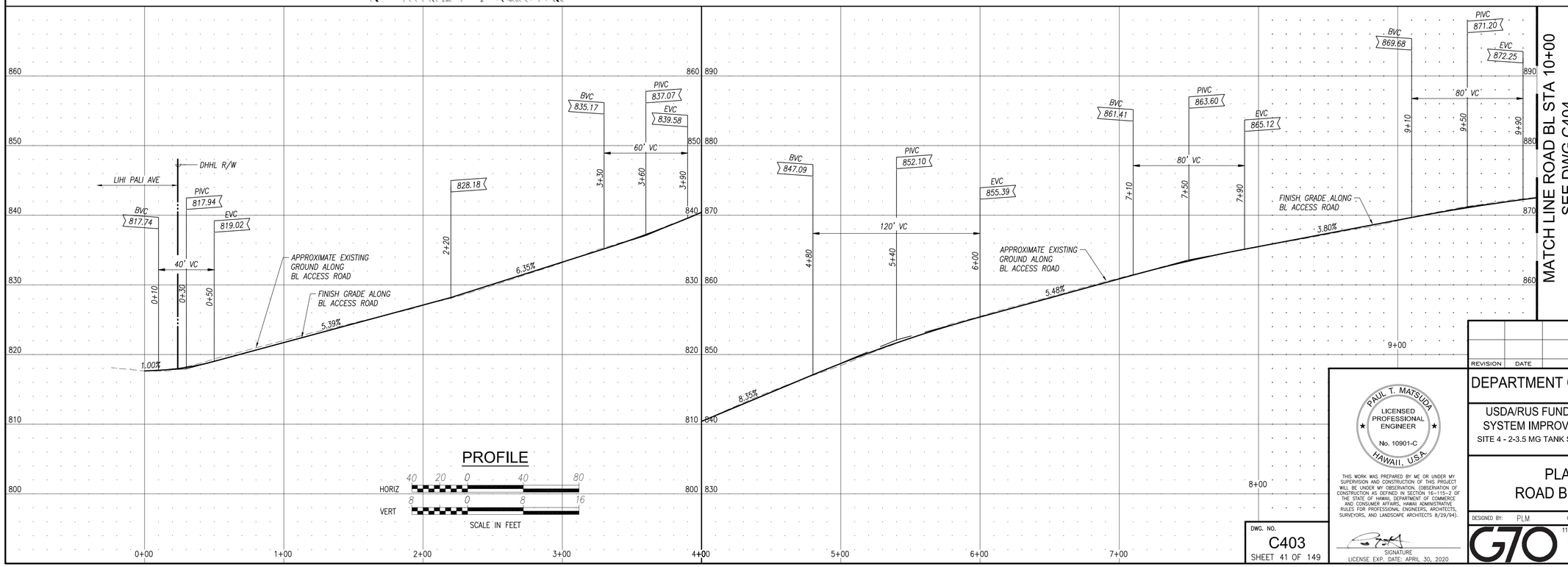
DWG. NO.
C402
SHEET 40 OF 149

FILE	POCKET	FOLDER	NO.



CURVE TABLE

CURVE NO	Δ	Δ/2	R	T	C	Lc
1	17°44'00"	8°52'00"	300.00'	46.80	92.48'	92.85'
2	10°02'00"	5°01'00"	500.00'	43.89	87.45'	87.56'
3	21°00'00"	10°30'00"	800.00'	148.27	291.58'	293.22'



REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

PLAN AND PROFILE
ROAD BL STA 0+00 TO 10+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C403
SHEET 41 OF 149

FILE	POCKET	FOLDER	NO.

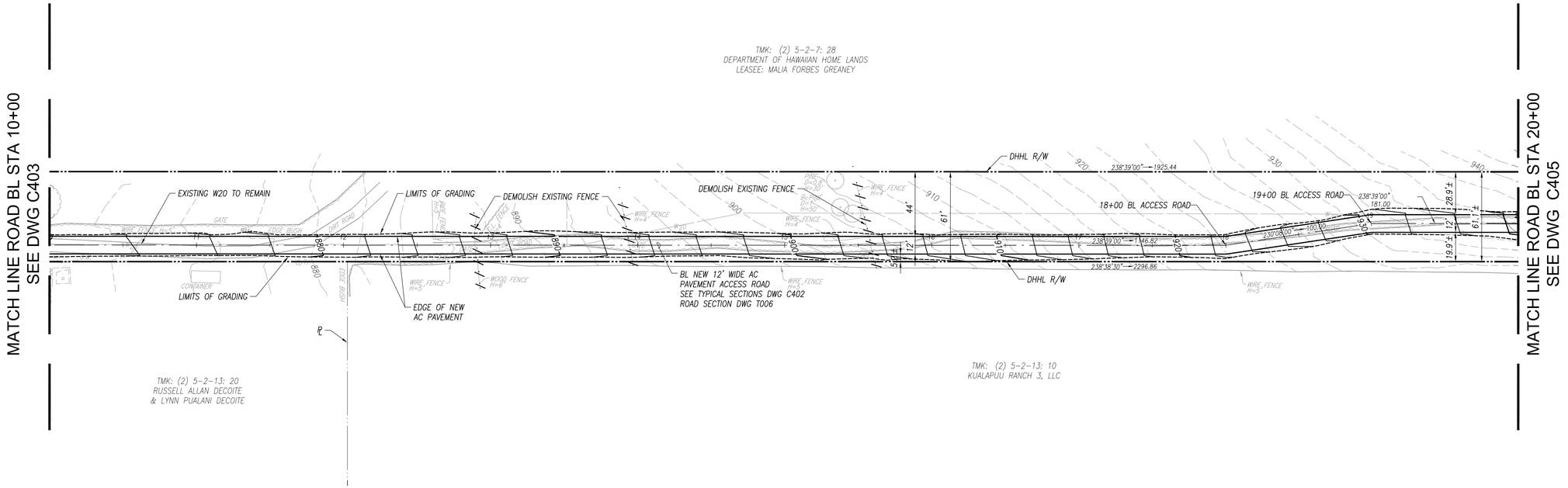
MATCH LINE ROAD BL STA 10+00
SEE DWG C403

MATCH LINE ROAD BL STA 20+00
SEE DWG C405

TMK: (2) 5-2-7: 28
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: MALIA FORBES GREANEY

TMK: (2) 5-2-13: 20
RUSSELL ALLAN DECOITE
& LYNN PUALANI DECOITE

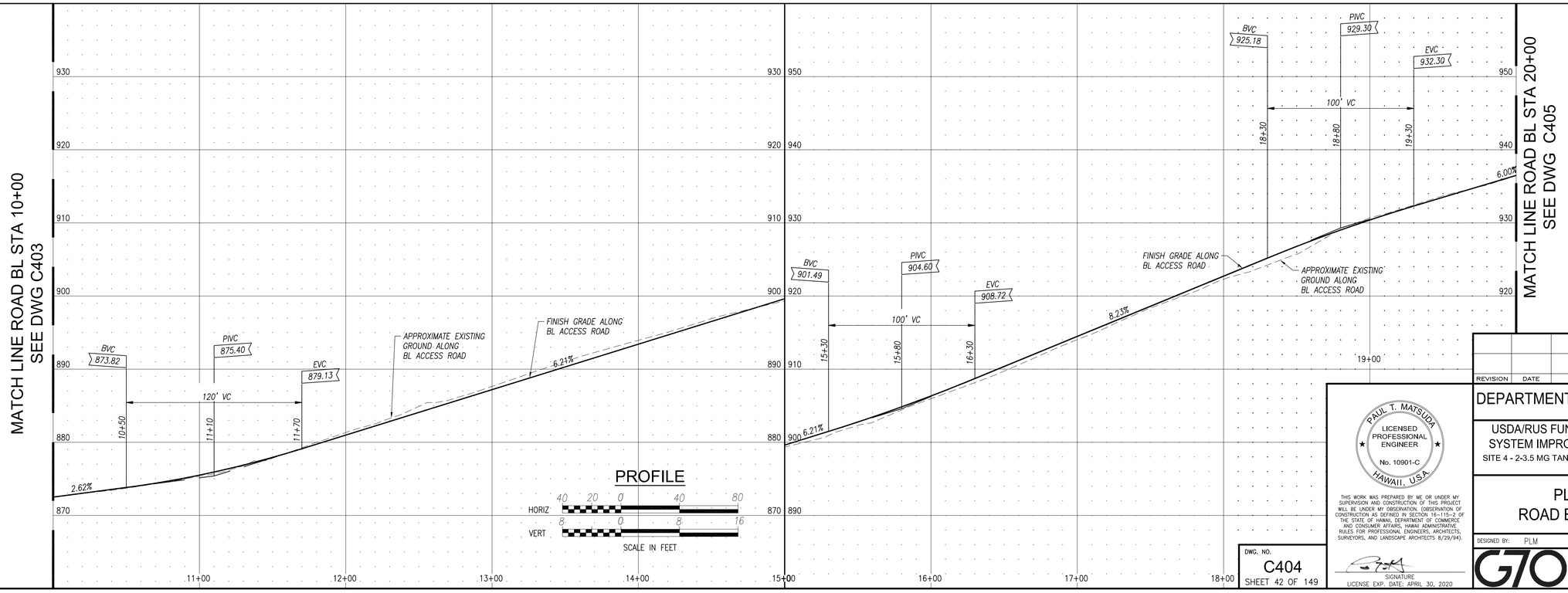
TMK: (2) 5-2-13: 10
KUALAPUU RANCH 3, LLC



PLAN

40 20 0 40 80

SCALE IN FEET



PROFILE

HORIZ 40 20 0 40 80

VERT 8 4 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

PLAN AND PROFILE
ROAD BL STA 10+00 TO 20+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

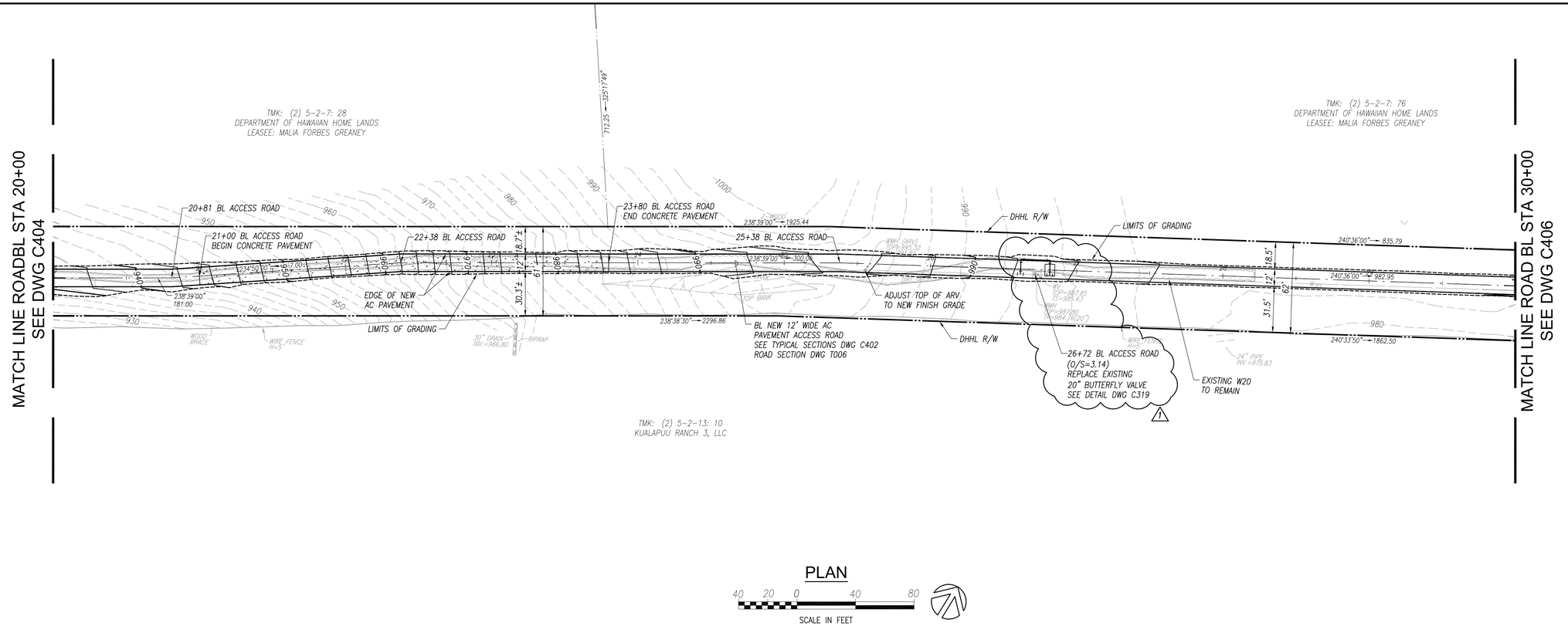
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

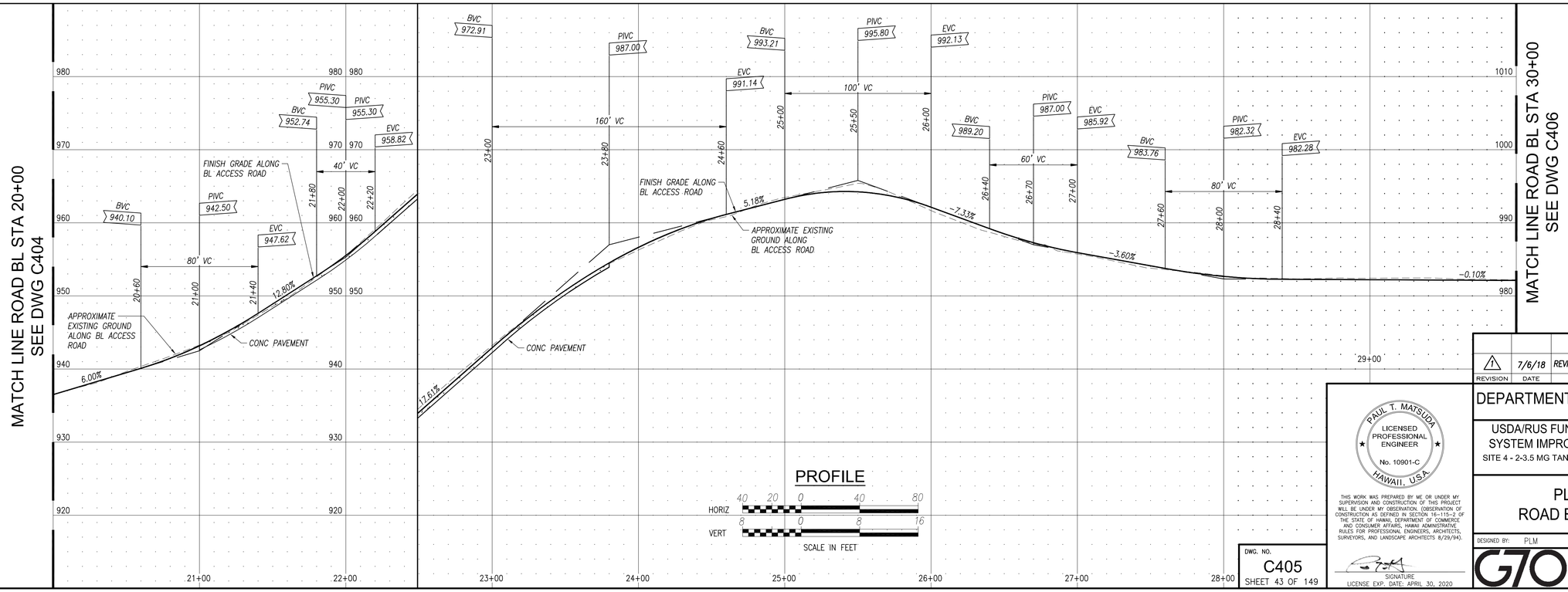
GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

DWG. NO.
C404
SHEET 42 OF 149

FILE	POCKET	FOLDER	NO.





REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED BUTTERFLY VALVE REPLACEMENT	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C405
SHEET 43 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

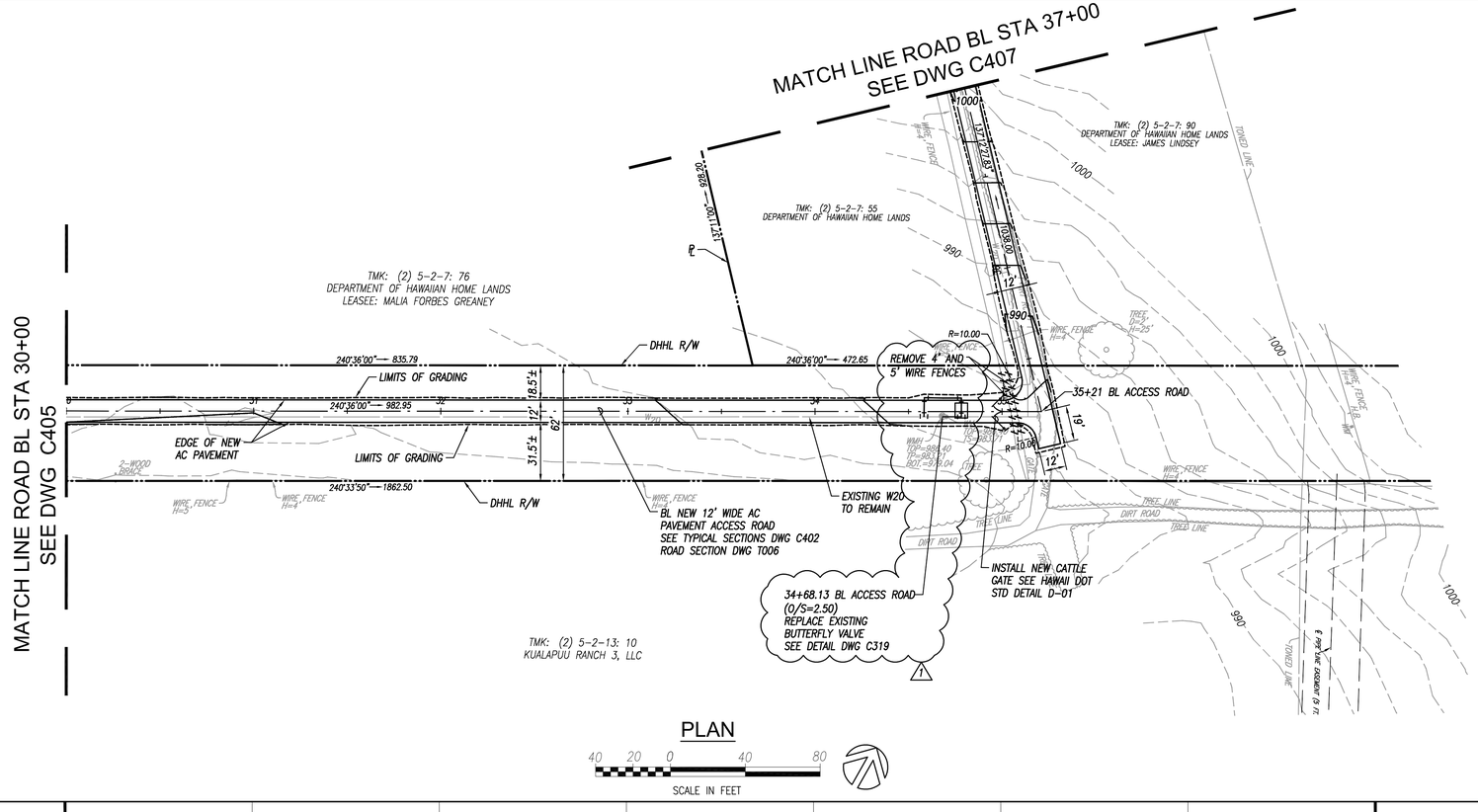
PLAN AND PROFILE
ROAD BL STA 20+00 TO 30+00

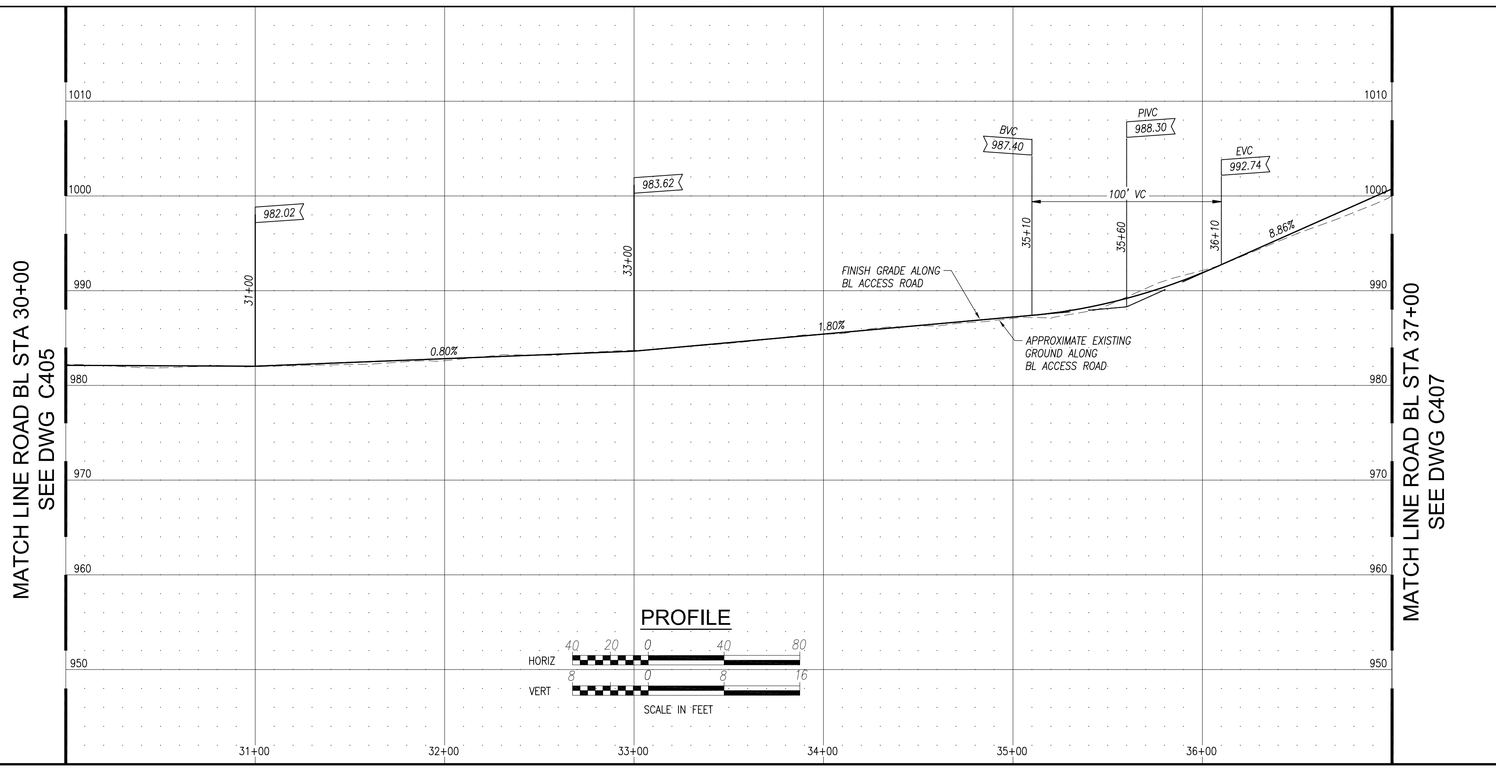
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.





REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED BUTTERFLY VALVE REPLACEMENT	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

PLAN AND PROFILE
ROAD BL STA 30+00 TO 37+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

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111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
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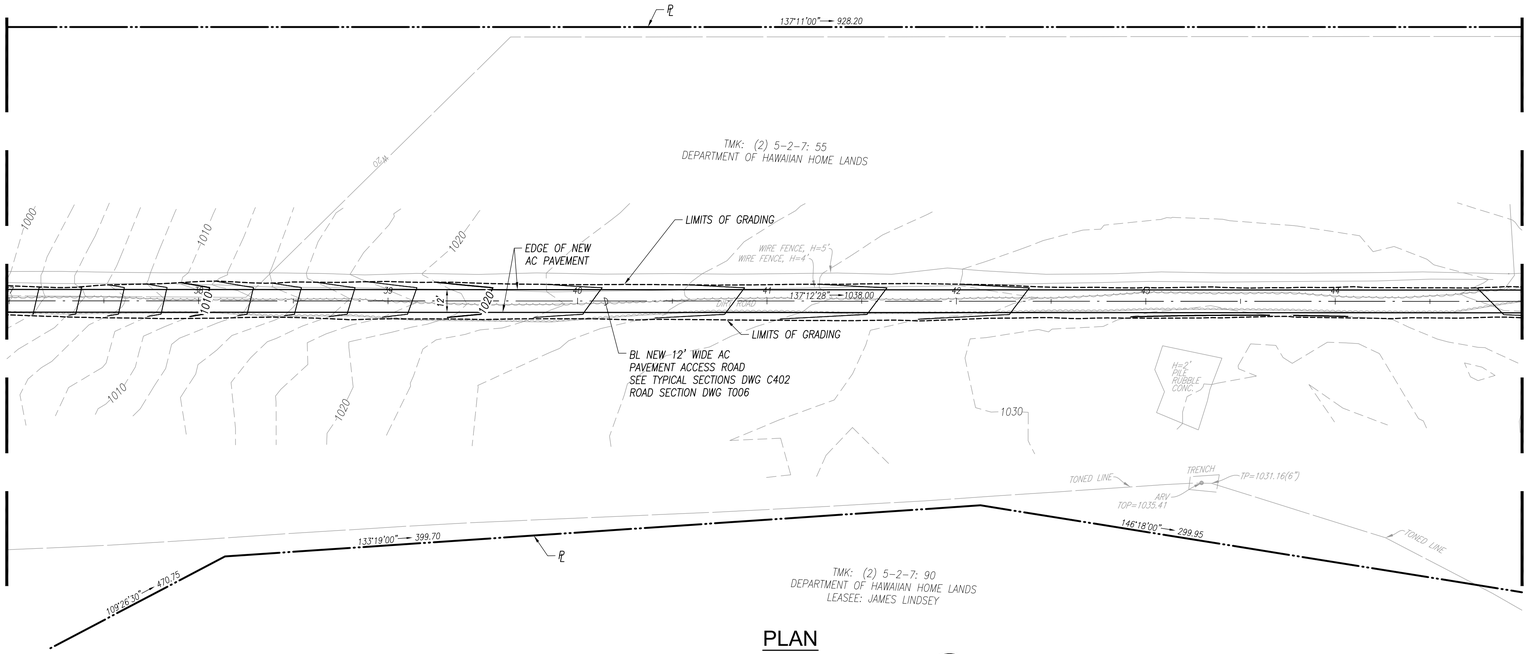
JUNE 2018

DWG. NO.
C406
SHEET 44 OF 149

FILE	POCKET	FOLDER	NO.

MATCH LINE ROAD BL STA 37+00
SEE DWG C406

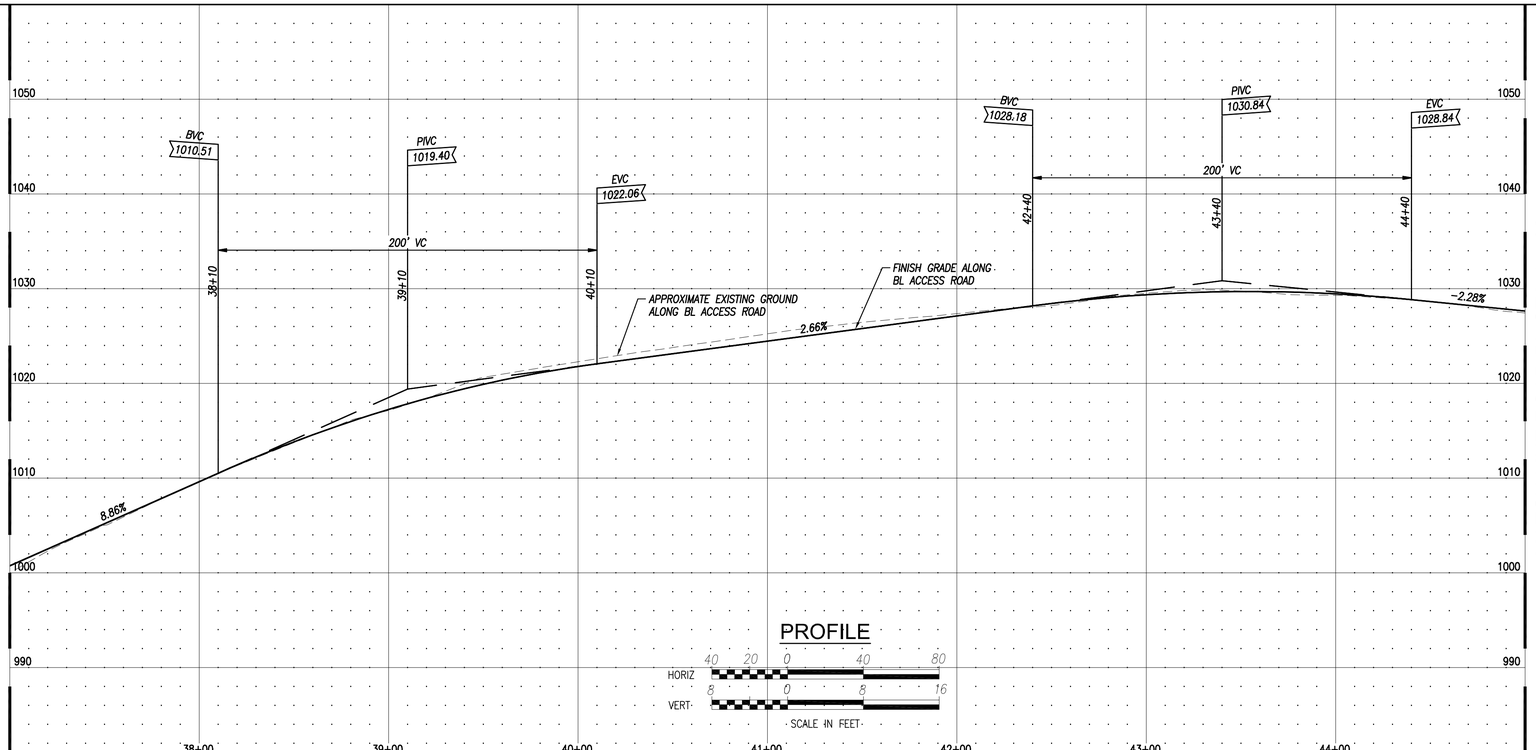
MATCH LINE ROAD BL STA 45+00
SEE DWG C408



PLAN

40 20 0 40 80

SCALE IN FEET



PROFILE

HORIZ 40 20 0 40 80

VERT 8 4 0 8 16

SCALE IN FEET

DWG. NO.
C407
SHEET 45 OF 149

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

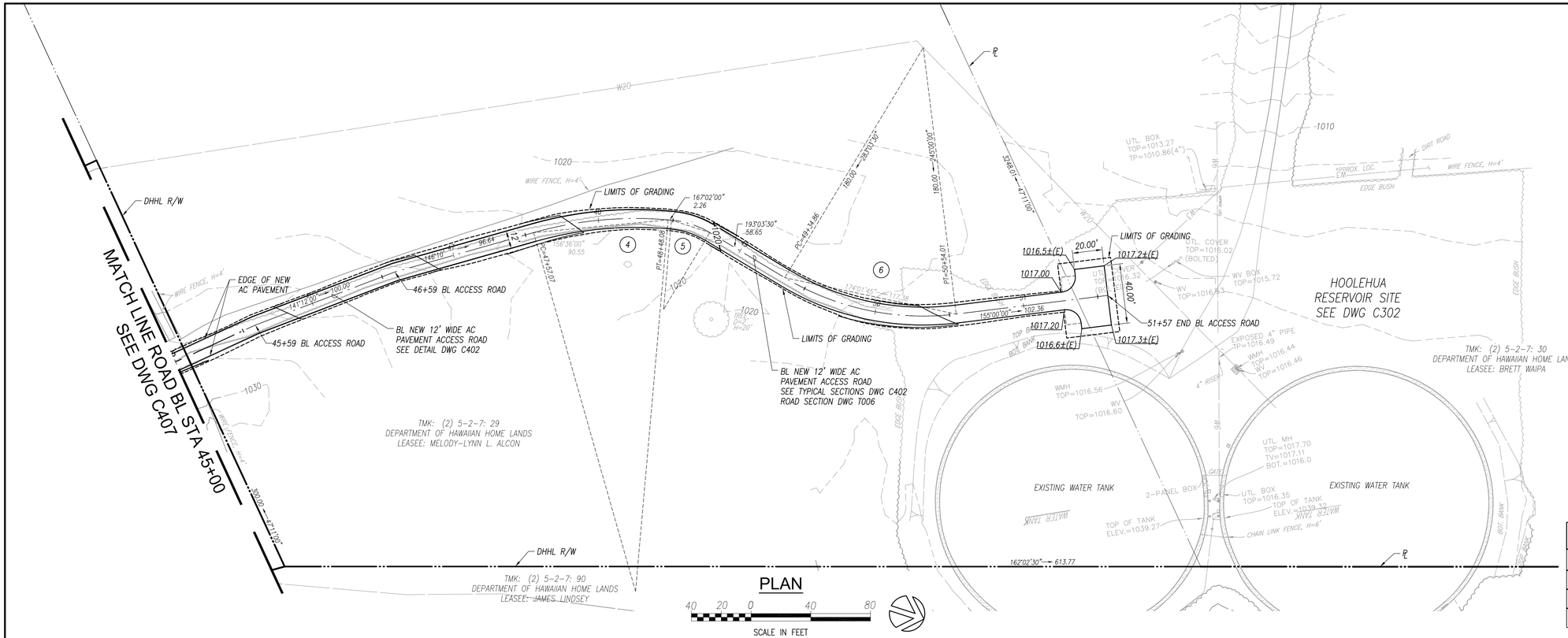
PLAN AND PROFILE
ROAD BL STA 37+00 TO 45+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

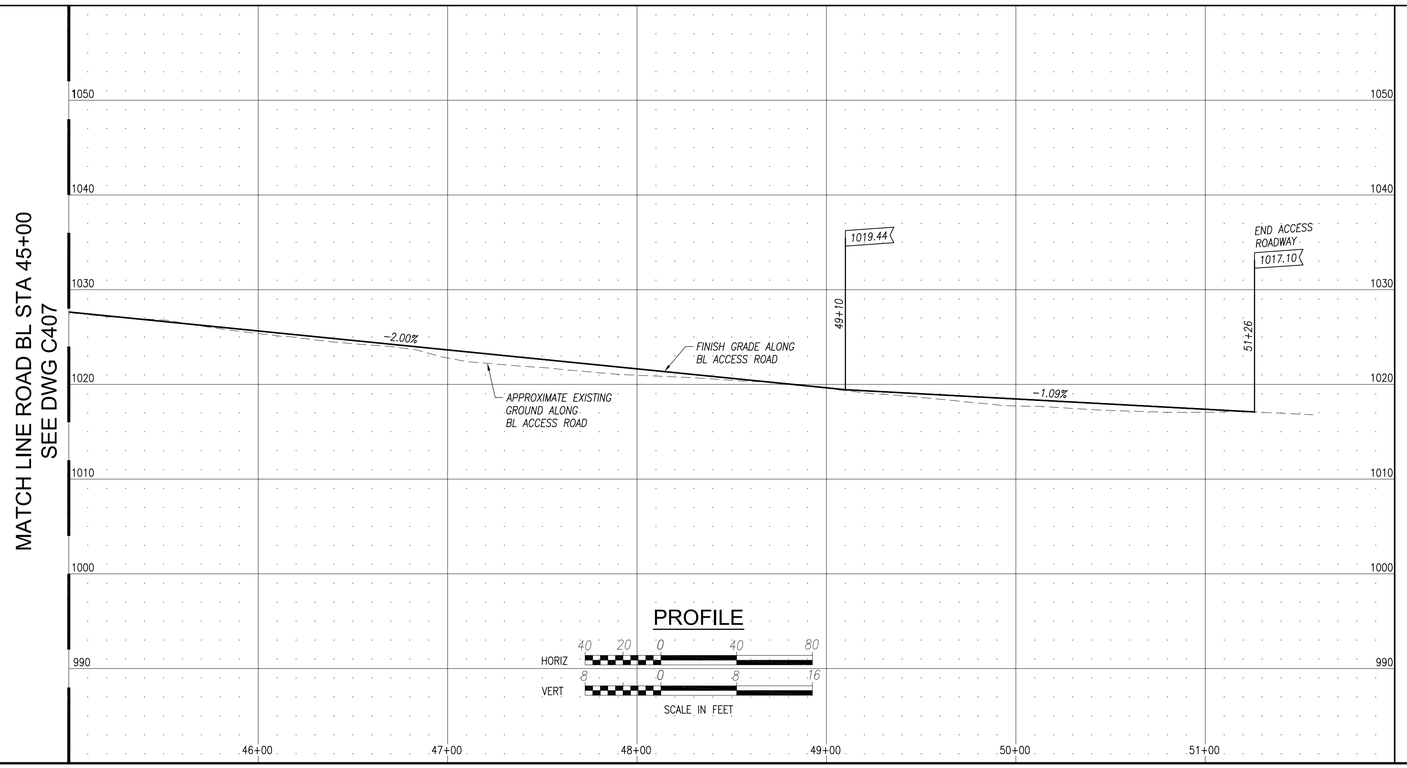
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



CURVE TABLE						
CURVE NO	Δ	Δ/2	R	T	C	Lc
4	20°52'00"	10°26'00"	250.00'	46.03	90.55'	91.05'
5	26°01'30"	13°00'45"	60.00'	13.87	27.02'	27.25'
6	38°03'30"	19°01'45"	180.00'	62.08	117.38'	119.56'



REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C408
SHEET 46 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - 2-3.5 MG TANK SITE IMPROVEMENTS AND ACCESS ROADWAY
JOB NO.

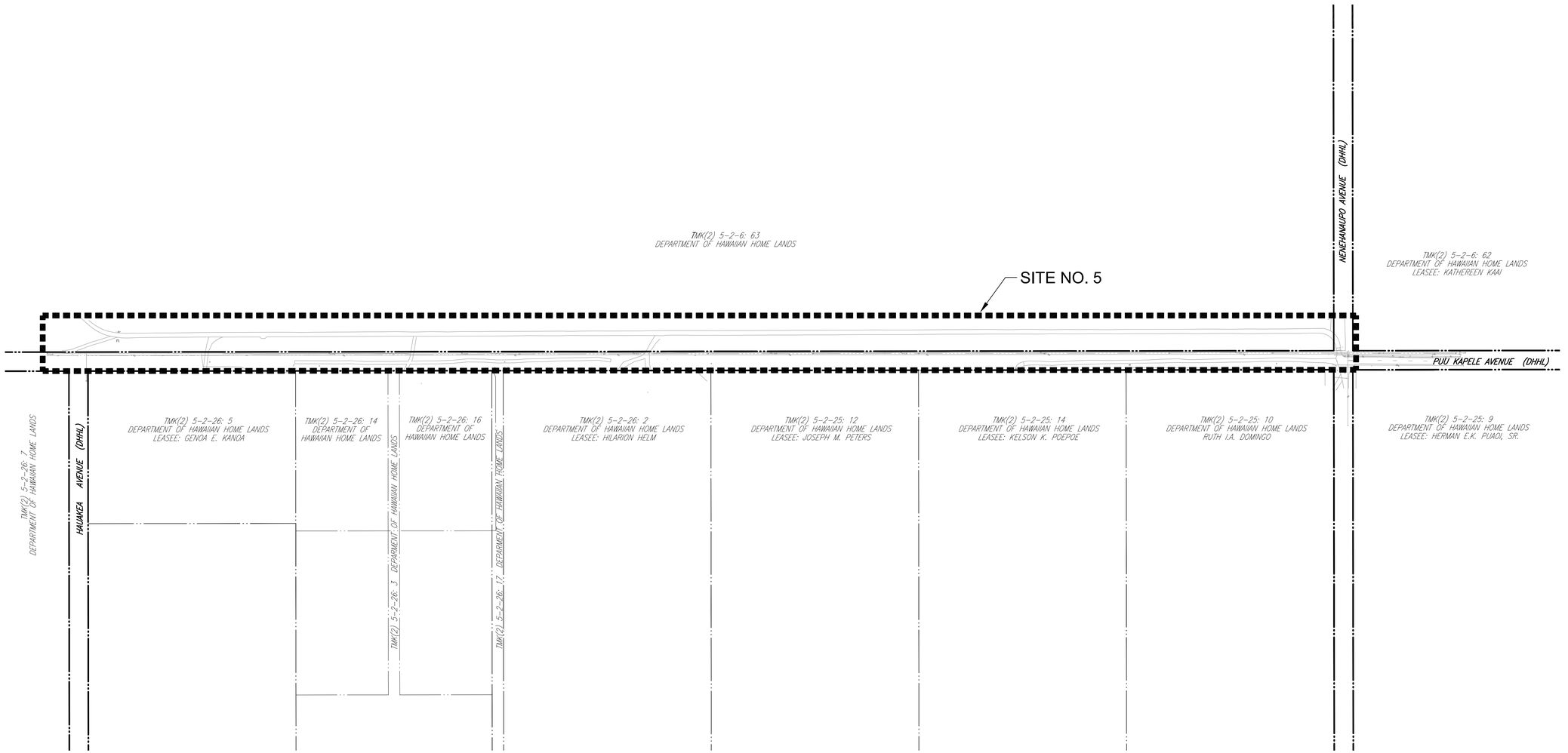
PLAN AND PROFILE
ROAD BL STA 45+00 TO END
ROAD BL 45+00 TO END

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



GENERAL PLAN

150 0 150 300

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

GENERAL PLAN

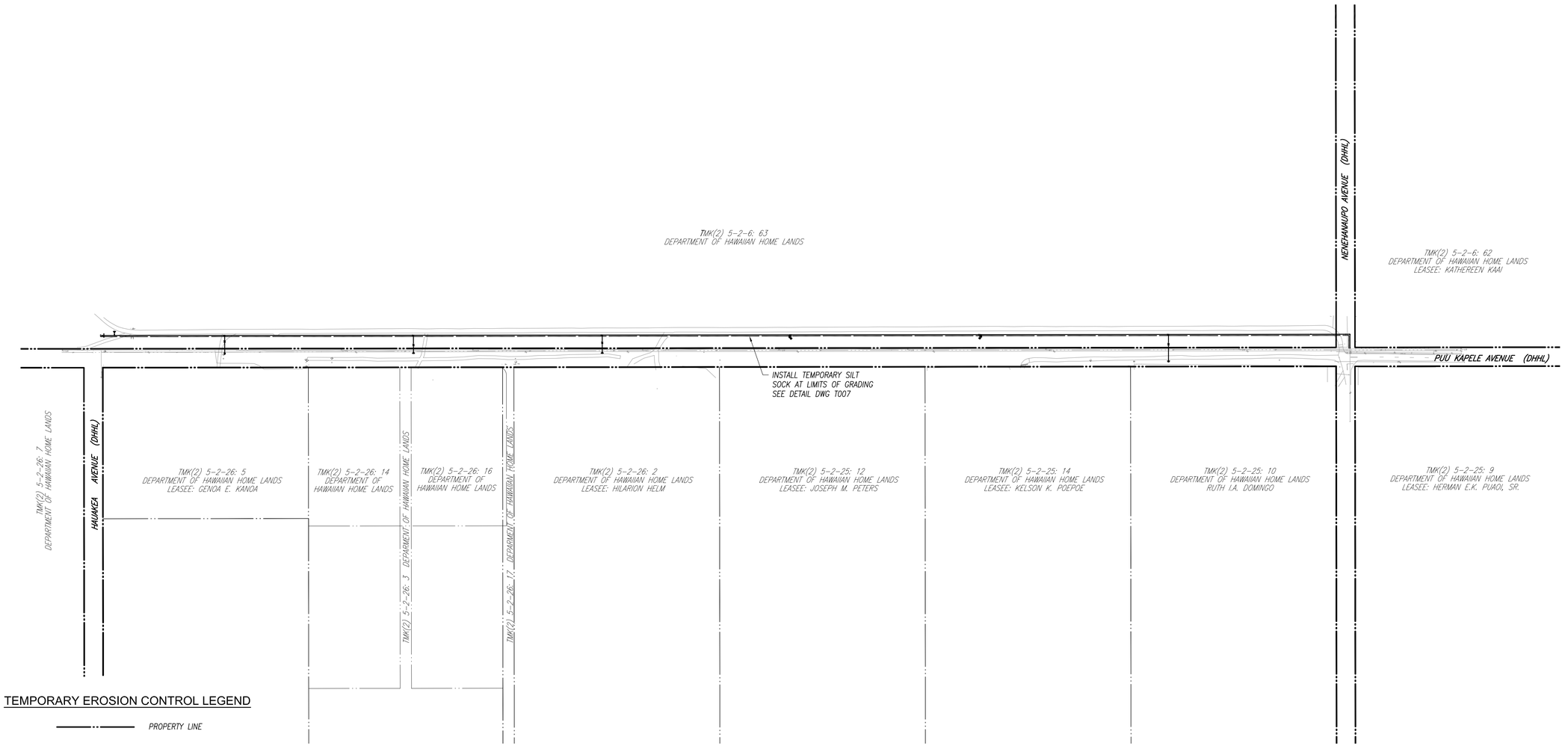
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C500
SHEET 47 OF 149

FILE	POCKET	FOLDER	NO.



TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

EROSION CONTROL PLAN

150 0 150 300

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C501
SHEET 48 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

EROSION CONTROL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

SERVICE LATERAL CONNECTION SCHEDULE

ID NO.	TMK	EXISTING: PREMISE ID NUMBER	EXISTING: BWS MTR NUMBER ON RECORD	EXISTING: BOX TYPE	EXISTING: MTR SIZE	EXISTING: LAT SIZE	NEW: CU RECON/ TYPE BOX	NEW: LATERAL TYPE BOX	NEW: COMMENTS
1	(2)5-2-006:063	30093	92971186	CONCRETE	2"	2"			
2	(2)5-2-026:005	30173	32652618	CONCRETE	5/8"	1"			
3	(2)5-2-026:016	NONE							
4	(2)5-2-026:002	30113	32709992	CONCRETE	5/8"	1"			
5	(2)5-2-025:014	30413	40490307	CONCRETE	5/8"	1"			

1

0+00 WATER LINE "C"
BEGIN NEW 8" WATER LINE
1 – 8" GATE VALVE, 150 LBS
1 – VALVE BOX
1 – VALVE MARKER
1 – GATE VALVE ANCHOR BLOCK
1 – CONCRETE BEAM WITH REVERSE BELL
TEMP FOR TESTING:
1 – 8" CAP TAPPED FOR 2 1/2" IPT
1 – 2 1/2" CLEANOUT
1 – CONCRETE BLOCK
SEE DWS STD DETAILS B14–B16, B18, V13 AND V18

0+34 WATER LINE "C"
FH CONNECTION
1 – 8"x6" TEE
1 – 6" GATE VALVE, 150 LBS
1 – 6" SLIDING VALVE BOX WITH CONCRETE SLAB
1 – FH (HT=5.0')
1 – HYDRANT EXTENSION
10 LF 6" PVC PIPE, DR 14
1 – FH MARKER
1 – FH CONC SLAB W/ REFLECTOR POSTS
1 – TYPE DB PAVEMENT MARKER
2 – CONCRETE BLOCKS
SEE DWS STD DETAILS FH6, FH8, FH9 AND V12

3+26 WATER LINE "C"
FH CONNECTION
1 – 8"x6" TEE
1 – 8" GATE VALVE, 150 LBS
1 – VALVE BOX
1 – 6" GATE VALVE, 150 LBS
1 – 6" SLIDING VALVE BOX WITH CONCRETE SLAB
1 – FH (HT=5.0')
1 – HYDRANT EXTENSION
48 LF 6" PVC PIPE, DR 14
1 – FH MARKER
1 – FH CONC SLAB W/ REFLECTOR POSTS
1 – TYPE DB PAVEMENT MARKER
2 – CONCRETE BLOCKS
SEE DWS STD DETAILS FH6, FH8, FH9 AND V12

TMK(2) 5-2-6: 63
DEPARTMENT OF HAWAIIAN HOME LANDS

NEW 8" WATER LINE "C"

DHHL R/W

PUU KAPELE AVENUE (DHHL)

283°11'00" — 3164.00

4950.50 — 103°11'00"

283°11'00" — 3267.00

CUT AND PLUG EXISTING LATERAL AFTER TRANSFER OF SERVICE

CUT AND PLUG EXISTING LATERALS AFTER TRANSFER OF SERVICE

CUT AND PLUG EXISTING LATERAL AFTER TRANSFER OF SERVICE

DHHL R/W

DHHL R/W

DHHL R/W

HAUAKEA AVENUE (DHHL)

TMK(2) 5-2-26: 7
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK(2) 5-2-26: 5
DEPARTMENT OF HAWAIIAN HOME LANDS
LEASEE: GENOA E. KANOA

TMK(2) 5-2-26: 14
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK(2) 5-2-26: 3
DEPARTMENT OF HAWAIIAN HOME LANDS

MATCH LINE WL "C" 8+00
SEE DWG C503

PLAN - WATER LINE "C"

40 20 0 40 80
SCALE IN FEET

APPROX. EXISTING GROUND ALONG WATER LINE "C"

INV 8" WATER LINE "C"

0+03 8" GV

0+06 CONC. BEAM

0+34 FH CONNECTION

3+23 8" GV

3+26 FH CONNECTION

7+33

BEGIN 8"W 389.30'

8"W 401.08' DEFLECT

8"W 432.54' DEFLECT

3' MIN COVER

5.35%

6.13%

4.20%

0+00 1+00 2+00 3+00 4+00 5+00 6+00 7+00

380 390 400 410 420 430 440

PROFILE - WATER LINE "C"

HORIZ 40 20 0 40 80
VERT 8 0 8 16
SCALE IN FEET

MATCH LINE WL "C" 8+00
SEE DWG C503

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

PLAN AND PROFILE
WATER LINE "C" 0+00 TO 8+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: ADC

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

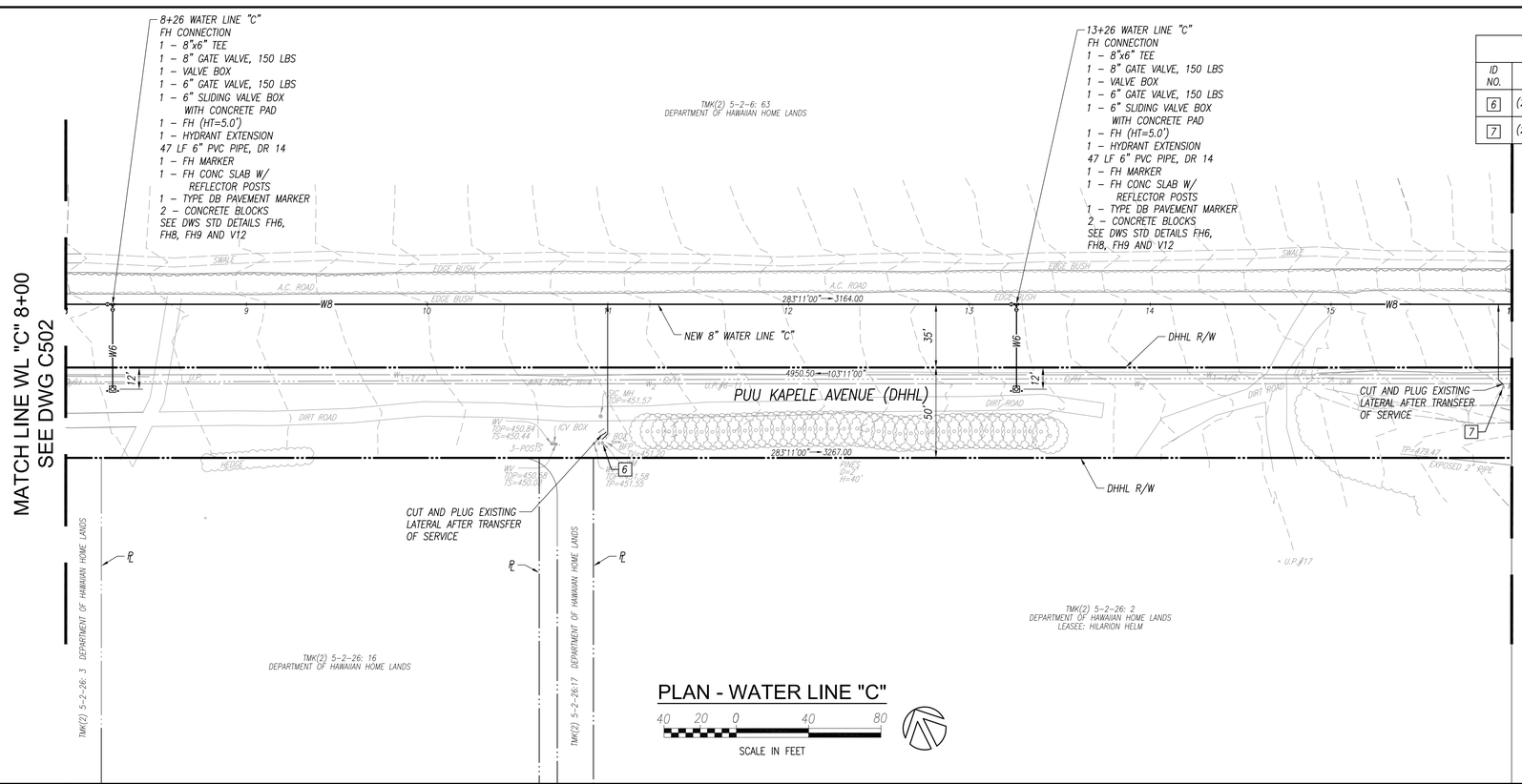
JUNE 2018

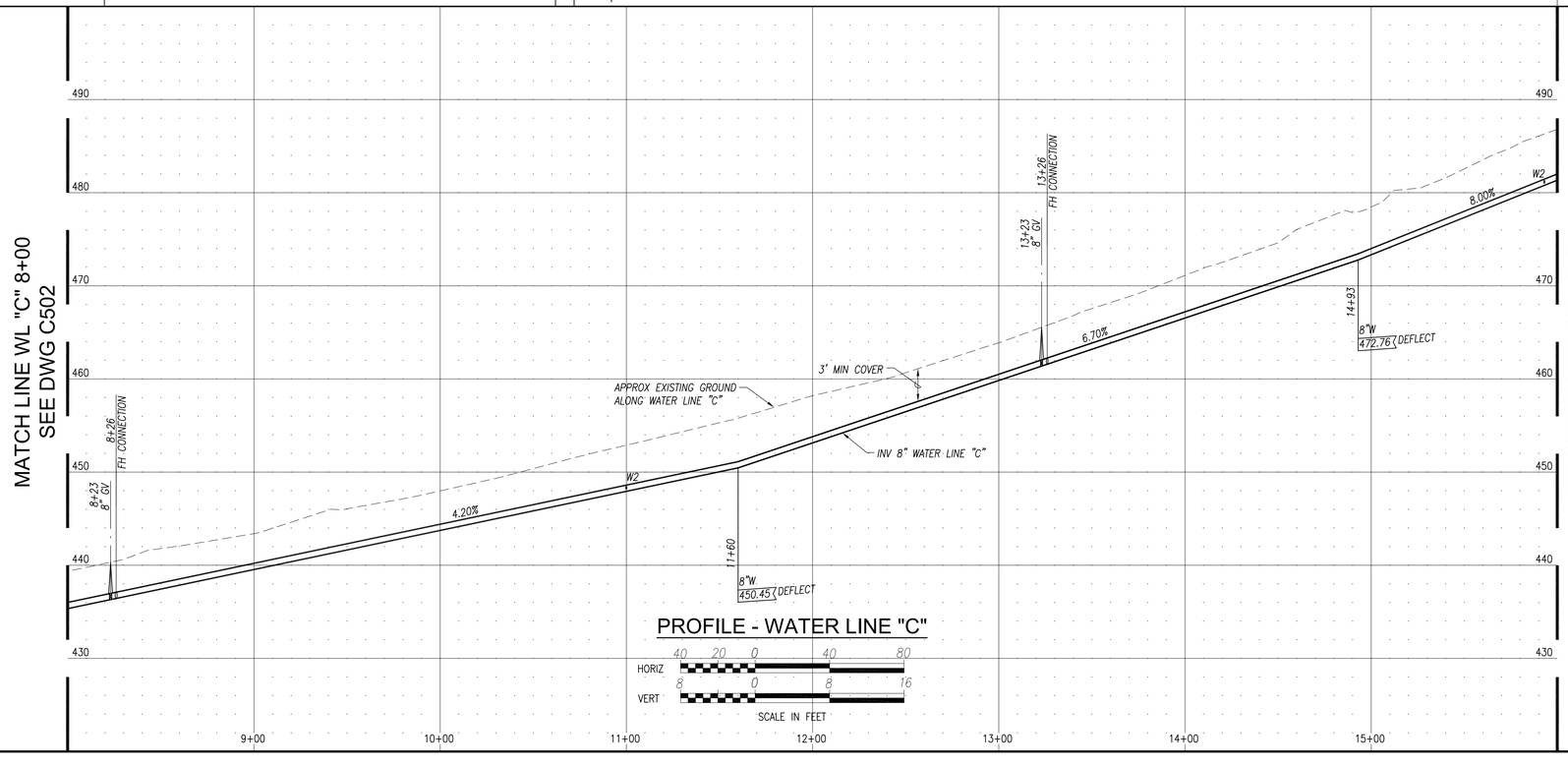
DWG. NO.
C502
SHEET 49 OF 149

FILE	POCKET	FOLDER	NO.

SERVICE LATERAL CONNECTION SCHEDULE

		EXISTING					NEW		
ID NO.	TMK	PREMISE ID NUMBER	BWS MTR NUMBER ON RECORD	BOX TYPE	MTR SIZE	LAT SIZE	CU RECON/ TYPE BOX	LATERAL TYPE BOX	COMMENTS
6	(2)5-2-026: 017								
7	(2)5-2-026: 002								





REVISION	DATE	BRIEF	MADE BY	APPROVED

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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

PLAN AND PROFILE
WATER LINE "C" 8+00 TO 16+00

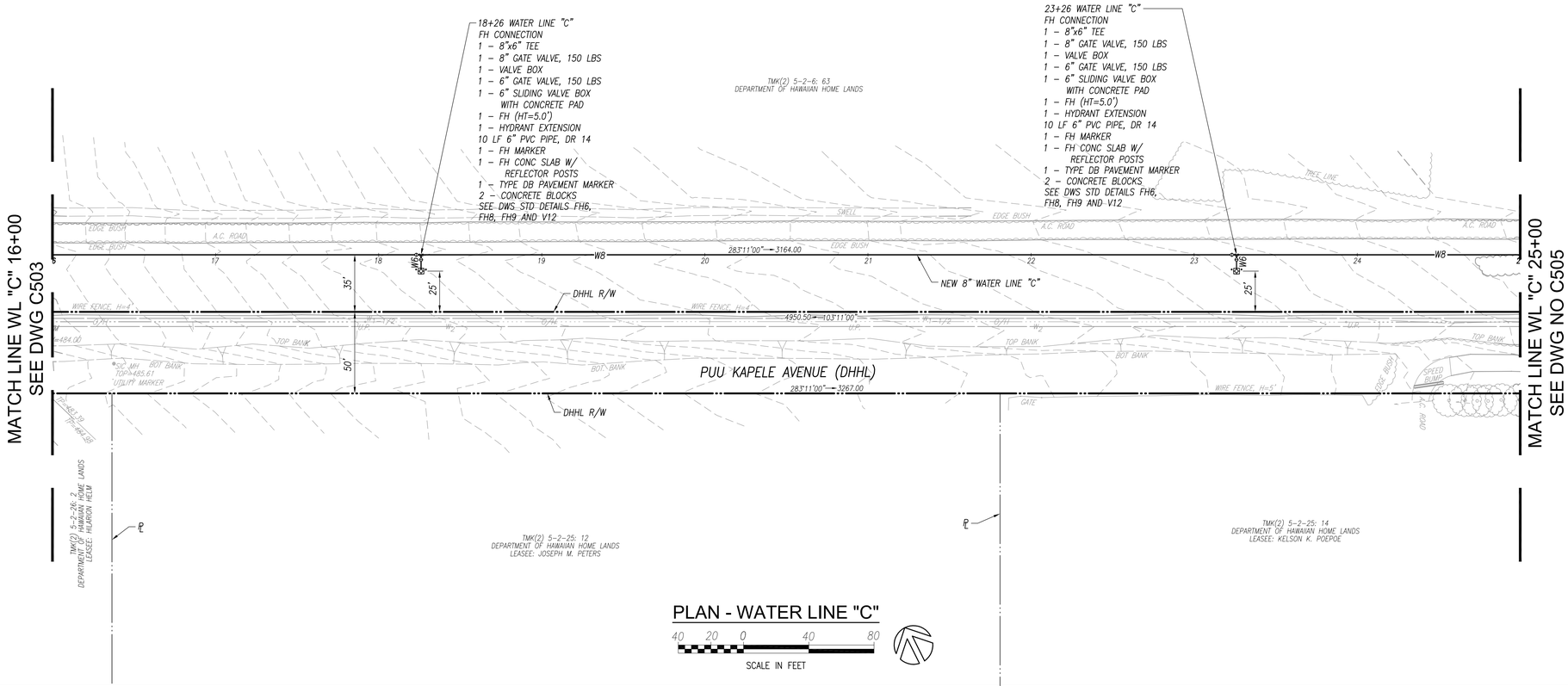
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: ADC

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C503
SHEET 50 OF 149

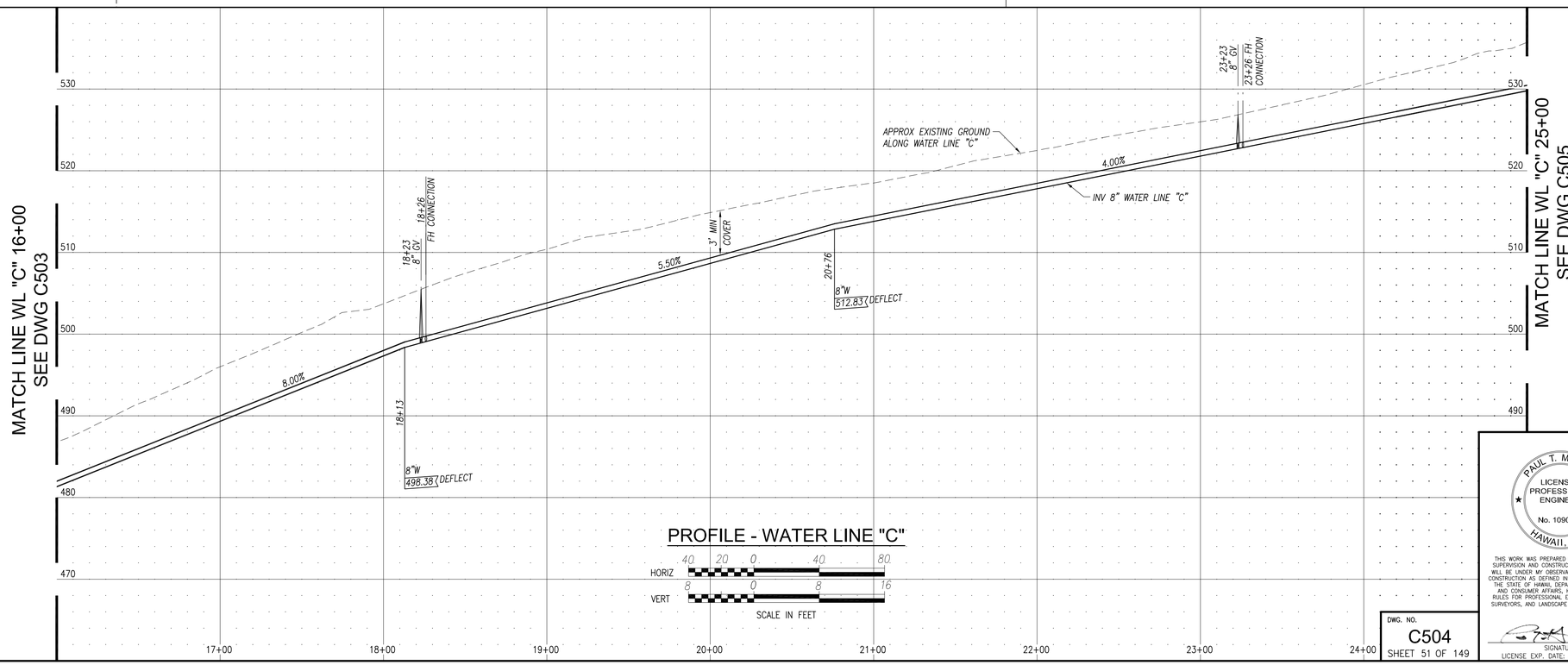
FILE	POCKET	FOLDER	NO.



PLAN - WATER LINE "C"

40 20 0 40 80

SCALE IN FEET



PROFILE - WATER LINE "C"

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

DWG. NO.
C504
SHEET 51 OF 149

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

PLAN AND PROFILE
WATER LINE "C" 16+00 TO 25+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: ADC

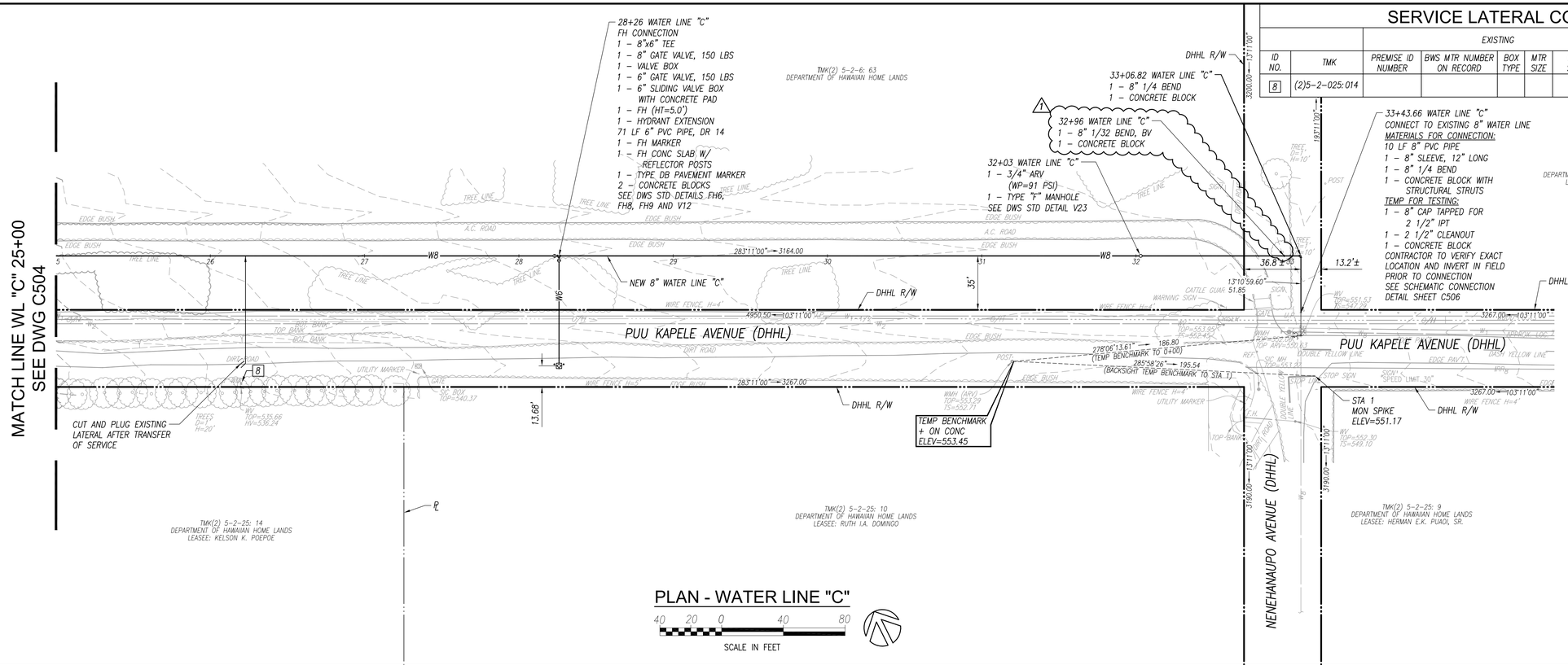
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

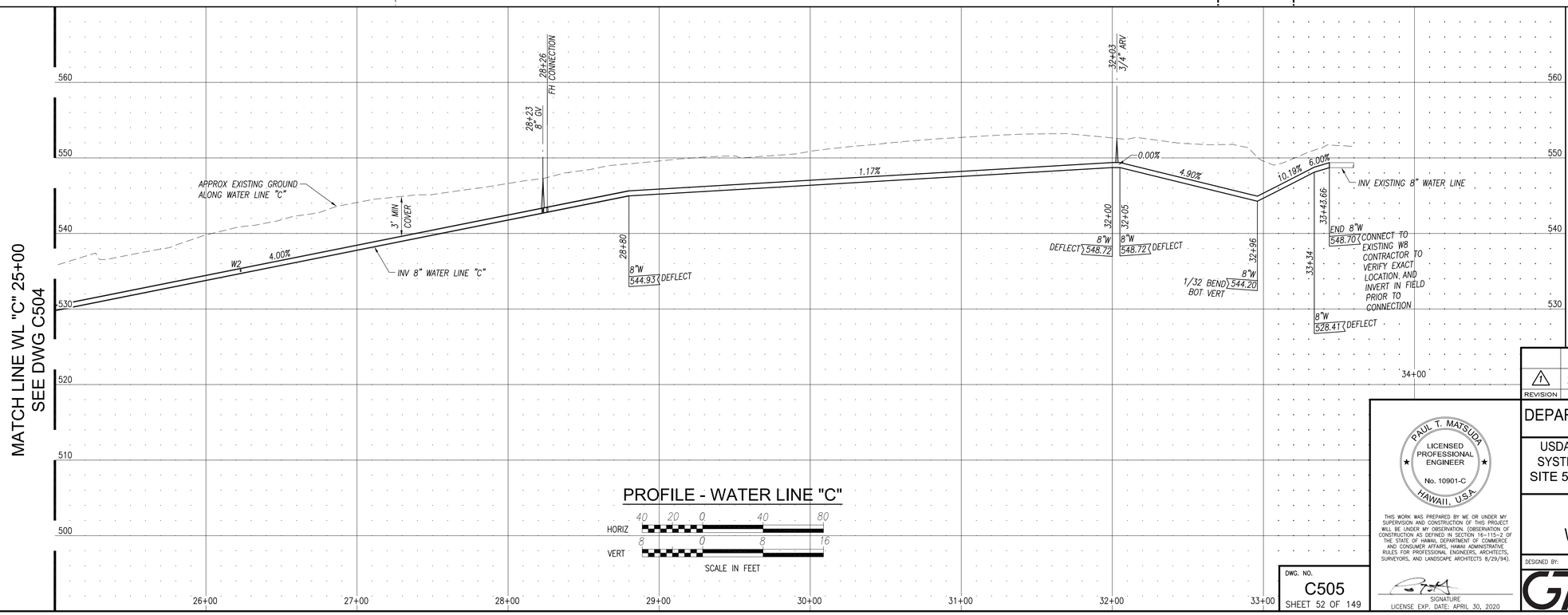
JUNE 2018

FILE	POCKET	FOLDER	NO.

SERVICE LATERAL CONNECTION SCHEDULE

ID NO.	TMK	EXISTING: PREMISE ID NUMBER	EXISTING: BWS MTR NUMBER ON RECORD	EXISTING: BOX TYPE	EXISTING: MTR SIZE	EXISTING: LAT SIZE	NEW: CU RECON/ TYPE BOX	NEW: LATERAL TYPE BOX	NEW: COMMENTS
8	(2)5-2-025:014								





REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED TOPO CALLOUTS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

PLAN AND PROFILE
WATER LINE "C" 25+00 TO END

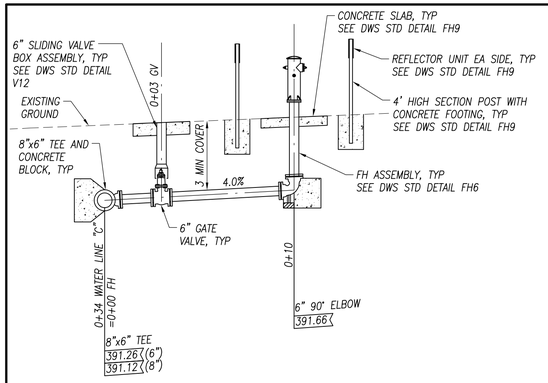
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: ADC

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

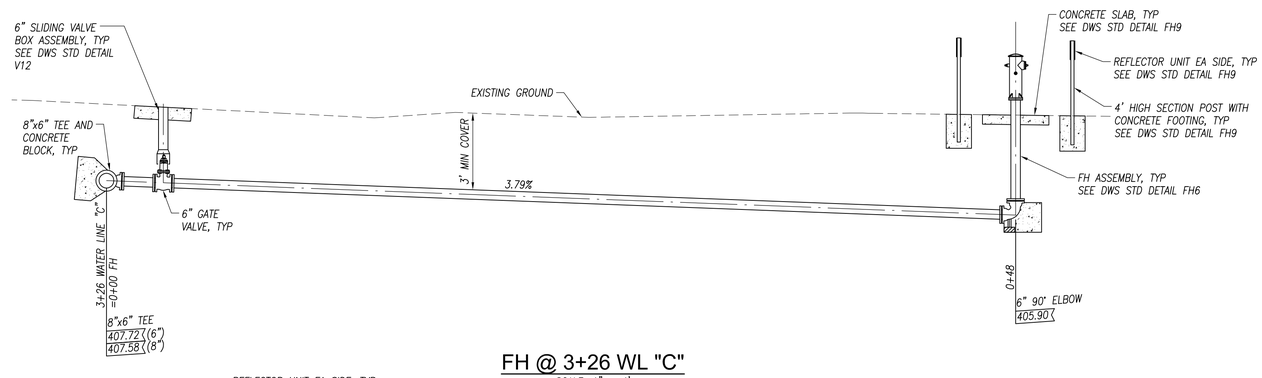
JUNE 2018

DWG. NO. C505
SHEET 52 OF 149

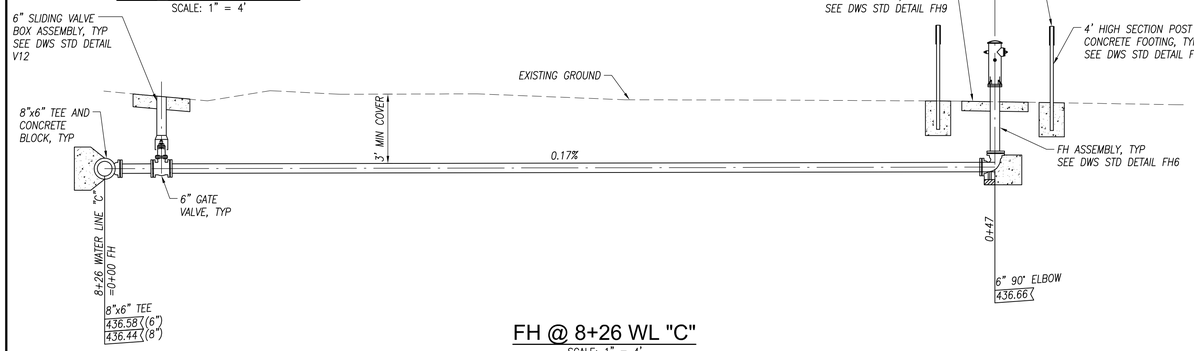
FILE	POCKET	FOLDER	NO.



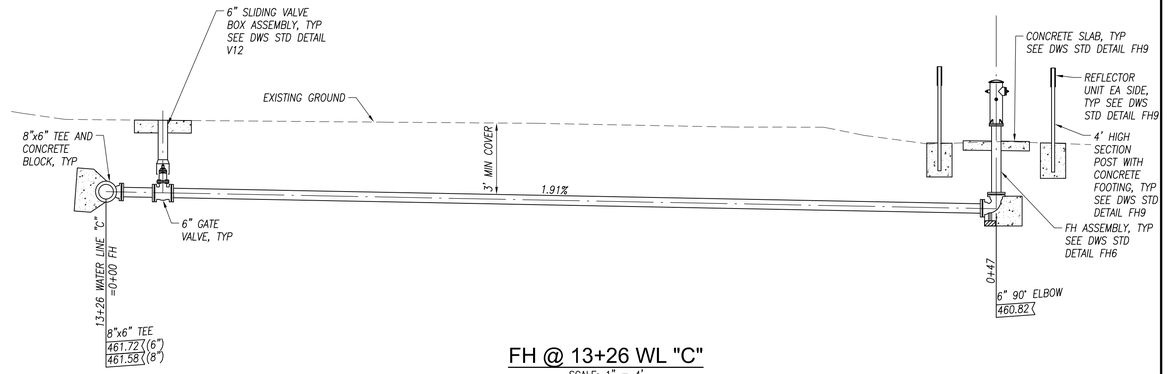
FH @ 0+34 WL "C"
SCALE: 1" = 4'



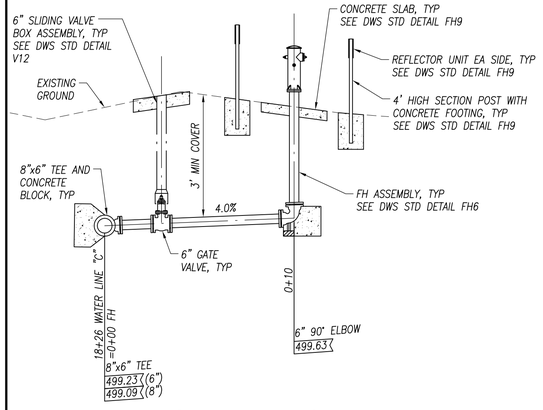
FH @ 3+26 WL "C"
SCALE: 1" = 4'



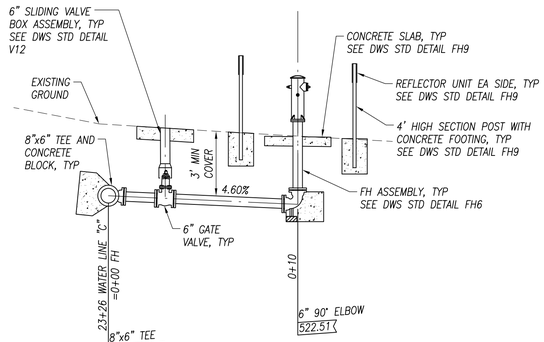
FH @ 8+26 WL "C"
SCALE: 1" = 4'



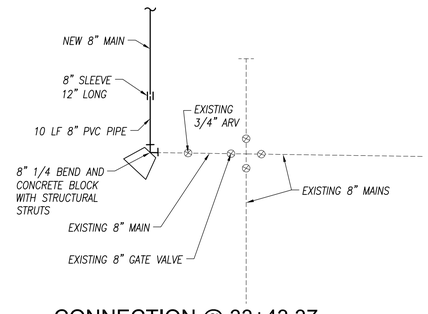
FH @ 13+26 WL "C"
SCALE: 1" = 4'



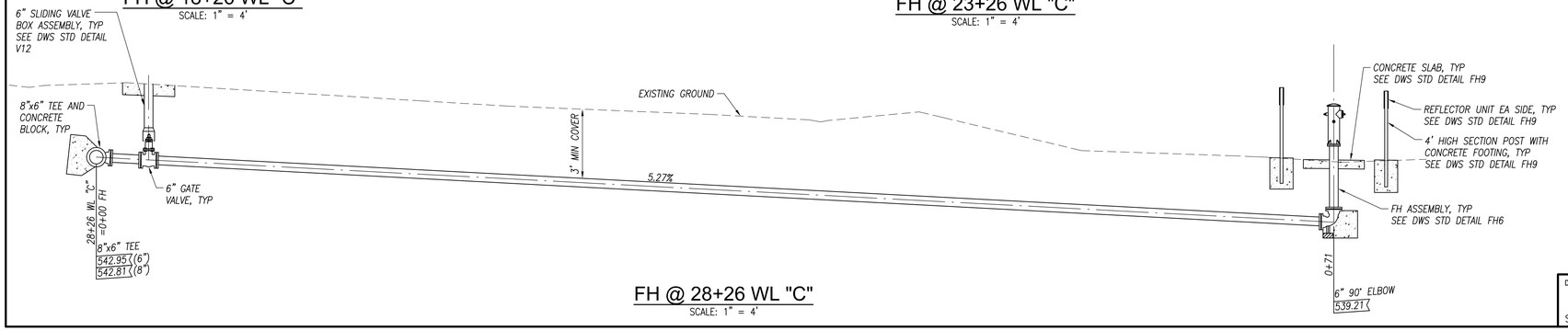
FH @ 18+26 WL "C"
SCALE: 1" = 4'



FH @ 23+26 WL "C"
SCALE: 1" = 4'



CONNECTION @ 33+43.37
PUU KAPELE AVENUE
NOT TO SCALE



FH @ 28+26 WL "C"
SCALE: 1" = 4'

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 5 - PUU KAPELE AVENUE IMPROVEMENTS
JOB NO.

CONNECTION DETAILS AND FH PROFILES

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: ADC

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

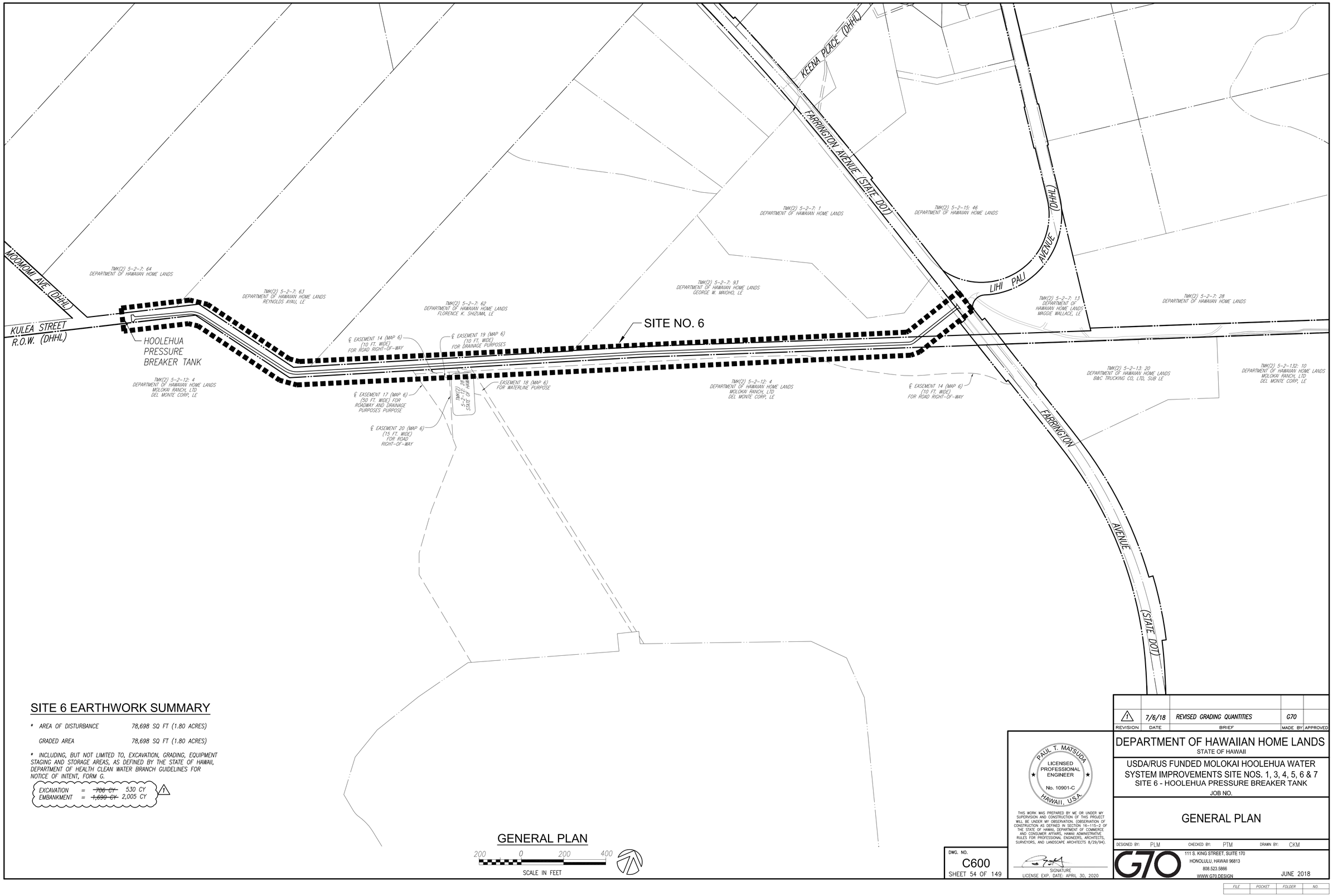
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C506
SHEET 53 OF 149

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



SITE 6 EARTHWORK SUMMARY

* AREA OF DISTURBANCE 78,698 SQ FT (1.80 ACRES)

GRADED AREA 78,698 SQ FT (1.80 ACRES)

* INCLUDING, BUT NOT LIMITED TO, EXCAVATION, GRADING, EQUIPMENT STAGING AND STORAGE AREAS, AS DEFINED BY THE STATE OF HAWAII, DEPARTMENT OF HEALTH CLEAN WATER BRANCH GUIDELINES FOR NOTICE OF INTENT, FORM G.

EXCAVATION = ~~706 CY~~ 530 CY
EMBANKMENT = ~~1,690 CY~~ 2,005 CY

1

GENERAL PLAN

200 0 200 400

SCALE IN FEET

DWG. NO.
C600
SHEET 54 OF 149

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED GRADING QUANTITIES	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

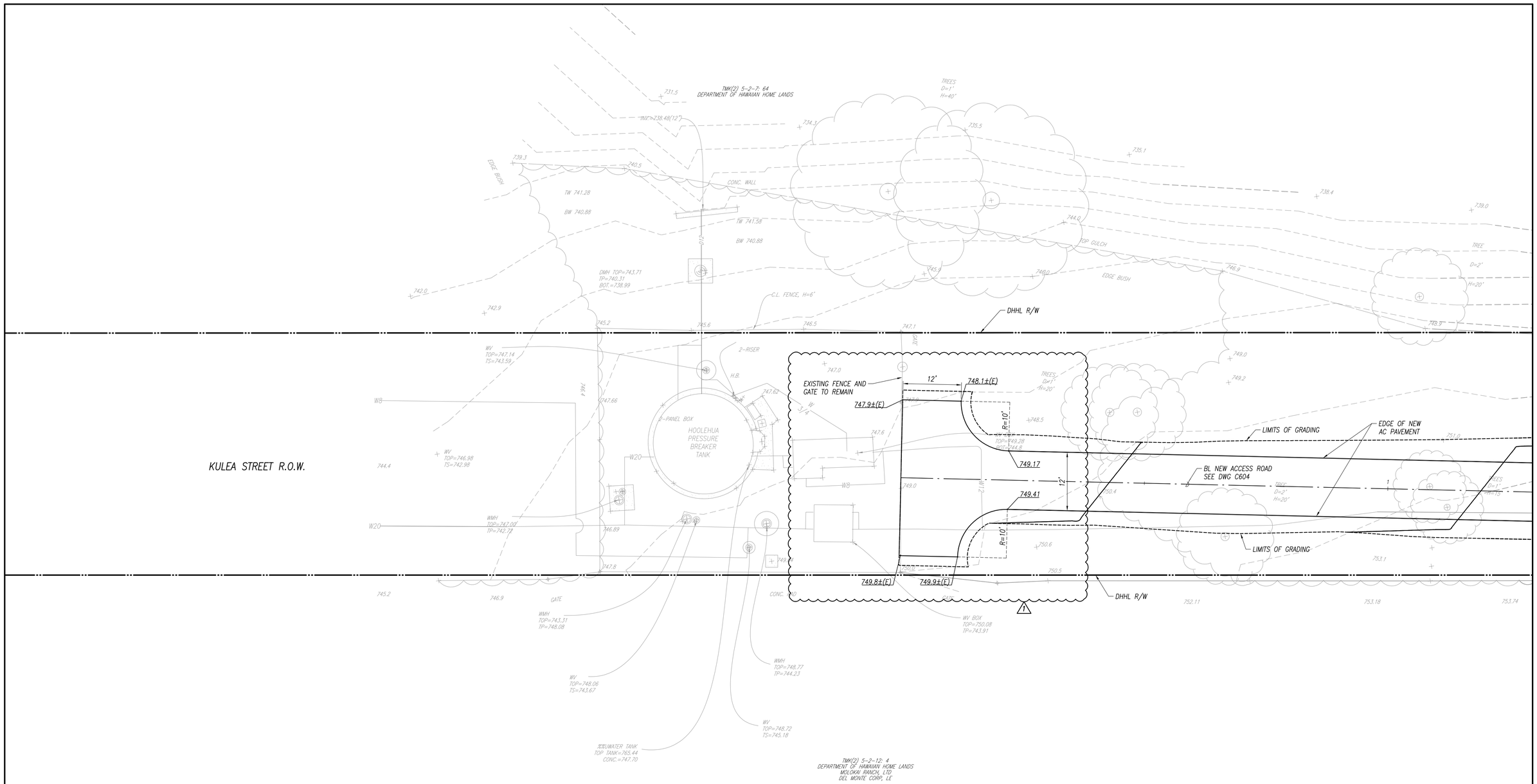
GENERAL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



SITE AND UTILITY PLAN
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK

10 5 0 10 20
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED CALLOUTS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C601
SHEET 55 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

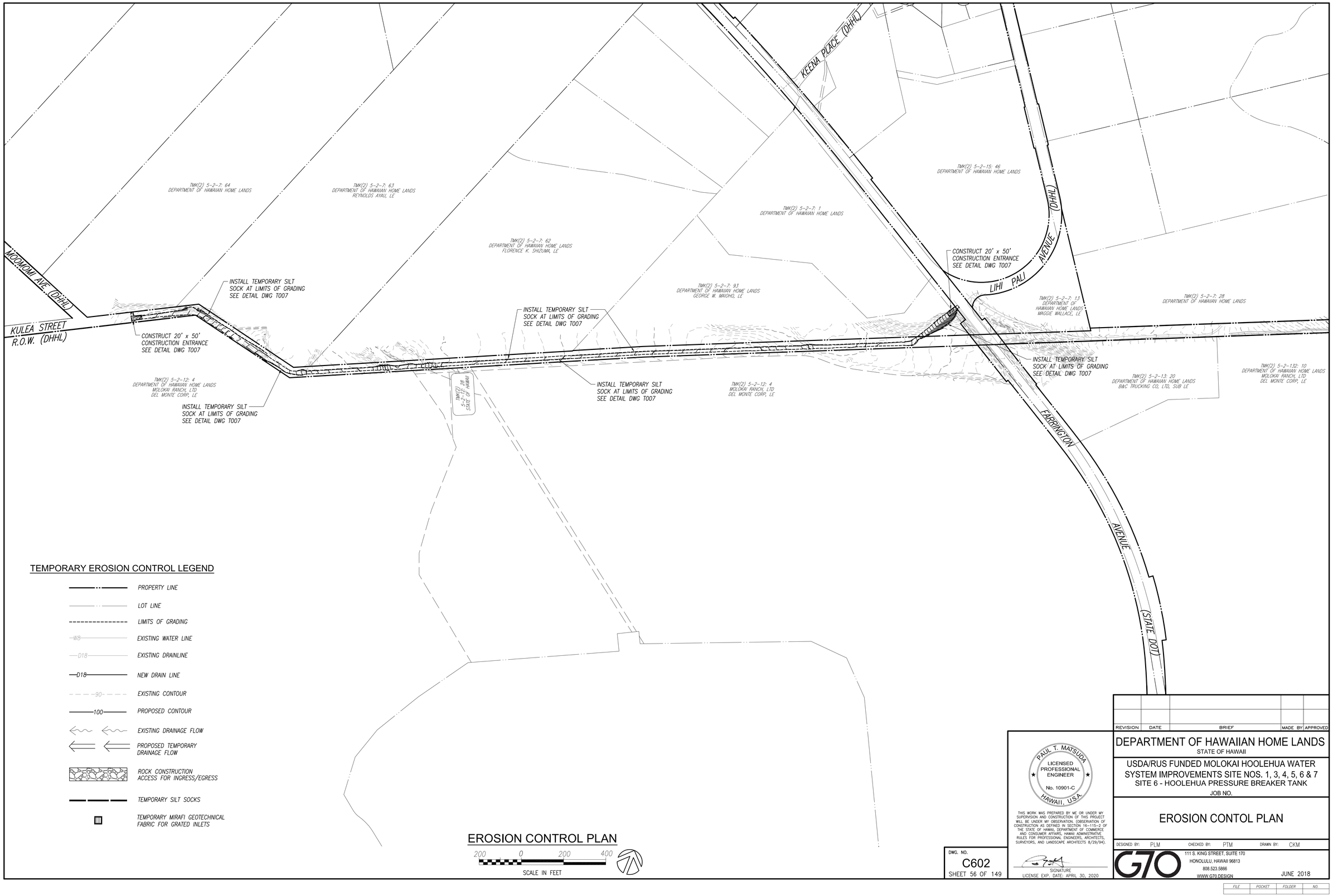
SITE AND UTILITY PLAN
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- W8 — EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

EROSION CONTROL PLAN

200 0 200 400

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C602
SHEET 56 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

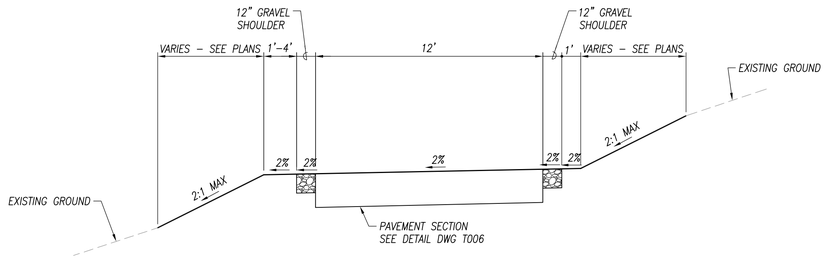
EROSION CONTOL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

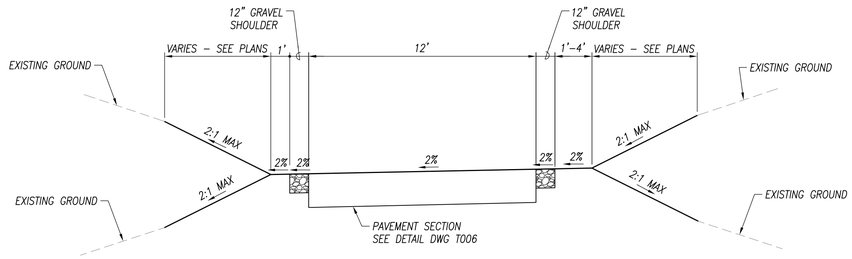
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

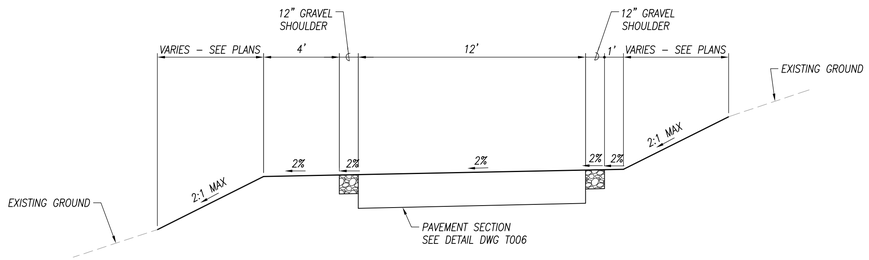
FILE	POCKET	FOLDER	NO.



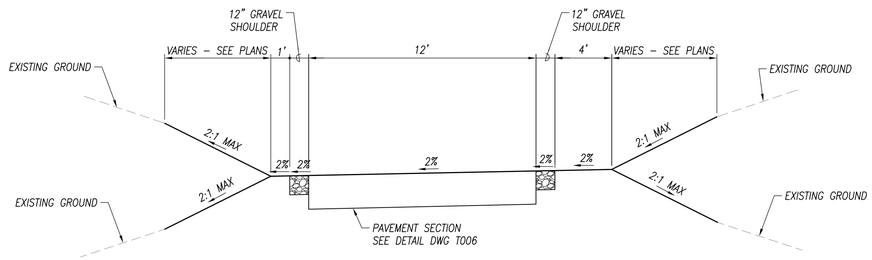
0+00 TO 2+73.85



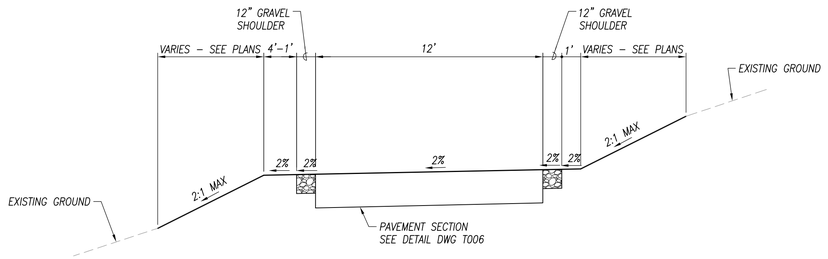
37+66.31 TO 37+91.66



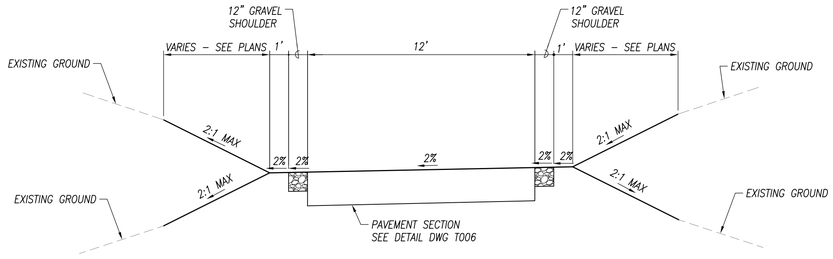
2+73.85 TO 3+40.54



37+91.66 TO 40+61.58



3+40.54 TO 5+75



5+75 TO 37+66.31

HOOLEHUA PRESSURE BREAKER TANK ACCESS ROAD

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED SECTIONS	G70	

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

TYPICAL SECTIONS AND DETAILS

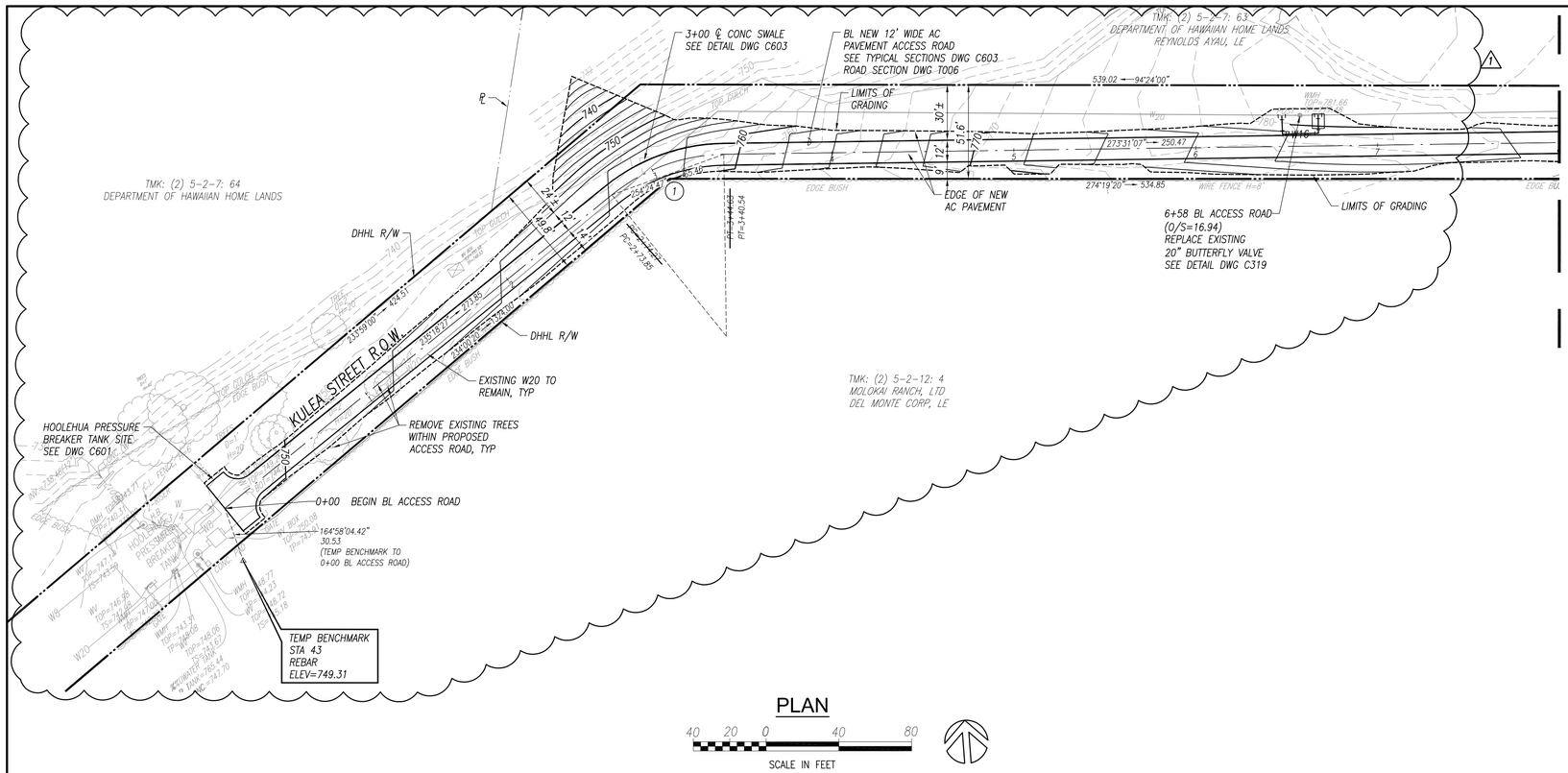
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

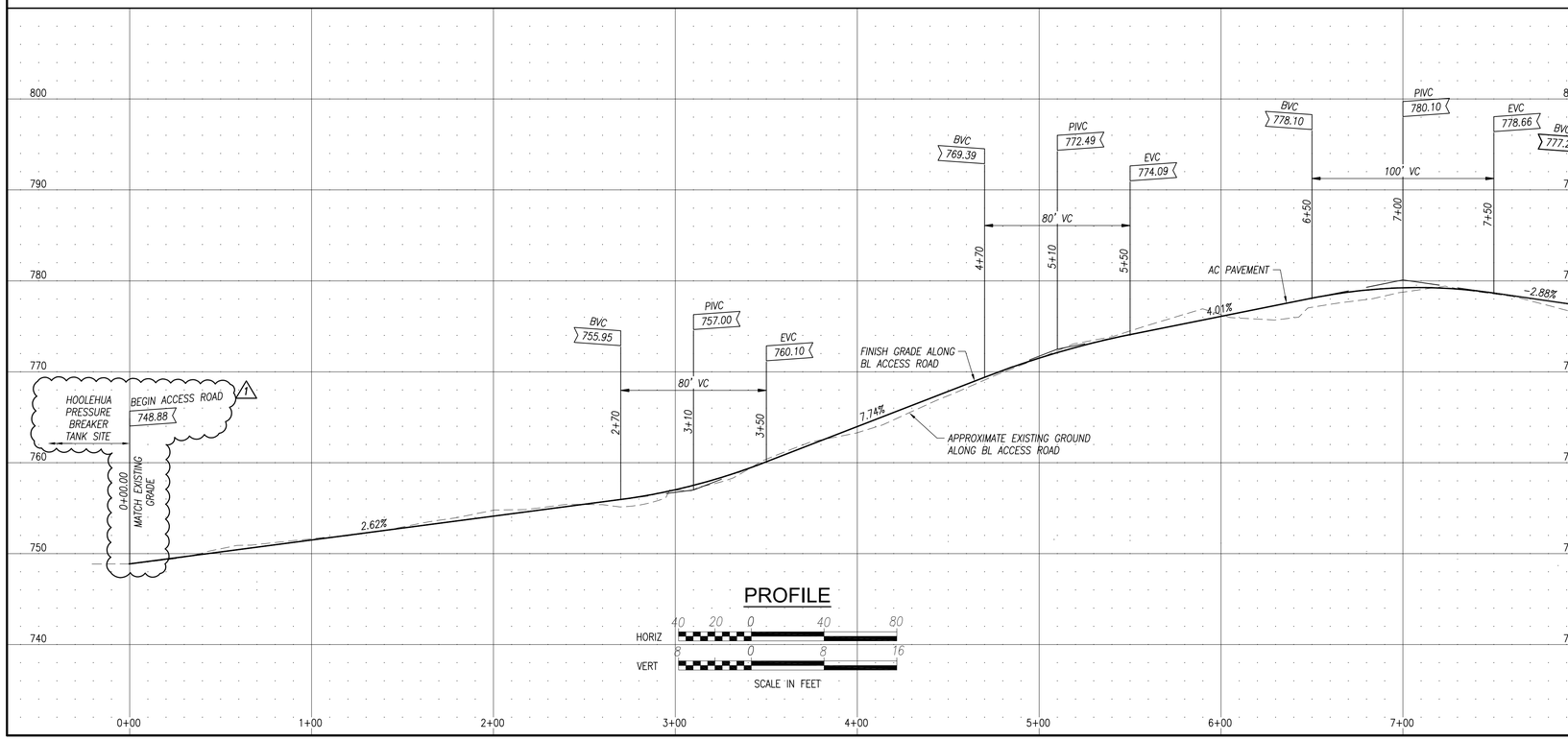
JUNE 2018

DWG. NO.
C603
SHEET 57 OF 149

FILE	POCKET	FOLDER	NO.



ROAD BL CURVE TABLE						
CURVE NO	Δ	Δ/2	R	T	C	Lc
1	38°12'40"	19°06'20"	100.00'	34.64	65.46'	66.69'



REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED ALIGNMENT AND GRADING	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

PLAN AND PROFILE - ACCESS ROAD
BL STA 0+00 TO 8+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

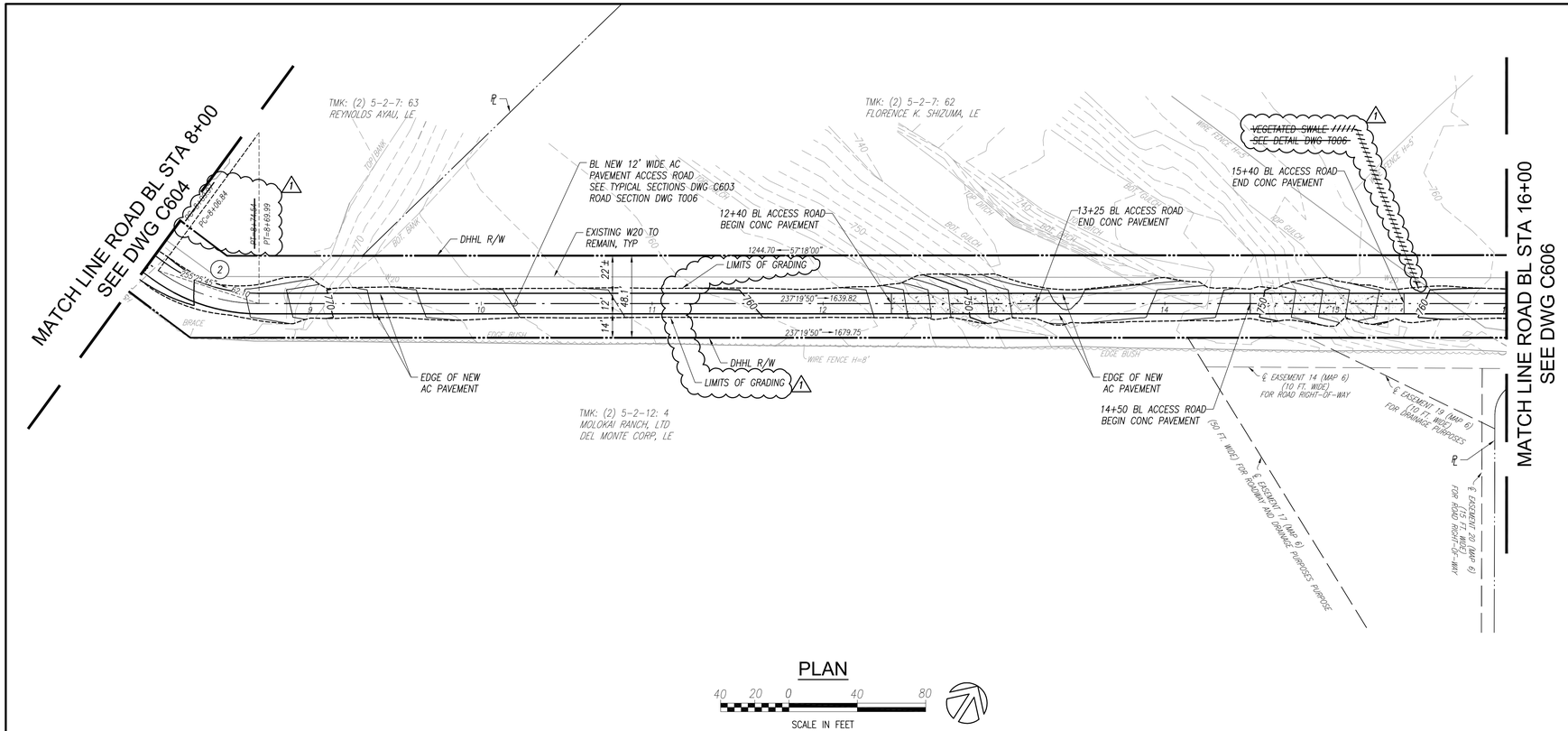
DWG. NO.
C604
SHEET 58 OF 149

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

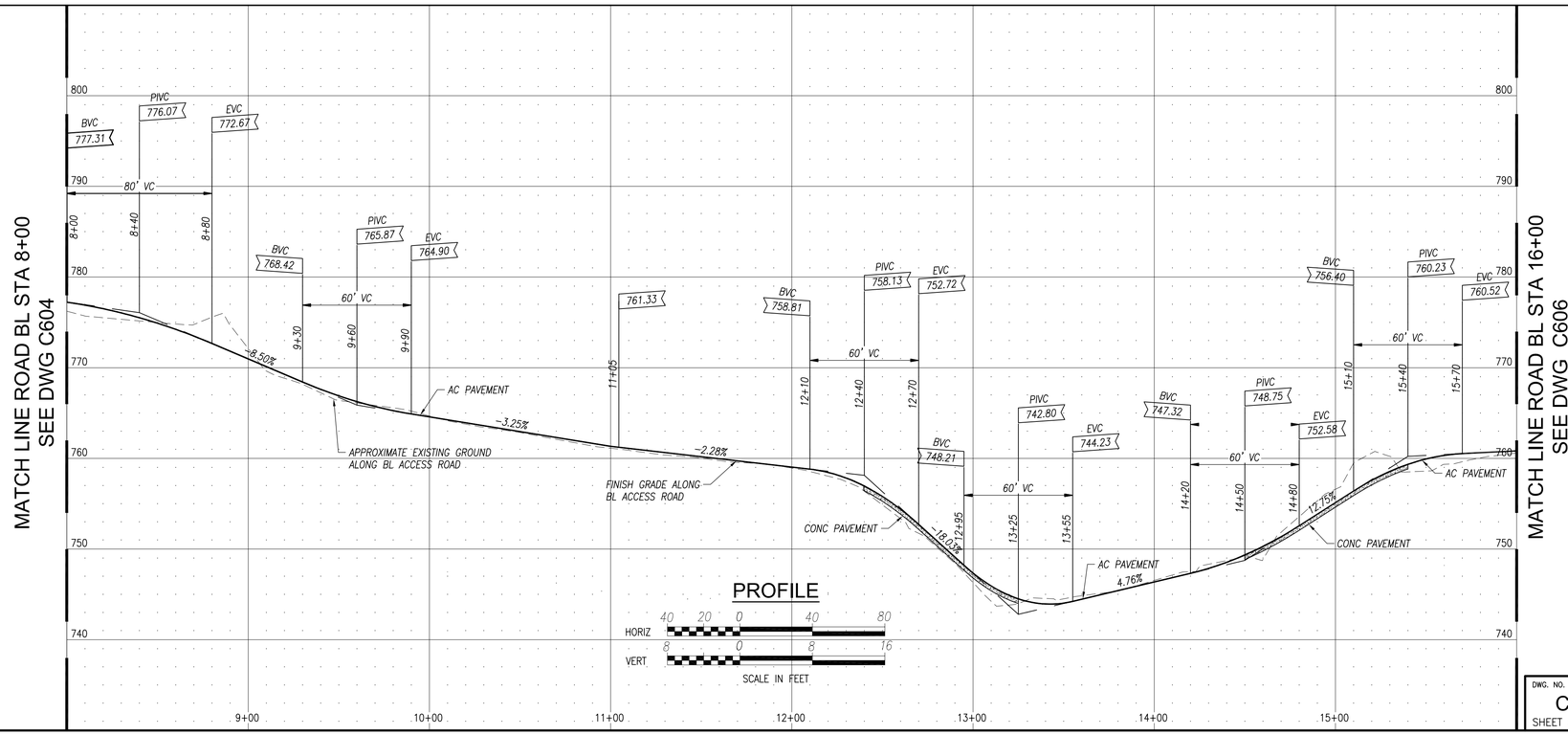


PLAN

40 20 0 40 80

SCALE IN FEET

ROAD BL CURVE TABLE						
CURVE NO	Δ	Δ/2	R	T	C	Lc
(2)	36°11'17"	18°05'39"	100.00'	32.67	62.12'	63.16'



PROFILE

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED ALIGNMENT AND GRADING	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

PLAN AND PROFILE - ACCESS ROAD
BL STA 8+00 TO 16+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

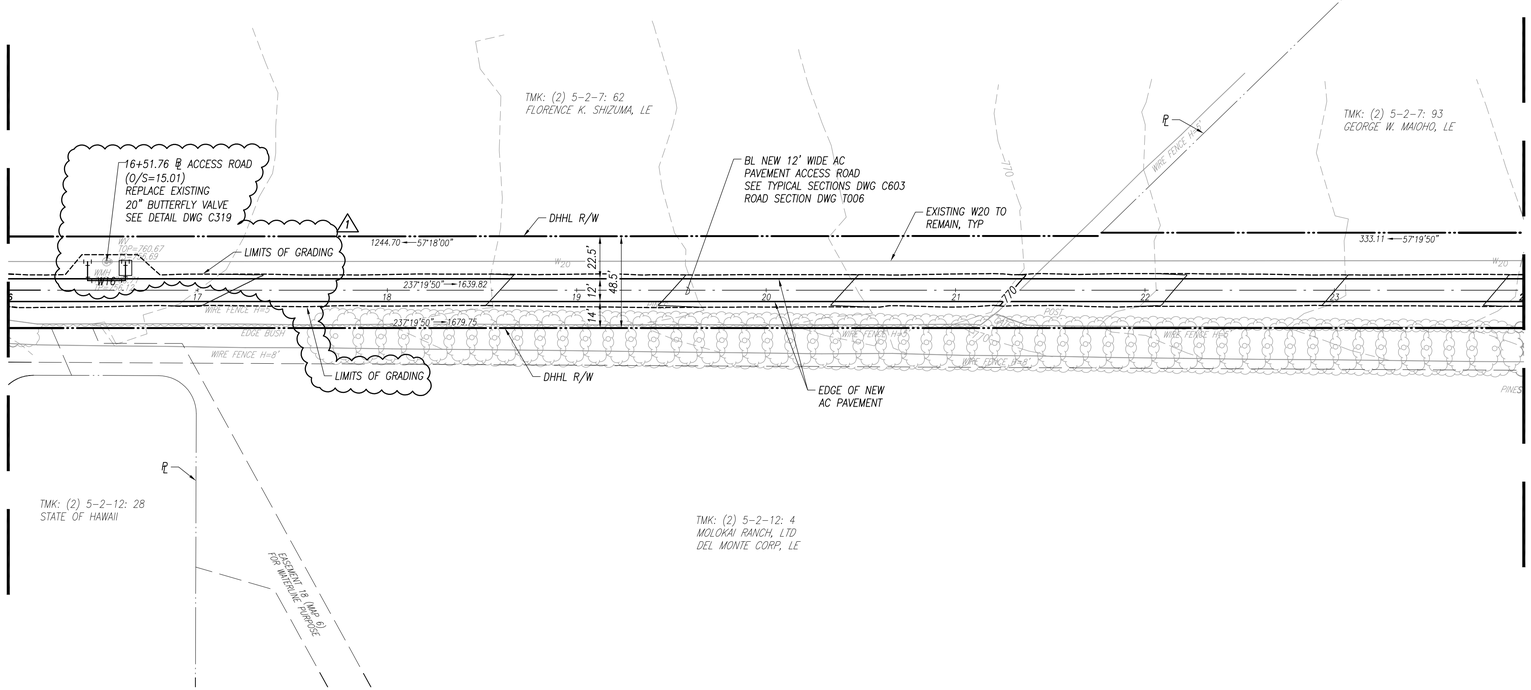
JUNE 2018

DWG. NO.
C605
SHEET 59 OF 149

FILE	POCKET	FOLDER	NO.

MATCH LINE ROAD BL STA 16+00
SEE DWG C605

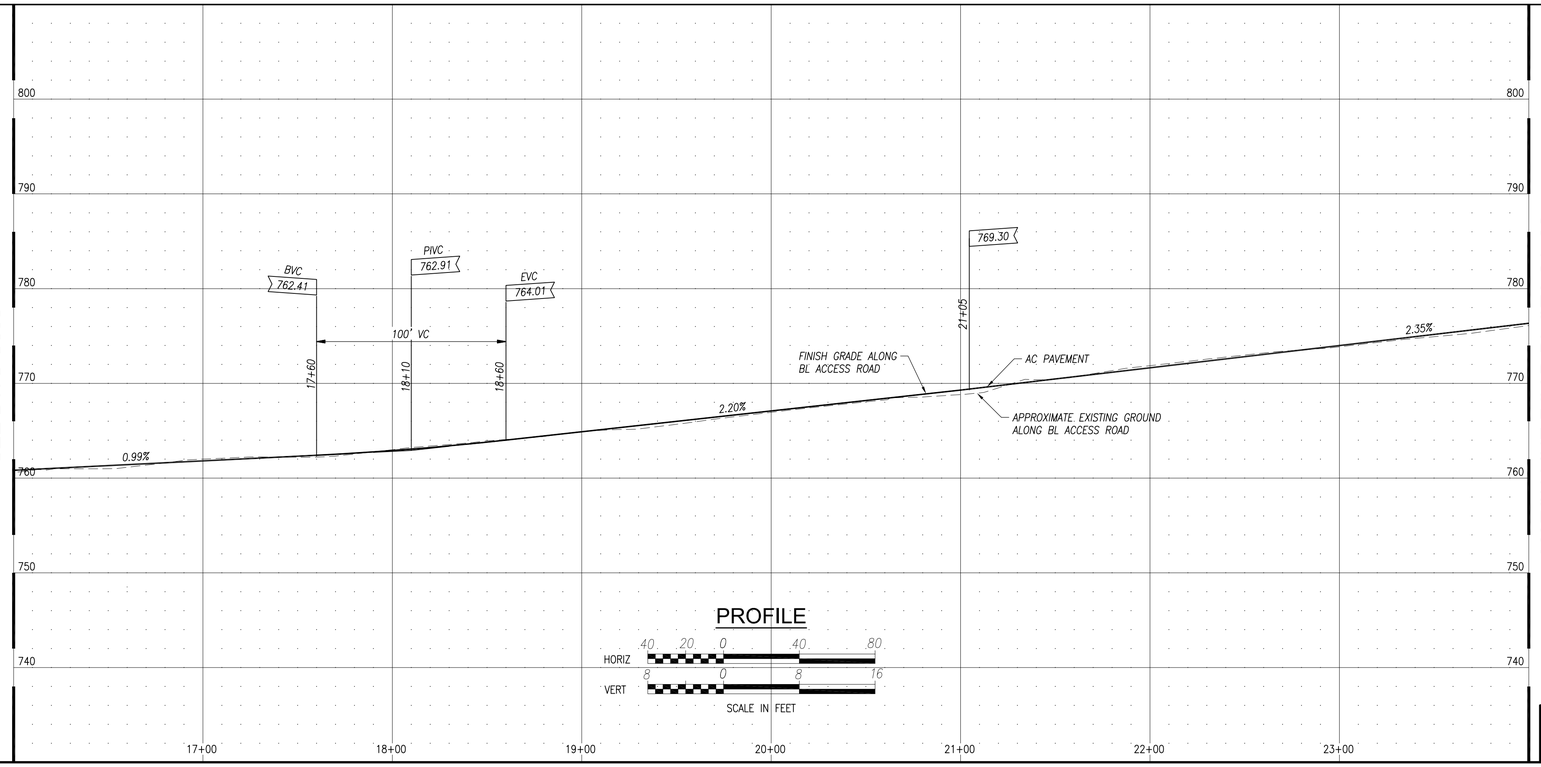
MATCH LINE ROAD BL STA 24+00
SEE DWG C607



PLAN

40 20 0 40 80

SCALE IN FEET



PROFILE

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	BUTTERFLY VALVE REPLACEMENT	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

PLAN AND PROFILE - ACCESS ROAD
BL STA 16+00 TO 24+00

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

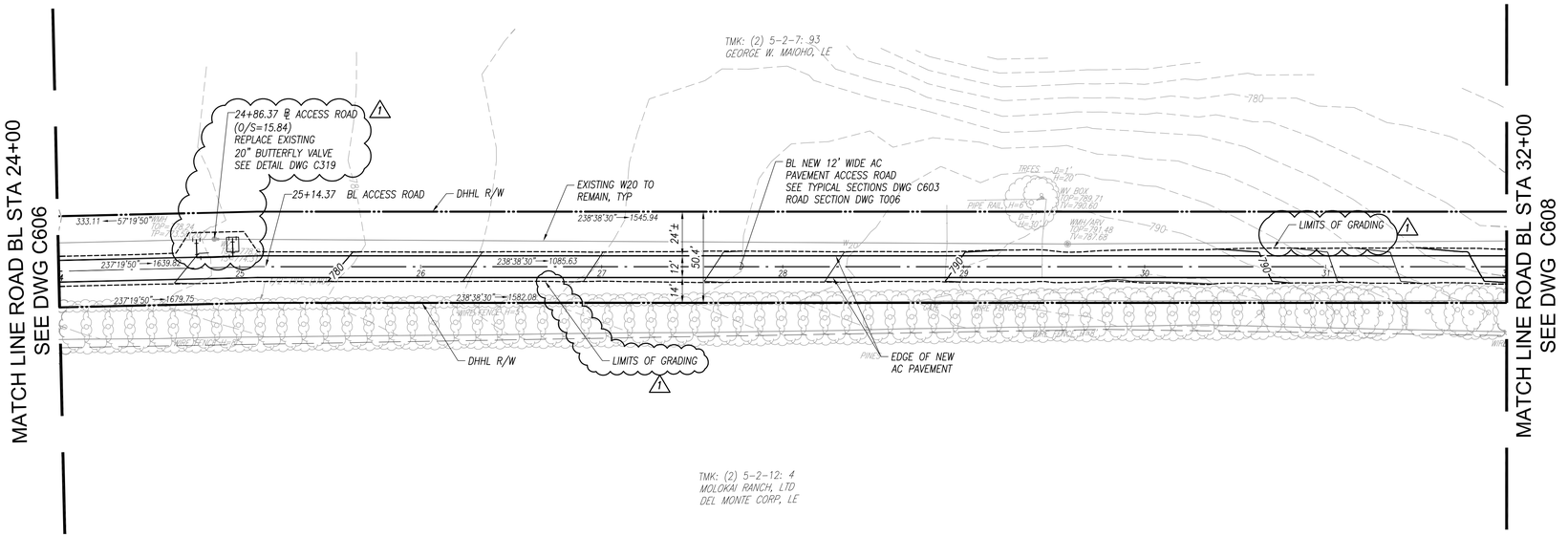
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C606
SHEET 60 OF 149

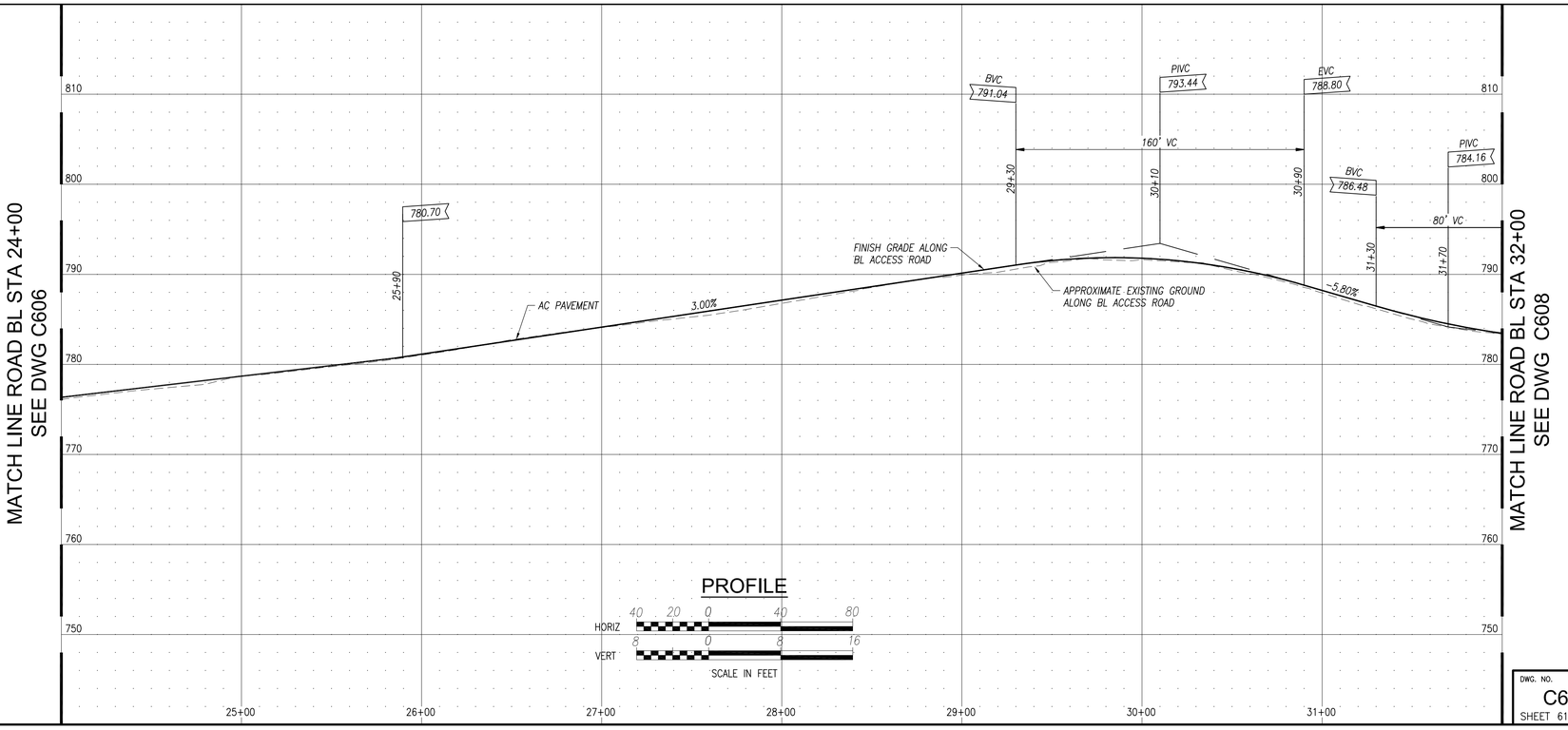
FILE	POCKET	FOLDER	NO.



PLAN

40 20 0 40 80

SCALE IN FEET



PROFILE

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	BUTTERFLY VALVE REPLACEMENT	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

PLAN AND PROFILE - ACCESS ROAD
BL STA 24+00 TO 32+00

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C607
SHEET 61 OF 149

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111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
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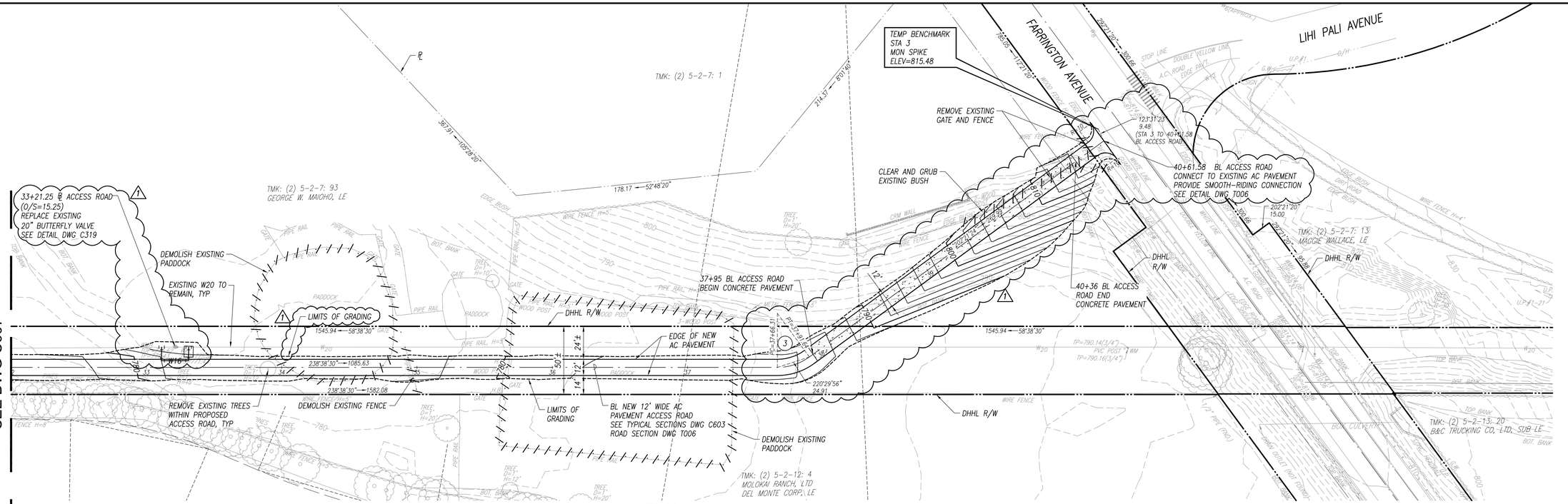
JUNE 2018

FILE	POCKET	FOLDER	NO.

MATCH LINE ROAD BL STA 32+00
SEE DWG C607



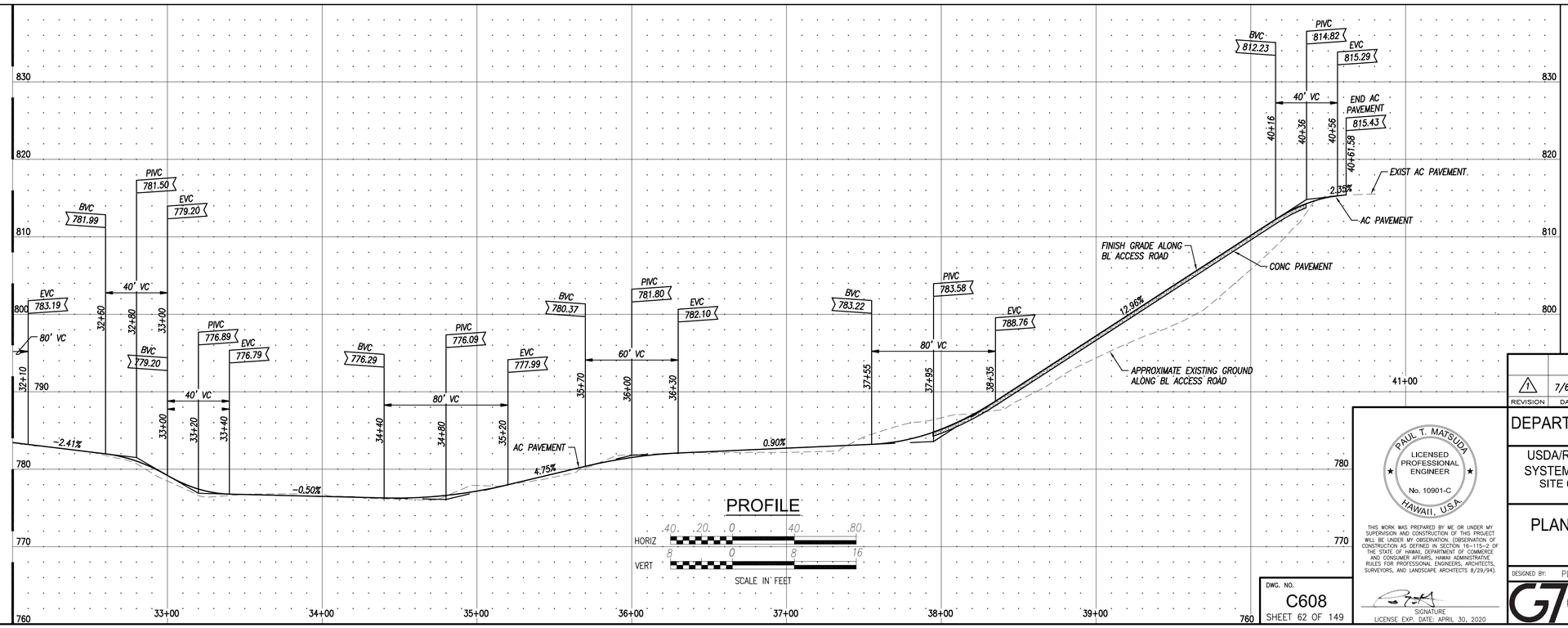
PLAN

40 20 0 40 80

SCALE IN FEET

ROAD BL CURVE TABLE						
CURVE NO	Δ	Δ/2	R	T	C	Lc
③	36°17'06"	18°08'33"	40.00'	13.11	24.91'	25.33'

MATCH LINE ROAD BL STA 32+00
SEE DWG C607



PROFILE

HORIZ 40 20 0 40 80

VERT 8 0 8 16

SCALE IN FEET

DWG. NO.
C608
SHEET 62 OF 149

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PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED GRADING & BFV REPLACEMENT	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 6 - HOOLEHUA PRESSURE BREAKER TANK
JOB NO.

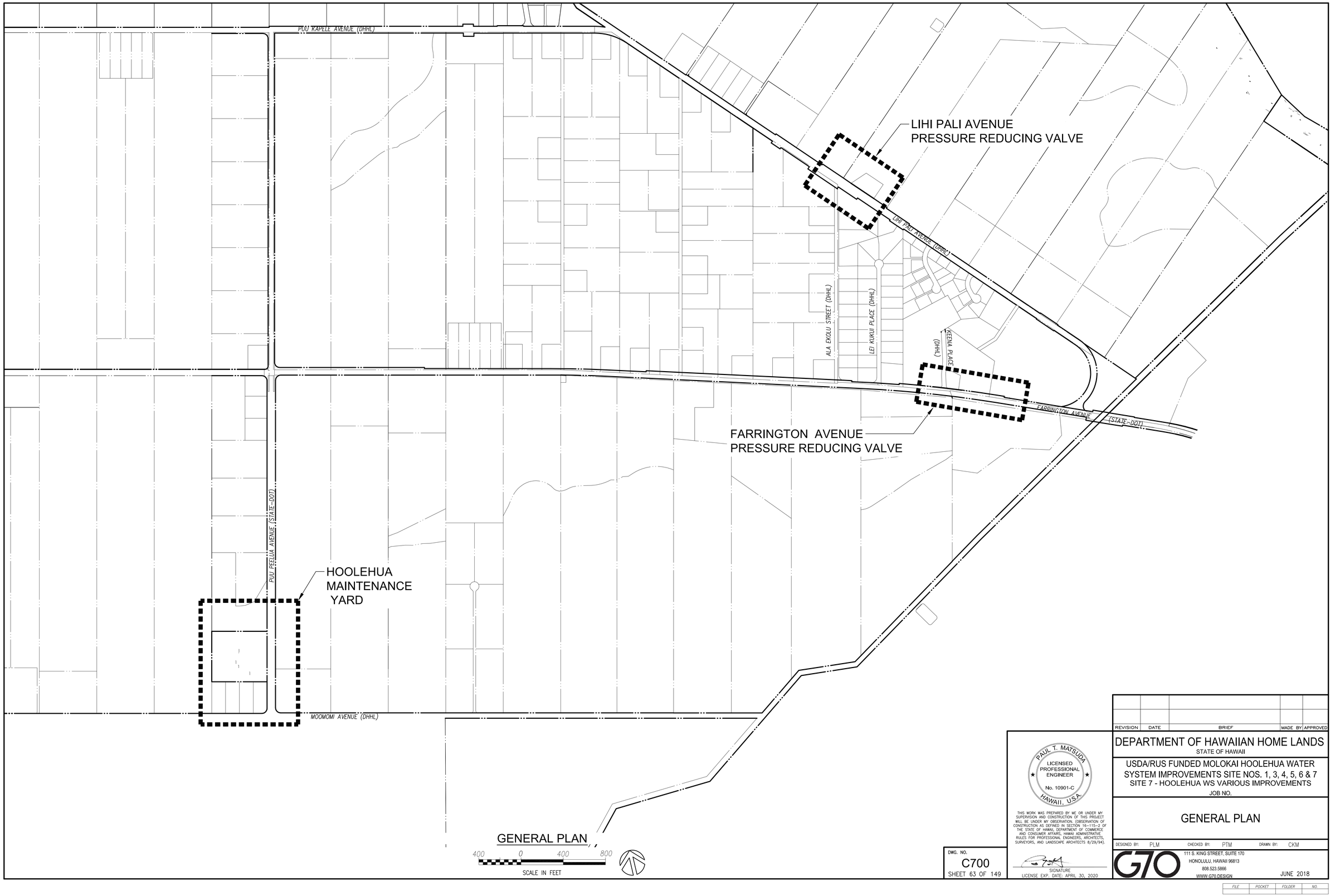
PLAN AND PROFILE - ACCESS ROAD
BL STA 32+00 TO END

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.



REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA WS VARIOUS IMPROVEMENTS
JOB NO.

GENERAL PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C700
SHEET 63 OF 149

FILE	POCKET	FOLDER	NO.

TMK(2) 5-2-23: 13
DEPARTMENT OF HAWAIIAN HOME LANDS
JOHN K Sr. BORDEN

TMK(2) 5-2-23: 12
DEPARTMENT OF HAWAIIAN HOMELANDS
CHARLOTTE L.M. SEALES

TMK(2) 5-2-23: 11
DEPARTMENT OF HAWAIIAN HOMELANDS
DAVID NUI AQUINO

TMK(2) 5-2-23: 9
DEPARTMENT OF HAWAIIAN HOME LANDS

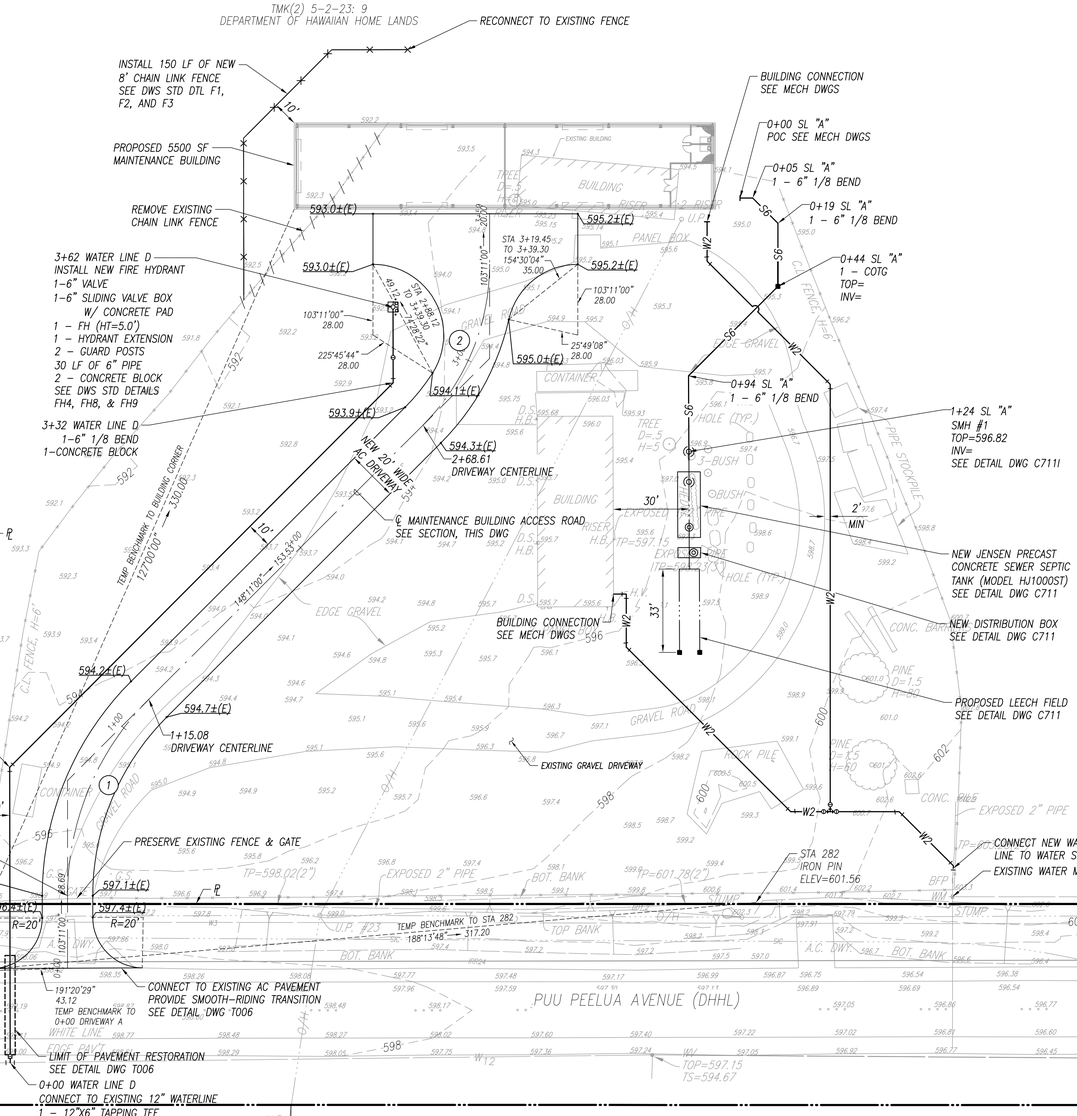
TMK(2) 5-2-23: 8
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK(2) 5-2-23: 10
DEPARTMENT OF HAWAIIAN HOME LANDS
MOSES Jr. PHILLIPS

HOOLEHUA WS MAINTENANCE BUILDING

	USERS	AVG DAILY FLOW	TOTAL FLOW	MIN. REQ. SEPTIC TANK SIZE	DESIGN SEPTIC TANK CAPACITY	EQUIVALENT BEDROOM UNITS	DESIGN EQUIVALENT BEDROOM UNITS	PERC RATE (ACTUAL)	PERC RATE (DESIGN)	ABSORPTION AREA	REQ. ABSORPTION AREA	DESIGN ABSORPTION AREA	INFILTRATOR WIDTH	INFILTRATOR LENGTH	NO. OF TRENCHES	LENGTH OF TRENCH	NOTES
		GAL/DAY	GAL	GAL	GAL			MIN/IN	MIN/IN	SF/BDRM	SF	SF	IN	LF		LF	
DESIGN																	
AVG DAILY USE	5	25	125	156.25	200	0.6	1.0	25.3	26.0	100	62.50	100	36	33	1	30	
MAX USE	10	15	150	187.50	200	0.8	1.0	25.3	26.0	100	75.00	100	36	33	1	30	

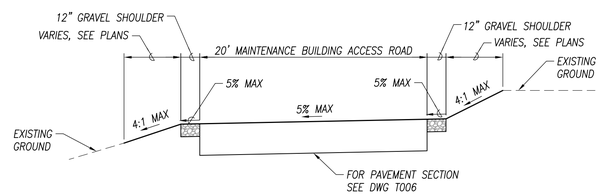
CURVE TABLE						
CURVE NO	Δ	Δ/2	R	T	C	Lc
(1)	45°00'00"	22°30'00"	110.00'	45.56	84.19'	86.39'
(2)	45°00'00"	22°30'00"	90.00'	37.28	68.88'	70.69'



SITE PLAN

30 15 0 30 60

SCALE IN FEET



ACCESS ROAD SECTION

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	REVISED SITE PLAN	G70	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA WS MAINTENANCE YARD
JOB NO.

MAINTENANCE BUILDING SITE PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C701
SHEET 64 OF 149

FILE	POCKET	FOLDER	NO.

TMK(2) 5-2-23: 9
DEPARTMENT OF HAWAIIAN HOME LANDS

TMK(2) 5-2-23: 8
DEPARTMENT OF HAWAIIAN HOME LANDS

PROPOSED 5800 SF
MAINTENANCE BUILDING

INSTALL TEMPORARY SILT
SOCK ALONG FENCE
SEE DETAIL DWG T007

CONSTRUCT 20' x 50'
CONSTRUCTION ENTRANCE
SEE DETAIL DWG T007

PUU PEELUA AVENUE (DHHL)

TEMPORARY EROSION CONTROL LEGEND

- PROPERTY LINE
- LOT LINE
- LIMITS OF GRADING
- EXISTING WATER LINE
- D18 — EXISTING DRAINLINE
- D18 — NEW DRAIN LINE
- 90 — EXISTING CONTOUR
- 100 — PROPOSED CONTOUR
- EXISTING DRAINAGE FLOW
- PROPOSED TEMPORARY DRAINAGE FLOW
- ROCK CONSTRUCTION ACCESS FOR INGRESS/EGRESS
- TEMPORARY SILT SOCKS
- TEMPORARY MIRAFI GEOTECHNICAL FABRIC FOR GRATED INLETS

EROSION CONTROL PLAN

20 10 0 20 40
SCALE IN FEET

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C702
SHEET 65 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA WS MAINTENANCE YARD
JOB NO.

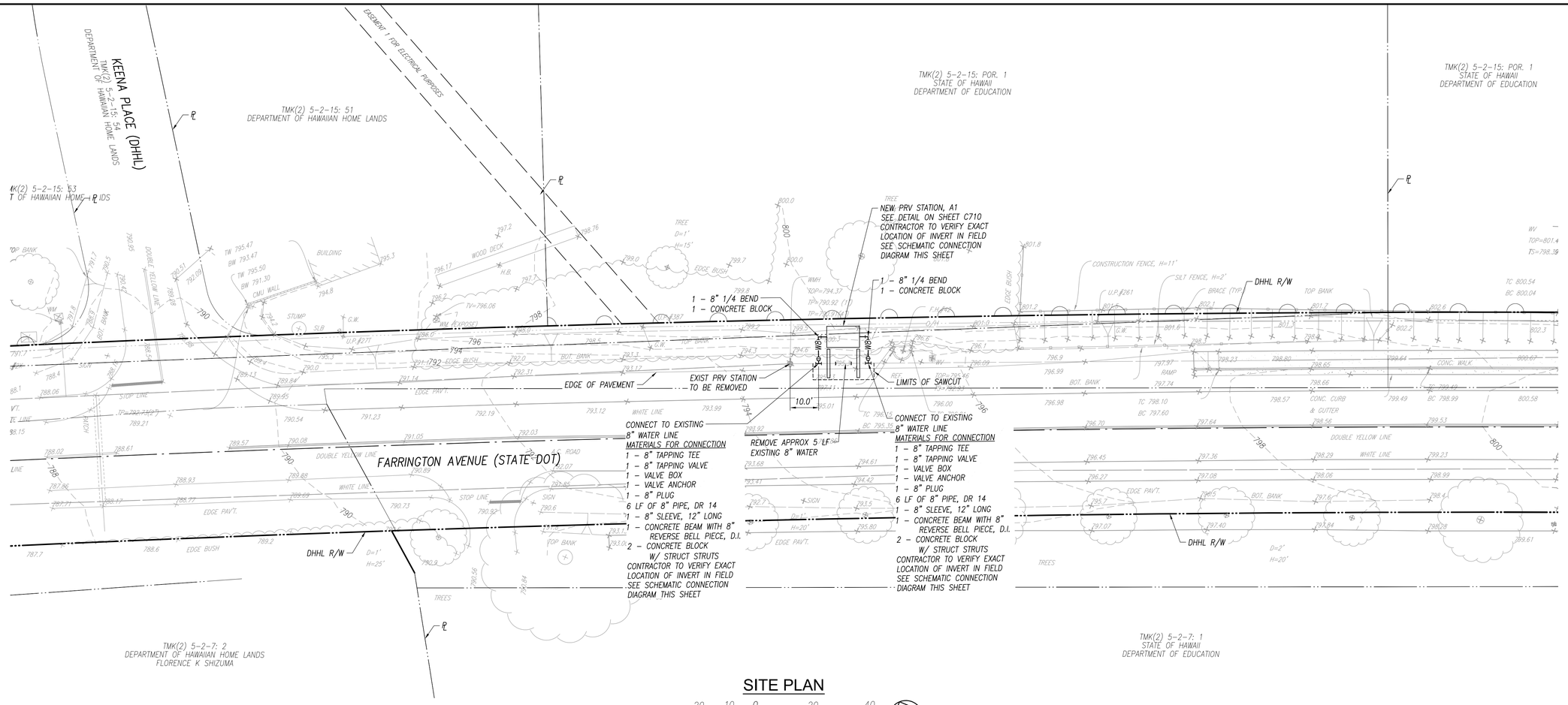
EROSION CONTROL PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

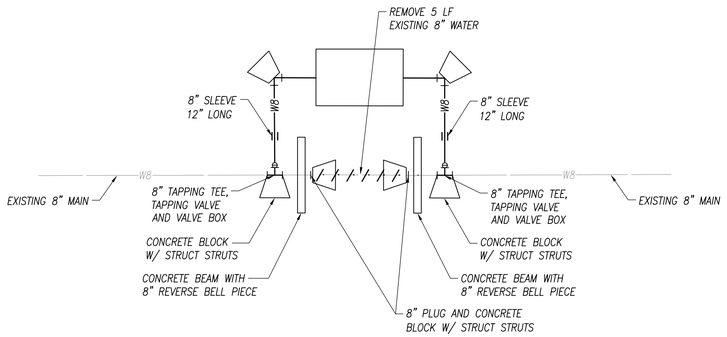
FILE	POCKET	FOLDER	NO.



SITE PLAN

20 10 0 20 40

SCALE IN FEET



CONNECTION DIAGRAM

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 7 - REPLACE EXIST PRV STATIONS FARRINGTON AVE

JOB NO.

FARRINGTON AVE PRV REPLACEMENT SITE PLAN

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C703
SHEET 66 OF 149

FILE	POCKET	FOLDER	NO.


TMK(2) 5-2-7: 35
DEPARTMENT OF HAWAIIAN HOME LANDS
FRANCIS K NAEOLE
TMK(2) 5-2-7: 59
DEPARTMENT OF HAWAIIAN HOME LANDS
FRANK FRANCIS Jr. KEOHO
TMK(2) 5-2-7: 46
DEPARTMENT OF HAWAIIAN HOME LANDS
TMK(2) 5-2-7: 59
DEPARTMENT OF HAWAIIAN HOME LANDS
FRANK FRANCIS Jr. KEOHO
DHHL R/W
317°02'40" 736.32
NEW PRV STATION, A2
SEE DETAIL ON DWG C710
CONTRACTOR TO VERIFY EXACT
LOCATION OF INVERT IN FIELD
SEE SCHEMATIC CONNECTION
DIAGRAM THIS SHEET
1 – 8" 1/4 BEND
1 – CONCRETE BLOCK
1 – 8" 1/4 BEND
1 – CONCRETE BLOCK
EDGE OF PAVEMENT
EXIST PRV STATION
TO BE REMOVED
W3(APPROX. LOC.)
LIHI PALI AVENUE (DHHL)
CONNECT TO EXISTING
8" WATER LINE
MATERIALS FOR CONNECTION
1 – 8" TAPPING TEE
1 – 8" TAPPING VALVE
1 – VALVE BOX
1 – VALVE ANCHOR
1 – 8" PLUG
6 LF OF 8" PIPE, DR 14
1 – 8" SLEEVE, 12" LONG
1 – CONCRETE BEAM WITH 8" REVERSE BELL PIECE, D.I.
2 – CONCRETE BLOCK W/ STRUCT STRUTS
CONTRACTOR TO VERIFY EXACT
LOCATION OF INVERT IN FIELD
SEE SCHEMATIC CONNECTION
DIAGRAM THIS SHEET
REMOVE APPROX
5 LF EXISTING
8" WATER
CONNECT TO EXISTING
8" WATER LINE
MATERIALS FOR CONNECTION
1 – 8" TAPPING TEE
1 – 8" TAPPING VALVE
1 – VALVE BOX
1 – VALVE ANCHOR
1 – 8" PLUG
6 LF OF 8" PIPE, DR 14
1 – 8" SLEEVE, 12" LONG
1 – CONCRETE BEAM WITH 8" REVERSE BELL PIECE, D.I.
2 – CONCRETE BLOCK W/ STRUCT STRUTS
CONTRACTOR TO VERIFY EXACT
LOCATION OF INVERT IN FIELD
SEE SCHEMATIC CONNECTION
DIAGRAM THIS SHEET
137°02'40" 304.17
137°02'40" 209.64
137°02'40" 232.81
47°02'40" 15.00
DHHL R/W
TMK(2) 5-2-15: 14
DEPARTMENT OF
HAWAIIAN HOME LANDS
WILLIAM M W BUCHANAN
TMK(2) 5-2-15: 48
DEPARTMENT OF HAWAIIAN HOME LANDS
DENNIS K. M. N. KEANINI
ALA EKOLU STREET (DHHL)
DHHL R/W
DHHL R/W

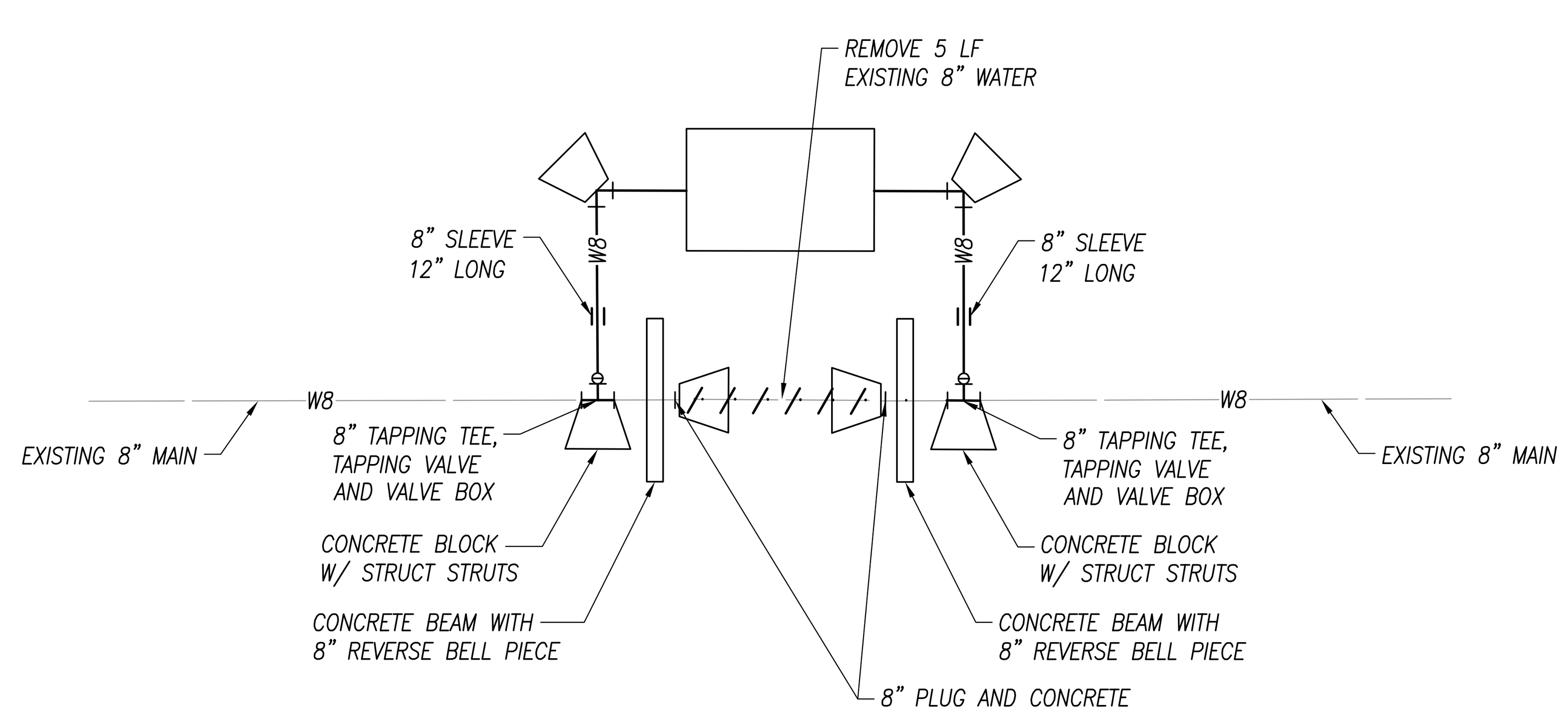
NOTE:

CONTRACTOR MAY ISOLATE PRV AND CUT IN REPLACEMENT IF IT IS DETERMINED THAT WORK WILL NOT AFFECT ANY EXISTING SERVICES.

SITE PLAN

20 10 0 20 40

SCALE IN FEET


REMOVE 5 LF
EXISTING 8" WATER
8" SLEEVE
12" LONG
8" SLEEVE
12" LONG
W8
W8
EXISTING 8" MAIN
EXISTING 8" MAIN
8" TAPPING TEE,
TAPPING VALVE
AND VALVE BOX
8" TAPPING TEE,
TAPPING VALVE
AND VALVE BOX
CONCRETE BLOCK
W/ STRUCT STRUTS
CONCRETE BLOCK
W/ STRUCT STRUTS
CONCRETE BEAM WITH
8" REVERSE BELL PIECE
CONCRETE BEAM WITH
8" REVERSE BELL PIECE
8" PLUG AND CONCRETE
BLOCK W/ STRUCT STRUTS

CONNECTION DIAGRAM

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - REPLACE EXIST PRV STATION ON LIHI PALI AVE
JOB NO.

LAHI PALI AVE PRV
REPLACEENT SITE PLAN

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JUNE 2018

DWG. NO.
C704
SHEET 67 OF 149

FILE POCKET FOLDER NO.

ARV REPLACEMENT PLAN

600 0 600 1200

SCALE IN FEET

NOTE:

REPLACE AIR RELIEF VALVES (ARV), SEE DWS STD DETAILS V4 AND V23.

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - REPLACE EXIST ARV STATIONS

JOB NO.

ARV REPLACEMENT PLAN

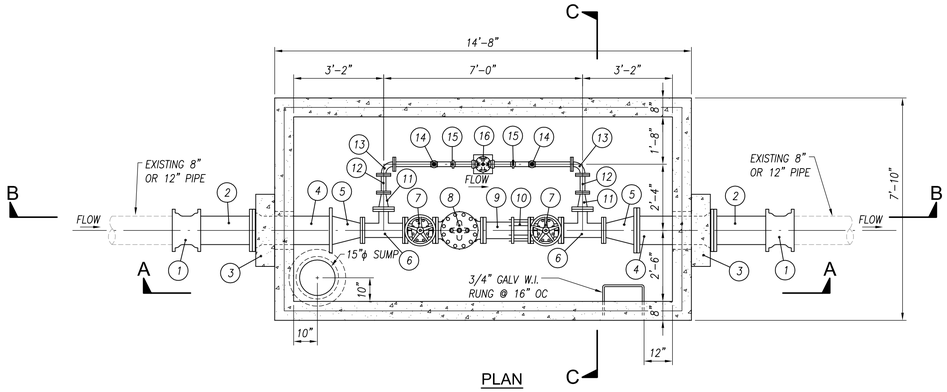
DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

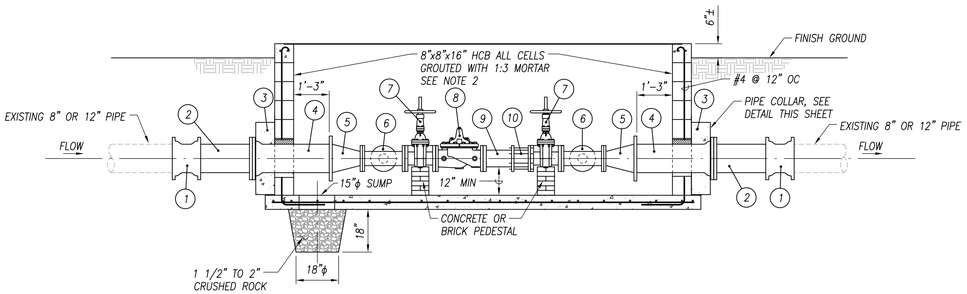
JUNE 2018

DWG. NO.
C705
SHEET 68 OF 149

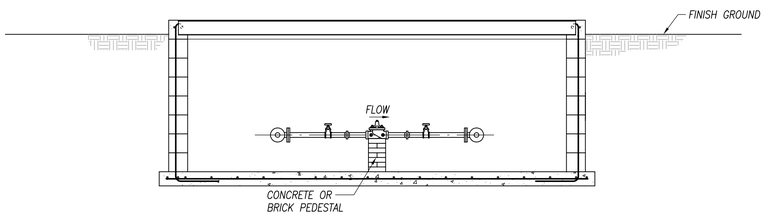
FILE	POCKET	FOLDER	NO.



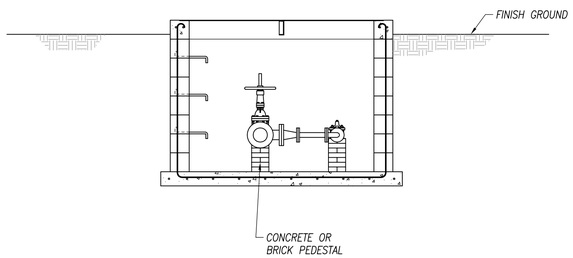
PLAN



SECTION A-A



SECTION B-B



SECTION C-C

MATERIALS LIST	
1	8" OR 12" SLEEVE, 12" LONG, MJ
2	8" OR 12" NIPPLE, 24" LONG, PE x PE
3	THRUST RESTRAINING COLLAR
4	8" OR 12" NIPPLE, FE x MJ
5	8"x6" OR 12"x6" REDUCER, FE
6	6"x4" TEE, FE
7	6" GATE VALVE, FE
8	6" PRESSURE REDUCING VALVE, FE
9	6" SPOOL PIECE, FE x PE
10	6" FLANGED ADAPTER WITH LOCK PINS
11	4"x2" REDUCER, FE
12	2" SPOOL PIECE, 12" LONG, FE
13	2" 90° BEND
14	2" GATE VALVE, SE
15	2" UNION
16	2" PRESSURE REDUCING VALVE, SE

NOTES:

1. SEE STRUCTURAL DRAWINGS FOR VAULT DETAILS
2. BYPASS METER SHALL BE RADIO READ TYPE MANUFACTURED BY BADGER METER INC., OR OTHER AS REQUIRED BY DWS.

PR STATION VALVE REPLACEMENT STATIONS "A1" AND "A2"

NOT TO SCALE

DWG. NO.
C710
SHEET 69 OF 149

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

JOB NO.

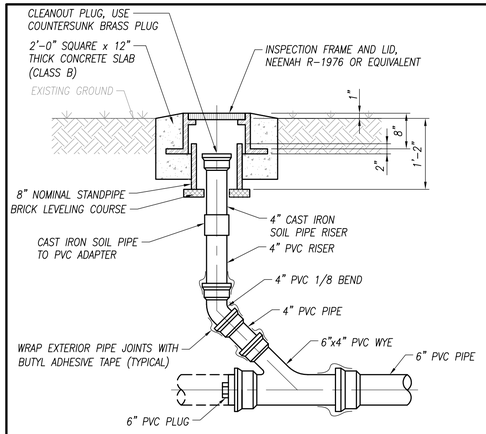
DETAILS 1

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

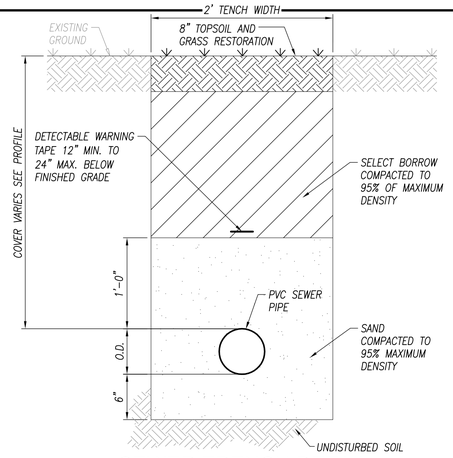
JUNE 2018

FILE	POCKET	FOLDER	NO.



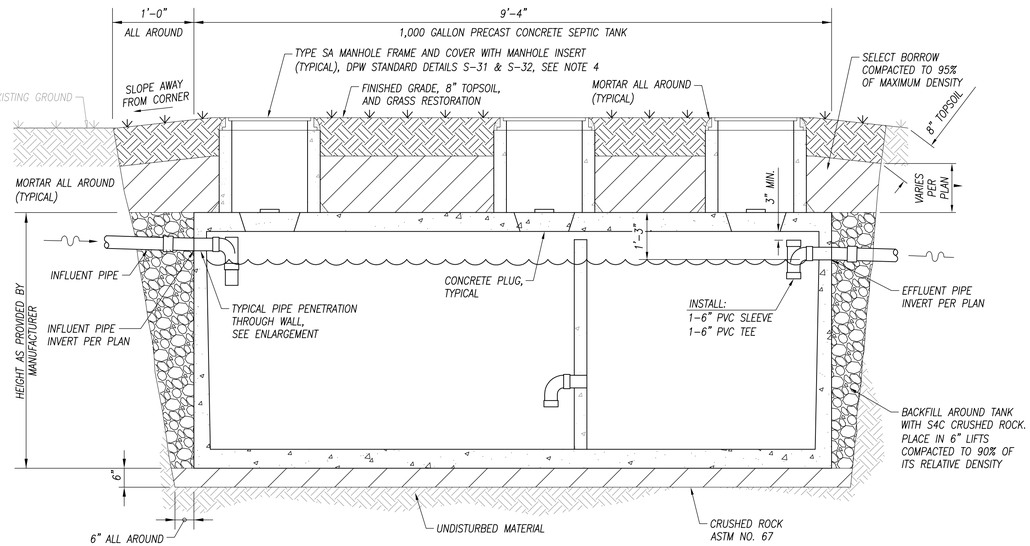
CLEANOUT TO GRADE DETAIL

NOT TO SCALE



SEWER TRENCH DETAIL

NOT TO SCALE

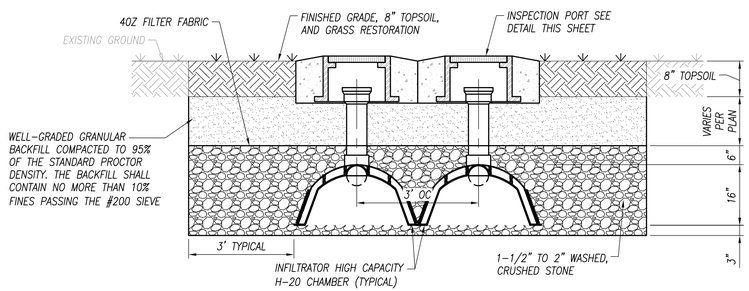


NOTES:

1. TANK SHALL BE WATERTIGHT, NON-BUOYANT AND RATED FOR H-20 TRAFFIC LOADING. PROVIDE ANTI-FLOTATION ANCHOR.
2. TANK SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF CHAPTER 62, "WASTEWATER SYSTEMS", OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
3. INTERIOR OF THE SEPTIC TANK AND MANHOLE RISERS SHALL BE COATED WITH A BITUMASTIC SEALANT.
4. ACCESS HOLE SHALL BE NO LARGER THAN 18-INCHES, THE CONTRACTOR SHALL PROVIDE EITHER A SAFETY COVER OVER THE INTERIOR ACCESS HOLE OR A BOLTED SECURITY MANHOLE COVER.

SEPTIC TANK DETAIL

NOT TO SCALE



HIGH CAPACITY INFILTRATOR H-20 CHAMBER TYPICAL CROSS SECTION

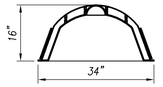
NOT TO SCALE

NOTES:

1. FOR TRAFFIC LOADING APPLICATIONS PLEASE CONTACT INFILTRATOR SYSTEMS TECHNICAL SERVICES DEPARTMENT FOR CURRENT DESIGN AND INSTALLATION SPECIFICATIONS.

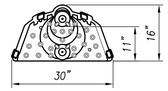
SEPTIC TANK OPERATION AND MAINTENANCE NOTES

1. SEPTIC TANKS SHALL BE INSPECTED A MINIMUM OF ONE TIME A YEAR. INSPECTION INVOLVES OPENING THE ACCESS COVER AND CHECKING IF EITHER THE SLUDGE OR SCUM LEVEL IS NEAR THE TOP OF OUTLET TEE.
2. THE SEPTIC TANK SHALL BE CLEANED IF EITHER: A. THE BOTTOM OF THE FLOATING SCUM MAT IS WITHIN THREE (3) INCHES OF THE BOTTOM OF THE OUTLET TEE; OR B. THE TOP OF THE SLUDGE LAYER COMES WITHIN SIX (6) INCHES OF THE BOTTOM OF THE OUTLET TEE.
3. CLEANING THE SEPTIC TANK SHALL CONSIST OF PUMPING OF THE CONTENTS INTO A TANK TRUCK AND HAULING IT TO A STATE HEALTH DEPARTMENT APPROVED POINT OF DISPOSAL. THE SEPTIC TANK SHALL NOT BE WASHED OR DISINFECTED AFTER PUMPING. A THREE INCH DEPTH OF RESIDUAL SLUDGE SHALL BE LEFT IN THE TANK FOR SEEDING PURPOSES.
4. THE INTERIOR OF THE SEPTIC TANK IS A CONFINED SPACE ENVIRONMENT. PERSONNEL SHALL NOT ENTER THE CONFINES OF THE SEPTIC TANK UNLESS PROPER SAFETY PROCEDURES ARE FOLLOWED. THERE IS POTENTIAL EXPLOSION AND/OR ASPHYXIATION (DEATH) HAZARD DUE TO PRESENCE OF GASES.
5. CHEMICAL OR BIOLOGICAL ADDITIVES, ENZYMES AND DISINFECTANTS DO NOT IMPROVE THE OPERATION OF SEPTIC TANKS AND ARE NOT RECOMMENDED. ORDINARY HOUSEHOLD CHEMICALS IN SMALL QUANTITIES WILL NOT ADVERSELY AFFECT THE OPERATION OF THE SEPTIC TANK. DO NOT ALLOW THE INTRODUCTION OF FATS, GREASE, GASOLINE OR OTHER PETROLEUM PRODUCTS, SOLVENTS, PAINT, PAINT THINNER, PESTICIDES, ANTIFREEZE, OR OTHER POISONOUS MATERIAL INTO THE SYSTEM.
6. BULKY OR STRINGY MATERIALS SUCH AS PAPER TOWELS, NEWSPAPER, WRAPPING PAPER, RAGS, DISPOSABLE DIAPERS, SANITARY NAPKINS, TAMPONS, PLASTIC, STICKS, ETC. SHALL NOT BE FLUSHED INTO THE SEPTIC TANK. THESE MATERIALS DO NOT EASILY DECOMPOSE AND WILL RESULT IN CLOGGING OF THE PLUMBING AND DISPOSAL SYSTEM.
7. IMPROPER OPERATION AND MAINTENANCE OF THE SEPTIC TANK WILL CLOG THE SYSTEM PIPING AND ADJACENT SOIL. THIS WILL RESULT IN PREMATURE FAILURE OF THE ABSORPTION BED DISPOSAL SYSTEM. FAILURE OF THE DISPOSAL SYSTEM WILL CAUSE OVERFLOWS AND FLOODING OF THE AREA IN PROXIMITY TO THE DISPOSAL SYSTEM. IF FAILURE OCCURS, COMPLETE REPLACEMENT OF THE DISPOSAL SYSTEM WILL BE REQUIRED.
8. THE SEPTIC TANK CONTAINS A FILTER ON THE OUTLET THAT MUST BE CLEANED WHEN THE TANK IS CLEANED. THIS FILTER IS INSTALLED TO INCREASE THE LIFE OF THE SEPTIC SYSTEM AND SHOULD NOT BE REMOVED.
9. MINIMIZING THE USE OF GARBAGE DISPOSERS AND PRACTICING WATER CONSERVATION WILL INCREASE THE USEFUL LIFE OF THE SEPTIC SYSTEM. IT IS ALSO RECOMMENDED THAT THE MAJOR WATER USING FIXTURES AND APPLIANCES NOT BE OPERATED AT THE SAME TIME (E.G. DISHWASHER, ETC.).
10. DISTRIBUTION BOXES SHALL BE CLEANED TO REMOVE SOLID MATERIAL A MINIMUM OF ONE TIME PER YEAR.



CHAMBER END VIEW

NOT TO SCALE

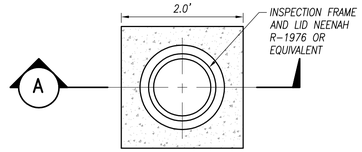


CHAMBER END PLATE

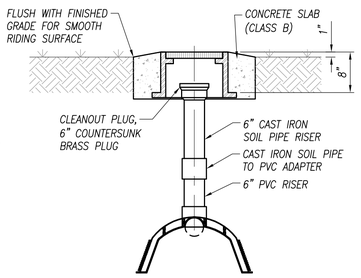
NOT TO SCALE

CHAMBER SPECIFICATIONS

SIZE (W x L x H) .... 34" x 75" x 16"
STORAGE CAPACITY .... 110 GAL/14.3 CY. FT.
WEIGHT .... 38 LBS
LOUVERED SIDEWALL HEIGHT .... 10"



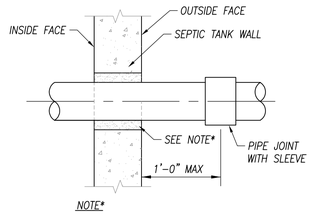
PLAN



SECTION "A"

INSPECTION PORT DETAIL

NOT TO SCALE

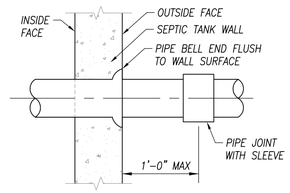


NOTE*

CORE DRILL HOLE (PIPE DIAMETER + 2 1/2"), CLEAN, INSTALL PIPE, AND FILL ANNULAR SPACE WITH NON-SHRINKING GROUT.

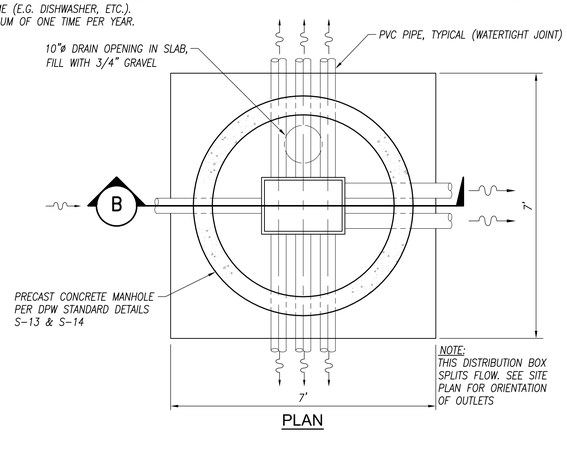
OPTION NO. 1: FIELD INSTALL

NOT TO SCALE



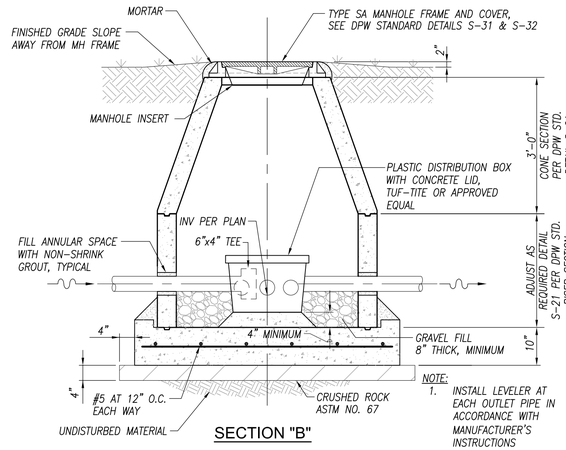
OPTION NO. 2: CAST-IN-PLACE

NOT TO SCALE



NOTE:
THIS DISTRIBUTION BOX SPLITS FLOW. SEE SITE PLAN FOR ORIENTATION OF OUTLETS

PLAN



SECTION "B"

NOTE:
1. INSTALL LEVELER AT EACH OUTLET PIPE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS

DISTRIBUTION BOX III DETAIL

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

PAUL T. MATSUDA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C711
SHEET 70 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

JOB NO.

DETAILS 2

DESIGNED BY: PLM CHECKED BY: PTM DRAWN BY: CKM

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

JUNE 2018

FILE	POCKET	FOLDER	NO.

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

DESIGN DEVELOPMENT SUBMITTAL

TMK#:

PROJECT TEAM

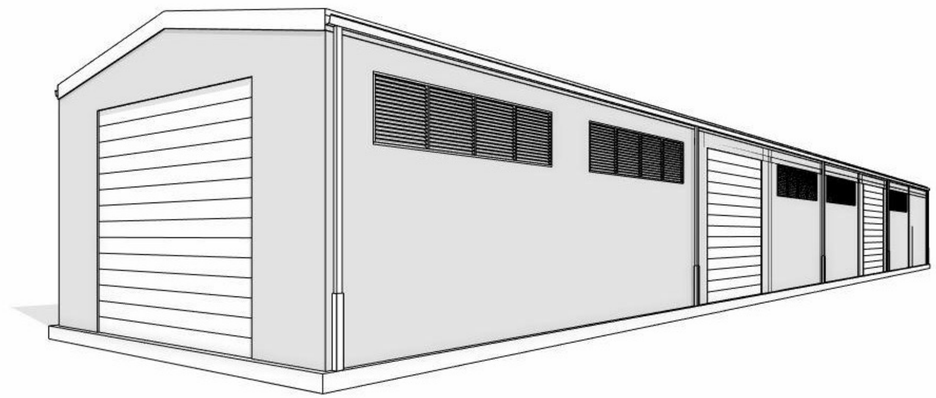
OWNER/CLIENT:

CIVIL/ARCHITECT:
G70
111 S. KING STREET SUITE 170
HONOLULU, HAWAII 96813

STRUCTURAL ENGINEER:
TANIMURA & ASSOCIATES INC
925 BETHEL ST # 309, HONOLULU, HI 96813

MECHANICAL ENGINEER:
RANDOLPH H MURAYAMA & ASSOCIATES
1267 YOUNG ST, HONOLULU, HI 96814

ELECTRICAL ENGINEER:
ALBERT CHONG ASSOCIATES INC
1117 KAPAHULU AVE, HONOLULU, HI 96816



INDEX TO DRAWINGS

TITLE

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T-101	PROJECT INFORMATION CODES & CODE DIAGRAMS
T-102	PROJECT INFORMATION CODES AND CODE DIAGRAMS, SYMBOLS, ABBREVIATIONS & NOTES

CIVIL

Sheet Number	Sheet Name

ARCHITECTURAL

Sheet Number	Sheet Name
A-100	SITE PLAN
A-101	FLOOR PLAN
A-102	REFLECTED CEILING PLAN
A-201	ENLARGED PLAN, INTERIOR ELEVATIONS, SECTIONS
A-301	EXTERIOR ELEVATIONS
A-401	BUILDING SECTIONS
A-601	PARTITION TYPES, FIXTURE MOUNTING HEIGHTS, MISCELLANEOUS DETAILS
A-701	DOOR SCHEDULE, DOOR DETAILS, WINDOW SCHEDULE, WINDOW DETAILS, FINISH SCHEDULE AND LEGEND
A-702	COLOR AND MATERIAL FINISH SCHEDULE, ROOM FINISH SCHEDULE

STRUCTURAL

S-100	Unnamed

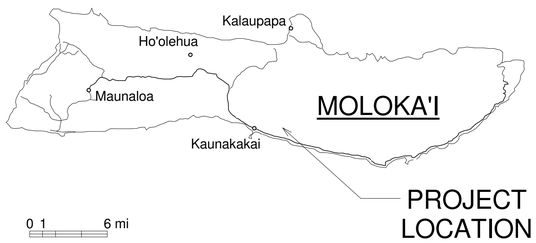
MECHANICAL

M-100	Unnamed

ELECTRICAL

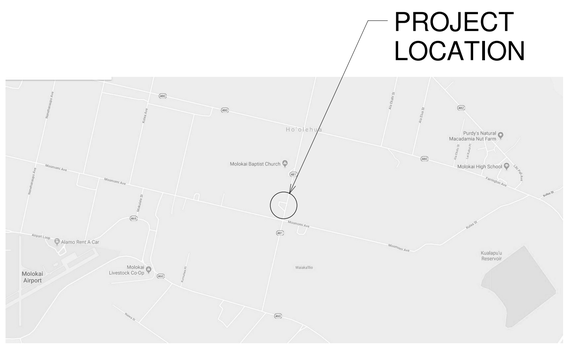
E-100	Unnamed

LOCATION MAP



MOLOKA'I, HAWAII

VICINITY MAP



ACKNOWLEDGEMENTS

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PROJECT INFORMATION CODES & CODE DIAGRAMS

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T-101
SHEET 71 OF 149

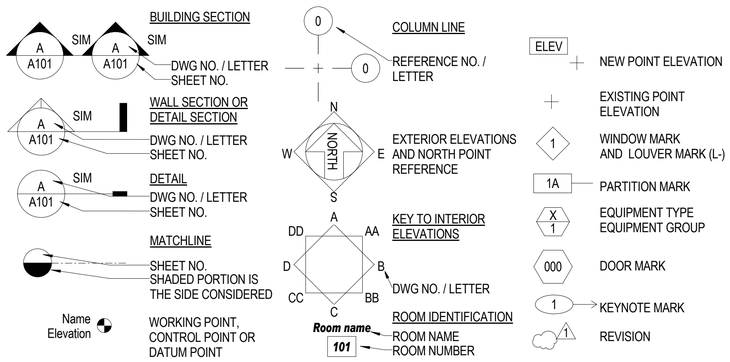
FILE	POCKET	FOLDER	NO.

5/26/2018 4:44:35 PM

ABBREVIATIONS

&	AND	DW	DISH WASHER	JAL	ALOUSIE	REBAR	REINFORCING BAR
	ANGLE	DWG	DRAWING	JAN	JANITOR	REC	RECESSED
@	AT	DWR	DRAWER	JB	JUNCTION BOX	REF	REFERENCE
	CENTER LINE			JC	JANITOR'S CLOSET	REINF	REINFORCED OR REINFORCING
	DIAMETER	E	EAST	JST	JOIST	REQD	REQUIRED
		EA	EACH				
'	FOOT; FEET	EC	ELASTOMERIC COATING	JT	JOINT	RESIL	RESILIENT
"	INCH	EFS	EXTERIOR FINISH			REV	REVISED, REVISION OR REVERSED
%	PERCENT	EIFS	EXTERIOR INSULATION & FINISH SYSTEM	KIT	KITCHEN	RF	ROOF, RESILIENT FLOOR
	PERPENDICULAR					RFG	ROOFING
#	POUND OR NUMBER	EJ	EXPANSION JOINT	L	LENGTH OR LONG	RGH	ROUGH
		EL	ELEVATION	LAB	LABORATORY		
A/C	AIR CONDITIONING	ELEC	ELECTRICAL	LAM	LAMINATE OR LAMINATED	RGTR	REGISTER
AB	ANCHOR BOLT	ELEV	ELEVATOR	LAV	LAVATORY	RH	ROBE HOOK, RIGHT HAND
ABBREV	ABBREVIATION	ENCL	ENCLOSURE	LDG	LANDING	RM	ROOM
ABV	ABOVE					RND	ROUND
AC	ASPHALT CONCRETE	EPS	EXPANDED POLYSTYRENE	LF	LINEAR FOOT	RO	ROUGH OPENING
		EQ	EQUAL	LH	LEFT HAND		
ACT	ACOUSTICAL TILE	EQPT	EQUIPMENT	LOC	LOCATION	RWC	RAIN WATER CONDUCTOR
ACOUS	ACOUSTICAL	EXP	EXPANSION	LT	LIGHT	RWD	REDWOOD
AD	AREA DRAIN	EWC	ELEC. WATER COOLER	LP	LOW POINT	RWL	RAIN WATER LEADER
ADD	ADDITIVE, ADDENDUM						
ADJ	ADJUSTABLE	EXIST	EXISTING	LVR	LOUVER	S	SOUTH
		EXT	EXTERIOR			SA	SINGLE ACTING
ADJA	ADJACENT			MAR	MARBLE	SAFB	SOUND ATTENUATION
AFF	ABOVE FINISH FLOOR	FA	FIRE ALARM	MAX	MAXIMUM		FIRE BLANKET
AGGR	AGGREGATE	FAB	FABRICATE	MAT	MATERIAL		
AHU	AIR HANDLING UNIT	FAEM	FLUID APPLIED ELASTOMERIC MEMBRANE	MC	MEDICINE CABINET	SB	SPLASH BLOCK
AL/ALUM	ALUMINUM	FB	FLAT BAR	MECH	MECHANICAL	SC	SCALE OR SOLID CORE
		FCU	FAN COIL UNIT				
ALT	ALTERNATE			MEMB	MEMBRANE	SCD	SEAT COVER DISPENSER
ANOD	ANODIZED	FD	FLOOR DRAIN	MET/MTL	METAL	SCHED	SCHEDULE
AP	ACCESS PANEL	FDN	FOUNDATION	MFR	MANUFACTURER	SCP	SCUPPER
APPROX	APPROXIMATE	FE	FIRE EXTINGUISHER	MH	MANHOLE OR MOP HOLDER	SD	SOAP DISPENSER OR
ARCH	ARCHITECTURAL	FEC-S	FIRE EXTINGUISHER CABINET-SURFACE	MIN	MINIMUM		SMOKE DETECTOR
		FEC-SR	FIRE EXTINGUISHER CABINET-SEMI RECESSED				
BD	BOARD			MIRR	MIRROR	SEC	SECTION
BLDG	BUILDING	FEC-R	FIRE EXTINGUISHER CABINET-RECESSED	MISC	MISCELLANEOUS		
BLKG	BLOCKING	FF	FINISH FLOOR	MLDG	MOLDING	SEP	SEPARATION
BLVD	BOULEVARD	FF&E	FURNITURE, FIXTURE & EQUIPMENT	MR	MOISTURE RESISTANT	SF	SQUARE FOOT
BM	BEAM	FIN	FINISH	MO	MASONRY OPENING	SH	SHELF
		FIX	FIXTURE			SHR	SHOWER
BOH	BACK OF HOUSE			MS	MOP SINK	SHT	SHEET
BOT	BOTTOM	FLR	FLOOR	MTD	MOUNTED		
BRKT	BRACKET	FLASHG	FLASHING	MTG	MOUNTING	SHTG	SHEATHING
BS	BOTH SIDES	FLDG	FOLDING	MUL	MULLION	SIM	SIMILAR
BTWN	BETWEEN	FLUOR	FLUORESCENT	MUN	MUNTIN	SL	SLOPE
		FOC	FACE OF CONCRETE			SLDG	SLIDING
BUR	BUILT-UP ROOFING			NIC	NOT IN CONTRACT	SLNT	SEALANT
		FOF	FACE OF FINISH	NOM	NOMINAL		
CAB	CABINET	FOM	FACE OF MASONRY	NTS	NOT TO SCALE	SM	SHEET METAL
CB	CATCH BASIN	FOS	FACE OF STUDS, SLAB OR STRUCTURE			SND	SANITARY NAPKIN DIPOSAL
CEM	CEMENT	FR	FRAME	OA	OVERALL	SP	SOLID PHENOLIC
CEM PLAS	CEMENT PLASTER	FS	FULL SIZE OF FLOOR SINK	OC	ON CENTER	SPEC	SPECIFICATION
CER	CERAMIC			OD	OUTSIDE DIAMETER	SQ	SQUARE
		FT	FOOT OR FEET	OFCI	OWNER FURNISHED CONTRACTOR INSTALLED		
CG	CORNER GUARD	FTG	FOOTING	OFD	OVERFLOW DRAIN	SS	SERVICE SINK
CI	CAST IRON	FURR	FURRING			SST	STAINLESS STEEL
CIP	CAST IN PLACE	FUT	FUTURE	OFF	OFFICE	ST	STONE
CJ	CONSTRUCTION OR CONTROL JOINT			OFOI	OWNER FURNISHED OWNER INSTALLED	STD	STANDARD
CLG	CEILING	GA	GAUGE	OH	OVERHANG	STL	STEEL
		GALV	GALVANIZED	OI	OWNER INSTALLED		
CLO	CLOSET	GB	GRAB BAR	OPNG	OPENING	STN	STAIN
CLR	CLEAR	GFRC	GLASS FIBER REINFORCED CONCRETE			STOR	STORAGE
CMU	CONCRETE MASONRY UNITS	GI	GALVANIZED IRON	OPP	OPPOSITE	STRL	STRUCTURAL
CNTR	COUNTER			OVHD	OVERHEAD	STRUC	STRUCTURE
COL	COLUMN	GL	GLASS			SUSP	SUSPENDED
		GLU-LAM	GLUE LAMINATED	PC	PIECE		
CONC	CONCRETE	GND	GROUND	PD	PLANTER DRAIN	SYM	SYMMETRICAL
COND	CONDITION	GR	GRADE	PERIM	PERIMETER	SYS	SYSTEM
CONN	CONNECTION	GYP	GYPSUM	PL	PLATE OR PROPERTY LINE	SW	SWITCH
CONSTR	CONSTRUCTION			PLAM	PLASTIC LAMINATE		
CONT	CONTINUOUS	H	HIGH OR HEIGHT			T	TREAD
		HB	HOSE BIBB	PLAS	PLASTER	TB	TOWEL BAR
CONTR	CONTRACTOR	HC	HOLLOW CORE	PLBG	PLUMBING	TD	TRENCH DRAIN
COP	COPPER	HD	HEAD	PLYWD	PLYWOOD	TEMP	TEMPERED
CORR	CORRIDOR	HDCP	HANDICAPPED	PNL	PANEL	THK	THICK
CPT	CARPET			PR	PAIR		
CT	CERAMIC TILE	HDWD	HARDWOOD			THR	THRESHOLD
		HDWE	HARDWARE	PREFAB	PREFABRICATE	TP	TOILET PARTITION
CTR	CENTER	HT	HEIGHT	PREP	PREPARATION	TSC-TTD	TOILET SEAT COVER -
CTSK	COUNTERSINK	HM	HOLLOW METAL	PROP	PROPERTY		TOILET TISSUE DISPENSER
CW	COLD WATER	HORIZ	HORIZONTAL	PT	PAINT, POINT		
					PAPER TOWEL DISPENSER AND RECEPTACLE	TPH	TOILET PAPER HOLDER
DA	DOUBLE ACTING	HR	HOUR OR HANDRAIL	PTDR		TW	TOP OF WALL
DBL	DOUBLE	HS	HAND SINK		PARTITION	TYP	TYPICAL
DD	DECK DRAIN	HP	HIGH POINT	PTN	POURED IN PLACE		
DECOR	DECORATIVE	HVAC	HEATING, VENTILATION, AIR CONDITIONING		POST INDICATE VALVE	UON	UNLESS OTHERWISE NOTED
DEMO	DEMOLITION			PVP	POLYVINYL CHLORIDE	UR	URINAL
		ID	INSIDE DIAMETER	PIV	PAVEMENT		
DEPT	DEPARTMENT	IN	INCH	PVC		VCT	VINYL COMPOSITION TILE
DET	DETAIL	INCL	INCLUSIVE, INCLUDED OR INCLUDING	PVMT	QUARRY TILE	VERT	VERTICAL
DF	DRINKING FOUNTAIN	INSUL	INSULATION			VIF	VERIFY IN FIELD
DIA	DIAMETER	INT	INTERIOR	QT	RISER, RADIUS		
DIM	DIMENSION				RADIUS	W/	WITH
		INTEG	INTEGRATED	R	RESILIENT BASE	WC	WATER CLOSET
DISP	DISPENSER	INFO	INFORMATION	RAD	RAIN CHAIN	WD	WOOD
DN	DOWN	INV	INVERT	RB	ROOF DRAIN	WDW	WINDOW
DR	DOOR			RC		WH	WALL HYDRANT
DS	DOWNSPOUT			RD			
						WJ	WALL JOINT
						W/O	WITHOUT
						WP	WATERPROOF
						WR	WATER RESISTANT
						WT	WEIGHT
						WHL	WEEP HOLE

SYMBOLS



GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE HONOLULU INCLUDING ALL AMENDMENTS AND AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG), FIRE DEPARTMENT REGULATIONS, UTILITY COMPANY REQUIREMENTS AND THE BEST TRADE PRACTICES.
2. ALL WORK SHALL CONFORM TO SEISMIC REQUIREMENTS OF SEISMIC ZONE XX. (SEE STRL DWGS)
3. TOP OF ARCHITECTURAL FINISH FLOOR @ 0.00 ELEVATION = XXXX BASED ON U.S. COAST AND GEODETIC SURVEY. ALTERNATIVE: [REFER TO CIVIL DRAWINGS FOR ARCHITECTURAL FINISH FLOOR ELEVATION]
4. THE CONTRACTOR SHALL FULLY EXECUTE ALL CONDITIONS OF THE CONTRACT, INCLUDING THE REQUIREMENTS OF THE GENERAL CONDITIONS (AIA DOCUMENT A201).
5. BEFORE COMMENCING WORK, THE CONTRACTOR SHALL FILE ALL REQUIRED CERTIFICATES OF INSURANCE WITH THE DEPARTMENT BUILDINGS, OBTAIN ALL REQUIRED PERMITS, AND PAY ALL FEES REQUIRED BY GOVERNING LOCAL AGENCIES.
6. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD PRIOR TO COMMENCING WORK, AND SHALL REPORT ANY CONDITIONS OF DISCREPANCIES BETWEEN DRAWINGS AND FIELD CONDITIONS REQUIRING MODIFICATIONS BEFORE PROCEEDING WITH WORK TO THE ARCHITECT.
7. MINOR DETAILS NOT USUALLY SHOWN OR SPECIFIED, BUT NECESSARY FOR PROPER CONSTRUCTION OF ANY PART OF THE WORK SHALL BE INCLUDED AS IF THEY WERE INDICATED IN THE DRAWINGS AND SPECIFICATIONS.
8. THE CONTRACTOR SHALL COORDINATE ALL WORK PROCEDURES WITH REQUIREMENTS OF LOCAL AUTHORITIES AND/OR BUILDING MANAGEMENT.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL CONDITIONS AND MATERIALS WITHIN THE PROPOSED CONSTRUCTION AREA. THE CONTRACTOR SHALL DESIGN AND INSTALL ADEQUATE SHORING AND BRACING FOR ALL STRUCTURAL OR REMOVAL TASKS. THE CONTRACTOR SHALL HAVE SOLE RESPONSIBILITY FOR ANY DAMAGE OR INJURIES CAUSED BY OR DURING THE EXECUTION OF THE WORK.
10. THE CONTRACTOR SHALL LAYOUT HIS OWN WORK, AND SHALL PROVIDE ALL DIMENSIONS REQUIRED FOR OTHER TRADES (PLUMBING, ELECTRICAL, ETC.).
11. THE CONTRACTOR SHALL REPORT TO THE ARCHITECT ANY DISCREPANCIES FOUND BETWEEN THE DRAWINGS THAT REQUIRE MODIFICATIONS BEFORE PROCEEDING WITH WORK.
12. THE CONTRACTOR SHALL COOPERATE WITH OWNER'S [FF&E, SECURITY, DATA, ETC.] CONTRACTORS FOR SCHEDULING, ACCESS, AND/OR INSTALLATION OF ALL ASSOCIATIVE EQUIPMENT WITHIN THE WORK AREA.
13. PLUMBING AND ELECTRICAL WORK SHALL BE PERFORMED BY PERSONS LICENSED IN THEIR TRADES, WHO SHALL ARRANGE FOR AND OBTAIN INSPECTIONS AND SIGN-OFFS.
14. THE CONTRACTOR SHALL DO ALL CUTTING, PATCHING, REPAIRING AS REQUIRED TO PERFORM ALL OF THE WORK INDICATED ON THE DRAWINGS, AND ALL OTHER WORK THAT MAY BE REQUIRED TO COMPLETE THE JOB.
15. THE CONTRACTOR, UPON COMPLETION OF THE WORK, SHALL APPLY FOR CERTIFICATE OF OCCUPANCY, AND SHALL ARRANGE FOR DEPARTMENT OF BUILDINGS INSPECTIONS AND SIGN-OFFS REQUIRED TO OBTAIN THE CERTIFICATE OF OCCUPANCY.
16. REFER TO CIVIL, LANDSCAPE, STRUCTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS AND SPECIFICATIONS. FOR ADDITIONAL GENERAL NOTES, ABBREVIATIONS AND SYMBOLS LEGENDS; ALL NOTES ARE TO BE REVIEWED AND APPLIED TO RELATED BUILDING COMPONENTS.
17. NOTES APPEAR ON VARIOUS SHEETS FOR DIFFERENT SYSTEMS AND MATERIAL. SHEETS ARE TO BE REVIEWED AND NOTES ON ANY ONE SHEET ARE TO BE APPLIED TO RELATED SYSTEMS AND MATERIALS DEPICTED ON OTHER DRAWINGS.
18. DETAILS NOT SHOWN ARE SIMILAR IN CHARACTER TO THOSE THAT ARE WHERE SPECIFIED DIMENSIONS, DETAILS OR DESIGN INTENT CANNOT BE DETERMINED; CONSULT THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

CONSTRUCTION NOTES

UNLESS OTHERWISE NOTED OR INDICATED DIMENSIONS ON THE PLANS SHALL BE FROM CENTERLINE OF THE COLUMN, GRIDLINE, OR FACE OF STRUCTURE/STUD.

ALL EXTERIOR OPENINGS SHALL BE FLASHED IN SUCH A WAY AS TO MAKE THEM WEATHERPROOF.

FLOOR SURFACES SHALL BE SLIP RESISTANT MEETING THE MINIMUM STATIC COEFFICIENT OF 0.6 FOR FLOORS AND 0.8 FOR RAMPS AS REQUIRED BY ADAAG.

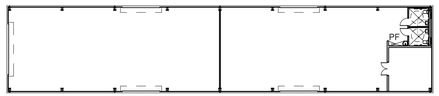
EXTERIOR PENESTRATION AND PENESTRATION ENCLOSING CONDITIONED SPACE SHALL BE WEATHERSTRIPPED OR OTHERWISE TIGHTLY SEALED TO MINIMIZE AIR LEAKAGE.

EXTERIOR DOORS AND DOORS ENCLOSING CONDITIONED SPACE SHALL MINIMIZE AIR LEAKAGE AROUND THEIR PERIMETER WHEN IN A CLOSED POSITION.
SEAL OR ASTRAGAL SHALL BE PROVIDED AT HEAD, SILL, AND JAMBS. MEETING PORTIONS OF SECTIONAL, BI-PARTING, OR DOUBLE DOORS SHALL BE PROVIDED WITH A WEATHER TIGHT ASTRAGAL OR SEAL.

WHERE MULTIPLE SWITCHES OR RECEPTACLES ARE LOCATED IN NEAR VICINITY, THE CONTRACTOR SHALL GANG SWITCHES OR RECEPTACLES UP TO THE MAXIMUM WIDTH AVAILABLE FOR FACE PLATES.

ALL SWITCHES AND/OR RECEPTACLES MOUNTED ABOVE COUNTERS SHALL BE INSTALLED SO THAT LENGTH OF FACE PLATE IS ORIENTED HORIZONTALLY.

CODE DIAGRAM



CODE - FLOOR PLAN

USE & OCCUPANCY CALSSIFICATION: S-1 & S-2
TYPE OF CONSTRUCTION: TYPE V (NON-SPRINKLERED)
PROPOSED BUILDING AREA: 5,850 SF
HEIGHT: 1 STORY/20 FEET
PROVIDE NON-COMBUSTIBLE CONSTRUCTION

PROJECT INFORMATION

GENERAL

LOT SIZE:

EXISTING FLOOR AREA: 8400SF
EXISTING PARAMETER: 380'-0"
TOTAL PARAMETER:> 30'-0"
OPEN = 275'-0"

TAX MAP KEY

2-1-058: 131 AND 2-1-058: 127

SCOPE OF WORK

CONVERSION OF EXISTING NED SHED INTO TRAINING FACILITY, ENCLOSE EXISTING ONE-STORY STRUCTURE & ADD NEW MEZZANINE.

REFERENCE CODES

BUILDING CODE: (OAHU/MAUI/HAWAII/KAUAI) COUNTY CODE - INTERNATIONAL BUILDING CODE 2006

ACCESSIBILITY: AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES

ENERGY CODE: (OAHU/MAUI/HAWAII/KAUAI) MODEL ENERGY CODE

ZONING

(OAHU/MAUI/HAWAII/KAUAI) COUNTY CODE: REVISED ORDINACNCE OF HONOLULU 1990 (ROH)
ZONING CODE: HCDA KAKAAKO MAKAI RULES

MINIMUM LOT AREA:
MINIMUM LOT WIDTH:

REQUIRED YARDS
FRONT:
SIDE/REAR:

MAXIMUM HEIGHT: 45'
EXISTING HEIGHT:26'
PROPOSED HEIGHT: NO CHANGES IN HEIGHT

MAUI COUNTY ZONING ORDINANCE
OFF STREET LOADING ZONE REQUIRED

CLUBHOUSE (1 STALL: 200 SF): 32 STALLS

SANITARY FACILITIES
ALLOWABLE MINIMUM SANITARY FACILITIES PER UNIFORM PLUMBING CODE (1991,1997)

BUILDING CODE NOTES

OCCUPANCY: OCCUPANCY A-3 - TRAINING AND SKILLED DEVELOPMENT NOT WITHIN A SCHOOL

CONSTRUCTION TYPE: V-B NON-SPRINKLERED

PROPOSED BUILDING AREA: 6,342 SF
BASE ALLOWABLE BUILDING AREA (TABLE 503): 6,000 SF

SECTION 506.2 FRONTAGE INCREASE
274'-0" / 380'-0" = 0.724 = 0.72
0.72 - 0.25 = 0.47 = 47% BONUS

TOTAL ALLOWABLE AREA
6,000 S.F. X 1.47 = 8,820 S.F. EXCEEDS PROPOSED BUILDING AREA

MAX HEIGHT: 26'

MAX STORIES: 1-STORY

FLOOD ZONE: AE 10'
CURRENT ELEVATION: FINISH FLOOR 7.70', FLOOD PROTECTION PROVIDED TO 10'

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PROJECT INFORMATION CODES AND CODE DIAGRAMS, SYMBOLS, ABBREVIATIONS & NOTES

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: GTO

04-23-18

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T-102
SHEET 72 OF 149

5/26/2018 4:44:35 PM

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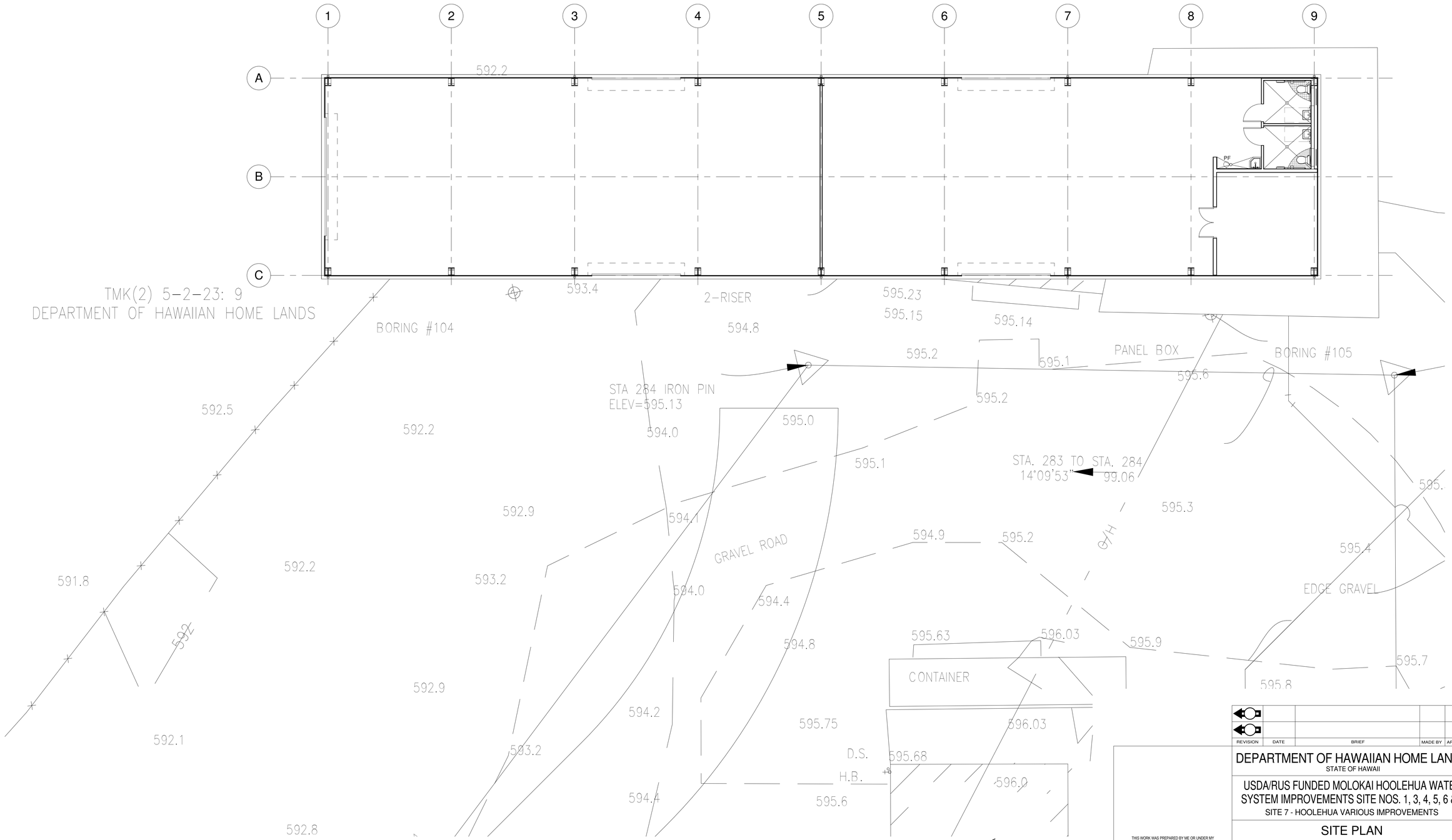

1 SITE PLAN
SCALE: 1/8" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

SITE PLAN

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

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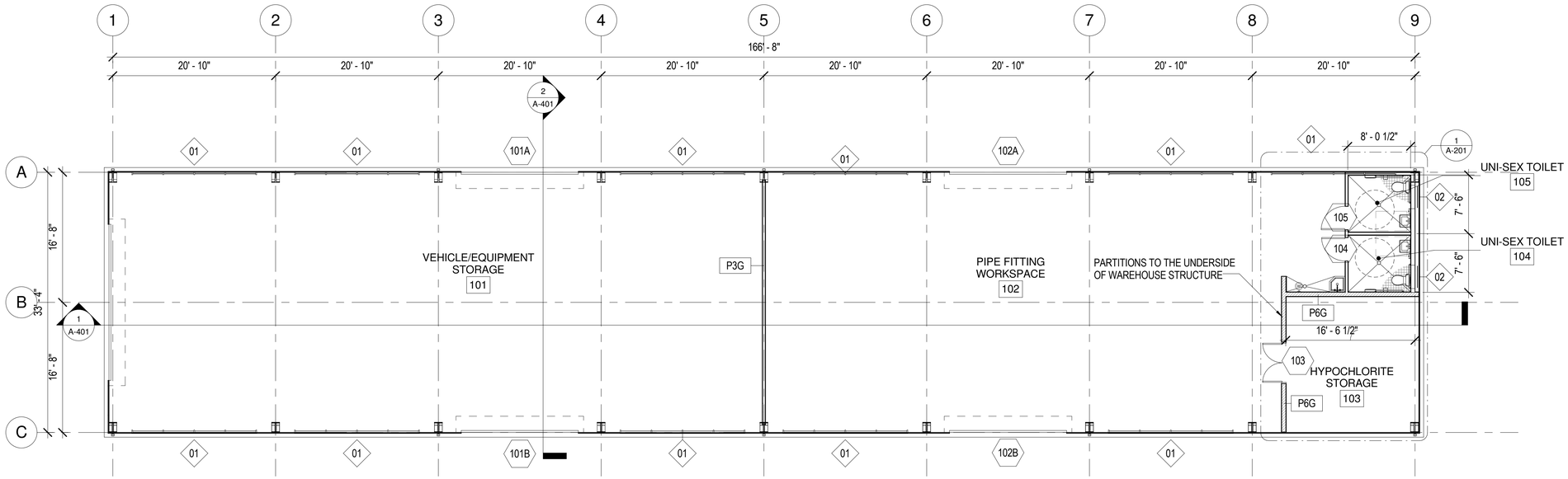
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
A-100
SHEET 73 OF 149

FILE	POCKET	FOLDER	NO.

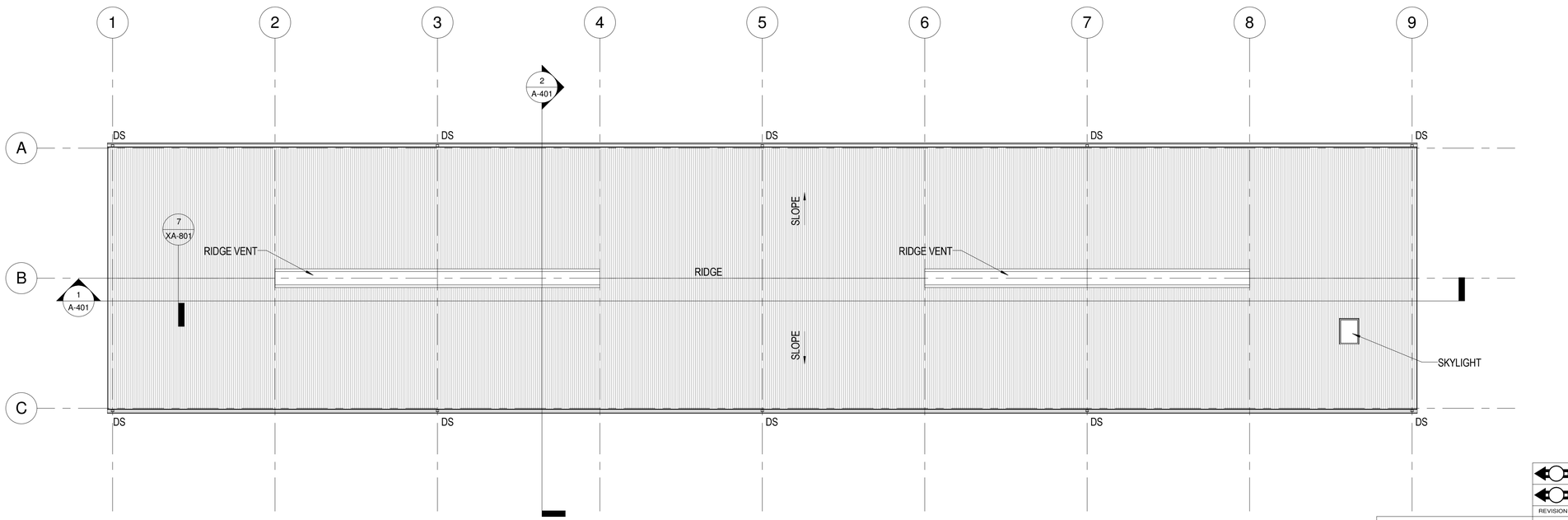
5/26/2018 4:44:28 PM

Name	Area
HYPOCHLORITE STORAGE	296 SF
UNI-SEX TOILET	58 SF
UNI-SEX TOILET	58 SF
PIPE FITTING WORKSPACE	2325 SF
VEHICLE/EQUIPMENT STORAGE	2788 SF
	5525 SF



1 FLOOR PLAN

SCALE: 1/8" = 1'-0"



2 ROOF PLAN

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'

N W NORTH E S

DWG. NO. A-101

SHEET 74 OF 149

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

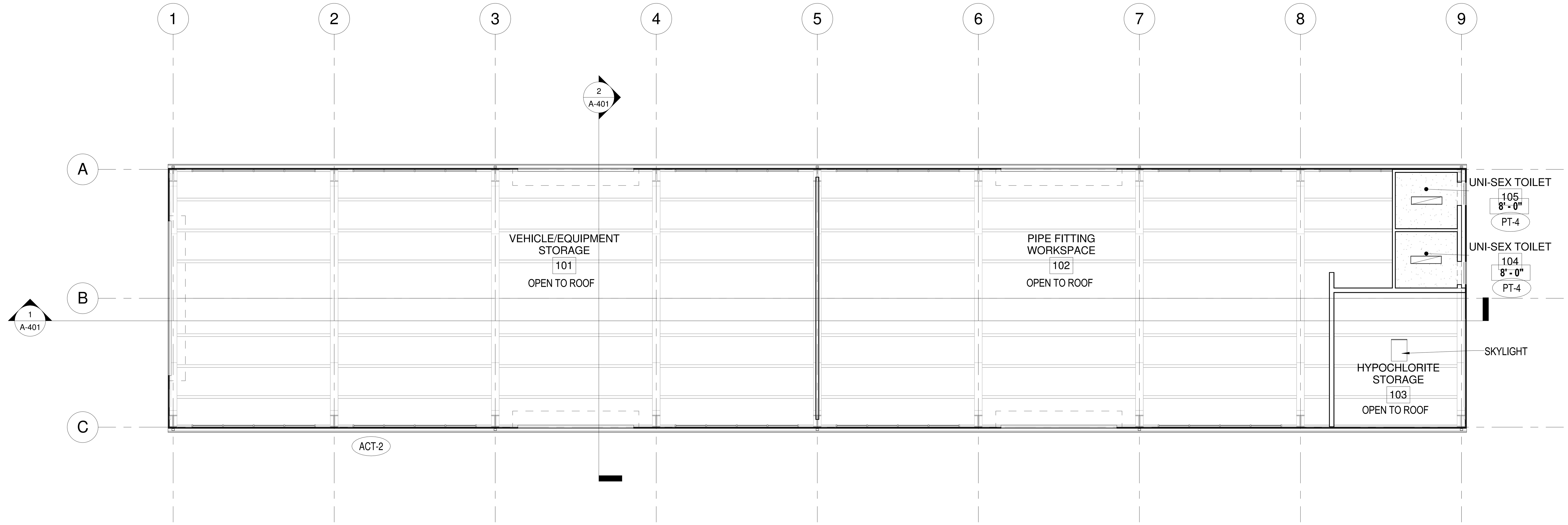
FLOOR PLAN

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

FILE	POCKET	FOLDER	NO.

5/26/2018 4:44:29 PM



1 REFLECTED CEILING PLAN

SCALE: 1/8" = 1'-0"

LEGEND

Symbol	Description
ACT-1	24" x 48" SUSPENDED ACOUSTICAL TILES
ACT-2 WASHABLE	24" x 48" SUSPENDED ACOUSTICAL TILES WHERE NOTED
PTD GYP BD	1 LAYER
	EXTERIOR SOFFIT BD
	2 X 4 RECESSED LAY-IN LIGHT FIXTURE
	2 X 2 RECESSED LAY-IN LIGHT FIXTURE
	TRACK LIGHT FIXTURE
	LINEAR PENDANT FIXTURE
	1 X 4 RECESSED FLUORESCENT
	6" RECESSED DOWNLIGHT
	6" RECESSED WALL WASHER
	4" DOWNLIGHT
	DECORATIVE SCONCE
	2 X 2 DIFFUSER
	LINEAR SLOT DIFFUSER

0' 8' 16' 32'

N W E S NORTH

REVISION	DATE	BRIEF	MADE BY	APPROVED

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REFLECTED CEILING PLAN

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DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

DWG. NO. A-102
SHEET 75 OF 149

04-23-18

FILE	POCKET	FOLDER	NO.

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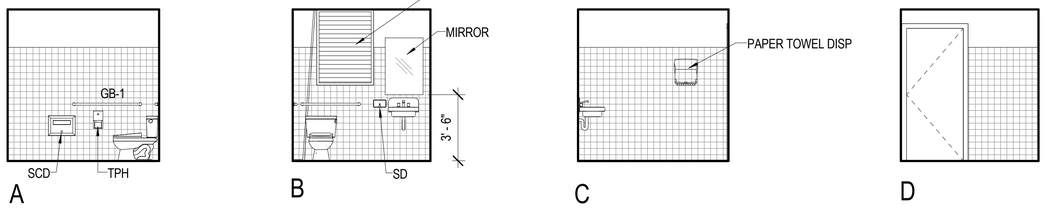
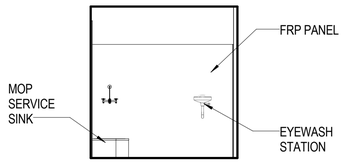


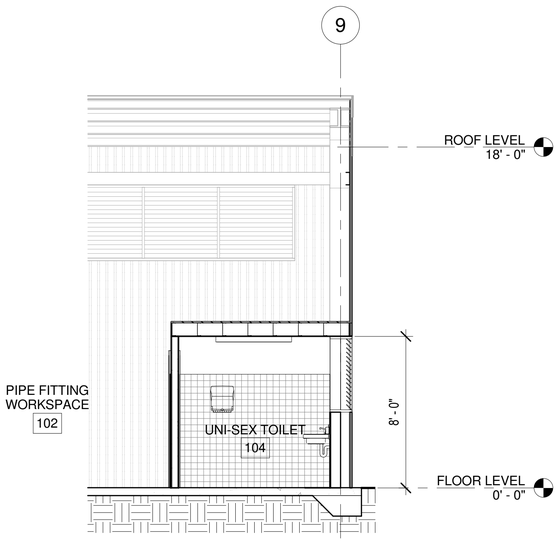
2 UNI-SEX TOILET 105

SCALE: 1/4" = 1'-0"



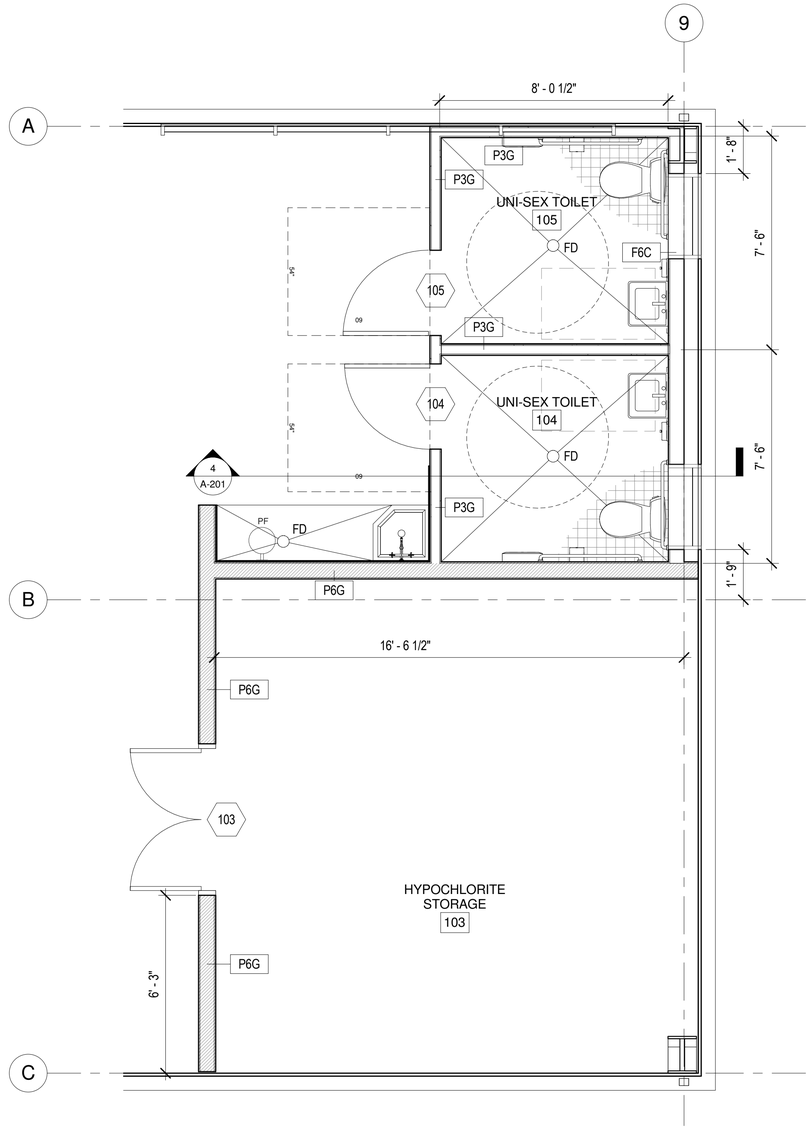
3 EYEWASH STATION

SCALE: 1/4" = 1'-0"



4 SECTION AT UNI-SEX TOILET

SCALE: 1/4" = 1'-0"



1 ENLARGED PLAN

SCALE: 3/8" = 1'-0"

0' 4' 8' 16'

A AA B BB C CC D DD

DWG. NO. A-201

SHEET 76 OF 149

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STATE OF HAWAII

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SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

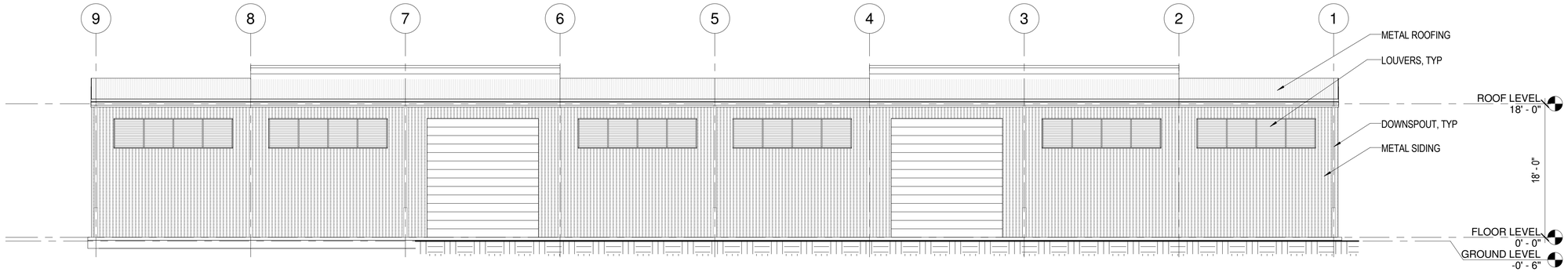
ENLARGED PLAN, INTERIOR ELEVATIONS, SECTIONS

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

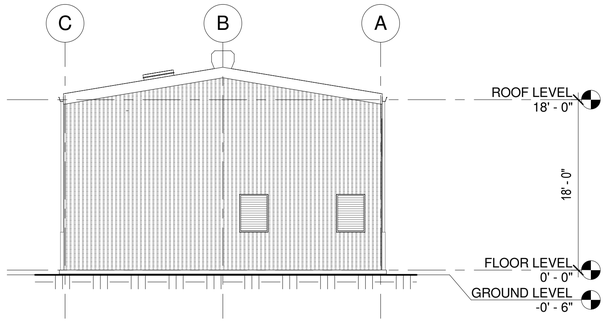
FILE	POCKET	FOLDER	NO.

5/26/2018 4:44:31 PM



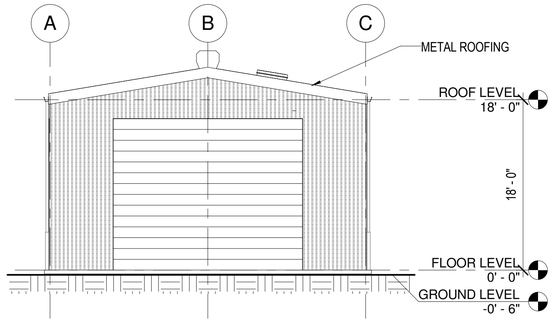
1 NORTH ELEVATION

SCALE: 1/8" = 1'-0"



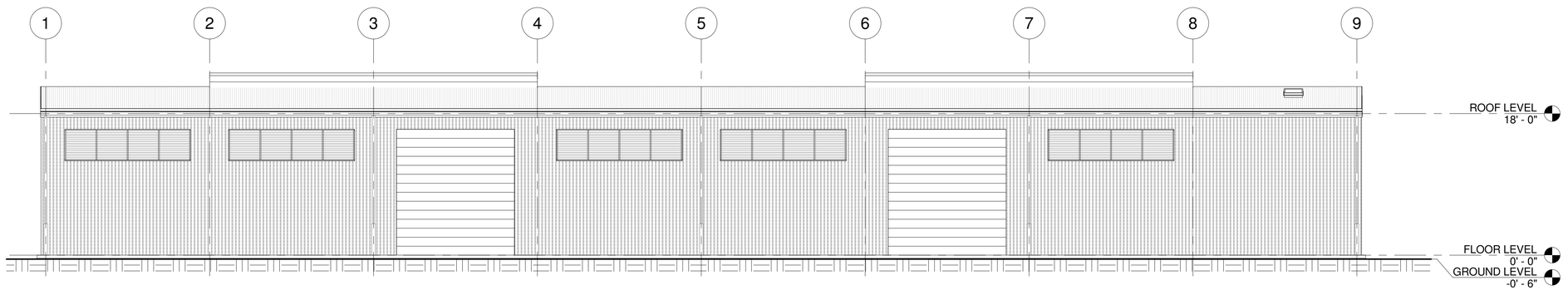
2 EAST ELEVATION

SCALE: 1/8" = 1'-0"



3 WEST ELEVATION

SCALE: 1/8" = 1'-0"



4 SOUTH ELEVATION

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'

REVISION	DATE	BRIEF	MADE BY	APPROVED

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

EXTERIOR ELEVATIONS

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

DWG. NO.
A-301
SHEET 77 OF 149

FILE	POCKET	FOLDER	NO.

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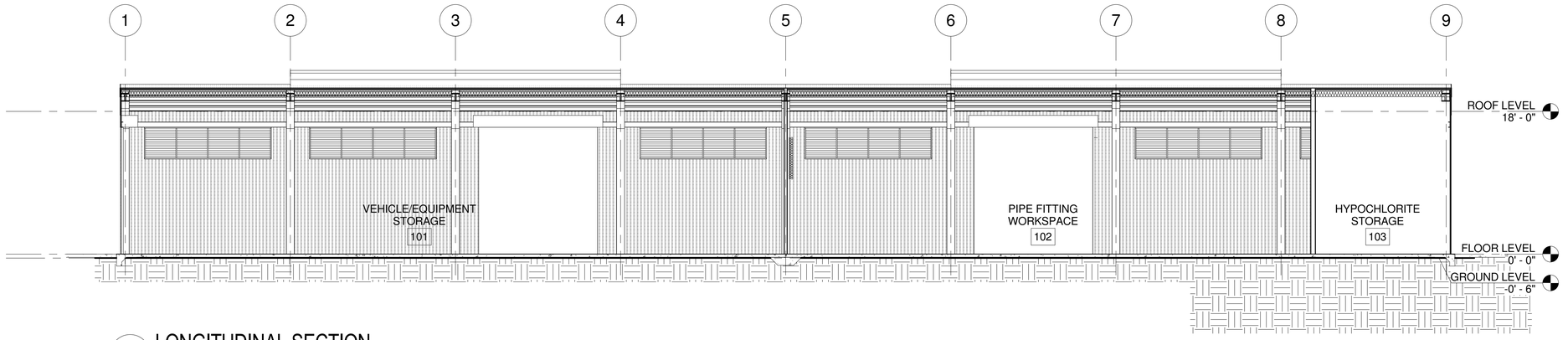
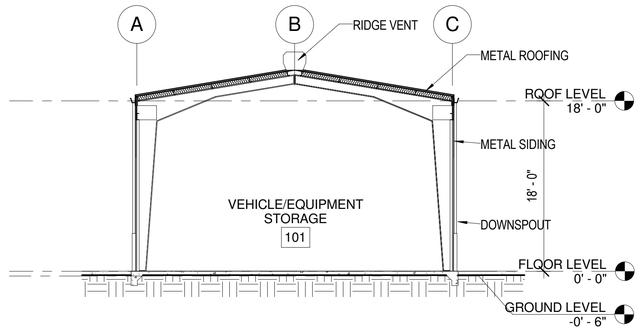


1 LONGITUDINAL SECTION

SCALE: 1/8" = 1'-0"



2 CROSS SECTION

SCALE: 1/8" = 1'-0"

0' 8' 16' 32'

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

BUILDING SECTIONS

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: G70

04-23-18

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
A-401
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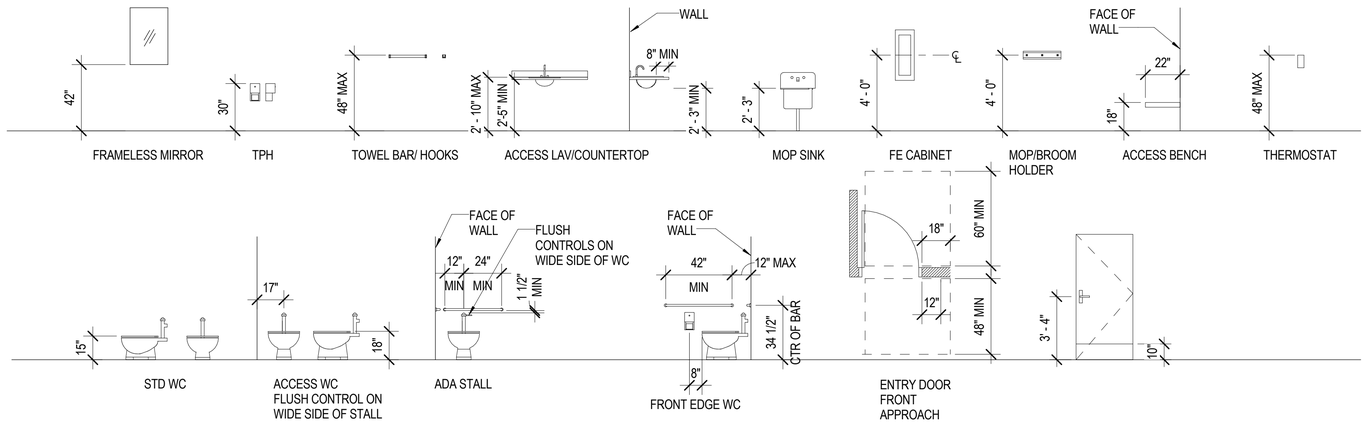
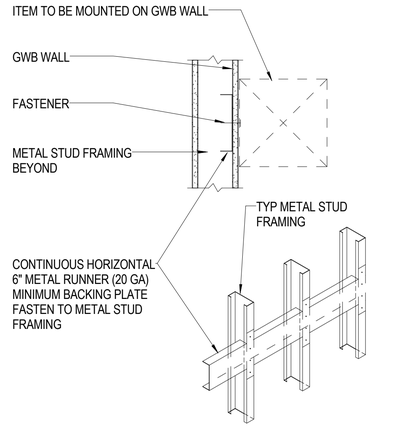


1 ADA STANDARDS/FIXTURE MOUNTING HEIGHTS

SCALE: 1/4" = 1'-0"

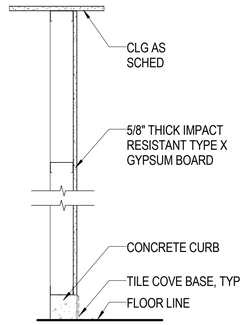


ISOMETRIC VIEW OF CONDITION OVER MULTIPLE STUDS

4 BACKING PLATE DETAIL

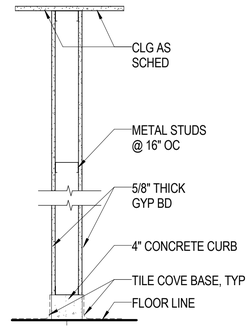
SCALE: 1 1/2" = 1'-0"

PARTITION TYPES



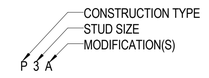
F6

FURRED CONDITIONS: VERIFY AND PROVIDE DEPTH FOR PLUMBING, STRUCTURAL AND/OR ELECTRICAL ELEMENT



P3G, P6G

LEGEND:



NOTE: BLANK INDICATES NO FIRE RATING

CONSTRUCTION TYPE
F- FURRING
P- BASIC PARTITION

STUD SIZE CODE
3 - 3 5/8" MET STUDS
6 - 6" MET STUDS

NOTE: BLANK INDICATES NO MODIFICATIONS

MODIFIERS
A - ACOUSTIC INSULATION
G - FULL HT GYP BD, BOTH SIDES

GENERAL NOTES:

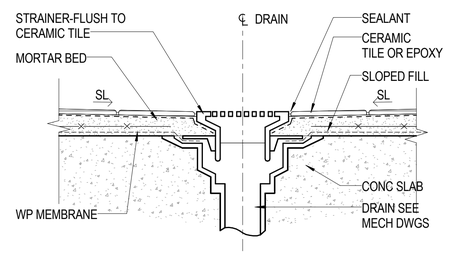
1. ALL GYPSUM BOARD : 5/8" THICK IMPACT RESISTANT TYPE X.

2. ALL PARTITIONS TO BE OF NON- COMBUSTIBLE CONSTRUCTION. . .

3. FOR ALL FIRE RATED PARTITIONS, THE FOLLOWING NOTES SHOULD APPLY:

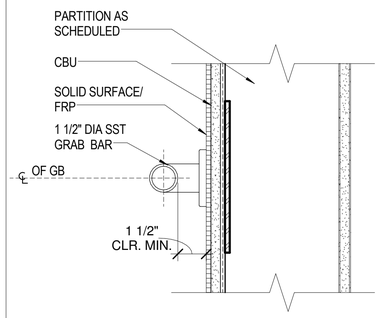
A. ANY WALL OUTLETS FOR DATA, VOICE, VIDEO, POWER OR OTHER UTILITIES SHOULD BE SEPARATED BY AT LEAST ONE STUD CAVITY HORIZONTALLY TO AVOID BACK-TO-BACK OUTLETS.

B. ELEC. PANEL BOARDS, FEC, EYE WASH, ETC SHALL BE WRAPPED WITH FIRE RESISTIVE MATERIAL TO MAINTAIN FIRE RESISTIVE CONSTRUCTION.



3 FLOOR DRAIN

SCALE: 3" = 1'-0"



2 GRAB BAR

SCALE: 3" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PARTITION TYPES, FIXTURE MOUNTING HEIGHTS, MISCELLANEOUS DETAILS

DESIGNED BY: JS CHECKED BY: RO DRAWN BY: GTO

04-23-18

DWG. NO.
A-601
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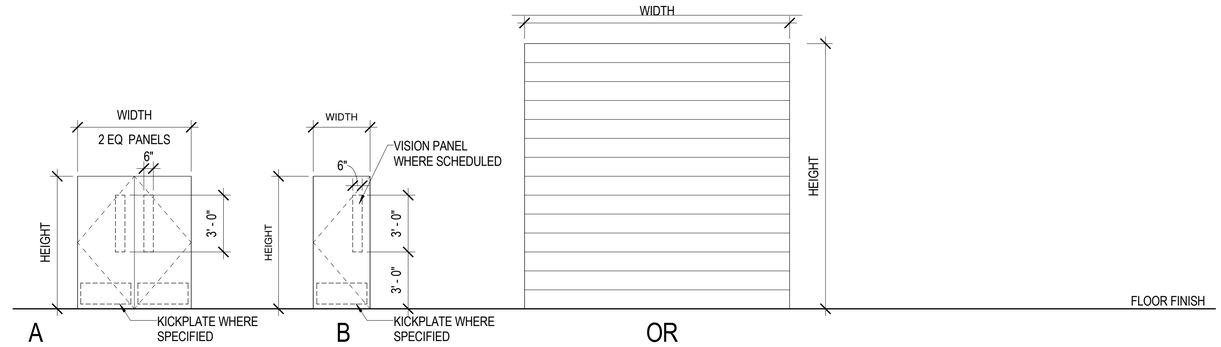
DOOR SCHEDULE

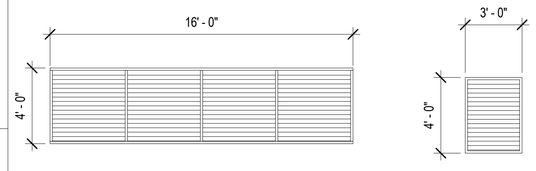
DOOR SCHEDULE												
MARK	WIDTH	HEIGHT	THICKNESS	DOOR TYPE	CONSTRUCTION	FINISH	HARDWARE GROUPS	FRAME MATERIAL	DET #/A-701 HEAD	DET #/A-701 JAMB	DET #/A-701 THRESHOLD	NOTE
101A	15' - 0"	16' - 0"	0' - 3"	OR								
101B	15' - 0"	16' - 0"	0' - 3"	OR								
102A	15' - 0"	16' - 0"	0' - 3"	OR								
102B	15' - 0"	16' - 0"	0' - 3"	OR								
103	5' - 0"	7' - 0"	0' - 1 3/4"	A2	FRP							
104	3' - 0"	7' - 0"	0' - 1 3/4"	B	WP	WP	007	MP	3	3	4	DOOR LOUVER
105	3' - 0"	7' - 0"	0' - 1 3/4"	B	WP	WP	007	MP	3	3	4	DOOR LOUVER
123	20' - 0"	16' - 0"	0' - 3"	OR								

DOOR TYPES



WINDOW TYPES

FOR WINDOW/LOUVER (SIM.) DETAILS SEE 4&5/A-802



L1 WITH INSECT SCREEN

L2 WITH INSECT SCREEN

DOOR REFERENCE NOTES

DOOR SCHEDULE HEADINGS WITH "( )" NUMBER IN PARENTHESIS CORRESPOND TO REFERENCE NOTES BELOW.

1. DOOR TYPES
OD - OVERHEAD COILING DOOR
F - FLUSH
FL - FLUSH W/ LOUVER
FV - FLUSH W/ VISION

2. DOOR CONSTRUCTION & FINISH:
FF - FACTORY FINISH
FRP - FIBERGLASS ON METAL-INSULATED CORE
HM - HOLLOW METAL, METAL PAINTED
WP - WOOD, PAINTED

3. FRAME CONSTRUCTION & FINISH:
SEE INTERIOR DRAWINGS FOR FINISH DESIGNATIONS.

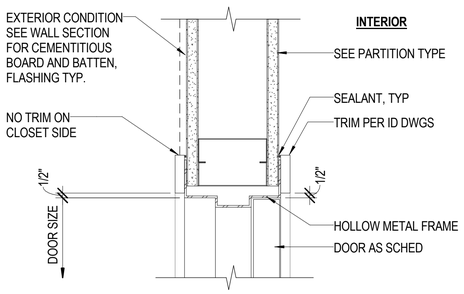
MP - METAL PAINTED

4. GLASS TYPES/LOUVER TYPES:

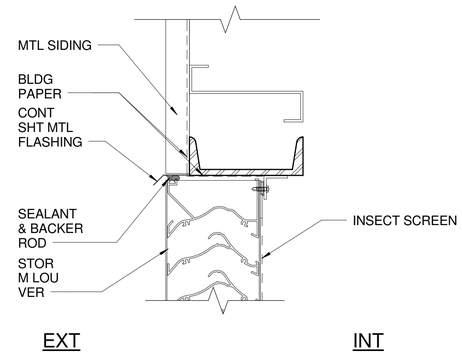
GLASS TYPES:
ALL GLASS SHALL BE AS SCHEDULED

TG - TEMPERED GLASS

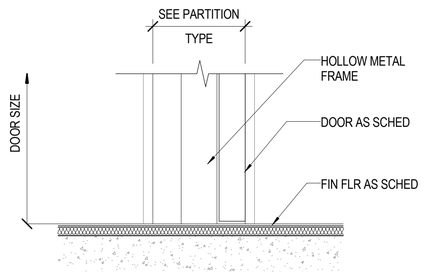
DOOR & LOUVER DETAILS



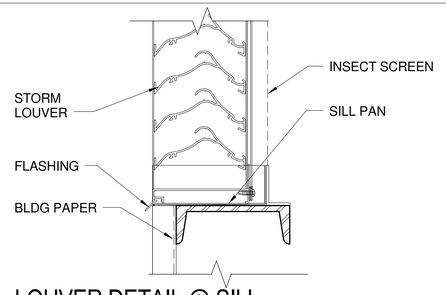
3 INT JAMB (HEAD SIM)
SCALE: 3" = 1'-0"



1 LOUVER DETAIL HEAD/JAMB (SIM)
SCALE: 3" = 1'-0"



4 INT DR THRESHOLD
SCALE: 3" = 1'-0"



2 LOUVER DETAIL @ SILL
SCALE: 3" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

DOOR SCHEDULE, DOOR DETAILS, WINDOW SCHEDULE, WINDOW DETAILS, FINISH SCHEDULE AND LEGEND

DESIGNED BY: JS CHECK DRAWN BY: G70

04-23-18

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. A-701
SHEET 80 OF 149

FILE	POCKET	FOLDER	NO.

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COLOR AND MATERIAL FINISH SCHEDULE

MARK	MATERIAL DESCRIPTION	MATERIAL MANUFACTURER	MATERIAL NAME	MATERIAL SIZE	MATERIAL NO/COLOR	MATERIAL FINISH	MATERIAL LOCATION USED/REMARKS
EXTERIOR FINISHES							
EXPT-1	EXTERIOR PAINT-WALLS	BENJAMIN MOORE	PAINT		BEIGE SUPREME	EGG SHELL	WALLS
EXPT-2	EXTERIOR PAINT-TRIM	BENJAMIN MOORE	PAINT		GOLDEN YELLOW	EGG SHELL	
EXPT-3	EXTERIOR PAINT-WINDOW/DOOR TRIM	BENJAMIN MOORE	PAINT		OCHER	EGG SHELL	
FLOORING							
CPT	CARPET TILE	SHAW	PATCRAFT	24" X 24"	BIG SPLASH MODULAR	202	OFFICE
CT-1	CERAMIC TILE-FLOORS	DAL TILE	KEYSTONES	1"X1" MESH			COVE BASE
SC	SEALED CONCRETE	-	-		-		PROVIDE SEALER
WALLS							
CT-2	CERAMIC TILE-WALLS	DAL TILE	KEYSTONES	4" X 4"			ACCENT STRIP
FRP	FIBERGLASS REIFORCED PLASTIC	MARLITE	INDURO	PANEL	4143 NEUTRAL GLACE		KITCHEN WALLS
GT-3	BATROOM WALLS	MAIPEI COMMERCIAL	GRAY				PROVIDE SEALER
PT-1	PAINT-WALLS	BENJAMIN MOORE	PAINT	-		EGG SHELL	WALLS
PT-2	PAINT-CEILING	BENJAMIN MOORE	PAINT	-		EGG SHELL	CEILING
PT-3	PAINT-CEILING BATHROOMS	BENJAMIN MOORE	PAINT	-		SEMI-GLOSS	CEILING-BATHROOMS
PT-4	PAINT-DOORS/FRAMES	BENJAMIN MOORE	PAINT	-		SEMI-GLOSS	DOORS/FRAMES
PT-5	PAINT-TRIM	BENJAMIN MOORE	PAINT	-		SEMI-GLOSS	TRIM

NOTE: ALL MANUFACTUERS LISTED ARE ALLOWED TO BE SUBSTITUTED WITH EQUAL MATERIAL OR BETTER

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME/DESCRIPTION	FLOOR	BASE	WALL	CEILING
101	VEHICLE/EQUIPMENT STORAGE	SC	-	PT-1	PT-2
102	PIPE FITTING WORKSPACE	SC	-	PT-1	PT-2
103	HYPOCHLORITE STORAGE	SC	RB-3	FRP	PT-2
104	UNI-SEX TOILET	CT-1/GT-1	CT-1/GT-1	CT-2/GT-3	PT-3
105	UNI-SEX TOILET	CT-1/GT-1	CT-1/GT-1	CT-2/GT-3	PT-3

NOTE: SCHEDULED FINISHES EXTEND INTO CLOSETS WITHIN ROOMS

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

COLOR AND MATERIAL FINISH SCHEDULE, ROOM FINISH SCHEDULE

DESIGNED BY: Designer CHECKED BY: Checker DRAWN BY: Author

04-23-18

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GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE BUILDING CODE THE COUNTY OF MAUI (LATEST).

2. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE 2002 WATER SYSTEM STANDARDS.

3. THE GENERAL NOTES AND TYPICAL DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN.

4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.

6. CIVIL PLANS ARE CONSIDERED A PART OF THE STRUCTURAL DESIGN DRAWINGS AND ARE TO BE USED TO DEFINE DETAIL CONFIGURATIONS INCLUDING, BUT NOT LIMITED TO RELATIVE LOCATION OF MEMBERS, ELEVATIONS, LOCATION OF ALL OPENINGS, ETC.

7. SEE CIVIL DRAWINGS FOR FINISH FLOOR ELEVATION, ETC.

8. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF THE JOB AND NOTIFY ALL DISCREPANCIES TO THE ENGINEER.

9. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS AND/OR SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.

10. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND THE PROTECTION OF ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY ORDINANCES.

11. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA PRIOR TO ERECTION.

12. THE CONTRACTOR SHALL TAKE ALL STEPS NECESSARY TO PROPERLY ALIGN THE STRUCTURE.

13. SHOP DRAWINGS REQUIRED BY THE SPECIFICATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION.

14. ALL REQUESTS BY THE CONTRACTOR TO CHANGE WHAT IS SHOWN IN THE CONTRACT DOCUMENTS MUST BE SUBMITTED IN WRITING TO THE ENGINEER FOR REVIEW AND APPROVAL.

FOUNDATION

1. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL ENGINEERING EXPLORATION REPORT TITLED 'GEOTECHNICAL ENGINEERING EXPLORATION - SITE NO. 1 AND SITE NO. 7 - DHHL MOLOKAI PROJECTS - ISLAND OF MOLOKAI, HAWAII - W.O. 7470-00' PREPARED BY GEOLABS, INC. AND DATED AUGUST 15, 2017. THIS REPORT SHALL BE MADE PART OF THESE DRAWINGS BY REFERENCE. A COPY OF THIS GEOTECHNICAL REPORT SHALL BE KEPT ON SITE DURING CONSTRUCTION.

2. THE AREA BELOW THE WATER TANK FOOTPRINT AND TWO FEET BEYOND THE EDGE OF THE WATER TANK SHALL BE OVEREXCAVATED A MINIMUM OF TWO FEET BELOW THE 12" THICK LAYER OF AGGREGATE SUBBASE AND BACKFILLED WITH STRUCTURAL FILL COMPACTED TO A MINIMUM OF 95 PERCENT RELATIVE COMPACTION. THIS TWO FEET OVEREXCAVATION SHALL BE FURTHER EVALUATED BY THE PROJECT GEOTECHNICAL ENGINEER BASED ON THE ACTUAL EXPOSED SUBGRADE CONDITIONS DURING CONSTRUCTION.

3. THE FOOTINGS AND SLAB ON GRADE SHALL BEAR ON 12" THICK LAYER OF AGGREGATE SUBBASE OVER RECOMPACTED ON-SITE SOILS OR NEW COMPACTED FILL MATERIAL. THIS AGGREGATE SUBBASE SHALL EXTEND A MINIMUM OF TWO FEET BEYOND THE EDGES OF THE TANK.

4. REFER TO GEOTECHNICAL REPORT FOR REQUIREMENTS OF STRUCTURAL FILL. STRUCTURAL FILL SHALL BE APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER BEFORE TRANSPORTING THE FILL TO THE SITE.

5. ALL FOOTINGS SHALL BE BOTTOMED A MINIMUM OF 24" BELOW THE LOWEST ADJACENT GRADE. FOOTINGS SHALL BE EMBEDDED TO PROVIDE A MINIMUM HORIZONTAL SETBACK OF 6 FEET MEASURED FROM THE OUTSIDE EDGE OF BOTTOM OF FOOTING TO THE SLOPE FACE.

6. ALL WATER, MUD AND DEBRIS SHALL BE REMOVED FROM THE BOTTOM OF FOOTING EXCAVATIONS PRIOR TO THE PLACEMENT OF CONCRETE.

7. THE BOTTOM OF ALL FOOTING TRENCHES SHALL BE OBSERVED BY A REPRESENTATIVE OF GEOLABS TO CONFIRM BEARING CONDITIONS AND REQUIRED EMBEDMENT DEPTHS PRIOR TO PLACING REINFORCING STEEL OR CONCRETE.

PROBING AND GROUTING

1. SUB SURFACE CAVITIES AND/ OR VOIDS ARE COMMONLY FOUND IN BASALTIC LAVA FORMATIONS. TO MITIGATE THE EFFECTS OF THESE VOIDS A SYSTEM OF PROBING AND GROUTING SHALL BE IMPLEMENTED AT ALL WALL AND SPOT FOOTINGS TO DETECT THE PRESENCE OF SUBSURFACE VOIDS.

2. 3 INCH MINIMUM DIAMETER PROBE HOLES SHALL BE DRILLED ALONG THE PERIMETER WALL FOOTINGS AT MAXIMUM SPACING OF 10 FEET ON CENTER AND BELOW THE CENTER OF EACH SPOT FOOTING. THE PROBES SHALL EXTEND TO A MINIMUM DEPTH OF 10 FEET BELOW THE BOTTOM OF FOOTINGS

3. IF SUBSURFACE VOIDS ARE ENCOUNTERED OR SUSPECTED THE CONTRACTOR SHALL DRILL ADDITIONAL PROBES AS DIRECTED BY THE PROJECT GEOTECHNICAL ENGINEER TO DETERMINE THE EXTENT OF THE SUBSURFACE VOID.

4. SUBSURFACE VOIDS AND PROBE HOLES SHALL BE FILLED WITH CONTROLLED LOW STRENGTH MATERIAL (CLSM) WITH A SLUMP BETWEEN 6 TO 9 INCHES OR SAND-CEMENT GROUT WITH A SLUMP BETWEEN 6 TO 9 INCHES. CONTRACTOR SHALL PROVIDE A UNIT PRICE FOR PROBING AND GROUTING IN HIS BID.

5. PROBING AND GROUTING OPERATIONS SHALL BE CONDUCTED UNDER THE OBSERVATION OF A GEOLABS REPRESENTATIVE TO ALLOW FOR ADDITIONAL RECOMMENDATIONS IF CHANGED CONDITIONS ARE OBSERVED.

6. IMPLEMENTATION OF THE FOUNDATION PROBING AND GROUTING OPERATION SHALL BE FURTHER EVALULATED BY THE PROJECT GEOTECHNICAL ENGINEER AFTER COMPLETION OF A SITE SPECIFIC EXPLORATION PROGRAM BY THE CONTRACTOR AT THE WATER TANK LOCATION.

CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318-05.

2. ALL MIXES FOR CONCRETE WALLS, SLABS/ FOUNDATION, COLUMNS AND ROOF SLAB SHALL CONTAIN 64 OZ. OF MASTERLIFE SRA 035 PER CUBIC YARD OF CONCRETE (REDUCES CONCRETE SHRINKAGE) AND MASTERLIFE 300D (INTEGRAL WATERPROOFING ADMIXTURE) AT A RATE OF 2% OF CEMENT MASS .

3. ALL CONCRETE UNLESS OTHERWISE NOTED SHALL BE NORMAL WEIGHT HARD ROCK TYPE (150 #/CUFT.). AGGREGATES SHALL CONFORM TO ASTM C-33. MAXIMUM WATER-CEMENT RATIO SHALL NOT EXCEED 0.55.

4. UNLESS OTHERWISE NOTED, CONCRETE SHALL BE AS FOLLOWS:

ITEM	CLASS
FOOTING	DW3500
FLOOR SLAB AND PIPE JACKETS	DW3500
COLUMN	DW4000
WALL	DW4000
ROOF SLAB	DW4000

THE BOTTOM 4 1/2" WALL AND FIRST 4 1/2" ABOVE THE HORIZONTAL CONSTRUCTION JOINT SHALL BE CLASS DW3000M CONCRETE.

5. ONE SET OF FIELD SAMPLES OF EACH CLASS OF CONCRETE PLACED EACH DAY SHALL BE TAKEN NOT LESS THAN ONCE A DAY, NOR LESS THAN ONCE FOR EACH 50 CUBIC YARDS, NOR LESS THAN ONCE FOR EACH 2000 SQUARE FEET OF SURFACE AREA FOR SLABS OR WALLS. ONE SET OF FIELD SAMPLES SHALL CONSIST OF 3 TEST CYLINDERS AND ONE SLUMP TEST. TEST CYLINDERS SHALL BE MADE AND CURED IN ACCORDANCE WITH ASTM C 31 AND TESTED IN ACCORDANCE WITH ASTM C 39. SLUMP TESTS SHALL BE MADE IN ACCORDANCE WITH ASTM C143.

6. CONCRETE SHALL BE PLACED INTO ITS FINAL POSITION WITHIN 90 MINUTES AFTER THE INTRODUCTION OF THE MIXING WATER TO THE CEMENT AND AGGREGATES PER ASTM C 94. AFTER 90 MINUTES HAS ELAPSED, THE SPECIAL INSPECTOR SHALL HAVE THE RIGHT TO REJECT THE CONCRETE BATCH. AFTER 150 MINUTES HAS ELAPSED, NO CONCRETE SHALL BE PLACED.

7. PIPES OTHER THAN ELECTRICAL CONDUITS SHALL NOT BE EMBEDDED IN STRUCTURAL CONCRETE EXCEPT WHERE SPECIFICALLY APPROVED.

8. CONCRETE SHALL BE MAINTAINED IN A MOIST CONDITION FOR A MINIMUM OF FIVE (5) DAYS AFTER PLACEMENT. ALTERNATE METHODS WILL BE APPROVED IF SATISFACTORY PERFORMANCE CAN BE ASSURED.

9. UNLESS OTHERWISE INDICATED, SLABS AND BEAMS SHALL BE SHORED 28 DAYS AFTER POURING OR UNTIL THEY HAVE ATTAINED THEIR SPECIFIED DESIGN STRENGTH. NO CONSTRUCTION LOADS EXCEEDING 60% OF THE DESIGN LIVE LOADS SHALL BE SUPPORTED ON ANY UNSHORED PORTION OF THE STRUCTURE.

10. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" UNLESS NOTED OTHERWISE.

11. FORMS FOR SLABS AND BEAMS SHALL BE PRECAMBERED L/240 FOR CANTILEVERS AND L/480 FOR OTHER SPANS WHERE 'L' IS EQUAL TO THE SPAN.

12. ALL INSERTS, ANCHOR BOLTS, PLATES AND OTHER ITEMS EMBEDDED IN CONCRETE SHALL BE GALVANIZED UNLESS OTHERWISE NOTED.

13. VERIFY LOCATIONS AND DIMENSIONS OF SLOTS, ANCHORS, DUCTS, ETC., BEFORE POURING CONCRETE.

14. REINFORCEMENT, ANCHOR BOLTS, REGLETS, DOWELS AND ALL OTHER EMBEDDED ITEMS SHALL BE POSITIVELY SECURED BEFORE POURING.

15. CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER PLACEMENT OF ALL INSERTS, ANCHOR BOLTS, PLATES, REGLETS, ETC.

16. LOCATIONS OF ALL VERTICAL CONSTRUCTION JOINTS IN SLABS, OR COLUMNS SHALL BE COORDINATED WITH AND APPROVED BY THE ENGINEER.

17. HORIZONTAL CONSTRUCTION JOINTS SHALL BE RAKED CLEAN AND LAITANCE REMOVED BEFORE NEXT POUR.

18. VERTICAL CONSTRUCTION JOINTS SHALL BE THOROUGHLY CLEANED AND WETTED BEFORE POUR.

19. SAWED CONCRETE CONTROL JOINTS FOR SLABS ON GRADE AS SHOWN ON THE DRAWINGS SHALL BE CUT AS SOON AS POSSIBLE AFTER FINISHING WITHOUT POPPING THE AGGREGATE BUT NOT MORE THAN 8 HOURS AFTER FINISHING.

20. WHEN NEW CONCRETE IS POURED AGAINST EXISTING CONCRETE, THE EXISTING CONTACT SURFACE SHALL BE CLEANED AND ROUGHENED. IMMEDIATELY PRIOR TO PLACING THE NEW CONCRETE, AN APPROVED BONDING AGENT SHALL BE APPLIED TO THE CONTACT SURFACE.

21. WHEN REBARS OR THREADED RODS ARE DRILLED AND GROUTED IN PLACE USE SIMPSON EPOXY-TIE ADHESIVE. HOLE DIAMETER SHALL BE AS PER MANUFACTURER'S RECOMMENDATIONS. HOLES SHALL BE BRUSHED AND AIR BLOWN TO REMOVE LOOSE PARTICLES. MANUFACTURER'S REPRESENTATIVE SHALL BE PRESENT TO SUPERVISE INSTALLATION OF FIRST BAR OR ROD.

REINFORCING STEEL

1. ALL REINFORCING STEEL EXCEPT TIES, STIRRUPS AND WELDED BARS SHALL CONFORM TO ASTM A615 GRADE 60. TIES AND STIRRUPS SHALL CONFORM TO ASTM A615 GRADE 40. IN GENERAL WELDED BARS SHALL BE ASTM A615 GRADE 40. THE ENGINEER SHALL APPROVE ALL BARS TO BE WELDED.

2. UNLESS OTHERWISE NOTED, SPLICES, LAPS, DOWEL EXTENSIONS AND EMBEDMENTS SHALL BE 45 BAR DIAMETERS MINIMUM.

3. ALL REINFORCING BARS MARKED CONTINUOUS (CONT.) ON THE PLANS SHALL BE LAPPED 45 BAR DIAMETERS MINIMUM.

4. BENDS NOT DIMENSIONED SHALL BE STANDARD HOOKS.

5. STAGGER ALL SPLICES WHERE POSSIBLE. WALL CIRCUMFRENTIAL REINFORCING SPLICES SHALL BE STAGGERED HORIZONTALLY NOT LESS THAN THREE FEET. SPLICES IN A VERTICAL ARRAY SHALL NOT BE CLOSER THAN EVERY THIRD REBAR.

6. WELD SPLICE SHALL BE CAPABLE OF DEVELOPING 125% OF THE SPECIFIED YIELD STRENGTH OF THE BAR IN TENSION.

7. ALL WELDING OF REINFORCING SHALL CONFORM TO "STRUCTURAL WELDING CODE - REINFORCING STEEL" (AWS D1.4).

8. WELDED WIRE FABRIC SHALL BE GALVANIZED AND CONFORM TO ASTM A-185.

9. LAP OUTERMOST CROSS WIRES OF EACH SHEET OF WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2" MINIMUM.

10. REBARS SHALL BE SUPPORTED ON METAL 'CHAIRS', BENT AND PLACED AS PER "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES" ACI 315 (LATEST).

11. MINIMUM COVER IN INCHES FOR REBARS FOR CAST-IN-PLACE CONCRETE:

CONCRETE CAST AGAINST EARTH	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:	
#5 AND SMALLER	1-1/2"
#6 AND LARGER	2"
CONCRETE NOT EXPOSED TO EARTH OR WEATHER:	
SLABS, WALLS, AND JOISTS	3/4"
BEAMS AND COLUMNS	1-1/2"

12. AT TIME CONCRETE IS PLACED, REINFORCING SHALL BE FREE FROM MUD, OIL, LAITANCE OR OTHER COATINGS ADVERSELY AFFECTING BOND CAPACITY.

13. BEFORE THE POUR THE GENERAL CONTRACTOR SHALL INSPECT THE PLACED REINFORCING TO INSURE CONFORMANCE TO THE DRAWINGS. ALL DISCREPANCIES SHALL BE CORRECTED PRIOR TO POURING.

METAL FRAMES AND COVERS

1. METAL FRAMES AND COVERS SHALL BE STAINLESS STEEL. ANCHOR BOLTS WELDED TO STAINLESS STEEL FRAMES SHALL BE STAINLESS STEEL.

RESERVOIR

1. ALL INTERSECTION AND SPLICES OF RUBBER WATERSTOPS SHALL BE JOINED BY VULCANIZATION OR OTHER APPROVED MEANS TO FORM A WATERTIGHT CONNECTION.

2. ONCE THE RESERVOIR FLOOR IS POURED, 6" +/- OF WATER SHALL BE MAINTAINED IN THE RESERVOIR FOR THE REMAINDER OF THE PROJECT.

3. ALL EXTERIOR RESERVOIR SURFACES SHALL BE PAINTED. ALL INTERIOR RESERVOIR WALL, COLUMNS AND FLOOR SURFACES SHALL BE COATED WITH A NSF APPROVED PAINT AS SPECIFIED IN THE WATER SYSTEM STANDARDS. COLOR SELECTION BY DWS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

GENERAL NOTES

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
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MAY 2018

DWG. NO. ST001
SHEET 82 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018

DESIGN CRITERIA

1. CODES: 2012 INTERNATIONAL BUILDING CODE
ACI 318-11 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
WATER SYSTEM STANDARDS STATE OF HAWAII 2002
ACI 350.3 SEISMIC DESIGN OF LIQUID CONTAINING CONCRETE STRUCTURES

2. FOUNDATION DESIGN CRITERIA

ALLOWABLE BEARING PRESSURE	3,000 PSF
PASSIVE RESISTANCE PRESSURE	350 PCF
COEFFICIENT OF FRICTION	0.5

3. SEISMIC LATERAL FORCES

SITE CLASS	D
RISK CATEGORY	IV
ESSENTIAL FACILITIES	
SEISMIC DESIGN CATEGORY	D
SEISMIC IMPORTANCE FACTOR	1.5
MAPPED SPECTRAL RESPONSE	
S_s	0.785
S_1	0.204
S_{DS}	0.617
S_{D1}	0.272
RESPONSE MODIFICATION FACTOR	8.0
SPECIAL REINFORCED CONCRETE MOMENT FRAME	

4. WIND FORCES

BASIC WIND SPEED	145
ULTIMATE 3 SECOND GUST	
WIND DIRECTIONALITY FACTOR K_d	0.80
WIND TOPOGRAPHIC FACTOR K_{zt}	1.7
EXPOSURE	C

5. LIVE LOADS

ROOF	20 PSF

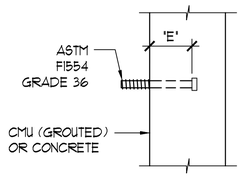
SPECIAL INSPECTION

1. ITEMS REQUIRING SPECIAL INSPECTION:
REINFORCING STEEL
CONCRETE (2006 IBC TABLE 1704.4)
EPOXY DOWELS (CONTINUOUS)

2. NOTIFY SPECIAL INSPECTOR 4 WORKING DAYS PRIOR TO NEED OF INSPECTION SERVICES.

3. THE CONTRACTOR SHALL BE FAMILIAR with THE SPECIAL INSPECTION REQUIREMENTS INCLUDING THE IDENTITY AND CONTACT INFORMATION OF THE SPECIAL INSPECTOR RESPONSIBLE FOR EACH REQUIREMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE SPECIAL INSPECTOR IN A TIMELY MANNER IF SPECIAL INSPECTIONS ARE NOT DONE THE CERTIFICATE OF OCCUPANCY MAY NOT BE ISSUED BY THE COUNTY.

BOLT SIZE	MINIMUM EMBEDMENT 'E'
1/2"ϕ	4"
5/8"ϕ	4"
3/4"ϕ	5"
7/8"ϕ	6"
1"ϕ	7"



NOTE:

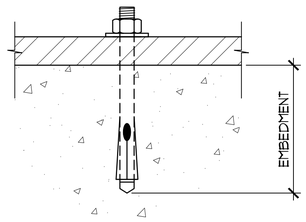
1. GROUT ALL CELLS W/ A.B. (ANCHOR BOLTS) FULL HEIGHT.
2. UNLESS NOTED OTHERWISE THESE ANCHOR BOLT DETAILS SHALL APPLY

TYP. ANCHOR BOLT DET. — A / ST102

SC: 3/4" = 1'-0"

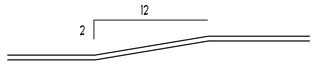
ANCHOR DIAMETER	HOLE DIAMETER	MINIMUM EMBEDMENT
1/2"	1/2"	4"
5/8"	5/8"	4"
3/4"	3/4"	4"

NOTES:
A. PRE APPROVAL FOR DYNABOLT SLEEVE ANCHOR MANUFACTURED BY ITW RAMSET/REDHEAD.
B. ANCHOR SHALL BE INSTALLED IN CONCRETE OR SOLID GROUT MASONRY.
C. ANCHOR ARE TYPE A304 STAINLESS STEEL UNLESS NOTED OTHERWISE.
D. DRILL HOLE WITH CARBIDE TIPPED HAMMER DRILL BITS COMPLYING TO ANSI B212.15-1994.

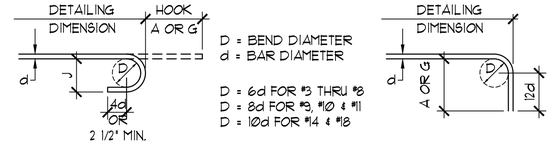


SLEEVE ANCHOR DETAIL — B / ST101

NOT TO SCALE



TYP. BAR OFFSET



AT 180 DEGREE BENDS — AT 90 DEGREE BENDS

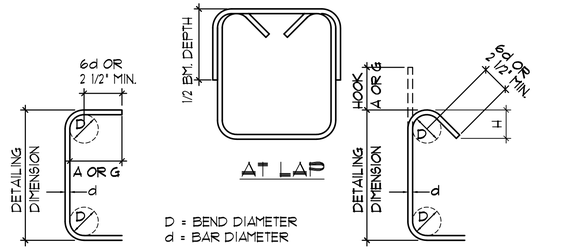
BAR SIZE	DIMENSION OF STD. 180 DEGREE HOOKS, ALL GRADES			DIMENSION OF STD. 90 DEGREE HOOKS, ALL GRADES	
	A OR G	J	D	A OR G	D
#3	5"	3"	2 1/4"	6"	2 1/4"
#4	6"	4"	3"	8"	3"
#5	7"	5"	3 3/4"	10"	3 3/4"
#6	8"	6"	4 1/2"	12"	4 1/2"
#7	10"	7"	5 1/4"	14"	5 1/4"
#8	11"	8"	6"	16"	6"
#9	15"	11 1/4"	9"	19"	9"
#10	17"	12 3/4"	10 1/4"	22"	10 1/4"
#11	19"	14 1/4"	11 1/4"	24"	11 1/4"
#14	26"	20 1/2"	17"	31"	17"
#18	35"	27"	22 3/4"	41"	22 3/4"

NOTE:

1. WHEN AVAILABLE DEPTH IS LIMITED, #3 THRU #11 GRADE 40 BARS HAVING 180 DEGREE HOOKS MAY BE BENT WITH D = 5d AND CORRESPONDINGLY SMALLER A AND J DIMENSIONS.
2. ALL BARS SHALL BE BENT COLD.

TYP. REBAR BENDING DETAIL — C / ST101

NOT TO SCALE



AT 90 DEGREE BENDS — AT 135 DEGREE BENDS

BAR SIZE	D	90 DEGREE HOOK: HOOK A OR G	135 DEGREE HOOK: HOOK A OR G	135 DEGREE HOOK: H APPROX.
#3	1 1/2"	4"	6"	2 1/4"
#4	2"	4 1/2"	8"	3"
#5	2 1/2"	6"	10"	3 3/4"

NOTE:

1. 135 DEGREE COLUMN TIE HOOKS MAY NOT BE BENT TO LESS THAN DIAMETER OF COLUMN VERTICAL BAR ENCLOSED IN HOOK.
2. THIS DETAIL SHALL APPLY TO GRADE 40, 50 & 60.
3. ALL BARS SHALL BE BENT COLD.

TYP. STIRRUP & TIE DETAIL — D / ST101

NOT TO SCALE

0' 1' 2' 3' 4'
3/4" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

ADRIAN C.M. LEE — LICENSED PROFESSIONAL ENGINEER — No. 9164-S — HAWAII, U.S.A.

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USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

NOTES AND TYPICAL DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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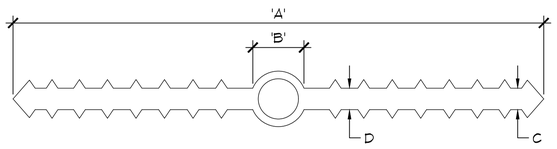
MAY 2018

DWG. NO. ST101
SHEET 83 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018



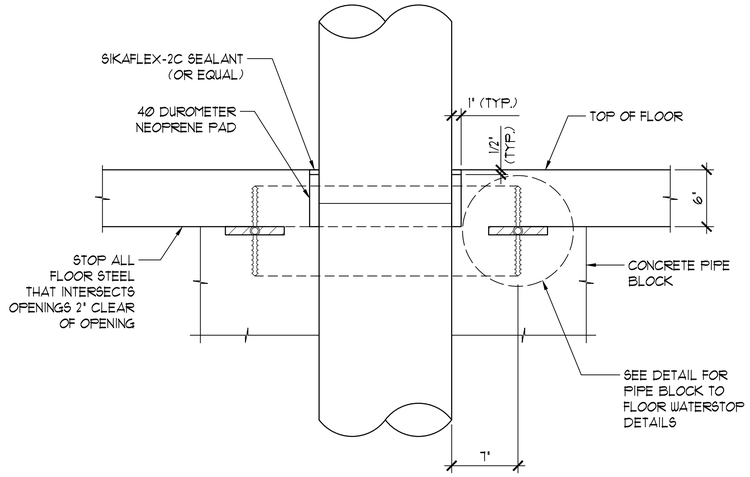
LOCATION	A	B	C	D	VINYLEX	GREEN-STREAK
FLOOR TO PIPE BLOCKS	6'	7/16" OR 1"	3/8"	3/8"	RB6-36H	732

WATER STOP NOTES:
1. ALL SPLICES SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

WATERSTOP SCHEDULE

NTS

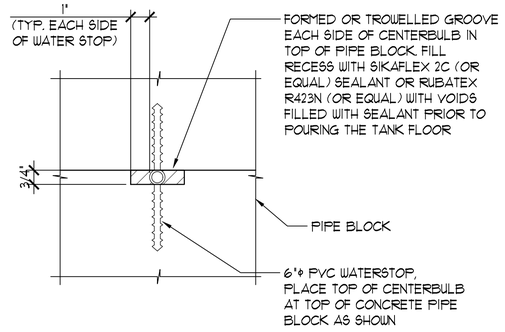
A
ST102



TYPICAL PIPE ENTRANCE THROUGH FLOOR DETAILS

SC: 1 1/2"=1'-0"

B
ST102



PIPE BLOCK TO FLOOR WATERSTOP DETAIL

SC: 3"=1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

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SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

TYPICAL DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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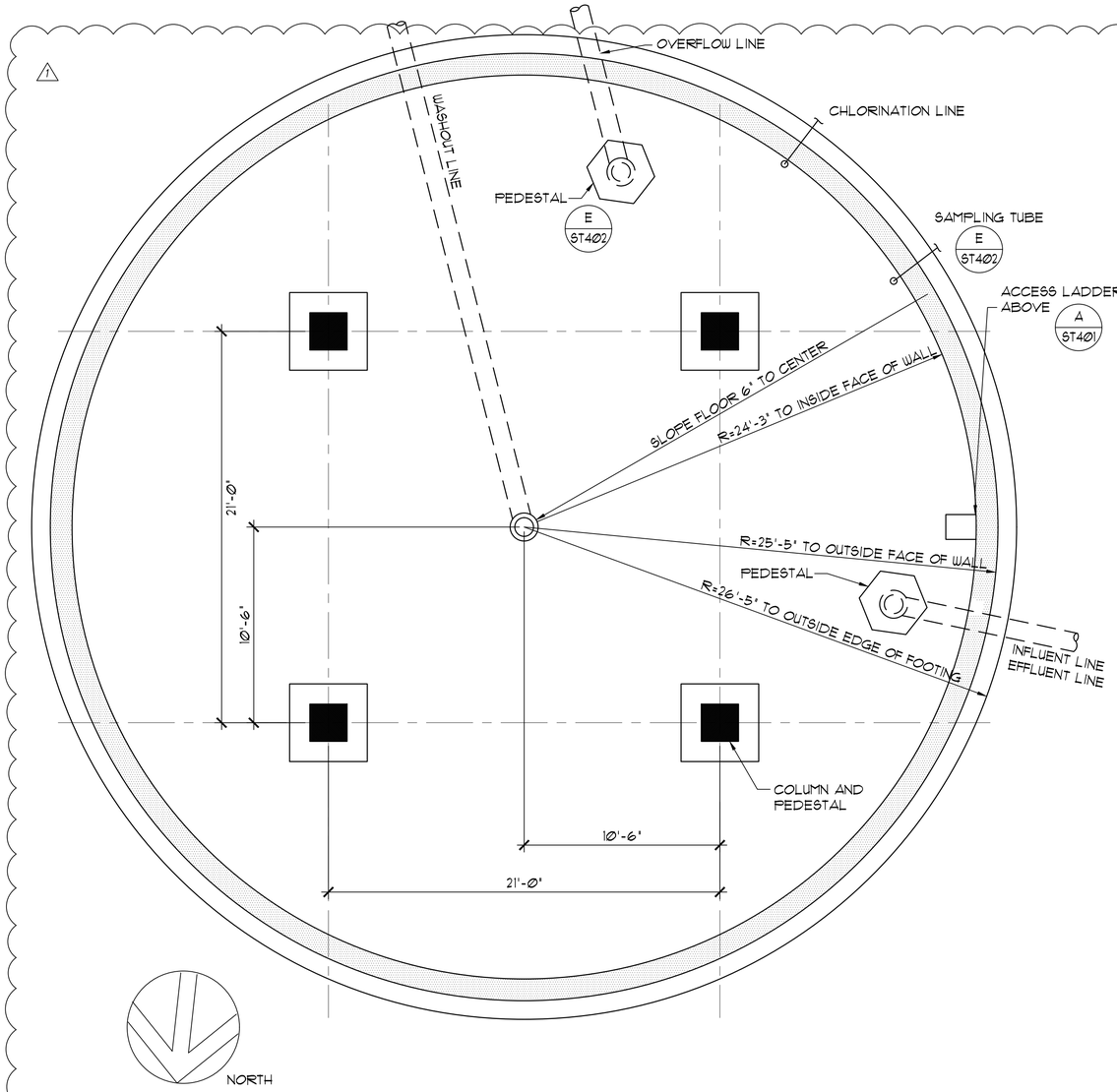
MAY 2018

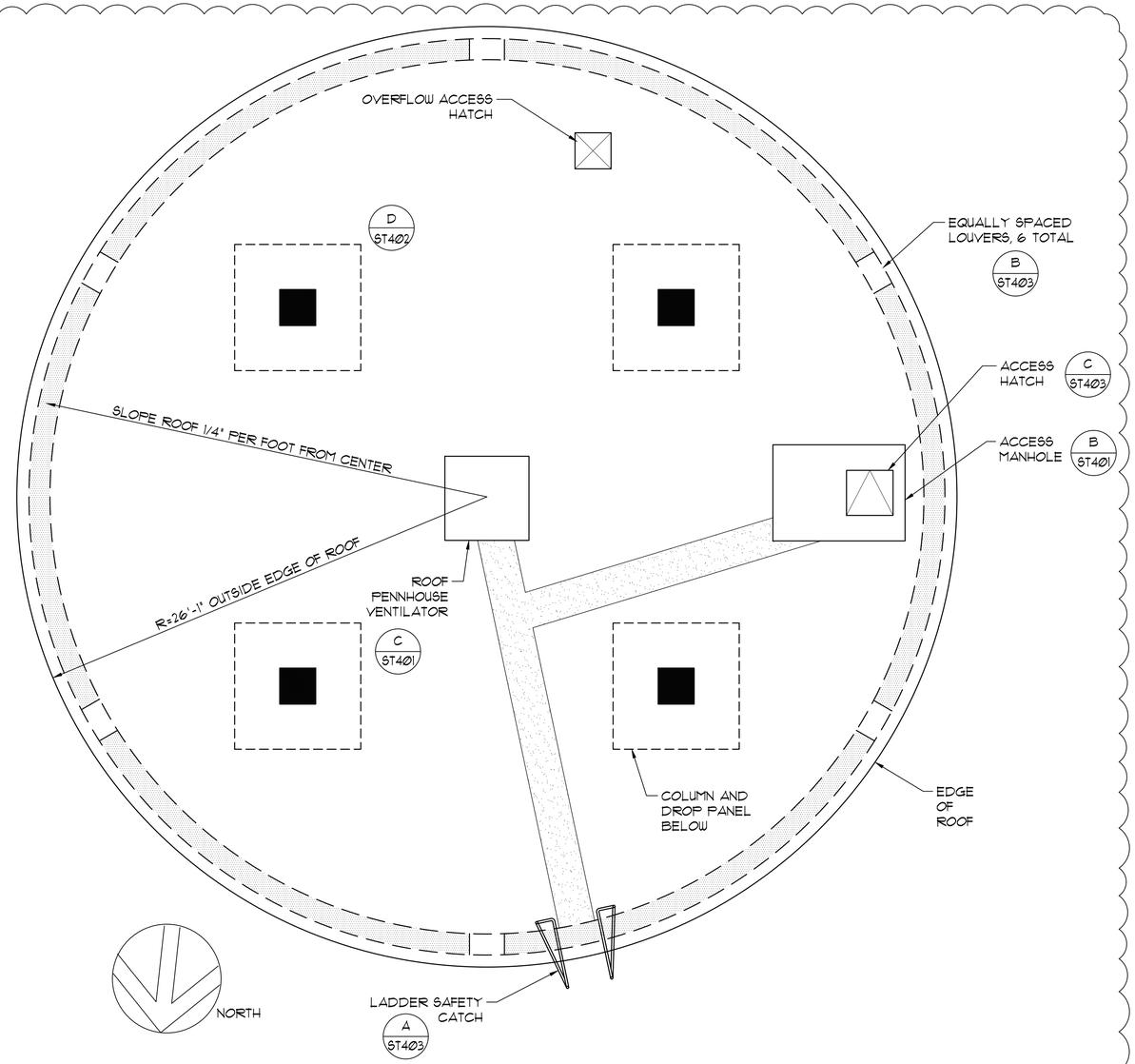
DWG. NO.
ST102
SHEET 84 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018



FLOOR PLAN

SC: 1/4"=1'-0"



ROOF PLAN

SC: 1/4"=1'-0"

0' 2' 4' 8' 12'

1/4" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM 2	JM	

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SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

FLOOR AND ROOF PLANS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

DWG. NO. ST201
SHEET 85 OF 149

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MAY 2018

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
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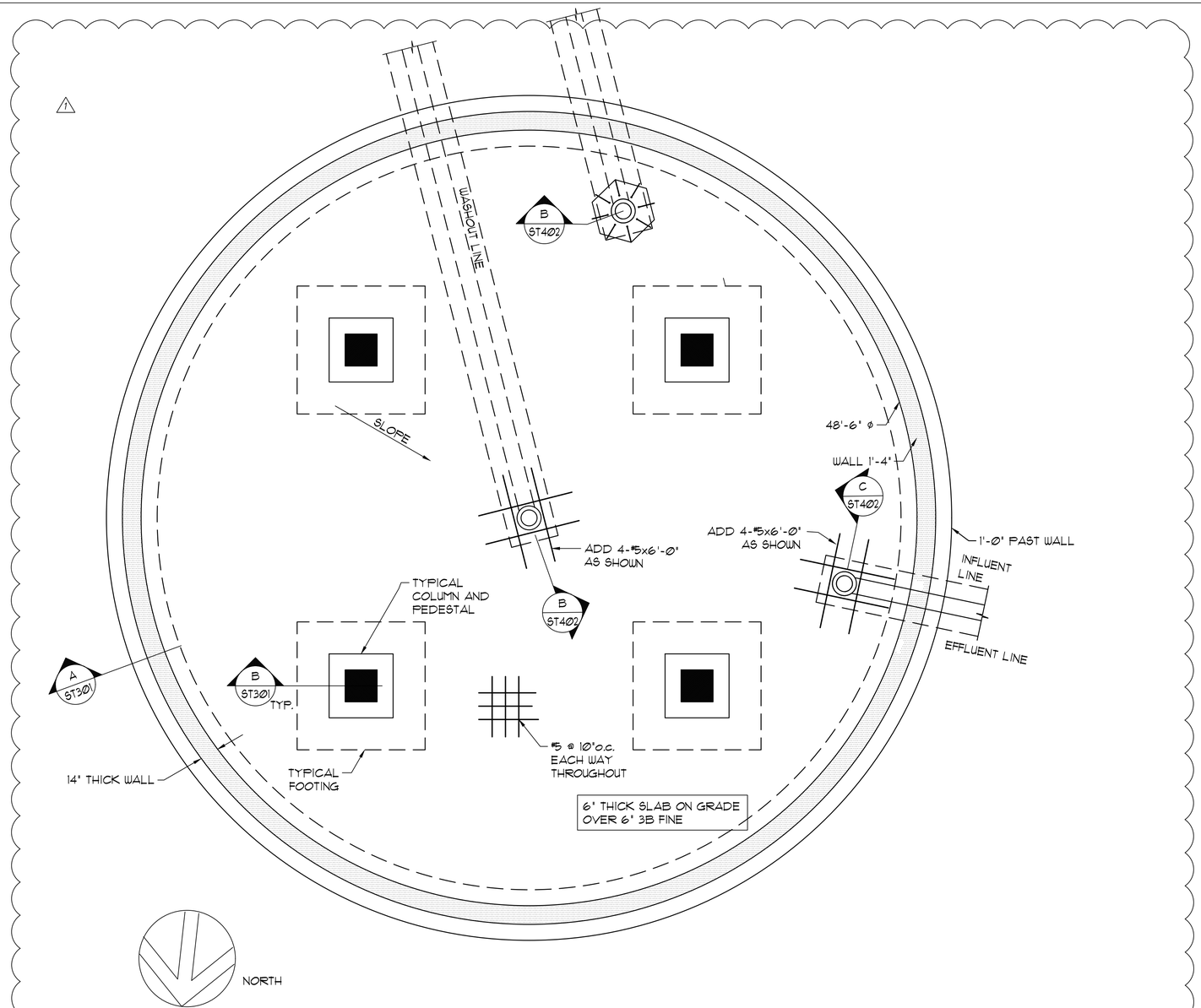

FOUNDATION PLAN

SC: 1/4"=1'-Ø"

0' 2' 4' 8' 12'

1/4" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM 2	JM	

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SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

FOUNDATION PLANS

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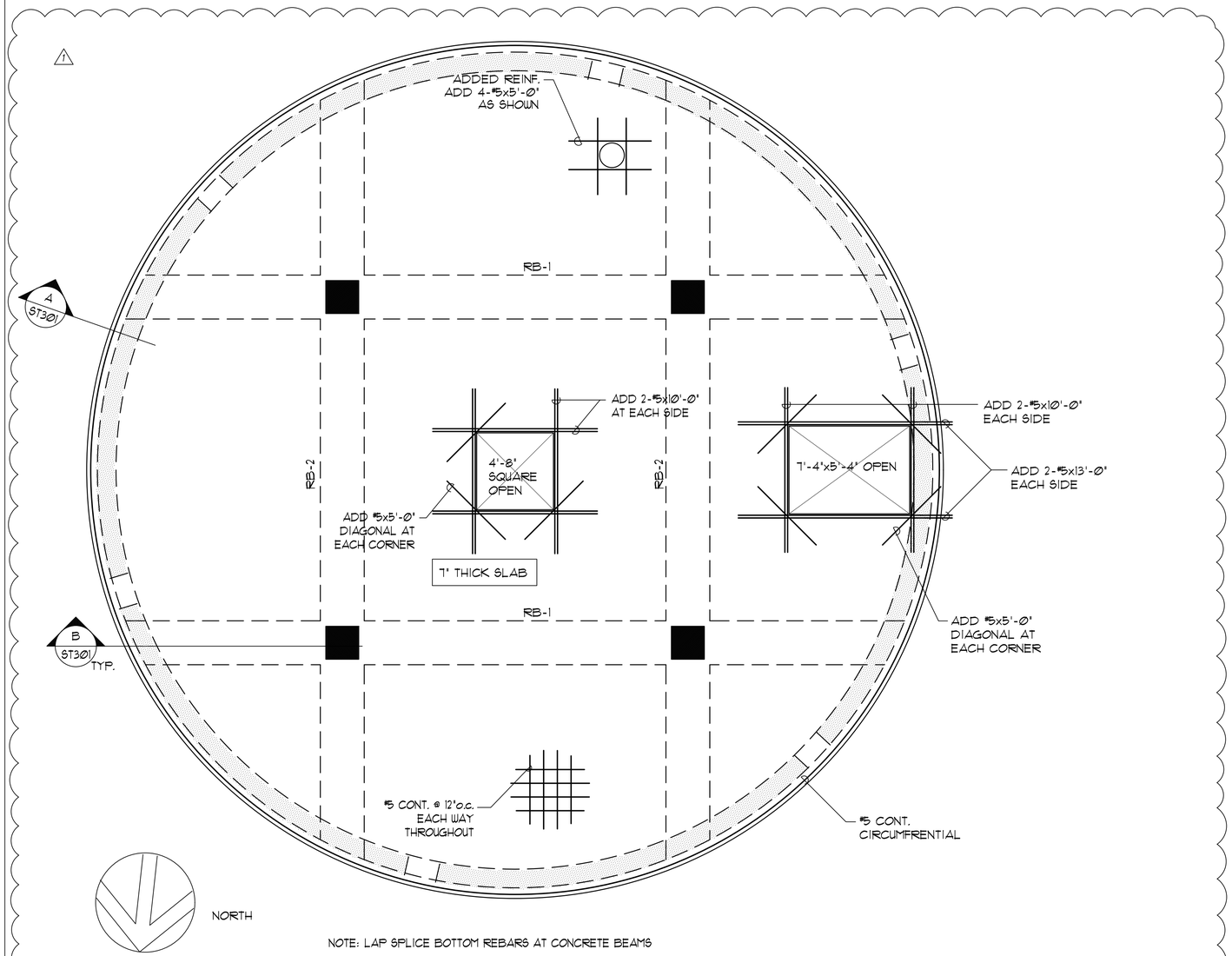
MAY 2018

DWG. NO. ST202

SHEET 86 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018

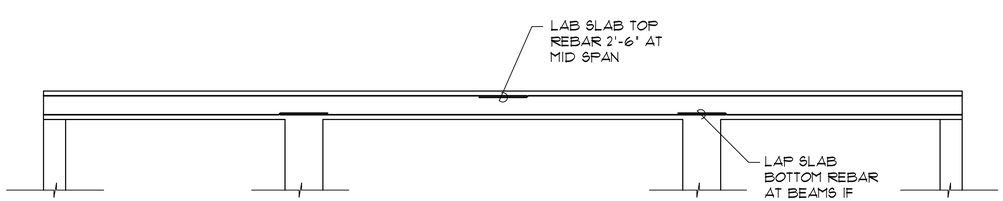


NOTE: LAP SPLICE BOTTOM REBARS AT CONCRETE BEAMS

ROOF SLAB - TOP AND BOTTOM REINFORCING

A ST203

SC: 1/4"=1'-Ø"



TYPICAL SLAB SECTION

B ST203

SC: 1/4"=1'-Ø"

0' 2' 4' 8' 12'

1/4" = 1'-0"

DWG. NO. ST203

SHEET 87 OF 149

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REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM 2	JM	

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

ROOF SLAB REINFORCING PLANS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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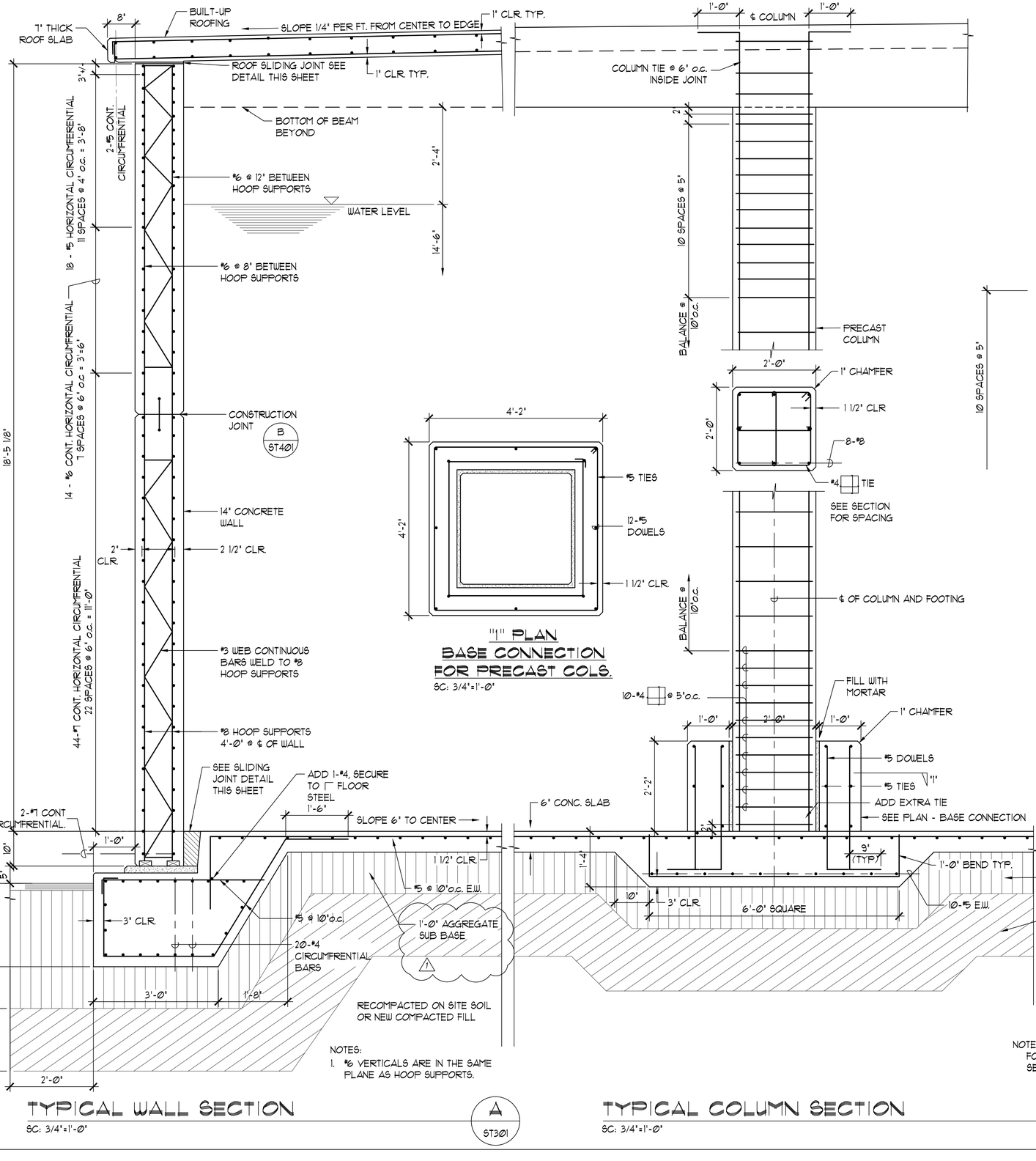


TYPICAL WALL SECTION

SC: 3/4"=1'-0"

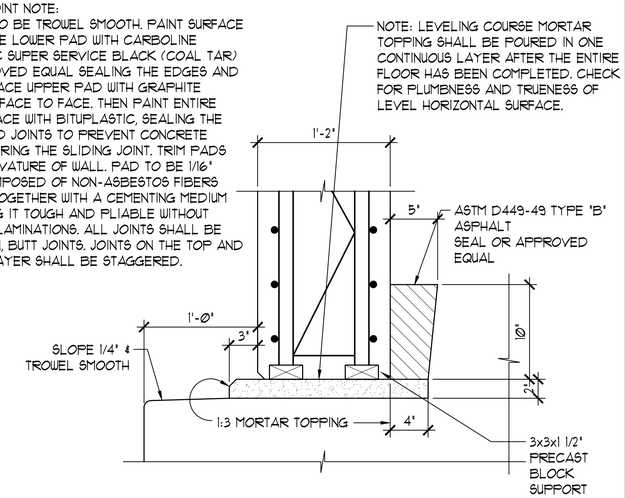
A ST301

TYPICAL COLUMN SECTION

SC: 3/4"=1'-0"

B ST301

SLIDING JOINT NOTE:
SURFACE TO BE TROWEL SMOOTH. PAINT SURFACE TO RECEIVE LOWER PAD WITH CARBOLINE BITUMASTIC SUPER SERVICE BLACK (COAL TAR) OR APPROVED EQUAL SEALING THE EDGES AND JOINTS. PLACE UPPER PAD WITH GRAPHITE SURFACES FACE TO FACE. THEN PAINT ENTIRE PAD SURFACE WITH BITUPLASTIC, SEALING THE EDGES AND JOINTS TO PREVENT CONCRETE FROM ENTERING THE SLIDING JOINT. TRIM PADS TO FIT CURVATURE OF WALL. PAD TO BE 1/16" THICK, COMPOSED OF NON-ASBESTOS FIBERS BONDED TOGETHER WITH A CEMENTING MEDIUM RENDERING IT TOUGH AND PLIABLE WITHOUT PLIES OR LAMINATIONS. ALL JOINTS SHALL BE TRUE, EVEN, BUTT JOINTS. JOINTS ON THE TOP AND BOTTOM LAYER SHALL BE STAGGERED.



SLIDING JOINT DETAIL

SC: 1 1/2"=1'-0"

C ST301

ROOF SLIDING JOINT

SC: 1 1/2"=1'-0"

D ST301

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM 2	JM	

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

SECTIONS AND DETAILS

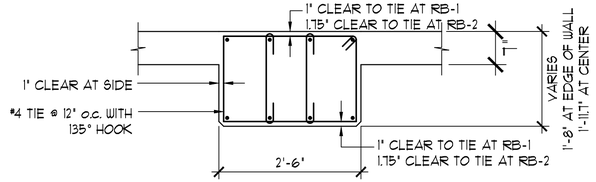
DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 309 Phone (808) 536-7692 email alee@tanimurasng.com
Honolulu, Hawaii 96813 Fax: (808) 537-4082

MAY 2018

DWG. NO. ST301
SHEET 88 OF 149

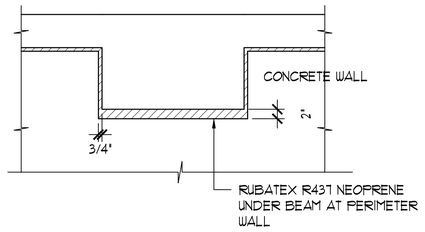
FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018



NOTE: CLEAR DISTANCES AT BEAM ARE TO TIES

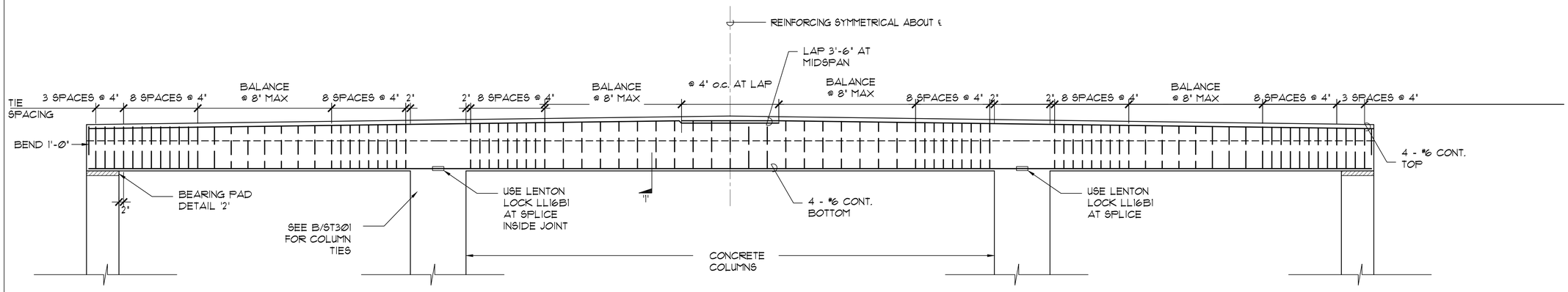
'1' SECTION - RB-1, RB-2

SC: 3/4"=1'-Ø"



'2' SECTION - CONCRETE BEAM AT WALL

SC: 3/4"=1'-Ø"



CONCRETE BEAM RB-1, RB-2 ELEVATION

SC: 1/2"=1'-Ø"

ST302

0' 1' 2' 3' 4' 5' 6'
1/2" = 1'-0"

0' 1' 2' 3' 4'
3/4" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

ADRIAN C. M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee

DWG. NO.
ST302
SHEET 89 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

CONCRETE ROOF BEAM DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 309 Phone (808) 536-7928 email alee@tanimuraeng.com
Honolulu, Hawaii 96813 Fax: (808) 537-9022

MAY 2018

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
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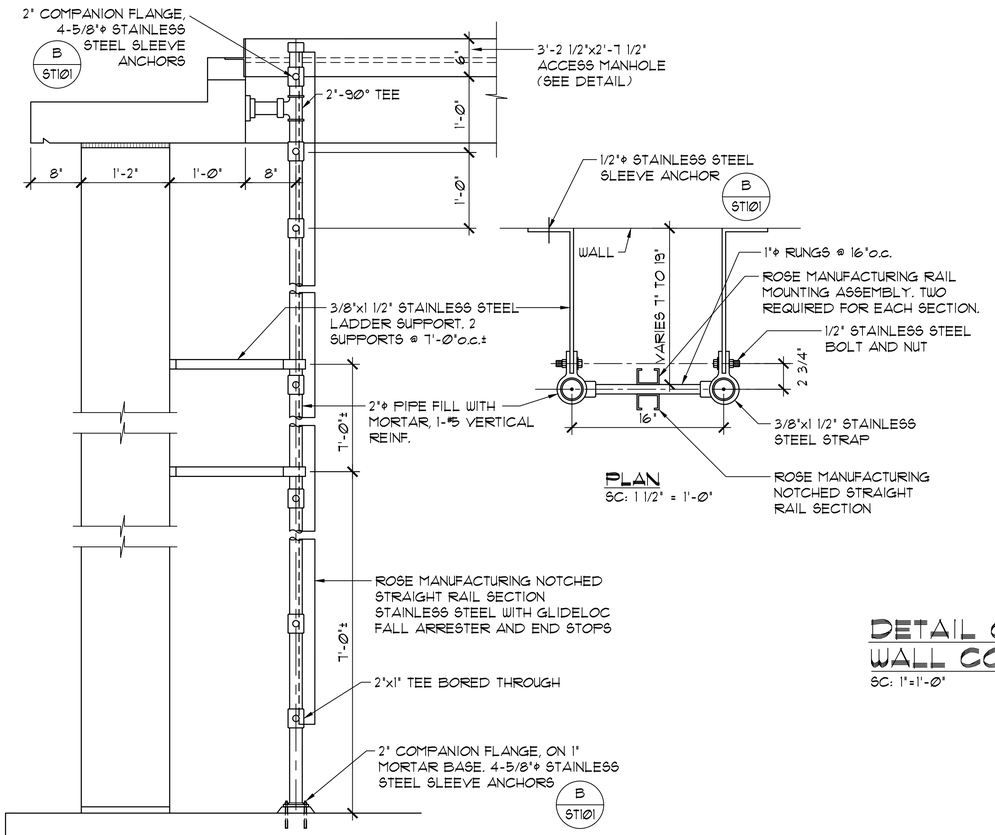
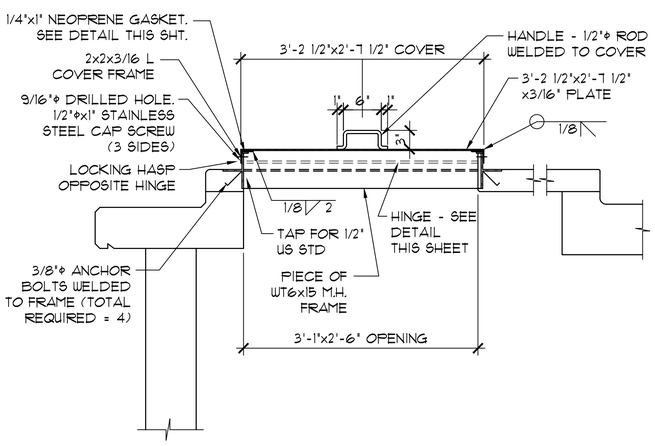


NOTE: 1. INTERIOR ACCESS LADDER SHALL BE TYPE 316 STAINLESS STEEL.
2. FULL BODY HARNESS WITH CHEST D-RINGS AND CARABINER (NIC) REQUIRED FOR USE WITH FALL ARRESTER.

ELEVATION OF INTERIOR LADDER

A ST401

SC: 1"=1'-0"

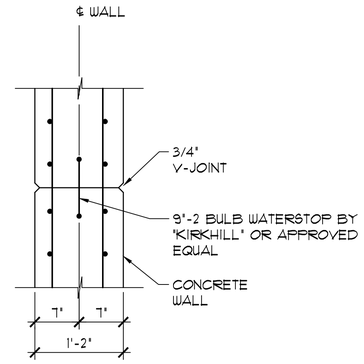


* ALL STEEL TO BE STAINLESS.

ACCESS MANHOLE FRAME DETAIL

B ST401

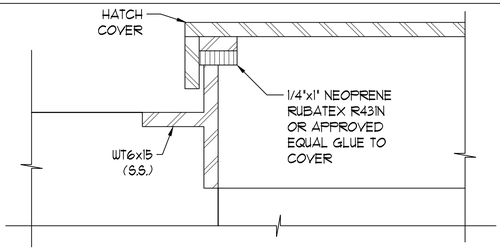
SC: 1"=1'-0"



DETAIL OF HORIZONTAL WALL CONSTRUCTION JOINT

C ST401

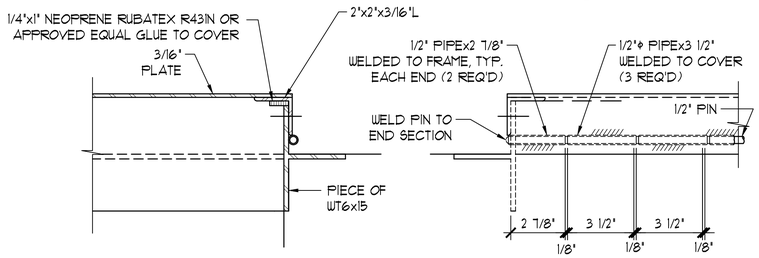
SC: 1"=1'-0"



GASKET DETAIL AT OVERFLOW & ACCESS M.H.S.

E ST401

SC: 3" = 1'-0"



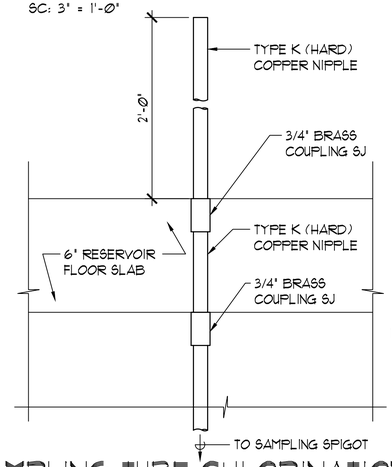
SECTION ELEVATION

* ALL STEEL TO BE STAINLESS.

MANHOLE HINGE DETAIL

F ST401

SC: 3" = 1'-0"

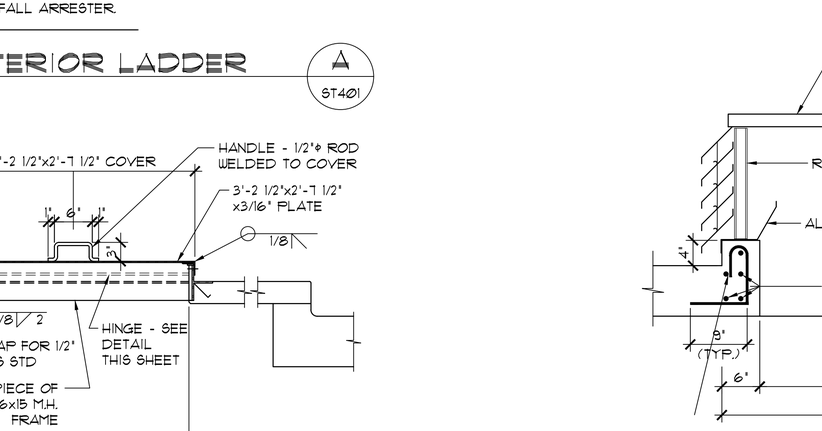


NOTES: 1. NIPPLES & FITTINGS SHALL BE BRONZE OR BRASS.
2. ISOLATE ALL BRASS OR BRONZE FITTINGS FROM REINFORCING STEEL.
3. CHLORINATION LINE SIMILAR EXCEPT USE PVC SCHEDULE 80.

SAMPLING TUBE CHLORINATION LINE DETAIL

G ST401

SC: 3" = 1'-0"



SECTION "B-B"

NOTES:
1. THE AIR FILTER SHALL MEET THE FOLLOWING STANDARD. AIR FILTER INSTITUTE TEST ON 20"x20" PANELS 1" THICK.

PAD POROSITY	= 10 PORES/LIN. IN.
RESISTANCE TO 800 CFM AIR	= 0.08 INCHES OF WATER
AVERAGE EFFICIENCY	= 63%
DUST CAPACITY AT 0.5 INCHES WATER RESISTANCE	= 364 GRAMS

2. AK 500 FILTER FOAM-DRY 10P.P.I.-1" THICK DISTRIBUTED BY HAWAIIAN AIR FILTER INC. OR APPROVED EQUAL.

ROOF VENTILATOR SECTION

D ST401

SC: 1"=1'-0"

0' 6" 1' 2' 3'
1" = 1'-0"

0' 3" 6" 1'
3" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

SECTIONS AND DETAILS

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MAY 2018

DWG. NO. ST401
SHEET 90 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
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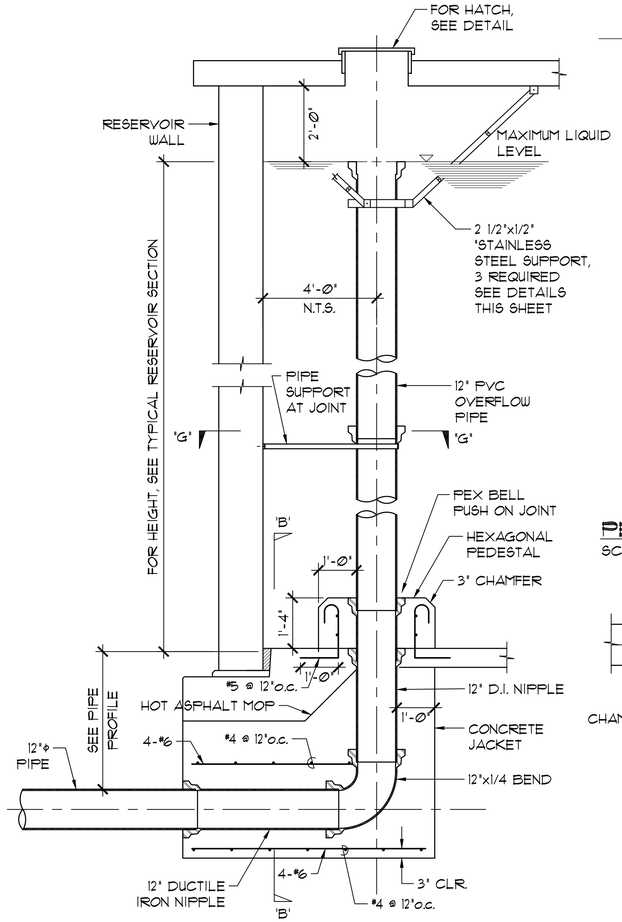
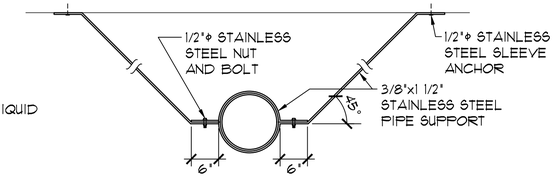
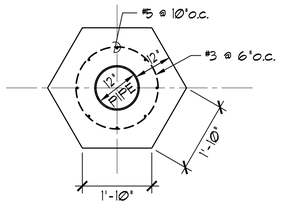




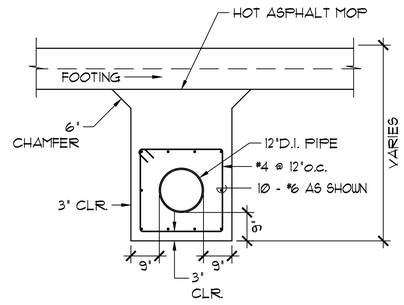
PLAN "G-G" - OVERFLOW PIPE SUPPORT AT PIPE JOINT

NTS



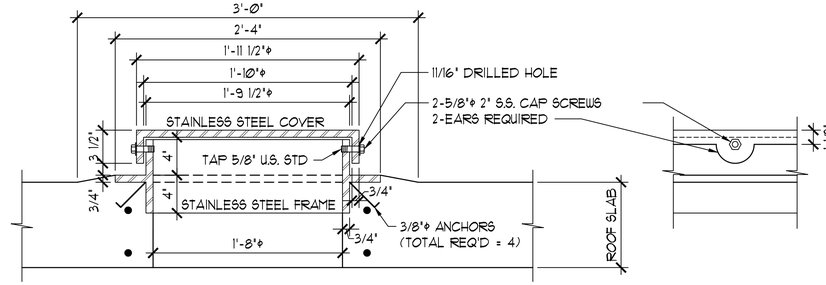
PEDESTAL FOR 12" OVERFLOW

SC: 1/2"=1'-Ø"



SECTION "B-B"

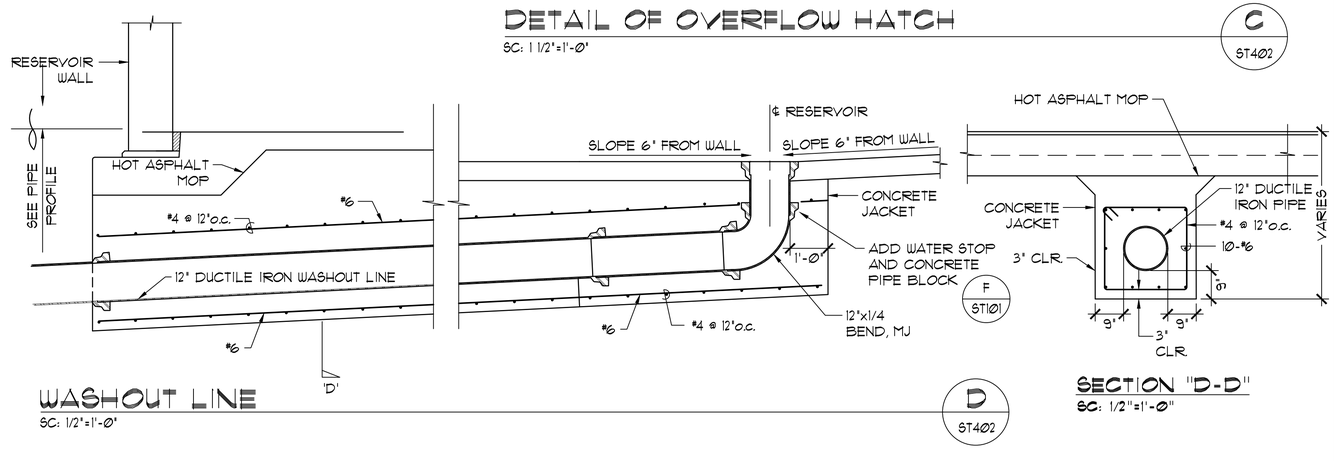
SC: 1/2"=1'-Ø"



DETAIL OF OVERFLOW HATCH

SC: 1 1/2"=1'-Ø"

C ST402



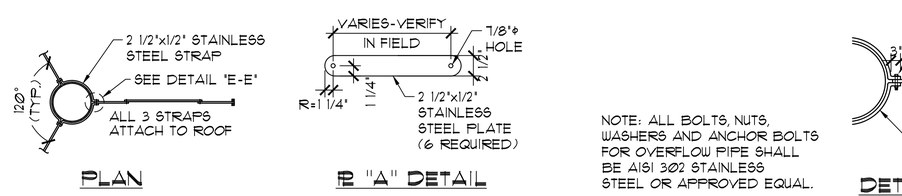
WASHOUT LINE

SC: 1/2"=1'-Ø"

D ST402

SECTION "D-D"

SC: 1/2"=1'-Ø"

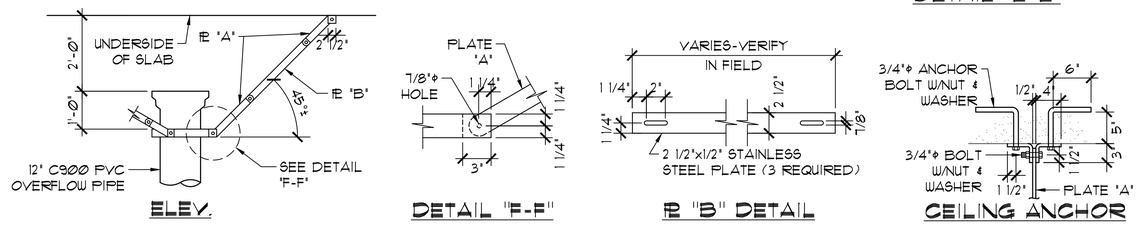


PLAN

PL "A" DETAIL

NOTE: ALL BOLTS, NUTS, WASHERS AND ANCHOR BOLTS FOR OVERFLOW PIPE SHALL BE AISI 302 STAINLESS STEEL OR APPROVED EQUAL.

DETAIL "E-E"



ELEV.

DETAIL "F-F"

PL "B" DETAIL

CEILING ANCHOR

OVERFLOW PIPE SUPPORT DETAILS

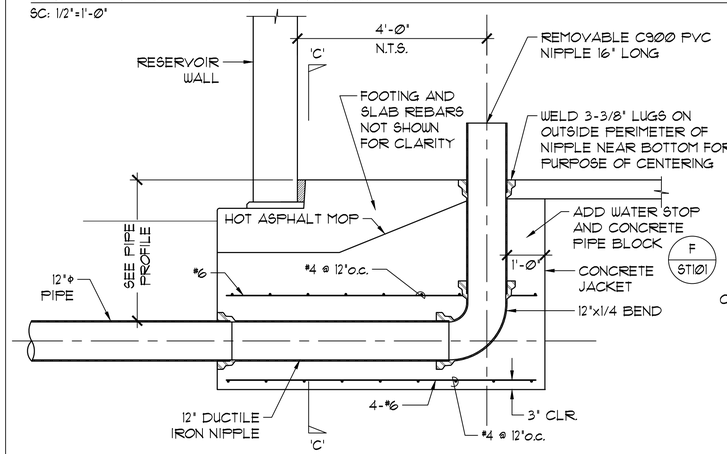
N.T.S.

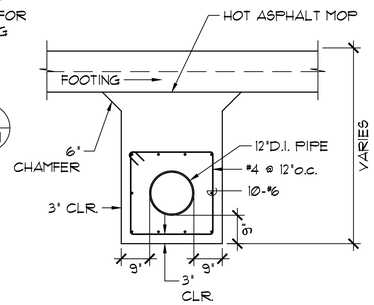
E ST402

DETAIL OF OVERFLOW

SC: 1/2"=1'-Ø"

A ST402





SECTION "C-C"

SC: 1/2"=1'-Ø"

INFLUENT/EFFLUENT LINE

SC: 1/2"=1'-Ø"

B ST402

0' 1' 2' 3' 4' 5' 6'
1/2" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 1 - KAULUWAI WELL SITE
NEW 0.2 MG RESERVOIR

DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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Adrian Lee

DWG. NO. ST402
SHEET 91 OF 149

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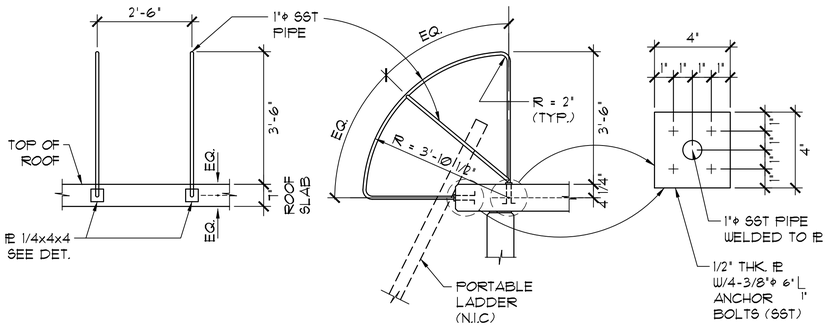


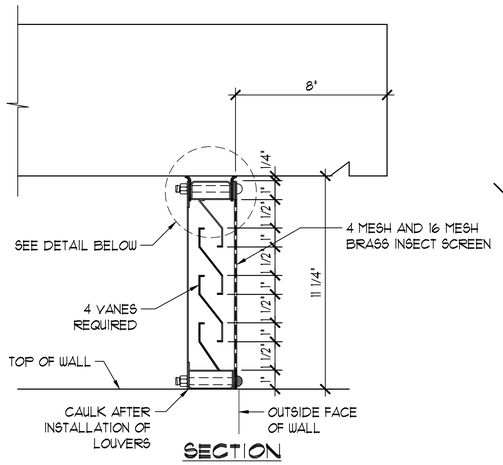
ELEVATION

SECTION

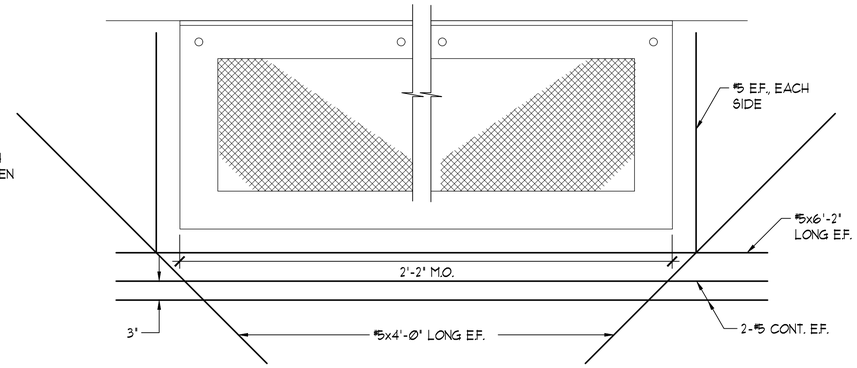
LADDER SAFETY CATCH DETAILS

N.T.S.

A ST403



SECTION

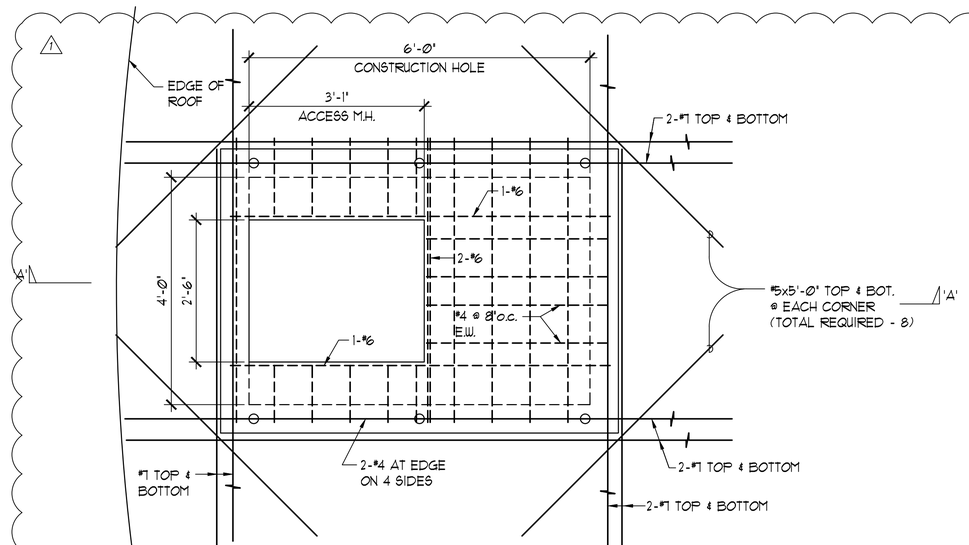


ELEVATION

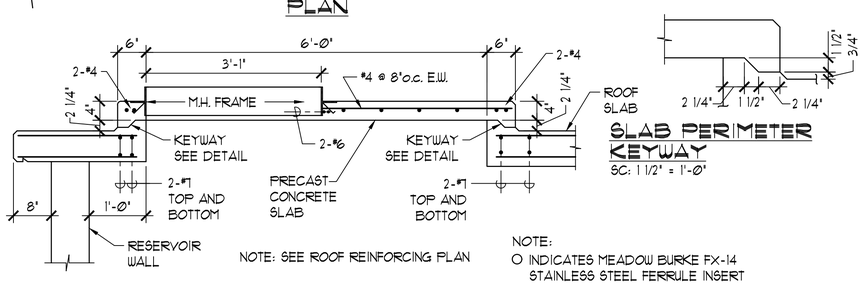
LOUVER DETAILS

N.T.S.

B ST403



PLAN



NOTE: SEE ROOF REINFORCING PLAN

SLAB PERIMETER KEYWAY

SC: 1 1/2" = 1'-0"

NOTE:
O INDICATES MEADOW BURKE FX-14 STAINLESS STEEL FERRULE INSERT FOR USE WITH 3/4"ø BOLT AND LIFTING DEVICE (6 TOTAL), COVER INSERT WITH PLASTIC CAP

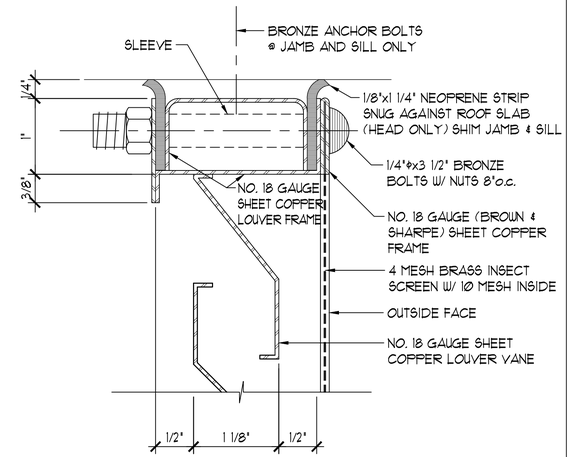
SECTION "A-A"

* ALL STEEL TO BE STAINLESS.

ACCESS HATCH

SC: 3/4"=1'-0"

C ST403



HEAD & JAMB SIMILAR DETAIL

N.T.S.

E ST403

0' 1' 2' 3' 4'

3/4" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
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MAY 2018

DWG. NO. ST403

SHEET 92 OF 149

FILE: Hoolehua WSI - New 0.2 MG Tank Structural.dwg
DATE REV.: 29/06/2018

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2006 INTERNATIONAL BUILDING CODE AS AMENDED BY COUNTY OF MAUI

2. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS.

3. THE GENERAL NOTES AND TYPICAL DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN.

4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.

6. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF THE JOB AND NOTIFY ALL DISCREPANCIES TO THE ARCHITECT.

7. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.

8. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND THE PROTECTION OF ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY

9. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA

10. THE CONTRACTOR SHALL NOTIFY TANIMURA & ASSOCIATES (PH. 536-7692) AND THE SPECIAL INSPECTOR FOUR (4) WORKING DAYS PRIOR TO POURING CONCRETE OR GROUTING.

FOUNDATION

1. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL ENGINEERING EXPLORATION REPORT TITLED "SITE NO. 1 AND SITE NO. 7 - DHHL MOLOKAI PROJECTS - ISLAND OF MOLOKAI, HAWAII - W.O. 7470-00 - AUGUST 15, 2017" PREPARED BY GEOLABS, INC. THIS REPORT SHALL BE MADE PART OF THESE DRAWINGS BY REFERENCE. A COPY OF THIS GEOTECHNICAL REPORT SHALL BE KEPT ON SITE DURING CONSTRUCTION.

2. THE RETAINING WALL FOOTINGS SHALL BE ON DIRECTLY ON RECOMPACTED ON-SITE SOIL AND/OR NEW COMPACTED FILL MATERIAL. IF DIFFERING SUBGRADE MATERIALS ARE ENCOUNTERED AT THE FOOTING SUBGRADE LEVEL (I.E. HARD BASALT ROCK AND STIFF CLAYEY SOILS) THE BASALT ROCK FORMATION SHALL BE OVEREXCAVATED A MINIMUM OF ONE FOOT AND THE OVEREXCAVATION SHALL BE BACKFILLED WITH COMPACTED STRUCTURAL FILL.

3. FILLS AND ONSITE SOILS SHALL BE COMPACTED TO A MINIMUM OF 95 PERCENT RELATIVE COMPACTION.

3. BACKFILL BEHIND THE RETAINING WALL SHALL BE ON-SITE SOILS OR SELECT GRANULAR FILL MATERIAL. BACKFILL SHALL BE COMPACTED TO BETWEEN 90 AND 95 PERCENT RELATIVE COMPACTION. BACKFILL SHALL NOT BE OVER COMPACTED.

4. ALL FOOTINGS SHALL BE BOTTOMED A MINIMUM OF 24" BELOW THE LOWEST ADJACENT GRADE AND A MINIMUM HORIZONTAL DISTANCE OF 6 FEET SHALL BE MAINTAINED BETWEEN THE BOTTOM EDGE OF FOOTING AND THE FACE OF SLOPE.

5. ALL WATER, MUD AND DEBRIS SHALL BE REMOVED FROM THE BOTTOM OF FOOTING EXCAVATIONS PRIOR TO THE PLACEMENT OF CONCRETE.

6. BOTTOM OF ALL FOOTING TRENCHES SHALL BE LEVEL AND STEPPED ACCORDING TO THE WALL PROFILE AND STEP FOOTING TYPICAL DETAIL. SLOPED FOOTING TRENCHES ARE NOT ALLOWED.

RETAINING WALLS

1. FINISHED GRADING BEHIND THE WALL SHALL BE DESIGNED TO MINIMIZE SURFACE WATER RUNOFF FROM ENTERING THE BACKFILL AREA.

2. 4 INCH DIAMETER WEEP HOLES SHALL BE PLACED NEAR THE BOTTOM OF RETAINING WALLS SPACED AT A MAXIMUM OF 8 FEET ON CENTER. A 1-FOOT THICK CONTINUOUS LAYER OF CRUSHED GRAVEL WRAPPED IN GEOTEXTILE FILTER FABRIC SUCH AS MIRAFI 140N OR SIMILAR SHALL BE PLACED ABOVE THE PIPE AND DIRECTLY BEHIND THE WALL. THE CRUSHED GRAVEL SHALL BE CONTINUOUS BETWEEN WEEP HOLES.

3. A 4 INCH DIAMETER CONTINUOUS PERFORATED DRAIN PIPE (PERFORATIONS FACED DOWN) SLOPED TO DAYLIGHT MAY BE USED IN PLACE OF THE WEEPHOLES. AT LEAST ONE OUTLET SHALL BE PROVIDED FOR EVERY 50 FEET OF PIPE.

4. DRAIN ROCK SHALL CONFORM TO THE FOLLOWING GRADATION:

SIEVE SIZE	% PASSING BY DRY WEIGHT
1-1/2 INCH	90 - 100
3/4 INCH	50 - 100
NO. 4	0 - 50
NO. 200	0 - 5

STANDARD SIZE AGGREGATES NO. 6, 57 AND 67 AND 1-1/2 INCH FILTER MATERIALS SHOULD SATISFY THIS GRADATION REQUIREMENT.

5. WATERPROOFING SHALL BE APPLIED AT THE WALL/ FOOTING CONSTRUCTION JOINT. FLASHING COMPOUND SHALL EXTEND 6 INCHES BEYOND EITHER SIDE OF THE JOINT.

6. BACKFILL SHALL NOT BE PLACED BEHIND CONCRETE MASONRY WALLS BEFORE 21 DAYS AFTER GROUTING THE WALL OR UNTIL THE GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1875 PSI. BACKFILL SHALL NOT BE PLACE BEHIND CONCRETE WALLS UNTIL THE CONCRETE HAS ATTAINED THE 28 DAY DESIGN STRENGTH. COMPRESSIVE TEST CYLINDERS MADE DURING THE CONCRETE POUR SHALL BE TESTED TO DETERMINE THE CONCRETE STRENGTH.

REINFORCED CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318-05.

2. ALL CONCRETE SHALL BE NORMAL WEIGHT (150 PCF) WITH AGGREGATES CONFORMING TO ASTM C-33. UNLESS OTHERWISE NOTED, THE COMPRESSIVE STRENGTHS OF CONCRETE AT 28 DAYS AND MAXIMUM AGGREGATE SIZES SHALL BE AS FOLLOWS:

	STRENGTH	AGGREGATE SIZE
FOOTING	3,000 PSI	1"
STEM WALL	3,000 PSI	3/4"

3. MAXIMUM WATER-CEMENT RATIO SHALL NOT EXCEED 0.55.

4. ALL REINFORCING STEEL EXCEPT TIES AND STIRRUPS SHALL CONFORM TO ASTM A615 GRADE 60. TIES, STIRRUPS AND REBARS TO BE WELDED SHALL BE ASTM A615 GRADE 40.

5. UNLESS OTHERWISE NOTED, SPLICES, LAPS, DOWEL EXTENSIONS AND EMBEDMENTS SHALL BE 48 BAR DIAMETERS BUT NOT LESS THAN 24" MINIMUM.

6. ALL REINFORCING BARS MARKED CONTINUOUS (CONT.) ON THE PLANS SHALL BE LAPPED 48 BAR DIAMETERS MINIMUM.

7. STAGGER ALL SPLICES WHERE POSSIBLE.

8. ALL WELDING OF REINFORCING SHALL CONFORM TO "STRUCTURAL WELDING CODE - REINFORCING STEEL" (AWS D1.4).

9. REBARS SHALL BE SUPPORTED, BENT AND PLACED AS PER "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES" ACI 315 (LATEST).

10. MINIMUM COVER IN INCHES FOR REBARS FOR CAST-IN-PLACE CONCRETE:

CONCRETE CAST AGAINST EARTH	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:	
#5 AND SMALLER	1-1/2"
#6 AND LARGER	2"

11. WELDED WIRE FABRIC SHALL BE GALVANIZED AND CONFORM TO ASTM A-185.

12. UNLESS OTHERWISE SHOWN LAP OUTERMOST CROSS WIRES OF EACH SHEET OF WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2" MINIMUM.

13. AT TIME CONCRETE IS PLACED, REINFORCING SHALL BE FREE FROM MUD, OIL, LAITANCE OR OTHER COATINGS ADVERSELY AFFECTING BOND CAPACITY.

14. REINFORCEMENT, ANCHOR BOLTS, SIMPSON CONNECTORS, DOWELS AND ALL OTHER EMBEDDED ITEMS SHALL BE POSITIVELY SECURED BEFORE POURING.

DESIGN CRITERIA

1. CODES: 2006 INTERNATIONAL BUILDING CODE
2012 AASHTO LRFD BRIDE DESIGN SPECIFICATIONS
2005 ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
2002 ACI 530-02 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

CONCRETE
f'c = 3,000 PSI
Fy = 60,000 PSI
CONCRETE MASONRY
f'm = 1,900 PSI
Fs = 24,000 PSI

2. FOUNDATION DESIGN CRITERIA

ALLOWABLE BEARING PRESSURE	3,000 PSF
LEVEL BACKFILL	
ACTIVE PRESSURE	40 PCF
PASSIVE RESISTANCE PRESSURE	350 PCF
COEFFICIENT OF FRICTION	0.35

VEHICLE LIVE LOAD SURCHARGE PER AASHTO

DYNAMIC LATERAL EARTH PRESSURE ASSUMING WALL MOVEMENT OF 2.5 INCHES, PE = 4.9xH SQUARED PER GEOTECHNICAL ENGINEERING REPORT

3. SEISMIC LATERAL FORCES

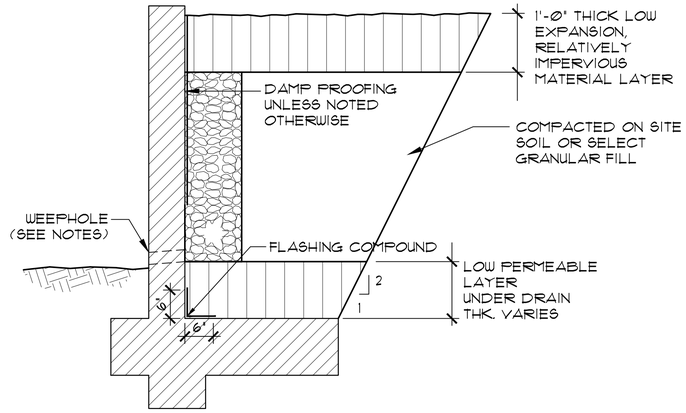
SITE CLASS	D
RISK CATEGORY	IV
ESSENTIAL FACILITIES	
SEISMIC DESIGN CATEGORY	D
MAPPED SPECTRAL RESPONSE	
Ss	0.806
S1	0.210
SDS	0.634
SD1	0.277

SPECIAL INSPECTION

1. ITEMS REQUIRING SPECIAL INSPECTION:
REINFORCING STEEL (PERIODIC)
CONCRETE (2006 IBC TABLE 1704.4)

2. NOTIFY SPECIAL INSPECTOR 4 WORKING DAYS PRIOR TO NEED OF INSPECTION SERVICES.

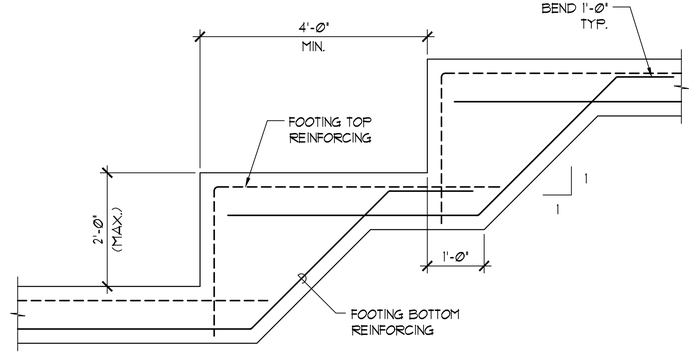
3. THE CONTRACTOR SHALL BE FAMILIAR with THE SPECIAL INSPECTION REQUIREMENTS INCLUDING THE IDENTITY AND CONTACT INFORMATION OF THE SPECIAL INSPECTOR RESPONSIBLE FOR EACH REQUIREMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE SPECIAL INSPECTOR IN A TIMELY MANNER IF SPECIAL INSPECTIONS ARE NOT DONE THE CERTIFICATE OF OCCUPANCY MAY NOT BE ISSUED BY THE COUNTY.



TYP. RETAINING WALL DET.

NO SCALE

A
SW001



TYP. STEPPED FTG.

SC: 3/4" = 1'-0"

B
SW00!

0' 1' 2' 3' 4'

3/4" = 1'-0"

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

Adrian Lee

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW RETAINING WALL

GEN. NOTES & TYP. DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 300 Phone: (808) 536-7692 email: alee@taniassoc.com
Honolulu, Hawaii 96813 Fax: (808) 537-9022

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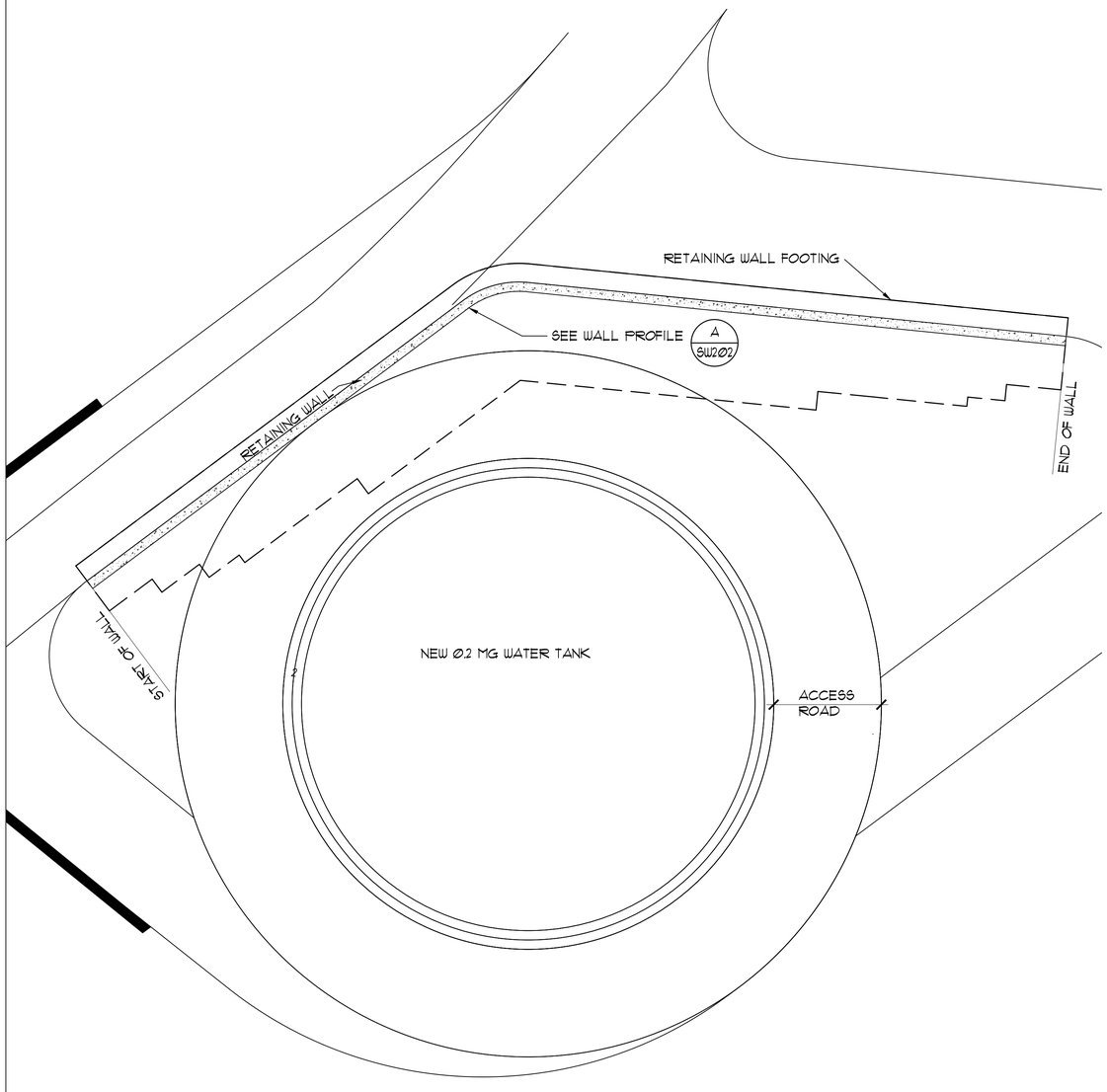
SW001
93 OF 149

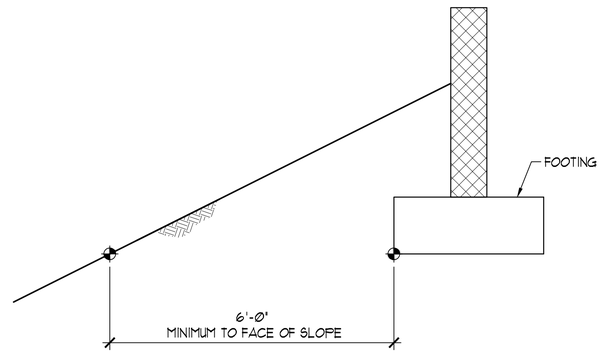
FILE: Site 1 Kauluwai Retaining Wall Structural.dwg
DATE REV.: 20/02/2018



RETAINING WALL - PLAN VIEW

SC: 1/8"=1'-0"

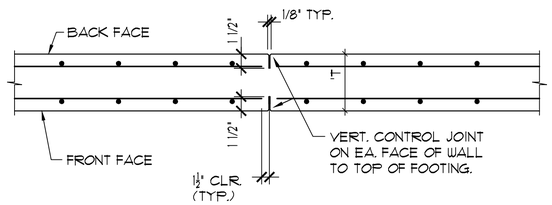
1
SW201



TYPICAL FOOTING SETBACK AT SLOPE

NOT TO SCALE

A
SW201



COND. AT CONCRETE WALL JOINT

TYP. JOINT DETAILS (PLAN AT WALL)

SC: 3/4" = 1'-0"

B
SW201

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 4' 8' 16' 24'
1/8" = 1'-0"

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94 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW RETAINING WALL

RETAINING WALL PLAN AND TYPICAL DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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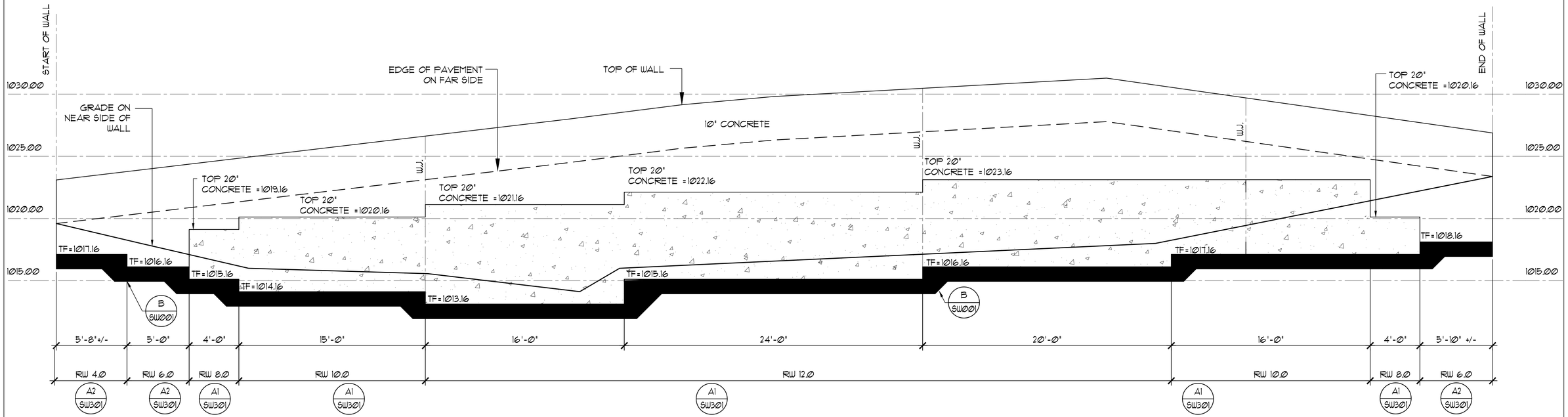
FILE: Site 1 Kauluwai Retaining Wall Structural.dwg
DATE REV.: 20/02/2018



NOTE:
1. TF INDICATES TOP OF FOOTING

RETAINING WALL PROFILE (VIEWED FROM RESERVOIR SIDE)

SC: 1/4"=1'-0"

A SW202

0' 2' 4' 8' 12'
1/4" = 1'-0"

FILE: Site 1 Kauluwai Retaining Wall Structural.dwg
DATE REV.: 20/02/2018

SW202
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SITE 1 - KAULUWAI WELL SITE
NEW RETAINING WALL

RETAINING WALL PROFILE

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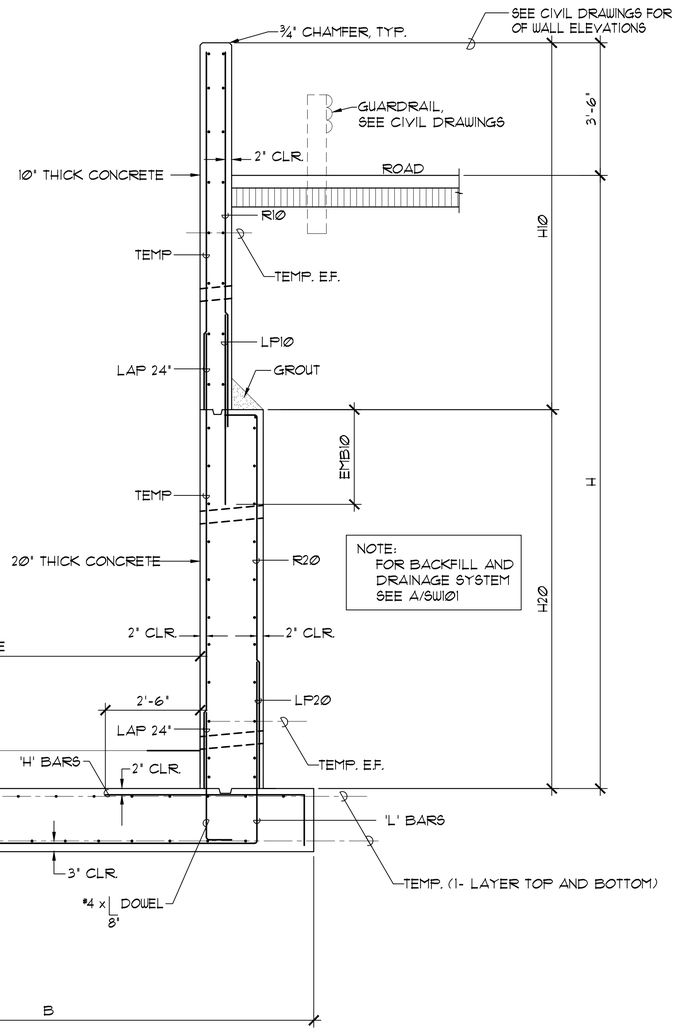
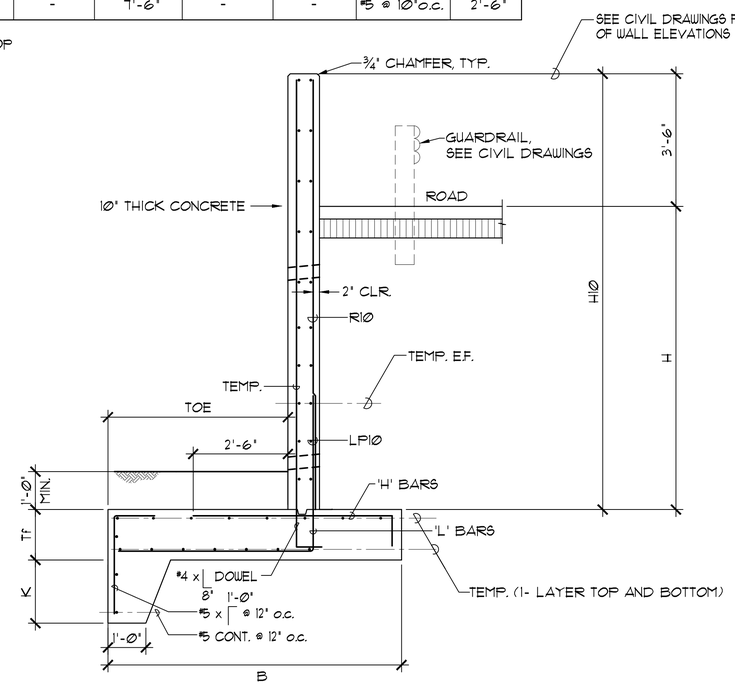
FEB 2018

RETAINING WALL SCHEDULE

	'H'	'B'	'TOE'	K	'tf'	'H' bars	'L' bars	H2Ø	R2Ø	LP2Ø	H1Ø	D1Ø	EMB1Ø	R1Ø	LP1Ø
RW-12	≤ 12'-0"	12'-6"	9'-6"	3'-4"	1'-8"	#5 @ 12"o.c.	#6 @ 6"o.c.	7'-0"	#6 @ 10"o.c.	3'-0"	7'-6"	#5 @ 10"o.c.	2'-6"	#5 @ 10"o.c.	2'-6"
RW-10	≤ 10'-0"	10'-6"	7'-6"	2'-10"	1'-4"	#5 @ 12"o.c.	#5 @ 6"o.c.	6'-0"	#5 @ 6"o.c.	2'-6"	7'-6"	#5 @ 10"o.c.	2'-6"	#5 @ 10"o.c.	2'-6"
RW-8	≤ 8'-0"	9'-6"	6'-6"	2'-4"	1'-4"	#5 @ 12"o.c.	#5 @ 6"o.c.	3'-0"	EXTEND 'L' BAR TO TOP OF STEM	-	8'-6"	#5 @ 8"o.c.	2'-6"	#5 @ 8"o.c.	2'-6"
RW-6	≤ 6'-0"	7'-9"	4'-9"	1'-8"	1'-4"	#5 @ 12"o.c.	#6 @ 6"o.c.	-	-	-	9'-6"	-	2'-6"	#5 @ 10"o.c.	2'-6"
RW-4	≤ 4'-0"	6'-0"	3'-0"	1'-4"	1'-2"	#5 @ 12"o.c.	#5 @ 10"o.c.	-	-	-	7'-6"	-	-	#5 @ 10"o.c.	2'-6"



'1' 8'-Ø" ≤ H ≤ 12'-Ø"



'2' 4'-Ø" ≤ H ≤ 6'-Ø"

SLAB/WALL TEMP REINF. STEEL SCHEDULE (ALL REBARS CONTINUOUS)		
THICKNESS	'TEMP' 1-LAYER	'TEMP E.F.' 2-LAYER
20"	#6@12"o.c.	#4@10"o.c. AT WALL
16"	#5@10"o.c.	-
14"	#5@12"o.c.	-
10"	-	#4@18"o.c. AT WALL

0' 1' 2' 3' 4' 5' 6'
1/2" = 1'-0"

RETAINING WALL SECTIONS AND SCHEDULES

SC: 1/2" = 1'-Ø"

SW3Ø1

FILE: Site 1 Kauluwai Retaining Wall Structural.dwg
DATE REV.: 20/02/2018

ADRIAN C. M. LEE LICENSED PROFESSIONAL ENGINEER No. 9164-S HAWAII, U.S.A.

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Adrian Lee

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
NEW RETAINING WALL

RETAINING WALL SECTIONS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

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GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE BUILDING CODE OF THE MAUI CITY AND COUNTY (LATEST).

2. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS.

3. THE GENERAL NOTES AND TYPICAL DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN.

4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.

6. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF THE JOB AND NOTIFY ALL DISCREPANCIES TO THE ARCHITECT.

7. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.

8. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND THE PROTECTION OF ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY

9. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA

10. THE CONTRACTOR SHALL NOTIFY TANIMURA & ASSOCIATES (PH. 536-7692) TWO (2) WORKING DAYS PRIOR TO BEGINNING ANY WORK WHICH WILL CONCEAL STRUCTURAL ELEMENT SUCH AS POURING CONCRETE (CONCEALING REINFORCING) OR SHEATHING WALLS (CONCEALING HOLD DOWN ANCHORS).

STRUCTURAL STEEL

1. ALL STRUCTURAL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STEEL PIPES AND STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B. CHANNELS, ANGLES, PLATES, BARS AND MISCELLANEOUS STEEL SHAPES SHALL CONFORM TO ASTM A-36. FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, LATEST EDITION. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

2. ALL BOLTS SHALL CONFORM TO ASTM A307.

3. WELDING: ALL WELDING IS TO COMPLY WITH A.W.S. SPECIFICATIONS AND IS TO BE DONE BY CERTIFIED WELDERS. ALL WELDING IS TO BE DONE BY ELECTRIC ARC PROCESS AND SHALL BE PERFORMED WITH APPROVED ELECTRODES AS REQUIRED BY I.B.C. WELDS ARE DESIGNED AT FULL STRESS AND MUST BE DONE IN THE SHOP OF A LICENSED FABRICATOR.

4. ALL WELDS NOT SHOWN SHALL BE FULL PENETRATION WELDS CAPABLE OF DEVELOPING THE FULL STRENGTH OF THE CONNECTING MEMBERS.

5. THE CONTRACTOR SHALL DETAIL ALL MEMBERS AND CONNECTIONS NOT SHOWN AND SHALL SUBMIT THEM TO THE ENGINEER FOR REVIEW AND APPROVAL. COST OF THESE MEMBERS AND CONNECTIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

6. GALVANIZE ALL STRUCTURAL STEEL SHAPES, PLATES, BOLTS AND ACCESSORIES EXPOSED TO WEATHER. OTHER SHAPES, PLATES AND ACCESSORIES SHALL BE SHOP PRIMED WITH A RUST INHIBITING PRIMER EXCEPT MEMBERS TO RECEIVE SPRAYED-ON FIREPROOFING.

CONCRETE REPAIR NOTES

1. REMOVE ALL DETERIORATED CONCRETE UNTIL ONLY SOUND CONCRETE REMAINS.

2. WHERE REINFORCING IS EXPOSED, CHIP CONCRETE AROUND THE BAR SUCH THAT THERE IS A MINIMUM OF ONE INCH BETWEEN THE BAR AND THE SURROUNDING CONCRETE.

3. CLEAN EXPOSED REINFORCING TO BARE METAL.

4. PERIMETER OF ALL SPALLED AREAS SHALL BE PROVIDED WITH AN EDGE CHIPPED OR SAW CUT ONE INCH MINIMUM DEEP INTO THE EXISTING CONCRETE.

5. THE CONTACT SURFACE SHALL BE ROUGHENED TO APPROXIMATELY 1/4 INCH OF DEPTH. AN APPROPRIATE PROCESS SHALL BE SELECTED SUCH THAT NO COARSE AGGREGATE IS ALLOWED TO BE POLISHED OR ROUNDED. THE CONTACT SURFACE SHALL NOT BE LIMITED TO THE DAMAGED CHIPPED OUT AREA BUT SHALL INCLUDE ALL EXISTING CONCRETE SURFACES TO RECEIVE NEW CONCRETE.

6. IMMEDIATELY PRIOR TO PLACING CONCRETE, AN APPROVED BONDING AGENT SHALL BE APPLIED TO THE PREPARED CONCRETE CONTACT SURFACE.

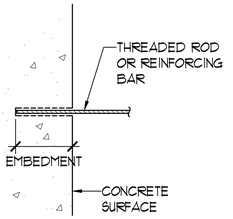
9. NEW CONCRETE SHALL BE NORMAL WEIGHT ACRYLIC MODIFIED MIX HAVING A MINIMUM COMPRESSIVE STRENGTH OF 6,000 PSI AT 28 DAYS AND A MAXIMUM AGGREGATE SIZE OF 3/4 INCH.

DESIGN CRITERIA

1. CODES: 2006 INTERNATIONAL BUILDING CODE

SPECIAL INSPECTION

SPECIAL INSPECTION NOT REQUIRED



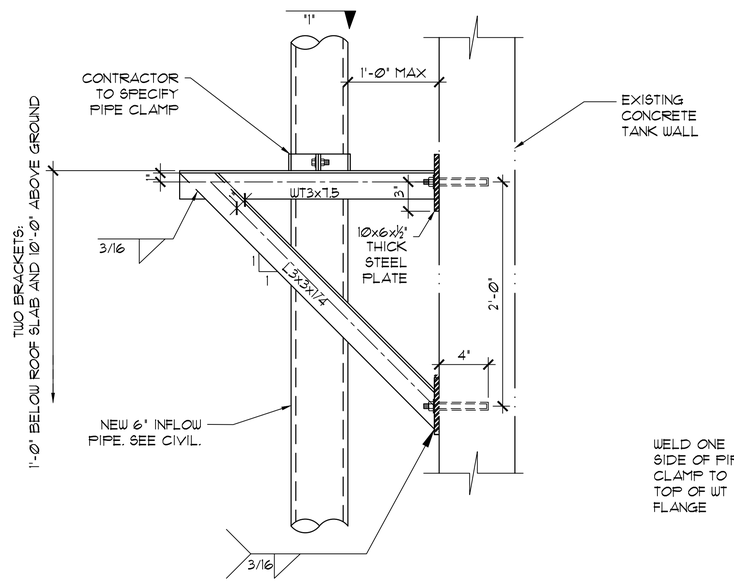
THREADED ROD (REBAR	DRILL BIT DIAMETER	MINIMUM EMBEDMENT
1/2"ϕ (#4)	5/8"	6"
5/8"ϕ (#5)	3/4"	6"
3/4"ϕ (#6)	7/8"	7"
7/8"ϕ (#7)	1"	8"

NOTES:
A. PRE APPROVAL FOR SIMPSON STRONG TIE ET EPOXY TIE ADHESIVE. ALL SUBSTITUTION REQUEST SHALL BE SUBMITTED WITH CURRENT ICBO REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
B. THREADED ROD SHALL BE ASTM A307. REINFORCING BAR SHALL BE ASTM A615 GRADE 60.
C. PRE DRILL HOLE WITH DRILL BIT COMPLYING WITH ANSI B212.15-1994.
D. CLEAN HOLE WITH OIL FREE COMPRESSED AIR AND NYLON BRUSH.
E. FILL HOLE HALF FULL WITH ADHESIVE THEN INSERT ANCHOR TO BOTTOM OF HOLE AND TWIST CLOCKWISE TO ENSURE ADHESIVE COVERS ANCHOR SURFACE. ADHESIVE MUST BE LEVEL WITH CONCRETE SURFACE AFTER INSERTION OF ANCHOR.

EPOXY ANCHOR DETAIL

NO SCALE

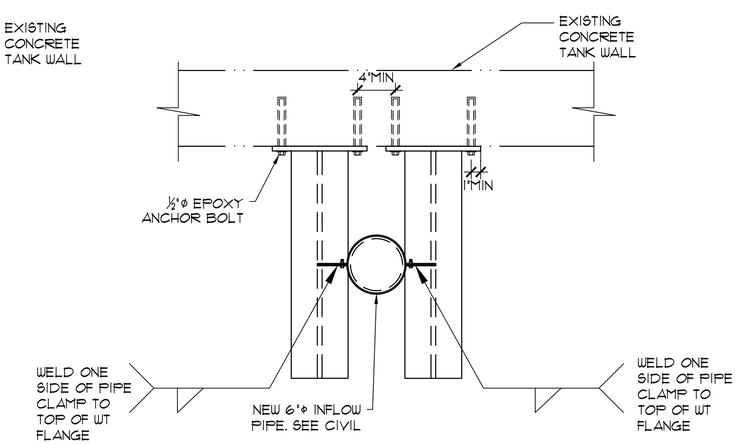
A
SR001



INFLOW SUPPORT DETAIL

SC: 1 1/2"=1'-0"

B
SR001



"I" INFLOW SUPPORT PLAN VIEW

0' 6" 1' 2'
1 1/2" = 1'-0"

ADRIAN C. M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

SR001
97 OF 146

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - HOOLEHUA TWO 3.5 MG RESERVOIRS

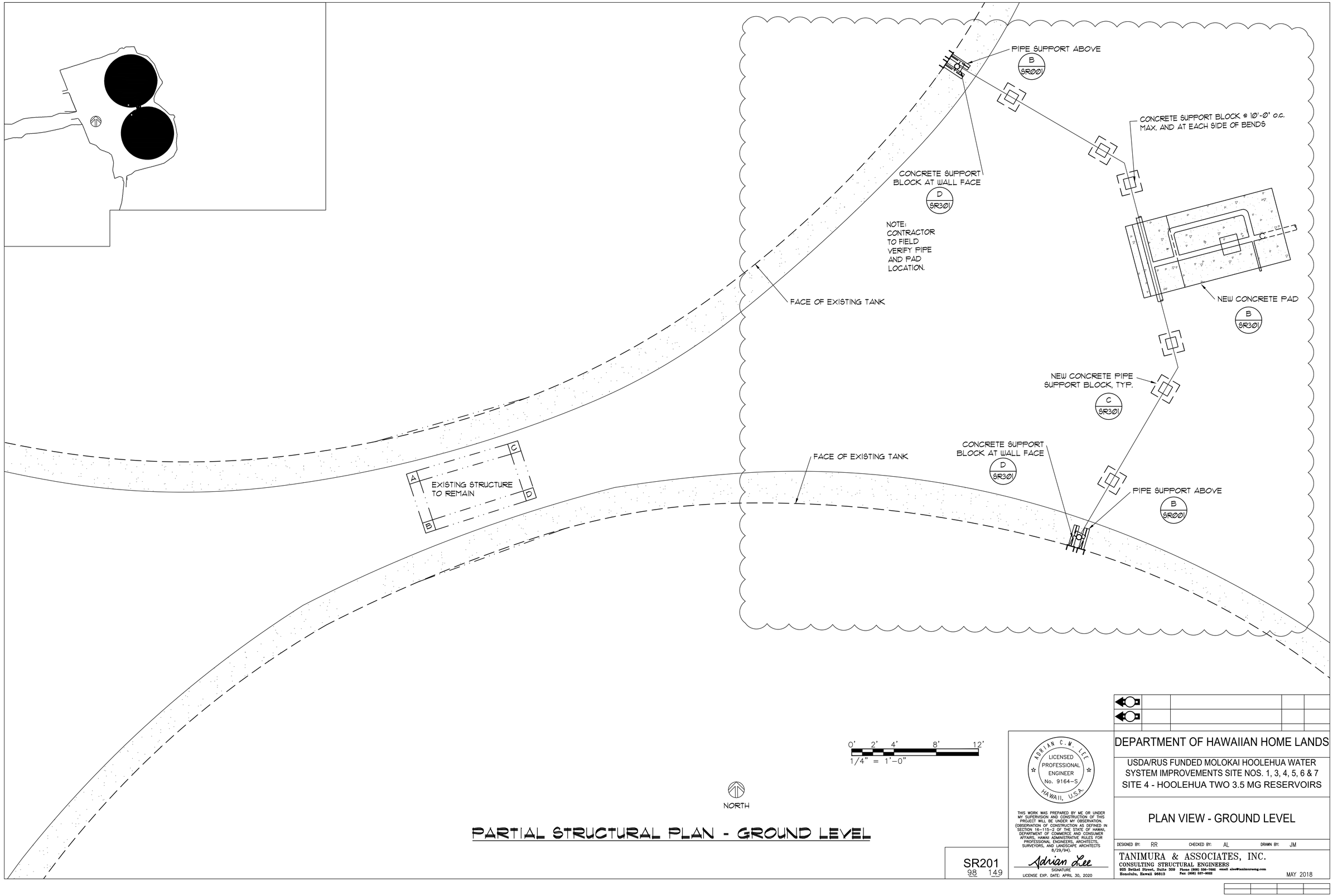
GENERAL NOTES & TYP. DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 309 Phone (808) 536-7692 email alee@tanimuraeng.com
Honolulu, Hawaii 96813 Fax: (808) 537-6022

MAY 2018

FILE: Site 4 Hoolehua 2 3.5 MG Tank base Repairs Structural.dwg
DATE REV.: 31/05/2018



PARTIAL STRUCTURAL PLAN - GROUND LEVEL

FILE: Site 4 Hoolehua 2 3.5 MG Tank base Repairs Structural.dwg
DATE REV.: 05/07/2018

SR201
98 149

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SITE 4 - HOOLEHUA TWO 3.5 MG RESERVOIRS

PLAN VIEW - GROUND LEVEL

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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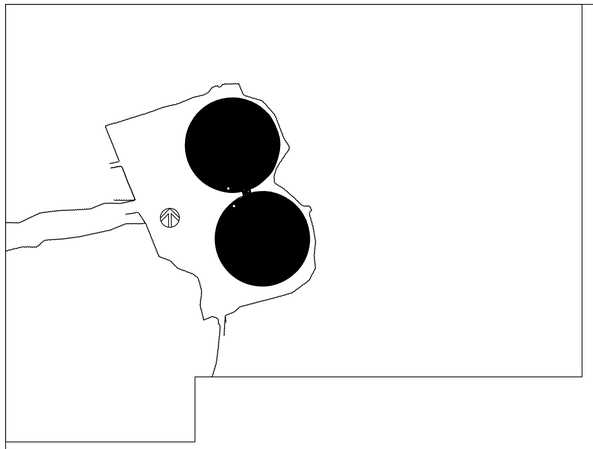
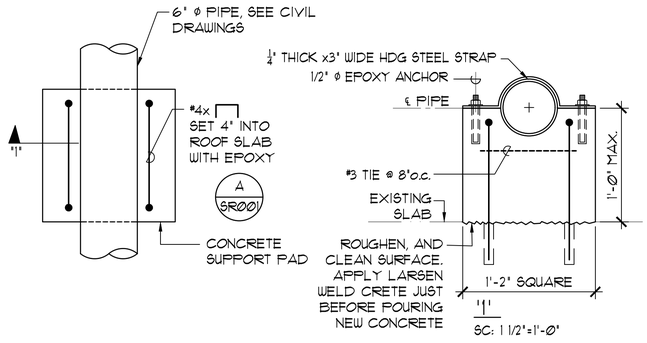
MAY 2018

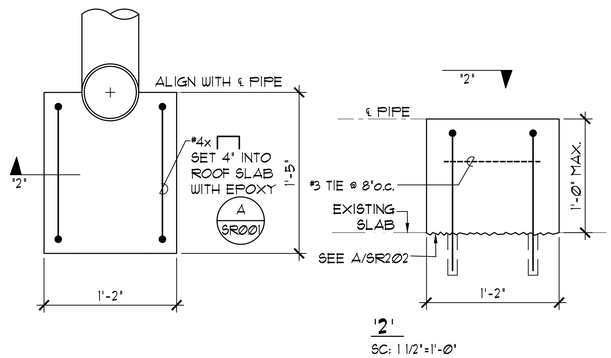




PLAN - PIPE SUPPORT DETAIL

SC: 1 1/2"=1'-0"

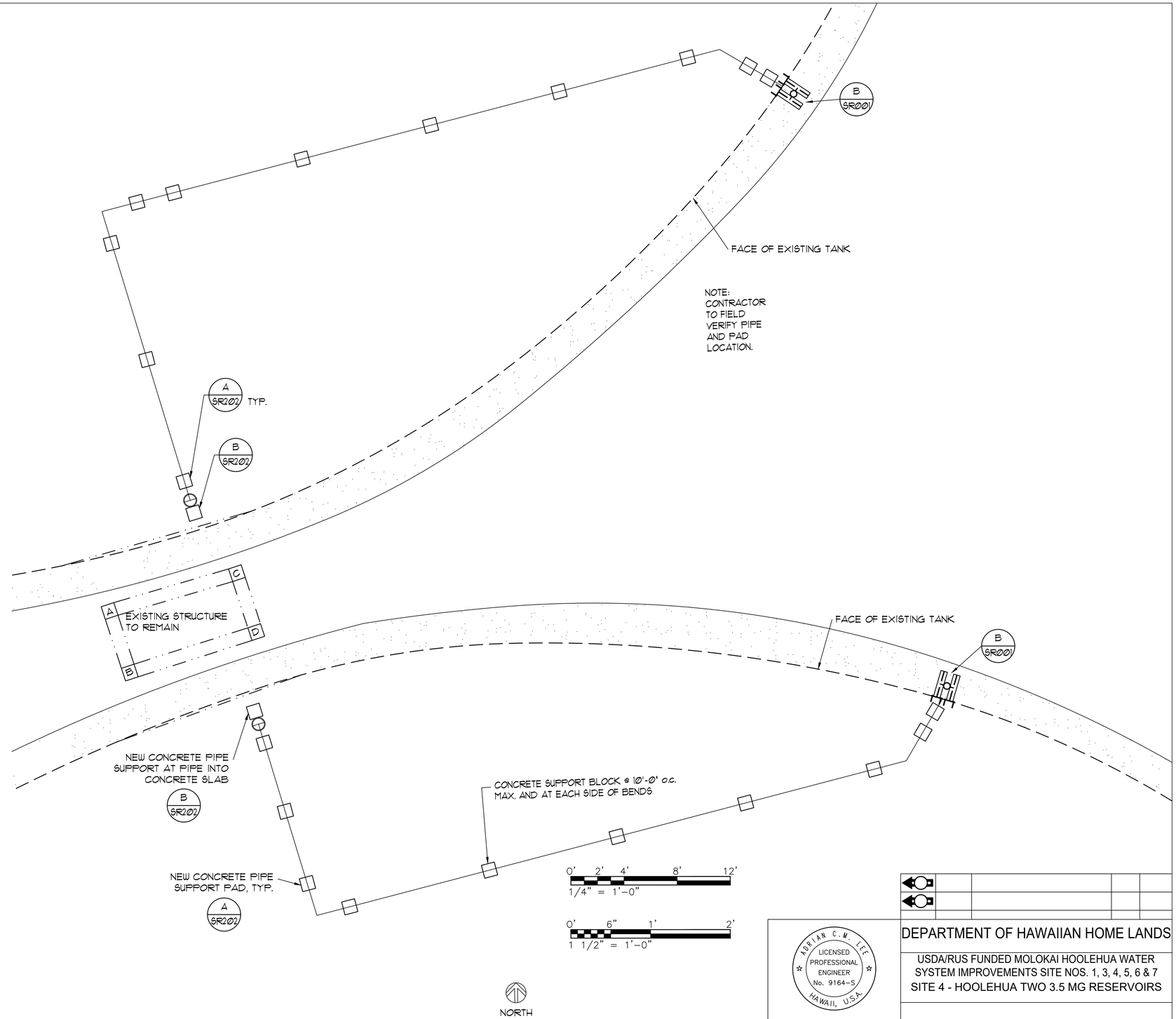
A SR202



PLAN - PIPE SUPPORT AT PIPE INTO ROOF

SC: 1 1/2"=1'-0"

B SR202



PARTIAL STRUCTURAL PLAN - TOP OF ROOF LEVEL

SC: 1/4"=1'-0"

SR202
99 OF 149

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Adrian Lee
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DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - HOOLEHUA TWO 3.5 MG RESERVOIRS

PLAN VIEW - ROOF LEVEL

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

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MAY 2018

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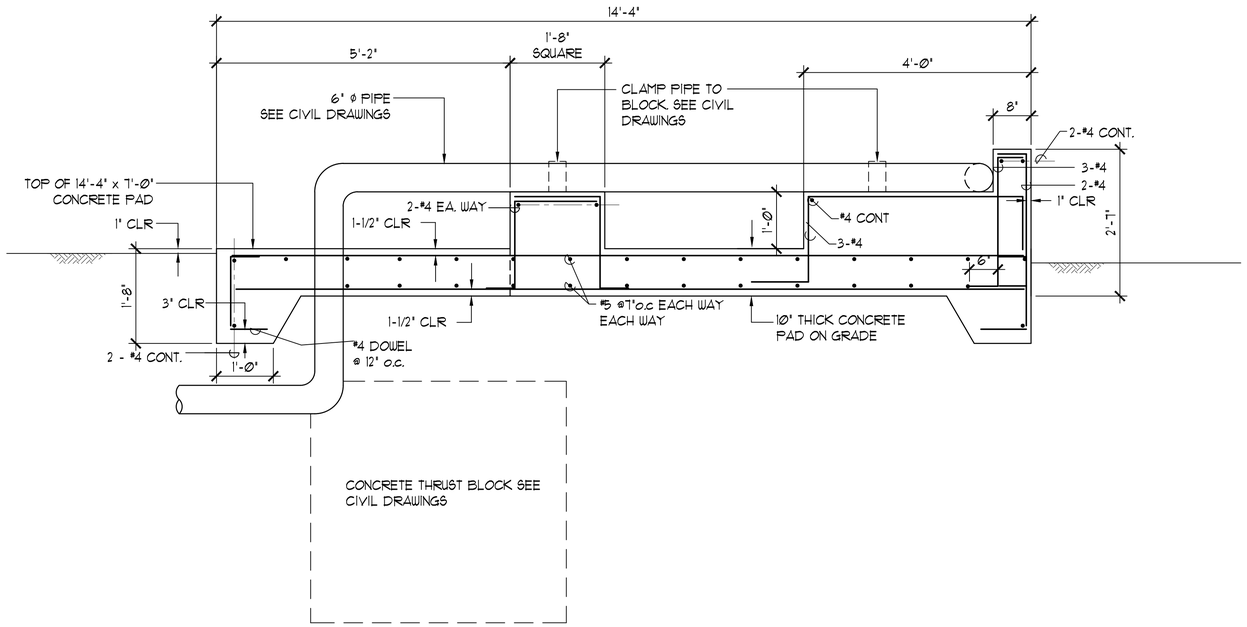
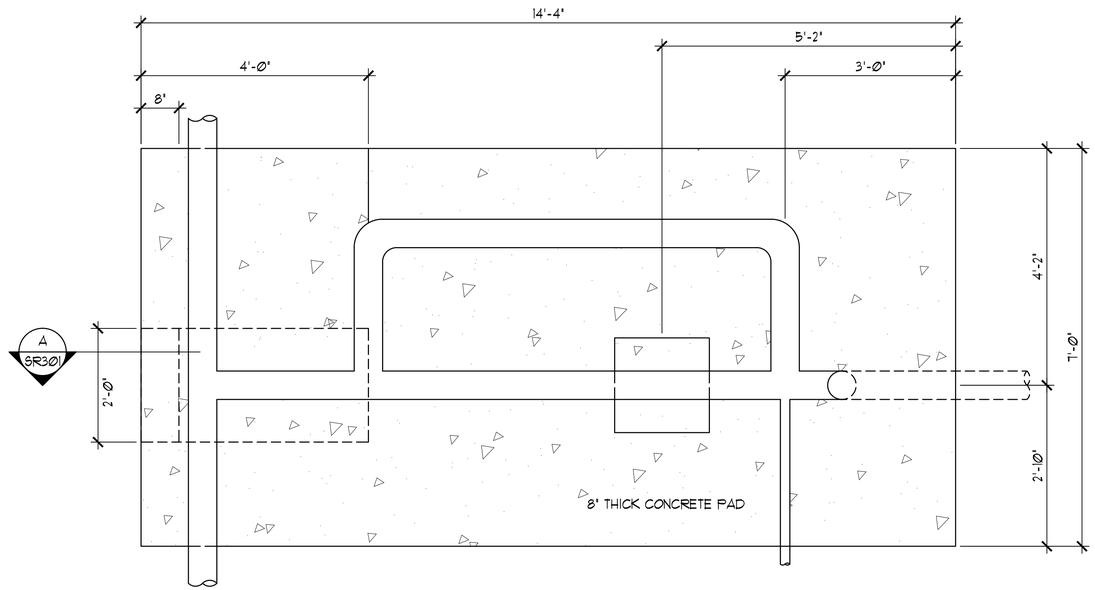


SECTION AT CONCRETE PAD

SCALE: 3/4" = 1'-0"

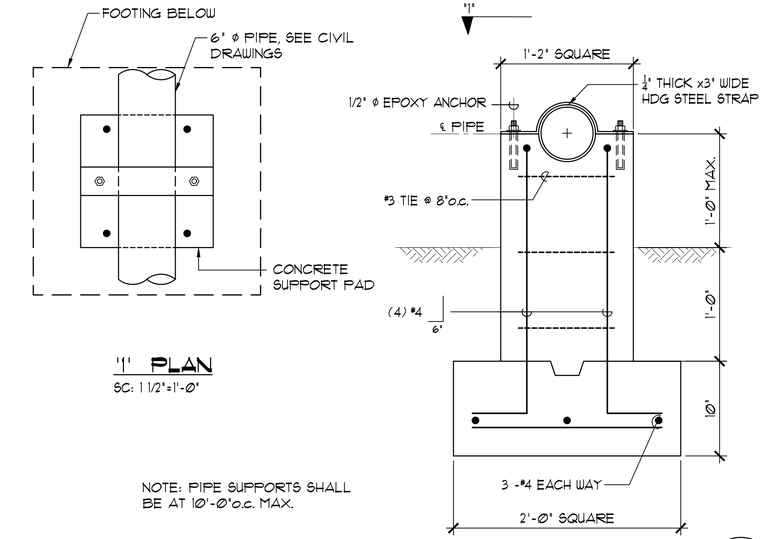
A / SR301



CONCRETE PAD - PLAN

SCALE: 3/4" = 1'-0"

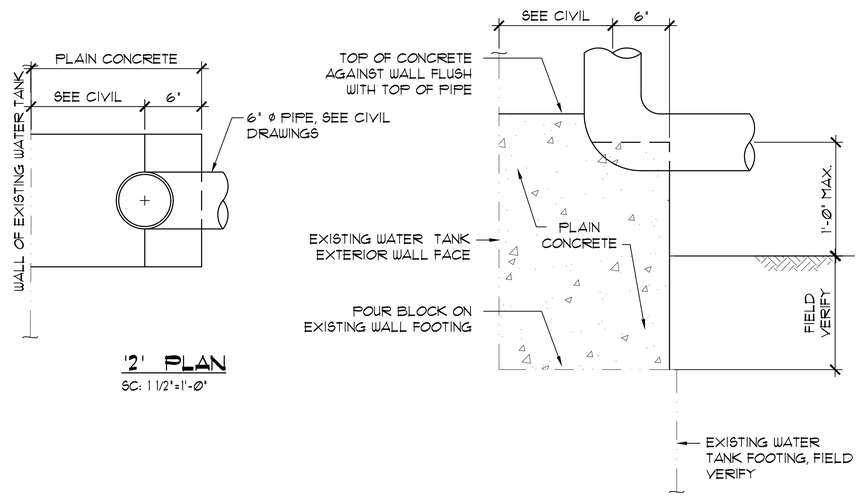
B / SR301



PIPE ABOVE SOIL SUPPORT DETAIL

SC: 1 1/2"=1'-0"

C / SR301



PIPE ABOVE SOIL SUPPORT DETAIL AT WALL

SC: 1 1/2"=1'-0"

D / SR301

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

SR301
100 149

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USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 4 - HOOLEHUA TWO 3.5 MG RESERVOIRS

DETAILS

DESIGNED BY: RR CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
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MAY 2018

FILE: Site 4 Hoolehua 2 3.5 MG Tank base Repairs Structural.dwg
DATE REV.: 05/07/2018

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE 2006 INTERNATIONAL BUILDING CODE AS AMENDED BY COUNTY OF MAUI

2. ALL MATERIALS AND WORKMANSHIP SHALL CONFORM TO THE DRAWINGS AND SPECIFICATIONS.

3. THE GENERAL NOTES AND TYPICAL DETAILS SHALL APPLY UNLESS OTHERWISE SHOWN.

4. DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALES SHOWN ON DRAWINGS.

5. DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY INDICATED BUT ARE OF SIMILAR CHARACTER TO DETAILS SHOWN, SIMILAR DETAILS OF CONSTRUCTION SHALL BE USED, SUBJECT TO REVIEW BY THE ENGINEER.

6. ALL INFORMATION SHOWN ON THE DRAWINGS RELATIVE TO EXISTING CONDITIONS IS GIVEN AS THE BEST PRESENT KNOWLEDGE, BUT WITHOUT GUARANTEE OF ACCURACY. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS PRIOR TO THE START OF THE JOB AND NOTIFY ALL DISCREPANCIES TO THE ARCHITECT.

7. ALL OMISSIONS OR CONFLICTS BETWEEN THE VARIOUS ELEMENTS OF THE WORKING DRAWINGS SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT BEFORE PROCEEDING WITH ANY WORK SO INVOLVED.

8. DURING THE CONSTRUCTION PERIOD THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE BUILDING AND THE PROTECTION OF ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES FROM DAMAGE. THE CONTRACTOR SHALL PROVIDE ADEQUATE SHORING, BRACING AND GUYS IN ACCORDANCE WITH ALL NATIONAL, STATE AND LOCAL SAFETY

9. ALL ERECTION PROCEDURES SHALL CONFORM TO OSHA STANDARDS. ANY DEVIATION MUST BE APPROVED BY OSHA

10. THE CONTRACTOR SHALL NOTIFY TANIMURA & ASSOCIATES (PH. 536-7692) AND THE SPECIAL INSPECTOR FOUR (4) WORKING DAYS PRIOR TO POURING CONCRETE OR GROUTING.

FOUNDATION

1. FOUNDATION DESIGN IS BASED ON GEOTECHNICAL ENGINEERING EXPLORATION REPORT TITLED "SITE NO. 1 AND SITE NO. 7 - DHHL MOLOKAI PROJECTS - ISLAND OF MOLOKAI, HAWAII - W.O. 7410-00 - AUGUST 15, 2017" PREPARED BY GEOLABS, INC. THIS REPORT SHALL BE MADE PART OF THESE DRAWINGS BY REFERENCE. A COPY OF THIS GEOTECHNICAL REPORT SHALL BE KEPT ON SITE DURING CONSTRUCTION.

2. THE BUILDING FOUNDATIONS SHALL BEAR ON THE RECOMPACTED ON-SITE SOIL AND/ OR NEW COMPACTED FILL MATERIAL. SEE GEOTECHNICAL ENGINEERING REPORT FOR COMPACTION REQUIREMENTS.

3. THE SLAB ON GRADE SHALL BE PLACED OVER A MINIMUM 12 INCH LAYER OF AGGREGATE SUB BASE MATERIAL.

4. THE SURFACE LAYER OF SOIL EXHIBIT SLIGHT SHRINK/ SWELL POTENTIAL. TO MITIGATE THE EFFECTS OF SHRINK/ SWELL THE SUBGRADE SOILS SHALL BE PROPERLY PREPARED PRIOR TO FILL PLACEMENT.

5. THE BOTTOM OF FOOTINGS SHALL BE EMBEDDED A MINIMUM OF 18 INCHES BELOW THE LOWEST ADJACENT FINISHED GRADES.M

REINFORCED CONCRETE

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318-05.

2. ALL CONCRETE SHALL BE NORMAL WEIGHT (150 PCF) WITH AGGREGATES CONFORMING TO ASTM C-33. UNLESS OTHERWISE NOTED, THE COMPRESSIVE STRENGTHS OF CONCRETE AT 28 DAYS AND MAXIMUM AGGREGATE SIZES SHALL BE AS FOLLOWS:

	STRENGTH	AGGREGATE SIZE
FOOTING	3,000 PSI	1"
STEM WALL	3,000 PSI	3/4"

3. MAXIMUM WATER-CEMENT RATIO SHALL NOT EXCEED 0.55.

4. ALL REINFORCING STEEL EXCEPT TIES AND STIRRUPS SHALL CONFORM TO ASTM A615 GRADE 60. TIES, STIRRUPS AND REBARS TO BE WELDED SHALL BE ASTM A615 GRADE 40.

5. UNLESS OTHERWISE NOTED, SPLICES, LAPS, DOWEL EXTENSIONS AND EMBEDMENTS SHALL BE 48 BAR DIAMETERS BUT NOT LESS THAN 24" MINIMUM.

6. ALL REINFORCING BARS MARKED CONTINUOUS (CONT.) ON THE PLANS SHALL BE LAPPED 48 BAR DIAMETERS MINIMUM.

7. STAGGER ALL SPLICES WHERE POSSIBLE.

8. ALL WELDING OF REINFORCING SHALL CONFORM TO "STRUCTURAL WELDING CODE - REINFORCING STEEL" (AWS D1.4).

9. REBARS SHALL BE SUPPORTED, BENT AND PLACED AS PER "MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES" ACI 315 (LATEST).

10. MINIMUM COVER IN INCHES FOR REBARS FOR CAST-IN-PLACE CONCRETE:

CONCRETE CAST AGAINST EARTH	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER:	
#5 AND SMALLER	1-1/2"
#6 AND LARGER	2"

11. WELDED WIRE FABRIC SHALL BE GALVANIZED AND CONFORM TO ASTM A-185.

12. UNLESS OTHERWISE SHOWN LAP OUTERMOST CROSS WIRES OF EACH SHEET OF WELDED WIRE FABRIC ONE SPACING OF CROSS WIRES PLUS 2" MINIMUM.

13. AT TIME CONCRETE IS PLACED, REINFORCING SHALL BE FREE FROM MUD, OIL, LAITANCE OR OTHER COATINGS ADVERSELY AFFECTING BOND CAPACITY.

14. REINFORCEMENT, ANCHOR BOLTS, SIMPSON CONNECTORS, DOWELS AND ALL OTHER EMBEDDED ITEMS SHALL BE POSITIVELY SECURED BEFORE POURING.

STRUCTURAL STEEL

1. ALL STRUCTURAL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STEEL PIPES AND STRUCTURAL TUBING SHALL CONFORM TO ASTM A500 GRADE B. CHANNELS, ANGLES, PLATES, BARS AND MISCELLANEOUS STEEL SHAPES SHALL CONFORM TO ASTM A-36. FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE A.I.S.C. SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, LATEST EDITION. SUBMIT SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION.

2. ALL BOLTS SHALL CONFORM TO ASTM A307.

3. WELDING: ALL WELDING IS TO COMPLY WITH A.W.S. SPECIFICATIONS AND IS TO BE DONE BY CERTIFIED WELDERS. ALL WELDING IS TO BE DONE BY ELECTRIC ARC PROCESS AND SHALL BE PERFORMED WITH APPROVED ELECTRODES AS REQUIRED BY IBC. WELDS ARE DESIGNED AT FULL STRESS AND MUST BE DONE IN THE SHOP OF A LICENSED FABRICATOR.

4. ALL WELDS NOT SHOWN SHALL BE FULL PENETRATION WELDS CAPABLE OF DEVELOPING THE FULL STRENGTH OF THE CONNECTING MEMBERS.

5. THE CONTRACTOR SHALL DETAIL ALL MEMBERS AND CONNECTIONS NOT SHOWN AND SHALL SUBMIT THEM TO THE ARCHITECT FOR REVIEW. COST OF THESE MEMBERS AND CONNECTIONS SHALL BE INCLUDED IN THE CONTRACTOR'S BID PRICE.

6. HOT DIP GALVANIZE ALL STRUCTURAL STEEL SHAPES, PLATES, BOLTS AND ACCESSORIES.

7. 1" OF NON-SHRINK GROUT SHALL BE USED UNDER ALL COLUMN BASE PLATES.

COLD-FORMED METAL FRAMING:

1. MEMBER REFERENCES: ALL MEMBERS NOTED ON THE DRAWINGS ARE DESIGNATED BY 2004 AISI STANDARD FOR COLD FORMED STEEL FRAMING - GENERAL PROVISIONS. ALL COLD-FORMED MEMBERS FOR THIS PROJECT SHALL CONFORM TO THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STRUCTURAL MEMBERS", 1996 EDITION.

2. ALL MEMBERS SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM A653 STRUCTURAL QUALITY SHEET STEEL. MEMBERS 54 MILS AND THICKER SHALL BE GRADE 50 KSI. MEMBERS LESS THAN
54 MILS THICK SHALL BE GRADE 33 KSI.

3. ALL MEMBERS SHALL BE HAVE A MINIMUM PROTECTIVE COATING EQUAL TO G90 GALVANIZED FINISH.

4. ALL SCREWED FASTENERS SHALL BE STANDARD THREADED, SELF DRILLING FASTENERS. USE APPROPRIATE THREADS AND HEADS FOR THEIR INTENDED USE. UNLESS NOTED OTHERWISE, ALL SCREWS NOTED ON DRAWINGS MAY BE No. 8, No. 10 OR No. 12. IN GENERAL USE NO. 12 SCREWS FOR THICK GAUGE MATERIAL.

5. WELDED CONNECTIONS: ALL WELDED CONNECTIONS SHALL BE MADE IN ACCORDANCE WITH THE "STRUCTURAL WELDING CODE - SHEET STEEL" (ANSI/AWS D1.3-89) AS PUBLISHED BY THE AMERICAN WELDING SOCIETY. ALL WELDS SHALL BE DONE BY CERTIFIED WELDERS AND SHALL BE SHOP WELDS. WELDERS SHALL BE QUALIFIED FOR EACH TYPE OF WELD USED ON THE PROJECT. PAINT ALL WELDS WITH A ZINC RICH PRIMER AFTER MAKING WELD.

6. CONTRACTOR SHALL NOT ENLARGE NOR MODIFY PREPUNCHED HOLES. NO OTHER HOLES ARE ALLOWED IN JOIST UNLESS SPECIFICALLY APPROVED BY THE ENGINEER. EDGE OF PREPUNCHED HOLES SHALL BE A MINIMUM OF 8 INCHES AWAY FROM SUPPORT.

PRE-ENGINEERED METAL BUILDING

1. ALL WORK SHALL CONFORM TO THE METAL BUILDING MANUFACTURER'S ASSOCIATION CODES, 2006 IBC, ASCE 7-05 AND CRITERIA NOTED HEREIN OR IN THE OTHER CONTRACT DOCUMENTS.

2. SHOP DRAWINGS, CALCULATIONS AND OTHER SUBMITTALS SHALL BE SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF HAWAII AND SUBMITTED TO THE ARCHITECT FOR APPROVAL.

3. PROVIDE AND INSTALL ANCHOR BOLT STEEL TEMPLATES FOR COLUMN ANCHOR BOLTS PRIOR TO CONCRETE POUR.

4. WHEN COMPUTING WIND UPLIFT, THE ACTUAL DEAD LOAD SHALL BE USED WHEN IT IS LESS THAN THE SPECIFIED DEAD LOAD.

5. A MINIMUM OF 1" OF NON-SHRINK LEVELING GROUT SHALL BE USED UNDER ALL COLUMN BASE PLATES. BUILDING MANUFACTURER SHALL ENSURE THAT ANCHOR BOLT PROJECTION ABOVE THE SLAB ACCOUNTS FOR THE GROUT.

6. PEMB ON DRAWINGS INDICATE PRE-ENGINEERED METAL BUILDING MANUFACTURER.

7. RIGID FRAME FOOTINGS ARE SHOWN FOR COMPLETENESS. THE FOOTING LENGTH, WIDTH, THICKNESS, REINFORCING AND ANCHOR BOLT EMBEDMENT WILL BE DESIGNED BY THE STRUCTURAL ENGINEER OF RECORD AFTER THE PEMB SUBMITS THE FRAME REACTIONS FOR REVIEW AND APPROVAL. FRAME REACTIONS SHALL BE LISTED BY LOAD CASE, USING UNFACTORED LOADS. MAXIMUM VERTICAL AND HORIZONTAL REACTIONS SHALL BE CLEARLY NOTED. THE CONTRACTOR SHALL TREAT THE FOOTING DESIGN AS A VARIABLE QUANTITY BECAUSE THE FOOTING SIZES AND REINFORCING MAY CHANGE FROM WHAT IS SHOWN.

8. RIGID FRAMES SHALL BE DESIGNED TO LIMIT DRIFT TO H/200. THE WIND LOADS USED IN THE CALCULATION OF DRIFT SHALL BE BASED ON A 10 YEAR MEAN RECURRENCE INTERVAL WHICH IS ABOUT 65 PERCENT OF THE ASCE 7 DESIGN LOADS WHICH IS BASED ON A 50 YEAR MEAN RECURRENCE INTERVAL.

9. THE RIGID FRAME DESIGNER SHALL BE RESPONSIBLE FOR DESIGNING THE SUPER STRUCTURE (RIGID FRAME, PORTAL FRAME, PURLINS, EAVE CHANNELS, FASCIA, CROSS BRACING, SAG RODS, STRUTS TO BRACE EXISTING CMU WALL, ETC.) ABOVE THE FOUNDATION IN ADDITION TO THE SIZE AND QUANTITY OF ALL ANCHOR BOLTS.THE RIGID FRAME DESIGNER SHALL BE HIRED AND PAID FOR BY THE CONTRACTOR. THE COST OF THE WORK FOR THE PEMB DESIGN SHALL BE INCLUDED IN THE CONTRACTOR'S BID.

DESIGN CRITERIA

1. CODES: 2006 INTERNATIONAL BUILDING CODE
2005 ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

CONCRETE
f'c = 3,000 PSI
Fy = 60,000 PSI

2. FOUNDATION DESIGN CRITERIA

ALLOWABLE BEARING PRESSURE	3,000 PSF
LEVEL BACKFILL	
ACTIVE PRESSURE	40 PCF
PASSIVE RESISTANCE PRESSURE	350 PCF
COEFFICIENT OF FRICTION	0.35

3. SEISMIC LATERAL FORCES

SITE CLASS	D
OCCUPANCY CATEGORY	II
SEISMIC DESIGN CATEGORY	D
MAPPED SPECTRAL RESPONSE	
Ss	0.806
S1	0.210
SDS	0.634
SD1	0.277

4. LATERAL WIND FORCES

WIND	
BASIC WIND SPEED	
(3 SECOND GUST)	105 MPH
WIND IMPORTANCE FACTOR I	1.00
WIND EXPOSURE	B
Kzt TOPOGRAPHIC FACTOR	1.3
Kd	0.80

SPECIAL INSPECTION

1. ITEMS REQUIRING SPECIAL INSPECTION:
REINFORCING STEEL (PERIODIC)
CONCRETE (2006 IBC TABLE 1704.4)
BOLTS IN CONCRETE (2006 IBC TABLE 1704.4)
HIGH STRENGTH BOLTING (AS REQ'D BY PEMB)

2. NOTIFY SPECIAL INSPECTOR 4 WORKING DAYS PRIOR TO NEED OF INSPECTION SERVICES.

3. THE CONTRACTOR SHALL BE FAMILIAR with THE SPECIAL INSPECTION REQUIREMENTS INCLUDING THE IDENTITY AND CONTACT INFORMATION OF THE SPECIAL INSPECTOR RESPONSIBLE FOR EACH REQUIREMENT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING THE SPECIAL INSPECTOR IN A TIMELY MANNER. IF SPECIAL INSPECTIONS ARE NOT DONE THE CERTIFICATE OF OCCUPANCY MAY NOT BE ISSUED BY THE COUNTY.

REVISION	DATE	BRIEF	MADE BY	APPROVED

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

GENERAL NOTES

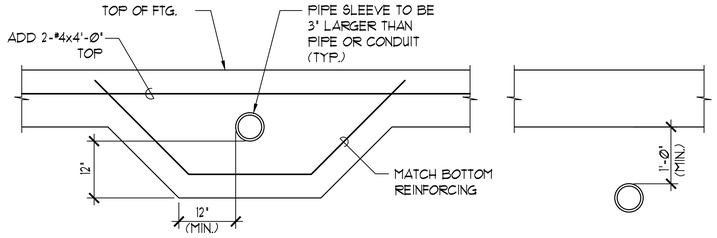
DESIGNED BY:	AL	CHECKED BY:	AL	DRAWN BY:	JM

JUNE 2018

DWG. NO.
SB001
SHEET 101 OF 149

35% SCHEMATIC DESIGN

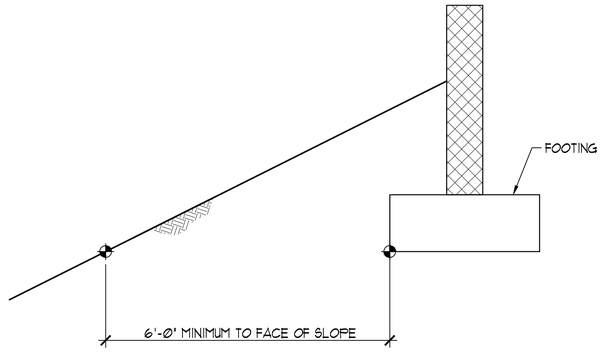
FILE	POCKET	FOLDER	NO.



COND. THRU FTG. COND. BELOW FTG.

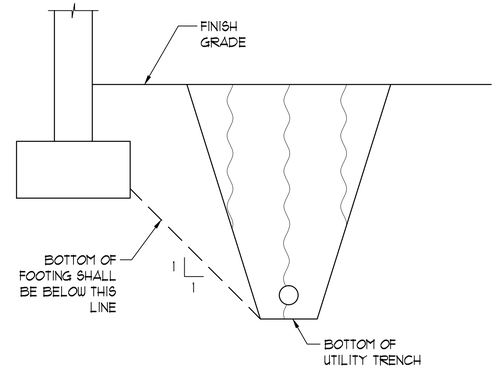
TYPICAL PIPES & CONDUITS AT FOOTING DETAIL — A / SB1Ø1

SC: 3/4" = 1'-Ø"



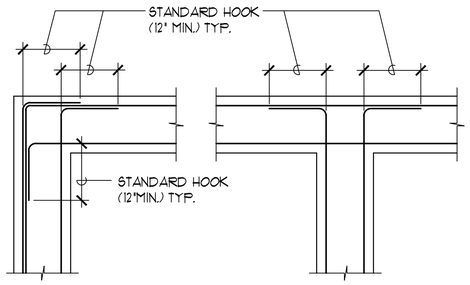
TYP FOOTING SETBACK AT SLOPE — B / SB1Ø1

NOT TO SCALE



FOOTING ADJACENT TO UTILITY TRENCH — C / SB1Ø1

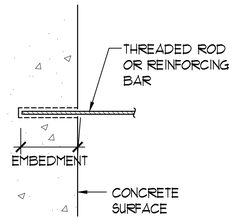
NO SCALE



COND. AT CORNER COND. AT INTERSECTION

TYP. REINFORCING PLAN FOR CONC. FOOTINGS — D / SB1Ø1

NOT TO SCALE



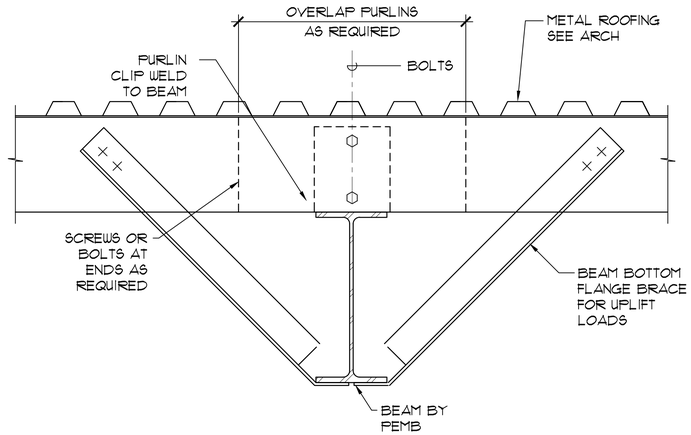
THREADED ROD (REBAR)	DRILL BIT DIAMETER	MINIMUM EMBEDMENT
1/2"ø (#4)	5/8"	6"
5/8"ø (#5)	3/4"	6"
3/4"ø (#6)	7/8"	7"
7/8"ø (#7)	1"	8"

NOTES:

A. PRE APPROVAL FOR SIMPSON STRONG TIE SET-XP EPOXY TIE ADHESIVE. ALL SUBSTITUTION REQUEST SHALL BE SUBMITTED WITH CURRENT ICBO REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
B. THREADED ROD SHALL BE ASTM A307. REINFORCING BAR SHALL BE ASTM A615 GRADE 60.
C. PRE DRILL HOLE WITH DRILL BIT COMPLYING WITH ANSI B212.15-1994.
D. CLEAN HOLE WITH OIL FREE COMPRESSED AIR AND NYLON BRUSH.
E. FILL HOLE HALF FULL WITH ADHESIVE THEN INSERT ANCHOR TO BOTTOM OF HOLE AND TWIST CLOCKWISE TO ENSURE ADHESIVE COVERS ANCHOR SURFACE. ADHESIVE MUST BE LEVEL WITH CONCRETE SURFACE AFTER INSERTION OF ANCHOR.

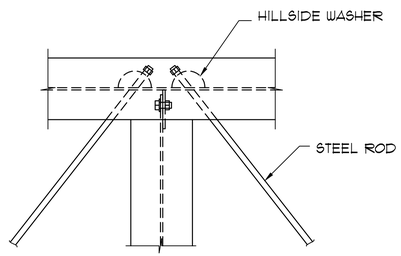
EPOXY ANCHOR DETAIL — E / SB1Ø1

NO SCALE



RIGID FRAME BOTTOM FLANGE BRACE — F / SB1Ø1

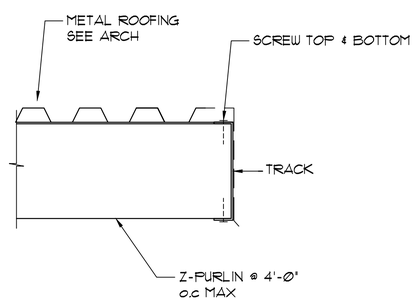
SC: 1 1/2"=1'-Ø"



INSTALL RODS AS CLOSE TO THE BEAM TOP FLANGE AS POSSIBLE.

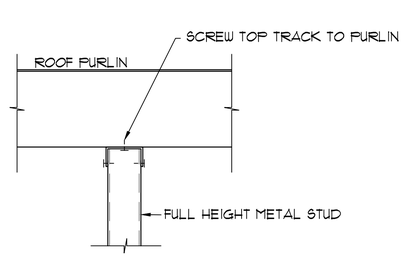
ROD BRACING DETAIL — G / SB1Ø1

SC: 1 1/2"=1'-Ø"



FASCIA CHANNEL DETAIL AT END OF PURLIN — H / SB1Ø1

SC: 1 1/2"=1'-Ø"



CONNECTION DETAIL — J / SB1Ø1

SC: 1 1/2"=1'-Ø"

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

TYPICAL DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

JUNE 2018

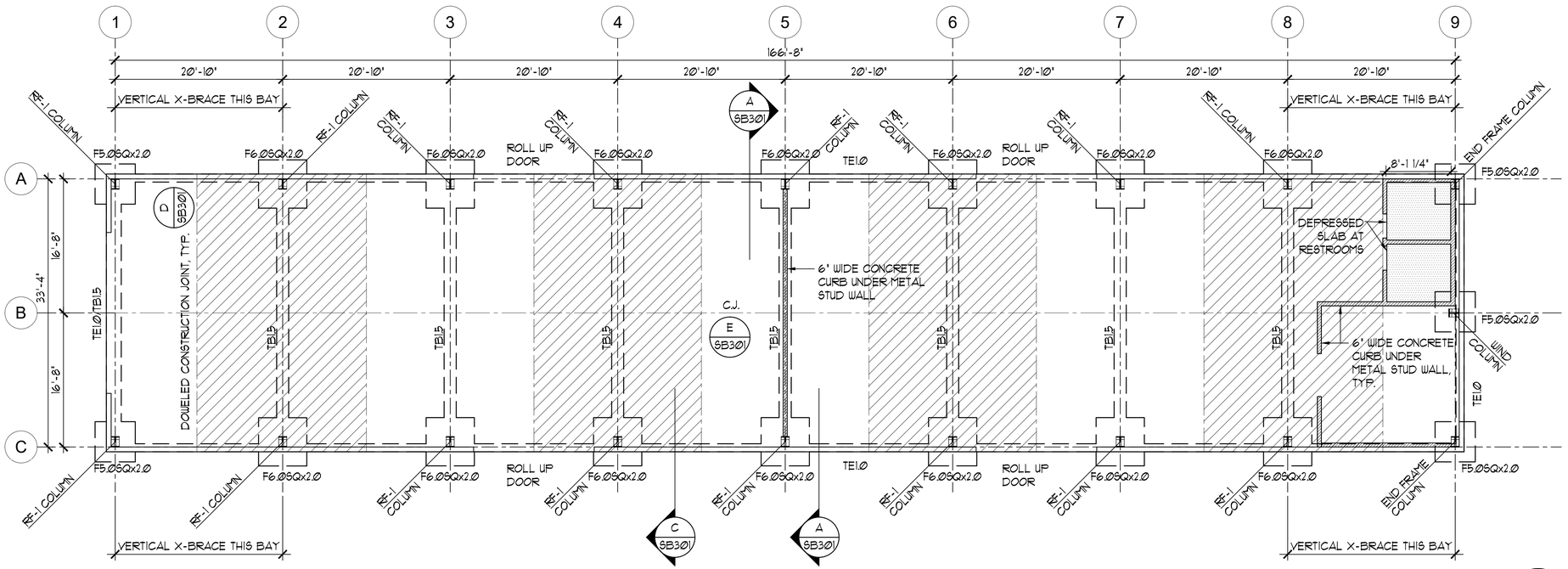
ADRIAN C.M. LEE — LICENSED PROFESSIONAL ENGINEER No. 9164-S — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. SB101
SHEET 102 OF 149

35□ SCHEMATIC DESIGN

FILE	POCKET	FOLDER	NO.



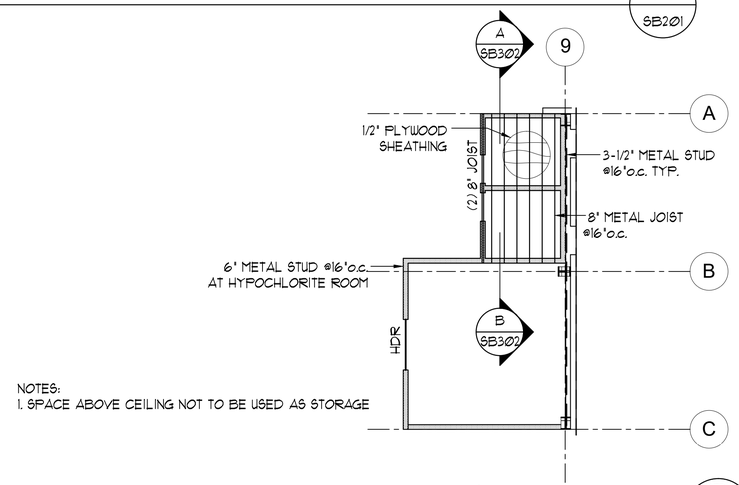
FOUNDATION PLAN

SC: 1/8"=1'-0"

A SB201

NOTES:

1. INTERIOR SLAB ON GRADE IS 6" THICK CONCRETE with REBAR @ 24'o.c. EACH WAY OVER 12" OF AGGREGATE SUB BASE.
2. HATCH AREAS INDICATE CLOSURE STRIP. POUR 7 DAYS MINIMUM AFTER COMPLETION OF ADJACENT SLAB STRIP.
3. SHADED AREA INDICATES 3" DEPRESS SLAB.
4. INDICATES CONCRETE CURB UNDER WALL AT INTERIOR OF BUILDING.



NOTES:
1. SPACE ABOVE CEILING NOT TO BE USED AS STORAGE

CEILING PLAN AT BATHROOMS

SC: 1/8"=1'-0"

B SB201

0' 4' 8' 16' 24'
1/8" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

FOUNDATION PLAN

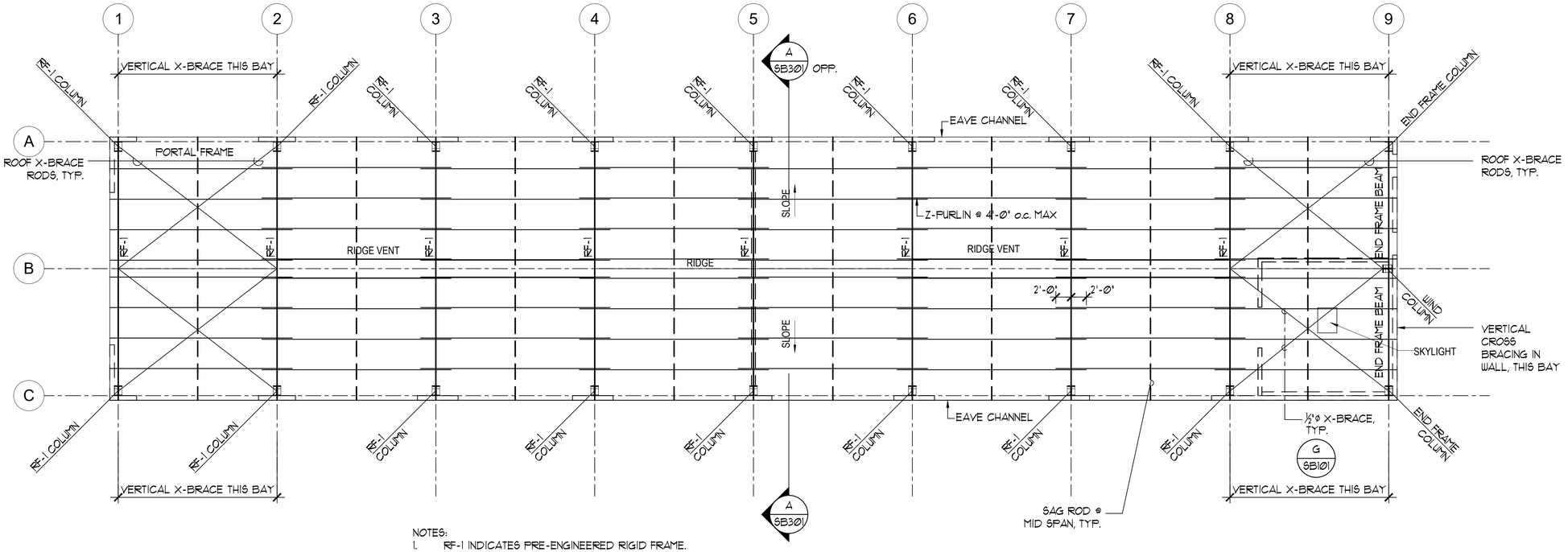
DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

JUNE 2018

DWG. NO. SB201
SHEET 103 OF 149

35□ SCHEMATIC DESIGN

FILE	POCKET	FOLDER	NO.



NOTES:
1. RF-1 INDICATES PRE-ENGINEERED RIGID FRAME.
2. SEE PRE ENGINEERED BUILDING NOTE ON SHEET S-001

ROOF FRAMING PLAN

SC: 1/8"=1'-0"

A SB202

0' 4' 8' 16' 24'
1/8" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

ROOF FRAMING PLAN

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: TM

JUNE 2018

ADRIAN C.M. LEE
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HAWAII, U.S.A.

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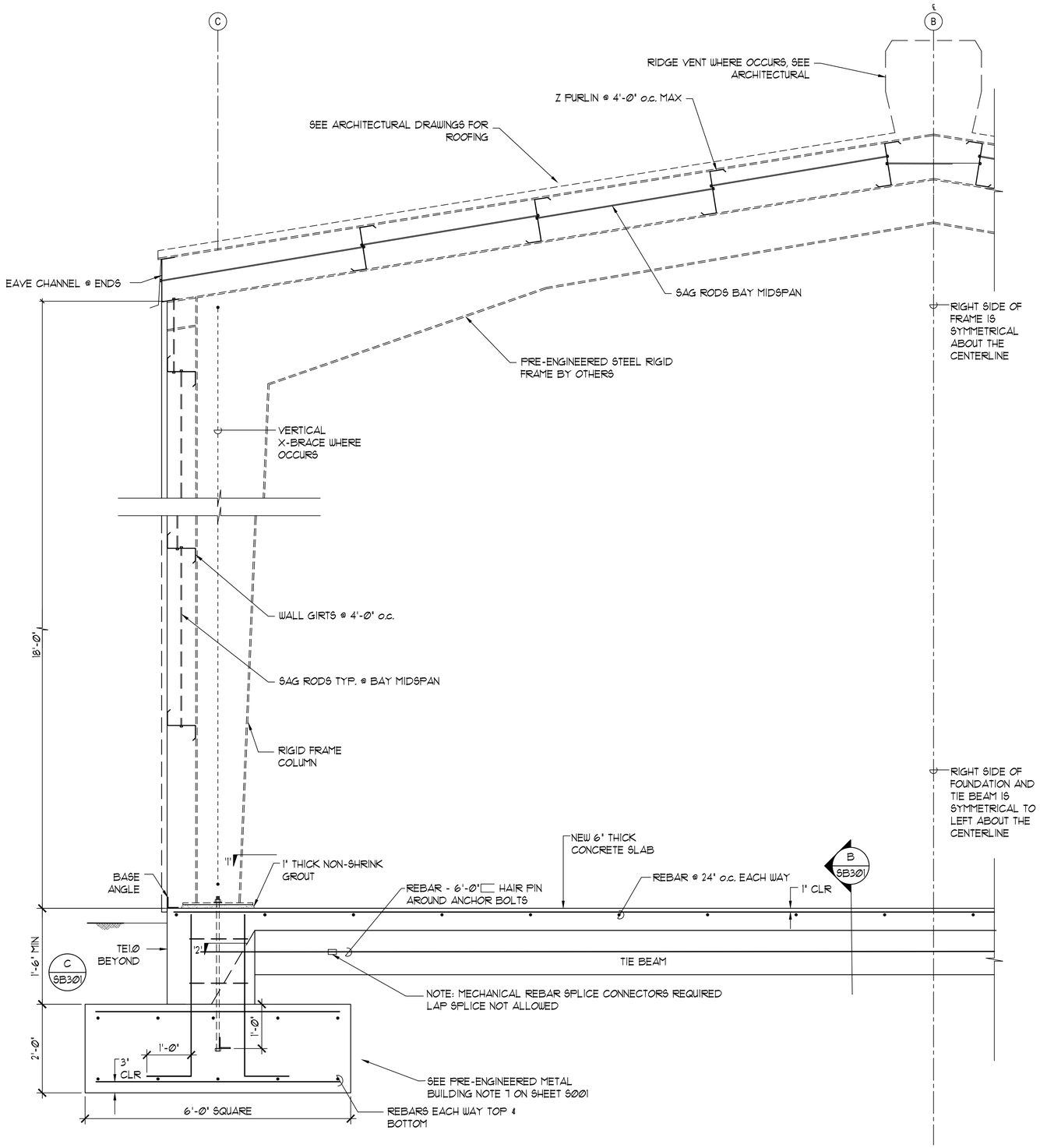
DWG. NO. SB202
SHEET 104 OF 149

35□ SCHEMATIC DESIGN

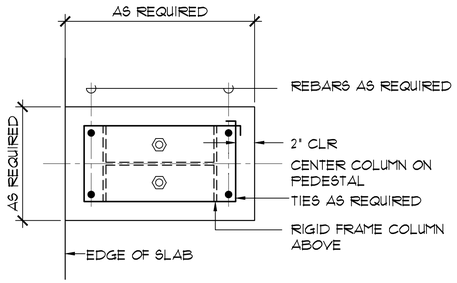
FILE	POCKET	FOLDER	NO.



SECTION AT RIGID FRAME

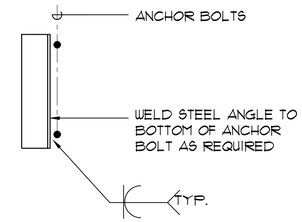
SC: 3/4"=1'-Ø"

A SB301



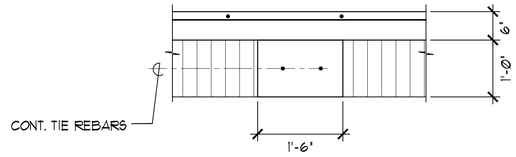
'1' PLAN PEDESTAL

SC: 1 1/2"=1'-Ø"



'2' PLAN ANCHOR BOLTS

SC: 1 1/2"=1'-Ø"

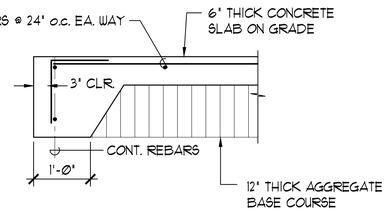


LAP SPLICE NOT ALLOWED USE MECHANICAL REBAR SPLICE CONNECTORS

TIE BEAM DETAIL

SC: 3/4"=1'-Ø"

B SB301

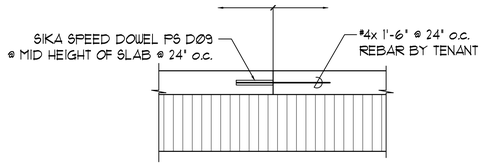


TEI.Ø SLAB EDGE

SC: 3/4"=1'-Ø"

C SB301

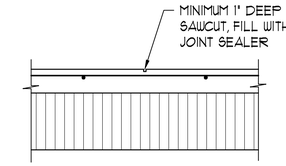
FIRST CONCRETE POUR SECOND CONCRETE POUR



DOWELED CONSTRUCTION JOINT

SC: 3/4" = 1'-Ø"

D SB301



NOTES:
1. SAW CUT SHALL BE DONE AS SOON AS THE CONCRETE HAS HARDENED SUFFICIENTLY TO AVOID EXCESSIVE RAVELING, BUT NOT MORE THAN 8 HOURS AFTER FINISHING.

SAWED CONTROL JOINT

SC: 3/4" = 1'-Ø"

E SB301

0' 1' 2' 3' 4'
3/4" = 1'-0"

0' 6" 1' 2'
1 1/2" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

SECTION AND DETAILS

ADRIAN C.M. LEE — LICENSED PROFESSIONAL ENGINEER No. 9164-S — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Adrian Lee
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

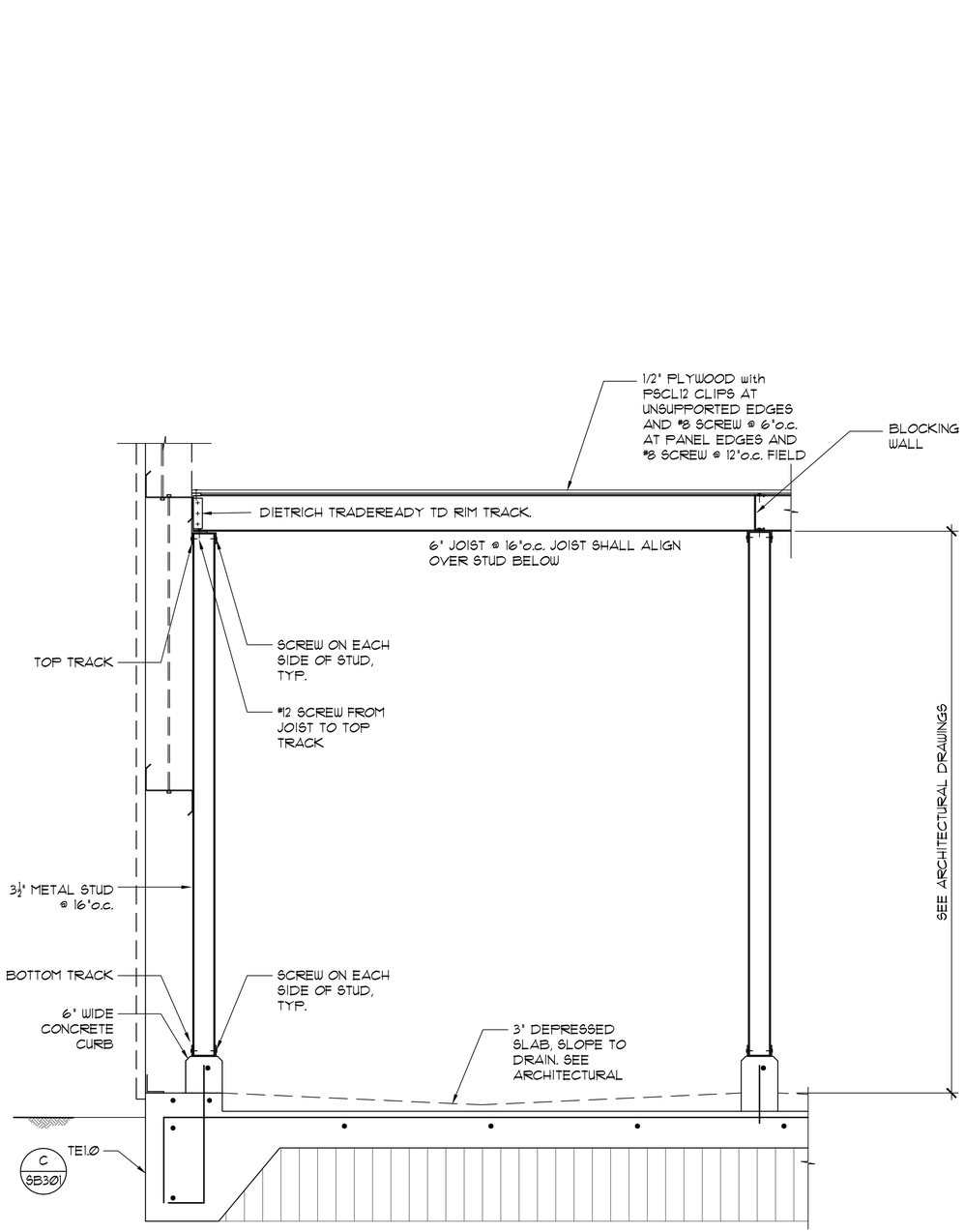
DESIGNED BY: AL CHECKED BY: AL DRAWN BY: CM

JUNE 2018

DWG. NO. SB301
SHEET 105 OF 149

35□ SCHEMATIC DESIGN

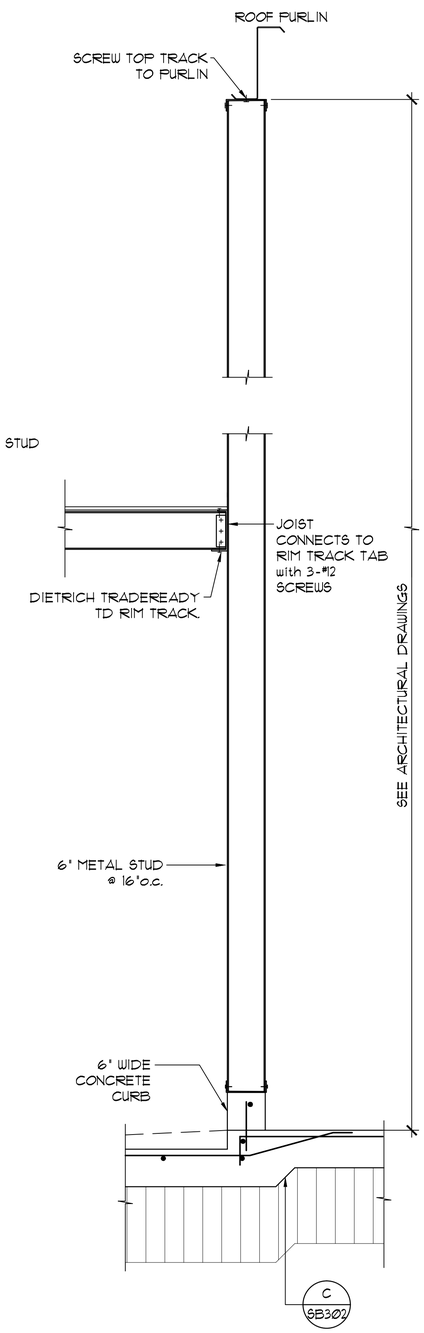
FILE	POCKET	FOLDER	NO.



SECTION THROUGH RESTROOM

SC: 1"=1'-0"

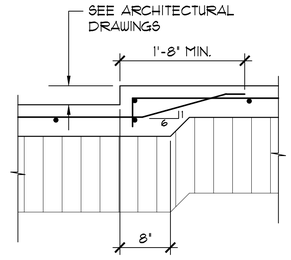
A SB302



SECTION THROUGH HYPOCHLORITE STORAGE ROOM

SC: 1"=1'-0"

B SB302



DEPRESSED SLAB

SC: 1" = 1'-0"

C SB302

0' 6" 1' 2' 3'
1" = 1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - NEW MAINTENANCE YARD BUILDING

SECTIONS

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

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Adrian Lee
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

JUNE 2018

DWG. NO. SB302
SHEET 106 OF 149

35□ SCHEMATIC DESIGN

FILE	POCKET	FOLDER	NO.

VAULT STRUCTURE NOTES

1. ALL WORK SHALL CONFORM TO THE 'STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION' (LATEST).

2. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH & A MAXIMUM WATER TO CEMENT RATIO AS FOLLOWS:

	STRENGTH	W/C RATIO
VAULT	4,000 PSI	0.48

3. ALL REINFORCING STEEL SHALL CONFORM TO ASTM A615 GRADE 60.

4. MINIMUM COVER IN INCHES FOR REBARS FOR CAST-IN-PLACE AND PRECAST CONCRETE EXCEPT AS NOTED:

CONCRETE CAST AGAINST EARTH (C.I.P.)	3"
FORMED CONCRETE EXPOSED TO EARTH OR WEATHER	2"

5. UNLESS OTHERWISE NOTED, SPLICES, LAPS, DOWEL EXTENSIONS AND EMBEDMENTS SHALL BE 48 BAR DIAMETERS MINIMUM.

6. ALL REINFORCING BARS MARKED 'CONT.' OR 'TEMP.' SHALL BE LAPPED 40 BAR DIAMETERS MINIMUM.

7. STAGGER ALL SPLICES WHERE POSSIBLE.

8. REBARS SHALL BE SUPPORTED, BENT AND PLACED AS PER 'MANUAL OF STANDARD PRACTICE FOR DETAILING CONCRETE STRUCTURES' ACI 315 (LATEST).

9. AT TIME CONCRETE IS PLACED, REINFORCING SHALL BE FREE FROM MUD, OIL, LAITANCE OR OTHER SUBSTANCES ADVERSELY AFFECTING BOND CAPACITY.

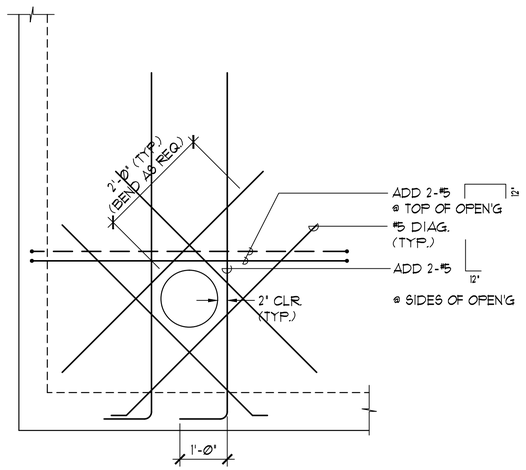
10. FOR REINFORCING NOT SHOWN ON THE PLANS, FOLLOW LATEST APPROVED VERSION OF THE 'STANDARD DETAILS FOR PUBLIC WORK CONSTRUCTION' (STANDARD DETAILS).

11. REINFORCEMENT, ANCHOR BOLTS, DOWELS AND ALL OTHER EMBEDDED ITEMS SHALL BE POSITIVELY SECURED BEFORE POURING.

DESIGN CRITERIA

1. AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS SIXTH EDITION 2012:

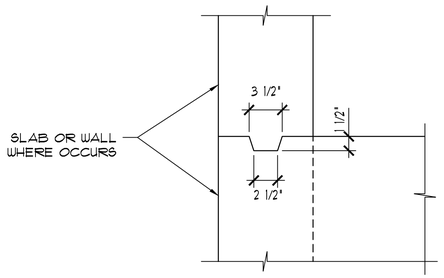
LIVE LOAD: 250 PSF (IN NON-TRAFFIC AREAS)
60 PCF ACTIVE PRESSURE (TOP RESTRAINED)
LIVE LOAD SURCHARGE PER AASHTO



ELEVATION

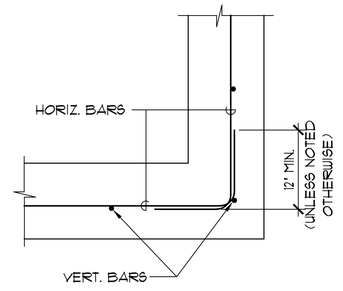
TYP. ADDED REINF. AT PIPES FOR C.I.P. VAULTS — A / SV001

N.T.S.



TYPICAL KEY DETAIL — B / SV001

N.T.S.



PLAN - TYP. CORNER REINFORCEMENT LAPPING — C / SV001

N.T.S.

FILE: Hoolehua WSI - New two Underground Vaults s.dwg
DATE REV.: 08/05/2018

SV001
SHEET 107 OF 149

ADRIAN C.M. LEE
LICENSED PROFESSIONAL ENGINEER
No. 9164-S
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

Adrian Lee
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

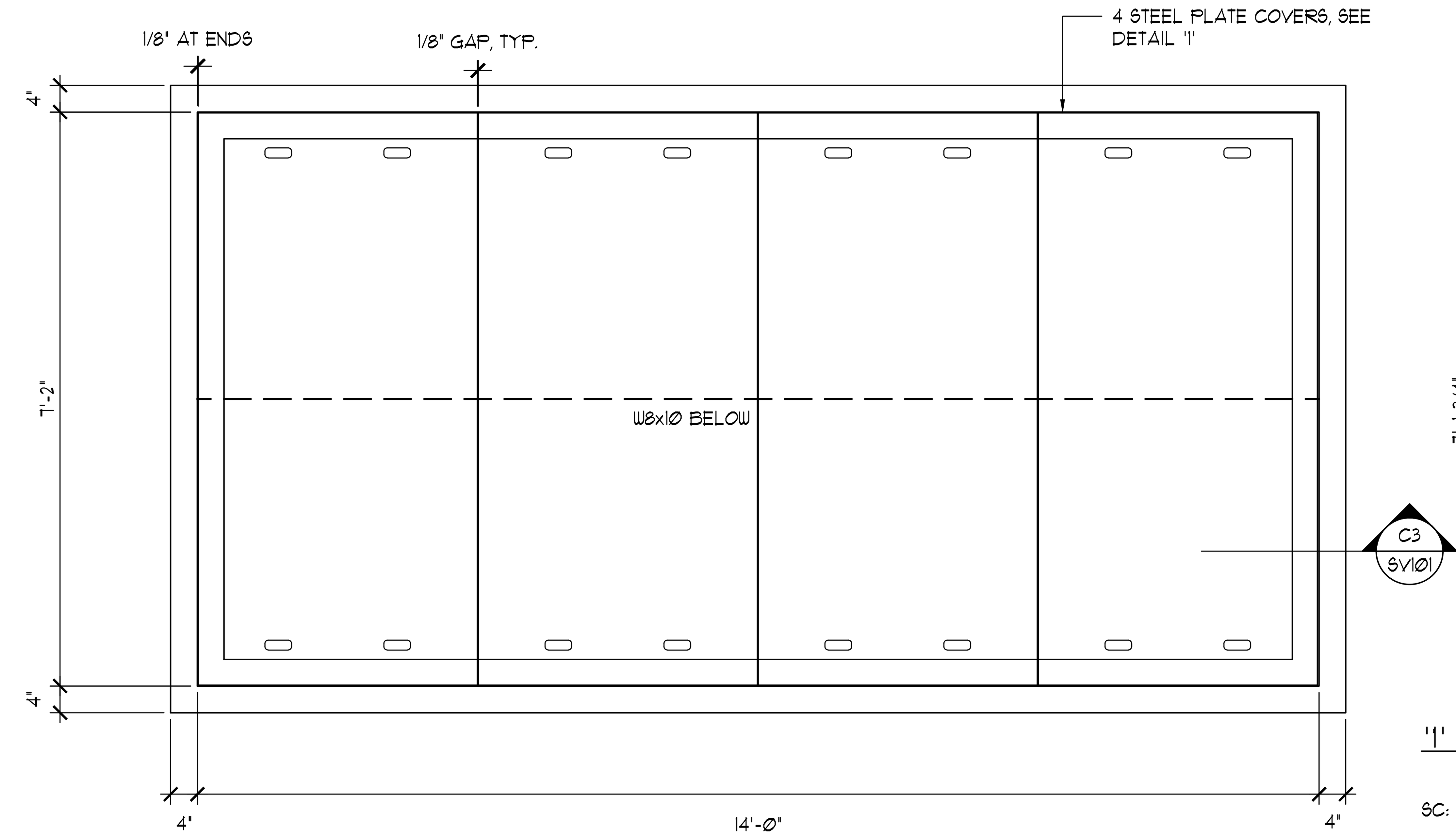
USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
TWO NEW UNDERGROUND VAULTS

GENERAL NOTES & TYP. DETAILS

DESIGNED BY: AL CHECKED BY: AL DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 309 Phone (808) 536-7922 email alee@tanimuraeng.com
Honolulu, Hawaii 96813 Fax: (808) 537-4022

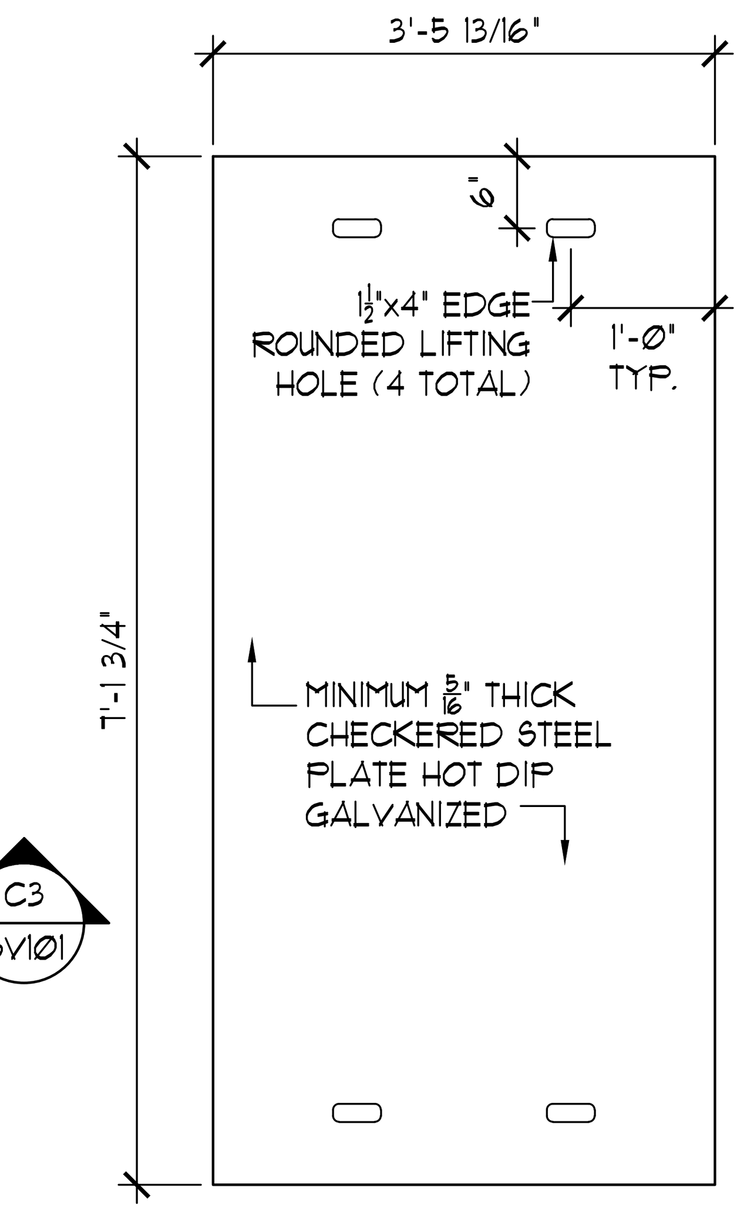
MAY 2018



PLAN - TOP COVER

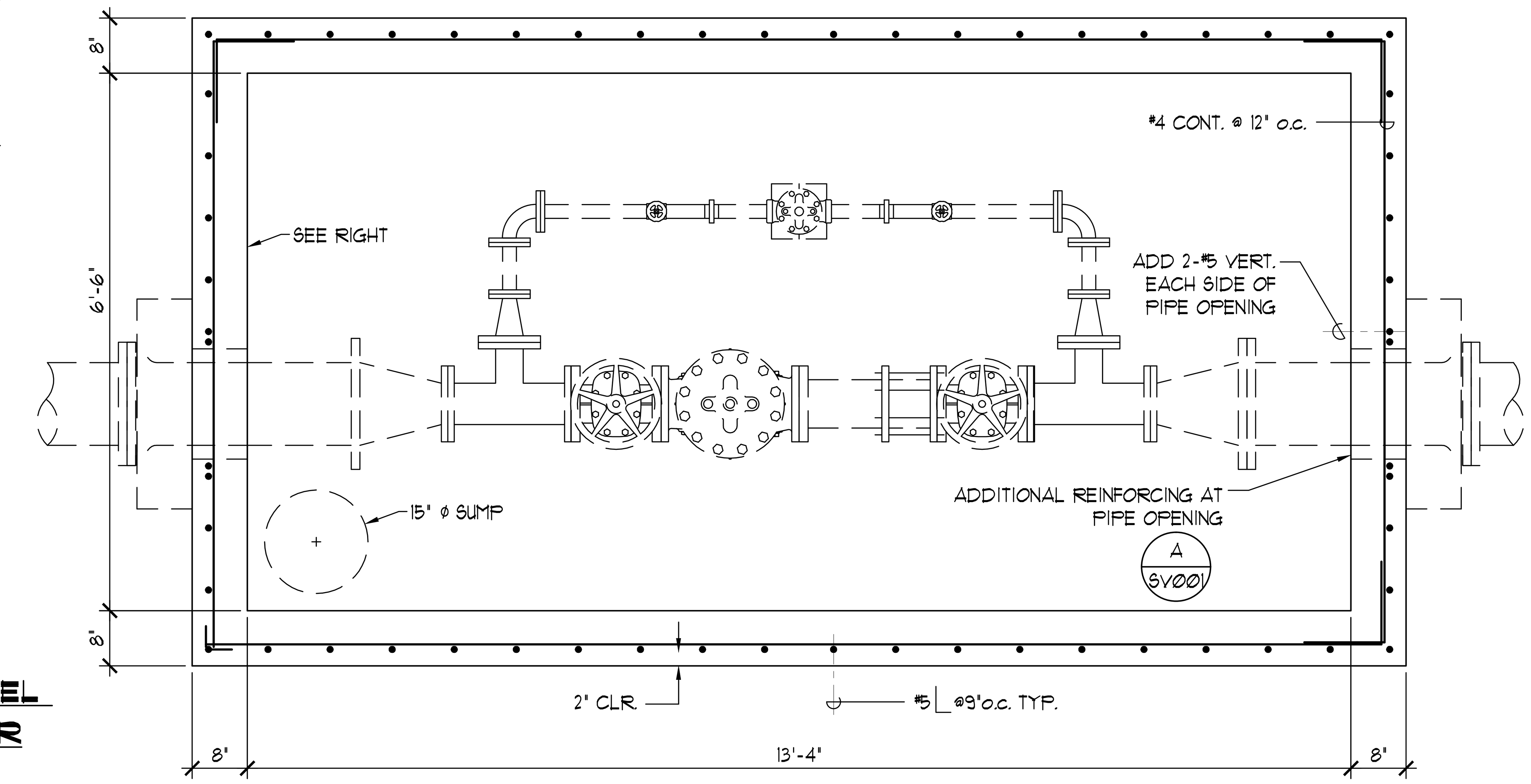
SC: 3/4"=1'-0"

A SV101



'1' PLAN - TYPICAL STEEL PLATE COVER

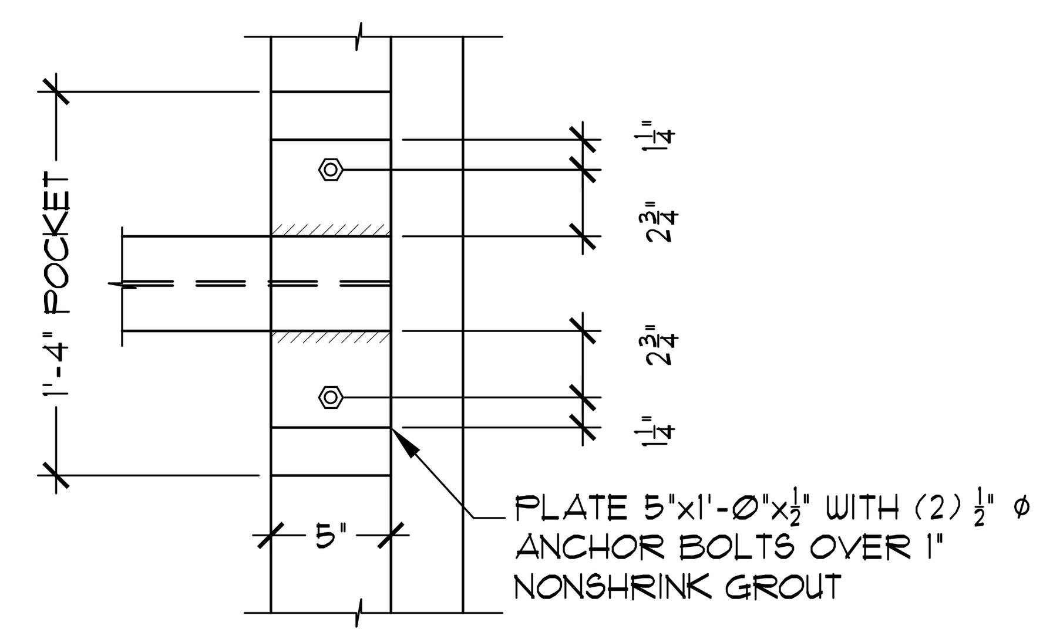
SC: 3/4"=1'-0"



PLAN

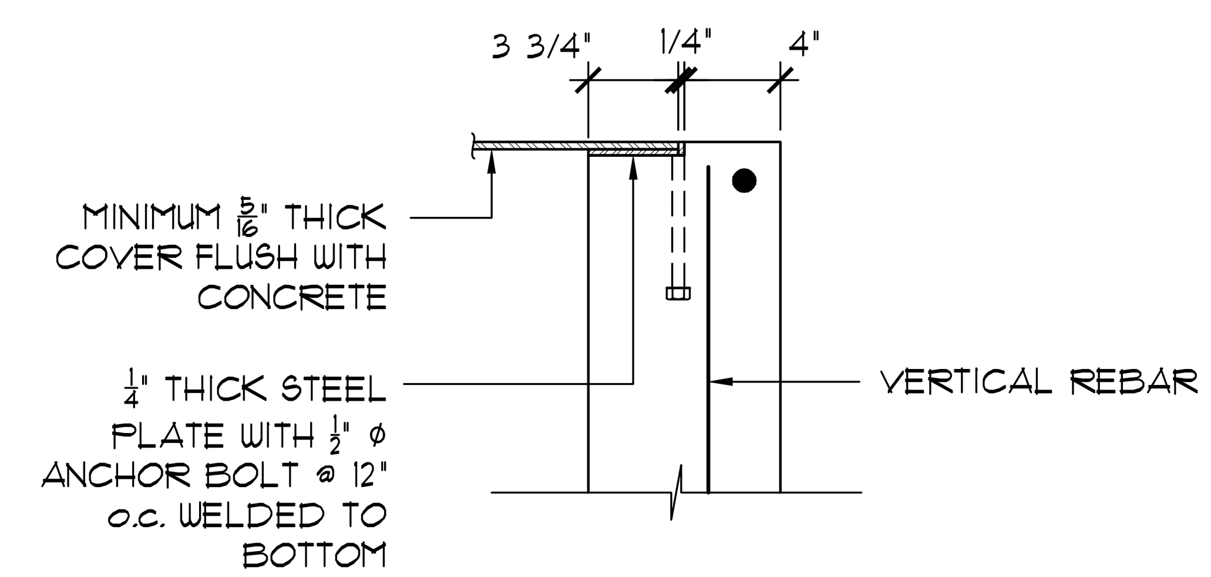
SC: 3/4"=1'-0"

B SV101



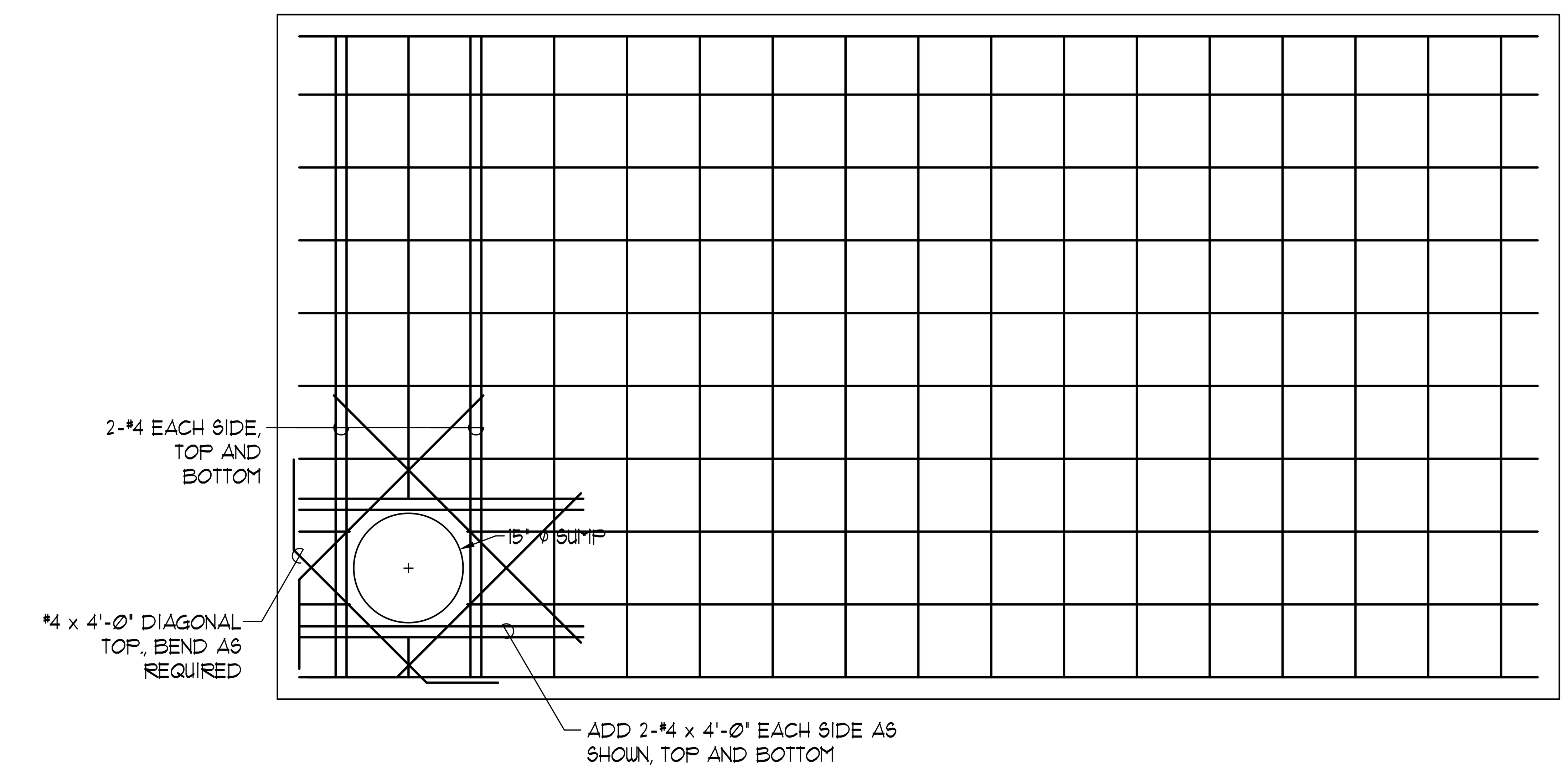
'2' PLAN - BEAM SEAT

SC: 1 1/2"=1'-0"



'3' TOP OF WALL AWAY FROM BEAM

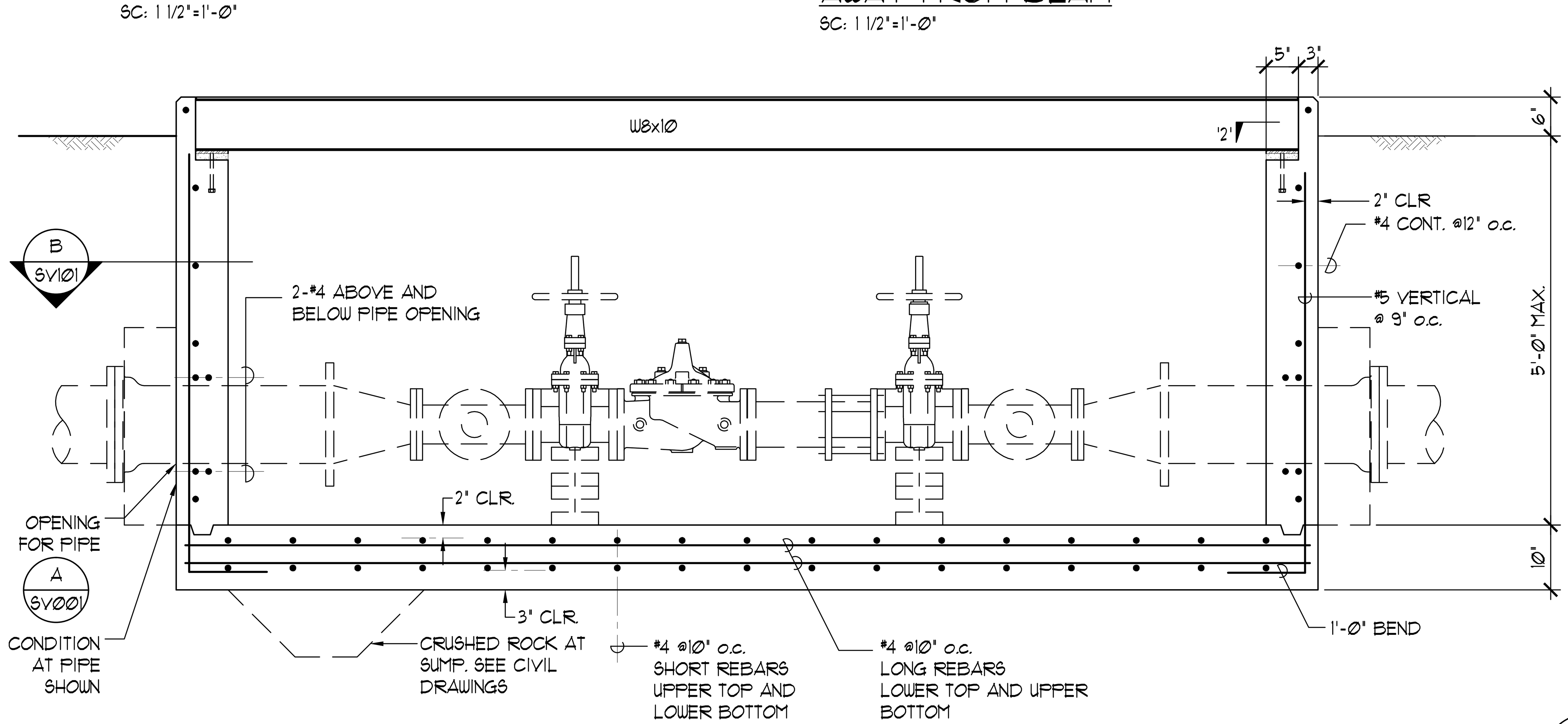
SC: 1 1/2"=1'-0"



PLAN - INVERT SLAB

SC: 3/4"=1'-0"

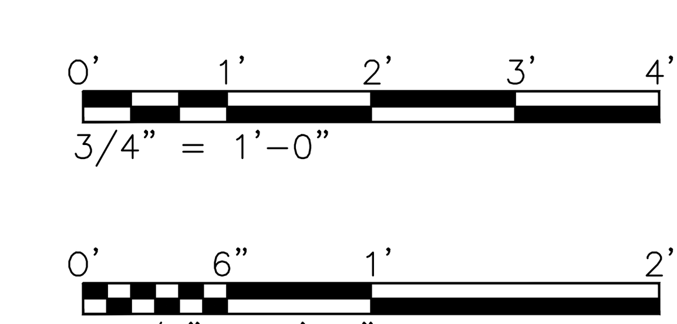
D SV101

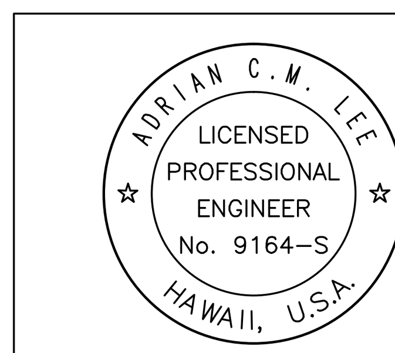


SECTION

SC: 3/4"=1'-0"

C SV101





THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

Adrian Lee

SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
TWO NEW UNDERGROUND VAULTS

VAULT A1 AND A2 PLANS & SECTIONS

DESIGNED BY: AL | CHECKED BY: AL | DRAWN BY: JM

TANIMURA & ASSOCIATES, INC.
CONSULTING STRUCTURAL ENGINEERS
925 Bethel Street, Suite 309 Honolulu, Hawaii 96813

MAY 2018

SV101

SHEET 108 OF 149

FILE: Hoolehua WSI - New two Underground Vaults s.dwg
DATE REV.: 08/05/2018

MECHANICAL LEGEND

SYMBOLS	ABBR.	DESCRIPTION
		EXISTING TO REMAIN
		NEW MECHANICAL\PLUMBING WORK
	(E)	EXISTING
	(N)	NEW
		EXISTING TO BE REMOVED
	FOS	FUEL OIL SUPPLY
	FOR	FUEL OIL RETURN
	TYP.	TYPICAL
	POC	POINT OF CONNECTION

GENERAL NOTES:

1. THE ENTIRE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE COUNTY OF MAUI'S BUILDING CODE (IBC 2006), ENERGY CODE (IECC 2006), FIRE CODE (UFC, 2012), AND ALL AGENCIES HAVING JURISDICTION.

2. DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND SHALL BE FOLLOWED AS CLOSELY AS ACTUAL FIELD CONDITIONS PERMIT. REASONABLE MODIFICATIONS TO SUIT JOB CONDITIONS SHALL NOT CONSTITUTE A BASIS FOR ADDITIONAL COMPENSATION.

3. PROMPTLY NOTIFY AND COORDINATE WITH THE CONTRACTING OFFICER OF DISCREPANCIES OR MAJOR DEVIATIONS FROM THE PLANS DUE TO UNFORESEEN OR VARYING FIELD CONDITIONS WHICH PREVENT HIM FROM FULFILLING THE TERMS OF THE CONTRACT.

4. VERIFY ALL CONDITIONS AND DIMENSIONS RELATED TO THE PROJECT BEFORE COMMENCING WITH THE REQUIRED WORK.

5. OBTAIN AND PAY FOR ALL PERMITS, FEES, CERTIFICATES, AND INSPECTIONS.

6. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT, INCLUDING CUTTING AND PATCHING AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. ALL MATERIALS SHALL BE NEW, FREE FROM DEFECTS, AND CONFORM TO CODE.

7. PATCH ALL SURFACES EXPOSED FROM CUTTING AND/OR REMOVAL WORK. PATCHING SHALL MATCH THE FINISH OF THE ADJACENT SURFACES.

8. ALL WORK INDICATED SHALL BE NEW WORK, UNLESS OTHERWISE INDICATED "EXISTING".

9. ALL ITEMS AND MATERIALS TO BE REMOVED SHALL BE DONE IN SUCH A MANNER AS TO PREVENT DAMAGE TO ITEMS AND MATERIALS TO REMAIN. ALL SUCH DAMAGES SHALL BE SATISFACTORILY REPAIRED AT NO ADDITIONAL COST TO THE OWNER.

10. ALL WASTE MATERIALS SHALL BE PROMPTLY REMOVED AND DISPOSED.

11. IMMEDIATELY CLEANUP AND NOTIFY THE STATE OF ANY FUEL OR HAZARDOUS MATERIAL SPILLS.

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO.
M110
SHEET 109 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

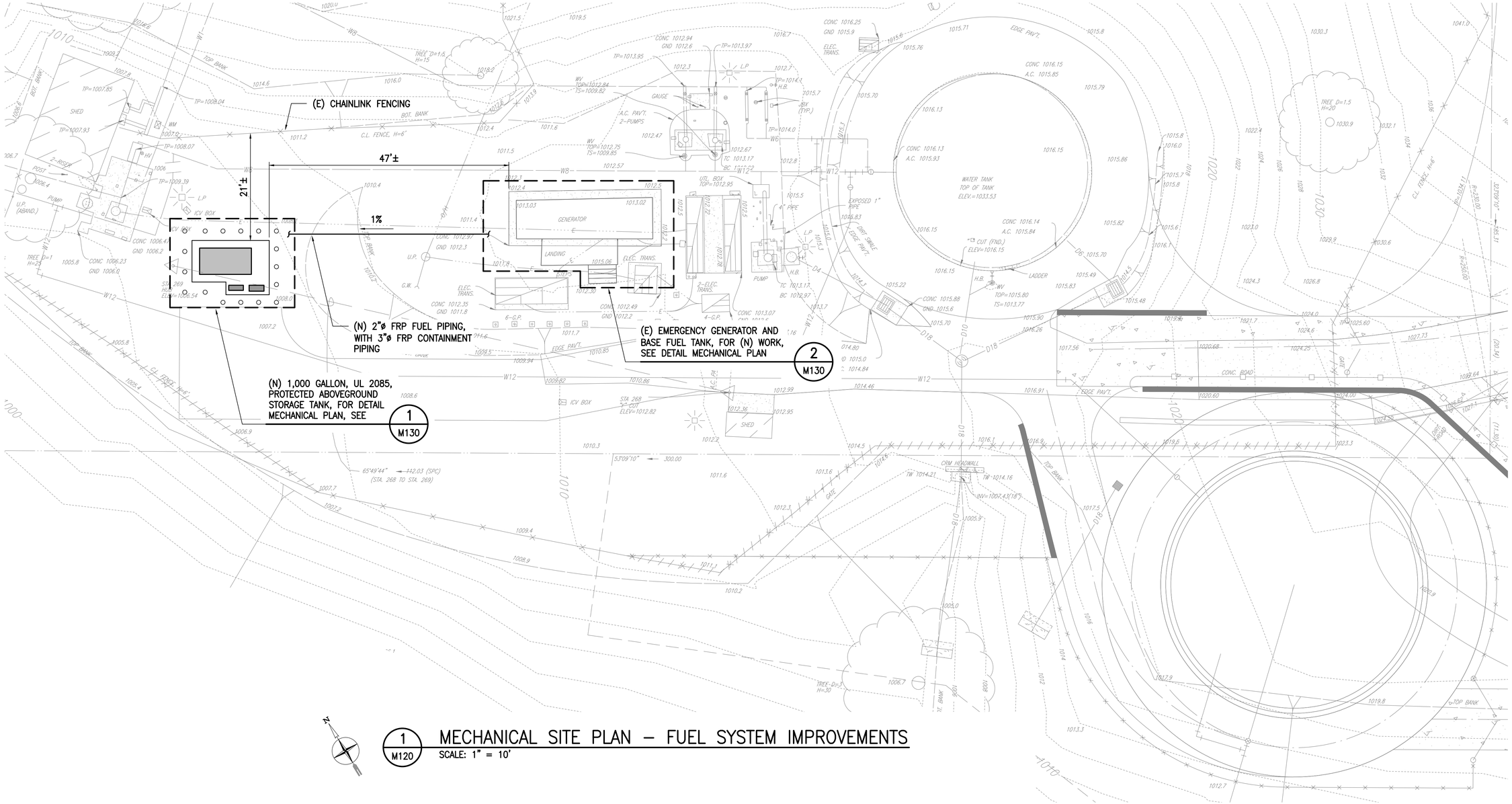
MECHANICAL LEGEND AND NOTES

DESIGNED BY: RN CHECKED BY: TNT DRAWN BY: RP, LS

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

FILE: Site01_MechLgndNtesSchdls.dwg
DATE REV.: 30/05/2018



1 M120 MECHANICAL SITE PLAN – FUEL SYSTEM IMPROVEMENTS

SCALE: 1" = 10'

GRAPHIC SCALE:

10' 0 10' 20'

SCALE: 1" = 10'

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

REVISION	DATE	BRIEF	MADE BY	APPROVED

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. M120
SHEET 10 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

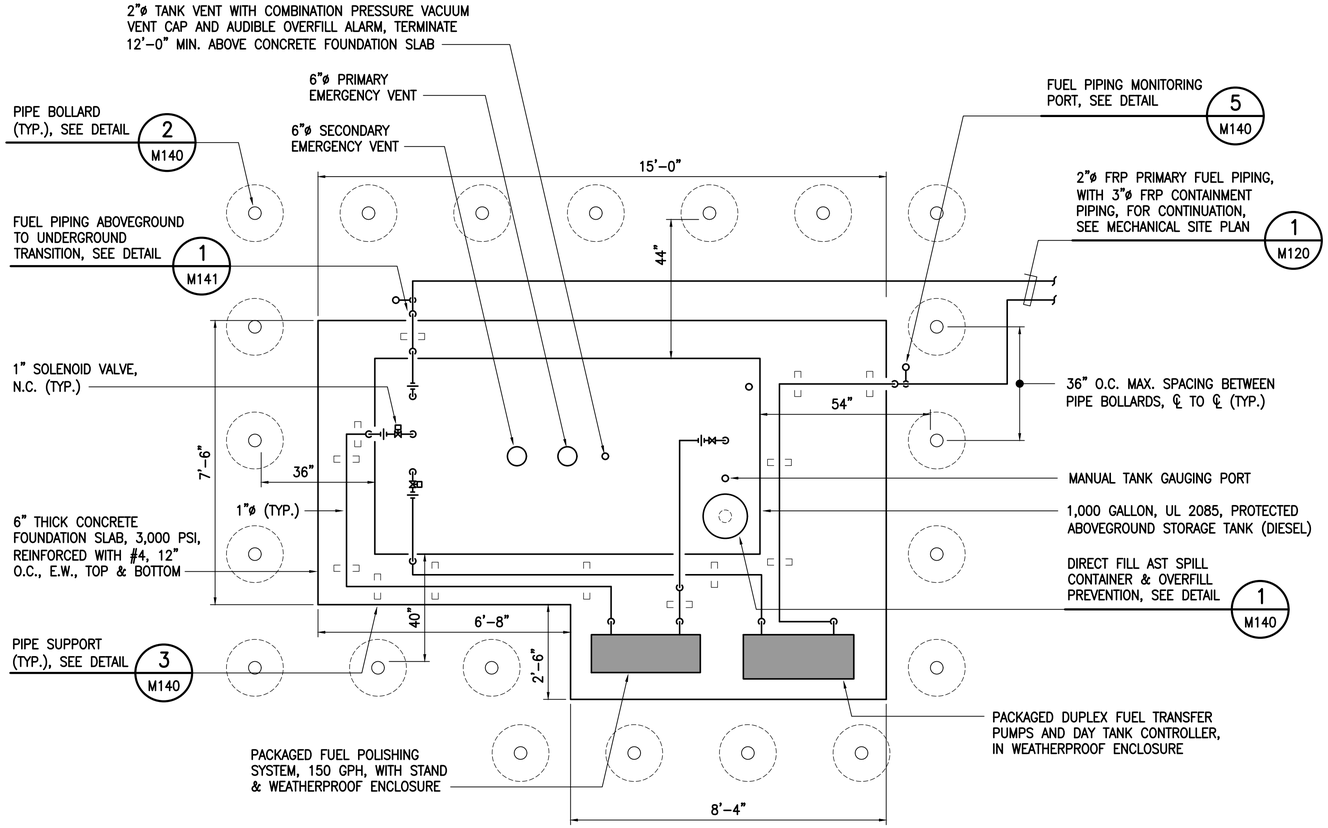
MECHANICAL SITE PLAN FUEL SYSTEM IMPROVEMENTS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

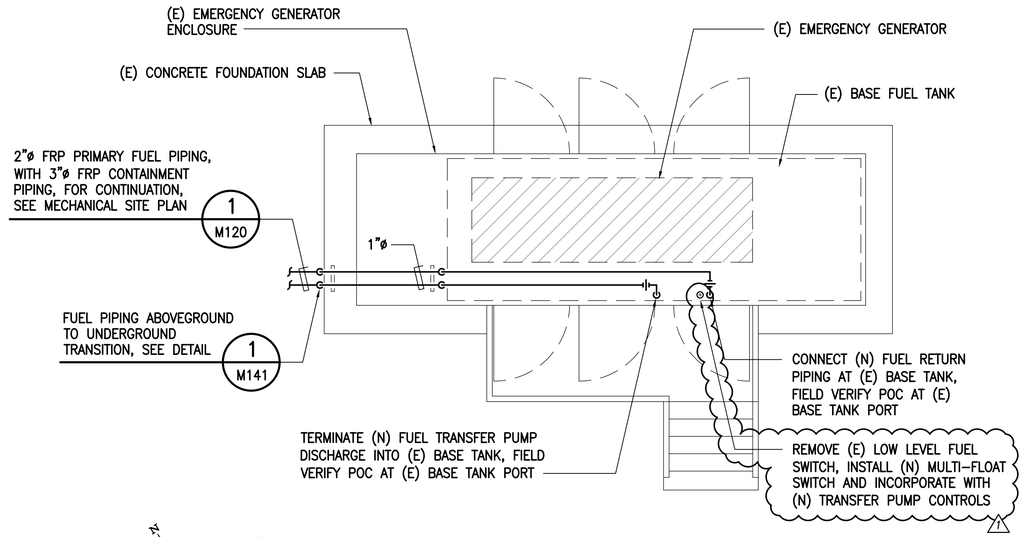
FILE: Site01_MechSitePlan.dwg
DATE REV.: 01/06/2018



1 M130 TANK AND PIPING DETAIL PLAN

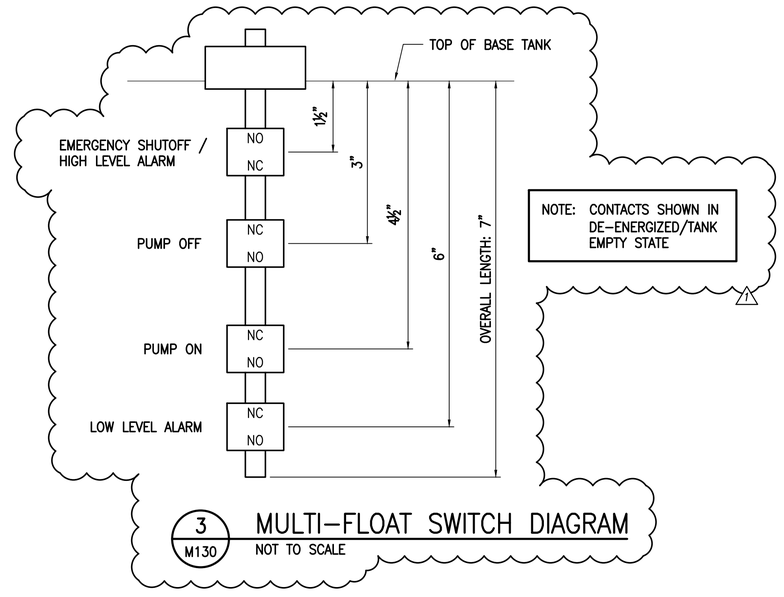
SCALE: 1/2" = 1'-0"

NOTE: SPACING BETWEEN PIPE BOLLARD AND TANK IS MEASURED FROM THE FACE OF BOLLARD TO TANK SURFACE



2 M130 EXISTING GENERATOR – NEW PIPING DETAIL PLAN

SCALE: 1/4" = 1'-0"



3 M130 MULTI-FLOAT SWITCH DIAGRAM

NOT TO SCALE

GRAPHIC SCALE:

SCALE: 1/2" = 1'-0"

2' 1' 0 2' 4'

GRAPHIC SCALE:

SCALE: 1/4" = 1'-0"

4' 2' 0 4' 8'

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

1	7/6/18	ADDENDUM NO. 2			

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

DETAIL MECHANICAL PLAN

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

TYSON T. TOYAMA LICENSED PROFESSIONAL ENGINEER 10226-M HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

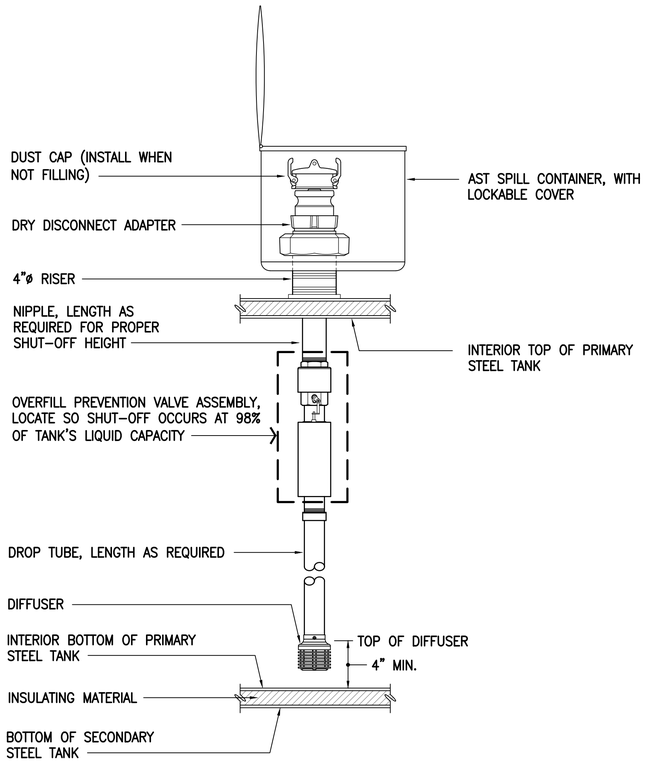
SIGNATURE
LICENSE EXP.: APRIL 30, 2020

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

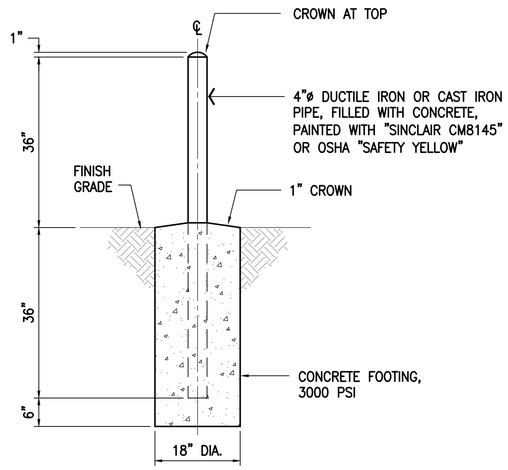
DWG. NO. M130
SHEET 111 OF 149

FILE: Site01_MechDtlPlnSecs.dwg
DATE REV.: 28/06/2018

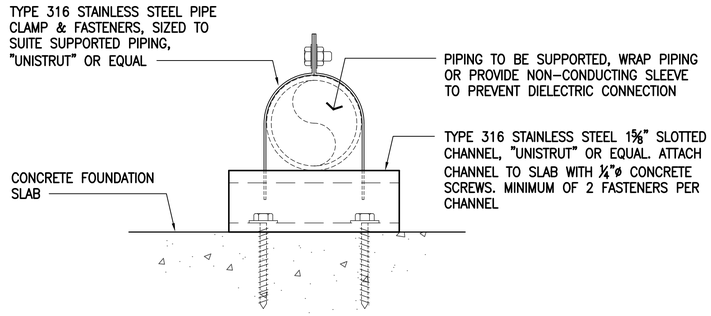
FILE	POCKET	FOLDER	NO.



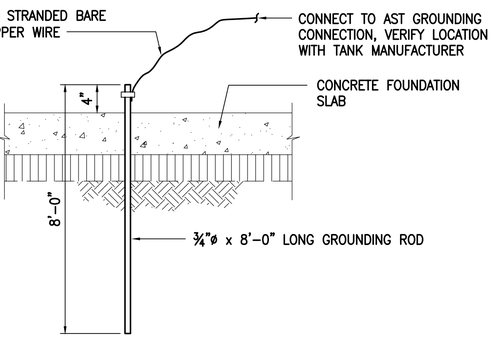
1 M140 OVERFILL PREVENTION AND SPILL CONTAINMENT DETAIL
NOT TO SCALE



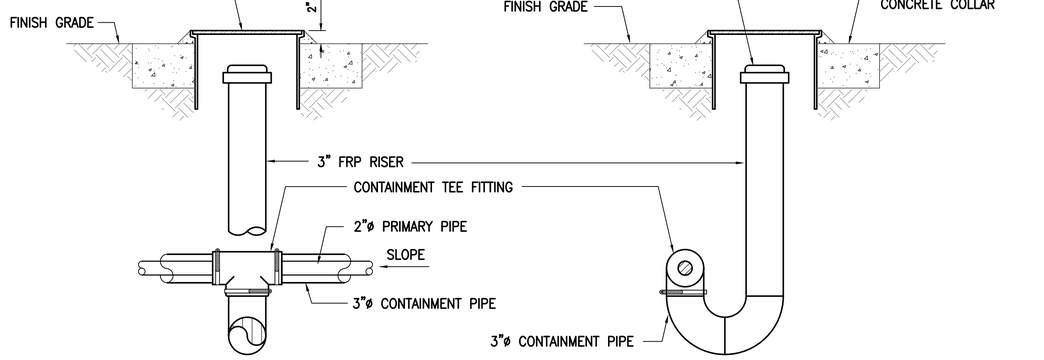
2 M140 PIPE BOLLARD DETAIL
NOT TO SCALE



3 M140 PIPING SUPPORT DETAIL
NOT TO SCALE



4 M140 GROUND WIRE INSTALLATION DETAIL
NOT TO SCALE



5 M140 FUEL PIPING MONITORING PORT DETAIL
NOT TO SCALE

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M140
SHEET 12 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

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Tyson T. Toyama
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

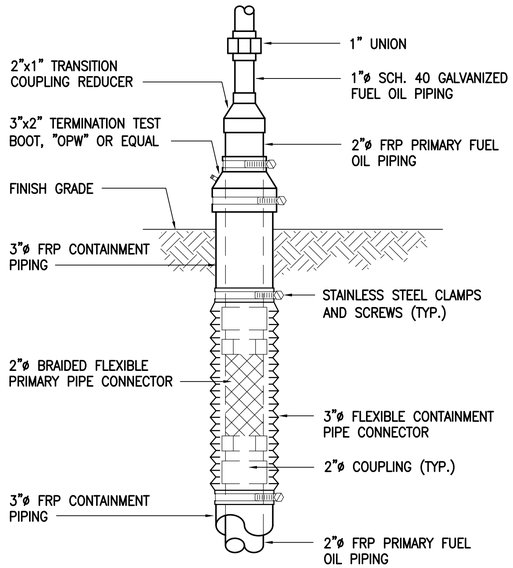
MECHANICAL DETAILS

DESIGNED BY: RN CHECKED BY: TNT DRAWN BY: SE, LS

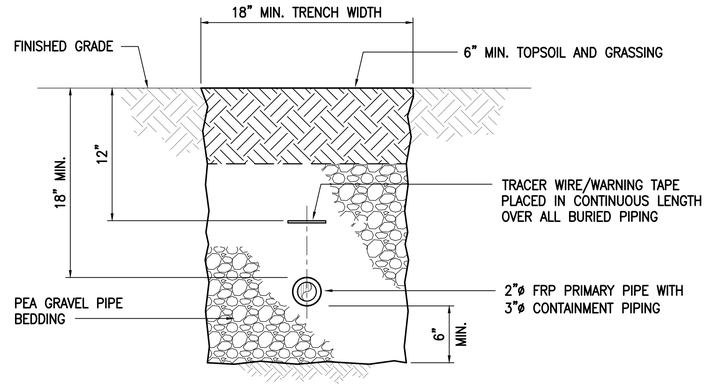
Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE: Site01_MechDetails.dwg
DATE REV.: 01/06/2018

FILE | POCKET | FOLDER | NO.



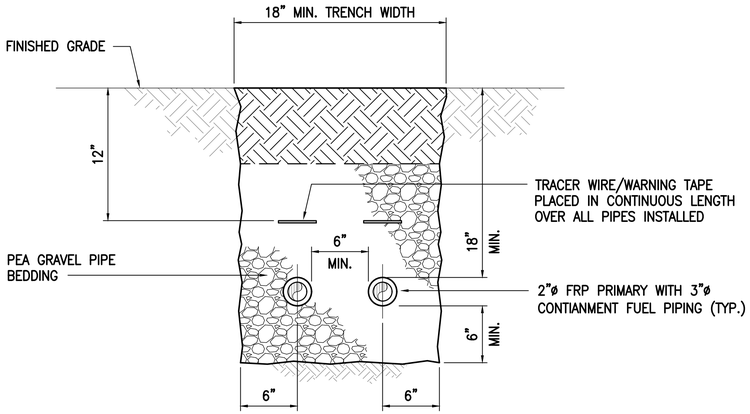
1 M141 FUEL PIPIING TRANSITION DETAIL
NOT TO SCALE



NOTES:

1. FABRICATE PIPE RUNS AT GRADE AND INSTALL IN THE COMPACTED PRE-GRADED BED. AFTER MAKING NECESSARY CONNECTIONS OF RUNS, BRANCHES, OR FITTINGS WHICH MUST BE COMPLETED IN THE TRENCH, REGRADE AND COMPACT PIPE BEDDING UNDER THESE CONNECTIONS.
2. UNLESS OTHERWISE SPECIFIED, THE FUEL PIPING SHALL BE SLOPED ⅛" PER FOOT (1%) IN THE DIRECTIONS INDICATED OIN THE DRAWINGS.

2 M141 TYPICAL SINGLE FUEL PIPING TRENCH DETAIL
NOT TO SCALE



NOTES:

1. FABRICATE PIPE RUNS AT GRADE AND INSTALL IN THE COMPACTED PRE-GRADED BED. AFTER MAKING NECESSARY CONNECTIONS OF RUNS, BRANCHES, OR FITTINGS WHICH MUST BE COMPLETED IN THE TRENCH, REGRADE AND COMPACT PIPE BEDDING UNDER THESE CONNECTIONS.
2. UNLESS OTHERWISE SPECIFIED, THE FUEL PIPING SHALL BE SLOPED ⅛" PER FOOT (1%) IN THE DIRECTIONS INDICATED OIN THE DRAWINGS.

3 M141 TYPICAL DUAL FUEL PIPE TRENCH DETAIL
NOT TO SCALE

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M141
SHEET 13 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

MECHANICAL DETAILS

DESIGNED BY: RN CHECKED BY: TNT DRAWN BY: RP, LS

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

FILE: Site01_MechDetails.dwg
DATE REV.: 01/06/2018

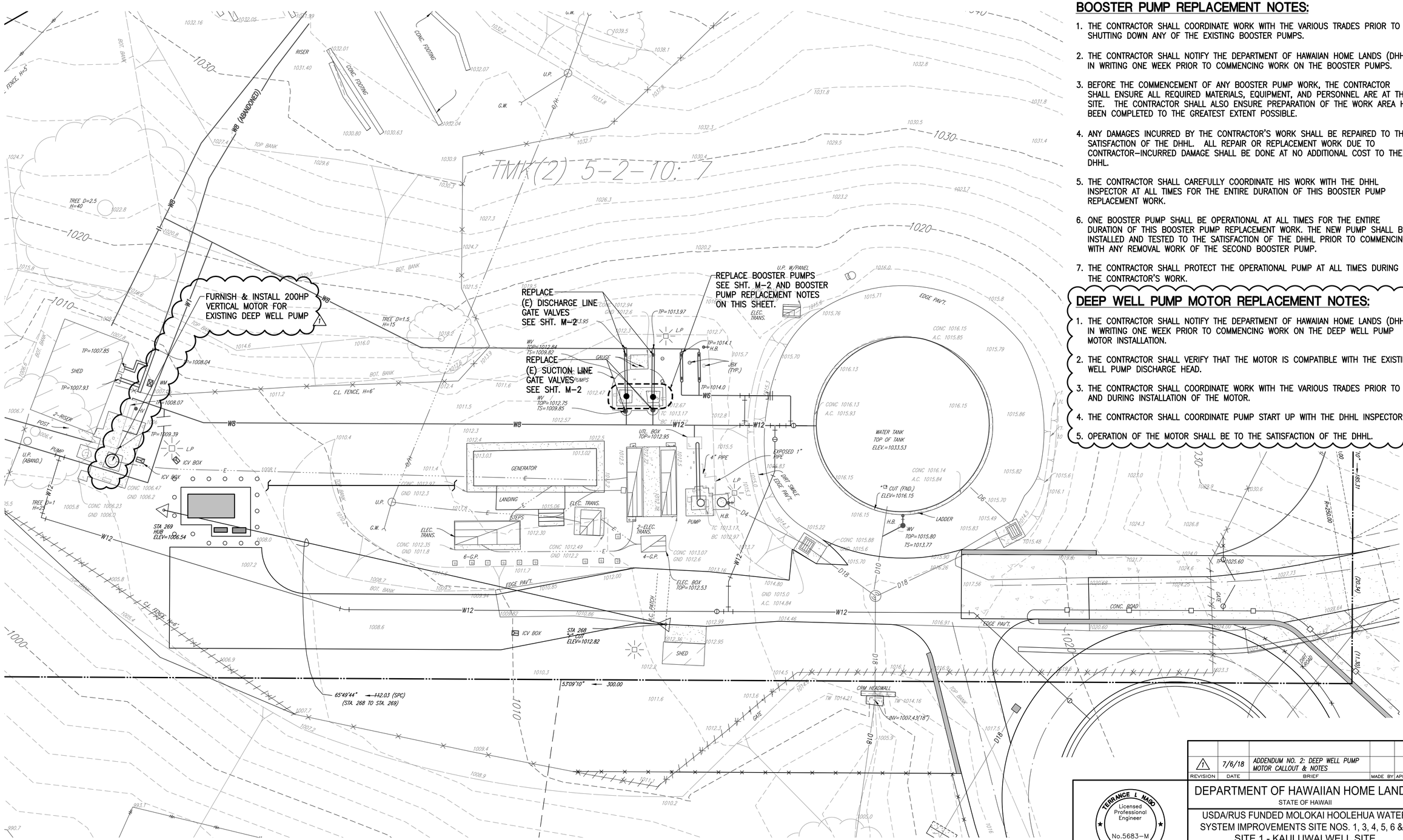
BOOSTER PUMP REPLACEMENT NOTES:

1. THE CONTRACTOR SHALL COORDINATE WORK WITH THE VARIOUS TRADES PRIOR TO SHUTTING DOWN ANY OF THE EXISTING BOOSTER PUMPS.
2. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE BOOSTER PUMPS.
3. BEFORE THE COMMENCEMENT OF ANY BOOSTER PUMP WORK, THE CONTRACTOR SHALL ENSURE ALL REQUIRED MATERIALS, EQUIPMENT, AND PERSONNEL ARE AT THE SITE. THE CONTRACTOR SHALL ALSO ENSURE PREPARATION OF THE WORK AREA HAS BEEN COMPLETED TO THE GREATEST EXTENT POSSIBLE.
4. ANY DAMAGES INCURRED BY THE CONTRACTOR'S WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE DHHL. ALL REPAIR OR REPLACEMENT WORK DUE TO CONTRACTOR-INCURRED DAMAGE SHALL BE DONE AT NO ADDITIONAL COST TO THE DHHL.
5. THE CONTRACTOR SHALL CAREFULLY COORDINATE HIS WORK WITH THE DHHL INSPECTOR AT ALL TIMES FOR THE ENTIRE DURATION OF THIS BOOSTER PUMP REPLACEMENT WORK.
6. ONE BOOSTER PUMP SHALL BE OPERATIONAL AT ALL TIMES FOR THE ENTIRE DURATION OF THIS BOOSTER PUMP REPLACEMENT WORK. THE NEW PUMP SHALL BE INSTALLED AND TESTED TO THE SATISFACTION OF THE DHHL PRIOR TO COMMENCING WITH ANY REMOVAL WORK OF THE SECOND BOOSTER PUMP.
7. THE CONTRACTOR SHALL PROTECT THE OPERATIONAL PUMP AT ALL TIMES DURING THE CONTRACTOR'S WORK.

DEEP WELL PUMP MOTOR REPLACEMENT NOTES:

1. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF HAWAIIAN HOME LANDS (DHHL) IN WRITING ONE WEEK PRIOR TO COMMENCING WORK ON THE DEEP WELL PUMP MOTOR INSTALLATION.
2. THE CONTRACTOR SHALL VERIFY THAT THE MOTOR IS COMPATIBLE WITH THE EXISTING WELL PUMP DISCHARGE HEAD.
3. THE CONTRACTOR SHALL COORDINATE WORK WITH THE VARIOUS TRADES PRIOR TO AND DURING INSTALLATION OF THE MOTOR.
4. THE CONTRACTOR SHALL COORDINATE PUMP START UP WITH THE DHHL INSPECTOR.
5. OPERATION OF THE MOTOR SHALL BE TO THE SATISFACTION OF THE DHHL.

1



GRAPHIC SCALE:

SCALE: 1" = 10'

10' 5' 0 10' 20'

MECHANICAL SITE PLAN - BOOSTER PUMP REPLACEMENT

SCALE: 1"=10'

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/18	ADDENDUM NO. 2: DEEP WELL PUMP MOTOR CALLOUT & NOTES		

TERRANCE L. NAGO
Licensed Professional Engineer
No. 5683-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

MECHANICAL SITE PLAN FOR BOOSTER PUMP REPLACEMENT

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SP, LS

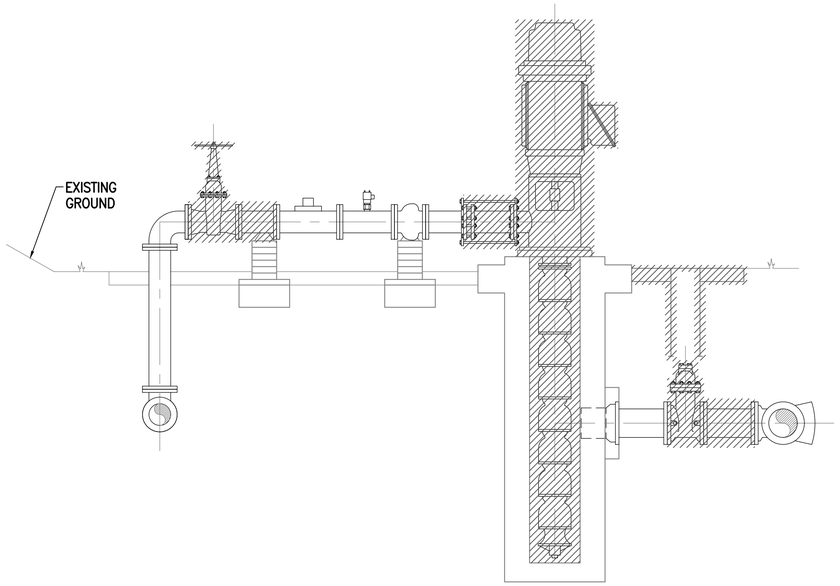
Okahara and Associates, Inc.
200 KOMOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

SITE 1 – KAULUWAI WELL SITE

DWG. NO. M-1
SHEET 114 OF 149

FILE	POCKET	FOLDER	NO.

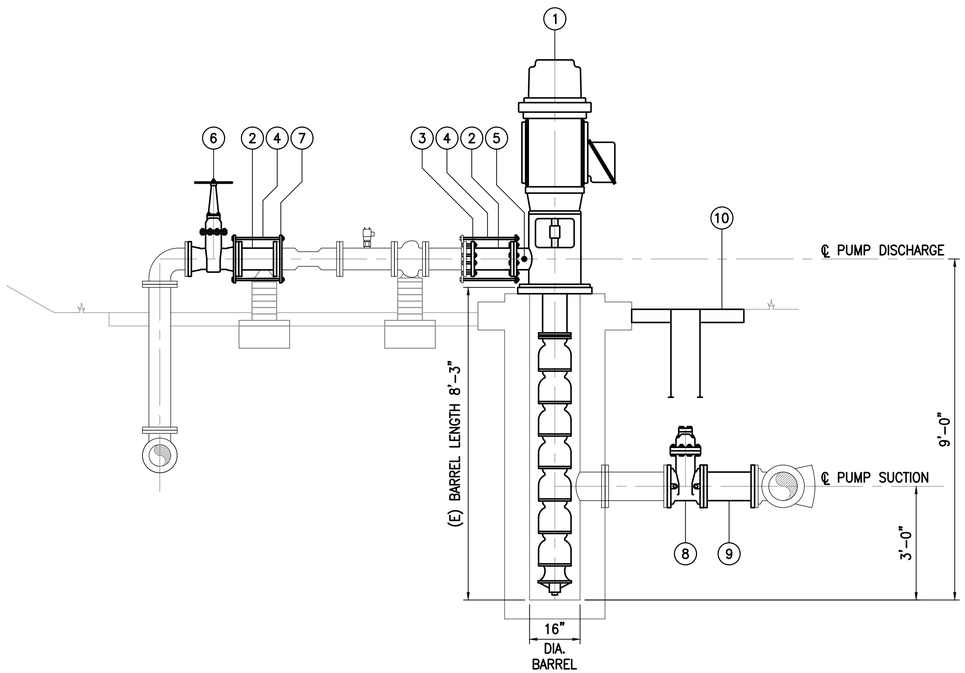
FILE: Sht-C-Site-Plan.dwg
DATE REV.: 29/06/2018



PUMP & PIPING DEMOLITION - ELEVATION
SCALE: ½"=1'-0"

DEMOLITION NOTES:

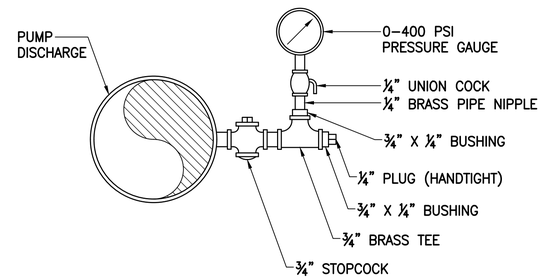
1. THIS DRAWING SHOWS ONLY THE EXTENT OF MECHANICAL DEMOLITION WORK REQUIRED FOR THE EXISTING BOOSTER PUMP. DEMOLITION WORK FOR STRUCTURAL, ADDITIONAL MECHANICAL, ELECTRICAL, AND OTHERS ARE REQUIRED, AS WELL. THE CONTRACTOR SHALL REFER TO THOSE DRAWINGS FOR THE EXTENT OF DEMOLITION WORK REQUIRED FOR THIS PROJECT. THE CONTRACTOR SHALL ALSO BE AWARE OF THE WORK SEQUENCE, WATER SHUT OFF TIME REQUIREMENTS, AND WORK SCHEDULE, AND PERFORM HIS DEMOLITION WORK ACCORDINGLY.
2. THE CONTRACTOR SHALL COORDINATE THE DEMOLITION WORK WITH HIS VARIOUS TRADES AND WITH THE DHHL INSPECTOR.
3. TWO EXISTING BOOSTER PUMPS ARE TO BE DEMOLISHED. HOWEVER, ONE PUMP SHALL BE OPERATIONAL AT ALL TIMES, WHETHER IT IS AN EXISTING PUMP OR A NEW PUMP.
4. ISOLATE THE PUMP TO BE REMOVED BY CLOSING THE NEAREST EXISTING GATE VALVES ON THE SUCTION LINE AND DISCHARGE LINE.
5. THE CONTRACTOR SHALL SHUT OFF THE POWER SUPPLY TO THE PUMP AND DISCONNECT THE NECESSARY WIRES AT THE PUMP MOTOR.
6. THE PUMP AND ANY PIPE COMPONENT SHOWN TO BE REMOVED SHALL BE REMOVED FROM THE SITE.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER HANDLING AND DISPOSAL OF WASTE GENERATED BY THIS DEMOLITION WORK. THE DISPOSAL SITE SHALL BE AT AN APPROVED LOCATION MEETING ALL FEDERAL, STATE, AND CITY LAWS AND REGULATIONS FOR THE TYPES AND QUANTITIES OF WASTE DEPOSITED.



PUMP & PIPING REPLACEMENT - ELEVATION
SCALE: ½"=1'-0"

MATERIAL LIST - BOOSTER PUMP REPLACEMENT

ITEM	DESCRIPTION
1	VERTICAL TURBINE BOOSTER PUMP, GOULDS, MODEL VIC-FLTM, SIZE: 12WALC, 7-STAGES, 540 GPM @ 473 FT. TDH; 100 HP, WP1, PREMIUM-EFFICIENCY MOTOR, 1800 RPM, 460V, 3 PHASE, 60 HZ, 1.15 SF.
2	6" PIPE ADAPTER, FE x PE, CLASS 250, CUT TO FIT.
3	6" EBAA SERIES 1006 "E-Z FLANGE" DUCTILE IRON FLANGE ADAPTER.
4	HARNESS RESTRAINT: FOUR 3/4" TYPE 316 THREADED ROD WITH NECESSARY HARNESS LUGS.
5	PRESSURE GAUGE ASSEMBLY. SEE DETAIL ON THIS SHEET.
6	6" RESILIENT WEDGE GATE VALVE, F.E., CLASS 250 FLANGES, NRS, WITH HANDWHEEL.
7	FORD 6" SERIES 420 EXTRA HEAVY ADAPTER FLANGE FOR D.I. PIPE, WITH SET SCREWS AND STAINLESS STEEL NUTS AND BOLTS.
8	8" RESILIENT WEDGE GATE VALVE, M.J.
9	8" D.I. PIPE NIPPLE, CUT TO FIT.
10	VALVE BOX FOR GATE VALVE, SEE DWS STANDARD DETAIL V12.



PRESSURE GAUGE DETAIL
NOT TO SCALE

NOTES:

1. THE CONTRACTOR SHALL VERIFY DIMENSIONS OF EXISTING SUCTION BARREL.
2. MATCH CENTERLINE OF EXISTING PUMP DISCHARGE PIPING. DO NOT FORCE CONNECTIONS TO CLOSE AT EXISTING PIPE FLANGE AND PUMP DISCHARGE FLANGE.
3. BOLT PATTERN OF PUMP DISCHARGE HEAD SHALL MATCH BOLT PATTERN OF EXISTING BARREL FLANGE. OTHERWISE AN ADAPTER PLATE SHALL BE PROVIDED.

GRAPHIC SCALE:

SCALE: 1/2" = 1'-0"
2' 1' 6" 0 1 2 3 4

REVISION	DATE	BRIEF	MADE BY	APPROVED

TERRANCE L. MIHO
Licensed Professional Engineer
No.5683-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

BOOSTER PUMP DEMOLITION AND REPLACEMENT ELEVATIONS

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SP, LS

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

SITE 1 - KAULUWAI WELL SITE

DWG. NO. M-2
SHEET 115 OF 149

FILE	POCKET	FOLDER	NO.

FILE: Sht-C-Mech-Piping-Plan.dwg
DATE REV.: 25/05/2018

MECHANICAL LEGEND

SYMBOLS	ABBR.	DESCRIPTION
		EXISTING TO REMAIN
		NEW MECHANICAL\PLUMBING WORK
	(E)	EXISTING
	(N)	NEW
— — —	S OR W	SOIL OR WASTE, BELOW FLOOR
	S OR W	SOIL OR WASTE, ABOVE FLOOR
- - - - - - - -	V	SANITARY VENT
— - —	CW	COLD WATER
	VTR	VENT THRU ROOF
—⏀ OR —|	CO	CLEANOUT, WCO–WALL, FCO–FLOOR, COTG–GRADE
	POC	POINT OF CONNECTION
22x12		DUCT: 1ST FIGURE – SIDE SHOWN, 2ND FIGURE – SIDE NOT SHOWN
		DUCT SECTION – SUPPLY OR OUTDOOR AIR
		DUCT SECTION – RETURN OR EXHAUST AIR
	ER	EXHAUST REGISTER
		SUPPLY – DIRECTION OF FLOW
		EXHAUST – DIRECTION OF FLOW
	(FE)	FIRE EXTINGUISHER AND CABINET
	CFM	CUBIC FEET PER MINUTE
	TYP.	TYPICAL

COUNTY OF MAUI
MAUI COUNTY CODE, CHAPTER 16.16A ENERGY CODE

I certify that this project's design substantially conforms to the Energy Code.

S□□□□□r□: Tyson T Toyama D□□□: 05–29–18
N□□ □: TYSON T. TOYAMA
T□□□: PRO□ECT ENGINEER
L□□□□□ N□: 10226-M

GENERAL NOTES:

1. THE ENTIRE INSTALLATION SHALL COMPLY WITH ALL APPLICABLE REQUIREMENTS OF THE COUNTY OF MAUI'S BUILDING CODE (IBC 2006), PLUMBING CODE (UPC 2006), ENERGY CODE (IECC 2006), FIRE CODE (NFPA 1, 2012), NATIONAL ELECTRICAL CODE (2008), AND ALL AGENCIES HAVING JURISDICTION.
2. DRAWINGS INDICATE THE GENERAL ARRANGEMENT AND SHALL BE FOLLOWED AS CLOSELY AS ACTUAL FIELD CONDITIONS PERMIT. REASONABLE MODIFICATIONS TO SUIT JOB CONDITIONS SHALL NOT CONSTITUTE A BASIS FOR ADDITIONAL COMPENSATION.
3. PROMPTLY NOTIFY AND COORDINATE WITH THE CONTRACTING OFFICER ANY DISCREPANCIES OR MAJOR DEVIATIONS FROM THE PLANS DUE TO UNFORESEEN OR VARYING FIELD CONDITIONS WHICH PREVENT THE TERMS OF THE CONTRACT FROM BEING FULFILLED. COORDINATE THE WORK AMONG THE VARIOUS TRADES AS NECESSARY TO AVOID CONFLICTS AND TO ENSURE THE INSTALLATION OF WORK WITHIN THE AVAILABLE SPACE.
4. OBTAIN AND PAY FOR ALL APPLICABLE PERMITS, FEES, CERTIFICATES, AND INSPECTIONS.
5. VERIFY ALL CONDITIONS AND DIMENSIONS RELATING TO THE PROJECT BEFORE ORDERING MATERIALS, OR COMMENCING WITH THE REQUIRED WORK.
6. FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT, INCLUDING CUTTING AND PATCHING, AS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM. ALL MATERIALS SHALL BE NEW, FREE FROM DEFECTS, AND CONFORM TO CODE.
7. PATCH ALL SURFACES EXPOSED FROM CUTTING AND/OR REMOVAL WORK. PATCHING SHALL MATCH THE FINISH AND QUALITY OF ADJACENT SURFACES TO THE SATISFACTION OF THE ENGINEER.
8. ALL WORK INDICATED SHALL BE NEW WORK UNLESS OTHERWISE INDICATED "EXISTING".
9. ALL WASTE MATERIALS SHALL BE PROMPTLY REMOVED AND DISPOSED OF AT AN OFF–SITE LOCATION.
10. PROVIDE TEMPORARY ACCESSIBLE ROUTES AROUND CONSTRUCTION IN ACCORDANCE WITH "ADAAG 402".

PLUMBING FIXTURE SCHEDULE

SYMBOL	FIXTURE	TYPE	PIPE SIZE W	PIPE SIZE V	PIPE SIZE CW	PIPE SIZE HW	GAL. PER FLUSH	GPM	REMARKS
WC 1	WATER CLOSET, ACCESSIBLE	FLOOR MOUNTED, FLUSH TANK, ELONGATED BOWL, WHITE	4"	2"	½"	–	1.6	–	SEE ARCH. DWGS. FOR MOUNTING HEIGHT
L 1	LAVATORY, ACCESSIBLE	WALL HUNG, VITREOUS CHINA, WHITE, CONCEALED FIXTURE SUPPORT	2"	1½"	½"	–	–	2.5	SEE ARCH. DWGS. FOR MOUNTING HEIGHT
MS 1	MOP SINK	FLOOR MOUNTED, CORNER SERVICE SINK, ENAMELED CAST IRON	3"	2"	¾"	–	–	2.5	PROVIDE FAUCET WITH INTEGRAL VACUUM BREAKER
EEW 1	EMERGENCY EYE WASH	WALL MOUNTED, STAINLESS STEEL, BARRIER FREE	2	1½"	½"	–	–	–	
FD 1	FLOOR DRAIN	CAST IRON, BRONZE FACE PLATE	2"	2"	–	–	–	–	PROVIDE WITH TRAP PRIMER CONNECTION
HB 1	HOSE BIBB, INTERIOR	CHROME PLATED BRASS, INTEGRAL VACUUM BREAKER	–	–	½'	–	–	–	PROVIDE WITH CONCEALED STOP
HB 2	HOSE BIBB, EXTERIOR	ROUGH BRASS, INTEGRAL VACUUM BREAKER	–	–	¾"	–	–	–	PROVIDE WITH STOP COCK

CEILING FAN SCHEDULE

SYMBOL	DESCRIPTION	ELECTRICAL VOLTS	ELECTRICAL PHASE	ELECTRICAL AMPS (HIGH)	OPER. WEIGHT (LBS)	REMARKS
CF 1	56" BLADE SWEEP, CEILING MOUNTED CIRCULATION FAN, 3 BLADES, LOOSE WIRE, VARIABLE SPEED, WHITE, HIGH PERFORMANCE, STEEL FAN BLADES	120	1	0.90	18	DESIGN BASED ON "CANARM, MODEL CP–56, PROVIDE WITH SAFETY CABLE & FAN MANUFACTURER'S FAN SPEED CONTROLS

EXHAUST FAN SCHEDULE

SYMBOL	AREA SERVED	AIR FLOW (CFM)	STATIC PRESSURE (IN.)	SPEED (RPM)	DRIVE	ELECTRICAL VOLTS	ELECTRICAL PHASE	ELECTRICAL WATTS	ELECTRICAL HP	OPER. WEIGHT (LBS)	REMARKS
EF 1	UNISEX TOILET (RM. 104)	250	0.375	1,050	DIRECT	115	1	96	–	42	DESIGN BASED ON "GREENHECK, MODEL CSP–A290". PROVIDE ROOF CAP, "GREENHECK MODEL RJ–6x9", WITH BUILT–IN BIRDSCREEN & DAMPER. INTERLOCK FAN OPERATION WITH RESTROOM LIGHT SWITCH.
EF 2	UNISEX TOILET (RM. 105)	250	0.375	1,050	DIRECT	115	1	96	–	42	DESIGN BASED ON "GREENHECK, MODEL CSP–A290". PROVIDE ROOF CAP, "GREENHECK MODEL RJ–6x9", WITH BUILT–IN BIRDSCREEN & DAMPER. INTERLOCK FAN OPERATION WITH RESTROOM LIGHT SWITCH.
EF 3	HYPOCHLORITE STORAGE (RM. 103)	960	0.500	1,725	DIRECT	115	1	–	0.25	45	DESIGN BASED ON "GREENHECK, MODEL G–099–A".

PLUMBING NOTES:

1. VERIFY LOCATIONS, SIZES, AND INVERT ELEVATIONS OF ALL EXISTING WATER AND SEWER LINES PRIOR TO COMMENCEMENT OF ANY NEW PLUMBING WORK UNDER THIS CONTRACT.
2. COPPER LINES SHALL BE PROTECTED AGAINST ELECTROLYTIC ACTION WITH DIELECTRIC UNIONS AT CONNECTIONS TO DISSIMILAR METAL, OR WRAPPED WITH TWO LAYERS OF PLASTIC TAPE WHERE LINES CONTACT FERROUS METALS.
3. PIPING SHALL BE INSPECTED INSIDE AND OUT FOR INTERIOR OBSTRUCTIONS AND BURRS BEFORE INSTALLATION. NEW DRAIN PIPING SHALL BE SLOPED AS REQUIRED BY THE PLUMBING CODE.
4. VERIFY THE PRESENCE AND LOCATION OF ALL EXISTING UTILITIES IN THE PROJECT AREA PRIOR TO THE CUTTING OF SLABS OR EXCAVATION OF TRENCHES. EXISTING ELECTRICAL, TELEPHONE, CONDUITS, AND WIRES ARE NOT SHOWN ON THE PLUMBING PLANS. CONTRACTOR SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF DAMAGED UTILITIES.

DEPARTMENT OF HEALTH NOTE

THE AIR CONDITIONING AND VENTILATION SYSTEM SHALL COMPLY WITH TITLE 11, ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, CHAPTER 39, AIR CONDITIONING AND VENTILATING REQUIREMENTS.

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M710
SHEET 116 OF 149

TYSON T. TOYAMA LICENSED PROFESSIONAL ENGINEER 10226-M HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16–115–2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

Tyson T Toyama
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS
□OB NO.

MECHANICAL LEGEND, NOTES AND SCHEDULES

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
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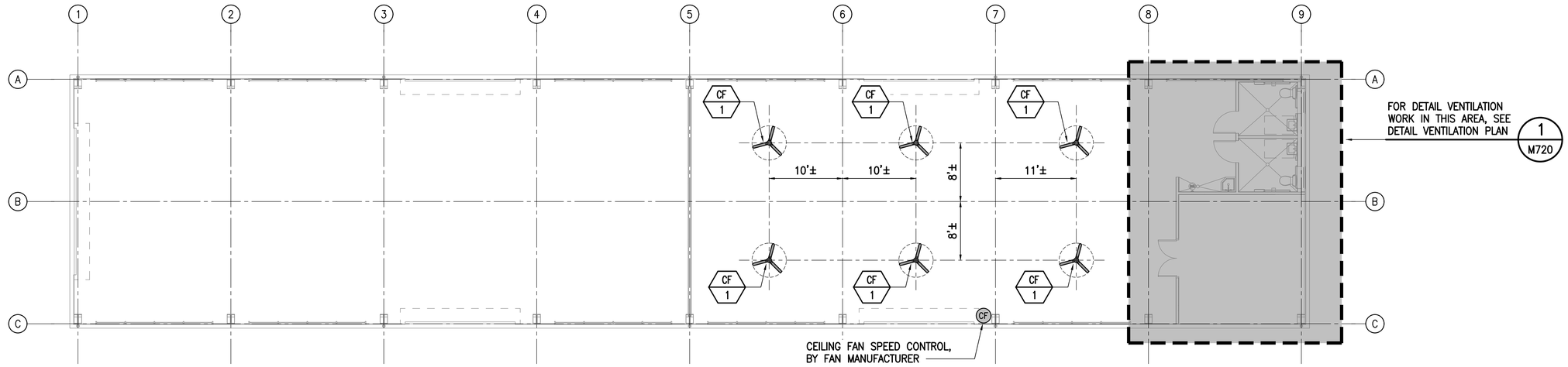
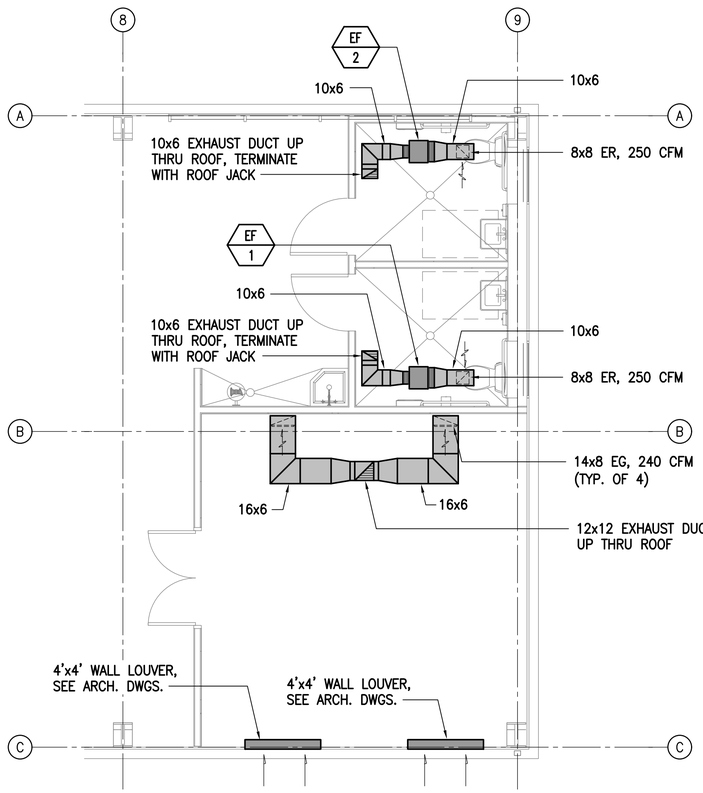
FILE	POCKET	FOLDER	NO.

FILE: Site07_MechLgndNtesSch.dwg
DATE REV.: 29/05/2018



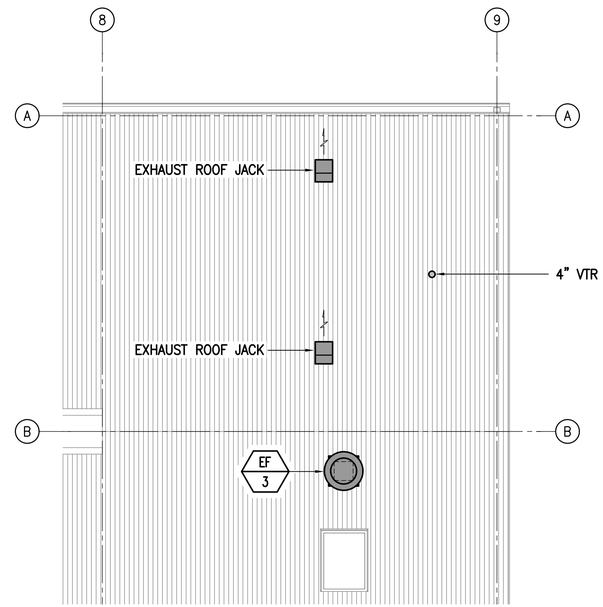
N

3 / M720 VENTILATION FLOOR PLAN
SCALE: 1/8" = 1'-0"



N

1 / M720 DETAIL VENTILATION FLOOR PLAN
SCALE: 1/4" = 1'-0"



N

2 / M720 DETAIL VENTILATION ROOF PLAN
SCALE: 1/4" = 1'-0"

GRAPHIC SCALE:
8' 4' 0 8' 16'
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE:
4' 2' 0 4' 8'
SCALE: 1/4" = 1'-0"

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M720
SHEET 11 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP., DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

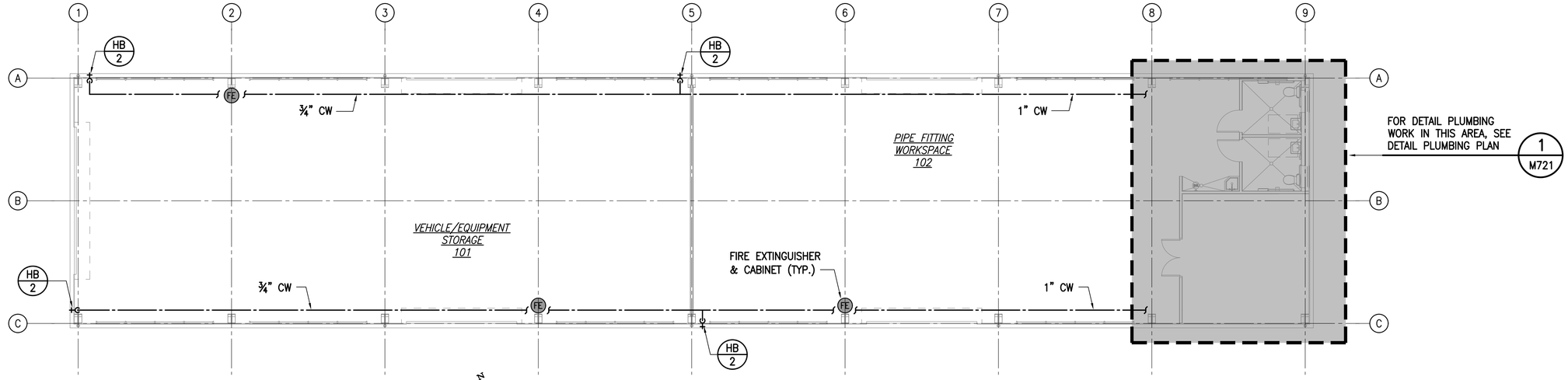
VENTILATION FLOOR PLANS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

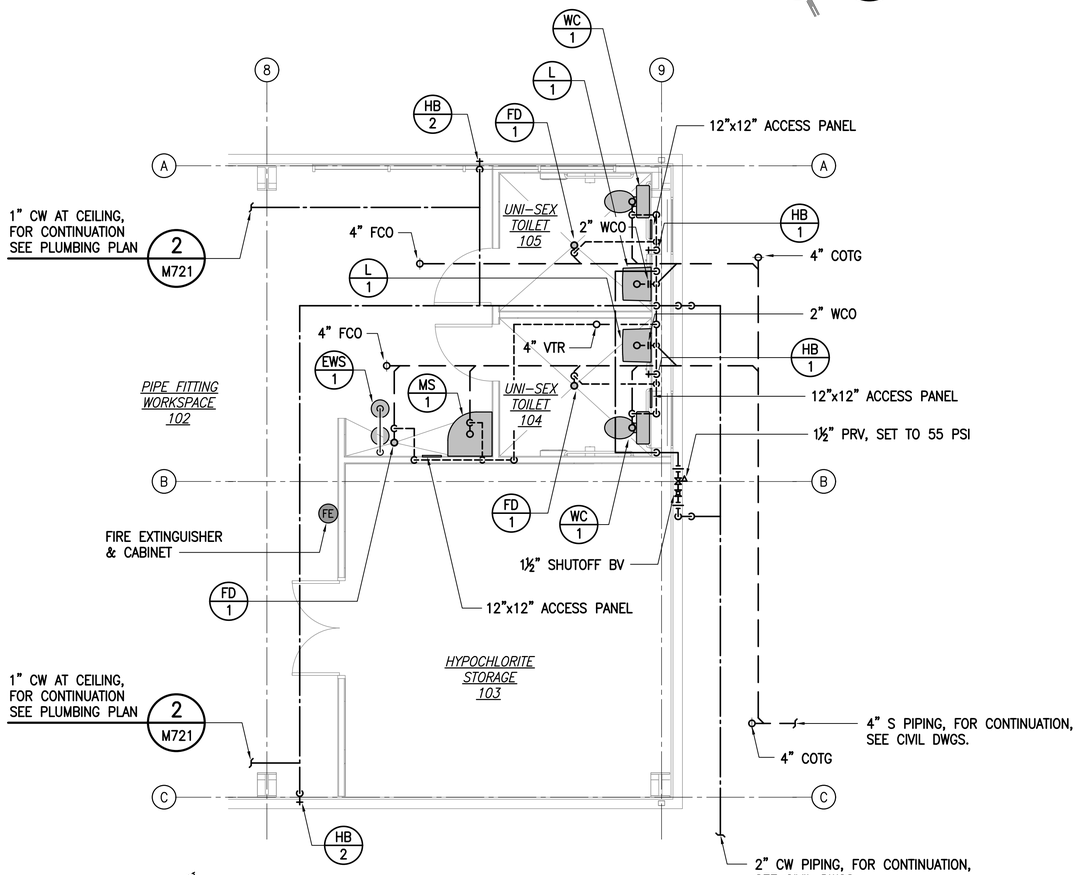
FILE: Site07_MechPlmbFirPlns.dwg
DATE REV.: 29/05/2018



N

2 M721 PLUMBING FLOOR PLAN

SCALE: 1/8" = 1'-0"



N

1 M721 DETAIL PLUMBING FLOOR PLAN

SCALE: 1/4" = 1'-0"

GRAPHIC SCALE:

SCALE: 1/8" = 1'-0"

8' 4' 0 8' 16'

GRAPHIC SCALE:

SCALE: 1/4" = 1'-0"

4' 2' 0 4' 8'

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M721 1

SHEET 18 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

1	7/6/18	ADDENDUM 2 – NEW SHEET ISSUED			

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PLUMBING FLOOR PLANS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

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200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
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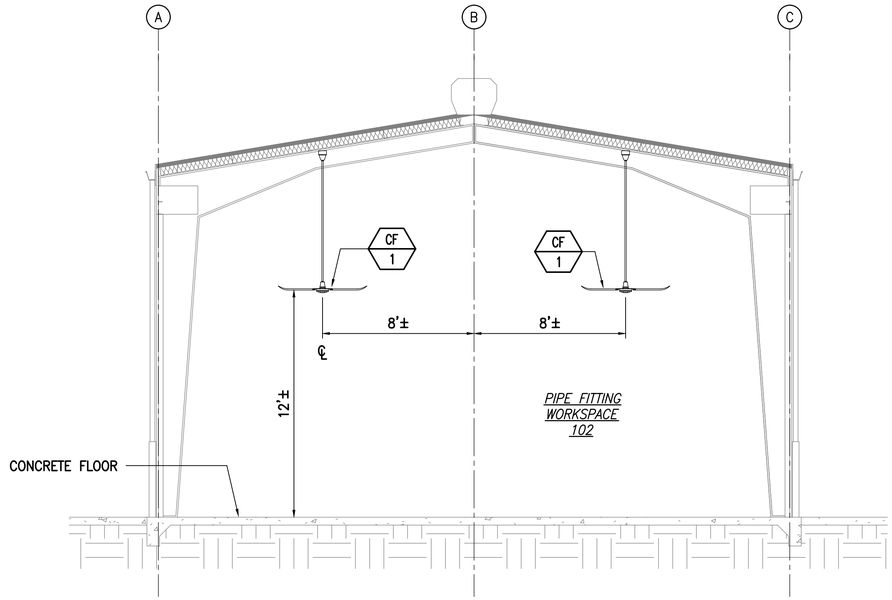
FILE	POCKET	FOLDER	NO.

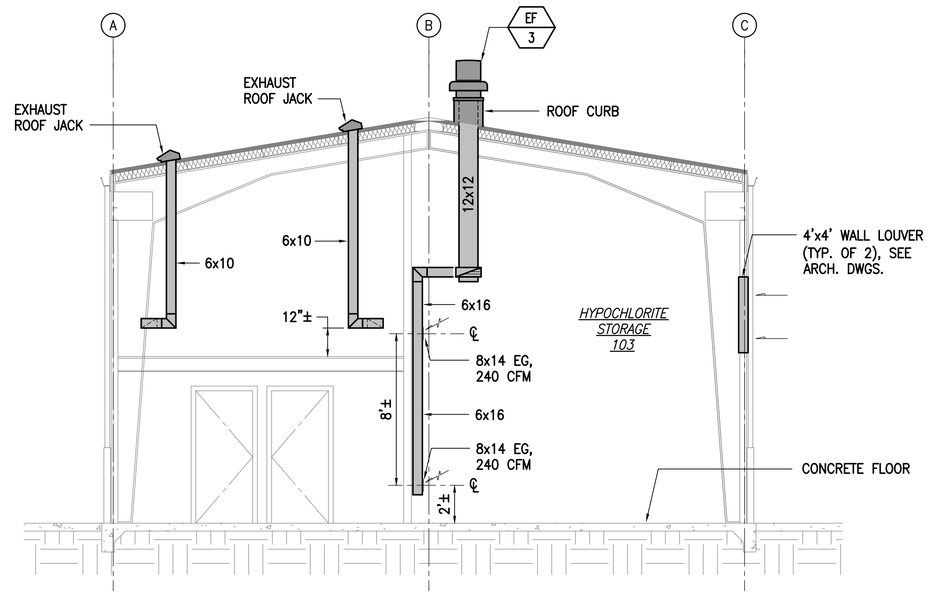
FILE: Site07_MechPlmbFlrPlns.dwg
DATE REV.: 28/06/2018



A
M730

MECHANICAL SECTION – PIPE FITTING WORKSPACE

SCALE: 1/4" = 1'–0"



B
M730

MECHANICAL SECTION – HYPOCHLORITE STORAGE

SCALE: 1/4" = 1'–0"

GRAPHIC SCALE:

SCALE: 1/4" = 1'-0"

4' 2' 0 4' 8'

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO.
M730
SHEET 119 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

MECHANICAL SECTIONS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

Okahara and Associates, Inc.
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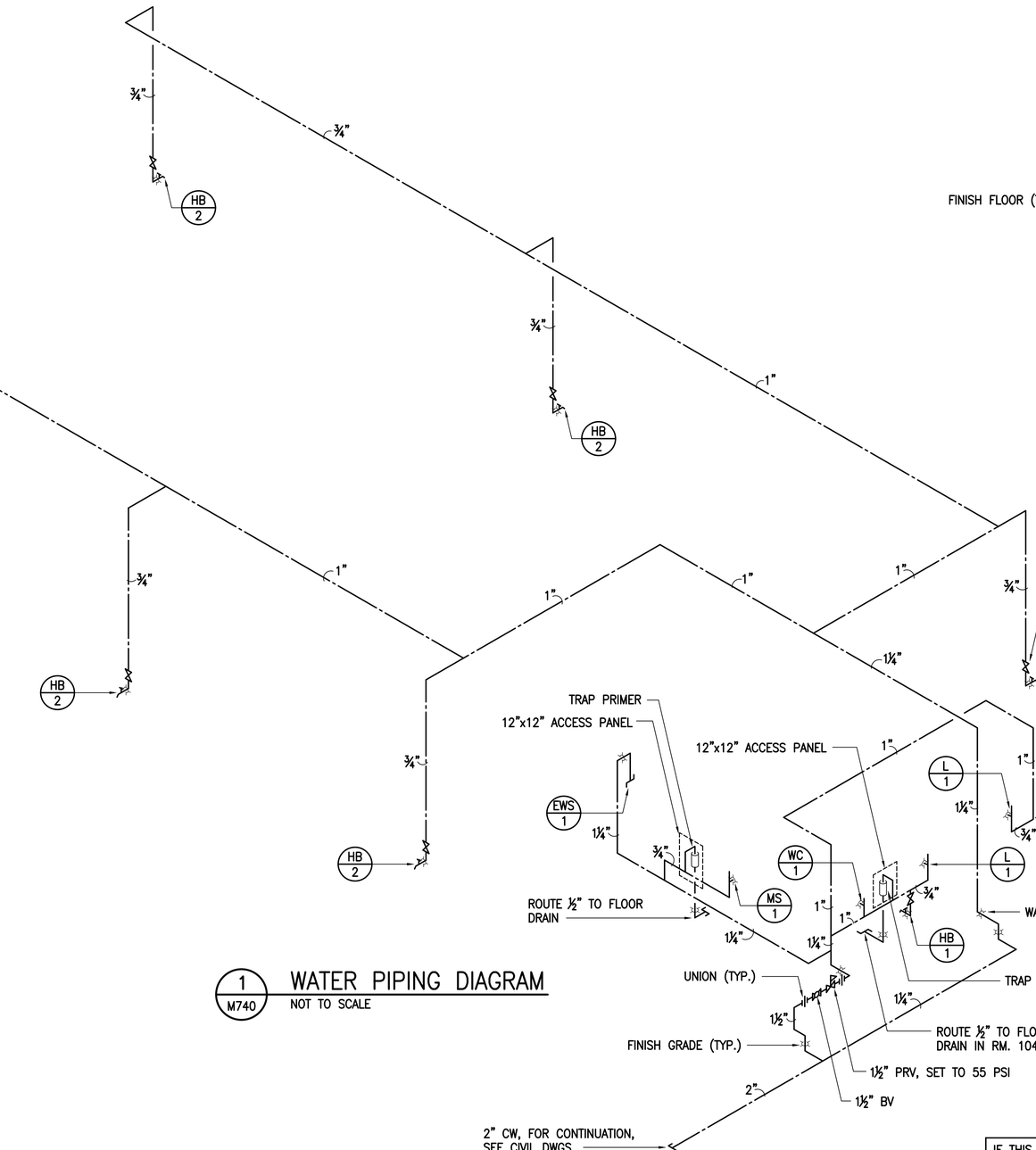
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

FILE: Site07_MechSections.dwg
DATE REV.: 30/05/2018



1 / M740

WATER PIPING DIAGRAM

NOT TO SCALE

2 / M740

SANITARY PIPING DIAGRAM

NOT TO SCALE

IF THIS SHEET IS LESS THAN
34"x22", IT IS A REDUCED PRINT.
SCALE REDUCED ACCORDINGLY.

1	7/6/18	ADDENDUM 2 – NEW SHEET ISSUED		

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER
SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PIPING DIAGRAMS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

TYSON T. TOYAMA
10226-M

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16–115–2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

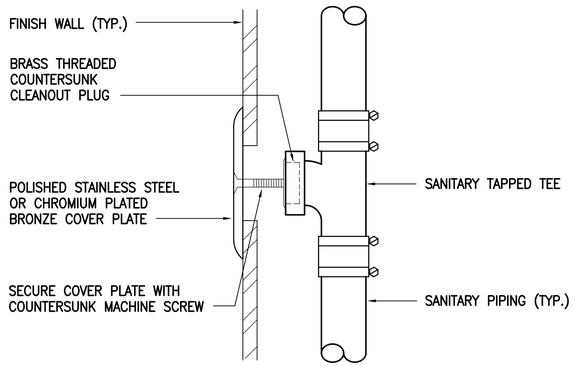
Tyson T. Toyama
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. M740 1
SHEET 120F 149

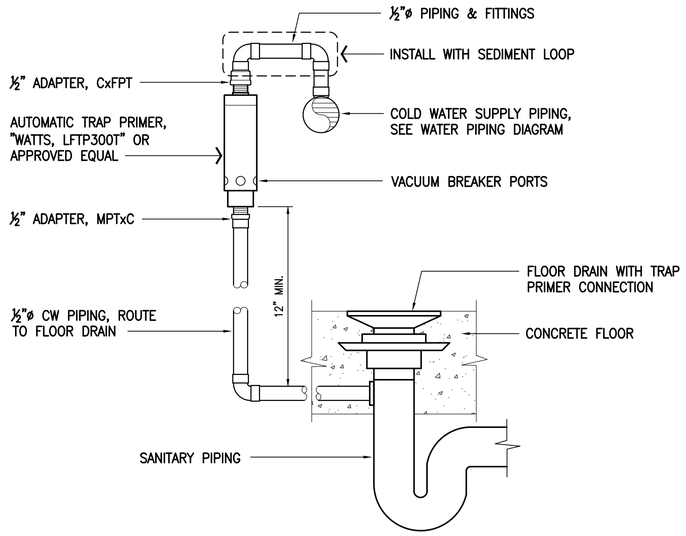
Okahara and
Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

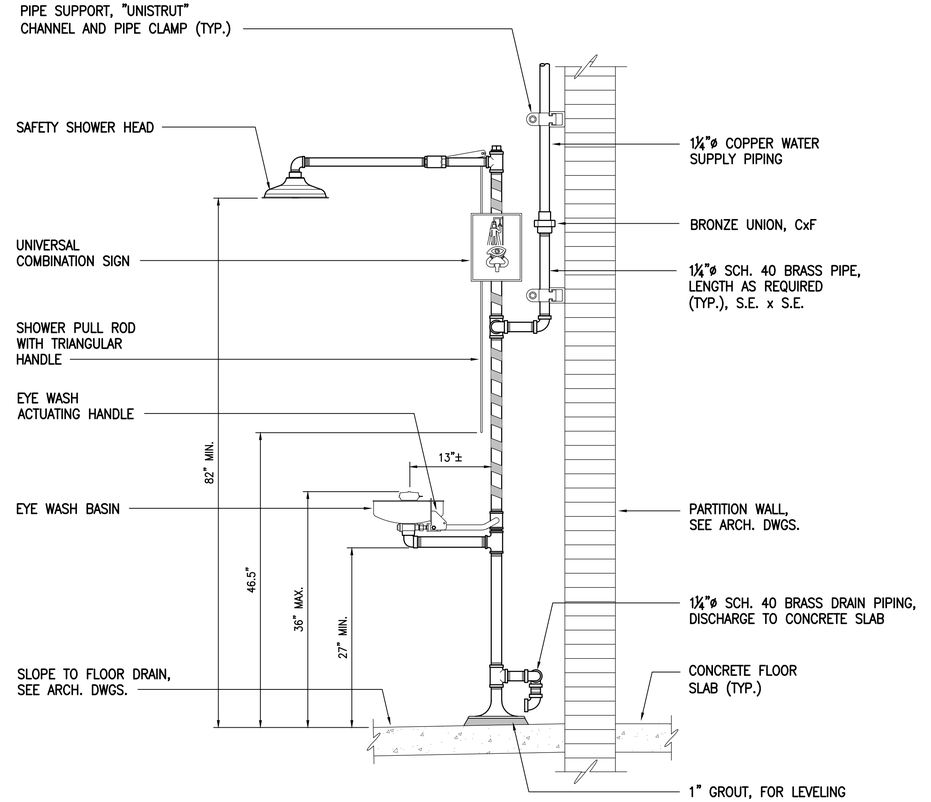
FILE: Site07_PipingDiagrams.dwg
DATE REV.: 28/06/2018



1 / M750 TYPICAL WALL CLEANOUT DETAIL
NOT TO SCALE



2 / M750 TRAP PRIMER DETAIL
NOT TO SCALE



3 / M750 EMERGENCY EYE WASH/SHOWER DETAIL
NOT TO SCALE

IF THIS SHEET IS LESS THAN 34"x22", IT IS A REDUCED PRINT. SCALE REDUCED ACCORDINGLY.

DWG. NO. M750 (1)
SHEET 12 OF 149

TYSON T. TOYAMA
LICENSED PROFESSIONAL ENGINEER
10226-M
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

1	7/6/18	ADDENDUM 2 – NEW SHEET ISSUED		

DEPARTMENT OF HAWAIIAN HOME LANDS

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

MECHANICAL DETAILS

DESIGNED BY: RL CHECKED BY: TTT DRAWN BY: RL

Okahara and Associates, Inc.
200 KOHOLA STREET
HILO, HAWAII 96720
PH: (808) 961-5527
FAX: (808) 961-5529

FILE	POCKET	FOLDER	NO.

FILE: Site07_MechDetails.dwg
DATE REV.: 28/06/2018

GENERAL NOTES:

1. PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. CONTRACTOR SHALL VISIT JOBSITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF DEMOLITION AND NEW WORK PRIOR TO THE START OF CONSTRUCTION.
2. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL VISIT JOBSITE AND REPORT ANY DISCREPANCIES AND/OR DIFFERENCE IN DRAWINGS, WITH RESPECT TO EXISTING CONDITIONS, TO THE ENGINEER.
3. CONTRACTOR SHALL RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY CONTRACTOR'S FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.
5. BEFORE ANY ELECTRICAL WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT REQUIRED SERVICES ARE NOT DISCONTINUED.
6. REMOVE ALL EXISTING EXPOSED CONDUIT AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CUT, CAPPED AND ABANDONED IN PLACE WITH ALL WIRES REMOVED.
7. PROVIDE METAL SEALS FOR ALL ABANDONED RACEWAY OPENINGS IN BOXES, CABINETS, AND EQUIPMENT ENCLOSURES; SEALS SHALL RETAIN NEMA RATING OF REMAINING BOXES, CABINETS, AND EQUIPMENT ENCLOSURES.
8. RETURN ALL SALVAGEABLE APPARATUS, AS DETERMINED BY DHHL OR ITS REPRESENTATIVES, TO A SITE DESIGNATED BY DHHL OR ITS REPRESENTATIVES, AT NO ADDITIONAL COST TO DHHL. DISPOSE OF ALL UNWANTED MATERIALS.
9. PRIOR TO PENETRATING OR DISTURBING ANY SURFACES IDENTIFIED AS CONTAINING HAZARDOUS MATERIALS, HAVE SURFACE/MATERIAL ABATED OR TREATED SO AS NOT TO CONTAMINATE SPACE OR AREA. REFER TO HAZARDOUS MATERIAL HANDLING REQUIREMENTS.

GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE HAWAIIAN ELECTRIC COMPANY AND HAWAIIAN TELCOM.
2. PROVIDE POLYOLEFIN 200LB TEST PULLCORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.
3. ALL ELECTRICAL EQUIPMENT ENCLOSURES AND EQUIPMENT MOUNTING HARDWARE AND FASTENERS FOR OUTDOOR INSTALLATION SHALL BE TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
$a	LT. SW., 1P, CONTROLLING OUTLET(S) "a", MTD. +48"
	DUPLEX RECEPTACLE, NEMA 5-15R, 120V, MTD. +18" OR AS NOTED
	SINGLE RECEPTACLE, NEMA 5-20R, 120V, MTD. +18" OR AS NOTED
	DUPLEX RECEPTACLE, WITH GROUND FAULT CIRCUIT INTERRUPTER, NEMA 5-20R, 120V, MTD. +18" OR AS NOTED
	ELECTRICAL PANELBOARD
(J)	JUNCTION BOX, CEIL. MTD., 4-11/16" NOM.
(J)	JUNCTION BOX, WALL MTD., 4-11/16" NOM.
	JUNCTION BOX MTD. ON CHANNEL SUPPORT, SEE DETAIL 2/E-003
	DUPLEX RECEPTACLE, WITH GROUND FAULT CIRCUIT INTERRUPTER, NEMA 5-20R, 120V, CHANNEL MOUNTED, IN WEATHERPROOF HOUSING, SEE DETAIL 3/E-003
(M/H)	MOTOR AND HEATER CONNECTION
(M)	MOTOR CONNECTION
(E)	EQUIPMENT CONNECTION
(FS)	FLOW SWITCH CONNECTION
(FT)	FLOW TRANSMITTER CONNECTION
(SV)	SOLENOID VALVE CONNECTION
(HDPS)	HIGH DISCHARGE PRESSURE SWITCH CONNECTION
(PCV)	PUMP CONTROL VALVE CONNECTION
(LS)	LIMIT SWITCH CONNECTION
$	ELECTRICAL EQUIPMENT DISCONNECT SWITCH, 1 OR 2 POLE
	DISCONNECT SWITCH, HP RATED
MCC	DENOTES "MOTOR CONTROL CENTER"
SPD	DENOTES "SURGE PROTECTIVE DEVICE"
WP	DENOTES "WEATHERPROOF"
SS	DENOTES "TYPE 316 STAINLESS STEEL"

SYMBOL	DESCRIPTION
	FLEXIBLE CONDUIT, LIQUIDTIGHT
	CONDUIT OR DUCTLINE BELOW REF. FL. OR GROUND
	EXPOSED CONDUIT
	EXISTING DUCTLINE
A S 1-4E 1-1C	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE, WITH DUCT COMPLEMENTS NOTED BELOW (TYPE "A" DUCT INDICATED WITH 1-4"E DUCT, AND TYPE "S" DUCT WITH 1-1"C DUCT; E=ELECTRIC, T=TELEPHONE, C=CONTROLS, I=INSTRUMENTATION); SEE SHEET E-005 FOR DUCT SECTION DETAILS
e-oh	EXISTING OVERHEAD UTILITY LINES
	2' X 4' HAWAIIAN TELCOM PULLBOX PER HAWAIIAN TELCOM REQUIREMENTS AND APPROVAL
	3' X 5' ELECTRIC PULLBOX SIMILAR TO MECO STANDARD PULLBOX REQUIREMENTS
	2' X 4' ELECTRIC PULLBOX SIMILAR TO MECO STANDARD PULLBOX REQUIREMENTS
	2' X 4' INSTRUMENTATION PULLBOX SIMILAR TO HAWAIIAN TELCOM STANDARD PULLBOX REQUIREMENTS WITH "INSTRUMENTATION" INSCRIBED ON COVER
	12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "POWER" INSCRIBED ON COVER
	12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "CONTROLS" INSCRIBED ON COVER
	12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "INSTRUMENTATION" INSCRIBED ON COVER
	EXISTING PULLBOX OR HANDHOLE, SEE PLANS FOR DESIGNATION

NOTE:

PROVIDE GREEN GROUND CONDUCTOR IN ALL NEW BRANCH AND FEEDER CIRCUITS INCLUDING LIGHT SWITCHING LEGS, SIZED PER NEC TABLE 250.122. ALL CONDUCTORS #12 AWG MINIMUM.

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

GENERAL NOTES AND ELECTRICAL SYMBOLS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

DWG. NO. E-001
SHEET 122 OF 149

OVERALL ELECTRICAL SITE PLAN

SCALE: 1"=700'

NORTH

700' 350' 0 700' 1400' 2100'

SCALE: 1"=700'

GRAPHIC SCALE

DWG. NO. E-002

SHEET 123 OF 149

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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SITE 1 - KAULUWAI WELL SITE

OVERALL ELECTRICAL SITE PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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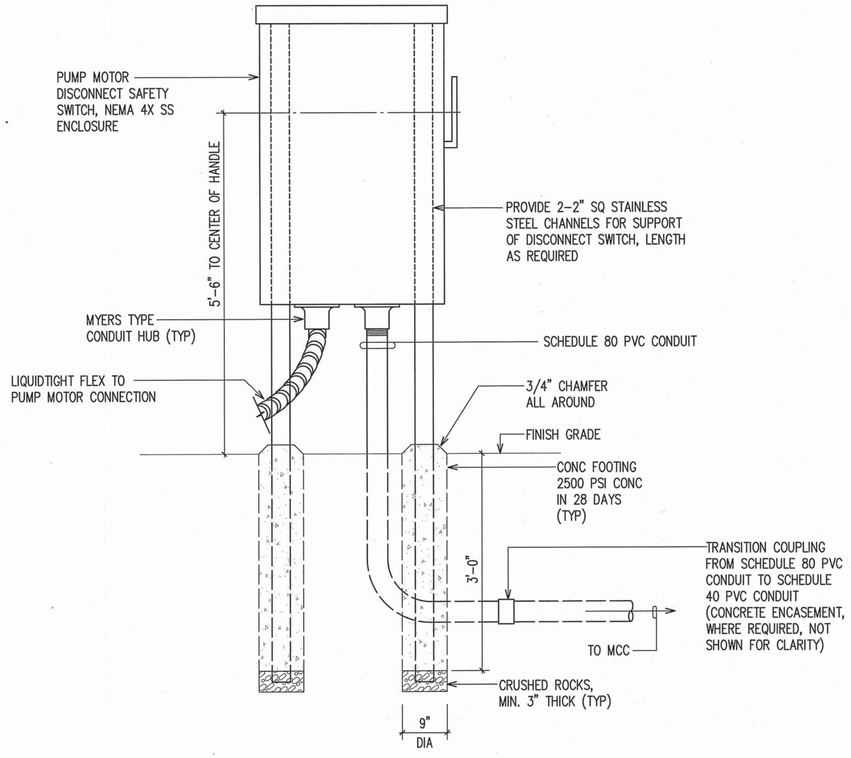
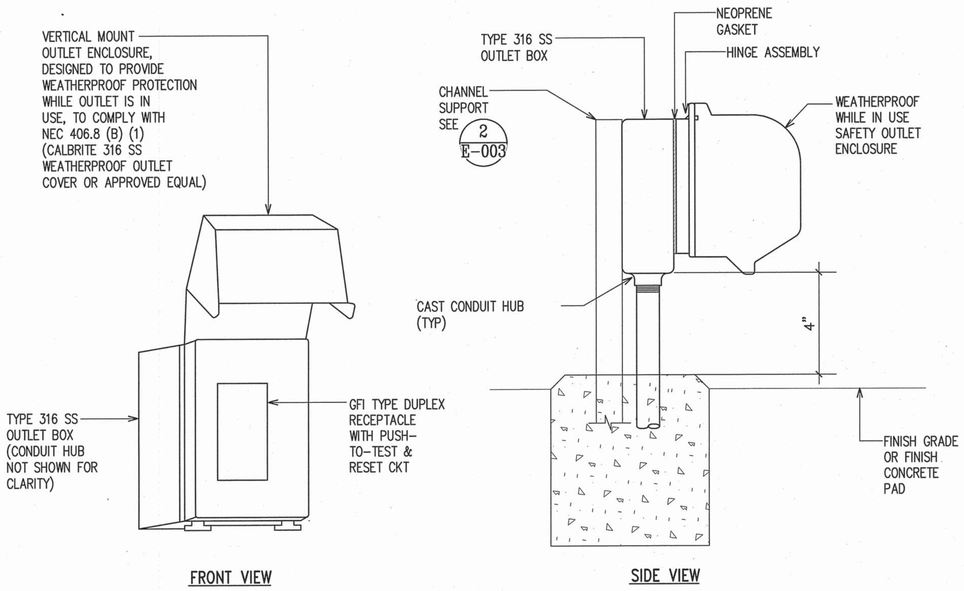
JUNE 2018



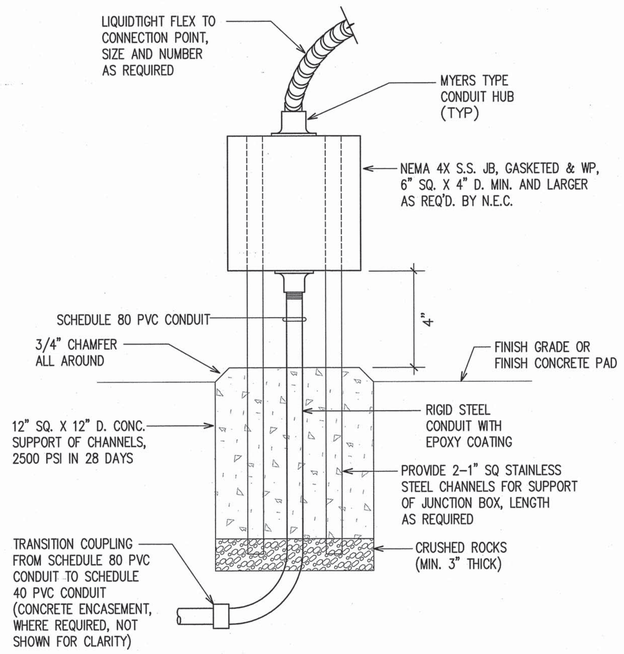
1 E-003 NOT TO SCALE

PUMP MOTOR DISCONNECT SWITCH MOUNTING DETAIL



3 E-003 NOT TO SCALE

WEATHERPROOF RECEPTACLE AND COVER DETAIL



NOTE:
1. ALL MOUNTING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.

2 E-003 NOT TO SCALE

CHANNEL MOUNTED JUNCTION BOX DETAIL

REVISION	DATE	BRIEF	MADE BY	APPROVED

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DWG. NO.
E-003
SHEET 124 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

MISCELLANEOUS ELECTRICAL DETAILS I

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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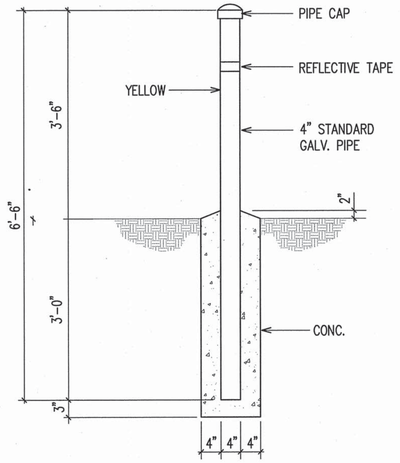
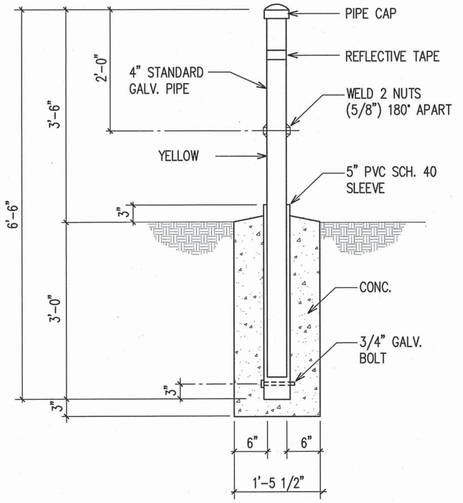
JUNE 2018



1 E-004 STATIONARY STANCHION



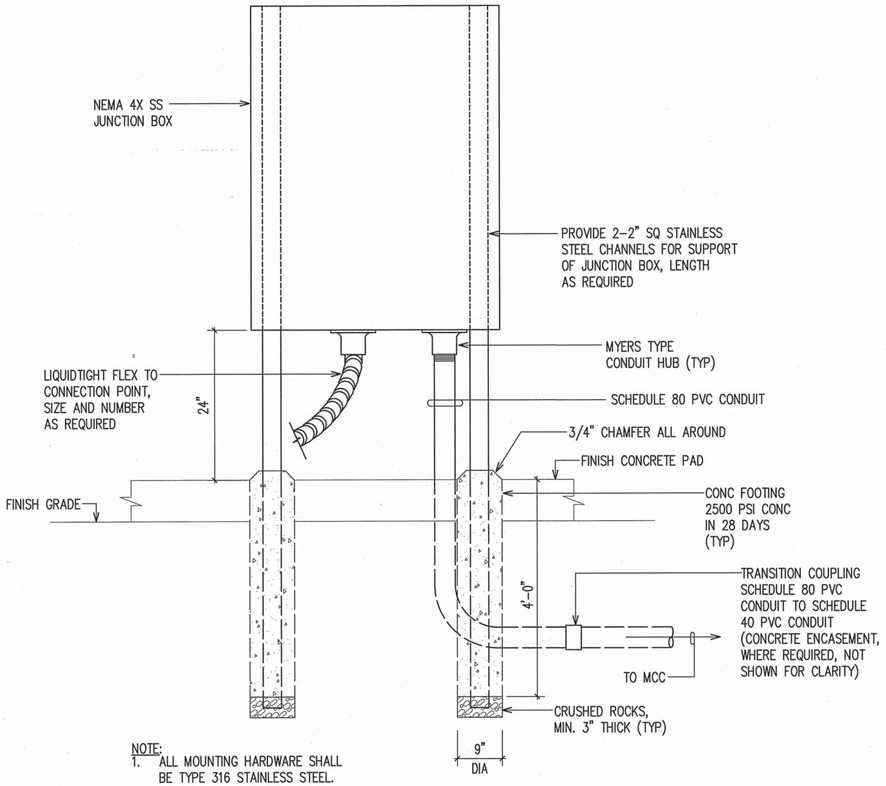
2 E-004 REMOVABLE STANCHION

STANCHION NOTES:

1. STANCHIONS SHALL CONFORM TO ASTM A43.
2. WELDED NUTS ARE FOR INSERTING BOLTS TO ACT AS HANDLES FOR LIFTING REMOVABLE STANCHIONS. TWO BOLTS SHALL BE PROVIDED AND USED TO INSTALL ALL STANCHIONS. BOLTS TO BE REMOVED AFTER INSTALLATION AND TURNED OVER TO OWNER.
3. STANCHIONS SHALL BE PAINTED YELLOW PER ANSI SPEC Z535.1 TO COMPLY WITH OSHA 1910.144 FOR COLOR CODING.
4. A 2" WIDE STRIP OF REFLECTIVE TAPE SHALL BE PLACED 6" BELOW THE TOP OF STANCHION.

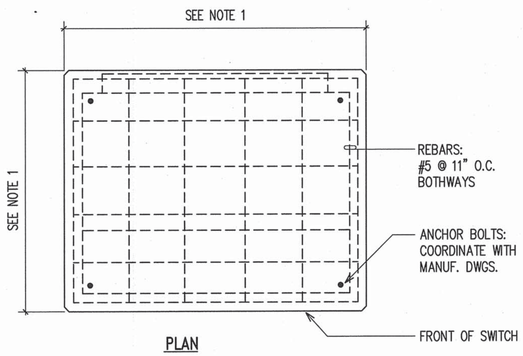
TYPICAL PROTECTIVE STANCHION DETAILS

NOT TO SCALE

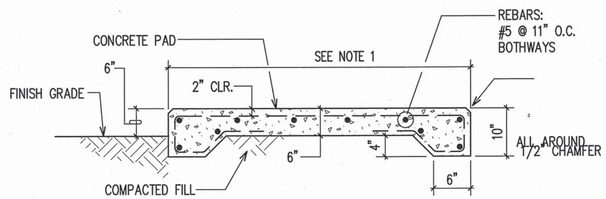


NOTE:
1. ALL MOUNTING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.

3 E-004 LARGE JUNCTION BOX MOUNTING DETAIL
NOT TO SCALE



PLAN



LONGITUDINAL SECTION

NOTES:

1. COORDINATE OVERALL PAD DIMENSIONS WITH EQUIPMENT BEING PROVIDED & ADJUST ACCORDINGLY. ALLOW 4" CLEARANCE FROM SIDE OF EQUIPMENT TO EDGE OF PAD.
2. PROVIDE CONDUIT STUB-UPS AS REQUIRED.
3. CONSTRUCTION OF CONCRETE PAD FOR TRANSFORMER SHALL BE SIMILAR.

4 E-004 TYPICAL LOAD INTERRUPTER DISCONNECT SWITCH CONCRETE PAD DETAIL
NOT TO SCALE

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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

MISCELLANEOUS ELECTRICAL DETAILS II

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

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JUNE 2018

DWG. NO. E-004
SHEET 125 OF 149

LAST_EDIT
Z:\JOJO\PROJECTS\21807\E-000-ONELINE DIAGRAM XREFS KKO-STAMP=Z:\JOJO\PROJECTS_PE_ STAMP\KKO-STAMP _X21807.ONE LINE=\\XREF_X21807.ONE LINE

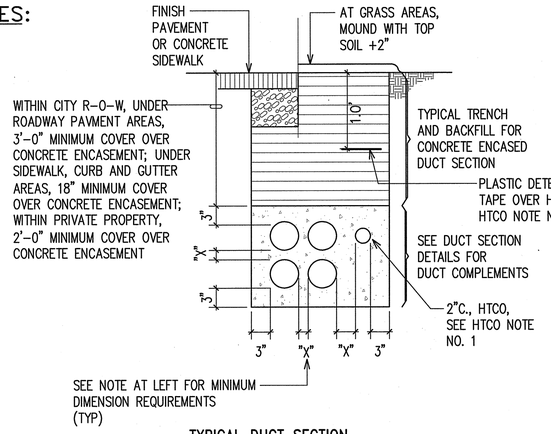
DUCT SECTION BACKFILL NOTES:

TYPE "A" BACKFILL – EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX. & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

TYPE "B" BACKFILL – EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

NOTE – IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.

CONCRETE – 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.



TYPICAL DUCT SECTION

DESIGNATION DESCRIPTIONS

ELEC = UTILITY CO. PRIMARY OR SECONDARY ELECTRIC
TEL = UTILITY CO. TELEPHONE
PWR = PRIMARY OR SECONDARY ELECTRIC
CTL = CONTROL
SIG = INSTRUMENTATION OR ANTENNA CABLE

MINIMUM "X" DIMENSION
DUCT SEPARATION REQUIREMENTS

ELEC – ELEC = 1 1/2"

ELEC – TEL = 3"

TEL – TEL = 1 1/2"

ELEC – CTL/SIG = 3"

TEL – CTL/SIG = 1 1/2"

PWR – CTL/SIG = 3"

ELEC – PWR = 1 1/2"

TEL – PWR = 3"

PWR – PWR = 1 1/2"

CTL/SIG – CTL/SIG = 1 1/2"

MINIMUM OF 3" CONCRETE ENCASEMENT AROUND DUCTBANK

WHERE DUCTLINE CROSSES OVER WATER LINE, PROVIDE THE FOLLOWING:

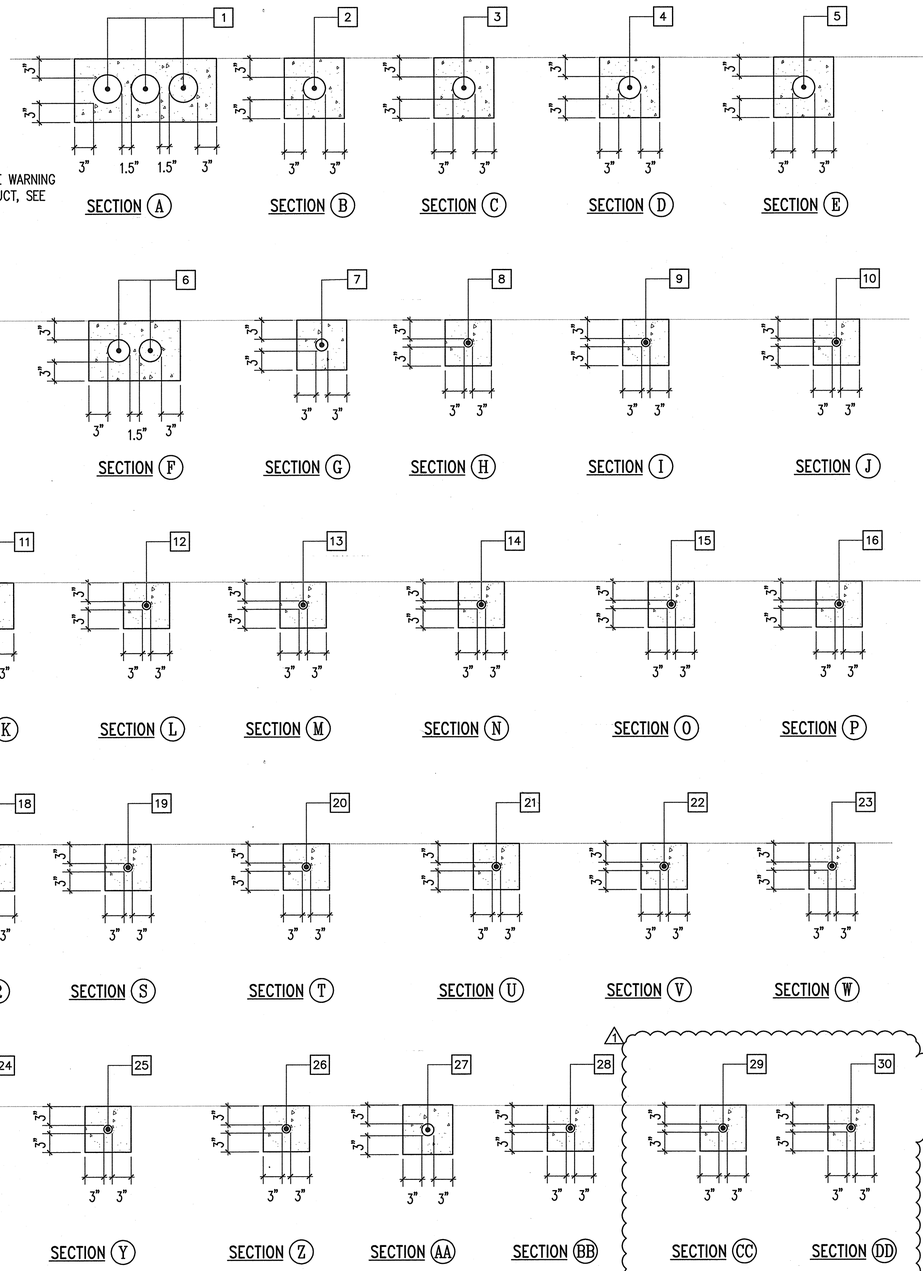
6" MINIMUM SEPARATION BETWEEN DUCTLINES AND WATER LINE.

PROVIDE CONCRETE JACKET AROUND DUCTLINES.

PROVIDE ONLY TYPE "B" BACKFILL AROUND WATER LINE.

HAWAIIAN TELCOM (HTCO) DUCTLINE NOTES:

1. CONTRACTOR SHALL PLACE NEPTCO WP 1800P MULETAPE, OR APPROVED EQUAL, IN EACH DUCT THROUGHOUT ITS ENTIRE LENGTH WITH PROTRUSIONS OF 2 FEET IN MANHOLES AND HANDHOLES AT EACH END, AND 1 FOOT IN PULLBOXES. MULETAPE IS RATED FOR 1800 LB PULL AND HAS FOOTAGE MARKINGS FOR MEASURING DUCT LENGTHS.
2. CONTRACTOR SHALL PLACE 4–MIL ORANGE COLORED PLASTIC WARNING TAPE, NOT LESS THAN 6" WIDE, ENTIRE LENGTH OF TRENCH FOR ALL UNDERGROUND INSTALLATIONS. TAPE SHOULD READ "WARNING–STOP DIGGING–CALL HTCO, COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION".



DUCT AND WIRE SCHEDULE

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	4"	PC	MAIN FEEDER FROM EXISTING SERVICE SWITCHBOARD
2	3"	SEE ONE-LINE DIAGRAM	POWER TO BOOSTER PUMP NO. 1 FROM MCC
3	3"	SEE ONE-LINE DIAGRAM	POWER TO BOOSTER PUMP NO. 2 FROM MCC
4	3"	SEE ONE-LINE DIAGRAM	POWER TO STEP UP TRANSFORMER FROM MCC
5	3"	SEE ONE-LINE DIAGRAM	POWER TO WELL PUMP NO. 1 FROM MCC
6	3"	SEE ONE-LINE DIAGRAM	POWER TO WELL PUMP NO. 2 FROM MCC INSTRUMENTATION
7	1 1/2"	32#12, 1#12 GND (8#12 SPARES)	CONTROLS TO CONTROLS PULLBOX AT BOOSTER AND WELL PUMP NO. 2 LOCATION FROM MCC
8	1"	12#12, 1#12 GND (4#12 SPARES)	CONTROLS TO BOOSTER PUMP FROM MCC
9	1"	8#12, 1#12 GND (4#12 SPARES)	CONTROLS TO BOOSTER PUMP NO. 2 FROM MCC
10	1"	4#12, 1#12 GND (2#12 SPARES)	CONTROLS TO BOOSTER PUMP NO. 1 FROM MCC
11	1"	2#12, 1#12 GND	CONTROLS TO SOLENOID VALVE CONNECTION
12	1"	12#12, 1#12 GND (7#12 SPARES)	CONTROLS TO WELL PUMP NO. 2
13	1"	2#12 , 1#12 GND	CHLORINATOR SOLENOID VALVE CONNECTION
14	1"	6#12, 1#12 GND (2#12 SPARES)	CONTROLS TO WELL PUMP NO. 1
15	1"	1-2/C#14 TWISTED, SHIELDED CABLES W/ GND	FLOW TRANSMITTER TO INSTRUMENTATION PULLBOX AT BOOSTER PUMP NO. 1
16	1"	2-2/C#14 TWISTED, SHIELDED CABLES W/ GND	FLOW TRANSMITTER TO INSTRUMENTATION PULLBOX AT BOOSTER PUMP NO. 2
17	1"	1-2/C#14 TWISTED, SHIELDED CABLES W/ GND	FLOW TRANSMITTER TO INSTRUMENTATION PULLBOX AT WELL PUMP NO. 1
18	1"	3-2/C#14 TWISTED, SHIELDED CABLES W/ GND	INSTRUMENTATION FROM PULLBOX TO EXISTING SCADA CABINET
19	1"	1-2/C#14 TWISTED, SHIELDED CABLES W/ GND	FLOW TRANSMITTER TO SCADA CABINET AT WELL PUMP NO. 2
20	1"	9#12 , 1#12 GND	POWER TO BOOSTER AND WELL PUMP NO. 2 LOCATION FROM MCC
21	1"	2#12 , 1#12 GND	POWER TO OUTDOOR RECEPTACLE
22	1"	2#12 , 1#12 GND	POWER TO GENERAL SITE LIGHTING
23	1"	4#12 , 1#12 GND	POWER TO WELL PUMP NO. 1 LOCATION FROM MCC
24	1"	2#12 , 1#12 GND	POWER TO ABOVEGROUND FUEL STORAGE TANK
25	1"	6#12 , 1#12 GND	POWER TO EXISTING GENERATOR AND NEW FUEL
26	1"	2#12 , 1#12 GND	POWER TO EXISTING GENERATOR CIRCUITS AND NEW FUEL POLISHING PANEL
27	1 1/2"	48#12 , 1#12 GND (6#12 SPARES)	CONTROLS TO SCADA CABINET
28	1"	2#12 , 1#12 GND	POWER TO SCADA CABINET
29	1"	7#12, 1#12 GND	POWER TO CHLORINATION SHED AND GENERAL LIGHTING
30	1"	4#12, 1#12 GND (2#12 SPARES)	CONTROLS TO CHLORINATION SHED

NOTES:
1. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
2. PC INDICATED PROVIDE PULLCORD.

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 ADDED POWER AND CONTROLS FOR EXISITNG CHLORINATION SHED	RHA	

DUCT SECTION DETAILS AND REQUIREMENTS

NOT TO SCALE

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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DWG. NO. E-005
SHEET 126 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

DUCT SECTION DETAILS AND REQUIREMENTS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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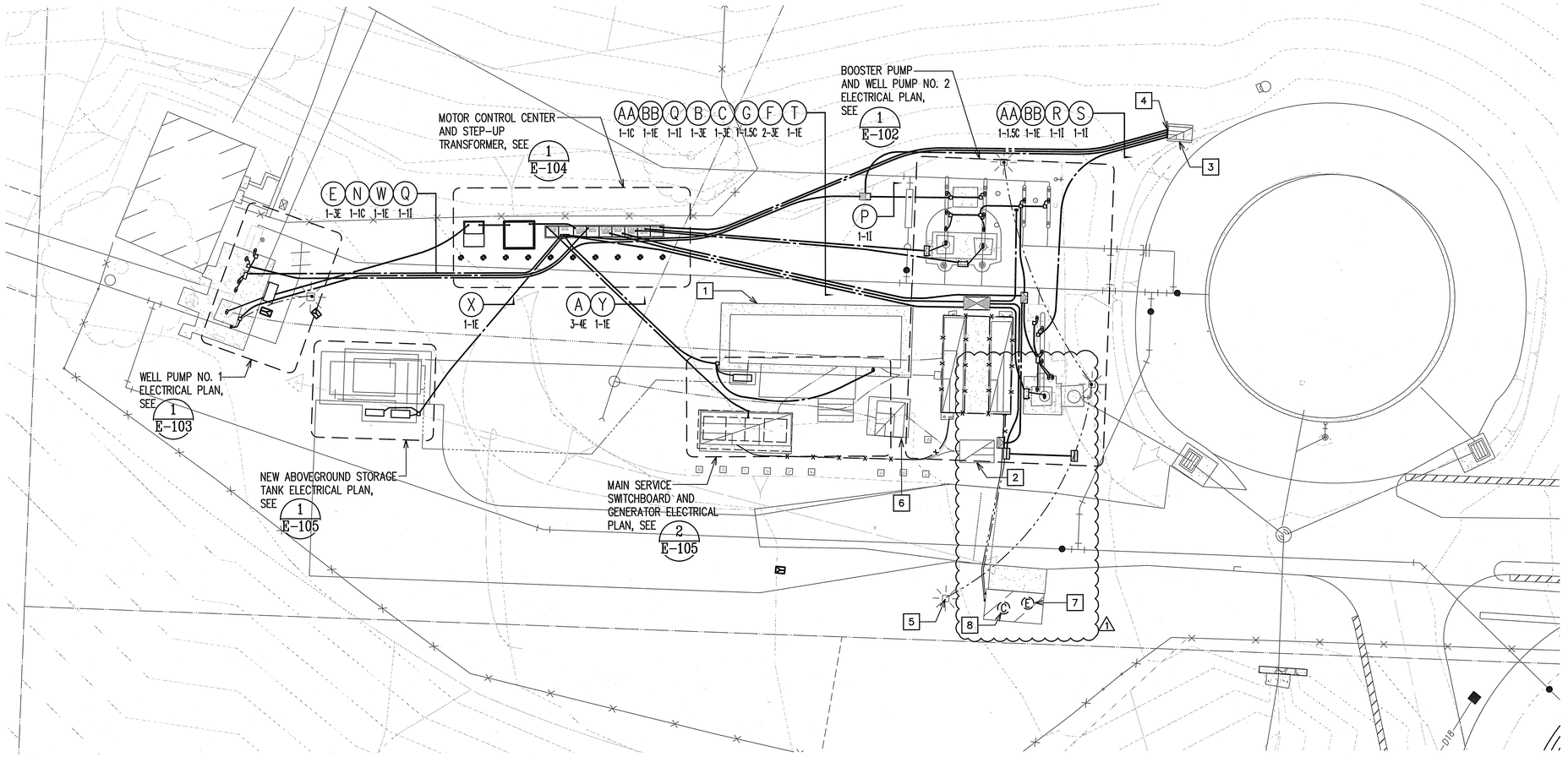


1 E-101 SITE 1 ELECTRICAL PLAN

SCALE: 1"=10'

NORTH

NOTES:

1. EXISTING 660KW GENERATOR.
2. EXISTING MECO 3'X5' HANDHOLE.
3. EXISTING SCADA CABINET.
4. STUB CONDUIT INTO EXISTING SCADA CABINET WITH NEW CONDUIT BODY; HEIGHT AS REQUIRED.
5. EXISTING AREA LIGHT
6. EXISTING MECO PADMOUNTED TRANSFORMER.
7. EXISTING AIR COMPRESSOR AND LIGHTING FOR CHLORINATION SHED. (1)
8. EXISTING CONTROLS FOR CHLORINATION SHED.
9. REMOVE ALL EQUIPMENT AND CONDUCTORS AS INDICATED. EMPTY DUCTLINES SHALL BE CAPPED AND ABANDONED IN PLACE.

(1) 10' 5' 0 10' 20' 30'
SCALE: 1"=10'
GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 ADDED CHLORINATION SHED	RHA	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

SITE 1 ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

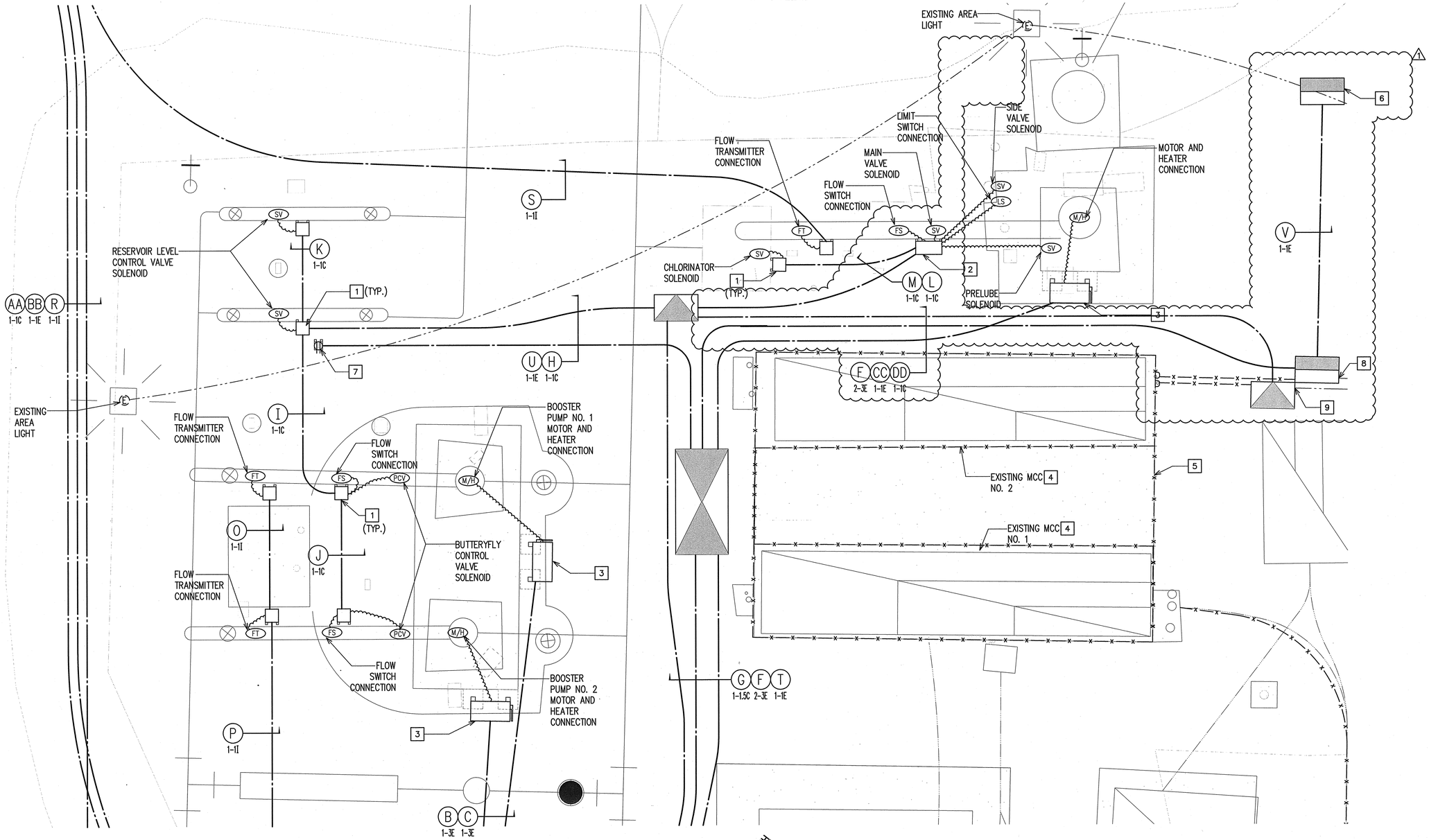
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

DWG. NO. E-101
SHEET 127 OF 149



BOOSTER PUMP AND WELL PUMP NO. 2 ELECTRICAL PLAN

NORTH

SCALE: 1/2"=1'-0"

NOTES:

1. 6"SQ X 6"D CHANNEL MOUNTED JUNCTION BOX, SEE SHEET 2/E-003.
2. 12"W X 18"H X 6"D NEMA 4XSS CHANNEL MOUNTED JUNCTION BOX, SEE DETAIL 3/E-004.
3. CHANNEL MOUNTED SAFETY DISCONNECT SWITCH, SEE DETAIL 1/E-003.
4. REMOVE ALL EQUIPMENT AND CONDUCTORS AS INDICATED. EMPTY DUCTLINES SHALL BE CAPPED AND ABANDONED IN PLACE
5. REMOVE EXISTING CONCRETE PAD FOR EXISTING MCC.
6. INTERCEPT EXISTING GENERAL LIGHTING BRANCH CIRCUIT WITH NEW PULLBOX.
7. CHANNEL MOUNTED 316 STAINLESS STEEL WEATHERPROOF RECEPTACLE, SEE DETAIL ON SHEET 3/E-003.

1

8. INTERCEPT EXISTING CHLORINATION SHED GENERAL BRANCH CIRCUIT WITH NEW PULLBOX.
9. INTERCEPT EXISTING CHLORINATION SHED CONTROLS WITH NEW PULLBOX.

2' 1' 0 2' 4' 6'

SCALE: 1/2"=1'-0"

GRAPHIC SCALE

DWG. NO. E-102
SHEET 128 OF 149

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 1 ADDED POWER AND CONTROLS FOR EXISTING CHLORINATION SHED	RHA	

KRAIG K. OTANI
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No. 14288-E
HAWAII, U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

BOOSTER PUMP AND WELL PUMP NO. 2 ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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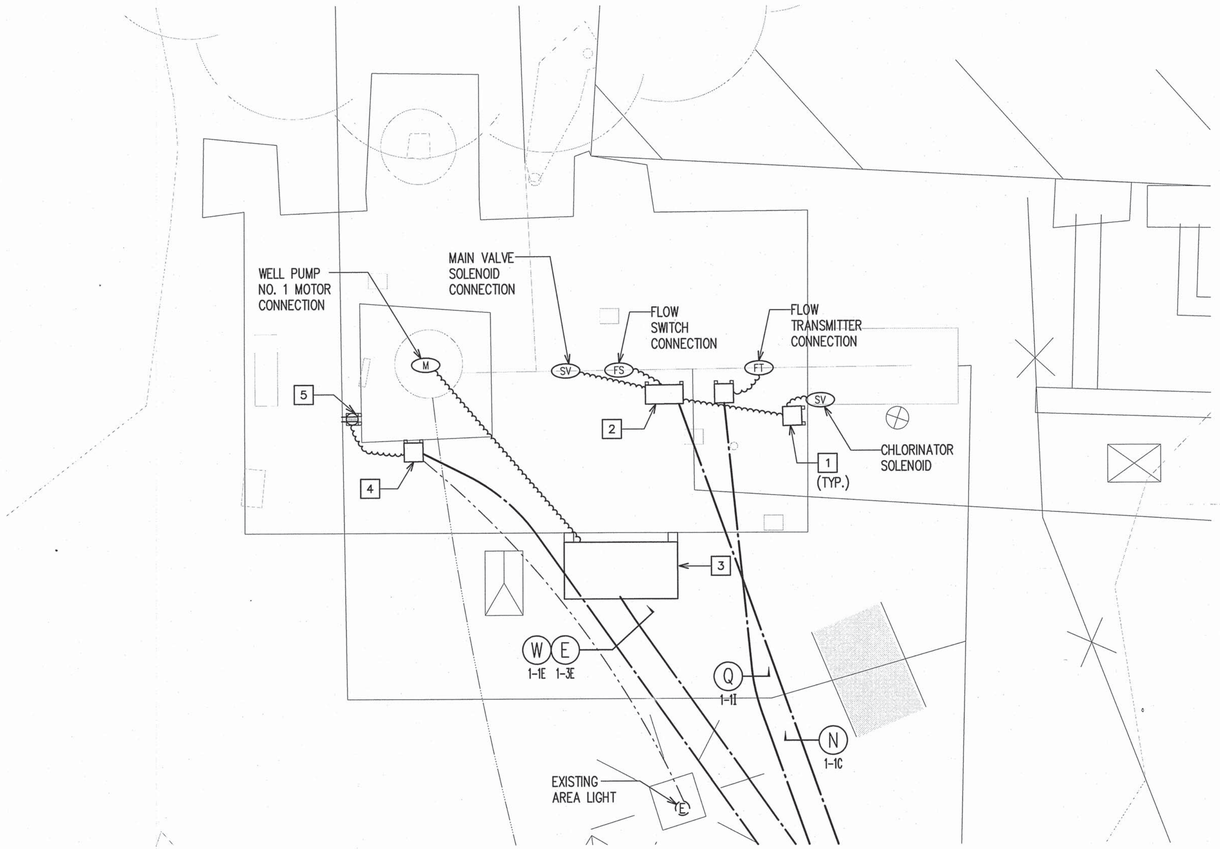
JUNE 2018



1 / E-103 WELL PUMP NO. 1 ELECTRICAL PLAN

SCALE: 1/2"=1'-0"

NORTH

NOTES:

1. 6"SQ X 6"D CHANNEL MOUNTED JUNCTION BOX, SEE SHEET 2/E-003.
2. 12"W X 18"H X 6"D NEMA 4XSS CHANNEL MOUNTED JUNCTION BOX, SEE DETAIL 2/E-003.
3. 36"SQ X 18"D ME,A 4XSS JUNCTION BOX. JUNCTION BOX TO BE MOUNTED WITH BOTTOM OF BOX +24" ABOVE THE PUMP CONCRETE PAD. PROVIDE LARGE WEATHER PROTECTED SIGN, MOUNTED ON JUNCTION BOX, LABELED "DANGER-2300 VOLTS! GROUND ALL LEADS BEFORE DISCONNECTING". SIZE OF LETTERING SHALL BE 2" HIGH FOR "DANGER-2300 VOLTS!" AND A MINIMUM OF 3/4" HIGH FOR REMAINING LETTERS. SEE DETAIL 3/E-004.
4. INTERCEPT EXISTING BRANCH CIRCUIT WITH NEW CHANNEL MOUNTED JUNCTION BOX.
5. CHANNEL MOUNTED 316 STAINLESS STEEL WEATHERPROOF RECEPTACLE, SEE DETAIL ON SHEET 3/E-003.

2' 1' 0 2' 4' 6'

SCALE: 1/2"=1'-0"

GRAPHIC SCALE

DWG. NO. E-103

SHEET 129 OF 149

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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K Kot

SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

WELL PUMP NO. 1 ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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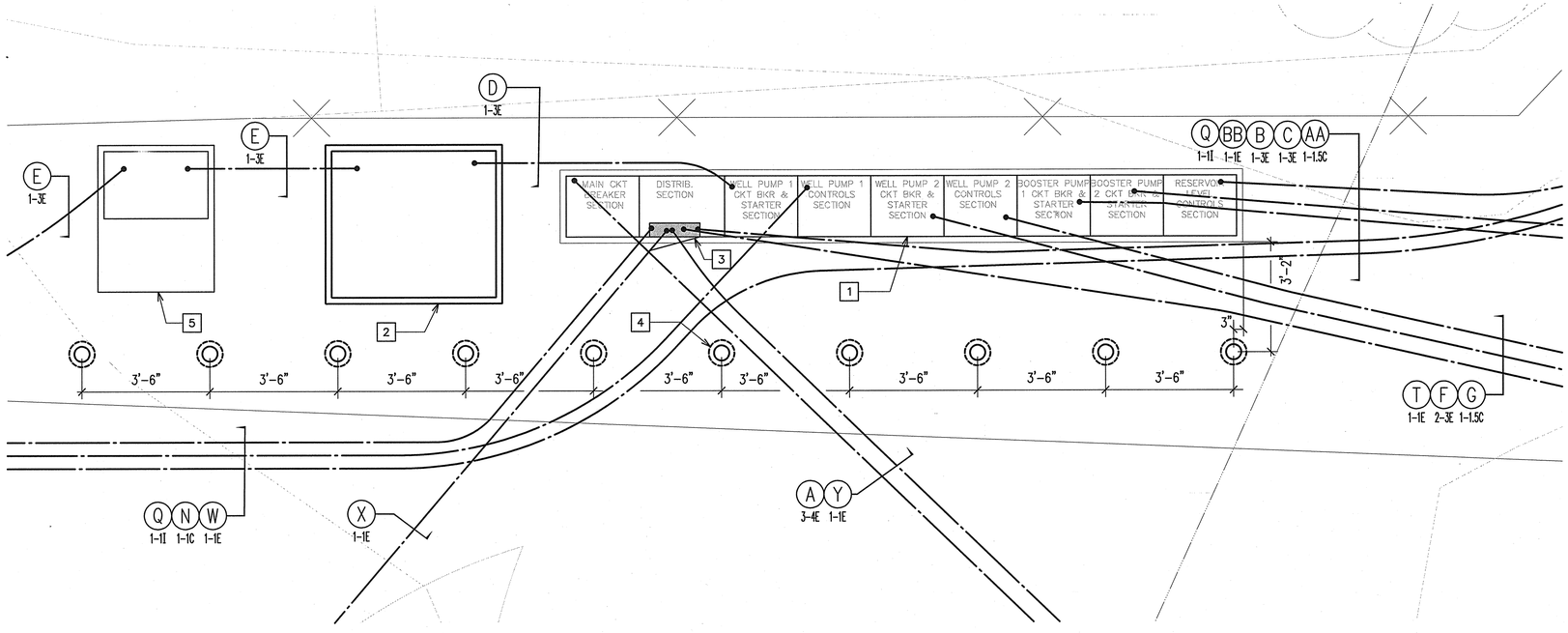
JUNE 2018



1 MCC AND STEP-UP TRANSFORMER ELECTRICAL PLAN
E-104 SCALE: 1/2"=1'-0"

NOTES:

1. FRONT OF NEW MCC, SEE SHEET E-109.
2. FRONT OF NEW STEP-UP TRANSFORMER.
3. PANEL A.
4. REMOVABLE PROTECTIVE STANCHION. SEE DETAIL 2/E-004.
5. FRONT OF PADMOUNTED LOAD INTERRUPTER SWITCH, SEE DETAIL 4/E-004.

NEW PANEL "A": 50 A MAIN BREAKER, 208Y/ 120 VOLTS, 3-PHASE, 4-WIRE, 10,000 A.I.C. INDUSTRIAL-BOLTED TYPE, MOUNTED IN MCC

CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER POLE	BREAKER AMPS	WIRE SIZE	KVA ON BUSSES PHASE A	PHASE B	PHASE C	WIRE SIZE	BREAKER POLE	BREAKER AMPS	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.
1	R-OUTDOOR	1	20	12	0.4			12	1	20	AREA LIGHTING	2
3	R-OUTDOOR	1	20	12		0.4		12	1	20	AREA LIGHTING	4
5,7	GENERATOR CIRCUITS	2	40	12			1.0	12	1	20	WELL PUMP TEST CKT	6
	-				1.0			12	1	20	BOOSTER PUMP TEST CKT	8
9	MCC STRIP HEATER	1	20	12		1.0		12	1	20	FUEL POLISHING PANEL 1	10
11	SCADA CABINET	1	20	12			1.0	12	1	20	FUEL POLISHING PANEL 2	12
~~13~~	~~BP-1 MOTOR HEATER~~	~~1~~	~~20~~	~~12~~	~~1.0~~			12	1	20	WELL PUMP 2 MOTOR HEATER	14
15	BP-2 MOTOR HEATER	1	20	12		1.0		12	3	20	AIR COMPRESSOR	16
17	S	1	20				0.5				-	18
19	S	1	20		0.5						-	20
21	PFB					0.0		12	1	20	L-CHLORINATION SHED	22
~~23~~	~~PFB~~						~~0.0~~				~~PFB~~	~~24~~
	CONNECTED LOAD PER PHASE				6.4	4.2	4.2					
	DEMAND LOAD PER PHASE				4.5	2.9	2.9					

*CONTRACTOR TO VERIFY EXISTING LOADS TO BE RECONNECTED

TOTAL CONNECTED LOAD (KVA)	14.8
DEMAND FACTOR	70%
TOTAL DEMAND LOAD (KVA)	10.4
HIGH LEG (AMPS)	37.3

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 ADDED CIRCUITS FOR AIR COMPRESSOR	RHA	

SCALE: 2' 1' 0 2' 4' 6'
GRAPHIC SCALE 1/2"=1'-0"

DWG. NO. E-104
SHEET 130 OF 149

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE
JOB NO.

MCC AND STEP-UP TRANSFORMER ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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Electrical Engineers
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Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

LAST EDIT
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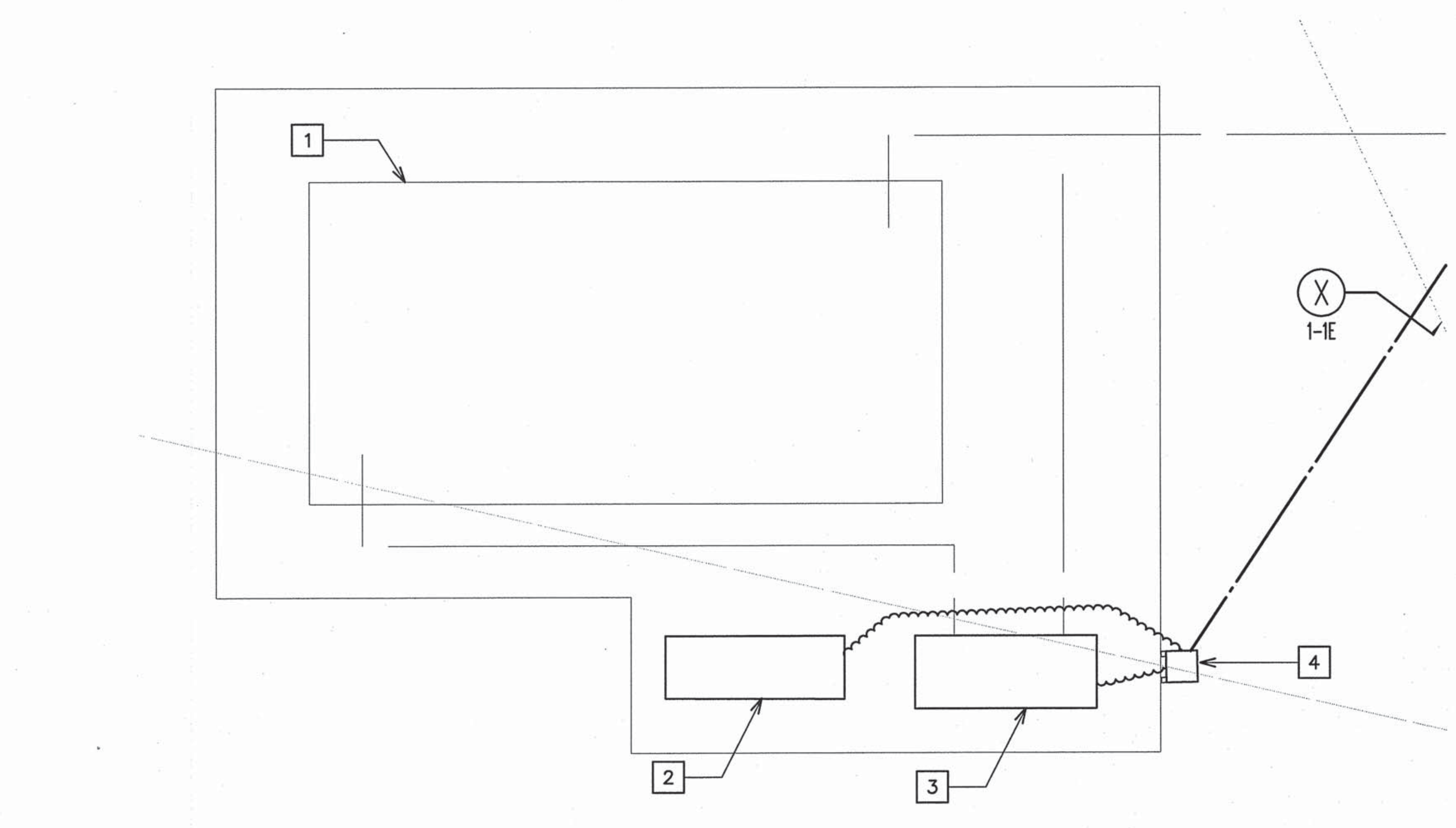
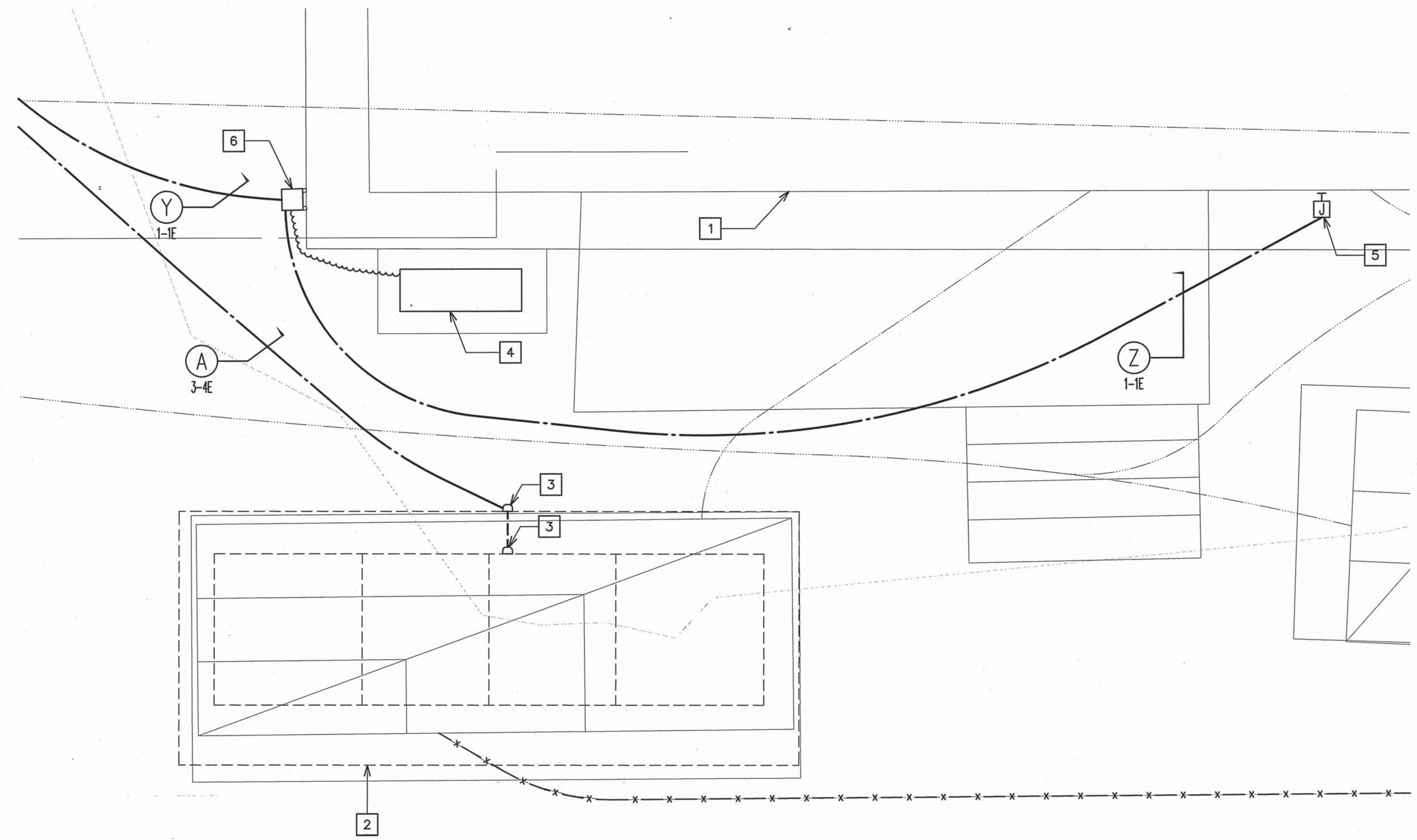


1 ABOVE GROUND FUEL TANK ELECTRICAL PLAN
E-105 SCALE: 1/2"=1'-0"

NORTH

NOTES:

1. NEW ABOVE GROUND STORAGE TANK. SEE MECHANICAL PLANS FOR DETAILS.
2. NEW PACKAGED FUEL POLISHING SYSTEM, SEE MECHANICAL PLANS FOR DETAILS.
3. NEW PACKAGED DUPLEX FUEL TRANSFER PUMP AND DAY TANK CONTROLLER. SEE MECHANICAL PLANS FOR DETAILS
4. 6"SQ X 6"D CHANNEL MOUNTED JUNCTION BOX, SEE SHEET 2/E-003.



2 EXISTING GENERATOR AND SWITCHBOARD ELECTRICAL PLAN
E-105 SCALE: 1/2"=1'-0"

NORTH

NOTES:

1. FRONT OF EXISTING 660KW GENERATOR
2. FRONT OF EXISTING MAIN SERVICE SWITCHBOARD.
3. STUB INTO EXISTING MAIN SERVICE SWITCHBOARD FOR NEW MCC FEEDERS WITH CONDUIT BODY; HEIGHT AS REQUIRED.
4. NEW PACKAGED FUEL POLISHING SYSTEM, SEE MECHANICAL PLANS FOR DETAILS.
5. RECONNECT TO EXISTING JUNCTION BOX FOR EXISTING GENERATOR CIRCUITS.
6. 6"SQ X 6"D CHANNEL MOUNTED JUNCTION BOX, SEE SHEET 2/E-003.

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

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LICENSED PROFESSIONAL ENGINEER
No. 14288-E
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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

ABOVE GROUND STORAGE TANK, SERVICE SWITCHBOARD, AND GENERATOR ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
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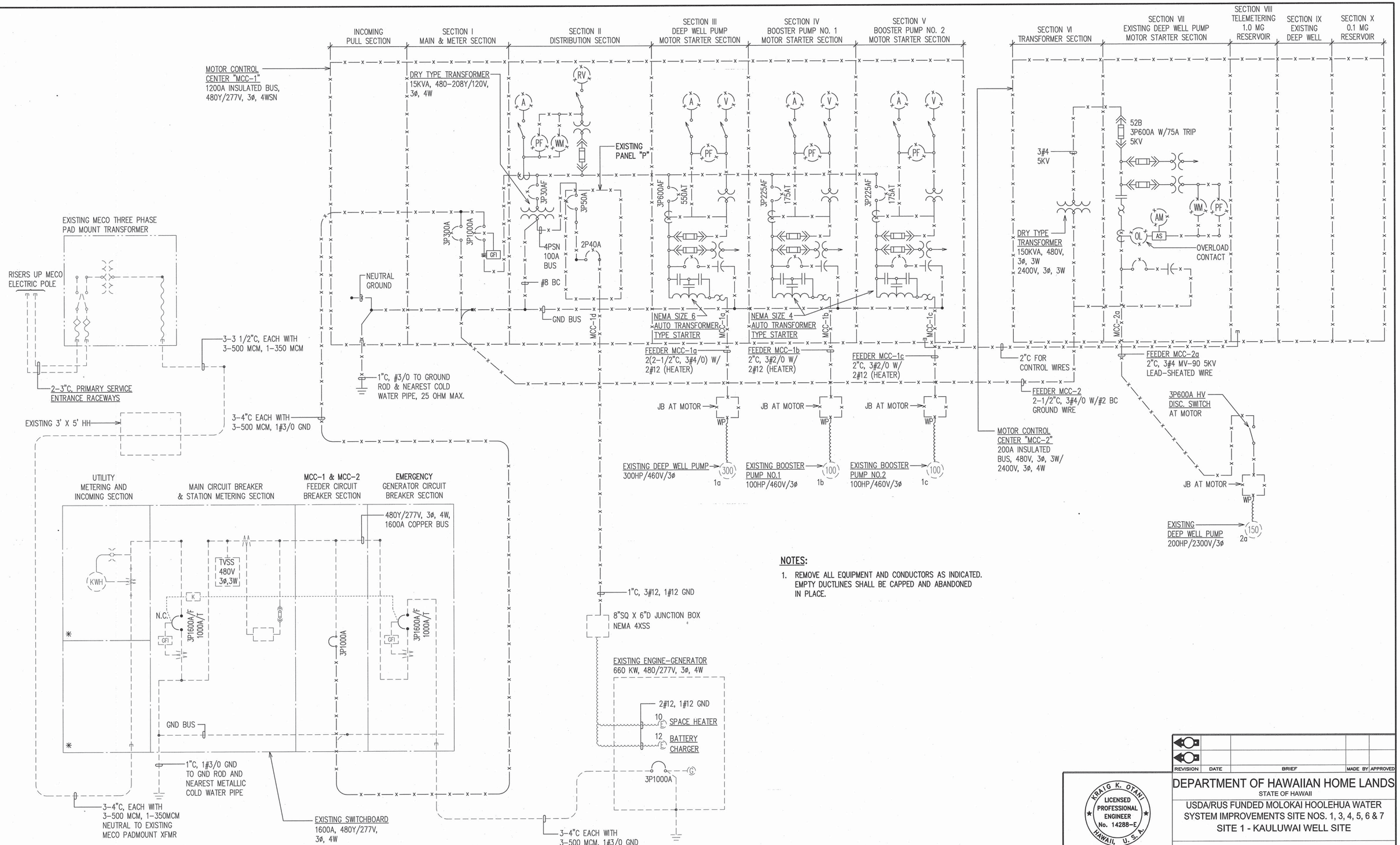
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

DWG. NO. E-105



NOTES:

1. REMOVE ALL EQUIPMENT AND CONDUCTORS AS INDICATED. EMPTY DUCTLINES SHALL BE CAPPED AND ABANDONED IN PLACE.

1 E-009 ONE LINE DIAGRAM-DEMO N.T.S.

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

ONE-LINE DIAGRAM-DEMO

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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DWG. NO. E-106
SHEET 132 OF 149

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Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

LAST SENT
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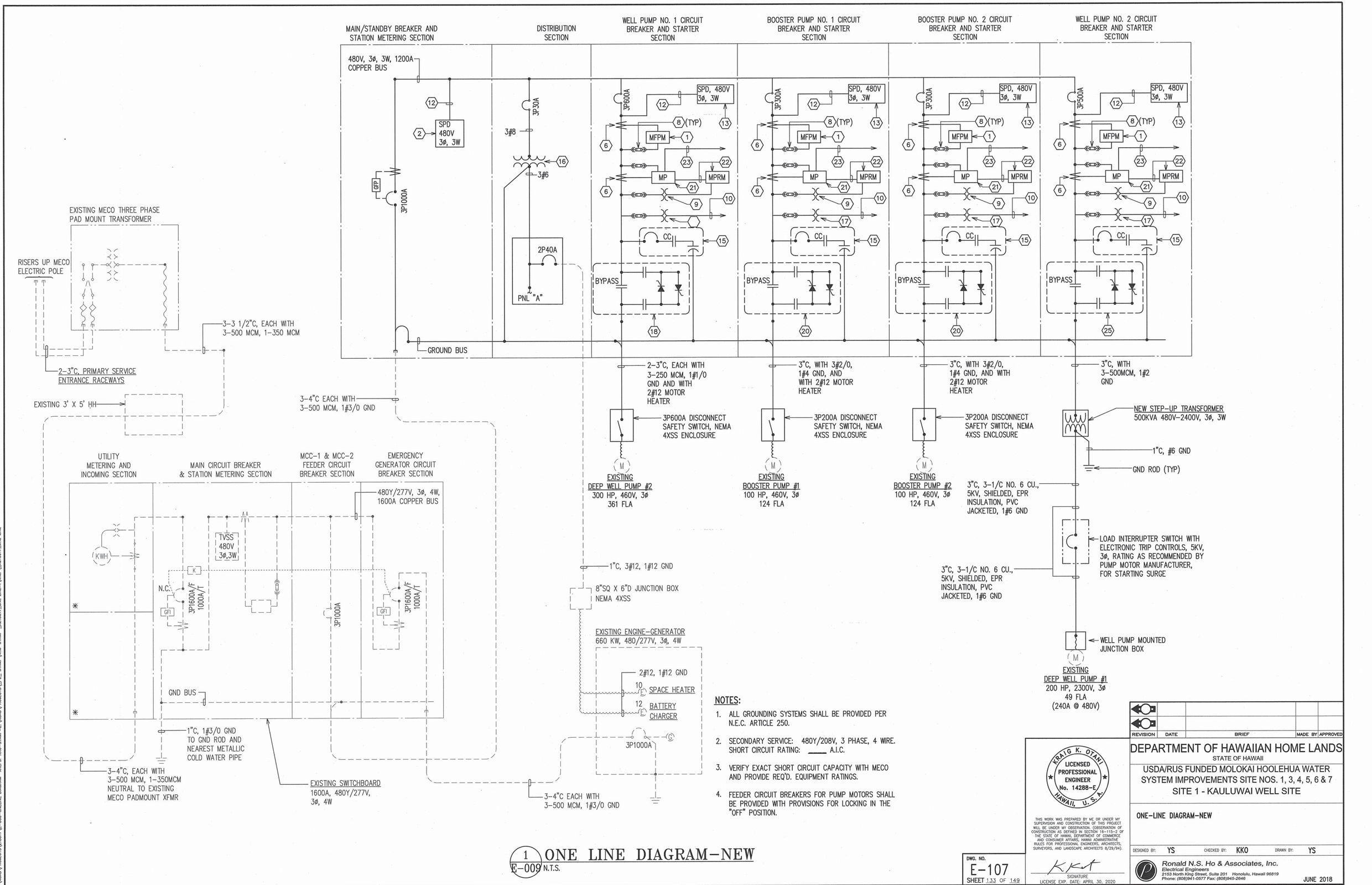

NOTES:

1. ALL GROUNDING SYSTEMS SHALL BE PROVIDED PER N.E.C. ARTICLE 250.
2. SECONDARY SERVICE: 480Y/208V, 3 PHASE, 4 WIRE. SHORT CIRCUIT RATING: ____ A.I.C.
3. VERIFY EXACT SHORT CIRCUIT CAPACITY WITH MECO AND PROVIDE REQ'D. EQUIPMENT RATINGS.
4. FEEDER CIRCUIT BREAKERS FOR PUMP MOTORS SHALL BE PROVIDED WITH PROVISIONS FOR LOCKING IN THE "OFF" POSITION.

1 E-009 **ONE LINE DIAGRAM-NEW** N.T.S.

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7

SITE 1 - KAULUWAI WELL SITE

ONE-LINE DIAGRAM-NEW

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. E-107
SHEET 133 OF 149

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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Electrical Engineers
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Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

LAST_EDIT
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SCHEDULE OF INSTRUMENTS

KEY ON PLAN	DESCRIPTION
1	THREE PHASE DIGITAL MULTIFUNCTION POWER MONITOR
2	MAIN ELECTRICAL SERVICE SURGE PROTECTION DEVICE, 480V, 3ø, 3W (SEE SPECS)
3	
4	TERMINAL CABINET FOR FUTURE GENERATOR CABLE CONNECTION
5	
6	CURRENT TRANSFORMER, 600V, 600:5
7	
8	FUSE HOLDER WITH FUSE, 600V, SIZE BY MANUFACTURER
9	CONTROL TRANSFORMER, 600V FOR 208–120V, KVA AS REQ'D
10	TO CONTROL CIRCUIT
11	
12	3#14, FURNISHED AS PART OF SURGE PROTECTON DEVICE AS SHORT AS POSSIBLE (MAX. LENGTH 30")
13	BRANCH FEEDER SURGE PROTECTION DEVICE, 480V, 3ø, 3W (SEE SPECS)
14	
15	CAPACITOR AND CAPACITOR BREAKER PER PUMP MOTOR MANUFACTURER'S RECOMMENDATIONS, INCLUDING ISOLATION CONTACTOR (CC) TO REMOVE CAPACITORS FROM SYSTEM
16	DRY–TYPE TRANSFORMER, 15 KVA, 480–208Y/120V, 3 PHASE, 4 WIRE, 80°C RISE.
17	CONTROL TRANSFORMER, 600V FOR 480–120V, 2–1KVA
18	300 HP MOTOR STARTER, SOLID–STATE TYPE WITH BYPASS CONTACTOR, AND SCR ISOLATION CONTACTORS WITH SOLID STATE OVERLOAD HEATERS SELECTED TO MATCH MOTOR NAMEPLATE RATING AT 480V, 3 PHASE
19	P.T.'S BY MECO, OBTAIN REQUIREMENTS & APPROVAL FROM MECO
20	100 HP MOTOR STARTER, SOLID–STATE TYPE WITH BYPASS CONTACTOR, AND SCR ISOLATION CONTACTORS WITH SOLID STATE OVERLOAD HEATERS SELECTED TO MATCH MOTOR NAMEPLATE RATING AT 480V, 3 PHASE
21	THREE PHASE MOTOR PROTECTOR, SYMCOM, INC. MOTOR SAVER MODEL 777KW SERIES WITH MODBUS INTERFACE
22	THREE PHASE MOTOR PROTECTOR REMOTE MANAGER, SYMCOM, INC. MODEL RM–2000 SERIES, WITH REQUIRED RS485MS–2W SERIAL INTERFACE FOR CONNECTING TO MODEL 777KW MOTOR PROTECTOR
23	TYPE RS485 NETWORK CABLE FOR INPUT INTO SCADA SYSTEM
24	C.T.'S BY MECO, OBTAIN REQUIREMENTS & APPROVAL FROM MECO
25	200 HP MOTOR STARTER, SOLID–STATE TYPE WITH BYPASS CONTACTOR, AND SCR ISOLATION CONTACTORS WITH SOLID STATE OVERLOAD HEATERS SELECTED TO MATCH MOTOR NAMEPLATE RATING AT 480V, 3 PHASE

1 ONE LINE DIAGRAM SCHEDULE
E–108 N.T.S.

REVISION	DATE	BRIEF	MADE BY	APPROVED

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. E–108
SHEET 134 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

ONE LINE DIAGRAM SCHEDULE

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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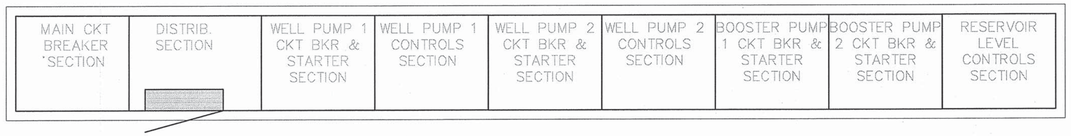
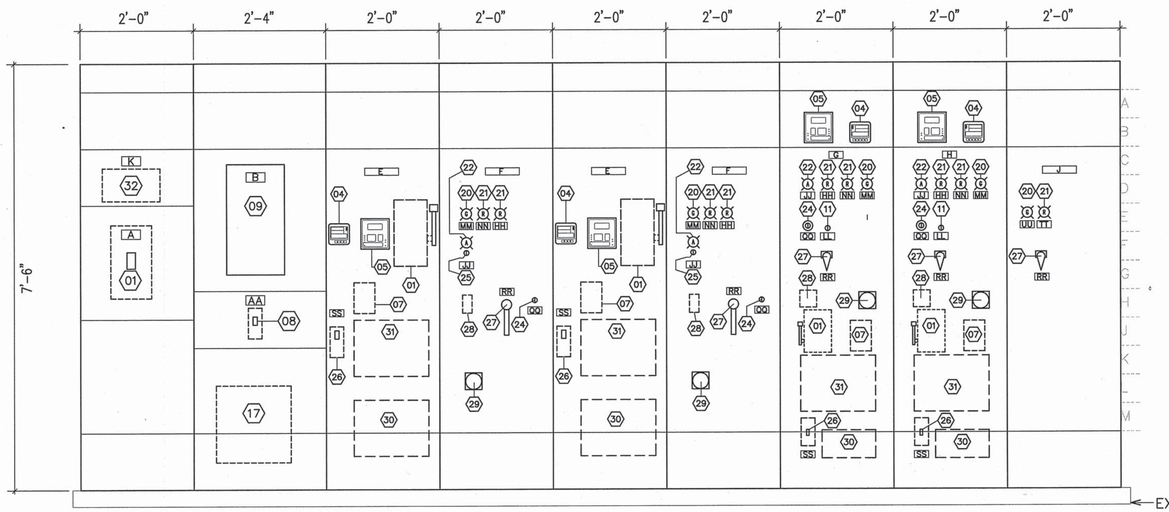


PLAN



EXISTING 3 1/2" HIGH CONCRETE PAD, WITH 2" CLEAR AROUND EQUIPMENT

ELEVATION

MCC NOTES:

1. MOTOR CONTROLLERS SHALL HAVE PROVISIONS FOR LOCKING IN THE "OFF" POSITION.
2. ALL SWITCHES MOUNTED ON FRONT PANEL OF MCC SHALL BE MOUNTED NO HIGHER THAN 70" ABOVE FINISH FLOOR. THE EMERGENCY STOP PUSHBUTTON SWITCH SHALL BE MOUNTED NO HIGHER THAN 60" ABOVE FINISH FLOOR.
3. MCC SHALL BE PROVIDED WITH REQUIRED SPACE HEATERS, AND WIRED TO CIRCUIT A-9.
4. MCC SHALL BE BOLTED TO CONCRETE PAD AS APPROPRIATE.
5. ENTIRE MOTOR CONTROL CENTER SHALL BE CONSTRUCTED ACCORDING TO UL 845. ENCLOSURE SHALL BE RATED NEMA 3R 316SS.

1 MOTOR CONTROL CENTER DETAILS
E-109 NOT TO SCALE

MCC COMPONENTS

ITEM	DESCRIPTION
01	CIRCUIT BREAKER (480V)
02	
03	NIGHT LIGHT TIME SWITCH
04	DIGITAL MULTI-FUNCTION POWER MONITOR
05	MOTOR PROTECTOR REMOTE MANAGER
06	
07	BRANCH FEEDER SPD (480V)
08	TRANSFORMER CIRCUIT BREAKER
09	PANEL "A"
10	
11	TROUBLE RESET PUSHBUTTON
12	
13	
14	BLUE LED LIGHT
15	AUTO-DIALER
16	
17	DRY TYPE TRANSFORMER
18	
19	
20	GREEN LED LIGHT
21	RED LED LIGHT
22	AMBER LED LIGHT
23	
24	EMERGENCY STOP PUSHBUTTON
25	
26	CAPACITOR CIRCUIT BREAKER
27	SELECTOR SW. (HAND-OFF-REMOTE) PISTOL
	GRIP
28	TEST/NORMAL SWITCH
29	RUNNING TIME METER
30	CAPACITOR
31	SOLID STATE SOFT STARTER
32	MAIN SERVICE SPD (480V)
33	
34	
35	
36	

MCC NAMEPLATES

ITEM	DESCRIPTION
A	MAIN CIRCUIT BREAKER
B	PANEL "A"
C	WELL PUMP NO. 1 STARTER
D	WELL PUMP NO. 1 CONTROLS
E	WELL PUMP NO. 2 STARTER
F	WELL PUMP NO. 2 CONTROLS
G	BOOSTER PUMP NO. 1 STARTER AND CONTROLS
H	BOOSTER PUMP NO. 2 STARTER AND CONTROLS
J	RESERVOIR LEVEL VALVE CONTROLS
K	SURGE PROTECTIVE DEVICE
L	
M	
N	
P	
Q	
R	
S	
T	
U	
V	
W	
X	
Y	
Z	

ABOVE NAMEPLATES TO BE 9" x 2 1/4" x 1/8" DILECTO WITH 5/8" WHITE LETTERING & BEVELED EDGES

MCC NAMEPLATES

ITEM	DESCRIPTION
AA	TRANSFORMER CIRCUIT BREAKER
BB	
CC	
DD	
EE	
FF	
GG	
HH	MAIN LINE FLOW
JJ	ALARM-NO FLOW
KK	ON FLOAT CONTROL
LL	TROUBLE RESET
MM	MOTOR STOPPED
NN	MOTOR RUNNING
PP	HIGH DISCHARGE PRESSURE
QQ	EMERGENCY STOP & RESET
RR	HAND-OFF-AUTO
SS	CAPACITOR CIRCUIT BREAKER
TT	RESERVOIR LEVEL VALVE OPEN
UU	RESERVOIR LEVEL VALVE CLOSE

ABOVE NAMEPLATES TO BE 4" x 2" x 1/8" DILECTO WITH 1/4" WHITE LETTERING & BEVELED EDGES

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION, (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. E-109
SHEET 135 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

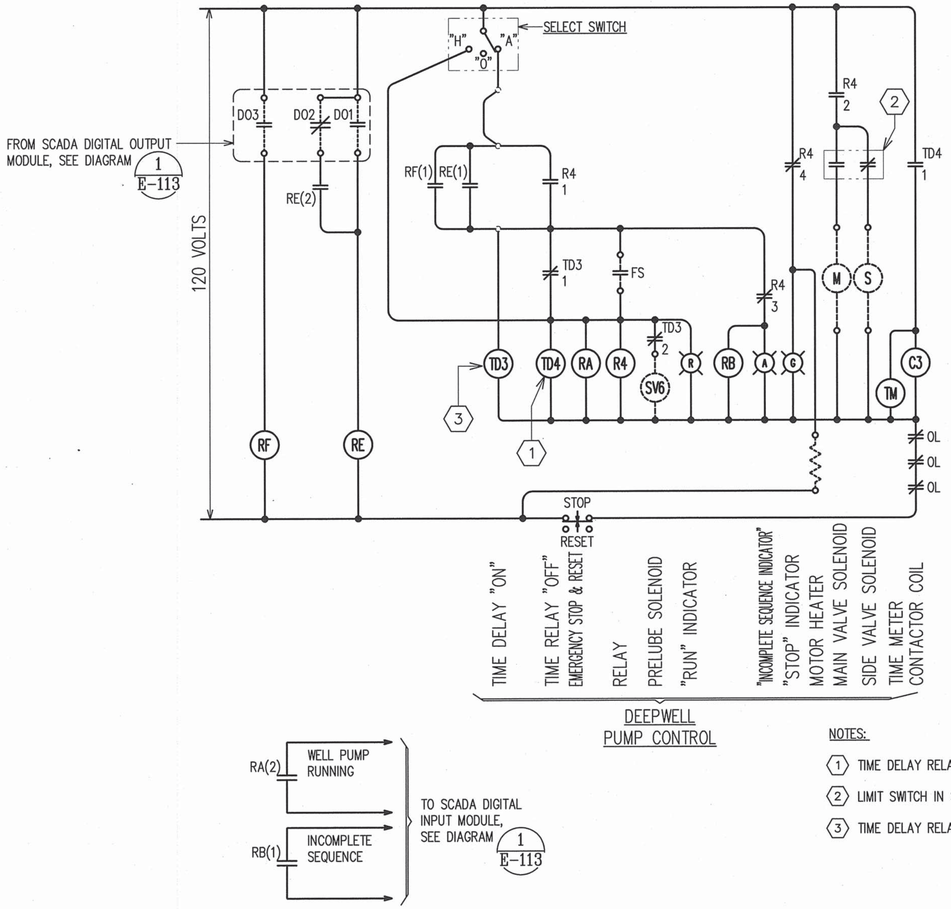
MOTOR CONTROL CENTER DETAILS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

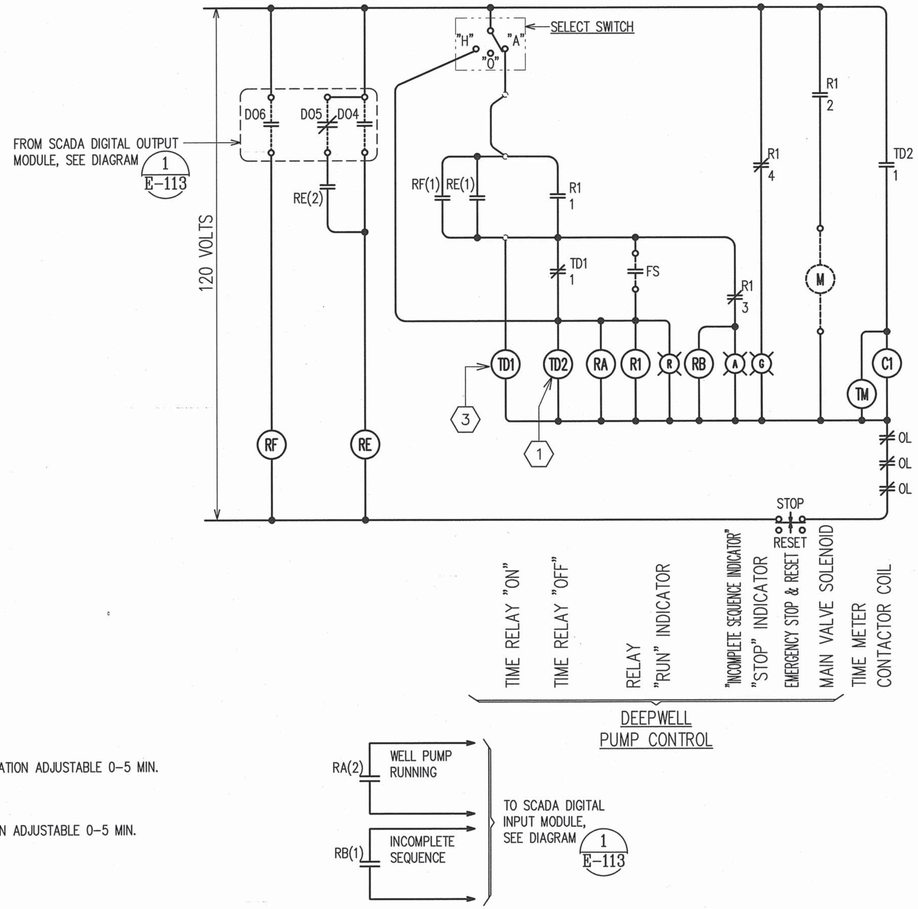
LAST EDIT
Z:\JOAT\PROJECTS\218017\E01-MCC DETAILS XREFS: _X218017-MCC ELEVATIONS=_X\REF_X218017-MCC ELEVATIONS KKO-STAMP=_PE_ STAMP\KKO-STAMP



NOTES:

1. TIME DELAY RELAY ON DE-ENERGIZATION ADJUSTABLE 0-5 MIN.
2. LIMIT SWITCH IN SIDE VALVE.
3. TIME DELAY RELAY ON ENERGIZATION ADJUSTABLE 0-5 MIN.

1 E-110 SITE NO. 1 WELL PUMP NO. 1 CONTROLS



2 E-110 SITE NO. 1 WELL PUMP NO. 2 CONTROLS

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. E-110
SHEET 136 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

SITE NO. 1 WELL PUMP CONTROL DIAGRAMS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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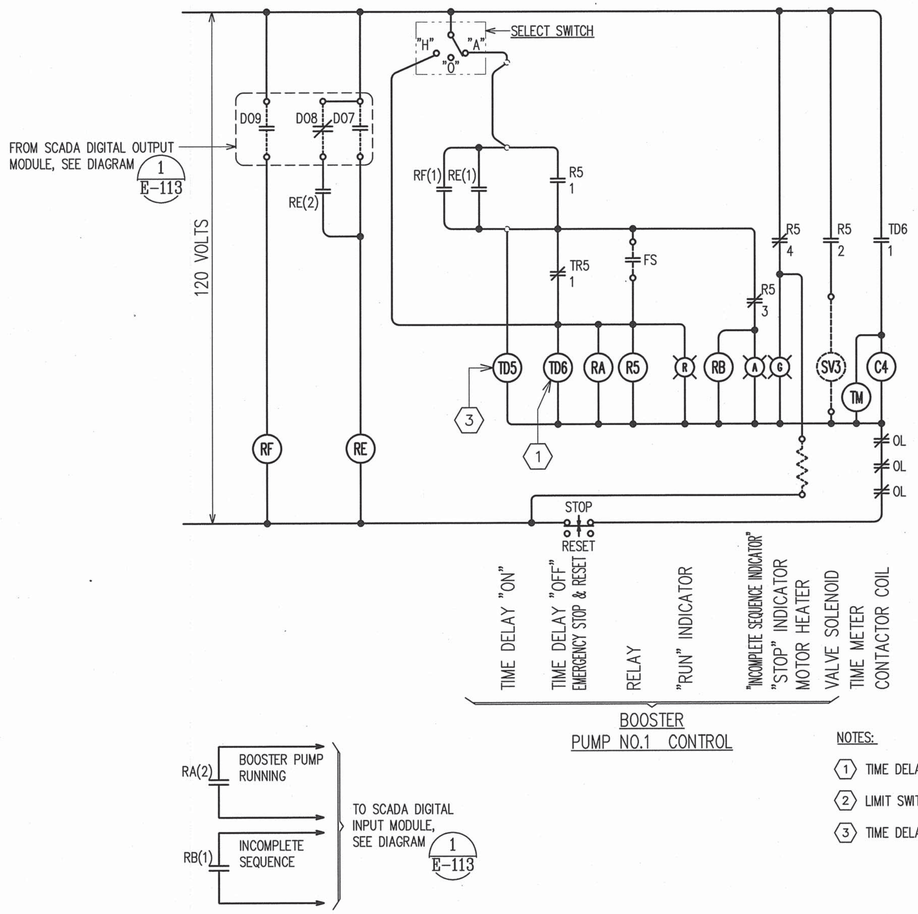
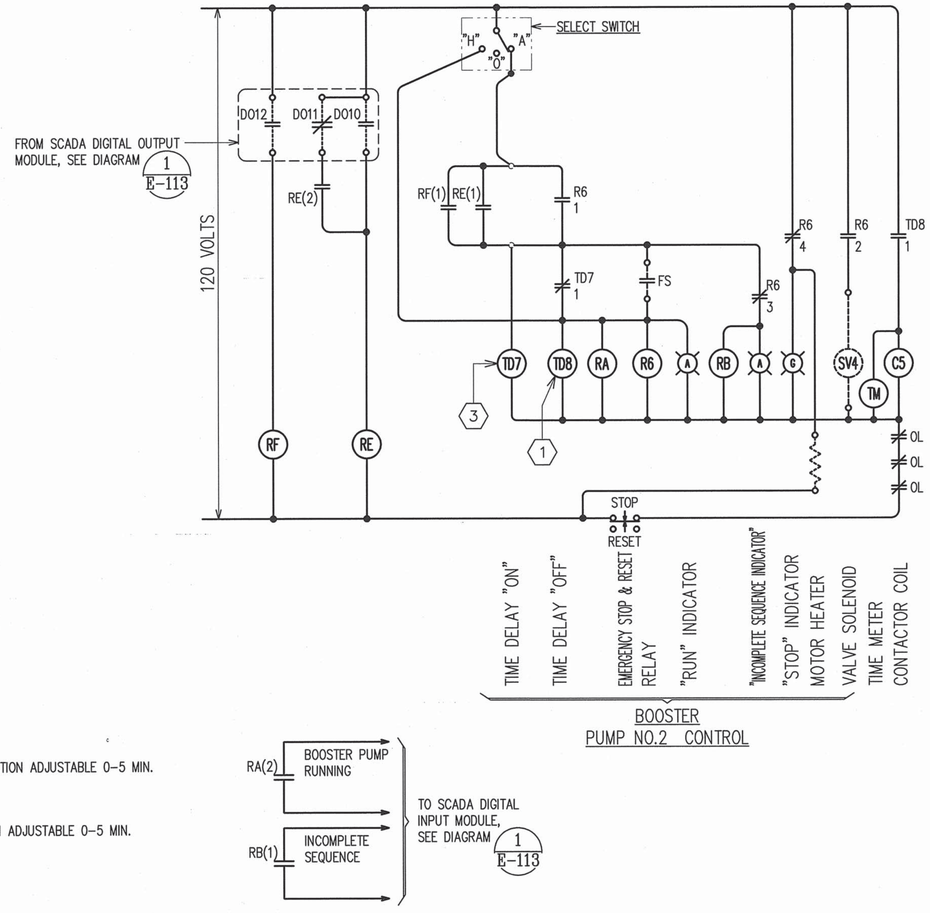
JUNE 2018



NOTES:

1. TIME DELAY RELAY ON DE-ENERGIZATION ADJUSTABLE 0-5 MIN.
2. LIMIT SWITCH IN SIDE VALVE.
3. TIME DELAY RELAY ON ENERGIZATION ADJUSTABLE 0-5 MIN.

1 E-111 SITE NO. 1 BOOSTER PUMP NO. 1 CONTROLS



2 E-111 SITE NO. 1 BOOSTER PUMP NO. 2 CONTROLS

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

SITE NO. 1 BOOSTER PUMP CONTROL DIAGRAMS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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SHEET 137 OF 149

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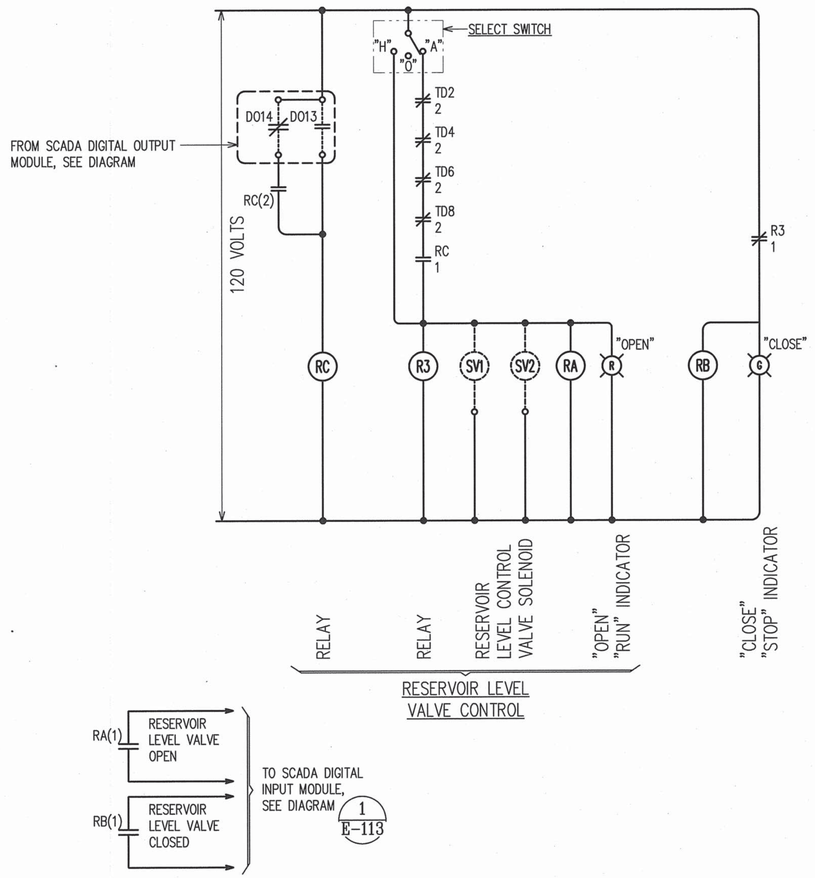

1 / E-112 SITE NO. 1 RESERVOIR LEVEL VALVE CONTROLS

REVISION	DATE	BRIEF	MADE BY	APPROVED

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

SITE NO. 1 RESERVOIR LEVEL VALVE CONTROLS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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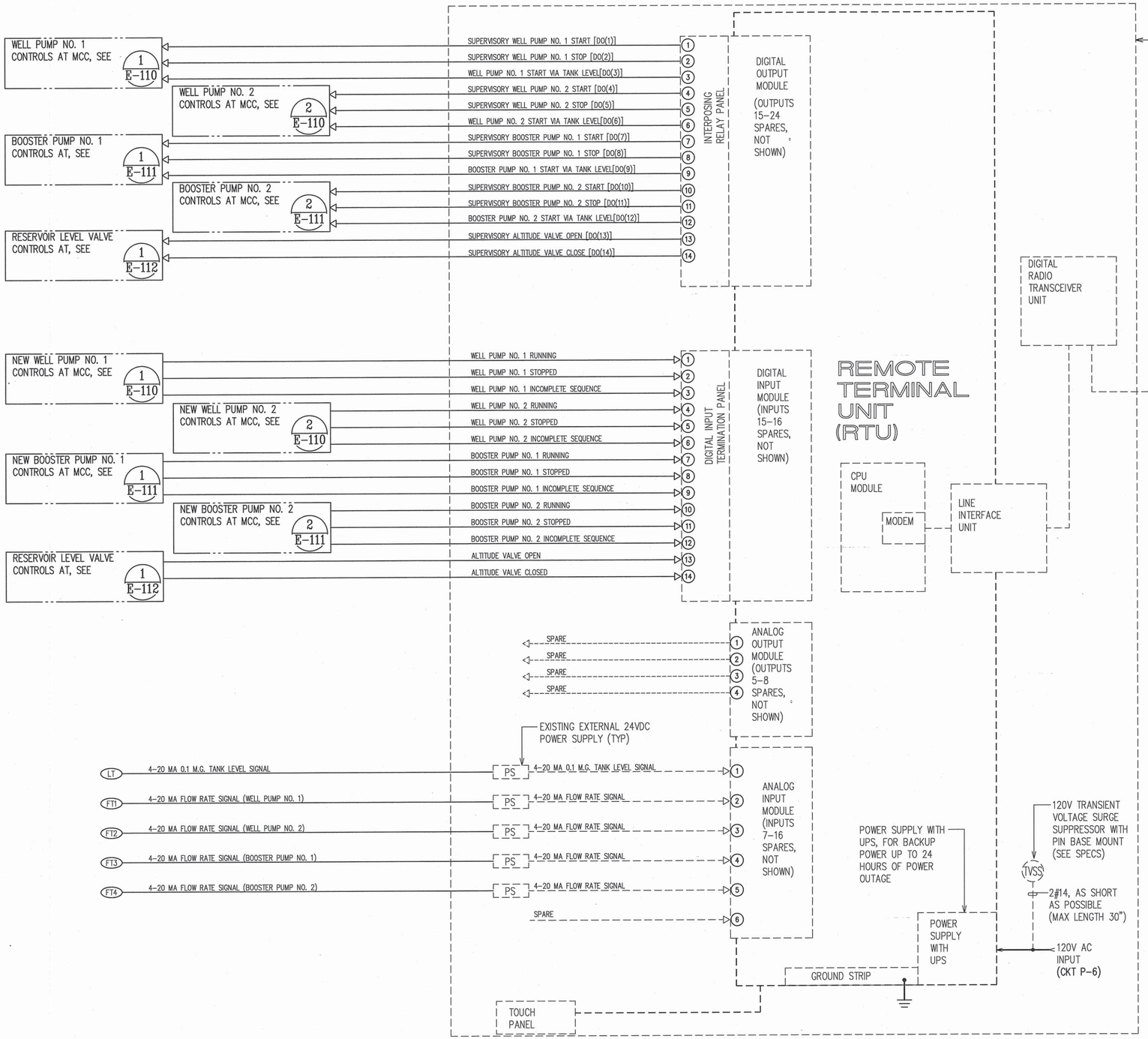
JUNE 2018

DWG. NO. E-112
SHEET 138 OF 149



1 / E-113 MOLOKAI WATER SYSTEM SITE NO. 1 SCADA DIAGRAM WITH MODIFICATIONS

REQUIRED MINIMUM SCADA INPUT POINTS AND MINIMUM PROVISIONS FOR ITEMS TO BE DISPLAYED / CONTROLLED ON TOUCH PANEL:

1. ENTIRE SITE OVERVIEW SCREEN.
2. WELL SITE SCREEN TO INCLUDE:
   a. WELL PUMPS MOTOR STATUS
   b. BOOSTER PUMPS MOTOR STATUS
   c. WELL PUMP FLOW
   d. BOOSTER PUMP FLOW
   e. 0.1 MG TANK LEVEL
   f. 1.0 MG TANK LEVEL
3. ONE ALARM SCREEN TO INCLUDE A SUMMARY OF ALARMS AND A PAST HISTORY OF ALARMS.
4. SECURITY SCREEN THAT ALLOW ACCESS TO CONTROL SCREENS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 1 - KAULUWAI WELL SITE

SITE NO. 1 SCADA DIAGRAM

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

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JUNE 2018

DWG. NO. E-113
SHEET 139 OF 149

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GENERAL NOTES:

1. PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. CONTRACTOR SHALL VISIT JOBSITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF DEMOLITION AND NEW WORK PRIOR TO THE START OF CONSTRUCTION.
2. PRIOR TO THE START OF CONSTRUCTION, CONTRACTOR SHALL VISIT JOBSITE AND REPORT ANY DISCREPANCIES AND/OR DIFFERENCE IN DRAWINGS, WITH RESPECT TO EXISTING CONDITIONS, TO THE ENGINEER.
3. CONTRACTOR SHALL RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY CONTRACTOR'S FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.
5. BEFORE ANY ELECTRICAL WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT REQUIRED SERVICES ARE NOT DISCONTINUED.
6. REMOVE ALL EXISTING EXPOSED CONDUIT AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CUT, CAPPED AND ABANDONED IN PLACE WITH ALL WIRES REMOVED.
7. PROVIDE METAL SEALS FOR ALL ABANDONED RACEWAY OPENINGS IN BOXES, CABINETS, AND EQUIPMENT ENCLOSURES; SEALS SHALL RETAIN NEMA RATING OF REMAINING BOXES, CABINETS, AND EQUIPMENT ENCLOSURES.
8. RETURN ALL SALVAGEABLE APPARATUS, AS DETERMINED BY DHHL OR ITS REPRESENTATIVES, TO A SITE DESIGNATED BY DHHL OR ITS REPRESENTATIVES, AT NO ADDITIONAL COST TO DHHL. DISPOSE OF ALL UNWANTED MATERIALS.
9. PRIOR TO PENETRATING OR DISTURBING ANY SURFACES IDENTIFIED AS CONTAINING HAZARDOUS MATERIALS, HAVE SURFACE/MATERIAL ABATED OR TREATED SO AS NOT TO CONTAMINATE SPACE OR AREA. REFER TO HAZARDOUS MATERIAL HANDLING REQUIREMENTS.

GENERAL CONSTRUCTION NOTES:

1. CONTRACTOR SHALL COORDINATE ALL WORK WITH THE HAWAIIAN ELECTRIC COMPANY AND HAWAIIAN TELCOM.
2. PROVIDE POLYOLEFIN 200LB TEST PULLCORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.
3. ALL ELECTRICAL EQUIPMENT ENCLOSURES AND EQUIPMENT MOUNTING HARDWARE AND FASTENERS FOR OUTDOOR INSTALLATION SHALL BE TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	LED LIGHT, PENDANT MTD.
	LED LIGHT, CEIL. MTD.
	LED LIGHT, WALL MTD.
A-2/32	LIGHT FIXTURE DESIGNATOR, INDICATES TYPE "A" WITH 2-32 WATT LAMPS
$a	LT. SW., 1P, CONTROLLING OUTLET(S) "a", MTD. +48"
	DUPLEX RECEPTACLE, NEMA 5-15R, 120V, MTD. +18" OR AS NOTED
	SINGLE RECEPTACLE, NEMA 5-20R, 120V, MTD. +18" OR AS NOTED
	DUPLEX RECEPTACLE, WITH GROUND FAULT CIRCUIT INTERRUPTER, NEMA 5-20R, 120V, MTD. +18" OR AS NOTED
	ELECTRICAL PANELBOARD
J	JUNCTION BOX, CEIL. MTD., 4-11/16" NOM.
J	JUNCTION BOX, WALL MTD., 4-11/16" NOM.
M	MOTOR CONNECTION
E	EQUIPMENT CONNECTION
$	ELECTRICAL EQUIPMENT DISCONNECT SWITCH, 1 OR 2 POLE
	DISCONNECT SWITCH, HP RATED
WP	DENOTES "WEATHERPROOF"
SS	DENOTES "TYPE 316 STAINLESS STEEL"

SYMBOL	DESCRIPTION
	FLEXIBLE CONDUIT, LIQUIDTIGHT
	CONDUIT OR DUCTLINE BELOW REF. FL. OR GROUND
	EXPOSED CONDUIT
	EXISTING DUCTLINE
A S (1-4E, 1-1C)	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE, WITH DUCT COMPLEMENTS NOTED BELOW (TYPE "A" DUCT INDICATED WITH 1-4"E DUCT, AND TYPE "S" DUCT WITH 1-1"C DUCT; E=ELECTRIC, T=TELEPHONE, C=CONTROLS, I=INSTRUMENTATION); SEE SHEET E-004 FOR DUCT SECTION DETAILS
e-oh	EXISTING OVERHEAD UTILITY LINES
	2' X 4' HAWAIIAN TELCOM PULLBOX PER HAWAIIAN TELCOM REQUIREMENTS AND APPROVAL
	3' X 5' ELECTRIC PULLBOX SIMILAR TO MECO STANDARD PULLBOX REQUIREMENTS
	EXISTING PULLBOX OR HANDHOLE, SEE PLANS FOR DESIGNATION

NOTE:

PROVIDE GREEN GROUND CONDUCTOR IN ALL NEW BRANCH AND FEEDER CIRCUITS INCLUDING LIGHT SWITCHING LEGS, SIZED PER NEC TABLE 250.122. ALL CONDUCTORS #12 AWG MINIMUM.

COUNTY OF MAUI

TO THE BEST OF MY KNOWLEDGE, THIS PROJECT'S DESIGN SUBSTANTIALLY CONFORMS TO THE BUILDING ENERGY CONSERVATION CODE FOR:

____ BUILDING COMPONENT SYSTEMS
X ELECTRICAL COMPONENT SYSTEMS
____ MECHANICAL COMPONENT SYSTEMS

SIGNATURE: KKO DATE: 6/1/18
NAME: Kraig K. Otani
TITLE: PROJECT MANAGER
LICENSE NO.: 14288-E

BUILDING ENERGY CONSERVATION CODE

EXTERIOR LIGHTING POWER ALLOWANCE 1760W INSTALLED 110W
INTERIOR LIGHTING POWER ALLOWANCE 4464W INSTALLED 2866W
CALCULATIONS: SEPARATE X ON DRAWINGS ____
(CHECK ONE)

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

GENERAL NOTES AND ELECTRICAL SYMBOLS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

DWG. NO. E-001
SHEET 140 OF 149

LAST EDIT:
Z:\ACAD\PROJECTS\21801\YE-401-GEN NOTES AND ELEC SYM XREFS: _X21801-SYMBOLS=;\XREF_X21801-SYMBOLS KKO-STAMP=Z:\ACAD\PROJECTS_FE_ STAMP\KKO-STAMP

SANDWICH ISLES COMMUNICATIONS' CONSTRUCTION NOTES
DECEMBER 9, 2016

GENERAL:

ALL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) AND SANDWICH ISLES COMMUNICATIONS (SIC), WHICH COMPLIES WITH ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL REQUIREMENTS.

ALL MATERIALS USED MUST BE APPROVED AND (OR) ACCEPTED BY SANDWICH ISLES COMMUNICATIONS, INC..

CONTRACTOR MAY REFER TO THE RUS WEBSITE (HTTP://WWW.RURDEV.USDA.GOV/RUSTELECOMPROGRAMS.HTML) FOR REGULATIONS, BULLETINS, FORMS, ETC.

CONTACT THE HAWAII ONE CALL CENTER AT (866) 423-7287 FOR LOCATING EXISTING UNDERGROUND FACILITIES PRIOR TO BEGINNING ANY EXCAVATION.

THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY FOR PROSECUTION OF THE WORK.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WORK SCHEDULES WITH ALL UTILITY COMPANIES, COUNTY, OR STATE AGENCIES REQUIRED FOR THIS PROJECT. THIS IS TO INCLUDE COORDINATION OF ANY INSPECTION AND SPECIFICATIONS BY THOSE UTILITY COMPANIES, COUNTY, OR STATE AGENCIES.

THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS RELATING TO THIS PROJECT BEFORE COMMENCING THE REQUIRED WORK.

THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES AND/OR CONDITIONS WHICH WOULD PREVENT HIM FROM FULFILLING THE TERMS OF THIS CONTRACT.

ALL SIC PULLBOXES THAT THE CONTRACTOR ENTERS FOR INSTALLATION OF FACILITIES MUST BE CLEARED OF STANDING WATER AND DEBRIS. CONTRACTOR SHALL ORGANIZE EXISTING CABLE FACILITIES, TO INCLUDE ADDING CABLE RACKS AND TYING DOWN EXISTING CABLE, IN ORDER TO ACCOMMODATE NEW FACILITIES BEING PLACED. CLEANING AND ORGANIZING OF PULLBOXES SHALL BE DONE TO THE SATISFACTION OF THE PROJECT MANAGER.

THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE OWNER AT COMPLETION OF THE PROJECT. AS-BUILT DRAWINGS REFER TO DOCUMENTS MAINTAINED AND ANNOTATED BY THE CONTRACTOR DURING CONSTRUCTION AND INCLUDE ANY CHANGES OR NEW INFORMATION FOUND OR ADDED THROUGHOUT CONSTRUCTION OF THE PROJECT.

CONDUITS:

1. ALL UNDERGROUND PVC CONDUITS, SWEEPS, COUPLINGS, ADAPTERS AND BELL ENDS SHALL BE SCHEDULE 40, UNLESS OTHERWISE SPECIFIED.

2. ALL HIGH DENSITY POLYETHYLENE CONDUITS SHALL BE SDR 11. TYPICAL 3-PACK UNIT INCLUDES THREE 1.5-INCH SDR 11 RATED CONDUITS IN THE COLORS OF BLACK, RED, AND ORANGE, UNLESS OTHERWISE SPECIFIED. ALL CONDUITS TO BE PRESSURE TESTED AT 120 PSI. FUSION SPLICING OF THE CONDUIT SHALL BE ACCEPTABLE ONLY WHEN PULLING JOINTS THROUGH BORES. ALL COUPLINGS SHALL BE DOUBLE "E-LOC" MANUFACTURED BY ETOC SPECIALTY PRODUCTS, INC.

3. MAIN CONDUIT RUNS, EXCEPT RISER CONDUITS, SHALL BE CONSTRUCTED WITH MINIMUM 6-FOOT RADIUS CURVES, UNLESS OTHERWISE APPROVED BY THE PROJECT MANAGER.

4. AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID MANDREL NOT LESS THAN 12-INCHES IN LENGTH AND HAVING A DIAMETER OF 1/4-INCH LESS THAN THE INSIDE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT. THE SIC PROJECT MANAGER SHALL BE PRESENT DURING ALL MANDREL TESTING. SUFFIXES LISTED IN RUS 515B FOR CONDUITS ARE APPLICABLE.

5. INSTALL MULETAPE IN ALL PVC CONDUITS TWO (2) INCH DIAMETER AND LARGER. THE NEPTCO MULETAPE (OR APPROVED EQUAL) IS AVAILABLE IN 3,000FT., 6,500FT., AND 10,000FT. REELS FROM WESTINGHOUSE ELECTRIC SUPPLY COMPANY (WESCO), THE NEPTCO MULETAPE IS PRE-LUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS. PVC CONDUITS WITH A DIAMETER OF 1.5-INCH OR LESS SHALL HAVE A POLY-LINE (P-LINE) INSTALLED. ALL DUCTS SHALL BE SEALED AFTER MULETAPE/P-LINE HAS BEEN INSTALLED, FOLLOWING THE SPECIFICATIONS BELOW.

6. ALL CONDUITS AND DUCTS SHALL BE PROPERLY SEALED USING COMMSCOPE, JACKMOON DUCT SEALS, APPLICABLE BUSHING SLEEVES AND BLANK DUCT PLUGS. THE CONDUIT DIAMETER, INSIDE DIAMETER AND CABLE SIZE(S) SHALL BE TAKEN INTO CONSIDERATION WHEN ORDERING AND INSTALLING "JACKMOON" DUCT SEALS.

   COMMSCOPE JACKMOON SEALS SHALL BE:

2-INCH CONDUIT:	TRIPLEX DUCT SEALS, SERIES 70
3-INCH CONDUIT:	TRIPLEX DUCT SEALS, SERIES 136
3.5-INCH AND LARGER CONDUIT:	QUADPLEX DUCT SEALS, SERIES 136

   ALL OTHER DUCTS SHALL HAVE COMMSCOPE, BLANK JACKMOON PLUGS TO KEEP THEM FREE OF WATER AND DEBRIS.

7. CONDUIT STUBS FROM HANDHOLES TO INDIVIDUAL RESIDENTIAL LOTS SHALL BE SCHEDULE 40 PVC, 1-INCH DIAMETER AND EXTENDED 5-FEET BEYOND PROPERTY LINE. CAP AND SEAL END AND MARK LOCATIONS WITH ABOVE GROUND MARKER.

8. ALL CONDUITS SHALL ENTER MANHOLES AT A 90 DEGREE ANGLE AND SHALL EXTEND INTO THE MANHOLE AS FOLLOWS: CONDUITS DESIGNATED FOR FIBER SHALL EXTEND 12-INCHES INTO THE MANHOLE. ALL OTHER CONDUITS SHALL BE FLUSH WITH THE INSIDE WALL AND INCLUDE BELL ENDS. ANY EXCEPTIONS SHALL ONLY BE PERMITTED WHEN SPECIFIED BY THE PROJECT MANAGER.

9. ALL CONDUITS ENTERING MANHOLES OR HANDHOLES SHALL BE GROUTED BETWEEN THE CONDUITS AND SIDEWALL, INSIDE AND OUT. ALL CONDUITS WILL ENTER THE MANHOLES AND HANDHOLES ON THE PROPERTY SIDE AT ALL TIMES UNLESS OTHERWISE SPECIFIED BY THE PROJECT MANAGER.

10. BACKFILL AND COMPACTION FOR DUCTLINE TRENCHES, MANHOLES AND HANDHOLES, SHALL BE IN ACCORDANCE WITH:

   A. STATE HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION WITH LATEST AMENDMENTS, IF CONSTRUCTION IS LOCATED UNDER A STATE STREET OR ROAD, OR LOCATED IN PRIVATE PROPERTY.

   B. THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 1994, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, WITH LATEST AMENDMENTS; COUNTY OF KAUAI, MAUI, OR HAWAII, AS THE CASE MAY BE, IF CONSTRUCTION IS LOCATED UNDER COUNTY STREETS AND ROADS.

11. BACKFILLING SHALL BE SUBJECT TO THE APPROVAL OF THE SIC PROJECT MANAGER, THE AUTHORIZED REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII AND/OR DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, COUNTY OF KAUAI, MAUI OR HAWAII, AS THE CASE MAY BE.

12. A THIRD PARTY GEOTECHNICAL ENGINEER, LICENSED AND INSURED IN THE STATE OF HAWAII, MUST CERTIFY THAT THE EXCAVATED AREA MEETS THE GOVERNING AGENCIES AND/OR OWNERS STANDARDS FOR BACKFILL AND COMPACTION.

13. EXCAVATED MATERIAL MAY BE REUSED AS BACKFILL, PROVIDING THAT IT CONFORMS TO REQUIREMENTS OF TYPE "A" AND TYPE "B" BACKFILL, AS REQUIRED WITHIN THE STANDARD SPECIFICATIONS. A WRITTEN SOILS REPORT OF CONFORMANCE BY A LICENSED THIRD PARTY GEOTECHNICAL ENGINEER IS NEEDED PRIOR TO BACKFILL USING THE EXCAVATED MATERIAL.

   A. TYPE A BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

   B. TYPE B BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1/2-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

14. ALL CONDUIT RUNS SHALL HAVE A 3-INCH NON-METALLIC WARNING TAPE PLACED 12-INCHES ABOVE THE CONDUIT RUN. THE TAPE SHALL READ "CAUTION BURIED FIBER OPTIC CABLE BELOW".

MANHOLES AND HANDHOLES:

1. ALL MANHOLES SHALL HAVE HS20-44 TRAFFIC LOADING COVERS (UNLESS OTHERWISE NOTED). HANDHOLES SHALL HAVE 20K TRAFFIC LOAD RATED COVERS.

2. ALL MANHOLE AND HANDHOLE COVERS SHALL HAVE COVER LOGO TO READ "SIC".

3. ALL MANHOLE AND HANDHOLE COVER BOLTS SHALL BE STAINLESS STEEL 3/4-INCH PENTAHEAD, UNLESS OTHERWISE NOTED.

4. ALL MANHOLES AND HANDHOLES ARE SPECIFIED AS FOLLOWS:

   A. UM35 AND UM46 MANHOLE - CONSISTS OF A REINFORCED CONCRETE MANHOLE WITH CAST IRON LID AND RISERS (IF REQUIRED). ALL MANHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

   B. UH35 AND UH46 HANDHOLE - CONSISTS OF A REINFORCED CONCRETE HANDHOLE WITH TRAFFIC RATED HINGED COVERS (UH35) OR SIX TRAFFIC RATED SLIP-NOT COVERS (UH46) AND RISERS (IF REQUIRED). ALL HANDHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

   C. UHC30X48X33 HANDHOLE (PULLBOX) - CONSISTS OF A TWO-TIER ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001430TA-SIC4).

   D. UHC13X24X30 HANDHOLE (PULLBOX) - CONSISTS OF AN ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001946TA-SIC1).

5. ALL MANHOLES AND HANDHOLES TO BE ORDERED WITH ALL HARDWARE, INCLUDING CABLE RACKS, STEPS AND LOCKS.

6. SET MANHOLE OR HANDHOLE ON A LEVEL AREA, IN THE BOTTOM OF THE EXCAVATION, ON A 4-INCH LAYER OF CRUSHED ROCK, FOR DRAINAGE PURPOSES.

7. THE BASE OF ALL MANHOLES AND HANDHOLES WILL BE PLACED LEVEL. SOME MANHOLES HAVE ADJUSTABLE FRAMES. ALL VOIDS CREATED DURING INSTALLATION MUST BE FILLED WITH MORTAR MIX OR CONCRETE. THIS IS ESPECIALLY TRUE FOR MANHOLES AND HANDHOLES SET IN ROADWAYS.

8. BEFORE BACKFILLING AND COMPACTING, MAKE SURE COVERS ARE IN PLACE AND SECURE. LAYER 6-INCHES TO 8-INCHES OF BACKFILL MATERIAL AROUND THE MANHOLE OR HANDHOLE. TAMP EACH INDIVIDUAL LAYER OF BACKFILL MATERIAL. CONTINUE THE LAYERING AND "TAMPING" UNTIL FINAL GRADE IS ACHIEVED.

9. THE TOPS OF ALL MANHOLES AND HANDHOLES SHALL BE FLUSH TO GRADE IN PAVED AREAS OR 1-INCH ABOVE FINISH GRADE IN NON-PAVED AREAS, UNLESS OTHERWISE SPECIFIED BY PROJECT MANAGER.

10. PROVIDE A 5/8-INCH DIAMETER X 8-FOOT COPPER CLAD GROUND ROD AT HANDHOLES AND MANHOLES AS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER.

11. FIELD MODIFICATIONS ARE ACCOMPLISHED BY USING A FINE TOOTHED SAW. RACKS OR OTHER EQUIPMENT MAY BE SECURED TO THE SIDE OF THE VAULT BY USE OF TOGGLE BOLTS, MOLLY BOLTS, ETC. AND MUST BE APPROVED BY THE PROJECT MANAGER.

SIC CONSTRUCTION NOTES
UTILITY POLE INSTALLATION:

1. ALL AERIAL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) BULLETIN 1753F-152.

2. UTILITY POLES SHALL BE PRESERVED UTILIZING THE PENTACHLOROPHENOL (PENTA) TYPE TREATMENT.

3. UTILITY POLES SHALL BE TERMITE PROTECTED UTILIZING TERMIMESH POLESOCK'S OR EQUIVALENT. POLESOCK'S SHALL EXTEND NO MORE THAN EIGHT INCHES ABOVE GROUND AND BE SECURED WITH STAINLESS STRAPPING. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.

4. THE POLE HOLE SHALL BE OF SUFFICIENT DIAMETER TO PERMIT THE POLE TO SETTLE FREELY TO THE BOTTOM OF THE HOLE WITHOUT TRIMMING THE BUTT AND STILL HAVE SUFFICIENT SPACE BETWEEN THE POLE AND THE SIDE OF THE HOLE TO PERMIT PROPER TAMPING OF THE BACKFILL AT EVERY POINT AROUND THE POLE, AND THROUGHOUT THE ENTIRE DEPTH OF THE HOLE.

5. THE POLE HOLE SHALL NOT EXCEED TWO TIMES THE DIAMETER OF THE POLES BUTT DIAMETER.

6. BACKFILL SHALL BE THOROUGHLY TAMPED THE FULL DEPTH OF THE POLE HOLE. EARTH MUST BE BANKED AROUND THE POLE TO A MINIMUM HEIGHT OF SIX INCHES ABOVE GROUND LEVEL.

7. POLES SHALL BE SET PLUMB EXCEPT AT CORNERS WHERE THEY SHALL BE SET AND RAKED AGAINST THE LOAD SO THAT THE POLE TOP WILL BE IN LINE AFTER THE LOAD IS APPLIED. THE RAKE POLE SHALL NOT EXCEED SIX INCHES FOR EACH TEN FEET OF POLE LENGTH AFTER THE CONDUCTORS ARE INSTALLED AT THE REQUIRED TENSION. DEADEND SHALL BE SET SO AS TO BE PLUMB AND IN LINE AFTER THE LOAD IS APPLIED.

8. POLE LIGHTNING PROTECTION SHALL BE A #6 AWG BARE COPPER WIRE IN ACCORDANCE WITH SIC/RUS CONSTRUCTION PRACTICES.

9. SUSPENSION STRAND / HARDWARE SHALL BE CLASS C GALVANIZED STEEL UTILITY GRADE FOR CORROSION AREAS.

10. GUY GUARDS, YELLOW IN COLOR SHALL BE PLACED ON ALL DOWN GUYS.

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS 8/29/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

SIC NOTES

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

DWG. NO.
E-002

SITE NO. 7
ELECTRICAL
SITE PLAN,
SEE 1/E-101

SITE NO. 1
KAULUWAI WELLS SITE

OVERALL ELECTRICAL SITE PLAN

SCALE: 1"=700'

NORTH

700' 350' 0 700' 1400' 2100'

SCALE: 1"=700'

GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

OVERALL ELECTRICAL SITE PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. E-003
SHEET 142 OF 149

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JUNE 2018

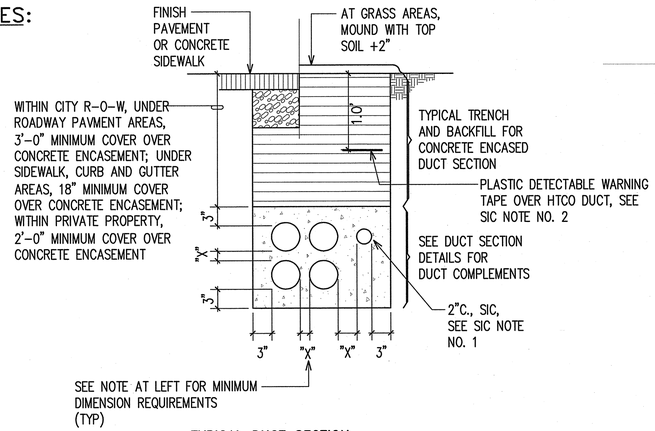
DUCT SECTION BACKFILL NOTES:

TYPE "A" BACKFILL – EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX. & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

TYPE "B" BACKFILL – EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

NOTE – IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.

CONCRETE – 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.



TYPICAL DUCT SECTION

DESIGNATION DESCRIPTIONS

ELEC = UTILITY CO. PRIMARY OR SECONDARY ELECTRIC
TEL = UTILITY CO. TELEPHONE
PWR = PRIMARY OR SECONDARY ELECTRIC
CTL = CONTROL
SIG = INSTRUMENTATION OR ANTENNA CABLE

MINIMUM "X" DIMENSION
DUCT SEPARATION REQUIREMENTS

ELEC – ELEC = 1 1/2"

ELEC – TEL = 3"

TEL – TEL = 1 1/2"

ELEC – CTL/SIG = 3"

TEL – CTL/SIG = 1 1/2"

PWR – CTL/SIG = 3"

ELEC – PWR = 1 1/2"

TEL – PWR = 3"

PWR – PWR = 1 1/2"

CTL/SIG – CTL/SIG = 1 1/2"

MINIMUM OF 3" CONCRETE ENCASEMENT AROUND DUCTBANK

WHERE DUCTLINE CROSSES OVER WATER LINE, PROVIDE THE FOLLOWING:

6" MINIMUM SEPARATION BETWEEN DUCTLINES AND WATER LINE.

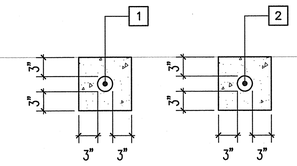
PROVIDE CONCRETE JACKET AROUND DUCTLINES.

PROVIDE ONLY TYPE "B" BACKFILL AROUND WATER LINE.

SANDWICH ISLES COMMUNICATION (SIC) DUCTLINE NOTES:

1. CONTRACTOR SHALL PLACE NEPTCO WP 1800P MULETAPE, OR APPROVED EQUAL, IN EACH DUCT THROUGHOUT ITS ENTIRE LENGTH WITH PROTRUSIONS OF 2 FEET IN MANHOLES AND HANDHOLES AT EACH END, AND 1 FOOT IN PULLBOXES. MULETAPE IS RATED FOR 1800 LB PULL AND HAS FOOTAGE MARKINGS FOR MEASURING DUCT LENGTHS.

2. CONTRACTOR SHALL PLACE 4-MIL ORANGE COLORED PLASTIC WARNING TAPE, NOT LESS THAN 6" WIDE, ENTIRE LENGTH OF TRENCH FOR ALL UNDERGROUND INSTALLATIONS. TAPE SHOULD READ "WARNING-STOP DIGGING-CALL SIC, COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION".



SECTION (A) SECTION (B)

DUCT SECTION DETAILS AND REQUIREMENTS

NOT TO SCALE

DUCT AND WIRE SCHEDULE

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	2"	SEE ONE-LINE DIAGRAM	POWER FROM EXISTING PANELBOARD TO NEW MAINTENANCE BUILDING (1)
2	2"	PC	SIC DUCTLINES TO NEW MAINTENANCE BUILDING

NOTES:
1. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
2. PC INDICATED PROVIDE PULLCORD.

DWG. NO. E-004
SHEET 143 OF 149

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 REROUTED POWER FROM EXISTING PANELBOARD	RHA	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

DUCT SECTION DETAILS AND REQUIREMENTS

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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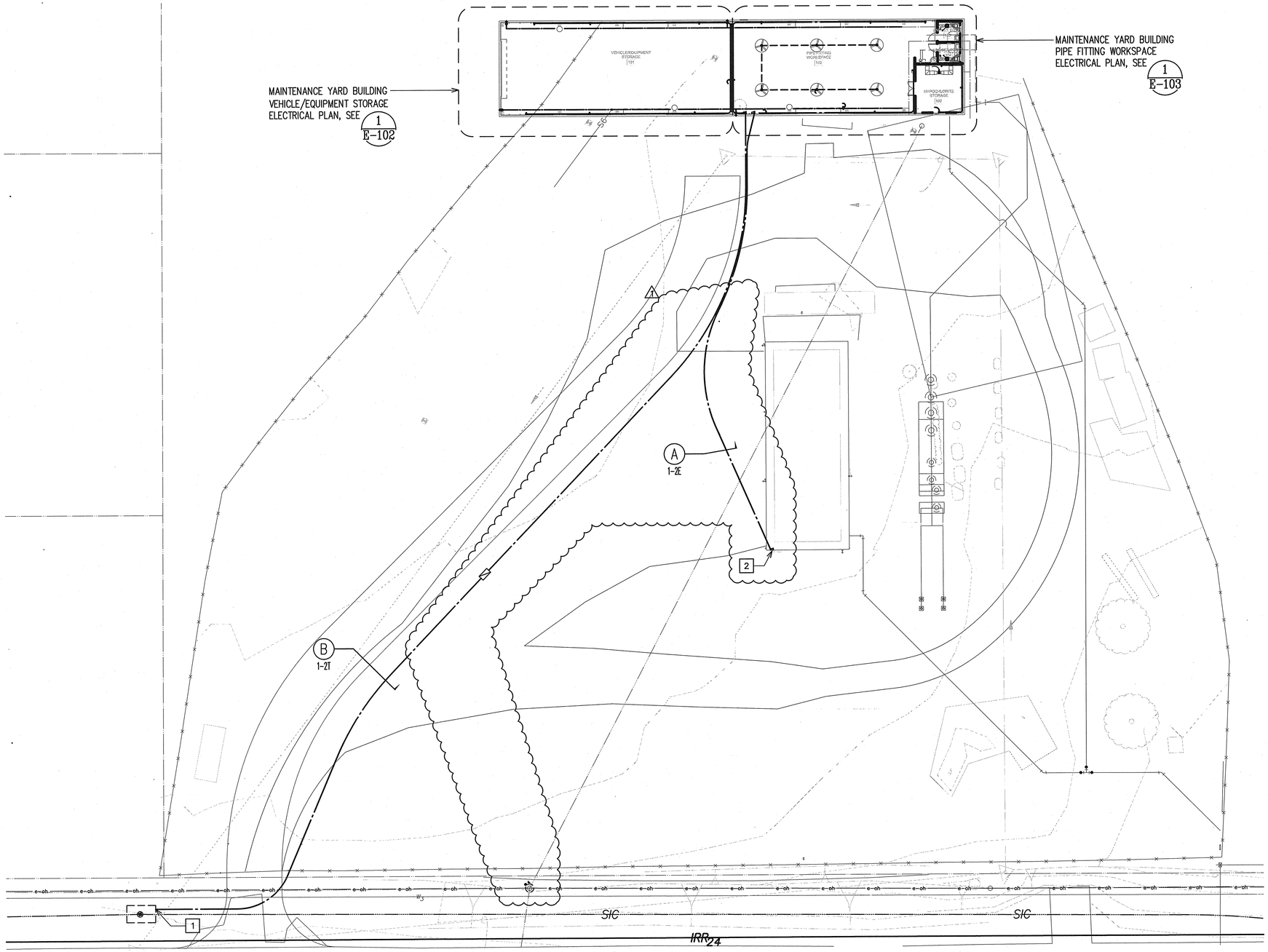
JUNE 2018

LAST EDIT
Z:\JOBS\PROJECTS\21807\7E-004-DUCT SECTION DETAILS XREFS: _X21807-DUCT SECTIONS=_\XREF_X21807-DUCT SECTIONS KKO-STAMP=Z:\ACAD\PROJECTS_PE_ STAMP\KKO-STAMP



1 E-101 SITE 7 ELECTRICAL PLAN SCALE: 1"=20'

NOTES:

1. BREAK AND PATCH EXISTING SIC MANHOLE FOR NEW TELECOMMUNICATIONS CIRCUIT TO NEW MAINTENANCE YARD BUILDING.
2. EXISTING PANELBOARD "X". EXTEND NEW CONDUIT FORM EXISTING PANELBOARD "X" TO NEW MAINTENANCE YARD BUILDING PANEL "A".

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

DWG. NO. E-101
SHEET 144 OF 149

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 REMOVED MECO EQUIPMENT	RHA	

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

SITE 7 ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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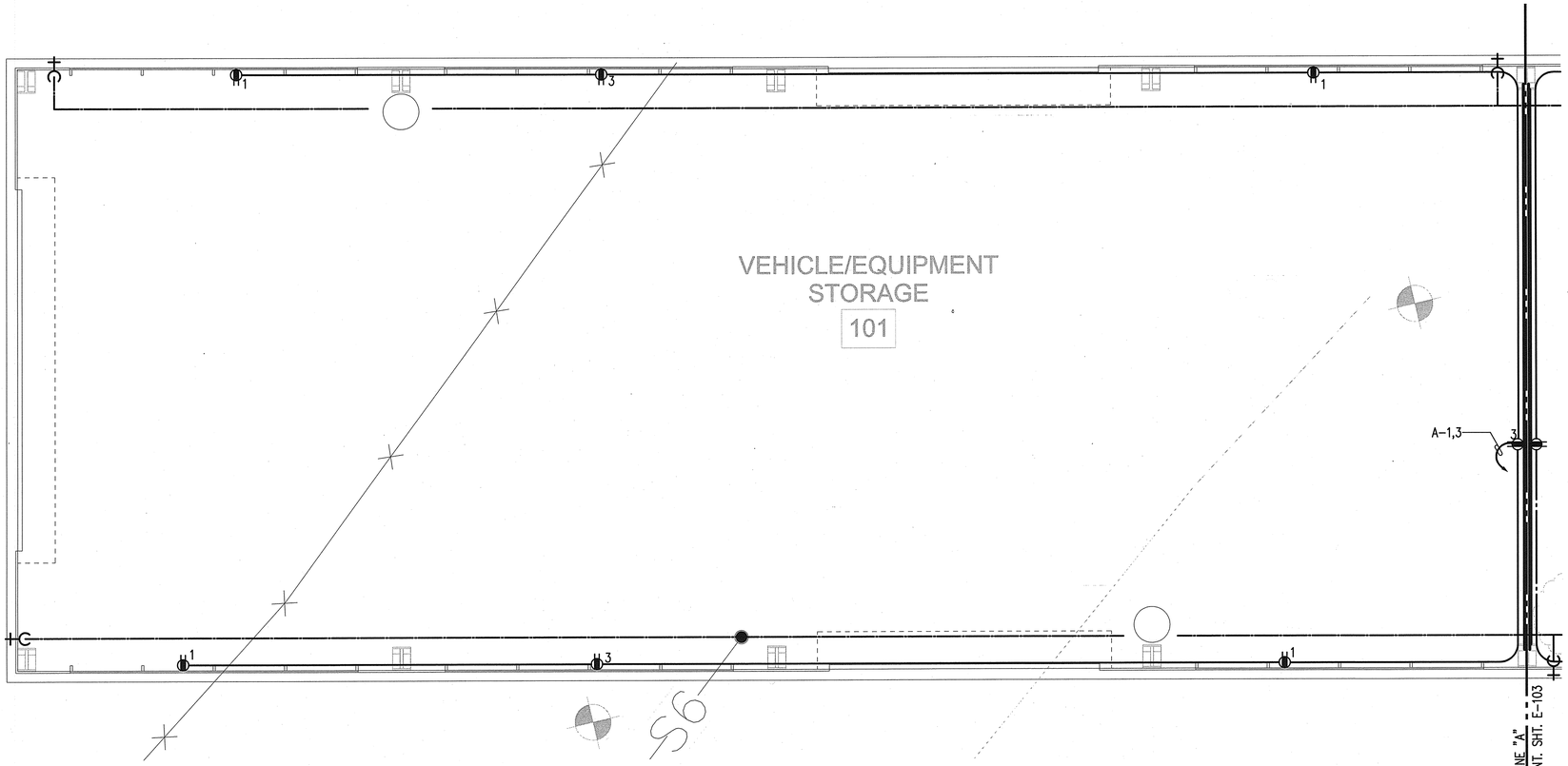
JUNE 2018



1 VEHICLE/EQUIPMENT STORAGE ELECTRICAL PLAN
E-102 SCALE: 1/4"=1'-0"

NORTH

4' 2' 0 4' 8' 12'

SCALE: 1/4"=1'-0"

GRAPHIC SCALE

DWG. NO. E-102
SHEET 145 OF 149

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STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

VEHICLE/EQUIPMENT STORAGE ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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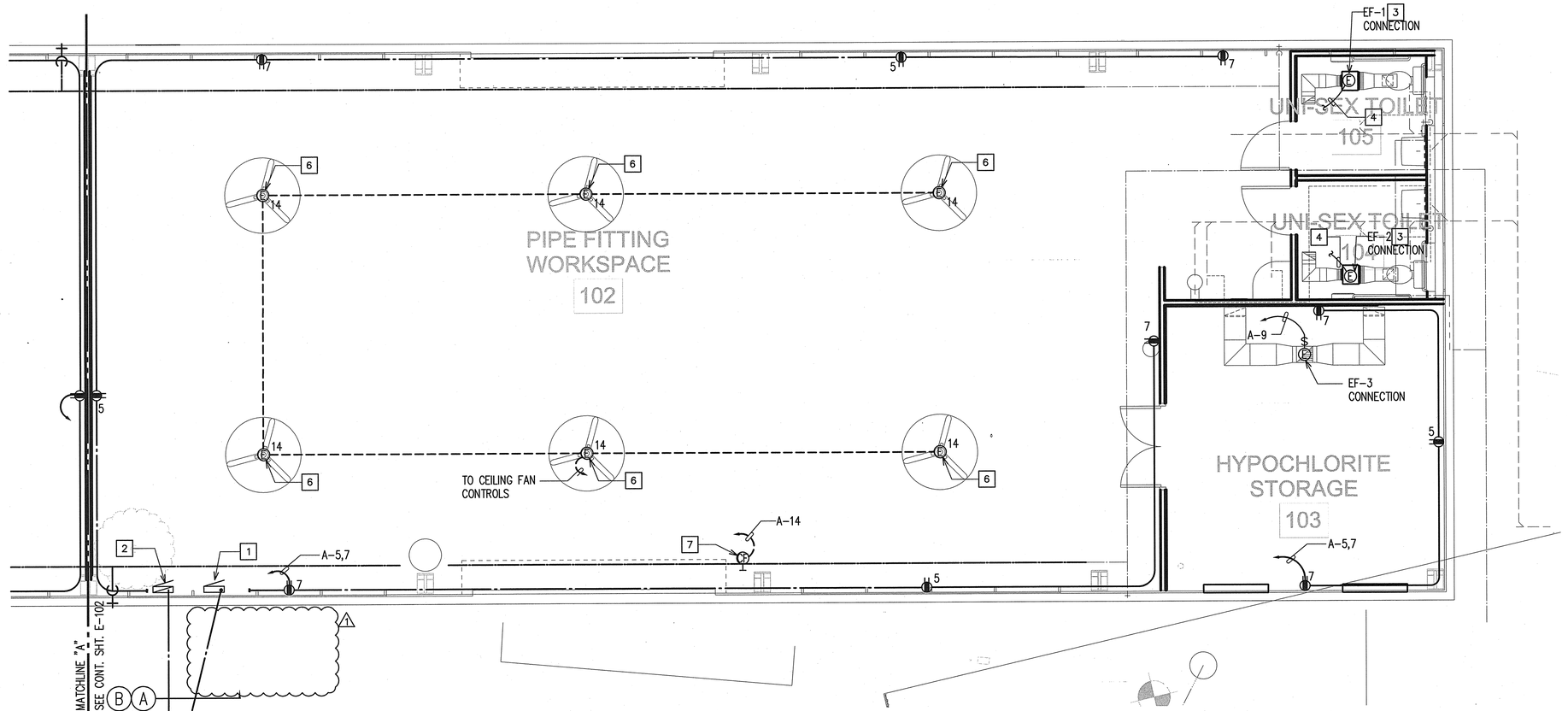

1 E-103 PIPE FITTING WORKSPACE ELECTRICAL PLAN

SCALE: 1/4"=1'-0"

NOTES:

1 NEW PANEL A
2 NEW TELEPHONE CABINET, SEE ELEVATION ON SHEET E-106.
3 EXHAUST FAN INTERLOCK WITH LIGHT SWITCH.
4 SEE CONTINUATION ON SHEET E-105.
5 CONTRACTOR TO PROVIDE DISCONNECT TOGGLE SWITCH.
6 CEILING FAN CONNECTION
7 CEILING FAN CONTROLS PROVIDED BY MECHANICAL.

NEW PANEL "A"

100 A MAIN LUGS ONLY
240 / 120 VOLTS, 1-PHASE, 3-WIRE
10000 * A.I.C. INDUSTRIAL-BOLTED TYPE, FLUSH MOUNTED

CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER POLE	BREAKER AMPS	WIRE SIZE	KVA ON BUSSES L1		KVA ON BUSSES L2		WIRE SIZE	BREAKER POLE	BREAKER AMPS	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.
1	R-STORAGE	1	20	12	0.8	1.2			12	1	20	L-STORAGE	2
3	R-STORAGE	1	20	12			0.6	1.2	12	1	20	L-STORAGE	4
5	R-WORKSPACE	1	20	12	1.0	1.2			12	1	20	L-WORKPLACE	6
7	R-WORKSPACE	1	20	12			1.2	1.0	12	1	20	L-WORKPLACE	8
9	EF-3	1	20	12	0.8	0.6			12	1	20	L-BATHROOM	10
11	S	1	20	12			0.5	0.5	12	1	20	L-EXTERIOR	12
13	S	1	20	12	0.5	0.8			12	1	20	CEILING FANS	14
15	PFB						0.5	0.5		1	20	S	16
17	PFB				0.0	0.0						PFB	18
19	PFB						0.0	0.0				PFB	20
	CONNECTED LOAD PER PHASE					2.7		4.2					
	DEMAND LOAD PER PHASE					2.2		3.4					

(*) NEW LOAD ON EXISTING CIRCUIT BREAKER

TOTAL CONNECTED LOAD (KVA)	6.9
DEMAND FACTOR	80%
TOTAL DEMAND LOAD (KVA)	5.5
HIGH LEG (AMPS)	28.0

4' 2' 0 4' 8' 12'
SCALE: 1/4"=1'-0"
GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 REMOVED MECO EQUIPMENT	RHA	

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PIPE FITTING WORKSPACE
ELECTRICAL PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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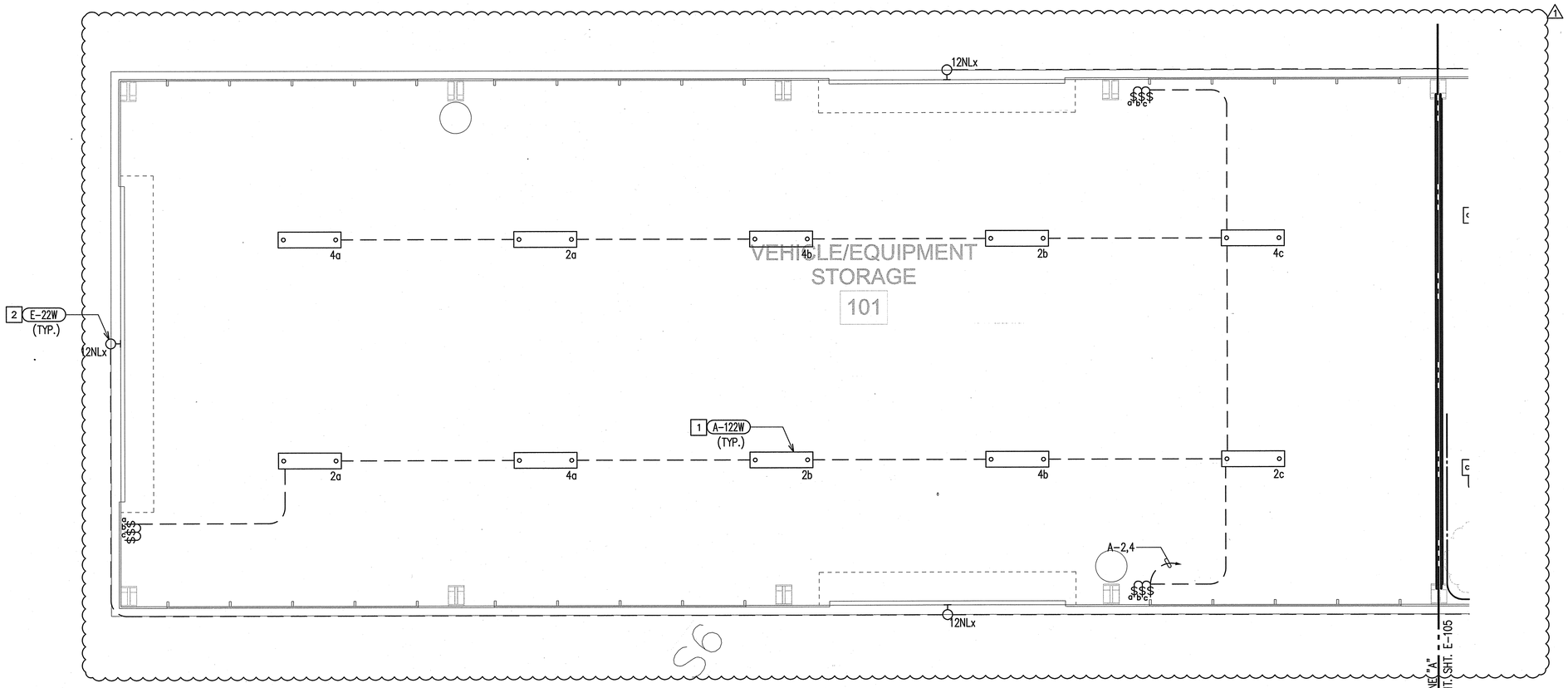
JUNE 2018

DWG. NO.
E-103
SHEET 146 OF 149



1 VEHICLE/EQUIPMENT STORAGE LIGHTING PLAN
E-104 SCALE: 1/4"=1'-0"

NORTH

LIGHT FIXTURE SCHEDULE

TYPE	LAMP/ WATTS	DESCRIPTION	MANUFACTURER OR APPROVED EQUAL
A	122W LED 4000'K	15" X 52" PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH GLOSS BAKED WHITE ENAMEL FINISH, MEDIUM LUMEN, 120V LED DRIVER	COLUMBIA LXEW SERIES, OR APPROVED EQUAL
B	178W LED 4000'K	15" X 52" PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH GLOSS BAKED WHITE ENAMEL FINISH, HIGH LUMEN, 120V LED DRIVER	COLUMBIA LXEW SERIES OR APPROVED EQUAL
C	92W LED 4000'K	6" X 4' PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH REFLECTIVE BAKED ENAMEL FINISH, EXTRA HIGH LUMEN, 120V LED DRIVER	COLUMBIA LXEM SERIES OR APPROVED EQUAL
D	19W LED 4000'K	4" X 4' SURFACE MOUNTED LUMINAIRE, COLD-GAUGE STEEL HOUSING, FROSTED ACRYLIC LENS, HIGH REFLECTIVE BAKED ENAMEL, LOW WATT, 120V LED DRIVER	COLUMBIA LCL SERIES OR APPROVED EQUAL
E	22W LED 3000'K	8.22"H X 5.25"H X 4.81"D SURFACE MOUNTED LUMINAIRE, DIE-CAST ALUMINUM HOUSING, FULL CUT-OFF, UL LISTED FOR WET LOCATIONS, POWER PAINT FINISH, 120V LED DRIVER	HUBBELL LNC-9L OR APPROVED EQUAL

NOTES:

1. LIGHT FIXTURES TO BE MOUNTED AT 16' AFF.
2. LIGHT FIXTURES TO BE MOUNTED 12' AFF.

4' 2' 0 4' 8' 12'

SCALE: 1/4"=1'-0"

GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 ADDED BUILDING BACKGROUND	RHA	

KRAIG K. OTANI
LICENSED PROFESSIONAL ENGINEER
No. 14288-E
HAWAII, U.S.A.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

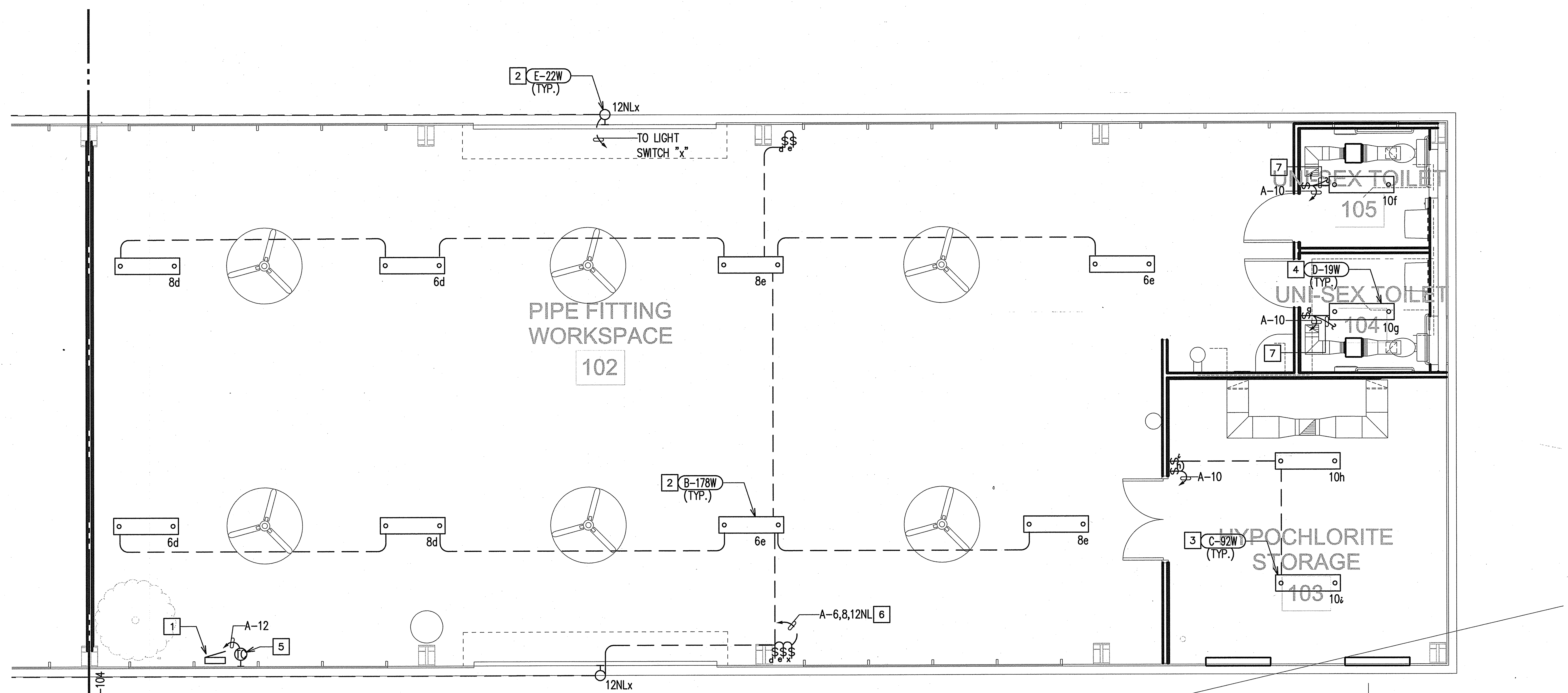
VEHICLE/EQUIPMENT STORAGE LIGHTING PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

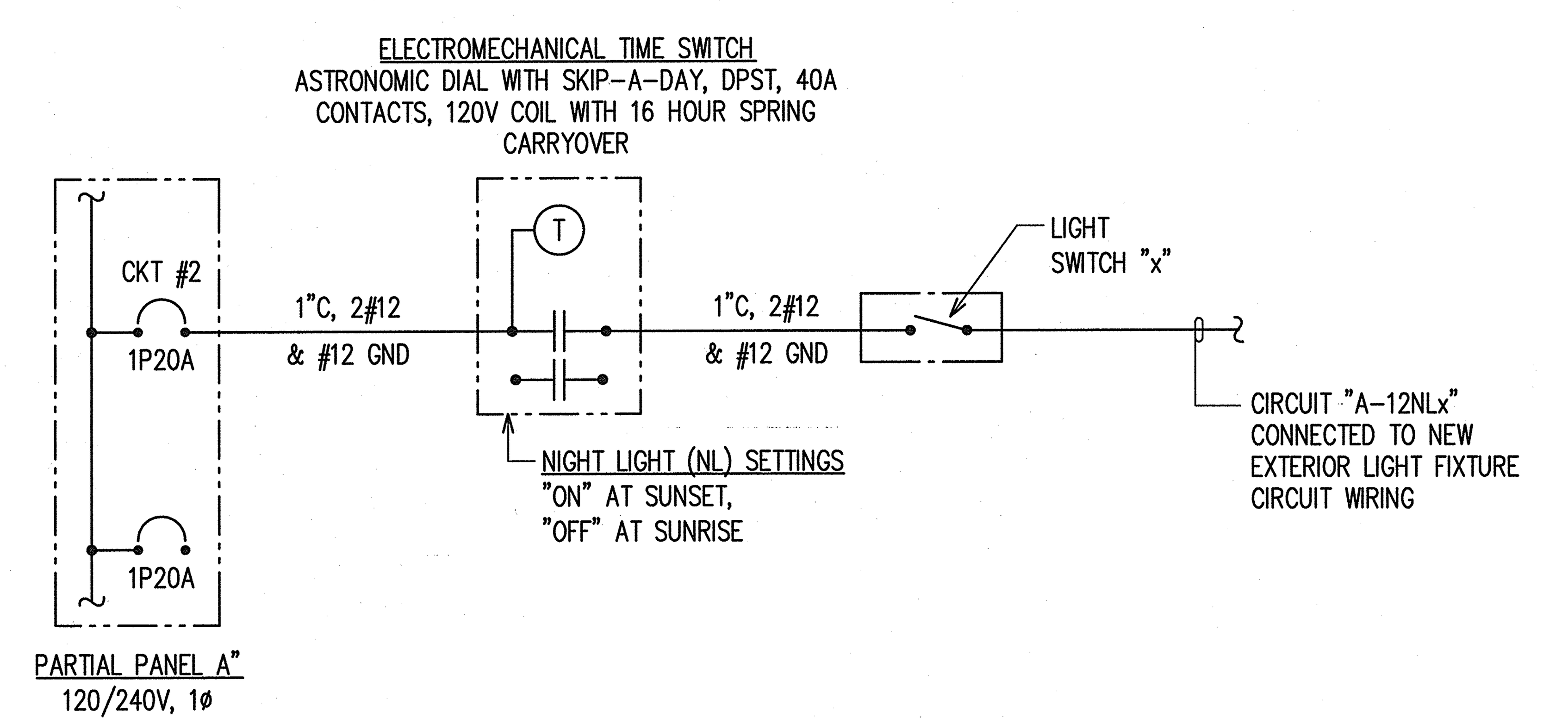
DWG. NO. E-104
SHEET 147 OF 149



1 PIPE FITTING WORKSPACE LIGHTING PLAN
E-105 SCALE: 1/4"=1'-0"

LIGHT FIXTURE SCHEDULE

TYPE	LAMP/ WATTS	DESCRIPTION	MANUFACTURER OR APPROVED EQUAL
A	122W LED 4000'K	15" X 52" PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH GLOSS BAKED WHITE ENAMEL FINISH, MEDIUM LUMEN, 120V LED DRIVER	COLUMBIA LXEW SERIES, OR APPROVED EQUAL
B	178W LED 4000'K	15" X 52" PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH GLOSS BAKED WHITE ENAMEL FINISH, HIGH LUMEN, 120V LED DRIVER	COLUMBIA LXEW SERIES OR APPROVED EQUAL
C	92W LED 4000'K	6" X 4' PENDANT MOUNTED LUMINAIRE, FIBERGLASS HOUSING, GASKETED, ACRYLIC LENS, HIGH REFLECTIVE BAKED ENAMEL FINISH, EXTRA HIGH LUMEN, 120V LED DRIVER	COLUMBIA LXEM SERIES OR APPROVED EQUAL
D	19W LED 4000'K	4" X 4' SURFACE MOUNTED LUMINAIRE, COLD-GAUGE STEEL HOUSING, FROSTED ACRYLIC LENS, HIGH REFLECTIVE BAKED ENAMEL, LOW WATT, 120V LED DRIVER	COLUMBIA LCL SERIES OR APPROVED EQUAL
E	22W LED 3000'K	8.22"H X 5.25"H X 4.81"D SURFACE MOUNTED LUMINAIRE, DIE-CAST ALUMINUM HOUSING, FULL CUT-OFF, UL LISTED FOR WET LOCATIONS, POWER PAINT FINISH, 120V LED DRIVER	HUBBELL LNC-9L OR APPROVED EQUAL



2 NIGHT LIGHT CONTROL DIAGRAM
E-705

NOTES:

1. NEW PANEL A.
2. LIGHT FIXTURES TO BE MOUNTED AT 12' AFF.
3. LIGHT FIXTURES TO BE MOUNTED AT 16' AFF.
4. LIGHT FIXTURES TO BE MOUNTED AT 8' AFF.
5. TIME CLOCK.
6. CONNECT EXTERIOR LIGHT FIXTURE BRANCH CIRCUIT TO NEW TIME CLOCK.
7. SEE CONTINUATION ON SHEET E-103

4' 2' 0 4' 8' 12'
SCALE: 1/4"=1'-0"
GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED

KRAIG K. OTANI LICENSED PROFESSIONAL ENGINEER No. 14288-E HAWAII, U.S.A.

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

USDA/RUS FUNDED MOLOKAI HOOLEHUA WATER SYSTEM IMPROVEMENTS SITE NOS. 1, 3, 4, 5, 6 & 7
SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

PIPE FITTING WORKPLACE LIGHTING PLAN

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

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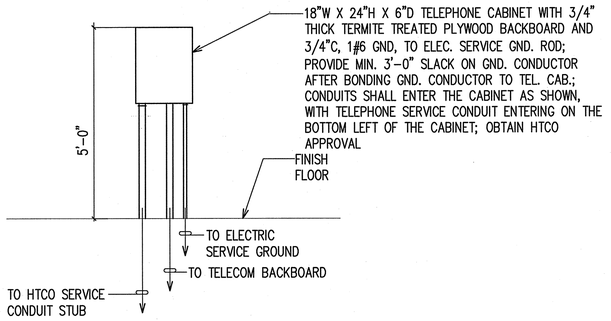
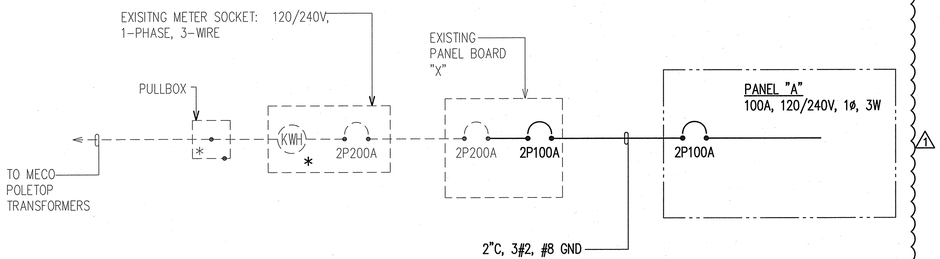
JUNE 2018

DWG. NO. E-105



1 E-106 **TELEPHONE CABINET ELEVATION**
SCALE: 1/2"=1'-0"



2 E-106 **ONE-LINE DIAGRAM**
NOT TO SCALE

EXISTING PANEL "X"				200 A MAIN LUGS ONLY 240 / 120 VOLTS, 1-PHASE, 3-WIRE 10000 * A.I.C. INDUSTRIAL-BOLTED TYPE, FLUSH MOUNTED									
CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER POLE	BREAKER AMPS	WIRE SIZE	KVA ON BUSSES L1		KVA ON BUSSES L2		WIRE SIZE	BREAKER POLE	BREAKER AMPS	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.
1	L-STORAGE, BATHROOM	1	20	12	1.0	1.0			12	1	20	R-GARAGE	2
3	L-GARAGE, FLOOD	1	20	12			1.0	1.0	12	1	20	R-GARAGE	4
5	L-GARAGE	1	20	12	1.0	1.0			12	1	20	R-OFFICE	6
7	R	1	20	12			1.0	1.0	12	1	20	R-SHOP	8
9,11	WELDER	2	50		4.0	1.0			12	1	20	R-SHOP	10
	-						4.0	1.0	12	1	20	R-GARAGE,STORAGE	12
13,15	COMPRESSOR	2	30		2.0	1.0			12	1	20	R	14
	-						2.0	1.0	12	1	20	R	16
17, 19	PANEL A (*)	2	100	2	2.7	0.0						PFB	18
	-						4.2	0.0				PFB	20
21	PFB				0.0	0.0						PFB	22
23	PFB						0.0	0.0				PFB	24
	CONNECTED LOAD PER PHASE				14.7		16.2						
	DEMAND LOAD PER PHASE				11.8		13.0						

(*) NEW LOAD ON NEW CIRCUIT BREAKER

TOTAL CONNECTED LOAD (KVA)	30.9
DEMAND FACTOR	80%
TOTAL DEMAND LOAD (KVA)	24.7
HIGH LEG (AMPS)	108.0

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
1	7/6/2018	ADDENDUM NO. 2 REMOVED MECO EQUIPMENT AND ADDED PANEL SCHEDULE	RHA	

KRAIG K. OTANI
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No. 14288-E
HAWAII, U.S.A.

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DWG. NO. E-106
SHEET 149 OF 149

DEPARTMENT OF HAWAIIAN HOME LANDS
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SITE 7 - HOOLEHUA VARIOUS IMPROVEMENTS

ELECTRICAL EQUIPMENT ELEVATIONS AND ONE-LINE DIAGRAM

DESIGNED BY: YS CHECKED BY: KKO DRAWN BY: YS

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201 Honolulu, Hawaii 96819
Phone: (808)941-0577 Fax: (808)945-2646

JUNE 2018

LAST_EDIT
Z:\ACAD\PROJECTS\218017\E-706-ELECTRICAL EQUIPMENT ELEVATION XREFS: XS-18 CONTROL BLDG _X218017-EQUIPMENT ELEVATIONS=_X\$1\$_X218017-EQUIPMENT ELEVATIONS KKO-STAMP=2:\ACAD\PROJECTS_PE_ STAMP\KKO-STAMP