ADDENDUM NO. 2
February 26, 2020

TO

PLANS, BID FORM, SPECIFICATIONS, CONTRACT AND BOND

FOR
Kau Water System Improvements – Phase 1

Kamaoa, Kau, Island of Hawaii

IFB No.: IFB-20-HHL-019

Sample DHHL Contract

Adding to Special Conditions (Attachment S5)

SC-33 Notice to Proceed

After construction plans are fully approved by all required agencies and after the contract is fully executed and signed by the Chairman, the Contractor will be sent a formal Notice to Proceed letter advising the Contractor of the date on which it may proceed with the work. DHHL Construction General Conditions, 3.1.4 modified as follows, "In the event the Notice to Proceed is not issued within two hundred seventy (270) days after (1) the date the contract is executed by all parties; or (2) for projects funded with State Capital Improvement Project (CIP) funds, the date that the written certificate that funds are available is issued, whichever is later, the Contractor may submit a claim for increased labor and material costs (but not overhead costs) which are directly attributable to the delay beyond the first two hundred seventy (270) days. Such claims shall be accompanied with the necessary documentation to justify the claim. No payment will be made for assumed escalation costs.

Technical Specifications

Civil

1. SECTION 02665 - WATER SYSTEM: PART 2 – PRODUCTS, 2.01. MATERIALS, replace the following paragraph in its entirety:

   "E. ELECTROMAGNETIC FLOWMETER"

Structural

1. SPECIFICATIONS: SECTION 03300 – CAST-IN-PLACE CONCRETE, Subsection 3.4, Item B.2, replace wording "without any vertical construction joints

and," with revised wording "or in vertical wall sections,"; remove wording "A horizontal construction joint can be used at the Contractor's option at the height indicated on the Drawings."

2. SPECIFICATIONS: Remove SECTION 03300 – CAST-IN-PLACE CONCRETE, Subsection 3.4, Item B.5.

3. SPECIFICATIONS: Remove SECTION 05500 – MISCELLANEOUS METAL FABRICATION, Subsection 1.1, Item B.6.

4. SPECIFICATIONS: Remove SECTION 05500 – MISCELLANEOUS METAL FABRICATION, Subsection 1.2, Item A.4.

5. SPECIFICATIONS: SECTION 05600 – ALUMINUM STAIRS, Subsection 1.1, Item A, remove wording "including security enclosure,"

6. SPECIFICATIONS: Remove SECTION 05600 – ALUMINUM STAIRS, Subsection 1.2, Item C and D.

7. SPECIFICATIONS: Remove SECTION 05600 – ALUMINUM STAIRS, Subsection 1.3, Item C and D.

8. SPECIFICATIONS: Remove SECTION 05600 – ALUMINUM STAIRS, Subsection 3.3, in its entirety.

9. SPECIFICATIONS: Remove SECTION 07500 – FLUID APPLIED ROOFING in its entirety.

10. SPECIFICATIONS: Replace SECTION 08900 – LOUVERS AND VENTS in its entirety with attached revision.

11. SPECIFICATIONS: Remove SECTION 09900 – RESERVOIR PAINTING, Subsection 2.1, Item C.4 and C.5.

Plans

Civil

The following plan sheet numbers have been revised and the revised drawings are reissued using Revision Delta 2, dated February 26, 2020:

1. PLANS: Drawing No. C-3 - Revisions include showing the electrical service equipment; showing the reservoir exterior stairs; and widening the AC pavement at the vicinity of the reservoir exterior stairs.

2. PLANS: Drawing No. C-4 - Revised grading where AC pavement was widened near reservoir exterior stairs.

3. PLANS: Drawing No. C-5 - Revisions include revising the alignment of the 8-inch reservoir effluent line; revising the layout of the 1-inch service lateral for the water filling station; relocating the reservoir level transmitter; relocating the water sampling station at the effluent line; deleting the concrete thrust beam on the reservoir effluent line; replacing the Toshiba flow meter on the effluent line with a Krohne flow meter; and adding one 8-inch gate valve with valve box and one 4-inch gate valve with valve box at the 4-inch interconnection line.

4. PLANS: Drawing No. C-7 - Revisions include revising the profiles to the 4-inch Interconnection Line and the 8-inch Effluent Line to suit its revisions described for Drawing No. C-5 above.

5. PLANS: Drawing No. C-9 - Revisions include removing the 1-1/2 – inch combination pressure relief and solenoid control valve and associated piping; reducing the size of the combination pressure relief and remote control valve from 4-inch to 1-1/2 – inch along with associated piping including the addition of two 4-inch ductile iron blind flanges with 1-1/2 – inch IPT taps; remove five straps for 4-inch pipes; add three more hold down clips for 4-inch pipes; replace the Toshiba flow meter at the influent control valve station with a Krohne flow meter.

6. PLANS: Drawing No. C-10 - Revisions include revising the sectional views of the reservoir influent control valve station to suit its revisions described for Drawing No. C-9 above; delete Section F.

7. PLANS: Drawing No. C-11 - Revisions include relocating the concrete support pedestal for the deleted 1-1/2 – inch combination pressure relief and solenoid control valve to the downsized 1-1/2 – inch combination pressure relief and remote control valve.

8. PLANS: Drawing No. C-12 - Revisions include revising the sectional views of the reservoir influent control valve station concrete foundation to suit its revisions described for Drawing No. C-11 above; delete Section F.

9. PLANS: Drawing No. C-13 - Revisions include deleting the Pipe Strap Detail for the 4-inch pipe and deleting the H-20 traffic rating for the flow meter vault access hatch.

10. PLANS: Drawing No. C-14 - Revision include adding a note to paint the exterior of the gauge cabinet with heat-reflective paint.

11. PLANS: Drawing No. C-15 - Revision include adding the Champion-Arrowhead brand to the hose bibb call out on the Water Sampling Station detail.

12. PLANS: Drawing No. C-16 - Revisions include adding in the Float Control Detail a call out to provide a stainless steel Unistrut support for the CF1 float control; and revisions to the 1-inch Combination Air Valve Assembly Detail.

13. PLANS: Drawing No. C-20 - Revisions include relocating three water meters and meter boxes; and adding a missing service lateral along with its reconnecting pipe to the new 4-inch waterline.

14. PLANS: Drawing No. C-21 - Revision include relocating one water meter and meter box.

15. PLANS: Drawing No. C-24 - Revisions include revising the inlet piping configuration to the 2-inch pressure relief valve; and relocating the vault ladder rungs.

Structural

1. PLANS: DETAIL 2/S-2 – Provided information for waterstop II; deleted information for waterstop IV.

2. PLANS: DETAIL 2/S-3 – Removed roof curb and added roof overhang.

3. PLANS: Added DETAIL 6/S-3 – SEISMIC CABLE ELEVATION AT VERTICAL WALL SECTION.

4. PLANS: Added detail 8/S-3 – HORIZONTAL SECTION OF VERTICAL WALL JOINT.

5. PLANS: DETAIL 1/S-4 – Revised perimeter drain layout of 6 mil poly liner, 30 mil membrane, and filter fabric.

6. PLANS: DETAIL 1/S-5 – Removed concrete pedestal from overflow pipe, and revised pipe through slab; replaced wording “Hot Asphalt Mop” from reservoir concrete footing and concrete jacket interface with revised wording “2 Layers of 6 mil Polyethylene Over Jacket”; added pipe coating to exposed overflow pipe.

7. PLANS: DETAIL 2/S-5 – Replaced wording “Hot Asphalt Mop” from reservoir concrete footing and concrete jacket interface with revised wording “2 Layers of 6 mil Polyethylene Over Jacket”.

8. PLANS: DETAIL 3/S-5 – Replaced wording “Hot Asphalt Mop” from reservoir concrete footing and concrete jacket interface with revised wording “2 Layers of 6 mil Polyethylene Over Jacket”; added pipe coating to exposed effluent and influent pipes.

9. PLANS: DETAIL 4/S-5 – Revised pipe grate detail.

10. PLANS: DETAIL 1/S-6 – Shifted staircase location; moved level indicator gauge board; removed staircase security fenced enclosure.

11. PLANS: DETAIL 2/S-6 – Shifted staircase location; moved level indicator gauge board; removed concrete roof curb and added roof overhang; removed scupper collector box; removed wall louvers; indicated wording “2% slope”; added roof ventilator opening.

12. PLANS: DETAIL 1/S-7 – Removed concrete roof curb and added roof overhang; removed fluid-applied roof coating; indicated wording “2% slope”; added wording “with broom finish” to “9” roof slab” callout.

13. PLANS: DETAIL 2/S-7 – Removed scupper collector box, downspout and splash block, wall louvers; removed concrete roof curb and added roof overhang; Added roof ventilator to rooftop.

14. PLANS: DETAIL 1/S-8 – Removed concrete roof curb and added roof overhang.

15. PLANS: DETAIL 1/S-9 – Removed concrete roof curb and added roof overhang.

16. PLANS: DETAIL 2/S-9 – Removed concrete roof curb and added roof overhang.

17. PLANS: DETAIL 4/S-9 – Removed concrete roof curb and added roof overhang.

18. PLANS: DETAIL 1/S-10 – Added safety rail on roof hatch curb at top of interior ladder; added wording “With ¼” FRP Bottom Plate” to “5’-0”x4’-11” Fiberglass Grating” callout; added wording “And Bottom Plate” to Interior Ladder Note #2.

19. PLANS: DETAIL 2/S-10 – Added safety rail on roof hatch curb at top of interior ladder; added bottom plate callout and detail bubble.

20. PLANS: DETAIL 3/S-10 – Added safety rail on roof hatch curb.

21. PLANS: DETAIL 6/S-10 – Added wording “And Bottom Plate” to “FRP Grating” callout.

22. PLANS: DETAIL 4/S-10 – Added wording “With ¼” FRP Bottom Plate” to “Fiberglass Grating Below” callout.

23. PLANS: SHEET S-11 – Revised sheet title to “RESERVOIR VENTILATOR DETAIL.”

24. PLANS: SHEET S-11 – Deleted wall louver details 1 and 2/S-11; Deleted 3/S-11 – SCUPPER COLLECTOR BOX DETAIL; Added detail 4/S-11 – ROOF VENTILATOR DETAIL.

25. PLANS: DETAIL 1/S-12 – Revised stair tread total length dimensions; removed security fence enclosure; added chain-link gate and duckbill gate stop at bottom stair landing.

26. PLANS: DETAIL 2/S-12 – Removed concrete roof curb; added guardrail toe plate; removed expanded metal security fence note.

27. PLANS: DETAIL 1/S-13 – Removed security fence enclosure; removed concrete roof curb and added roof overhang; adjusted stair landing guardrail.

28. PLANS: DETAIL 3/S-13 – Removed security fence enclosure.

29. PLANS: DETAIL 1/S-14 – Revised upper and lower stair tread total length dimension.

30. PLANS: Deleted SHEET S-15 in its entirety.

31. PLANS: SHEET S-16 – Revised sheet title to "FENCE GATE DETAILS."

32. PLANS: Deleted detail 2, 3, and 4/S-16. Added detail 5/S-16 – GATE DETAIL, and "Chain-Link Fence Gate Notes."

33. PLANS: DETAIL 1/S-17 – "Section A," removed concrete roof curb and added roof overhang. Added bracket to water level indicator horizontal pipe.

34. PLANS: SHEET S-18 – Revised sheet title to "RESERVOIR RAILING DETAILS."

35. PLANS: DETAIL 1/S-18 – Removed concrete roof curb and roof opening dimension; added guardrail toe plate.

36. PLANS: DETAIL 2/S-18 – Removed concrete roof curb; added guardrail toe plate.

37. PLANS: DETAIL 3/S-18 – Added guardrail toe plate.

38. PLANS: SHEET S-18 – Deleted fluid-applied roofing details 5, 6, 7, and 8/S-18.

<u>Electrical</u>

1. PLANS: DRAWING E-2 – Removed Duct Section B. The combination pressure relief and solenoid control valve has been removed.

2. PLANS: DRAWING E-4 – Removed electrical work for the combination pressure relief and solenoid control valve.

3. PLANS: DRAWING E-7 – Per DWS, the flow meters and level transmitters shall be modbus. Revised the SCADA diagram to reflect modbus connections and not analog.

Also removed connections for the combination pressure relief and solenoid control valve, and removed diagram 2/E-7 as it is no longer required.

END OF ADDENDUM NO. 2

SECTION 02665 - WATER SYSTEM

PART 2 – PRODUCTS

2.01. MATERIALS

E. ELECTROMAGNETIC FLOWMETER:

1. General Description:

Electromagnetic flowmeters shall be installed as shown on the plans at the 0.10-MG reservoir influent control valve station and the reservoir effluent line. The meter shall be capable of measuring flow rates and converting them to an analog signal to be sent to the SCADA system specified for this project.

Electromagnetic flowmeter shall be a Krohne Waterflux 3070C with the Krohne FlexPower and battery backup, or approved equal, conforming to the following specifications.

a. Overall Requirements:

1.) Description: This section of the specifications includes the furnishing and installation of an electromagnetic flowmeter at the location described below. The flowmeter shall include an electromagnetic flow sensor and an integral signal converter.

a.) Reservoir Influent Control Valve Station

1. Number required: One.
2. Flowmeter sensor size: 4 inches.
3. Maximum operating pressure: 300 psi.
4. Flange ends: ANSI Class 150.
5. Location: As shown on the plans.

b.) Reservoir Effluent Line

1. Number required: One.
2. Flowmeter sensor size: 8 inches.
3. Maximum operating pressure: 300 psi.
4. Flange ends: ANSI Class 150.
5. Location: As shown on the plans.

b. Sensor:

1.) Operating Principle: Utilizing Faraday's Law of Electromagnetic Induction, the flow of liquid through the sensor induces an electrical voltage that is proportional to the velocity of the flow.

2.) Construction: The flow sensor tube shall be stainless steel. Liner material shall be Rilsan and shall be NSF approved for

potable water. Connecting flanges shall be Type 316L stainless steel, ANSI Class 150.

3.) Installation: As shown on the plans.

4.) Electrodes: Reference and measurement electrodes shall be 316 stainless steel or Hastalloy C, or approved equal.

5.) Grounding electrodes: Not required if reference electrode is used.

6.) Operating temperature: -13 to 149˚F.

7.) Enclosure Rating: NEMA 4X watertight.

c. Signal Converter: Compact version IFC 070, IP 68 for submersion in flooded chambers. Plug and play IP 68 connectors. Back up battery pack. External IP 68 FlexPower unit. RS 485 Modbus RTU interface. Power supply: 115/230 VAC. Pulse output: Digital (frequency or pulse) for external display of flow rate or totalization. Empty pipe detector is required.

d. Sensor and Signal Converter Performance:

1.) Flow range: 1.0 to 39.4 feet per second for the accuracy stated below for the 4-inch flow meter and 0.3 to 1.0 feet per second for the accuracy stated below for the 8-inch flow meter.

2.) Accuracy: 0.5 % of actual flow.

3.) Calibration: 3 points minimum, witnessed.

e. Spare Parts: Spare parts for the equipment shall include the following, unless otherwise noted.

1.) One set of manufacturer's recommended spare parts.

2.) Two additional copies of the Operations Manual.

f. Calibration of Flow Sensor:

1.) Each flow sensor shall be wet calibrated and all of the calibration information and factory settings matching the sensor shall be stored in an integrally mounted memory unit or converter. The memory unit shall store sensor calibration data and signal converter settings for the lifetime of the product. At initial commissioning, the flowmeter shall commence measurement without any initial programming. Any customer specified settings are downloaded to the memory unit. A certification of calibration shall accompany each flow sensor.

2.) Test mode: Provide the ability to verify the accuracy of the unit and the integrity of the current loop with the OPTICHECK tool for on-site verification.

3.) Self-diagnostics: Internal checks of all outputs and displays.

4.) In-situ calibration verification: The equipment shall be able to verify in a quantifiable manner the meter's current conditions versus the meter's condition when originally manufactured. This calibration verification of the meter shall be performed without need for physical access to the flow sensor unit."

SECTION 08900 – LOUVERS AND VENTS

PART 1 – GENERAL

1.1 DESCRIPTION:

A. Furnishing of all labor, materials, tools and equipment necessary for installation of the penthouse gravity ventilator covered in this section and the Project Drawings, and as needed for a complete and proper installation.

1.2 SUBMITTALS:

A. Product Data: Include manufacturer's product specifications, technical support data, installation and maintenance recommendations and standard details, including flashing methods, hardware and accessories.

B. Shop drawings shall indicate materials, thicknesses, profiles, accessories, connection and dimensions.

C. Calculations: Submit a minimum of 2 sets of calculations stamped by a structural engineer licensed in the State of Hawaii.

D. Manufacturer to provide samples upon request; sized to represent material adequately.

E. Warranty: Submit executed copy of ventilator assembly Manufacturer's Warranty.

1.3 FABRICATOR QUALIFICATIONS:

A. A firm experienced in producing metal fabrications similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units within the project schedule.

B. Welding: Qualify procedures and personnel according to the following:

1. AWS D1.1, "Structural Welding Code – Steel."

2. AWS D1.2, "Structural Welding Code – Aluminum."

3. AWS D1.6, "Structural Welding Code – Stainless Steel."

C. Certify that each welder has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone recertification.

1.4 DELIVERY, STORAGE, AND HANDLING:

A. Delivery: Deliver materials to Project site in manufacturer's original, sealed and labeled packaging with manufacturer's name, product brand name and type, date of manufacture, and directions for storing.

B. Storage: Store materials in a dry area indoors, protected from damage and in accordance with manufacturer's instructions for protection of units.

C. Handle all materials in such a manner as to preclude damage to finish or unit.

1.5 PROJECT CONDITIONS:

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by the manufacturer.

B. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

C. The Contractor shall verify that other trades with related work are complete before installing pre-fabricated component(s). Mounting surfaces shall be straight and secure; substrates shall be of proper width. Refer to construction documents, shop drawings, and manufacturer's installation instructions.

1.6 DESIGN PERFORMANCE:

A. Design of ventilator frame structure and connection to the roof slab/curb shall meet the wind load requirements per the 2006 edition of the International Building Code.

1.7 WARRANTY:

A. The warranty of this equipment is to be free from defects in material and workmanship for a period of one year from the purchase date. Any units or parts which prove defective during the warranty period will be replaced at the Manufacturers option when returned to Manufacturer, transportation prepaid.

PART 2 – MATERIALS

2.1 FABRICATED GRAVITY VENTILATOR:

A. Description and Features: The ventilator is low silhouette for intake applications with natural gravity or negative pressure system.

B. Hood and Base:

1. Shall be aluminum, constructed of precision formed, arched panels with interlocking seams. Vertical end panels are fully locked into hood end panels. Curb cap has pre-punched mounting holes for installation.

C. Bird Screen:

1. Constructed of ½" aluminum mesh, and mounted horizontally across the intake area of the hood.

D. Insect Screen:

1. Constructed of fine mesh aluminum, fitted above the bird screen, but not over the top of the throat.

E. Filters

1. Shall be mounted in open end racks for easy removal.

2. Washable 2-inch aluminum mesh designed to remove contaminants from the air.

F. Manufacturers: Examples of manufacturers meeting the above requirements:

1. Greenheck – Model "FGI" (www.greenheck.com), Schofield, Wisconsin, 54476. Phone: (715) 359-6171.

2. Approved equal

G. Fasteners: Provide stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be non-corrosive and compatible with trim, hardware, anchors and other components of louver unit. Where fasteners screw-anchor into frame members less than 0.125 inches thick, reinforce the interior to receive screw threads, or provide standard, non-corrosive, pressed-in, splined grommet nuts.

H. Anchors, Clips and Accessories: Fabricate anchors, clips and accessories of non-magnetic stainless steel. Anchors, clips and louver accessories fabricated of hot-dip zinc coated steel or iron may be used for concealed work.

2.2 FABRICATION REQUIREMENTS:

A. Fabricate to minimize field adjustments, splicing, mechanical joints and field assembly nuts.

B. Preassemble units to greatest extent possible and disassemble as necessary for shipping and handling.

C. Clearly mark units for reassembly and coordinated installation.

D. Join frame-to-frame connections by welding in shop, and frame and lade members to one another by riveting, except where field bolted/screwed connections between frame members are necessary due to size of louver.

E. Maintain equal blade spacing to produce uniform appearance.

PART 3 – EXECUTION

3.1 INSTALLATION:

A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing metal fabrications to in-place construction. Include threaded fasteners for concrete inserts, through-bolts, and other connectors. For pre-fabricated items secure as recommended by Manufacturer.

B. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

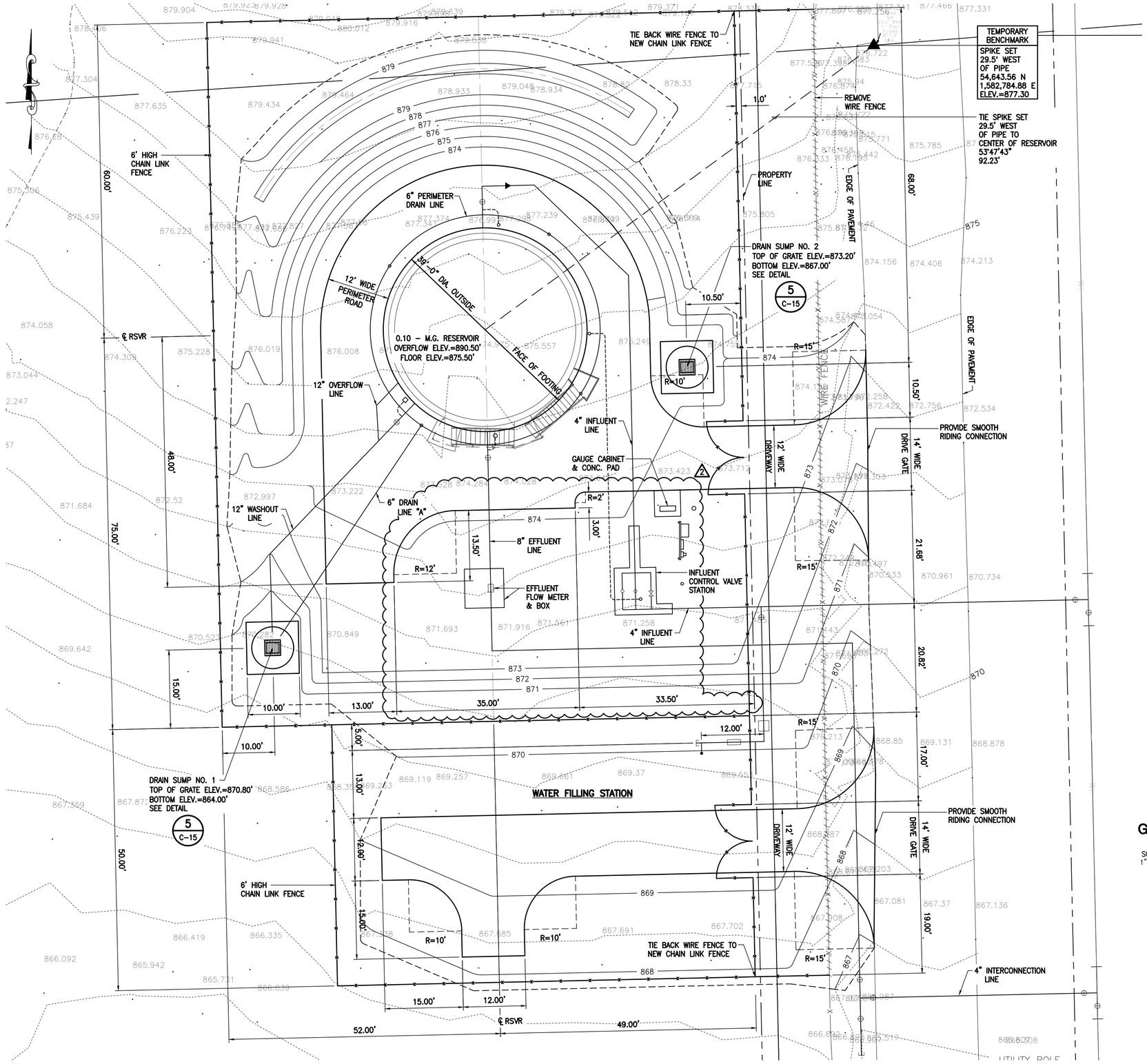
C. Provide items that are to be built into concrete, or similar construction in a timely manner, not to delay progress of construction.

D. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are designed to be bolted or screw field connections.

PART 4 – PAYMENT

No separate payment for will be made; compensation for such work shall be deemed to be included in the Lump Sum Bid for the item of which it is a part.

END OF SECTION



NOTES

1. FOR CHAIN LINK FENCE AND 14-FEET WIDE DRIVE GATE DETAILS, SEE DWS STANDARD DETAILS F1, F2, AND F3 IN THE WATER SYSTEM STANDARDS.
2. FOR CHAIN LINK FENCE SPECIFICATIONS, SEE SECTION 303.33 OF THE WATER SYSTEM STANDARDS.
3. PROVIDE TWO GATE STOPS PER DRIVE GATE. LOCATE GATE STOPS IN THE FIELD.
4. PAINT ALL COMPONENTS OF THE NEW FENCE AND GATES WITH TWO COATS OF BLACK MACHINERY ENAMEL AFTER WEATHERING PERIOD. COORDINATE WITH DWS INSPECTOR.
5. TOP OF CONCRETE FOOTINGS FOR FENCE AND GATE POSTS SHALL BE CROWNED TO SHED WATER.
6. ALL FENCE AND GATE COMPONENTS SHALL BE HOT-DIP GALVANIZED.
7. PROVIDE BARBED-WIRE SYSTEM FOR FENCE AND GATE. BARBED-WIRE EXTENSION ARMS SHALL BE ORIENTED AWAY FROM THE PROPERTY LINE.
8. FOR SIZES OF POSTS AND RAILS, SEE TABLE 300-14 OF THE WATER SYSTEM STANDARDS.
9. FENCE FABRIC SHALL BE TWISTED AND BARBED SELVAGE.
10. MAXIMUM CLEARANCE FROM GROUND TO BOTTOM OF FENCE FABRIC SHALL BE COORDINATED WITH DWS INSPECTOR. DRESS GROUND SURFACE AS NEEDED ALONG FENCE LINE TO COMPLY WITH CLEARANCE REQUIREMENT.

TMK: (3) 9-3-002: 030
(HAWN ISLAND DEVELOPMENT CO., INC.)

0.10 - M.G. RESERVOIR & WATER FILLING STATION SITE PLAN

SCALE: 1"=10'

GRAPHIC SCALE:

SCALE: 1" = 10'

10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

0.10 - M.G. RESERVOIR & WATER FILLING STATION SITE PLAN

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: TN CHECKED BY: TN DRAWN BY: SLP

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

DWG. NO. C-3
SHEET 5 OF 54

FILE | POCKET | FOLDER | NO.

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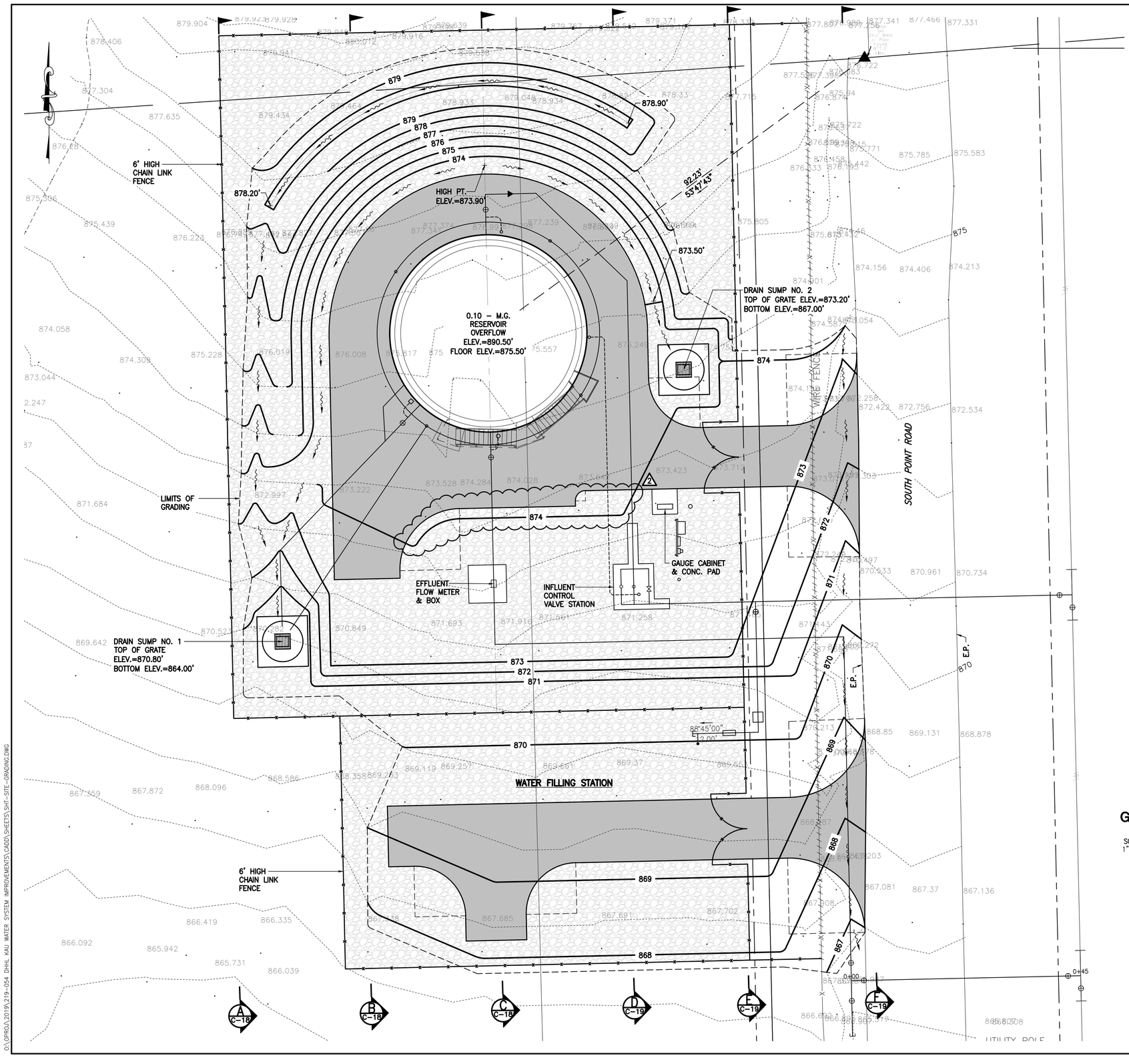

GRADING NOTES

1. ALL GRADING WORK SHALL CONFORM TO CHAPTER 10 OF THE HAWAII COUNTY CODE. SHOULD A GRADING PERMIT BE REQUIRED, NO WORK SHALL COMMENCE UNTIL THE COUNTY DEPARTMENT OF PUBLIC WORKS (DPW) APPROVES A GRADING PERMIT.
2. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE DPW SHALL BE PAYABLE BY THE CONTRACTOR.
3. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60.1, FUGITIVE DUST.
4. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 55, WATER POLLUTION CONTROL AND CHAPTER 54, WATER QUALITY STANDARDS, AND TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.
5. THE CONTRACTOR SHALL SOD OR PLANT ALL SLOPES AND EXPOSED AREAS IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.
6. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
7. THE CONTRACTOR SHALL INFORM THE DPW OF THE LOCATION OF THE DISPOSAL AND/OR BORROW SITE(S) REQUIRED FOR THIS PROJECT WHEN AN APPLICATION FOR A GRADING PERMIT IS MADE. THE DISPOSAL AND/OR BORROW SITE(S) MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.
8. NO GRADING WORK SHALL BE DONE SATURDAYS, SUNDAYS AND HOLIDAYS ANYTIME WITHOUT PRIOR APPROVAL FROM THE COUNTY DEPARTMENT OF PUBLIC WORKS. GRADING WORK ON NORMAL WORKING DAYS SHALL BE BETWEEN THE HOURS OF 8:00 A.M. TO 3:30 P.M.
9. FILLS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
10. THE CONTRACTOR SHALL REMOVE ALL VEGETATION BEFORE PLACING FILLS ON NATURAL GROUND SURFACE.

    RESERVOIR SITE & WATER FILLING STATION
    AREA GRADED: 0.42 ACRES
    TOTAL EXCAVATION: 318 C.Y.
    TOTAL EMBANKMENT: 181 C.Y.

11. SHOULD ANY UNANTICIPATED ARCHAEOLOGICAL SITE BE ENCOUNTERED, ALL WORK SHOULD CEASE IN THE IMMEDIATE AREA AND THE PLANNING DEPARTMENT AND STATE HISTORICAL PRESERVATION DIVISION SHALL BE NOTIFIED. SUBSEQUENT WORK SHALL RESUME AFTER CLEARANCE FROM THE PLANNING DEPARTMENT AND STATE HISTORICAL PRESERVATION DIVISION IS OBTAINED.

LEGEND:

- 2" A.C. PAVEMENT OVER 6" LAYER OF 1½" COMPACTED BASECOURSE
- 6" LAYER OF 2½" DRAIN ROCK
- 870 — FINISH CONTOUR
- EXISTING CONTOUR

0.10 M.G. - RESERVOIR SITE & WATER FILLING STATION GRADING PLAN

SCALE: 1"=10'

GRAPHIC SCALE:

SCALE: 1" = 10'

10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

PAUL T. MATSUDA
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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

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

0.10 M.G. – RESERVOIR SITE & WATER FILLING STATION GRADING PLAN

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

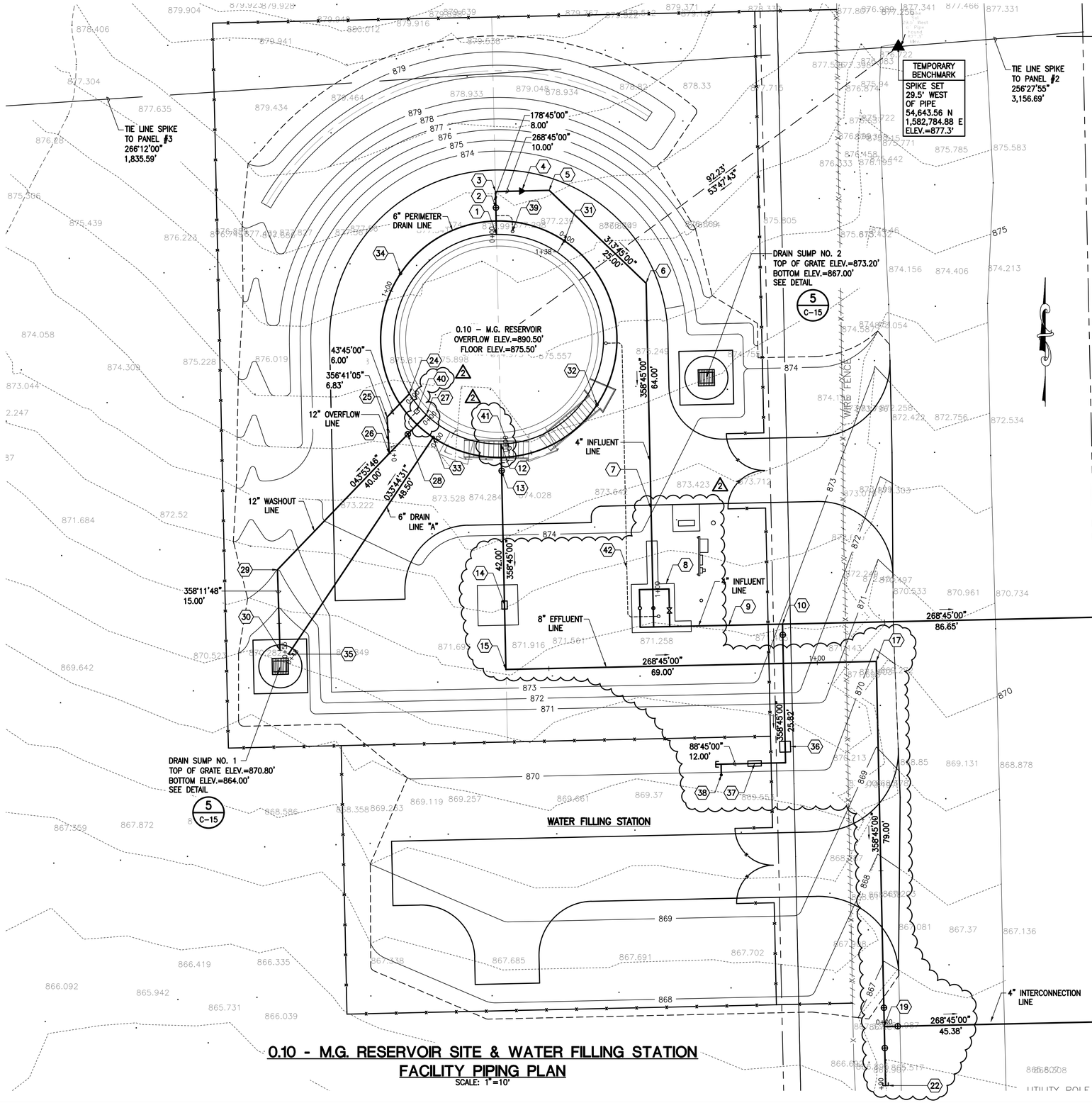
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

DWG. NO. C-4
SHEET 6 OF 54

FILE	POCKET	FOLDER	NO.

D:\OPROJ\2019\219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-SITE-GRADING.DWG



0.10 - M.G. RESERVOIR SITE & WATER FILLING STATION FACILITY PIPING PLAN

SCALE: 1"=10'

1. STA. 0+00 (8" INFL. LINE)
BEGIN RESERVOIR INFLUENT LINE.
1–8" D.I. SOLID BODY SLEEVE, M.J.
NECESSARY 8" D.I. NIPPLE
FOR PROFILE, SEE SHEET C-7

2. STA. 0+05 (8" INFL. LINE)
1–8" G.V., M.J., 250#
1–VALVE BOX

3. STA. 0+08 (8" INFL. LINE)
1–8" 90° D.I. BEND, M.J.
1–CONC. BLOCK

4. STA. 0+12 (8"/4" INFL. LINE)
1–8"x4" D.I. REDUCER, M.J.

5. STA. 0+18 (4" INFL. LINE)
1–4" 45° D.I. BEND, M.J.
1–CONC. BLOCK

6. STA. 0+43 (4" INFL. LINE)
1–4" 45° D.I. BEND, M.J.
1–CONC. BLOCK

7. STA. 0+85 (4" INFL. LINE)
BEGIN RESERVOIR INFLUENT CONTROL VALVE STATION

8. STA. 1+04 (4" INFL. LINE)
RESERVOIR INFLUENT CONTROL VALVE STATION
FOR DETAIL, SEE SHEET C-9

9. STA. 1+21 (4" INFL. LINE)
END RESERVOIR INFLUENT CONTROL VALVE STATION

10. STA. 1+31 (4" INFL. LINE)
1" TYPE A SERVICE LATERAL FOR WATER FILLING STATION
1–1" BRONZE DOUBLE STRAP SERVICE SADDLE FOR 4" D.I. PIPE
SEE DWS STANDARD DETAILS L9 AND L10

11. STA. 1+94± (4" INFL. LINE)
END OF 4" INFLUENT LINE.
1–4"x4" D.I. TEE, M.J., WITH MEGALUGS
1–4" D.I. SOLID BODY SLEEVE, M.J., WITH MEGALUGS
2–4" G.V., M.J., 250#, WITH MEGALUGS
2–VALVE BOXES
2–4" TRANSITION COUPLINGS (ROMAC MACRO HP, OR APPROVED EQUAL)
1–CONC. BLOCK WITH STRUCT. STRUTS
NECESSARY 4" D.I. NIPPLES
FOR SCHEMATIC CONNECTION, SEE DETAIL 1 C-16

12. STA. 0+00 (8" EFFL. LINE)
BEGIN RESERVOIR EFFLUENT LINE.
1–8" D.I. SOLID BODY SLEEVE, M.J.
NECESSARY 8" D.I. NIPPLE
FOR PROFILE, SEE SHEET C-7

13. STA. 0+05 (8" EFFL. LINE)
1–8" G.V., M.J., 250#
1–VALVE BOX

14. STA. 0+30 (8" EFFL. LINE)
1–8" ELECTOMAGNETIC FLOWMETER (KROHNE WATERFLUX 3070C WITH FLEXPOWER, OR APPROVED EQUAL) 2
1–METER BOX
SEE DETAIL 1 C-13
1–8" FLANGE COUPLING ADAPTER (EBAA MEGA-FLANGE SERIES 2108, OR APPROVED EQUAL)
1–8" D.I. SOLID BODY SLEEVE, M.J.
1–8" D.I. PIPE ADAPTER, F.E.xP.E., 5'–0" LONG

15. STA. 0+42 (8" EFFL. LINE)
1–8" 90° D.I. BEND, M.J.
1–CONC. BLOCK

16. STA. 0+43 (8" EFFL. LINE)
1–8" 45° D.I. BEND, M.J.
1–CONC. BLOCK

17. STA. 1+11 (8" EFFL. LINE)
1–8" 90° D.I. BEND, M.J.
1–CONC. BLOCK

18. STA. 1+10 (8" EFFL. LINE)
1–8" 45° D.I. BEND, M.J.
1–CONC. BLOCK

STA. 1+79 (8" EFFL. LINE)=
19. STA. 0+00 (4" INTERCONNECTION LINE)
BEGIN 4" INTERCONNECTION LINE.
FOR PROFILE, SEE SHEET C-7
1–8"x4" D.I. TEE, M.J.
3–8" G.V., M.J., 250#
3–VALVE BOX
1–CONC. BLOCK

20. STA. 1+79 (8" EFFL. LINE)
1–8" G.V., M.J., 250#
1–VALVE BOX

21. STA. 1+90 (8" EFFL. LINE)
1–CONC. THRUST BEAM WITH REVERSE BELL PIECE
FOR DETAIL, SEE DWS STANDARD DETAIL W16 AND W17 TYPE D SOIL CONDITION

22. STA. 1+90 (8" EFFL. LINE)
END OF 8" EFFLUENT LINE
1–8" D.I. CAP WITH 2" CLEANOUT
1–CLEANOUT BOX
1–CONC. BLOCK

23. STA. 0+46± (4" INTERCONN. LINE)
END OF 4" INTERCONNECTION LINE.
1–4"x4" D.I. TEE, M.J., WITH MEGALUGS
1–4" D.I. SOLID BODY SLEEVE, M.J., WITH MEGALUGS
2–4" G.V., M.J., 250#, WITH MEGALUGS
2–VALVE BOXES
2–4" TRANSITION COUPLINGS (ROMAC MACRO HP, OR APPROVED EQUAL)
1–CONC. BLOCK WITH STRUCT. STRUTS
NECESSARY 4" D.I. NIPPLES
FOR SCHEMATIC CONNECTION, SEE DETAIL 1 C-16

24. STA. 0+00 (12" OVERFLOW LINE)
BEGIN RESERVOIR OVERFLOW LINE.
1–12" D.I. SOLID BODY SLEEVE, M.J.
NECESSARY 12" D.I. NIPPLE
FOR PROFILE, SEE SHEET C-8

25. STA. 0+06 (12" OVERFLOW LINE)
1–12" 45° D.I. BEND, M.J.
1–CONC. BLOCK

STA. 0+12.83 (12" OVERFLOW LINE)=
26. STA. 0+10 (12" WASHOUT LINE)
END OF 12" OVERFLOW LINE.
1–12"x12" D.I. WYE, M.J.
1–CONC. BLOCK

27. STA. 0+00 (12" WASHOUT LINE)
BEGIN RESERVOIR WASHOUT LINE.
1–12" D.I. SOLID BODY SLEEVE, M.J.
NECESSARY 12" D.I. NIPPLE
FOR PROFILE, SEE SHEET C-8

28. STA. 0+05 (12" WASHOUT LINE)
1–12" BFV, M.J., 250#
1–VALVE BOX

29. STA. 0+40 (12" WASHOUT LINE)
1–12" 45° D.I. BEND, M.J.
1–CONC. BLOCK

30. STA. 0+55 (12" WASHOUT LINE)
END OF 12" WASHOUT LINE.
PENETRATE WALL OF DRAIN SUMP
1–12" D.I. NIPPLE, 4'–0" LONG
1–12" D.I. SOLID BODY SLEEVE, M.J.
1–12" CHECK VALVE (TIDEFLEX TF-1, OR APPROVED EQUAL)

31. STA. 0+00 (6" PERIMETER DRAIN)
BEGIN 6" PVC PERIMETER DRAIN
HIGH POINT – PIPE INV. ELEV.=872.20
PROVIDE 4" OBSERVATION PORT 3 C-15
SEE DETAIL
FOR PROFILE, SEE SHEET C-8

32. STA. 0+34.55 (6" PERIMETER DRAIN)
PIPE INV. ELEV.=871.90
PROVIDE 4" OBSERVATION PORT 3 C-15
SEE DETAIL

STA. 0+69.11 (6" PERIMETER DRAIN)=
33. STA. 0+00 (6" DRAIN LINE "A")
BEGIN 6" PVC DRAIN LINE "A"
LOW POINT – PIPE INV. ELEV.=871.60
PROVIDE 4" OBSERVATION PORT 3 C-15
SEE DETAIL
1–6"x6" PVC TEE
FOR PROFILE, SEE SHEET C-8

34. STA. 1+03.66 (6" PERIMETER DRAIN)
PIPE INV. ELEV.=871.90
PROVIDE 4" OBSERVATION PORT 3 C-15
SEE DETAIL

35. STA. 1+38.21 (6" DRAIN LINE "A")
END OF 6" DRAIN LINE "A"
PENETRATE WALL OF DRAIN SUMP
1–6" D.I. PIPE NIPPLE, 4'–0" LONG
1–6" D.I. SOLID BODY SLEEVE, M.J.
1–6" CHECK VALVE (TIDEFLEX TF-1, OR APPROVED EQUAL)

36. 1" WATER SUPPLY LINE TO FILLING STATION
1–⅝" WATER METER
1–TYPE B METER BOX AND COVER

37. 1" WATER SUPPLY LINE TO FILLING STATION
1–1" RPP BACKFLOW PREVENTER (WATTS SERIES 909QTS, OR APPROVED EQUAL)

38. 1" WATER SUPPLY LINE TO FILLING STATION
SMALL SPIGOT SEE DETAIL 6 C-13

39. WATER SAMPLING STATION (INFLUENT)
SEE DETAIL 2 C-15

40. RESERVOIR LEVEL TRANSMITTER
SEE DETAIL 5 C-14

41. WATER SAMPLING STATION (EFFLUENT)
SEE DETAIL 2 C-15

42. PILOT CONTROL LINES
2 – ⅜" POLYETHYLENE TUBING WITHIN 2½" DIAMETER PVC SCH. 40 CONDUIT. FROM 4" RESERVOIR INFLUENT CONTROL VALVE TO CF-1 FLOAT CONTROL IN RESERVOIR. PROVIDE 18" MINIMUM COVER OVER CONDUIT.

GRAPHIC SCALE:
SCALE: 1" = 10'
10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

0.10 – M.G. RESERVOIR SITE & WATER FILLING STATION FACILITY PIPING PLAN

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

DWG. NO. C-5
SHEET 7 OF 54

FILE | POCKET | FOLDER | NO.

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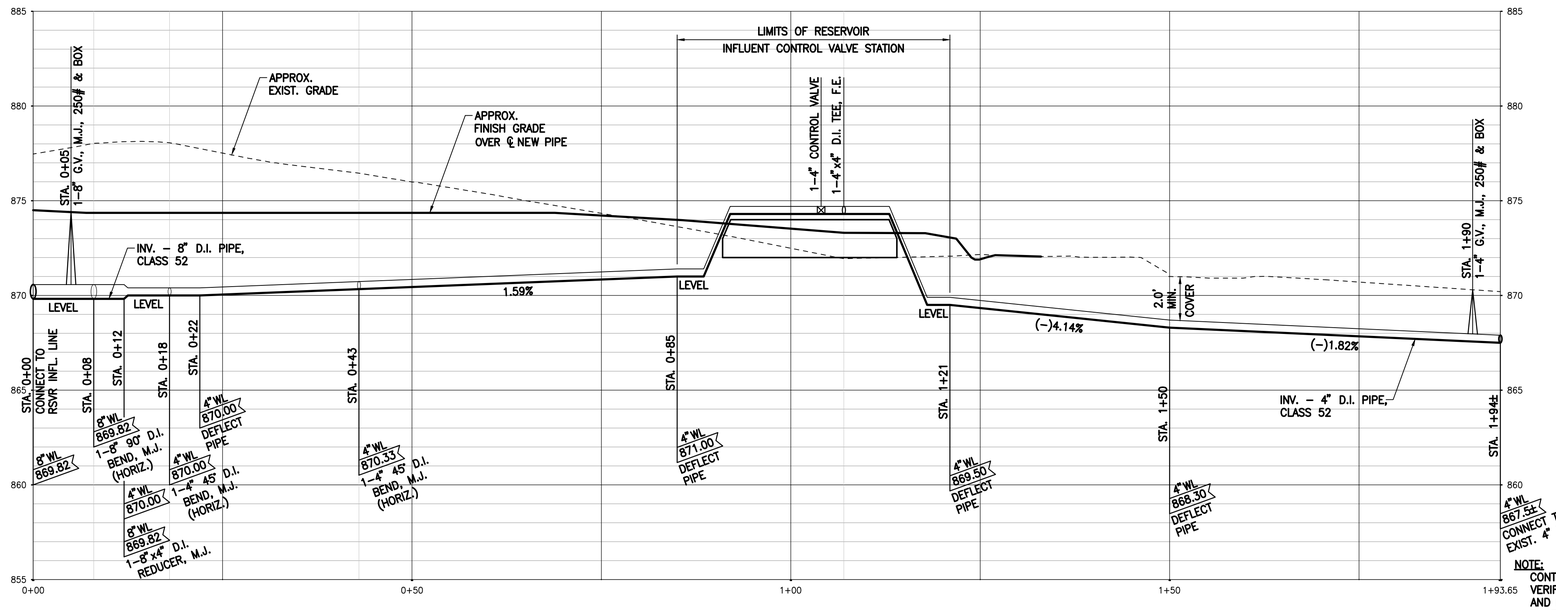
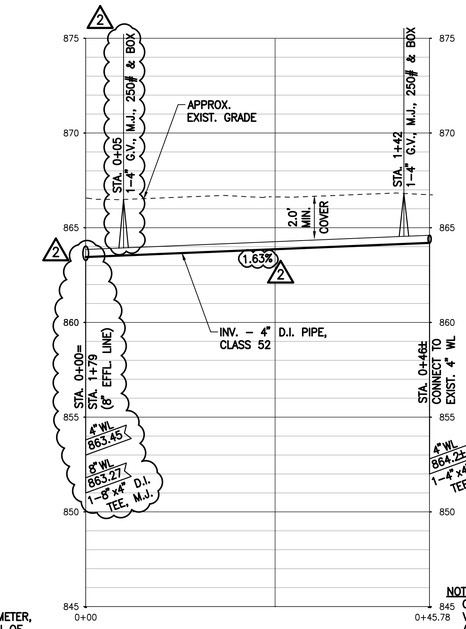


4"/8" INFLUENT LINE - PROFILE

SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'

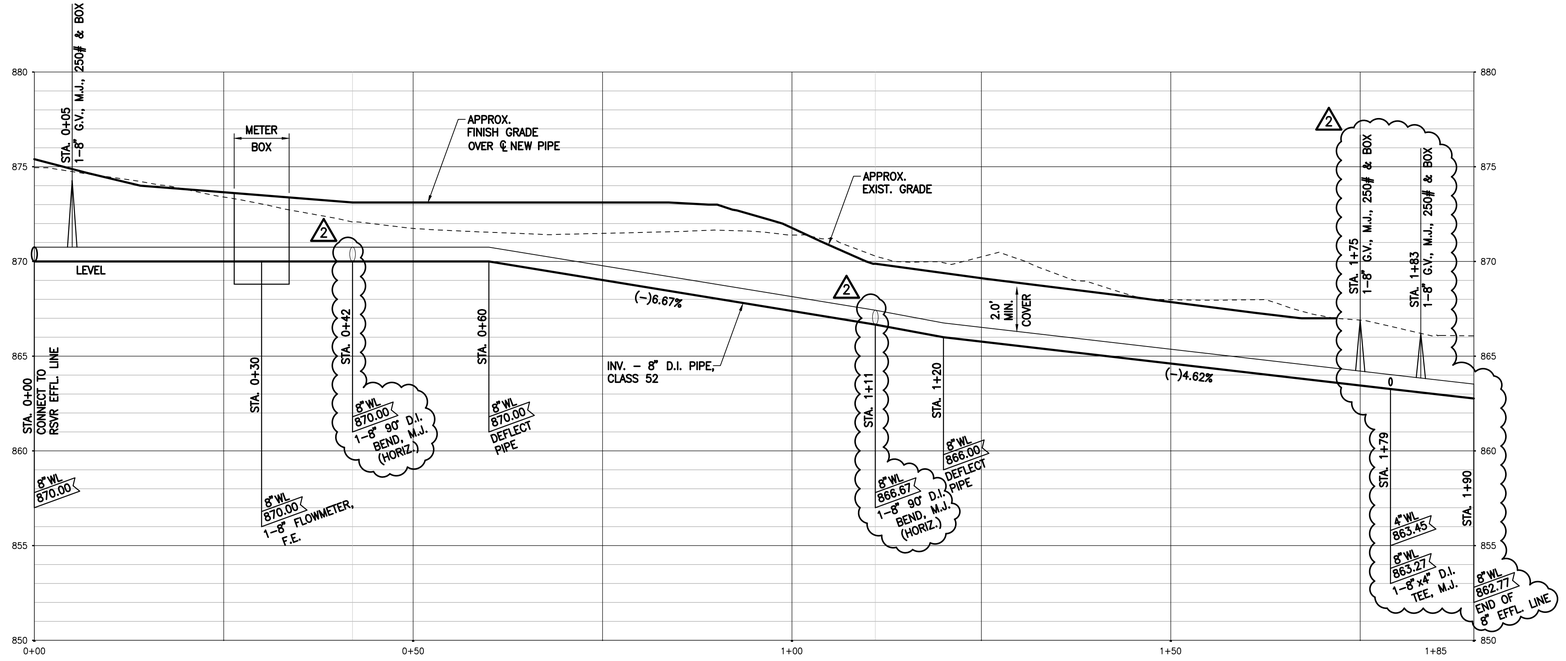
NOTE:
CONTRACTOR SHALL VERIFY LOCATION, DIAMETER, AND INVERT ELEVATION OF EXISTING 4" AC PIPE.



4" INTERCONNECTION LINE - PROFILE

SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'

NOTE:
CONTRACTOR SHALL VERIFY LOCATION, DIAMETER, AND INVERT ELEVATION OF EXISTING 4" AC PIPE.



8" EFFLUENT LINE - PROFILE

SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'

GRAPHIC SCALES:

SCALE: 1" = 4'
4' 2' 0 4' 8'

SCALE: 1" = 10'
10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

INFLUENT, EFFLUENT & INTERCONNECTION LINE PROFILES

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

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G70
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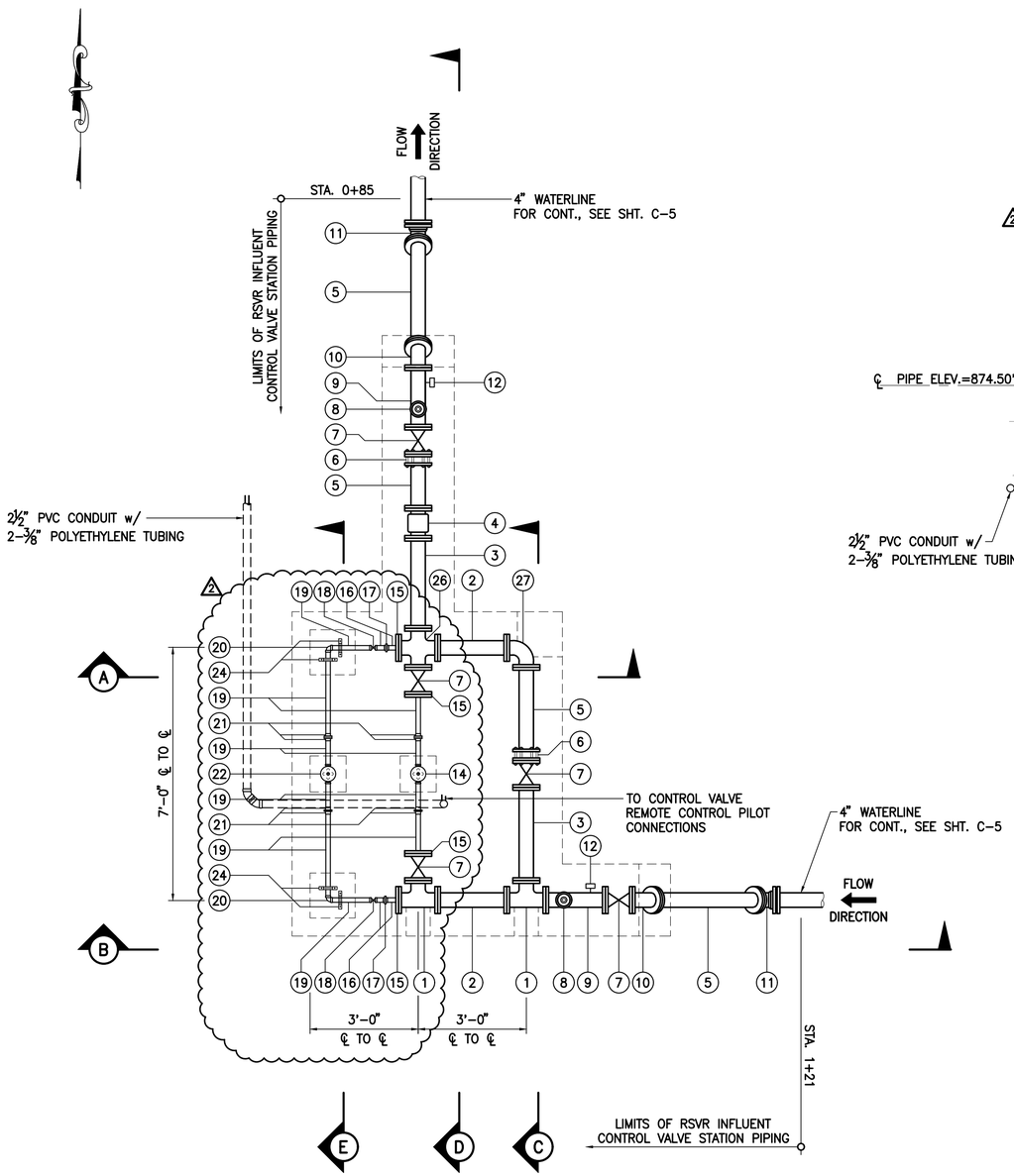
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

DWG. NO. C-7
SHEET 9 OF 54

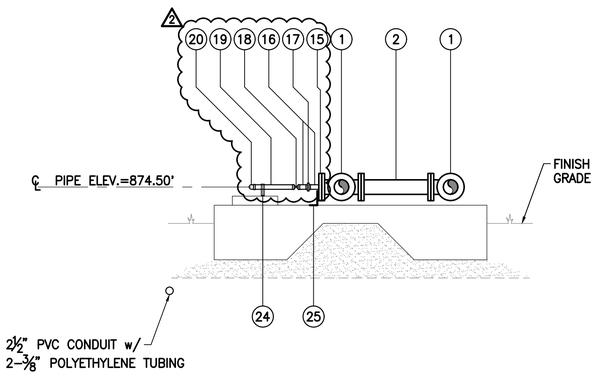
FILE	POCKET	FOLDER	NO.

D:\OPROJ\2019\19-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-PR-1.DWG



RESERVOIR INFLUENT CONTROL VALVE STATION PIPE ARRANGEMENT PLAN

SCALE: ½"=1'-0"



SECTION - A

SCALE: ½"=1'-0"

GRAPHIC SCALE:

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

2' 1' 6" 0 1 2 3 4

MATERIAL LIST

ITEM	DESCRIPTION
1	4"x4" D.I. TEE, F.E.
2	4" D.I. SPOOL, F.E.xF.E., 23" LONG
3	4" D.I. SPOOL, F.E.xF.E., 30" LONG
4	4" ELECTROMAGNETIC FLOWMETER KROHNE WATERFLUX 3070C WITH FLEXPOWER, OR APPROVED EQUAL. (2)
5	4" D.I. ADAPTER, F.E.xP.E., CUT TO FIT
6	4" FLANGE COUPLING ADAPTER, ROMAC STYLE FCA501, WITH STAINLESS STEEL BOLTS, NUTS, AND ANCHOR PINS
7	4" GATE VALVE, CLASS 200, F.E., OS & Y, WITH HAND WHEEL
8	1" COMBINATION AIR VALVE ASSEMBLY, SEE DETAIL 2/C-16
9	4" D.I. SPOOL, F.E.xF.E., 20" LONG
10	4" 45° D.I. BEND, F.E.
11	4" 45° D.I. BEND, M.J., WITH MEGALUGS
12	PRESSURE GAGE ASSEMBLY, SEE DETAIL 4/C-16
13	4" D.I. SPOOL, F.E.xF.E., 19" LONG
14	(2) 1½" COMBINATION PRESSURE RELIEF AND REMOTE CONTROL VALVE, F.E., CLA-VAL MODEL NO. 56G-03KC WITH X101 VALVE POSITION INDICATOR, KO ANTI-CAVITATION TRIM, AND CF1-C1 FLOAT CONTROL. CRL RANGE: 20-200 PSI
15	4" BLIND FLANGE WITH 1½" NPT TAP
16	1½" BRASS NIPPLE, SCH. 40
17	1½" BRONZE UNION, S.E.
18	1½" BRASS BALL VALVE, S.E.
19	1½" BRASS PIPE, SCH. 40
20	1½" 90° BRASS ELBOW, S.E.
21	1½" FORD LOK-PAK METER COUPLING, CAT. NO. CF35-66, WITH STAINLESS STEEL BOLTS
22	1½" PRESSURE RELIEF VALVE, S.E., CLA-VAL MODEL NO. 50G-01 KC WITH X 101 VALVE POSITION INDICATOR AND KO ANTI-CAVITATION TRIM CRL RANGE : 20-200 PSI
~~23~~	~~STAINLESS STEEL PIPE STRAP FOR 4" D.I. PIPE, SEE DETAIL~~ ~~3/C-13~~ (2)
24	STAINLESS STEEL PIPE STRAP FOR 1½" BRASS PIPE, SEE DETAIL 3/C-13
25	HOLD DOWN CLIP, SEE DETAIL 2/C-13
26	4"x4"x4"x4" D.I. CROSS, F.E.
27	4" 90° D.I. BEND, F.E.
~~28~~	~~1½" COMBINATION PRESSURE RELIEF AND SOLENOID CONTROL VALVE, S.E., CLA-VAL MODEL, SBG-07KC WITH X101 VALVE POSITION INDICATOR, KO ANTI-CAVITATION TRIM, OPENING & CLOSING SPEED CONTROLS, AND PILOT ISOLATION VALVES & Y-STRAINER. CRL RANGE: 20-200 PSI~~
~~29~~	~~1½" BRASS TEE, S.E.~~ (2)

NOTE:
1. ALL FLANGES SHALL BE ANSI B16.1, CLASS 125 UNLESS OTHERWISE NOTED.
2. ALL PIPE SUPPORT ASSEMBLES SHALL BE STAINLESS STEEL.
3. NUTS AND BOLTS SHALL BE STAINLESS STEEL.
4. PROVIDE FELT PAPER BETWEEN STAINLESS STEEL PIPE STRAP AND PIPE.
5. ALL CLAYTON VALVES SHALL BE EPOXY COATED INTERNALLY.

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR INFLUENT CONTROL VALVE STATION PIPE ARRANGEMENT PLAN, SECTION & MATERIAL LIST

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

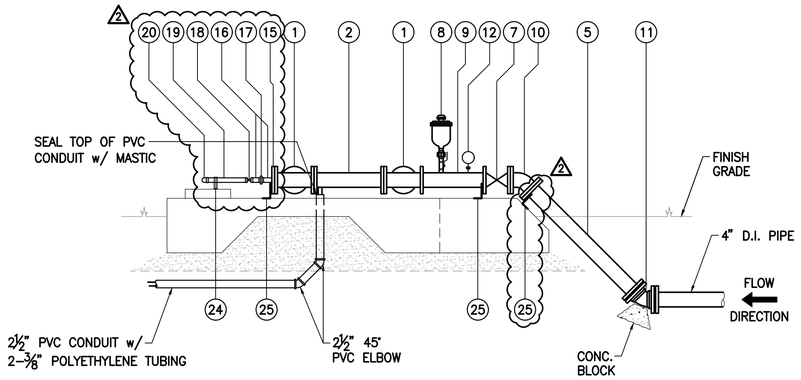
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

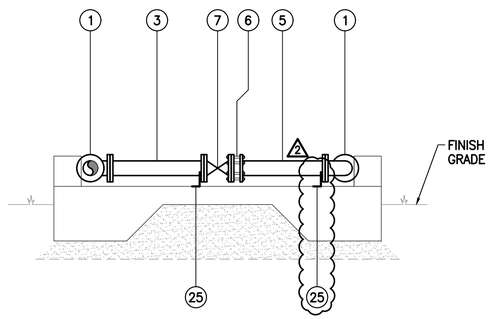
DWG. NO. C-9
SHEET 11 OF 54

FILE | POCKET | FOLDER | NO.

D:\(PROJ\2019\219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-M-1.DWG



SECTION - B
SCALE: ½"=1'-0"



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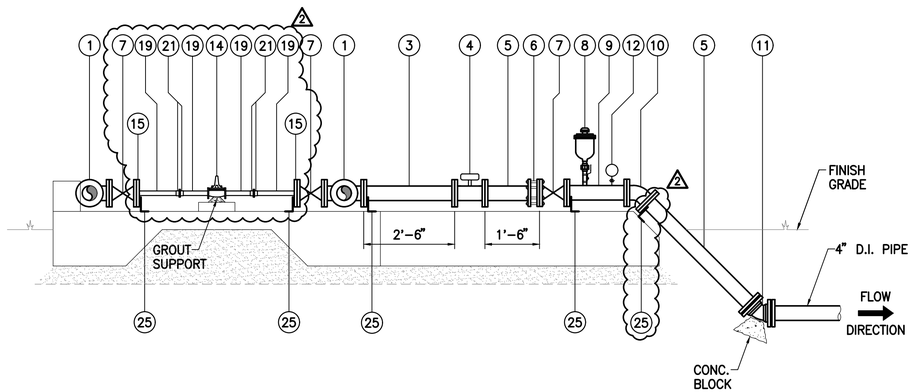

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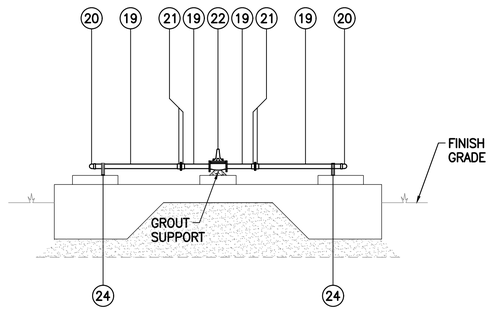


SECTION - E
SCALE: ½"=1'-0"

MATERIAL LIST

ITEM	DESCRIPTION
1	4"x4" D.I. TEE, F.E.
2	4" D.I. SPOOL, F.E.xF.E., 23" LONG
3	4" D.I. SPOOL, F.E.xF.E., 30" LONG
4	4" ELECTROMAGNETIC FLOWMETER KROHNE WATERFLUX 3070C WITH FLEXPOWER, 2 OR APPROVED EQUAL.
5	4" D.I. ADAPTER, F.E.xP.E., CUT TO FIT
6	4" FLANGE COUPLING ADAPTER, ROMAC STYLE FCA501, WITH STAINLESS STEEL BOLTS, NUTS, AND ANCHOR PINS
7	4" GATE VALVE, CLASS 200, F.E., OS & Y, WITH HAND WHEEL
8	1" COMBINATION AIR VALVE ASSEMBLY, SEE DETAIL 2/C-16
9	4" D.I. SPOOL, F.E.xF.E., 20" LONG
10	4" 45° D.I. BEND, F.E.
11	4" 45° D.I. BEND, M.J., WITH MEGALUGS
12	PRESSURE GAGE ASSEMBLY, SEE DETAIL 4/C-16
13	4" D.I. SPOOL, F.E.xF.E., 19" LONG
14	2 1½" COMBINATION PRESSURE RELIEF AND REMOTE CONTROL VALVE, F.E., CLA-VAL MODEL NO. 56G-03KC WITH X101 VALVE POSITION INDICATOR, KO ANTI-CAVITATION TRIM, AND CF1-C1 FLOAT CONTROL. CRL RANGE: 20-200 PSI
15	4" BLIND FLANGE WITH 1½" NPT TAP
16	1½" BRASS NIPPLE, SCH. 40
17	1½" BRONZE UNION, S.E.
18	1½" BRASS BALL VALVE, S.E.
19	1½" BRASS PIPE, SCH. 40
20	1½" 90° BRASS ELBOW, S.E.
21	1½" FORD LOK-PAK METER COUPLING, CAT. NO. CF35-66, WITH STAINLESS STEEL BOLTS
22	1½" PRESSURE RELIEF VALVE, S.E., CLA-VAL MODEL NO. 50G-01 KC WITH X 101 VALVE POSITION INDICATOR AND KO ANTI-CAVITATION TRIM CRL RANGE : 20-200 PSI
~~23~~	~~STAINLESS STEEL PIPE STRAP FOR 4" D.I. PIPE, SEE DETAIL~~ 3/C-13 2
24	STAINLESS STEEL PIPE STRAP FOR 1½" BRASS PIPE, SEE DETAIL 3/C-13
25	HOLD DOWN CLIP, SEE DETAIL 2/C-13
26	4"x4"x4"x4" D.I. CROSS, F.E.
27	4" 90° D.I. BEND, F.E.
~~28~~	~~1½" COMBINATION PRESSURE RELIEF AND SOLENOID CONTROL VALVE, S.E., CLA-VAL MODEL 58G-07KC WITH X101 VALVE POSITION INDICATOR, KO ANTI-CAVITATION TRIM, OPENING & CLOSING SPEED CONTROLS, AND PILOT ISOLATION VALVES & Y-STRAINER. CRL RANGE: 20-200 PSI~~
~~29~~	~~1½" BRASS TEE, S.E.~~ 2

NOTE:
1. ALL FLANGES SHALL BE ANSI BI6.1, CLASS 125 UNLESS OTHERWISE NOTED.
2. ALL PIPE SUPPORT ASSEMBLES SHALL BE STAINLESS STEEL.
3. NUTS AND BOLTS SHALL BE STAINLESS STEEL.
4. PROVIDE FELT PAPER BETWEEN STAINLESS STEEL PIPE STRAP AND PIPE.
5. ALL CLAYTON VALVES SHALL BE EPOXY COATED INTERNALLY.

GRAPHIC SCALE:
SCALE: 1/2" = 1'-0"
2' 1' 6" 0 1 2 3 4

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR INFLUENT CONTROL VALVE STATION
SECTIONS & MATERIAL LIST

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

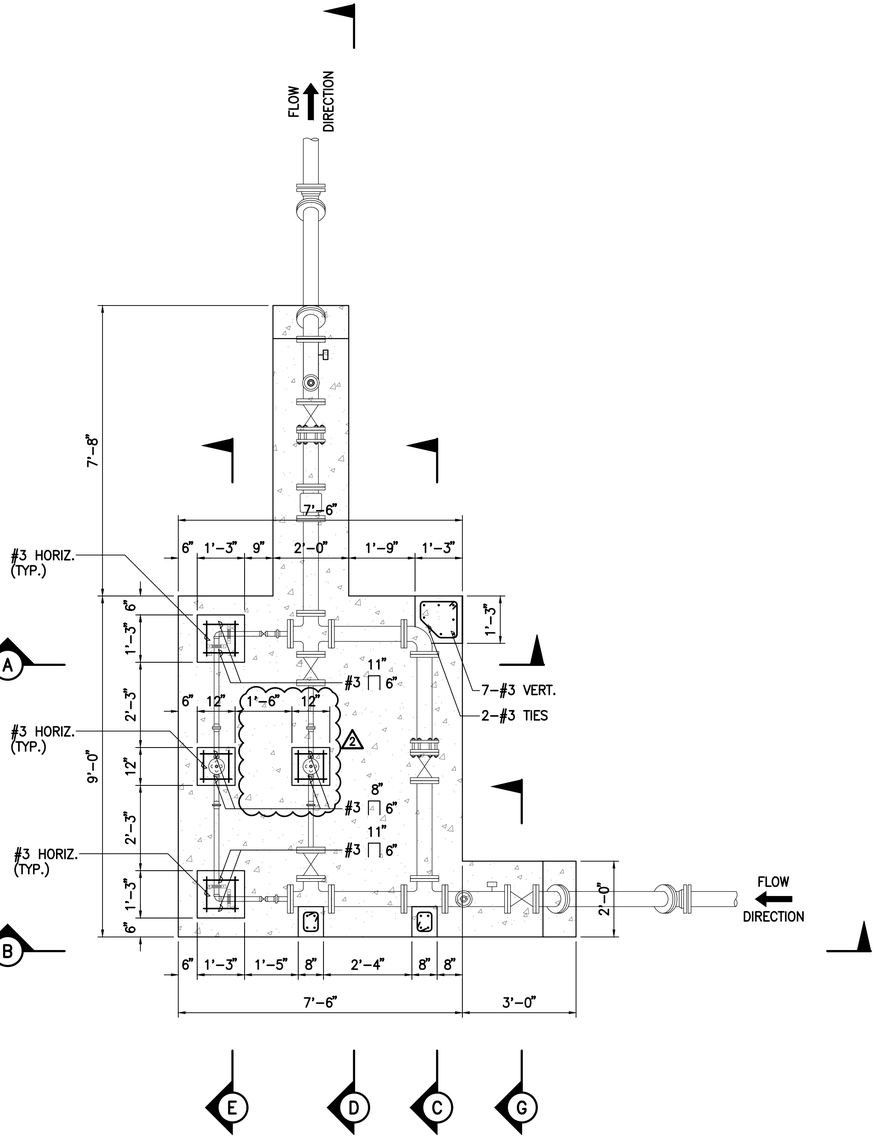
G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020

DWG. NO.
C-10
SHEET 12 OF 54

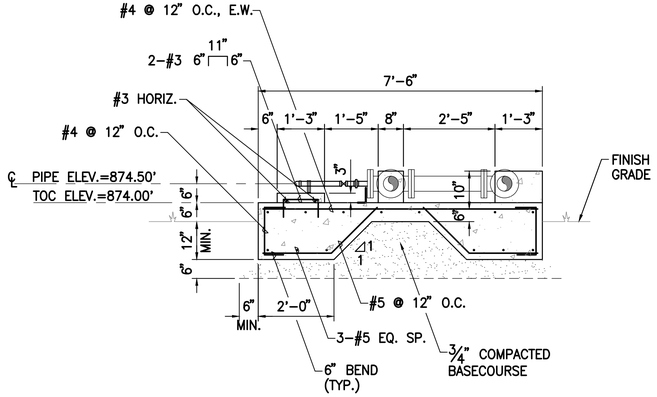
FILE | POCKET | FOLDER | NO.

D:\DPROJ\2019\219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-M-2.DWG



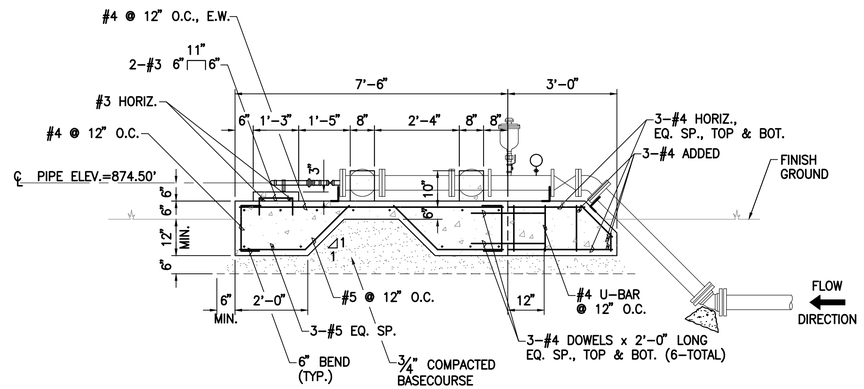
RESERVOIR INFLUENT CONTROL VALVE STATION FOUNDATION PLAN

SCALE: ½"=1'-0"



SECTION - A

SCALE: ½"=1'-0"



SECTION - B

SCALE: ½"=1'-0"

GRAPHIC SCALE:

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

2' 1' 6" 0 1 2 3 4

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

PAUL T. MATSUDA
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No. 10901-C
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SIGNATURE
LICENSE EXP., DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR INFLUENT CONTROL VALVE STATION
FOUNDATION PLAN & SECTIONS

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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DWG. NO. C-11
SHEET 13 OF 54

FILE	POCKET	FOLDER	NO.

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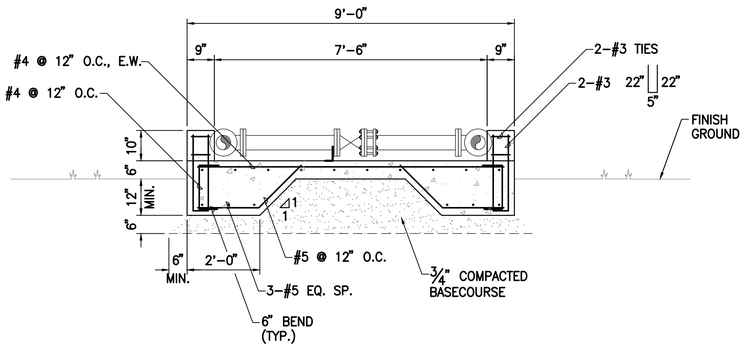
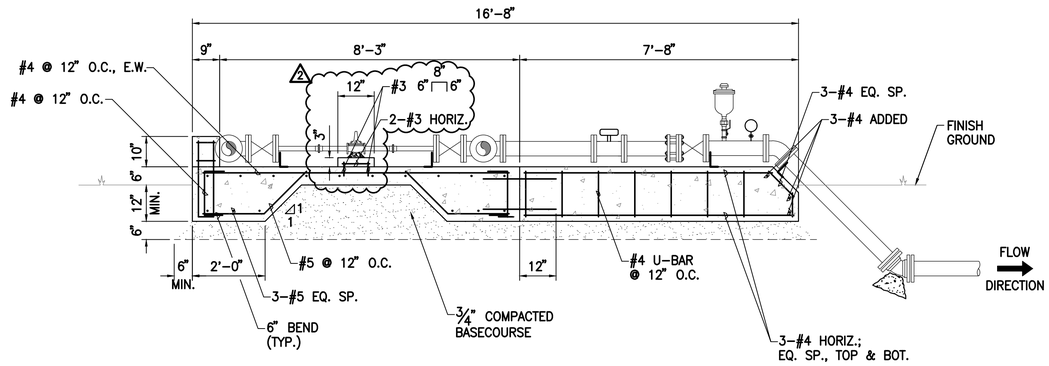
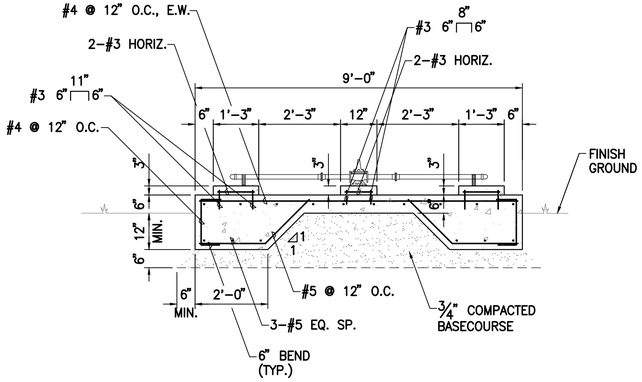


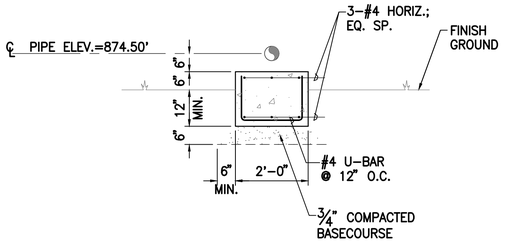
SECTION - C
SCALE: 1/2"=1'-0"



SECTION - D
SCALE: 1/2"=1'-0"



SECTION - E
SCALE: 1/2"=1'-0"



SECTION - G
SCALE: 1/2"=1'-0"

GRAPHIC SCALE:

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

2' 1' 6" 0 1 2 3 4

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

DWG. NO.
C-12
SHEET 14 OF 54

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No. 10901-C
HAWAII, U.S.A.

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SIGNATURE
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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR INFLUENT CONTROL VALVE STATION SECTIONS

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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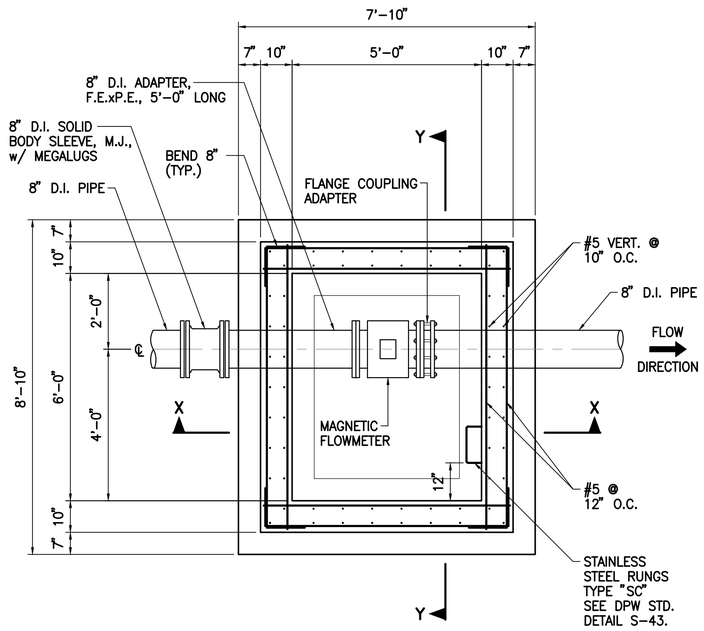
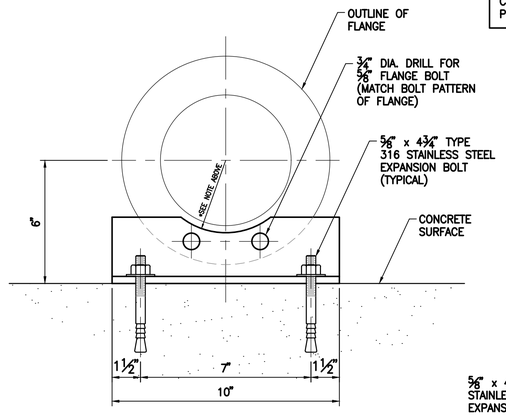
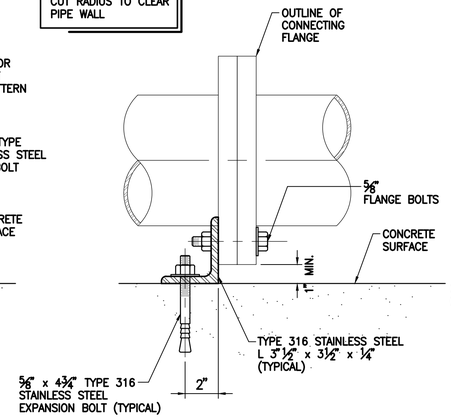


1 C-13 **PLAN - FLOWMEASURE VAULT**
NOT TO SCALE



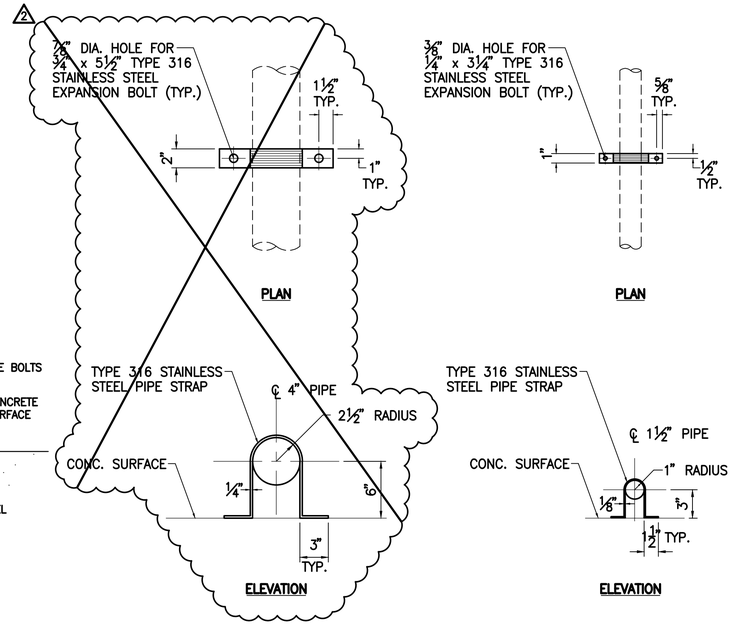
FRONT ELEVATION

*NOTE:
CUT RADIUS TO CLEAR PIPE WALL

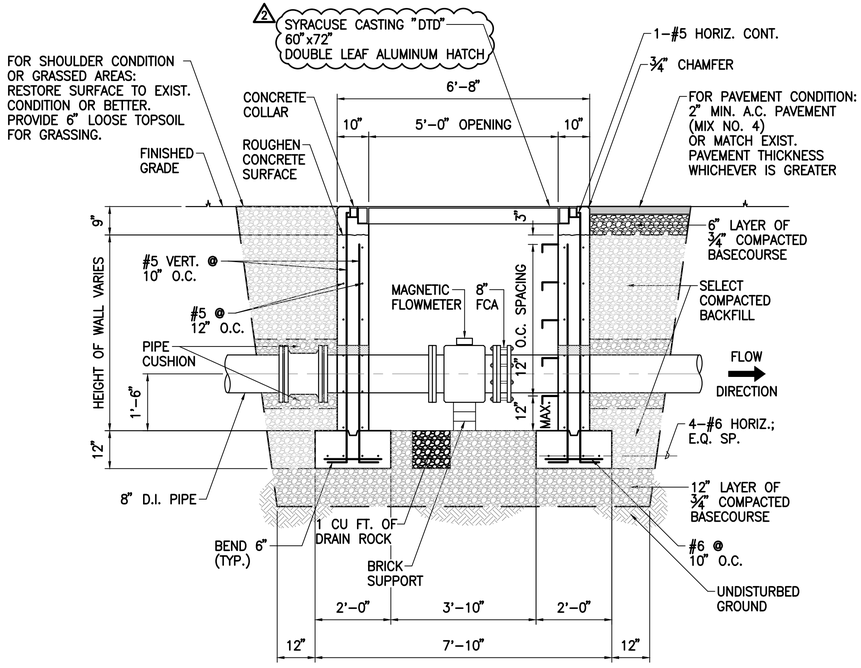


SIDE ELEVATION

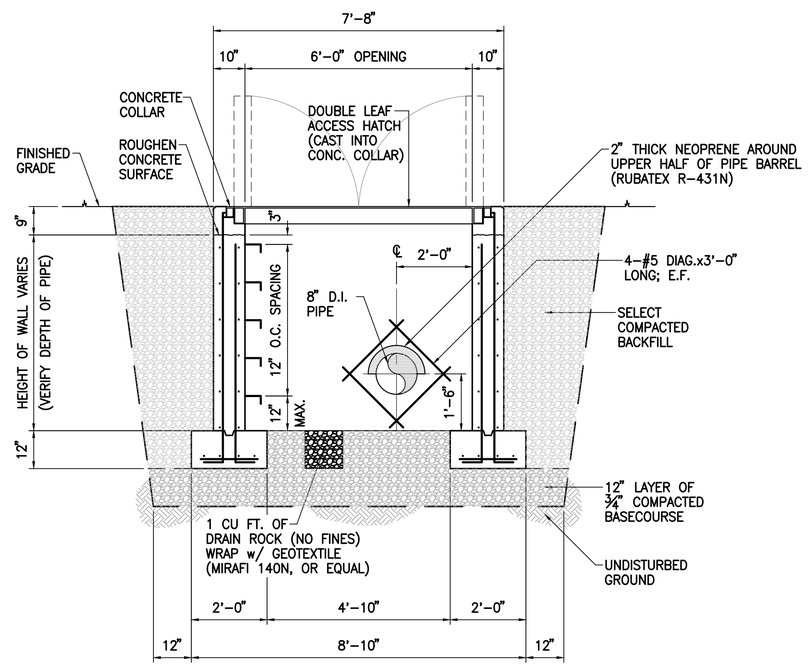
2 C-13 **HOLD DOWN CLIP DETAIL (4" PIPE)**
NOT TO SCALE



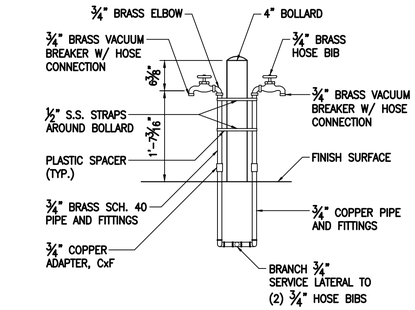
3 C-13 **PIPE STRAP DETAIL**
SCALE: 1½"=1'-0"



4 C-13 **SECTION "X-X"**
NOT TO SCALE



5 C-13 **SECTION "Y-Y"**
NOT TO SCALE



6 C-13 **SMALL SPIGOT DETAIL**
NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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HAWAII, U.S.A.

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. **C-13**
SHEET 15 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

CIVIL DETAILS

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

G70
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WWW.G70.DESIGN

FEBRUARY 2020

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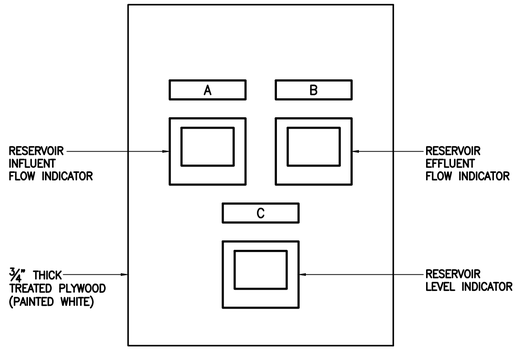
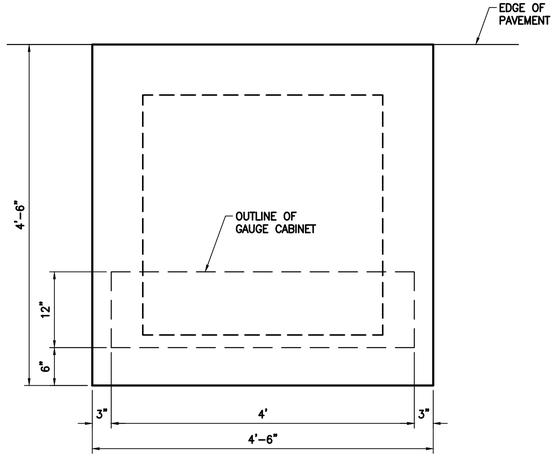


GAUGE CABINET LABEL SCHEDULE	
LABEL	**DESCRIPTION**
A	RESERVOIR INFLUENT FLOW
B	RESERVOIR EFFLUENT FLOW
C	RESERVOIR WATER LABEL

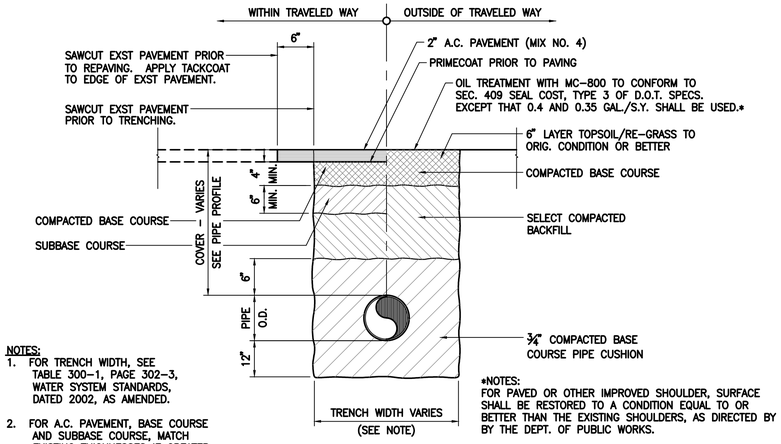
NOTES:

MOUNT PLYWOOD WITH NEMA 4X 12 GA. TYPE 316L STAINLESS STEEL CABINET (HOFFMAN CAT. NO. A62H4812SS6LP3PT, OR APPROVED EQUAL). PAINT EXTERIOR OF S.S. CABINET WITH TWO COATS OF HEAT-REFLECTIVE PAINT (COLOR: WHITE), TUFF-GARD HEAT BLOCK, OR APPROVED EQUAL. 2

1 C-14 **GAUGE CABINET ELEVATION**
NOT TO SCALE



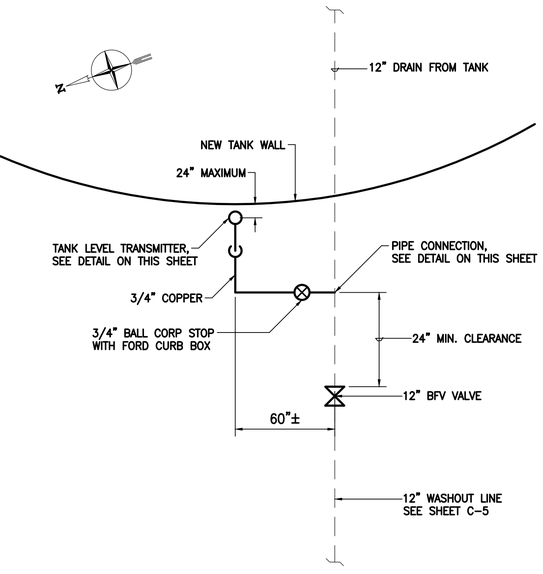
2 C-14 **CONCRETE PAD FOR GAUGE CABINET**
SCALE: 1"=1'-0"



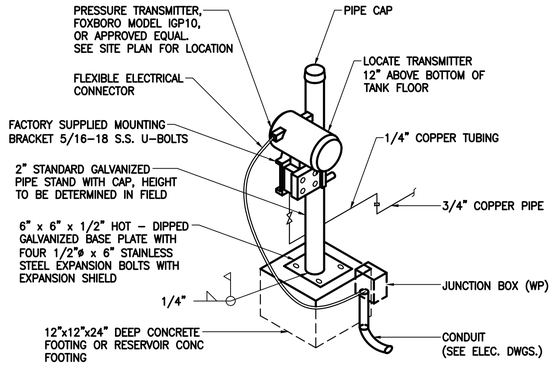
NOTES:
1. FOR TRENCH WIDTH, SEE TABLE 300-1, PAGE 302-3, WATER SYSTEM STANDARDS, DATED 2002, AS AMENDED.
2. FOR A.C. PAVEMENT, BASE COURSE AND SUBBASE COURSE, MATCH EXISTING THICKNESSES IF GREATER THAN SHOWN ON THIS DETAIL.

*NOTES:
FOR PAVED OR OTHER IMPROVED SHOULDER, SURFACE SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN THE EXISTING SHOULDERS, AS DIRECTED BY BY THE DEPT. OF PUBLIC WORKS.

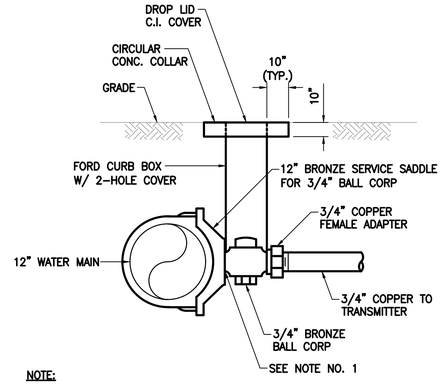
3 C-14 **TYPICAL DUCTILE IRON PIPE TRENCH SECTION**
NOT TO SCALE



4 C-14 **TANK LEVEL TRANSMITTER PLAN**
NOT TO SCALE

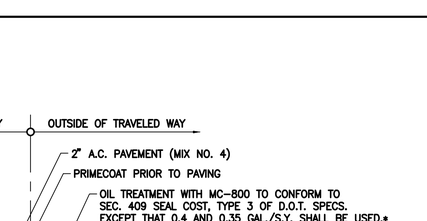


5 C-14 **TANK LEVEL TRANSMITTER DETAIL**
NOT TO SCALE



NOTE:
1. PROVIDE SERVICE SADDLE OUTLET AND ¾" BRONZE BALL CORP INLET WITH AWWA TAPERED THREAD.

6 C-14 **PIPE CONNECTION DETAIL**
NOT TO SCALE



7 C-13 **TYPICAL THICKENED EDGE DETAIL**
SCALE: 1"=1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

CIVIL DETAILS

PAUL T. MATSUDA
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No. 10901-C
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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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DWG. NO. C-14
SHEET 16 OF 54

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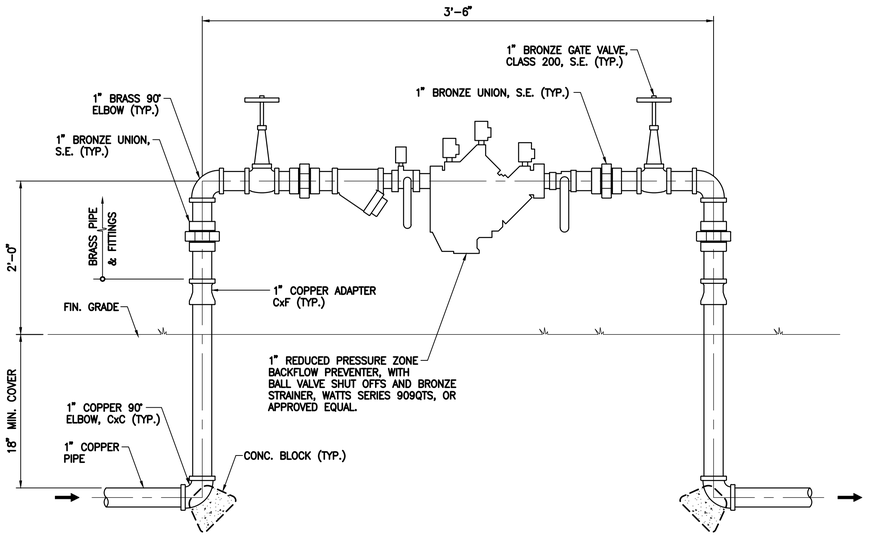
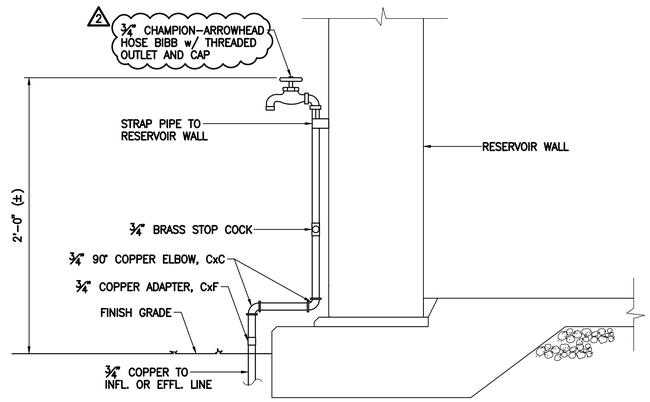
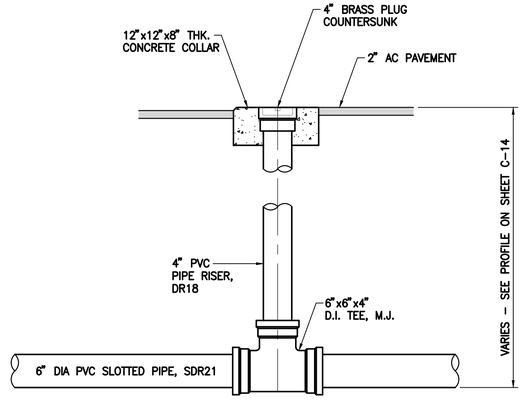


1 C-15 **BACKFLOW PREVENTER ASSEMBLY DETAIL**
NOT TO SCALE

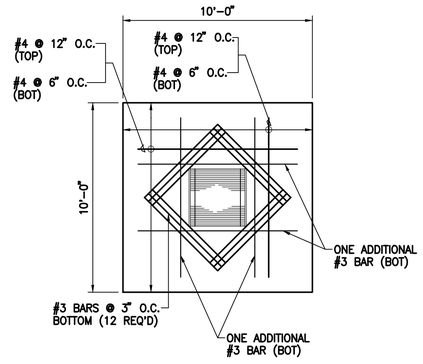


NOTE:
1. STRAPS AND CLAMPS TO SUPPORT PIPING SHALL BE STAINLESS STEEL WITH FELT PAPER BETWEEN PIPE AND STRAP/CLAMP.

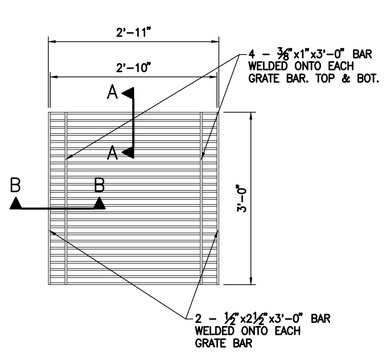
2 C-15 **WATER SAMPLING STATION DETAIL**
NOT TO SCALE



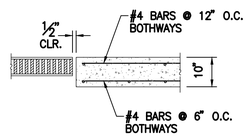
3 C-15 **OBSERVATION PORT DETAIL FOR TANK PERIMETER DRAIN**
NOT TO SCALE



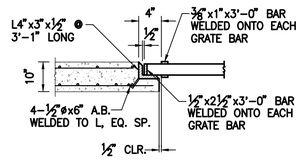
PLAN



GRATING



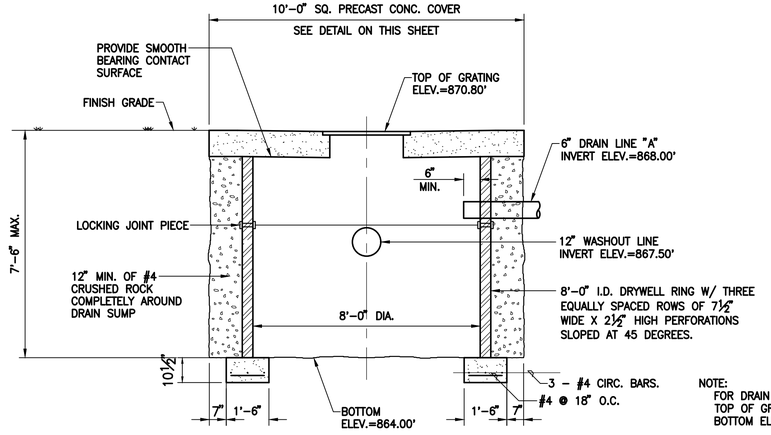
SECTION A-A



SECTION B-B

NOTES
1. ALL WELD 5/16".
2. ALL STEEL SHALL BE STRUCTURAL GRADE.
3. GRATES AND FRAME L'S SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.

4 C-15 **DRAIN SUMP COVER DETAILS**
NOT TO SCALE



NOTE:
FOR DRAIN SUMP NO. 2:
TOP OF GRATING ELEV.=874.70'
BOTTOM ELEV.=868.00'

5 C-15 **DRAIN SUMP DETAIL**
SCALE: ⅜"=1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-15
SHEET 17 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

CIVIL DETAILS

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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WWW.G70.DESIGN

FEBRUARY 2020

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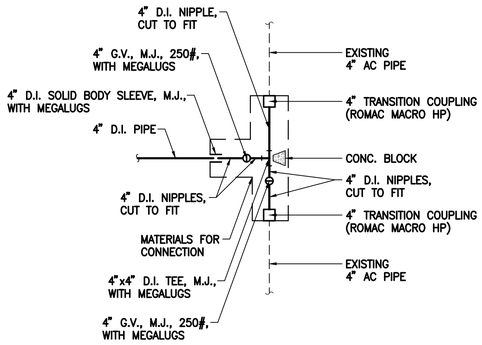
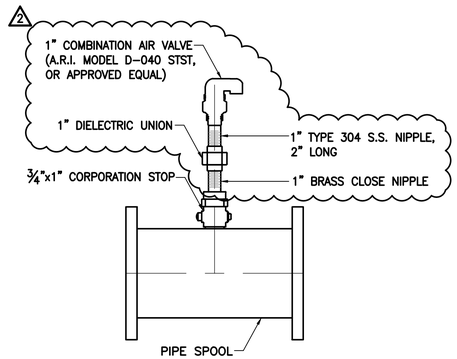
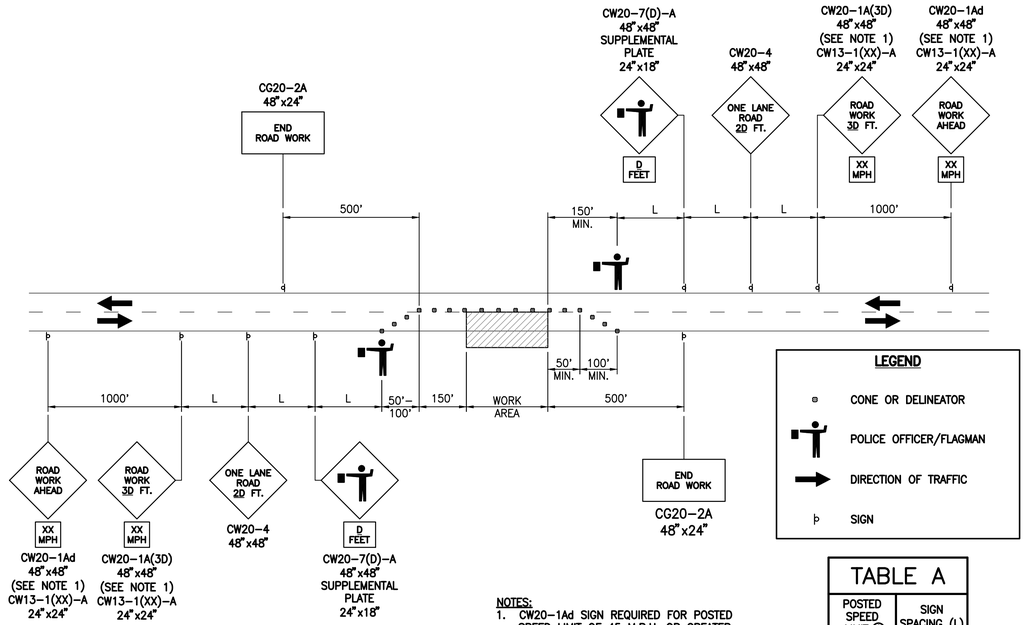


NOTE:
1. THE CONTRACTOR SHALL VERIFY LOCATION, OUTSIDE DIAMETER, AND INVERT ELEVATION OF THE EXISTING AC PIPE.
2. THE EXISTING AC PIPE CONTAINS ASBESTOS. REMOVAL AND DISPOSAL OF THE PIPE SHALL BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE, AND COUNTY RULES AND REGULATIONS. ONLY A QUALIFIED CONTRACTOR SHALL REMOVE AND DISPOSE OF THE AC PIPE.
3. DO NOT CUT EXISTING A.C. PIPE. FOR ALL PIPE CONNECTIONS AND WHERE PIPES ARE CALLED OUT TO BE CUT AND PLUG, THE EXISTING A.C. PIPE SHALL BE REMOVED AT ITS NEAREST JOINT.

1 C-16 CONNECTION SCHEMATIC DETAIL AT STA. 1+94+ (4" INFL. LINE) & STA. 0+46± (4" INTERCONN. LINE)
NOT TO SCALE



2 C-16 1" COMBINATION AIR VALVE ASSEMBLY DETAIL
NOT TO SCALE



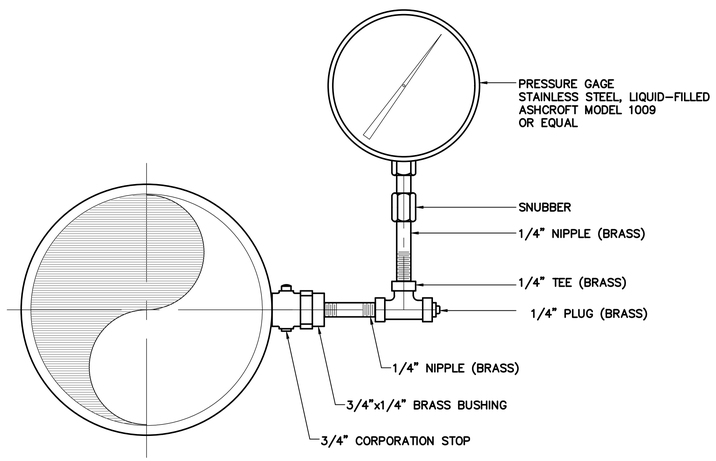
NOTES:
1. CW20-1Ad SIGN REQUIRED FOR POSTED SPEED LIMIT OF 45 M.P.H. OR GREATER.
2. ONE LANE ROAD (CW20-4) AND FLAGGER AHEAD (CW-20-7) SIGNS SHALL BE REMOVED OR COVERED WHEN NO WORK IS BEING PERFORMED AND LANE IS NOT CLOSED.
3. CONES OR DELINEATORS SHALL BE INSTALLED AT 10' O.C. MAX. SPACING
4. SIGN SPACING LENGTH (L) IS SHOWN IN "TABLE A"

TABLE A

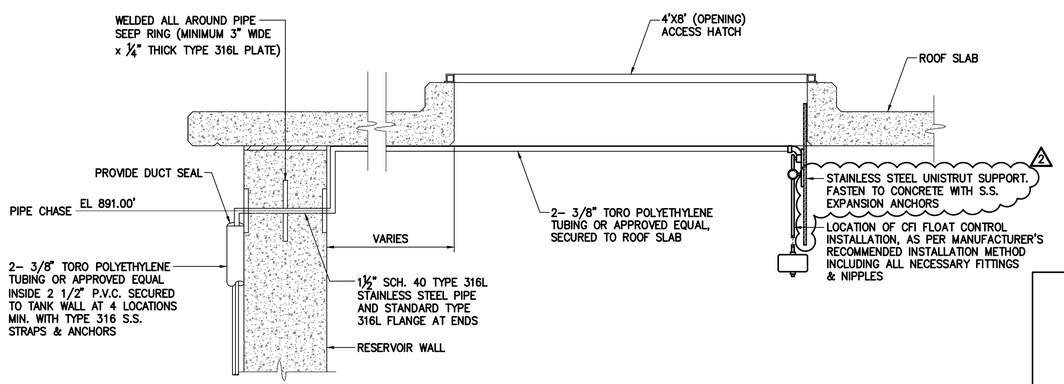
POSTED SPEED LIMIT ① (MPH)	SIGN SPACING (L) (FEET)
20	250
25	250
30	250
35	250
40	500
45	500
50	1000
55	1000

① USE ADVISORY SPEEDS WHEN POSTED

3 C-16 WORKING ON SHOULDER OR ROADSIDE (COUNTY) - TRAFFIC CONTROL PLAN
NOT TO SCALE



4 C-16 PRESSURE GAGE ASSEMBLY DETAIL
NOT TO SCALE



5 C-16 FLOAT CONTROL DETAIL
SCALE: ¾"=1'-0"

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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

DWG. NO. C-16
SHEET 18 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

TRAFFIC CONTROL PLAN & CIVIL DETAILS

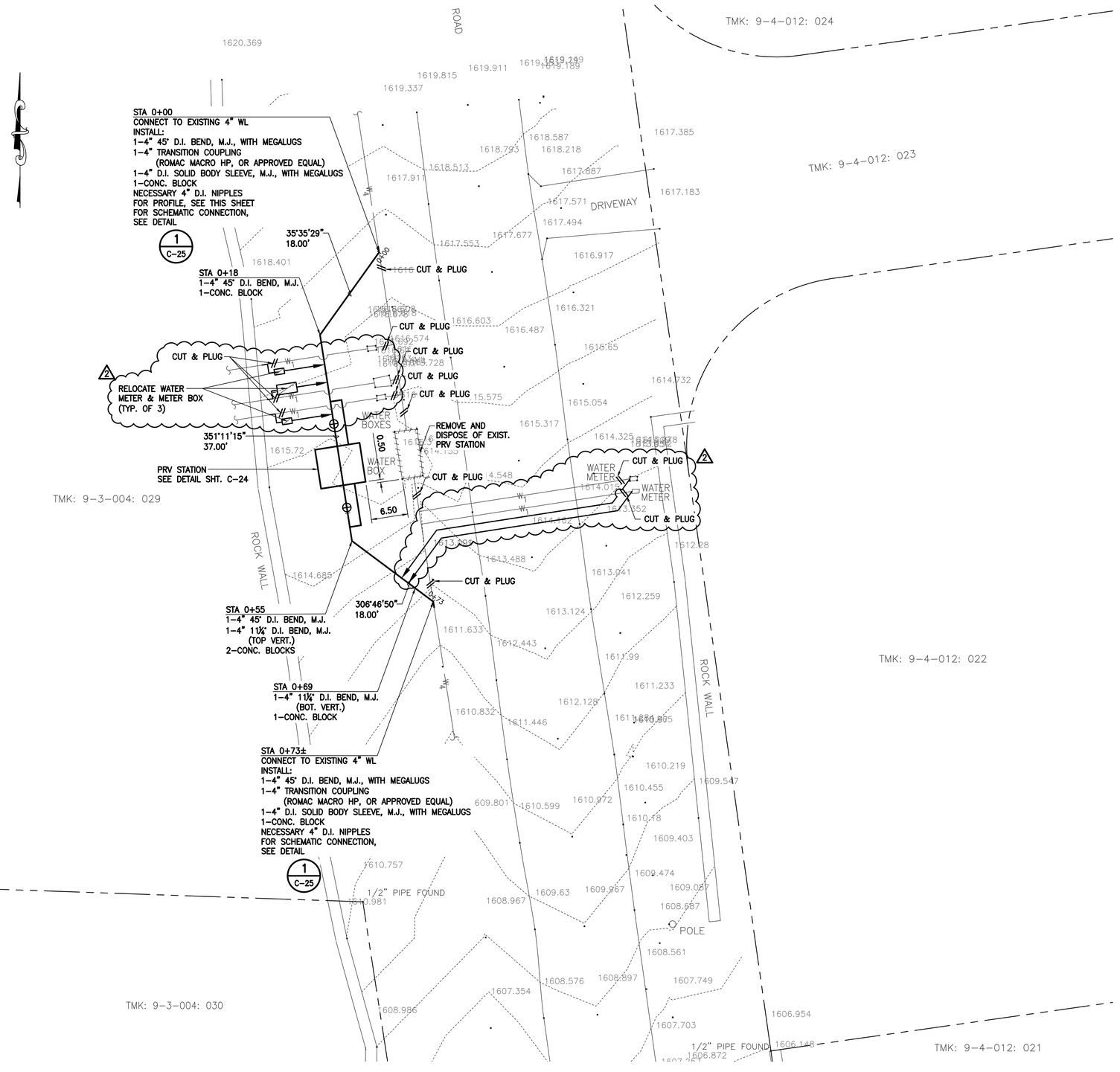
DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

GTO
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.GTO.DESIGN

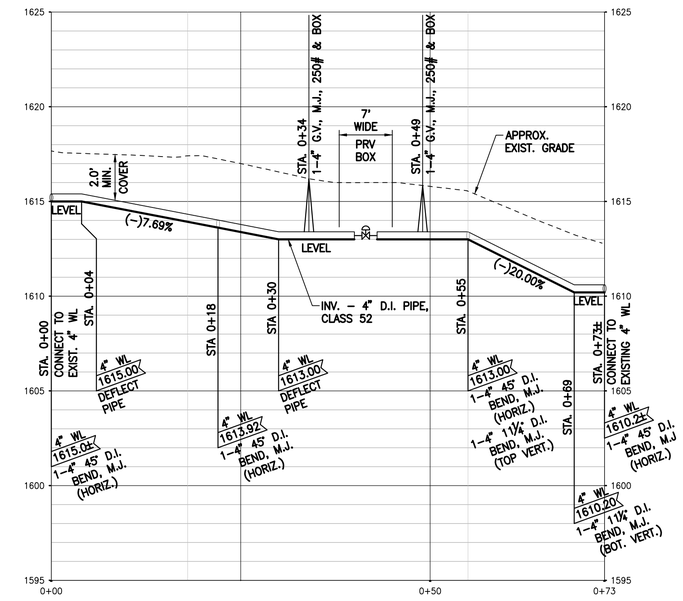
FEBRUARY 2020

FILE | POCKET | FOLDER | NO.

O:\GPRO\J_2019\J219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-DETAILS-4.DWG



PRV NO. 1 - PLAN
SCALE: 1"=10'



PRV NO. 1 - PROFILE
SCALE: HORIZ. 1"=10'
VERT. 1"=4'

GRAPHIC SCALES:

SCALE: 1" = 4'
4' 2' 0 4' 8'

SCALE: 1" = 10'
10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

PAUL T. MATSUDA
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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

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

PRV NO. 1 – PLAN & PROFILE

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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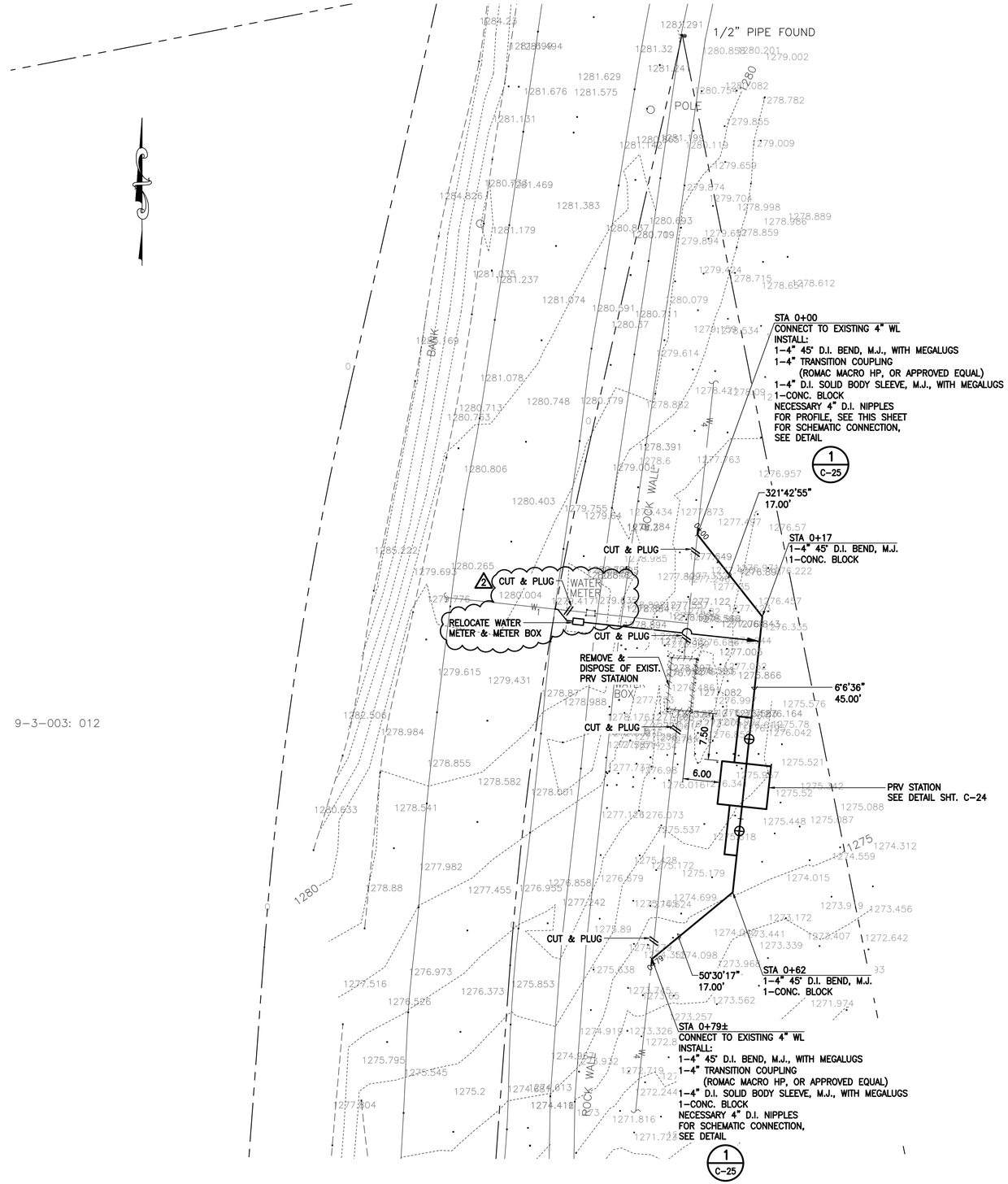
FEBRUARY 2020

ADDITIVE ALTERNATIVE ITEM A

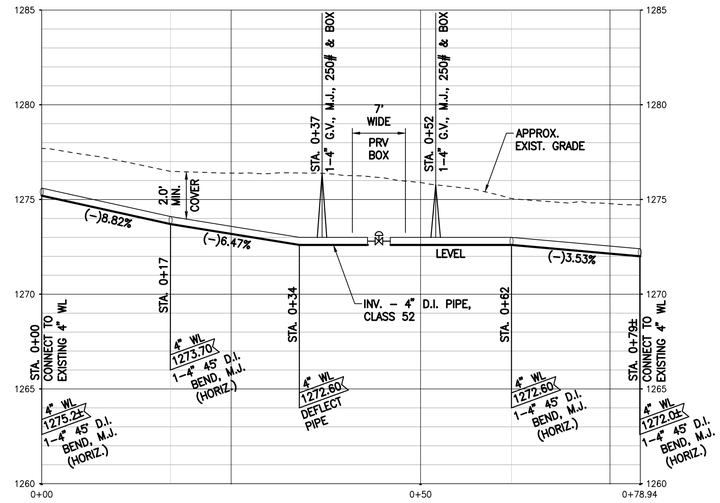
DWG. NO. C-20
SHEET 22 OF 54

FILE	POCKET	FOLDER	NO.

G:\(PROJ)\2019\219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CAD\SHEETS\SHT-PRT-PLAN.DWG



PRV NO. 2 - PLAN
SCALE: 1"=10'



PRV NO. 2 - PROFILE
SCALE: HORIZ. 1"=10'
VERT. 1"=4'

GRAPHIC SCALES:

SCALE: 1" = 4' 4' 2' 0 4' 8'

SCALE: 1" = 10' 10' 5' 0 10' 20'

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

PRV NO. 2 – PLAN & PROFILE

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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FEBRUARY 2020

ADDITIVE ALTERNATIVE ITEM B

DWG. NO. C-21
SHEET 23 OF 54

FILE | POCKET | FOLDER | NO.

9-3-003: 012

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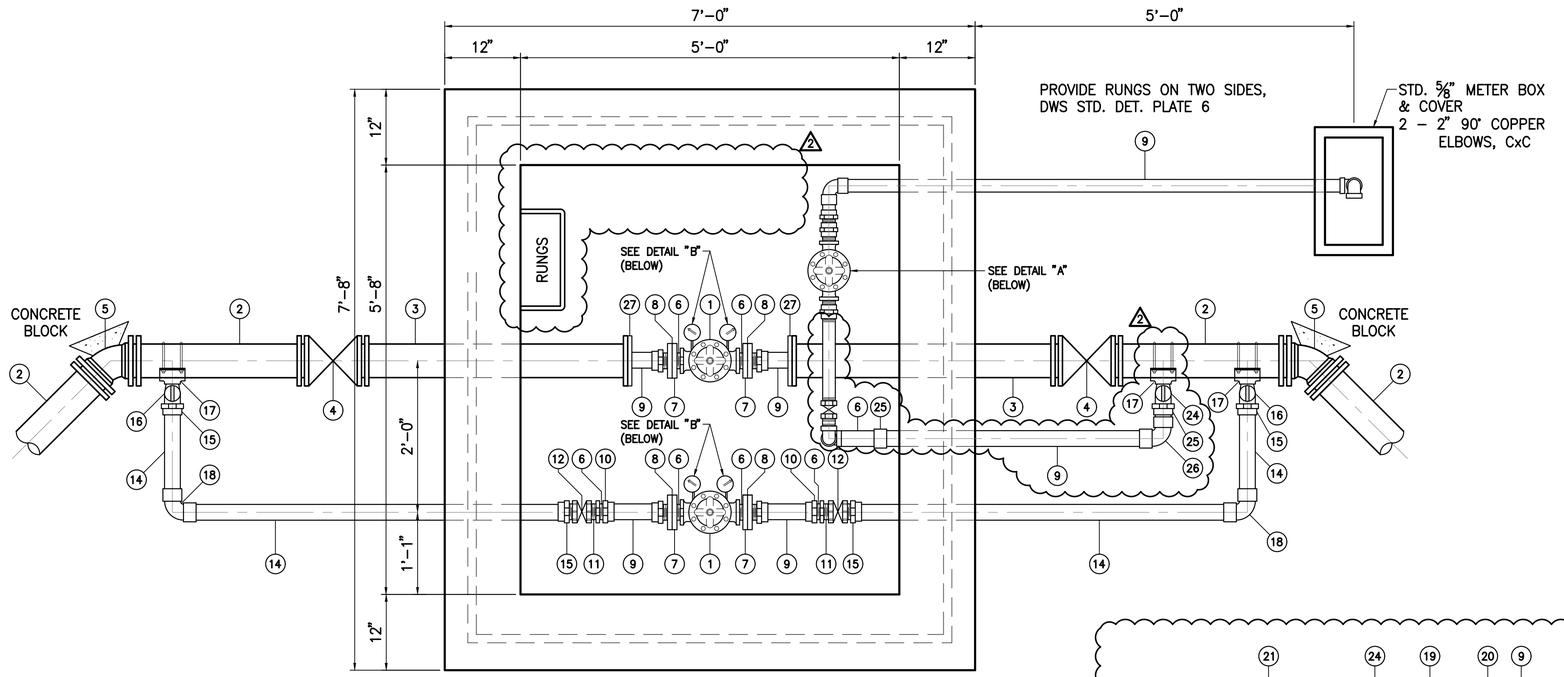
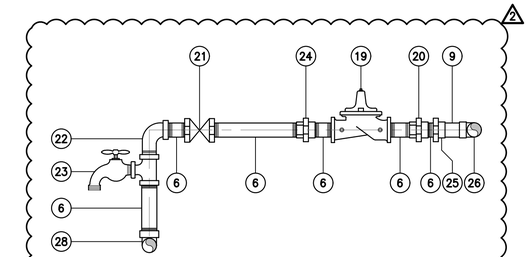


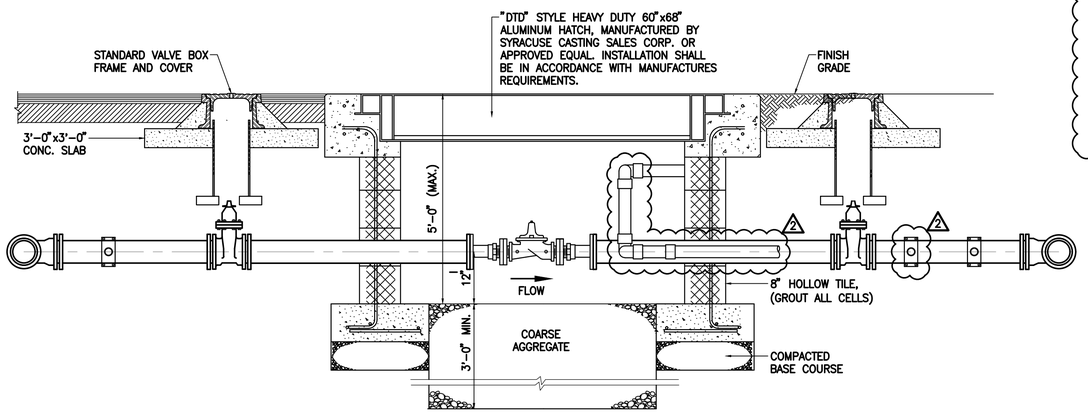
PLAN
2" & 2" PRESSURE REDUCING VALVE DETAIL
SCALE: 1"=1'-0"



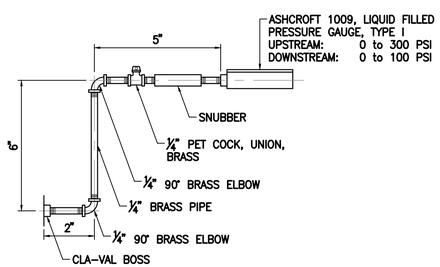
DETAIL "A"
2" PRESSURE RELIEF DETAIL
NOT TO SCALE

MATERIAL SCHEDULE	
ITEM	DESCRIPTION
1	2" COMBINATION PRESSURE REDUCING AND SUSTAINING VALVE, S.E., CLAVAL MODEL 92-01,BC-KC, WITH ANTI-CAVITATION (KO) TRIM, X101 VALVE POSITION INDICATOR AND X141 PRESSURE GAGE ASSEMBLIES.
2	4" D.I. PIPE, CLASS 52, CUT TO FIT
3	4" D.I. ADAPTER, F.E. x P.E., CLASS 53, CUT TO FIT
4	4" GATE VALVE, M.J., 250#, w/ MEGALUGS, AND VALVE BOX
5	4" 90° D.I. BEND, M.J., w/ MEGALUGS
6	2" BRASS NIPPLE
7	2" FORD METER FLANGE, CAT. NO. CF31-77, w/ STAINLESS STEEL BOLTS AND NUTS
8	2" FORD LOK - PAK METER COUPLING NO. CF34-77
9	2" COPPER PIPE. CUT TO FIT. PROVIDE CLEARANCE FOR ADJUSTMENT
10	2" COPPER ADAPTER, CxF
11	2½"x2" BRASS BUSHING
12	2½" BALL VALVE, S.E., w/ HANDLE
13	2½" COPPER ADAPTER, CxM
14	2½" COPPER PIPE. CUT TO FIT
15	2½" COPPER ADAPTER, CxF
16	2"x2½" BRONZE CORP STOP
17	4"x2" DOUBLE STRAP SERVICE SADDLE
18	2½" 90° COPPER ELBOW, CxC
19	2" PRESSURE RELIEF VALVE, S.E., CLAVAL MODEL 50-01,KG-KC, w/ X101 VALVE POSITION INDICATOR. CRL RANGE: 20-200 PSI
20	2" BRASS UNION, S.E.
21	2" BALL VALVE, S.E., w/ HANDLE
22	2" BRASS 90° STREET ELBOW
23	2"x2"x¾" BRASS TEE, S.E., w/ ¾" HOSE BIB w/ VACUUM BREAKER
24	2"x2" BRONZE CORP STOP
25	2" COPPER ADAPTER, CxF (2)
26	2" 90° COPPER ELBOW, CxC
27	4"x2" BRASS COMPANION FLANGE WITH FLANGE INSULATION GASKET KIT
28	2" 90° BRASS ELBOW (2)

NOTES:
1. CLAYTON VALVES SHALL BE EQUIPPED WITH EPOXY COATING INTERNALLY AND EXTERNALLY AND WITH VALVE POSITION INDICATORS. (X101)
2. PRESSURE REDUCER SETTINGS: COORDINATE WITH DEPARTMENT OF WATER SUPPLY
3. CRD RANGE: 15 TO 75 P.S.I.
   CRL RANGE: 20 TO 200 P.S.I.



ELEVATION
2" & 2" PRESSURE REDUCING VALVE UNIT
SCALE: ¾"=1'-0"



DETAIL "B"
PRESSURE GAUGE
NOT TO SCALE

GRAPHIC SCALES:

SCALE: 3/4" = 1'-0" — 12" 6" 0 1 2 3 — 9" 3"

SCALE: 1" = 1'-0" — 12" 9" 6" 3" 0 1' 2'

SCALE: 1 1/2" = 1'-0" — 1' 9" 6" 3" 0 1

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	TN	

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

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

TYPICAL 2"X2" PRV STATION

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

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WWW.G70.DESIGN

FEBRUARY 2020

ADDITIVE ALTERNATIVE ITEM A, B, C, & D

DWG. NO. C-24
SHEET 26 OF 54

FILE	POCKET	FOLDER	NO.

O:\JOBS\2019\219-054 DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-DETAILS-DEDUCTIVE-1.DWG

RESERVOIR STRUCTURAL GENERAL NOTES:

DESIGN REFERENCES:

1. ACI 350-06 CODE REQUIREMENTS FOR ENVIRONMENTAL ENGINEERING CONCRETE STRUCTURES.
2. ACI 350.03-06 SEISMIC DESIGN OF LIQUID-CONTAINING CONCRETE STRUCTURES.

DESIGN LOADS:

1. ROOF LOAD---------- 40 PSF LIVE LOAD
2. LIQUID (WATER)---------- 62.5 PCF
3. SOIL BEARING CAPACITY---------- 2,000 PSF (ASSUMED)
4. SEISMIC DESIGN PARAMETERS
   A. SPECTRAL RESPONSE ACCELERATION (5% DAMPING)------ S_S = 2.637g
      S_1 = 1.207g
   B. SITE CLASS---------- D (ASSUMMED)
   C. DESIGN SPECTRAL RESPONSE ACCELERATION---------- S_{DS} = 1.758g
      S_{D1} = 1.207g
   D. IMPORTANCE FACTOR---------- 1.25
   E. RESPONSE MODIFICATION FACTOR ---------- R_I = 2.0
      R_C = 1.00
5. BACKFILL HEIGHT----------6" BELOW TOP OF FOOTING

FOUNDATION:

1. FOUNDATION DESIGN IS BASED ON THE DRAFT GEOTECHNICAL INVESTIGATION BY _____.
2. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATION FROM EITHER SURFACE WATER, GROUND WATER OR SEEPAGE.
3. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING AND SHORING NECESSARY TO PRESERVE EXCAVATIONS AND EARTH BANKS AND ADJACENT STRUCTURES AND PROPERTY FROM DAMAGE.
4. BLASTING WILL NOT BE ALLOWED ON THE PROJECT.
5. EXCAVATIONS FOR FOOTINGS SHALL BE APPROVED BY THE SOILS ENGINEER PRIOR TO PLACING THE CONCRETE AND REINFORCING. SOILS ENGINEER SHALL SUBMIT LETTER OF COMPLIANCE TO THE DEPART OF WATER SUPPLY.
6. IMPORTED NON-EXPANSIVE GRANULAR SELECT BORROW MATERIAL FOR USE AS FILL AND/OR BACKFILL SHALL CONSIST OF WELL-GRADED GRANULAR MATERIALS, FREE OF ORGANIC MATTER, DEBRIS, AND PARTICLES GREATER THAN 3 INCHES IN MAXIMUM DIMENSION. THE IMPORTED MATERIAL SHALL HAVE LESS THAN 15% FINES PASSING THE NO. 200 SIEVE, A CBR VALUE OF AT LEAST 25, A LIQUID LIMIT OF 25% OR LESS, AND FINES A PLASTICITY INDEX OF 10% OR LESS.
7. ALL IMPORTED SOILS SHOULD BE INSPECTED AND APPROVED AT THE BORROW SITE(S) AND TESTED PRIOR TO IMPORT BY A CONTRACTOR RETAINED GEOTECHNICAL ENGINEER FOR SPECIAL INSPECTION DURING CONSTRUCTION.
8. FILL AND BACKFILL SHALL BE PLACED IN UNIFORM LIFTS OF NO MORE THAN 8 INCHES IN LOOSE THICKNESS, MOISTURE-CONDITIONED TO WITHIN 2 PERCENT OF IT'S OPTIMUM MOISTURE CONTENT AND COMPACTED TO AT LEAST 95 PERCENT MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557.

FLOOR SLAB UNDERLAYMENT:

1. PREPARE AREA UNDER FLOOR SLAB BY SCARIFYING TO A MINIMUM DEPTH OF 6-INCHES BELOW SOIL SURFACE, MOISTURE CONDITIONED TO ABOUT 2 PERCENT ABOVE OPTIMUM MOISTURE CONTENT AND RE-COMPACTED TO AT LEAST 95% RELATIVE DENSITY AS DETERMINED BY ASTM D1557. SHAPE SUBSURFACE SOIL TO DRAIN ENTIRE AREA BELOW THE FLOOR SLAB TO THE PERIMETER DRAIN.
2. INSTALL 30 MIL CHLOROSULFONATED POLYETHYLENE (CSPE) REINFORCED SHEET MATERIAL OVER IMPORTED GRANULAR STRUCTURAL FILL. CSPE MEMBRANE SHALL BE REINFORCED WITH A POLYESTER SCRIM FABRIC AND MANUFACTURED BY THE CALANDAR PROCESS.
3. INSTALL CSPE SHEET WRINKLE-FREE ON THE SHAPED SUBSURFACE SOIL. FIELD SEAMS SHALL BE SEALED WITH EITHER HEAT WELDING OR SOLVENT ADHESIVE. THE SEAL AT ALL SEAMS SHALL BE PER MANUFACTURER'S RECOMMENDATIONS AND SHALL BE CONTINUOUS AND WATERTIGHT.
4. THE EDGES OF THE CSPE SHEET SHALL BE TERMINATED IN A MANNER TO MOVE WATER CARRIED ON THE SHEET TO THE PERIMETER DRAIN PIPE AND PREVENT WATER FROM FLOWING OFF THE SHEET.
5. THE PERFORATED PVC DRAIN PIPE SHALL BE INSTALLED PER DETAIL SURROUNDED BY DRAINAGE ROCK AND WRAPPED IN FILTER FABRIC. DRAIN ROCK SHALL BE 3/4" NOMINAL POORLY GRADED (NO FINES) CRUSHED AGGREGATE.
6. THE FILTER FABRIC SHALL BE A NON-WOVEN 100% STAPLE FIBER POLYPROPYLENE NEEDLE-PUNCHED FILTER FABRIC DESIGNED FOR DRAINAGE AND FILTRATION.
7. THE AGGREGATE BASE COURSE SHALL BE COMPACTED IN LIFTS TO A MINIMUM 95 PERCENT COMAPCTION AS DETERMINED BY ASTM D1557.
8. A 6 MIL VAPOR RETARDER SHEET SHALL BE INSTALLED OVER THE AGGREGATE BASE COURSE AGGREGATE. CONTINUOUSLY SEAL ALL SEAMS WITH ADHESIVE TAPE RECOMMENDED BY MANUFACTURER. THE REINFORCED CONCRETE SLAB IS TO BE PLACED DIRECTLY ON THE VAPOR BARRIER.
9. THE 6 MIL VAPOR RETARDER SHALL CONFORM TO ASTM E1745, CLASS B WITH NYLON OR POLYESTER-CORD REINFORCED, THREE-PLY HIGH-DENSITY POLYETHYLENE SHEET OR ONE-PLY EXTRUDED POLYOEFIN SHEET.

CONCRETE NOTES:

1. CONCRETE - CLASSES
   A. WALL, COLUMNS AND ROOF SLAB ---------- DWS 4000
   B. FOOTING, FLOOR SLAB, AND CONCRETE JACKET UNDER FLOOR SLAB ---------- DWS 4000
2. POUR OPENINGS (WINDOWS) SHALL BE PROVIDED IN FORMWORK FOR PLACING CONCRETE IN WALLS.
   A. MINIMUM POUR OPENING SIZE SHALL BE 24" X 24".
   B. HORIZONTAL DISTANCE BETWEEN POUR OPENINGS SHALL NOT EXCEED SEVEN (7) FEET CENTER TO CENTER.
   C. VERTICAL DISTANCE BETWEEN ROWS OF OPENINGS OR FLOOR SLAB SHALL NOT EXCEED FOUR (4) FEET.
3. RESERVOIR FLOOR SLAB SHALL BE CURED WITH 6" MINIMUM WATER POND AT HIGH POINT OF SLAB FROM FINAL SET UNTIL TANK IS TO BE CLEANED AND PLACED IN OPERATION.
4. LAPS SHALL BE 48 BAR DIA (24" MIN), UNLESS OTHERWISE NOTED, SPLICES OF WALL HORIZONTAL REINFORCEMENT SHALL BE STAGGERED HORIZONTALLY BY MORE THAN TWO LAP LENGTHS ON CENTER AND SHALL NOT COINCIDE VERTICALLY BY MORE THAN EVERY THIRD BAR.
5. ALL EXTERIOR CONCRETE SURFACES SHALL RECEIVE AN ARCHITECTURAL FINISH AS SPECIFIED IN THE WATER SYSTEM STANDARDS, DIVISION 300, SECTION 303.03S, SURFACE FINISHES, UNLESS OTHERWISE SPECIFIED.
6. ALL EXPOSED CORNERS SHALL HAVE 3/4 INCH CHAMFERS, UNLESS NOTED OTHERWISE.
7. USE OF POWDER DRIVEN FASTENERS SHALL NOT BE PERMITTED IN CONCRETE WALLS EXCEPT AS NOTED IN THE SPECIFICATIONS OR AS APPROVED BY THE DEPARTMENT OF WATER.
8. ALL ANCHORS AND INSERTS FOR SUSPENDING MECHANICAL AND ARCHITECTURAL WORK SHALL BE CAST-IN-PLACE WHEREVER POSSIBLE. WHEN ADDITIONAL FASTENERS ARE REQUIRED, ONLY THOSE THAT ARE ANCHORED IN DRILLED HOLES WITH THE APPROVAL OF THE DEPARTMENT OF WATER SUPPLY SHALL BE PERMITTED.
9. RESERVOIR WALL CONSTRUCTION TOLERANCES:
   A. OUT OF ROUND TOLERANCES: 3/4" IN 50', 3/8" IN 10' AND 3/16" IN 2' FROM SPECIFIED CURVATURE.
   B. VERTICAL ALIGNMENT: 3/8"± FROM TOP OF WALL TO BOTTOM
   C. WALL THICKNESS: 1/8"±.
   D. CONCRETE COVER: +3/8" TO -1/4"
10. TESTING OF CYLINDERS SHALL BE PAID FOR BY THE CONTRACTOR. FIVE (5) CYLINDERS SHALL BE TAKEN PER CLASS OF CONCRETE POURED IN ANY ONE DAY'S OPERATION AND SHALL BE MADE FOR EVERY 50 CY OF CONCRETE OF EACH CLASS. TWO (2) CYLINDERS SHALL BE TESTED AT THE AGE OF 7-DAYS AND 28-DAYS. THE LAST SAMPLE SHALL BE HELD IN RESERVE FOR USE TO VERIFY SUSPECT TEST RESULTS OR A SPOILED TEST SAMPLE.
11. TO ASSURE ADHERENCE TO APPROVED MIX DESIGNS, SLUMP TESTS SHALL BE CONDUCTED ON EACH READY-MIX CONCRETE TRUCK DISCHARGING ON-SITE FOR PROJECT SITE, WITH THE EXCEPTION OF CONCRETE FOR THRUST BLOCKS. TESTING SHALL BE PAID FOR BY THE CONTRACTOR.

REINFORCING STEEL:

1. ALL REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615 GRADE 60.
2. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
   A. FOOTING, CONCRETE JACKET, ETC. CAST AGAINST EARTH ------- 3"
   B. FOOTING, CONCRETE JACKET, ETC. FORMED AND EXPOSED TO EARTH OR WEATHER ---------- 2"
   C. COLUMNS ---------- 2½"
   D. ROOF SLAB ---------- 2" TOP
      2" BOTTOM
   E. WALLS ---------- 2"
3. REINFORCING STEEL SHALL BE SPLICED WHERE INDICATED ON PLANS. PROVIDE LAP SPLICE LENGTH PER TYPICAL DETAILS AND SCHEDULE, UNLESS OTHERWISE NOTED.
4. MECHANICAL SPLICE CONNECTORS SHALL HAVE AN ALLOWABLE TENSION CAPACITY EQUAL TO 125 PERCENT OF THE SPECIFIED MINIMUM YIELD STRENGTH OF REINFORCING BARS.
5. BAR BENDS AND HOOKS SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH TYPICAL DETAIL ON SHEET S002.
6. REINFORCING STEEL SHALL BE PLACED AND SECURED IN CONFORMANCE WITH CRSI MANUAL OF STANDARD PRACTICE WITH PLACEMENT TOLERANCES PER ACI STANDARD 117.

STRUCTURAL ALUMINUM STAIR AND GUARDRAIL NOTES:

1. FABRICATION AND ERECTION OF STRUCTURAL ALUMINUM SHALL CONFORM TO THE ALUMINUM DESIGN MANUAL, 2010 EDITION.
2. STRUCTURAL ALUMINUM ALLOY AND TEMPER FOR EXTRUSIONS, BARS, SHAPES, AND PLATES SHALL CONFORM TO TYPE 6061-T6.
3. STAIR STRINGER SHALL BE ALUMINUM CHANNEL.
4. WELDS AND WELDING PROCEDURES SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.2 OF THE AMERICAN WELDING SOCIETY.
5. WELDING SHALL BE PERFORMED BY WELDERS QUALIFIED FOR WELDING PROCEDURES TO BE USED.
6. WELDING ELECTRODES SHALL BE 5356.
7. ALL WELDS TO BE ⅛" MINIMUM.
8. ALUMINUM BASE PLATES AND LOCATIONS WHERE ALUMINUM WILL BE IN CONTACT WITH CONCRETE MUST BE COATED WITH ONE COAT OF A ZINC EPOXY RICH PAINT, SUCH AS ZINC MOLYBDATE PRIMER.
9. ALUMINUM EXTRUSIONS, SHAPES, ETC. TO BE IN CONTACT WITH STEEL AND OTHER DISSIMILAR METAL COMPONENTS SHALL BE SEPARATED BY A CORROSION BARRIER TAPE OR POLYMERIC COATING. CLEAN ALUMINUM COMPONENT REMOVING OIL, GREASE, AND DIRT. APPLY BARRIER AND ALLOW TO CURE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
10. USE SST 316 FOR ALL BOLTS UNLESS NOTED OTHERWISE.
11. WHERE SST BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.
12. POST-INSTALLED CONCRETE ANCHORS SHALL CONSIST OF ⅝" ø TYPE 316 STAINLESS STEEL THREADED ROD WITH HILTI HIT HY 200-A ADHESIVE WITH EMBEDMENT AS NOTED ON DETAILS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
13. BAR GRATING TO BE 19-4 ALUMINUM SWAGED, SEE PLAN FOR DEPTH.
14. STAIR TREADS TO BE WITH ALUMINUM BAR GRATING TO MATCH LANDING GRATING.

WATERSTOP NOTES:

1. SEE SPECIFICATION FOR MATERIAL REQUIREMENTS.
2. WATERSTOPS SHALL BE HELD IN PLACE IN THE FORMS BY THE USE OF A SPLIT FORM OR OTHER APPROVED METHOD.
3. HORIZONTAL WATERSTOPS SHALL BE MANUALLY BENT-UP DURING CONCRETE PLACEMENT UNTIL CONCRETE IS PLACED TO LEVEL OF WATERSTOP; ADDITIONAL CONCRETE SHALL THEN BE PLACED, AFTER WHICH THE CONCRETE SHALL BE THOROUGHLY VIBRATED.
4. ALL VERTICAL WATERSTOPS SHALL BE SECURED IN CORRECT POSITION USING HOG RINGS OR GROMMETS SPACED AT 12 INCHES ON CENTER ALONG THE LENGTH OF THE WATERSTOP AND WIRE TIE TO ADJACENT REINFORCING STEEL.
5. DIRECTION CHANGES AND INTERSECTIONS SHALL BE PREMOLDED FITTINGS. FIELD BUTT SPLICES SHALL BE DONE BY SQUARING ENDS AND USE OF SPECIAL SPLICING TOOL SPECIFIED BY MANUFACTURER. FOLLOW APPROVED MANUFACTURER RECOMMENDATIONS. LAPPING OF WATERSTOP, USE OF ADHESIVES, OR SOLVENTS SHALL NOT BE ALLOWED.

SPECIAL INSPECTION:

1. SPECIAL INSPECTIONS ARE REQUIRED FOR THIS PROJECT AND SHALL BE PERFORMED IN ACCORDANCE WITH IBC CHAPTER 17. SPECIAL INSPECTIONS SHALL BE PERFORMED BY THE DEPARTMENT OF WATER SUPPLY (DWS) OR DWS-HIRED SPECIAL INSPECTOR IN THESE CATEGORIES:

   CONCRETE PLACEMENT (EXCEPT CURBS, DRAINAGE SWALE SITE CONCRETE) - STRUCTURAL WELDING - CONCRETE ANCHOR INSTALLATION - REINFORCING STEEL PLACEMENT - GRADING, EXCAVATION, BACKFILLING

STRUCTURAL OBSERVATION:

1. STRUCTURAL OBSERVATION SHALL BE THE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEM BY THE ENGINEER OF RECORD OR HIS REPRESENTATIVE FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS AT SIGNIFICANT CONSTRUCTION STAGES AND AT COMPLETION OF THE STRUCTURAL SYSTEM.
2. STRUCTURAL OBSERVATION DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR SPECIAL INSPECTION.
3. AT THE CONCLUSION OF THE PROJECT'S CONSTRUCTION THE STRUCTURAL OBSERVER SHALL SUBMIT TO THE BUILDING OFFICIAL A WRITTEN STATEMENT THAT THE REQUIRED SITE VISITS HAVE BEEN MADE AND STATE ANY REPORTED DEFICIENCIES THAT, TO THE BEST OF THE STRUCTURAL OBSERVER'S KNOWLEDGE, HAVE NOT BEEN RESOLVED.
4. THE ENGINEER OF RECORD SHALL BE NOTIFIED AT LEAST THREE DAYS PRIOR TO EACH OF THE FOLLOWING STAGES OF THE RESERVOIR CONSTRUCTION. EACH STAGE SHALL BE OBSERVED ON THE LAST DAY BEFORE THE WORK IS COMPLETE PRIOR TO PLACING CONCRETE SO THAT CORRECTIVE ACTION CAN BE MADE DURING THE OBSERVATION PERIOD:
   A. FLOOR AND WALL FOOTING REINFORCING
   B. FIRST AND SECOND WALL SECTION REINFORCING
   C. ROOF SLAB REINFORCING IN THE FIRST ROOF SLAB SECTION TO BE CONSTRUCTED.
5. THE REPORT PREPARED BY THE STRUCTURAL OBSERVER SHALL BE PREPARED FOR EACH SITE VISIT LISTING ANY DEFICIENCIES OBSERVED THAT WERE NOT CORRECTED PRIOR TO LEAVING THE SITE. THE REPORT SHALL BE SUBMITTED TO THE DEPT OF WATER SUPPLY WITHIN TWO DAYS OF THE SITE VISIT.

ABBREVIATIONS

AC	ASPHALT
ALUM	ALUMINUM
BOT	BOTTOM
℄	CENTERLINE
CLR	CLEAR
CONT	CONTINUOUS
D.I.	DUCTILE IRON
DIA/ø	DIAMETER
DWGS	DRAWINGS
E.F.	EACH FACE
EMBED	EMBEDMENT
EXP	EXPANSION
GALV	GALVANIZED
HORIZ	HORIZONTAL
LBS	POUNDS
MAX	MAXIMUM
MIN	MINIMUM
PL	PLATE
PVC	POLYVINYL CHLORIDE
REINF	REINFORCEMENT
SCH	SCHEDULE
SQ	SQUARE
S.S.	STAINLESS STEEL
STD	STANDARD
TYP	TYPICAL
VERT	VERTICAL

REVISION	DATE	BRIEF	MADE BY	APPROVED

DWG. NO. S-1
SHEET 29 OF 54

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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 8/23/94).

Jerry S Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR GENERAL NOTES

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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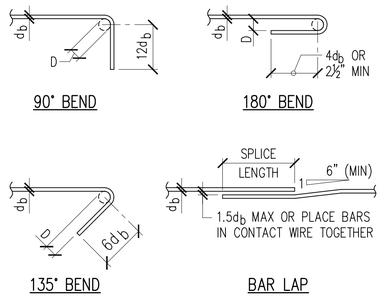
JANUARY 2020

FILE	POCKET	FOLDER	NO.

MINIMUM SPLICE & EMBEDMENT LENGTHS										
	CONCRETE STRENGTH = 4,500 PSI					CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		EMBEDMENT			LAP SPLICE		EMBEDMENT		
			STRAIGHT					STRAIGHT		
BAR SIZE	BOT. BAR OR WALL BAR	TOP BAR	BOT. BAR OR WALL BAR	TOP BAR	W/ STD HOOK	BOT. BAR OR WALL BAR	TOP BAR	BOT. BAR OR WALL BAR	TOP BAR	W/ STD HOOK
#3, #4	24"	32"	18"	24"	8"	25"	33"	19"	25"	8"
#5	32"	42"	24"	32"	9"	32"	42"	24"	32"	10"
#6	36"	47"	27"	36"	11"	38"	50"	29"	38"	12"
#7	52"	68"	40"	52"	13"	55"	72"	42"	55"	14"
#8	59"	77"	45"	59"	15"	63"	82"	48"	63"	16"
#9	67"	88"	51"	67"	17"	71"	93"	54"	71"	18"
#10	73"	95"	56"	73"	18"	78"	102"	60"	78"	19"
#11	81"	106"	62"	81"	20	86"	112"	66"	86"	21"

NOTES:
1. LENGTHS ARE FOR CONCRETE WITH REBAR SPACE 6 BAR DIAMETERS MINIMUM. INCREASE 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
2. "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.

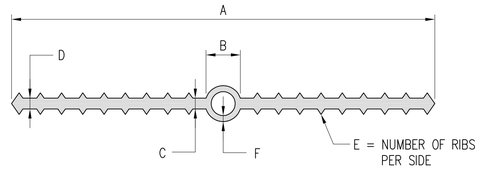


D = $6d_b$ FOR #8 AND SMALLER
D = $8d_b$ FOR #9 TO #11

1 S-2

TYPICAL REBAR SPLICE AND EMBEDMENT LENGTH SCHEDULE

NOT TO SCALE



TYPE	LOCATION	A	B	C	D	E	F	VINYLEX	GREENSTREAK	
I	WALL TO WALL FOOTING	9"	1"	⅜"	⅜"	8	½"	RB938H	735	2
II	VERTICAL WALL	6"	–	⅜"	⅜"	7	–	R638	679	
III	FLOOR TO PIPE BLOCKS	6"	1" OR 7/8"	⅜"	⅜"	7 OR 8	¼" OR 9/32"	RB638H	732	2
IV	OVERFLOW PIPE AT PEDESTAL**	–	–	–	–	–	–	KK590	SS-0320	

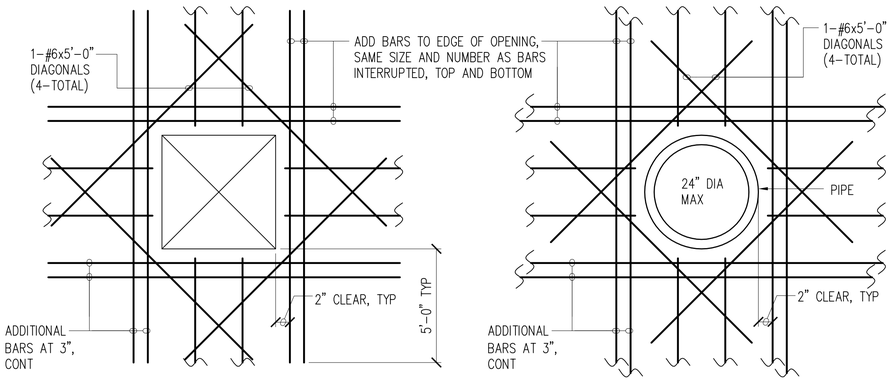
* SEE NOTE 1 BELOW
** HYDROPHILIC STRAP WATERSTOP

NOTES:
1. NO CENTER BULB ALLOWED IN THE WATERSTOP.
2. SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
3. ALL SPLICES SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

2 S-2

PVC WATER STOP SCHEDULE

NOT TO SCALE



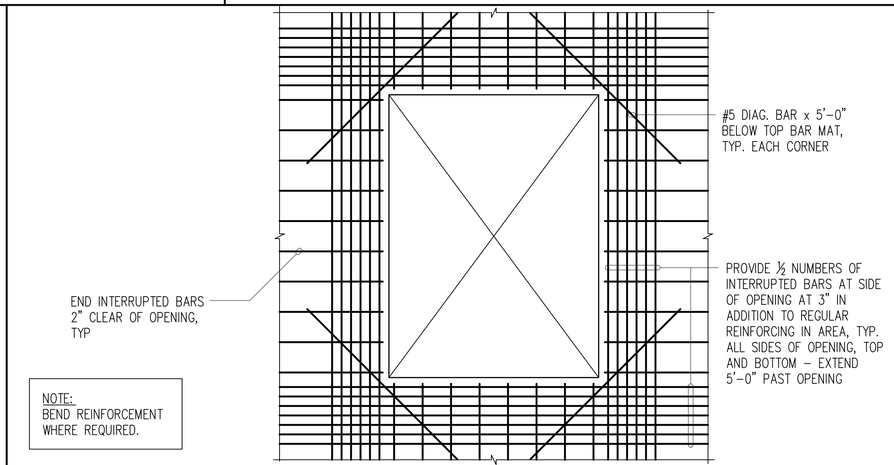
PLAN – ROOF SLAB

PLAN – FLOOR SLAB

3 S-2

TYPICAL ADDED REINFORCING AT OPENINGS

NOT TO SCALE



NOTE:
BEND REINFORCEMENT WHERE REQUIRED.

4 S-2

TYPICAL REINFORCING AT LARGE SLAB OPENING

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	DY	

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Jerry S Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL–30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

TYPICAL RESERVOIR DETAILS

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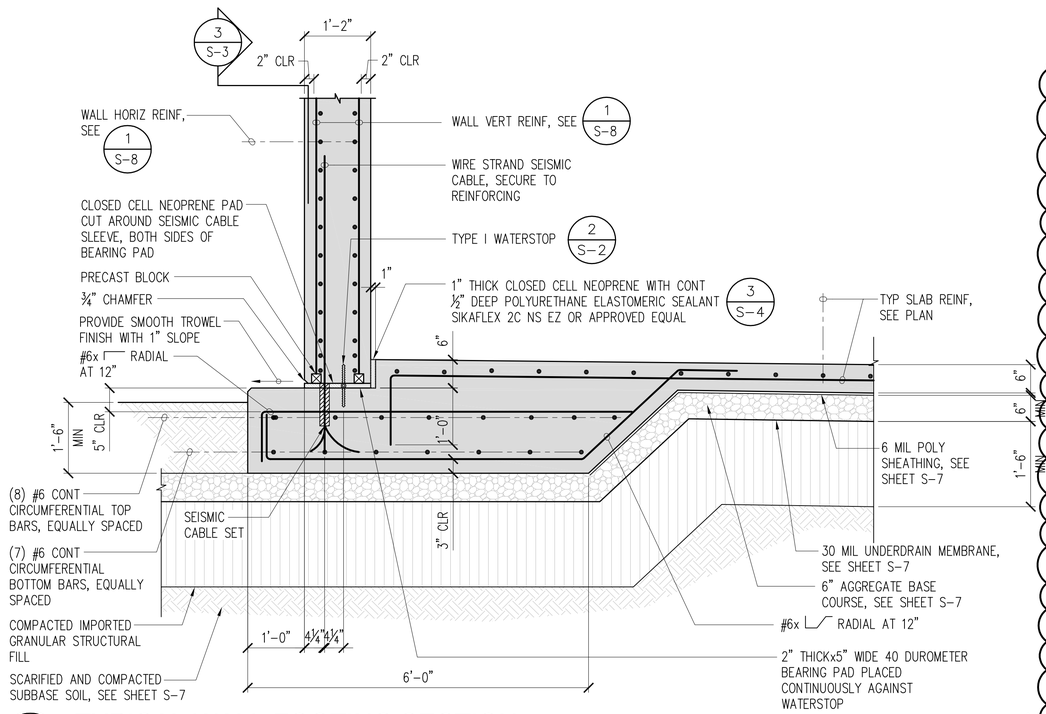
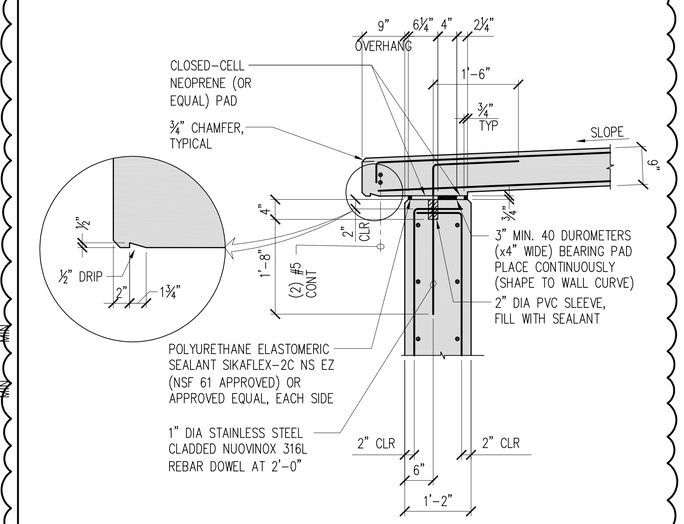
JANUARY 2020

DWG. NO. S-2
SHEET 30 OF 54

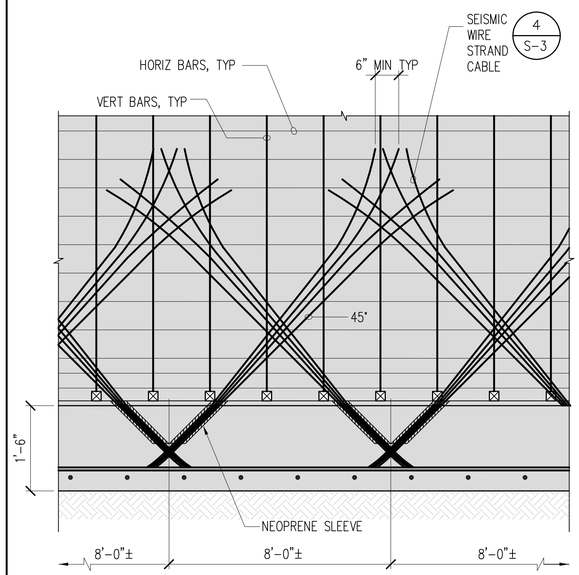
FILE	POCKET	FOLDER	NO.



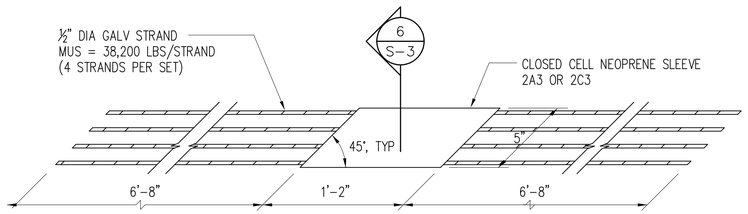
1 S-3 **TYPICAL WALL FOOTING SECTION**
SCALE: 3/4" = 1'-0"



2 S-3 **TYPICAL ROOF WALL JOINT**
SCALE: 3/4" = 1'-0"

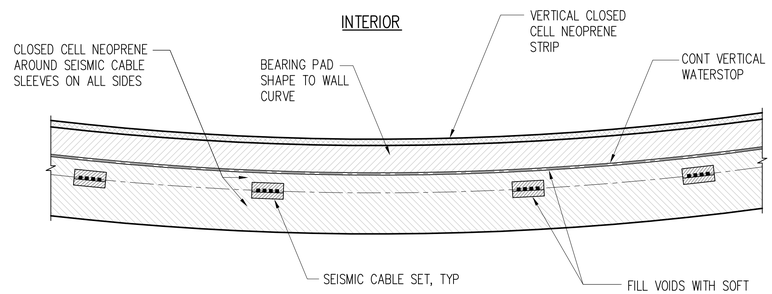


3 S-3 **SEISMIC CABLE SPLAY**
SCALE: 3/4" = 1'-0"

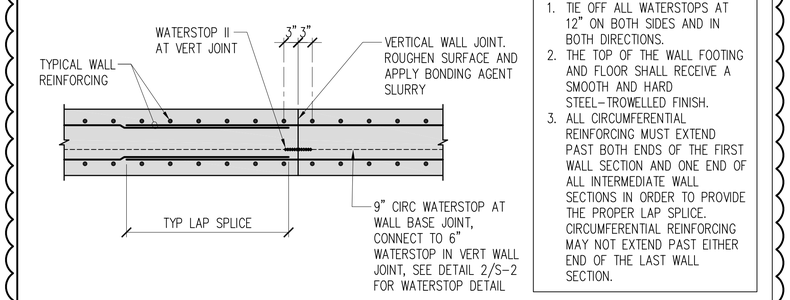


30 SETS TOTAL, PLACE 15 SETS IN EACH DIRECTION

4 S-3 **PLAN OF SEISMIC CABLE SET**
NOT TO SCALE

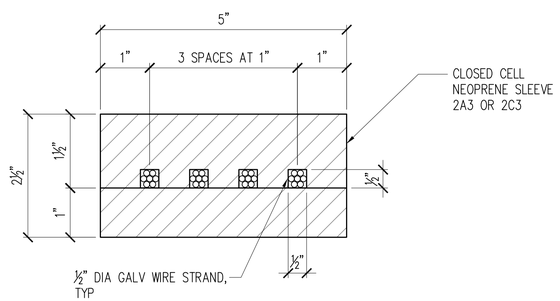


5 S-3 **WALL BASE JOINT PLAN VIEW**
NOT TO SCALE

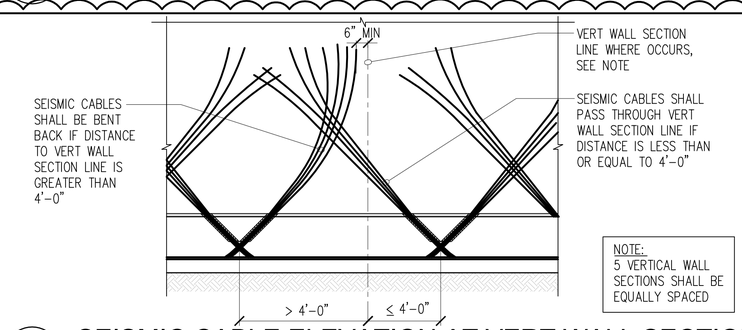


NOTES:
1. TIE OFF ALL WATERSTOPS AT 12" ON BOTH SIDES AND IN BOTH DIRECTIONS.
2. THE TOP OF THE WALL FOOTING AND FLOOR SHALL RECEIVE A SMOOTH AND HARD STEEL-TROWELLED FINISH.
3. ALL CIRCUMFERENTIAL REINFORCING MUST EXTEND PAST BOTH ENDS OF THE FIRST WALL SECTION AND ONE END OF ALL INTERMEDIATE WALL SECTIONS IN ORDER TO PROVIDE THE PROPER LAP SPLICE. CIRCUMFERENTIAL REINFORCING MAY NOT EXTEND PAST EITHER END OF THE LAST WALL SECTION.

8 S-3 **HORIZONTAL SECTION OF VERT WALL JOINT**
NOT TO SCALE



6 S-3 **SEISMIC CABLE SET SECTION**
NOT TO SCALE



NOTE:
5 VERTICAL WALL SECTIONS SHALL BE EQUALLY SPACED

7 S-3 **SEISMIC CABLE ELEVATION AT VERT WALL SECTION**
NOT TO SCALE

2

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

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	DY	

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
S-3
SHEET 31 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR FOUNDATION SECTION AND DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

G70
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HONOLULU, HAWAII 96813
808.523.5866
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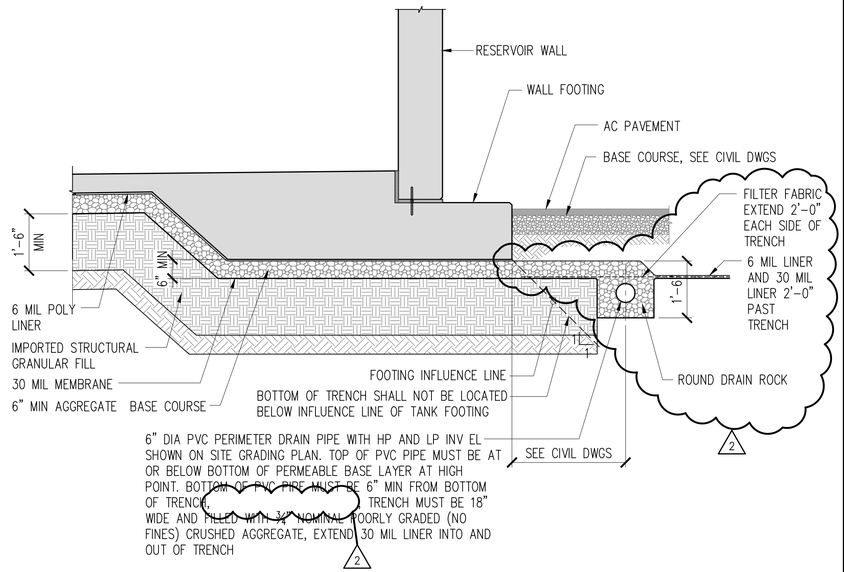
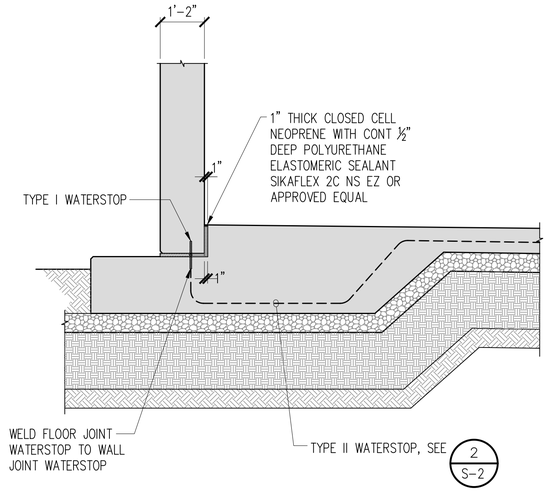
JANUARY 2020

FILE	POCKET	FOLDER	NO.



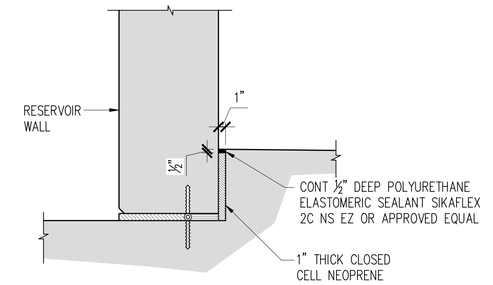
1 S-4 **PERIMETER DRAIN DETAIL**

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



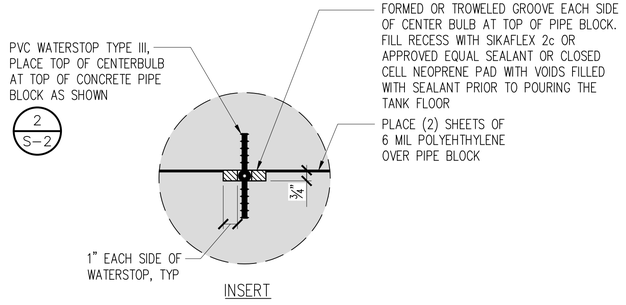
2 S-4 **TYPICAL SECTION - FLOOR CONSTUCTION JOINT AT WATERSTOP AT WALL**

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



3 S-4 **WALL BASE SEALANT DETAIL**

NOT TO SCALE



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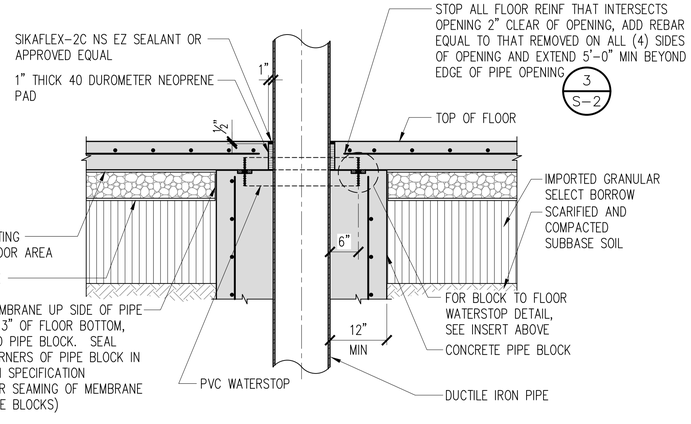
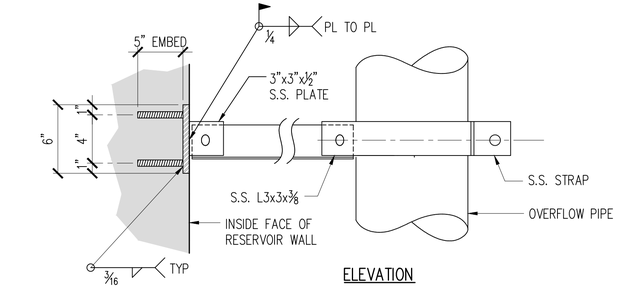


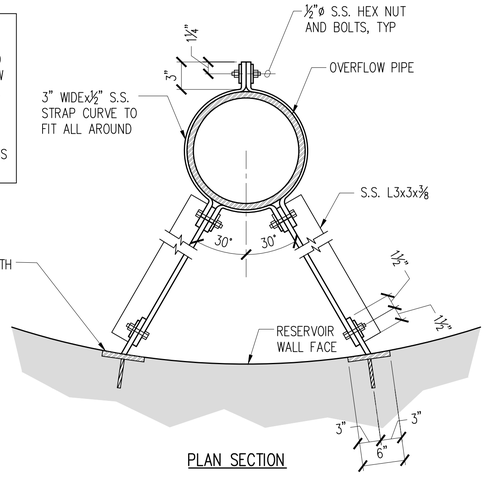
4 S-4 **TYPICAL PIPE ENTRANCE THROUGH FLOOR DETAILS**

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



ELEVATION

NOTE:
ALL BOLTS, NUTS, WASHERS, PLATES AND ANGLES FOR OVERFLOW PIPE SUPPORTS SHALL BE AISI TYPE 316 STAINLESS STEEL OR APPROVED EQUAL. SUBMIT SHOP DRAWINGS FOR APPROVAL.



PLAN SECTION

5 S-4 **OVERFLOW PIPE SUPPORT DETAILS**

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	DY	

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Jerry S Fujita
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LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR FOUNDATION DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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WWW.G70.DESIGN

JANUARY 2020

DWG. NO. S-4
SHEET 32 OF 54

FILE	POCKET	FOLDER	NO.

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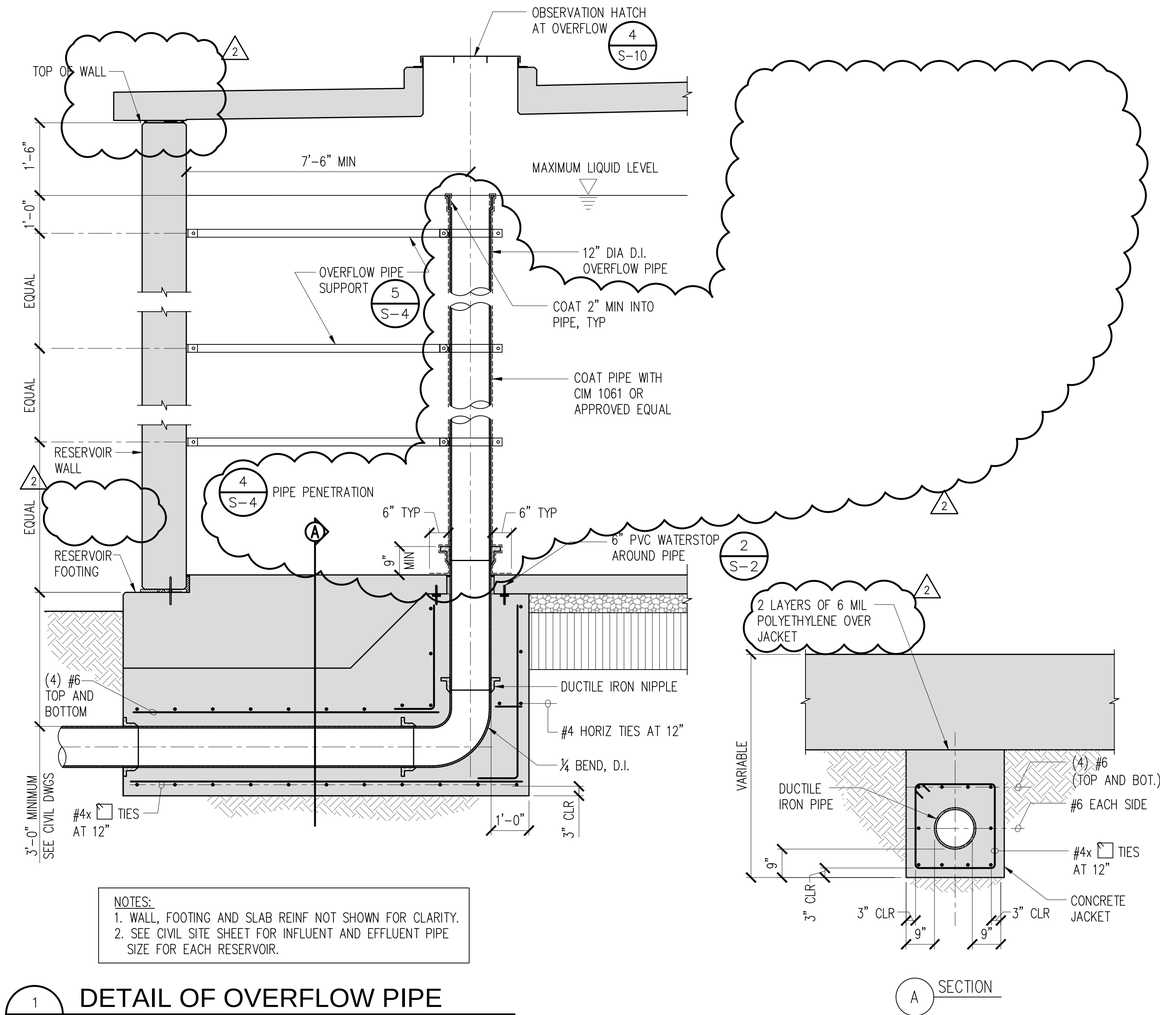
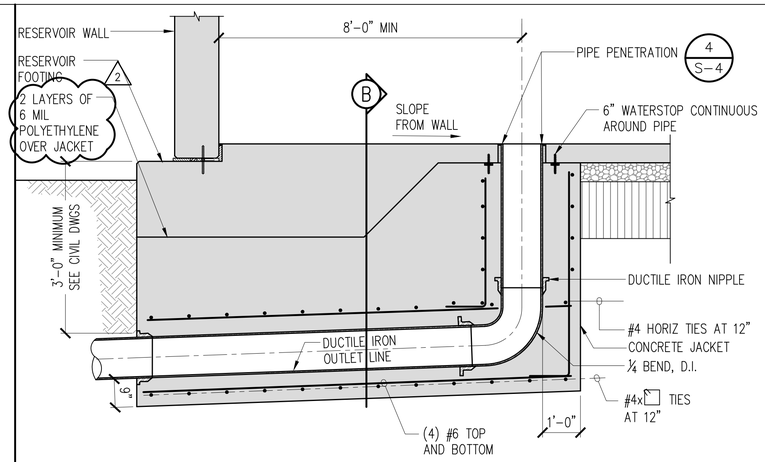


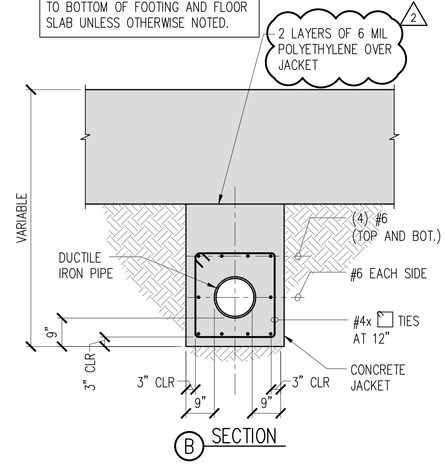
NOTES:
1. WALL, FOOTING AND SLAB REINF NOT SHOWN FOR CLARITY.
2. SEE CIVIL SITE SHEET FOR INFLUENT AND EFFLUENT PIPE SIZE FOR EACH RESERVOIR.

1 S-5 **DETAIL OF OVERFLOW PIPE**
NOT TO SCALE



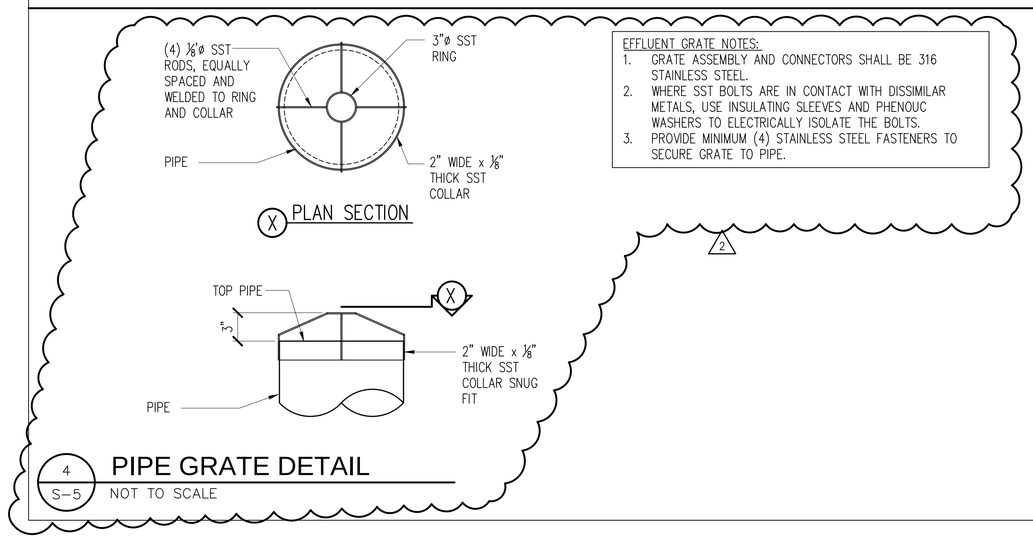
2 S-5 **WASHOUT LINE**
SCALE: 1/2" = 1'-0"

NOTE:
CONCRETE JACKET TO BE POURED TO BOTTOM OF FOOTING AND FLOOR SLAB UNLESS OTHERWISE NOTED.



3 S-5 **EFFLUENT LINE (INFLUENT, SIM)**
SCALE: 1/2" = 1'-0"

NOTES:
1. SEE CIVIL SITE SHEET FOR INFLUENT AND EFFLUENT PIPE SIZE FOR RESERVOIR.
2. CONCRETE JACKET TO BE POURED TO BOTTOM OF FOOTING AND FLOOR SLAB UNLESS OTHERWISE NOTED.



EFFLUENT GRATE NOTES:
1. GRATE ASSEMBLY AND CONNECTORS SHALL BE 316 STAINLESS STEEL.
2. WHERE SST BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOUC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.
3. PROVIDE MINIMUM (4) STAINLESS STEEL FASTENERS TO SECURE GRATE TO PIPE.

4 S-5 **PIPE GRATE DETAIL**
NOT TO SCALE

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JERRY S FUJITA
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Jerry S Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

OVERFLOW, INFLUENT/EFFLUENT AND WASHOUT LINE SECTION AND DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

G70
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JANUARY 2020

DWG. NO. S-5
SHEET 33 OF 54

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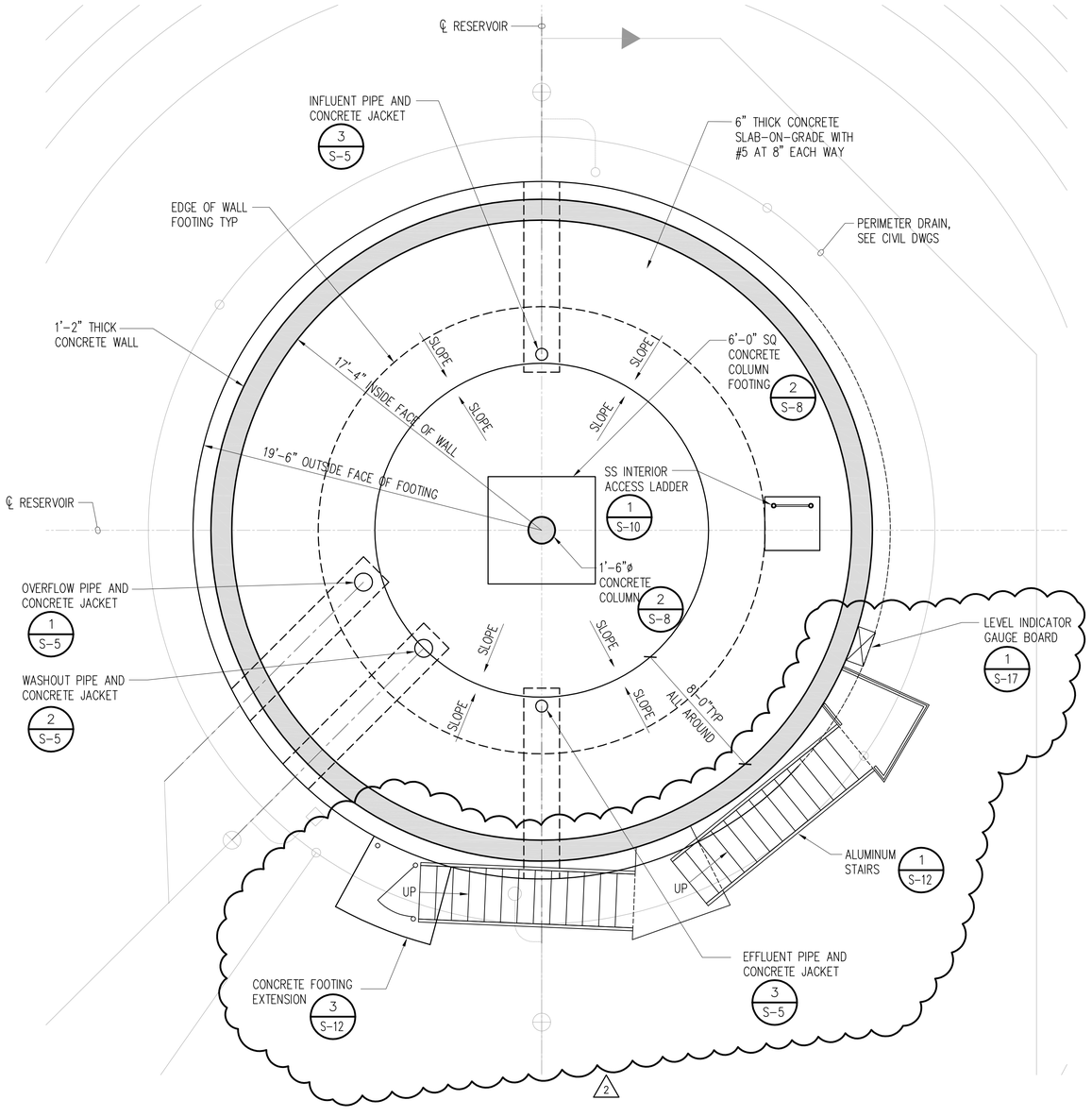
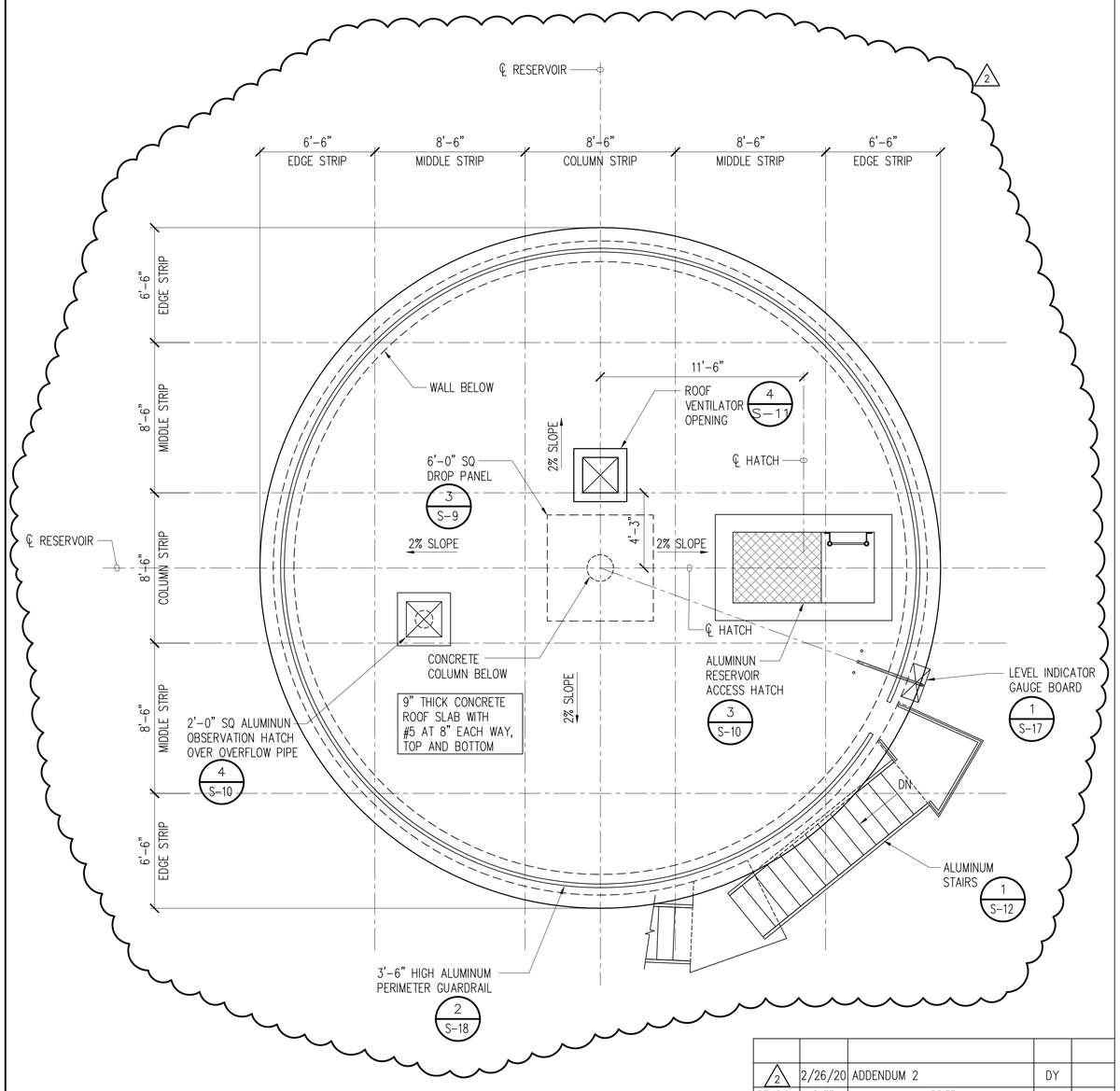


1 S-6 RESERVOIR STRUCTURAL FOUNDATION PLAN

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



2 S-6 RESERVOIR STRUCTURAL ROOF SLAB PLAN

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

NORTH

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SHEET 34 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR STRUCTURAL FOUNDATION AND ROOF SLAB PLANS

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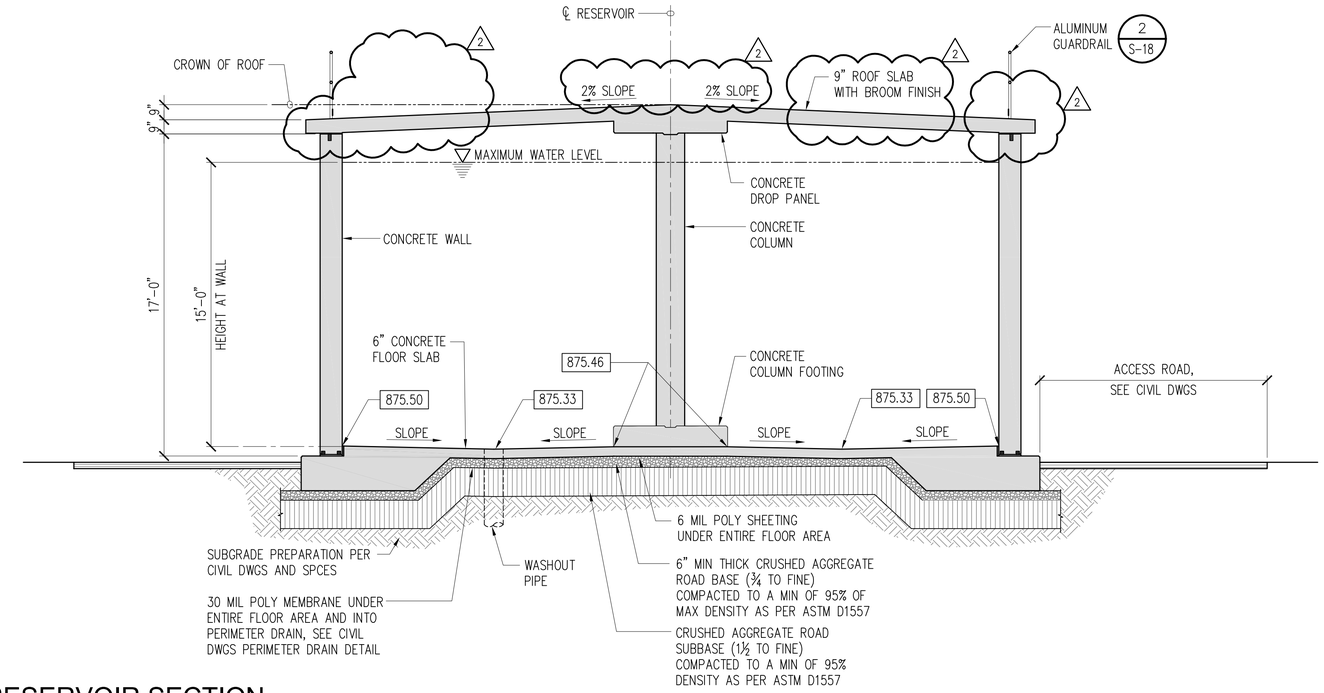
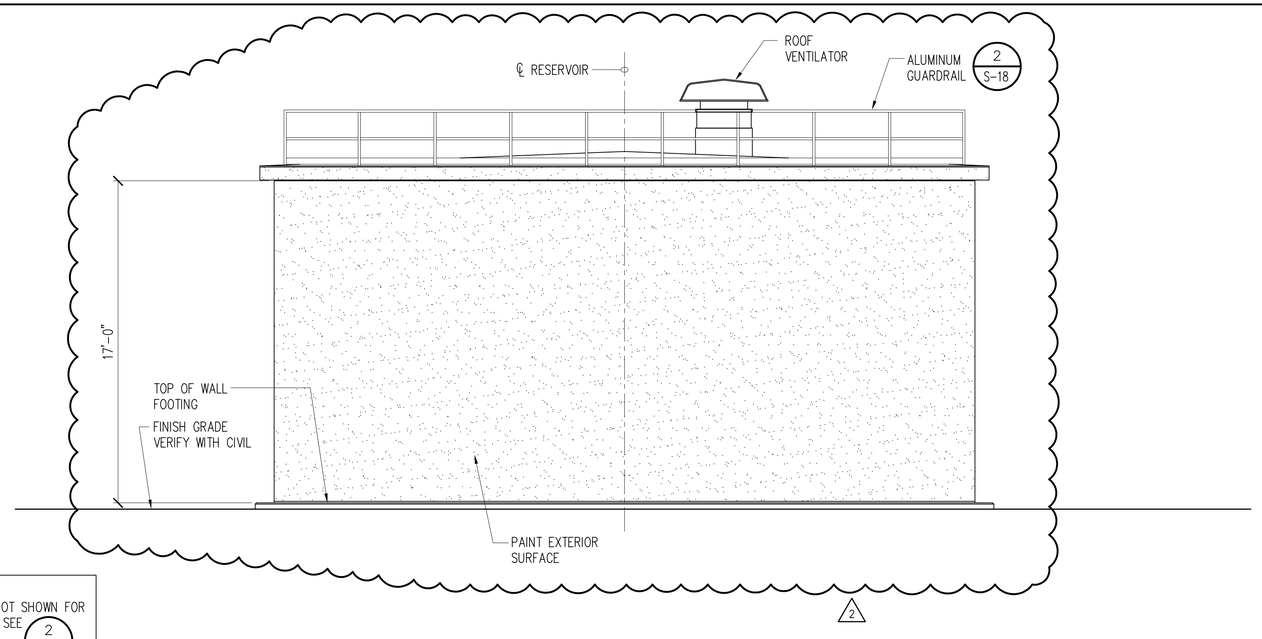


1 S-7 **RESERVOIR SECTION**

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



2 S-7 **RESERVOIR ELEVATION**

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

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S-7
SHEET 35 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR SECTION
AND ELEVATION

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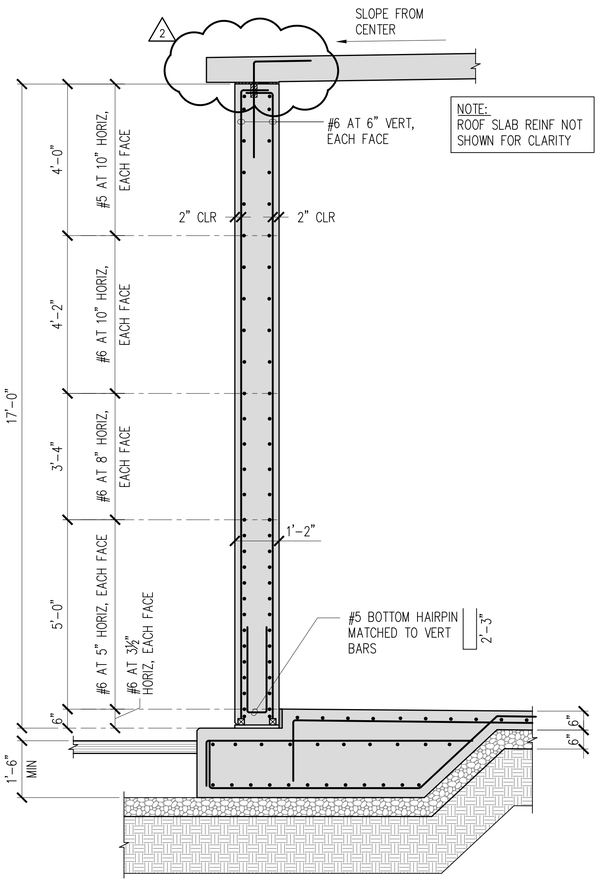
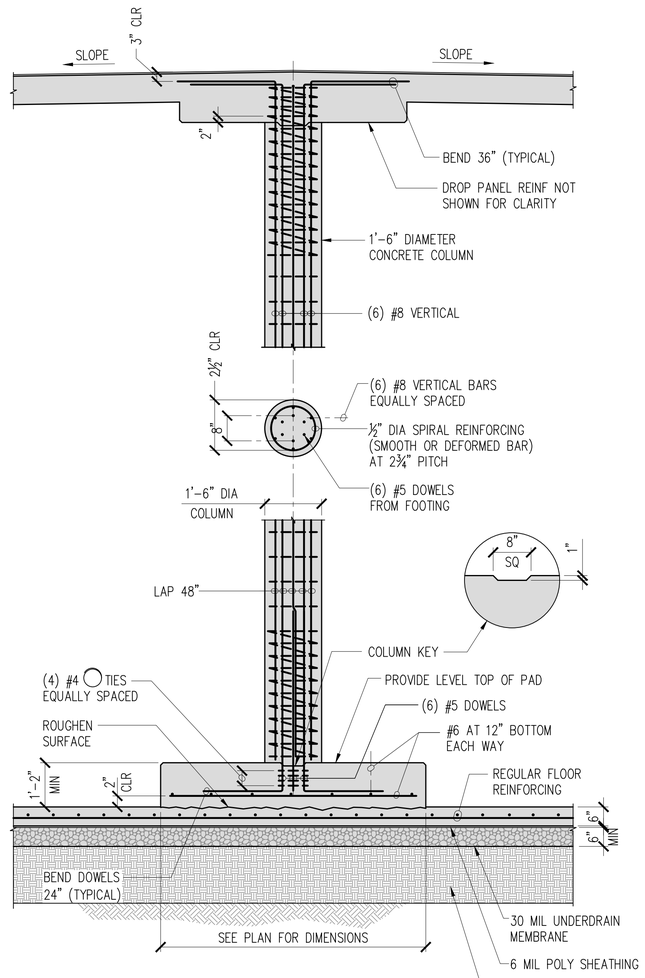


1 S-8 REINFORCED CONCRETE RESERVOIR - TYPICAL WALL SECTION

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



2 S-8 COLUMN DETAIL

NOT TO SCALE

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR WALL AND COLUMN SECTION

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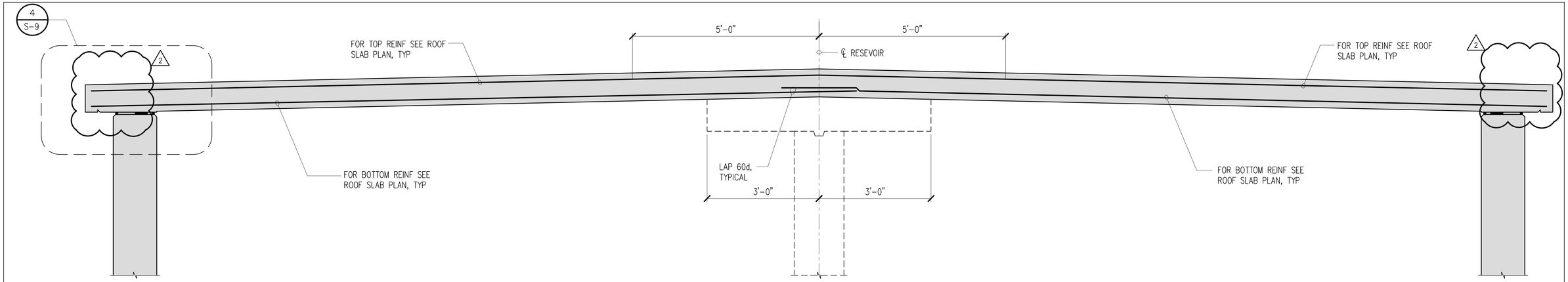
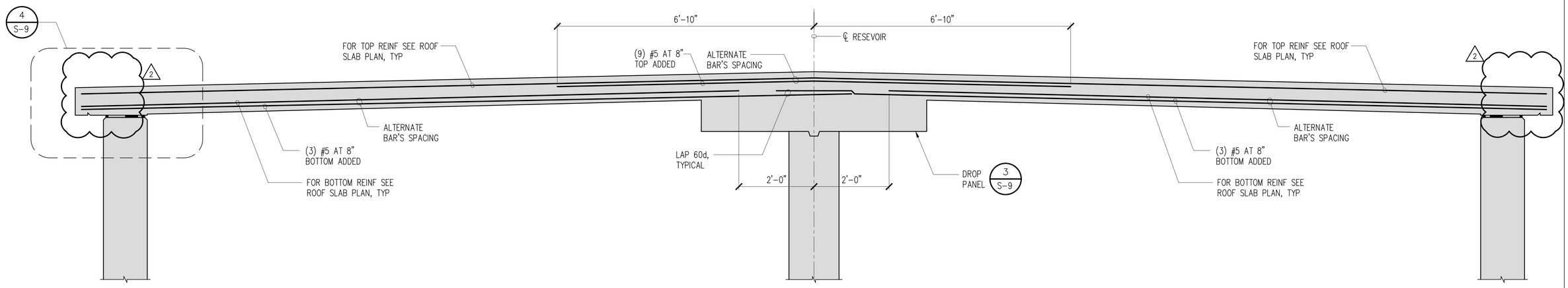


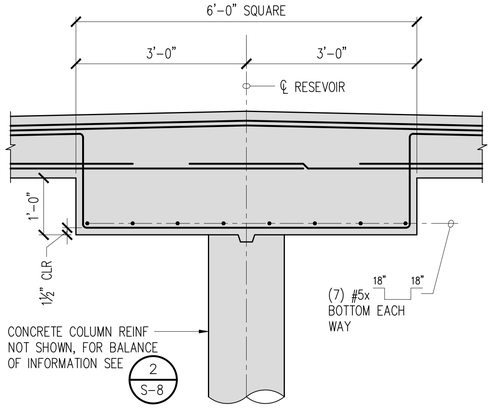
1 S-9 TYPICAL EDGE STRIP REINFORCING

NOT TO SCALE



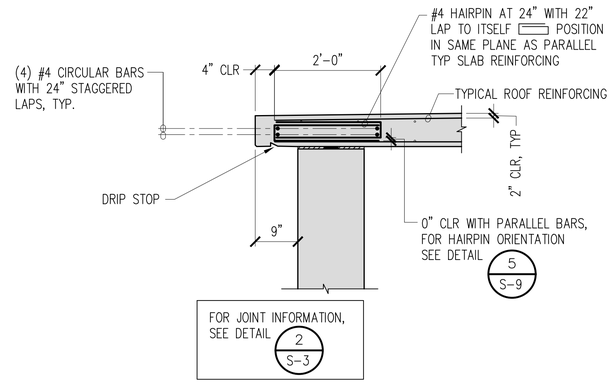
2 S-9 TYPICAL COLUMN AND EDGE STRIP REINFORCING

NOT TO SCALE



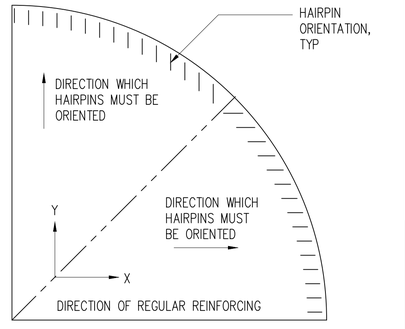
3 S-9 TYPICAL DROP PANEL DETAIL

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



4 S-9 ROOF EDGE REINFORCING

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



5 S-9 PLAN OF HAIRPIN ORIENTATION

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

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S-9
SHEET 37 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR ROOF SECTIONS AND DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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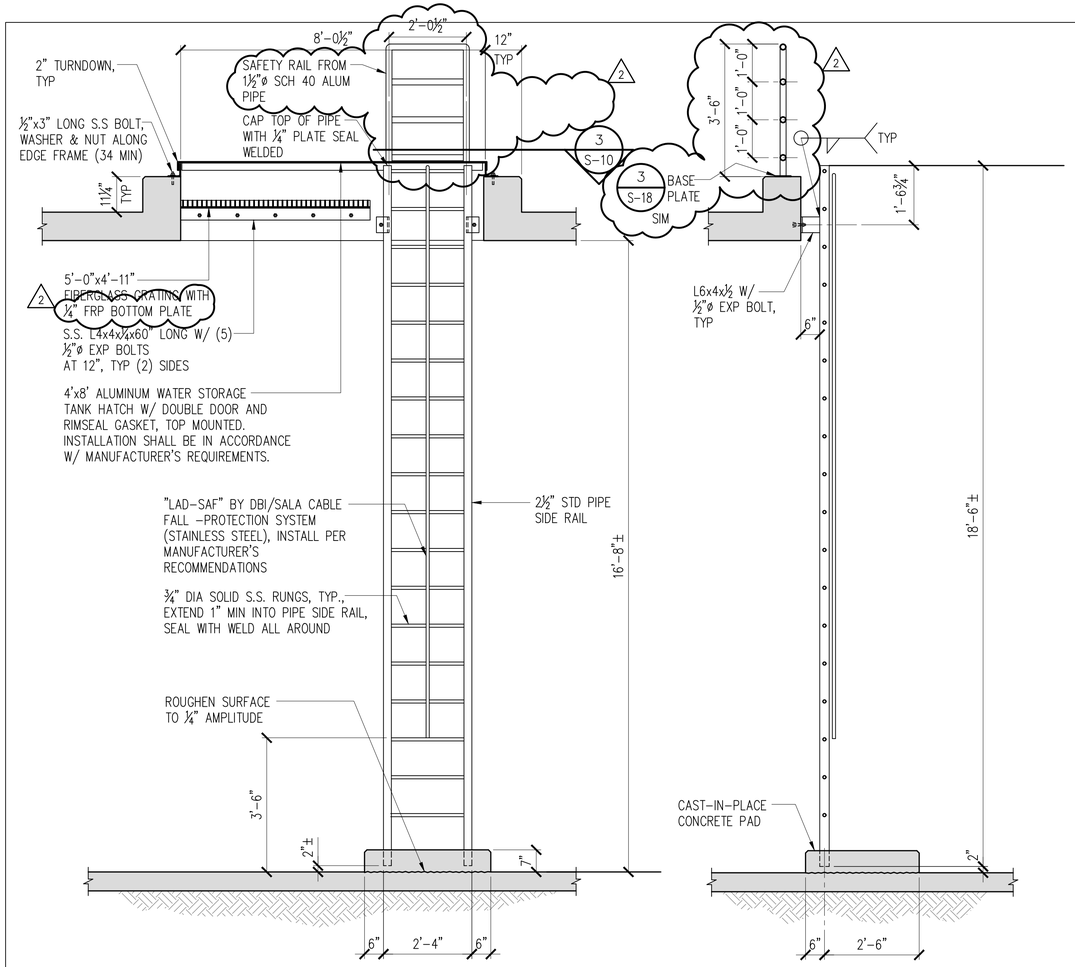


INTERIOR LADDER AND ROOF HATCH

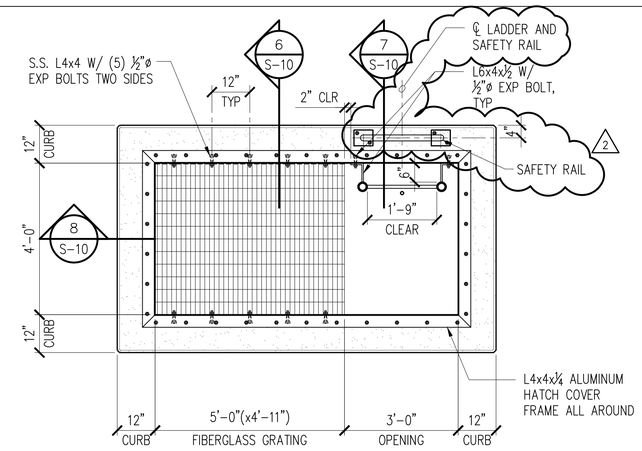
1 / S-10 SCALE: 1/2" = 1'-0"

ELEVATION OF INTERIOR LADDER

2 / S-10 SCALE: 1/2" = 1'-0"

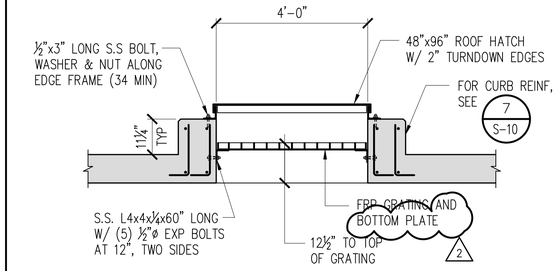
INTERIOR LADDER NOTES:

1. ALL MATERIALS FOR INTERIOR LADDERS PIPE, SIDE RAILS, RUNGS, BRACKETS AND "SAF-T-CLIMB" TO BE SST 316.
2. ROOF HATCH GRATING AND BOTTOM PLATE TO BE FIBERGLASS.
3. HATCH GRATING SHALL HAVE A MINIMUM 100 PSF LOAD RATING FOR THE SPECIFIED SPAN.
4. LADDER BARS TO BE SOLID BARS.
5. ALL WELDS TO BE ¼" MINIMUM.
6. ROOF HATCH TO BE MANUFACTURED OF ALUMINUM.
7. ALL ALUMINUM IN CONTACT WITH CONCRETE MUST BE COATED WITH A HEAVY BITUMASTIC COATING OR EPOXY PAINT.
8. ALL BOLTS SST 316 UNLESS NOTED OTHERWISE.
9. WHERE SST BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.



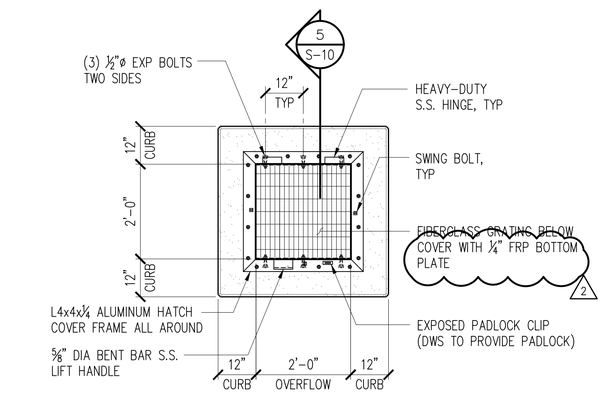
PLAN - ROOF HATCH

3 / S-10 SCALE: 1/2" = 1'-0"



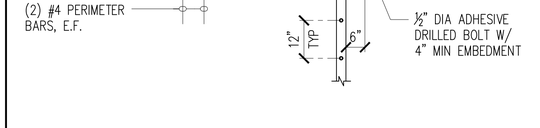
SECTION

6 / S-10 SCALE: 1/2" = 1'-0"



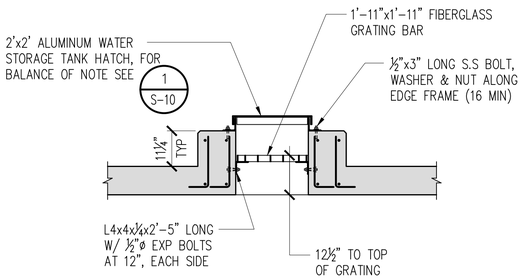
PLAN - 2'-0" SQ OBSERVATION HATCH

4 / S-10 SCALE: 1/2" = 1'-0"



SECTION

7 / S-10 SCALE: 1/2" = 1'-0"



NOTES:

1. PROVIDE GRAPHITE PAD AND SILICONE GASKET BETWEEN FRAME AND CONCRETE.
2. FOR BALANCE OF INFORMATION, SEE 6/S-10

SECTION

5 / S-10 SCALE: 1/2" = 1'-0"

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

INTERIOR LADDER, ACCESS AND OBSERVATION HATCH DETAILS

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Jerry S Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

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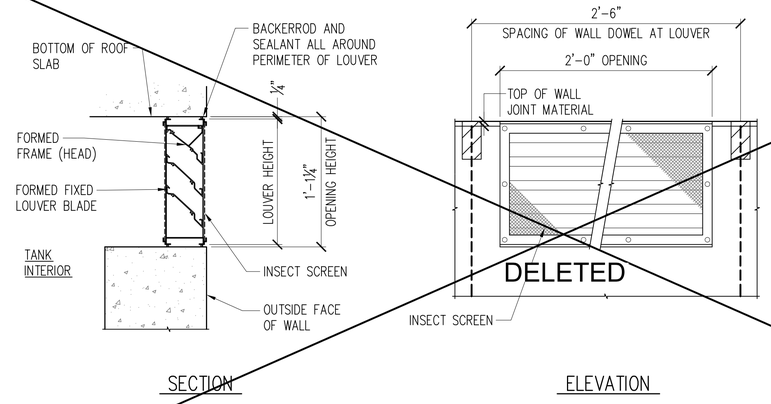
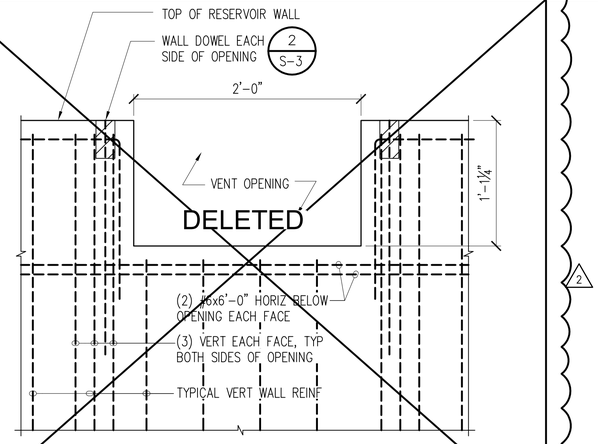


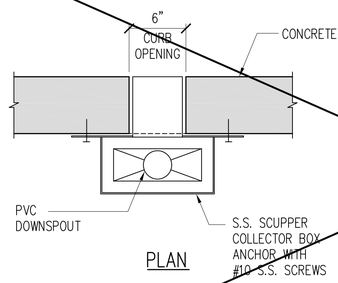
1 S-11 **LOUVER WALL VENT DETAILS**

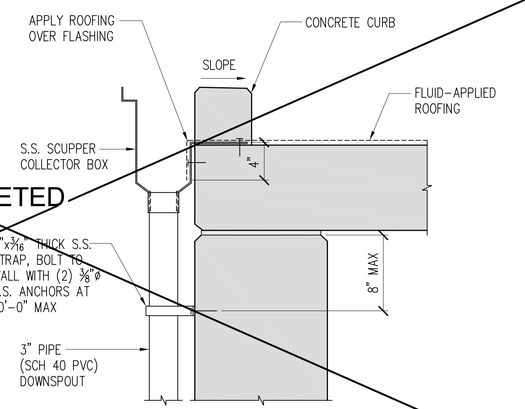
NOT TO SCALE



2 S-11 **TOP OF WALL OPENING**

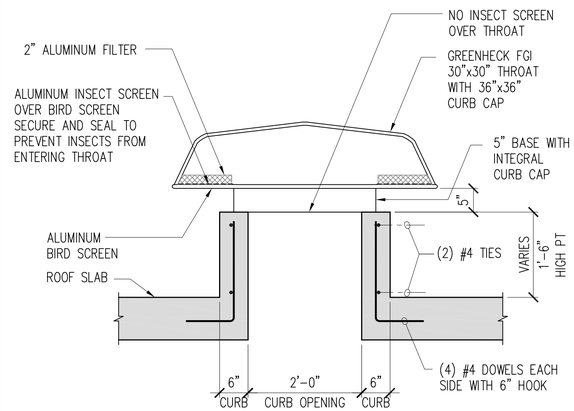
SCALE: 1 1/2" = 1'-0"





3 S-9 **SCUPPER COLLECTOR BOX DETAIL**

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



4 S-11 **ROOF VENTILATOR DETAIL**

NOT TO SCALE

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR VENTILATOR DETAIL 2

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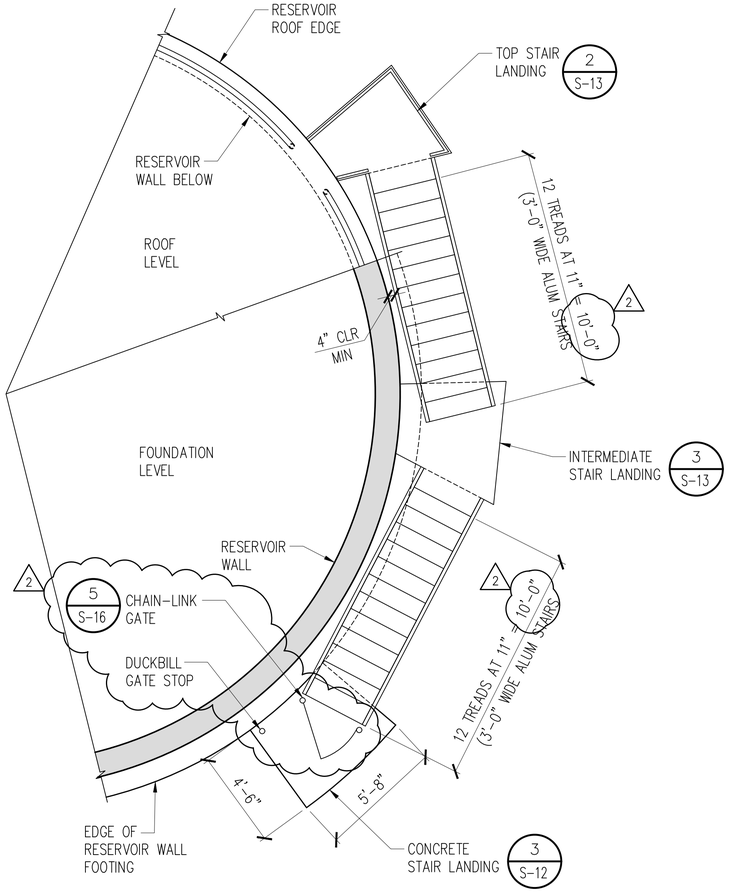
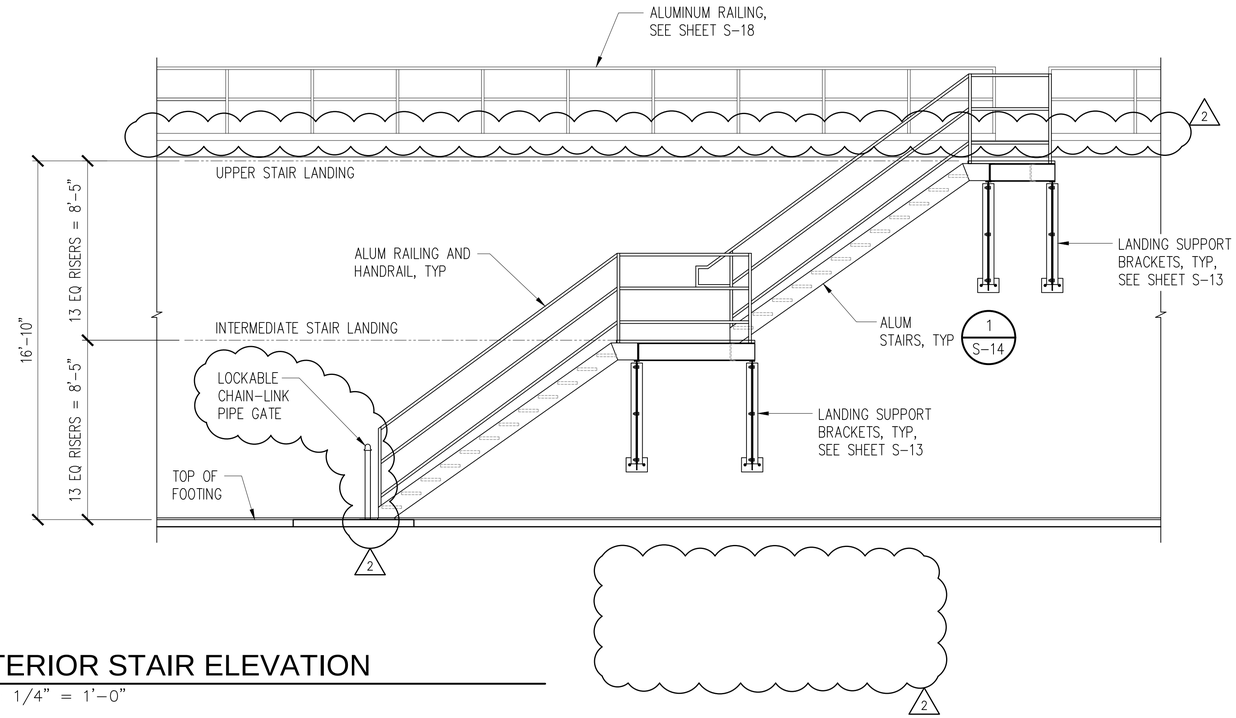


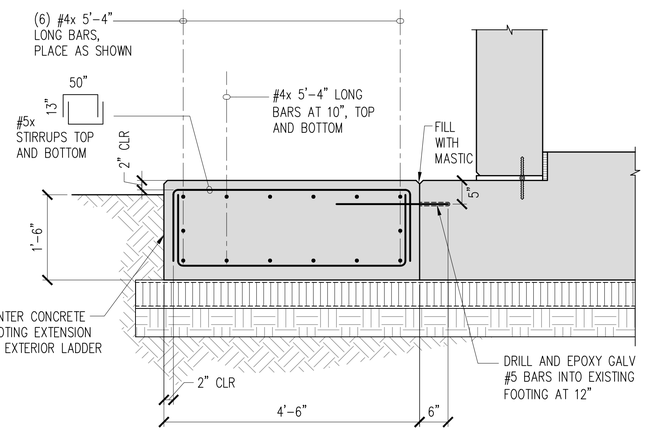
1 S-12 **EXTERIOR STAIR AND LANDING PLAN**

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



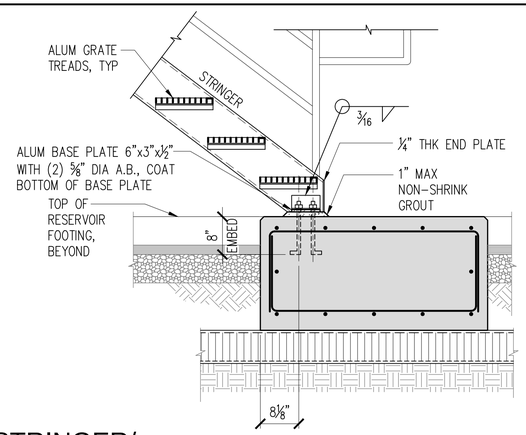
2 S-12 **EXTERIOR STAIR ELEVATION**

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



3 S-12 **WALL FOOTING EXTENSION DETAIL**

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



4 S-12 **STRINGER/ STRINGERFOOTING CONNECTION**

NOT TO SCALE

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DWG. NO. S-12
SHEET 40 OF 54

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR EXTERIOR STAIR PLAN AND DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

G70
111 S. KING STREET, SUITE 170
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808.523.5866
WWW.G70.DESIGN

JANUARY 2020

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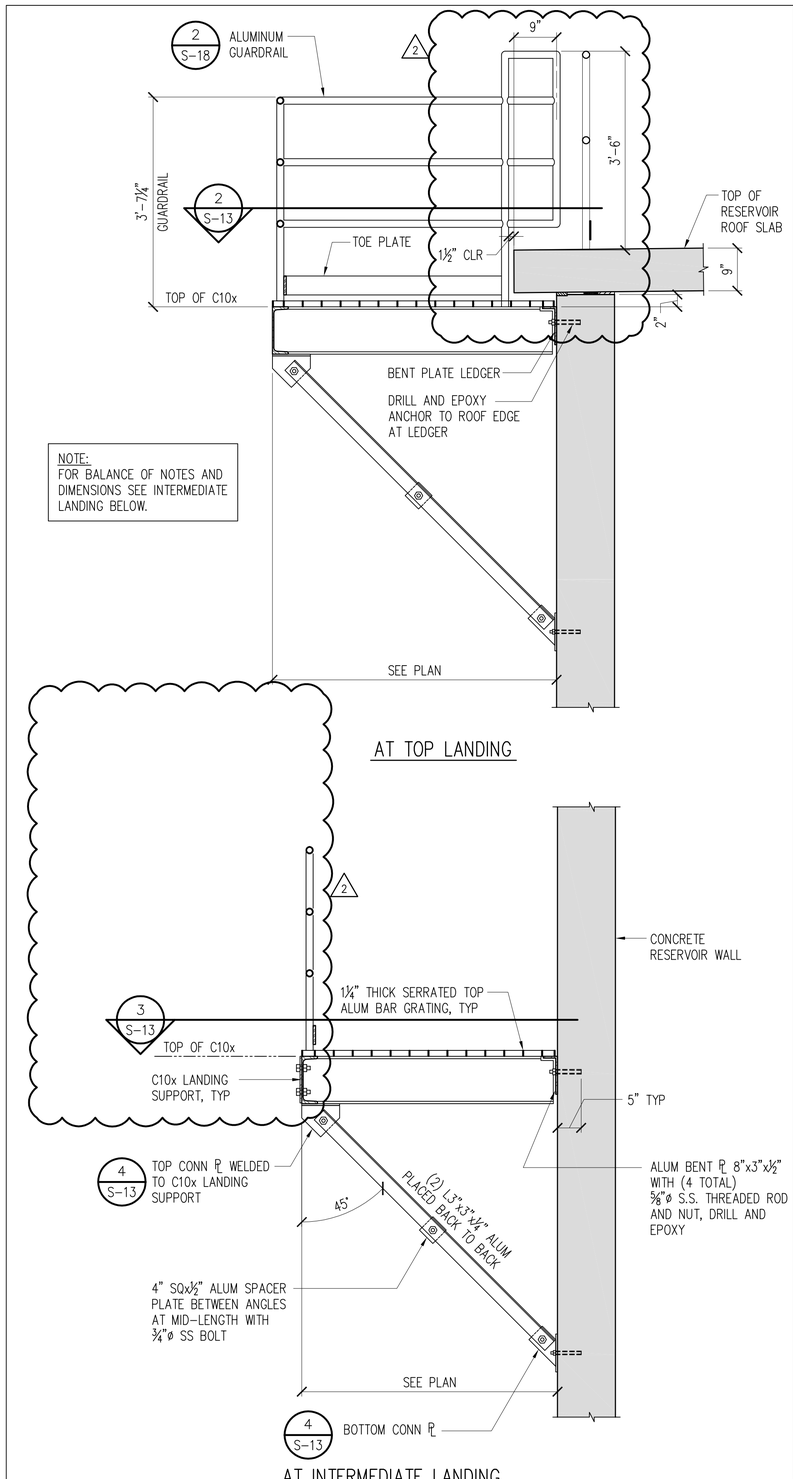
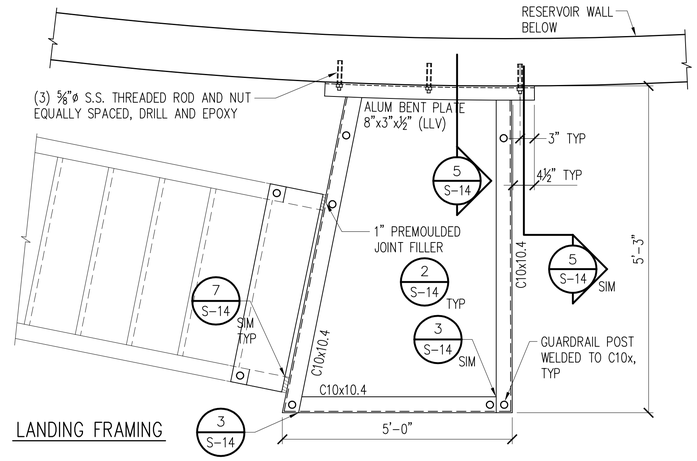


1 S-13 **EXTERIOR STAIR LANDING SUPPORT SECTIONS**

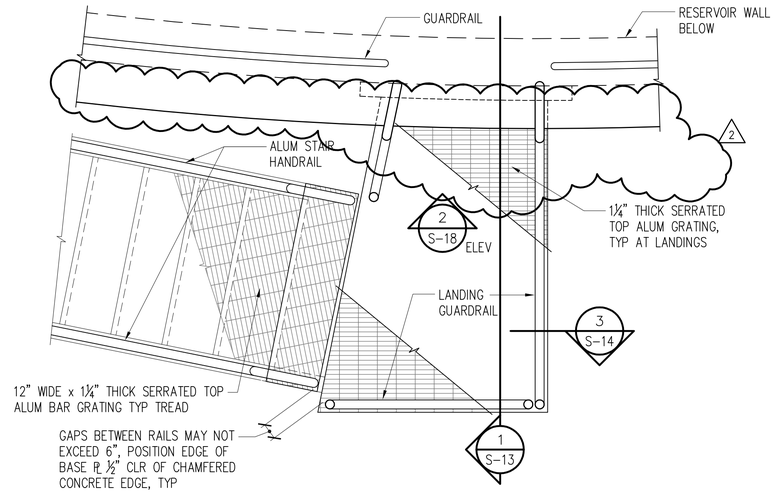
NOT OT SCALE



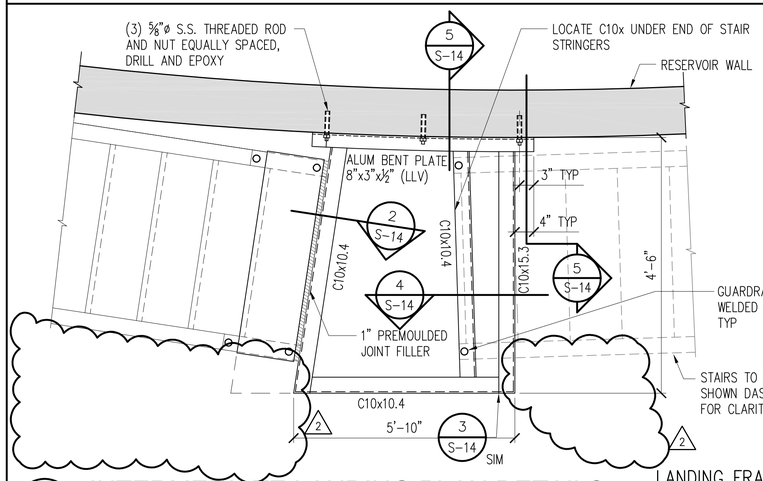
LANDING FRAMING

2 S-13 **TOP STAIR LANDING PLAN DETAILS**

NOT TO SCALE



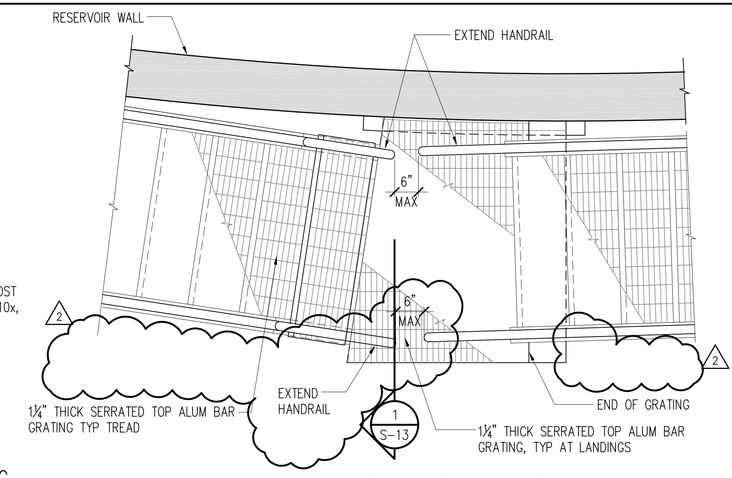
LANDING GUARDRAIL LAYOUT



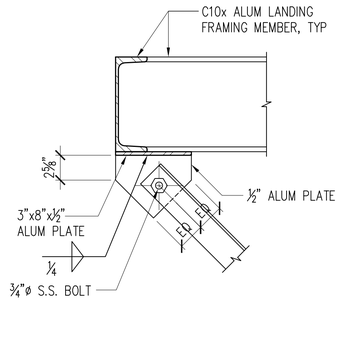
LANDING FRAMING

3 S-13 **INTERMEDIATE LANDING PLAN DETAILS**

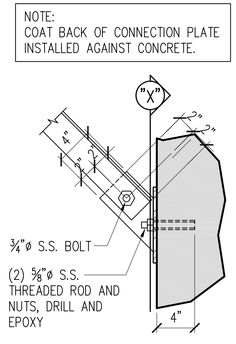
NOT TO SCALE



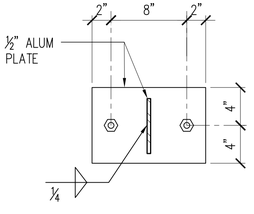
LANDING GUARDRAIL LAYOUT



TOP CONN ℄



BOTTOM CONN ℄



SECTION "X"

4 S-13 **LANDING SUPPORT CONNECTION PLATES**

NOT TO SCALE

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	DY	

DWG. NO. S-13
SHEET 41 OF 54

JERRY S FUJITA
LICENSED PROFESSIONAL ENGINEER
No. 11573-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 8/23/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR STAIR FRAMING AND DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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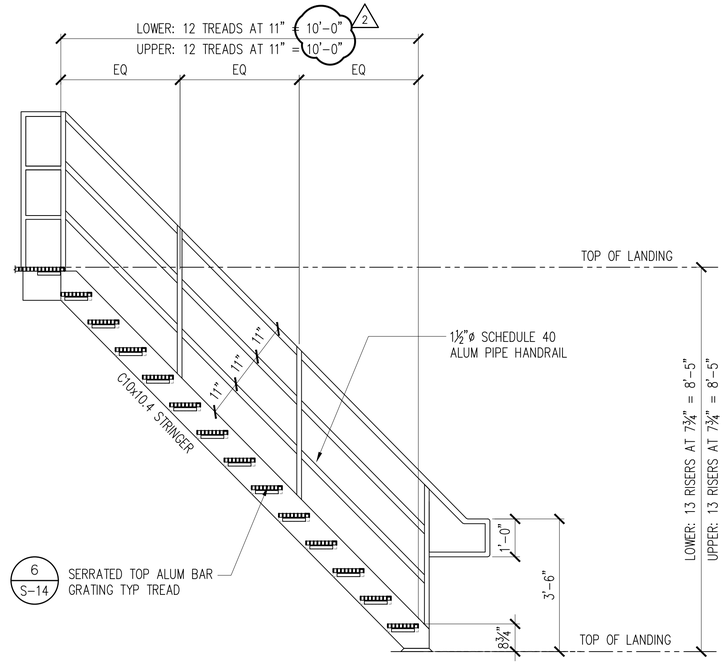
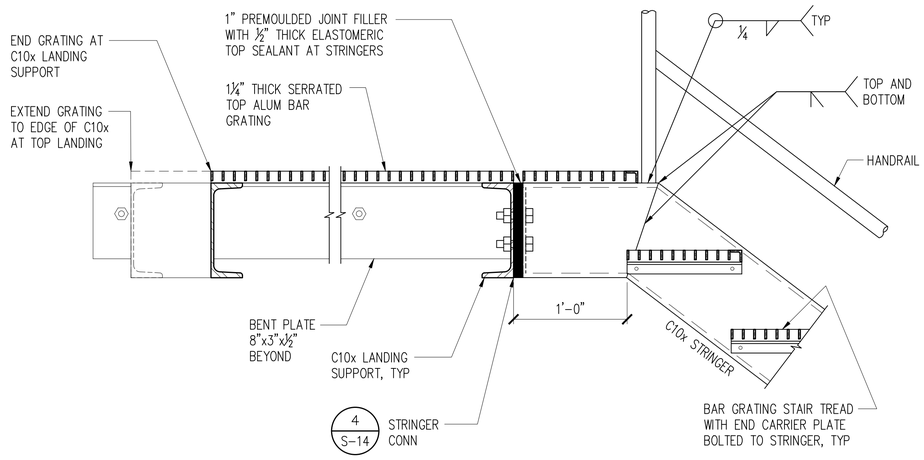


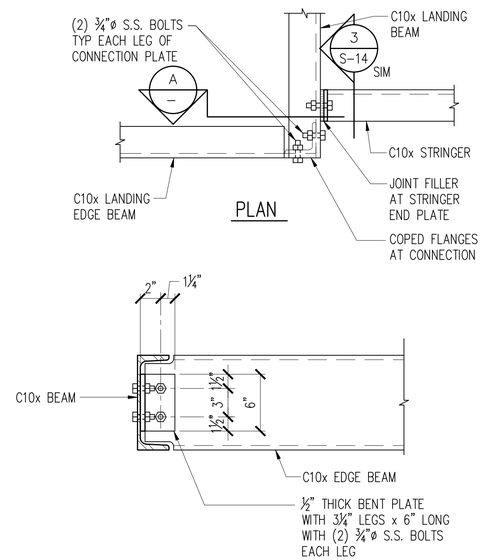
1 S-14 TYPICAL STAIR HANDRAIL & STRINGER ELEVATION

NOT TO SCALE



2 S-14 TOP OF STRINGER AT LANDING

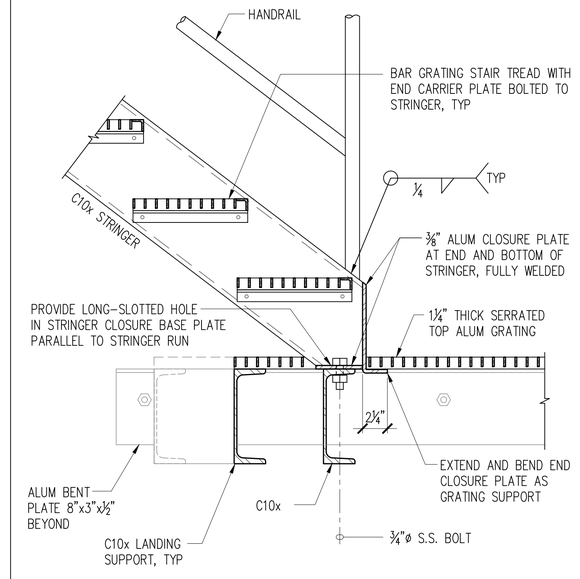
SCALE: 1 1/2" = 1'-0"



A SECTION

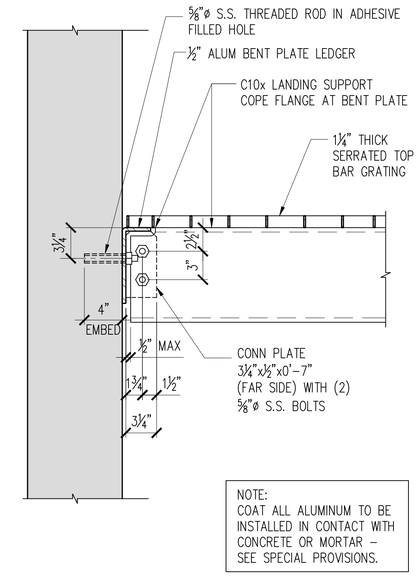
3 S-14 CHANNEL TO CHANNEL

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



4 S-14 BOTTOM OF STRINGER AT LANDING

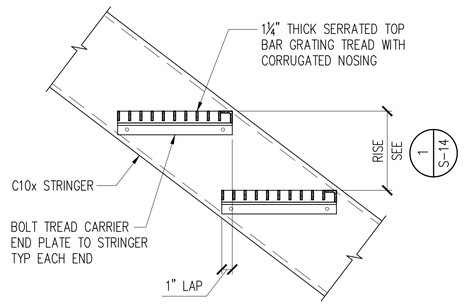
SCALE: 1 1/2" = 1'-0"



NOTE:
COAT ALL ALUMINUM TO BE INSTALLED IN CONTACT WITH CONCRETE OR MORTAR - SEE SPECIAL PROVISIONS.

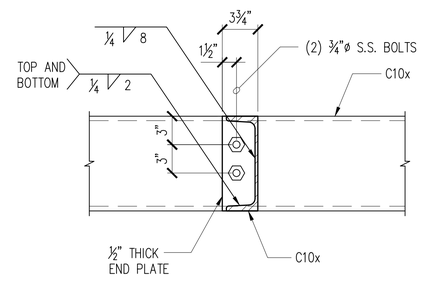
5 S-14 C10x LANDING SUPPORT TO LEDGER

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



6 S-14 STAIR TREAD DETAIL

NOT TO SCALE



7 S-14 STAIR STRINGER TOP CONNECTION

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

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	DY	

JERRY S FUJITA
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Jerry S Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR STAIR DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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SHEET 42 OF 54

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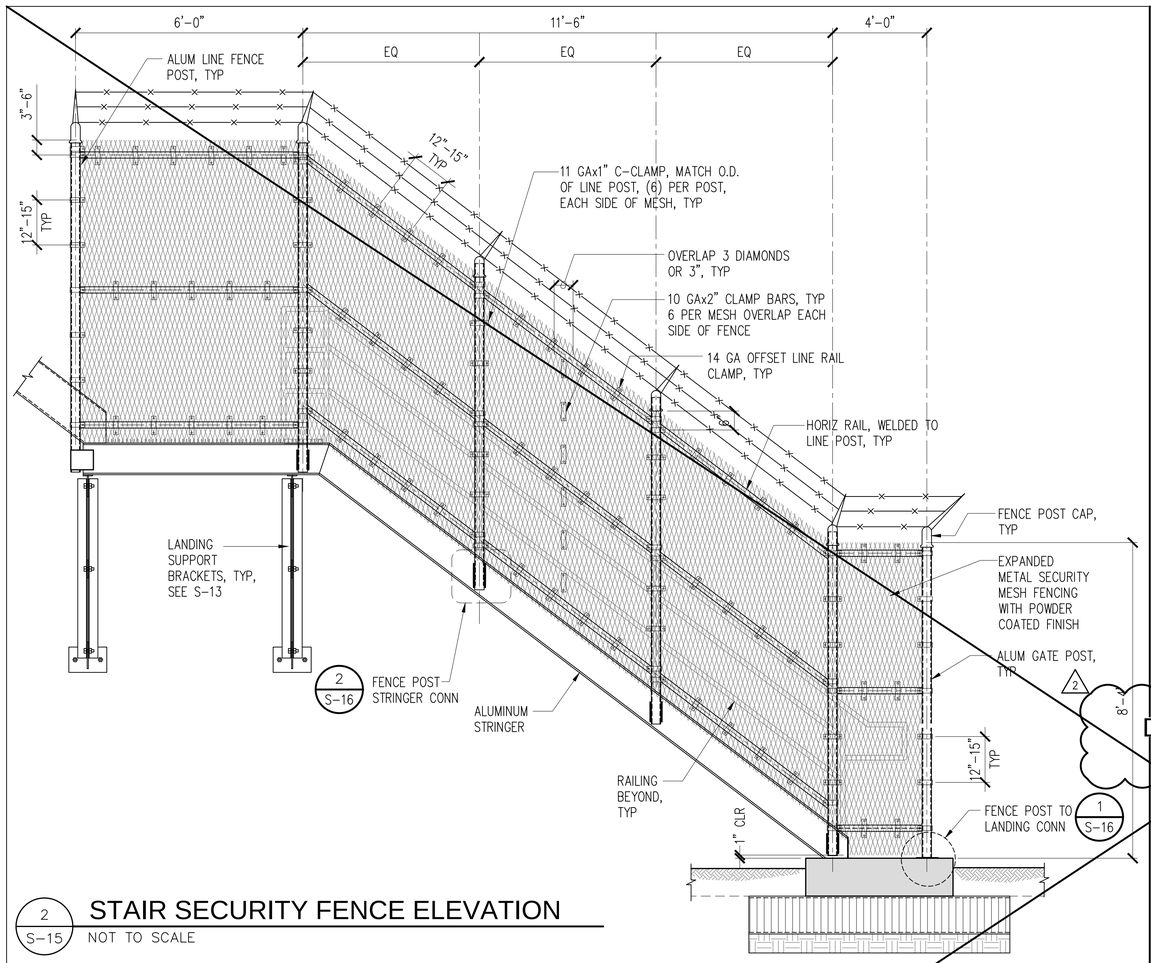
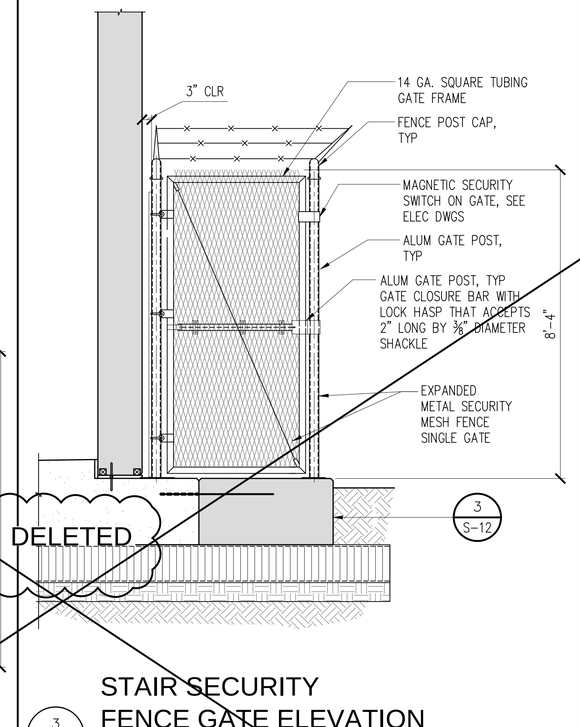


2 S-15 **STAIR SECURITY FENCE ELEVATION**

NOT TO SCALE

NOTES:

1. GATE DESIGNED AND PROVIDED BY FENCE MANUFACTURER. PROVIDE GATE LATCH AND BARBED WIRE.



3 S-15 **STAIR SECURITY FENCE GATE ELEVATION**

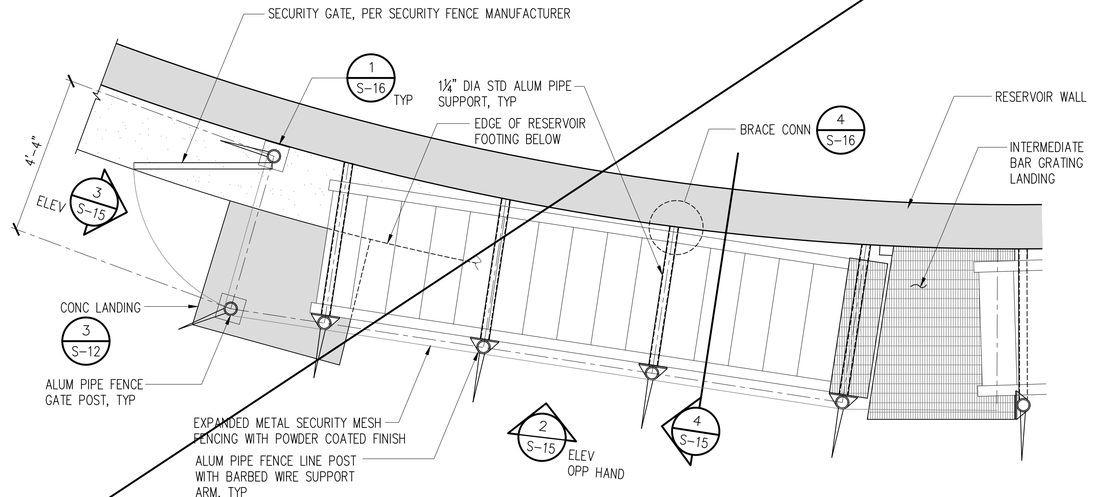
NOT TO SCALE

STAIR SECURITY FENCING NOTES:

1. THE HIGH SECURITY FENCE SHALL BE A SECUREX FENCE EXPANDED METAL FENCE SYSTEM AS MANUFACTURED BY: NILES FENCE AND SECURITY PRODUCTS OR APPROVED EQUAL.
2. FENCING SYSTEM SHALL BE 8 FEET HIGH USING 3 HORIZONTAL RAILS (TOP, MID-HEIGHT AND BOTTOM) BETWEEN POSTS WITH A NO-CLIMB 9 GAUGE EXPANDED METAL MESH WITH A 3/4-INCH HOLE. SIZE ENTIRE FENCING SYSTEM AND GATE SHALL BE FINISHED WITH A POLYESTER POWDER COATING FOR ENHANCED CORROSION PROTECTION.
3. FENCE FRAMEWORKS SHALL CONSIST OF THE FOLLOWING:

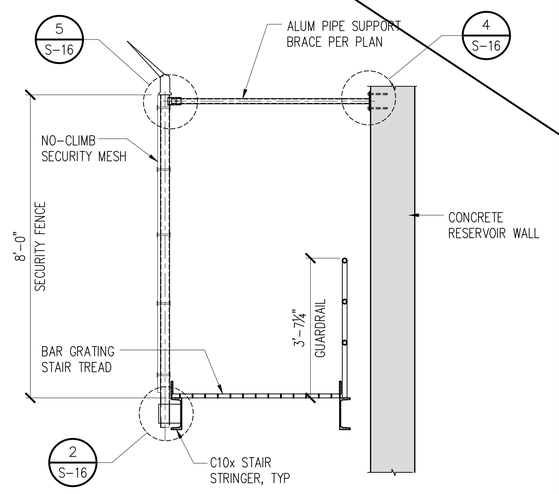
A.	LINE POSTS	2 1/2" DIA	SCH 40	6061-T6
B.	GATE POSTS	3 1/2" DIA	SCH 40	6061-T6
C.	HORIZONTAL RAILS	1 1/4" DIA	SCH 40	6061-T6

4. ALL FENCE FITTINGS AND HARDWARE SHALL BE POLYESTER POWDER COATING TO MATCH FENCING.
5. FASTENERS SHALL BE SS 316 CARRIAGE BOLTS WITH BREAKAWAY NUTS OR OTHER APPROVED TAMPER-PROOF SECURITY FASTENER, UNLESS NOTED OTHERWISE. BOLT SIZE IS CONTINGENT ON MESH AND FITTINGS PER SECURITY FENCE MANUFACTURER.
6. USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.
7. WHERE DISSIMILAR METALS ARE JOINED, (E.G. GALVANIZED STEEL FENCE POST CAPS ON ALUMINUM POSTS), PROVIDE EPOXY PAINT COATING OR SEPARATE WITH ISOLATION TAPE TO ELECTRONICALLY ISOLATE MATERIALS FROM DISSIMILAR METALS.
8. THE FENCING ALIGNMENT SHALL BE LOCATED RELATIVE TO THE EXTERIOR STAIR STRINGER AS INDICATED ON THIS SHEET. NEW POSTS SHALL BE PROVIDED FOR FENCING.
9. ATTACH AND SECURE MESH TO POSTS AND HORIZONTAL RAILS AND POSTS WITH FASTENERS AND IN MANNER SPECIFIED BY MANUFACTURER. PROVIDE SPECIAL SIZED POSTS, END TENSIONER ASSEMBLIES AT CORNERS AND TERMINATION (GATE) POSTS AS RECOMMENDED BY MANUFACTURER.
10. MESH CONNECTION HARDWARE INDICATED IN DETAILS IS FOR GENERAL CONCEPT/REQUIREMENTS ONLY. THE ACTUAL TYPE, NUMBER, CONFIGURATION AND/OR LOCATION WILL VARY DEPENDING ON MANUFACTURER.
11. INSTALL 3 STRANDS BARBED WIRE ABOVE TOP OF FENCE. BARBED WIRE SUPPORT ARMS TO HAVE POLYESTER POWDER COATING TO MATCH FENCE SYSTEM.



1 S-15 **PARTIAL STAIR SECURITY FENCE PLAN**

NOT TO SCALE



4 S-15 **STAIR SECURITY FENCE SECTION**

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

GRAPHIC SCALE:

1' 0 2' 4'

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

1' 0 1' 2'

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

REVISION	DATE	BRIEF	MADE BY	APPROVED
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DWG. NO. S-15

SHEET 43 OF 54

JERRY S FUJITA LICENSED PROFESSIONAL ENGINEER No. 11573-S HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
JFB-20-HHL-019

RESERVOIR EXTERIOR STAIR SECURITY FENCING PLAN AND ELEVATIONS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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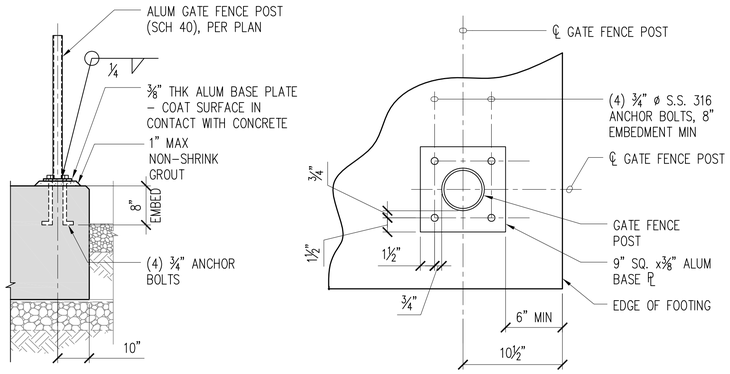
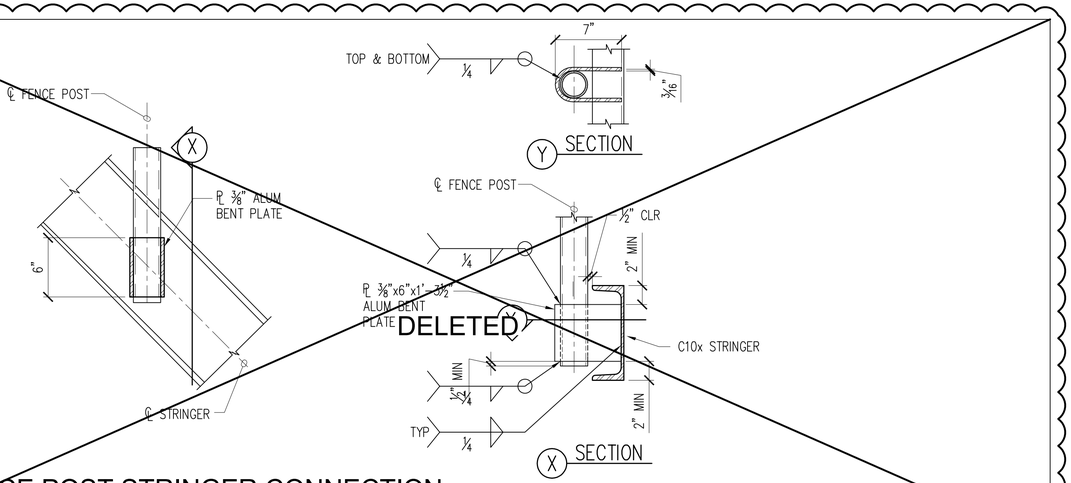


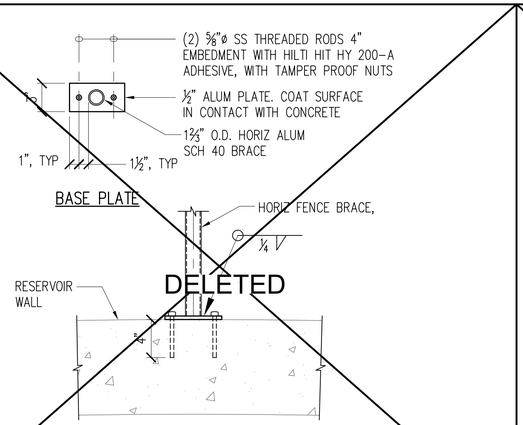
1 S–16 **FENCE GATE POST CONNECTION**

SCALE: 1 1/2" = 1'–0"



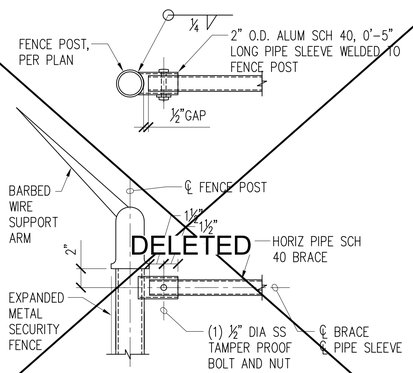
2 S–16 **FENCE POST STRINGER CONNECTION**

SCALE: 1 1/2" = 1'–0"



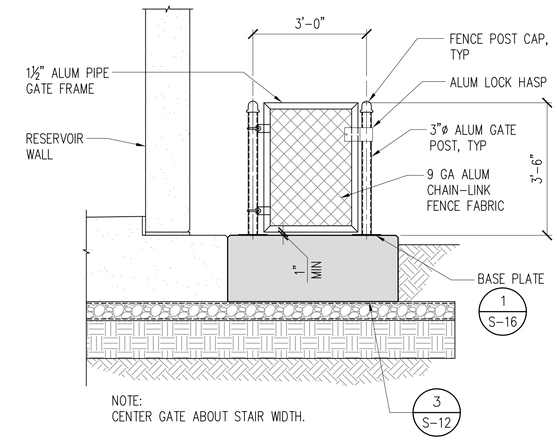
3 S–16 **FENCE BRACE TO WALL CONNECTION**

SCALE: 1 1/2" = 1'–0"



4 S–16 **FENCE BRACE TO FENCE POST CONNECTION**

SCALE: 1 1/2" = 1'–0"



5 S–16 **FENCE GATE ELEVATION**

NOT TO SCALE

CHAIN–LINK FENCE GATE NOTES:

1. GATE SHALL BE CHAIN–LINK SINGLE LEAF GATE AS INDICATED ON THE PLANS. GATE FRAME SHALL BE 1–1/2" O.D. SCHEDULE 40, TYPE 6061–T6 ALUMINUM PIPE, ALL WELDED CONSTRUCTION. THE GATE SHALL BE FURNISHED COMPLETE WITH SPECIAL PIVOT TYPE HINGES, STOPS, AND LOCKING DEVICE FOR PADLOCK
2. GATE POSTS SHALL BE 3" DIAMETER, SCHEDULE 40, TYPE 6061–T6 ALUMINUM.
3. ALL GATE COMPONENTS AND HARDWARE SHALL BE MADE OF ALUMINUM.
4. FENCE MESH SHALL BE NO. 9 GAUGE AND HAVE A UNIFORM DIAMOND MESH MEASURING APPROXIMATELY 2–INCHES BETWEEN ITS PARALLEL SIDES. FENCE MESH SHALL BE CONSTRUCTED OF 6061–T94 ALUMINUM ALLOY.
5. WHERE DISSIMILAR METALS ARE JOINED, PROVIDE EPOXY PAINT COATING OR SEPARATE WITH ISOLATION TAPE TO ELECTRONICALLY ISOLATE MATERIALS FROM DISSIMILAR METALS.
6. PROVIDE DUCKBILL GATE STOP. LOCATE GATE STOP IN THE FIELD.

GRAPHIC SCALE:

6" 0 6" 12" 18"

SCALE: 1 1/2" = 1'–0"

DWG. NO. S-16

SHEET 44 OF 54

JERRY S FUJITA LICENSED PROFESSIONAL ENGINEER No. 11573–S HAWAII, U.S.A.

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SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

FENCE GATE DETAILS 2

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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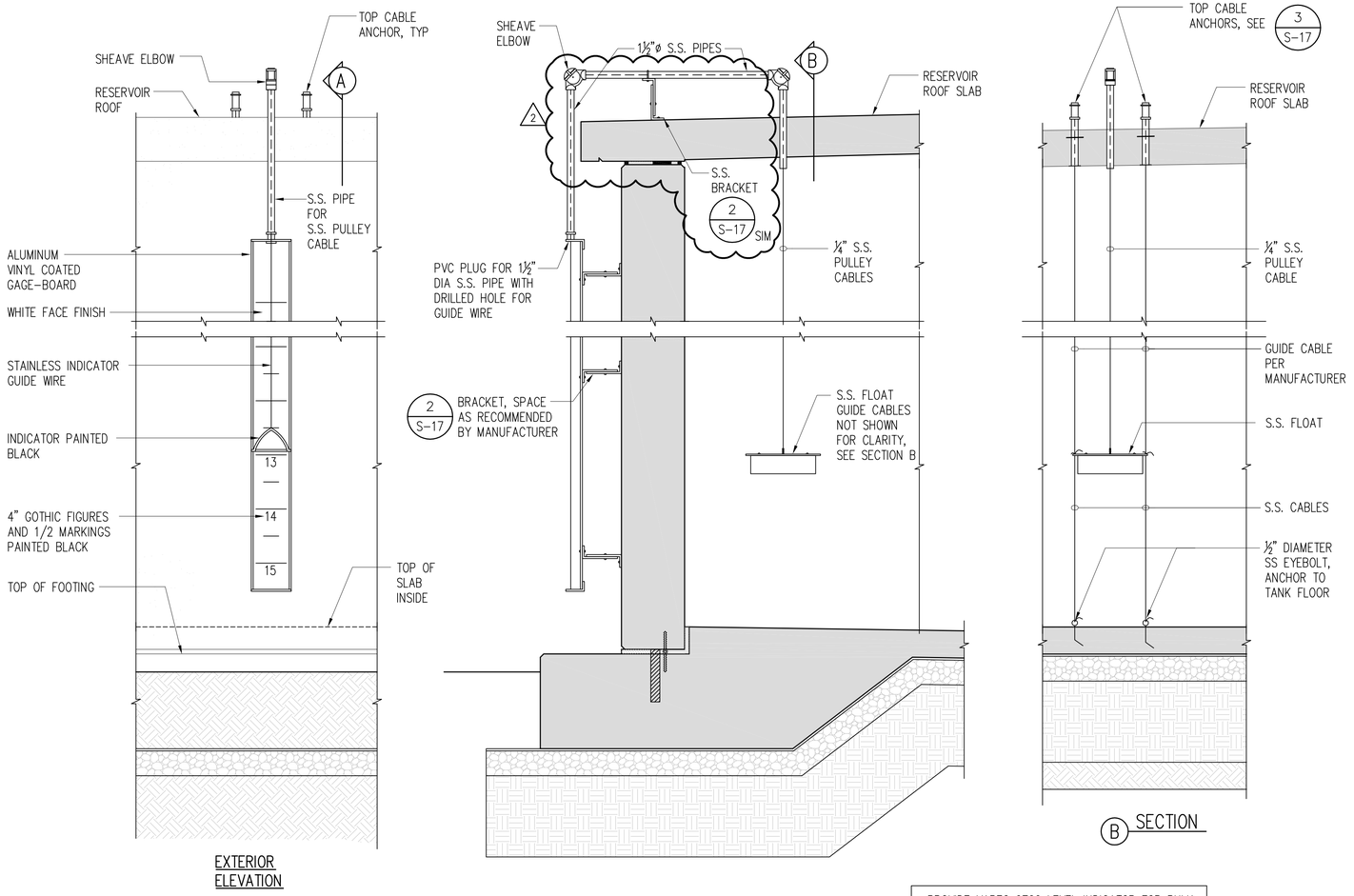
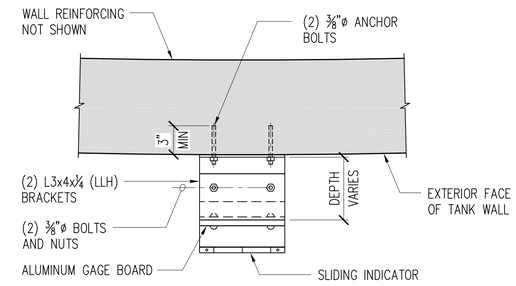


PROVIDE VAREC 6700 LEVEL INDICATOR FOR BULK STORAGE SYSTEM OR APPROVED EQUAL

1 S-17 WATER LEVEL INDICATOR

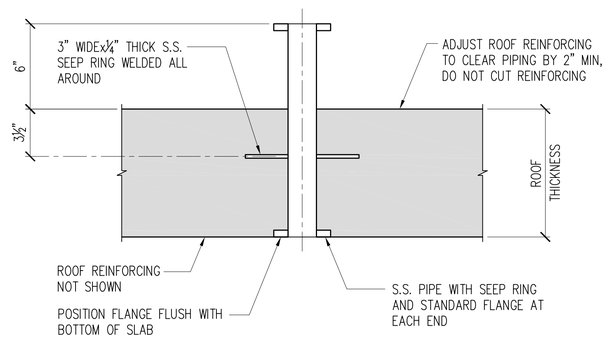
NOT TO SCALE



NOTES:
1. FOR SIZE OF INDICATOR BOARD AND BRACKET REQUIREMENTS, SEE MANUFACTURER'S LITERATURE.
2. BRACKETS, ANCHORS, NUTS AND BOLTS SHALL BE STAINLESS STEEL, TYPICAL.
3. ALL ANCHOR BOLTS SHALL BE LOCATED TO AVOID EMBEDDED REINFORCING STEEL.

2 S-17 INDICATOR BRACKET PLAN DETAIL

NOT TO SCALE



3 S-17 TYPICAL CABLE PIPE THROUGH ROOF

NOT TO SCALE

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

MISCELLANEOUS RESERVOIR DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

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SHEET 45 OF 54

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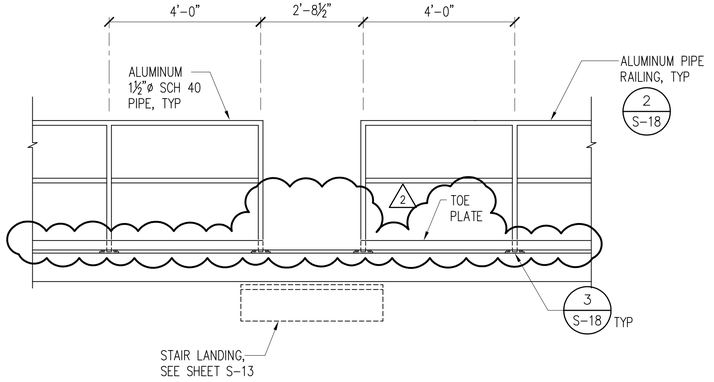
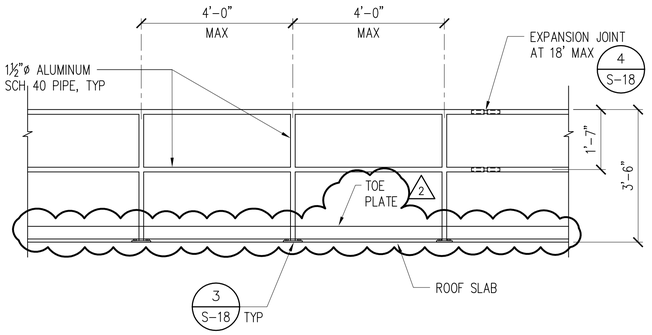


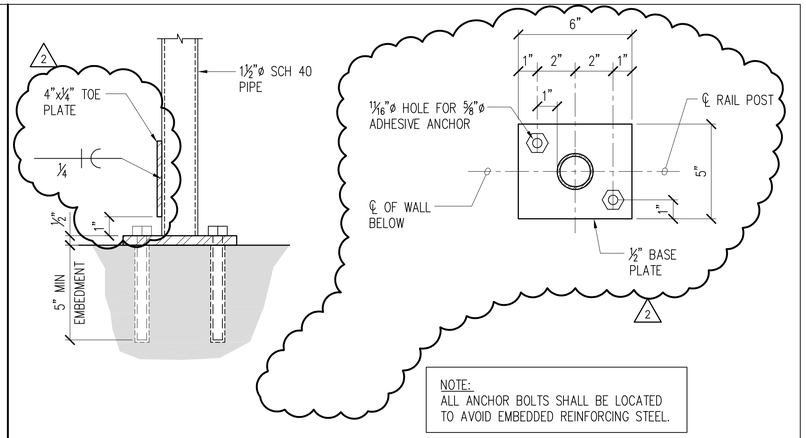
1 S-18 GUARDRAILS AT STAIR LANDING

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



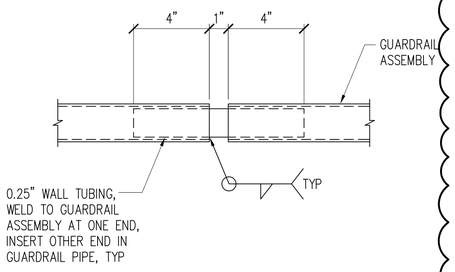
2 S-18 TYPICAL GUARDRAIL ELEVATION

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



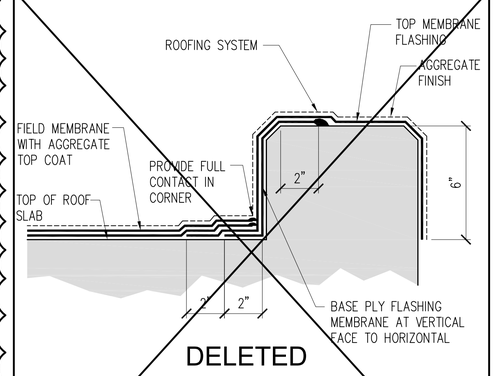
3 S-18 GUARDRAIL BASE PLATE DETAILS

SCALE: 3" = 1'-0"



4 S-18 GUARDRAIL EXPANSION JOINT DETAIL

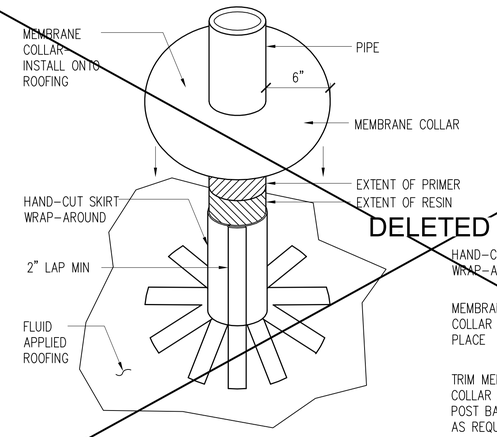
SCALE: 3" = 1'-0"



DELETED

5 S-18 TYPICAL ROOFING AT ROOF CURB

SCALE: 3" = 1'-0"



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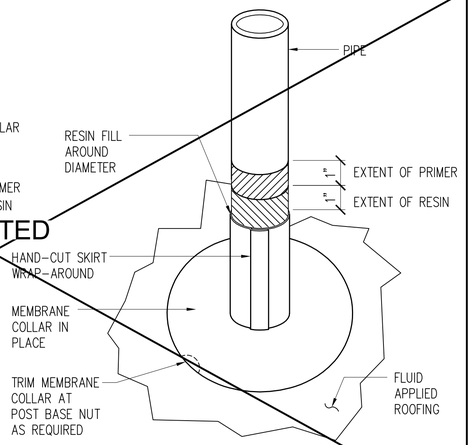
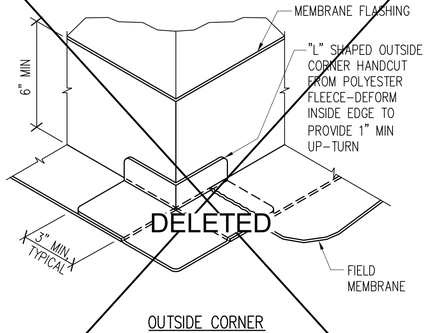


6 S-18 TYPICAL PIPE SEALING DETAIL

NOT TO SCALE

GUARDRAIL NOTES:

1. ALL MATERIAL FOR GUARDRAILS AND BASEPLATES TO BE ALUMINUM 6061-T6.
2. ALL ALUMINUM IN CONTACT WITH CONCRETE MUST BE COATED WITH A HEAVY BITUMASTIC COATING OR EPOXY PAINT.
3. USE SST 316 FOR ALL BOLTS UNLESS NOTED OTHERWISE.
4. WHERE SST BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.



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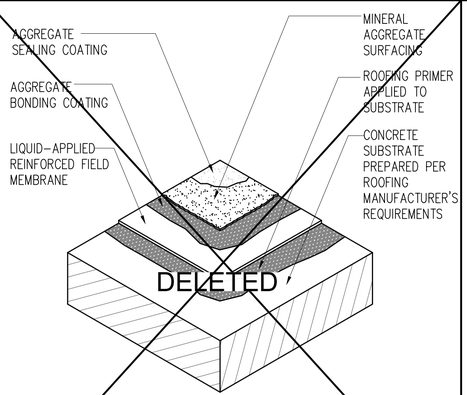
OUTSIDE CORNER

7 S-18 ROOF FLASHING AT CORNER

NOT TO SCALE



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8 S-18 TYPICAL LIQUID-APPLIED ROOFING ASSEMBLY DETAIL

NOT TO SCALE

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2	2/26/20	ADDENDUM 2	DY	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

2 RESERVOIR RAILING DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

JERRY S FUJITA
LICENSED PROFESSIONAL ENGINEER
No. 11573-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 8/23/94).

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO. S-18
SHEET 46 OF 54

G70
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JANUARY 2020

FILE	POCKET	FOLDER	NO.

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.

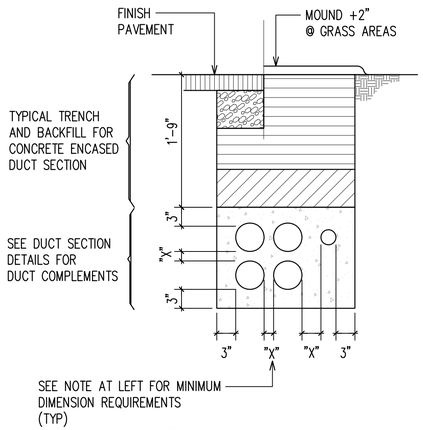
TYPE "B" BACKFILL – EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

NOTE – IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.

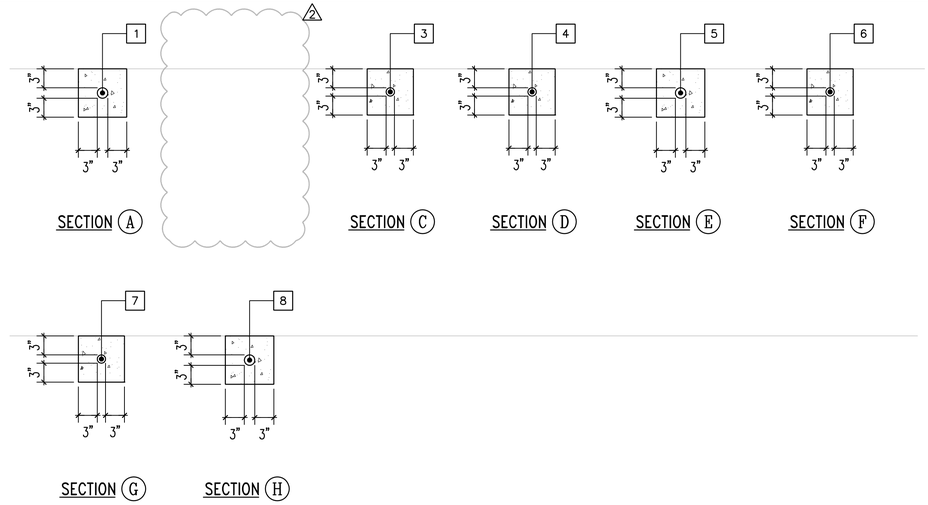
CONCRETE – 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.

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



TYPICAL DUCT SECTION



DUCT AND WIRE SCHEDULE

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	2"	PC	HELCO SECONDARY
2			
3	1"	1-2/C#14 TWISTED, SHIELDED CABLES W/GND	INSTRUMENTATION FROM SCADA CABINET TO CONTROL VALVE STATION PRESSURE TRANSMITTER
4	1"	1-2/C#14 TWISTED, SHIELDED CABLES W/GND	INSTRUMENTATION FROM SCADA CABINET TO RESERVOIR LEVEL TRANSMITTER
5	2"	(2) FLOW METER CABLE	FLOW METER VAULT AND CONTROL VALVE STATION FLOW METER SIGNALS TO SCADA CABINET
6	1"	FLOW METER CABLE	FLOW METER VAULT SIGNAL TO SCADA CABINET
7	1"	2#12, 1#12 GND	120V POWER TO AREA LIGHT POLE
8	2"	ANTENNA CABLE	SCADA CABINET TO ANTENNA
9			
10			

NOTES:
1. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
2. PC INDICATES PROVIDE PULLCORD.

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 = 3"

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.

DUCT SECTION DETAILS AND REQUIREMENTS

NOT TO SCALE

DWG. NO.
E-2
SHEET 48 OF 54

RONALD N. S. HO & ASSOCIATES, INC.
ELECTRICAL ENGINEERS

BRYCE H. KANEMURA
LICENSED PROFESSIONAL ENGINEER
No. 16360-E
HAWAII, U. S. A.

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SIGNATURE 2020.02.25
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	BHK	

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

DUCT SECTION DETAILS AND REQUIREMENTS

DESIGNED BY: BHK CHECKED BY: BO DRAWN BY: BHK

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FEBRUARY 2020

FILE	POCKET	FOLDER	NO.

FILE PATH: Z:\ACAD\PROJECTS\219186\E002_219186-duct sections.dwg CAD USER: bkanemura PLOT DATE: 2020.02.25 XREFS: | BHK-STAMP | _x219186-duct sections |

NOTES:

1. AREA LIGHT FIXTURE. SEE DETAIL 2/E-8.
2. RADIO ANTENNA. SEE DETAIL 3/E-8.

874

873

872

6"SQ X 4"D NEMA 4XSS JUNCTION BOX, SEE DETAIL 1/E-8

12"SQ X 6"D NEMA 4XSS JUNCTION BOX, SEE DETAIL 1/E-8

D 1-1I C 1-1I E 1-2I

H 1-2A

F 1-1I

A 1-2E

G 1-1E

2/E-6 ELECTRICAL SERVICE EQUIPMENT ELEVATION

A/1-80 1

FM

PT

1/E-4 CONTROL VALVE STATION AND FLOW METER VAULT ELECTRICAL PLAN

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

NORTH

2' 1' 0 2' 4' 6'

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

GRAPHIC SCALE

DWG. NO. E-4

SHEET 50 OF 54

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RONALD N. S. HO & ASSOCIATES, INC.
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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

CONTROL VALVE STATION AND FLOW METER VAULT ELECTRICAL PLAN

DESIGNED BY: BHK CHECKED BY: BO DRAWN BY: BHK

GTO
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FEBRUARY 2020

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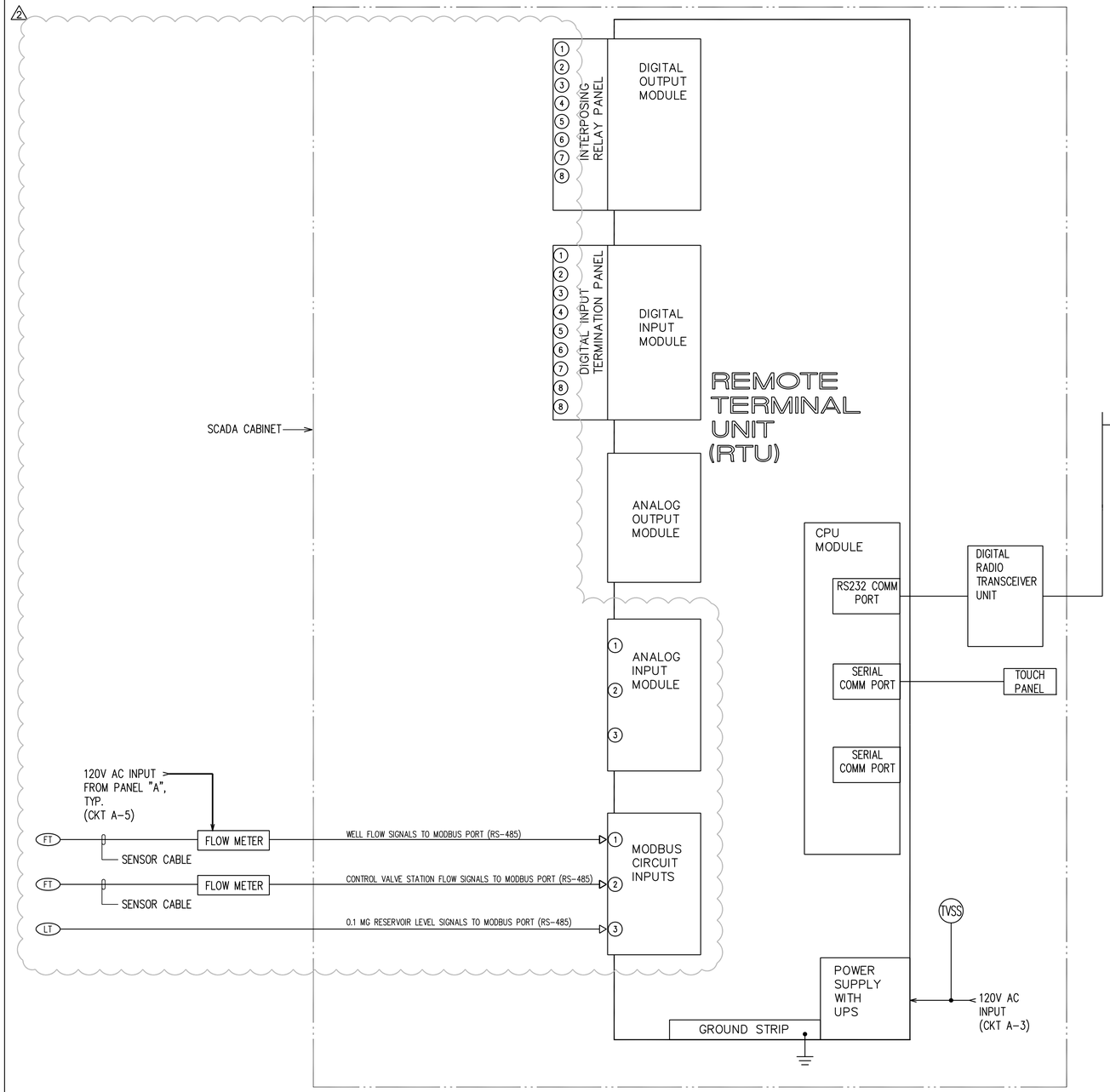
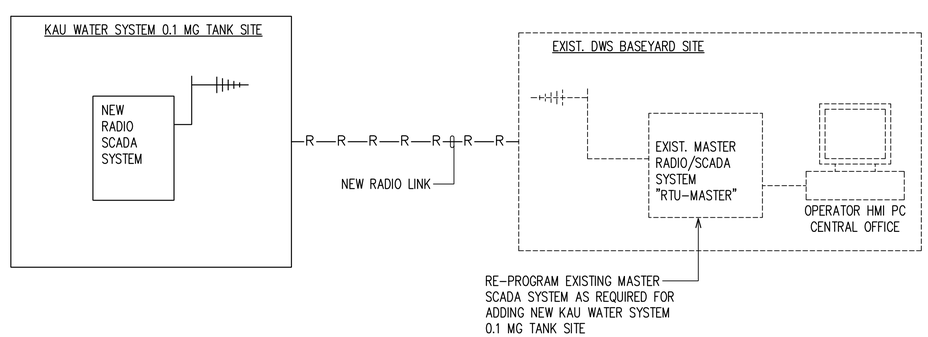
FILE PATH: Z:\ACAD\PROJECTS\219186\E004_219186-control valve, flow vault elec plan.dwg CAD USER: bkanemura PLOT DATE: 2020.02.25 XREFS: | BHK-STAMP | _x219186-allelec | x219186-altbkgnd | x2019-11-06-19 - Tank-Site-FM | x217010-01 X-TOPO | xCVS-M-Plan | xFMV-Plan | xGauge Cabinet Pad | xStair Layout - Kai Hawaii |



1/E-7 SCADA SYSTEM SCHEMATIC DIAGRAM



SCADA SYSTEM OPERATION NOTES:

1. THE SCADA CONTRACTOR SHALL PROGRAM THE NEW RTU AND RE-PROGRAM THE EXISTING MASTER SCADA SYSTEM AS REQUIRED AND AS INDICATED IN THE SPECIFICATIONS.

3/E-7 OVERALL SCADA SYSTEM SCHEMATIC DIAGRAM

REVISION	DATE	BRIEF	MADE BY	APPROVED
2	2/26/20	ADDENDUM 2	BHK	

RONALD N. S. HO & ASSOCIATES, INC.
ELECTRICAL ENGINEERS

BRYCE H. KANEMURA
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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

SCADA SYSTEM SCHEMATIC DIAGRAM

DESIGNED BY: BHK CHECKED BY: BO DRAWN BY: BHK

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FEBRUARY 2020

DWG. NO. E-7
SHEET 53 OF 54

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FILE PATH: Z:\ACAD\PROJECTS\219186\E007_219186-scada diagram.dwg CAD USER: bkanemura PLOT DATE: 2020.02.25 XREFS: | BHK-STAMP | _x219186-scada-control diagrams |