



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS
91-5420 Kapolei Parkway,
Kapolei, HI. 96707

PLANS

FOR
FURNISHING LABOR AND MATERIALS FOR

Kau Water System Improvements – Phase 1
Kamaoa, Kau, Island of Hawaii, Hawaii

TMK: (3) 9-3-001:002; (3) 9-3-002:005, 030; (3) 9-3-003:013, 025

IFB No.: IFB-20-HHL-019

February 2020



STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

CONSTRUCTION PLANS FOR
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
NEW 100,000 GALLON WATER RESERVOIR
KAMAOA, KAU, ISLAND OF HAWAII, HAWAII

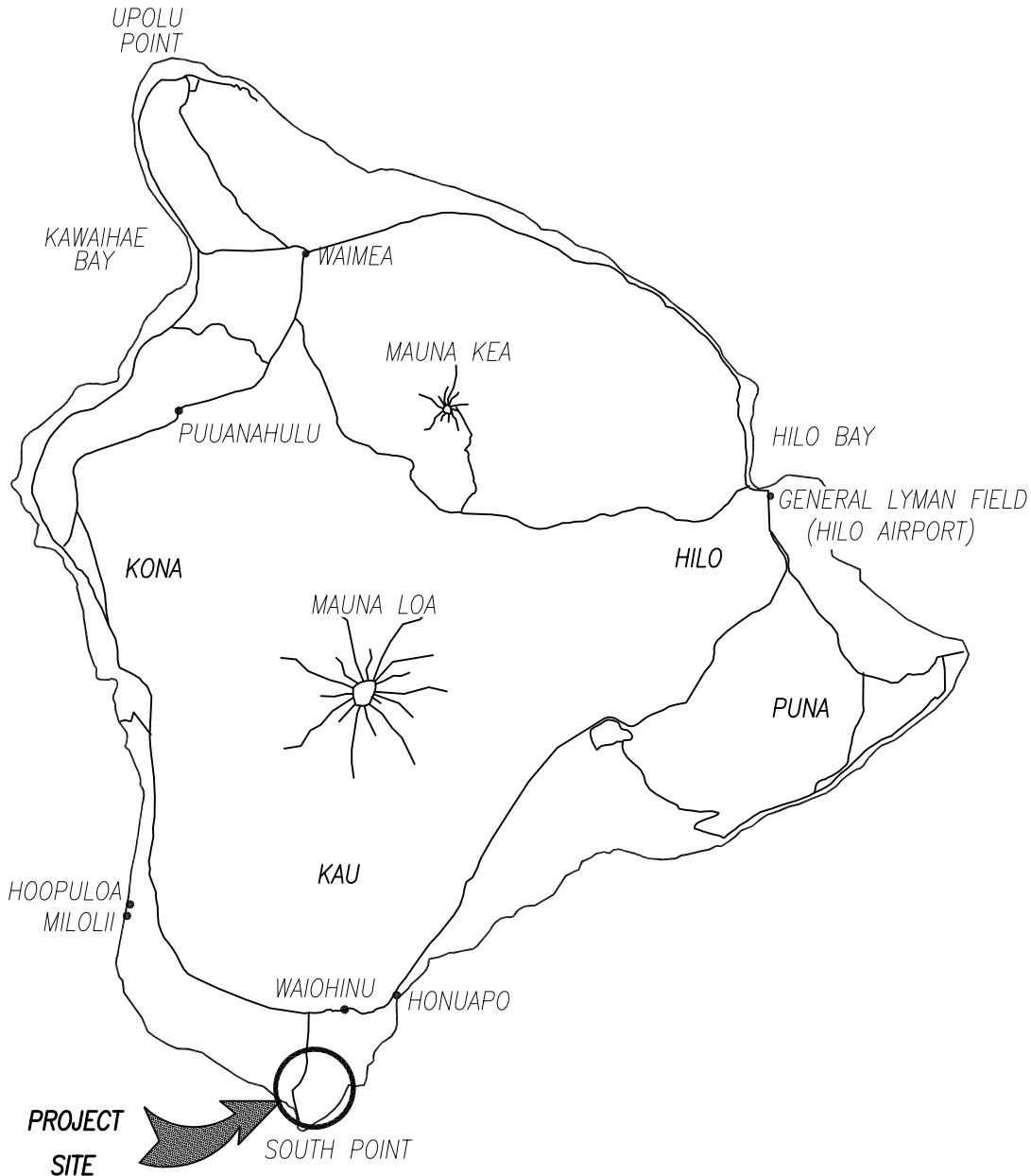
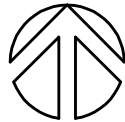
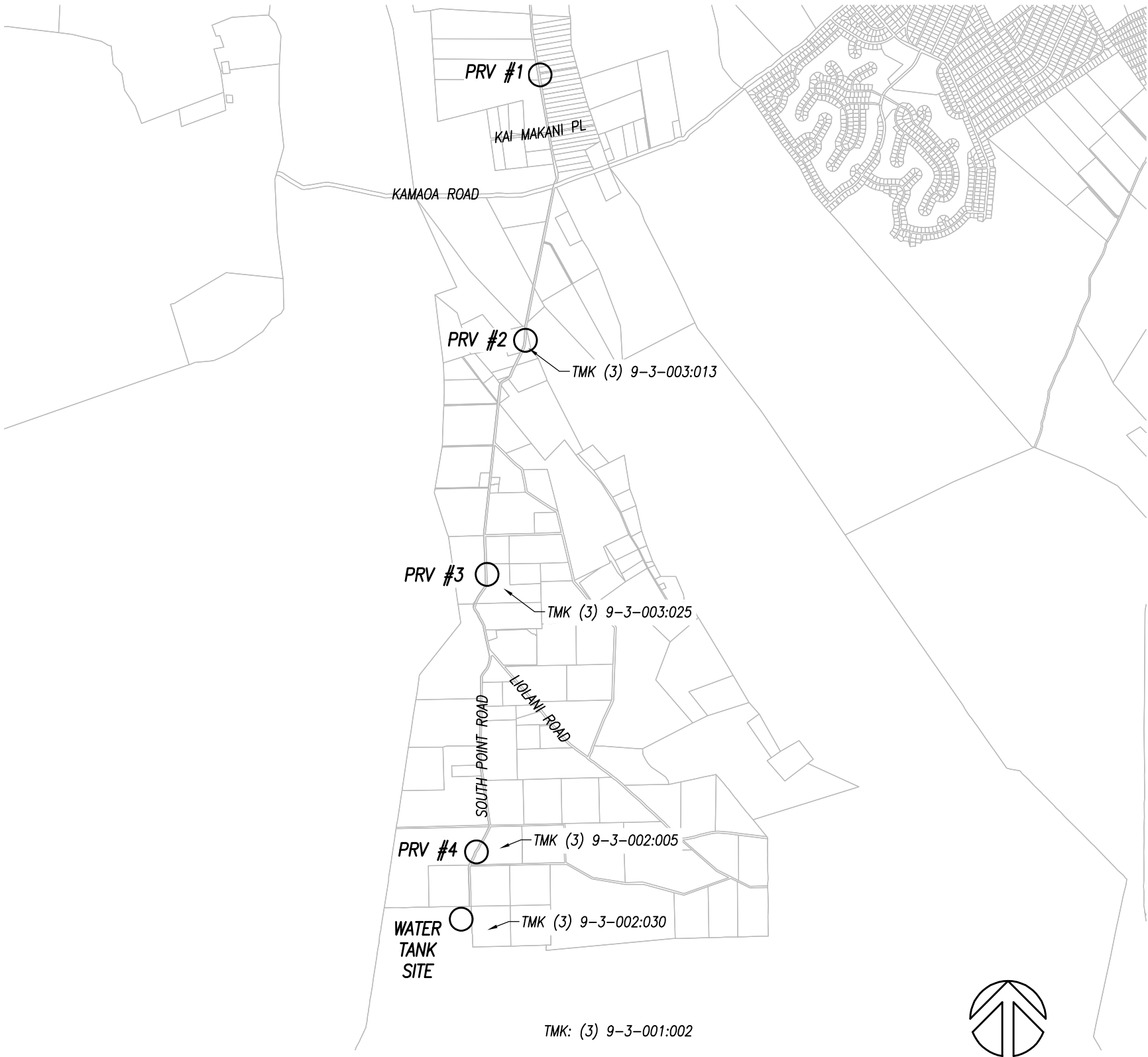
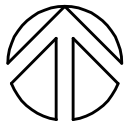
TAX MAP KEYS: (3) 9-3-001:002, (3) 9-3-002:005, 030, (3) 9-3-003:013, 025

IFB-20-HHL-019

PREPARED BY:



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

LOCATION MAP	VICINITY MAP	APPROVALS
 <p>HAWAII ISLAND NOT TO SCALE</p> 	 	<div><div>CHAIRMAN, HAWAIIAN HOMES COMMISSION STATE OF HAWAII</div><div>DATE</div></div> <div><div>DIRECTOR, DEPARTMENT OF PUBLIC WORKS COUNTY OF HAWAII (FOR WORK WITHIN COUNTY RIGHT-OF-WAY ONLY)</div><div>DATE</div></div> <div><div>CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION DEPARTMENT OF HEALTH, STATE OF HAWAII</div><div>DATE</div></div> <div><div>DEPARTMENT OF WATER SUPPLY COUNTY OF HAWAII</div><div>DATE</div></div>

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IFB number


PAUL T. MATSUDA

LICENSED PROFESSIONAL ENGINEER

No. 10901-C

HAWAII, USA


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



SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
T002
SHEET 2 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
DRAWING INDEX					
DESIGNED BY:		CHECKED BY: PTM		DRAWN BY:	
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CA:\OPRO\2019\2-19-054-DHHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHI--NOTES--1.DWG

GENERAL NOTE

THIS PROJECT CONSISTS OF IMPROVEMENTS TO THE DEPARTMENT OF WATER SUPPLY (DWS) PUBLIC WATER SYSTEM #108 INCLUDING THE INSTALLATION OF A NEW 100,000 GALLON WATER RESERVOIR, NEW WATER SPIGOT TO PROVIDE WATER TO DHHL LESSEES, AND THE REPLACEMENT OF FOUR PRESSURE REGULATING VALVES.

NOTES FOR SOLID WASTE DISPOSAL

- UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THIS CONSTRUCTION INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE COUNTY LANDFILLS WILL BE SUBJECT TO THE INSTITUTED TIPPING FEE SYSTEM, WITH NO EXCEPTIONS OR EXEMPTIONS.
- ALL WASTES GENERATED BY CONSTRUCTION, INCLUDING GRUBBING, DEMOLITION AND EXCESS EXCAVATION MATERIAL MAY BE BROUGHT TO THE WEST HAWAII OR THE HILO LANDFILL. ALL COST FOR LANDFILL FEES SHALL BE INCLUDED IN THE CONTRACTORS BID.
- CONSTRUCTION, DEMOLITION AND GRUBBING MATERIAL SHALL NOT BE DEPOSITED AT ANY OF THE COUNTY TRANSFER STATIONS, BUT SHALL BE TRANSPORTED FOR DISPOSAL AT EITHER THE WEST HAWAII OR HILO LANDFILL.

WATERLINE NOTES

- ALL WORK SHALL BE DONE ACCORDING TO THE WATER SYSTEM STANDARDS, STATE OF HAWAII, DATED 2002, AS AMENDED.
- ALL EXISTING WATERLINES, WATERLINE APPURTENANCES AND OTHER UTILITY LOCATIONS SHOWN ON THE PLANS ARE OBTAINED FROM THE LATEST RELIABLE SOURCES. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXACT LOCATION OF ALL UTILITIES IN THE FIELD AND SHALL BEAR ALL COSTS FOR DAMAGES DONE DURING THE CONTRACT PERIOD.
- THE CONTRACTOR SHALL INFORM THE D.W.S. ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND TWO WEEKS PRIOR TO ANY CONNECTION, CHLORINATION, SHUT-OFF OR RELOCATION WORK.
- ALL CONNECTIONS TO THE EXISTING WATER SYSTEM SHALL BE DONE BY THE D.W.S. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, BACKFILL, ROAD REPAIR, TRAFFIC CONTROL, AND PROVIDE EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE CONNECTION.
- THE CONTRACTOR SHALL PAY FOR ALL WORK, EQUIPMENT AND MATERIAL FURNISHED BY THE D.W.S.
- WHERE WATER SHUTOFF OF MORE THAN 3--HOURS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE A TEMPORARY BYPASS LINE, SIZE OF WHICH SHALL BE DETERMINED BY THE D.W.S. ENGINEER. THE D.W.S. ENGINEER ALSO RESERVES THE RIGHT TO REQUIRE BYPASS LINES, REGARDLESS OF THE WATER SHUT-OFF PERIOD, IF DEEMED NECESSARY.
- PROJECTS REQUIRING TEMPORARY CONSTRUCTION WATER SERVICE SHALL BE METERED AND PAID FOR BY CONTRACTOR.
- OUTSIDE OF STATE ROAD RIGHT-OF--WAYS: MINIMUM COVER ON WATER SYSTEM PIPELINES 4--INCH THROUGH 8--INCH TO BE 2.0 FEET. MINIMUM COVER ON 12--INCH PIPELINES TO BE 2.5 FEET. MINIMUM COVER ON PIPELINES GREATER THAN 12--INCH TO BE 3.0 FEET. MAXIMUM COVER ON PIPELINES NOT TO EXCEED 5 FEET UNLESS APPROVED BY THE MANAGER OF DWS. WITHIN STATE ROAD RIGHT-OF--WAYS: MIN. COVER ON ALL SIZES OF WATERLINES TO BE 3.0 FEET.
- ALL NEWLY INSTALLED WATERLINES SHALL HAVE A 4 MIL THICK, 6--INCH WIDE, NON METALLIC BLUE WARNING TAPE OVER CENTERLINE OF PIPE LABELED "CAUTION -- WATERLINE BURIED BELOW" PLACED 12 INCHES BELOW FINISHED GRADE ALONG THE ENTIRE LENGTH OF THE TRENCH.
- UNLESS OTHERWISE SHOWN, MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 12--INCHES PROVIDED THE OTHER UTILITY IS CONCRETE JACKETED, AND 18--INCHES IF NO CONCRETE JACKETS ARE USED. IN ALL APPLICABLE INSTANCES, THE WATERLINES SHALL BE AT A GRADE HIGHER THAN OTHER UTILITIES. UTILIZE PERPENDICULAR CROSSINGS WHERE PRACTICABLE. FOR WATERLINES, CENTER FULL PIPELENGTHS AT UTILITY CROSSINGS WHENEVER POSSIBLE.
- UNLESS OTHERWISE SHOWN, MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 8--FEET (CLEAR SPACE NOT CENTERLINE TO CENTERLINE) FOR ROAD RIGHT-OF--WAYS OF 50 FEET OR LESS, AND 10--FEET FOR ROAD RIGHT-OF--WAYS OF MORE THAN 50 FEET.
- WHEN WATERLINE IS WITHIN 6--FEET OF A PRESSURIZED SEWER LINE OR WITHIN 18--INCHES OF A GRAVITY SEWER LINE, THE SEWER MAIN SHALL BE REINFORCED CONCRETE JACKETED. WHENEVER A WATER MAIN CROSSES UNDER A SEWER MAIN, THE SEWER MAIN SHALL HAVE REINFORCED CONCRETE JACKET ON BOTH SIDES OF CROSSING TO A DISTANCE 5 FEET FROM THE WATERLINE (MEASURED PERPENDICULAR TO WATERLINE). STANDARD CONCRETE JACKET DETAILS FOR SEWER LINES, AS SPECIFIED BY THE DEPARTMENT OF PUBLIC WORKS STANDARDS SHALL BE FOLLOWED. PLASTIC PIPES SHALL NOT BE JACKETED. DUCTILE IRON OR CONCRETE CYLINDER PIPE SHALL BE USED FOR THE PORTION TO BE JACKETED.
- ALL WATER SYSTEM PIPELINES, 4--INCHES OR LARGER IN DIAMETER, SHALL BE DUCTILE IRON, PUSH ON JOINTS, CLASS 52, AND ALL PIPELINES SMALLER THAN 4--INCHES IN DIAMETER SHALL BE SOFT COPPER, TYPE "K", UNLESS OTHERWISE SPECIFIED.
- SOLDER (1/8--INCH DIA.) AND FLUX USED SHALL NOT CONTAIN MORE THAN 0.2% LEAD.
- ALL FITTINGS (MINIMUM CLASS 250) AND GATE VALVES (RESILIENT TYPE, CLASS 200) SHALL BE DUCTILE IRON, WITH MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED. BUTTERFLY VALVES (MJ) SHALL BE CLASS 250 WITH FUSION EPOXY COATED INTERIOR UNLESS OTHERWISE SPECIFIED. SLOPE OF PIPE INVERT AT VALVE LOCATIONS SHALL NOT EXCEED 6% -- ADJUST PIPE AS APPROPRIATE PER STANDARDS.
- PIPE JOINT RESTRAINTS FOR MECHANICAL JOINT (MJ) FITTINGS AND MJ VALVES SHALL BE "MEGALUG" SERIES AS MANUFACTURED BY EBAA IRON, INC., OR AN APPROVED EQUAL (WEDGE TYPE), WHERE EVER CALLED FOR ON THE PLANS AND SPECIFICATIONS.

- THE WATERLINE SHALL BE TESTED AT A MINIMUM OF 225 PSI OR ONE--AND--ONE--HALF TIMES THE STATIC PRESSURE AT THE LOW POINT (WHICHEVER IS GREATER), UNDER D.W.S. SUPERVISION. THE TESTING SHALL BE DONE JUST PRIOR TO PAVING, WHENEVER APPLICABLE. (WHICHEVER IS GREATER), UNDER D.W.S. SUPERVISION. THE TESTING SHALL BE DONE JUST PRIOR TO PAVING, WHENEVER APPLICABLE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHLORINATION OF THE WATER SYSTEM PER THE MOST CURRENT STANDARDS OF GOVERNING AGENCIES AND SHALL BEAR ALL COST(S). THE PERSON(S) ENGAGED TO DO THE CHLORINATION WORK MUST HAVE THE APPROPRIATE VALID LICENSE TO PERFORM THE WORK IN THE STATE OF HAWAII.
- EXISTING VALVES, FIRE HYDRANT UNITS, VALVE BOXES, FRAMES AND COVERS DESIGNATED "REMOVE AND SALVAGE" SHALL BE CLEANED OF ALL DIRT, SCABS, AND CONCRETE AND DELIVERED TO THE RESPECTIVE D.W.S. BASEYARD. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS, UNLESS SPECIFIED OTHERWISE.
- UNLESS OTHERWISE SHOWN, EXISTING WATERLINES, VALVES, FITTINGS AND APPURTENANCES NOT DESIGNATED "REMOVE AND SALVAGE" SHALL BE ABANDONED IN PLACE. ALL EXPOSED VALVE BOXES, VALVES, PIPES AND APPURTENANCES SHALL BE REMOVED AND DISPOSED OF PROPERLY AT NO COST TO THE D.W.S.
- METER BOXES FOR 5/8--INCH METERS PLACED OUTSIDE OF PAVEMENT TO BE TYPE "B" PER STD DETAILS M1 & M2. METER BOXES FOR 1--INCH METERS OR FOR 5/8--INCH METERS LOCATED WITHIN PAVEMENT TO BE TYPE "X" PER STD DETAIL M3.
- RELOCATION OF EXISTING METERS SHALL BE DONE UNDER D.W.S. SUPERVISION. RELOCATIONS OF CUSTOMER SERVICE LINES TO RELOCATED METERS SHALL BE COPPER (TYPE "K") AND DONE BY THE CONTRACTOR. ALL WORK AND MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR AND CONSIDERED INCIDENTAL TO THE RELOCATION WORK. EXISTING METER BOXES DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S COST. WHEN APPLICABLE, A DIELECTRIC UNION SHALL BE USED TO CONNECT THE COPPER PIPE TO THE CUSTOMER'S GALVANIZED IRON (G.I.) PIPE.
- SERVICE LATERALS TO BE ABANDONED SHALL BE CUT AND PLUGGED AT THE WATER MAIN. METER BOXES TO BE ABANDONED SHALL BE REMOVED AND GROUND SHALL BE RESTORED TO A CONDITION BETTER OR EQUAL TO SURROUNDING AREA.
- WHEN COMPACTION TESTS ARE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE D.W.S. WITH PROCTOR RESULTS OF MATERIALS TO BE USED FOR THAT PORTION OF THE WORK REQUIRING COMPACTION. THESE RESULTS SHALL BE CERTIFIED AND SHALL BE FURNISHED TO D.W.S. ONE WEEK PRIOR TO COMMENCEMENT OF WORK. COST FOR COMPACTION TESTS SHALL BE INCIDENTAL TO PIPELINE INSTALLATION.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND CERTIFY THE RECORD DRAWINGS (AS--BUILT DRAWINGS) AS TO ACCURACY AND AS--BUILT CONDITION. THE CONTRACTOR SHALL THEN SUBMIT THE RECORD DRAWINGS TO THE D.W.S.
- PIPE CUSHION MATERIAL FOR COPPER PIPES SHALL BE AS SPECIFIED IN DIVISION 200 -- MATERIALS, SECTION 209, PARAGRAPH 209.02B.
- UNLESS OTHERWISE SPECIFIED, RETAINER GLANDS SHALL BE "MEGALUG SERIES 1100" AS MANUFACTURED BY EBAA IRON, INC.
- 4"x4"x4" REINFORCED CONCRETE SLAB FOR FIRE HYDRANT SHALL BE REINFORCED WITH 6x6 x 10/10 WELDED WIRE FABRIC. SLAB TO SLOPE AWAY FROM HYDRANT AT 2% IN ALL DIRECTIONS.
- LOTS REQUIRING A DWS APPROVED REDUCED PRESSURE PRINCIPAL TYPE BACKFLOW PREVENTON ASSEMBLY SHALL HAVE ONE. IT MUST BE INSTALLED ON PRIVATE PROPERTY IN ACCORDANCE WITH STANDARD DETAIL V9 (ABOVE GROUND) AND DEPARTMENTAL STAFF MUST APPROVE THE INSTALLATION BEFORE WATER SERVICE CAN BE STARTED. NO TAPS OR CONNECTIONS ARE ALLOWED BETWEEN THE METER AND THE APPROVED BACKFLOW PREVENTION ASSEMBLY. THE OWNER IS REQUIRED TO TEST THE BACKFLOW PREVENTION ASSEMBLY 1 TIME PER YEAR. THE OWNER SHALL MAKE THEIR OWN PROVISIONS FOR THOSE TIMES WHEN THE BACKFLOW ASSEMBLY IS BEING TESTED.
- ALL BRASS PRODUCTS MUST CONFORM TO NSF STANDARD 61 AND NSF 372 OF THE SDWA, AND BE CERTIFIED AS "LEAD--FREE" BY THE MANUFACTURER. "LEAD--FREE" IS DEFINED AS THE ALLOWABLE LEAD CONTENT OF NOT MORE THAN 0.25% IN THE WETTED SURFACE. CERTIFICATION FROM THE MANUFACTURER MUST BE SUBMITTED TO THE DEPARTMENT OF WATER SUPPLY FOR REVIEW AND APPROVAL PRIOR TO INSTALLATION. ANY BRASS PRODUCTS INSTALLED WITHOUT APPROVAL MUST BE REMOVED AT NO EXPENSE TO THE DEPARTMENT.
- FIRE HYDRANTS REQUIRE JOINT RESTRAINT BETWEEN THE TEE AND THE GATE VALVE.
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK IN THE CONSTRUCTION AREA AND NOTIFY THE HAWAII COUNTY DEPARTMENT OF WATER SUPPLY INSPECTOR AND THE DEPARTMENT OF LAND AND NATURAL RESOURCES--HISTORIC PRESERVATION DIVISION (808) 692--8015. THE CONTRACTOR SHALL NOT RECOMMENCE WORK IN THIS AREA UNTIL GIVEN WRITTEN CLEARANCE FROM THE DEPARTMENT OF WATER SUPPLY.

STANDARD TRAFFIC NOTES

- ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST AMENDED EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", APPLICABLE SECTIONS OF PART 5 OF THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION," DATED SEPTEMBER, 1984, AND THE "2005 HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", UNLESS OTHERWISE INDICATED ON THE PLANS, SPECIFICATIONS, OR STANDARD TRAFFIC NOTES.
- THE CONTRACTOR SHALL INSTALL PERMANENT OR TEMPORARY PAVEMENT MARKERS, STRIPING AND MARKINGS AS REQUIRED BY SECTION(S) 629 AND 755.05 OF THE "2005 HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", AND AS AMENDED. TO ENSURE PROPER LANE WIDTHS AND THE SAFE FLOW OF TRAFFIC, TEMPORARY STRIPING SHALL BE INSTALLED AS CLOSELY AS POSSIBLE TO THE FINAL STRIPING PLAN, BUT NOT IN A MANNER THAT WOULD OBSTRUCT PERMANENT STRIPING LAYOUT OPERATIONS.

THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC SIGNS AND MARKINGS FOR ALL PROJECT--RELATED TEMPORARY TRAFFIC CONTROL PLANS. THE CONTRACTOR SHALL COORDINATE AND HIRE SPECIAL DUTY POLICE OFFICER(S) AS NEEDED TO PROVIDE TRAFFIC CONTROL WHILE WORKING WITHIN THE COUNTY RIGHT OF WAY.
- THE CONTRACTOR SHALL INFORM THE TRAFFIC DIVISION AT LEAST SIX (6) WORKING DAYS PRIOR TO ANY WORK ON PAVEMENT MARKINGS OPERATIONS AND/OR SIGN INSTALLATIONS TO SCHEDULE A REVIEW AND APPROVAL OF THE STRIPING LAYOUT AND/OR SIGNING PLANS.
- THE APPROVED STRIPING PLAN SHALL BE LAID OUT USING MARKING PAINT OR OTHER APPROVED METHODS. FIELD ADJUSTMENTS SHALL BE MADE AS DIRECTED BY THE INSPECTOR BEFORE THE FINAL MARKINGS ARE APPLIED.
- ALL PAVEMENT MARKINGS THAT BECOME INAPPLICABLE SHALL BE REMOVED BY THE CONTRACTOR AT HIS OWN EXPENSE. REMOVAL SHALL BE BY ERADICATION OR BY OTHER METHODS APPROVED BY THE INSPECTOR BEFORE THE NEW PAVEMENT MARKINGS ARE APPLIED. EXCESSIVE GOUGING OF THE PAVEMENT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
- ALL PAVEMENT STRIPING SHALL BE WITH ALKYD BASED REFLECTIVE THERMOPLASTIC COMPOUND PAVEMENT MARKING AS SPECIFIED IN SECTION(S) 629 AND 755.05 OF THE HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005 EDITION, AND AS AMENDED, ON ALL ROADWAYS. THE CONTRACTOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE CERTIFYING THAT THE THERMOPLASTIC MATERIALS TO BE USED MEET THE CURRENT AASHTO M--247 (FOR GLASS BEADS) AND AASHTO M--249 (FOR STRIPING) SPECIFICATIONS.

FOR CROSSWALKS AND STOP LINES, THE CONTRACTOR SHALL APPLY HIGH SKID--RESISTANT WHITE CORUNDUM OR APPROVED EQUAL.
- ON CONCRETE PAVEMENTS, PRE--STRIPE APPLICATION AREA WITH BINDER MATERIAL, PRIMER, OR PRIME SEAL COAT RECOMMENDED BY PAVEMENT MARKER MANUFACTURER.
- HEAT APPLIED PRE--FORMED THERMOPLASTIC PAVEMENT MARKING TAPE WITH VISIBLE TEMPERATURE INDICATORS, OR AN EQUAL PAVEMENT MARKING TAPE THAT IS APPROVED BY THE TRAFFIC DIVISION SHALL BE USED FOR ALL BIKE LANE SYMBOLS AND LEGENDS PER TRAFFIC STANDARD DETAIL TR--111, AND MAY BE USED FOR CROSSWALKS, STOP LINES, PAVEMENT ARROWS, ALPHABETS, AND SYMBOLS IN LIEU OF THERMOPLASTIC COMPOUND.

HEAT APPLIED PRE--FORMED THERMOPLASTIC PAVEMENT MARKING TAPE FOR BIKE LANE SYMBOLS AND LEGENDS PER TRAFFIC STANDARD DETAIL TR--111, CROSSWALKS AND STOP LINES SHALL BE MADE OF A DURABLE, HIGH SKID--RESISTANT MATERIAL.
- REFLECTORIZED RAISED PAVEMENT MARKERS (RPM'S) SHALL BE THE REGULAR SIZED MARKERS WITH APPROXIMATE DIMENSIONS OF 4"x4"x0.7". THE CONTRACTOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE CERTIFYING THAT THE RPM'S TO BE USED MEET OR EXCEED THE CURRENT STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
- ALL TRAFFIC SIGNS AND POSTS SHALL MEET THE REQUIREMENTS OF THE COUNTY OF HAWAII STANDARD DETAIL T--1 EXCEPT THAT FLANGED CHANNEL POSTS AND OCTAGONAL POSTS WILL NOT BE ACCEPTABLE. SIGNS SHALL BE ON ALUMINUM SHEETING OF 0.080--INCH MINIMUM THICKNESS. SIGN POSTS SHALL BE 2" SQUARE TELESAR TUBING NO. 20 F 12 OR EQUIVALENT WITH 2 1/4" SQUARE TELESAR ANCHOR POST.

FOR ALL COUNTY DEDICATED STREETS, THE CONTRACTOR SHALL PLACE A TRAFFIC DIVISION MAINTENANCE STICKER ON THE BACK OF EACH SINGLE--SIDED SIGN. STICKERS ARE TO BE ACQUIRED AT THE TRAFFIC DIVISION.
- ALL TRAFFIC SIGNS SHALL BE HIGH INTENSITY RETROREFLECTIVE SHEETING, WITH TYPE IV FOR REGULATORY, WARNING, AND DIRECTIONAL SIGNS AND TYPE IX (FLUORESCENT YELLOW GREEN SHEETING) FOR PEDESTRIAN, SCHOOL, AND BICYCLE CROSSING SIGNS.
- THE 2 1/4" SQUARE ANCHOR POST FOR SIGNS SHALL BE DRIVEN INTO THE GROUND, A.C. PAVEMENT OR CONCRETE SIDEWALK IN ACCORDANCE WITH THE PLANS. ALL DAMAGES TO THE SURROUNDING AREA SHALL BE REPAIRED TO ITS ORIGINAL CONDITION OR BETTER.

BEFORE DRIVING INTO CONCRETE, A NEAT HOLE OF APPROXIMATELY 3 INCH DIAMETER SHALL BE DRILLED THROUGH THE CONCRETE PRIOR TO THE INSTALLATION OF THE ANCHOR POST. IF DRIVING INTO THE CONCRETE OR A.C. PAVEMENT IS NOT POSSIBLE WITHOUT DAMAGE TO THE SURROUNDING CONCRETE OR A.C. PAVEMENT, A 12" BY 12" SQUARE SHALL BE SAW--CUT AND REMOVED PRIOR TO THE INSTALLATION OF THE ANCHOR POST AND THEN PATCHED, WITH HOT MIX TO MATCH THE EXISTING A.C. PAVEMENT, OR CONCRETE TO MATCH THE EXISTING CONCRETE SIDEWALK.
- UPON COMPLETION OF ALL CONSTRUCTION WORK, INCLUDING, BUT NOT LIMITED TO THE FINAL PAVING OF THE ENTIRE PROJECT AREA AND OFF--SITE CONSTRUCTION, THE CONTRACTOR SHALL RESTRIPE ALL PAVEMENT MARKINGS WITHIN AND IN THE VICINITY OF THE CONSTRUCTION AREA AS APPROVED BY THE TRAFFIC DIVISION AND IN ACCORDANCE WITH ITEM 6 OF THE CURRENT STANDARD TRAFFIC NOTES. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY PAVEMENT MARKINGS, PERMANENT PAVEMENT MARKINGS, AND ALL TRAFFIC SIGNS AND POSTS UNTIL THE PROJECT IS ACCEPTED BY THE COUNTY OF HAWAII.

ALL TRAFFIC SIGNS AND POSTS WITHIN AND IN THE VICINITY OF THE CONSTRUCTION AREA THAT HAVE BEEN DAMAGED, REMOVED, OR ADVERSELY AFFECTED BY THE CONSTRUCTION WORK SHALL BE REPLACED BY THE CONTRACTOR ACCORDING TO ITEM(S) 10, 11, AND 12 OF THE CURRENT STANDARD TRAFFIC NOTES AT NO COST TO THE COUNTY.

DWG. NO.
C-1
SHEET 3 OF 54

- ALL DEDICATED STREETS MUST HAVE STREET NAMES WHICH HAVE BEEN APPROVED BY RESOLUTION BEFORE ACCEPTANCE OF THE STREET BY THE COUNTY OF HAWAII.

UNLESS OTHERWISE APPROVED BY THE TRAFFIC DIVISION, ALL STREET NAME SIGNS SHALL HAVE AN UPPERCASE FIRST LETTER/LOWER CASE FORMAT AND THE PROPER HAWAIIAN SPELLING FOR THE STREET NAMES AS APPROVED BY THE COUNTY OF HAWAII PLANNING DEPARTMENT.

PRIOR TO STREET NAME SIGN FABRICATION, STREET NAME SIGN SUBMITTALS SHALL BE REVIEWED AND APPROVED BY THE TRAFFIC DIVISION.

- INSTALL "PRIVATE ROAD" SIGN(S) ON ALL PRIVATE ROAD(S). SIGN SHALL BE ON 18" WIDE BY 12" HIGH ALUMINUM PLATE WITH 4" BLACK LETTERING ON WHITE REFLECTORIZED SHEETING WITH BORDER.
- ALL SIGNS & MARKINGS FOR PRIVATE ROADWAYS SHALL BE MAINTAINED BY THE PRIVATE OWNERS.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS (NPDES) AND OTHER AUTHORIZATIONS

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

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

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

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

OTHER

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

PUBLIC HEALTH, SAFETY & CONVENIENCE NOTES:

- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
- THE CONTRACTOR AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY MAY REQUIRE SUPPLEMENTARY MEASURES AS NECESSARY.
- THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

EROSION & TEMPORARY DUST CONTROL:

- DURING CONSTRUCTION, PREVENTATIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION, OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS THE JOB PROGRESSES.
- FUGITIVE DUST AND SOLID WASTE DISPOSAL SHALL MEET REQUIREMENTS OF ADMINISTRATIVE RULES, TITLE II, CHAPTER 60, AIR POLLUTION CONTROL AND CHAPTER 58, SOLID WASTE MANAGEMENT CONTROL.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.



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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE		BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

CONSTRUCTION NOTES

DESIGNED BY:	TN	CHECKED BY:	TN	DRAWN BY:	SLP
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G70.DESIGN					
FEBRUARY 2020					

FILE	POCKET	FOLDER	NO.
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CA:\OPROA\2019\2-19-2054_DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHI-NOTES-2.DWG

BEST MANAGEMENT PRACTICES NOTES:

1. MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SUCH AS TEMPORARY STORM DRAIN PROTECTION SHALL BE IN PLACE BEFORE ANY TRENCHING WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
2. ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
3. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED BY THE CONTRACTOR AFTER COMPLETION OF THE PROJECT PRIOR TO FINAL ACCEPTANCE OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
4. INSTALL AND MAINTAIN STORM DRAIN PROTECTION MEASURE AT INLET OPENINGS SUBJECT TO POTENTIAL CONSTRUCTION RUNOFF.
5. AT THE END OF THE CONSTRUCTION OPERATIONS, EXIST. CB'S AND INLETS SURROUNDING THE PROJECT SHALL BE INSPECTED AND ANY ACCUMULATED SEDIMENT AND DEBRIS FOUND IN THE CB'S SHALL BE REMOVED. FLUSHING INTO THE CB'S IS PROHIBITED.
6. THE FINAL LIFT OF EACH DAY'S WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIAL.
7. GOOD HOUSEKEEPING SHALL BE UTILIZED TO ENSURE PROTECTION OF ROADWAYS FROM MUD, DIRT, AND DEBRIS.

CIVIL ABBREVIATIONS / SYMBOLS

ABAND.	ABANDONED
A.C.	ASPHALT CONCRETE
APPROX.	APPROXIMATE
ARV	AIR RELIEF VALVE
BxS	BELL END BY SPIGOT (PLAIN) END
BFV	BUTTERFLY VALVE
BOT.	BOTTOM
B.V.	BOTTOM VERTICAL
BW	BOTTOM OF WALL
B/WAY	BOTH WAYS
BWS	BOARD OF WATER SUPPLY
CB	CATCH BASIN
CFS	CUBIC FEET PER SECOND
CL	CENTERLINE
C.L.	CHAIN LINK
CLR.	CLEARANCE
CMU	CONCRETE MASONRY UNIT
C.O.	CLEANOUT
CONC.	CONCRETE
CONT.	CONTINUATION, CONTINUOUS
CORP.	CORPORATION (DETAIL)
C.Y.	CUBIC YARD
DB	DIRECT BURIED
D.I.	DUCTILE IRON
D.L.	DRAIN LINE
D.P.P.	DEPARTMENT OF PLANNING AND PERMITTING
DPW	DEPARTMENT OF PUBLIC WORKS
DWGS.	DRAWINGS
DWS	DEPARTMENT OF WATER SUPPLY
E/TEL	ELECTRICAL/TELEPHONE
EFFL	EFFLUENT
ELEV.	ELEVATION
EMB.	EMBANKMENT
EQ.	EQUAL
EXC.	EXCAVATION
EXIST.	EXISTING
F.E.	FLANGE END
FxS	FLANGE END BY SPIGOT (PLAIN) END
F.H.	FIRE HYDRANT
FT.	FEET
GND.	GROUND
G.V.	GATE VALVE
HAR	HAWAII ADMINISTRATIVE RULES
HELCO	HAWAIIAN ELECTRIC LIGHT COMPANY
HORIZ.	HORIZONTAL
HRS	HOURS
INFL.	INFLUENT
INV.	INVERT
L.F.	LINEAR FEET
L.P.	LIGHT POST
L.R.	LONG RADIUS
LT.	LIGHT
LTD.	LIMITED
LOC.	LOCATION
MECH.	MECHANICAL
M.G.	MILLION GALLON
MIN.	MINIMUM
M.J.	MECHANICAL JOINT
NGPC	NOTICE OF GENERAL PERMIT COVERAGE
NO.	NUMBER
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

O.C.	ON CENTER
O.D.	OUTSIDE DIAMETER
P.E.	PLAIN END
PSI	POUNDS PER SQUARE INCH
PVC	POLYVINYL CHLORIDE
PVMT.	PAVEMENT
REINF.	REINFORCED
ROW	RIGHT OF WAY
RPP	REDUCED PRESSURE PRINCIPLE
RW	RETAINING WALL
REV.	REVERSE
SCH.	SCHEDULE
SDMH	STORM DRAIN MANHOLE
S.E.	SCREWED ENDS
S.F.	SQUARE FEET
SHT.	SHEET
SLB	STREET LIGHT BOX
SP.	SPACE, SPACING
STA.	STATION
STD.	STANDARD
STRUCT.	STRUCTURAL
TEL	TELEPHONE
THV	TOP OF HAND VALVE
TMK	TAX MAP KEY
T.O.C.	TOP OF CURB
T.O.G.	TOP OF GRATE
TP	TOP OF PIPE
TRC	TOP OF ROLL-CURB
T.V.	TOP VERTICAL
TW	TOP OF WALL
TYP.	TYPICAL
UV	ULTRAVIOLET
VERT.	VERTICAL
WM	WATER METER OR WATER MAIN
WMH	WATER MANHOLE
WSO	WATER SYSTEM OPERATIONS
WSS	WATER SYSTEM STANDARDS
WSO	WATER SYSTEM OPERATIONS
WSS	WATER SYSTEM STANDARDS
WV	WATER VALVE
Ø	DIAMETER
⋈	CUT & PLUG EXIST. WATER LINE
D _#	EXIST. DRAIN LINE
E _#	EXIST. ELECTRICAL LINE
W _#	EXIST. WATER LINE

DWG. NO.
C-2
SHEET 4 OF 54



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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

CONSTRUCTION NOTES

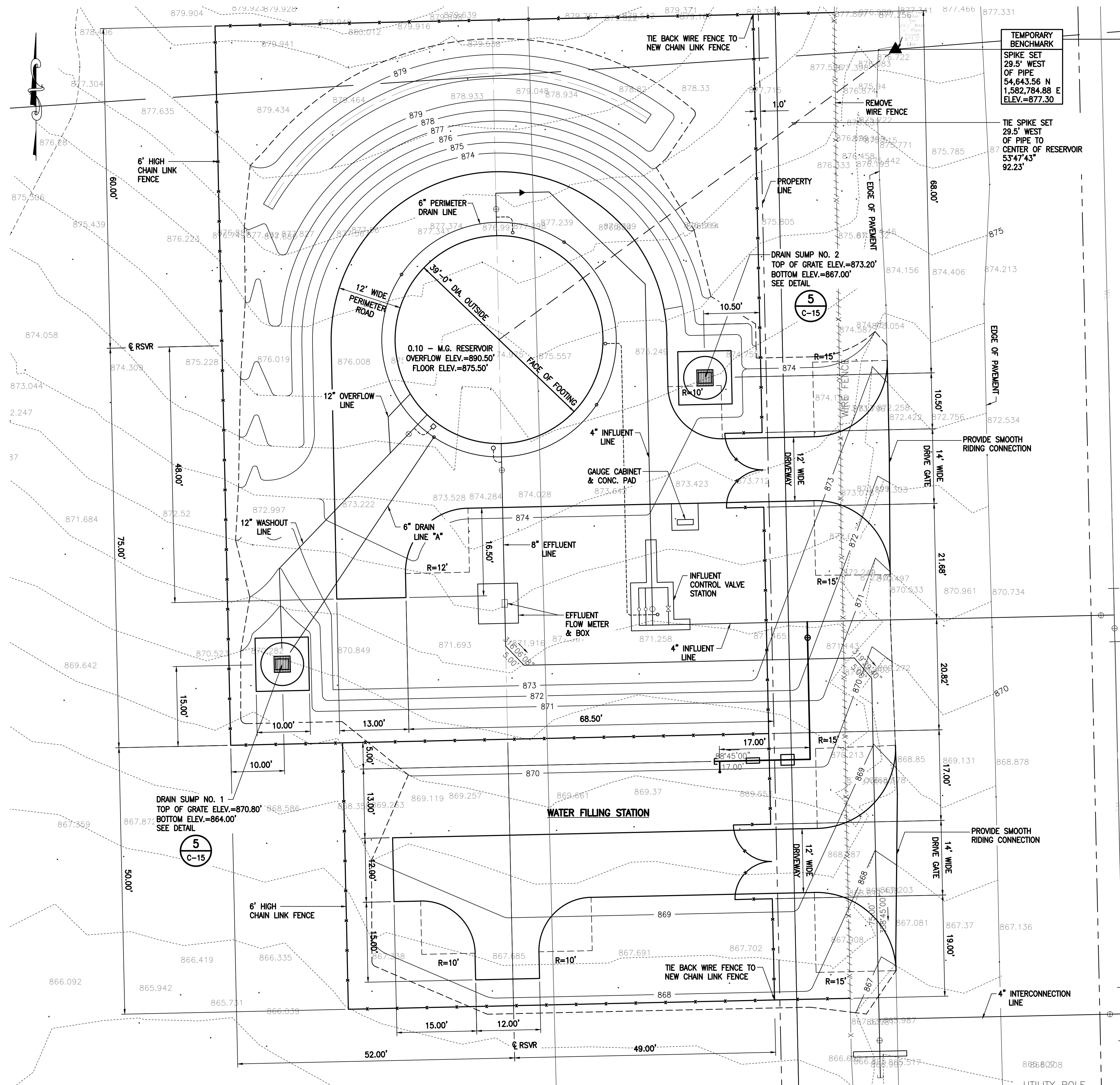
DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

G70 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5985
WWW.G70.DESIGN

FEBRUARY 2020

FILE	POCKET	FOLDER	NO.
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CA:\OPROA\2019\2-19-054.DHHL KAU WATER SYSTEM IMPROVEMENTS\CAOA SHEETS\SH1-SITE-PLANS.DWG



0.10 - M.G. RESERVOIR & WATER FILLING STATION
SITE PLAN
SCALE: 1"=10'

GRAPHIC SCALE:



DWG. NO.
C-3
SHEET 5 OF 54

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

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

SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII				
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019				
0.10 - M.G. RESERVOIR & WATER FILLING STATION SITE PLAN				
DESIGNED BY:	TN	CHECKED BY:	TN	DRAWN BY:
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5985 WWW.G7O.DESIGN				
FEBRUARY 2020				

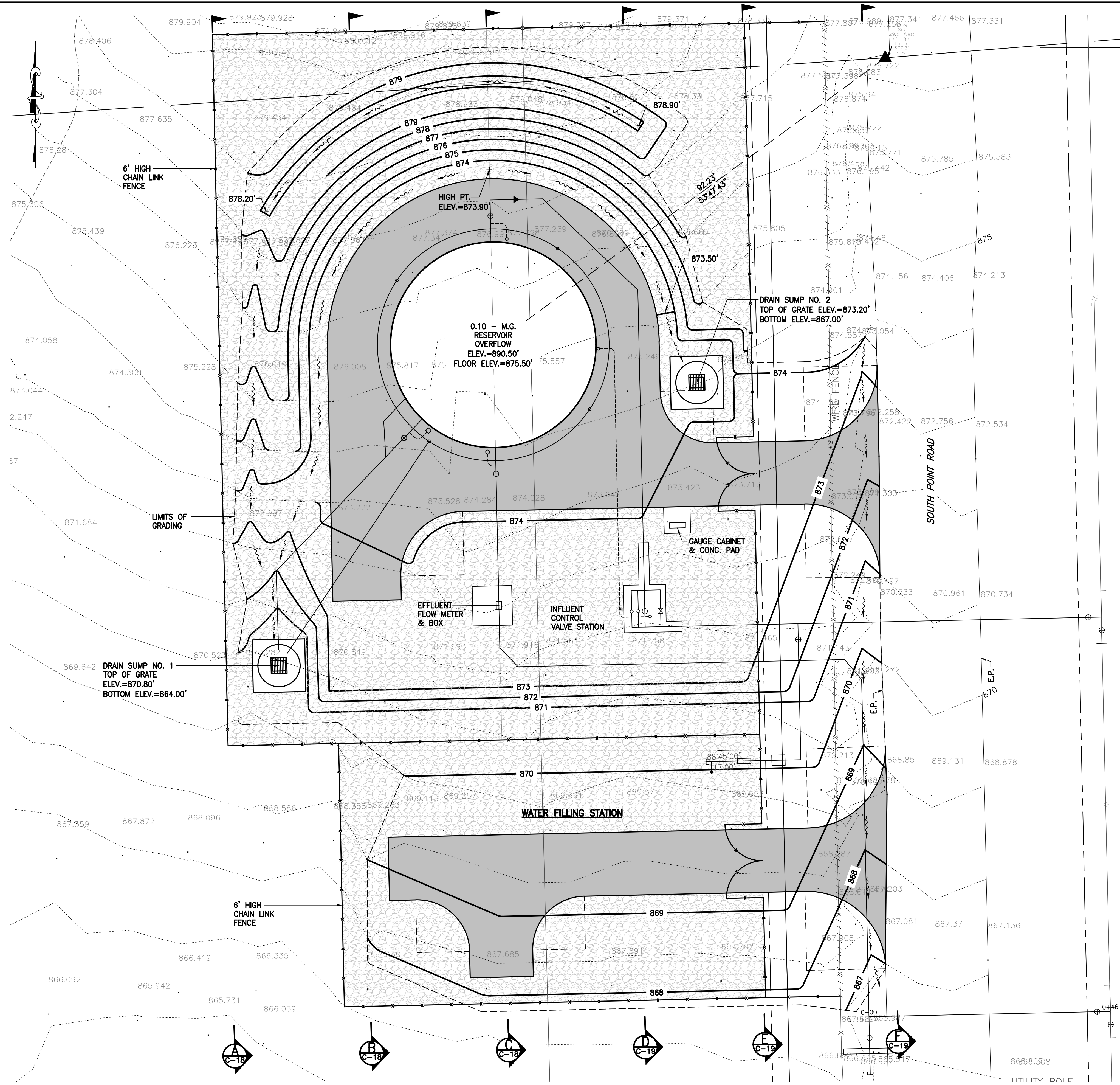
FILE	POCKET	FOLDER	NO.

NOTES

- FOR CHAIN LINK FENCE AND 14'-FEET WIDE DRIVE GATE DETAILS, SEE DWS STANDARD DETAILS F1, F2, AND F3 IN THE WATER SYSTEM STANDARDS.
- FOR CHAIN LINK FENCE SPECIFICATIONS, SEE SECTION 303.33 OF THE WATER SYSTEM STANDARDS.
- PROVIDE TWO GATE STOPS PER DRIVE GATE. LOCATE GATE STOPS IN THE FIELD.
- PAINT ALL COMPONENTS OF THE NEW FENCE AND GATES WITH TWO COATS OF BLACK MACHINERY ENAMEL AFTER WEATHERING PERIOD. COORDINATE WITH DWS INSPECTOR.
- TOP OF CONCRETE FOOTINGS FOR FENCE AND GATE POSTS SHALL BE CROWNED TO SHED WATER.
- ALL FENCE AND GATE COMPONENTS SHALL BE HOT-DIP GALVANIZED.
- PROVIDE BARBED-WIRE SYSTEM FOR FENCE AND GATE. BARBED-WIRE EXTENSION ARMS SHALL BE ORIENTED AWAY FROM THE PROPERTY LINE.
- FOR SIZES OF POSTS AND RAILS, SEE TABLE 300-14 OF THE WATER SYSTEM STANDARDS.
- FENCE FABRIC SHALL BE TWISTED AND BARBED SELVAGE.
- 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.)

CA:\OPROA\2019\2-19-054 DPHL KAU WATER SYSTEM IMPROVEMENTS\CAOA SHEETS\SHI-SITE-GRADING.DWG



GRADING NOTES

- 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.
- 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.
- 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.
- 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.
- THE CONTRACTOR SHALL SOD OR PLANT ALL SLOPES AND EXPOSED AREAS IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- 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.
- 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.
- FILLS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
- 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.

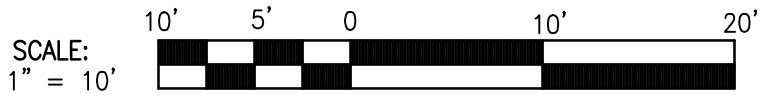
- SHOULD ANY UNANTICIPATED ARCHAEOLOGICAL SITE BE ENCOUNTERED, ALL WORK SHOULD CEASE IN THE IMMEDIATE AREA AND THE PLANNING DEPARTMENT AND STATE HISTORICAL PRESERVATION DIVISION SHALL BE NOTIFIED. SUBSEQUENT WORK SHALL RESUME AFTER CLEARANCE FROM THE PLANNING DEPARTMENT AND STATE HISTORICAL PRESERVATION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

LEGEND:

- 2" A.C. PAVEMENT OVER
6" LAYER OF 1 1/2" COMPACTED BASECOURSE
- 6" LAYER OF 2 1/2" DRAIN ROCK
- 870 FINISH CONTOUR
- EXISTING CONTOUR

0.10 M.G. - RESERVOIR SITE & WATER FILLING STATION
GRADING PLAN
SCALE: 1"=10'

GRAPHIC SCALE:



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

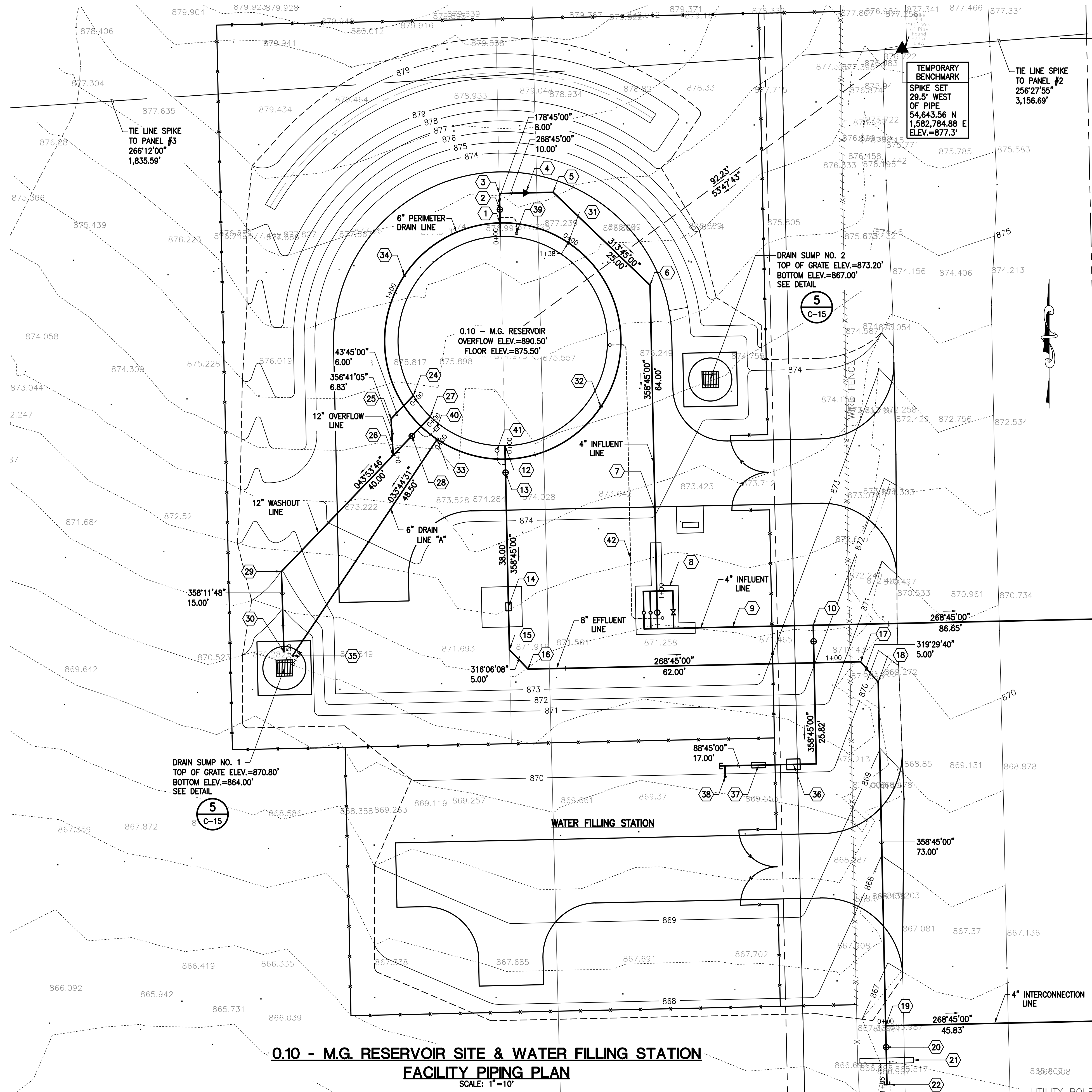
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-4
SHEET 6 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED
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:
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G7O.DESIGN		SLP		
G7O		FEBRUARY 2020		

FILE POCKET FOLDER NO.

CA:\OPROA\2019\2054 DPHIL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHI--SITE--PIPING.DWG



- 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.
SEE DETAIL
- 5

STA. 0+18 (4" INFL. LINE)
1-4" 45° D.I. BEND, M.J.
1-CONC. BLOCK
- 6

STA. 0+38 (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+36 (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
- 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" ELECTROMAGNETIC FLOWMETER
(TOSHIBA LF654 WITH COMBINED LF620
CONVERTER, OR APPROVED EQUAL)
1-METER BOX
SEE DETAIL
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+38 (8" EFFL. LINE)
1-8" 45° 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+05 (8" EFFL. LINE)
1-8" 45° 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
- 19

STA. 1+75 (8" EFFL. LINE)=
STA. 0+00 (4" INTERCONNECTION LINE)
BEGIN 4" INTERCONNECTION LINE.
FOR PROFILE, SEE SHEET C-7
1-8"x4" D.I. TEE, M.J.
1-CONC. BLOCK
- 20

STA. 1+79 (8" EFFL. LINE)
1-8" G.V., M.J., 250#
1-VALVE BOX
- 21

STA. 1+82 (8" EFFL. LINE)
1-CONC. THRUST BEAM WITH
REVERSE BELL PIECE
FOR DETAIL, SEE DWS STANDARD DETAIL
B16 AND B17 TYPE D SOIL CONDITION
- 22

STA. 1+85 (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
- 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
- 26

STA. 0+12.83 (12" OVERFLOW LINE)=
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" BVF, 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
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
SEE DETAIL
- 33

STA. 0+69.11 (6" PERIMETER DRAIN)=
STA. 0+00 (6" DRAIN LINE "A")
BEGIN 6" PVC DRAIN LINE "A"
LOW POINT - PIPE INV. ELEV.=871.60
PROVIDE 4" OBSERVATION PORT
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
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
1-5/8" 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
- 39

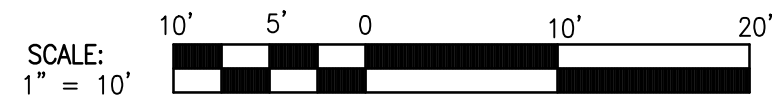
WATER SAMPLING STATION (INFLUENT)
SEE DETAIL
- 40

RESERVOIR LEVEL TRANSMITTER
SEE DETAIL
- 41

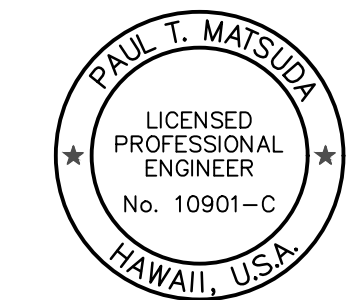
WATER SAMPLING STATION (EFFLUENT)
SEE DETAIL
- 42

PILOT CONTROL LINES
2 - 3/8" POLYETHYLENE TUBING WITHIN
2 1/2" 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:



DWG. NO.
C-5
SHEET 7 OF 54



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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION DATE BRIEF MADE BY APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

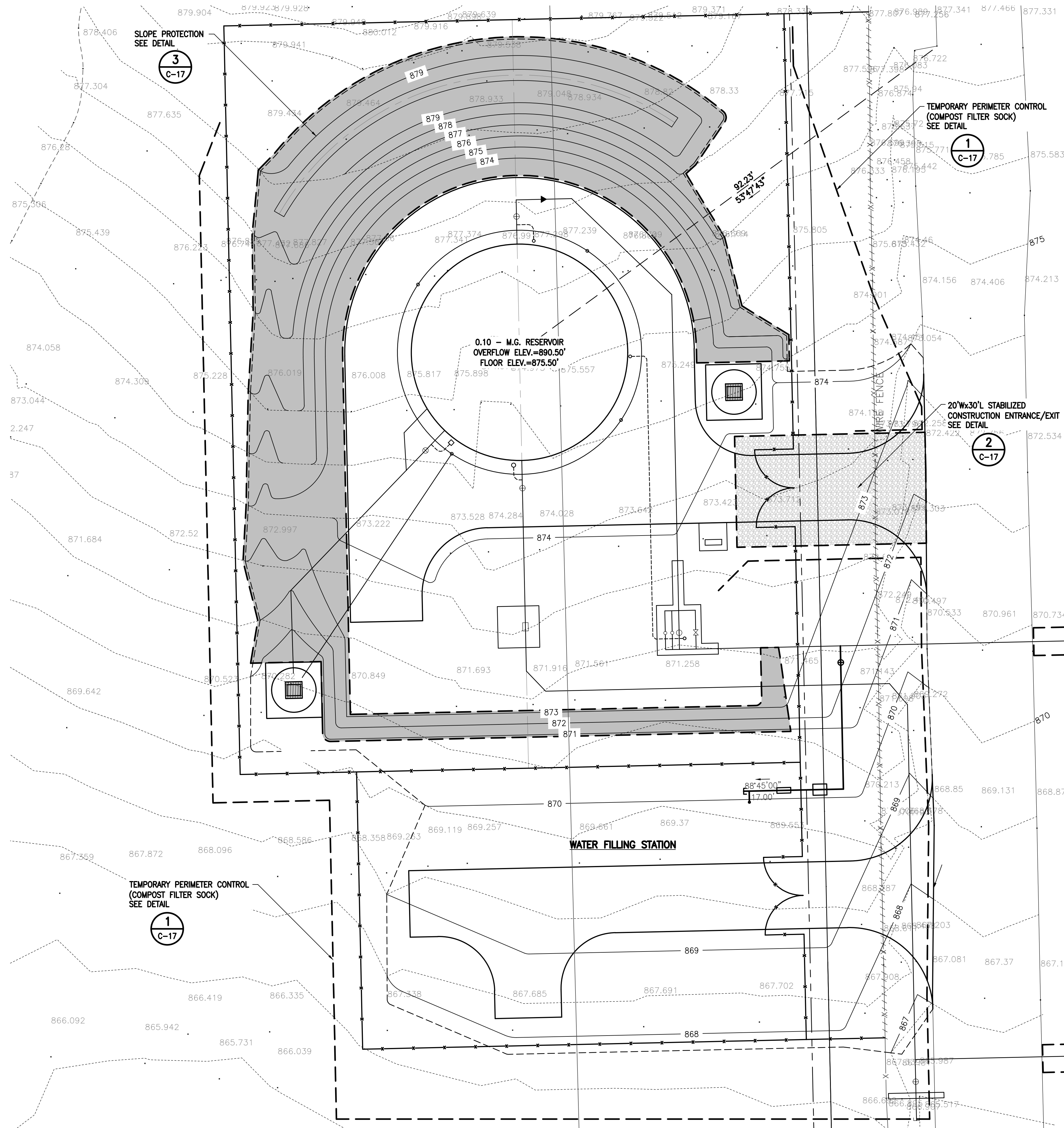
0.10 - M.G. RESERVOIR SITE & WATER FILLING STATION
FACILITY PIPING PLAN

DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5985
WWW.G70.DESIGN
FEBRUARY 2020



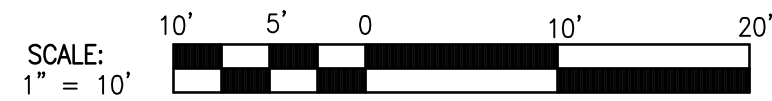
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CA:\OPROA\2019\2-19-054 DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHI-SITE-EROSION-CONTROL-PLANS.DWG



0.10 - M.G. RESERVOIR & WATER FILLING STATION
EROSION CONTROL PLAN
SCALE: 1"=10'

GRAPHIC SCALE:



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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-6
SHEET 8 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

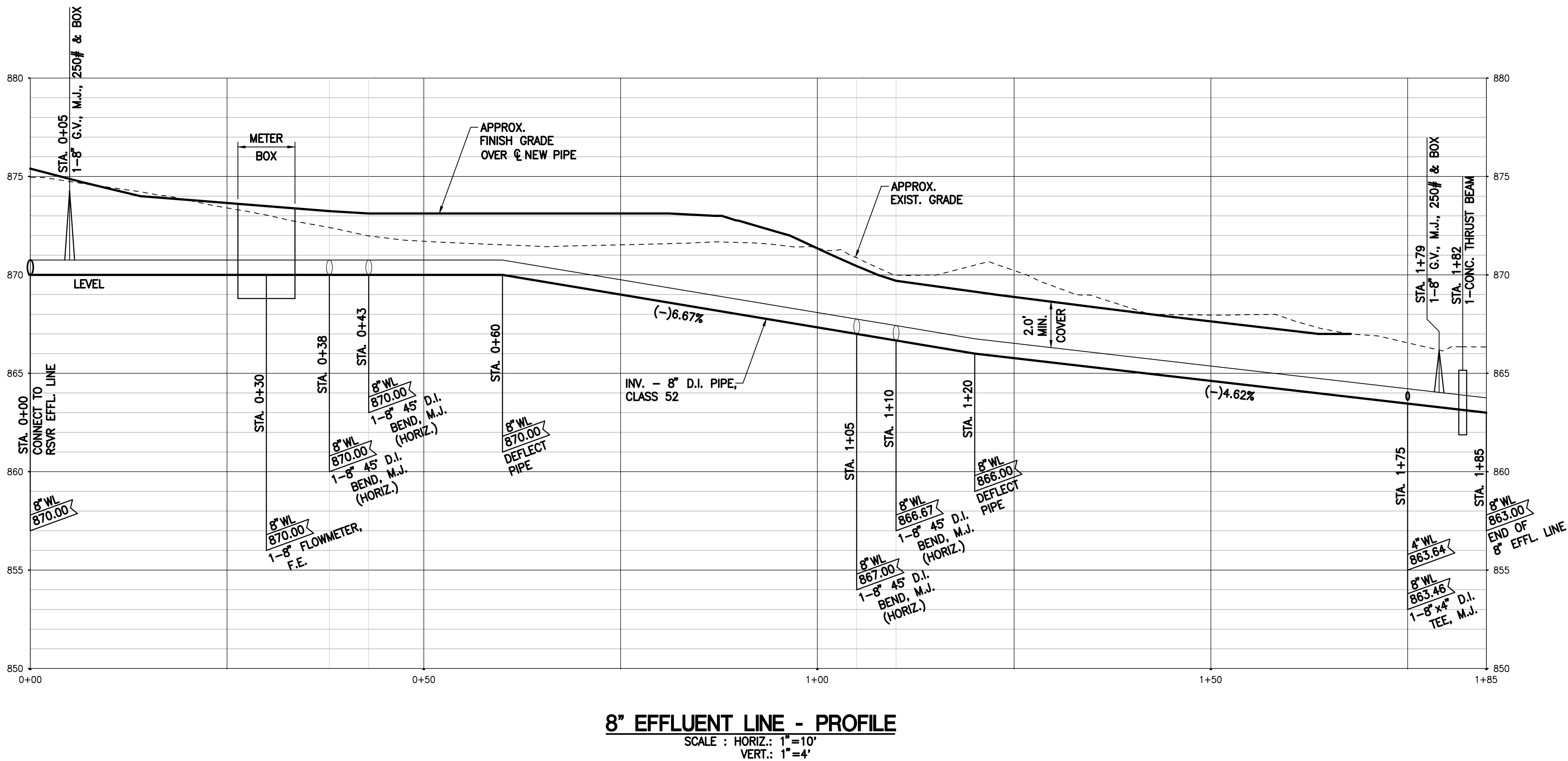
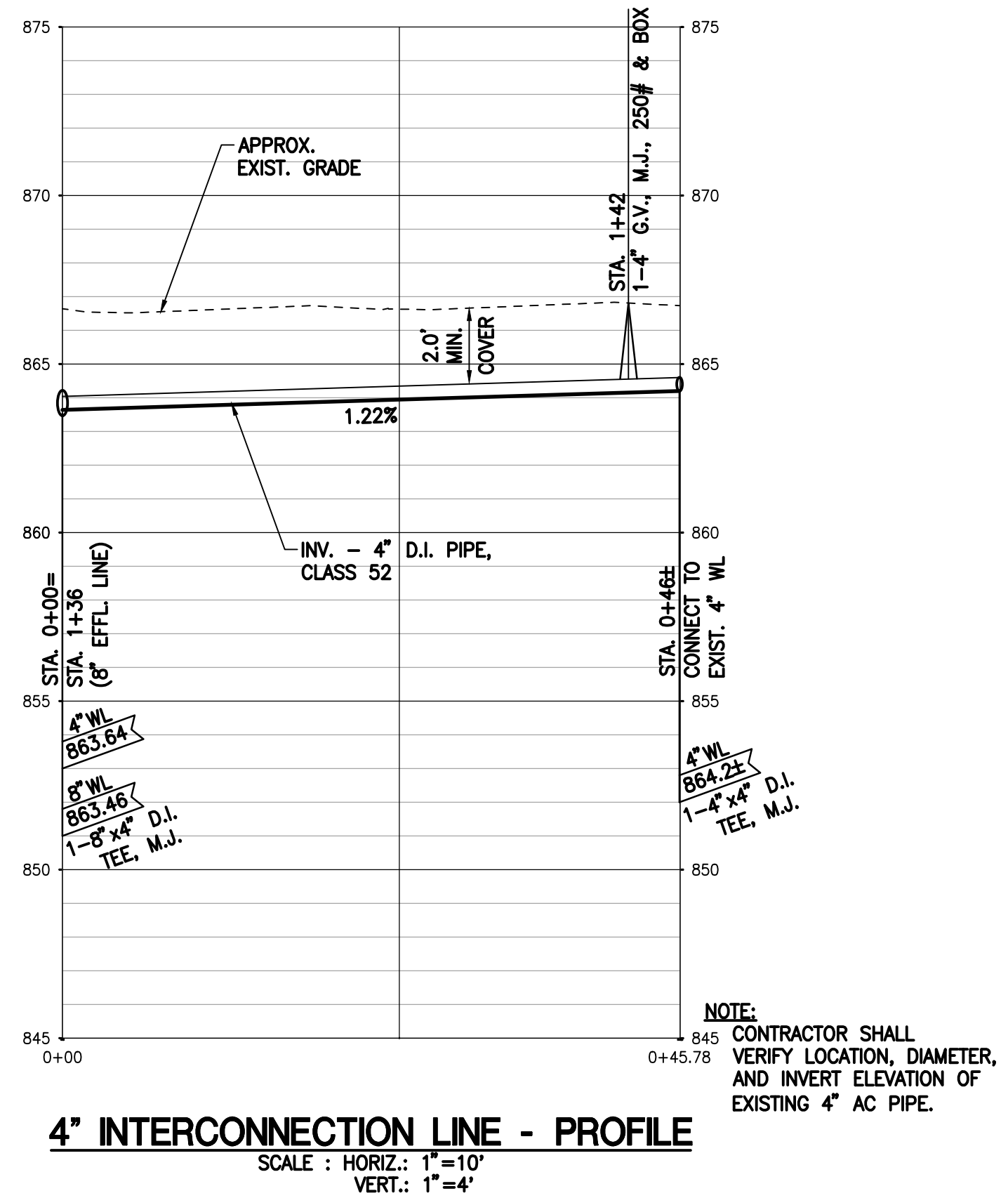
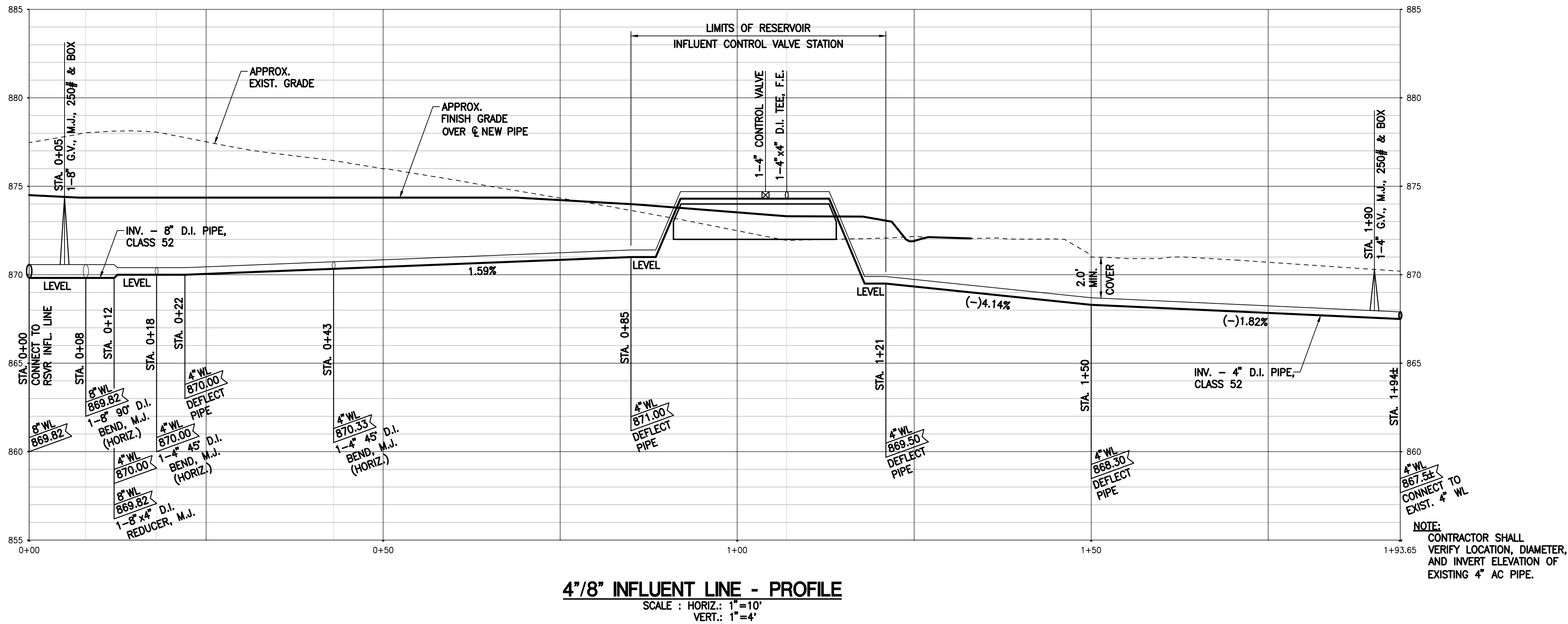
0.10 - M.G. RESERVOIR & WATER FILLING STATION
EROSION CONTROL PLAN

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

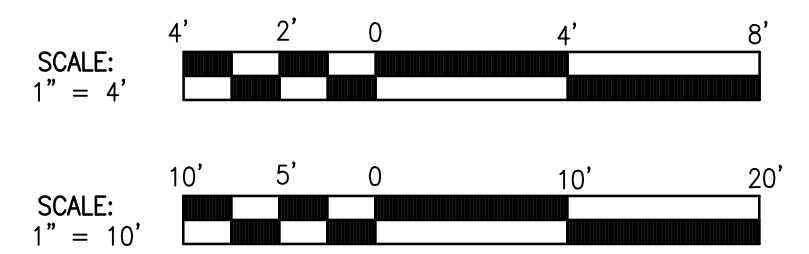
G70 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5985
WWW.G70.DESIGN
FEBRUARY 2020

FILE	POCKET	FOLDER	NO.

CA:\OPROA\2019\2-19-2054_DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SH1-PR-1.DWG



GRAPHIC SCALES:



REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

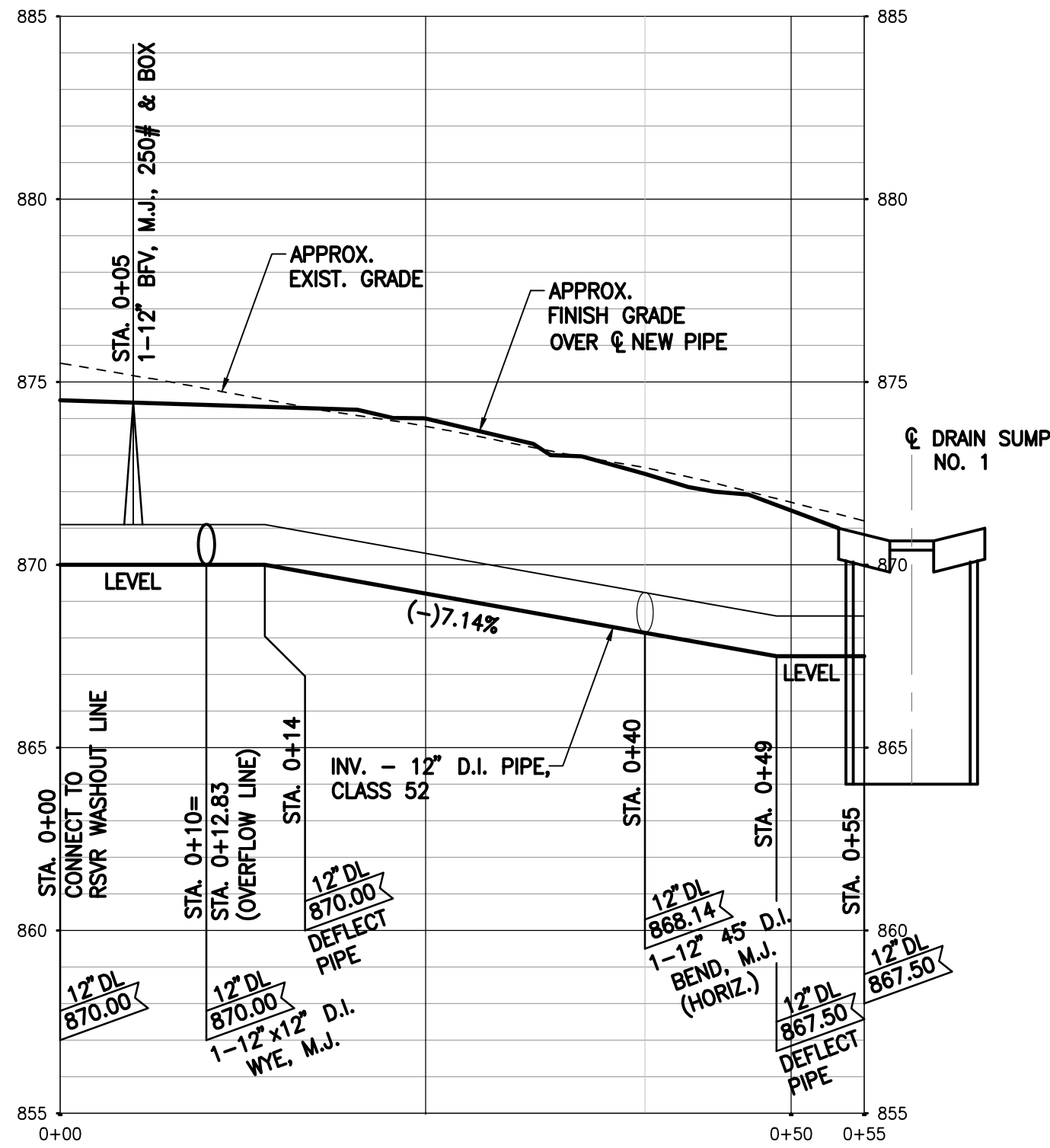
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

INFLUENT, EFFLUENT & INTERCONNECTION LINE PROFILES

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

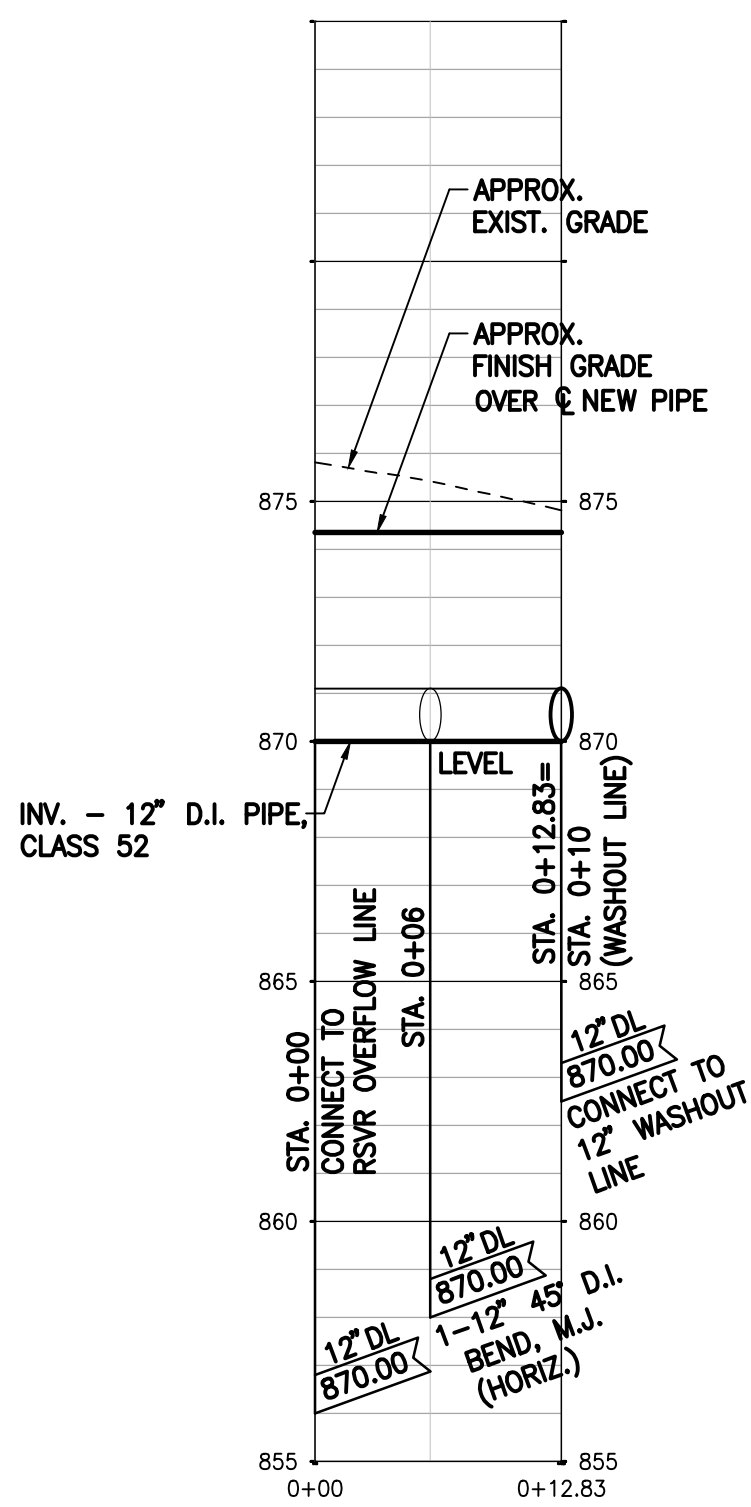
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HONOLULU, HAWAII 96813
808-523-5885
WWW.G70.DESIGN

FEBRUARY 2020



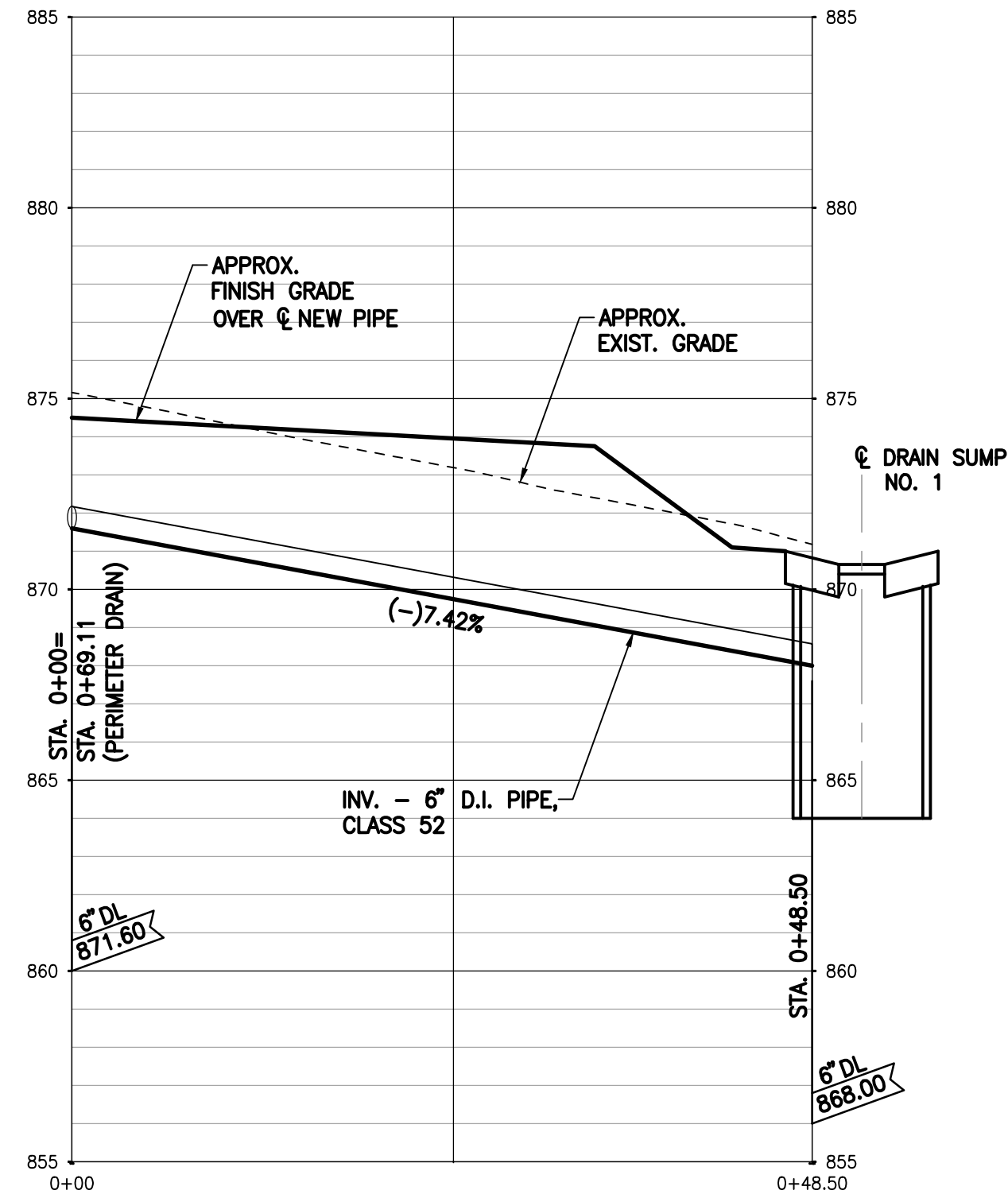
12" WASHOUT LINE - PROFILE

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



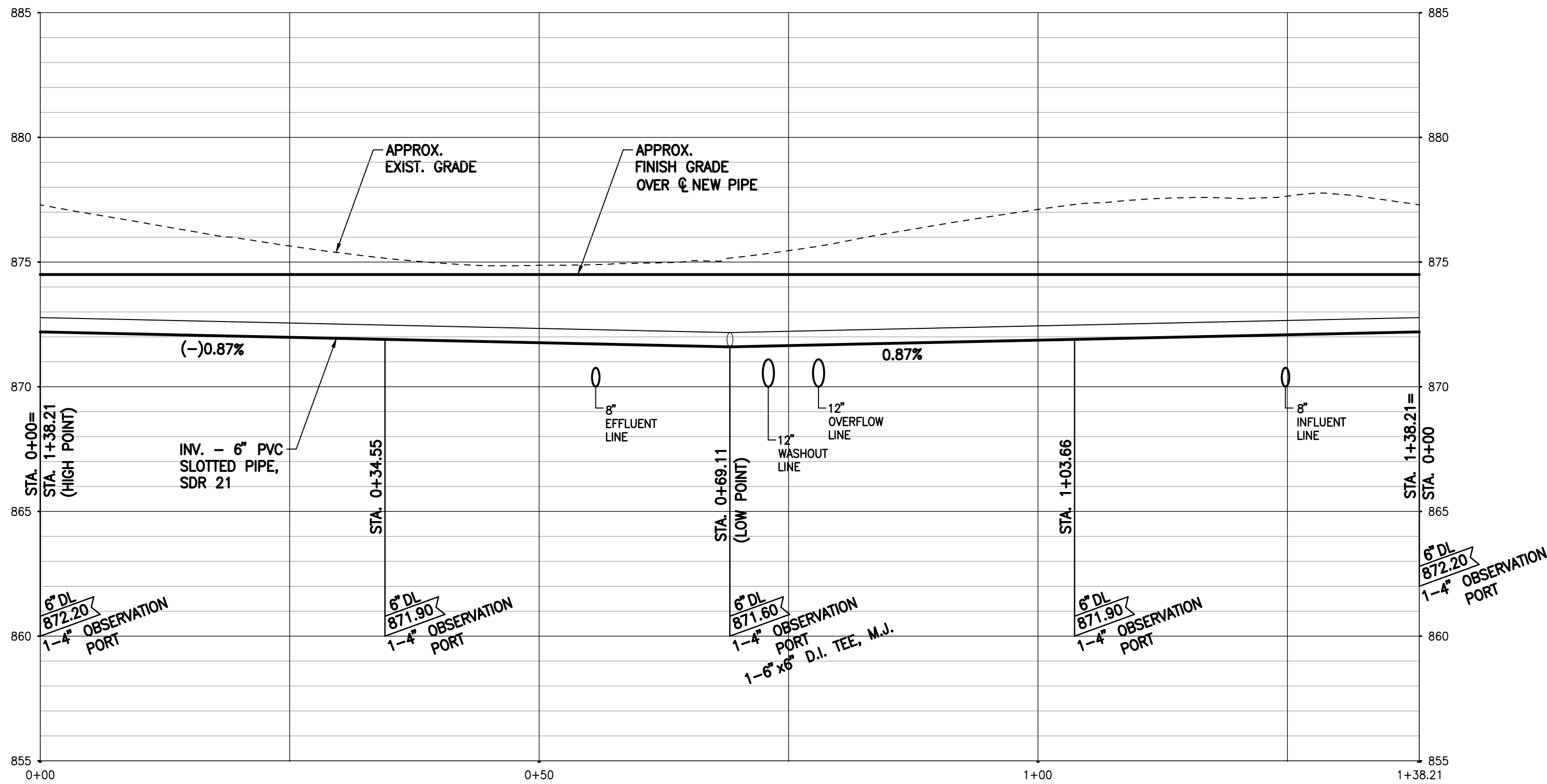
12" OVERFLOW LINE - PROFILE

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



6" DRAIN LINE "A" - PROFILE

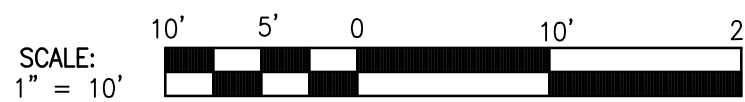
SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'



6" PERIMETER DRAIN - PROFILE

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

GRAPHIC SCALES:



REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

DRAIN LINE PROFILES

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

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5885
WWW.G70.DESIGN
FEBRUARY 2020

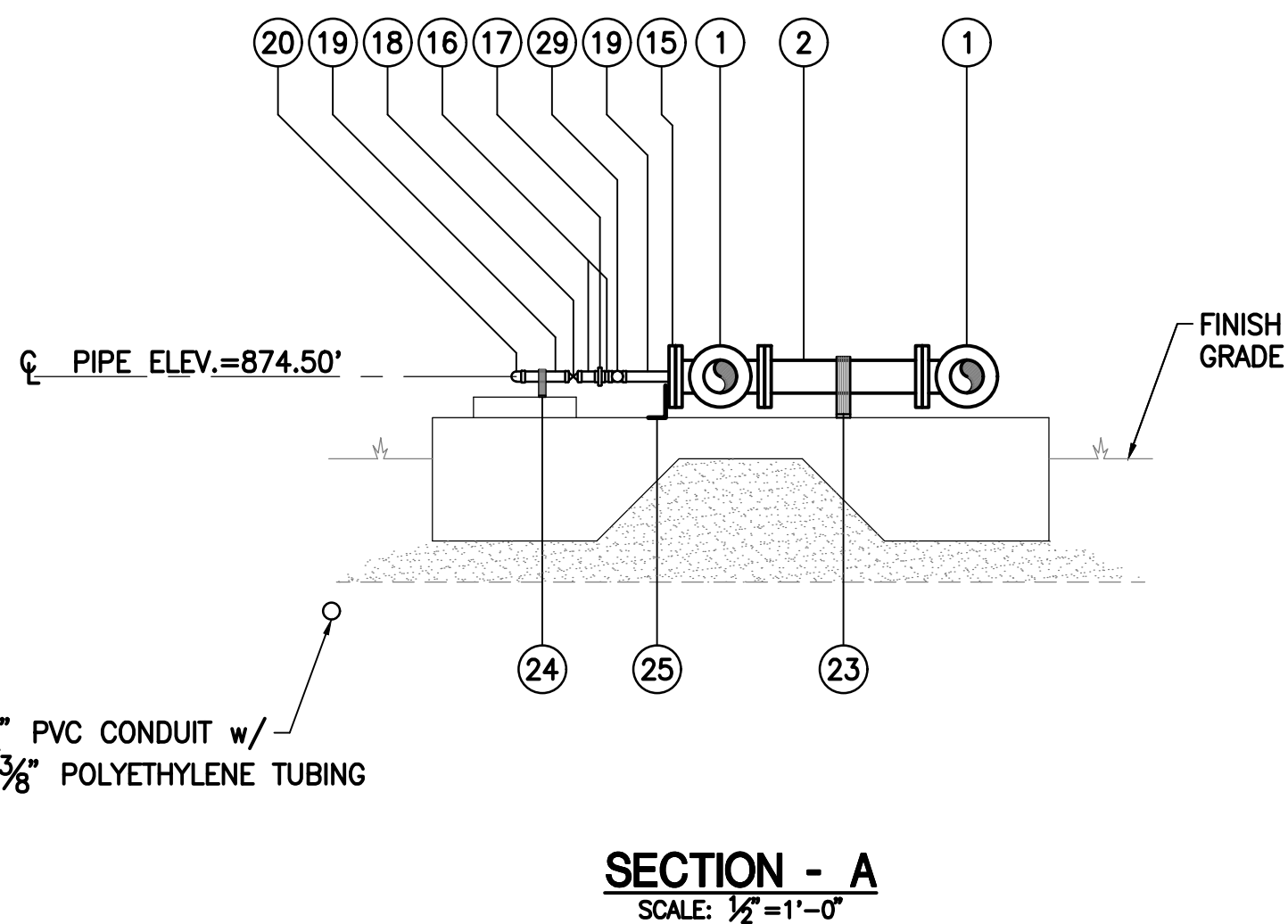
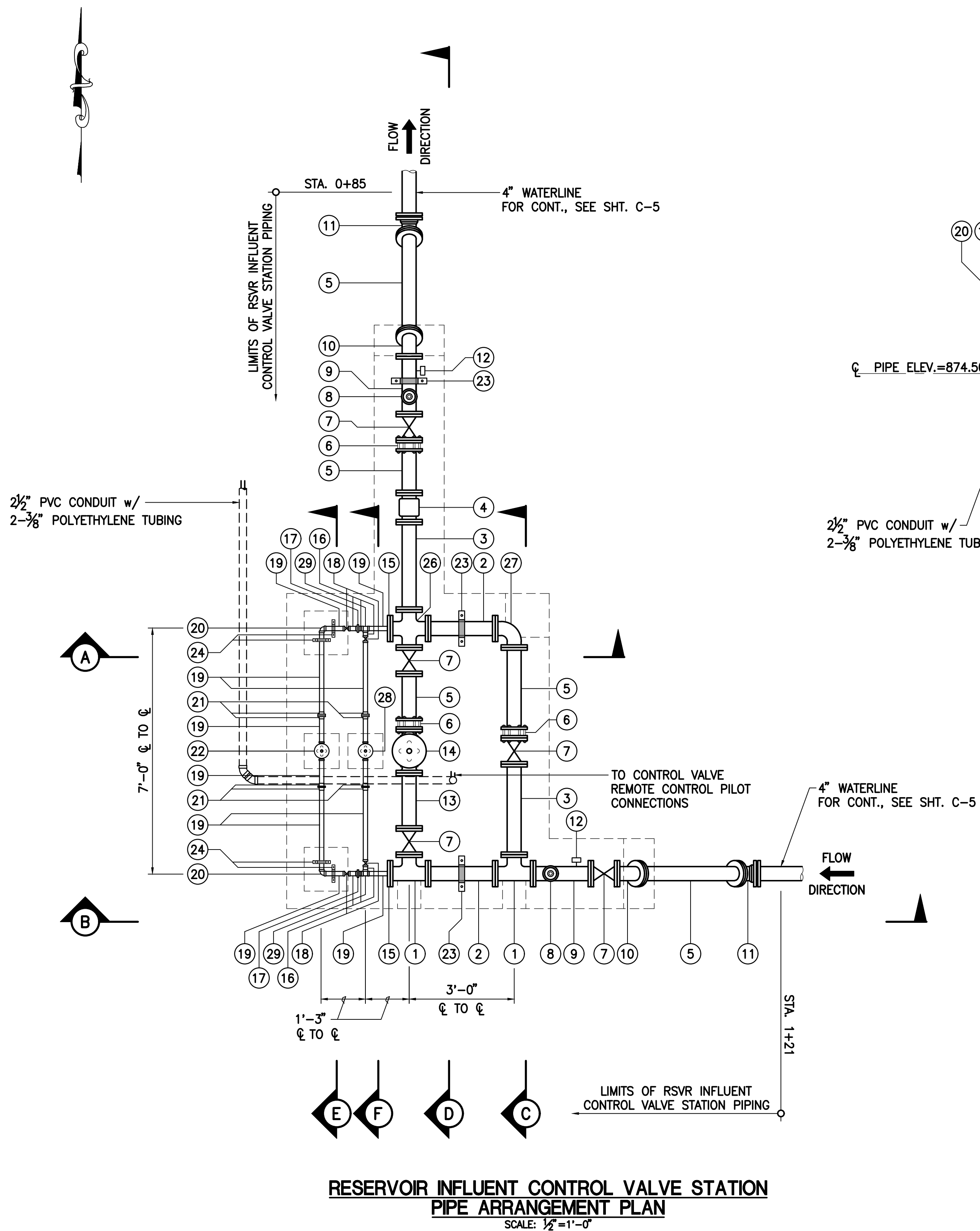


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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

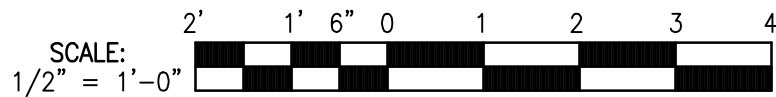
DWG. NO.
C-8
SHEET 10 OF 54

CA:\OPROA\2019\2-19-054_DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SHT-W-1.DWG



RESERVOIR INFLUENT CONTROL VALVE STATION
PIPE ARRANGEMENT PLAN
SCALE: 1/2"=1'-0"

GRAPHIC SCALE:



MATERIAL LIST

ITEM	DESCRIPTION
1	4" x 4" 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 TOSHIBA LF 654 WITH COMBINED LF 620 CONVERTER, 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	4" 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 1 1/2" NPT TAP
16	1 1/2" BRASS NIPPLE, SCH. 40
17	1 1/2" BRONZE UNION, S.E.
18	1 1/2" BRASS BALL VALVE, S.E.
19	1 1/2" BRASS PIPE, SCH. 40
20	1 1/2" 90° BRASS ELBOW, S.E.
21	1 1/2" FORD LOK-PAK METER COUPLING, CAT. NO. CF35-66, WITH STAINLESS STEEL BOLTS
22	1 1/2" 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
24	STAINLESS STEEL PIPE STRAP FOR 1 1/2" BRASS PIPE, SEE DETAIL 2 C-13
25	HOLD DOWN CLIP, SEE DETAIL 2 C-13
26	4" x 4" x 4" D.I. CROSS, F.E.
27	4" 90° D.I. BEND, F.E.
28	1 1/2" 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.
29	1 1/2" BRASS TEE, S.E.

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.



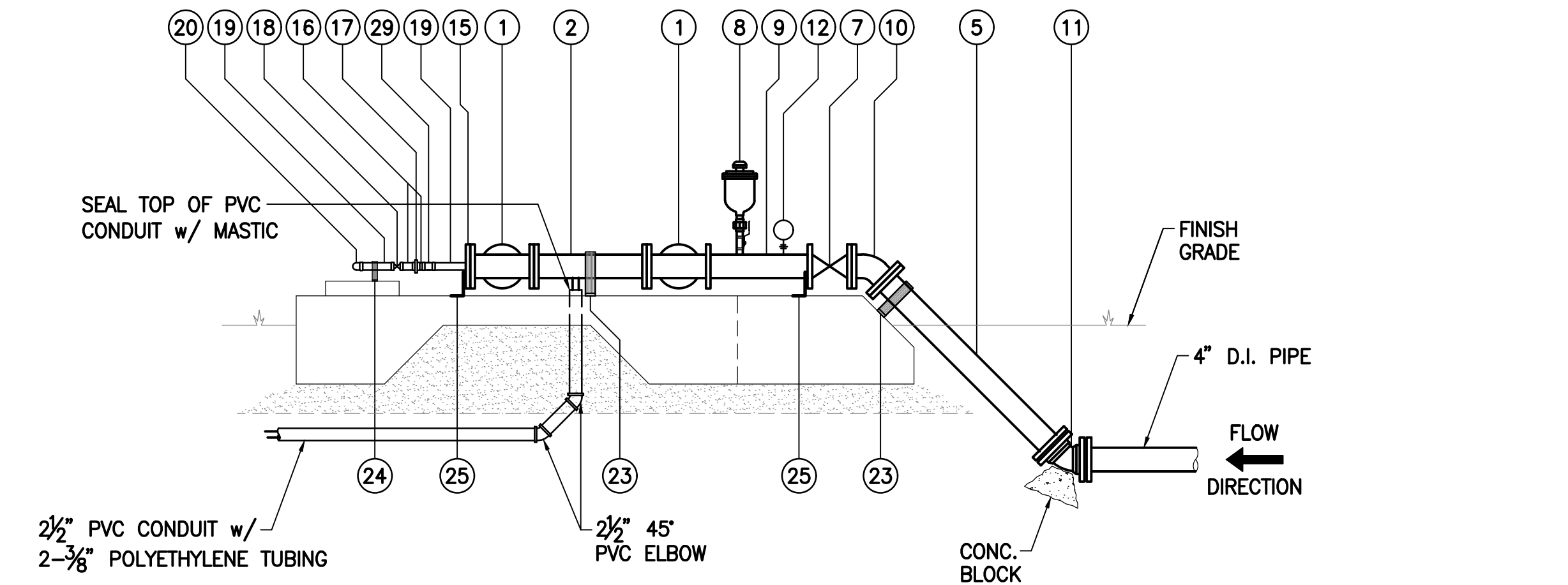
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS,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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

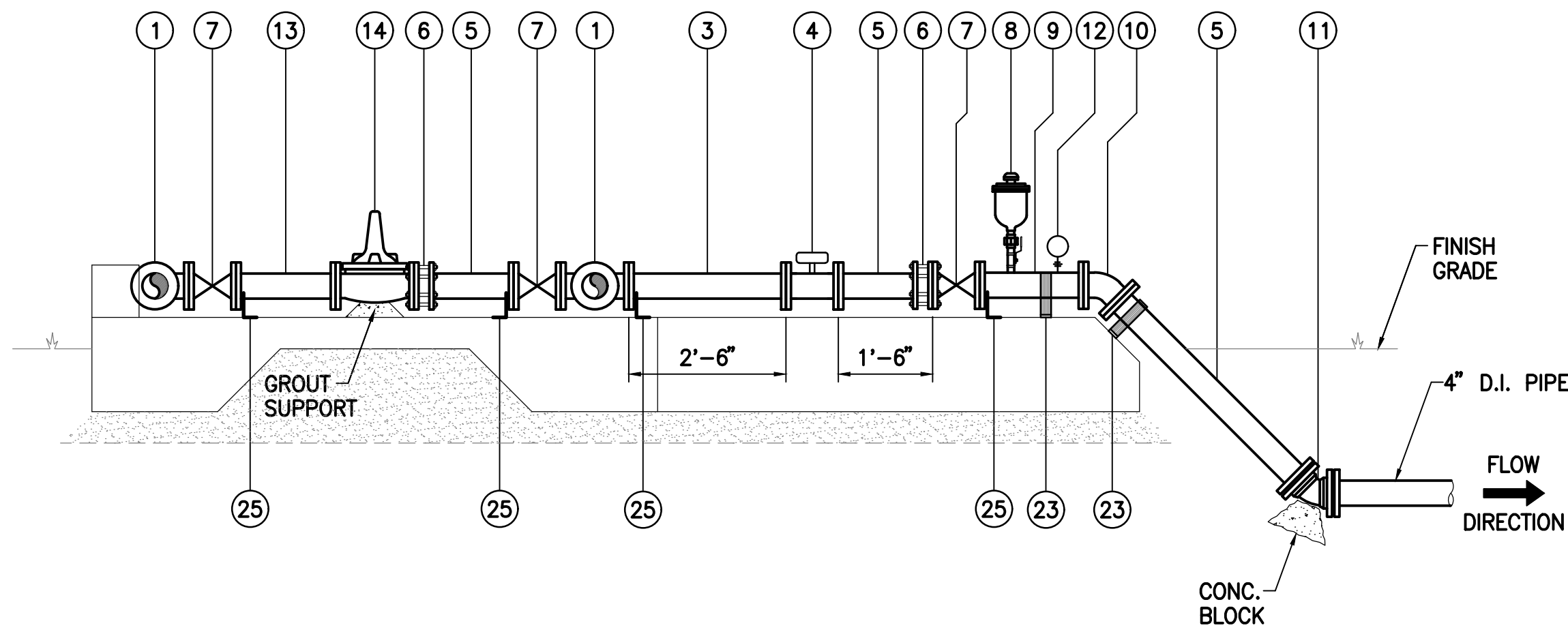
DWG. NO.
C-9
SHEET 11 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED
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:
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G7O.DESIGN		G7O		
FEBRUARY 2020				

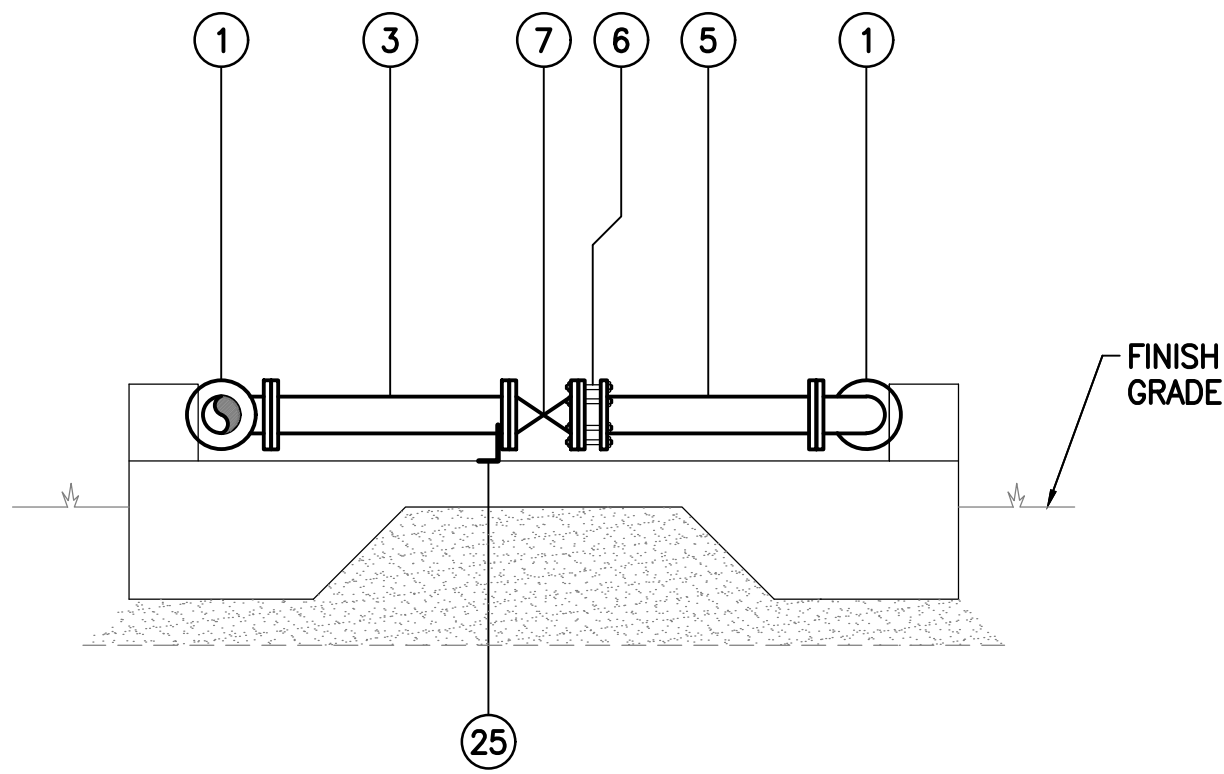
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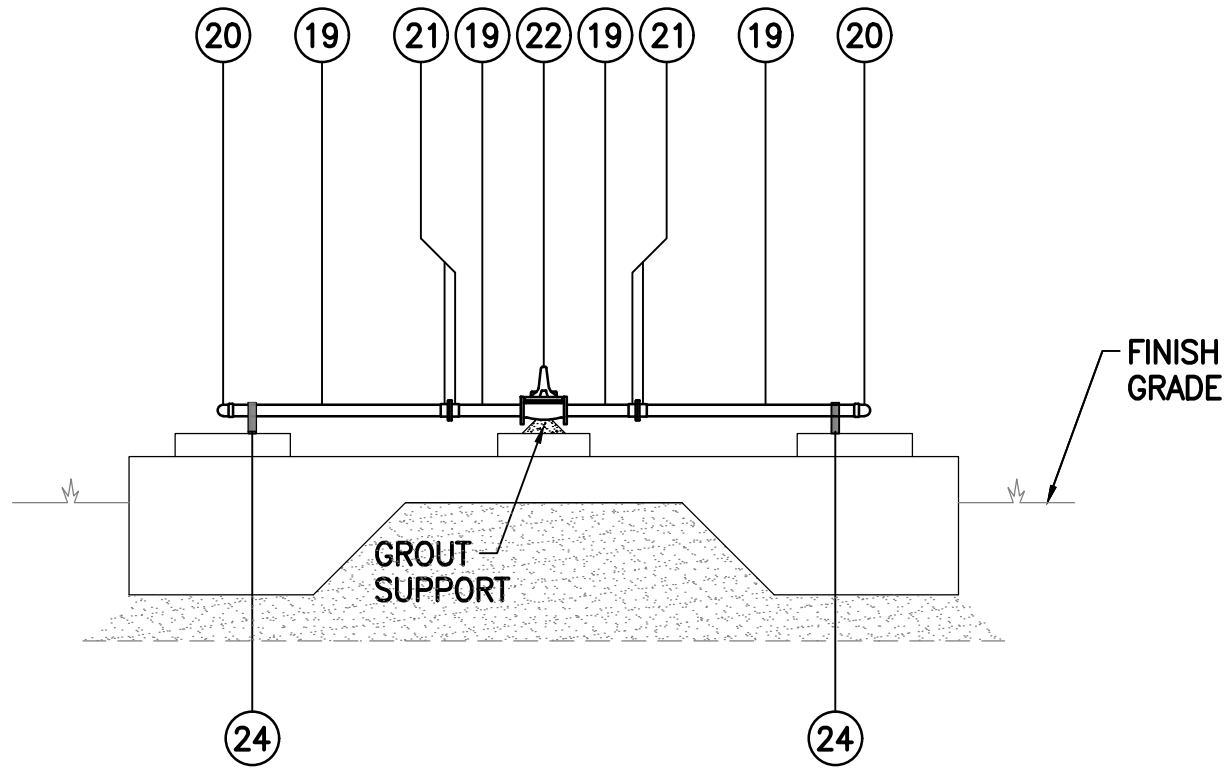
SECTION - B
SCALE: 1/2" = 1'-0"



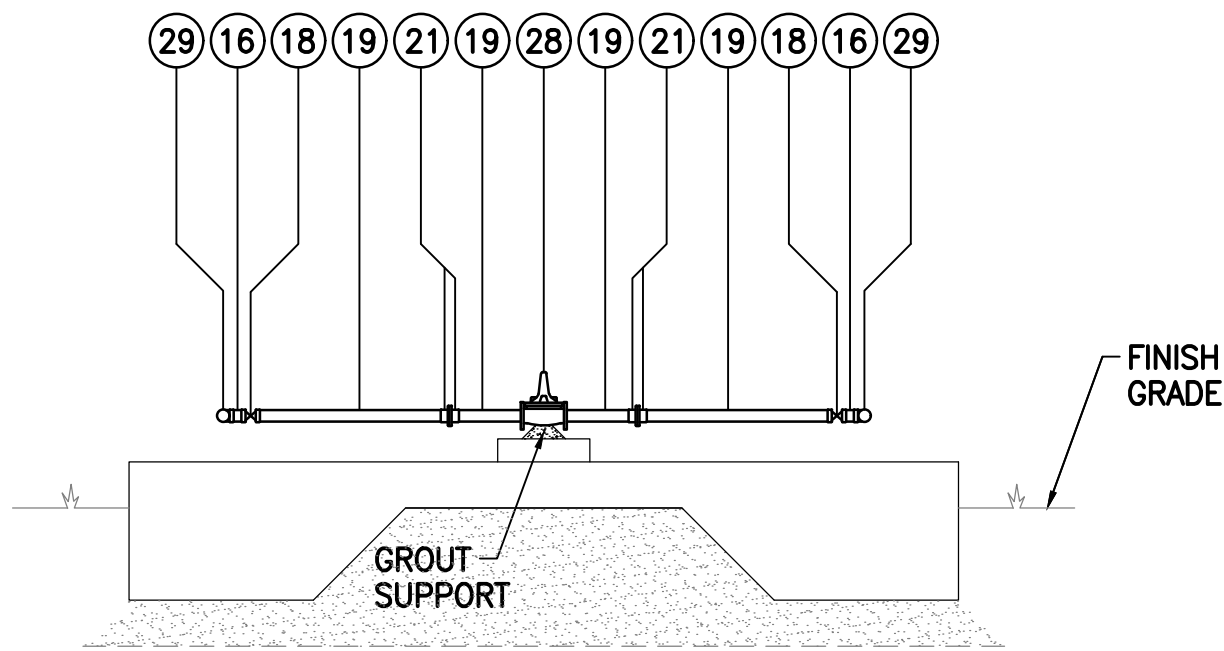
SECTION - D
SCALE: 1/2" = 1'-0"



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



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



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

MATERIAL LIST

ITEM	DESCRIPTION
1	4" x 4" D.I. TEE, F.E.
2	4" D.I. SPOOL, F.E.x F.E., 23" LONG
3	4" D.I. SPOOL, F.E.x F.E., 30" LONG
4	4" ELECTROMAGNETIC FLOWMETER TOSHIBA LF 654 WITH COMBINED LF 620 CONVERTER, OR APPROVED EQUAL.
5	4" D.I. ADAPTER, F.E.x P.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.x F.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.x F.E., 19" LONG
14	4" 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 1 1/2" NPT TAP
16	1 1/2" BRASS NIPPLE, SCH. 40
17	1 1/2" BRONZE UNION, S.E.
18	1 1/2" BRASS BALL VALVE, S.E.
19	1 1/2" BRASS PIPE, SCH. 40
20	1 1/2" 90° BRASS ELBOW, S.E.
21	1 1/2" FORD LOK-PAK METER COUPLING, CAT. NO. CF35-66, WITH STAINLESS STEEL BOLTS
22	1 1/2" 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
24	STAINLESS STEEL PIPE STRAP FOR 1 1/2" BRASS PIPE, SEE DETAIL 3 C-13
25	HOLD DOWN CLIP, SEE DETAIL 2 C-13
26	4" x 4" x 4" D.I. CROSS, F.E.
27	4" 90° D.I. BEND, F.E.
28	1 1/2" 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	1 1/2" BRASS TEE, S.E.

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

REVISION	DATE	BRIEF	MADE BY	APPROVED
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
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5985 WWW.G70.DESIGN				
FEBRUARY 2020				



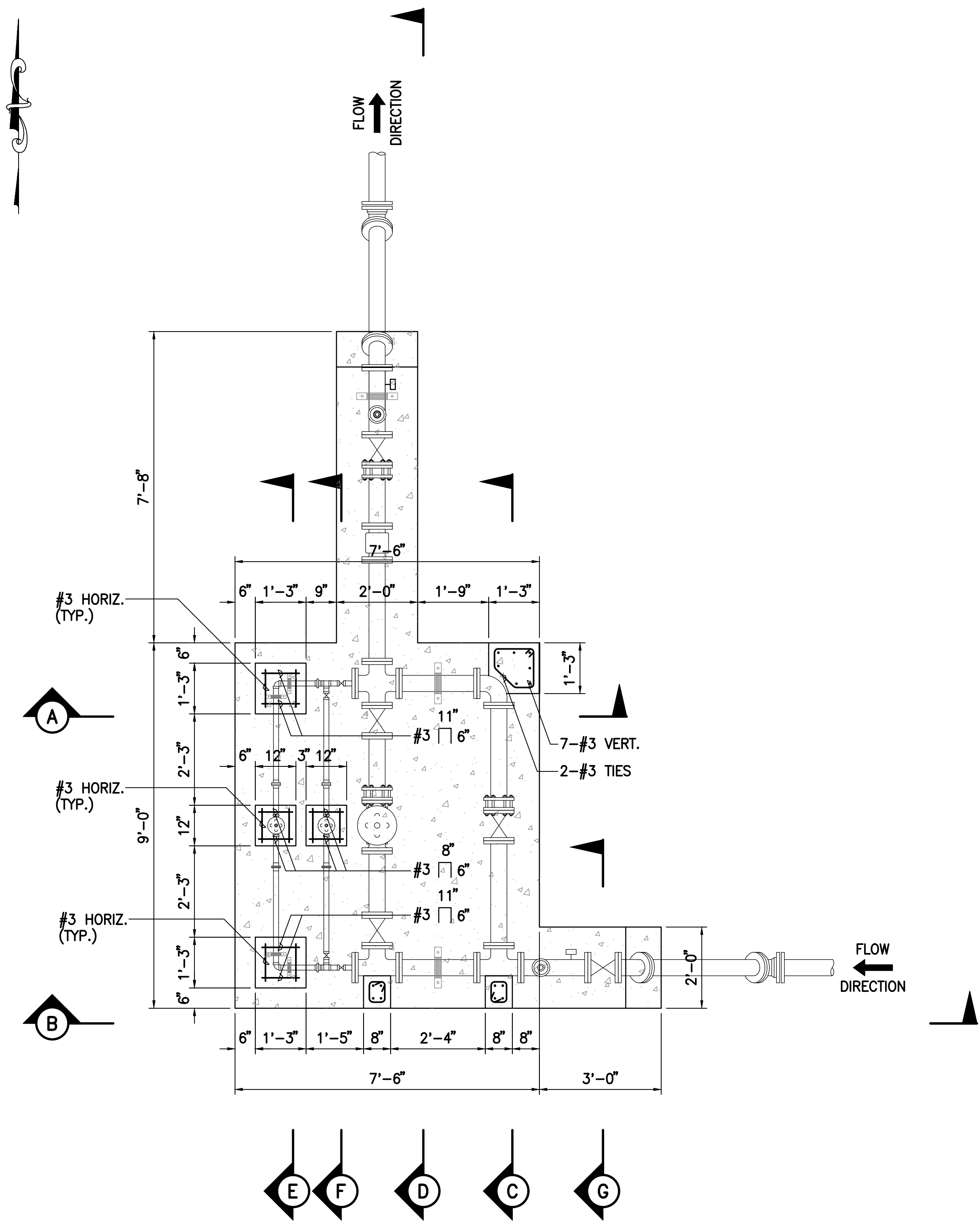
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS,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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

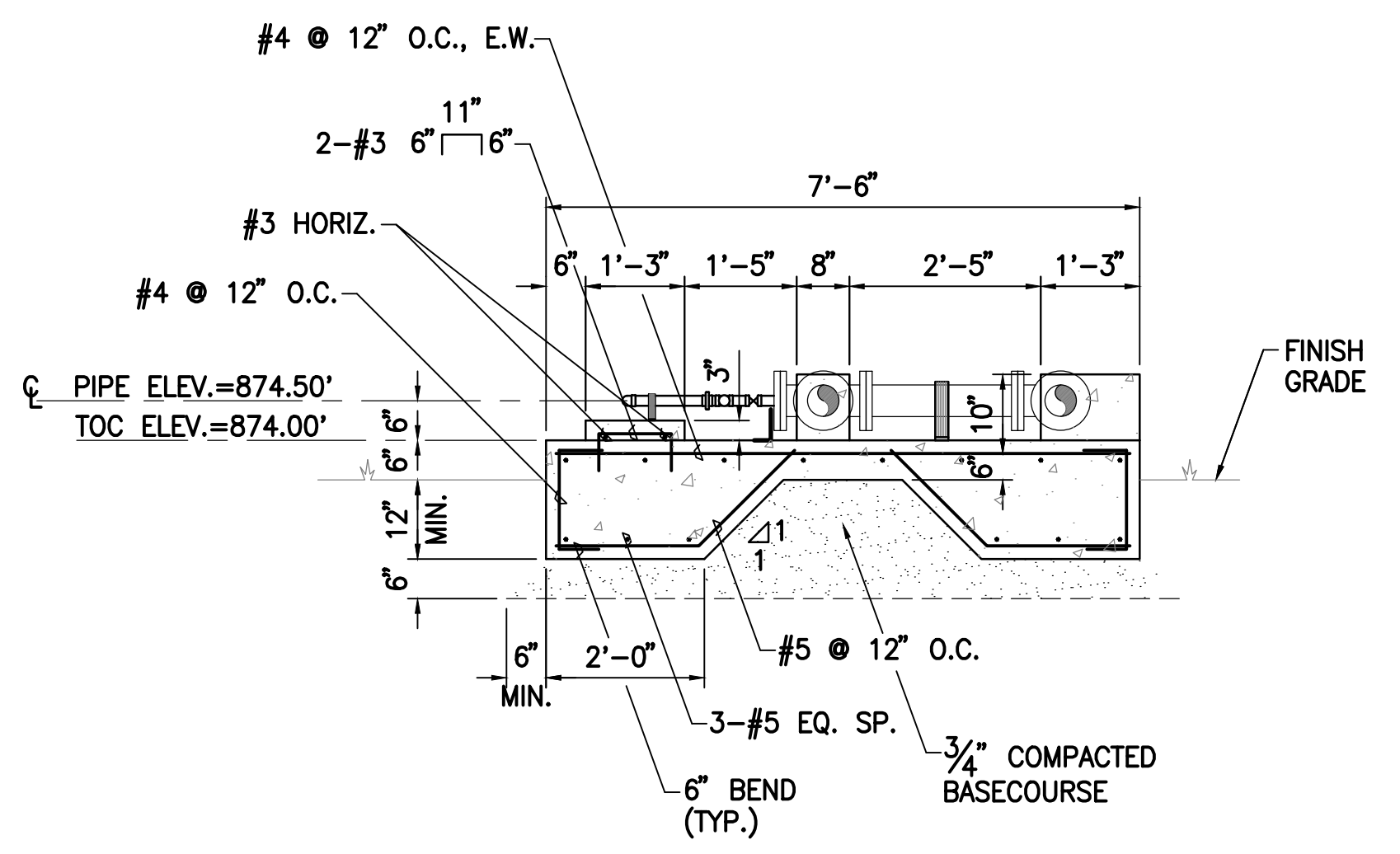
DWG. NO.
C-10
SHEET 12 OF 54

GRAPHIC SCALE:

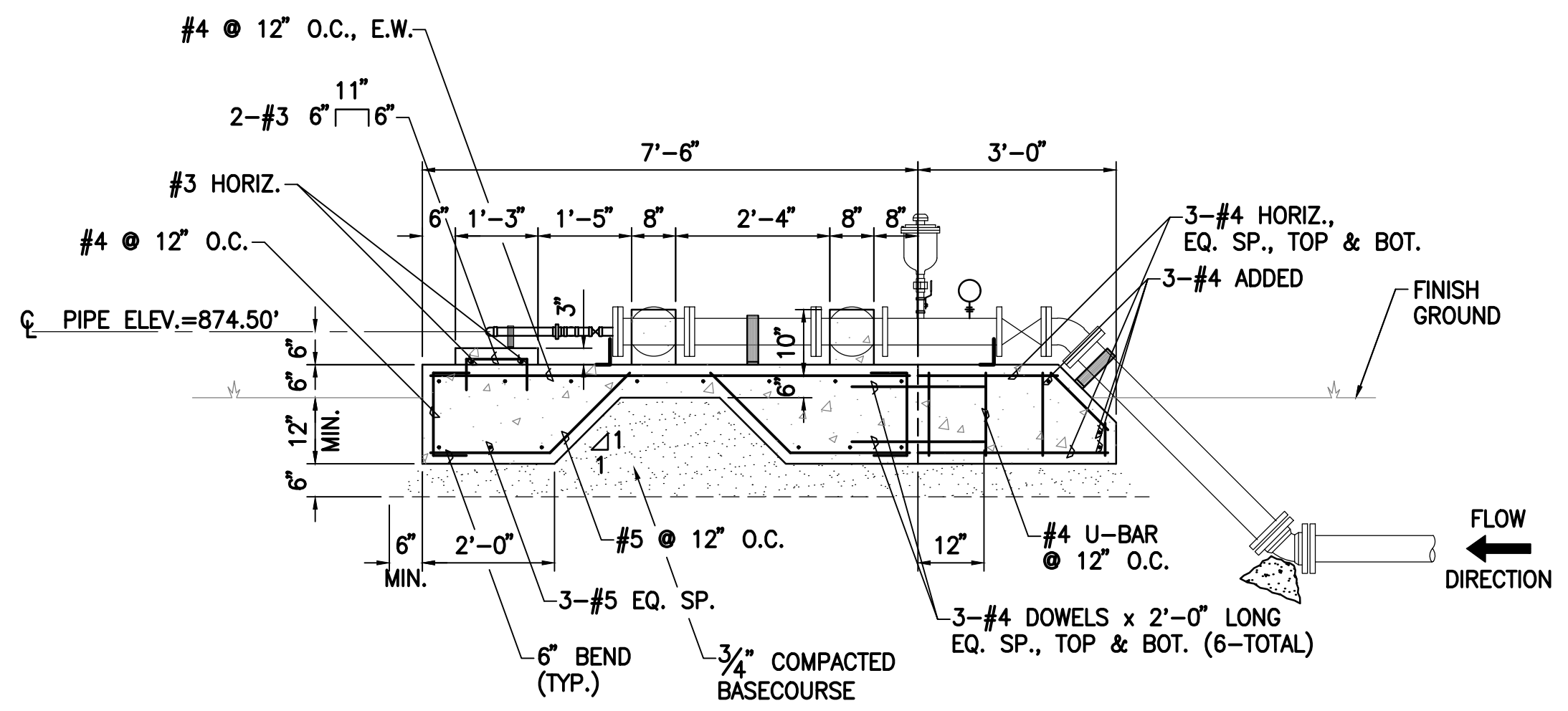




RESERVOIR INFLUENT CONTROL VALVE STATION
FOUNDATION PLAN
SCALE: 1/2" = 1'-0"

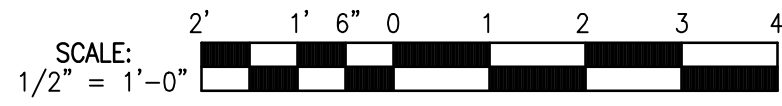


SECTION - A
SCALE: 1/2" = 1'-0"



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

GRAPHIC SCALE:



DWG. NO.
C-11
SHEET 13 OF 54

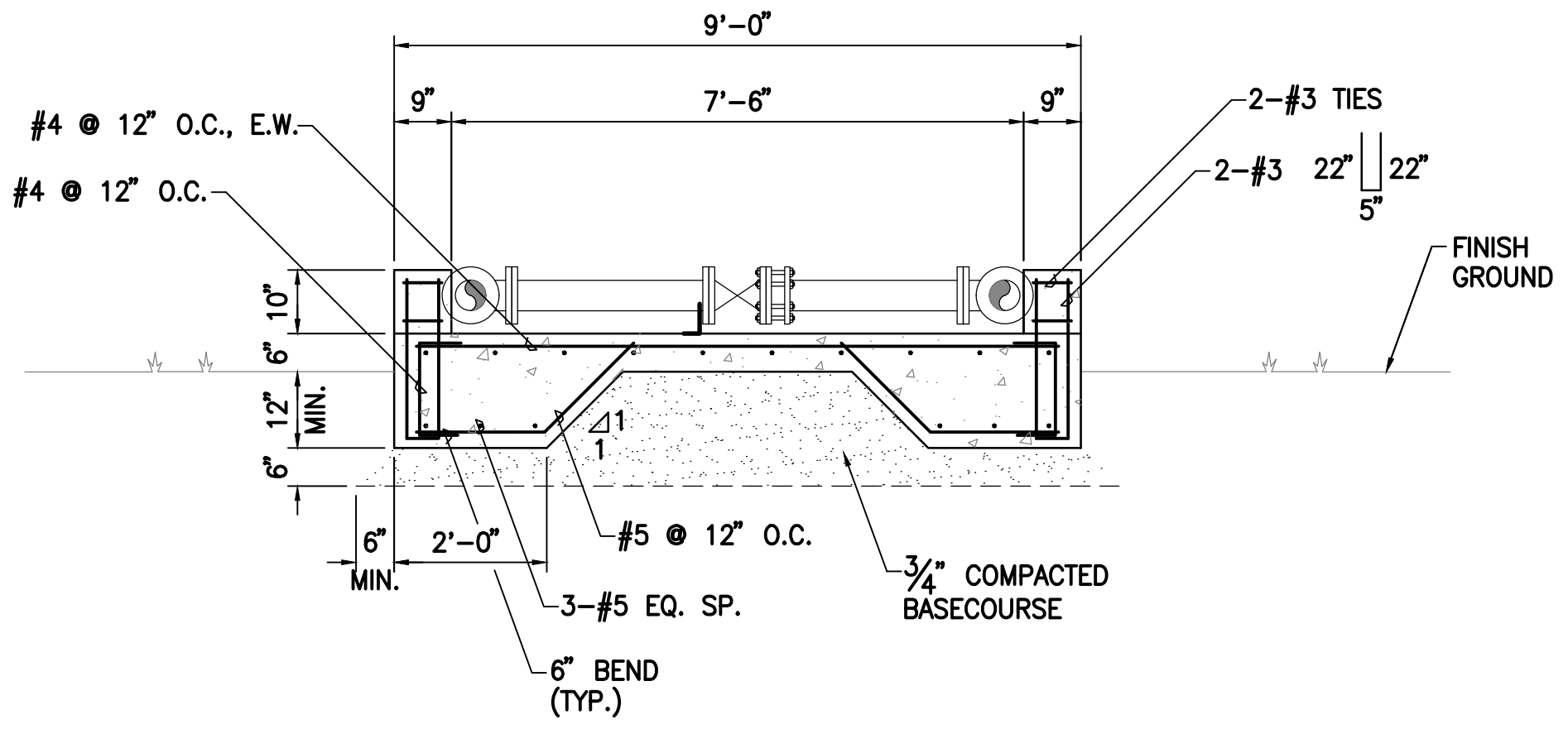
PAUL T. MATSUOKA
LICENSED PROFESSIONAL ENGINEER
No. 10901-C
HAWAII, U.S.A.

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).

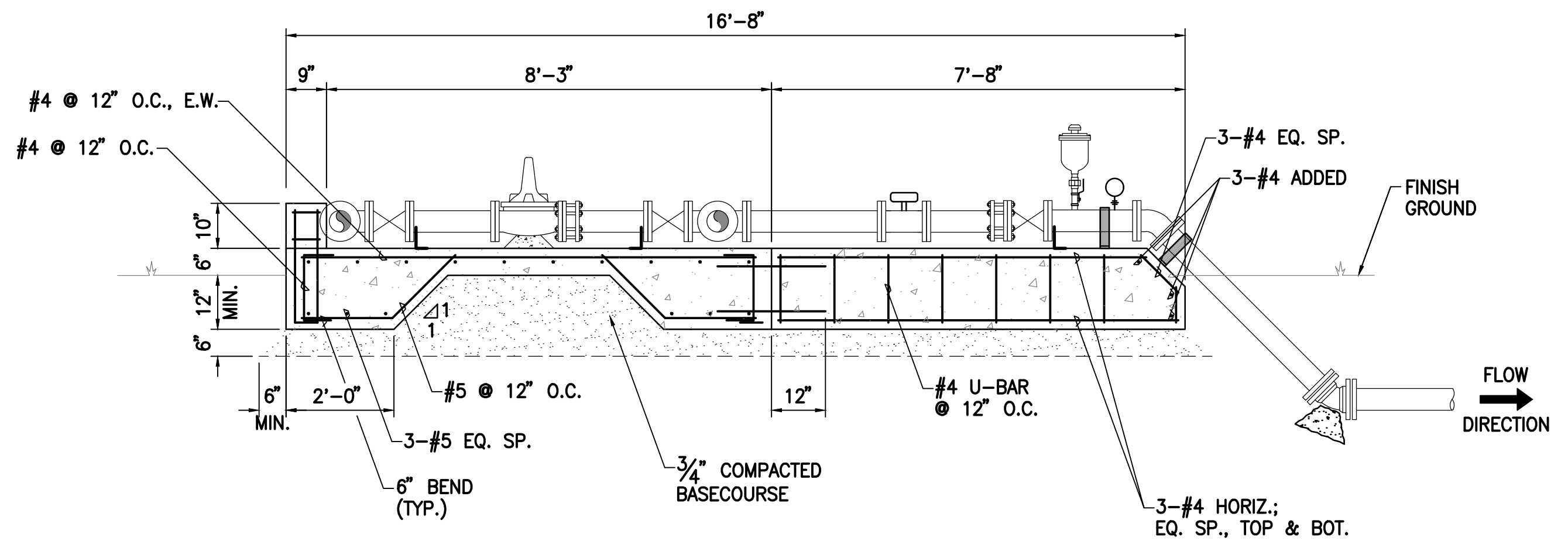
SIGNATURE
DATE: APRIL 30, 2020

REVISION	DATE	BRIEF		MADE BY APPROVED
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
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5886 WWW.G7O.DESIGN				
FEBRUARY 2020				

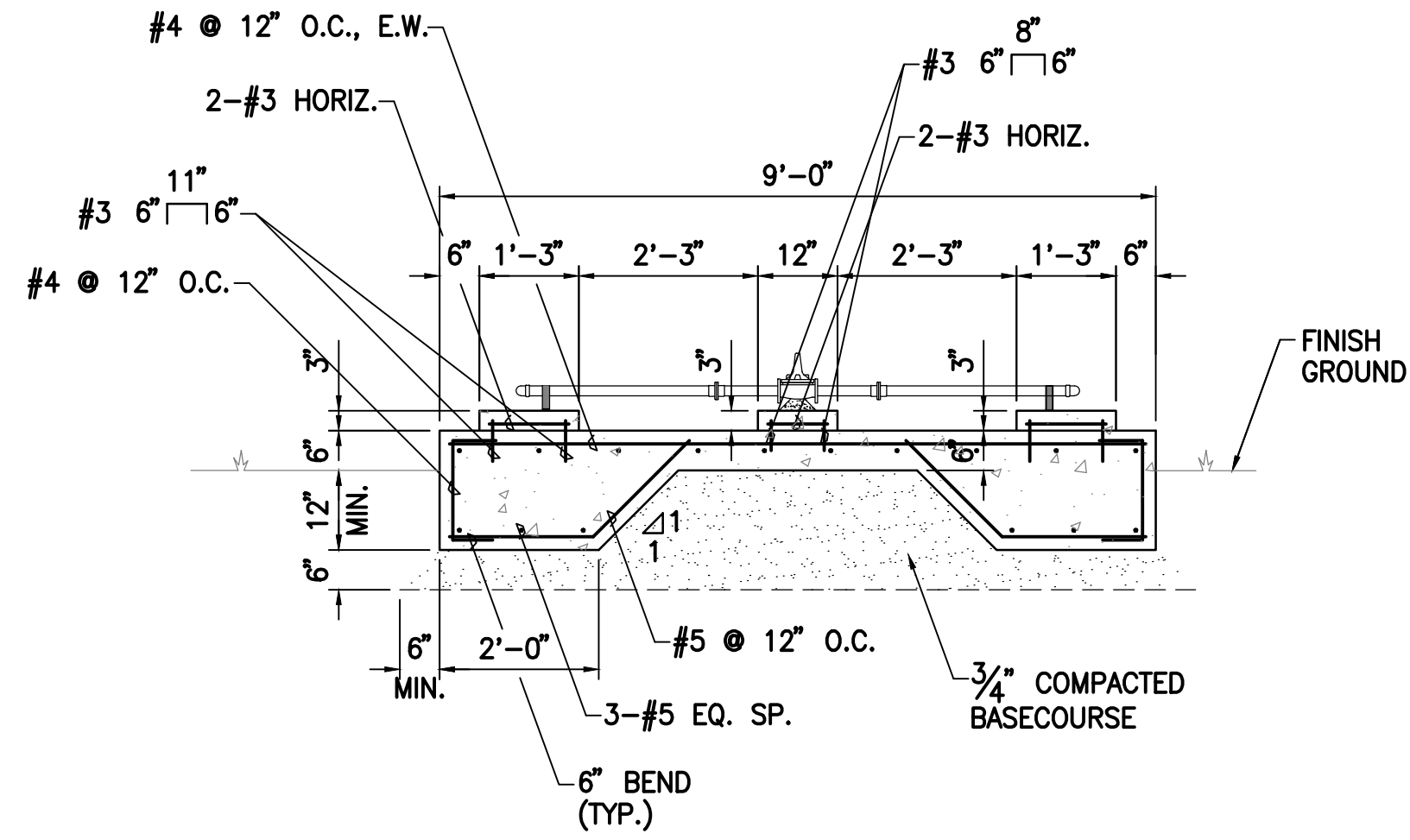
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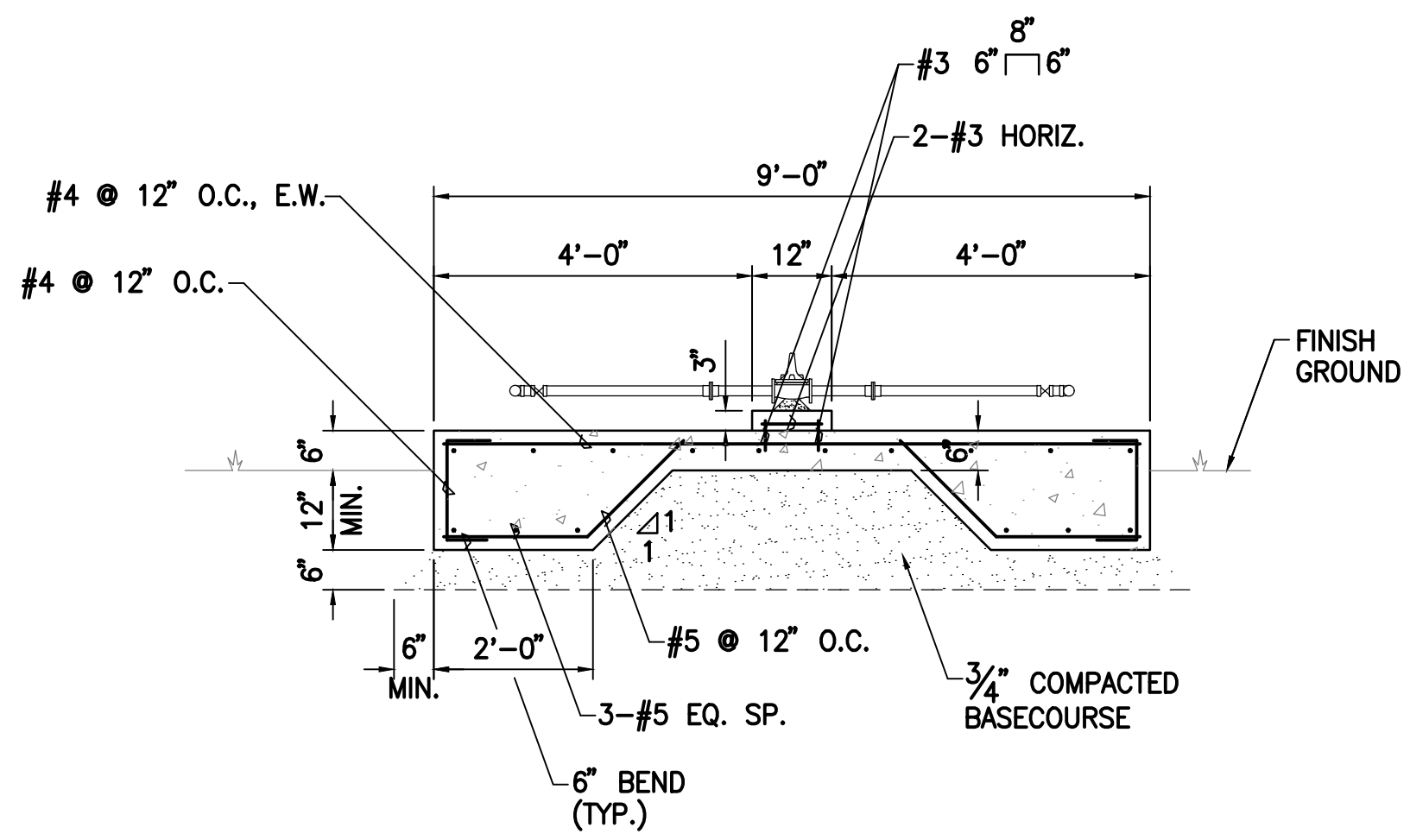
SECTION - C
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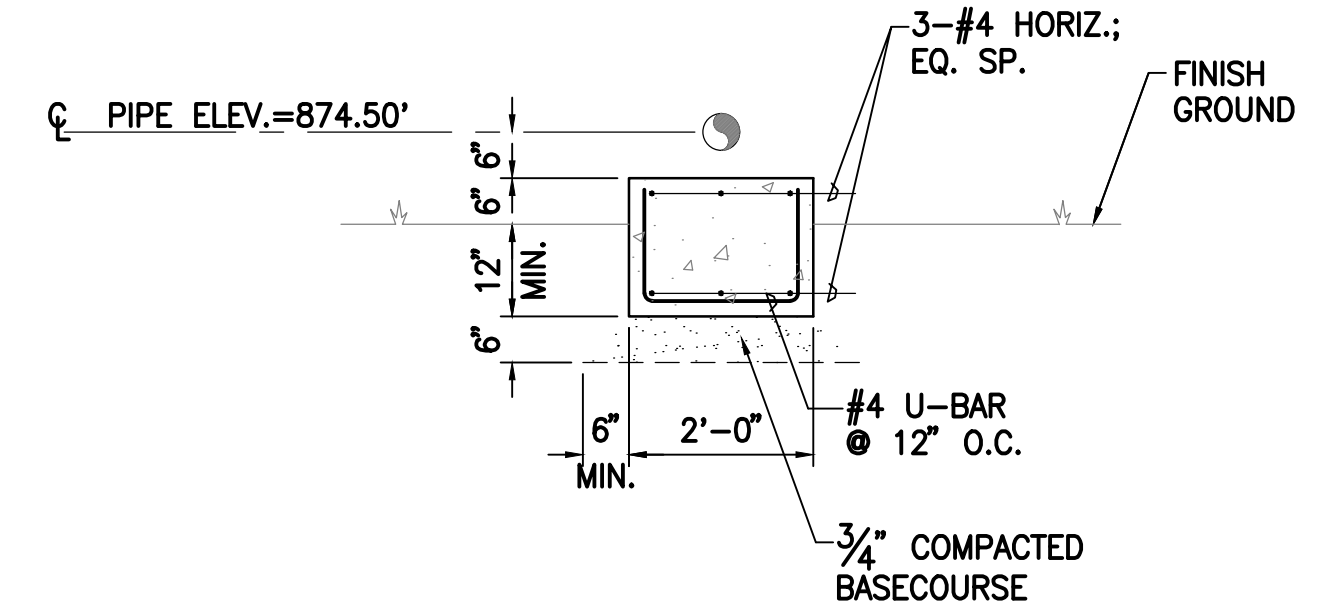
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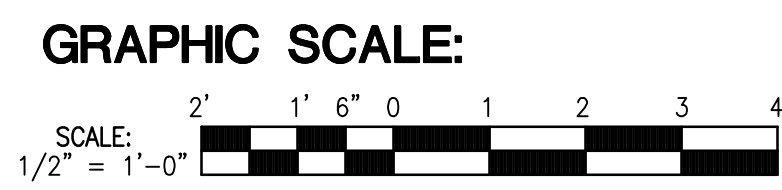
SECTION - E
SCALE: 1/2"=1'-0"



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



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



DWG. NO.
C-12
SHEET 14 OF 54

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

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

SIGNATURE

LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
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
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G70.DESIGN					
FEBRUARY 2020					



G7O 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G7O.DESIGN

FEBRUARY 2020


SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-13
SHEET 15 OF 54

FILE	POCKET	FOLDER	NO.



NOTES:

2
C-14

CONCRETE PAD FOR GAUGE CABINET

SCALE: 1"=1'-0"

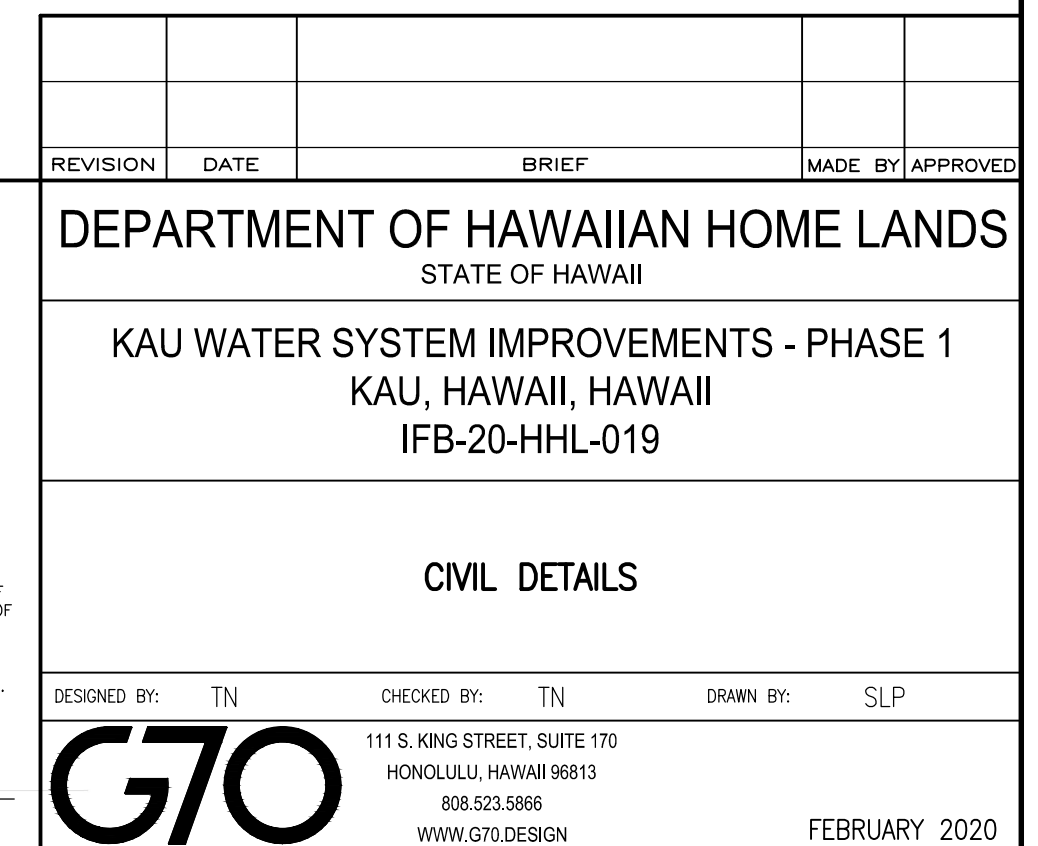


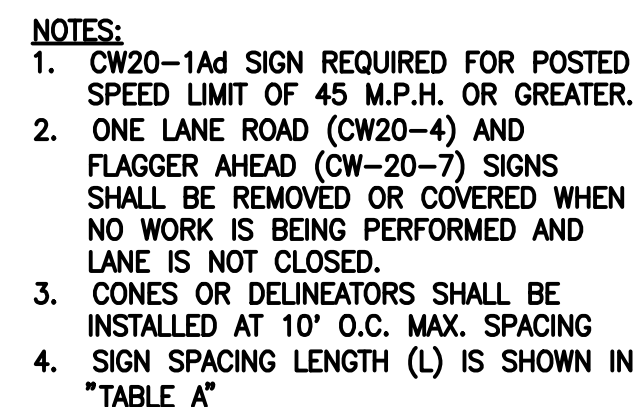
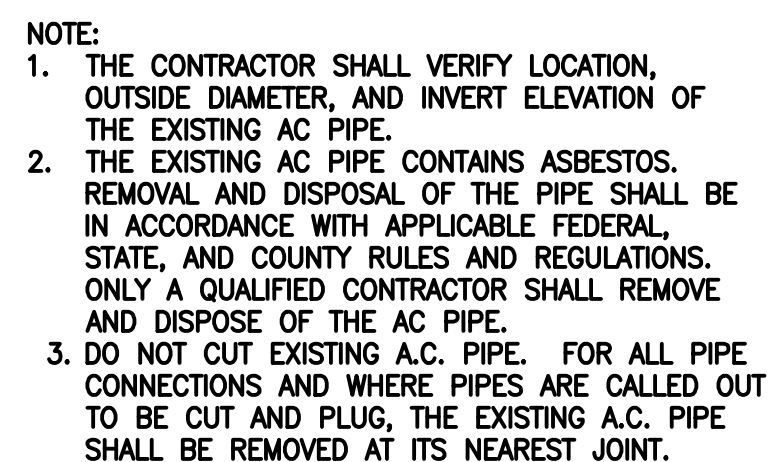
G70 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

FEBRUARY 2020


SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

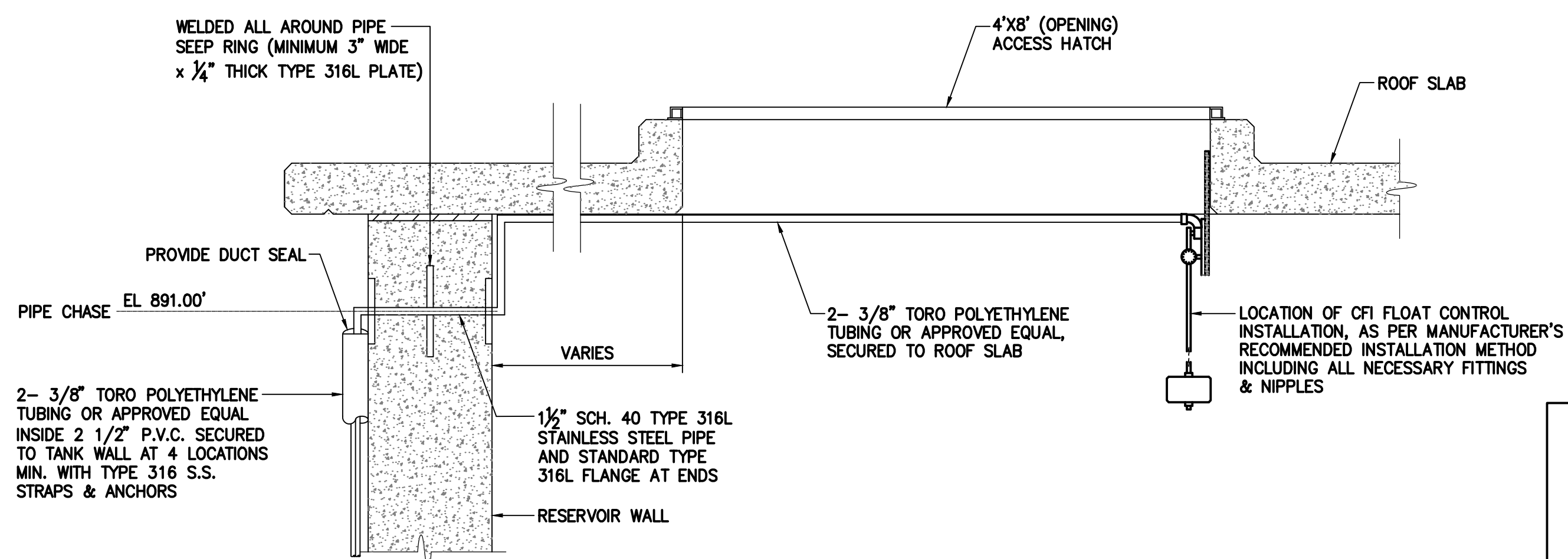
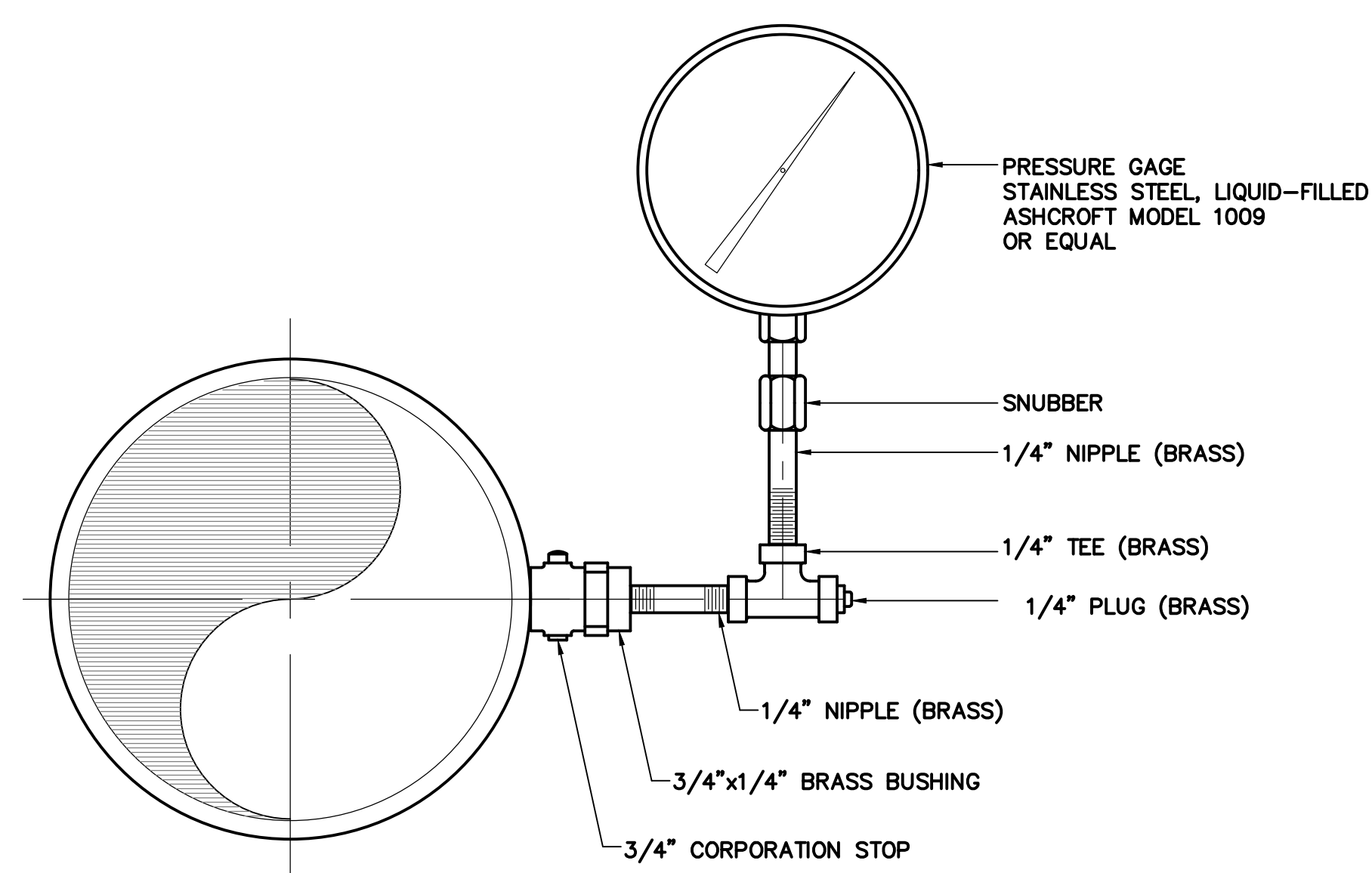
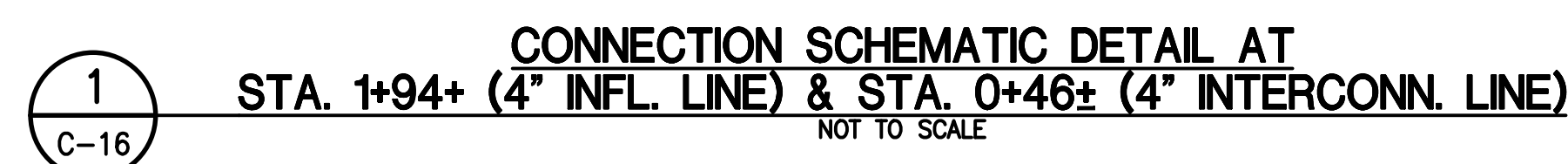
DWG. NO.
C-14
SHEET 16 OF 54






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



DWG. NO.
C-16
SHEET 18 OF 54



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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

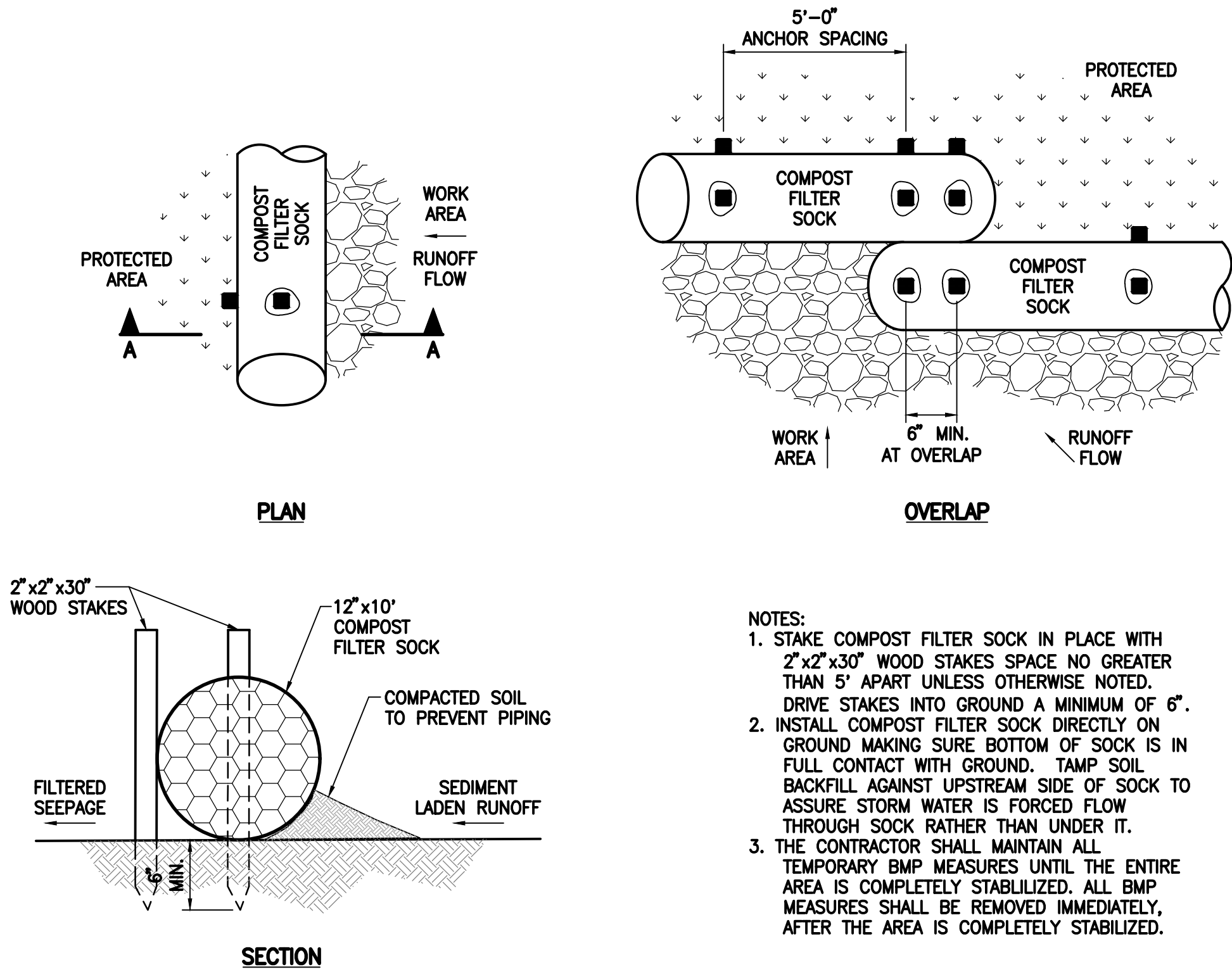
TRAFFIC CONTROL PLAN & CIVIL DETAILS

DESIGNED BY: TN	CHECKED BY: TN	DRAWN BY: SLP
 <div> <p>111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN</p> </div>		
		FEBRUARY 2020

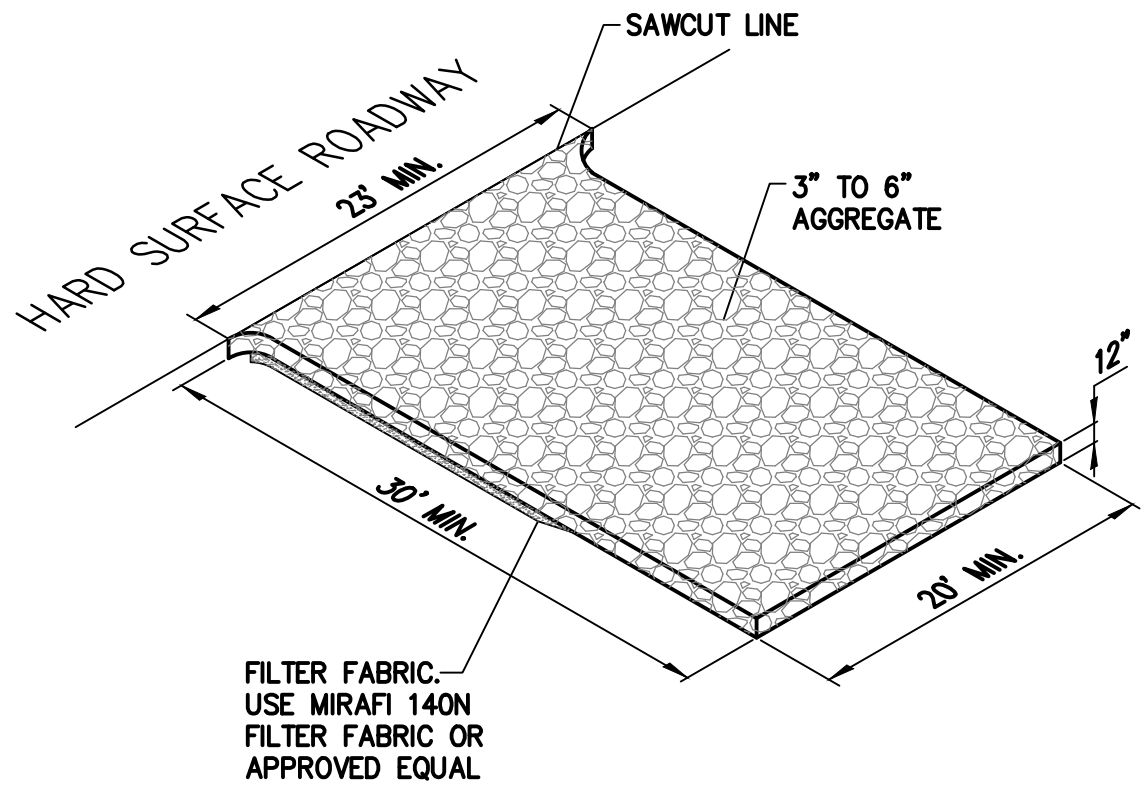
FILE	POCKET	FOLDER	NO.
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EROSION CONTROL NOTES:

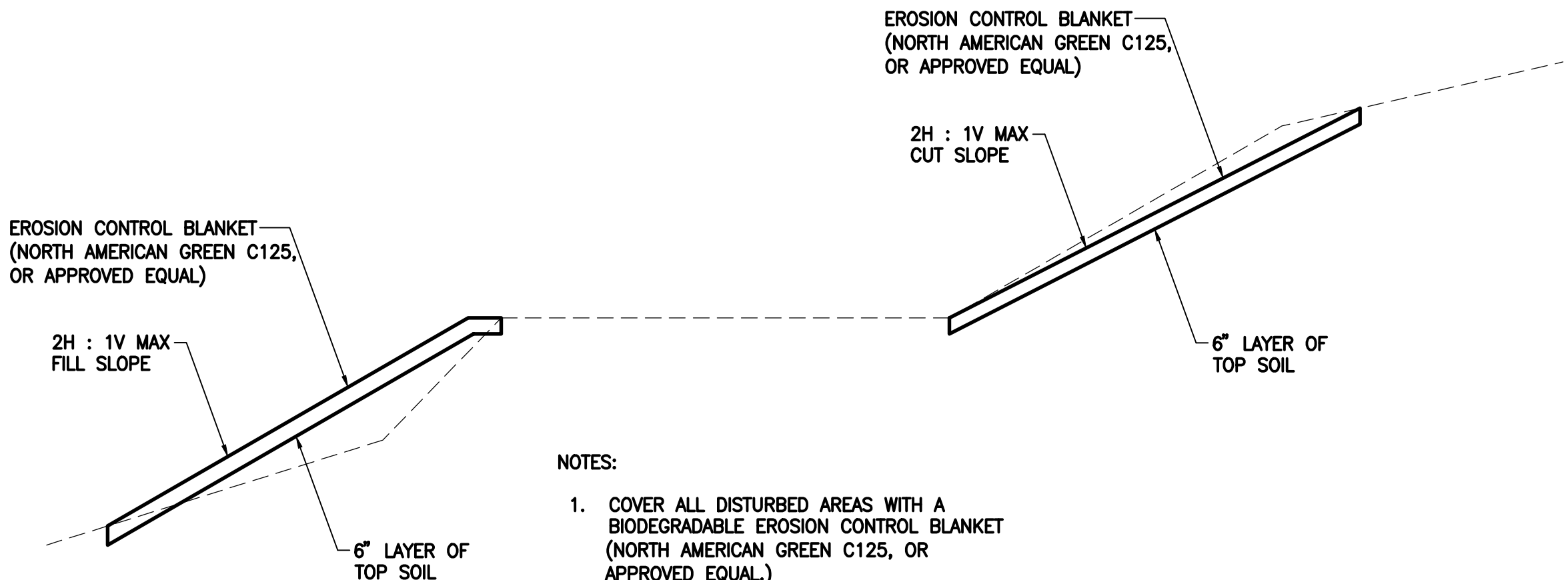
- A. TEMPORARY EROSION CONTROL MEASURES:
1. FURNISH AND INSTALL TEMPORARY PERIMETER CONTROL:
- A. ALONG LIMITS OF GRADING: COMPOST FILTER SOCK, 12" DIAMETER BIOSOCK AS MANUFACTURED BY ENVIROTECH BIO SOLUTIONS, OR APPROVED EQUAL.
- B. INSPECT ALL TEMPORARY PERIMETER CONTROLS WEEKLY DURING DRY PERIODS AND WITHIN 24 HOURS OF ANY RAINFALL OF 0.5 INCH OR GREATER WHICH OCCURS WITHIN A 24-HOUR PERIOD; AND DAILY DURING PERIODS OF PROLONGED RAINFALL.
- C. UPON PROJECT COMPLETION, REMOVE ALL PERIMETER CONTROLS.
2. FURNISH AND INSTALL TEMPORARY STABILIZED CONSTRUCTION ENTRANCE/EXIT:
- A. INSTALL AT THE LOCATION AS SHOWN ON THE PLANS.
- B. APPLY 12" MINIMUM LAYER OF CRUSHED AGGREGATE FREE OF FINES. THE AGGREGATE SHALL BE 3" TO 6" IN SIZE.
- C. FURNISH AND INSTALL A GEOTEXTILE FILTER FABRIC BELOW THE AGGREGATE LAYER. THE GEOTEXTILE FILTER FABRIC SHALL BE A MIRAFI X100, OR APPROVED EQUAL.
- D. SURFACE AGGREGATE SHALL BE PERIODICALLY REPLENISHED.
- E. INSPECT CONSTRUCTION ENTRANCE/EXIT WEEKLY DURING DRY PERIODS AND WITHIN 24 HOURS OF ANY RAINFALL OF 0.5 INCH OR GREATER WHICH OCCURS WITHIN A 24-HOUR PERIOD; AND DAILY DURING PERIODS OF PROLONGED RAINFALL FOR DAMAGE.
- F. REMOVE DEPOSITED SEDIMENT FROM ADJACENT ROADWAYS OR PAVED AREAS WITHIN 24 HOURS OR AS DIRECTED BY BWS. REMOVAL OF SEDIMENT SHALL BE BY SHOVELING OR STREET SWEEPING.
- G. UPON PROJECT COMPLETION, REMOVE CONSTRUCTION ENTRANCE/EXIT AND RESTORE THE AREA TO ITS ORIGINAL CONDITION, OR BETTER.
3. FURNISH AND INSTALL TEMPORARY SLOPE PROTECTION:
- A. DISTURBED AREAS SHALL BE COVERED WITH A BIODEGRADABLE EROSION CONTROL BLANKET. THE BLANKET SHALL BE NORTH AMERICAN GREEN C125, OR APPROVED EQUAL.
- B. APPLY BLANKET TO DISTURBED SOILS AND AREAS WHERE VEGETATION HAS BEEN REMOVED.
- C. INSPECT BLANKET WEEKLY FOR ANY DISPLACED OR DAMAGED AREAS.
- B. PERMANENT EROSION CONTROL MEASURES:
1. DRAIN ROCK OVER THE EROSION CONTROL BLANKET SHALL BE PROVIDED ESTABLISH A PERMANENT AGGREGATE STABILIZATION OVER ALL AREAS OF DISTURBED SOIL.



1 COMPOST FILTER SOCK DETAIL
C-17 NOT TO SCALE

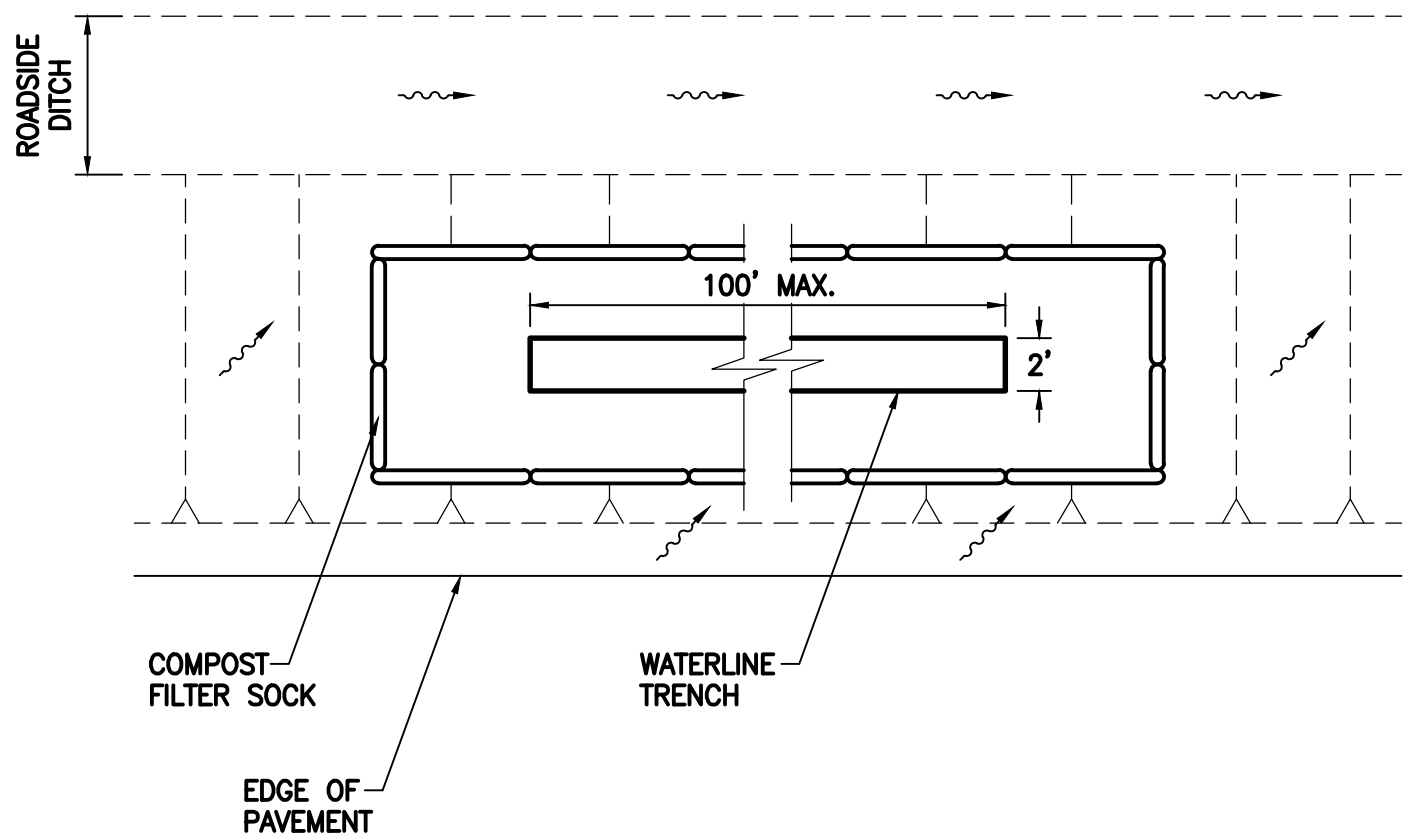


2 STABILIZED CONSTRUCTION ENTRANCE / EXIT
C-17 NOT TO SCALE



- NOTES:
1. COVER ALL DISTURBED AREAS WITH A BIODEGRADABLE EROSION CONTROL BLANKET (NORTH AMERICAN GREEN C125, OR APPROVED EQUAL.)
2. FOR PERMANENT EROSION CONTROL MEASURES, DRAIN ROCK OVER THE EROSION CONTROL BLANKET SHALL BE PROVIDED TO ESTABLISH A PERMANENT AGGREGATE STABILIZATION OVER ALL DISTURBED AREAS.

3 SLOPE PROTECTION DETAIL
C-17 NOT TO SCALE



- NOTES:
1. PLACE COMPOST FILTER SOCK FLUSH WITH EACH OTHER AND GROUND
2. PROVIDE ADDITIONAL FILTER SOCKS ADJACENT TO ROADSIDE DITCH AND OTHER LOCATIONS AS NECESSARY.
3. REMOVE FILTER SOCKS AFTER TRENCH HAS BEEN BACKFILLED AND AREA OF GROUND DISTURBANCE STABILIZED.
4. STOCKPILE FOR TRENCH BACKFILL SHALL BE WITHIN THE AREA CORDONED WITH COMPOST FILTER SOCKS. ADJUST FILTER SOCK CONFIGURATION, AS NEEDED.

4 TRENCH PROTECTION DETAIL - PLAN
C-17 NOT TO SCALE

DWG. NO.
C-17
SHEET 19 OF 54

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

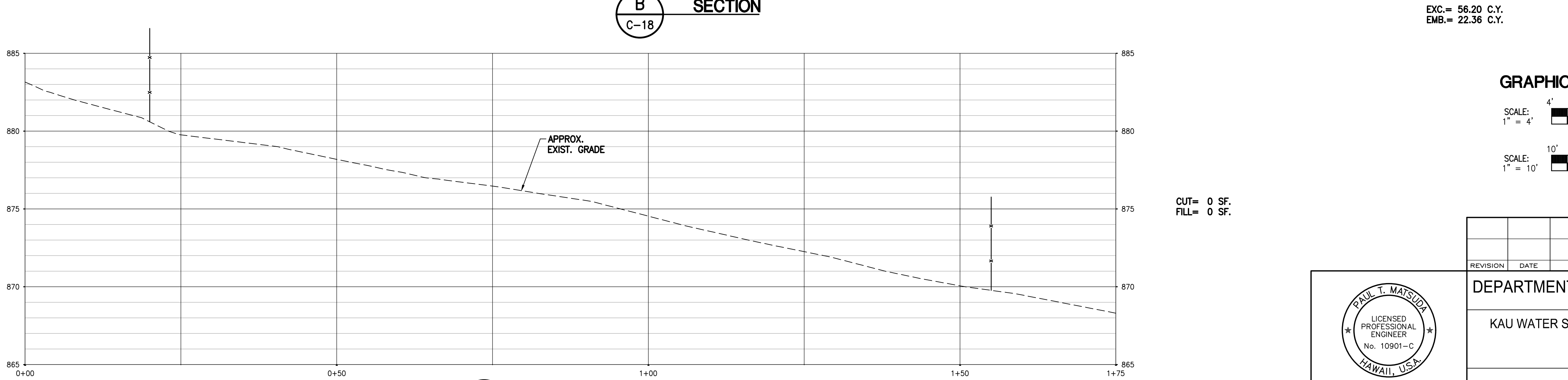
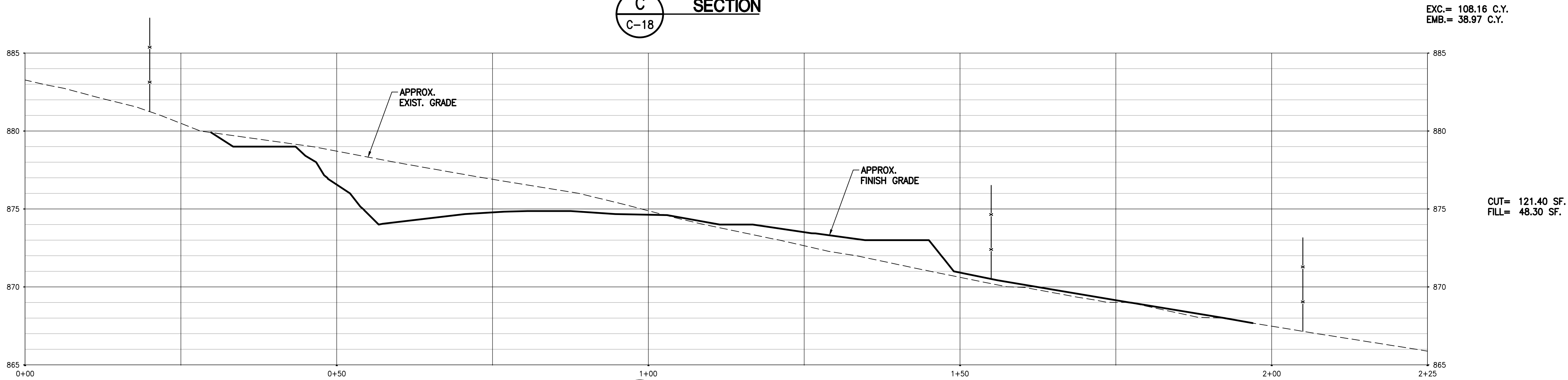
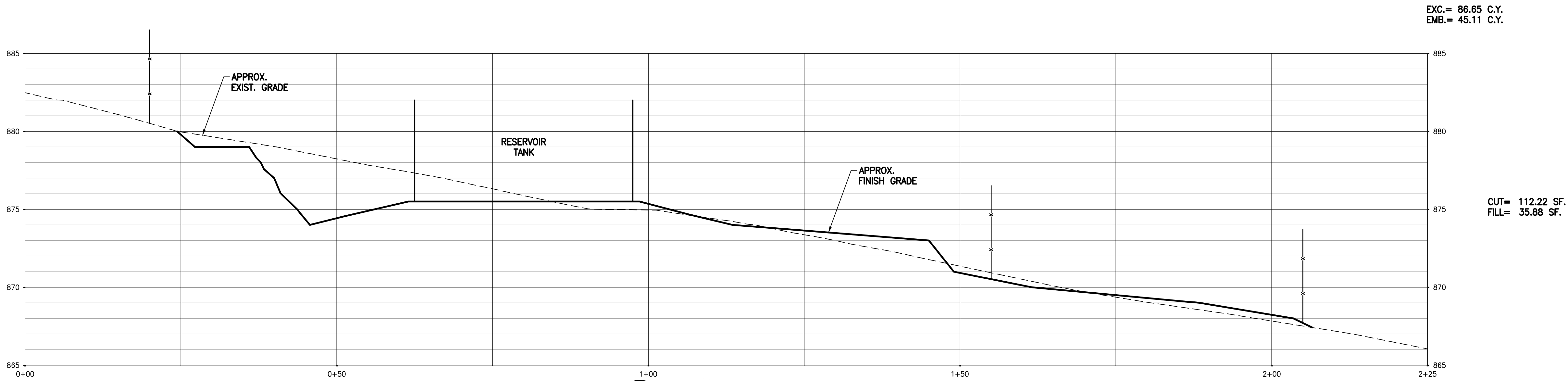
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS,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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

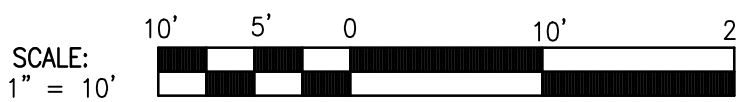
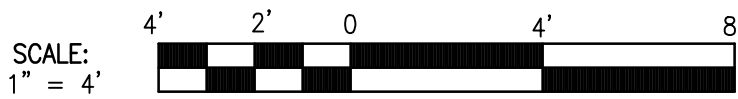
REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
CIVIL DETAILS					
DESIGNED BY:	TN	CHECKED BY:	TN	DRAWN BY:	SLP
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G7O.DESIGN					
FEBRUARY 2020					

FILE POCKET FOLDER NO.

C:\OPROA\2019\2-19-2054_DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SH1-XS-1.DWG

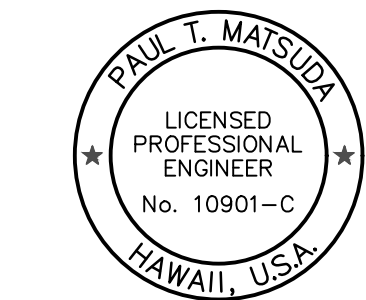


GRAPHIC SCALES:



SECTION A-18

SITE CROSS SECTIONS
SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'



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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-18
SHEET 20 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

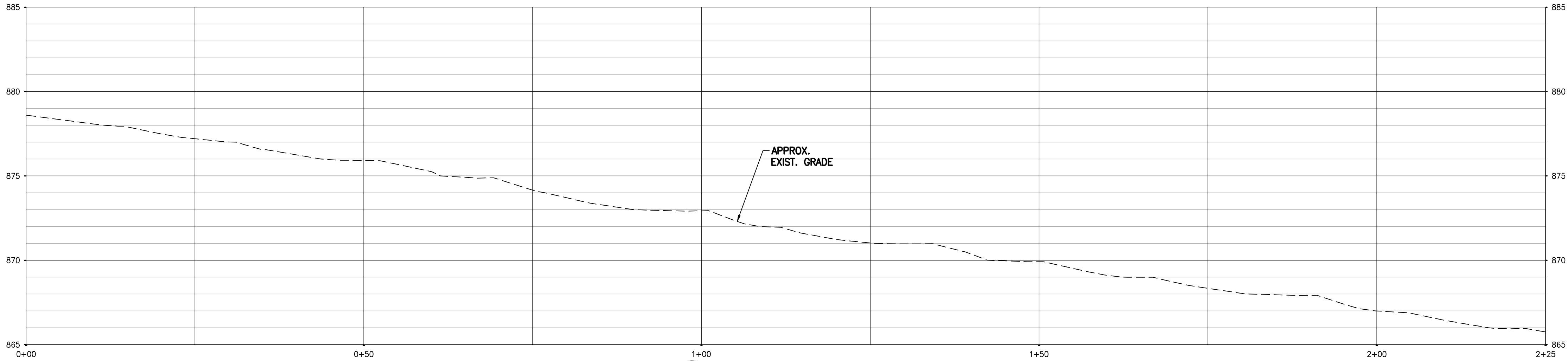
SITE CROSS SECTIONS

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

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5885
WWW.G70.DESIGN
FEBRUARY 2020

FILE POCKET FOLDER NO.

CA:\OPROA\2019\2-19-2054_DPHL KAU WATER SYSTEM IMPROVEMENTS\CADD\SHEETS\SH1-XS-2.DWG



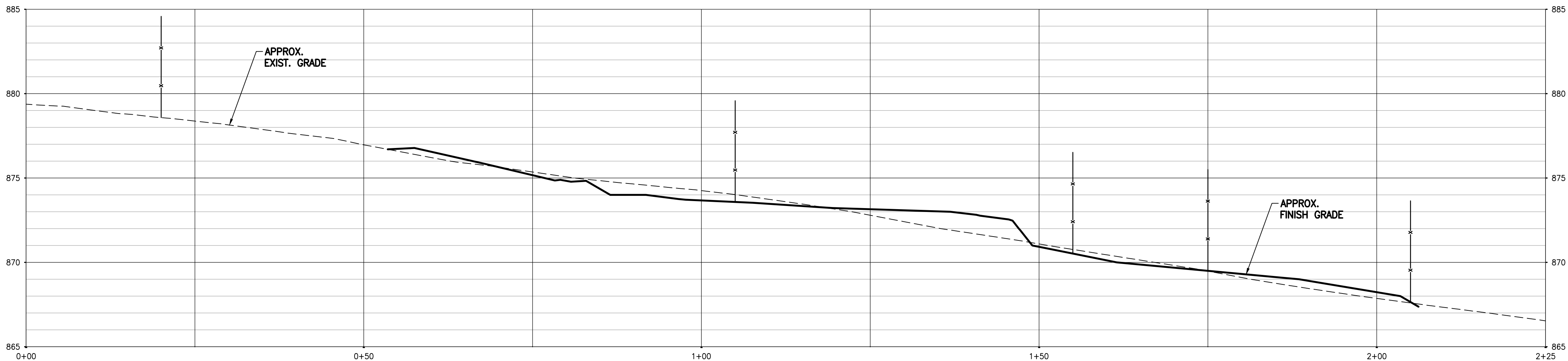
F
SECTION
C-19

EXC.= 25 C.Y.
EMB.= 37 C.Y.

CUT= 0 SF.
FILL= 0 SF.

**SITE CROSS SECTIONS
EARTH WORK QUANTITIES**

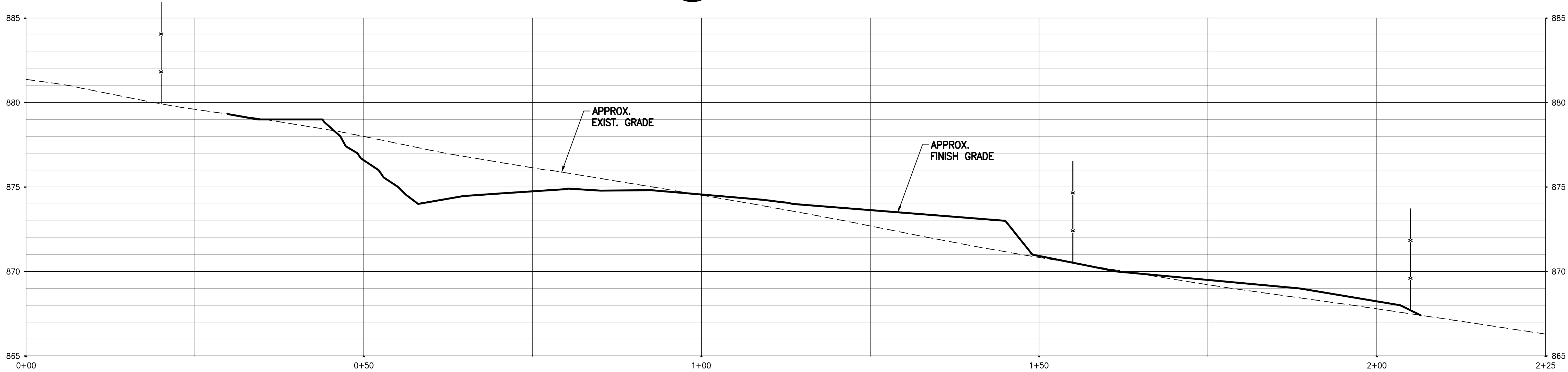
EXCAVATION: 318 C.Y.
EMBANKMENT: 181 C.Y.



E
SECTION
C-19

EXC.= 61.79 C.Y.
EMB.= 69.15 C.Y.

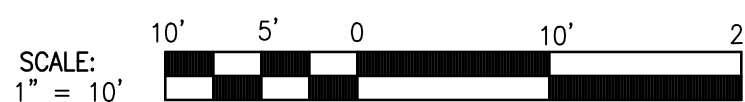
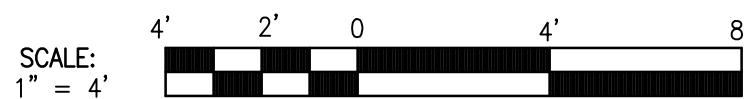
CUT= 58.52 SF.
FILL= 87.80 SF.



D
SECTION
C-19

SITE CROSS SECTIONS
SCALE : HORIZ.: 1"=10'
VERT.: 1"=4'

GRAPHIC SCALES:



CUT= 74.94 SF.
FILL= 61.56 SF.



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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

DWG. NO.
C-19
SHEET 21 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
SITE CROSS SECTIONS					
DESIGNED BY:	TN	CHECKED BY:	TN	DRAWN BY:	SLP
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5985 WWW.G70.DESIGN					
FEBRUARY 2020					

FILE	POCKET	FOLDER	NO.

CA:\OPROA\2019\2-19-054 DPHL KAU WATER SYSTEM IMPROVEMENTS\CAOA SHEETS\SH1-PRI-PLAN.DWG

TMK: 9-3-004: 029

STA 0+00
CONNECT TO EXISTING 4" WL
INSTALL:
1-4" 45° D.I. BEND, M.J., WITH MEGALUGS
1-4" TRANSITION COUPLING
(ROMAC MACRO HP, OR APPROVED EQUAL)
1-4" D.I. SOLID BODY SLEEVE, M.J., WITH MEGALUGS
1-CONC. BLOCK
NECESSARY 4" D.I. NIPPLES
FOR PROFILE, SEE THIS SHEET
FOR SCHEMATIC CONNECTION,
SEE DETAIL

1
C-25

STA 0+18
1-4" 45° D.I. BEND, M.J.
1-CONC. BLOCK

PRV STATION
SEE DETAIL SHT. C-24

STA 0+55
1-4" 45° D.I. BEND, M.J.
1-4" 1 1/4" D.I. BEND, M.J.
(TOP VERT.)
2-CONC. BLOCKS

STA 0+69
1-4" 1 1/4" D.I. BEND, M.J.
(BOT. VERT.)
1-CONC. BLOCK

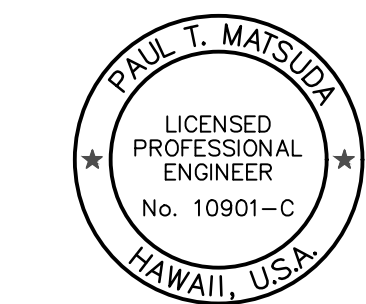
STA 0+73±
CONNECT TO EXISTING 4" WL
INSTALL:
1-4" 45° D.I. BEND, M.J., WITH MEGALUGS
1-4" TRANSITION COUPLING
(ROMAC MACRO HP, OR APPROVED EQUAL)
1-4" D.I. SOLID BODY SLEEVE, M.J., WITH MEGALUGS
1-CONC. BLOCK
NECESSARY 4" D.I. NIPPLES
FOR SCHEMATIC CONNECTION,
SEE DETAIL

1
C-25

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

ADDITIVE
ALTERNATIVE ITEM A

DWG. NO.
C-20
SHEET 22 OF 54



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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

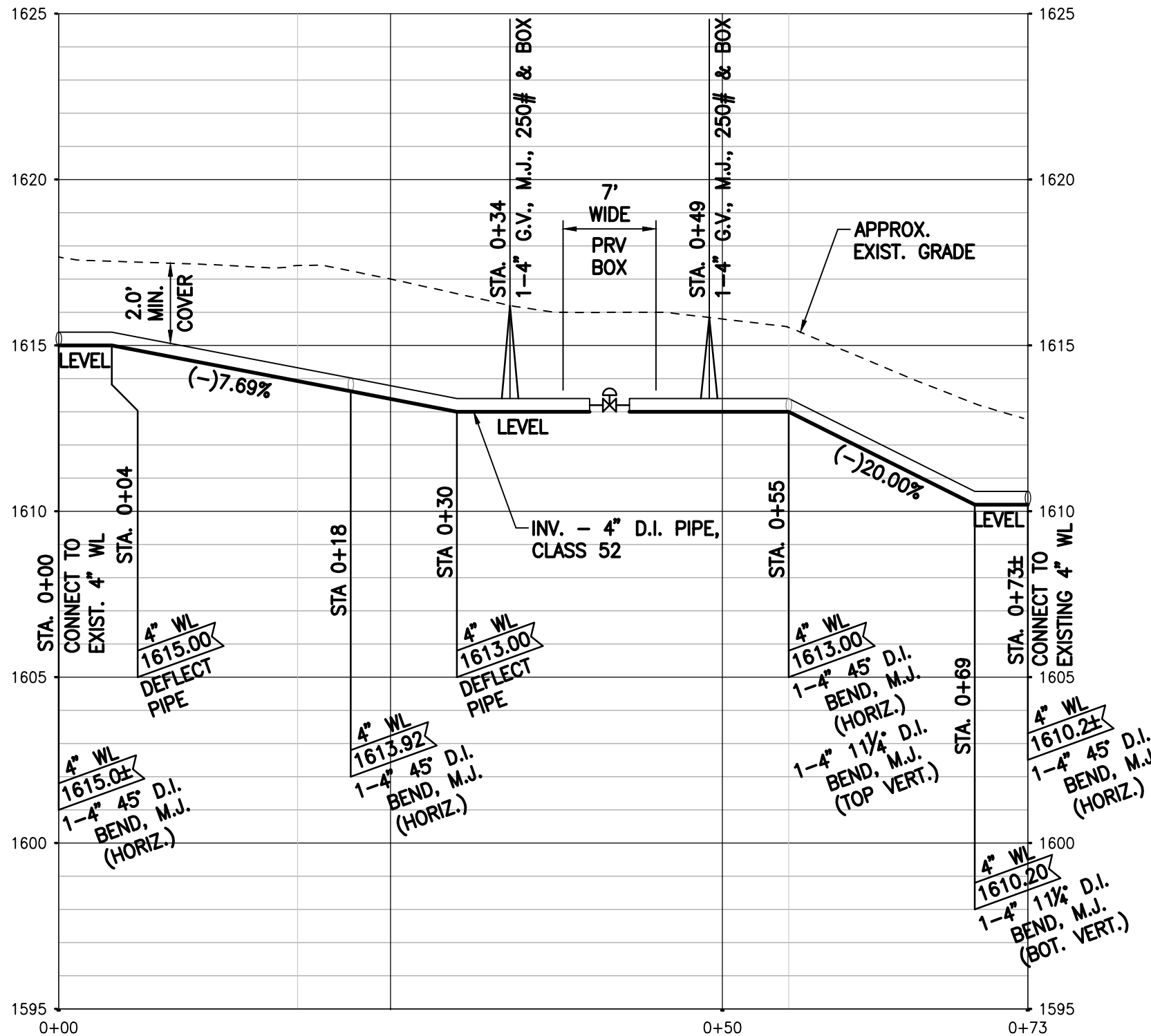
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

PRV NO. 1 - PLAN & PROFILE

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

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5886
WWW.G70.DESIGN
FEBRUARY 2020

FILE POCKET FOLDER NO.



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

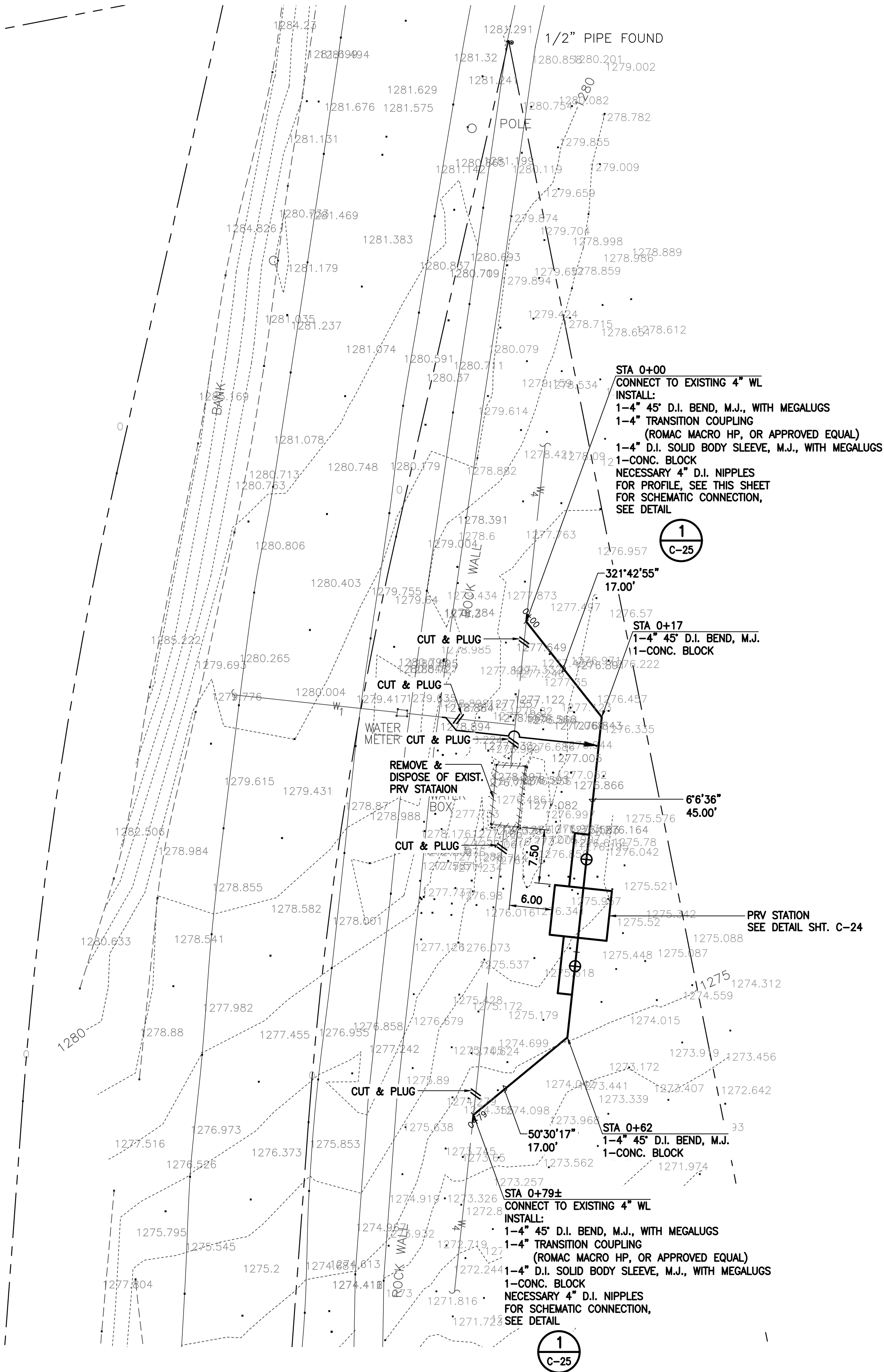
GRAPHIC SCALES:

SCALE: 1" = 4'

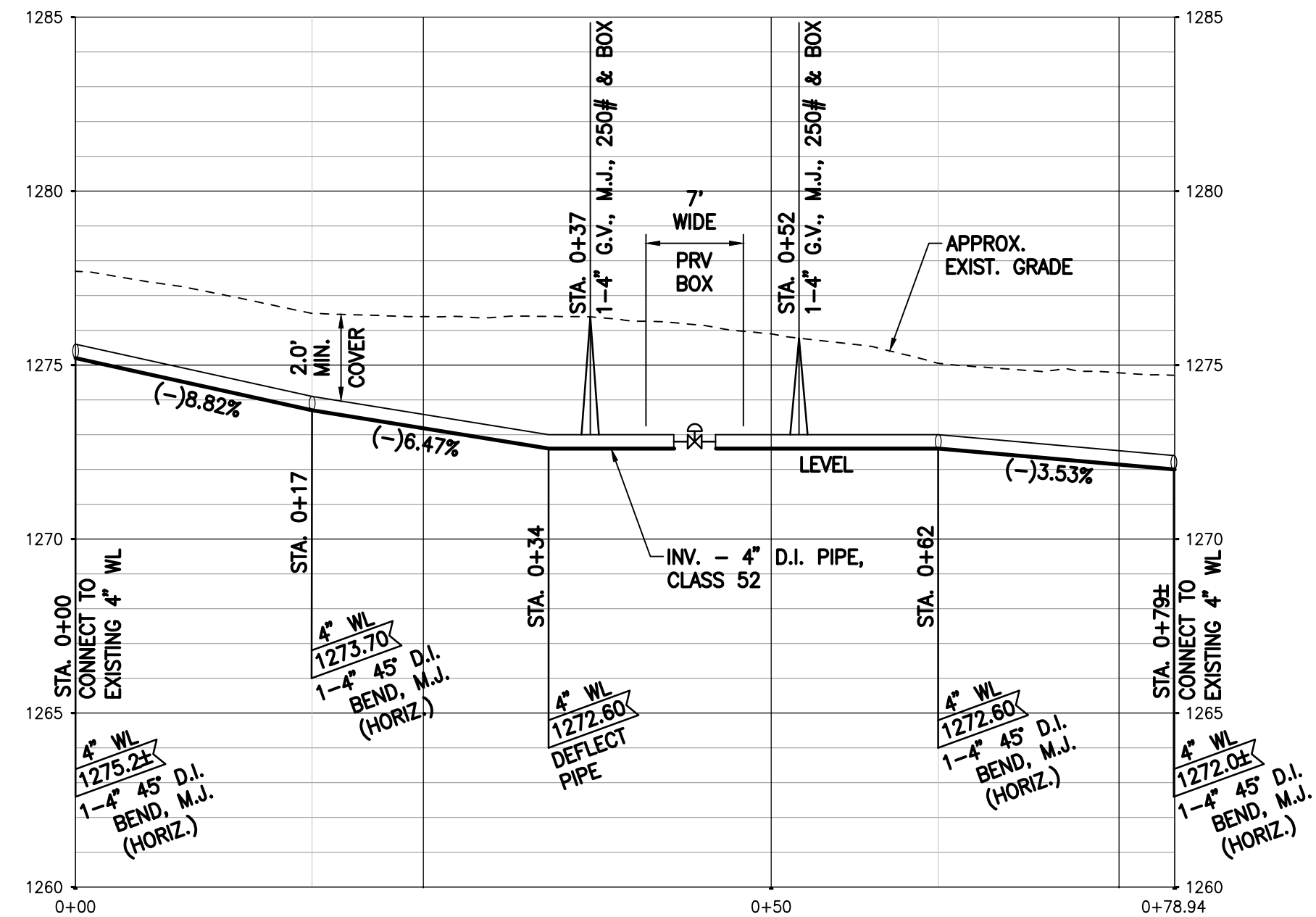
SCALE: 1" = 10'

CA:\OPROA\2019\2-19-2054 DPHL KAU WATER SYSTEM IMPROVEMENTS\CAOA SHEETS\SH1-PR2-PLAN.DWG

9-3-003: 012

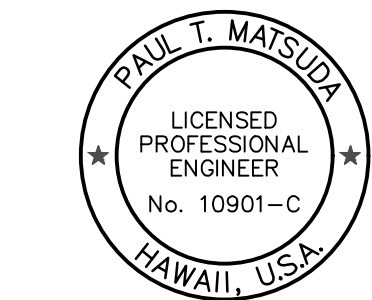
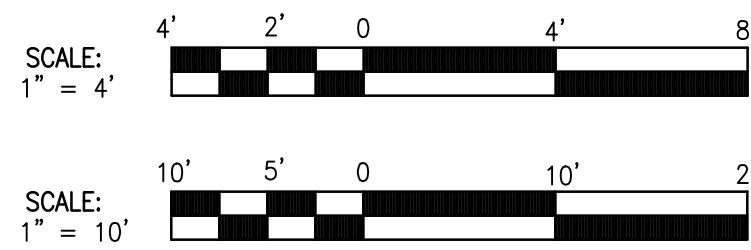


PRV NO. 2 - PLAN
SCALE: 1"=10'



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

GRAPHIC SCALES:



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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

ADDITIVE
ALTERNATIVE ITEM B

DWG. NO.
C-21
SHEET 23 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

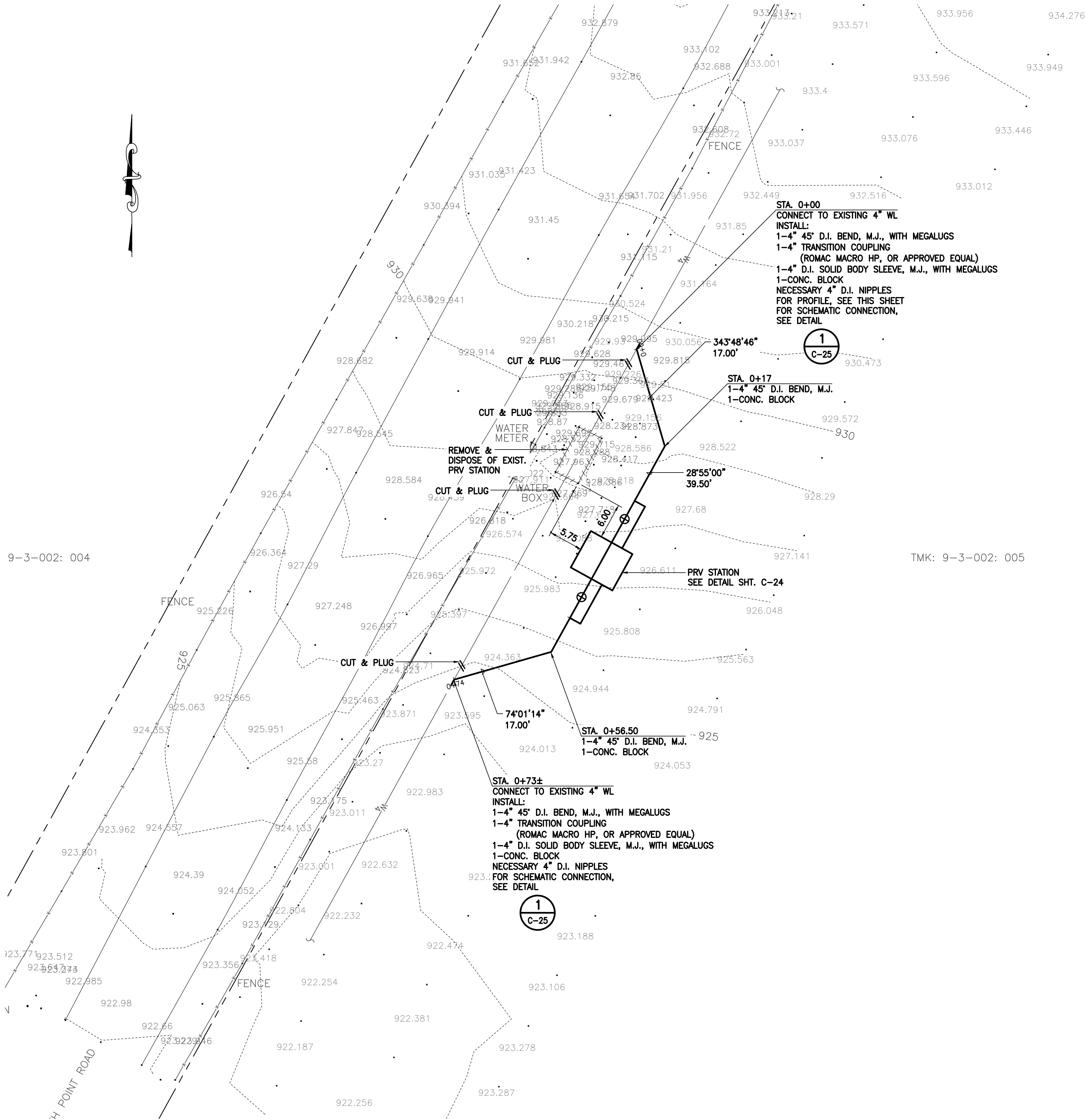
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

PRV NO. 2 - PLAN & PROFILE

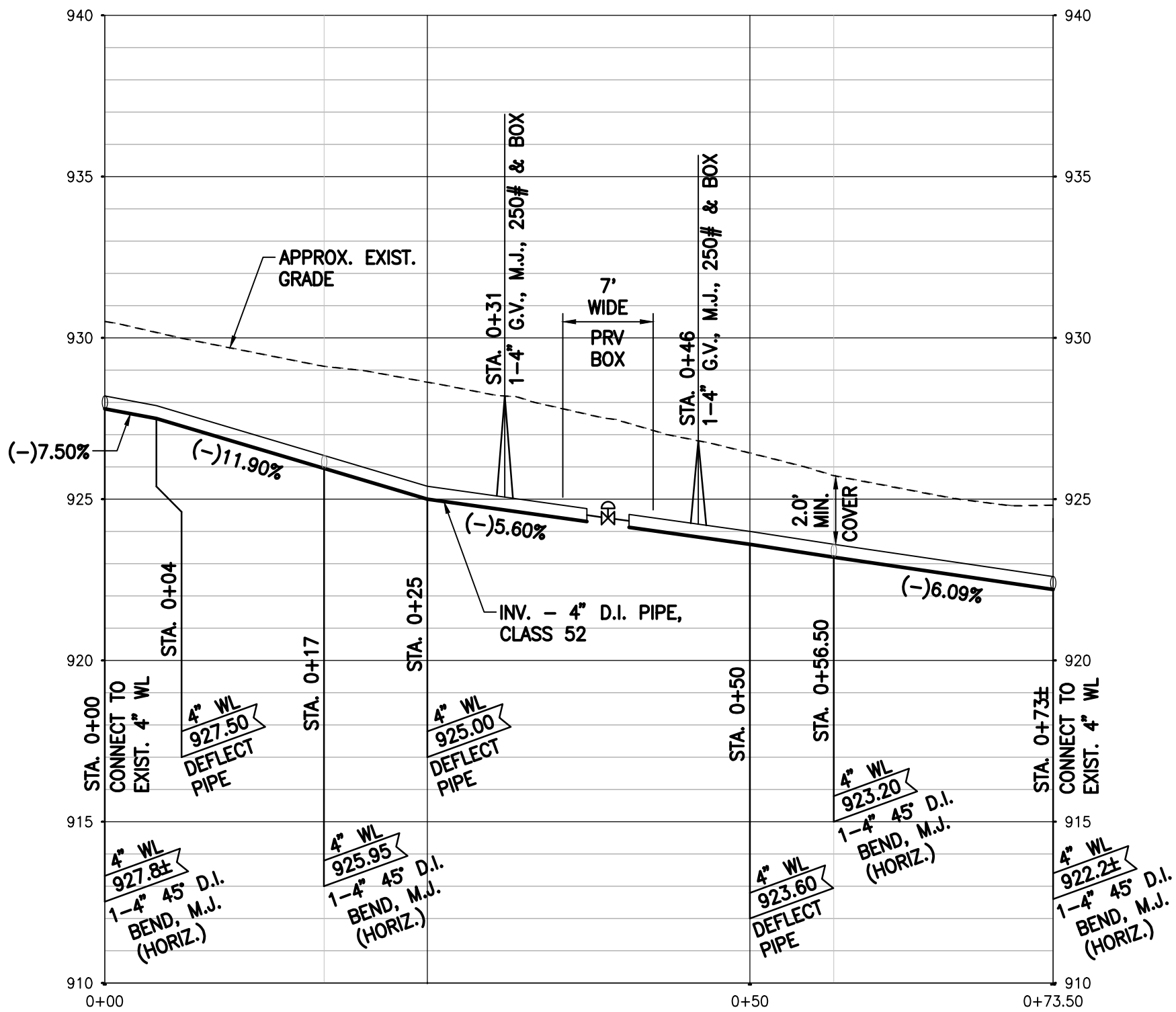
DESIGNED BY: TN	CHECKED BY: TN	DRAWN BY: SLP
G7O		
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808-523-5885 WWW.G7O.DESIGN		
FEBRUARY 2020		

FILE	POCKET	FOLDER	NO.
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CA:\OPROA\2019\219-054 DPHL KAU WATER SYSTEM IMPROVEMENTS\CAOA SHEETS\SH1-PB4-PLAN.DWG

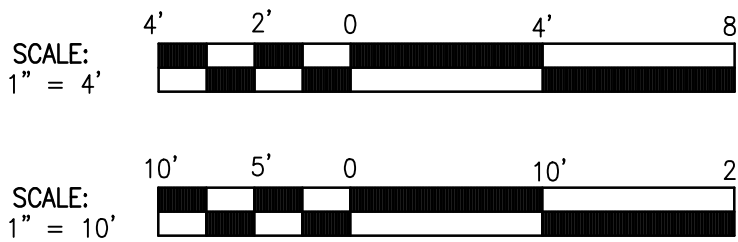


PRV NO. 4 - PLAN
SCALE: 1"=10'



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

GRAPHIC SCALES:



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

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[Signature]
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

ADDITIVE
ALTERNATIVE ITEM D

DWG. NO.
C-23
SHEET 25 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

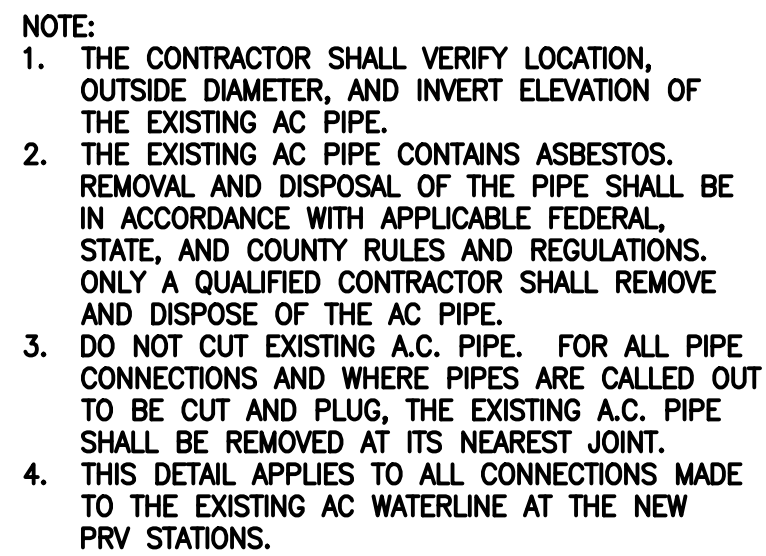
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

PRV NO. 4 - PLAN & PROFILE

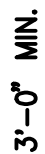
DESIGNED BY: TN CHECKED BY: TN DRAWN BY: SLP

G70 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808-523-5885
WWW.G70.DESIGN

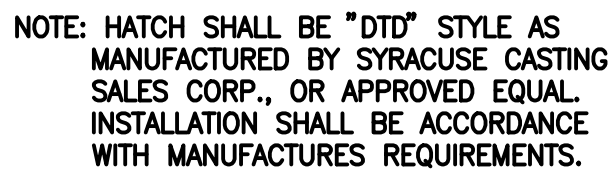
FEBRUARY 2020



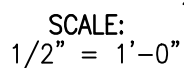
NOT TO SCALE



SCALE: $1\frac{1}{2}" = 1'-0"$



SCALE: $\frac{1}{8}'' = 1' - 0''$



REVISION	DATE	BRIEF	MADE BY	APPROVED
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KAU WATER SYSTEM IMPROVEMENTS - PHASE 1

TYPICAL 2"X2" PRV STATION DETAILS


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

 111 S. KING STREET, SUITE 170

FEBRUARY 2020

ADDITIVE ALTERNATIVE
ITEM A, B, C, & D

DWG. NO.
C-25
SHEET 27 OF 28



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LICENSE EXP. DATE: APRIL 30, 2020

P:\5051-5\100\5069 DHHL-Kau Water System Improvements 0.1 MG Reservoir\004 Drawings\Structural\AutoCAD\2020-02-11_5069 DHHL-Kau Reservoir\5069_5-01.dwg, 2/11/2020 8:20:22 AM, dykornicoz

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 ----- $R_1 = 2.0$
 $R_0 = 1.00$
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 ¼" 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
CL	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



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DWG. NO.
S-1
SHEET 29 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

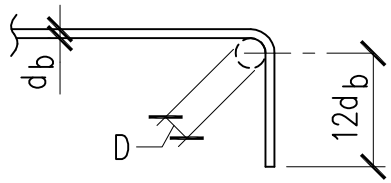
RESERVOIR GENERAL NOTES

DESIGNED BY: DY	CHECKED BY: JF	DRAWN BY: CADD
111 S. KING STREET, SUITE 110 HONOLULU, HAWAII 96813 808.523.5866 WWW.G7O.DESIGN		
JANUARY 2020		

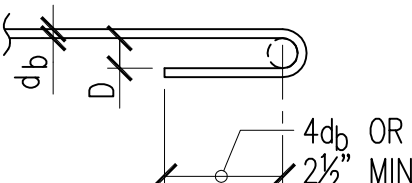
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MINIMUM SPLICE & EMBEDMENT LENGTHS										
BAR SIZE	CONCRETE STRENGTH = 4,500 PSI					CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		EMBEDMENT			LAP SPLICE		EMBEDMENT		
	BOT. BAR OR WALL BAR	TOP BAR	BOT. BAR OR WALL BAR	TOP BAR	W/ STD HOOK	BOT. BAR 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"

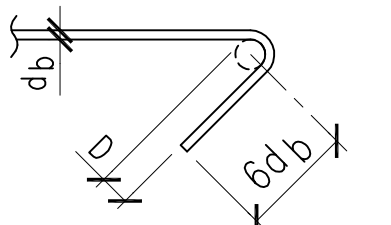
NOTES:
1. LENGTHS ARE FOR CONCRETE WITH REBAR SPACE 6 BAR DIAMETERS MINIMUM. INCREASE 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
2. "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.



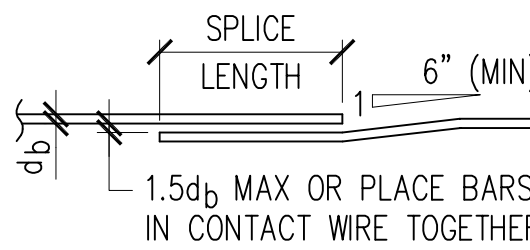
90° BEND



180° BEND

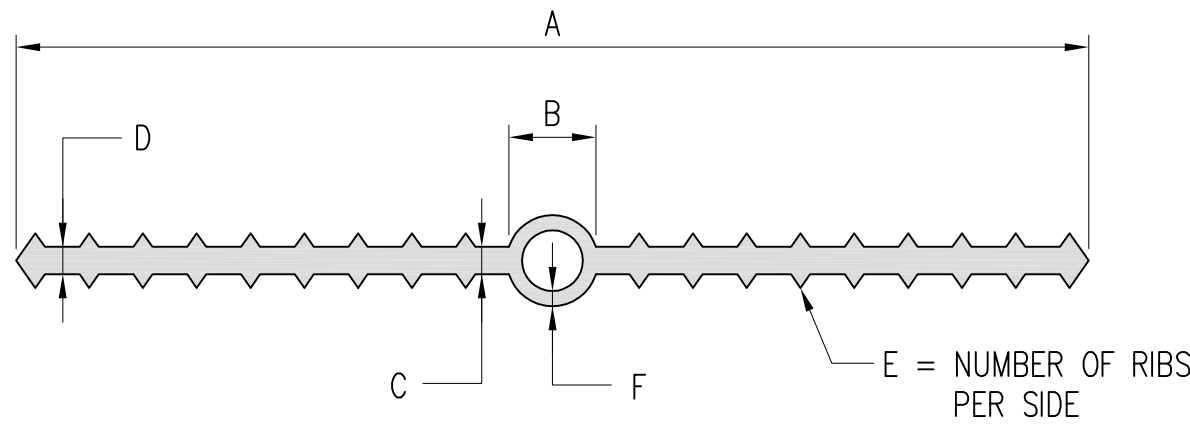


135° BEND



BAR LAP

D = 6db FOR #8 AND SMALLER
D = 8db FOR #9 TO #11



TYPE	LOCATION	A	B	C	D	E	F	VINYLEX	GREENSTREAK
I	WALL TO WALL FOOTING	9"	1"	3/8"	3/8"	8	1/2"	RB938H	735
II	-	-	-	-	-	-	-	-	-
III	FLOOR TO PIPE BLOCKS	6"	1" OR 7/8"	3/8"	3/8"	7 OR 8	1/4" OR 3/32"	RB638H	732
IV	OVERFLOW PIPE AT PEDESTAL**	-	-	-	-	-	-	KK590	SS-0320

* SEE NOTE 1 BELOW
** HYDROPHILIC STRAP WATERSTOP

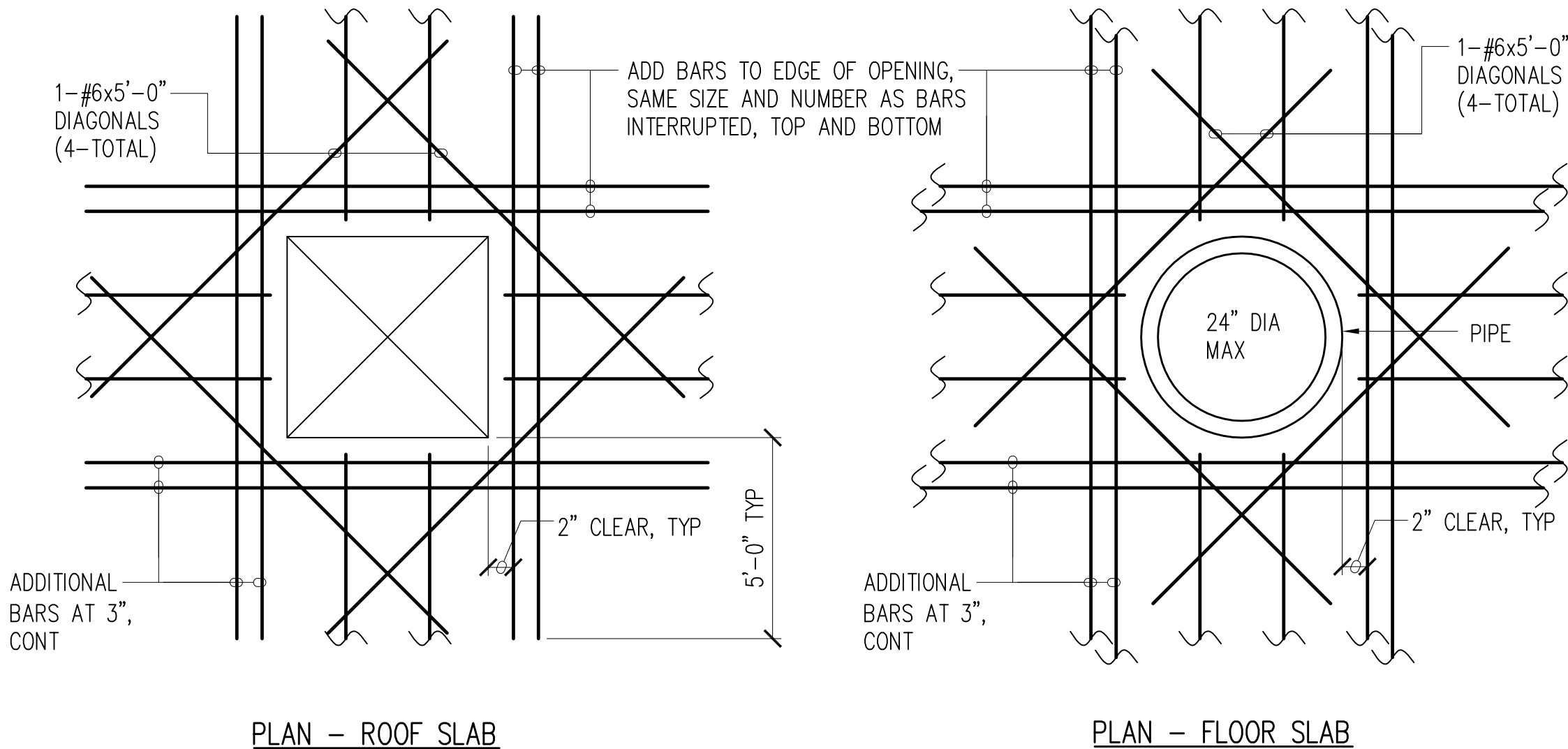
NOTES:
1. NO CENTER BULB ALLOWED IN THE WATERSTOP.
2. SEE SPECIFICATIONS FOR MATERIAL REQUIREMENTS.
3. ALL SPLICES SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

1 TYPICAL REBAR SPLICE AND EMBEDMENT LENGTH SCHEDULE

S-2 NOT TO SCALE

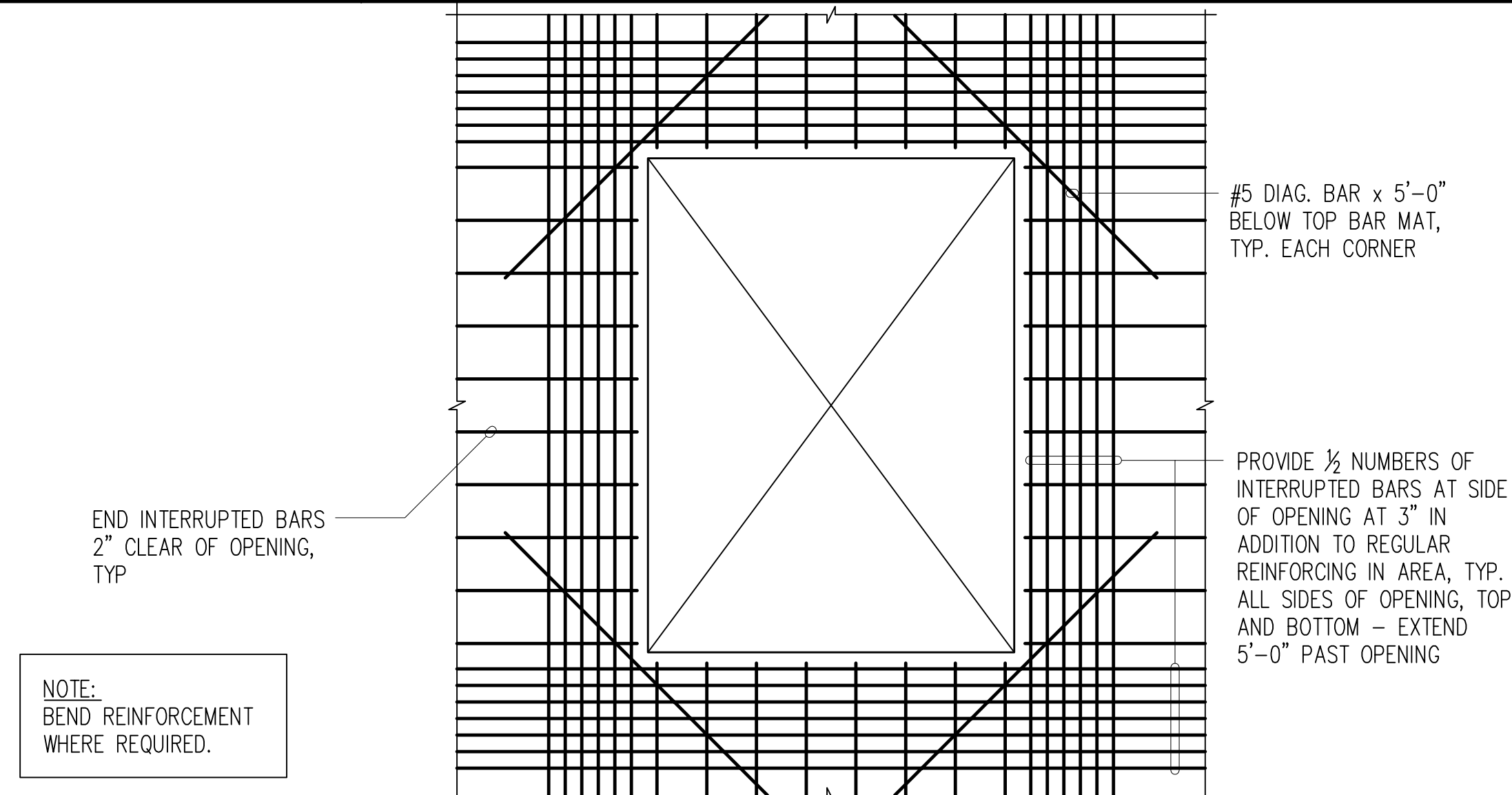
2 PVC WATER STOP SCHEDULE

S-2 NOT TO SCALE



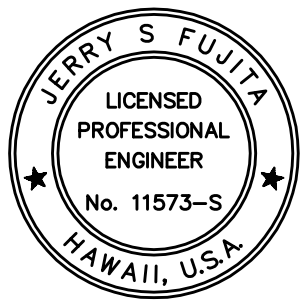
3 TYPICAL ADDED REINFORCING AT OPENINGS

S-2 NOT TO SCALE



4 TYPICAL REINFORCING AT LARGE SLAB OPENING

S-2 NOT TO SCALE



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

DWG. NO.
S-2
SHEET 30 OF 54

REVISION	DATE	BRIEF	MADE BY	APPROVED

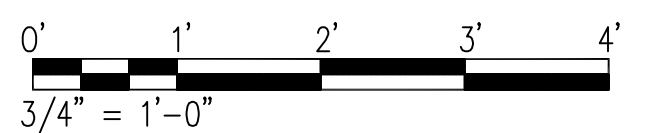
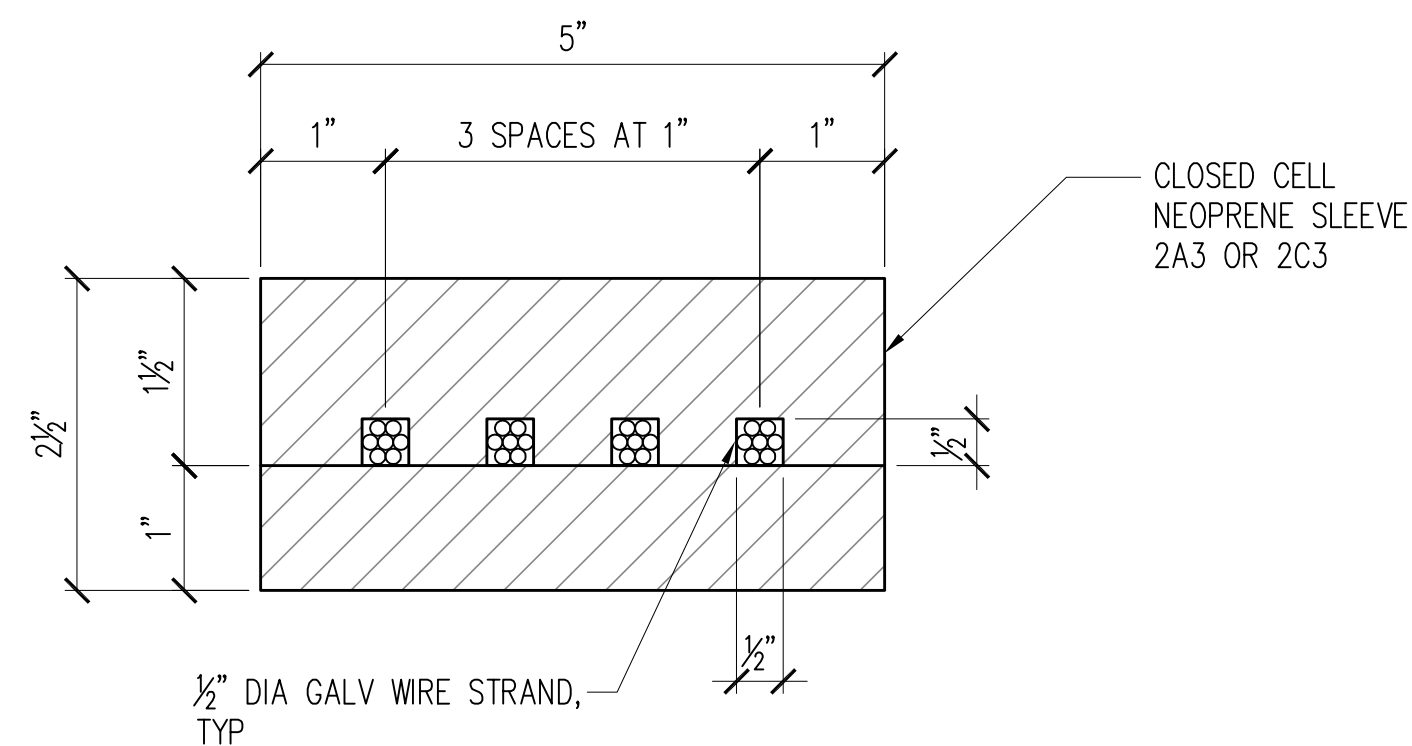
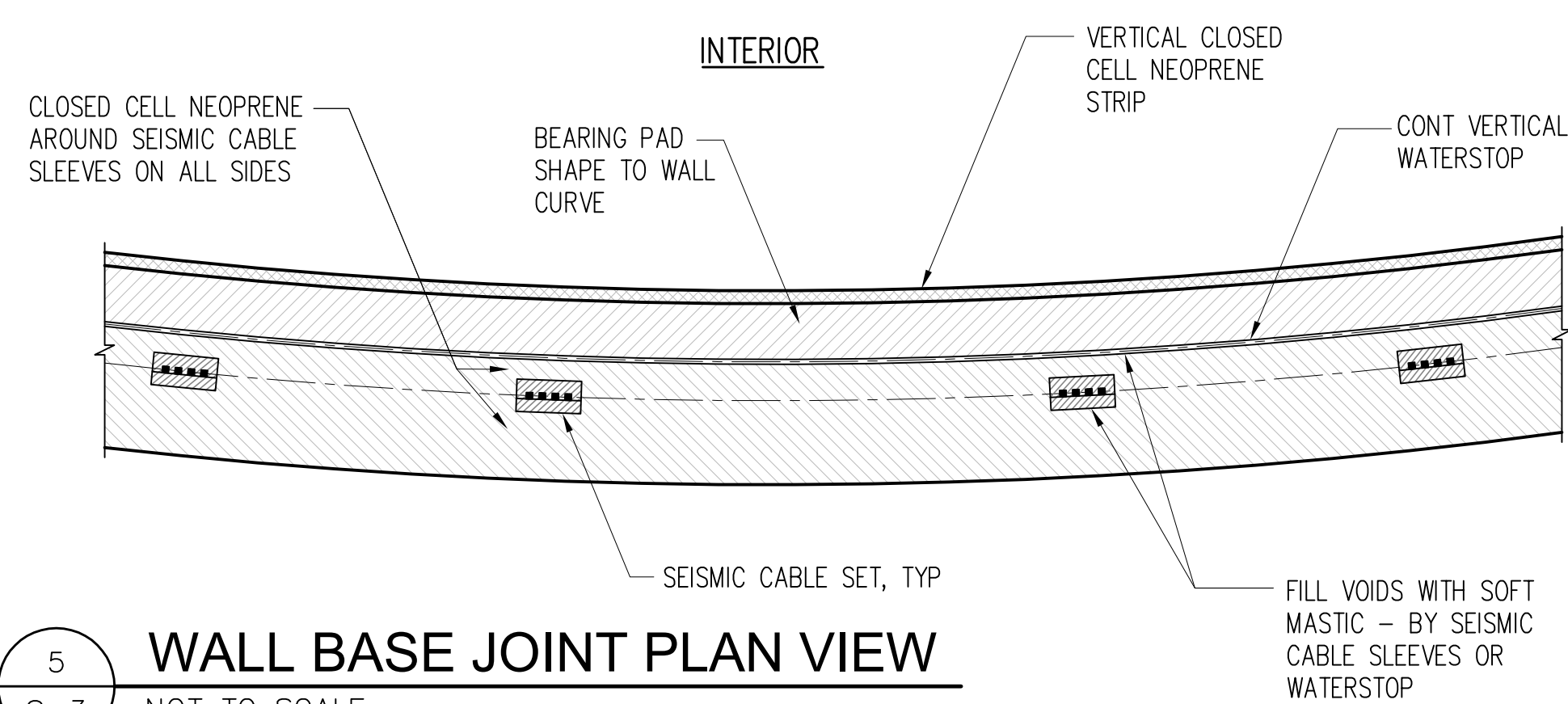
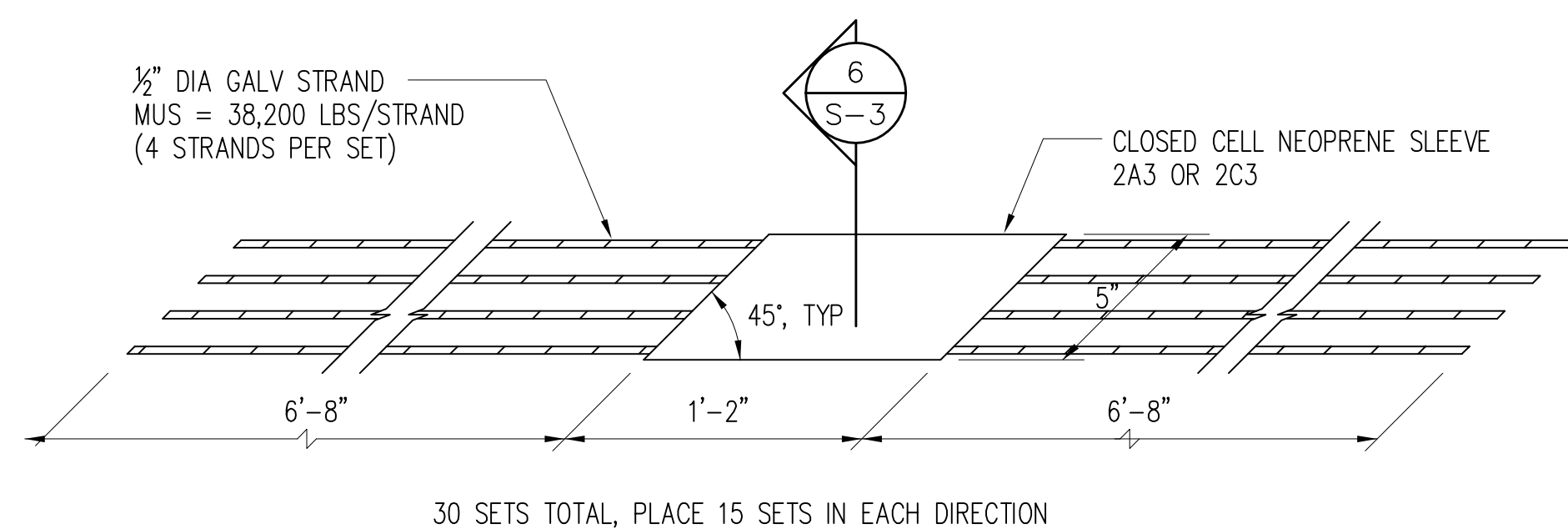
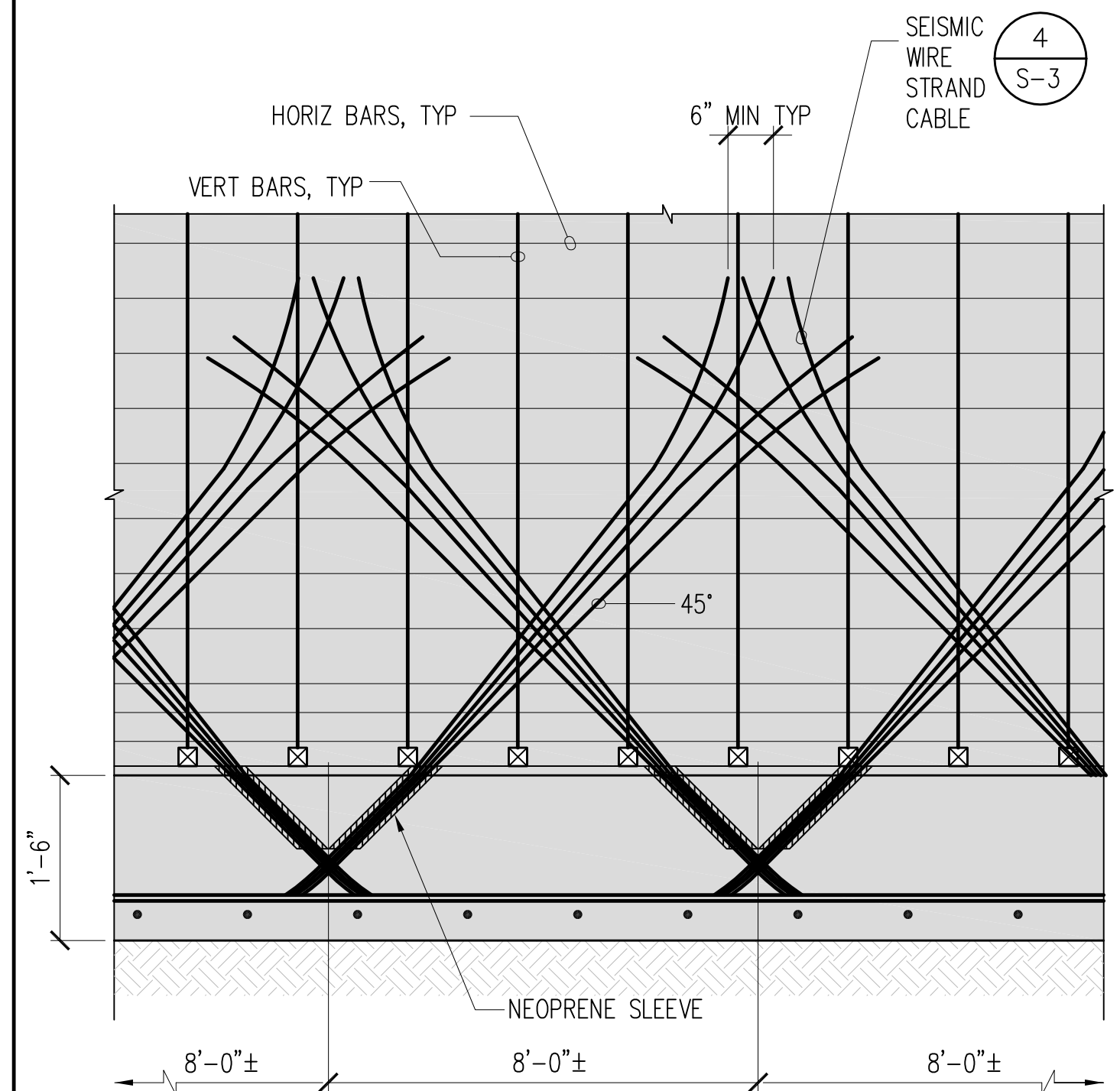
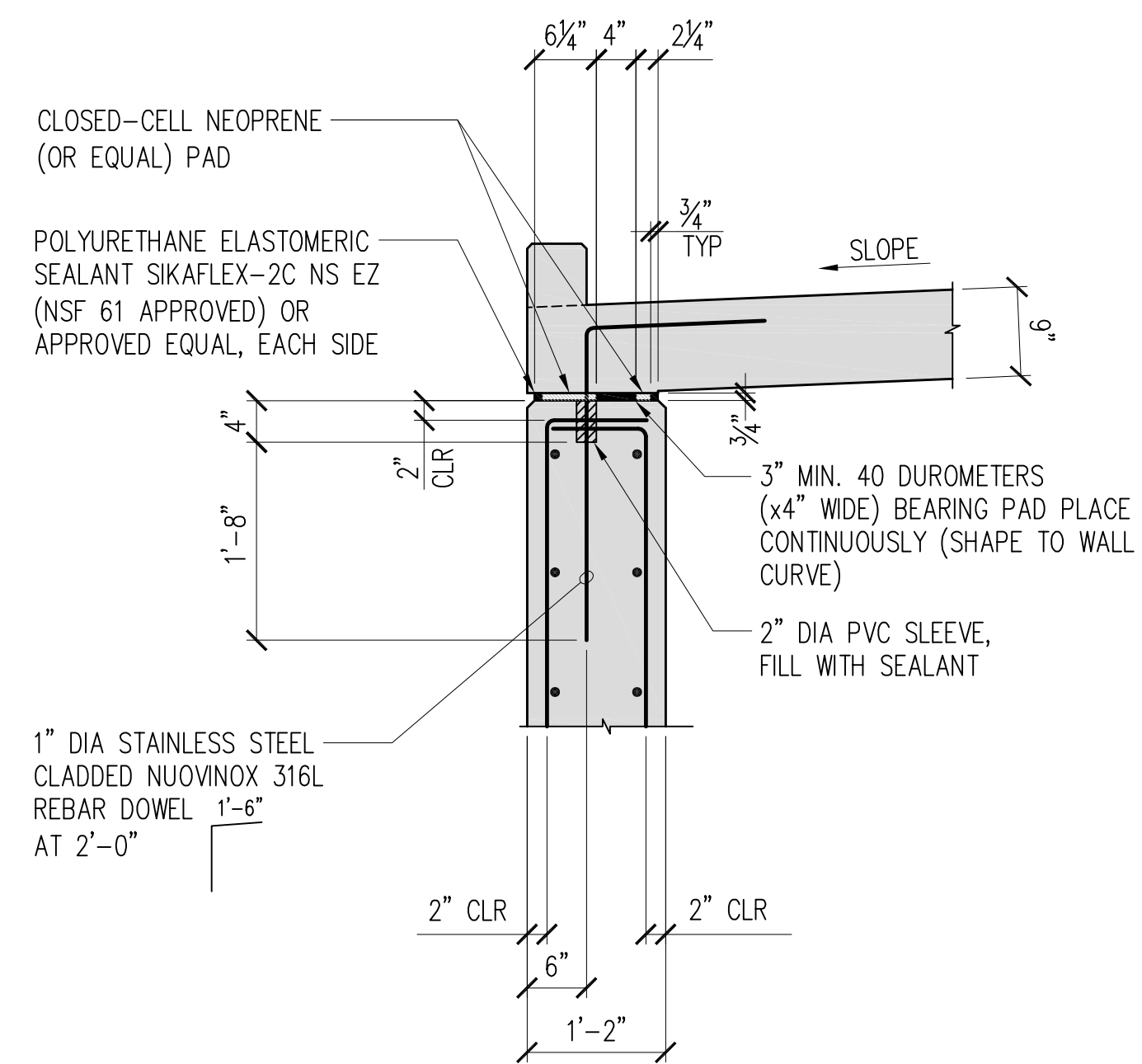
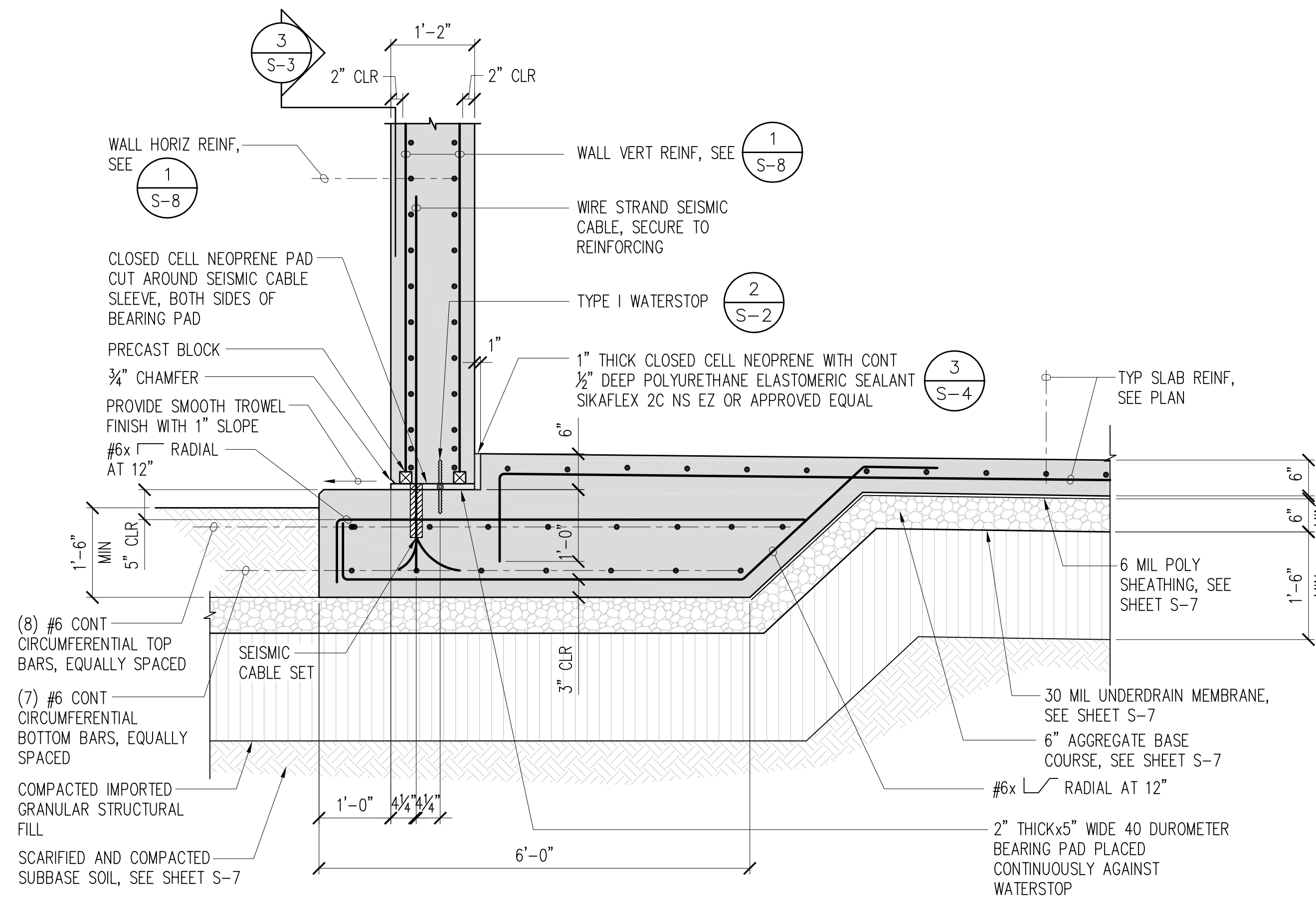
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

TYPICAL RESERVOIR DETAILS

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN
JANUARY 2020

FILE	POCKET	FOLDER	NO.
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REVISION	DATE	BRIEF	MADE BY	APPROVED

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

JANUARY 2020

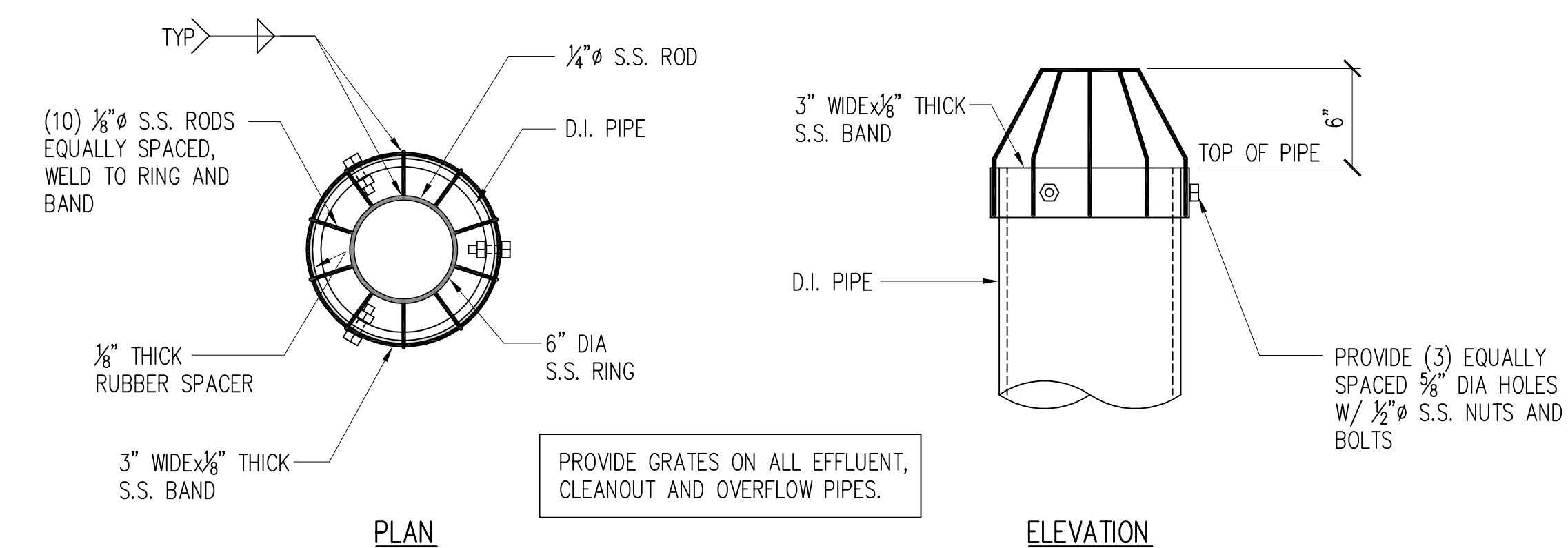
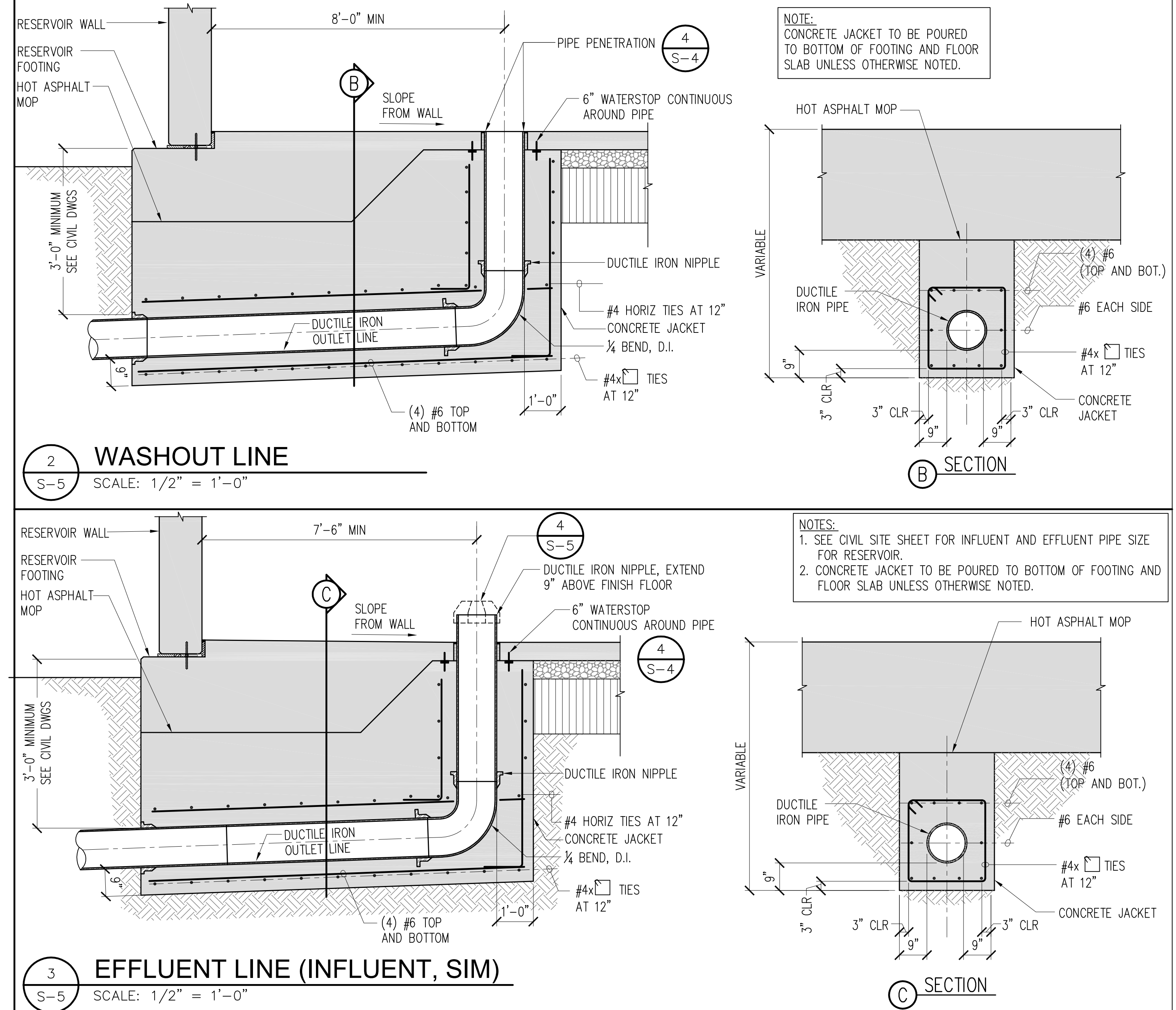
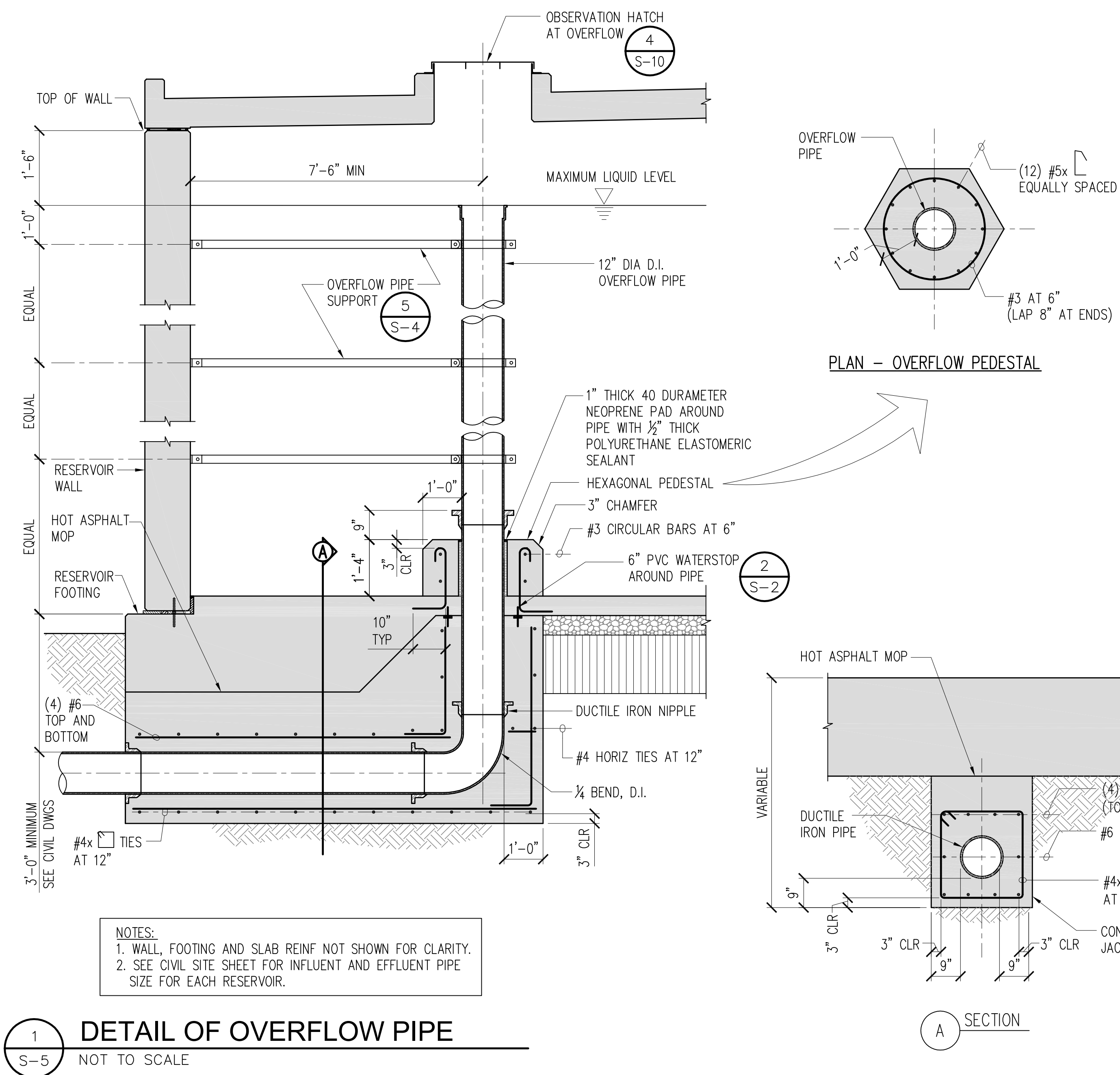
DWG. NO.
S-3
SHEET 31 OF 54

A circular professional engineer seal. The outer ring contains the text "JERRY S FUJITA" at the top and "HAWAII, U.S.A." at the bottom, separated by two five-pointed stars. The inner circle contains the text "LICENSED PROFESSIONAL ENGINEER" and "No. 11573-S" below it.

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

FILE	POCKET	FOLDER	NO.



NOTES:

1. ADJUST DIMENSIONS ACCORDINGLY TO FIT PIPE SIZE.
2. USE S.S. 316 FOR ALL NUTS AND BOLTS NOT FULLY ENCASED IN CONCRETE UNLESS NOTED OTHERWISE.
3. WHERE S.S. BOLTS ARE IN CONTACT WITH DISSIMILAR METALS, USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.

A circular professional engineer seal. The outer ring contains the text "JERRY S. FUJITA" at the top and "HAWAII, U.S.A." at the bottom, separated by two five-pointed stars. The inner circle contains the text "LICENSED PROFESSIONAL ENGINEER" and "No. 11573-S" below it.

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SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

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

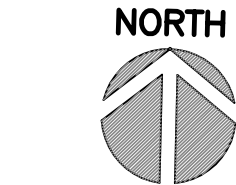
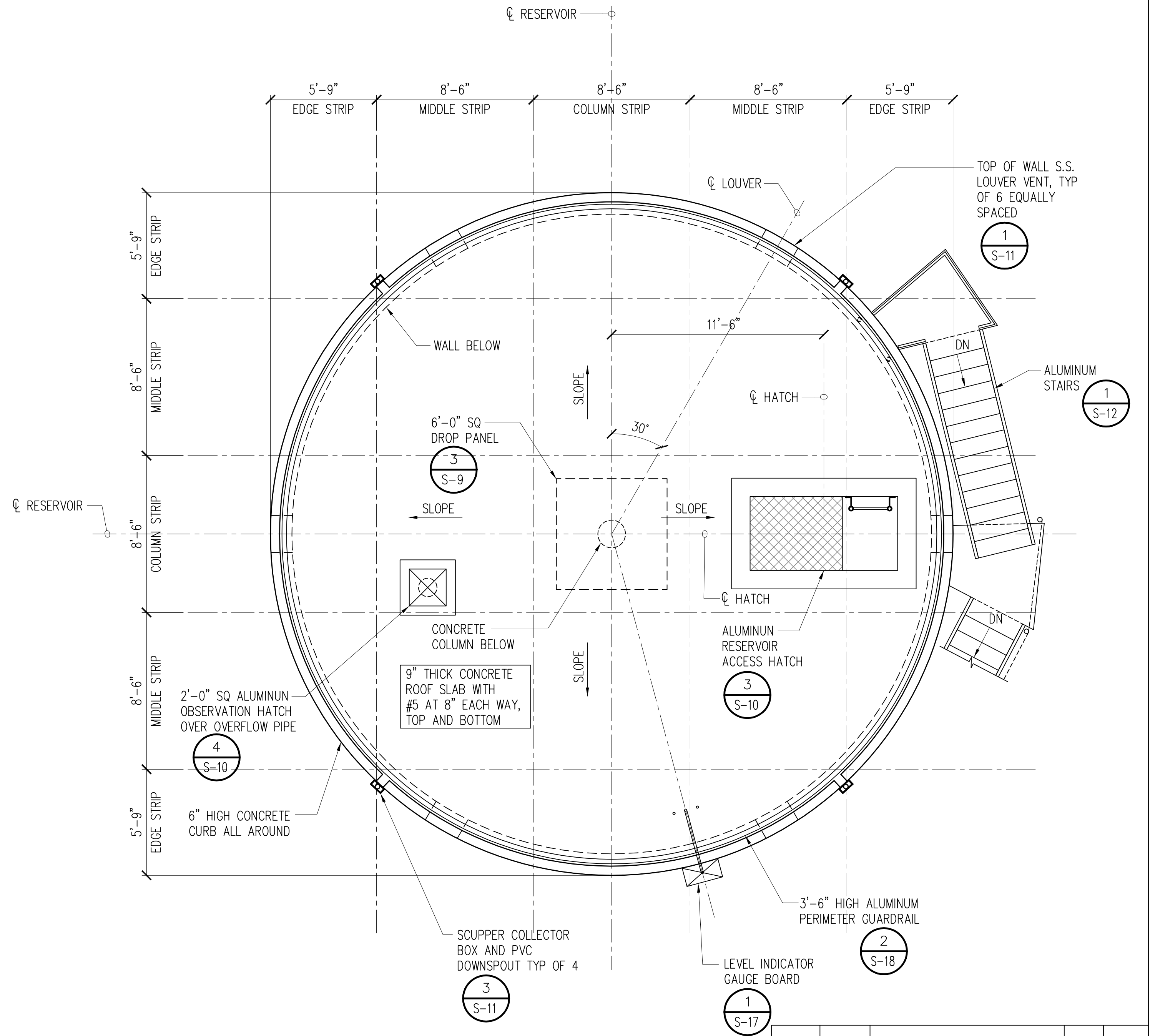
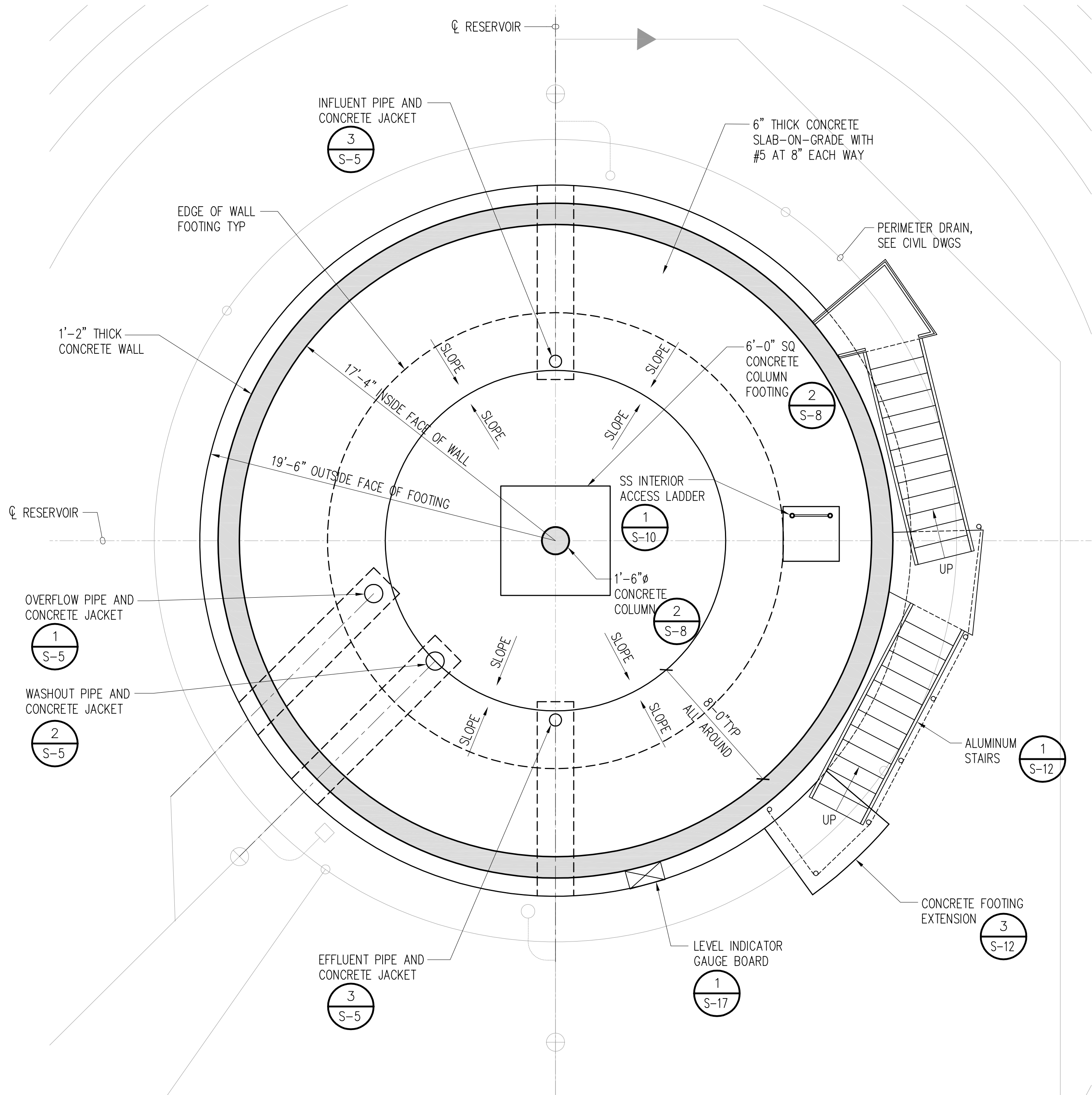
DESIGNED BY: DY	CHECKED BY: JF	DRAWN BY: CADD
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G70 111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

JANUARY 2020

FILE	POCKET	FOLDER	NO.

P:\5051-5100\5069 DHHL-Kau Water System Improvements 01 MG Reservoir\004 Drawings\Structural\AutoCAD_format\2020-02-11_5069 DHHL-Kau Reservoir\5069_S-06-07.dwg, 2/11/2020 8:25:07 AM, dyokomizo



DWG. NO. S-6
SHEET 34 OF 54



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SIGNATURE
JERRY S. FUJITA
LICENSE EXP. DATE: APRIL-00, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

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

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

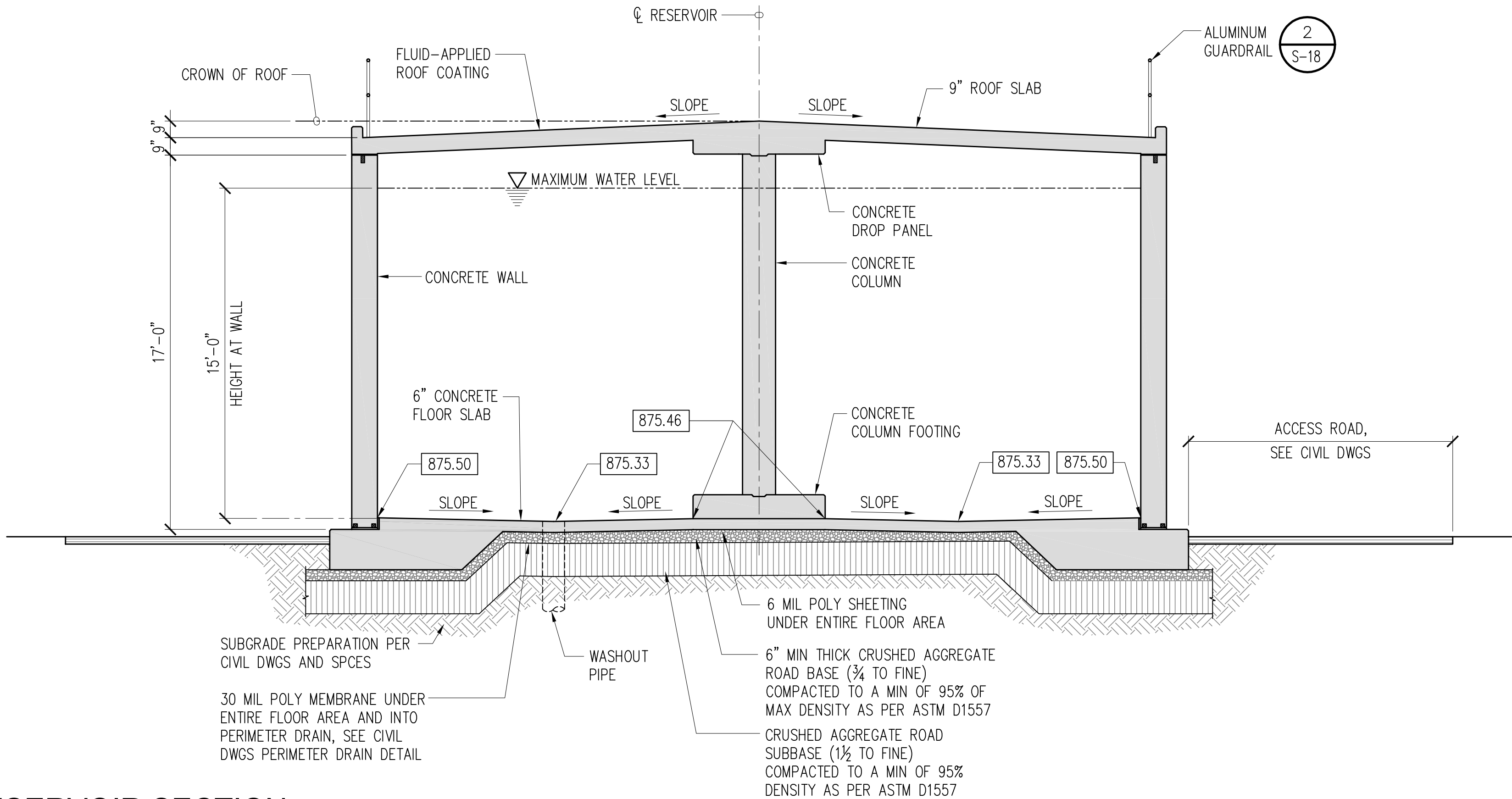
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
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JANUARY 2020

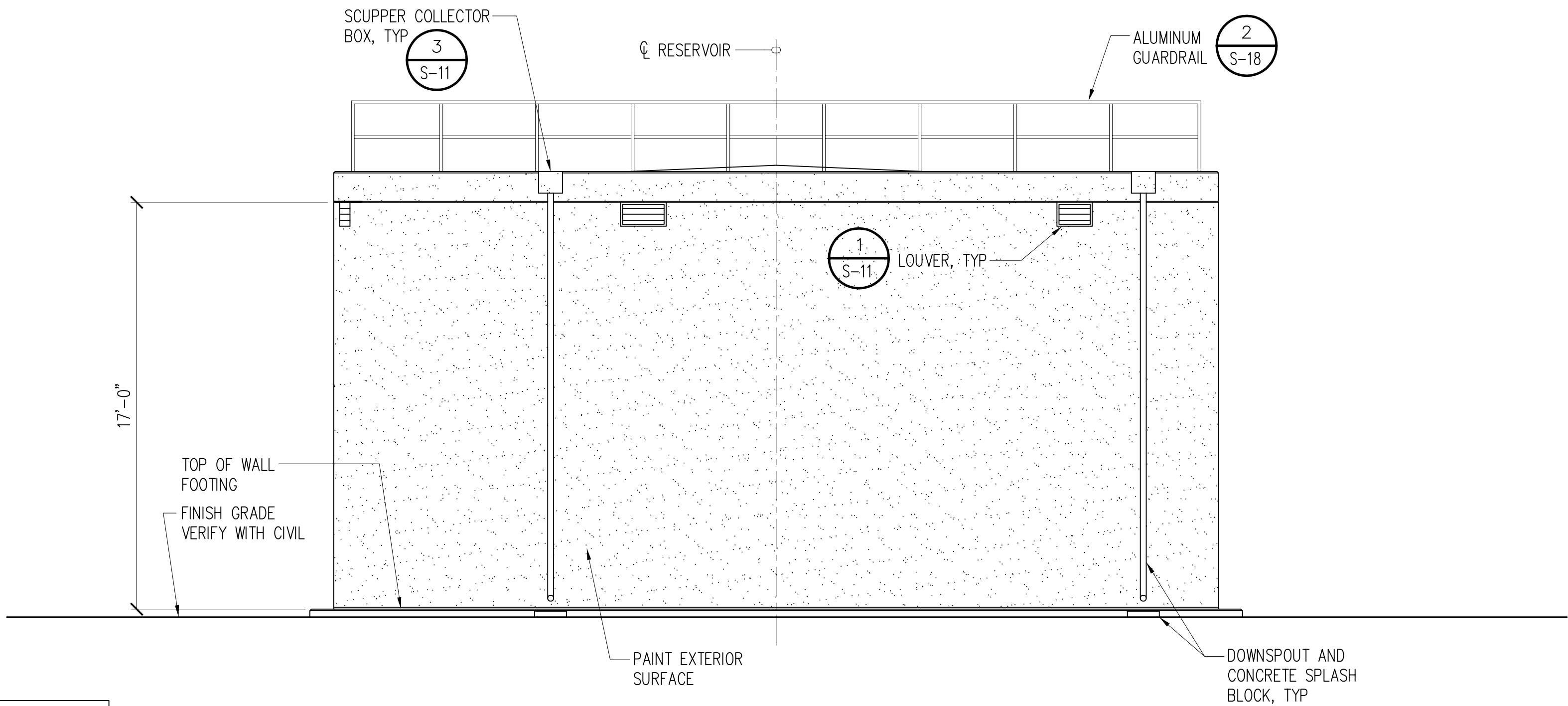


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1
S-7
RESERVOIR SECTION
SCALE: 1/4" = 1'-0"



NOTE:
STAIRS NOT SHOWN FOR
CLARITY, SEE
2
S-12

2
S-7
RESERVOIR ELEVATION
SCALE: 1/4" = 1'-0"

DWG. NO.
S-7
SHEET 35 OF 54

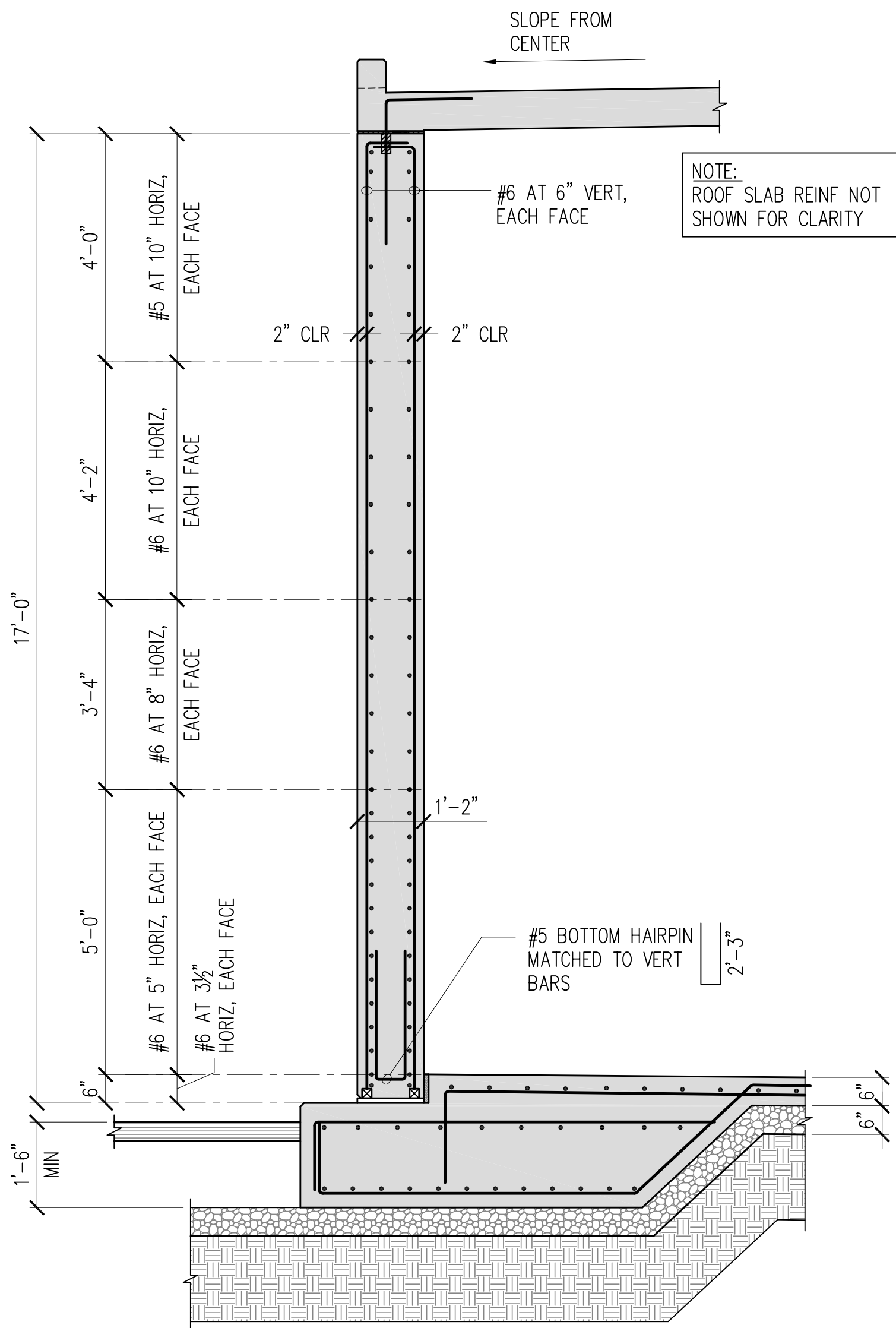
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS,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

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

Signature: *Jerry S. Fujita*
SIGNATURE
LICENSE EXP. DATE: APRIL 01, 2020

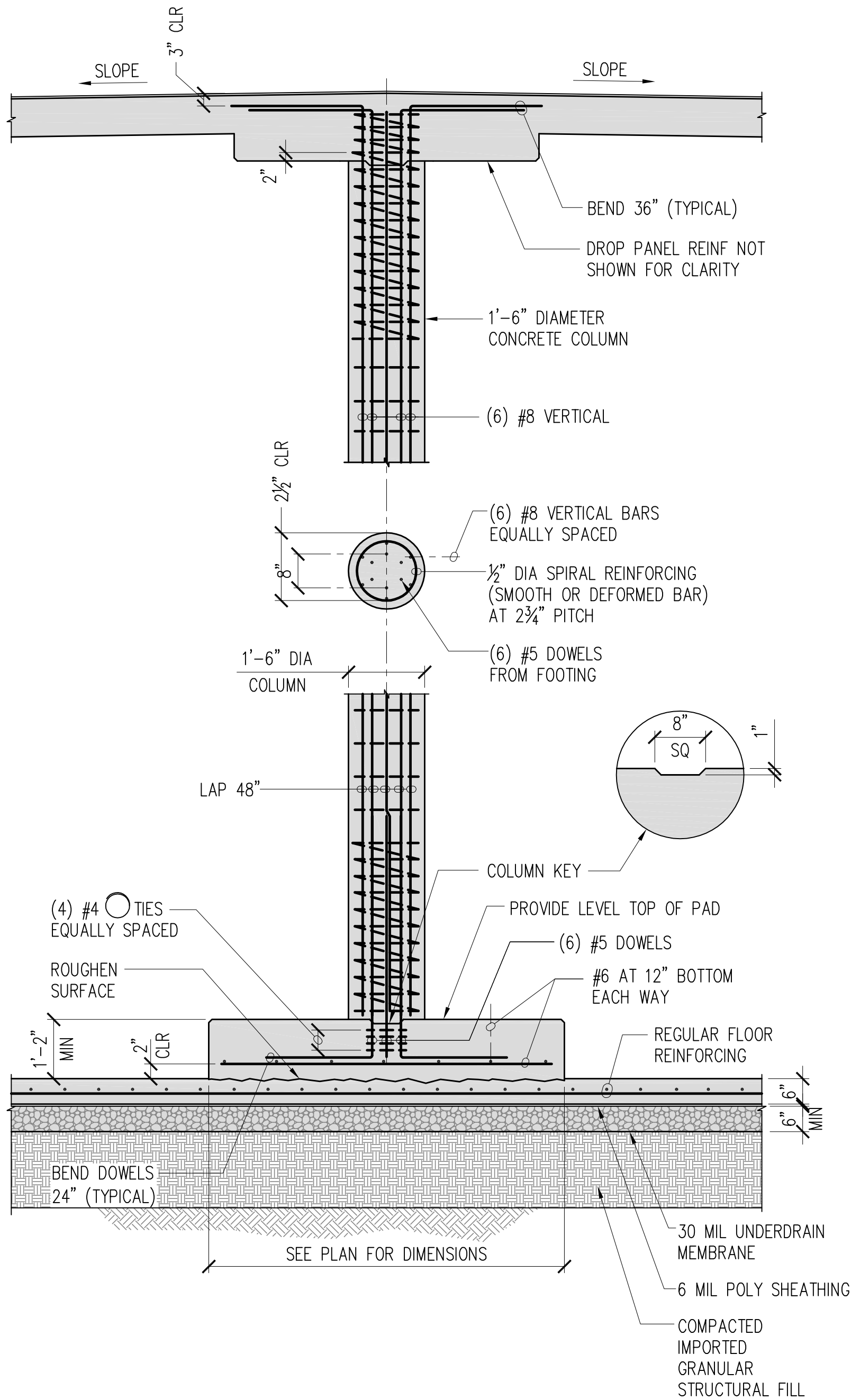
REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
RESERVOIR SECTION AND ELEVATION					
DESIGNED BY:	DY	CHECKED BY:	JF	DRAWN BY:	CADD
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN					
JANUARY 2020					
FILE	POCKET	FOLDER	NO.		

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REINFORCED CONCRETE RESERVOIR -
TYPICAL WALL SECTION

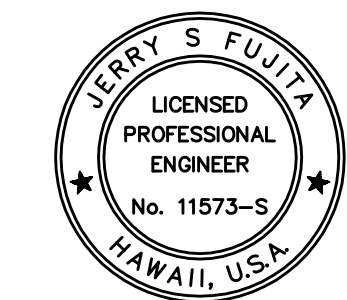
1
S-8
SCALE: 1/2" = 1'-0"



COLUMN DETAIL

2
S-8
NOT TO SCALE

DWG. NO.
S-8
SHEET 36 OF 54



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Jerry S. Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 01, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

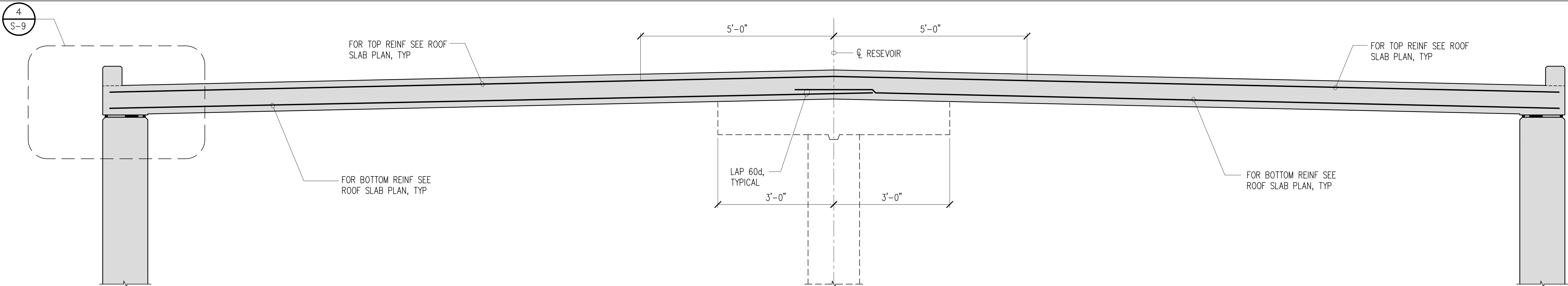
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

RESERVOIR WALL AND
COLUMN SECTION

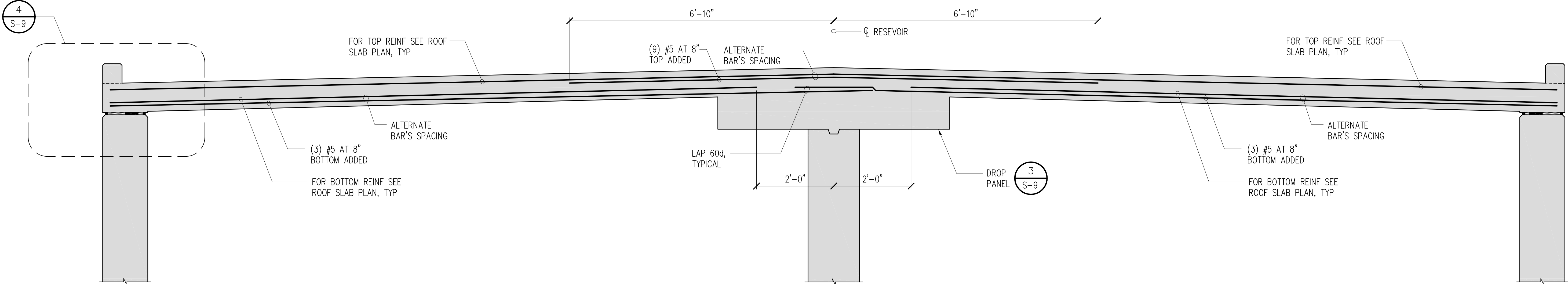
DESIGNED BY: DY	CHECKED BY: JF	DRAWN BY: CADD
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN		
JANUARY 2020		

FILE	POCKET	FOLDER	NO.

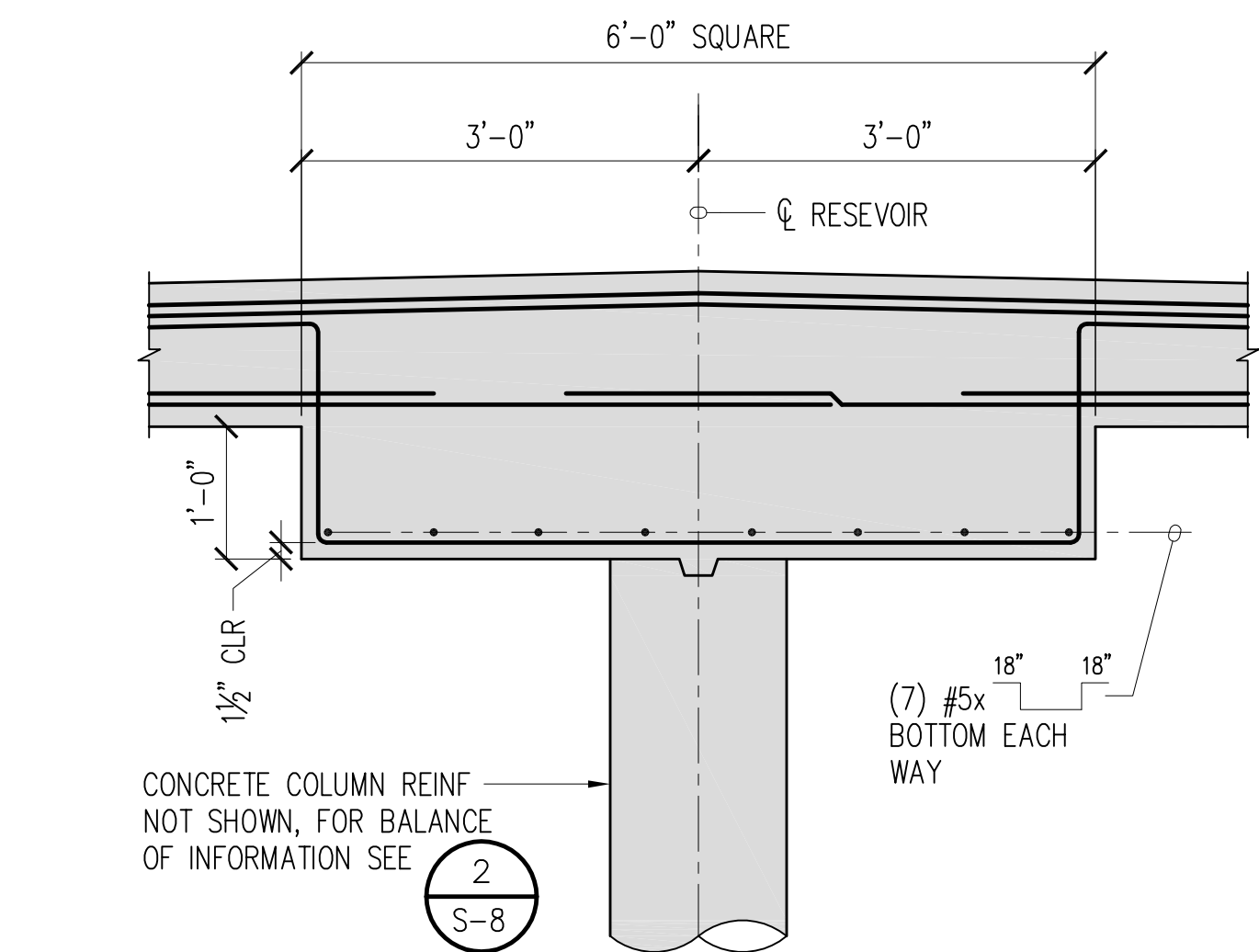
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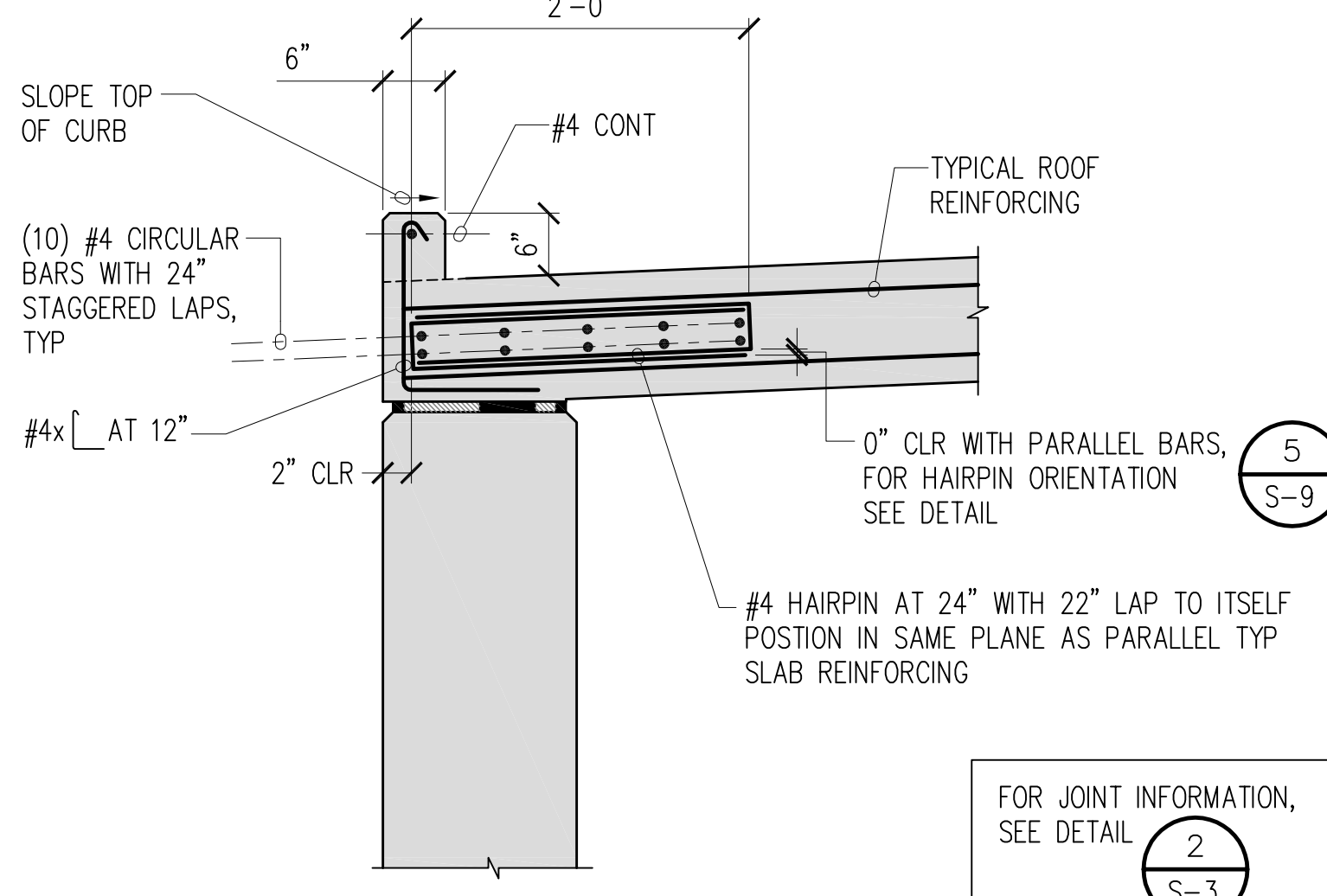
1 TYPICAL EDGE STRIP REINFORCING
NOT TO SCALE



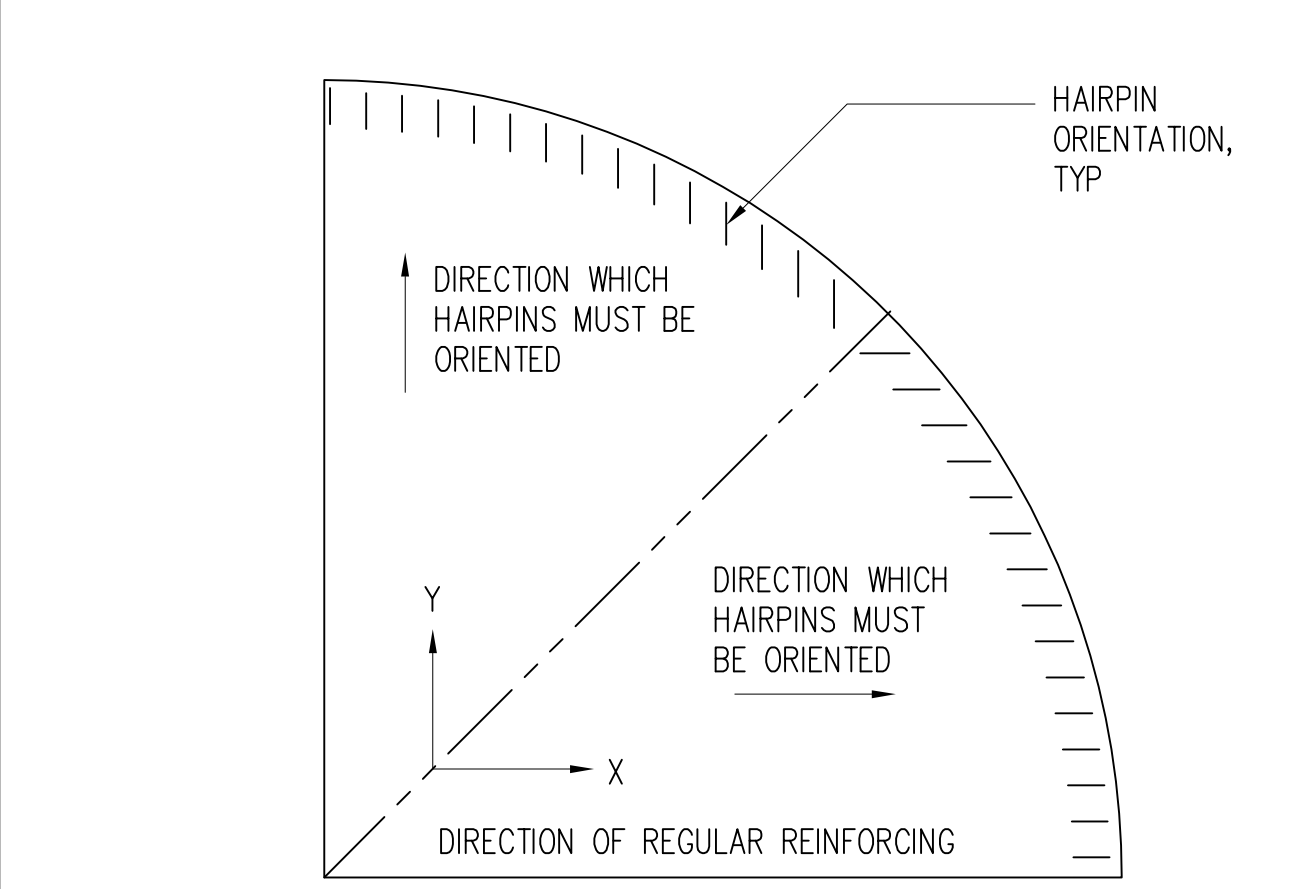
2 TYPICAL COLUMN AND EDGE STRIP REINFORCING
NOT TO SCALE



3 TYPICAL DROP PANEL DETAIL
SCALE: 3/4" = 1'-0"



4 ROOF EDGE REINFORCING
SCALE: 1" = 1'-0"



5 PLAN OF HAIRPIN ORIENTATION
SCALE: 1 1/2" = 1'-0"

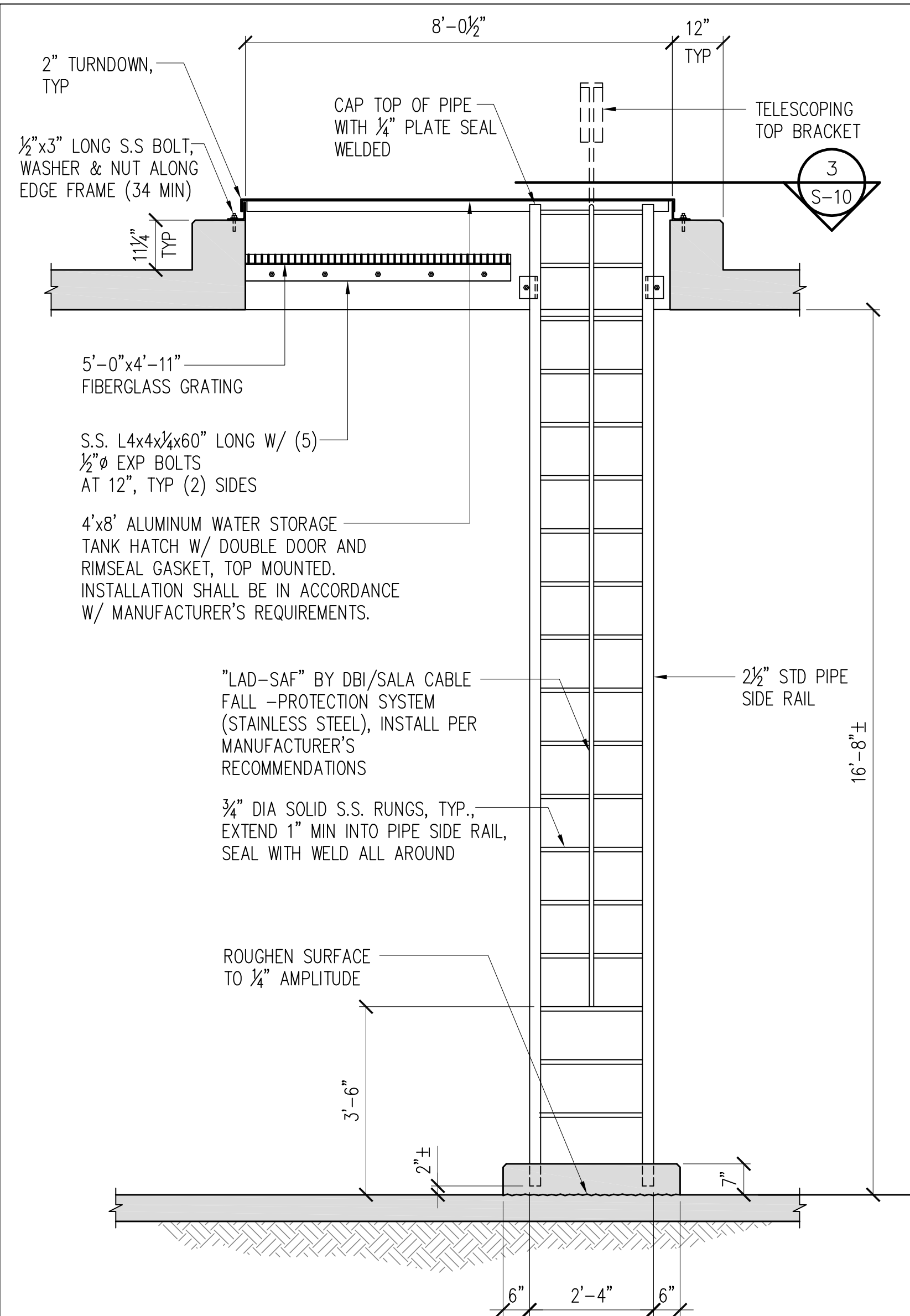
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN SECTION 16-115-2 OF THE STATE OF HAWAII, DEPARTMENT OF COMMERCE AND CONSUMER AFFAIRS, HAWAII ADMINISTRATIVE RULES FOR PROFESSIONAL ENGINEERS,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

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

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

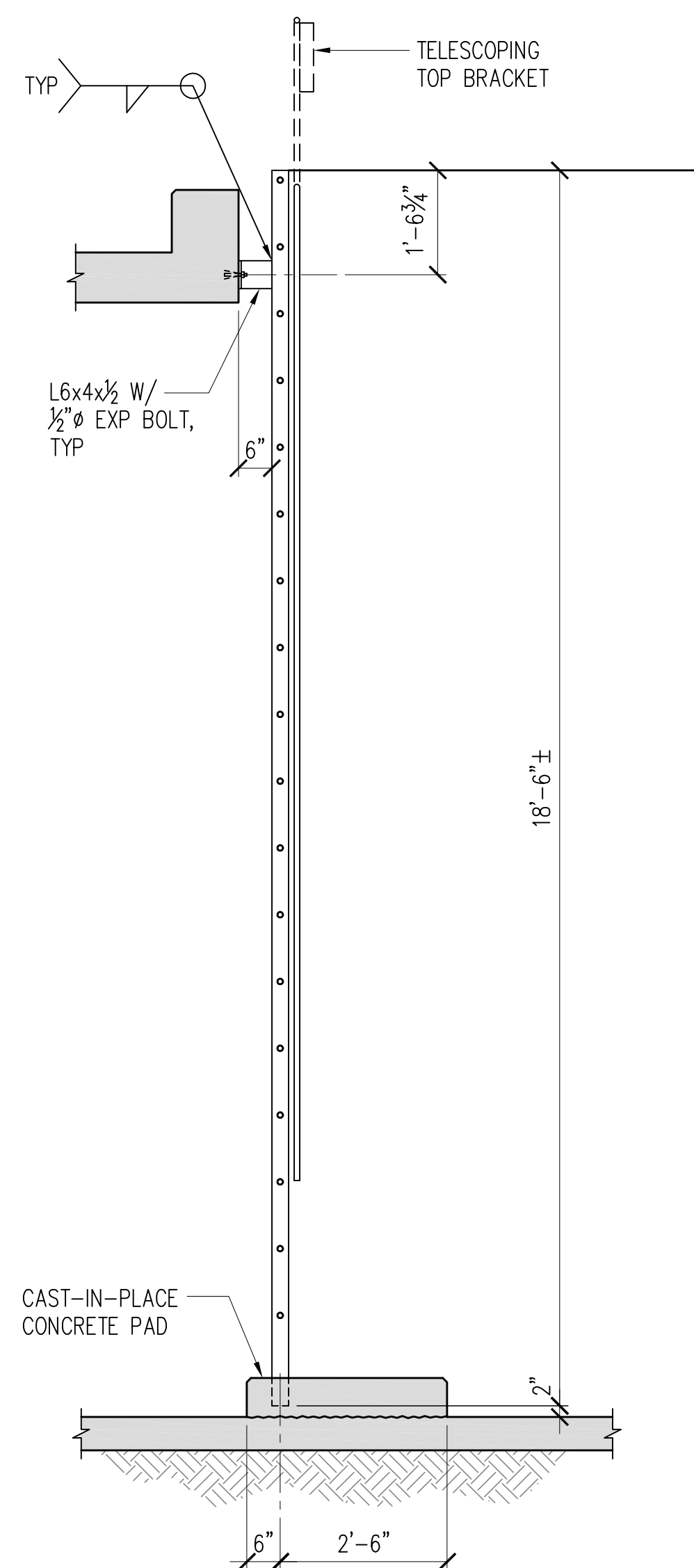
REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII				
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019				
RESERVOIR ROOF SECTIONS AND DETAILS				
DESIGNED BY: DY	CHECKED BY: JF	DRAWN BY: CADD		
111 S. KING STREET, SUITE 110 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN		JANUARY 2020		

FILE	POCKET	FOLDER	NO.



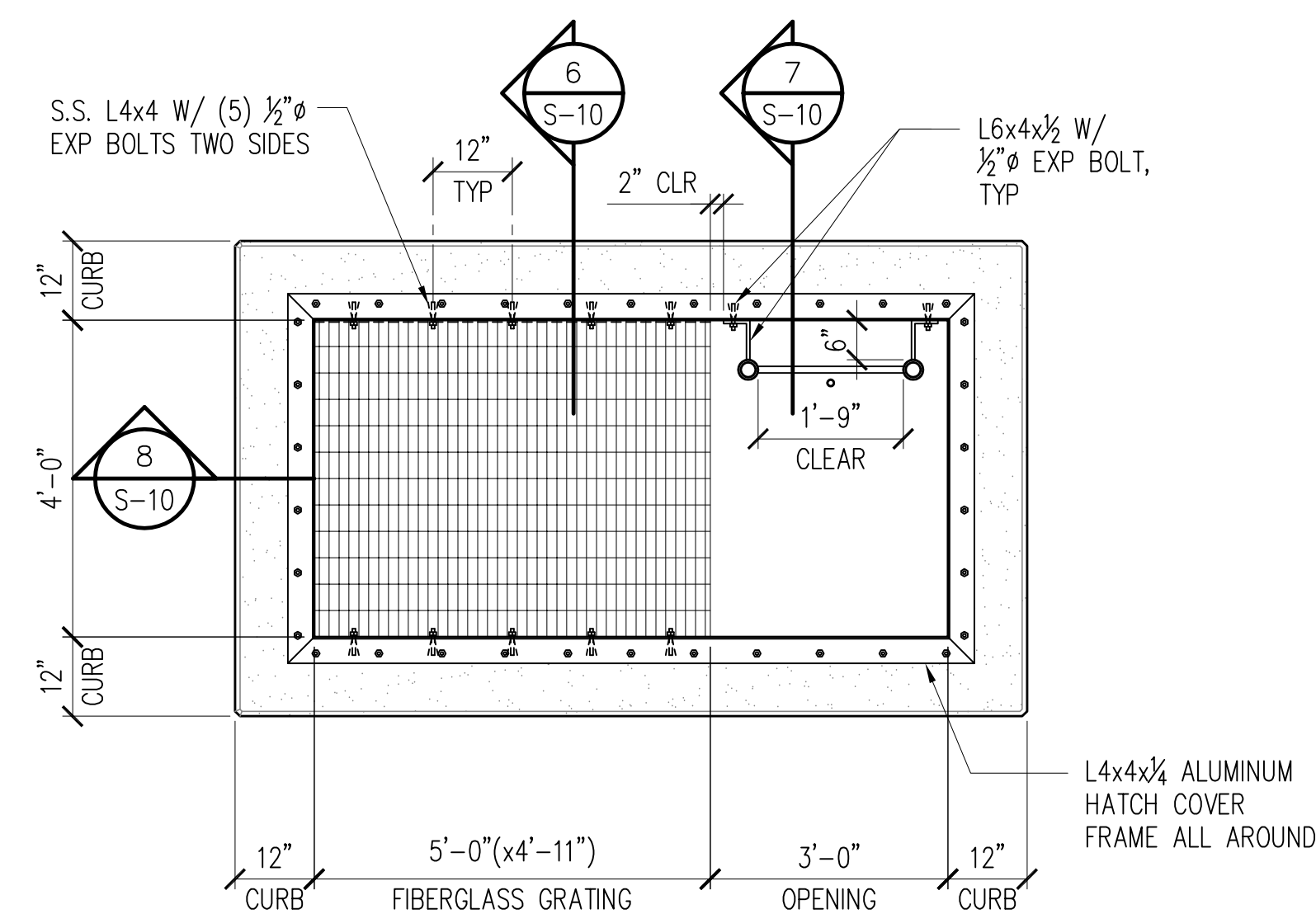
INTERIOR LADDER AND ROOF HATCH

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



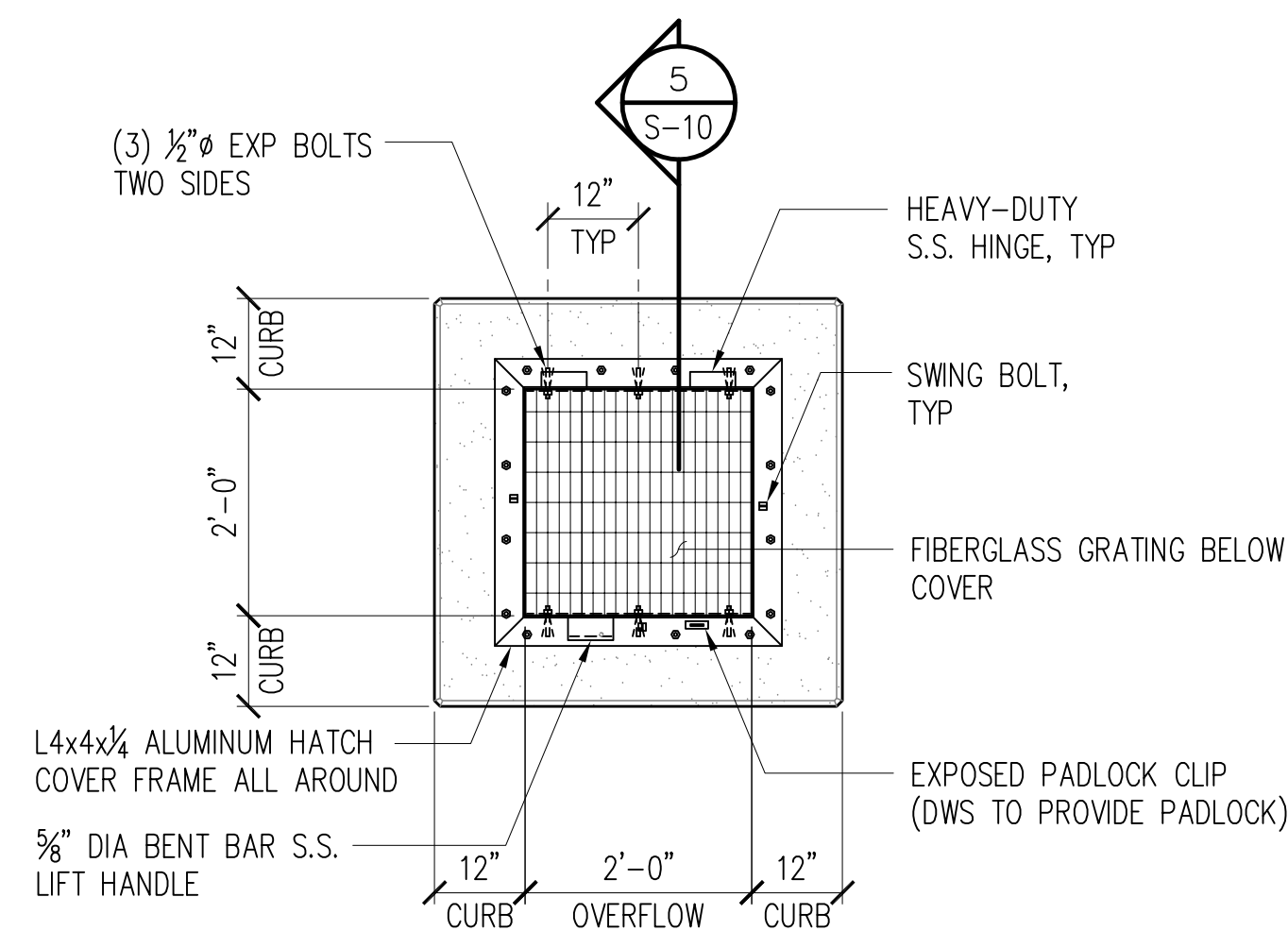
ELEVATION OF INTERIOR LADDER

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

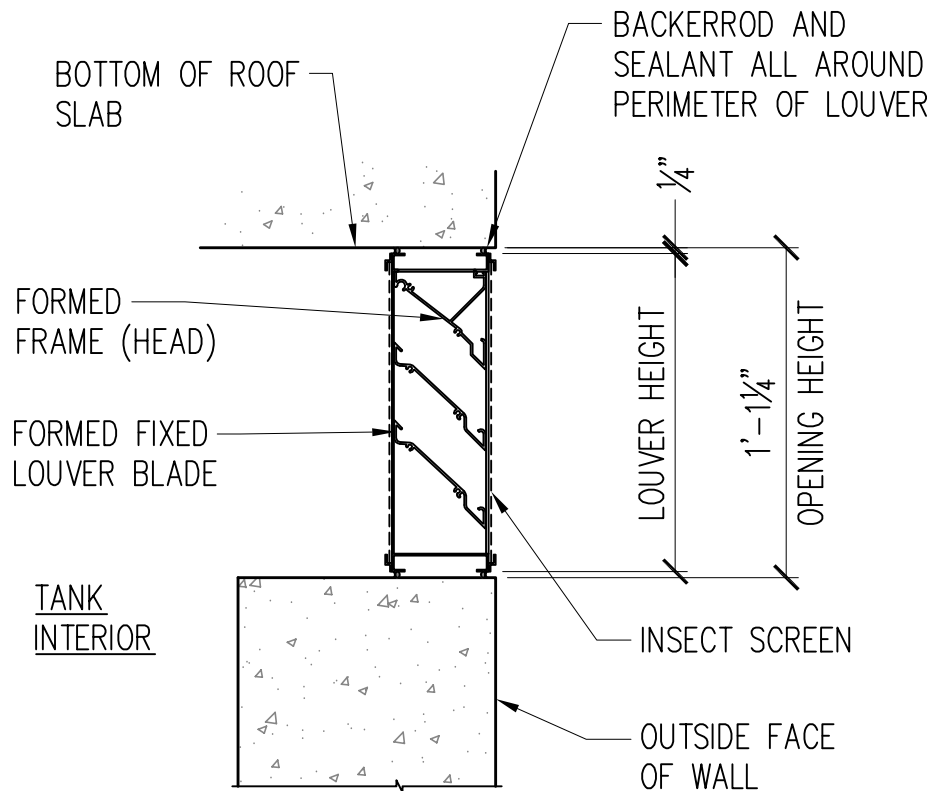


PLAN - ROOF HATCH

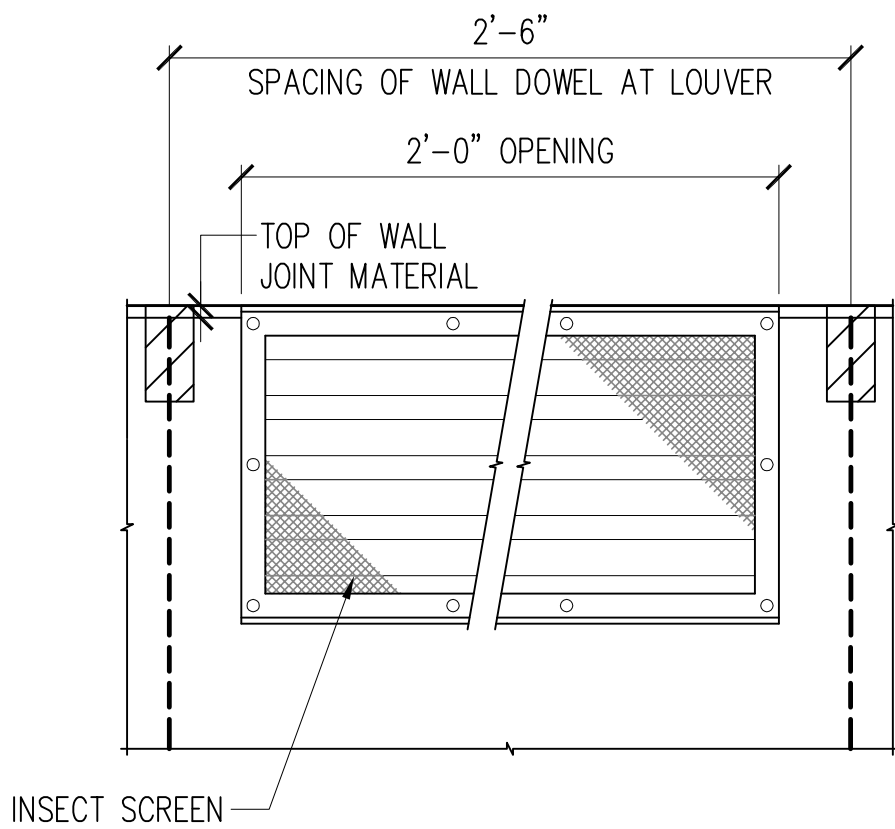
3 PLAN - ROOM
S-10 SCALE: 1/2" = 1'-0"



P:\5051-5100\5069 DHHL-Kau Water System Improvements 01 MG Reservoir\004 Drawings\Structural\AutoCAD_format\2020-02-11_5069 DHHL Kau Reservoir\5069_S-11.dwg, 2/11/2020 8:28:29 AM, dylomizno

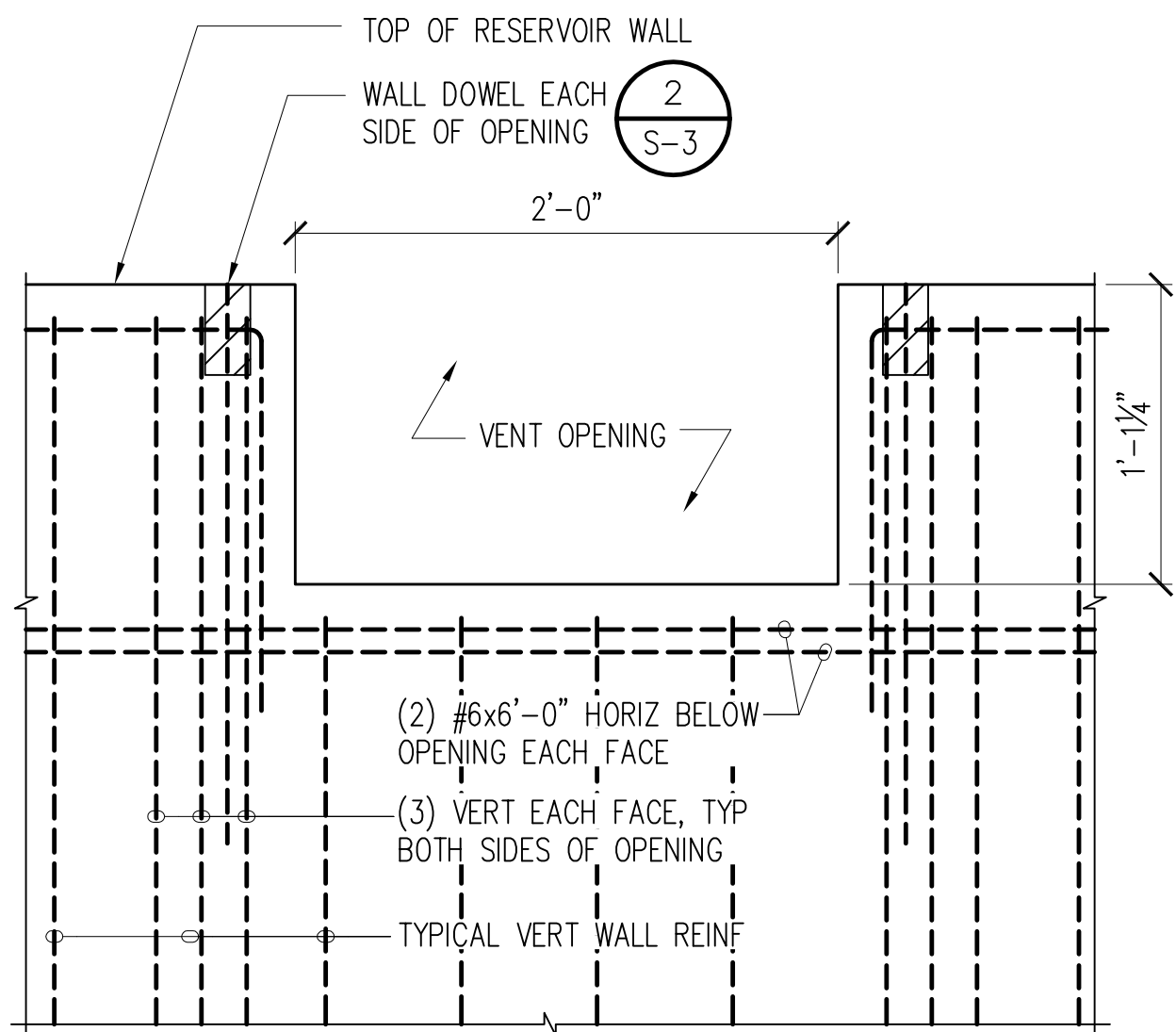


SECTION

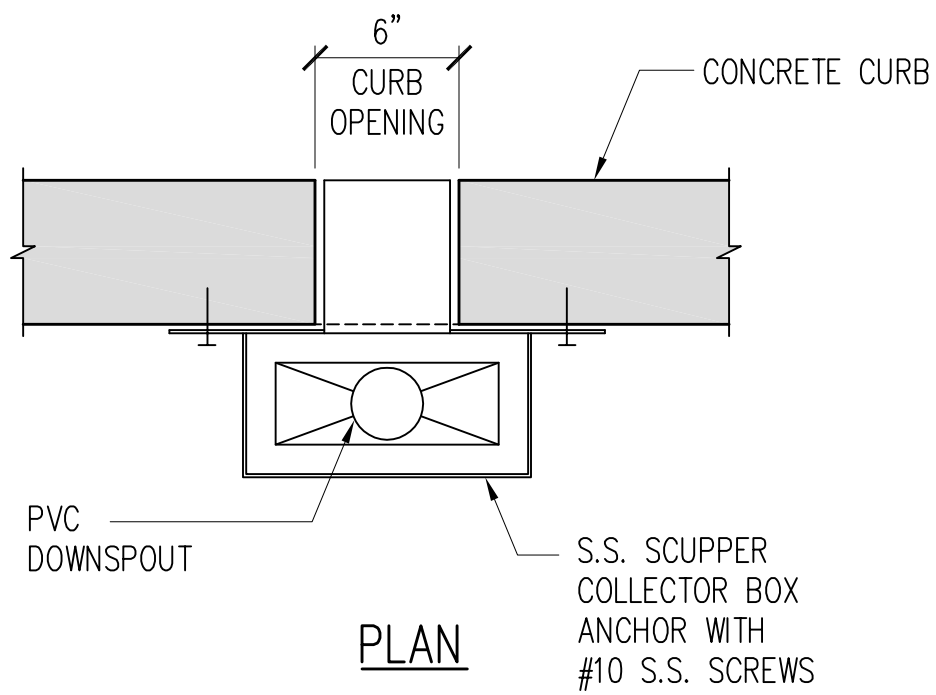


ELEVATION

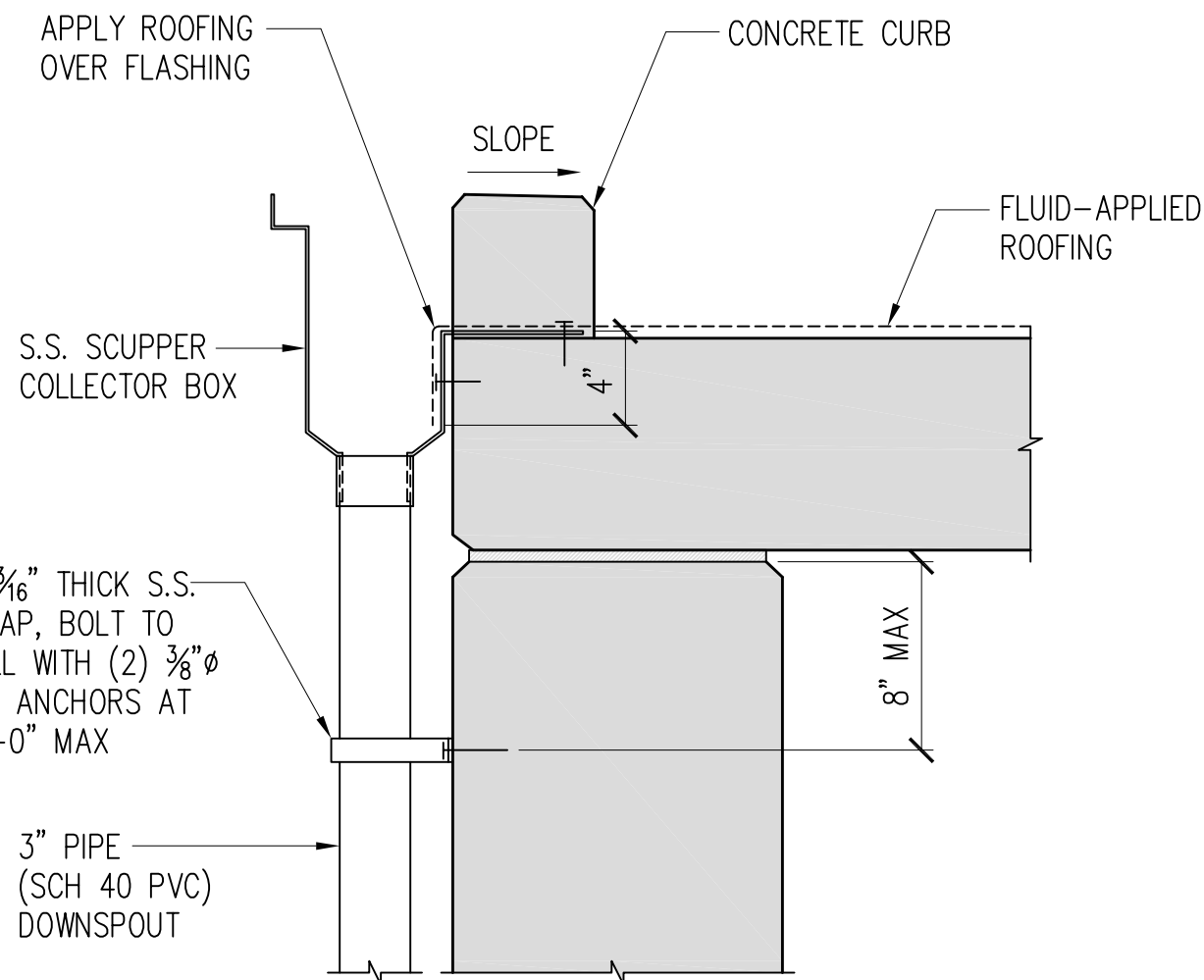
1 LOUVER WALL VENT DETAILS
S-11 NOT TO SCALE



2 TOP OF WALL OPENING
S-11 SCALE: 1 1/2" = 1'-0"



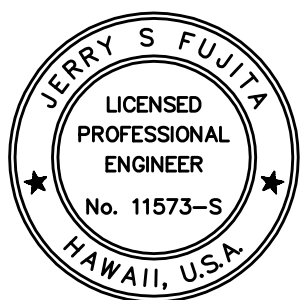
PLAN



SECTION

3 SCUPPER COLLECTOR BOX DETAIL
S-9 SCALE: 1 1/2" = 1'-0"

DWG. NO.
S-11
SHEET 39 OF 54



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

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

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

RESERVOIR LOUVER DETAILS

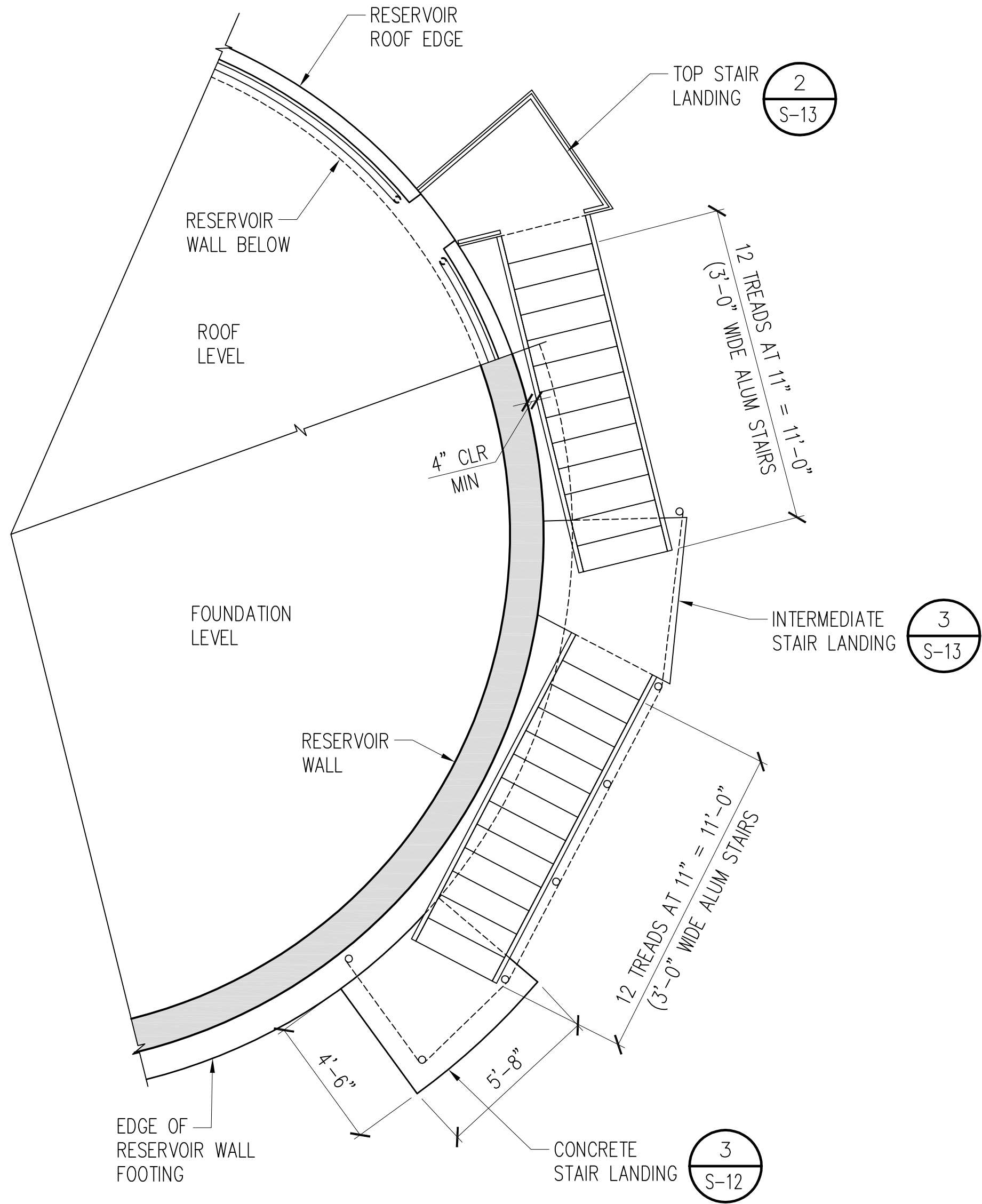
DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD

111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN
JANUARY 2020

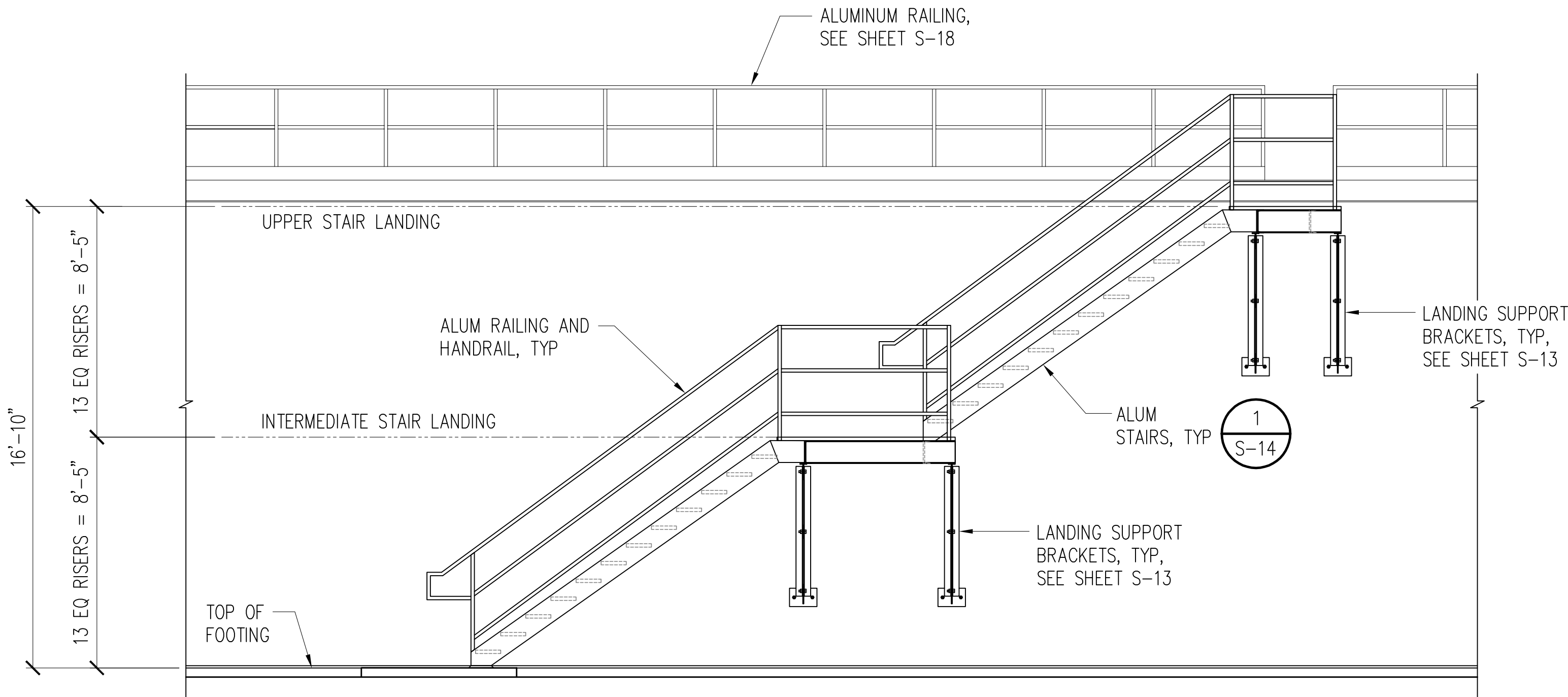
G70

FILE POCKET FOLDER NO.

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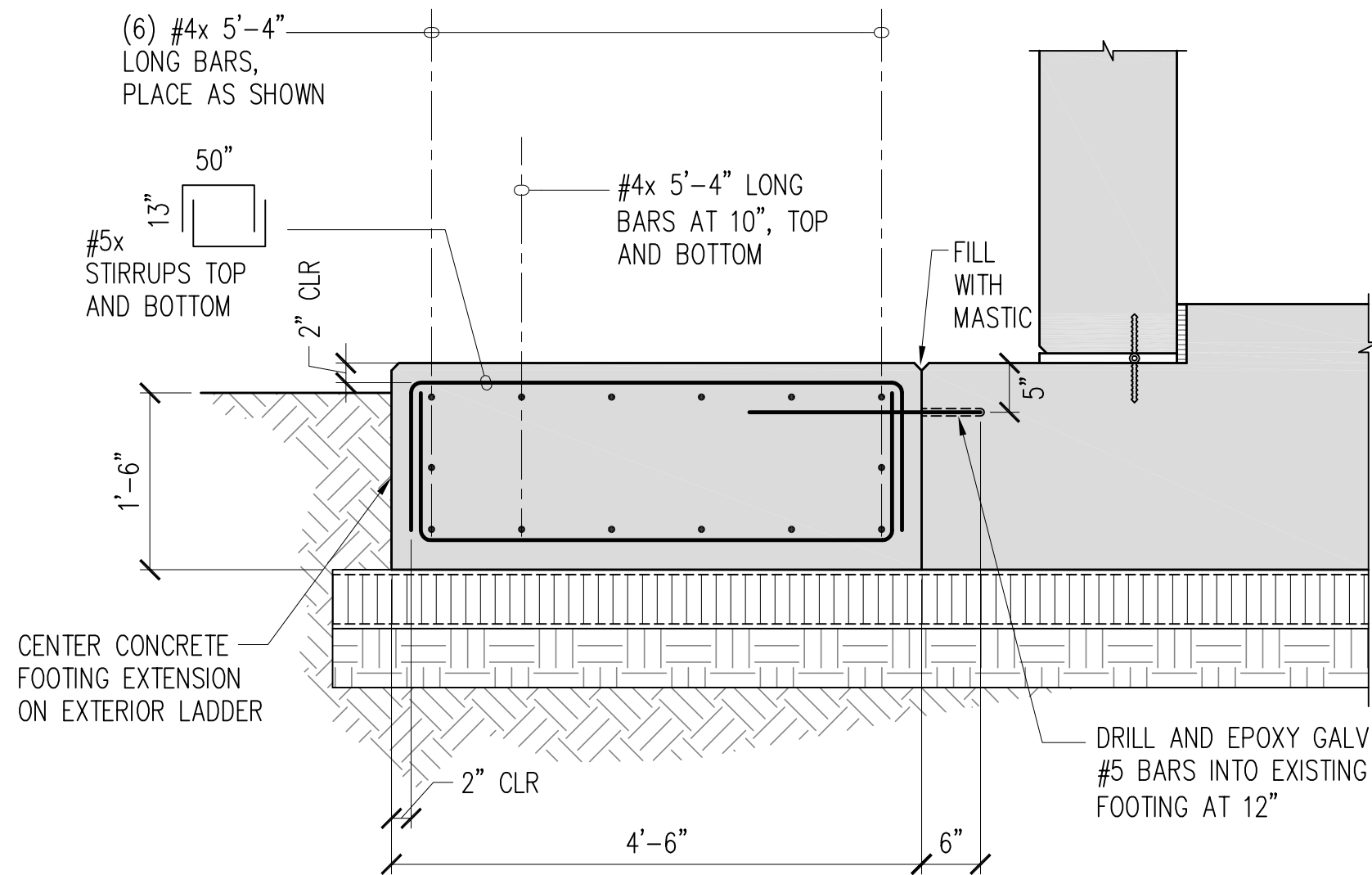


1
S-12
EXTERIOR STAIR AND LANDING PLAN
SCALE: 1/4" = 1'-0"

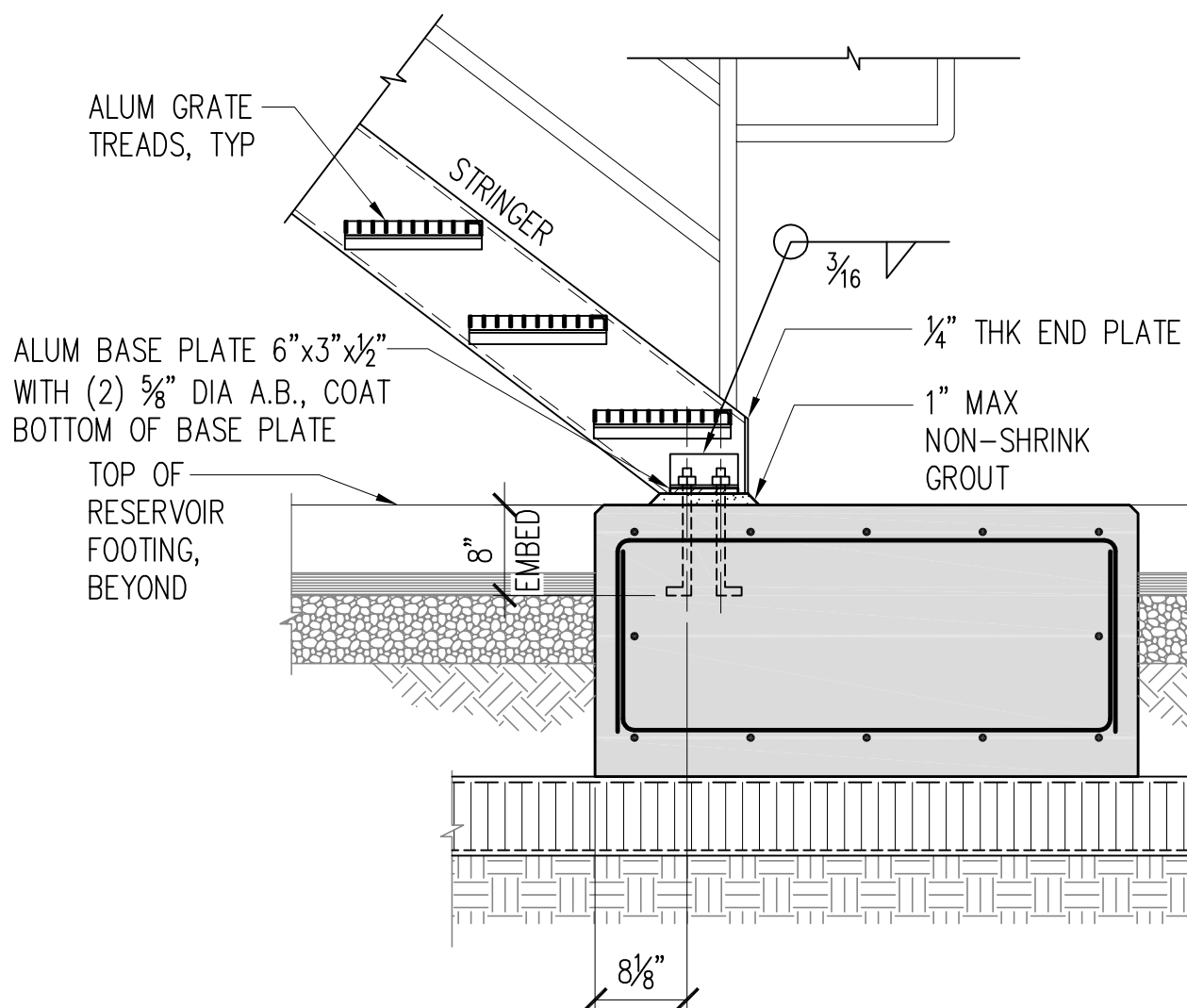


NOTES:
1. EXPANDED METAL SECURITY FENCE NOT SHOWN FOR CLARITY, SEE SHEET S-15.

2
S-12
EXTERIOR STAIR ELEVATION
SCALE: 1/4" = 1'-0"




3
S-12
WALL FOOTING EXTENSION DETAIL
SCALE: 3/4" = 1'-0"



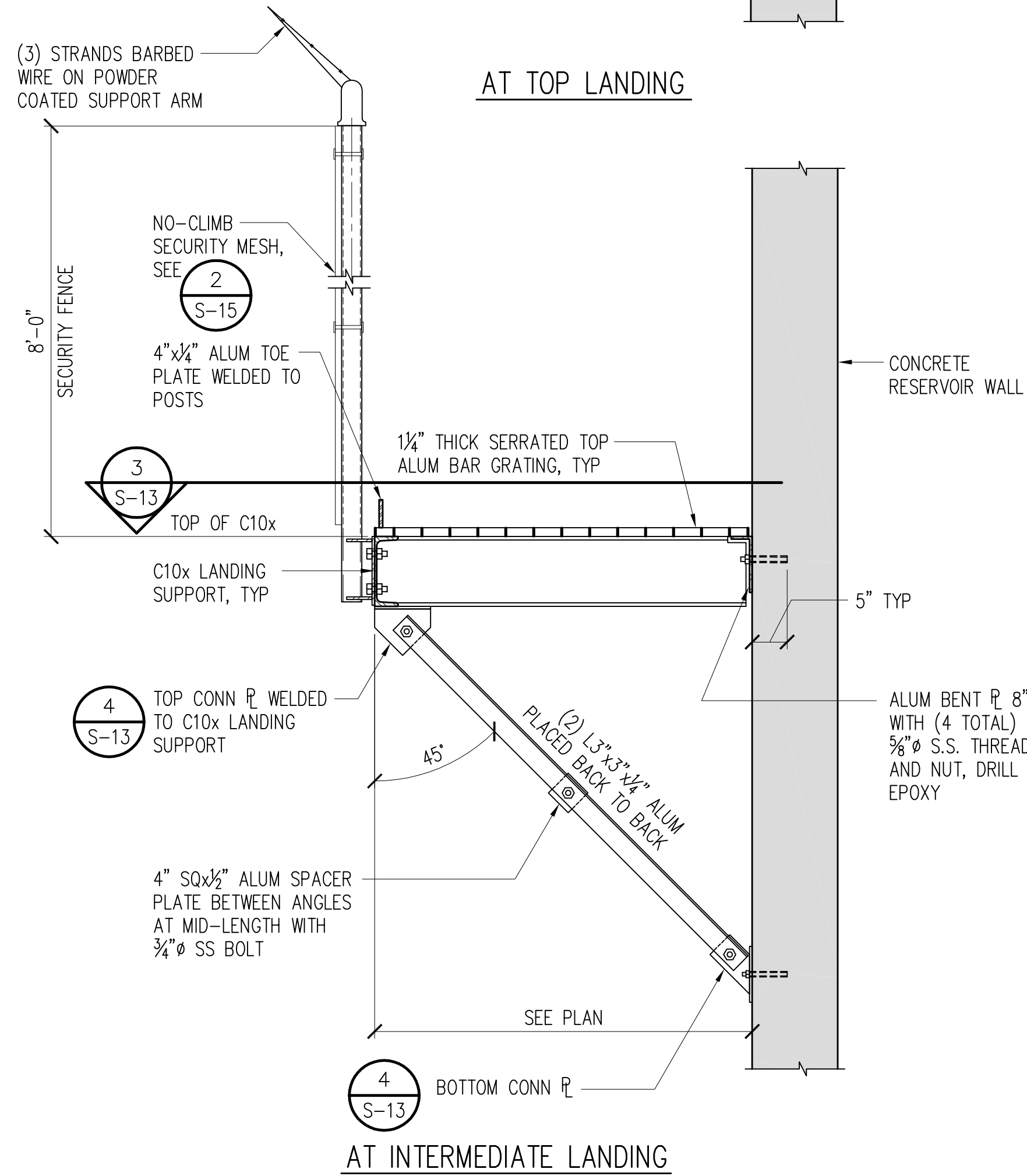
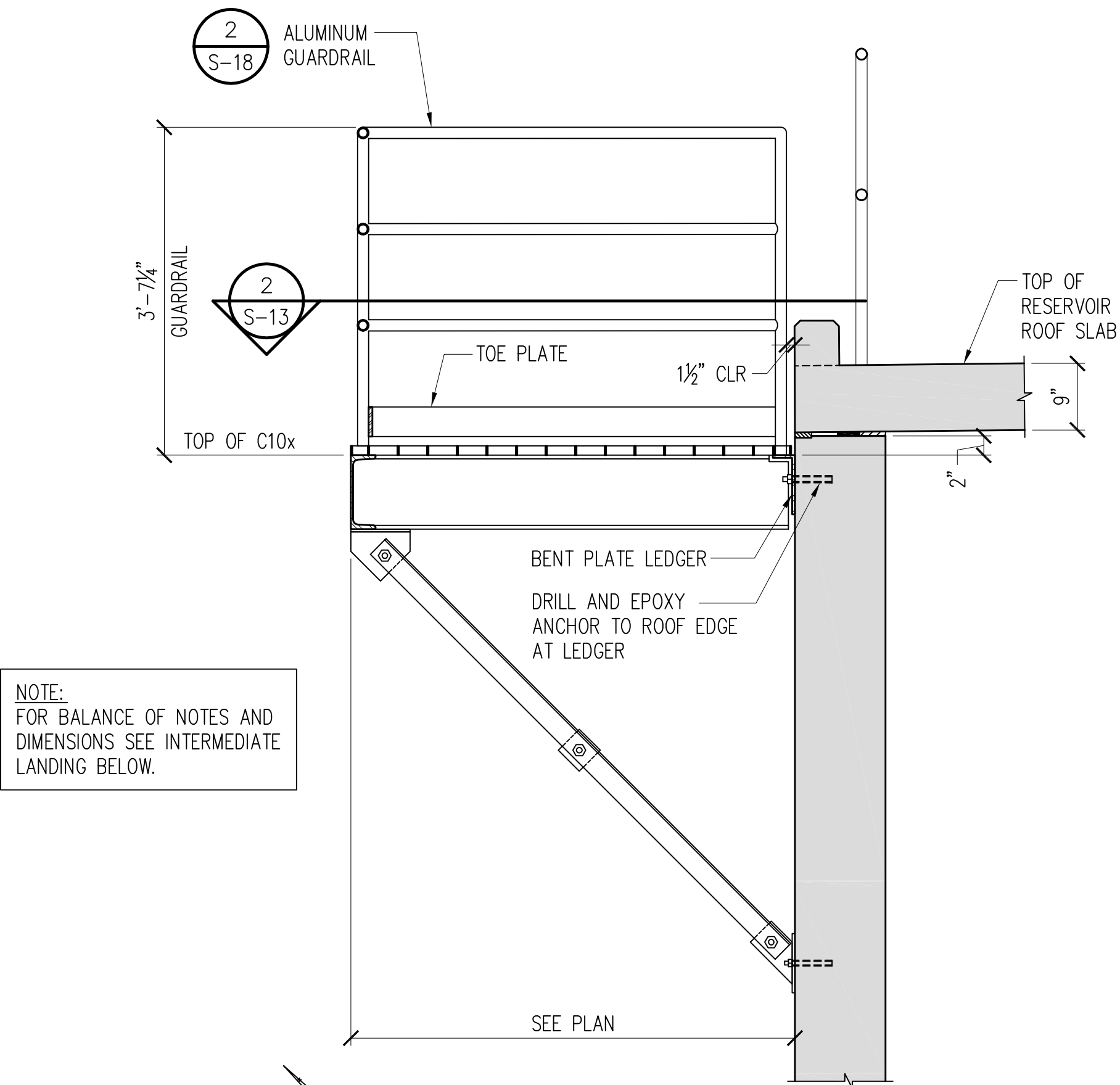
4
S-12
**STRINGER/
STRINGERFOOTING CONNECTION**
NOT TO SCALE

DWG. NO.
S-12
SHEET 40 OF 54

JERRY S. FUJITA
LICENSED
PROFESSIONAL
ENGINEER
No. 11573-S
HAWAII, U.S.A.
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Jerry S. Fujita
SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

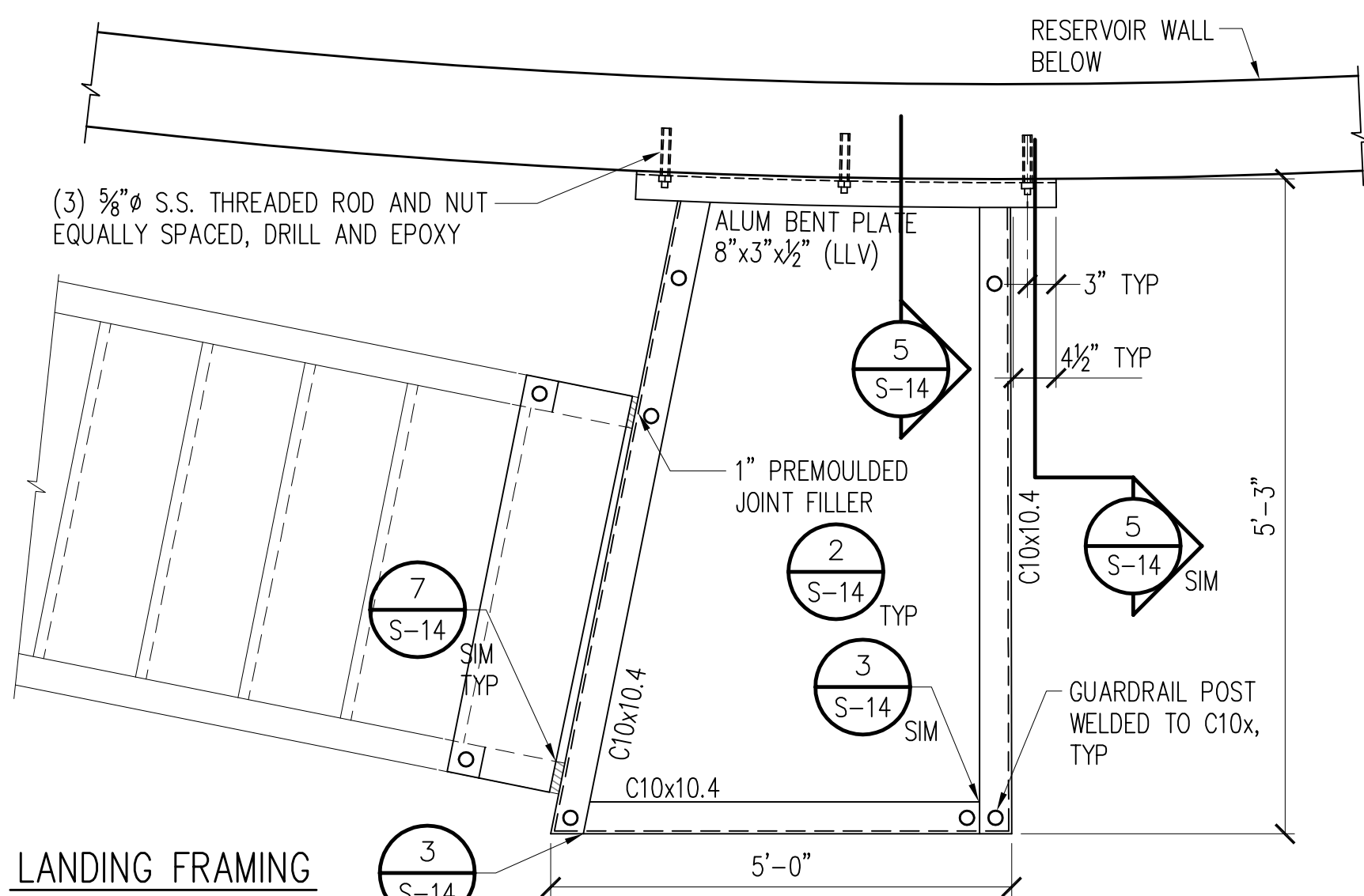
REVISION	DATE	BRIEF		MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS					
STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1					
KAU, HAWAII, HAWAII					
IFB-20-HHL-019					
RESERVOIR EXTERIOR STAIR PLAN					
AND DETAILS					
DESIGNED BY:	DY	CHECKED BY:	JF	DRAWN BY:	CADD
					
111 S. KING STREET, SUITE 170					
HONOLULU, HAWAII 96813					
808.523.5866					
WWW.G70.DESIGN					
JANUARY 2020					

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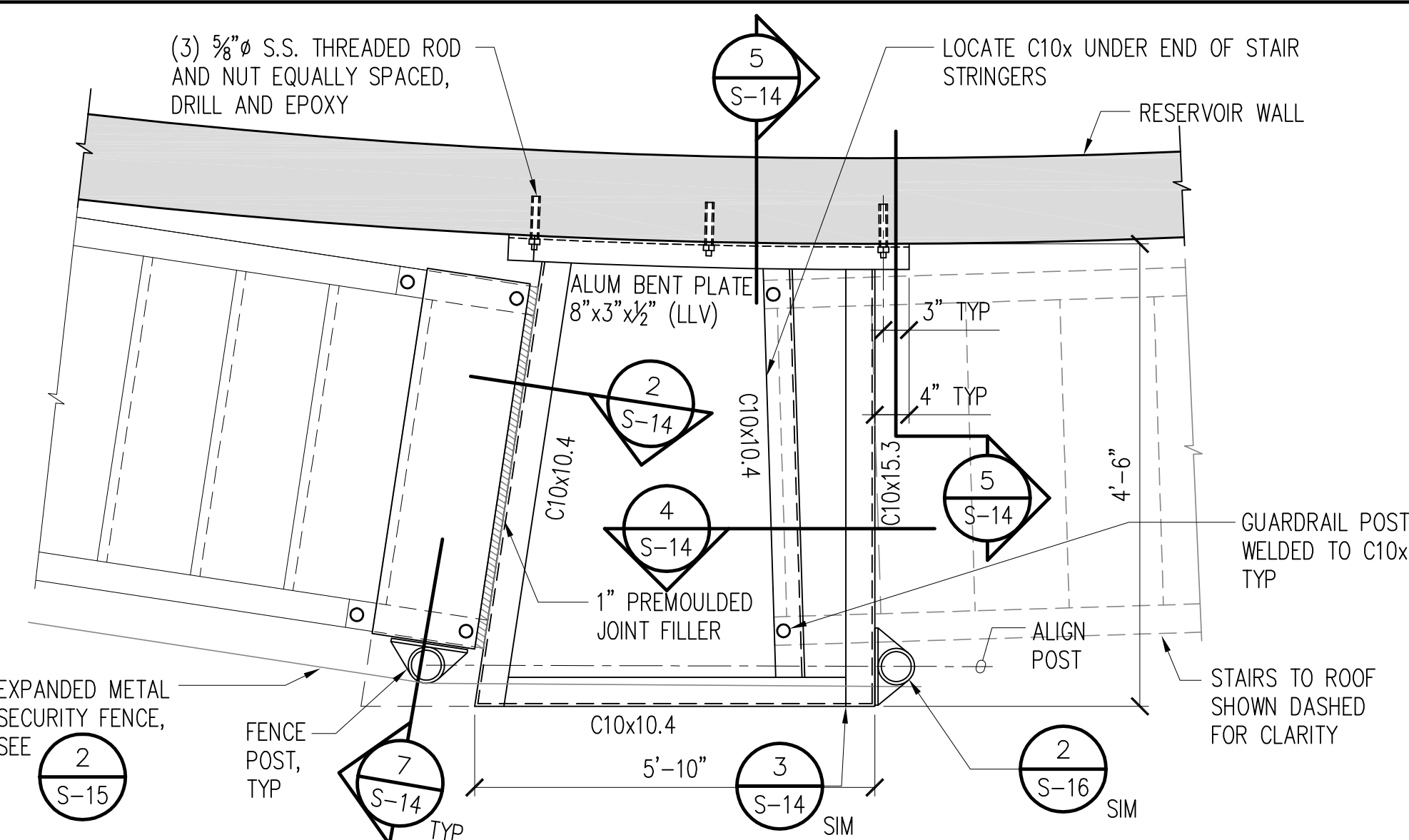
1
S-13
NOT OT SCALE

EXTERIOR STAIR LANDING SUPPORT SECTIONS



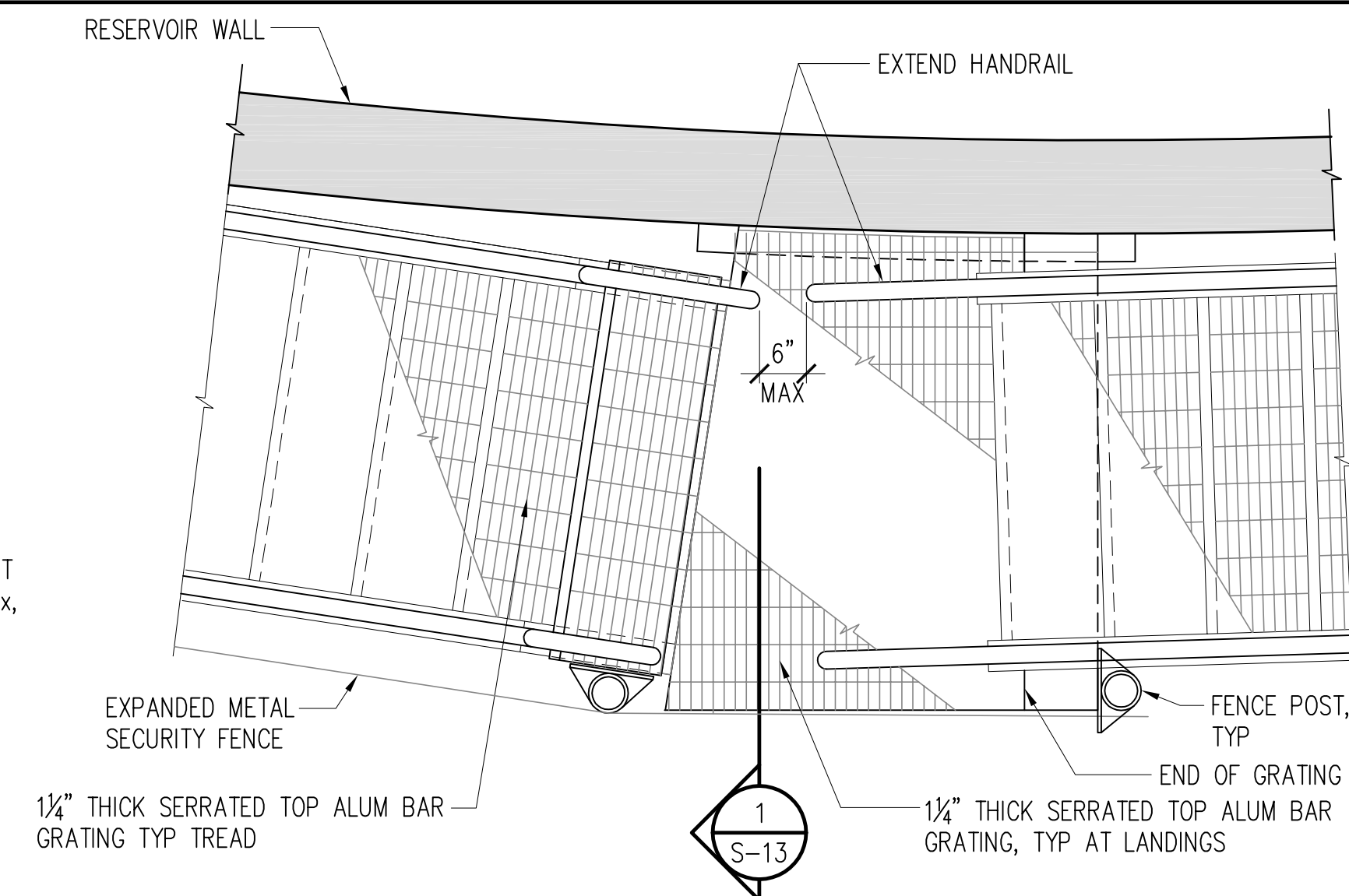
2
S-13
NOT TO SCALE

TOP STAIR LANDING PLAN DETAILS



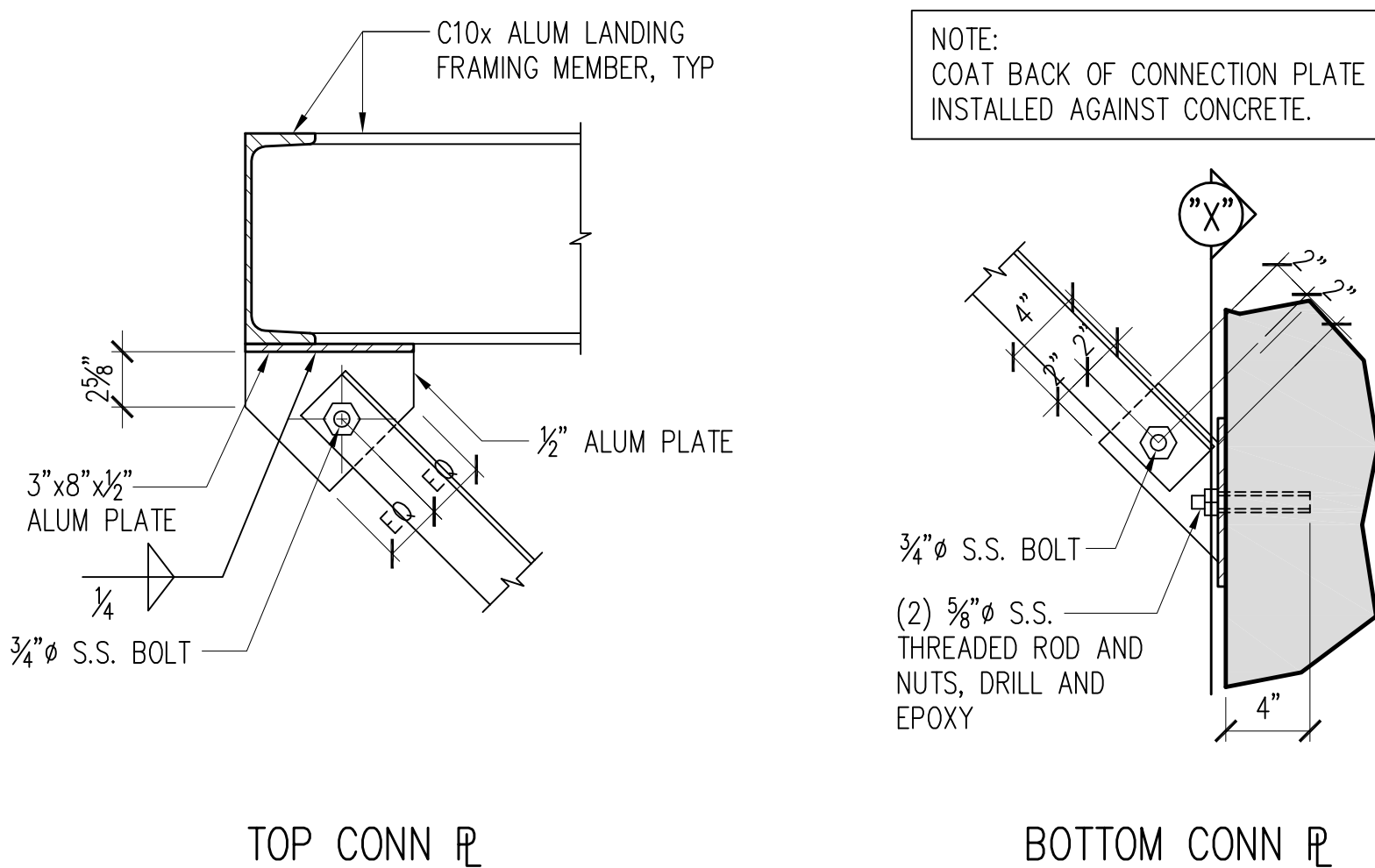
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S-13
NOT TO SCALE

INTERMEDIATE LANDING PLAN DETAILS



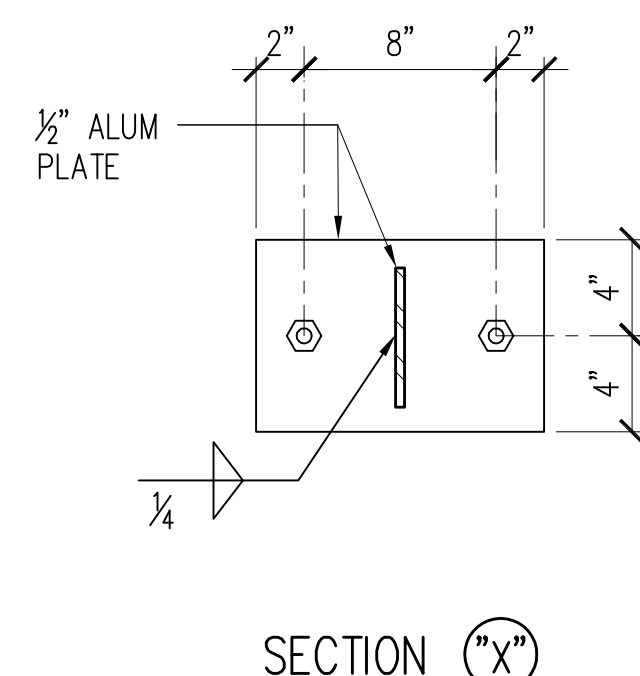
LANDING GUARDRAIL LAYOUT

LANDING GUARDRAIL LAYOUT



4
S-13
NOT TO SCALE

LANDING SUPPORT CONNECTION PLATES



SECTION "X-X"

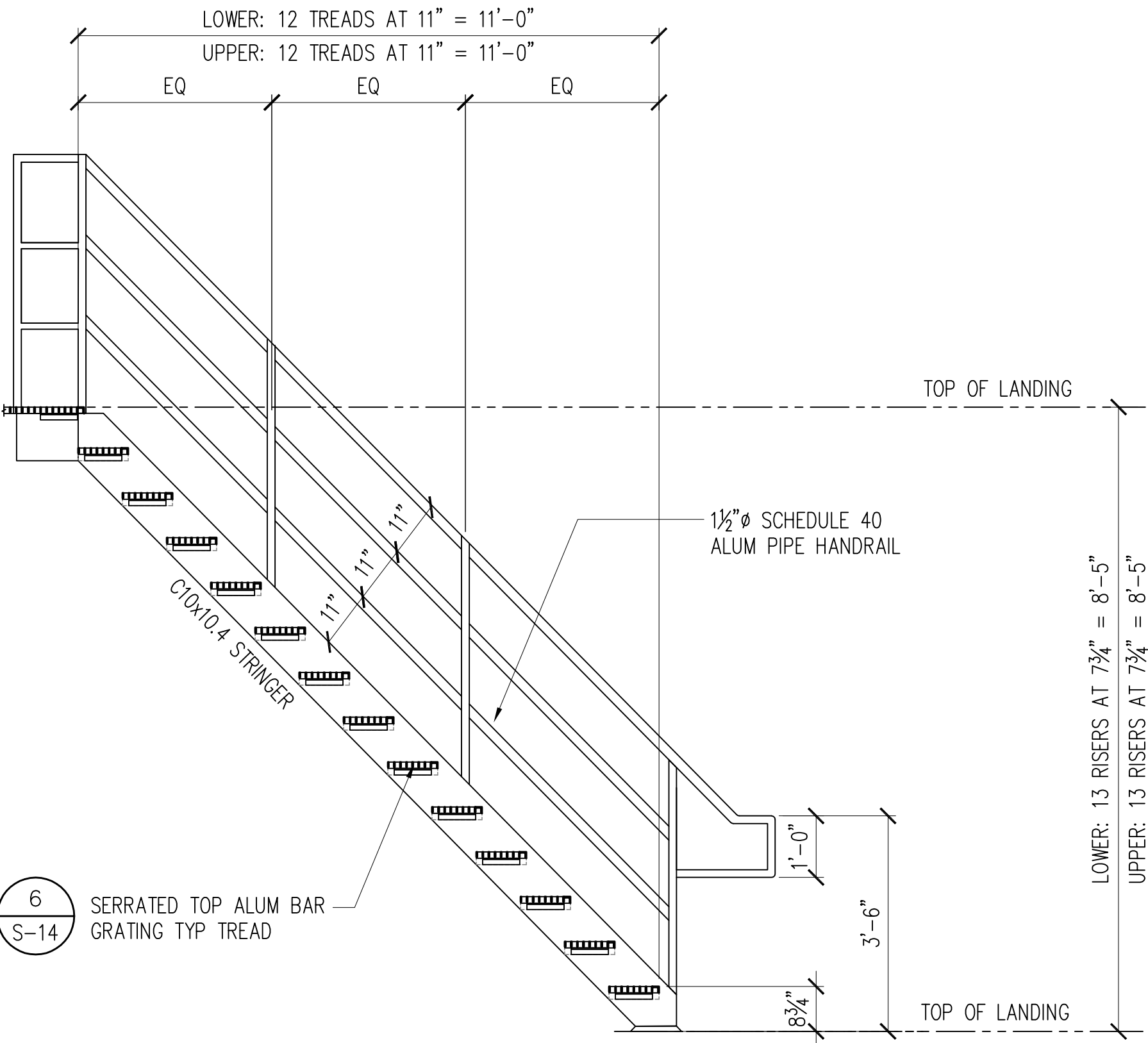
DWG. NO.
S-13
SHEET 41 OF 54

DESIGNED BY: DY
CHECKED BY: JF
DRAWN BY: CADD
JANUARY 2020

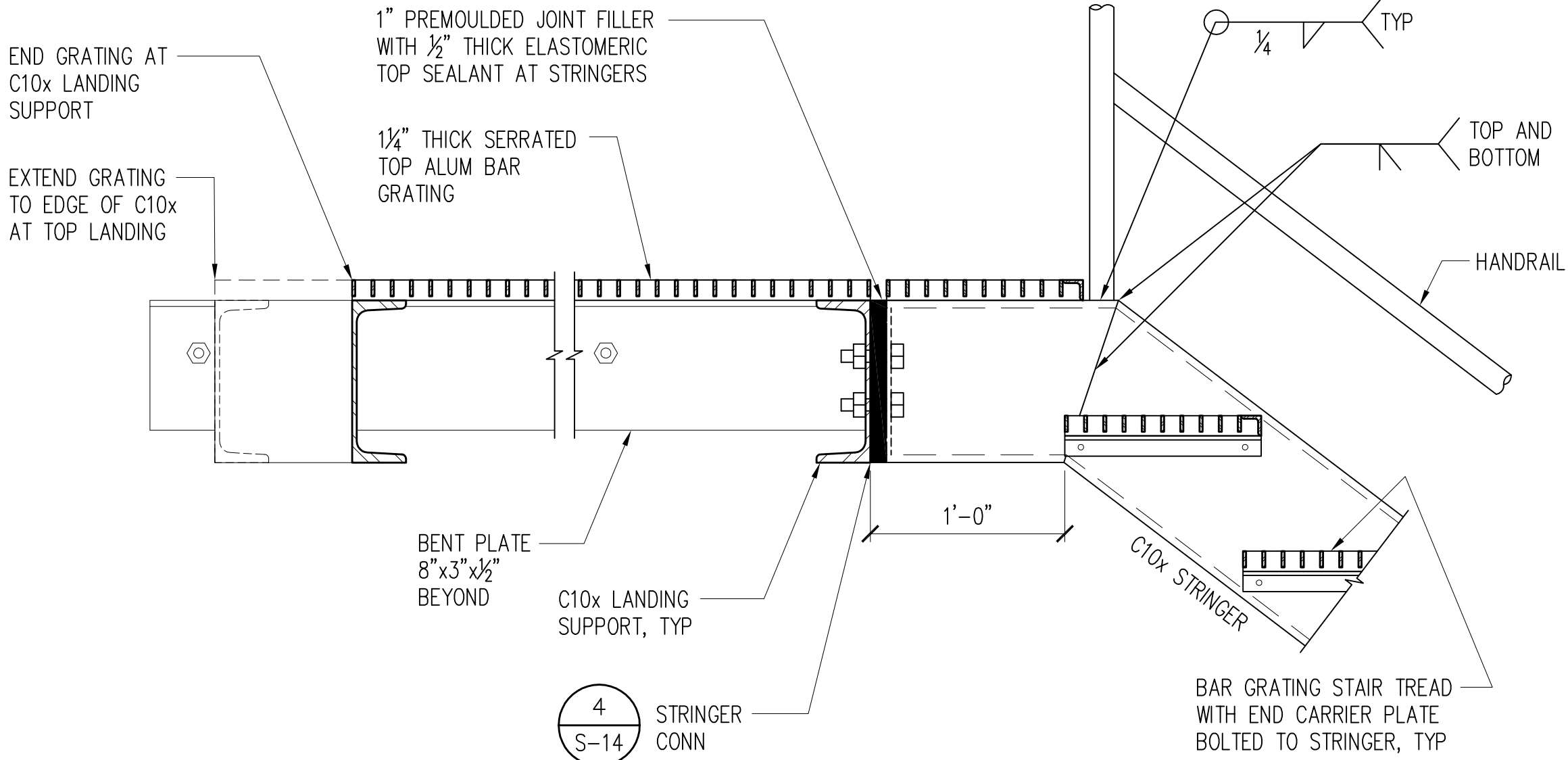
REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII				
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019				
RESERVOIR STAIR FRAMING AND DETAILS				
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN	G70			

FILE POCKET FOLDER NO.

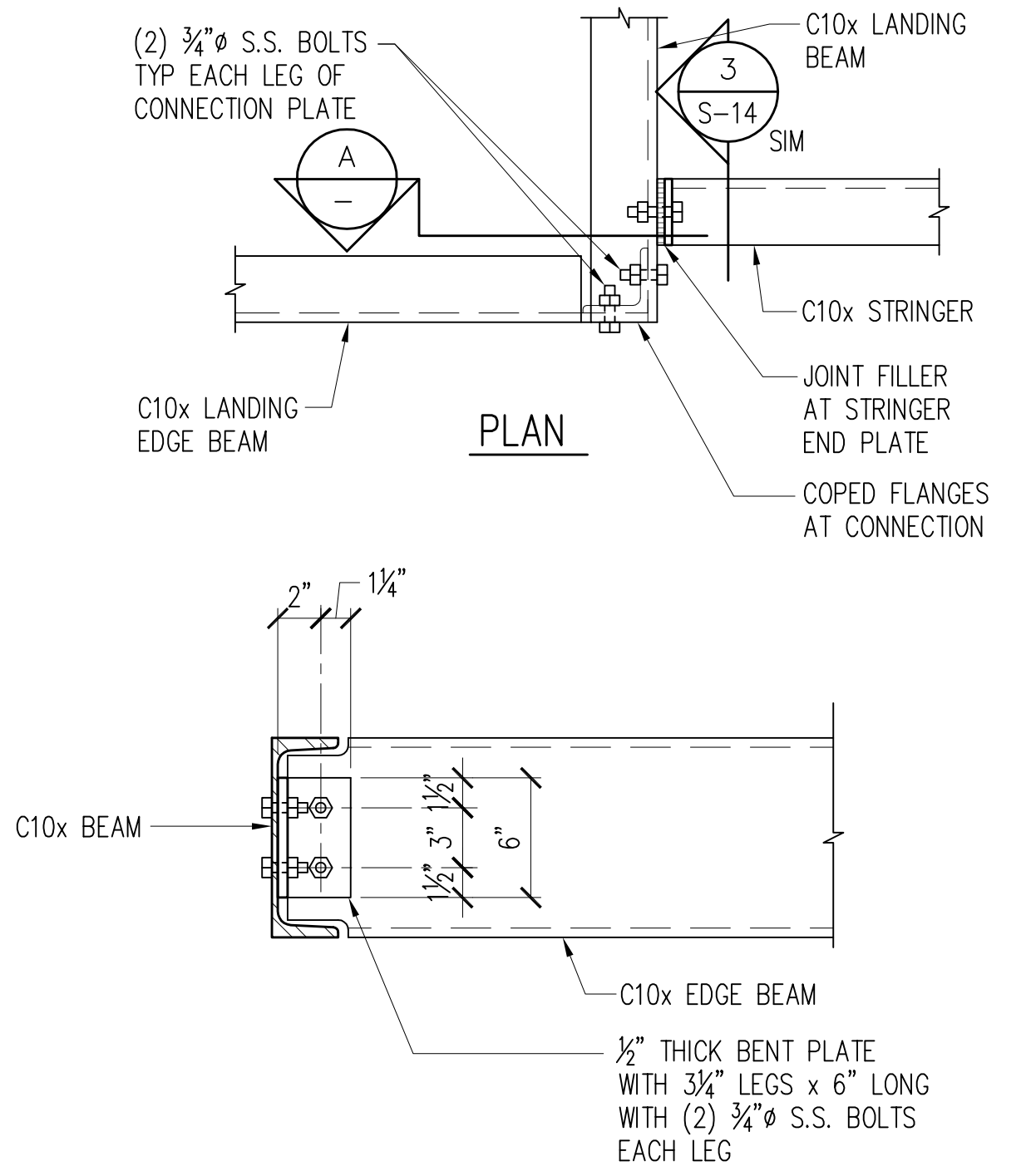
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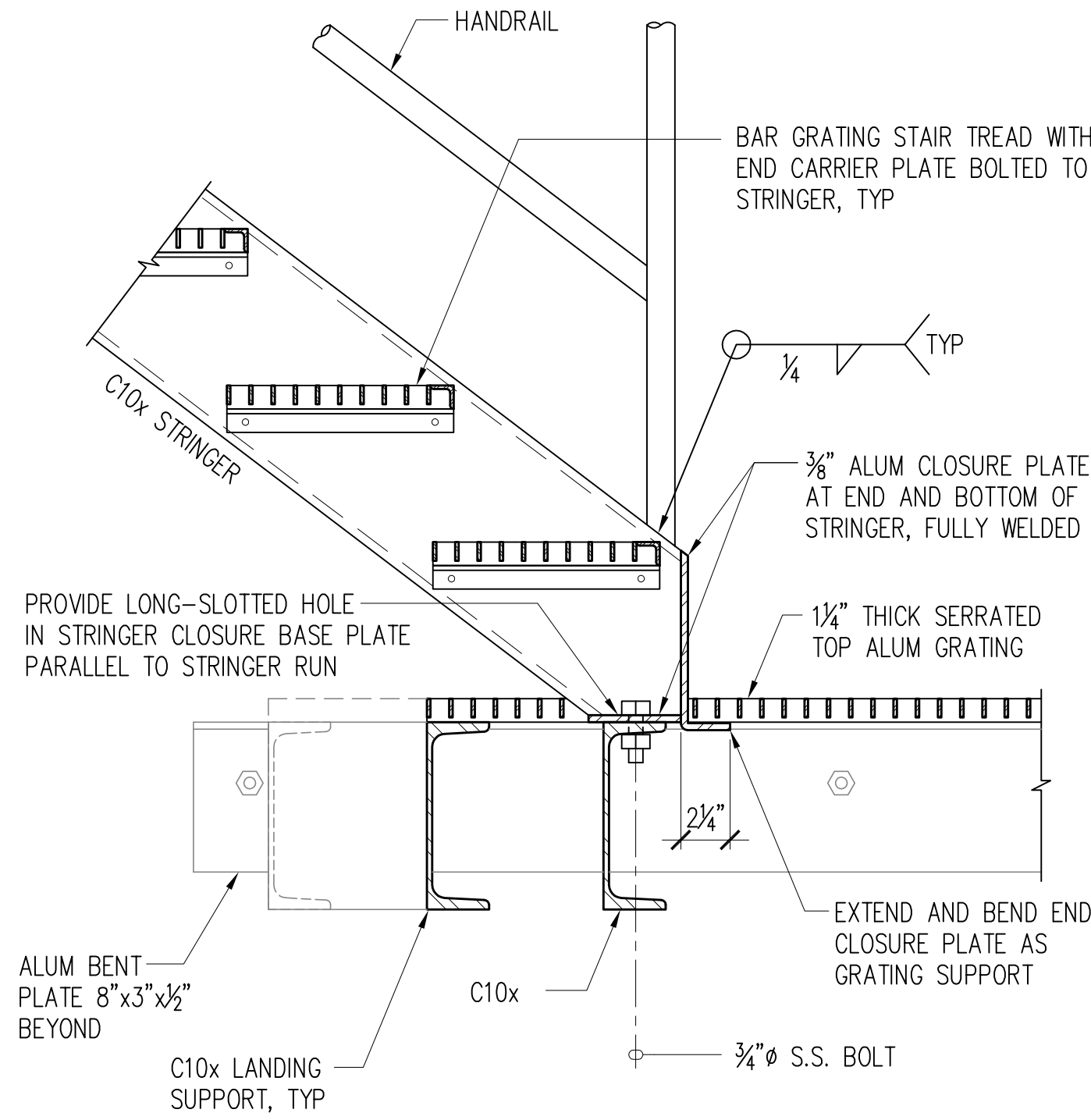
1 TYPICAL STAIR HANDRAIL & STRINGER ELEVATION
S-14 NOT TO SCALE



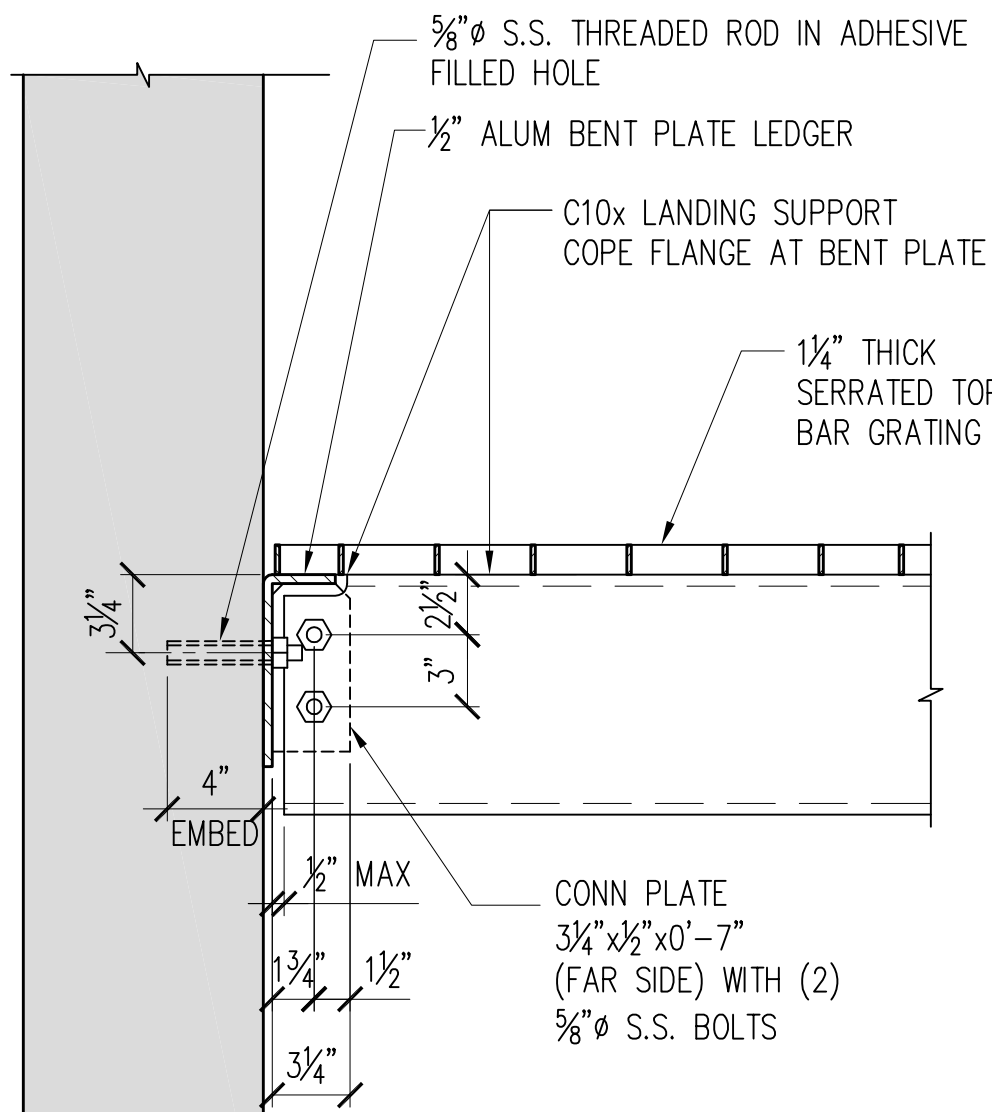
2 TOP OF STRINGER AT LANDING
S-14 SCALE: 1 1/2" = 1'-0"



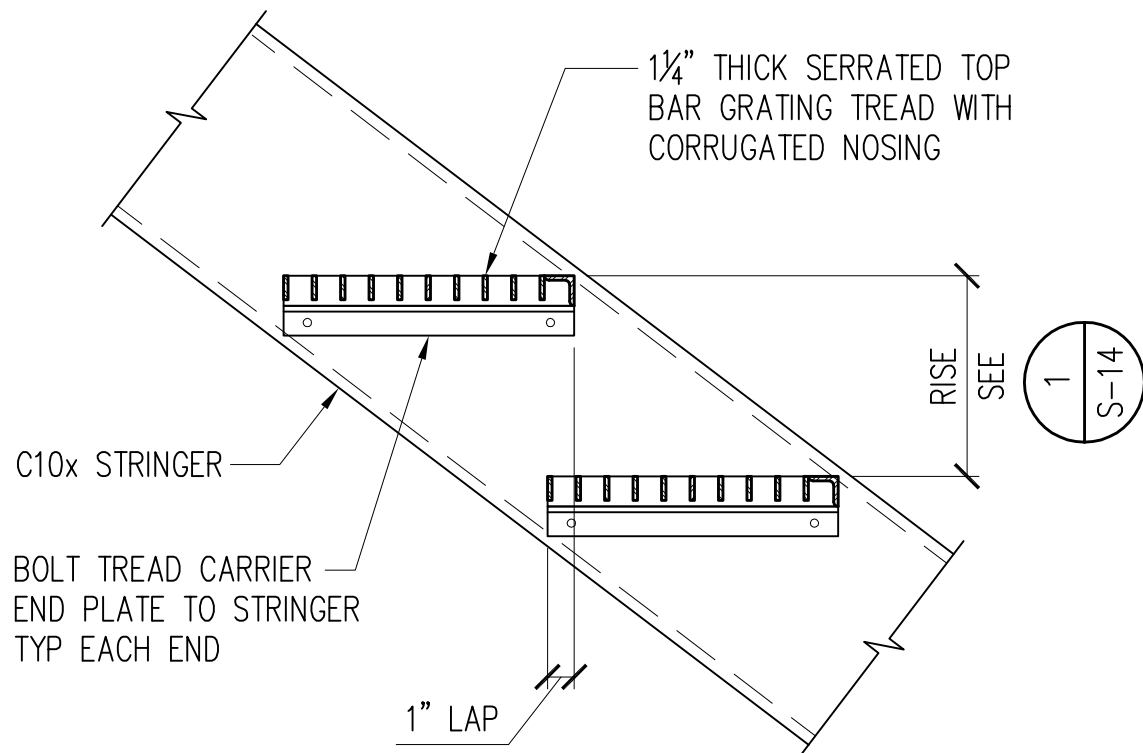
3 CHANNEL TO CHANNEL
S-14 SCALE: 1 1/2" = 1'-0"



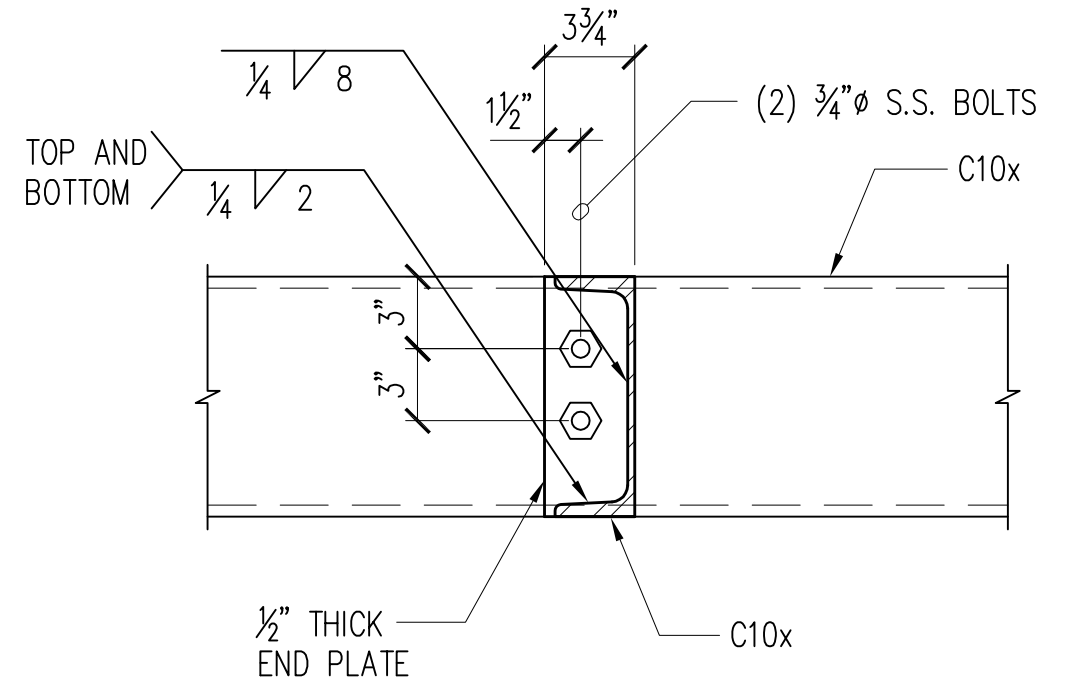
4 BOTTOM OF STRINGER AT LANDING
S-14 SCALE: 1 1/2" = 1'-0"



5 C10x LANDING SUPPORT TO LEDGER
S-14 SCALE: 1 1/2" = 1'-0"



6 STAIR TREAD DETAIL
S-14 NOT TO SCALE



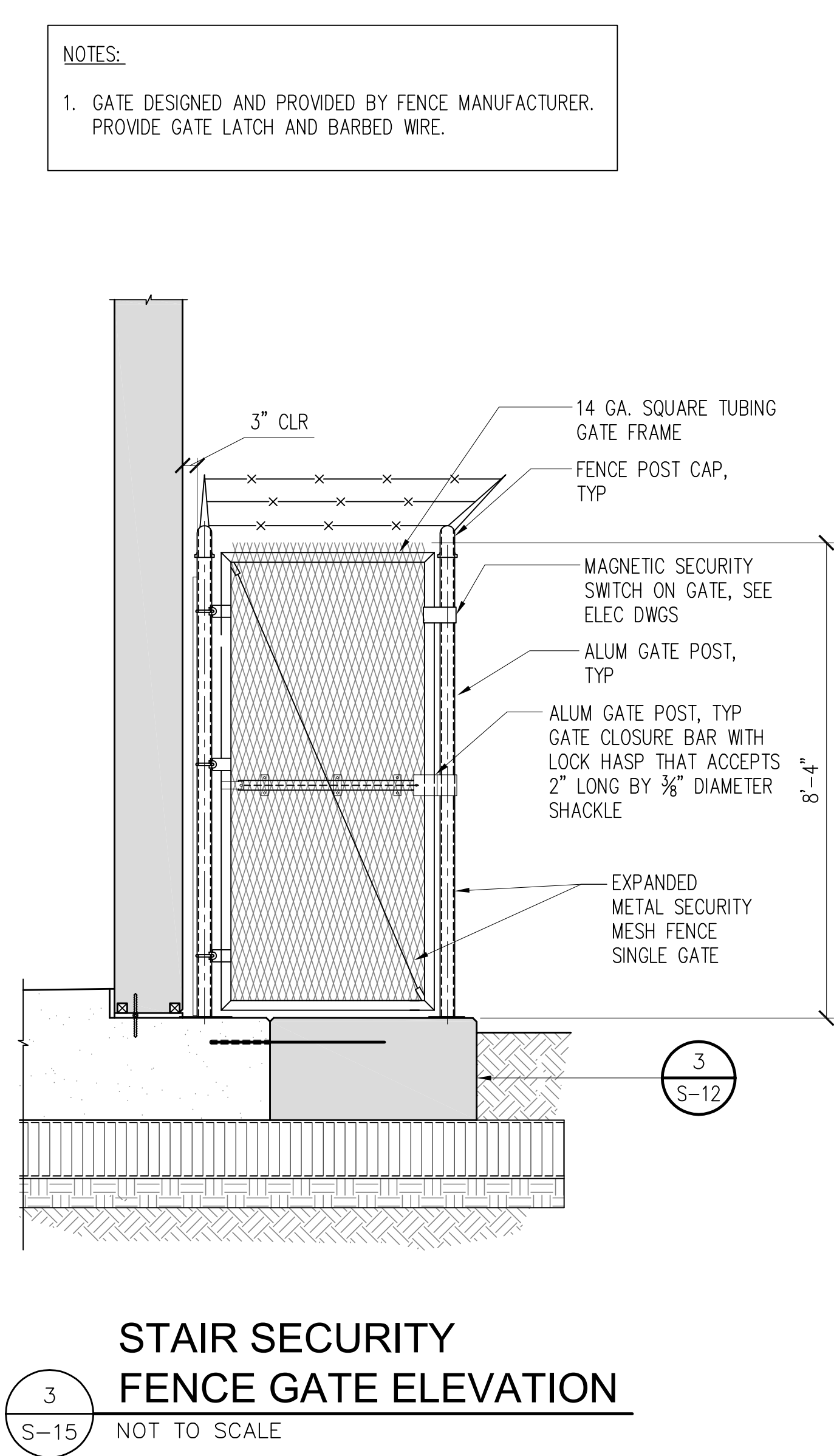
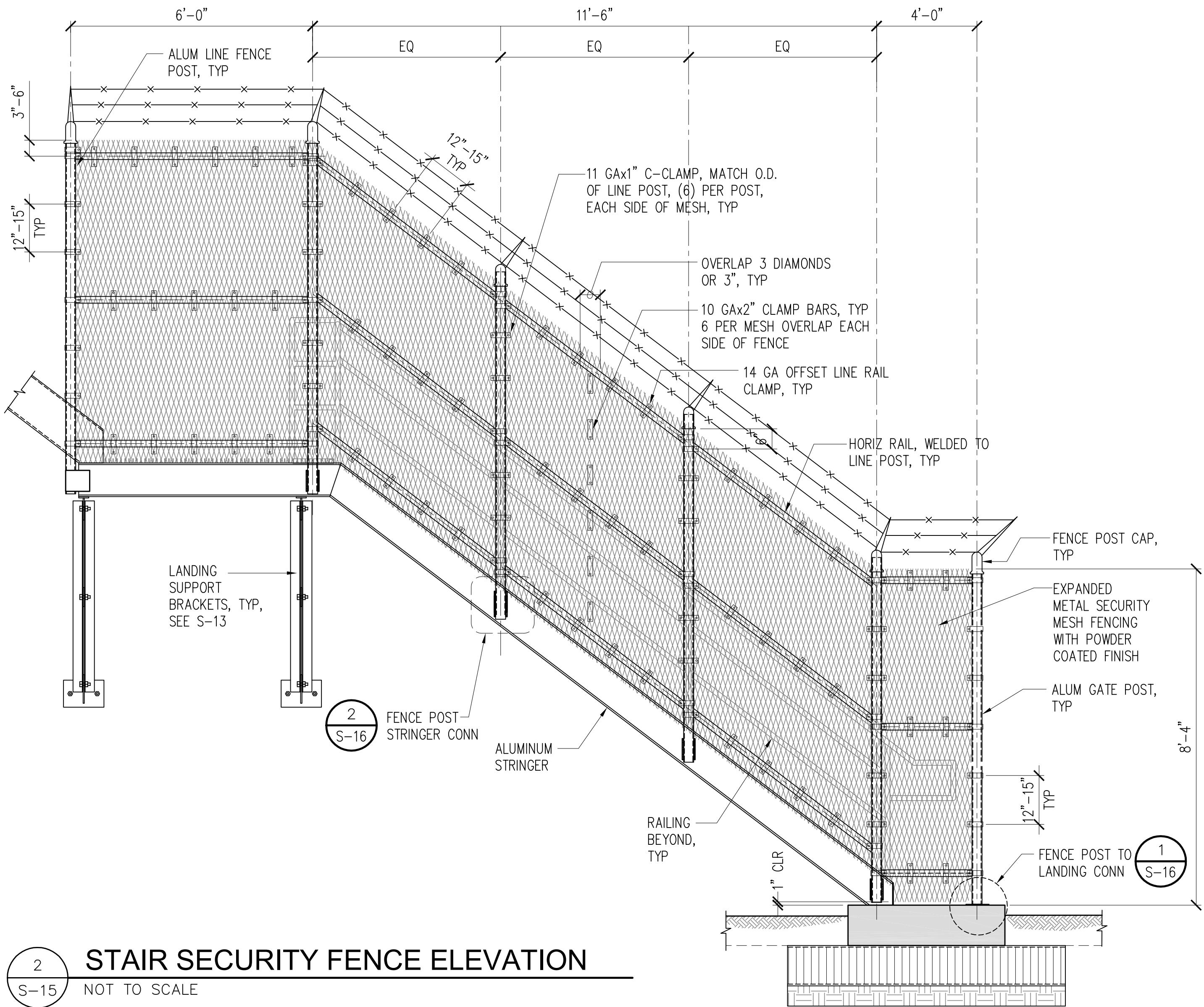
7 STAIR STRINGER TOP CONNECTION
S-14 SCALE: 1 1/2" = 1'-0"

DWG. NO.
S-14
SHEET 42 OF 54

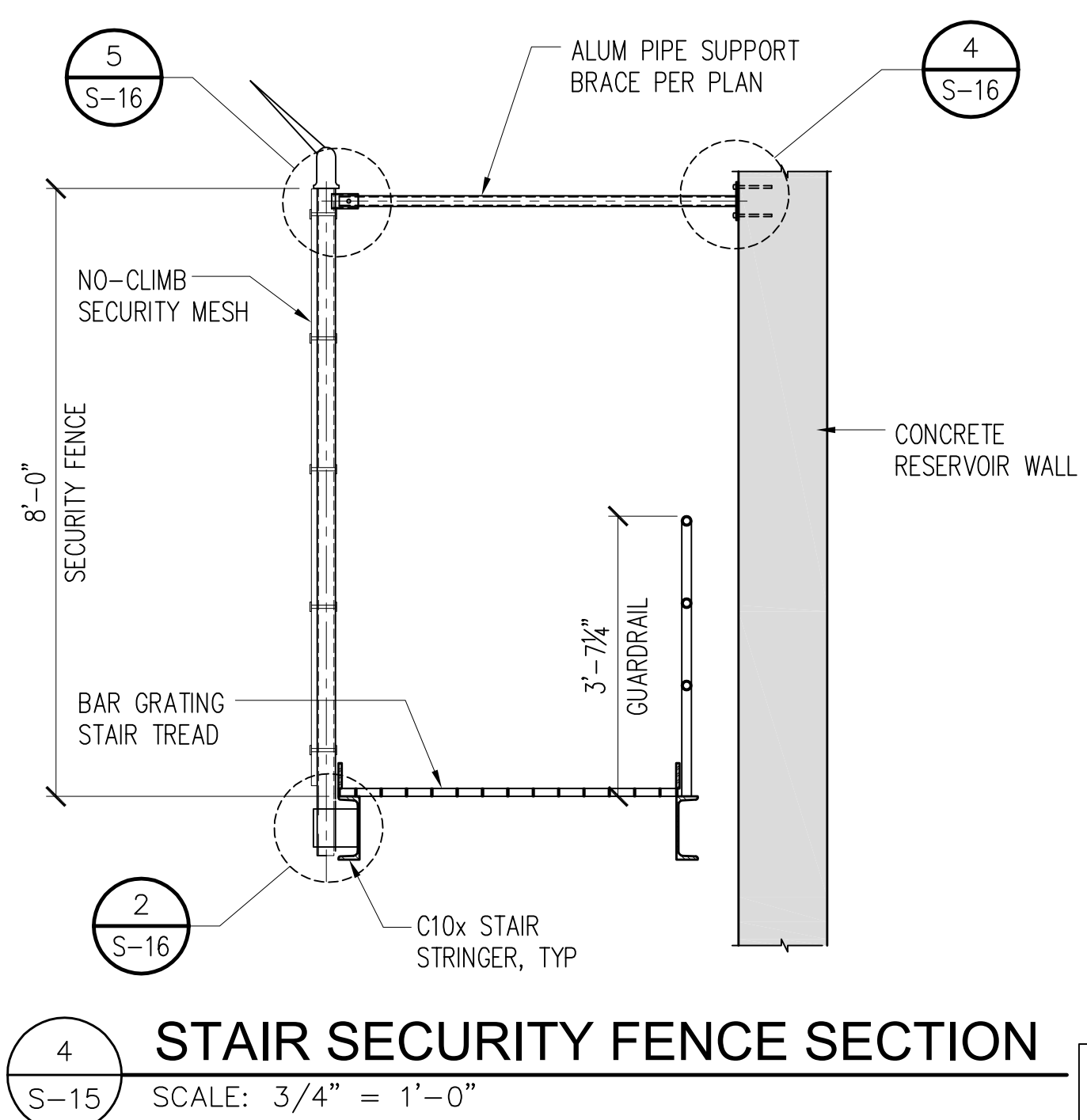
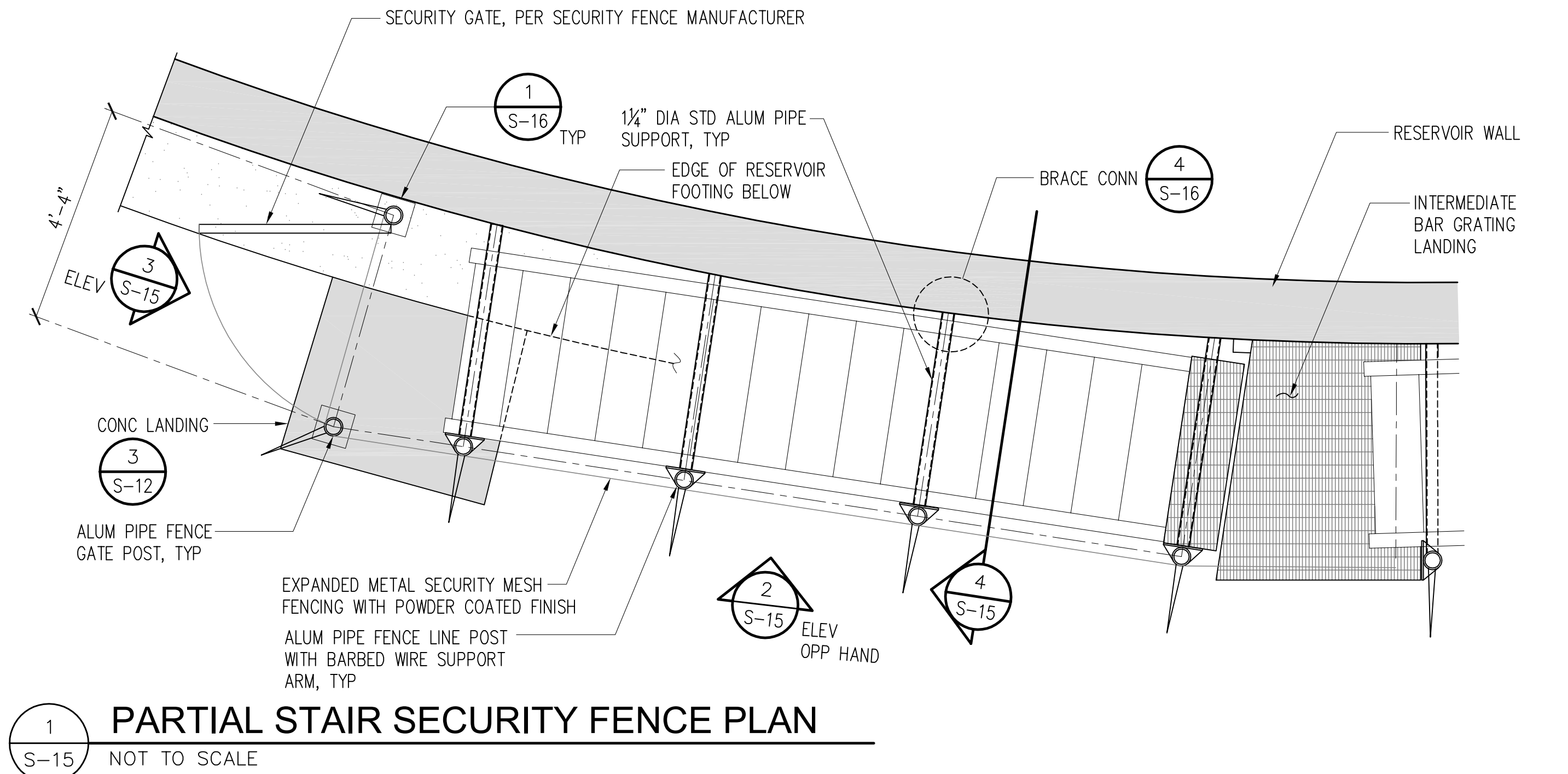
DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019
RESERVOIR STAIR
DETAILS
DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN
JANUARY 2020

REVISION DATE BRIEF MADE BY APPROVED
G70
FILE POCKET FOLDER NO.

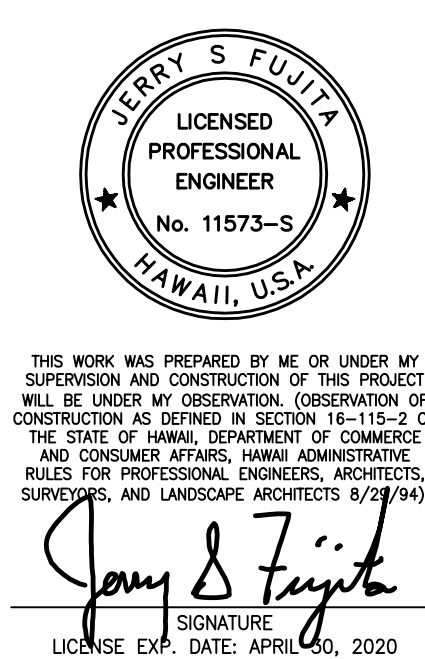
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- STAIR SECURITY FENCING NOTES:
- THE HIGH SECURITY FENCE SHALL BE A SECUREX FENCE EXPANDED METAL FENCE SYSTEM AS MANUFACTURED BY: NILES FENCE AND SECURITY PRODUCTS OR APPROVED EQUAL.
 - FENCING SYSTEM SHALL BE 8 FEET HIGH USING 3 HORIZONTAL RAILS (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.
 - 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
 - ALL FENCE FITTINGS AND HARDWARE SHALL BE POLYESTER POWDER COATING TO MATCH FENCING.
 - 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.
 - USE INSULATING SLEEVES AND PHENOLIC WASHERS TO ELECTRICALLY ISOLATE THE BOLTS.
 - 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.
 - THE FENCING ALIGNMENT SHALL BE LOCATED RELATIVE TO THE EXTERIOR STAIR STRINGER AS INDICATED ON THIS SHEET. NEW POSTS SHALL BE PROVIDED FOR FENCING.
 - 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.
 - 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.
 - INSTALL 3 STRANDS BARBED WIRE ABOVE TOP OF FENCE. BARBED WIRE SUPPORT ARMS TO HAVE POLYESTER POWDER COATING TO MATCH FENCE SYSTEM.



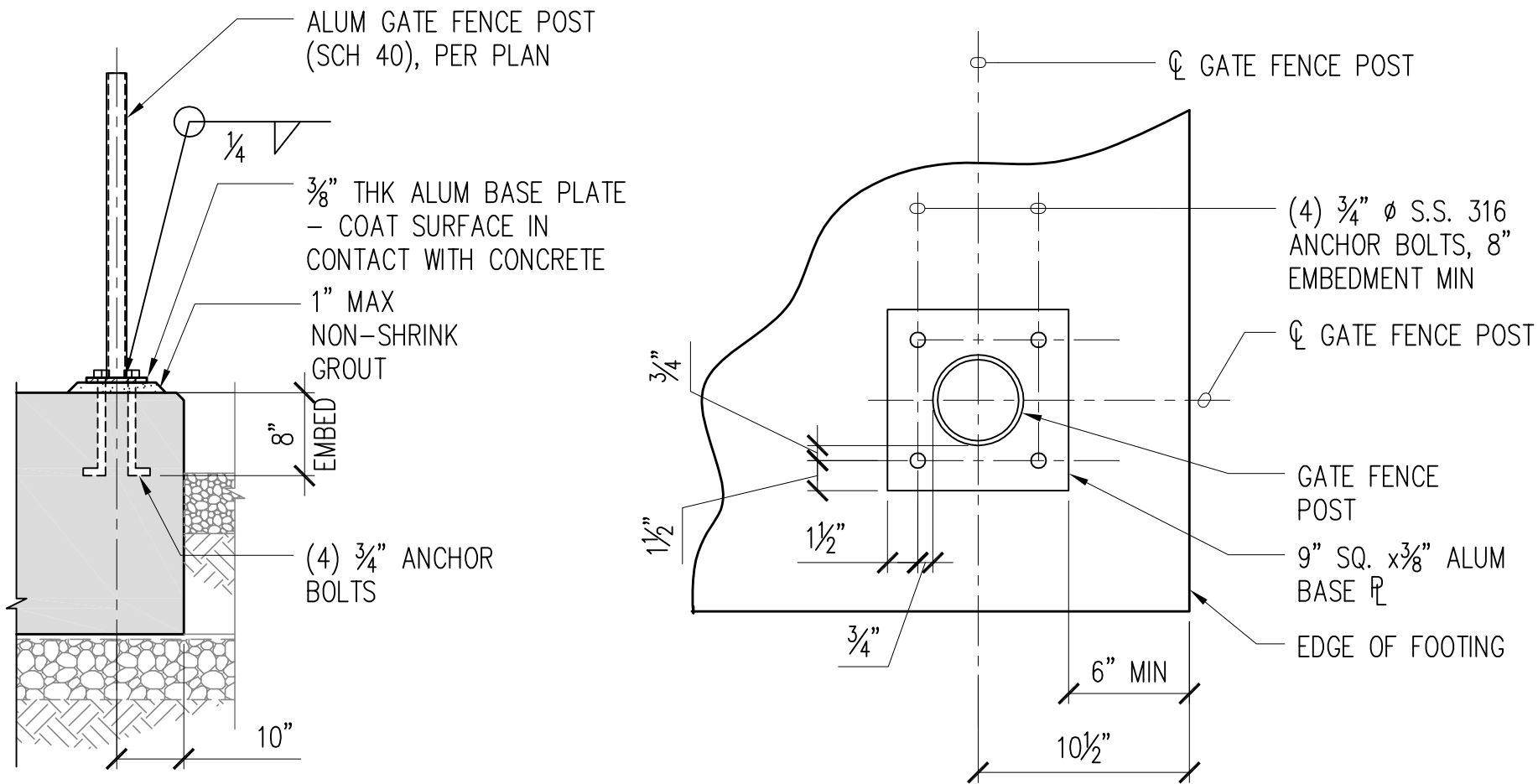
DWG. NO. S-15
SHEET 43 OF 54



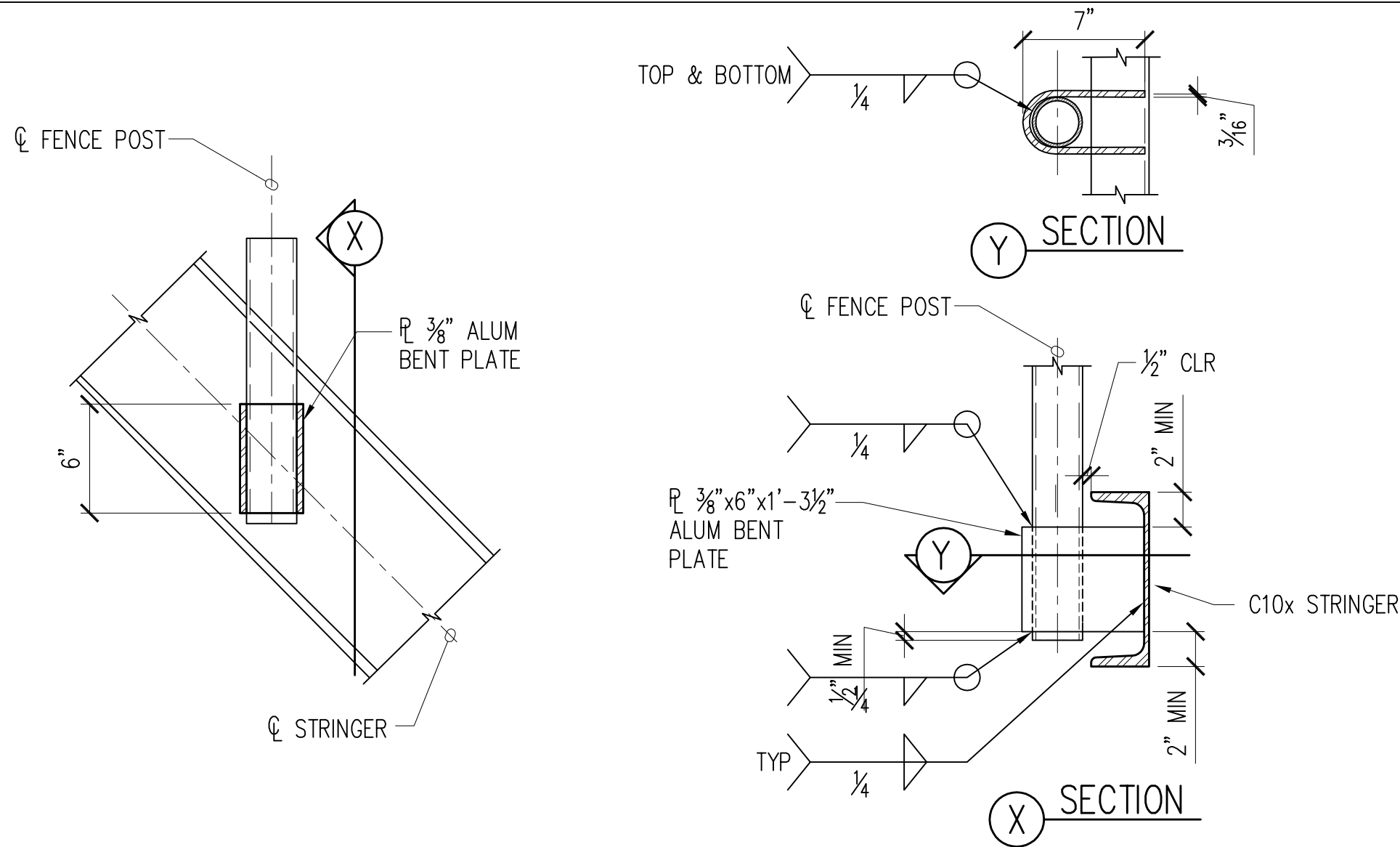
REVISION		DATE	BRIEF	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
RESERVOIR EXTERIOR STAIR SECURITY FENCING PLAN AND ELEVATIONS					
DESIGNED BY:	DY	CHECKED BY:	JF	DRAWN BY:	CADD
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G7O.DESIGN		G7O			
JANUARY 2020					

FILE POCKET FOLDER NO.

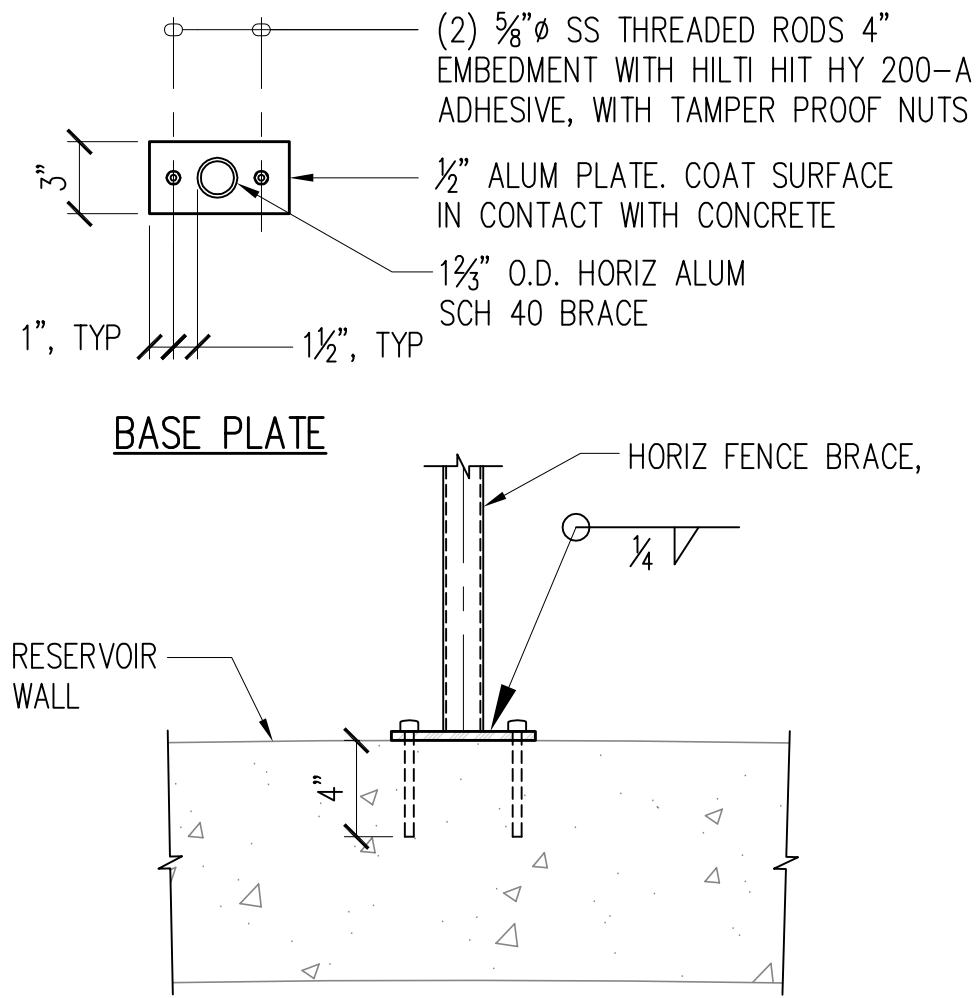
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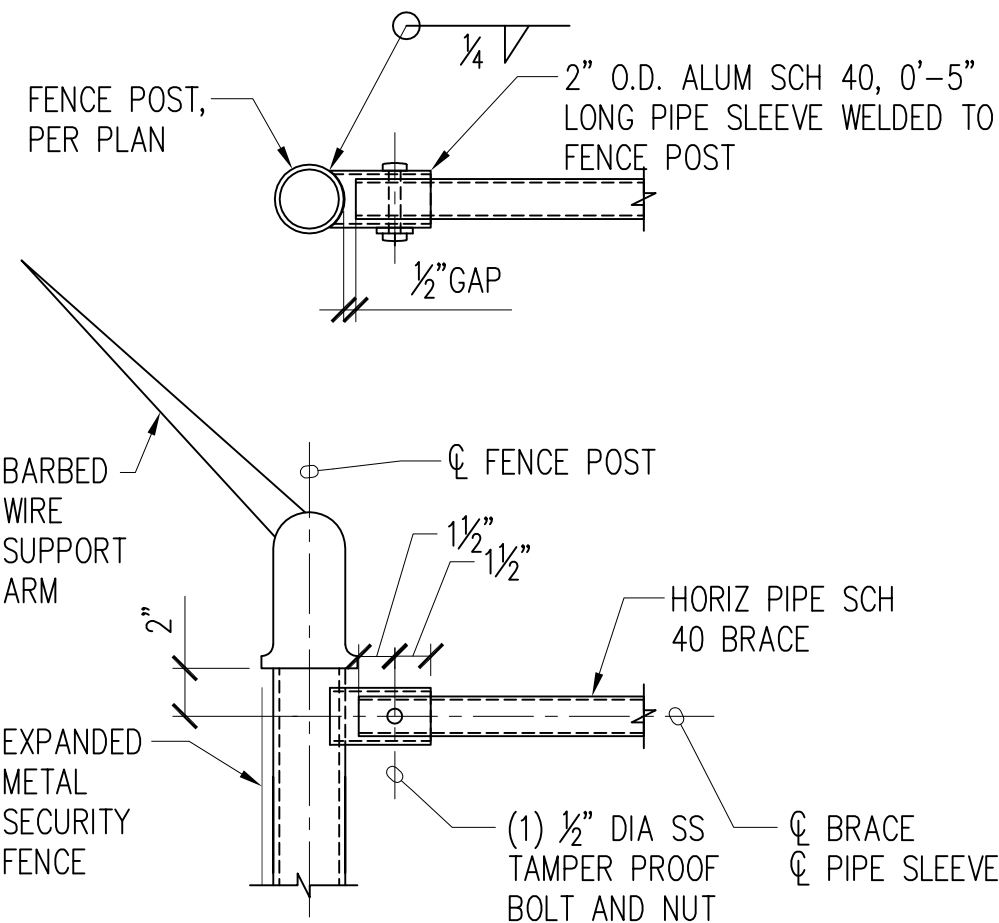
1 FENCE GATE POST CONNECTION
S-16 SCALE: 1 1/2" = 1'-0"



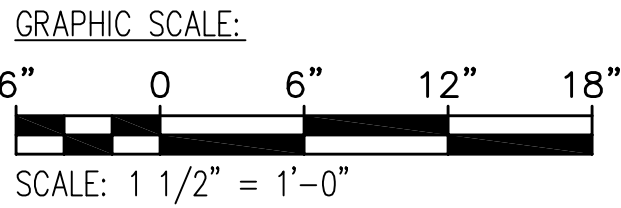
2 FENCE POST STRINGER CONNECTION
S-16 SCALE: 1 1/2" = 1'-0"



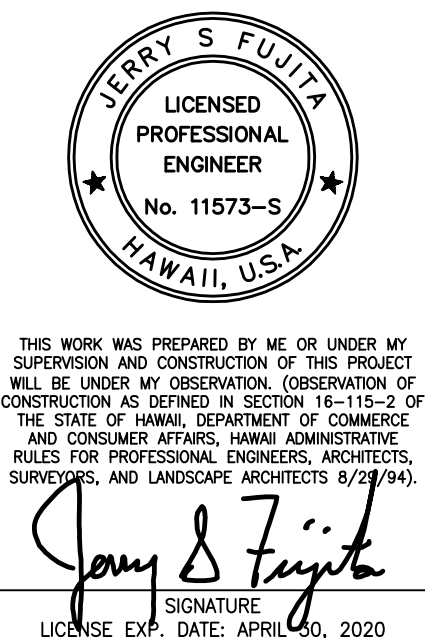
3 FENCE BRACE TO WALL CONNECTION
S-16 SCALE: 1 1/2" = 1'-0"



4 FENCE BRACE TO FENCE POST CONNECTION
S-16 SCALE: 1 1/2" = 1'-0"



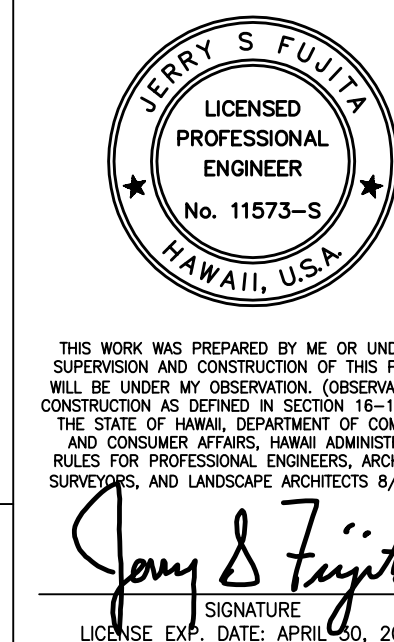
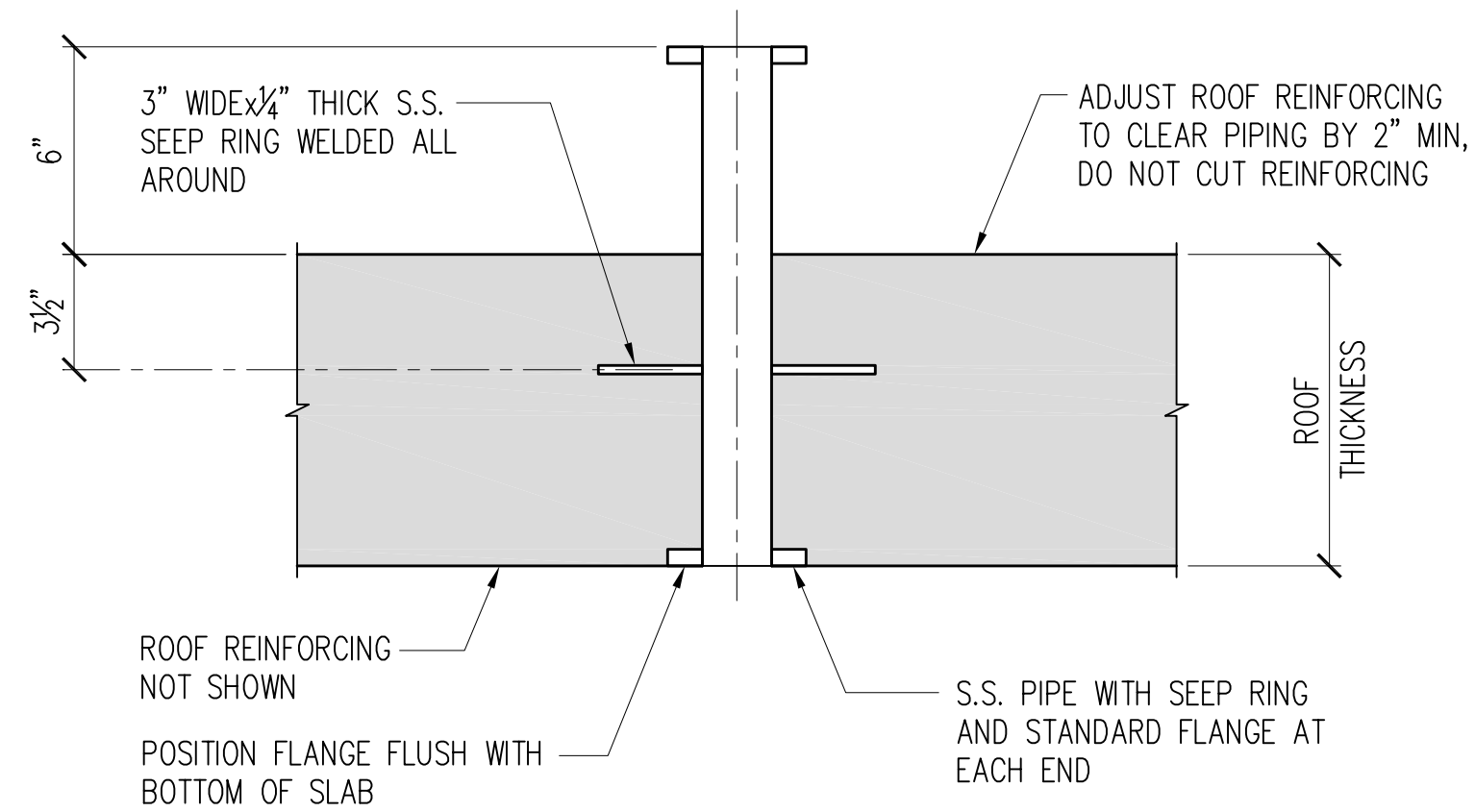
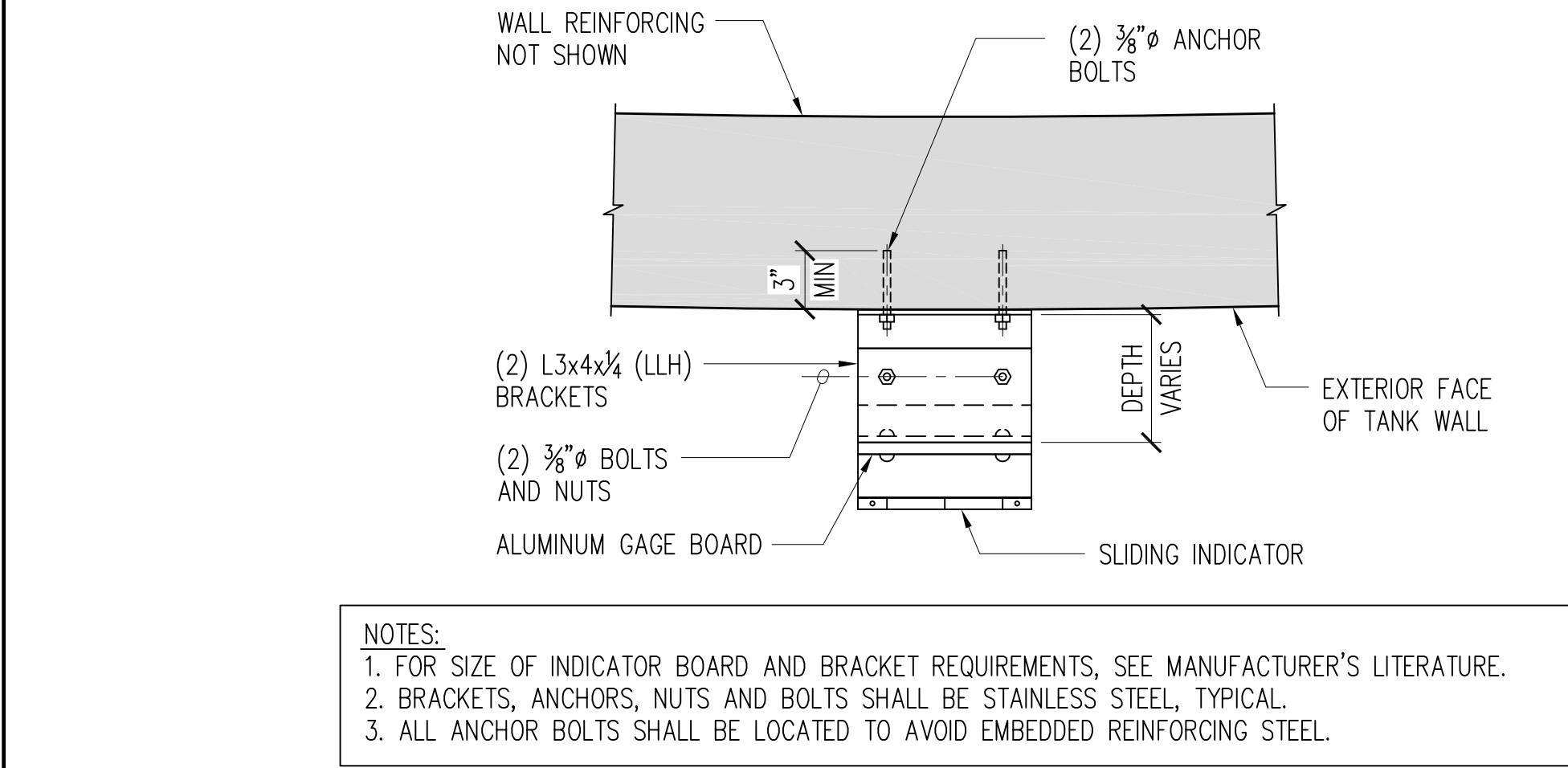
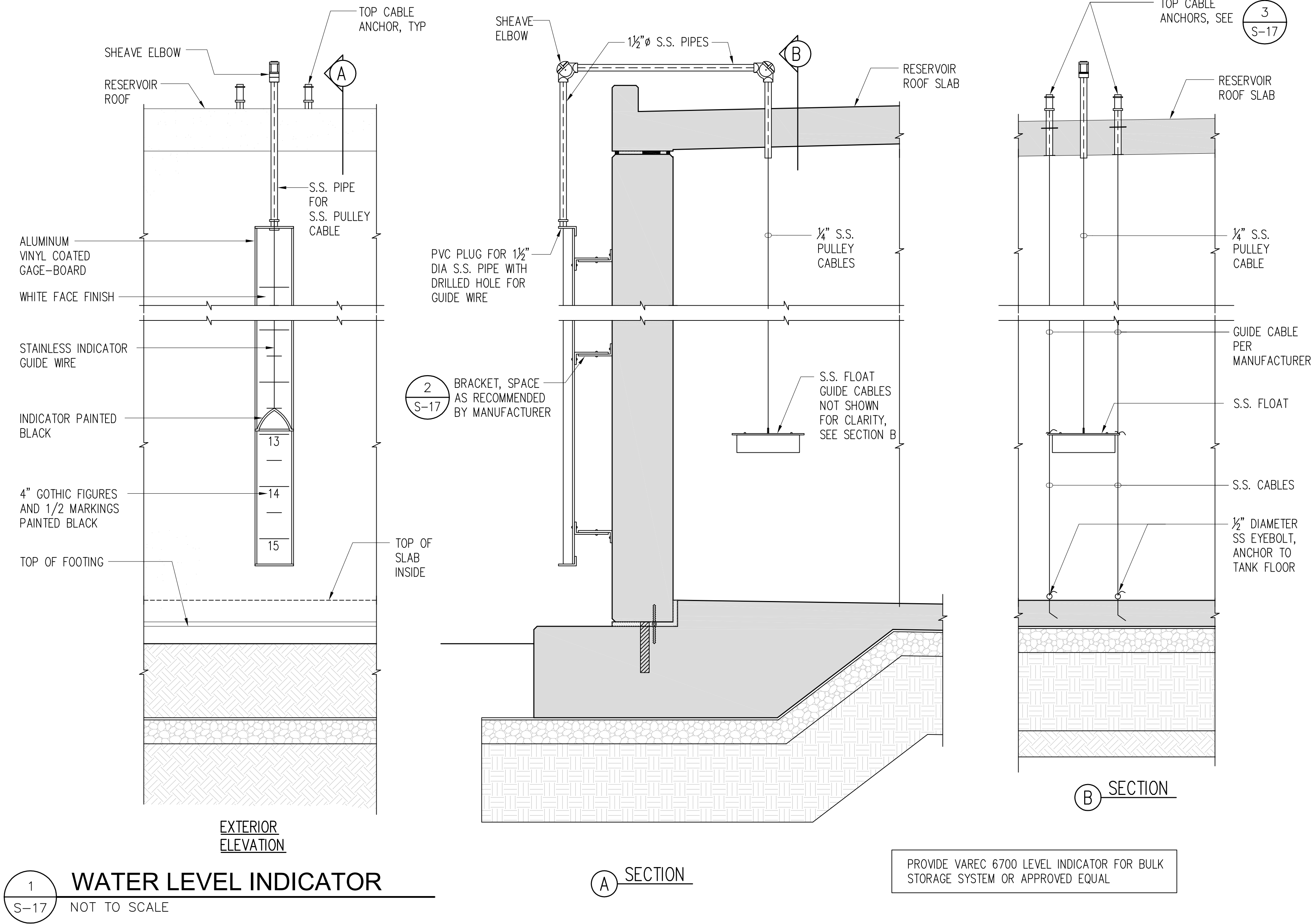
DWG. NO.
S-16
SHEET 44 OF 54



REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
RESERVOIR EXTERIOR STAIR SECURITY FENCING DETAILS					
DESIGNED BY:	DY	CHECKED BY:	JF	DRAWN BY:	CADD
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN					
JANUARY 2020					

FILE	POCKET	FOLDER	NO.
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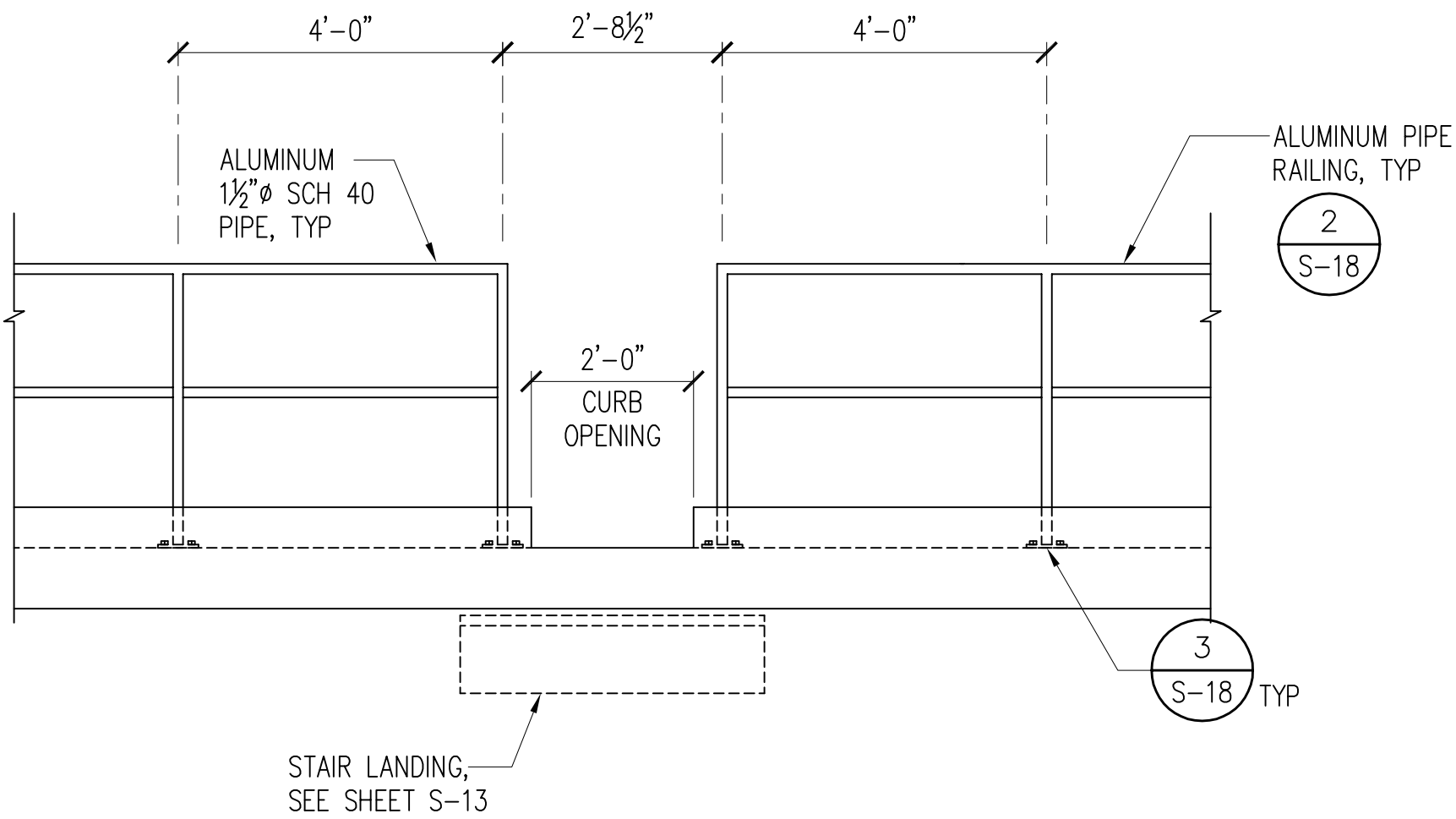


DWG. NO.
S-17
SHEET 45 OF 54

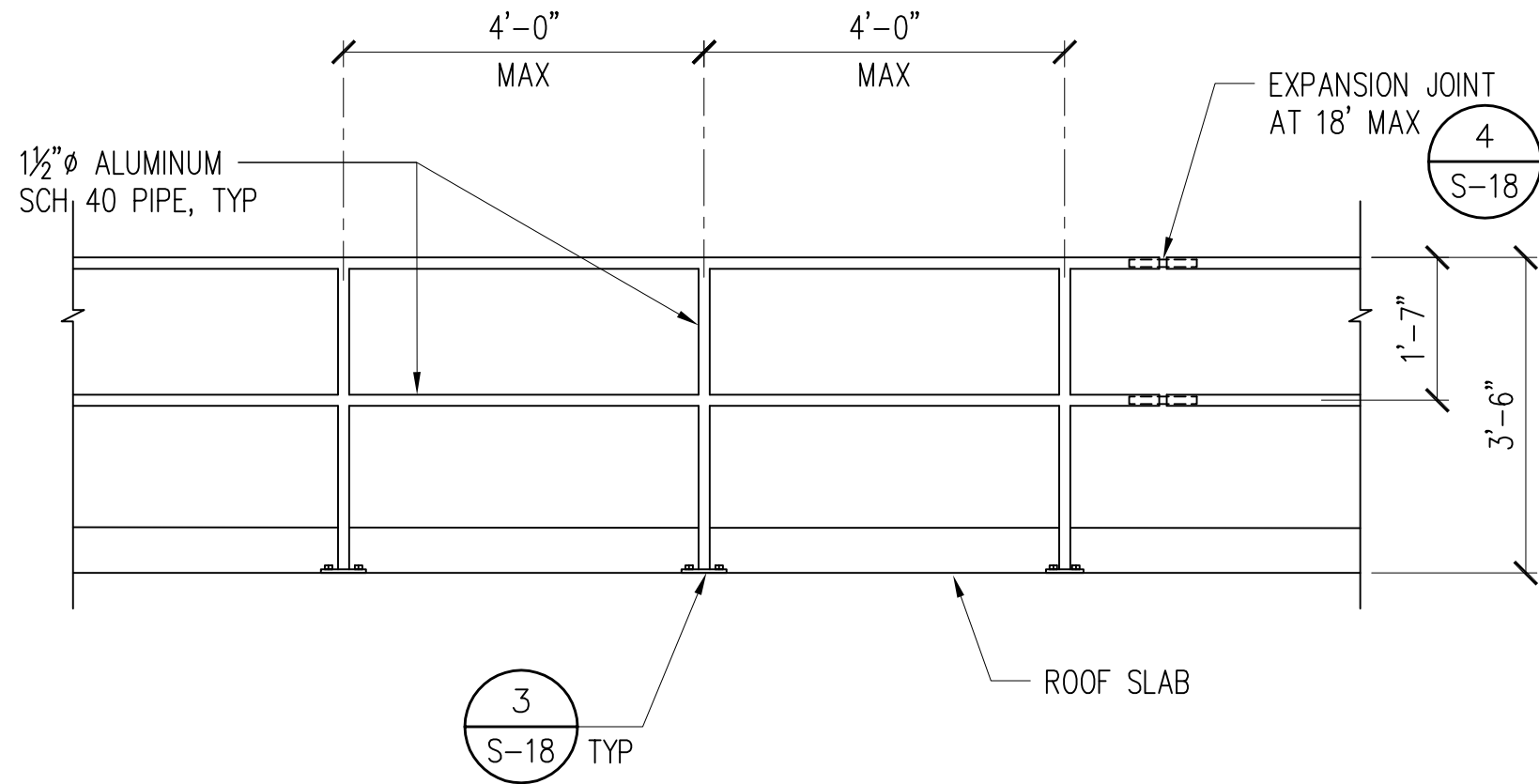
REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
MISCELLANEOUS RESERVOIR DETAILS					
DESIGNED BY:	DY	CHECKED BY:	JF	DRAWN BY:	CADD
111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN					
JANUARY 2020					

FILE	POCKET	FOLDER	NO.
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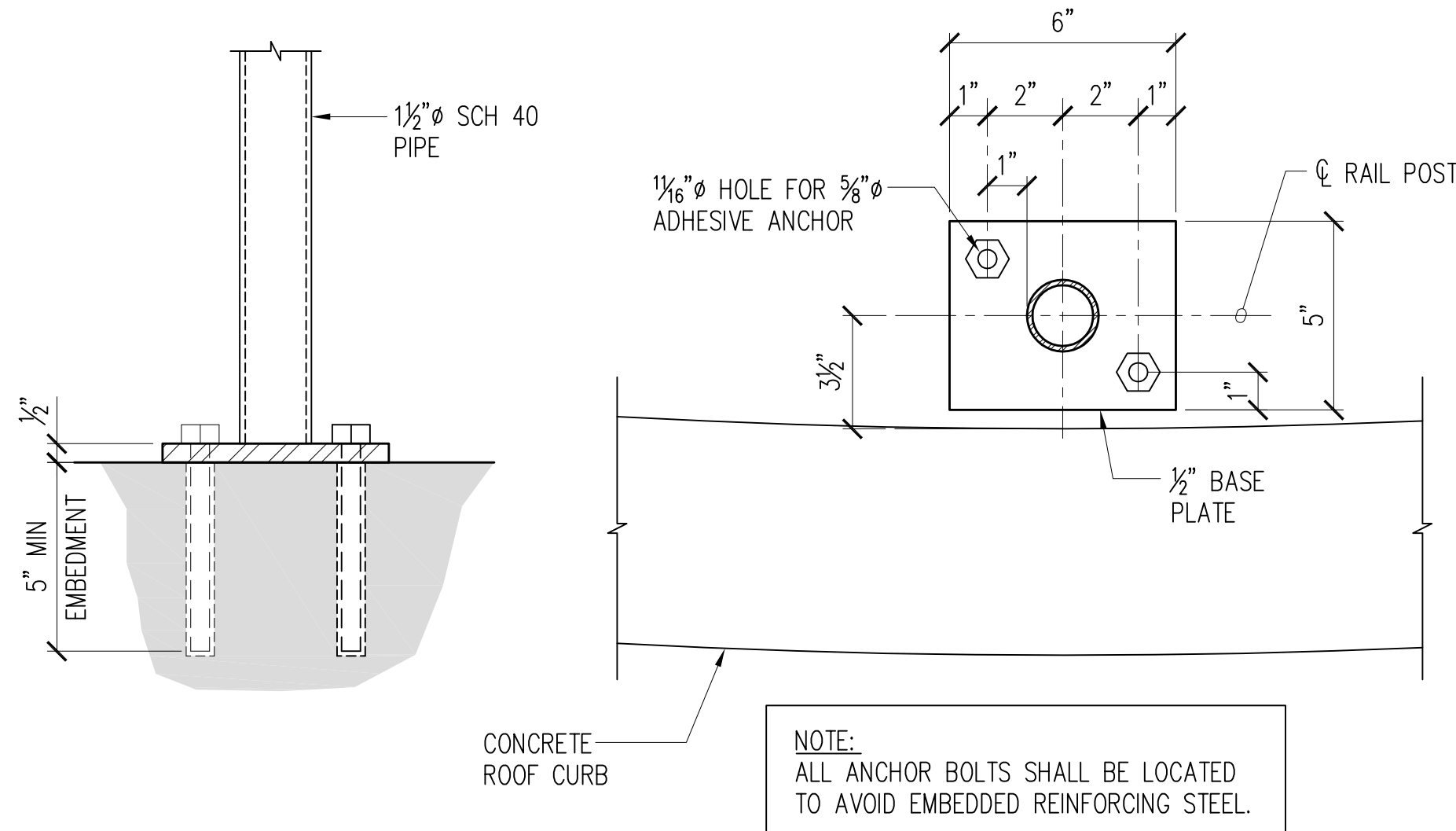
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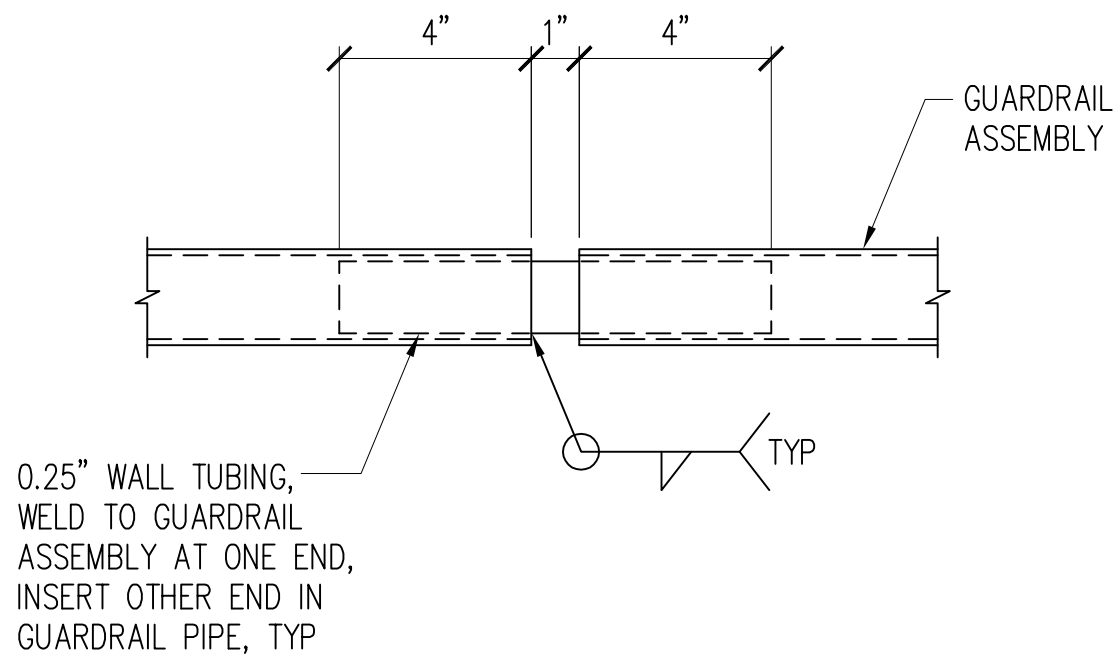
1 GUARDRAILS AT STAIR LANDING
S-18 SCALE: 1/2" = 1'-0"



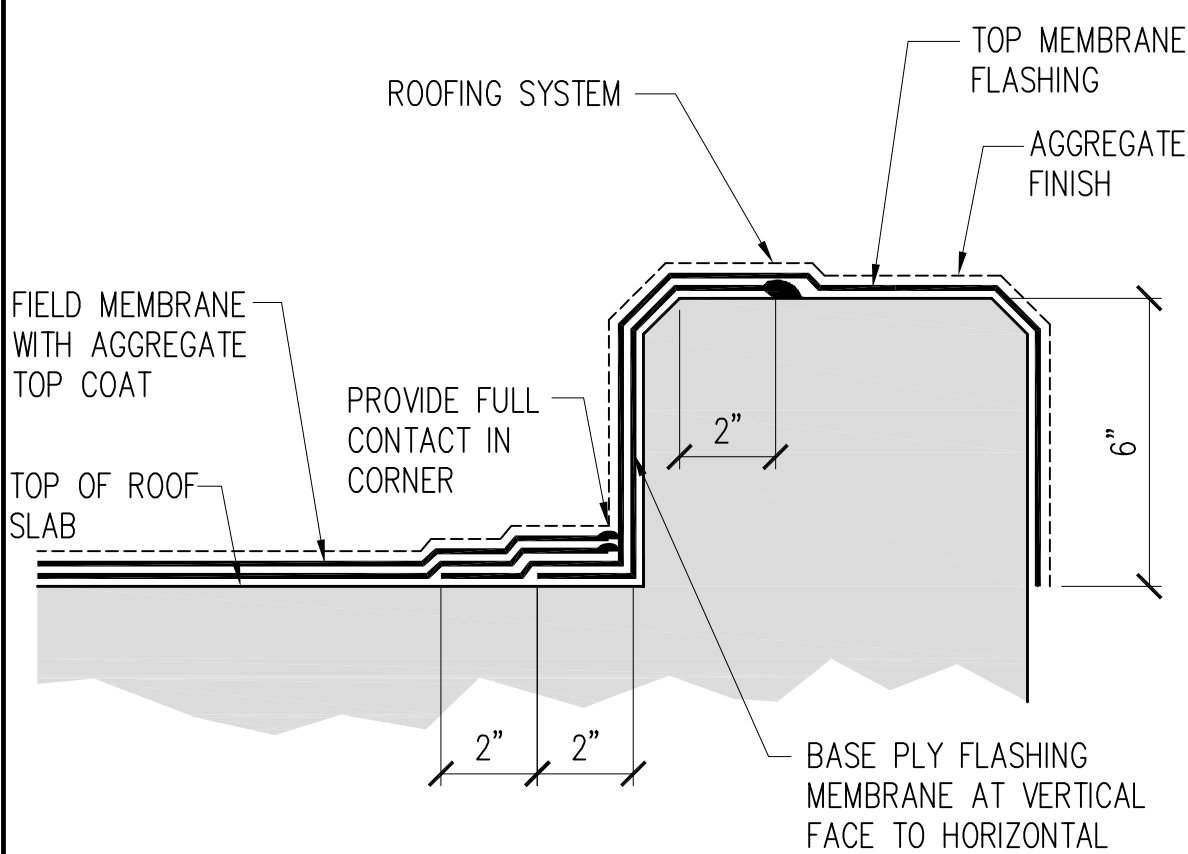
2 TYPICAL GUARDRAIL ELEVATION
S-18 SCALE: 1/2" = 1'-0"



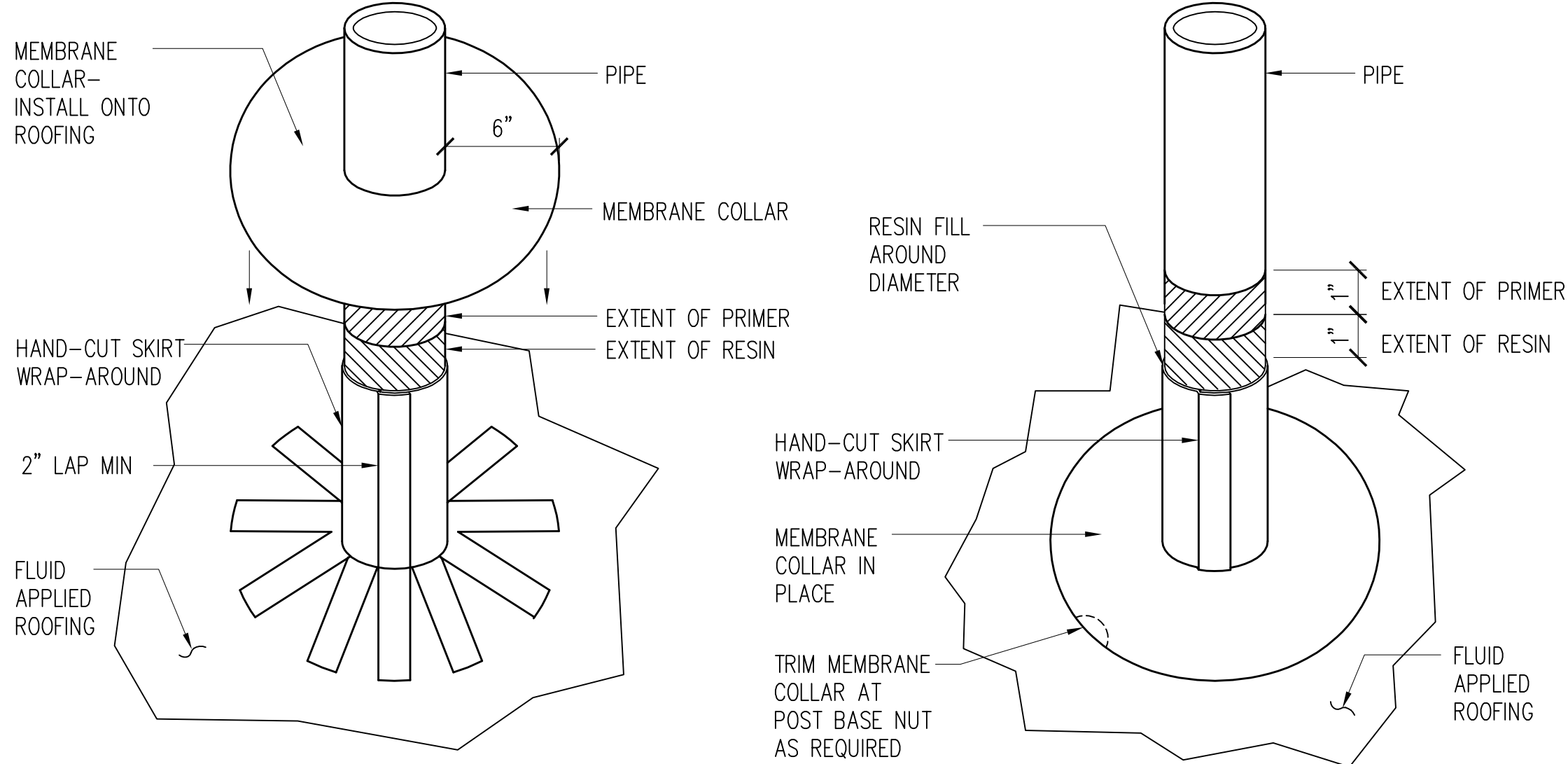
3 GUARDRAIL BASE PLATE DETAILS
S-18 SCALE: 3" = 1'-0"



4 GUARDRAIL EXPANSION JOINT DETAIL
S-18 SCALE: 3" = 1'-0"



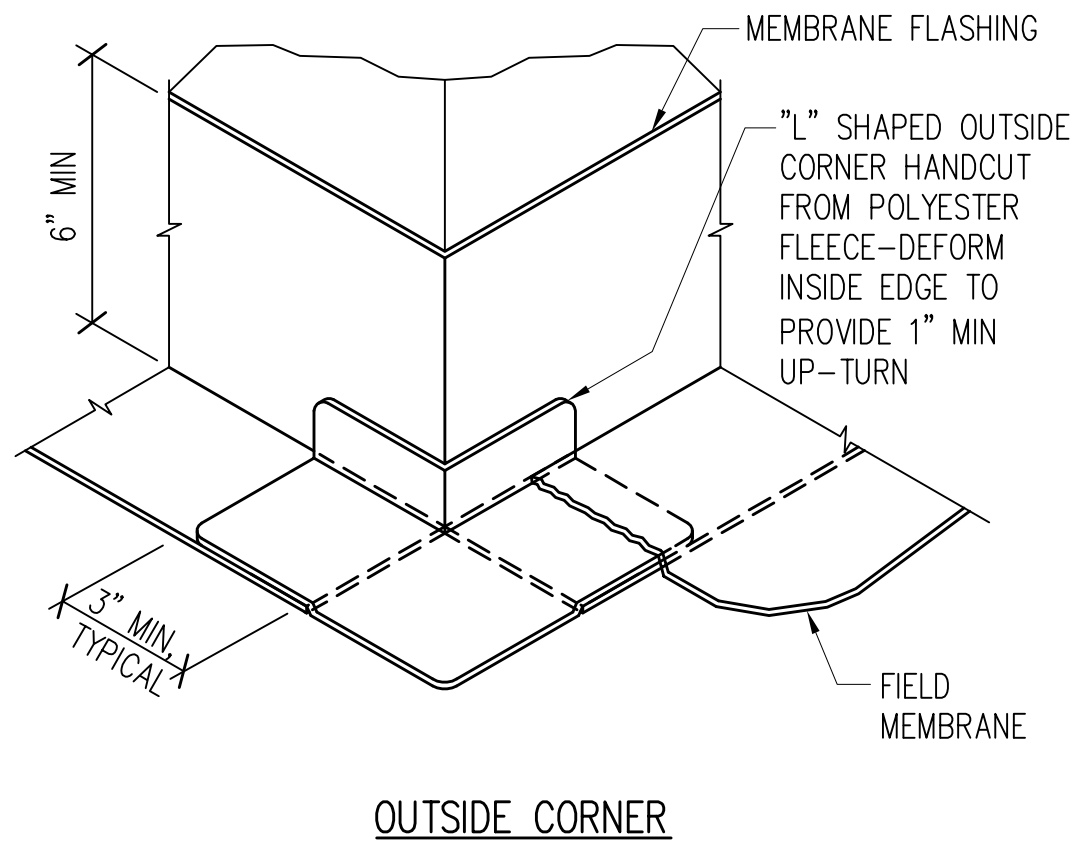
5 TYPICAL ROOFING AT ROOF CURB
S-18 SCALE: 3" = 1'-0"



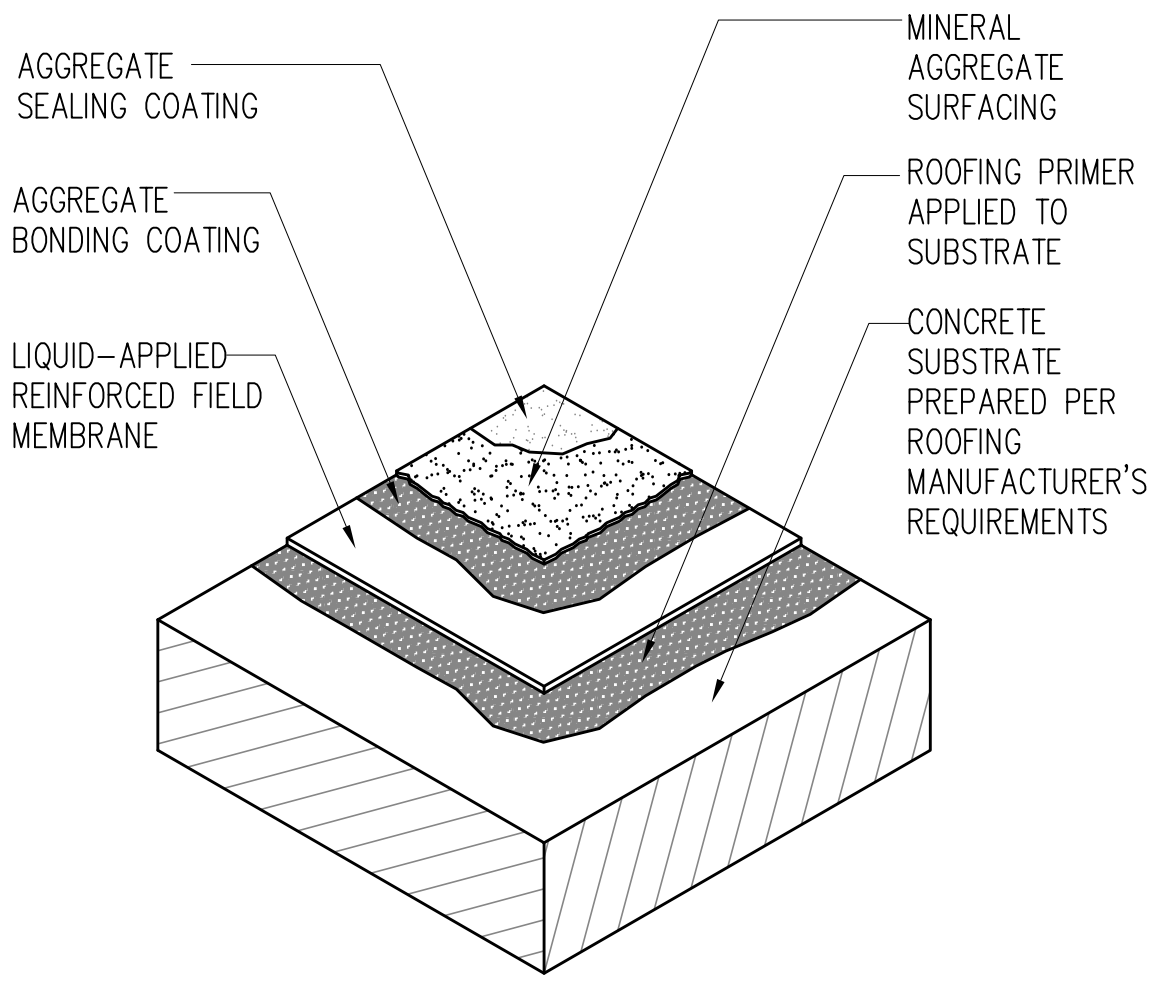
6 TYPICAL PIPE SEALING DETAIL
S-18 NOT TO SCALE

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.



7 ROOF FLASHING AT CORNER
S-18 NOT TO SCALE



8 TYPICAL LIQUID-APPLIED ROOFING ASSEMBLY DETAIL
S-18 NOT TO SCALE

DWG. NO. S-18
SHEET 46 OF 54

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 8/28/94).

DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD
111 S. KING STREET, SUITE 170
HONOLULU, HAWAII 96813
808.523.5866
WWW.G70.DESIGN

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

SIGNATURE
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED	
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII					
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019					
RESERVOIR RAILING AND ROOFING DETAILS					
DESIGNED BY: DY CHECKED BY: JF DRAWN BY: CADD					
G70					
JANUARY 2020					
FILE	POCKET	FOLDER	NO.		

ELECTRICAL SYMBOLS			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	DUPLEX RECEPTACLE, NEMA 5-15R, 120V, MTD. +18" OR AS NOTED		FLEXIBLE CONDUIT, LIQUIDTIGHT
	DUPLEX RECEPTACLE, WITH GROUND FAULT CIRCUIT INTERRUPTER, NEMA 5-20R, 120V, MTD. +18" OR AS NOTED		EXPOSED CONDUIT
	ELECTRICAL PANELBOARD		CONDUIT OR DUCTLINE BELOW REF. FL. OR GROUND
	JUNCTION BOX, CEIL. MTD., 4-11/16" NOM.		CONDUIT CONCEALED ABOVE REF. FL., 3 WIRES WITH GROUND WIRE
	JUNCTION BOX, WALL MTD., 4-11/16" NOM.		EXISTING UTILITY OVERHEAD LINES
	JUNCTION BOX MTD. ON CHANNEL SUPPORT, SEE DETAIL 1/E-8		EXISTING DUCTLINE
	LT. SW., 1P, CONTROLLING OUTLET(S) "a", MTD. +48" OR AS NOTED		ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE, WITH DUCT COMPLEMENTS NOTED BELOW (TYPE "A" DUCT INDICATED WITH 1-4"E DUCT, AND TYPE "S" DUCT WITH 1-1"C DUCT; E=ELECTRIC, T=TELEPHONE, C=CONTROLS, I=INSTRUMENTATION, A=ANTENNA); SEE SHEET E-2 FOR DUCT SECTION DETAILS
	EQUIPMENT CONNECTION		
	PRESSURE TRANSMITTER CONNECTION		
	LEVEL TRANSMITTER CONNECTION		
	FLOW METER CONNECTION		
	LIMIT SWITCH CONNECTION		3'X5' HELCO CONCRETE HANDHOLE PER HELCO REQUIREMENTS AND APPROVAL
	CONTROL VALVE CONNECTION		
	AREA LIGHT POLE		
SPD	DENOTES "SURGE PROTECTIVE DEVICE"	NOTE: NO HASH MARKS ON CONDUITS INDICATE 2 WIRES; INDICATES 3 WIRES; INDICATES 4 WIRES, ETC.	
WP	DENOTES "WEATHERPROOF"		
SS	DENOTES "TYPE 316 STAINLESS STEEL"		

GENERAL CONSTRUCTION NOTES

1.
- CONTRACTOR SHALL COORDINATE ALL WORK WITH THE HAWAII ELECTRIC LIGHT COMPANY.
2.
- PROVIDE POLYOLEFIN 200LB TEST PULLCORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.
3.
- ALL ELECTRICAL EQUIPMENT ENCLOSURES AND EQUIPMENT MOUNTING HARDWARE AND FASTENERS FOR OUTDOOR INSTALLATION SHALL BE TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.

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

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
2020.02.07
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS STATE OF HAWAII				
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1 KAU, HAWAII, HAWAII IFB-20-HHL-019				
ELECTRICAL SYMBOLS, GENERAL NOTES				
DESIGNED BY:	BHK	CHECKED BY:	BO	DRAWN BY: BHK
		111 S. KING STREET, SUITE 170 HONOLULU, HAWAII 96813 808.523.5866 WWW.G70.DESIGN		
			FEBRUARY 2020	

 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.

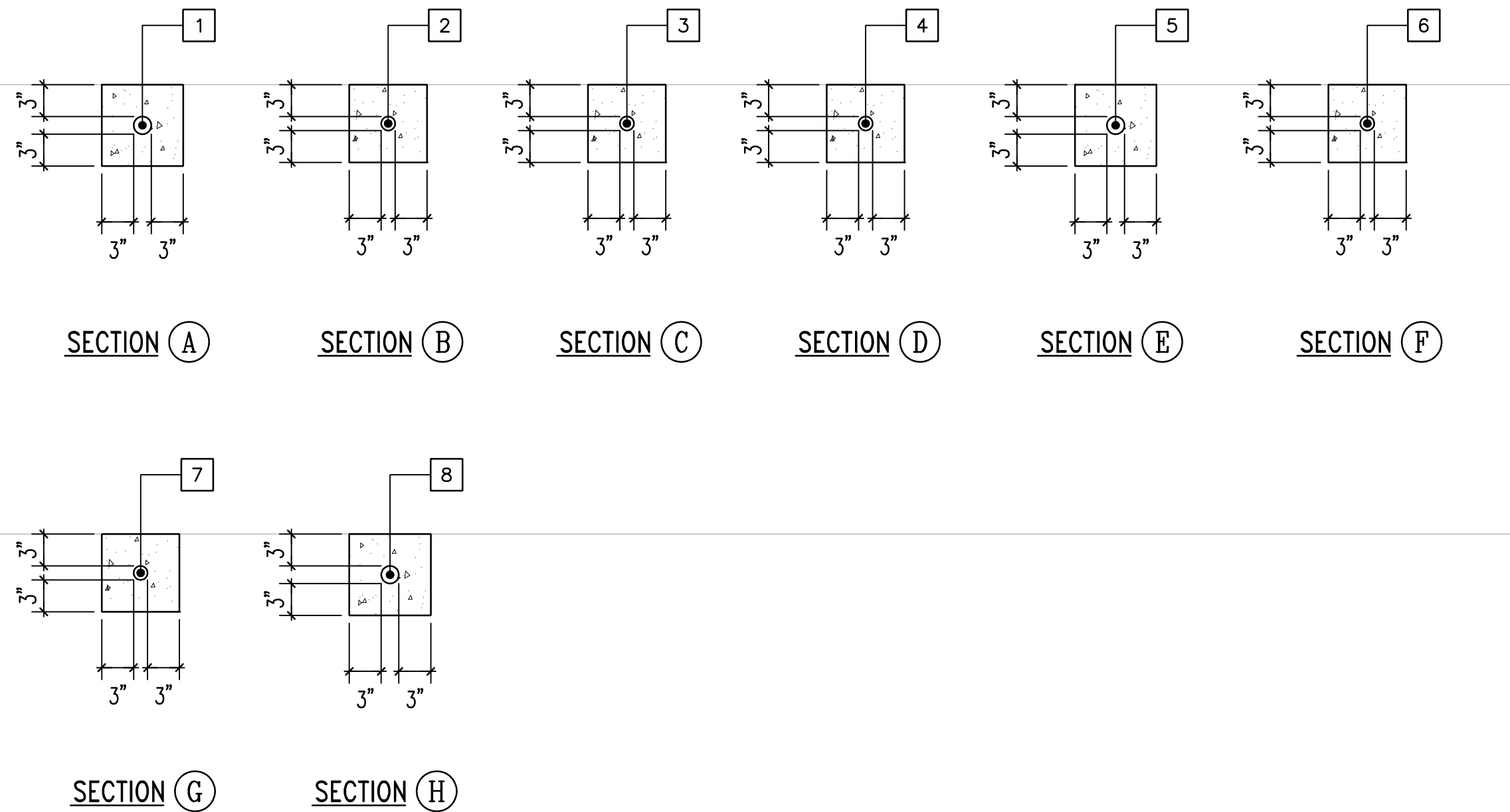
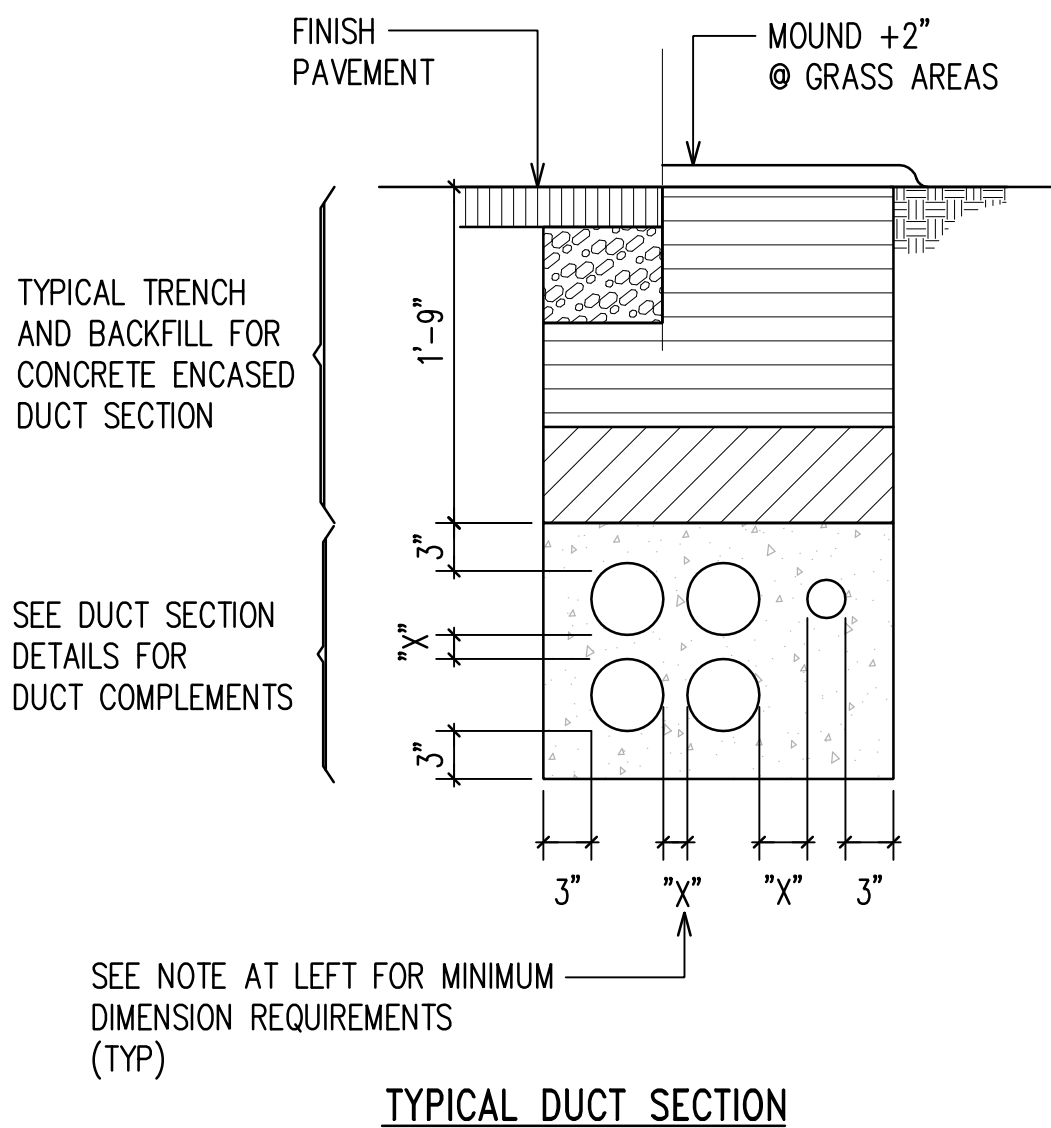
 NOTE – IF NORMAL MATERIAL AT
BOTTOM OF TRENCH IS NOT TYPE
"B", AN ADDITIONAL 3" SHALL BE
EXCAVATED & TYPE "B" BACKFILL
PROVIDED.

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

ELEC = UTILITY CO. PRIMARY OR SECONDARY ELECTRIC
TEL = UTILITY CO. TELEPHONE
PWR = PRIMARY OR SECONDARY ELECTRIC
CTL = CONTROL
SIG = INSTRUMENTATION OR ANTENNA CABLE

MINIMUM OF 3" CONCRETE
ENCASEMENT AROUND
DUCTBANK

1. 6" MINIMUM SEPARATION BETWEEN DUCTLINES AND WATER LINE.
2. PROVIDE CONCRETE JACKET AROUND DUCTLINES.
3. PROVIDE ONLY TYPE "B" BACKFILL AROUND WATER LINE.



NOT TO SCALE

DUCT AND WIRE SCHEDULE			
NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	2"	PC	HELCO SECONDARY
2	1"	4#12 CONTROLS (2#12 SPARE)	CONTROLS FROM SCADA CABINET TO SOLENOID CONTROL VALVE
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:

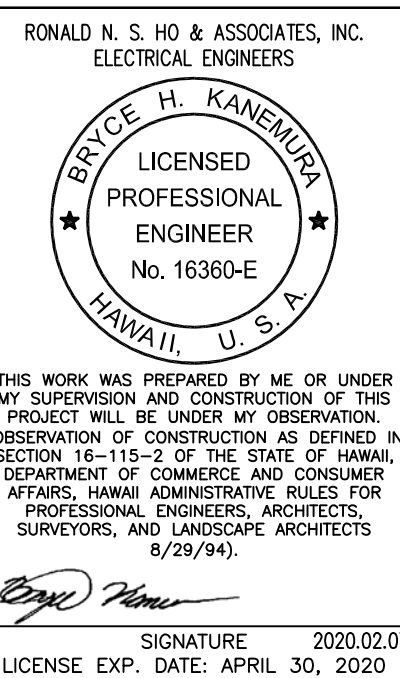
- ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
- PC INDICATES PROVIDE PULLCORD.

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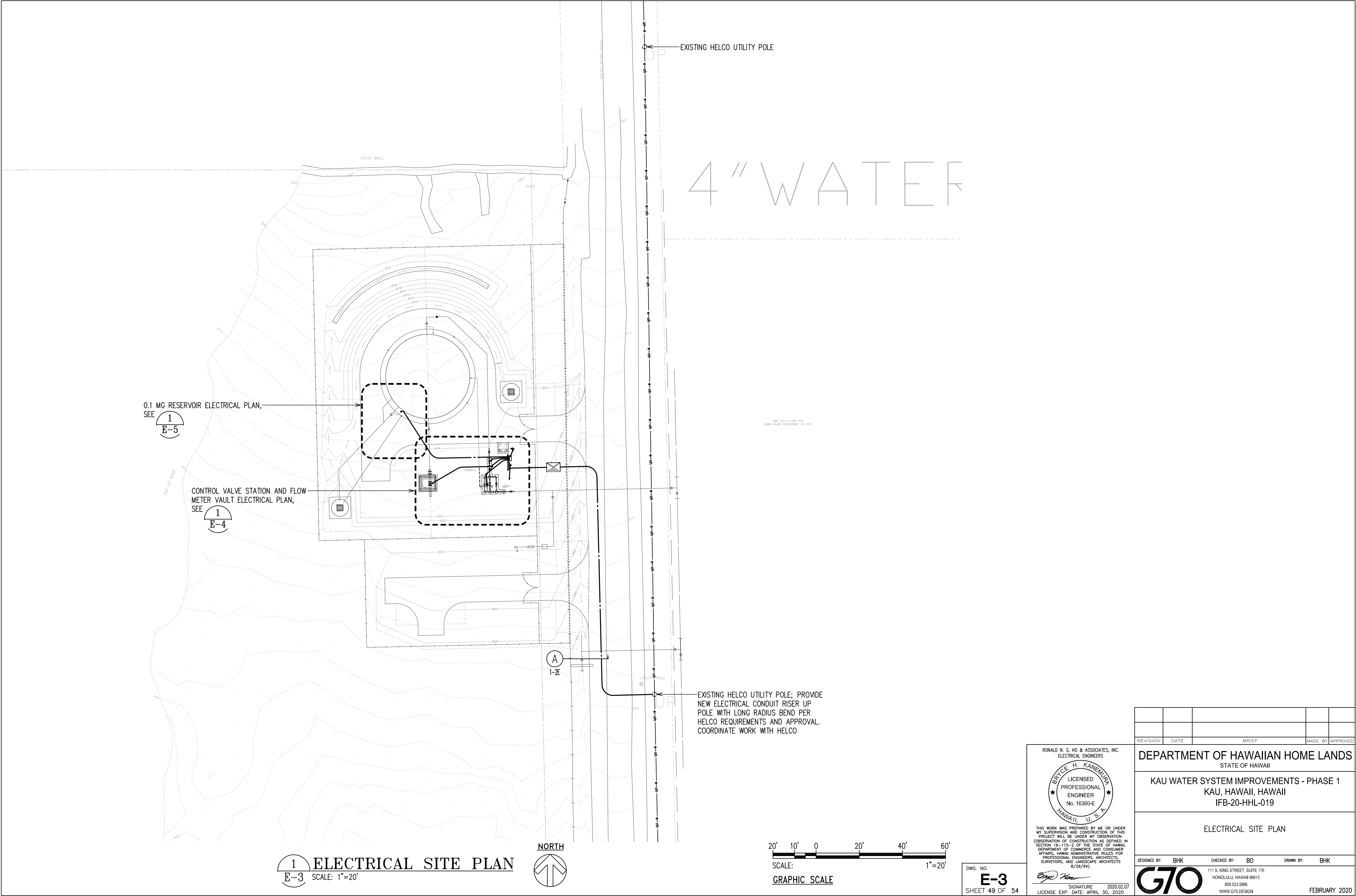
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

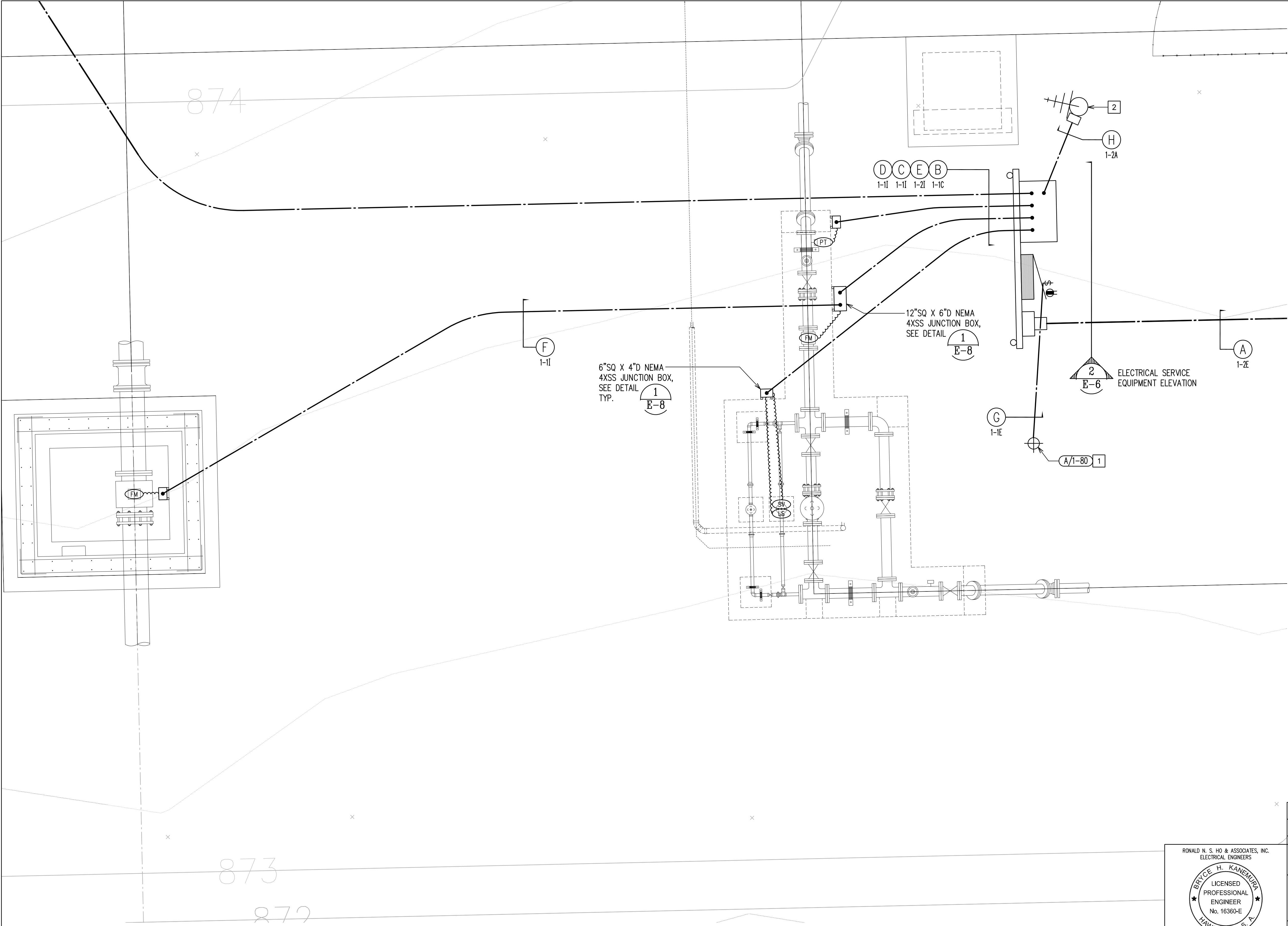
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DWG. NO.
E-2
SHEET 48 OF 54





NOTES:

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

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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
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G7O

111 S. KING STREET, SUITE 110
HONOLULU, HAWAII 96813
808.523.5866
WWW.G7O.DESIGN

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

BYRON H. KANEMURA
LICENSED PROFESSIONAL ENGINEER
No. 16380-E
HAWAII, U.S.A.

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

SIGNATURE: *[Signature]* 2020.02.07
LICENSE EXP. DATE: APRIL 30, 2020

DESIGNED BY: BHK

CHECKED BY: BO

DRAWN BY: BHK

111 S. KING STREET, SUITE 110
HONOLULU, HAWAII 96813
808.523.5866
WWW.G7O.DESIGN

FEBRUARY 2020

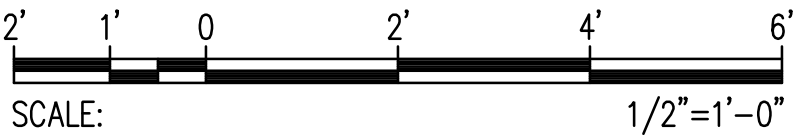
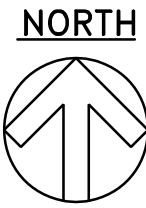
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1
E-5

0.1 MG RESERVOIR ELECTRICAL PLAN

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



GRAPHIC SCALE

DWG. NO.
E-5
SHEET 51 OF 54

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

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

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Bryce Kanemura
SIGNATURE
2020.02.07
LICENSE EXP. DATE: APRIL 30, 2020

REVISION	DATE	BRIEF	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

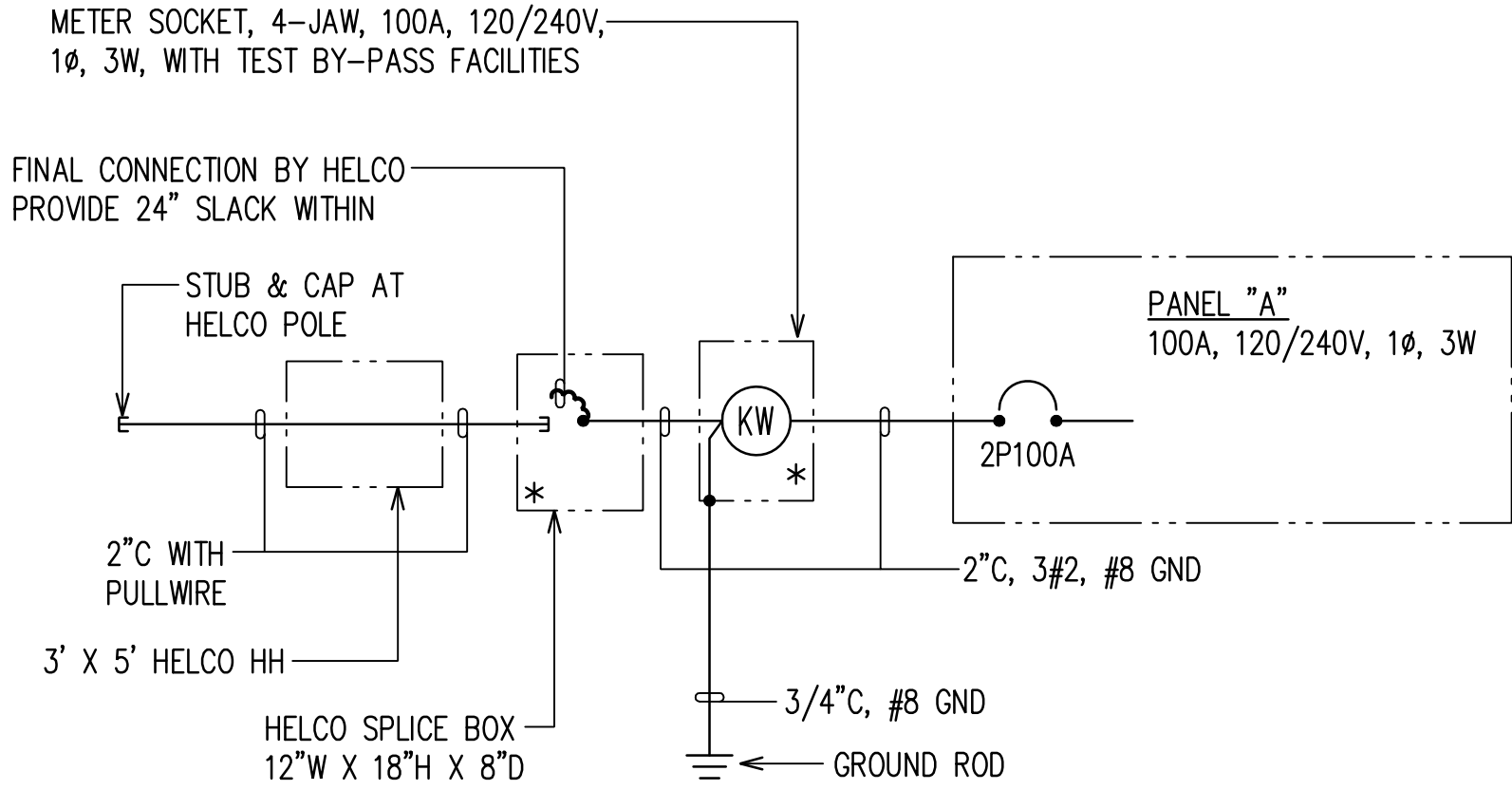
KAU WATER SYSTEM IMPROVEMENTS - PHASE 1
KAU, HAWAII, HAWAII
IFB-20-HHL-019

0.1 MG RESERVOIR ELECTRICAL PLAN

DESIGNED BY: BHK	CHECKED BY: BO	DRAWN BY: BHK
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808.523.5866
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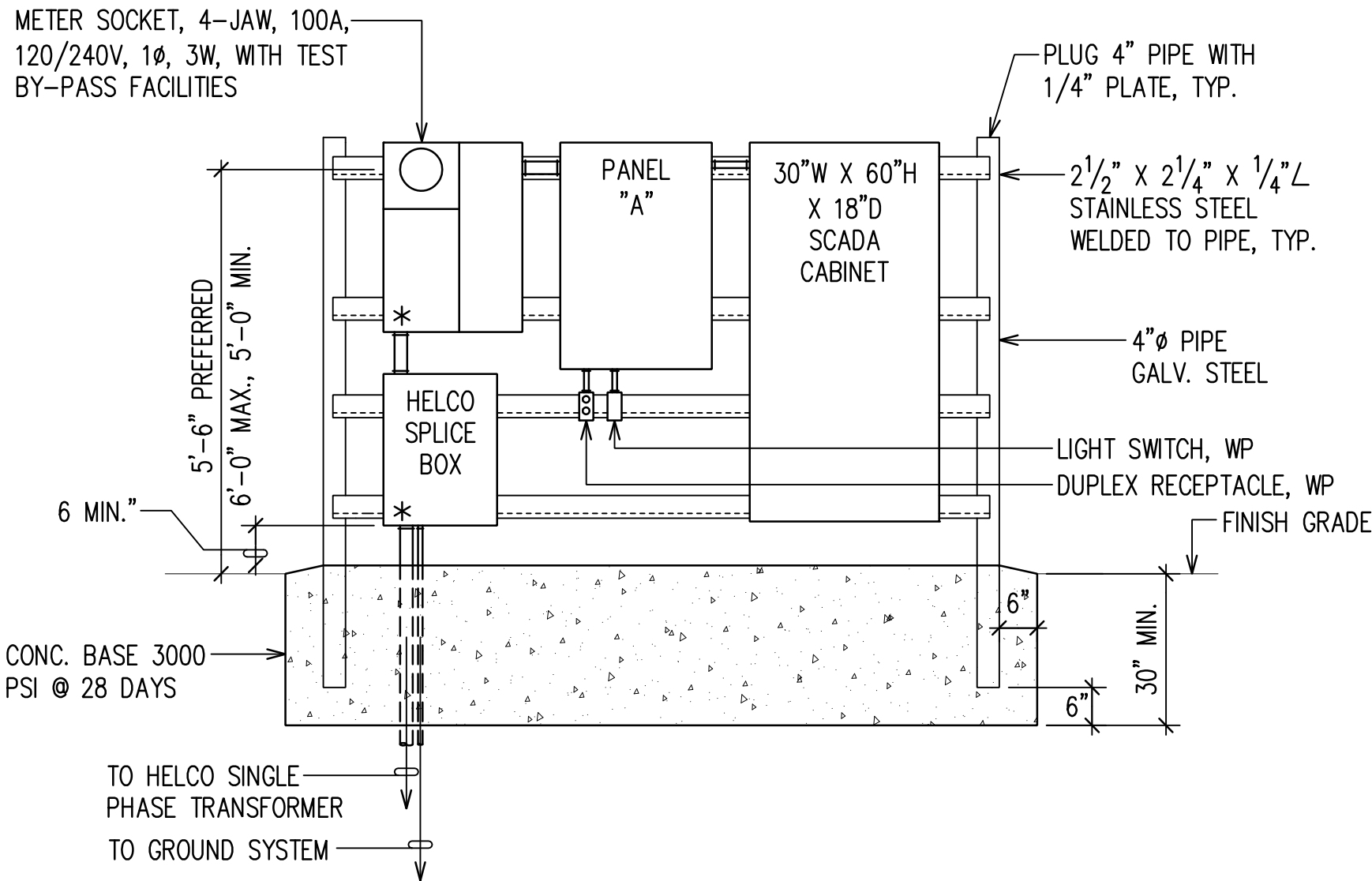


120/240V, 1Ø SYSTEM SERVICE DATA:

- SERVICE VOLTAGE: 120/240V, 1Ø, 3W
- LOAD DATA:
CONNECTED: 2.3 KVA
DEMAND: 1.6 KVA
- SERVICE CONDUCTORS:
1 SET: 3#2
- METERING: HELCO STD. B-5; RATE G
- TYPE: OVERHEAD/UNDERGROUND

NOTES: 1. * INDICATES PROVISION FOR HELCO SEALS AND OBTAIN HELCO APPROVALS

1 ONE-LINE DIAGRAM
E-6



NOTES:

- "*" INDICATES PROVISION FOR HELCO SEALS.
- OBTAIN HELCO SHOP DRAWING APPROVAL FOR PULLBOX AND METER SOCKETS.
- ALL EQUIPMENT ENCLOSURES SHALL BE RATED NEMA 4XSS.
- ALL SUPPORTS, FASTENING BOLTS, NUTS & WASHERS SHALL BE 316 STAINLESS STEEL.
- GROUND AND BOND PER N.E.C.

2 ELECTRICAL SERVICE EQUIPMENT ELEVATION
E-6 NOT TO SCALE

NEW PANEL "A"		100 A MAIN BREAKER 240 / 120 VOLTS, 1-PHASE, 3-WIRE 10,000 A.I.C. MINIMUM INDUSTRIAL-BOLTED TYPE, WITH INTEGRAL SURGE PROTECTIVE DEVICE									
CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER		WIRE SIZE	KVA ON BUSESSES		WIRE SIZE	BREAKER		USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.
		POLE	AMPS		PHASE A	PHASE B		POLE	AMPS		
1	R	1	20	12	0.2					PFB	2
3	SCADA CABINET	1	20	12		0.5				PFB	4
5	GAUGE CABINET	1	20	12	0.5					PFB	6
7	L	1	20	12		0.1				PFB	8
9	S	1	20		0.5					SPD	10
11	S	1	20			0.5				-	12
CONNECTED LOAD PER PHASE					1.2	1.1					
DEMAND LOAD PER PHASE					0.8	0.8					
										TOTAL CONNECTED LOAD (KVA)	2.3
										DEMAND FACTOR	70%
										TOTAL DEMAND LOAD (KVA)	1.6
										HIGH LEG (AMPS)	7.0

LIGHT FIXTURE SCHEDULE			
TYPE	LAMP/ WATTS	DESCRIPTION	MANUFACTURER OR PRE-APPROVED EQUAL
A	80W LED 3000°K 70 CRI	27" DIAMETER, CAST ALUMINUM HOUSING, SILICONE GASKETING, TYPE V DISTRIBUTION, FULL CUTOFF, STAINLESS STEEL HARDWARE, FIXED OUTPUT DRIVER 120, 5 YR, WARRANTY, UL LISTED, BRONZE FINISH, 48 LEDS, 530 MA, CONTROLLED VIA MANUAL LIGHT SWITCH	VISIONAIRE LIGHTING PRE-2-L SERIES, OR PRE-APPROVED EQUAL

REVISION	DATE	BRIEF	MADE BY	APPROVED

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

BRYCE H. KANEMURA
LICENSED PROFESSIONAL ENGINEER
No. 16380-E
HAWAII, U. S. A.

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Signature: *Bryce Kanemura*
2020.02.07
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

ONE-LINE DIAGRAM

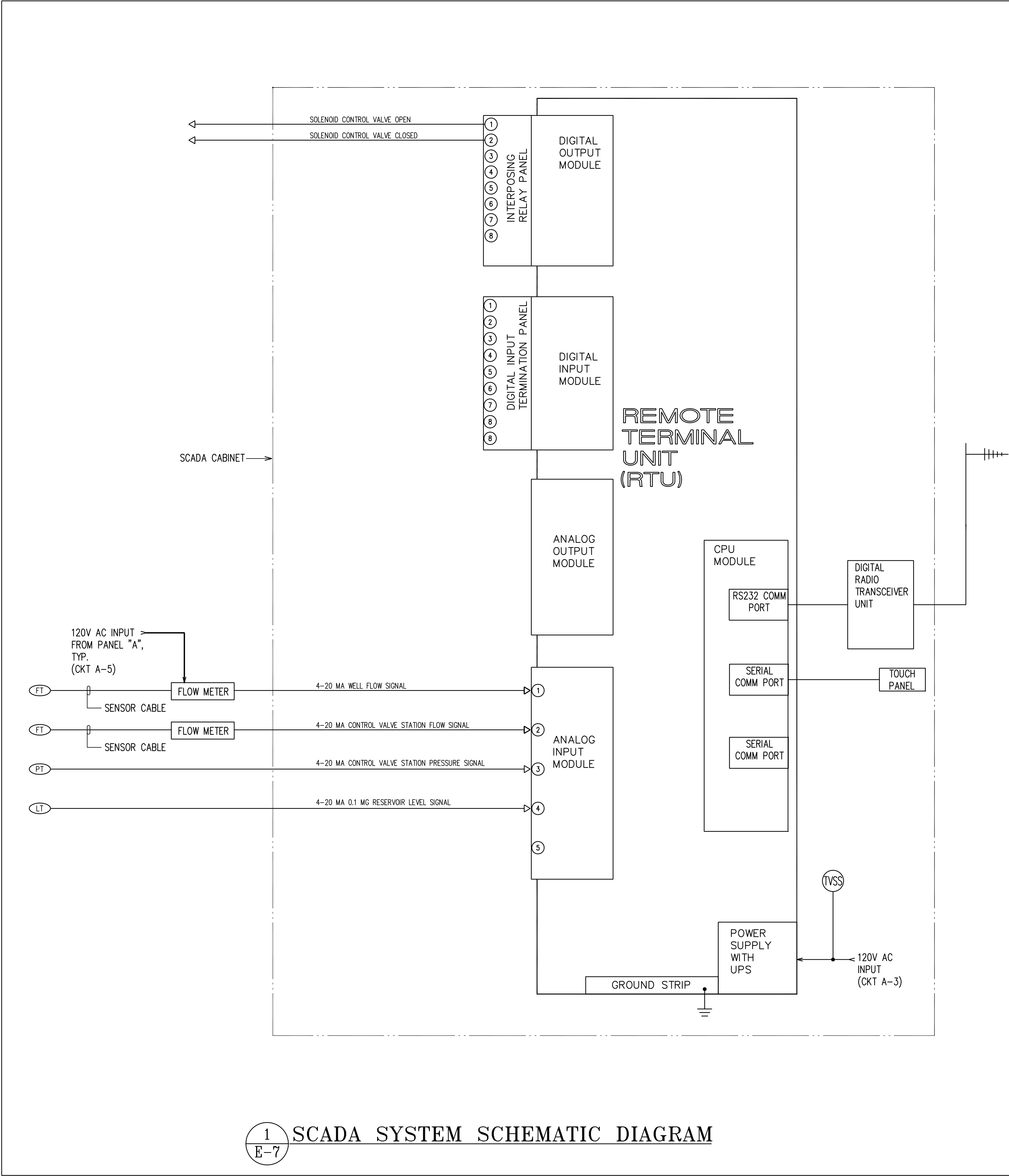
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DWG. NO.
E-6
SHEET 52 OF 54

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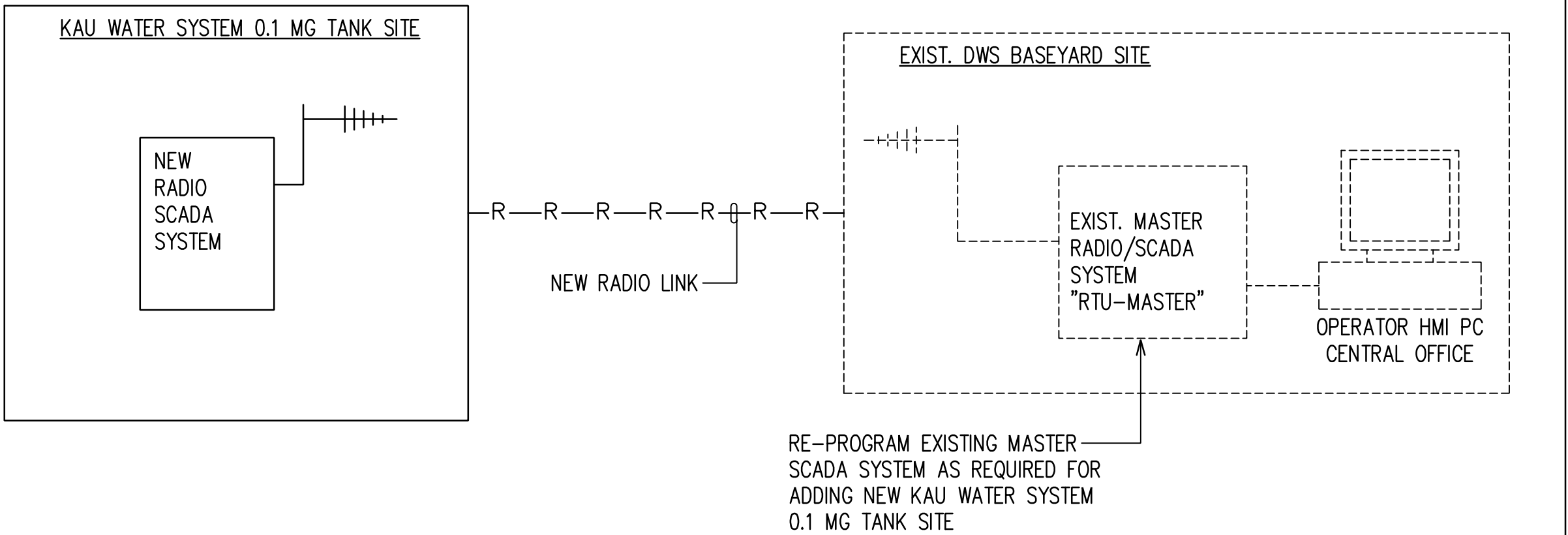


1
E-7

SCADA SYSTEM SCHEMATIC DIAGRAM

2
E-7

TYPICAL INSTRUMENTATION DIAGRAMS



- 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

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

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DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

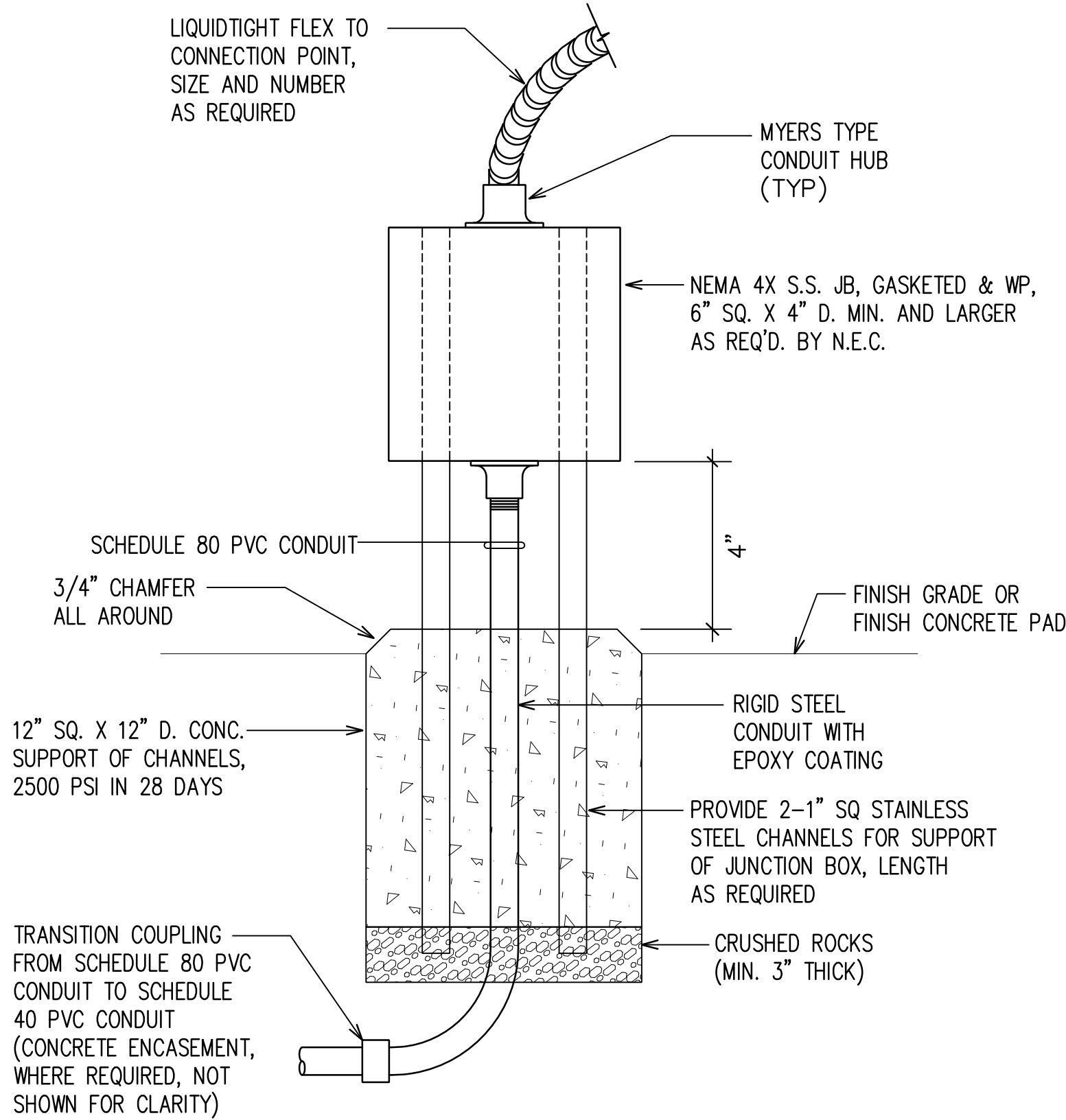
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KAU, HAWAII, HAWAII
IFB-20-HHL-019

SCADA SYSTEM SCHEMATIC DIAGRAM

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

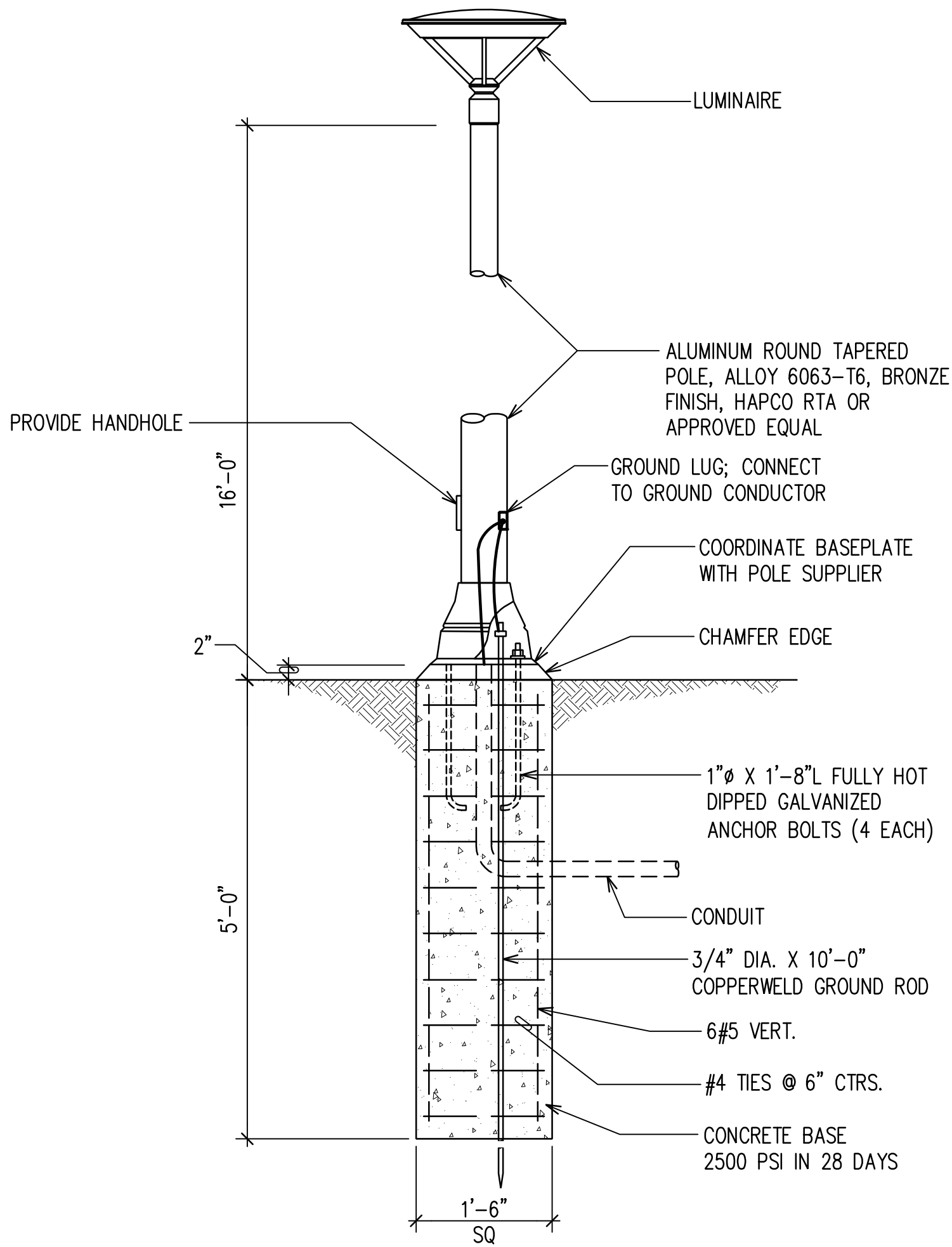
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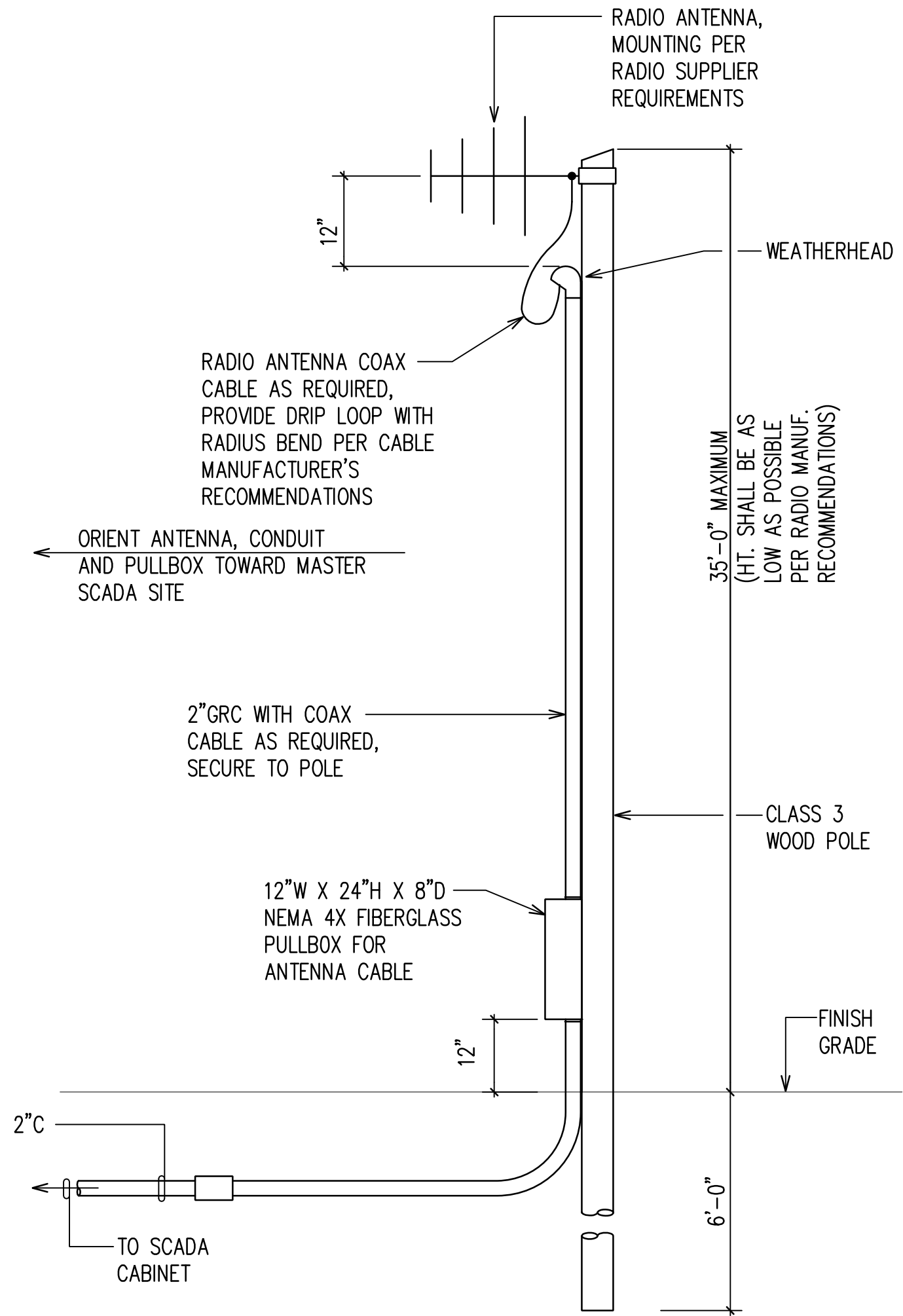


NOTE:
1. ALL MOUNTING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.

1 CHANNEL SUPPORTED JUNCTION BOX DETAIL
E-8 NOT TO SCALE



2 AREA LUMINAIRE MOUNTING DETAIL
E-8 NOT TO SCALE



- NOTES:
1. PROVIDE GROUNDING OF ANTENNA MAST AND COAXIAL ANTENNA CABLE PER RADIO MANUFACTURER'S RECOMMENDATIONS.
 2. ANTENNA MOUNTING HEIGHT SHALL NOT BE LESS THAN 16 FEET FROM EXISTING GROUND SURFACE, OR MANUFACTURER'S RECOMMENDATION, WHICHEVER IS HIGHER.
 3. ALL MOUNTING HARDWARE SHALL BE TYPE 316 STAINLESS STEEL.

3 RADIO ANTENNA-POLE TOP MOUNTING DETAIL
E-8 NOT TO SCALE