

STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 ENGINEERING DIVISION

FOR  
 DIVISION OF FORESTRY AND WILDLIFE

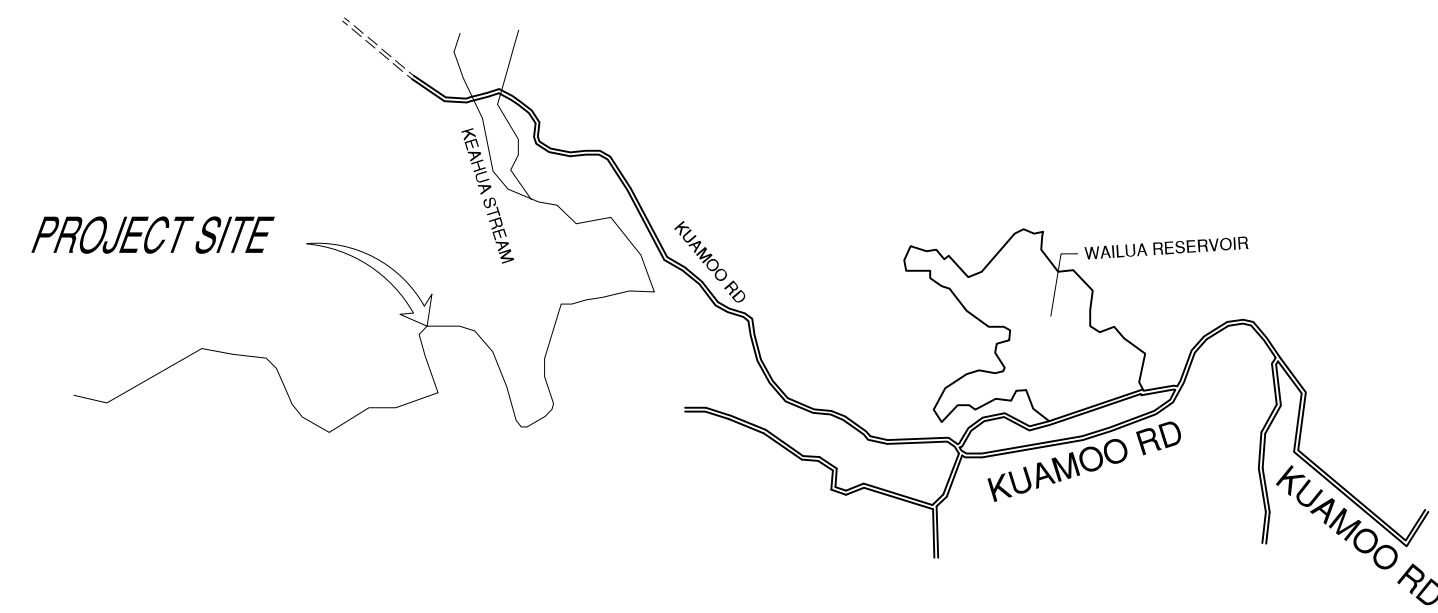
JOB NO. D00AK67B

LIHU'E-KOLOA FOREST RESERVE

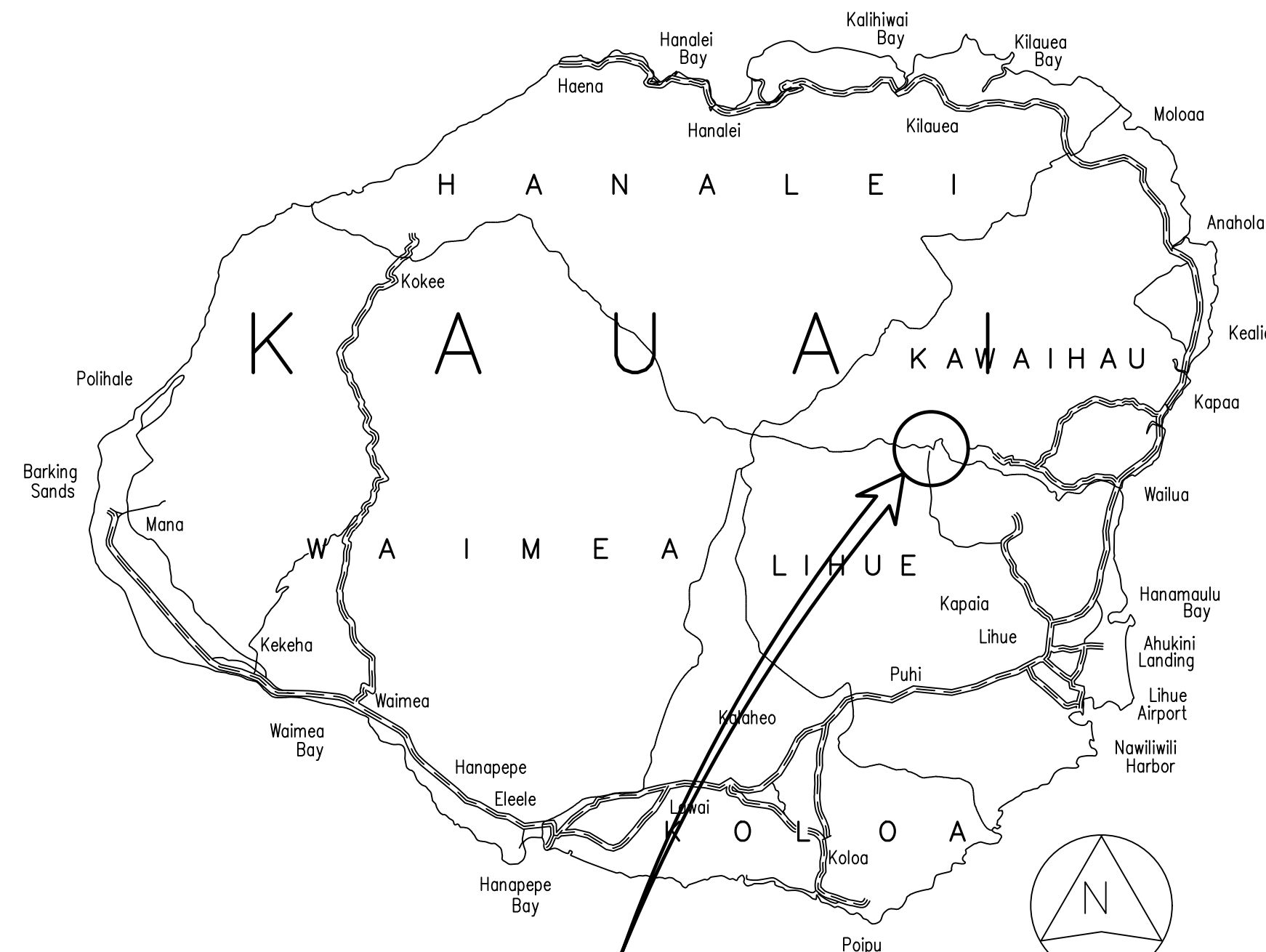
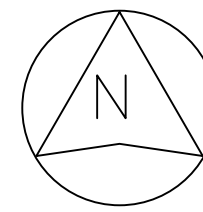
QUEENSLAND LOOP ROAD LOW WATER CROSSING

KAUAI, HAWAII

T.M.K.: 4-4-2-001-002



LOCATION MAP  
 NOT TO SCALE



SITE LOCATION

ISLAND OF KAUAI  
 NOT TO SCALE

INDEX

DESCRIPTION	DRAWING NO.	SHEET NO.
TITLE SHEET	T-1	1
CONSTRUCTION NOTES 01	C-01	2
CONSTRUCTION NOTES 02	C-02	3
SITE GRADING PLAN - QUEENSLAND	C-03	4
PLAN AND PROFILE - QUEENSLAND	C-04	5
ROADWAY SECTIONS 01 - QUEENSLAND	C-05	6
ROADWAY DETAILS 01 - QUEENSLAND	C-06	7
PHASE 1 EROSION CONTROL/BMP PLAN - QUEENSLAND	C-07	8
PHASE 2 EROSION CONTROL/BMP PLAN - QUEENSLAND	C-08	9
STRUCTURAL NOTES	S-1	10
TYPICAL DETAILS	S-2	11
QUEENSLAND CROSSING DEMO PLAN	S-3	12
QUEENSLAND CROSSING IMPROVEMENT PLAN VIEW	S-4	13
QUEENSLAND CROSSING PLAN	S-5	14
QUEENSLAND CROSSING ELEV	S-6	15
QUEENSLAND CROSSING SECTIONS	S-7	16
QUEENSLAND CROSSING SECTIONS AND DEBRIS CATCHER DETAIL	S-8	17
WINGWALL SECTIONS	S-9	18

SCOPE OF WORK: WORK SHALL GENERALLY CONSIST OF PROVIDING CONCRETE BOX CULVERTS AND RETAINING WALLS AT THE QUEENSLAND CROSSING. THE CULVERTS AND RETAINING WALLS WILL PREVENT FUTURE WASHOUT DUE TO FLOODING.

APPROVED: \_\_\_\_\_ DATE: 02/14/2024

*Robert Hauff*

DAVID G. SMITH  
 ADMINISTRATOR  
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 DEPARTMENT OF LAND AND NATURAL RESOURCES

APPROVED: \_\_\_\_\_ DATE: 02/14/2024

*Cary S. Chang*

CARY S. CHANG, P.E.  
 CHIEF ENGINEER  
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 DEPARTMENT OF LAND AND NATURAL RESOURCES

JOB NO. D00AK67B LIHU'-KOLOA FOREST RESERVE, KEAHUA AND QUEENSLAND LOW WATER CROSSINGS

**NOTES FOR GENERAL CONSTRUCTION**

1. ALL CONSTRUCTION WORK IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE PUBLICATIONS "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984", AS AMENDED, BY THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI AND HAWAII. THE STANDARD DETAILS ARE AVAILABLE AT THE COUNTY OF KAUAI CLERK'S OFFICE.
2. CONSTRUCTION SHALL BE DONE IN SUBSTANTIAL CONFORMANCE WITH GEOTECHNICAL ENGINEERING REPORT "LIHUE-KOLOA FOREST RESERVE QUEENSLAND CROSSING" DATED AUGUST 19, 2021 BY HART CROWSER WHERE APPLICABLE.
3. TOPOGRAPHIC INFORMATION OBTAINED FROM "TOPOGRAPHIC MAP SHOWING QUEENSLAND CROSSING" PREPARED BY ESAKI SURVEYING & MAPPING, MAY 4, 2021. THIS TOPOGRAPHIC SURVEY WAS BASED ON THE BEST AVAILABLE INFORMATION AND ACCURACY MUST BE VERIFIED PRIOR TO STARTING CONSTRUCTION.
4. ALL COORDINATES, GRIDS AND AZIMUTHS ARE REFERRED TO KEAHUA BRIDGE-KUAMOO ROAD"
5. ELEVATIONS SHOWN ON THE PLANS ARE BASED ON MEAN SEA LEVEL DATUM BENCH MARK IS SHOWN ON SHEET C-04.
6. SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, COUNTY OF KAUAI, SEPTEMBER 1984, AND ITS AMENDMENTS.
7. PRIOR TO CONSTRUCTION THE CONTRACTOR SHALL CONTACT THE VARIOUS UTILITY AGENCIES FOR LOCATION OF EXISTING UTILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL LOCATE AND PROTECT ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS. ANY COSTS INCURRED BY DAMAGES TO EXISTING UTILITIES WILL BE BORNE BY THE CONTRACTOR.
8. ALL EXISTING UTILITIES, WHETHER OR NOT SHOWN ON THE PLANS, SHALL BE PROTECTED AT ALL TIMES BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED.
9. WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATION AND DEPTH.
10. ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT EDITION.
11. THE CONTRACTOR SHALL MAKE PROPER ARRANGEMENTS FOR THE USE OF UTILITIES SUCH AS ELECTRICITY, WATER, ETC. AND SHALL BE RESPONSIBLE FOR THE PAYMENT OF ALL COSTS RESULTING FROM SUCH USAGE.
12. SURVEYS SHALL BE DONE UNDER THE SUPERVISION OF A LAND SURVEYOR LICENSED IN THE STATE OF HAWAII.
13. THE CONTRACTOR SHALL CONTACT THE DEPARTMENT OF LAND AND NATURAL RESOURCES, ENGINEERING DIVISION, INSPECTION SECTION AT LEAST FIVE (5) WORKING DAYS BEFORE COMMENCING ANY WORK ON THE PROJECT. THE CONTRACTOR SHALL HOLD A PRECONSTRUCTION MEETING WITH THE CONSTRUCTION SECTION OF DLNR BEFORE COMMENCING ANY WORK.
14. CONTRACTOR SHALL SUBMIT 'AS-BUILT' PLANS WITHIN 14 DAYS AFTER FINAL INSPECTION, INCLUDING STREET MONUMENT DATA (ELEVATIONS & LOCATION) DONE BY A LICENSED SURVEYOR, REGISTERED IN THE STATE OF HAWAII.
15. IF SYSTEM CONDITIONS REQUIRE NON-EMERGENCY NIGHT TIME WORK DURING THE AUTUMN SEABIRD FALL SEASON (SEPTEMBER 15 THROUGH DECEMBER 15), USE OF LIGHTING SHALL BE RESTRICTED BETWEEN 9:00 PM TO 4:30 AM. IF LIGHTING OF THE WORK AREA IS REQUIRED IN SUCH SITUATION, ALL LIGHTS SHALL BE SHIELDED (MINIMUM LIGHT SPILL TOWARDS THE SKY) AND DIRECTED DOWNWARDS TO THE MAXIMUM EXTENT PRACTICABLE. MINIMUM REQUIREMENTS FOR LIGHTING BY HIOSH AND OSHA SHALL BE PROVIDED AND ASSURED BY THE CONTRACTOR. THE CONTRACTOR SHALL TRAIN ALL EMPLOYEES WORKING AT NIGHT (RECORDS RETAINED BY THE CONTRACTOR) IN HOW TO HANDLE ANY RETRIEVED DOWNED BIRDS AND SHALL HAVE APPROPRIATE EQUIPMENT AS APPROVED BY SAVE OUR SHEARWATERS (SOS) ON SITE TO HOLD AND TRANSPORT ANY RETRIEVED BIRDS TO A SOS FACILITY. THIS REQUIREMENT DOES NOT ALLOW LIGHTING AS MAY BE RESTRICTED BY OTHER GOVERNMENT AGENCIES.
16. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OVERTIME AND/OR NIGHT WORK PAYMENTS FOR COUNTY'S STAFF INSPECTION PERSONNEL INCLUDING CONSULTANTS WHEN THE CONTRACT REQUIRES OVERTIME OR NIGHT WORK TO BE PERFORMED, OR DIRECTS THE CONTRACTOR TO WORK ADDITIONAL SHIFTS OR OVERTIME FOR COUNTY'S CONVENIENCE.
17. ALL GRADING, GRUBBING AND STOCKPILING WORK SHALL BE PERFORMED IN ACCORDANCE WITH COUNTY OF KAUAI ORDINANCE NO. 808.

18. AFTER EACH RAINFALL EVENT, THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS, AND OTHER AREAS. THE COST INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE COUNTY ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.
19. DURING CLEANING OPERATIONS, THE CONTRACTOR SHALL SUPPLY A WATER TRUCK FOR DUST CONTROL PURPOSES UNTIL THE VEGETATION HAS RE-ESTABLISHED ITSELF. EXCESS WATER, INCLUDING SILT AND DIRT, SHALL NOT BE ALLOWED TO RUN-OFF THE PROPERTY.
20. BENCHMARKS THAT ARE DISTURBED OR DESTROYED SHALL BE RESTORED UNDER A LICENSED LAND SURVEYOR'S DIRECTION. COPIES OF FIELD NOTES, DESCRIPTIONS AND NEW VALUES OF THE NEW BENCHMARK SHALL BE SENT TO THE DEPARTMENT OF PUBLIC WORKS SURVEY SECTION FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
21. BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE EMPLOYED AT ALL TIMES TO THE MAXIMUM EXTENT PRACTICABLE TO PREVENT DAMAGE BY SEDIMENTATION, EROSION OR DUST TO STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
22. DLNR WILL DELEGATE THE CONTRACTOR AS THE AUTHORIZED REPRESENTATIVE TO SUBMIT ALL NECESSARY DOCUMENTS AND REPORTS AS REQUIRED BY THE COUNTY AND DOH DIRECTLY TO THEIR OFFICES AT NO COSTS TO THE STATE.
23. VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DIRECTION.
24. AT ALL TIMES DURING PERFORMANCE OF THIS CONTRACT, ASSUME SOLE AND COMPLETE RESPONSIBILITY FOR THE SITE SAFETY CONDITIONS FOR ALL PERSONS AND PROPERTY.
25. HARD BOULDERS AND MEDIUM HARD TO HARD BASALT ROCK MAY BE ENCOUNTERED NEAR OR AT THE SITE. APPROPRIATE EQUIPMENT FOR EXCAVATING THE MEDIUM HARD TO HARD BASALT ROCK SHALL BE REQUIRED.
26. NO BLASTING SHALL BE ALLOWED ON THIS PROJECT.
27. CONSTRUCT TEMPORARY BARRICADES DURING CONSTRUCTION, FOR THE PROTECTION OF LIFE, SAFETY, AND PROPERTY.
28. THE LIHUE-KOLOA FOREST RESERVE SHALL REMAIN OPEN DURING THE CONSTRUCTION PERIOD. PROVIDE TEMPORARY BARRICADES AND WARNING SIGNS TO PROTECT THE PUBLIC DURING THE CONSTRUCTION PERIOD.
29. PROVIDE AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND TAKE NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.
30. EXISTING PEDESTRIAN WALKWAYS SHALL BE MAINTAINED IN A PASSABLE CONDITION OR PROVIDE FOR ALTERNATE/TEMPORARY ACCESSIBLE PEDESTRIAN ACCESS ROUTES AND FACILITIES PER THE 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN CHAPTER 2 AND ADAAG 201.3 AND ADAAG 206.1.
31. NO PERFORMANCE OF ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.
32. COORDINATE CONSTRUCTION ACTIVITIES WITH ANY ADJACENT OR RELATED CONSTRUCTION ACTIVITIES ON ANOTHER CONSTRUCTION SITE. AVOID DELAY OR HINDRANCE IN THE PERFORMANCE OF THEIR RESPECTIVE CONTRACTS.
33. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. ALL DAMAGED PORTIONS SHALL BE REPLACED IN ACCORDANCE WITH THE STANDARDS AND SPECIFICATIONS OF THE AFFECTED UTILITY COMPANY AND SHALL BE THE CONTRACTORS RESPONSIBILITY. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTORS RESPONSIBILITY.
34. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTION POINT TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR NEW LINES.
35. NOTIFY ALL AGENCIES AND UTILITY COMPANIES TO VERIFY THE ACTUAL LOCATION OF ALL SITE UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATION.
36. NOTIFY AND COORDINATE ALL SITE WORK WITH THE ONE CALL CENTER AT (866) 423-7287 AT LEAST 5 WORKING DAYS PRIOR TO THE START OF EXCAVATION OR TRENCHING.

37. IF WATER, SEWAGE, OR ELECTRICAL SERVICES ARE PLANNED TO BE INTERRUPTED FOR MORE THAN 1 HOUR, PROVIDE TEMPORARY WATER, SEWAGE, AND ELECTRICAL SERVICES DURING THE INTERRUPTION AT NO ADDITIONAL COST TO THE STATE.
38. ADJUST MANHOLE AND/OR VALVE BOX FRAMES AND COVERS AS REQUIRED BY THE UTILITY COMPANIES.
39. CONFORM WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL, OF TITLE 11, HAWAII ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
40. OBTAIN AND PAY FOR ALL REQUIRED PERMITS FROM THE APPROPRIATE GOVERNMENT AGENCIES.
41. RESTORE ALL AREAS DISTURBED AS A RESULT OF ALL CONSTRUCTION ACTIVITIES, TO EQUAL OR BETTER CONDITION(S), INCLUDING BUT NOT LIMITED TO VEGETATION, PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALKWAYS, FENCES, ETC. UNLESS SPECIFICALLY NOTED OTHERWISE.
42. IF ONE (1) OR MORE ACRE OF LAND IS DISTURBED, DO NOT START GROUND DISTURBANCE UNTIL A NPDES PERMIT IS OBTAINED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII, AND HAS SATISFIED ALL OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM. ALSO, FOR COUNTY PROJECTS, PROVIDE A WRITTEN COPY OF THE NPDES PERMIT TO THE APPROPRIATE COUNTY OR GOVERNMENTAL AGENCY PER THEIR REQUIREMENTS.
43. ALL STRIPING SHALL BE A THERMOPLASTIC TYPE.
44. PROVIDE THEFT-RESISTANT FASTENERS FOR ALL ACCESSORY MOUNTINGS. ALL FASTENERS SHALL BE STAINLESS STEEL WITH THEFT-RESISTANT TYPE HEADS OR NUTS.
45. PROVIDE ALL INCIDENTAL AND NECESSARY WORK TO COMPLETE THE PROJECT.
46. THE JOB SITE SHALL BE LEFT IN A SAFE, SECURE CONDITION AT THE END OF EACH CONSTRUCTION WORKDAY. CLEAN UP AND REMOVE, FROM THE JOB SITE, ALL RUBBISH AND MAINTAIN THE PREMISES IN A CLEAN ORDERLY CONDITION AT ALL TIMES.
47. UPON COMPLETION OF CONSTRUCTION THE ENTIRE JOB SITE SHALL BE CLEANED OF ALL RUBBISH AND DEBRIS.

**HISTORICAL PRESERVATION NOTES**

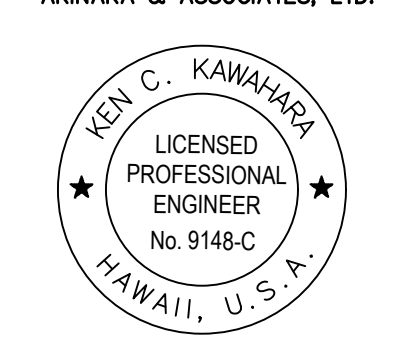
1. SHOULD HISTORIC REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF SHELL OR CHARCOAL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES, WORK SHALL CEASE IMMEDIATELY IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL CORDON OFF THE AREA AND IMMEDIATELY NOTIFY THE STATE HISTORIC PRESERVATION DIVISION AT (808) 692-8015, WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND THE APPROPRIATE MITIGATION MEASURES, IF NECESSARY. IN ADDITION, IF HUMAN BURIALS ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY OF KAUAI POLICE DEPARTMENT.

**WATER POLLUTION AND EROSION CONTROL NOTES**

1. GENERAL:
  - A. THE CONTRACTOR IS REMINDED OF THE REQUIREMENTS OF SECTION 209-WATER POLLUTION AND EROSION CONTROL AND SECTION 620-DUST CONTROL, IN THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS. SECTION 209 DESCRIBES BUT IS NOT LIMITED TO: SUBMITTAL REQUIREMENTS; CONSTRUCTION REQUIREMENTS; METHOD OF MEASUREMENT; AND BASIS OF PAYMENT.
  - B. THE CONTRACTOR SHALL FOLLOW THE GUIDELINES IN THE "INTERIM BEST MANAGEMENT PRACTICES MANUAL FOR CONSTRUCTION SITES FOR COUNTY OF KAUAI" IN DEVELOPING, INSTALLING AND MAINTAINING THE BEST MANAGEMENT PRACTICES (BMPS) FOR THE PROJECT. THE CONTRACTOR MAY SUBMIT ALTERNATE METHODS TO THE COUNTY FOR ACCEPTANCE.
  - C. THE CONTRACTOR SHALL KEEP A COPY OF THE APPROVED BMP PLAN, NOI, ETC. ON THE PROJECT SITE. THE BMP PLAN SHALL BE UPDATED TO REFLECT ANY CHANGES MADE DURING THE COURSE OF CONSTRUCTION FOR THE DURATION OF THE PROJECT.
  - D. THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE, WILL BE RESPONSIBLE FOR ALL FINES OR PENALTIES FOR NONCOMPLIANCE TO ENVIRONMENTAL LAWS, INCLUDING BUT NOT LIMITED TO, THE CLEAN WATER ACT, CLEAN AIR ACT, NPDES, ETC. THERE IS NO MAXIMUM LIMIT ON THE AMOUNT ASSESSED PER DAY. THE STATE WILL NOT REIMBURSE THE CONTRACTOR FOR FINES AND/OR PENALTIES INCURRED.
  - E. THE DLNR MAY DEDUCT THE COST FROM THE PROGRESS PAYMENT FOR ALL CITATIONS RECEIVED BY THE DEPARTMENT FOR NON-COMPLIANCE, OR THE CONTRACTOR/OWNER SHALL REIMBURSE THE STATE AND/OR COUNTY FOR THE FULL AMOUNT OF THE OUTSTANDING COST INCURRED BY THE STATE AND/OR COUNTY.

2. WASTE DISPOSAL:
  - A. WASTE MATERIALS: ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER THAT DOES NOT LEAK. THE DUMPSTER SHALL MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHALL BE EMPTIED A MINIMUM OF TWICE PER WEEK OR AS OFTEN AS IS DEEMED NECESSARY. NO CONSTRUCTION WASTE MATERIAL SHALL BE BURIED ONSITE. THE CONTRACTOR'S SUPERVISORY PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.
  - B. HAZARDOUS WASTE: ALL HAZARDOUS WASTE MATERIAL SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATIONS OR BY THE MANUFACTURER. THE CONTRACTOR'S SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND SHALL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES FOR FOLLOWED.
  - C. SANITARY WASTE: ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE UNITS A MINIMUM OF ONCE PER WEEK, OR AS REQUIRED.
3. EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:
  - A. ALL CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EACH WEEK AND WITHIN 24 HOURS FOLLOWING ANY RAINFALL EVENT OF 0.5 INCHES OR GREATER.
  - B. ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER. IF REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS AFTER THE INSPECTION.
  - C. BUILT UP SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE.
  - D. SILT SCREEN OF FENCE SHALL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, TO VERIFY THAT THE FABRIC FENCE IS SECURELY ATTACHED TO THE FENCE POST OR CONCRETE SLAB AND TO VERIFY THAT THE FENCE POST ARE FIRMLY IN THE GROUND
  - E. TEMPORARY AND PERMANENT SEEDING AND PLANTING SHALL BE INSPECTED FOR BARE SPOTS, WASH OUTS AND HEALTHY GROWTH.
  - F. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER A MAINTENANCE INSPECTION REPORT PROMPTLY AFTER EACH WEEKLY INSPECTION.
  - G. THE CONTRACTOR SHALL SELECT A MINIMUM OF THREE PERSONNEL WHO SHALL BE RESPONSIBLE FOR INSPECTIONS, MAINTENANCE AND REPAIR ACTIVITIES AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.
  - H. PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES SHALL RECEIVE TRAINING FROM THE CONTRACTOR. THEY SHALL BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ONSITE IN GOOD WORKING ORDER.
  - I. ALL SLOPES AND EXPOSED AREAS SHALL BE GRASSED AS FINAL GRADES HAVE BEEN ESTABLISHED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA IN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED OR EXPOSED FOR MORE THAN 15 DAYS SHALL BE GRASSED IN ORDER TO PREVENT DUST EMISSION, EROSION AND SILT RUNOFF. AREAS WITH IMPORTED SOILS SHALL BE GRASSED NOT MORE THAN 5 WORKING DAYS AFTER THE FINAL GRADES HAVE BEEN ESTABLISHED.
  - J. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

PM: CLJ  
 CURRENT OPER: RIT 2/9/2024 3:15 PM  
 LAST SAVED BY: RIT REVISED: 2/9/2024 3:15 PM  
 PATH: G:\AI\2002 LIHUE-KOLOA LOW WATER CROSSINGS\300 DSON\310 PLANS  
 FILE: KAIZ002 - CONSTRUCTION NOTES 01.DWG  
 BEGIN: 9-Feb-24

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
<b>AKINAKA &amp; ASSOCIATES, LTD.</b>  <b>STATE OF HAWAII</b> DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>CONSTRUCTION NOTES 01</b>					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: FEB 2024		
CHECKED: KCK			SCALE: AS SHOWN		
APPR Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov CHIEF State of Hawaii Chief Engineer					DRAWING NO.
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION					DATE <b>C-01</b>

**WATER POLLUTION AND EROSION CONTROL NOTES (CON'T)**

4. GOOD HOUSE KEEPING BEST MANAGEMENT PRACTICES:

A. MATERIALS POLLUTION PREVENTION PLAN.

a. APPLICABLE MATERIALS OR SUBSTANCES LISTED BELOW ARE EXPECTED TO BE PRESENT ONSITE DURING CONSTRUCTION. OTHER MATERIALS AND SUBSTANCES NOT LISTED BELOW SHALL BE ADDED TO THE INVENTORY OF THE CONSTRUCTION CONTRACTOR'S SITE-SPECIFIC BMP PLAN.

CONCRETE	FERTILIZERS
DETERGENTS	PETROLEUM BASED PRODUCTS
PAINTS (ENAMEL & LATEX)	CLEANING SOLVENTS
METAL STUDS	WOOD
TAR	MASONRY BLOCK

b. MATERIAL MANAGEMENT SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCT AS IS REQUIRED TO DO THE JOB.

c. ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE UNDER A ROOF OR OTHER ENCLOSURE.

d. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.

e. SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.

f. A PRODUCT SHALL BE USED UP COMPLETELY BEFORE DISPOSING OF THE CONTAINER.

g. MANUFACTURER'S RECOMMENDATION FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.

h. THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ONSITE.

B. HAZARDOUS MATERIAL POLLUTION PREVENTION PLAN:

a. PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.

b. ORIGINAL LABELS AND MATERIALS SAFETY DATA SHEETS MSDS SHALL BE RETAINED AND MADE AVAILABLE TO THE COUNTY ENGINEER UPON REQUEST.

c. SURPLUS PRODUCTS SHALL BE DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR LOCAL AND STATE RECOMMENDED REGULATIONS.

C. ONSITE AND OFFSITE PRODUCTS SPECIFIC PLANS:

THE FOLLOWING PRODUCT SPECIFIC PRACTICES SHALL BE FOLLOWED ONSITE:

a. PETROLEUM BASED PRODUCTS: ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVE REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.

b. FERTILIZERS: APPLY FERTILIZED USED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, WORK FERTILIZER INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE SHALL BE IN A COVERED SHED.

c. PAINTS: SEAL AND STORE ALL CONTAINER WHEN NOT REQUIRED FOR USE. DO NOT DISCHARGE EXCESS PAINT TO THE ROADWAY DRAINAGE SYSTEM. DISPOSE PROPERLY ACCORDING TO MANUFACTURER'S INSTRUCTION OR STATE AND LOCAL REGULATIONS.

d. CONCRETE TRUCKS: WASH OUT OR DISCHARGE CONCRETE TRUCK DRUM WASH WATER ONLY AT A DESIGNATED SITE. DO NOT DISCHARGE WATER IN ROADWAY DRAINAGE SYSTEM OR WATERS OF THE UNITED STATES. CONTACT DRINKING WATER BRANCH, DEPARTMENT OF HEALTH AT (808) 586-4258 TO RECEIVE PERMISSION TO DESIGNATE A DISPOSAL SITE. CLEAN DISPOSAL SITE AS REQUIRED OR AS REQUESTED BY THE OWNER'S REPRESENTATIVE.

D. SPILL CONTROL PLAN:

a. POST A SPILL PREVENTION PLAN TO INCLUDE MEASURES TO PREVENT AND CLEAN UP EACH SPILLWAY.

b. THE CONTRACTOR SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. DESIGNATE AT LEAST THREE SITE PERSONNEL WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. POST THE NAMES OF RESPONSIBLE SPILL PERSONAL IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.

c. CLEARLY POST MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP. MAKE SITE PERSONNEL AWARE OF THE PROCEDURES AND THE LOCATION OF INFORMATION AND CLEANUP SUPPLIES.

d. KEEP MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP IN THE MATERIAL STORAGE AREA ONSITE. CLEAN UP ALL SPILL IMMEDIATELY AFTER DISCOVERY.

e. KEEP THE SPILL AREA WELL VENTILATED. PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH HAZARDOUS SUBSTANCE.

f. REPORT SPILLS OF TOXIC HAZARDOUS MATERIAL TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

**SEVERE STORM PREPAREDNESS NOTES**

1. SECURE THE CONSTRUCTION SITE BY TAKING THE FOLLOWING STEPS:

A. CLEAR THE SITE OF ANY CONSTRUCTION DEBRIS OR TRASH THAT MAY BECOME MOBILIZED BY STORM WATER OR HIGH WINDS. SECURE ALL DUMPSTERS ON-SITE BY STORING THEM INDOORS OR SECURELY COVERING THEM TO PREVENT STORED DEBRIS FROM BEING MOBILIZED BY STORM WATER OR HIGH WINDS. PHYSICALLY SECURE THE DUMPSTER IF THERE IS CONCERN THAT THE DUMPSTER ITSELF MAY BY MOBILIZED BY HIGH WINDS.

B. INSPECT THE SITE'S BMPs FOR THEIR CONDITION PRIOR TO THE STORM. WHERE PRACTICAL, REPAIR OR REPLACE BMP'S THAT ARE DAMAGED OR WILL OTHERWISE NOT PERFORM PROPERLY DURING THE STORM EVENT. CLEAR ANY DEBRIS OR ACCUMULATED SEDIMENT ON ANY BMP TO REDUCE FLOODING RISK.

C. REMOVE BMPs IF THEY MAY CAUSE LOSS OF LIFE AND PROPERTY DURING THE SEVERE WEATHER EVENT. FOR EXAMPLE, IF THE SEVERE WEATHER INCLUDES HIGH WINDS, REMOVE ANY NON-CRITICAL BMPs THAT MAY BECOME AIRBORNE AND POSE A RISK TO PROPERTY OR PEOPLE. ONCE CONDITIONS IMPROVE AND SAFETY OR PROPERTY LOSS IS NO LONGER A CONCERN, BMPs MUST BE REINSTALLED AS SOON AS POSSIBLE.

D. SECURE, COVER, OR REMOVE STOCKPILES OF MATERIALS THAT MAY BECOME MOBILIZED BY EITHER STORM WATER OR HIGH WINDS.

E. SECURE, COVER, OR REMOVE ANY OTHER SITE MATERIALS THAT MAY BECOME MOBILIZED BY EITHER STORM WATER OR HIGH WINDS. IN PARTICULAR, ENSURE THAT ALL CONTAINERS ARE ADEQUATELY SEALED OR STORED INDOORS TO PREVENT ANY SPILLS TO THE ENVIRONMENT.

F. CLEAR ANY DRAINAGE INLETS AND DRAINAGE SYSTEMS OF ANY DEBRIS OR BUILT-UP SEDIMENT TO ENSURE THAT THEY WILL ALLOW ADEQUATE STORM WATER FLOW TO REDUCE THE RISK OF FLOODING. REMOVE DRAIN INLET PROTECTION AFTER CLEARING ANY DEBRIS OR SEDIMENT IF IT CAN BE REASONABLY ASSUMED THAT IT WOULD INCREASE THE RISK OF FLOODING, EROSION, OR LOSS OF PROPERTY OR LIFE. ONCE CONDITIONS IMPROVE AND SAFETY, PROPERTY LOSS, OR EROSION IS NO LONGER A CONCERN, INLET PROTECTION MUST BE REINSTALLED AS SOON AS POSSIBLE.

G. TEMPORARILY STABILIZE OR COVER EXPOSED SOIL AREAS AT THE SITE (IF FEASIBLE), TO PREVENT EROSION AND DISCHARGE OF SEDIMENT TO STATE WATERS.

**PERMIT REQUIREMENTS**

1. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER THE WATER POLLUTION AND EROSION CONTROL SUBMITTALS AS DETAILED IN SUBSECTION 209.04 OF THE SPECIFICATIONS. NO WORK SHALL BEGIN UNTIL THE SUBMITTAL HAS BEEN REVIEWED AND APPROVED BY THE ENGINEER.

2. THE CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL PERMIT CONDITIONS.

3. PERMITS MAY INCLUDE BUT ARE NOT LIMITED TO THE FOLLOWING:

- A. U.S. DEPARTMENT OF THE ARMY PERMIT
- B. WATER QUALITY CERTIFICATION
- C. COASTAL ZONE MANAGEMENT (CZM) FEDERAL CONSISTENCY CERTIFICATION

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR:

A. PROVIDING ANY ADDITIONAL INFORMATION REQUIRED TO COMPLETE THE PERMIT PROCESS, INCLUDING BUT NOT LIMITED TO THE SITE-SPECIFIC BMP PLAN AND QUESTIONS REGARDING THE CONSTRUCTION PROCESS/METHODOLOGY, AND

B. HANDLING ANY REVISIONS REQUIRED TO ADDRESS THE CONSTRUCTION EQUIPMENT AND METHODOLOGY PROPOSED BY THE CONTRACTOR FOR USE ON THIS JOB.

5. THE CONTRACTOR, AT THE CONTRACTOR'S OWN EXPENSE AND WITH NO ADDITIONAL COST TO THE STATE, SHALL APPLY FOR AND OBTAIN NPDES NOTICE OF INTENT (NOI) FOR DISCHARGES ASSOCIATED WITH HYDROTEST WATER AND/OR DEWATERING SHOULD THE CONTRACTOR ELECT TO DISCHARGE HYDROTEST AND/OR DEWATERING EFFLUENT INTO STATE WATERS. ACCORDINGLY, THE CONTRACTOR SHALL APPLY FOR AND OBTAIN THE SITE SPECIFIC NPDES PERMIT FOR THE SUBJECT ACTIVITIES.

6. THE CONTRACTOR, AT THE CONTRACTOR'S OWN EXPENSE AND WITH NO ADDITIONAL COST TO THE STATE, SHALL APPLY FOR A DOH NOISE VARIANCE SHOULD THE CONTRACTOR ELECT, AND DLNR APPROVES, TO WORK OUTSIDE OF NORMAL WORKING HOURS.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 54, WATER QUALITY STANDARDS, AND CHAPTER 55, WATER POLLUTION CONTROL OF HAR TITLE 11, OF THE STATE DEPARTMENT OF HEALTH.

8. THE CONTRACTOR, AT THE CONTRACTOR'S OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREAS FREE FROM DUST NUISANCE AND ANY MATERIAL TRACKED ON TO THE ROADWAYS. THE WORK SHALL BE CONFORMANCE WITH THE AIR AND WATER POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.

**PAVEMENT AND TRENCH RESTORATION NOTES**

1. PAVEMENT RESURFACING WORK SHALL INCLUDE 2-INCH THICKNESS OF EXISTING A.C. TO BE COLD PLANED AND CONSTRUCTION OF A MINIMUM OF 2-INCH OF NEW A.C. (STATE MIX IV) LAYER.

2. ALL EXISTING PAVEMENT STRIPING DISTURBED BY THIS PROJECT SHALL BE RESTORED. THE STRIPING MATERIALS SHALL BE THERMOPLASTIC TAPE OR THERMOPLASTIC EXTRUSION. PAINTING IS NOT ACCEPTABLE.

**ADDITIONAL DOFAW NOTES**

1. TAKE ALL MEASURES TO MINIMIZE DISTURBANCE OR DAMAGING EXISTING NATIVE PLANT SPECIES DURING CONSTRUCTION. DOFAW WILL CONDUCT BIOLOGICAL SURVEY OF ENTIRE PROJECT AREA (STAGING AND CONSTRUCTION) PRIOR TO CONTRACTOR STARTING WORK.

2. PRIOR TO ENTERING THE JOB SITE, ALL EQUIPMENT AND FOOTWEAR MUST BE WASHED WITH POTABLE WATER AND SPRAYED WITH 70% ALCOHOL OR FRESH 10% CLOROX SOLUTION TO PREVENT EXOTIC PLANTS AND SEEDS FROM BEING INTRODUCED TO THE JOB SITE/AREA.

3. HAWAIIAN HOARY BATS OR 'OPE'APE'A (LASIURUS CINEREUS SEMOTUS) IS KNOWN TO RESIDE IN THE VICINITY OF THE PROJECT AREA AND MAY ROOST IN NEARBY TREES. ANY SITE CLEARING REQUIRED MUST BE TIMED TO AVOID DISTURBING THE BAT'S BIRTHING AND PUP REARING SEASON (JUNE 1 THROUGH SEPTEMBER 15). IF THIS CANNOT BE AVOIDED, WOODY PLANTS GREATER THAN 15 FEET (4.6 METERS) IN HEIGHT MUST NOT BE DISTURBED, REMOVED, OR TRIMMED WITHOUT CONSULTING DOFAW AND STATE'S CONSTRUCTION REPRESENTATIVE. BARBED WIRE IS NOT ALLOWED BECAUSE BAT MORTALITIES HAVE BEEN DOCUMENTED BY ENSNAREMENT DURING FLIGHT.

4. NIGHT WORK THAT REQUIRES OUTDOOR LIGHTING MUST NOT BE CONDUCTED DURING THE SEABIRD FLEDGING SEASON FROM SEPTEMBER 15 THROUGH DECEMBER 15. THIS IS THE PERIOD WHEN YOUNG SEABIRDS TAKE THEIR MAIDEN VOYAGE TO THE OPEN SEA. ARTIFICIAL LIGHTING CAN ADVERSELY IMPACT SEABIRDS BY CAUSING DISORIENTATION. THIS DISORIENTATION CAN RESULT IN COLLISION WITH MANMADE ARTIFACTS OR GROUNDING OF BIRDS. FOR NIGHT LIGHTING THAT MIGHT BE REQUIRED, DOFAW REQUIRES THAT ALL LIGHTS BE FULLY SHIELDED TO MINIMIZE IMPACTS.

5. THE ACTIVITIES ARE OCCURRING IN A STATE FOREST RESERVE AND THEREFORE ARE SUBJECT TO AND EXPECTED TO FOLLOW ALL PERTINENT CHAPTER 104 DOFAW-HAR THAT HAVE BEEN UPDATED IN JANUARY 2021. <http://dlnr.hawaii.gov/dofaw/files/2013/09/HARChapter13-104.pdf>

6. STATE LANDS UNDER THE JURISDICTION OF DOFAW ARE OPEN TO PUBLIC HUNTING THROUGHOUT THE YEAR. PLEASE VIEW THE HUNTING RULES AND DAYS ON OUR AGENCY WEBSITE. BLAZE ORANGE SHALL BE WORN ON ALL LEGAL HUNTING DAYS. <http://dlnr.hawaii.gov/recreation/hunting/kaui/>

7. IN THE EVENT ANY ARCHAEOLOGICAL SITES OR REMAINS SUCH AS BONES OR CHARCOAL DEPOSITS, HUMAN BURIALS, ROCK OR CORAL ALIGNMENTS, ROCK WALLS ARE ENCOUNTERED, CONTRACTOR SHALL STOP ALL ACTIVITY AND CONTACT STATE HISTORIC PRESERVATION DIVISION IN KAPOLEI (808) 692-8015 OR SHERI MANN (808) 729-0714 IMMEDIATELY.

8. REPORTING OF INAPPROPRIATE ACTIVITIES TO DOFAW AND/OR DOCARE IS ENCOURAGED. DOCARE HOTLINE (808) 643-DLNR

**ADDITIONAL NOTES RELATING HAWAII EXPERIMENTAL TROPICAL FOREST (H.E.T.F. BIOSECURITY MEASURES (SUCH AS RAPID OHIA DEATH. (VERIFY WITH DOFAW ON APPLICABILITY))**

WITH REFERENCE TO THE H.E.T.F. BIOSECURITY HANDOUT, (WHICH IS AVAILABLE FROM D.O.F.A.W. STAFF) COMPLY WITH THE FOLLOWING PARAPHRASED INSTRUCTIONS TO PREVENT THE INTRODUCTION AND SPREAD OF HARMFUL ORGANISMS INCLUDING, BUT NOT LIMITED TO WEEDS, INSECTS, AND INFECTED PLANTS.

1. INSPECT AND CLEAN ALL EQUIPMENT, GEAR, AND VEHICLES (PERSONAL AND PROJECT) THAT ENTER AND EXIT THE JOB SITE.

2. ENSURE THAT ALL GEAR EQUIPMENT AND VEHICLES ARE FREE OF ANY PLANT, ANIMAL, OR EARTHEN MATERIALS. ALL EQUIPMENT, GEAR, AND VEHICLES SHALL BE INSPECTED, CLEANED AND SANITIZED WITH 70% ALCOHOL OR 10% CLOROX SOLUTION BEFORE ENTERING THE JOB SITE, AND BEFORE LEAVING ANY WEED INFECTED/CONTAMINATED AREA TO PREVENT TRACKING IN HARMFUL ORGANISMS (E.G.: WEEDS, INSECTS, PESTS) AND PREVENT SPREAD TO PRISTINE AND HEALTHY FOREST AREAS. EQUIPMENT TO INSPECT AND CLEAN INCLUDE BUT IS NOT LIMITED TO:

a. CINDER ARE CLOTHES & FOOTWEAR (TREADS, LACES, BOOT TONGUES), SOCKS, PANT LEGS, POCKETS, JACKETS, RAIN GEAR (POCKETS AND CUFFS).

b. EQUIPMENT & SUPPLIES-TOOLS, TOOL BAGS, BACKPACKS & BAGS (FOLDS, POCKETS, VELCRO), WOOD AND BUILDING MATERIALS, FENCING MATERIALS, BOTTOMS OF PLASTIC BUCKETS, CARDBOARD BOXES (ROACHES & ANTS), OPEN FOOD AND WATER CONTAINERS, TENTS, HAMMOCKS, TARPS, HELICOPTER SLING NETS, CHAINSAW BLADES.

c. VEHICLES - THE INSIDE OF THE VEHICLES SHOULD BE VACUUMED AND THE TRUCK BEDS SWEEPED OUT REGULARLY, ESPECIALLY IF USED OFF-ROAD. CLEAN PLACES SUCH AS THE INSIDE LIP OF BUMPERS, SEATS, FLOORS, DASHBOARDS, DOOR JAMBS, TIRES (ESPECIALLY TIRE TREADS), AND THE UNDERCARRIAGE.

d. HEAVY EQUIPMENT, TRUCKS, ALL TYPES OF EARTHMOVING CONSTRUCTION EQUIPMENT AND GENERAL CONSTRUCTION EQUIPMENT AND SUPPLIES.

e. OTHER- ENSURE SOIL AND STERILE AND FREE OF INSECTS, WEEDS, AND PATHOGENS. ANYTHING SUSPICIOUS SHOULD NOT BE TAKEN ONTO THE JOB SITE.

3. ON A DAILY BASIS, PACK AND REMOVE ALL TRASH, INCLUDING ANY DISCARDED FOOD, FROM THE JOB SITE TO PREVENT NEGATIVELY AFFECTING THE FLORA AND FAUNA AT THE FIELD SITE. (\*DISCARDED FOOD MAY CONTAIN UNSEEN INSECTS, FUNGUS, BACTERIA, AND PARASITES; AND IS AN ATTRACTANT FOR INVASIVE INSECTS).

4. FOLLOW METHODS OF CLEANING SPECIFIED IN H.E.T.F. BIOSECURITY HANDOUT. SPECIFIED METHODS OF CLEANING INCLUDE:

a. WATER & HOSE, BRUSH, TWEEZERS, CLEAN RAG, KNIFE EDGE, BLEACH RINSE AND/OR INSECTICIDE.

b. CLEANING SHALL BE PERFORMED AWAY FROM THE FOREST WITH A NEARBY RECEIPTACLE FOR DISPOSAL.

c. LAUNDERING OF WASHABLE ITEMS SHALL BE PERFORMED AFTER EACH TRIP.

d. IF ITEMS CANNOT BE CLEANED, THEY CANNOT BROUGHT INTO THE FOREST.

e. IF CONTAMINATED SUPPLIES ARE DISCOVERED, THEY MUST BE IMMEDIATELY REMOVED AND PROPERLY DISPOSED, AWAY FROM THE H.E.T.F.

5. CLEAN AND DISINFECT EQUIPMENT PRIOR TO MOBILIZATION TO JOB SITE.

6. IN THE EVENT THAT INFECTED OHIA TREES ARE FOUND AT THE FIELD SITE, THE CONTRACTOR SHALL BE INFORMED AND AT THE DIRECTION OF DOFAW TAKE MEASURES TO PREVENT THE SPREAD OF THE CERATOCYSTIS INFECTION OF OHIA TREES.

a. MEASURES INCLUDE AND ARE NOT LIMITED TO:

i. CONTACTING MAPUANA O'SULLIVAN 808-346-2338 OR SHERI MANN 808-729-0714 REGARDING THE LOCATION OF THE INFECTED OHIA TREES AND INCLUDING DIGITAL PICTURES OF THE CROWN OF THE SUSPECTED INFECTED TREE AND PLACES ON THE WOOD WITH CHARACTERISTIC STAINING OF THE INFECTION

ii. DO NOT TRANSPORT ANY OHIA WOOD.

iii. FOLLOW THE REQUIRED H.E.T.F. BIOSECURITY MEASURES (AS NOTED IN THE ABOVE ITEMS 1-5)

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
<div style="display: flex; justify-content: space-between;"> <div style="text-align: center;"> </div> <div style="text-align: right;"> <p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p> <p>LIHUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSING</p> <p><b>CONSTRUCTION NOTES 02</b></p> </div> </div>					
DESIGNED: GMG		SUBMITTED:			
DRAWN: KJM/AKK		DATE: FEB 2024		SCALE: AS SHOWN	
<p>Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer</p> <p>EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION</p>				DRAWING NO. <b>C-02</b>	

TRUE NORTH  
SCALE: 1" = 10'

NOTES:

1. ALL WORK DAMAGED OR CAUSED TO BE DEFECTIVE BY THE CONSTRUCTION OPERATIONS AND WHICH IS NOT INDICATED TO BE REPLACED OR INCLUDED WITH NEW CONSTRUCTION SHALL BE COMPLETELY REPAIRED OR FILLED IN AS REQUIRED TO MATCH THE ADJACENT EXISTING SURFACE.
2. ALL TREES SHALL REMAIN UNLESS OTHERWISE NOTED. THE CONTRACTOR SHALL RETAIN THE SERVICES OF AN ARBORIST FOR ALL WORK NEAR EXISTING TREES. THE CONTRACTOR SHALL PRESERVE AND PROTECT EXISTING TREES FROM DAMAGE TO FOLIAGE, BRANCHES, TRUNKS OR ROOTS. ARBORIST SHALL BE CERTIFIED BY INTERNATIONAL SOCIETY OF ARBORICULTURE.
3. THE CONTRACTOR SHALL REMOVE VEGETATION BEFORE THE PLACING OF FILLS ON A NATURAL GROUND SURFACE.

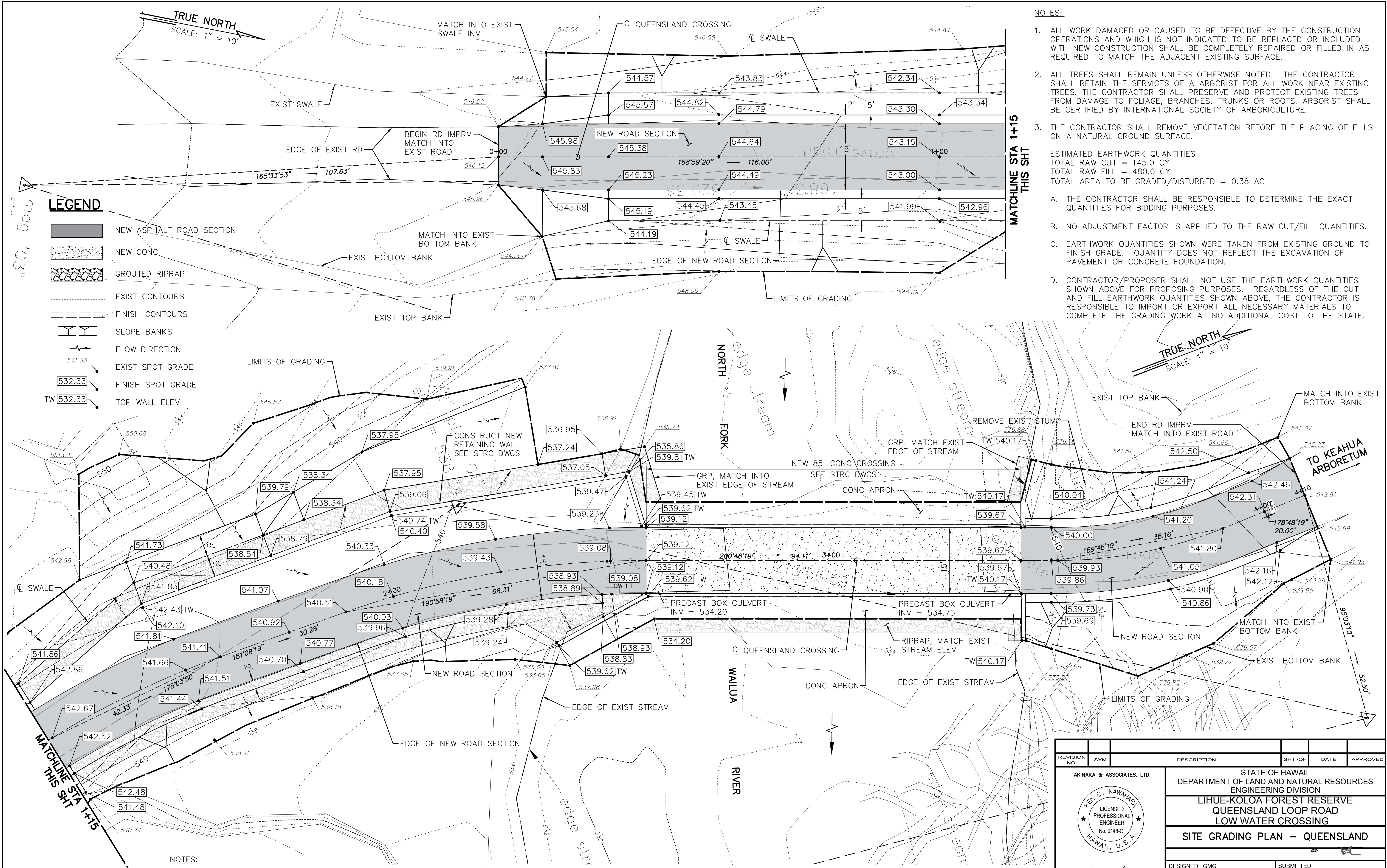
ESTIMATED EARTHWORK QUANTITIES  
 TOTAL RAW CUT = 145.0 CY  
 TOTAL RAW FILL = 480.0 CY  
 TOTAL AREA TO BE GRADED/DISTURBED = 0.38 AC

- A. THE CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE THE EXACT QUANTITIES FOR BIDDING PURPOSES.
- B. NO ADJUSTMENT FACTOR IS APPLIED TO THE RAW CUT/FILL QUANTITIES.
- C. EARTHWORK QUANTITIES SHOWN WERE TAKEN FROM EXISTING GROUND TO FINISH GRADE. QUANTITY DOES NOT REFLECT THE EXCAVATION OF PAVEMENT OR CONCRETE FOUNDATION.
- D. CONTRACTOR/PROPOSER SHALL NOT USE THE EARTHWORK QUANTITIES SHOWN ABOVE FOR PROPOSING PURPOSES. REGARDLESS OF THE CUT AND FILL EARTHWORK QUANTITIES SHOWN ABOVE, THE CONTRACTOR IS RESPONSIBLE TO IMPORT OR EXPORT ALL NECESSARY MATERIALS TO COMPLETE THE GRADING WORK AT NO ADDITIONAL COST TO THE STATE.

**LEGEND**

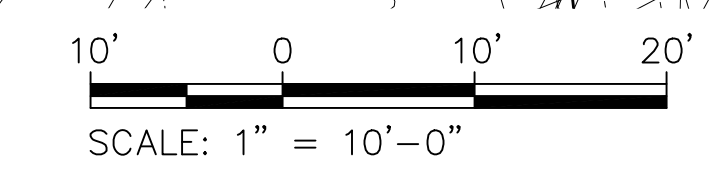
- NEW ASPHALT ROAD SECTION
- NEW CONC
- GROUDED RIPRAP
- EXIST CONTOURS
- FINISH CONTOURS
- SLOPE BANKS
- FLOW DIRECTION
- EXIST SPOT GRADE
- FINISH SPOT GRADE
- TOP WALL ELEV

PM: CLJ  
 CURRENT OPER: RIT 2/9/2024 11:55 AM  
 LAST SAVED BY: RIT REVISED: 2/9/2024 11:58 AM  
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 FILE: KAI2002 - GRADING PLAN 03 (QUEENSLAND).DWG  
 BEGIN: 9-Feb-24



- NOTES:
1. FOR ROAD SECTIONS, SEE SHT C-05
  2. FOR AC PAVEMENT SECTIONS, SEE SHT C-06
  3. GRADES AT INTERVALS ARE EVERY 25 FT ALONG ROAD CENTERLINE BEGINNING AT STA 0+00

**SITE GRADING PLAN - QUEENSLAND**  
 SCALE: 1" = 10'

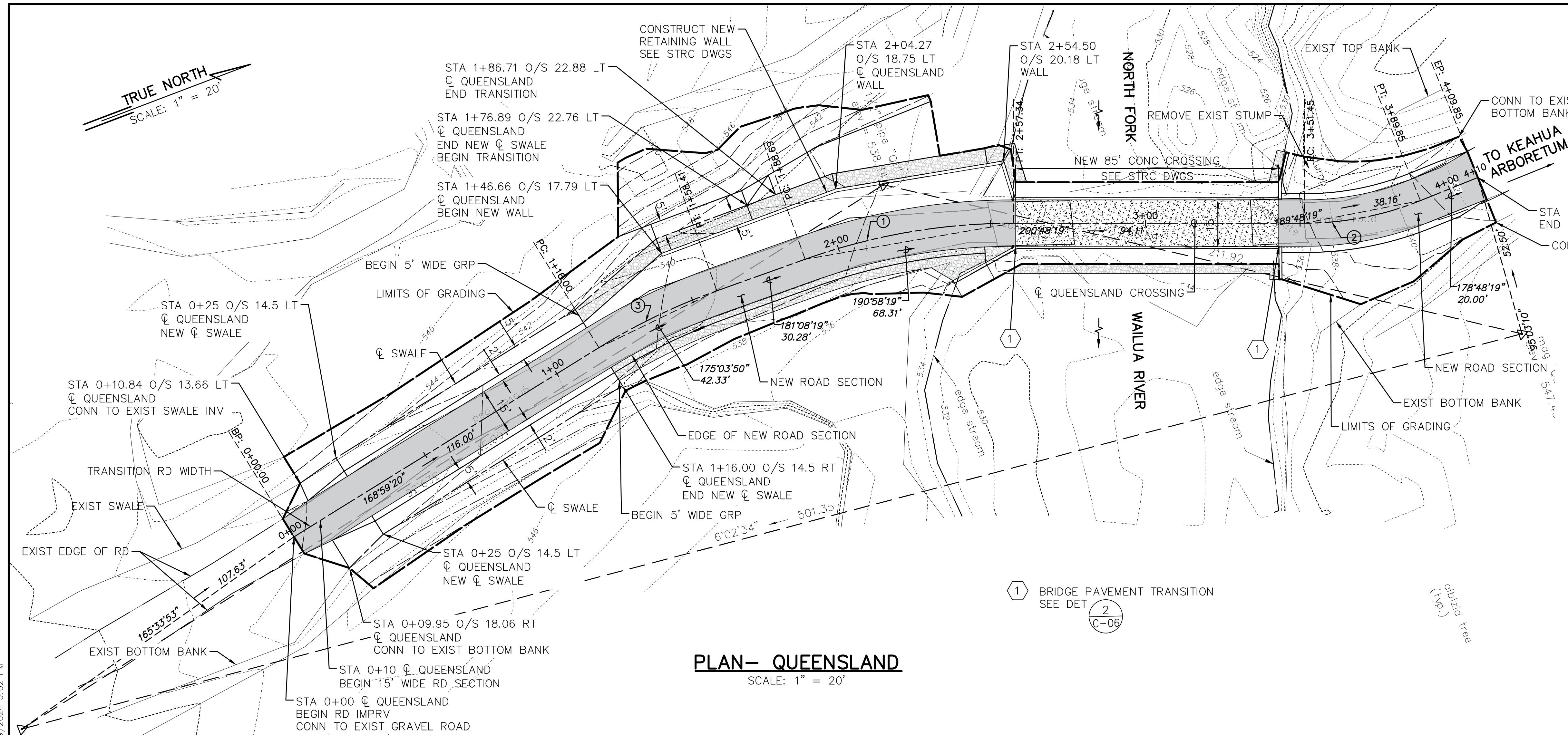


REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

	STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION	
	LIHUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSING	
	SITE GRADING PLAN - QUEENSLAND	
	DESIGNED: GMG	SUBMITTED:
DRAWN: KJM/AKK	DATE: FEB 2024	
CHECKED: KCK	SCALE: AS SHOWN	
APPR: Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer	DRAWING NO. <b>C-03</b>	

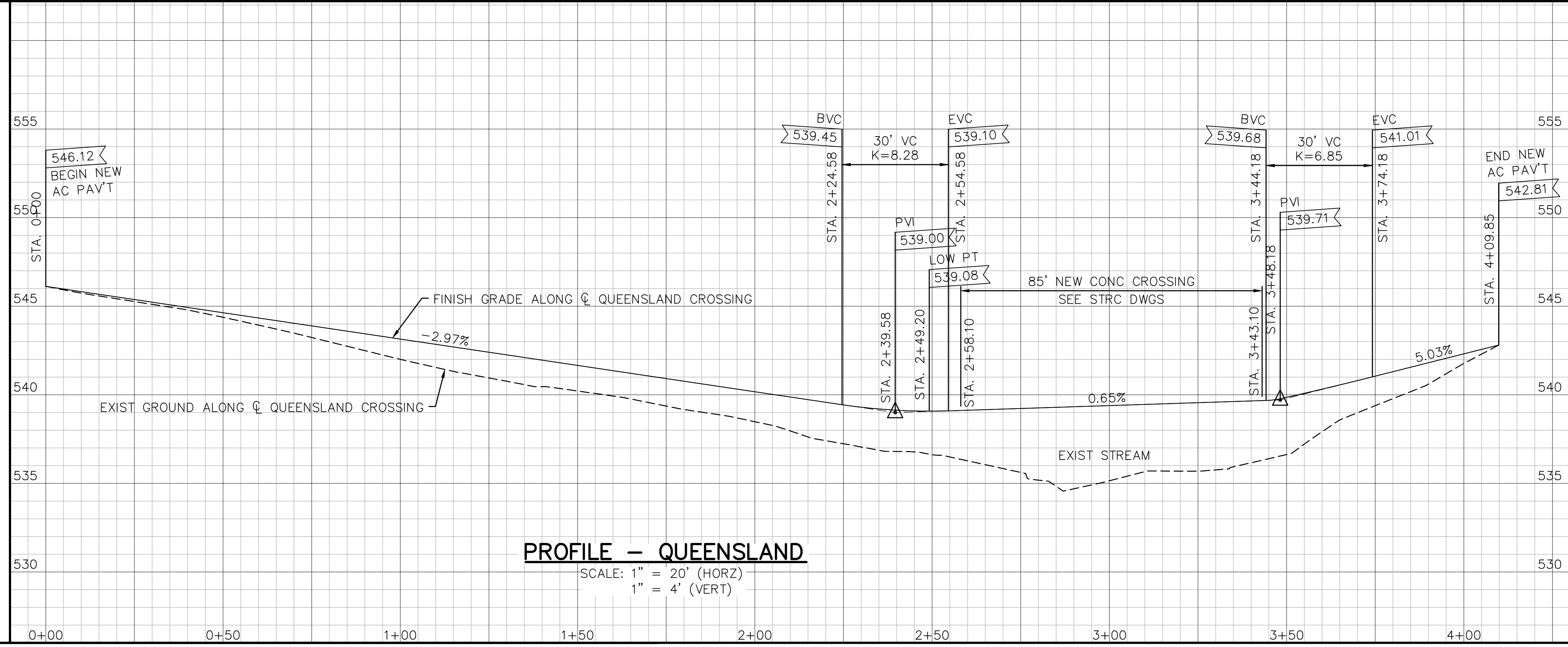
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CURVE	Δ	Δ/2	R	T	C	Lc
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2	22°00'00"	11°00'00"	100.00	19.44	38.16	38.40
3	12°08'59"	6°04'30"	200.00	21.29	42.33	42.41



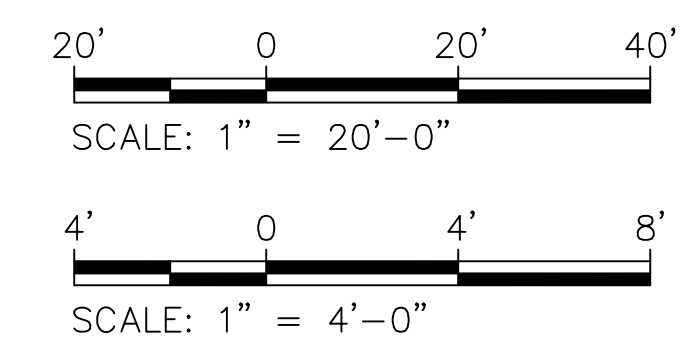
**PLAN - QUEENSLAND**  
SCALE: 1" = 20'

**LEGEND**

- NEW ASPHALT ROAD SECTION
- NEW CONC
- GROUTED RIPRAP
- EXIST. CONTOURS
- FINISH CONTOURS
- SLOPE BANKS



**PROFILE - QUEENSLAND**  
SCALE: 1" = 20' (HORZ)  
1" = 4' (VERT)



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

AKINAKA & ASSOCIATES, LTD.

Ken C. Kawahara  
Licensed Professional Engineer  
No. 9148-C  
HAWAII, U.S.A.

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

**LIHUE-KOLOA FOREST RESERVE  
QUEENSLAND LOOP ROAD  
LOW WATER CROSSING**

**PLAN AND PROFILE -  
QUEENSLAND**

DESIGNED: GMG  
DRAWN: KJM/AKK  
CHECKED: KCK

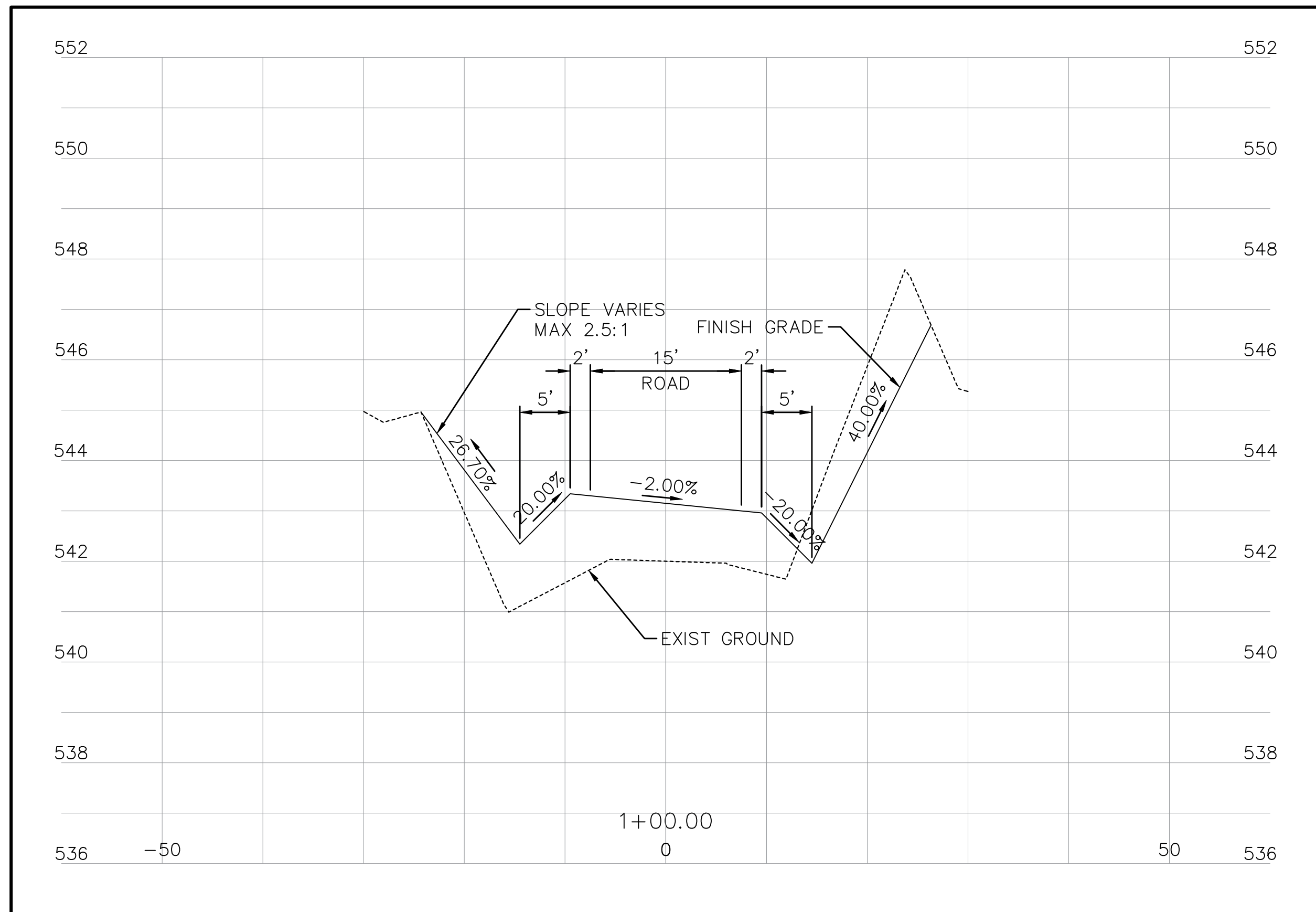
SUBMITTED:  
DATE: FEB 2024  
SCALE: AS SHOWN

EXPIRATION DATE OF THE LICENSE 4/30/2024  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

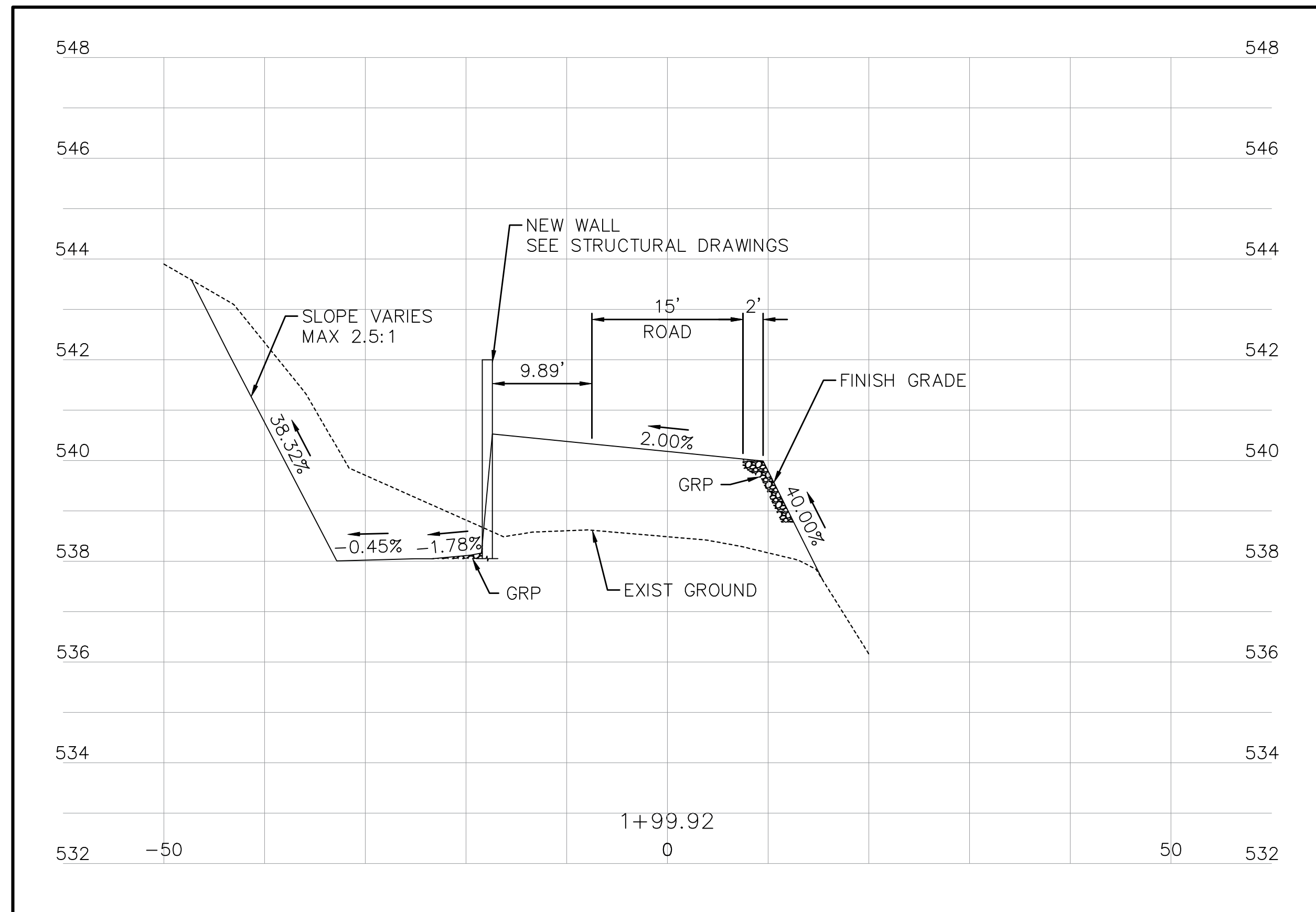
Carty Chang  
E-signed 2024-02-14 09:55AM HST  
carty.s.chang@hawaii.gov  
State of Hawaii  
Chief Engineer

DRAWING NO. **C-04**

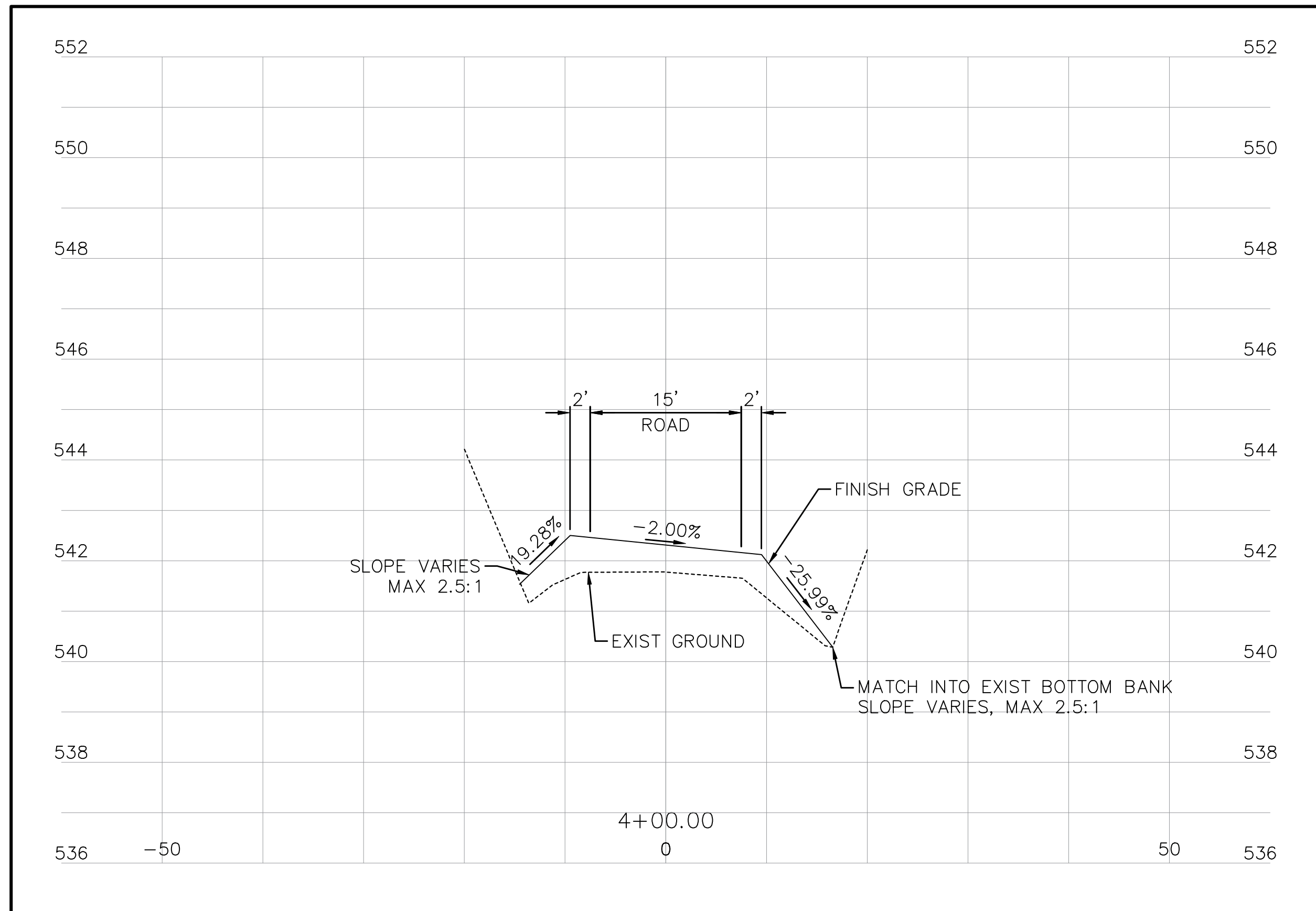
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 LAST SAVED BY: RIT REVISOR: 2/9/2024 3:02 PM



**STA. 1+00**  
 SCALE: 1" = 10' HORIZ.  
 SCALE: 1" = 2' VERT.

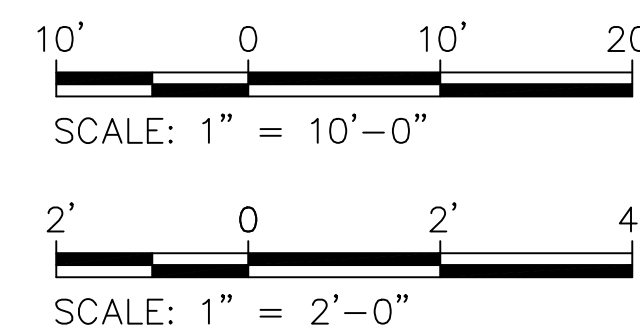


**STA. 1+99.92**  
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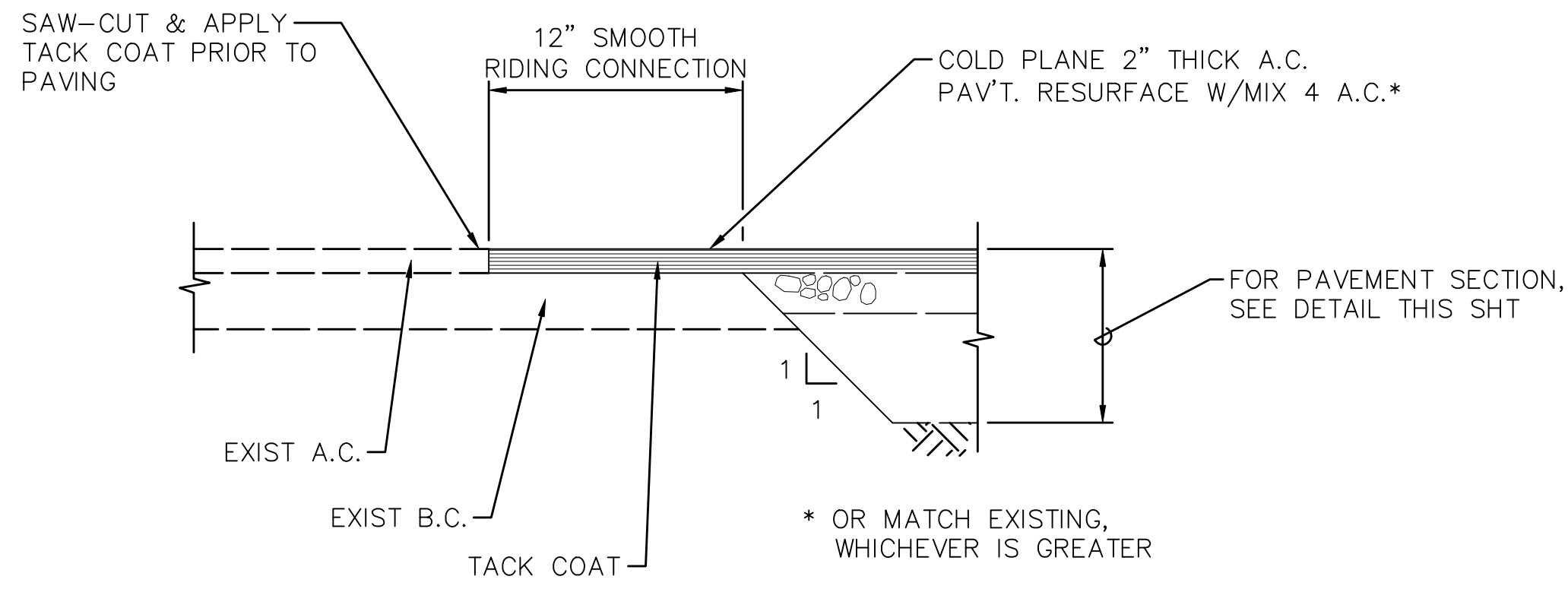
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 SCALE: 1" = 2' VERT.

NOTES:  
 FOR AC PAVEMENT SECTIONS, SEE SHT C-06

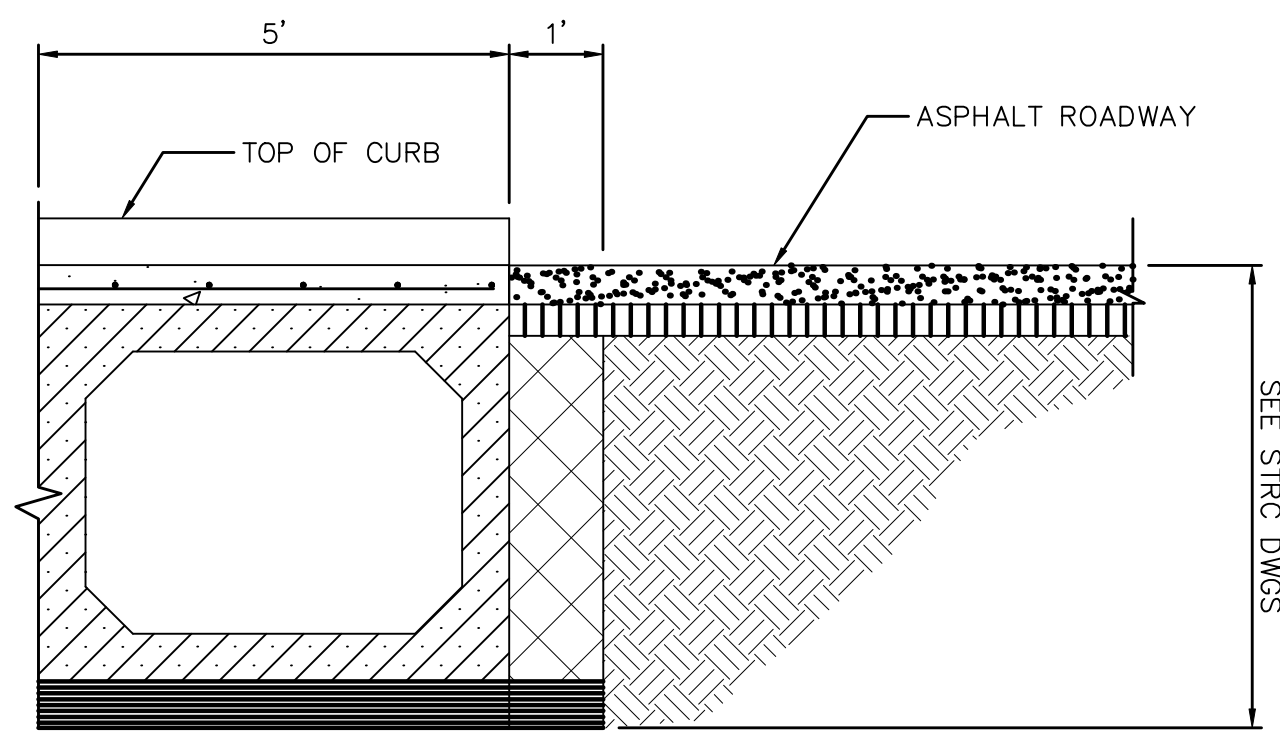


REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD. STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIHUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSING ROADWAY SECTIONS 01 - QUEENSLAND					
DESIGNED: GMG			SUBMITTED:		
DRAWN: KJM/AKK			DATE: FEB 2024		
CHECKED: KCK			SCALE: AS SHOWN		
APPR: Carty Chang			E-signed 2024-02-14 09:55AM HST		DRAWING NO.
CHIEF: Carty Chang			State of Hawaii		C-05

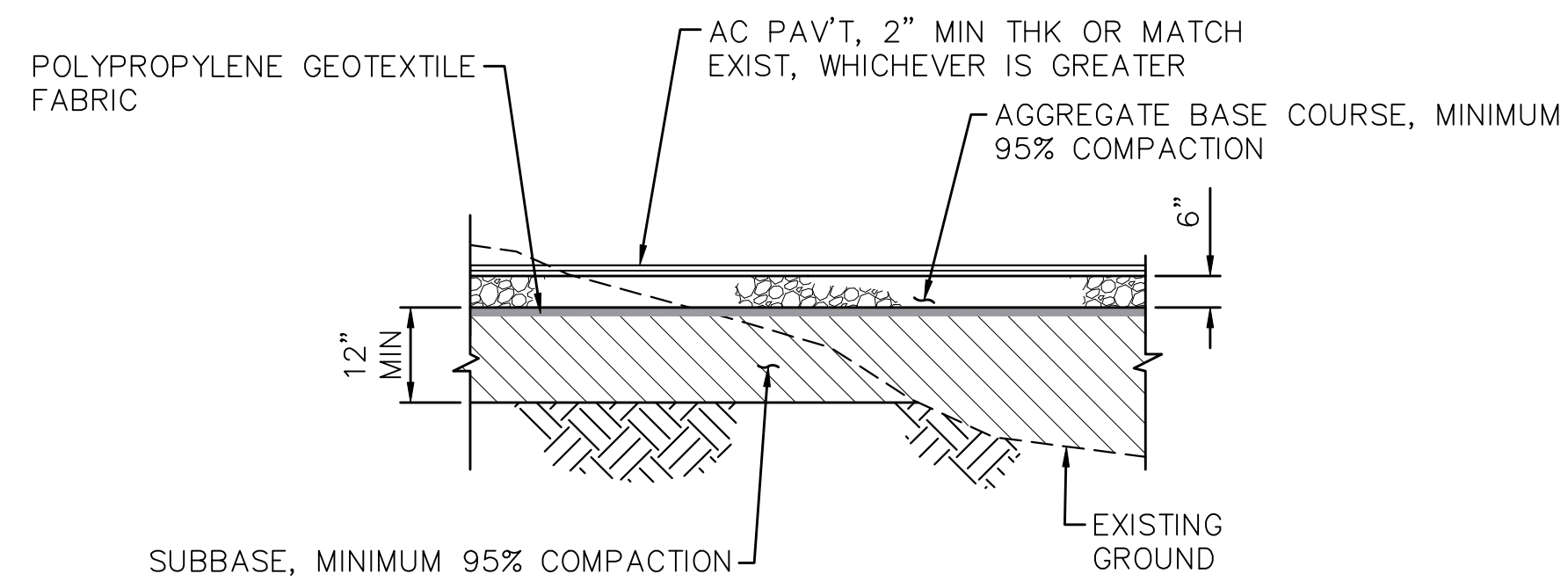
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 PM: CLJ  
 CURRENT OPER: RIT 1/7/2022 2:26 PM  
 LAST SAVED BY: BITT REVISED: 1/15/2024 4:25 PM



**1 SMOOTH RIDING CONNECTION DETAIL**  
 C-06 NOT TO SCALE



**2 BRIDGE PAVEMENT TRANSITION DETAILS**  
 C-06 NOT TO SCALE



**3 TYPICAL PAVEMENT SECTION**  
 C-06 NOT TO SCALE

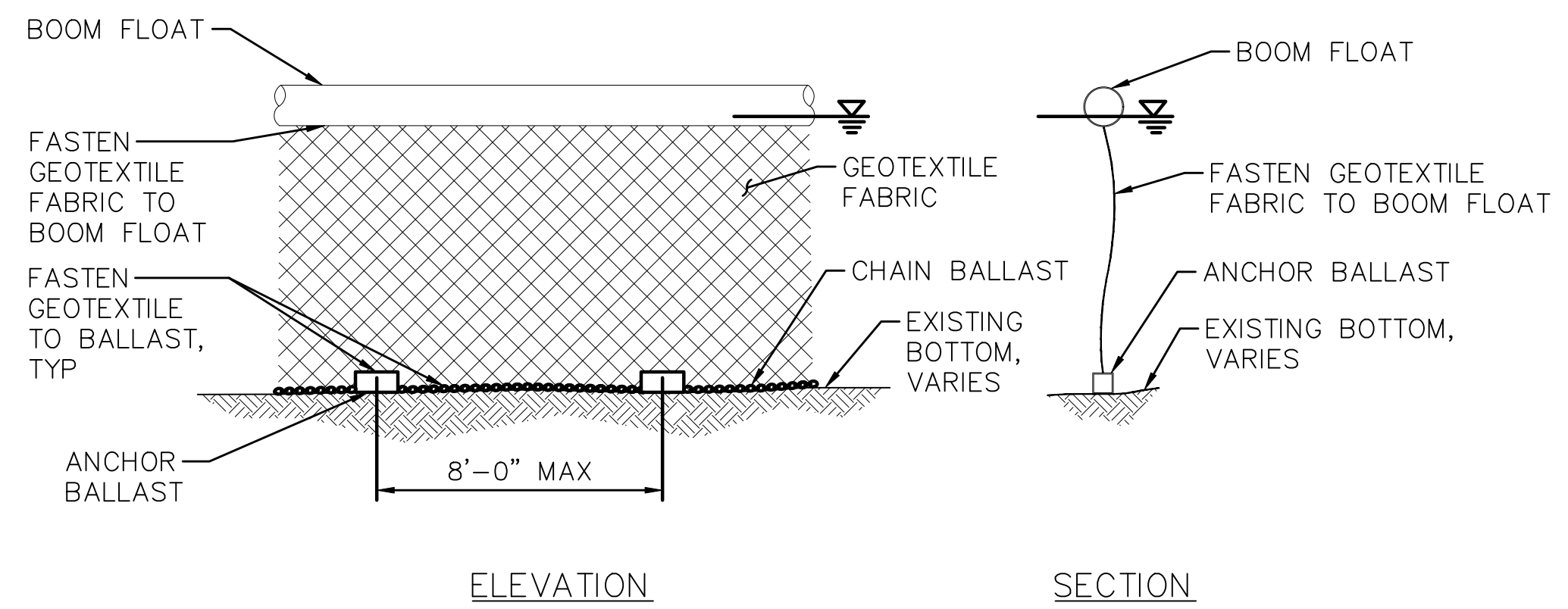
**BMP NOTES:**

1. CONSTRUCTION WORK WITHIN THE STREAM BED SHALL BE DONE DURING DRY PERIODS WHEN STREAM FLOW IS MINIMAL. WORK SHALL BE DISCONTINUED DURING STORM EVENTS OR DURING FLOOD CONDITION.
2. FILL MATERIAL FOR SAND BAGS SHALL BE CLEANED GRANULAR MATERIAL. CONTRACTOR TO SUBMIT SPECIFICATIONS OF THE SAND BAG AND FILL MATERIAL PRIOR TO CONSTRUCTION. FILL MATERIAL SHALL BE CLEANED OFFSITE. RUNOFF FROM CLEANING OF FILL MATERIAL SHALL NOT BE DISCHARGED INTO STATE WATERS.
3. TREATED WOOD MATERIAL IS NOT PERMITTED FOR FORMS WITHIN THE STREAM CHANNEL.
4. BMPs ARE REQUIRED FOR CONTRACTOR'S STOCKPILE AND STAGING AREAS TO PREVENT CONTAMINATED RUNOFF FROM FLOWING INTO STATE WATERS.
5. RUNOFF COLLECTED WITHIN CONTAINED AREAS SHALL NOT BE ALLOWED TO FLOW INTO STREAM CHANNEL OR ANY STATE WATERS.
6. FRESH CONCRETE SHALL BE PREVENTED FROM ENTERING THE STREAM DURING ALL CONCRETING WORK. CONCRETE SHALL NOT OVERFLOW FORMWORK. FORMWORK AND JOINTS SHALL BE SEALED AGAINST CONCRETE LEAKAGE.
7. NO DEBRIS SHALL BE ALLOWED TO ENTER THE STREAM. A PAN SHALL BE USED TO CAPTURE DEBRIS DURING SOIL NAIL WALL WORK.
8. DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION.

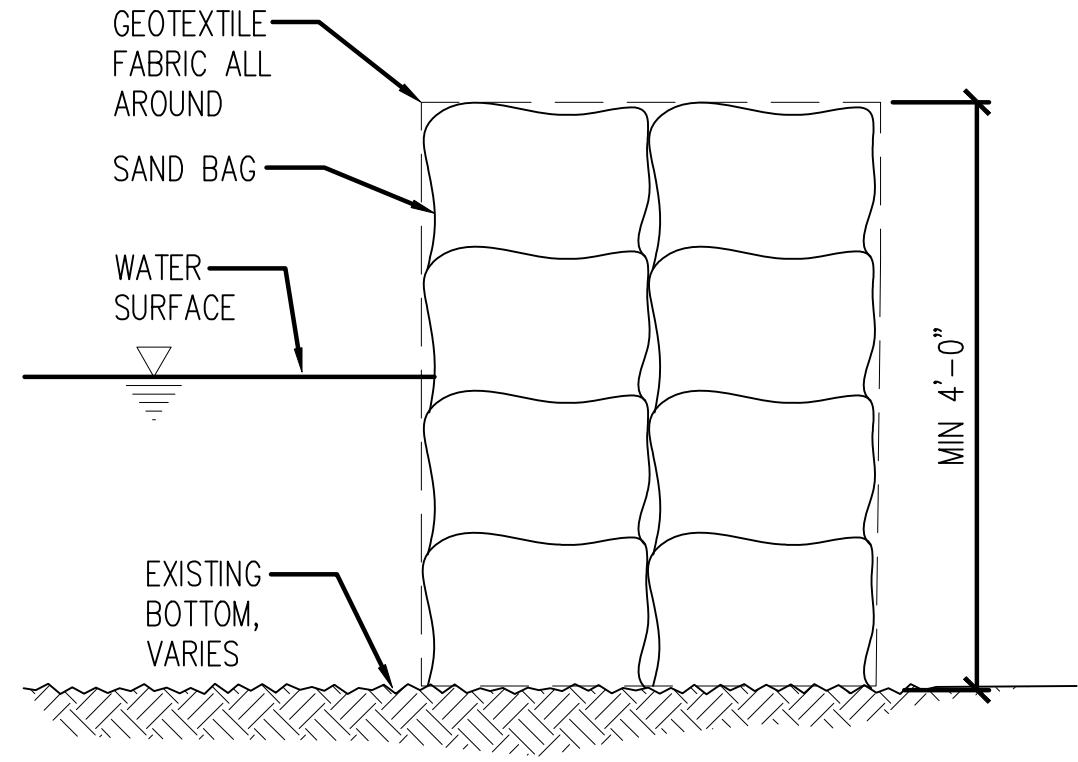
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 FILE: KAI2002 - ROADWAY DETAILS 01.DWG  
 BEGIN: 9-Feb-24

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
AKINAKA & ASSOCIATES, LTD. STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION LIHUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSING ROADWAY DETAILS 01 - QUEENSLAND					
			DESIGNED: GMG DRAWN: KJM/AKK CHECKED: KCK SUBMITTED: DATE: FEB 2024 SCALE: AS SHOWN		
APPR: Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer			DRAWING NO. <b>C-06</b>		



ELEVATION SECTION



SANDBAG WRAPPING IN GEOTEXTILE FABRIC DETAIL (WORK W/IN STREAM)

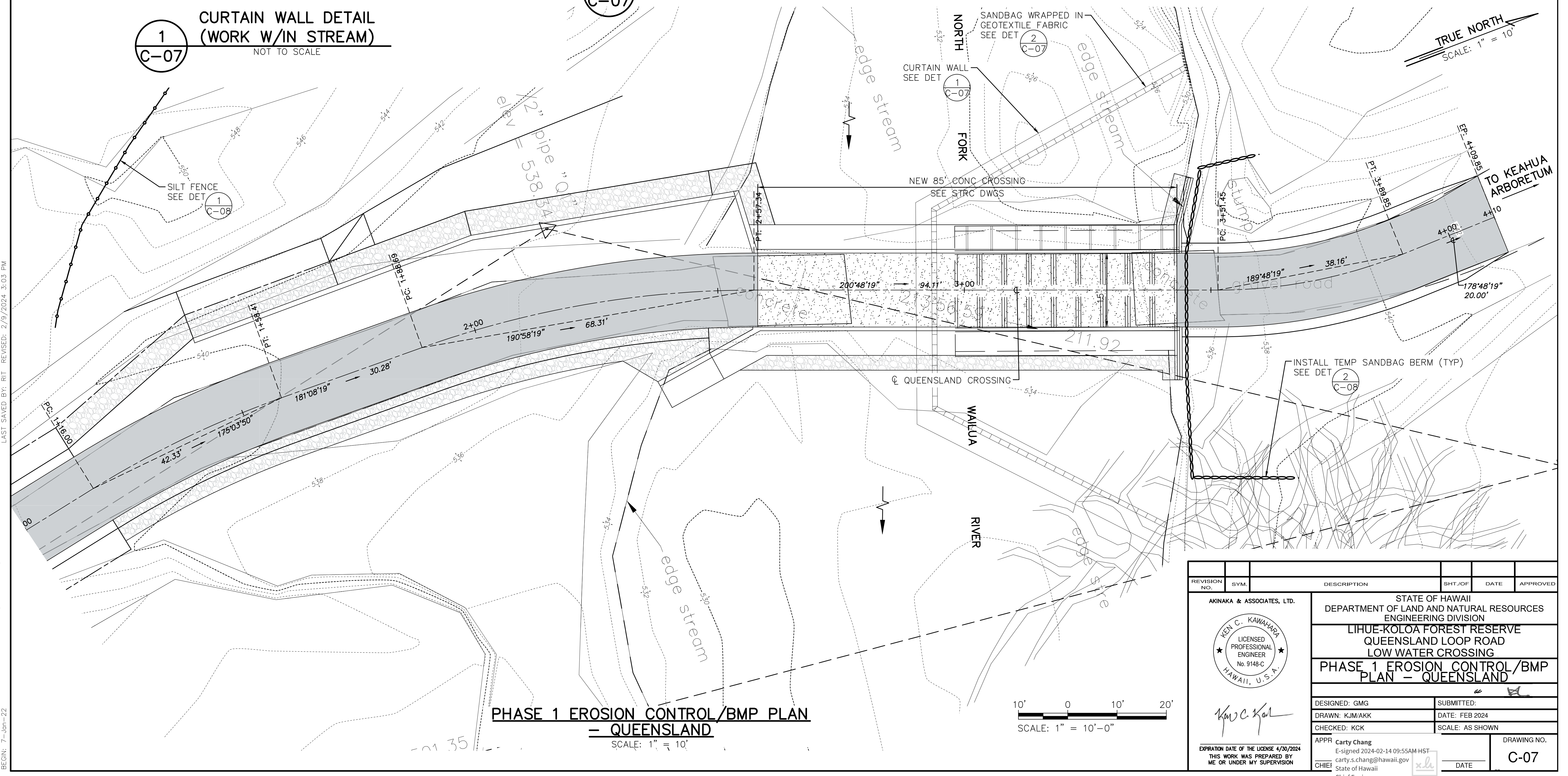
NOTES:  
 1. IMPLEMENTATION OF BEST MANAGEMENT PRACTICES (BMPs) INCLUDES CONSTRUCTION OF WORK SCAFFOLDING/PLATFORMS THAT WILL PROTECT STREAM BELOW FROM FALLING DEBRIS DURING CONSTRUCTION. COST OF MAINTENANCE OF BMPs AND OTHER ASSOCIATED WORK SHALL BE INCLUDED IN THE ENVIRONMENTAL POLLUTION CONTROL BID ITEM.  
 2. ANY REMOVAL OF ROCK OR MATERIAL TO FACILITATE THE PLACEMENT OF SANDBAGS SHALL BE COMPLETELY REMOVED FROM WAILUA RIVER.

**LEGEND**

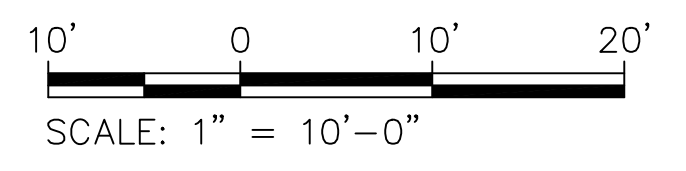
	NEW ASPHALT ROAD SECTION
	NEW CONC
	GROUTED RIPRAP
	EXIST. CONTOURS
	FINISH CONTOURS
	SLOPE BANKS
	SILT FENCE
	SANDBAG BERM

**1**  
 C-07  
 CURTAIN WALL DETAIL (WORK W/IN STREAM)  
 NOT TO SCALE

**2**  
 C-07  
 SANDBAG WRAPPING IN GEOTEXTILE FABRIC DETAIL (WORK W/IN STREAM)  
 NOT TO SCALE



**PHASE 1 EROSION CONTROL/BMP PLAN - QUEENSLAND**  
 SCALE: 1" = 10'



PM: CLJ  
 CURRENT OPER: RIT 1/7/2022 10:06 AM  
 LAST SAVED BY: RIT REVISOR: 2/9/2024 3:03 PM  
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 FILE: KAI2002 - EROSION CONTROL PLAN 03 (QUEENSLAND).DWG  
 BEGIN: 7-jan-22

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

AKINAKA & ASSOCIATES, LTD.

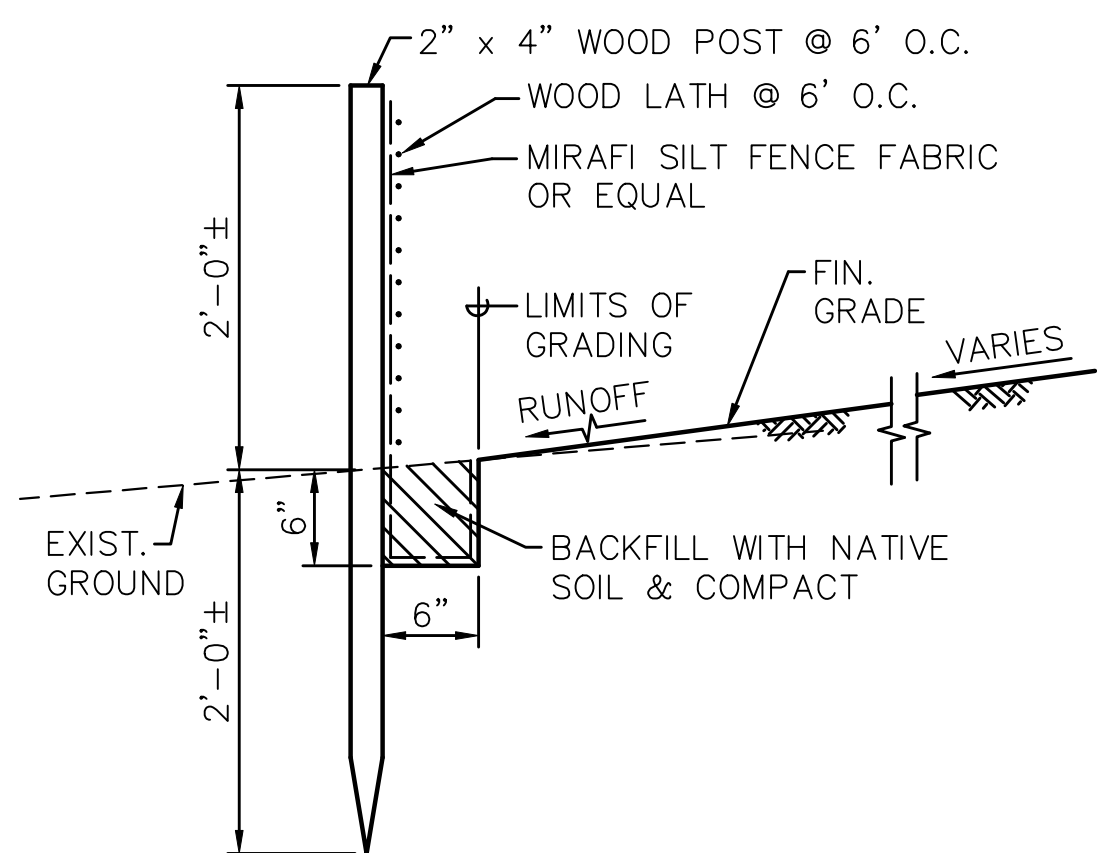
Ken C. Kawahara  
 Licensed Professional Engineer  
 No. 9148-C  
 HAWAII, U.S.A.

STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 ENGINEERING DIVISION  
 LIHUE-KOLOA FOREST RESERVE  
 QUEENSLAND LOOP ROAD  
 LOW WATER CROSSING  
 PHASE 1 EROSION CONTROL/BMP PLAN - QUEENSLAND

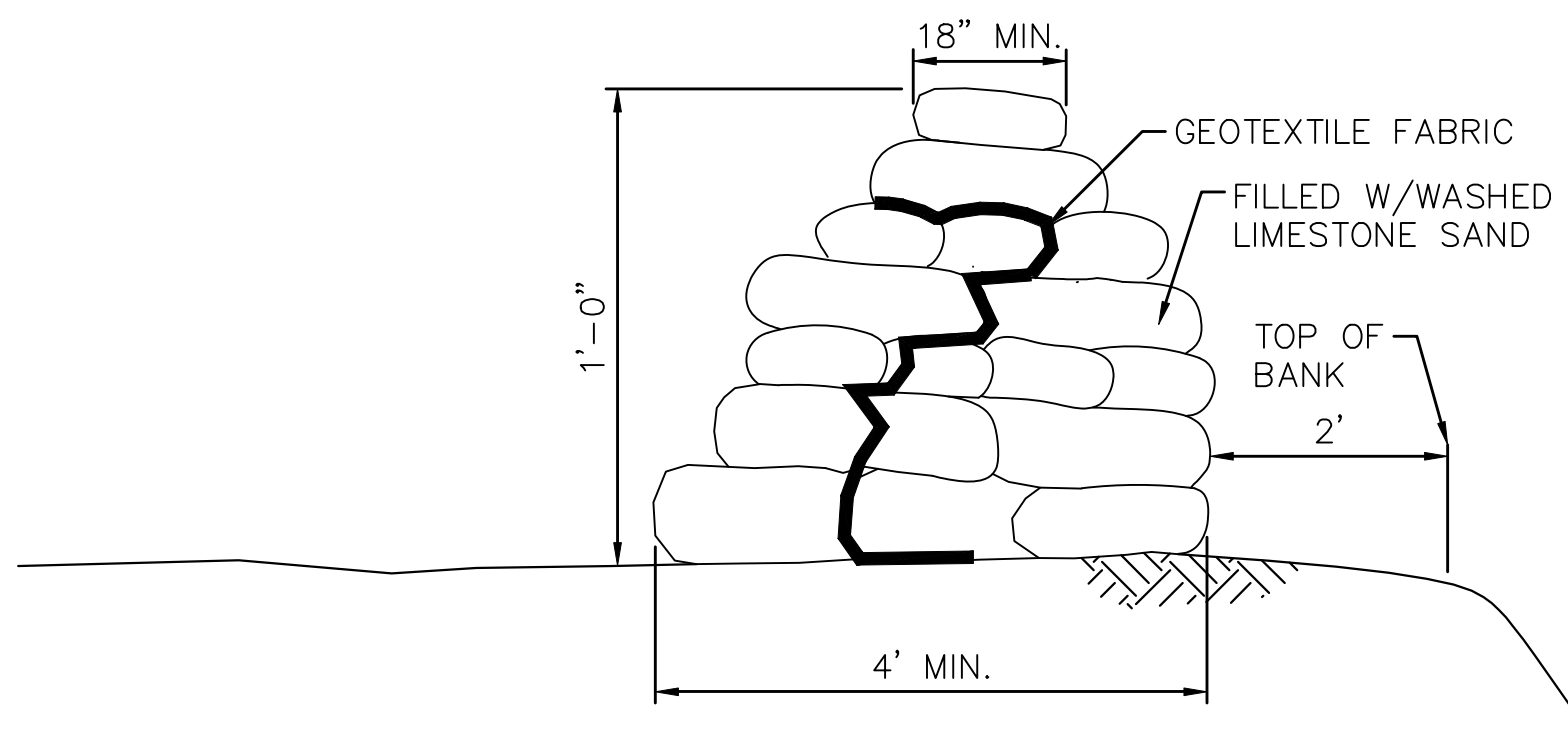
DESIGNED: GMG  
 DRAWN: KJM/AKK  
 CHECKED: KCK  
 APPR: Carty Chang  
 E-signed 2024-02-14 09:55AM HST  
 carty.s.chang@hawaii.gov  
 State of Hawaii  
 Chief Engineer

DATE: FEB 2024	SCALE: AS SHOWN
DRAWING NO. C-07	DATE: _____





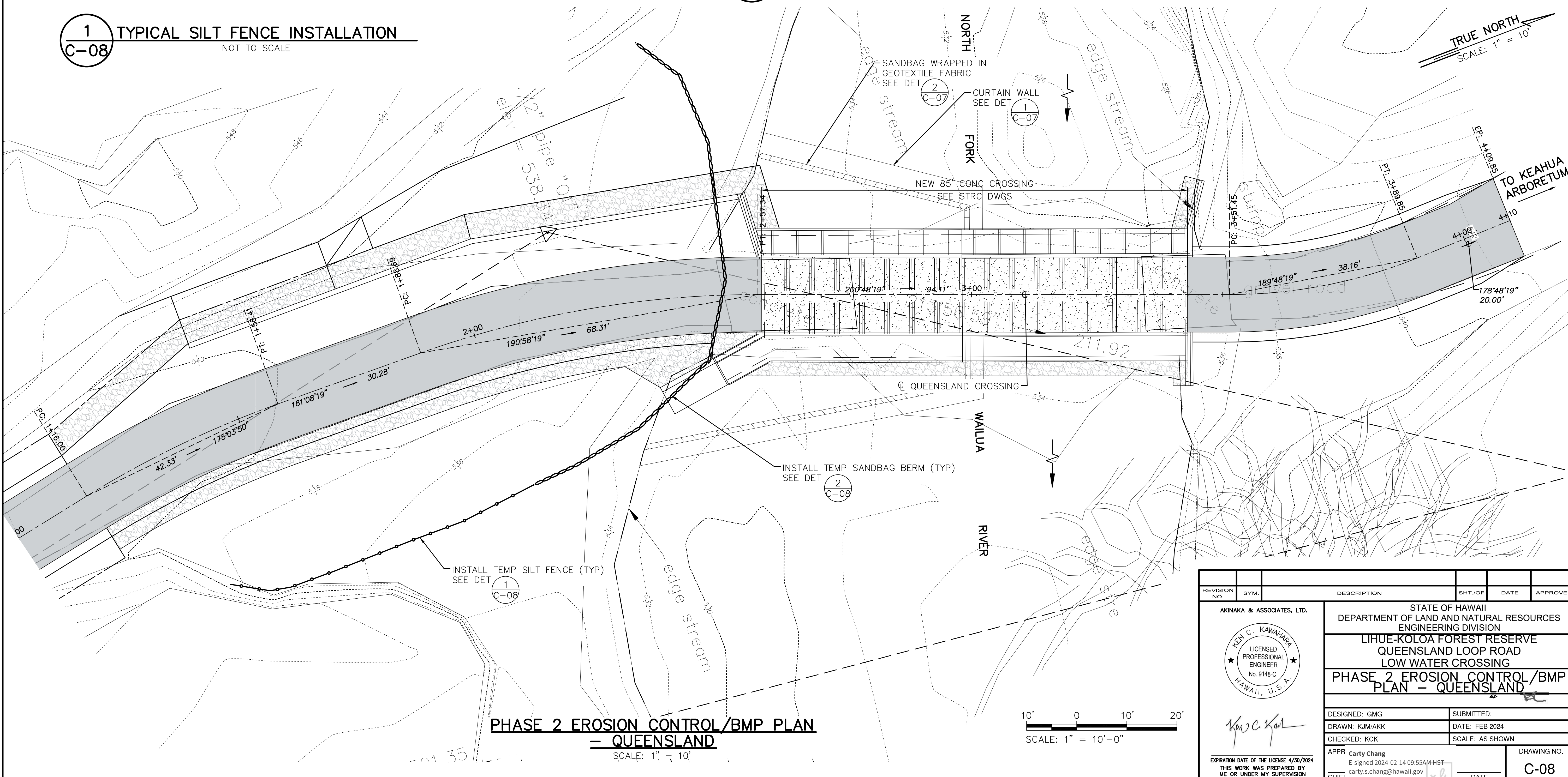
**1 TYPICAL SILT FENCE INSTALLATION**  
C-08 NOT TO SCALE



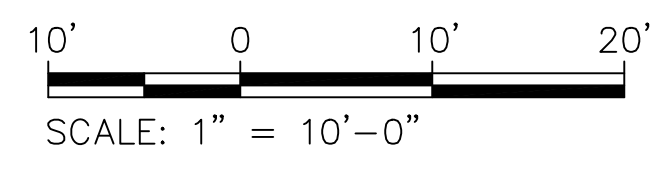
**2 TEMPORARY SANDBAG BERM**  
C-08 NOT TO SCALE

**LEGEND**

	NEW ASPHALT ROAD SECTION
	NEW CONC
	GROUTED RIPRAP
	EXIST. CONTOURS
	FINISH CONTOURS
	SLOPE BANKS
	SILT FENCE
	SANDBAG BERM



**PHASE 2 EROSION CONTROL/BMP PLAN**  
**— QUEENSLAND**  
SCALE: 1" = 10'



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

	STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION	
	LIHUE-KOLOA FOREST RESERVE QUEENSLAND LOOP ROAD LOW WATER CROSSING	
PHASE 2 EROSION CONTROL/BMP PLAN - QUEENSLAND		
DESIGNED: GMG	SUBMITTED:	
DRAWN: KJM/AKK	DATE: FEB 2024	
CHECKED: KCK	SCALE: AS SHOWN	
APPR: Carty Chang	DRAWING NO. C-08	
<small>EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION</small>		

PM: CLJ  
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 FILE: KAI2002 - EROSION CONTROL PLAN 04 (QUEENSLAND).DWG  
 BEGIN: 10-Jan-22

GENERAL:

- A. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE AASHTO LRFD BRIDGE DESIGN SPECIFICATION, 9TH EDITION, 2020 INCLUDING ITS SUBSEQUENT INTERIM SPECIFICATIONS, AND THE HAWAII STANDARD SPECIFICATIONS FOR BRIDGE AND ROAD CONSTRUCTION, 2005 AS MODIFIED BY THE STATE OF HAWAII DEPARTMENT OF TRANSPORTATION.
- B. THE CONTRACTOR SHALL COMPARE THE CIVIL AND STRUCTURAL DRAWINGS WITH EACH OTHER AND REPORT IN WRITING TO THE ENGINEER, INCONSISTENCIES OR OMISSIONS.
- C. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING THE WORK. REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES OR OMISSIONS.
- D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR METHODS OF CONSTRUCTION, WORKMANSHIP AND JOB SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING AS REQUIRED FOR STABILITY OF STRUCTURAL MEMBERS AND SYSTEMS.
- E. DETAILS NOTED AS TYPICAL ON STRUCTURAL DRAWINGS SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED OTHERWISE.
- F. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.
- G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, STRUCTURES, STREETS, AND UTILITIES DURING THE CONSTRUCTION PERIOD. ANY DAMAGE OR DETERIORATED PROPERTY SHALL BE RESTORED TO THE SAME OR BETTER CONDITION AT NO COST TO THE STATE.

DEMOLITIONS NOTES:

- A. THE CONSTRUCTION DRAWINGS INDICATE THE GENERAL EXTENT OF REQUIRED DEMOLITION AND REMOVAL WORK.
- B. THE CONTRACTOR SHALL FIELD VERIFY EXISTING CONDITIONS (PRIOR TO BID) TO DETERMINE THE EXTENT OF ALL REQUIRED DEMOLITION WORK. THE REMOVAL OR DEMOLITION OF MATERIALS, ACCESSORIES, FIXTURES, ETC., SHALL BE COMPLETE AND INCLUDE ALL RELATED ITEMS TO THE EXTENT THAT FUTURE CONSTRUCTION CAN BE PERFORMED AND COMPLETED WITHOUT ADDITIONAL COST TO THE STATE.
- C. ALL NECESSARY PRECAUTIONS SHALL BE TAKEN TO INSURE AGAINST DAMAGE TO EXISTING ITEMS AND FEATURES REMAINING IN PLACE.
- D. THE CONTRACTOR SHALL REMOVE EXISTING ITEMS AS DEEMED NECESSARY SO THAT FUTURE WORK CAN BE PERFORMED AND ALSO, SO THAT ANY EXISTING ITEM IS NOT DAMAGED WHEN FUTURE WORK IS PERFORMED. THE CONTRACTOR SHALL ALSO INSTALL ANY OR ALL OF THE ITEMS, PATCH AND RESTORE SURROUNDING SURFACES AS REQUIRED AS PART OF THE WORK ACCEPTABLE TO THE CONTRACTING OFFICER.
- E. LOCATION OF UNDERGROUND UTILITIES AND PIPES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS OF THE EXISTING UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THEM. ANY PORTION OF THE EXISTING UTILITIES THAT MUST BE REMOVED OR OTHERWISE DISTURBED TO ACCOMPLISH THIS WORK CALLED FOR ON THE PLANS SHALL BE RECONSTRUCTED, REPLACED OR RESTORED TO THE ORIGINAL CONDITION AT THE CONTRACTOR'S OWN EXPENSE.

DESIGN CRITERIA:

- A. DEAD LOAD  
WEIGHT OF ALL COMPONENTS OF THE STRUCTURES, APPURTENANCES ATTACHED THERETO, AND EARTH COVERS.
- B. LIVE LOAD  
HL-93 TRUCK
- C. LATERAL EARTH PRESSURE  
ACTIVE CONDITION, ABOVE GROUNDWATER ----- = 35 PCF  
ACTIVE CONDITION, BELOW GROUNDWATER ----- = 65 PCF  
AT REST CONDITION ----- = 65 PCF
- D. HYDRAULIC LOADS  
100-YEAR EVENT  
VELOCITY----- = 3.8 FT/S<sup>2</sup>  
HEIGHT----- = 5'-9" FROM STREAMBED

FOUNDATION:

- A. FOUNDATION DESIGN IS BASED UPON GEOTECHNICAL INVESTIGATIONS BY HART CROWSER AND DATED AUGUST 19, 2021.
- B. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, AND SHORING NECESSARY FOR PERSONNEL SAFETY AND TO PRESERVE EXCAVATIONS AND EARTH BANKS, AND ADJACENT STRUCTURES AND PROPERTY FOR DAMAGE.
- C. EXCAVATION BOUNDARIES AND GRADE ELEVATIONS FOR FOOTING SHALL BE APPROVED BY THE ENGINEER PRIOR TO PLACING THE CONCRETE AND REINFORCING.
- D. BACKFILL BEHIND THE RETAINING STRUCTURES (ABOVE THE GROUNDWATER LEVEL) MAY CONSIST OF THE ON-SITE SOILS OR SELECT GRANULAR FILLS (TYPE A STRUCTURE BACKFILL). BACKFILL SHALL BE PLACED IN UNIFORM LIFTS OF NO MORE THAN 8 INCHES IN LOOSE THICKNESS AND UNIFORMLY COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION. BECAUSE SHALLOW GROUNDWATER CONDITIONS ARE ANTICIPATED, BACKFILL MATERIALS BELOW THE GROUNDWATER LEVEL SHOULD CONSIST OF FREE-DRAINING GRANULAR MATERIALS, SUCH AS AASHTO M43, NO 67 GRADATION (ASTM C33, NO 67 GRADATION), WRAPPED ON ALL SIDES WITH NON-WOVEN FILTER FABRIC (MIRAFI 180N OR EQUIVALENT). THE FREE-DRAINING GRANULAR MATERIALS SHOULD BE USED UP TO A LEVEL OF ABOUT 12 INCHES ABOVE THE GROUNDWATER LEVEL TO FACILITATE COMPACTION OF THE BACKFILL MATERIALS.

CONCRETE:

- A. CONCRETE SHALL BE NORMAL WEIGHT HARD ROCK CONCRETE AND SHALL HAVE 4000 PSI MINIMUM 28-DAY COMPRESSIVE STRENGTHS.
- B. ALL CONCRETE SHALL HAVE MAXIMUM W/C RATIO OF 0.45 EXCEPT FOR CLASS "A" WHICH SHALL BE AS SPECIFIED IN THE STANDARD SPECIFICATIONS.

- C. TETRAGUARD AS20 SHRINKAGE REDUCING ADMIXTURE, ECLIPSE PLUS SHRINKAGE REDUCING ADMIXTURE, OR AN APPROVED EQUAL, SHALL BE INCLUDED IN THE CONCRETE MIX FOR THE CONCRETE TOPPING AND BRIDGE RAILING. THE REQUIRED DOSAGE SHALL BE 128 OUNCES PER CUBIC YARD OF CONCRETE OR AS RECOMMENDED BY THE MANUFACTURER. ADDITION OF SHRINKAGE REDUCING ADMIXTURE SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
- D. A CORROSION INHIBITING ADMIXTURE SHALL BE INCLUDED IN THE CONCRETE MIX FOR ALL CONCRETE. THE CORROSION INHIBITING ADMIXTURE SHALL CONTAIN A MINIMUM OF 30% CALCIUM NITRATE BY MASS AND SHALL BE ADDED AT A DOSAGE RATE OF 4.0 GALLONS PER CUBIC YARD OF CONCRETE OR AS RECOMMENDED BY THE MANUFACTURER. THE ADMIXTURE SHALL BE RHEOCRETE CNI CALCIUM NITRATE-BASED CORROSION INHIBITOR, DCI S CORROSION INHIBITOR OR AN APPROVED EQUAL. ADDITION OF CORROSION INHIBITING ADMIXTURE SHALL BE AS RECOMMENDED BY THE MANUFACTURER.
- D. ALL INSERTS, ANCHOR BOLTS, PLATES, ETC. EMBEDDED IN CONCRETE SHALL BE HOT-DIP GALVANIZED UNLESS OTHERWISE NOTED.
- E. CONSTRUCTION JOINTS MAY BE RELOCATED BY THE CONTRACTOR AND SUBMITTED TO THE ENGINEER FOR APPROVAL. CONSTRUCTION JOINTS SHALL BE MADE AND RELOCATED AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE AND TO MINIMIZE SHRINKAGE STRESSES. ALL CONSTRUCTION JOINTS SHALL BE CLEANED, LAITANCE REMOVED AND WETTED. SEE TYPICAL DETAILS FOR SPECIFIC REQUIREMENTS.
- F. UNLESS OTHERWISE NOTED, CHAMFER ALL CONCRETE EDGES 3/4".
- G. CONCRETE DELIVERY TICKETS SHALL RECORD ALL FREE WATER IN THE MIX: AT BATCHING BY PLANT, FOR CONSISTENCY BY DRIVER, AND ANY ADDITIONAL REQUEST BY CONTRACTOR IF PERMITTED BY THE MIX DESIGN.
- H. REINFORCING BARS, ANCHOR BOLTS, INSERTS AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.

REINFORCING STEEL:

- A. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60 UNLESS OTHERWISE NOTED.
- B. CLEAR CONCRETE COVERAGE FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
  - a. FOOTING CAST AGAINST EARTH ----- 3"
  - b. FOOTING FORMED AND EXPOSED TO EARTH ----- 2"
  - c. WALL FACES EXPOSED TO EARTH OR WEATHER ----- 2"
- C. STAINLESS STEEL REINFORCING BARS SHALL BE TYPE 316 GRADE CONFORMING TO ASTM A955 GRADE 60.
- D. SPLICES:
  - a. REINFORCING STEEL SHALL BE SPLICED ONLY WHERE INDICATED ON PLANS.

FIBER REINFORCED POLYMER STRUCTURAL MEMBERS:

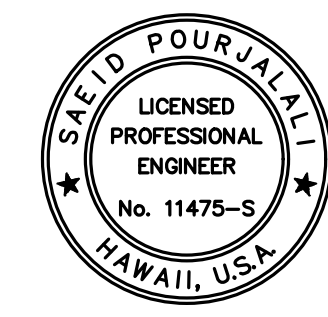

- A. FIBER-REINFORCED PLOYMER STRUCTURAL SHAPES SHALL BE MANUFACTURED BY THE PULTRUDED METHOD FROM A NON-FLAME RETARDANT ISOPHTHALIC POLYESTER RESIN SYSTEM. THE MEMBERS SHALL HAVE A MINIMUM TENSILE AND COMPRESSIVE STRESS IN THE LENGTHWISE DIRECTION OF 30 KSI (ASTM D638), A MINIMUM FLEXURAL STRESS LENGTHWISE OF 30 KSI (ASTM D790) AND A MODULUS OF ELASTICITY OF 2,800 KSI.
- B. ALL BOLTED CONNECTIONS FOR FRP MEMBERS SHALL BE WITH STAINLESS STEEL BOLTS IN CONFORMANCE WITH ASTM F593.
- C. INSTALL BEAMS WITH ANY CROWN IN MEMBER ORIENTED UPWARD.
- D. STAINLESS STEEL WEDGE ANCHORS SHALL HAVE A CURRENT ICC ES REPORT. ANCHORS SHALL BE INSTALLED PER PRODUCTS ICC ES REPORT.
- E. MEMBERS SHALL BE INSTALLED IN A MANNER THAT WILL ALLOW THEM TO BE REMOVED IN THE FUTURE BY REMOVING BOLTS, AND NO EXTRAORDINARY EFFORT.

STRUCTURAL STEEL:

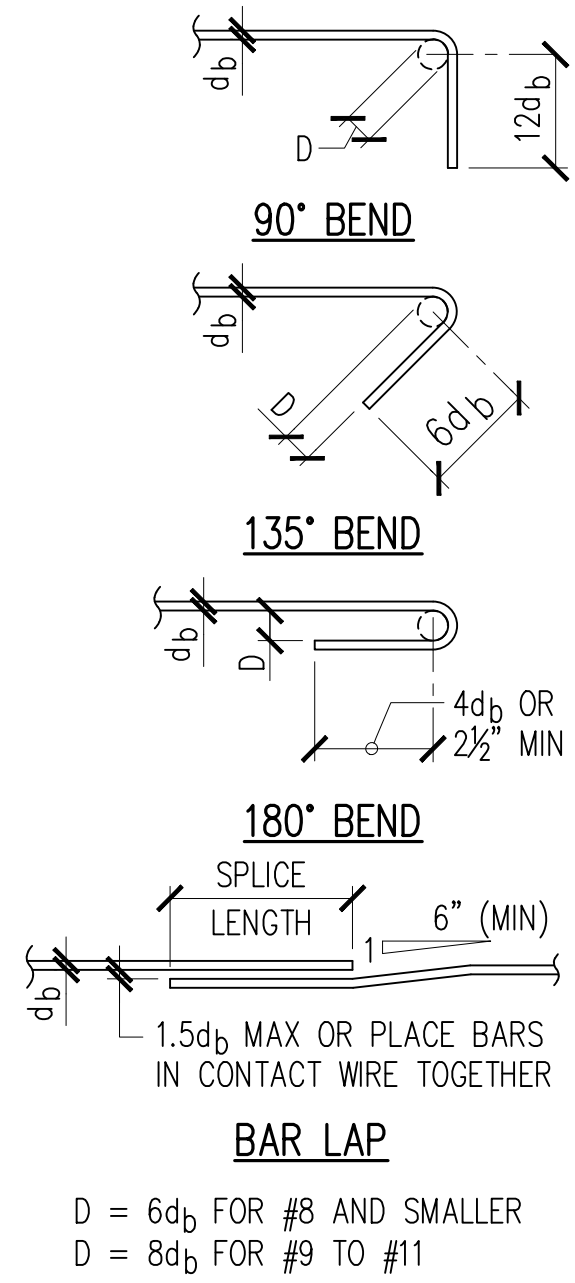
- A. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, THIRTEENTH EDITION.
- B. STAINLESS STEEL ROLLED FLAT BARS, HOT ROLLED OR EXTRUDED STRUCTURAL SHAPES, SUCH AS ANGLES, TEES, CHANNELS, OR BEAMS SHALL CONFORM TO ASTM A276.
- C. WELDS AND WELDING PROCEDURES SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.1 OF THE AMERICAN WELDING SOCIETY.
- D. WELDING SHALL BE PERFORMED BY WELDERS PREQUALIFIED FOR WELDING PROCEDURES TO BE USED.
- E. WELDING ELECTRODES SHALL BE E70XX FOR CARBON STEEL. FOR STAINLESS STEEL FILLER MATERIAL SHALL BE COMPATIBLE WITH MATERIAL WELDED PER AWS STANDARDS.
- F. STAINLESS STEEL BOLTS SHALL CONFORM TO ASTM F593, TYPE 316, AND STAINLESS STEEL NUTS TO ASTM F594, TYPE 316.
- G. STAINLESS STEEL THREADED RODS SHALL CONFORM TO ASTM A193, GRADE B8.

PRECAST CULVERT:

- A. LOCATION OF LIFTING DEVICES FOR THE PRECAST CULVERT SHOULD BE DESIGNED BY PRECAST MANUFACTURER.
- B. THE LIFTING HOLES SHALL BE FILLED WITH EPOXY NON-SHRINK GROUT.
- C. REINFORCING STEEL SHALL EXTEND FILL WIDTH OF END WALL PROVIDING 3" CLEARANCE.
- D. ANY SPACE BETWEEN ADJACENT BOXES TO BE FILLED WITH GROUT.

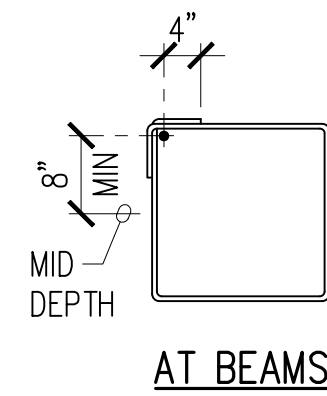
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
					
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE            QUEENSLAND LOOP ROAD            LOW WATER CROSSING</b>					
<b>STRUCTURAL NOTES</b>					
					
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION					
DESIGNED: CS	SUBMITTED: CS				
DRAWN: CAD	DATE: OCT 2023				
CHECKED: SP	SCALE: AS SHOWN				
A Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov C State of Hawaii Chief Engineer					DRAWING NO. <b>S-1</b>

MINIMUM SPLICE AND EMBEDMENT LENGTHS					
CONCRETE STRENGTH = 4,000 PSI					
BAR SIZE	LAP SPLICE		DEVELOPMENT		
	TOP BARS	OTHER BARS	STRAIGHT OTHER BARS	TOP BARS	WITH STANDARD HOOK
#3	29"	21"	12"	17"	10"
#4	29"	21"	12"	17"	10"
#5	36"	26"	15"	21"	12"
#6	43"	31"	18"	26"	16"
#7	54"	39"	23"	32"	18"
#8	71"	51"	30"	42"	20"
#9	90"	64"	38"	53"	22"
#10	114"	81"	48"	67"	26"
#11	140"	100"	59"	82"	28"



**TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE**

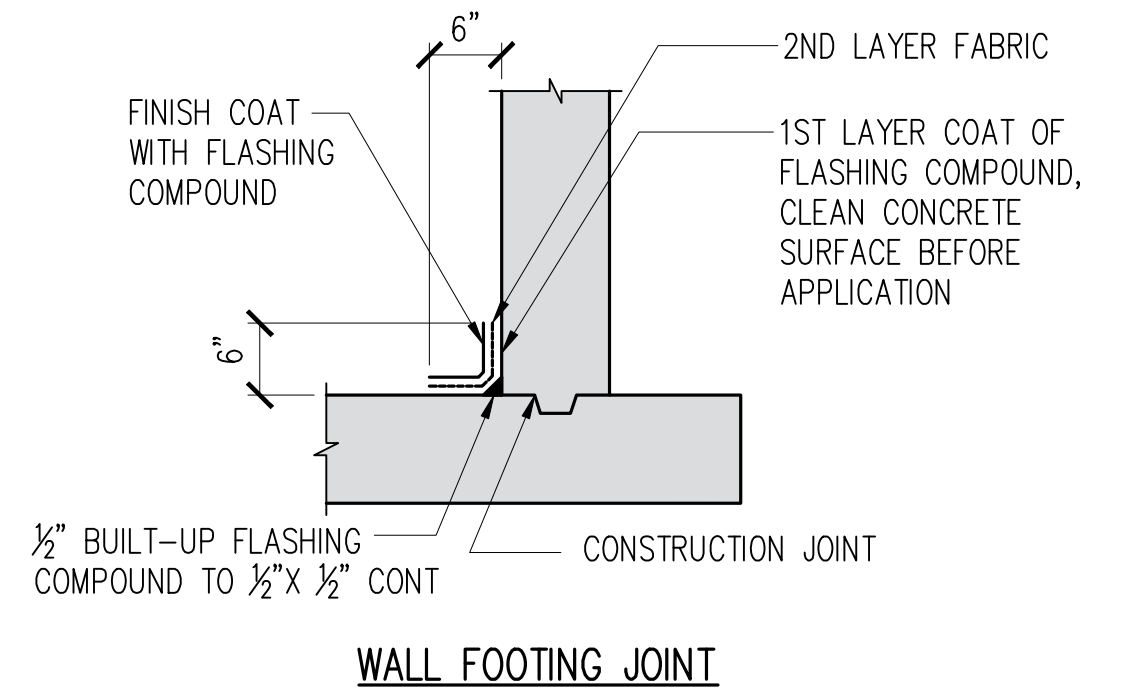
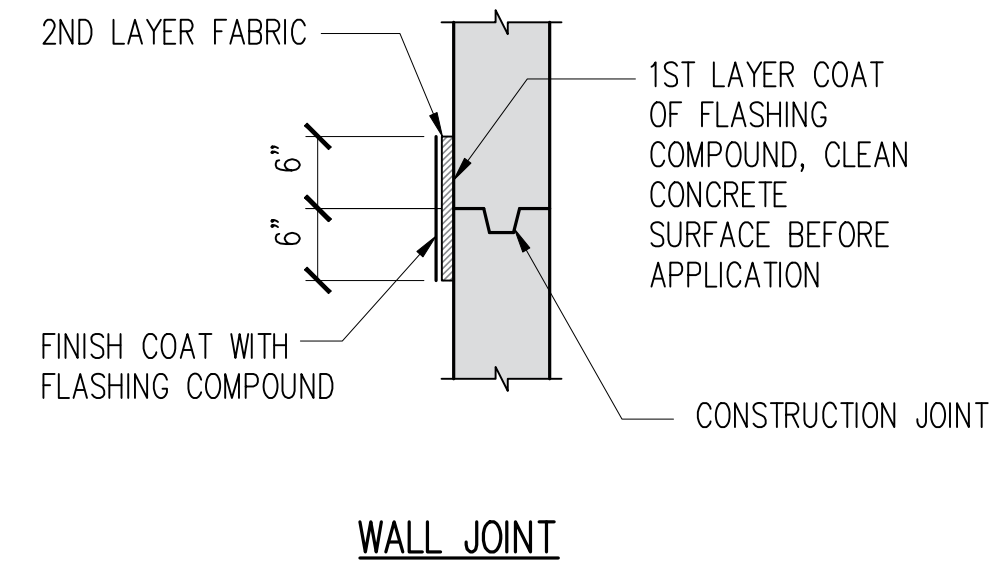
1  
S-2 NOT TO SCALE



NOTE:  
1. THESE DETAILS SHALL APPLY TO #3, #4, AND #5 BARS - GRADE 40 AND GRADE 60.  
2. ALL BARS SHALL BE BENT COLD.

**TYPICAL TIE AND STIRRUPS DETAIL**

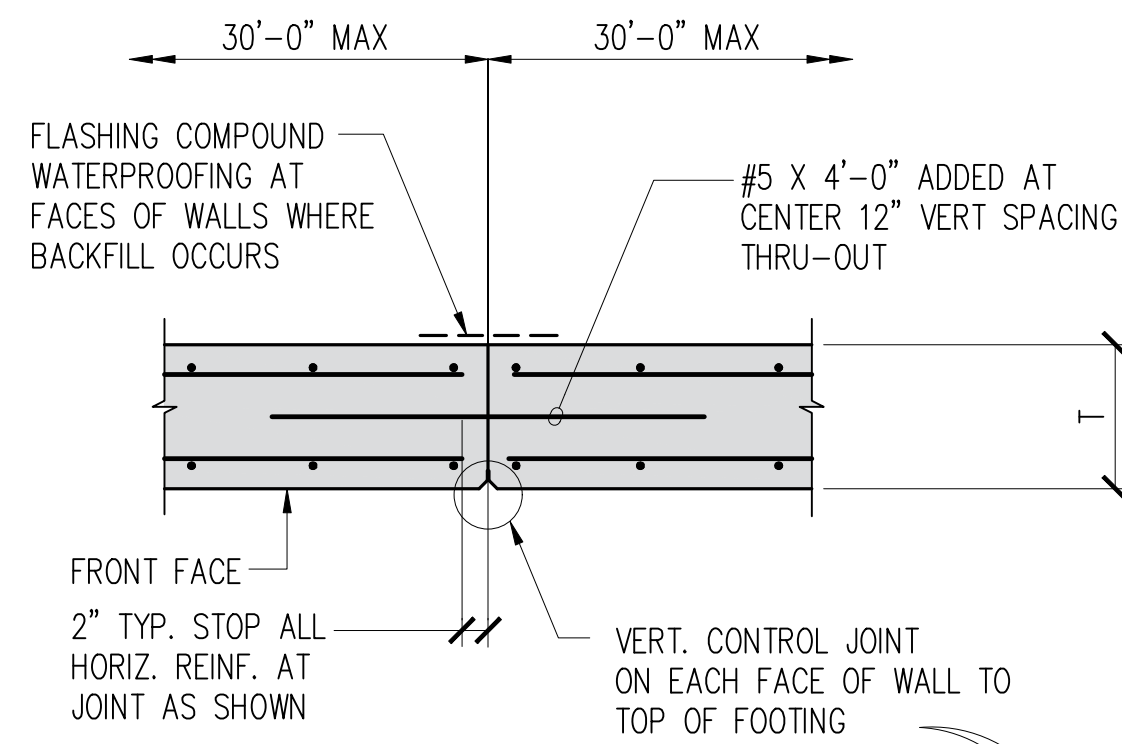
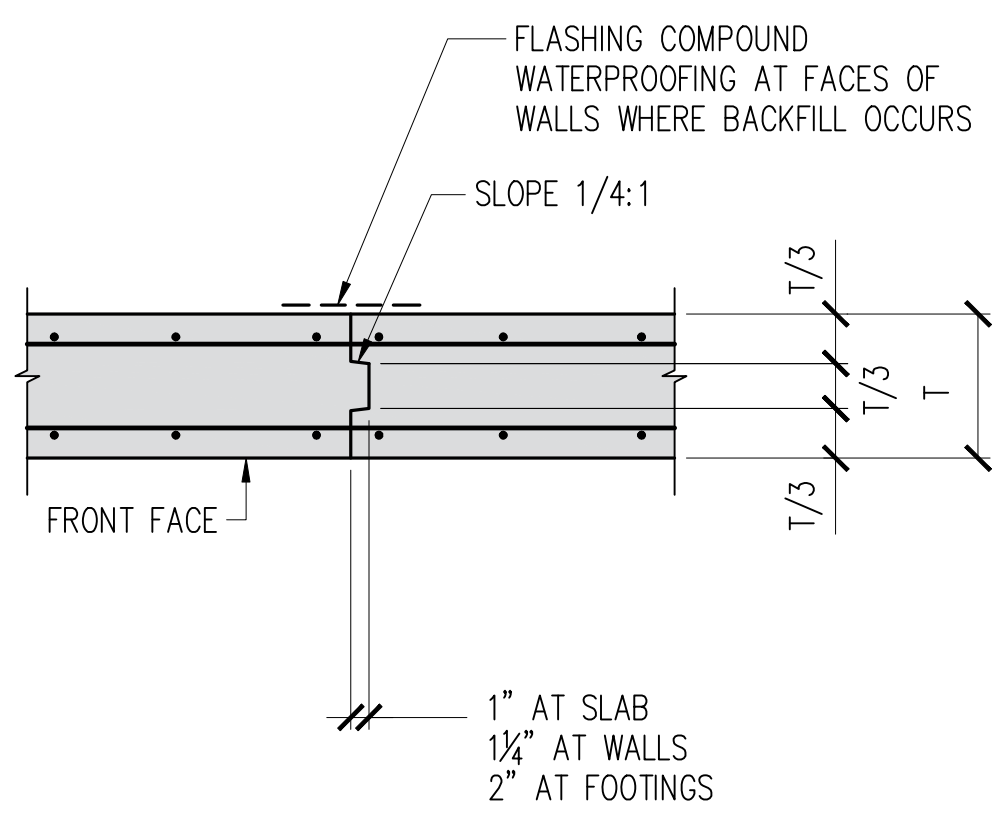
2  
S-2 NOT TO SCALE



NOTE: TYPICAL EACH FACE UNLESS NOTED OTHERWISE

**TYPICAL WATERPROOFING DETAIL**

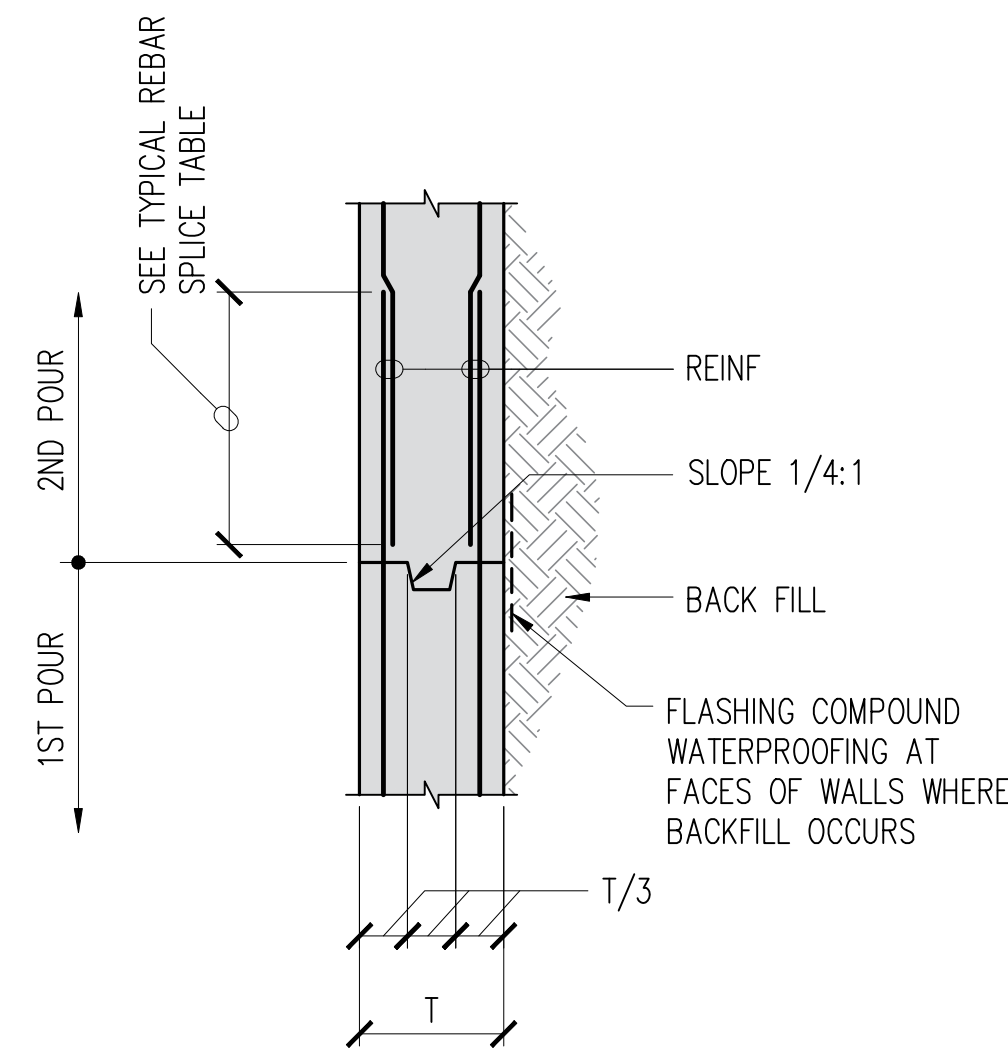
3  
S-2 NOT TO SCALE



NOTES:  
1. SAW CUTTING SHALL OCCUR AS SOON AS CONCRETE SURFACE IS FIRM ENOUGH TO NOT BE TORN BY CUTTING BLADE AND BEFORE SHRINKAGE CRACKING OCCURS, BUT NO LATER THAN 12 HOURS AFTER CONCRETE HAS BEEN POURED.  
2. UNLESS NOTED OTHERWISE SUBMIT JOINTING PLANS FOR REVIEW.

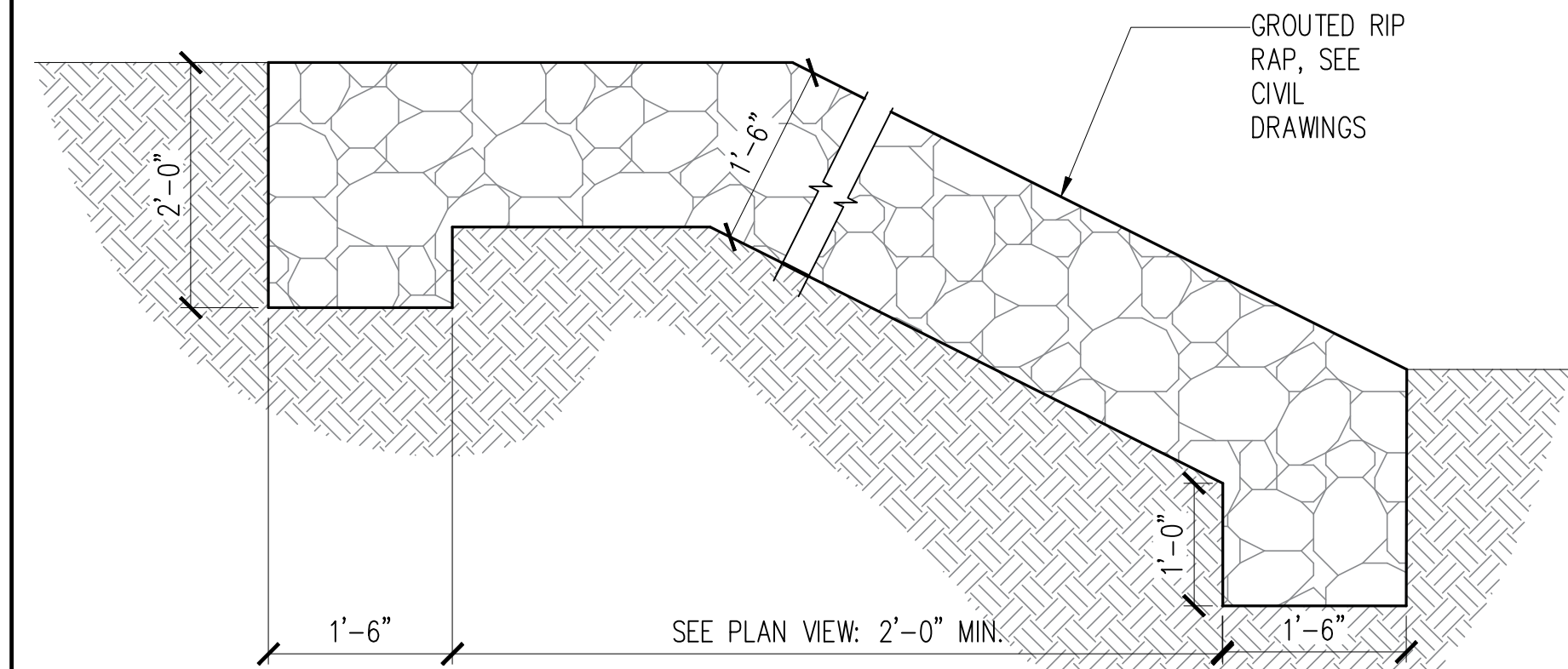
**TYPICAL JOINT DETAILS**

4  
S-2 NOT TO SCALE



**TYPICAL REBAR LAP DETAILS AT JOINT**

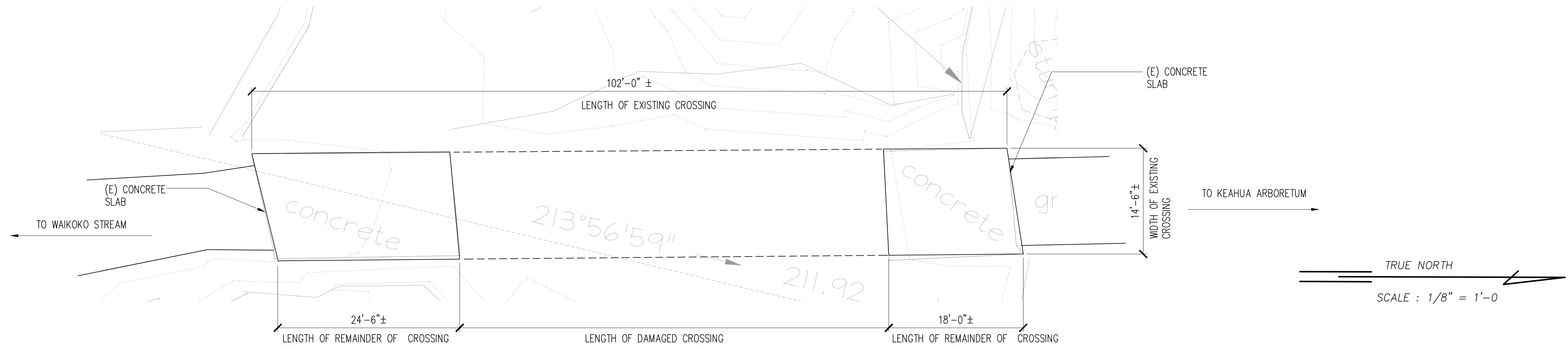
5  
S-2 NOT TO SCALE



6  
S-2 NOT TO SCALE

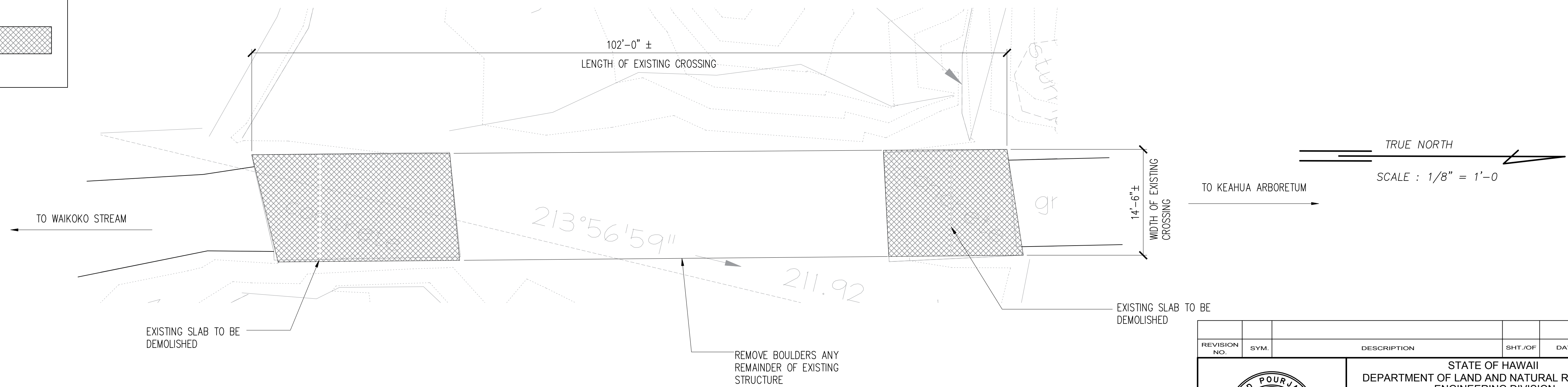
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>TYPICAL DETAILS</b>					
DESIGNED: CS	SUBMITTED: CS				
DRAWN: CAD	DATE: OCT 2023				
CHECKED: SP	SCALE: AS SHOWN				
Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer		DRAWING NO. <b>S-2</b> DATE			

301-555015345 D:\NR - Lihue-Koloa Forest Reserve, Keahua and Queensland Low Water Crossings, Kaula\050 Drawings\Structural\AutoCAD\_format\2024-02-06\6345\_S-2.dwg 3/24/2024 9:41:53 AM tamahana



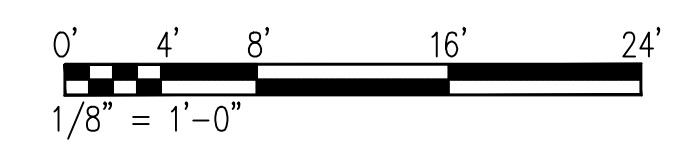
1 EXISTING QUEENSLAND CROSSING- PLAN VIEW  
 S-3 SCALE: 1/8" = 1'-0"

LEGEND:  
 DENOTES DEMOLITION AREA



NOTE:  
 SEE CIVIL DRAWINGS FOR  
 APPROACH ROADWAYS  
 DEMOLITION PLAN

2 EXISTING QUEENSLAND CROSSING DEMO- PLAN VIEW  
 S-3 SCALE: 1/8" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

*Said Pourjalli*

EXPIRATION DATE OF THE LICENSE 4/30/2024  
 THIS WORK WAS PREPARED BY  
 ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 ENGINEERING DIVISION  
 LIHU'E-KOLOA FOREST RESERVE  
 QUEENSLAND LOOP ROAD  
 LOW WATER CROSSING  
**QUEENSLAND CROSSING DEMO PLAN**

DESIGNED: CS      SUBMITTED: CS  
 DRAWN: CAD      DATE: OCT 2023  
 CHECKED: SP      SCALE: AS SHOWN

Carty Chang  
 E-signed 2024-02-14 09:55AM HST  
 carty.s.chang@hawaii.gov  
 State of Hawaii  
 Chief Engineer

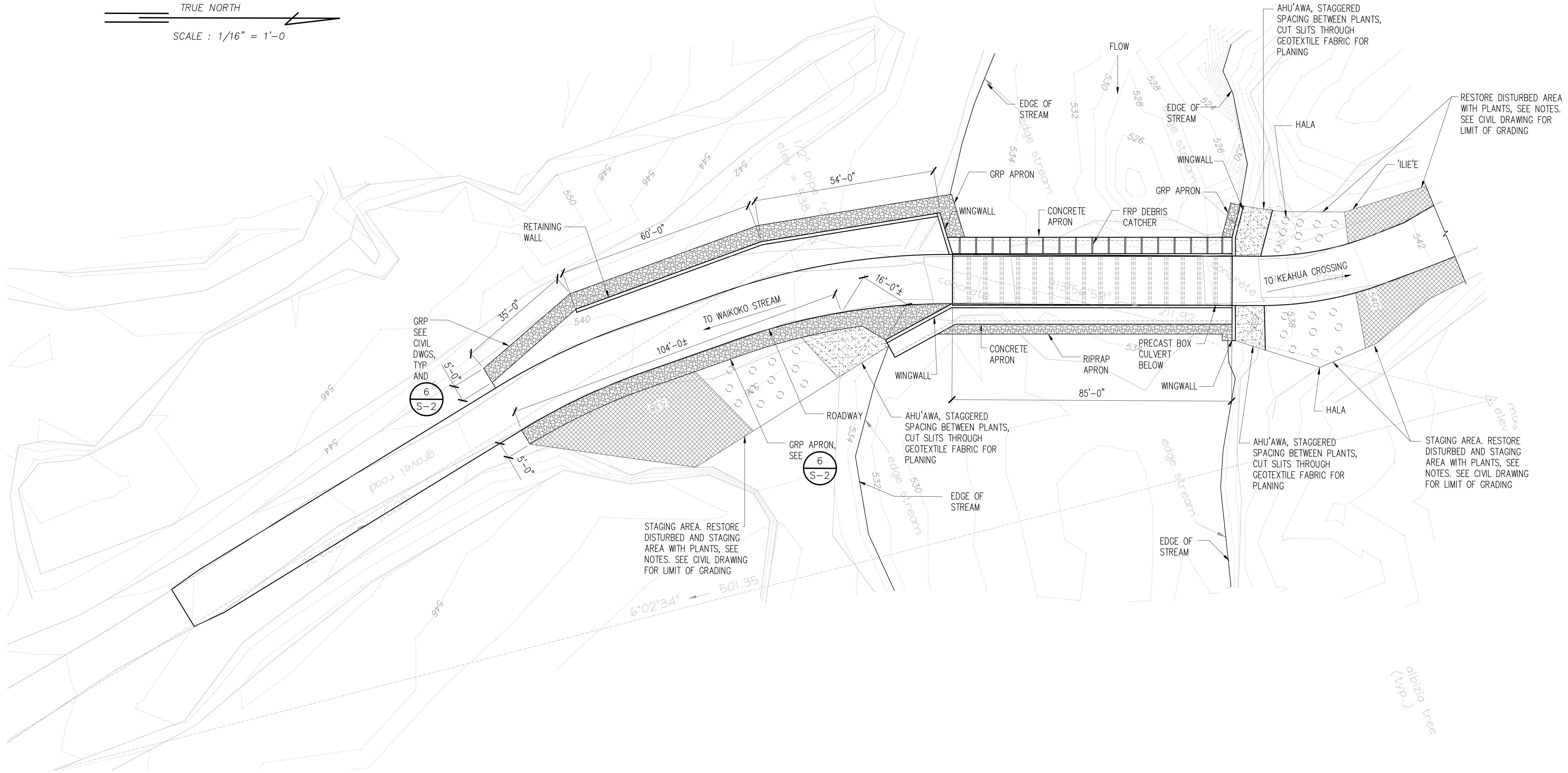
DATE

**S-3**

JOB NO. D00AK67B      SHEET NO. 12 OF 18 SHEETS

301-555016345 D:\NR - Lihue-Koloa Forest Reserve, Keahua and Queensland Low Water Crossings, Keahua\050 Drawings\Structural\AutoCAD\_format\2024-02-06\6345\_S-3.dwg 2/2/2024 9:41:56 AM, tamaha

TRUE NORTH  
SCALE : 1/16" = 1'-0"



- PLANT RESTORATION NOTES:**
1. DISTURBED AREA DUE TO CONSTRUCTION AND STAGING SHALL BE RESTORED PER PROVIDED PLANT LIST.
  2. PLANS SHOW CONCEPTUAL PLANTING AREAS. LANDSCAPE CONTRACTOR SHALL SUBMIT PROPOSED PLANTING PLAN, SOIL PREPARATION REQUIREMENTS, AND PLANTING DETAIL FOR EACH PLANT ON THE PLANT LIST FOR REVIEW.
  3. PLANTS SHALL BE FURNISHED TO COVER THE AREAS INDICATED ON THE PLANS.
  4. LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING EXISTING AND NEW IMPROVEMENTS.
  5. ALL PLANTING LOCATIONS SHALL BE STAKED OUT BY CONTRACTOR FOR APPROVAL BY THE ENGINEER. DO NOT PLANT UNTIL GROUND HAS BEEN PREPARED AND FREE OF STONES GREATER THAN 1/2", DIA., SITE IS NEAT, ORDERLY, AND THE ENGINEER ACCEPTS SITE FOR PLANTING.
  6. PLANT ESTABLISHMENT AND MAINTENANCE SHALL BE PROVIDED BY THE LANDSCAPE CONTRACTOR FOR AN THREE (3) MONTH PERIOD.

PLANT LIST	
COMMON/BOTANICAL NAME	SIZE AND REMARKS
HALA / PANDANUS TECTORIUS	25 GALLON CAN, 6' OVERALL HEIGHT
'AHU'AWA / CYPERUS JAVANICUS	4" POTS AT 18" O.C. SPACING
'ILIE'E / PLUMBAGO ZEYLANICA	4" POTS AT 18" O.C. SPACING

**LEGEND**

- INDICATES 'AHU'AWA
- INDICATES HALA
- INDICATES 'ILIE'E

1 **QUEENSLAND CROSSING IMPROVEMENT PLAN VIEW**  
S-4 SCALE: 1/16" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

*Sarah Pourjaleel*

EXPIRATION DATE OF THE LICENSE 4/30/2024  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

**LIHUE-KOLOA FOREST RESERVE  
QUEENSLAND LOOP ROAD  
LOW WATER CROSSING  
QUEENSLAND CROSSING  
IMPROVEMENT PLAN VIEW**

DESIGNED: CS      SUBMITTED: CS

DRAWN: CAD      DATE: OCT 2023

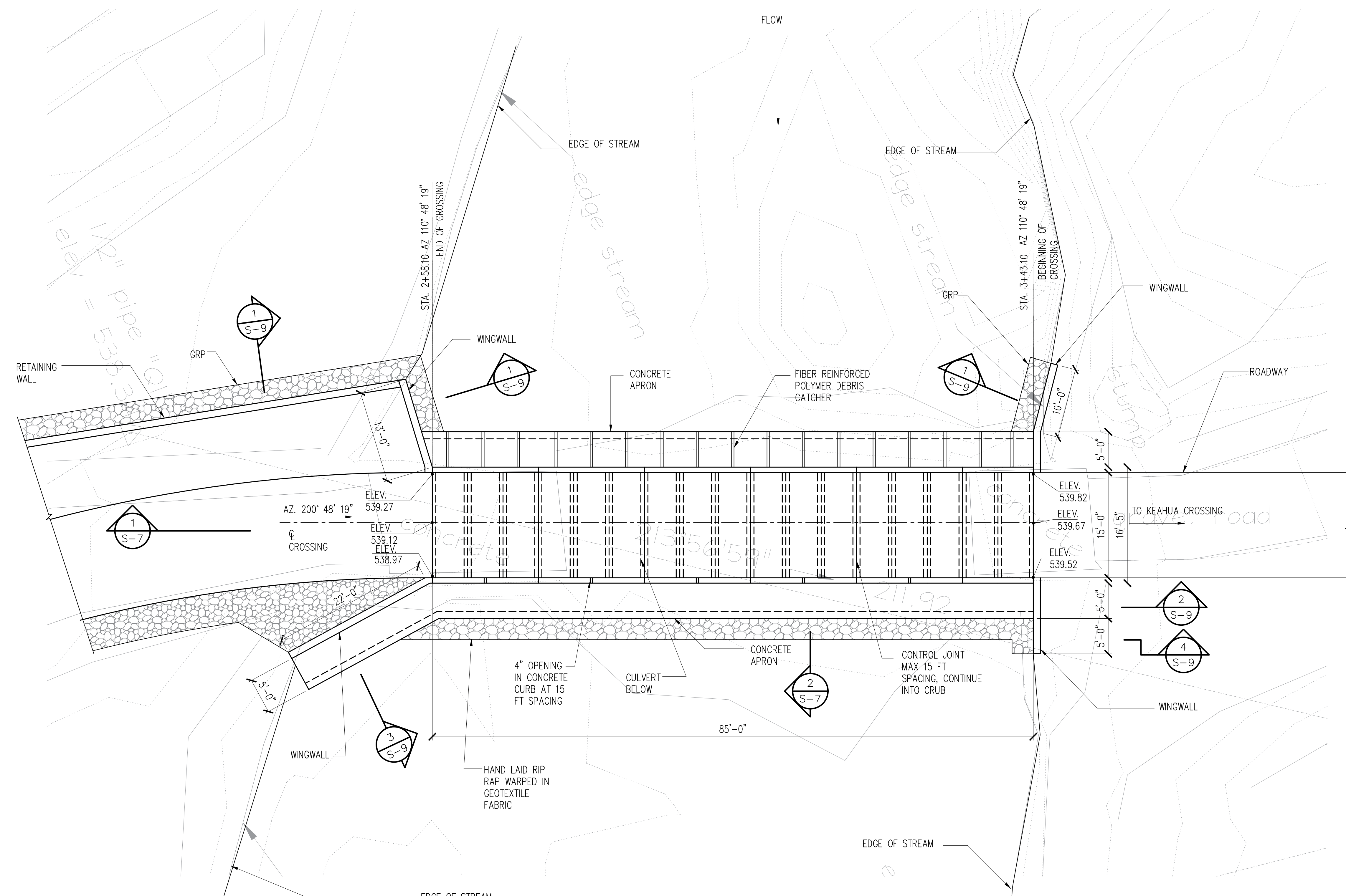
CHECKED: SP      SCALE: AS SHOWN

<p>Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer</p>	<p>DRAWING NO. <b>S-4</b></p>
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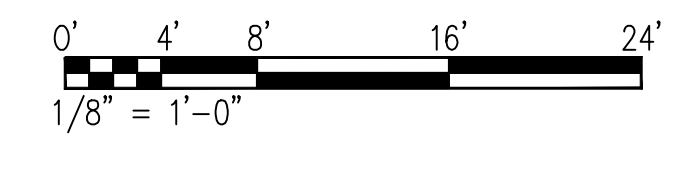
JOB NO. D00AK67B      SHEET NO. 13 OF 18 SHEETS

301-555016345 DLNR - Lihue-Koloa Forest Reserve, Keahua and Queensland Low Water Crossings, Kaula\050 Drawings\Structural\AutoCAD\_format\2024-02-06\6345\_S-4.dwg 2/23/2024 9:42:00 AM tamahana

TRUE NORTH  
SCALE : 1/8" = 1'-0"

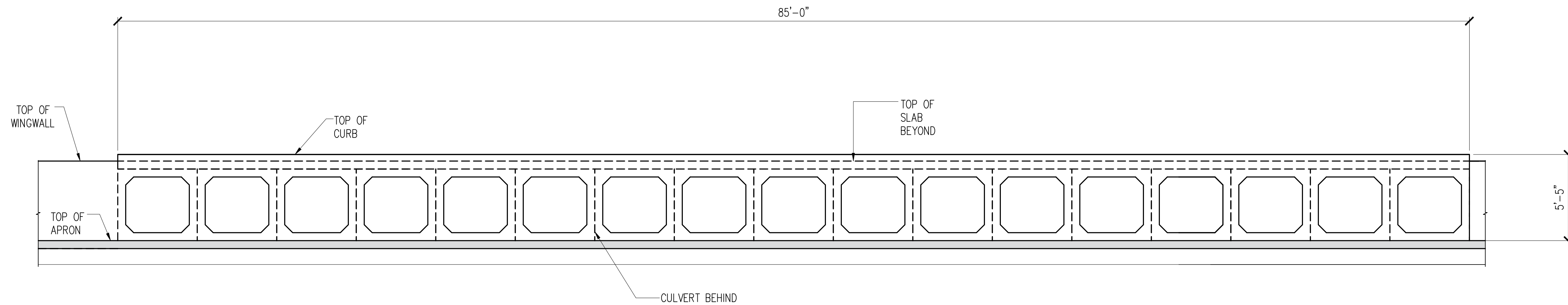


1  
S-5  
**QUEENSLAND CROSSING PLAN VIEW**  
SCALE: 1/8" = 1'-0"

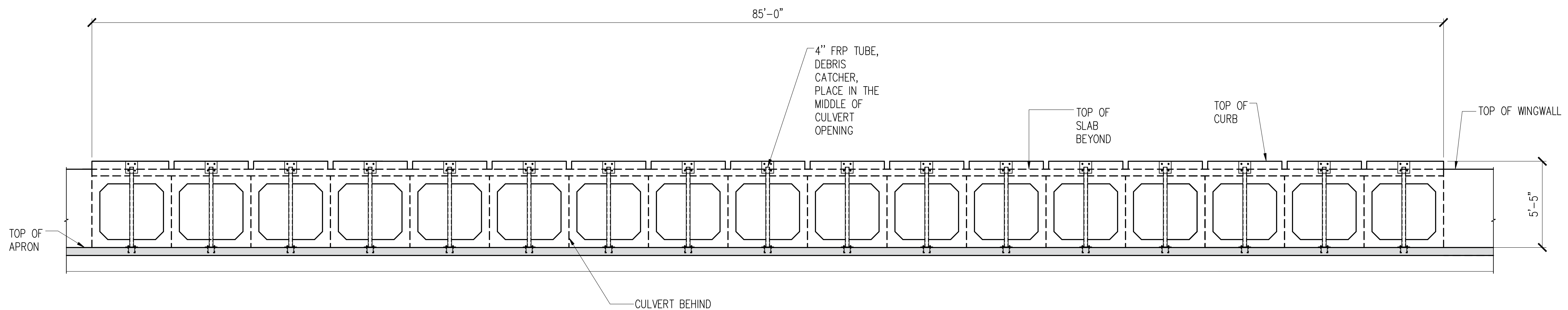


REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>QUEENSLAND CROSSING PLAN</b>					
DESIGNED:	CS	SUBMITTED:	CS		
DRAWN:	CAD	DATE:	OCT 2023		
CHECKED:	SP	SCALE:	AS SHOWN		
Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer			DRAWING NO. <b>S-5</b> DATE		
JOB NO. D00AK67B			SHEET NO. 14 OF 18 SHEETS		

301-555016345 DLNR - Lihue-Koloa Forest Reserve, Keahua and Queensland Low Water Crossings, Kaula\050 Drawings\Structural\AutoCAD\_format\2024-02-06\6345\_S-5.dwg, 3/21/2024 9:42:03 AM, tamaha



1 CROSSING DOWNSTREAM ELEVATION  
S-6 SCALE: 1/4" = 1'-0"



2 CROSSING UPSTREAM ELEVATION  
S-6 SCALE: 1/4" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

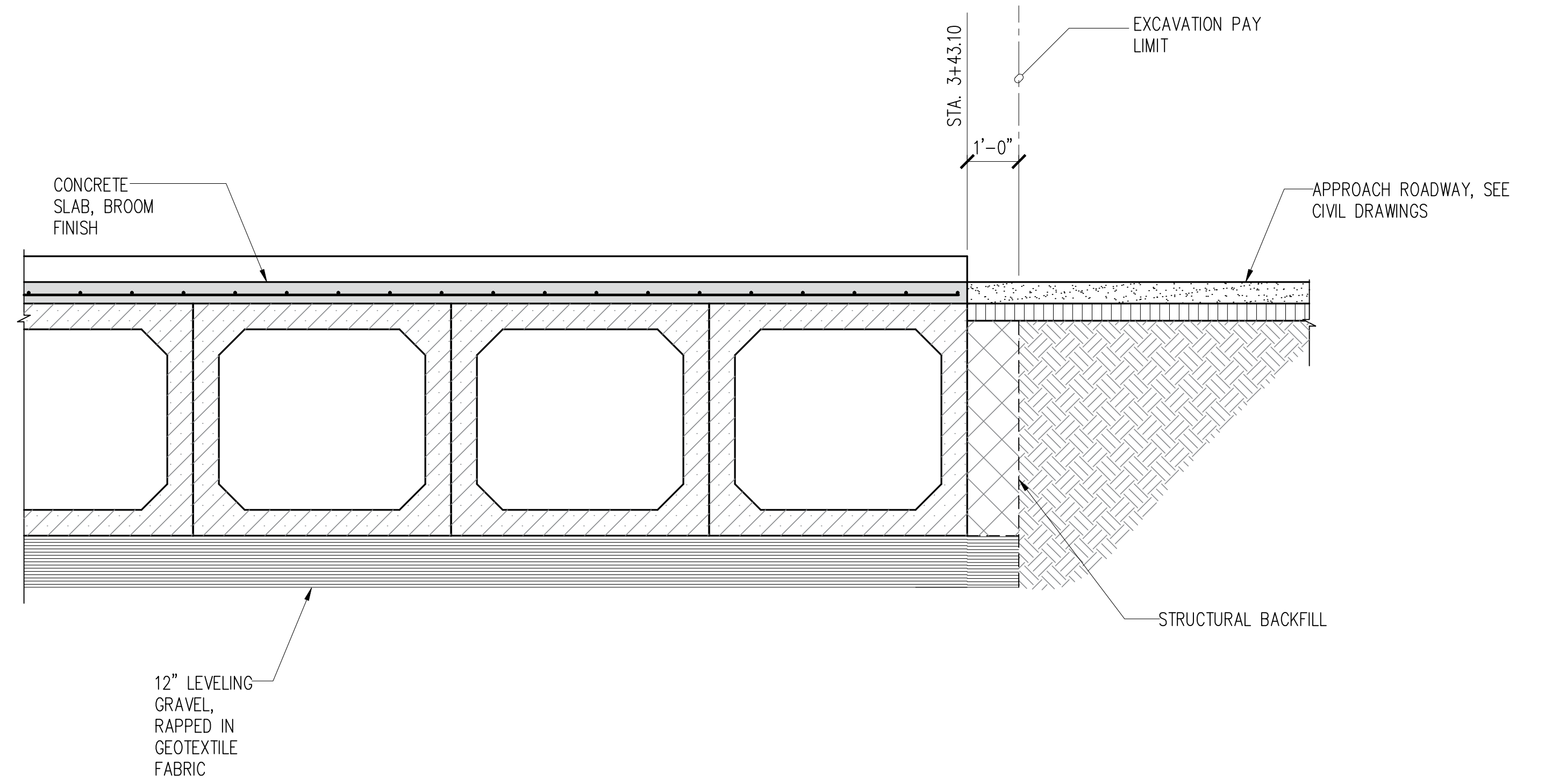
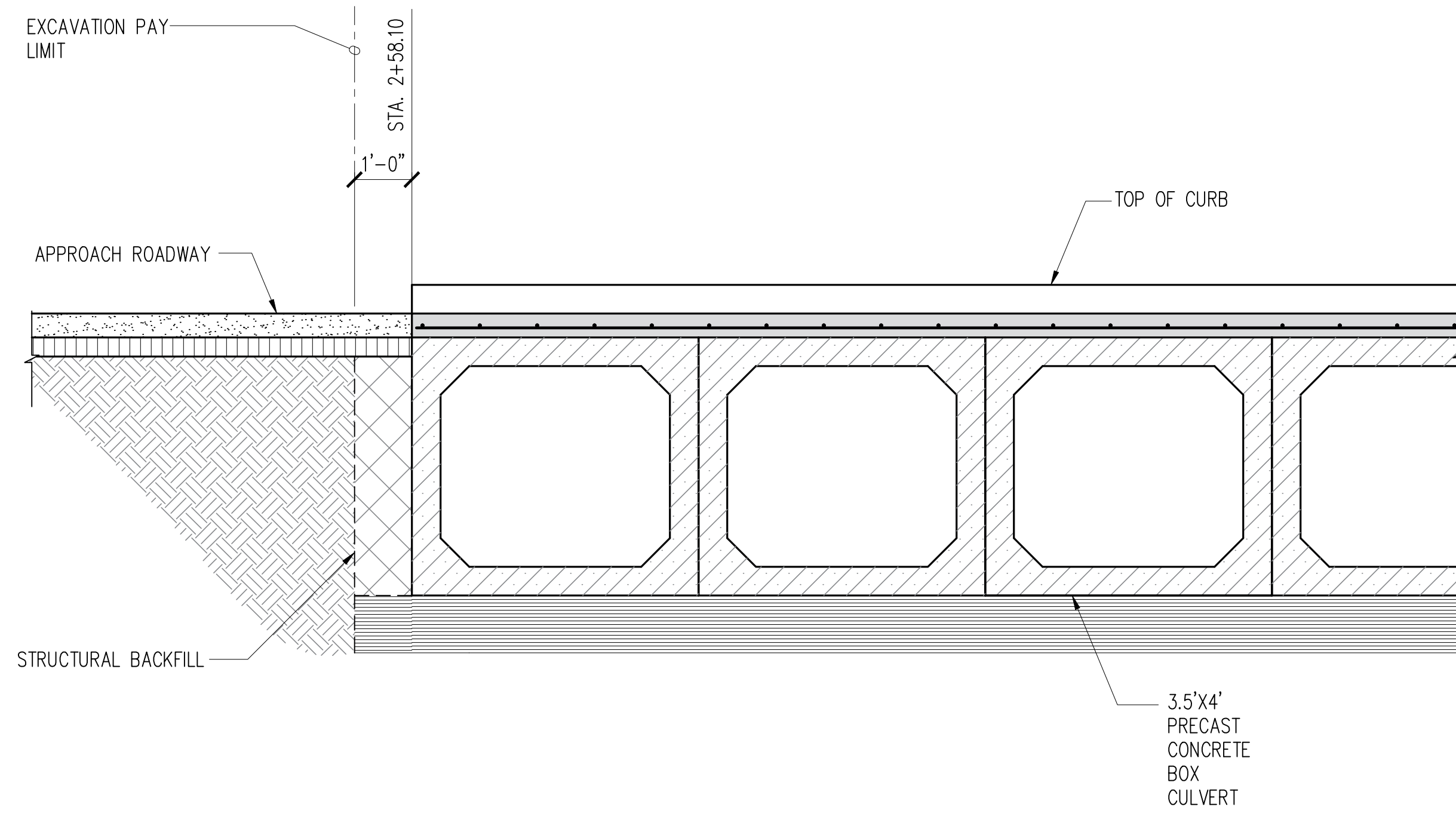
*Saeed Pourjaleel*  
EXPIRATION DATE OF THE LICENSE 4/30/2024  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION  
**LIHUE-KOLOA FOREST RESERVE  
QUEENSLAND LOOP ROAD  
LOW WATER CROSSING**  
**QUEENSLAND CROSSING ELEV.**

DESIGNED: CS	SUBMITTED: CS
DRAWN: CAD	DATE: OCT 2023
CHECKED: SP	SCALE: AS SHOWN
DRAWING NO. <b>S-6</b>	

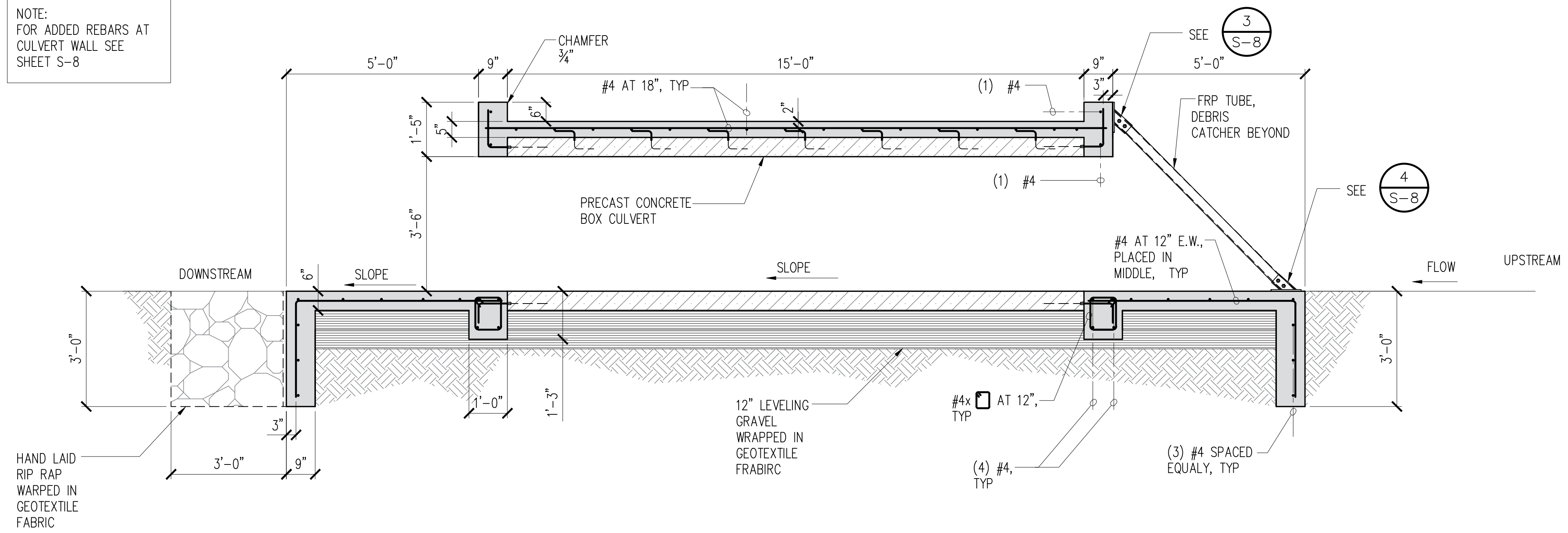
JOB NO. D00AK67B      SHEET NO. 15 OF 18 SHEETS

301-555016345 DLNR - Lihue-Koloa Forest Reserve, Keahua and Queensland Low Water Crossings, Kaula\050 Drawings\Structural\AutoCAD\_format\2024-02-06\6345\_S-6.dwg, 2/2/2024 9:42:06 AM, tamahana

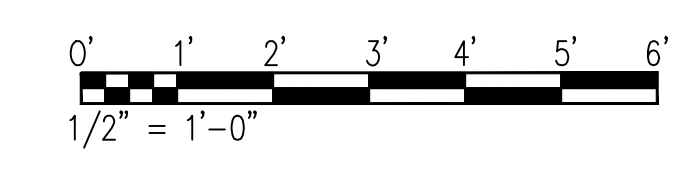


1 CROSSING LONG SECTION  
S-7 SCALE: 1/2" = 1'-0"

NOTE:  
FOR ADDED REBARS AT  
CULVERT WALL SEE  
SHEET S-8



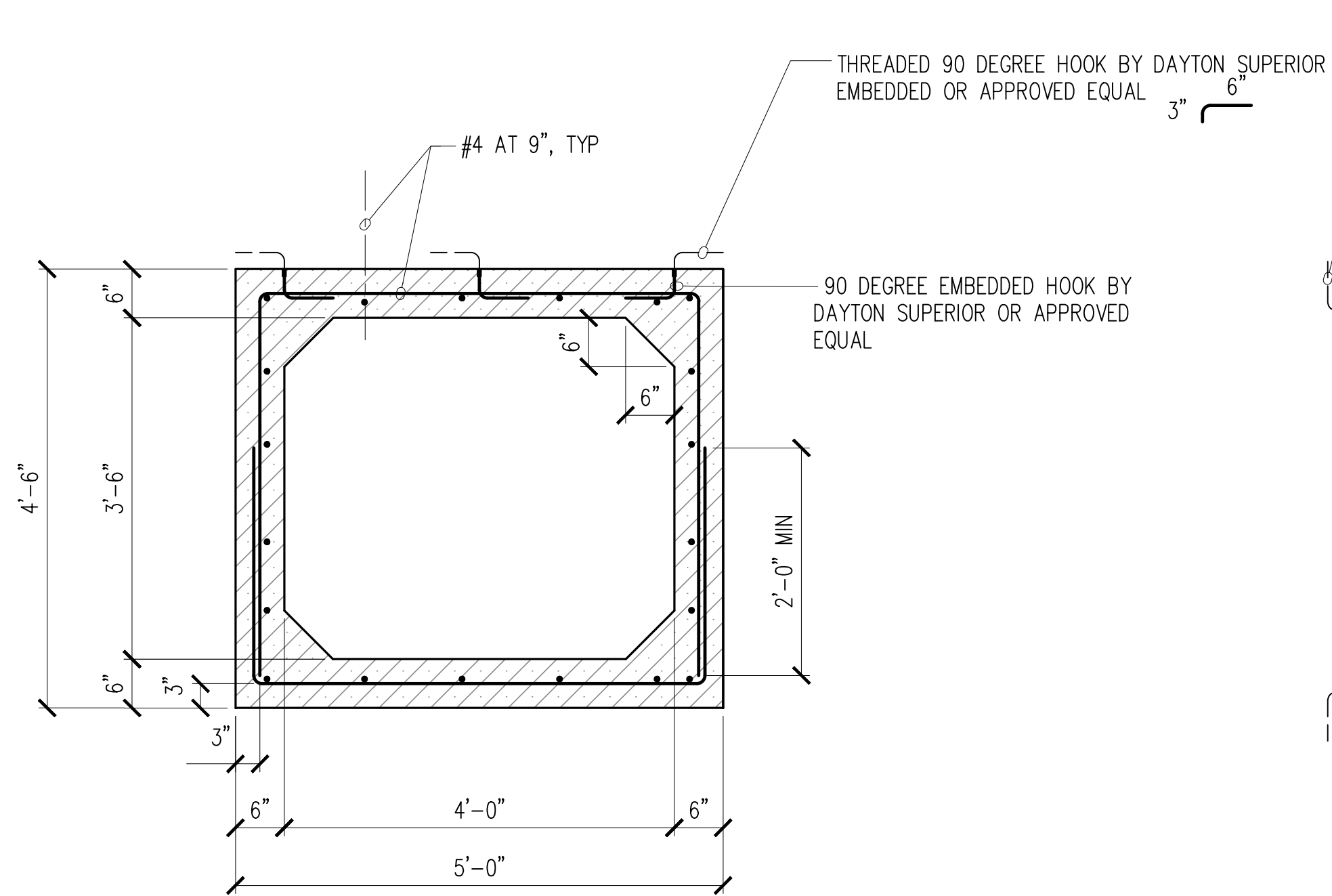
2 CROSSING TRAN. SECTION  
S-7 SCALE: 1/2" = 1'-0"



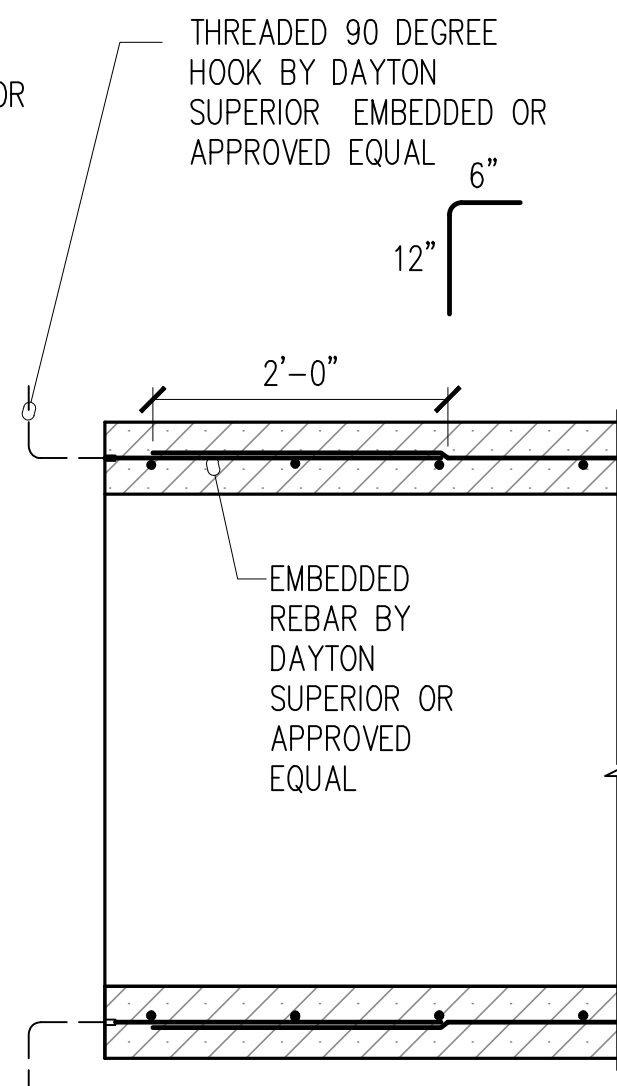
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>QUEENSLAND CROSSING SECTIONS</b>					
DESIGNED: CS			SUBMITTED: CS		
DRAWN: CAD			DATE: OCT 2023		
CHECKED: SP			SCALE: AS SHOWN		
APPROVE <i>Sarah Pajala</i> <small>EXPIRATION DATE OF THE LICENSE 4/30/2024            THIS WORK WAS PREPARED BY            ME OR UNDER MY SUPERVISION</small>			CHIEF EN <i>Carty Chang</i> <small>E-signed 2024-02-14 09:55AM HST            carty.s.chang@hawaii.gov            State of Hawaii            Chief Engineer</small>		
DRAWING NO. S-7					DATE

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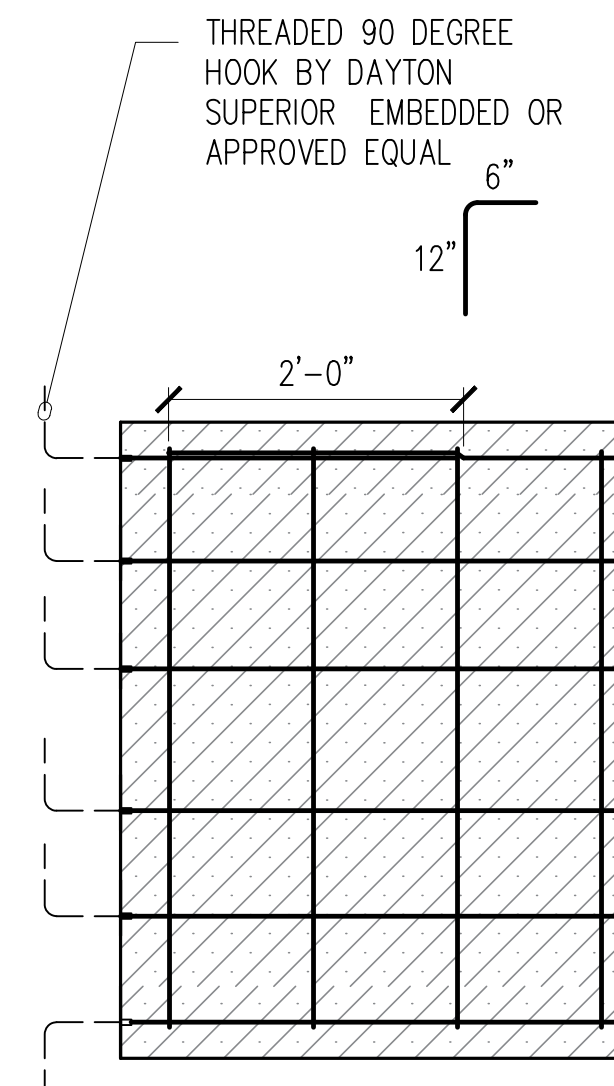




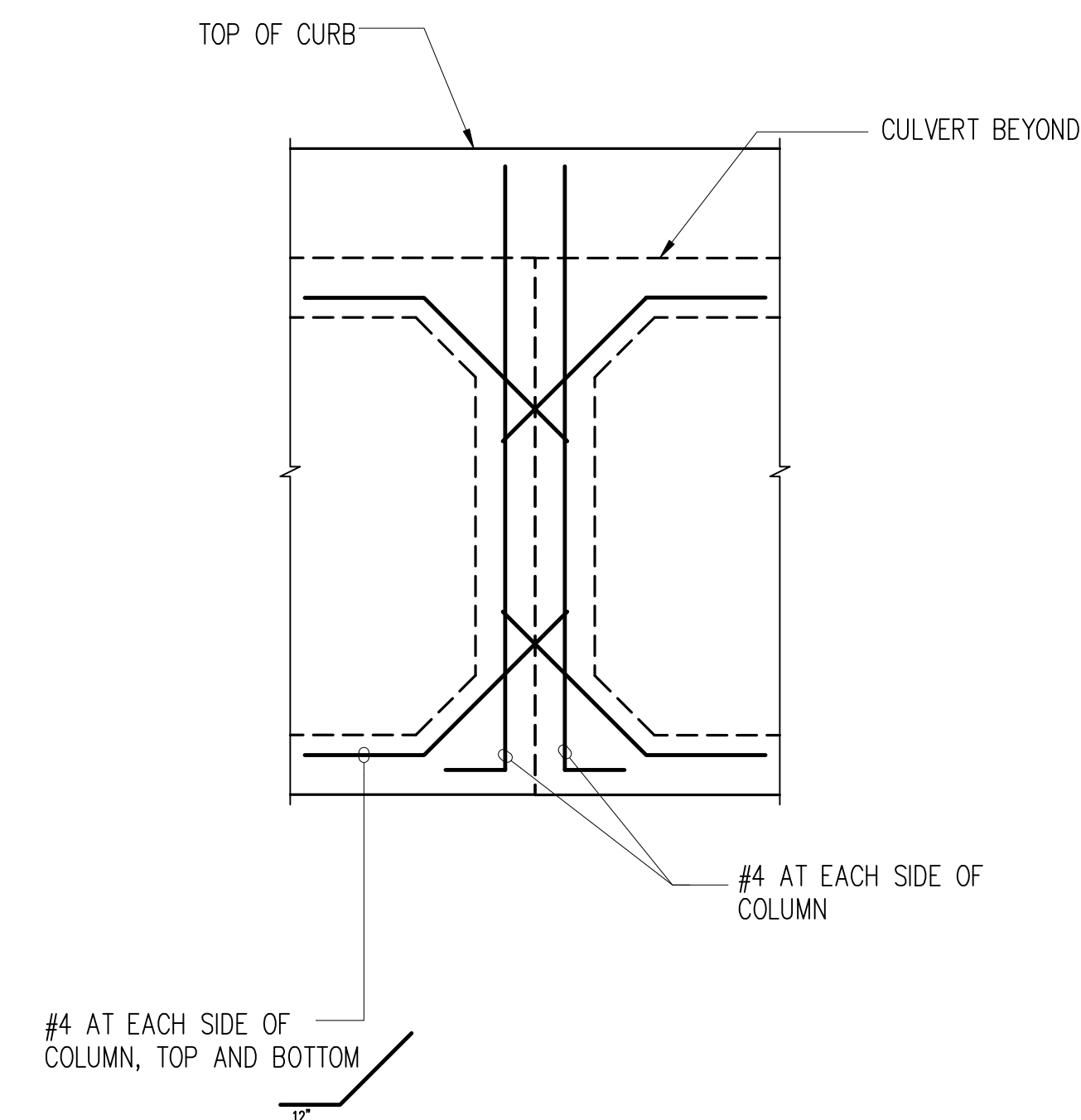
**TRANSVERSE SECTION**



**END SECTION AT OPENING**



**END SECTION AT WALL**



**ADDED REBAR AT END WALLS**

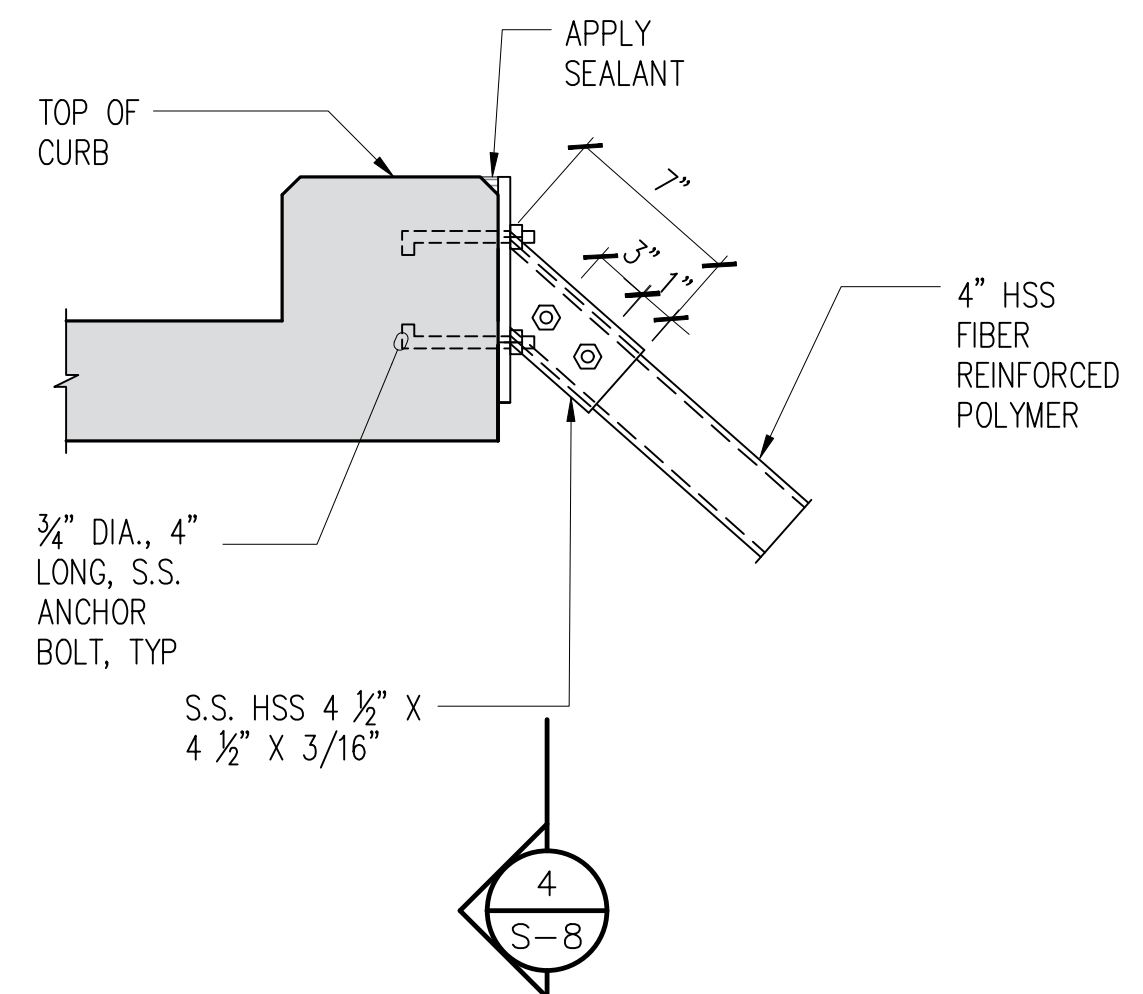
**1 PRECAST CULVERT DETAILS**

S-8 SCALE: 3/4" = 1'-0"

NOTE:  
THREADED REBARS MAY BE REPLACED WITH EMBEDDED REBARS EXTENDING OUTSIDE OF PRECAST SECTIONS. EXTENDED REBARS SHALL BE DAMAGED DURING INSTALLATION AND SHIPMENT.

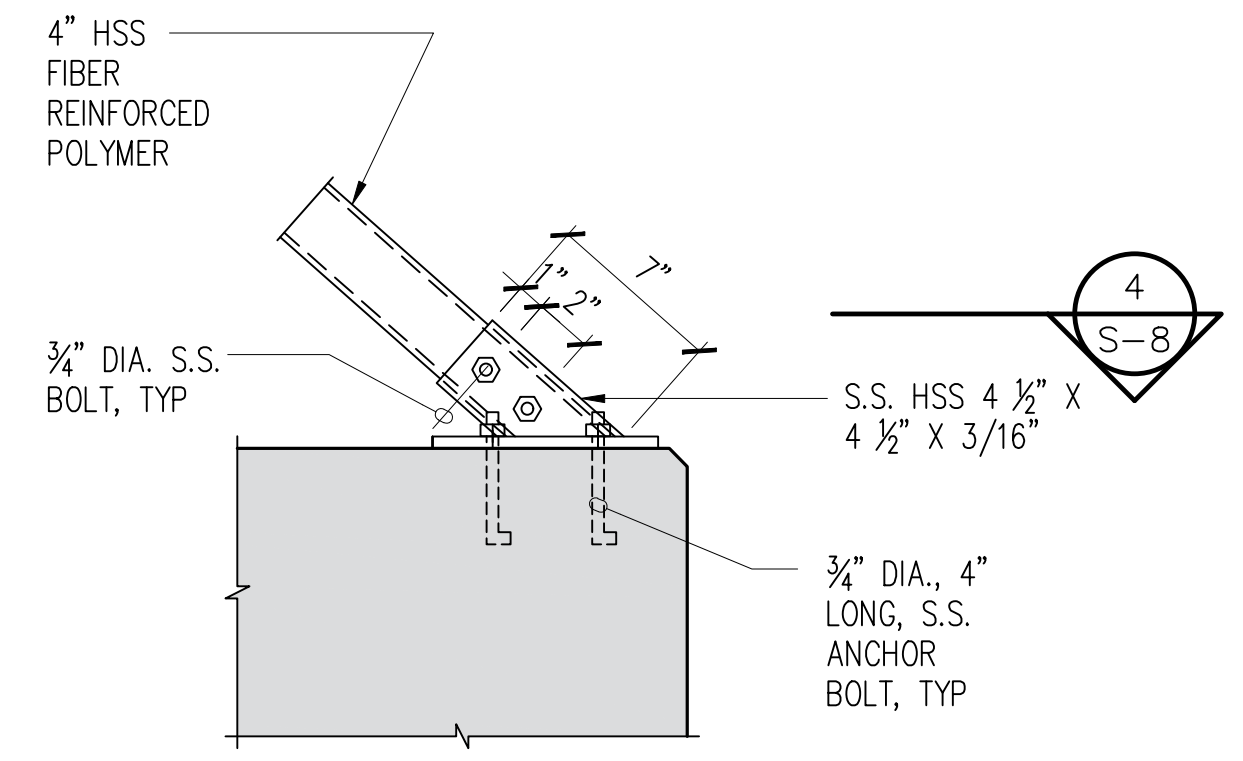
**5**

S-8 SCALE: 3/4" = 1'-0"



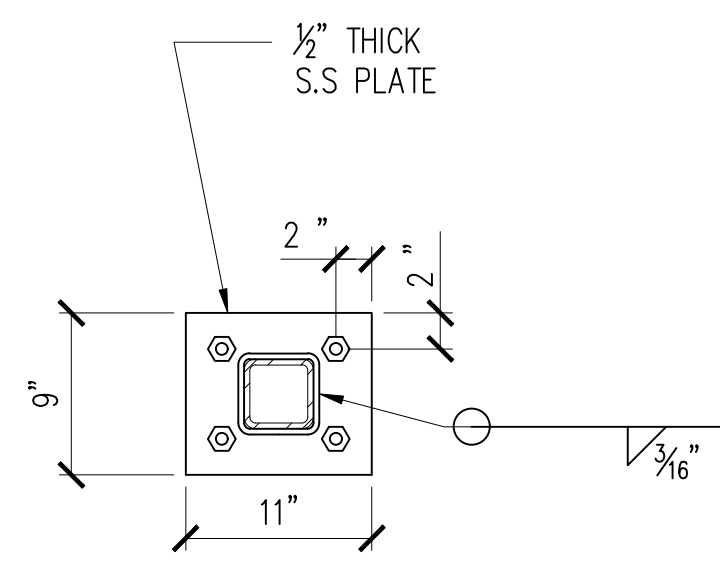
**2 DEBRIS CATCHER AT TOP**

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



**3 DEBRIS CATCHER AT BASE**

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

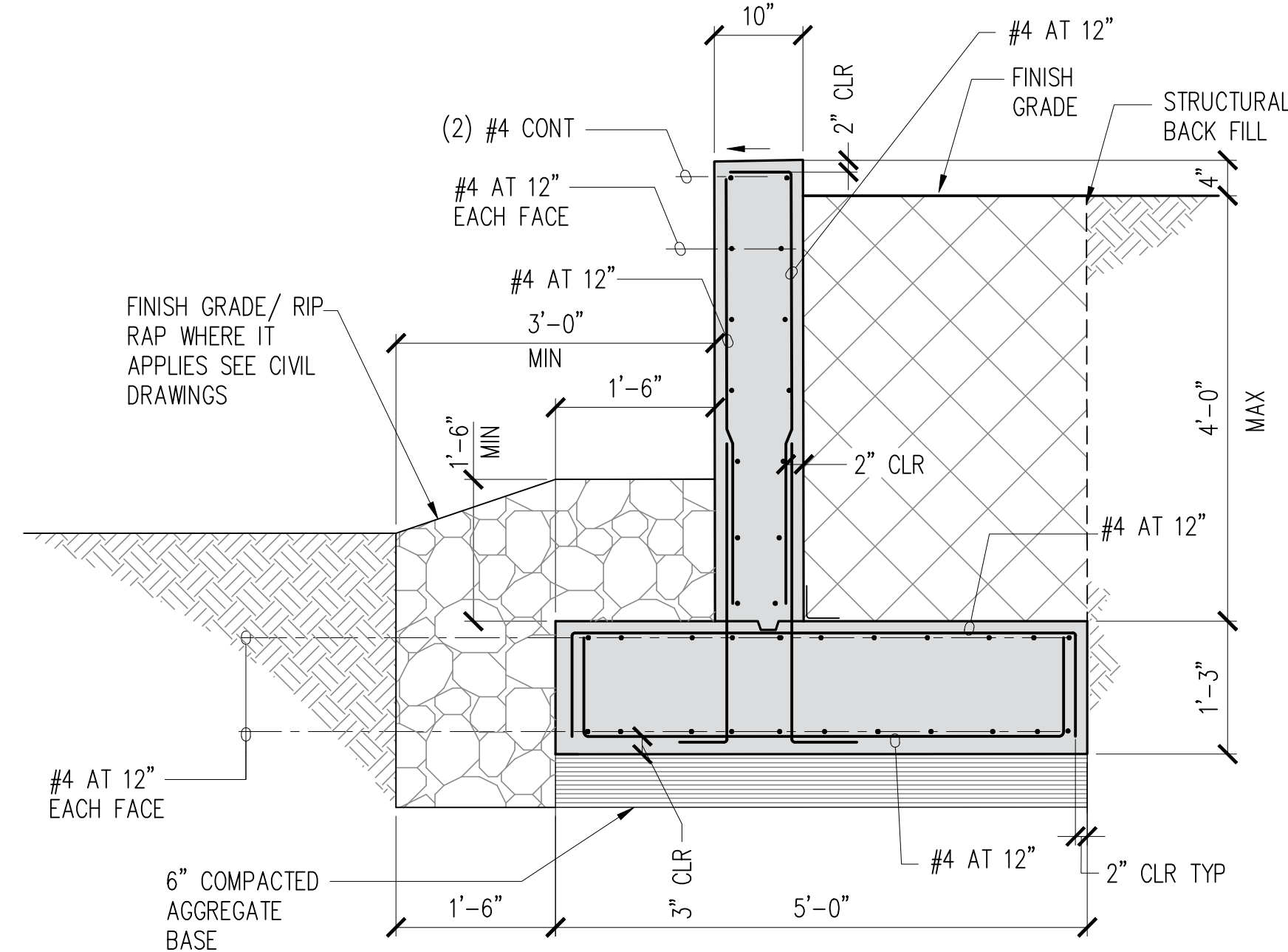


**4 SECTION**

S-8 SCALE: 3/4" = 1'-0"

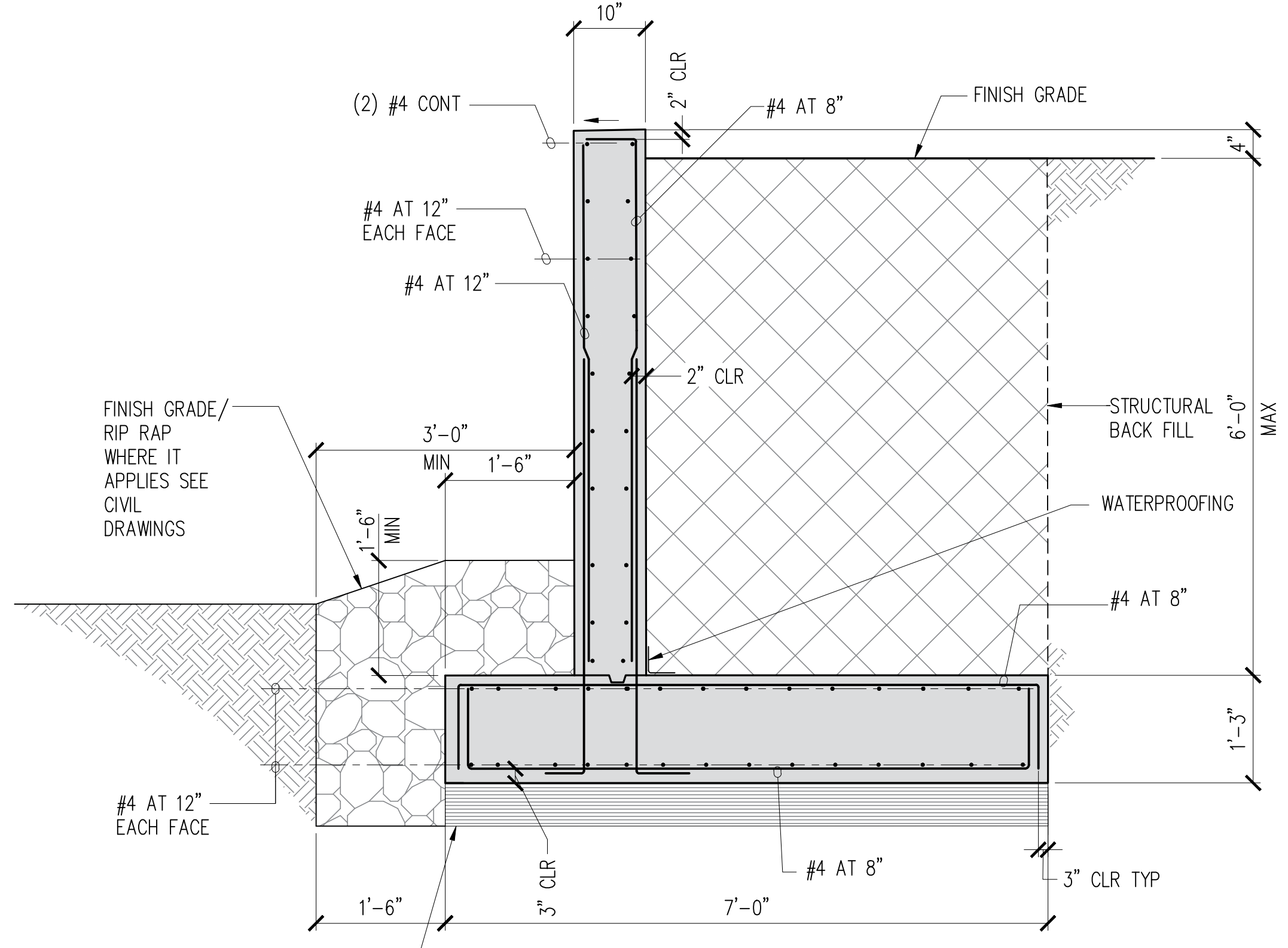
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>QUEENSLAND CROSSING SECTIONS</b> <b>AND DEBRIS CATCHER DETAIL</b>					
DESIGNED:	CS	SUBMITTED:	CS		
DRAWN:	CAD	DATE:	OCT 2023		
CHECKED:	SP	SCALE:	AS SHOWN		
APPROVED:				DRAWING NO.	<b>S-8</b>
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION		Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov State of Hawaii Chief Engineer		DATE	

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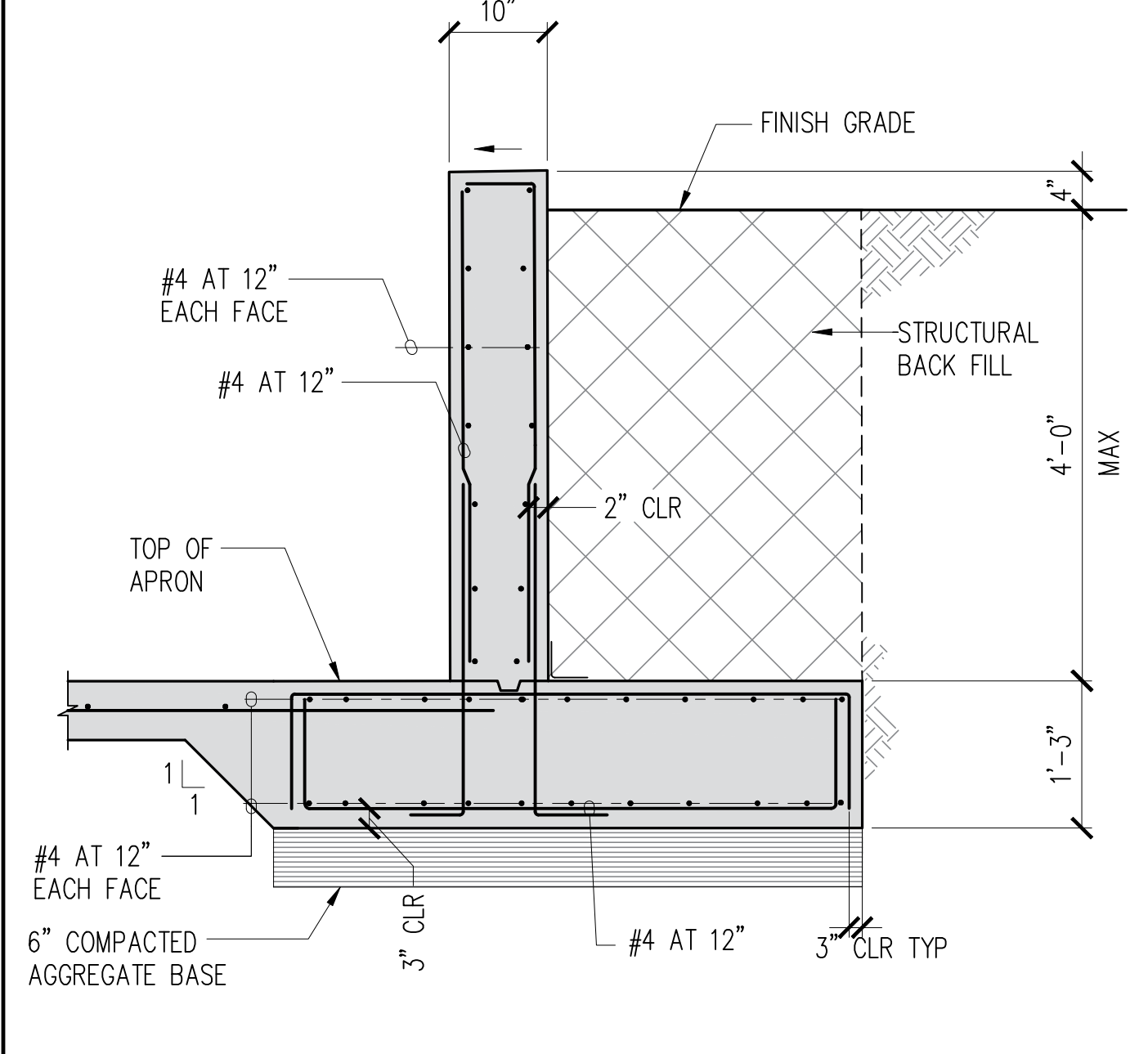
WALL LESS THAN 4'-0" HIGH

1 RETAINING WALL SECTIONS  
S-9 SCALE: 3/4" = 1'-0"

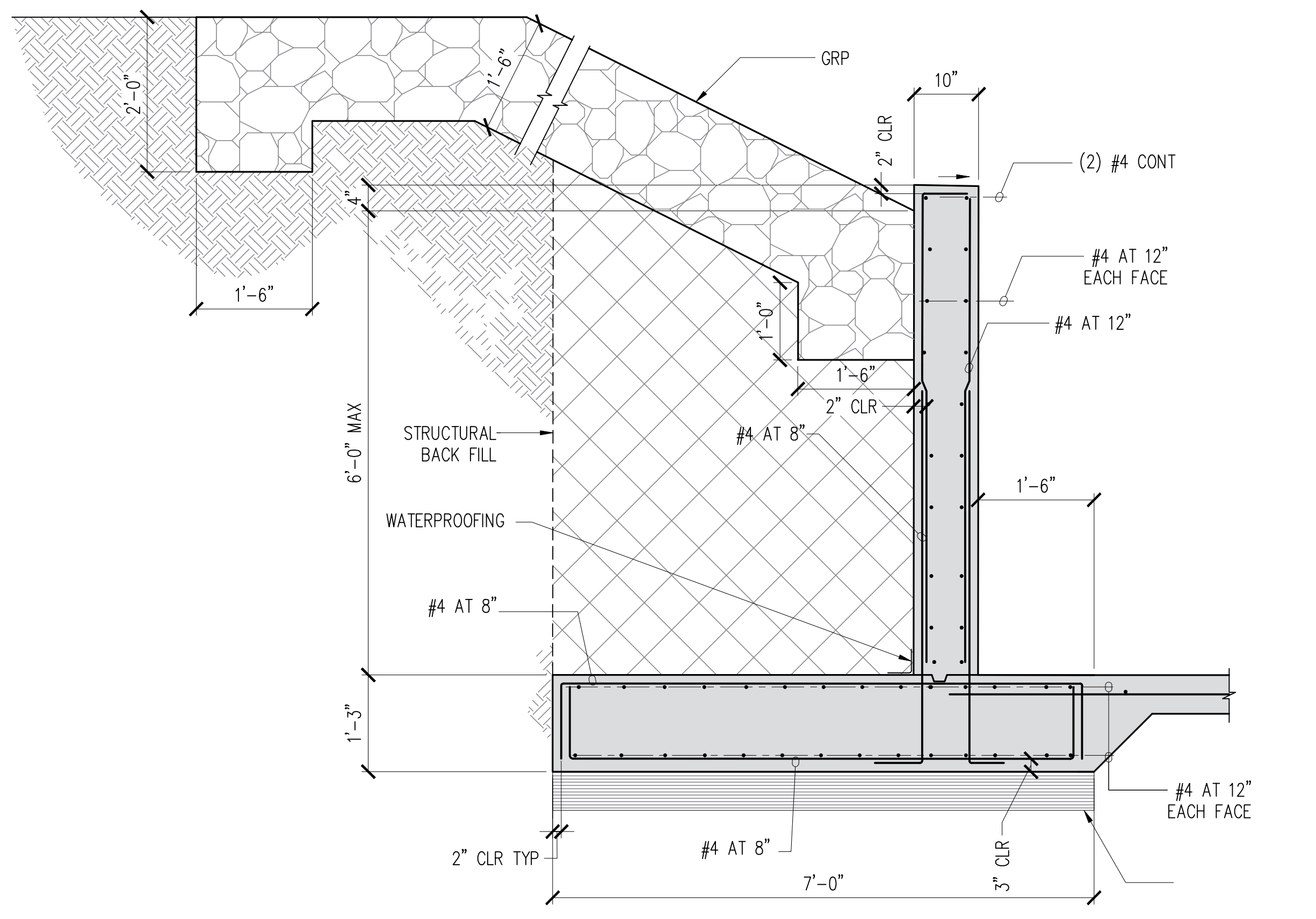


WALL LESS BETWEEN 4'-0" AND 6'-0" HIGH

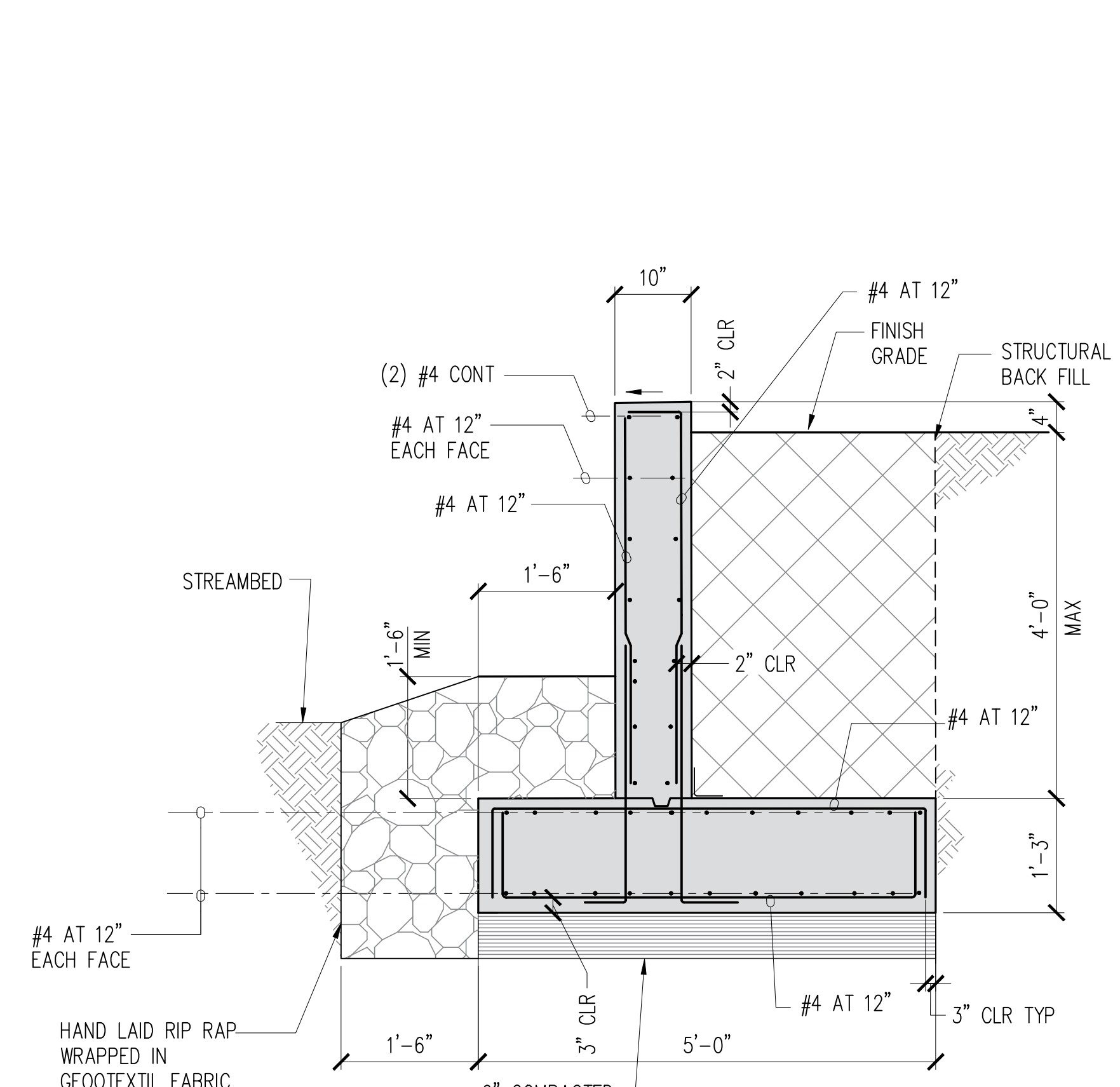
2 RETAINING WALL SECTION  
S-9 SCALE: 3/4" = 1'-0"



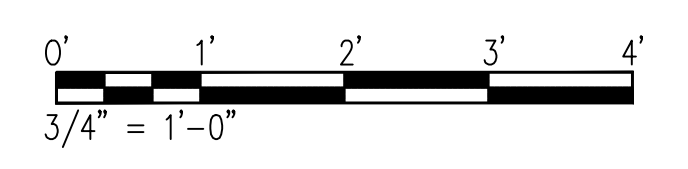
2 RETAINING WALL SECTION  
S-9 SCALE: 3/4" = 1'-0"



3 RETAINING WALL SECTION  
S-9 SCALE: 3/4" = 1'-0"



4 RETAINING WALL SECTION  
S-9 SCALE: 3/4" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION <b>LIHUE-KOLOA FOREST RESERVE</b> <b>QUEENSLAND LOOP ROAD</b> <b>LOW WATER CROSSING</b> <b>WING WALL SECTIONS</b>					
DESIGNED: CS			SUBMITTED: CS		
DRAWN: CAD			DATE: OCT 2023		
CHECKED: SP			SCALE: AS SHOWN		
API Carty Chang E-signed 2024-02-14 09:55AM HST carty.s.chang@hawaii.gov CH State of Hawaii Chief Engineer			DRAWING NO. <b>S-9</b>		
EXPIRATION DATE OF THE LICENSE 4/30/2024 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION			DATE		

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