

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

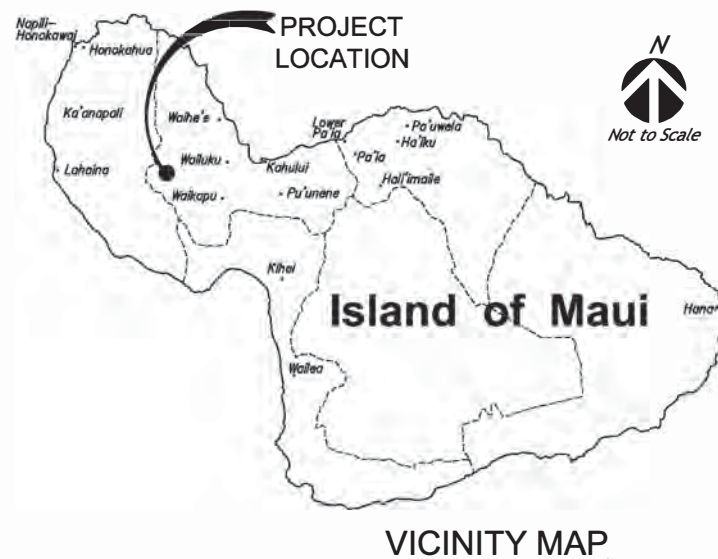
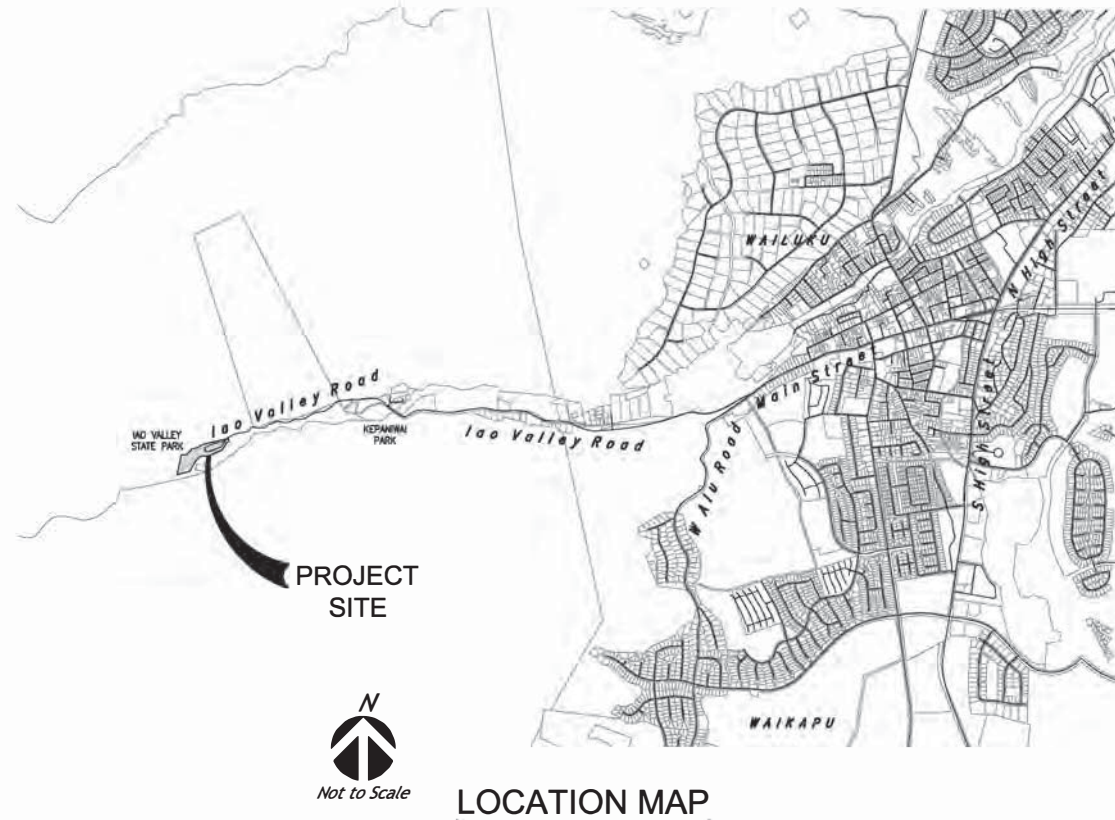
FOR
 DIVISION OF STATE PARKS

JOB NO. J45CM41A

IAO VALLEY STATE MONUMENT FLOOD REPAIRS

WAILUKU, MAUI, HAWAII

TMK: 3-3-001: 012 (Portion)



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APPROVED: *Curt A. Cottrell* DATE: Dec 9, 2016

CURT A. COTTRELL
 ADMINISTRATOR
 DIVISION OF STATE PARKS
 DEPARTMENT OF LAND AND NATURAL RESOURCES

APPROVED: *Carty S. Chang* DATE: Dec 9, 2016

CARTY S. CHANG, P.E.
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DRAWING NO.
T-1
 SHEETS

CONSTRUCTION NOTES

- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986," AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984," AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI AND HAWAII.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS" AND CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
- THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES, AND STRUCTURES WHERE SHOWN IN THESE PLANS ARE BASED ON AVAILABLE RECORDS, VERIFIED WHENEVER POSSIBLE BY FIELD OBSERVATIONS. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF SAID INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES AND SHALL PROTECT SUCH UTILITIES AT ALL TIMES. DAMAGE TO EXISTING UTILITIES AS A RESULT OF CONSTRUCTION ACTIVITIES SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE. PROTECTION AGAINST INJURY TO PERSONNEL RESULTING FROM CONTACT WITH THE EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HISTORIC FEATURES ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE STATE HISTORIC PRESERVATION DIVISION (692-8015) AND THE STATE PARKS ARCHAEOLOGIST (578-0286), AND THE ENGINEER. IN THE EVENT ANY SUSPECTED HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE MAUI POLICE DEPARTMENT, THE STATE HISTORIC PRESERVATION DIVISION (692-8015) AND THE STATE PARKS ARCHAEOLOGIST (578-0286), AND THE ENGINEER.
- THE CONTRACTOR SHALL 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 CLARIFICATION IN WRITING. CONTRACTOR SHALL TAKE ALL RESPONSIBILITY FOR THE INFORMATION SHOWN ON THESE PLANS AND THE PROJECT DOCUMENTS. ANY MODIFICATION OR REPLACEMENT OF UNACCEPTED WORK DUE TO INCORRECT INTERPRETATION OF INFORMATION SHALL BE AT THE CONTRACTOR'S EXPENSE.
- THE CONTRACTOR SHALL RESTORE, TO THEIR ORIGINAL CONDITION OR BETTER AT NO ADDITIONAL COST TO THE STATE, ALL IMPROVEMENTS AND NATURAL FEATURES DAMAGED DIRECTLY OR INDIRECTLY AS A RESULT OF THE PROJECT AND CONSTRUCTION, INCLUDING STREAMS, TRAILS, ETC. ANY RESTORATION TO HISTORIC ELEMENTS SHALL BE APPROVED BY THE ENGINEER.
- THE CONTRACTOR SHALL SUBMIT A STATEMENT OF WORK AND A HEALTH AND SAFETY PLAN SPECIFIC TO THIS PROJECT FOR THE ENGINEER'S APPROVAL PRIOR TO COMMENCING WORK. NO WORK SHALL COMMENCE WITHOUT AN APPROVED STATEMENT OF WORK AND A HEALTH AND SAFETY PLAN.
- NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS, DOWNSLOPE AREAS, OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY AT NO ADDITIONAL COST TO THE STATE.
- CONTRACTOR SHALL COORDINATE WITH THE STATE DLNR PARKS DIVISION IN REGARDS TO VEHICLE PARKING, SITE ACCESS, AND STAGING OF MATERIALS AND EQUIPMENT DURING CONSTRUCTION. ANY DAMAGES TO THE EXISTING PROPERTIES AS A RESULT OF THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AND RESTORED TO THE ORIGINAL CONDITION OR BETTER AT THE CONTRACTOR'S EXPENSE.
- CONTRACTORS WORKING AT HEIGHT -- A FALL PROTECTION PLAN IS REQUIRED WHENEVER A WORKER IS WORKING AT HEIGHT. THE PLAN SHALL BE AVAILABLE AT THE WORK SITE AT ALL TIMES. WORKERS AFFECTED BY THE FALL PROTECTION PLAN SHALL BE TRAINED IN ALL ITS ELEMENTS AND THE PLAN SHALL BE MADE AVAILABLE TO THEM. ALL WORKERS WORKING ON STEEP SLOPES REQUIRED TO HAVE A CERTIFICATE OF TRAINING OR TRAINING REFRESHER COURSE FROM AN INDEPENDENT GOVERNMENT APPROVED OR COMMERCIAL TRAINING FACILITIES FOR WORKING AT HEIGHT DATED NO LATER THAN 24 MONTHS PRIOR TO BEING ON STEEP SLOPES. NO PERSONS SHALL BE ALLOWED ON STEEP SLOPES WITHOUT SUCH CERTIFICATION.
- TOPOGRAPHIC SURVEY WAS CONDUCTED IN NOVEMBER 2016. CURRENT GEOLOGICAL CONDITIONS MAY VARY FROM THAT SHOWN ON THIS PLAN. CONTRACTOR SHALL VERIFY AND MARK ALL MITIGATION AREAS WITH THE ENGINEER PRIOR TO STARTING WORK.
- ANY UNUSED DRILLED ANCHOR HOLE(S) SHALL BE BACKFILLED WITH GROUT, OR OTHER MATERIAL APPROVED BY THE ENGINEER IN WRITING, BY THE CONTRACTOR PRIOR TO DEMOBILIZATION AT NO ADDITIONAL COST TO THE STATE. IF IT IS DETERMINED BY THE ENGINEER THAT THE ANCHOR HOLE LOCATION IS VISIBLE FROM THE TRAIL, GROUT SHALL BE SCULPTED AND TINTED TO MATCH THE SURROUNDING GEOLOGY IN COLOR AND TEXTURE AT NO ADDITIONAL COST TO THE STATE.
- ALL ROCK DOWELS AND ANCHORS SHALL BE GROUTED IN THE PRESENCE OF THE ENGINEER. ANY GROUTING PERFORMED WITHOUT THE ENGINEER'S PRESENCE IS GROUNDS FOR REJECTION OF THE DOWEL OR ANCHOR AT THE CONTRACTOR'S EXPENSE. IN ADDITION, THE CONTRACTOR SHALL BE PREPARED TO DEMONSTRATE AND VERIFY TO THE ENGINEER THE DEPTH OF ANY ANCHOR HOLE OR ANCHOR INSTALLED.

CONSTRUCTION NOTES (Cont'd)

- CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL CONSTRUCTION PERMITS. STATE WILL OBTAIN ENVIRONMENTAL PERMITS.
- PRIOR TO MOBILIZATION TO THE SITE, CONTRACTOR SHALL SUBMIT A METHOD STATEMENT PLAN FOR THE ENGINEER'S REVIEW AND APPROVAL DESCRIBING ALL ASPECTS OF THIS CONSTRUCTION WORK IN FINE DETAILS INCLUDING MOBILIZATION, STAGING, ANY DRILLING OPERATION, SHOTCRETING, AND OTHER RELATED WORK. CONTRACTOR SHALL NOT MOBILIZE TO THE SITE WITHOUT FIRST RECEIVING THE APPROVED METHOD STATEMENT PLAN.
- CONTRACTOR SHALL HIRE A PROFESSIONAL INDEPENDENT SECURITY GUARD DURING PARK CLOSURES AT NO ADDITIONAL COST TO THE STATE. THE SECURITY GUARD SHALL BE FLUENT IN ENGLISH AND SHALL BE ABLE TO COMMUNICATE EFFECTIVELY WITH THE VISITING PUBLIC AND THE PARKS STAFF.
- ALL GROUTED ANCHORS AND DOWELS SHALL BE REVIEWED AND APPROVED BY THE ENGINEER PRIOR TO COVERING THE ANCHOR OR DOWEL WITH CONCRETE PLUG OR CAP. ANY PLUGGING OF ANCHOR HOLES WITHOUT PRIOR APPROVAL OF THE ENGINEER SHALL BE REASON FOR REJECTION OF THE ANCHOR OR DOWEL.

EROSION CONTROL NOTES

- MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY CONSTRUCTION WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED, REPAIRED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND SHALL BE INCIDENTAL AND INCLUDED WITHIN THE CONTRACTOR'S BID.
- PROTECT DITCHES FROM CONSTRUCTION RUNOFF USING SILT FENCING OR SILT SOCKS.
- CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACED AREA.
- STORM WATER RUNOFF FLOWING TOWARD THE CONSTRUCTION AREA SHALL BE DIVERTED, USING APPROPRIATE CONTROL MEASURES.
- CONTRACTOR TO REMOVE DAILY, PRIOR TO AND AFTER THE DAY'S WORK, ALL SOIL AND LOOSE DEBRIS ON AND ALONG THE PATH AND HILLSIDE.
- CONTROL DUST GENERATED BY CONSTRUCTION VEHICLES AND ACTIVITIES, USING WATER OR OTHER APPROPRIATE MEASURES.

HISTORICAL PRESERVATION NOTES

- 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. IF HUMAN BURIALS ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY OF MAUI POLICE DEPARTMENT.

DLNR STREAM CHANNEL ALTERATION PERMIT NOTES

- THE CONTRACTOR SHALL PROTECT AND PRESERVE THE NATURAL CHARACTER OF THE STREAM BANK AND STREAM BED TO THE GREATEST EXTENT POSSIBLE. THE CONTRACTOR SHALL PLANT OR COVER LANDS DENUDED OF VEGETATION AS QUICKLY AS POSSIBLE TO PREVENT EROSION AND USE NATIVE PLANT SPECIES COMMON TO RIPARIAN ENVIRONMENTS TO IMPROVE THE HABITAT QUALITY OF THE STREAM ENVIRONMENT.

PUBLIC HEALTH, SAFETY AND 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 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.
- 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.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT SAFETY MEASURES ARE IN PLACE AND OPERATIONAL BEFORE ANY SCALING OR OTHER MITIGATION WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD AND SHALL MEET THE CURRENT INDUSTRY STANDARDS AND AS APPROVED BY THE ENGINEER. SAFETY MEASURES SHALL NOT BE REMOVED WITHOUT WRITTEN APPROVAL FROM THE STATE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING THAT THE PARK IS CLEAR OF ALL DEBRIS, TRASH, EQUIPMENT, AND/OR ANY OTHER HAZARDOUS MATERIALS OR TOOLS AND IS SAFE FOR PUBLIC USE PRIOR TO THE PARK OPENING TO THE PUBLIC.
- THE CONTRACTOR SHALL APPLY AND PAY FOR ALL NECESSARY CONSTRUCTION PERMITS.
- THE CONTRACTOR SHALL PROTECT EXISTING UTILITIES AT ALL TIMES DURING CONSTRUCTION, AND ANY DAMAGE TO THEM SHALL BE REPAIRED AND/OR PAID FOR BY THE CONTRACTOR AS DETERMINED BY THE STATE.
- THE CONTRACTOR SHALL SUBMIT WITH THE BID DOCUMENTS A COPY OF THE PUBLIC SAFETY PLAN REFLECTING A DETAILED DESCRIPTION OF HOW PUBLIC SAFETY COULD BE AFFECTED AND DESCRIPTION OF METHODS USED BY THE CONTRACTOR TO SAFE GUARD THE PUBLIC AND SURROUNDING PROPERTIES AGAINST ROCKFALL HAZARDS DURING THE CONSTRUCTION WORK.
- CONTRACTOR SHALL COORDINATE WORK HOURS AND TRAIL CLOSURES WITH THE STATE PARKS STAFF AND DLNR. NOTICE FOR FULL DAY CLOSURES OF THE PARK SHALL BE GIVEN AT LEAST 30 DAYS IN ADVANCE. ALL TRAIL CLOSURE REQUESTS MUST BE REVIEWED AND APPROVED BY THE STATE PRIOR TO ISSUANCE. SEE SPECIFICATIONS SECTION 01019 - GENERAL SPECIFICATIONS FOR INFORMATION REGARDING WORK HOURS, TRAIL CLOSURES, CONSTRUCTIONS SCHEDULING, ETC.
- THE CONTRACTOR'S ATTENTION IS DIRECTED TO TITLE 11, HAWAII ADMINISTRATIVE RULES, CHAPTER 46, "COMMUNITY NOISE CONTROL" IN WHICH MAXIMUM ALLOWABLE NOISE LEVELS HAVE BEEN SET. IF THE CONSTRUCTION ACTIVITIES FOR THIS PROJECT WILL EXCEED THE ALLOWABLE NOISE LEVELS, THE CONTRACTOR WILL BE REQUIRED TO OBTAIN A PERMIT FROM THE DIRECTOR OF THE DEPARTMENT OF HEALTH. THE CONTRACTOR SHALL OBTAIN A COPY OF CHAPTER 46 AND BECOME FAMILIAR WITH THE NOISE LEVEL RESTRICTIONS AND THE PROCEDURES FOR OBTAINING A PERMIT FOR CONSTRUCTION ACTIVITIES.

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
NOTES					
DESIGNED:			SUBMITTED:		
DRAWN:			DATE: DECEMBER 2, 2016		
CHECKED:			SCALE:		
APPROVED:			DRAWING NO.		
CHIEF ENGINEER			DATE		
C-1					
SHEET NO. 2 OF 19 SHEETS					

Carty Chang

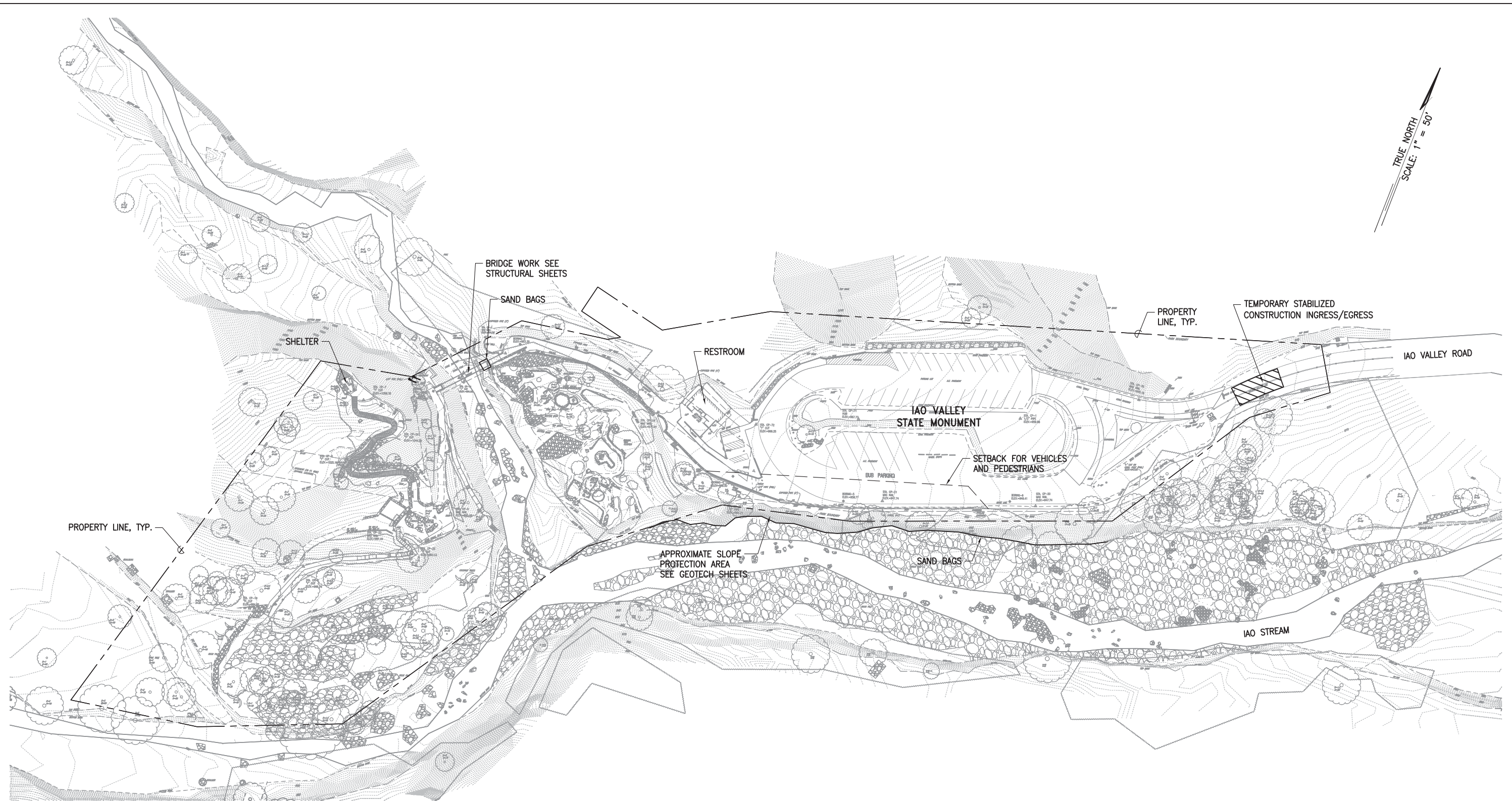
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expiration date of the license: 4/30/2018

JOB NO. J45CM41A



TRUE NORTH
SCALE: 1" = 50'

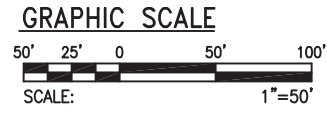
OVERALL PLAN
SCALE : 1"=50'

BENCHMARK
USC&GS DISK "U 6 1950"
ON THE WEST SIDE OF MARKET STREET, ON THE CONCRETE BALUSTRADE
AT THE SOUTH END OF THE BRIDGE OVER IAO STREAM
TOP OF BRASS DISK
ELEV. = 249.10 L.M.S.L.

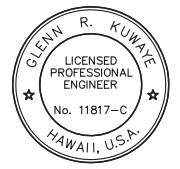
NOTES
HORIZONTAL DATUM: NAD 83(PA11) (2010.00) HI ZONE 2 STATE PLANE COORDINATES, U.S. FEET.
ELEVATIONS ESTABLISHED ONSITE USING STATIC GPS OBSERVATIONS.

UNDERGROUND UTILITY LINES AND/OR STRUCTURES, IF SHOWN, ARE PROVIDED FOR INFORMATION ONLY AND ARE BASED ON INFORMATION SHOWN ON PLANS/MAPS PREPARED BY OTHERS. THE INFORMATION SHOWN, THEREFORE, MAY OR MAY NOT BE REPRESENTATIVE OF ACTUAL FIELD CONDITIONS. THE UNDERGROUND UTILITY LINES AND/OR STRUCTURES MAY OR MAY NOT BE PRESENT AT THE LOCATIONS SHOWN OR OTHER UNDERGROUND UTILITY LINES AND/OR STRUCTURES NOT SHOWN MAY BE PRESENT.

UNLESS OTHERWISE NOTED, ALL LOCATIONS OF UNDERGROUND UTILITY LINES AND/OR STRUCTURES ARE APPROXIMATE. NO GUARANTEE IS MADE ON THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE USER(S) OF THIS TOPOGRAPHIC SURVEY MAP SHALL VERIFY THE INFORMATION, AS NEEDED, DURING DESIGN AND CONSTRUCTION.



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OVERALL PLAN					
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JOB NO. J45CM41A			SHEET NO. 3 OF 19 SHEETS		



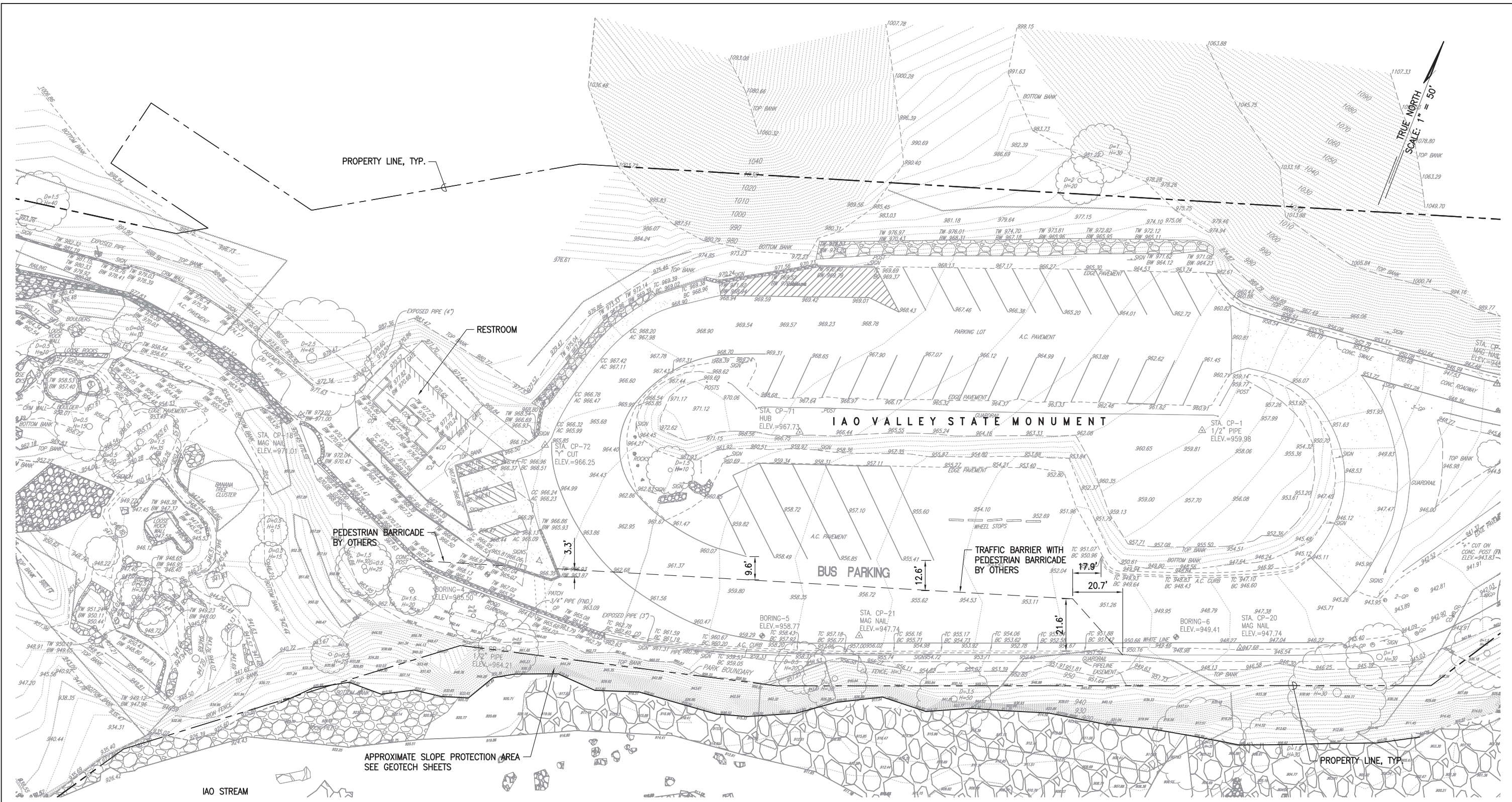
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Glenn R. Kuwata
CHIEF ENGINEER

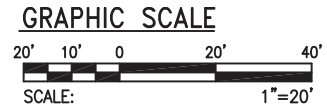
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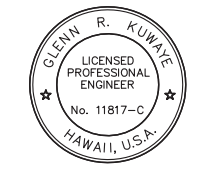
C-2



TRUE NORTH
SCALE: 1" = 50'



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PARKING LOT PLAN					
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CHIEF ENGINEER			DATE		
JOB NO. J45CM41A			SHEET NO. 4 OF 19 SHEETS		



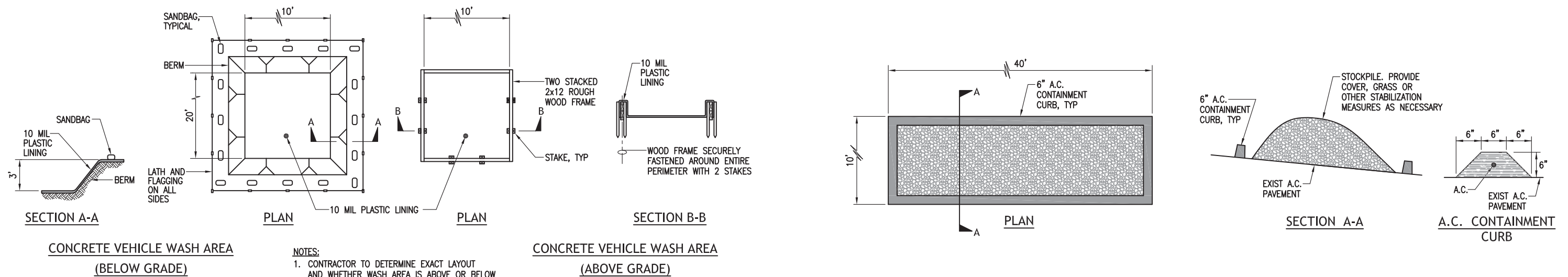
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DATE OF LICENSE: 4/30/2018



C-3

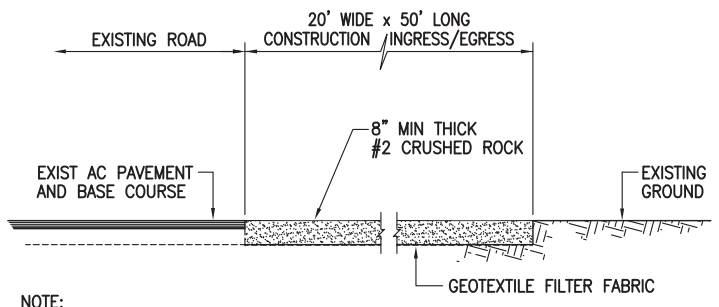


**CONCRETE VEHICLE WASH AREA
(BELOW GRADE)**

**CONCRETE VEHICLE WASH AREA
(ABOVE GRADE)**

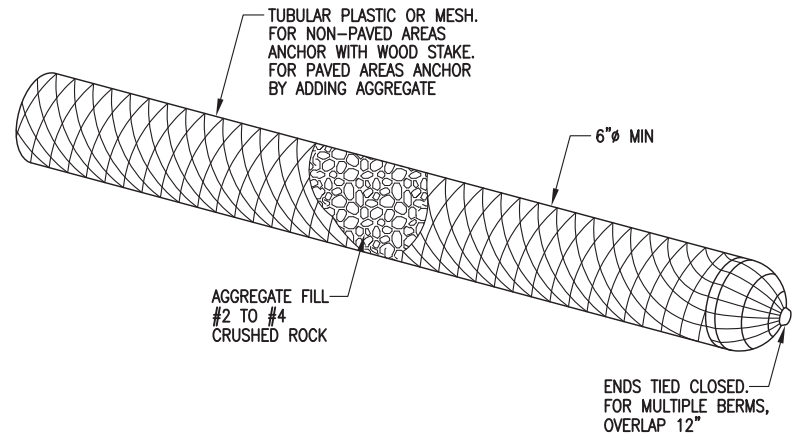
- NOTES:**
1. CONTRACTOR TO DETERMINE EXACT LAYOUT AND WHETHER WASH AREA IS ABOVE OR BELOW GRADE IN FIELD.
 2. A CONCRETE WASHOUT SIGN SHALL BE INSTALLED WITHIN 30 FEET OF THE TEMPORARY CONCRETE WASHOUT FACILITY.

**1 CONCRETE WASHDOWN BASIN DETAIL
C-4 NOT TO SCALE**

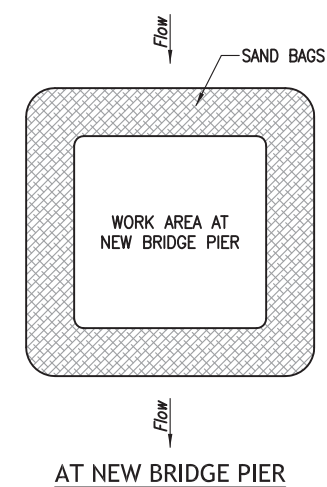


NOTE:
INSTALL 8" OF #2 CRUSHED ROCK

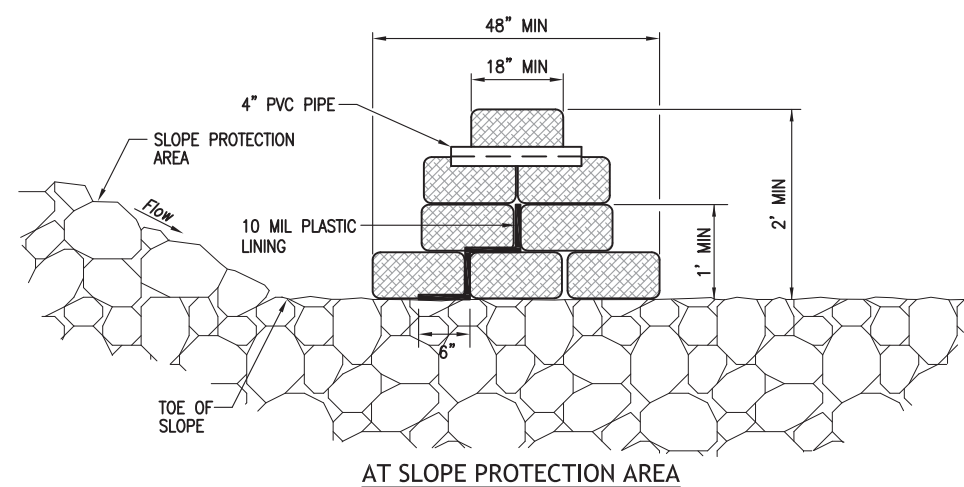
**3 TEMPORARY STABILIZED CONSTRUCTION INGRESS/EGRESS DETAIL
C-4 NOT TO SCALE**



**4 AGGREGATE FILTER POUCH DETAIL
C-4 NOT TO SCALE**



AT NEW BRIDGE PIER

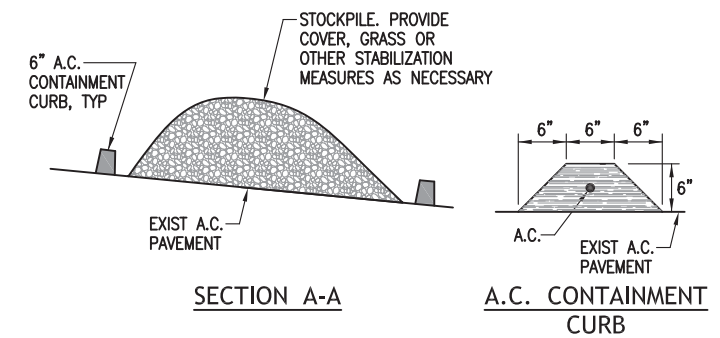


AT SLOPE PROTECTION AREA

**5 SAND BAG DETAIL
C-4 NOT TO SCALE**

- NOTES:**
1. SANDBAG SHALL BE WOVEN POLYPROPYLENE OR POLYIMIDE FABRIC WITH ULTRAVIOLET PROTECTION.
 2. BURLAP MATERIAL MAY NOT BE USED FOR SANDBAGS
 3. FILL MATERIAL FOR SANDBAGS SHALL BE CLEANED GRANULAR MATERIAL
 4. CONTRACTOR TO PREPARE GROUND BENEATH SANDBAGS TO PROVIDE A FLAT SURFACE FOR SANDBAG PLACEMENT. AFTER SANDBAG REMOVAL, CONTRACTOR TO RESTORE GROUND DISTURBED BY SANDBAGS TO PRE-CONSTRUCTION CONDITION

**2 STOCKPILE AREA DETAIL
C-4 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. EXCAVATED MATERIAL SHALL BE HAULED OFF SITE FOR DISPOSAL. ROCK CRUSHING IS NOT ALLOWED ONSITE.
3. 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.
4. RUNOFF COLLECTED WITHIN CONTAINED AREAS SHALL NOT BE ALLOWED TO FLOW INTO STREAM CHANNEL OR ANY STATE WATERS. RUNOFF COLLECTED WITHIN CONTAINED AREAS SHALL BE PUMPED TO A VACUUM TRUCK AND TAKEN OFFSITE. THE RUNOFF COLLECTED WITHIN THE VACUUM TRUCK SHALL NOT DISCHARGE INTO THE STREAM OR ANY STATE WATERS.
5. TREATED WOOD MATERIAL IS NOT PERMITTED FOR FORMS WITHIN THE STREAM CHANNEL.
6. BMPs ARE REQUIRED FOR CONTRACTOR'S STOCKPILE AND STAGING AREAS.
7. SAND BAGS SHALL BE USED DURING CONSTRUCTION OF NEW BRIDGE PIER. SAND BAGS SHALL BE REMOVED AFTER GROUND DISTURBANCE FOR NEW BRIDGE PIER IS COMPLETED. AREAS DISTURBED BY SAND BAGS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION.
8. DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION.
9. 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.
10. NO DEBRIS SHALL BE ALLOWED TO ENTER THE STREAM. A PAN SHALL BE USED TO CAPTURE DEBRIS DURING BRIDGE WORK.

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CHIEF ENGINEER			DATE		
C-4					

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expiration date of the license: 4/30/2018
JOB NO. J45CM41A

STRUCTURAL GENERAL NOTES

I. GENERAL

- A. GENERAL NOTES AND TYPICAL DETAILS SHOWN APPLY TO THE ENTIRE PROJECT AND ALL PHASES OF CONSTRUCTION UNLESS NOTED OTHERWISE.
- B. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS AND SHALL REPORT ANY DISCREPANCIES IN WRITING TO THE ENGINEER BEFORE ORDERING MATERIALS OR COMMENCING WORK.
- C. DETAILS SHOWN ON DRAWINGS SHALL BE TYPICAL FOR ALL SIMILAR CONDITIONS. MODIFY DETAILS FOR SPECIAL CONDITIONS AS DIRECTED BY THE ENGINEER.
- D. COORDINATE ALL PENETRATIONS THROUGH STRUCTURAL MEMBERS WITH ENGINEER AND SUBCONTRACTORS.
- E. SEE CIVIL DRAWINGS FOR DETAILS NOT SHOWN.

II. CONSTRUCTION

- A. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR MEANS AND METHODS OF CONSTRUCTION, WORKMANSHIP, AND JOB SAFETY INCLUDING BUT NOT LIMITED TO ALL DEWATERING, FALSEWORK, BRACINGS, MUD SILLS, AND OTHER TEMPORARY ITEMS USED FOR THE CONSTRUCTION OF THE PROJECT.
- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE STABILITY OF THE STRUCTURE FOR ALL CONDITIONS AT ALL STAGES OF CONSTRUCTION. THE DESIGN, ADEQUACY, AND SAFETY OF ERECTION BRACING, SHORING, SAFETY MEASURES, TEMPORARY SUPPORTS, ETC. IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND HAS NOT BEEN INCORPORATED BY THE STRUCTURAL ENGINEER. THE CONTRACTOR SHALL PROVIDE THE NECESSARY BRACING TO MAINTAIN STABILITY DURING CONSTRUCTION.
- C. THE CONTRACTOR SHALL NOTIFY THE ENGINEER AT LEAST 48 HOURS IN ADVANCE FOR REVIEW AND OBSERVATION OF PLACEMENT OF REINFORCING STEEL AND CONCRETE.
- D. CONSTRUCTION LOADING SHALL NOT EXCEED THE DESIGN LIVE LOADING UNLESS SHORES ARE USED. ALLOWABLE LOADING SHALL BE REDUCED IN AREAS WHERE THE STRUCTURAL ELEMENTS HAVE NOT ATTAINED FULL DESIGN STRENGTH.
- E. ANY DAMAGE TO EXISTING STRUCTURES SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS.

III. FOUNDATION WORK:

- A. FOUNDATION REPORT TITLED "DRAFT GEOTECHNICAL ENGINEERING EXPLORATION, IAO VALLEY STATE MONUMENT FLOOD REPAIRS" HAS BEEN PREPARED BY GEOLABS, INC. DATED DECEMBER 1, 2016.

IV. CONCRETE

- A. ALL CONCRETE SHALL DEVELOP A 28-DAY COMPRESSIVE STRENGTH OF 4000 PSI, HAVE A MAXIMUM WATER TO CEMENT RATIO OF 0.45, AND A MAXIMUM CEMENT CONTENT OF 650 LBS/CYD.
- B. SEE SPECIFICATIONS FOR MATERIAL, MIXING, PLACEMENT, TESTING AND CURING OF CONCRETE.
- C. REINFORCING BARS SHALL BE DETAILED IN ACCORDANCE WITH THE LATEST EDITION OF THE AMERICAN CONCRETE INSTITUTE (ACI) DETAILING MANUAL.
- D. ALL CONCRETE SHALL BE CURED FOR A MINIMUM OF SEVEN CONSECUTIVE DAYS IMMEDIATELY AFTER PLACEMENT BY THE USE OF WET BURLAP, FOG SPRAYING, CURING COMPOUNDS, OR OTHER APPROVED METHODS. SEE SPECIFICATIONS FOR CURING OF VERTICAL SURFACES.
- E. PROVIDE SLEEVES FOR PLUMBING AND ELECTRICAL OPENINGS IN CONCRETE BEFORE PLACING. DO NOT CUT ANY REINFORCING WHICH MAY CONFLICT. CORING OF CONCRETE IS NOT PERMITTED. NOTIFY THE STRUCTURAL ENGINEER IN ADVANCE OF CONDITIONS NOT SHOWN ON THE DRAWINGS.
- F. ALL PHASES OF WORK PERTAINING TO THE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF ACI 318.
- G. BONDING AGENT SHALL BE A THREE-COMPONENT, PREPROPORTIONED, ANTI-CORROSION, WATER-BASED, EPOXY MODIFIED PORTLAND CEMENT BONDING AGENT. BOND STRENGTH SHALL EXCEED 2,400 PSI IN ACCORDANCE WITH ASTM C882.

V. REINFORCING STEEL

- A. UNLESS OTHERWISE NOTED ON PLAN. ALL REINFORCING BARS SHALL BE ASTM A615 GRADE 60, DEFORMED.
- B. WHERE WELDED CONNECTIONS ARE REQUIRED, REINFORCING STEEL SHALL BE ASTM A706 GRADE 60 DEFORMED BARS.
- C. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
- D. SPLICES:
 - 1. UNLESS OTHERWISE NOTED, MINIMUM SPLICE SHALL BE 48 BAR DIAMETERS OR 2'-0" WHICHEVER IS GREATER.
 - 2. W.W.R; LAP 12" OR ONE FULL MESH WHICHEVER IS GREATER.
- E. ALL REINFORCING BAR BENDS SHALL BE MADE COLD.
- F. BAR BEND, HOOKS, AND OFFSETS SHALL BE IN ACCORDANCE WITH THE ACI DETAILING MANUAL AND AS DETAILED IN DRAWINGS.
- G. CONCRETE CLEAR COVER SHALL BE AS FOLLOWS:
 - 1. FOOTINGS AND SLABS POURED AGAINST EARTH 3"
 - 2. FOOTINGS AND SLABS POURED AGAINST FORMS AND LATER EXPOSED TO EARTH 2"
 - 3. OTHERS 2"
- H. PLASTIC TIPPED "CHAIRS" SHALL BE USED TO MAINTAIN MINIMUM CONCRETE CLEAR COVER FOR ALL SLAB AND FOOTING REINFORCING.
- J. REINFORCING STEEL, BOLTS, AND OTHER INSERTS SHALL BE POSITIVELY SECURED IN PLACE BEFORE PLACING CONCRETE. BAR PLACEMENT AND SUPPORTS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

VI. STRUCTURAL STEEL

- A. MATERIAL:
 - 1. STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL MEET THE REQUIREMENTS OF ASTM A992 WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI.
 - 2. SHAPED STRUCTURAL PIPE SHALL CONFORM TO ASTM A500, GRADE B WITH A MINIMUM YIELD STRENGTH OF 42,000 PSI.
 - 3. STEEL PLATES, BAR, CHANNELS, AND ANGLES SHALL CONFORM TO ASTM A36 WITH A MINIMUM YIELD STRENGTH OF 36,000 PSI.
- B. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE LATEST AISC AND AWS CODES.
- C. ALL WELDING, WHETHER SHOP OR FIELD, SHALL BE PERFORMED ONLY BY CERTIFIED WELDERS.
- D. ALL CONNECTIONS SHALL DEVELOP THE FULL STRENGTH OF MEMBERS CONNECTED UNLESS DETAILED OTHERWISE.
- E. PLATE INSERTS EMBEDDED IN CONCRETE SHALL HAVE THE ANCHORS WELDED TO DEVELOP THE FULL STRENGTH OF THE ANCHOR.
- F. UNLESS OTHERWISE NOTED ALL EMBEDDED BOLTS, ANCHORS, PLATES, INSERTS, ETC., SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
- G. UNLESS SHOWN OTHERWISE ALL STEEL TO STEEL CONNECTIONS SHALL USE 3/4" ASTM A325X BOLTS. PROVIDE DIRECT TENSION INDICATOR WASHERS FOR ALL HIGH-STRENGTH BOLTS.
- H. NO HOLES OTHER THAN THOSE SPECIALLY DETAILED SHALL BE ALLOWED THROUGH STRUCTURAL STEEL MEMBERS.
- J. ALL ANCHOR BOLTS SHALL BE ASTM F1554, GRADE 55.
- K. ALL ANCHOR BOLTS SHALL BE INSTALLED A MINIMUM 4" FROM THE CLOSEST FOUNDATION EDGE OR CONTROL JOINT AND TO THE DEPTH AS SHOWN ON THE PLANS.
- L. ALL POST-INSTALLED ANCHOR BOLT HOLES SHALL BE DRILLED USING "SAFE SET" TECHNOLOGY, OR EQUIVALENT, ANCHORS SHALL BE EMBEDDED 6" INTO THE CONCRETE SLAB USING HILTI HIT-HY 200 EPOXY RESIN, OR EQUIVALENT, UNLESS NOTED OTHERWISE.
- M. WELDS SHALL BE MADE WITH ASTM A233, E-70 SERIES ELECTRODES FOR STEEL TO STEEL CONNECTIONS.
- N. NON-SHRINK GROUT SHALL BE A PREMIXED COMPOUND CONSISTING OF NON-STAINING, NON-METALLIC AGGREGATE, CEMENT, WATER REDUCING AND PLASTICIZING AGENTS CAPABLE OF DEVELOPING MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI IN 3 DAYS AND 7,000 PSI IN 28 DAYS.


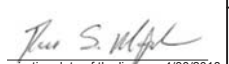
VI. STRUCTURAL STEEL (CONT.)

- P. ALL BASE PLATES, BOLTS, ANCHOR RODS, NUTS, AND WASHERS SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
- Q. ALL DAMAGE DONE TO GALVANIZED SURFACE OF STRUCTURAL STEEL SHALL BE REPAIRED.

VII. DESIGN DATA

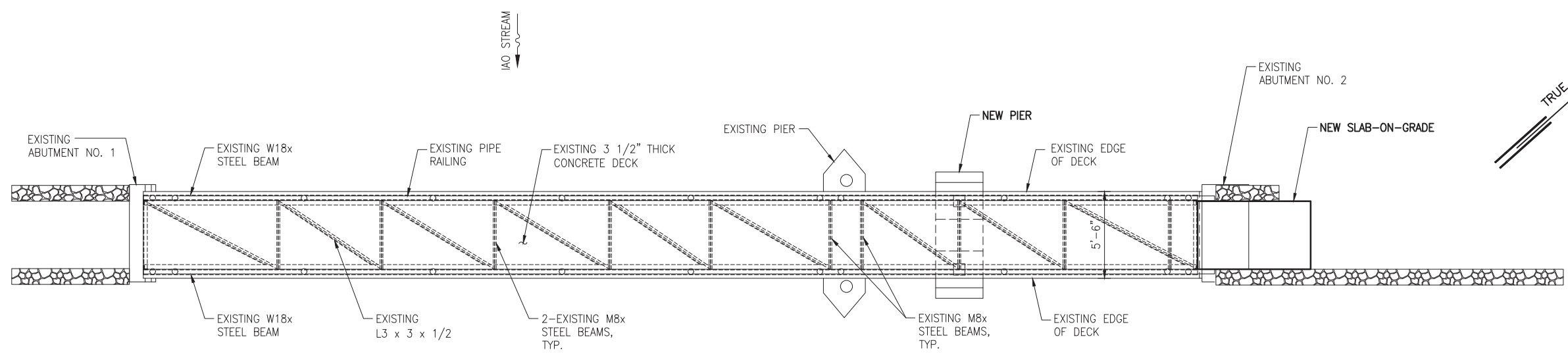
- A. MINIMUM LIVE LOADS:
 - 1. PEDESTRIAN = 85 PSF
- B. DEAD LOADS:
 - 1. CONCRETE = 160 PCF
 - 2. STEEL = 490 PCF
- C. WIND LOADS
 - 1. 50 PSF ON EXPOSED VERTICAL FACE OF SUPERSTRUCTURE.
- D. BASIS OF DESIGN.
 - 1. INTERNATIONAL BUILDING CODE 2012.
 - 2. ASCE 7-10 MINIMUM DESIGN LOADS FOR BUILDING AND OTHER STRUCTURES
 - 3. ACI 318-14 BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE.
 - 4. AISC 14TH EDITION - STEEL CONSTRUCTION MANUAL (LOAD AND RESISTANCE FACTOR DESIGN).
 - 5. AASHTO 1997 GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES.

DRAWING NAME: Z:\00 ONGOING\16-023-IAO STREAM EMERG REPAIR-WOC\01 CAD\12-02-16\16\SB-S0001 GNOTES.DWG PLOT TIME: 12-02-16, 11:23 AM

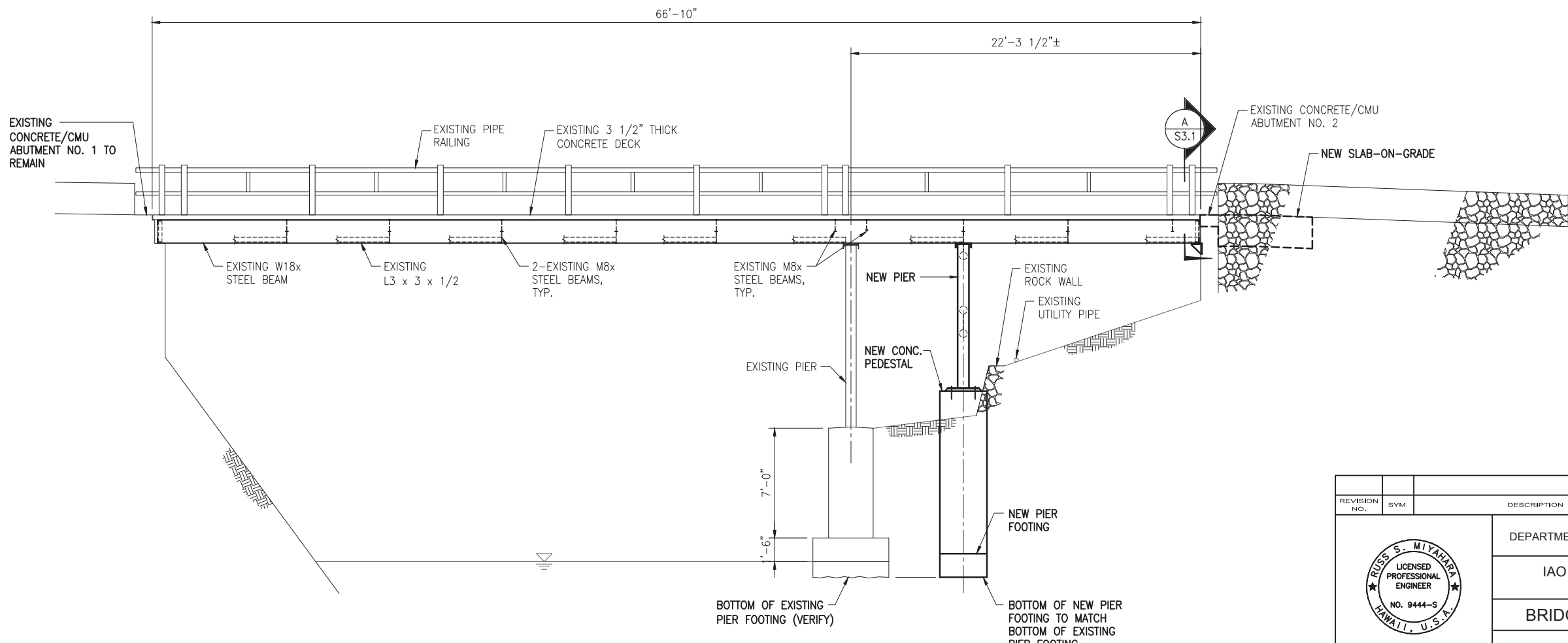
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IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
STRUCTURAL GENERAL NOTES					
DESIGNED: RM, KL		SUBMITTED:			
DRAWN: VT		DATE: DECEMBER 2, 2016			
CHECKED: RM		SCALE:			
APPROVED:					DRAWING NO.
 <small>operation date of the license: 4/30/2018</small>					S0.1
CHIEF ENGINEER			DATE		
JOB NO. J45CM41A			SHEET NO. 6 OF 19 SHEETS		

Carty Chang
E-signed 2016-12-09 01:18PM HST
carty.s.chang@hawaii.gov





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



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

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

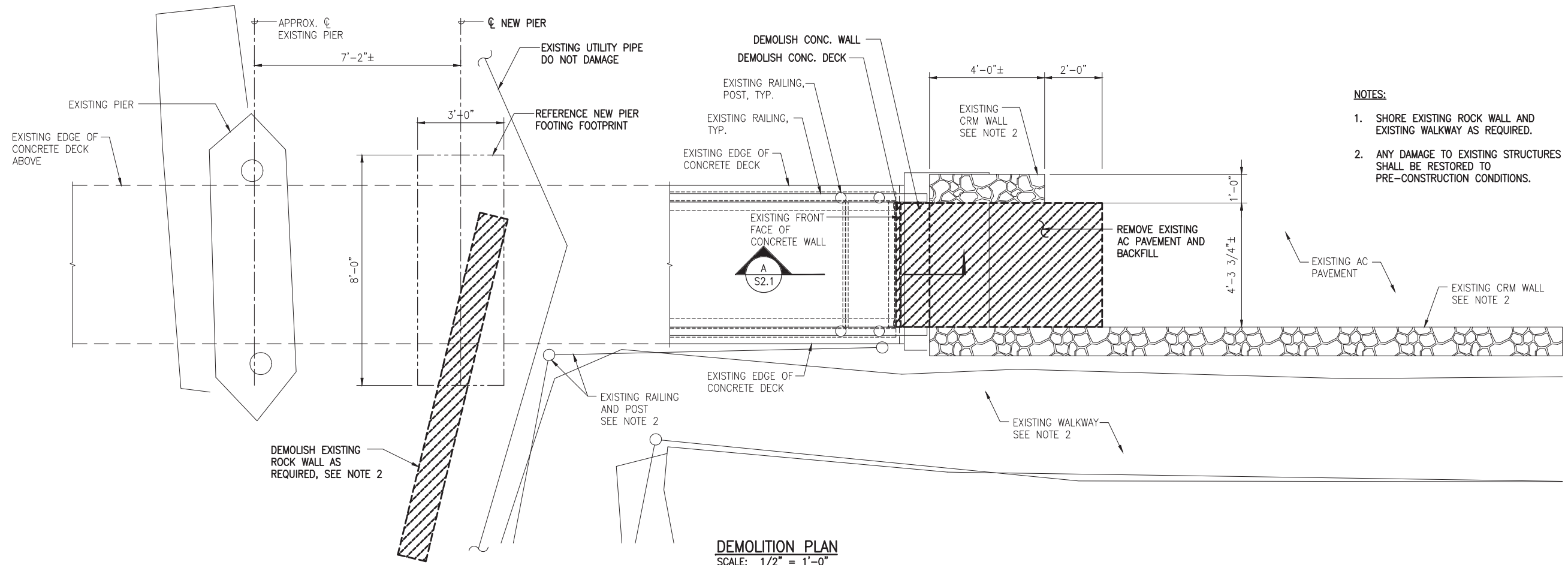
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IAO VALLEY STATE MONUMENT FLOOD REPAIRS			
BRIDGE PLAN AND ELEVATION			
DESIGNED: RM, KL	SUBMITTED:		
DRAWN: VT	DATE: DECEMBER 2, 2016		
CHECKED: RM	SCALE:		
APPROVED:			DRAWING NO.
			S1.1
CHIEF ENGINEER			

This work was prepared by me or under my supervision.
 expiration date of the license: 4/30/2018
 JOB NO. J45CM41A SHEET NO. 7 OF 19 SHEETS

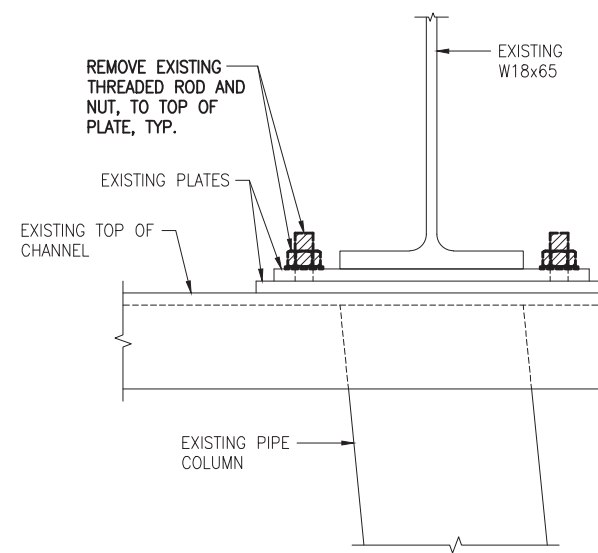
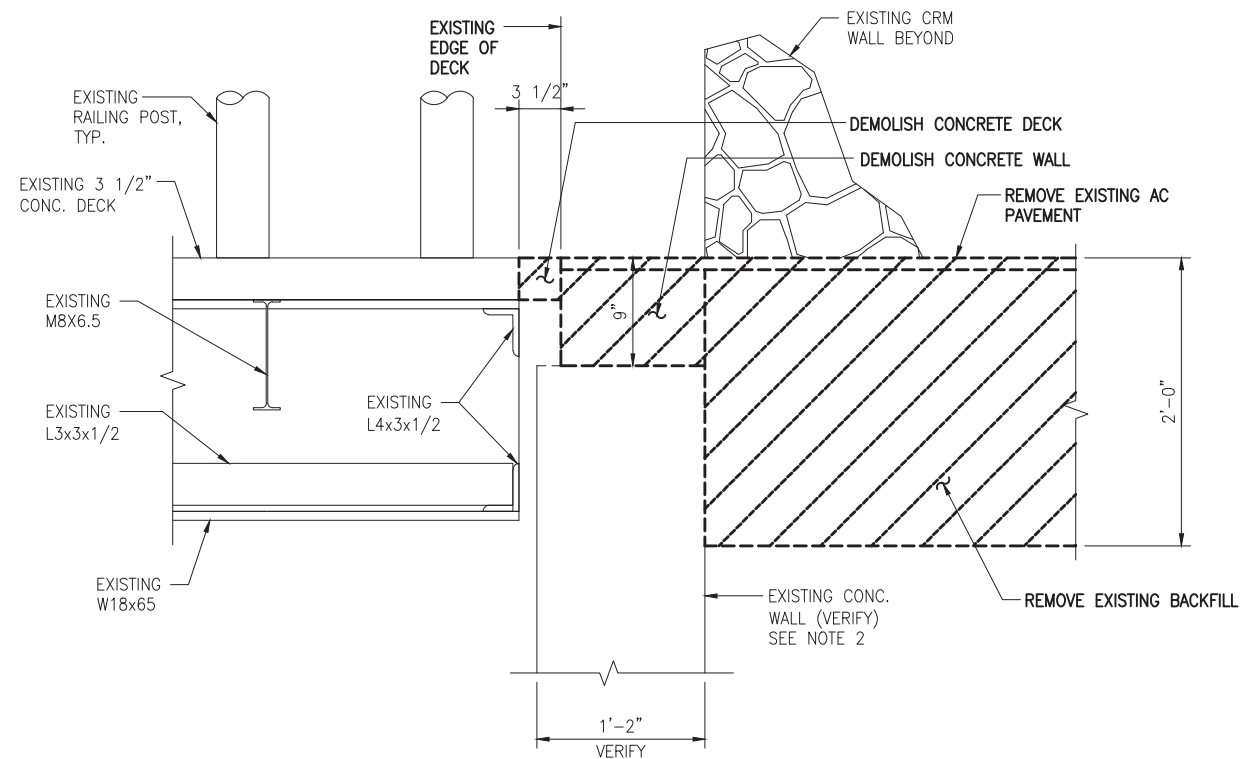
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- NOTES:**
1. SHORE EXISTING ROCK WALL AND EXISTING WALKWAY AS REQUIRED.
 2. ANY DAMAGE TO EXISTING STRUCTURES SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITIONS.



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED

Russ S. Miyahara
LICENSED PROFESSIONAL ENGINEER
NO. 9444-S
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

IAO VALLEY STATE MONUMENT
FLOOD REPAIRS

DEMOLITION PLAN AND SECTIONS

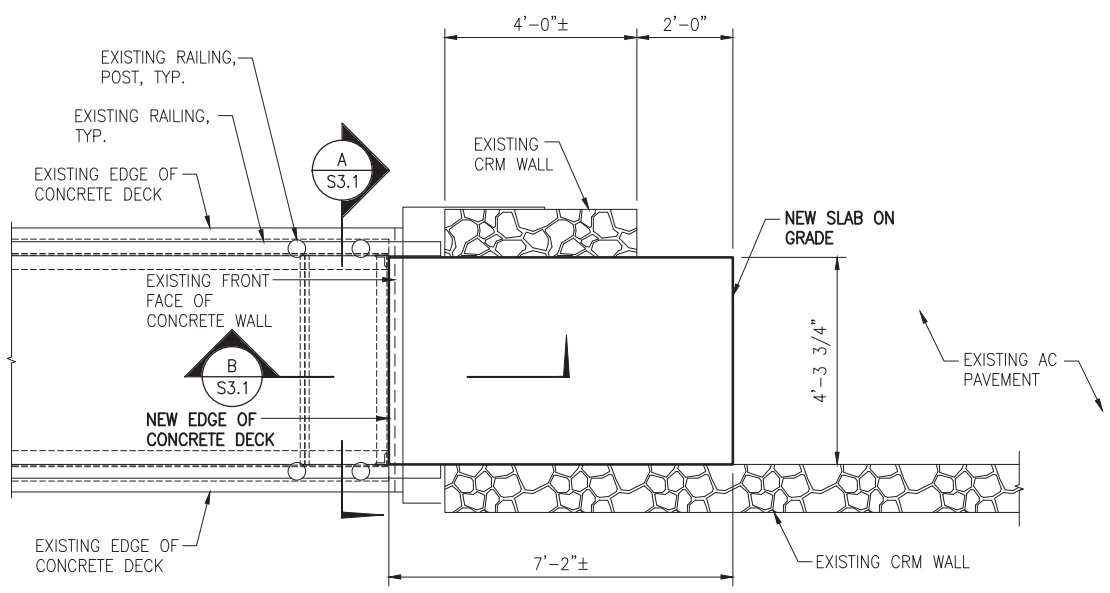
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DRAWN: VT	DATE: DECEMBER 2, 2016
CHECKED: RM	SCALE:
APPROVED:	DRAWING NO.
 CHIEF ENGINEER	DATE S2.1

JOB NO. J45CM41A SHEET NO. 8 OF 19 SHEETS

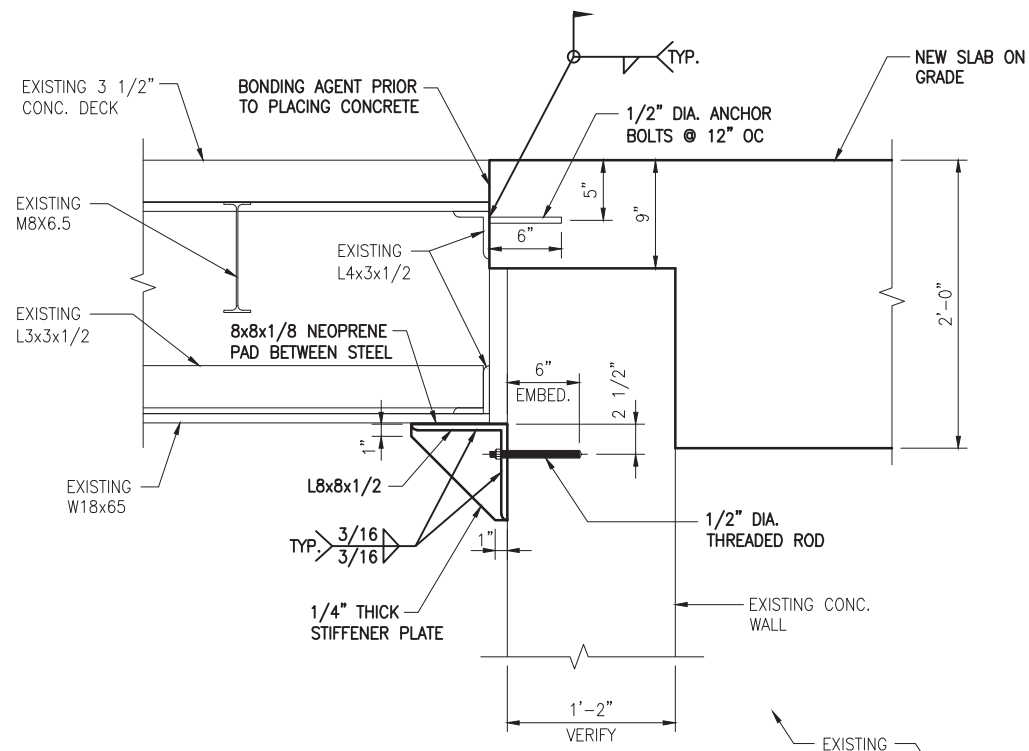
Carty Chang
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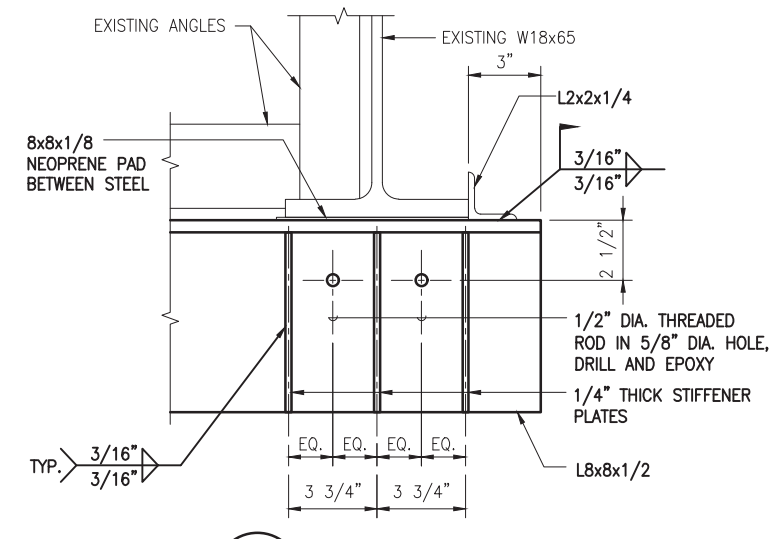
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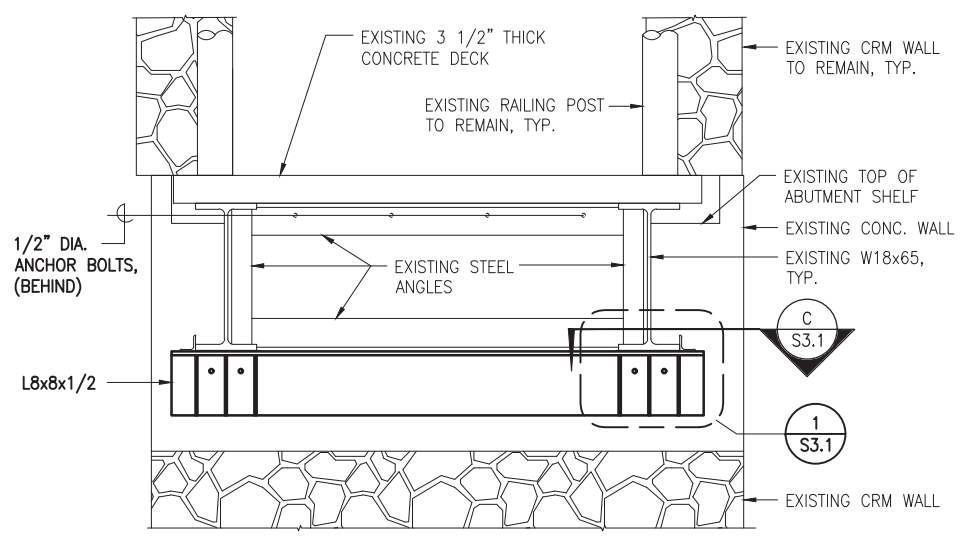
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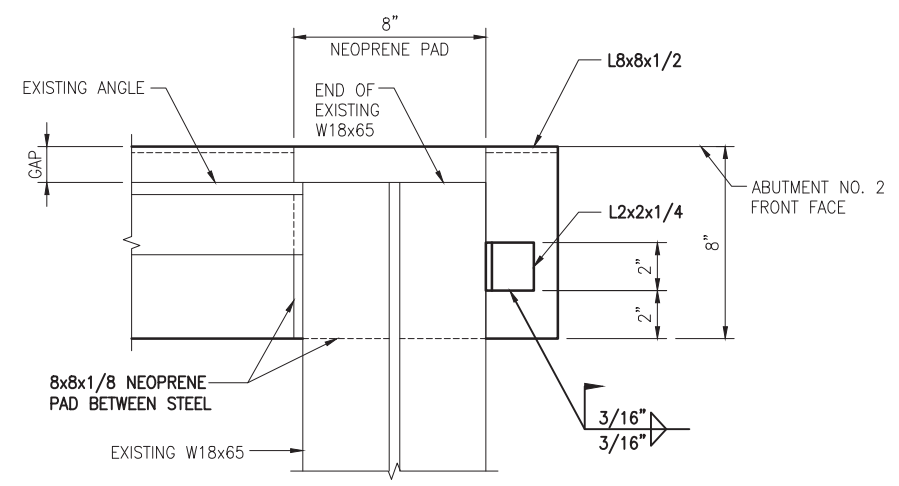
B SECTION
SCALE: 1 1/2" = 1'-0"



1 DETAIL
SCALE: 3" = 1'-0"



A SECTION - ABUTMENT NO. 2
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C SECTION
SCALE: 3" = 1'-0"

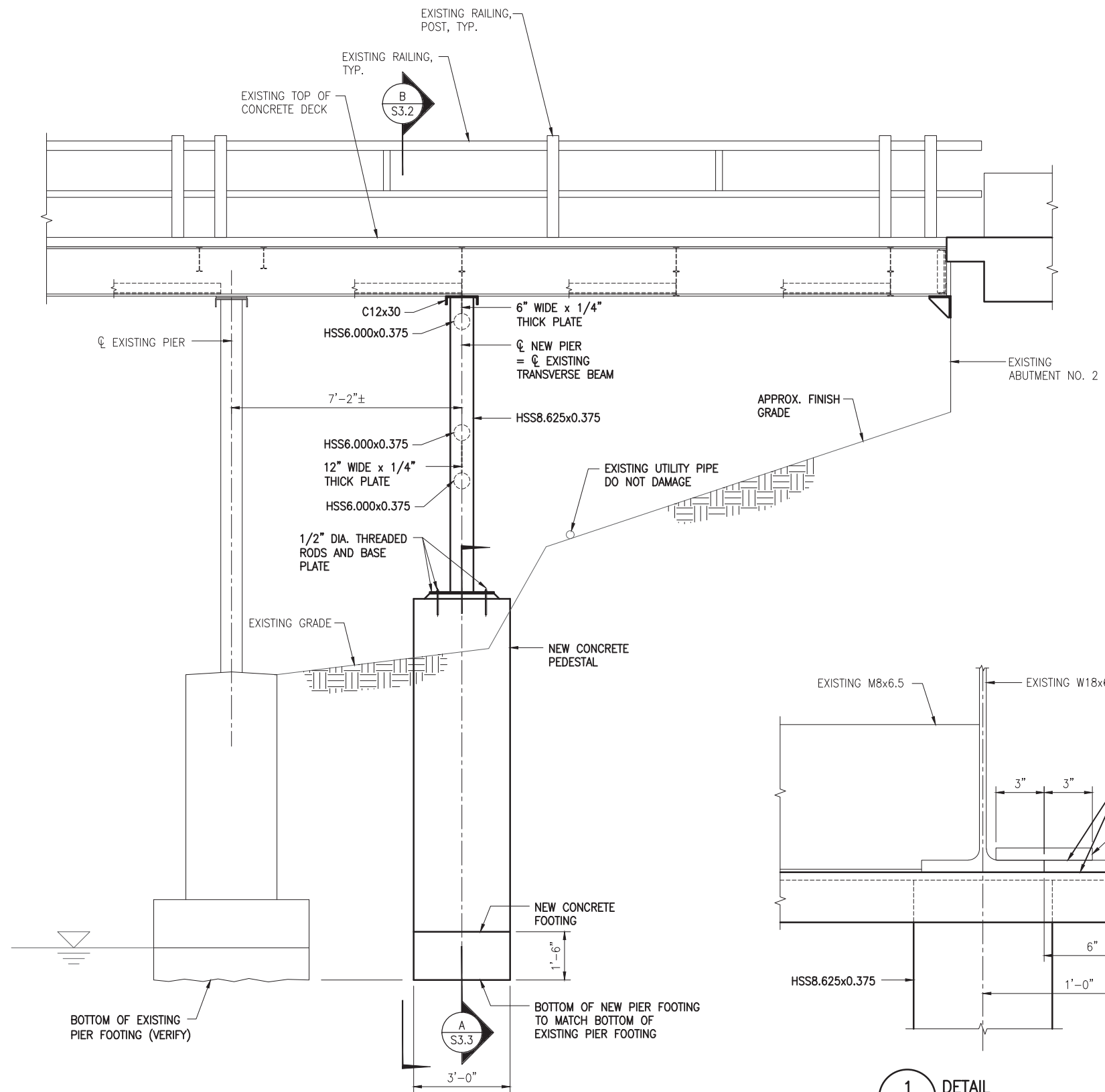
REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED

		STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION	
IAO VALLEY STATE MONUMENT FLOOD REPAIRS			
ABUTMENT NO. 2 PLAN AND SECTIONS			
DESIGNED: RM, KL	SUBMITTED:		
DRAWN: VT	DATE: DECEMBER 2, 2016		
CHECKED: RM	SCALE:		
APPROVED:	DRAWING NO.		
		S3.1	
CHIEF ENGINEER		DATE	
JOB NO. J45CM41A		SHEET NO. 9 OF 19 SHEETS	

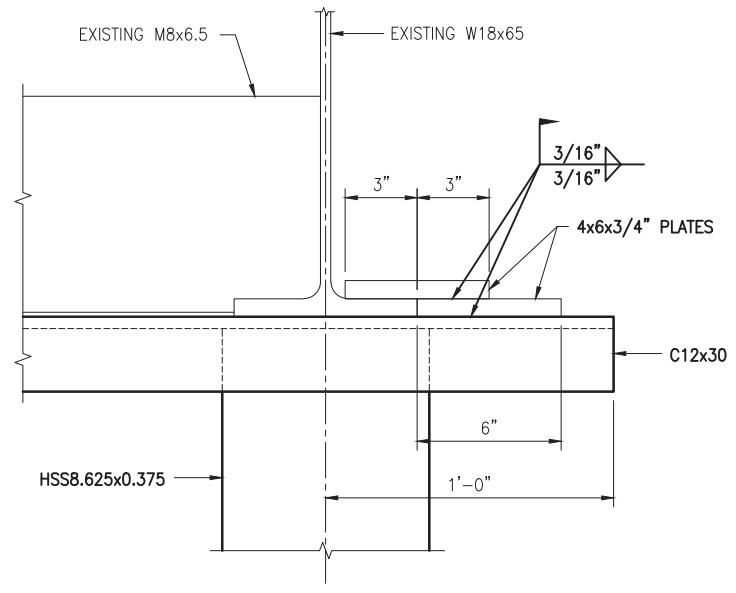
Carty Chang
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carty.s.chang@hawaii.gov



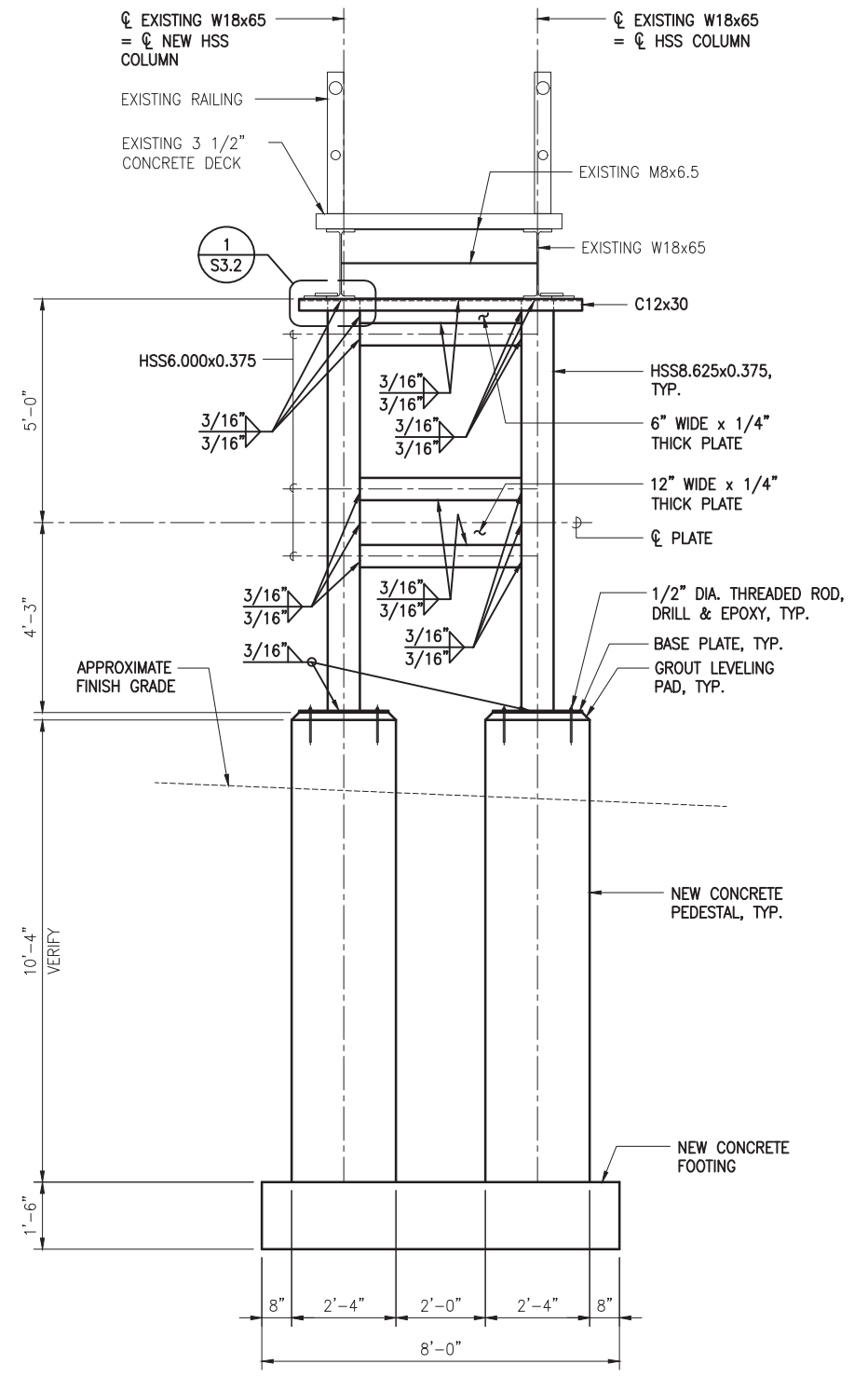
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A LONGITUDINAL SECTION
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1 DETAIL
S3.2 SCALE: 3" = 1'-0"

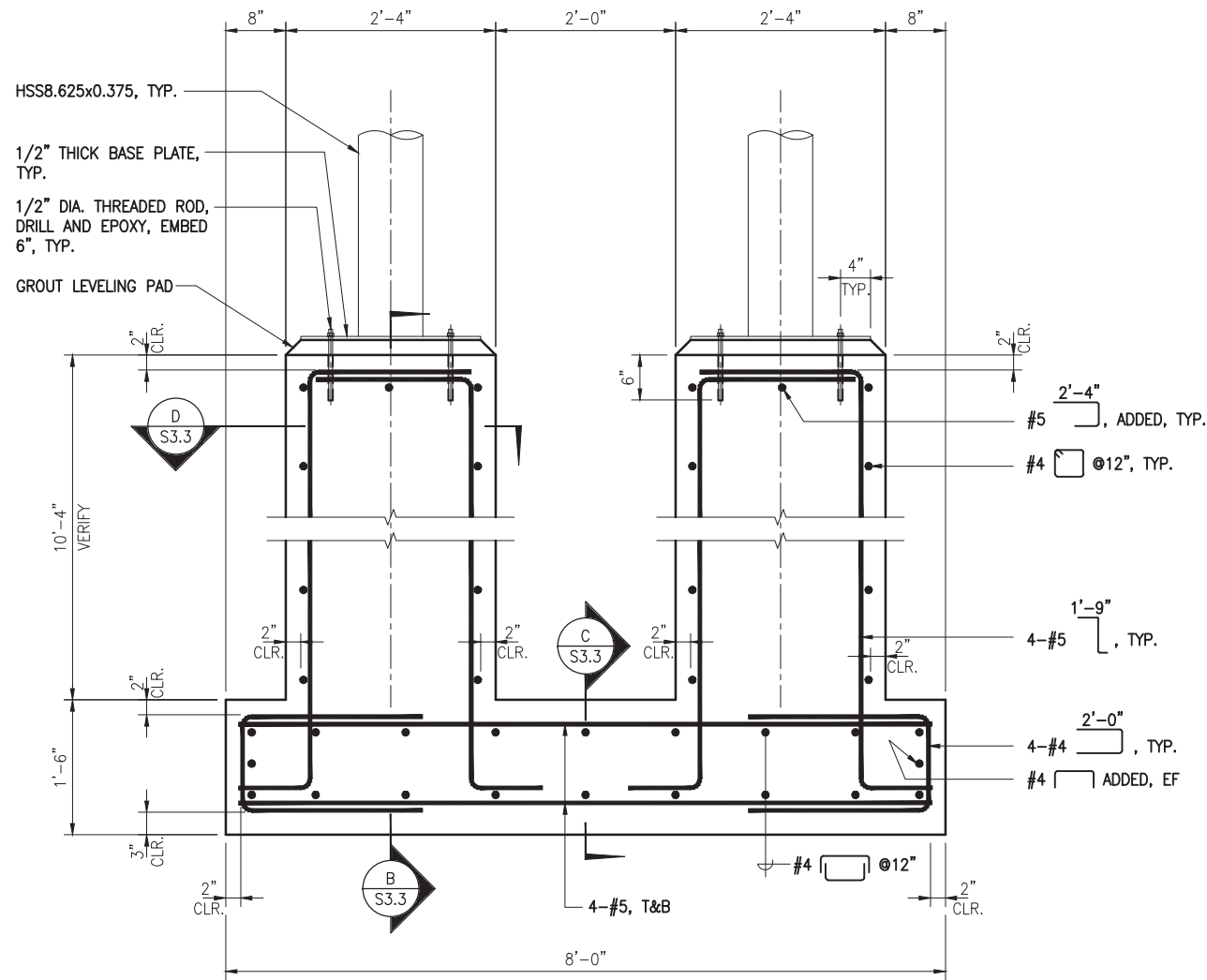


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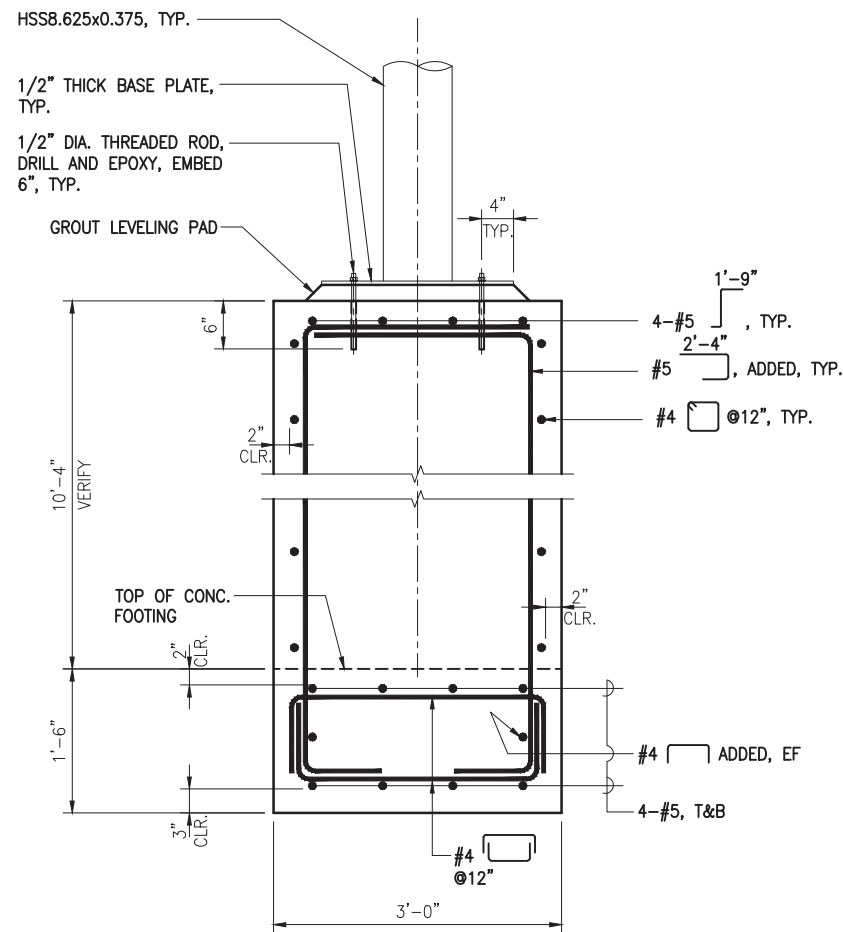
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STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION IAO VALLEY STATE MONUMENT FLOOD REPAIRS PIER SECTIONS					
DESIGNED: RM, KL			SUBMITTED:		
DRAWN: VT			DATE: DECEMBER 2, 2016		
CHECKED: RM			SCALE:		
APPROVED:					DRAWING NO.
					S3.2
This work was prepared by me or under my supervision. Carty Chang E-signed 2016-12-09 01:18PM HST carty.s.chang@hawaii.gov					CHIEF ENGINEER DATE:
JOB NO. J45CM41A SHEET NO. 10 OF 19 SHEETS					

Carty Chang
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carty.s.chang@hawaii.gov

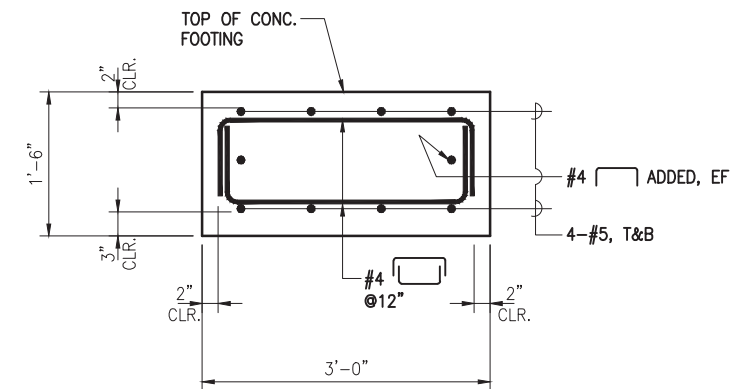
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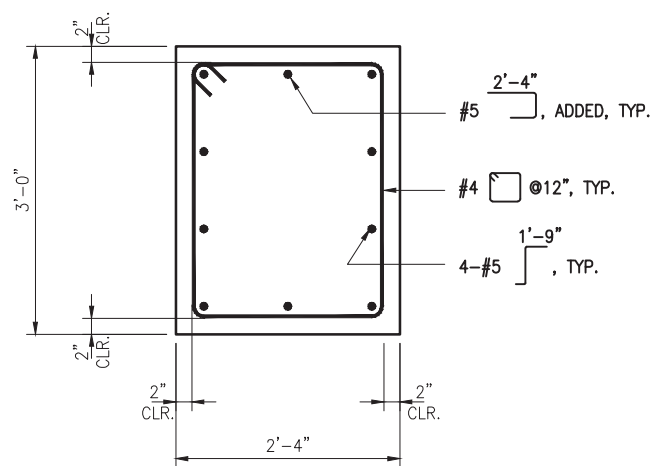
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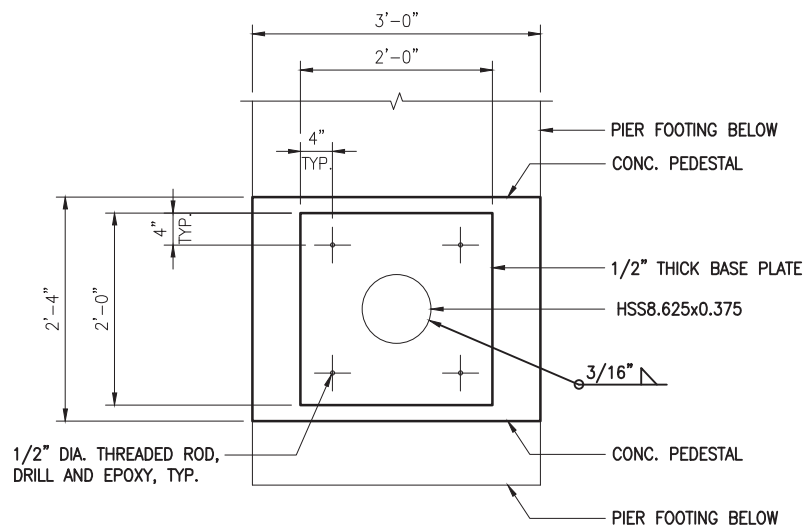
B SECTION
S3.3 SCALE: 1" = 1'-0"




C SECTION
S3.3 SCALE: 1" = 1'-0"



D SECTION
S3.3 SCALE: 1" = 1'-0"



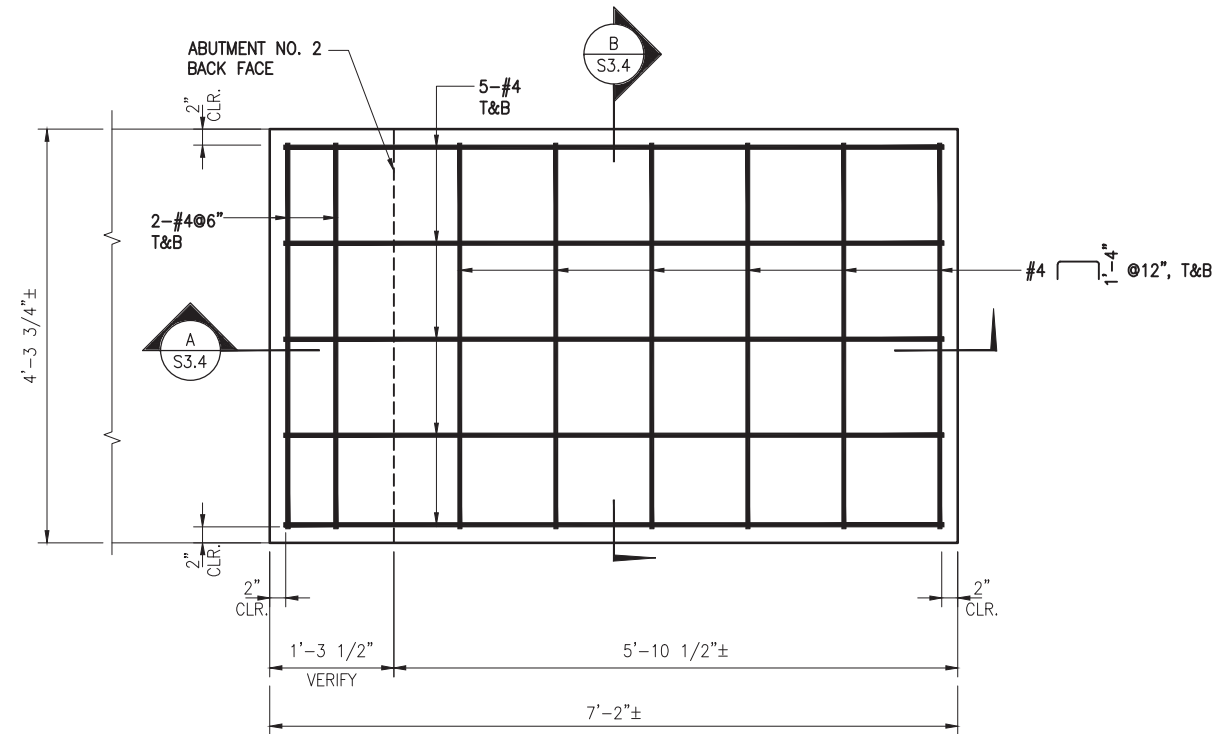
1 BASE PLATE DETAIL
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REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION IAO VALLEY STATE MONUMENT FLOOD REPAIRS PIER SECTIONS					
DESIGNED: RM, KL		SUBMITTED:			
DRAWN: VT		DATE: DECEMBER 2, 2016			
CHECKED: RM		SCALE:			
APPROVED:				DRAWING NO.	
 This work was prepared by me or under my supervision.				S3.3	
CHIEF ENGINEER				DATE	
JOB NO. J45CM41A			SHEET NO. 11 OF 19 SHEETS		

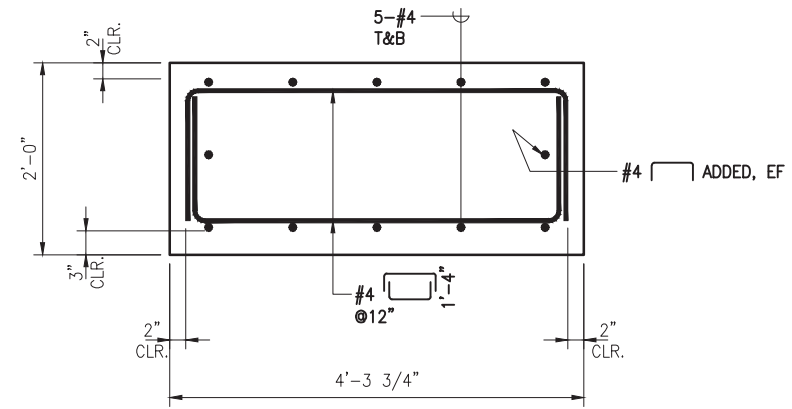
Carty Chang
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carty.s.chang@hawaii.gov



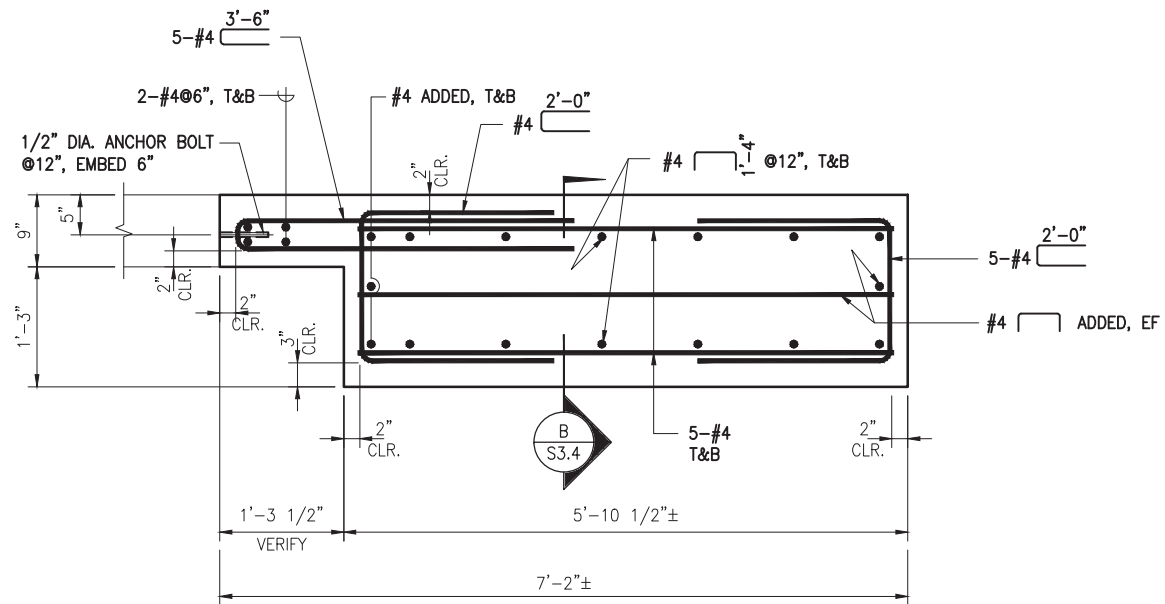
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PLAN
SCALE: 1" = 1'-0"



B SECTION
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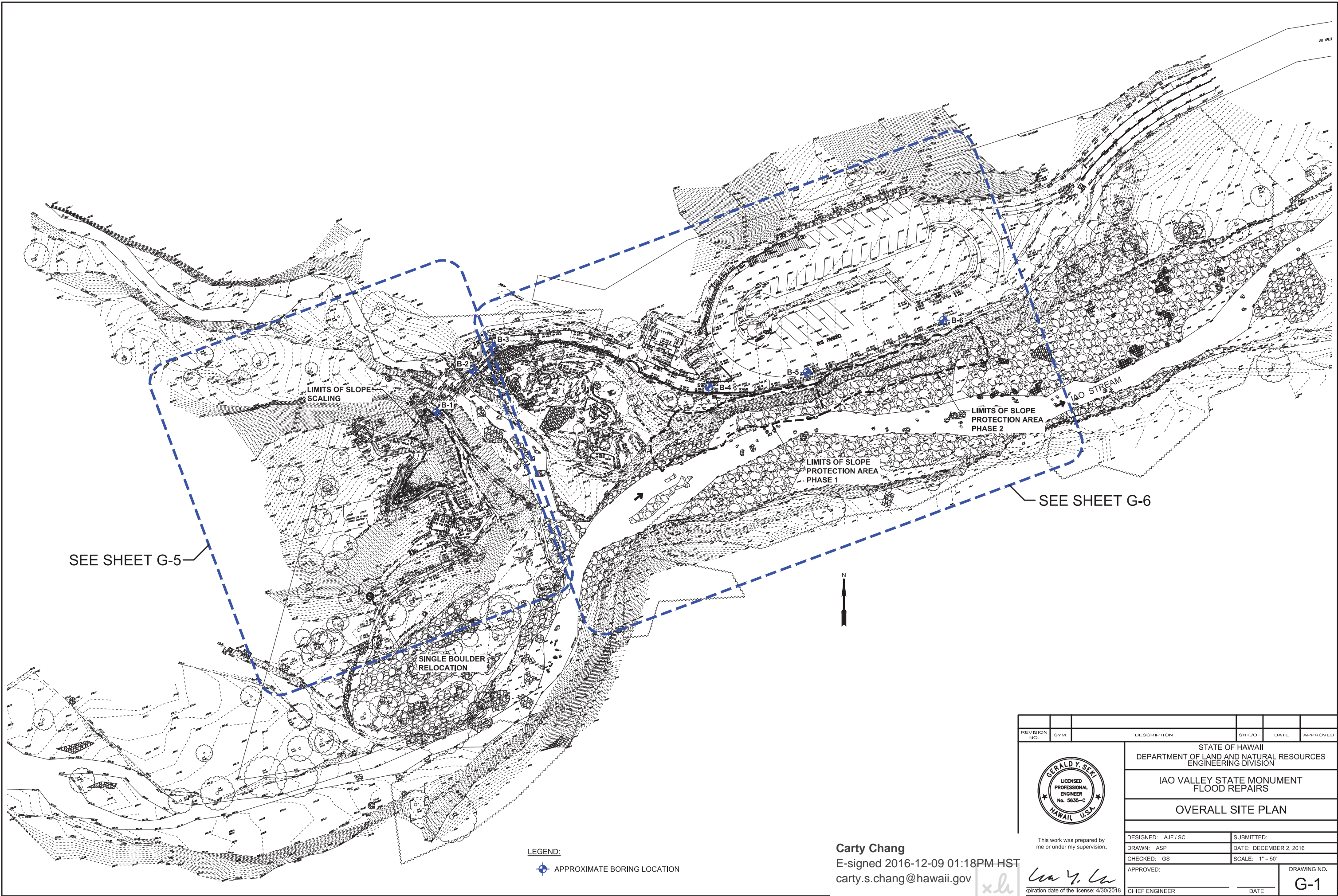


A SECTION
SCALE: 1" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION IAO VALLEY STATE MONUMENT FLOOD REPAIRS SLAB ON GRADE					
DESIGNED: RM, KL DRAWN: VT CHECKED: RM			SUBMITTED: DATE: DECEMBER 2, 2016 SCALE:		
APPROVED: <i>Russ S. Miyahara</i> CHIEF ENGINEER					DRAWING NO. S3.4
OPERATION DATE OF LICENSE: 4/30/2018 JOB NO. J45CM41A			SHEET NO. 12 OF 19 SHEETS		

Carty Chang
E-signed 2016-12-09 01:18PM HST
carty.s.chang@hawaii.gov

xli





SEE SHEET G-5

SEE SHEET G-6

LEGEND:
 APPROXIMATE BORING LOCATION

Carty Chang
 E-signed 2016-12-09 01:18PM HST
 carty.s.chang@hawaii.gov

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
OVERALL SITE PLAN					
DESIGNED: AJF / SC			SUBMITTED:		
DRAWN: ASP			DATE: DECEMBER 2, 2016		
CHECKED: GS			SCALE: 1" = 50'		
APPROVED:			DRAWING NO.		
 This work was prepared by me or under my supervision.			 CHIEF ENGINEER		
JOB NO. J45CM41A SHEET NO. 13 OF 19 SHEETS					

G-1

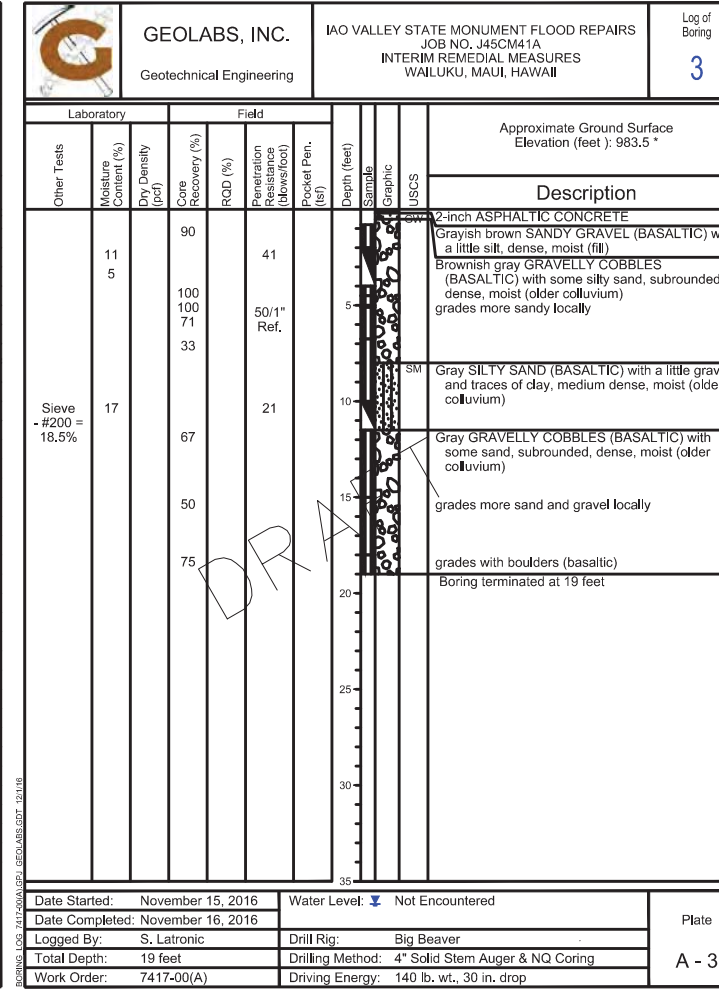
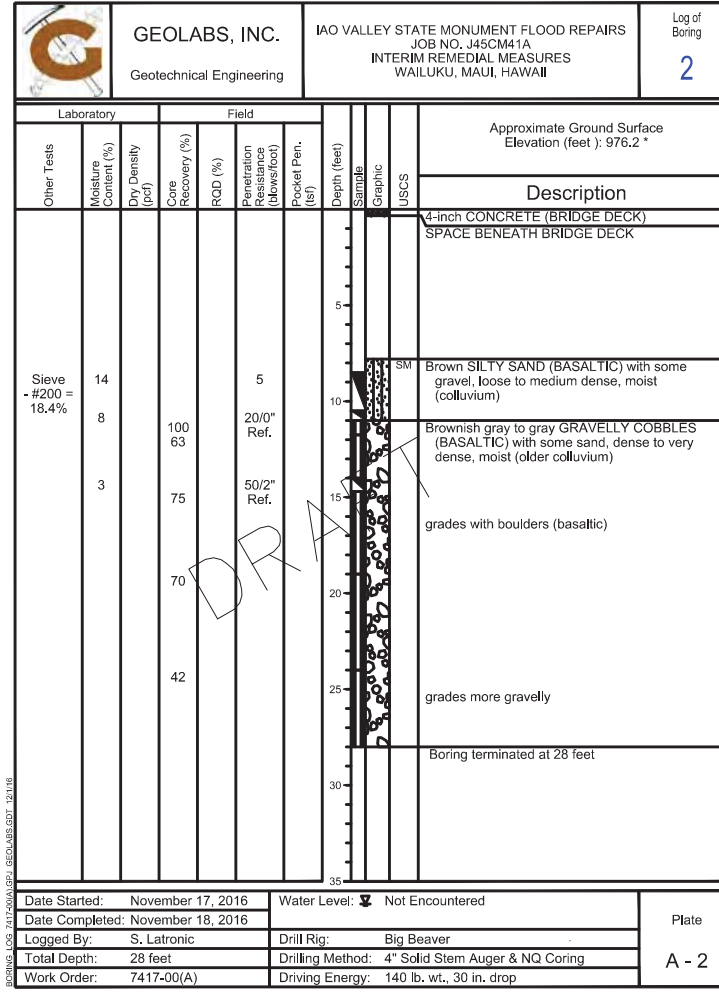
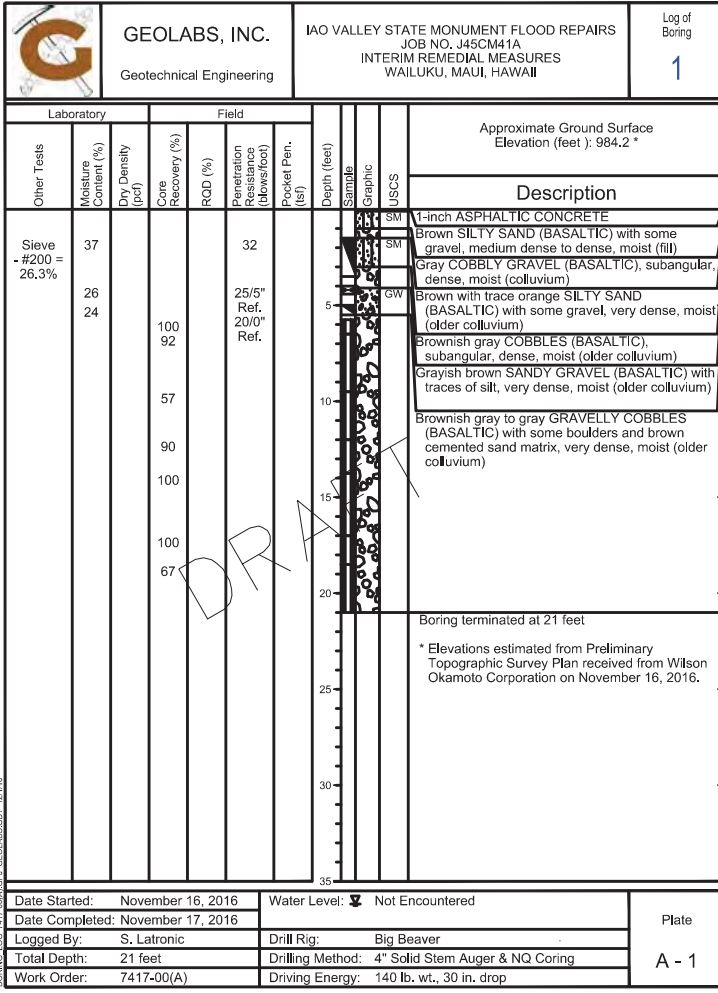
GEOTECHNICAL NOTES

- 1. A GEOTECHNICAL ENGINEERING REPORT ENTITLED "DRAFT GEOTECHNICAL ENGINEERING EXPLORATION, IAO VALLEY STATE MONUMENT REPAIRS, JOB NO. J45DM41A, INTERIM REMEDIAL MEASURES, WAILUKU, MAUI, HAWAII" DATED DECEMBER 1, 2016 HAS BEEN PREPARED BY GEOLABS, INC. A COPY OF THE REPORT IS ON FILE AT THE OFFICE OF THE ENGINEER FOR REVIEW BY THE CONTRACTOR.
2. FOR BORING LOCATIONS, SEE SHEETS G-1, G-5, AND G-6.
3. THE INFORMATION PRESENTED IN THE LOGS OF BORINGS DEPICT THE SUBSURFACE CONDITIONS ENCOUNTERED AT THAT SPECIFIED LOCATION AND AT THE TIME OF THE FIELD EXPLORATION ONLY. VARIATIONS OF SUBSOIL CONDITIONS FROM THOSE DEPICTED IN THE LOGS OF BORINGS MAY OCCUR BETWEEN AND BEYOND THE BORINGS.
4. THE PENETRATION RESISTANCE SHOWN ON THE LOGS OF BORINGS INDICATE THE NUMBER OF BLOWS REQUIRED FOR THE SPECIFIC SAMPLER TYPE USED. THE BLOW COUNTS MAY NEED TO BE FACTORED TO OBTAIN THE STANDARD PENETRATION TEST (SPT) BLOW COUNTS.
5. THE DATA GIVEN IS FOR GENERAL INFORMATION ONLY. BIDDERS SHALL EXAMINE THE SITE AND THE BORING DATA AND DRAW THEIR OWN CONCLUSIONS THEREFROM AS TO THE CHARACTER OF MATERIALS TO BE ENCOUNTERED. THE ENGINEER WILL NOT ASSUME RESPONSIBILITY FOR VARIATIONS OF SUBSOIL QUALITY OR CONDITIONS OTHER THAN AT THE BORING LOCATIONS SHOWN AND AT THE TIME THE BORINGS WERE TAKEN.

GEOLABS, INC. Geotechnical Engineering. Soil Log Legend. UNIFIED SOIL CLASSIFICATION SYSTEM (USCS). MAJOR DIVISIONS: GRAVELS, SANDS, SILTS AND CLAYS, HIGHLY ORGANIC SOILS. USCS: GW, GP, GM, GC, SW, SP, SM, SC, ML, CL, OL, MH, CH, OH, PT. TYPICAL DESCRIPTIONS: WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, SILTY GRAVELS, GRAVEL-SAND-SILT MIXTURES, CLAYEY GRAVELS, GRAVEL-SAND-CLAY MIXTURES, etc.

GEOLABS, INC. Geotechnical Engineering. Soil Classification Log Key (with deviations from ASTM D2488). GEOLABS, INC. CLASSIFICATION*. GRANULAR SOIL (- #200 < 50%), COHESIVE SOIL (- #200 > 50%). PRIMARY constituents are based on plasticity. SECONDARY constituents are based on plasticity. ACCESSORY descriptions compose of the following: with some > 12%, with a little 5 - 12%, with traces of < 5%.

GEOLABS, INC. Geotechnical Engineering. Rock Log Legend. ROCK DESCRIPTIONS: BASALT, BOULDERS, BRECCIA, CLINKER, COBBLES, CORAL, FINGER CORAL, LIMESTONE, SANDSTONE, SILTSTONE, TUFF, VOID/CAVITY. ROCK DESCRIPTION SYSTEM: MASSIVE: Greater than 24 inches apart. SLIGHTLY FRACTURED: 12 to 24 inches apart. MODERATELY FRACTURED: 6 to 12 inches apart. CLOSELY FRACTURED: 3 to 6 inches apart. SEVERELY FRACTURED: Less than 3 inches apart.



STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION. IAO VALLEY STATE MONUMENT FLOOD REPAIRS BORING LOGS 1. Carty Chang, E-signed 2016-12-09 01:18PM HST, carty.s.chang@hawaii.gov. DESIGNED: AJF / SC, DRAWN: ASP, CHECKED: GS, APPROVED: [Signature]. SHEET NO. 14 OF 19 SHEETS.

Laboratory		Field						Approximate Ground Surface Elevation (feet): 965.5'	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
									4-inches ASPHALTIC CONCRETE
	20	100			9/6" +50/5"		15/0"		Brown SILTY SAND with some gravel, medium dense, moist (fill)
	13	77					5		Brownish gray angular COBBLY BOULDERS (BASALTIC) with some angular to subangular gravel and silty sand, very dense, moist (overcast fill)
	3		83		7		7		
							10		
					20/0" Ref.		10		
	6	118			22/6" +30/5"		15		
			33				15		
							20		
					10/0" Ref.		20		
							25		
					25/1"		30		
							35		

Date Started: November 7, 2016 Water Level: 62.0 ft. 11/09/2016 1139 HRS
 Date Completed: November 9, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 80.17 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 4.1

Laboratory		Field						(Continued from previous plate)	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
	10		25		45/6" +10/0" Ref.		40		Brownish gray subangular COBBLY BOULDERS (BASALTIC) with some clayey sand and subrounded gravel, very dense, wet (older colluvium)
	8				37		45		
			71				50		
					15/0" Ref.		50		
							55		
					23		55		
							60		
					40/6" +35/2"		60		
							65		Gray subrounded COBBLY BOULDERS (BASALTIC) with some clayey sand and subrounded gravel, very dense (older colluvium)
					15/0" Ref.		65		
							70		

Date Started: November 7, 2016 Water Level: 62.0 ft. 11/09/2016 1139 HRS
 Date Completed: November 9, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 80.17 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 4.2

Laboratory		Field						(Continued from previous plate)	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
	10		69				75		
					15/0" Ref.		75		
							80		Boring terminated at 80.17 feet
					35/2"		80		
							85		
							90		
							95		
							100		
							105		

Date Started: November 7, 2016 Water Level: 62.0 ft. 11/09/2016 1139 HRS
 Date Completed: November 9, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 80.17 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 4.3

Laboratory		Field						Approximate Ground Surface Elevation (feet): 958.8'	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
									3-inches ASPHALTIC CONCRETE
	18	97			26		5		Brown SILTY SAND with some gravel, medium dense, moist (fill)
	9	108			32		5		Brownish gray angular COBBLY BOULDERS (BASALTIC) with some angular to subangular gravel and silty sand, very dense, moist (overcast fill)
			33		83		5		
							10		
					15/0" Ref.		10		
							15		
					15/0" Ref.		15		
							20		
					14/6" +15/0" Ref.		20		
							25		
					11/6" +40/3"		25		
							30		
					75		30		
							35		

Date Started: November 9, 2016 Water Level: 54.8 ft. 11/11/2016 1236 HRS
 Date Completed: November 11, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 81.5 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 5.1

Laboratory		Field						(Continued from previous plate)	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
	9	121			37/6" +25/3"		40		
					30/5"		40		Brown and gray subangular COBBLY BOULDERS (BASALTIC) with some silty sand and subangular to subrounded gravel, very dense, wet (older colluvium)
	4						45		
					10/0" Ref.		45		
							50		
					40		50		
					86		50		
							55		
					15/0" Ref.		55		
							60		
					15/0" Ref.		60		
							65		
					67		65		
							70		

Date Started: November 9, 2016 Water Level: 54.8 ft. 11/11/2016 1236 HRS
 Date Completed: November 11, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 81.5 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 5.2

Laboratory		Field						(Continued from previous plate)	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
					10/0" Ref.		75		Brown and gray subrounded COBBLY BOULDERS (BASALTIC) with some clayey sand and subrounded to rounded gravel, very dense (older colluvium)
					70		75		
					10/0" Ref.		75		
							80		Boring terminated at 81.5 feet
					43		80		
							85		
							90		
							95		
							100		
							105		

Date Started: November 9, 2016 Water Level: 54.8 ft. 11/11/2016 1236 HRS
 Date Completed: November 11, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 81.5 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 5.3

Laboratory		Field						Approximate Ground Surface Elevation (feet): 949.5'	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/foot)	Pocket Pen. (tsf)	Depth (feet)	Sample Graphic	USCS
									4-inches ASPHALTIC CONCRETE
	13	113			107		5		Brownish gray angular COBBLY BOULDERS (BASALTIC) with some angular to subangular gravel and silty sand, very dense, moist (overcast fill)
	100				16/6" +15/0" Ref.		5		
					10/0" Ref.		10		
							15		
					29		15		
							20		Brown and gray subangular COBBLY BOULDERS (BASALTIC) with some silty sand and subangular to subrounded gravel, very dense, wet (older colluvium)
					15/0" Ref.		20		
					20/1"		20		
							25		
							30		
					16		30		
							35		
					69		35		
					70		35		

Date Started: November 14, 2016 Water Level: 51.0 ft. 11/17/2016 1542 HRS
 Date Completed: November 15, 2016
 Logged By: B. Aiu Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)
 Total Depth: 80.5 feet Drilling Method: 4" Solid Stem Auger & PQ Coring
 Work Order: 7417-00(A) Driving Energy: 140 lb. wt., 30 in. drop

Plate A - 6.1

Carty Chang
 E-signed 2016-12-09 01:18PM HST
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REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

IAO VALLEY STATE MONUMENT FLOOD REPAIRS

BORING LOGS 2

DESIGNED: AJF / SC SUBMITTED: DATE: DECEMBER 2, 2016
 DRAWN: ASP SCALE: NOT TO SCALE
 CHECKED: GS
 APPROVED: DATE: DRAWING NO. G-3
 CHIEF ENGINEER DATE

This work was prepared by me or under my supervision.



JOB NO. J45CM41A SHEET NO. 15 OF 19 SHEETS

Laboratory		Field					Description	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/ft)	Pocket Pen. (tsf)	Depth (feet)	USCS
	8		49		30/5		30	
	7		81		49		40	
	27		17		30		45	
	16	114	45		26		50	
			33		15/0* Ref.		55	
			28		15/0* Ref.		60	
	31	83	43		50		65	
							70	
								Brown and gray subrounded COBBLY BOULDERS (BASALTIC) with some clayey sand and subrounded to rounded gravel, very dense (older colluvium)

Date Started: November 14, 2016	Water Level: 51.0 ft. 11/17/2016 1542 HRS	Plate
Date Completed: November 15, 2016		A - 6.2
Logged By: B. Aiu	Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)	
Total Depth: 80.5 feet	Drilling Method: 4" Solid Stem Auger & PQ Coring	
Work Order: 7417-00(A)	Driving Energy: 140 lb. wt., 30 in. drop	

Laboratory		Field					Description	
Other Tests	Moisture Content (%)	Dry Density (pcf)	Core Recovery (%)	ROD (%)	Penetration Resistance (blows/ft)	Pocket Pen. (tsf)	Depth (feet)	USCS
			77		15/0* Ref.		75	
	14		60		30/3"		75	
	38				20/0* Ref.		80	
								Boring terminated at 80.5 feet

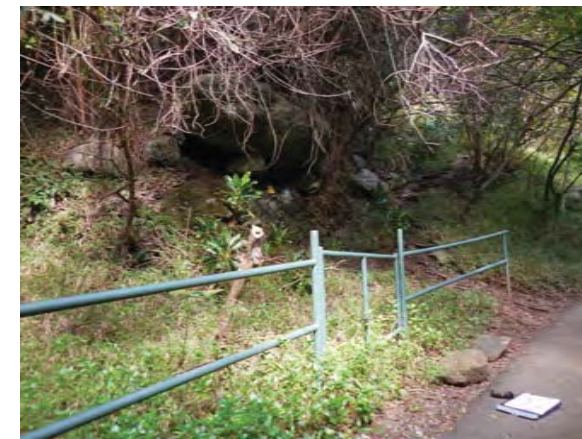
Date Started: November 14, 2016	Water Level: 51.0 ft. 11/17/2016 1542 HRS	Plate
Date Completed: November 15, 2016		A - 6.3
Logged By: B. Aiu	Drill Rig: CME-75DG1 (Energy Transfer Ratio = 80.3%)	
Total Depth: 80.5 feet	Drilling Method: 4" Solid Stem Auger & PQ Coring	
Work Order: 7417-00(A)	Driving Energy: 140 lb. wt., 30 in. drop	

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
BORING LOGS 3					
DESIGNED: AJF / SC			SUBMITTED:		
DRAWN: ASP			DATE: DECEMBER 2, 2016		
CHECKED: GS			SCALE: NOT TO SCALE		
APPROVED:			DRAWING NO.		
 This work was prepared by me or under my supervision.			 CHIEF ENGINEER		
			DATE		
			G-4		

Carty Chang
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JOB NO. J45CM41A



SLOPE SCALING NOTES

1. SLOPE SCALING SHALL BE CONDUCTED IN ACCORDANCE WITH THE SLOPE SCALING SPECIFICATIONS SECTION 671 CONTAINED IN THE CONTRACT DOCUMENTS.
2. SLOPE SCALING SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER.
3. SLOPE SCALING SHALL BE PERFORMED AS A LIGHT INTENSITY EFFORT USING MANUAL EFFORT AND HAND TOOLS TO REMOVE THE LOOSE SURFACE COBBLES AND BOULDERS FROM THE DESIGNATED SLOPE SCALING AREA.
4. EXCAVATION OF THE SLOPE SURFACE TO REMOVE MATERIAL SHALL BE AVOIDED UNLESS APPROVED ON A SITE SPECIFIC BASIS BY THE ENGINEER.
5. SCALING DEBRIS SHALL BE COMPLETELY REMOVED FROM THE SLOPE SITE AND DISPOSED OF PROPERLY OFFSITE. ALTERNATIVELY, SCALED ROCK MATERIALS MEETING THE REQUIREMENT FOR SLOPE TOE FILL STABILIZATION MATERIAL AT THE PARKING LOT SLOPE SITE MAY BE TEMPORARILY STOCKPILED AT AN APPROPRIATE LOCATION AND USED AS NECESSARY. ALL REMAINING SCALED MATERIAL MUST BE PROPERLY DISPOSED OFFSITE IF IT IS NOT USED AS FILL STABILIZATION MATERIAL.
6. THE EXISTING EARTH SLUMP DEBRIS CONTAINING SOILS AND ORGANIC DEBRIS SHOWN ON THE PLAN SHALL BE COMPLETELY REMOVED AND DISPOSED OF PROPERLY OFFSITE.
7. THE EXISTING PLASTIC FENCING ALONG THE BASE OF THE SLOPE MAY BE REMOVED TO FACILITATE THE SLOPE SCALING AND EARTH SLUMP DEBRIS REMOVAL.

BOULDER STABILIZATION/RELOCATION NOTES

1. THE SINGLE LARGE BOULDER SHALL BE MOVED INTACT DOWN SLOPE TO THE FLATTER TERRAIN ADJACENT TO THE EXISTING RAILING AND PAVED PATHWAY AS SHOWN ON THE PLAN.
2. THE BOULDER SHALL BE MOVED IN A CONTROLLED MANNER USING APPROPRIATE SAFETY RESTRAINT APPARATUS TO CONTROL THE DOWN SLOPE BOULDER MOVEMENT.
3. MOVEMENT METHOD AND APPARATUS SHALL MINIMIZE SCARRING OF THE ROCK SURFACE.
4. THE BOULDER SHALL BE PLACED IN THE NEW LOCATION WITH THE LARGER OF FLATTER SURFACE AREA ORIENTED IN A STABLE CONTACT WITH THE GROUND SURFACE.
5. ROCK DEBRIS REMAINING OR GENERATED BY THE CONTROLLED MOVEMENT SHALL BE CLEANED FROM THE SLOPE SURFACE AND DEPOSITED IN A STABLE GROUND SETTING THAT IS APPROVED BY THE ENGINEER.

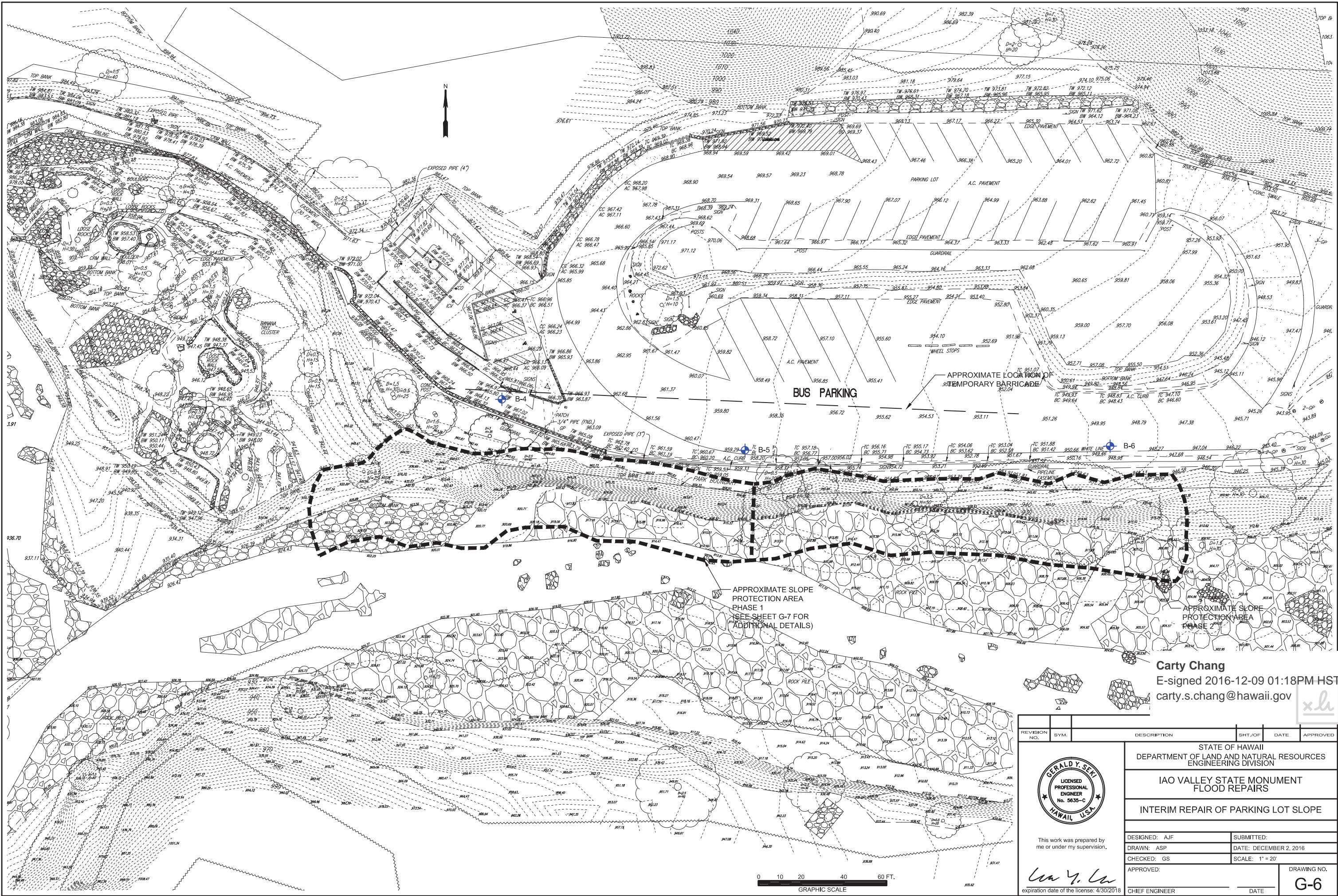
LEGEND

- APPROXIMATE LIMITS OF SLOPE SCALING AREA
- APPROXIMATE LOCATION OF EXISTING EARTH SLUMP MATERIAL TO BE DISPOSED

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STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
SLOPE SCALING AND BOULDER REMOVAL MITIGATION					
DESIGNED: SC			SUBMITTED:		
DRAWN: ASP			DATE: DECEMBER 2, 2016		
CHECKED: GS			SCALE: 1" = 20'		
APPROVED:			DRAWING NO.		
			G-5		
This work was prepared by me or under my supervision.			CHIEF ENGINEER _____ DATE _____		
expiraton date of the license: 4/30/2018			JOB NO. J45CM41A SHEET NO. 17 OF 19 SHEETS		

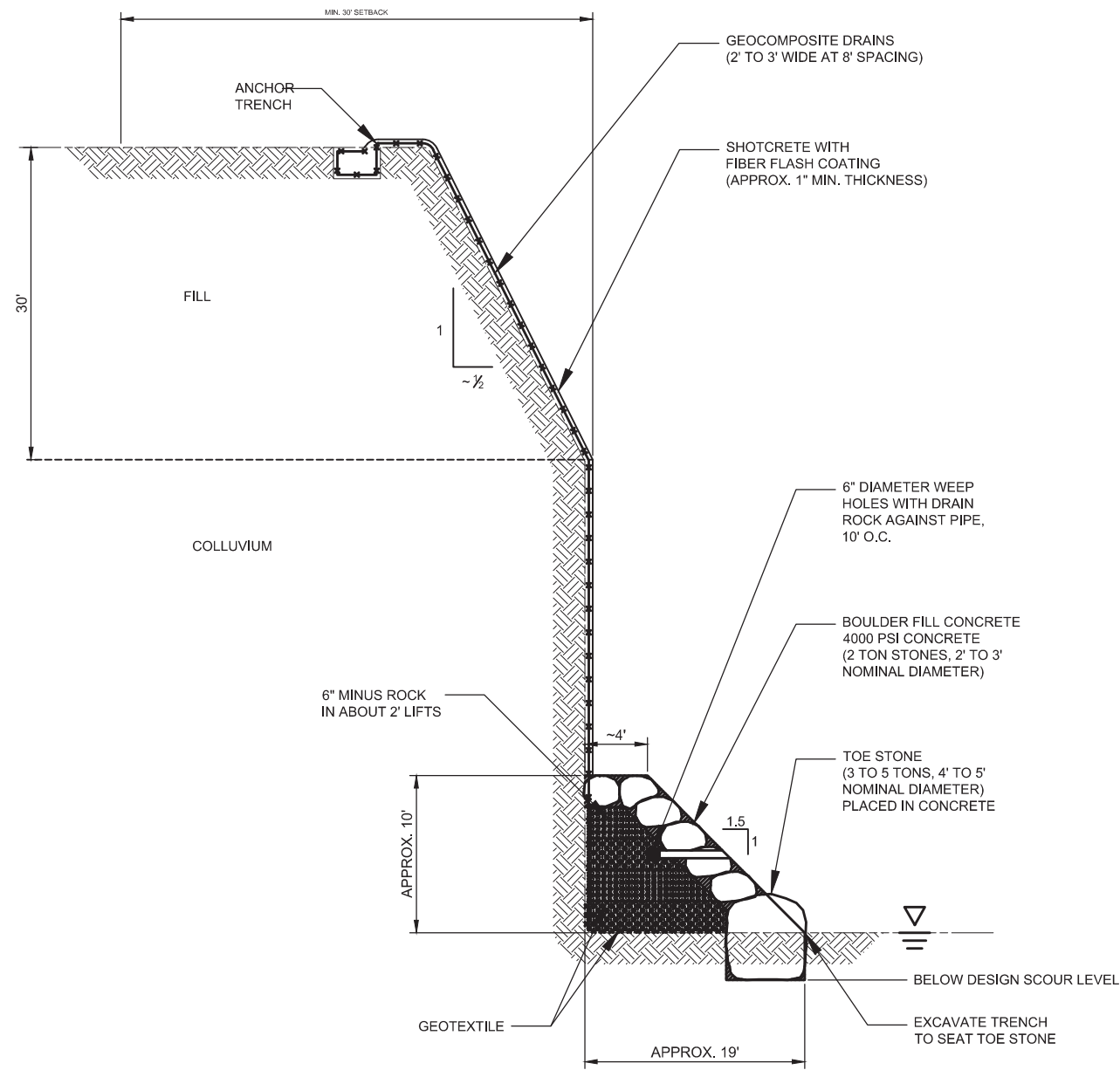


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REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED

STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION	
IAO VALLEY STATE MONUMENT FLOOD REPAIRS	
INTERIM REPAIR OF PARKING LOT SLOPE	
DESIGNED: AJF	SUBMITTED:
DRAWN: ASP	DATE: DECEMBER 2, 2016
CHECKED: GS	SCALE: 1" = 20'
APPROVED:	DRAWING NO.
<i>Carty Chang</i>	G-6
CHIEF ENGINEER	DATE

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 expiration date of the license: 4/30/2018
 JOB NO. J45CM41A SHEET NO. 18 OF 19 SHEETS



- NOTES:**
1. EXCAVATE EXISTING SLOPE FACE TO FINISHED SLOPE LINE.
 2. PERFORM SLOPE SCALING ON FINISHED SLOPE TO REMOVE LOOSE MATERIALS PRIOR TO PLACEMENT OF GECOMPOSITE DRAINS AND SHOTCRETE.
 3. SHOTCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS OF 4,000 PSI AND HAVE A MAXIMUM 0.45 WATER TO CEMENT RATIO. A SHRINKAGE REDUCING ADMIXTURE, SUCH AS ECLIPSE OR MASTER LIFE AS20 OR APPROVED EQUAL SHALL BE ADDED AT A DOSAGE OF 128 OZ. PER CUBIC YARD AS RECOMMENDED BY THE MANUFACTURER. SHOTCRETE SHALL CONTAIN 7.5 LBS. OF STRUX 90/40 SYNTHETIC STRUCTURAL FIBER OR EQUIVALENT.
 4. SHOTCRETE SHALL BE CURED USING SINAK LITHIUM CURE OR APPROVED EQUAL AT A COVERAGE RATE OF NO MORE THAN 200 SQ. FT. PER GALLON FOR THE SHOTCRETE.

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
IAO VALLEY STATE MONUMENT FLOOD REPAIRS					
TYPICAL DETAILS					
DESIGNED: GS			SUBMITTED:		
DRAWN: ASP			DATE: DECEMBER 2, 2016		
CHECKED: GS			SCALE: NOT TO SCALE		
APPROVED:			DRAWING NO.		
 This work was prepared by me or under my supervision.			 CHIEF ENGINEER		
OPERATION DATE OF THE LICENSE: 4/30/2018			DATE		
JOB NO. J45CM41A			SHEET NO. 19 OF 19 SHEETS		

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G-7