

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

DIVISION OF FORESTRY AND WILDLIFE

JOB NO. 500CH15A

PUU WAAWAA
 STRUCTURE IMPROVEMENTS
 AND DAM COMPLIANCE

PUUWAAWAA (MAUKA), NORTH KONA, HAWAII

TMK: 3rd. DIV. 7-1-001:006, 007

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APPROVED:

5/6/16

DATE

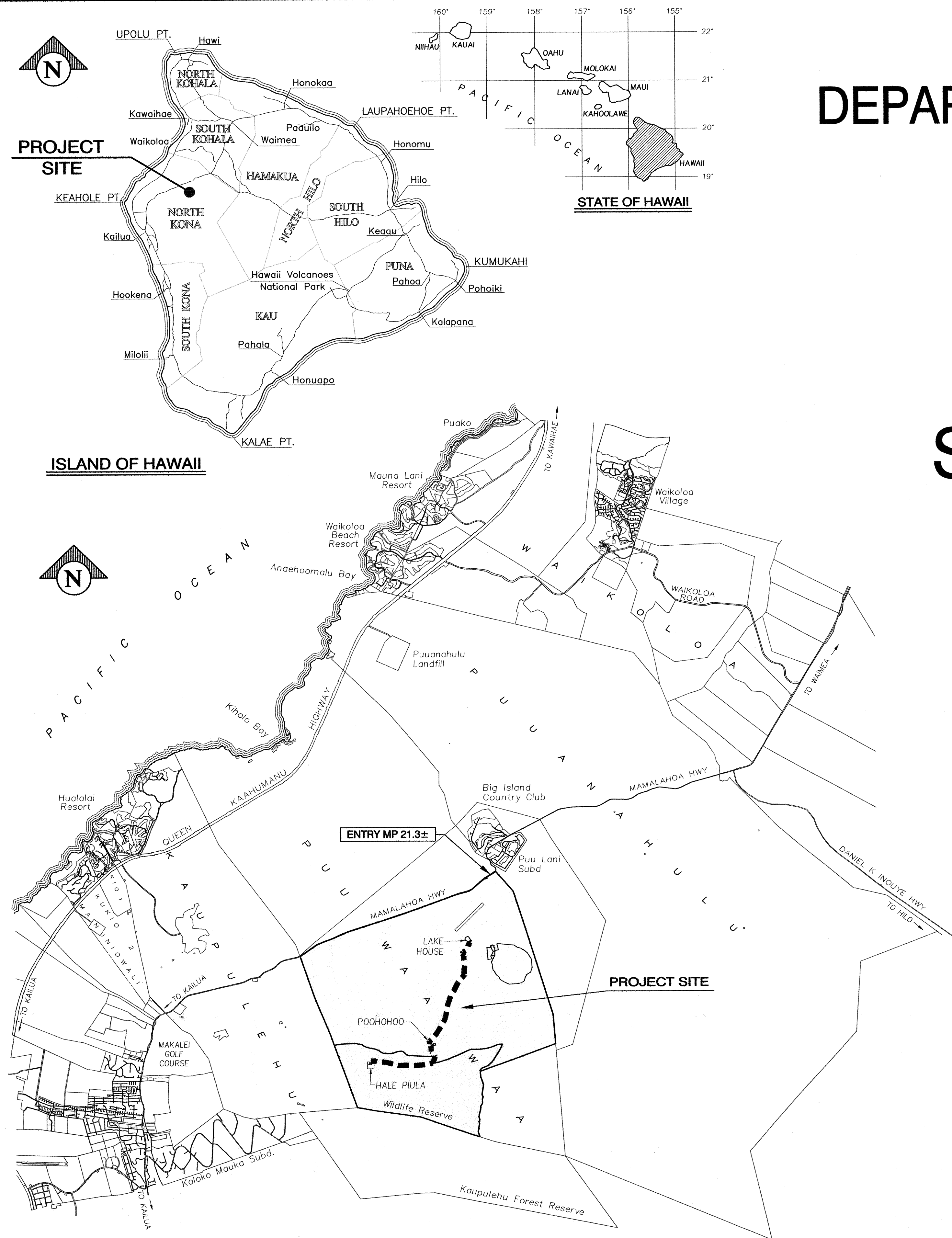
DAVID G. SMITH
 ADMINISTRATOR
 DIVISION OF FORESTRY AND WILDLIFE
 DEPARTMENT OF LAND AND NATURAL RESOURCES

APPROVED:

5/6/16

DATE

CARTY S. CHANG, P.E.
 CHIEF ENGINEER
 ENGINEERING DIVISION
 DEPARTMENT OF LAND AND NATURAL RESOURCES



LOCATION PLAN
 NOT TO SCALE

DRAWING NO.
 T-1

PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE
 JOB NO. 500CH15A

**HAWAII EXPERIMENTAL TROPICAL FOREST (H.E.T.F.)
BIOSECURITY MEASURES**

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

- 1) CONTRACTOR SHALL INSPECT AND CLEAN ALL EQUIPMENT, GEAR, AND VEHICLES (PERSONAL AND FIELD) THAT ENTER AND EXIT THE JOB SITE. CONTRACTOR MUST ENSURE THAT ALL GEAR EQUIPMENT AND VEHICLES ARE FREE OF ANY PLANT, ANIMAL, OR EARTHEN MATERIALS.
- 2) ALL EQUIPMENT, GEAR, AND VEHICLES SHALL BE INSPECTED AND CLEANED 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 SPREADING THEM TO PRISTINE AND HEALTHY FOREST AREAS.

EQUIPMENT TO INSPECT AND CLEAN INCLUDE BUT IS NOT LIMITED TO:

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

-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...

-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.

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

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

- 3) CONTRACTOR SHALL 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. THEY ALSO BECOME FOOD FOR INVASIVE INSECTS).

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

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

-CLEANING SHOULD BE DONE AWAY FROM THE FOREST IN A DESIGNATED AREA WITH A NEARBY RECEPTACLE FOR DISPOSAL.

-LAUNDERING OF WASHABLE ITEMS SHOULD BE DONE AFTER EACH TRIP.

-IF THEY CANNOT BE CLEANED THEY SHOULD NOT BE TAKEN INTO THE FOREST.

-IF CONTAMINATED SUPPLIES ARE FOUND, THEY MUST BE DISPOSED OF AWAY FROM THE H.E.T.F.

- 5) IT IS PREFERABLE THAT THE CONTRACTOR 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 TAKE MEASURES TO PREVENT THE SPREAD OF THE CERATOCYSTIS INFECTION OF OHIA TREES.

SUCH MEASURES INCLUDE:

CONTACTING DR. FRIDAY, HUGES, OR KEITH 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.

ADDRESSES: DR. J.B. FRIDAY: (808)969-8254 (jbfriday@hawaii.edu)
DR. FLINT HUGHES: (808)854-2617 (fhughes@fs.fed.us)
DR. LISA KEITH: (808)959-4357 (Lisa.Keith@ars.usda.gov)

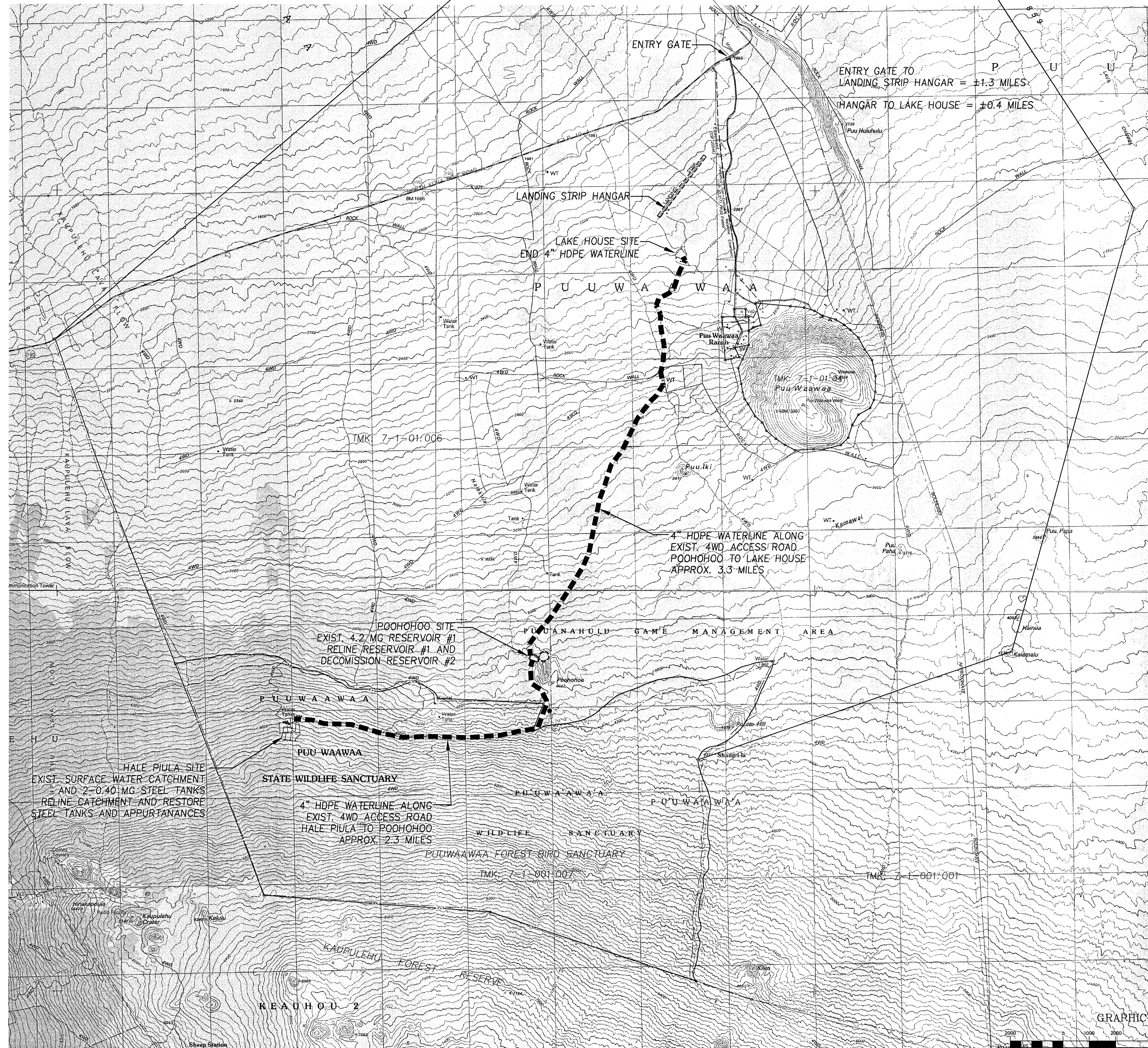
CONTRACTOR SHALL NOT TRANSPORT AFFECTED OHIA WOODS.

CONTRACTOR SHALL FOLLOW THE REQUIRED H.E.T.F. BIOSECURITY MEASURES (WRITTEN ABOVE IN POINTS NO. 1-4) WITH ADDED ATTENTION TO THE FOLLOWING:

-TOOLS SHOULD BE CLEANED WITH EITHER LYSOL OR 70% RUBBING ALCOHOL SOLUTION. 10% SOLUTION OF CHLORINE BLEACH AND WATER CAN BE USED SO LONG AS TOOLS ARE OILED AFTERWARDS.

-CHAINSAW BLADES SHOULD BE BRUSHED CLEAN, SPRAYED WITH CLEANING SOLUTION, AND RUN BRIEFLY TO LUBRICATE THEM.

*** FOR DETAILED INFORMATION REGARDING CERATOCYSTIS WILT IN OHIA TREES REFER TO WEBSITE: http://www2.ctahr.hawaii.edu/forestry/disease/ohia_wilt/html#article



TRUE NORTH
Scale: 1 in. = 2,000 ft.

GRAPHIC SCALE



(IN FEET)
1 inch = 2000ft.

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
GENERAL PLAN BIOSECURITY NOTES					
DESIGNED: JKI		SUBMITTED: GY		DATE: MAY 6, 2016	
DRAWN: GYI		CHECKED: JKI		SCALE: As Noted	
APPROVED: <i>[Signature]</i>			DATE: MAY - 6 2016		DRAWING NO. G-1
INABA ENGINEERING, INC.			DATE		JOB NO. 500CH15A
EI #15015			FB #		SHEET NO. 2 OF 38 SHEETS

**WATER POLLUTION AND EROSION CONTROL
BEST MANAGEMENT PRACTICES**

- THE CONTRACTOR SHALL INSTALL DEVICES AND UTILIZE BEST MANAGEMENT PRACTICES (BMP) APPROPRIATE FOR THE PROJECT. THE CONTRACTOR SHALL REFERENCE THE CITY AND COUNTY OF HONOLULU'S BEST MANAGEMENT PRACTICES MANUAL FOR CONSTRUCTION SITES IN HONOLULU, AND RULES RELATING TO SOIL EROSION STANDARDS AND GUIDELINES. A COPY OF EACH OF THESE DOCUMENTS AND PLANS SHALL BE KEPT ON THE PROJECT SITE AT ALL TIMES, AND SHALL BE PRODUCED UPON REQUEST OF THE DISTRICT ENGINEER OR HIS DESIGNATED REPRESENTATIVE. THESE DOCUMENTS SHALL SERVE AS GUIDELINES ONLY, AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT SAFETY RELATIVE TO TRAFFIC, PONDING PROBLEMS, ETC. ARE CONSIDERED AND ADDRESSED. THIS WORK SHALL BE CONSIDERED PART OF THE PROJECT, AND WILL NOT BE PAID FOR BY THE STATE.
- THE CONTRACTOR SHALL CONSIDER AND INSTALL BMP MEASURES WHICH TAKE INTO ACCOUNT HIGH INTENSITY AND PROLONGED RAINFALL, AND TO ADDRESS THE POTENTIAL PROBLEMS THAT MAY RESULT BEFORE THE START OF ANY EXCAVATION OR EMBANKMENT WORK.
- THE STATE RESERVES THE RIGHT TO DETERMINE THE APPROPRIATENESS AND ADEQUACY OF PROPOSED AND/OR IMPLEMENTED BMP'S. ADDITIONAL BMP MEASURES REQUIRED BY THE STATE SHALL NOT BE PAID FOR BY THE STATE.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES, INJURIES AND/OR CLAIMS RESULTING FROM HIS BMP'S.
- THE CONTRACTOR SHALL DESIGNATE AT LEAST ONE (1) PERSON WHO WILL BE RESPONSIBLE FOR INSPECTION, MAINTENANCE, AND REPAIR ACTIVITIES. PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES SHALL RECEIVE TRAINING FROM THE CONTRACTOR, AT THE CONTRACTOR'S EXPENSE. TRAINING SHALL INCLUDE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR MINIMIZING EROSION AND SEDIMENT AND FOR RETAINING SEDIMENT ON-SITE.
- DISCHARGES INTO STATE WATERS DUE TO DEWATERING AND/OR HYDROTESTING ACTIVITIES REQUIRE SEPARATE NPDES PERMIT(S) FROM THE STATE DEPARTMENT OF HEALTH (DOH). IF THE CONTRACTOR CHOOSES TO DISCHARGE DEWATERING AND/OR HYDROTESTING EFFLUENT INTO STATE WATERS, HE SHALL OBTAIN THE NECESSARY PERMIT(S) FROM THE DOH, AND SHALL SUBMIT A COMPLETE SET OF THE PERMIT TO THE DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR) PRIOR TO COMMENCING THE PERMITTED ACTIVITY. NO DEWATERING AND/OR HYDROTESTING ACTIVITIES WILL BE AUTHORIZED UNTIL THE RECEIPT OF THE NPDES PERMIT(S) FROM THE DOH.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY CITATIONS OR FINES THAT MAY BE LEVIED AS RELATED TO THE NPDES PROGRAM ON THIS PERMIT, WHETHER DIRECTLY LEVIED AGAINST THE CONTRACTOR OR THE DLNR.
- THE CONTRACTOR MAY DISCUSS PROPOSED AND IMPLEMENTED BMP MEASURES AND THE ADEQUACY OF THEM, WITH THE DISTRICT ENGINEER.

STRUCTURAL BEST MANAGEMENT PRACTICES

EXAMPLES OF STRUCTURAL BMP'S INCLUDE, BUT ARE NOT LIMITED TO:

- SILT FENCES
- INLET PROTECTION
- COVERINGS
- HYDROMULCHING
- SEDIMENT TRAPS
- STABILIZED CONSTRUCTION ENTRANCES
- DIVERSION DITCHES
- VEGETATIVE STABILIZATION
- FILTER BERMS
- SEDIMENT BASINS

- THE CONTRACTOR SHALL INSPECT EROSION AND SEDIMENT CONTROL MEASURES TWICE DAILY AND AFTER 0.5 INCHES OF RAINFALL.
- IF REPAIRS TO OR MAINTENANCE OF THE CONTRACTOR'S EROSION CONTROL MEASURES ARE NECESSARY, THE CONTRACTOR SHALL INITIATE THE REPAIRS OR MAINTENANCE WITHIN TWENTY-FOUR (24) HOURS AFTER INSPECTION AND NOTING OF THE DEFICIENCY.

REPAIRS AND MAINTENANCE MAY INCLUDE THE FOLLOWING:

- REPLACING SILT FENCE FABRIC WHEN TEARS ARE FOUND, AND ENSURING THAT THE FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS AND FIRMLY IN THE GROUND.
- REMOVING AND DISPOSING OF SEDIMENT MATERIAL WHEN SEDIMENT BUILD-UP REACHES ONE-THIRD (1/3) THE HEIGHT OF A SILT FENCE.
- REMOVING AND DISPOSING OF SEDIMENT MATERIAL WHEN THE DEPTH IN A SEDIMENT BASIN REACHES TEN PERCENT (10%) OF THE DESIGN CAPACITY.
- RESTORING BARE SPOTS AND WASHOUTS, AND ENSURING HEALTHY PLANT GROWTH IN BOTH TEMPORARY AND PERMANENT SEEDED AND PLANTED AREAS.

- THE CONTRACTOR SHALL MAKE EVERY EFFORT TO INSTALL STRUCTURAL BMPS AS NEAR THE POLLUTANT SOURCE AS PRACTICABLE. INLET PROTECTION SHALL SERVE AS THE LAST MEASURE TO PREVENT POLLUTANTS FROM ENTERING THE STORM DRAIN SYSTEM.

NON-STRUCTURAL BEST MANAGEMENT PRACTICES

- WASTE DISPOSAL: 1. WASTE MATERIALS**
All waste materials shall be collected and stored in a securely lidded, leak proof metal dumpster. The dumpster shall meet all County and State solid waste management regulations. All dumpsters at the project site shall be emptied a minimum of once per week, and more often, if necessary. No construction waste materials shall be buried on-site. The Contractor, at his expense, shall train supervisory personnel in the correct procedures for waste disposal.
 - HAZARDOUS WASTE**
All hazardous waste materials shall be disposed of in the manner specified by local or State or Federal regulations.
 - SANITARY WASTE**
All sanitary waste shall be collected from the portable restroom facilities a minimum of once per week, and more often, as necessary.
- EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:**
 - All erosion and sediment control measures shall be inspected daily prior to and after each day's construction.
 - All control measures, per approved NPDES plan, shall be maintained in good working order. If a repair is necessary, it shall be initiated within twenty four (24) hours of the problem being discovered.
 - Any revisions to approved NPDES plans shall be submitted to the DOH for review and approval before any field adjustments are made.

- SPILL PREVENTION:**
 - The following material management practices shall be followed to reduce the risk of spills or other accidental exposure of material and substances to storm water runoff and discharge.
 - GOOD HOUSEKEEPING**
 - Store only enough products and material required to perform the job.
 - Materials that may become potential pollutants that are stored in a neat and orderly manner in their original containers, and if possible, covered or enclosed.
 - Products shall be kept in their original containers, with the original manufacturer's labeling.
 - Products shall not be mixed, except as recommended or allowed by the manufacturers.
 - Appropriate products shall have secondary containment.
 - Whenever possible, use up all of a product prior to disposing of the container.
 - Manufacturer's directions for proper use and disposal shall be followed.
 - Material shall be disposed of in a manner permitted by local, State or Federal regulations.
 - Contractor shall conduct daily inspections to ensure proper use and disposal of material.
 - Litter shall be picked up on a daily basis and disposed of properly.
 - Dust shall be controlled by wetting or by the application of a soil binder.
 - HAZARDOUS PRODUCTS**
 - Products shall be kept in their original containers with the original manufacturer's labeling.
 - Material safety data sheets (MSDS) shall be retained and available for review by users.
 - Manufacturer's directions for proper use and disposal shall be followed.
 - All hazardous waste material shall be disposed of in a manner permitted by local, State or Federal regulations.

- PRODUCT SPECIFIC PRACTICES**
The following practices shall be followed on-site:
 - VEHICLES**
All on-site vehicles shall be monitored for leaks and shall be subject to regular preventive maintenance to reduce the chance of leaks occurring. Leaks that cannot be repaired immediately shall be contained in spill pans or other appropriate containers.
 - PETROLEUM PRODUCTS**
Petroleum products shall be stored in tightly sealed containers that shall be clearly labeled. Asphalt-containing materials (such as tack and prime coats) used on-site shall be applied according to manufacturers' directions.

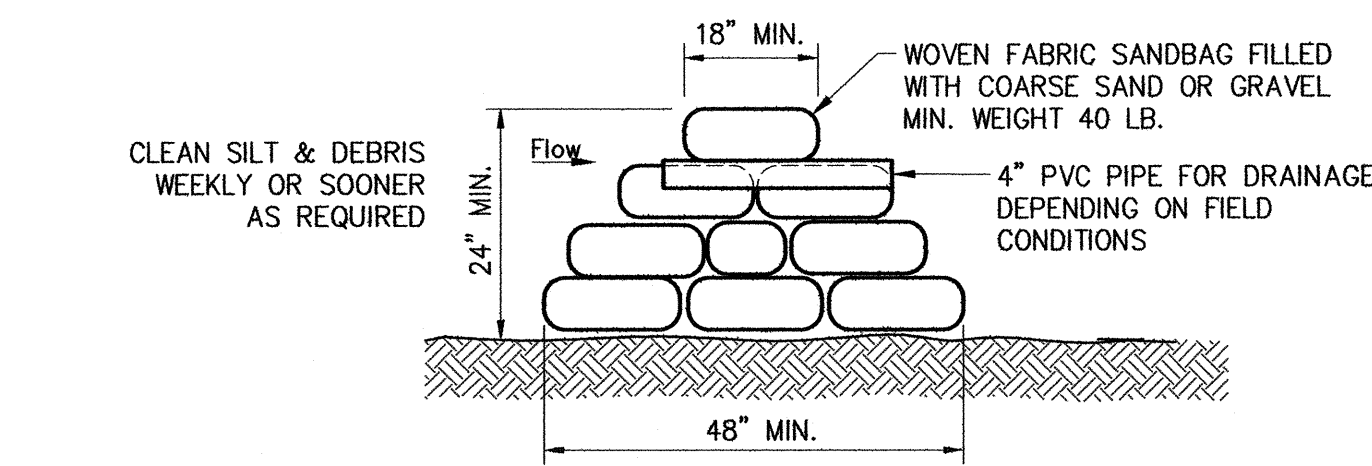
- CONCRETE TRUCKS**
Concrete trucks shall discharge drum wash water only at designated sites. Wash water shall not be discharged to the storm drain system. The Contractor shall contain the discharged drum wash water at the designated site, and shall remove concrete and other residue as required by the Engineer.
- SPILL CONTROL PRACTICES**
In addition to good housekeeping and material management practices, the following spill prevention and cleanup practices shall be observed.
 - Manufacturers' recommendations for spill cleanup shall be clearly posted, and site personnel shall be made aware of the procedures and location of cleanup supplies.
 - Materials and equipment necessary for spill cleanup shall be kept in the material storage area on-site.
 - All spills shall be cleaned up immediately after discovery.
 - All spill areas shall be kept well ventilated, and cleanup personnel shall wear appropriate clothing and equipment.
 - Toxic or hazardous material spills, regardless of size, shall be reported to the appropriate governmental agencies. A report shall be prepared to include measures to prevent this type of spill in the future, and how to cleanup such a spill. A description of the spill, the cause, and the cleanup measure undertaken shall also be included in the report.
 - The Contractor shall be responsible for spill prevention and cleanup. He shall designate at least one on-site personnel to receive spill prevention and cleanup training. The Contractor, at his expense shall do training. The name of this person shall be posted in the material storage area and in the on-site office trailer.

8/15/01

ENVIRONMENTAL PROTECTION

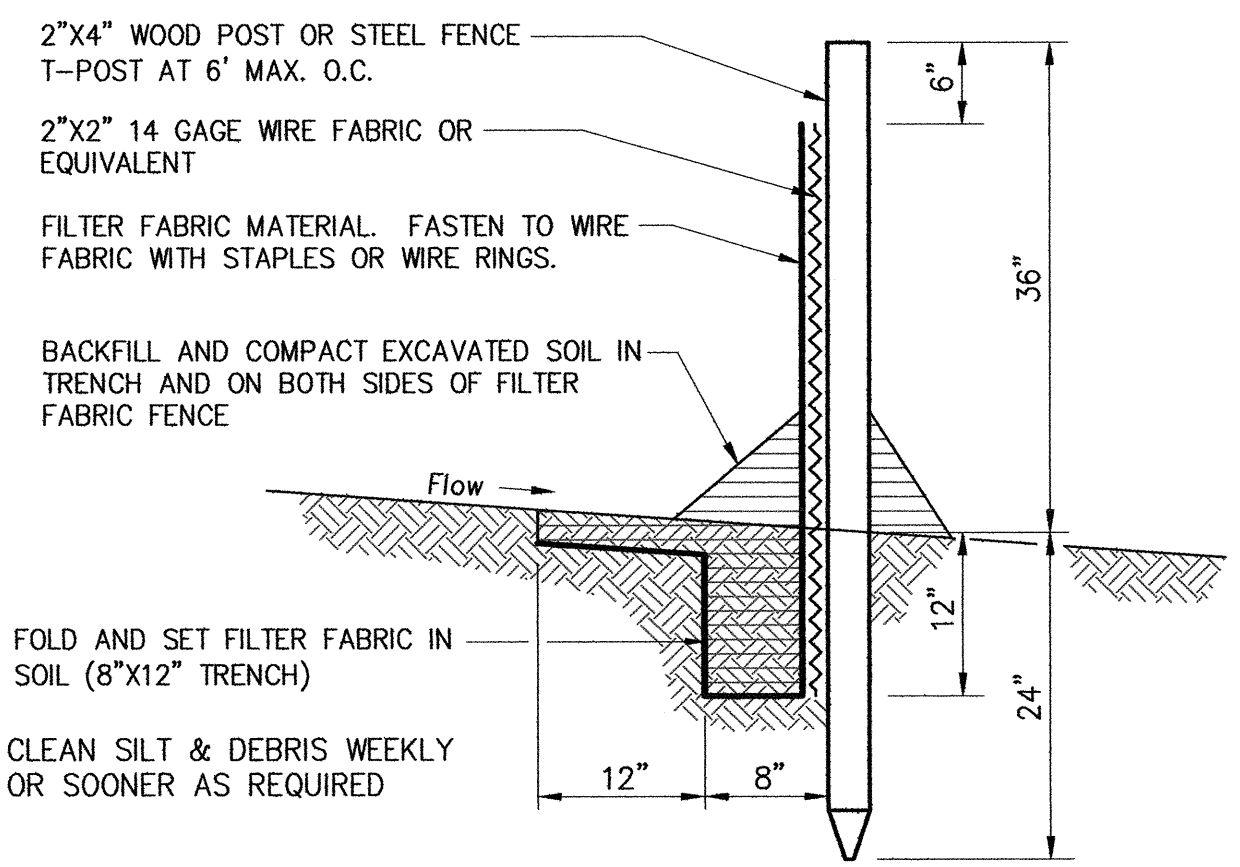
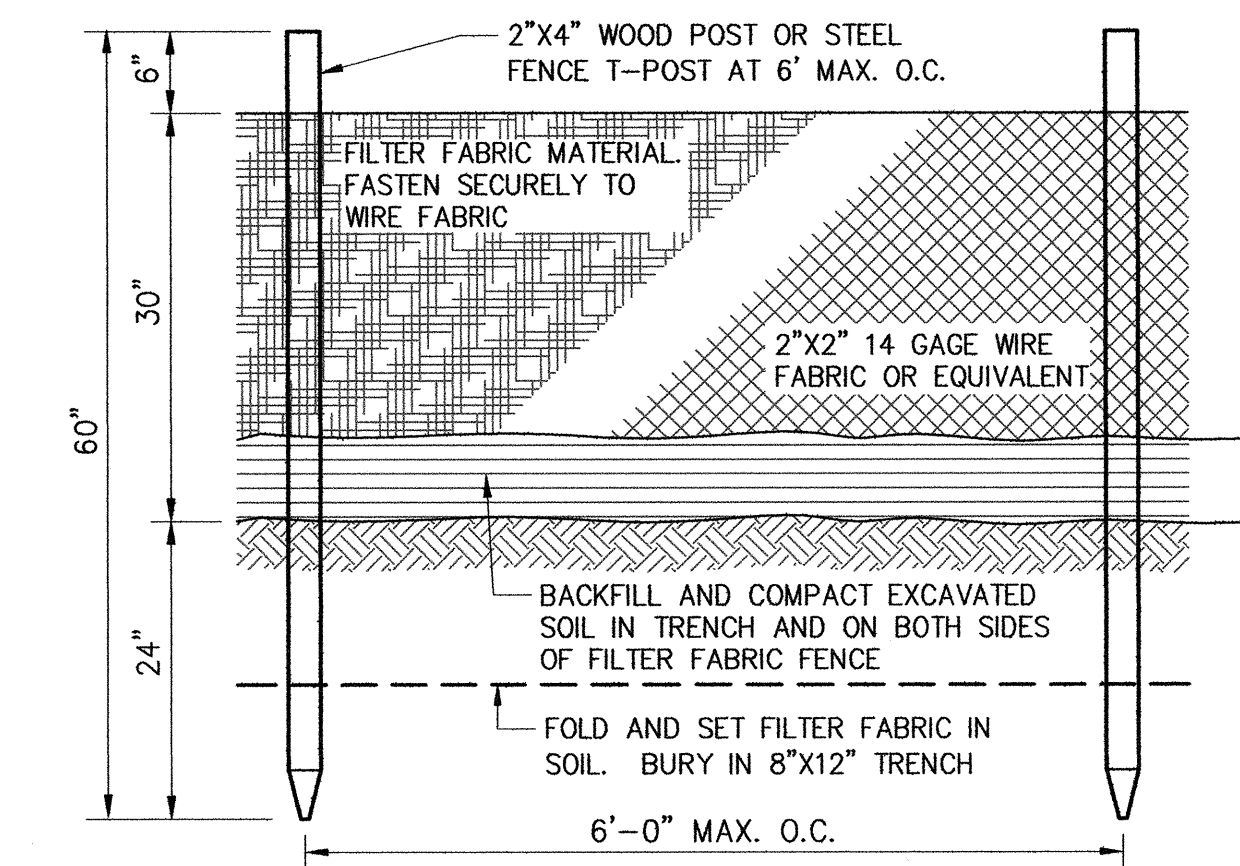
UNDER THE PROVISIONS OF CHAPTER 342, HAWAII REVISED STATUTES, ENVIRONMENTAL QUALITY, CHAPTER 37-A, WATER QUALITY STANDARDS, SPECIFICALLY, SECTION 6.A.5, AND CHAPTER 43, SPECIFICALLY, CHAPTER 10, THE FOLLOWING GENERAL REQUIREMENTS SHALL BE COMPLIED WITH FOR POLLUTION CONTROL IN PERFORMING THE CONSTRUCTION ACTIVITIES.

- 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 REMEDIAL ACTION BY THE DIRECTOR, DEPARTMENT OF PUBLIC WORKS OR OWNER, SHALL BE PAYABLE BY THE CONTRACTOR.
- 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 GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE PUBLIC HEALTH REGULATIONS, STATE DEPARTMENT OF HEALTH, ON WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS.
- SHOULD EROSION BE A PROBLEM, ALL AFFECTED SLOPES AND EXPOSED AREAS SHALL BE SOODED OR PLANTED IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.

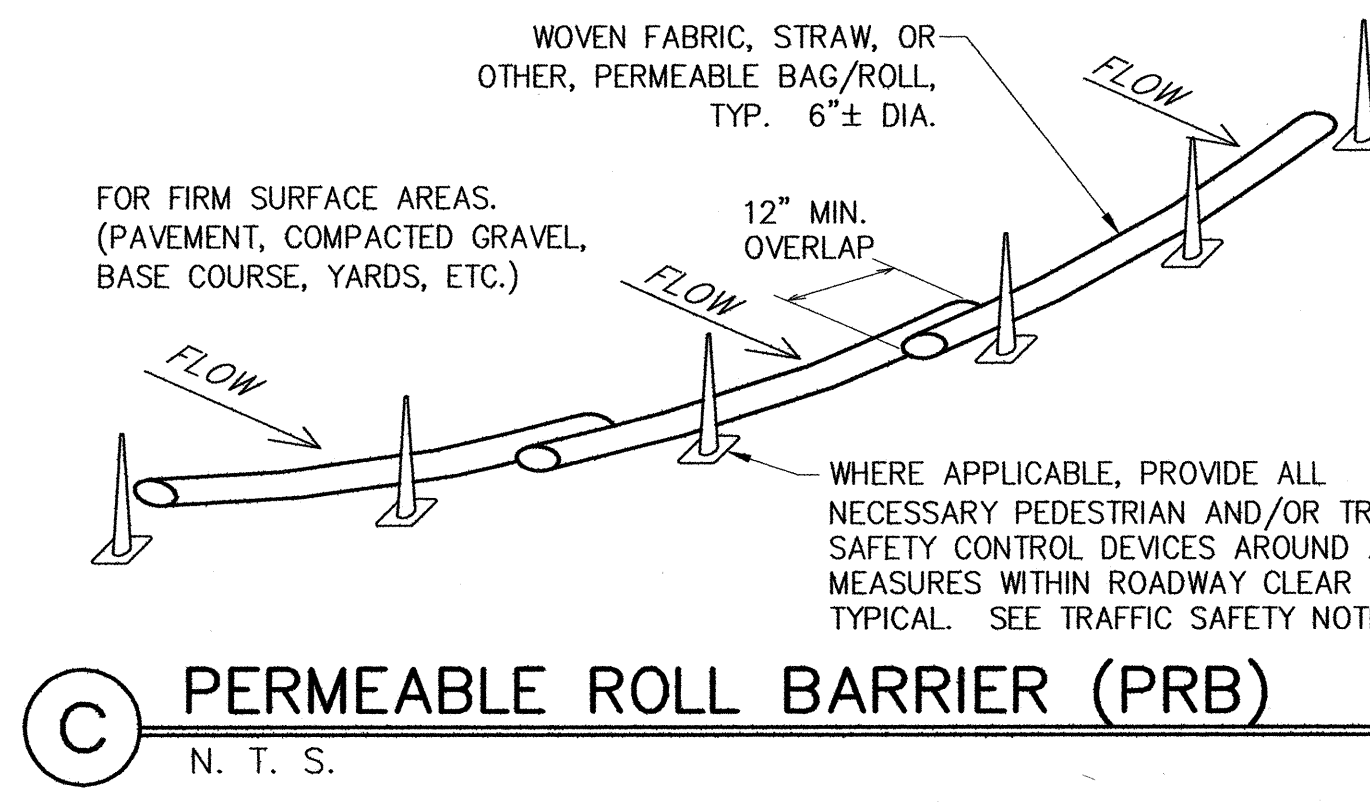
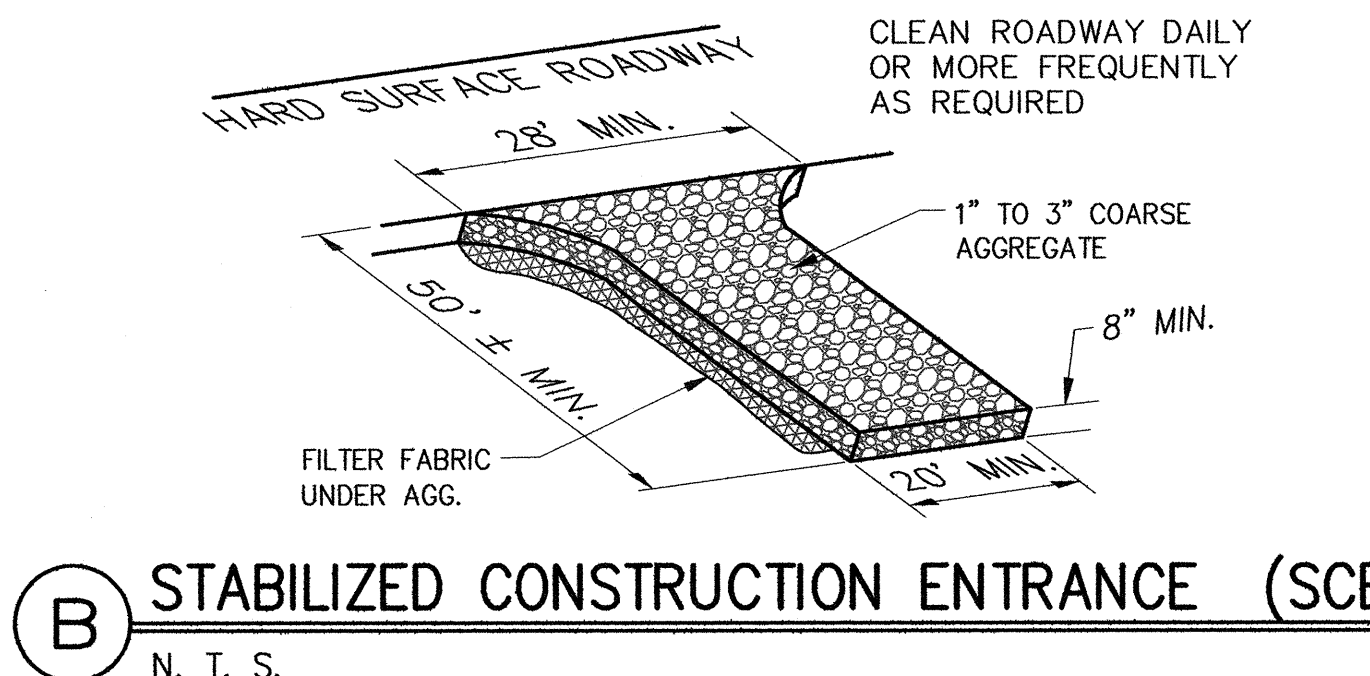


- USE OF SAND BAG BARRIERS:**
- BARRIER FOR CONSTRUCTION IN A STREAM CHANNEL
 - DIVERSION DIKE
 - EMBANKMENT FOR TEMPORARY SEDIMENT OR RETENTION BASIN
 - SEDIMENT BARRIER NEAR TOE OF SLOPES
 - AT CONSTRUCTION PERIMETER

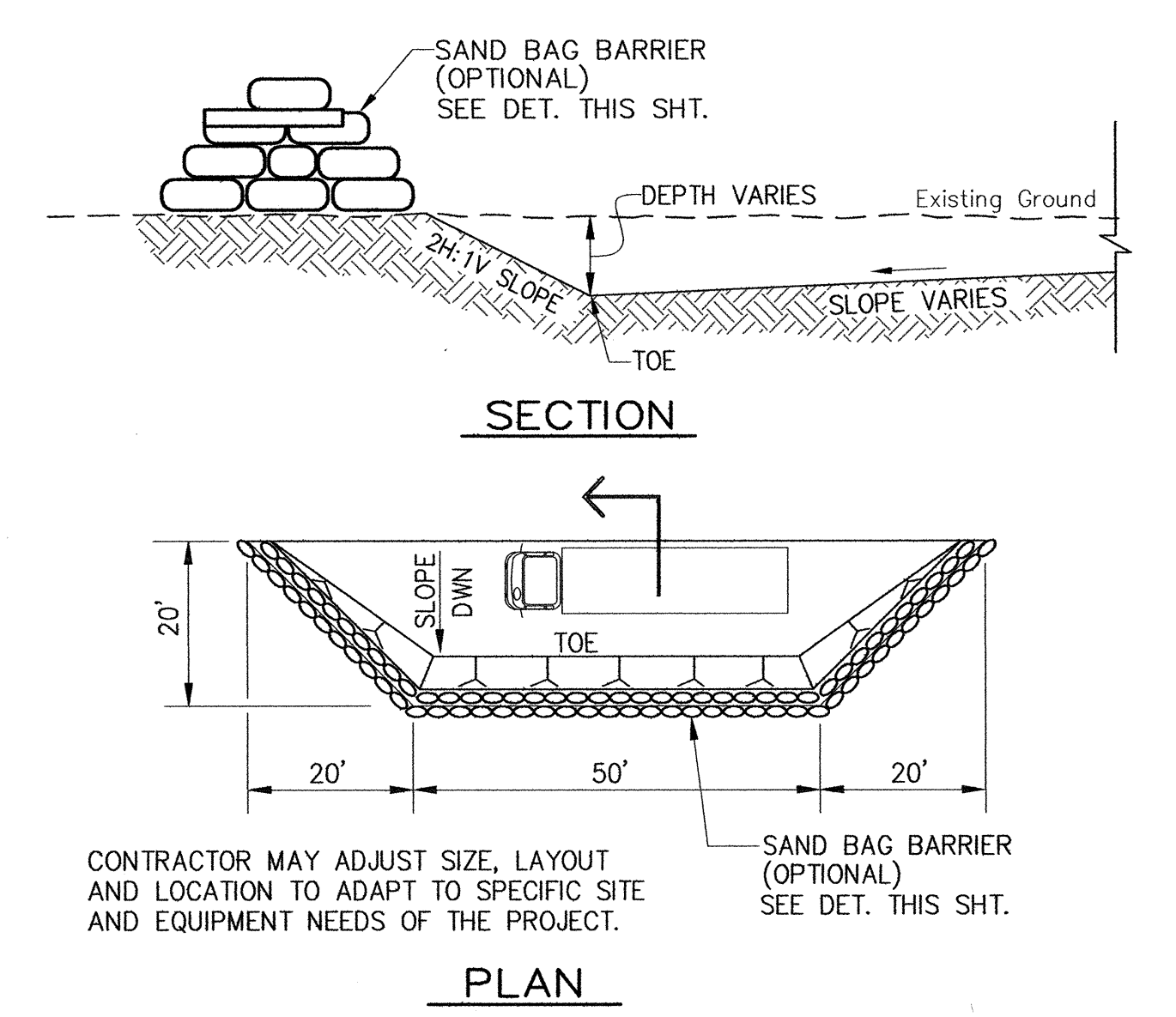
D SAND BAG BARRIER (SBB)
N. T. S.



A SILT FENCE DETAIL (SF)
N. T. S.



- TRAFFIC SAFETY**
- THE CONTRACTOR SHALL PROVIDE NECESSARY TRAFFIC SAFETY CONTROL DEVICES SUCH AS REFLECTIVE CONES, DELINEATORS, BARRIERS, ETC AROUND ALL BMP MEASURES TO ENSURE THE SAFETY OF ROADWAY TRAFFIC, PEDESTRIANS AND PARK USERS.
 - TRAFFIC SAFETY DEVICES SHALL BE EFFECTIVE IN DAY OR NIGHT AND IN ALL WEATHER CONDITIONS, TO WARN AND PROTECT MOTORISTS, BIKERS, BICYCLISTS, PEDESTRIANS AND ANY OTHER USERS OF THE ROADWAY AND PARK WHILE BMP MEASURES ARE IN USE FOR THE DURATION OF THE PROJECT.



E CONTAINMENT AREA DETAIL (CA)
NOT TO SCALE

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- HYDRO-MULCH WITH GRASS SEED FOR SLOPES SUBJECT TO EROSION. AT SOIL OR ROCK & SOIL EXCAVATION OR EMBANKMENT CONDITION.
 - FOR SLOPES GREATER THAN 2:1, PROVIDE SLOPE PROTECTION MATTING, JUTE MESH OR EQUAL, PRIOR TO HYDRO MULCH.
 - EROSION STABILIZATION NOT REQUIRED FOR ROCK EXCAVATION.
 - GRASSING SHALL BE INSTALLED AND MAINTAINED AS SOON AS PRACTICABLE TO PREVENT SOIL EROSION.

F SLOPE STABILIZATION (SS)
N. T. S.

USE DETAILS WHERE APPLICABLE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
WATER POLLUTION & EROSION CONTROL NOTES & TYPICAL DETAILS					
DESIGNED: JKI		SUBMITTED: 6/2/01			
DRAWN: JKI		DATE: MAY 6, 2016			
CHECKED: JKI		SCALE: As Noted			
APPROVED: <i>[Signature]</i>		MAY - 6 2016		DRAWING NO. G-2	
INABA ENGINEERING, INC.		DATE		JOB NO. 500CH15A	
163 #15015		FB #		SHEET NO. 3 OF 38 SHEETS	

GRADING NOTES

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

- APPROX. GRADED AREA = 1.2 ACRE
- APPROX. EXCAVATION = 7,068 CY
- APPROX. EMBANKMENT = 7,095 CY

NOTE: THE QUANTITIES GIVEN ARE APPROXIMATE ONLY AND TO BE USED FOR PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL USE WHATEVER MEANS NECESSARY TO DETERMINE THE ACTUAL QUANTITY OF WORK REQUIRED FOR THIS PROJECT.

N.P.D.E.S. PERMIT COMPLIANCE

- THE DEPT. OF LAND AND NATURAL RESOURCES AND/OR CONSULTANT SHALL OBTAIN THE NOTICE OF GENERAL PERMIT COVERAGE (NGPC) OF THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) FOR THE SUBJECT PROJECT FROM THE CLEAN WATER BRANCH (CWB), ENVIRONMENTAL MANAGEMENT DIVISION, STATE OF HAWAII DEPARTMENT OF HEALTH (DOH).
- THE CONTRACTOR SHALL THEN COMPLY WITH AND SUBMIT TO THE DOH ALL OTHER NECESSARY CONTRACTOR SPECIFIC AND JOBSITE SPECIFIC REQUIRED INFORMATION PRIOR TO STARTING WORK ON THE JOBSITE. ANY ADDITIONAL FEES AND COSTS ASSOCIATED WITH COMPLETING THE CONTRACTOR REQUIRED INFORMATION PORTION OF THE NPDES, NOI PERMIT FORM AND SUBSEQUENT REQUIREMENTS SHALL BE PAID FOR BY THE CONTRACTOR.
- THE CONTRACTOR SHALL COMPLY WITH CONDITIONS OF THE PERMIT AS FOLLOWS:
 - NOTIFY DOH OF THE CONSTRUCTION START DATE WITHIN SEVEN (7) CALENDAR DAYS BEFORE THE START OF CONSTRUCTION ACTIVITIES.
 - COMPLETE AND SUBMIT THE SOLID WASTE DISCLOSURE FORM FOR CONSTRUCTION SITES TO THE DOH, SOLID AND HAZARDOUS WASTE BRANCH, SOLID WASTE SECTION, AS SPECIFIED ON THE FORM AT LEAST 30 CALENDAR DAYS BEFORE THE START OF THE CONSTRUCTION ACTIVITIES. THE FORM CAN BE DOWNLOADED AT: <http://health.hawaii.gov/shwb/files/2013/06/swdiscformnov2008.pdf>.
 - IMPLEMENT THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IN ACCORDANCE WITH HAR 11-55, APPENDIX C. THE DIRECTOR OF HEALTH RESERVES THE RIGHT TO REQUIRE THE CONTRACTOR TO MODIFY THE SWPPP.
 - THE CONTRACTOR SHALL SUBMIT A NEW NOI WITH FILING FEE AND OBTAIN A NEW NGPC FOR ANY REVISIONS TO THE INFORMATION SUBMITTED IN THE NOI (WITH THE EXCEPTION OF CHANGES TO CONTACT PERSON INFORMATION FOR NON-TRANSFER OF OWNERSHIP AND CHANGES TO THE SWPPP).
 - THE CONTRACTOR SHALL COMPLETE AND SUBMIT THE NOTICE OF CESSATION (NOC) WITHIN SEVEN (7) CALENDAR DAYS AFTER THE END OF THE MONTH THAT THE PROJECT WAS COMPLETED.
 - ALL NGPC COMPLIANCE SUBMITTALS, INCLUDING THE NOC SHALL BE SUBMITTED ON THE CWB COMPLIANCE SUBMITTAL FORM FOR INDIVIDUAL NPDES PERMITS AND NGPC'S. THIS FORM SHALL BE COMPLETED ON THE E-PERMITTING PORTAL LOCATED AT: <https://eha-cloud.doh.hawaii.gov/epermit>.
- UNLESS OTHERWISE SPECIFIED IN THE PLANS AND SPECIFICATIONS, ALL COSTS ASSOCIATED WITH FIELD COMPLIANCE OF THE REQUIREMENTS AND REGULATIONS OF THE GENERAL PERMIT COVERAGE SHALL BE PAID FOR BY THE CONTRACTOR. THESE COSTS SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE CONSIDERED INCIDENTAL TO, AND INCLUDED IN, THE VARIOUS BID ITEMS OF WORK.
- THE FIELD WORK MAY INCLUDE AND NOT BE LIMITED TO; EROSION CONTROL MEASURES, SILT FENCES, SILTING PONDS, SILT ROLLS, ETC., AND COMPLIANCE TO A SITE SPECIFIC BEST MANAGEMENT PRACTICES PLAN DEVELOPED AND IMPLEMENTED BY THE CONTRACTOR AND OTHER CONTROLS OR MEASURES INDICATED ON THE PLANS AND SPECIFICATIONS. THIS INCLUDES ALL PERIODIC CLEANING, MAINTENANCE OF THE FACILITIES, RECORD KEEPING, ETC. FOR THE DURATION OF THE PROJECT.

WATERLINE NOTES

- ALL WORK SHALL BE DONE ACCORDING TO THE "WATER SYSTEM STANDARDS", STATE OF HAWAII, DATED 2002, AS AMENDED.
 - THE CONTRACTOR SHALL INFORM THE DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR) ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND TWO WEEKS PRIOR TO ANY CONNECTION, SHUTOFF OR RELOCATION WORK.
 - THE CONTRACTOR SHALL PAY FOR ALL WORK AND MATERIALS.
 - ALL EXISTING WATERLINES, WATERLINE APPURTENANCES AND OTHER UTILITY LOCATIONS SHOWN ON THE PLANS ARE OBTAINED FROM LATEST RELIABLE SOURCES. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXACT LOCATION OF ALL UTILITIES IN THE FIELD AND SHALL BEAR ALL COST FOR DAMAGES DONE UNTO THEM DURING THE CONTRACT PERIOD. EXCAVATION ALONG OR NEAR WATER SERVICE LATERALS SHALL BE DONE BY HAND.
 - ALL CONNECTIONS TO EXISTING WATERLINES SHALL BE DONE BY THE CONTRACTOR. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, BACKFILL, ROAD REPAIR, TRAFFIC CONTROL, ETC. AND SHALL PROVIDE ALL EQUIPMENT NECESSARY TO COMPLETE THE CONNECTION.
 - WHERE WATER SHUTOFF OF MORE THAN 3-DAYS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE A TEMPORARY BY-PASS LINE.
 - MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 8- FEET FOR ROAD RIGHT-OF-WAYS OF 50- FEET OR LESS, MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 12-INCHES PROVIDED THE OTHER UTILITY IS CONCRETE JACKETED AND 18-INCHES IF NO CONCRETE JACKETS ARE USED. IN ALL APPLICABLE INSTANCES THE WATERLINES SHALL BE AT A GRADE HIGHER THAN OTHER UTILITIES. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 10- FEET FOR ROAD RIGHT-OF-WAYS OF MORE THAN 50- FEET.
 - THE WATERLINE SHALL BE TESTED AT A MINIMUM OF 225 P.S.I. OR ONE AND A HALF TIMES THE STATIC PRESSURE AT THE LOW POINT, WHICHEVER IS GREATER.
 - EXISTING WATERLINES, VALVES, FITTINGS AND APPURTENANCES NOT DESIGNATED "REMOVE AND SALVAGE" SHALL BE ABANDONED IN PLACE. ALL EXPOSED VALVE BOXES, VALVES, PIPES AND APPURTENANCES SHALL BE REMOVED AND DISPOSED OF PROPERLY.
 - WHEN COMPACTION TESTS ARE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE DLNR WITH PROCTOR RESULTS OF MATERIALS TO BE USED FOR THAT PORTION OF WORK REQUIRING COMPACTION. THESE RESULTS SHALL BE CERTIFIED AND SHALL BE FURNISHED TO DLNR ONE WEEK PRIOR TO COMMENCEMENT OF WORK. COST FOR COMPACTION TESTS SHALL BE INCIDENTAL TO PIPELINE INSTALLATION.
 - ALL NEW INSTALLED WATERLINES SHALL HAVE A BLUE METALLIC WARNING TAPE LABELED "WATERLINE" PLACED DIRECTLY OVER THE COMPACTED CUSHION MATERIAL. SEE TYPICAL TRENCH DETAIL.
 - CONSTRUCTION PROJECTS REQUIRING TEMPORARY WATER SERVICE FROM DWS SHALL BE METERED AND PAID FOR BY THE CONTRACTOR.
 - THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND CERTIFY THE RECORD DRAWINGS (AS-BUILT DRAWINGS) AS TO ACCURACY AND AS-BUILT CONDITION, AND THEN A LICENSED ENGINEER SHALL CERTIFY THE DRAWINGS AS SUBMITTED BY THE CONTRACTOR. THE CONTRACTOR SHALL THEN SUBMIT THE RECORD DRAWINGS AND AS-BUILT TRACINGS TO THE DLNR.
 - COPPER PIPE AND FITTINGS SHALL CONFORM TO DWS WATER SYSTEM STANDARDS, SECTION 208.01-COPPER TUBING.
- NOTE: WHERE APPLICABLE IN THESE NOTES, REFERENCE TO THE DWS SHALL ALSO MEAN THE DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR) AND DIVISION OF FORESTRY AND WILDLIFE (DOFAW).

SOLID WASTE NOTES

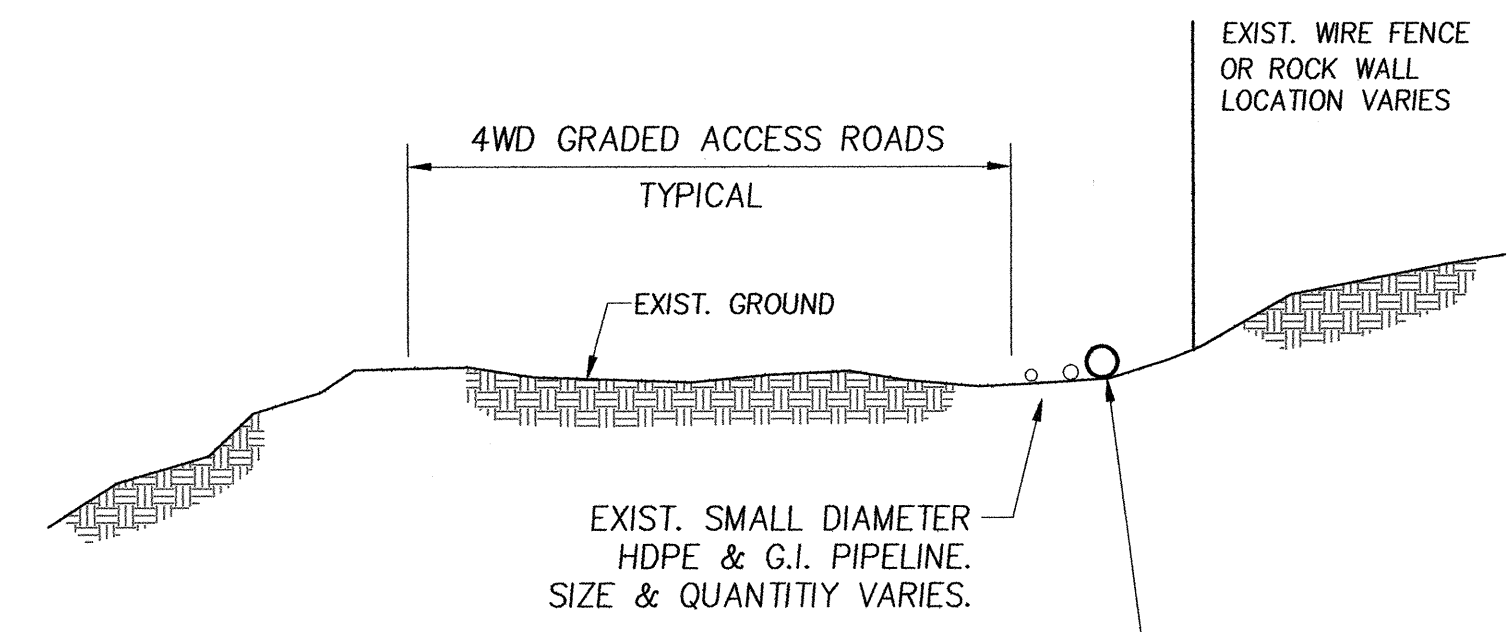
- UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THIS CONSTRUCTION INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE COUNTY LANDFILLS WILL BE SUBJECT TO THE INSTITUTED TIPPING FEE SYSTEM WITH NO EXCEPTIONS OR EXEMPTIONS.
 - ALL WASTES GENERATED BY CONSTRUCTION, INCLUDING GRUBBING, DEMOLITION AND EXCESS EXCAVATION MATERIAL MAY BE BROUGHT TO THE WEST HAWAII OR THE HILO LANDFILL. THE CONTRACTOR SHALL CHECK WITH THE SOLID WASTE DIVISION FOR DISCLOSURE OF THE CURRENT LANDFILL TIPPING FEE AND CONSIDERATION OF THAT FEE SHALL BE INCLUDED IN THE CONTRACTOR'S BID SUM.
 - CONSTRUCTION, DEMOLITION, AND GRUBBING MATERIAL SHALL NOT BE DEPOSITED AT ANY OF THE COUNTY OF HAWAII TRANSFER STATIONS, BUT SHALL BE TRANSPORTED FOR DISPOSAL TO EITHER THE WEST HAWAII OR HILO LANDFILL.
 - ASBESTOS MATERIAL MUST BE SEPARATED OUT, DOUBLE BAGGED AND LANDFILLED IN ACCORDANCE WITH REGULATIONS OF THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, COUNTY OF HAWAII. INFORMATION MAY BE OBTAINED BY CALLING THE DEPARTMENT AT 808-961-8339 BETWEEN 7:00 AM AND 4:00 P.M. MONDAY THROUGH FRIDAY.
- NEW REQUIREMENTS EFFECTIVE MARCH 1, 2016.**
- THE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, SOLID WASTE DIVISION WILL REQUIRE A "NOTICE OF AUTHORIZATION" (NOA) FOR EACH LOAD OF CONSTRUCTION AND DEMOLITION DEBRIS OR GRADING AND GRUBBING MATERIAL BEING DISPOSED OF AT THE EAST OR WEST HAWAII SANITARY LANDFILL. THE CONTRACTOR WILL BE RESPONSIBLE TO OBTAIN THIS NOA FROM THE SOLID WASTE DIVISION.
 - IF REQUIRED TO OBTAIN THE NOA, THE CONTRACTOR SHALL PREPARE A SOLID WASTE DEMOLITION PLAN/REPORT TO THE SATISFACTION OF THE SOLID WASTE DIVISION, TO DECLARE APPROXIMATE QUANTITIES OF WASTE GENERATED FROM THE PROJECT THAT WILL BE SENT TO THE COUNTY LANDFILL OR BE RECYCLED OR REUSED AND NOT DIRECTED TO THE LANDFILL.

GENERAL NOTES

- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION," SEPTEMBER 1986 AND 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.
- EXCEPT FOR THE PORTION OF THE DOFAW GROUND AND FACILITIES AFFECTED BY THE CONTRACT, THE FACILITIES SHALL BE IN USE BY THE PUBLIC. THE CONTRACTOR SHALL PROVIDE FULL COOPERATION WITH THE DOFAW TO EFFECTIVELY MAINTAIN SUCH USE OF THE FACILITIES.
- CONTRACTOR TO PROTECT ALL EXISTING STRUCTURES TO REMAIN. ALL DAMAGES SHALL BE REPAIRED/REPLACED TO THE SATISFACTION OF THE ENGINEER AT NO COST TO THE STATE.
- UNLESS OTHERWISE NOTED, ALL EXISTING PAVEMENT, UTILITY LINES, AND OTHER IMPROVEMENTS DAMAGED OR UNDERMINED AS A RESULT OF THE CONTRACTOR'S OPERATIONS, SHALL BE RECONSTRUCTED OR REPLACED BY THE CONTRACTOR AT HIS OWN EXPENSE TO MATCH EXISTING CONDITIONS.
- THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL STATE AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
- DEBRIS GENERATED SHALL BE DISPOSED OF "OFF-SITE" BY THE CONTRACTOR AT HIS EXPENSE.
- ALL EXISTING IMPROVEMENTS, WHETHER SHOWN ON THE PLANS OR NOT, BUT WILL BE IN THE WAY OF NEW CONSTRUCTION, SHALL BE REMOVED AND/OR RELOCATED BY THE CONTRACTOR WITH THE APPROVAL OF THE ENGINEER.
- THE CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF THE CONSTRUCTION ANY DISCREPANCIES SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION.
- THE CONTRACTOR SHALL TONE THE AREA PRIOR TO ANY REMOVAL, GRADING, OR EXCAVATION WORK.
- THE WORK REQUIRED TO COMPLETE THE PROJECT BU NOT ITEMIZED SPECIFICALLY IN THE PROPOSAL SHALL CONSIDERED INCIDENTAL TO THE VARIOUS ITEM IN THE PROPOSAL.
- THE PARK SHALL REMAIN OPEN DURING THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL INSTALL ADEQUATE TEMPORARY BARRICADES AND WARNING SIGNS TO PROTECT THE PUBLIC DURING THE CONSTRUCTION PERIOD. PROVIDE AND MAINTAIN A SAFE VEHICLE AND PEDESTRIAN ACCESS THROUGHOUT THE CONSTRUCTION PERIOD.
- THE CONTRACTOR SHALL VISIT THE JOBSITE PRIOR TO SUBMITTING HIS BID TO FAMILIARIZE HIMSELF WITH THE ACTUAL CONDITIONS AND LOCATIONS OF ALL EXISTING UTILITIES, BUILDINGS, FACILITIES AND FEATURES OF THE WORK AREA.
- THE CONTRACTOR SHALL RE-PLANT ALL EXISTING GRASS, TREES, PLANTS AND/OR SHRUBS AFFECTED BY HIS WORK AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL REPLACE TOPSOIL AND GRASSING AFFECTED BY HIS WORK.
- THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY AGENCIES WHICH MAY BE AFFECTED BY THIS PROJECT AND SHALL NOTIFY THEM IN ADVANCE OF ANY TRENCHING WORK.
- ALL GRADING WORK SHALL CONFORM TO CHAPTER 10 OF THE HAWAII COUNTY CODE. SHOULD A GRADING PERMIT BE REQUIRED, NO WORK SHALL COMMENCE UNTIL THE COUNTY OF HAWAII, DEPT. OF PUBLIC WORKS APPROVES A GRADING PERMIT.
- THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN EXISTING DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE DEPT OF LAND & NATURAL RESOURCES S SHALL BE PAYABLE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, KEEP THE PROJECT AREA AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH.
- COMPACTION FOR ALL WORK INCLUDING; RESERVOIR CUT & FILL, RESERVOIR EMBANKMENT, ROADWAY REPAIRS, AND WATERLINE CROSSING WITHIN ROADS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
- ALL FILL SHALL BE LAID IN ONE (1) FOOT LOOSE LIFTS, WATERED AND COMPACTED BEFORE THE NEXT ONE FOOT LIFT IS PLACED.
- THE CONTRACTOR SHALL PRIME AND PAINT ALL NEW SURFACES EXPOSED TO VIEW AND ANY EXISTING SURFACES EXPOSED TO VIEW AND ANY EXISTING SURFACES DAMAGED, REPAIRED AND/OR EXPOSED TO REMOVAL WORK, TO MATCH EXISTING ADJACENT SURFACE UNLESS NOTED OTHERWISE TO BE HIGHLIGHTED WITH "OPTIC-YELLOW" COLOR.

HIGH DENSITY POLYETHYLENE (HDPE) PIPE

- HDPE PIPE SHALL CONFORM TO DWS WATER SYSTEM STANDARDS SECTION 208.03-PLASTIC TUBING, AS APPLICABLE, AND PROJECT SPECIFICATIONS SECTION 02620 - HIGH DENSITY POLYETHYLENE PIPE.
- HDPE PIPE SHALL BE IPS, DR-9, 250 PSI.
- FITTINGS SHALL BE HDPE IPS DR-9 OR COMPRESSION TYPE BRASS WITH STAINLESS STEEL STIFFENERS, OR APPROVED EQUAL.
- HDPE PIPE FIELD JOINTS SHALL BE THERMAL BUTT HEAT FUSION UNLESS OTHERWISE NOTED.
- WARNING TAPE SHALL BE METALLIC DETECTABLE UNDERGROUND WARNING TAPE. TAPE SHALL CONSIST OF A SOLID ALUMINUM FOIL CORE, 35 GAGE MINIMUM, ENCASED ON BOTH SIDES WITH PLASTIC HAVING A MINIMUM OVERALL THICKNESS OF 5 MILS, BE 3 INCHES WIDE, HAVE BLACK LETTERING ON BLUE COLOR CODED BACKGROUND WHICH CONFORMS TO APWA UNIFORM COLOR CODE SPECIFICATIONS.
- THE CONTRACTOR SHALL INSTALL DETECTABLE WARNING TAPE IN ACCORDANCE WITH MANUFACTURER REQUIREMENTS TO ENSURE ELECTRICAL CONTINUITY AND DETECTABILITY.

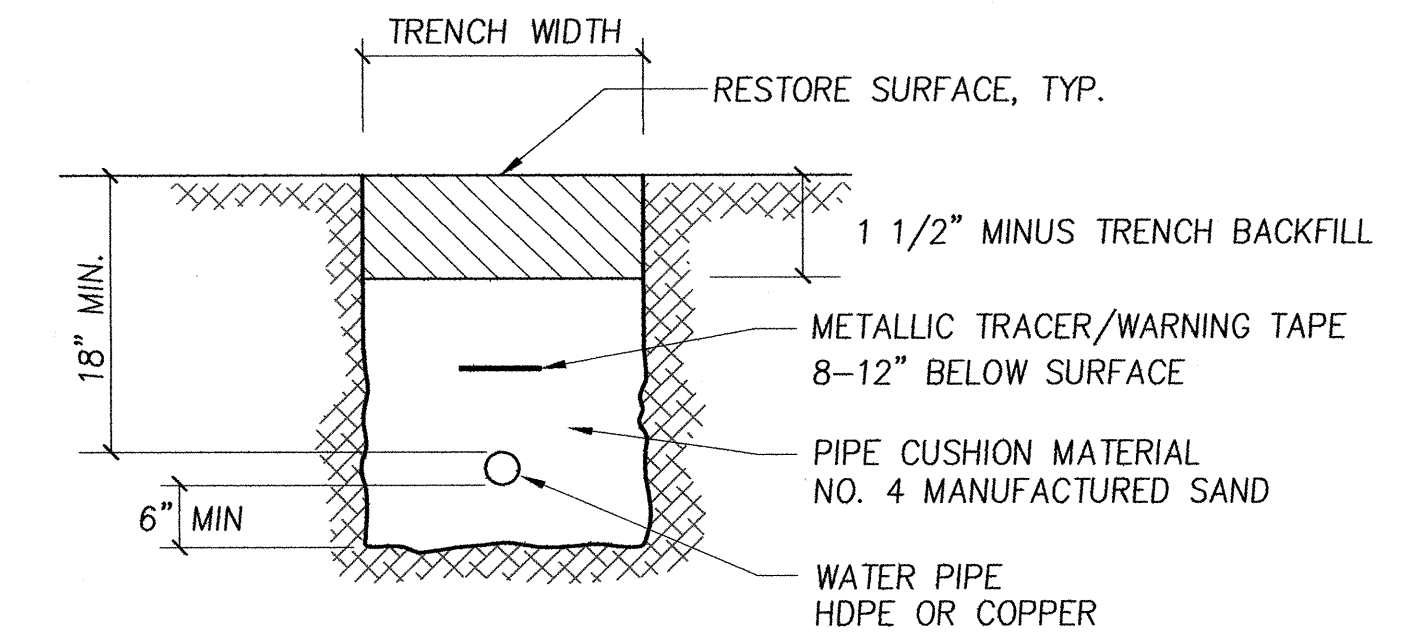


NEW 4" HDPE PIPELINE FOLLOWS ALONG EXIST. PIPES, TYP. "SNAKE" PIPELINE TO PROVIDE ADEQUATE SLACK TO ALLOW PIPE EXPANSION AND CONTRACTION PER MANUFACTURER RECOMMENDATIONS. BURY PIPES AT VARIOUS CROSSINGS, TYP. SEE NOTES BELOW.

THE CONTRACTOR SHALL ALSO MAKE NECESSARY ALLOWANCES FOR PIPE QUANTITIES TO ALLOW FOR LAYING HDPE PIPE ALONG THE IRREGULAR TERRAIN.

TYPICAL PIPELINE SECTION SURFACE INSTALLATION

A NOT TO SCALE

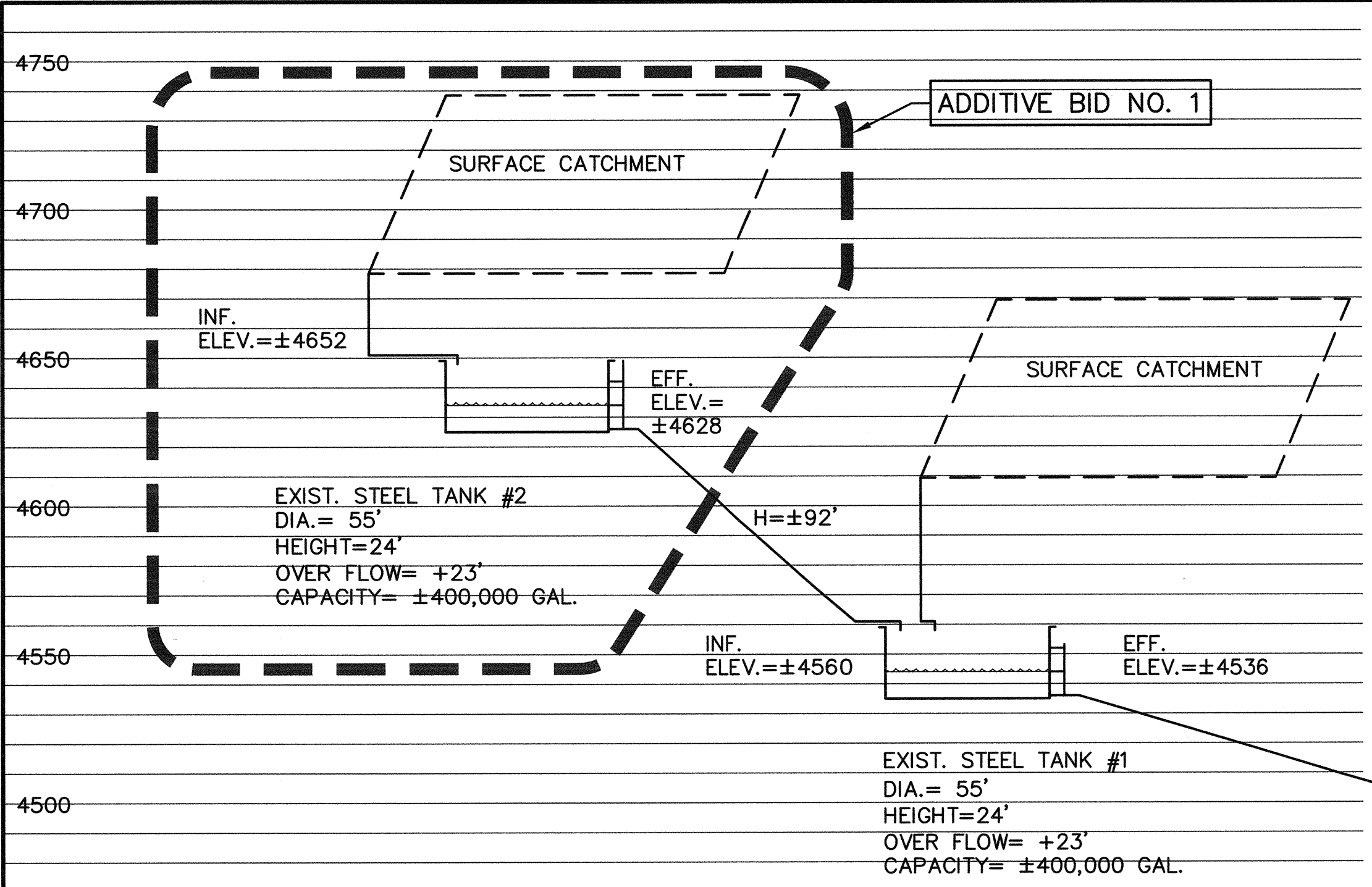


- PIPELINE SHALL BE INSTALLED IN TRENCH AT ALL VEHICLE CROSSINGS, FENCE CROSSINGS, GATE CROSSINGS, AND FIRE BREAK LINES, TYP.
- CONTRACTOR SHALL USE CARE TO NOT DAMAGE ANY WIRE FENCING WHEN TRENCHING BELOW THE FENCELINE AND SHALL RESTORE SURFACE TO EXISTING GRADES.
- CONTRACTOR SHALL NOT CROSS THROUGH OR DAMAGE ANY ROCK WALLS AND SHALL USE CARE WHEN WORKING NEAR EXISTING ROCK WALLS.

TYPICAL TRENCH SECTION AT ROAD CROSSINGS

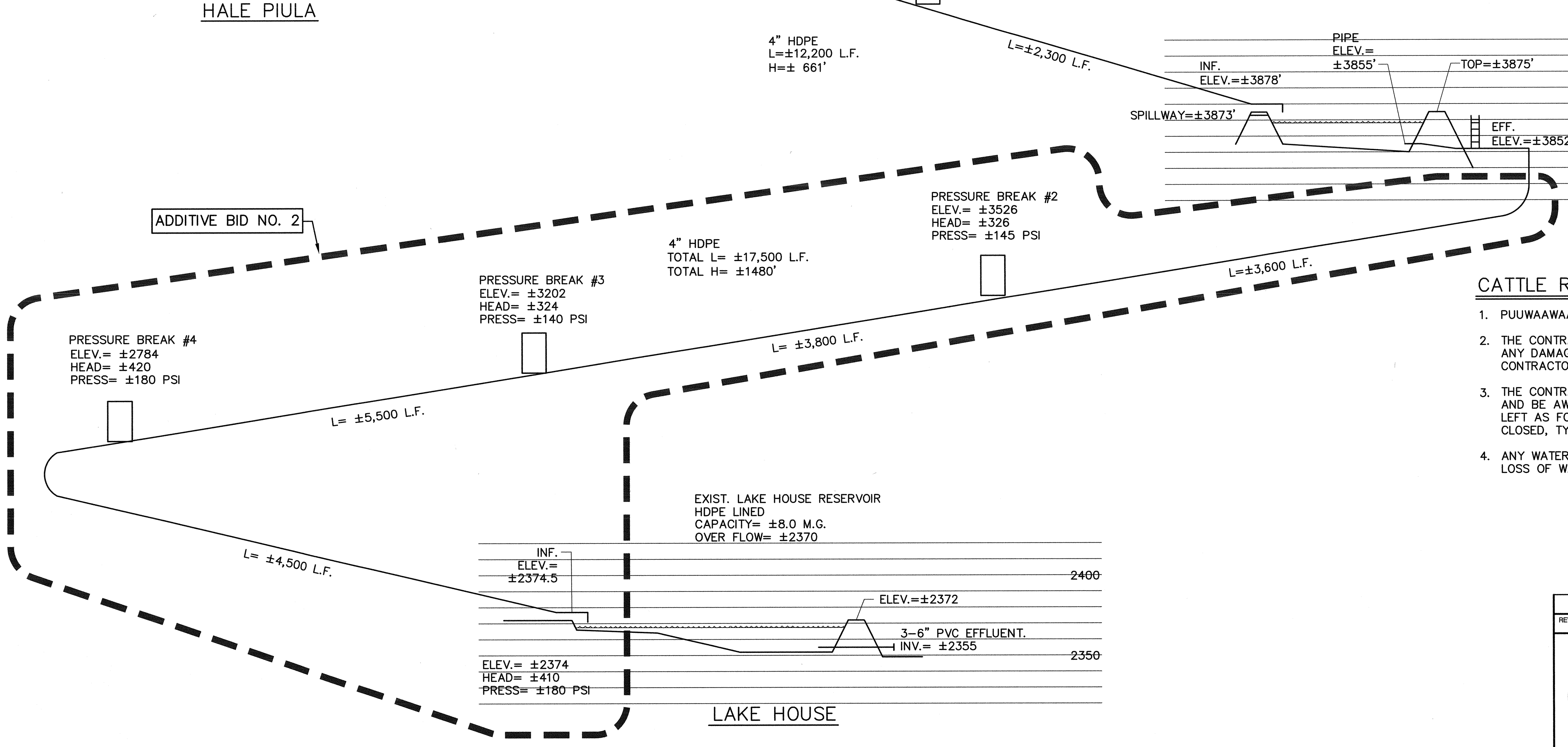
B NOT TO SCALE

REVISION NO.	SYMBOL	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
LEGEND MISC. CONSTRUCTION NOTES					
DESIGNED: JK1		SUBMITTED: <i>[Signature]</i>		DATE: MAY 6, 2016	
DRAWN: JK1		CHECKED: JK1		SCALE: As Noted	
APPROVED: <i>[Signature]</i>		DATE: MAY - 6 2016		DRAWING NO. G-3	
NABA ENGINEERING, INC.		CHIEF ENGINEER		DATE	



GENERAL PROJECT PHASING

- THE WORK SHALL BE PRIORITIZED AS FOLLOWS:
- DAM COMPLIANCE WORK.
 - WORK AT LAKE HOUSE RESERVOIR FOR ROADWAY EMBANKMENT.
 - WORK AT POOHOOHOO RESERVOIR NO. 2, BREACH EMBANKMENT.
 - STRUCTURE IMPROVEMENTS 1. IMPROVEMENTS SHALL BE COORDINATED AND SCHEDULED TO STORE EXISTING WATER SUPPLIES AND TO MAINTAIN THE ABILITY TO CONTINUE CATCHING AND STORING WATER DURING THE CONSTRUCTION PERIOD.
 - POOHOOHOO RESERVOIR NO. 1, INSTALL NEW RESERVOIR LINER AND APPURTENANCES.
 - 4" HDPE PIPELINE FROM HALE PIULA TO RESERVOIR NO. 1
 - TRANSFER AVAILABLE WATER FROM STEEL TANK NO. 1 TO RESERVOIR NO. 1.
 - PROVIDE TEMPORARY BYPASS AND REPAIR STEEL TANK NO. 1.
 - COMPLETE SURFACE CATCHMENT SYSTEM FOR STEEL TANK NO. 1.
 - TRANSFER WATER FROM STEEL TANK NO. 2 TO STEEL TANK NO. 1 OR RESERVOIR NO. 1. AND BEGIN REPAIRS TO TANK NO. 2.
 - COMPLETE CATCHMENT SYSTEM FOR STEEL TANK NO. 2.
 - STRUCTURE IMPROVEMENTS 2.
 - INSTALL 4" PIPELINE FROM POOHOOHOO RESERVOIR NO. 1 TO LAKE HOUSE RESERVOIR.



CATTLE RANCHING NOTES

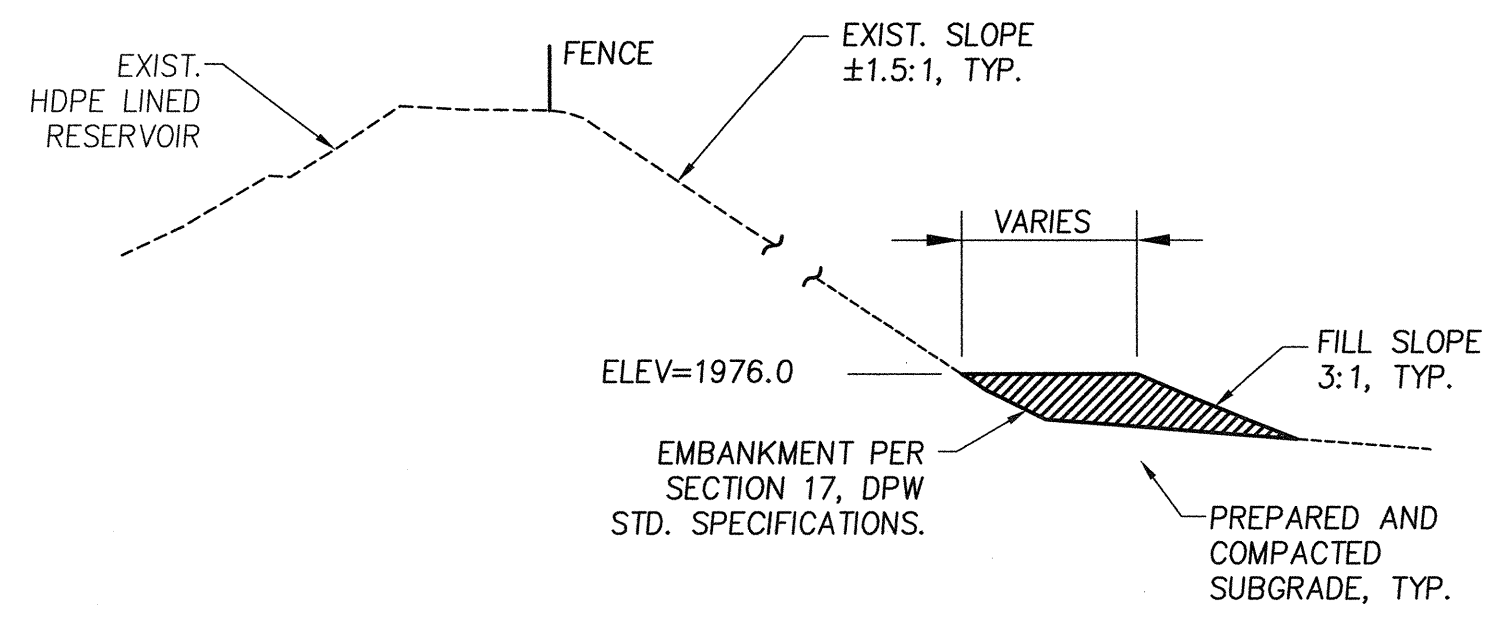
- PUUWAAWAA IS ACTIVELY USED FOR CATTLE RANCHING OPERATIONS.
- THE CONTRACTOR SHALL USE CARE TO NOT DAMAGE CATTLE FACILITIES. ANY DAMAGE TO FACILITIES SHALL BE REPAIRED IMMEDIATELY AT THE CONTRACTORS EXPENSE.
- THE CONTRACTOR SHALL USE CARE WHEN TRAVERSING THE RANCH AREAS AND BE AWARE OF THE CATTLE. PASSAGE THROUGH GATES SHALL BE LEFT AS FOUND. IF GATE IS OPEN, LEAVE OPEN, IF GATE IS CLOSED KEEP CLOSED, TYPICAL.
- ANY WATERLINES DAMAGED SHALL BE REPAIRED IMMEDIATELY TO PREVENT LOSS OF WATER FOR CATTLE OPERATIONS.

WATER SYSTEM PROFILE
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
WATER SYSTEM PROFILE					
DESIGNED: JKI	SUBMITTED: <i>GW</i>				
DRAWN: JKI	DATE: MAY 6, 2016				
CHECKED: JKI	SCALE: As Noted				
APPROVED: <i>[Signature]</i>	DATE: MAY - 6 2016		DRAWING NO. G-4		
INABA ENGINEERING, INC.	CHIEF ENGINEER		DATE		

DLNR \15015-Puuwaa\01-Drawings\05-SystemProfile

A TYPICAL EMBANKMENT SECTION
NOT TO SCALE



STA. 2+10
INSTALL 64 L.F. 6" SCHEDULE 80
PVC PIPE FOR FUTURE WATERLINE.
SEE PROFILE ON SHEET C-2

EXIST. WOOD PUMP
SHED TO REMAIN

RELOCATE PROPANE TANK.
NO PIPE CONNECTIONS
REQUIRED.

ROADWAY REGRADING FILL
AREA. (±5,500 SF) SEE
DETAIL "A" AND CROSS
SECTIONS

INSTALL PVC FITTINGS TO PROVIDE
1 1/2" FIRE HOSE CONNECTION ON
ONE EXISTING 6" PVC EFFLUENT
PIPE, PER DETAIL A/C-2.

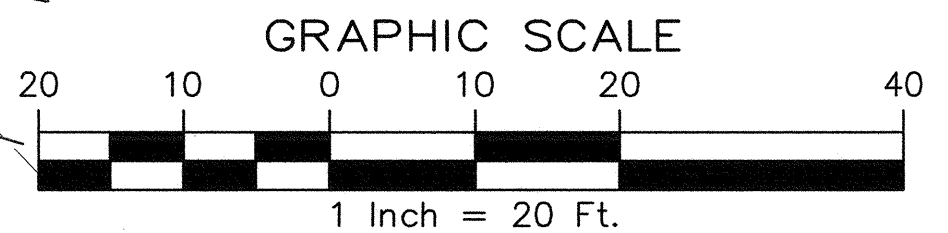
BL CURVE DATA:
D= 46°45'36"
R= 320.00'
T= 138.34'
LC= 261.16'
CH= 253.97'

BASELINE LAYOUT DATA		
NO.	AZ	DIST
L1	72°33'33"	110.00'
L2	49°10'45"	253.97'
L3	25°47'57"	89.17'
L4	1°47'30"	89.67'
L5	12°16'46"	68.99'

INSTALL HDPE LINER SAFETY
LADDER PER DETAIL C/C-8.
THREE LOCATIONS. CONTRACTOR
TO COORDINATE EXACT LOCATION
WITH ON-SITE DOFAW STAFF, TYP.

LAKE HOUSE RESERVOIR
ESTIMATED CAPACITY
±8.0 M.G. / 24.6 ACRE-FEET

PLAN
SCALE: 1"=20'



REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
LAKE HOUSE RESERVOIR SITE PLAN					
DESIGNED: JKI	SUBMITTED: [Signature]				
DRAWN: JKI	DATE: MAY 6, 2016				
CHECKED: JKI	SCALE: As Noted				
APPROVED: [Signature]	DATE: MAY 6, 2016		DRAWING NO. C-1		
INABA ENGINEERING, INC. ID# 15015	FB #		JOB NO. 500CH15A SHEET NO. 6 OF 38 SHEETS		

TRAV. L-3
1 1/2" PIPE
ELEV=2367.35
N 5027.5682
E -5432.1693

27°39'00"
L=433.05'
TO TRAV L-1

TRAV. L-4
1 1/2" PIPE
ELEV=2359.13
N 5223.7696
E -5464.7593

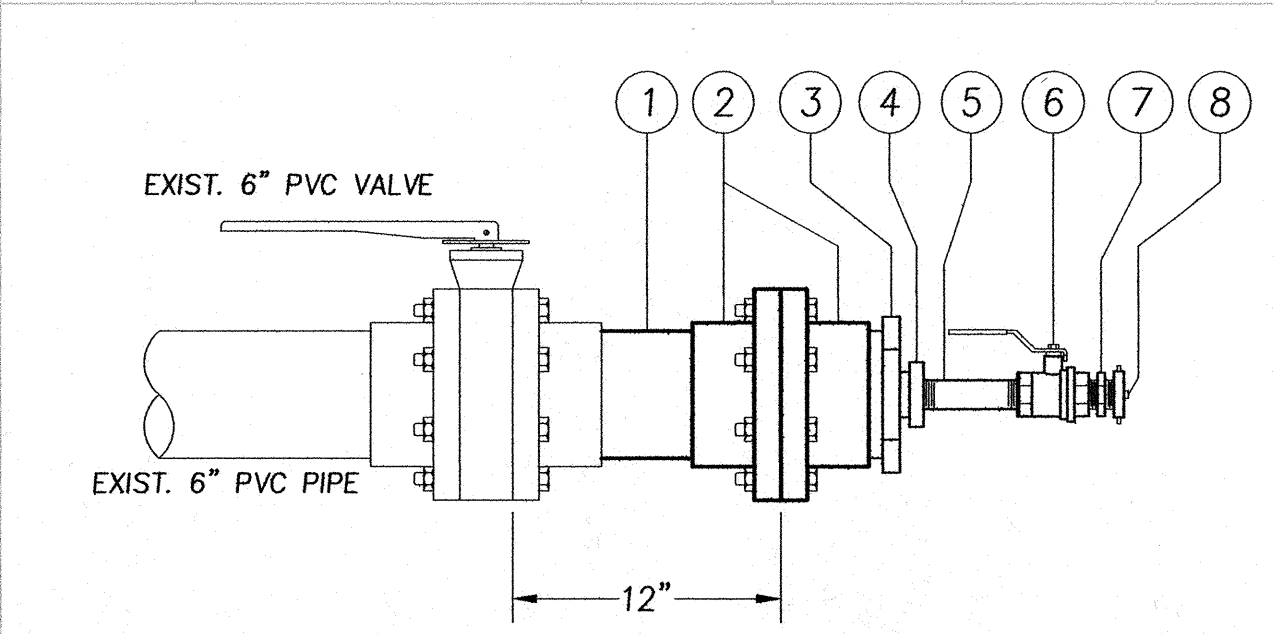
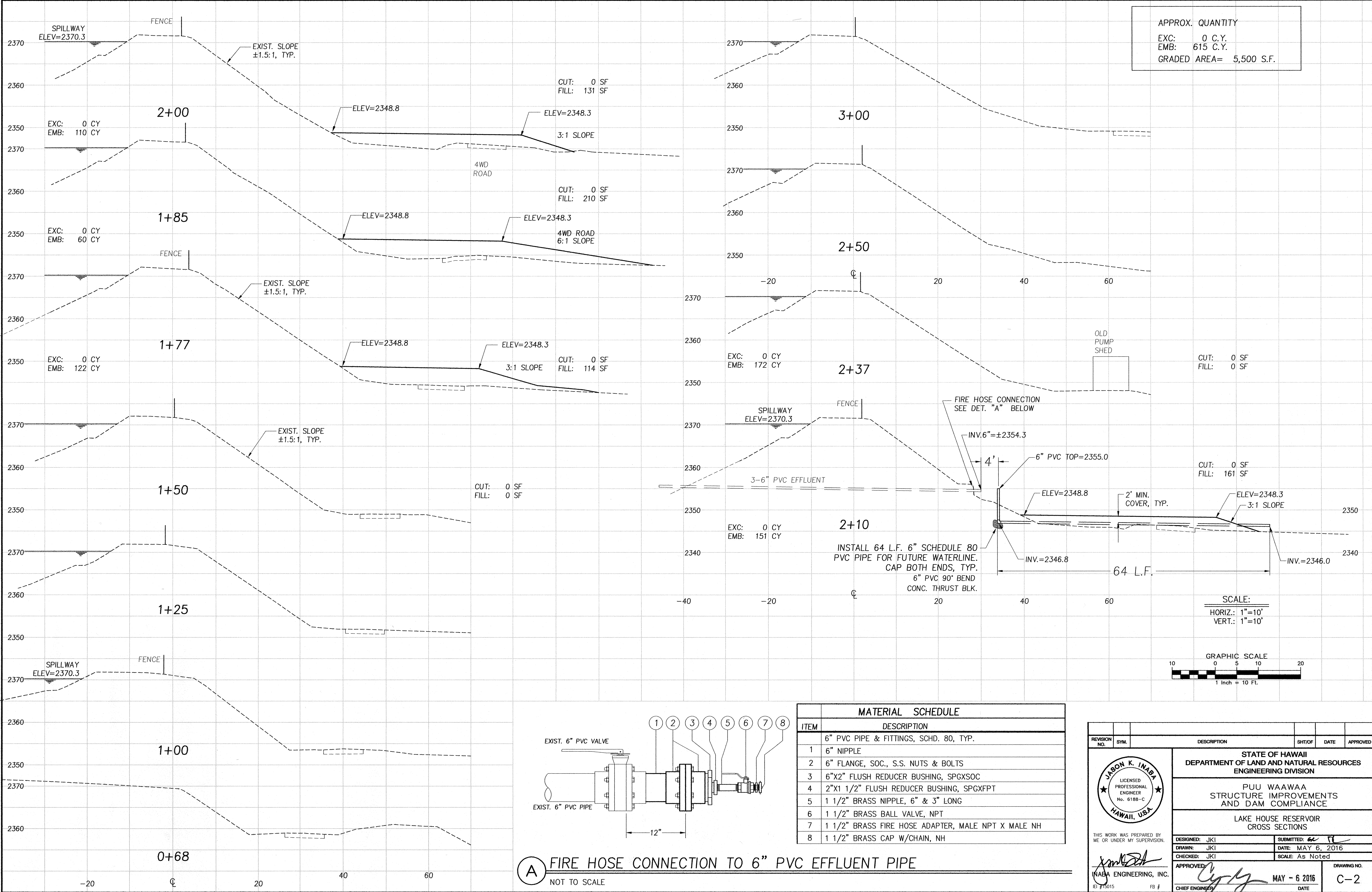
TRAV. L-2
1 1/2" PIPE
ELEV=2371.75
N 5426.5725
E -5166.3187

TRAV. L-5
1 1/2" PIPE
ELEV=2342.53
N 5501.5640
E -5313.6081

BASELINE FOR
CROSS SECTIONS
N 5463.8757
E -5078.7498

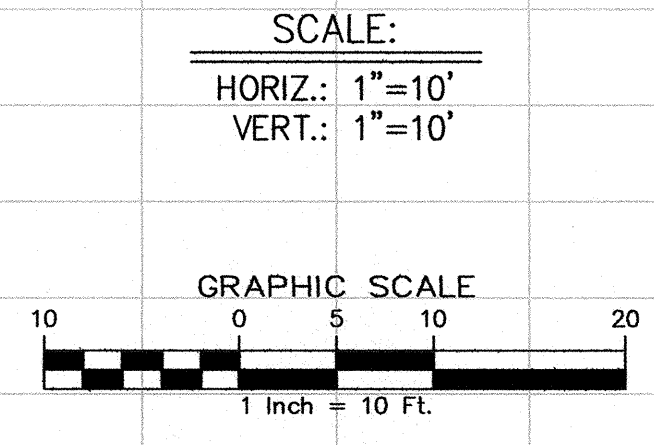
158°41'58"
L=457.85'
TO TRAV L-1

APPROX. QUANTITY
 EXC: 0 C.Y.
 EMB: 615 C.Y.
 GRADED AREA= 5,500 S.F.



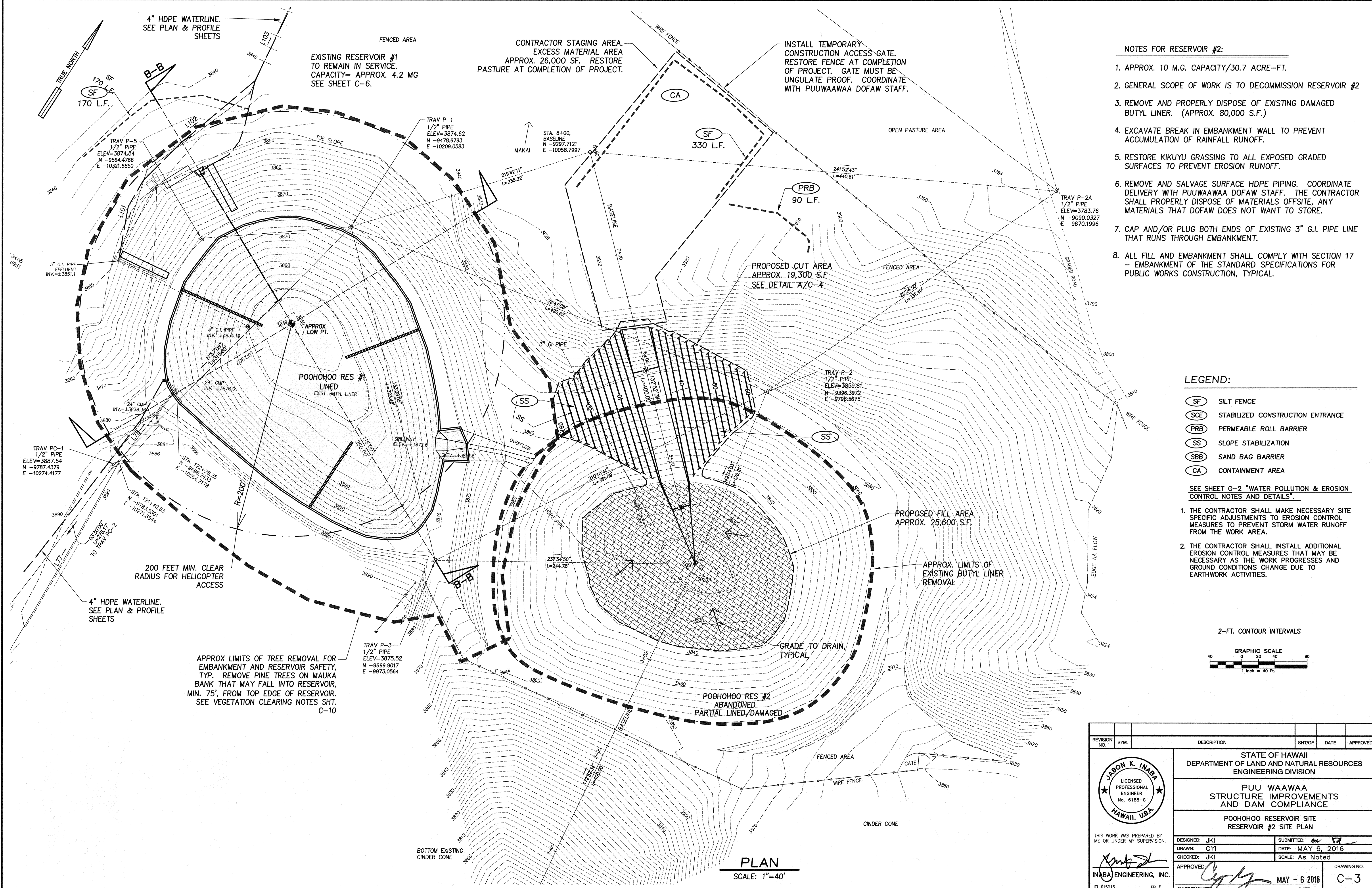
MATERIAL SCHEDULE	
ITEM	DESCRIPTION
	6" PVC PIPE & FITTINGS, SCHD. 80, TYP.
1	6" NIPPLE
2	6" FLANGE, SOC., S.S. NUTS & BOLTS
3	6"x2" FLUSH REDUCER BUSHING, SPGXSOC
4	2"x1 1/2" FLUSH REDUCER BUSHING, SPGXFPT
5	1 1/2" BRASS NIPPLE, 6" & 3" LONG
6	1 1/2" BRASS BALL VALVE, NPT
7	1 1/2" BRASS FIRE HOSE ADAPTER, MALE NPT X MALE NH
8	1 1/2" BRASS CAP W/CHAIN, NH

(A) FIRE HOSE CONNECTION TO 6" PVC EFFLUENT PIPE
 NOT TO SCALE



REVISION NO.	SYMBOL	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
LAKE HOUSE RESERVOIR CROSS SECTIONS					
DESIGNED: JKI DRAWN: JKI CHECKED: JKI APPROVED: <i>[Signature]</i> INABA ENGINEERING, INC. 15015 IED #15015					
SUBMITTED: <i>[Signature]</i> DATE: MAY 6, 2016 SCALE: As Noted MAY - 6 2016 DATE					
JOB NO. 500CH15A SHEET NO. 7 OF 38 SHEETS					

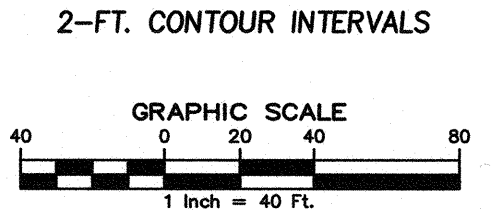
06-Base-LakeHouseR2-AdjJustElev.dwg



- NOTES FOR RESERVOIR #2:
- APPROX. 10 M.G. CAPACITY/30.7 ACRE-FT.
 - GENERAL SCOPE OF WORK IS TO DECOMMISSION RESERVOIR #2
 - REMOVE AND PROPERLY DISPOSE OF EXISTING DAMAGED BUTYL LINER. (APPROX. 80,000 S.F.)
 - EXCAVATE BREAK IN EMBANKMENT WALL TO PREVENT ACCUMULATION OF RAINFALL RUNOFF.
 - RESTORE KIKUYU GRASSING TO ALL EXPOSED GRADED SURFACES TO PREVENT EROSION RUNOFF.
 - REMOVE AND SALVAGE SURFACE HDPE PIPING. COORDINATE DELIVERY WITH PUUWAAWAA DOFAW STAFF. THE CONTRACTOR SHALL PROPERLY DISPOSE OF MATERIALS OFFSITE, ANY MATERIALS THAT DOFAW DOES NOT WANT TO STORE.
 - CAP AND/OR PLUG BOTH ENDS OF EXISTING 3" G.I. PIPE LINE THAT RUNS THROUGH EMBANKMENT.
 - ALL FILL AND EMBANKMENT SHALL COMPLY WITH SECTION 17 - EMBANKMENT OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, TYPICAL.

- LEGEND:
- (SF) SILT FENCE
 - (SCE) STABILIZED CONSTRUCTION ENTRANCE
 - (PRB) PERMEABLE ROLL BARRIER
 - (SS) SLOPE STABILIZATION
 - (SBB) SAND BAG BARRIER
 - (CA) CONTAINMENT AREA

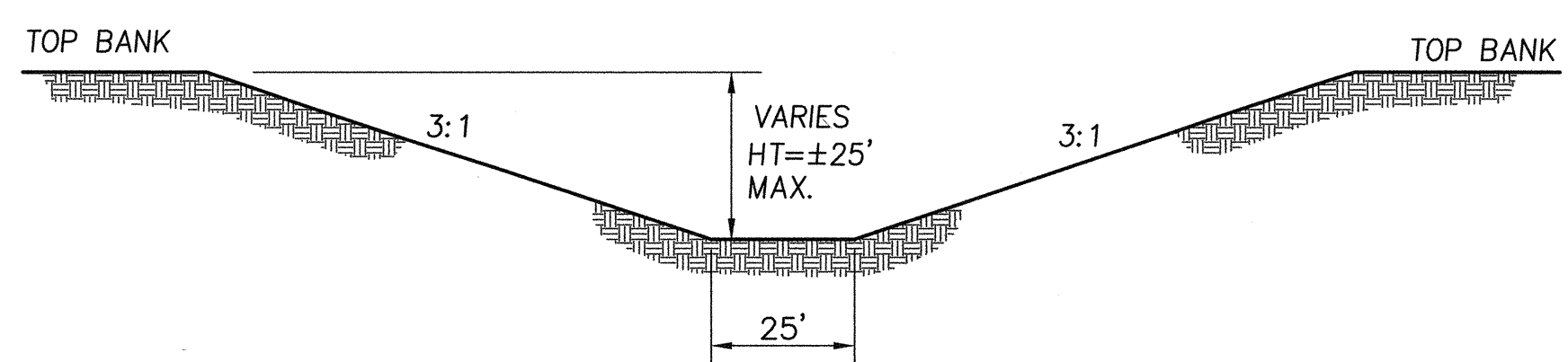
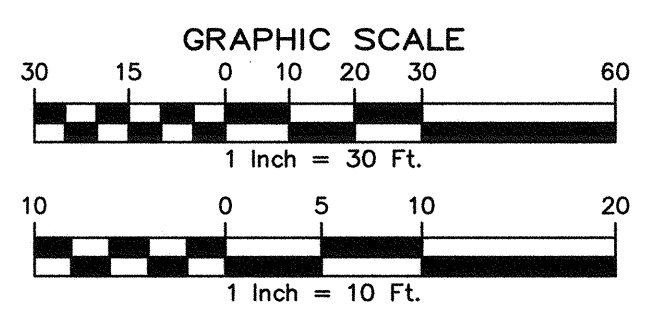
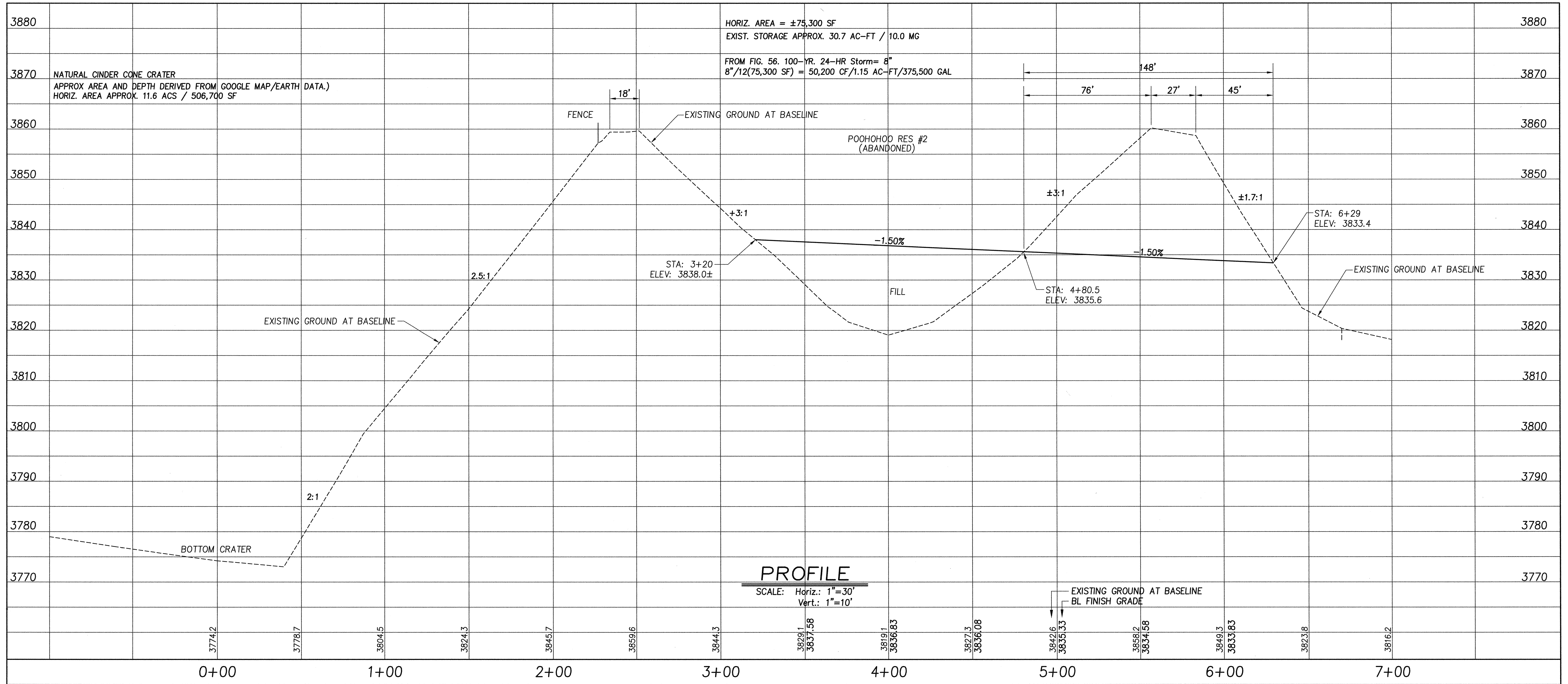
- SEE SHEET G-2 "WATER POLLUTION & EROSION CONTROL NOTES AND DETAILS".
- THE CONTRACTOR SHALL MAKE NECESSARY SITE SPECIFIC ADJUSTMENTS TO EROSION CONTROL MEASURES TO PREVENT STORM WATER RUNOFF FROM THE WORK AREA.
 - THE CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES THAT MAY BE NECESSARY AS THE WORK PROGRESSES AND GROUND CONDITIONS CHANGE DUE TO EARTHWORK ACTIVITIES.



REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION					
PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE					
POOHOOHO RESERVOIR SITE RESERVOIR #2 SITE PLAN					
DESIGNED: JKI DRAWN: GYI CHECKED: JKI			SUBMITTED: <i>[Signature]</i> DATE: MAY 6, 2016 SCALE: As Noted		
APPROVED: <i>[Signature]</i> INABA ENGINEERING, INC. ID #15015			DRAWING NO. C-3 DATE: MAY - 6 2016		

\DLNR\15015-Puuwawaa\01-Drawings\10-Base-Poohohoo11 1=4

PLAN
SCALE: 1"=40'



A TYPICAL CUT SECTION
 SCALE: 1"=30'

REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED

DESIGNED: JKI
 DRAWN: JKI
 CHECKED: JKI
 APPROVED: *[Signature]*
 NABA ENGINEERING, INC.
 ID #15015

STATE OF HAWAII
 DEPARTMENT OF LAND AND NATURAL RESOURCES
 ENGINEERING DIVISION

PUU WAAWAA
 STRUCTURE IMPROVEMENTS
 AND DAM COMPLIANCE

POOHOO RESERVOIR SITE
 RESERVOIR #2 - PROFILE

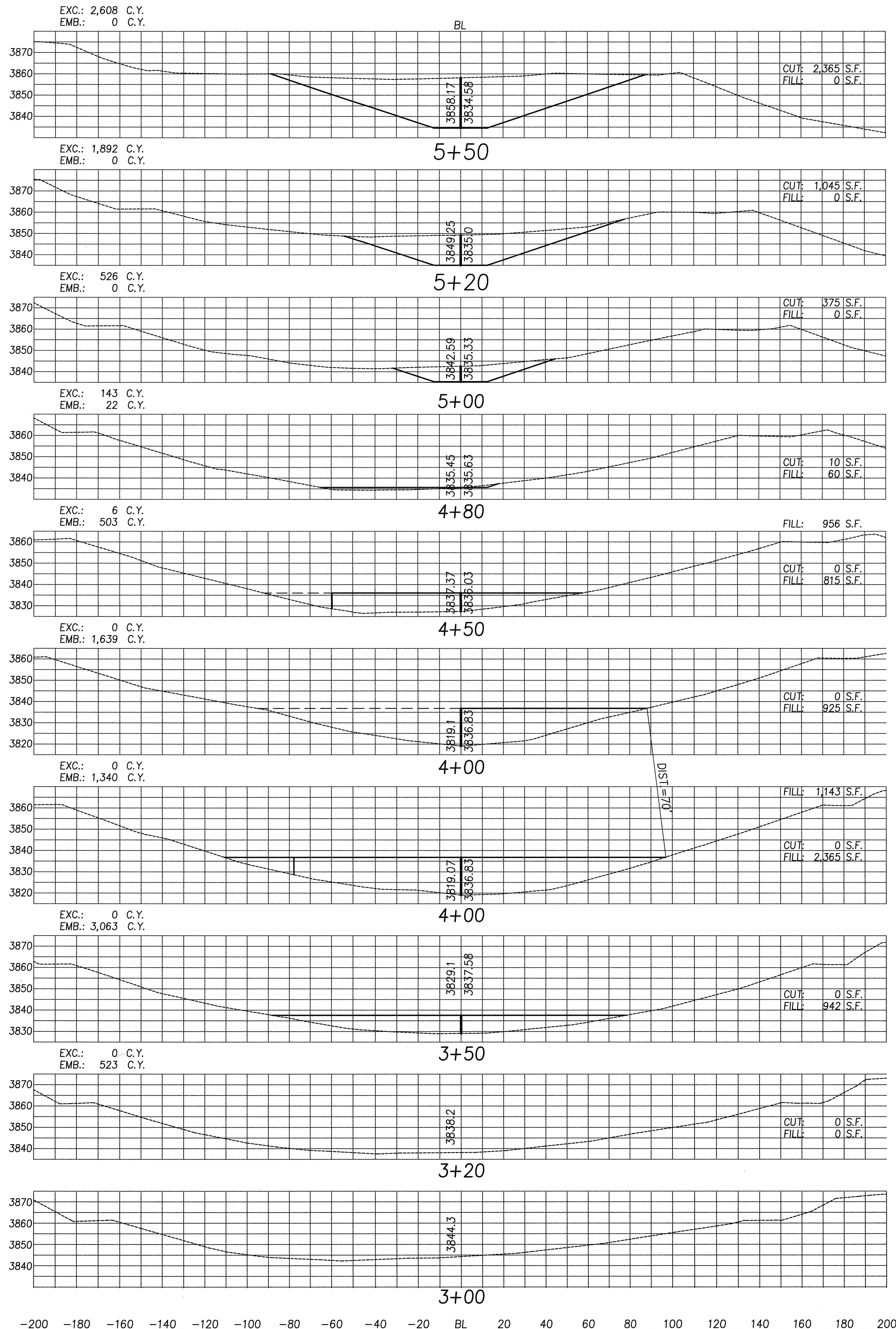
DATE: MAY 6, 2016
 SCALE: As Noted
 DATE: MAY - 6 2016
 DATE

DATE: MAY 6, 2016
 DATE

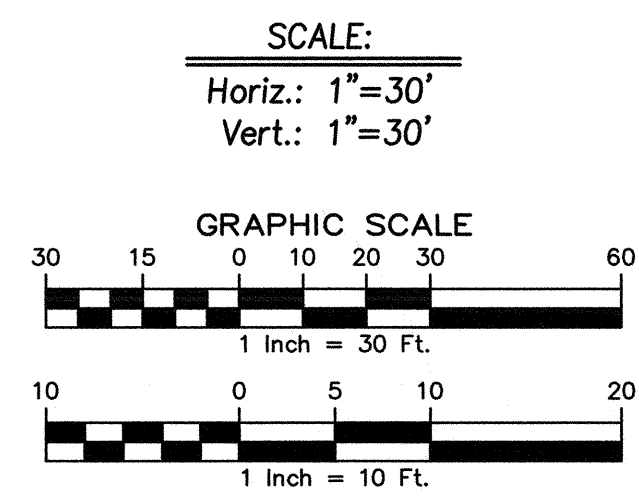
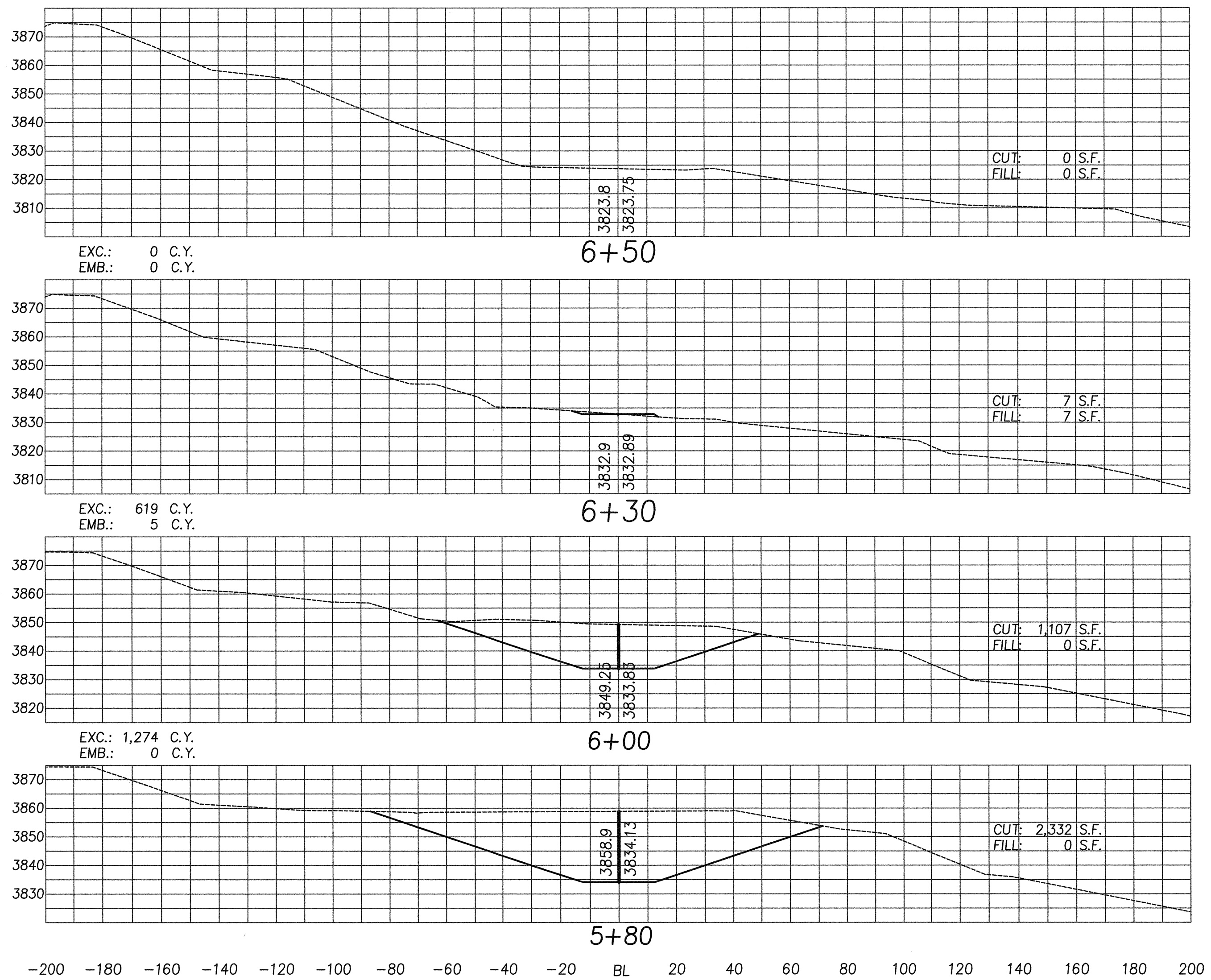
DRAWING NO. C-4

\DLNR\15015-Puuwaawaa\01-Drawings\10-Base-Poohoo12_AdjustElev 1=30

\\DLNR\15015-Puuwaawa\01-Drawings\10-Base-Pooohoo\12_Adjust\Elev 1=30



APPROX. QUANTITIES
 EXC.: 7,068 C.Y.
 EMB.: 7,095 C.Y.
 GRADED AREA= 1.02 ACRES



REVISION NO.	SYM.	DESCRIPTION	SHT/OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION PUU WAAWAA STRUCTURE IMPROVEMENTS AND DAM COMPLIANCE POOHOHOO RESERVOIR SITE RESERVOIR #2 - CROSS SECTIONS					
DESIGNED: JKJ		SUBMITTED: <i>JKJ</i>		DATE: MAY 6, 2016	
DRAWN: JKJ		CHECKED: JKJ		SCALE: As Noted	
APPROVED: <i>JKJ</i>		DATE: MAY - 6 2016		DRAWING NO. C-5	
IEI #15015		FB #		JOB NO. 500CH15A	