

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

JOB NO. J38CH20B

# GEOHERMAL WELL PLUGGING AND ABANDONMENT SOH-1 AND SOH-2

PUNA DISTRICT, HAWAII, HAWAII  
TMK: (3) 1-4-001:002, TMK: (3) 1-4-002:032

PREPARED BY:

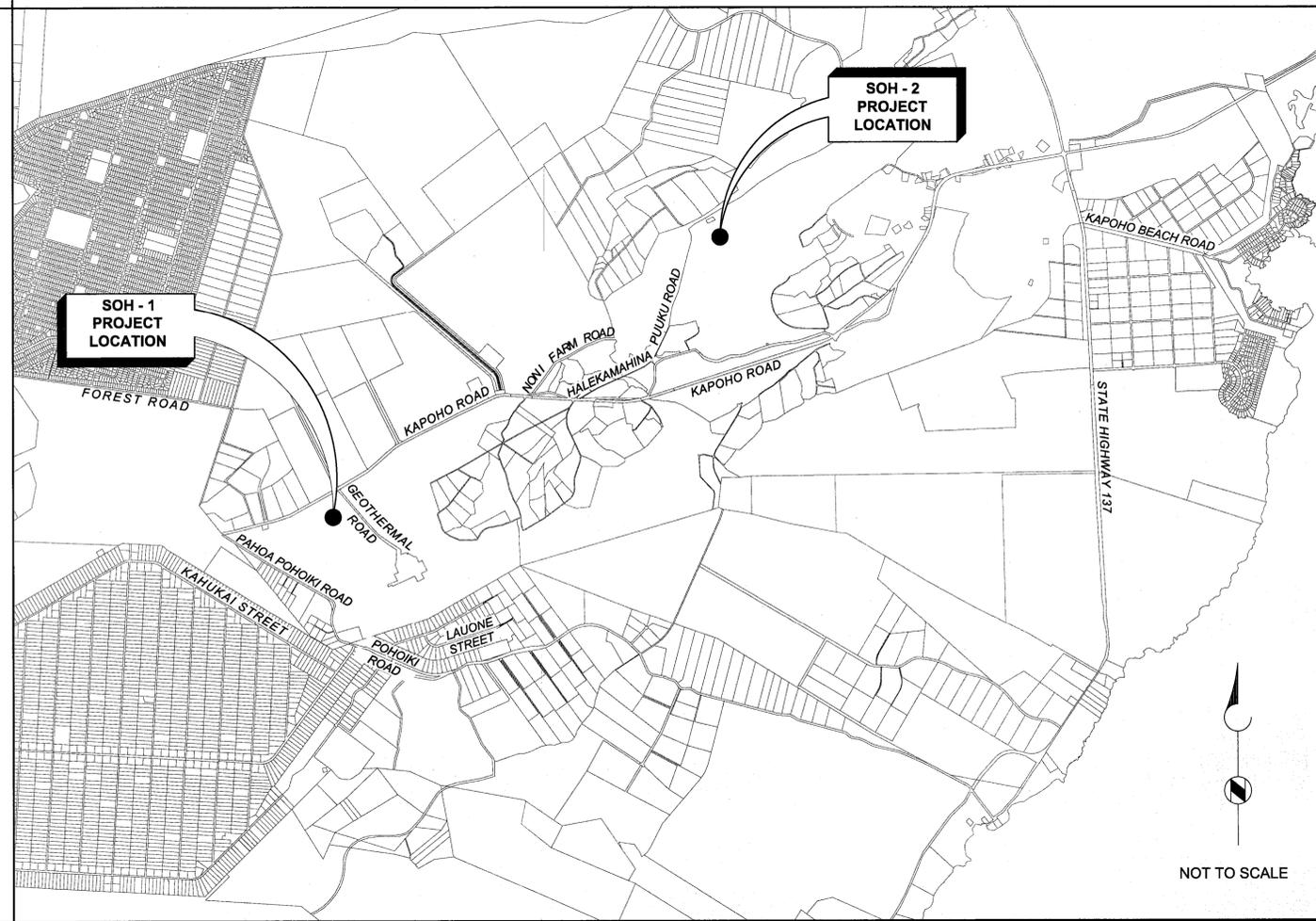
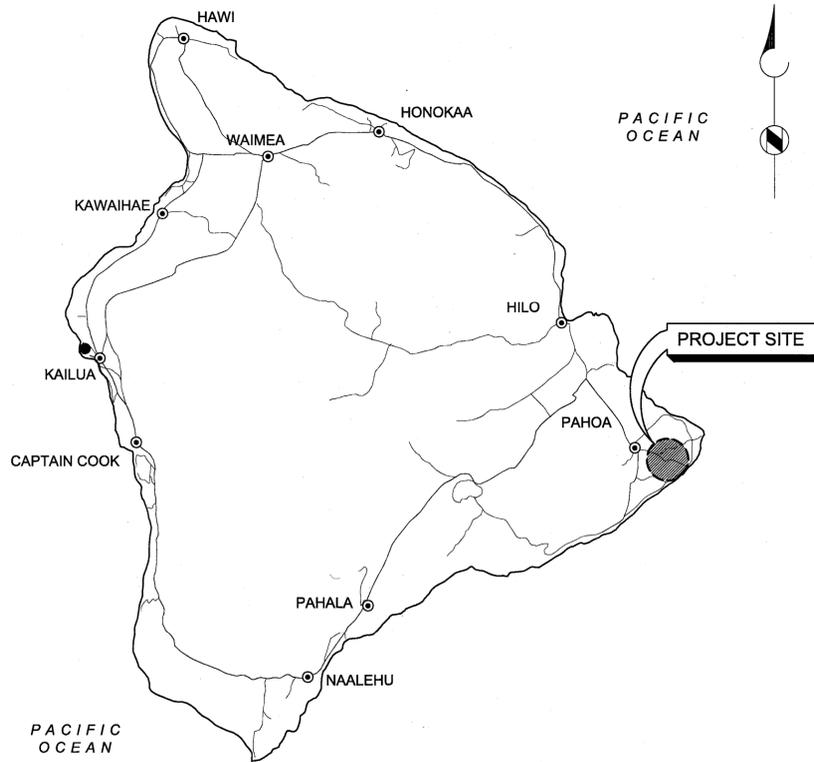
**Brown and Caldwell**

737 BISHOP STREET, SUITE 3000  
HONOLULU, HAWAII, 96813

VICINITY MAP

LOCATION MAP

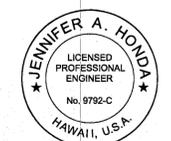
INDEX OF DRAWINGS



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APPROVAL

*C. Chang*  
CARTY S. CHANG, P.E.  
CHIEF ENGINEER  
ENGINEERING DIVISION  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
4/8/16 DATE

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED
					
STATE OF HAWAII <b>DEPARTMENT OF LAND AND NATURAL RESOURCES</b> ENGINEERING DIVISION <b>GEOHERMAL WELL PLUGGING AND ABANDONMENT SOH-1 AND SOH-2</b> PUNA DISTRICT, HAWAII, HAWAII TITLE SHEET, VICINITY MAP, LOCATION MAP, INDEX OF DRAWINGS, AND APPROVAL					
DESIGNED: JH	SUBMITTED: <input checked="" type="checkbox"/>				
DRAWN: YN	DATE: 2/23/2016				
CHECKED: DN	SCALE: AS SHOWN				
APPROVED: <i>C. Chang</i>	DATE: APR 08 2016		DRAWING NO. T-1		
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. EXPIRATION DATE OF LICENSE - 4/30/2016					

2/24/2016 YNODA P:\PROJECTS\HAWAII, STATE OF (HI)\146503 - GEOHERMAL WELL PLUGGING DESIGN\ CAD\2-SHEETS\G-GENERAL\146503-SF-T-001.DWG

JOB NO. J38CH20B - GEOHERMAL WELL PLUGGING AND ABANDONMENT

**CONSTRUCTION NOTES**

- ALL WORK TO BE DONE IN ACCORDANCE WITH THE COUNTY OF HAWAII, "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPT. 1984 AND "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPT. 1986.
- THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM PUBLIC STREETS AT ALL TIMES.
- THE CONTRACTOR SHALL CONDUCT ALL TESTS AS REQUIRED BY THE ENGINEER AND SHALL BE RESPONSIBLE FOR ALL EXPENSES INCURRED CONDUCTING THESE TESTS.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES. PERSONAL INJURY RESULTING FROM CONTACT WITH EXISTING UTILITIES SHALL BE THE CONTRACTOR'S RESPONSIBILITY.
- VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO THE START OF CONSTRUCTION. ANY DISCREPANCY SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR DIRECTION.
- NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION ACTIVITY SO AS TO CAUSE FALLING ROCK, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS AS NECESSARY. THE COSTS INCURRED FOR ANY REMEDIAL ACTION SHALL BE PAYABLE BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF CHAPTER 46, COMMUNITY NOISE CONTROL; CHAPTER 54, WATER QUALITY STANDARDS; CHAPTER 55, WATER POLLUTION CONTROL; AND CHAPTER 59, AMBIENT AIR QUALITY STANDARDS OF TITLE 11, ADMINISTRATIVE RULES OF THE STATE DEPARTMENT OF HEALTH.
- ALL WORK CALLED FOR ON THE PLANS AND NOT ITEMIZED IN THE PROPOSAL AND ALL WORK NOT CALLED FOR BUT REQUIRED FOR THE CONSTRUCTION OF THIS PROJECT, SHALL BE CONSIDERED INCIDENTAL.
- THE CONTRACTOR SHALL REMOVE ALL EXISTING FENCES WITHIN LIMITS OF GRADING, UNLESS OTHERWISE NOTED ON PLANS.
- 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/HER EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM RUBBISH, DUST, NOISE, EROSION, ETC. THE WORK SHALL BE DONE IN CONFORMANCE WITH THE AIR AND WATER 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 CONTROL ACCESS TO ALL OPENINGS TO PREVENT UNAUTHORIZED ENTRY UNDERGROUND. UNUSED CHASES, MANWAYS, OR OTHER OPENINGS SHALL BE TIGHTLY COVERED, BULKHEADED, OR FENCED OFF, AND SHALL BE POSTED WITH WARNING SIGNS INDICATING "KEEP OUT" OR SIMILAR LANGUAGE. COMPLETED OR UNUSED SECTIONS OF THE UNDERGROUND FACILITY SHALL BE BARRICADED.

**GRUBBING AND GRADING NOTES**

- ALL GRADING WORK SHALL CONFORM TO THE BEST MANAGEMENT PRACTICES (BMPS) IN 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 COMPLY WITH NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS.
- 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.
- ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
- TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.
- THE CONTRACTOR SHALL COVER ALL SLOPES AND EXPOSED AREAS WITH COCONUT MATS, IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- 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 7:00A.M. TO 3:30P.M.

- THE CONTRACTOR SHALL REMOVE ALL VEGETATION OR DEBRIS BEFORE PLACING FILLS ON NATURAL GROUND SURFACE.
- ALL GRADING AND CONSTRUCTION WORK SHALL IMPLEMENT MEASURES TO ENSURE THAT THE DISCHARGE OF POLLUTANTS FROM THE CONSTRUCTION SITE WILL BE REDUCED TO THE MAXIMUM EXTENT PRACTICABLE AND WILL NOT CAUSE OR CONTRIBUTE TO AN EXCEEDANCE OF WATER QUALITY STANDARDS.
- ADEQUATE MEASURES SHALL BE PROVIDED TO PREVENT FLOODING AND EROSION PROBLEMS TO ADJACENT PROPERTIES.
- SHOULD ANY UNANTICIPATED ARCHAEOLOGICAL SITE(S) BE UNCOVERED, ALL WORK SHALL CEASE IN THE IMMEDIATE AREA AND THE DLNR, STATE HISTORIC PRESERVATION DIVISION (933-0482) SHALL BE NOTIFIED. NO WORK SHALL RESUME UNTIL CLEARANCE HAS BEEN OBTAINED FROM THE STATE HISTORIC PRESERVATION DIVISION.

**SITE SPECIFIC CONSTRUCTION BMP PLAN NOTES**

GENERAL:

- THESE NOTES ARE INTENDED TO AMEND AND SUPPLEMENT ANY REQUIREMENTS AND PROVISIONS OF SPECIFICATIONS. COMPLY WITH THE REQUIREMENTS OF THIS PLAN AND THE REQUIREMENTS OF THE SPECIFICATIONS. WHERE REQUIREMENTS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENT SHALL BE IMPLEMENTED.
- THE BEST MANAGEMENT PRACTICES (BMP) SHOWN IN THIS SITE SPECIFIC CONSTRUCTION BMP PLAN ARE THE MINIMUM REQUIRED AND ARE SELECTED BASED ON ANTICIPATED MEANS AND METHODS. THE CONTRACTOR SHALL MODIFY AND AMEND THIS PLAN AS NECESSARY TO ACCOMMODATE THE SPECIFIC MEANS AND METHODS USED.
- WHERE SUFFICIENT DETAIL REGARDING INSTALLATION, CONDUCTING THE WORK, AND/OR MAINTENANCE OF BMP'S IS NOT INCLUDED IN THESE PLANS, REFER TO THE CITY AND COUNTY OF HONOLULU STORMWATER BEST MANAGEMENT PRACTICE MANUAL, CONSTRUCTION, NOVEMBER 2011, CITY AND COUNTY OF HONOLULU, DEPARTMENT OF ENVIRONMENTAL SERVICES.
- A SPECIFIC INDIVIDUAL APPOINTED BY THE CONTRACTOR SHALL BE DESIGNATED TO BE RESPONSIBLE FOR EROSION, SEDIMENT, AND DUST CONTROLS ON THIS PROJECT.
- BMP'S SHALL BE EMPLOYED AT ALL TIMES TO THE MAXIMUM EXTENT PRACTICABLE TO PREVENT DAMAGE TO STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
- IF THE CONTRACTOR IS NOT ABLE TO SATISFACTORILY CONTROL EROSION, SEDIMENT, AND DUST EMISSIONS FROM THE PROJECT SITE, ALL CONSTRUCTION WORK SHALL CEASE EXCEPT FOR WATERING AND OTHER STABILIZATION EFFORTS.
- CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREAS. THE FIRST CONSTRUCTION SECTION SHALL BE STABILIZED BEFORE THE NEXT SECTION SHALL BEGIN. STABILIZATION SHALL BE ACCOMPLISHED BY TEMPORARILY OR PERMANENTLY PROTECTING THE DISTURBED SOIL SURFACE FROM RAINFALL IMPACT AND RUNOFF.
- THE CONTRACTOR SHALL PROVIDE ADDITIONAL EROSION, SEDIMENT, AND DUST CONTROL STRUCTURES AS NEEDED WHERE CONTRACTOR TRAVELS OR WORKS BEYOND THE GRADING LIMITS INDICATED ON THE PLANS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESPONDING TO FUGITIVE DUST AND WATER BORNE SILT COMPLAINTS FROM NEIGHBORING PROPERTIES AND SHALL PROVIDE ADDITIONAL MITIGATION MEASURES AS NECESSARY.
- EROSION, SEDIMENT, AND DUST CONTROL BMP'S SHALL BE IN PLACE AND FUNCTIONAL BEFORE ANY EARTH MOVING, GRUBBING OR EXCAVATION WORK IS INITIATED. THE BMP'S SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
- ALL BMP'S SHALL BE CHECKED AND REPAIRED AS NECESSARY. INSPECT BMP'S DAILY. THE CONTRACTOR SHALL MAINTAIN RECORDS OF CHECKS AND REPAIRS. AN INSPECTION AND MAINTENANCE REPORT WILL BE GENERATED FOR EACH INVESTIGATION, AND THE REPORTS KEPT ON FILE.
- IF HEAVY RAINS ARE PROJECTED DURING A WORKDAY, ALL BMP'S THAT ARE A PART OF THIS PROJECT SHALL BE INSPECTED IMMEDIATELY AND REINFORCED AS NECESSARY.
- ALL EROSION, SEDIMENT, AND DUST CONTROL BMP'S THAT ARE A PART OF THIS PROJECT SHALL REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED TO PREVENT THE TRANSPORT OF DUST OR SEDIMENT LADEN WATERS FROM THE SITE.

EROSION CONTROL:

- THE CONTRACTOR SHALL TRAIN HIS/HER EMPLOYEES AND SUBCONTRACTORS ON THE BMP'S FOR EROSION, SEDIMENT, AND DUST CONTROL.
- LIMIT CONSTRUCTION EQUIPMENT AND ACTIVITIES TO THE LIMITS OF CONSTRUCTION SHOWN ON THESE PLANS.
- PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN 20 CALENDAR DAYS PRIOR TO ANY CONSTRUCTION-RELATED LAND DISTURBANCE.
- TEMPORARY SOIL STABILIZATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS.
- VEGETATIVE COVER SHALL BE PROVIDED PER THE PROJECT SPECIFICATIONS. PLANTING AND MAINTENANCE OF VEGETATIVE COVER SHALL CONFORM TO THE SPECIFICATIONS AND THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION, 2005" AND ITS AMENDMENTS.

SEDIMENT CONTROL:

- INSTALL SEDIMENT CONTROL BMP'S INCLUDING TEMPORARY ACCESS AND HAUL ROADS, STAGING AREAS, AND CONSTRUCTION ENTRANCE/EXITS AS INDICATED ON THE PLAN TO AID IN THE REMOVAL AND PREVENT DIRT/MUD FROM ACCUMULATING ON THE TIRES OF TRUCKS EXITING THE PROJECT SITE.
- PROVIDE PERIMETER SEDIMENT CONTROL BMP'S AROUND ALL AREAS OF ACTIVE CONSTRUCTION INCLUDING STOCKPILES, HAUL ROADS, STAGING AREAS, EXCAVATIONS, GRUBBED AREAS, AND AREAS WHERE PERMANENT SURFACE RESTORATION HAS NOT BEEN ESTABLISHED.
- ALL SEDIMENT CONTROL BMP'S SHALL BE CLEARED OF SILT IMMEDIATELY FOLLOWING THE END OF ANY RAINFALL THAT CAUSES SILT BUILDUP BEHIND THE BMP.
- ALL SEDIMENT CONTROL BMP'S SHALL BE INSPECTED FOR DAMAGE AND MAINTAINED SO THAT THEY ARE WORKING PROPERLY.
- SWEEP AND VACUUM STREETS USING EQUIPMENT SPECIFICALLY INTENDED FOR REMOVING SEDIMENTS FROM PAVED ROADWAYS. SWEEPING AND VACUUMING EQUIPMENT SHALL NOT CAUSE FUGITIVE DUST EMISSIONS. DO NOT USE KICK BROOMS OR SWEEPER ATTACHMENTS.
- SWEEP AND VACUUM STREETS OF SEDIMENT DAILY DURING TRENCHING AND EXCAVATION ACTIVITIES. DO NOT WASH SEDIMENT FROM THE CONSTRUCTION SITE TO SURROUNDING AREAS. DISPOSE OF COLLECTED SEDIMENT AS DIRECTED BY THE ENGINEER.

DUST CONTROL:

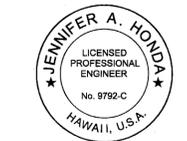
- THE CONTRACTOR SHALL PROVIDE EFFECTIVE MEASURES FOR THE CONTROL OF FUGITIVE DUST EMISSIONS FROM THE PROJECT AND SURROUNDING AREAS CAUSED BY OPERATIONS. THESE MEASURES SHALL MEET THE REQUIREMENTS OF STATE OF HAWAII ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH, AIR POLLUTION CONTROL (11-60.1).
- PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL MEET WITH THE ENGINEER AND PROVIDE INFORMATION ON THE SOURCE OF WATER FOR DUST CONTROL. IN ADDITION, THE CONTRACTOR SHALL SUBMIT CONSTRUCTION PLANS, SCHEDULES AND/OR OTHER WRITTEN MEASURES WHICH PROVIDE FOR DUST CONTROL.
- GRUBBED AND GRADED AREAS SHALL BE THOROUGHLY WATERED AFTER CONSTRUCTION ACTIVITY HAS CEASED FOR THE DAY PRIOR TO WEEKENDS AND HOLIDAYS.
- DUST CONTROL WITH WATER SPRAY (BY TRUCK OR TEMPORARY SPRINKLERS) SHALL BE INSTALLED AS NEEDED. DO NOT OVERWATER.
- THE CONTRACTOR SHALL CONDUCT OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED TO PREVENT FUGITIVE DUST EMISSIONS.

NON-STORMWATER POLLUTION MANAGEMENT:

- THE CONTRACTOR SHALL NOT PERFORM EQUIPMENT OR VEHICLE CLEANING OR MAINTENANCE AT THE CONSTRUCTION SITE.
- PERFORM ALL FUELING AT DESIGNATED FUELING AREA(S) THAT ARE EQUIPPED WITH EMERGENCY SPILL CLEANUP KITS, ARE ON LEVEL-GRADE, ARE PROTECTED FROM STORM WATER RUN-ON AND RUN-OFF, AND ARE AT LEAST 50-FEET AWAY FROM DRAINAGE FACILITIES OR WATERCOURSES.

2/24/2016 YNODA P:\PROJECTS\HAWAII, STATE OF (H)\146503 - GEOTHERMAL WELL PLUGGING DESIGN\CAD\2-SHEETS\C-CV\146503-SF-C-001.DWG

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED



*Jennifer A. Honda*  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.  
EXPIRATION DATE OF LICENSE - 4/30/2016

STATE OF HAWAII  
**DEPARTMENT OF LAND AND NATURAL RESOURCES**  
ENGINEERING DIVISION

**GEOTHERMAL WELL PLUGGING AND ABANDONMENT SOH-1 AND SOH-2**  
PUNA DISTRICT, HAWAII, HAWAII

NOTES

DESIGNED: JH	SUBMITTED: <i>[Signature]</i>
DRAWN: YN	DATE: 2/23/2016
CHECKED: DN	SCALE: AS SHOWN
APPROVED: <i>[Signature]</i>	DRAWING NO. C-1

CHIEF ENGINEER DATE: APR 08 2016

JOB NO. J38CH20B - GEOTHERMAL WELL PLUGGING ABANDONMENT

**WASTE MANAGEMENT AND MATERIALS POLLUTION CONTROL:**

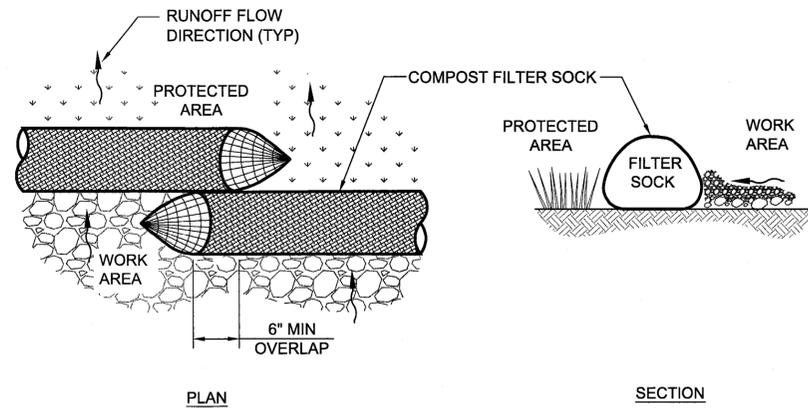
1. STORE ALL HAZARDOUS MATERIALS OFF-SITE OR IN THE DESIGNATED STAGING AND MATERIALS STORAGE AREA UNDER A COVERED AREA. DISPOSE OF ALL HAZARDOUS WASTE IN ACCORDANCE WITH FEDERAL AND STATE REGULATIONS.
2. STOCKPILE AND DUMPSTER AREAS SHALL NOT BE CLOSE TO CONCENTRATED STORM WATER RUNOFF FLOWING INTO STATE RECEIVING WATERS. STOCKPILING AREAS SHALL BE KEPT TO A MINIMUM AS MUCH AS POSSIBLE.
3. PROVIDE SEDIMENT CONTROL BMP'S AROUND ALL ACTIVE STOCKPILES PRIOR-TO AND DURING WET WEATHER EVENTS.
4. PROVIDE PLASTIC COVERS OVER ALL COLD-MIX STOCKPILES.
5. TRASH DUMPSTERS SHALL BE LEAK PROOF AND SHALL NOT BE OVERFILLED TO THE LEVEL WHERE THEIR COVERS CANNOT BE FULLY SHUT.
6. REMOVE ALL CONSTRUCTION AND DEMOLITION WASTES INCLUDING ASPHALT PAVEMENT, EXCAVATED SOIL, EXCAVATED ROCK, SITE TRASH, OR OTHER SOLID OR LIQUID WASTES TO A RECYCLING OR DISPOSAL FACILITY PERMITTED BY THE STATE OF HAWAII DEPARTMENT OF HEALTH.
7. THE CONTRACTOR SHALL PROVIDE ADEQUATELY SIZED CONCRETE TRUCK AND CONCRETE PUMP WASHOUT AREAS. DO NOT ALLOW CONCRETE WASH WATERS TO EXIT THE CONSTRUCTION SITE, ENTER STORM DRAINS OR FLOW INTO STATE RECEIVING WATERS.
8. SWEEP, VACUUM AND PROPERLY DISPOSE OF ALL ASPHALT OR CONCRETE SAW-CUT SLURRY. DO NOT ALLOW SAW-CUT SLURRY TO EXIT THE CONSTRUCTION SITE, ENTER STORM DRAINS OR FLOW INTO STATE RECEIVING WATERS.
9. PROVIDE TEMPORARY SANITARY FACILITIES. HAUL AND DISPOSE OF SANITARY WASTES PER THE APPLICABLE FEDERAL AND STATE REGULATIONS.

**SPILL CONTROL PLAN:**

1. A SPILL PREVENTION PLAN SHALL BE POSTED AND ADJUSTED TO INCLUDE A DESCRIPTION AND CAUSE OF EACH SPILL, MEASURES TO PREVENT AND CLEAN UP EACH SPILL.
2. THE CONTRACTOR SHALL BE THE SPILL PREVENTION AND CLEANUP COORDINATOR. THE CONTRACTOR SHALL DESIGNATE AT LEAST ONE SITE EMPLOYEE WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. THE NAMES OF RESPONSIBLE SPILL PERSONNEL SHALL BE POSTED IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.
3. MANUFACTURERS' RECOMMENDED METHODS FOR SPILL CLEANUP SHALL BE CLEARLY POSTED AND SITE PERSONNEL SHALL BE MADE AWARE OF THE PROCEDURES AND THE LOCATION OF THE INFORMATION AND CLEANUP SUPPLIES.
4. MATERIALS AND EQUIPMENT NECESSARY FOR SPILL CLEANUP SHALL BE KEPT IN THE MATERIAL STORAGE AREA ONSITE.
5. ALL SPILLS SHALL BE CLEANED UP IMMEDIATELY AFTER DISCOVERY. NOTIFY THE ENGINEER IMMEDIATELY OF ALL SPILLS.
6. THE SPILL AREA SHALL BE KEPT WELL VENTILATED AND PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH A HAZARDOUS SUBSTANCE.
7. SPILLS OF TOXIC HAZARDOUS MATERIAL SHALL BE REPORTED TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF THE SIZE.

**CONSTRUCTION STAGING AREAS**

1. STORE ALL MATERIALS WITHIN THE STAGING AREA UNLESS BEING ACTIVELY USED FOR CONSTRUCTION.
2. PROVIDE A DESIGNATED COVERED STORAGE AREA FOR HAZARDOUS MATERIALS.
3. PROVIDE SANITATION FACILITIES.
4. PROVIDE A DESIGNATED FUELING AREA WITH FUEL SPILL PREVENTION AND CLEANUP SUPPLIES.
5. NO VEHICLE OR EQUIPMENT MAINTENANCE IS ALLOWED IN THE STAGING AREA. PERFORM ALL VEHICLE AND EQUIPMENT CLEANING AND MAINTENANCE AT OFF-SITE LOCATION.
6. REMOVE AND DISPOSE OF ALL IMPORTED MATERIAL AND RESTORE STAGING AREA TO EXISTING CONDITIONS AFTER CONSTRUCTION IS COMPLETE.

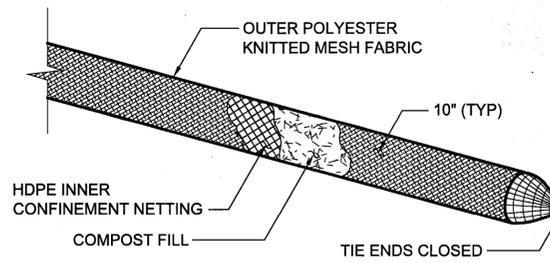


**NOTES:**

1. THE COMPOST FILTER SOCK SHALL BE INSPECTED AFTER EACH RAINFALL EVENT. MAKE REPAIRS AS NEEDED, OR AS DIRECTED BY THE ENGINEER.
2. IF THE COMPOST FILTER SOCK BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE COMPOST FILTER SOCK SHALL BE REMOVED, CLEANED, AND REPLACED.
3. DISPOSE OF SILT, SEDIMENT, AND DEBRIS AFTER EACH EVENT, OR AS DIRECTED BY THE ENGINEER.

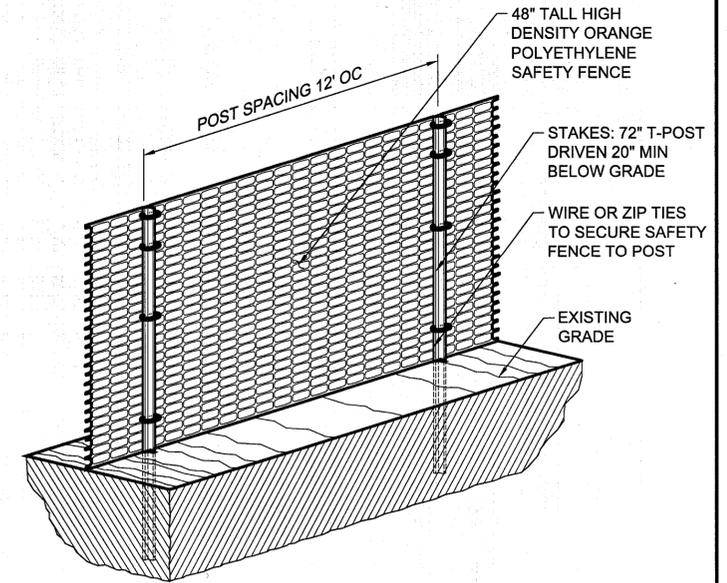
COMPOST FILTER SOCK FOR PERIMETER CONTROL

DETAIL A  
C-2  
SCALE: NONE



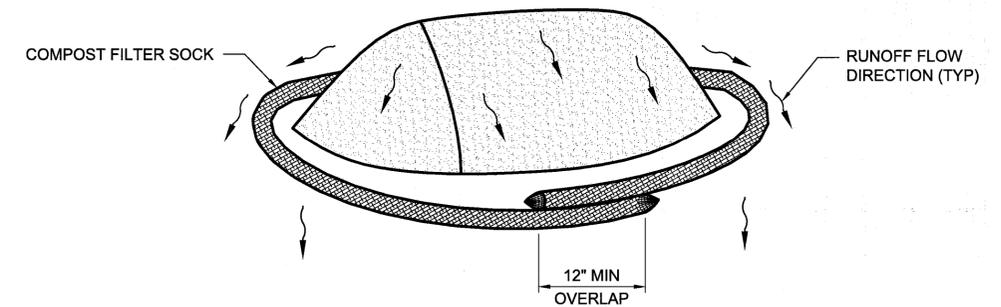
COMPOST FILTER SOCK MATERIALS

DETAIL B  
C-2  
SCALE: NONE



PERIMETER SAFETY FENCE

DETAIL C  
C-2  
SCALE: NONE

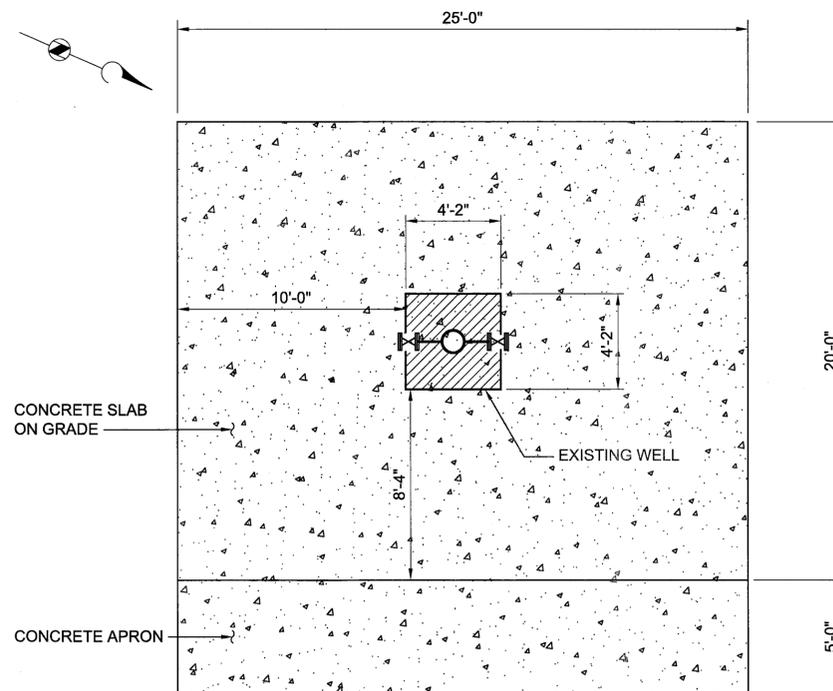


**NOTES:**

1. INSTALL COMPOST FILTER SOCK AROUND ALL STOCKPILES PRIOR-TO AND DURING RAINFALL EVENTS OR WHEN STOCKPILES ARE NOT BEING ACTIVELY USED.
2. THE COMPOST FILTER SOCK SHALL BE INSPECTED AFTER EACH RAINFALL EVENT. MAKE REPAIRS AS NEEDED, OR AS DIRECTED BY THE ENGINEER.
3. IF THE COMPOST FILTER SOCK BECOMES CLOGGED WITH SEDIMENT SO THAT IT NO LONGER ADEQUATELY PERFORMS ITS FUNCTION, THE COMPOST FILTER SOCK SHALL BE REMOVED, CLEANED, AND REPLACED.
4. DISPOSE OF SILT, SEDIMENT, AND DEBRIS AFTER EACH EVENT, OR AS DIRECTED BY THE ENGINEER.

COMPOST FILTER SOCK FOR STOCKPILE PROTECTION

DETAIL D  
C-2  
SCALE: NONE



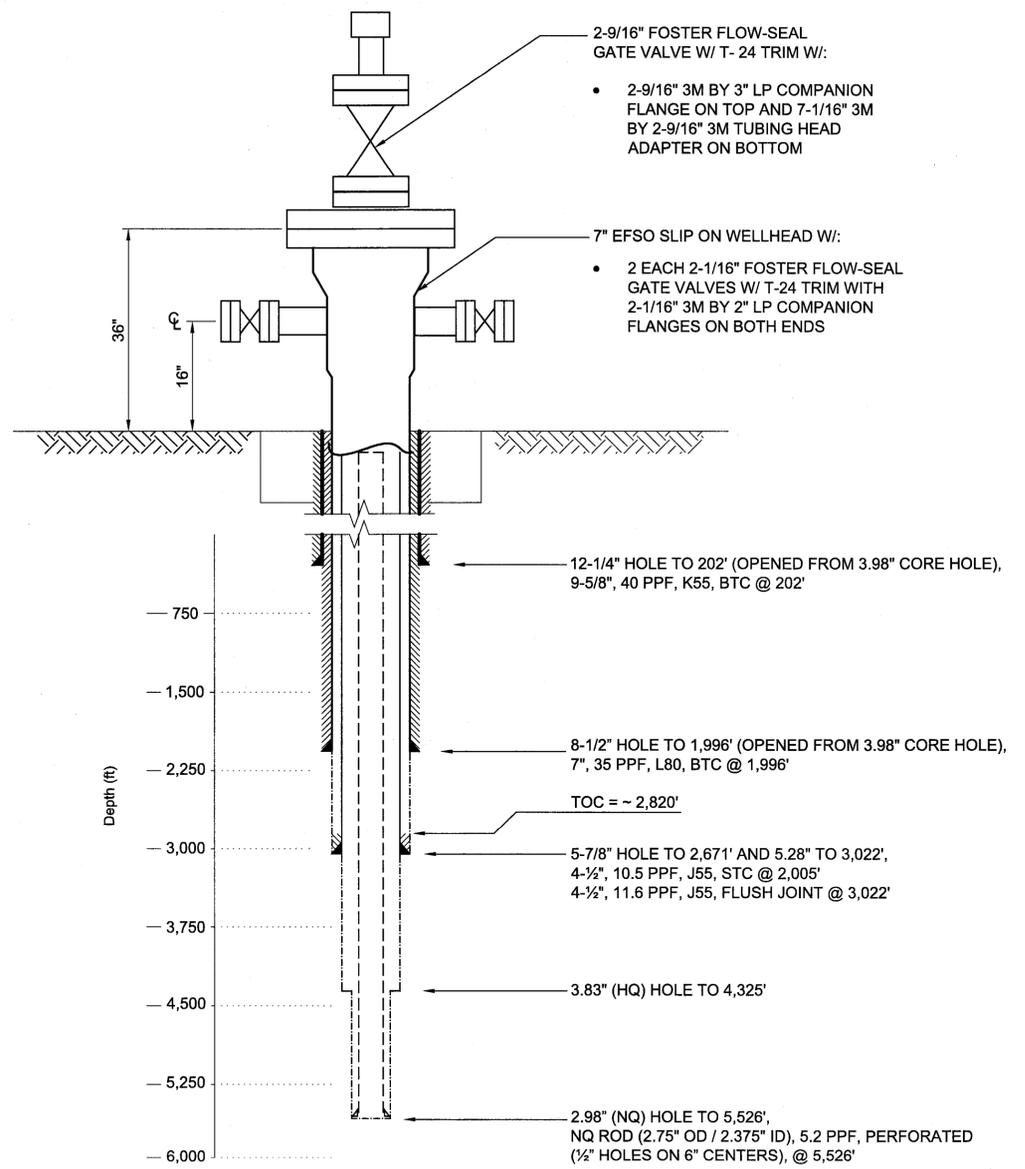
SOH - 1 WELL SITE PLAN (SOH - 2 WELL SIMILAR)  
PLAN  
SCALE: 1/8" = 1'-0"

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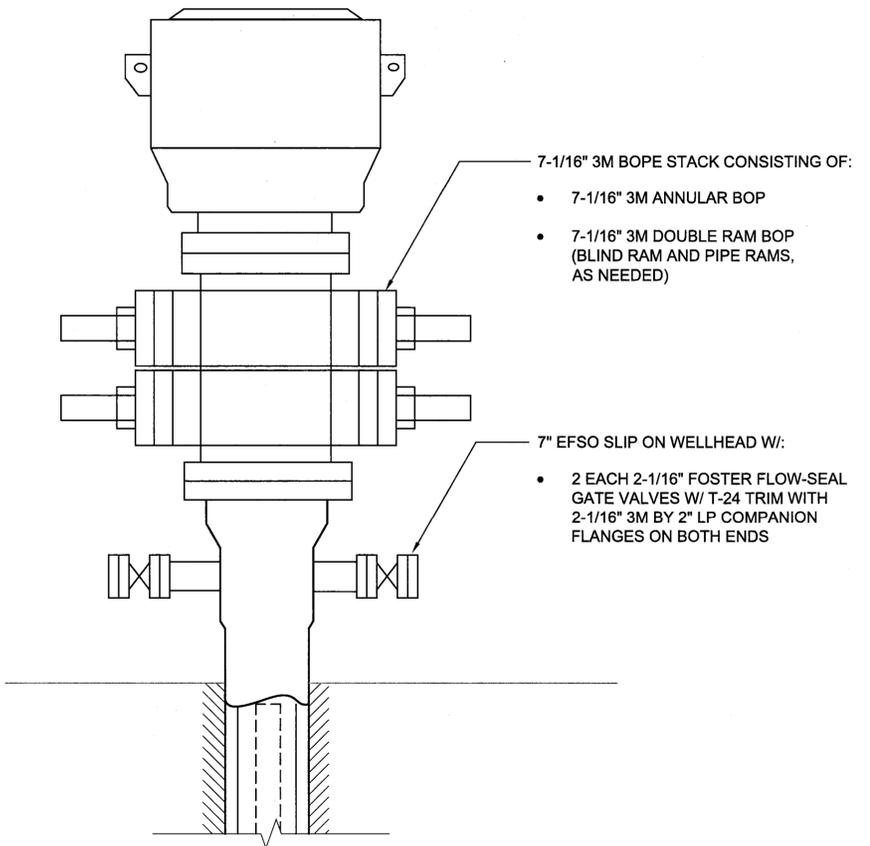
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JOB NO. J38CH20B - GEOTHERMAL WELL PLUGGING ABANDONMENT

2/24/2016 YNODA P:\PROJECTS\HAWAII, STATE OF (H)\146803 - GEOTHERMAL WELL PLUGGING DESIGN\CAD\2-SHEETS\CIVIL\146803-SF-C-003.DWG



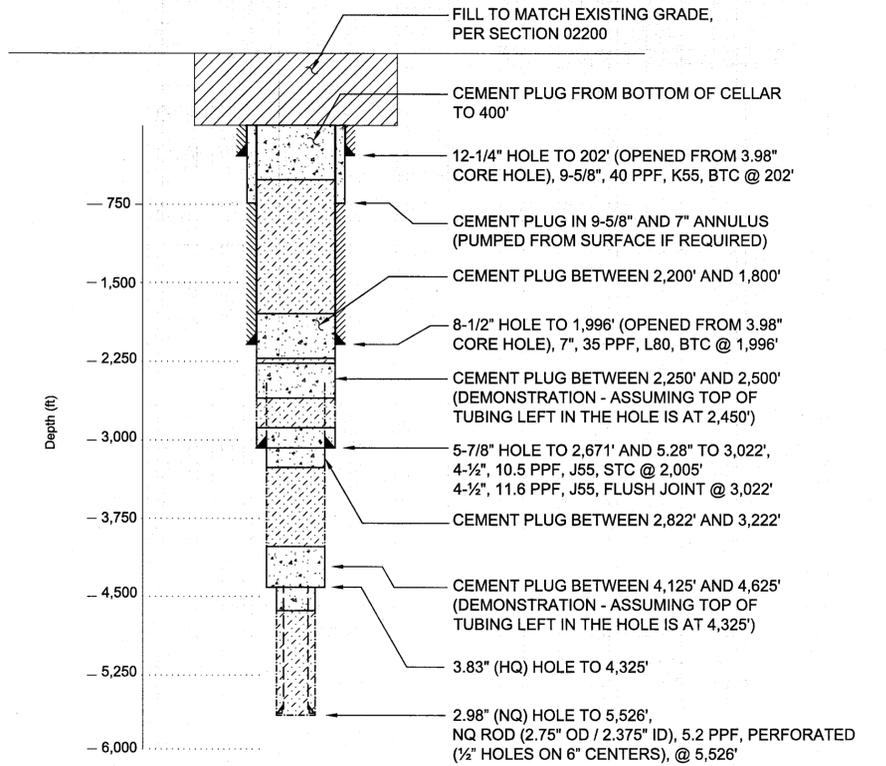
EXISTING SOH- 1 WELL AND WELLHEAD DIAGRAM  
NOT TO SCALE



SOH- 1 BLOWOUT PREVENTION EQUIPMENT (BOPE) DIAGRAM  
NOT TO SCALE

**LEGEND**

BOPE	BLOWOUT PREVENTION EQUIPMENT
BWOC	BY WEIGHT OF CEMENT
EFSO	EXTERNAL FLANGED SIDE OUTLET
ID	INTERNAL DIAMETER
EUE	EXTERNAL UPSET END
MIRU	MOVE IN AND RIG UP
NU	NIPPLE UP
OD	OUTER DIAMETER
POH	PULL OUT OF THE HOLE
PPB	POUNDS PER BARREL
PPF	POUNDS PER FOOT
RDMO	RIG DOWN AND MOVE OFF
STC	SHORT THREADED AND COUPLED
TD	TOTAL DEPTH
WOC	WAIT ON CEMENT
XO	CROSS OVER
	20 PPB BENTONITE MUD
	PREMIUM CEMENT WITH 40% BWOC SILICA FLOUR



SOH- 1 CEMENT AND BENTONITE PLUG INTERVALS  
NOT TO SCALE

**GENERAL NOTES:**

1. ALL MUD USED IN ABANDONMENT WILL HAVE 20 PPB BENTONITE (CHEMICAL THINNERS MAY BE USED IF NECESSARY).
2. ALL CEMENT WILL BE PREMIUM CEMENT WITH AT LEAST 40% BWOC SILICA FLOUR AND ADDITIVES AS NEEDED TO REDUCE FRICTION AND PREVENT PREMATURE THICKENING DURING PUMPING AND DISPLACING.

REVISION NO.	SYM.	DESCRIPTION	SHT OF	DATE	APPROVED

WILLIAM M. RICKARD  
Exp. 12-31-17  
PETROLEUM  
No. 23001

JENNIFER A. HOIDA  
LICENSED PROFESSIONAL ENGINEER  
No. 9792-C  
HAWAII, U.S.A.

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

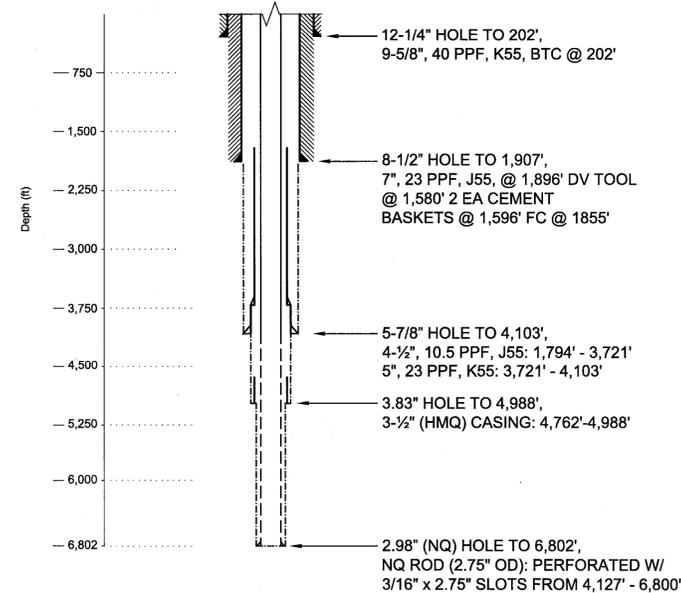
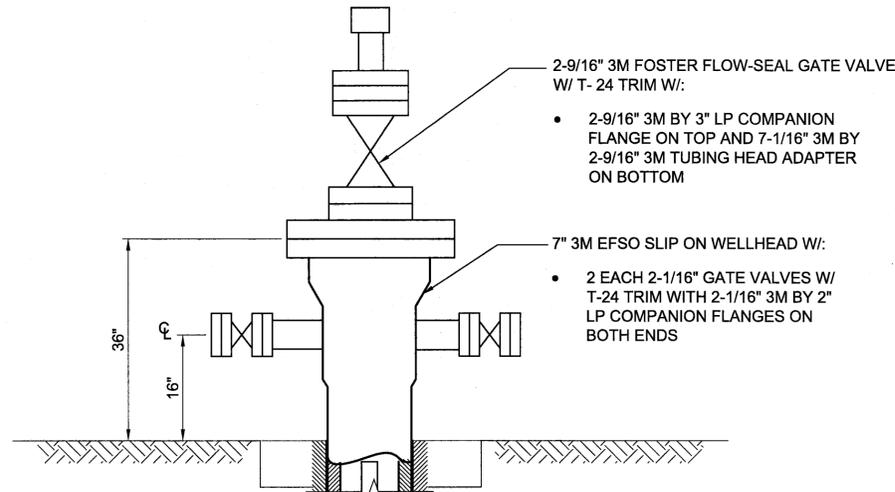
**GEOTHERMAL WELL PLUGGING AND ABANDONMENT SOH-1 AND SOH-2**  
PUNA DISTRICT, HAWAII, HAWAII

SOH - 1 WELL PLUGGING AND ABANDONMENT

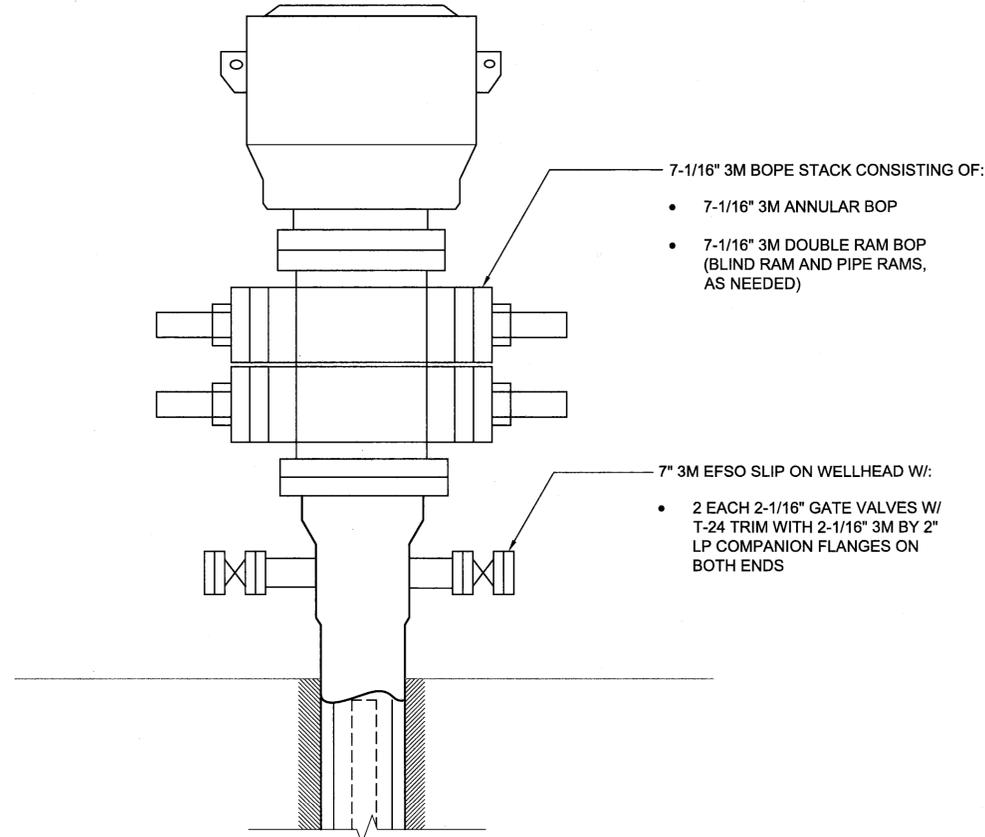
DESIGNED: JH	SUBMITTED:
DRAWN: YN	DATE: 2/23/2016
CHECKED: DN	SCALE: AS SHOWN
APPROVED:	DRAWING NO. C-3

EXPIRATION DATE OF LICENSE - 4/30/2016

JOB NO. J38CH20B - GEOTHERMAL WELL PLUGGING ABANDONMENT



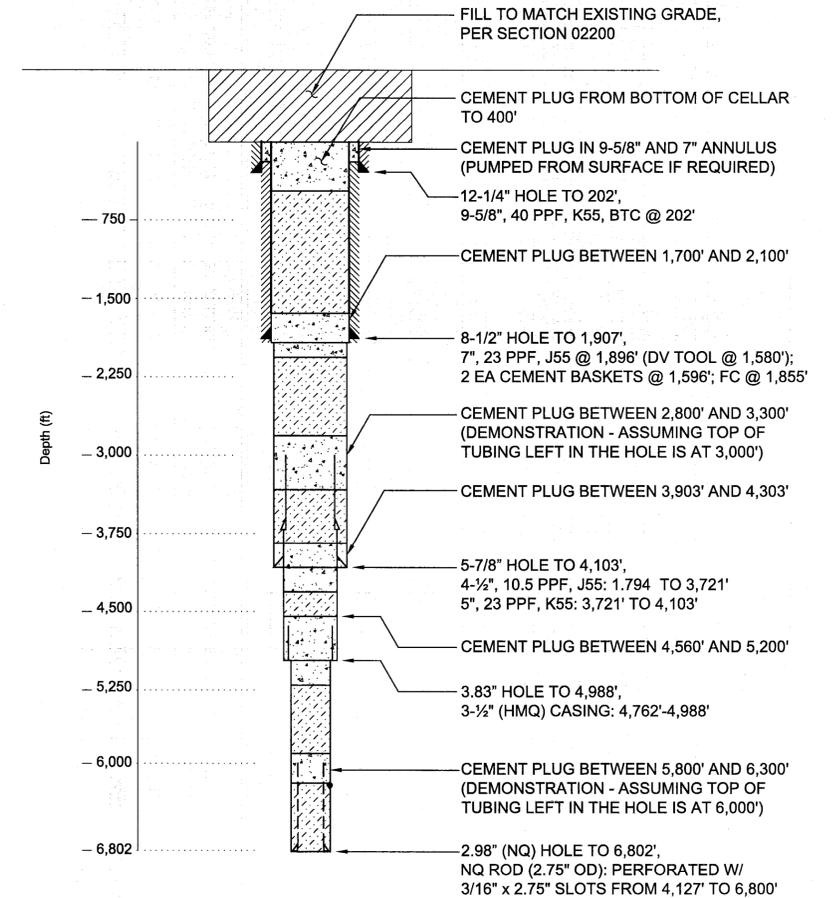
EXISTING SOH- 2 WELL AND WELLHEAD DIAGRAM  
NOT TO SCALE



SOH- 2 BLOWOUT PREVENTION EQUIPMENT (BOPE) DIAGRAM  
NOT TO SCALE

LEGEND

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BWOC	BY WEIGHT OF CEMENT
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SOH- 2 CEMENT AND BENTONITE PLUG INTERVALS  
NOT TO SCALE

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2/24/2016 YONDA P:\PROJECTS\HAWAII, STATE OF (H)\146503 - GEOTHERMAL WELL PLUGGING DESIGN\CAD\2-SHEET\SC-CIVIL\146503-SF-C-004.DWG

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED

WILLIAM M. RICKARD  
PROFESSIONAL ENGINEER  
PETROLEUM  
No. 23001  
Exp. 12-31-17

JENNIFER A. HONDA  
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**GEOTHERMAL WELL PLUGGING AND ABANDONMENT SOH-1 AND SOH-2**  
PUNA DISTRICT, HAWAII, HAWAII

**SOH - 2 WELL PLUGGING AND ABANDONMENT**

DESIGNED: JH	SUBMITTED:
DRAWN: YN	DATE: 2/23/2016
CHECKED: DN	SCALE: AS SHOWN
APPROVED:	DATE: APR 08 2016
CHIEF ENGINEER	DRAWING NO. C-4

JOB NO. J38CH20B - GEOTHERMAL WELL PLUGGING ABANDONMENT