STATE OF HAWAII

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

PLANS

FOR

FURNISHING LABOR AND MATERIALS FOR

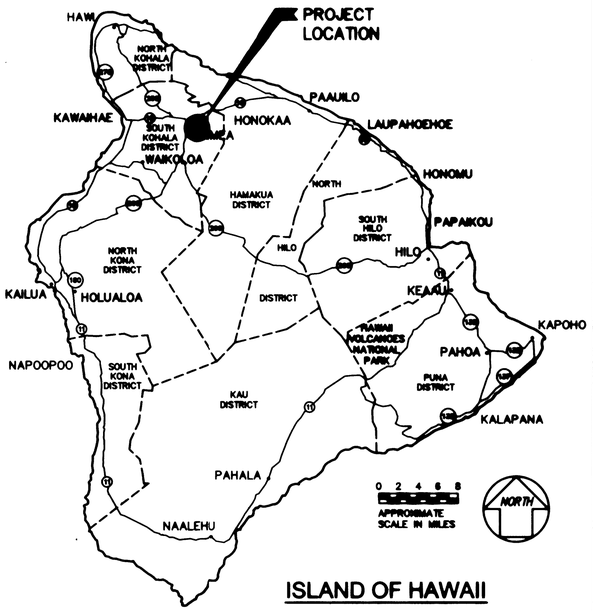
Puukapu Non-Potable Water System Operation and Maintenance Services

KAMUELA, SOUTH KOHALA, ISLAND OF HAWAII, HAWAII

T.M.K. (3) 6-4-35, 36, 37, 38

IFB No.: IFB-20-HHL-013

January 2020



ISLAND OF HAWAII

STATE OF HAWAII

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU

HYBRID WATER SYSTEM

WAIMEA, SOUTH KOHALA, HAWAII

IFB-09-HHL-008

TAX MAP KEY : (3) 6-4-01: 32-38, 41-45, 51, 53, and 54

PREPARED BY:

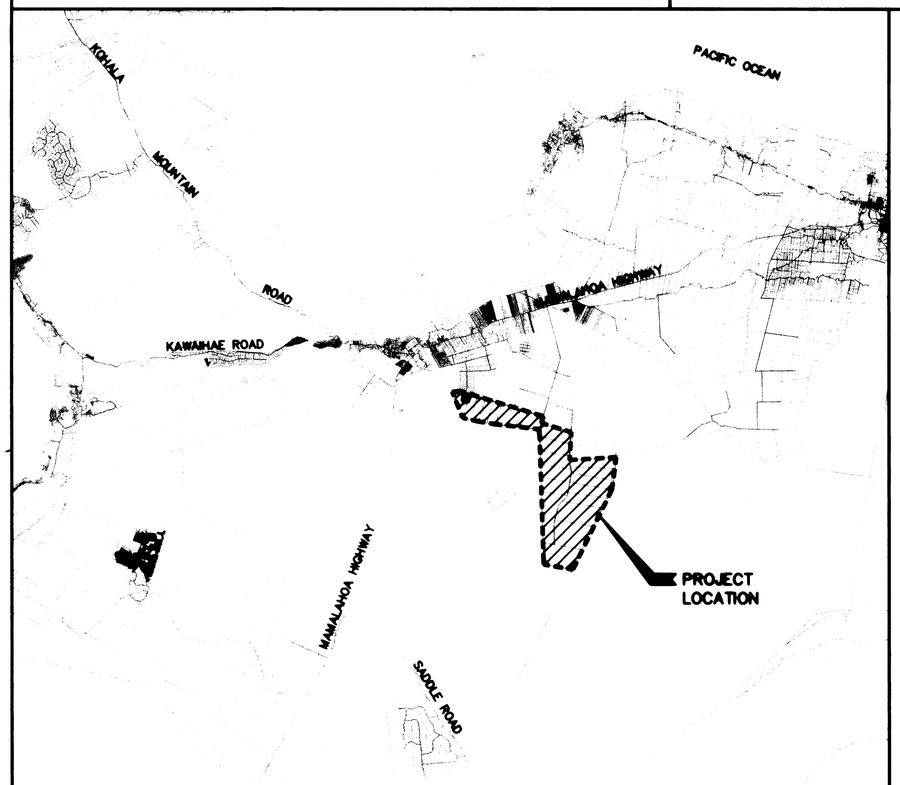
AKINAKA & ASSOCIATES, LTD.

3049 UALENA ST., SUITE 500

HONOLULU, HAWAII 96817

MATTHEW K. FUJIOKA LICENSED PROFESSIONAL ENGINEER No. 11470-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION



LOCATION MAP

APPROVED BY:

CHAIRMAN, HAWAIIAN HOMES COMMISSION
STATE OF HAWAII — DATE 6/4/09

~~DIRECTOR, PLANNING DEPARTMENT~~
~~COUNTY OF HAWAII~~ — ~~DATE~~

~~CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION~~
~~DEPARTMENT OF HEALTH, STATE OF HAWAII~~ — ~~DATE~~

~~SANDWICH ISLES COMMUNICATION, INC.~~ — ~~DATE~~

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE 11/10/10

INDEX TO DRAWINGS

Last Save by: MKF
Last Saved: 5/7/2009
Plotted on: 6/2/2009
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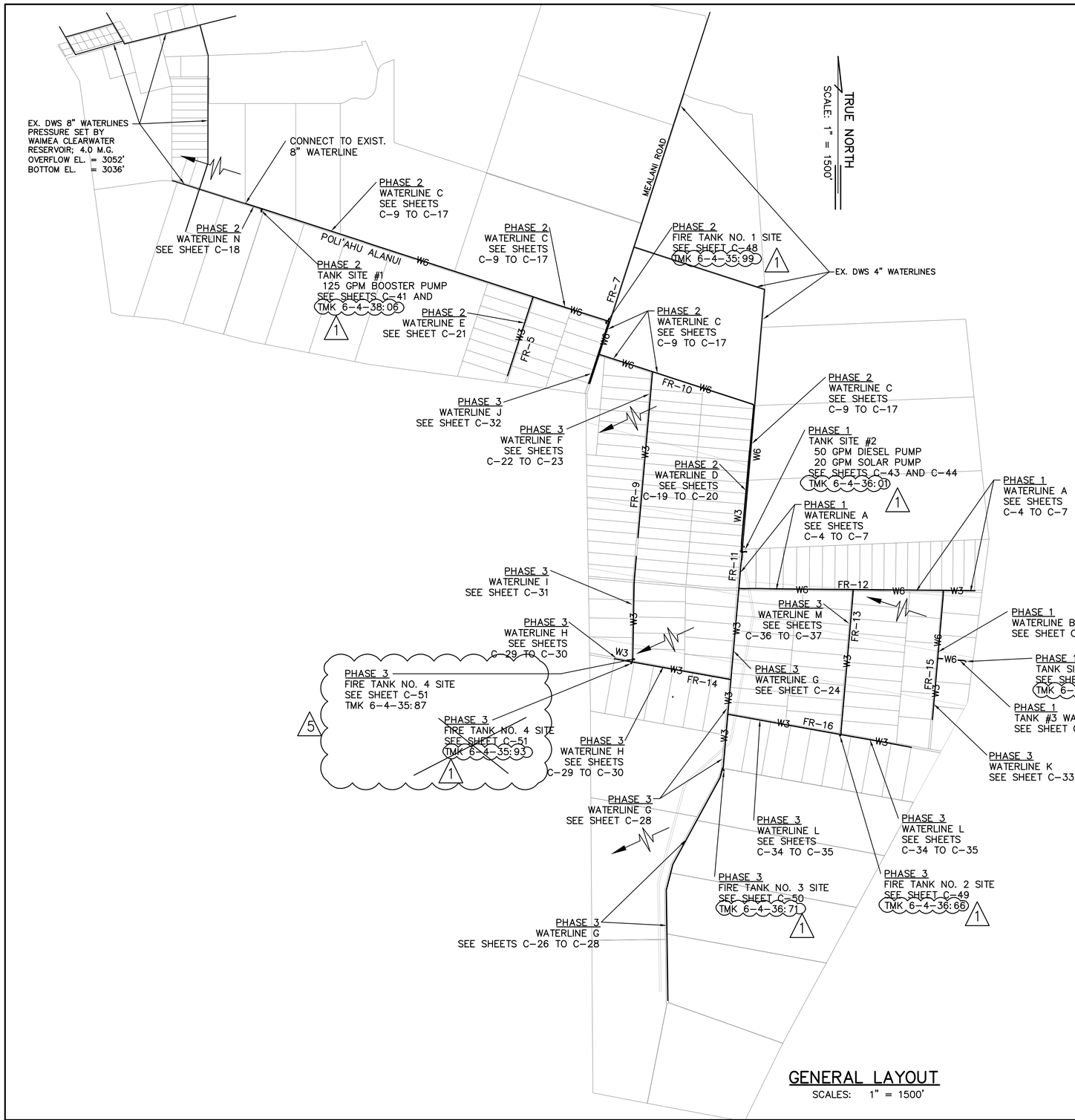
PUUKAPU HYBRID WATER SYSTEM



GENERAL LAYOUT

SCALES: 1" = 1500'

WATERLINE NOTES (APPLICABLE FOR WATER SYSTEM UP TO THE MASTER METER AND BACKFLOW PREVENTION ASSEMBLY)

1. ALL WORK SHALL BE DONE ACCORDING TO THE WATER SYSTEM STANDARDS, STATE OF HAWAII, DATED 2002, AS AMENDED.
2. THE CONTRACTOR SHALL INFORM THE D.W.S. ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND ONE WEEK PRIOR TO ANY CONNECTION, CHLORINATION, SHUT-OFF OR RELOCATION.
3. THE CONTRACTOR SHALL PAY FOR ALL WORK, EQUIPMENT AND MATERIAL FURNISHED BY THE D.W.S.
4. ALL EXISTING WATERLINE, WATERLINE APPURTENANCES AND OTHER 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 COSTS FOR DAMAGES DURING THE CONTRACT PERIOD.
5. WHERE WATER SHUT-OFF OF MORE THAN 3-HOURS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN COST, SHALL PROVIDE A TEMPORARY BYPASS LINE, SIZE OF WHICH SHALL BE DETERMINED BY THE D.W.S. ENGINEER. THE D.W.S. ENGINEER, ALSO RESERVES THE RIGHT TO REQUIRE THE BYPASS LINES, REGARDLESS OF THE WATER SHUT-OFF PERIOD, IF IT IS DEEMED NECESSARY.
6. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 8-FEET (CLEAR SPACE - NOT CENTERLINE TO CENTERLINE) FOR ROAD RIGHT-OF-WAYS OF 50 FEET OR LESS, AND 10-FEET FOR ROAD RIGHT-OF-WAYS OF MORE THAN 50 FEET.
7. 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. UTILIZE PERPENDICULAR CROSSINGS WHERE PRACTICAL. FOR WATERLINES, CENTER FULL PIPE LENGTHS AT UTILITY CROSSINGS WHENEVER POSSIBLE.
8. ALL FITTINGS (MINIMUM CLASS 250) AND ALL GATE VALVES (RESILIENT TYPE, CLASS 200) SHALL BE DUCTILE IRON, WITH MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED. BUTTERFLY VALVES (MJ) SHALL BE CLASS 250 WITH FUSION EPOXY COATED INTERIOR UNLESS OTHERWISE SPECIFIED. SLOPE OF PIPE INVERT AT VALVE LOCATIONS SHALL NOT EXCEED 6% - ADJUST PIPE AS APPROPRIATE PER STANDARDS.
9. 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), UNDER D.W.S. SUPERVISION.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHLORINATION OF THE WATER SYSTEM PER THE MOST CURRENT STANDARDS GOVERNING AGENCIES AND SHALL BEAR ALL COSTS(S). THE PERSON(S) ENGAGED TO DO THE CHLORINATION WORK MUST HAVE THE APPROPRIATE LICENSE TO PERFORM THE WORK IN THE STATE OF HAWAII. THE D.W.S. WILL NOT ASSUME OWNERSHIP OF NOR GRANT ANY WATER SERVICE TO THE SUBDIVISION UNTIL THE SUBDIVISION WATER SYSTEM IS DEDICATED TO THE D.W.S. ALONG WITH ALL NECESSARY EASEMENTS AND DOCUMENTS.
11. ALL CONNECTIONS TO THE EXISTING WATER SYSTEM SHALL BE DONE BY THE D.W.S. THE CONTRACTOR SHALL PERFORM ALL EXCAVATION, BACKFILL, ROAD REPAIR, TRAFFIC CONTROL, AND PROVIDE EQUIPMENT AND MATERIALS NECESSARY TO COMPLETE THE CONNECTION.
12. OUTSIDE OF STATE ROAD RIGHT-OF-WAYS: MINIMUM COVER ON WATER SYSTEM PIPELINES 4-INCH THROUGH 8-INCH TO BE 2.0 FEET. MINIMUM COVER ON 12-INCH PIPELINES TO BE 2.5 FEET. MINIMUM COVER ON PIPELINES GREATER THAN 12-INCH TO BE 3.0 FEET. MAXIMUM COVER ON PIPELINES NOT TO EXCEED 5 FEET UNLESS APPROVED BY THE MANAGER OF D.W.S.
13. ALL WATER SYSTEM PIPELINES, 4-INCHS OR LARGER IN DIAMETER, SHALL BE DUCTILE IRON, PUSH ON JOINTS, CLASS 52, AND ALL PIPELINES SMALLER THAN 4-INCHES IN DIAMETER SHALL BE SOFT COPPER, TYPE "K", UNLESS OTHERWISE SPECIFIED.
14. PIPE JOINT RESTRAINTS FOR MECHANICAL JOINT (MJ) FITTINGS AND MJ VALVES SHALL BE "MEGALUG" SERIES AS MANUFACTURED BY EBAA IRON, INC., OR AN APPROVED EQUAL (WEDGE TYPE), WHERE EVER CALLED FOR ON THE PLANS AND SPECIFICATIONS.
15. RELOCATION OF EXISTING METERS SHALL BE DONE BY OR UNDER DWS SUPERVISION. RELOCATIONS OF CUSTOMER SERVICE LINES TO RELOCATED METERS SHALL BE COPPER (TYPE "K") AND DONE BY THE CONTRACTOR. ALL WORK AND MATERIALS SHALL BE PROVIDED BY THE CONTRACTOR AND CONSIDERED INCIDENTAL TO THE RELOCATION WORK. EXISTING METER BOXES DAMAGED BY THE CONTRACTOR SHALL BY REPLACED AT THE CONTRACTOR'S COST. WHERE APPLICABLE, A DIELECTRIC UNION SHALL BE USED TO CONNECT THE COPPER PIPE TO THE CUSTOMER'S G.I. PIPE.
16. ALL NEWLY INSTALLED WATERLINES SHALL HAVE A 4 MIL. THIICK 6" WIDE, NON METALLIC BLUE WARNING TAPE OVER CENTERLINE OF PIPE LABELED "CAUTION-WATERLINE BURIED BELOW" PLACED 12" BELOW FINISHED GROUND ALONG THE ENTIRE LENGTH OF THE TRENCH.
17. CONSTRUCTION PROJECTS REQUIRING TEMPORARY WATER SERVICE SHALL BE METERED AND PAID FOR BY THE CONTRACTOR.
18. THE CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN AND CERTIFY THE RECORD DRAWINGS (AS-BUILT DRAWINGS) AS TO ACCURACY AND AS-BUILT CONDTION, AND THE LICENSED ENGINEER SHALL CERTIFY THE DRAWING. THE CONTRACTOR SHALL THEN SUBMIT THE DRAWINGS AND AS-BUILT TRACINGS TO THE DWS.

1500' 0 1500' 3000'

SCALE: 1" = 1500'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
4/05/11	PCD 5 - RELOCATE FIRE TANK #4	A&A	
1/19/2010	PCD 1 - REV. TMKS	A&A	

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

GENERAL LAYOUT

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 4/7/2011
Plotted on: 6/23/2011
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SHEET 2 OF 70 SHEETS

GENERAL NOTES

1. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSION AND EXISTING CONDITIONS AND SHALL NOTIFY THE CONTRACTING OFFICER IN WRITING, OF ANY DISCREPANCIES BETWEEN THE CONTRACT DOCUMENTS AND EXISTING CONDITIONS PRIOR TO COMMENCING THE WORK. COMMENCEMENT OF WORK SHALL INDICATE THE CONTRACTOR'S ACCEPTANCE OF EXISTING CONDITIONS.
2. ALL ITEMS AND MATERIALS SHOWN ON THE DRAWINGS ARE NEW UNLESS OTHERWISE NOTED.
3. THE CONTRACTOR SHALL OBSERVE, COMPLY WITH, AND ACCOMPLISH ALL WORK IN STRICT ACCORDANCE WITH ALL THE LATEST LOCAL, STATE AND FEDERAL LAWS, REGULATIONS AND STANDARDS HAVING JURISDICTION OVER THIS PROJECT FOR THE PROTECTION OF PUBLIC HEALTH, SAFETY AND ENVIRONMENTAL QUALITY.
4. ALL WORK SHALL CONFORM TO THE UNIFORM BUILDING CODE (UBC) 1997 OR THE LATEST EDITION, AS AMENDED AND ADOPTED BY THE COUNTY OF HAWAII.
5. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL UTILITIES, WHETHER SHOWN ON THE DRAWINGS OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF THESE ITEMS IN THE EVENT OF DAMAGE DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES.
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE RESULTING FROM THE PERFORMANCE OF HIS WORK UNDER THIS CONTRACT. ANY AND ALL DAMAGES SHALL BE CORRECTED AT THE CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE CONTRACTING OFFICER. PATCH AND FINISH ALL DAMAGED SURFACES OR AS DIRECTED BY THE CONTRACTING OFFICER.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING BARRIERS AROUND THE CONSTRUCTION AREA AND SAFE DETOUR ROUTES FOR PEDESTRIANS, AS PER THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) 4.1.1(4).
8. THE CONTRACTOR SHALL RE-CONTOUR EXISTING GRADES AS NECESSARY TO CREATE PROPERLY FUNCTIONING SWALES, TRENCH DRAINS, SIDEWALK TRENCH OR PIPE DRAINS FOR CLEAR INLETS AND OUTLETS TO "DAYLIGHT".
9. ALL CONSTRUCTION SHALL BE FULLY ACCESSIBLE AND COMPLY WITH THE ADAAG REQUIREMENTS, SECTION 4.1.1(3).
10. CONSTRUCTION LAYOUT SHALL BE DONE BY A LICENSED CIVIL ENGINEER OR LICENSED SURVEYOR.

PUBLIC HEALTH, SAFETY AND CONVENIENCE NOTES

1. THE CONTRACTOR, AT HIS/HER OWN EXPENSE, SHALL KEEP THE PROJECT AND ITS SURROUNDING AREAS FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH. THE CITY SHALL REQUIRE SUPPLEMENTARY MEASURES IF REQUIRED.
2. 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.
3. THE CONTRACTOR'S ATTENTION IS DIRECTED TO CHAPTER 46 PUBLIC HEALTH REGULATIONS DEPARTMENT OF HEALTH, STATE OF HAWAII, "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 PUBLIC 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. APPLICATION AND INFORMATION ON VARIANCES ARE AVAILABLE AT THE ENVIRONMENTAL HEALTH SERVICES DIVISION, 591 ALA MOANA BOULEVARD, HONOLULU, HAWAII 96813 OR BY TELEPHONE (586-4700).

CONSTRUCTION NOTES

1. 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 DEPARTMENTS OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
2. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES, APPURTENANCES AND STRUCTURES AS SHOWN ON THESE DRAWINGS WERE COMPILED FROM RECORD DRAWINGS PROVIDED BY UTILITY AND GOVERNMENT AGENCIES AND FROM THE ENGINEER'S MEASUREMENTS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO THE EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
3. THE CONTRACTOR SHALL OBTAIN ALL PERMITS AND LICENSES, PAY ALL CHARGES, FEES AND TAXES, GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS DRAWN AND SPECIFIED.
4. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
5. THE CONTRACTOR SHALL PROVIDE ACCESS TO AND FROM DRIVEWAYS AND PUBLIC STREETS AT ALL TIMES EXCEPT AS NOTED ON THE PLANS.
6. WHEN TRENCH EXCAVATION IS ADJACENT TO OR UNDER EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPERLY SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE FROM POSSIBLE SLIDES, CAVE-INS AND SETTLEMENT AND FOR PROPERLY SUPPORTING EXISTING STRUCTURES AND FACILITIES WITH BEAMS, STRUTS OR UNDER-PINNING TO FULLY PROTECT THEM FROM DAMAGE.
7. BACKFILL UNDER EXISTING STRUCTURES OR FACILITIES SHALL BE SANDY OR GRANULAR MATERIAL COMPLETELY PLACED AS SOON AS THE PIPE IS LAID AND TESTED. THE BACKFILL MATERIAL SHALL BE RAMMED WITH PROPER TOOLS UNTIL COMPACTED TO 90 TO 95 PERCENT OF ITS MAXIMUM DENSITY.
8. 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 CONTRACTING OFFICER.
9. THE CONTRACTOR SHALL NOTIFY ALL AGENCIES TO VERIFY THE ACTUAL LOCATIONS OF ALL UTILITIES IN THE PROJECT AREA PRIOR TO EXCAVATION. THE CONTRACTOR SHALL COORDINATE ALL WORK.
10. THE CONTRACTOR SHALL RESTORE TO THEIR ORIGINAL CONDITION ALL IMPROVEMENTS DAMAGED AS A RESULT OF THE CONSTRUCTION, INCLUDING PAVEMENTS, EMBANKMENTS, CURBS, SIGNS, LANDSCAPING, STRUCTURES, UTILITIES, WALLS, FENCES, ETC. UNLESS PROVIDED FOR SPECIFICALLY IN THE PROPOSAL, DEMOLITION AND RESTORATION OF EXISTING ITEMS SHALL BE INCIDENTAL AND INCLUDED WITHIN THE AMOUNT PAID FOR UNCLASSIFIED TRENCH EXCAVATION.
11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING/RECONSTRUCTING ALL CONCRETE CURBS AND GUTTERS, AND SIDEWALKS DAMAGED DURING CONSTRUCTION.
12. 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 TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL". BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
13. NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATER COURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.

GRADING NOTES

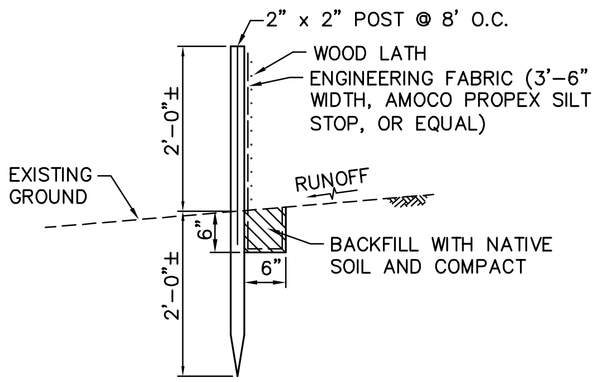
1. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
2. 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.
3. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
4. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
5. WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
6. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
7. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.
8. IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.
9. NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHALL COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE VIOLATOR. FURTHERMORE, VIOLATORS SHALL BE SUBJECTED TO ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES.

EROSION / TEMPORARY DUST CONTROL NOTES

1. DURING CONSTRUCTION, PREVENTIVE MEASURES SHALL BE USED TO CONTROL FORESEEABLE DUST, EROSION OR SEDIMENTATION PROBLEMS WHICH MAY ARISE AS THE JOB PROGRESSES.
2. DRAINAGE SYSTEMS AS SHOWN ON THE CONSTRUCTION PLANS SHALL BE CONSTRUCTED AS EARLY AS PRACTICABLY POSSIBLE.
3. ALL FILL, SUBBASE AND BASE MATERIAL PLACED WITHIN THE ROAD PAVEMENT PRISM SHALL BE SUBSTANTIALLY COMPACTED BY THE END OF THE DAY.
4. THE CONTRACTOR SHALL CONDUCT HIS GRADING OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED WITH WATER DURING HIS GRADING OPERATIONS AT ALL TIMES.
5. WATER TRUCK AND/OR TEMPORARY SPRINKLERS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES TO ENSURE BARE EARTH DOES NOT CREATE A DUST PROBLEM.

WATER NOTES

1. ALL MATERIAL AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES UP TO THE 4" MASTER METER SHALL BE IN ACCORDANCE WITH THE COUNTY OF HAWAII'S "WATER SYSTEM STANDARDS", DATED 2002, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, UNLESS OTHERWISE SPECIFIED.
2. CONTRACTOR SHALL VERIFY ALL CONDITIONS AT PROJECT SITE INCLUDING EXISTING STRUCTURES AND SITE CONDITIONS BEFORE COMMENCING WORK AND NOTIFY THE ENGINEER OF ANY CONFLICTS IN THE DRAWINGS AND SPECIFICATIONS.
3. CONTRACTOR SHALL VERIFY AND CHECK ALL DIMENSIONS AND DETAILS SHOWN ON THE DRAWINGS PRIOR TO START OF CONSTRUCTION. THE CONTRACTORS SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY DISCREPANCY OR CONFLICT FOUND IN THE FIELD PRIOR TO OR DURING THE COURSE OF CONSTRUCTION AND SHALL NOT PROCEED WITH CONSTRUCTION UNTIL THE DISCREPANCY OR CONFLICT IS RESOLVED. DIMENSIONS SHOWN ARE TYPICALLY TO THE WALL FINISH, UNLESS INDICATED OTHERWISE.
4. COORDINATE ALL OPERATIONS WITH THE DHHL WEST HAWAII SUPERVISOR FOR MATERIAL STORAGE, DELIVERY ACCESS TO AND FROM WORK SITE, SPECIAL NOISY OPERATIONS, TIMING OF WORK, SEQUENCE OF OPERATIONS, INTERRUPTION OF MECHANICAL AND ELECTRICAL UTILITIES, ETC. REFER TO THE SPECIFICATIONS FOR ANY WORK PHASING REQUIREMENTS.
5. EXISTING AREAS DAMAGED AS A RESULT OF WORK DONE UNDER THIS CONTRACT SHALL BE REPAIRED AND FINISHED TO MATCH THE ADJACENT FINISHES.
6. COORDINATE CONTRACTOR MOBILIZATION SCHEDULE, STORAGE, EQUIPMENT, AND ACCESS TO THE SITE WITH THE DHHL WEST HAWAII SUPERVISOR.
7. VERIFY LOCATIONS OF ALL UTILITY LINES, CONDUITS, SURFACE OR SUB-SURFACE STRUCTURES, ETC. OF ANY NATURE THAT MAY BE AFFECTED BY THE WORK BEFORE STARTING WORK.
8. CONTRACTOR SHALL, AT ALL TIME, DURING THE COURSE OF WORK, KEEP THE CONSTRUCTION AREA, THE OWNER'S PREMISES, INCLUDING STREETS, ACCESS ROAD, AND OTHER AREAS USED BY THE CONTRACTOR CLEAN AND FREE FROM ACCUMULATION OF WASTE MATERIALS AND RUBBISH.
9. CONTRACTOR SHALL PROTECT NEW AND EXISTING WORK, EQUIPMENT, MATERIALS AND FINISHES. DAMAGED ITEMS SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR.
10. AT THE COMPLETION OF THE WORK, ALL SURPLUS MATERIALS AND DEBRIS SHALL BE REMOVED FROM THE RESERVOIR PREMISES AND THOROUGHLY CLEANED UP TO THE SATISFACTION OF THE ENGINEER AND DHHL WEST HAWAII SUPERVISOR.
11. PAYMENT FOR ITEMS OF WORK SPECIFIED IN THE DRAWINGS, SPECIAL PROVISIONS AND SPECIFICATIONS FOR WHICH PAYMENT IS NOT SPECIFIED SHALL NOT BE MADE DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS ITEMS IN THE PROPOSAL AND NO ADDITIONAL PAYMENT SHALL BE MADE.



SILT FENCE
NOT TO SCALE

MANAGER, DEPARTMENT OF WATER SUPPLY DATE
COUNTY OF HAWAII

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

GENERAL NOTES

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

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Last Saved: 10/4/2010
Plotted on: 6/23/2011
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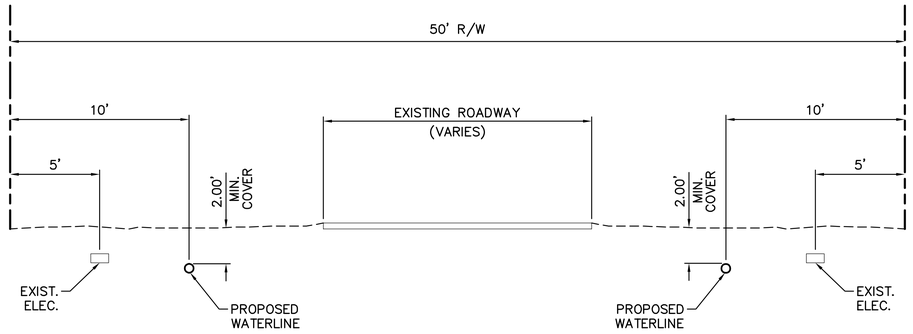
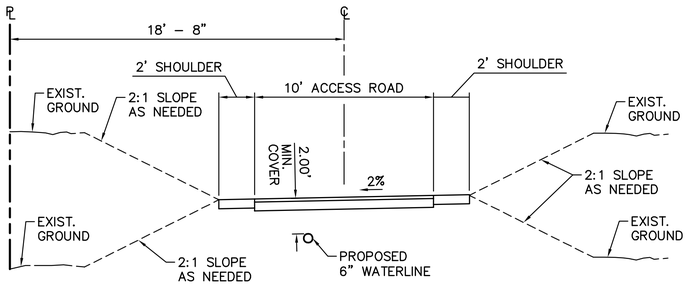
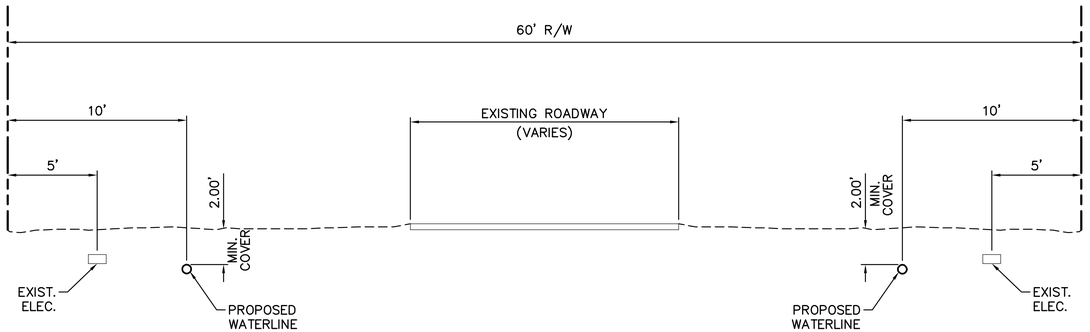


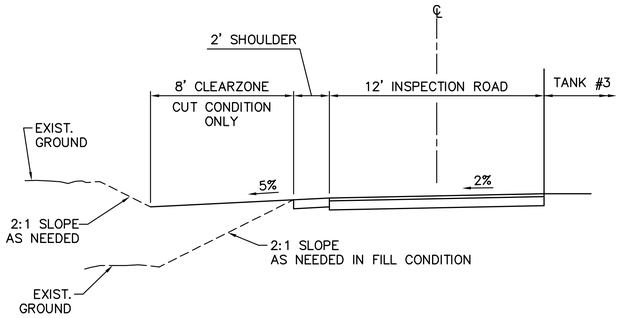
TYPICAL 50' RIGHT-OF-WAY



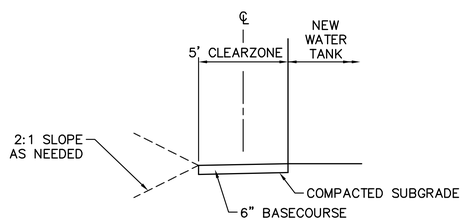
TANK #3 ACCESS ROAD



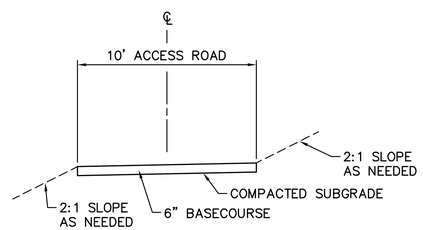
TYPICAL 60' RIGHT-OF-WAY



TANK #3 INSPECTION ROAD



CLEARZONE SECTION



TYPICAL ACCESS ROAD

TYPICAL SECTIONS

SCALE: 1" = 4'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

TYPICAL SECTIONS

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

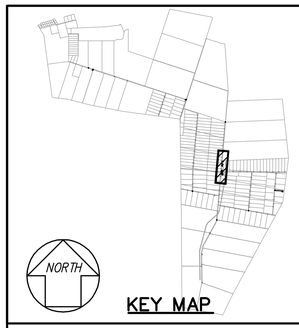
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

C-3

SHEET 4 OF 70 SHEETS

Last Save by: RKI
Last Saved: 2/17/2010
Plotted on: 6/23/2011
G:\DHHL08-01\Acad\DHHL061004.dwg



KEY MAP

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 1
SEE TANK NO. 2 & BOOSTER PUMP SITE PLAN, SEE SHT. C-43

2 PHASE 1
STA. 0+00 ℄ WATERLINE A
1 – 6" TEE
2 – 6" GATE VALVES
2 – VALVE BOXES
2 – 6" FLANGE ADAPTERS
1 – 6"x3" REDUCER
1 – CONC. BLOCKS

3 PHASE 1
STA. 7+70 ℄ WATERLINE A
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 1
STA. 10+23 ℄ WATERLINE A
= PHASE 3
STA. 0+00 ℄ WATERLINE G
1 – 6" TEE
3 – 6" GATE VALVES
3 – VALVE BOXES
3 – 6" FLANGE ADAPTERS
1 – 6"x3" REDUCER
1 – CONC. BLOCK
FOR WATERLINE G SEE SHT. C-24

5 PHASE 1
STA. 10+66.64 ℄ WATERLINE A
DEFLECT 6" PIPE

6 PHASE 1
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

7 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42 (1)

PHASE 1 WATERLINE A
SEE SHT. C-5

℄ WATERLINE A
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

OLD BOUNDARY LINE

PHASE 2
WATERLINE C
SEE SHT. C-9

PHASE 2
WATERLINE D
SEE SHT. C-19

PHASE 3
WATERLINE G
SEE SHT. C-24

60' R/W
SEE TYP. SECTION
SHEET C-3

MATCHLINE
STA. 10+66.64
SEE SHEET C-5

FIRE ROAD – 11 (FR-11)
FIRE ROAD – 12 (FR-12)

LOT R-8
LOT 71
LOT 72
LOT 73
LOT 74
LOT 75
LOT 76
LOT 77
LOT 78
LOT 129
LOT 130
LOT 131
LOT 141
LOT 142

Exist. DWS UH Experimental Tank,
Ground el. = 3247'
Spillway el.= 3258' o.c.

① R=1000' C=43.63'
② R=1000' C=43.63'

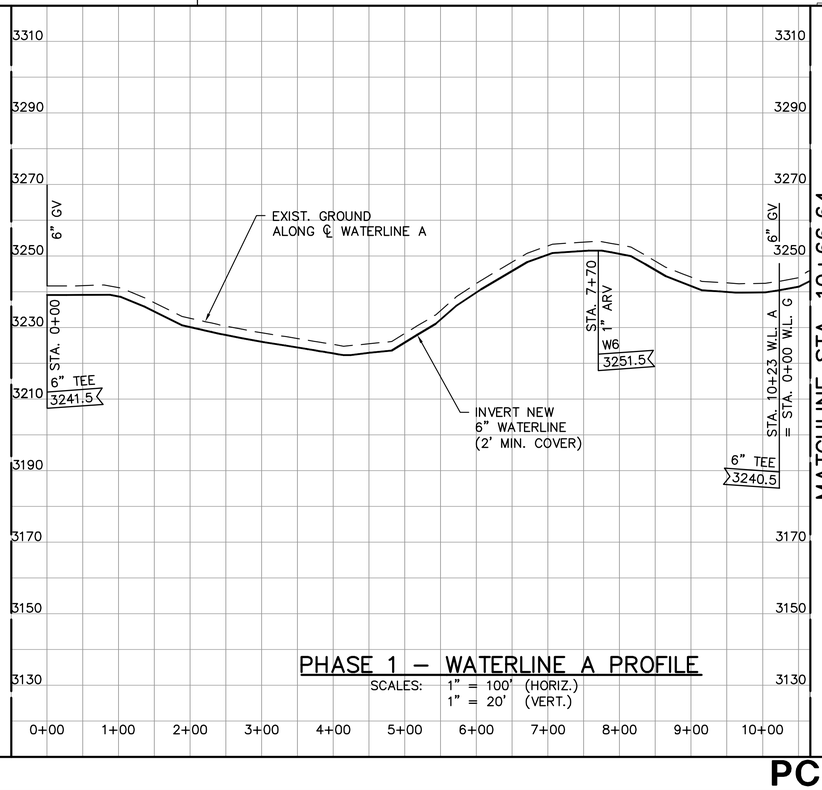
5° 00' 00" 203.41'
7° 30' 00" 116.84'
5° 00' 00" 615.72'
275° 00' 00" 43.41'

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

PHASE 1 – WATERLINE A PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 1 – WATERLINE A PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

MATCHLINE STA. 10+66.64
SEE SHEET C-5

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
2	2°30'00"	1°15'00"	1000.00	21.82	43.63	43.63	6°15'00"
1	2°30'00"	1°15'00"	1000.00	21.82	43.63	43.63	6°15'00"

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 1
WATERLINE A PLAN & PROFILE
STA. 0+00 TO STA. 10+66.64

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

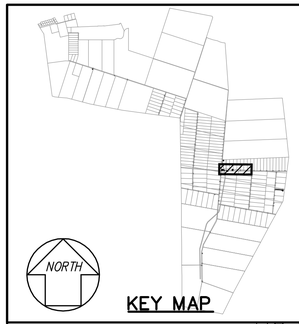
Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
G:\DHHL06-01\Acad\DHHL061002.dwg

PCD. NO. 2 C-4



KEY MAP

LEGEND

PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)

EXIST. ELECTRICAL LINE

EXIST. WATERLINE W/SIZE

PROPOSED WATERLINE W/SIZE

FUTURE PHASE PROPOSED WATERLINE W/SIZE

EXIST. ROADWAY

PROPOSED DRYWELL

PROPOSED GATE VALVE, ARV, OR CLEANOUT

DOUBLE SERVICE LATERAL

SINGLE SERVICE LATERAL

SCALE: 1" = 100'

TRUE NORTH

1 PHASE 1
STA. 10+23.23 ℄ WATERLINE A
= PHASE 3
STA. 0+00 ℄ WATERLINE G
SEE SHEET C-24

2 PHASE 1
STA. 10+66.64 ℄ WATERLINE A
DEFLECT 6" PIPE

3 PHASE 1
STA. 15+78 ℄ WATERLINE A
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 1
STA. 21+29 ℄ WATERLINE A
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

5 PHASE 1
STA. 24+10 ℄ WATERLINE A
1 - 6" GATE VALVE
1 - VALVE BOX
2 - 6" FLANGE ADAPTERS

6 PHASE 1
STA. 26+06 ℄ WATERLINE A
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

7 PHASE 1
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

LOT 77 LOT 79 LOT 80 LOT 81 LOT 82 LOT 83 LOT 84 LOT 85 LOT 142 LOT 129 LOT 128

PHASE 1
WATERLINE A
SEE SHT. C-4

OLD BOUNDARY LINE

℄ WATERLINE A
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

ELEC. LINES SHOWN SCHEMATICALLY.
APPROXIMATE LOCATIONS SHOWN WITHIN R/W
ON TYPICAL SECTIONS. CONTRACTOR TO
VERIFY LOCATION IN THE FIELD, TYP.

60' R/W
SEE TYP. SECTION
SHEET C-3

275° 00' 00" 43.41'
R=1000' C=122.10'
R=1000' C=43.63'
270° 30' 00" 214.69'
268° 00' 00" 119.58'
R=5000' C=43.63'
271° 00' 00" 529.33'
270° 30' 00" 2067.91'

R/W

FIRE ROAD - 11 (FR-11)

FIRE ROAD - 12 (FR-12)

MATCHLINE STA. 10+66.64
SEE SHEET C-4

MATCHLINE STA. 40+00
SEE SHEET C-6

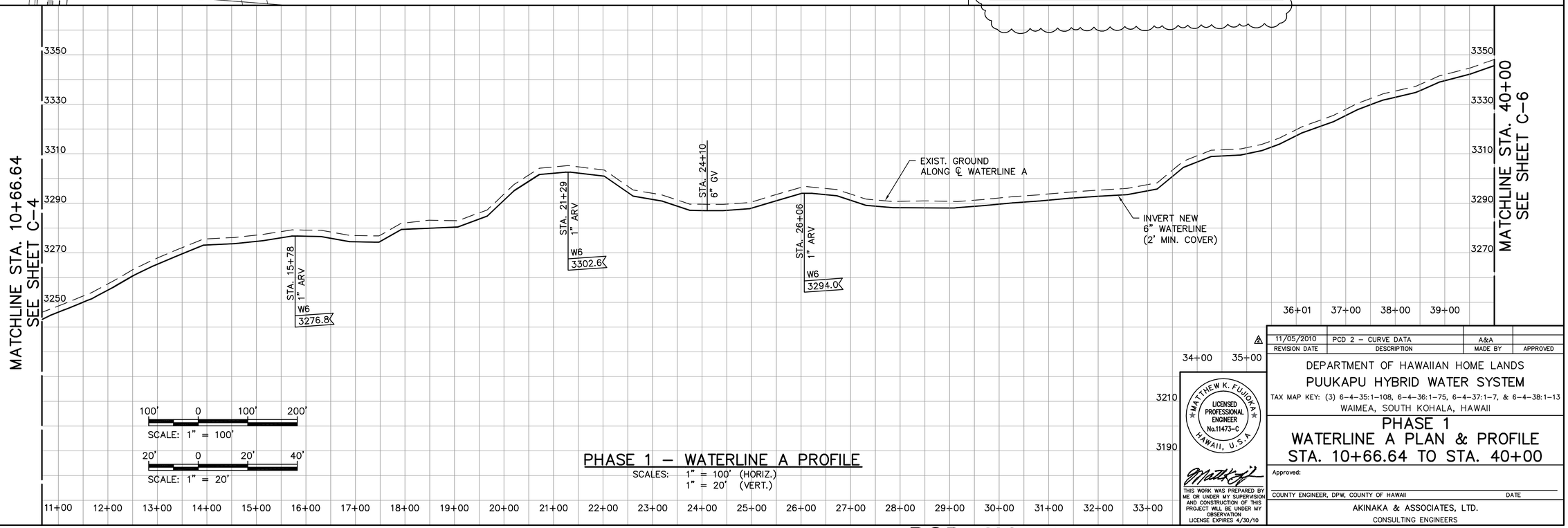
OLD BOUNDARY LINES

PHASE 3
WATERLINE G
SEE SHT. C-24

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	7°00'00"	3°30'00"	1000.00	61.16	122.10	122.17	271°30'00"
2	2°30'00"	1°15'00"	1000.00	21.82	43.63	43.63	269°15'00"
3	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	270°45'00"
4	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	270°45'00"

PHASE 1 - WATERLINE A PLAN

SCALE: 1" = 100'



100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

PHASE 1 - WATERLINE A PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

11/05/2010	PCD 2 - CURVE DATA	A&A	
REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 1
WATERLINE A PLAN & PROFILE
STA. 10+66.64 TO STA. 40+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

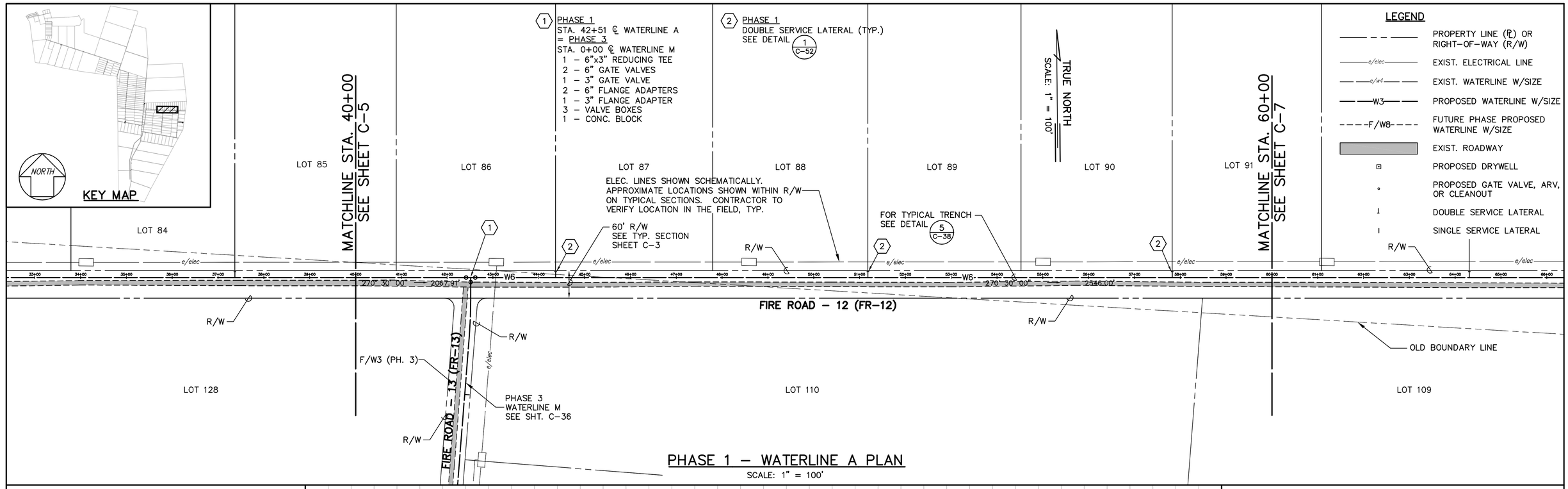
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

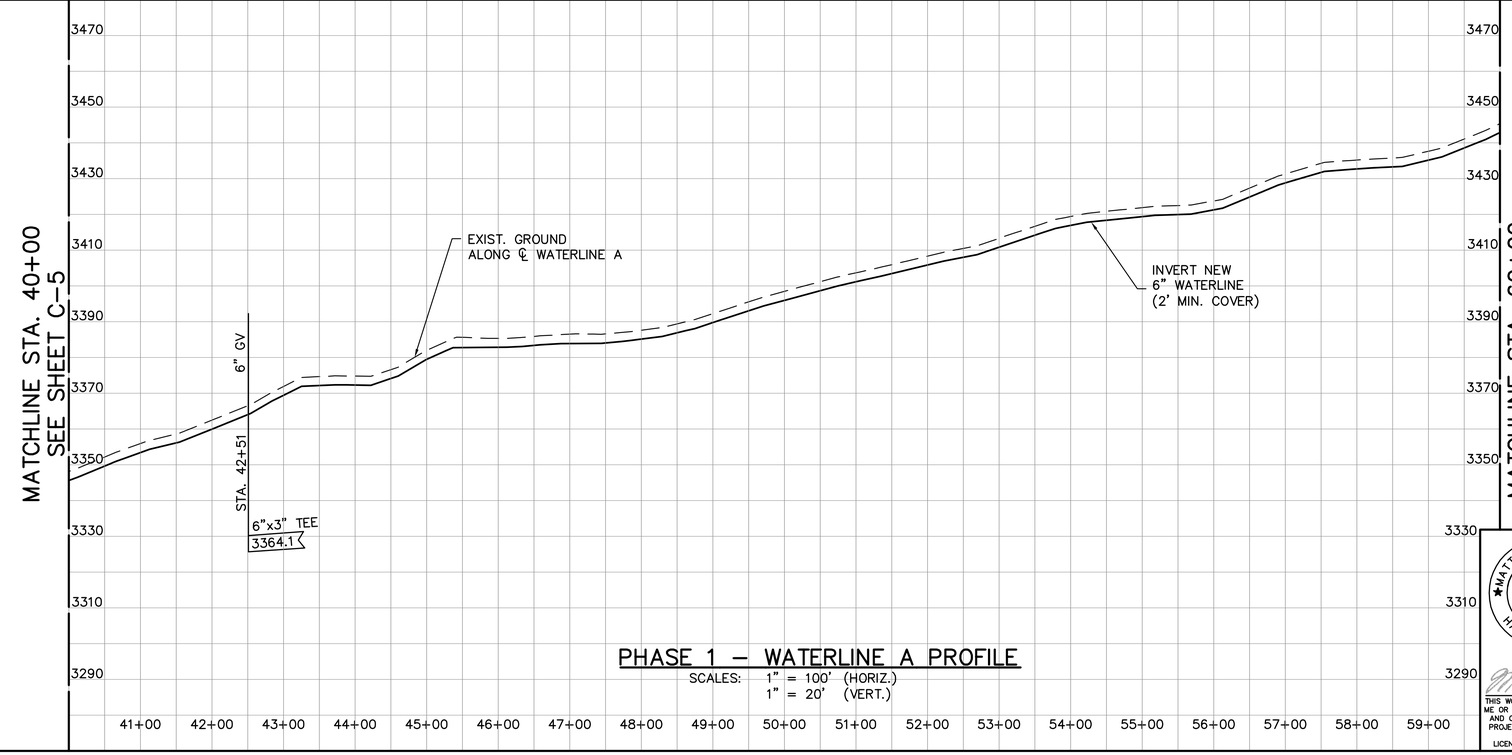
FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
G:\DHHL06-01\Acad\DHHL061006.dwg

PCD. NO. 2 C-5 SHEET 6 OF 70 SHEETS



PHASE 1 – WATERLINE A PLAN
SCALE: 1" = 100'



PHASE 1 – WATERLINE A PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 1
WATERLINE A PLAN & PROFILE
STA. 40+00 TO STA. 60+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 6/13/2009
Plotted on: 6/23/2011
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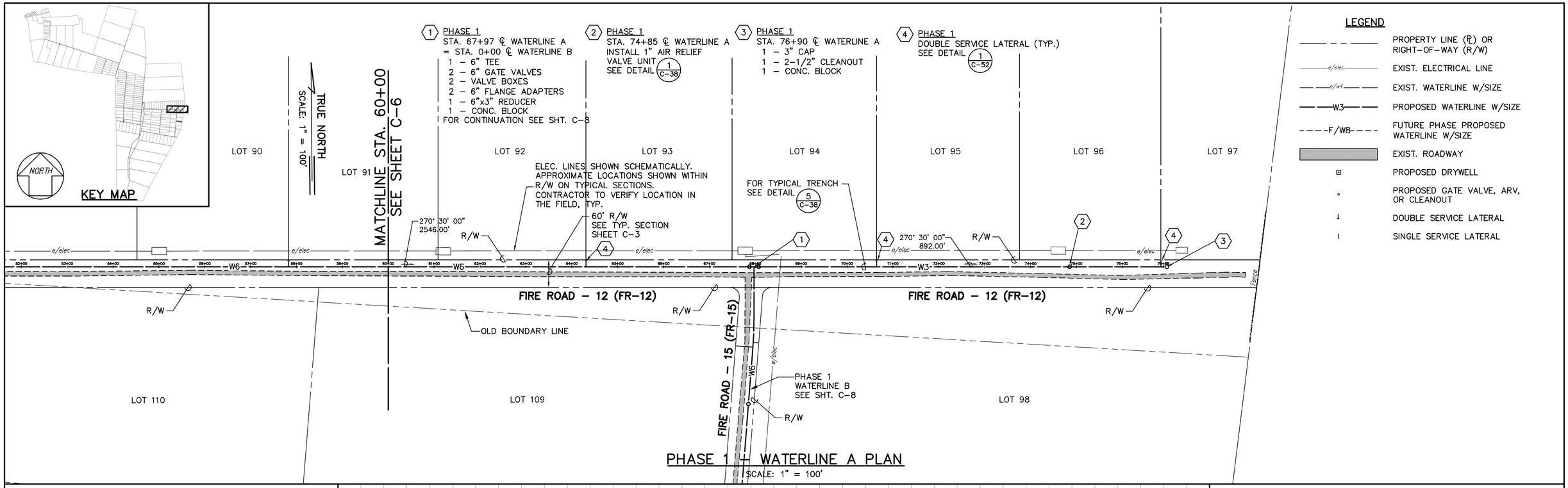
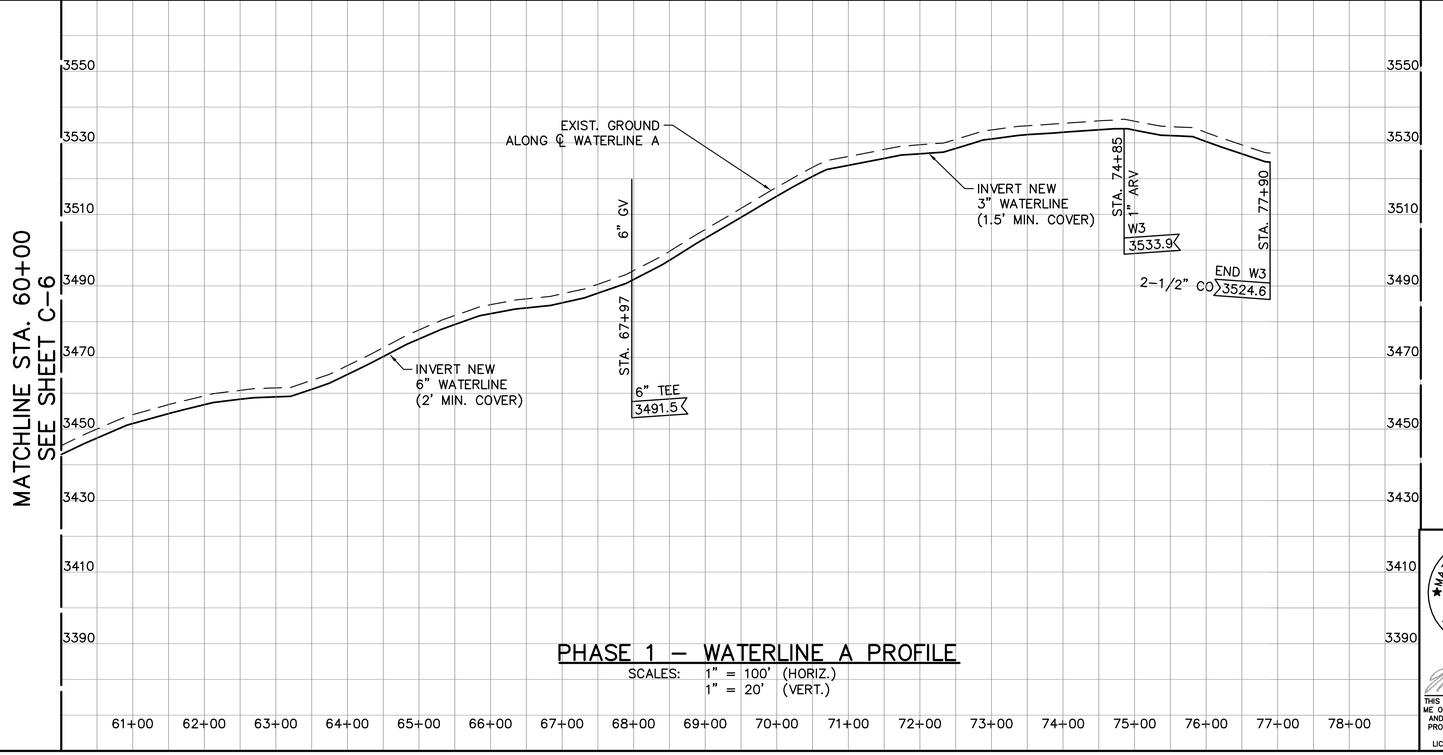


PHASE 1 – WATERLINE A PLAN

SCALE: 1" = 100'



PHASE 1 – WATERLINE A PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 1
WATERLINE A PLAN & PROFILE
STA. 60+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CKM
Last Saved: 6/15/2009
Plotted on: 6/23/2011
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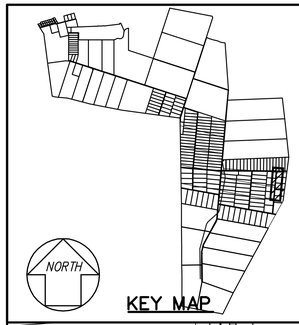


KEY MAP

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 1
STA. 0+00 ℄ WATERLINE B
SEE SHEET C-7

2 PHASE 1
STA. 3+00 ℄ WATERLINE B
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 1
STA. 9+50 ℄ WATERLINE B
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 1
STA. 16+45 ℄ WATERLINE B
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

5 PHASE 1
STA. 19+26 ℄ WATERLINE B
= STA. 0+00 ℄ TANK #3 WATERLINE
= STA. 0+00 ℄ WATERLINE K
INSTALL
1 = 6" TEE
3 – 6" GATE VALVES
3 – VALVE BOXES
6 – 6" FLANGE ADAPTER
1 – 6" x 3" REDUCER
1 – CONC. BLOCK
FOR CONTINUATION SEE SHT. C-33
SEE TANK NO. 3 ACCESS ROAD PLAN & PROFILE SHT. C-47

6 PHASE 1
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

7 PHASE 1
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

PHASE 1 WATERLINE A SEE SHT. C-7

0° 30' 00" 103.91'

R=1000' C= 78.52"

50' R/W SEE TYP. SECTION SHEET C-3

2721.38

PHASE 1 TANK NO. 3 W.L. SEE SHT. C-47

FOR TYPICAL TRENCH SEE DETAIL 5/C-38

PHASE 3 WATERLINE K SEE SHT. C-33

FIRE ROAD – 15 (FR-15)

FIRE ROAD – 12 (FR-12)

OLD BOUNDARY LINE

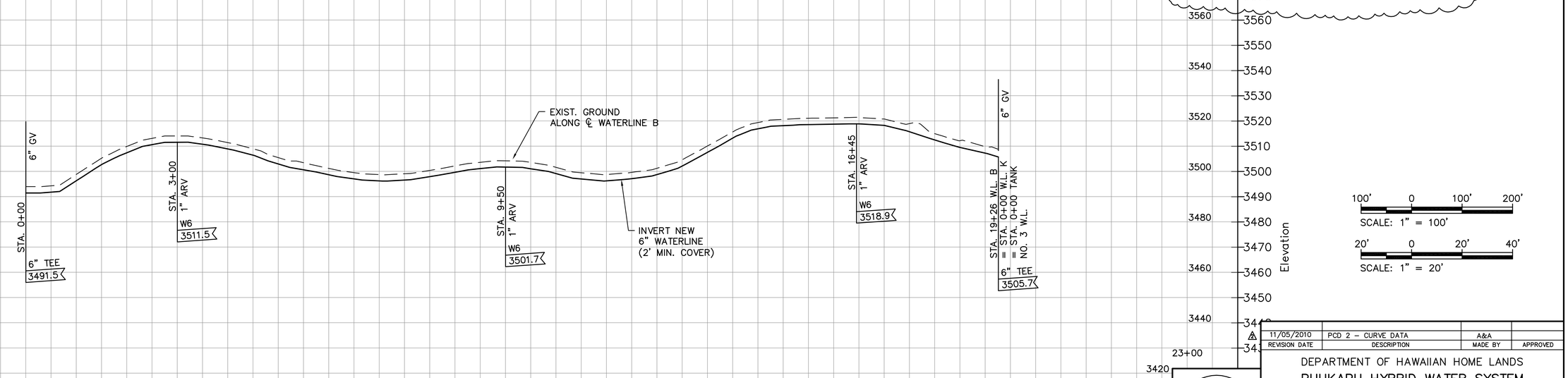
TO TANK NO. 3

LOT 93 LOT 94 LOT 98 LOT 99 LOT 100 LOT 101 LOT 102 LOT 106 LOT 107 LOT 108 LOT 109

PHASE 1 – WATERLINE B PLAN
SCALE: 1" = 100'

CURVE DATA

CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	4°30'00"	0.0393	1000.00	39.29	78.52	78.54	2°45'00"



PHASE 1 – WATERLINE B PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 1
WATERLINE B PLAN & PROFILE
STA. 0+00 TO END

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
G:\DHHL06-01\Acad\DHHL061009.dwg

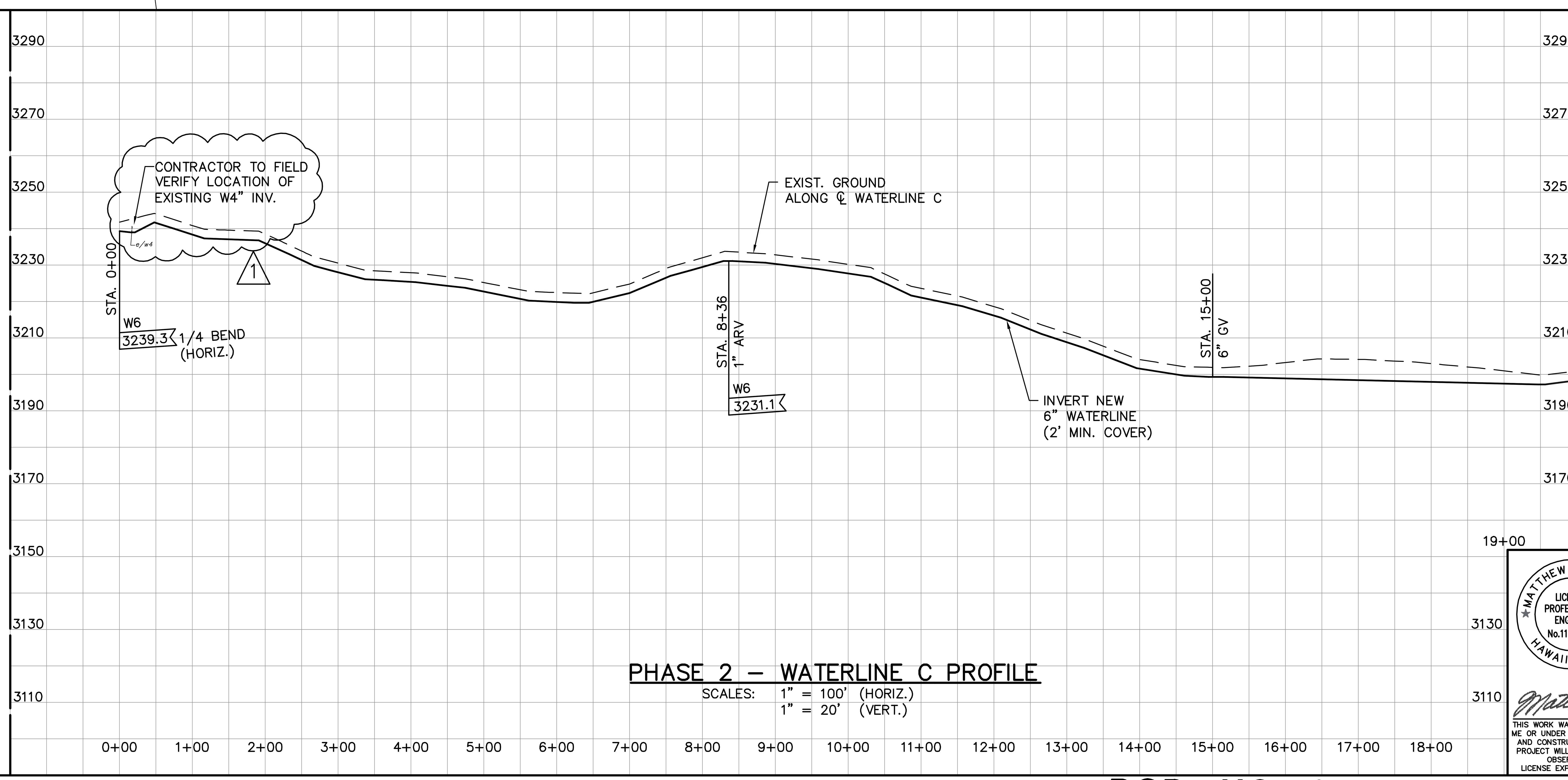
PCD. NO. 2 C-8 SHEET 9 OF 70 SHEETS

PHASE 2 – WATERLINE C PLAN

SCALE: 1" = 100'

LEGEND

—— – – ——	PROPERTY LINE (℗) OR RIGHT-OF-WAY (R/W)
—— e/elec ——	EXIST. ELECTRICAL LINE
—— e/w4 ——	EXIST. WATERLINE W/SIZE
—— W3 ——	PROPOSED WATERLINE W/SIZE
– – – F/W8 – – –	FUTURE PHASE PROPOSED WATERLINE W/SIZE
(shaded)	EXIST. ROADWAY
⊡	PROPOSED DRYWELL
∘	PROPOSED GATE VALVE, ARV, OR CLEANOUT
⫰	DOUBLE SERVICE LATERAL
╵	SINGLE SERVICE LATERAL
(hatched)	CONSTRUCTION INGRESS/EGRESS



PHASE 2 – WATERLINE C PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

CURVE DATA

CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	10°00'00"	5°00'00"	205.00	17.94	35.73	35.78	180°00'00"
2	10°00'00"	5°00'00"	200.00	17.50	34.86	34.91	180°00'00"

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

MANAGER, DEPARTMENT OF WATER SUPPLY COUNTY OF HAWAII — DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 - CURVE DATA	A&A	
1/19/2010	PCD 1 - ADDED NOTE	A&A	

LICENSED PROFESSIONAL ENGINEER No.11473-C — MATTHEW K. FUJIOKA — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2 WATERLINE C PLAN & PROFILE STA. 0+00 TO STA. 20+00

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

PCD. NO. 2 **C-9**

SHEET 10 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
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G:\DHHL06-01\Acad\DHHL061010.dwg

KEY MAP

NORTH

TRUE NORTH
SCALE: 1" = 100'

MATCHLINE STA. 20+00
SEE SHEET C-9

MATCHLINE STA. 42+00
SEE SHEET C-11

OLD BOUNDARY LINE

LOT 69 | LOT 68 | LOT 67 | LOT 66 | LOT 65 | LOT 64 | LOT 63 | LOT 62 | LOT 61 | LOT 60

FIRE ROAD – 10 (FR-10)

FIRE ROAD – 11 (FR-11)

R/W

e/elec

e/w4

W6

W3

WATERLINE D
SEE SHEETS
C-19 & C-20

ELEC. LINES SHOWN SCHEMATICALLY.
APPROXIMATE LOCATIONS SHOWN WITHIN R/W
ON TYPICAL SECTIONS. CONTRACTOR TO
VERIFY LOCATION IN THE FIELD, TYP.

60' R/W
SEE TYP. SECTION
SHEET C-3

℄ WATERLINE C
FOR TYPICAL TRENCH
SEE DETAIL 5 / C-38

185° 00' 00" — 3860.65'

R=50'
C=62.25'
① R/W

1 PHASE 2
STA. 21+11 ℄ WATERLINE C
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1 / C-38

2 PHASE 2
STA. 26+50 ℄ WATERLINE C
1 – 6" GATE VALVE
2 – 6" FLANGE ADAPTERS
1 – VALVE BOX

3 PHASE 2
STA. 38+88 ℄ WATERLINE C
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1 / C-38

4 PHASE 2
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1 / C-52

5 CONTRACTOR TO FIELD VERIFY
LOCATION, CLEARANCE &
EXISTING INVERTS.
1. 12" MIN. VERT. CLEARANCE
WITH CONC. JACKET
2. 18" MIN. VERT. CLEARANCE
WITHOUT CONC. JACKET

6 40' LONG CONSTRUCTION
INGRESS/EGRESS
SEE DET. C-42

2

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	77°00'00"	38°30'00"	50.00	39.77	62.25	67.20	146°30'00"

PHASE 2 – WATERLINE C PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE

3210 / 3190 / 3170 / 3150 / 3130 / 3110 / 3090 / 3070 / 3050 / 3030

STA. 21+11
1" ARV
W6
3202.3

STA. 26+50
6" GV

EXIST. GROUND
ALONG ℄ WATERLINE C

INVERT NEW
6" WATERLINE
(2' MIN. COVER)

CONTRACTOR TO FIELD
VERIFY LOCATION OF
EXISTING W4" INV.

STA. 38+88
1" ARV
W6
3129.8

21+00 | 22+00 | 23+00 | 24+00 | 25+00 | 26+00 | 27+00 | 28+00 | 29+00 | 30+00 | 31+00 | 32+00 | 33+00 | 34+00 | 35+00 | 36+00 | 37+00 | 38+00 | 39+00 | 40+00 | 41+00

PHASE 2 – WATERLINE C PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 20+00 TO STA. 42+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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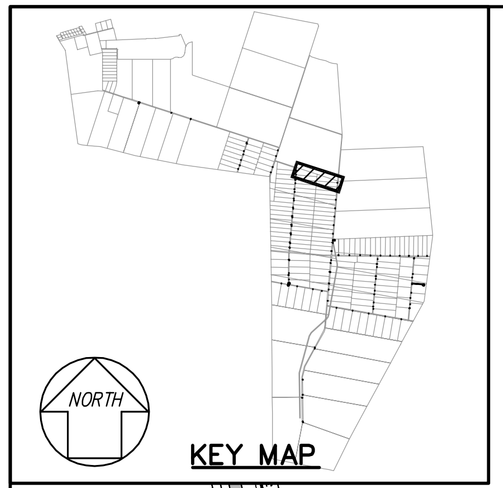
PCD. NO. 2 C-10

SHEET 11 OF 70 SHEETS



KEY MAP

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

TRUE NORTH
SCALE: 1" = 100'

(1) PHASE 2
STA. 54+25 ℄ WATERLINE C
1 – 6" GATE VALVE
2 – 6" FLANGE ADAPTERS
1 – VALVE BOX

LOT 61
LOT 60
LOT 58
LOT 59

FIRE ROAD – 11 (FR-11)
FIRE ROAD – 10 (FR-10)
FIRE ROAD – 9 (FR-9)

e/w4
e/elec
W6
W3

108° 00' 00"
2957.23'

MATCHLINE STA. 42+00
SEE SHEET C-10

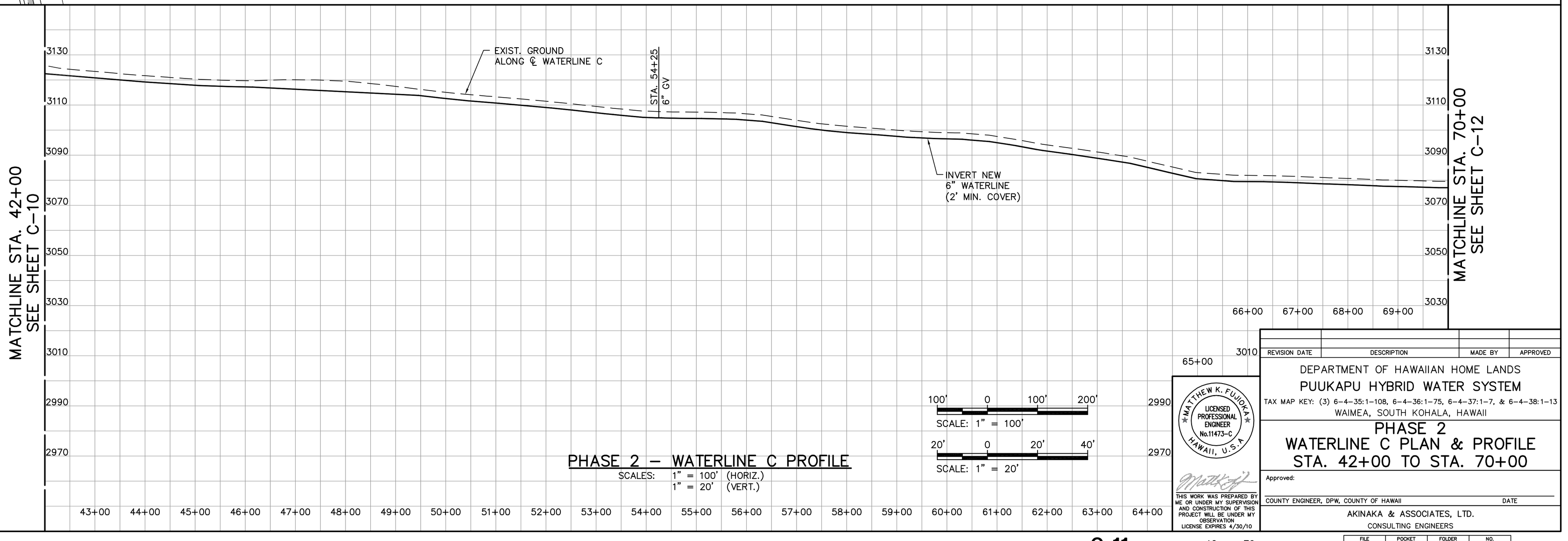
MATCHLINE STA. 70+00
SEE SHEET C-12

℄ WATERLINE C
FOR TYPICAL TRENCH
SEE DETAIL 5 / C-38

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

PHASE 2 – WATERLINE C PLAN
SCALE: 1" = 100'

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE



PHASE 2 – WATERLINE C PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 42+00 TO STA. 70+00

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 10/2/2010
Plotted on: 7/22/2011
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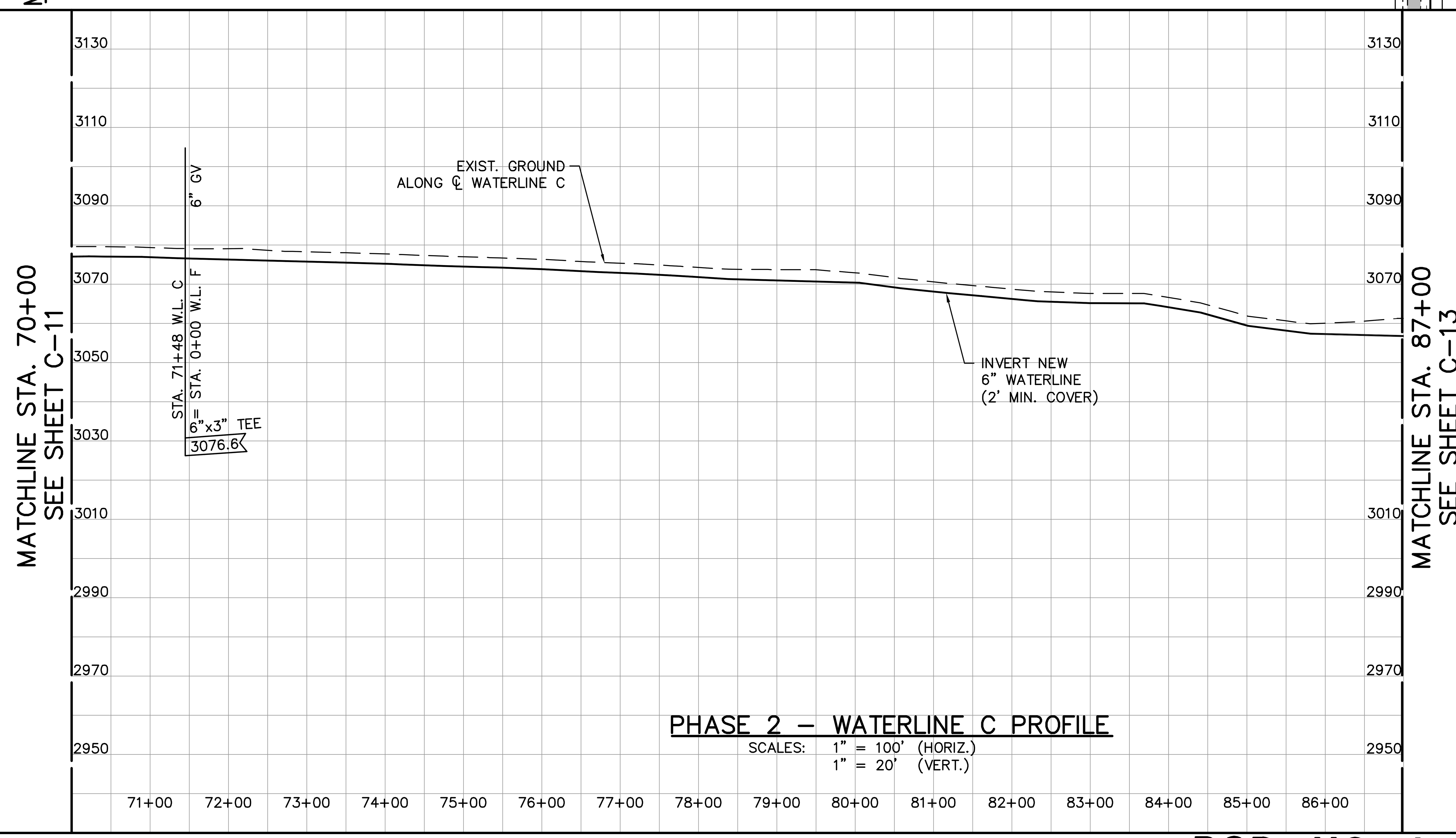
LEGEND

— — —	PROPERTY LINE (℗) OR RIGHT–OF–WAY (R/W)
e/elec	EXIST. ELECTRICAL LINE
e/w4	EXIST. WATERLINE W/SIZE
W3	PROPOSED WATERLINE W/SIZE
F/W8	FUTURE PHASE PROPOSED WATERLINE W/SIZE
(shaded)	EXIST. ROADWAY
⊡	PROPOSED DRYWELL
∘	PROPOSED GATE VALVE, ARV, OR CLEANOUT
⫰	DOUBLE SERVICE LATERAL
ı	SINGLE SERVICE LATERAL



100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

	REVISION DATE	DESCRIPTION	MADE BY	APPROVED
△1	1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6–4–35:1–108, 6–4–36:1–75, 6–4–37:1–7, & 6–4–38:1–13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 70+00 TO STA. 87+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473–C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CKM
Last Saved: 2/1/2010
Plotted on: 5/24/2010
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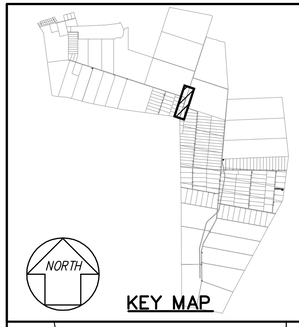


KEY MAP

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 2
STA. 87+67 ℄ WATERLINE C
= STA. 0+00 ℄ WATERLINE J
1 – 6" TEE
2 – GATE VALVES
4 – FLANGE ADAPTERS
2 – VALVE BOXES
1 – 6" x 3" REDUCER
1 – CONC. BLOCK

2 PHASE 2
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1 / C-52

3 PHASE 2
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2 / C-52

ELEC. LINES SHOWN SCHEMATICALLY.
APPROXIMATE LOCATIONS SHOWN
WITHIN R/W ON TYPICAL SECTIONS.
CONTRACTOR TO VERIFY LOCATION IN
THE FIELD, TYP.

PHASE 3
WATERLINE J
SEE SHT. C-32

60' R/W
SEE TYP. SECTION
SHEET C-3

LOT 18 | LOT 17 | LOT 16 | LOT 15 | LOT 169 | LOT R-2 | LOT 20 | LOT 22 | LOT 23 | LOT 24

POLI'AHU ALANUI

FIRE ROAD – 7 (FR-7)

FIRE ROAD – 10 (FR-10)

MATCHLINE STA. 87+00
SEE SHEET C-12

MATCHLINE STA. 97+00
SEE SHEET C-14

℄ WATERLINE C
FOR TYPICAL TRENCH
SEE DETAIL 5 / C-38

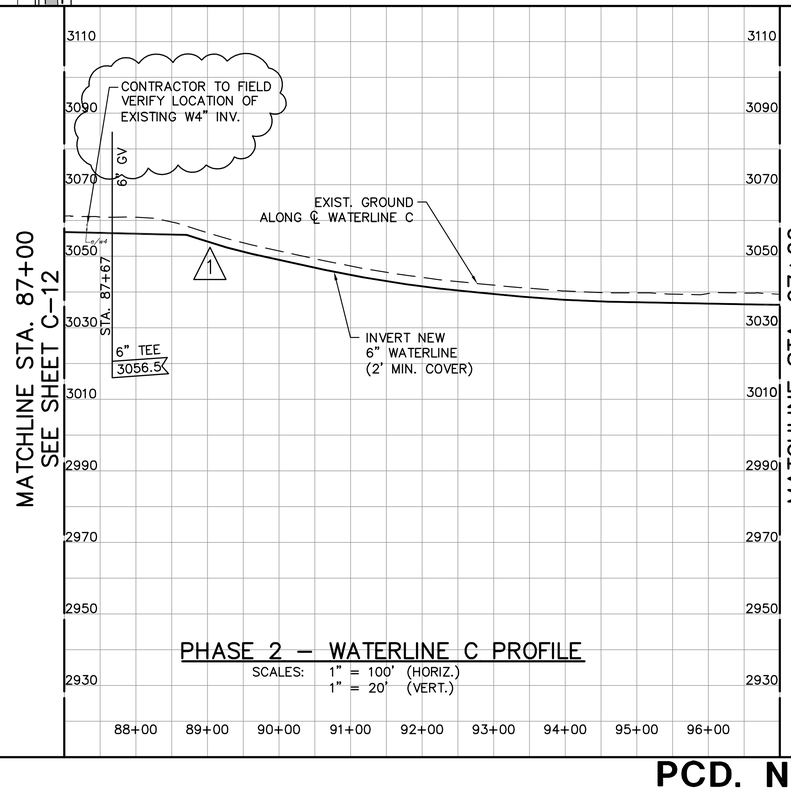
4 CONTRACTOR TO FIELD VERIFY
LOCATION, CLEARANCE &
EXISTING INVERTS.
1. 12" MIN. VERT. CLEARANCE
WITH CONC. JACKET
2. 18" MIN. VERT. CLEARANCE
WITHOUT CONC. JACKET

198'-00"-00" | 973.27' | 198'-00"-00"

PHASE 2 – WATERLINE C PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (P) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL



PHASE 2 – WATERLINE C PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 87+00 TO STA. 97+00

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/5/2010
Plotted on: 5/24/2010
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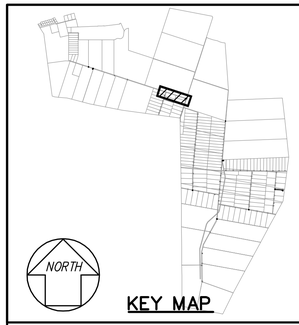
PCD. NO. 1 C-13

SHEET 14 OF 70 SHEETS



KEY MAP

LEGEND

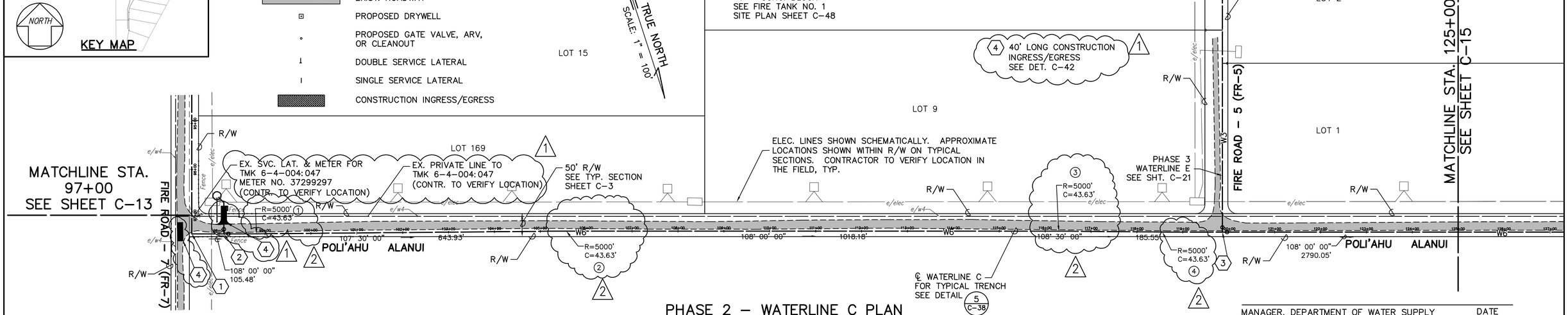
- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

(1) PHASE 2
STA. 97+40.37 ℄ WATERLINE C
1 – 6" 1/4 BEND
1 – CONC. BLOCK

(2) PHASE 2
STA. 98+10 ℄ WATERLINE C
1 – 6" TEE
2 – 6" GATE VALVES
2 – VALVE BOXES
4 – 6" FLANGE ADAPTERS
1 – CONC. BLOCK
SEE FIRE TANK NO. 1
SITE PLAN SHEET C-48

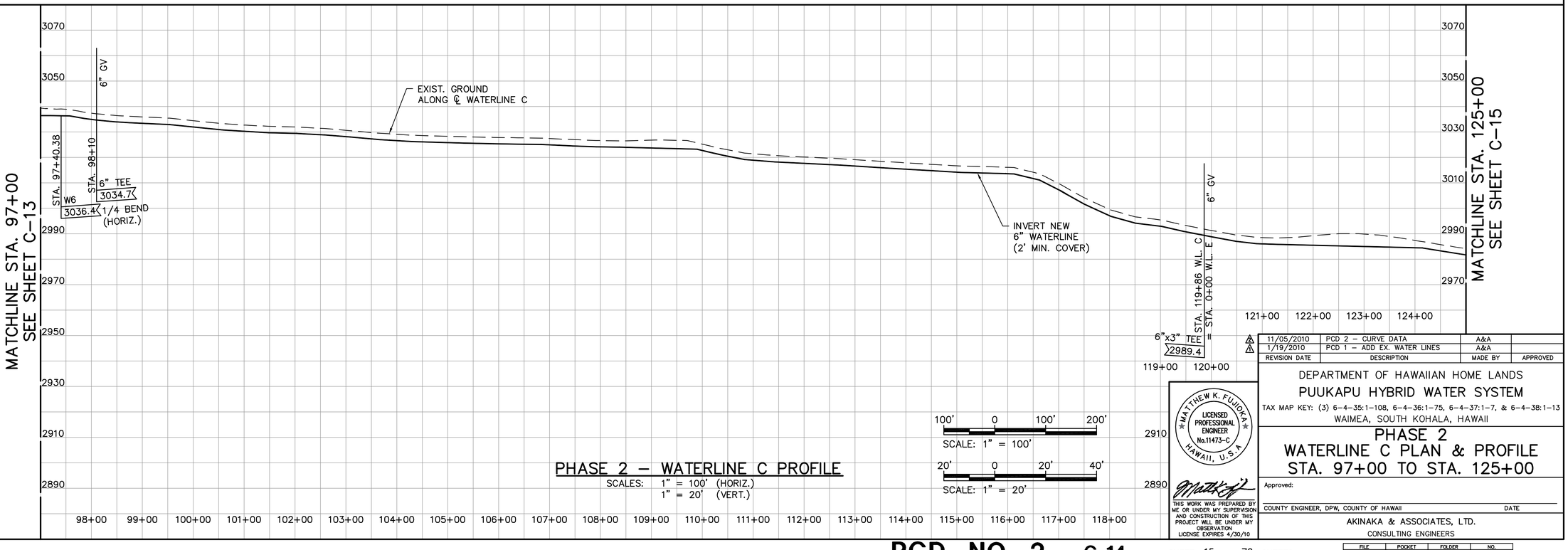
(3) PHASE 2
STA. 119+86 ℄ WATERLINE C
= PHASE 3
STA. 0+00 ℄ WATERLINE E
1 – 6" x 3" REDUCING TEE
1 – 6" GATE VALVES
1 – 3" GATE VALVE
2 – VALVE BOXES
2 – 6" FLANGE ADAPTERS
2 – 3" FLANGE ADAPTERS
1 – CONC. BLOCK

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	107°45'00"
2	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	107°45'00"
3	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	108°15'00"
4	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	108°15'00"



PHASE 2 – WATERLINE C PLAN
SCALE: 1" = 100'

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE



PHASE 2 – WATERLINE C PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADD EX. WATER LINES	A&A	

MATTHEW K. FUJIOKA LICENSED PROFESSIONAL ENGINEER No.11473-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 97+00 TO STA. 125+00

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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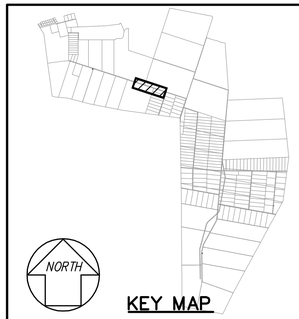
PCD. NO. 2 C-14

SHEET 15 OF 70 SHEETS



KEY MAP

MATCHLINE STA. 125+00
SEE SHEET C-14

LOT 2

LOT 1

TRUE NORTH
SCALE: 1" = 100'

(1) PHASE 2
STA. 135+50 ℄ WATERLINE C
1 – 6" GATE VALVE
2 – 6" FLANGE ADAPTERS
1 – VALVE BOX

LEGEND

- PROPERTY LINE (P) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

MATCHLINE STA. 150+00
SEE SHEET C-16

50' R/W
SEE TYP. SECTION
SHEET C-3

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

R/W

e/elec

W6

121+00 122+00 123+00 124+00 125+00 126+00 127+00 128+00 129+00 130+00 131+00 132+00 133+00 134+00 135+00 136+00 137+00 138+00 140+00 141+00 143+00 144+00 145+00 146+00 147+00 148+00 149+00 150+00 151+00 152+00 153+00 154+00

108° 00' 00"
2790.05'

POLI'AHU

ALANUI

℄ WATERLINE C
FOR TYPICAL TRENCH
SEE DETAIL 5 C-38

R=5000'
C=43.63'
(1)

107° 30' 00"
185.55'

R=5000'
C=43.63'
(2)

(2)

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	107°45'00"
2	0°30'00"	0°15'00"	5000.00	21.82	43.63	43.63	107°45'00"

PHASE 2 – WATERLINE C PLAN

SCALE: 1" = 100'

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE

3010 2990 2970 2950 2930 2910 2890 2870 2850 2830

EXIST. GROUND
ALONG ℄ WATERLINE C

STA. 135+50
6" GV

INVERT NEW
6" WATERLINE
(2' MIN. COVER)

MATCHLINE STA. 125+00
SEE SHEET C-14

MATCHLINE STA. 150+00
SEE SHEET C-16

126+00 127+00 128+00 129+00 130+00 131+00 132+00 133+00 134+00 135+00 136+00 137+00 138+00 139+00 140+00 141+00 142+00 143+00 144+00 145+00 146+00 147+00 148+00 149+00

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

PHASE 2 – WATERLINE C PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 125+00 TO STA. 150+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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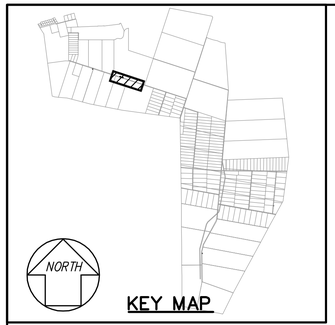
PCD. NO. 2 C-15



KEY MAP

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

MATCHLINE STA. 150+00
SEE SHEET C-15

TRUE NORTH
SCALE: 1" = 100'

(1) PHASE 2
STA. 155+00 ℄ WATERLINE C
1 – 6" GATE VALVE
1 – VALVE BOX
2 – 6" FLANGE ADAPTERS

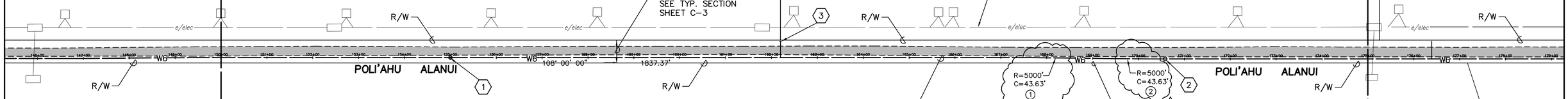
(2) PHASE 2
STA. 170+58 ℄ WATERLINE C
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1 / C-38

(3) PHASE 2
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1 / C-52

MATCHLINE STA. 175+00
SEE SHEET C-17

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

50' R/W
SEE TYP. SECTION SHEET C-3



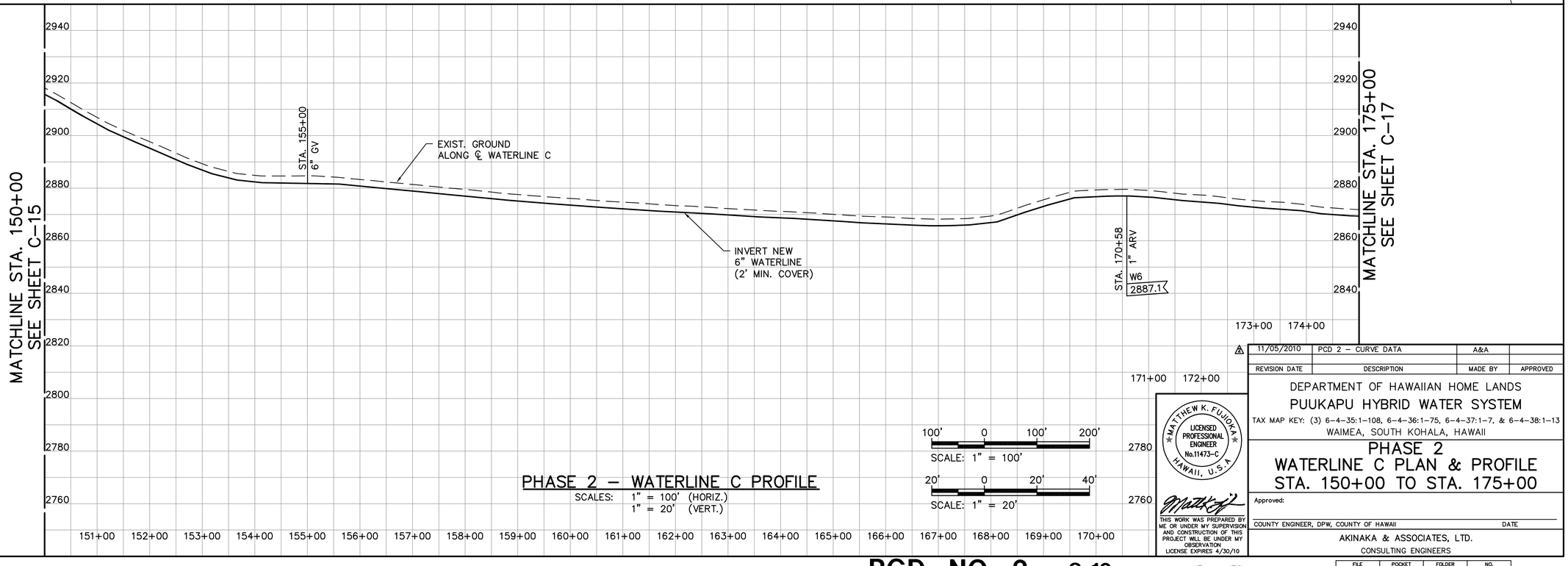
℄ WATERLINE C
FOR TYPICAL TRENCH
SEE DETAIL 5 / C-38

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	1°00'00"	0°30'00"	5000.00	43.63	87.27	87.27	108°30'00"
2	1°00'00"	0°30'00"	5000.00	43.63	87.27	87.27	108°30'00"

PHASE 2 – WATERLINE C PLAN

SCALE: 1" = 100'

MANAGER, DEPARTMENT OF WATER SUPPLY — DATE
COUNTY OF HAWAII



PHASE 2 – WATERLINE C PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 150+00 TO STA. 175+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES: 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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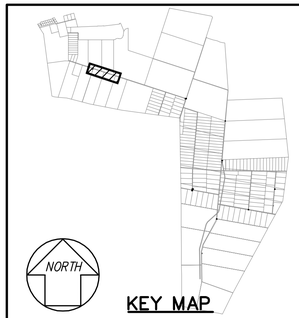
PCD. NO. 2 C-16

SHEET 17 OF 70 SHEETS



KEY MAP

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

TRUE NORTH
SCALE: 1" = 100'

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

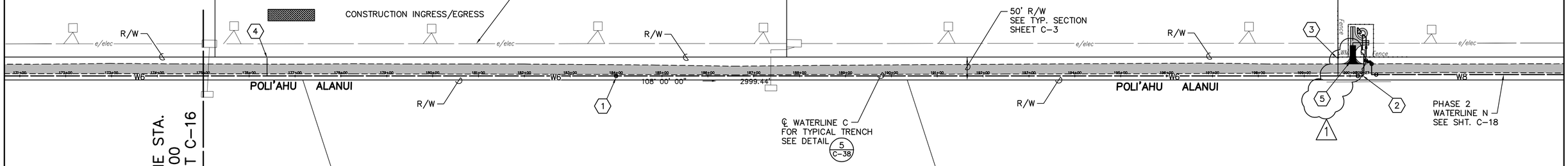
(1) PHASE 2
STA. 184+00 ℄ WATERLINE C
1 – 6" GATE VALVE
1 – VALVE BOX
2 – 6" FLANGE ADAPTERS

(2) PHASE 2
END WATERLINE C
STA. 200+26.89 ℄ WATERLINE C
1 – 6" 1/8 BEND
1 – CONC. BLOCK
SEE PHASE 2 BOOSTER PUMP SITE SHEET C-41

(3) PHASE 2
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

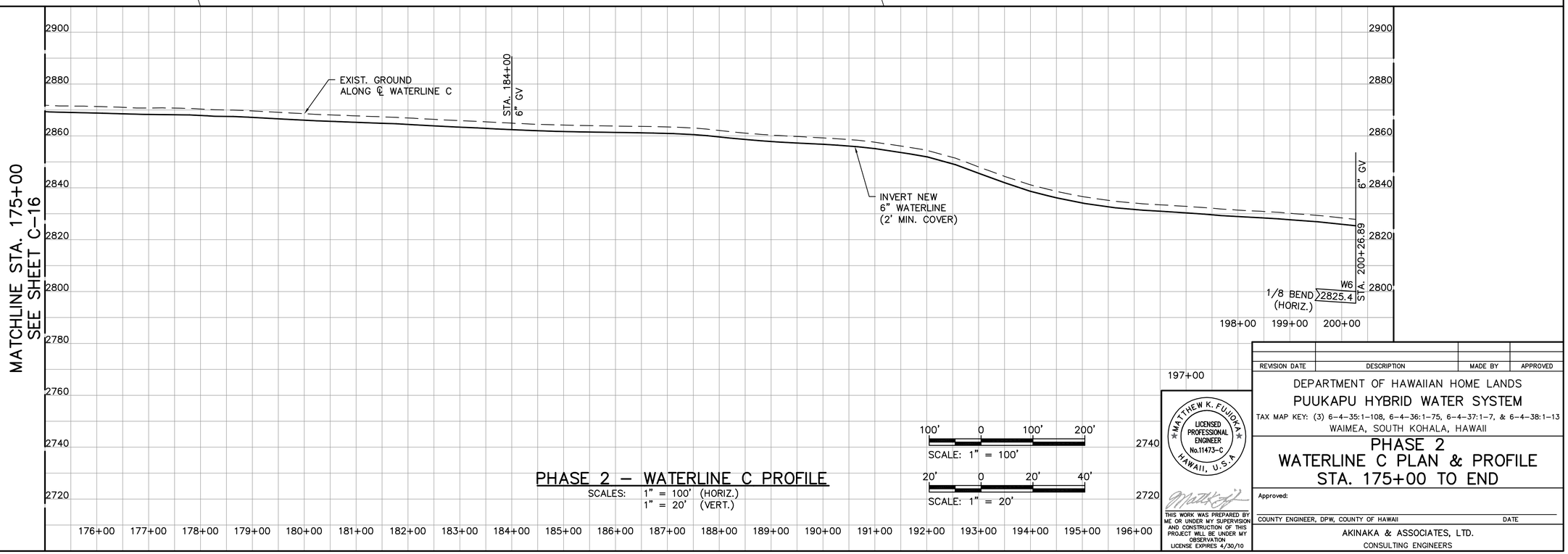
(4) PHASE 2
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

(5) 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42



MATCHLINE STA. 175+00
SEE SHEET C-16

PHASE 2 – WATERLINE C PLAN
SCALE: 1" = 100'



PHASE 2 – WATERLINE C PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII
DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE C PLAN & PROFILE
STA. 175+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

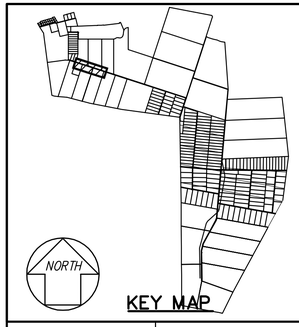
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

C-17

SHEET 18 OF 70 SHEETS

Last Save by: RKI
Last Saved: 10/2/2010
Plotted on: 6/23/2011
G:\DHHL08-01\Acad\DHHL061018.dwg



KEY MAP

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 2
SEE TANK NO. 1 & BOOSTER PUMP SITE PLAN, SHT. C-41

2 PHASE 2
STA. 0+00 ℄ WATERLINE N
~~1 – 8" GATE VALVE~~
~~1 – 8" CAP~~
~~1 – 8" x 6" TEE~~
1 – VALVE BOX
1 – CONC. BLOCK
1 – 8" 1/4 BEND
1 – 8" x 6" REDUCER
1 – ARV AND BOX PER DWS STD. DETAIL. V1

3 PHASE 2
STA. 4+78.08 ℄ WATERLINE N
CONNECT TO EXIST. ~~8" WATERLINE~~
REMOVE:
– EXIST. CAP & CLEANOUT
– EXIST. BOX
INSTALL:
1 – 8" SOLID BODY SLEEVE W/ MEGALUGS

4 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

50' R/W
SEE TYP. SECTION SHEET C-3

R/W

e/elec

Fence

W6

W8

POLI'AHU ALANUI

PHASE 2 WATERLINE C SEE SHT. C-17

℄ WATERLINE N FOR TYPICAL TRENCH SEE DETAIL 5 / C-38

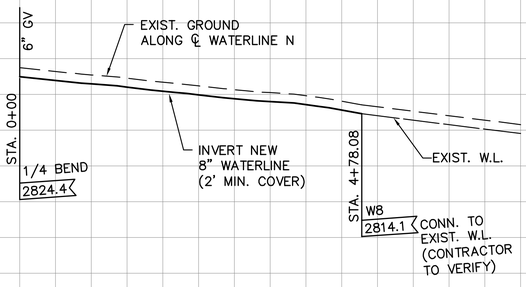
0+00 1+00 2+00 3+00 4+00

e/W8

PHASE 2 – WATERLINE N PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 2 – WATERLINE N PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – REV. NOTES	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE N PLAN & PROFILE
STA. 0+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/5/2010
Plotted on: 5/24/2010
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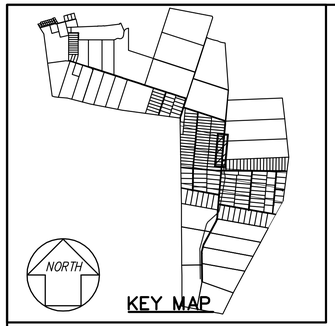
PCD. NO. 1 **C-18**



KEY MAP

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 2
SEE TANK #2 & BOOSTER PUMP SITE PLAN, SHT. C-43

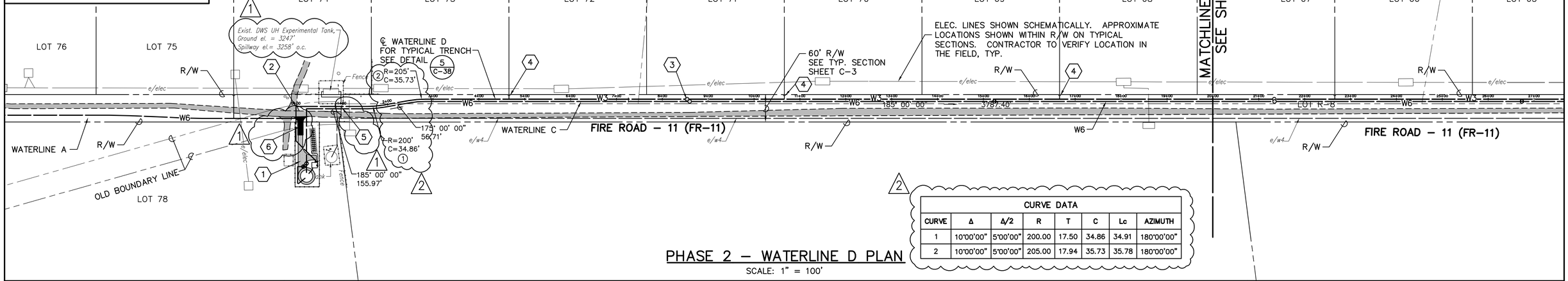
2 PHASE 2
STA. 0+00 ℄ WATERLINE D
1 – 3" 1/4 BEND
1 – CONC. BLOCK

3 PHASE 2
STA. 8+54 ℄ WATERLINE D
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 2
DOUBLE SERVICE LATERAL (TYP)
SEE DETAIL 1/C-52

5 CONTRACTOR TO FIELD VERIFY LOCATION, CLEARANCE & EXISTING INVERTS.
1. 12" MIN. VERT. CLEARANCE WITH CONC. JACKET
2. 18" MIN. VERT. CLEARANCE WITHOUT CONC. JACKET

6 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42



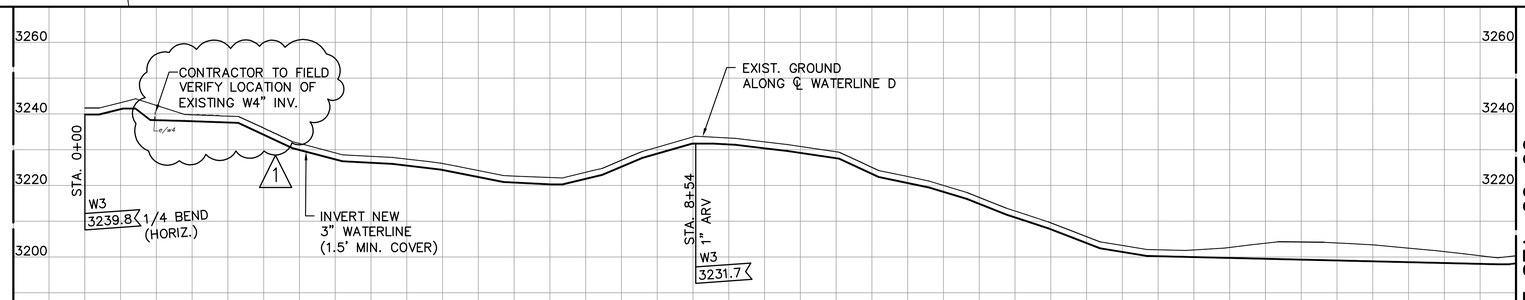
PHASE 2 – WATERLINE D PLAN
SCALE: 1" = 100'

2

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	10°00'00"	5°00'00"	200.00	17.50	34.86	34.91	180°00'00"
2	10°00'00"	5°00'00"	205.00	17.94	35.73	35.78	180°00'00"

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 2 – WATERLINE D PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE D PLAN & PROFILE
STA. 0+00 TO STA. 20+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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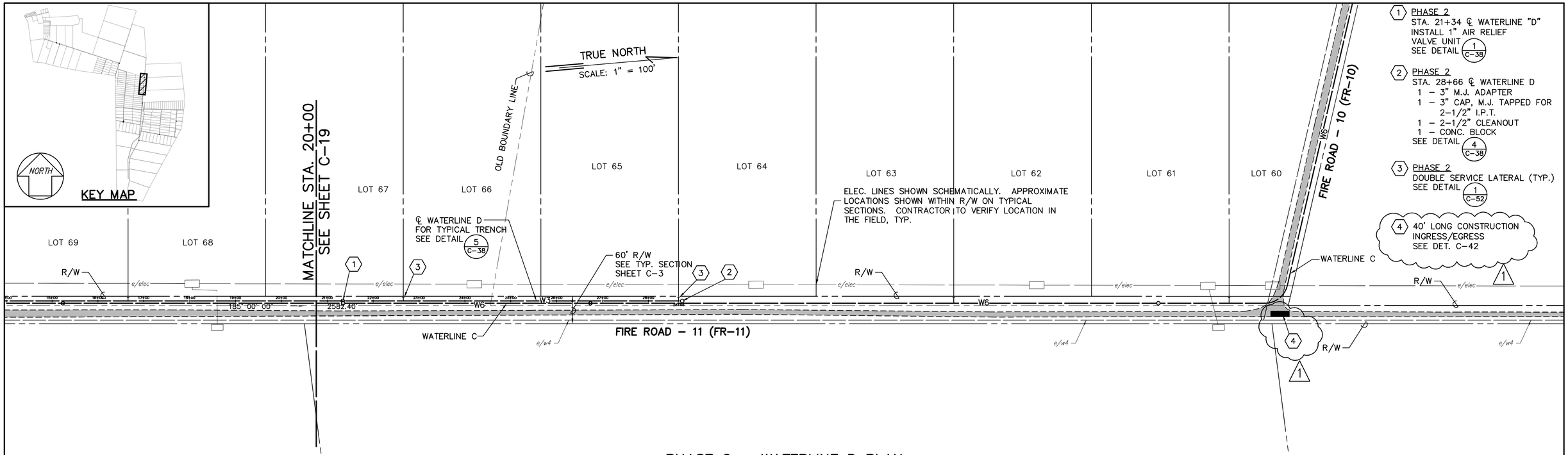
PCD. NO. 2 C-19

SHEET 20 OF 70 SHEETS

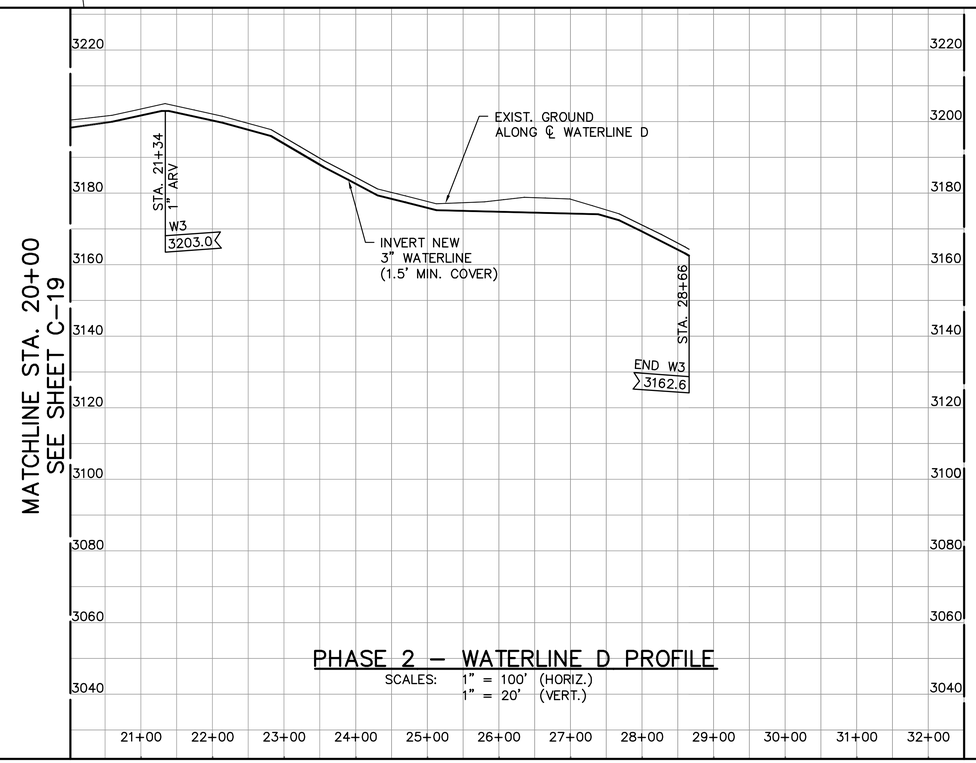


PHASE 2 - WATERLINE D PLAN

SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 2 - WATERLINE D PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 2
WATERLINE D PLAN & PROFILE
STA. 20+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
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HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/5/2010
Plotted on: 6/23/2011
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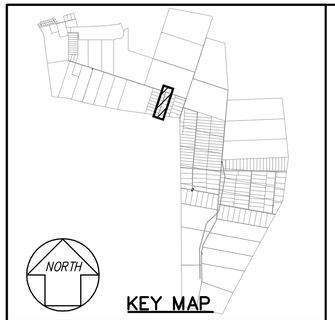
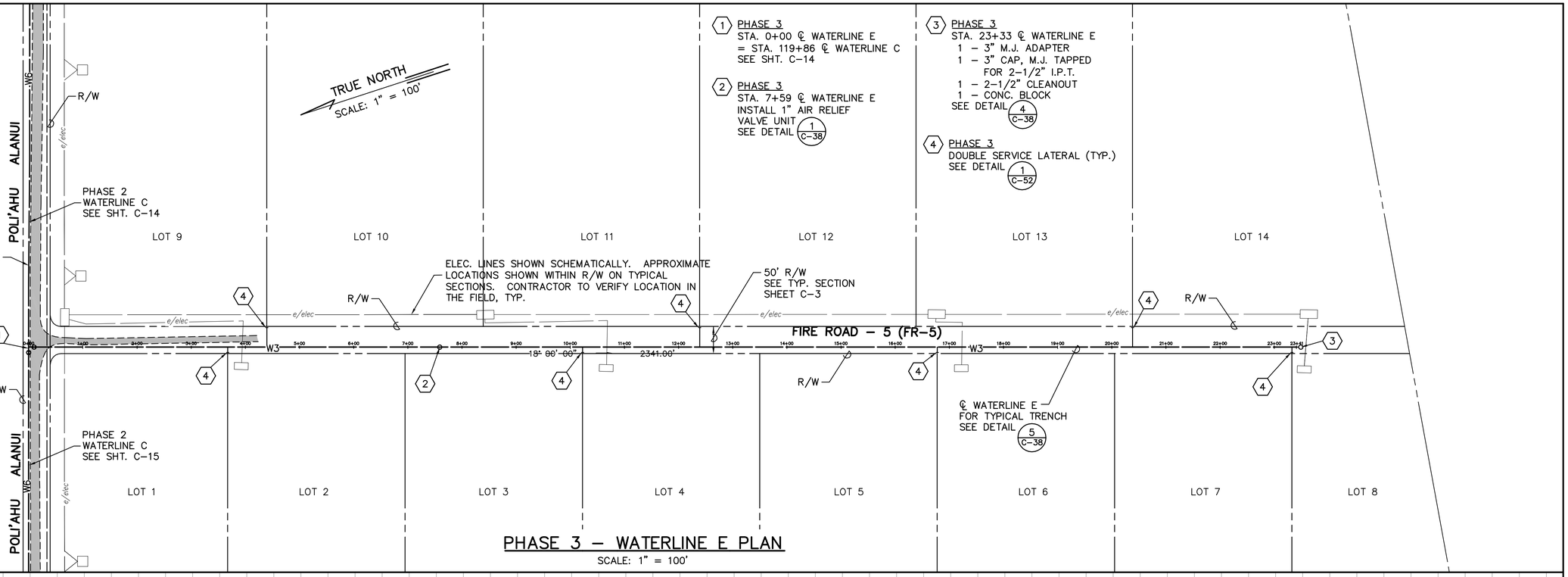


KEY MAP

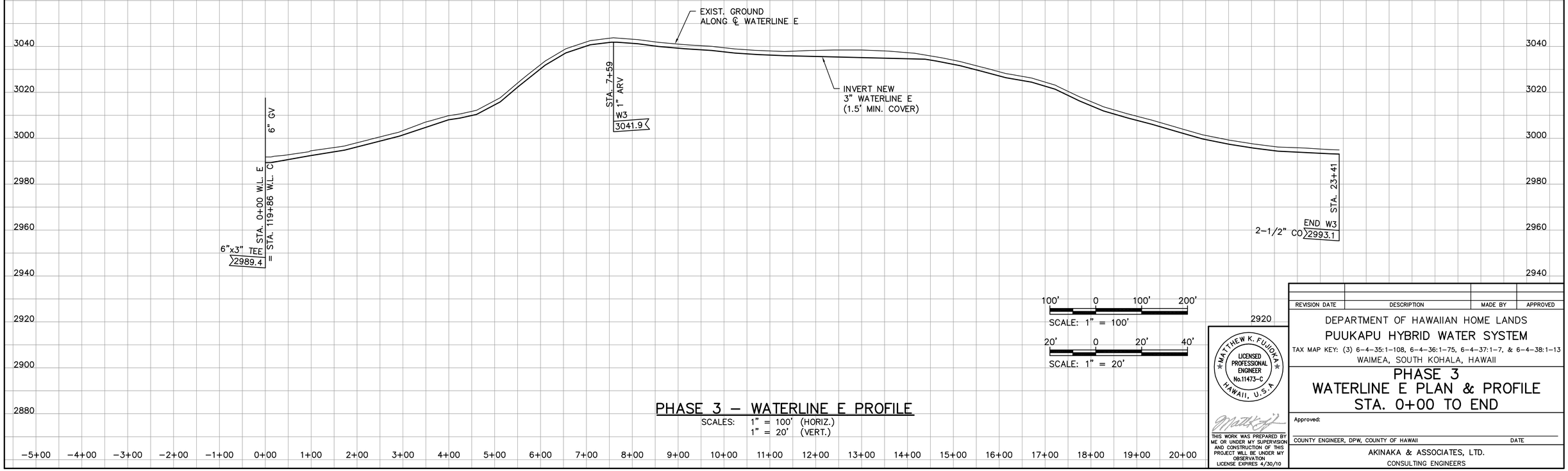
LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL



PHASE 3 – WATERLINE E PLAN

SCALE: 1" = 100'



PHASE 3 – WATERLINE E PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE E PLAN & PROFILE
STA. 0+00 TO END

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CKM
Last Saved: 2/1/2010
Plotted on: 6/23/2011
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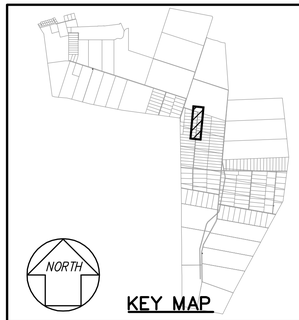

KEY MAP

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

TRUE NORTH
SCALE: 1" = 100'

1. PHASE 3
STA. 0+00 ℄ WATERLINE F
= STA. 71+48 ℄ WATERLINE C
SEE SHT. C-12

2. PHASE 3
STA. 14+13 ℄ WATERLINE F
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

3. PHASE 3
STA. 16+00 ℄ WATERLINE F
1 - 3" GATE VALVE
1 - VALVE BOX
2 - 3" FLANGE ADAPTERS

4. PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

5. CONTRACTOR TO FIELD VERIFY LOCATION, CLEARANCE & EXISTING INVERTS.
1. 12" MIN. VERT. CLEARANCE WITH CONC. JACKET
2. 18" MIN. VERT. CLEARANCE WITHOUT CONC. JACKET

FIRE ROAD - 10 (FR-10)
W6
OLD BOUNDARY LINE
MATCHLINE STA. 25+00
SEE SHEET C-23

LOT 59 | LOT 58 | LOT 57 | LOT 56 | LOT 55 | LOT 54 | LOT 53 | LOT 52 | LOT 51

R=200'
C=45.28'
18° 00' 00"
25.26'

50' R/W
SEE TYP. SECTION SHEET C-3

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

℄ WATERLINE F
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

R/W
e/elec
W3
5° 00' 00"
4625.37'

FIRE ROAD - 9 (FR-9)

LOT 22 | LOT 23 | LOT 24 | LOT 25 | LOT 26 | LOT 27 | LOT 28 | LOT 29 | LOT 30

PHASE 2
WATERLINE C
SEE SHT. C-12

CURVE DATA

CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	13°00'00"	6°30'00"	200.00	22.79	45.28	45.38	11°30'00"

PHASE 3 - WATERLINE F PLAN
SCALE: 1" = 100'

PHASE 3 - WATERLINE F PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING W4" INV.

6" GV
STA. 0+00 W.L. E
= STA.71+48 W.L. C
6"x3" TEE
3076.0

EXIST. GROUND ALONG ℄ WATERLINE F

STA. 14+13
1" ARV
W3
3090.8

STA. 16+00
3" GV

INVERT NEW 3" WATERLINE F (1.5' MIN. COVER)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

3160 | 3140 | 3120 | 3100 | 3080 | 3060 | 3040 | 3020 | 3000 | 2980

0+00 | 1+00 | 2+00 | 3+00 | 4+00 | 5+00 | 6+00 | 7+00 | 8+00 | 9+00 | 10+00 | 11+00 | 12+00 | 13+00 | 14+00 | 15+00 | 16+00 | 17+00 | 18+00 | 19+00 | 20+00 | 21+00 | 22+00 | 23+00 | 24+00

MATCHLINE STA. 25+00
SEE SHEET C-23

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 - CURVE DATA	A&A	
1/19/2010	PCD 1 - ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE F PLAN & PROFILE
STA. 0+00 TO STA. 25+00

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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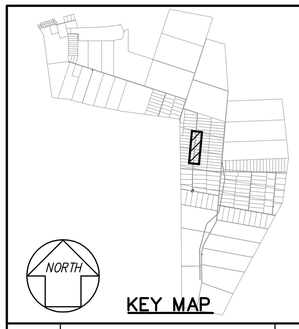
PCD. NO. 2 C-22

SHEET 23 OF 70 SHEETS



KEY MAP

TRUE NORTH
SCALE: 1" = 100'

MATCHLINE STA. 25+00
SEE SHEET C-22

1 PHASE 3
STA. 31+50 ℄ WATERLINE F
1 – 3" GATE VALVE.
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS

2 PHASE 3
STA. 47+00 ℄ WATERLINE F
1 – 3" MJ ADAPTER
1 – 3" CAP, M.J. TAPPED FOR 2–1/2" I.P.T.
1 – 2–1/2" CLEANOUT
1 – CONC. BLOCK
SEE DETAIL 4 C-38

3 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1 C-52

OLD BOUNDARY LINE

50' R/W
SEE TYP. SECTION SHEET C-3

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD. TYP.

℄ WATERLINE F FOR TYPICAL TRENCH SEE DETAIL 5 C-38

FIRE ROAD – 9 (FR-9)

LOT 53 LOT 52 LOT 51 LOT 50 LOT 49 LOT 48 LOT 47 LOT 46 LOT 45 LOT 44 LOT 43

LOT 28 LOT 29 LOT 30 LOT 31 LOT 32 LOT 33 LOT 34 LOT 35 LOT 36 LOT 37 LOT 38

R/W, e/elec, W3, 5° 00' 00", 4629.37'

PHASE 3 – WATERLINE F PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT–OF–WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

MATCHLINE STA. 25+00
SEE SHEET C-22

STA. 31+50
3" GV

EXIST. GROUND ALONG ℄ WATERLINE F

INVERT NEW 3" WATERLINE F (1.5' MIN. COVER)

END W3
2–1/2" CO
3137.2

STA. 47+00

3180 3160 3140 3120 3100 3080 3060 3040 3020 3000

26+00 27+00 28+00 29+00 30+00 31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00

PHASE 3 – WATERLINE F PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6–4–35:1–108, 6–4–36:1–75, 6–4–37:1–7, & 6–4–38:1–13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE F PLAN & PROFILE
STA. 25+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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FILE	POCKET	FOLDER	NO.

Last Save by: CKM
Last Saved: 6/15/2009
Plotted on: 6/23/2011
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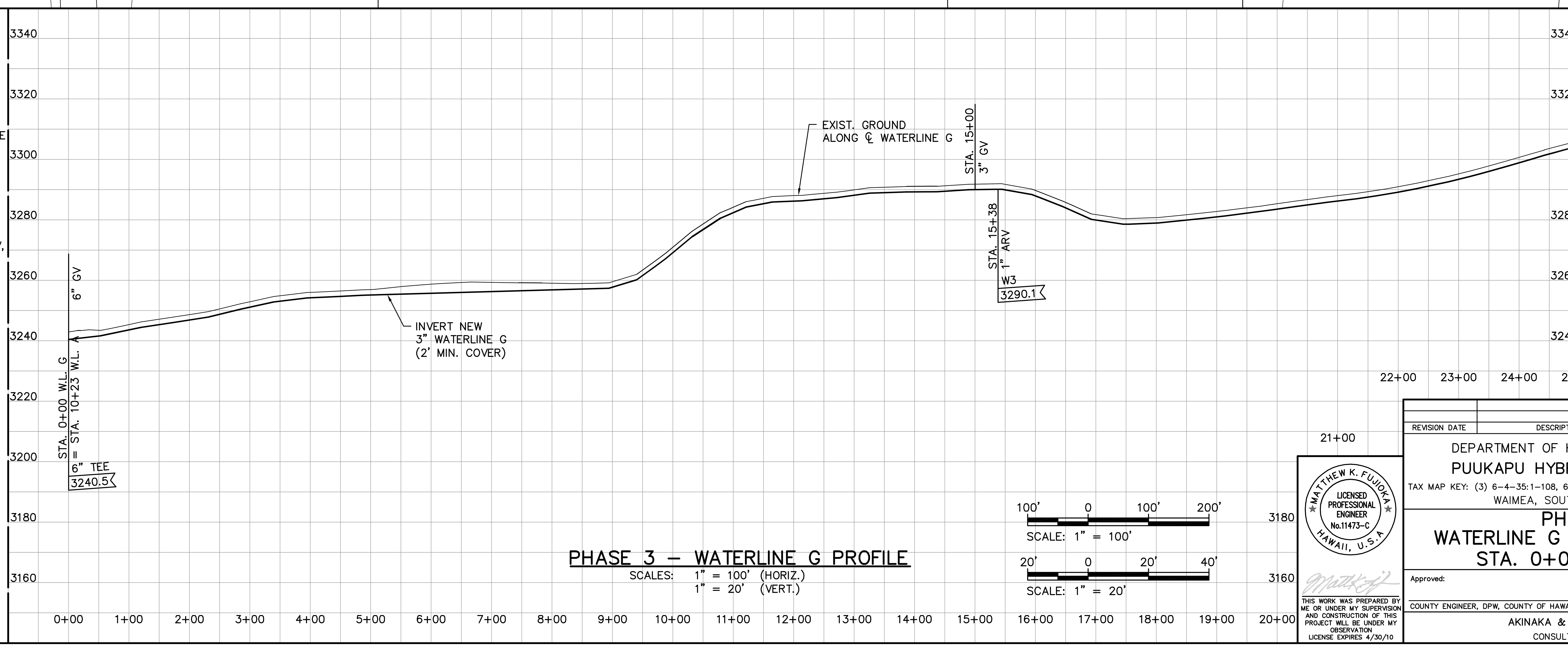
PHASE 3 – WATERLINE G PLAN

SCALE: 1" = 100'

LEGEND

	PROPERTY LINE (℗) OR RIGHT-OF-WAY (R/W)
e/elec	EXIST. ELECTRICAL LINE
e/w4	EXIST. WATERLINE W/SIZE
W3	PROPOSED WATERLINE W/SIZE
F/W8	FUTURE PHASE PROPOSED WATERLINE W/SIZE
	EXIST. ROADWAY
	PROPOSED DRYWELL
	PROPOSED GATE VALVE, ARV, OR CLEANOUT
	DOUBLE SERVICE LATERAL
	SINGLE SERVICE LATERAL



PHASE 3 – WATERLINE G PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE G PLAN & PROFILE
STA. 0+00 TO 25+00

MATTHEW K. FUJIOKA — LICENSED PROFESSIONAL ENGINEER No.11473-C — HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

C-24 SHEET 25 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 6/23/2011
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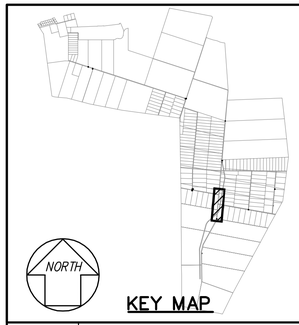


KEY MAP

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 3
STA. 25+78 ℄ WATERLINE G
= STA. 0+00 ℄ WATERLINE H
1 – 3" TEE
3 – 3" GATE VALVES
3 – VALVE BOXES
6 – 3" FLANGE ADAPTERS
1 – CONC. BLOCK

2 PHASE 3
STA. 35+70 ℄ WATERLINE G
= STA. 0+00 ℄ WATERLINE L
1 – 3" TEE
3 – 3" GATE VALVES
3 – VALVE BOXES
6 – 3" FLANGE ADAPTERS
1 – CONC. BLOCK

3 PHASE 3
STA. 44+50 ℄ WATERLINE G
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

PHASE 3
WATERLINE L
SEE SHT. C-34

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

OLD BOUNDARY LINE

LOT 135
LOT 136
LOT 137
LOT 158
LOT 159

60' R/W
SEE TYP. SECTION
SHEET C-3

R/W
e/elec
W3
5' 00' 00"
992.00'
1483.32'

PHASE 3
WATERLINE H
SEE SHT. C-29

FIRE ROAD – 11 (FR-11)
FIRE ROAD – 14 (FR-14)

℄ WATERLINE G
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

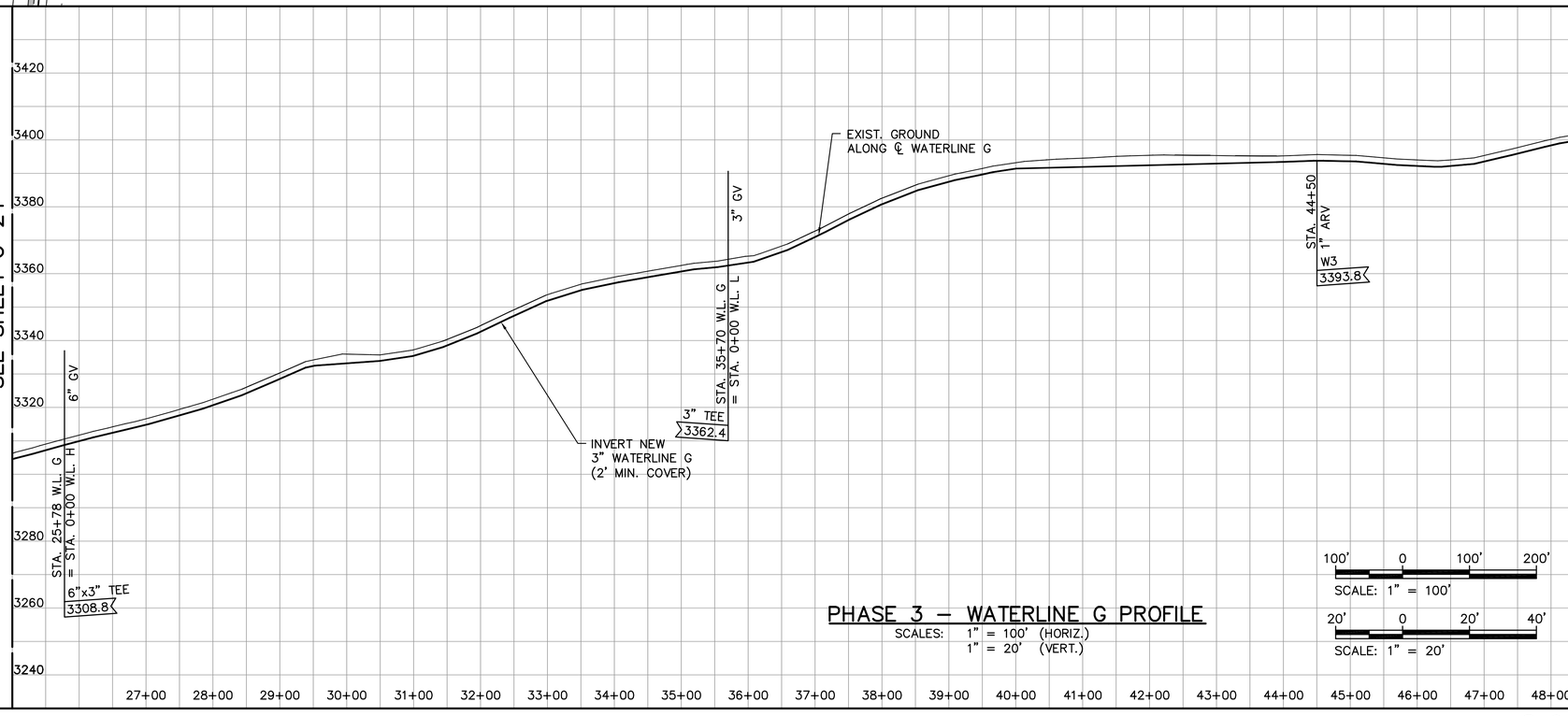
MATCHLINE STA. 25+00
SEE SHEET C-24

MATCHLINE STA. 50+00
SEE SHEET C-26

R=100
C=41.25

DT-CableBx
Fence
Gate
TeleBx
28' 46' 44"
33.18'
14' 14' 35"
244.01'

PHASE 3 – WATERLINE G PLAN
SCALE: 1" = 100'



PHASE 3 – WATERLINE G PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE G PLAN & PROFILE
STA. 25+00 TO 50+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 6/23/2011
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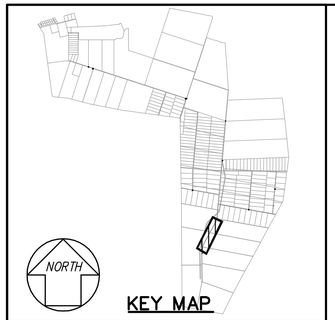


KEY MAP

TRUE NORTH
SCALE: 1" = 100'

(1) PHASE 3
STA. 51+18 ℄ WATERLINE G
1 – 3" TEE
2 – 3" GATE VALVE
4 – 3" FLANGE ADAPTERS
2 – VALVE BOXES
1 – CONC. BLOCK

(2) PHASE 3
SEE FIRE TANK NO. 3
SITE PLAN SHEET C-50

(3) PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

(4) 40' LONG CONSTRUCTION
INGRESS/EGRESS
SEE DET. C-42

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

60' R/W
SEE TYP. SECTION
SHEET C-3

R/W

W3

14° 14' 35"
244.01'

28° 46' 44"
33.18'

28° 36' 45"
2791.91'

℄ WATERLINE G
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

MATCHLINE STA. 50+00
SEE SHEET C-25

MATCHLINE STA. 75+00
SEE SHEET C-27

OLD BOUNDARY LINE

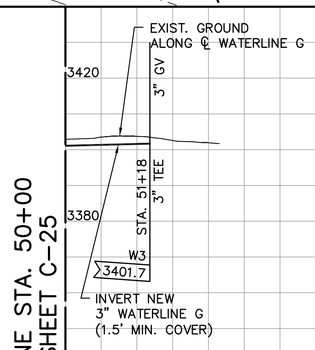
① R=100 C=41.25

Gate Telebox

Fence

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	23°46'44"	11°53'22"	100.00	21.05	41.20	41.50	16°53'22"

PHASE 3 – WATERLINE G PLAN
SCALE: 1" = 100'



PHASE 3 – WATERLINE G PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

MATCHLINE STA. 75+00
SEE SHEET C-27

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE G PLAN & PROFILE
STA. 50+00 TO 75+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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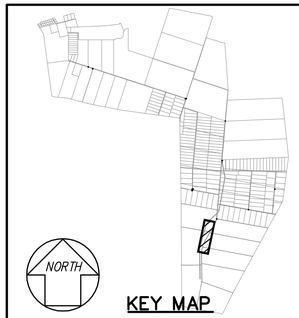
PCD. NO. 2 C-26

SHEET 27 OF 70 SHEETS



KEY MAP

(1) PHASE 3
STA. 81+64 ℄ WATERLINE G
DEFLECT 3" PIPE

(2) PHASE 3
STA. 89+13 ℄ WATERLINE G
DEFLECT 3" PIPE

TRUE NORTH
SCALE: 1" = 100'

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

R/W

MATCHLINE STA. 75+00
SEE SHEET C-26

W3
28° 36' 45"
2791.91'

60' R/W
SEE TYP. SECTION
SHEET C-3

13° 55' 50"
748.95'

℄ WATERLINE G
FOR TYPICAL TRENCH
SEE DETAIL 5 / C-38

MATCHLINE STA. 100+00
SEE SHEET C-28

359° 14' 55"

OLD BOUNDARY LINE

PHASE 3 – WATERLINE G PLAN
SCALE: 1" = 100'

LEGEND

——— – – ———	PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
———e/elec———	EXIST. ELECTRICAL LINE
——e/w4——	EXIST. WATERLINE W/SIZE
——W3——	PROPOSED WATERLINE W/SIZE
– – – –F/W8– – – –	FUTURE PHASE PROPOSED WATERLINE W/SIZE
	EXIST. ROADWAY
⊡	PROPOSED DRYWELL
∘	PROPOSED GATE VALVE, ARV, OR CLEANOUT
ı	DOUBLE SERVICE LATERAL
ı	SINGLE SERVICE LATERAL

100' 0 100' 200'
SCALE: 1" = 100'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE G PLAN
STA. 75+00 TO 100+00

MATTHEW K. FUJIOKA
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No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

C-27

SHEET 28 OF 70 SHEETS

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 6/23/2011

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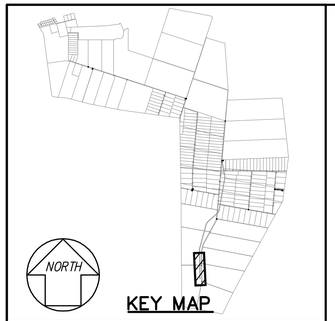


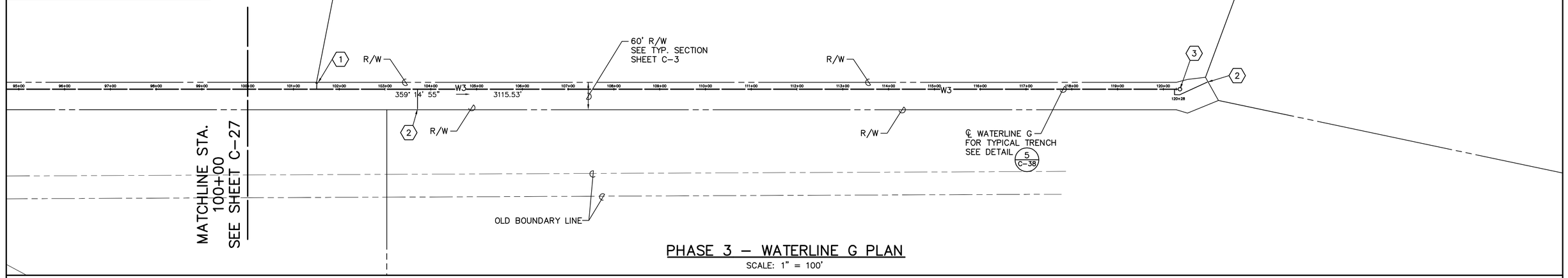
KEY MAP

(1) PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1 / C-52

(2) PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2 / C-52

(3) PHASE 3
STA. 120+28 ℄ WATERLINE G
1 – 3" MJ ADAPTER
1 – 3" CAP, M.J. TAPPED FOR 2-1/2" I.P.T.
1 – 2-1/2" CLEANOUT
1 – CONC. BLOCK
SEE DETAIL 4 / C-38

TRUE NORTH
SCALE: 1" = 100'



PHASE 3 – WATERLINE G PLAN
SCALE: 1" = 100'

LEGEND

——— – – ———	PROPERTY LINE (P) OR RIGHT-OF-WAY (R/W)
———e/elec———	EXIST. ELECTRICAL LINE
——e/w4——	EXIST. WATERLINE W/SIZE
——W3——	PROPOSED WATERLINE W/SIZE
– – – –F/W8– – – –	FUTURE PHASE PROPOSED WATERLINE W/SIZE
	EXIST. ROADWAY
⊡	PROPOSED DRYWELL
∘	PROPOSED GATE VALVE, ARV, OR CLEANOUT
⊥	DOUBLE SERVICE LATERAL
ı	SINGLE SERVICE LATERAL

100' 0 100' 200'
SCALE: 1" = 100'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE G PLAN
STA. 100+00 TO END

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
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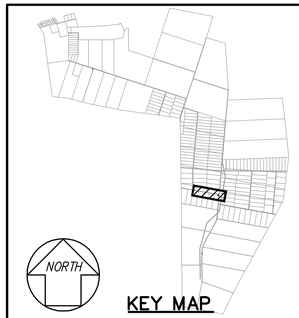


KEY MAP

1 PHASE 3
STA. 0+00 ℄ WATERLINE H
= STA. 25+78 ℄ WATERLINE G
SEE SHT. C-25

2 PHASE 3
STA. 6+79 ℄ WATERLINE H
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

4 PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

TRUE NORTH
SCALE: 1" = 100'

MATCHLINE STA. 20+00
SEE SHEET C-30

FIRE ROAD – 11 (FR-11)

FIRE ROAD – 14 (FR-14)

R/W

e/elec

W3

LOT 158

LOT 157

LOT 156

LOT 155

LOT 154

LOT 135

LOT 138

LOT 147

LOT 134

LOT R-7

OLD BOUNDARY LINE

PHASE 3
WATERLINE G
SEE SHT. C-25

PHASE 3
WATERLINE G
SEE SHT. C-24

R=500'
C=44.78'

95° 00' 00"
25.30'

W6

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

50' R/W
SEE TYP. SECTION
SHEET C-3

℄ WATERLINE H
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

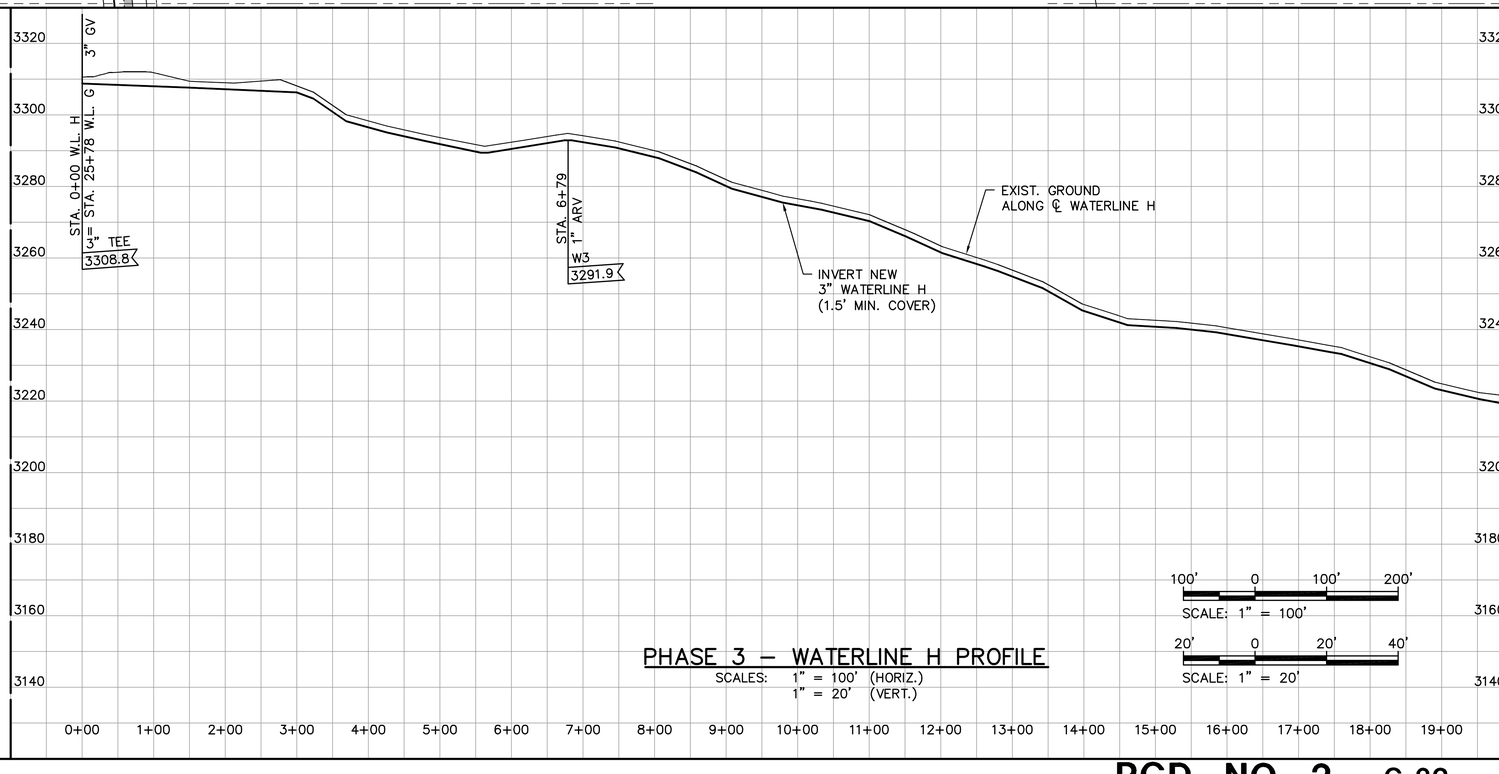
100° 06' 00"
2763.90'

1+00 2+00 3+00 4+00 5+00 6+00 7+00 8+00 9+00 10+00 11+00 12+00 13+00 14+00 15+00 16+00 17+00 18+00 19+00 20+00 21+00 22+00 23+00 24+00 25+00 26+00 27+00

CURVE DATA

CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	5°08'00"	2°34'00"	500.00	22.41	44.78	44.80	97°34'00"

PHASE 3 – WATERLINE H PLAN
SCALE: 1" = 100'



PHASE 3 – WATERLINE H PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE H PLAN & PROFILE
STA. 0+00 TO STA. 20+00

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
G:\DHHL06-01\Acad\DHHL061025.dwg

PCD. NO. 2 C-29

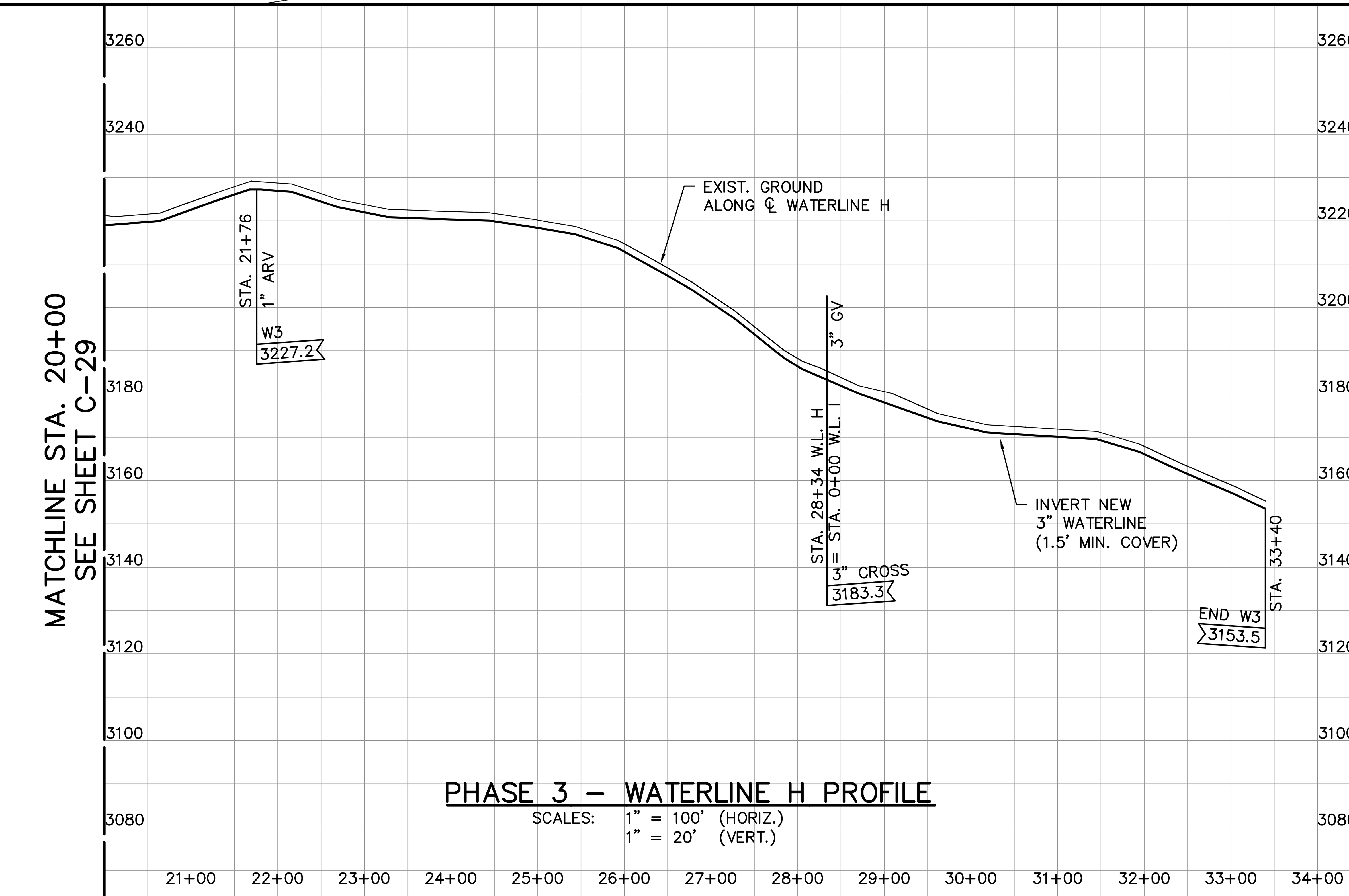
SHEET 30 OF 70 SHEETS

PHASE 3 – WATERLINE H PLAN

SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℗) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 3 – WATERLINE H PROFILE

SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1 1/19/2010	PCD 1 – ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE H PLAN & PROFILE
STA. 20+00 TO END

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

PCD. NO. 1 C-30

SHEET 31 OF 70 SHEETS

Last Save by: RKI
Last Saved: 2/4/2010
Plotted on: 5/24/2010
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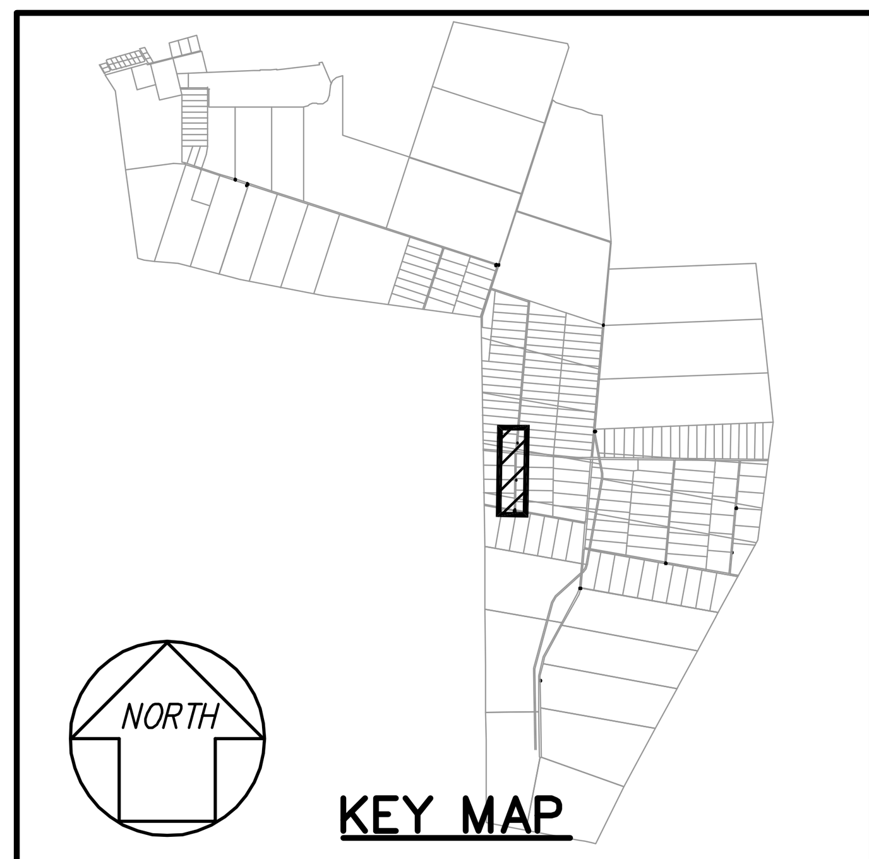


TRUE NORTH
SCALE: 1" = 100'

(1) PHASE 3
STA. 0+00 ℄ WATERLINE I
= STA. 28+34 ℄ WATERLINE H
SEE SHT. C-30

(2) PHASE 3
STA. 4+27 ℄ WATERLINE I
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

(3) PHASE 3
STA. 15+00 ℄ WATERLINE I
1 – 3" GATE VALVE
2 – 3" FLANGE ADAPTERS
1 – VALVE BOX

(4) PHASE 3
STA. 15+71 ℄ WATERLINE I
INSTALL BLOW-OFF TEE
1 – 3" TEE
1 – 3" GATE VALVE
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS
21 L.F. 3" PIPE
1 – CONC. BLOCKS
1 – 5' DIAMETER DRYWELL
SEE SHEET C-39

(5) PHASE 3
STA. 28+34 ℄ WATERLINE I
INSTALL BLOW-OFF TEE
1 – 3" TEE
1 – 3" GATE VALVE
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS
23 L.F. 3" PIPE
1 – CONC. BLOCKS
1 – 5' DIAMETER DRYWELL
SEE SHEET C-39

(6) PHASE 3
STA. 29+85 ℄ WATERLINE I
1 – 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

(7) PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

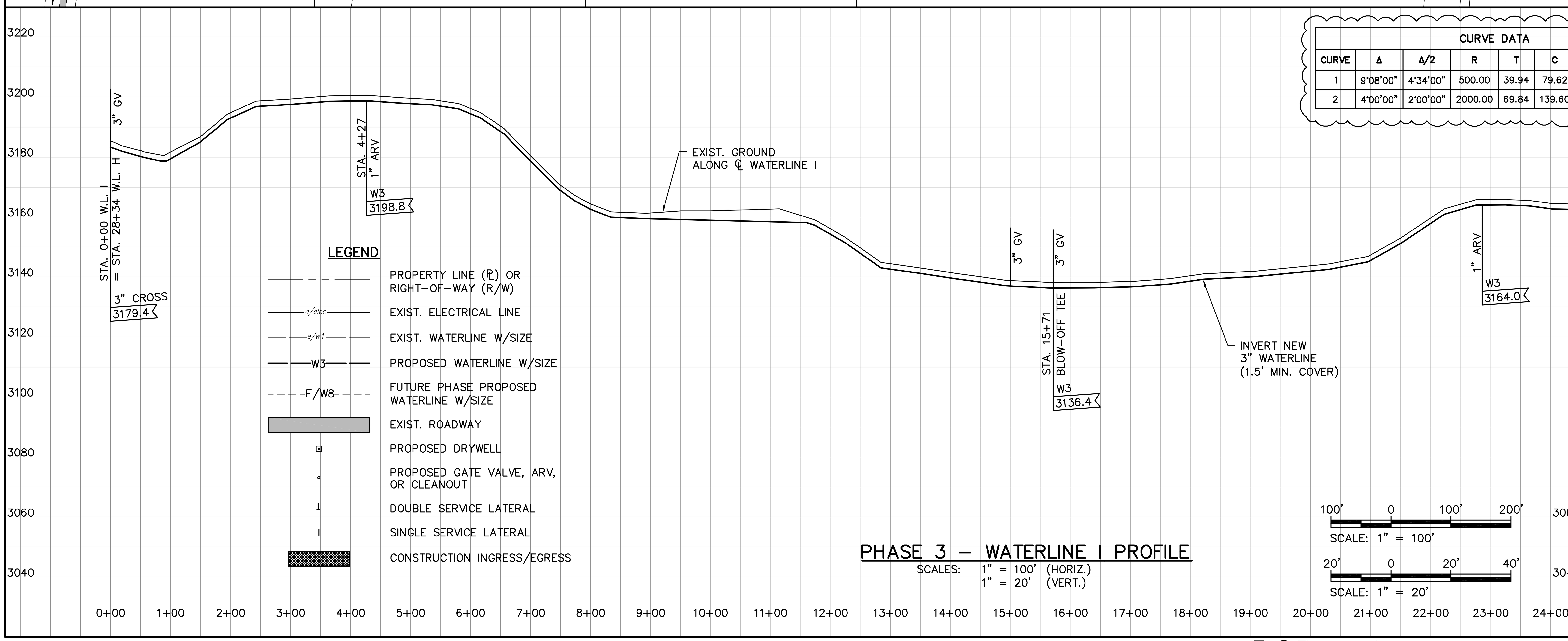
(8) PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

(9) 40' LONG CONSTRUCTION
INGRESS/EGRESS
SEE DET. C-42

PHASE 3 – WATERLINE I PLAN
SCALE: 1" = 100'

CURVE DATA

CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	9°08'00"	4°34'00"	500.00	39.94	79.62	79.70	185°34'00"
2	4°00'00"	2°00'00"	2000.00	69.84	139.60	139.63	183°00'00"



LEGEND

- PROPERTY LINE (PL) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

PHASE 3 – WATERLINE I PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE I PLAN & PROFILE
STA. 0+00 TO END

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

PCD. NO. 2 C-31

SHEET 32 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

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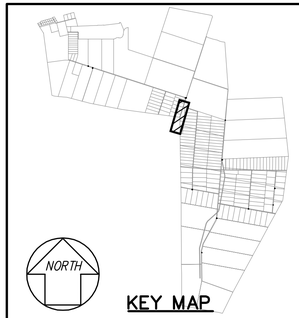
Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010



KEY MAP

1 PHASE 3
STA. 0+00 ℄ WATERLINE J
=STA. 87+67 ℄ WATERLINE C
SEE SHT. C-13

2 PHASE 3
STA. 8+70 ℄ WATERLINE J
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

4 PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

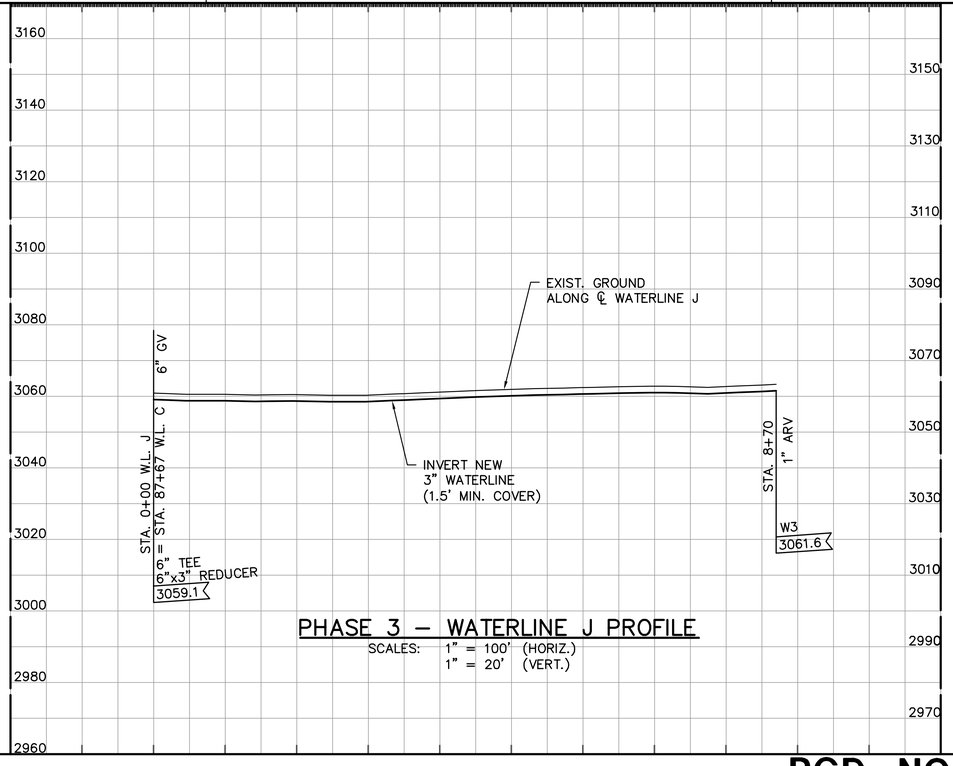
5 CONTRACTOR TO FIELD VERIFY LOCATION, CLEARANCE & EXISTING INVERTS.
1. 12" MIN. VERT. CLEARANCE WITH CONC. JACKET
2. 18" MIN. VERT. CLEARANCE WITHOUT CONC. JACKET

6 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42

PHASE 3 – WATERLINE J PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS



PHASE 3 – WATERLINE J PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADD UBC TABLE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE J PLAN & PROFILE
STA. 0+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/5/2010
Plotted on: 5/24/2010
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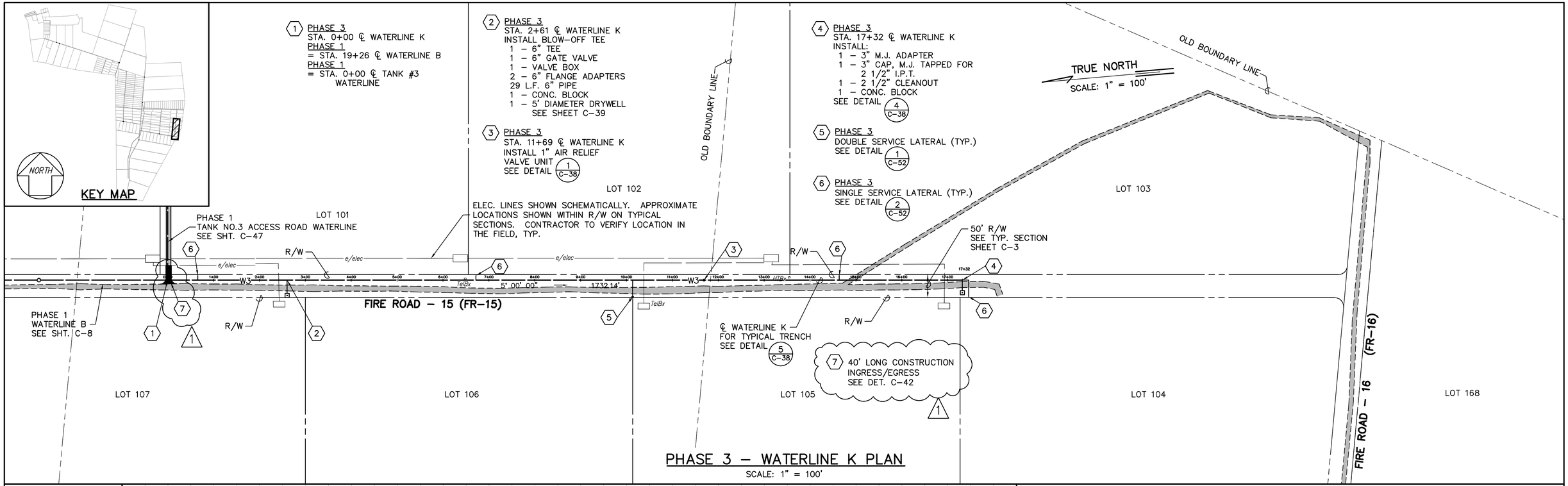
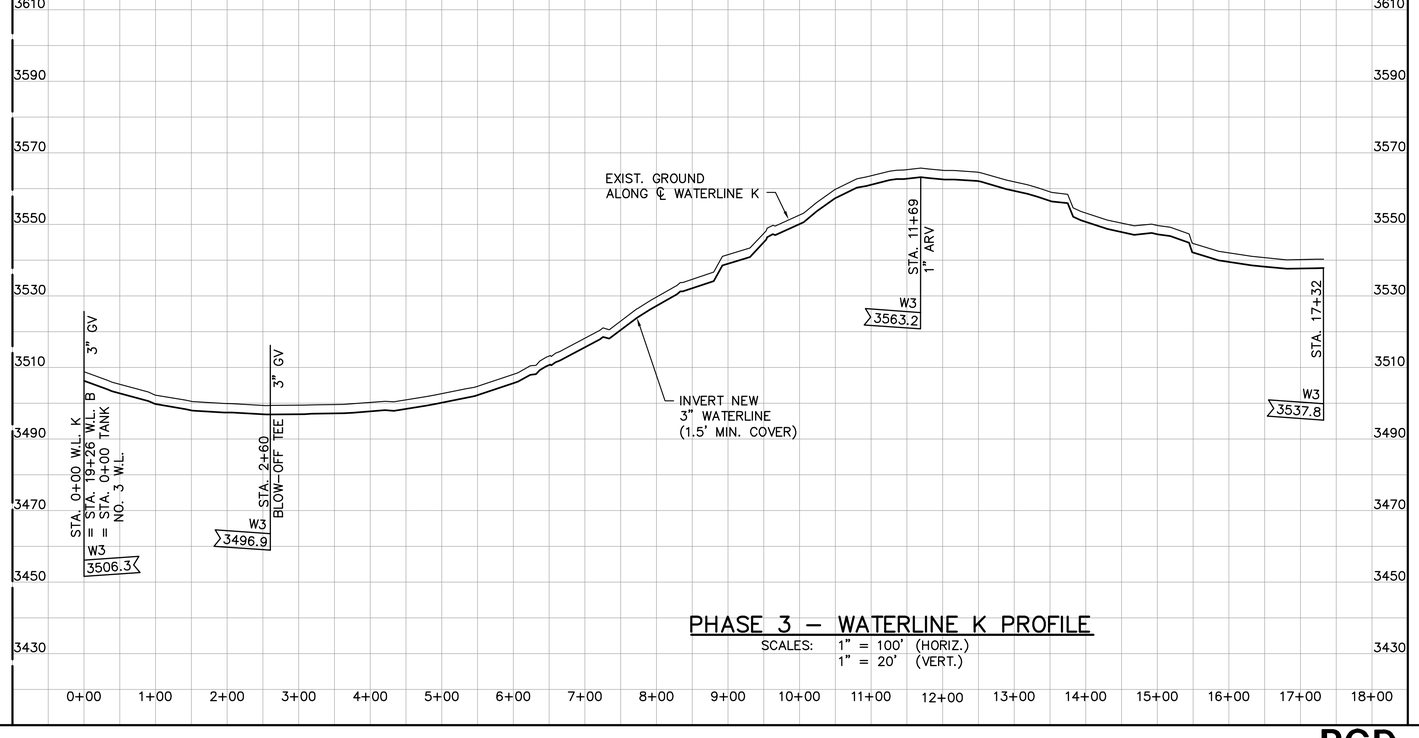
PCD. NO. 1 C-32 SHEET 33 OF 70 SHEETS



PHASE 3 – WATERLINE K PLAN
SCALE: 1" = 100'



PHASE 3 – WATERLINE K PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

LEGEND

- PROPERTY LINE (℄) OR RIGHT–OF–WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADDED NOTE	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE K PLAN & PROFILE
STA. 0+00 TO END

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

PCD. NO. 1 C-33

SHEET 34 OF 70 SHEETS

Last Save by: RKI
Last Saved: 2/4/2010
Plotted on: 5/24/2010
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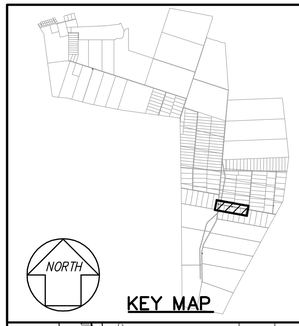

KEY MAP

1 PHASE 3
STA. 0+00 ℄ WATERLINE L
= STA. 35+70 ℄ WATERLINE G
SEE SHEET C-25

2 PHASE 3
STA. 7+28 ℄ WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 3
STA. 17+50 ℄ WATERLINE L
1 – 3" GATE VALVE
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS

4 PHASE 3
STA. 18+64 ℄ WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

5 PHASE 3
STA. 24+70 ℄ WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

6 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

TRUE NORTH
SCALE: 1" = 100'

MATCHLINE STA. 30+00
SEE SHEET C-35

LOT 137 | LOT 120 | LOT R-10 | LOT 164

℄ | R/W | W3 | e/elec

275° 00' 00"
27.91'

R=500
C=44.78 (1)

PHASE 3
WATERLINE G
SEE SHT. C-25

50' R/W
SEE TYP. SECTION
SHEET C-3

FIRE ROAD – 16 (FR-16)

280° 08' 00"
3167.63'

℄ WATERLINE L
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

WATERLINE R

FIRE ROAD – 11 (FR-11)

OLD BOUNDARY LINE

LOT 159 | LOT 160 | LOT 161 | LOT 162 | LOT 163

PHASE 3 – WATERLINE L PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- EXIST. ELECTRICAL LINE
- EXIST. WATERLINE W/SIZE
- PROPOSED WATERLINE W/SIZE
- FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	5°08'00"	2°34'00"	500.00	22.41	44.78	44.80	277°34'00"

2

STA. 0+00 W.L. L
= STA. 35+70 W.L. G
W3
3361.8

STA. 7+28
1" ARV
W3
3386.1

EXIST. GROUND
ALONG ℄ WATERLINE L

STA. 17+50
3" GV
W3
3439.8

STA. 18+64
1" ARV
W3
3440.7

INVERT NEW
3" WATERLINE
(1.5' MIN. COVER)

STA. 24+70
1" ARV
W3
3443.0

MATCHLINE STA. 30+00
SEE SHEET C-35

PHASE 3 – WATERLINE L PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE L PLAN & PROFILE
STA. 0+00 TO STA. 30+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

PCD. NO. 2 C-34

SHEET 35 OF 70 SHEETS

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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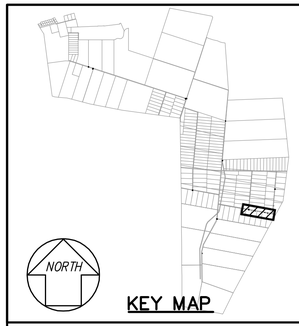

KEY MAP

MATCHLINE STA. 30+00
SEE SHEET C-34

FIRE ROAD – 13 (FR-13)

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 3
SEE FIRE TANK NO. 2
SITE PLAN SHT. C-49

2 PHASE 3
STA. 32+40 ℄ WATERLINE L
= STA. 0+00 ℄ WATERLINE M
SEE SHT. C-36
1 – 3" CROSS
4 – 3" GATE VALVES
4 – VALVE BOXES
8 – 3" FLANGE ADAPTERS
1 – CONC. BLOCK

3 PHASE 3
STA. 40+79 ℄ WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

4 PHASE 3
STA. 47+15 ℄ WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

5 PHASE 3
STA. 49+29 ℄ WATERLINE L
INSTALL BLOW-OFF TEE
1 – 3" TEE
1 – 3" GATE VALVE, FL.
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS
20 L.F. 3" PIPE
1 – CONC. BLOCKS
1 – 5' DIAMETER DRYWELL
SEE SHT. C-39

6 PHASE 3
STA. 52+67 ℄
END WATERLINE L
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

7 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

8 40' LONG CONSTRUCTION
INGRESS/EGRESS
SEE DET. C-42

LOT 119
LOT 104
LOT 163
LOT 164
LOT 165
LOT 166
LOT 167
LOT 168

50' R/W
SEE TYP. SECTION
SHEET C-3

FIRE ROAD – 16 (FR-16)

FIRE ROAD – 15 (FR-15)

R/W
℄

280° 08' 00"
1357.34'

280° 36' 00"
573.16'

R=5000
C=40.724

280° 08' 00"
14.36'

℄ WATERLINE L
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

PHASE 3 – WATERLINE L PLAN
SCALE: 1" = 100'

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	0°28'00"	0°14'00"	5000.00	20.36	40.72	40.72	280°22'00"
2	0°28'00"	0°14'00"	5000.00	20.36	40.72	40.72	280°22'00"

MATCHLINE STA. 30+00
SEE SHEET C-34

EXIST. GROUND
ALONG ℄ WATERLINE L

INVERT NEW
3" WATERLINE
(1.5' MIN. COVER)

STA. 32+40 W.L. L
= STA. 0+00 W.L. M
= FIRE TANK NO. 2 CONN.
3" GV
3" CROSS
3476.9

STA. 40+79
1" ARV
W3
3531.9

STA. 47+15
1" ARV
W3
3545.7

STA. 49+28
BLOW-OFF TEE
3" GV
W3
3522.7

STA. 52+67
1" ARV
W3
3552.6

3580 3560 3540 3520 3500 3480 3460 3440 3420 3400

31+00 32+00 33+00 34+00 35+00 36+00 37+00 38+00 39+00 40+00 41+00 42+00 43+00 44+00 45+00 46+00 47+00 48+00 49+00 50+00 51+00 52+00 53+00

PHASE 3 – WATERLINE L PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

LEGEND
- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE L PLAN & PROFILE
STA. 30+00 TO END

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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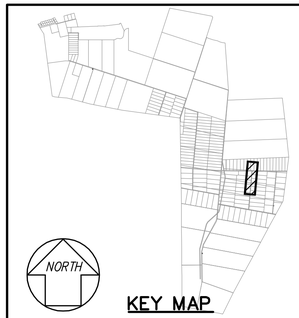
PCD. NO. 2 C-35

SHEET 36 OF 70 SHEETS



KEY MAP

TRUE NORTH
SCALE: 1" = 100'

PHASE 1
WATERLINE A
SEE SHT. C-6

1 PHASE 3
STA. 0+00 ℄ WATERLINE M
= STA. 42+51 ℄ WATERLINE A
SEE SHEET C-4

2 PHASE 3
STA. 7+33 ℄ WATERLINE M
INSTALL 1" AIR RELIEF
VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 3
STA. 14+00 ℄ WATERLINE M
INSTALL BLOW-OFF TEE
1 – 3" TEE
1 – 3" GATE VALVE
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS
25 L.F. 3" PIPE
1 – CONC. BLOCKS
1 – 5' DIAMETER DRYWELL
SEE SHEET C-39

4 PHASE 3
STA. 20+00 ℄ WATERLINE M
1 – 3" GATE VALVE, FL.
1 – VALVE BOX
2 – 3" FLANGE ADAPTERS

5 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

6 PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

LOT 87 | LOT 86 | LOT 85 | LOT 110 | LOT 111 | LOT 112 | LOT 113 | LOT 114 | LOT 115 | LOT 128 | LOT 127 | LOT 126 | LOT 125 | LOT 124 | LOT 123 | LOT R-11

FIRE ROAD – 12 (FR-12)
FIRE ROAD – 13 (FR-13)
OLD BOUNDARY LINE
R/W
e/elec
W6
W3
50' R/W
SEE TYP. SECTION
SHEET C-3
ELEC. LINES SHOWN SCHEMATICALLY.
APPROXIMATE LOCATIONS SHOWN WITHIN R/W
ON TYPICAL SECTIONS. CONTRACTOR TO
VERIFY LOCATION IN THE FIELD, TYP.
R=1000'
C=78.52'
0° 30' 00"
49.74'
5° 00' 00"
3886.22
℄ WATERLINE M
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38
MATCHLINE STA. 20+00
SEE SHEET C-37

PHASE 3 – WATERLINE M PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	4°30'00"	2°15'00"	1000.00	39.29	78.52	78.54	2°45'00"

2

STA. 0+00 W.L. M
= STA. 42+51 W.L. A
6" GV
6"x3" TEE
3361.0
STA. 7+33
1" ARV
W3
3345.4
EXIST. GROUND
ALONG ℄ WATERLINE M
INVERT NEW
3" WATERLINE
(1.5' MIN. COVER)
STA. 14+00
BLOW-OFF TEE
3" GV
W3
3333.9
STA. 20+00
3" GATE VALVE
W3
3477.2
MATCHLINE STA. 20+00
SEE SHEET C-37

PHASE 3 – WATERLINE M PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'
20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE M PLAN & PROFILE
STA. 0+00 TO STA. 20+00

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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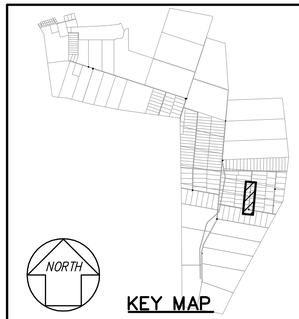

KEY MAP

MATCHLINE STA. 20+00
SEE SHEET C-36

TRUE NORTH
SCALE: 1" = 100'

1 PHASE 3
STA. 23+83.30 ℄ WATERLINE M
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

2 PHASE 3
STA. 40+86.84 ℄ WATERLINE M
INSTALL 1" AIR RELIEF VALVE UNIT
SEE DETAIL 1/C-38

3 PHASE 3
DOUBLE SERVICE LATERAL (TYP.)
SEE DETAIL 1/C-52

4 PHASE 3
SINGLE SERVICE LATERAL (TYP.)
SEE DETAIL 2/C-52

5 40' LONG CONSTRUCTION INGRESS/EGRESS
SEE DET. C-42

ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

50' R/W
SEE TYP. SECTION SHEET C-3

5' 00' 00"
3886.22'

℄ WATERLINE M
FOR TYPICAL TRENCH
SEE DETAIL 5/C-38

OLD BOUNDARY LINE

FIRE ROAD 13 (FR-13)

FIRE ROAD 16 (FR-16)

R=100
C=22.87

R=100
C=13.95

10' 08' 00"
28.14'

357' 00' 00"
25.47'

PHASE 3
WATERLINE L
SEE SHT. C-35

LOT 114 | LOT 115 | LOT 116 | LOT 117 | LOT 118 | LOT 119 | LOT 120 | LOT 121 | LOT 122 | LOT 123 | LOT 124 | LOT 125 | LOT 126 | LOT 163 | LOT 164 | LOT 165

R/W | W3 | e/elec | ℄

PHASE 3 – WATERLINE M PLAN
SCALE: 1" = 100'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- e/elec — EXIST. ELECTRICAL LINE
- e/w4 — EXIST. WATERLINE W/SIZE
- W3 — PROPOSED WATERLINE W/SIZE
- F/W8 — FUTURE PHASE PROPOSED WATERLINE W/SIZE
- EXIST. ROADWAY
- PROPOSED DRYWELL
- PROPOSED GATE VALVE, ARV, OR CLEANOUT
- DOUBLE SERVICE LATERAL
- SINGLE SERVICE LATERAL
- CONSTRUCTION INGRESS/EGRESS

MATCHLINE STA. 20+00
SEE SHEET C-36

CURVE DATA							
CURVE	Δ	Δ/2	R	T	C	Lc	AZIMUTH
1	8°00'00"	4°00'00"	100.00	6.99	13.95	13.96	1°00'00"
2	13°08'00"	6°34'00"	100.00	11.51	22.87	22.92	3°34'00"

2

EXIST. GROUND ALONG ℄ WATERLINE M

INVERT NEW 3" WATERLINE (1.5' MIN. COVER)

STA. 23+83.30
1" ARV
W3
3381.2

STA. 40+86.84
1" ARV
W3
3477.2

STA. 41+05
3" GV

3" CROSS
3476.9

3480 | 3460 | 3440 | 3420 | 3400 | 3380 | 3360 | 3340 | 3320 | 3300

21+00 | 22+00 | 23+00 | 24+00 | 25+00 | 26+00 | 27+00 | 28+00 | 29+00 | 30+00 | 31+00 | 32+00 | 33+00 | 34+00 | 35+00 | 36+00 | 37+00 | 38+00 | 39+00 | 40+00 | 41+00

PHASE 3 – WATERLINE M PROFILE
SCALES: 1" = 100' (HORIZ.)
1" = 20' (VERT.)

100' 0 100' 200'
SCALE: 1" = 100'

20' 0 20' 40'
SCALE: 1" = 20'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
11/05/2010	PCD 2 – CURVE DATA	A&A	
1/19/2010	PCD 1 – ADDED NOTE	A&A	

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

PHASE 3
WATERLINE M PLAN & PROFILE STA. 20+00 TO END

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CLJ
Last Saved: 11/8/2010
Plotted on: 11/8/2010
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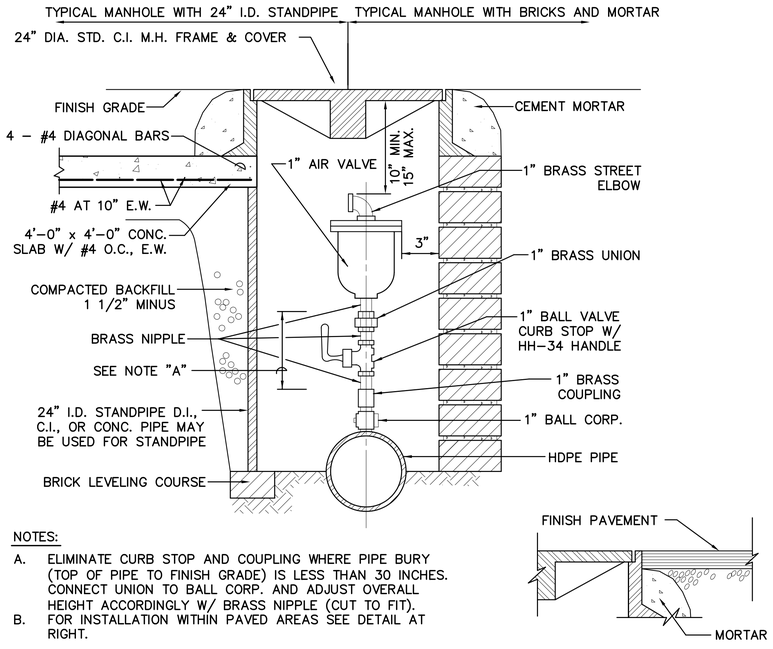
PCD. NO. 2 C-37

SHEET 38 OF 70 SHEETS

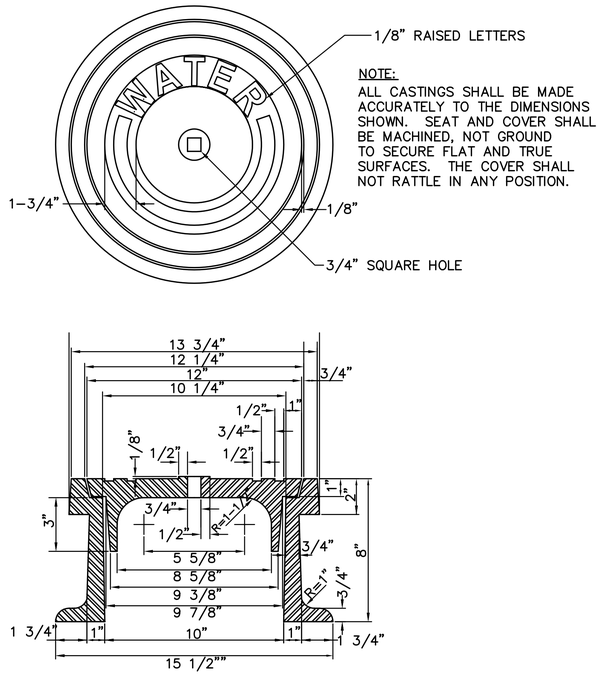


NOTES:

A. ELIMINATE CURB STOP AND COUPLING WHERE PIPE BURY (TOP OF PIPE TO FINISH GRADE) IS LESS THAN 30 INCHES. CONNECT UNION TO BALL CORP. AND ADJUST OVERALL HEIGHT ACCORDINGLY W/ BRASS NIPPLE (CUT TO FIT).

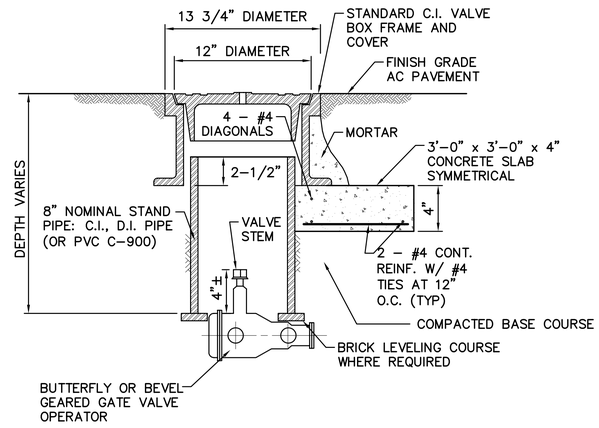
B. FOR INSTALLATION WITHIN PAVED AREAS SEE DETAIL AT RIGHT.

1 C–38 **1" AIR VALVE UNIT DETAIL**
NOT TO SCALE



NOTE:
ALL CASTINGS SHALL BE MADE ACCURATELY TO THE DIMENSIONS SHOWN. SEAT AND COVER SHALL BE MACHINED, NOT GROUND TO SECURE FLAT AND TRUE SURFACES. THE COVER SHALL NOT RATTLE IN ANY POSITION.

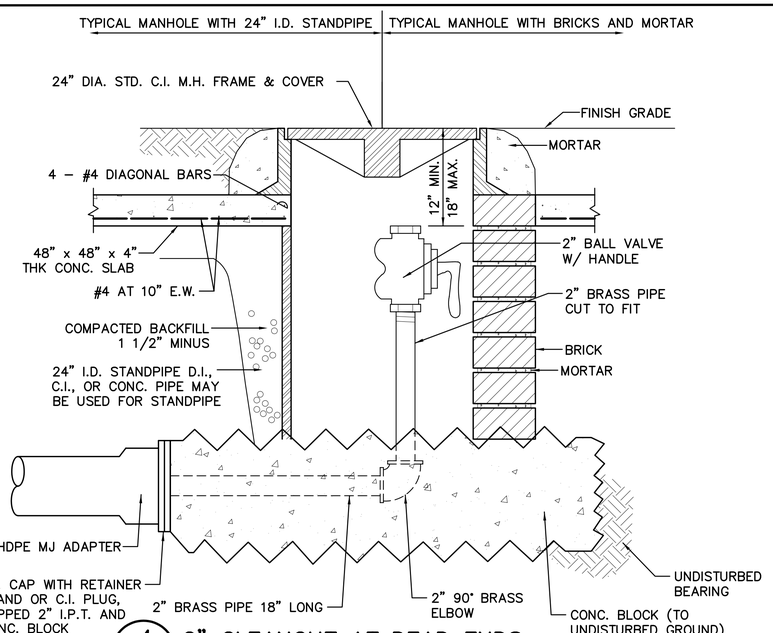
2 C–38 **CAST IRON FRAME & COVER**
NOT TO SCALE



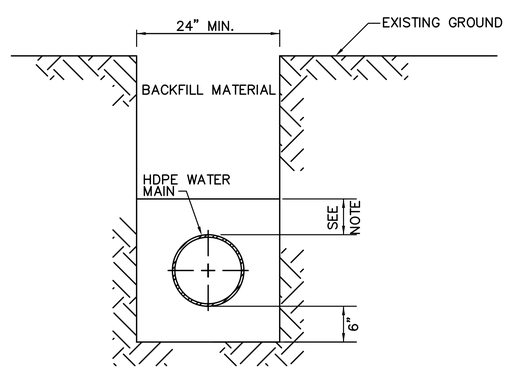
NOTE:

1. THE LIMIT OF PIPE CUSION BACKFILL AROUND THE VALVE SHALL BE THE TRENCH WIDTH X 4 FEET ON EACH SIDE OF VALVE AND FILL TO 8" BELOW FINISH GRADE.
2. CONCRETE SHALL BE DWS 2500.

3 C–38 **12" VALVE BOX INSTALLATION**
NOT TO SCALE



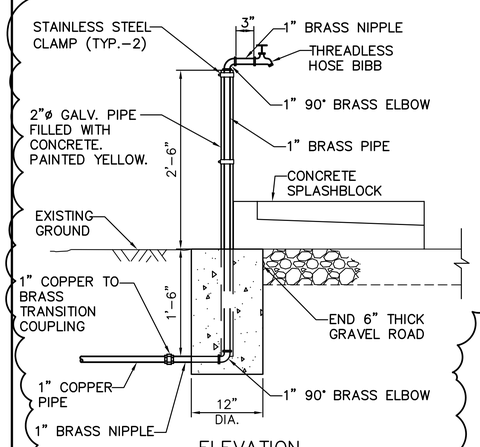
4 C–38 **2" CLEANOUT AT DEAD ENDS**
NOT TO SCALE



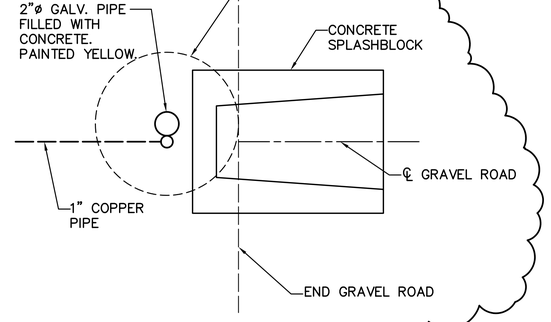
NOTE:

1. 12" OF CUSHION MATERIAL FOR PIPES 16" OR LARGER. 6" CUSHION MATERIAL FOR PIPES 12" OR SMALLER AT LOCATIONS WHERE INVERT IS ABOVE 4–FOOT ELEVATION.

5 C–38 **WATERLINE TRENCH DETAILS**
NOT TO SCALE



ELEVATION



PLAN

11 6 C–38 **HOSE BIBB DETAILS**
NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
8/7/2013	PCD 11–ADD HOSE BIBB DETAILS.	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6–4–35:1–108, 6–4–36:1–75, 6–4–37:1–7, & 6–4–38:1–13
WAIMEA, SOUTH KOHALA, HAWAII

WATER DETAILS

KEN C. KAWAHARA LICENSED PROFESSIONAL ENGINEER No. 9148–C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/14

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

PCD NO. 11 C-38

SHEET 39 OF ____ SHEETS

Last Save by: SMQ
Last Saved: 8/13/2013
Plotted on: 8/13/2013
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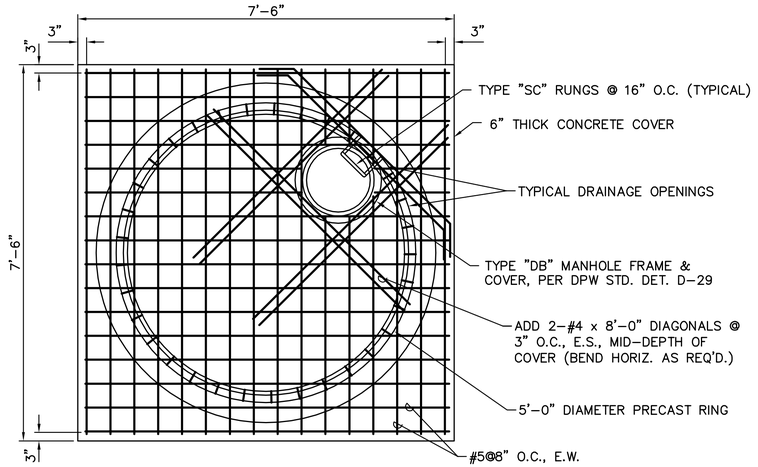

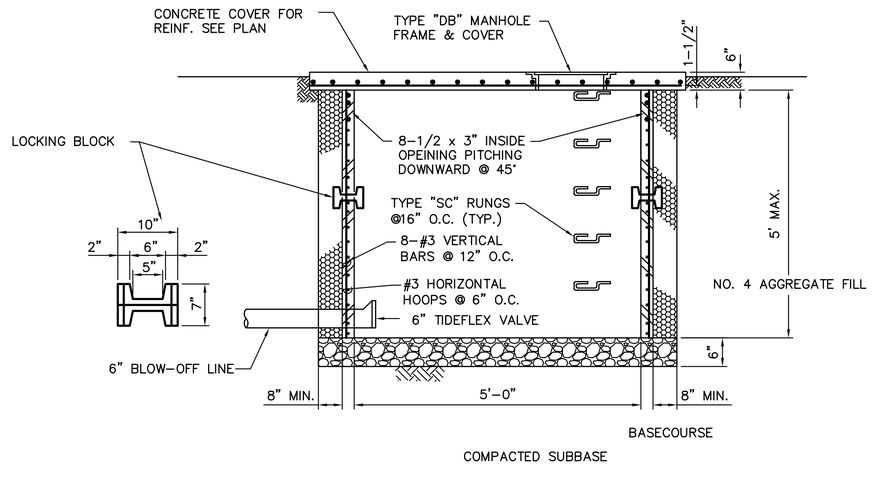

DRYWELL DETAILS

SCALE: NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

DRYWELL DETAILS

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

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Last Saved: 6/16/2009
Plotted on: 6/23/2011
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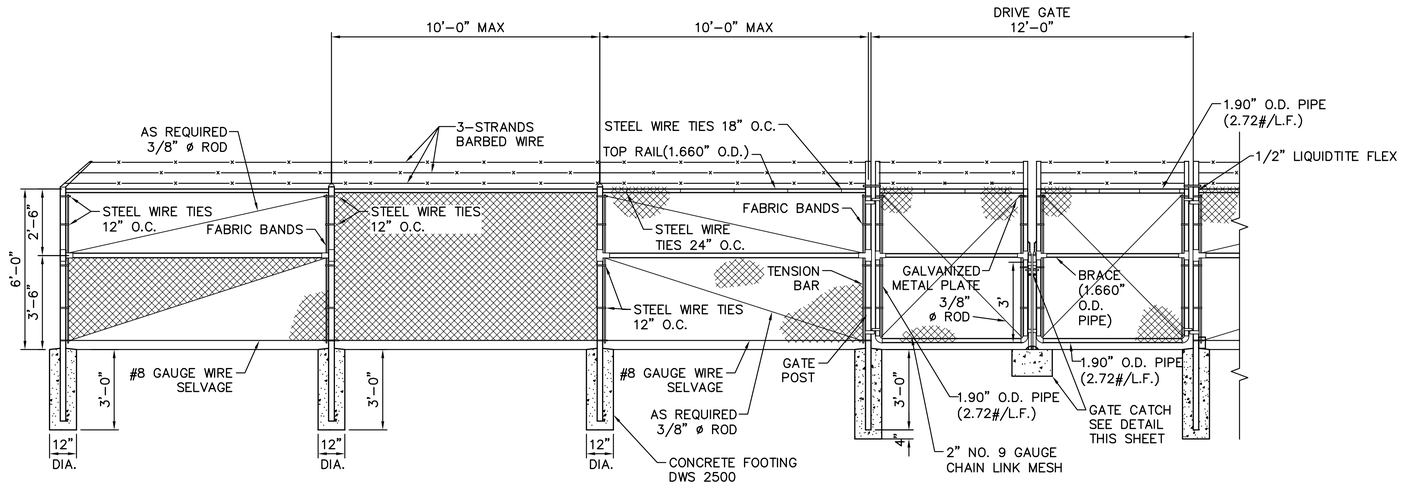
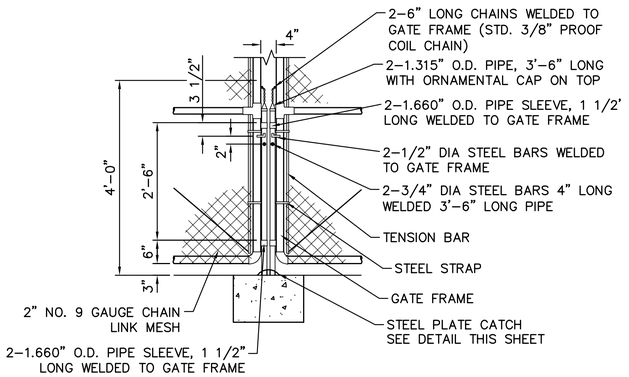
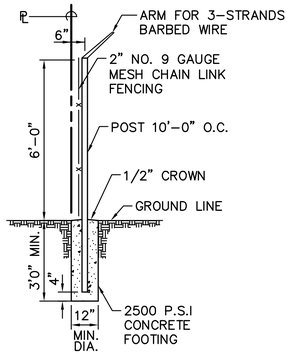


DRIVE GATE DETAIL

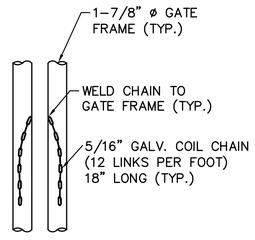
SCALE: 3/8" = 1'-0"



DETAIL AT CATCH JOINT



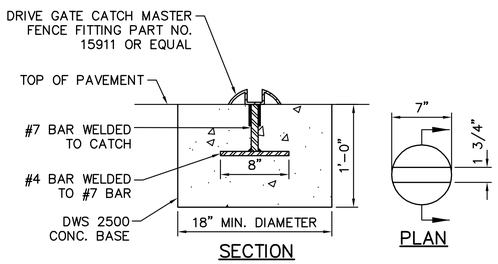
SECTION



CHAIN LOCK DETAIL

NOT TO SCALE

NOTES:
1. PROVIDE 2 GATE STOPS, SIMILAR IN CONSTRUCTION AS GATE CATCH FOR DRIVE GATES WHEN FULLY OPEN.
2. ALL MATERIALS SHALL BE HOT-DIPPED GALVANIZED UNLESS SPECIFIED OTHERWISE.



SECTION

PLAN

GATE CATCH DETAIL

NOT TO SCALE

FENCE & GATE DETAILS

SCALE AS SHOWN

2' 0 2' 4'

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

FENCE & GATE DETAILS

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 6/15/2009
Plotted on: 6/23/2011
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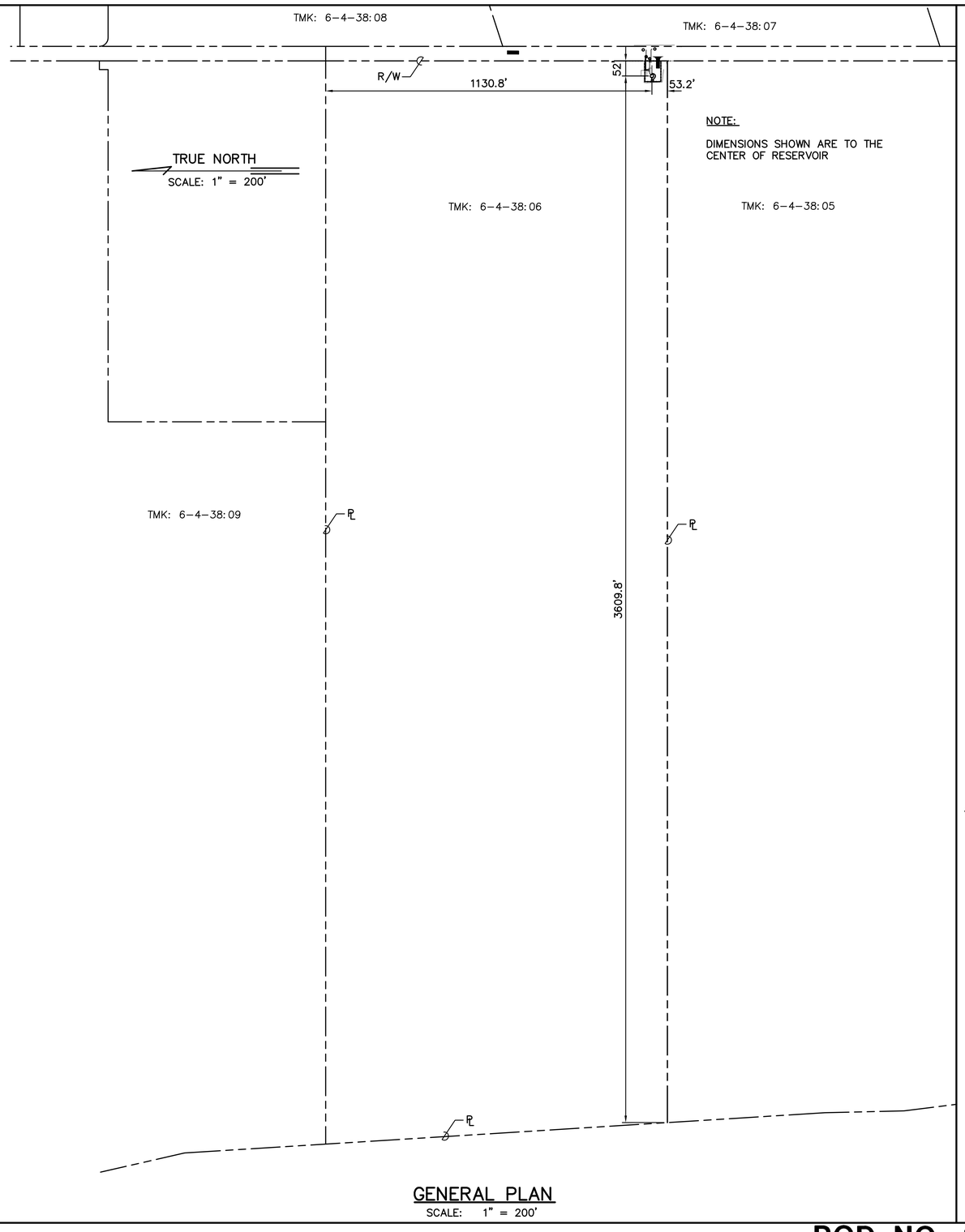


NOTE:

DIMENSIONS SHOWN ARE TO THE CENTER OF RESERVOIR

GENERAL PLAN

SCALE: 1" = 200'

(1) PHASE 2 BOOSTER PUMP AND TANK #1 SITE EFFLUENT LINE = STA. 199+88 ℄ WATERLINE C SEE SHEET C-17

(2) PHASE 2 BOOSTER PUMP AND TANK #1 SITE INSTALL 241 L.F. 6' HIGH CHAIN LINK FENCE SHT. C-40

(3) PHASE 2 BOOSTER PUMP SITE AND TANK #1 SITE INFLUENT LINE = STA. 0+00 ℄ WATERLINE N SEE SHEET C-18

(5) PHASE 2 BOOSTER PUMP AND TANK #1 SITE
2 - 6" GATE VALVES
2 - VALVE BOXES
2 - 6" 1/4 BENDS
2 - CONC. BLOCKS
1 - 4" COMPOUND WATER METER SEE DWS STD. DET. M16 AND M17
1 - METER BOX FOR 4" COMPOUND METER

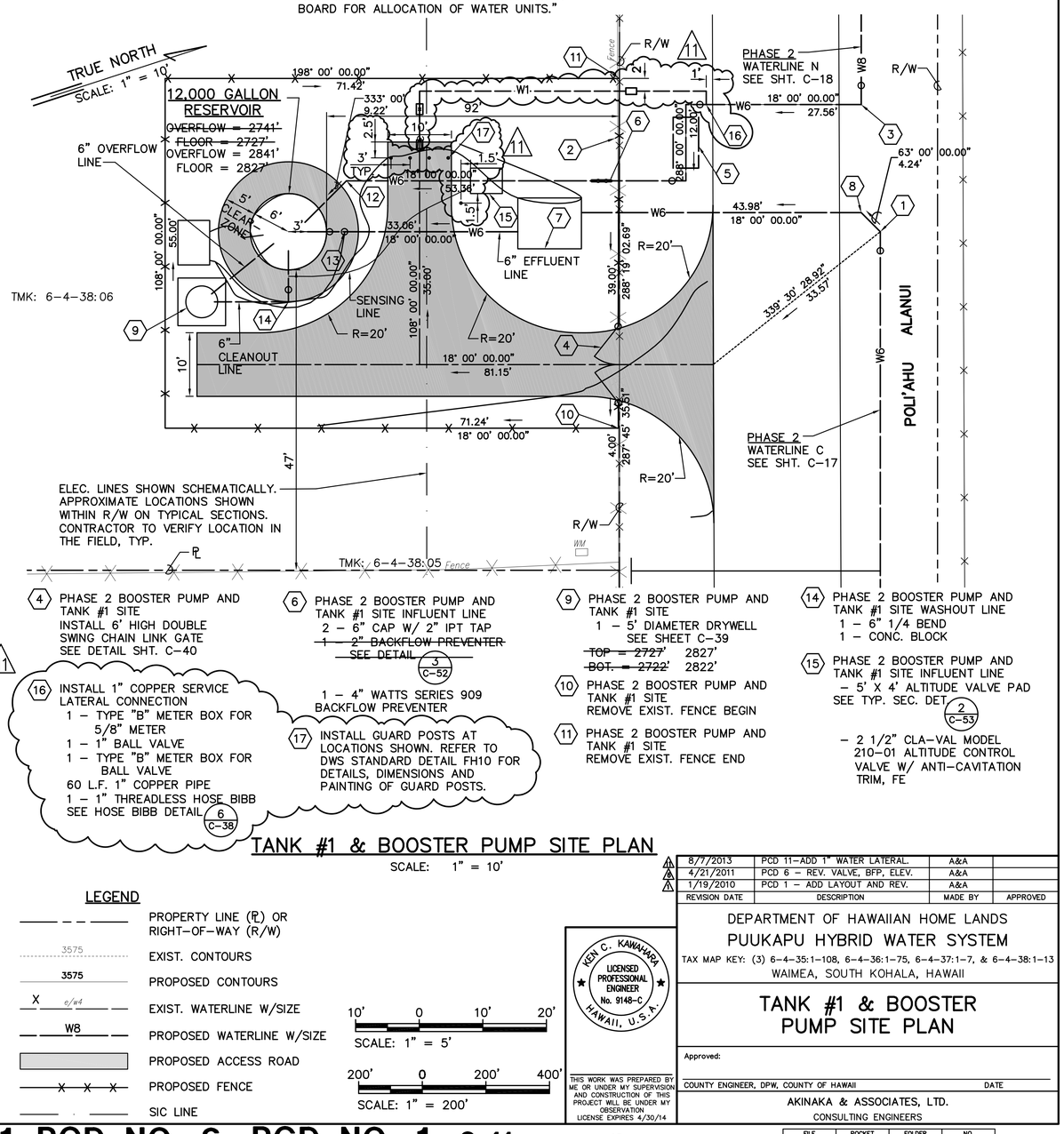
"INSTALLATION OF 4" WATER METER WILL BE CONTINGENT ON THE EXECUTION OF A WATER AGREEMENT BETWEEN DHHL AND THE WATER BOARD FOR ALLOCATION OF WATER UNITS."

(7) PHASE 2 BOOSTER PUMP AND TANK #1 SITE EFFLUENT LINE - 10' X 8' BOOSTER PUMP PAD SEE TYP. SEC. DET. 2/C-53

(8) PHASE 2 BOOSTER PUMP AND TANK #1 SITE EFFLUENT LINE
1 - 6" 1/8 BEND
1 - CONC. BLOCK

(12) PHASE 2 BOOSTER PUMP AND TANK #1 SITE INFLUENT LINE
1 - 1/8 BEND
1 - CONC. BLOCK

(13) PHASE 2 BOOSTER PUMP AND TANK #1 SITE EFFLUENT LINE
1 - 6" TEE
1 - 6" GATE VALVE
1 - VALVE BOX
1 - CONC. BLOCK



ELEC. LINES SHOWN SCHEMATICALLY. APPROXIMATE LOCATIONS SHOWN WITHIN R/W ON TYPICAL SECTIONS. CONTRACTOR TO VERIFY LOCATION IN THE FIELD, TYP.

(4) PHASE 2 BOOSTER PUMP AND TANK #1 SITE
INSTALL 6' HIGH DOUBLE SWING CHAIN LINK GATE
SEE DETAIL SHT. C-40

(6) PHASE 2 BOOSTER PUMP AND TANK #1 SITE INFLUENT LINE
2 - 6" CAP W/ 2" IPT TAP
~~1 - 2" BACKFLOW PREVENTER~~
~~SEE DETAIL 3/C-52~~
1 - 4" WATTS SERIES 909 BACKFLOW PREVENTER

(9) PHASE 2 BOOSTER PUMP AND TANK #1 SITE
1 - 5' DIAMETER DRYWELL
SEE SHEET C-39
~~TOP = 2727'~~ 2827'
~~BOT. = 2722'~~ 2822'

(10) PHASE 2 BOOSTER PUMP AND TANK #1 SITE REMOVE EXIST. FENCE BEGIN

(11) PHASE 2 BOOSTER PUMP AND TANK #1 SITE REMOVE EXIST. FENCE END

(14) PHASE 2 BOOSTER PUMP AND TANK #1 SITE WASHOUT LINE
1 - 6" 1/4 BEND
1 - CONC. BLOCK

(15) PHASE 2 BOOSTER PUMP AND TANK #1 SITE INFLUENT LINE
- 5' X 4' ALTITUDE VALVE PAD SEE TYP. SEC. DET. 2/C-53
- 2 1/2" CLA-VAL MODEL 210-01 ALTITUDE CONTROL VALVE W/ ANTI-CAVITATION TRIM, FE

(11) (16) INSTALL 1" COPPER SERVICE LATERAL CONNECTION
1 - TYPE "B" METER BOX FOR 5/8" METER
1 - 1" BALL VALVE
1 - TYPE "B" METER BOX FOR BALL VALVE
60 L.F. 1" COPPER PIPE
1 - 1" THREADLESS HOSE BIBB
SEE HOSE BIBB DETAIL 6/C-38

(17) INSTALL GUARD POSTS AT LOCATIONS SHOWN. REFER TO DWS STANDARD DETAIL FH10 FOR DETAILS, DIMENSIONS AND PAINTING OF GUARD POSTS.

TANK #1 & BOOSTER PUMP SITE PLAN

SCALE: 1" = 10'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- X e/w EXIST. WATERLINE W/SIZE
- W8 PROPOSED WATERLINE W/SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- SIC LINE

10' 0 10' 20'
SCALE: 1" = 5'

200' 0 200' 400'
SCALE: 1" = 200'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
8/7/2013	PCD 11-ADD 1" WATER LATERAL.	A&A	
4/21/2011	PCD 6 - REV. VALVE, BFP, ELEV.	A&A	
1/19/2010	PCD 1 - ADD LAYOUT AND REV.	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

TANK #1 & BOOSTER PUMP SITE PLAN

KEN C. KAWAHARA
LICENSED PROFESSIONAL ENGINEER
No. 9148-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/14

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

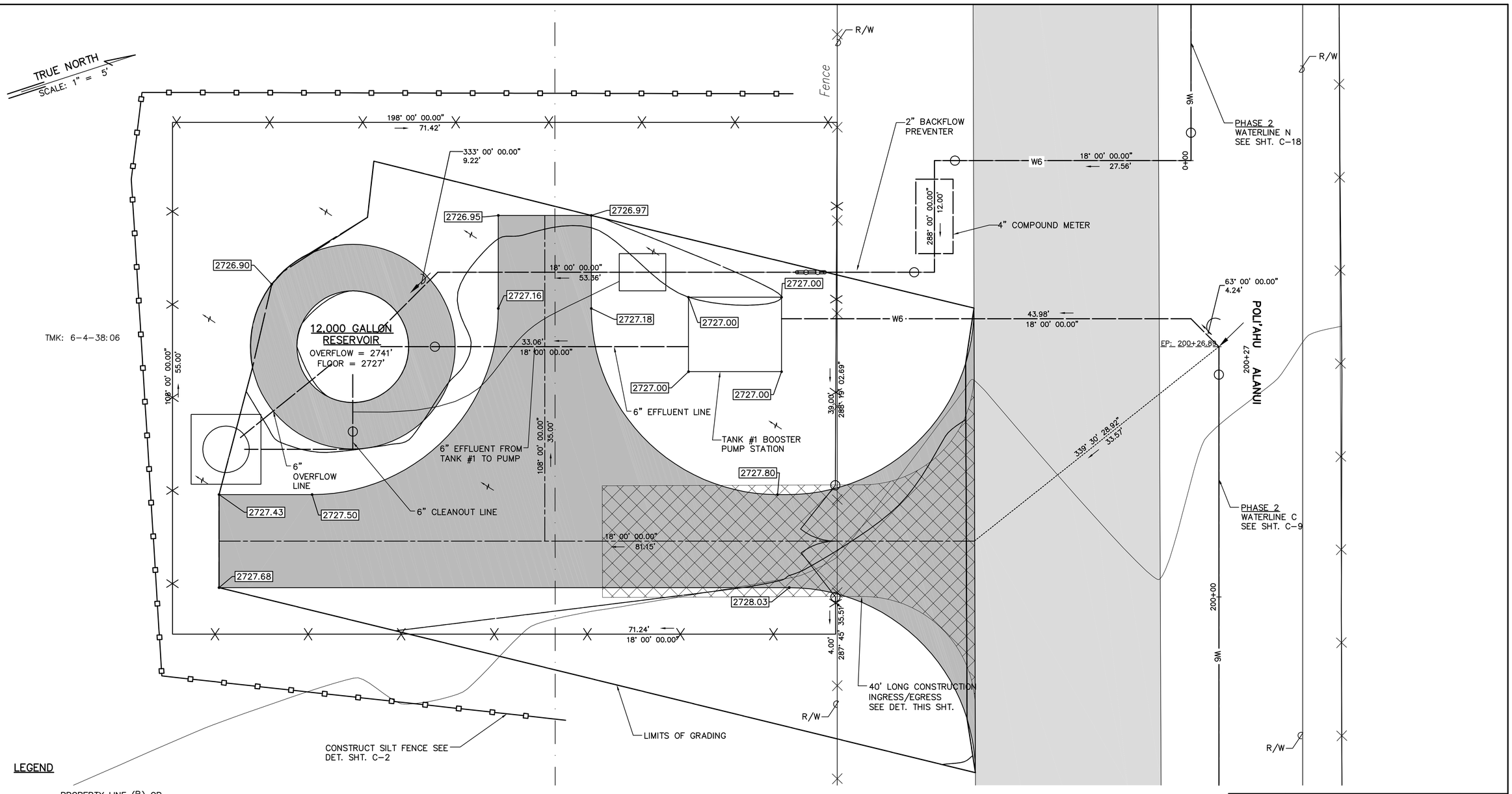
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: SMQ
Last Saved: 8/13/2013
Plotted on: 8/13/2013
G:\DHHL06-01\PCD\PCD 11\PCD 11_DHHL061041-standpipe.dwg

PCD NO. 11 PCD NO. 6 PCD NO. 1 C-41

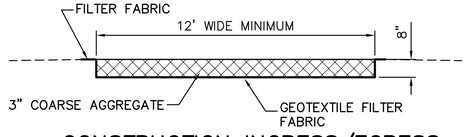
SHEET 42 OF ____ SHEETS



LEGEND

- PROPERTY LINE (P) OR RIGHT-OF-WAY (R/W)
- 3575 — EXIST. CONTOURS
- 3575 — PROPOSED CONTOURS
- e/w4 — EXIST. WATERLINE W/ SIZE
- W6 — PROPOSED WATERLINE W/ SIZE
- PROPOSED GRAVEL ACCESS ROAD
- PROPOSED FENCE

GRADING QUANTITIES:
CUT = 0 CU. YDS.
FILL = 155 CU. YDS.



CONSTRUCTION INGRESS/EGRESS
NOT TO SCALE

TANK #1 & BOOSTER PUMP GRADING PLAN
SCALES: 1" = 5'

5' 0 5' 10'
SCALE: 1" = 5'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TANK #1 & BOOSTER PUMP GRADING PLAN

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 10/11/2010
Plotted on: 6/23/2011
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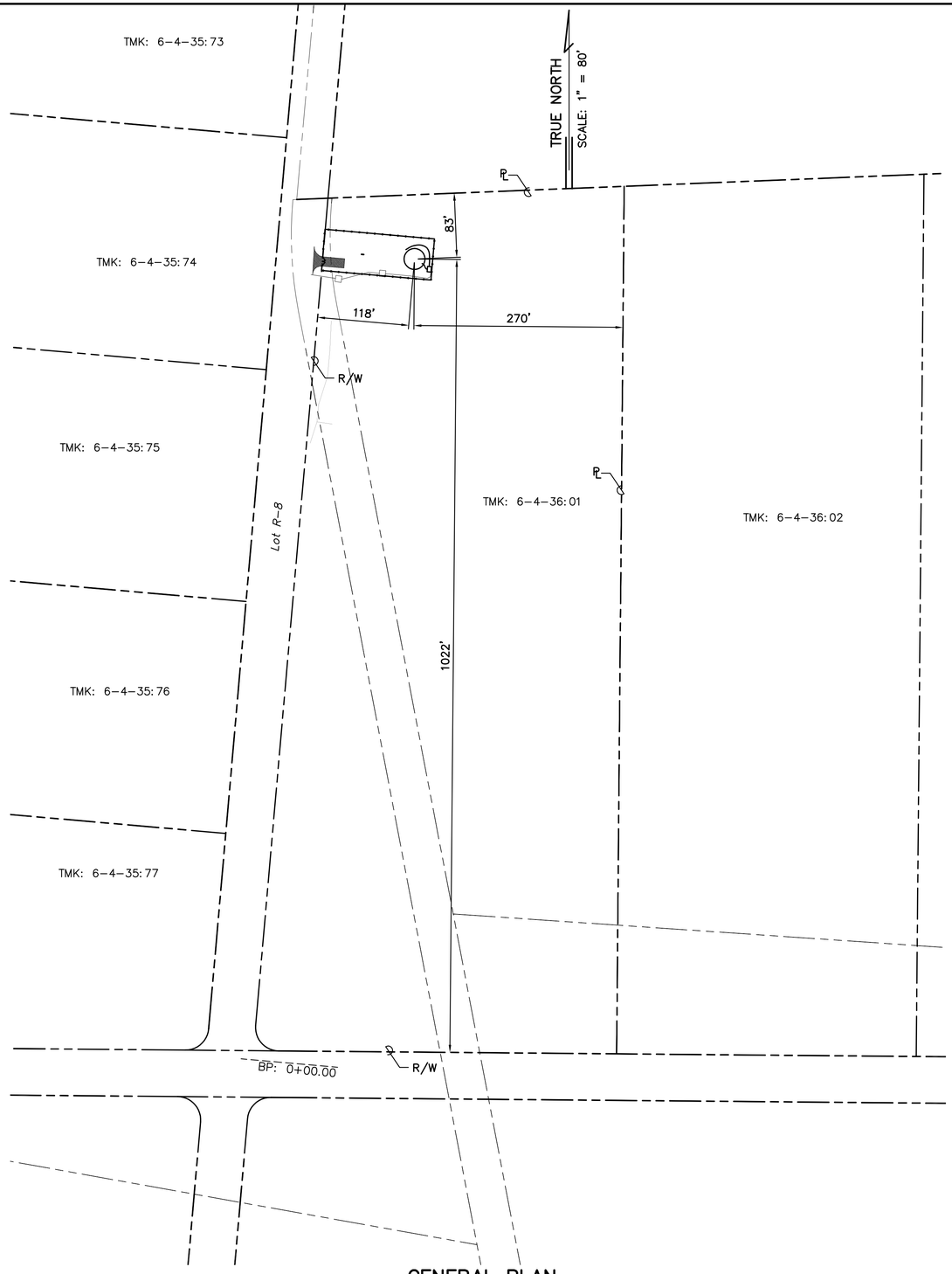
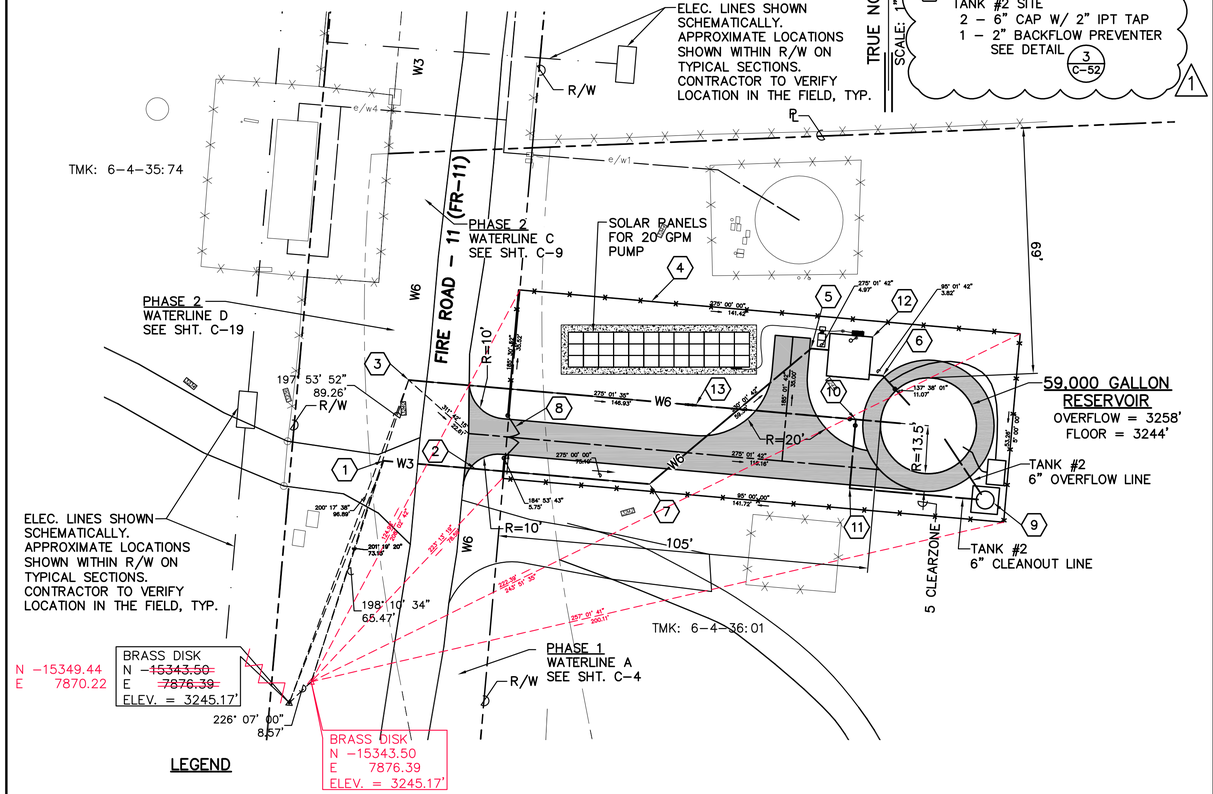


GENERAL PLAN

SCALE: 1" = 80'

1. PHASE 1 BOOSTER PUMP AND TANK #2 SITE EFFLUENT LINE = STA. 0+00 ℄ WATERLINE D SEE SHEET C-19
2. PHASE 1 BOOSTER PUMP AND TANK #2 SITE EFFLUENT LINE TO TANK SITE #3 = STA. 0+00 ℄ WATERLINE A SEE SHEET C-4
3. PHASE 1 BOOSTER PUMP AND TANK #2 SITE INFLUENT LINE = STA. 0+00 ℄ WATERLINE C SEE SHEET C-9
4. PHASE 1 BOOSTER PUMP AND TANK #2 SITE INSTALL 379 L.F. 6' HIGH CHAIN LINK FENCE SEE DETAIL SHT. C-40
5. PHASE 1 BOOSTER PUMP AND BOOSTER PUMP TO EFFLUENT
   1 - 6" 1/8 BEND
   1 - CONC. BLOCK
6. PHASE 1 BOOSTER PUMP AND TANK #2 SITE TO BOOSTER PUMP
   1 - 6" 1/8 BEND
   1 - CONC. BLOCK
7. PHASE 1 BOOSTER PUMP AND TANK #2 SITE EFFLUENT FROM BOOSTER PUMP
   1 - 6" 45° BEND
   1 - CONC. BLOCK
8. PHASE 1 BOOSTER PUMP AND TANK #2 SITE INSTALL 6' HIGH DOUBLE SWING CHAIN LINK GATE SEE DETAIL SHT. C-40
9. PHASE 1 BOOSTER PUMP AND TANK #2 SITE
   1 - 5' DIAMETER DRYWELL SEE SHEET C-39
   TOP = 3244'
   BOT. = 3239'
10. PHASE 1 BOOSTER PUMP AND TANK #2 SITE INFLUENT LINE
    1 - 6" TEE
    2 - GATE VALVES
    2 - VALVE BOXES
    1 - CONC. BLOCK
11. PHASE 1 BOOSTER PUMP AND TANK #2 SITE WASHOUT
    1 - 6" 1/4 BEND
    1 - CONC. BLOCK
12. PHASE 1 BOOSTER PUMP AND TANK #2 SITE
    - 12' x 12' BOOSTER PUMP PAD SEE TYP. SEC. DET. (2 / C-53)
13. PHASE 1 BOOSTER PUMP AND TANK #2 SITE
    2 - 6" CAP W/ 2" IPT TAP
    1 - 2" BACKFLOW PREVENTER SEE DETAIL (3 / C-52)



TANK #2 & BOOSTER PUMP SITE PLAN

SCALE: 1" = 20'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W8 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- SIC LINE

20' 0 20' 40'
SCALE: 1" = 20'

80' 0 80' 160'
SCALE: 1" = 80'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 - ADD BFP & LAYOUT	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

TANK #2 & BOOSTER PUMP SITE PLAN

MATTHEW K. FUJIOKA LICENSED PROFESSIONAL ENGINEER No.11473-C HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

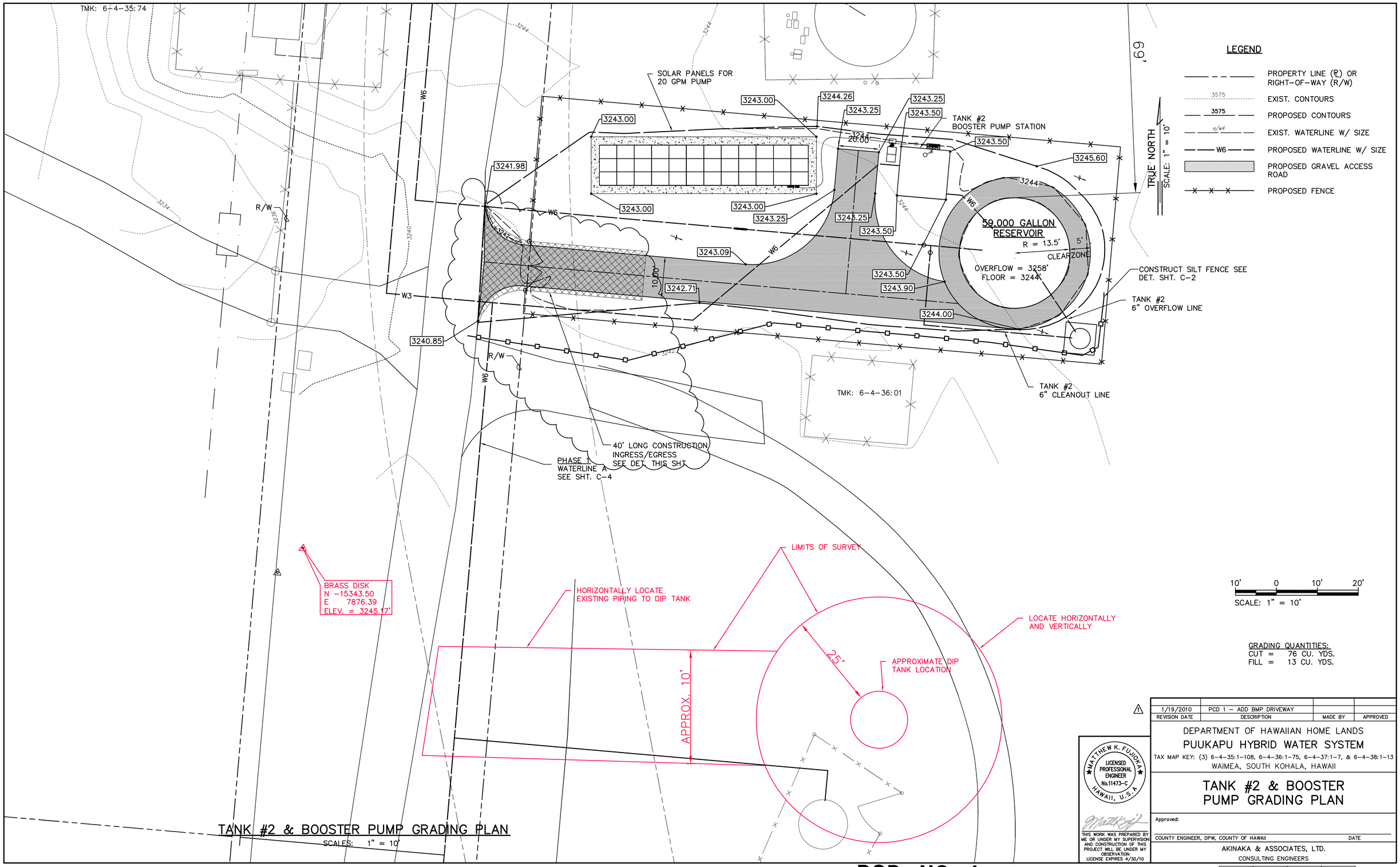
Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 9/6/2011
Plotted on: 4/8/2014
G:\DHHL06-01\Acad\DHHL061040.dwg



TANK #2 & BOOSTER PUMP GRADING PLAN
SCALES: 1" = 10'

GRADING QUANTITIES:
CUT = 76 CU. YDS.
FILL = 13 CU. YDS.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADD BMP DRIVEWAY		

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TANK #2 & BOOSTER PUMP GRADING PLAN

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/1/2011
Plotted on: 6/23/2011
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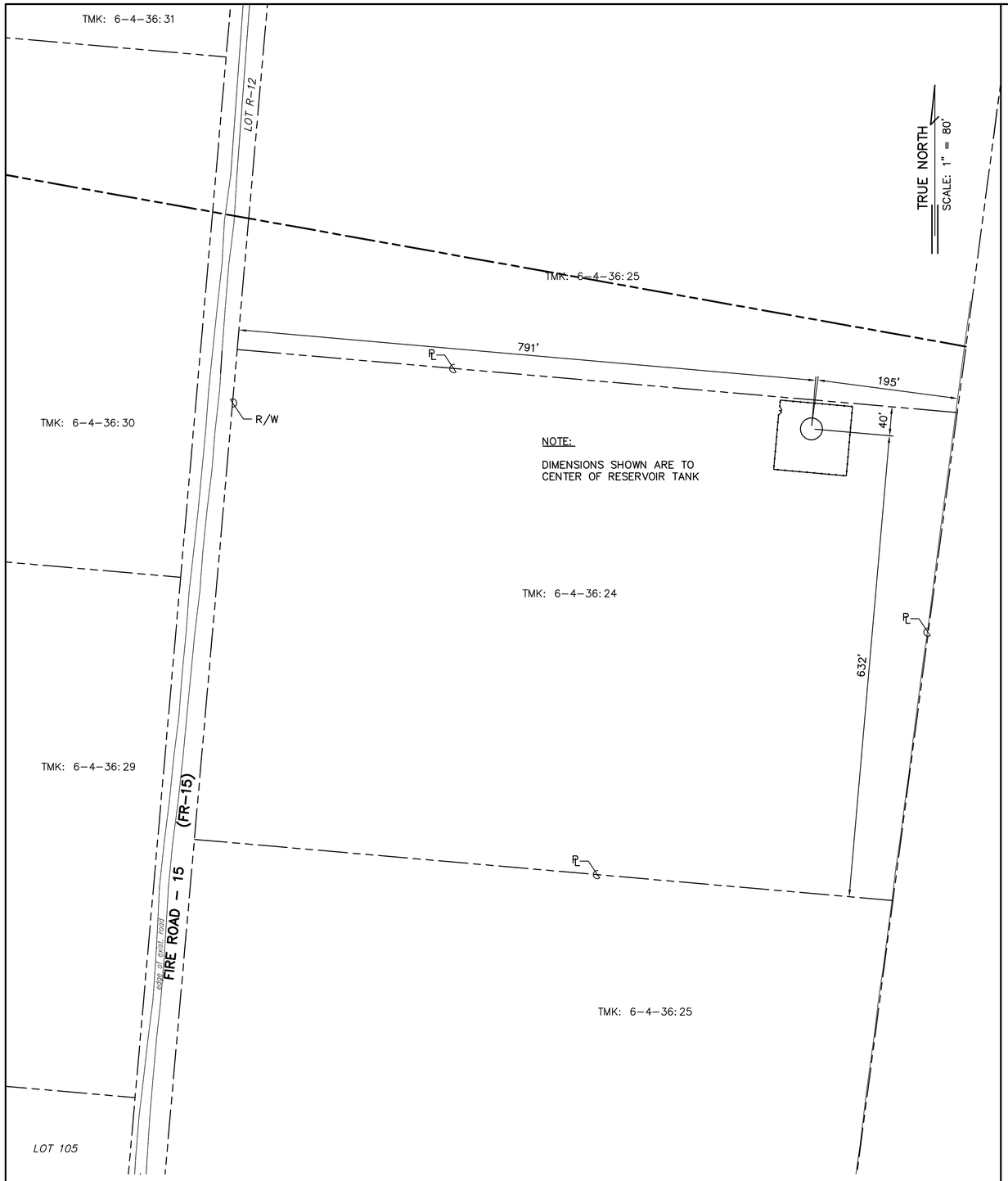


GENERAL PLAN
SCALE: 1" = 80'

(1) PHASE 1 TANK #3 SITE
INSTALL 12' WIDE 6' HIGH DOUBLE SWING CHAIN LINK GATE
SEE DETAIL SHT. C-40

(2) PHASE 1 TANK #3 SITE
INSTALL 377 L.F. OF 6' HIGH CHAIN LINK FENCE
SEE DETAIL SHT. C-40

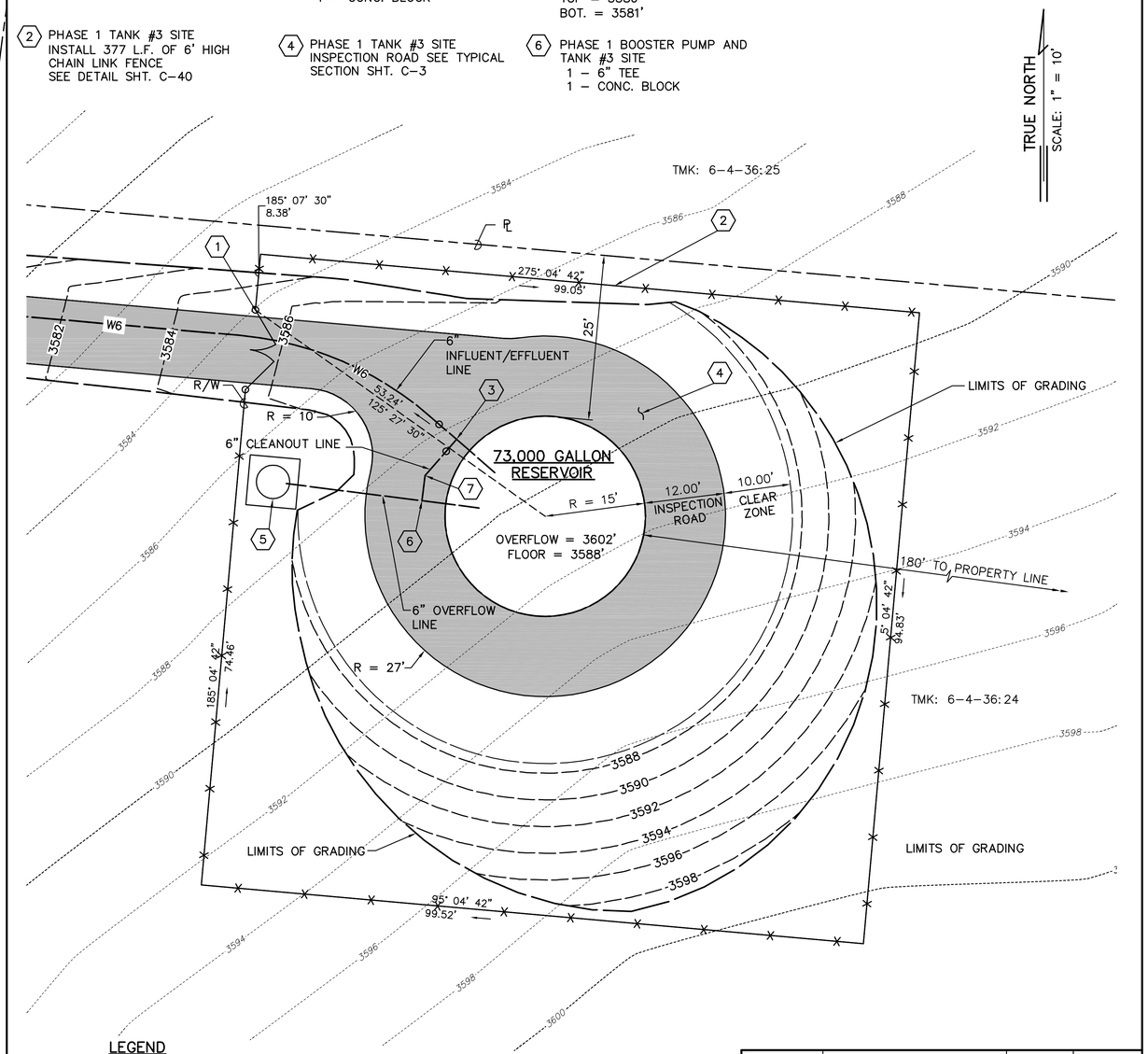
(3) PHASE 1 TANK #3 SITE
1 - 6" TEE
2 - 6" GATE VALVES
2 - VALVE BOXES
1 - CONC. BLOCK

(4) PHASE 1 TANK #3 SITE
INSPECTION ROAD SEE TYPICAL SECTION SHT. C-3

(5) PHASE 1 BOOSTER PUMP AND TANK #3 SITE
1 - 5' DIAMETER DRYWELL
SEE SHEET C-39
TOP = 3586'
BOT. = 3581'

(6) PHASE 1 BOOSTER PUMP AND TANK #3 SITE
1 - 6" TEE
1 - CONC. BLOCK

(7) PHASE 1 BOOSTER PUMP AND TANK #3 SITE
1 - 6" 1/16 BEND
1 - CONC. BLOCK



TANK #3 SITE PLAN
SCALE: 1" = 10'

LEGEND

- PROPERTY LINE (PL) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W8 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE

10' 0 10' 20'
SCALE: 1" = 10'

80' 0 80' 160'
SCALE: 1" = 80'

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No.11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 - LAYOUT	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TANK #3 SITE PLAN

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/10/2010
Plotted on: 5/24/2010
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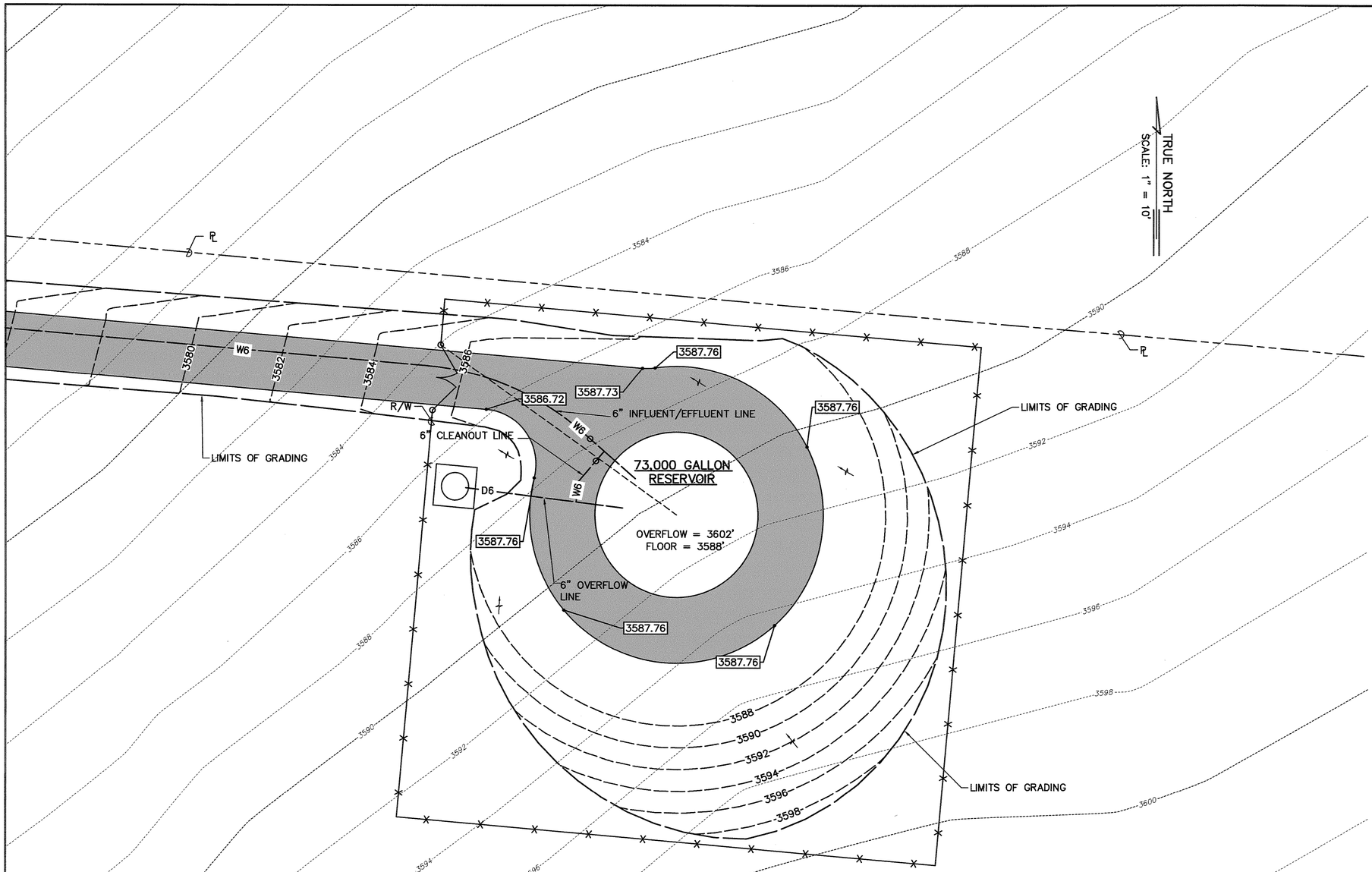
PCD. NO. 1 C-45



LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- W6 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- FLOW ARROWS

10' 0 10' 20'
SCALE: 1" = 10'

TANK #3 GRADING PLAN
SCALES: 1" = 10'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54
WAIMEA, SOUTH KOHALA, HAWAII

TANK #3 GRADING PLAN

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: CKM
Last Saved: 6/16/2009
Plotted on: 6/16/2009
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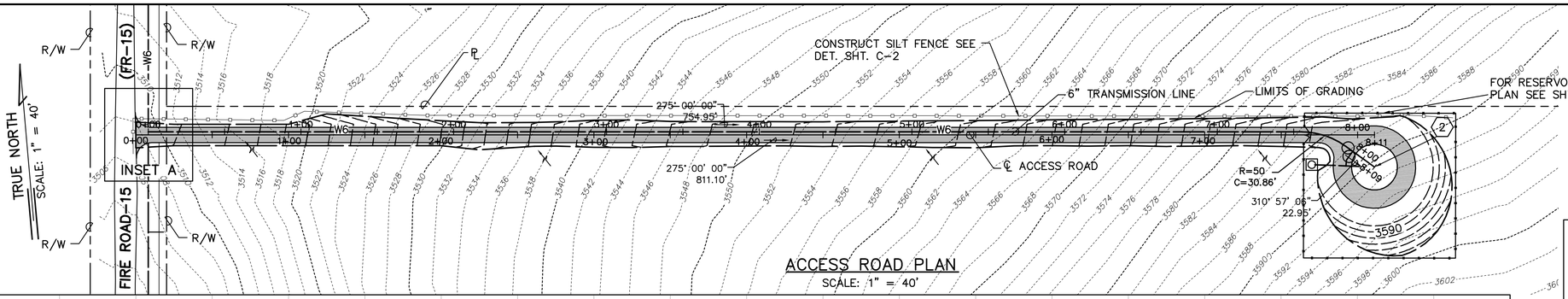
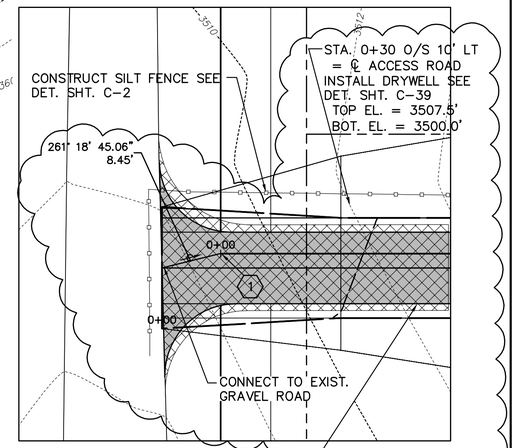


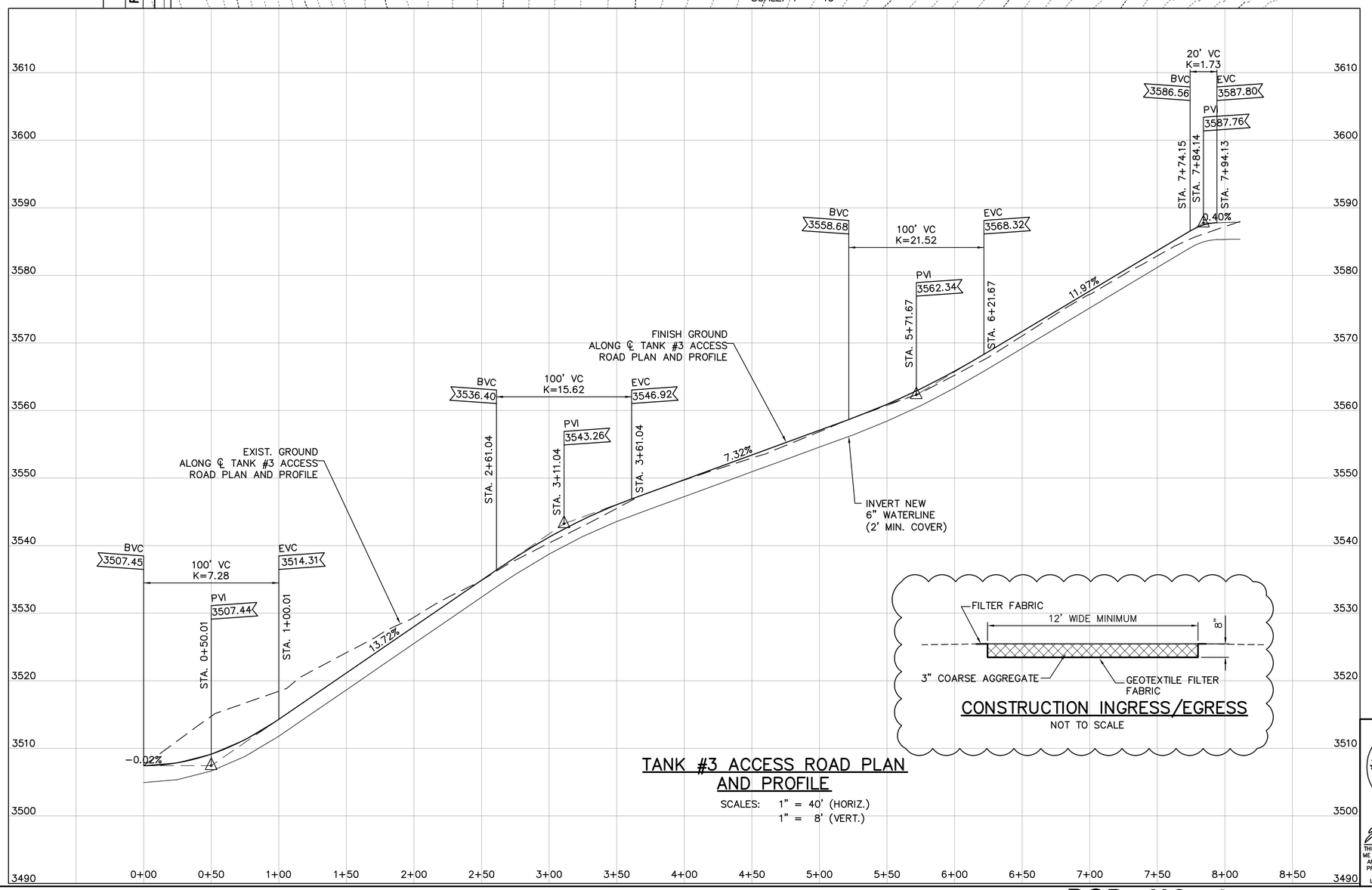
ACCESS ROAD PLAN
SCALE: 1" = 40'

1 PHASE 1 TANK SITE #3
STA. 0+00 ℄ TANK #3 WATERLINE
= STA. 19+26.12 WATERLINE B
= STA. 0+00 WATERLINE K
SEE SHEET C-8

2 PHASE 1 TANK SITE #3
STA. 8+09.28 TANK #3 WATERLINE
= STA. 8+11 O/S 21.34' R
℄ TANK #3 ACCESS ROAD



GRADING QUANTITIES:
CUT = 1153 CU. YDS.
FILL = 171 CU. YDS.



TANK #3 ACCESS ROAD PLAN AND PROFILE
SCALES: 1" = 40' (HORIZ.)
1" = 8' (VERT.)

CONSTRUCTION INGRESS/EGRESS
NOT TO SCALE

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w# EXIST. WATERLINE W/ SIZE
- W6 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- FLOW ARROW

40' 0 40' 80'
SCALE: 1" = 40'
8' 0 8' 16'
SCALE: 1" = 8'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADD BMP AND DRYWELL		

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TANK #3 ACCESS ROAD PLAN AND PROFILE

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 3/1/2010
Plotted on: 5/24/2010
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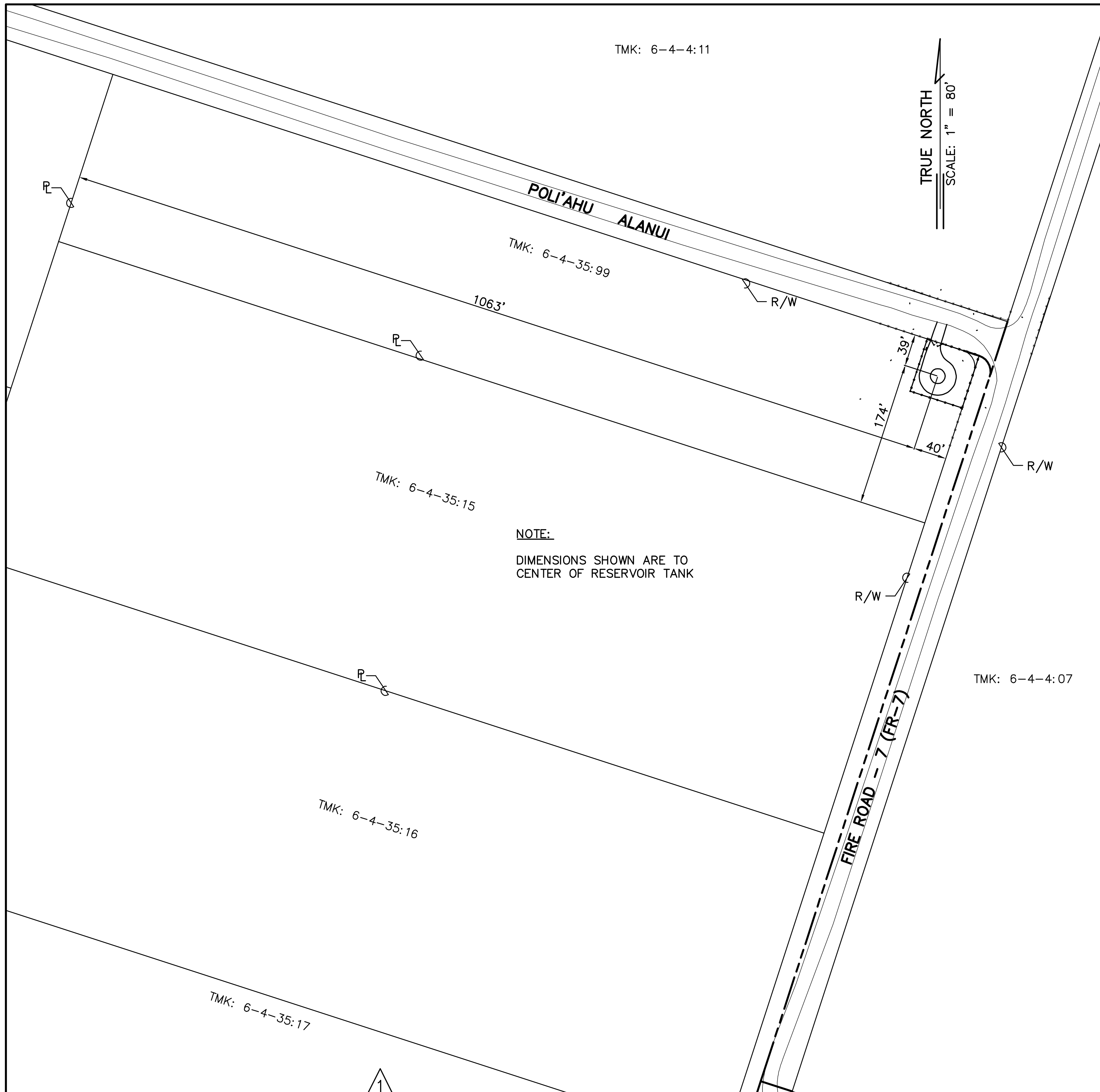
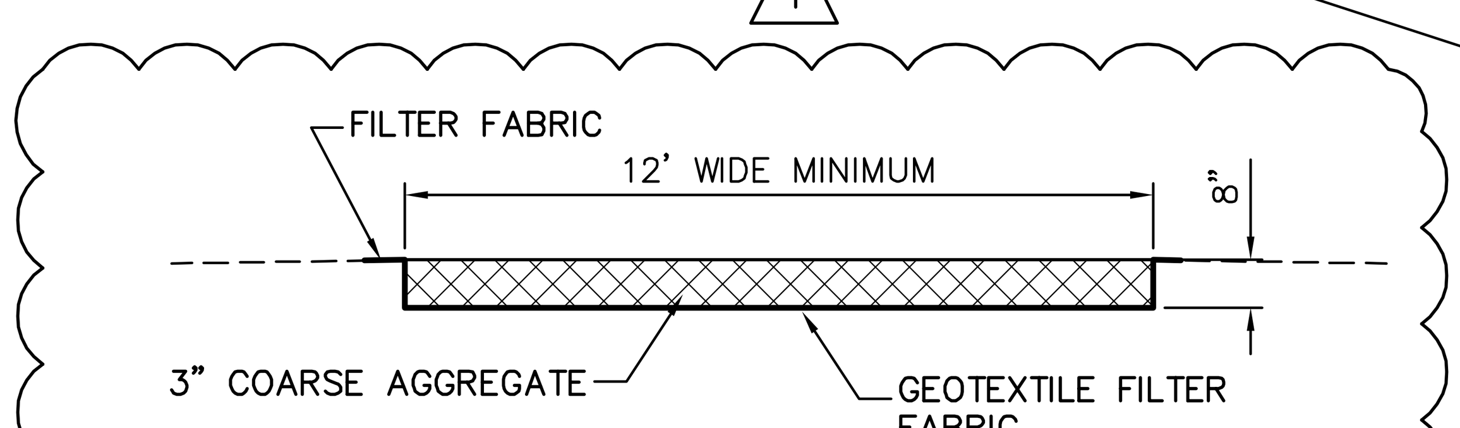
PCD. NO. 1 C-47

SHEET 48 OF 70 SHEETS



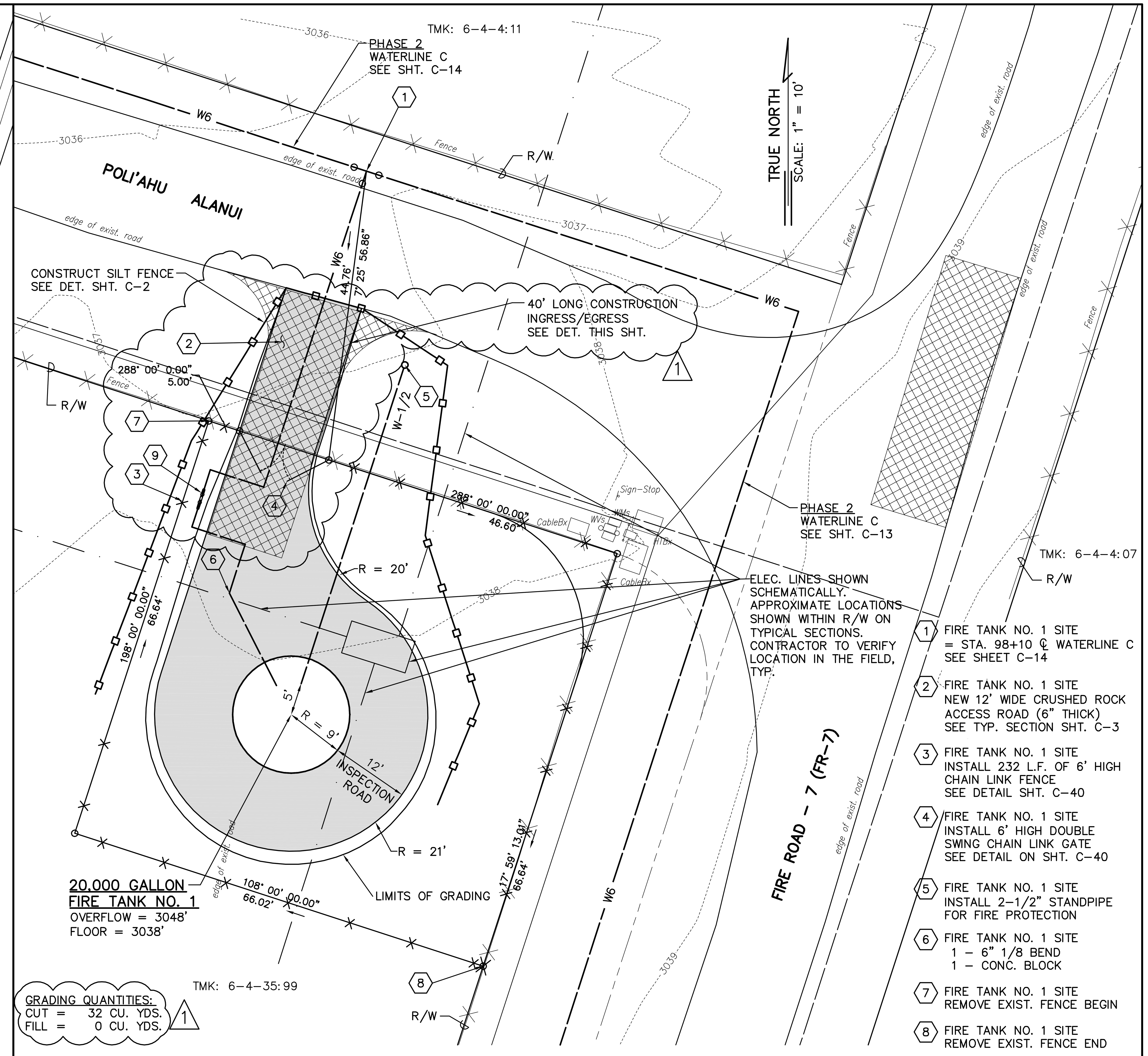


CONSTRUCTION INGRESS/EGRESS

NOT TO SCALE

GENERAL PLAN

SCALE: 1" = 80'



FIRE TANK NO. 1 SITE PLAN

SCALE: 1" = 10'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W8 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- SIC LINE

9 FIRE TANK NO. 1 SITE
2 - 6" CAPS W/ 2" IPT TAP
1 - 2" BACKFLOW PREVENTER
SEE DETAIL 3/C-52

10' 0 10' 20'
SCALE: 1" = 10'

80' 0 80' 160'
SCALE: 1" = 80'

MATTHEW K. FUJIOKA LICENSED PROFESSIONAL ENGINEER No.11473-C HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 - MOVE TANK, ADD BFP		
	PCD 1 - ADD BMP	A&A	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

FIRE TANK NO. 1 SITE PLAN

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

Last Save by: RKI
Last Saved: 2/10/2010
Plotted on: 5/24/2010
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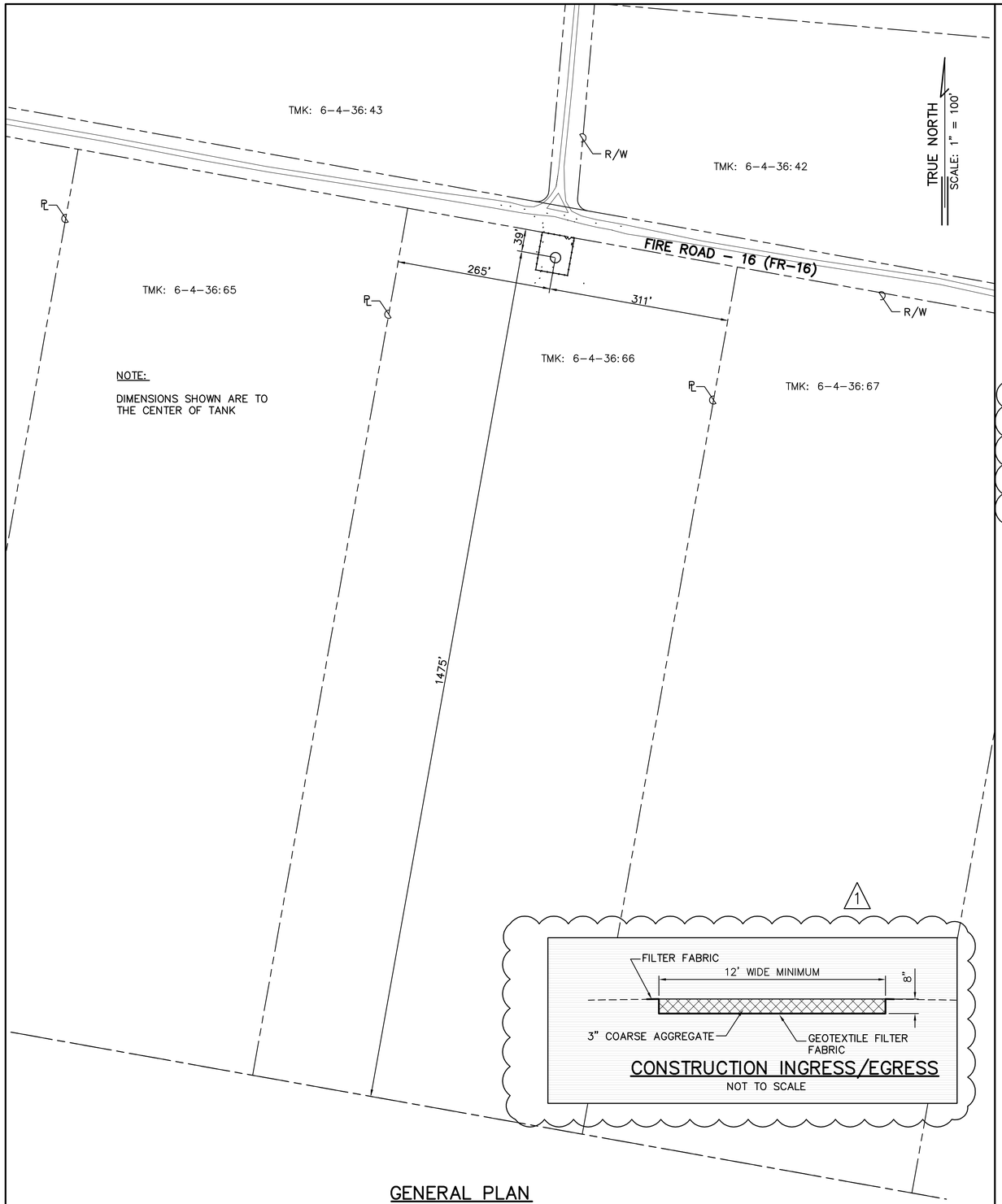
PCD. NO. 1 **C-48**

SHEET 49 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.



GENERAL PLAN

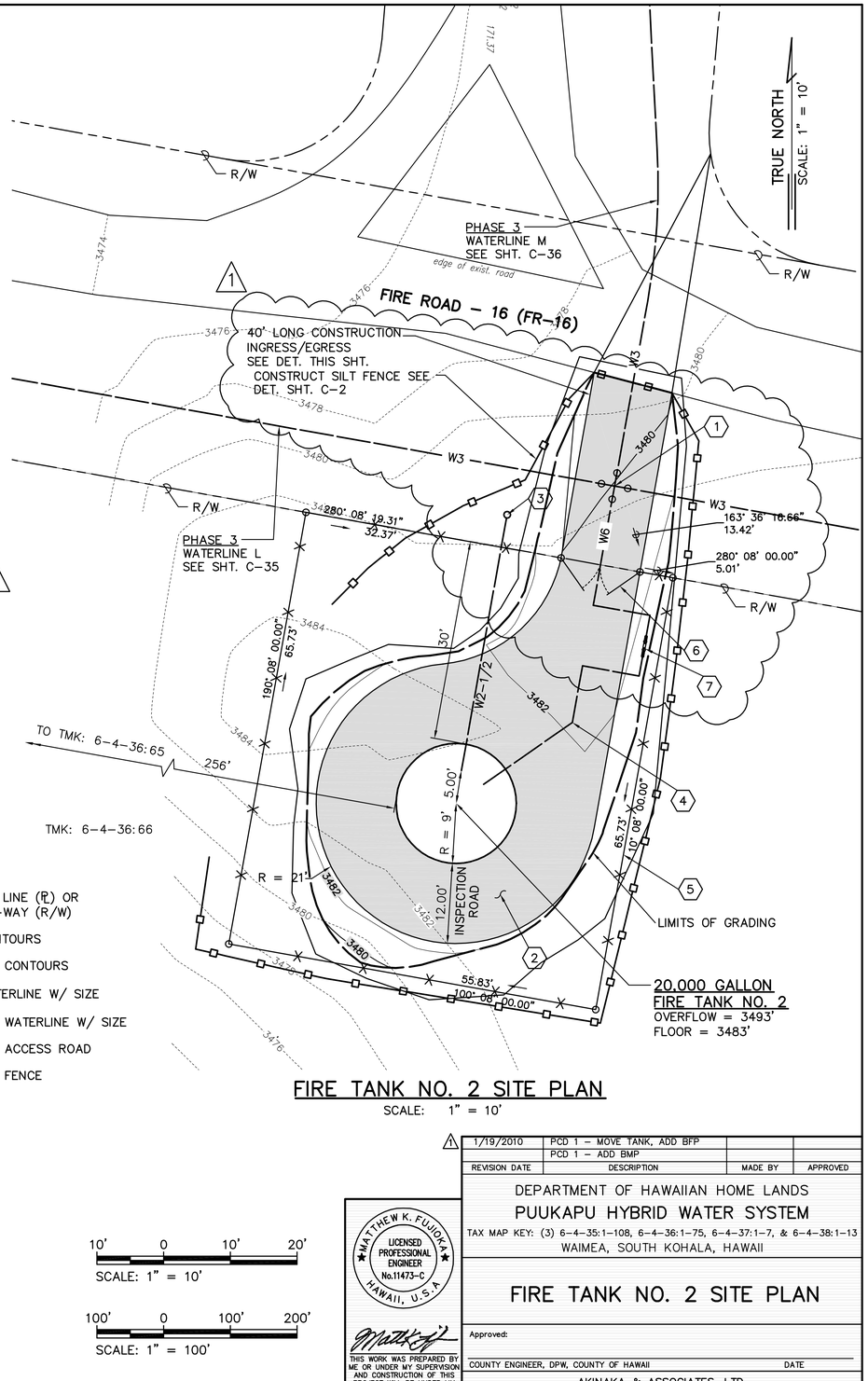
SCALE: 1" = 100'

CONSTRUCTION INGRESS/EGRESS

NOT TO SCALE

1. FIRE TANK NO. 2 SITE
   = STA. 41+44.31 ℄ WATERLINE L
   SEE SHEET C-35
2. FIRE TANK NO. 2 SITE
   NEW 12' WIDE CRUSHED ROCK ACCESS ROAD (6" THICK)
   SEE TYP. SECTION SHT. C-3
3. FIRE TANK NO. 2 SITE
   INSTALL 2-1/2" STANDPIPE FOR FIRE PROTECTION
4. FIRE TANK NO. 2 SITE
   1 - 6" 1/8 BEND
   1 - CONC. BLOCK
5. FIRE TANK NO. 2 SITE
   INSTALL 196 L.F. 6' HIGH CHAIN LINK FENCE
   SEE DETAIL SHT. C-40
6. FIRE TANK NO. 2 SITE
   INSTALL 18' WIDE 6' HIGH DOUBLE SWING CHAIN LINK FENCE
   SEE DETAIL SHT. C-40
7. FIRE TANK NO. 2 SITE
   2 - 6" CAP W/ 2" IPT TAP
   1 - 2" BACKFLOW PREVENTER
   SEE DETAIL 3/C-52

GRADING QUANTITIES:
CUT = 80 CU. YDS.
FILL = 17 CU. YDS.



FIRE TANK NO. 2 SITE PLAN

SCALE: 1" = 10'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W6 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE

10' 0 10' 20'
SCALE: 1" = 10'

100' 0 100' 200'
SCALE: 1" = 100'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 - MOVE TANK, ADD BFP		
	PCD 1 - ADD BMP		

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

FIRE TANK NO. 2 SITE PLAN

MATTHEW K. FUJIOKA
LICENSED PROFESSIONAL ENGINEER
No. 11473-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

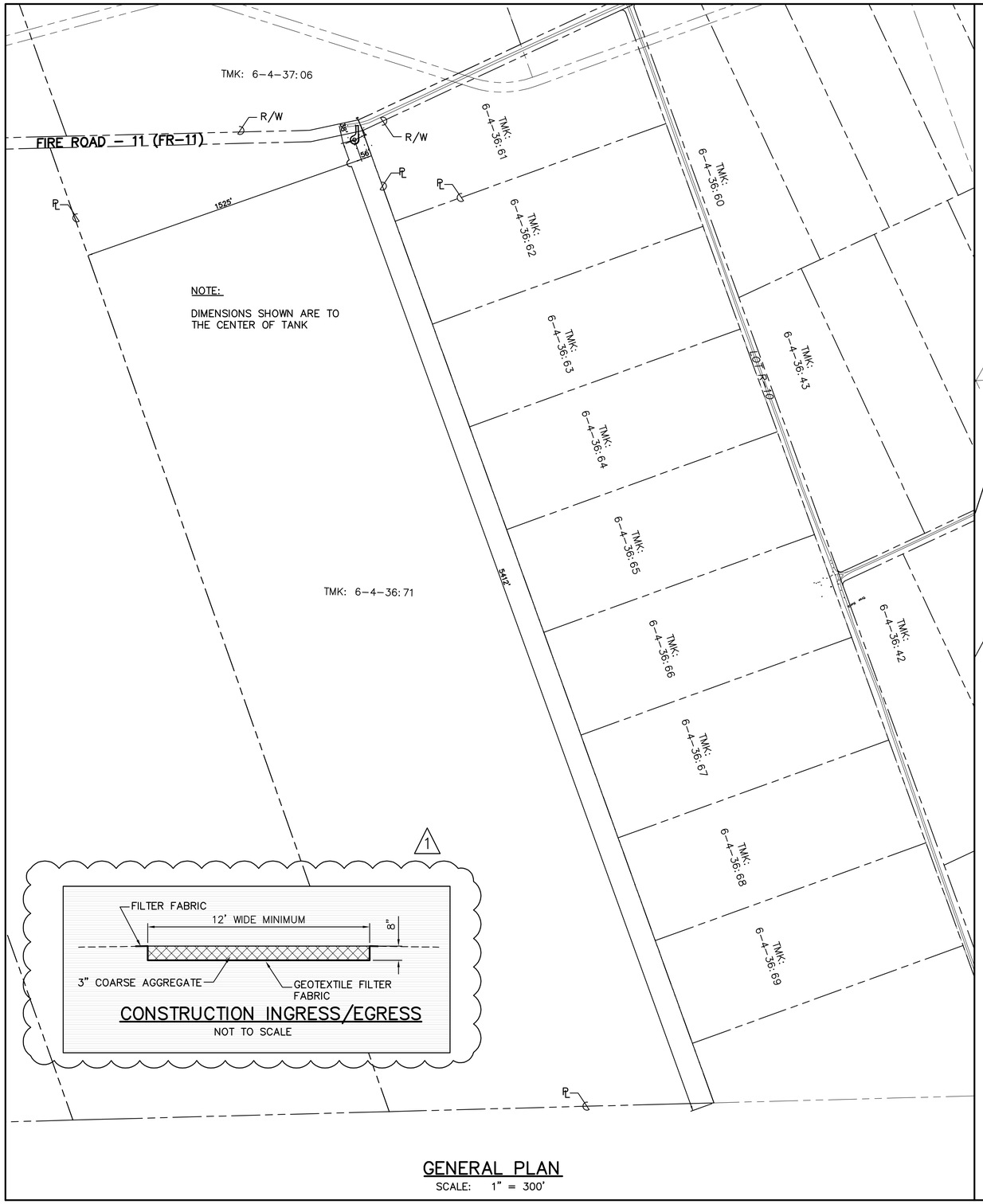
Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

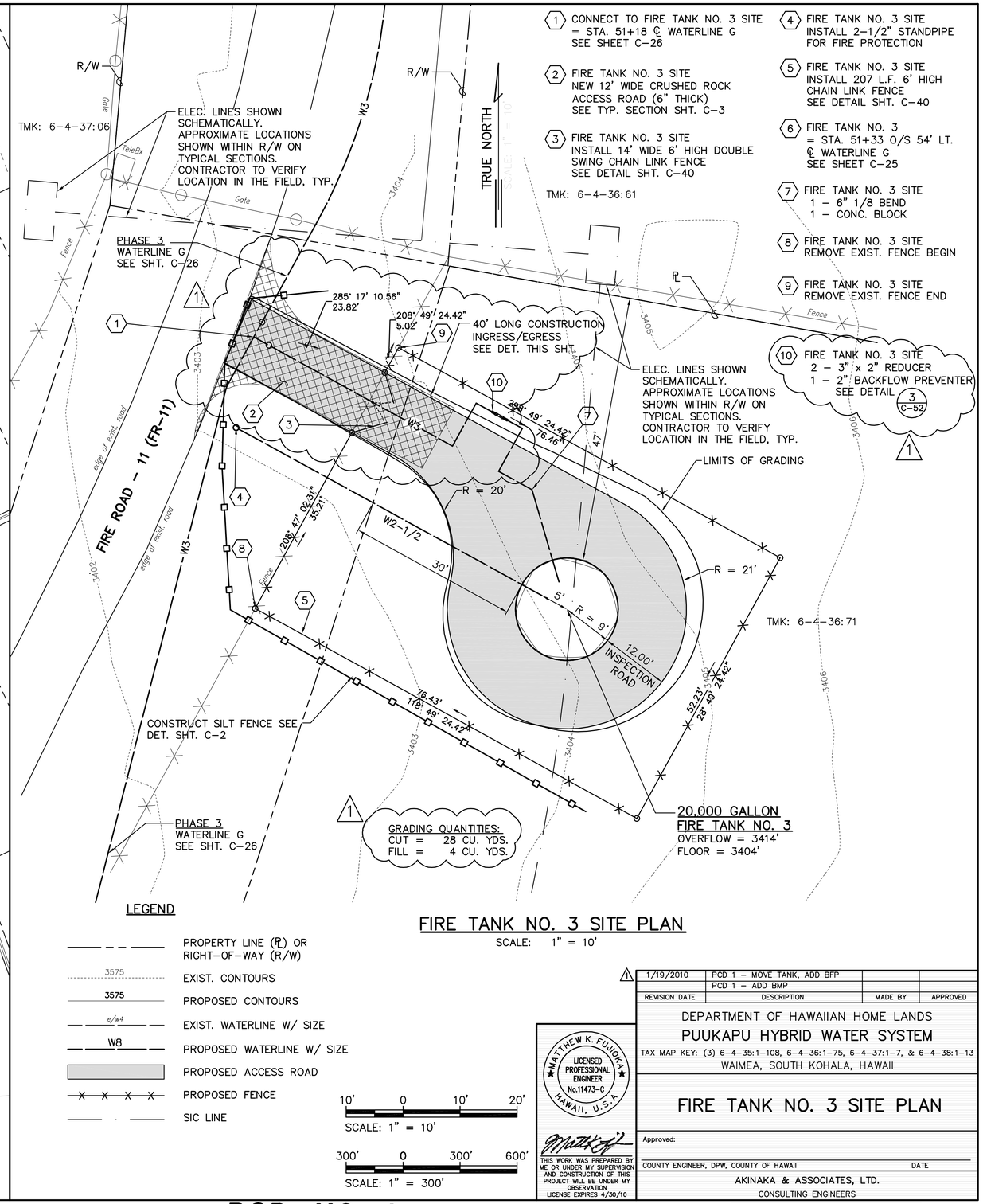
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/10/2010
Plotted on: 5/24/2010
g:\dhh106-01\Acad\DHHL061036.dwg



GENERAL PLAN
SCALE: 1" = 300'



FIRE TANK NO. 3 SITE PLAN
SCALE: 1" = 10'

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W8 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- SIC LINE

10' 0 10' 20'
SCALE: 1" = 10'

300' 0 300' 600'
SCALE: 1" = 300'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – MOVE TANK, ADD BFP		
	PCD 1 – ADD BMP		

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

FIRE TANK NO. 3 SITE PLAN

MATTHEW K. FUJIOKA LICENSED PROFESSIONAL ENGINEER No.11473-C HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

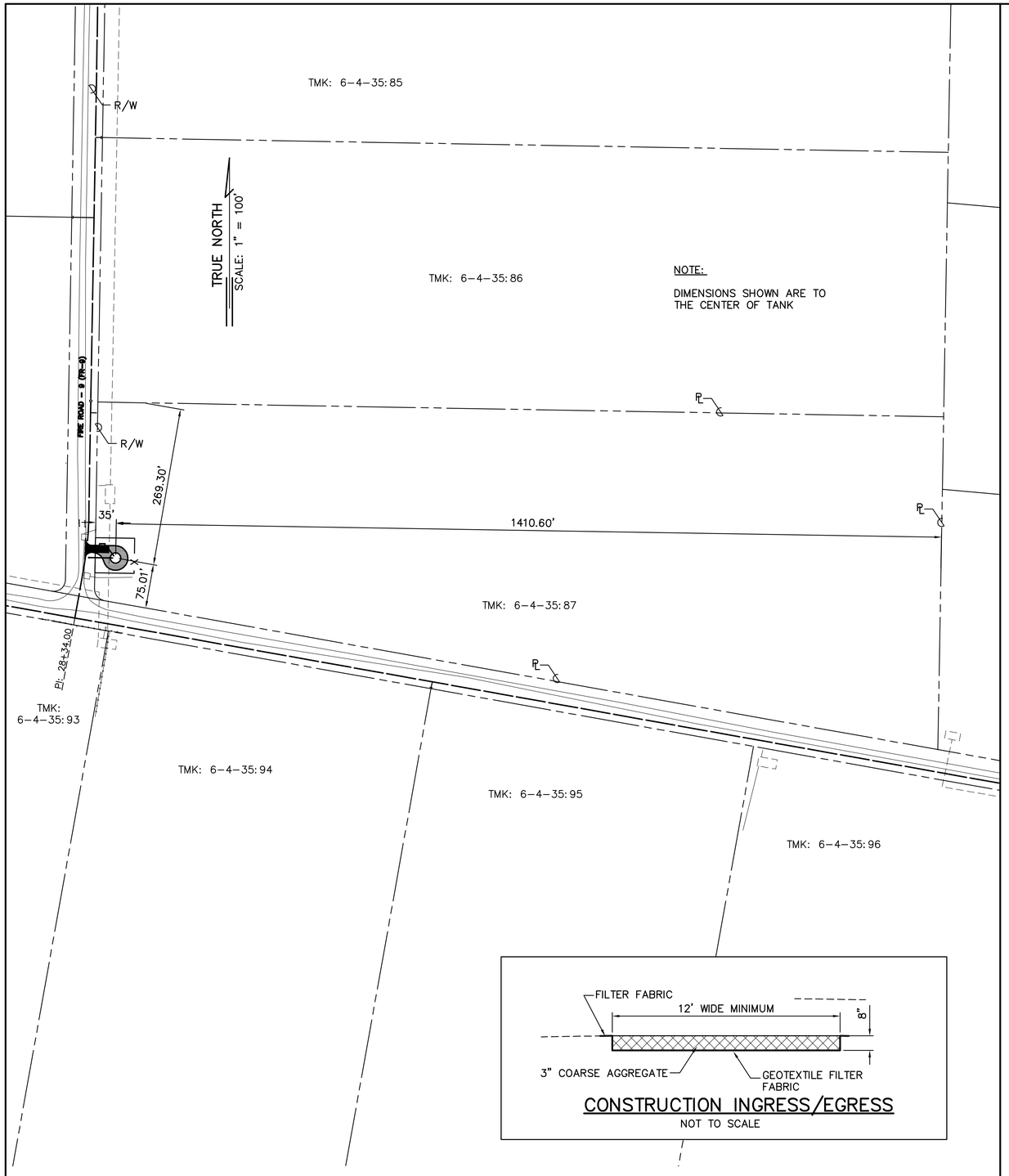
Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 2/10/2010
Plotted on: 5/24/2010
g:\dhh106-01\Acad\DHHL061037.dwg

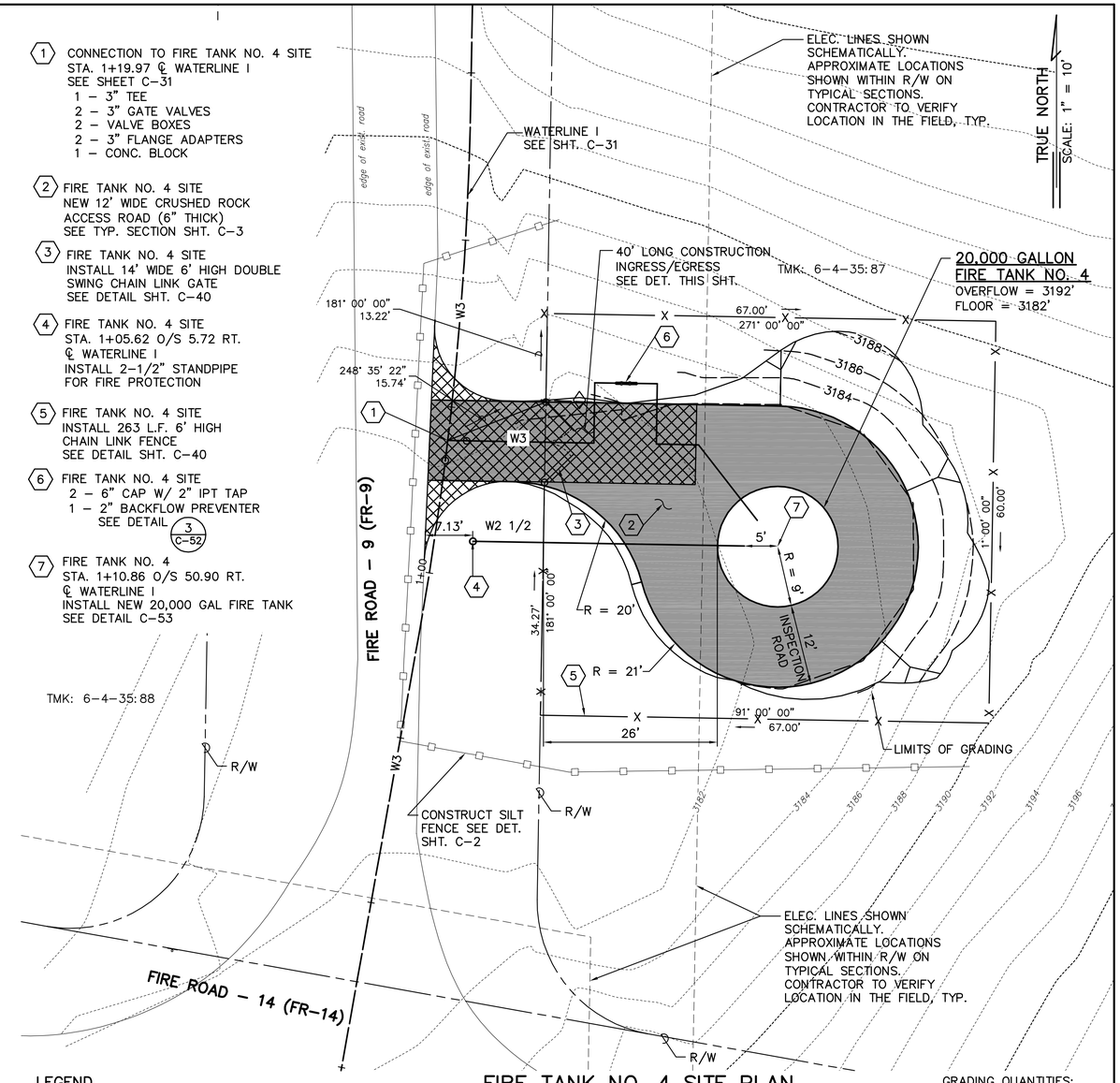
PCD. NO. 1 **C-50** SHEET 51 OF 70 SHEETS



GENERAL PLAN
SCALE: 1" = 100'

CONSTRUCTION INGRESS/EGRESS
NOT TO SCALE

1. CONNECTION TO FIRE TANK NO. 4 SITE
   STA. 1+19.97 ℄ WATERLINE I
   SEE SHEET C-31
   1 – 3" TEE
   2 – 3" GATE VALVES
   2 – VALVE BOXES
   2 – 3" FLANGE ADAPTERS
   1 – CONC. BLOCK
2. FIRE TANK NO. 4 SITE
   NEW 12' WIDE CRUSHED ROCK ACCESS ROAD (6" THICK)
   SEE TYP. SECTION SHT. C-3
3. FIRE TANK NO. 4 SITE
   INSTALL 14' WIDE 6' HIGH DOUBLE SWING CHAIN LINK GATE
   SEE DETAIL SHT. C-40
4. FIRE TANK NO. 4 SITE
   STA. 1+05.62 O/S 5.72 RT.
   ℄ WATERLINE I
   INSTALL 2-1/2" STANDPIPE FOR FIRE PROTECTION
5. FIRE TANK NO. 4 SITE
   INSTALL 263 L.F. 6' HIGH CHAIN LINK FENCE
   SEE DETAIL SHT. C-40
6. FIRE TANK NO. 4 SITE
   2 – 6" CAP W/ 2" IPT TAP
   1 – 2" BACKFLOW PREVENTER
   SEE DETAIL 3/C-52
7. FIRE TANK NO. 4
   STA. 1+10.86 O/S 50.90 RT.
   ℄ WATERLINE I
   INSTALL NEW 20,000 GAL FIRE TANK
   SEE DETAIL C-53



FIRE TANK NO. 4 SITE PLAN
SCALE: 1" = 10'

GRADING QUANTITIES:
CUT = 8 CU. YDS.
FILL = 72 CU. YDS.

LEGEND

- PROPERTY LINE (℄) OR RIGHT-OF-WAY (R/W)
- 3575 EXIST. CONTOURS
- 3575 PROPOSED CONTOURS
- e/w4 EXIST. WATERLINE W/ SIZE
- W8 PROPOSED WATERLINE W/ SIZE
- PROPOSED ACCESS ROAD
- PROPOSED FENCE
- SIC LINE

10' 0 10' 20'
SCALE: 1" = 10'

100' 0 100' 200'
SCALE: 1" = 100'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
5 04/05/2011	PCD 5 – TANK RELOCATION	RKI	
	SUPERSEDES SHT. C-51		

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

FIRE TANK NO. 4 SITE PLAN

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/12

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

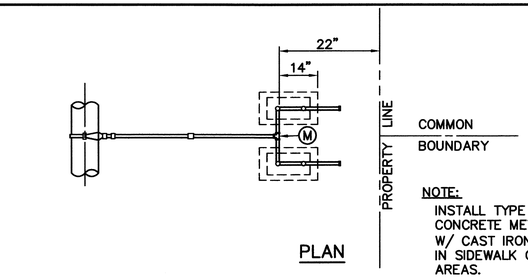
Last Save by: RKI
Last Saved: 4/7/2011
Plotted on: 4/7/2011
G:\DHHL06-01\PCD\PCD 5\Fire Tank #4.dwg

PCD. NO. 5 C-51

SHEET 52 OF ____ SHEETS

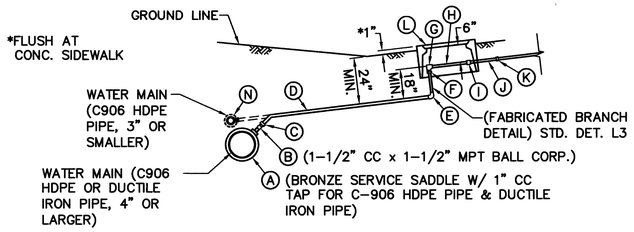
FILE	POCKET	FOLDER	NO.

SCHEDULE OF FITTINGS		
ITEM	DESCRIPTION	DOUBLE SERVICE
A	BRONZE SERVICE SADDLE W/ 1–1/2" CC TAP FOR C–900 PVC PIPE & DUCTILE IRON PIPE	1
B	1–1/2" CC x 1–1/2" MPT BALL CORPORATION	1
C	PACK JOINT COUPLING (FORD C14–66 OR APPROVED EQUAL)	1
D	1–1/2" COPPER TUBE, TYPE "K" SOFT	2
E	1" 90° COPPER ELBOW, S x S	2
F	1" COPPER MALE ADAPTER, S x T (WHEN CONNECTING TO 3" OR SMALLER PVC PIPE)	2
G	ANGLE VALVE, 1" FEMALE IPT INLET x 3/4" METER COUPLING NUT OUTLET (FORD BA13–342W OR APPROVED EQUAL)	2
H	METER SPACER, SUPPLIED BY DEPT. OF WATER & INSTALLED BY CONTRACTOR	2
I	BALL VALVE W/ HANDLE, 3/4" METER COUPLING NUT INLET x 1" FEMALE IPT OUTLET (FORD B13–342 W/ HT–34 HANDLE OR APPROVED EQUAL)	2
J	LINESETTER, 1" COPPER TUBE, TYPE "K" SOFT, 12" LONG (SEE STD. DET. L3)	2
K	1" PLASTIC THREAD PROTECTOR	2
L	TYPE "B" CONCRETE METER BOX WITH CAST IRON COVER	2
M	1" x 1" x 1–1/2" COPPER TEE, S x S x S	1
N	TEE W/ 1–1/2" BUSHING (WHEN CONNECTING TO 3" OR SMALLER PIPE)	1



PLAN

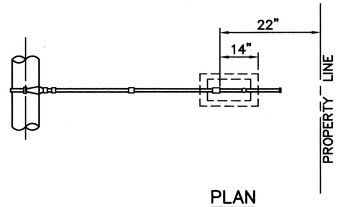
NOTE:
INSTALL TYPE "X" CONCRETE METER BOX W/ CAST IRON COVER IN SIDEWALK OR PAVED AREAS.



PROFILE

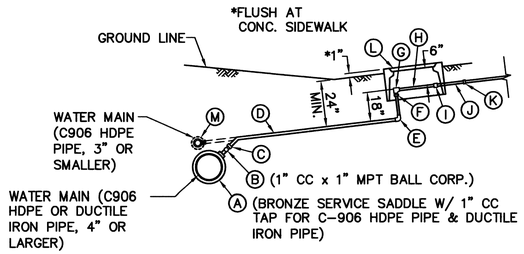
1 C–52 DOUBLE SERVICE LATERAL
NOT TO SCALE

SCHEDULE OF FITTINGS		
ITEM	DESCRIPTION	SINGLE SERVICE
A	BRONZE SERVICE SADDLE W/ 1" CC TAP FOR C–900 PVC PIPE & DUCTILE IRON PIPE	1
B	1" CC x 1" MPT BALL CORPORATION	1
C	PACK JOINT COUPLINGS (FORD C14–44 OR APPROVED EQUAL)	1
D	1" COPPER TUBE, TYPE "K" SOFT	1
E	1" 90° COPPER ELBOW, S x S	1
F	1" COPPER MALE ADAPTER, S x T (WHEN CONNECTING TO 3" OR SMALLER PVC PIPE)	1
G	ANGLE VALVE, 1" FEMALE IPT INLET x 3/4" METER COUPLING NUT OUTLET (FORD BA13–342W OR APPROVED EQUAL)	1
H	METER SPACER, SUPPLIED BY DEPT. OF WATER & INSTALLED BY CONTRACTOR	1
I	BALL VALVE W/ HANDLE, 3/4" METER COUPLING NUT INLET x 1" FEMALE IPT OUTLET (FORD B13–342 W/ HT–34 HANDLE OR APPROVED EQUAL)	1
J	LINESETTER, 1" COPPER TUBE, TYPE "K" SOFT, 12" LONG (SEE STD. DET. L3)	1
K	1" PLASTIC THREAD PROTECTOR	1
L	TYPE "B" CONCRETE METER BOX W/ CAST IRON COVER	1
M	TEE W/ 1" BUSHING (WHEN CONNECTING TO 3" OR SMALLER PIPE)	1



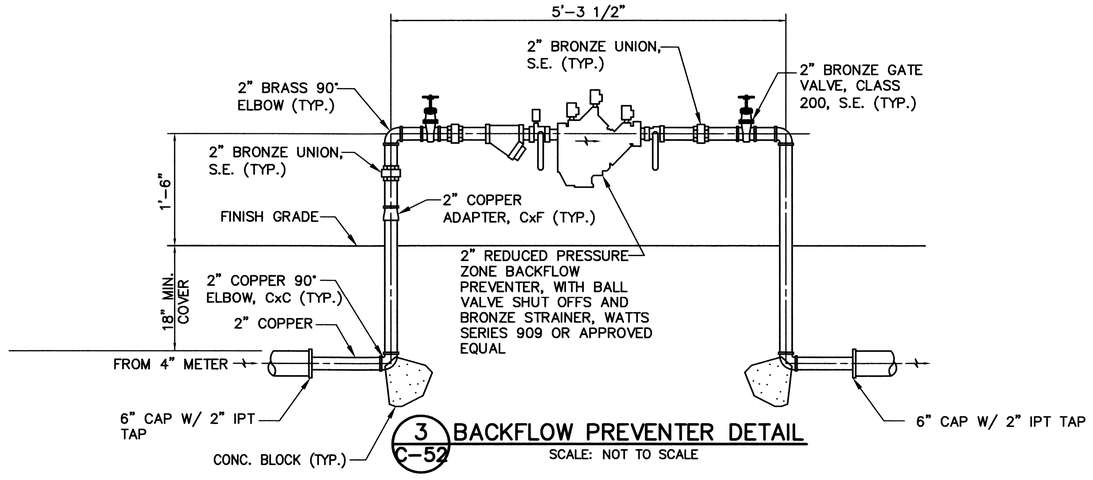
PLAN

NOTE:
INSTALL TYPE "X" CONCRETE METER BOX W/ CAST IRON COVER IN SIDEWALK OR PAVED AREAS.



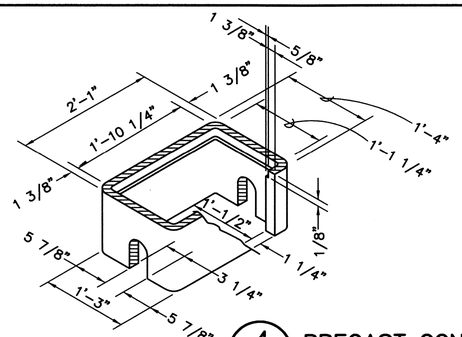
PROFILE

2 C–52 SINGLE SERVICE LATERAL
NOT TO SCALE

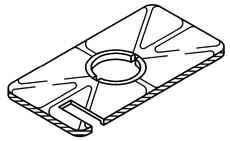


3 C–52 BACKFLOW PREVENTER DETAIL
SCALE: NOT TO SCALE

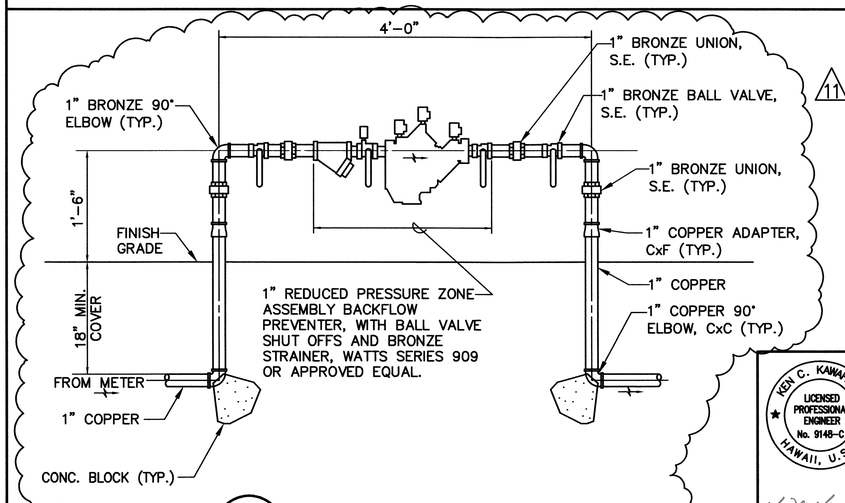
MANAGER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE



4 C–52 PRECAST CONCRETE METER BOX AND COVER
NOT TO SCALE



CAST IRON COVER



5 C–52 1" BACKFLOW PREVENTER DETAIL
SCALE: NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
8/29/2013	PCD 11– ADD 1" BACKFLOW PREVENTER DETAIL 5/C–52	A&A	
1/19/2010	PCD 1 – REV. BACKFLOW DETAIL	A&A	

KEN C. KAWAHARA
LICENSED PROFESSIONAL ENGINEER
No. 9148–C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/14

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6–4–35:1–108, 6–4–36:1–75, 6–4–37:1–7, & 6–4–38:1–13
WAIMEA, SOUTH KOHALA, HAWAII

MISCELLANEOUS DETAILS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

Last Save by: SMQ
Last Saved: 8/29/2013
Plotted on: 8/29/2013
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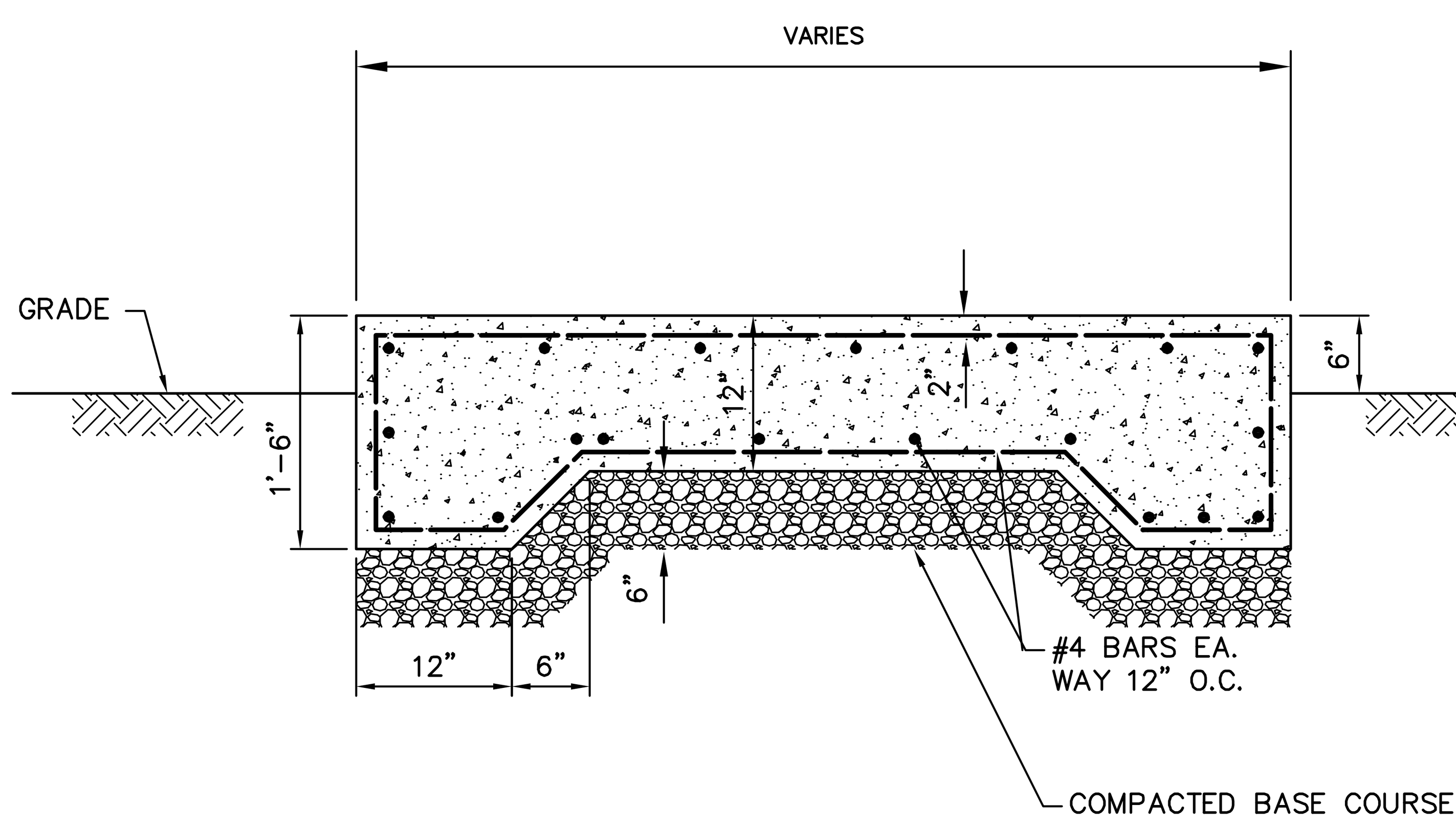
PCD. NO. 11 PCD. NO. 1 C-52

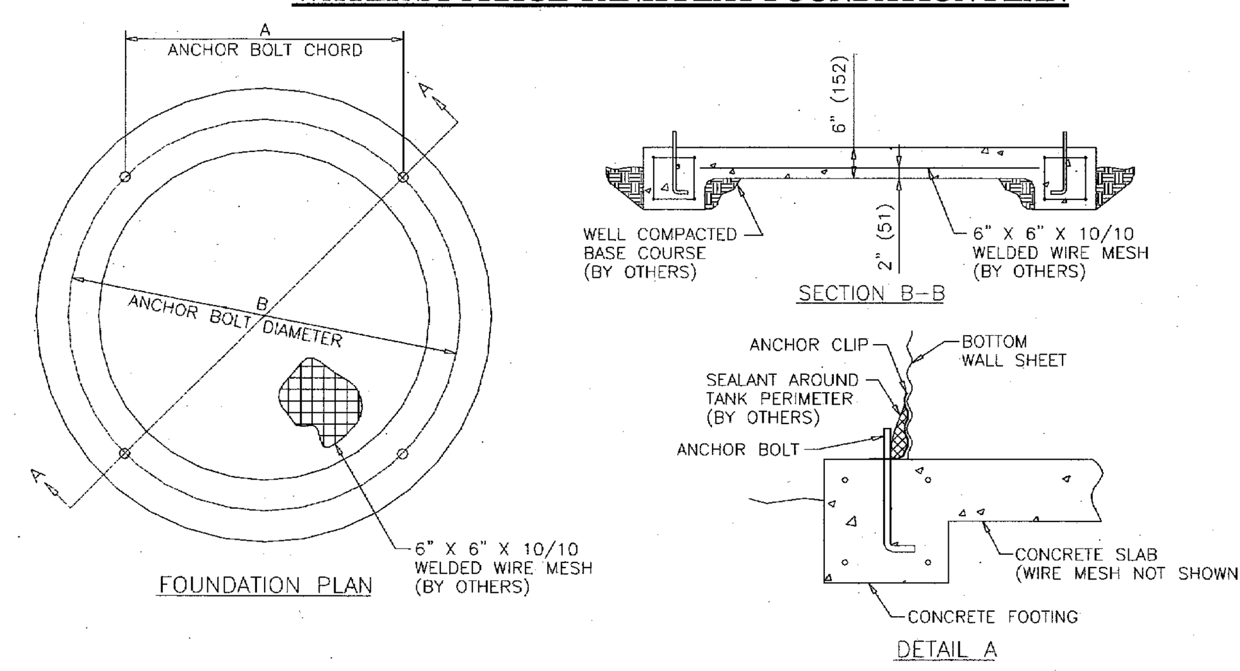
SHEET 53 OF ____ SHEETS



2 / C-53 TYPICAL CONCRETE PAD SECTION
SCALE: NOT TO SCALE

SCAFCO GRAIN SYSTEMS COMPANY

WATER STORAGE TANK FLAT FOUNDATION PLAN



TANK DIA.	QTY. OF ANCHOR BOLTS	A	B	C
6'	4	4'-5 11/16"	6'-3 15/16"	3'-2"
9'	6	4'-7 7/8"	9'-3 3/4"	4'-7 7/8"
12'	8	4'-8 7/16"	12'-3 9/16"	6'-1 3/4"
15'	10	4'-8 5/8"	15'-3 3/8"	7'-7 5/8"
18'	12	4'-8 3/4"	18'-3 3/16"	9'-1 5/8"
21'	14	4'-8 3/4"	21'-3"	10'-7 1/2"
24'	16	4'-8 3/4"	24'-2 13/16"	12'-1 3/8"
27'	18	4'-8 11/16"	27'-2 5/8"	13'-7 5/16"

TANK DIA.	QTY. OF ANCHOR BOLTS	A	B	C
30'	20	4'-8 11/16"	30'-2 7/16"	15'-1 1/4"
33'	22	4'-8 11/16"	33'-2 1/4"	16'-7 1/8"
36'	24	4'-8 5/8"	36'-2"	18'-1"
39'	26	4'-8 5/8"	39'-1 13/16"	19'-6 15/16"
42'	28	4'-8 5/8"	42'-1 5/8"	21'-13/16"
48'	32	4'-8 9/16"	48'- 1/4"	24'-1/8"
60'	40	4'-8 1/2"	60'-1/2"	30'-1/4"

GENERAL CONCRETE NOTES:

1. Site must be 95% compacted soil back-fill or undisturbed soil. Site must be free from standing water and well drained.
2. Soil around footing ring must be uniform. (Not fine sand)
3. Foundation design is based on uniform soil bearing capacity of 2000 LB. per square foot. Concrete compressive strength at 28 days shall be 2500 psi.
4. Reinforcing steel-standard deformed bars Fy = 40,000 psi.
5. Add (1) pound to rebar requirements for each end lap. Lap bars 15".
6. These are general concrete foundation requirements, and should be evaluated with respect to each site. Consult with a local engineer if site is questionable.
7. Foundation should be poured smooth for proper weather seal and bin anchorage.

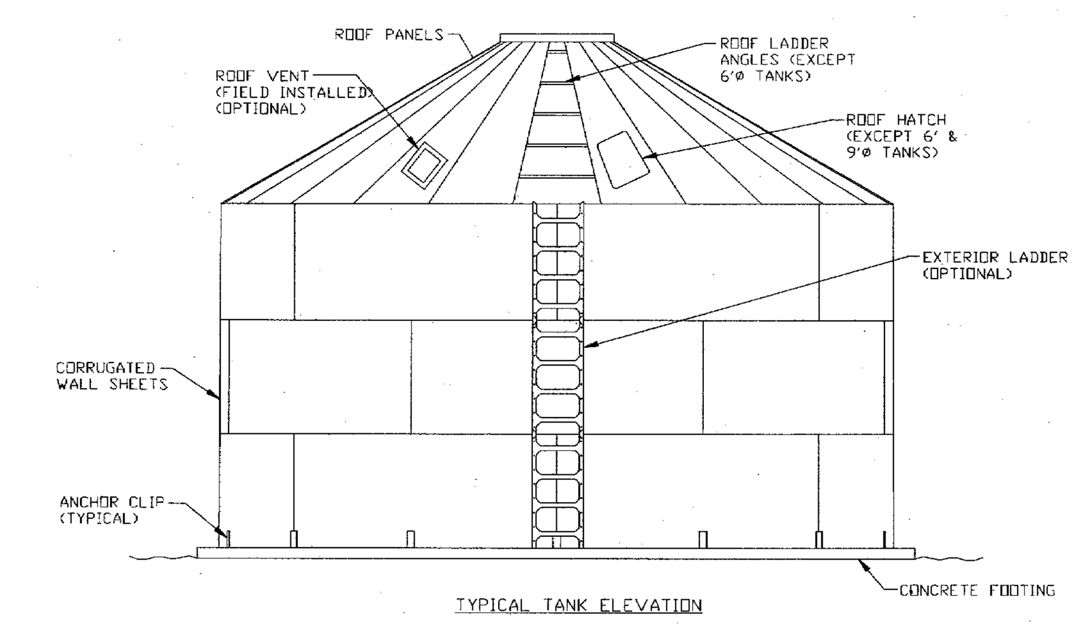
ADDITIONAL NOTES:

1. Chart above has concrete and reinforcing bar quantities for the foundation illustrated. Top of foundation is 4" above grade.
2. Anchor bolts are 5/8" x 12" A307 with 3" threaded length.

PAGE 3

SCAFCO GRAIN SYSTEMS COMPANY

WATER STORAGE TANK SPECIFICATIONS

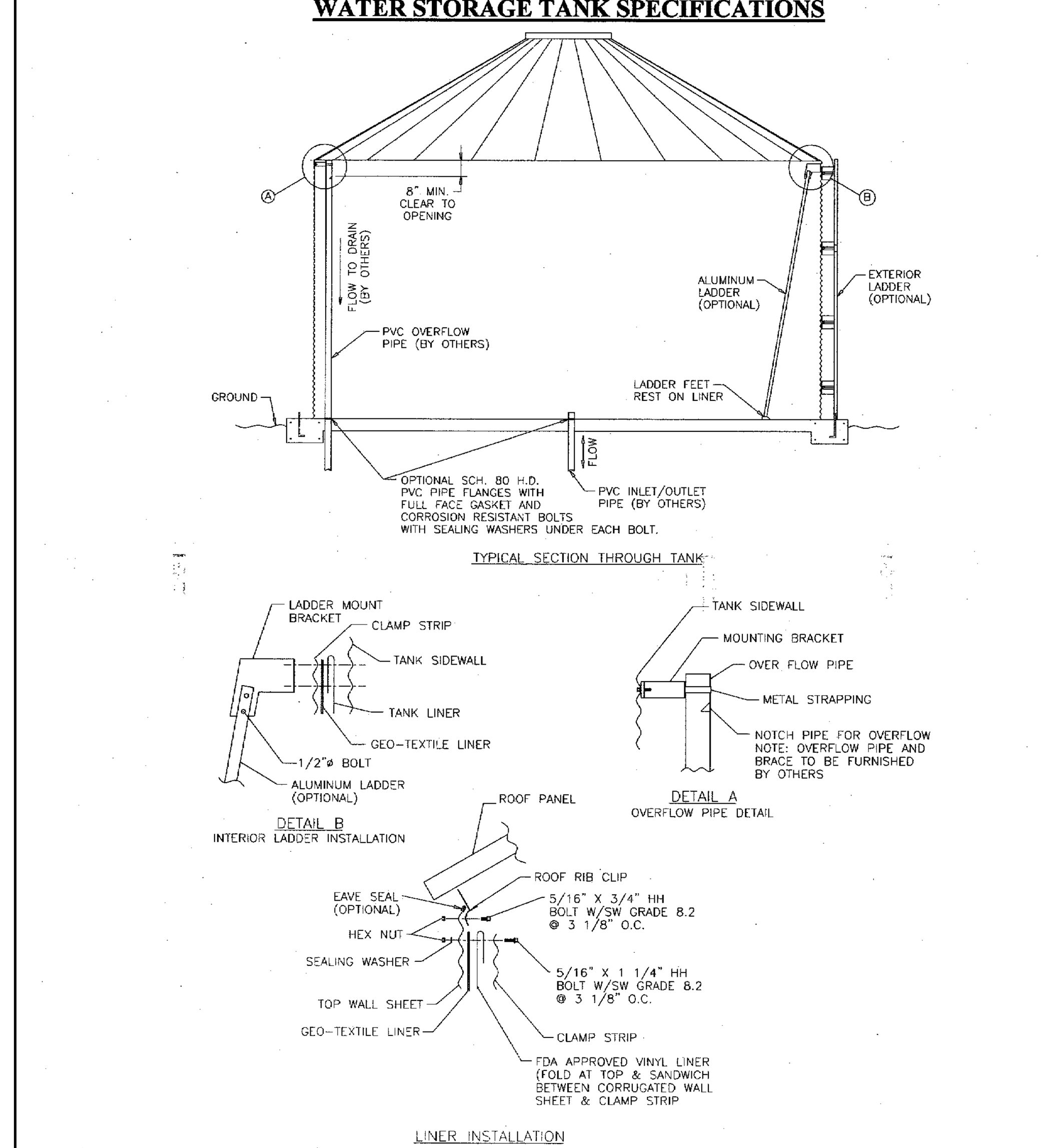


MODEL NO.	DIA.	EAVE HEIGHT	CAPACITY TO EAVE (GAL)	WALL SHEET GAUGES	MODEL NO.	DIA.	EAVE HEIGHT	CAPACITY TO EAVE (GAL)	WALL SHEET GAUGES
601	6'	3' 7"	600	20	2401	24'	3' 7"	10,700	20
602		7' 2"	1,400	20-20	2402		7' 2"	22,600	20-18
603		10' 9"	2,100	20-20-20	2403		10' 9"	34,500	20-18-17
604		14' 3"	2,900	20-20-20-20	2404		14' 3"	46,500	20-18-17-14
901	9'	3' 7"	1,500	20	2701	27'	3' 7"	13,500	20
902		7' 2"	3,100	20-20	2702		7' 2"	28,600	20-18
903		10' 9"	4,800	20-20-20	2703		10' 9"	43,700	20-18-15
904		14' 3"	6,500	20-20-20-20	2704		14' 3"	58,800	20-18-15-14
1201	12'	3' 7"	2,600	20	3001	30'	3' 7"	16,700	20
1202		7' 2"	5,600	20-20	3002		7' 2"	35,300	20-18
1203		10' 9"	8,600	20-20-18	3003		10' 9"	54,000	20-18-15
1204		14' 3"	11,600	20-20-18-18	3004		14' 3"	72,600	20-18-15-13
1501	15'	3' 7"	4,100	20	3301	33'	3' 7"	20,200	18
1502		7' 2"	8,800	20-20	3302		7' 2"	42,700	18-17
1503		10' 9"	13,500	20-20-18	3303		10' 9"	65,300	18-17-15
1504		14' 3"	18,100	20-20-18-17	3304		14' 3"	87,900	18-17-15-13
1801	18'	3' 7"	6,000	20	3601	36'	3' 7"	24,100	18
1802		7' 2"	12,700	20-20	3602		7' 2"	50,900	18-17
1803		10' 9"	19,400	20-20-18	3603		10' 9"	77,800	18-17-14
1804		14' 3"	26,100	20-20-18-17	3604		14' 3"	104,600	18-17-14-12
2101	21'	3' 7"	8,200	20					
2102		7' 2"	17,300	20-18					
2103		10' 9"	26,400	20-18-17					
2104		14' 3"	35,600	20-18-17-15					

PAGE 5

SCAFCO GRAIN SYSTEMS COMPANY

WATER STORAGE TANK SPECIFICATIONS



PAGE 6

NOTES:

1. DETAILS SHOWN ABOVE ARE EXCERPTS FROM THE INSTALLATION INSTRUCTIONS FOR SCAFCO WATER STORAGE SYSTEMS.
2. PREFABRICATED TANK COMPONENTS DO NOT INCLUDE THE REINFORCED CONCRETE FOUNDATION OR THE PIPE INLETS/OUTLETS THROUGH THE TANK FLOOR.

1 / C-53 PREFABRICATED WATER STORAGE TANK
SCALE: NOT TO SCALE

UBC CODES

TANK	#1	#2	#3	FIRE TANKS
JURISDICTION:	HAWAII COUNTY, HAWAII	HAWAII COUNTY, HAWAII	HAWAII COUNTY, HAWAII	HAWAII COUNTY, HAWAII
CODES:	UNIFORM BUILDING CODE, 1991, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO); HAWAII COUNTY PLUMBING CODE, CHAPTER 17 OF HAWAII COUNTY CODE, 1983, REPUBLISHED 2005; NATIONAL ELECTRICAL CODE, 2002, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	UNIFORM BUILDING CODE, 1991, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO); HAWAII COUNTY PLUMBING CODE, CHAPTER 17 OF HAWAII COUNTY CODE, 1983, REPUBLISHED 2005; NATIONAL ELECTRICAL CODE, 2002, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	UNIFORM BUILDING CODE, 1991, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO); HAWAII COUNTY PLUMBING CODE, CHAPTER 17 OF HAWAII COUNTY CODE, 1983, REPUBLISHED 2005; NATIONAL ELECTRICAL CODE, 2002, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)	UNIFORM BUILDING CODE, 1991, INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS (ICBO); HAWAII COUNTY PLUMBING CODE, CHAPTER 17 OF HAWAII COUNTY CODE, 1983, REPUBLISHED 2005; NATIONAL ELECTRICAL CODE, 2002, NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
OCCUPANCY:	M2	M2	M2	M2
CONSTRUCTION TYPE:	TYPE II–N	TYPE II–N	TYPE II–N	TYPE II–N
SEISMIC LOAD:	3	3	3	3
WIND LOADS:	MIN. BASIC WIND SPEED–80 MPH	MIN. BASIC WIND SPEED–80 MPH	MIN. BASIC WIND SPEED–80 MPH	MIN. BASIC WIND SPEED–80 MPH
EXPOSURE	C	C	C	C
DESIGN WIND PRESSURE:	29 LBS. PER SQ. FT.	29 LBS. PER SQ. FT.	29 LBS. PER SQ. FT.	29 LBS. PER SQ. FT.
ZONE:	AGRICULTURAL	AGRICULTURAL	AGRICULTURAL	AGRICULTURAL
FIRE SPRINKLERS:	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE	NOT APPLICABLE
GROSS BUILDING AREA:	114 SQ. FT.	573 SQ. FT.	707 SQ. FT.	255 SQ. FT.

1

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010	PCD 1 – ADD UBC TABLE	A&A	

MATTHEW K. FUJIOKA ★ LICENSED PROFESSIONAL ENGINEER No.11473-C ★ HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

MISCELLANEOUS DETAILS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
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PCD. NO. 1 C-53

SHEET 54 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: RKI
Last Saved: 1/20/2010
Plotted on: 5/24/2010
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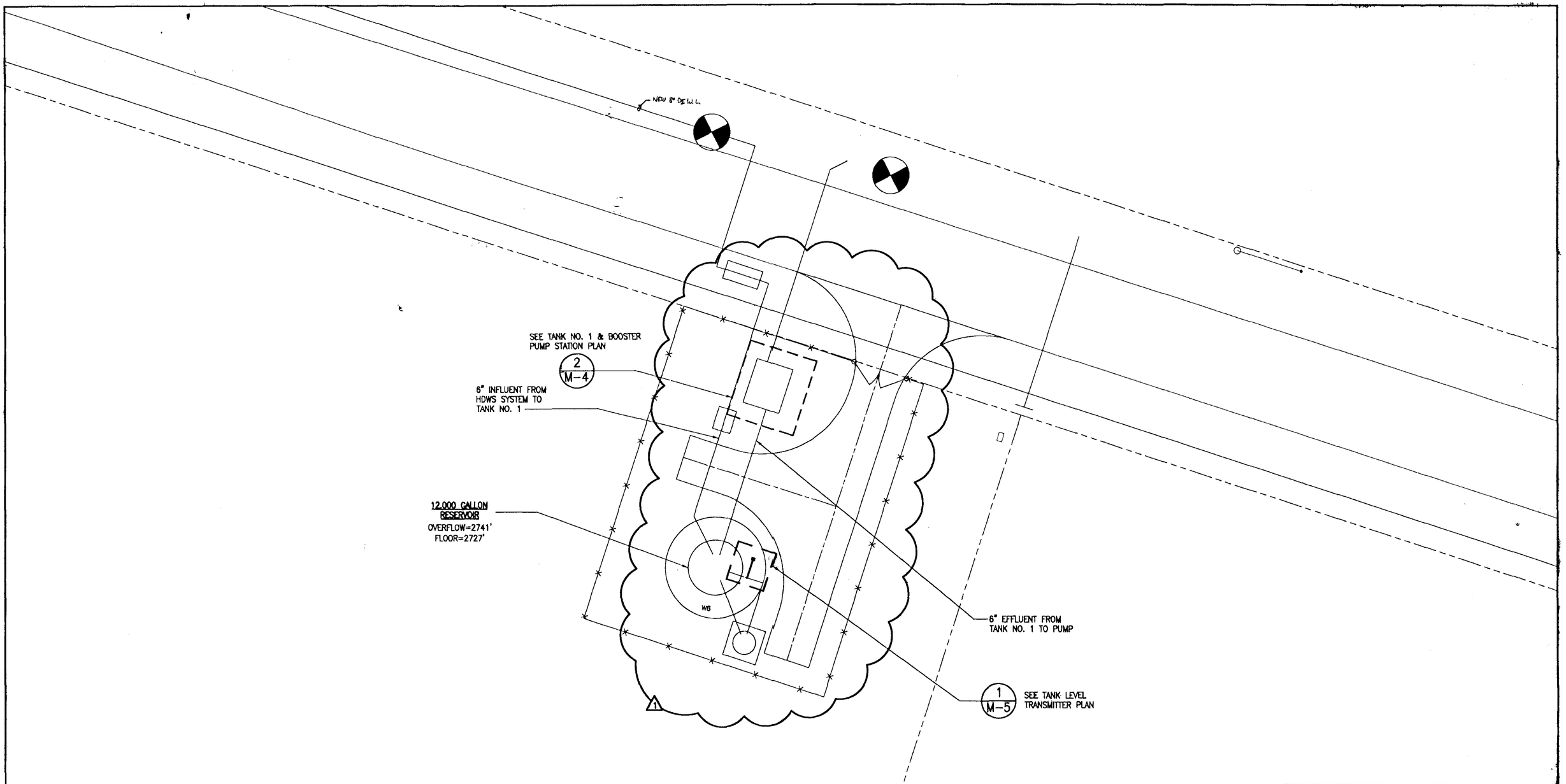

N

1 / M-1 TANK NO. 1 & BOOSTER PUMP STATION PLAN

SCALE: 1" = 10'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
2/1/10	POD NO.1	GYS	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU UPPER WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

1

TANK NO. 1 & BOOSTER PUMP STATION PLAN

GLENN Y. SUZUKI
LICENSED PROFESSIONAL ENGINEER
5684-M
HAWAII, U.S.A.

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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FILE	POCKET	FOLDER	NO.

TRUE NORTH
SCALE: 1" = 10'

CableBx
R/W
R/W
edge of exist. road
edge of exist. road
Tank
Wall
Solar Panel
TVBx
W4
Fence
Fence
Tank
W3
W4
WMs
2-Syphon
Fence
Hui Tank
WV
WMs
WV
WV
SEE TANK NO. 2 & BOOSTER PUMP STATION PLAN
1
M-4
FIRE ROAD - 11 (FR-11)
Wall
Fence
R/W
Gate
Gravel Road
TelBx
W3
edge of exist. road
edge of exist. road
R/W
W4
W5
W5
W6
SEE TANK LEVEL TRANSMITTER PLAN
1
M-5
59,000 GALLON RESERVOIR
OVERFLOW = 3258'
FLOOR = 3244'
6" OVERFLOW
DRYWELL
(E) 6" CLEANOUT LINE
1

N

1 / M-2 TANK NO. 2 & BOOSTER PUMP STATION PLAN
SCALE: 1" = 10'

2/1/10	PCD NO. 1	GYS	
REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 8-4-35:1-108, 8-4-36:1-75, 8-4-37:1-7, & 8-4-38:1-1
WAIMEA, SOUTH KOHALA, HAWAII
1

GLENN Y. SUZUKI
LICENSED PROFESSIONAL ENGINEER
5684-M
HAWAII, U.S.A.

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TANK NO. 2 & BOOSTER PUMP STATION PLAN

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

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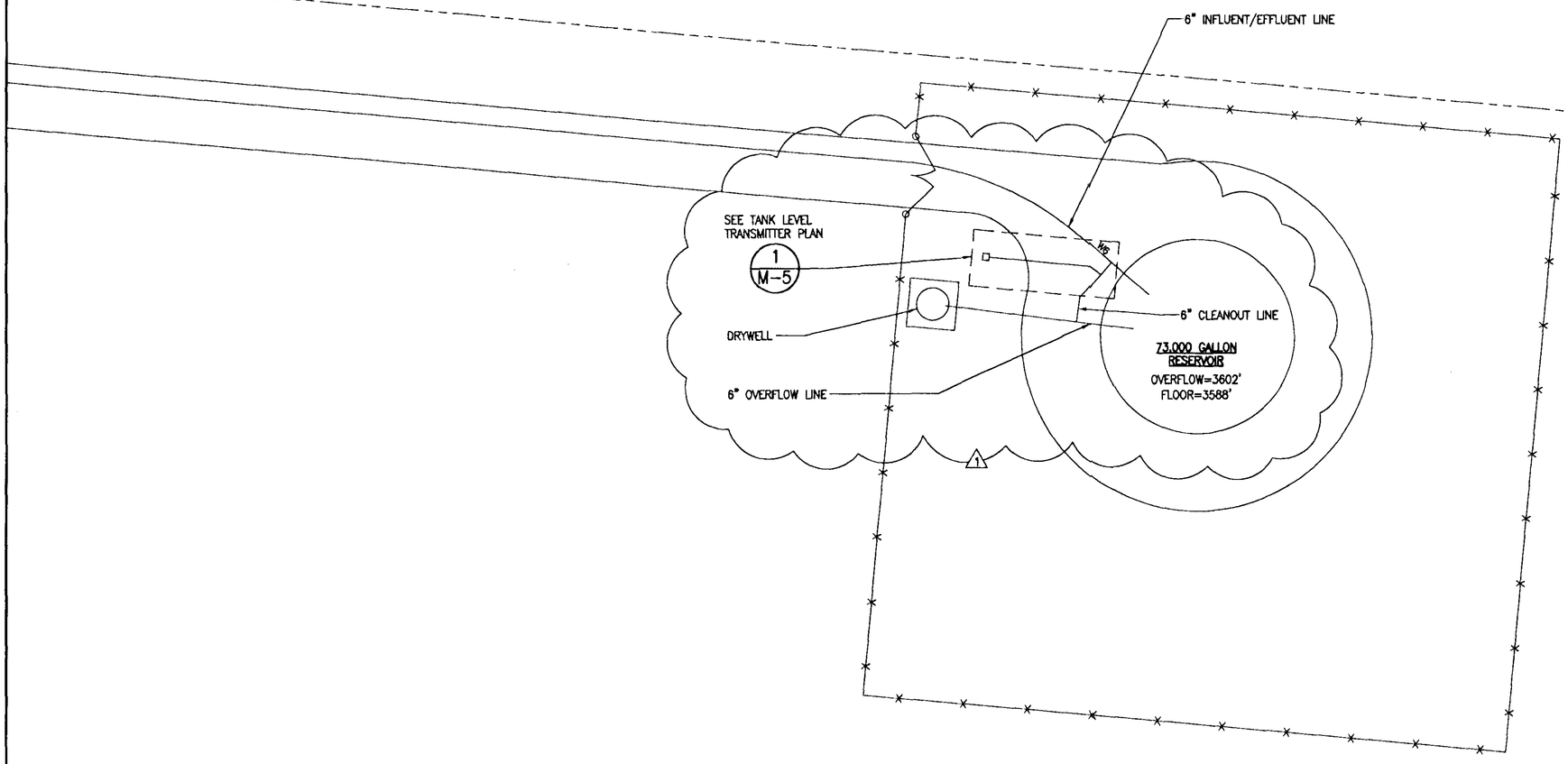
FILE	POCKET	FOLDER	NO.



N

1 / M-3 TANK NO. 3 SITE PLAN

SCALE: 1" = 10'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
2/1/10	PCD NO. 1	GYS	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13 1

WAIMEA, SOUTH KOHALA, HAWAII

TANK NO. 3 SITE PLAN

GLENN Y. SUZUKI LICENSED PROFESSIONAL ENGINEER 5684-M HAWAII, U.S.A.

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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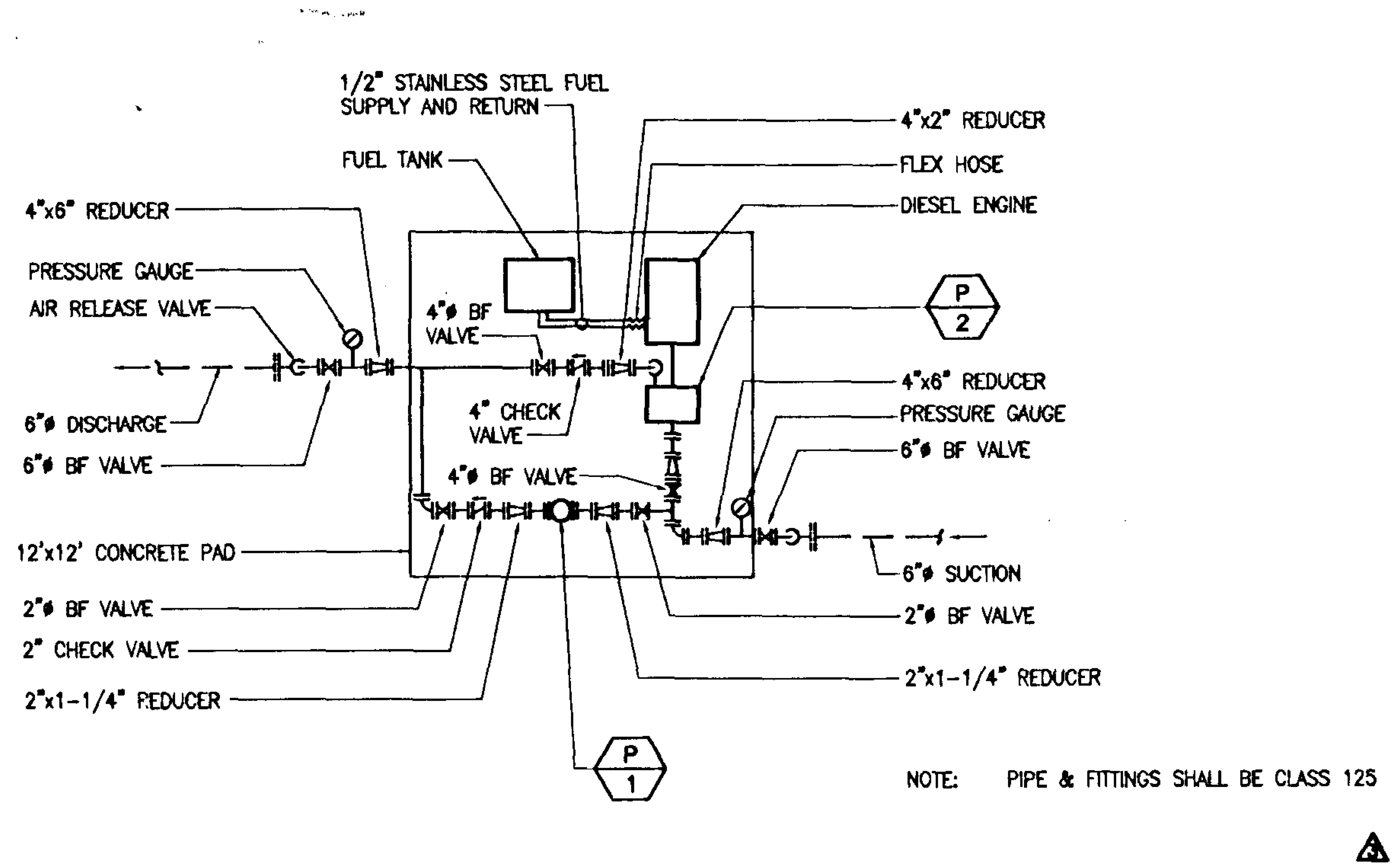
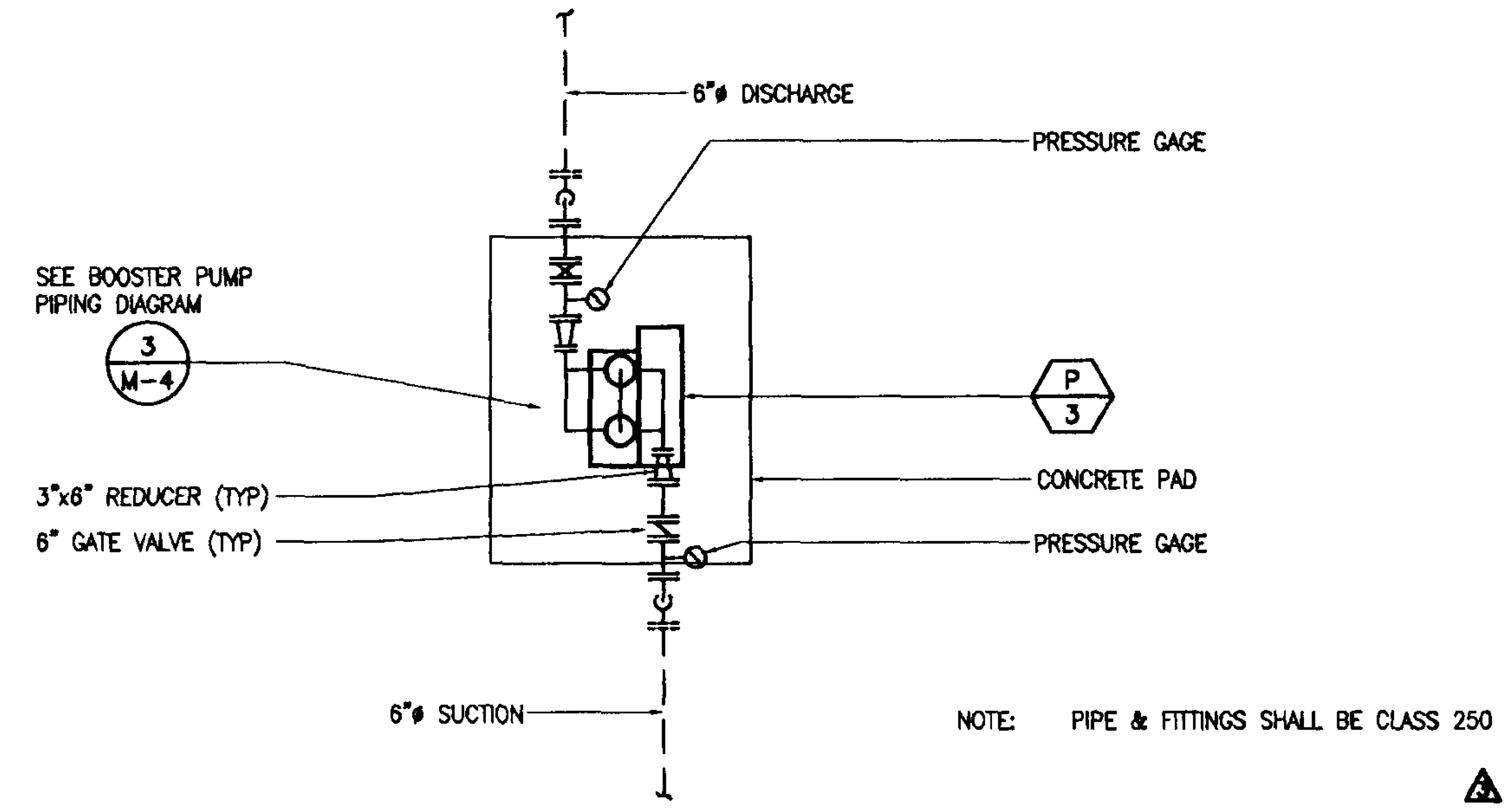
FILE	POCKET	FOLDER	NO.



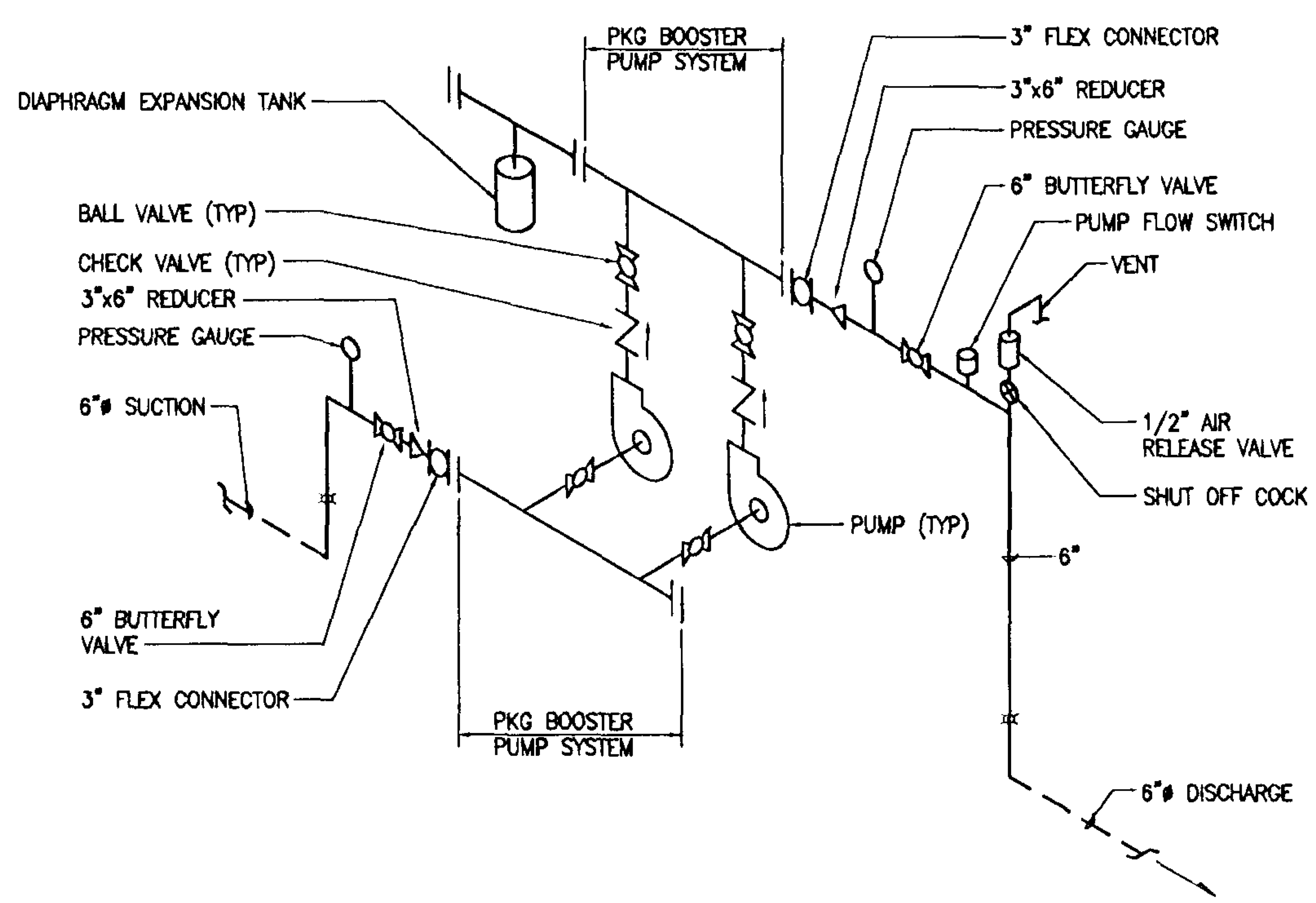
1 (M-4) TANK NO. 2 & BOOSTER PUMP STATION PLAN

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



2 (M-4) TANK NO. 1 & BOOSTER PUMP STATION PLAN

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



3 (M-4) BOOSTER PUMP PIPING DIAGRAM

NOT TO SCALE

PUMP SCHEDULE

SYMBOL	QTY	TYPE	SERVICE	GPM	TOTAL HEAD IN FT.	RPM	ELECTRICAL HP	ELECTRICAL VOLTAGE	REMARKS
P 1	1-EA	PHOTOVOLTAIC POWERED VERTICAL MULTISTAGE CENTRIFUGAL	BOOSTER	20	370	3500	5	208/3/60	GOULD MODEL 1SVB1JL9, ENVIROSEP, OR APPROVED EQUAL
P 2	1-EA	DIESEL DRIVEN HORIZONTAL SPLIT CASE CENTRIFUGAL	BOOSTER	50	370	3000	10	208/3/60	MTH PUMPS MODEL 153L, ENVIROSEP OR APPROVED EQUAL
P 3	1-EA	SKID MOUNTED DUPLEX, CENTRIFUGAL	BOOSTER	125	560	3500	30	208/3/60	GOULD MODEL 33SVBF12Q6TA, ENVIROSEP, OR APPROVED EQUAL

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
2/1/10	PCD NO1	GYS	
7/28/09	ADDENDUM NO2	SET	

GLENN Y. SUZUKI
LICENSED PROFESSIONAL ENGINEER
5684-M
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/10

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

~~WAIMEA, SOUTH KOHALA, HAWAII~~

PHASE 1 AND PHASE 2 BOOSTER PUMP PLAN

Approved:

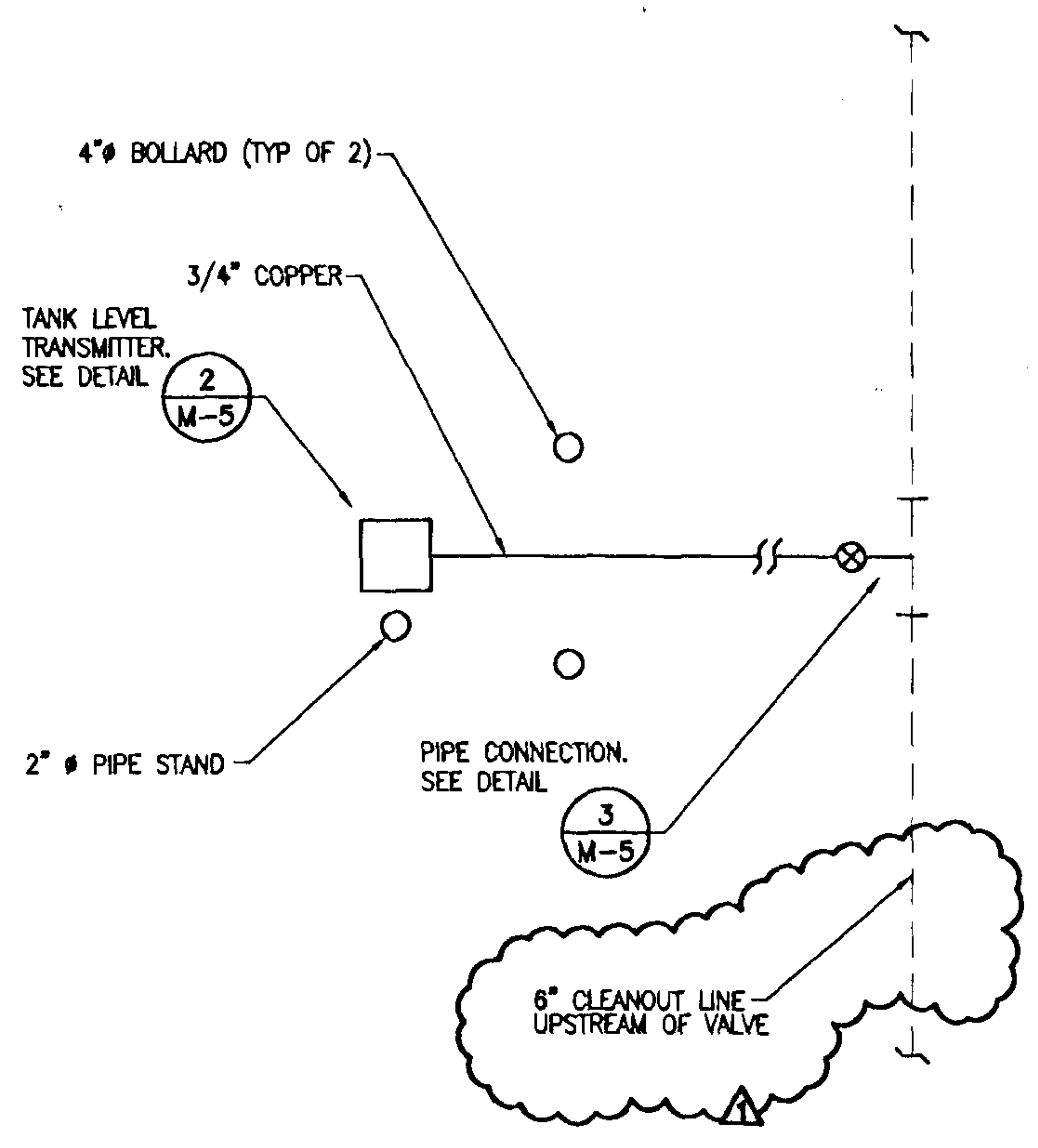
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

M-4

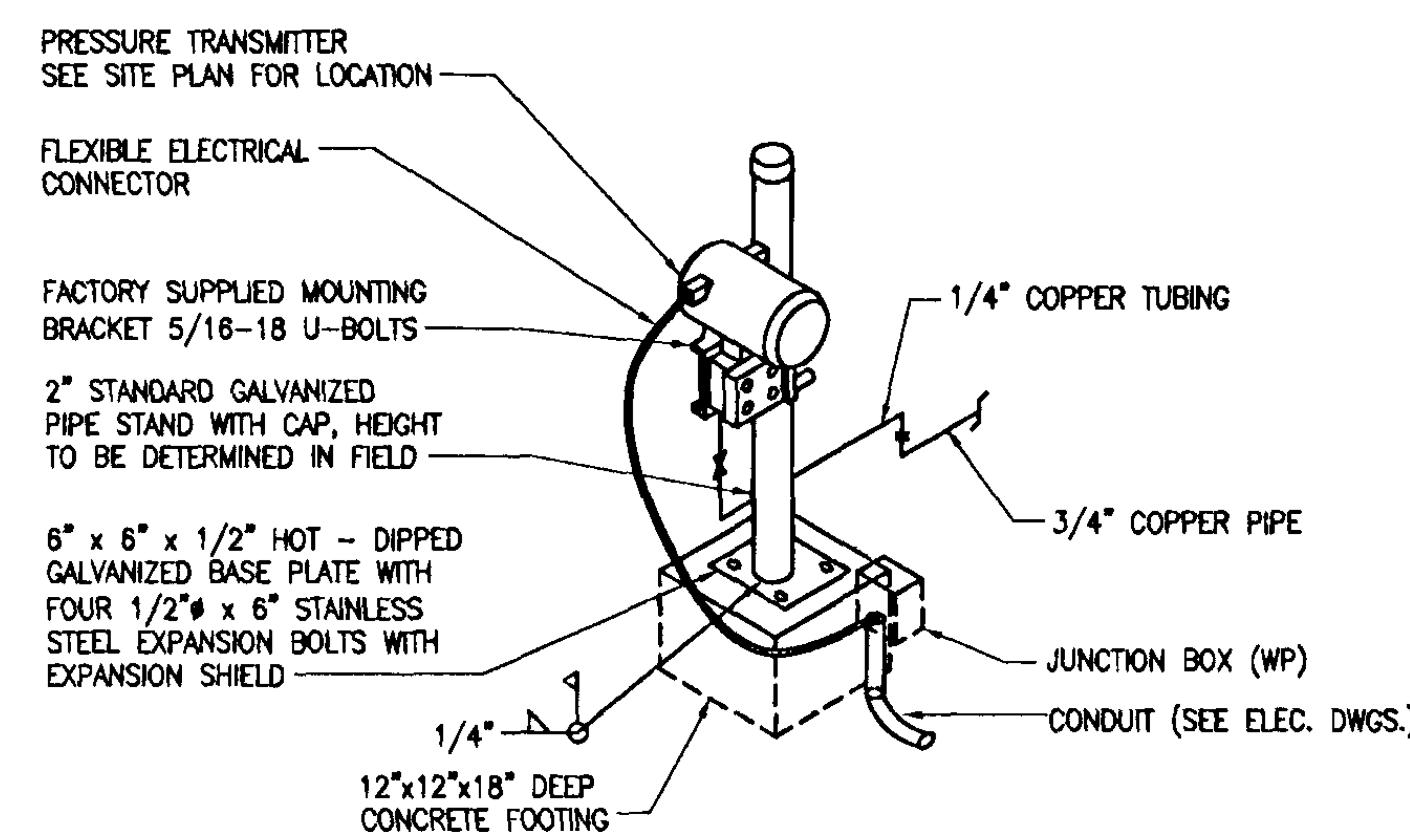
SHEET 58 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.



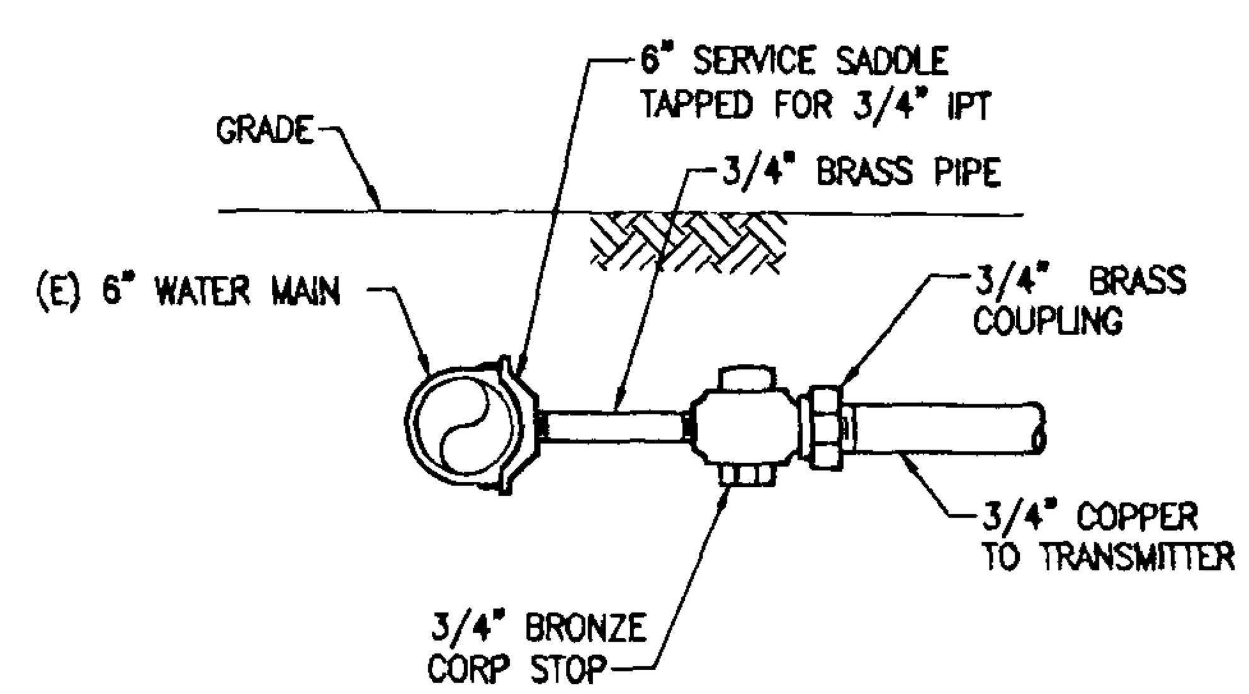
1 M-5 TANK LEVEL TRANSMITTER PLAN

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



2 M-5 TANK LEVEL TRANSMITTER DETAIL

NOT TO SCALE



3 M-5 PIPE CONNECTION DETAIL

NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

MECHANICAL DETAILS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

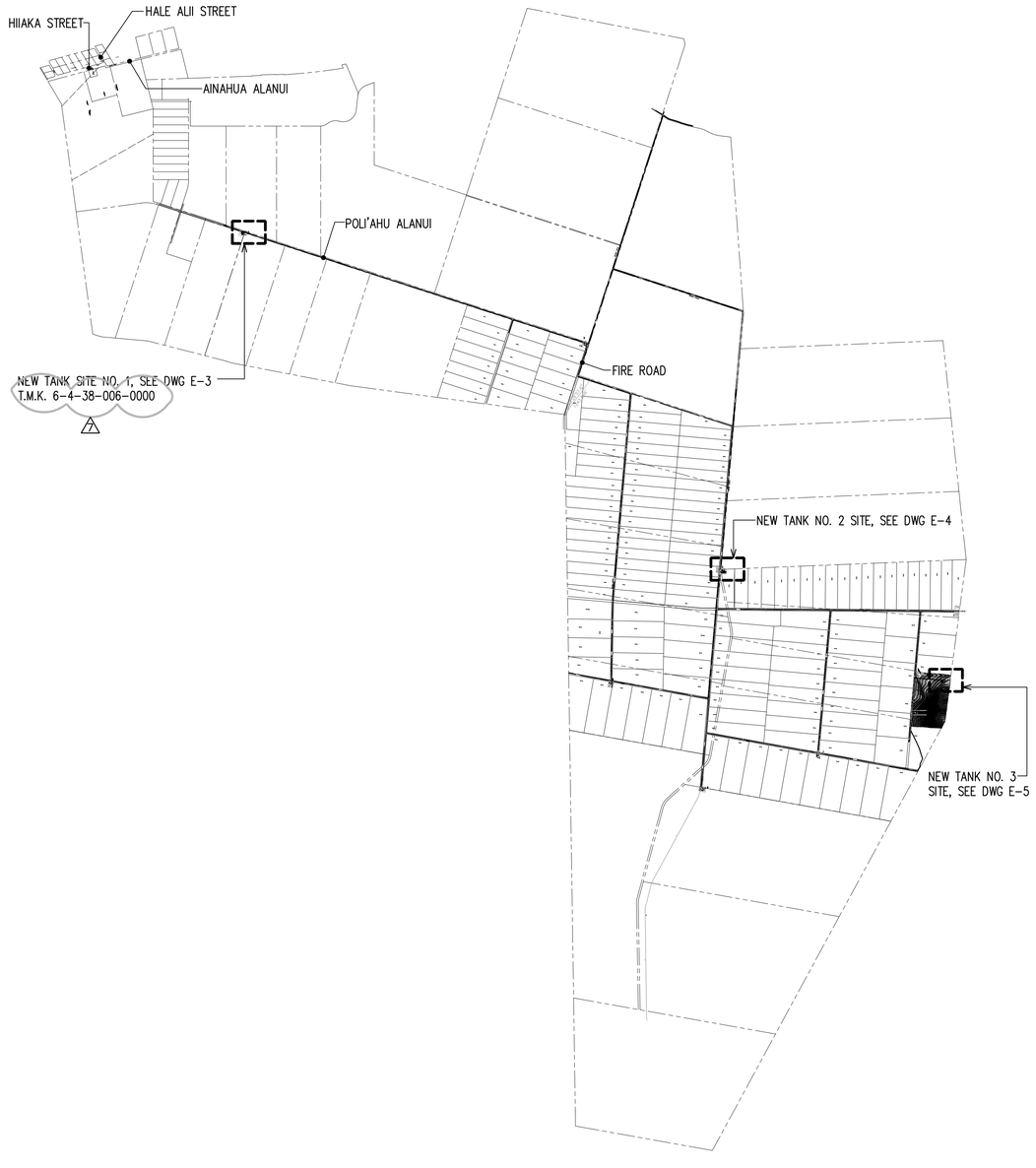
AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

M-5

SHEET 59 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.



ABBREVIATIONS

A	AMPERES	NO	NUMBER
AF	AMP FRAME	NOM	NOMINAL
AFF/AFG	ABOVE FINISHED FLOOR/GRADE		
ARCH	ARCHITECT	OC	OVER CURRENT
AT	AMP TRIP		
AVG	AVERAGE	PFB	PROVISIONS FOR FUTURE CIRCUIT BREAKERS
BATT	BATTERY	PH	PHASE
BKR	BREAKER	PNL	PANEL
BLDG	BUILDING	PROVS	PROVISIONS
BTM	BOTTOM	PSI	POUNDS PER SQUARE INCH
C	CONDUIT	REQ/REQ'D	REQUIRE/REQUIRED
CAB	CABINET	REQM'T	REQUIREMENT
CKT	CIRCUIT	RM	ROOM
CTR	CENTER		
		SCHED	SCHEDULE
D	DIMENSIONAL DEPTH	SHT	SHEET
DET	DETAIL	SPECS	SPECIFICATIONS
DIA	DIAMETER	SQ	SQUARE
DIAG	DIAGRAM	S.S.	STAINLESS STEEL (TYPE 316)
DISC	DISCONNECT	STD	STANDARD
DWG/DWGS	DRAWING/DRAWINGS	SW/SWBD	SWITCH/SWITCHBOARD
EM/EMERG	EMERGENCY	TBD	TO BE DETERMINED
ENCL	ENCLOSURE	TYP	TYPICAL
EQ	EQUAL		
EXIST	EXISTING	UON	UNLESS OTHERWISE NOTED
		USPC	UNIVERSAL SOLAR PUMP CONTROLLER
FDR	FEEDER		
FIN	FINISH	V	VOLTS
FLR	FLOOR		
		W	WIRE/WATT/DIMENSIONAL WIDTH
GND/GND'G	GROUND/GROUNDING	w/	WITH
GR	GRADE	WP	WEATHERPROOF-RATED
GRC	GALVANIZED RIGID CONDUIT		
H	DIMENSIONAL HEIGHT	+48" AFF	FORTY-EIGHT INCHES ABOVE FINISH FLOOR
HP	HORSEPOWER	ø	PHASE
		℄	CENTER-LINE
JB/J-BOX	JUNCTION BOX		
KAIC	KILOAMPERES INTERRUPTING CAPACITY		
KVA	KILOVOLT AMPERES		
KW	KILO-WATT		
KWH	KILO-WATT HOUR		
L	DIMENSIONAL LENGTH/LONG		
MAX	MAXIMUM		
MECH	MECHANICAL		
MIN	MINIMUM		
MTD/MTG	MOUNTED/MOUNTING		

ELECTRICAL SYMBOLS

SYMBOL EXISTING	SYMBOL NEW	DESCRIPTION
		DISCONNECT SWITCH, FUSIBLE UON, HEAVY-DUTY, HP-RATED CHANNEL MOUNTED UON, SEE DETAIL ON DWG E-9
	J	JUNCTION BOX, SMALL – SIZED PER NEC 314.16, WALL MOUNTED UON
	M	ELECTRICAL CONNECTION, MOTOR
	PT	ELECTRICAL CONNECTION, PRESSURE TRANSMITTER
		FLEXIBLE CONDUIT, LIQUIDTIGHT IN DAMP OR WET LOCATIONS
	A 1-4E, B 1-1C	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; ITEMS IN CIRCLE INDICATES DUCT SECTION TYPE, WITH DUCT COMPLEMENTS NOTED BELOW (TYPE "A" DUCT INDICATED WITH 1-2"E DUCTS, AND TYPE "I" DUCT WITH 1-1"C DUCT; E=ELECTRIC, C=CONTROLS, I=INSTRUMENTATION); SEE DWG E-2 FOR DUCT SECTION DETAILS
	← 1 , 1	NOTE INDICATOR, NOTE NUMBER 1 REFERENCED, ALL OTHERS SIMILAR, SEE NOTES ON RESPECTIVE SHEETS
		12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "POWER" INSCRIBED ON COVER
		12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "INSTRUMENTATION" INSCRIBED ON COVER
		12" X 20" WATER METER TYPE PRECAST CONCRETE PULLBOX, WITH STEEL COVER AND WITH "CONTROLS" INSCRIBED ON COVER
		DUPLEX RECEPTACLE, WITH GROUND FAULT CIRCUIT INTERRUPTER, NEMA 5-20R, 120V, CHANNEL MOUNTED, IN WEATHERPROOF HOUSING, SEE DETAIL D/E-9
		JUNCTION BOX MTD. ON CHANNEL SUPPORT, SEE DETAIL B/E-9

NOTES:

1. NO HASH MARKS ON CONDUIT INDICATE 2 WIRES; —//— INDICATES 3- WIRES; —///— INDICATES 4 WIRES; ETC. EQUIPMENT GROUNDING WIRE IS NOT INCLUDED IN COUNT, BUT SHALL BE PROVIDED PER NEC 250.122.
2. ALL WORK SHOWN ON ALL DRAWINGS SHALL BE NEW UNLESS OTHERWISE INDICATED.
3. "X" THROUGH SYMBOL INDICATES ITEM TO BE REMOVED OR AS NOTED.

OVERALL ELECTRICAL SITE PLAN

SCALE: 1"=2000'

NORTH

2000' 1000' 0 2000' 4000' 6000'

SCALE: 1"=2000'

GRAPHIC SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
7 6/21/2011	PCD 7 - ADDED TMK FOR TANK SITE NO. 1	RHA	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

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

Signature 2014.04.08

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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FILE	POCKET	FOLDER	NO.

LAST SAVE: 06/21/11 @ 13:25:10 BY: RS PLOT SC 1=2000
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DUCT SECTION BACKFILL NOTES:

- TYPE "A" BACKFILL – EARTH & GRAVEL ROCK SIZE TO BE 1" MAX. & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
- TYPE "B" BACKFILL – EARTH & GRAVEL MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
- NOTE – IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.
- CONCRETE – 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.

DESIGNATION DESCRIPTIONS

ELEC = PRIMARY OR SECONDARY ELECTRIC
CTL = CONTROL
SIG = INSTRUMENTATION OR ANTENNA CABLE

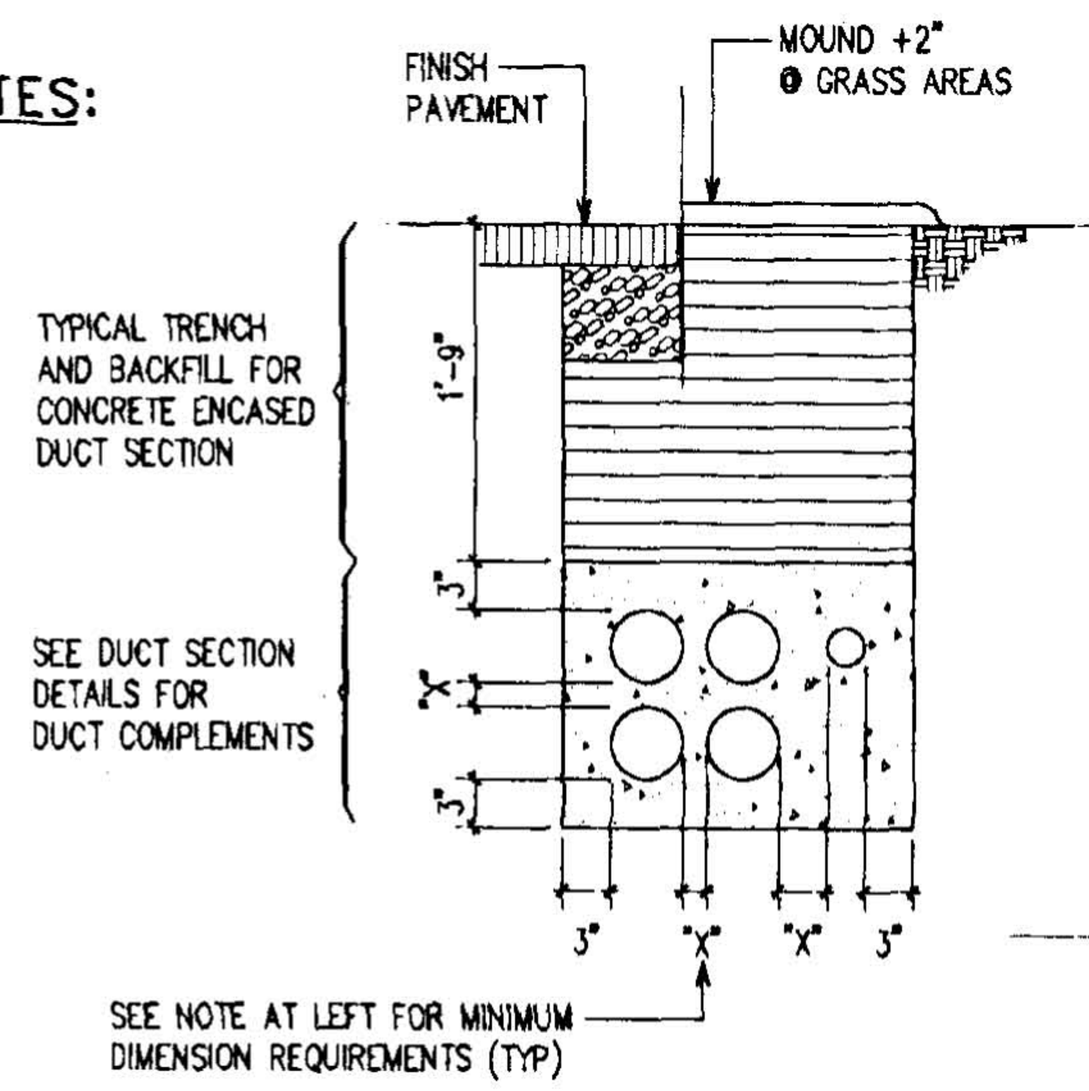
MINIMUM "X" DIMENSION
DUCT SEPARATION REQUIREMENTS

ELEC – ELEC = 1 1/2"

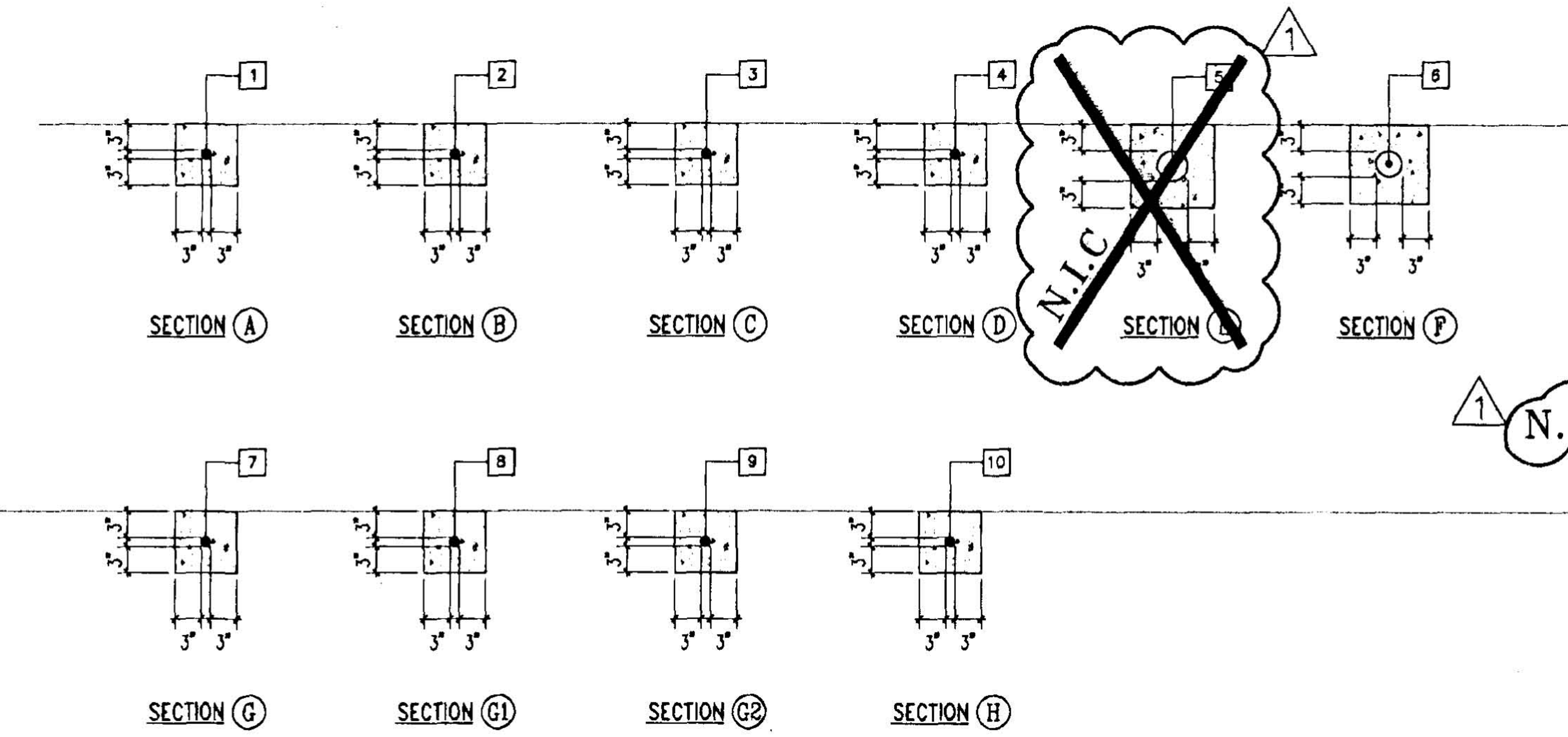
ELEC – CTL/SIG = 3"

CTL/SIG – CTL/SIG = 1 1/2"

MINIMUM OF 3" CONCRETE ENCASEMENT AROUND DUCTBANK



TYPICAL DUCT SECTION



DUCT AND WIRE SCHEDULE

NO.	DUCT SIZE	WIRE SIZE	DESTINATION OR USE
1	1"	1-2/C#14 TWISTED, SHIELDED CABLE W/GND	INSTRUMENTATION CIRCUIT FROM TANK LEVEL TRANSMITTER TO LIMIT VALUE SWITCH
2	1"	3#10, 1#10 GND	UNIVERSAL SOLAR PUMP CONTROLLER TO SOLAR BOOSTER PUMP "P-1"
3	1"	4#14, 1#14 GND CONTROLS	TELEMETRY SYSTEM TO REMOTE SWITCH INPUT AT THE UNIVERSAL SOLAR PUMP CONTROLLER
4	1"	4#14, 1#14 GND CONTROLS	TELEMETRY SYSTEM TO DIESEL DRIVEN BOOSTER PUMP "P-2" CONTROL PANEL
5	3"	[illegible]	HELCO SERVICE POLE TO ELECTRICAL SERVICE EQUIPMENT
6	2.5"	3#3/0, 1#6 GND	FEEDER TO PACKAGED DUPLEX BOOSTER PUMP "P-3" CONTROL PANEL
7	1"	2#12, 1#12 GND	120V CIRCUITS TO DUPLEX RECEPTACLE OUTLET AND 24VDC POWER SUPPLY
8	1"	2#12, 1#12 GND	120V CIRCUIT TO DUPLEX RECEPTACLE OUTLET
9	1"	2#12, 1#12 GND	120V CIRCUIT TO 24VDC POWER SUPPLY
10	1"	6#14, 1#14 GND CONTROLS	TELEMETRY SYSTEM TO PACKAGED DUPLEX BOOSTER PUMP "P-3" CONTROL PANEL

1 N.I.C

NOTES:
1. ALL CONCRETE ENCASED DUCTS SHALL BE SCHEDULE 40 PVC.
2. ALL DIRECT BURIED DUCTS SHALL BE SCHEDULE 80 PVC.
3. PC INDICATES PROVIDE PULLCORD.

DUCT SECTION DETAILS AND REQUIREMENTS

NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1 1/19/2010	PCD 1 – OMITTED DUCT SECTION "E" & SCHEDULE ITEM "5"	RHA	

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

DUCT SECTION DETAILS AND REQUIREMENTS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

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

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

Signature 2010.02.01

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LICENSE EXPIRES 04/30/2010

PCD. NO. 1

E-2

SHEET 61 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

1/E-3 TANK NO. 1 AND BOOSTER PUMP STATION ELECTRICAL SITE PLAN

SCALE: 1"=5'

1	1/19/2010	PCD 1 - MOVED SERVICE EQUIPMENT ONTO METER POLE	RHA	
	REVISION DATE	DESCRIPTION	MADE BY	APPROVED

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

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

Signature 2010.02.01

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LICENSE EXPIRES 04/30/2010

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TANK NO. 1 AND BOOSTER PUMP STATION
ELECTRICAL SITE PLAN

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

PCD. NO. 1

E-3

SHEET 62 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

LAST SAVE: 02/01/10 @ 14:17:58 BY: RS
FILE PATH: Z:\ACAD\PROJECTS\27089\...

GENERAL NOTES:

1. SIZE OF SOLAR PUMP CONTROLLER AND ASSOCIATED SOLAR ARRAY (SEE ALSO NOTE 3 BELOW) IS CONCEPTUAL ONLY AND NOT FOR CONSTRUCTION. CONTRACTOR SHALL SIZE SYSTEM AND SHALL BE RESPONSIBLE FOR OBTAINING AND VERIFYING ALL REQUIRED DATA.
2. SOLAR-POWERED TELEMETERING SYSTEM LOCATION AND ORIENTATION IS CONCEPTAL ONLY AND NOT FOR CONSTRUCTION, SEE NOTE 3 BELOW
3. SOLAR ARRAY SHALL BE INSTALLED AT A TILT ANGLE, ORIENTATION, AND ELEVATION AS RECOMMENDED BY THE SOLAR ARRAY MANUFACTURER. ACTUAL ARRAY LOCATION SHALL AVOID TREES, STRUCTURES, AND OBSTRUCTIONS WHICH CAN CAST SHADOWS ON THE SOLAR MODULES, ESPECIALLY DURING THE WINTER MONTHS WHEN THE ARC OF THE SUN IS LOWEST OVER THE HORIZON. CONTRACTOR SHALL VISIT SITE AND LOCATE SOLAR ARRAYS ACCORDINGLY.

1/E-4 BOOSTER PUMP STATION SITE PLAN

SCALE: 1"=5'

NORTH

5' 2.5' 0 5' 10' 15'
SCALE: 1"=5'
GRAPHIC SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

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

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

Signature 2009.05.11

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LICENSE EXPIRES 04/30/2010

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54
WAIMEA, SOUTH KOHALA, HAWAII

TANK NO. 2 AND BOOSTER PUMP STATION
ELECTRICAL SITE PLAN

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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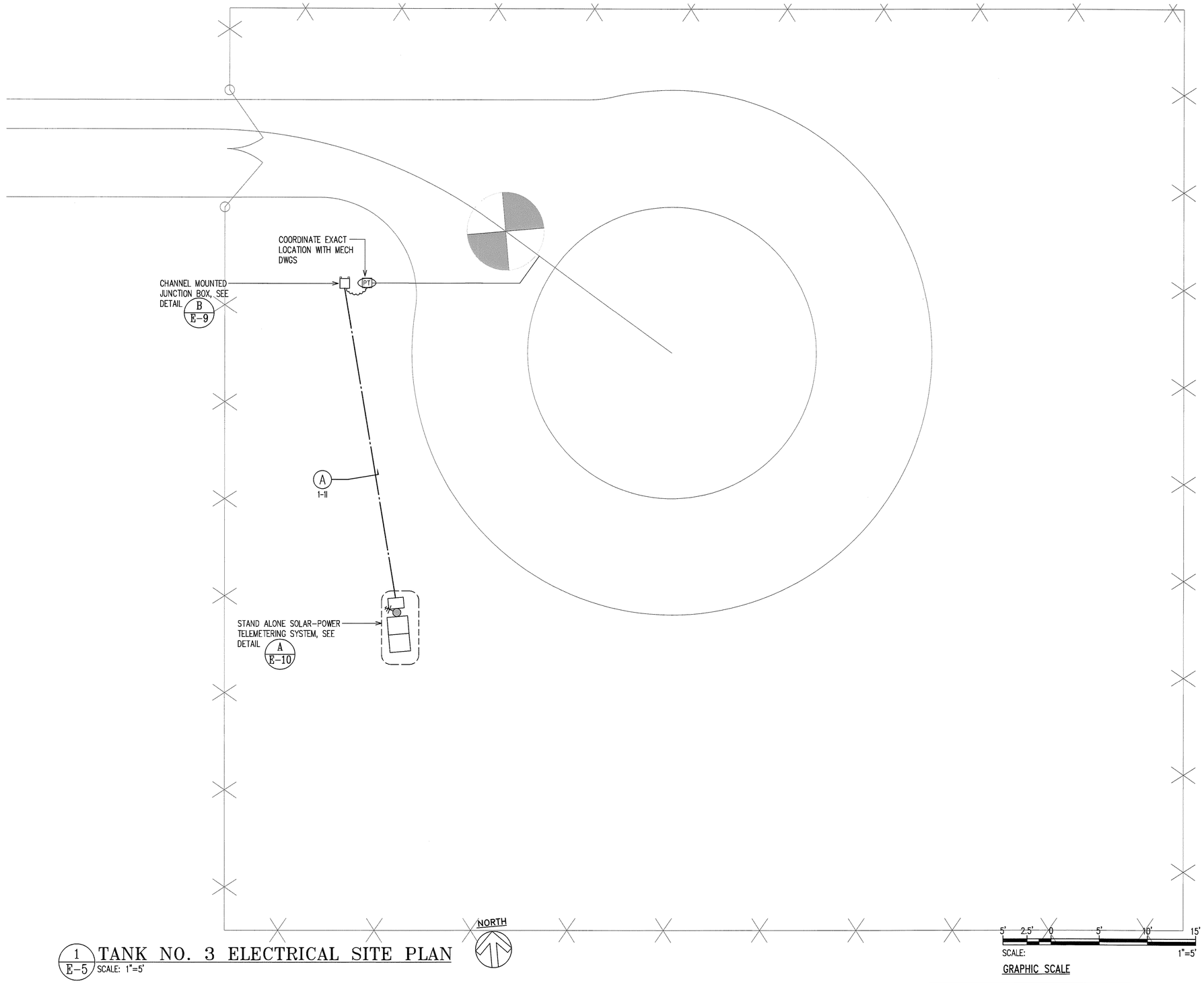
CONSULTING ENGINEERS

LAST SAVE: 05/11/09 @ 10:12:16 BY: AM PLOT SC 1=5

E-4

SHEET 63 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.



1 E-5 TANK NO. 3 ELECTRICAL SITE PLAN
SCALE: 1"=5'

GRAPHIC SCALE

GENERAL NOTES:

1. SOLAR-POWERED TELEMETERING SYSTEM LOCATION AND ORIENTATION IS CONCEPTAL ONLY AND NOT FOR CONSTRUCTION, SEE NOTE 2 BELOW
2. SOLAR ARRAY SHALL BE INSTALLED AT A TILT ANGLE, ORIENTATION, AND ELEVATION AS RECOMMENDED BY THE SOLAR ARRAY MANUFACTURER. ACTUAL ARRAY LOCATION SHALL AVOID TREES, STRUCTURES, AND OBSTRUCTIONS WHICH CAN CAST SHADOWS ON THE SOLAR MODULES, ESPECIALLY DURING THE WINTER MONTHS WHEN THE ARC OF THE SUN IS LOWEST OVER THE HORIZON. CONTRACTOR SHALL VISIT SITE AND LOCATE SOLAR ARRAYS ACCORDINGLY.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54
WAIMEA, SOUTH KOHALA, HAWAII

TANK NO. 3 ELECTRICAL SITE PLAN

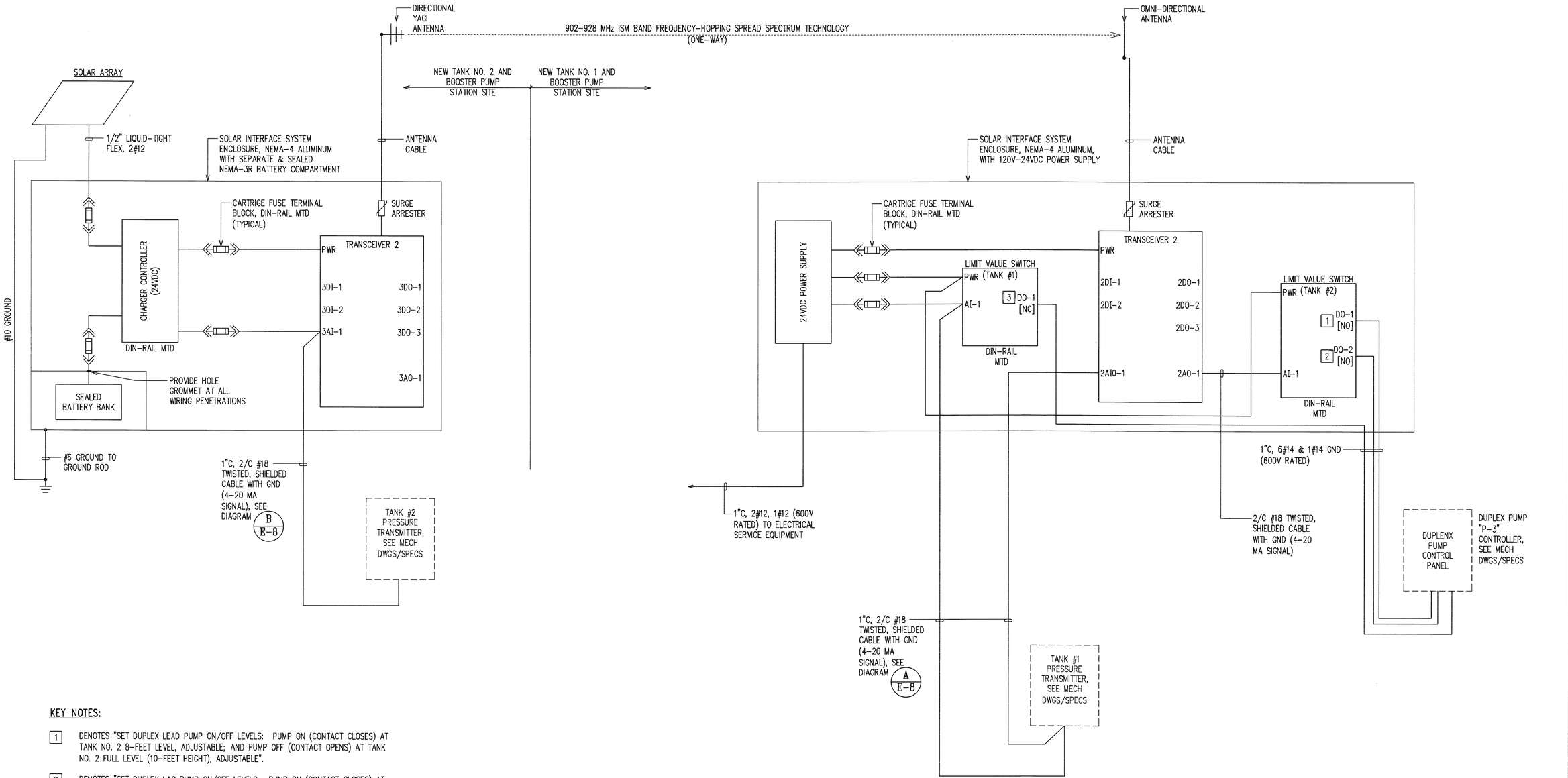
RONALD N. S. HO & ASSOCIATES, INC.
ELECTRICAL ENGINEERS
ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
Signature 2009.05.11
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 04/30/2010

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

LAST SAVED: 05/11/09 @ 10:12:24 BY: AM PLOT SC 1=5
FILE PATH: Z:\ACAD\PROJECTS\27089\p005_27089_task-3 site plan.dwg CAD USER: andy PLOT DATE: 2009.05.11 XREFS: | _x27089-dbdoc | x27089-dbbkgnd | xBASE-TOPO | xBASE-END HATCH | xBASE-EWATER | xBASE-GRADING | xBASE-FWATER_2004 | xBASE-ETEXT 100_2004 | x2070289M04-PHASE 1 | x2070289M04-PHASE 2 | xm02 | xm03 | xm01 |



KEY NOTES:

1. DENOTES "SET DUPLEX LEAD PUMP ON/OFF LEVELS: PUMP ON (CONTACT CLOSES) AT TANK NO. 2 8-FEET LEVEL, ADJUSTABLE; AND PUMP OFF (CONTACT OPENS) AT TANK NO. 2 FULL LEVEL (10-FEET HEIGHT), ADJUSTABLE".
2. DENOTES "SET DUPLEX LAG PUMP ON/OFF LEVELS: PUMP ON (CONTACT CLOSES) AT TANK NO. 2 6-FEET LEVEL, ADJUSTABLE; AND PUMP OFF (CONTACT OPENS) AT TANK NO. 2 FULL LEVEL (10-FEET HEIGHT), ADJUSTABLE".
3. DENOTES "LOCKOUT ALL BOOSTER PUMPS DUE TO TANK NO. 1 LOW WATER LEVEL".

GENERAL NOTES:

1. 76,000 GALLON TANK SPILLWAY ELEVATION = 3,685 FEET.
2. NOT USED.

A / E-6 TELEMETERING DIAGRAM BETWEEN TANK NO. 1 AND TANK NO. 2 SITES

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54

WAIMEA, SOUTH KOHALA, HAWAII

TANK 1 SITE TO TANK 2 SITE TELEMETERING DIAGRAM

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

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

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

Signature 2009.05.11

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LICENSE EXPIRES 04/30/2010

FILE	POCKET	FOLDER	NO.

LAST SAVED: 05/11/09 @ 10:12:31 BY: AM PLOT SC 1"=1"
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KEY NOTES:

1. DENOTES "SET SOLAR PUMP P-1 ON/OFF LEVELS: PUMP ON (CONTACT CLOSES) AT TANK NO. 3 8-FEET TANK LEVEL; AND PUMP OFF (CONTACT OPENS) AT TANK NO. 3 FULL LEVEL (10-FEET HEIGHT)".
2. DENOTES "SET DIESEL DRIVEN PUMP P-2 OFF LEVEL: PUMP TO BE TURNED ON MANUALLY AND AUTOMATICALLY TURNED OFF (CONTACT OPEN) AT TANK NO. 3 FULL LEVEL (10-FEET HEIGHT)".
3. DENOTES "LOCKOUT ALL BOOSTER PUMPS DUE TO TANK NO. 2 LOW WATER LEVEL".

GENERAL NOTES:

1. 76,000 GALLON TANK SPILLWAY ELEVATION = 3,685 FEET.
2. NOT USED.

A/E-7 TELEMETERING DIAGRAM BETWEEN TANK NO. 2 AND TANK NO. 3 SITES

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

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

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

Signature 2009.05.11

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LICENSE EXPIRES 04/30/2010

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54
WAIMEA, SOUTH KOHALA, HAWAII

SOLAR-POWERED TELEMETERING DIAGRAM

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

LAST SAVE: 05/11/09 @ 10:12:39 BY: AM PLOT SC 1"=1'
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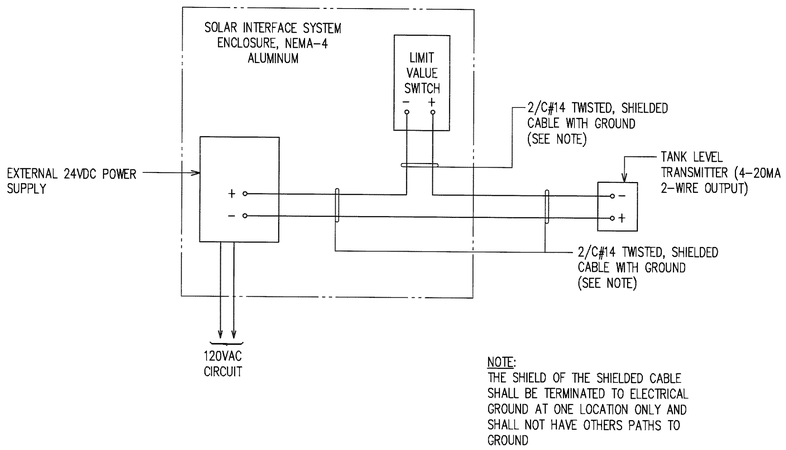
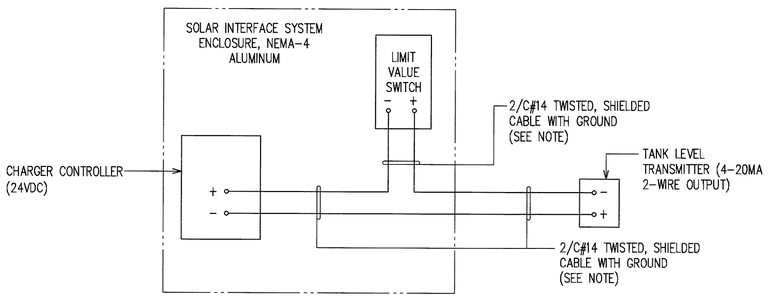


NOTE:
THE SHIELD OF THE SHIELDED CABLE SHALL BE TERMINATED TO ELECTRICAL GROUND AT ONE LOCATION ONLY AND SHALL NOT HAVE OTHERS PATHS TO GROUND

A / E-8 TANK WATER LEVEL SIGNAL INSTRUMENTATION DIAGRAM

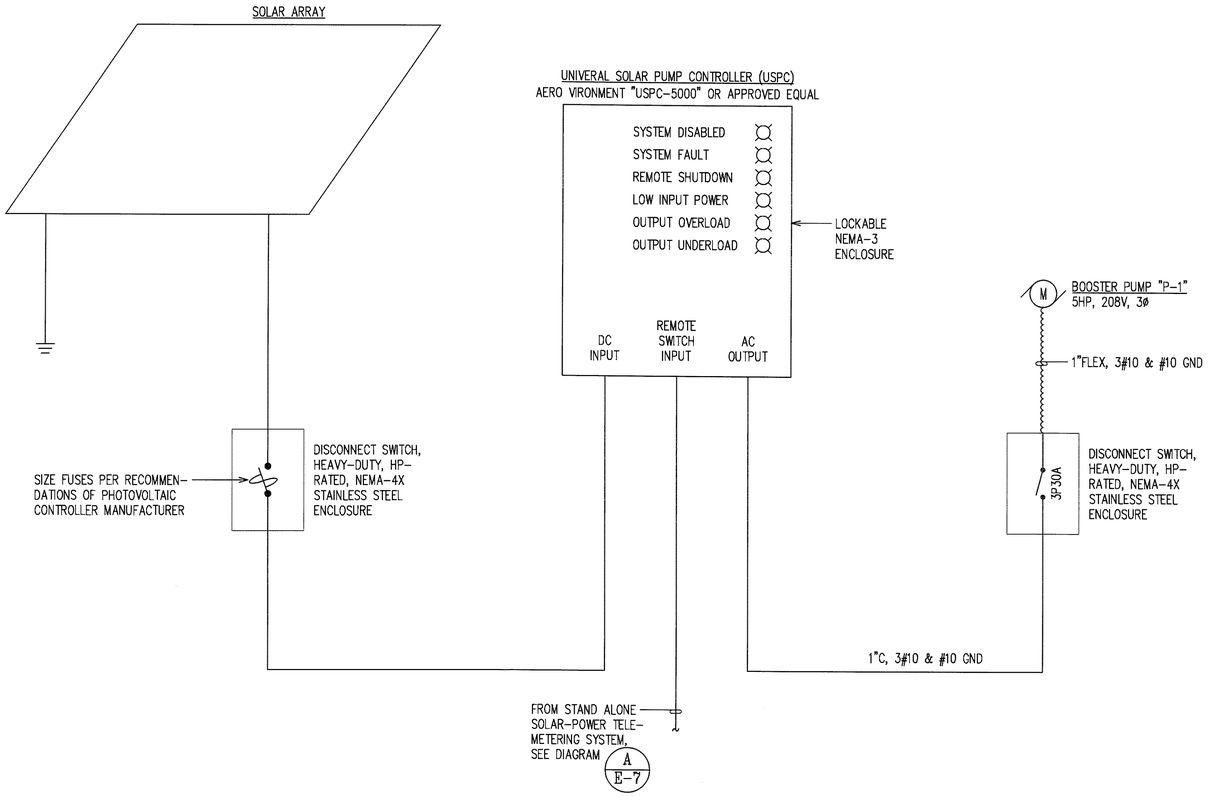
TANK SITE NO. 1



NOTE:
THE SHIELD OF THE SHIELDED CABLE SHALL BE TERMINATED TO ELECTRICAL GROUND AT ONE LOCATION ONLY AND SHALL NOT HAVE OTHERS PATHS TO GROUND

B / E-8 TANK WATER LEVEL SIGNAL INSTRUMENTATION DIAGRAM

TYPICAL AT TANK SITE NOS. 2 AND 3



C / E-8 SOLAR-POWERED PUMP WIRING DIAGRAM

(TANK NO. 2 SITE AND BOOSTER PUMP STATION SITE)

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54

WAIMEA, SOUTH KOHALA, HAWAII

TYPICAL INSTRUMENTATION WIRING DIAGRAMS

RONALD N. S. HO & ASSOCIATES, INC.
ELECTRICAL ENGINEERS
ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4940-E
HAWAII, U.S.A.

Signature 2009.05.11

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LICENSE EXPIRES 04/30/2010

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

LAST SAVE: 05/11/09 @ 10:12:45 BY: AM PLOT SC 1"=1'
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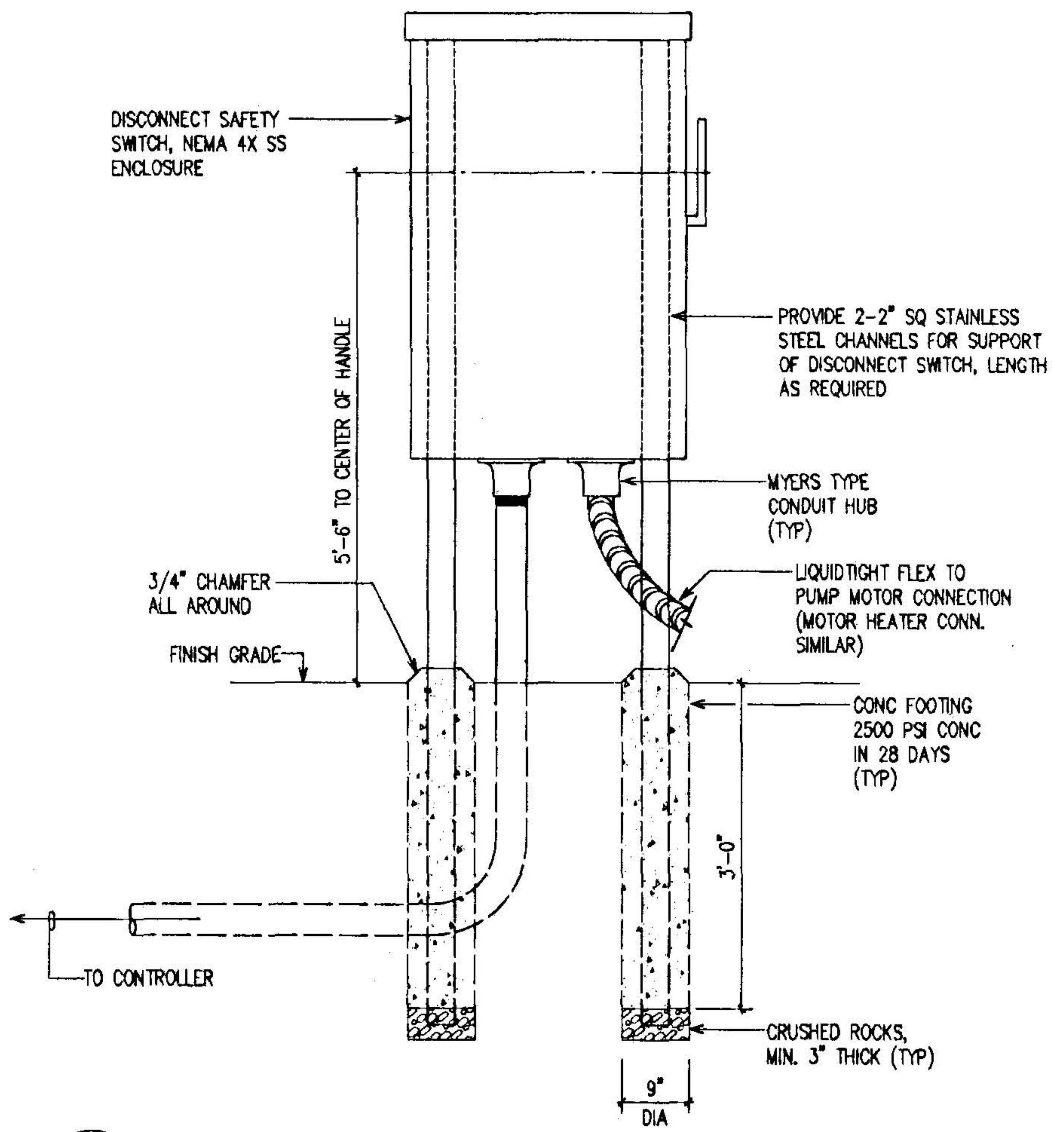
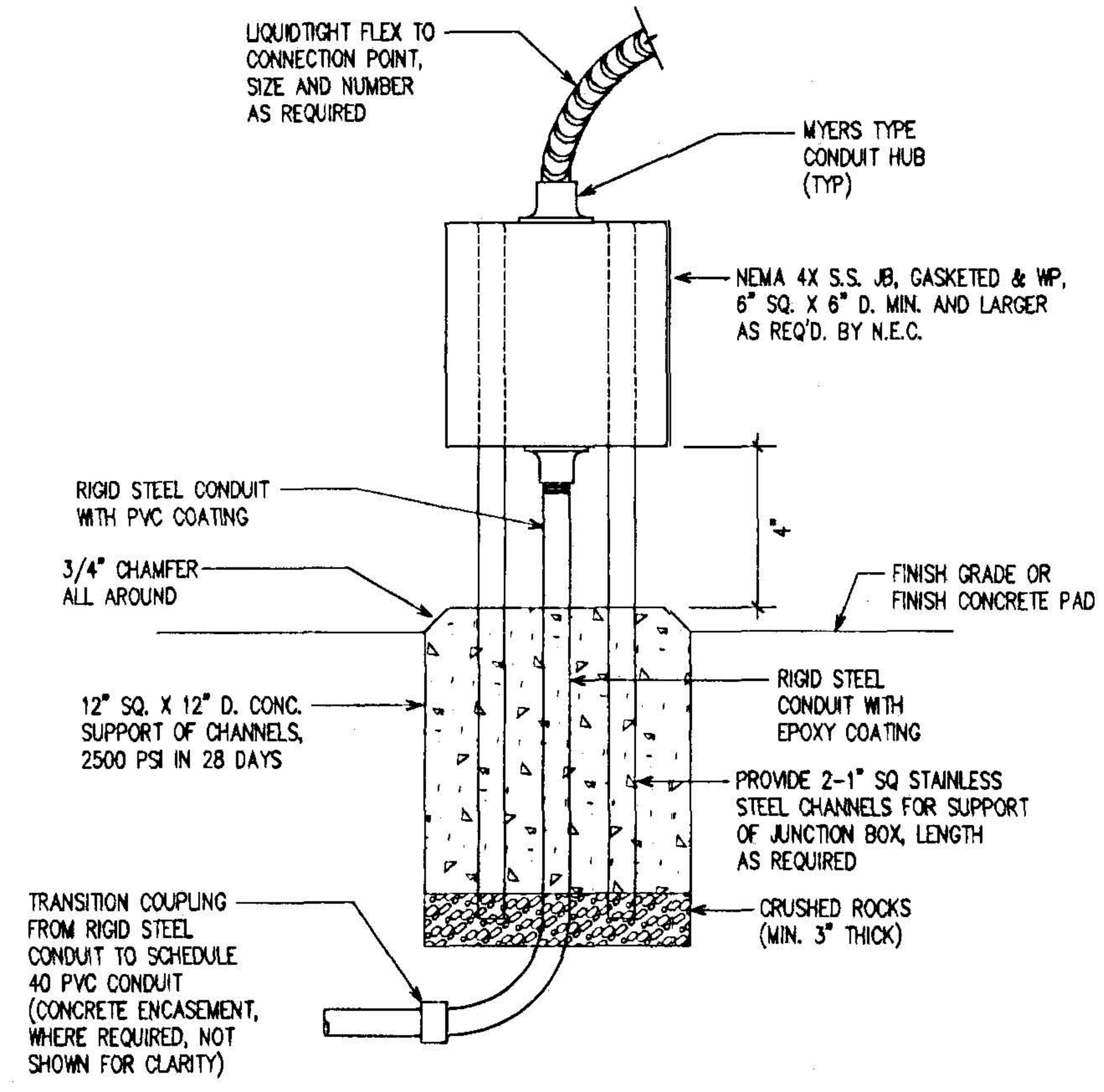
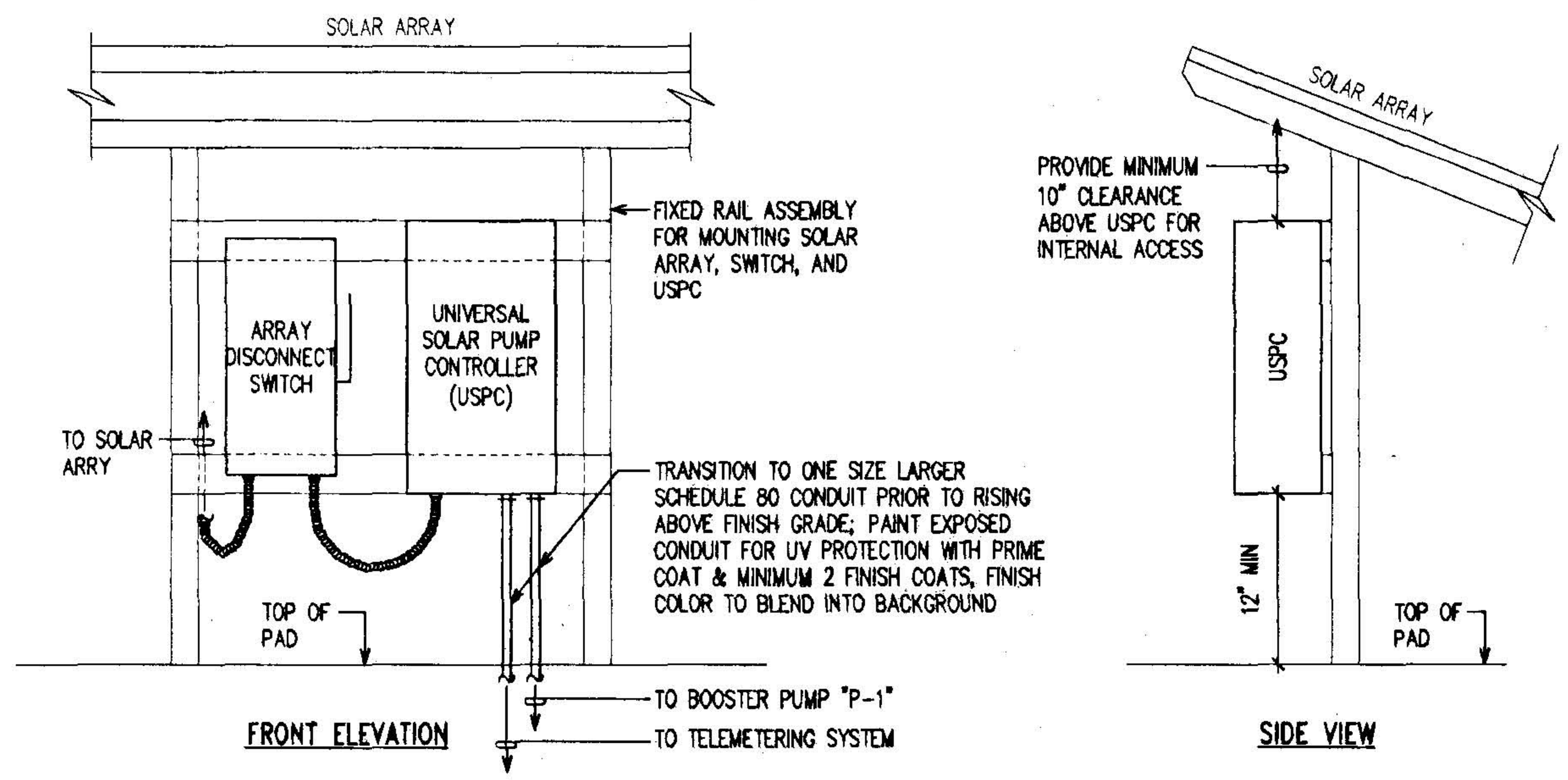


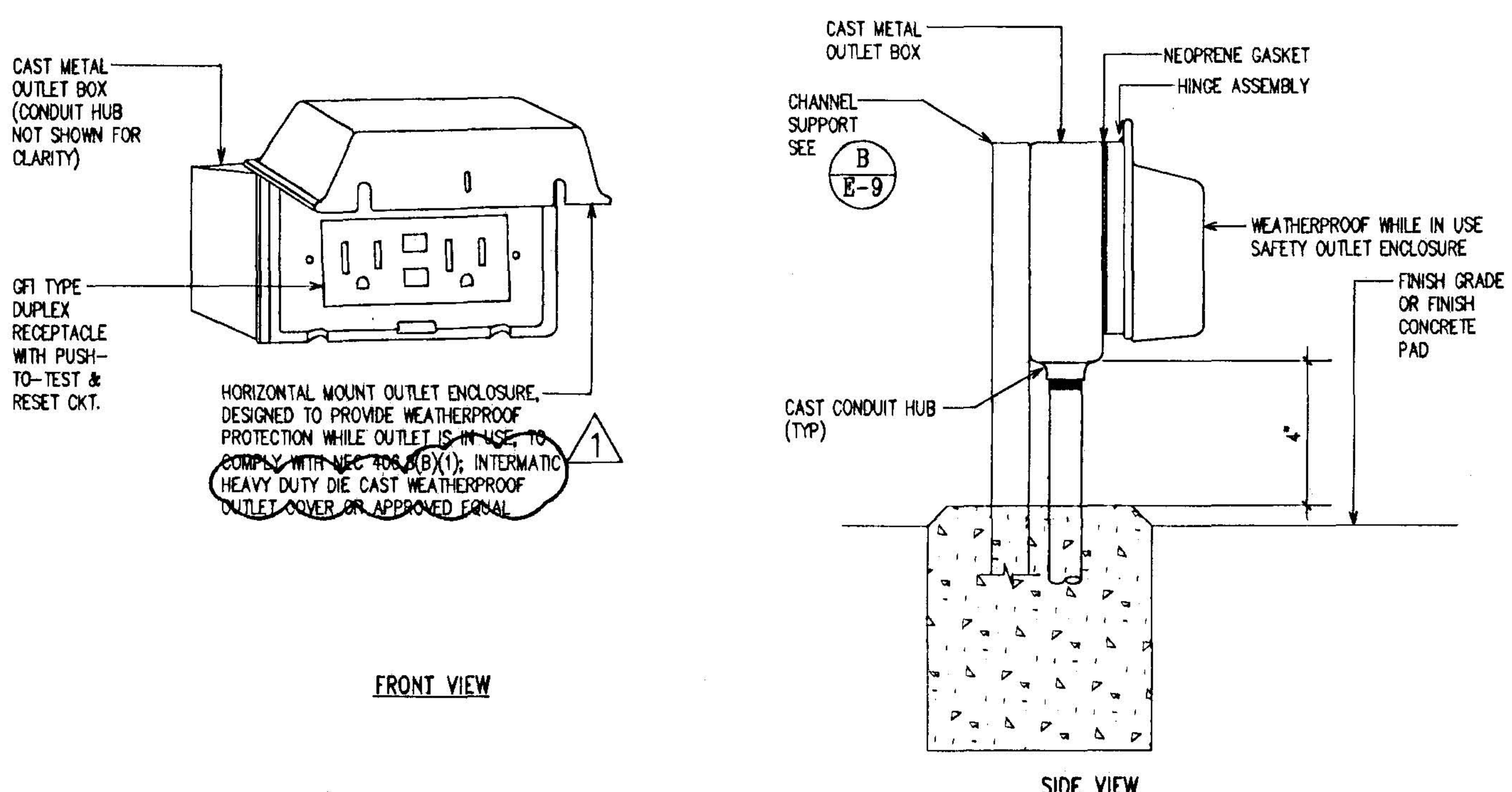
A/E-9 DISCONNECT SWITCH MOUNTING DETAIL
NOT TO SCALE



B/E-9 CHANNEL SUPPORTED JUNCTION BOX DETAIL
NOT TO SCALE



C/E-9 PUMP CONTROLLER AND SWITCH MOUNTING DETAIL
NOT TO SCALE



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

D/E-9 WEATHERPROOF RECEPTACLE DETAIL
NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1/19/2010 (1)	PCD 1 - REVISED WEATHERPROOF RECEPTACLE COVER TYPE	RHA	

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

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

Signature 2010.02.01

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LICENSE EXPIRES 04/30/2010

DEPARTMENT OF HAWAIIAN HOME LANDS
PUUKAPU HYBRID WATER SYSTEM
TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13
WAIMEA, SOUTH KOHALA, HAWAII

TYPICAL INSTRUMENTATION WIRING DIAGRAMS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

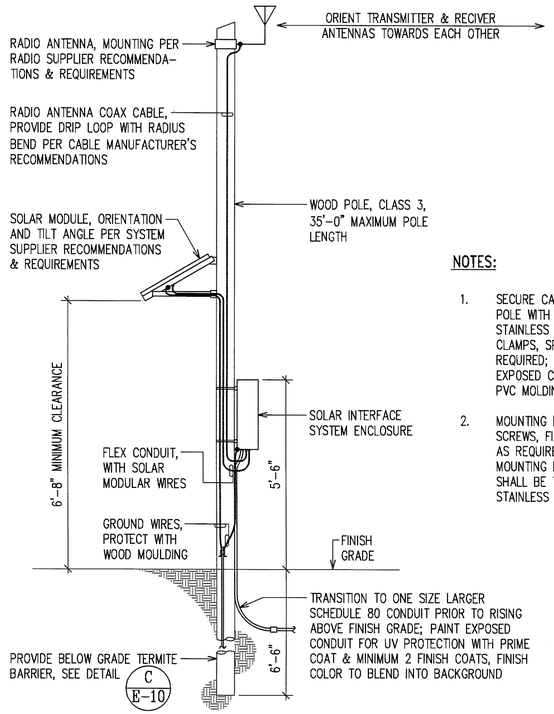
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

PCD. NO. 1

E-9

SHEET 68 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.

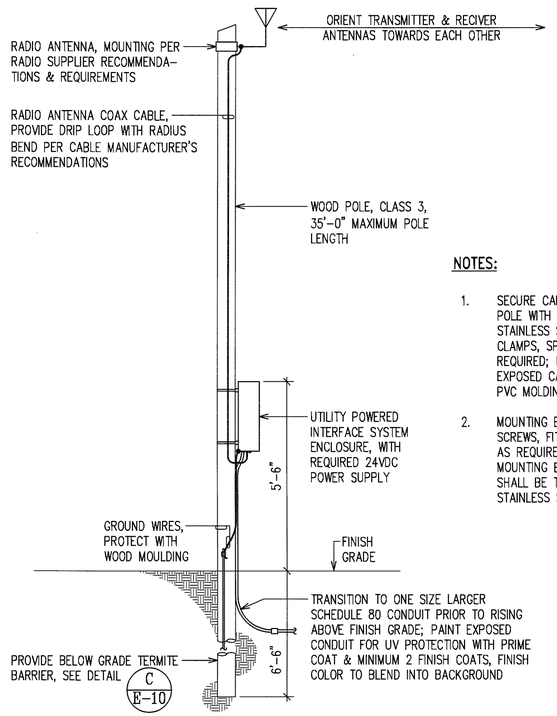


NOTES:

1. SECURE CABLES TO POLE WITH TYPE 316 STAINLESS STEEL CLAMPS, SPACING AS REQUIRED; PROTECT EXPOSED CABLES WITH PVC MOLDING.
2. MOUNTING BOLTS, SCREWS, FITTINGS, ETC, AS REQUIRED FOR MOUNTING EQUIPMENT SHALL BE TYPE 316 STAINLESS STEEL.

A E-10 STAND ALONE SOLAR-POWER TELEMETERING SYSTEM MOUNTING DETAIL

NOT TO SCALE

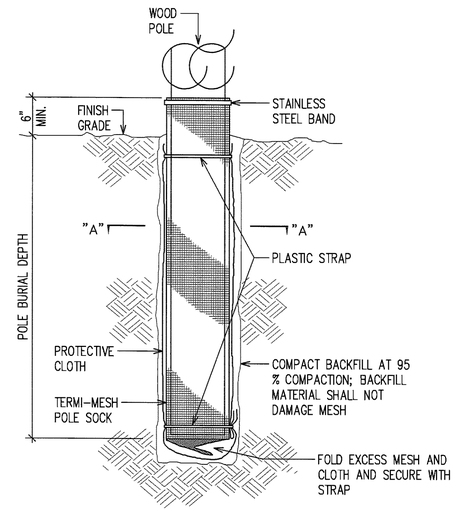


NOTES:

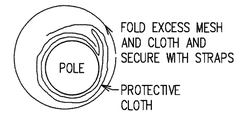
1. SECURE CABLES TO POLE WITH TYPE 316 STAINLESS STEEL CLAMPS, SPACING AS REQUIRED; PROTECT EXPOSED CABLES WITH PVC MOLDING.
2. MOUNTING BOLTS, SCREWS, FITTINGS, ETC, AS REQUIRED FOR MOUNTING EQUIPMENT SHALL BE TYPE 316 STAINLESS STEEL.

B E-10 UTILITY-POWER TELEMETERING SYSTEM MOUNTING DETAIL

NOT TO SCALE



TYPICAL BARRIER INSTALLATION



SECTION "A-A"

GENERAL NOTES:

1. TERMI-MESH IS A PHYSICAL BARRIER SYSTEM THAT PREVENTS GROUND TERMITES FROM ATTACKING WOOD POLES BELOW GRADE. CAREFULL INSTALLATION IS ESSENTIAL TO INSURE EFFECTIVE TERMITE PROTECTION.
2. TERMI-MESH IS A PREFORMED STAINLESS STEEL MESH SOCK THAT IS INSTALLED OVER THE BUTT OF THE POLE. THE SOCK IS TIGHTLY SECURED TO THE POLE WITH ALL EXCESS MESH FOLDED OVER TO PREVENT TERMITES FROM PENETRATING THROUGH VOIDS OR CHECKS IN THE WOOD. THE SOCK COVERS THE BUTT OF THE POLE UP TO MINMUM 6 INCHES ABOVE GRADE TO PREVENT TERMITES FROM FORMING MUD TUNNELS OVER THE BARRIER.
3. INSTALLATION OF GROUND ROD, CONDUIT RISERS, WIRING, AND MOUNTING HARDWARE & FASTENERS SHALL NOT PENETRATE OR COMPROMISE BARRIER SYSTEM.

C E-10 TERMITE BARRIER INSTALLATION DETAIL

NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-01:32-38, 41-45, 51, 53 and 54

WAIMEA, SOUTH KOHALA, HAWAII

MISCELLANEOUS ELECTRICAL DETAILS II

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

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

Signature 2009.05.11

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Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

LAST SAVE: 05/11/09 @ 10:11:47 BY: AM PLOT SC 1"=1"
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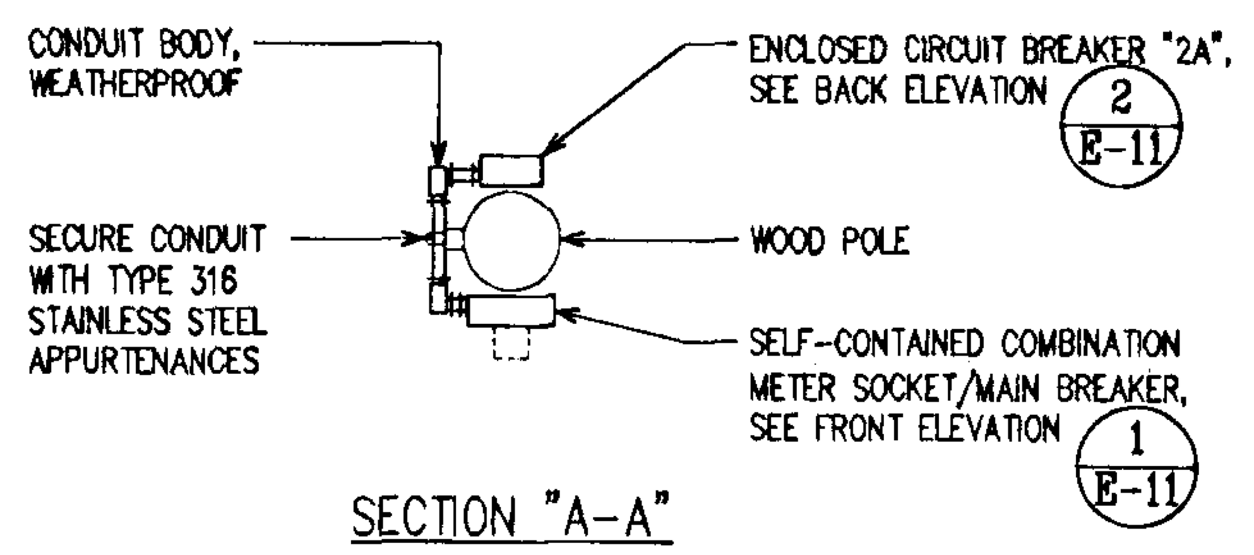
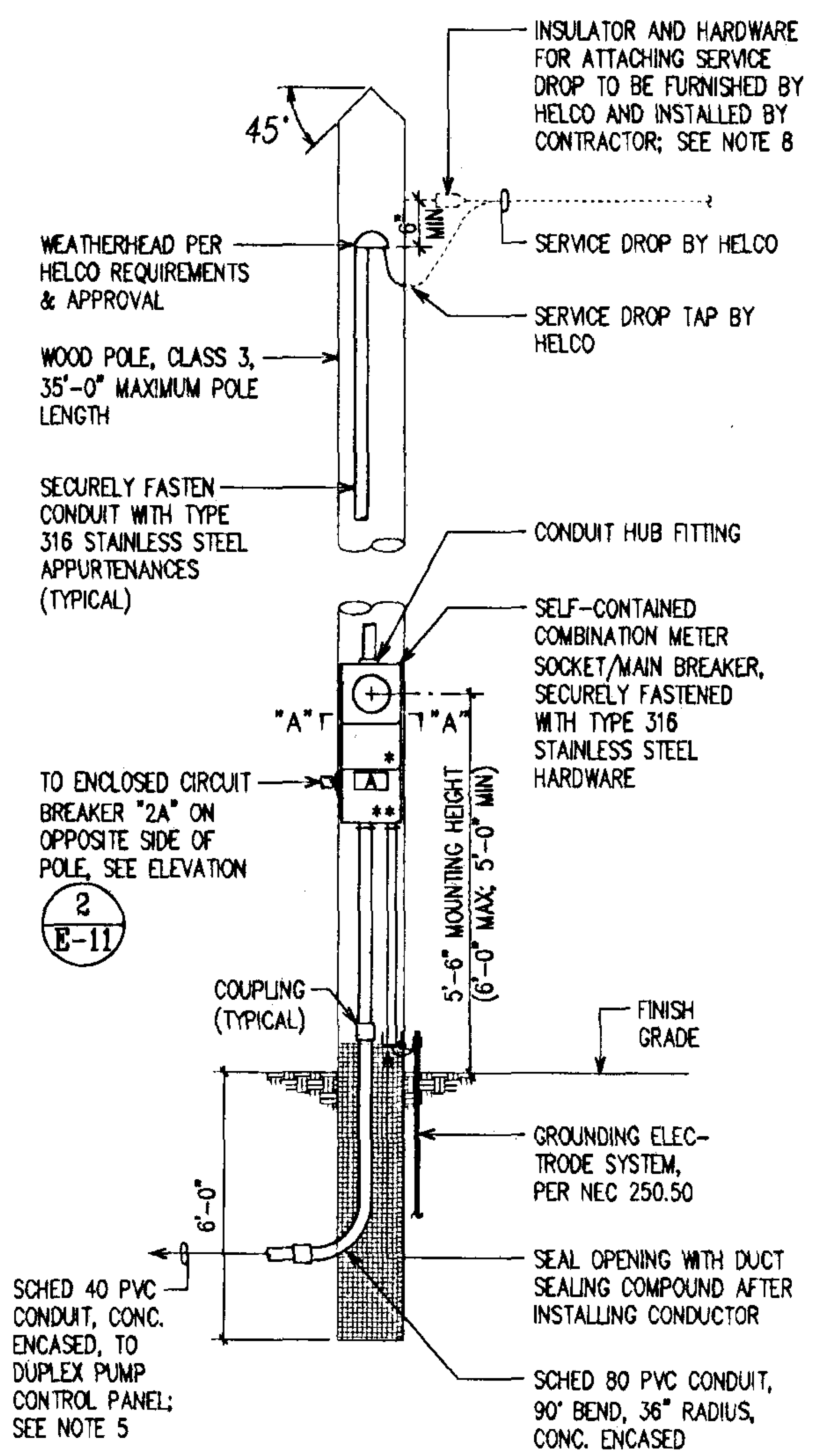


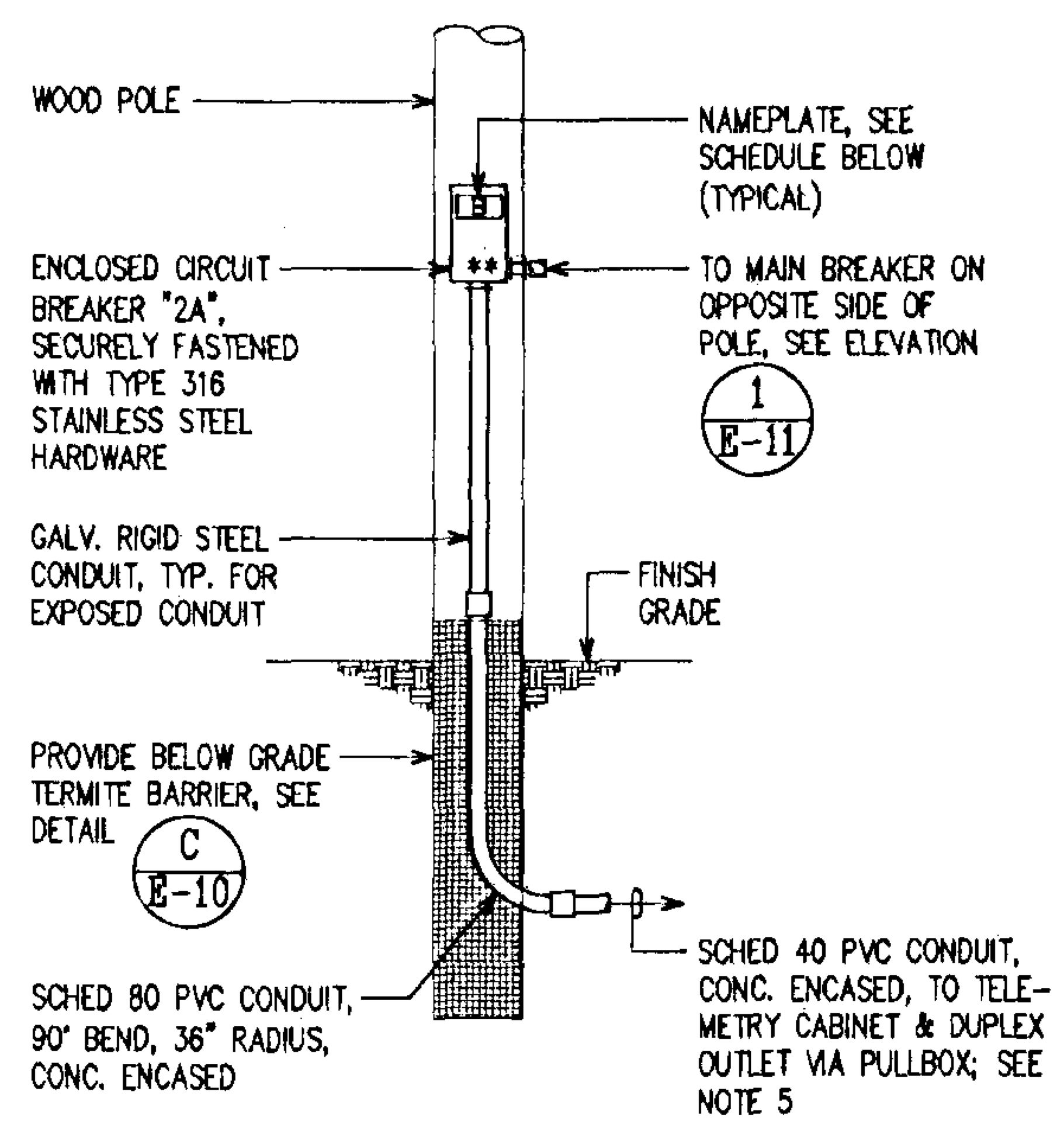
SECTION "A-A"



1/E-11 FRONT ELEVATION (TOWARD ROAD)

METER INSTALLATION DETAIL NOTES:

1. CONTRACTOR SHALL MAKE ALL ELECTRICAL CONNECTION TO DUPLEX PUMP CONTROL PANEL.
2. ALL CONDUITS TO CONTAIN A POLYOLEFIN PULL LINE. (JET LINE CAT #232 OR EQUIV).
3. ALL FASTENING BOLTS, NUTS & WASHERS SHALL BE TYPE 316 STAINLESS STEEL.
4. PROVIDE 4 FT CLEARANCE IN FRONT OF METER.
5. SEE SITE PLAN FOR EXACT ORIENTATION OF CONDUIT RUNS TO HELCO SECONDARY SERVICE AND DUPLEX BOOSTER PUMP CONTROL PANEL.
6. "*" DENOTES "PROVIDE WITH PROVISIONS FOR HELCO SEALS".
7. "**" DENOTES "PROVIDE WITH PROVISIONS FOR PADLOCKING DOOR".
8. HELCO SHALL DESIGNATE MINIMUM HEIGHT ABOVE GROUND FOR THE POINT OF ATTACHMENT OF THE SERVICE DROP.



2/E-11 BACK ELEVATION

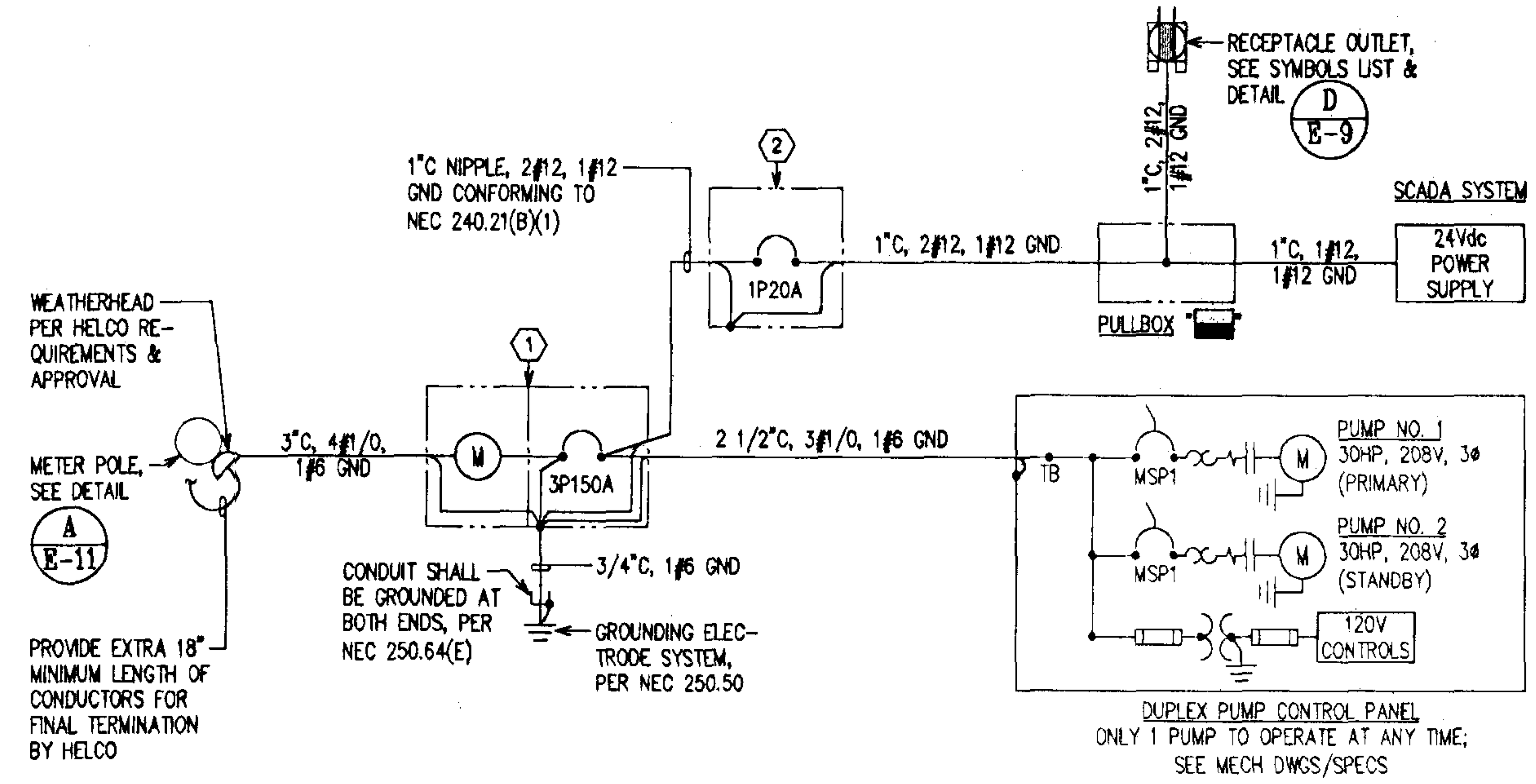
NAMEPLATES

ITEM	DESCRIPTION
A	SERVICE MAIN
B	TELEMETRY CABINET & RECEPTACLE MAIN

ABOVE NAMEPLATES TO BE 9" X 2 1/4" X 1/8" DILECTO WITH 5/8" WHITE LETTERING & BEVELED EDGES.

A/E-11 TANK SITE NO. 1 METER INSTALLATION DETAILS

NOT TO SCALE



TANK SITE NO. 1 ELECTRICAL SERVICE ONE-LINE DIAGRAM

SCHEDULE OF EQUIPMENT

KEY ON PLAN	DESCRIPTION
1	SELF-CONTAINED 7-JAW METER SOCKET/MAIN BREAKER COMBINATION, 208Y/120V, 3Ø, 4W, MAXIMUM 200A RATING, NEMA-3R STAINLESS STEEL ENCLOSURE, COMPLETE WITH COMMERCIAL TEST BYPASS/DISCONNECT FACILITY, PROVISIONS FOR HELCO SEALS AND GROUND BAR, PER HELCO REQUIREMENTS & APPROVAL; METER BY HELCO.
2	ENCLOSDED CIRCUIT BREAKER "2A", NEMA-4X TYPE 316 STAINLESS STEEL ENCLOSURE, COMPLETE WITH GROUND BAR.

SERVICE DATA SUMMARY NOTES:

1.	SERVICE VOLTAGE:	208Y/120V, 3-PHASE, 4-WIRE; MAX 2kAIC @ DELIVERY POINT.
2.	LOAD DATA	CONNECTED: 34.0 KVA; ESTIMATED DEMAND: 32.8 KVA
3.	SERVICE CONDUCTORS:	4 NO. 1/0
4.	METERING:	HELCO METER STANDARD B-8; RATE SCHEDULE "G"
5.	TYPE:	OVERHEAD
6.	BILLING INFORMATION:	DEPARTMENT OF HAWAIIAN HOME LANDS WEST OAHU DISTRICT OFFICE 64-756 MAMALAHOA HIGHWAY KAMUELA HI 96743 ATTN: MR. JIM DUPONT

	REVISION DATE	DESCRIPTION	MADE BY	APPROVED
1	1/19/2010	PCD 1 - REVISED DIAGRAM & METER INSTALLATION DETAILS	RHA	

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

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

Signature 2010.02.01

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DEPARTMENT OF HAWAIIAN HOME LANDS

PUUKAPU HYBRID WATER SYSTEM

TAX MAP KEY: (3) 6-4-35:1-108, 6-4-36:1-75, 6-4-37:1-7, & 6-4-38:1-13

WAIMEA, SOUTH KOHALA, HAWAII

TANK SITE NO. 1 ELECTRICAL SERVICE DETAILS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

PCD. NO. 1 — E-11 — SHEET 70 OF 70 SHEETS

FILE	POCKET	FOLDER	NO.