STATE OF HAWAII

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

PLANS

FOR

FURNISHING LABOR AND MATERIALS FOR

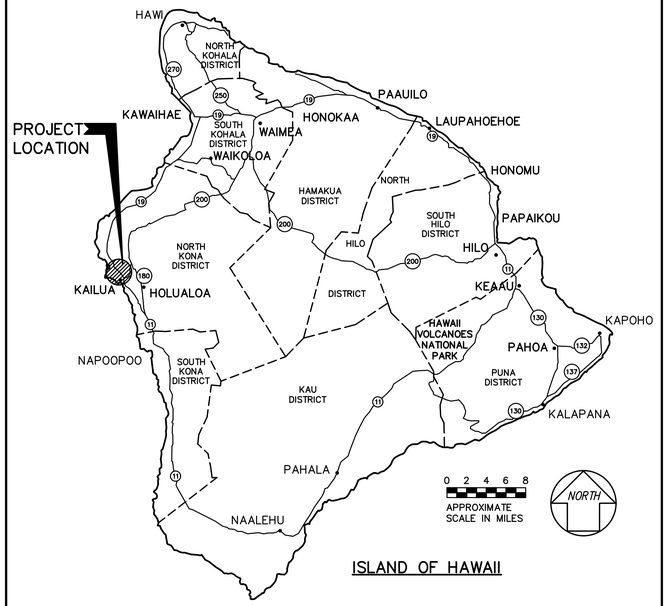
LAIOPUA VILLAGE 4 SUBDIVISION, PHASE 2 - HEMA

Kailua-Kona, North Kona, Island of Hawaii, Hawaii

T.M.K. (3) 7-4-21:12 (portion)

IFB No.: IFB-21-HHL-007

November 2020



STREET & UTILITY PLANS FOR

LA'I'OPUA VILLAGE 4 SUBDIVISION PHASE 2 - HEMA

KAILUA-KONA, NORTH KONA, HAWAII

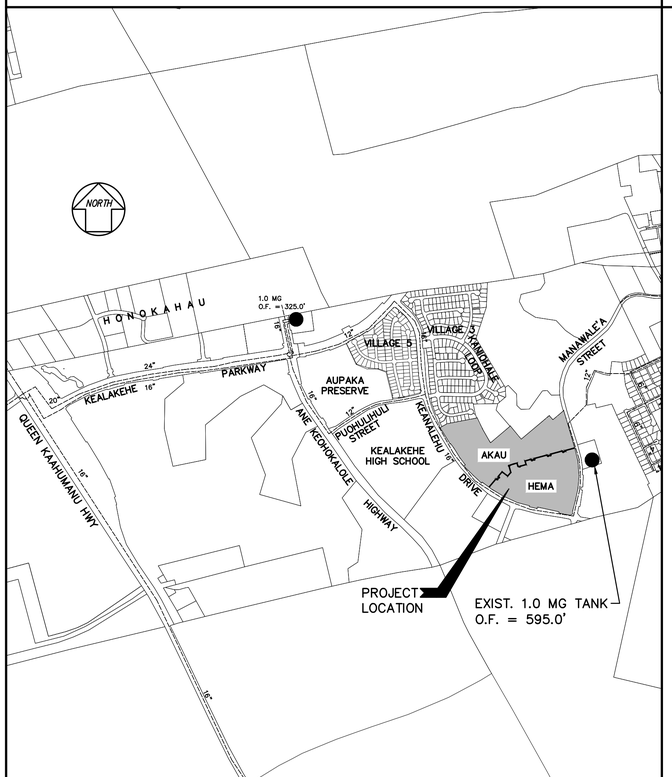
OWNER / DEVELOPER: DEPARTMENT OF HAWAIIAN HOME LANDS

HALE KALANIANAOLE
95-5420 KAPOLEI PARKWAY
KAPOLEI, HAWAII 96707

TAX MAP KEY : (3) 7-4-21:12 (PORTION)
SUBDIVISION APPLICATION NO: SUB-05-000170
DPW FOLDER: 74139-A

PREPARED BY:

AKINAKA & ASSOCIATES, LTD.
1100 ALAKEA STREET, SUITE 1800
HONOLULU, HAWAII 96813



LOCATION MAP

APPROVED BY:

CHAIRMAN, HAWAIIAN HOMES COMMISSION
STATE OF HAWAII — DATE

DIRECTOR, PLANNING DEPARTMENT
COUNTY OF HAWAII — DATE

DIRECTOR, DEPARTMENT OF PUBLIC WORKS
COUNTY OF HAWAII
(PUD PERMIT 05-000003) — DATE

DIRECTOR, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
COUNTY OF HAWAII (FOR SEWER) — DATE

MANAGER-CHIEF ENGINEER, DEPARTMENT OF WATER SUPPLY
COUNTY OF HAWAII — DATE

DEPARTMENT OF HEALTH, STATE OF HAWAII — DATE

INDEX TO DRAWINGS

LA'I'OPUA VILLAGE 4 SUBDIVISION, PHASE 2 - HEMA

GENERAL NOTES

1. ALL CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH STANDARD DETAILS AND STANDARD SPECIFICATIONS OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.

2. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING VALVE BOXES, MANHOLE COVERS AND CENTERLINE MONUMENTS AND SHALL HAVE THEM RAISED TO MEET THE NEW PAVEMENT GRADE.

3. EXISTING PAVEMENT SHALL BE BROOMED OFF AND SHALL RECEIVE A TACK COAT OF 0.15 GALLON PER SQUARE YARD OF EMULSIFIED ASPHALT (SS-1) BEFORE PLACING A.C. PAVEMENT. THE COST OF THE TACK COAT SHALL BE INCIDENTAL TO THE A.C. PAVEMENT.

4. THE CONTRACTOR SHALL PAVE THE TOTAL WIDTH OF ROADWAY EACH DAY SO AS NOT TO LEAVE A LONGITUDINAL PAVEMENT DROP BETWEEN LANE PASSES OF THE PAVER. HOWEVER, AT THE DISCRETION OF THE ENGINEER, THE CONTRACTOR MAY CONSTRUCT A TRANSITION TAPER (1' WIDE) SO AS NOT TO LEAVE A VERTICAL FACE.

5. THE CONTRACTOR SHALL PROVIDE A SMOOTH-RIDING CONNECTION TO EXISTING STREETS AND DRIVEWAYS AND AT THE BEGINNING AND ENDING OF THE PROJECT LIMITS AS DIRECTED BY THE ENGINEER.

6. PAVEMENT STRIPING, INCLUDING CENTERLINE, CROSSWALK, STOP LINES, ETC. AND RAISED PAVEMENT MARKERS SHALL CONFORM TO THE COUNTY STANDARDS FOR PAVEMENT MARKINGS AND STRIPING NOTES OR AS MODIFIED BY THE DETAILS ON THESE PLANS.

7. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60.1, FUGITIVE DUST.

8. THE CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) LANE FOR TRAFFIC MOVEMENT AT ALL TIMES. TWO (2) LANES FOR TRAFFIC MOVEMENT SHALL BE PROVIDED BETWEEN THE HOURS OF 3:30 P.M. TO 8:00 A.M.

9. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL COORDINATE THE REFERENCING OF THE CENTERLINE MONUMENTS TO BE RECONSTRUCTED BY A SURVEYOR LICENSED TO PRACTICE IN THE STATE OF HAWAII. AFTER PAVING, THE SURVEYOR SHALL LOCATE THE MONUMENTS, AND AFTER RECONSTRUCTION OF THE MONUMENTS, THE SURVEYOR SHALL PUNCH THE CENTERLINE LOCATION ON THE BRASS PINS. THE SURVEYOR SHALL SUBMIT WRITTEN CERTIFICATION OF THE INSTALLATION AND LOCATION OF THE CENTERLINE MONUMENTS TO THE ENGINEER.

10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE DONE TO THE DWS EXISTING WATER SYSTEM.

11. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN THE 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 THE CONSTRUCTION PERIOD.

12. THE GENERAL CONTRACTOR OF THE PROJECT SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS," AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL." THE GENERAL CONTRACTOR OF THE PROJECT SHALL OBTAIN NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT COVERAGE(S) FOR THE FOLLOWING:
    1. STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES THAT DISTURB ONE (1) ACRE OR MORE, AND
    2. DISCHARGES OF HYDROTESTING EFFLUENT TO STATE WATERS.

    IN ACCORDANCE WITH STATE LAW, ALL DISCHARGES RELATED TO PROJECT CONSTRUCTION OR OPERATIONS ARE REQUIRED TO COMPLY WITH STATE WATER QUALITY STANDARDS (HAWAII ADMINISTRATIVE RULES, CHAPTER 11-54). BEST MANAGEMENT PRACTICES SHALL BE USED TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENT, DEBRIS, AND OTHER POLLUTANTS TO STATE WATERS. PERMIT COVERAGE IS AVAILABLE FROM THE DEPARTMENT OF HEALTH, CLEAN WATER BRANCH AT HTTP://HEALTH.HAWAII.GOV/CWB. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING OTHER FEDERAL, STATE, OR LOCAL AUTHORIZATIONS AS REQUIRED BY LAW.

CONSTRUCTION NOTES

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COUNTY OF HAWAII, DEPARTMENT OF PUBLIC WORKS "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION," DATED SEPTEMBER 1984, AND "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION" DATED SEPTEMBER 1986.

2. CONSTRUCTION SHALL BE DONE IN SUBSTANTIAL CONFORMANCE WITH THE SUBSURFACE INVESTIGATION REPORT, "LAIOPUA VILLAGE 4 AKAU AND HEMA SUBDIVISIONS KEALAKEHE, HAWAII, HAWAII" DATED MARCH 22, 2012, BY FEWELL GEOTECHNICAL ENGINEERING, LTD. WHERE APPLICABLE.

3. THE ENGINEER RESERVES THE RIGHT TO MAKE CHANGES TO THE DRAINAGE SYSTEM AS SUCH CHANGES ARE FOUND TO BE NECESSARY AS THE LAND IS CLEARED AND EROSION CONTROL CONSTRUCTION PROGRESSES.

4. ALL CONSTRUCTION LINES, GRADES AND SURVEY MONUMENT STAKEOUTS SHALL BE MADE BY LICENSED SURVEYORS.

5. A LICENSED SURVEYOR SHALL SUBMIT A LETTER TO THE DEPARTMENT OF PUBLIC WORKS CERTIFYING THAT THE MONUMENT STAKEOUT AND INSTALLATION IS CORRECT.

6. THE CONTRACTOR SHALL NOTIFY THE ENGINEER SUFFICIENTLY IN ADVANCE OF OPENING ANY OR UTILIZING EXISTING BORROW PITS OR ON SITE BORROW, SO THAT A DETERMINATION CAN BE MADE AS TO THE SUITABILITY OF THE BORROW MATERIAL TO BE INCORPORATED INTO THE ROAD CONSTRUCTION.

7. THE CONTRACTOR SHALL CONDUCT ALL TESTS AS REQUESTED BY THE ENGINEER AND BE RESPONSIBLE FOR ALL EXPENSES INCURRED IN CONDUCTING THESE TESTS.

8. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLAN OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF THE SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES.

9. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH THE CURRENT EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," AND AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS.

10. ALL VEGETATION, INCLUDING TREES, SHALL BE REMOVED FROM WITHIN THE ENTIRE GRADED ROADWAY RIGHT-OF-WAY.

11. TOPOGRAPHIC INFORMATION WAS OBTAINED FROM "VILLAGES OF LAIOPUA VILLAGE 4 TOPOGRAPHIC MAP" PREPARED BY ESAKI SURVEYING & MAPPING, FEBRUARY 2012 AND MAY NOT ACCURATELY REFLECT FIELD CONDITIONS. THE CONTRACTOR SHALL MAKE ADJUSTMENTS TO THE PROPOSED IMPROVEMENTS AS NECESSARY AT NO ADDITIONAL COST TO THE STATE.

NOTES FOR WORK WITHIN THE COUNTY RIGHT-OF-WAY

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE COUNTY OF HAWAII, DEPARTMENT OF PUBLIC WORKS (DPW), "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION," DATED SEPTEMBER 1986 AND "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION," DATED SEPTEMBER 1984.

2. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLAN OR NOT, AND SHALL BE RESPONSIBLE FOR THE REPAIR OR REPLACEMENT OF SAME IN THE EVENT OF DAMAGES DUE TO HIS CONSTRUCTION PRACTICES. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE RESPECTIVE UTILITY COMPANIES.

3. THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC CONTROL DEVICES IN CONFORMANCE WITH THE CURRENT EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS," AND AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS.

4. THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PUBLIC WORKS 48 HOURS BEFORE THE COMMENCEMENT OF ANY UTILITY LINE WORK TO SCHEDULE A FIELD REVIEW AND SECURE APPROVAL OF THE PROPOSED UTILITY LINE LOCATION WITHIN THE COUNTY RIGHT-OF-WAY.

5. THE PROPOSED UTILITY LINE LOCATION SHALL BE LAID OUT IN THE FIELD PRIOR TO THE CONDUCTING OF THE FIELD REVIEW BY THE DEPARTMENT OF PUBLIC WORKS.

6. FIELD ADJUSTMENTS SHALL BE MADE AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS PRIOR TO THE COMMENCEMENT OF ANY UTILITY LINE WORK.

7. THE REQUIRED PERMIT, UNDER CHAPTER 22, ARTICLE 3, SECTION 22-44 OF THE HAWAII COUNTY CODE, SHALL BE OBTAINED FROM THE DEPARTMENT OF PUBLIC WORKS BY THE CONTRACTOR FOR WORK WITHIN THE COUNTY RIGHT-OF-WAY.

8. THE CONTRACTOR SHALL PROVIDE AT LEAST ONE (1) LANE FOR TRAFFIC MOVEMENT AT ALL TIMES. TWO (2) LANES FOR TRAFFIC MOVEMENT SHALL BE PROVIDED BETWEEN THE HOURS OF 3:30 P.M. TO 8:00 A.M.

9. THE EXISTING PAVEMENT SHALL BE SAW-CUT BEFORE COMMENCEMENT OF TRENCHING WORK.

10. ANY PAVEMENT OUTSIDE THE CONTRACT ZONE LIMITS DAMAGED AS A RESULT OF CONSTRUCTION OPERATIONS SHALL BE RESTORED TO ITS ORIGINAL CONDITION, OR BETTER, AS DIRECTED BY THE DPW.

11. A TEMPORARY COLD MIX PATCH SHALL BE APPLIED IMMEDIATELY UPON COMPLETION OF THE BACKFILLING OPERATION AND SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL A PERMANENT PATCH IS AUTHORIZED BY THE DEPARTMENT OF PUBLIC WORKS.

12. NO MATERIAL, EXCEPT THE TRENCH EXCAVATED MATERIAL, SHALL BE STOCKPILED CLOSER THAN SIX (6) FEET FROM THE EXISTING EDGE OF PAVEMENT.

13. NO CONSTRUCTION EQUIPMENT SHALL BE PARKED WITHIN THE ROAD RIGHT-OF-WAY IN SUCH A MANNER THAT THE EQUIPMENT WILL OBSTRUCT THE NORMAL MOVEMENT AND SIGHT DISTANCE OF THE DRIVING MOTORIST, EXCEPT DURING ACTUAL WORKING HOURS.

14. EXCEPT DURING ACTUAL WORKING HOURS, ALL SIGNS THAT DO NOT PERTAIN TO THE CONSTRUCTION ACTIVITY, SUCH AS "MEN WORKING" AND "FLAGMAN AHEAD" SHALL BE COVERED OR LAID DOWN. HOWEVER, ALL SIGNS NECESSARY FOR THE SAFETY OF THE PUBLIC SHALL BE MAINTAINED.

15. ANY PAVEMENT MARKINGS, STRUCTURES, AND APPURTENANCES (WITHIN OR OUTSIDE OF THE CONTRACT ZONE LIMITS) DAMAGED AND/OR WORN AWAY UNDER THE PERMIT SHALL BE REPAINTED OR RECONSTRUCTED AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS.

16. NO TRENCHING SHALL BE LEFT OPEN FOR MORE THAN FIVE (5) WORKING DAYS.

17. SHOULD TRENCHING OCCUR THROUGH AN EXISTING SIDEWALK OR SHOULD DAMAGES OCCUR TO THE SIDEWALK AS A RESULT OF TRENCHING, THE FOLLOWING PROCEDURE SHALL BE UTILIZED TO REPAIR THE SIDEWALK.

    A. ALL PORTLAND CEMENT CONCRETE TO BE REMOVED SHALL FIRST BE CUT WITH A CONCRETE SAW THAT HAS A DIAMOND OR CARBORUNDUM ABRASIVE WHEEL. THOSE CUTS SHALL BE MADE TO A DEPTH EQUAL TO AT LEAST ONE-FOURTH OF THE DEPTH OF THE SLAB, OR ENOUGH AS IS DEEMED NECESSARY BY THE DEPARTMENT OF PUBLIC WORKS, TO PERMIT BREAKING OUT THE BALANCE OF THE CONCRETE WITHOUT SPALLING OFF THE EXPOSED EDGES OF THE SLAB LEFT IN PLACE.

    B. IF ANY CONCRETE BLOCK IS TOUCHED, THE WHOLE BLOCK SHALL BE REMOVED AND LATER REPLACED, UNLESS A MINOR VARIATION IS AUTHORIZED BY THE DPW OR ITS REPRESENTATIVE.

    C. ANY DAMAGES TO ADJACENT AREAS DUE TO SETTLEMENT OR TO ANY OTHER EFFECTS WHATSOEVER CAUSED BY THE TRENCH CONSTRUCTION SHALL BE PROPERLY REPAIRED AND CORRECTED.

    D. ALL OTHER INCIDENTAL WORK SHALL BE SATISFACTORILY PERFORMED TO EFFECT THE PROPER RESTORATION OF THE SIDEWALK AREA.

    E. SHOULD DAMAGE TO A SIDEWALK, CURB AND/OR GUTTER OCCUR AT A LOCATION WHERE A CURB RAMP SHOULD EXIST, OR TO A DRIVEWAY THAT DOES NOT MEET WITH THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT (ADA), REPAIR WORK SHALL INCLUDE THE CONSTRUCTION OF A CURB RAMP, RECONSTRUCTION TO THE DRIVEWAY SUCH THAT THE REPAIR WORK COMPLIES WITH THE ADA AND MEETS WITH THE APPROVAL OF THE DPW.

18. THE PERMITTEE SHALL MAINTAIN, TO THE SATISFACTION OF THE DEPARTMENT OF PUBLIC WORKS, THE AREA WORKED WITHIN THE GOVERNMENT RIGHT-OF-WAY INCLUDING ANY REPAIRS TO PAVEMENT AND SHOULDER DAMAGED AS A RESULT OF THE INSTALLATION WORK, FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL INSPECTION. THE PERMITTEE SHALL UNDERTAKE REPAIRS EXPEDITIOUSLY, WHENEVER DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS DURING THE MAINTENANCE PERIOD.

19. SUBDIVIDER SHALL BE INFORMED THAT CHAPTER 23, UNDERGROUND INJECTION CONTROL (UIC), ADMINISTRATIVE RULES, DEPT. OF HEALTH, PROHIBIT ANY PERSON FROM OPERATING, CONSTRUCTING OR MODIFYING AN INJECTION WELL (DRYWELL) UNLESS AUTHORIZED BY A PERMIT ISSUED BY THE DIRECTOR OF HEALTH, STATE OF HAWAII. FURTHERMORE, SHOULD DEDICATION OF ROADWAYS INCLUDING DRYWELL BE CONTEMPLATED, THE DEPT. OF PUBLIC WORKS WILL NOT APPROVE DEDICATION OF ROADWAYS PRIOR TO COMPLIANCE WITH CHAPTER 23, UIC, ADMINISTRATIVE RULES.

ARCHAEOLOGICAL NOTES

1. IN THE EVENT THAT AN ARCHAEOLOGICAL OR HISTORICAL STRUCTURE WITHIN THE WORK AREA IS INADVERTENTLY DAMAGED DURING CONSTRUCTION, CEASE WORK IN THE VICINITY OF THE SITE AND NOTIFY THE DEPARTMENT OF HAWAIIAN HOME LANDS AND THE STATE HISTORIC PRESERVATION DIVISION (SHPD) OF THE DEPARTMENT OF LAND AND NATURAL RESOURCES OF THE DAMAGE. SHPD WILL DETERMINE THE APPROPRIATE MITIGATION MEASURES.

2. IN THE EVENT THAT A PREVIOUSLY UNKNOWN ARCHAEOLOGICAL FEATURE IS EXPOSED BY CONSTRUCTION, CEASE WORK IN THE VICINITY OF THE NEW FEATURE AND NOTIFY THE DEPARTMENT OF HAWAIIAN HOME LANDS, THE SHPD, AND THE HAWAII COUNTY PLANNING DEPARTMENT OF THE NEW DISCOVERY.

3. IN THE EVENT THAT PREVIOUSLY UNKNOWN HUMAN REMAINS ARE EXPOSED BY CONSTRUCTION, CEASE ALL WORK IN THE AREA OF THE REMAINS, AND PROTECT THE AREA WITH AN APPROPRIATE MATERIAL. NOTIFY THE DEPARTMENT OF HAWAIIAN HOME LANDS AND THE SHPD.

DEPT. OF HEALTH NOTES

1. OWNER SHALL OBTAIN PERMIT TO CONSTRUCT AND OPERATE INJECTION WELL(S) IN COMPLIANCE WITH CHAPTER 23, UNDERGROUND INJECTION CONTROL (UIC), ADMINISTRATIVE RULES, DEPARTMENT OF HEALTH.

SOLID WASTE CONSTRUCTION NOTES

1. UNLESS OTHERWISE SPECIFIED, THE CONTRACTOR IS RESPONSIBLE FOR THE PROPER HANDLING, STORAGE AND/OR DISPOSAL OF ALL WASTE GENERATED BY THIS CONSTRUCTION, INCLUDING GRUBBING AND EXCESS EXCAVATED MATERIAL. ANY MATERIAL BROUGHT TO THE COUNTY LANDFILLS WILL BE SUBJECTED TO THE INSTITUTED TIPPING FEE SYSTEM, WITH NO EXCEPTIONS OR EXEMPTIONS.

2. ALL WASTES GENERATED BY CONSTRUCTION, INCLUDING GRUBBING, DEMOLITION AND EXCESS EXCAVATION MATERIAL MAY BE BROUGHT TO THE WEST HAWAII OR THE HILO LANDFILL. THE CONTRACTOR SHALL CHECK WITH THE SOLID WASTE DIVISION FOR DISCLOSURE OF THE CURRENT LANDFILL FEE AND CONSIDERATION OF THAT FEE SHALL BE INCLUDED IN THE CONTRACTOR'S BID SUM.

3. CONSTRUCTION, DEMOLITION AND GRUBBING MATERIAL SHALL NOT BE DEPOSITED AT ANY OF THE COUNTY TRANSFER STATIONS, BUT SHALL BE TRANSPORTED FOR DISPOSAL TO EITHER THE WEST HAWAII OR HILO LANDFILL.

4. ASBESTOS MATERIAL MUST BE SEPARATED, DOUBLE BAGGED AND LANDFILLED IN ACCORDANCE WITH REGULATIONS OF THE SOLID WASTE DIVISION, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT. INFORMATION MAY BE OBTAINED BY CALLING THE DIVISION AT (808) 961-8339 BETWEEN 7:00 A.M. AND 4:00 P.M. MONDAY THROUGH FRIDAY.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

CONSTRUCTION NOTES 1

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 2 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 6/5/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Construction Notes 1.DWG

WATERLINE NOTES

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 DEPARTMENT OF WATER SUPPLY (DWS) ENGINEER 72 HOURS PRIOR TO THE BEGINNING OF ANY WATERLINE WORK AND TWO WEEKS PRIOR TO ANY CONNECTION, CHLORINATION, SHUT-OFF OR RELOCATION WORK.
3. THE CONTRACTOR SHALL PAY FOR ALL WORK, EQUIPMENT AND MATERIALS FURNISHED BY THE DWS.
4. ALL EXISTING WATERLINES, WATERLINE APPURTENANCES AND OTHER UTILITY LOCATIONS SHOWN ON THE PLANS ARE OBTAINED FROM THE LATEST RELIABLE SOURCES. THE CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY THE EXACT LOCATION OF ALL UTILITIES IN THE FIELD AND SHALL BEAR ALL COST FOR DAMAGES DONE TO THE WATER SYSTEM.
5. ALL CONNECTIONS TO EXISTING WATERLINES SHALL BE DONE BY THE DWS. CONTRACTOR SHALL PERFORM ALL EXCAVATION, BACKFILL, ROAD REPAIR, TRAFFIC CONTROL, AND PROVIDE EQUIPMENT NECESSARY TO COMPLETE THE CONNECTION.
6. WHERE WATER SHUT-OFF OF MORE THAN 3 HOURS BECOMES NECESSARY, THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL PROVIDE A TEMPORARY BY-PASS LINE. THE DWS ENGINEER SHALL DETERMINE THE BY-PASS LINE SIZE. IF NECESSARY, THE DWS ENGINEER MAY REQUIRE A BY-PASS LINE, REGARDLESS OF THE EXPECTED SHUT-OFF PERIOD.
7. MINIMUM HORIZONTAL CLEARANCE BETWEEN WATERLINE AND OTHER UTILITIES SHALL BE 8 FEET UNLESS OTHERWISE SPECIFIED. MINIMUM VERTICAL CLEARANCE BETWEEN WATERLINES AND OTHER UTILITIES SHALL BE 12" PROVIDED CONCRETE JACKETS ARE USED, AND 18" IF NO CONCRETE JACKETS ARE USED. IN ALL APPLICABLE INSTANCES, THE WATERLINES SHALL BE AT A GRADE HIGHER THAN OTHER UTILITIES.
8. ALL MATERIALS FOR FITTINGS AND GATE VALVES SHALL MEET COUNTY STANDARDS AND HAVE MECHANICAL JOINTS UNLESS OTHERWISE SPECIFIED. MATERIALS FOR BUTTERFLY VALVES SHALL MEET COUNTY STANDARDS UNLESS OTHERWISE SPECIFIED.
9. THE WATERLINE SHALL BE TESTED AT A MINIMUM OF 225 PSI OR ONE AND A HALF TIMES THE STATIC PRESSURE AT THE LOW POINT, WHICHEVER IS GREATER, UNDER DWS SUPERVISION JUST PRIOR TO PAVING.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CHLORINATION OF THE WATER SYSTEM AND SHALL BEAR ALL COSTS. THE PERSON(S) ENGAGED TO DO THE CHLORINATION WORK MUST HAVE THE APPROPRIATE LICENSE TO PERFORM THE WORK IN THE STATE OF HAWAII.
11. EXISTING VALVES, FIRE HYDRANT UNITS, VALVE BOXES, FRAMES, AND COVERS DESIGNATED "REMOVE AND SALVAGE" SHALL BE CLEANED OF ALL DIRT, SCABS, AND CONCRETE AND DELIVERED TO THE RESPECTIVE DWS BASEYARD. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS, UNLESS SPECIFIED OTHERWISE.
12. EXISTING WATERLINES, VALVES, FITTINGS AND APPURTENANCES NOT DESIGNATED "REMOVE AND SALVAGE" SHALL BE ABANDONED IN PLACE. ALL EXPOSED VALVE BOXES, VALVES, PIPES AND APPURTENANCES SHALL BE REMOVED AND DISPOSED OF PROPERLY AT NO COST TO THE DWS.
13. RELOCATION OF EXISTING METERS SHALL BE DONE BY OR UNDER DWS SUPERVISION. RELOCATIONS OF CUSTOMER SERVICE LINES TO RELOCATED METERS SHALL BE DONE BY THE CONTRACTOR AND PIPE MATERIALS SHALL MEET COUNTY STANDARDS. ALL WORK AND MATERIALS REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR AND CONSIDERED INCIDENTAL TO THE RELOCATION WORK. EXISTING METER BOXES DAMAGED BY THE CONTRACTOR SHALL BE REPLACED AT THE CONTRACTOR'S COST. A DIELECTRIC UNION SHALL BE USED TO CONNECT THE SERVICE LINE PIPE TO THE CUSTOMER'S G.I. PIPE (IF APPLICABLE).
14. THE DWS WILL NOT ASSUME OWNERSHIP OF NOR GRANT ANY WATER SERVICE UNTIL THE WATER SYSTEM IS DEDICATED TO THE DWS ALONG WITH ALL NECESSARY EASEMENTS AND DOCUMENTS.
15. WHEN COMPACTION TESTS ARE REQUIRED, THE CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE THE DWS WITH PROCTOR RESULTS OF MATERIALS TO BE USED FOR THAT PORTION OF WORK REQUIRING COMPACTION. THESE RESULTS SHALL BE CERTIFIED AND SHALL BE FURNISHED TO DWS ONE WEEK PRIOR TO COMMENCEMENT OF WORK. COST FOR COMPACTION TESTS SHALL BE INCIDENTAL TO PIPELINE INSTALLATION.
16. ALL NEWLY INSTALLED WATERLINES SHALL HAVE A BLUE, NON METALLIC WARNING TAPE LABELED "CAUTION WATER LINE BURIED BLOW" PLACED DIRECTLY OVER THE COMPACTED CUSHION MATERIAL.
17. CONSTRUCTION PROJECTS REQUIRING TEMPORARY WATER SERVICE SHALL BE METERED AND PAID FOR BY THE CONTRACTOR.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORD DRAWINGS (AS-BUILT DRAWINGS) AND THE LICENSED ENGINEER SHALL CERTIFY THE DRAWINGS AS TO ACCURACY AND SUBMIT THE DRAWINGS AND AS-BUILT TRACINGS TO THE DWS.
19. ALL PIPE MATERIALS FOR WATERLINES SHALL MEET COUNTY STANDARDS UNLESS OTHERWISE SPECIFIED.
20. LOTS REQUIRING A DWS APPROVED REDUCED PRESSURE PRINCIPAL TYPE BACKFLOW PREVENTION ASSEMBLY SHALL HAVE ONE. IT MUST BE INSTALLED ON PRIVATE PROPERTY IN ACCORDANCE WITH STANDARD DETAIL W9 (ABOVE GROUND) AND DEPARTMENTAL STAFF MUST APPROVE THE INSTALLATION BEFORE WATER SERVICE CAN BE STARTED. NO TAPS OR CONNECTIONS ARE ALLOWED BETWEEN THE METER AND THE APPROVED BACKFLOW PREVENTION ASSEMBLY. THE OWNER IS REQUIRED TO TEST THE BACKFLOW PREVENTION ASSEMBLY 1 TIME PER YEAR. THE OWNER SHALL MAKE THEIR OWN PROVISIONS FOR THOSE TIMES WHEN THE BACKFLOW ASSEMBLY IS BEING TESTED.

GRADING NOTES

1. ALL GRADING WORK SHALL CONFORM TO CHAPTER 10 OF THE HAWAII COUNTY CODE. SHOULD A GRADING PERMIT BE REQUIRED, NO WORK SHALL COMMENCE UNTIL THE DEPARTMENT OF PUBLIC WORKS (DPW) APPROVES A GRADING PERMIT.
2. ALL GRADING WORK FOR LAIOPUA VILLAGE: PHASE 2 – HEMA SUBDIVISION SHALL BE IN CONFORMANCE WITH THE "SUBSURFACE INVESTIGATION REPORT, LAIOPUA VILLAGE 4 AKAU AND HEMA SUBIDIVISIONS KEALAKEHE, HAWAII, HAWAII" DATED MARCH 22, 2012, BY FEWELL GEOTECHNICAL ENGINEERING, LTD. WHERE APPLICABLE.
3. THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS RESULTING FROM HIS WORK. THE COSTS INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE DPW SHALL BE PAYABLE BY THE CONTRACTOR.
4. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREAS FREE FROM DUST NUISANCES. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLUUTION CONTROL RULES OF THE STATE DEPARTMENT OF HEALTH, HAR 11-60-1, FUGITIVE DUST.
5. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 55, WATER POLLUTION CONTROL AND CHAPTER 54, WATER QUALITY STANDARDS, AND TO THE EROSION AND SEDIMENTATION CONTROL STANDARDS AND GUIDELINES OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.
6. THE CONTRACTOR SHALL MAT ALL SLOPES AND EXPOSED AREAS IMMEDIATELY AFTER THE GRADING WORK HAS BEEN COMPLETED.
7. FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
8. THE CONTRACTOR SHALL INFORM THE DPW OF THE LOCATION OF THE DISPOSAL AND/OR BORROW SITE(S) REQUIRED FOR THIS PROJECT WHEN AN APPLICATION FOR A GRADING PERMIT IS MADE. THE DISPOSAL AND/OR BORROW SITE(S) MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.
9. NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS ANYTIME WITHOUT PRIOR APPROVAL FROM THE DEPARTMENT OF PUBLIC WORKS. GRADING WORK ON NORMAL WORKING DAYS SHALL BE BETWEEN THE HOURS OF 7:00 A.M. TO 3:30 P.M.
10. FILLS SHALL BE COMPACTED TO 90 PERCENT (90%) OF MAXIMUM DENSITY PER ASTM D-1557 TEST.
11. THE CONTRACTOR SHALL REMOVE ALL VEGETATION BEFORE PLACING FILLS ON NATURAL GROUND SURFACE.
12. THE CONTRACTOR SHALL PROVIDE ADEQUATE MEASURES TO PREVENT FLOODING AND EROSION PROBLEMS TO ADJACENT PROPERTIES.
13. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, COMMUNITY NOISE CONTROL.

TRAFFIC NOTES

1. ALL TRAFFIC SIGNS AND PAVEMENT MARKINGS SHALL CONFORM TO THE LATEST AMENDED EDITIONS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES", APPLICABLE SECTIONS OF PART 5 OF THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", DATED SEPTEMBER, 1984, AND THE "2005 HAWAI'I STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", UNLESS OTHERWISE INDICATED ON THE PLANS, SPECIFICATIONS, OR STANDARD TRAFFIC NOTES.
2. THE CONTRACTOR SHALL INSTALL PERMANENT OR TEMPORARY PAVEMENT MARKERS, STRIPING AND MARKINGS AS REQUIRED BY SECTION(S) 629 AND 755.05 OF THE "2005 HAWAI'I STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", AND AS AMENDED. TO ENSURE PROPER LANE WIDTHS AND THE SAFE FLOW OF TRAFFIC, TEMPORARY STRIPING SHALL BE INSTALLED AS CLOSELY AS POSSIBLE TO THE FINAL STRIPING PLAN, BUT NOT IN A MANNER THAT WOULD OBSTRUCT PERMANENT STRIPING LAYOUT OPERATIONS.

   THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL TRAFFIC SIGNS AND MARKINGS FOR ALL PROJECT-RELATED TEMPORARY TRAFFIC CONTROL PLANS. THE CONTRACTOR SHALL COORDINATE AND HIRE SPECIAL DUTY POLICE OFFICER(S) AS NEEDED TO PROVIDE TRAFFIC CONTROL WHILE WORKING WITHIN THE COUNTY RIGHT OF WAY.
3. THE CONTRACTOR SHALL INFORM THE TRAFFIC DIVISION AT LEAST SIX (6) WORKING DAYS PRIOR TO ANY WORK ON PAVEMENT MARKINGS OPERATIONS AND/OR SIGN INSTALLATIONS TO SCHEDULE A REVIEW AND APPROVAL OF THE STRIPING LAYOUT AND/OR SIGNING PLANS.
4. THE APPROVED STRIPING PLAN SHALL BE LAID OUT USING MARKING PAINT OR OTHER APPROVED METHODS. FIELD ADJUSTMENTS SHALL BE MADE AS DIRECTED BY THE INSPECTOR BEFORE THE FINAL MARKINGS ARE APPLIED.
5. ALL PAVEMENT MARKINGS THAT BECOME INAPPLICABLE SHALL BE REMOVED BY THE CONTRACTOR AT HIS OWN EXPENSE. REMOVAL SHALL BE BY ERADICATION OR BY OTHER METHODS APPROVED BY THE INSPECTOR BEFORE THE NEW PAVEMENT MARKINGS ARE APPLIED. EXCESSIVE GOUGING OF THE PAVEMENT SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
6. ALL PAVEMENT STRIPING SHALL BE WITH ALKYD BASED REFLECTIVE THERMOPLASTIC COMPOUND PAVEMENT MARKING AS SPECIFIED IN SECTION(S) 629 AND 755.05 OF THE HAWAI'I STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005 EDITION, AND AS AMENDED, ON ALL ROADWAYS. THE CONTRACTOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE CERTIFYING THAT THE THERMOPLASTIC MATERIALS TO BE USED MEET THE CURRENT AASHTO M-247 (FOR GLASS BEADS) AND AASHTO M-249 (FOR STRIPING) SPECIFICATIONS.

   FOR CROSSWALKS AND STOP LINES, THE CONTRACTOR SHALL APPLY HIGH SKID-RESISTANT WHITE CORUNDUM OR APPROVED EQUAL.

TRAFFIC NOTES CON'T.

7. ON CONCRETE PAVEMENTS, PRE-STRIPE APPLICATION AREA WITH BINDER MATERIAL, PRIMER, OR PRIME SEAL COAT RECOMMENDED BY PAVEMENT MARKER MANUFACTURER.
8. HEAT APPLIED PRE-FORMED THERMOPLASTIC PAVEMENT MARKING TAPE WITH VISIBLE TEMPERATURE INDICATORS, OR AN EQUAL PAVEMENT MARKING TAPE THAT IS APPROVED BY THE TRAFFIC DIVISION SHALL BE USED FOR ALL BIKE LANE SYMBOLS AND LEGENDS PER TRAFFIC STANDARD DETAIL TR-111, AND MAY BE USED FOR CROSSWALKS, STOP LINES, PAVEMENT ARROWS, ALPHABETS, AND SYMBOLS IN LIEU OF THERMOPLASTIC COMPOUND.

   HEAT APPLIED PRE-FORMED THERMOPLASTIC PAVEMENT MARKING TAPE FOR BIKE LANE SYMBOLS AND LEGENDS PER TRAFFIC STANDARD DETAIL TR-111, CROSSWALKS AND STOP LINES SHALL BE MADE OF A DURABLE, HIGH SKID-RESISTANT MATERIAL.
9. REFLECTORIZED RAISED PAVEMENT MARKERS (RPM'S) SHALL BE THE REGULAR SIZED MARKERS WITH APPROXIMATE DIMENSIONS OF 4"X4"X0.7". THE CONTRACTOR SHALL SUBMIT CERTIFICATE OF COMPLIANCE CERTIFYING THAT THE RPM'S TO BE USED MEET OR EXCEED THE CURRENT STATE OF HAWAI'I, DEPARTMENT OF TRANSPORTATION SPECIFICATIONS.
10. ALL TRAFFIC SIGNS AND POSTS SHALL MEET THE REQUIREMENTS OF THE COUNTY OF HAWAI'I STANDARD DETAIL T-1 EXCEPT THAT FLANGED CHANNEL POSTS AND OCTAGONAL POSTS WILL NOT BE ACCEPTABLE. SIGNS SHALL BE ON ALUMINUM SHEETING OF 0.080-INCH MINIMUM THICKNESS. SIGN POSTS SHALL BE 2" SQUARE TELESPAR TUBING NO. 20 F 12 OR EQUIVALENT WITH 2 1/4" SQUARE TELESPAR ANCHOR POST.

    FOR ALL COUNTY DEDICATED STREETS, THE CONTRACTOR SHALL PLACE A TRAFFIC DIVISION MAINTENANCE STICKER ON THE BACK OF EACH SINGLE-SIDED SIGN. STICKERS ARE TO BE ACQUIRED AT THE TRAFFIC DIVISION.
11. ALL TRAFFIC SIGNS SHALL BE HIGH INTENSITY RETROREFLECTIVE SHEETING, WITH TYPE IV FOR REGULATORY, WARNING, AND DIRECTIONAL SIGNS AND TYPE IX (FLUORESCENT YELLOW GREEN SHEETING) FOR PEDESTRIAN, SCHOOL, AND BICYCLE CROSSING SIGNS.
12. THE 2 1/4" SQUARE ANCHOR POST FOR SIGNS SHALL BE DRIVEN INTO THE GROUND, A.C. PAVEMENT OR CONCRETE SIDEWALK IN ACCORDANCE WITH THE PLANS. ALL DAMAGES TO THE SURROUNDING AREA SHALL BE REPAIRED TO ITS ORIGINAL CONDITION OR BETTER. BEFORE DRIVING INTO CONCRETE, A NEAT HOLE OF APPROXIMATELY 3 INCH DIAMETER SHALL BE DRILLED THROUGH THE CONCRETE PRIOR TO THE INSTALLATION OF THE ANCHOR POST. IF DRIVING INTO THE CONCRETE OR A.C. PAVEMENT IS NOT POSSIBLE WITHOUT DAMAGE TO THE SURROUNDING CONCRETE OR A.C. PAVEMENT, A 12" BY 12" SQUARE SHALL BE SAW-CUT AND REMOVED PRIOR TO THE INSTALLATION OF THE ANCHOR POST AND THEN PATCHED, WITH HOT MIX TO MATCH THE EXISTING A.C. PAVEMENT, OR CONCRETE TO MATCH THE EXISTING CONCRETE SIDEWALK.
13. UPON COMPLETION OF ALL CONSTRUCTION WORK, INCLUDING, BUT NOT LIMITED TO THE FINAL PAVING OF THE ENTIRE PROJECT AREA AND OFF-SITE CONSTRUCTION, THE CONTRACTOR SHALL RESTRIPE ALL PAVEMENT MARKINGS WITHIN AND IN THE VICINITY OF THE CONSTRUCTION AREA AS APPROVED BY THE TRAFFIC DIVISION AND IN ACCORDANCE WITH ITEM 6 OF THE CURRENT STANDARD TRAFFIC NOTES. THE CONTRACTOR SHALL MAINTAIN ALL TEMPORARY PAVEMENT MARKINGS, PERMANENT PAVEMENT MARKINGS, AND ALL TRAFFIC SIGNS AND POSTS UNTIL THE PROJECT IS ACCEPTED BY THE COUNTY OF HAWAI'I.

    ALL TRAFFIC SIGNS AND POSTS WITHIN AND IN THE VICINITY OF THE CONSTRUCTION AREA THAT HAVE BEEN DAMAGED, REMOVED, OR ADVERSELY AFFECTED BY THE CONSTRUCTION WORK SHALL BE REPLACED BY THE CONTRACTOR ACCORDING TO ITEM(S) 10, 11, AND 12 OF THE CURRENT STANDARD TRAFFIC NOTES AT NO COST TO THE COUNTY.
14. ALL DEDICATED STREETS MUST HAVE STREET NAMES WHICH HAVE BEEN APPROVED BY RESOLUTION BEFORE ACCEPTANCE OF THE STREET BY THE COUNTY OF HAWAI'I.

    UNLESS OTHERWISE APPROVED BY THE TRAFFIC DIVISION, ALL STREET NAME SIGNS SHALL HAVE AN UPPERCASE FIRST LETTER/LOWERCASE FORMAT AND THE PROPER HAWAIIAN SPELLING FOR THE STREET NAMES AS APPROVED BY THE COUNTY OF HAWAI'I PLANNING DEPARTMENT.

    PRIOR TO STREET NAME SIGN FABRICATION, STREET NAME SIGN SUBMITTALS SHALL BE REVIEWED AND APPROVED BY THE TRAFFIC DIVISION.
15. INSTALL "PRIVATE ROAD" SIGN(S) ON ALL PRIVATE ROAD(S). SIGN SHALL BE ON 18" WIDE BY 12" HIGH ALUMINUM PLATE WITH 4" BLACK LETTERING ON WHITE REFLECTORIZED SHEETING WITH BORDER.
16. ALL SIGNS & MARKINGS FOR PRIVATE ROADWAYS SHALL BE MAINTAINED BY THE PRIVATE OWNERS.

COMPACTION TESTING

THE DEPARTMENT OF HAWAIIAN HOME LANDS SHALL HIRE AN INDEPENDENT TESTING LAB TO CONDUCT COMPACTION TESTS. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS. COMPACTION TESTS SHALL BE TAKEN ACCORDING TO SECTION 207.1, SPECIAL INSTRUCTIONS OF FIELD COMPACTION TESTING, HDOT TECHNICAL MANUAL ON MATERIAL QUALITY CONTROL, AS FOLLOWS:

A. SUBBASE: ONE (1) COMPACTION TEST PER LIFT, PER 300 LINEAR FEET.

B. BASE COURSE: ONE (1) COMPACTION TEST PER LIFT, PER 200 LINEAR FEET.

C. ONE (1) COMPACTION TEST PER LIFT, PER 500 LINEAR FEET OF TRENCH.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CONSTRUCTION NOTES 2

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 3 OF 68 SHEETS

Last Save by: LRS
Last Saved: 7/3/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Construction Notes 2.DWG

WASTEWATER COLLECTION SYSTEM NOTES:

GENERAL REQUIREMENTS:

1. THE GENERAL REQUIREMENTS AND COVENANTS OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAI'I (JULY 1972): THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (APPLICABLE NON-WASTEWATER SECTIONS, SEPTEMBER 1986), THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAI'I (APPLICABLE NON-WASTEWATER SECTIONS, SEPTEMBER 1984), WASTEWATER SYSTEM DESIGN STANDARDS, CITY AND COUNTY OF HONOLULU (JULY 2017), WASTEWATER SYSTEM STANDARD DETAILS, CITY AND COUNTY OF HONOLULU (JULY 2017) AND THE COUNTY OF HAWAI'I, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, WASTEWATER DIVISION (WWD) STANDARD DETAILS (WW-1 THRU WW-9, CURRENT VERSION) SHALL BE APPLICABLE AND INCORPORATED HEREIN UNLESS OTHERWISE NOTED.
2. BASIS OF BEARING (HORIZONTAL CONTROL): EXIST. STREET MONUMENT ALONG KEANALEHU DRIVE
3. BASIS OF ELEVATION (VERTICAL CONTROL): EXIST. STREET MONUMENT ALONG KEANALEHU DRIVE (388.24)
4. SURVEY CONTROL AND LAYOUT WHEN REQUIRED SHALL BE PERFORMED BY, OR UNDER THE DIRECT SUPERVISION OF, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF HAWAI'I.
5. THE CONTRACTOR SHALL PROCURE AND CONFORM TO ALL PERMITS AND LICENSES REQUIRED, PAY ALL ASSOCIATED CHARGES AND FEES AND GIVE ALL NOTICES NECESSARY AND INCIDENTAL TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
   A. THE CONTRACTOR SHALL PROCURE AND CONFORM TO A NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FROM THE STATE OF HAWAI'I, DEPARTMENT OF HEALTH, CLEAN WATER BRANCH FOR ANY PROJECT WHERE CONSTRUCTION ACTIVITIES WILL DISTURB ONE (1) ACRE OR MORE OF TOTAL LAND AREA OR WHERE DEWATERING IS REQUIRED.
   B. ALL STORMWATER POLLUTION PREVENTION MEASURES SHALL BE INSTALLED SO AS TO PREVENT STORMWATER RUNOFF, CONSTRUCTION WATER, FUELS, CHEMICALS, OR OTHER LIQUIDS BEING DIRECTED INTO OR ONTO ANY SANITARY SEWER FACILITIES WITHIN THE PROJECT LIMITS. BEST MANAGEMENT PRACTICES (BMPS) MAY INCLUDE, BUT SHALL NOT BE LIMITED TO, USE OF RAINSTOPPER MANHOLE INSERTS.
6. A MINIMUM HORIZONTAL SEPARATION OF 8 FEET BETWEEN WATER AND SEWER LINES ARE REQUIRED. IF NOT POSSIBLE, SECTION 2.4.12.B OF THE "WASTEWATER SYSTEM DESIGN STANDARDS, CITY AND COUNTY OF HONOLULU, JULY 2017" APPLIES.
7. A MINIMUM OF 18 INCH VERTICAL CLEARANCE AT WATER AND SEWER MAIN CROSSINGS WITH SEWER UNDERNEATH THE WATER IS REQUIRED. IF NOT POSSIBLE, SECTION 2.4.12.B OF THE "WASTEWATER SYSTEM DESIGN STANDARDS, CITY AND COUNTY OF HONOLULU, JULY 2017" APPLIES.
8. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, AND EQUIPMENT REQUIRED FOR THE COMPLETE INSTALLATION OF THE SUBJECT WORK UNLESS SPECIFICALLY NOTED OTHERWISE ON THE PLANS APPROVED BY THE WWD.
9. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PERFORM ALL WORK NECESSARY TO COMPLETE CONSTRUCTION PER THE APPROVED PLANS AND SPECIFICATIONS AND SUCH INCIDENTALS AS MAY BE NECESSARY TO MEET APPLICABLE AGENCY REQUIREMENTS INCLUDING, BUT NOT LIMITED TO, OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA) REGULATIONS, AND PROVIDE A COMPLETED PROJECT. ONLY PLANS APPROVED BY WWD SHALL BE USED FOR CONSTRUCTION OF, OR CONNECTION TO, THE COUNTY'S PUBLIC WASTEWATER SYSTEM. ANY ADDITIONS, DELETIONS, OR CHANGES TO THE WASTEWATER SYSTEM SHALL MEET THE WRITTEN APPROVAL OF THE COUNTY OF HAWAII, DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, WASTEWATER DIVISION PRIOR TO STARTING THE REVISED WORK.
   A. THE CONTRACTOR SHALL MAINTAIN ONE COMPLETE SET OF APPROVED PLANS ON THE CONSTRUCTION SITE AT ALL TIMES WHERE HE SHALL RECORD THE SIZES, MATERIALS, STATION LOCATIONS AND ELEVATIONS OF ALL EXISTING UTILITIES ENCOUNTERED. THESE FIELD RECORD DRAWINGS SHALL BE KEPT CONTINUOUSLY UP TO DATE AND SHALL BE AVAILABLE FOR INSPECTION BY THE WWD ON REQUEST.
10. INSPECTIONS SHALL BE REQUIRED FOR ALL WORK WHICH INVOLVES THE WWD'S SEWER MAINS, LATERALS, CLEANOUTS, AND ALL NEW SEWER CONSTRUCTION TO BE DEDICATED TO THE COUNTY OF HAWAII. CALL THE WASTEWATER DIVISION AT (808) 961-8338 DURING NORMAL BUSINESS HOURS (7:00 AM TO 3:30 PM, MONDAY THROUGH FRIDAY, EXCEPT COUNTY OF HAWAI'I HOLIDAYS) AT LEAST TWO (2) WORKING DAYS IN ADVANCE TO SCHEDULE AN INSPECTION.
   A. WWD INSPECTION SHALL BE PERFORMED PRIOR TO BACKFILLING OR COVERING THE PIPE AND ASSOCIATED APPURTENANCES IN PUBLIC EASEMENTS OR RIGHTS-OF-WAY, BEFORE PRIVATE SEWER OR LATERALS ARE CONNECTED TO THE PUBLIC SEWER SYSTEM, AND AFTER ALL ASSOCIATED PLUMBING WORK ON PRIVATE PROPERTY IS COMPLETE, IN ACCORDANCE WITH THE PLUMBING PERMIT.
   B. WHEN WWD DETERMINES THROUGH INSPECTION THAT MATERIAL, EQUIPMENT OR WORKMANSHIP DO NOT MEET THE REQUIREMENTS, THE CONTRACTOR WILL BE GIVEN WRITTEN NOTICE OF NONCOMPLIANCE. IMMEDIATE CORRECTION OF THE DEFICIENCIES SHALL BE ADDRESSED BY THE CONTRACTOR WITH THE WWD ENGINEER AND/OR THEIR REPRESENTATIVE.
   C. ANY INSPECTION BY WWD, HAWAII COUNTY OR OTHER AGENCIES SHALL NOT, IN ANY WAY, RELIEVE THE CONTRACTOR FROM ANY OBLIGATION TO PERFORM THE WORK IN STRICT COMPLIANCE WITH APPLICABLE REGULATIONS, CODES, CONTRACT DOCUMENTS, PLANS, SPECIFICATIONS OR GOVERNING AGENCY REQUIREMENTS.
11. SEWER WORK SHALL BE SCHEDULED SUCH THAT WORK SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS OR COUNTY OF HAWAI'I HOLIDAYS. IF SUCH WORK DICTATES PERFORMANCE ON THESE NON-WORK DAYS, OR AFTER NORMAL HOURS OF OPERATION (3:30 PM TO 7:00 AM), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PAYMENT OF OVERTIME CHARGES TO THE WWD.
12. THE CONTRACTOR SHALL NOTIFY THE HAWAI'I ONE CALL CENTER OF ANY PLANNED EXCAVATION ON PUBLIC OR PRIVATE PROPERTY AT LEAST FIVE WORKING DAYS, BUT NOT MORE THAN TWENTY-EIGHT CALENDAR DAYS, PRIOR TO COMMENCING SUCH EXCAVATION (IN ACCORDANCE WITH HRS 269 E-7). CALL 1-866-423-7287 (OR 811). ERRORS IN ONE CALL'S SANITARY SEWER LOCATES SHALL BE REPORTED IMMEDIATELY TO THE WWD AT (808) 961-8338.
13. LOCATIONS AND DESCRIPTIONS OF EXISTING UTILITIES SHOWN ON THE PLANS ARE COMPILED FROM AVAILABLE RECORDS AND/OR FIELD SURVEY. THE ENGINEER AND UTILITY PROVIDERS DO NO GUARANTEE THE ACCURACY OR COMPLETENESS OF SUCH RECORDS. THE CONTRACTOR SHALL FIELD VERIFY LOCATIONS, SIZES, MATERIALS AND DEPTHS OF ALL EXISTING UTILITIES WHERE PROPOSED FACILITIES CROSS.

GENERAL REQUIREMENTS (CON'T):

14. THE CONTRACTOR SHALL FIELD VERIFY EXISTING SANITARY SEWER LOCATIONS, ELEVATIONS, AND MATERIALS WITHIN THE PROJECT LIMITS PRIOR TO CONSTRUCTION. POT-HOLING MAY BE REQUIRED FOR SUCH VERIFICATION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXPOSING POTENTIAL UTILITY CONFLICTS FAR ENOUGH AHEAD OF CONSTRUCTION TO MAKE NECESSARY LINE AND GRADE MODIFICATIONS WITHOUT DELAYING THE WORK.
16. ALL EXISTING UTILITIES EXCEPT THOSE SPECIFICALLY DESIGNATED FOR ABANDONMENT OR REMOVAL ON THE APPROVED PLANS, INCLUDING WASTEWATER LINE(S), WHETHER OR NOT SHOWN ON THE PLANS , SHALL BE PROTECTED AND REPAIRED BY THE CONTRACTOR IF DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL LEAVE EXISTING FACILITIES IN AN EQUAL TO OR BETTER THAN ORIGINAL CONDITION. THE CONTRACTOR SHALL PAY ALL ASSOCIATED EXPENSES: IN THE EVENT OF DAMAGE TO EXISTING UTILITY FACILITIES OTHER THAN SANITARY SEWER, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE UTILITY SERVICE PROVIDER. IN THE EVENT OF DAMAGE TO EXISTING SANITARY SEWER FACILITIES, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE WWD AT (808) 961-8338.
17. THE CONTRACTOR SHALL NOTIFY AND COORDINATE WITH PRIVATE UTILITIES FOR ADJUSTMENT TO OR RELOCATION OF POWER POLES, VAULTS, ETC. TO AVOID CONFLICT WITH COUNTY SEWER STRUCTURES, LINES AND ASSOCIATED APPURTENANCES.
18. EXPOSED ENDS OF SEWER LINES THAT ARE ABANDONED OR TO BE ABANDONED IN PLACE SHALL BE CAPPED OR PLUGGED WITH CONCRETE FOR A MINIMUM LENGTH EQUAL TO TWO TIMES THE DIAMETER OF THE ABANDONED PIPE AND INTERFERING PORTIONS REMOVED BY THE CONTRACTOR TO THE EXTENT NECESSARY TO ACCOMPLISH THE WORK, UNLESS OTHERWISE SPECIFIED.
19. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL SANITARY SEWER STRUCTURES AND MANHOLES AT ALL TIMES.
20. BYPASSING OR SPILLING OF SEWAGE TO THE GROUND, DRAINAGE SYSTEM OR STATE WATERS IS PROHIBITED. IN SUCH CASES, THE CONTRACTOR SHALL IMMEDIATELY CALL THE WWD AT (808) 961-8338, TAKE IMMEDIATE ACTION TO CONTAIN THE SEWAGE, AND PAY PENALTIES, INCLUDING LEGAL FEES AND OTHER COSTS RELATED TO THE BYPASS AND/OR SPILL.
21. THE CONTRACTOR SHALL BE IN PERSON ON THE JOB SITE OR BE REPRESENTED ON THE JOB SITE BY A RESPONSIBLE AGENT WITH AUTHORITY TO ACT FOR THE CONTRACTOR IN CONNECTION WITH THIS PROJECT AT ALL TIMES.
22. THE CONTRACTOR SHALL, AT ALL TIMES DURING THE WORK, KEEP THE PREMISES CLEAN AND ORDERLY. PUBLIC STREETS AND RIGHTS-OF-WAY SHALL BE KEPT CLEAN OF MUD, DUST AND DEBRIS. THE CONTRACTOR SHALL ADEQUATELY WATER DISTURBED AREAS ON-SITE FOR DUST ABATEMENT, AS NEEDED. UPON COMPLETION OF THE WORK, THE CONTRACTOR SHALL REPAIR ALL DAMAGE CAUSED BY EQUIPMENT AND LEAVE THE PROJECT FREE OF RUBBISH AND EXCESS MATERIALS OF ANY KIND. DROPPING OR WASHING DEBRIS OR RUBBISH OF ANY KIND INTO THE SANITARY SEWER SYSTEM IS PROHIBITED.

SEWER SYSTEM REQUIREMENTS:

GRAVITY MAINS

1. SEWER MAIN PIPE AND FITTINGS:
   A. ALL SANITARY SEWER PIPE AND FITTINGS SHALL BE WWD STANDARD APPROVED MATERIAL, UNLESS OTHERWISE NOTED ON THE APPROVED PLANS.
   B. LAYING OF PIPE SHALL GENERALLY COMMENCE AT THE LOWEST POINT, THE BELL END FACING UPSTREAM, REGARDLESS OF THE STATIONING SHOWN ON THE PLANS. PIPE SHALL BE FITTED TOGETHER AND MATCHED WITH GASKETS PROPERLY SEATED SO THAT WHEN LAID IT WILL FORM A UNIFORM AND SMOOTH INVERT.
   C. REFER TO THE DRAWINGS FOR DETAILED REQUIREMENTS FOR ALL CONNECTIONS TO EXISTING SANITARY SEWER PIPE. DETAILS SHALL BE PROVIDED TO AND APPROVED BY WWD.
   D. THE INTERIOR OF THE SEWER PIPE SHALL BE CLEARED OF ALL DEBRIS AND FOREIGN MATERIALS AS THE WORK PROGRESSES. BEFORE LEAVING THE WORKPLACE FOR THE NIGHT, EXPOSED ENDS OF SEWER PIPE SHALL BE CLOSED WITH TEMPORARY COVERS TO PREVENT EARTH AND DEBRIS FROM ENTERING THE PIPE.
   E. BECAUSE OF THE NATURE OF PLASTIC PIPE AND FITTINGS, THE CONTRACTOR IS CAUTIONED TO EXERCISE CARE IN HANDLING, LOADING, UNLOADING, AND STORING TO AVOID DAMAGE.
   I. KEEP PIPE AND GASKETS CLEAN, AWAY FROM OIL, GREASE, EXCESSIVE HEAT AND ELECTRIC MOTORS, WHICH PRODUCE OZONE, AND PROTECTED FROM DIRECT SUNLIGHT AND TEMPERATURE CHANGES IN PROLONGED EXPOSURE TO AVOID CRACKING.
   II. HEAVY IMPACT MAY CAUSE A SLIGHT LONGITUDINAL INDENTATION ON THE OUTSIDE OF THE PIPE AND A CRACK ON THE INSIDE. THIS WILL RESULT IN A SPLIT AS SOON AS THE PIPE IS PLACED UNDER LOADING. ANY PIPE THAT HAS BEEN IMPACTED SHALL BE EXAMINED CLOSELY FOR THIS TYPE OF DAMAGE.
2. TRENCH, PIPE BEDDING, AND BACKFILL:
   A. THE CONTRACTOR SHALL HAVE APPROPRIATE EQUIPMENT ON-SITE TO PRODUCE A DRY, FIRM, SMOOTH, UNDISTURBED SUBGRADE AT THE TRENCH BOTTOM THAT IS TRUE TO LINE AND GRADE. THE TRENCH BOTTOM SHALL BE FREE OF LOOSE MATERIALS OR TOOTH GROOVES FOR THE ENTIRE TRENCH WIDTH PRIOR TO PLACING PIPE BEDDING MATERIAL.
   B. THE CONTRACTOR SHALL FURNISH AND INSTALL SUFFICIENT TRENCH BOXES, SHORING, SHEETING OR BRACING TO INSURE THE SAFETY OF WORKMEN AND THE PUBLIC, PROTECT THE WORK, AND PROTECT EXISTING FACILITIES.
      I. SHORING, SHEETING, AND BRACING SHALL COMPLY WITH OSHA RULES, ORDERS AND REGULATIONS.
      II. WHERE REQUIRED BY OSHA, THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE DRAWINGS AND/OR CALCULATIONS FOR SPECIALLY DESIGNED BRACING AND SHORING, PREPARED AND STAMPED BY A HAWAI'I REGISTERED PROFESSIONAL ENGINEER, TO THE WWD A MINIMUM OF FIVE (5) WORKING DAYS PRIOR TO BEGINNING ASSOCIATED EXCAVATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ADEQUACY OF ALL SHEETING, SHORING AND BRACING AND COMPLIANCE WITH THE LAW. FAILURE OF THE INSPECTOR TO SUSPEND THE WORK OR NOTIFY THE CONTRACTOR OF ANY INADEQUACY OF SHEETING, SHORING OR BRACING OR NONCOMPLIANCE WITH THE LAW SHALL NOT RELIEVE THE CONTRACTOR OF THIS RESPONSIBILITY.
      III. THE CONTRACTOR SHALL FURNISH AND MAINTAIN SHORING, SHEETING AND BRACING UNTIL AFTER THE PIPELINE AND APPURTENANCES HAVE BEEN INSTALLED AND THE INSPECTOR HAS APPROVED THE PLACEMENT OF SUFFICIENT BACKFILL. THE CONTRACTOR SHALL PROVIDE ADEQUATE SAFETY MEASURES TO ALLOW FOR ACCESS BY THE INSPECTOR OR TESTING PERSONNEL TO PERFORM COMPACTION TESTING AND INSPECTION OF THE LIFTS OF BACKFILL PLACED.
   C. NO TRENCHES IN THE ROADS OR DRIVEWAYS SHALL BE LEFT OPEN OVERNIGHT, ALL SUCH TRENCHES SHALL BE PLATED OR CLOSED AND NORMAL TRAFFIC FLOW RESTORED BEFORE THE END OF EACH WORK DAY.
   I. THE STEEL TRENCH PLATES SHALL BE CAPABLE OF SUPPORTING HS-20 LOADING.
   II. THE PLATES MUST EXTEND BEYOND THE EDGE OF THE TRENCH WALL FAR ENOUGH TO ADEQUATELY SUPPORT HS-20 TRAFFIC LOADS. IN NO CASE SHALL THE PLATES EXTEND LESS THAN TWELVE (12) INCHES BEYOND THE TRENCH WALL.
   III. EACH PLATE MUST BE FULLY SUPPORTED AROUND ITS' PERIMETER TO PREVENT WOBBLING OR ROCKING.
   VI. THE PLATES SHALL BE SECURED TO PREVENT ANY MOVEMENT.
   V. TRENCHES AND EXCAVATIONS BENEATH THE PLATES SHALL BE ADEQUATELY SHORED AND BRACED TO WITHSTAND HS-20 TRAFFIC LOADS.
   VI. TEMPORARY PAVING OR COLD MIX ASPHALTIC CONCRETE (CUTBACK) SHALL BE PLACED AND CONTINUOUSLY MAINTAINED AROUND ALL OUTSIDE EDGES OF THE TRENCH PLATES UNTIL THEY ARE REMOVED.
   D. TRENCHES SHALL BE PROPERLY BACKFILLED AND COMPACTED AS SHOWN ON THE APPROVED PLAN.
   E. PIPE BEDDING SHALL BE CLASS B 3/4" AGGREGATE BASE COURSE PLACED WITHIN THE DRY TRENCH, AT NOT LESS THAN 4 INCHES BUT NOT MORE THAN 5 INCHES IN COMPACTED THICKNESS. BEDDING SHALL BE COMPACTED TO 95 PERCENT MAXIMUM DRY DENSITY, UNLESS OTHERWISE NOTED ON PLANS, TO AVOID STRESS CONCENTRATIONS AND ASSOCIATED IRREGULAR PIPE DEFORMATIONS. RECESSES CONSTRUCTED IN THE BEDDING, FOLLOWED BY HAND COMPACTION OF BACKFILL AROUND THE BELLS, WILL PROVIDE CONTINUOUS LONGITUDINAL SUPPORT AND UNIFORM BEARING BELOW THE PIPE JOINTS.
   F. THE REMAINDER OF THE PIPE EMBEDMENT SHALL ALSO BE CLASS B 3/4" AGGREGATE BASE COURSE PROPERLY PLACED, IN LIFTS NOT TO EXCEED 6", AROUND THE PIPE HAUNCHES AND EXTENDING TO A MINIMUM OF 12" COMPACTED THICKNESS OVER THE TOP OF THE PIPE. PIPE ZONE EMBEDMENT SHALL BE COMPACTED TO A 95 PERCENT MAXIMUM DRY DENSITY, UNLESS OTHERWISE NOTED ON PLANS, TO PROVIDE ADEQUATE SIDE SUPPORT AND ENSURE THE PIPE'S FULL STRENGTH IS ACHIEVED WHILE AVOIDING PIPE DEFLECTION, VERTICAL AND LATERAL DISPLACEMENT.
   G. CONTROLLED LOW-STRENGTH MATERIAL (CLSM) SHALL BE USED AS THE FINAL BACKFILL UNLESS OTHERWISE NOTED ON THE PLAN OR APPROVED IN WRITING BY THE WWD ENGINEER.
   H. COMPACTION TESTING FOR BEDDING AND EMBEDMENT MATERIALS FOR SEWER MAIN INSTALLATION SHALL BE PERFORMED BY AN INDEPENDENT TESTING AND QUALITY CONTROL LABORATORY. COMPACTION TEST FREQUENCY SHALL BE A MINIMUM OF ONE (1) TEST PER 150 LINEAL FEET PER LIFT OR A FRACTION THEREOF ON ALTERNATING SIDES OF THE PIPE OR STRUCTURE. THE ENGINEER RESERVES THE RIGHT TO INCREASE OR DECREASE THE FREQUENCY OF COMPACTION TESTING TO MATCH FIELD CONDITIONS. TEST RESULTS SHALL BE SUBMITTED TO THE WWD ENGINEER FOR EVALUATION AS PART OF THE FINAL ACCEPTANCE PROCESS.
3. SEWER MANHOLES AND APPURTENANCES:
   A. ALL PRECAST CONCRETE SEWER MANHOLES SHALL CONFORM TO THE LATEST VERSION OF ASTM C478.
   B. ALL SEWER MANHOLE BASE, SECTIONS, CONE, FLAT TOP, BENCHES, AND CHANNELS SHALL INCLUDE A CONCRETE WATERPROOFING, PROTECTION, AND IMPROVEMENT ADMIXTURE. ADMIXTURE SHALL BE XYPEX ADMIX C-1000 OR APPROVED EQUAL PRODUCT. DOSAGE SHALL BE PER MANUFACTURER'S INSTRUCTION AND SHALL NOT BE LESS THAN 3% OF THE WEIGHT OF THE PORTLAND CEMENT FRACTION OF THE MIX.
   C. ALL DROP SEWER MANHOLES, TRANSITIONAL SEWER MANHOLE (RECEIVING MANHOLE AND THE NEXT TWO MANHOLES DOWNSTREAM FROM THE DISCHARGE OF A FORCE MAIN), AND SEWER MANHOLE(S) WITH CONNECTING PIPES GREATER THAN OR EQUAL TO 12 INCHES NOMINAL DIAMETER SHALL ALSO BE LINED WITH A PVC LINER, DURA-PLATE OR AN APPROVED EQUAL PRODUCT.

CHIEF, WASTEWATER DIVISION — DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

CONSTRUCTION NOTES 3

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 4 OF 68 SHEETS

Last Save by: LRS
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Plotted on: 3/9/2020
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SEWER SYSTEM REQUIREMENTS (CON'T):

D. ALL CONSTRUCTED (CAST–IN–PLACE) SEWER MANHOLE BENCHES AND CHANNELS SHALL BE COATED USING XYPEX MEGAMIX I OR AN APPROVED EQUAL PRODUCT.

E. SEWER MANHOLE CHANNELS, INCLUDING THOSE AT CONNECTIONS TO EXISTING MANHOLES, SHALL PROVIDE A SMOOTH TRANSITION BETWEEN INLET AND OUTLET SEWERS. THE ANGLE BETWEEN THE INLET AND OUTLET SHALL BE A MINIMUM OF 90 DEGREES.

F. UNLESS OTHERWISE APPROVED OR NOTED, ALL MANHOLES FOR CONNECTING SEWER LINES LESS THAN OR EQUAL TO 12–INCH NOMINAL DIAMETER SHALL BE PROVIDED WITH "ECCENTRIC" CONE SECTION WITH TYPE SA FRAMES AND COVERS (STD. DETAIL S–22).

G. UNLESS OTHERWISE APPROVED OR NOTED, ALL MANHOLES WITH CONNECTING SEWER LINES GREATER THAN 12–INCH NOMINAL DIAMETER OR LESS THAN 5 FEET DEEP SHALL BE PROVIDED WITH A FRAME AND COVER WITH A MINIMUM 48" CLEAR OPENING. THE 52–INCH COVER SHALL HAVE A SMALLER 25–5/16–INCH COVER INSTALLED FOR ROUTINE MAINTENANCE AND INSPECTION. THE SMALLER COVER SHALL BE PROVIDED WITH RECESSED STAINLESS STEEL BOLTS TO ALLOW SECURING. PERMANENT ALIGNMENT MARKS (MATCH MARKS) SHALL BE PROVIDED FOR THE BOLTS TO FACILITATE REINSTALLATION OF THE COVER. THE FRAME AND COVER SHALL BE AN ECCENTRIC CONFIGURATION, D&L FOUNDRY & SUPPLY; MODEL A–1428 OR APPROVED EQUAL.

H. A FLEXIBLE PIPE TO MANHOLE CONNECTOR SHALL BE USED WHENEVER A PIPE PENETRATES INTO A PRECAST CONCRETE MANHOLE OR STRUCTURE. CONNECTIONS SHALL BE WATER–TIGHT AND SHALL PROVIDE FOR SMOOTH FLOW INTO AND THROUGH THE MANHOLE WITH NO PONDING.

I. NEW SEWER PIPE CONNECTIONS TO NEW MANHOLES SHALL BE WITH AN APPROVED CAST–IN–PLACE MANHOLE PIPE ADAPTER (A–LOK, ECONOSEAL, OR APPROVED EQUAL PRODUCT).

II. EXISTING SEWER PIPE CONNECTIONS TO NEW MANHOLES SHALL BE WITH AN APPROVED MANHOLE PIPE ADAPTER (A–LOK FIELD SLEEVE OR APPROVED EQUAL PRODUCT).

III. SEWER PIPE CONNECTIONS TO EXISTING MANHOLES SHALL BE WITH AN APPROVED MANHOLE PIPE ADAPTER (A–LOK FIELD SLEEVE OR APPROVED EQUAL PRODUCT). OPENINGS FOR NEW CONNECTIONS TO EXISTING MANHOLES SHALL BE CORE–DRILLED AND SURFACE ROUGHENED. SMALL CHIPPING HAMMERS OR SIMILAR LIGHT TOOLS MAY BE USED TO ENLARGE EXISTING OPENINGS OR SHAPE CHANNELS IN EXISTING MANHOLES. USE OF PNEUMATIC JACKHAMMERS OR OTHER HEAVY TOOLS WHICH COULD DAMAGE OR CRACK THE MANHOLE BASE IS PROHIBITED.

I. ONE HAND GRAB RUNG AT THE TOP OF THE MANHOLE SHALL BE STAINLESS STEEL TYPE "SA" PER DPW STANDARD DETAIL S–42. SEWER MANHOLE RUNGS SHALL BE TYPE "SP" COPOLYMER POLYPROPYLENE PLASTIC, BOWCO INDUSTRIES INC./MEADOW BURKE PART NO. 9381OR IN ACCORDANCE WITH WASTEWATER STANDARD DETAIL WW–7.

J. RUNGS AND ECCENTRIC CONES OR COVERS SHALL NOT BE ALIGNED ABOVE FLOW LINES. THEY SHALL BE PLACED ON THE SIDE OF THE MANHOLE WITH THE LARGEST SHELF.

K. SEWER MANHOLES LOCATED IN UNPAVED AREAS SHALL BE PROVIDED A REINFORCED 3000 PSI CLASS "A" CONCRETE COLLAR. THE REINFORCED CONCRETE COLLAR SHALL BE A MINIMUM OF 12" THICK, AND EXTEND A MINIMUM OF 12" BEYOND THE FRAME AND COVER. REINFORCEMENT SHALL CONSIST OF AT LEAST ONE (1) #4 BAR PLACED AT LEAST 3" CLEAR FROM THE EDGE OF CONCRETE AND WRAPPED AROUND THE MANHOLE TOP SECTION (WITH AT LEAST 15" LAP), CENTERED VERTICALLY IN THE COLLAR.

L. ALL MANHOLE SECTIONS SHALL BE JOINED USING RAM–NEK RN103 OR APPROVED EQUAL.

4. SEWER LATERAL PIPE AND FITTINGS:

A. NEW SEWER LATERALS AND CLEANOUTS SHALL BE 6" DIAMETER, WWD STANDARD PIPE AND FITTINGS.

B. SEWER CLEANOUTS SHALL BE LOCATED IN THE COUNTY RIGHT–OF–WAY OR EASEMENT WITHIN ONE FOOT OF THE PROPERTY LINE OR BOUNDARY. THE CLEANOUT SHALL BE EASILY ACCESSIBLE (I.E. NOT BE BURIED OR LOCATED UNDER OR CLOSE TO ROCK WALLS, FENCES OR OTHER OBSTRUCTIONS.)

I. NEW HIGH FLOW AND/OR HIGH FOG (FAT, OIL, AND GREASE) POTENTIAL DISCHARGERS SHALL INSTALL A SEWER MANHOLE IN LIEU OR A CLEANOUT AT THE PROPERTY LINE.

C. SEWER LATERAL CONNECTIONS TO AN EXISTING SEWER MAIN SHALL BE MADE WITH A WYE CONFIGURED FLEXIBLE SADDLE (FERNCO TSW–6 OR APPROVED EQUAL) ROTATED 45 DEGREES ABOVE THE MAIN SPRING LINE UNLESS OTHERWISE DIRECTED BY THE WWD.

I. SEWER LATERAL SADDLE CONNECTIONS AND CORED SEWER MAIN ENTRY, WHEN DIRECTED BY THE WWD, SHALL PROVIDE A SMOOTH TRANSITION AND UNOBSTRUCTED FLOW TO THE MAIN. SADDLES SHALL COMPLETELY OVERLAY THE CORED AREA ON THE MAIN. SADDLES SHALL BE SECURED TO THE MAIN WITH STAINLESS STEEL STRAPS AND JACKETED WITH CLASS B REINFORCED CONCRETE IN ACCORDANCE WITH DPW STANDARD DETAIL S–5. THE REINFORCED CONCRETE JACKET SHALL COMPLETELY ENCASE THE EXISTING SEWER MAIN, BE A MINIMUM OF 6" THICK, AND EXTEND A MINIMUM OF 6" EACH WAY BEYOND THE SADDLE.

5. SEWER LINE ACCEPTANCE TESTS:

A. THE CONTRACTOR SHALL PROVIDE AND PAY FOR ALL MATERIALS, EQUIPMENT, AND FACILITIES NECESSARY FOR TESTING ALL UTILITY BACKFILL, PIPE AND STRUCTURES IN ACCORDANCE WITH THESE PLANS AND COUNTY STANDARD SPECIFICATIONS AND REQUIREMENTS.

B. ALL NEWLY INSTALLED SEWER MAINS AND LATERALS ARE SUBJECT TO LEAKAGE TESTING–AND CCTV INSPECTION PRIOR TO FINAL ACCEPTANCE AS DIRECTED BY THE WWD.

C. LEAKAGE TESTING SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SECTION 21.3 D OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986. ALL COSTS FOR SUCH TESTING SHALL BE BORNE BY THE CONTRACTOR.

D. DEFLECTION TESTING WHEN REQUIRED BY WWD, SHALL BE ACCOMPLISHED IN ACCORDANCE WITH SECTION 21.3 E OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986. ALL COSTS FOR SUCH TESTING SHALL BE BORNE BY THE CONTRACTOR.

E. AN INITIAL CCTV INSPECTION WILL BE PERFORMED BY THE COUNTY AT NO COST TO THE CONTRACTOR SUBJECT TO THE CONDITIONS BELOW.

I. THE CONTRACTOR SHALL OBTAIN A COPY OF THE SEWER LINE ACCEPTANCE TEST CRITERIA FROM THE WWD PRIOR TO REQUESTING OR SCHEDULING A CCTV INSPECTION.

II. THE CONTRACTOR SHALL ASSIST THE COUNTY IN THE PERFORMANCE OF THE CCTV INSPECTION, SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL REQUIREMENTS DURING CCTV INSPECTION, AND SHALL BE RESPONSIBLE FOR CLEANING AND REMOVING ALL DIRT, GRIT, ROCK, DEBRIS AND FOREIGN MATERIALS FROM THE PIPES AND MANHOLES PRIOR TO CCTV INSPECTION. IN THE EVENT THAT PIPES OR MANHOLES ARE FOUND TO HAVE BEEN INADEQUATELY CLEANED, THE COUNTY WILL TERMINATE THE CCTV INSPECTION. THE COST OF SUBSEQUENT CCTV INSPECTION(S) WILL BE CHARGED TO THE CONTRACTOR.

III. THE CONTRACTOR SHALL HAVE A SUPERVISORY REPRESENTATIVE PRESENT DURING PERFORMANCE OF THE CCTV INSPECTION.

IV. IF THE CCTV INSPECTION REVEALS CONDITIONS SUCH AS DENTS, OUT–OF–ROUND, ETC. THE WORK SHALL BE CONSIDERED DEFECTS AND SUBJECT TO REPAIR.

V. IF THE CCTV INSPECTION REVEALS PIPE SAGS EXCEEDING THE SEWER LINE ACCEPTANCE TEST CRITERIA BELOW THEY SHALL BE CONSIDERED DEFECTS SUBJECT TO CORRECTION OR A DEDUCTIVE PAYMENT FOR THE ENTIRE RUN OF THE PIPING FROM STRUCTURE–TO–STRUCTURE ACCORDING TO THE FOLLOWING TABLE:

SAG TOLERANCES				
PIPE SLOPE	NOM. PIPE SIZE	COMPLIES W/ SPECIFICATIONS	50% PAYMENT OF BID AMOUNT	RECONSTRUCTION REQUIRED
< 0.4%	6"	< 1/2"	1/2"–1"	> 1"
	8"	< 1/2"	1/2"–1"	> 1"
	10"	< 1"	1" – 1–1/2"	> 1–1/2"
	12"	< 1"	1" – 1–1/2"	> 1–1/2"
	> 12"	< 1"	1" – 1–1/2"	> 1–1/2"
0.4% TO 0.7%	6"	< 1/2"	1/2" – 1–1/2"	> 1–1/2"
	8"	< 1/2"	1/2" – 1–1/2"	> 1–1/2"
	10"	< 1"	1" – 2"	2"
	12"	< 1"	1" – 2"	2"
	> 12"	< 1"	1" – 2"	2"
>0.7%	6"	< 1"	1" – 1–1/2"	> 1–1/2"
	8"	< 1"	1" – 2"	> 2"
	10"	< 1–1/2"	1–1/2" – 2"	> 2"
	12"	< 1–1/2"	1–1/2" – 2–1/2"	> 2–1/2"
	>12"	< 1–1/2"	1–1/2" – 3"	3"

VI. CCTV INSPECTIONS WILL BE RECORDED. IN THE EVENT THAT THE CONTRACTOR REQUESTS A COPY OF THE CCTV INSPECTION, THE CONTRACTOR WILL BE CHARGED FOR THE COPY AT A RATE OF $25.00.

6. FINAL PROJECT SUBMITTALS:

A. "AS–BUILT" PLANS AND CERTIFIED EASEMENTS RECORDED WITH THE BUREAU OF CONVEYANCES, IF APPLICABLE ARE REQUIRED FOR FINAL CONTRACT ACCEPTANCE OF SEWER CONSTRUCTION BY WWD. UPON FINAL PROJECT INSPECTION AND DECLARATION OF SATISFACTORY COMPLETION BY THE WASTEWATER DIVISION CHIEF, SUBMIT TO WWD ONE (1) SET OF FIELD RECORD DRAWINGS AND ONE (1) SET OF "AS–BUILT" PLANS ONE (1) ELECTRONIC SET IN AUTOCAD 2009 OR NEWER VERSION AND ONE (1) ELECTRONIC SET IN ABODE PDF FORMAT.

B. IT IS MANDATORY THAT THE "AS–BUILT" PLANS SHOW CORRECTLY IDENTIFIED PROPERTY TMK NUMBERS, LOCATION OF SEWER MANHOLES, LATERALS, CLEANOUTS AND ALL OTHER MAJOR COMPONENTS OF THE WASTEWATER COLLECTION SYSTEM INCLUDING RIM AND INVERT ELEVATIONS AT ALL SEWER MANHOLES, LATERAL CONNECTIONS AT THE MAIN, AND LATERAL ELEVATIONS AT THE CLEANOUT. SUBMITTED DOCUMENTATION SHALL BE CERTIFIED BY A HAWAII LICENSED PROFESSIONAL LAND SURVEYOR ATTESTING TO THE LOCATION AND ELEVATIONS OF ALL MAJOR COMPONENTS OF THE WASTEWATER COLLECTION SYSTEM AS SHOWN ON THE AS–BUILT PLANS.

EXISTING CONDITION ASSESSMENT:

1. THE CONTRACTOR SHALL KEEP ALL PROJECT ACTIVITIES WITHIN THE PROJECT AREA. IN THE EVENT THAT A PREVIOUSLY UNKNOWN ARCHAEOLOGICAL FEATURE, HISTORIC PROPERTY, OR HUMAN REMAINS (INCLUDING HUMAN SKELETAL REMAINS, CREMATIONS, CEREMONIAL OBJECTS, FUNERARY OBJECTS, BURIAL GOODS, ETC.) ARE EXPOSED BY CONSTRUCTION, THE CONTRACTOR SHALL CEASE WORK IN THE VICINITY IMMEDIATELY AND NOTIFY THE WWD, STATE OF HAWAI'I HISTORIC PRESERVATION DIVISION (SHPD), THE APPROPRIATE MEDICAL EXAMINER OR CORONER, AND THE APPROPRIATE POLICE DEPARTMENT, OF THE DISCOVERY. THE CONTRACTOR SHALL PROTECT THE AREA OF THE REMAINS WITH AN APPROPRIATE MATERIAL. THE CONTRACTOR SHALL COOPERATE WITH THE POLICE OR DEPARTMENT OF LAND AND NATURAL RESOURCES IN THE INVESTIGATION, RECORDING, PRESERVATION AND SALVAGE.

CONCRETE NOTES

1. DESIGN AND CONSTRUCTION SHALL CONFORM TO THE LATEST "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" OF THE AMERICAN CONCRETE INSTITUTE.
2. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT THE AGE OF 28 DAYS UNLESS NOTED OTHERWISE.
3. ALL REINFORCING SHALL BE ASTM A–615 GRADE 60.
4. ARRANGEMENT AND DETAILS OF REINFORCING STEEL, INCLUDING BAR SUPPORTS AND SPLICES, SHALL BE IN ACCORDANCE WITH THE LATEST ACI 315 DETAIL MANUAL.
5. ALL SLAB REINFORCING SHALL HAVE A MINIMUM EXTENSION INTO THE SUPPORT IN ACCORDANCE WITH THE LATEST ACI CODE. IF SUCH EXTENSION IS NOT POSSIBLE, BARS SHOULD TERMINATE IN STANDARD HOOKS.
6. ALL REINFORCING SHALL LAP A MINIMUM OF 1.76 Ld AT SPLICES UNLESS OTHERWISE SHOWN. FOR TOP BARS INCREASE LAP BY A FACTOR OF 1.4.

BAR SIZE	TENSION DEVELOPMENT LENGTH
#3	12–INCHES
#4	12–INCHES
#5	15–INCHES
#6	19–INCHES
#7	26–INCHES
#8	35–INCHES

7. WHEREVER IT IS NECESSARY TO SPLICE REINFORCEMENT OTHERWISE THAN IS SHOWN ON THE CONTRACT DRAWINGS, THE CHARACTER OF THE SPLICE SHALL BE AS SPECIFIED BY THE ENGINEER. SPLICING SHALL BE STAGGERED.
8. HOOK BARS AT OPENINGS.
9. ALL EXPOSED EDGES AND CORNERS OF CONCRETE SHALL BE CHAMFERED 3/4–INCH UNLESS OTHERWISE NOTED.
10. UNLESS OTHERWISE SHOWN, THE MINIMUM COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

CONCRETE CAST AGAINST THE EARTH	3 INCHES
CONCRETE EXPOSED TO EARTH OR WEATHER	2–1/2 INCHES
CONCRETE EXPOSED TO INTERIOR TANK ATMOSPHERE	2 INCHES
ALL OTHER EXPOSURES	1–1/2 INCHES

11. ALL REINFORCING MARKED CONTINUOUS (CONT.) ON THE PLANS SHALL BE LAPPED AS REQUIRED, UNDER NOTE NO. 6, AT ALL SPLICES, LAPS, CORNERS AND INTERSECTIONS.

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

CONSTRUCTION NOTES 4

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257–C
HAWAII, USA

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 5 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: MLUM
Last Saved: 10/25/2019
Plotted on: 3/9/2020
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ABBREVIATIONS

A	AREA
AC	ASPHALTIC CONCRETE
ACS	ACRES
ARV	AIR RELIEF VALVE
BC	BOTTOM OF CURB
BM	BENCHMARK
BMP	BEST MANAGEMENT PRACTICES
BV	BOTTOM VERTICAL
BVC	BEGIN VERTICAL CURVE
℄	CENTER LINE
CB	CATCH BASIN
CFS	CUBIC FEET PER SECOND
CLR	CLEARANCE
CO	CLEANOUT
CONC	CONCRETE
CONN	CONNECTION
DIA	DIAMETER
DPP	DEPARTMENT OF PLANNING AND PERMITTING
DPW	DEPARTMENT OF PUBLIC WORKS
DW	DRYWELL
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
EVC	END VERTICAL CURVE
EXIST	EXISTING
FE	FLANGE END
FG	FINISH GRADE
FH	FIRE HYDRANT
FIN	FINISH
FT	FEET
GV	GATE VALVE
H/HORIZ	HORIZONTAL
HECO	HAWAIIAN ELECTRIC COMPANY
HGL	HYDRAULIC GRADE LINE
HP	HIGH POINT
HT	HEIGHT
HTCO/HTEL	HAWAIIAN TELCOM
ID	INNER DIAMETER
INV	INVERT
IPT	IRON PIPE THREAD
LAT	LATERAL
LC	LENGTH OF CURVE
LF	LINEAR FOOT/FEET
LT	LEFT
MAX	MAXIMUM
MH	MANHOLE
MIN	MINIMUM
MJ	MECHANICAL JOINT
NGPC	NOTICE OF GENERAL PERMIT COVERAGE
NO.	NUMBER
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NTS	NOT TO SCALE
O/S	OFFSET
OC	ON CENTER
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
ℙ	PROPERTY LINE
PAVT	PAVEMENT
PC	POINT ON CURVE
PE	PLAIN END
PI	POINT OF INTERSECTION
POC	POINT OF CONNECTION
PT	POINT, POINT ON TANGENT
PVC	POLYVINYL CHLORIDE
PVI	POINT OF VERTICAL INTERSECTION
Q	FLOW
R	RADIUS OF CURVE
R/W	RIGHT-OF-WAY
REINF	REINFORCED
RT	RIGHT
S	SOUTH, SEWER, SLOPE
SF	SQUARE FOOT
SHT	SHEET
SMH	SEWER MANHOLE
STA.	STATION
STD	STANDARD
STRUCT	STRUCTURAL
T	TOP
TC	TOP OF CURB
TEMP	TEMPORARY
THK	THICK
T.M.K.	TAX MAP KEY
TV	TOP VERTICAL
TYP	TYPICAL
V/VERT	VERTICAL
VB	VALVE BOX
W	WATER, WEST
W/	WITH
WL	WATER LINE
WSS	WATER SYSTEM STANDARD
WWD	WASTEWATER DIVISION

Last Save by: LRS
Last Saved: 6/5/2019
Plotted on: 3/9/2020

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REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

ABBREVIATIONS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

KANIOHALE LOOP

KEANALEHU DRIVE

TRUE NORTH
SCALE: 1" = 100'

BENCH MARK
EXIST. STREET MON.
(BRASS PIN)
PIN ELEV. = 388.24

LAIOPUA VILLAGE 3
(EXISTING)

321° 18' 29"
1665.46'
(BENCH MARK EXIST.
STREET MON. (BRASS PIN)
TO EXIST ST MON.)

CBU (USPS)
LOT (BY
OTHERS)

LOT (BY
OTHERS)

RETAINING
WALL

AKAU (BY OTHERS) SUBDIVISION

KO'OKO'OLAU ST (BY OTHERS)

ALTERNATE
BID
(LOTS 88
TO 108)

KAWELU PL

PUAKALA PL (44' R/W)

OHEMAKAI ST EXT (44' R/W)

KOAI'A ST (44' R/W)

ILIE'E PL (44' R/W)

MANAWALE'A STREET

(BASE BID)
WATER
STUB

(BASE BID)
SEWER
STUB

END FENCING
AND GUARDRAIL

263° 39' 42"
162.30'
(ST SURVEY MON.
TO END FENCING
AND GUARDRAIL)

8'x8' ELECTRICAL EASEMENT
IN FAVOR OF HELCO
(TYP FOR ALL EASEMENTS)

PROJECT LIMITS

10' WIDE "NO VEHICULAR ACCESS"
PLANTING SCREEN EASEMENT

RETAINING WALL

COMMON ACCESS EASEMENT
358° 34' 00"
178.18'
(ST SURVEY MON. TO
BEGIN FENCING AND
GUARDRAIL)

10' WIDE "NO VEHICULAR ACCESS"
PLANTING SCREEN EASEMENT

PROJECT LIMITS

BEGIN FENCING
AND GUARDRAIL

LEGEND

E/W8	EXIST. WATER LINE
-W8-	NEW WATER LINE
E/D24	EXIST. DRAIN LINE
-D24-	NEW DRAIN LINE
E	EXIST. UTILITY/ELECT. LINE
E/S8	EXIST. SEWER LINE
-S8-	NEW SEWER LINE
	DOUBLE SERVICE SEWER LATERAL
	SINGLE SERVICE SEWER LATERAL
	FIRE HYDRANT
	1 1/2" DOUBLE SERVICE WATER LATERAL W/ TYPE C CONNECTION FOR TWO 5/8" METERS
	1" SINGLE SERVICE WATER LATERAL W/ TYPE A CONNECTION FOR ONE 5/8" METER
(17)	LOT NUMBER
	AKAU/HEMA BOUNDARY LINE/ PROJECT LIMITS
	TRANSFORMER
	NEW PRIVACY FENCE & GUARDRAIL
	NEW RETAINING WALL

NOTES:
1. ALL LOTS TO BE SERVICED BY GRAVITY SEWER.
2. WATER AND SEWER LATERALS FOR LOTS 85–108 MAY BE INSTALLED UNDER AN ADDITIVE ALTERNATE. HOWEVER, LOTS WILL NOT BE SERVICED UNTIL WATER IS AVAILABLE.
3. IF LAVA TUBES ARE ENCOUNTERED DURING TRENCH EXCAVATION FOR SEWER LINES, CONTRACTOR SHALL NOTIFY AND COORDINATE WITH WWD.
4. DUE TO LIMITED WATER AVAILABILITY, BASE BID WILL INCLUDE THE CONSTRUCTION OF UTILITIES AND ROADWAYS FOR OHEMAKAI ST EXT, ILIE'E PL, KOAIA ST, AND PUAKALA PL. KAWELU PL (LOTS 88 TO 108) WILL BE CONSTRUCTED UNDER THE FOLLOWING ADDITIVE ALTERNATIVE BID ITEMS:
   - BASE BID – GRADE LOTS, BLAST AND HAMMER UTILITY TRENCHES. BACKFILL WITH 6" MINUS.
   - ALTERNATE 1 – INSTALLATION OF SEWER AND DRAINAGE SYSTEM.
   - ALTERNATE 2 – INSTALLATION OF WATER MAIN. WATER LATERALS WILL NOT BE INSTALLED UNDER THIS PROJECT.
   - ALTERNATE 3 – INSTALLATION OF ELECTRICAL SYSTEM, ROADWAY, SIDEWALKS, AND SIGNAGE.

GENERAL LAYOUT PLAN
SCALE: 1" = 100'

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

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Last Saved: 9/6/2019
Plotted on: 3/9/2020
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

GENERAL LAYOUT PLAN

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

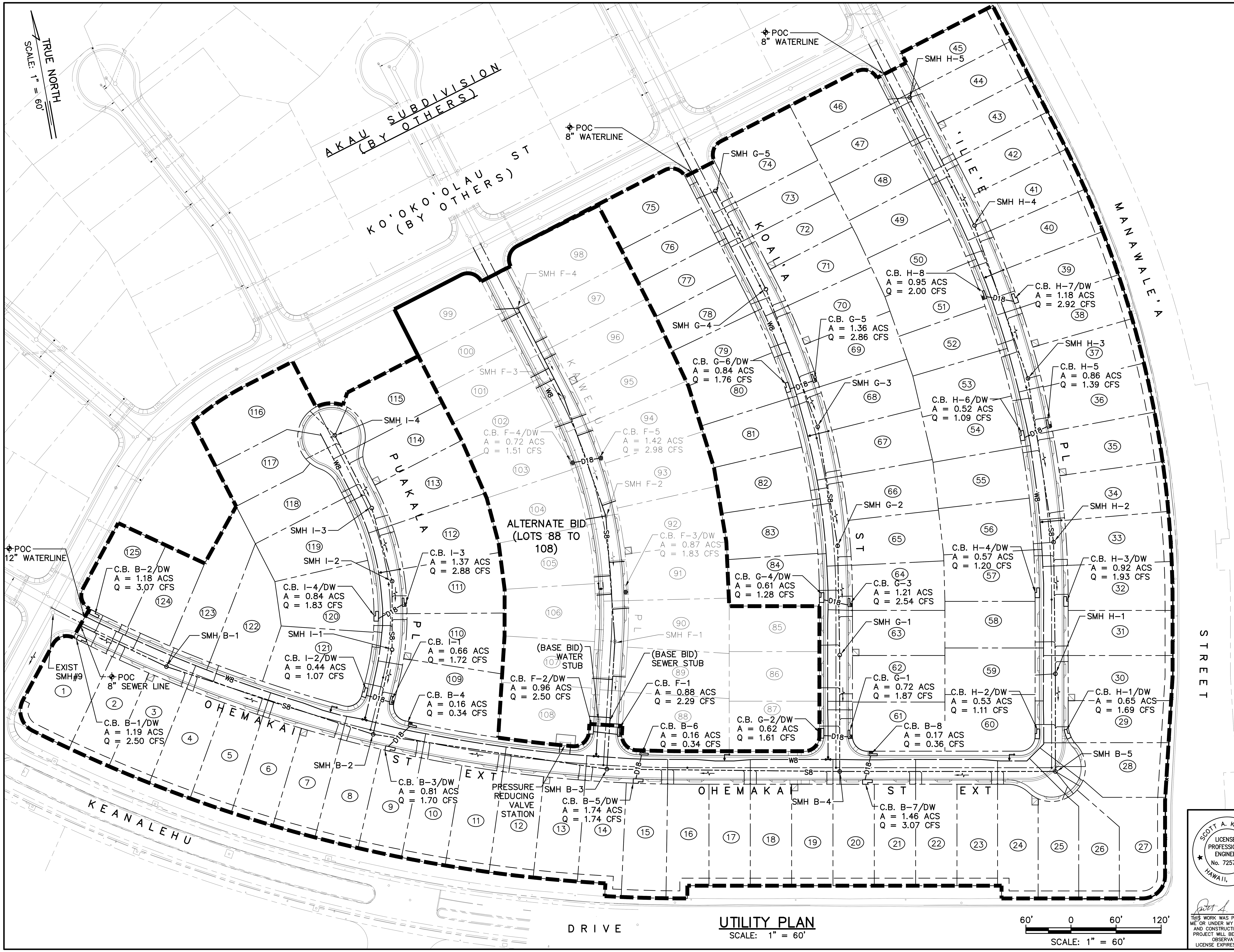
Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 7 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.



TRUE NORTH
SCALE: 1" = 60'
AKAU SUBDIVISION (BY OTHERS)
KO'OKO'OLAU ST (BY OTHERS)
POC 8" WATERLINE
POC 8" WATERLINE
POC 12" WATERLINE
EXIST SMH#9
POC 8" SEWER LINE
SMH H-5
SMH H-4
SMH H-3
SMH H-2
SMH H-1
SMH B-5
SMH G-5
SMH G-4
SMH G-3
SMH G-2
SMH G-1
SMH F-4
SMH F-3
SMH F-2
SMH F-1
SMH I-4
SMH I-3
SMH I-2
SMH I-1
SMH B-1
SMH B-2
SMH B-3
SMH B-4
C.B. H-8 A = 0.95 ACS Q = 2.00 CFS
C.B. H-7/DW A = 1.18 ACS Q = 2.92 CFS
C.B. H-6/DW A = 0.52 ACS Q = 1.09 CFS
C.B. H-5 A = 0.86 ACS Q = 1.39 CFS
C.B. H-4/DW A = 0.57 ACS Q = 1.20 CFS
C.B. H-3/DW A = 0.92 ACS Q = 1.93 CFS
C.B. H-2/DW A = 0.53 ACS Q = 1.11 CFS
C.B. H-1/DW A = 0.65 ACS Q = 1.69 CFS
C.B. G-5 A = 1.36 ACS Q = 2.86 CFS
C.B. G-6/DW A = 0.84 ACS Q = 1.76 CFS
C.B. G-4/DW A = 0.61 ACS Q = 1.28 CFS
C.B. G-3 A = 1.21 ACS Q = 2.54 CFS
C.B. G-2/DW A = 0.62 ACS Q = 1.61 CFS
C.B. G-1 A = 0.72 ACS Q = 1.87 CFS
C.B. F-5 A = 1.42 ACS Q = 2.98 CFS
C.B. F-4/DW A = 0.72 ACS Q = 1.51 CFS
C.B. F-3/DW A = 0.87 ACS Q = 1.83 CFS
C.B. F-2/DW A = 0.96 ACS Q = 2.50 CFS
C.B. F-1 A = 0.88 ACS Q = 2.29 CFS
C.B. I-3 A = 1.37 ACS Q = 2.88 CFS
C.B. I-4/DW A = 0.84 ACS Q = 1.83 CFS
C.B. I-1 A = 0.66 ACS Q = 1.72 CFS
C.B. I-2/DW A = 0.44 ACS Q = 1.07 CFS
C.B. B-1/DW A = 1.19 ACS Q = 2.50 CFS
C.B. B-2/DW A = 1.18 ACS Q = 3.07 CFS
C.B. B-3/DW A = 0.81 ACS Q = 1.70 CFS
C.B. B-4 A = 0.16 ACS Q = 0.34 CFS
C.B. B-5/DW A = 1.74 ACS Q = 1.74 CFS
C.B. B-6 A = 0.16 ACS Q = 0.34 CFS
C.B. B-7/DW A = 1.46 ACS Q = 3.07 CFS
C.B. B-8 A = 0.17 ACS Q = 0.36 CFS
ALTERNATE BID (LOTS 88 TO 108)
(BASE BID) WATER STUB
(BASE BID) SEWER STUB
PRESSURE REDUCING VALVE STATION
KOALI'A ST
'ILIE'E PL
KAWELU PL
PUAKALA PL
MANAWALE'A STREET
OHEMAKAI ST EXT
KEANALEHU DRIVE

UTILITY PLAN
SCALE: 1" = 60'

60' 0 60' 120'
SCALE: 1" = 60'

LEGEND

—E/W8—	EXIST. WATER LINE
-W8-	NEW WATER LINE
—E/D24—	EXIST. DRAIN LINE
-D24-	NEW DRAIN LINE
—e—	EXIST. UTILITY/ELECT. LINE
—E/S8—	EXIST. SEWER LINE
-S8-	NEW SEWER LINE
	DOUBLE SERVICE SEWER LATERAL
	SINGLE SERVICE SEWER LATERAL
	FIRE HYDRANT
	1 1/2" DOUBLE SERVICE WATER LATERAL W/ TYPE C CONNECTION FOR TWO 5/8" METERS
	1" SINGLE SERVICE WATER LATERAL W/ TYPE A CONNECTION FOR ONE 5/8" METER
	TRANSFORMER
(17)	LOT NUMBER
	SEWER FLOW DIRECTION
	AKAU/HEMA BOUNDARY LINE/ PROJECT LIMITS

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

UTILITY PLAN

SCOTT A. KUNIOKA LICENSED PROFESSIONAL ENGINEER No. 7257-C HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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SHEET 8 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: MLUM
Last Saved: 9/6/2019
Plotted on: 3/9/2020
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GRADING NOTES

1. PROVIDE SILT FENCE AT BOTTOM OF SLOPE
   SEE DETAIL 2/10
2. PROVIDE DUST SCREEN
   SEE DETAIL 3/10
3. PROVIDE CATCH BASIN SEDIMENT CONTROL DEVICE
   SEE DETAIL 1/10
4. PROVIDE 20' WIDE x 50' LONG GRAVEL INGRESS/EGRESS FOR VEHICULAR ACCESS 8" THICK #3 GRAVEL

LEGEND

- EXIST. CONTOURS
- FINISH CONTOUR LINES
- SILT FENCE
- DUST SCREEN
- FUTURE LOT LINE
- (17) LOT NUMBER
- FLOW ARROW

EROSION & DUST CONTROL PLAN

SCALE: 1" = 80'

80' 0 80' 160'

SCALE: 1" = 80'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

EROSION & DUST CONTROL PLAN

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FILE	POCKET	FOLDER	NO.

SHEET 9 OF 68 SHEETS

Last Save by: LRS
Last Saved: 12/17/2019
Plotted on: 3/9/2020

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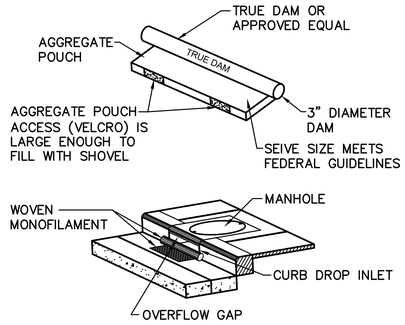
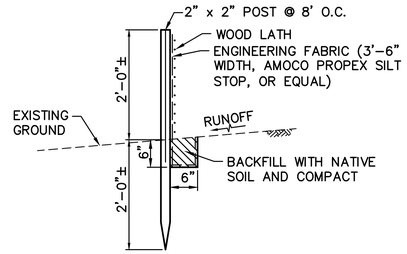


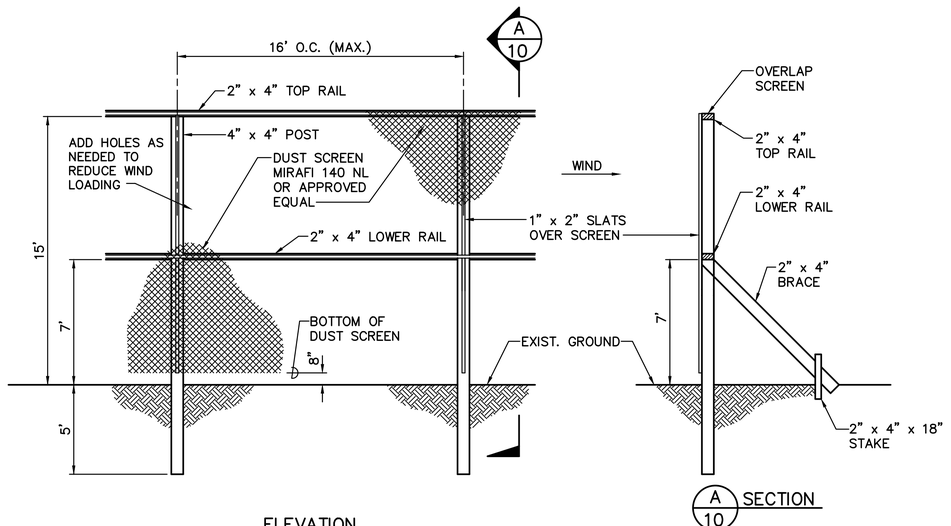
1/10 SEDIMENT CONTROL DEVICE FOR CATCH BASINS

NOT TO SCALE



2/10 SILT FENCE INSTALLATION

NOT TO SCALE



NOTE:

DUST SCREEN SHALL BE MAINTAINED FOR DURATION OF CONSTRUCTION AND REMOVED UPON ITS COMPLETION.

3/10 DUST SCREEN DETAIL

NOT TO SCALE

NOTES TO CONTRACTOR:

1. CONTRACTOR SHALL MAINTAIN SEDIMENT BARRIERS AND/OR TRAPS.
2. CONTRACTOR SHALL MAINTAIN ALL TEMPORARY BMP MEASURES UNTIL THE ENTIRE AREA IS COMPLETELY STABILIZED. ALL BMP MEASURES SHALL BE REMOVED IMMEDIATELY AFTER THE AREA IS COMPLETELY STABILIZED.

Last Save by: LRS
Last Saved: 2/17/2015
Plotted on: 3/9/2020
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

EROSION CONTROL DETAILS

SCOTT A. KUNIOKA
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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

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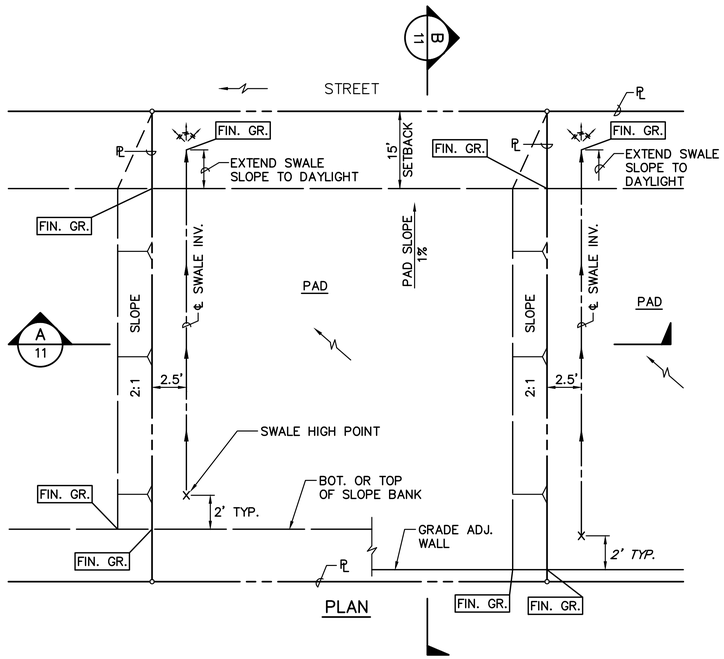
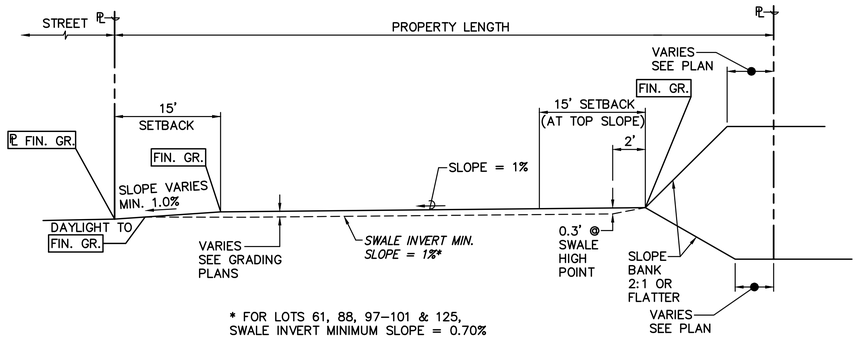
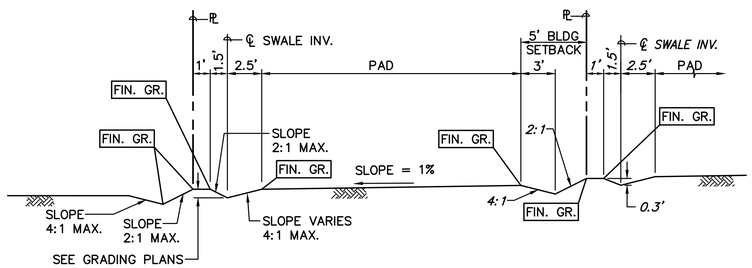




B 11 TYPICAL LONGITUDINAL SECTION OF PROPERTY

NOT TO SCALE



SECTION "A–A"

A 11 TYPICAL LOT GRADING DETAIL

NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

TYPICAL LOT GRADING DETAILS

SCOTT A. KUNIOKA
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COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

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FILE	POCKET	FOLDER	NO.

SHEET 11 OF 68 SHEETS

Last Save by: LRS
Last Saved: 8/22/2017
Plotted on: 3/9/2020
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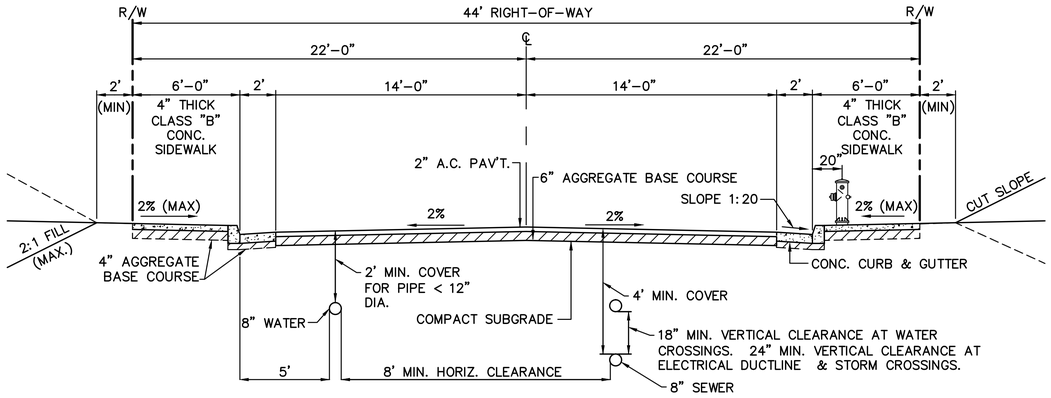
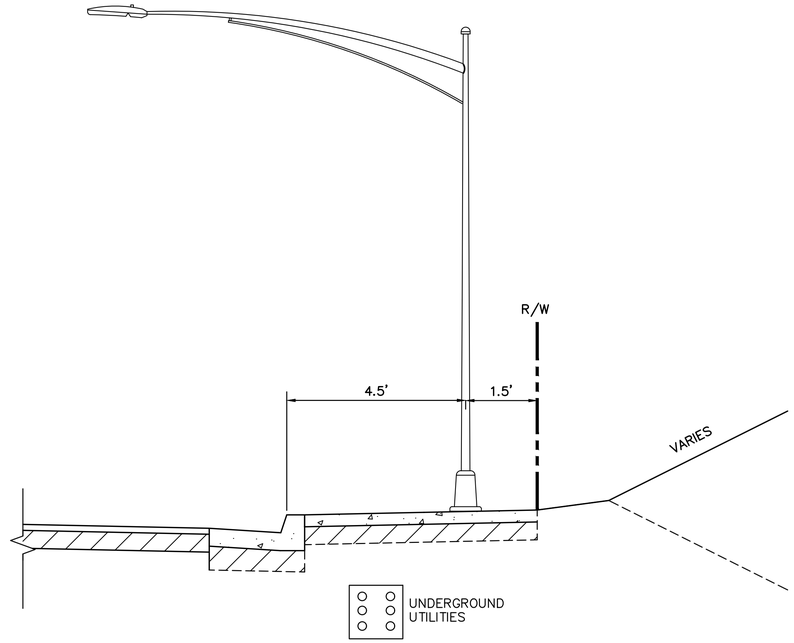


1/12 TYPICAL SECTION – 44 FT. ROAD RIGHT-OF-WAY

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



2/12 TYPICAL SECTION – SIDEWALK

SCALE: NOT TO SCALE

4' 0 4' 8'

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

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

TYPICAL SECTIONS

SCOTT A. KUNIOKA LICENSED PROFESSIONAL ENGINEER No. 7257-C HAWAII, U.S.A.

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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FILE	POCKET	FOLDER	NO.

SHEET 12 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/25/2019
Plotted on: 3/9/2020

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TRUE NORTH
SCALE: 1" = 40'

FOR CONTINUATION SEE SHEET 14

LEGEND

- EXIST. CONTOURS
- FINISH CONTOUR LINES
- FUTURE LOT LINE
- (17) LOT NUMBER
- 442.94 FINISH SPOT GRADE
- eg/ts EXISTING GROUND/TOP OF SIDEWALK
- NEW 2:1 SLOPE
- FLOW DIRECTION
- SWALE

EARTHWORK QUANTITIES

EXC. = 38,880 CU. YDS.
EMB. = 31,300 CU. YDS.
AREA TO BE GRADED = 27.3 ACS.

NOTES:
1. EARTHWORK QUANTITIES ARE FOR GRADING PERMIT PURPOSES.
2. QUANTITIES DO NOT INCLUDE SHRINKAGE AND GRUBBING LOSSES.
3. CONTRACTOR SHALL VERIFY EXIST SITE CONDITIONS PRIOR TO BID.
4. SEE TYPICAL LOT GRADING DETAILS, SHEET 11 FOR SWALE DETAILS.

GRADING PLAN 1
SCALE: 1" = 40'

40' 0 40' 80'
SCALE: 1" = 40'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

GRADING PLAN 1

SCOTT A. KUNIOKA
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FILE	POCKET	FOLDER	NO.

SHEET 13 OF 68 SHEETS

Last Save by: LRS
Last Saved: 8/22/2017
Plotted on: 3/9/2020
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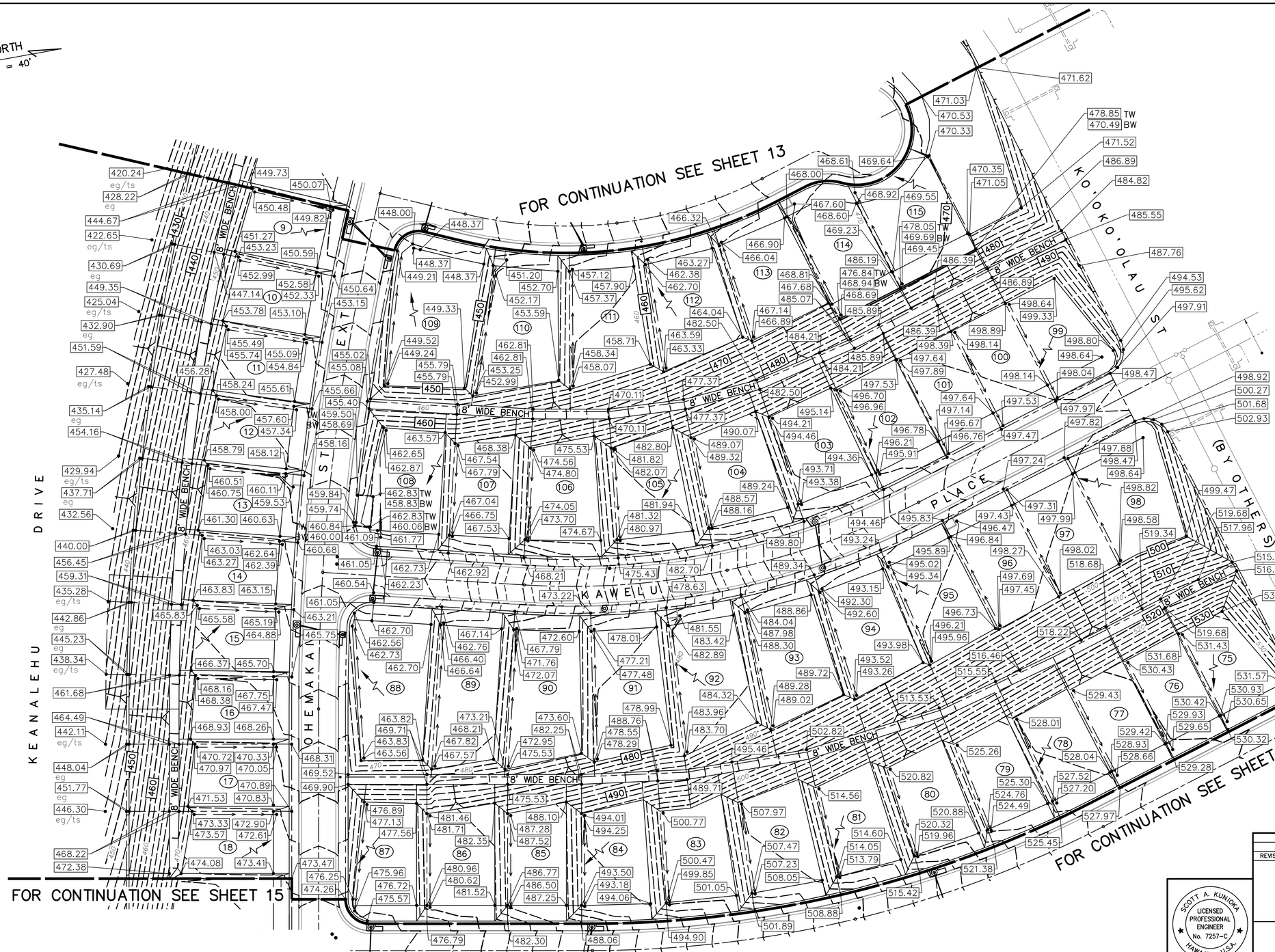
TRUE NORTH
SCALE: 1" = 40'



LEGEND

- EXIST. CONTOURS
- 440 FINISH CONTOUR LINES
- GRADING PHASE CONTOUR LINES
- FUTURE LOT LINE
- (17) LOT NUMBER
- 442.94 FINISH SPOT GRADE
- eg/ts EXISTING GROUND/TOP OF SIDEWALK
- TW/BW TOP OF WALL/BOTTOM OF WALL ELEVATION
- NEW 2:1 SLOPE
- FLOW DIRECTION
- SWALE

NOTE:
SEE TYPICAL LOT GRADING DETAILS, SHEET 11 FOR SWALE DETAILS.

GRADING PLAN 2
SCALE: 1" = 40'

40' 0 40' 80'
SCALE: 1" = 40'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

GRADING PLAN 2

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, U.S.A.

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COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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CONSULTING ENGINEERS

SHEET 14 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 8/22/2017
Plotted on: 3/9/2020
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LEGEND

440 (dashed)	EXIST. CONTOURS
440 (boxed)	FINISH CONTOUR LINES
(dashed line)	FUTURE LOT LINE
(17)	LOT NUMBER
442.94	FINISH SPOT GRADE
eg/ts/tb	EXISTING GROUND/TOP OF SIDEWALK/TOP OF BANK
TW/FF/BF/BW	TOP WALL/FRONT FACE/BOTTOM FACE/BOTTOM WALL
(symbol)	NEW 2:1 SLOPE
(symbol)	FLOW DIRECTION
(symbol)	SWALE

NOTE:
SEE TYPICAL LOT GRADING DETAILS, SHEET 11 FOR SWALE DETAILS.

GRADING PLAN 3
SCALE: 1" = 40'

40' 0 40' 80'
SCALE: 1" = 40'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
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GRADING PLAN 3

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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SHEET 15 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: KNL G:\DHHL11-02 Laiopua Village
Last Saved: 10/11/2017 4\ACAD\DHHL1102-Grading Plan 3.DWG
Plotted on: 3/9/2020

ROAD NOTES

(R1) STA 0+00 ℄ OHEMAKAI ST EXT
= STA 9+30.19 ℄ EXIST OHEMAKAI ST
= STA 2+14 ℄ KO'OKO'OLAU ST
EXIST INT ST MON
TOP OF PIN EL=431.03

(R2) STA 0+43.01 ℄ OHEMAKAI ST EXT
PROVIDE SMOOTH RIDING CONNECTION
SEE DETAIL SHT 43

(R3) STA 0+43.97 ℄ OHEMAKAI ST EXT
MATCH NEW CURB, GUTTER AND
SIDEWALK TO EXIST

(R4) STA 0+45.01 ℄ OHEMAKAI ST EXT
BEGIN OHEMAKAI ST EXT
REMOVE EXIST CONC HEADER AND
END ROAD BARRIER W/MARKERS

(R5) STA 0+46.08 ℄ OHEMAKAI ST EXT
MATCH NEW CURB, GUTTER AND
SIDEWALK TO EXIST

(R6) STA 4+31.36 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEEL CHAIR RAMP
SEE DETAIL SHT 28 & 29

(R7) STA 4+55.82 ℄ OHEMAKAI ST EXT
= STA 0+00 ℄ PUAKALA PL
INSTALL ST SURVEY MON
TOP OF PIN EL=447.00

(R8) STA 4+79.97 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEEL CHAIR RAMP
SEE DETAIL SHT 28 & 29

SEWER NOTES

(S1) STA 0+45.75 O/S 3.53' RT ℄ OHEMAKAI ST EXT
CONN NEW 8" PIPE TO EXIST 8" PIPE
INV=422.77 (CONTRACTOR TO FIELD VERIFY, SEE NOTE 1)
REMOVE:
1 – 8" CAP
1 – PIPE MARKER

(S2) STA 1+71.88 O/S 5' RT ℄ OHEMAKAI ST EXT
CONSTRUCT SMH "B–1"
TOP=434.01
INV=425.60 (8", 6")

(S3) STA 4+60.80 O/S 5' RT ℄ OHEMAKAI ST EXT
CONSTRUCT SMH "B–2"
TOP=447.13
INV=435.75

(S4) SMH 9 (BY OTHERS)
INV=421.73

WATER NOTES

(W1) STA 0+45.52 O/S 10.48' LT ℄ OHEMAKAI ST EXT
CONN NEW 8" PIPE TO EXIST 12" PIPE
REMOVE & SALVAGE:
1 – 12" CAP
1 – 2" CO & BOX
1 – CONC BLOCK
INSTALL:
1 – 12" SLEEVE, 12" LONG
1 – 12"X8" REDUCER. PE X MJ, SEB
TEMP FOR TESTING:
1 – 8" CAP TAPPED FOR 2" IPT
1 – 2" CO
1 – CONC BLOCK

(W2) STA 0+65 O/S 10.47' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W3) STA 1+08.76 O/S 11' LT ℄ OHEMAKAI ST EXT
BEGIN WL PIPE DEFLECTION

(W4) STA 2+10 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W5) STA 3+59.97 O/S 11' LT ℄ OHEMAKAI ST EXT
END WL PIPE DEFLECTION

(W6) STA 3+87.67 O/S 9' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W7) STA 3+98 O/S 11' LT ℄ OHEMAKAI ST EXT
INSTALL:
TYPE "A" FH CONN
1 – 8"X6" TEE, MJ x FE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" 1/4 BEND, MJ
1 – 6" HYDRANT ELBOW, MJ
14 LF 6" PIPE
1 – FH (HT=3')
3 – CONC BLOCK

(W8) STA 4+12.80 O/S 9' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W9) STA 4+40.52 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W10) STA 4+45.25 O/S 11' LT ℄ OHEMAKAI ST EXT
INSTALL:
1 – 8" TEE, MJ
3 – 8" GV, MJ
3 – VALVE BOX & COVER
1 – CONC BLOCK

(W11) STA 4+91.59 O/S 10.47' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

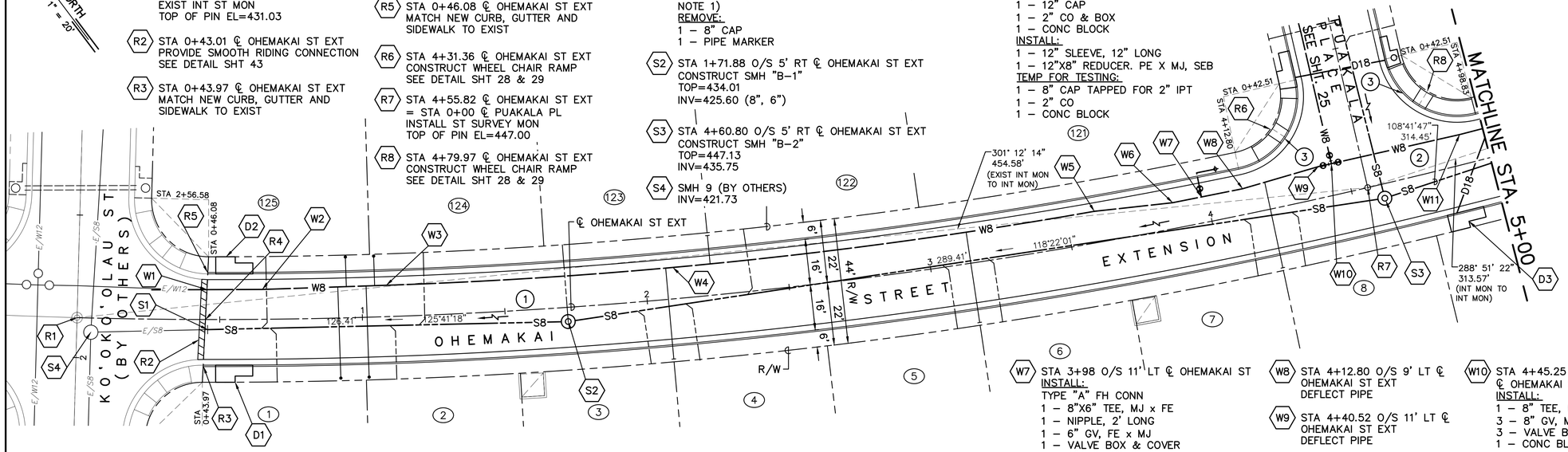
CURVE DATA			
CURVE	(1)	(2)	(3)
Δ	14°37'22"	10°04'21"	91°22'49"
Δ/2	7°48'41"	5°02'10.5"	45°41'24.5"
R	1786.00	1786.00	26.00
T	229.15	157.40	26.63
C	454.58	313.57	37.21
Lc	455.82	313.98	41.47

DRAIN NOTES

(D1) STA 0+51.96 ℄ OHEMAKAI ST EXT
CONSTRUCT CB "B–1"/DW
INV=426.76 (CB)
INV=406.76 (DW)
SEE STRUCTURAL SHEETS S–1, S–2 & S–3

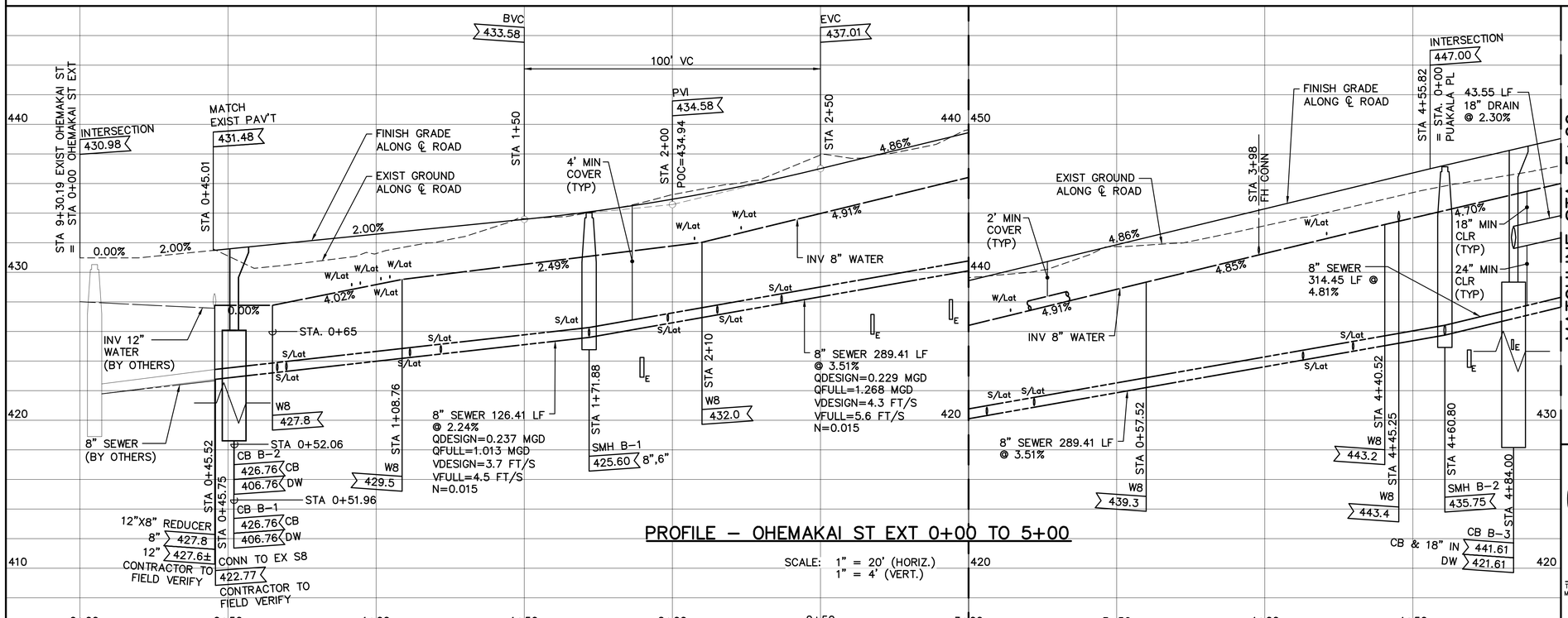
(D2) STA 0+52.06 ℄ OHEMAKAI ST EXT
CONSTRUCT CB "B–2"/DW
INV=426.09 (CB)
INV=406.09 (DW)
SEE STRUCTURAL SHEETS S–1, S–2 & S–3

(D3) STA 4+84.00 ℄ OHEMAKAI ST EXT
CONSTRUCT CB "B–3"/DW
INV=441.61 (CB & 18")
INV=421.61 (DW)
SEE STRUCTURAL SHEETS S–1, S–2 & S–3



PLAN – OHEMAKAI ST EXT 0+00 TO 5+00

SCALE: 1" = 20'



PROFILE – OHEMAKAI ST EXT 0+00 TO 5+00

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

NOTES:
1. IF THE ELEVATION OF THE EXISTING STUB OUT VARIES FROM THE PLANNED ELEVATION, THE CONTRACTOR SHALL OBTAIN THE ENGINEERS AND WWD APPROVAL OF ANY ASSOCIATED PLAN CHANGES BEFORE PROCEEDING WITH CONSTRUCTION.
2. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL (6/41)
3. ALL SEWER CLEANOUT FRAMES & COVERS SHALL BE TRAFFIC RATED.
4. ALL SEWER LINES ARE GRAVITY LINES.

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

PLAN & PROFILE
OHEMAKAI ST EXTENSION (ROAD "B–1")
STA. 0+00 TO 5+00

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257–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 4/30/22

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 16 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/26/2019
Plotted on: 3/9/2020
G:\DHHL11–02 Laiopua Village 4\ACAD\DHHL1102–Plan & Profile–Road B–1 1.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) STA 7+45.23 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEELCHAIR RAMP
SEE DETAIL SHT 28 & 29

(R2) STA 7+69.79 ℄ OHEMAKAI ST EXT
= STA 0+00 ℄ KAWELU PL
INSTALL ST SURVEY MON
TOP OF PIN EL=461.50

(R3) STA 7+94.36 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEELCHAIR RAMP
SEE DETAIL SHT 28 & 29

(R4) PT STA 8+81.59 ℄ OHEMAKAI ST EXT
INSTALL ST SURVEY MON
TOP OF PIN EL=466.75

SEWER NOTES

(S1) STA 7+74.77 O/S 5' RT ℄ OHEMAKAI ST EXT
CONSTRUCT SMH "B-3"
TOP=461.63
INV=450.89

WATER NOTES

(W1) STA 5+13.50 O/S 10.47' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W2) STA 5+57.27 O/S 11' LT ℄ OHEMAKAI ST EXT BEGIN WL PIPE DEFLECTION

(W3) STA 5+67.50 O/S 11' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W4) STA 7+09.75 O/S 11' LT ℄ OHEMAKAI ST EXT END WL PIPE DEFLECTION
INSTALL:
1 – 8" 1/4 BEND, MJ
1 – 8"X4" REDUCER, SEB
1 – CONC BLOCK

(W5) PRESSURE REDUCING VALVE STATION
SEE DETAILS SHT 40

(W6) STA 7+23.94 O/S 11' LT ℄ OHEMAKAI ST EXT BEGIN WL PIPE DEFLECTION
INSTALL:
1 – 8" 1/4 BEND, MJ
1 – CONC BLOCK

(W7) STA 7+59.23 O/S 11' LT ℄ OHEMAKAI ST EXT
INSTALL:
1 – 8" TEE, MJ
3 – 8" GV, MJ
3 – VALVE BOX & COVER
1 – CONC BLOCK

(W8) STA 7+61.92 O/S 11' LT ℄ OHEMAKAI ST EXT END WL PIPE DEFLECTION

(W9) STA 8+07 O/S 10.43' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W10) STA 8+30 O/S 10.46' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W11) STA 8+93.09 O/S 11' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W12) STA 9+18.50 O/S 9' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W13) STA 9+31 O/S 9' LT ℄ OHEMAKAI ST EXT
INSTALL:
TYPE "A" FH CONN
1 – 8"X6" TEE, MJ x FE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" 1/4 BEND, MJ
1 – 6" HYDRANT ELBOW, MJ
17 LF 6" PIPE
1 – FH (HT=4.5')
3 – CONC BLOCKS

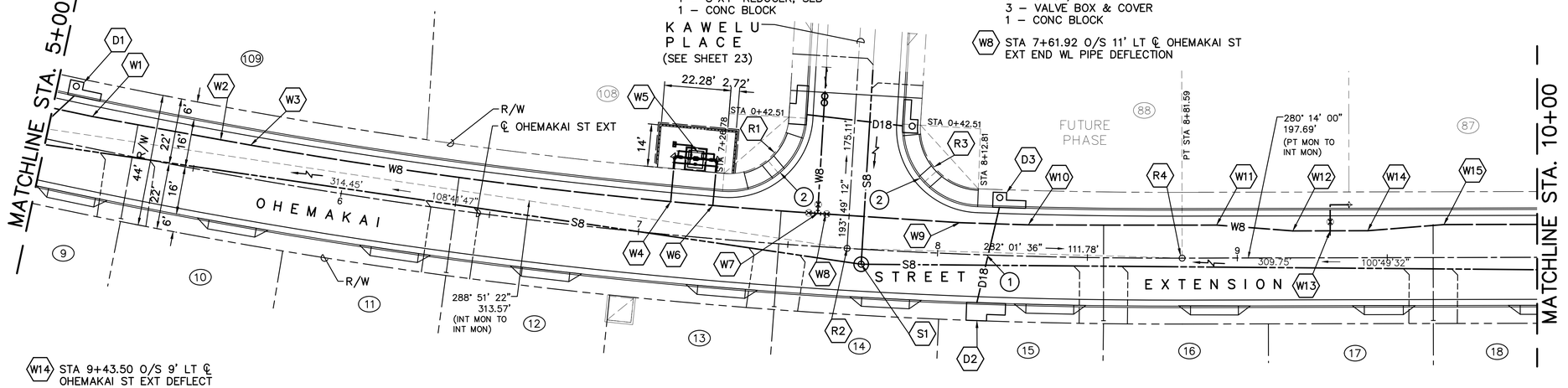
CURVE DATA		
CURVE	(1)	(2)
△	10°04'21"	91°22'49"
△/2	5°02'10.5"	45°41'24.5"
R	1786.00	26.00
T	157.40	26.63
C	313.57	37.21
Lc	313.98	41.47

DRAIN NOTES

(D1) STA 5+06.15 ℄ OHEMAKAI ST EXT
TYPE "A" CB "B-4"
INV=442.61 (18")

(D2) STA 8+13.71 ℄ OHEMAKAI ST EXT
CONSTRUCT CB "B-5"/DW
INV=457.30 (CB & 18")
INV=437.30 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D3) STA 8+20.12 ℄ OHEMAKAI ST EXT
CONSTRUCT TYPE "A" CB "B-6"
INV=457.55 (18")

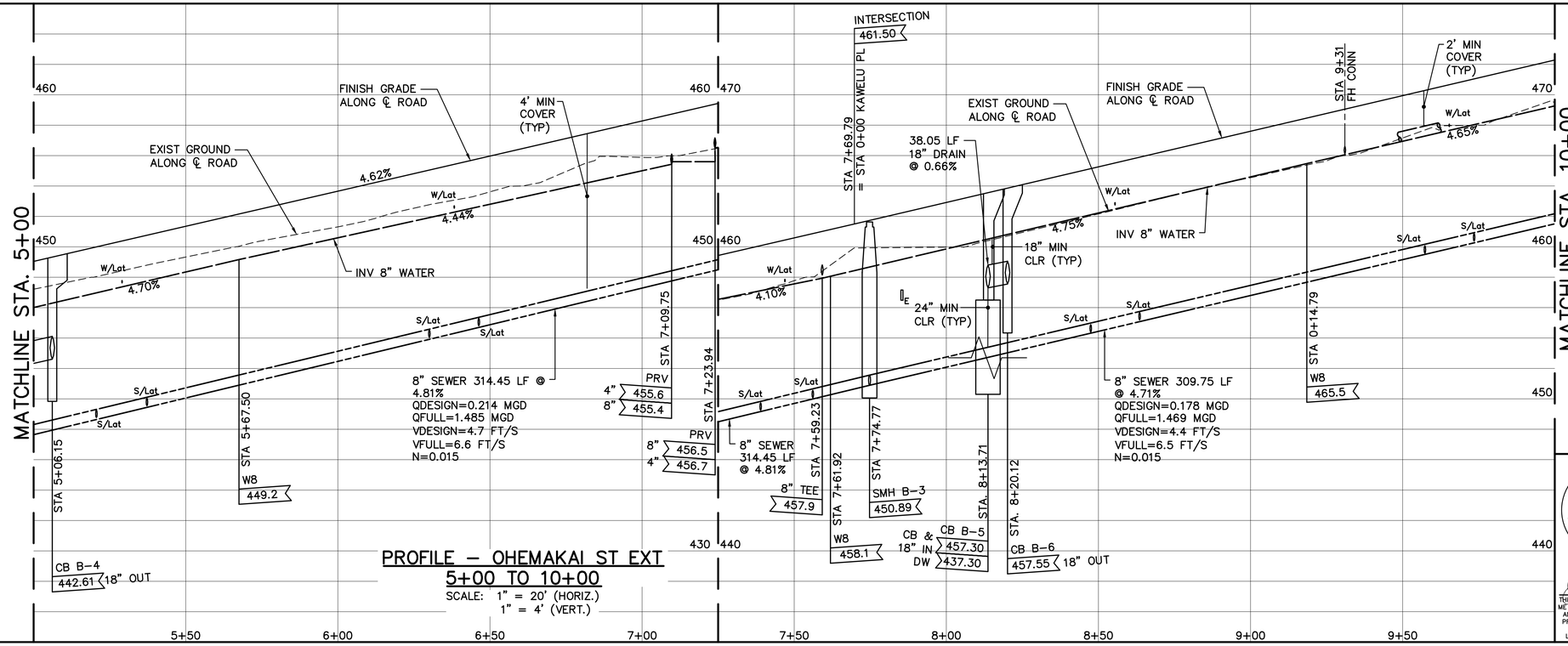


(W14) STA 9+43.50 O/S 9' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

(W15) STA 9+68.91 O/S 10.88' LT ℄ OHEMAKAI ST EXT DEFLECT PIPE

PLAN – OHEMAKAI ST EXT 5+00 TO 10+00

SCALE: 1" = 20'



PROFILE – OHEMAKAI ST EXT 5+00 TO 10+00

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL 6/41
2. ALL SEWER CLEANOUT FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
OHEMAKAI ST EXTENSION (ROAD "B-1")
STA. 5+00 TO 10+00

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 17 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/26/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road B-1 2.DWG

ROAD NOTES

(R1) STA 10+32.81 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEEL CHAIR RAMP
SEE DETAIL SHT 28 & 29

(R2) STA 10+55.03 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEEL CHAIR RAMP
SEE DETAIL SHT 28 & 29

(R3) STA 10+79.28 ℄ OHEMAKAI ST EXT
= STA 0+00 ℄ KOAI'A ST
INSTALL ST SURVEY MON
TOP OF PIN EL=476.00

(R4) STA 11+03.53 ℄ OHEMAKAI ST EXT
CONSTRUCT WHEEL CHAIR RAMP
SEE DETAIL SHT 28 & 29

(R5) STA 13+66.28 ℄ OHEMAKAI ST
= STA 0+00 ℄ 'ILIE'E PL ROAD PI
INSTALL ST SURVEY MON
TOP OF PIN EL=487.75

(R6) SEE SHT 27
FOR KNUCKLE DETAIL

SEWER NOTES

(S1) STA 10+84.28 O/S 5' RT ℄ OHEMAKAI ST EXT
CONSTRUCT SMH "B-4"
TOP=476.13
INV=465.49 (8", 6")

(S2) STA 13+71.28 O/S 5' RT ℄ OHEMAKAI ST EXT
CONSTRUCT SMH "B-5"
TOP=487.75
INV=481.50 (8", 6")

WATER NOTES

(W1) STA 10+31.50 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W2) STA 10+68.78 O/S 11' LT ℄ OHEMAKAI ST EXT
INSTALL:
1 – 8" TEE, MJ
3 – 8" GV, MJ
3 – VALVE BOX & COVER
1 – CONC BLOCK

(W3) STA 10+82.81 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W4) STA 11+13 O/S 10.50' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W5) STA 11+38 O/S 10.5' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W6) STA 11+58 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W7) STA 11+89 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W8) STA 12+72 O/S 11' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W9) STA 12+97.50 O/S 9' LT ℄ OHEMAKAI ST EXT
DEFLECT PIPE

(W10) STA 13+10.00 O/S 9' LT ℄ OHEMAKAI ST EXT
INSTALL:
TYPE "A" FH CONN
1 – 8"X6" TEE, MJ x FE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" 1/4 BEND, MJ
1 – 6" HYDRANT ELBOW, MJ
13 LF 6" PIPE
1 – FH (HT=3.5')
3 – CONC BLOCK

(W11) STA 13+33.28 O/S 9' LT ℄ OHEMAKAI ST EXT
1 – 1/8 BEND, H, MJ
1 – CONC BLOCK

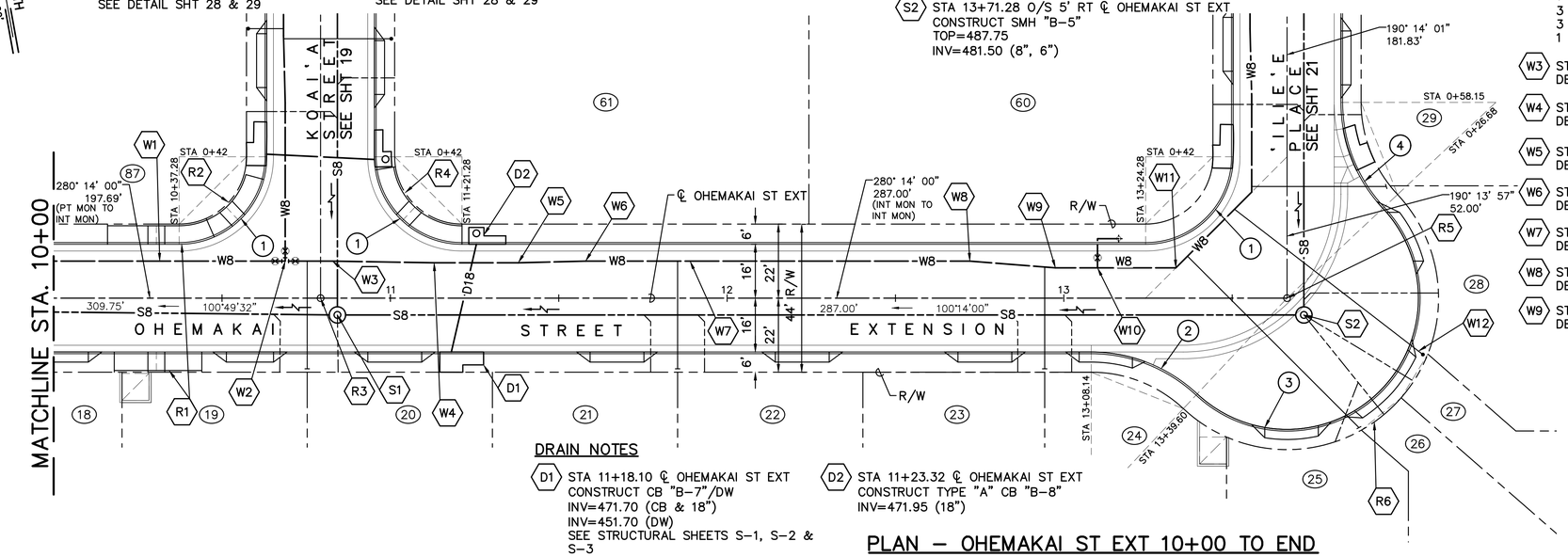
(W12) FLAG LOT WATER LATERALS
SEE DET (2/39)

CURVE DATA				
CURVE	(1)	(2)	(3)	(4)
Δ	89°59'54"	43°10'16"	176°19'36	43°09'50"
Δ/2	44°59'57"	21°35'08"	88°09'48"	21°34'55"
R	26.00	46.00	39.00	46.00
T	26.00	18.20	1216.21	18.20
C	36.77	33.85	77.96	33.84
Lc	40.84	34.66	120.02	34.65

DRAIN NOTES

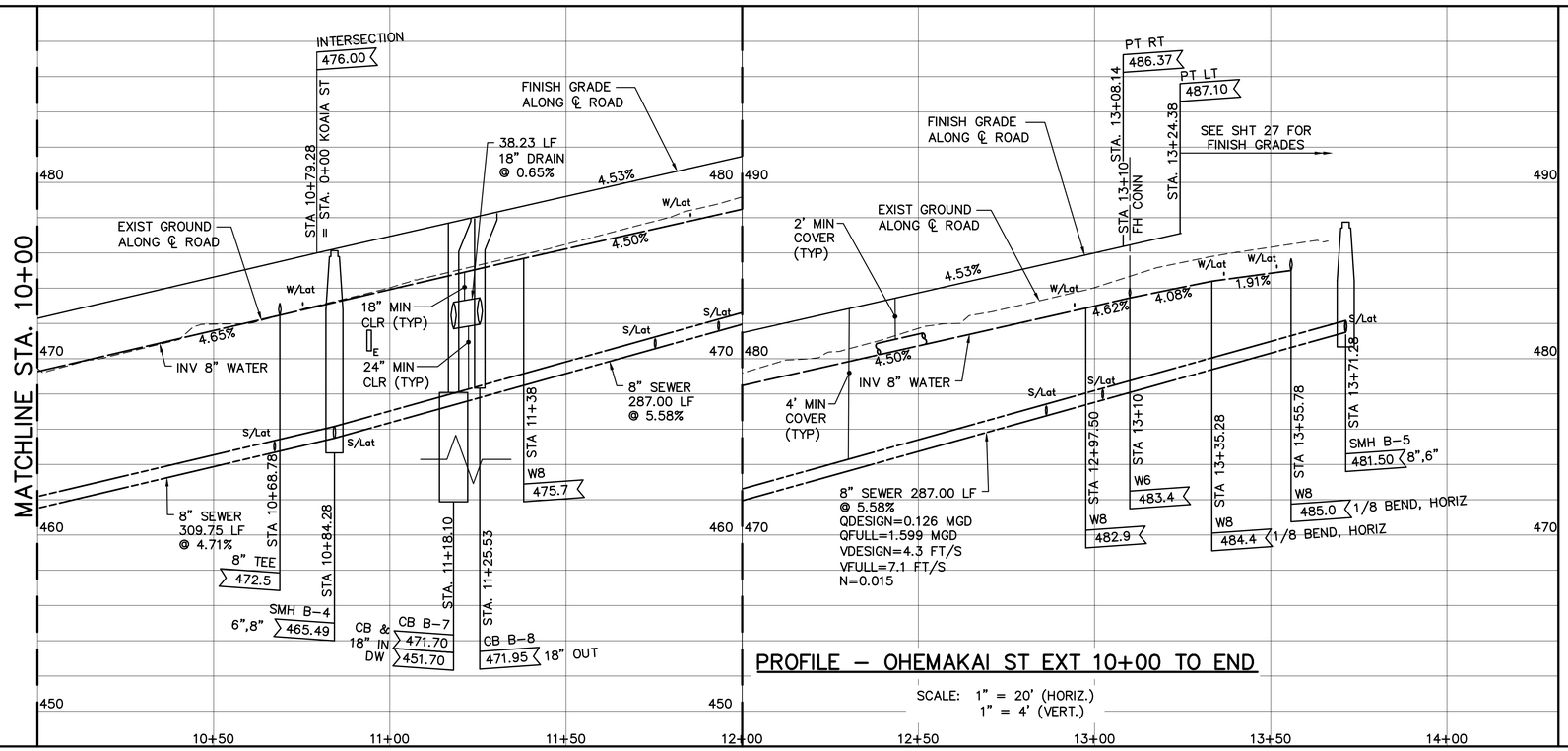
(D1) STA 11+18.10 ℄ OHEMAKAI ST EXT
CONSTRUCT CB "B-7"/DW
INV=471.70 (CB & 18")
INV=451.70 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D2) STA 11+23.32 ℄ OHEMAKAI ST EXT
CONSTRUCT TYPE "A" CB "B-8"
INV=471.95 (18")



PLAN – OHEMAKAI ST EXT 10+00 TO END

SCALE: 1" = 20'



PROFILE – OHEMAKAI ST EXT 10+00 TO END

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL (6/41)
2. ALL SEWER CLEANOUT FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
OHEMAKAI ST EXTENSION (ROAD "B-1")
STA. 10+00 TO END

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 18 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 6/27/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road B-1 3.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) STA 0+00 ℄ KOAI'A ST
= STA 10+79.28 ℄ OHEMAKAI ST EXT

(R2) PC STA 2+23.83 ℄ KOAI'A ST
INSTALL ST SURVEY MON
TOP OF PIN EL=488.67

(R3) POC STA 4+40.81 ℄ KOAI'A ST
INSTALL ST SURVEY MON
TOP OF PIN EL=509.32

SEWER NOTES

(S1) STA 1+50 O/S 5' RT ℄ KOAI'A ST
CONSTRUCT SHALLOW DROP SMH "G-1"
TOP=481.54
INV=474.00 (8" IN)
INV=468.00 (8" OUT)

(S2) STA 2+95 O/S 5' RT ℄ KOAI'A ST
CONSTRUCT SHALLOW DROP SMH "G-2"
TOP=495.35
INV=488.75 (8" IN)
INV=483.25 (8" OUT)

(S3) STA 4+55 O/S 5' RT ℄ KOAI'A ST
CONSTRUCT SMH "G-3"
TOP=510.58
INV=503.25

WATER NOTES

(W1) STA 0+40 O/S 10.5' LT ℄ KOAI'A ST
DEFLECT PIPE

(W2) STA 0+58 O/S 10.5' LT ℄ KOAI'A ST
DEFLECT PIPE

(W3) STA 0+78 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W4) STA 1+20 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W5) STA 1+63.50 O/S 11' LT ℄ KOAI'A ST
DFLECT PIPE

(W6) STA 1+93 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W7) STA 2+13 O/S 10.45' LT ℄ KOAI'A ST
DFLECT PIPE

(W8) STA 2+37 O/S 10.45' LT ℄ KOAI'A ST
DEFLECT PIPE

(W9) STA 2+68.82 O/S 11' LT ℄ KOAI'A ST
BEGIN WL DEFLECTION

(W10) STA 4+46.10 O/S 11' LT ℄ KOAI'A ST
INSTALL:
TYPE "B" FH CONN
1 – 8"X6" TEE, MJ x FE
2 – JOINT RESTRAINTS BTWN TEE & VALVE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" HYDRANT ELBOW, MJ
29 LF 6" PIPE
1 – FH (HT= 3.23')
2 – CONC BLOCK

(W11) STA 4+57.97 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W12) STA 4+69.83 O/S 11' LT ℄ KOAI'A ST
END WL DEFLECTION

CURVE DATA	
CURVE	(1)
Δ	13°37'00"
Δ/2	6°48'30"
R	913.00
T	109.00
C	216.47
Lc	216.98

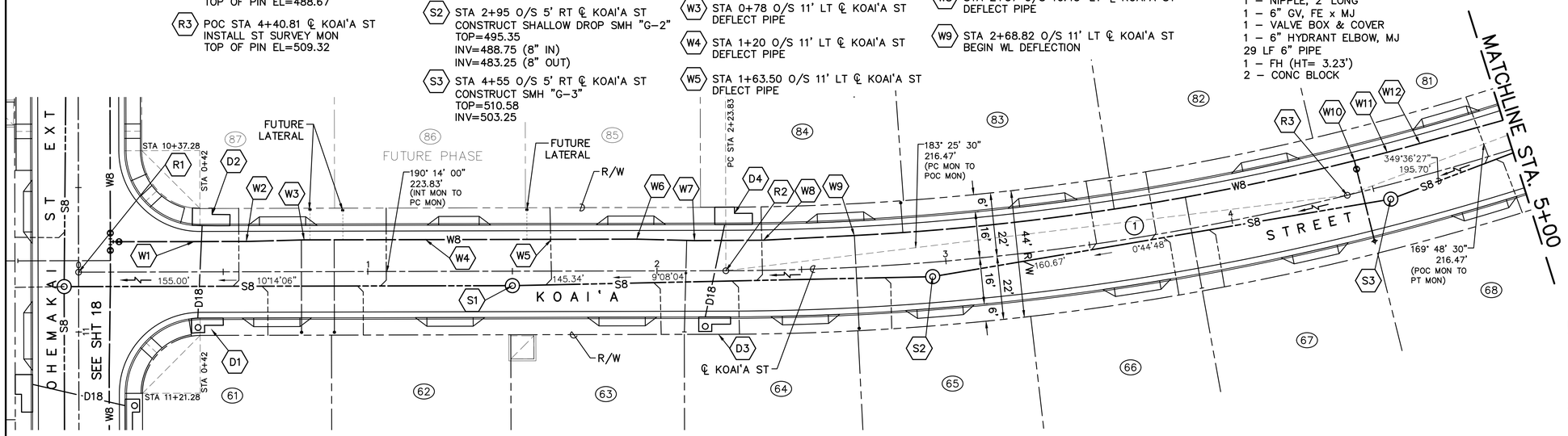
DRAIN NOTES

(D1) STA 0+41.20 ℄ KOAI'A ST
CONSTRUCT TYPE "A" CB "G-1"
INV=469.20 (18")

(D2) STA 0+42.80 ℄ KOAI'A ST
CONSTRUCT CB "G-2"/DW
INV=468.95 (CB & 18")
INV=448.95 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D3) STA 2+16.66 ℄ KOAI'A ST
CONSTRUCT TYPE "A" CB "G-3"
INV=481.75 (18")

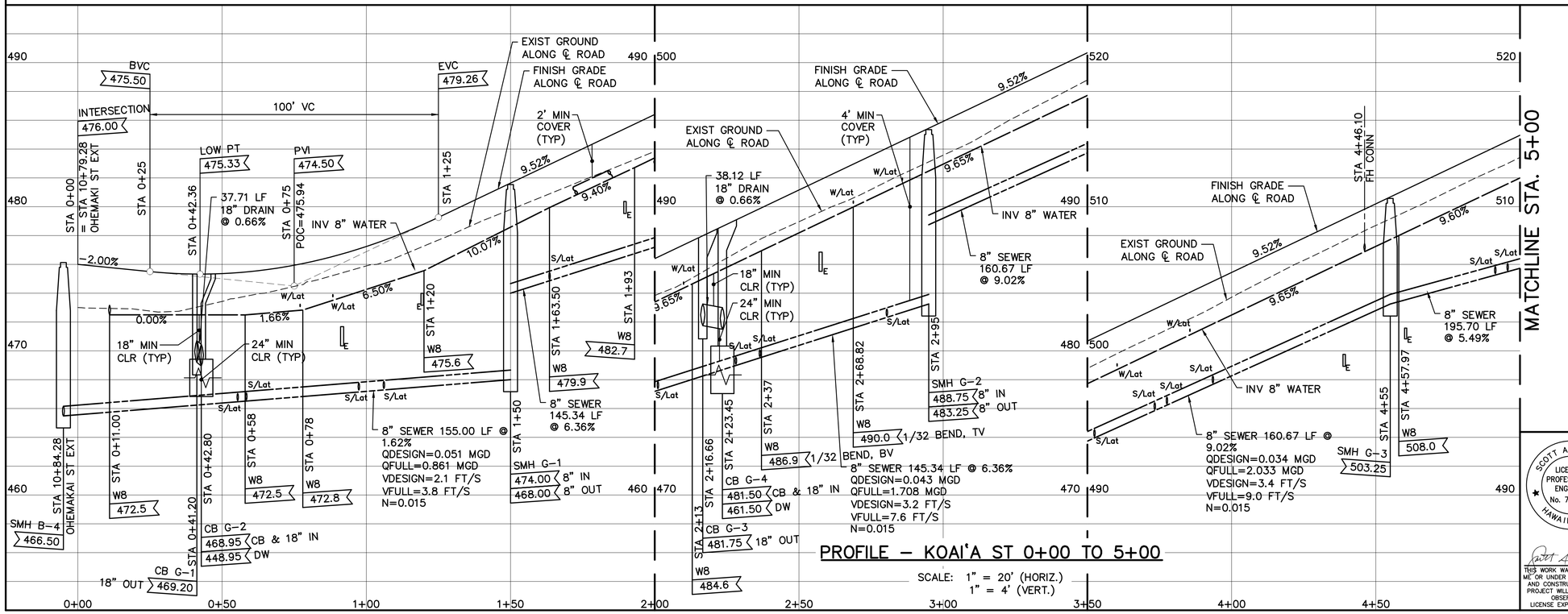
(D4) STA 2+23.45 ℄ KOAI'A ST
CONSTRUCT CB "G-4"/DW
INV=481.50 (CB & 18")
INV=461.50 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3



PLAN – KOAI'A ST 0+00 TO 5+00

SCALE: 1" = 20'

NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL (6/41)
2. ALL SEWER CLEANOUT FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. DUE TO LIMITED WATER CREDITS, WATER LATERALS FOR LOTS 85 TO 87 WILL NOT BE CONSTRUCTED UNDER THIS PROJECT. TRENCHES FOR FUTURE LATERALS WILL BE HAMMERED AND BACKFILLED.
4. ALL SEWER LINES ARE GRAVITY LINES.



PROFILE – KOAI'A ST 0+00 TO 5+00

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
KOAI'A ST (ROAD "G-1")
STA. 0+00 TO 5+00

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 19 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 10/23/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road G-1 1.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) PT STA 6+57.79 ℄ KOAI'A ST
INSTALL ST SURVEY MON
TOP OF PIN EL=526.67

(R2) STA 8+32.55 ℄ KOAI'A ST
END KOAI'A ST
REMOVE EXIST CONC HEADER AND END ROAD BARRIER W/ MARKERS

(R3) STA 8+32.55 ℄ KOAI'A ST
MATCH NEW CURB, GUTTER AND SIDEWALK TO EXIST

(R4) STA 8+34.55 ℄ KOAI'A ST
PROVIDE SMOOTH RIDING CONNECTION
SEE DETAIL SHT 41

(R5) EXIST ST MON
STA 8+77.55 ℄ KOAI'A ST
= STA 12+93.65 KO'OKO'OLAU ST
TOP OF PIN EL=531.54

SEWER NOTES

(S1) STA 6+50 O/S 5' RT ℄ KOAI'A ST
CONSTRUCT SHALLOW DROP SMH "G-4"
TOP=526.20
INV=516.75 (8" IN)
INV=514.00 (8" OUT)

(S2) STA 7+92.62 O/S 5' RT ℄ KOAI'A ST
CONSTRUCT SMH "G-5"
TOP=530.10
INV=524.47 (6", 8")

WATER NOTES

(W1) STA 5+03 O/S 10.40' LT ℄ KOAI'A ST
DEFLECT PIPE

(W2) STA 5+30 O/S 10.40' LT ℄ KOAI'A ST
DEFLECT PIPE

(W3) STA 5+63.35 O/S 11' LT ℄ KOAI'A ST
BEGIN WL PIPE DEFLECTION

(W4) STA 6+00 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W5) STA 6+57.79 O/S 11' LT ℄ KOAI'A ST
END WL PIPE DEFLECTION

(W6) STA 8+25 O/S 11' LT ℄ KOAI'A ST
DEFLECT PIPE

(W7) STA 8+32.55 O/S 11' LT ℄ KOAI'A ST
CONN NEW 8" PIPE TO EXIST 8" PIPE
REMOVE & SALVAGE:
1 – 8" CAP
1 – 2" CO & BOX
1 – CONC BLOCK
INSTALL:
1 – 8" SLEEVE, 12" LONG
TEMP FOR TESTING:
1 – 8" CAP, TAPPED FOR 2" IPT
1 – 2" CO
1 – CONC BLOCK

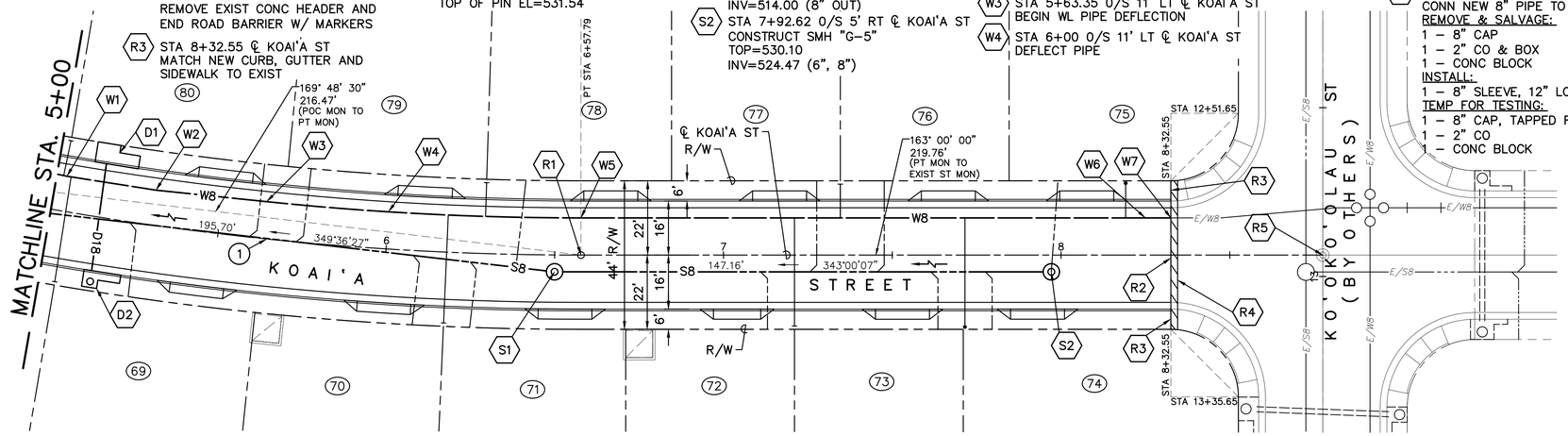
DRAIN NOTES

(D1) STA 5+14.06 ℄ KOAI'A ST
CONSTRUCT CB "G-6"/DW
INV=509.85 (CB & 18")
INV=489.85 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D2) STA 5+14.72 ℄ KOAI'A ST
CONSTRUCT TYPE "A" CB "G-5"
INV=510.10 (18")

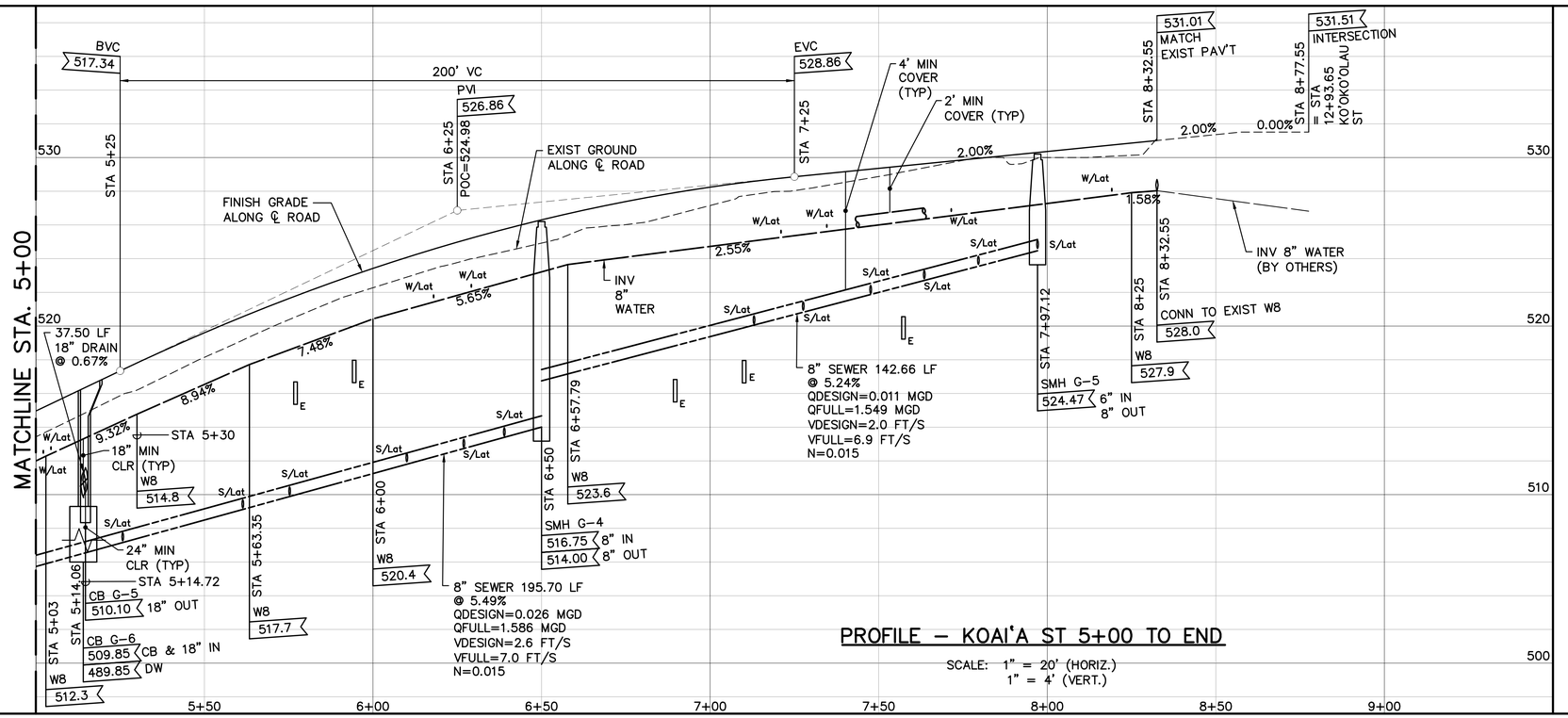
CURVE DATA	
CURVE	(1)
Δ	13°37'00"
Δ/2	6°48'30"
R	913.00
T	109.00
C	216.47
Lc	216.98

NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL (6/41)
2. ALL SEWER FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.



PLAN – KOAI'A ST 5+00 TO END

SCALE: 1" = 20'



PROFILE – KOAI'A ST 5+00 TO END

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

4' 0 4' 8'
SCALE: 1" = 4'-0"

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

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
KOAI'A ST (ROAD "G-1")
STA. 5+00 TO END

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 20 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/26/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road G-1 2.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) STA 0+00 ℄ 'ILIE'E PL
=STA 13+66.28 ℄ OHEMAKAI ST
ST SURVEY MON

(R2) PC STA 2+23.83 ℄ 'ILIE'E PL
INSTALL ST SURVEY MON
TOP OF PIN EL=502.38

SEWER NOTES

(S1) STA 1+25 O/S 5' RT ℄ 'ILIE'E PL
CONSTRUCT SHALLOW DROP SMH "H-1"
TOP=492.50
INV=487.00 (8" IN)
INV=484.90 (6" IN, 8" OUT)

(S2) STA 3+00 O/S 5' RT ℄ 'ILIE'E PL
CONSTRUCT SMH "H-2"
TOP=509.90
INV=504.25 (6", 8")

WATER NOTES

(W1) STA 0+31.51 O/S 10.5' LT ℄ 'ILIE'E PL
1 – 8" 1/8 BEND, MJ
1 – CONC BLOCK

(W2) STA 0+60 O/S 10.5' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W3) STA 0+80 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W4) STA 1+00 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W5) STA 2+00 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W6) STA 2+20 O/S 10.45' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W7) STA 2+45.24 O/S 10.45' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W8) STA 2+82.44 O/S 11' LT ℄ 'ILIE'E PL
BEGIN WL DEFLECTION

(W9) STA 3+27.48 O/S 11' LT ℄ 'ILIE'E PL
INSTALL:
TYPE "B" FH CONN
1 – 8"X6" TEE, MJ x FE
2 – JOINT RESTRAINTS BTWN TEE & VALVE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" HYDRANT ELBOW, MJ
29 LF 6" PIPE
1 – FH (HT= 3.5')
2 – CONC BLOCK

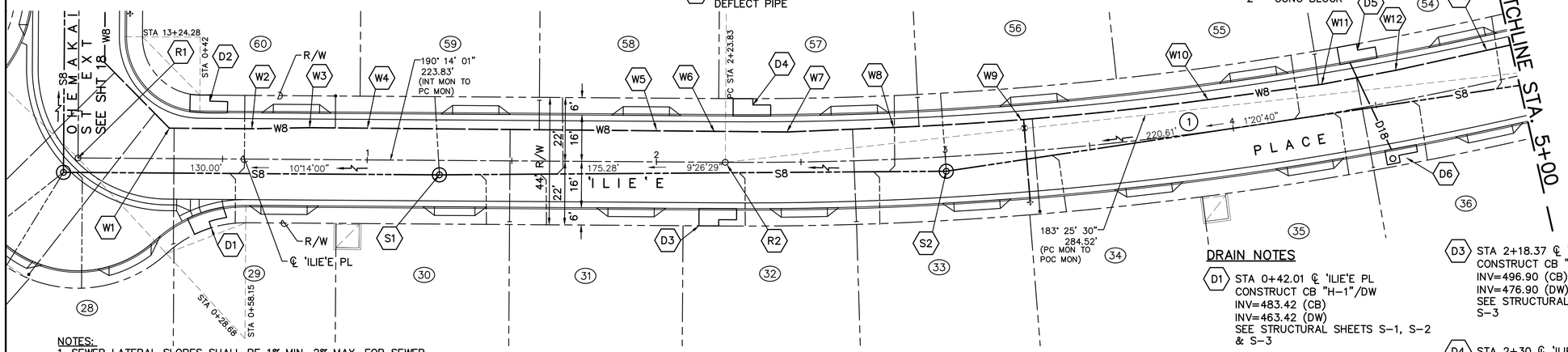
(W10) STA 3+92.74 O/S 11' LT ℄ 'ILIE'E PL
END WL DEFLECTION

(W11) STA 4+32.76 O/S 10.34' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W12) STA 4+58.99 O/S 10.56' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W13) STA 4+91.51 O/S 11' LT ℄ 'ILIE'E PL
BEGIN WL DEFLECTION

CURVE DATA	
CURVE	(1)
Δ	13°37'00"
Δ/2	6°48'30"
R	1200.00
T	143.27
C	284.52
Lc	8.52



NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL (6/41)
2. ALL SEWER FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.

PLAN – 'ILIE'E PL 0+00 TO 5+00

SCALE: 1" = 20'

DRAIN NOTES

(D1) STA 0+42.01 ℄ 'ILIE'E PL
CONSTRUCT CB "H-1"/DW
INV=483.42 (CB)
INV=463.42 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

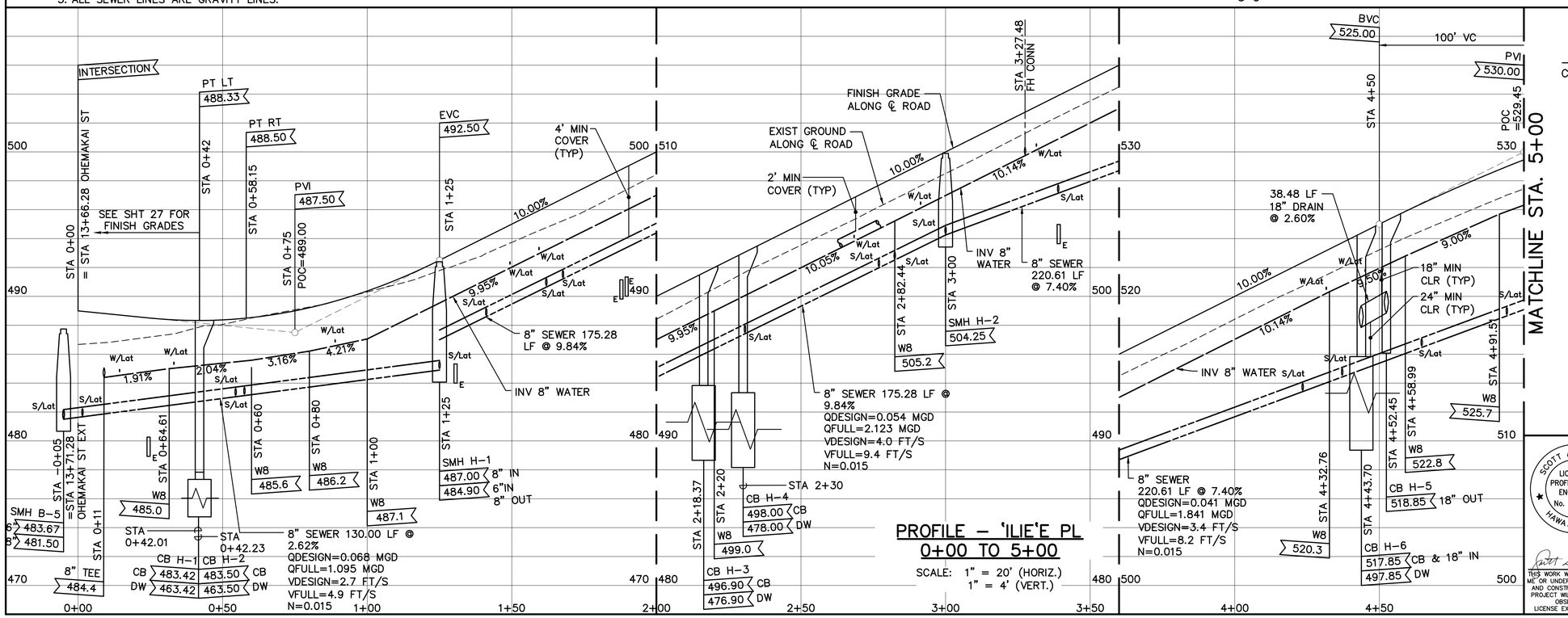
(D2) STA 0+42.23 ℄ 'ILIE'E PL
CONSTRUCT CB "H-2"/DW
INV=483.50 (CB)
INV=463.50 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D3) STA 2+18.37 ℄ 'ILIE'E PL
CONSTRUCT CB "H-3"/DW
INV=496.90 (CB)
INV=476.90 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D4) STA 2+30 ℄ 'ILIE'E PL
CONSTRUCT CB "H-4"/DW
INV=498.00 (CB)
INV=478.00 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D5) STA 4+43.70 ℄ 'ILIE'E PL
CONSTRUCT CB "H-6"/DW
INV=517.85 (CB & 18")
INV=497.85 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D6) STA 4+52.45 ℄ 'ILIE'E PL
CONSTRUCT TYPE "A" CB "H-5"
INV=518.85 (18")



PROFILE – 'ILIE'E PL 0+00 TO 5+00

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

CHIEF, WASTEWATER DIVISION — DATE

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
'ILIE'E PL (ROAD "H-1")
STA. 0+00 TO 5+00

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

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

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 21 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: KNL
Last Saved: 4/4/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road H-1 1.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) POC STA 5+09.02 ℄ 'ILIE'E PL
INSTALL ST SURVEY MON
TOP OF PIN EL=530.14

(R2) PT STA 7+94.20 ℄ 'ILIE'E PL
INSTALL ST SURVEY MON
TOP OF PIN EL=546.58

(R3) STA 9+68.97 ℄ 'ILIE'E PL
END 'ILIE'E PL
REMOVE EXIST CONC HEADER AND
END ROAD BARRIER W/MARKERS

(R4) STA 9+68.97 ℄ 'ILIE'E PL
MATCH NEW CURB, GUTTER AND
SIDEWALK TO EXIST

(R5) STA 9+70.68 ℄ 'ILIE'E PL
PROVIDE SMOOTH RIDING CONNECTION
SEE DETAIL SHT 41

(R6) EXIST ST MON
STA 10+13.96 ℄ 'ILIE'E PL
= STA 15+80.65 ℄ KO'OKO'OLAU ST
TOP OF PIN EL=554.43

SEWER NOTES

(S1) STA 5+20 O/S 5' RT ℄ 'ILIE'E PL
CONSTRUCT SMH "H-3"
TOP=530.76
INV=520.57 (8", 6")

(S2) STA 7+35 O/S 5' RT ℄ 'ILIE'E PL
CONSTRUCT SHALLOW DROP SMH "H-4"
TOP=543.13
INV=537.25 (8" IN)
INV=534.20 (8" OUT, 6" IN)

(S3) STA 9+25.76 O/S 5' RT ℄ 'ILIE'E PL
CONSTRUCT SMH "H-5"
TOP=552.71
INV=547.50 (6" IN, 8" OUT)

WATER NOTES

(W1) STA 5+30 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W2) STA 5+63 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W3) STA 5+93.61 O/S 11' LT ℄ 'ILIE'E PL
END WL DEFLECTION

(W4) STA 6+31 O/S 10.42' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W5) STA 6+57.80 O/S 10.42' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W6) STA 6+65.60 O/S 10.64' LT ℄ 'ILIE'E PL
INSTALL:
TYPE "B" FH CONN
1 – 8"X6" TEE, MJ x FE
2 – JOINT RESTRAINTS BTWN TEE & VALVE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – CI VALVE BOX & COVER, MJ
1 – 6" HYDRANT ELBOW, MJ
29 LF 6" PIPE
1 – FH (HT= 3')
2 – CONC BLOCK

(W7) STA 6+94.99 O/S 11' LT ℄ 'ILIE'E PL
BEGIN WL PIPE DEFLECTION

(W8) STA 7+05 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W9) STA 7+94.20 O/S 11' LT ℄ 'ILIE'E PL
END WL PIPE DEFLECTION

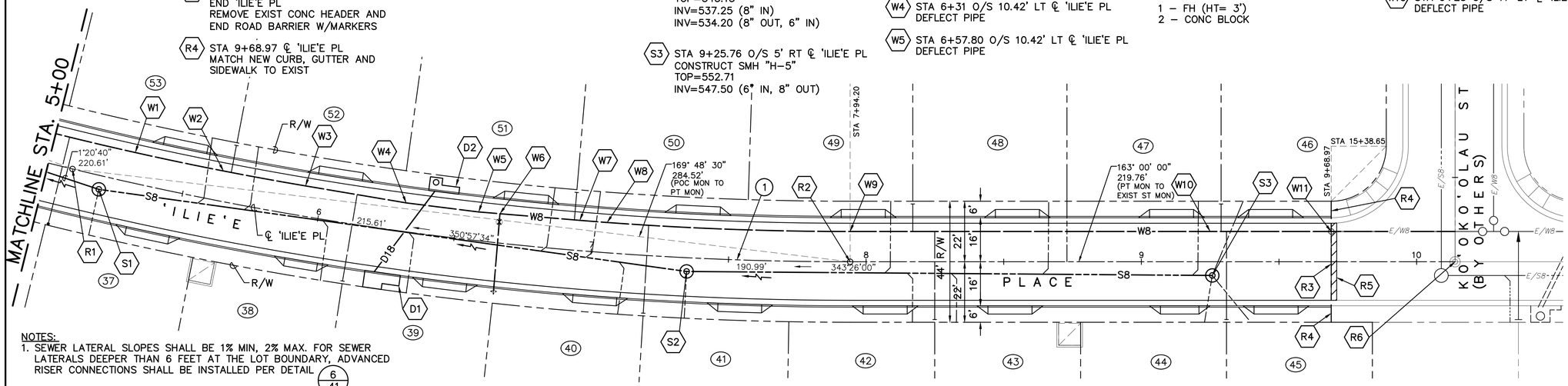
(W10) STA 9+25 O/S 11' LT ℄ 'ILIE'E PL
DEFLECT PIPE

(W11) STA 9+68.96 O/S 11' LT ℄ 'ILIE'E PL
CONN NEW 8" PIPE TO EXIST 8" PIPE
REMOVE & SALVAGE:
1 – 8" CAP
1 – 2" CO & BOX
1 – CONC BLOCK
INSTALL:
1 – 8" SLEEVE, 12" LONG
TEMP FOR TESTING:
1 – 8" CAP, TAPPED FOR 2" IPT
1 – 2" CO
1 – CONC BLOCK

DRAIN NOTES

(D1) STA 6+23 'ILIE'E PL
CONSTRUCT CB "H-7"/DW
INV=530.52 (CB & 18")
INV=510.52 (DW)
SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D2) STA 6+42.07 'ILIE'E PL
CONSTRUCT TYPE "A" CB "H-8"
INV=531.36 (18")

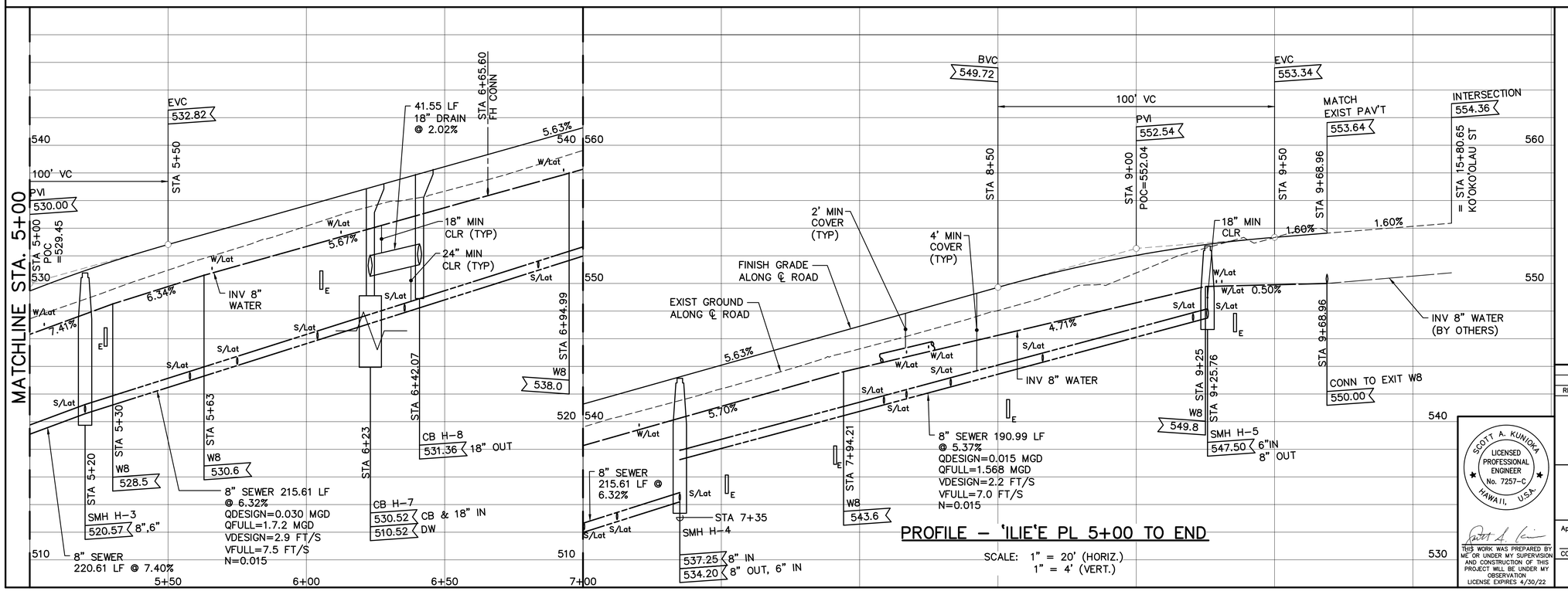


NOTES:
1. SEWER LATERAL SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL 6/41
2. ALL SEWER CLEANOUT FRAMES AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.

PLAN – 'ILIE'E PL 5+00 TO END
SCALE: 1" = 20'

CHIEF, WASTEWATER DIVISION — DATE

CURVE DATA	
CURVE	(1)
△	13°37'00"
△/2	6°48'30"
R	1200.00
T	143.27
C	284.52
Lc	8.52



PROFILE – 'ILIE'E PL 5+00 TO END
SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

4' 0 4' 8'
SCALE: 1" = 4'-0"

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
'ILIE'E PL (ROAD "H-1")
STA. 5+00 TO END

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

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

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 22 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/27/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road H-1 2.DWG

TRUE NORTH
SCALE: 1" = 20'

BASE BID

ROAD NOTES

(R1) STA 0+00 ℄ KAWELU PL = STA 7+69.79 ℄ OHEMAKAI ST EXT
ST SURVEY MON

(R2) STA 0+51.48 ℄ KAWELU PL
INSTALL CONC HEADER AND END ROAD BARRIER WITH MARKERS

SEWER NOTES

(S1) STA 0+60 O/S 5' RT ℄ KAWELU PL
1 – 8" CAP
1 – PIPE MARKER
INV=452.67

DRAIN NOTES

(D1) STA 0+41.94 ℄ KAWELU PL
CONSTRUCT TYPE "A" CB "F–1"/DW
INV=454.89 (18")
INSTALL PERMANENT SEDIMENT CONTROL DEVICE

(D2) STA 0+43.74 ℄ KAWELU PL
CONSTRUCT CB "F–2"/DW
INV=454.64 (CB & 18")
INV=434.64 (DW)
SEE STRUCTURAL SHEETS S–1, S–2, & S–3. INSTALL PERMANENT SEDIMENT CONTROL DEVICE

WATER NOTES

(W1) STA 0+38 O/S 10.50' LT ℄ KAWELU PL
DEFLECT PIPE

(W2) STA 0+55.11 O/S 10.50' LT ℄ KAWELU PL
1 – CO
1 – ARV
2 – MH

(W3) STA 0+60 O/S 10.50' LT ℄ KAWELU PL
SEE SHEET 39 FOR PROFILE
1 – 8" CAP
1 – PIPE MARKER
INV=458.20

ALT BID 1

SEWER NOTES

(S2) STA 1+65.11 O/S 5' RT ℄ KAWELU PL
CONSTRUCT SHALLOW DROP SMH "F–1"
TOP=468.04
INV=462.50 (8" IN)
INV=454.69 (8" OUT)

(S3) STA 3+31.86 O/S 5' RT ℄ KAWELU PL
CONSTRUCT SMH "F–2"
TOP=483.10
INV=476.23

(S4) STA 4+98.62 O/S 5' RT ℄ KAWELU PL
CONSTRUCT SMH "F–3"
TOP=495.09
INV=488.80 (8" IN)
INV=485.23 (8" OUT)

DRAIN NOTES

(D3) STA 2+29.03 ℄ KAWELU PL
CONSTRUCT CB "F–3"/DW
INV=469.08 (CB)
INV=449.08 (DW)
SEE STRUCTURAL SHEETS S–1, S–2 & S–3

(D4) STA 4+06.28 ℄ KAWELU PL
CONSTRUCT TYPE "A" CB "F–5"
INV=483.76 (18")

(D5) STA 4+12.06 ℄ KAWELU PL
CONSTRUCT CB "F–4"/DW
INV=483.51 (CB & 18")
INV=463.51 (DW)
SEE STRUCTURAL SHEETS S–1, S–2 & S–3

ALT BID 3

WATER NOTES

(W4) STA 0+80 O/S 11' LT ℄ KAWELU PL
DEFLECT PIPE

(W5) STA 1+10 O/S 11' LT ℄ KAWELU PL
DEFLECT PIPE

(W6) STA 1+65.11 O/S 11' LT ℄ KAWELU PL
BEGIN WL PIPE DEFLECTION

(W7) STA 2+35.65 O/S 11' LT ℄ KAWELU PL
INSTALL:
TYPE "A" FH CONN
1 – 8"X6" TEE, MJ x FE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" 1/4 BEND, MJ
1 – 6" HYDRANT ELBOW, MJ
14 LF 6" PIPE
1 – FH (HT= 3.5')
3 – CONC BLOCK

(W8) STA 3+50 O/S 11' LT ℄ KAWELU PL
DEFLECT PIPE

(W9) STA 3+73.64 O/S 11' LT ℄ KAWELU PL
END WL DEFLECTION

(W10) STA 4+02 O/S 10.36' LT ℄ KAWELU PL
DEFLECT PIPE

(W11) STA 4+28 O/S 10.37' LT ℄ KAWELU PL
DEFLECT PIPE

(W12) STA 4+56.21 O/S 11' LT ℄ KAWELU PL
BEGIN WL DEFLECTION

(W13) STA 4+98.62 O/S 11' LT ℄ KAWELU PL
END WL DEFLECTION

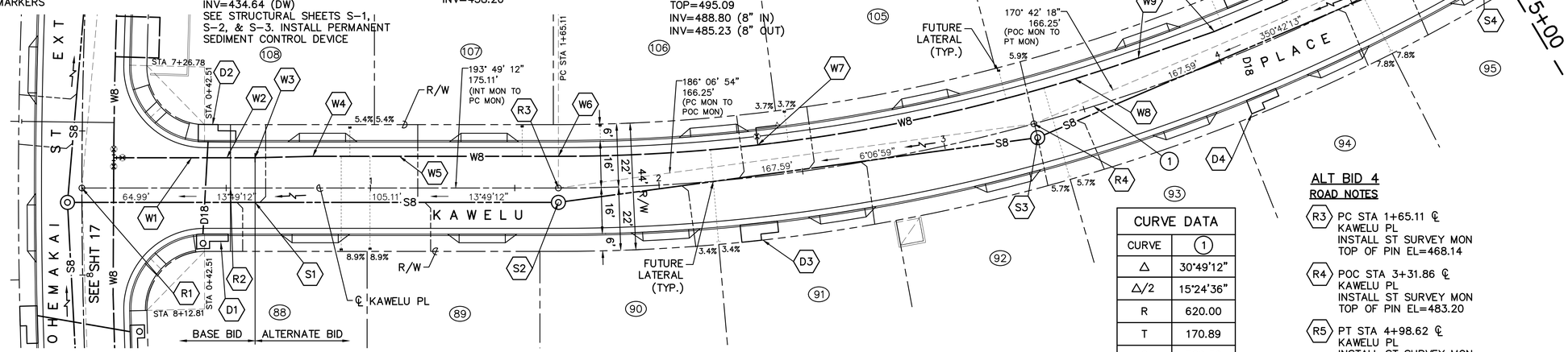
ALT BID 4

ROAD NOTES

(R3) PC STA 1+65.11 ℄ KAWELU PL
INSTALL ST SURVEY MON
TOP OF PIN EL=468.14

(R4) POC STA 3+31.86 ℄ KAWELU PL
INSTALL ST SURVEY MON
TOP OF PIN EL=483.20

(R5) PT STA 4+98.62 ℄ KAWELU PL
INSTALL ST SURVEY MON
TOP OF PIN EL=495.19

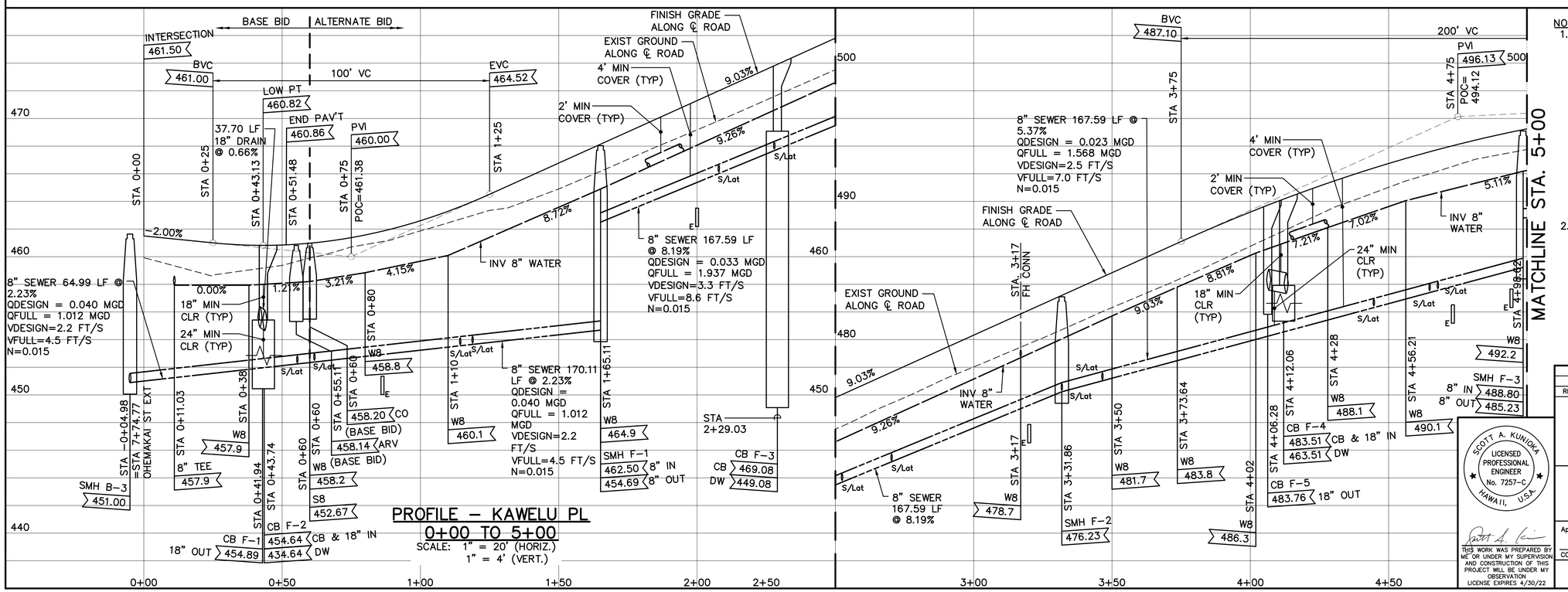


PLAN – KAWELU PL 0+00 TO 5+00

SCALE: 1" = 20'

CURVE DATA	
CURVE	(1)
Δ	30°49'12"
Δ/2	15°24'36"
R	620.00
T	170.89
C	329.50
Lc	333.50

CHIEF, WASTEWATER DIVISION — DATE



PROFILE – KAWELU PL 0+00 TO 5+00

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

NOTES:
1. DUE TO LIMITED WATER AVALIABILITY, BASE BID WILL INCLUDE THE CONSTRUCTION OF UTILITIES AND ROADWAYS FOR OHEMAKAI ST EXT, ILIE'E PL, KOAIA ST, AND PUAKALA PL. KAWELU PL (LOTS 88 TO 108) WILL BE CONSTRUCTED UNDER THE FOLLOWING ADDITIVE ALTERNATIVE BID ITEMS:
   BASE BID – GRADE LOTS, BLAST AND HAMMER UTILITY TRENCHES. BACKFILL WITH 6" MINUS.
   ALTERNATE 1 – INSTALLATION OF SEWER AND DRAINAGE SYSTEM.
   ALTERNATE 2 – INSTALLATION OF WATER MAIN. WATER LATERALS WILL NOT BE INSTALLED UNDER THIS PROJECT.
   ALTERNATE 3 – INSTALLATION OF ELECTRICAL SYSTEM, ROADWAY, SIDEWALKS, AND SIGNAGE.
2. ALL SEWER LINES ARE GRAVITY LINES.

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

PLAN & PROFILE
KAWELU PL (ROAD "F")
STA. 0+00 TO 5+00

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257–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 4/30/22

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

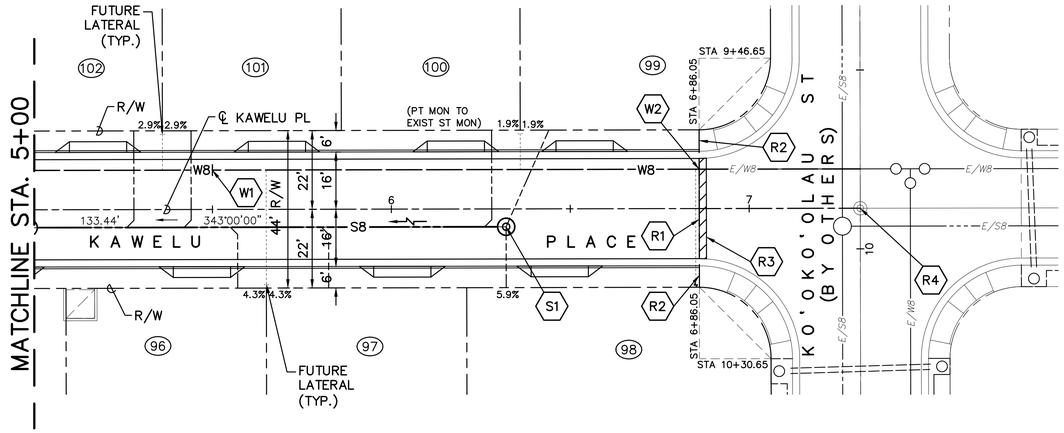
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 23 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 1/9/2020
Plotted on: 3/9/2020
G:\DHHL11–02 Laiopua Village 4\ACAD\DHHL1102–Plan & Profile–Road F–1 1.DWG

TRUE NORTH
SCALE: 1" = 20'



PLAN – KAWELU PL 5+00 TO END

SCALE: 1" = 20'

ALT BID 2
SEWER NOTES

(S1) STA 6+32.06 O/S 5' RT ℄ KAWELU PL
CONSTRUCT SMH "F-4"
TOP=497.60
INV=491.47 (6" IN, 8" OUT)

ALT BID 3
WATER NOTES

(W1) STA 5+50 O/S 11' LT ℄ KAWELU PL
DEFLECT PIPE

(W2) STA 6+86.05 O/S 11' LT ℄ KAWELU PL
CONN NEW 8" PIPE TO EXIST 8" PIPE
REMOVE & SALVAGE:
1 – 8" CAP
1 – 2" CO & BOX
1 – CONC BLOCK
INSTALL:
1 – 8" SLEEVE, 12" LONG
TEMP FOR TESTING:
1 – 8" CAP, TAPPED FOR 2" IPT
1 – 2" CO
1 – CONC BLOCK

ALT BID 4
ROAD NOTES

(R1) STA 6+86.05 ℄ KAWELU PL
END KAWELU PL
REMOVE EXIST CONC HEADER AND
END ROAD BARRIER W/MARKERS

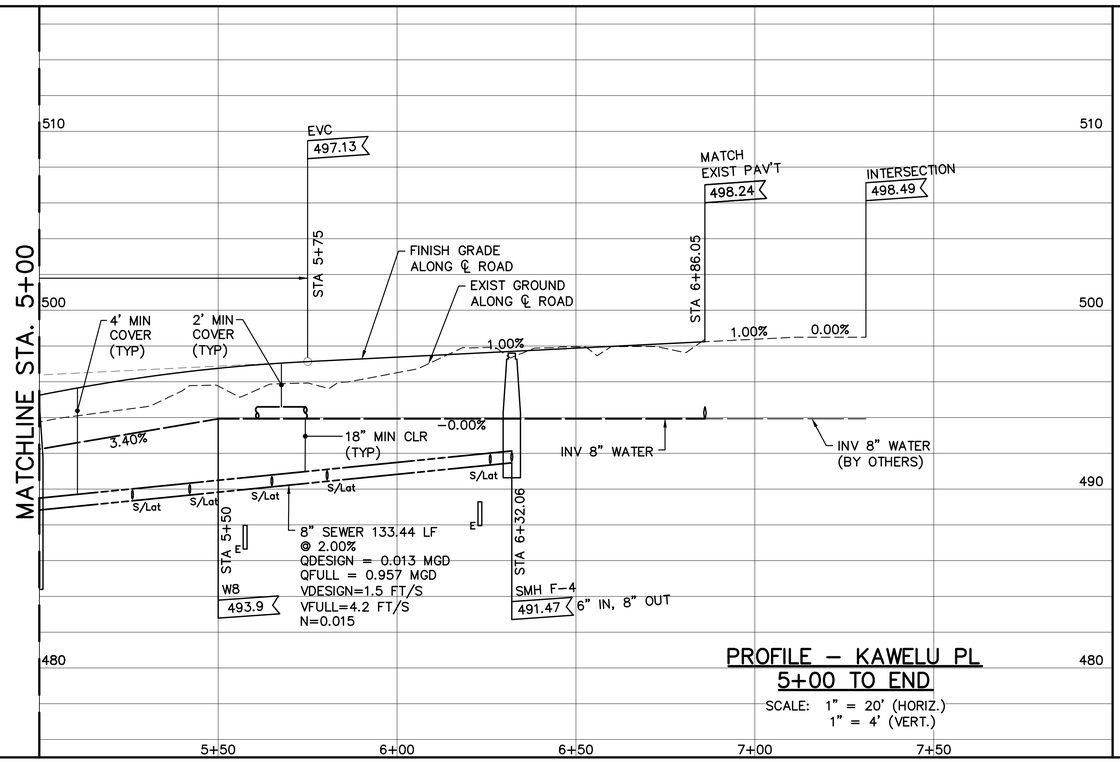
(R2) STA 6+86.05 ℄ KAWELU PL
MATCH NEW CURB, GUTTER AND
SIDEWALK TO EXIST

(R3) STA 6+88.05 ℄ KAWELU PL
PROVIDE SMOOTH RIDING CONNECTION
SEE DETAIL SHT 41

(R4) EXIST ST MON
STA 7+31.05 ℄ KAWELU PL
= STA 9+88.65 ℄ KO'OKO'OLAU ST
TOP OF PIN EL=498.49

NOTES:
1. DUE TO LIMITED WATER AVAILABILITY, BASE BID WILL INCLUDE THE CONSTRUCTION OF UTILITIES AND ROADWAYS FOR OHEMAKAI ST EXT, ILIE'E PL, KOAIA ST, AND PUAKALA PL. KAWELU PL (LOTS 88 TO 108) WILL BE CONSTRUCTED UNDER THE FOLLOWING ADDITIVE ALTERNATIVE BID ITEMS:
   BASE BID – GRADE LOTS, BLAST AND HAMMER UTILITY TRENCHES. BACKFILL WITH 6" MINUS.
   ALTERNATE 1 – INSTALLATION OF SEWER AND DRAINAGE SYSTEM.
   ALTERNATE 2 – INSTALLATION OF WATER MAIN. WATER LATERALS WILL NOT BE INSTALLED UNDER THIS PROJECT.
   ALTERNATE 3 – INSTALLATION OF ELECTRICAL SYSTEM, ROADWAY, SIDEWALKS, AND SIGNAGE.
2. ALL SEWER LINES ARE GRAVITY LINES.

CHIEF, WASTEWATER DIVISION DATE



PROFILE – KAWELU PL 5+00 TO END

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

4' 0 4' 8'
SCALE: 1" = 4'–0"

20' 0 20' 40'
SCALE: 1" = 20'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
KAWELU PL (ROAD "F")
STA. 5+00 TO END

SCOTT A. KUNIOKA
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No. 7257-C
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 24 OF 68 SHEETS

Last Save by: LRS
Last Saved: 1/9/2020
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road F-1 2.DWG

TRUE NORTH
SCALE: 1" = 20'

ROAD NOTES

(R1) STA 0+00 ℄ PUAKALA PL = STA 4+55.32 ℄ OHEMAKAI ST ST SURVEY MON

(R2) PC STA 0+71.61 ℄ PUAKALA PL INSTALL ST SURVEY MON TOP OF PIN EL=446.79

(R3) POC STA 1+96.50 ℄ PUAKALA PL INSTALL ST SURVEY MON TOP OF PIN EL=456.69

(R4) PT STA 3+21.39 ℄ PUAKALA PL INSTALL ST SURVEY MON TOP OF PIN EL=466.48

(R5) ℄ CDS STA 4+08.35 ℄ PUAKALA PL INSTALL ST SURVEY MON TOP OF PIN EL=468.93

SEWER NOTES

(S1) STA 1+10 O/S 5' RT ℄ PUAKALA PL CONSTRUCT SMH "I-1" TOP=448.81 INV=438.85

(S2) STA 2+00 O/S 5' RT ℄ PUAKALA PL CONSTRUCT SHALLOW DROP SMH "I-2" TOP=456.91 INV=451.60 (8" IN) INV=447.53 (8" OUT)

(S3) STA 3+00 O/S 5' RT ℄ PUAKALA PL CONSTRUCT SMH "I-3" TOP=465.28 INV=459.70

(S4) STA 4+08.35 O/S 5' RT ℄ PUAKALA PL CONSTRUCT SMH "I-4" TOP=468.93 INV=463.60 (6" IN, 8" OUT)

WATER NOTES

(W1) STA 0+40 O/S 10.50' LT ℄ PUAKALA PL DEFLECT PIPE

(W2) STA 0+58 O/S 10.50' LT ℄ PUAKALA PL DEFLECT PIPE

(W3) STA 0+81.19 O/S 11' LT ℄ PUAKALA PL BEGIN WL DEFLECTION

(W4) STA 1+05 O/S 11' LT ℄ PUAKALA PL DEFLECT PIPE

(W5) STA 1+17.15 O/S 11' LT ℄ PUAKALA PL END WL DEFLECTION

(W6) STA 1+40 O/S 10.28' LT ℄ PUAKALA PL DEFLECT PIPE

(W7) STA 1+63.95 O/S 10.33' LT ℄ PUAKALA PL DEFLECT PIPE

(W8) STA 1+85.91 O/S 11' LT ℄ PUAKALA PL BEGIN WL DEFLECTION

(W9) STA 2+13.77 O/S 11' LT ℄ PUAKALA PL
INSTALL:
TYPE "B" FH CONN
1 – 8"X6" TEE, MJ x FE
2 – JOINT RESTRAINTS BTWN TEE & VALVE
1 – NIPPLE, 2' LONG
1 – 6" GV, FE x MJ
1 – VALVE BOX & COVER
1 – 6" HYDRANT ELBOW, MJ
29 LF 6" PIPE
1 – FH (HT= 4')
2 – CONC BLOCK

(W10) STA 3+21.41 O/S 11' LT ℄ PUAKALA PL END WL PIPE DEFLECTION

(W11) STA 4+21.60 O/S 11' LT ℄ PUAKALA PL END 8" WL
INSTALL:
1 – 8" CAP TAPPED FOR 2" IPT
1 – 1" ARV
1 – 2" CO
2 – MH
1 – CONC BLOCK

CURVE DATA				
CURVE	(1)	(2)	(3)	(4)
Δ	40°53'26"	43°09'27"	43°10'07"	266°19'32"
Δ/2	20°26'43"	21°34'43.5"	21°35'03.5"	133°09'46"
R	350.00	46.00	46.00	39.00
T	130.48	18.19	18.20	41.59
C	244.52	33.84	33.84	56.89
Lc	249.79	34.65	34.66	181.28

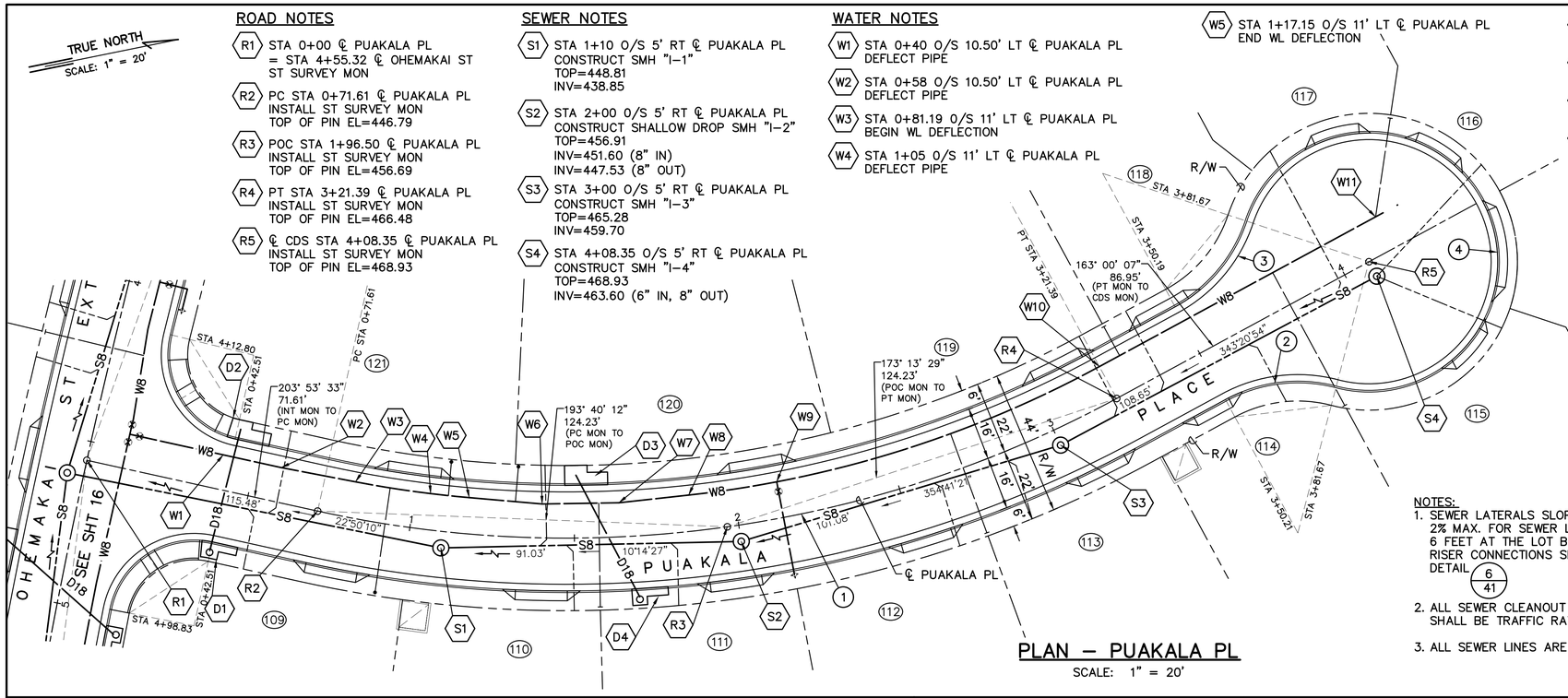
DRAIN NOTES

(D1) STA 0+42.11 ℄ PUAKALA PL CONSTRUCT TYPE "A" CB "I-1" INV=440.30 (18")

(D2) STA 0+42.36 ℄ PUAKALA PL CONSTRUCT CB "I-2"/DW INV=440.05 (CB & 18") INV=420.05 (DW) SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D3) STA 1+50.64 ℄ PUAKALA PL CONSTRUCT CB "I-4"/DW INV=445.98 (CB & 18") INV=425.98 (DW) SEE STRUCTURAL SHEETS S-1, S-2 & S-3

(D4) STA. 1+68.67 ℄ PUAKALA PL CONSTRUCT TYPE "A" CB "I-3" INV=447.73 (18")

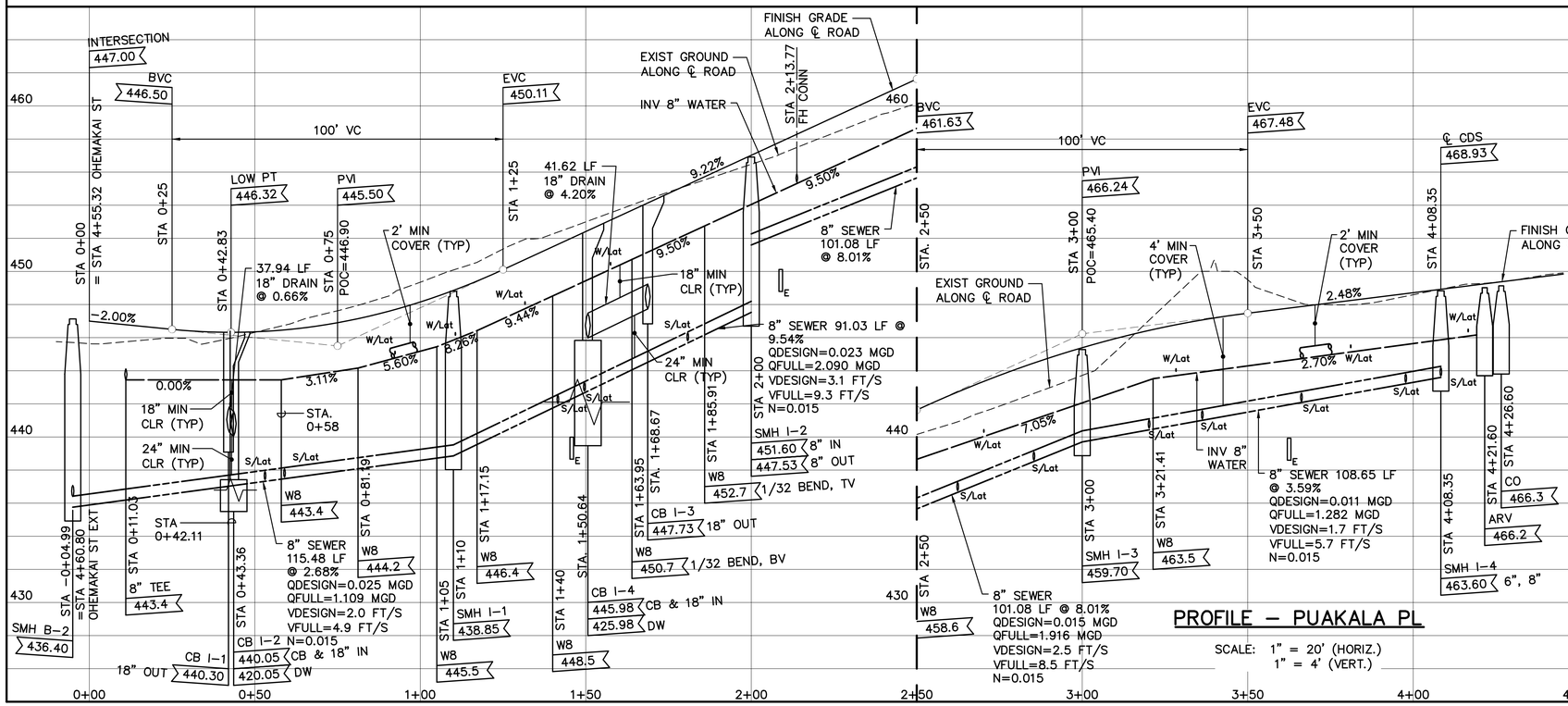


PLAN – PUAKALA PL

SCALE: 1" = 20'

NOTES:
1. SEWER LATERALS SLOPES SHALL BE 1% MIN, 2% MAX. FOR SEWER LATERALS DEEPER THAN 6 FEET AT THE LOT BOUNDARY, ADVANCED RISER CONNECTIONS SHALL BE INSTALLED PER DETAIL 6/41
2. ALL SEWER CLEANOUT FRAME AND COVERS SHALL BE TRAFFIC RATED.
3. ALL SEWER LINES ARE GRAVITY LINES.

CHIEF, WASTEWATER DIVISION — DATE



PROFILE – PUAKALA PL

SCALE: 1" = 20' (HORIZ.)
1" = 4' (VERT.)

4' 0 4' 8'
SCALE: 1" = 4'-0"

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PLAN & PROFILE
PUAKALA PL (ROAD "I")
STA. 0+00 TO END

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

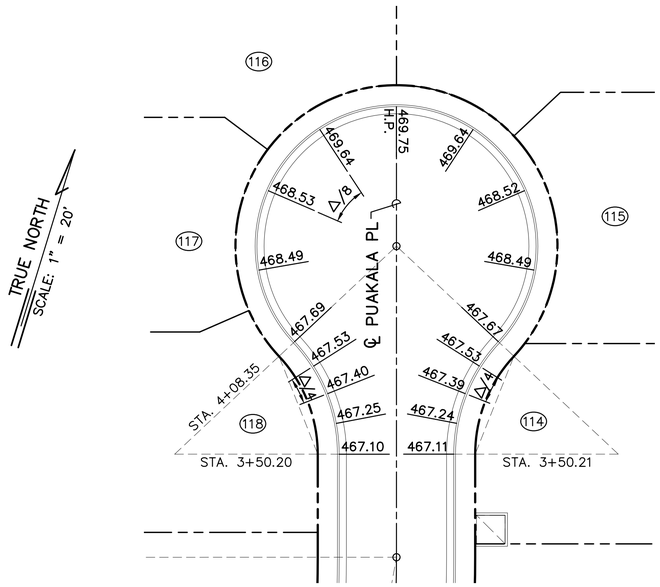
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

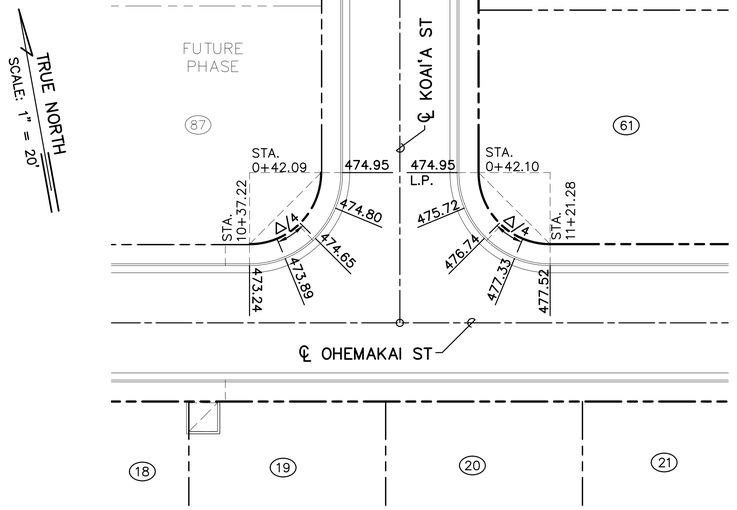
FILE	POCKET	FOLDER	NO.

SHEET 25 OF 68 SHEETS

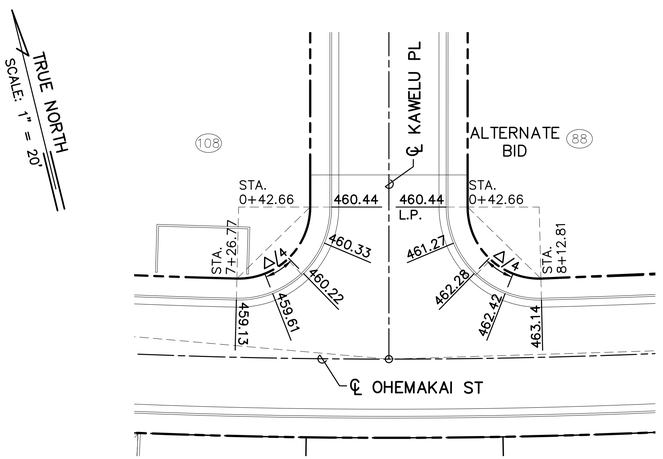
Last Save by: LRS
Last Saved: 6/27/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Plan & Profile-Road LDWG



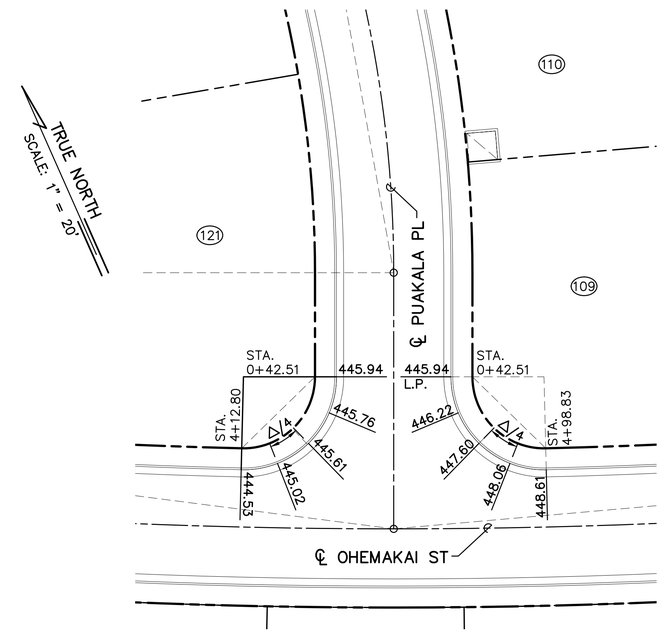
PUAKALA PL
SCALE: 1" = 20'



OHEMAKAI ST / KOAI'A ST
SCALE: 1" = 20'



OHEMAKAI ST / KAWELU PL
SCALE: 1" = 20'



OHEMAKAI ST / PUAKALA PL
SCALE: 1" = 20'

NOTE: ELEVATIONS SHOWN ARE BOTTOM OF CURB.

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CURB RETURN GRADES

SCOTT A. KUNIOKA
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

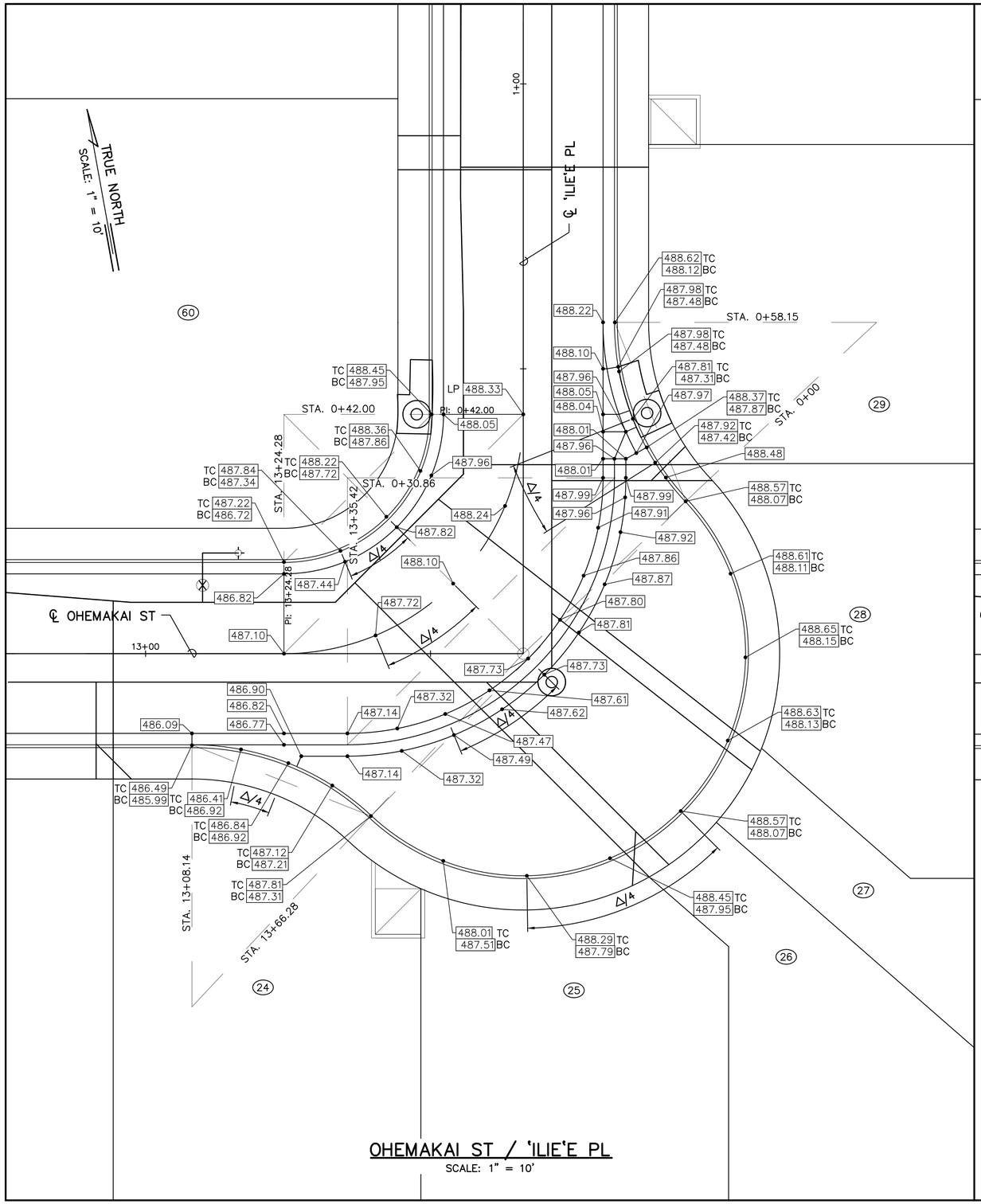
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 26 OF 68 SHEETS

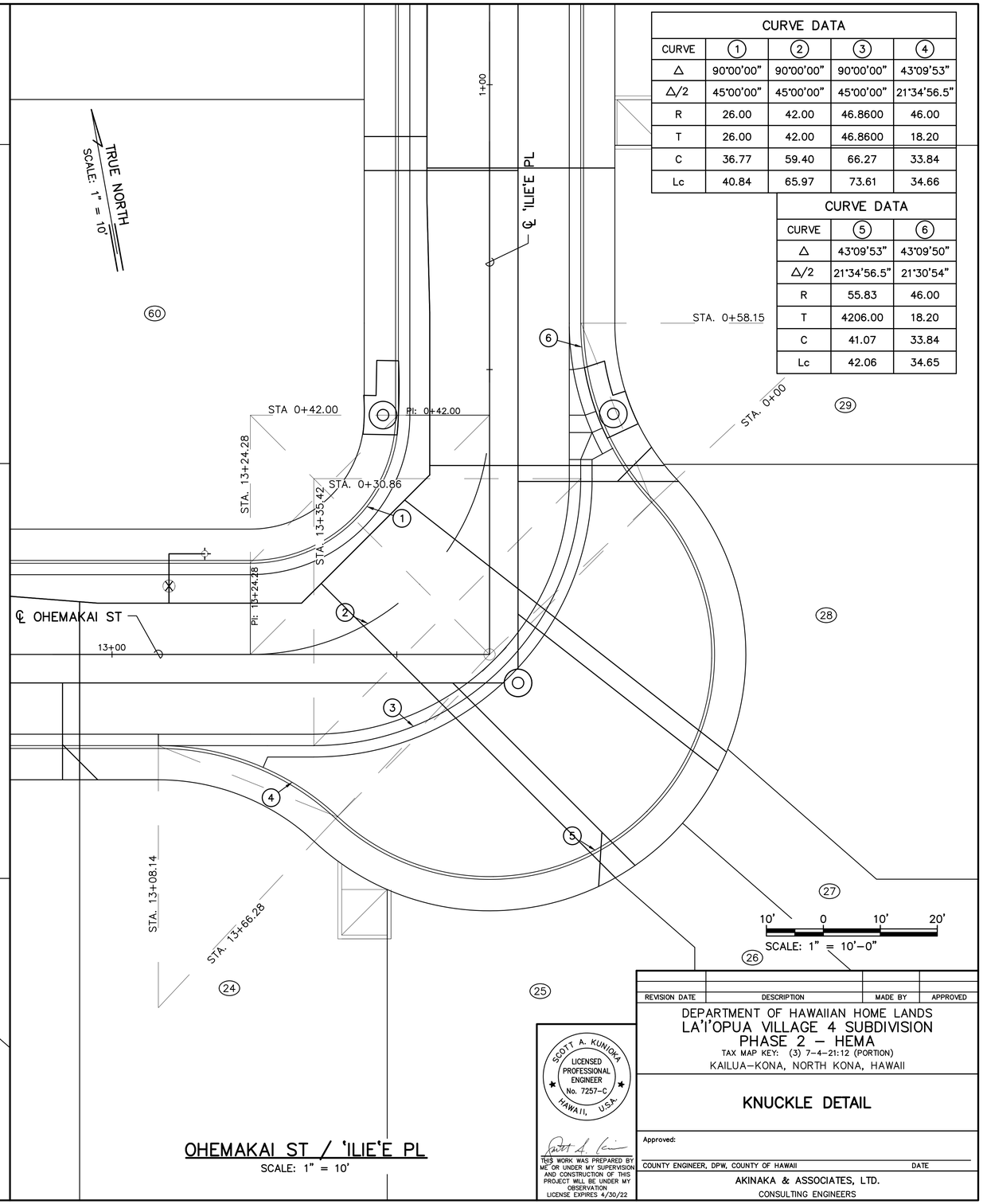
Last Save by: KNL
Last Saved: 3/12/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Curb Return Grades.DWG



OHEMAKAI ST / 'ILIE'E PL

SCALE: 1" = 10'



CURVE DATA				
CURVE	(1)	(2)	(3)	(4)
Δ	90°00'00"	90°00'00"	90°00'00"	43°09'53"
Δ/2	45°00'00"	45°00'00"	45°00'00"	21°34'56.5"
R	26.00	42.00	46.8600	46.00
T	26.00	42.00	46.8600	18.20
C	36.77	59.40	66.27	33.84
Lc	40.84	65.97	73.61	34.66

CURVE DATA		
CURVE	(5)	(6)
Δ	43°09'53"	43°09'50"
Δ/2	21°34'56.5"	21°30'54"
R	55.83	46.00
T	4206.00	18.20
C	41.07	33.84
Lc	42.06	34.65

OHEMAKAI ST / 'ILIE'E PL

SCALE: 1" = 10'

10' 0 10' 20'

SCALE: 1" = 10'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

KNUCKLE DETAIL

SCOTT A. KUNIOKA
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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 27 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 2/26/2015
Plotted on: 3/9/2020

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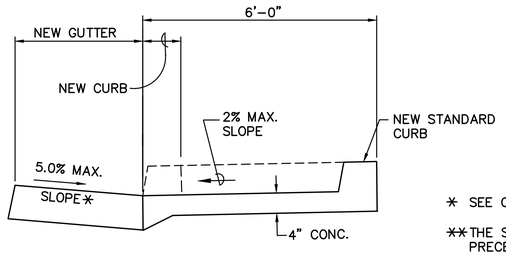
CURB RAMP AND SIDEWALK NOTES:

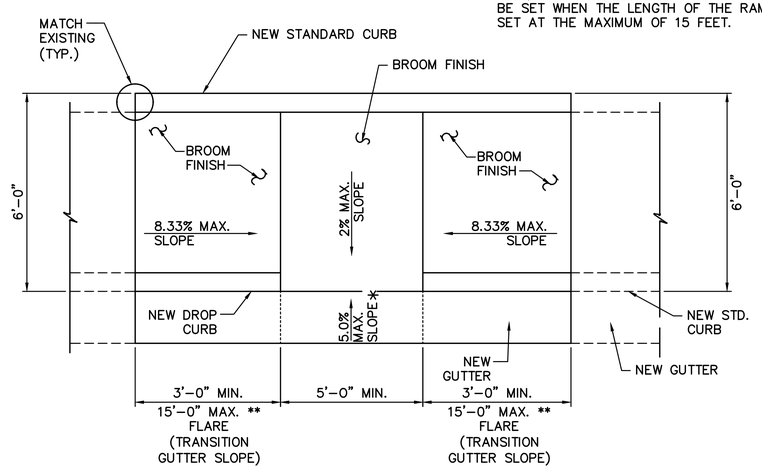
1. THESE TYPICAL DETAILS ARE INTENDED AS CURB RAMP GUIDELINES FOR DESIGN AND CONSTRUCTION.
2. A 2% MAXIMUM CROSS SLOPE SHALL BE MAINTAINED IN THE DIRECTION OF PEDESTRIAN TRAFFIC.
3. SUBJECT TO FIELD CONDITIONS, THE ENGINEER SHALL DETERMINE THE FINAL LOCATION OF CURB RAMPS. WHEN NECESSITATED BY EXISTING PHYSICAL CONDITIONS, ALTERNATE CURB RAMPS MAY BE USED SUBJECT TO THE ENGINEER'S APPROVAL.
4. ALL PULLBOXES SHALL BE INSTALLED AWAY FROM THE CURB RAMP AND WITHIN THE SIDEWALK/UNPAVED AREA TO THE MAXIMUM EXTENT FEASIBLE.
5. WHERE NECESSARY, EXISTING PULLBOXES, HANDHOLES, MANHOLES, ETC. SHALL BE ADJUSTED TO MATCH CURB RAMP GRADE. ADJUSTMENTS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS CURB RAMP ITEMS UNLESS INDICATED OTHERWISE.
6. TRANSITIONS FROM RAMPS TO GUTTERS AND ROADWAYS SHALL BE FLUSH.
7. CURB RAMPS AND SIDEWALKS SHALL BE CONSTRUCTED TO ELIMINATE PONDING TO THE MAXIMUM EXTENT FEASIBLE.
8. FOR AN EXISTING SIDEWALK, ENTIRE SIDEWALK BETWEEN NEAREST SCORE LINES SHALL BE REMOVED. FOR CURBS > 6" HIGH, FLARES SHALL BE CONSTRUCTED AT A MAX. RATIO OF 12H:1V. HOWEVER, IF "X" >/= 48", FLARES SHALL BE CONSTRUCTED AT A MAX. RATIO OF 10H:1V.
9. THE MAXIMUM SLOPES OF ADJOINING GUTTERS OR ROAD SURFACE IMMEDIATELY FRONTING THE CURB RAMP SHALL NOT EXCEED 5%.
10. THERE SHALL BE A 30"X48" LEVEL GROUND SURFACE (2% MAX. CROSS SLOPE, BOTH DIRECTIONS) FOR A FORWARD OR SIDE APPROACH, AS APPROPRIATE, TO A PEDESTRIAN PUSH BUTTON.
11. CONSTRUCTION JOINTS ARE REQUIRED TO JOIN CURB RAMPS WITH SIDEWALKS.
12. UNLESS OTHERWISE NOTED, NEW GUTTERS ARE REQUIRED AS SHOWN.
13. ALL CURB RAMPS SHALL BE REINFORCED WITH 6X6 W1.4/W1.4 WELDED WIRE FABRIC.
14. SURFACE OF SIDEWALKS AND CURB RAMPS SHALL BE FIRM, STABLE, AND SLIP-RESISTANT. THIS INCLUDES THE SURFACES OF PULLBOXES, VALVE COVERS, MANHOLE COVERS, ETC.
15. BED COURSE MATERIAL IS REQUIRED FOR CURB RAMPS, SIDEWALKS, AND GUTTERS.
16. ALL SIDEWALKS SHALL PROVIDE A MINIMUM CLEAR WIDTH OF 3'-0" (EXCLUDING CURB) FOR PEDESTRIAN CIRCULATION. IF THIS CANNOT BE MET, A MINIMUM 32-INCH CLEAR WIDTH IS ALLOWED FOR A DISTANCE OF 24-INCHES.
17. PASSING SPACES ALONG NEW SIDEWALKS WITH LESS THAN 5' CLEAR WIDTH SHALL BE PROVIDED AT MAXIMUM 200' INTERVALS AS REQUIRED BY ADA GUIDELINES. THE PASSING AREA SHALL BE A MINIMUM 5' WIDE BY 5' LONG AS FEASIBLE.
18. IF POSSIBLE, INSTALL UTILITY POLES, FIRE HYDRANTS, LIGHT POLES, SIGN POSTS, PULLBOXES, ETC. OFF OF SIDEWALK BUT WITHIN THE RIGHT-OF-WAY.
19. OBJECTS PROTRUDING FROM UTILITY POLES AND WALLS ADJACENT TO THE SIDEWALKS (I.E. WALL MOUNTED FIRE HYDRANTS, TELEPHONES, METERS ON POLES, ETC.) SHALL BE MOUNTED TO MEET THE 2010 STANDARDS FOR ACCESSIBLE DESIGN SECTION 307 AND WILL BE SUBJECT TO ENGINEER'S APPROVAL.
20. IF A CURB RAMP IS NOT CONSTRUCTED ACCORDING TO THE PLANS, THE CONTRACTOR SHALL RECONSTRUCT THE CURB RAMP AT NO COST TO THE STATE. CONSTRUCTION TOLERANCE FOR PORTLAND CEMENT CONCRETE SHALL BE BASED ON 1/4 INCH PER 10 FT. (±0.2%). REMEDIAL MEASURES WILL NOT BE ACCEPTED.
21. ADDITIONAL INFORMATION IS AVAILABLE FROM:
    A) AMERICAN WITH DISABILITIES ACT AND ARCHITECTURAL BARRIERS ACT ACCESSIBILITY GUIDELINES, JULY 23, 2004, UNITED STATES ACCESS BOARD.
    B) ACCESSIBLE RIGHTS-OF-WAY: A DESIGN GUIDE, NOV. 1999, THE ACCESS BOARD.
    C) DESIGNING SIDEWALKS AND TRAILS FOR ACCESS, PART 1, JULY 1999, FHWA.
    D) DESIGNING SIDEWALKS AND TRAILS FOR ACCESS, PART 2, JULY 2001, FHWA.



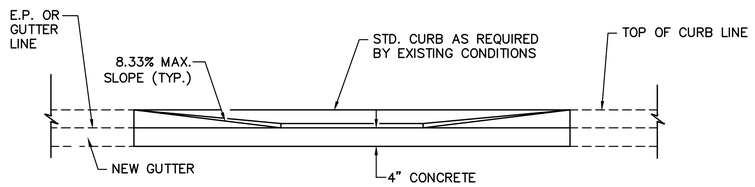
TYPICAL SECTION

* SEE CURB RAMP AND SIDEWALK NOTE NO. 9.

** THE SLOPE OF THE RAMP SHALL TAKE PRECEDENCE OVER THE LENGTH OF THE RAMP. IF THE MAXIMUM SLOPE OF A RAMP CANNOT BE MET WITHIN A LENGTH OF 15 FEET, THEN THE SLOPE OF THE RAMP SHALL BE SET WHEN THE LENGTH OF THE RAMP IS SET AT THE MAXIMUM OF 15 FEET.



PLAN



ELEVATION

1/28 CURB RAMP – TYPE "B" MODIFIED

SIDEWALK WIDTH 6'-0" OR GREATER BUT LESS THAN 15'-0" WIDTH

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CURB RAMP DETAILS 1

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

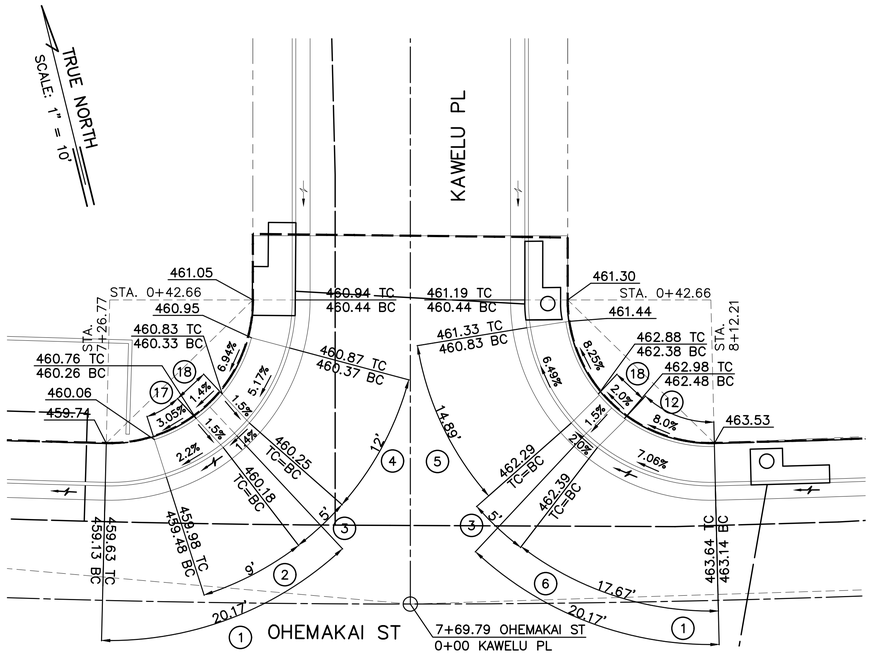
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 28 OF 68 SHEETS

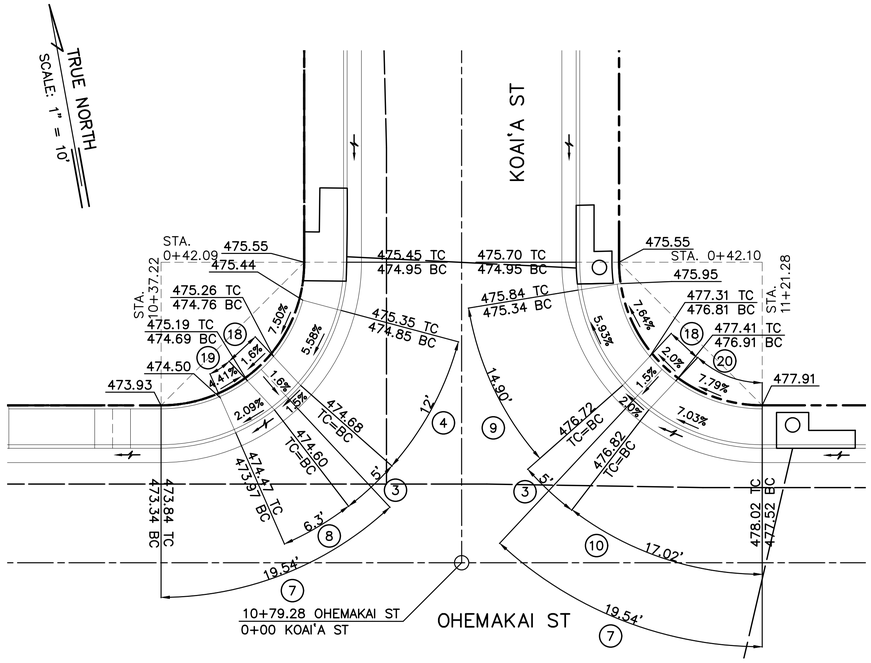
FILE	POCKET	FOLDER	NO.

Last Save by: MLUM
Last Saved: 9/9/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Curb Ramp Details 2.DWG



OHEMAKAI ST / KAWELU PL

SCALE: 1" = 10'



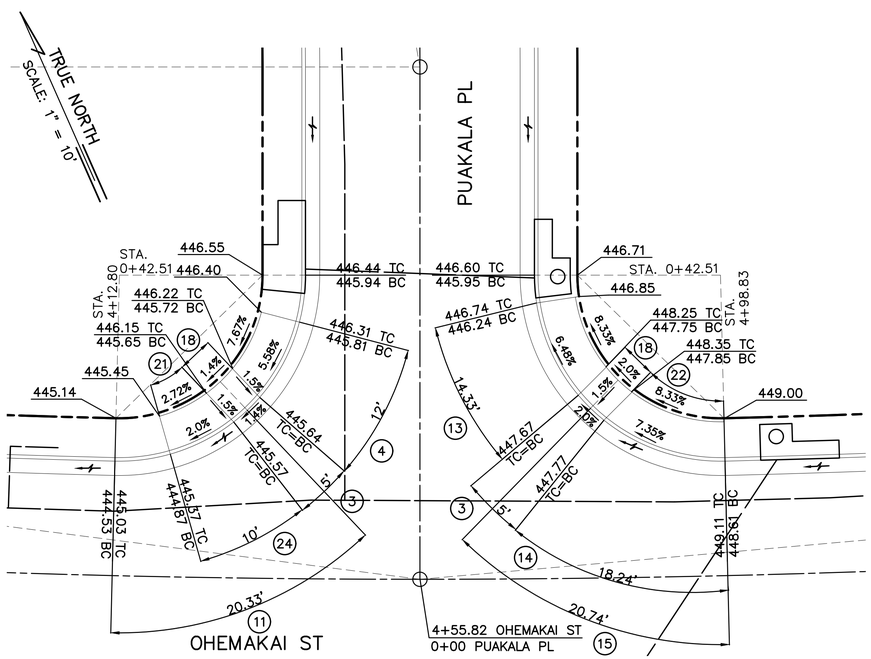
OHEMAKAI ST / KOAI'A ST

SCALE: 1" = 10'

CURVE DATA						
CURVE	①	②	③	④	⑤	⑥
Δ	44°27'24"	19°49'47"	11°02'06"	26°26'28"	32°48'14"	38°55'18"
Δ/2	22°13'42"	9°54'54"	5°31'03"	13°13'14"	16°24'07"	19°27'39"
R	26.00	26.00	26.00	26.00	26.00	26.00
T	10.63	4.55	2.51	6.11	7.65	9.19
C	19.67	8.95	5.00	11.89	14.68	17.32
Lc	20.17	9.00	5.00	12.00	14.89	17.66

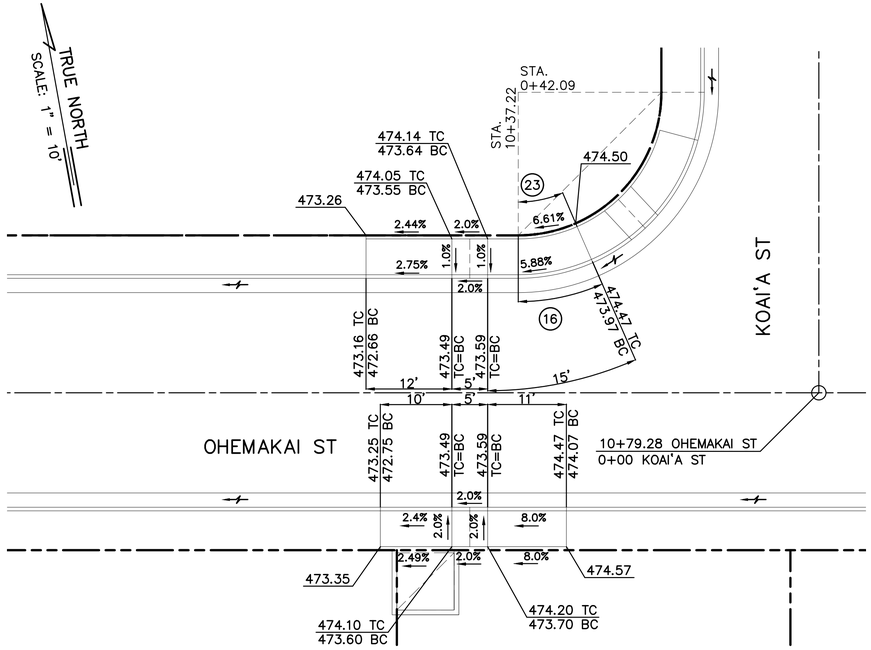
CURVE DATA						
CURVE	⑦	⑧	⑨	⑩	⑪	⑫
Δ	43°02'57"	23°38'44"	32°50'31"	37°30'18"	44°48'20"	37°17'08"
Δ/2	21°31'28.5"	11°49'22"	16°25'16"	18°45'09"	22°24'10"	18°38'34"
R	26.00	26.00	26.00	26.00	26.00	20.00
T	10.26	5.44	7.66	8.83	10.72	6.75
C	19.08	10.65	14.70	16.72	19.82	12.79
Lc	19.54	10.73	14.90	17.02	20.33	13.02

CURVE DATA						
CURVE	⑬	⑭	⑮	⑯	⑰	⑱
Δ	31°34'12"	40°10'45"	45°42'	17°01'34"	18°25'19"	14°21'41"
Δ/2	15°47'06"	20°05'23"	22°51'	8°30'47"	9°12'40"	7°10'51"
R	26.00	26.00	26.00	26.00	20.00	20.00
T	7.35	9.51	10.96	5.44	3.24	2.52
C	14.15	17.86	20.19	10.65	6.40	5.00
Lc	14.33	18.23	20.74	10.73	6.43	5.01



OHEMAKAI ST / PUAKALA PL

SCALE: 1" = 10'



OHEMAKAI ST / KOAI'A ST

SCALE: 1" = 10'

GRAPHIC SCALE:

10 0 10 20

SCALE: 1" = 10'

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

LA'I'OPUA VILLAGE 4 SUBDIVISION

PHASE 2 – HEMA

TAX MAP KEY: (3) 7-4-21:12 (PORTION)

KAILUA–KONA, NORTH KONA, HAWAII

CURB RAMP DETAILS 2

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 29 OF 68 SHEETS

Last Save by: MLUM
Last Saved: 9/9/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village
4:\ACAD\DHHL1102-Curb Ramp Details 3.DWG

DRIVEWAY TIES

LOT NUMBER	DRIVEWAY ℄ STA.	DRIVEWAY WIDTH*
1	0+82.98 OHEMAKAI ST	16'
2	1+36.34 OHEMAKAI ST	16'
3	1+89.69 OHEMAKAI ST	16'
4	2+43.05 OHEMAKAI ST	16'
5	2+96.40 OHEMAKAI ST	16'
6	3+49.76 OHEMAKAI ST	16'
7	4+03.11 OHEMAKAI ST	16'
8	4+57.46 OHEMAKAI ST	16'
9	5+12.08 OHEMAKAI ST	16'
10	5+66.14 OHEMAKAI ST	16'
11	6+20.48 OHEMAKAI ST	16'
12	6+70.84 OHEMAKAI ST	16'
13	7+29.17 OHEMAKAI ST	16'
14	7+83.51 OHEMAKAI ST	16'
15	8+37.85 OHEMAKAI ST	16'
16	8+92.35 OHEMAKAI ST	16'
17	9+48.81 OHEMAKAI ST	13'
18	10+02.31 OHEMAKAI ST	16'
19	10+58.31 OHEMAKAI ST	14'
20	11+01.31 OHEMAKAI ST	16'
21	11+67.31 OHEMAKAI ST	16'
22	12+22.31 OHEMAKAI ST	16'
23	12+76.55 OHEMAKAI ST	16'
24	13+12.49 OHEMAKAI ST	16'
25	13+67.66 OHEMAKAI ST	16'
26 & 27	13+95.53 OHEMAKAI ST	24.40'
28	0+18.78 'ILIE'E PL	16.65'
29	0+71.37 'ILIE'E PL	16'
30	1+30.37 'ILIE'E PL	14'
31	1+91.37 'ILIE'E PL	16'
32	2+50.88 'ILIE'E PL	16'
33	3+09.77 'ILIE'E PL	16'
34	3+68.73 'ILIE'E PL	16'
35	4+24.21 'ILIE'E PL	16'
36	4+86.57 'ILIE'E PL	16'
37	5+40.58 'ILIE'E PL	16'
38	5+96.59 'ILIE'E PL	12'
39	6+48.61 'ILIE'E PL	16'
40	7+02.67 'ILIE'E PL	16'
41	7+54.66 'ILIE'E PL	16'
42	8+06.94 'ILIE'E PL	16'
43	8+52.27 'ILIE'E PL	16'
44	9+13.94 'ILIE'E PL	14'
45	9+48.94 'ILIE'E PL	16'
46	9+46.96 'ILIE'E PL	16'
47	9+10.96 'ILIE'E PL	16'
48	8+54.96 'ILIE'E PL	16'

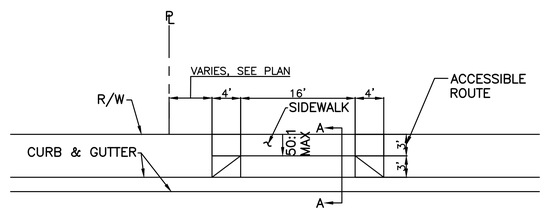
* DRIVEWAY WIDTHS EXCLUDE STANDARD DROP CURB WIDTHS

DRIVEWAY TIES

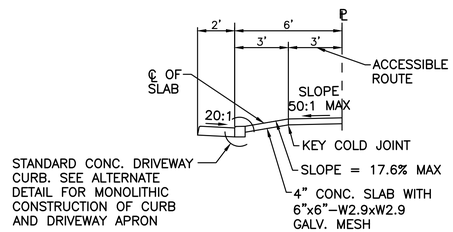
LOT NUMBER	DRIVEWAY ℄ STA.	DRIVEWAY WIDTH*
49	7+98.95 'ILIE'E PL	16'
50	7+38.17 'ILIE'E PL	16'
51	6+74.64 'ILIE'E PL	16'
52	6+05.74 'ILIE'E PL	16'
53	5+47.58 'ILIE'E PL	16'
54	4+84.05 'ILIE'E PL	16'
55	4+09.64 'ILIE'E PL	16'
56	3+32.16 'ILIE'E PL	16'
57	2+68.96 'ILIE'E PL	16'
58	1+96.41 'ILIE'E PL	16'
59	1+37.41 'ILIE'E PL	16'
60	0+75.41 'ILIE'E PL	16'
61	0+69.41 KOAI'A ST	16'
62	1+28.41 KOAI'A ST	16'
63	1+87.91 KOAI'A ST	16'
64	2+50.78 KOAI'A ST	16'
65	2+96.60 KOAI'A ST	16'
66	3+64.07 KOAI'A ST	16'
67	4+25.60 KOAI'A ST	16'
68	4+85.17 KOAI'A ST	16'
69	5+45.72 KOAI'A ST	16'
70	6+00.41 KOAI'A ST	16'
71	6+53.16 KOAI'A ST	16'
72	7+04.03 KOAI'A ST	14'
73	7+53.03 KOAI'A ST	16'
74	7+93.03 KOAI'A ST	16'
75	8+07.62 KOAI'A ST	16'
76	7+66.62 KOAI'A ST	16'
77	7+16.62 KOAI'A ST	16'
78	6+66.62 KOAI'A ST	16'
79	6+10.72 KOAI'A ST	16'
80	5+50.32 KOAI'A ST	16'
81	4+80.92 KOAI'A ST	16'
82	4+15.32 KOAI'A ST	16'
83	3+35.71 KOAI'A ST	16'
84	2+64.32 KOAI'A ST	16'
85	1+91.04 KOAI'A ST	16'
86	1+31.56 KOAI'A ST	14'
87	0+70.56 KOAI'A ST	16'
88	0+80.84 KAWELU PL	16'
89	1+38.72 KAWELU PL	16'
90	2+01.35 KAWELU PL	16'
91	2+61.36 KAWELU PL	16'
92	3+18.36 KAWELU PL	16'
93	3+81.16 KAWELU PL	16'
94	4+37.19 KAWELU PL	16'
95	4+91.09 KAWELU PL	16'

DRIVEWAY TIES

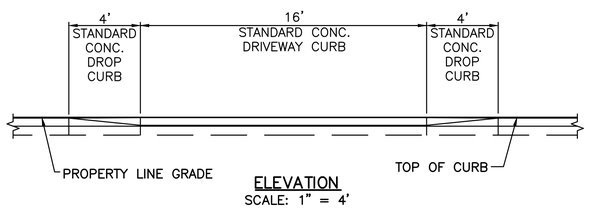
LOT NUMBER	DRIVEWAY ℄ STA.	DRIVEWAY WIDTH*
96	5+47.02 KAWELU PL	16'
97	6+03.02 KAWELU PL	16'
98	6+47.02 KAWELU PL	16'
99	6+54.05 KAWELU PL	16'
100	6+18.05 KAWELU PL	16'
101	5+68.05 KAWELU PL	16'
102	5+18.05 KAWELU PL	16'
103	4+54.45 KAWELU PL	16'
104	3+78.98 KAWELU PL	16'
105	2+96.85 KAWELU PL	16'
106	2+20.53 KAWELU PL	16'
107	1+39.36 KAWELU PL	16'
108	0+83.36 KAWELU PL	16'
109	0+79.07 PUAKALA PL	16'
110	1+40.32 PUAKALA PL	16'
111	1+96.83 PUAKALA PL	16'
112	2+53.34 PUAKALA PL	16'
113	3+07.97 PUAKALA PL	16'
114	3+45.23 PUAKALA PL	12'
115	4+22.09 PUAKALA PL	16'
116	4+42.05 PUAKALA PL	16'
117	4+17.75 PUAKALA PL	16'
118	3+46.96 PUAKALA PL	16'
119	3+09.60 PUAKALA PL	16'
120	2+08.32 PUAKALA PL	16'
121	0+99.06 PUAKALA PL	16'
122	2+80.65 OHEMAKAI ST	16'
123	2+05.00 OHEMAKAI ST	16'
124	1+46.88 OHEMAKAI ST	16'
125	0+84.95 OHEMAKAI ST	16'
CBU LOT	4+44.14 PUAKALA PL	23.21'



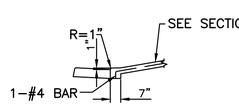
PLAN
SCALE: 1" = 10'



SECTION A-A
SCALE: 1" = 4'



ELEVATION
SCALE: 1" = 4'



ALTERNATE DETAIL
SCALE: 1" = 4'

DRIVEWAY APRON DETAIL

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DRIVEWAY DETAILS

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 30 OF 68 SHEETS

Last Save by: KNL
Last Saved: 9/9/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Driveway Details.DWG

DRIVEWAY LAYOUT PLAN 1
SCALE: 1" = 40'

Last Save by: MLUM
Last Saved: 9/9/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-DRIVEWAY LAYOUT PLAN 1.DWG

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
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DRIVEWAY LAYOUT PLAN 1

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
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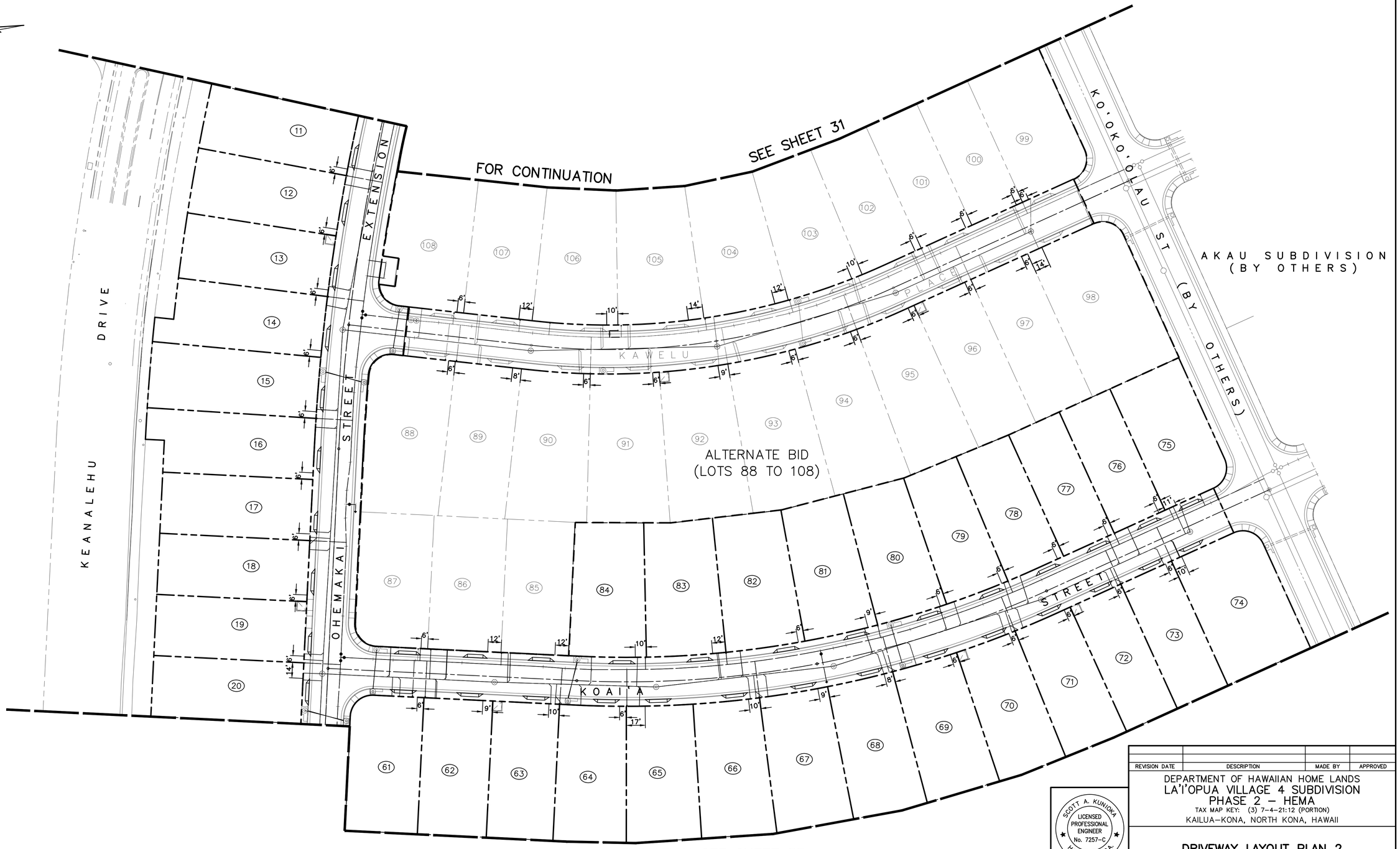
FILE	POCKET	FOLDER	NO.

TRUE NORTH
SCALE: 1" = 40'



DRIVEWAY LAYOUT PLAN 2
SCALE: 1" = 40'

Last Save by: LRS
Last Saved: 9/9/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-DRIVEWAY LAYOUT PLAN 2.DWG

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DRIVEWAY LAYOUT PLAN 2

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

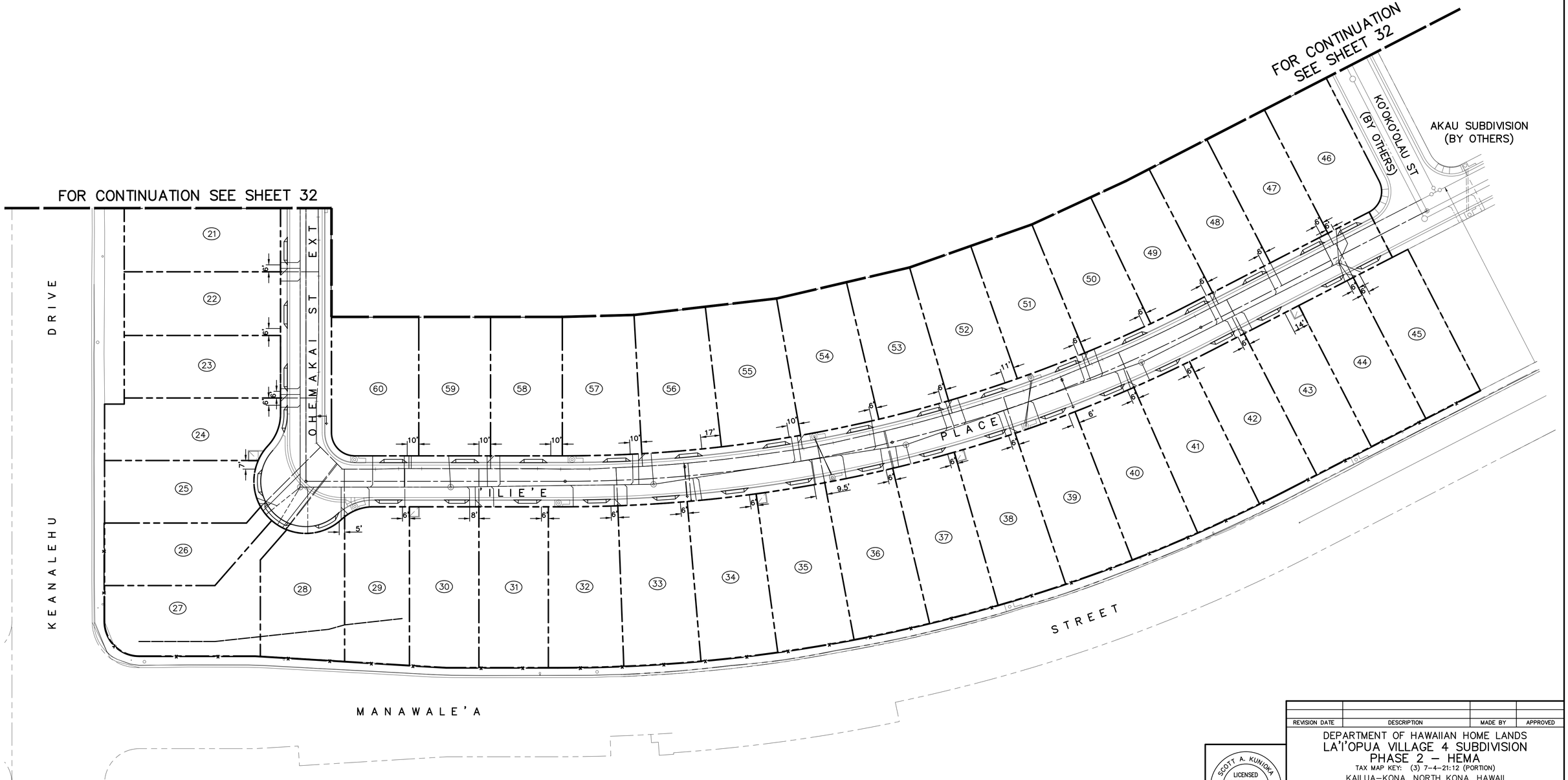
Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

TRUE NORTH
SCALE: 1" = 40'



DRIVEWAY LAYOUT PLAN 3
SCALE: 1" = 40'

40 0 40 80
SCALE: 1" = 40'

Last Save by: KNL
Last Saved: 9/9/2019
Plotted on: 3/9/2020

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4\ACAD\DHHL1102-DRIVEWAY LAYOUT PLAN
3.DWG

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DRIVEWAY LAYOUT PLAN 3

SCOTT A. KUNIOKA
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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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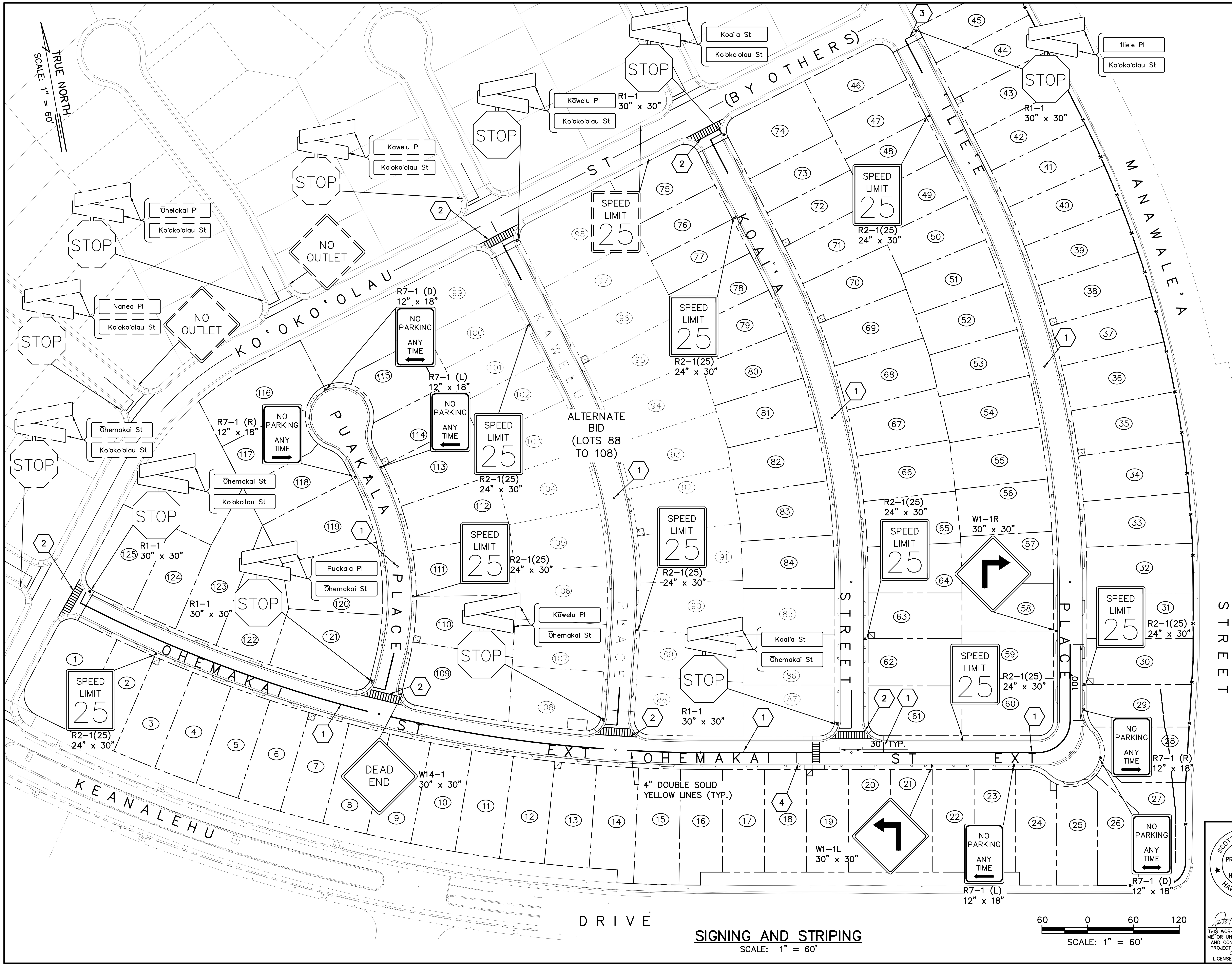
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.



SIGNING AND STRIPING

SCALE: 1" = 60'

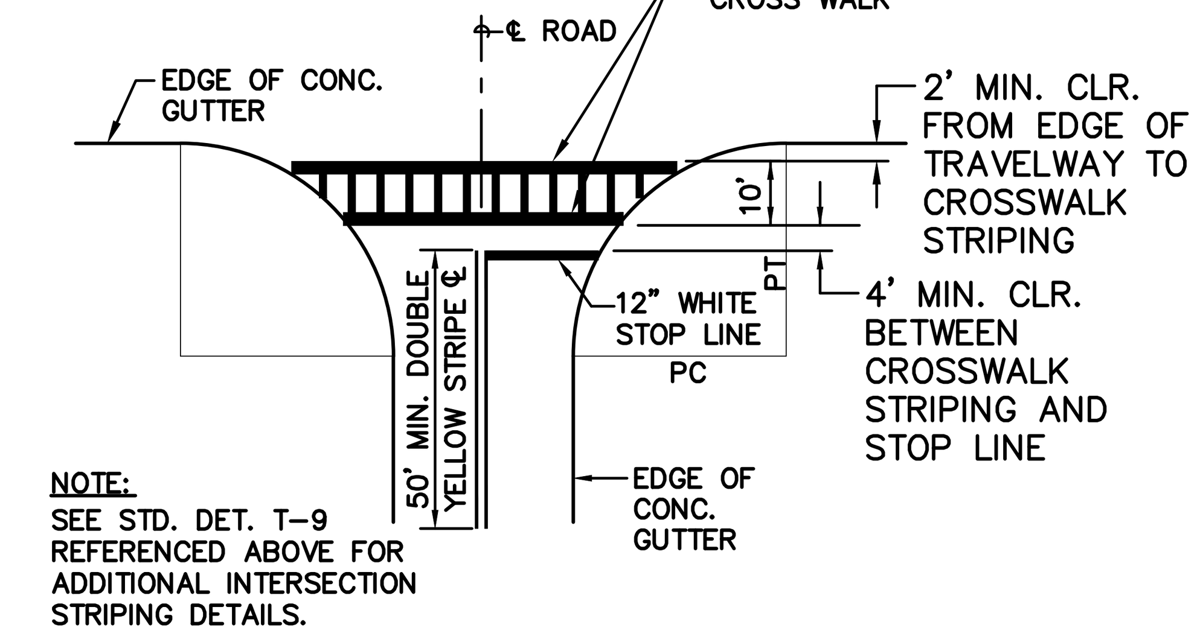
60 0 60 120

SCALE: 1" = 60'

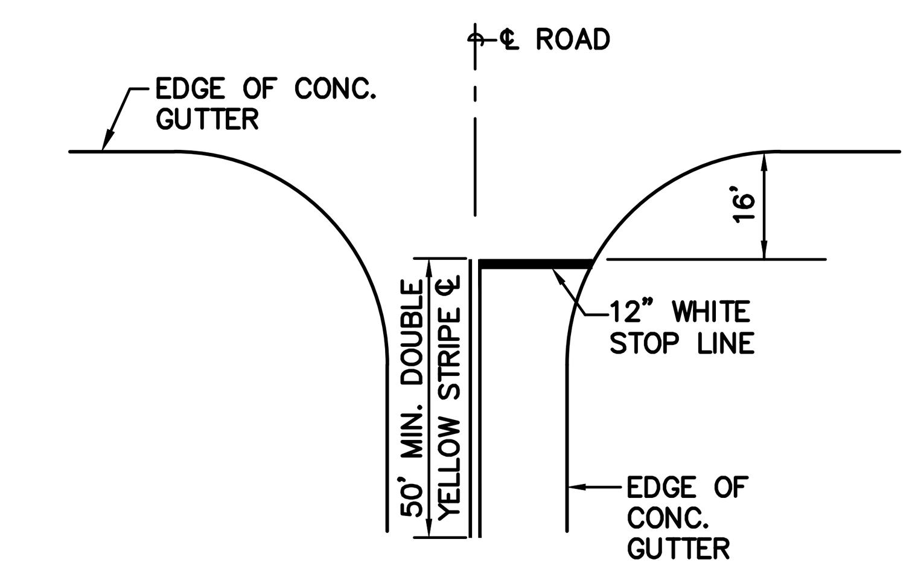
TYPICAL INSTALLATIONS	DEPARTMENT OF PUBLIC WORKS COUNTY OF HAWAII'S STANDARD DETAIL
HEIGHT & LATERAL LOCATION OF SIGN	T-2
LOCATION FOR STOP SIGNS	T-3
INTERSECTION DETAIL FOR STRIPING	T-9
STRIPING DETAILS	T-10
STREET NAME & SIGN DETAIL	T-1

NOTE:
1. ALL REGULATORY SIGNS SHALL BE REFLECTORIZED WITH TYPE IV HIGH INTENSITY RETRORETLECTIVE SHEETING.
2. SEE TRAFFIC NOTES ON SHEET 3

REFERENCE:
MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS OF THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAYS ADMINISTRATION, LATEST EDITION.



TYPICAL LOCAL STREET INTERSECTION STRIPING



TYPICAL STOP LINE STRIPING

1. BLUE REFLECTIVE MARKER
2. INSTALL CROSS WALK, STOP LINE AND CENTERLINE STRIPING
3. INSTALL STOP LINE AND CENTERLINE STRIPING
4. INSTALL STOP LINE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SIGNING AND STRIPING

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SCOTT A. KUNIOKA LICENSED PROFESSIONAL ENGINEER No. 7257-C HAWAII, U.S.A.

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SHEET 34 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 12/17/2019
Plotted on: 3/9/2020
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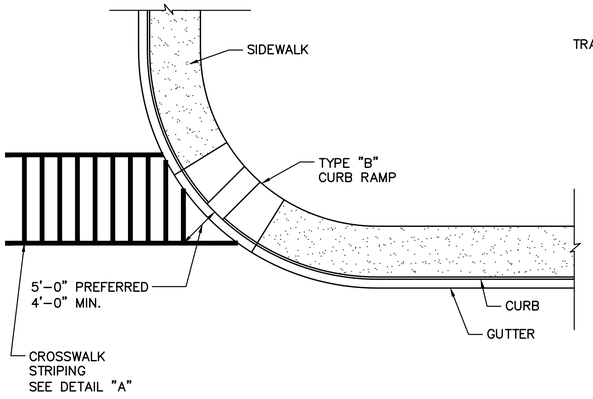
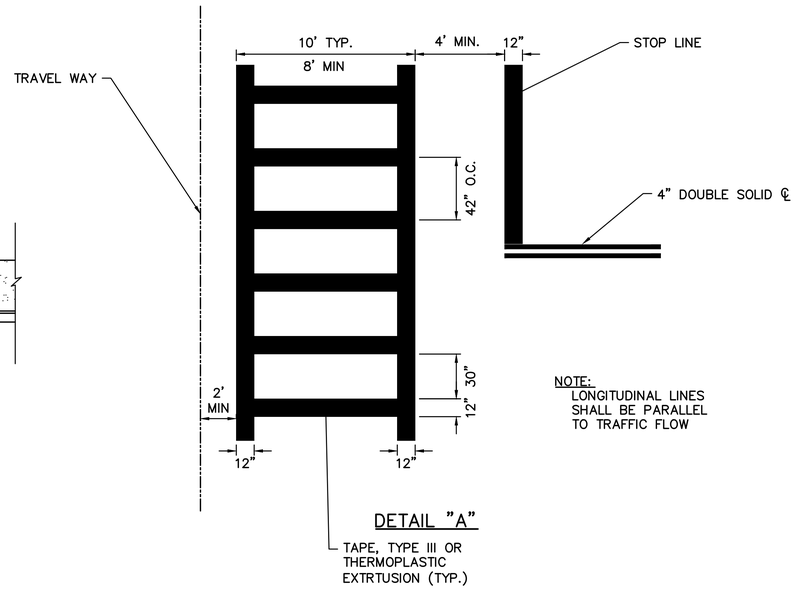


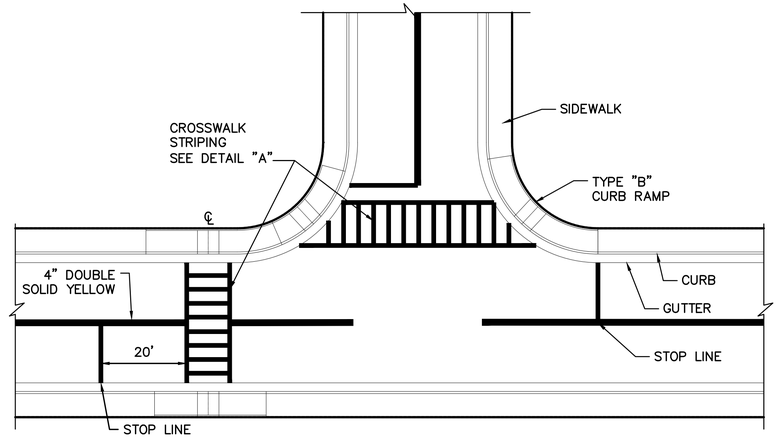
TYPICAL CROSSWALK STRIPING
AT DIAGONAL CURB RAMP



DETAIL "A"

NOTE:
LONGITUDINAL LINES
SHALL BE PARALLEL
TO TRAFFIC FLOW

CROSSWALK STRIPING DETAIL
SCALE: NOT TO SCALE



OHEMAKAI STREET AND KOAI'A STREET
INTERSECTION STRIPING DETAIL
SCALE: NOT TO SCALE

Last Save by: LRS
Last Saved: 12/17/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Curb Ramp Details 1.DWG

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CURB RAMP STRIPING DETAILS

SCOTT A. KUNIOKA
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HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

KO'OKO'OLAU ST &
OHEMAKAI ST EXT
SIGHT DISTANCE

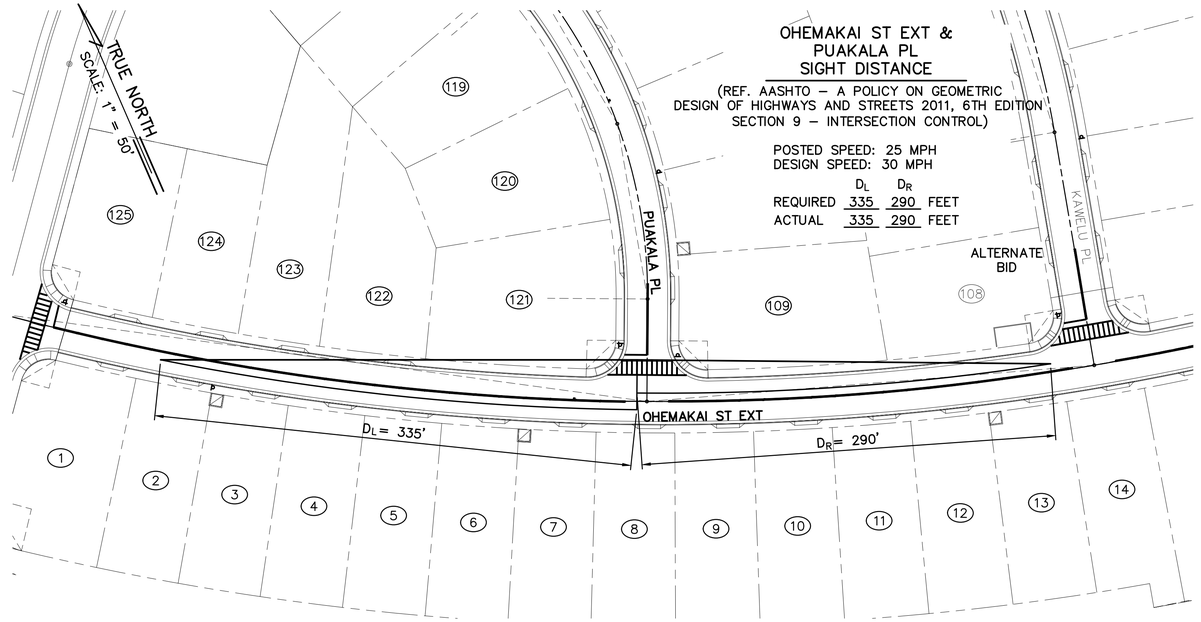
(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011, 6TH EDITION SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	335	N/A	FEET

KO'OKO'OLAU ST / OHEMAKAI ST EXT

SCALE: 1" = 50'



OHEMAKAI ST EXT &
PUAKALA PL
SIGHT DISTANCE

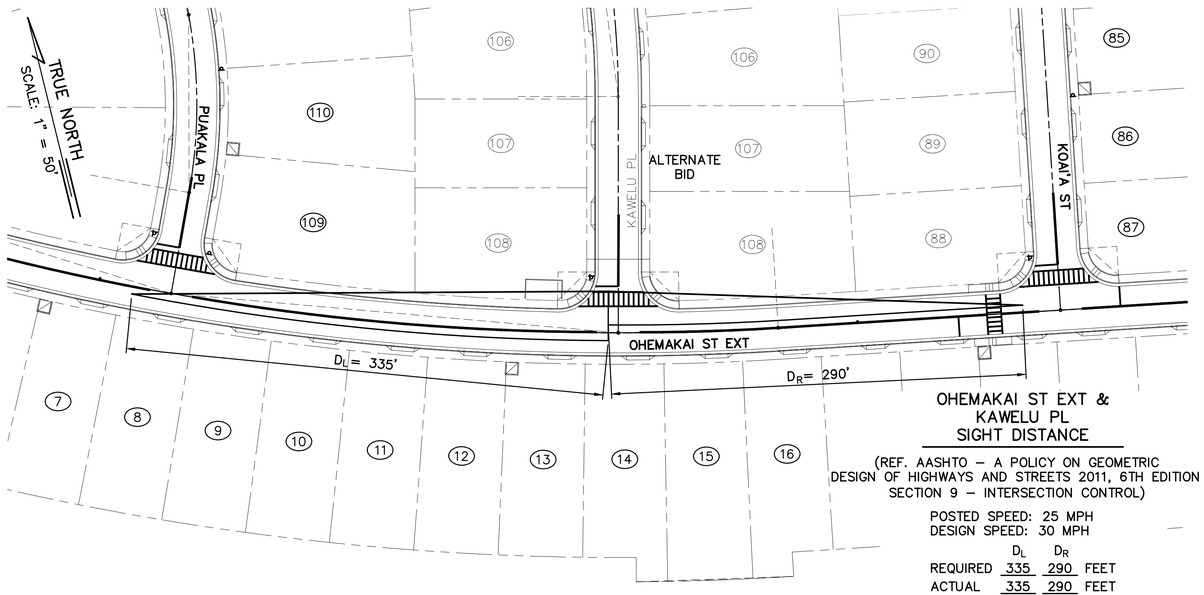
(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011, 6TH EDITION SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	335	290	FEET

OHEMAKAI ST EXT / PUAKALA PL

SCALE: 1" = 50'



OHEMAKAI ST EXT &
KAWELU PL
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2011, 6TH EDITION SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	335	290	FEET

OHEMAKAI ST EXT / KAWELU PL

SCALE: 1" = 50'

GRAPHIC SCALE:

50' 0 50' 100'

SCALE: 1" = 50'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257–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 4/30/22

SIGHT DISTANCE DETAILS 1

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

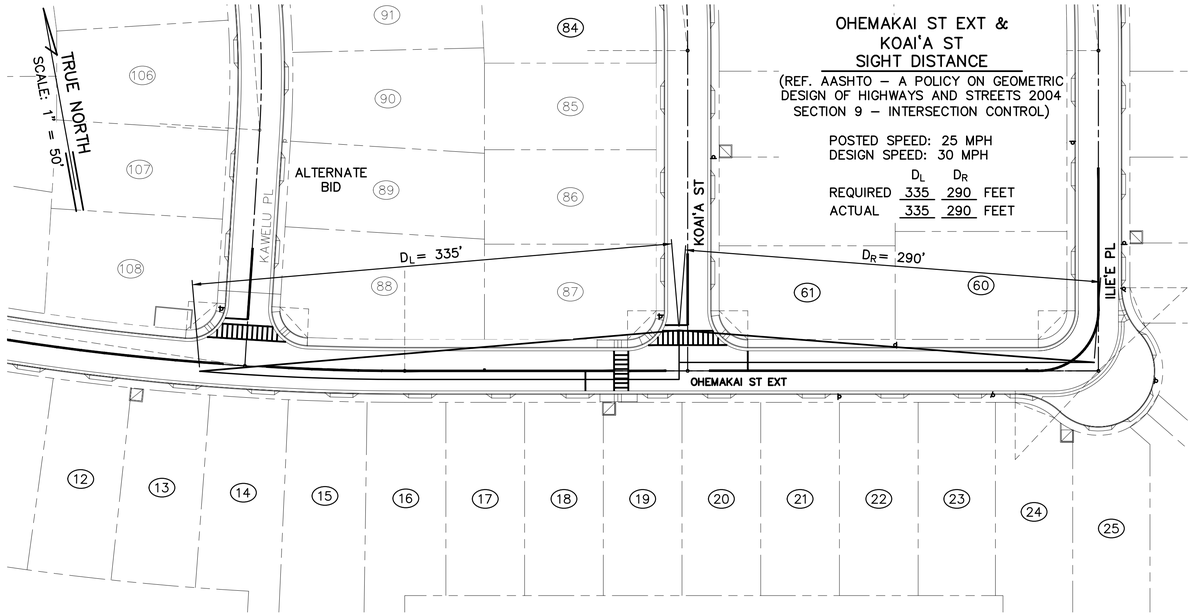
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 36 OF 68 SHEETS

Last Save by: KNL
Last Saved: 3/12/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Sight Distance Details 1.DWG



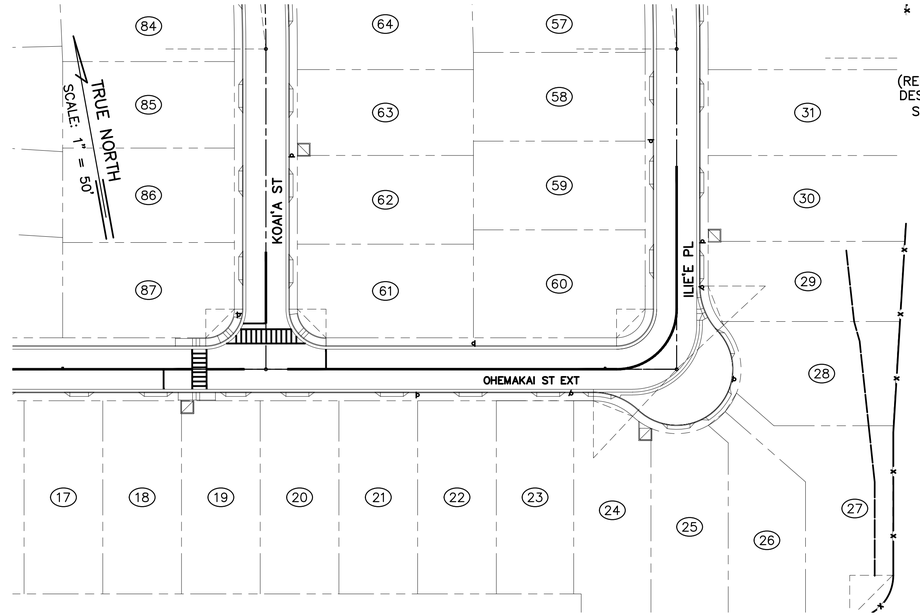
OHEMAKAI ST EXT & KOAI'A ST
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2004 SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	335	290	FEET

OHEMAKAI ST EXT / KOAI'A ST
SCALE: 1" = 50'



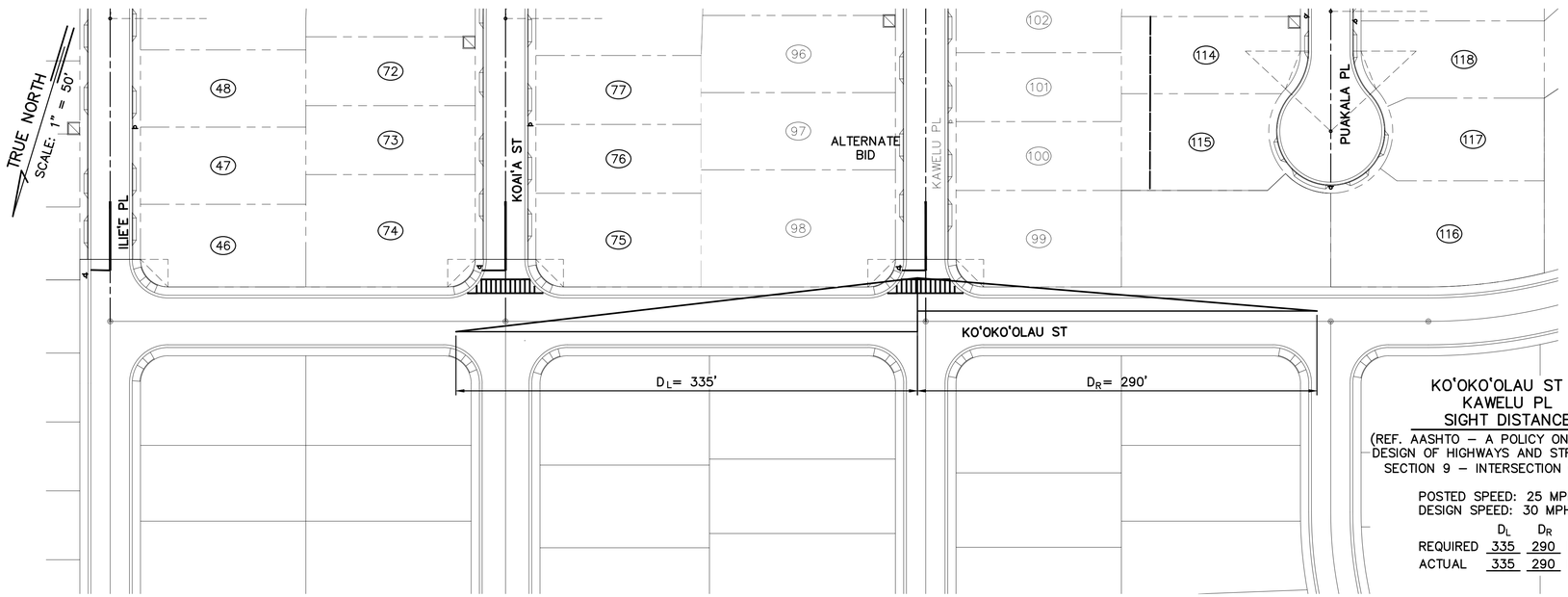
OHEMAKAI ST EXT & ILIE'E PL
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2004 SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	N/A	N/A	FEET
ACTUAL	N/A	N/A	FEET

OHEMAKAI ST EXT / ILIE'E PL
SCALE: 1" = 50'



KO'OKO'OLAU ST & KAWELU PL
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2004 SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	335	290	FEET

KO'OKO'OLAU ST / KAWELU PL
SCALE: 1" = 50'

GRAPHIC SCALE:
50' 0 50' 100'
SCALE: 1" = 50'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SIGHT DISTANCE DETAILS 2

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

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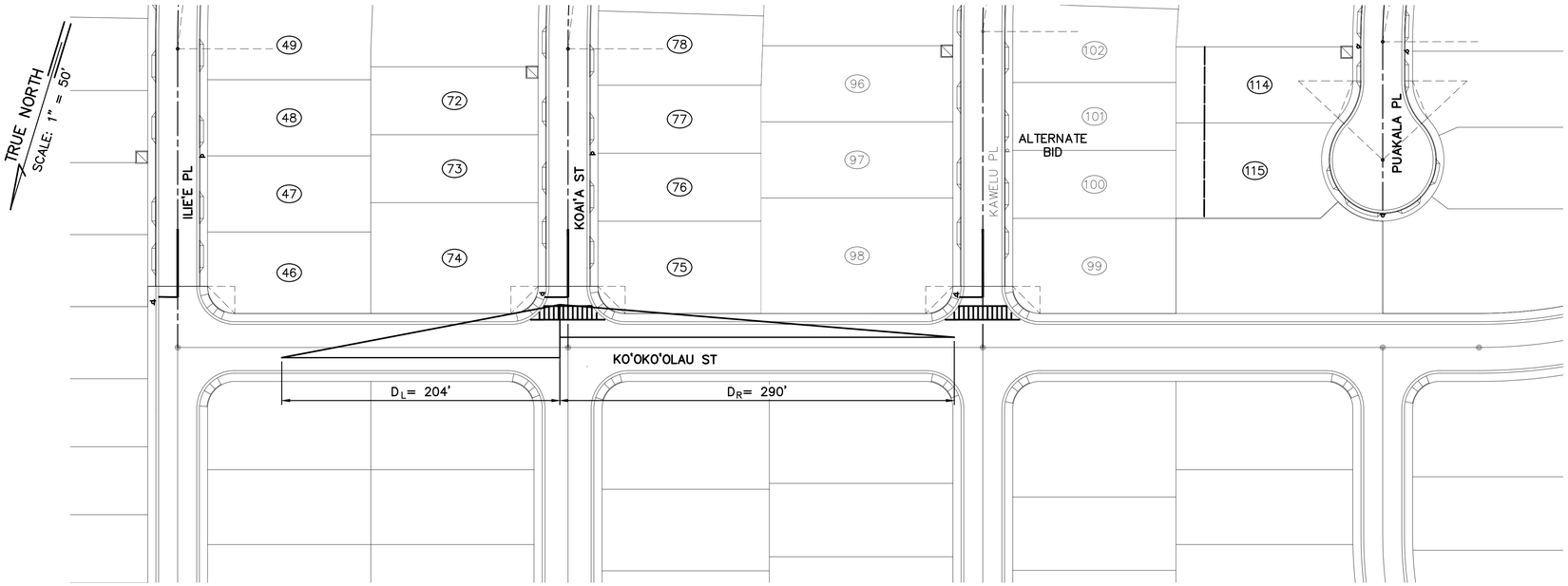
FILE	POCKET	FOLDER	NO.

SHEET 37 OF 68 SHEETS

Last Save by: KNL
Last Saved: 3/12/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Sight Distance Details 2.DWG



KO'OKO'OLAU ST / KOAI'A ST

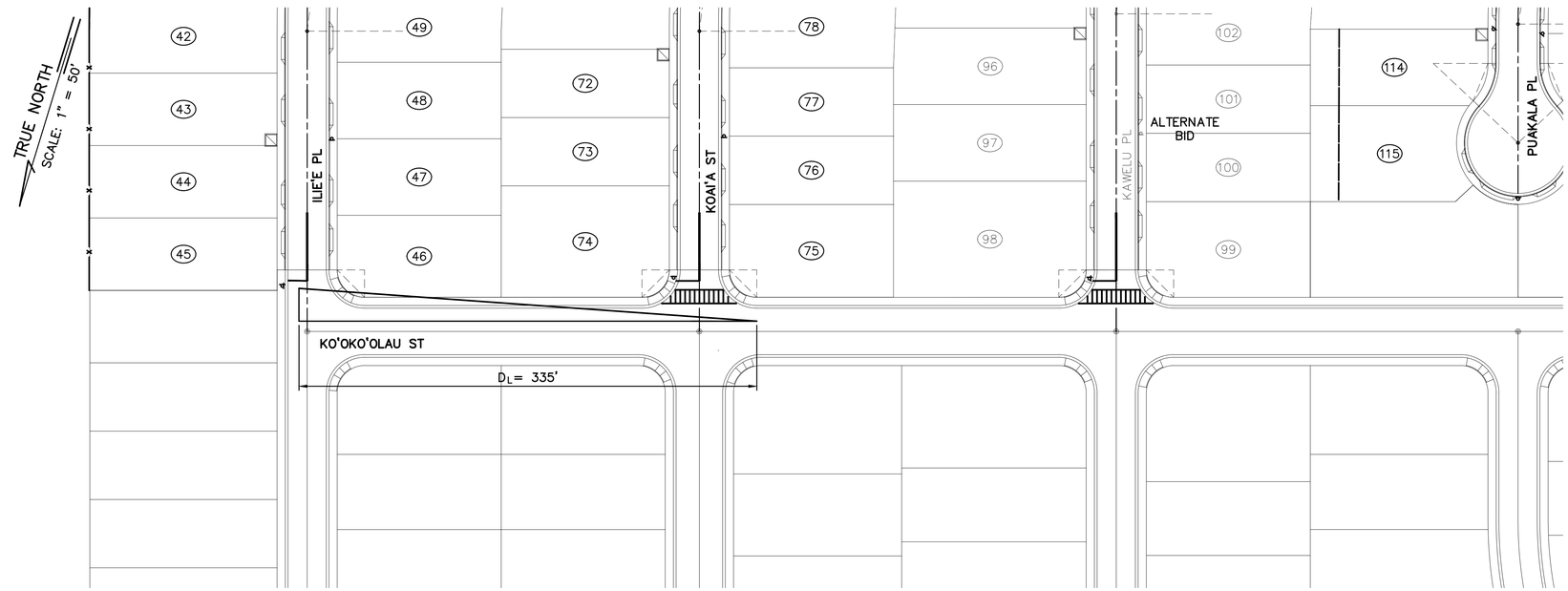
SCALE: 1" = 50'

KO'OKO'OLAU ST &
KOAI'A ST
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2004 SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	290	FEET
ACTUAL	N/A	290	FEET



KO'OKO'OLAU ST / ILIE'E PL

SCALE: 1" = 50'

KO'OKO'OLAU ST &
ILIE'E PL
SIGHT DISTANCE

(REF. AASHTO – A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS 2004 SECTION 9 – INTERSECTION CONTROL)

POSTED SPEED: 25 MPH
DESIGN SPEED: 30 MPH

	D_L	D_R	
REQUIRED	335	N/A	FEET
ACTUAL	335	N/A	FEET

GRAPHIC SCALE:

50' 0 50' 100'

SCALE: 1" = 50'–0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

SIGHT DISTANCE DETAILS 3

SCOTT A. KUNIOKA
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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

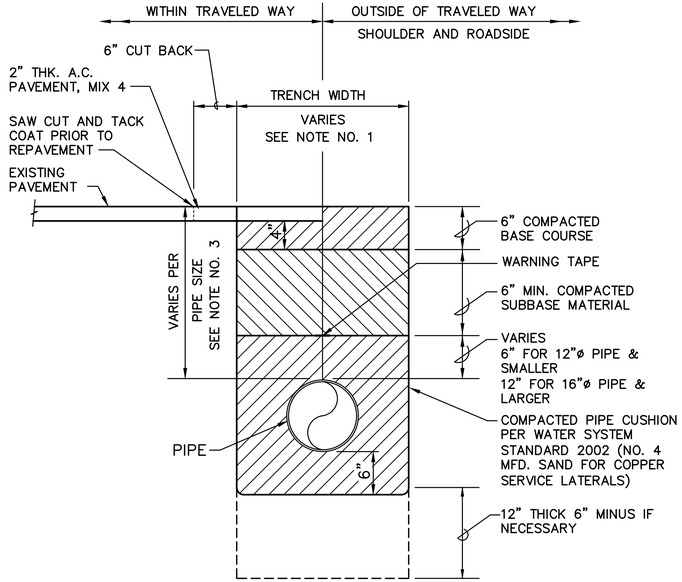
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

SHEET 38 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

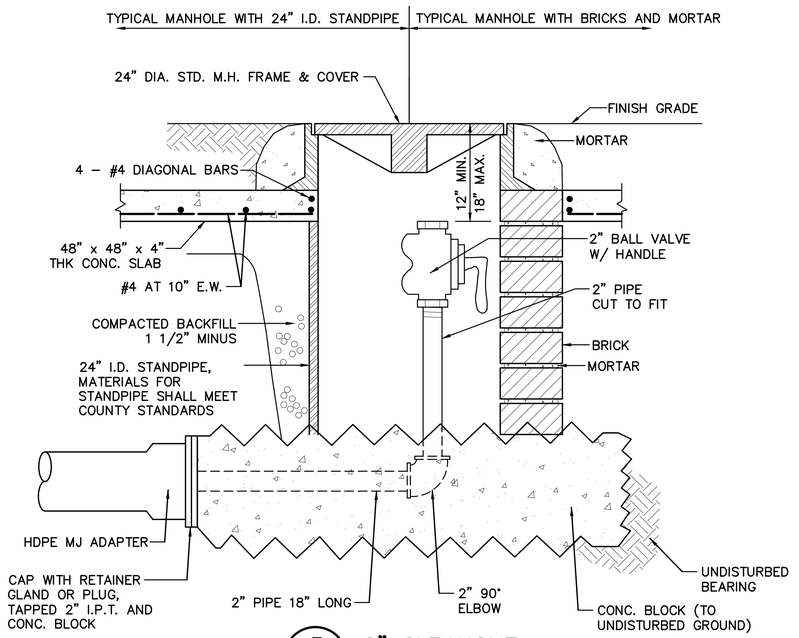
Last Save by: KNL
Last Saved: 3/12/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Sight Distance Details 3.DWG

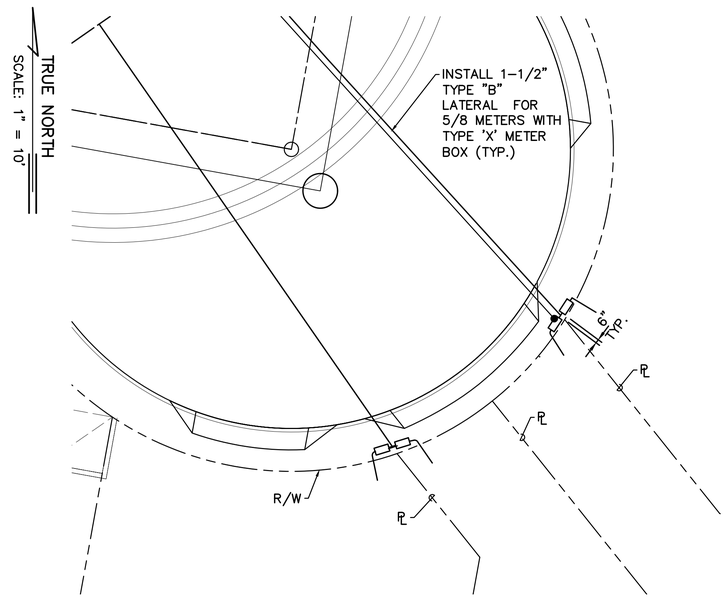


NOTES:
1. SEE TABLE 300-1, PAGE 302-3, WATER SYSTEM STANDARDS 2002.
2. LOCAL MATERIAL MAY BE USED OUTSIDE SHOULDER AREA.
3. SEE TABLE 100-3, PAGE 102-4, WATER SYSTEM STANDARDS, 2002.
4. DRIVEWAY RESTORATION
   A. WHERE EXISTING DRIVEWAY IS CONCRETE, 4" CONCRETE REINFORCED WITH 6x6x10/10 WWM ON 4" BASE COURSE SHALL BE USED IN LIEU OF THE ABOVE SECTION.
   B. WHERE AN EXISTING DRIVEWAY IS UNPAVED, THE DRIVEWAY SHALL BE RESTORED TO A CONDITION EQUAL OR BETTER THAN THE EXISTING DRIVEWAY.
   C. WHERE EXISTING DRIVEWAY IS PAVED, THE DRIVEWAY SHALL BE RESTORED AS SHOWN ABOVE.
   D. CONTRACTOR SHALL NOTIFY THE OWNER OF THE DRIVEWAY 48 HOURS BEFORE THE COMMENCEMENT OF ANY WORK.

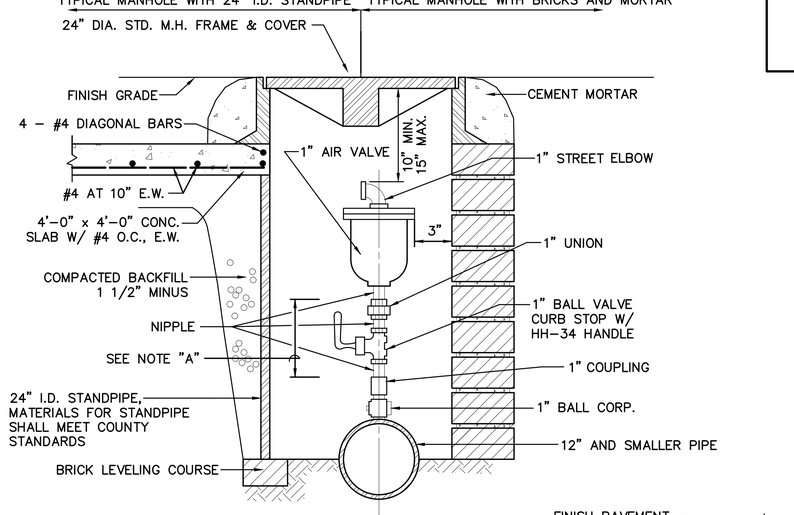
1/39 TRENCHING DETAIL
SCALE: 1" = 10'



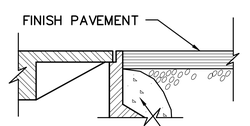
3/39 2" CLEANOUT
NOT TO SCALE



2/39 FLAG LOT WATER LATERAL DETAIL
SCALE: 1" = 10'



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 TO RIGHT.



MANHOLE INSTALLATION WITHIN PAVED AREAS

4/39 1" AIR VALVE UNIT
NOT TO SCALE

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

WATER DETAILS

SCOTT A. KUNIOKA
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LICENSE EXPIRES 4/30/22

Approved:

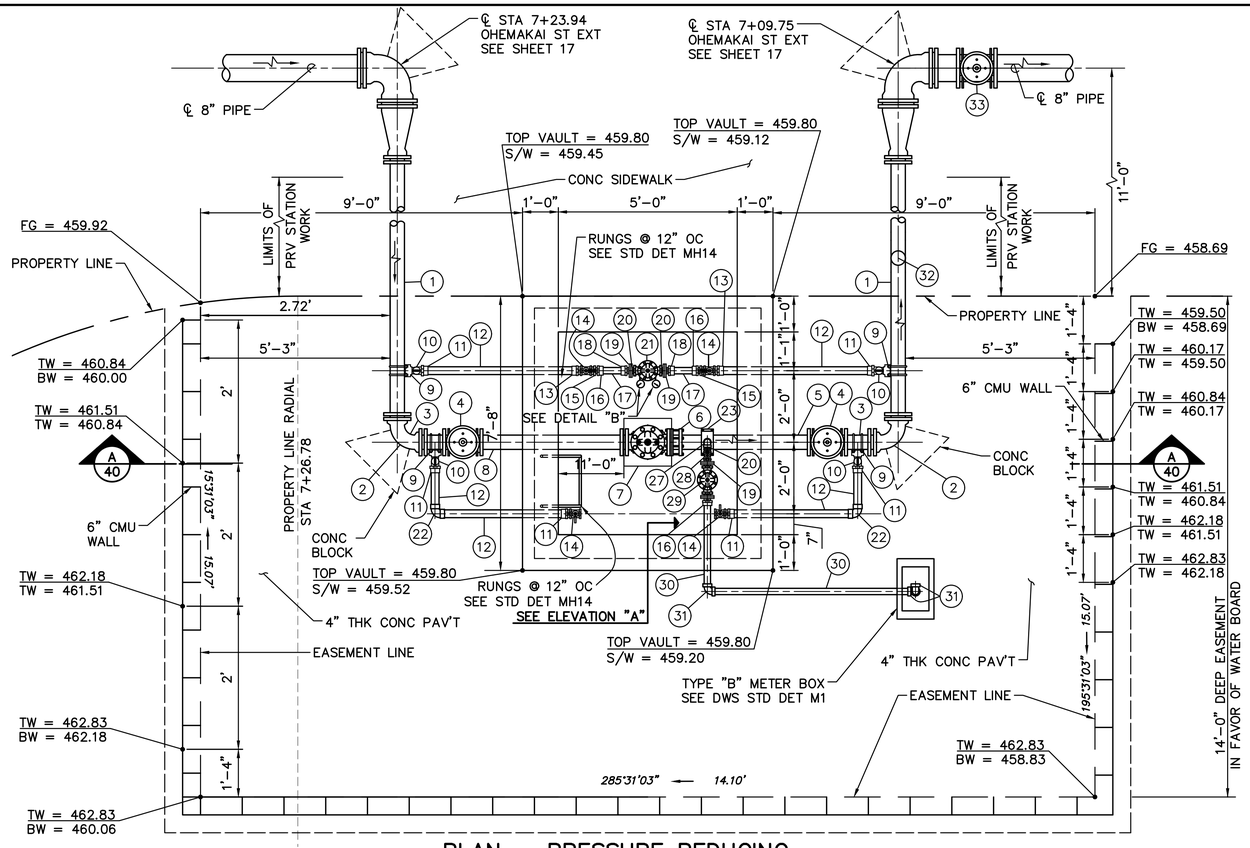
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

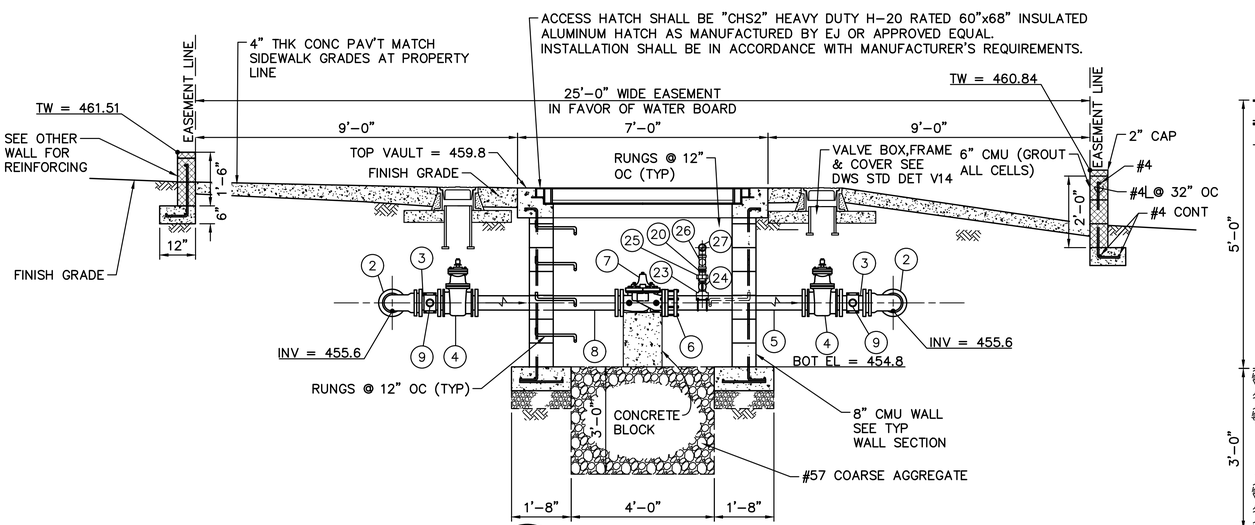
SHEET 39 OF 68 SHEETS

Last Save by: KNL
Last Saved: 4/4/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Water Details.DWG



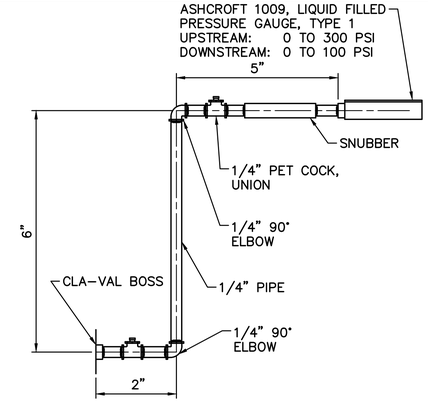
PLAN – PRESSURE REDUCING VALVE STATION

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



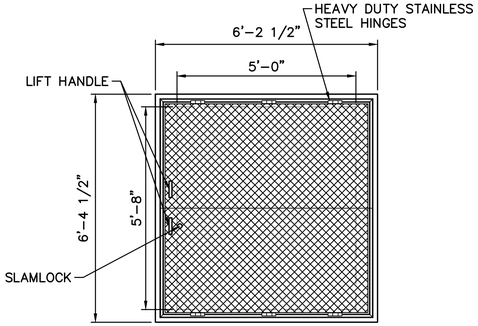
A/40 SECTION

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



DETAIL "B"

NOT TO SCALE

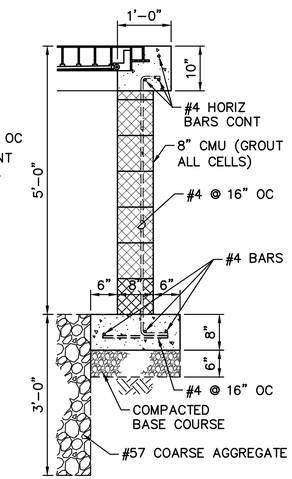


NOTE: HATCH SHALL BE "CHS2" MANUFACTURED BY EJ OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS.

"CHS2" HEAVY DUTY H-20 RATED INSULATED ALUMINUM HATCH – 60"x68" COVER PLAN

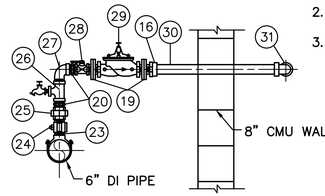
SCALE: 1/2" = 1'-0"

MATERIAL SCHEDULE	
ITEM	DESCRIPTION
1	4" PIPE, CUT-TO-FIT
2	4" 90° BEND, MJ WITH JOINT RESTRAINT
3	4" NIPPLE, CUT-TO-FIT
4	4" GATE VALVE, 150#, MJ
5	4" PIPE, PE, CUT-TO-FIT
6	4" FLANGED COUPLING ADAPTER
7	4" PRESSURE REDUCING/SUSTAINING VALVE, FE, CLA-VAL MODEL 92G-01 BYSP KCX X101
8	4" PIPE, FE x PE, 4'-0" LONG
9	4" x 2" DOUBLE STRAP SERVICE SADDLE
10	2" x 2 1/2" CORP STOP
11	2 1/2" FEMALE ADAPTER, C-F
12	2 1/2" PIPE, CUT-TO-FIT
13	2 1/2" MALE ADAPTER, C-M
14	2 1/2" BALL VALVE, SE
15	2 1/2" x 2" BUSHING
16	2" MALE ADAPTER, C-M
17	2" PIPE, 8" LONG
18	2" FORD LOCK PACK No. CF35-77
19	2" METER FLANGES, FORD No. CF31-77
20	2" CLOSE NIPPLE
21	2" PRESSURE REDUCING VALVE, SE, CLA-VAL MODEL 90G-01 ABS KCX X101
22	2 1/2" 90° ELBOW
23	4" x 1 1/2" DOUBLE STRAP SERVICE SADDLE
24	1 1/2" x 2" CORP STOP
25	2" UNION
26	2" x 2" x 1" TEE W/1" HOSE BIBB
27	2" STREET ELBOW
28	2" BALL VALVE, SE
29	2" PRESSURE RELIEF VALVE, SE, CLA-VAL MODEL 50G-01 BP KCX X101
30	2" PIPE, CUT-TO-FIT
31	2" ELBOW, C-C
32	1" AIR RELIEF VALVE
33	8" GATE VALVE, 150# MJ



TYPICAL WALL SECTION

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



ELEVATION "A"

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

NOTES:
1. CLAYTON VALVES SHALL BE EQUIPPED WITH EPOXY COATING INTERNALLY AND EXTERNALLY.
2. PRESSURE REDUCER SETTINGS: 4" = 50 PSI, 2" = 55 PSI
3. CRD RANGE: 15 TO 75 PSI
   CRL RANGE: 20 TO 200 PSI

1' 0 1' 2' 3'
SCALE: 3/4" = 1'-0"

2' 0 2' 4'
SCALE: 1/2" = 1'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PRESSURE REDUCING VALVE DETAILS

SCOTT A. KUNIOKA
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LICENSE EXPIRES 4/30/22

Approved:

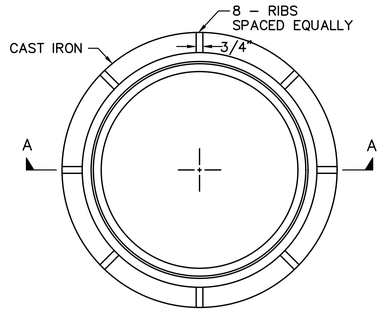
COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

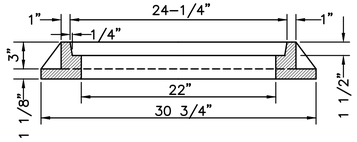
SHEET 40 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

Last Save by: LRS
Last Saved: 8/22/2017
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-PRV Details.dwg

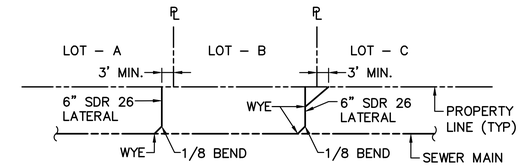


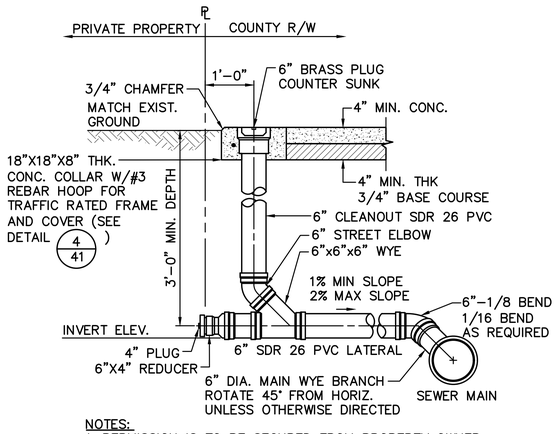
PLAN OF MANHOLE FRAME



SECTION A–A

1/41 MH FRAME TYPE SA
NOT TO SCALE

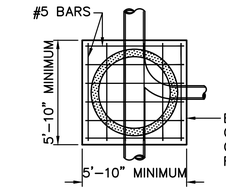




NOTES:
1. PERMISSION IS TO BE SECURED FROM PROPERTY OWNER BEFORE CONSTRUCTION @ PROPERTY LINE IS STARTED

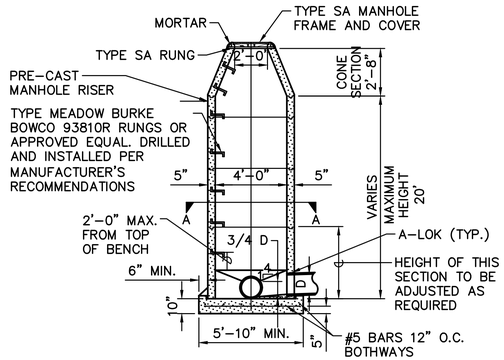
2. MINIMUM BURIAL DEPTH OF 3' IS REQUIRED FOR SEWER LATERALS LOCATED UNDER SIDEWALK AREAS.

3/41 SEWER LATERAL DETAIL
NOT TO SCALE

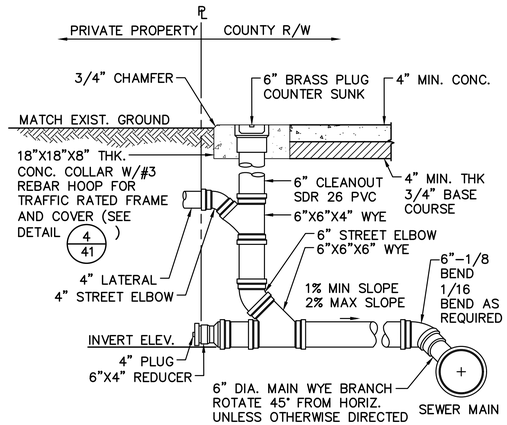


SECTION A–A

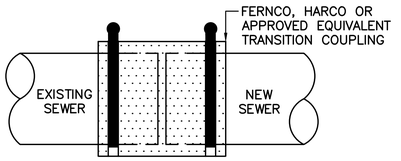
NOTE:
UNLESS OTHERWISE APPROVED OR NOTED, ALL MANHOLES SHALL BE PROVIDED "ECCENTRIC" CONE SECTIONS WITH TYPE SA FRAMES AND COVERS (STD. DETAIL S–31).



5/41 PLAIN SEWER MANHOLE
SCALE: 1/4" = 1'–0"



6/41 ADVANCE RISER CONNECTION
NOT TO SCALE



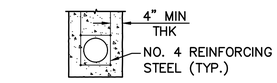
NOTES:
1. THE METHOD OF CONNECTING NEW PVC MAIN SEWER PIPE TO EXISTING MAIN SEWER PIPE SHOWN ON THIS DETAIL APPLIES TO ALL SUCH CONNECTIONS REQUIRED FOR MAIN SEWER, SIDE SEWER, AND MANHOLE REPLACEMENT WORK.

2. PIPE ENDS SHALL BE CUT TRUE AND FLUSH AND SHALL BUTT TOGETHER EVENLY AND TIGHT.

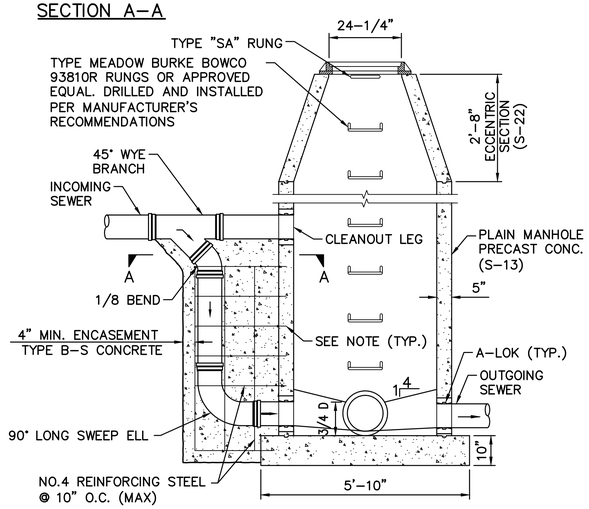
3. CRUSHED SURFACING TOP COURSE SHALL BE PLACED AND COMPACTED AROUND CONNECTION TO ASSURE PIPE STAYS TRUE AND NO SETTLEMENT OCCURS.

4. THIS APPLICATION MAY BE USED FOR GRAVITY SYSTEMS FOR REPAIRS OR NEW INSTALLATIONS.

8/41 TYPICAL NEW SEWER PIPE CONNECTION TO EXISTING
NOT TO SCALE

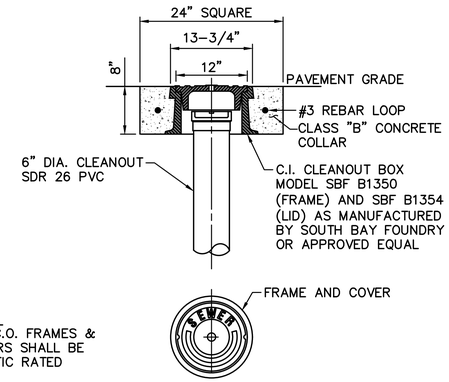


SECTION A–A



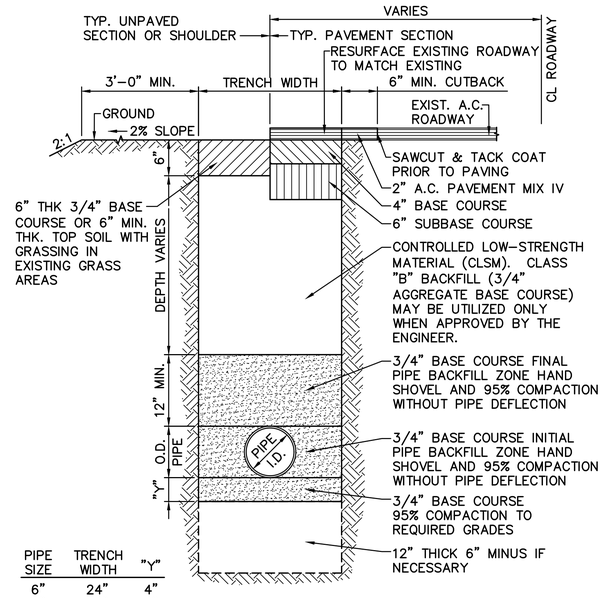
NOTE: 4" EMBEDMENT WITH HILTI HSE 2421 EPOXY OR EQUIVALENT.

2/41 SHALLOW DROP MANHOLE
NOT TO SCALE



NOTE:
ALL C.O. FRAMES & COVERS SHALL BE TRAFFIC RATED

4/41 TRAFFIC RATED C.O. FRAME & COVER
NOT TO SCALE



PIPE SIZE	TRENCH WIDTH	"Y"
6"	24"	4"
8"	24"	4"
10"	24"	4"
12"	30"	5"

NOTE: TRENCH RESTORATION WITHIN STATE RIGHT–OF–WAYS SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF HAWAI'I DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION.

7/41 SEWER TRENCH DETAIL
NOT TO SCALE

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257–C
HAWAII, U.S.A.

SEWER DETAILS

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/22

Approved:

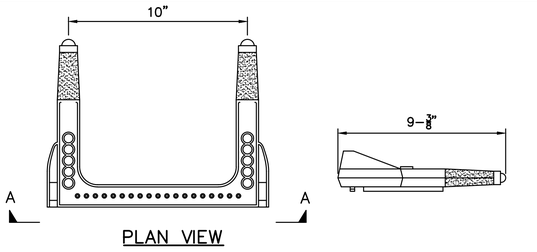
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

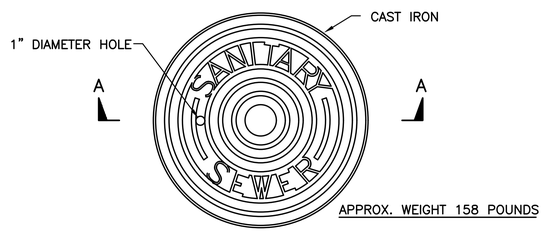
SHEET 41 OF 68 SHEETS

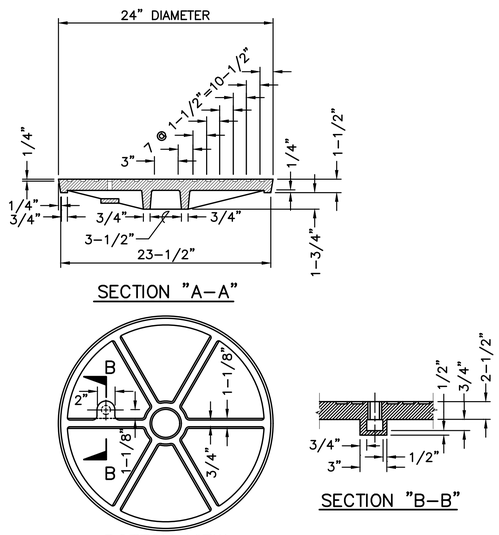
Last Save by: KNL
Last Saved: 3/12/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Miscellaneous Details 5.DWG



1/42 MANHOLE RUNG – TYPE SP

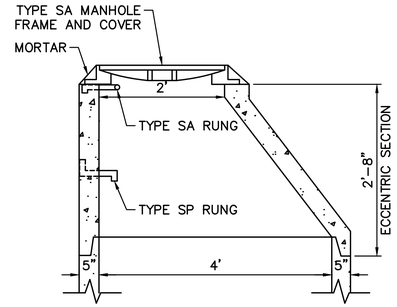
NOT TO SCALE





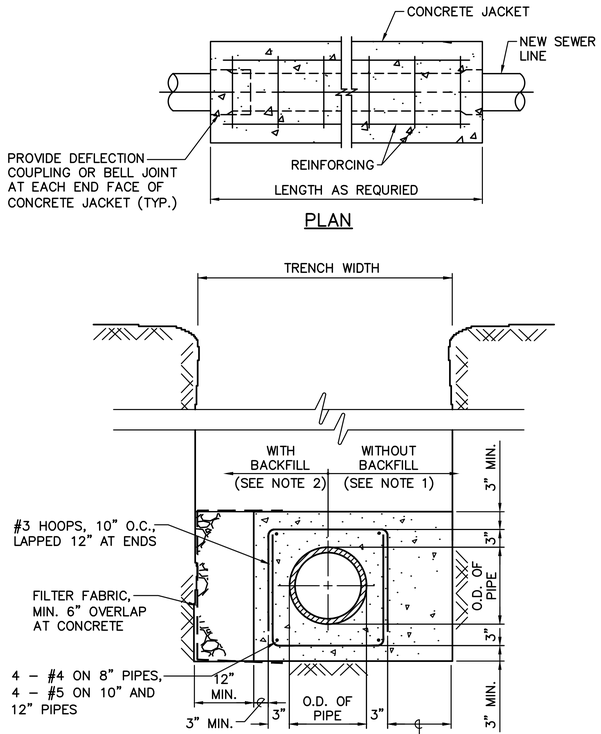
2/42 SMH COVER – TYPE SA

NOT TO SCALE



3/42 PRE-CAST CONCRETE ECCENTRIC MH CONE

NOT TO SCALE



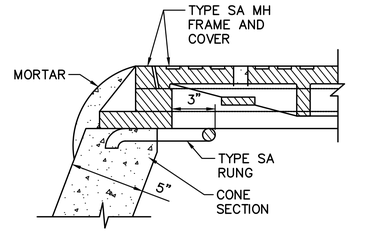
NOTES:

1. CONCRETE JACKET MAY EXTEND TO TRENCH WALL FOR NARROW TRENCH. TRENCH WALL SHALL BE CUT VERTICAL AND NEAT.
2. FORMS SHALL BE USED FOR CONSTRUCTION OF CONCRETE JACKET IN WIDE TRENCH WITH CRUSHED ROCK BEDDING BACKFILL. FORMS SHALL BE REMOVED.

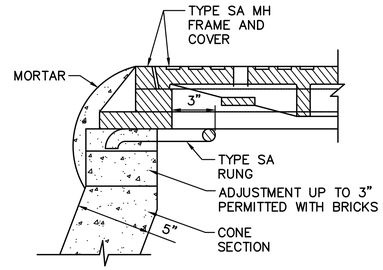
SECTION

4/42 REINFORCED CONCRETE JACKET FOR PIPES 12-INCH AND SMALLER

NOT TO SCALE



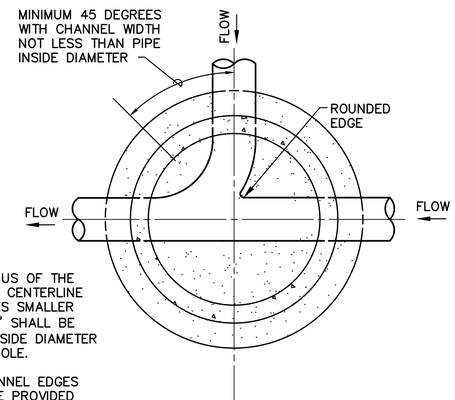
SHOWN WITHOUT GRADE RING



SHOWN WITH GRADE RING

5/42 PRE-CAST MH – DETAIL AT TOP RUNG

NOT TO SCALE



NOTES:

1. THE RADIUS OF THE CHANNEL CENTERLINE FOR PIPES SMALLER THAN 12" SHALL BE 1/2 X INSIDE DIAMETER OF MANHOLE.
2. ALL CHANNEL EDGES SHALL BE PROVIDED WITH SMOOTH ROUNDED EDGES.

6/42 TYP. CHANNELIZATION OF SEWER MANHOLE

NOT TO SCALE

CHIEF, WASTEWATER DIVISION DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

LA'I'OPUA VILLAGE 4 SUBDIVISION

PHASE 2 – HEMA

TAX MAP KEY: (3) 7-4-21:12 (PORTION)

KAILUA-KONA, NORTH KONA, HAWAII

SEWER DETAILS

SCOTT A. KUNIOKA LICENSED PROFESSIONAL ENGINEER No. 7257-C HAWAII, U.S.A.

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Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.

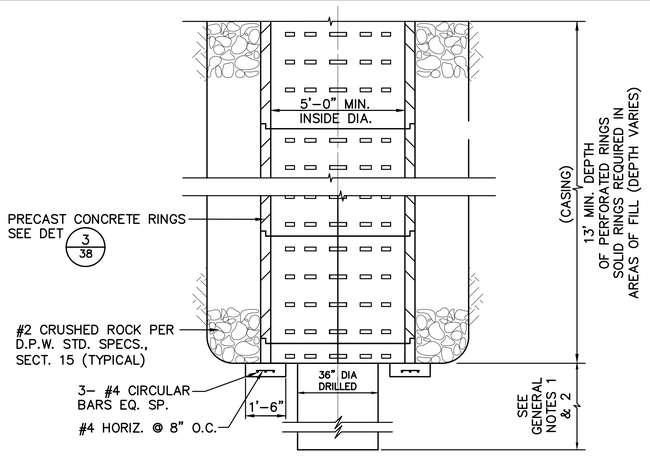
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 42 OF 68 SHEETS

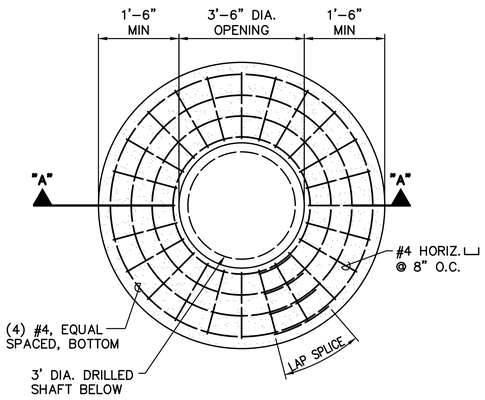
Last Save by: LRS
Last Saved: 6/25/2019
Plotted on: 3/9/2020

G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Miscellaneous Details 7.DWG

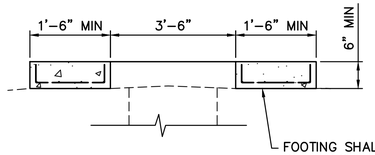


NOTE:
1. CONTRACTOR SHALL TEST DRAINAGE CAPACITY OF DRYWELLS. TESTING SHALL CONFORM WITH CURRENT DOH STANDARDS AND RESULTS TO BE SUBMITTED TO ENGINEER AND DPW. TESTING RESULTS SHALL BE CERTIFIED BY A LICENSED GEOLOGIST IN THE STATE OF HAWAII.
2. CONTRACTOR SHALL CONSTRUCT DRY WELL TO SPECIFIED DEPTH AND TEST EACH DRYWELL TO VERIFY CAPACITY OF 2 CFS. IF ADDITIONAL CAPACITY REQUIRED, CONTRACTOR SHALL DRILL 36" DIA CORING TO DEPTH REQUIRED TO PROVIDE 2 CFS CAPACITY.
3. RING FOOTING TO BE USED IF WELL IS OVEREXCAVATED OR IF IN COMPRESSIBLE SOIL CONDITION.
4. LEVELING GROUT (AT THE RING BASE ONLY) MAY BE USED ONLY WHEN ON SOLID ROCK.

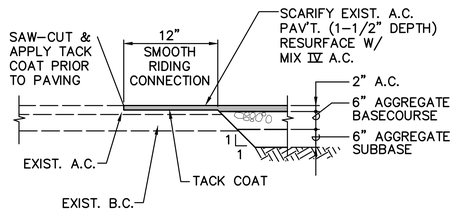
1/43 DRYWELL DETAIL
NOT TO SCALE



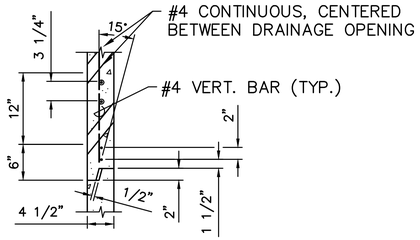
2/43 DRYWELL FOOTING DETAIL
NOT TO SCALE



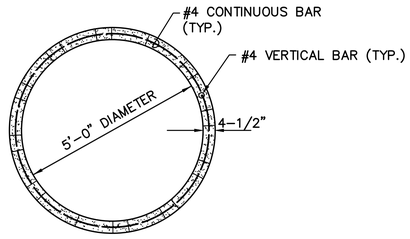
SECTION A–A



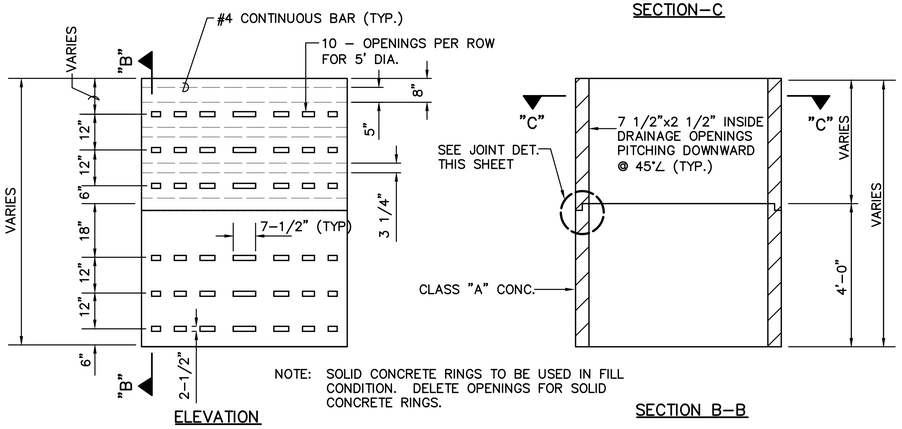
5/43 SMOOTH RIDING CONNECTION DETAIL
NOT TO SCALE



JOINT DETAIL



SECTION–C

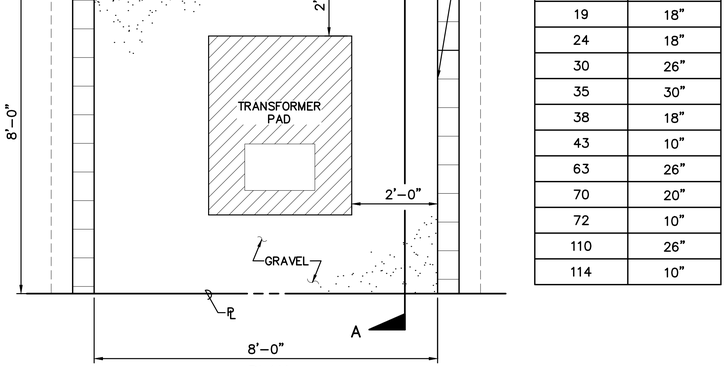


ELEVATION

NOTE: SOLID CONCRETE RINGS TO BE USED IN FILL CONDITION. DELETE OPENINGS FOR SOLID CONCRETE RINGS.

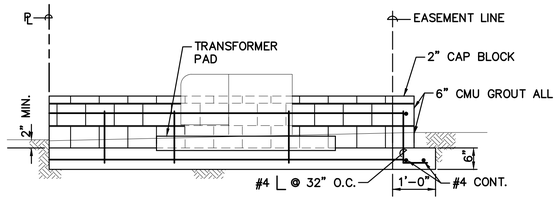
SECTION B–B

3/43 PRECAST REINF. CONC. RING DETAILS
SCALE: 1/2" = 1'-0"



PLAN

LOT #	APPROX. WALL HT.
3	10"
7	18"
13	18"
19	18"
24	18"
30	26"
35	30"
38	18"
43	10"
63	26"
70	20"
72	10"
110	26"
114	10"



SECTION A–A

4/43 CMU WALL DETAIL FOR ELEC PAD
NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

MISCELLANEOUS DETAILS

SCOTT A. KUNIOKA
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No. 7257-C
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 43 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/25/2019
Plotted on: 3/9/2020
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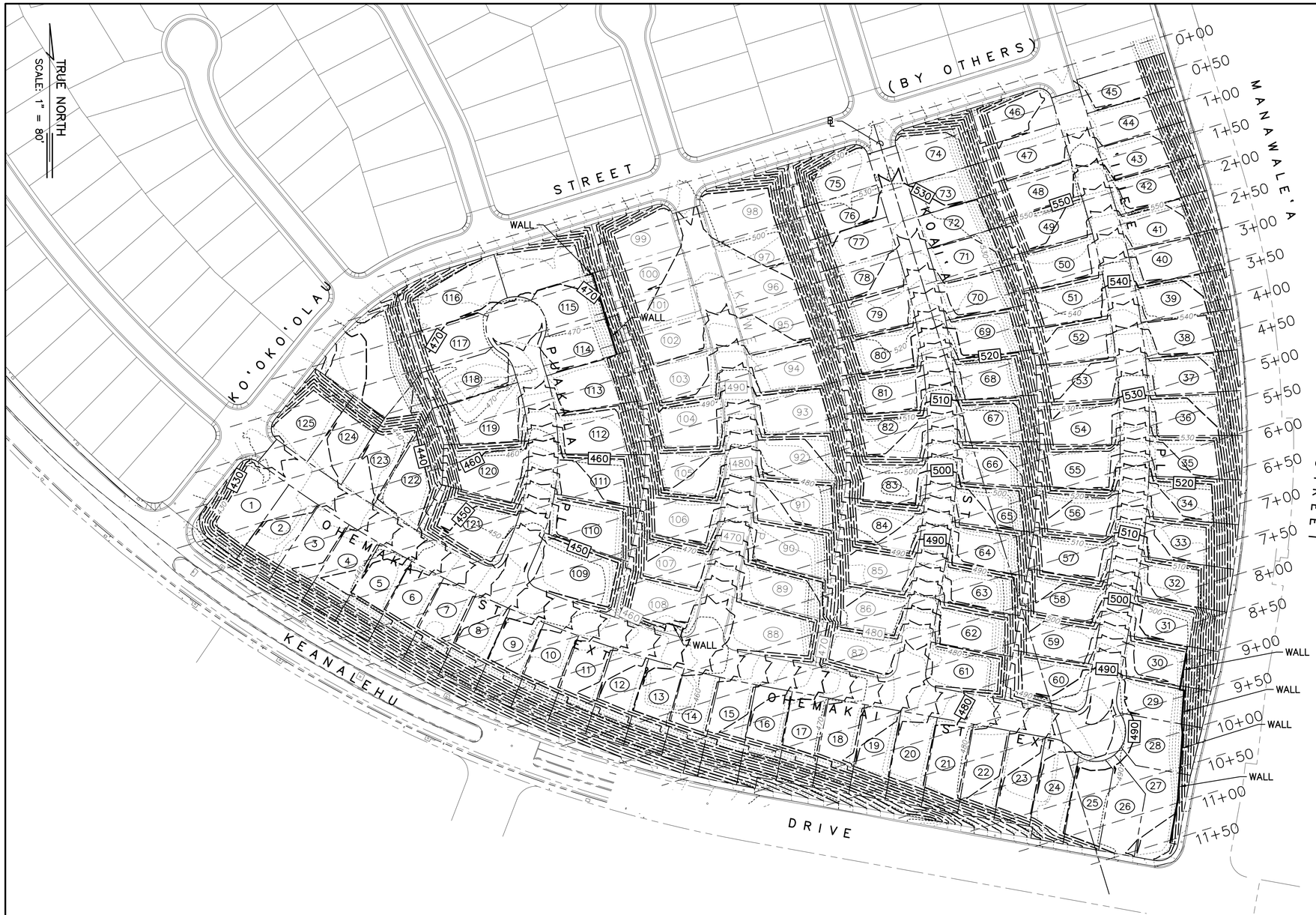

LEGEND

- EXIST. CONTOURS
- FINISH CONTOUR LINES
- FUTURE LOT LINE
- (17) LOT NUMBER

GRADING SECTION KEY MAP

SCALE: 1" = 80'

80' 0 80' 160'

SCALE: 1" = 80'-0"

Last Save by: LRS
Last Saved: 5/6/2019
Plotted on: 3/9/2020

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REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

GRADING SECTION KEY MAP

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SHEET 44 OF 68 SHEETS

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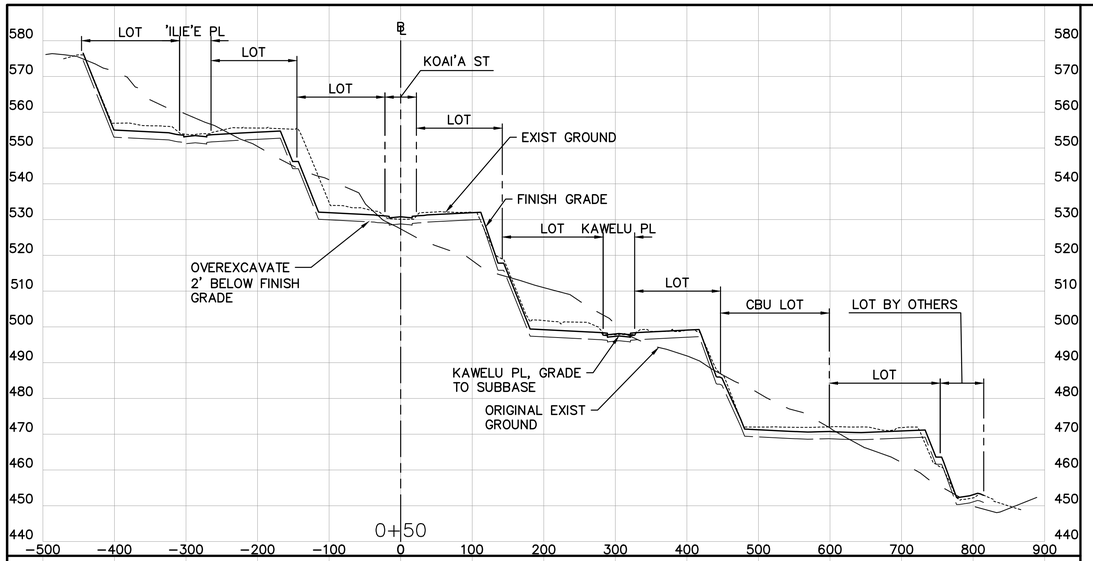

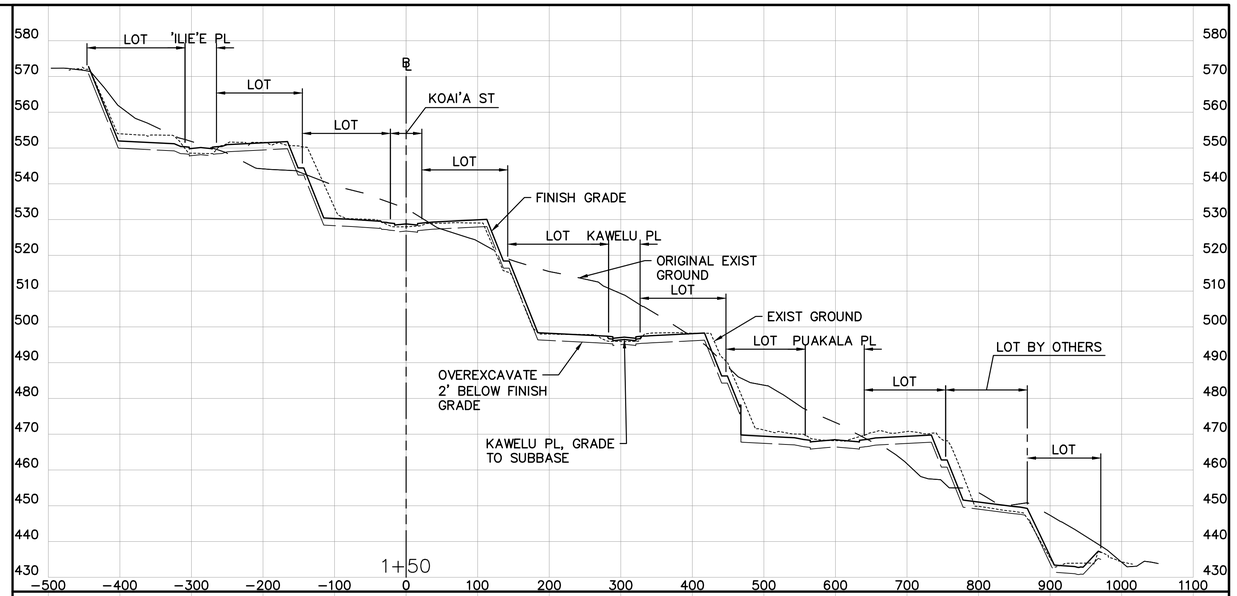

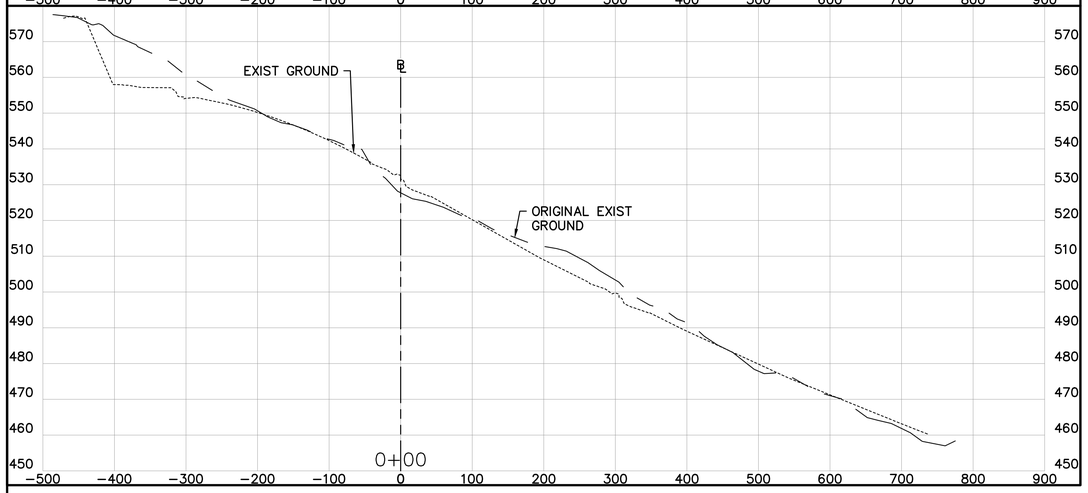

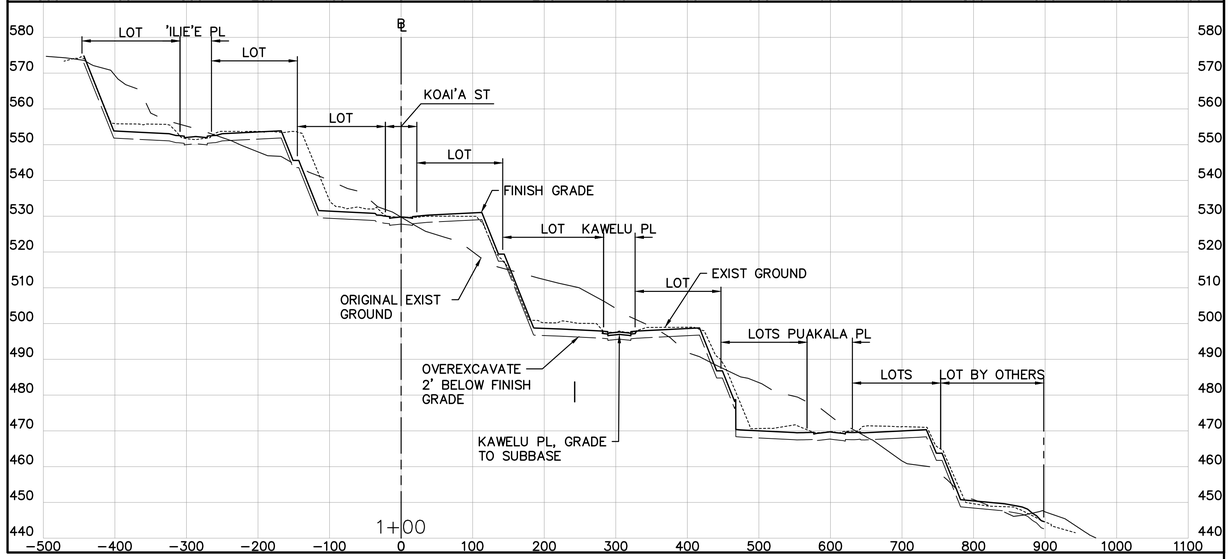

VERT. 20' 0 20' 40'
SCALE: 1" = 20'-0"

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

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LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CROSS SECTIONS
STA 0+00 TO STA 1+50

Approved:

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SHEET 45 OF 68 SHEETS

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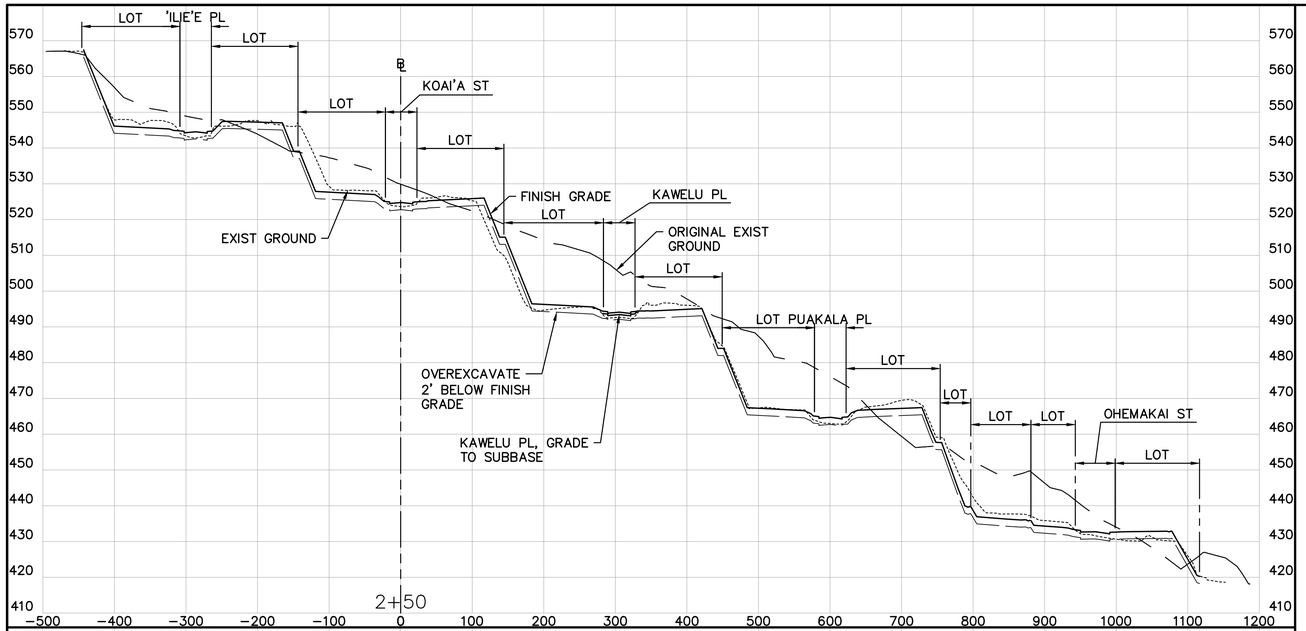
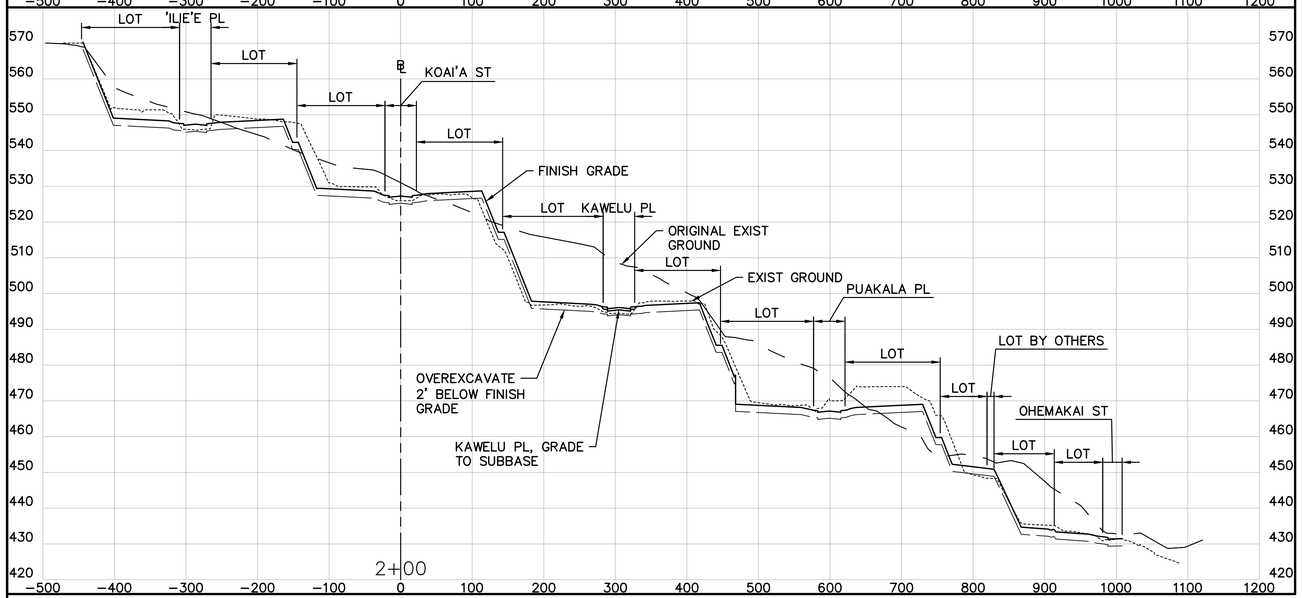
4\ACAD\DHHL1102-Grading Sections 1.DWG





VERT. 20' 0 20' 40'
SCALE: 1" = 20'−0"

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

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DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CROSS SECTIONS
STA 2+00 TO STA 2+50

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FILE	POCKET	FOLDER	NO.

SHEET 46 OF 68 SHEETS

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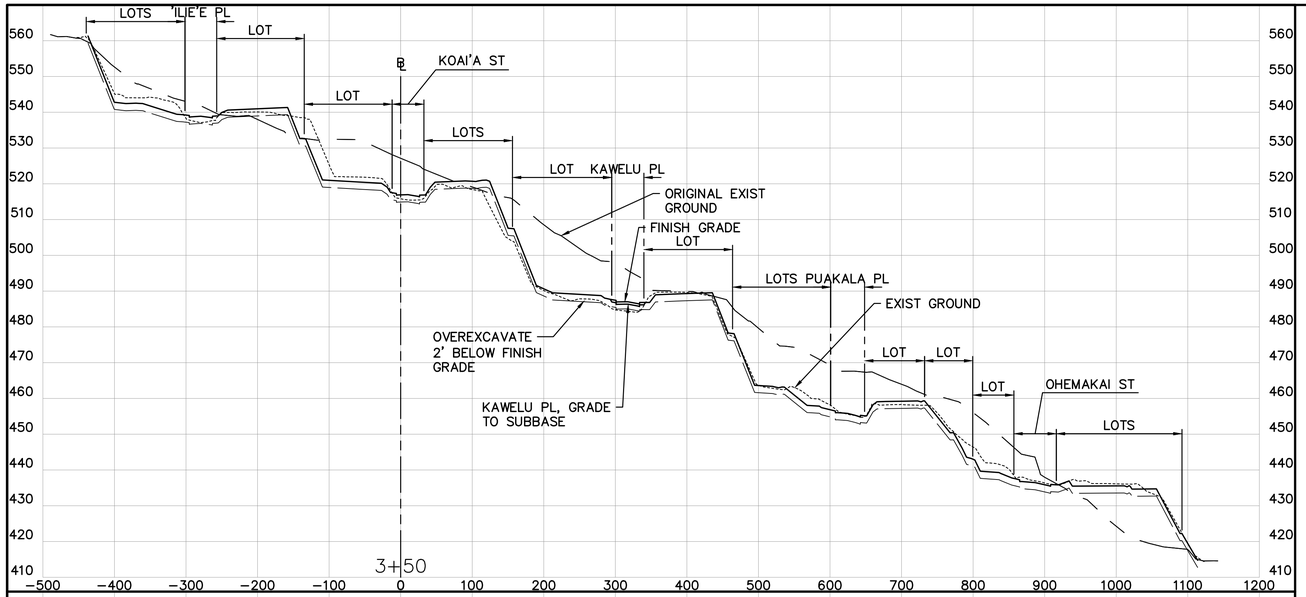
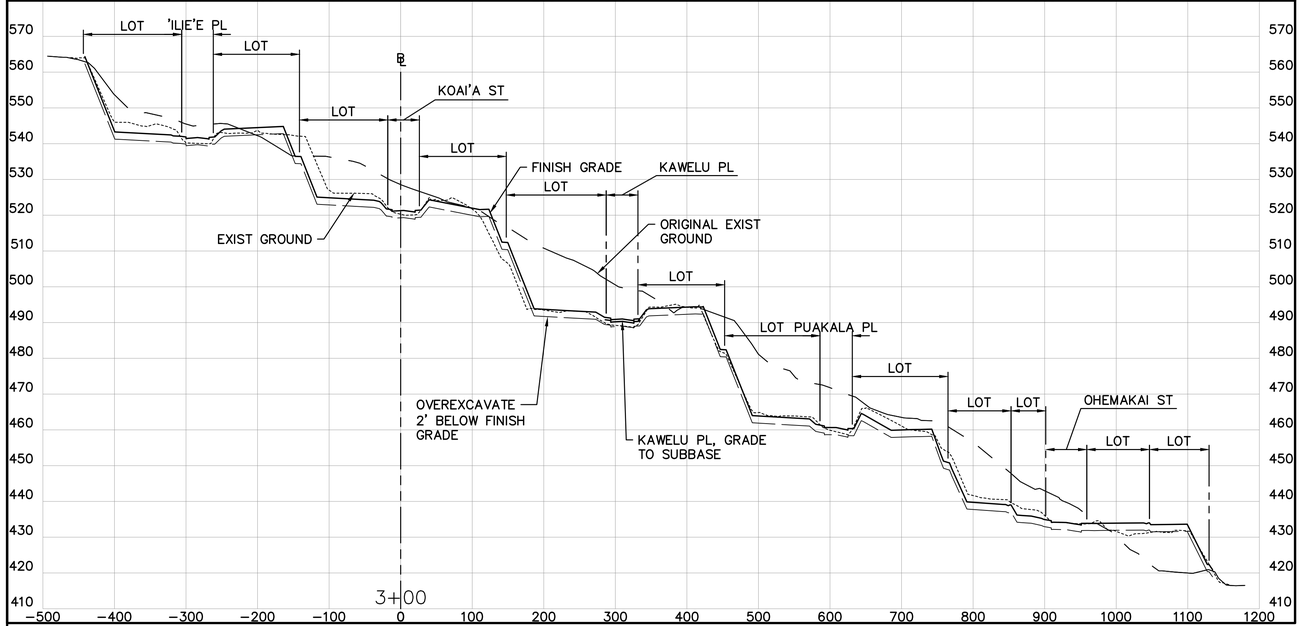
4\ACAD\DHHL1102-Grading Sections 2.DWG





VERT. 20' 0 20' 40'
SCALE: 1" = 20'−0"

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

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CROSS SECTIONS
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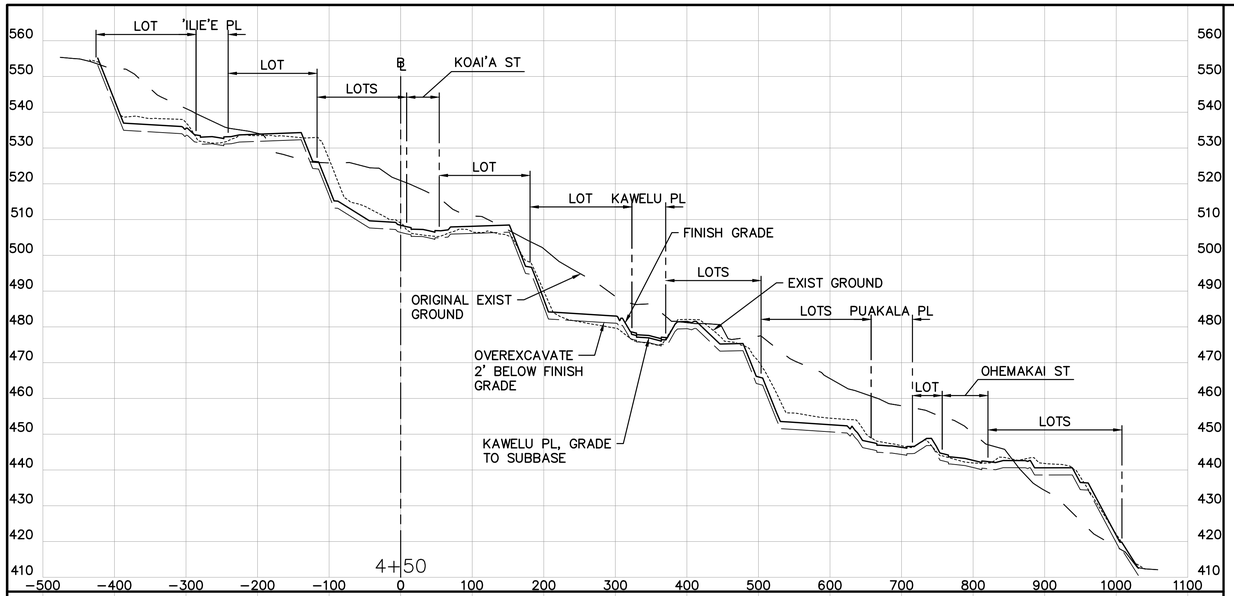

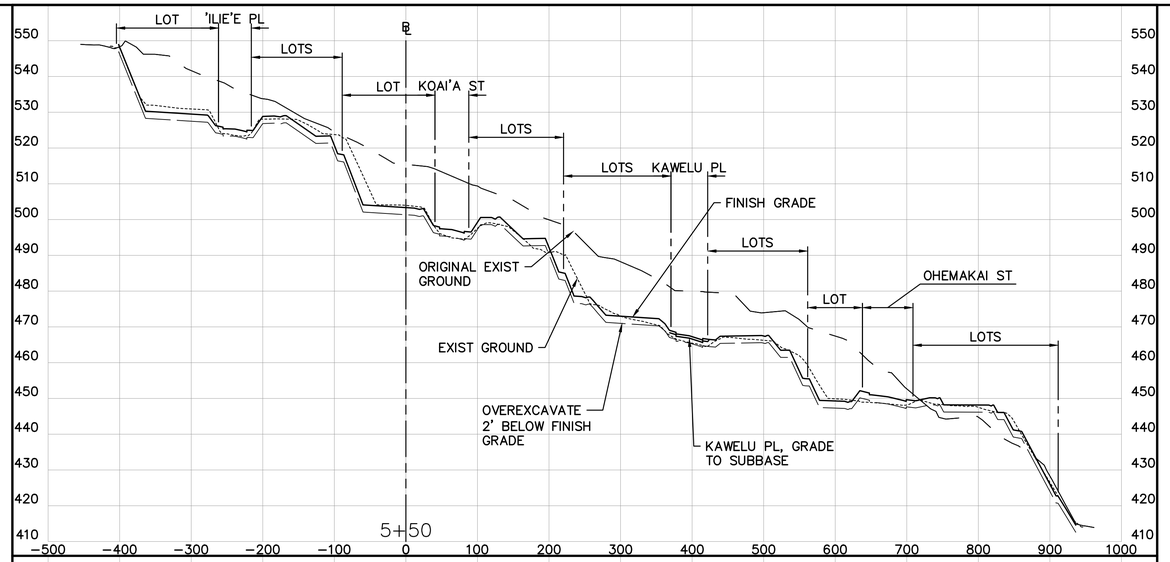

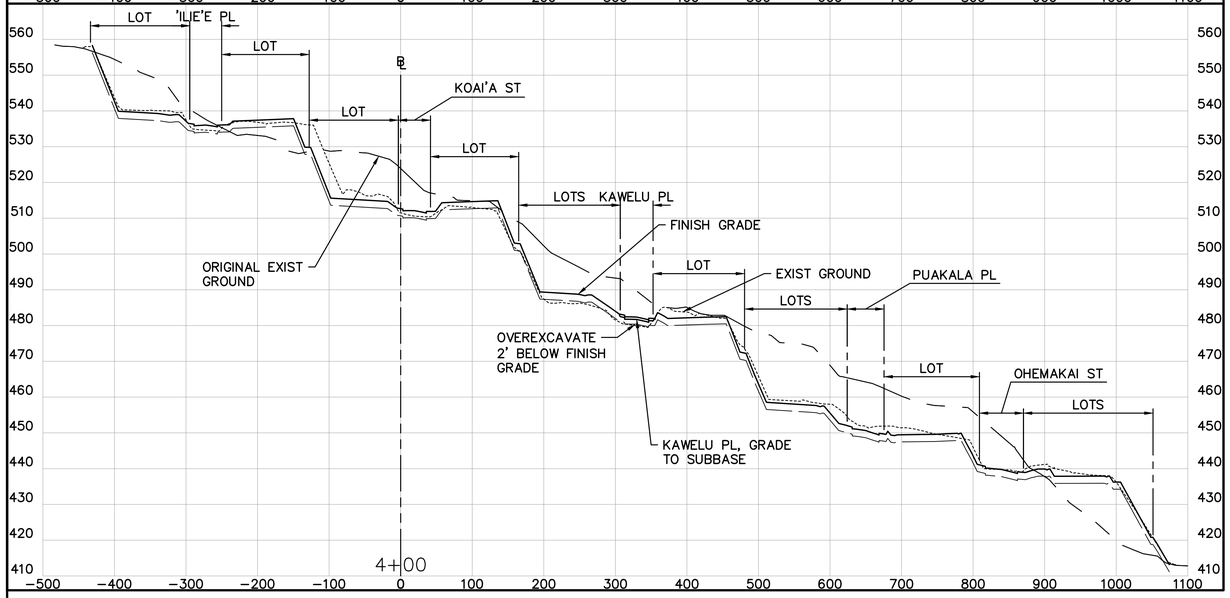

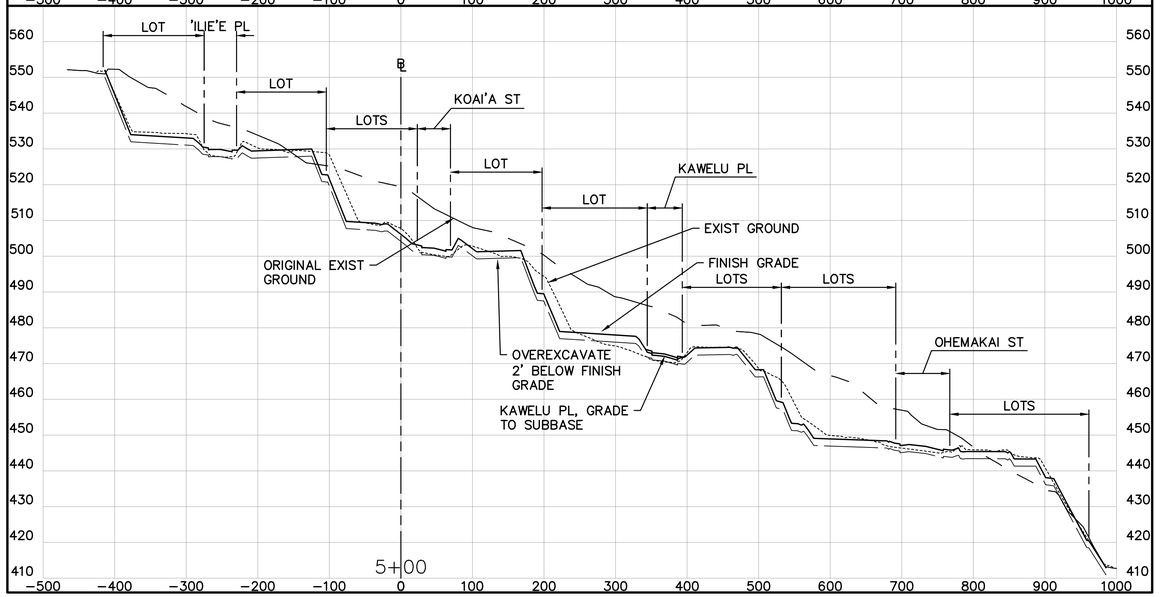

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LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CROSS SECTIONS
STA 4+00 TO STA 5+50

Approved:

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FILE	POCKET	FOLDER	NO.

SHEET 48 OF 68 SHEETS

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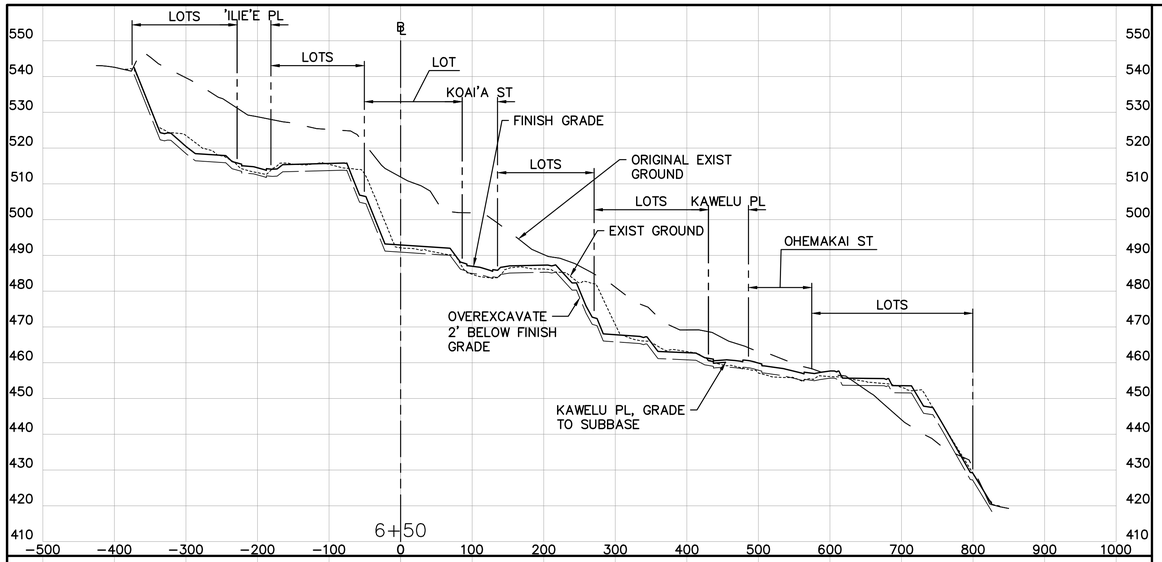

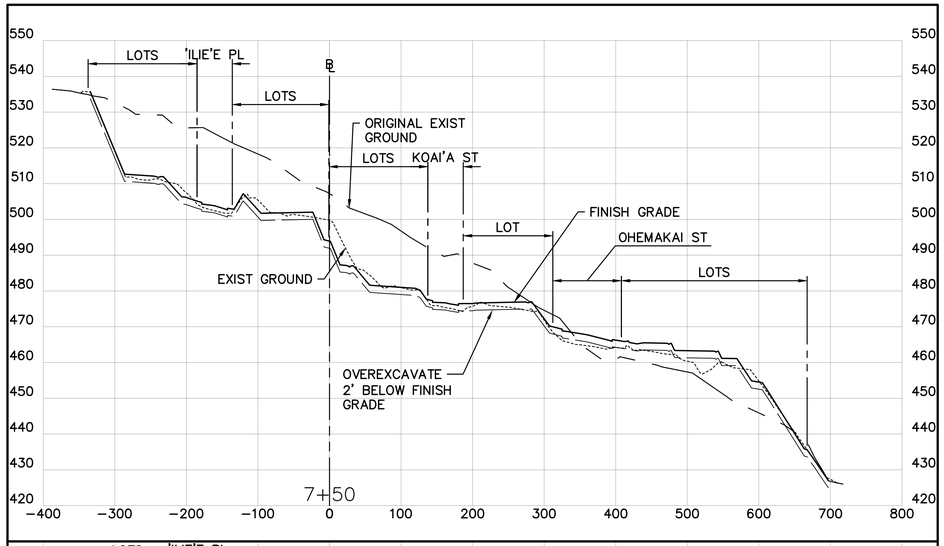

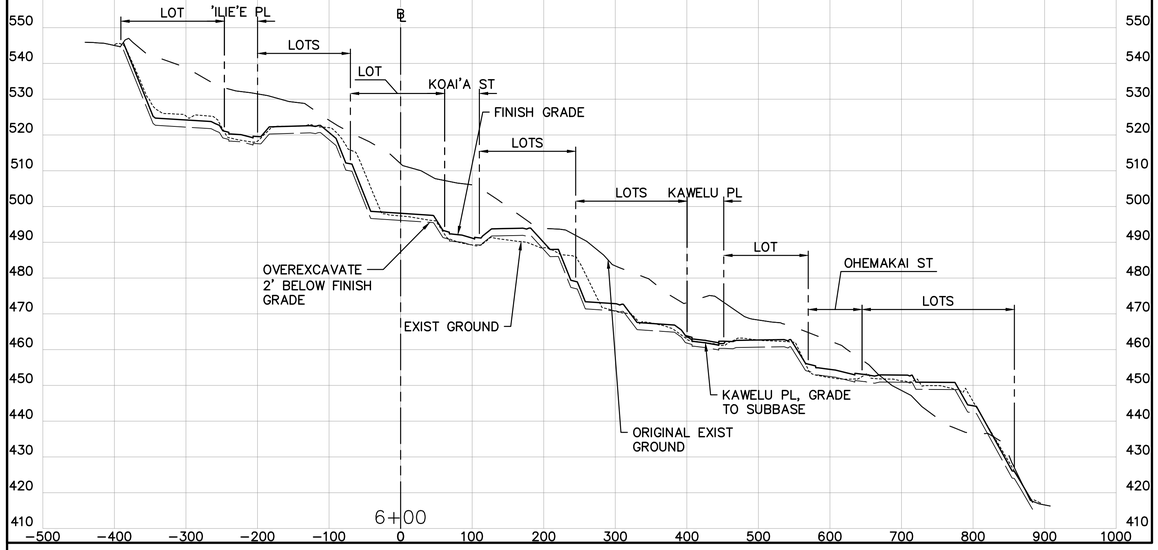

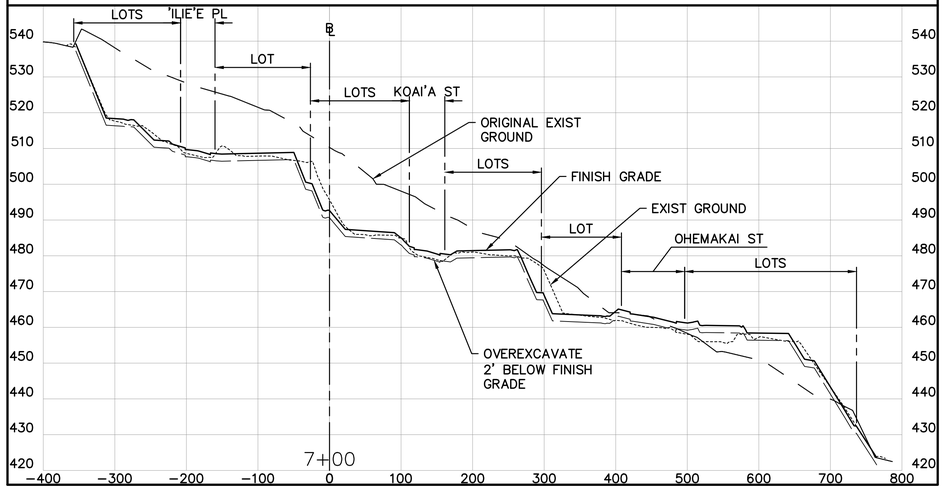

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HORZ. 100' 0 100' 200'
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STA 6+00 TO STA 7+50

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HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

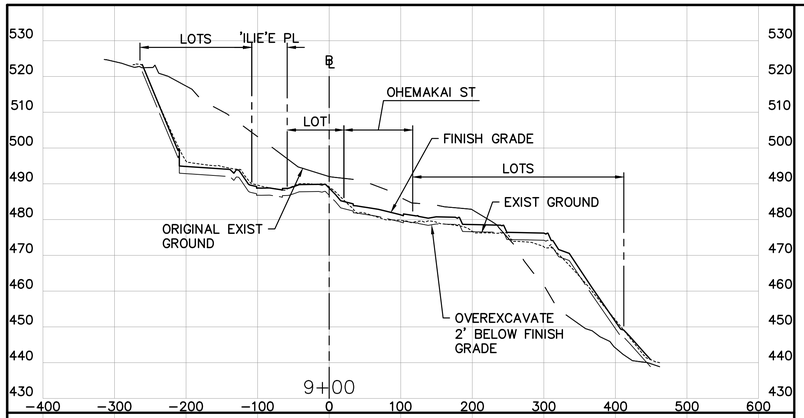
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

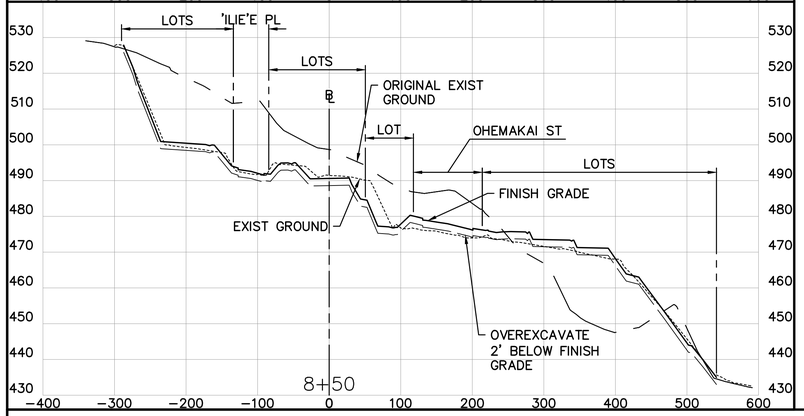
FILE	POCKET	FOLDER	NO.

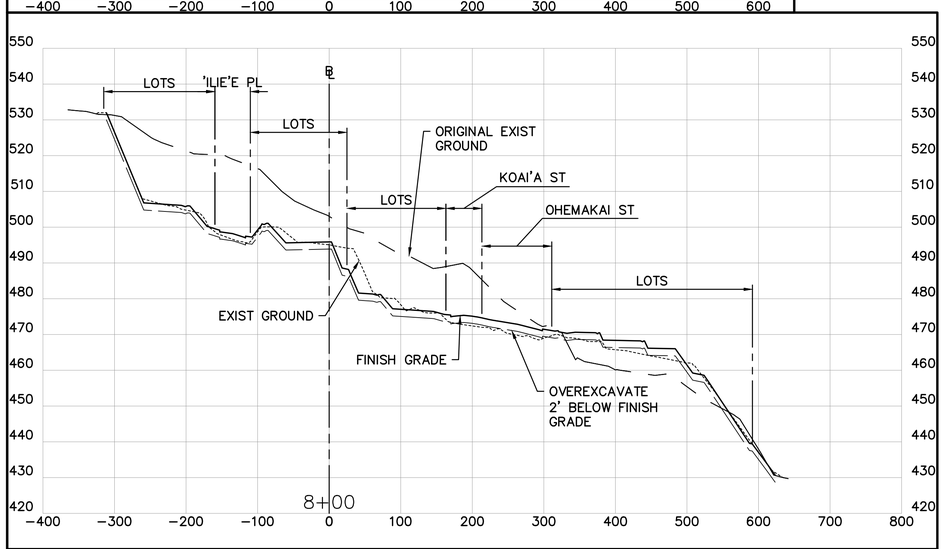
SHEET 49 OF 68 SHEETS

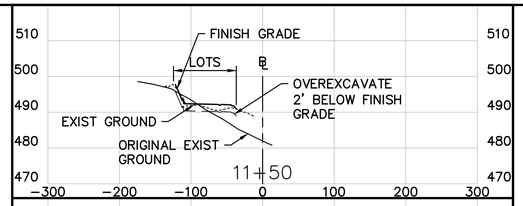
Last Save by: LRS
Last Saved: 6/5/2019
Plotted on: 3/9/2020

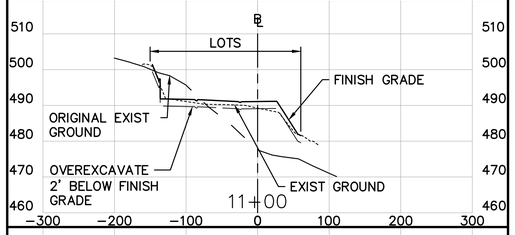
G:\DHHL11-02 Laiopua Village
4\ACAD\DHHL1102-Grading Sections 5.DWG

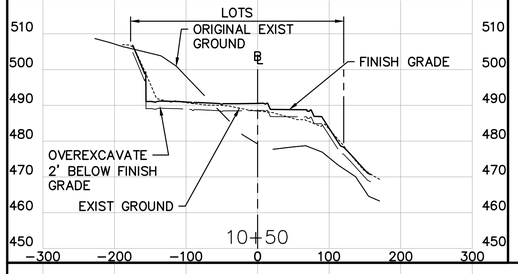


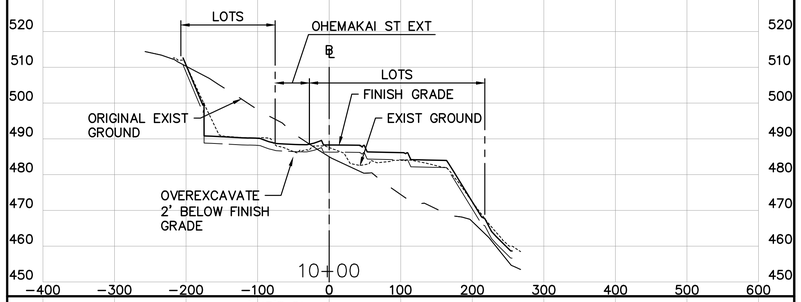


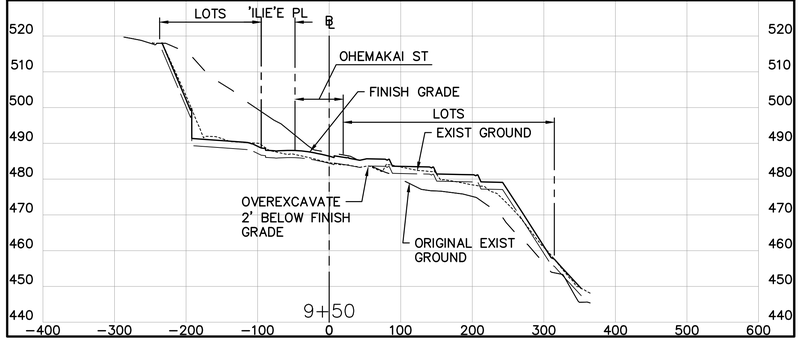












VERT. 20' 0 20' 40'
SCALE: 1" = 20'-0"

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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

CROSS SECTIONS
STA 8+00 TO STA 11+50

SCOTT A. KUNIOKA
LICENSED PROFESSIONAL ENGINEER
No. 7257-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 4/30/22

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEET 50 OF 68 SHEETS

Last Save by: LRS
Last Saved: 6/5/2019
Plotted on: 3/9/2020
G:\DHHL11-02 Laiopua Village 4\ACAD\DHHL1102-Grading Sections 6.DWG

GENERAL:

A. WORKMANSHIP AND MATERIALS SHALL CONFORM TO THE BUILDING CODE OF THE COUNTY OF HAWAII (AMENDED IBC, 2006 EDITION). HOWEVER, WHERE REFERENCE IS MADE TO PERFORMANCE CONFORMING TO OTHER STANDARDS THE MORE STRINGENT SHALL APPLY.

B. THE CONTRACTOR SHALL COMPARE ALL THE CONTRACT DOCUMENTS WITH EACH OTHER AND REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES AND OMISSIONS.

C. THE CONTRACTOR SHALL TAKE FIELD MEASUREMENTS AND VERIFY FIELD CONDITIONS AND SHALL COMPARE SUCH FIELD MEASUREMENTS AND CONDITIONS WITH THE DRAWINGS BEFORE COMMENCING WORK. REPORT IN WRITING TO THE ENGINEER ALL INCONSISTENCIES AND OMISSIONS.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE WORK OF ALL TRADES.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR METHODS OF CONSTRUCTION, WORKMANSHIP AND JOB SAFETY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING AND BRACING AS REQUIRED FOR STABILITY OF STRUCTURAL MEMBERS AND SYSTEMS.

F. CONSTRUCTION LOADING SHALL NOT EXCEED DESIGN LIVE LOAD UNLESS SPECIAL SHORING IS PROVIDED. ALLOWABLE LOADS SHALL BE REDUCED IN AREAS WHERE THE STRUCTURE HAS NOT ATTAINED FULL DESIGN STRENGTH.

G. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF THE ADJACENT PROPERTIES, STRUCTURES, STREETS AND UTILITIES DURING THE CONSTRUCTION PERIOD.

H. DETAILS NOTED AS TYPICAL ON THE STRUCTURAL DRAWINGS SHALL APPLY IN ALL CONDITIONS UNLESS SPECIFICALLY SHOWN OR NOTED.

DESIGN CRITERIA:

A. BASIC WIND SPEED AND EXPOSURE ——— 105 MPH, EXPOSURE C
B. ALLOWABLE FOUNDATION BEARING CAPACITIES
   a. DEAD LOAD + LIVE LOAD ——— 3,000 PSF
   b. DEAD LOAD + LIVE LOAD + WIND OR SEISMIC ——— 4,000 PSF

FOUNDATION:

A. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATION FROM SURFACE WATER, GROUND WATER OR SEEPAGE, AND OBTAIN NPDES PERMIT, IF REQUIRED.

B. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, AND SHORING NECESSARY TO PRESERVE EXCAVATIONS AND EARTH BANKS.

C. FOOTINGS SHALL BEAR ON UNDISTURBED IN-SITU FIRM SOILS. BOTTOM OF FOOTINGS SHALL BE COMPACTED TO PROVIDE A RELATIVELY FIRM AND SMOOTH BEARING SURFACE PRIOR TO PLACEMENT OF REINFORCING STEEL AND CONCRETE. IF SOFT AND/OR LOOSE MATERIALS ARE ENCOUNTERED AT THE BOTTOM OF FOOTING EXCAVATIONS, THEY SHALL BE OVER-EXCAVATED TO EXPOSE THE UNDERLYING FIRM MATERIALS. THE OVER-EXCAVATED AREAS SHALL BE BACKFILLED WITH SELECT GRANULAR MATERIAL COMPACTED TO A MINIMUM OF 95% RELATIVE COMPACTION OR THE FOOTING BOTTOM MAY BE EXTENDED DOWN TO THE UNDERLYING COMPETENT MATERIAL.

CONCRETE:

A. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318.

B. CONCRETE SHALL BE REGULAR WEIGHT HARD ROCK CONCRETE AND SHALL HAVE THE FOLLOWING MINIMUM 28 DAY COMPRESSIVE STRENGTHS:
   a. FOOTINGS ——— 4,000 PSI
   b. FENCE POST FOOTING ——— 3,000 PSI
   c. CATCH BASIN ——— 4,000 PSI
   d. P/C DRYWELL ——— SEE CIVIL DWGS
   e. WALL ——— 4,000 PSI
   f. ALL OTHER CONCRETE ——— 3,000 PSI

C. CONCRETE DELIVERY TICKETS SHALL RECORD ALL FREE WATER IN THE MIX: AT BATCHING BY PLANT, FOR CONSISTENCY BY DRIVER, AND ANY ADDITIONAL REQUEST BY CONTRACTOR IF PERMITTED BY THE MIX DESIGN.

D. ALL INSERTS, ANCHOR BOLTS, PLATES, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE HOT-DIPPED GALVANIZED ACCORDING TO ASTM A153 UNLESS OTHERWISE NOTED.

E. REINFORCING BARS, ANCHOR BOLTS, INSERTS, AND OTHER ITEMS TO BE CAST IN THE CONCRETE SHALL BE SECURED IN POSITION PRIOR TO PLACEMENT OF CONCRETE.

F. CONDUITS, PIPES, AND SLEEVES PASSING THROUGH A SLAB OR FOOTING AND NOT CONFORMING TO TYPICAL DETAILS SHALL BE LOCATED AND SUBMITTED TO THE ENGINEER FOR APPROVAL.

CONCRETE (CONT):

G. CONDUITS, PIPES, AND SLEEVES EMBEDDED WITHIN A SLAB OR WALL (OTHER THAN THOSE MERELY PASSING THROUGH) SHALL BE:
   a. NO LARGER IN OUTSIDE DIMENSIONS THAN ONE THIRD THE OVERALL SLAB OR WALL THICKNESS IN WHICH THEY ARE EMBEDDED.
   b. PLACED IN THE MIDDLE ONE THIRD OF SLAB OR WALL THICKNESS
   c. SPACED NO CLOSER THAN THREE DIAMETERS OR WIDTHS ON CENTER.

H. THE CONTRACTOR SHALL LOCATE CONSTRUCTION JOINTS SO AS NOT TO IMPAIR THE STRENGTH OF THE STRUCTURE AND TO MINIMIZE SHRINKAGE STRESSES. SUBMIT LOCATION OF CONSTRUCTION JOINTS TO THE ENGINEER FOR APPROVAL, UNLESS OTHERWISE NOTED.

I. NON-SHRINK GROUT SHALL BE A PREMIXED NON-METALLIC FORMULA, CAPABLE OF DEVELOPING A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 1 DAY AND 5,000 PSI IN 28 DAYS.

REINFORCING STEEL:

A. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.

B. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
   a. FOOTINGS, GRADE BEAMS, ETC. CAST AGAINST EARTH ——— 3"
   b. FOOTINGS, GRADE BEAMS, ETC. FORMED AND EXPOSED TO EARTH OR WEATHER ——— 2"
   c. BEAMS AND COLUMNS PRIMARY REINFORCEMENT, STIRRUPS, TIES AND SPIRALS ——— 1 1/2"

C. REINFORCING STEEL SHALL BE SPLICED WHERE INDICATED ON PLANS. PROVIDE LAP SPLICE LENGTH PER TYPICAL DETAILS AND SCHEDULE, UNLESS OTHERWISE NOTED.

D. MECHANICAL SPLICE CONNECTORS SHALL DEVELOP IN TENSION 125 PERCENT OF THE SPECIFIED MINIMUM YIELD STRENGTH OF REINFORCING BARS.

E. BAR BENDS AND HOOKS SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH ACI 318.

STRUCTURAL STEEL:

A. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL OF STEEL CONSTRUCTION, 14th EDITION.

B. STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE NOTED.

C. STEEL TUBES (HSS) SHALL CONFORM TO ASTM A500, GRADE B

D. PLATES AND BARS SHALL CONFORM TO ASTM A36.

E. WELDS AND WELDING PROCEDURES SHALL CONFORM TO THE STRUCTURAL WELDING CODE AWS D1.1 OF THE AMERICAN WELDING SOCIETY.

F. WELDING SHALL BE PERFORMED BY WELDERS PREQUALIFIED FOR WELDING PROCEDURES TO BE USED.

G. WELDING ELECTRODES SHALL BE E70XX.

H. ALL ANCHOR BOLTS, PLATES, AND OTHER ITEMS TO BE CAST IN CONCRETE SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153 UNLESS OTHERWISE NOTED.

I. BOLTS SHALL CONFORM TO ASTM A307, GRADE A UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED ACCORDING TO ASTM A153.

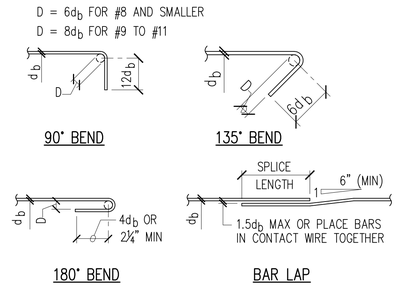
K. ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION ACCORDING TO ASTM A123.

MINIMUM SPLICE AND DEVELOPMENT LENGTHS

BAR SIZE	CONCRETE STRENGTH = 3,000 PSI					CONCRETE STRENGTH = 4,000 PSI				
	LAP SPLICE		DEVELOPMENT			LAP SPLICE		DEVELOPMENT		
			STRAIGHT		WITH STANDARD HOOK			STRAIGHT		WITH STANDARD HOOK
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS		TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	
#3	28"	22"	22"	18"	10"	26"	20"	20"	16"	8"
#4	38"	30"	30"	22"	12"	34"	26"	26"	20"	10"
#5	48"	36"	36"	28"	14"	42"	32"	32"	24"	12"
#6	56"	44"	44"	34"	18"	50"	38"	38"	30"	16"
#7	82"	64"	64"	48"	20"	72"	54"	54"	42"	18"
#8	94"	72"	72"	56"	22"	82"	62"	62"	48"	20"
#9	106"	82"	82"	62"	26"	92"	70"	70"	54"	22"
#10	118"	92"	92"	70"	28"	102"	80"	80"	62"	26"
#11	132"	102"	102"	78"	32"	114"	88"	88"	68"	28"

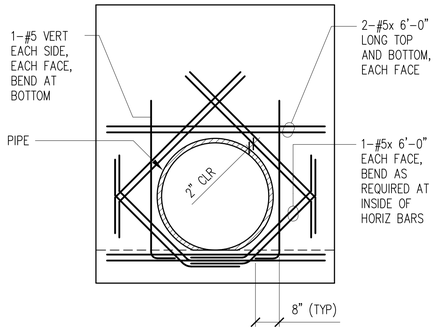
NOTES:

1. LENGTHS ARE FOR CONCRETE WITH REBAR SPACED AT 6 BAR DIAMETERS MINIMUM. INCREASE LENGTHS BY 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
2. "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.



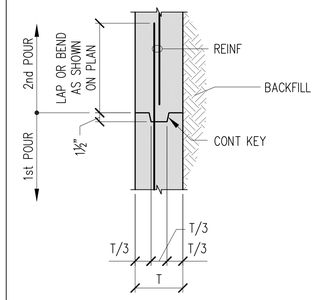
1 S-1 TYPICAL REBAR SPLICE AND DEVELOPMENT LENGTH SCHEDULE

NOT TO SCALE



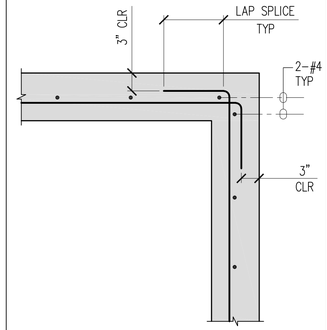
2 S-1 ADDED REINFORCING AT PIPE OPENINGS

NOT TO SCALE



3 S-1 TYPICAL CONSTRUCTION JOINT DETAIL

NOT TO SCALE



4 S-1 TYPICAL CORNER BEND DETAIL

NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

GENERAL NOTES AND TYPICAL DETAILS

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
HAWAII, U.S.A.

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LICENSE EXPIRES 4/30/20

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

S-1 SHEET 51 OF 68 SHEETS

Last Save by: BLUM
Last Saved: 4/4/2019
Plotted on: 9/17/2019

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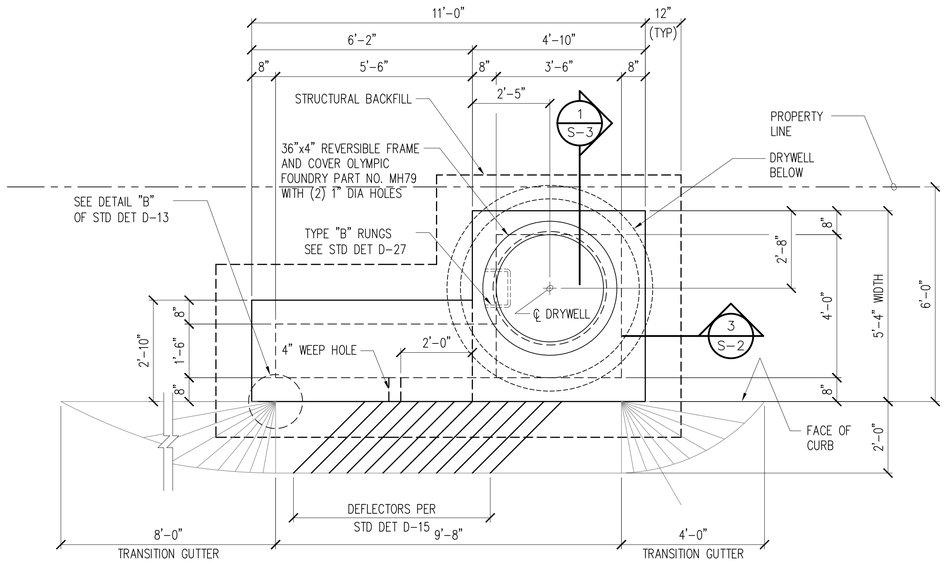
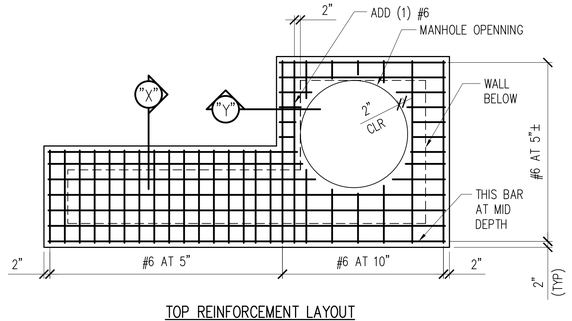
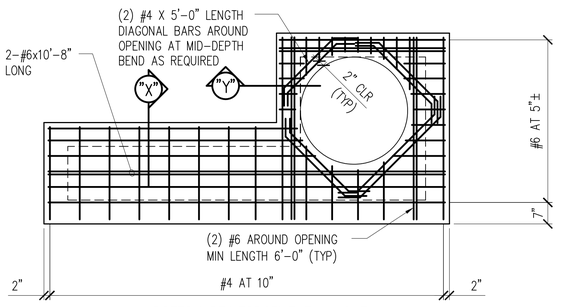


1 S-2 **PLAN - CATCH BASIN (MODIFIED TYPE A)**

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



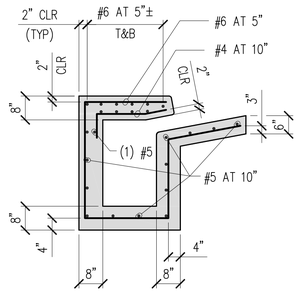
TOP REINFORCEMENT LAYOUT



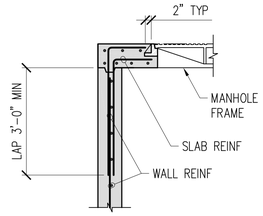
BOTTOM REINFORCEMENT LAYOUT

2 S-2 **TOP SLAB REINFORCEMENT LAYOUT**

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



SECTION "X"



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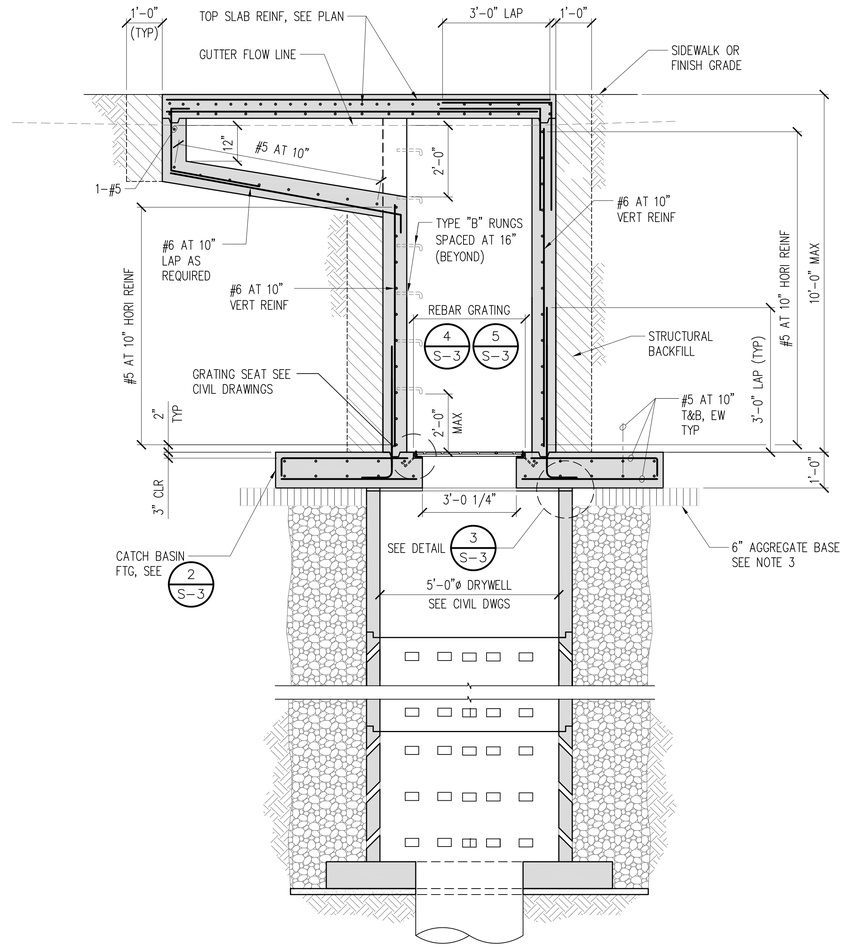

3 S-2 **SECTION**

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

NOTES:

1. REFERENCE CIVIL DRAWINGS FOR THE ELEVATION OF CATCH BASINS, AND LOCATIONS, NUMBER AND SIZE OF PIPES. OPENING OF OUTLET PIPE SHALL BE ROUNDED WITH MINIMUM RADIUS OF 0.15 TIMES PIPE DIAMETER.
2. PROVIDE 2 CUBIC FEET OF CRUSHED ROCK, ASTM SIZE #9 ROCK SAND AT WEEP HOLE.
3. CATCH BASIN FOOTING BASE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE DENSITY BEFORE CASTING FOOTING.

0' 1' 2' 3' 4' 5' 6'

1/2" = 1'-0"

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DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

MODIFIED TYPE "A" CATCH BASIN

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

S-2 SHEET 52 OF 68 SHEETS

Last Save by: BLUM
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Plotted on: 9/17/2019

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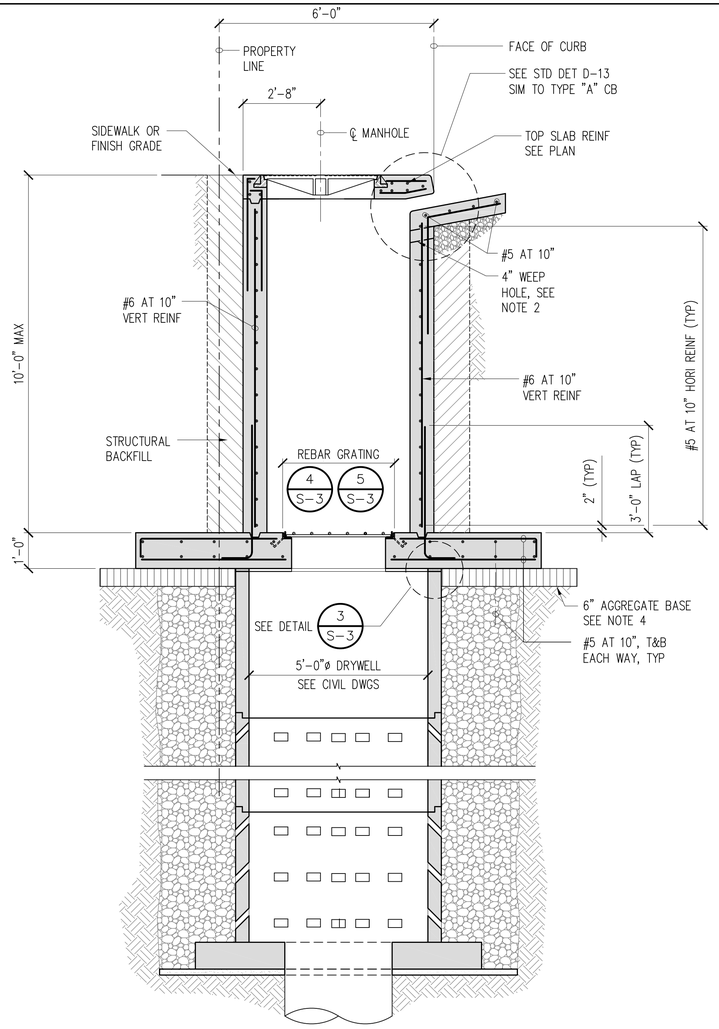
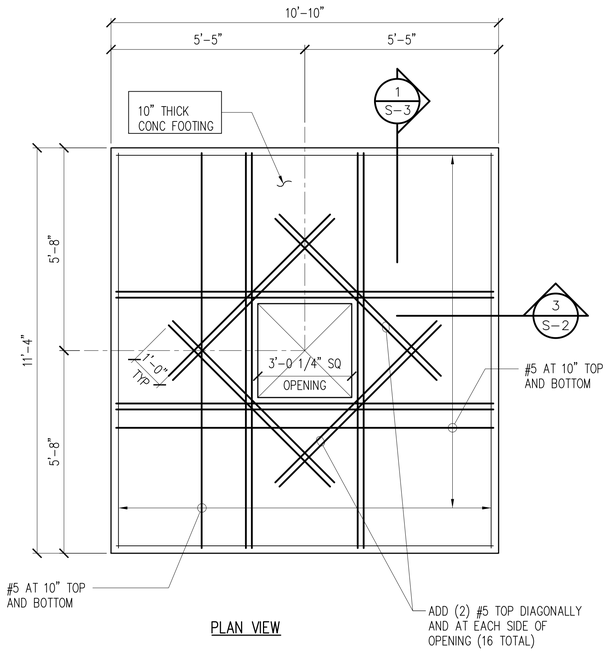


1 S-3 **SECTION**
SCALE: 1/2" = 1'-0"

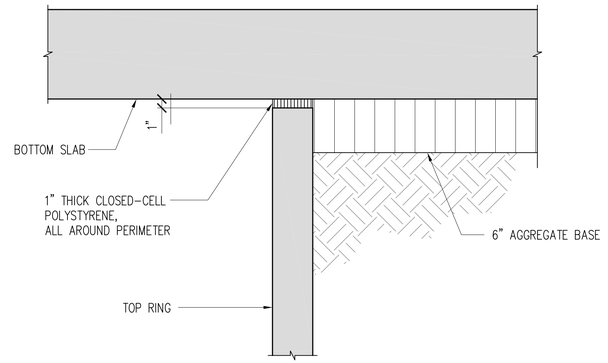


PLAN VIEW

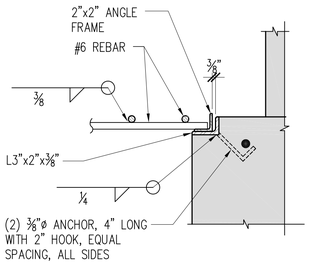
2 S-3 **PLAN - CATCH BASIN FOOTING**
SCALE: 1/2" = 1'-0"

NOTES:

1. REFERENCE CIVIL DRAWINGS FOR THE ELEVATION OF CATCH BASINS, AND LOCATIONS, NUMBER AND SIZE OF PIPES. OPENING OF OUTLET PIPE SHALL BE ROUNDED WITH MINIMUM RADIUS OF 0.15 TIMES PIPE DIAMETER.
2. PROVIDE 2 CUBIC FEET OF CRUSHED ROCK, ASTM SIZE #9 ROCK SAND AT WEEP HOLE.
3. PROVIDE TYPE "B" MANHOLE RUNGS AT 16" OC PER STANDARD DETAILS D-27.
4. CATCH BASIN FOOTING BASE SHALL BE COMPACTED TO A MINIMUM OF 95% RELATIVE DENSITY BEFORE CASTING FOOTING.



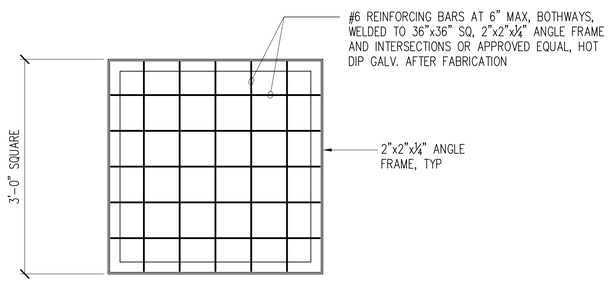
3 S-3 **DETAIL**
NOT TO SCALE



5 S-3 **REBAR GRATING SEAT DETAIL**
NOT TO SCALE

NOTES:

1. GRATING SHALL BE HOT DIPPED GALVANIZED AFTER FABRICATION.
2. ALL STEEL SHALL BE STRUCTURAL GRADE (ASTM A36 MIN.)
3. ALL WELDS 3/8" UNLESS OTHERWISE NOTED.
4. ALL WELDING SHALL BE IN ACCORDANCE WITH CURRENT EDITION OF REINFORCED STEEL WELDING CODE AWS D1.4.



4 S-3 **DRYWELL REBAR GRATING DETAIL**
NOT TO SCALE

0' 1' 2' 3' 4' 5' 6'
1/2" = 1'-0"

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

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LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

MODIFIED TYPE "A" CATCH BASIN DETAILS

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S-3 SHEET 53 OF 68 SHEETS

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Plotted on: 9/17/2019
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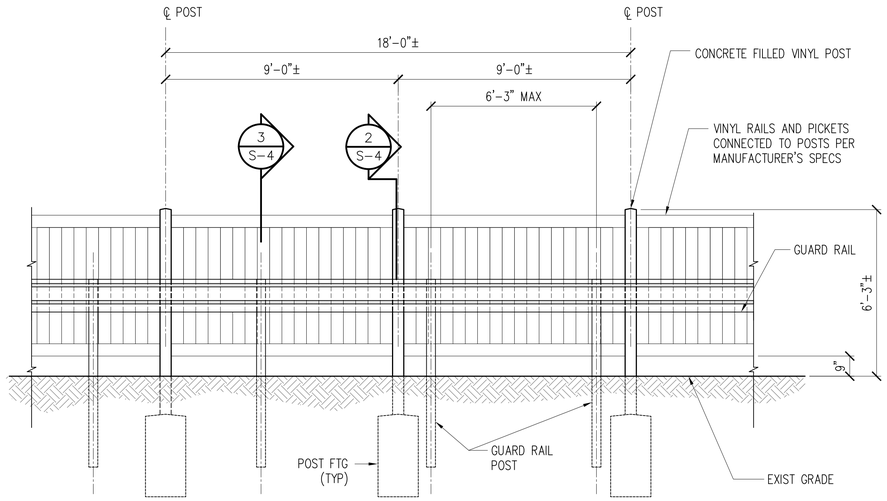
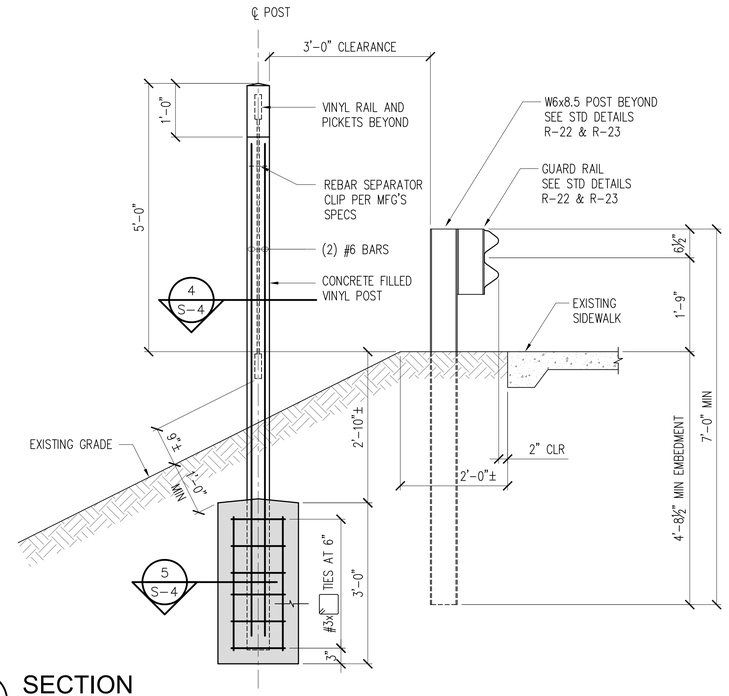


1 / S-4 **ELEVATION - PRIVACY FENCE**
SCALE: 3/8" = 1'-0"



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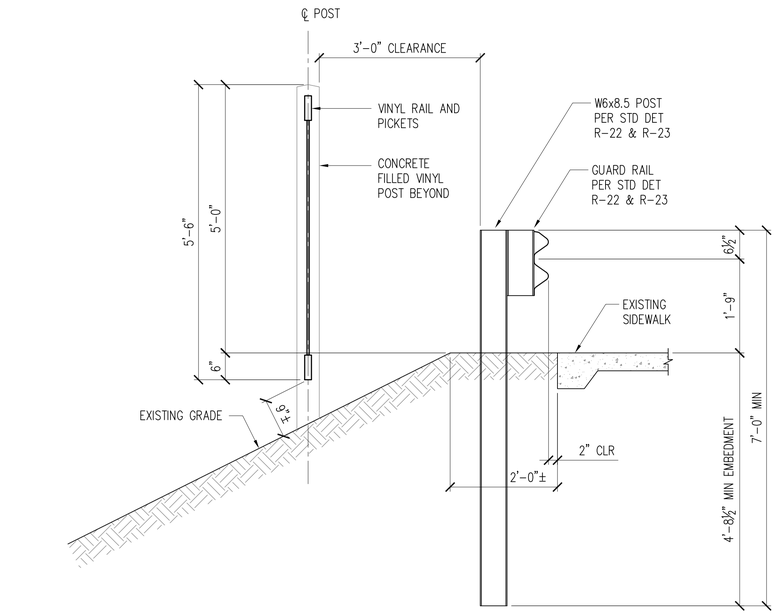

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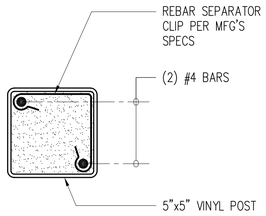
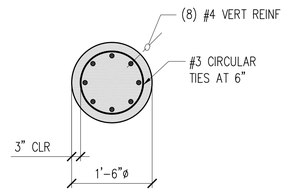
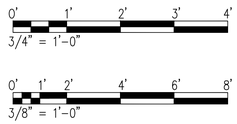


4 / S-4 **SECTION**
NOT TO SCALE



5 / S-4 **SECTION**
SCALE: 3/4" = 1'-0"



KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
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 4/30/20

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

PRIVACY FENCE

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

S-4 SHEET 54 OF 68 SHEETS

Last Save by: BLUM
Last Saved: 4/4/2019
Plotted on: 9/17/2019

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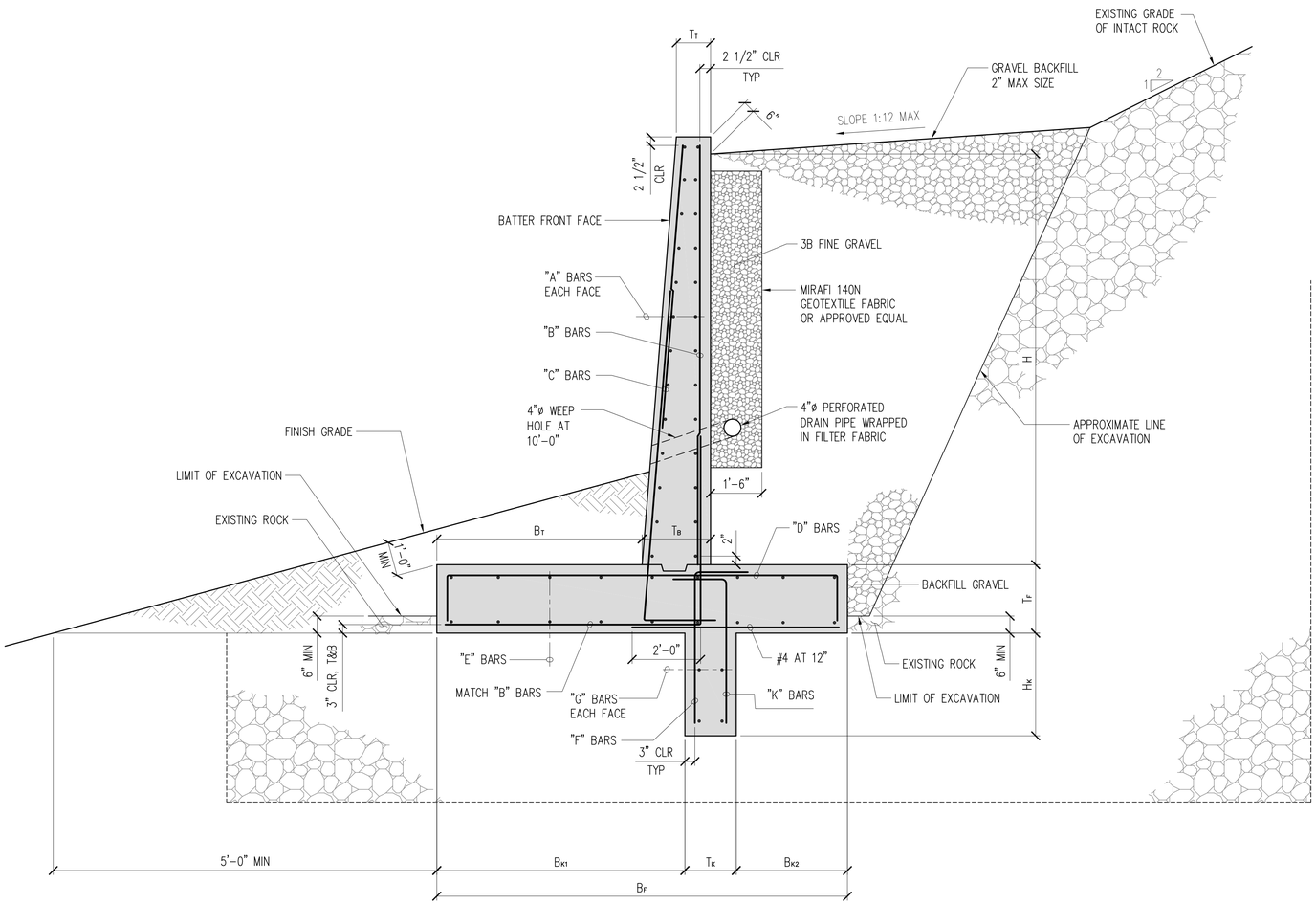
NOTES:

1. REFERENCE CIVIL DRAWINGS FOR LOCATIONS AND HEIGHTS OF RETAINING WALLS.
2. FOUNDATION OF RETAINING WALLS SHALL BE EMBEDDED A MINIMUM OF 6" INTO THE EXISTING INTACT BASALT ROCK. BOTTOM OF FOUNDATION EXCAVATION SHALL BE CLEANED OUT OF ALL LOOSE MATERIAL PRIOR TO PLACEMENT OF REINFORCEMENT OR CONCRETE.



RETAINING WALL SCHEDULE																	
WALL HEIGHT "H"	WALL STEM					FOUNDATION					SHEAR KEY						
	"T_T"	"T_B"	"A" BARS	"B" BARS	"C" BARS	"B_F"	"B_T"	"T_F"	"D" BARS	"E" BARS	"H_K"	"T_K"	"B_{K1}"	"B_{K2}"	"F" BARS	"G" BARS	"K" BARS
8'-1" ≤ 12'-0"	1'-0"	2'-0"	#4 AT 12"	#6 AT 6"	#6 AT 12"	12'-0"	6'-0"	2'-0"	#6 AT 12"	#4 AT 12"	3'-0"	1'-6"	7'-3"	3'-3"	#6 AT 12"	#4 AT 12"	#4 AT 12"
4'-1" ≤ 8'-0"	1'-0"	1'-6"	#4 AT 12"	#5 AT 6"	#5 AT 12"	8'-0"	4'-0"	1'-6"	#5 AT 12"	#4 AT 12"	2'-6"	1'-4"	3'-4"	3'-4"	#5 AT 12"	#4 AT 12"	#4 AT 12"
≤ 4'-0"	0'-8"	0'-10"	#4 AT 12"	#4 AT 12"	#4 AT 12"	4'-0"	2'-0"	1'-0"	#4 AT 12"	#4 AT 12"	2'-0"	1'-0"	1'-6"	1'-6"	#4 AT 12"	#4 AT 12"	#4 AT 12"

1 S-5 RETAINING WALL SECTION
SCALE: NTS

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

RETAINING WALL (ALTERNATIVE ONE)

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
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 4/30/20

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII — DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

S-5 SHEET 55 OF 68 SHEETS

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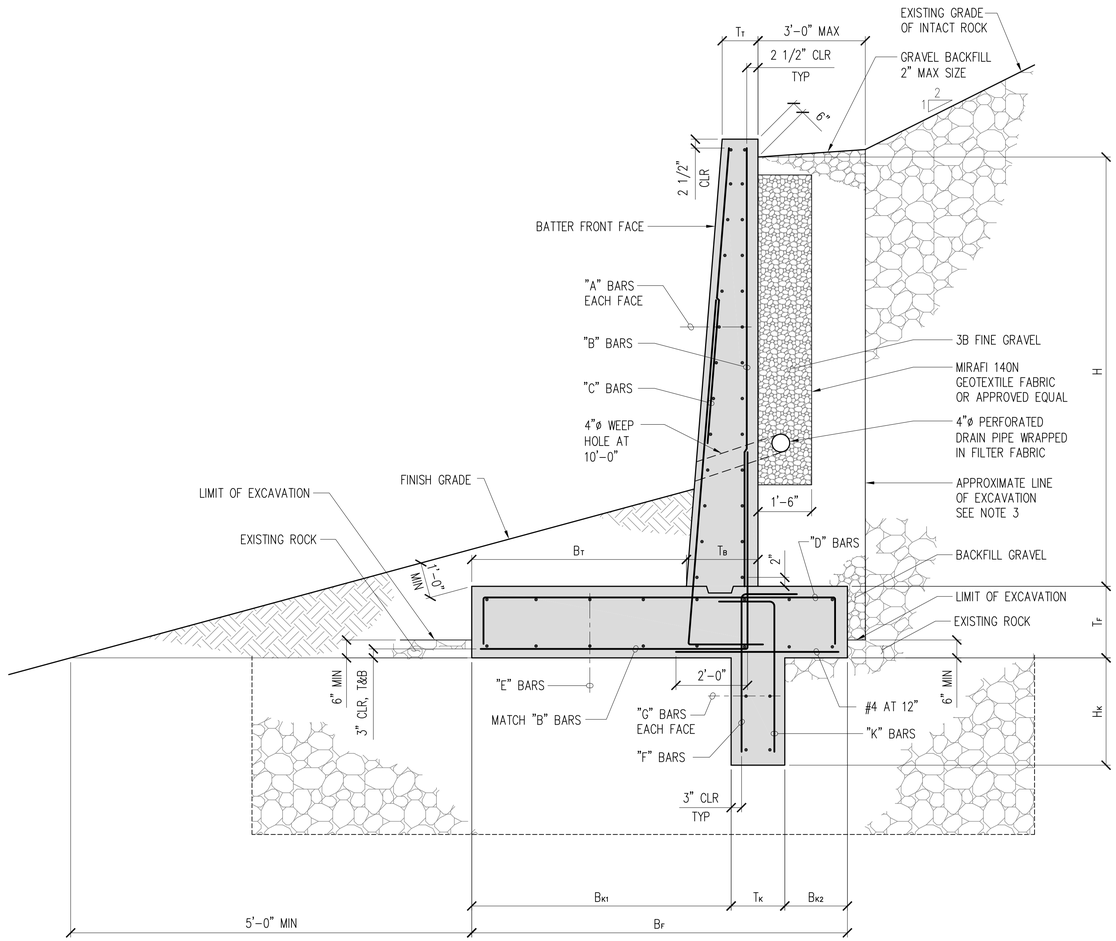
Last Save by: BLUM
Last Saved: 4/4/2019
Plotted on: 9/17/2019

NOTES:

1. REFERENCE CIVIL DRAWINGS FOR LOCATIONS AND HEIGHTS OF RETAINING WALLS.
2. FOUNDATION OF RETAINING WALLS SHALL BE EMBEDDED A MINIMUM OF 6" INTO THE EXISTING INTACT BASALT ROCK. BOTTOM OF FOUNDATION EXCAVATION SHALL BE CLEANED OUT OF ALL LOOSE MATERIAL PRIOR TO PLACEMENT OF REINFORCEMENT OR CONCRETE.
3. EXCAVATION FOR THE WALL SHALL RESULT IN A VERTICAL OR NEAR-VERTICAL INTACT ROCK FACE. THE EXCAVATION WORK SHALL BE OBSERVED AND APPROVED BY A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF HAWAII.



RETAINING WALL SCHEDULE																	
WALL HEIGHT "H"	WALL STEM					FOUNDATION					SHEAR KEY						
	"T_T"	"T_B"	"A" BARS	"B" BARS	"C" BARS	"B_F"	"B_T"	"T_F"	"D" BARS	"E" BARS	"H_K"	"T_K"	"B_{K1}"	"B_{K2}"	"F" BARS	"G" BARS	"K" BARS
8'-1" ≤ 12'-0"	1'-0"	1'-6"	#4 AT 12"	#5 AT 6"	#5 AT 12"	6'-0"	3'-0"	1'-6"	#4 AT 12"	#4 AT 12"	3'-0"	1'-6"	3'-3"	1'-3"	#4 AT 6"	#4 AT 12"	#4 AT 12"
4'-1" ≤ 8'-0"	0'-10"	1'-4"	#4 AT 12"	#5 AT 12"	#4 AT 12"	4'-0"	2'-0"	1'-6"	#5 AT 12"	#4 AT 12"	2'-6"	1'-0"	2'-6"	0'-6"	#5 AT 12"	#4 AT 12"	#4 AT 12"
≤ 4'-0"	0'-8"	0'-10"	#4 AT 12"	#4 AT 12"	#4 AT 12"	3'-0"	1'-6"	1'-0"	#4 AT 12"	#4 AT 12"	1'-6"	1'-0"	1'-6"	0'-6"	#4 AT 12"	#4 AT 12"	#4 AT 12"

1 / S-6 RETAINING WALL SECTION
SCALE: NTS

Last Save by: BLUM
Last Saved: 4/4/2019
Plotted on: 9/17/2019
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 – HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

RETAINING WALL (ALTERNATIVE TWO)

KEN KAZUO HAYASHIDA
LICENSED PROFESSIONAL ENGINEER
No. 6818-S
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 4/30/20

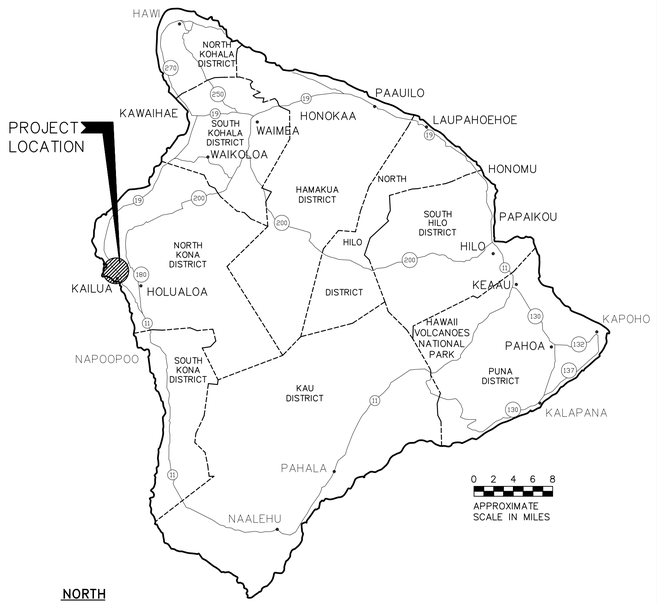
Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

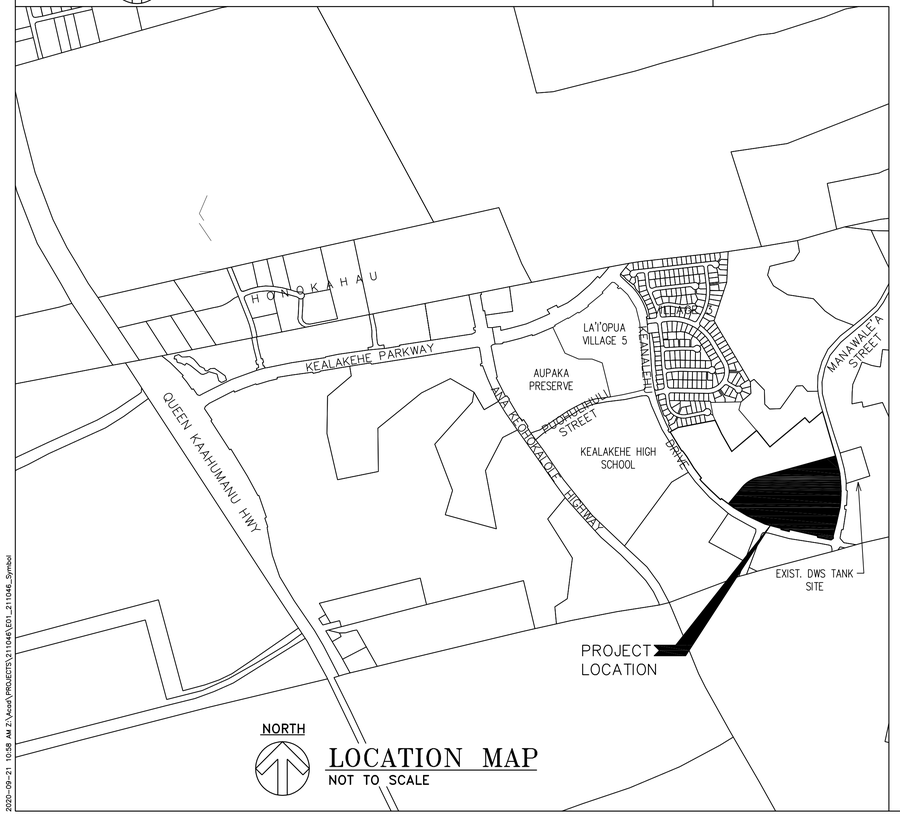
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

S-6 SHEET 56 OF 68 SHEETS



ISLAND OF HAWAII
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

GENERAL NOTES:

1. PROVIDE 5' MINIMUM CLEAR BETWEEN STREET LIGHT POLES & SEWER LATERALS.
2. PROVIDE 3' MINIMUM CLEAR BETWEEN PULLBOXES & SEWER LATERALS.
3. PROVIDE 6' MINIMUM CLEAR BETWEEN TRANSFORMER PADS & SEWER LATERALS (DO NOT STRADDLE).
4. PROVIDE 3' MINIMUM CLEAR BETWEEN DUCTLINES & SEWER LINES.
5. CONTRACTOR SHALL VERIFY SEWER LATERAL LOCATIONS WITH CIVIL SHEETS.
6. PROVIDE 8' MINIMUM HORIZONTAL CLEAR & 18" VERTICAL CLEAR BETWEEN WATER LINES & ALL ELECTRICAL SYSTEMS.
7. CONTRACTOR SHALL BE RESPONSIBLE TO ARRANGE WITH THE GENERAL CONTRACTOR TO IDENTIFY THE LOCATIONS OF CIVIL SITE UTILITIES, DRIVEWAYS, ETC. PRIOR TO ELECTRICAL CONTRACTORS LAYOUT OF ELECTRIC, TELEPHONE, STREET LIGHT, TRAFFIC SIGNAL, AND CATV SYSTEMS.

NOTES FOR CONSTRUCTION:

a. THE LOCATION OF OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN PROXIMITY OF UNDERGROUND LINES AND SHALL MAINTAIN ADEQUATE CLEARANCE WHEN OPERATING EQUIPMENT UNDER ANY OVERHEAD LINES.

b. THE CONTRACTOR IS TO COMPLY WITH THE DIRECTIONS OF THE STATE OF HAWAII OCCUPATIONAL SAFETY AND HEALTH LAW (HIOSH).

c. WHEN TRENCH EXCAVATION IS ADJACENT TO EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS 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 UNDERPINNING TO FULLY PROTECT IT FROM DAMAGE.

d. AS REQUIRED BY THE COUNTY OF HAWAII, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.

e. WHERE PEDESTRIAN WALKWAYS EXIST, SUCH WALKWAYS SHALL BE MAINTAINED IN PASSABLE CONDITION OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.

f. DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHT-OF-WAYS ARE OTHERWISE PROVIDED FOR SATISFACTORILY.

g. THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN BY THE ENGINEER TO EXIST FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. 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.

h. FOR CONSTRUCTION OF HELCO FACILITIES, CONTRACTOR TO REFER TO HELCO DRAWING _-_-___. CONTACT KELLY IKEDA AT HELCO (1-808-327-0515) FOR ANY QUESTIONS OR COMMENTS OF HELCO FACILITIES.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	STREET LIGHT, 35W LED LUMINAIRE, GALVANIZED STEEL POLE &		HELCO 2' X 3' PULLBOX
	BRACKET ARM, SEE DETAIL A/E-10		HELCO 3' X 5' PULLBOX
			HELCO 4' X 6' PULLBOX
	EXISTING STREET LIGHT & BRACKET ARM TO REMAIN		
			EXST HELCO 5' X 7' MANHOLE
			EXST HELCO 6' X 11' MANHOLE
1	NOTE SYMBOL, SEE PLAN FOR NOTES		
			STREET LIGHT PULLBOX QUAZITE TIER 22 17"X30", SEE DETAIL A/E-9
	BREAKLINE TO BEGIN & END DUCT SECTION TYPE		
	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS;		SIC COM 13" X 24" x 30" HANDHOLE, SEE DETAIL ON SHEET E-12
	INDICATES TYPE "A" DUCT SECTION WITH "2-2E" DUCTS.		SIC COM 30" X 48" HANDHOLE, SEE DETAIL ON SHEET E-12
A 2-2E	SEE SHEET E-8 & E-9 FOR DUCT SECTIONS AND		SIC COM 3' X 5' HANDHOLE, SEE DETAIL ON SHEET E-12
	CONDUIT SCHEDULES		GROUND ROD, 5/8" DIA. X 8'-0" (BMZ)
	STUB, CAP, & MARK CONDUIT(S) WITH CONCRETE		
a	MARKER, SEE DETAIL F/E-11		EXST HAWAIIAN TELCOM HANDHOLE
	SAWCUT EXST. A.C. PAVEMENT, CONC. SIDEWALK, CURB & GUTTER		EXST HAWAIIAN TELCOM MANHOLE
	PRIOR TO TRENCH EXCAVATION. RESTORE SUBBASE, BASECOURSE,		EXST SANDWICH ISLES MANHOLE
	PAVEMENT, CONC. SIDEWALK, CURB & GUTTER PER CITY		
	REQUIREMENTS, THICKNESS SHALL MATCH EXST ROAD DESIGN		HELCO TRANSFORMER PAD LOT, 6' X 7' EASEMENT & CONCRETE PAD,
L	STREET LIGHT DUCTS & WIRING		SEE DETAIL E/E-11
e	EXST. UNDERGROUND ELEC/SIGNAL DUCTLINE & WIRING		
t	EXST. UNDERGROUND STREET LIGHT CABLES & CONDUITS		EXST. HELCO SWITCHING EASEMENT PAD LOT
1	NON METERED STREET LIGHT I.D. TAG, 1 = LIGHT NO.,		
	SEE DETAIL C/E-10		

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SYMBOL LIST

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers
GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
04/30/22
EXPIRATION DATE OF THE LICENSE

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

2020-09-21 10:58 AM Z:\Acad\PROJECTS\21104EL01_21104E_Symbol

HAWAII ELECTRIC LIGHT COMPANY (HELCO) NOTES

1. LOCATION OF HELCO FACILITIES
THE LOCATION OF HELCO'S OVERHEAD AND UNDERGROUND FACILITIES SHOWN ON THE PLANS ARE FROM EXISTING RECORDS WITH VARYING DEGREES OF ACCURACY AND ARE NOT GUARANTEED AS SHOWN. THE CONTRACTOR SHALL VERIFY IN THE FIELD THE LOCATIONS OF THE FACILITIES AND SHALL EXERCISE PROPER CARE IN EXCAVATING AND WORKING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITIES AND UTILITY CROSSINGS ARE SHOWN, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS AND CROSSINGS TO VERIFY THE DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HELCO'S FACILITIES WHETHER SHOWN OR NOT SHOWN ON THE PLANS.

2. COMPLIANCE WITH HAWAII OCCUPATIONAL SAFETY AND HEALTH LAWS
THE CONTRACTOR SHALL COMPLY WITH THE STATE OF HAWAII'S OCCUPATIONAL SAFETY AND HEALTH LAWS AND REGULATIONS, INCLUDING WITHOUT LIMITATION, THOSE RELATED TO WORKING ON OR NEAR EXPOSED OR ENERGIZED ELECTRICAL LINES AND EQUIPMENT.

3. EXCAVATION PERMIT
THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT FROM THE COUNTY TWO WEEKS PRIOR TO STARTING CONSTRUCTION. PLEASE REFER TO OUR REQUEST NUMBER AT THAT TIME.

4. CAUTION!!! ELECTRICAL HAZARD!!!
EXISTING HELCO OVERHEAD AND UNDERGROUND LINES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION UNLESS PRIOR SPECIAL ARRANGEMENTS HAVE BEEN MADE WITH HELCO. ONLY HELCO PERSONNEL ARE TO HANDLE THESE ENERGIZED LINES AND ERECT TEMPORARY GUARDS TO PROTECT THESE LINES FROM DAMAGE. THE CONTRACTOR SHALL WORK CAUTIOUSLY AT ALL TIMES TO AVOID ACCIDENTS AND DAMAGE TO EXISTING HELCO FACILITIES, WHICH CAN RESULT IN ELECTROCUTION.

5. OVERHEAD LINES
STATE LAW REQUIRES THAT A WORKER AND THE LONGEST OBJECT HE OR SHE MAY CONTACT CANNOT COME CLOSER THAN A MINIMUM RADIAL CLEARANCE OF 10 FEET WHEN WORKING CLOSE TO OR UNDER ANY OVERHEAD LINES RATED 50KV AND BELOW. FOR EACH ADDITIONAL 1KV ABOVE 50KV, AN ADDITIONAL 0.4 INCH SHALL BE ADDED TO THE 10-FOOT CLEARANCE REQUIREMENT. THE PRECEDING INFORMATION ON LINE CLEARANCE REQUIREMENTS IS PROVIDED AS A CONVENIENCE AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO BE INFORMED OF AND COMPLY WITH ANY REVISIONS OR AMENDMENTS TO THE LAW.

SHOULD THE CONTRACTOR ANTICIPATE THAT HIS WORK WILL RESULT IN THE NEED TO ENCROACH WITHIN THE MINIMUM REQUIRED CLEARANCE AT ANY TIME, THE CONTRACTOR SHALL NOTIFY HELCO AT LEAST FOUR (4) WEEKS PRIOR TO THE PLANNED ENCROACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE, DE-ENERGIZE, OR BLANKET HELCO LINES) CAN BE PUT IN PLACE. HELCO'S COST OF SAFEGUARDING ITS LINES WILL BE CHARGED TO THE CONTRACTOR.

CONTACT HELCO'S CUSTOMER INSTALLATIONS DEPARTMENT AT 969-6666 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

REFER TO SECTION X OF HELCO'S ELECTRIC SERVICE INSTALLATION MANUAL FOR ADDITIONAL GUIDELINES WHEN WORKING AROUND HELCO'S FACILITIES. A COPY MAY BE OBTAINED FROM HELCO'S CUSTOMER INSTALLATIONS DEPARTMENT.

6. POLE BRACING
A MINIMUM CLEARANCE OF 10 FEET MUST BE MAINTAINED WHEN EXCAVATING AROUND UTILITY POLES AND/OR THEIR ANCHOR SYSTEM TO PREVENT WEAKENING OR POLE SUPPORT FAILURE. SHOULD WORK REQUIRE EXCAVATING WITHIN 10 FEET OF A POLE AND/OR ITS ANCHOR SYSTEM, THE CONTRACTOR SHALL PROTECT, SUPPORT, SECURE, AND TAKE ALL OTHER PRECAUTIONS TO PREVENT DAMAGE TO OR LEANING OF THESE POLES. THE CONTRACTOR IS RESPONSIBLE FOR ALL ASSOCIATED COSTS TO BRACE, REPAIR, OR STRAIGHTEN POLES. ALL MEANS OF STRUCTURAL SUPPORT FOR THE POLE PROPOSED BY THE CONTRACTOR SHALL FIRST BE REVIEWED BY HELCO BEFORE IMPLEMENTATION. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HELCO CONSTRUCTION AND MAINTENANCE DEPT., SUPERINTENDENT A MINIMUM OF TWO (2) WEEKS IN ADVANCE.

7. UNDERGROUND LINES
THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF UNDERGROUND LINES. HELCO'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HELCO PERSONNEL ARE TO BREAK INTO EXISTING HELCO FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HELCO'S ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF ITS UNDERGROUND LINES WILL BE CHARGED TO THE CONTRACTOR. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HELCO'S 62KV UNDERGROUND LINES (SEE HELCO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HELCO'S UNDERGROUND 62KV LINES" FOR DETAILED REQUIREMENTS).

FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL ONE-CALL A MINIMUM OF 72 HOURS IN ADVANCE.

FOR ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE LINES, THE CONTRACTOR SHALL CALL HELCO'S CONSTRUCTION & MAINTENANCE DEPT., SUPERINTENDENT, A MINIMUM OF TWO (2) WEEKS IN ADVANCE.

8. UNDERGROUND FUEL PIPELINES

THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HELCO'S UNDERGROUND FUEL OIL PIPELINES. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HELCO'S UNDERGROUND FUEL OIL PIPELINES (SEE HELCO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HELCO'S UNDERGROUND FUEL PIPELINES" FOR DETAILED REQUIREMENTS).

9. EXCAVATIONS
WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HELCO'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR:

SHEETING AND BRACING THE EXCAVATION AND STABILIZING THE EXISTING GROUND TO RENDER IT SAFE AND SECURE AND TO PREVENT POSSIBLE SLIDES, CAVE-INS, AND SETTLEMENTS.

PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNINGS TO FULLY PROTECT IT FROM DAMAGE.

BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DEPARTMENT FOR THERMAL BACKFILL SPECIFICATIONS).

10. RELOCATION OF HELCO FACILITIES
ANY WORK REQUIRED TO RELOCATE OR MODIFY HELCO FACILITIES SHALL BE DONE BY HELCO, OR BY THE CONTRACTOR UNDER HELCO'S SUPERVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HELCO'S WORK, WHICH MAY INCLUDE, BUT NOT BE LIMITED TO, EXCAVATION AND BACKFILL, PERMITS AND TRAFFIC CONTROL, BARRICADING, AND RESTORATION OF PAVEMENT, SIDEWALKS, AND OTHER FACILITIES.

ALL COSTS ASSOCIATED WITH ANY RELOCATION OR MODIFICATION (EITHER TEMPORARY OR PERMANENT) FOR THE CONVENIENCE OF THE CONTRACTOR, OR TO ENABLE THE CONTRACTOR TO PERFORM HIS WORK IN A SAFE AND EXPEDITIOUS MANNER IN FULFILLING HIS CONTRACT OBLIGATIONS SHALL BE BORNE BY THE CONTRACTOR.

11. CONFLICTS
ANY REDESIGN OR RELOCATION OF HELCO'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HELCO IS NOT RESPONSIBLE FOR ANY DELAY OR DAMAGE THAT MAY ARISE AS A RESULT OF ANY CONFLICTS DISCOVERED OR IDENTIFIED WITH RESPECT TO THE LOCATION OR CONSTRUCTION OF HELCO'S ELECTRICAL FACILITIES IN THE FIELD, REGARDLESS OF WHETHER THE CONTRACTOR HAS MET THE REQUESTED MINIMUM ADVANCE NOTICES. IN ORDER TO MINIMIZE ANY DELAY OR IMPACT ARISING FROM SUCH CONFLICTS, HELCO SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.

12. DAMAGE TO HELCO FACILITIES
THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HELCO SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HELCO'S FACILITIES AS A RESULT OF HIS OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES TO HELCO'S TROUBLE DISPATCHER. REPAIR WORK SHALL BE DONE BY HELCO OR BY THE CONTRACTOR UNDER HELCO'S SUPERVISION. ALL COSTS FOR DAMAGES TO HELCO'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HELCO'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HELCO'S TROUBLE DESK (969-6666) (A 24-HOUR NUMBER) SO HELCO PERSONNEL CAN SECURE THE DAMAGED SECTION AND REPORT ANY OIL SPILLS TO THE PROPER AUTHORITIES. ALL COSTS ASSOCIATED WITH THE DAMAGE, REPAIR, AND OIL SPILL CLEANUP SHALL BE BORNE BY THE CONTRACTOR.

13. HELCO STAND-BY PERSONNEL
THE CONTRACTOR MAY REQUEST HELCO TO PROVIDE AN INSPECTOR TO STAND-BY DURING CONSTRUCTION NEAR HELCO'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR. THE CONTRACTOR SHALL CALL THE HELCO CONSTRUCTION AND MAINTENANCE DEPT., SUPERINTENDENT A MINIMUM OF 5 WORKING DAYS IN ADVANCE TO ARRANGE FOR HELCO STAND-BY PERSONNEL.

14. CLEARANCES
THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HELCO'S DUCTLINE AND ALL ADJACENT STRUCTURES (CHARTED AND UNCHARTED) IN THE TRENCH:

STRUCTURE TYPE	MINIMUM CLEARANCE(INCHES)
WATER LINES, PARALLEL	36 (A)
WATER LINES, CROSSING	12 (B)
SEWER LINES, PARALLEL	36 (C)
SEWER LINES, CROSSING	24 (D)
DRAIN LINES, PARALLEL	12
DRAIN LINES, CROSSING	6 (E)
ELECTRICAL AND GAS LINES, PARALLEL	12
ELECTRICAL AND GAS LINES, CROSSING	12
TELEPHONE LINES, PARALLEL	6 (E)
TELEPHONE LINES, CROSSING	6 (E)
CHEVRON OIL LINES, PARALLEL	36
CHEVRON OIL LINES, CROSSING	48 BELOW OIL LINE (F)

A. THE MINIMUM HORIZONTAL CLEARANCES TO WATER LINES PARALLEL TO ELECTRICAL DUCTLINES MUST BE INCREASED TO 60 INCHES IF THE WATER LINE IS GREATER THAN 16 INCHES IN DIAMETER

B. THE MINIMUM VERTICAL CLEARANCES TO WATER LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 6 INCHES IF THE ELECTRICAL DUCTLINE STRUCTURE IS CONCRETE ENCASED AND IS BELOW THE WATER LINE AND THE WATER LINE IS LESS THAN 16 INCHES IN DIAMETER.

C. A MINIMUM HORIZONTAL CLEARANCE OF 36 INCHES IS REQUIRED BETWEEN NEW HANDHOLES AND EXISTING SEWER LATERALS.

D. THE MINIMUM VERTICAL CLEARANCES TO SEWER PIPES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 12 INCHES IF THE SEWER PIPE IS JACKETED IN CONCRETE.

E. THE MINIMUM CLEARANCES SHALL BE INCREASED TO 12 INCHES IF THE ELECTRICAL DUCTLINE IS DIRECT BURIED.

F. THE MINIMUM VERTICAL CLEARANCES TO OIL LINES CROSSING ELECTRICAL DUCTLINES CAN BE REDUCED TO 24 INCHES BELOW OIL LINES IF THE CROSSINGS ARE ENCASED IN 6 INCHES OF CONCRETE.

G. THE CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER & HELCO OF ANY HEAT SOURCES (POWER CABLE DUCT BANK, STEAMLINE, ETC.) ENCOUNTERED THAT ARE NOT PROPERLY IDENTIFIED ON THE DRAWING.

THE FOLLOWING CLEARANCE SHALL BE MAINTAINED BETWEEN HELCO'S FUEL OIL PIPELINES AND ALL ADJACENT STRUCTURES: 24-INCHES, PARALLEL OR CROSSING. THE MINIMUM CLEARANCE CAN BE REDUCED TO 12 INCHES (PARALLEL AND BELOW ONLY) IF THE STRUCTURE IS JACKETED IN CONCRETE.

15. INDEMNITY
THE CONTRACTOR SHALL INDEMNIFY, DEFEND AND HOLD HARMLESS HELCO FROM AND AGAINST ALL LOSSES, DAMAGES, CLAIMS, AND ACTIONS, INCLUDING BUT NOT LIMITED TO REASONABLE ATTORNEY'S FEES AND COSTS BASED UPON OR ARISING OUT OF DAMAGE TO PROPERTY OR INJURIES TO PERSONS, OR OTHER TORTIOUS ACTS CAUSED OR CONTRIBUTED TO BY CONTRACTOR OR ANYONE ACTING UNDER ITS DIRECTION OR CONTROL OR ON ITS BEHALF; PROVIDED CONTRACTOR'S INDEMNITY SHALL NOT BE APPLICABLE TO ANY LIABILITY BASED UPON THE SOLE NEGLIGENCE OF HELCO.

16. SCHEDULE
CONTRACTOR SHALL FURNISH HIS CONSTRUCTION SCHEDULE 22 WORKING DAYS PRIOR TO STARTING WORK ON HELCO FACILITIES. CONTRACTOR SHALL GIVE HELCO, IN WRITING 30 WORKING DAYS NOTICE TO PROCEED WITH HELCO'S PORTION OF WORK.

17. AUTHORITY
ALL CONSTRUCTION, RESTORATION WORK, AND INSPECTION SHALL BE SUBJECT TO WHICHEVER GOVERNMENTAL AGENCY HAS AUTHORITY OVER THE WORK.

18. SPECIFICATIONS CONSTRUCTION OF HELCO'S UNDERGROUND FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISIONS OF HELCO SPECIFICATIONS CS7001, CS7003, CS7202, CS9301, AND CS9401 AND APPLICABLE HELCO STANDARDS.

19. CONSTRUCTION
CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, EQUIPMENT, AND SERVICES TO PROPERLY PERFORM AND FULLY COMPLETE ALL WORK SHOWN ON THE CONTRACT, DRAWINGS, AND SPECIFICATIONS. ALL MATERIALS SHALL BE NEW AND MANUFACTURED IN THE UNITED STATES OF AMERICA. ALL MANHOLE, HANDHOLE, AND DUCTLINE INSTALLATIONS SHALL BE INSPECTED AND APPROVED BY HELCO PRIOR TO EXCAVATION AND PRIOR TO PLACING CONCRETE.

CONTRACTOR SHALL NOTIFY HELCO'S INSPECTION DIVISION AT 935-1171 AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE. CONTRACTOR TO COORDINATE WORK TO BREAK INTO HELCO'S EXISTING ELECTRICAL FACILITIES WITH HELCO'S UNDERGROUND DIVISION AT 935-1171 AT LEAST 10 WORKING DAYS IN ADVANCE.

20. STAKEOUT
THE CONTRACTOR SHALL ARRANGE FOR TONEOUTS OF ALL UNDERGROUND FACILITIES AND SHALL STAKEOUT ALL PROPOSED HELCO FACILITIES WITHIN THE PROJECT AREA SO AS TO NOT CONFLICT WITH ANY UTILITY (EXISTING OR PROPOSED) AND ANY PROPOSED CONSTRUCTION OR IMPROVEMENT WORK FOR VERIFICATION BY HELCO BEFORE PROCEEDING WITH HELCO WORK.

21. DUCTLINES
ALL DUCTLINE INSTALLATIONS SHALL BE PVC SCHEDULE 40 ENCASED IN CONCRETE, UNLESS OTHERWISE NOTED. ALL COMPLETED DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR IN THE PRESENCE OF HELCO'S INSPECTOR USING HELCO'S STANDARD PRACTICE. THE CONTRACTOR SHALL INSTALL A 1/8" POLYOLEFIN PULL LINE IN ALL COMPLETED DUCTLINES AFTER MANDREL TESTING IS COMPLETE.

22. JOINT POLE REMOVAL
THE LAST JOINT POLE OCCUPANT OFF THE POLES SHALL REMOVE THE POLES.

23. AS-BUILT PLANS
THE CONTRACTOR SHALL PROVIDE HELCO WITH TWO SETS OF AS-BUILT REPRODUCIBLE TRACINGS SHOWING THE OFFSETS, STATIONING, AND VERTICAL ELEVATION OF THE DUCT LINE(S) CONSTRUCTED.

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/22
EXPIRATION DATE OF THE LICENSE

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

HELCO NOTES

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

E-2 SHEET 58 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

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SANDWICH ISLES COMMUNICATIONS' NOTES
DECEMBER 9, 2016

GENERAL:

ALL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) AND SANDWICH ISLES COMMUNICATIONS (SIC), WHICH COMPLIES WITH ALL APPLICABLE CITY, COUNTY, STATE AND FEDERAL REQUIREMENTS.

ALL MATERIALS USED MUST BE APPROVED AND (OR) ACCEPTED BY SANDWICH ISLES COMMUNICATIONS, INC.

CONTRACTOR MAY REFER TO THE RUS WEBSITE (HTTPS://WWW.RD.USDA.GOV/PUBLICATIONS/REGULATIONS-GUIDELINES) FOR REGULATIONS, BULLETINS, FORMS, ETC.

CONTACT THE HAWAII ONE CALL CENTER AT (866) 423-7287 FOR LOCATING EXISTING UNDERGROUND FACILITIES PRIOR TO BEGINNING ANY EXCAVATION.

THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY FOR PROSECUTION OF THE WORK.

IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WORK SCHEDULES WITH ALL UTILITY COMPANIES, COUNTY, OR STATE AGENCIES REQUIRED FOR THIS PROJECT. THIS IS TO INCLUDE COORDINATION OF ANY INSPECTION AND SPECIFICATIONS BY THOSE UTILITY COMPANIES, COUNTY, OR STATE AGENCIES.

THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DIMENSIONS RELATING TO THIS PROJECT BEFORE COMMENCING THE REQUIRED WORK.

THE CONTRACTOR SHALL PROMPTLY NOTIFY THE ENGINEER OF ANY DISCREPANCIES AND/OR CONDITIONS WHICH WOULD PREVENT HIM FROM FULFILLING THE TERMS OF THIS CONTRACT.

ALL SIC PULLBOXES THAT THE CONTRACTOR ENTERS FOR INSTALLATION OF FACILITIES MUST BE CLEARED OF STANDING WATER AND DEBRIS. CONTRACTOR SHALL ORGANIZE EXISTING CABLE FACILITIES, TO INCLUDE ADDING CABLE RACKS AND TYING DOWN EXISTING CABLE, IN ORDER TO ACCOMMODATE NEW FACILITIES BEING PLACED. CLEANING AND ORGANIZING OF PULLBOXES SHALL BE DONE TO THE SATISFACTION OF THE PROJECT MANAGER.

THE CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE OWNER AT COMPLETION OF THE PROJECT. AS-BUILT DRAWINGS REFER TO DOCUMENTS MAINTAINED AND ANNOTATED BY THE CONTRACTOR DURING CONSTRUCTION AND INCLUDE ANY CHANGES OR NEW INFORMATION FOUND OR ADDED THROUGHOUT CONSTRUCTION OF THE PROJECT.

CONDUITS:

1. ALL UNDERGROUND PVC CONDUITS, SWEEPS, COUPLINGS, ADAPTERS AND BELL ENDS SHALL BE SCHEDULE 40, UNLESS OTHERWISE SPECIFIED.

2. ALL HIGH DENSITY POLYETHYLENE CONDUITS SHALL BE SDR 11. TYPICAL 3-PACK UNIT INCLUDES THREE 1.5-INCH SDR 11 RATED CONDUITS IN THE COLORS OF BLACK, RED, AND ORANGE, UNLESS OTHERWISE SPECIFIED. ALL CONDUITS TO BE PRESSURE TESTED AT 120 PSI. FUSION SPLICING OF THE CONDUIT SHALL BE ACCEPTABLE ONLY WHEN PULLING JOINTS THROUGH BORES. ALL COUPLINGS SHALL BE DOUBLE E-LOC MANUFACTURED BY ETCO SPECIALTY PRODUCTS, INC.

3. MAIN CONDUIT RUNS, EXCEPT RISER CONDUITS, SHALL BE CONSTRUCTED WITH MINIMUM 6-FOOT RADIUS CURVES, UNLESS OTHERWISE APPROVED BY THE PROJECT MANAGER.

4. AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID MANDREL NOT LESS THAN 12-INCHES IN LENGTH AND HAVING A DIAMETER OF 1/4-INCH LESS THAN THE INSIDE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT. THE SIC PROJECT MANAGER SHALL BE PRESENT DURING ALL MANDREL TESTING. SUFFIXES LISTED IN RUS 515B FOR CONDUITS ARE APPLICABLE.

5. INSTALL MULETAPE IN ALL PVC CONDUITS TWO (2) INCH DIAMETER AND LARGER. THE NEPTCO MULETAPE (OR APPROVED EQUAL) IS AVAILABLE IN 3,000FT., 6,500FT., AND 10,000FT. REELS FROM WESTINGHOUSE ELECTRIC SUPPLY COMPANY (WESCO), THE NEPTCO MULETAPE IS PRE-LUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS. PVC CONDUITS WITH A DIAMETER OF 1.5-INCH OR LESS SHALL HAVE A POLY-LINE (P-LINE) INSTALLED. ALL DUCTS SHALL BE SEALED AFTER MULETAPE/P-LINE HAS BEEN INSTALLED, FOLLOWING THE SPECIFICATIONS BELOW.

6. ALL CONDUITS AND DUCTS SHALL BE PROPERLY SEALED USING COMMSCOPE, JACKMOON DUCT SEALS, APPLICABLE BUSHING SLEEVES AND BLANK DUCT PLUGS. THE CONDUIT DIAMETER, INSIDE DIAMETER AND CABLE SIZE(S) SHALL BE TAKEN INTO CONSIDERATION WHEN ORDERING AND INSTALLING "JACKMOON" DUCT SEALS.

   COMMSCOPE JACKMOON SEALS SHALL BE:

2-INCH CONDUIT:	TRIPLEX DUCT SEALS, SERIES 70
3-INCH CONDUIT:	TRIPLEX DUCT SEALS, SERIES 136
3.5-INCH AND LARGER CONDUIT:	QUADPLEX DUCT SEALS, SERIES 136

   ALL OTHER DUCTS SHALL HAVE COMMSCOPE, BLANK JACKMOON PLUGS TO KEEP THEM FREE OF WATER AND DEBRIS.

7. CONDUIT STUBS FROM HANDHOLES TO INDIVIDUAL RESIDENTIAL LOTS SHALL BE SCHEDULE 40 PVC, 1-INCH DIAMETER AND EXTENDED 5-FEET BEYOND PROPERTY LINE. CAP AND SEAL END AND MARK LOCATIONS WITH ABOVE GROUND MARKER. CONDUITS WILL NOT BE LOCATED WITHIN THE DRIVEWAY AREA.

8. ALL CONDUITS SHALL ENTER MANHOLES AT A 90 DEGREE ANGLE AND SHALL EXTEND INTO THE MANHOLE AS FOLLOWS: CONDUITS DESIGNATED FOR FIBER SHALL EXTEND 12-INCHES INTO THE MANHOLE. ALL OTHER CONDUITS SHALL BE FLUSH WITH THE INSIDE WALL AND INCLUDE BELL ENDS. ANY EXCEPTIONS SHALL ONLY BE PERMITTED WHEN SPECIFIED BY THE PROJECT MANAGER.

9. ALL CONDUITS ENTERING MANHOLES OR HANDHOLES SHALL BE GROUTED BETWEEN THE CONDUITS AND SIDEWALL, INSIDE AND OUT. ALL CONDUITS WILL ENTER THE MANHOLES AND HANDHOLES ON THE PROPERTY SIDE AT ALL TIMES UNLESS OTHERWISE SPECIFIED BY THE PROJECT MANAGER.

10. BACKFILL AND COMPACTION FOR DUCTLINE TRENCHES, MANHOLES AND HANDHOLES, SHALL BE IN ACCORDANCE WITH:

    A. STATE HIGHWAY DEPARTMENT'S STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION WITH LATEST AMENDMENTS, IF CONSTRUCTION IS LOCATED UNDER A STATE STREET OR ROAD, OR LOCATED IN PRIVATE PROPERTY.

    B. THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 1994, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, WITH LATEST AMENDMENTS; COUNTY OF KAUAI, MAUI, OR HAWAII, AS THE CASE MAY BE, IF CONSTRUCTION IS LOCATED UNDER COUNTY STREETS AND ROADS.

11. BACKFILLING SHALL BE SUBJECT TO THE APPROVAL OF THE SIC PROJECT MANAGER, THE AUTHORIZED REPRESENTATIVE OF THE DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII AND/OR DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, COUNTY OF KAUAI, MAUI OR HAWAII, AS THE CASE MAY BE.

12. A THIRD PARTY GEOTECHNICAL ENGINEER, LICENSED AND INSURED IN THE STATE OF HAWAII, MUST CERTIFY THAT THE EXCAVATED AREA MEETS THE GOVERNING AGENCIES AND/OR OWNERS STANDARDS FOR BACKFILL AND COMPACTION.

13. EXCAVATED MATERIAL MAY BE REUSED AS BACKFILL, PROVIDING THAT IT CONFORMS TO REQUIREMENTS OF TYPE "A" AND TYPE "B" BACKFILL, AS REQUIRED WITHIN THE STANDARD SPECIFICATIONS. A WRITTEN SOILS REPORT OF CONFORMANCE BY A LICENSED THIRD PARTY GEOTECHNICAL ENGINEER IS NEEDED PRIOR TO BACKFILL USING THE EXCAVATED MATERIAL.

    A. TYPE A BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

    B. TYPE B BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1/2-INCH AND MIXTURE SHALL NOT CONTAIN MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

14. ALL CONDUIT RUNS SHALL HAVE A 3-INCH NON-METALLIC WARNING TAPE PLACED 12-INCHES ABOVE THE CONDUIT RUN. THE TAPE SHALL READ "CAUTION BURIED FIBER OPTIC CABLE BELOW".

MANHOLES AND HANDHOLES:

1. ALL MANHOLES SHALL HAVE HS20-44 TRAFFIC LOADING COVERS (UNLESS OTHERWISE NOTED). HANDHOLES SHALL HAVE 20K TRAFFIC LOAD RATED COVERS.

2. ALL MANHOLE AND HANDHOLE COVERS SHALL HAVE COVER LOGO TO READ "SIC".

3. ALL MANHOLE AND HANDHOLE COVER BOLTS SHALL BE STAINLESS STEEL 3/4-INCH PENTAHEAD, UNLESS OTHERWISE NOTED.

4. ALL MANHOLES AND HANDHOLES ARE SPECIFIED AS FOLLOWS:

    A. UM35 AND UM46 MANHOLE – CONSISTS OF A REINFORCED CONCRETE MANHOLE WITH CAST IRON LID AND RISERS (IF REQUIRED). ALL MANHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

    B. UH35 AND UH46 HANDHOLE – CONSISTS OF A REINFORCED CONCRETE HANDHOLE WITH TRAFFIC RATED HINGED COVERS (UH35) OR SIX TRAFFIC RATED SLIP-NOT COVERS (UH46) AND RISERS (IF REQUIRED). ALL HANDHOLES ARE UNDER MASTER PURCHASE AGREEMENT WITH HAWAII PRECAST, INC. LOCATED IN CAPTAIN COOK, HAWAII (808-326-7730).

    C. UHC30X48X33 HANDHOLE (PULLBOX) – CONSISTS OF A TWO-TIER ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001430TA-SIC4).

    D. UHC13X24X30 HANDHOLE (PULLBOX) – CONSISTS OF AN ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001946TA-SIC1).

5. ALL MANHOLES AND HANDHOLES TO BE ORDERED WITH ALL HARDWARE, INCLUDING CABLE RACKS, STEPS AND LOCKS.

6. SET MANHOLE OR HANDHOLE ON A LEVEL AREA, IN THE BOTTOM OF THE EXCAVATION, ON A 4-INCH LAYER OF CRUSHED ROCK, FOR DRAINAGE PURPOSES.

7. THE BASE OF ALL MANHOLES AND HANDHOLES WILL BE PLACED LEVEL. SOME MANHOLES HAVE ADJUSTABLE FRAMES. ALL VOIDS CREATED DURING INSTALLATION MUST BE FILLED WITH MORTAR MIX OR CONCRETE. THIS IS ESPECIALLY TRUE FOR MANHOLES AND HANDHOLES SET IN ROADWAYS.

8. BEFORE BACKFILLING AND COMPACTING, MAKE SURE COVERS ARE IN PLACE AND SECURE. LAYER 6-INCHES TO 8-INCHES OF BACKFILL MATERIAL AROUND THE MANHOLE OR HANDHOLE. TAMP EACH INDIVIDUAL LAYER OF BACKFILL MATERIAL. CONTINUE THE LAYERING AND "TAMPING" UNTIL FINAL GRADE IS ACHIEVED.

9. THE TOPS OF ALL MANHOLES AND HANDHOLES SHALL BE FLUSH TO GRADE IN PAVED AREAS OR 1-INCH ABOVE FINISH GRADE IN NON-PAVED AREAS, UNLESS OTHERWISE SPECIFIED BY PROJECT MANAGER.

10. PROVIDE A 5/8-INCH DIAMETER X 8-FOOT COPPER CLAD GROUND ROD AT HANDHOLES AND MANHOLES AS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER.

11. FIELD MODIFICATIONS ARE ACCOMPLISHED BY USING A FINE TOOTHED SAW. RACKS OR OTHER EQUIPMENT MAY BE SECURED TO THE SIDE OF THE VAULT BY USE OF TOGGLE BOLTS, MOLLY BOLTS, ETC. AND MUST BE APPROVED BY THE PROJECT MANAGER.

UTILITY POLE INSTALLATION:

1. ALL AERIAL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF THE RURAL UTILITIES SERVICES (RUS) BULLETIN 1753F-152.

2. UTILITY POLES SHALL BE PRESERVED UTILIZING THE PENTACHLOROPHENOL (PENTA) TYPE TREATMENT.

3. UTILITY POLES SHALL BE TERMITE PROTECTED UTILIZING TERMIMESH POLESOCK'S OR EQUIVALENT. POLESOCK'S SHALL EXTEND NO MORE THAN EIGHT INCHES ABOVE GROUND AND BE SECURED WITH STAINLESS STRAPPING. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.

4. THE POLE HOLE SHALL BE OF SUFFICIENT DIAMETER TO PERMIT THE POLE TO SETTLE FREELY TO THE BOTTOM OF THE HOLE WITHOUT TRIMMING THE BUTT AND STILL HAVE SUFFICIENT SPACE BETWEEN THE POLE AND THE SIDE OF THE HOLE TO PERMIT PROPER TAMPING OF THE BACKFILL AT EVERY POINT AROUND THE POLE, AND THROUGHOUT THE ENTIRE DEPTH OF THE HOLE.

5. THE POLE HOLE SHALL NOT EXCEED TWO TIMES THE DIAMETER OF THE POLES BUTT DIAMETER.

6. BACKFILL SHALL BE THOROUGHLY TAMPED THE FULL DEPTH OF THE POLE HOLE. EARTH MUST BE BANKED AROUND THE POLE TO A MINIMUM HEIGHT OF SIX INCHES ABOVE GROUND LEVEL.

7. POLES SHALL BE SET PLUMB EXCEPT AT CORNERS WHERE THEY SHALL BE SET AND RAKED AGAINST THE LOAD SO THAT THE POLE TOP WILL BE IN LINE AFTER THE LOAD IS APPLIED. THE RAKE POLE SHALL NOT EXCEED SIX INCHES FOR EACH TEN FEET OF POLE LENGTH AFTER THE CONDUCTORS ARE INSTALLED AT THE REQUIRED TENSION. DEADEND SHALL BE SET SO AS TO BE PLUMB AND IN LINE AFTER THE LOAD IS APPLIED.

8. POLE LIGHTNING PROTECTION SHALL BE A #6 AWG BARE COPPER WIRE IN ACCORDANCE WITH SIC/RUS CONSTRUCTION PRACTICES.

9. SUSPENSION STRAND/HARDWARE SHALL BE CLASS C GALVANIZED STEEL UTILITY GRADE FOR CORROSION AREAS.

10. GUY GUARDS, YELLOW IN COLOR SHALL BE PLACED ON ALL DOWN GUYS.

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SIC NOTES

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/22
EXPIRATION DATE OF THE LICENSE

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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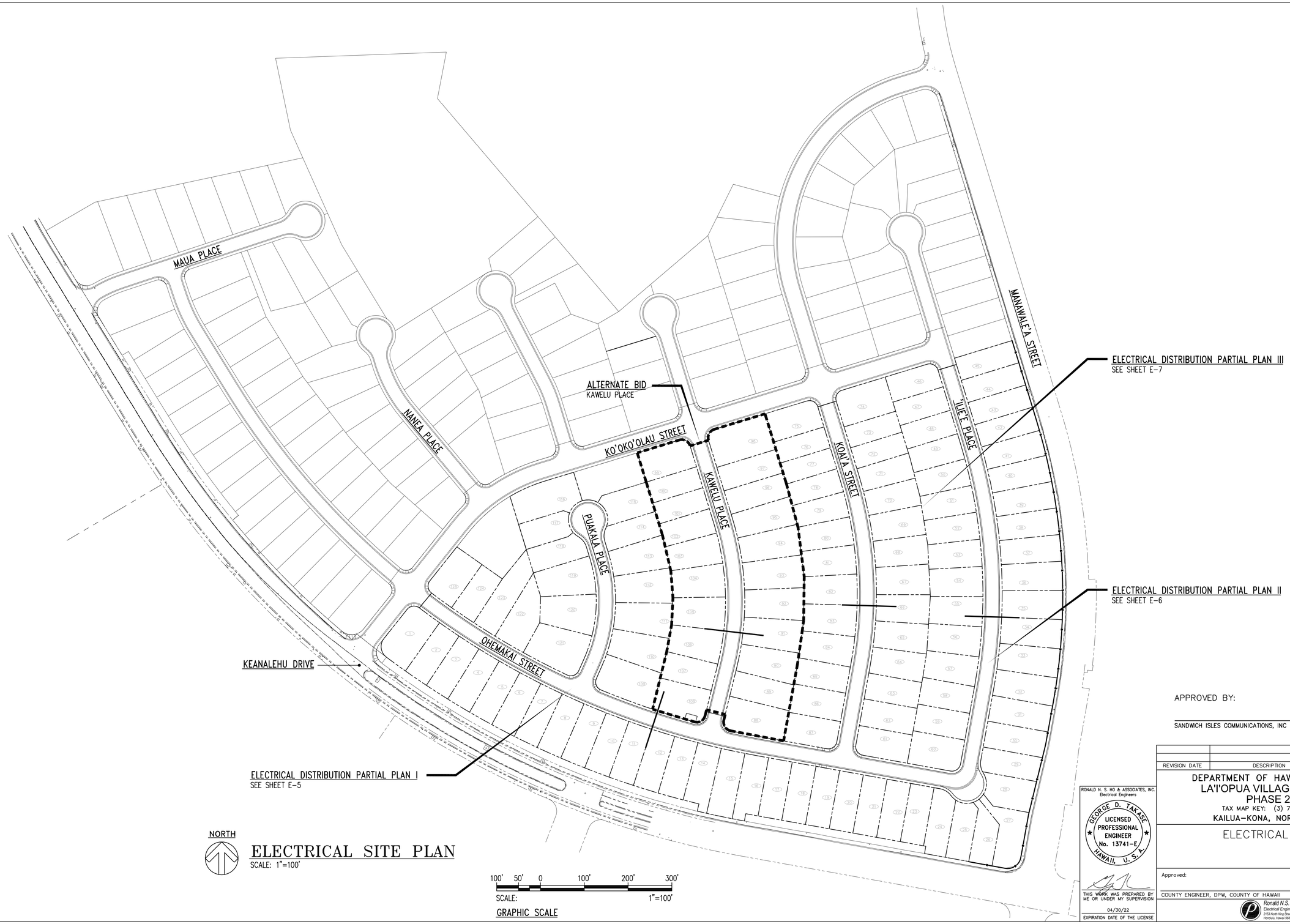

ELECTRICAL SITE PLAN

SCALE: 1"=100'

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

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DEPARTMENT OF HAWAIIAN HOME LANDS
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Honolulu, Hawaii 96819

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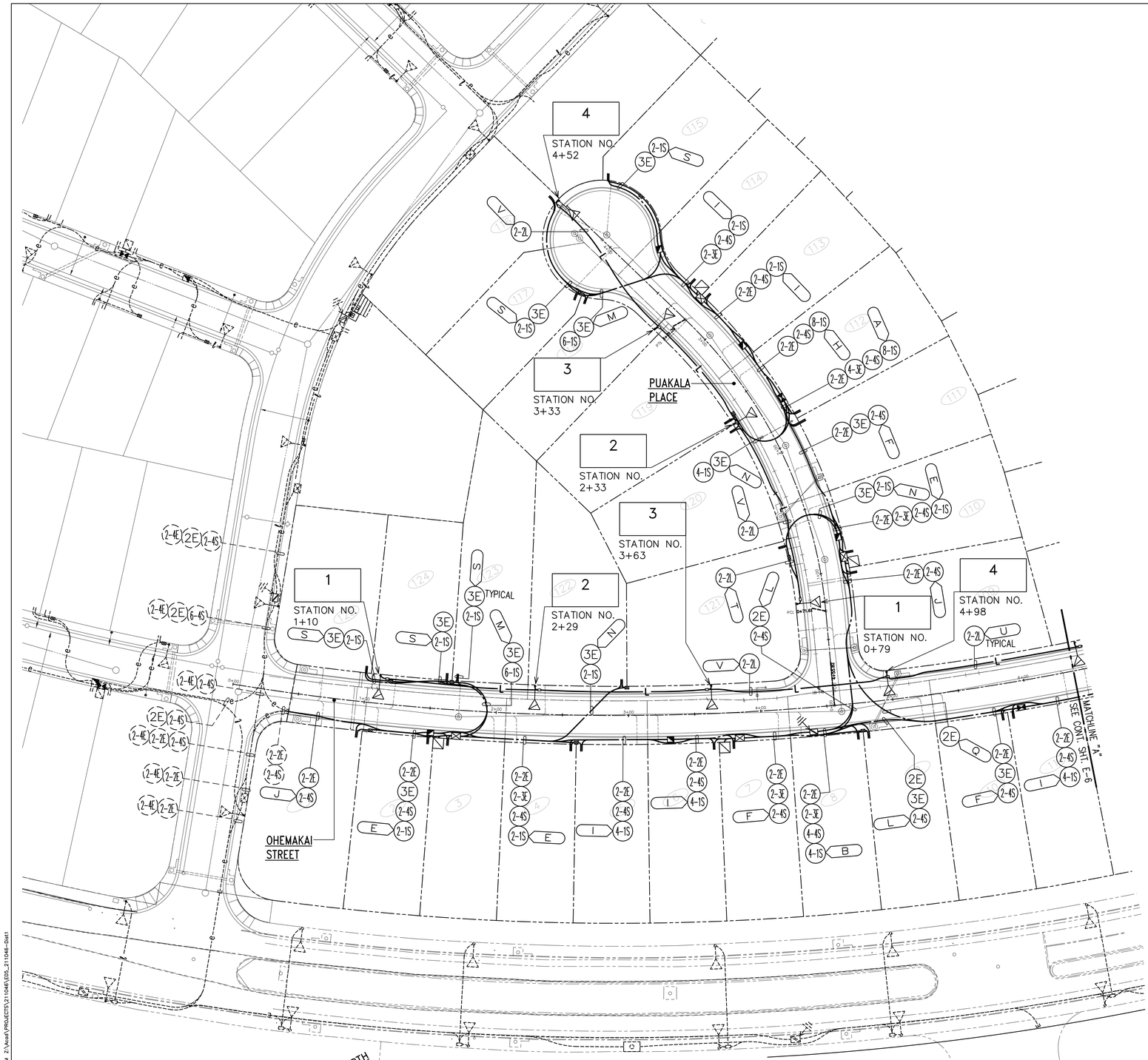

ELECTRICAL DISTRIBUTION I

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DISTRIBUTION PLAN I

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Electrical Engineers
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Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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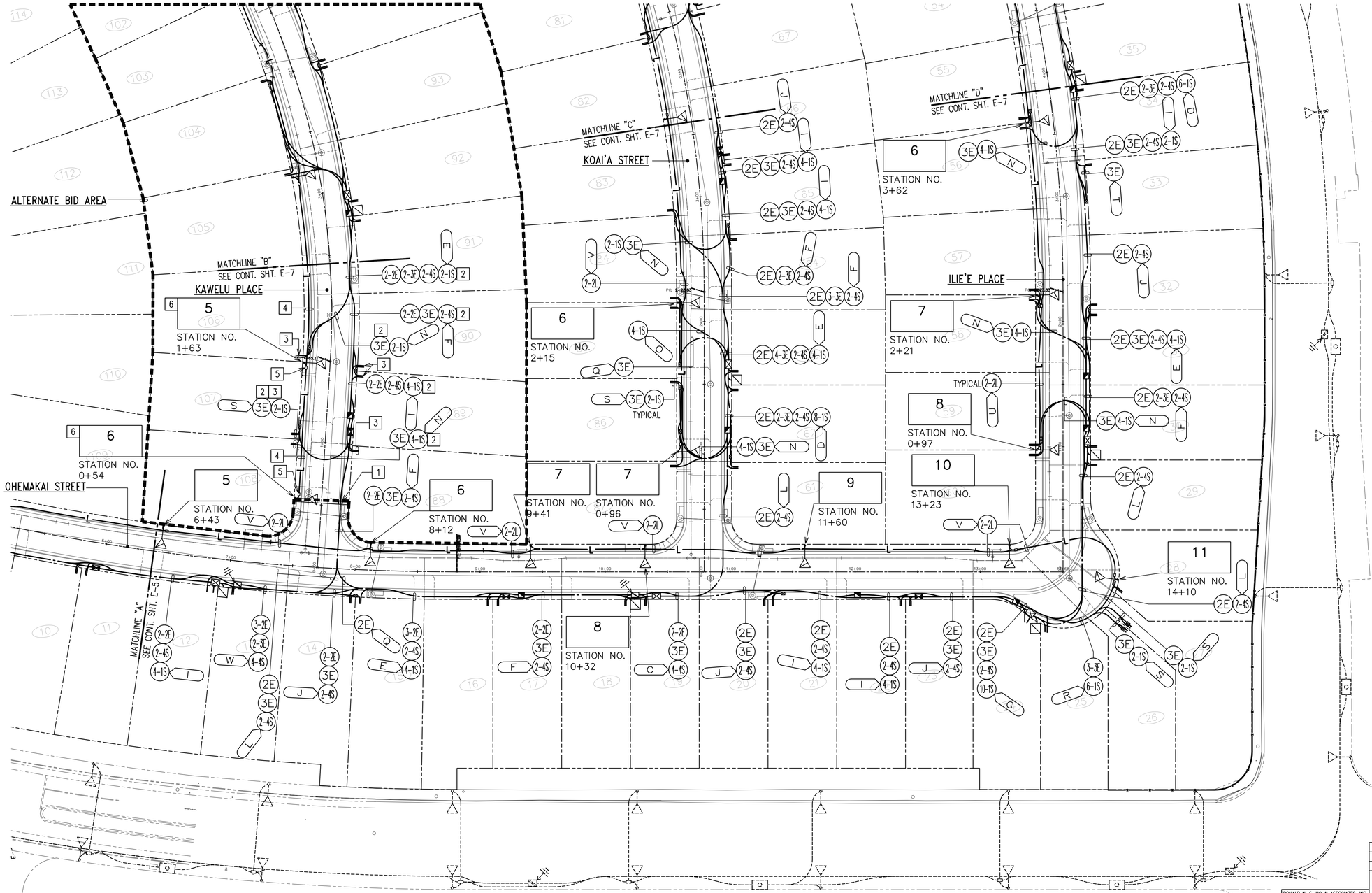

ELECTRICAL DISTRIBUTION II

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

NOTE(S):

1. BASE BID: CONDUITS GOING ONTO KAWELU PLACE TO BE MARKED AND STUBBED
2. HELCO AND SIC BOXES AND CONDUITS AS INDICATED
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
3. 1-3" HELCO CONDUIT, 2-1" SIC CONDUITS FOR PROPERTY STUB
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
4. 2" LIGHTING CONDUIT
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
5. STREET LIGHTING HANDHOLE
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
6. STREET LIGHT STANDARD
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DISTRIBUTION PLAN II

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/22
EXPIRATION DATE OF THE LICENSE

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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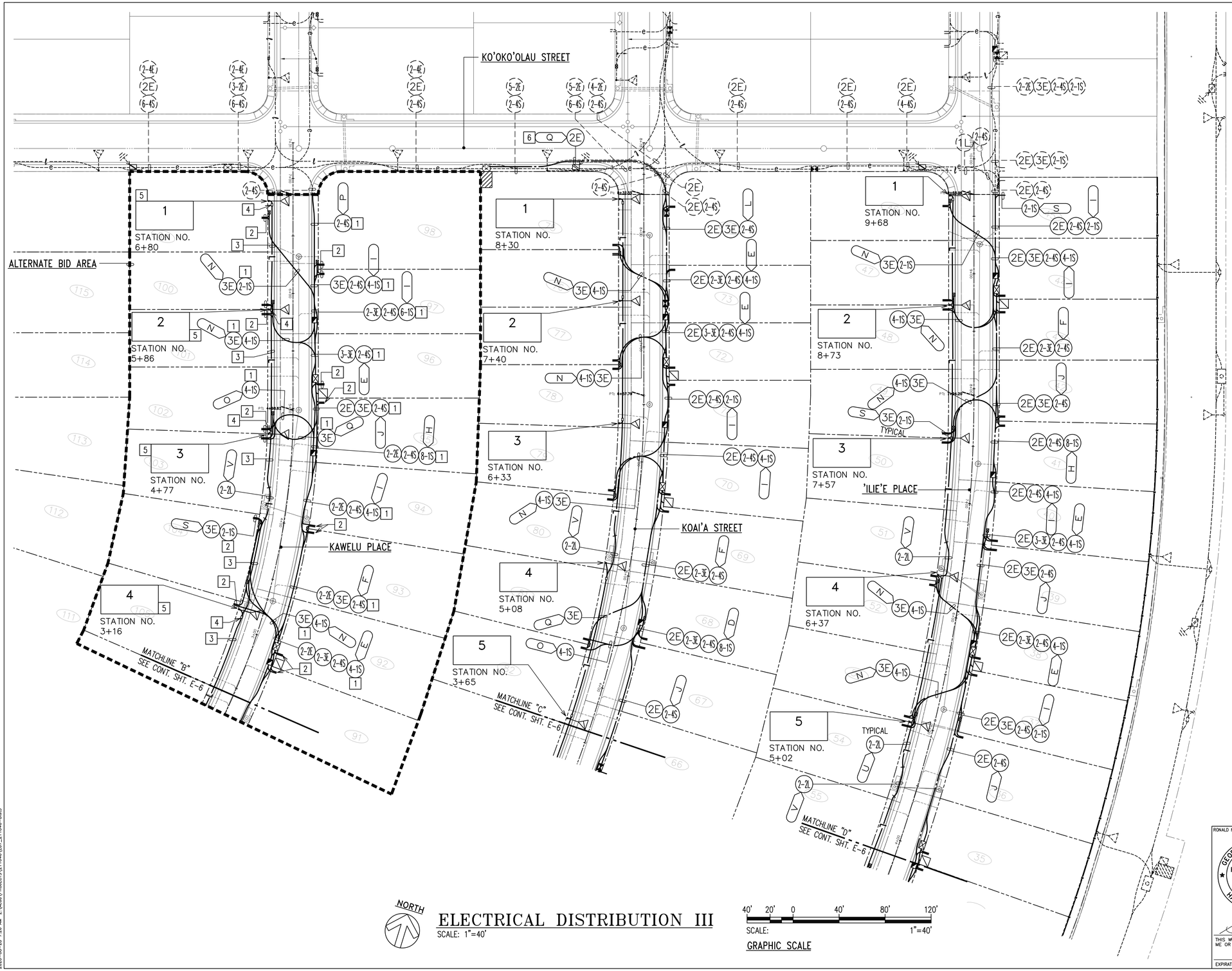

NOTE(S):

1. HELCO AND SIC BOXES AND CONDUITS AS INDICATED
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
2. 1–3" HELCO CONDUIT, 2–1" SIC CONDUITS FOR PROPERTY STUB
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
3. 2" LIGHTING CONDUIT
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
4. STREET LIGHTING HANDHOLE
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
5. STREET LIGHT STANDARD
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH
   ALTERNATE 3: INSTALLATION OF ELECTRICAL INFRASTRUCTURE
6. KO'OKO'OLAU STREET – MODIFYING EXISTING ROADWAY
   BASE BID: BLASTING AND HAMMERING OF UTILITY TRENCH, INSTALLATION OF ELECTRICAL INFRASTRUCTURE
   ALTERNATE 3: REMOVAL OF THIS PORTION OF WORK FROM BID

NORTH

ELECTRICAL DISTRIBUTION III

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

DISTRIBUTION PLAN III

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
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04/30/22
EXPIRATION DATE OF THE LICENSE

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2155 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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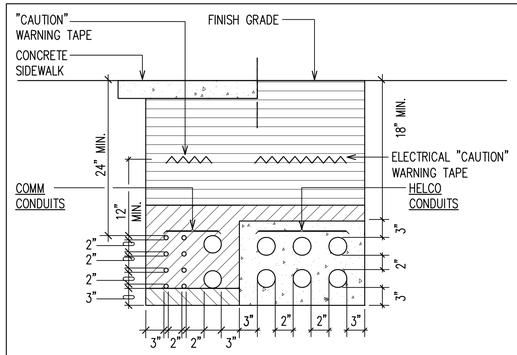

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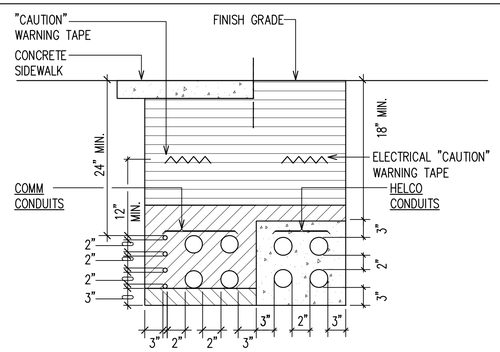

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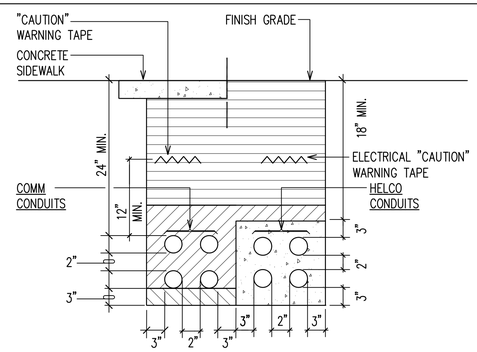

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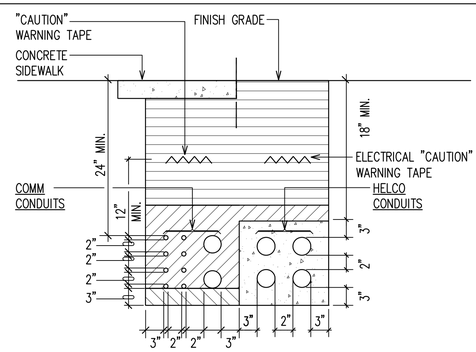

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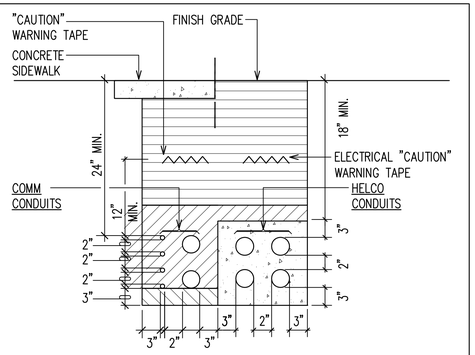

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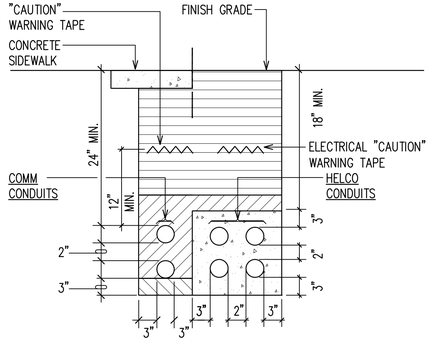

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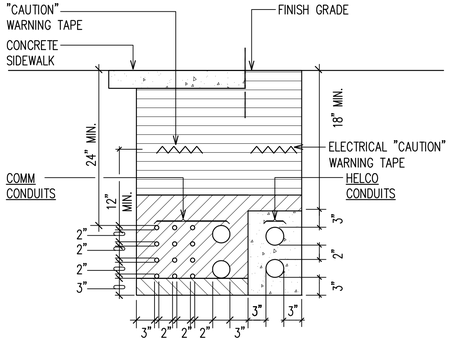

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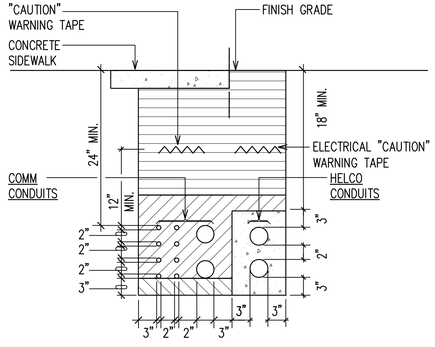

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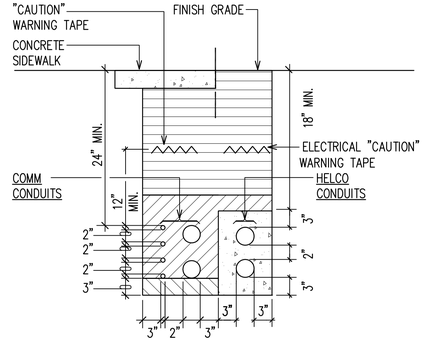

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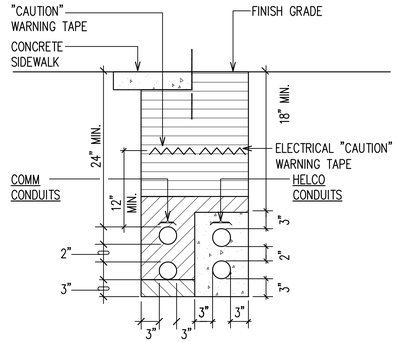

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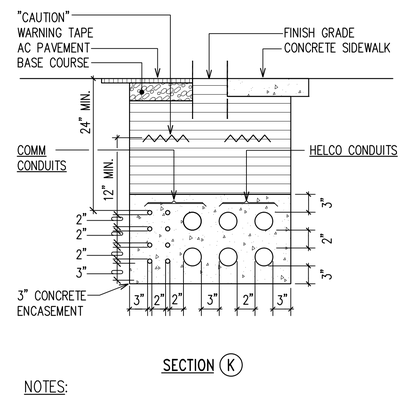

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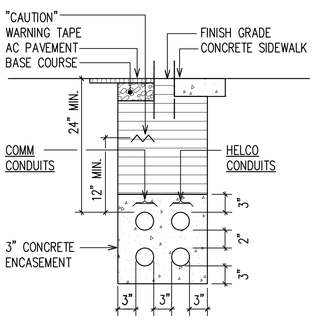

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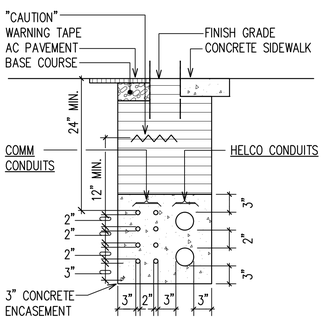

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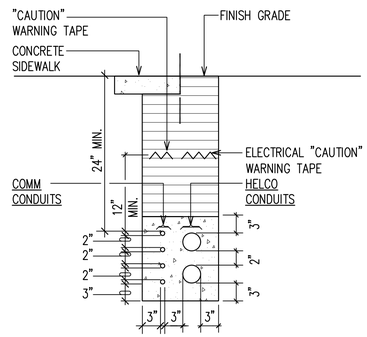

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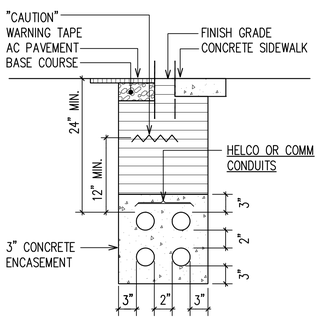

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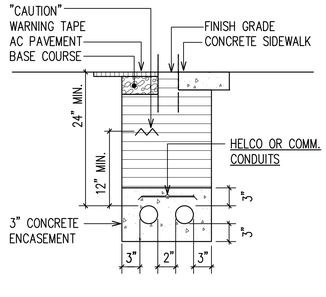

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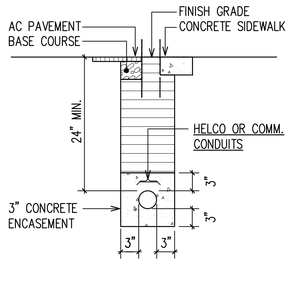

SECTION (Q)

NOTES:

1. ELECTRICAL WARNING TAPE–HEAVY GAUGE 4 MIL, RED WITH BLACK LETTERING, 3" WIDE, "BURIED ELECTRIC LINE BELOW–CAUTION" @ DIRECT BURIED CONDUITS.
2. "CAUTION" WARNING TAPE REQUIRED OVER ENTIRE LENGTH OF ALL CONDUITS.
3. 3" SEPARATION REQUIRED BETWEEN ELECTRICAL AND TELEPHONE CONDUITS WITHIN CONCRETE ENCASEMENT.
4. CONTRACTOR TO MAINTAIN MIN. 8" SEPERATION FROM DUCTLINE TO PROPERTY LINE/EASEMENT.
5. SEE DISTRIBUTION PLANS FOR DUCT QUANTITY.
6. CONTRACTOR TO CONSTRUCT HELCO FACILITIES PER HELCO DRAWING _–_–___. SEE E–1, NOTES FOR CONSTRUCTION, NOTE H.

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. THE MATERIAL SHALL BE NONEXPANSIVE. 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, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS. CONCRETE FOR STREET LIGHT DUCTS TO HAVE 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

TYPICAL DUCT SECTIONS I

NOT TO SCALE

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
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LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7–4–21:12 (PORTION)
KAILUA–KONA, NORTH KONA, HAWAII

TYPICAL DUCT SECTIONS I

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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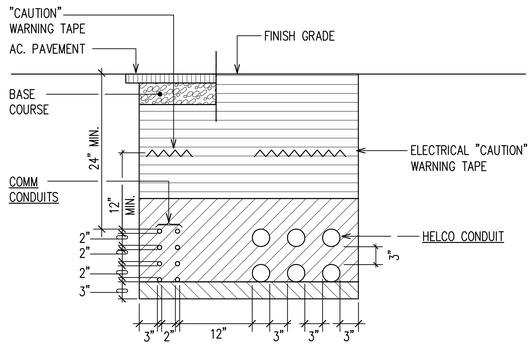

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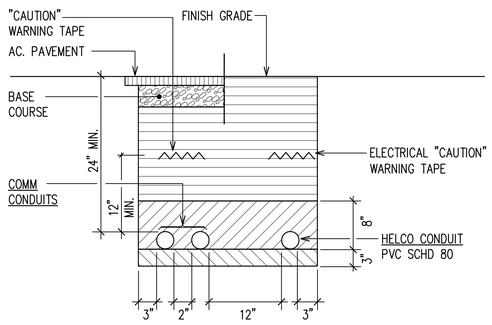

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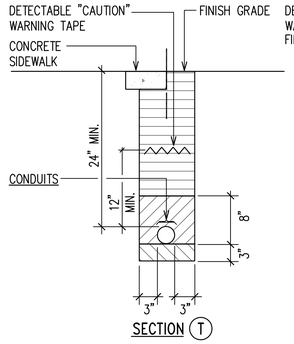

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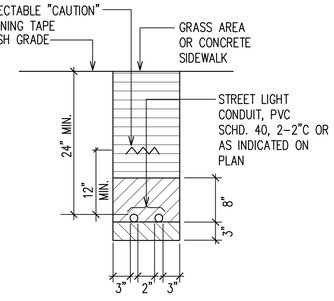

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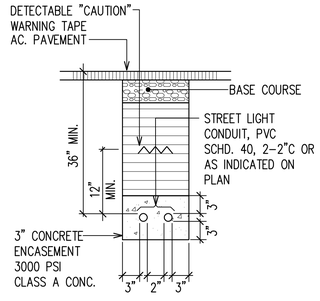

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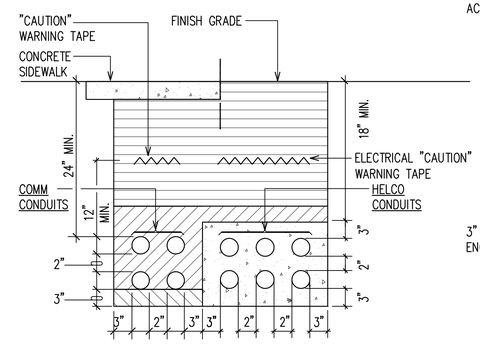

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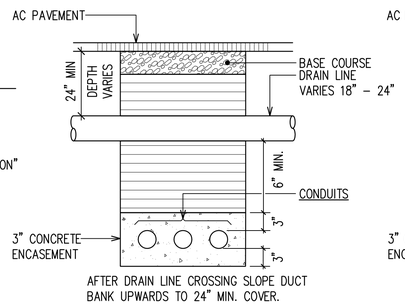
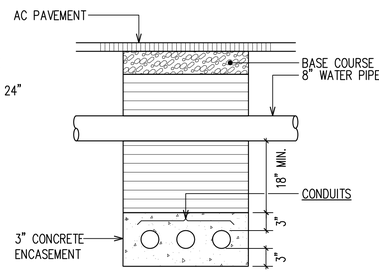


AFTER DRAIN LINE CROSSING SLOPE DUCT BANK UPWARDS TO 24" MIN. COVER.

DRAIN CROSSING VERTICAL CLEARANCE



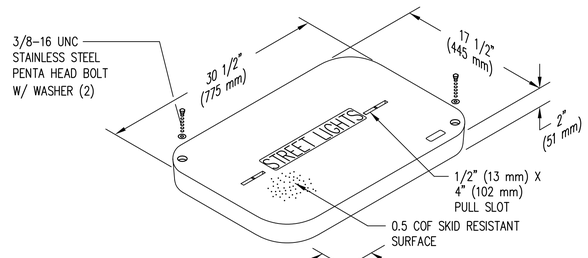
WATER CROSSING VERTICAL CLEARANCE

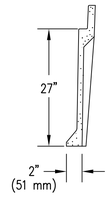
TYPICAL DUCT SECTIONS II

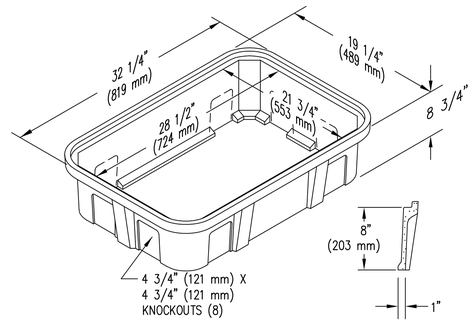
NOT TO SCALE

CONDUIT SCHEDULE

ITEM	DESCRIPTION	ITEM	DESCRIPTION
(2E)	HAWAII ELECTRIC LIGHT CO. 1-2"C	(8-1S)	SANDWICH ISLES COMM UD(4x2-1")
(2-2E)	HAWAII ELECTRIC LIGHT CO. 2-2"C	(6-1S)	SANDWICH ISLES COMM UD(3x2-1")
(4-2E)	HAWAII ELECTRIC LIGHT CO. 4-2"C	(4-1S)	SANDWICH ISLES COMM UD(2x2-1")
(6-2E)	HAWAII ELECTRIC LIGHT CO. 6-2"C	(2-1S)	SANDWICH ISLES COMM UD(1x2-1")
(3E)	HAWAII ELECTRIC LIGHT CO. 1-3"C	(2-4S)	SANDWICH ISLES COMM UD(1x2-4")
(2-3E)	HAWAII ELECTRIC LIGHT CO. 2-3"C	(4-4S)	SANDWICH ISLES COMM UD(2x2-4")
(2-5E)	HAWAII ELECTRIC LIGHT CO. 2-5"C	(6-4S)	SANDWICH ISLES COMM UD(3x2-4")
		(1L)	STREET LIGHT 1-1"C
		(2-2L)	STREET LIGHT 2-2"C







A / E-9 17"X30" QUAZITE TIER 22 - STREET LIGHT PULLBOX

NOT TO SCALE

NOTE(S):

1. ALL CONDUITS SHALL ENTER VERTICALLY AT THE BOTTOM OF THE PULLBOXES.
2. ALL DIMENSIONS AND LINES ARE APPROXIMATE.
3. FIELD ADJUST PULLBOX LOCATIONS AND CONDUIT CLEARANCES AS REQUIED.
4. CONDUIT 90° BEND RADII SHALL BE 18"-24" TO ALLOWABLE TRENCHING DEPTH
5. PULLBOX COVERS SHALL BE LABELED "STREET LIGHTS"
6. INSTALL GROUND RODS IN EACH PULLBOX.
7. ALL PULLBOXES WILL BE QUAZITE TYPE, TIER 22 RATING.
8. APPROVED EQUAL PULLBOX MAY BE SUBMITTED FOR APPROVAL.

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

TYPICAL DUCT SECTIONS (CONT.)

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

RONALD N. S. HO & ASSOCIATES, INC.
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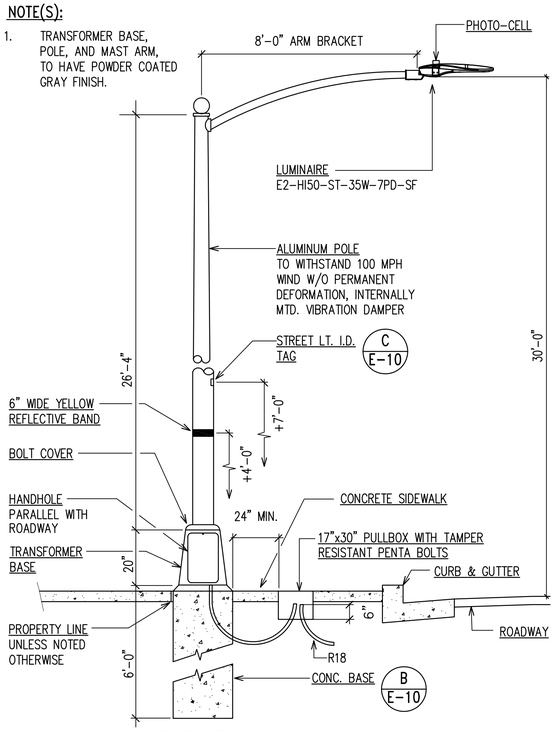
FILE	POCKET	FOLDER	NO.

2020-03-11 1:47 PM Z:\Acad\PROJECTS\211046\E09_211046_Duct2

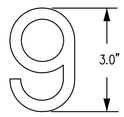
NOTE(S):

1. TRANSFORMER BASE, POLE, AND MAST ARM, TO HAVE POWDER COATED GRAY FINISH.



ELEVATION

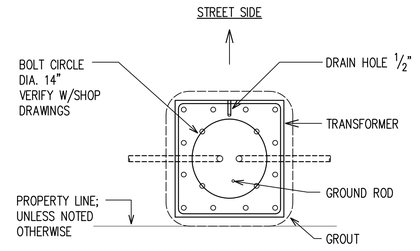
A E-10 STREET LIGHT STANDARD
NOT TO SCALE



NOTES:

1. FONT: STANDARD HIGHWAY.
2. POLE NUMBER HEIGHT SHALL BE 3" HIGH (WIDTH IS NUMERAL DEPENDENT).
3. MACHINE CUT ON BLACK ADHESIVE SCOTCHLITE SHEETING OR EQUAL.
4. AFFIX NUMBER TO CLEAN SURFACE OF POLE 6'-0" ABOVE FINISH GRADE. NUMBER TO FACE STREET.

C E-10 STREET LIGHT I.D. TAG DETAIL
NOT TO SCALE



D E-10 CONCRETE BASE PLAN
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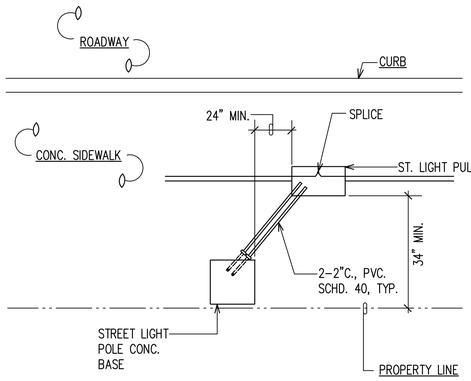
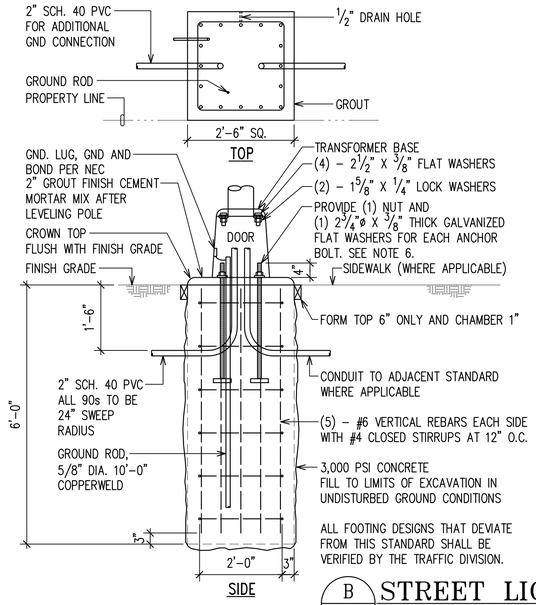


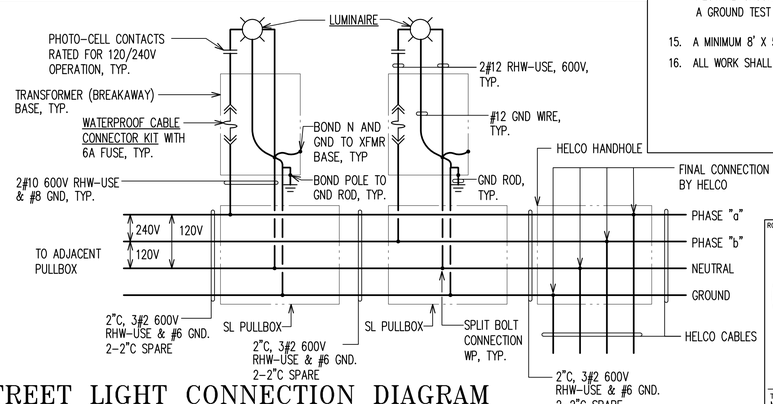
F E-10 STREET LIGHT SECONDARY CONNECTION
NOT TO SCALE



B E-10 STREET LIGHT BASE DETAIL
NOT TO SCALE

NOTES:

1. IF FOUNDATIONS ARE PRECAST, MANUFACTURER AND MATERIALS SUPPLIERS SHALL BE IN COMPLIANCE WITH THE MOST CURRENT EDITION OF THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION AND WHERE APPLICABLE THE NATIONAL PRECAST CONCRETE ASSOCIATION.
2. A MINIMUM 4,500 PSI 28-DAY COMPRESSION STRENGTH CONCRETE SHALL BE USED.
3. EACH FOUNDATION SHALL NOT BE HANDLED OR TRANSPORTED UNTIL AT LEAST 80% OF THE 28-DAY CONCRETE COMPRESSION STRENGTH HAS BEEN REACHED.
4. EACH FOUNDATION SHALL NOT BE INSTALLED UNTIL THE 28-DAY CONCRETE COMPRESSION STRENGTH HAS BEEN ACHIEVED.
5. CLSM OR EQUIVALENT SHALL BE USED TO BACKFILL AROUND EACH FOUNDATION.
6. UTILIZE SHIMS TO LEVEL TRANSFORMER BASE.



E E-10 STREET LIGHT CONNECTION DIAGRAM
NOT TO SCALE

STREET LIGHT NOTES:

1. NO CHANGES WILL BE ALLOWED OR ACCEPTED AFTER THE APPROVAL OF THE FINAL STREET LIGHT DESIGN WITHOUT VALID JUSTIFICATION FROM THE ENGINEERING DESIGN FIRM AND WITH APPROVAL OF THE COUNTY OF HAWAII, DPW, TRAFFIC DIVISION.
2. ALL STREET LIGHT IDENTIFICATION TAG NUMBERING FOR METAL POLES SHALL START WITH "1" AND CONTINUE NUMERICALLY FOR EACH STREET IN THE SUBDIVISION. ALL NEW TAGS NUMERAL HEIGHT SHALL BE A MINIMUM OF 3". ALL STREET LIGHT I.D. TAG NUMBERING FOR WOODEN POLES SHALL BE IN ACCORDANCE WITH HELCO'S NUMBERING SYSTEM.
3. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SECONDARY CIRCUIT EXTENSIONS TO THE NEAREST HELCO SECONDARY. IF THE STREET LIGHTS ARE INSTALLED BEFORE HELCO INSTALLS THEIR SECONDARY, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND INFORMING HELCO OF STREET LIGHT LOCATIONS AND POLE CONTACTS.
4. THE DEVELOPER/CONTRACTOR SHALL INFORM AND COORDINATE WITH THE COUNTY TRAFFIC DIVISION, STREET LIGHT INSPECTOR FOR INSPECTIONS OF STREET LIGHT SYSTEM INSTALLATIONS NO LATER THAN 5 WORKING DAYS PRIOR TO AN ON-SITE VISIT.
5. FOR FINAL INSPECTION APPROVAL: ANY SUBDIVISION WITH TWO (2) OR MORE STREET LIGHTS, THE DEVELOPER SHALL SET UP ACCOUNT WITH HELCO; PROVIDING STREET NAME(S), POLE NUMBER(S), GPS COORDINATES, WATTAGE, AND BILLING ADDRESS TO ENERGIZE LIGHTS IN THE SUBDIVISION. A COPY OF THE STREET LIGHT INFORMATION SHALL ALSO BE PROVIDED TO THE COUNTY FOR INSPECTION PURPOSES. THE DEVELOPER WILL ALSO BE RESPONSIBLE FOR ENERGY COST UNTIL STREET(S) ARE DEDICATED TO COUNTY; WHERE UPON BILLING WILL BE TRANSFERED TO THE COUNTY.
6. THE CONTRACTOR SHALL INSCRIBE THE MONTH AND YEAR OF INSTALLATION ON PHOTOELECTRIC (PE) CELLS AND LAMPS. ALL PE'S SHALL HAVE THE NORTH INDEX FACING NORTH.
7. ALL MATERIALS AND LABOR SHALL BE WARRANTED FOR A MINIMUM OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
8. ACCEPTABLE STREET LIGHT MATERIALS:
   A. LED LUMINARIES:
      E2 LIGHTING:
      E2-HI50-ST-35W-7PD-SF, 35W
      (OR LATEST MODELS\APPROVED EQUAL)
   B. PHOTOELECTRIC CELLS: COMPLETELY SOLID STATE, FAIL "ON"
      FISHER PIERCE: FP-7790B SPS
   C. ALUMINUM POLES: INTERNAL MOUNTED VIBRATION DAMPER, MIN. 0.188 WALL THICKNESS. MUST BE F.H.W.A. APPROVED AND SHALL COMPLY WITH THE CURRENT AASHTO STREET LIGHTING STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC STANDARDS. 12" POLE MOUNT-BASE BOLT PATTERN; ARM LENGTH SHALL BE PER PLAN.
      HAPCO SINGLE MAST ARM POLE PART#RTA30D8BFM1 (*SEE NOTE)-GC
      *NOTE: MAST ARM LENGTH PART#CODE; 8=8', A=10'
      HAPCO SINGLE TRUSS ARM POLE PART#RTA30C8BFT1 (*SEE NOTE)-GC
      *NOTE: MAST ARM LENGTH CATALOG#CODES; C=12', E=15'
      FOR TRUSS ARM TYPE, REFERENCE HAPCO STYLE 85 TAPERED TRUSS-STYLE WITH ALUMINUM BRACKET MOUNTING; CATALOG#CODES: CPB85-007 = 12' TRUSS ARM; CPB85-011 = 15' TRUSS ARM
   D. TRANSFORMER BASES: ALUMINUM WITH 14" BASE BOLT CIRCLE. MUST BE F.H.W.A APPROVED AND IN COMPLIANCE WITH THE 2001 AMENDED AND ADOPTED AASHTO BREAK AWAY SPECIFICATIONS.
      HAPCO - 70501 (TB1-17)
      VALMONT - M093 (TB1-17)
   E. WOODEN POLES:
      SOUTHERN YELLOW PINE OR DOUGLAS FIR, CLASS III, PENTA TREATED AS PER AWPA USE CATEGORY SYSTEM UC4B, COMMODITY SPECIFICATION D, 35' LENGTH
   F. WIRE: RHW-STRANDED-SIZE SHALL BE PER PLAN. WHITE TAPE DENOTING NEUTRAL SHALL BE A MINIMUM OF 12".
9. SUBMIT A SCALED DRAWING OF STREET LIGHT LOCATIONS (PREFERABLY ON ONE SHEET) AND DETAILS OF FIXTURE MOUNTING, LUMINARIES TYPE, ARM LENGTH, IDENTIFICATION TAGS. FOR UNDERGROUND CIRCUITS, FOUNDATIONS, BASES AND POLES, DRAWINGS SHALL ALSO BE SUBMITTED TO THE TRAFFIC DIVISION AFTER PLAN APPROVAL AND BEFORE CONSTRUCTION BEGINS.
10. SHOP DRAWINGS SHALL BE SUBMITTED FOR ANY DEVIATIONS FROM THE ORIGINAL PLAN FOR APPROVAL BY THE TRAFFIC DIVISION.
11. UPON APPROVAL BY THE COUNTY OF HAWAII, TRAFFIC DIVISION, ANY STREET LIGHT(S) REQUIRED ON EXISTING POLE(S) MAY BE INSTALLED BY THE TRAFFIC DIVISION AT A COST OF $2500.00 PER LIGHT. THE DEVELOPER SHALL THEN SUBMIT A CHECK, PAYABLE TO THE COUNTY DIRECTOR OF FINANCE ALONG WITH THE SUBDIVISION NUMBER, DPW FOLDER NUMBER, TAX KEY AND POLE NUMBER(S).
12. WHEN STREET LIGHT(S) ARE INSTALLED ON ROADWAYS THAT ARE UNDER STATE JURISDICTION, THE DEVELOPER SHALL SUBMIT PLANS TO THE STATE DOT FOR APPROVAL. THE COUNTRY OF HAWAII, TRAFFIC DIVISION WILL THEN INSTALL ON EXISTING POLE(S) WITH COST DEPENDENT ON HEIGHT OF POLE.
13. ALL OVERHEAD WIRING STREET LIGHT FIXTURES SHALL BE BONDED TO THE NEUTRAL WIRE IN THE FIXTURE. ALL BONDED STREET LIGHT FIXTURES SHALL HAVE A 2"X2" REFLECTIVE GREEN STICKER PLACED AT THE BASE OF WIRE OPENING ON THE ALUMINUM ARM, SIGNIFYING THAT THE STREET LIGHTS ARE BONDED.
14. ALL UNDERGROUND STREET LIGHT WIRING SHALL HAVE A #6 AWG (MINIMUM) GROUND WIRE ROUTED IN SERIES FROM THE NEUTRAL-GROUND SOURCE POINT TO EACH STREET LIGHT GROUND ROD FOR A STREET LIGHT FIXTURE GROUND POINT. A GROUND TEST MEASUREMENT SHOULD INDICATE A MAXIMUM OF 25 OHMS TO GROUND.
15. A MINIMUM 8' X 5/8" COPPER GROUND ROD SHALL BE USED FOR EACH STREET LIGHT FOUNDATION.
16. ALL WORK SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

STREET LIGHT DETAIL

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers
GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
04/30/22
EXPIRATION DATE OF THE LICENSE

Approved:
COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

E-10 SHEET 66 OF 68 SHEETS

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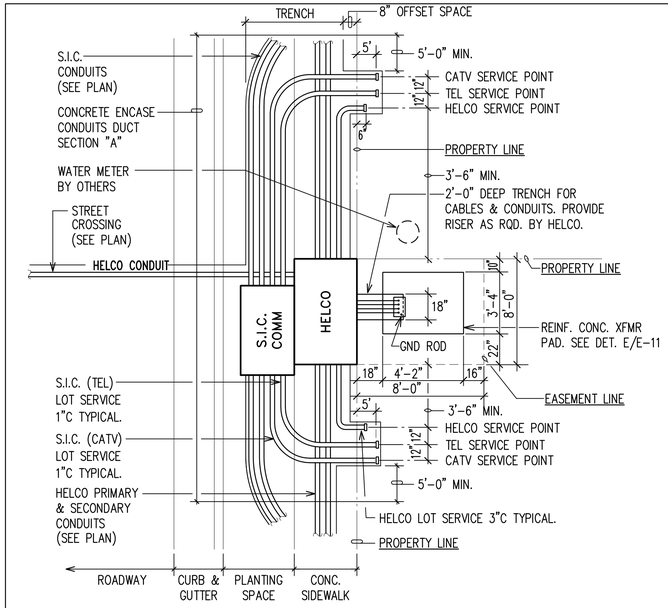
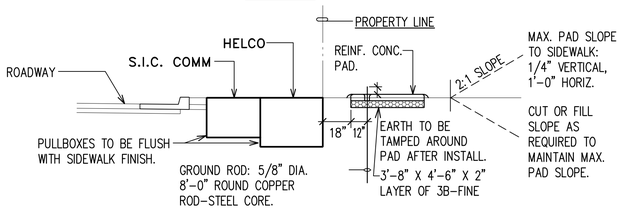


PLAN VIEW

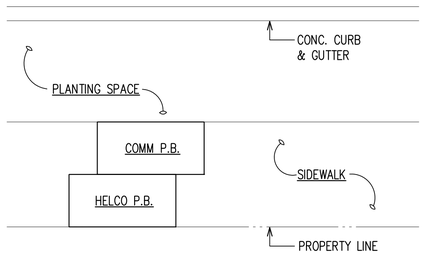


ELEVATION

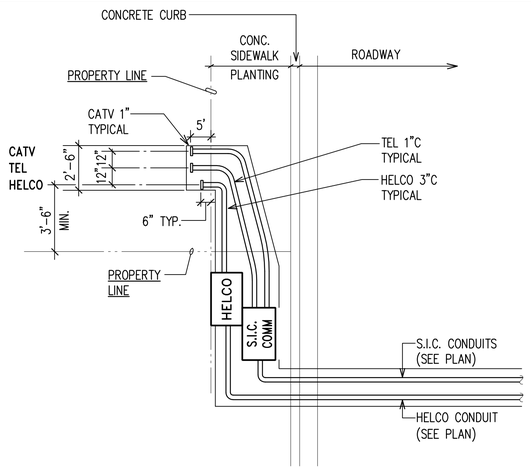
NOTES:

1. REINFORCED CONCRETE TRANSFORMER PAD TO BE CONSTRUCTED AS SHOWN ON THIS SHEET & HELCO STANDARD DRAWING NO. 011249 & NO. 30-5001.
2. GRADE AND COMPACT LOT AS REQUIRED BY HELCO.
3. HIGHEST FRONT CORNER OF TRANSFORMER PAD LOT SHALL MATCH FINAL SIDEWALK GRADE.
4. CONCRETE ENCASE ALL HELCO PRIMARY DUCTS AND COMM 4" DUCTS THAT ARE NOT INSTALLED UNDER CONCRETE SIDEWALK.

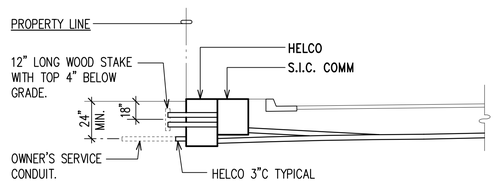
A E-11 TYPICAL TRANSFORMER PAD LOT
NOT TO SCALE



B E-11 TYPICAL HANDHOLE GROUP ARRANGEMENT
NOT TO SCALE



PLAN VIEW

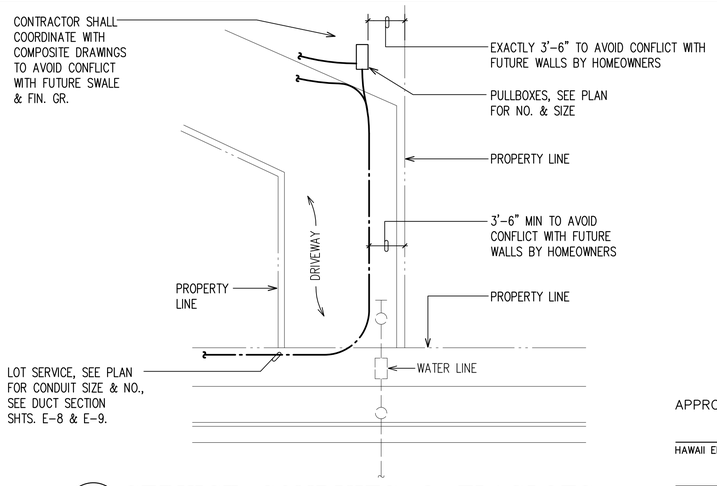


ELEVATION

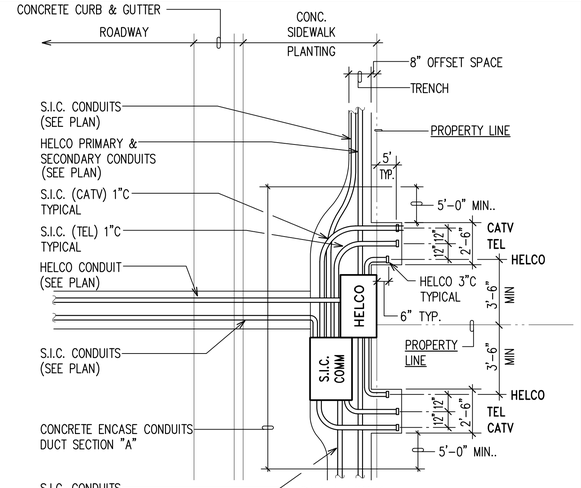
NOTES:

CONCRETE ENCASE ALL HELCO PRIMARY DUCTS THAT ARE NOT INSTALLED UNDER CONCRETE SIDEWALK. CONCRETE ENCASE ALL COMM. DUCTS UNDER ROADWAYS.

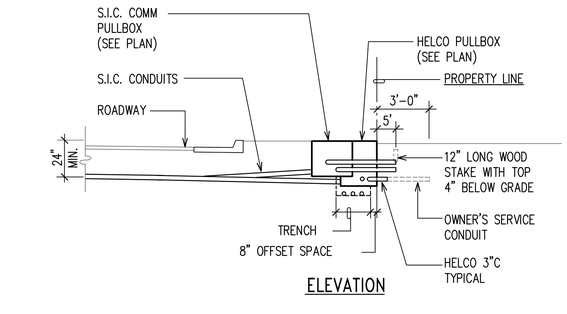
C E-11 TYPICAL LOT SERVICE
NOT TO SCALE



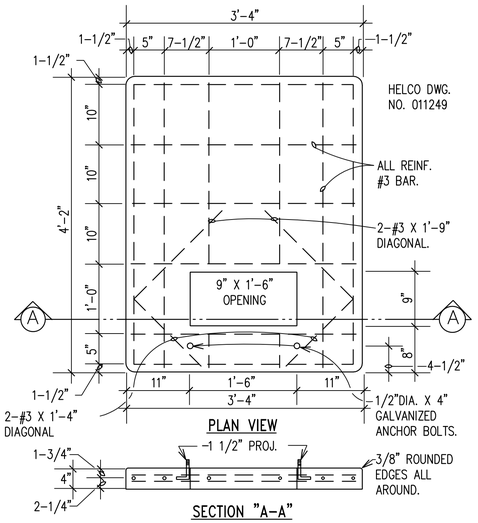
D E-11 SERVICE CONDUITS @ FLAGLOTS
NOT TO SCALE



PLAN VIEW



ELEVATION



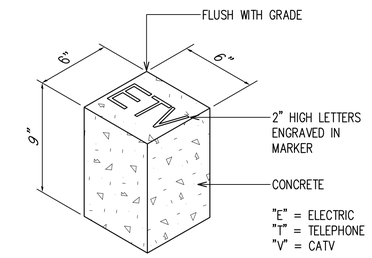
PLAN VIEW

SECTION "A-A"

NOTES:

1. COMPRESSIVE STRENGTH OF CONCRETE : 3000 PSI IN 28 DAYS.
2. REINFORCING ROUND DEFORMED BAR SHALL BE CLEAN & NEW.
3. CURE CONCRETE BY APPROVED METHOD.
4. TOP OF CONC. PAD TO BE SMOOTH, TRUE & LEVEL, FREE FROM DEFECTS.
5. CONTRACTOR HAS OPTION OF FURNISHING CAST-IN-PLACE OR PRECAST.

E E-11 CONCRETE TRANSFORMER PAD DETAIL
NOT TO SCALE



F E-11 CONCRETE CONDUIT STUB-OUT MARKER
NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

LOT SERVICE DETAIL, TRANSFORMER DETAIL

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY DATE

SANDWICH ISLES COMMUNICATIONS, INC DATE

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

GEORGE D. TAKASE
LICENSED PROFESSIONAL ENGINEER
No. 13741-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/22
EXPIRATION DATE OF THE LICENSE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

FILE	POCKET	FOLDER	NO.

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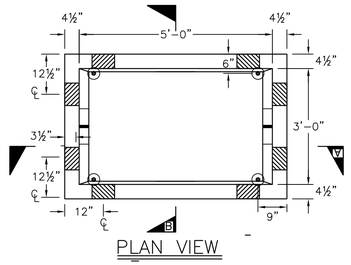
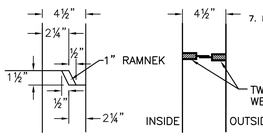


PLAN VIEW

	WEIGHT (lbs.)	CONCRETE (C.Y.)
BASE	3,900	0.87
ROOF	1,800	0.38
RISER	600	0.15

REINFORCING = 163 lbs. (#4)
65 lbs. (#5)
60 lbs. (#6)
1" RAMNEK = 13 ea.

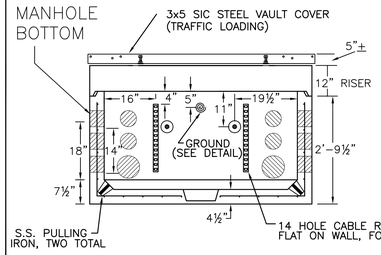
NOTES:
1. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 5,000 P.S.I. AT 28 DAYS.
2. ALL REINFORCING STEEL SHALL BE NEW STOCK DEFORMED BARS CONFORMING TO ASTM A706W GRADE 60 UNLESS OTHERWISE NOTED. PLACEMENT OF REBARS SHALL BE IN ACCORDANCE WITH ACI-315 & ACI-318. ALL BARS SHALL BE CLEAN OF RUST, GREASE OR OTHER MATERIALS LIKELY TO IMPAIR BOND. ALL BENDS SHALL BE MADE COLD.
3. ALL REINFORCING BARS SHALL BE ACCURATELY & SECURELY PLACED. ALL REINFORCING SHALL BE LAPPED 40 BAR DIAMETERS OR EIGHTEEN (18) INCHES, WHICHEVER IS GREATER AT SPLICES. ALL SPLICES SHALL BE MADE AWAY FROM POINT OF MAXIMUM STRESS.
4. CONCRETE COVER TO REINFORCING STEEL SHALL BE 1-1/2" MINIMUM.
5. ALLOW CONCRETE TO CURE A MINIMUM OF 7 DAYS PRIOR TO SHIPPING.
6. STRUCTURAL DESIGN CRITERIA:
   A. AASHTO HS20-44 LOADING
   B. ACTIVE EARTH PRESSURE ABOVE THE WATER TABLE = 40 PCF
   C. SOIL UNIT WEIGHT = 110 PCF
7. MANHOLE SHALL NOT BE PLACED BELOW THE WATER TABLE.



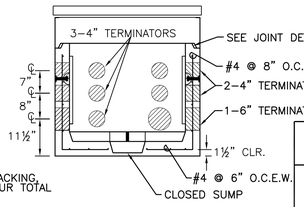
JOINT DETAIL
NTS

GROUND
NTS

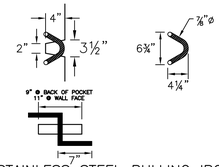
3X5 SIC MANHOLE BOTTOM



SECTION A



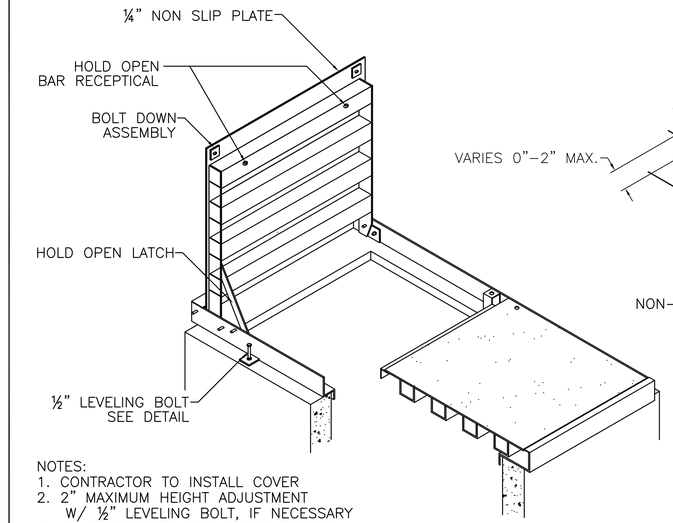
SECTION B

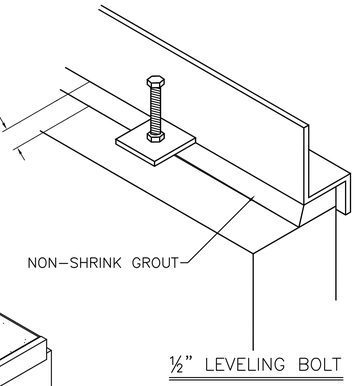


STAINLESS STEEL PULLING IRON
SCALE:¾"=1'-0"

HAWAII PRECAST, INC. P.O. BOX 160 KAILUA-KONA, HI 96745 Ph: (808) 326-7730 Fax: (808) 329-9026		
SANDWICH ISLES COMMUNICATIONS, INC. 3'0" X 5'0" HANDHOLE		
SCALE: ½"=1'-0"	DRAWN BY:	CHECKED BY:
DATE: 11/10/00REV.	SHEET: 1 OF 1	

UH 3x5



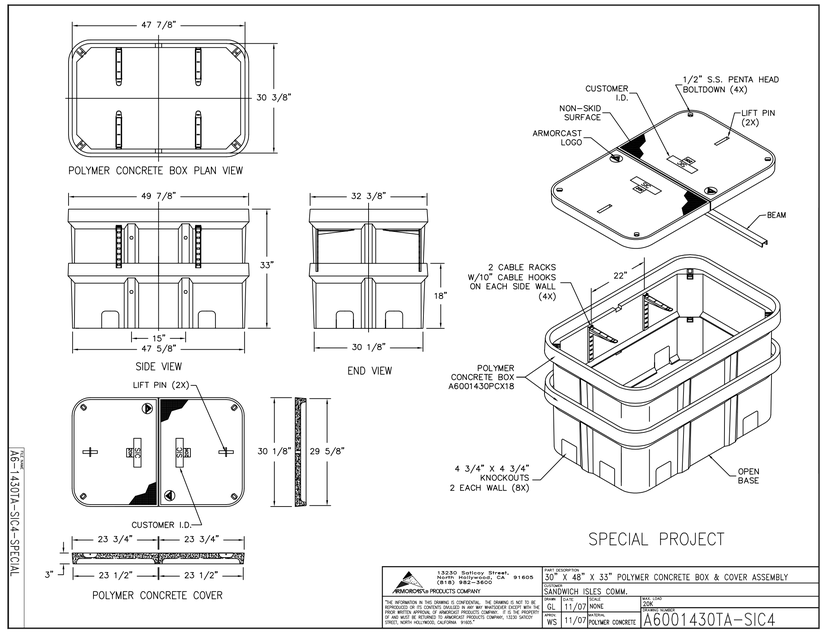


½" LEVELING BOLT

NOTES:
1. CONTRACTOR TO INSTALL COVER
2. 2" MAXIMUM HEIGHT ADJUSTMENT W/ ½" LEVELING BOLT, IF NECESSARY
3. CONTRACTOR TO FILL SPACE BETWEEN COVER & TOP OF WALL W/ NON-SHRINK GROUT AFTER ADJUSTMENT.

HAWAII PRECAST, INC. P.O. BOX 160 KAILUA-KONA, HI 96745 Ph: (808) 326-7730 Fax: (808) 329-9026		
3x5 HANDHOLE COVER		
SCALE: NONE	DRAWN BY:	CHECKED BY:
DATE: 08/15/08	SHEET: 2 OF 3	

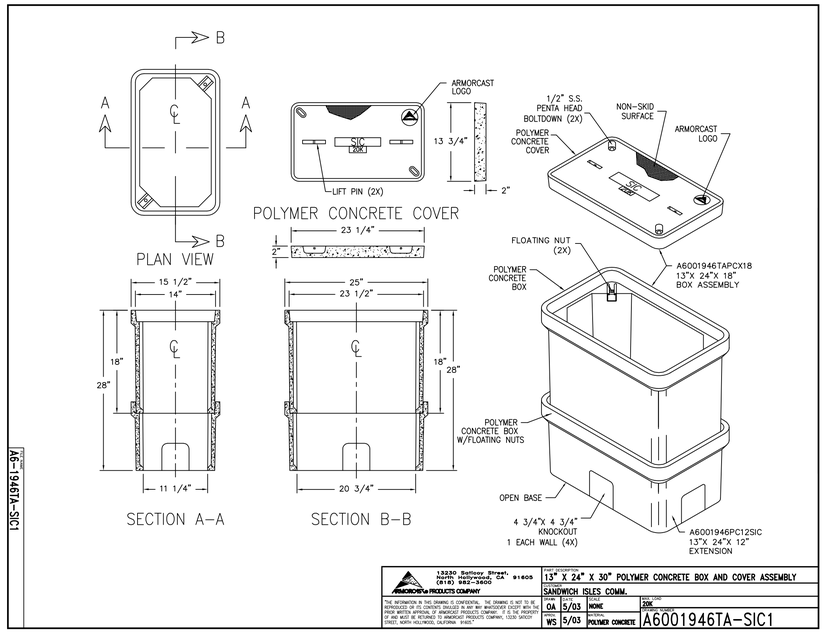
UH 3x5 COVER



ARMORCAST® PRODUCTS COMPANY 13230 Gathway Street, Hesperia, CA 91605 (818) 982-3400	PART DESCRIPTION 30" X 48" X 33" POLYMER CONCRETE BOX & COVER ASSEMBLY		
	CUSTOMER SANDWICH ISLES COMM.		
	DRAWN BY: GL 11/07	SCALE: NONE	LOAD: 20K
	CHECKED BY: WS 11/07	MATERIAL: POLYMER CONCRETE	DRAWING NUMBER: A6001430TA-SIC4
THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL. THE DRAWING IS NOT TO BE REPRODUCED, COPIED OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE PRIOR WRITTEN APPROVAL OF ARMORCAST PRODUCTS COMPANY. IT IS THE PROPERTY OF AND MUST BE RETURNED TO ARMORCAST PRODUCTS COMPANY, 13230 GATEWAY STREET, NORTH HOLLYWOOD, CALIFORNIA 91605.			

A6-14301A-SIC4-SPECIAL

UHC 30x48x33



ARMORCAST® PRODUCTS COMPANY 13230 Gathway Street, Hesperia, CA 91605 (818) 982-3400	PART DESCRIPTION 13" X 24" X 30" POLYMER CONCRETE BOX AND COVER ASSEMBLY		
	CUSTOMER SANDWICH ISLES COMM.		
	DRAWN BY: OA 5/03	SCALE: NONE	LOAD: 20K
	CHECKED BY: WS 5/03	MATERIAL: POLYMER CONCRETE	DRAWING NUMBER: A6001946TA-SIC1
THE INFORMATION IN THIS DRAWING IS CONFIDENTIAL. THE DRAWING IS NOT TO BE REPRODUCED, COPIED OR USED IN WHOLE OR IN PART FOR ANY PURPOSE WITHOUT THE PRIOR WRITTEN APPROVAL OF ARMORCAST PRODUCTS COMPANY. IT IS THE PROPERTY OF AND MUST BE RETURNED TO ARMORCAST PRODUCTS COMPANY, 13230 GATEWAY STREET, NORTH HOLLYWOOD, CALIFORNIA 91605.			

A6-19461A-SIC1

UHC 13x24x30

FOR REFERENCE ONLY

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
LA'I'OPUA VILLAGE 4 SUBDIVISION
PHASE 2 - HEMA
TAX MAP KEY: (3) 7-4-21:12 (PORTION)
KAILUA-KONA, NORTH KONA, HAWAII

SIC REFERENCE DRAWINGS I

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/22
EXPIRATION DATE OF THE LICENSE

Ronald N.S. Ho & Associates, Inc.
Electrical Engineers
2153 North King Street, Suite 201
Honolulu, Hawaii 96819

E-12 SHEET 68 OF 68 SHEETS

FILE	POCKET	FOLDER	NO.

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