

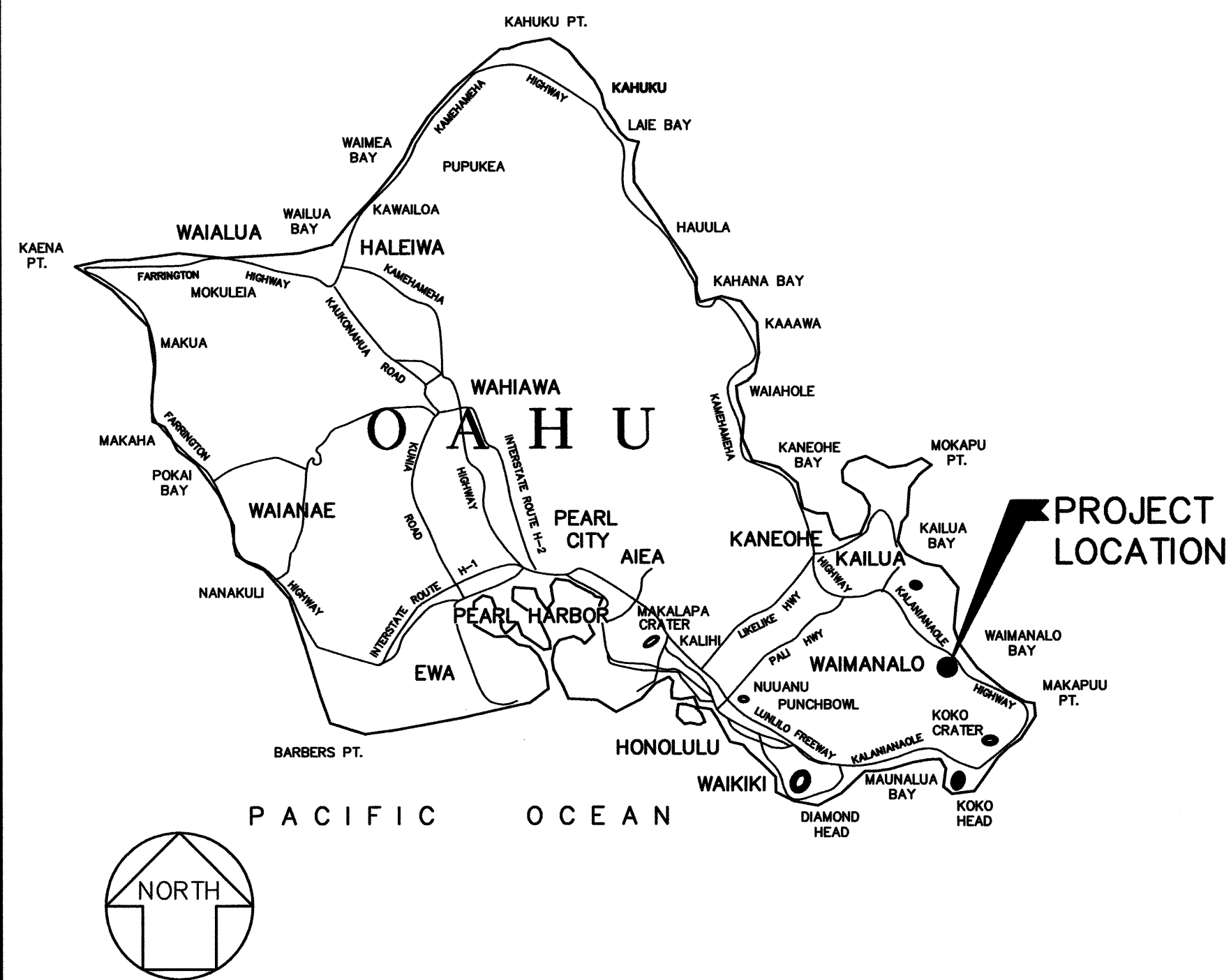
STATE OF HAWAII
DEPARTMENT OF HAWAIIAN HOME LANDS

KAKAINA SUBDIVISION

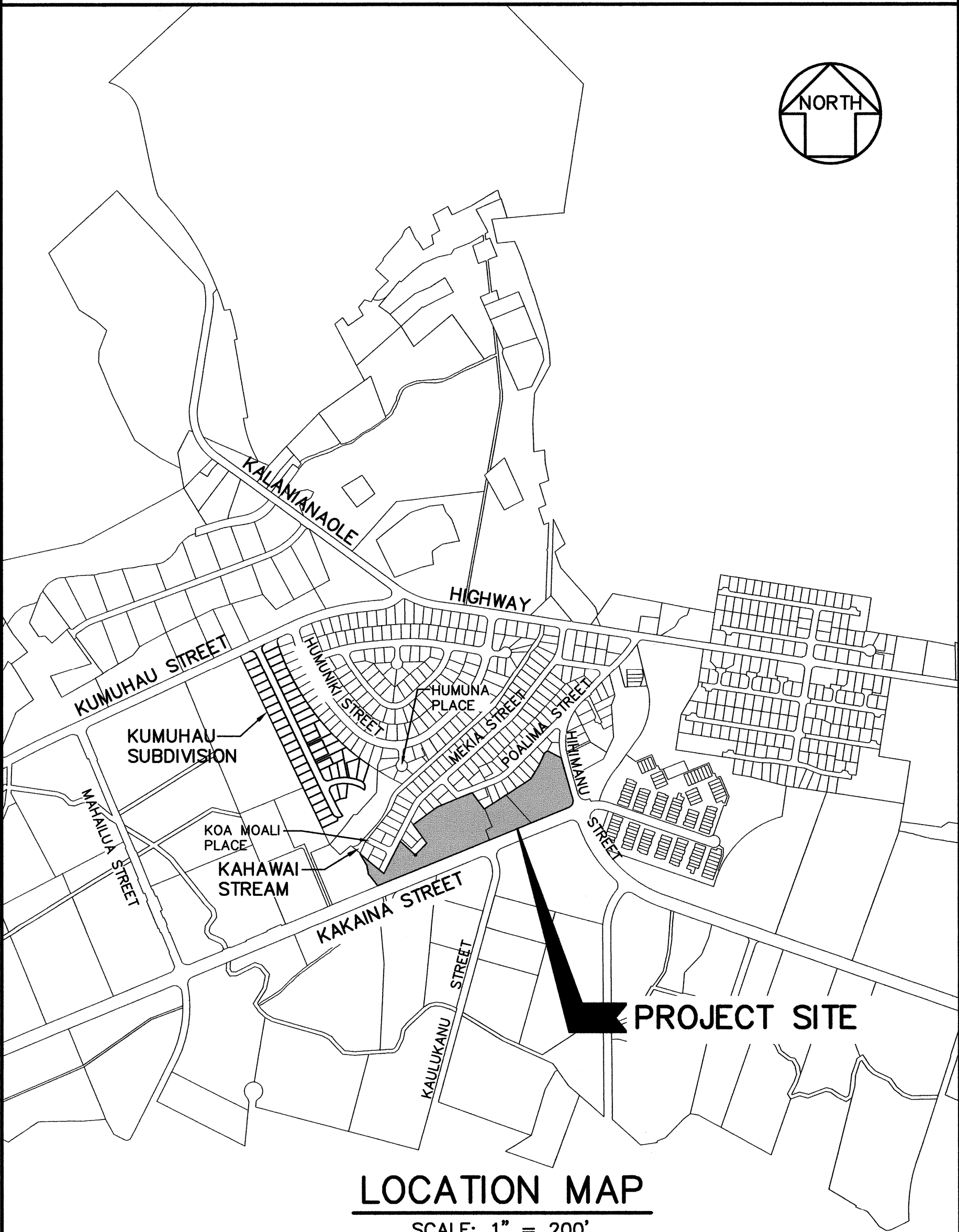
DEVELOPED UNDER THE HAWAIIAN HOMES COMMISSION ACT
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
(SUB'D. FILE NO. 2011/SUB-23)

PREPARED BY
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS
HONOLULU, HAWAII



GRAPHIC SCALE IN MILES
1 0 1 2 3 6 9
ISLAND MAP



LOCATION MAP
SCALE: 1" = 200'

APPROVED:

CHAIRMAN, DEPARTMENT OF HAWAIIAN HOME LANDS
STATE OF HAWAII

DATE

DIRECTOR, DEPARTMENT OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

DATE

MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY
(FOR WORK AFFECTING BWS FACILITIES IN CITY/STATE R/W AND BWS
EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

DATE

CHIEF, ENVIRONMENTAL MANAGEMENT DIVISION, DEPARTMENT OF HEALTH
STATE OF HAWAII

DATE

INDEX TO DRAWINGS

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
1.....	TITLE SHEET, LOCATION MAP AND INDEX TO DRAWINGS	46 - 47.....	CURB RETURN GRADES
2 - 6.....	GENERAL NOTES	48 - 51.....	CURB RAMP DETAILS
7.....	GENERAL LAYOUT	52.....	TRAFFIC SIGNING & STRIPING PLAN
8 - 9.....	GRADING PLAN	53.....	TRAFFIC STRIPING DETAILS
10.....	ELEVATION PLAN - KAKAINA STREET	54 - 60.....	TRAFFIC CONTROL PLANS & NOTES
11.....	ELEVATION PLAN - HIHIMANU STREET	61 - 66.....	CROSS SECTIONS
12.....	ELEVATION PLAN - POALIMA STREET	E1 - E18.....	ELECTRICAL SHEETS
13 - 14.....	GRADING DETAILS	L1 - L3.....	LANDSCAPE PLAN
15.....	EROSION CONTROL PLAN		
16.....	EROSION CONTROL DETAILS		
17 - 18.....	UTILITY PLAN		
19.....	TYPICAL ROAD SECTIONS		
20 - 21.....	PLAN & PROFILE: ROAD "A"		
22.....	PLAN & PROFILE: ROAD "B"		
23.....	PLAN & PROFILE: HIHIMANU STREET		
24.....	PLAN - KAKAINA STREET & MISCELLANEOUS PROFILES		
25.....	PLAN - POALIMA & MEKIA STREET		
26.....	MISCELLANEOUS PROFILES - POALIMA & MEKIA STREET		
27.....	CONCRETE DITCH PLAN & PROFILE		
28 - 35.....	DRAINAGE DETAILS		
36.....	GENERAL NOTES AND TYPICAL DETAILS		
37.....	CONCRETE DITCH DETAILS		
38.....	SPECIAL CATCH BASIN B8 DETAILS		
39.....	SPECIAL CATCH BASIN D1 DETAILS		
40.....	SPECIAL GRATED INLET & CONCRETE BOX CULVERT DETAILS		
41 - 42.....	WATER DETAILS		
43.....	WALL DETAILS		
44.....	MISCELLANEOUS DETAILS		
45.....	MAILBOX DETAILS		

BID SET
FEBRUARY 7, 2012

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CONSTRUCTION NOTES

- ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 2005 AND STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII AND ALL APPLICABLE UPDATES.
- THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES 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.
- NO CONTRACTOR SHALL PERFORM ANY CONSTRUCTION OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW INTO EXISTING CITY DRAINAGE SYSTEMS, OR ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AS WELL AS CHAPTER 14 OF THE REVISED ORDINANCES OF HONOLULU, AS AMENDED. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION.
- THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT TWO (2) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK.
- THE CONTRACTOR MAY SUBMIT A SUBSTITUTION REQUEST TO PRECAST ANY CITY OWNED AND/OR MAINTAINED DRAINAGE STRUCTURE (EX., CATCH BASINS, DRAIN MANHOLES, DRAIN INLETS, CULVERTS, ETC). HOWEVER, PRIOR TO CONSTRUCTION AND INSTALLATION OF ANY PRECAST STRUCTURE, THE CONTRACTOR SHALL A) SUBMIT SIX (6) SETS OF SHOP DRAWINGS TO THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AND OBTAIN WRITTEN APPROVAL AND B) NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES. NON-COMPLIANCE WITH ANY OF THESE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL PRECAST CONSTRUCTION WORK AND REJECTION OF ALL PRECAST STRUCTURES ALREADY CONSTRUCTED.
- CONFINED SPACE FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:
 - ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:
 - FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.
 - LIFELINE AND ASSOCIATED CLIPS.
 - INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
 - TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
 - EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
 - CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
 - CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON MONOXIDE AND FLAMMABLES (CAPABLE OF MONITORING AT A DISTANCE AT LEAST 20-FEET AWAY).
 - PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
 - CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
 - ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.
- FOR BENCH MARK, SEE SHEET 7.
- TOPOGRAPHIC INFORMATION OBTAINED FROM "TOPOGRAPHIC SURVEY AT KAKAINA SUBDIVISION" PREPARED BY ACE LAND SURVEYING LLC. ON 04/20/07.

GRADING NOTES

- ALL GRADING WORK SHALL BE DONE IN ACCORDANCE WITH CHAPTER 14, ARTICLES 13, 14, 15 AND 16, AS RELATED TO GRADING, SOIL EROSION AND SEDIMENT CONTROL OF THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND SOILS REPORT BY FEWELL GEOTECHNICAL ENGINEERING, LTD. DATED JULY 9, 2007.
- NO CONTRACTOR SHALL PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATIONS OCCUR, THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
- THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 60.1, "AIR POLLUTION CONTROL".
- THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTHS OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATIONS AND DEPTHS PRIOR TO EXCAVATION FOR THE NEW LINES.
- ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, ADEQUATE PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
- ALL SLOPES AND EXPOSED AREAS SHALL BE SODDED OR PLANTED AS SOON AS FINAL GRADES HAVE BEEN ESTABLISHED. PLANTING SHALL NOT BE DELAYED UNTIL ALL GRADING WORK HAS BEEN COMPLETED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA WITHIN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED SHALL BE PLANTED.
- FILLS ON SLOPES STEEPER THAN 5:1 SHALL BE KEYED.
- THE CITY SHALL BE INFORMED OF THE LOCATION OF THE BORROW/DISPOSAL SITE FOR THE PROJECT WHEN THE APPLICATION FOR A GRADING PERMIT IS MADE. THE BORROW/DISPOSAL SITE MUST ALSO FULFILL THE REQUIREMENTS OF THE GRADING ORDINANCE.
- NO GRADING WORK SHALL BE DONE ON SATURDAYS, SUNDAYS AND HOLIDAYS AT ANY TIME WITHOUT PRIOR NOTICE TO THE DIRECTOR, D.P.P., PROVIDED SUCH GRADING WORK IS ALSO IN CONFORMANCE WITH THE COMMUNITY NOISE CONTROL STANDARDS CONTAINED IN THE HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 46, "COMMUNITY NOISE CONTROL".
- THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
- ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54, "WATER QUALITY STANDARDS", AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL", AND IF APPLICABLE, THE NPDES PERMIT FOR THE PROJECT. BEST MANAGEMENT PRACTICES SHALL BE EMPLOYED AT ALL TIMES DURING THE CONSTRUCTION PERIOD.
- WHERE APPLICABLE AND FEASIBLE THE MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
- TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
- TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR GRADING PERMIT.
- IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.
- FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, D.P.P. AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT TWO (2) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK. FOR CITY PROJECTS, THE CONTRACTOR SHALL COORDINATE INSPECTIONAL SERVICES WITH THE RESPONSIBLE CITY AGENCY.
- PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK AND NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015). IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, D.P.P. (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.
- FOR ALL PROJECTS, WHICH WILL DISTURB ONE (1) ACRE OR MORE OF LAND, THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL A NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII, AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM. ALSO, FOR NON-CITY AND OTHER NONGOVERNMENTAL AGENCY PROJECTS, THE CONTRACTOR SHALL PROVIDE A WRITTEN COPY OF THE NGPC TO THE PERMITTING AND INSPECTION SECTION, CIVIL ENGINEERING BRANCH, D.P.P., AT LEAST SEVEN (7) CALENDAR DAYS BEFORE THE START OF THE CONSTRUCTION. FOR CITY OR OTHER GOVERNMENTAL PROJECTS, THE CONTRACTOR SHOULD PROVIDE A WRITTEN COPY OF THE NGPC TO THE APPROPRIATE CITY DEPARTMENT OR GOVERNMENTAL AGENCY PER THEIR REQUIREMENTS.

GRADING NOTES CONT'D.

- ALL GRADING AND CONSTRUCTION WORK SHALL IMPLEMENT MEASURES TO ENSURE THAT THE DISCHARGE OF POLLUTANTS FROM THE CONSTRUCTION SITE WILL BE REDUCED TO THE MAXIMUM EXTENT PRACTICABLE AND WILL NOT CAUSE OR CONTRIBUTE TO AN EXCEEDANCE OF WATER QUALITY STANDARDS.
- NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHALL COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE VIOLATOR. FURTHERMORE, VIOLATORS SHALL BE SUBJECTED TO ADMINISTRATIVE, CIVIL AND/OR CRIMINAL PENALTIES.
- FOR BENCH MARK, SEE SHEET 7.

TEMPORARY DUST CONTROL

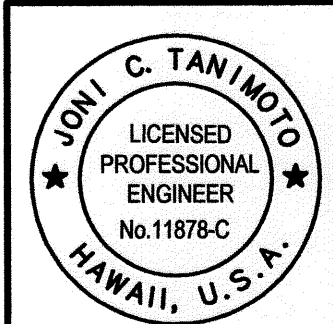
- THE GRADED OR PROJECT SITE THAT IS CLEARED OF VEGETATION SHALL BE KEPT DAMP.
- THE GRADED OR PROJECT SITE THAT IS CLEARED OF VEGETATION SHALL BE KEPT DAMP FOR SEVEN (7) DAYS A WEEK. AT THE END OF EACH DAY, THE SITE SHALL BE SUFFICIENTLY DAMPENED SO THAT THE SITE WILL REMAIN MOISTENED DURING THE NIGHT.
- THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO THAT EXCAVATION, EMBANKMENT AND IMPORTED MATERIAL SHALL BE DAMPENED TO PREVENT DUST PROBLEMS.
- IN APPLYING FOR A GRADING PERMIT, THE CONTRACTOR SHALL SUBMIT PLANS, SCHEDULES AND/OR WRITTEN MEASURES WHICH PROVIDE FOR DUST CONTROL. THE DUST CONTROL MEASURES SHALL CONTAIN POSITIVE STATEMENTS WHICH REQUIRE ACTION OR WORK THAT PREVENTS DUST PROBLEMS.

SPECIAL NOTES:

- THE CONTRACTOR SHALL INSTALL THE DUST SCREEN AND OTHER TEMPORARY EROSION CONTROL MEASURES PRIOR TO CLEARING & GRUBBING.
- THE CONTRACTOR SHALL CONSTRUCT EROSION CONTROL BERM PRIOR TO GRADING.
- THE CONTRACTOR SHALL ASSURE THAT NO FILL MATERIAL IS DEPOSITED INTO EXISTING DRAINAGE SYSTEM.

HISTORIC PRESERVATION NOTE

PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES-HISTORIC PRESERVATION DIVISION (692-8015), WHICH WILL ACCESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND AND APPROPRIATE MITIGATION MEASURE IF NECESSARY. IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING & PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.



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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GENERAL NOTES			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

FILE	POCKET	FOLDER	NO.
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Plotted on: 2/2/2012
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GRADING REQUIREMENTS AS PER SOILS ENGINEER (FEWELL GEOTECHNICAL ENGINEERING, LTD.)

SITE PREPARATION

1. PRIOR TO THE START OF THE ACTUAL GRADING OPERATIONS, THE SITE SHALL BE CLEARED AND GRUBBED IN ACCORDANCE WITH SECTION 10 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION OF THE CITY AND COUNTY OF HONOLULU (STANDARD SPECIFICATIONS).
 - A. ALL VEGETATION, BOULDERS, RUBBISH AND OTHER DELETERIOUS MATERIALS SHALL BE REMOVED AND WASTED OFF-SITE. STOCKPILES OF CLEARED AND GRUBBED MATERIALS OBSERVED AT THE SITE SHALL ALSO BE REMOVED AND WASTED OFF-SITE.
 - B. THE DEPTH OF THE GRUBBING OPERATIONS CAN BEST BE DETERMINED IN THE FIELD, BUT IT IS LIKELY THAT 2 TO 4 INCHES SHALL SUFFICE. DEEPER GRUBBING SHALL BE ANTICIPATED WHERE TREES OR LARGE SHRUBS EXIST.
 - C. THE ORGANICALLY CONTAMINATED GRUBBED MATERIALS ARE NOT SUITABLE FOR USE AS FILL AND SHALL BE REMOVED FROM THE SITE. THEY MAY BE STOCKPILED FOR FUTURE USE AS TOPSOIL PROVIDED THEY MEET THE REQUIREMENTS OF THE PROJECT LANDSCAPE ARCHITECT.
2. WHERE THE EXISTING GROUND TO RECEIVE FILL SLOPES IN EXCESS OF 5H:1V, THE GROUND SURFACE SHALL BE BENCHED WITH A SERIES OF HORIZONTAL TERRACES PRIOR TO THE PLACEMENT OF FILL. THE BENCHES SHALL EXTEND THROUGH ANY LOOSE MATERIALS INTO THE VERY STIFF TO HARD NATURAL GROUND OR PROPERLY COMPACTED FILLS.

GRADING

3. ONCE THE SITE HAS BEEN CLEARED AND GRUBBED, SITE GRADING MAY COMMENCE TO GENERATE THE PLANNED FINISH GRADES. THE GRADED BUILDING PADS OF THE LOTS SHALL EXTEND AT LEAST 5 FEET BEYOND THE PERIMETER OF THE STRUCTURES AND THEIR RELATED STRUCTURAL ATTACHMENTS. WHERE THIS CRITERIA CANNOT BE MET, DEEPER THAN NORMAL FOUNDATIONS WILL BE REQUIRED.
4. THE EXISTING UNCOMPACTED FILLS OVER THE SITE SHALL BE REMOVED THROUGHOUT THE AREA OF THE NEW CONSTRUCTION AND DOWN TO THE VERY STIFF TO HARD NATURAL ALLUVIAL CLAYS PRIOR TO ADDITIONAL GRADING. SEDIMENTS AND OTHER LOOSE MATERIALS FOUND IN DITCHES OR SWALES ON SITE SHALL SIMILARLY BE REMOVED.
 - A. THE ACTUAL DEPTH AND LATERAL EXTENT OF THE REMOVAL OF THESE MATERIALS MUST BE DETERMINED IN THE FIELD DURING CONSTRUCTION. THE BORING INFORMATION INDICATES THAT THE UNCOMPACTED FILLS EXTEND TO DEPTHS RANGING FROM 1/2 TO 4 FEET BELOW THE EXISTING GROUND SURFACE AND GENERALLY DOWN TO A DEPTH OF 2-1/2 TO 3 FEET.
 - B. THE EXCAVATED MATERIAL MAY BE RE-USED AS FILL IN THE GRADING PROVIDED IT MEETS THE MATERIAL RECOMMENDATIONS FOR FILL AND IS SELECTIVELY PLACED, MOISTURE-CONDITIONED, AND COMPACTED AS RECOMMENDED HEREIN.
5. CARE MUST BE TAKEN BY THE CONTRACTOR TO MINIMIZE THE POTENTIAL FOR UNDERMINING THE EXISTING STRUCTURES ALONG THE PROPERTY LINES OF THE SITE DURING THE EXCAVATION TO REMOVE THE UNCOMPACTED FILLS. TEMPORARY UNDERPINNING OF THESE EXISTING STRUCTURES SHALL BE ANTICIPATED TO ALLOW THE REMOVAL OF THE UNCOMPACTED FILLS AND THEIR REPLACEMENT WITH COMPACTED FILL.
6. ONCE THE UNCOMPACTED FILLS HAVE BEEN REMOVED, THE THEN-EXPOSED GROUND SURFACE IN THE AREAS TO RECEIVE FILL OR NEW CONSTRUCTION SHALL BE PROOF-ROLLED TO DETECT ANY SOFT SPOTS OR REMAINING UNCOMPACTED FILLS. THE PROOF-ROLLING SHALL CONSIST OF NO LESS THAN 5 PASSES WITH A CATERPILLAR 825B COMPACTOR, OR ITS EQUIVALENT, WEIGHING AT LEAST 40,000 POUNDS.
7. SOFT SPOTS OR ANY REMAINING UNCOMPACTED FILLS SHALL BE REMOVED DOWN TO VERY STIFF TO HARD NATURAL GROUND AND THE RESULTING DEPRESSION BACKFILLED IN ACCORDANCE WITH THE RECOMMENDATIONS HEREIN
8. THE EXPANSIVE ON-SITE CLAYS SHALL THEN BE REMOVED A SUFFICIENT DEPTH BENEATH THE PROPOSED CONCRETE SLABS-ON-GRADES SUCH THAT THE SLAB AND PAVEMENTS ARE UNDERLAIN BY LOW-EXPANSION IMPORTED FILL.
 - A. THE EXPANSIVE SOILS SHALL BE REMOVED THROUGHOUT THE AREAS OF THE LOTS, ROADWAYS AND OTHER AREAS DESIGNATED FOR NEW CONSTRUCTION, EXCEPT FOR AREAS DESIGNATED FOR LANDSCAPING.
 - B. THE DEPTH OF THE UNDERCUTTING AND REMOVAL OF THE EXPANSIVE SOILS SHALL EXTEND A SUFFICIENT DEPTH BELOW THE CONCRETE SLABS-ON-GRADES TO ALLOW THE PLACEMENT OF AT LEAST 3 FEET OF LOW-EXPANSION IMPORTED FILL BENEATH THE SLABS, AS MEASURED FROM THE BOTTOM OF THE CONCRETE SLAB.
 - C. THE DEPTH OF THE UNDERCUTTING SHALL EXTEND A SUFFICIENT DEPTH BELOW THE PAVEMENT SECTIONS (AS MEASURED FROM THE BOTTOM OF THE AGGREGATE BASE COURSE LAYER) TO ALLOW THE PLACEMENT OF AT LEAST 2 FEET OF LOW-EXPANSION IMPORTED FILLS BENEATH THESE ITEMS.
9. ONCE THE EXPANSIVE SOILS HAVE BEEN REMOVED, THE THEN-EXISTING SOIL SUBGRADE, AND OTHER AREAS TO RECEIVE FILL OR NEW CONSTRUCTION SHALL BE SCARIFIED, MOISTURE-CONDITIONED TO AT LEAST 3 PERCENT ABOVE ITS OPTIMUM MOISTURE CONTENT, AND UNIFORMLY COMPACTED TO AT LEAST 90 PERCENT RELATIVE COMPACTION AS DETERMINED BY LABORATORY COMPACTION TEST ASTM D1557.

GRADING REQUIREMENTS AS PER SOILS ENGINEER (FEWELL GEOTECHNICAL ENGINEERING, LTD.) CONT'D.

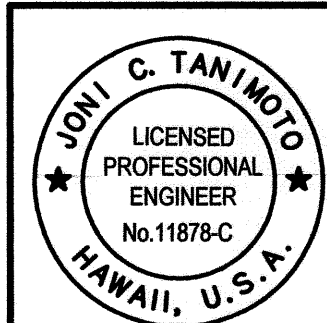
10. THE EXPANSIVE CLAY SUBGRADES SHALL BE KEPT MOIST AND NOT ALLOWED TO DRY EXCESSIVELY DURING THE INTERVENING PERIOD BETWEEN ITS COMPACTION AND SUBSEQUENT PLACEMENT OF ADDITIONAL FILL OR NEW CONSTRUCTION. WHERE SIGNIFICANT DRYING OCCURS, SUCH THAT SHRINKAGE CRACKS EXCEED 1/8 INCH, THE SUBGRADE SHALL BE SCARIFIED, MOISTURE CONDITIONED AND COMPACTED AS RECOMMENDED HEREIN.
11. THE EXCAVATED EXPANSIVE SOILS MAY BE USED AS FILL IN THE SITE GRADING PROVIDED THEY ARE USED BELOW THE ABOVE-RECOMMEND THICKNESS OF LOW-EXPANSION IMPORTED FILL, AND THEY ARE PLACED, MOISTURE-CONDITIONED AND COMPACTED AS RECOMMENDED HEREIN.
12. FILL PLACED WITHIN 3 FEET OF THE BOTTOM OF THE CONCRETE SLABS-ON-GRADES AND WITHIN 2 FEET OF THE FOUNDATIONS AND PAVEMENT SECTIONS SHALL CONSIST OF A LOW-EXPANSION, RELATIVELY IMPERVIOUS IMPORTED MATERIAL.
13. LOW-EXPANSION IMPORTED FILL SHALL BE FREE OF ORGANICS, ROCKS OR SOIL CLODS LARGER THAT 2 INCHES IN MAXIMUM DIMENSION AND MEET THE FOLLOWING ADDITIONAL REQUIREMENTS.
 - A. THE LOW-EXPANSION IMPORTED FILL SHALL EXHIBIT A LIQUID LIMIT OF LESS THAN 60 AND PI OF LESS THAN 20.
 - B. THE LOW-EXPANSION IMPORTED FILL SHALL EXHIBIT A CBR IN EXCESS OF 10 AND A SWELL OF NO MORE THAN 2-1/2 PERCENT WHEN TESTED IN ACCORDANCE WITH LABORATORY CBR TEST ASTM 1883 UNDER A 51-POUND PER SQUARE FOOT SURCHARGE AND 96 HOURS OF SOAKING.
 - C. WHEN COMPACTED TO 90 PERCENT RELATIVE COMPACTION, THE LOW-EXPANSION IMPORTED FILL SHALL ALSO EXHIBIT A PERMEABILITY, k OF LESS THAT 1 x 10⁻⁴ CM/SEC WHEN TESTED IN ACCORDANCE WITH ASTM D5084.
 - D. ALL BORROW SITE MATERIALS SHALL BE TESTED AND MEET THE REQUIREMENTS OF THE RECOMMENDATION PRIOR TO USE.
14. FILL AND BACKFILL SHALL BE PLACED IN HORIZONTAL LIFTS OF NO MORE THAN 8 INCHES IN LOOSE THICKNESS, MOISTURE CONDITIONED AS INDICATED BELOW AND UNIFORMLY COMPACTED TO AT LEAST 90 PERCENT RELATIVE COMPACTION AS DETERMINED BY ASTM D1557. FILL PLACED WITHIN 2 FEET OF THE PAVEMENT SUBGRADES SHALL BE COMPACTED TO AT LEAST 95 PERCENT RELATIVE COMPACTION.
 - A. THE ON-SITE EXPANSIVE CLAYS SHALL BE MOISTURE-CONDITIONED TO AT LEAST 3 PERCENT ABOVE THEIR OPTIMUM MOISTURE CONTENTS.
 - B. IMPORTED LOW-EXPANSION FILL MOISTURE-CONDITIONED TO WITHIN 3 PERCENT OF ITS OPTIMUM MOISTURE CONTENT.
15. SHOULD EXCESSIVE DRYING OF THE LOW-EXPANSION SOIL SUBGRADES OCCUR DURING THE INTERVENING PERIOD BETWEEN THE CONSTRUCTION OF THE LOTS AND THE DWELLING CONSTRUCTION, THE SUBGRADE SHALL BE SCARIFIED FOR A DEPTH OF AT LEAST 8-INCHES, MOISTURE-CONDITIONED AND RE-COMPACTED AS RECOMMENDED HEREIN.
16. CUT AND FILL SLOPES SHALL BE LIMITED TO NO STEEPER THAN 2H:1V FOR HEIGHTS OF UP TO 10 FEET. SLOPES EXCEEDING THIS HEIGHT ARE NOT ANTICIPATED ON THIS PROJECT AND SHALL BE INDIVIDUALLY EVALUATED SHALL THEY OCCUR.

UTILITIES

17. THE INSTALLATION OF THE UTILITIES SHALL BE IN ACCORDANCE WITH SECTION 11 OF THE STANDARD SPECIFICATIONS AND THE APPROPRIATE SECTION OF THE STANDARD SPECIFICATIONS PERTAINING TO EACH UTILITY.
18. BACKFILLS FOR THE UTILITIES SHALL BE SELECTIVELY PLACED, MOISTURE CONDITIONED, AND COMPACTED IN ACCORDANCE WITH THE GRADING RECOMMENDATIONS ABOVE, USING THE APPROPRIATE MECHANICAL COMPACTORS AROUND AND ABOVE THE PIPES. FLOODING, JETTING AND/OR PONDING WITH WATER ARE NOT ACCEPTABLE METHODS OF COMPACTION.
19. THE UTILITIES MAY BE FOUNDED IN COMPACTED FILLS OR THE NATURAL EXPANSIVE SOILS. WHERE THE UTILITIES ARE FOUNDED WITHIN 3 FEET OF THE FINISH GRADES, FLEXIBLE COUPLINGS SHOULD BE PROVIDED WHERE THEY PASS BETWEEN THE NATURAL EXPANSIVE SOILS AND THE LOW-EXPANSION FILLS, OR WHERE THEY CONNECT TO A STRUCTURE FROM THE EXPANSIVE SOILS.
20. UTILITIES SHALL BE DESIGNED SUCH THAT THEY ARE NOT WITHIN THE SUPPORTIVE PRISM OF SOIL BENEATH THE FOUNDATIONS OF THE DWELLINGS OR STRUCTURES. THIS IS DELINEATED BY AN IMAGINARY LINE EXTENDING DOWN FROM THE OUTSIDE EDGES OF THE FOUNDATIONS AT A SLOPE OF 1-1/2H:1V, THE GEOTECHNICAL SOILS ENGINEER SHALL BE NOTIFIED SHOULD THIS OCCUR SUCH THAT IT CAN BE EVALUATED AND ADDITIONAL RECOMMENDATIONS PROVIDED.
21. THE UTILITY EXCAVATIONS AND OTHER DEEP SITE EXCAVATIONS SHALL BE SHORED AND BRACED IN ACCORDANCE WITH THE HIOSH AND OTHER APPLICABLE GOVERNMENTAL REGULATIONS TO SAFEGUARD THE WORKERS IN THE TRENCH. THE DESIGN OF THE SHORING AND BRACING SYSTEM SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
22. GROUNDWATER WAS ENCOUNTERED AT DEPTHS CORRESPONDING TO BETWEEN ELEV. 17 AND ELEV. 28 DURING THIS INVESTIGATION. DEWATERING SHALL BE ANTICIPATED FOR UTILITY EXCAVATIONS OR OTHER DEEP EXCAVATIONS APPROACHING THESE LEVELS. THE DESIGN OF THE DEWATERING SYSTEM SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

QUALITY CONTROL

1. THE SITE PREPARATION AND SITE GRADING, INCLUDING THE PROOF-ROLLING OPERATIONS SHALL BE OBSERVED BY THE GEOTECHNICAL ENGINEER TO DETERMINE WHETHER THE ANTICIPATED MATERIALS ARE ENCOUNTERED.
2. INTERMITTENT FIELD DENSITY TESTS SHALL BE TAKEN ON THE FILLS AND BACKFILLS TO DETERMINE WHETHER THE SPECIFIED LEVELS OF COMPACTION ARE CONSISTENTLY OBTAINED.
3. SAMPLES OF THE PROPOSED FILL MATERIALS SHALL BE SUBMITTED TO THE GEOTECHNICAL ENGINEER NO LESS THAN 7 WORKING DAYS PRIOR TO THEIR INTENDED JOB-SITE DELIVERY TO ALLOW ADEQUATE TIME FOR TESTING, EVALUATION, AND APPROVAL.
4. FOUNDATION EXCAVATIONS SHALL BE OBSERVED BY A GEOTECHNICAL ENGINEER TO DETERMINE WHETHER THE ANTICIPATED BEARING MATERIALS ARE ENCOUNTERED. THE RECOMMENDATIONS PROVIDED HEREIN ARE CONTINGENT ON ADEQUATE CONSTRUCTION OBSERVATIONS AND TESTING OF THE GEOTECHNICAL ASPECTS OF THE CONSTRUCTION BY THE GEOTECHNICAL ENGINEER.
5. DUE TO THE PRESENCE OF UNCOMPACTED FILL AND EXPANSIVE SOILS AT THE SITE, MORE THAN THE NORMAL EARTHWORK OBSERVATION AND TESTING WILL BE NECESSARY. THE CONSTRUCTION BUDGET FOR THE PROJECT SHALL BE ADJUSTED TO ACCOMMODATE THESE COSTS.



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

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII				
GENERAL NOTES				
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS				

FILE	POCKET	FOLDER	NO.
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Last Saved: 2/1/2012
Plotted on: 2/2/2012

SEWER NOTES

- ALL SEWER CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1986, STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984, AS AMENDED, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU AND THE COUNTIES OF KAUAI, MAUI AND HAWAII, CURRENT CITY PRACTICES, THE REVISED ORDINANCES OF HONOLULU, 1990, AS AMENDED, AND THE DESIGN STANDARDS OF THE DEPARTMENT OF WASTEWATER MANAGEMENT, VOL. 1, JULY 1993.
- IN THE EVENT THAT ANY CHANGE IN ALIGNMENT OR GRADE FOR THE PROPOSED SEWERS ARE REQUIRED DUE TO UNFORESEEN CONFLICT WITH OTHER UTILITIES, THE ENGINEER IN CHARGE OR THE MAKER OF THE PLANS SHALL BE RESPONSIBLE FOR THE REQUIRED CHANGES WHICH ARE TO BE PRESENTED TO THE DEPARTMENT OF PLANNING AND PERMITTING FOR APPROVAL.
- THE CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AT 768-8084 TO ARRANGE FOR INSPECTIONAL SERVICES AND SUBMIT FOUR (4) SETS OF APPROVED CONSTRUCTION PLANS SEVEN (7) DAYS PRIOR TO COMMENCEMENT OF CONSTRUCTION WORK. THE CONTRACTOR SHALL PAY FOR ALL INSPECTION COSTS.
- CRUSHED ROCK CRADLE IS PERMITTED WHERE SOIL IS STABLE. IN AREAS OF UNSTABLE SOIL, THE MAKER OF THE PLANS AND THE CONSTRUCTION ENGINEER WILL DETERMINE THE PIPE SUPPORT REQUIRED.
- TREES IN THE ROAD RIGHT-OF-WAY SHALL BE SITUATED A MINIMUM OF FIVE (5) FEET FROM THE CITY'S SEWER LINES.
- THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS RESEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES, INCLUDING AND AFFECTING SEWER LINES, IN THE PRESENCE OF THE DPP INSPECTOR AND EXERCISE PROPER CARE IN EXCAVATING THE AREA. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGED UTILITIES.
- SEWER LATERAL SHALL BE CLEAR OF AND NOT CONFLICTING WITH ANY OTHER UTILITY. MINIMUM HORIZONTAL AND VERTICAL CLEARANCES SHALL BE STRICTLY OBSERVED AND FOLLOWED.
- SLOPE FOR SEWER LATERALS SHALL BE 1.00% UNLESS OTHERWISE NOTED.
- BUILDING PLUMBING FACILITIES SHALL BE CONTROLLED BY SEWER LATERAL INVERTS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTINUOUS SEWER SERVICE TO ALL AFFECTED AREAS DURING CONSTRUCTION.
- THE CONSULTING ENGINEER SHALL SUBMIT TO THE DEPARTMENT OF PLANNING AND PERMITTING MYLAR "AS-BUILT" TRACINGS OF THE CONSTRUCTION PLANS AS ACTUALLY CONSTRUCTED, SHOWING ALL CHANGES FROM THE ORIGINAL PLANS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY SEWAGE SPILLS CAUSED DURING CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE STATE DEPARTMENT OF HEALTH AND UTILIZE APPROPRIATE SAMPLING AND ANALYZING PROCEDURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PUBLIC NOTIFICATIONS AND PRESS RELEASES.
- THE CONTRACTOR SHALL INSTALL "RAINSTOPPER" MANHOLE INSERTS IN ALL SEWER MANHOLES WITH TYPE "SA" FRAME AND COVER.
- ALL DROP AND SHALLOW DROP SEWER MANHOLES SHALL BE LINED WITH EPOXY LINERS. ALSO, IF THE VELOCITY EXCEEDS TEN (10) FEET PER SECOND (FPS), THE SEWER MANHOLE SHALL BE EPOXY LINED.
- THE CONTRACTOR SHALL OBTAIN APPROVAL FOR ADVANCE SEWER RISER AGREEMENT AT THE DEPARTMENT OF PLANNING AND PERMITTING AND OBTAIN BUILDING PERMIT FOR PLUMBING WORK BEFORE ANY ADVANCE RISER IS MADE.
- ALL SEWER PIPE JOINTS WITHIN EASEMENTS SHALL BE WRAPPED WITH GEOTEXTILE ROOT BARRIER.
- SEWER PIPES THIRTY (30) INCHES AND LARGER SHALL BE OF CORROSION RESISTANT MATERIAL OR PROTECTED INTERNALLY WITH LINING.
- S4C PIPE CRADLE SEALS SHALL BE INSTALLED TEN (10) FEET FROM ALL SEWER MANHOLES TO PREVENT SOIL MIGRATION. SEE DETAIL, SHEET 43.
- GEOTEXTILE FABRIC TO ENVELOP THE PIPE CRADLE AND SELECT BACKFILL MATERIAL SHALL BE PROVIDED WHERE WATER OR UNSTABLE SOIL CONDITIONS ARE ENCOUNTERED.
- CONFINED SPACE

FOR ENTRY BY CITY PERSONNEL, INCLUDING INSPECTORS, INTO A PERMIT REQUIRED CONFINED SPACE AS DEFINED IN 29 CFR PART 1910.146(B), THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING:

I. ALL SAFETY EQUIPMENT REQUIRED BY THE CONFINED SPACE REGULATIONS APPLICABLE TO ALL PARTIES OTHER THAN THE CONSTRUCTION INDUSTRY, TO INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING:

A. FULL BODY HARNESSES FOR UP TO TWO PERSONNEL.

SEWER NOTES CONT'D.

- LIFELINE AND ASSOCIATED CLIPS.
 - INGRESS/EGRESS AND FALL PROTECTION EQUIPMENT.
 - TWO-WAY RADIOS (WALKIE-TALKIES) IF OUT OF LINE-OF-SIGHT.
 - EMERGENCY (ESCAPE) RESPIRATOR (10 MINUTE DURATION).
 - CELLULAR TELEPHONE TO CALL FOR EMERGENCY ASSISTANCE.
 - CONTINUOUS GAS DETECTOR (CALIBRATED) TO MEASURE OXYGEN, HYDROGEN SULFIDE, CARBON
 - PERSONAL MULTI-GAS DETECTOR TO BE CARRIED BY INSPECTOR.
 - CONTINUOUS FORCED AIR VENTILATION ADEQUATE TO PROVIDE SAFE ENTRY CONDITIONS.
 - ONE ATTENDANT/RESCUE PERSONNEL TOPSIDE (TWO, IF CONDITIONS WARRANT IT).
- WHEN CONNECTING TO A LIVE SEWER LINE, THE CONTRACTOR SHALL ABIDE BY ALL CONDITIONS THAT THE STATE DEPARTMENT OF HEALTH SETS FORTH TO MITIGATE ANY WASTEWATER SPILL THAT MAY OCCUR. THE CONTRACTOR SHALL INFORM THE CITY INSPECTOR FIVE (5) WORKING DAYS PRIOR TO THE ACTUAL CONNECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY FINES AND PENALTIES DUE TO ANY SPILLS RESULTING FROM THE CONNECTION.
 - NO RUNGS SHALL BE INSTALLED INSIDE NEW SEWER MANHOLES.
 - IF CONTRACTOR ENCOUNTERS FLOW MONITORING DEVICES SUCH AS SPECIAL SEWER MANHOLE COVER EMBEDDED WITH SOLAR PANELS; NOTIFY CITY & COUNTY OF HONOLULU, ENV-CSM, AT 768-7272 TO COORDINATE TEMPORARY REMOVAL.
 - CONTRACTOR SHALL MAINTAIN VISIBILITY AND MAINTENANCE ACCESS TO LIVE SEWER MANHOLE LOCATIONS AT ALL TIMES, INCLUDING DURING NON-WORK HOURS AND PAVING OPERATIONS.
 - CONTRACTOR SHALL USE MANHOLE DEBRIS CATCHING DEVICE WHEN PERFORMING MANHOLE HEIGHT ADJUSTMENT WORK AND REMOVE ANY CONSTRUCTION DEBRIS THAT HAS FALLEN INTO THE MANHOLE. DISPOSAL OF CONSTRUCTION DEBRIS IN THE SEWER SYSTEM IS STRICTLY PROHIBITED.
 - FOR PRECAST SEWER MANHOLES, THE CONSULTING ENGINEER SHALL SUBMIT FOUR (4) SETS OF SHOP DRAWINGS TO DPP FOR APPROVAL. AFTER THE SHOP DRAWINGS ARE APPROVED, THE MANUFACTURER SHALL NOTIFY THE INSPECTION SECTION, CIVIL ENGINEERING BRANCH, DPP, AT 768-8084 TO ARRANGE FOR INSPECTION SERVICES FOR CONCRETE POURS MADE AT ITS PLANT SEVEN (7) DAYS PRIOR TO POUR.

SPECIAL PROVISIONS FOR PVC PLASTIC SEWER PIPE (FOR PIPES 6" TO 12" IN DIAMETER ONLY)

- POLYVINYL CHLORIDE (PVC) PLASTIC SEWER PIPE AND APPURTENANCES USED ON THIS PROJECT SHALL CONFORM TO THE REQUIREMENTS OF SECTION 21 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION DATED SEPTEMBER 1986, EXCEPT AS MODIFIED HEREIN.
 - GENERAL. PVC GRAVITY SEWER PIPE AND FITTINGS SHALL CONFORM TO THE REQUIREMENTS OF C-900/C-905. (DR 18 MINIMUM WALL THICKNESS)
 - ACCEPTANCE. THE BASIS FOR ACCEPTANCE SHALL BE THE INSPECTION OF PIPE, FITTINGS AND COUPLINGS, THE TESTS SPECIFIED HEREIN AND IN SECTION 21, AND COMPLIANCE WITH THE SPECIFICATIONS. AT THE TIME OF MANUFACTURE, EACH LOT OF PIPE AND FITTINGS SHALL BE INSPECTED FOR DEFECTS AND TESTED FOR IMPACT, STIFFNESS AND FLATTENING IN ACCORDANCE WITH ASTM D3034. THE ENGINEER MAY REQUIRE CERTIFICATION BY THE MANUFACTURER THAT THE TEST RESULTS COMPLY WITH SPECIFICATION REQUIREMENTS. WHEN THE PIPE IS DELIVERED TO THE JOB SITE, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO PROVIDE ADDITIONAL TESTING TO INSURE THE QUALITY OF THE PIPE AT NO EXPENSE TO THE CITY. PIPE WHICH IS NOT INSTALLED WITHIN 120 DAYS OF THE LATEST FACTORY TEST SHALL NOT BE USED WITHOUT PRIOR APPROVAL OF THE ENGINEER.
 - SELECTION OF TEST PIPE. WHEN TESTING IS REQUIRED BY THE ENGINEER, ONE TEST PIPE SHALL BE SELECTED AT RANDOM BY THE ENGINEER FROM EACH 1200 LINEAR FEET OR FRACTION THEREOF OF EACH SIZE OF PIPE DELIVERED TO THE JOB SITE BUT NO LESS THAN ONE TEST PIPE PER LOT. A LOT SHALL BE DEFINED AS PIPE HAVING THE SAME IDENTIFICATION MARKING. THE LENGTH OF SPECIMEN OF EACH SELECTED PIPE SHALL BE A MINIMUM OF 8 FEET.
 - CELL CLASSIFICATION. PIPE SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B, 13364-A, OR 13364-B AS DEFINED IN ASTM D1784. THE FITTINGS SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION D1784. THE FITTINGS SHALL BE MADE OF PVC PLASTIC HAVING A CELL CLASSIFICATION OF 12454-B, 12454-C, OR 13343-C. PVC COMPOUNDS OF OTHER CELL CLASSIFICATIONS SHALL BE PRE-QUALIFIED BY THE MANUFACTURER.
 - JOINTS. PIPE JOINTS SHALL BE BELL AND SPIGOT TYPE WITH AN ELASTOMERIC GASKET. THE GASKETED JOINTS SHALL BE MANUFACTURED WITH A SOCKET CONFIGURATION WHICH WILL PRECLUDE IMPROPER INSTALLATION OF THE GASKET AND WILL INSURE THE GASKET REMAINS IN PLACE DURING THE JOINING OPERATION. ALL PIPE SHALL HAVE A HOME MARK ON THE SPIGOT END TO INDICATE PROPER PENETRATION WHEN THE JOINT IS MADE.

SPECIAL PROVISIONS FOR PVC PLASTIC SEWER PIPE (FOR PIPES 6" TO 12" IN DIAMETER ONLY)

- IDENTIFICATION MARKS. ALL PIPE FITTINGS AND COUPLINGS SHALL BE CLEARLY MARKED AT AN INTERVAL NOT TO EXCEED 5 FEET AS FOLLOWS:
 - NOMINAL PIPE DIAMETER.
 - PVC CELL CLASSIFICATION.
 - COMPANY, PLANT, SHIFT, ASTM, SDR, AND DATE DESIGNATIONS.
 - SERVICE DESIGNATION AND LEGEND.

G. DIMENSIONS AND TOLERANCES:

TABLE - PIPE DIMENSION (INCHES)

NOMINAL SIZE	AVERAGE O.D.	TOLERANCE ON AVERAGE	MINIMUM WALL THICKNESS	APPROX. WT./20' LENGTH (LBS.)
6	6.275	±0.011	0.180	49.4
8	8.4000	±0.012	0.240	88.5
10	10.500	±0.015	0.300	136.6
12	12.500	±0.018	0.360	198.1

- CHEMICAL RESISTANCE. THE PVC COMPOUND FAR CELL CLASSIFICATIONS NOT SPECIFICALLY IDENTIFIED IN ITEM D ABOVE SHALL BE PREQUALIFIED BY THE PIPE MANUFACTURER BY MEETING THE CHEMICAL RESISTANCE TESTS WHICH FOLLOW. COMPOUND SAMPLES AND MOLDED TEST SPECIMENS SHALL BE PREPARED IN ACCORDANCE WITH ASTM D543.

TENSILE AND IZOD IMPACT EXPOSURE SPECIMENS SHALL BE IMMERSED IN THE SOLUTIONS SPECIFIED IN TABLE 2 FOR A PERIOD OF 112 DAYS. TEST SPECIMENS SHALL BE CONDITIONED TO CONSTANT WEIGHT AT 110°F (43.3°C) BEFORE AND AFTER SUBMERSION. THE SOLUTIONS SHALL BE KEPT AT A TEMPERATURE OF 77°F ±5°F (24°C ±3°C). AT 28-DAY INTERVALS, SELECTED SPECIMENS SHALL BE REMOVED, WASHED, SURFACE DRIED AND TESTED.

TABLE 2 - TEST SOLUTIONS

CHEMICAL SOLUTION	CONCENTRATION (%)
SULFURIC ACID	20*
SODIUM HYDROXIDE	5
AMMONIUM HYDROXIDE	5*
NITRIC ACID	1*
FERRIC CHLORIDE	1
SOAP	0.1
DETERGENT (LINEAR ALKYL BENZYL SULFONATE OR LAS)	0.1
BACTERIOLOGICAL	BOD NOT LESS THAN 700 PPM

*VOLUMETRIC PERCENTAGES OF CONCENTRATED REAGENTS OF C.P. GRADE

WEIGHT CHANGE SPECIMENS SHALL BE 2 INCHES IN DIAMETER AND MAY BE MOLDED DISCS OR DISCS CUT FROM THE PIPE WALL. SPECIMENS SHALL BE CONDITIONED FOR SEVEN DAYS AT 43° ±2°C, COOLED IN A DESICCATOR FOR THE THREE HOURS AT 23° ±2°C, WEIGHED, AND THEN IMMERSED IN THE SOLUTIONS. AT 4 WEEK INTERVALS, SELECTED SPECIMENS SHALL BE REMOVED, WASHED, SURFACE DRIED AND WEIGHED. THESE SAME SPECIMENS SHALL THEN BE RECONDITIONED FOR SEVEN DAYS AT 43° ±2°C, COOLED IN A DESICCATOR FOR THREE HOURS AT 23° ±2°C AND AGAIN WEIGHED.

INITIAL AND PAST EXPOSURE SPECIMENS SHALL MEET THE FOLLOWING REQUIREMENTS WHEN TESTED AT 23° ±2°C:

PROPERTY	ASTM TEST METHOD	CELL CLASS MINIMUM VALUES		
		12454	13343	13364
TENSILE STRENGTH (YIELD), PSI	D638	7000	6000	6000
IMPACT STRENGTH, FT-LBS/IN.	D256 METHOD A	0.65	1.5	1.5
WEIGHT CHANGE, %	D543	1.5	1.5	1.5

IF ANY SPECIMEN FAILS TO MEET THE REQUIREMENTS AT ANY TIME DURING THE 112 DAY EXPOSURE PERIOD, THE MATERIAL WILL BE SUBJECT TO REJECTION.

- TRENCH EXCAVATION. TRENCHES FOR PVC SEWER PIPE SHALL BE EXCAVATED AND PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 11 OF THE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION EXCEPT AS MODIFIED HEREIN.

(1) OVEREXCAVATION. THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE EQUAL TO THE OUTSIDE DIAMETER OF THE PIPE PLUS 18-INCHES FOR PIPE UP TO 12" (I.D.). IF THE TRENCH EXCAVATION EXCEEDS THE COMPUTED MAXIMUM ALLOWABLE TRENCH WIDTH WHETHER BY EXCAVATION, CAVE-IN, OR BY GROUND MOVEMENT, THE CONTRACTOR SHALL PROVIDE AT HIS OWN EXPENSE ADDITIONAL BEDDING, ANOTHER TYPE AT BEDDING, AND/OR A HIGHER STRENGTH OF PIPE DESIGNATED BY THE ENGINEER. WHERE SHORING IS REQUIRED, THE ALLOWABLE WIDTH OF THE TRENCH SHALL BE INCREASED ONLY BY THE THICKNESS OF THE SHEATHING.

APPROVED:

CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS
AND WORK IN CITY R/W ONLY)

DATE

SPECIAL PROVISIONS FOR PVC PLASTIC SEWER PIPE (FOR PIPES 6" TO 12" IN DIAMETER ONLY) CONT'D

- PIPE BEDDING. WHERE UNSUITABLE MATERIAL IS ENCOUNTERED AT THE SUB GRADE AND ADDITIONAL EXCAVATION IS REQUIRED, THE VOID CREATED BY THE ADDITIONAL EXCAVATION SHALL BE FILLED AND COMPACTED WITH BEDDING MATERIAL SPECIFIED ON THE PLANS OR SPECIAL PROVISIONS. WHERE CONCRETE IS SPECIFIED TO BED THE PIPE, THE TOP OF THE CONCRETE SHALL BE CONSIDERED AS THE TOP OF THE BEDDING.

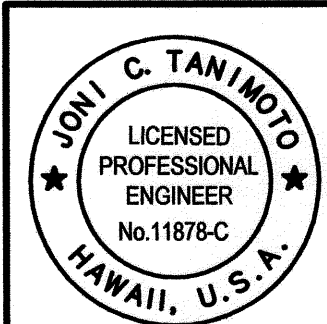
BEDDING MATERIAL SHALL CONSIST OF ONE OF THE FOLLOWING:

- BEACH SAND.
- NO. 8 OR NO. 67 AGGREGATE CONFORMING TO THE GRADATION REQUIREMENTS OF ASTM C33.
- 3/8" FILTER AGGREGATE.
- NATIVE FREE-DRAINING GRANULAR MATERIAL HAVING A MINIMUM SAND EQUIVALENT OF 30 OR HAVING A COEFFICIENT OF PERMEABILITY GREATER THAN 0.001 CENTIMETER PER SECOND.
- OTHER MATERIAL APPROVED BY THE ENGINEER.

BEDDING MATERIAL SHALL FIRST BE PLACED SO THAT THE PIPE IS SUPPORTED FOR THE FULL LENGTH OF THE BARREL WITH FULL BEARING ON THE BOTTOM SEGMENT OF THE PIPE EQUAL TO A MINIMUM AT 0.4 TIMES THE OUTSIDE DIAMETER OF THE BARREL. IF THE PIPE IS TO BE LAID IN A ROCK EXCAVATION, THE ROCK SHALL BE REMOVED SUCH THAT NO RIBS, ROCKS, OR SOLID PROJECTIONS SHALL BE WITHIN 6 INCHES OF THE SEWER PIPE HORIZONTALLY AND THERE SHALL BE AT LEAST 4 INCHES OF BEDDING BELOW THE PIPE.

- MANDREL TEST OF PVC PIPE. A MANDREL TEST SHALL BE PERFORMED NO SOONER THAN 30 DAYS AFTER THE TRENCH BACKFILL IS COMPLETED. IN ROADWAY AREAS THE 30-DAY PERIOD SHALL BEGIN AFTER INSTALLATION AND COMPACTION OF BEDDING, BACKFILL AND SUBBASE TO WITHIN 2 FEET OF THE FINISHED PAVEMENT GRADE. A RIGID MANDREL SHALL BE PULLED THROUGH THE PIPE BY HAND BETWEEN ADJACENT MANHOLES TO MEASURE FOR OBSTRUCTIONS (DEFLECTIONS, JOINT OFFSETS AND LATERAL PIPE INTRUSIONS). THE MANDREL SHALL HAVE A CROSS SECTION EQUIVALENT TO A CIRCLE HAVING A DIAMETER AT LEAST 95 PERCENT OF THE SPECIFIED AVERAGE INSIDE DIAMETER OF THE PIPE. THE MINIMUM LENGTH OF THE CIRCULAR PORTION OF THE MANDREL SHALL BE EQUAL TO THE NOMINAL DIAMETER OF THE PIPE. THIS TEST SHALL BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF THE ENGINEER. ALL MATERIAL, EQUIPMENT AND LABOR REQUIRED TO PERFORM THE TEST SHALL BE PROVIDED BY THE CONTRACTOR AT NO COST TO THE CITY. ANY SECTION OF PIPE THAT FAILS TO PERMIT PASSAGE OF THE MANDREL WILL NOT BE ACCEPTED UNTIL PROPERLY REPAIRED OR REPLACED AND RETESTED.

- BEDDING FOR PVC PIPE SEWER SHALL BE CLASS "B" AS SHOWN ON S-47 OF THE STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION UNLESS OTHERWISE NOTED.
- THE MAXIMUM DESIGN DEFLECTION (FLATTENING) FOR PLASTIC PIPE SHALL BE 5 PERCENT. THE MAXIMUM SDR (STANDARD DIMENSION RATIO OF PIPE OUTSIDE DIAMETER TO PIPE WALL THICKNESS) SHALL BE 35.
- SPECIAL WATERTIGHT MANHOLE COUPLINGS PER STANDARD DETAIL S-48 WILL BE REQUIRED FOR ALL MANHOLE CONNECTIONS. COUPLINGS MAY BE CAST DIRECTLY INTO CAST-IN-PLACE MANHOLES OR GROUTED INTO PRECAST CONCRETE MANHOLES WITH NON-SHRINK OR EXPANSION TYPE GROUT.
- FOR CONNECTIONS OF PVC LATERAL SEWERS TO MAINS OF DIFFERENT MATERIALS, AN APPROVED SADDLE WYE FITTING CONSTRUCTED OF THE SAME MATERIAL AS THE MAIN LINE SHALL BE INSTALLED. CONNECTION TO THE SADDLE FITTING SHALL BE MADE BY MEANS OF AN APPROVED FLEXIBLE RUBBER COUPLING IN ACCORDANCE WITH THE COUPLING MANUFACTURER'S INSTALLATION RECOMMENDATIONS OR BY OTHER MEANS ACCEPTABLE TO THE ENGINEER.
- FEWELL GEOTECHNICAL ENGINEERING'S LETTER DATED: XXXXXX RECOMMENDS APPROVAL OF THE USE OF PVC PIPE FOR KAKAINA SUBDIVISION.
- PVC PIPE SHALL BE LIMITED TO USE IN AGRICULTURAL, RESIDENTIAL AND APARTMENT ZONED AREAS AND IN SIZES FROM 6 INCHES TO 12 INCHES IN DIAMETER.



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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GENERAL NOTES			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

FILE	POCKET	FOLDER	NO.
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Last Save by: SHU
Last Saved: 12/2/2011
Plotted on: 2/2/2012

WATER NOTES (SEE SHEET 42 FOR EXTERNAL CORROSION PROTECTION NOTES)

- UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER SYSTEM FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE CITY & COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM STANDARDS", DATED 2002, THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
- ALL PLANS APPROVED BY THE BOARD OF WATER SUPPLY ARE BASED SOLELY ON THE ADEQUACY OF THE WATER SUPPLY. ALL OTHER FEATURES OF THE WATER SYSTEM SUCH AS LINES, GRADES, FITTINGS, ETC. AND DRAINAGE AND OTHER FEATURES OF THE IMPROVEMENTS SHALL NOT BE THE RESPONSIBILITY OF THE BOARD OF WATER SUPPLY.
- UNLESS OTHERWISE SPECIFIED, ALL LATERALS AND CONNECTIONS SHALL BE COPPER TYPE "C-1" WITH BLIND METER SPLICE LENGTHS MEASURING AT 7 1/2". TO ACCOMMODATE 3/4" METERS. TYPE "C-1" SERVICE LATERALS SHALL BE ONE 1-1/2 INCH DIAMETER LATERAL BRANCHING TO TWO 1 INCH DIAMETER CONNECTIONS.
- TEST PRESSURE SHALL BE 150 PSI. DURING THE 30-MINUTE PRESSURE TEST, THE PRESSURE SHALL NOT DROP MORE THAN 10 PSI.
- THE CONTRACTOR SHALL NOTIFY THE BWS CAPITAL PROJECTS DIVISION, CONSTRUCTION SECTION IN WRITING AND SUBMIT SIX (6) SETS OF APPROVED CONSTRUCTION PLANS ONE WEEK PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
- AFTER INSTALLATION OF TAPPING SLEEVE AND VALVE PRIOR TO ACTUAL TAPPING OPERATIONS, THE ASSEMBLY SHALL BE TESTED AT 150 PSI ON BOTH SIDES OF THE VALVE.
- THE CONTRACTOR SHALL CHLORINATE THE ENTIRE INSIDE SURFACE OF EACH PIPE AND FITTING WITH DISINFECTION SOLUTION OF 5 OUNCES OF SODIUM HYPOCHLORITE MIXED WITH 10 GALLONS OF WATER. (FOR CONNECTION ONLY)
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL WATER LINES DURING CONSTRUCTION. THE CONTRACTOR SHALL BE ESPECIALLY CAREFUL WHEN EXCAVATING BEHIND WATER LINE, TEES AND BENDS WHEREVER THERE IS A POSSIBILITY OF WATERLINE MOVEMENT DUE TO REMOVAL OF THE SUPPORTING EARTH BEYOND THE EXISTING REACTION BLOCKS. THE CONTRACTOR SHALL TAKE WHATEVER MEASURE NECESSARY TO PROTECT THE WATER LINES, SUCH AS CONSTRUCTING SPECIAL REACTION BLOCKS (WITH BWS APPROVAL) AND/OR MODIFYING HIS CONSTRUCTION METHODS.
- THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES AS SHOWN ON THE PLANS ARE FROM THE LATEST AVAILABLE DATA BUT IS NOT GUARANTEED AS TO THE ACCURACY OR THE ENCOUNTERING OF OTHER OBSTACLES DURING THE COURSE OF THE WORK. THE CONTRACTOR SHALL BE RESPONSIBLE AND SHALL PAY FOR ALL DAMAGES TO EXISTING UTILITIES. THE CONTRACTOR SHALL NOT ASSUME THAT WHERE NO UTILITIES ARE SHOWN, THAT NONE EXIST.
- PRIOR TO INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY BOARD OF WATER SUPPLY, THE MANUFACTURER'S CERTIFICATION THAT ALL CAST IRON (GREY OR DUCTILE) FITTINGS FOR THE PROJECT CONFORM IN ALL RESPECTS TO THE WATER SYSTEM STANDARDS, DATED 2002.
- POLYGON SHAPE FOR MECHANICAL JOINT GLANDS AS DESCRIBED IN AWWA STANDARD C111 SHALL BE "STRAIGHT-SIDED" OR AN APPROVED EQUAL ON A JOB TO JOB BASIS.
- REAPPROVAL SHALL BE REQUIRED IF THIS PROJECT IS NOT UNDER CONSTRUCTION WITHIN A PERIOD OF TWO YEARS.
- CONTRACTOR SHALL CUT AND PLUG ALL EXISTING UNUSED LATERALS AT THE MAIN WHETHER OR NOT SHOWN ON THE PLANS. THE DAMAGED AREA SHALL BE REPAIRED TO AN EQUAL OR BETTER CONDITION THAN THE IMMEDIATE AREA. ALL WORK SHALL BE DONE AT THE EXPENSE OF THE CONTRACTOR.
- THE CONTRACTOR SHALL FURNISH AND INSTALL POLYETHYLENE WRAP, 3 FEET MINIMUM AT ALL TAPS (FOR DI PIPE AND COPPER LATERAL COMBINATION ONLY) AND PLASTIC PIPE (PE TUBING) 3 FEET LONG AFTER METERS FOR ALL SERVICE LATERAL CONNECTIONS.
- ADEQUATE OFF-SITE FIRE PROTECTION MEETING THE BWS STANDARD SHALL BE INSTALLED AND COMPLETED PRIOR TO CONSTRUCTION OF HOMES, INCLUDING MODEL HOMES.
- AT THE ELECTRICAL/SIGNAL DUCTLINE WATER CROSSINGS, ADJUST ALL ELECTRICAL/SIGNAL DUCTLINE ELEVATIONS TO MAINTAIN 6" VERTICAL CLEAR SEPARATION FROM ALL WATERLINES (12" CLEAR FOR ALL ELECTRICAL/SIGNAL DUCTLINE STRUCTURES LARGER THAN 16") AT NO COST TO THE BOARD OF WATER SUPPLY.
- MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATERLINE SYSTEMS AND NEAREST ELECTRICAL/SIGNAL DUCTLINES PARALLELING THE WATER SYSTEM AT NO COST TO THE BOARD OF WATER SUPPLY.
- MAINTAIN 3'-0" MIN. HORIZONTAL CLEAR SEPARATION BETWEEN STREET LIGHT/TRAFFIC SIGNAL, STANDARDS (INCLUDING ANY MODULAR UNITS) AND THE NEAREST WATER SYSTEM. CONTRACTOR SHALL FIELD VERIFY FOR ANY CONFLICTS AT EACH STREET LIGHT/TRAFFIC SIGNAL STANDARD LOCATION. WHERE CONFLICTS OCCUR, THE CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER TO REVISE THE STREET LIGHT/TRAFFIC SIGNAL STANDARD TO PROVIDE THE REQUIRED CLEARANCES AT NO COST TO THE BWS.
- THE CONTRACTOR/DEVELOPER SHALL OBTAIN A NPDES PERMIT PRIOR TO CHLORINATION AND/OR DEWATERING. A COPY OF THE PERMIT SHALL BE SUBMITTED TO THE BOARD OF WATER SUPPLY, CAPITAL PROJECTS DIVISION, CONSTRUCTION SECTION.

WATER NOTES CONT'D.

- PIPE CUSHION SHALL BE OF HIGH RESISTIVITY MATERIAL. THE CONTRACTOR SHALL SUBMIT A SOIL CERTIFICATION THAT HIGH RESISTANT CUSHION MATERIAL HAS A RESISTIVITY GREATER THEN 5,000 OHM-CM. REMAINDER OF THE BACKFILL MATERIAL SHALL BE SPECIFIED IN THE WATER SYSTEM STANDARDS. PIPE CUSHION AND BACKFILL MATERIAL SHALL CONTAIN NO HAZARDOUS SUBSTANCES ABOVE REGULATORY ACTION LEVELS INCLUDING BUT NOT LIMITED TO LEAD, ASBESTOS, MERCURY, CHROMIUM, CADMIUM, ZINC, STRONTIUM, AND POLYCHLORINATED BIPHENYLS (PCB).
- UPON COMPLETION OF THE PROJECT, THE DEVELOPER SHALL PROVIDE THE BWS WITH A CERTIFICATE FROM A REGISTERED SOILS ENGINEER CERTIFYING THAT THE ROAD PRISM HAS BEEN CONSTRUCTED IN ACCORDANCE TO CITY AND COUNTY ROADS STANDARDS.
- ALL DUCTILE IRON PIPE, FITTINGS AND VALVES SHALL BE WRAPPED WITH TWO LAYERS OF 8 MIL. POLYETHYLENE WRAP.
- TWO-WAY BLUE REFLECTIVE HYDRANT MARKERS TYPE DB SHALL BE INSTALLED AT ALL NEW FIRE HYDRANT INSTALLATIONS. CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS OF HYDRANT MARKERS WITH THE NEAREST HONOLULU FIRE DEPARTMENT BATTALION CHIEF.
- CLEANING SHALL BE BY THE USE OF "PIGS" INTRODUCED INTO THE PIPELINE AND RUN COMPLETELY THROUGH ALL INSTALLED PIPELINES AND ALL BRANCH LINES FOR FIRE HYDRANTS. "PIGGING" OF SERVICE LATERALS IS NOT REQUIRED. BARE FOAM "PIGS" SHALL BE USED TO SWAB PIPING CLEAN AS EACH LENGTH OF THE PIPELINE IS INSTALLED. EACH "PIG" SHALL CONSIST OF A CYLINDRICAL PIECE OF POLYURETHANE FOAM WITH A DENSITY OF 3-7 POUNDS PER CUBIC FOOT AND A VINYL-COATED NOSE. OUTSIDE DIAMETER OF THE "PIG" SHALL BE EQUAL TO 1-1/4 TO 1-1/2 TIMES THE INSIDE DIAMETER OF THE PIPE BEING INSTALLED. THE LENGTH OF THE "PIG" SHALL BE 1-1/2 TO 2 TIMES ITS DIAMETER. PRIOR TO USE, THE "PIG" SHALL BE SUBMERGED IN A CHLORINE SOLUTION OF 1 OZ. OF 5% CHLORINE BLEACH IN 5 GALLONS OF WATER. "PIGGING" OF THE PIPELINE SHALL BE CONSIDERED INCIDENTAL TO THE INSTALLATION OF THE NEW PIPELINE.
- ALL SECTIONS OF THE WATER MAIN REQUIRING REINFORCED CONCRETE JACKETING SHALL BE DUCTILE IRON PIPE OR CONCRETE CYLINDER PIPE AND FITTINGS.
- BALL CORPORATION AND BALL STOP SHALL BE USED IN LIEU OF A CORPORATION STOP AND STOPCOCK, RESPECTIVELY.
- INSTALL 4 MIL THICK, NON-METALLIC, BLUE COLORED, 6 INCHES WIDE WARNING TAPE OVER CENTERLINE OF THE PIPE AND BELOW THE BASE COURSE ALONG THE ENTIRE LENGTH OF TRENCH. TAPE SHOULD BE MARKED WITH "CAUTION WATER LINE BURIED BELOW".
- POLYVINYL CHLORIDE (PVC) PIPES SHALL BE CLASS 150. ALL DUCTILE IRON VALVES AND METALLIC FITTINGS SHALL BE WRAPPED WITH TWO LAYERS OF 8 MIL POLYETHYLENE WRAP. NO BENDING OF POLYVINYL CHLORIDE PIPES SHALL BE PERMITTED. THE INSTALLATION OF PVC PIPE, ACCORDING TO THE PLANS AND SPECIFICATIONS AS BID ON BY THE CONTRACTOR, MAY REQUIRE ADDITIONAL DESIGN WORK, ADDITIONAL FITTINGS AND SPECIAL COUPLINGS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID THE THE PROPOSAL FOR PVC PIPE. ANY ADDITIONAL DESIGN WORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- ALL POLYVINYL CHLORIDE (PVC) PIPE DEFLECTIONS SHALL BE ACCOMPLISHED ONLY BY THE USE OF SPECIAL PVC DEFLECTION COUPLINGS. DEFLECTION AROUND CURVES SHALL BE ACCOMPLISHED ONLY BY THE USE OF PVC DEFLECTION COUPLINGS.
- THE CONTRACTOR SHALL FURNISH AND INSTALL POLYETHYLENE WRAP, 3 FEET MINIMUM AT ALL TAPS (FOR DI PIPE AND COPPER LATERAL COMBINATION ONLY) AND PLASTIC PIPE (PE TUBING) 3 FEET LONG AFTER METERS FOR ALL SERVICE LATERAL CONNECTIONS.
- ALL SECTIONS OF THE WATER MAIN REQUIRING REINFORCED CONCRETE JACKETING SHALL BE DUCTILE IRON PIPE CLASS 52 WITH DUCTILE IRON FITTINGS OR CONCRETE CYLINDER PIPE AND FITTINGS.
- BOSSSED TEES REQUIRED FOR ALL LATERAL AND ARV CONNECTIONS TO PVC MAINS.
- THE CONTRACTOR SHALL INSTALL ELECTRONIC MARKERS TO ALL MAINS AND TEST THE ELECTRONIC MARKERS PRIOR TO INSTALLATIONS TO VERIFY PROPER OPERATION. BWS PERSONNEL SHALL VERIFY THE NUMBER AND LOCATIONS OF PLACED ELECTRONIC MARKERS BEFORE FINAL PAVING OF THE PROJECT.
- ALL PVC FITTINGS SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATIONS (AWWA) C-907. DUCTILE IRON FITTINGS SHALL BE USED FOR ALL TYPES OF FITTINGS NOT SPECIFIED IN AWWA C-907.
- REACTION BLOCK REQUIREMENTS FOR PVC FITTINGS SHALL BE THE SAME FOR DUCTILE IRON FITTINGS.
- THE USE OF HUB CLAMPS AND SET SCREWS ON PVC SCREWS ON PVC FITTINGS IS NOT APPROVED.
- PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BWS, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM TO AWWA C-907.

WATER NOTES CONT'D.

- FOR CUT-IN CONNECTION TO EXISTING:
"ALL WATERLINE CONSTRUCTION REQUIRING SHUTDOWN CONNECTION SHALL BE SCHEDULED FOR NORMAL WORKING HOURS AT SIX (6) HOURS MAXIMUM DOWNTIME."
- WATER PIPELINE CHLORINATION AND TESTING PROCEDURES
A. THE FOLLOWING CHLORINATION AND WATER SAMPLE COLLECTION PROCEDURE SHALL APPLY TO ALL WATER PIPELINE PROJECTS:

STEP 1: CHLORINATE MAIN BY FILING WITH WATER AND INTRODUCING CHLORINE IN SUFFICIENT QUANTITY TO OBTAIN A MINIMUM CHLORINE CONCENTRATION OF 50 PARTS PER MILLION. LEAVE CHLORINATED WATER IN MAIN OVERNIGHT.

STEP 2: FLUSH MAIN WITH FRESH WATER UNTIL ALL CHLORINE HAS BEEN FLUSHED OUT AS EVIDENCE BY THE ORTHO-TOLIDINE TEST, THEN COLLECT A WATER SAMPLE WHILE CONTINUING TO FLUSH THE MAIN.

STEP 3: REPEAT STEPS 1 AND 2. AFTER COLLECTING THE SECOND WATER SAMPLE, STOP FLUSHING AND ALLOW THE WATER TO STAND IN THE MAIN OVERNIGHT.

STEP 4: THOROUGHLY FLUSH THE MAIN WITH FRESH WATER UNTIL ALL WATER THAT HAD BEEN STANDING IN THE MAIN OVERNIGHT HAS BEEN FLUSHED OUT. STOP FLUSHING AND LET THE WATER STAND IN THE MAIN FOR ONE HOUR. COLLECT A WATER SAMPLE.

B. THE MAIN IS DEEMED ACCEPTABLE AND CERTIFIED WHEN (1) TWO CONSECUTIVE WATER SAMPLES, COLLECTED 24 HOURS APART UNDER STEPS 1 AND 2, SHOW NO TOTAL AND FECAL COLIFORM AND LESS THAN 200 COLONY FORMING UNITS (CFU) OF TOTAL BACTERIA AND (2) THE SAMPLE OF WATER HELD IN THE MAIN FOR ONE HOUR, COLLECTED UNDER STEP 4, ALSO SHOWS NO TOTAL AND FECAL COLIFORM AND LESS THAN 200 CFU OF TOTAL BACTERIA.

C. CHLORINATION, FLUSHING, SAMPLING AND TESTING WILL BE EXTENDED SHOULD UNSATISFACTORY RESULTS BE ENCOUNTERED. ANY SAMPLE THAT SHOWS POSITIVE COLIFORM PRESENCE OR TOTAL BACTERIA GREATER THAN 200 CFU IS UNSATISFACTORY.

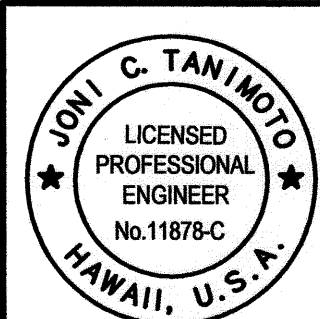
D. STEPS 1 AND 2 MAY BE REPEATED BEFORE COLLECTING THE ONE-HOUR HOLD SAMPLE SPECIFIED IN STEP 4. REPEATING STEPS 1 AND 2 IS RECOMMENDED IN THE EVENT THE SAMPLES SHOW THE PRESENCE OF COLIFORMS AND/OR INCREASING TOTAL BACTERIAL RESULTS FROM ONE SAMPLE TO THE NEXT.

E. WATER SAMPLES THAT SHOW THE PRESENCE OF ATYPICAL COLONIES, DEBRIS OR RESULTS INCONSISTENT WITH EXISTING WATER ARE SUBJECT TO RECONFIRMATION. BWS RESERVES THE RIGHT TO REQUEST AND TEST ADDITIONAL WATER SAMPLES IN THE INTEREST OF SAFEGUARDING PUBLIC HEALTH AND SAFETY.
- BOARD OF WATER SUPPLY APPROVAL OF THESE PLANS DOES NOT CONSTITUTE A WATER COMMITMENT. AVAILABILITY OF WATER WILL BE DETERMINED WHEN BUILDING PERMIT IS PRESENTED TO THE DEPARTMENT. WATER COMMITMENT WILL DEPEND UPON THE STATUS OF THE WATER SYSTEM AT THAT TIME. SHOULD WATER SERVICE BE MADE AVAILABLE, THE WATER COMMITMENT WILL BE EFFECTIVE WHEN THE PROJECT RECEIVES AN APPROVED BUILDING PERMIT FROM THE BUILDING DEPARTMENT. ALL WATER COMMITMENTS WILL BE CANCELED IN THE EVENT THE BUILDING PERMIT IS CANCELED.
- ADEQUATE OFF-SITE FIRE PROTECTION MEETING THE BWS STANDARD SHALL BE INSTALLED & COMPLETED PRIOR TO CONSTRUCTION OF HOMES, INCLUDING MODEL HOMES.
- PRESSURE REGULATORS RECOMMENDED FOR ALL LOTS BELOW THE 87 FOOT ELEVATION.
- FOR TRENCHLESS UTILITY WORK (MICRO-TUNNELING, DIRECTIONAL DRILLING, PIPE RAMMING/JACKING OF NEW UTILITIES SUCH AS ELECTRICAL DUCT LINES, SEWER LINES OR DRAIN LINES) CROSSING OR PARALLELING EXISTING WATERLINES, PROVIDE 3' MINIMUM HORIZONTAL AND VERTICAL CLEARANCE TO EXISTING WATERLINES. THE UTILITY OWNER OR CONTRACTOR SHALL MAKE ADJUSTMENTS TO MEET THE MINIMUM CLEARANCES SHOULD THE UTILITY LINE BE INSTALLED CLOSER TO THE EXISTING WATERLINES, AT NO COST TO BWS. THE CONTRACTOR SHALL SUBMIT AS-BUILT PLANS OF THE NEW UTILITY LINES AFTER INSPECTION OF THE PROJECT.
- FIBER OPTIC DUCTLINES SHALL BE INSTALLED AT A MINIMUM OF 5' HORIZONTAL CLEARANCE TO ANY WATERLINES OR APPURTENANCES
- WHERE 5' HORIZONTAL CLEARANCE IS NOT FEASIBLE, FIBER OPTIC DUCTLINES SHALL BE AT LEAST 3' CLEAR, HORIZONTALLY, AND SHALL BE JACKETED IN CONCRETE, OR GROUTED IN CONCRETE AND ENCASED IN A CARRIER PIPE.

APPROVED:

MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN
CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

DATE



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

WATER NOTES CONT'D.

- FOR FIBER OPTIC DUCTLINES CROSSING WATERLINES, THE FIBER OPTIC DUCTLINES SHALL BE CONCRETE JACKETED OR CONCRETE GROUTED AND ENCASED, AND SHALL BE A MINIMUM OF 18" BELOW THE WATERLINE (FOR OPEN TRENCH INSTALLATIONS), OR A MINIMUM OF 3' BELOW THE WATERLINE (FOR MICRO-TUNNELING, DIRECTIONAL DRILLING INSTALLATIONS).
- THE CONTRACTOR WILL PROVIDE ADEQUATE SUPPORT FOR THE WATERLINE WHEN THE FIBER OPTIC LINE IS INSTALLED UNDER OUR MAIN. FIBER OPTIC LINES WILL BE ALLOWED TO CROSS UNDER A WATERLINE, ONLY ON A STRAIGHT PORTION OF PIPE, WITHOUT THE PRESENCE OF ANY BENDS OR SUPPORTS.
- PRIOR TO THE PVC FITTING INSTALLATION, THE CONTRACTOR SHALL SUBMIT FOR APPROVAL BY THE BWS, THE MANUFACTURER'S CERTIFICATION THAT ALL PVC FITTINGS CONFORM TO AWWA C-907.

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GENERAL NOTES			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

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Last Save by: SHU
Last Saved: 1/30/2012
Plotted on: 2/2/2012

SIGNING AND MARKING NOTES

- ALL TRAFFIC SIGN AND PAVEMENT MARKING INSTALLATIONS SHALL BE DONE IN ACCORDANCE WITH THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, "2009 EDITION, AS AMENDED, THE LATEST SPECIFICATIONS FROM THE TRAFFIC REVIEW BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, AND AS SHOWN ON THE PLANS.
- CONTRACTOR SHALL NOTIFY AND COORDINATE WORK WITH THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, ONE (1) WEEK IN ADVANCE OF COMMENCING WORK AT 768-8084.
- CONTRACTOR SHALL SUBMIT MATERIAL BROCHURES FOR ALL SIGNS AND PAINT MATERIALS TO THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING.
- THE SIGNING AND/OR STRIPING CONTRACTOR SHALL KEEP ONE (1) SET OF APPROVED PLANS AT THE PROJECT SITE AT ALL TIMES DURING CONSTRUCTION WORK.
- CONTRACTOR SHALL PAINT TEMPORARY GUIDELINES AND OUTLINE OF ARROWS, LEGENDS, AND CROSSWALKS WITH A TWO INCH (2") WIDE BRUSHED LINE ON THE DAY THE ROADWAY IS OPENED TO TRAFFIC. THESE MARKINGS MUST BE APPROVED BY THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING.
- CONTRACTOR SHALL NOTIFY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084, THREE (3) DAYS IN ADVANCE OF FINAL INSPECTION.
- CONTRACTOR SHALL MEET WITH THE INSPECTOR FROM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING DURING THE FINAL INSPECTION.
- WITHIN TEN (10) DAYS FOLLOWING NOTIFICATION OF AWARD OF CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE DEPARTMENT OF PLANNING AND PERMITTING (PHONE: 768-8084) FOR APPROVAL, A LIST OF ANY SIGNING AND PAVEMENT MARKING MATERIAL WHICH HE PROPOSES TO INSTALL. THE LIST SHALL BE COMPLETE AS TO THE NAME OF THE MANUFACTURER, CATALOG NUMBER, AND SHALL BE SUPPLEMENTED WITH MATERIAL BROCHURES.
- UPON FINAL INSPECTION OF THE PROJECT, THE CONTRACTOR SHALL SUBMIT A LETTER CERTIFICATION FOR ALL TRAFFIC SIGNING AND PAVEMENT MARKING MATERIALS INSTALLED.
- SIGNS SHALL BE ATTACHED TO BRACKETS WITH 5/16" ZINC PLATED STEEL BOLTS, NUTS AND WASHERS. SIGNS 48" WIDE OR LARGER THAN 10 SQ. FT. IN AREA SHALL BE MOUNTED ON TWO 2" GALV. PIPE POST. THE SIGN SHALL BE INSTALLED WITH AT LEAST (1) ONE FOOT CLEARANCE FROM THE SIGN EDGE TO THE CURB FACE.
- ALL TRAFFIC SIGNS SHALL BE REFLECTORIZED.
- RAISED PAVEMENT MARKERS SHALL BE INSTALLED IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
- LOCATION OF "STOP" SIGN:
 - INSTALL "STOP" SIGN AT CURB TANGENT POINT.
 - INSTALL "STOP" SIGN ON METAL STREET LIGHT STANDARD IF A STANDARD IS LOCATED WITHIN 10 FEET OF CURB RETURN.
 - INSTALL "STOP" SIGN IN FRONT OF UTILITY POLE IF A POLE IS LOCATED WITHIN 10 FEET OF CURB RETURN.
- PAVEMENT WORD AND SYMBOL MARKINGS SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF PLANNING AND PERMITTING STANDARDS.
- THE CONTRACTOR SHALL USE THERMOPLASTIC MATERIAL, APPROVED BY THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING AND PERMITTING, FOR ALL CROSSWALKS, STOP BARS, PAVEMENT ARROWS, CENTER LINES, LANE LINES, ARC LINES, CHANNELIZED TRAFFIC ISLANDS, AND LEGENDS.

GENERAL NOTES FOR TRAFFIC CONTROL PLAN

- THE PERMITTEE SHALL MAKE MINOR ADJUSTMENTS AT INTERSECTIONS, DRIVEWAYS, BRIDGES, STRUCTURES, ETC., TO FIT FIELD CONDITIONS.
- CONES OR DELINEATORS SHALL BE EXTENDED TO A POINT WHERE THEY ARE VISIBLE TO APPROACHING TRAFFIC.
- TRAFFIC CONTROL DEVICES SHALL BE INSTALLED SUCH THAT THE SIGN OR DEVICE FARHEST FROM THE WORK AREA IS PLACED FIRST. THE OTHERS SHALL THEN BE PLACED PROGRESSIVELY TOWARD THE WORK AREA.
- REGULATORY AND WARNING SIGNS WITHIN THE CONSTRUCTION ZONE THAT ARE IN CONFLICT WITH THE TRAFFIC CONTROL PLANS SHALL BE REMOVED OR COVERED.
- FLAGGERS AND/OR POLICE OFFICERS SHALL BE IN SIGHT OF EACH OTHER OR IN DIRECT COMMUNICATION AT ALL TIMES.
- WHEN REQUIRED BY THE ISSUING OFFICE, THE PERMITTEE SHALL INSTALL A FLASHING ARROW SIGNAL AS SHOWN ON THE TRAFFIC CONTROL PLANS.
- ALL TRAFFIC LANES SHALL BE A MINIMUM OF 10 FEET WIDE.
- ALL CONSTRUCTION WARNING SIGNS SHALL BE PROMPTLY REMOVED OR COVERED WHENEVER THE MESSAGE IS NOT APPLICABLE OR NOT IN USE.
- THE BACKS OF ALL SIGNS USED FOR TRAFFIC CONTROL SHALL BE APPROPRIATELY COVERED TO PRECLUDE THE DISPLAY OF INAPPLICABLE SIGN MESSAGES (I.E., WHEN SIGNS HAVE MESSAGES ON BOTH FACES).
- LANE CLOSURE SHALL BE LIMITED ONLY TO THE EXTENT OF ACCOMPLISHING EACH DAY'S WORK. AS SOON AS EACH DAY'S WORK IS COMPLETED, THE PERMITTEE SHALL REMOVE ALL TRAFFIC CONTROL DEVICES NO LONGER NEEDED TO PERMIT FREE AND SAFE PASSAGE OF PUBLIC TRAFFIC. REMOVAL SHALL BE IN THE REVERSE ORDER OF INSTALLATION. EXISTING FADED OR OBLITERATED PAVEMENT MARKINGS THAT ARE NECESSARY FOR SAFE TRAFFIC FLOW IN THE CONSTRUCTION AREA SHALL BE REPLACED WITH TEMPORARY OR PERMANENT MARKINGS BEFORE OPENING THE ROADWAY TO PUBLIC TRAFFIC EACH DAY.
- PERMANENT PAVEMENT MARKINGS AND TRAFFIC SIGNS SHALL BE REPLACED UPON COMPLETION OF EACH PHASE OF WORK.
- CONES AND DELINEATORS SHALL BE SPACED AT A MAXIMUM DISTANCE OF 20 FEET APART. A MINIMUM OF SIX CHANNELIZING DEVICES SHALL BE USED FOR EACH TAPER LENGTH.
- DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THE RIGHT-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY. FURTHER, THE PERMITTEE SHALL CONTROL TRAFFIC GOING IN AND OUT OF DRIVEWAYS.
- BUFFER AND TAPER AREAS ON APPROACH TO ANY WORK AREA SHALL BE KEPT CLEAR OF VEHICLES AND EQUIPMENT.
- A HIGH LEVEL WARNING DEVICE (FLAG TREE) SHALL BE INSTALLED ON APPROACH TO ALL WORK AREAS.
- "NO PARKING" SIGNS SHALL BE POSTED WITHIN ANY WORK AREA AND FOR THE BUFFER AND TAPER AREAS APPROACHING THE WORK AREA.
- TRAFFIC CONTROL PLANS ARE APPROVED FOR WORK ON ANY CITY STREET AREA ONLY BETWEEN THE HOURS OF 8:30 A.M. AND 3:30 P.M.

TRAFFIC NOTES FOR WORK ON CITY & COUNTY STREETS

- A PERMIT SHALL BE OBTAINED FROM THE DEPARTMENT OF TRANSPORTATION SERVICES BEFORE WORK ON ANY PORTION OF A PUBLIC STREET OR HIGHWAY MAY BEGIN. CONSTRUCTION TRAFFIC CONTROL PLANS APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES AND/OR THE DEPARTMENT OF PLANNING AND PERMITTING MUST BE PROVIDED WHEN APPLYING FOR THE PERMIT.
- THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS AND OTHER PROTECTIVE FACILITIES, WHICH SHALL CONFORM TO THE "HAWAII ADMINISTRATION RULES GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITE ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAYS ADMINISTRATION'S "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROLS FOR STREET AND HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS."
- WORK ON ANY CITY STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:30 A.M. TO 3:30 P.M., MONDAY THROUGH FRIDAY, UNLESS OTHERWISE PERMITTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
- DURING WORKING HOURS, THE CONTRACTOR SHALL PROVIDE FOR THROUGH TRAFFIC. DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL AND ALL LANES SHALL BE OPEN TO TRAFFIC.
- AS REQUIRED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, THE CONTRACTOR SHALL PROVIDE OFF-DUTY POLICE OFFICERS TO CONTROL THE FLOW OF TRAFFIC.
- WHERE PEDESTRIAN WALKWAYS EXIST, THEY SHALL BE MAINTAINED IN PASSABLE CONDITION, OR OTHER FACILITIES FOR PEDESTRIANS SHALL BE PROVIDED. PASSAGE BETWEEN WALKWAYS AT INTERSECTIONS SHALL LIKEWISE BE PROVIDED.
- DRIVEWAYS SHALL BE KEPT OPEN UNLESS THE OWNERS OF THE PROPERTY USING THESE RIGHTS-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
- CONTRACTOR SHALL REFERENCE TO THE APPROVAL OF THE DEPARTMENT OF TRANSPORTATION SERVICES AND THE DEPARTMENT OF PLANNING AND PERMITTING, ALL EXISTING TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS PRIOR TO THE COMMENCEMENT OF CONSTRUCTION. THE CONTRACTOR SHALL REPLACE OR REPAIR ALL TRAFFIC SIGNS, POSTS AND PAVEMENT MARKINGS DISTURBED BY HIS ACTIVITIES.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF PLANNING AND PERMITTING AT 768-8084 ONE (1) WEEK PRIOR TO ANY WORK TO BE DONE ON SIGNS, POST AND PAVEMENT MARKINGS.
- NO EQUIPMENT SHALL BE STORED WITHIN STREET RIGHTS-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DEPARTMENT OF TRANSPORTATION SERVICES.
- THE OWNER (DEPARTMENT OF HAWAIIAN HOME LANDS) SHALL ENSURE THAT THE CONTRACTOR INSTALLS THE CONSTRUCTION TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MUTCD AND THE HAWAII ADMINISTRATION RULES AS SPECIFIED IN TRAFFIC NOTE #2.

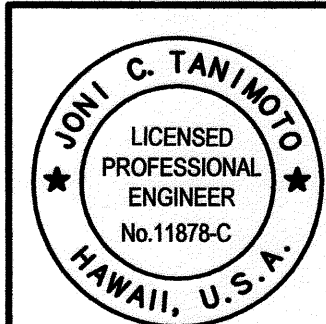
HISTORIC PRESERVATION NOTE

PURSUANT TO CHAPTER 6E, HRS, IN THE EVENT ANY ARTIFACTS OR HUMAN REMAINS ARE UNCOVERED DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL IMMEDIATELY SUSPEND WORK IN THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE HONOLULU POLICE DEPARTMENT, THE STATE DEPARTMENT OF LAND AND NATURAL RESOURCES- HISTORIC PRESERVATION DIVISION (692-8015), WHICH WILL ACCESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND AND APPROPRIATE MITIGATION MEASURE IF NECESSARY. IN ADDITION, FOR NON-CITY PROJECTS, THE CONTRACTOR SHALL INFORM THE CIVIL ENGINEERING BRANCH, DEPARTMENT OF PLANNING & PERMITTING (768-8084); AND FOR CITY PROJECTS, NOTIFY THE RESPONSIBLE CITY AGENCY.

APPROVED:

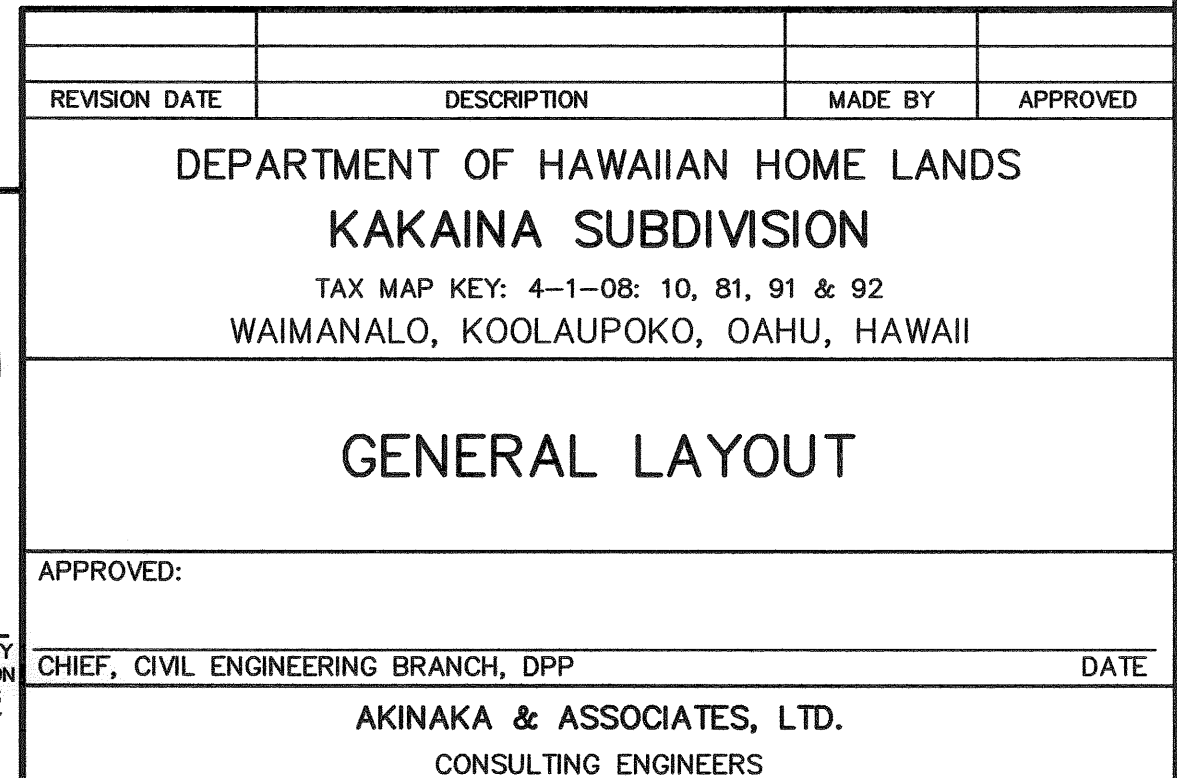
CHIEF, TRAFFIC REVIEW BRANCH, DPP

DATE

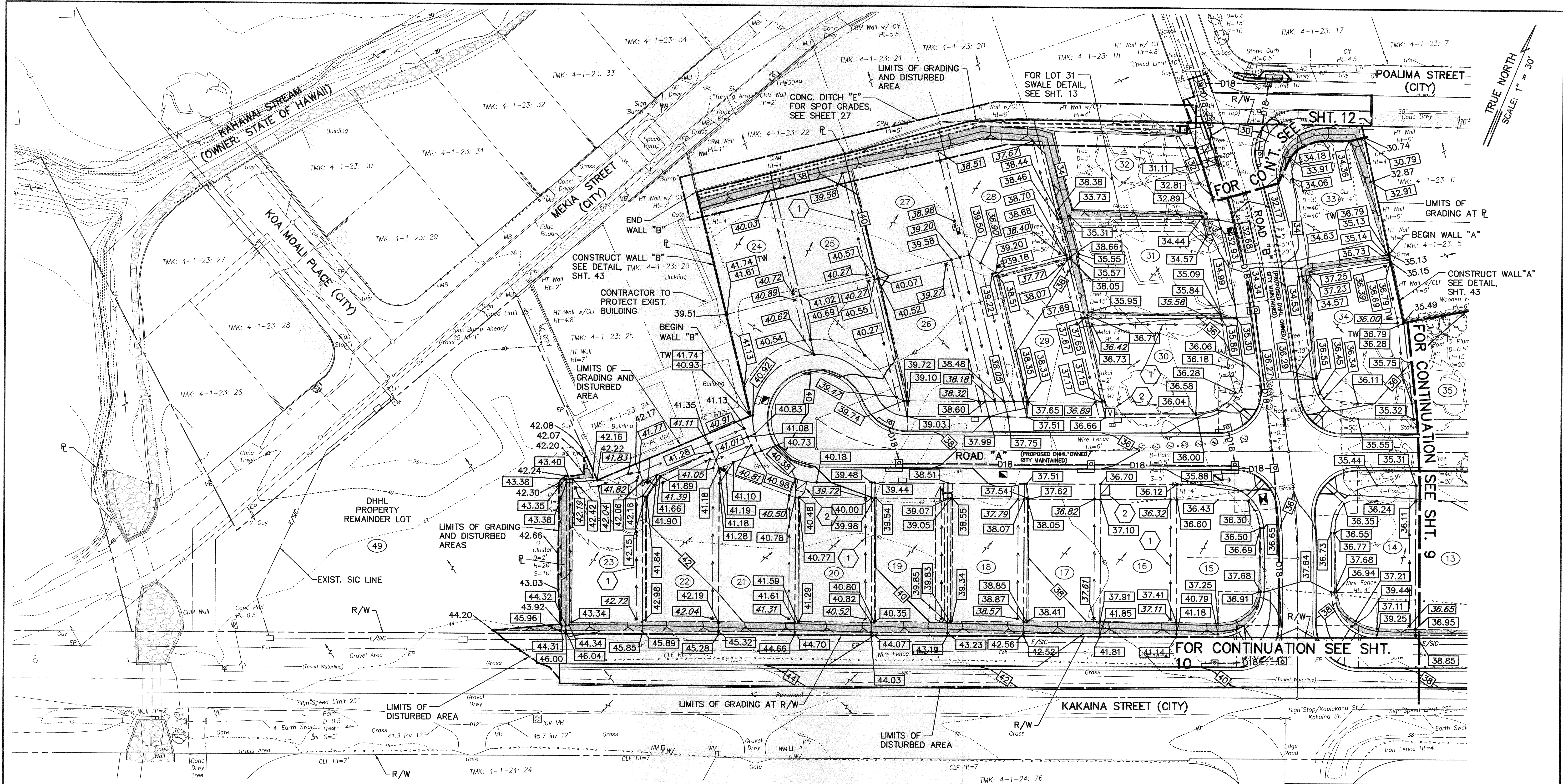


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GENERAL NOTES			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



Last Save by: MSM
Last Saved: 1/31/2012
Plotted on: 2/2/2012
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LEGEND

- LIMITS OF GRADING
---50--- EXISTING CONTOUR
—50— FINISH CONTOUR
— RUN-OFF FLOW DIRECTION
XX.XX FINISH SPOT GRADES
XX.XX EXISTING GRADES
- ⑩ LOT NUMBER
NEW 2:1 SLOPE
EXIST. LOT
NEW LOT
LIMITS OF GRADING AT R
TOP OF WALL ELEV.
FINISH GROUND ELEV. AT FACE OF WALL
EXIST. GROUND ELEV. AT FACE OF WALL
- HIGH PT. EARTH SWALE SEE DETAIL, SHEET 13
XX.XX SWALE SPOT GRADES
1 SWALES FOR LOTS 2, 4-12, 14, 16-30 & 34 SEE DETAIL, SHEET 13
2 SEE SHEET 14 FOR GRADING AT TRANSFORMER PADS & CATV POWER SUPPLY EQUIP.
* LOTS 13, 19, 31 & 43-45 REQUIRE SPECIAL SWALE GRADING FOR SWALE DETAILS, SEE SHEETS 13 AND 14

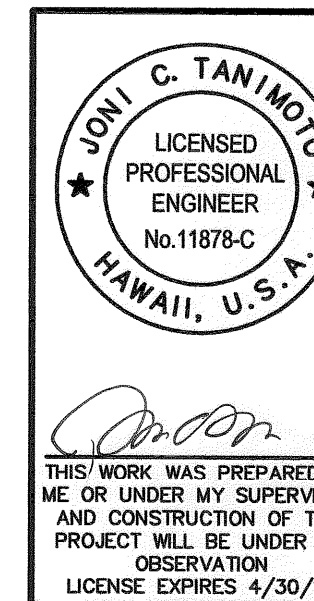
EARTHWORK QUANTITIES

AREA TO BE GRADED = 7.32 ACS.
EXC. = 8,858 C.Y.
EMB. = 6,183 C.Y.
AREA TO BE DISTURBED = 8.46 ACS.

NOTES:

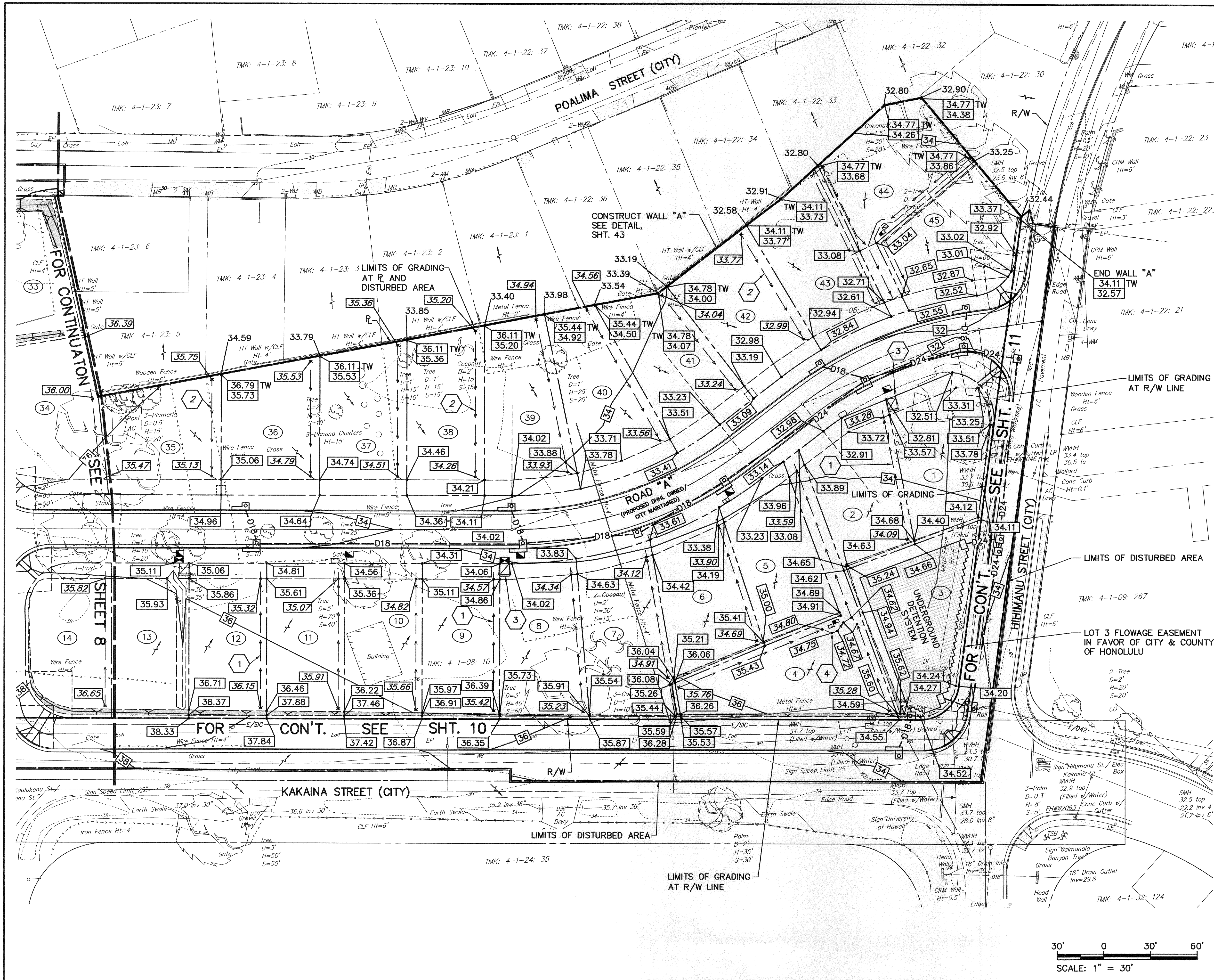
1. EARTHWORK QUANTITIES ARE FOR GRADING PERMIT PURPOSES.
2. QUANTITIES DOES NOT INCLUDE SHRINKAGE AND GRUBBING LOSSES.
3. CONTRACTOR SHALL DEMOLISH AND REMOVE EXIST. STRUCTURES, CONC. SLABS, A.C. PAVEMENTS, FENCE AND TREES WITHIN THE LIMITS OF GRADING UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO VERIFY EXIST. SITE CONDITIONS PRIOR TO BID.

30' 0 30' 60'
SCALE: 1" = 30'



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GRADING PLAN			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

Last Save by: MSM
Last Saved: 2/2/2012
Plotted on: 2/2/2012
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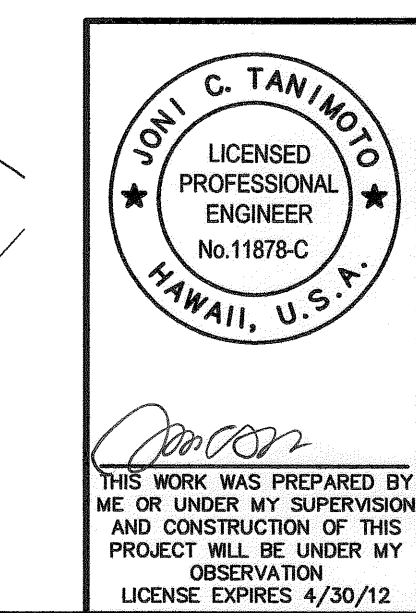


TRUE NORTH
SCALE: 1" = 30'

- LEGEND**
- LIMITS OF GRADING
 - 50--- EXISTING CONTOUR
 - 50— FINISH CONTOUR
 - RUN-OFF FLOW DIRECTION
 - XX.XX FINISH SPOT GRADES
 - XX.XX EXISTING GRADES
 - XX.XX SWALE SPOT GRADES
 - ⑩ LOT NUMBER
 - NEW 2:1 SLOPE
- EXIST. LOT LIMITS OF GRADING AT R/W NEW LOT TOP OF WALL ELEV. 41.74 TW 41.61 FINISH GROUND ELEV. AT FACE OF WALL EXIST. GROUND ELEV. AT FACE OF WALL 39.51
- HIGH PT. EARTH SWALE SEE DETAIL, SHEET 13
- XX.XX SWALE SPOT GRADES

- 1 SWALES FOR LOTS 2, 4-12, 14, 16-30 & 34. SEE DETAIL, SHEET 13
 - 2 SWALES FOR LOTS 35-42. SEE DETAIL, SHEET 13
 - 3 SEE SHEET 14 FOR GRADING AT TRANSFORMER PADS & CATV POWER SUPPLY EQUIP.
 - 4 DIRECT SWALE AROUND ELECTRICAL BOXES
- * LOTS 13, 19, 31 & 43-45 REQUIRE SPECIAL SWALE GRADING FOR SWALE DETAILS, SEE SHEETS 13 AND 14

- NOTE:**
- CONTRACTOR SHALL DEMOLISH AND REMOVE EXIST. STRUCTURES, CONC. SLABS, A.C. PAVEMENTS, FENCE AND TREES WITHIN THE LIMITS OF GRADING UNLESS OTHERWISE NOTED.
 - CONTRACTOR TO VERIFY EXIST. SITE CONDITIONS PRIOR TO BID.

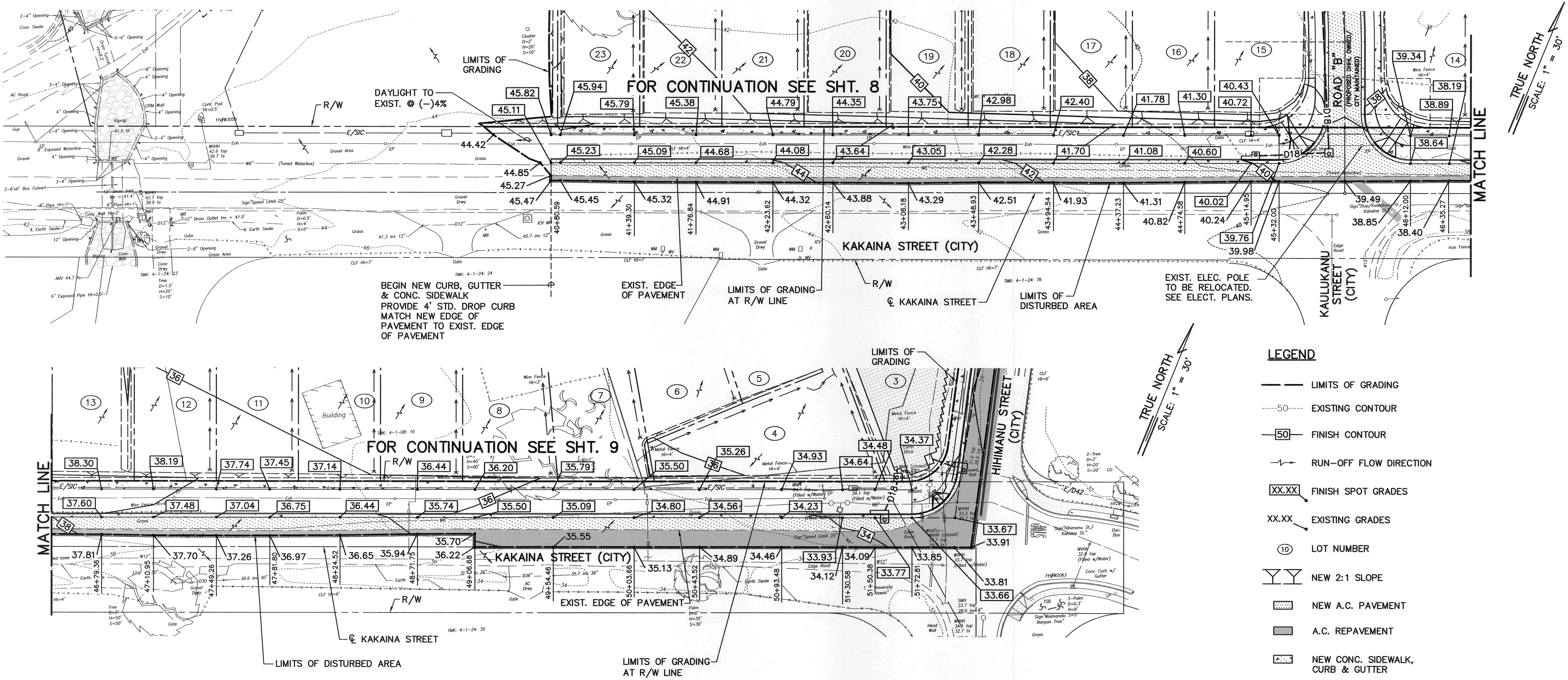


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GRADING PLAN			
APPROVED: _____ CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

30' 0 30' 60'
SCALE: 1" = 30'

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Last Save by: MSM
Last Saved: 2/2/2012
Plotted on: 2/2/2012

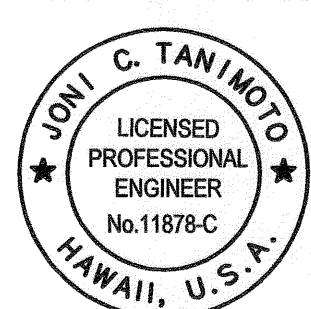
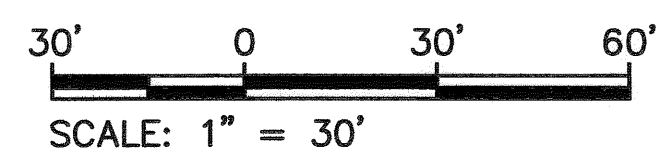


ELEVATION PLAN – KAKAINA STREET
SCALE: 1" = 30'

- LEGEND**
- LIMITS OF GRADING
 - 50--- EXISTING CONTOUR
 - 50— FINISH CONTOUR
 - RUN-OFF FLOW DIRECTION
 - XX.XX FINISH SPOT GRADES
 - XX.XX EXISTING GRADES
 - ⑩ LOT NUMBER
 - NEW 2:1 SLOPE
 - NEW A.C. PAVEMENT
 - A.C. REPAVEMENT
 - NEW CONC. SIDEWALK, CURB & GUTTER
 - SMOOTH RIDING CONNECTION

NOTE:

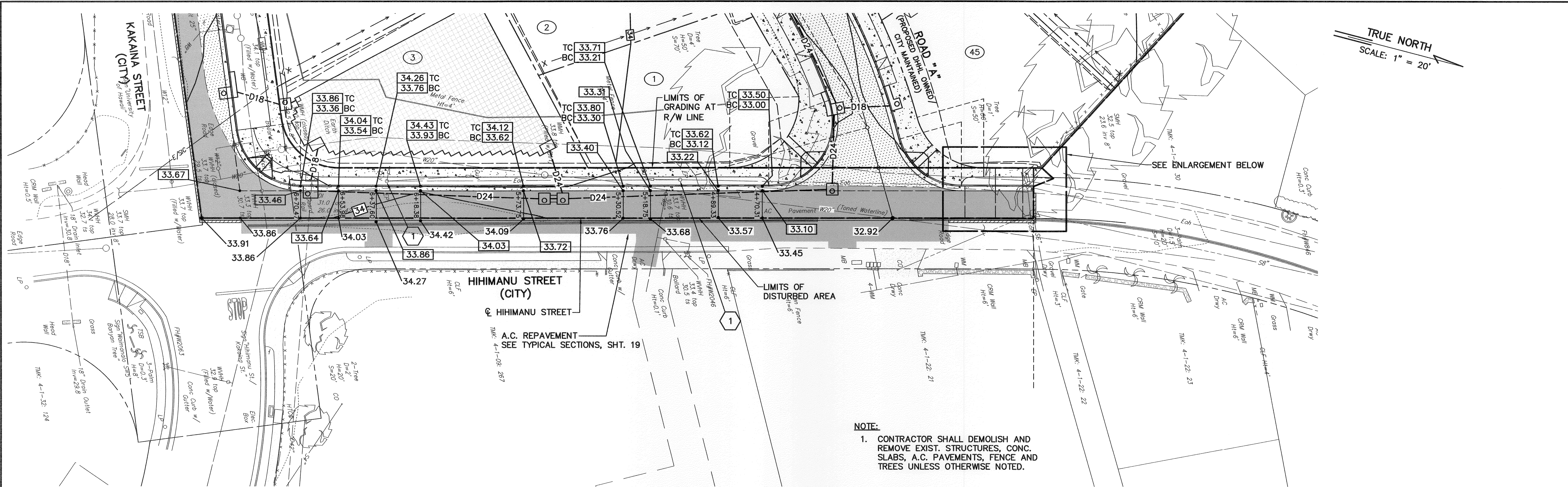
- CONTRACTOR SHALL DEMOLISH AND REMOVE EXIST. STRUCTURES, CONC. SLABS, A.C. PAVEMENTS, FENCE AND TREES UNLESS OTHERWISE NOTED.



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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
ELEVATION PLAN – KAKAINA STREET			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

Last Save by: MSM
Last Saved: 2/3/2012
Plotted on: 2/3/2012
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ELEVATION PLAN - HIHIMANU STREET

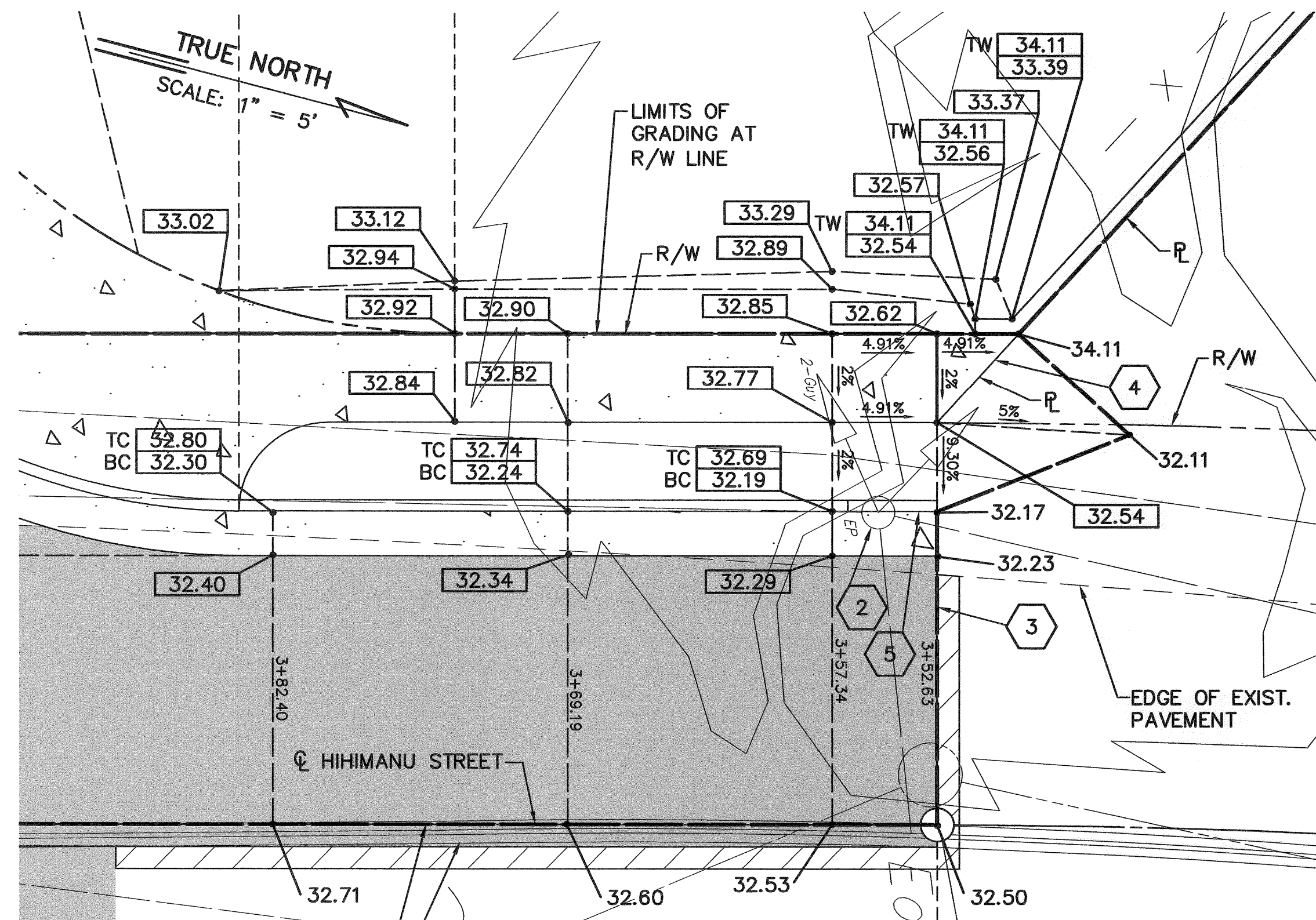
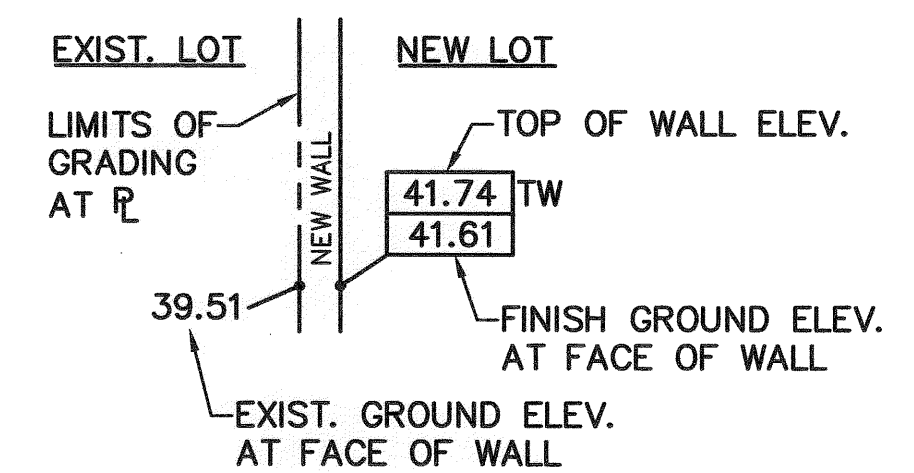
SCALE: 1" = 20'

NOTE:

1. CONTRACTOR SHALL DEMOLISH AND REMOVE EXIST. STRUCTURES, CONC. SLABS, A.C. PAVEMENTS, FENCE AND TREES UNLESS OTHERWISE NOTED.

LEGEND

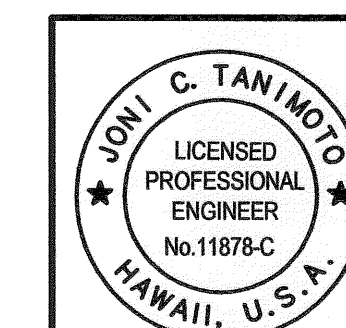
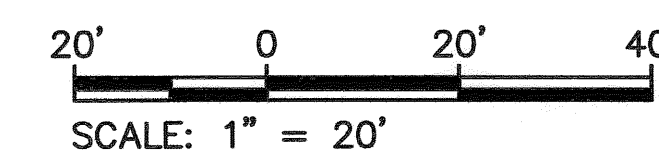
- LIMITS OF GRADING
- 50--- EXISTING CONTOUR
- 50— FINISH CONTOUR
- RUN-OFF FLOW DIRECTION
- XX.X FINISH SPOT GRADES
- XX.X EXISTING GRADES
- ⑩ LOT NUMBER
- YY NEW 2:1 SLOPE
- NEW A.C. PAVEMENT
- A.C. REPAVEMENT
- NEW CONC. SIDEWALK, CURB & GUTTER
- SMOOTH RIDING CONNECTION



ENLARGEMENT

SCALE: 1" = 5'

A.C. REPAVEMENT
SEE TYPICAL SECTIONS, SHT. 19

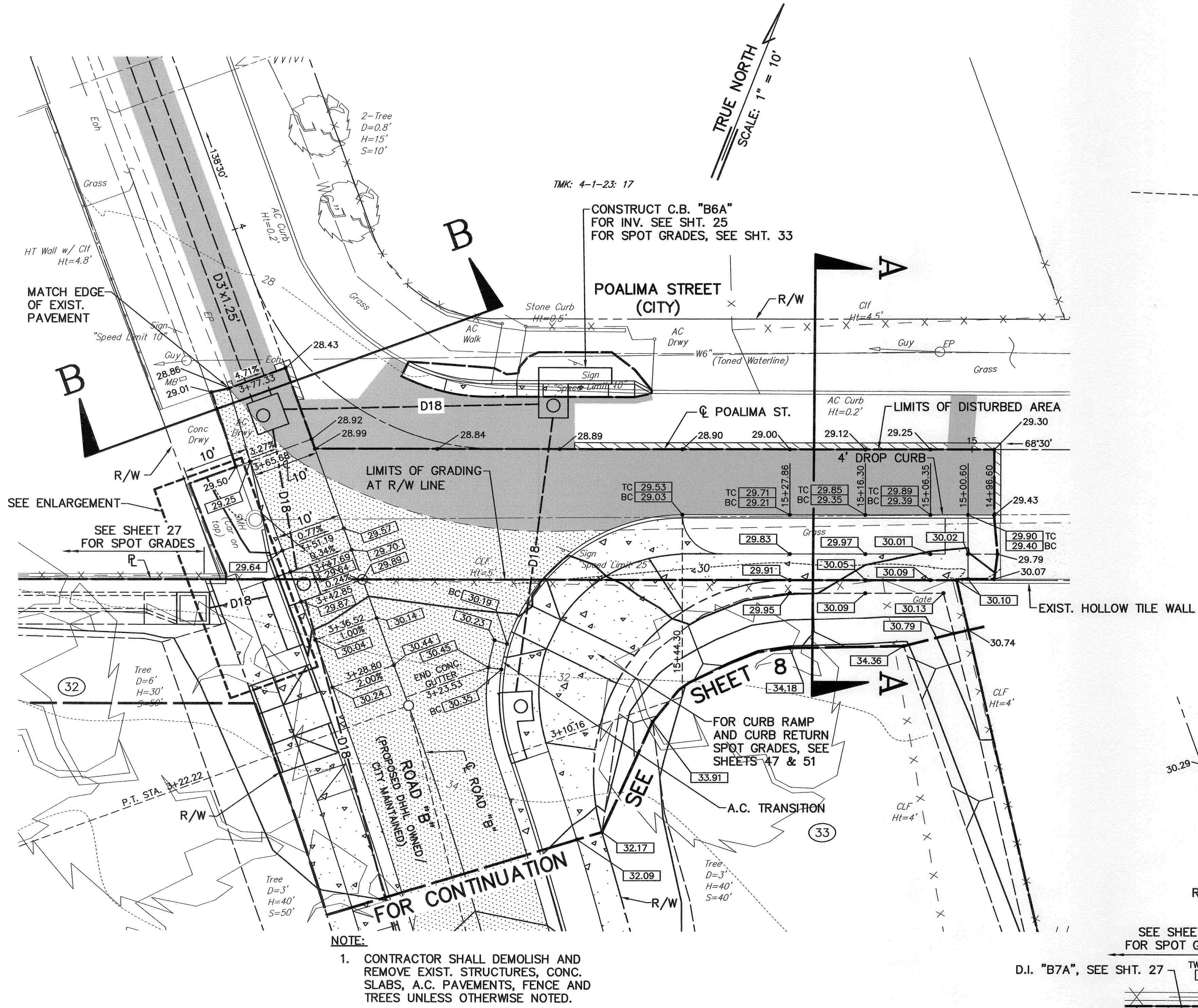


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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
ELEVATION PLAN - HIHIMANU STREET			
APPROVED: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

Last Save by: MSM
Last Saved: 2/2/2012
Plotted on: 2/2/2012

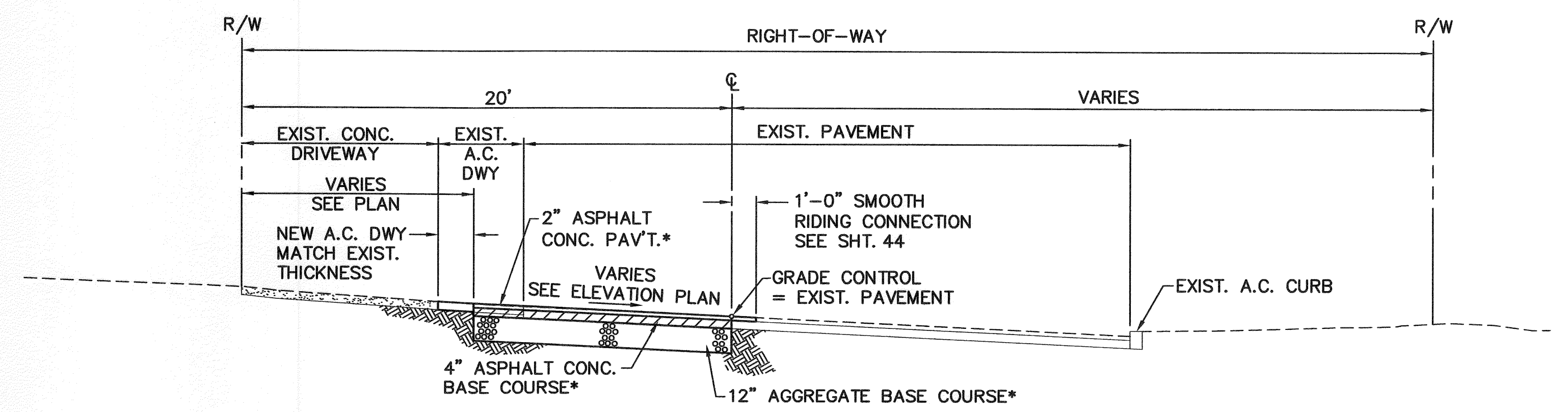
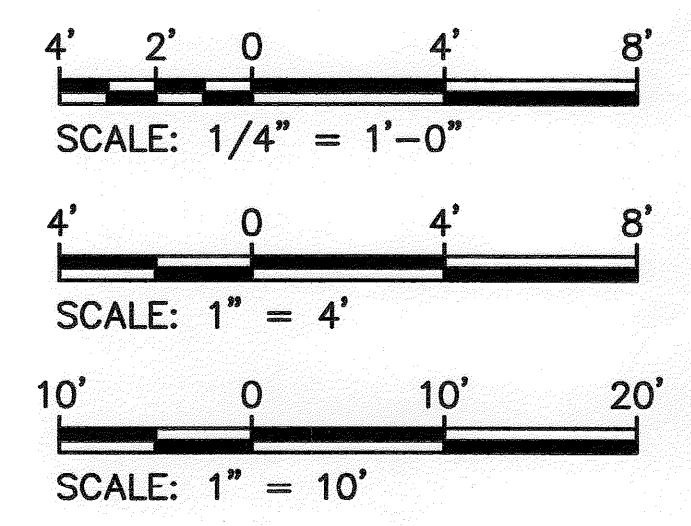
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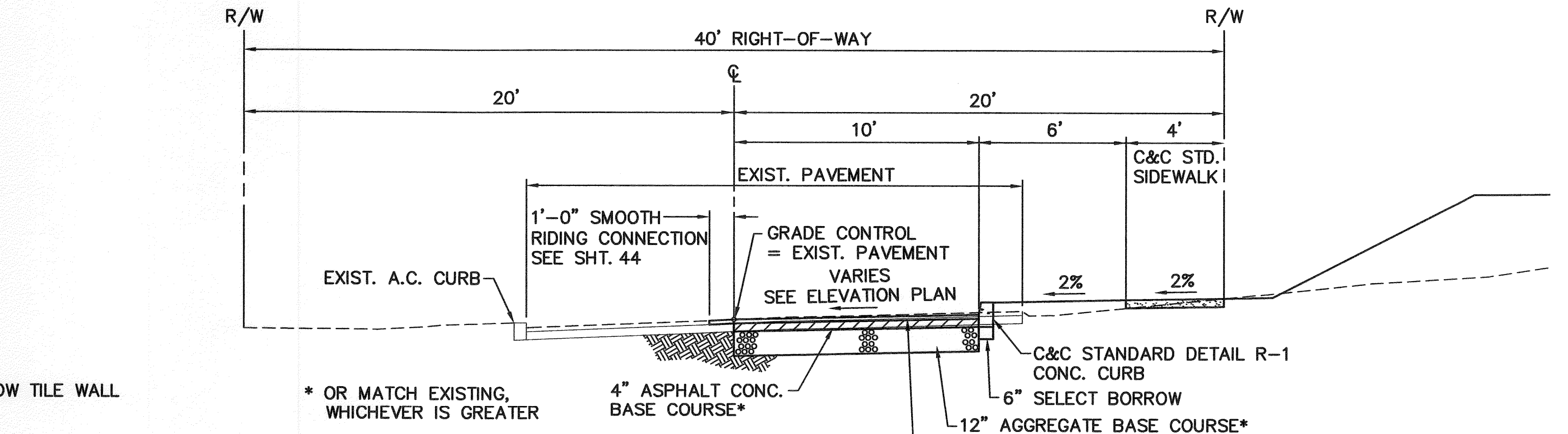
ELEVATION PLAN - POALIMA STREET
SCALE: 1" = 10'

LEGEND

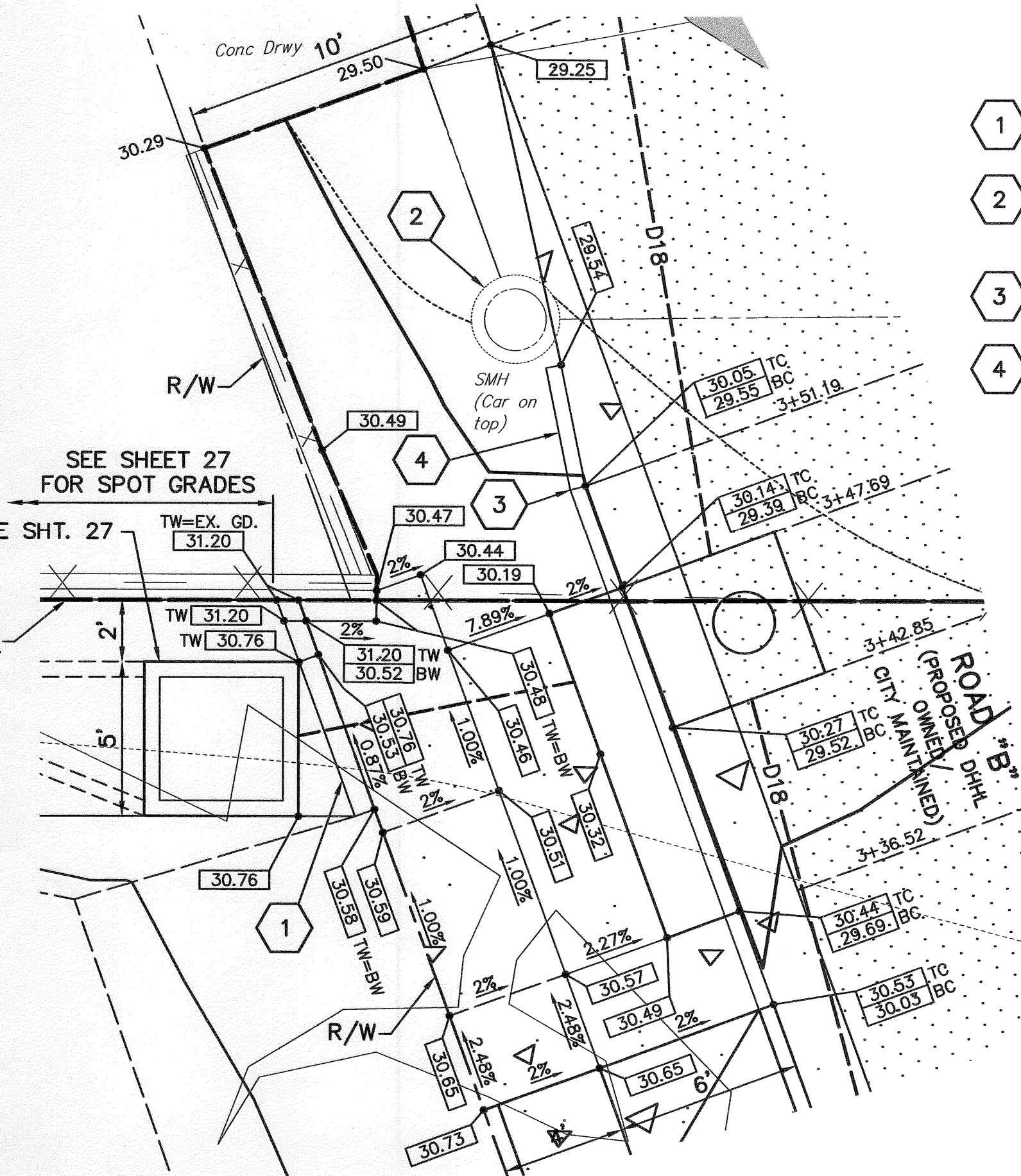
- LIMITS OF GRADING
- 50--- EXISTING CONTOUR
- 50— FINISH CONTOUR
- RUN-OFF FLOW DIRECTION
- XX.XX FINISH SPOT GRADES
- XX.XX EXISTING GRADES
- ⑩ LOT NUMBER
- NEW 2:1 SLOPE
- NEW A.C. PAVEMENT
- A.C. REPAVEMENT
- NEW CONC. SIDEWALK, CURB & GUTTER
- SMOOTH RIDING CONNECTION



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



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

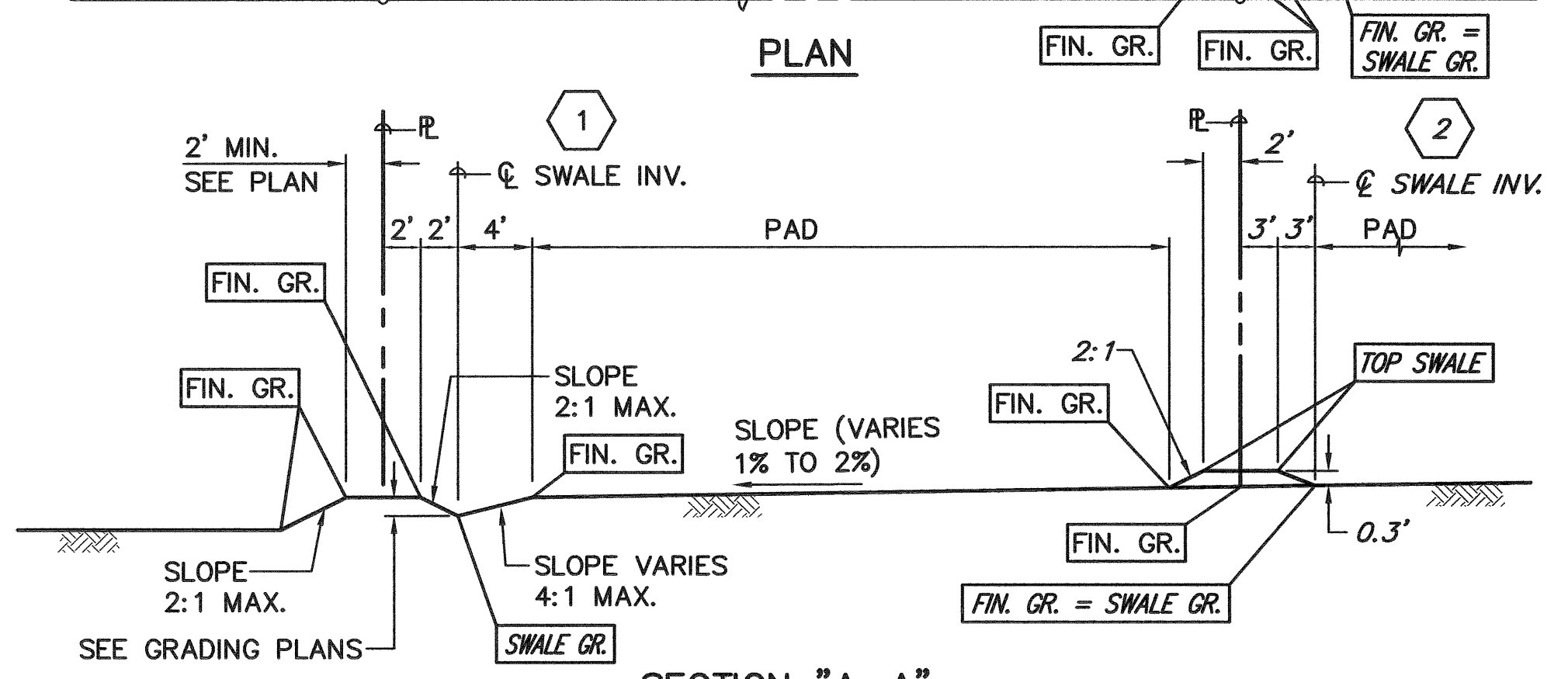


ENLARGEMENT
SCALE: 1" = 4'

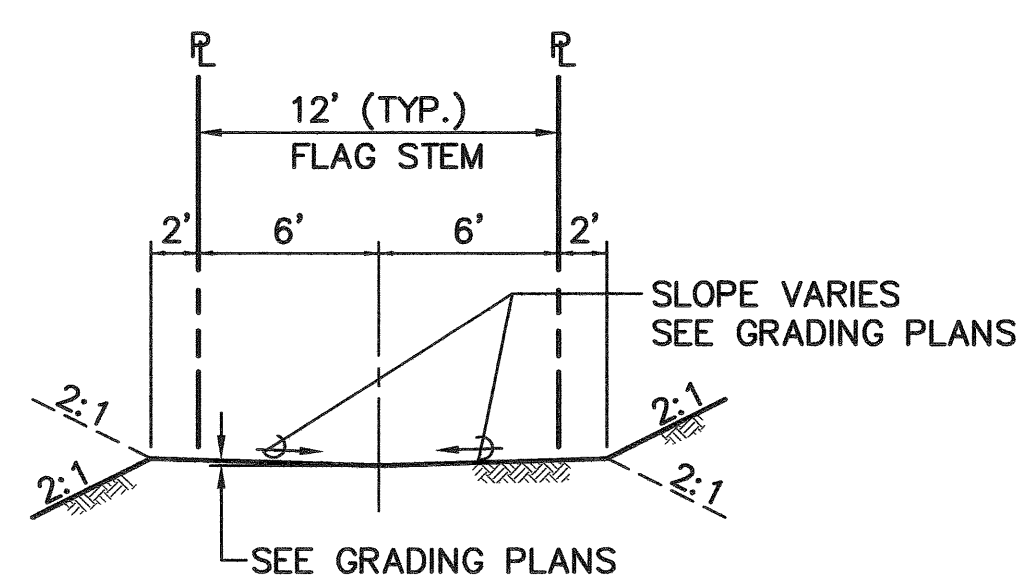
- 1 CONSTRUCT TYPE "B" WALL PER DPW STD. DETAIL R-31
- 2 ADJUST EXIST. SMH TOP TO FINISH GRADE TOP = 26.61
- 3 END CONC. CURB & GUTTER
- 4 CONSTRUCT 4' STD. DROP CURB


APPROVED: _____ DATE _____
CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS AND WORK WITHIN CITY R/W ONLY)

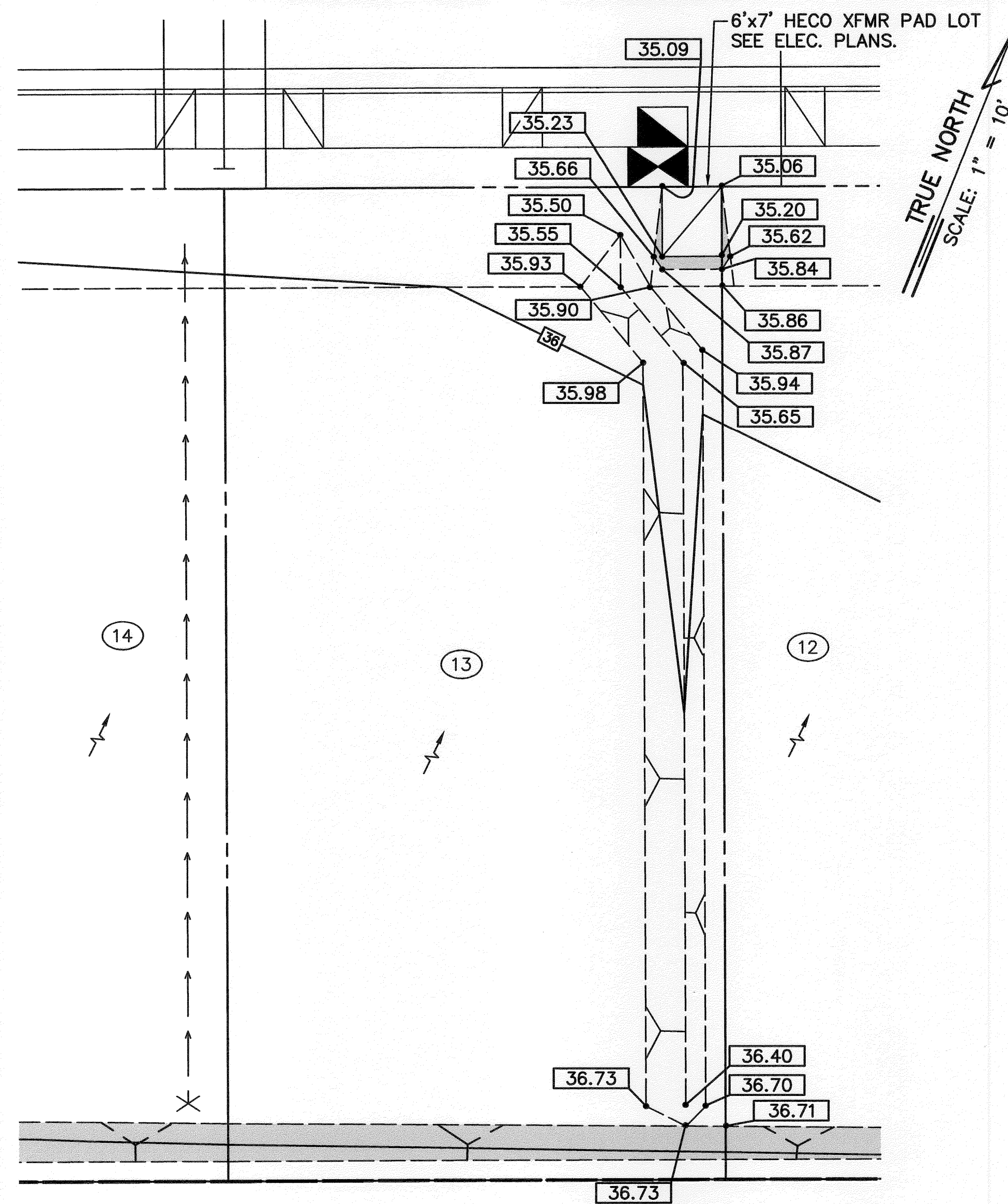
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
ELEVATION PLAN - POALIMA STREET			
APPROVED: _____ DATE _____ CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



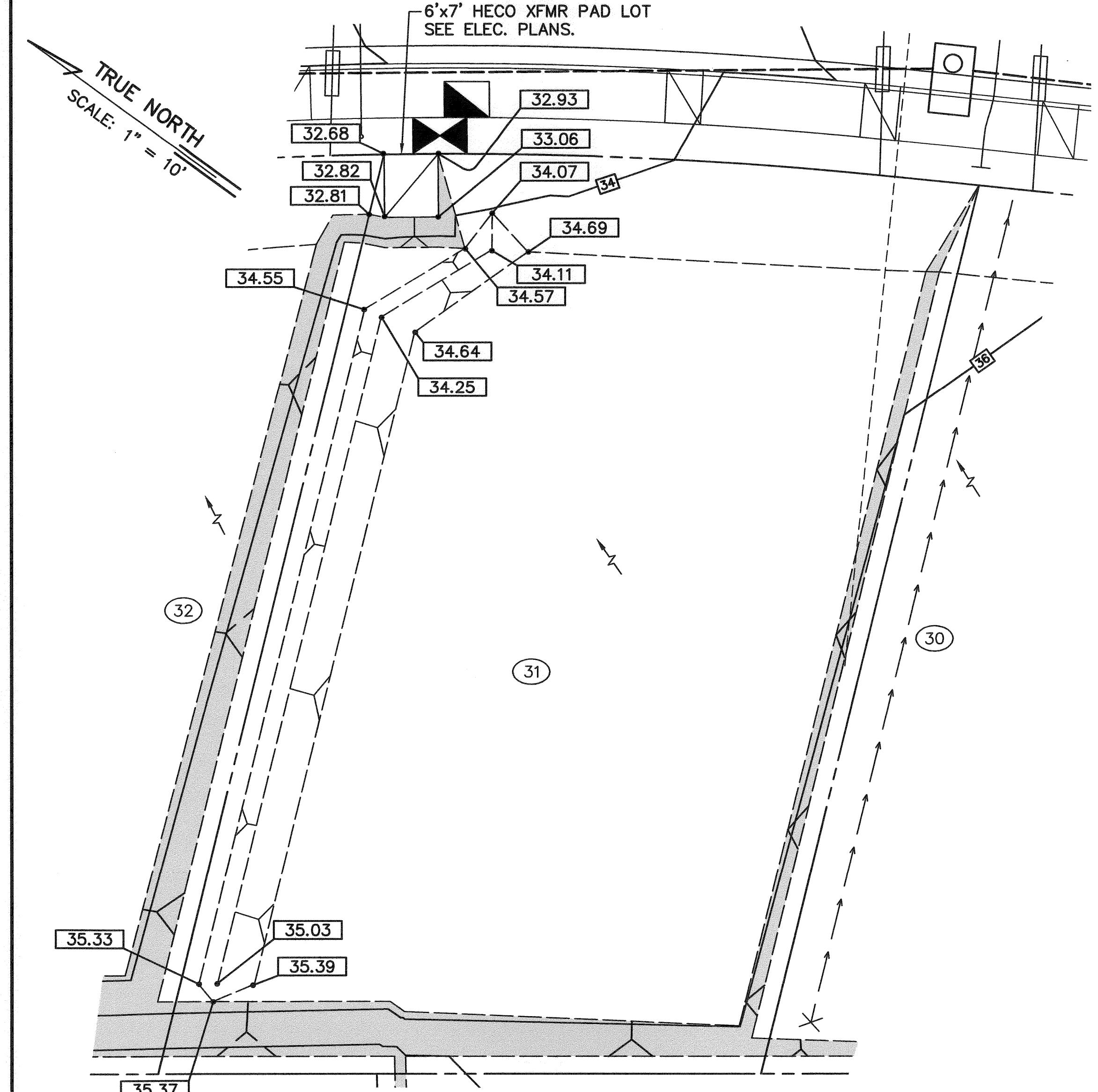
A TYPICAL LOT GRADING DETAIL
13 NOT TO SCALE



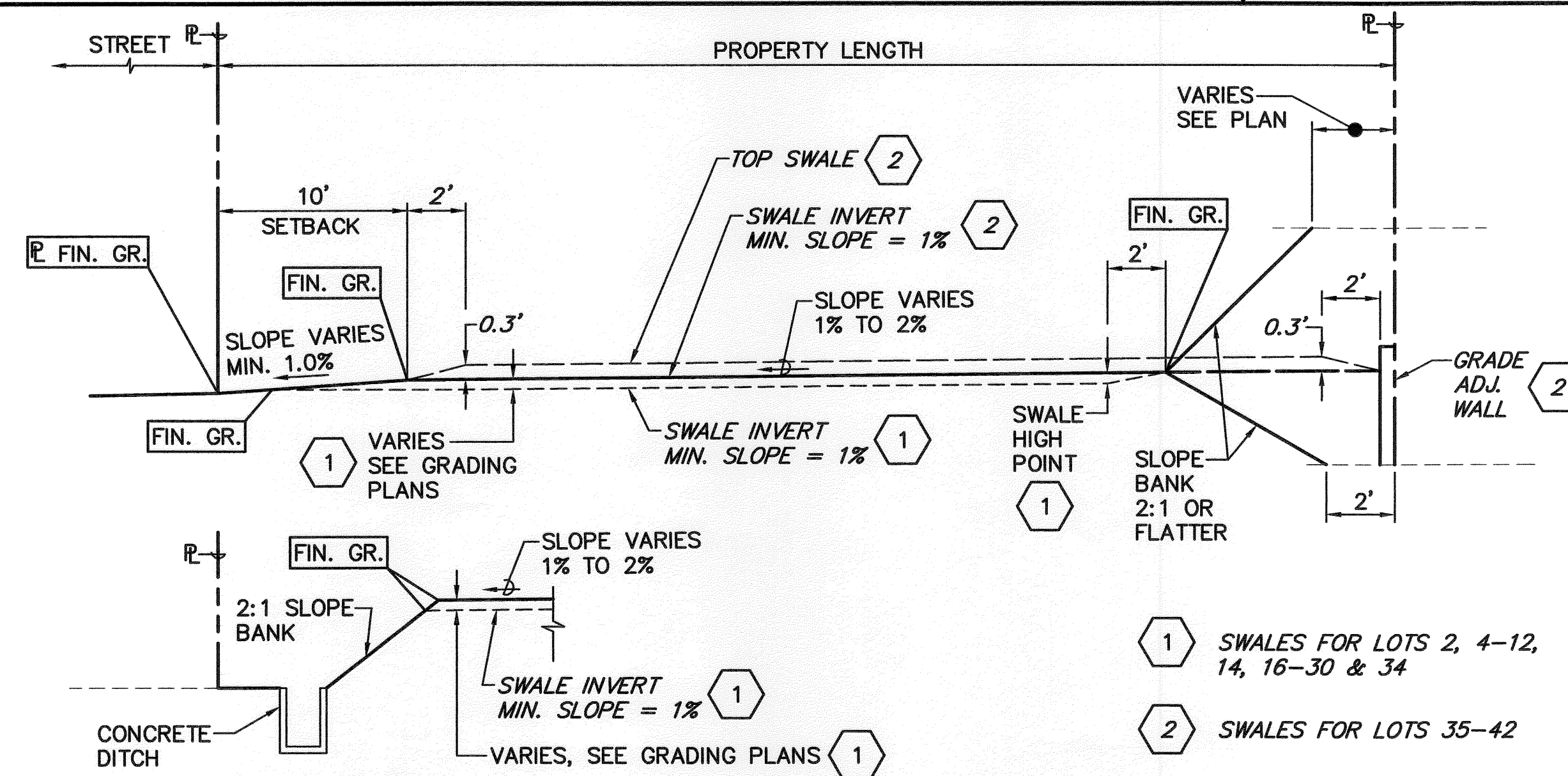

 CONDITION AT LEAS LOT STEM
 LOTS 4, 22, 23, 27 & 28
 NOT TO SCALE



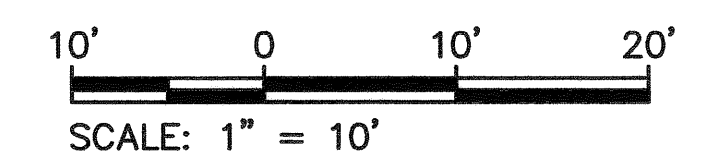
1 LOT 13 SWALE
13 SCALE: 1" = 10'



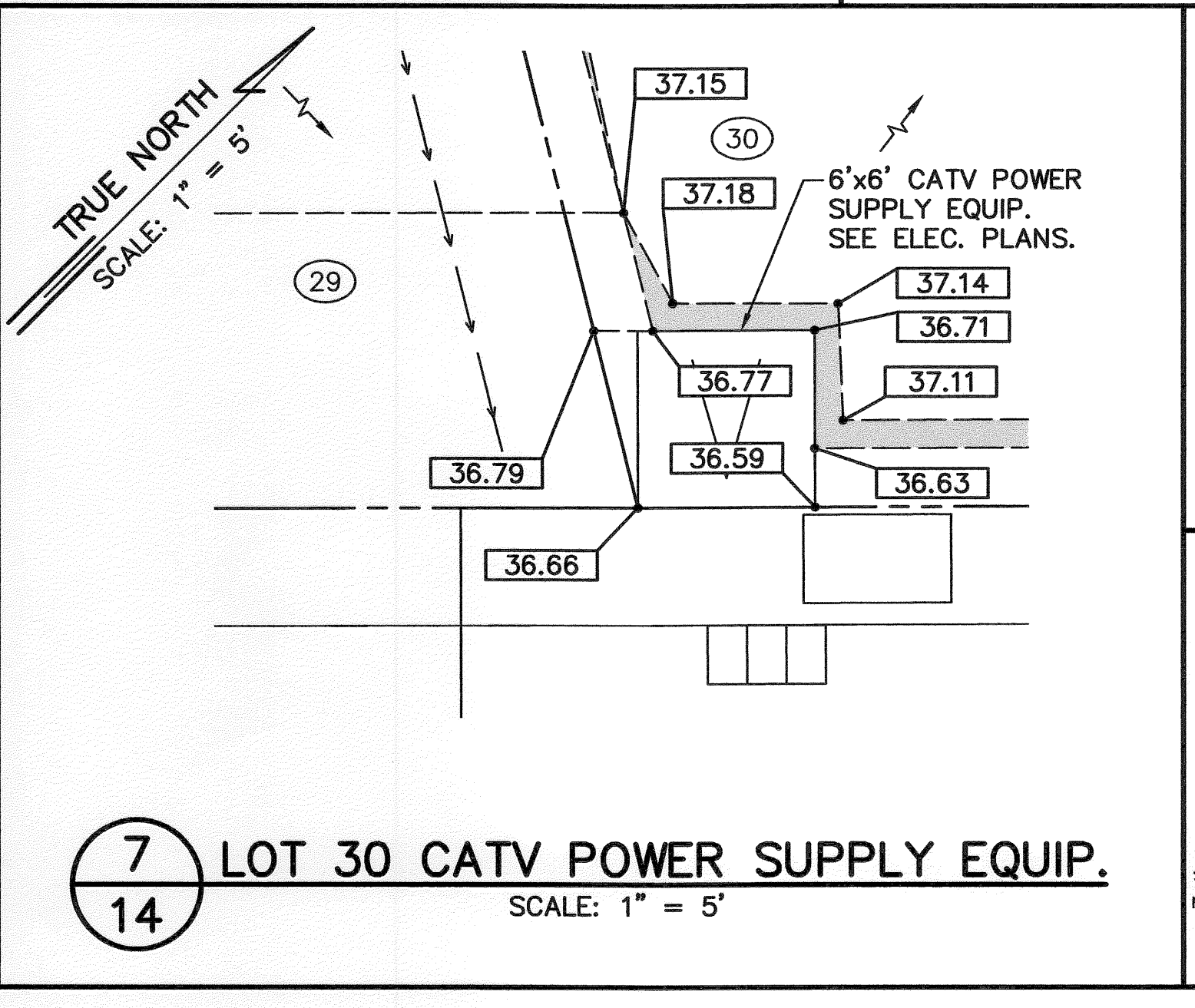
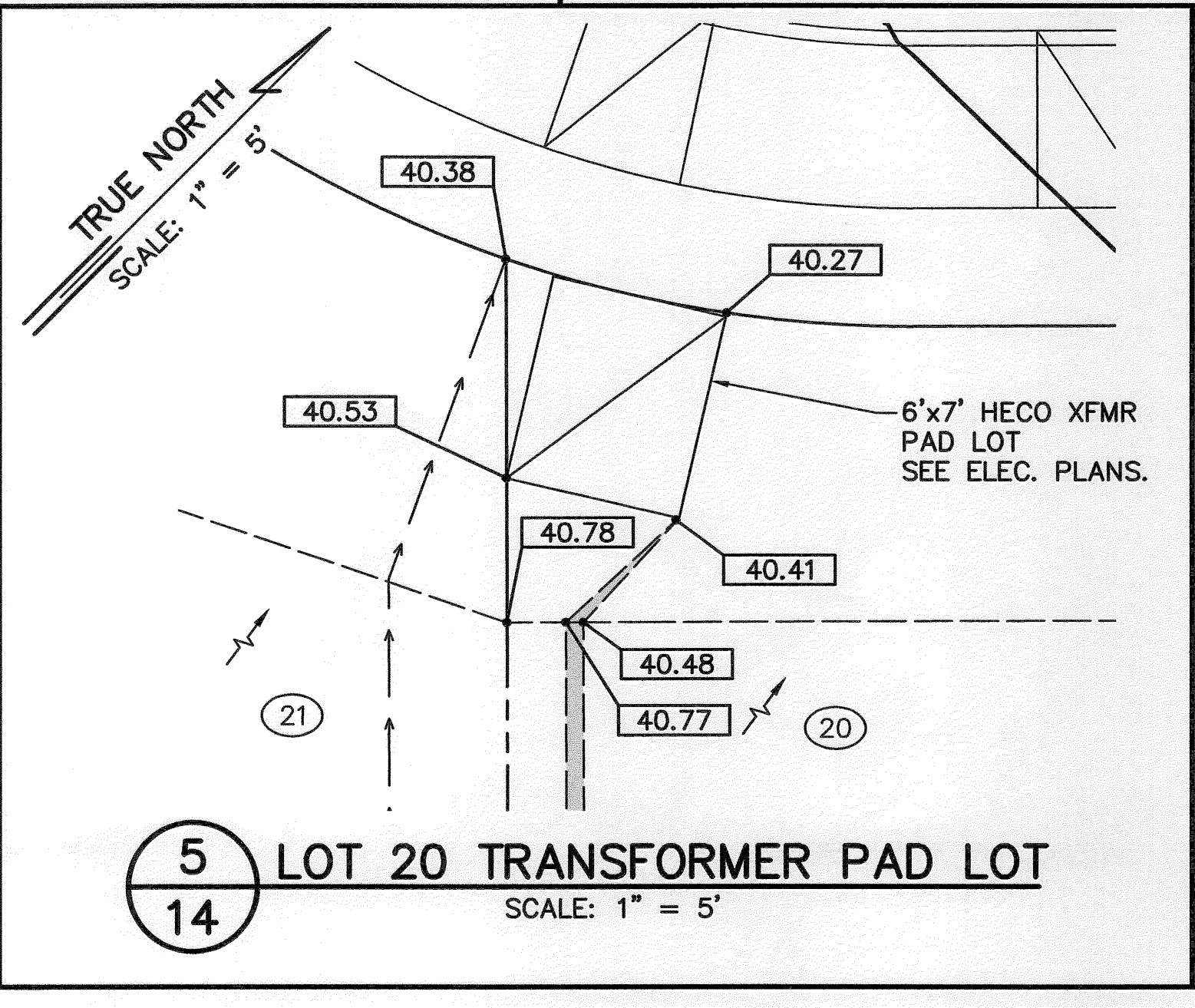
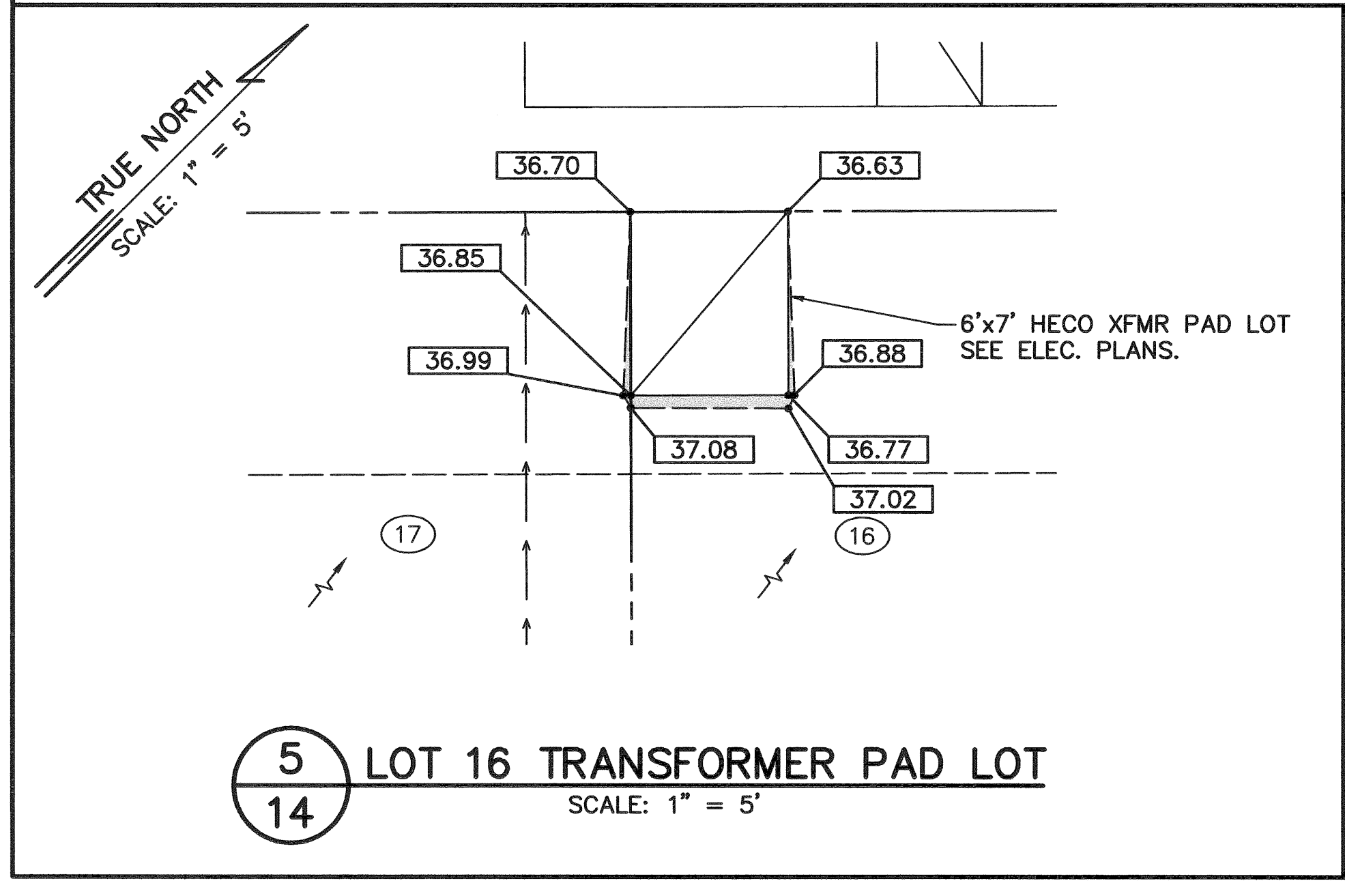
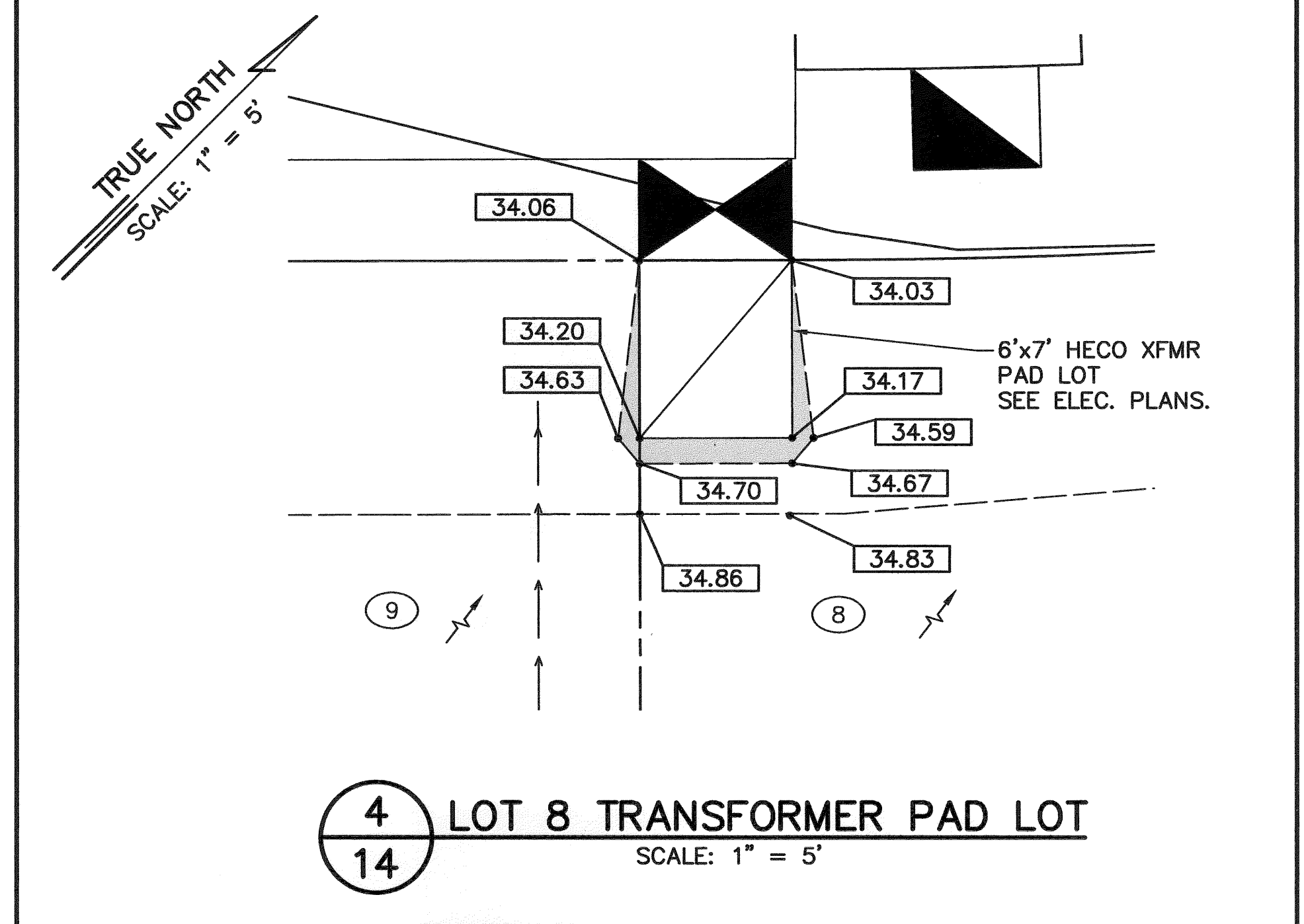
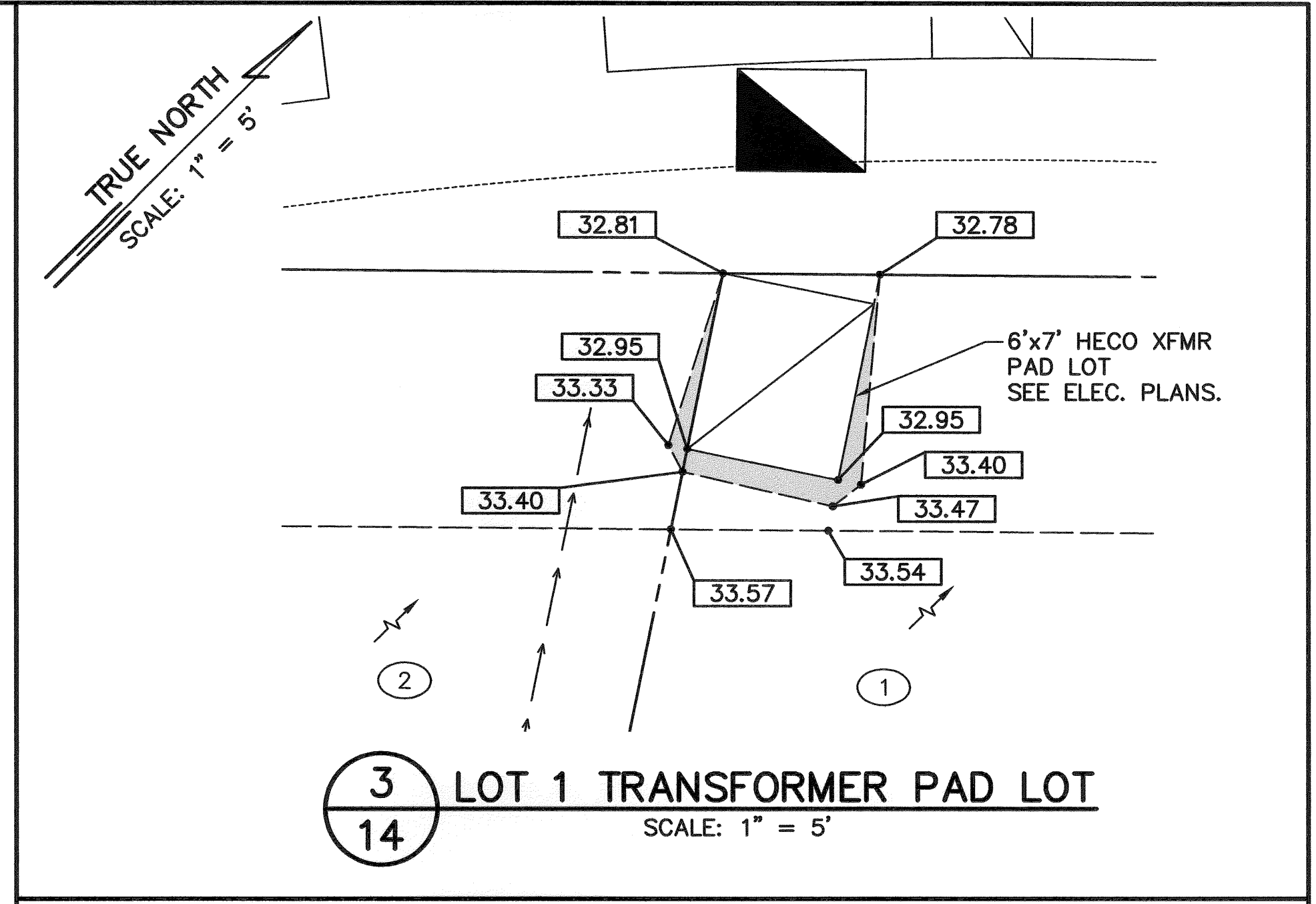
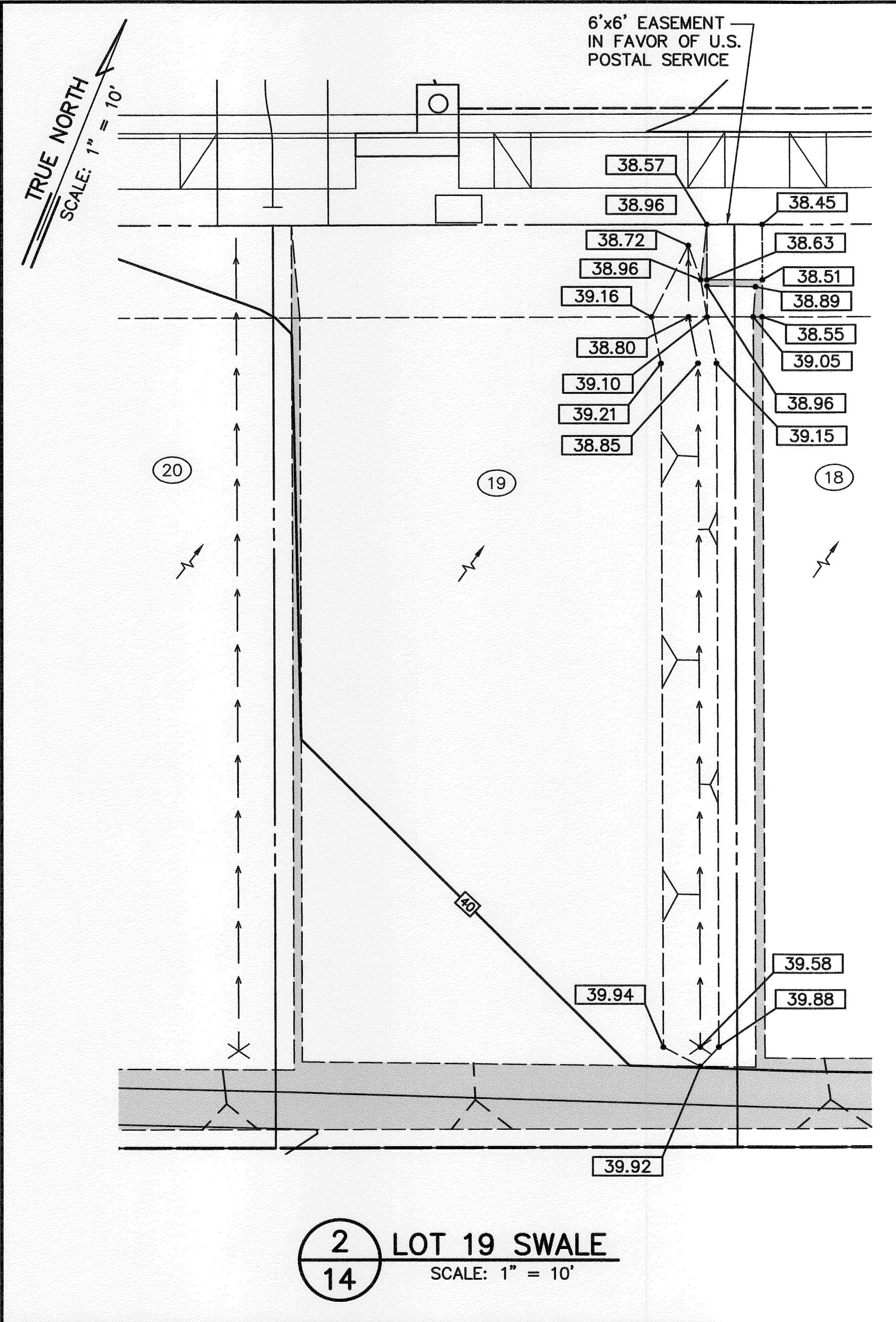
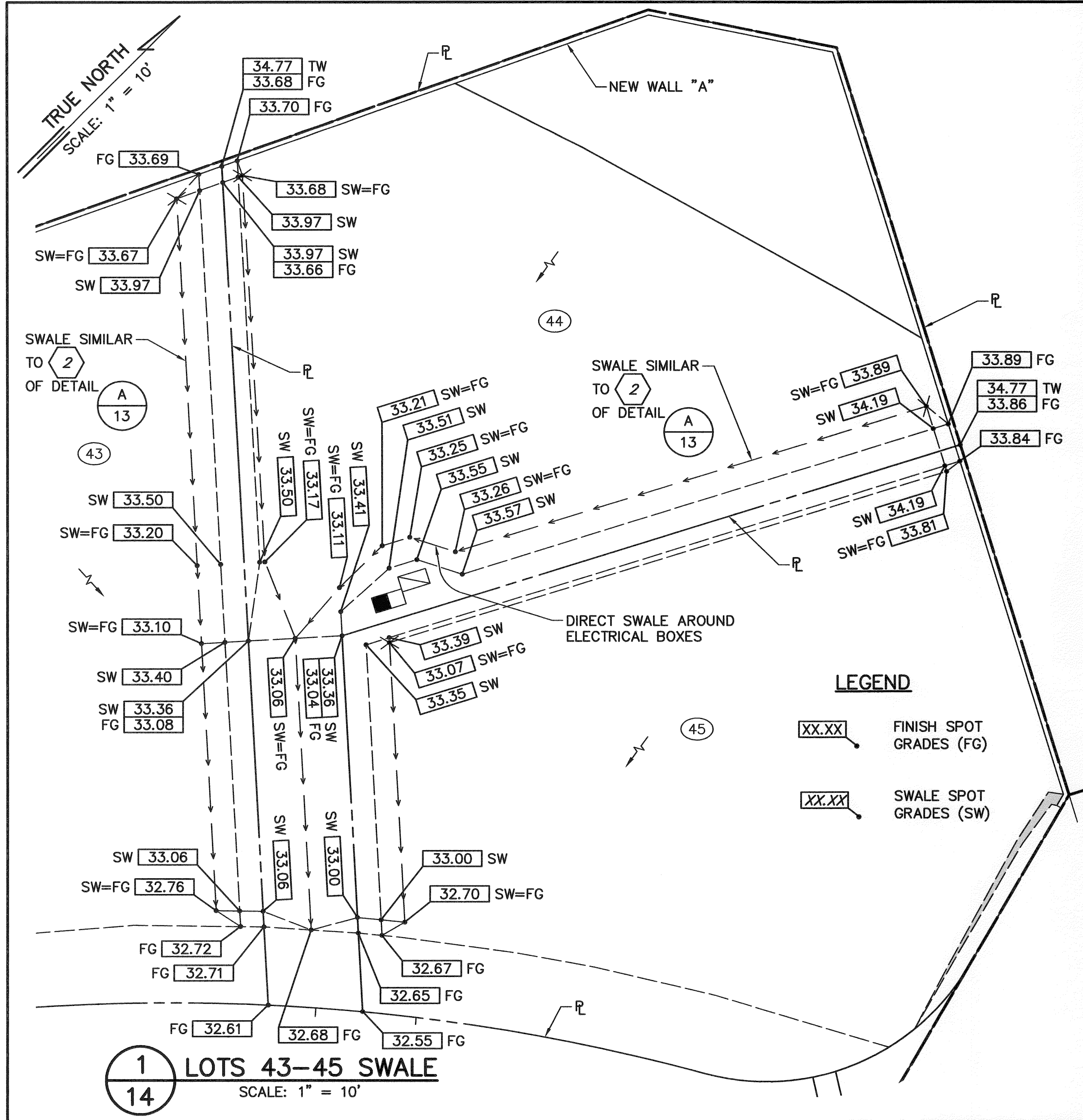
2 LOT 31 SWALE
13 SCALE: 1" = 10'



C TYPICAL LONGITUDINAL SECTION OF PROPERTY
13 NOT TO SCALE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED								
<p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p>KAKAINA SUBDIVISION</p> <p>TAX MAP KEY: 4-1-08: 10, 81, 91 & 92</p> <p>WAIMANALO, KOOLAUPOKO, OAHU, HAWAII</p>											
<p>GRADING DETAILS</p>											
<p>APPROVED: _____</p>											
BY SHOW THIS MY 2	CHIEF, CIVIL ENGINEERING BRANCH, DPP		DATE								
<p>AKINAK & ASSOCIATES, LTD.</p> <p>CONSULTING ENGINEERS</p>											
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%; text-align: center;">FILE</td> <td style="width: 25%; text-align: center;">POCKET</td> <td style="width: 25%; text-align: center;">FOLDER</td> <td style="width: 25%; text-align: center;">NO.</td> </tr> <tr> <td style="height: 30px;"></td> <td></td> <td></td> <td></td> </tr> </table>				FILE	POCKET	FOLDER	NO.				
FILE	POCKET	FOLDER	NO.								



5'05'10'

SCALE: 1" = 5'

10'010'20'

SCALE: 1" = 10'

REVISION DATE

DESCRIPTION

MADE BY

APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

KAKAIA SUBDIVISION

TAX MAP KEY: 4-1-08: 10, 81, 91 & 92

WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

GRADING DETAILS

APPROVED:

CHIEF, CIVIL ENGINEERING BRANCH, DPP

AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

FILE

POCKET

FOLDER

NO.

JONI C. TANIMOTO

LICENSED PROFESSIONAL ENGINEER

No.11878-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 4/30/12

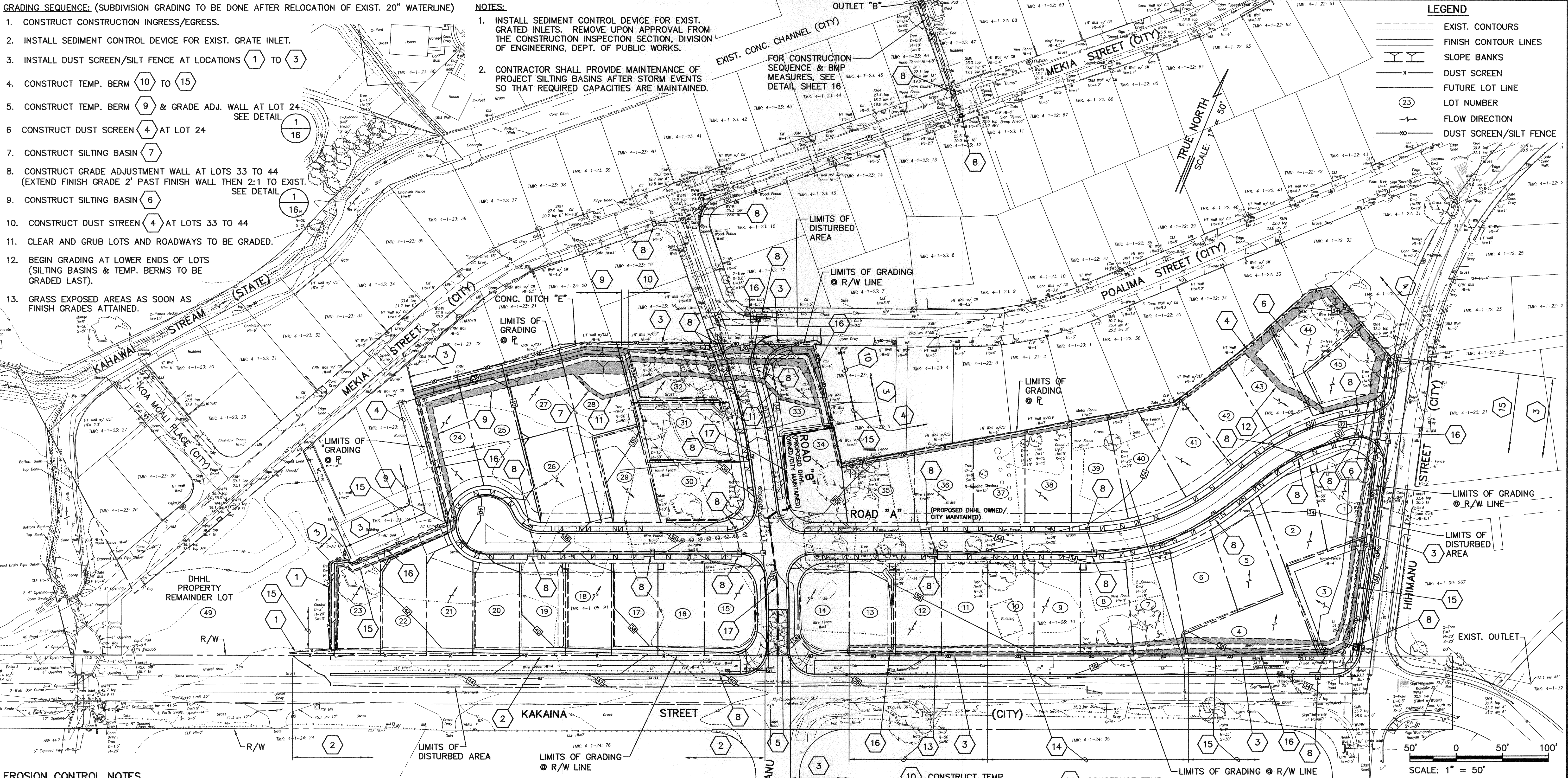
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Last Saved: 1/11/2012
Plotted on: 2/3/2012
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Subd\ACAD\KAKAIA\DHHL0602KA15A.dwg

GRADING SEQUENCE: (SUBDIVISION GRADING TO BE DONE AFTER RELOCATION OF EXIST. 20" WATERLINE)

1. CONSTRUCT CONSTRUCTION INGRESS/EGRESS.
2. INSTALL SEDIMENT CONTROL DEVICE FOR EXIST. GRATE INLET.
3. INSTALL DUST SCREEN/SILT FENCE AT LOCATIONS ① TO ③
4. CONSTRUCT TEMP. BERM ⑩ TO ⑮
5. CONSTRUCT TEMP. BERM ⑨ & GRADE ADJ. WALL AT LOT 24 SEE DETAIL ① ⑮
6. CONSTRUCT DUST SCREEN ④ AT LOT 24
7. CONSTRUCT SILTING BASIN ⑦
8. CONSTRUCT GRADE ADJUSTMENT WALL AT LOTS 33 TO 44 (EXTEND FINISH GRADE 2' PAST FINISH WALL THEN 2:1 TO EXIST. SEE DETAIL ① ⑮)
9. CONSTRUCT SILTING BASIN ⑥
10. CONSTRUCT DUST STREEN ④ AT LOTS 33 TO 44
11. CLEAR AND GRUB LOTS AND ROADWAYS TO BE GRADED.
12. BEGIN GRADING AT LOWER ENDS OF LOTS (SILTING BASINS & TEMP. BERMS TO BE GRADED LAST).
13. GRASS EXPOSED AREAS AS SOON AS FINISH GRADES ATTAINED.

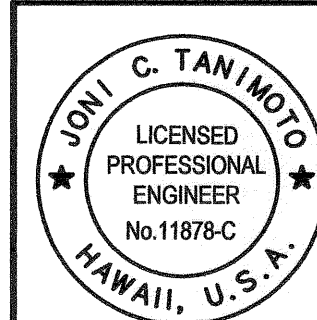
NOTES:

1. INSTALL SEDIMENT CONTROL DEVICE FOR EXIST. GRATED INLETS. REMOVE UPON APPROVAL FROM THE CONSTRUCTION INSPECTION SECTION, DIVISION OF ENGINEERING, DEPT. OF PUBLIC WORKS.
2. CONTRACTOR SHALL PROVIDE MAINTENANCE OF PROJECT SILTING BASINS AFTER STORM EVENTS SO THAT REQUIRED CAPACITIES ARE MAINTAINED.



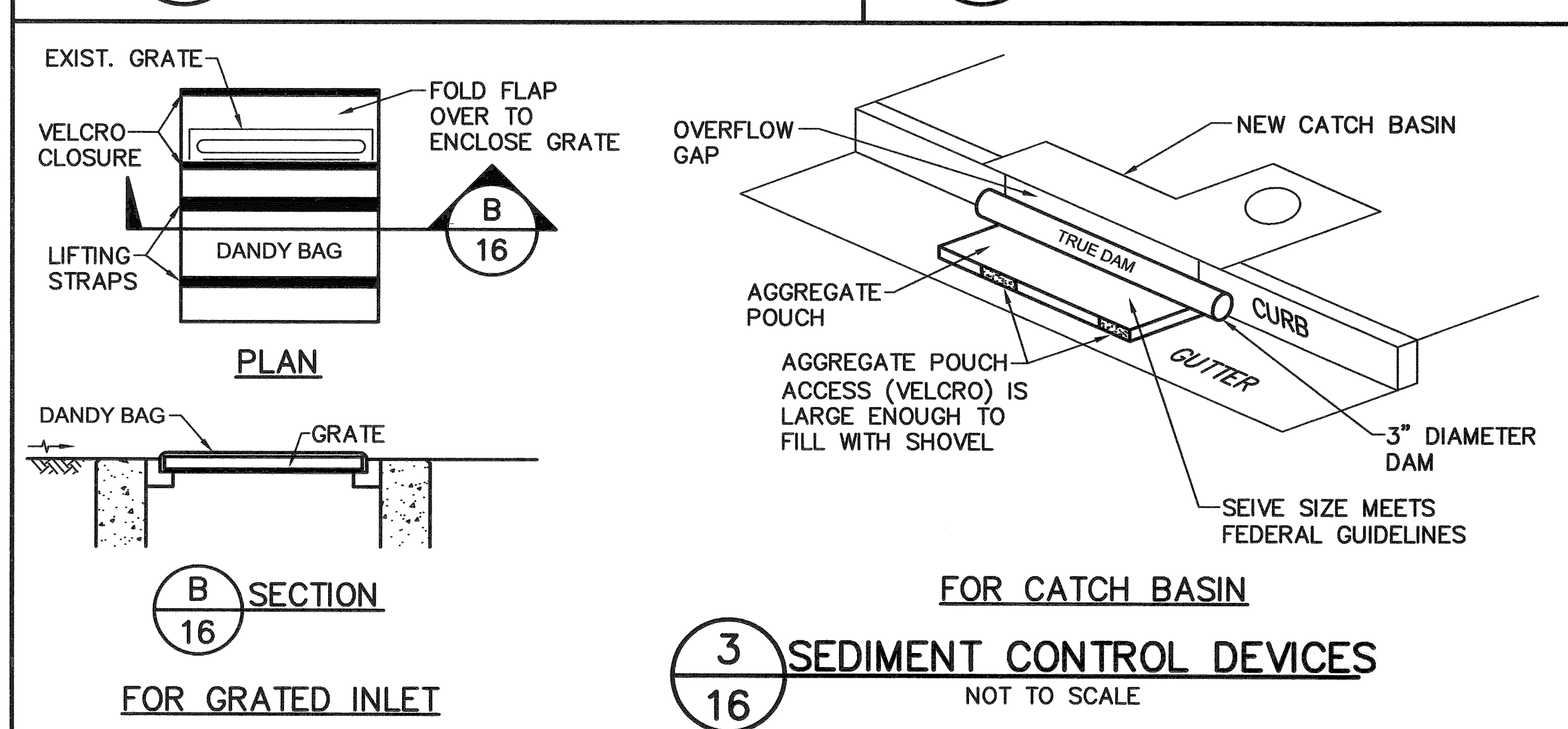
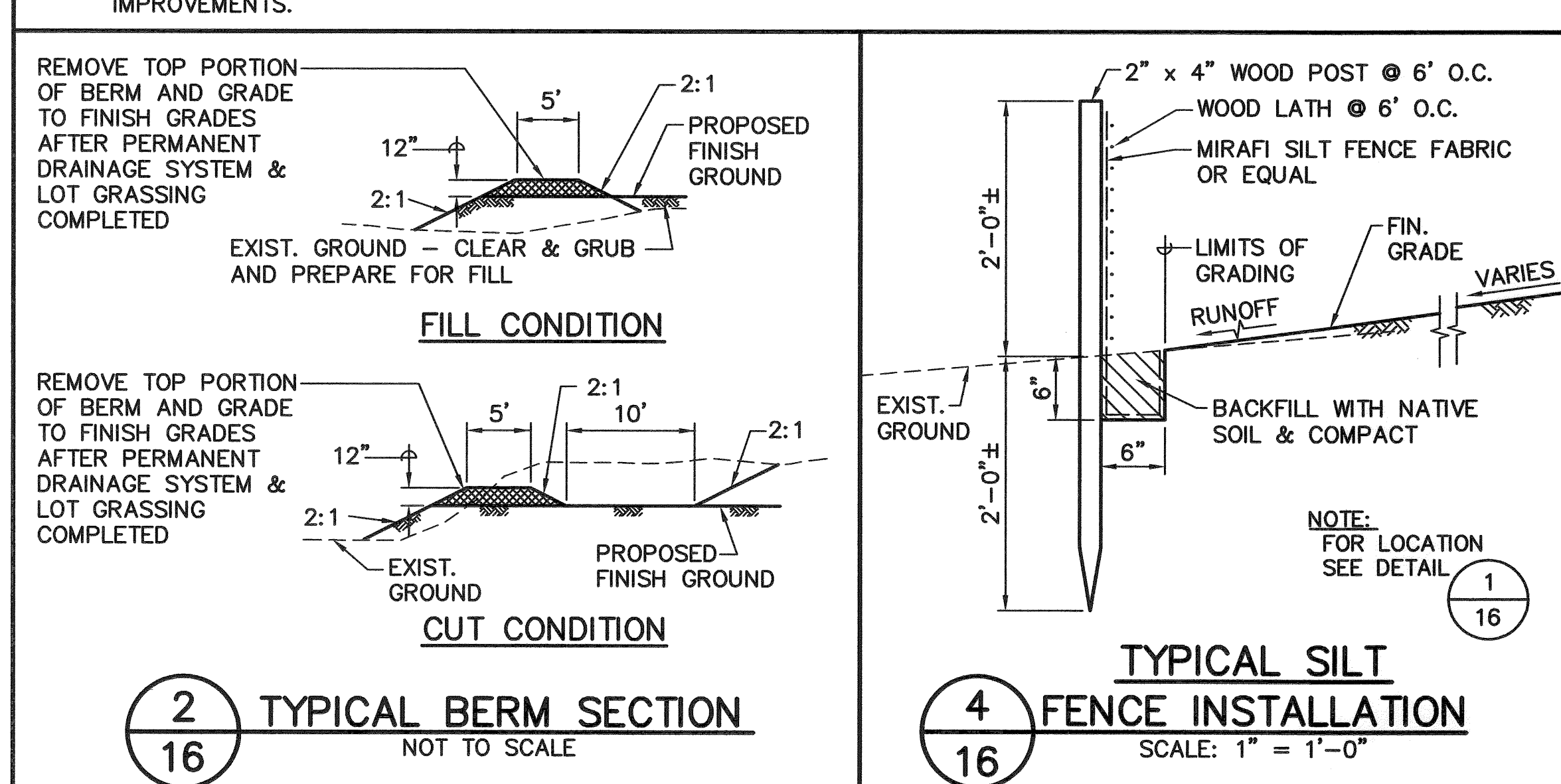
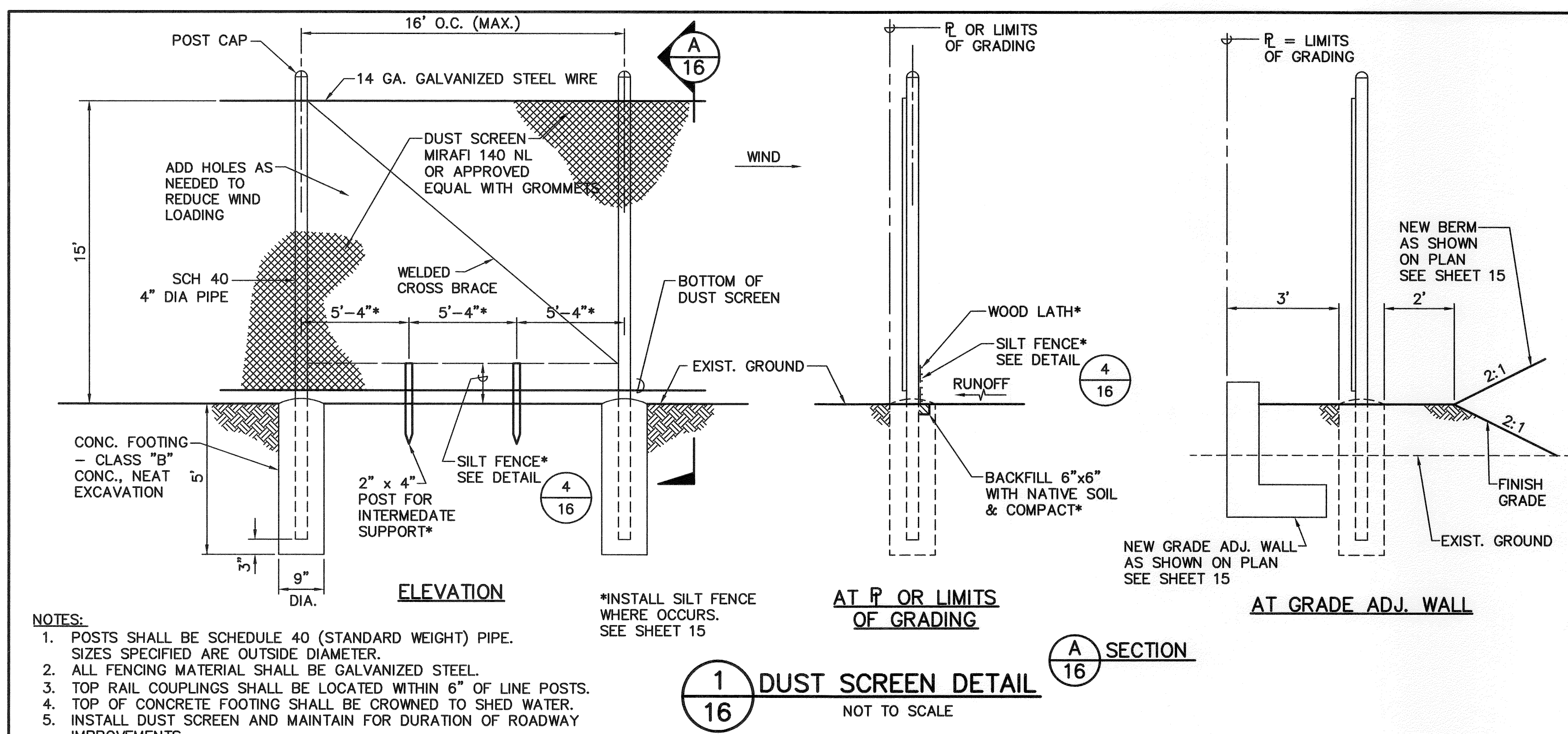
EROSION CONTROL NOTES

- ① INSTALL DUST SCREEN SEE DETAIL ① ⑮
- ② INSTALL DUST SCREEN AT R/W SEE DETAIL ① ⑮
- ③ INSTALL DUST SCREEN & SILT FENCE AT LIMITS OF GRADING SEE DETAIL ① ⑮
- ④ INSTALL DUST SCREEN 3' FROM FINISH WALL (④ FINISH GRADE ELEV.) SEE DETAIL ① ⑮
- ⑤ 20' WIDE x 50' LONG (APPROX.) CONSTRUCTION INGRESS/EGRESS 8" THICK 1" TO 3" COARSE AGGREGATE OR LARGER (7" MAX). PROVIDE FILTER FABRIC BETWEEN SOIL & COARSE AGGREGATE.
- ⑥ CONSTRUCT TEMP. EARTH BERM SILTING BASIN (GRASSED) TOP = 32.50 BOTTOM = 29.15 (REMOVAL OF UNCOMPACTED FILL/EXPANSIVE SOILS PER SHEET 3) SILTING BASIN TRIBUTARY AREA = 4.77 ACS. STORAGE REQ. FOR EROSION CONTROL = 636 CU. YDS. STORAGE AVAILABLE = 1,282 CU. YDS.
- ⑦ CONSTRUCT TEMP. EARTH BERM SILTING BASIN (GRASSED) TOP = 34.50 BOTTOM = 32.00 (REMOVAL OF UNCOMPACTED FILL/EXPANSIVE SOILS PER SHEET 3) SILTING BASIN TRIBUTARY AREA = 3.70 ACS. STORAGE REQ. FOR EROSION CONTROL = 493 CU. YDS. STORAGE AVAILABLE = 511 CU. YDS.
- ⑧ INSTALL SEDIMENT CONTROL DEVICE FOR EXIST. GRATE INLETS, NEW GRATE INLETS & NEW CATCH BASINS SEE DETAIL ③ ⑮
- ⑨ CONSTRUCT TEMP. EARTH BERM (GRASSED) TOP = 12" ABOVE FINISH GRADE SEE DETAIL ② ⑮
- ⑩ CONSTRUCT TEMP. EARTH BERM (GRASSED) TOP = 34.50 SEE DETAIL ② ⑮
- ⑪ TOP OF TEMP. SILTING BASIN = 34.75 (EXIST.)
- ⑫ TOP OF TEMP. SILTING BASIN = 32.50 (EXIST.)
- ⑬ CONSTRUCT TEMP. EARTH BERM (GRASSED) TOP = 38.00 SEE DETAIL ② ⑮
- ⑭ CONSTRUCT TEMP. EARTH BERM (GRASSED) TOP = 37.00 SEE DETAIL ② ⑮
- ⑮ CONSTRUCT TEMP. EARTH BERM (GRASSED) TOP = 12" ABOVE EXIST. GROUND SEE DETAIL ② ⑮
- ⑯ BOTTOM OF TEMP. EARTH BERM 2' FROM WALL/R
- ⑰ SILTING TRIBUTARY LIMITS

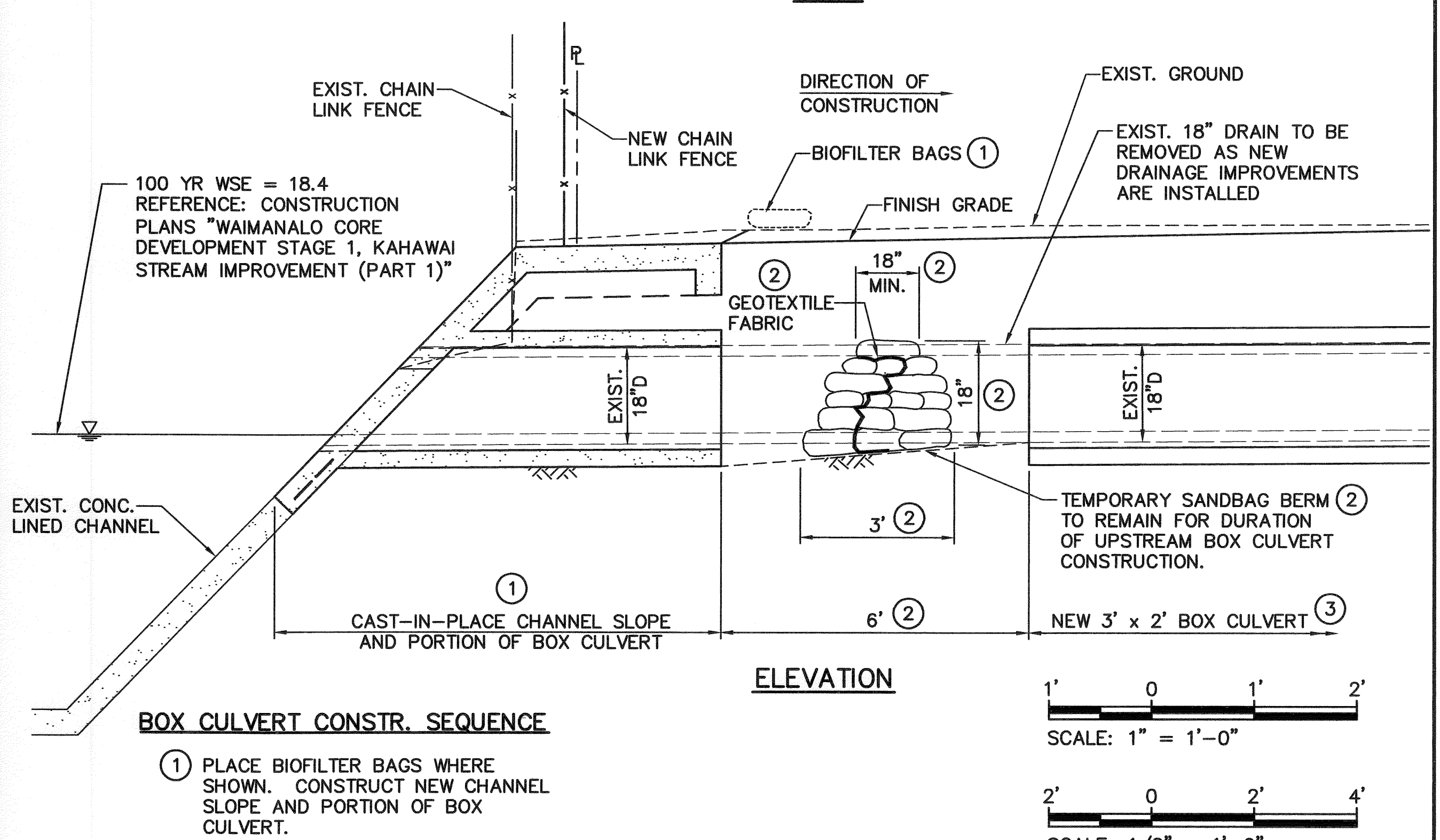
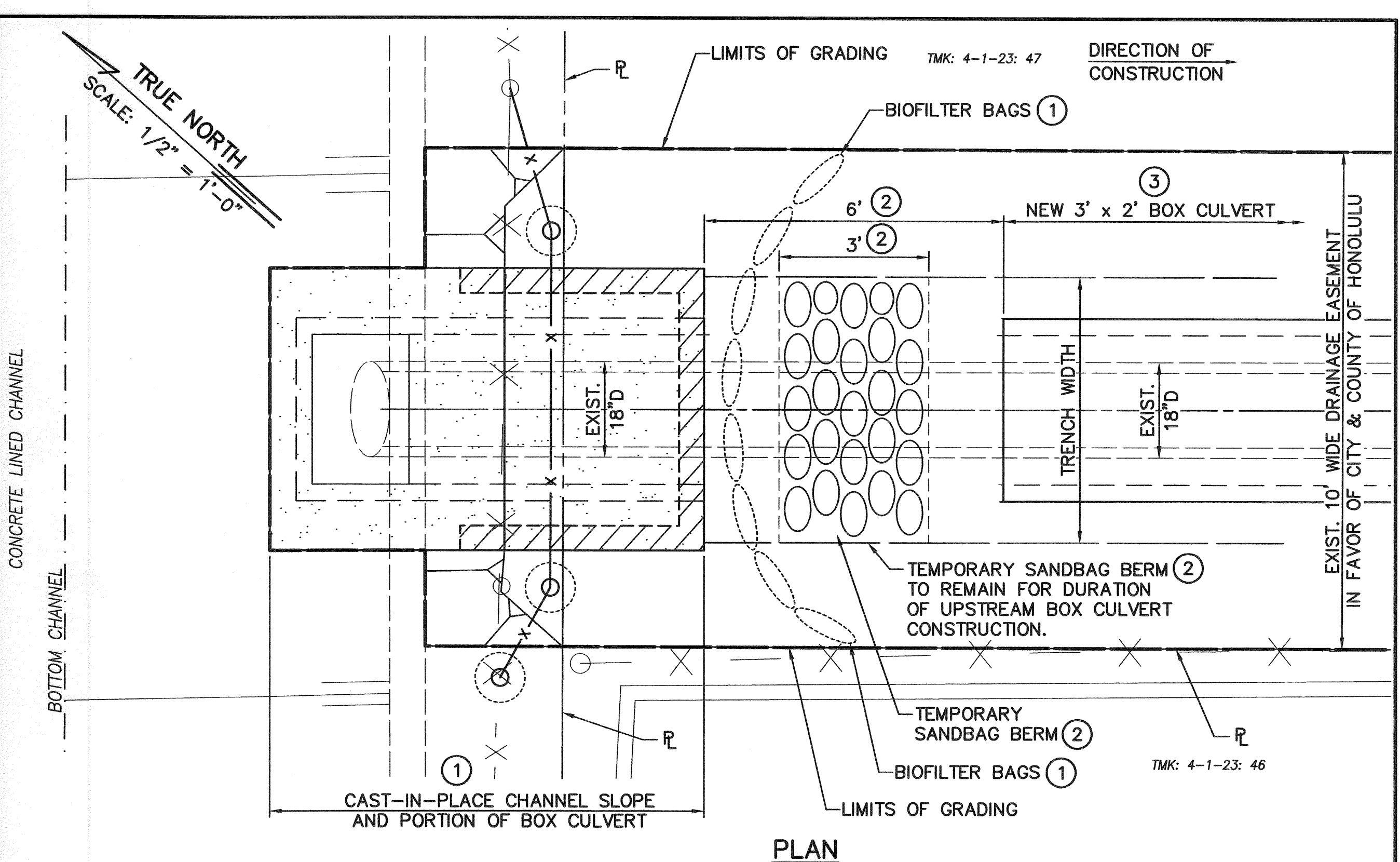


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS			
KAKAINA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92			
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
EROSION CONTROL PLAN			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



- EROSION CONTROL/BMP NOTES**
- MEASURES TO CONTROL EROSION AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY CONSTRUCTION WORK IS INITIATED. THESE MEASURES SHALL BE PROPERLY CONSTRUCTED AND MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
 - ALL CONTROL MEASURES SHALL BE CHECKED AND REPAIRED AS NECESSARY.
 - CONSTRUCT TEMPORARY SILT FENCE AS SHOWN PER PLANS.
 - ALL STORM DRAIN INLETS THAT MAY RECEIVE RUNOFF AS A RESULT OF THE CONSTRUCTION WORK SHALL USE AN INLET FILTER DEVICE. INLET FILTERS SHALL REMAIN UNTIL COMPLETION OF CONSTRUCTION WORK. CONTRACTOR SHALL PERIODICALLY INSPECT INLET FILTERS TO ENSURE DRAINAGE THROUGH MATERIAL IS MAINTAINED. CONTRACTOR SHALL REMOVE SEDIMENT FILTER DURING AN EVENT OF ABOVE NORMAL RAINFALL AND TO REPLACE FILTER AFTER EVENT HAS PASSED.
 - AT THE END OF THE GRADING OPERATION, EXISTING STORM DRAIN INLETS SURROUNDING THE PROJECT SITE SHALL BE INSPECTED AND ANY ACCUMULATED SEDIMENT AND DEBRIS FOUND IN THE STORM DRAIN INLETS SHALL BE REMOVED. FLUSHING INTO THE STORM DRAINS IS PROHIBITED.
 - GOOD HOUSEKEEPING SHALL BE UTILIZED TO ENSURE PROTECTION OF ROADWAYS FROM MUD, DIRT, AND DEBRIS.
 - STABILIZATION CONTROLS ARE TO INCLUDE PERMANENT SEEDING OF ALL EXPOSED AREAS IMMEDIATELY FOLLOWING FINAL GRADING OPERATIONS.
 - CONTRACTOR SHALL CONDUCT ON-GOING ON-SITE CLEANUP OF DELETERIOUS AND/OR HAZARDOUS MATERIAL.
 - THE CONTRACTOR SHALL ENSURE THAT ALL TIRES OF CONSTRUCTION VEHICLES ARE SUFFICIENTLY CLEANED OFF SO THAT DIRT OR DEBRIS IS NOT TRACKED OFF THE CONSTRUCTION SITE. WASHING OF TIRES WITH WATER WILL NOT BE ACCEPTABLE UNLESS THE RUNOFF IS CONTAINED AND DOES NOT ENTER THE STORM DRAIN SYSTEM OR ONTO THE CITY OR STATE ROW.
 - THE CONTRACTOR SHALL ENSURE THAT EXISTING ROADWAYS USED TO ACCESS THE PROJECT ARE CLEANED OF ALL DEBRIS, TRASH, DIRT, MUD, ETC., THROUGHOUT THE WORK DAY.
 - THE FINAL LIFT OF EACH DAY'S WORK SHALL BE COMPACTED TO PREVENT EROSION OF FILL MATERIAL.
 - ANY DIRT OR GRASSSED AREA DISTURBED SHALL BE RESTORED BY SEEDED HYDRO-MULCH. CONTRACTOR TO ENSURE GRASS IS FULLY ESTABLISHED.



BOX CULVERT CONSTR. SEQUENCE

- PLACE BIOFILTER BAGS WHERE SHOWN. CONSTRUCT NEW CHANNEL SLOPE AND PORTION OF BOX CULVERT.
- REMOVE BIOFILTER BAGS, EXCAVATE 6' LONG TRENCH AND INSTALL SANDBAG BERM.
- INSTALL NEW 3' x 2' BOX CULVERT UPSTREAM OF SANDBAG BERM. INSTALL 6' LONG BOX CULVERT WITHIN SANDBAG BERM LIMITS AFTER COMPLETION OF UPSTREAM BOX CULVERT CONSTRUCTION.

BMP FOR DRAINAGE IMPROVEMENTS AT TMK: 4-1-23:47
SCALE: 1/2" = 1'-0"

5
16

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LICENSE EXPIRES 4/30/12

REVISION DATE DESCRIPTION MADE BY APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
KAKAIA SUBDIVISION
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

EROSION CONTROL DETAILS

APPROVED: CHIEF, CIVIL ENGINEERING BRANCH, DPP DATE

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE POCKET FOLDER NO.

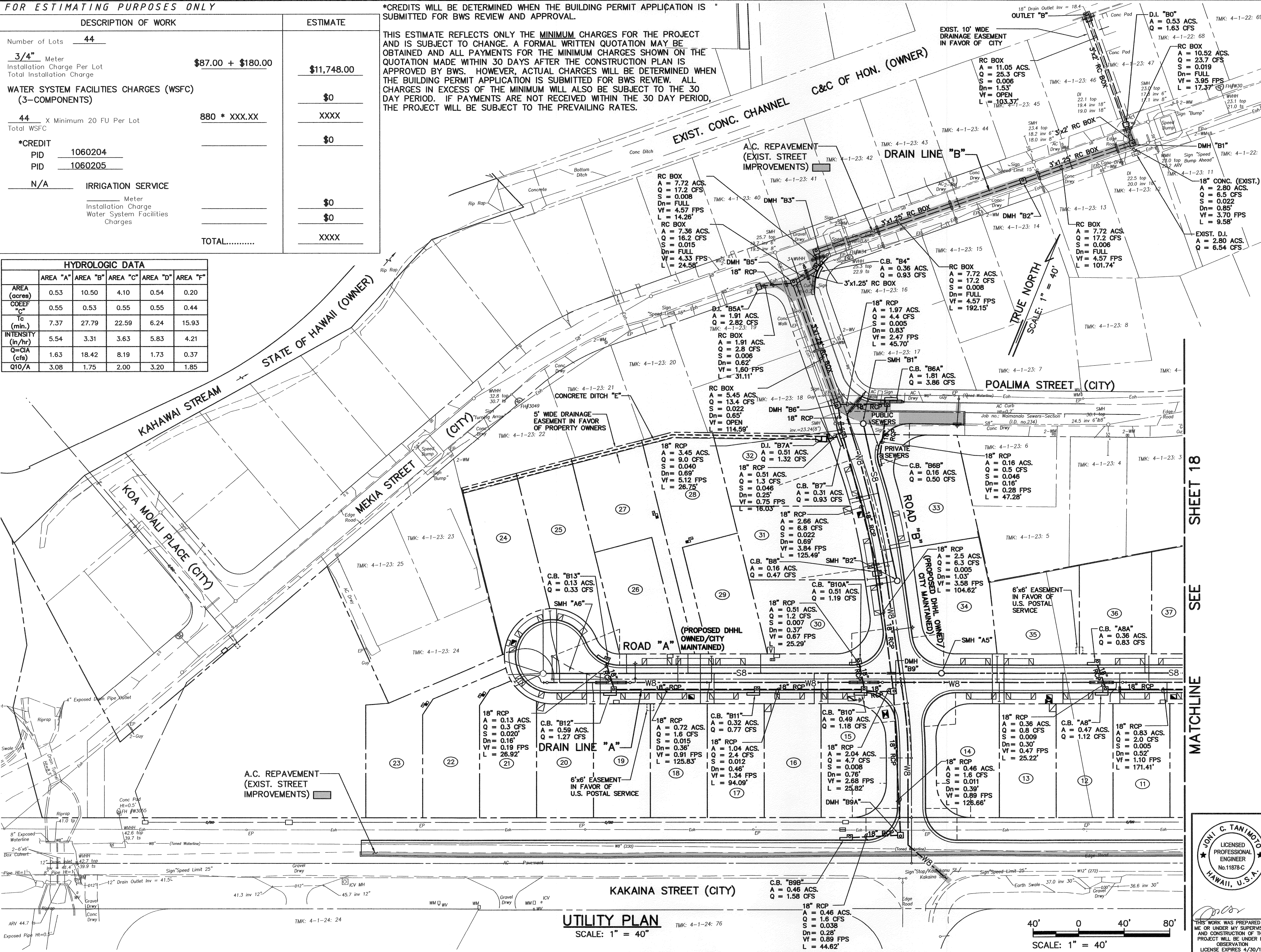
FOR ESTIMATING PURPOSES ONLY

DESCRIPTION OF WORK		ESTIMATE
Number of Lots	44	
3/4" Meter		
Installation Charge Per Lot	\$87.00 + \$180.00	\$11,748.00
Total Installation Charge		
WATER SYSTEM FACILITIES CHARGES (WSFC)		
(3-COMPONENTS)		\$0
44 X Minimum 20 FU Per Lot	880 * XXX.XX	XXXX
Total WSFC		
*CREDIT		\$0
PID 1060204		
PID 1060205		
N/A	IRRIGATION SERVICE	
	Meter	
	Installation Charge	\$0
	Water System Facilities Charges	\$0
	TOTAL.....	XXXX

HYDROLOGIC DATA					
AREA (acres)	AREA "A"	AREA "B"	AREA "C"	AREA "D"	AREA "E"
COEFF "C"	0.53	10.50	4.10	0.54	0.20
Tc (min.)	0.55	0.53	0.55	0.55	0.44
INTENSITY (in/hr)	7.37	27.79	22.59	6.24	15.93
Q=CIA (cfs)	5.54	3.31	3.63	5.83	4.21
Q10/A	1.63	18.42	8.19	1.73	0.37
	3.08	1.75	2.00	3.20	1.85

*CREDITS WILL BE DETERMINED WHEN THE BUILDING PERMIT APPLICATION IS SUBMITTED FOR BWS REVIEW AND APPROVAL.

THIS ESTIMATE REFLECTS ONLY THE MINIMUM CHARGES FOR THE PROJECT AND IS SUBJECT TO CHANGE. A FORMAL WRITTEN QUOTATION MAY BE OBTAINED AND ALL PAYMENTS FOR THE MINIMUM CHARGES SHOWN ON THE QUOTATION MADE WITHIN 30 DAYS AFTER THE CONSTRUCTION PLAN IS APPROVED BY BWS. HOWEVER, ACTUAL CHARGES WILL BE DETERMINED WHEN THE BUILDING PERMIT APPLICATION IS SUBMITTED FOR BWS REVIEW. ALL CHARGES IN EXCESS OF THE MINIMUM WILL ALSO BE SUBJECT TO THE 30 DAY PERIOD. IF PAYMENTS ARE NOT RECEIVED WITHIN THE 30 DAY PERIOD, THE PROJECT WILL BE SUBJECT TO THE PREVAILING RATES.



LEGEND

- W8 EXIST. WATER LINE
- W8 NEW WATER LINE
- D24 EXIST. DRAIN LINE
- D24 NEW DRAIN LINE
- EoH EXIST. UTILITY/ELECT. LINE
- S8 EXIST. SEWER LINE
- S8 NEW SEWER LINE
- SINGLE SERVICE SEWER LATERAL
- FIRE HYDRANT
- DOUBLE SERVICE WATER LATERAL "C-1"
- SINGLE SERVICE WATER LATERAL "A"
- TRANSFORMER PADS
- LOT NUMBER
- 18" RCP PIPE DIAMETER & TYPE
- A = 11.99 AC. DRAINAGE AREA, ACRES
- Q10 = 55.64 CFS FLOW IN CFS, CUBIC FEET PER SECOND
- S = 0.260 SLOPE, FEET PER FOOT
- Dn = 0.79' NORMAL DEPTH, FEET
- Vf = 6.78 FPS VELOCITY, FEET PER SECOND AT FULL FLOW
- A.C. REPAVEMENT

APPROVED: _____ DATE _____

CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS AND WORK IN CITY R/W ONLY)

CHIEF, TRAFFIC REVIEW BRANCH, DPP _____ DATE _____

MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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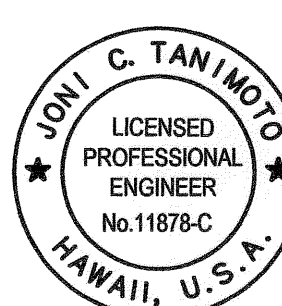
DEPARTMENT OF HAWAIIAN HOME LANDS
KAKAINA SUBDIVISION
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

UTILITY PLAN

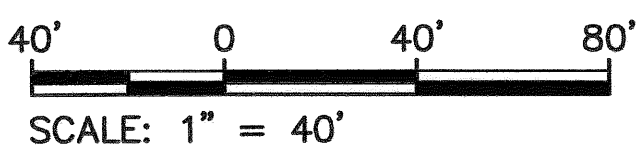
APPROVED: _____ DATE _____

CHIEF, CIVIL ENGINEERING BRANCH, DPP

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS



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LICENSE EXPIRES 4/30/12

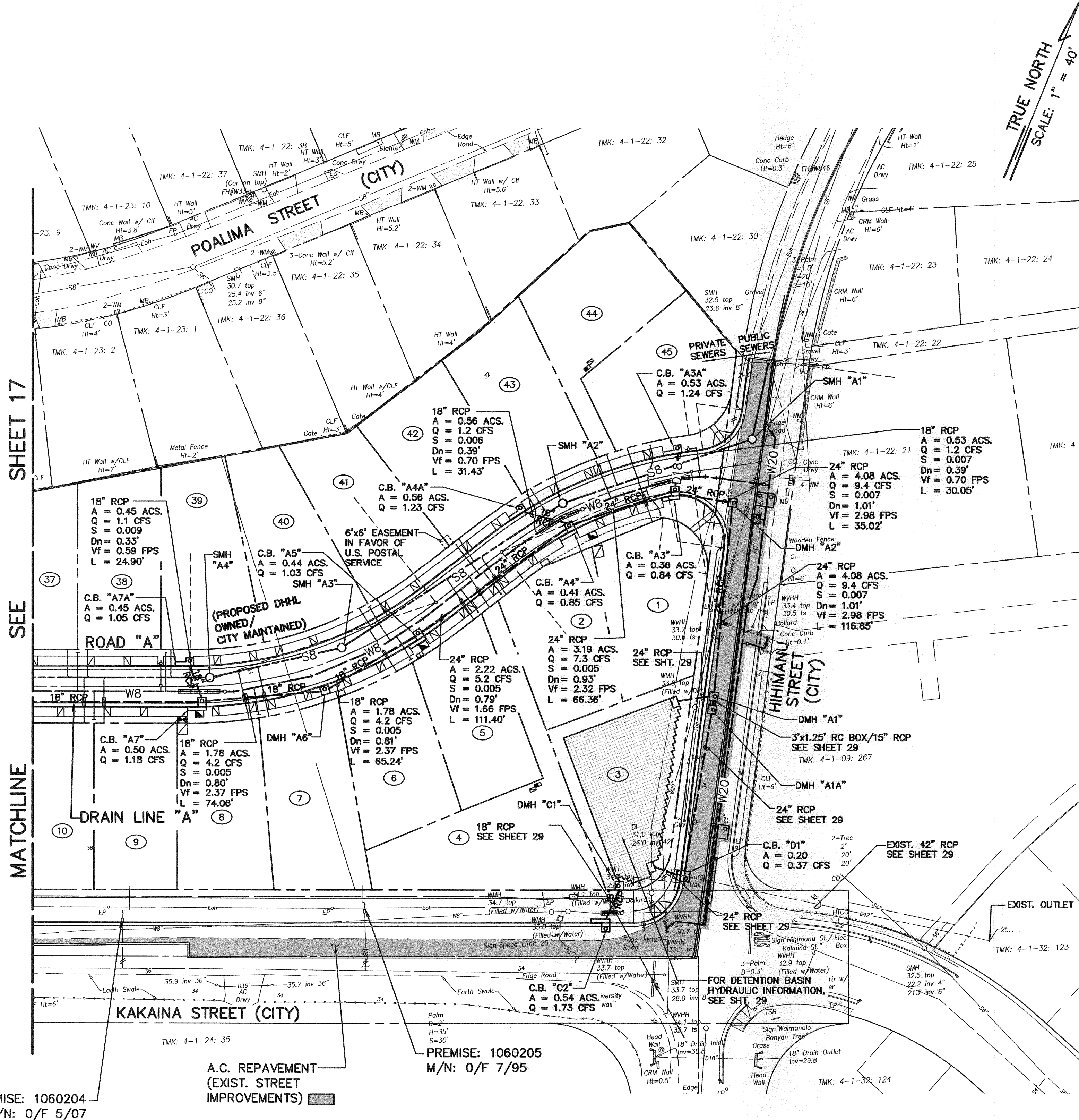


FILE	POCKET	FOLDER	NO.
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G:\DHH106-02 Kumuhau & Kakaina
Subd\ACAD\KAKAINA\DHHL0602KA18.dwg

Last Save by: MSM
Last Saved: 2/3/2012
Plotted on: 2/3/2012

HYDROLOGIC DATA					
	AREA "A"	AREA "B"	AREA "C"	AREA "D"	AREA "F"
AREA (acres)	0.53	10.50	4.10	0.54	0.20
COEFF "C"	0.55	0.53	0.55	0.55	0.44
Tc (min.)	7.37	27.79	22.59	6.24	15.93
INTENSITY (in/hr)	5.54	3.31	3.63	5.83	4.21
Q=CIA (cfs)	1.63	18.42	8.19	1.73	0.37
Q10/A	3.08	1.75	2.00	3.20	1.85



LEGEND

- W8 EXIST. WATER LINE
- W8 NEW WATER LINE
- D24 EXIST. DRAIN LINE
- D24 NEW DRAIN LINE
- EoH EXIST. UTILITY/ELECT. LINE
- S8 EXIST. SEWER LINE
- S8 NEW SEWER LINE
- SINGLE SERVICE SEWER LATERAL
- FIRE HYDRANT
- DOUBLE SERVICE WATER LATERAL "C-1"
- SINGLE SERVICE WATER LATERAL "A"
- TRANSFORMER PADS
- 5 LOT NUMBER
- 18" RCP PIPE DIAMETER & TYPE
- A = 11.99 AC. DRAINAGE AREA, ACRES
- Q = 55.64 CFS FLOW IN CFS, CUBIC FEET PER SECOND
- S = 0.260 SLOPE, FEET PER FOOT
- Dn = 0.79' NORMAL DEPTH, FEET
- Vf = 6.78 FPS VELOCITY, FEET PER SECOND AT FULL FLOW
- A.C. REPAVEMENT

APPROVED: _____ DATE _____

CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS AND WORK IN CITY R/W ONLY)

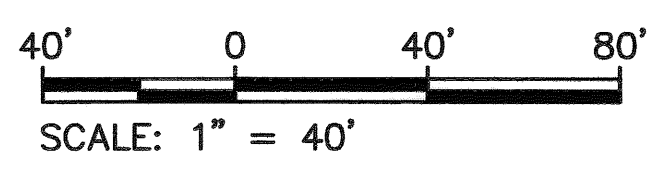
CHIEF, TRAFFIC REVIEW BRANCH, DPP _____ DATE _____

MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
UTILITY PLAN			
APPROVED: _____ DATE _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			



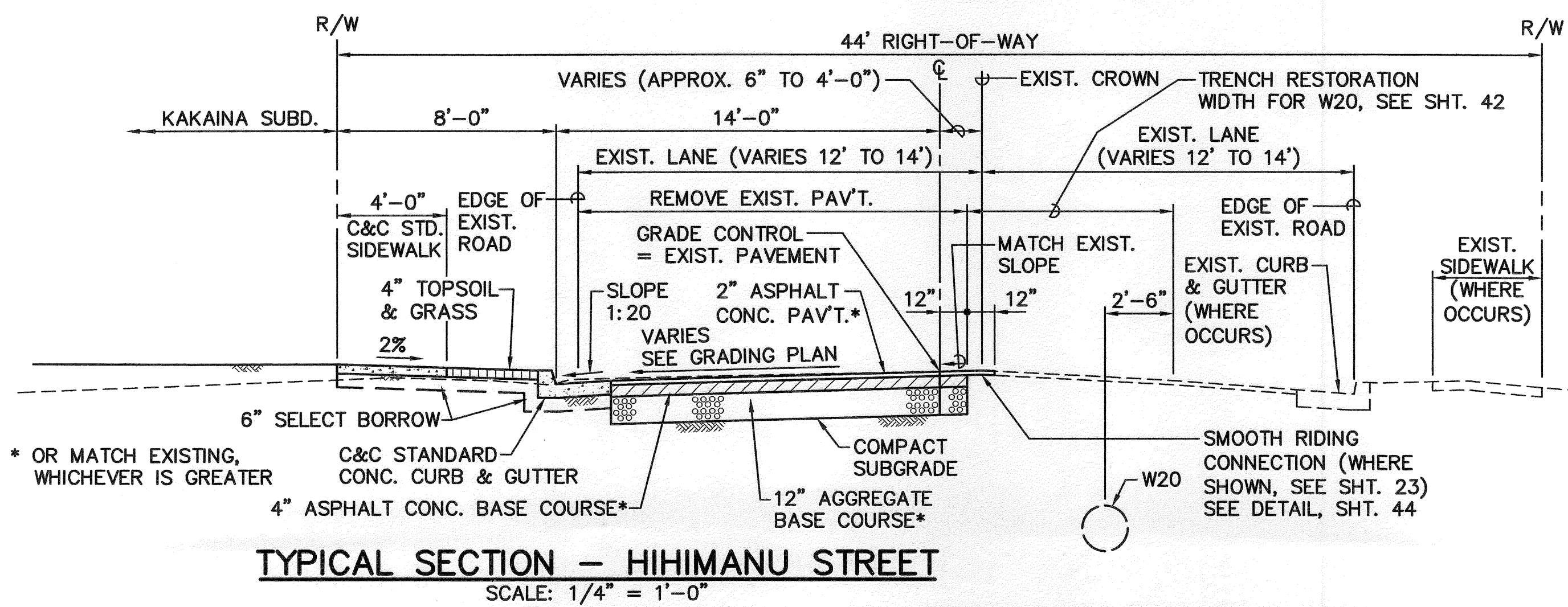
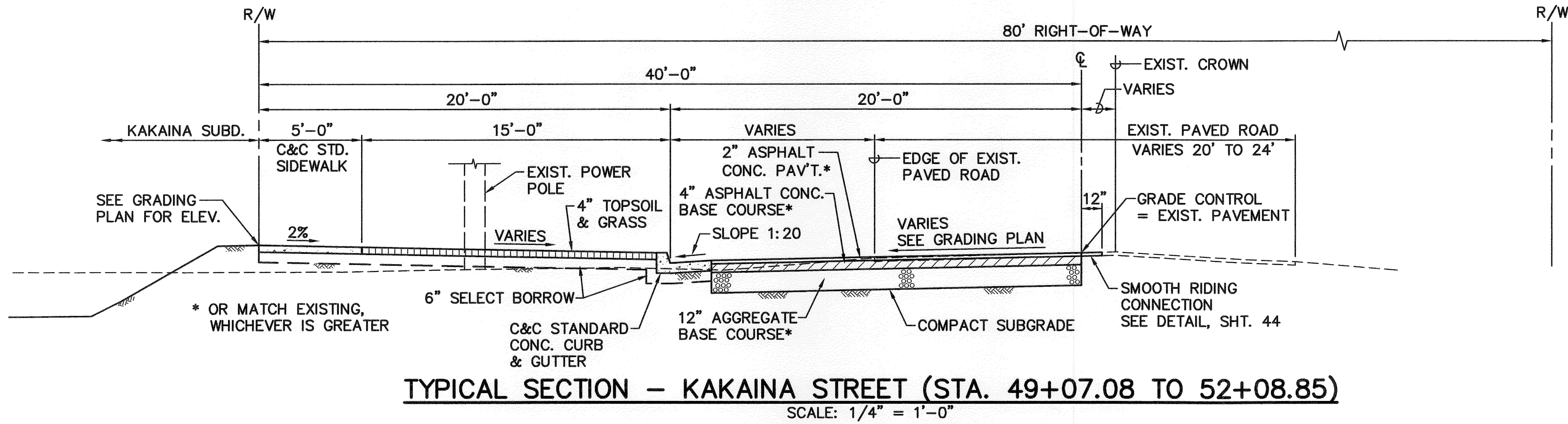
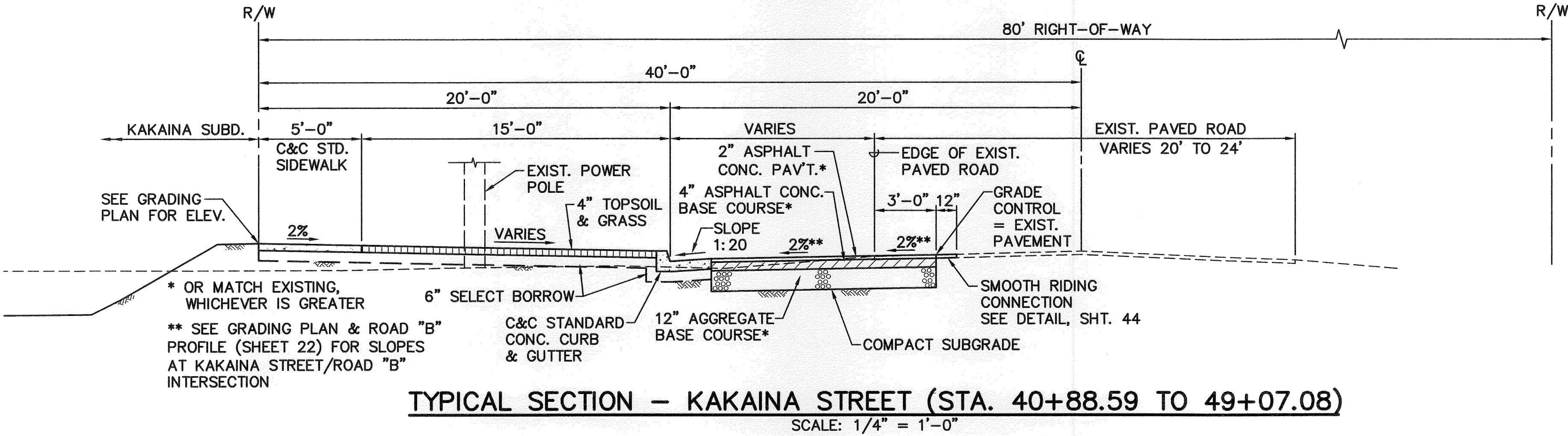
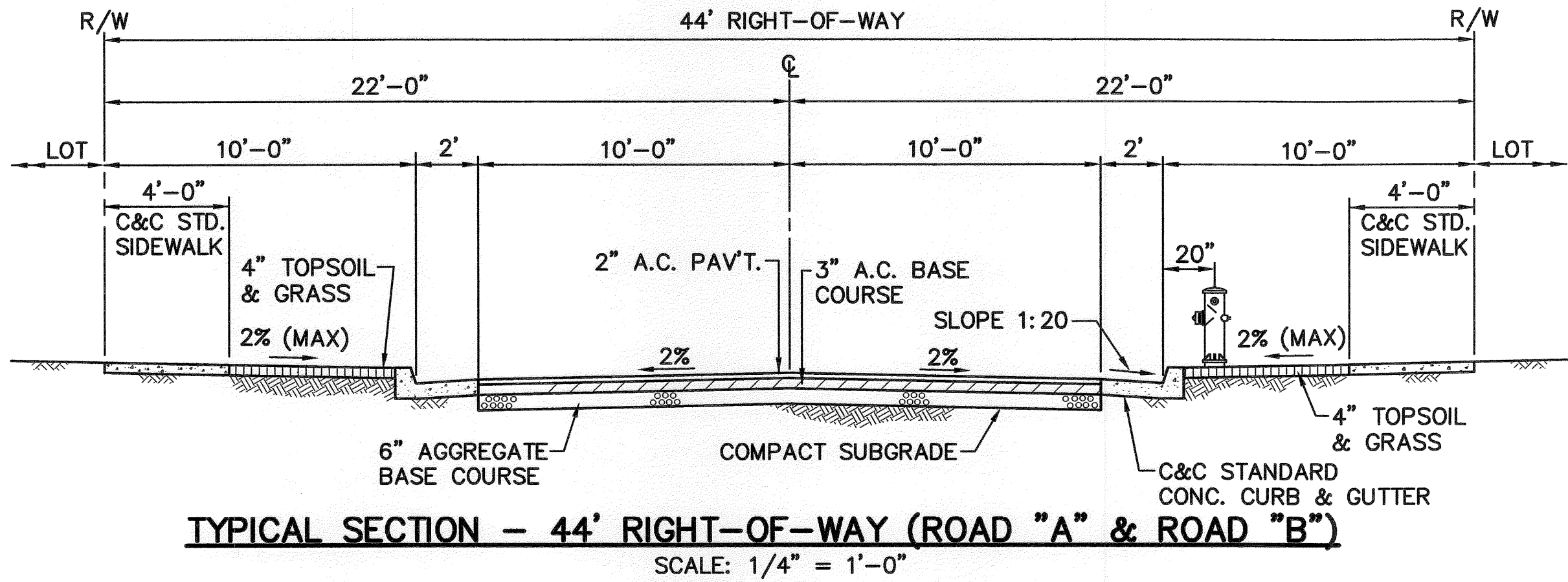
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LICENSE EXPIRES 4/30/12



FILE	POCKET	FOLDER	NO.

DRIVEWAY TIES		
LOT NUMBER	DRIVEWAY C STA.	DRIVEWAY WIDTH*
1	0+69.76 RD. A	18'
2	1+42.20 RD. A	18'
4	1+68.04 RD. A	12.57'
5	1+94.48 RD. A	18'
6	2+50.48 RD. A	18'
7	2+94.83 RD. A	18'
8	3+26.65 RD. A	18'
9	3+90.25 RD. A	18'
10	4+40.25 RD. A	18'
11	4+90.25 RD. A	18'
12	5+39.85 RD. A	18'
13	5+90.25 RD. A	18'
14	6+25.11 RD. A	18'
15	7+53.91 RD. A	14'
16	7+93.50 RD. A	18'
17	8+51.28 RD. A	17.25'
18	8+96.91 RD. A	18'
19	9+29.41 RD. A	17'
20	9+84.91 RD. A	18'
21	09°56'48.55" FROM 10+02.12 RD. A	CH = 14.35'
22 & 23	54°45'34.07" FROM 10+02.12 RD. A	CH = 21.18'
24	121°02'45.38" 10+02.12 RD. A	18'
25	189°07'07.85" 10+02.12 RD. A	18'
26	9+19.04 RD. A	18'
27 & 28	8+76.82 RD. A	24.72'
29	8+45.46 RD. A	18'
30	1+94.13 RD. B	18'
31	2+36.36 RD. B	18'
32	3+03.71 RD. B	18'
33	2+55.28 RD. B	18'
34	6+30.10 RD. A	18'
35	5+92.10 RD. A	18'
36	4+94.19 RD. A	18'
37	4+56.19 RD. A	18'
38	4+00.19 RD. A	18'
39	3+22.66 RD. A	18'
40	2+82.65 RD. A	18'
41	2+08.87 RD. A	18'
42	1+46.55 RD. A	18'
43	0+86.92 RD. A	18'
44 & 45	0+56.15 RD. A	CH = 26.61'

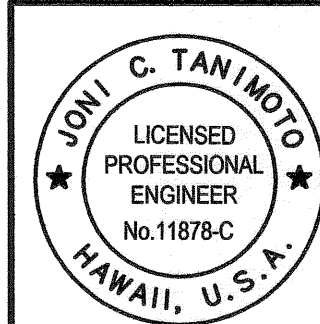
* DRIVEWAY WIDTHS EXCLUDE STANDARD DROP CURB WIDTHS



APPROVED:

CHIEF, TRAFFIC REVIEW BRANCH, DPP

DATE



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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TYPICAL ROAD SECTIONS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

ROAD NOTES

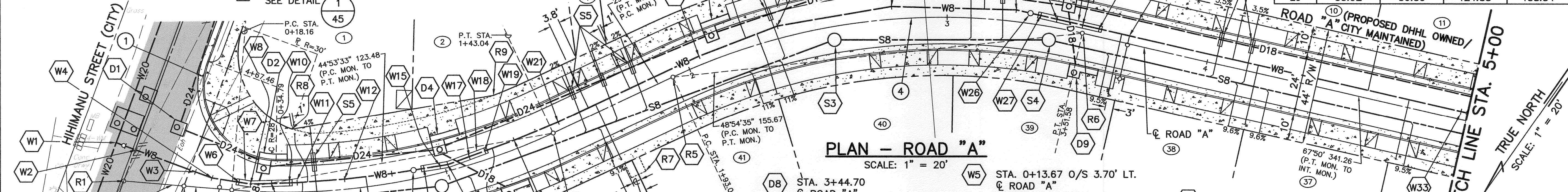
- R1 P.I. STA. (-)0+22.83 ϕ ROAD "A"
= STA. 4+13.77 ϕ HIHIMANU ST.
INSTALL ST. SURVEY MON.
- R2 P.I. STA. 0+00 ϕ ROAD "A"
INSTALL ϕ MON.
- R3 P.C. STA. 0+18.16 ϕ ROAD "A"
INSTALL ST. SURVEY MON.
- R4 P.T. STA. 1+43.04 ϕ ROAD "A"
INSTALL ST. SURVEY MON.
- R5 P.C. STA. 1+93.04 ϕ ROAD "A"
INSTALL ST. SURVEY MON.
- R6 P.T. STA. 3+51.58 ϕ ROAD "A"
INSTALL ST. SURVEY MON.
- R7 6"x6" CONC. PAD WITH TYPE III (16) CBU
SEE DETAIL
- R8 STA. 0+41.32 O/S 23.97' LT.
 ϕ ROAD "A" = ϕ P.I.
- R9 STA. 1+27.21 O/S 22' LT.
 ϕ ROAD "A" = ϕ P.I.

DRAIN NOTES

- D1 STA. (-)0+03.70 O/S 21.84' LT.
 ϕ ROAD "A"
CONSTRUCT DMH "A2"
STD. DETAIL D-18
TOP = 32.78
INV. = 27.27

CURVE DATA

CURVE	1	2	3	4
Δ	110°19'32"	74°27'57"	29°48'48"	37°50'51"
$\Delta/2$	55°09'46"	37°13'58.5"	14°54'24"	18°55'25.5"
R	28.00	28.00	240.00	240.00
T	40.23	21.28	63.89	82.28
C	45.96	33.88	123.48	155.67
Lc	53.92	36.39	124.88	158.54



SEWER NOTES

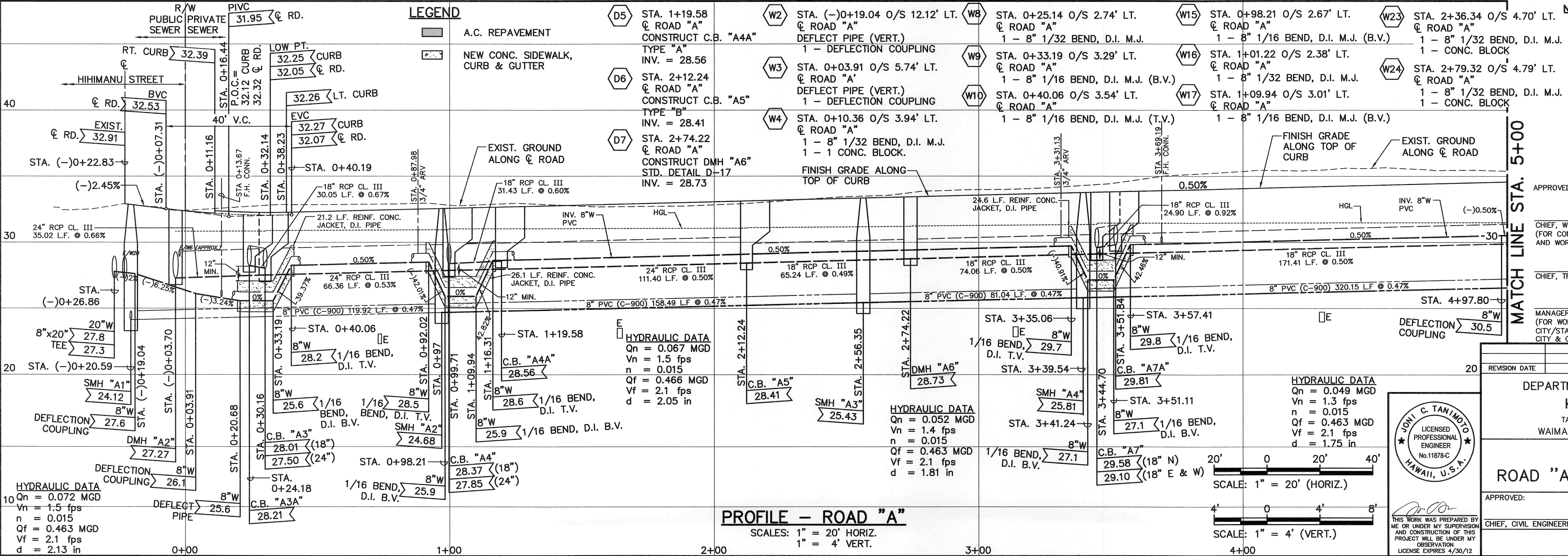
- S1 STA. (-)0+20.59 O/S 14.33' RT.
 ϕ ROAD "A" = STA. 4+00.56
O/S 6' RT. ϕ HIHIMANU ST.
CONSTRUCT SMH "A1"
TOP = 32.66
INV. = 24.12
- S2 STA. 0+97 O/S 5' RT.
 ϕ ROAD "A"
CONSTRUCT SMH "A2"
TOP = 32.24
INV. = 24.68
- S3 STA. 2+56.35 O/S 5' RT.
 ϕ ROAD "A"
CONSTRUCT SMH "A3"
TOP = 33.06
INV. = 25.43
- S4 STA. 3+39.54 O/S 5' RT.
 ϕ ROAD "A"
CONSTRUCT SMH "A4"
TOP = 33.47
INV. = 25.81
- S5 7 L.F. PLAIN CONC.
JACKET FOR 6" SEWER
- S6 STA. 0+50.53 O/S 2.94' RT.
 ϕ ROAD "A"
INSTALL DOUBLE WYE

WATER NOTES

- W1 STA. (-)0+26.86 O/S 14.29' LT.
 ϕ ROAD "A"
INSTALL:
1 - 20" x 8" TEE, D.I. M.J.
1 - 8" G.V., C.L. 150 M.J.
W/ ANCHOR BLOCK
1 - CONC. BLOCK
1 - VALVE BOX & COVER
- W2 STA. 0+13.67 O/S 3.70' LT.
 ϕ ROAD "A"
INSTALL F.H. CONN.
1 - 8" x 6" TEE, D.I. M.J.
1 - 6" G.V. C.L. 150 W/ ANCHOR
BLOCK
1 - DEFLECTION COUPLING
1 - C.I. VALVE BOX & COVER
1 - 6" 1/4 BEND, D.I. M.J.
1 - 6" HYDRANT ELBOW,
M.J. x F.E.
1 - F.H. (HT. = 5.5')
1 - F.H. EXTENSION PIECE
1 - F.H. MARKER
23 L.F. 6" PVC PIPE, CL. 150
3 - CONC. BLOCKS
SEE F.H. PROFILE, SHT. 41
- W3 STA. 0+42.97 O/S 3.59' LT.
 ϕ ROAD "A"
DEFLECT PIPE (HORIZ.)
1 - DEFLECTION COUPLING
- W4 STA. 0+61.25 O/S 3.88' LT.
 ϕ ROAD "A"
DEFLECT PIPE (HORIZ.)
1 - DEFLECTION COUPLING
- W5 STA. 0+87.98 O/S 3.35' LT.
 ϕ ROAD "A"
1 - 3/4" ARV (APCO)
(W.P. = 87.2 P.S.I.)
1 - ARV BOX
1 - 8" BOSSSED TEE, D.I.
TAPPED FOR 3/4" C.C.T.
SEE B.W.S. STD. DETAIL V2
- W6 STA. 0+92.02 O/S 3.13' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (T.V.)
- W7 STA. 0+20.68 O/S 3.16' LT.
 ϕ ROAD "A"
DEFLECT PIPE (VERT.)
- W8 21.2 L.F. REINF. CONC. JACKET
FOR 8" WATER, D.I. PIPE
- W9 STA. 0+25.14 O/S 2.74' LT.
 ϕ ROAD "A"
1 - 8" 1/32 BEND, D.I. M.J.
- W10 STA. 0+33.19 O/S 3.29' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (B.V.)
- W11 STA. 0+40.06 O/S 3.54' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (T.V.)
- W12 STA. 0+98.21 O/S 2.67' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (B.V.)
- W13 STA. 1+01.22 O/S 2.38' LT.
 ϕ ROAD "A"
1 - 8" 1/32 BEND, D.I. M.J.
- W14 STA. 1+09.94 O/S 3.01' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (B.V.)
- W15 STA. 2+36.34 O/S 4.70' LT.
 ϕ ROAD "A"
1 - 8" 1/32 BEND, D.I. M.J.
1 - CONC. BLOCK
- W16 STA. 2+79.32 O/S 4.79' LT.
 ϕ ROAD "A"
1 - 8" 1/32 BEND, D.I. M.J.
1 - CONC. BLOCK
- W17 STA. 4+97.80 O/S 3.00' LT.
 ϕ ROAD "A"
DEFLECT PIPE (VERT.)
- W18 26.1 L.F. REINF. CONC. JACKET
FOR 8" WATER, D.I. PIPE
- W19 STA. 1+16.31 O/S 3.27' LT.
 ϕ ROAD "A"
1 - 8" 1/16 BEND, D.I. M.J. (T.V.)
- W20 STA. 1+28.31 O/S 3.30' LT.
 ϕ ROAD "A"
DEFLECT PIPE (HORIZ.)
1 - DEFLECTION COUPLING
- W21 STA. 1+46.49 O/S 3.00' LT.
 ϕ ROAD "A"
1 - DEFLECTION COUPLING
- W22 STA. 2+05.13 O/S 3.31' LT.
 ϕ ROAD "A"
DEFLECT PIPE (HORIZ.)
1 - DEFLECTION COUPLING
- W23 STA. 4+97.80 O/S 3.00' LT.
 ϕ ROAD "A"
DEFLECT PIPE (VERT.)

LEGEND

- A.C. REPAVEMENT
- NEW CONC. SIDEWALK,
CURB & GUTTER



NOTES

- ALL WATER PIPE FITTINGS AND ALL WATER
PIPE SECTIONS REQUIRING REINFORCED
CONCRETE JACKETING SHALL BE DUCTILE
IRON PIPE CLASS 52.
- FOR DRIVEWAY TIES, SEE SHEET 19
- 1 1/2" DOUBLE SERVICE WATER LATERAL
W/ TYPE C-1 CONNECTION FOR TWO 3/4"
METERS
- 1" SINGLE SERVICE WATER LATERAL W/
TYPE A CONNECTION FOR ONE 3/4"
METER
- A.C. REPAVEMENT
(EXIST. STREET IMPROVEMENTS)

APPROVED: _____ DATE _____

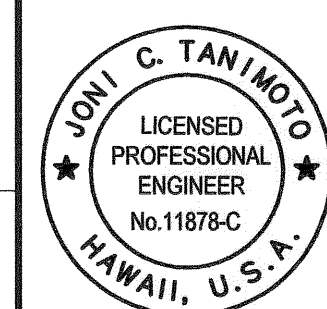
CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS
AND WORK IN CITY R/W ONLY)

CHIEF, TRAFFIC REVIEW BRANCH, DPP

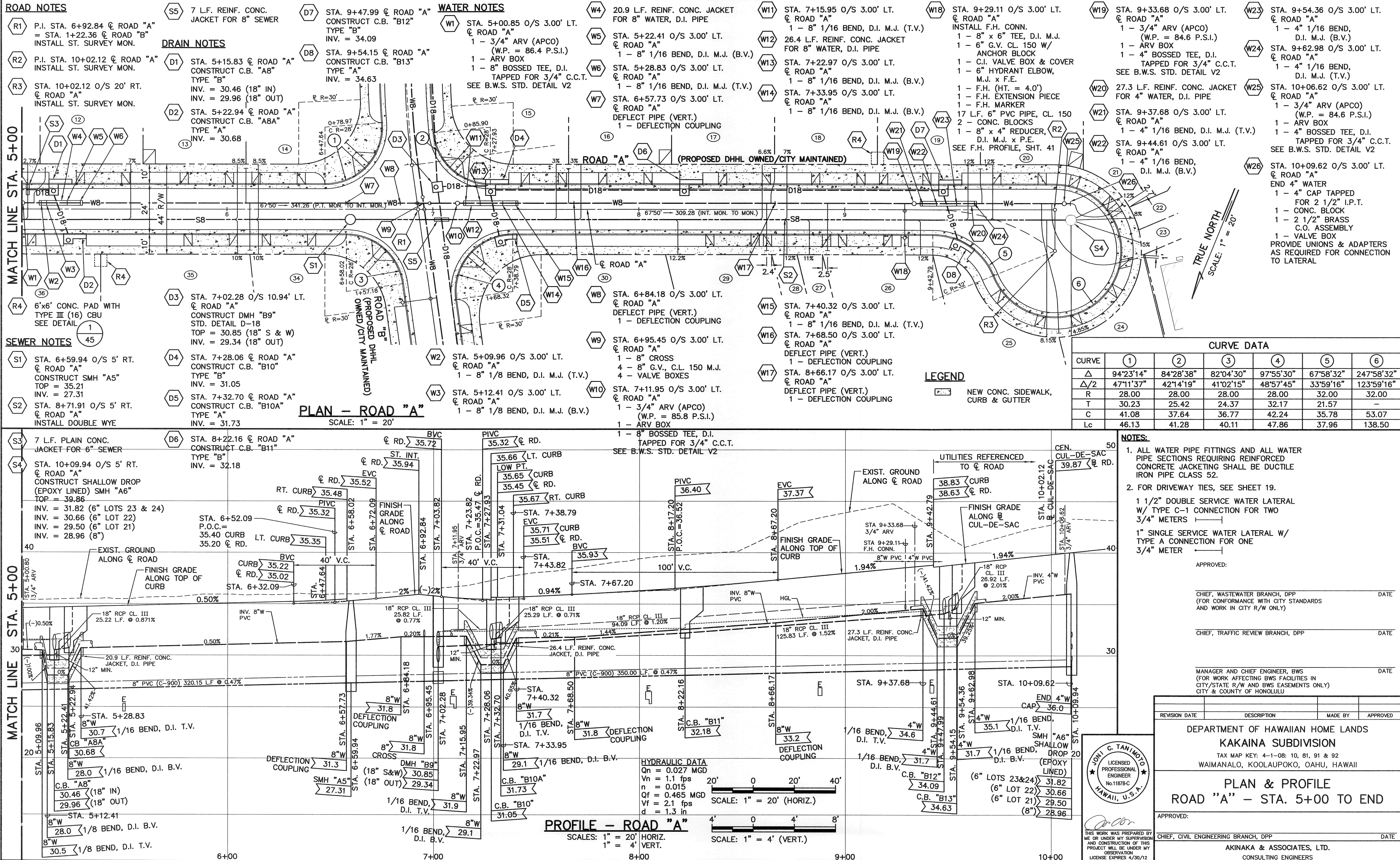
MANAGER AND CHIEF ENGINEER, BWS
FOR WORK AFFECTING BWS FACILITIES IN
CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

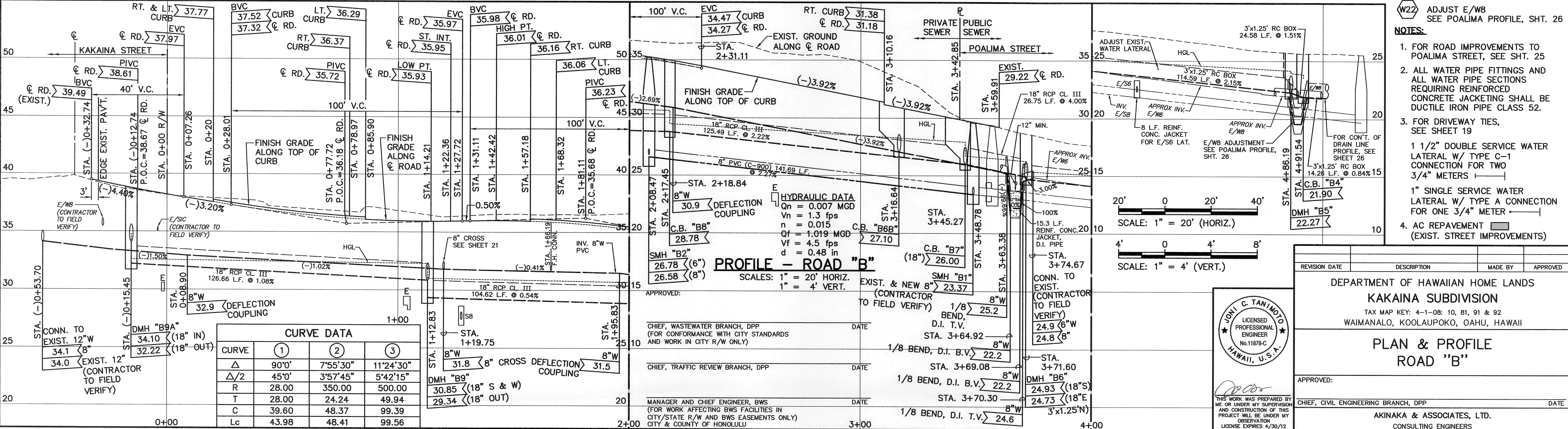
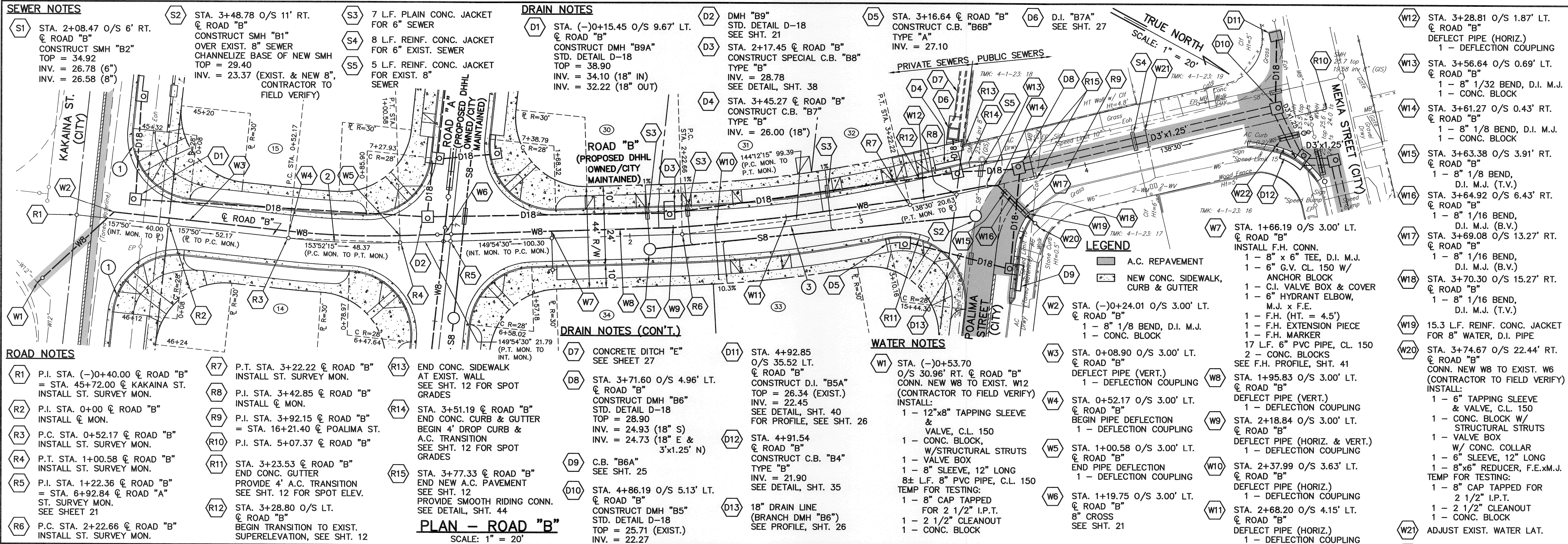
REVISION DATE DESCRIPTION MADE BY APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS			
KAKAINA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92			
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
PLAN & PROFILE			
ROAD "A" - STA. 0+00 TO 5+00			
APPROVED: _____ DATE _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



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





LEGEND

- NEW A.C. PAVEMENT
- A.C. REPAVEMENT
- NEW CONC. SIDEWALK, CURB & GUTTER

WATER NOTES

PHASE 2 - CONNECT NEW 20" W.L. TO EXIST. 20" W.L.

- W1 STA. 3+93.02 O/S 2.79' LT.
 Q. HIHIMANU ST.
 CONNECT TO EXIST. 20" CCP
 INSTALL:
 1 - 20" CCP BEND (52'19"31")
 1 - CONC. BLOCK
 W/STRUCT STRUTS
 1 - CCP x D.I. ADAPTER
 4.6 L.F. 20" D.I. PIPE, CL. 52
 (CONNECT AT W1)
 1 - 20" INSULATED COUPLING
 8 L.F. 20" CCP, CL. 150
 1 - 20" BUTT STRAP
 TEMP FOR TESTING @ W1 :
 1 - 20" CAP TAPPED
 FOR 4" I.P.T.
 1 - 4" CLEANOUT
 1 - CONC. BLOCK

ROAD NOTES

- R1 STA. 3+52.63 Q. HIHIMANU ST.
 BEGIN NEW A.C. PAV'T, CONC.
 CURB, GUTTER & S/W.
 PROVIDE STD. 4' DROP CURB.
 SEE SPOT ELEV. SHEET 11
 R2 ST. SURVEY MON.
 SEE SHEET 20

- W2 STA. 6+98.75 O/S 18.27' RT.
 Q. HIHIMANU ST.
 CONNECT TO EXIST. 20" CCP
 INSTALL:
 1 - 20" CCP BEND (56'31'30")
 1 - CONC. BLOCK W/STRUCT. STRUTS
 1 - CCP x D.I. ADAPTER
 4.1 L.F. 20" D.I. PIPE, CL. 52
 (CONNECT AT W15)
 1 - 20" INSULATED COUPLING
 2.5 L.F. 20" CCP, CL. 150
 (CONNECT AT EXIST. 20"x12" TEE)
 1 - 20" BUTT STRAP
 TEMP FOR TESTING @ W15 :
 1 - 20" CAP TAPPED
 FOR 4" I.P.T.
 1 - 4" CLEANOUT
 1 - CONC. BLOCK

- R3 A.C. REPAVEMENT
 SEE TYPICAL SECTION, SHT. 19
 R4 PROVIDE SMOOTH-RIDING CONN.
 SEE DETAIL, SHT. 44
 R5 CONSTRUCT STD. CONC. CURB
 & GUTTER

- W3 CONNECT NEW 8"W TO EXIST. 8"W
 INSTALL:
 1 - 8" TEE, M.J.
 1 - CONC. BLOCK W/STRUCT. STRUTS
 6.6 L.F. 8" D.I. PIPE, CL. 52
 8 L.F. 8" PVC, CL. 150
 1 - 8" SLEEVE, 12" LONG
 8" PVC, CL. 150, CUT TO FIT (≈ 8 L.F.)
 TEMP FOR TESTING @ 8" 1/4 BEND:
 1 - 8" CAP TAPPED FOR
 2 1/2" I.P.T.
 1 - 2 1/2" C.O.
 1 - CONC. BLOCK
 CONNECT TO EXIST. 6"W
 REMOVE:
 1 - EXIST. 8" x 6" TEE
 INSTALL:
 1 - 8" x 6" REDUCER, M.J., L.E.B.
 1 - 6" 1/4 BEND, M.J.
 1 - CONC. BLOCK
 EXIST. 6"W, G.V. & F.H. TO REMAIN
 SEE PROFILE

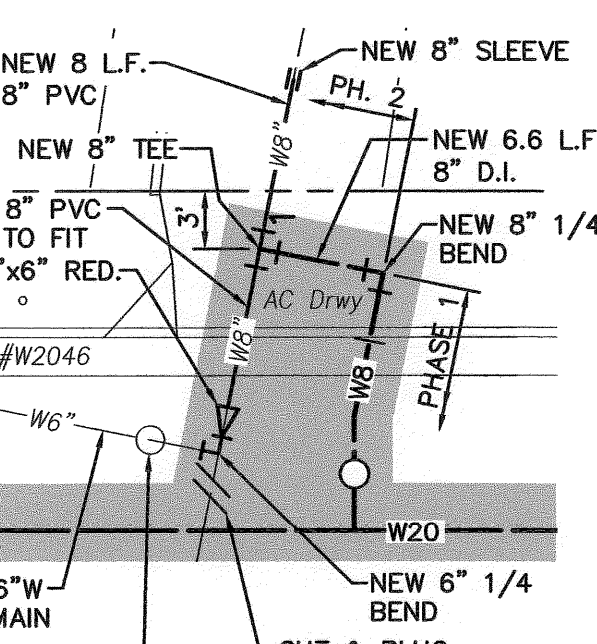
- R6 P.I. STA. 7+13.35 Q. HIHMANU ST.
 = P.I. STA. 52+08.85 Q. KAKAINA ST.
 END NEW A.C. PAVEMENT
 FOR CONTINUATION, SEE SHEET 24

SEWER NOTES

- S1 STA. 3+52.96 O/S 2.24' RT.
 CONN. NEW 8"S TO EXIST. SMH.
 ADJUST EXIST. SMH TOP TO
 FINISH GRADE
 TOP = 32.45
 INV. = 23.60 (EXIST. & NEW 8"S,
 CONTRACTOR TO FIELD VERIFY)

- S2 SMH "A1"
 SEE SHT. 20

- W4 ABANDON EXIST. 20"W
 IN PLACE
 W5 REMOVE PORTION OF
 EXIST. 20"W
 W6 EXIST. 20"W TO REMAIN
 W7 CUT & PLUG EXIST. 6"W
 AT MAIN
 INSTALL:
 1 - 6" PLUG
 1 - 6" HUB CLAMP
 W/ STRONG BACK TIE
 1 - CONC. BLOCK
 W8 CUT & PLUG EXIST. 6"W
 W9 CUT & PLUG EXIST. 20"W
 REMOVE PORTION OF E/W20
 (WITHIN NEW 8"W CROSSING)
 AFTER NEW 20"W IN SERVICE



8"W CONN. DETAIL

SCALE: 1" = 10'

PLAN - HIHIMANU STREET

SCALE: 1" = 20'

WATER NOTES

PHASE 1 - CONSTRUCT NEW 20" WATERLINE

- W1 STA. 3+97.94 O/S 7.71' LT.
 Q. HIHIMANU ST.
 1 - 20" 1/8 BEND, M.J.
 1 - CONC. BLOCK
 W2 STA. 4+26.46 O/S 7.71' LT.
 Q. HIHIMANU ST.
 1 - 20" x 8" TEE, M.J.
 1 - CONC. BLOCK
 8" D.I. PIPE, CL. 52, P.E., CUT TO FIT
 1 - 8" G.V., CL. 150, M.J.
 (3' FROM TEE)
 1 - VALVE BOX
 1 - TEMP. 8" PLUG @ 8" G.V.
 1 - CONC. BLOCK @ 8" PLUG
 W3 STA. 4+35.54 O/S 7.71' LT.
 Q. HIHIMANU ST.
 1 - 20" BGGV W/ 3" BYPASS,
 FL., CL. 150
 1 - TYPE "A" MANHOLE
 2 - 20" ADAPTERS,
 FL. x B.E., 3'-0"
 1 - 20" DISMANTLING JOINT, FL.
 2 - CONC. CAPPING COLLARS
 W4 STA. 4+47.62 O/S 7.71' LT.
 Q. HIHIMANU ST.
 1 - 2" ARV (OFFSET)
 (W.P. = 87.7 P.S.I.)
 1 - TYPE "D" MANHOLE
 W5 STA. 4+83.95 O/S 7.71' LT.
 Q. HIHIMANU ST.
 1 - 20" 1/32 BEND, M.J.
 1 - CONC. BLOCK
 W6 STA. 5+01.08 O/S 4.30' LT.
 Q. HIHIMANU ST.
 1 - 20" 1/32 BEND, M.J.
 1 - CONC. BLOCK
 W7 STA. 5+22.98 O/S 4.30' LT.
 Q. HIHIMANU ST.
 1 - 20" x 8" TEE, M.J.
 1 - CONC. BLOCK
 1 - 8" G.V., CL. 150, M.J.
 1 - VALVE BOX
 1 - 8" 1/32 BEND, M.J. (HORIZ.)
 1 - 8" 1/16 BEND, M.J. (B.V.)
 1 - 8" 1/4 BEND, M.J. (HORIZ. & T.V.)
 1 - TEMP. 8" PLUG @ 8" 1/4 BEND
 4 - CONC. BLOCKS
 13.6 L.F. 8" D.I. PIPE, CL. 52
 CONNECTION TO EXIST. 8"W TO
 BE DONE IN PHASE 2
 SEE PROFILE

CURVE DATA	
CURVE	(1)
Δ	82°30'
Δ/2	41°15'
R	28.00
T	24.56
C	36.92
Lc	40.32

ELECTRICAL NOTES

- E1 RELOCATE EXIST. ELECT.
 POLE, SEE ELECT. PLANS
 NOTE:
 1. EXIST. ELECT. POLES TO
 REMAIN UNLESS
 OTHERWISE NOTED

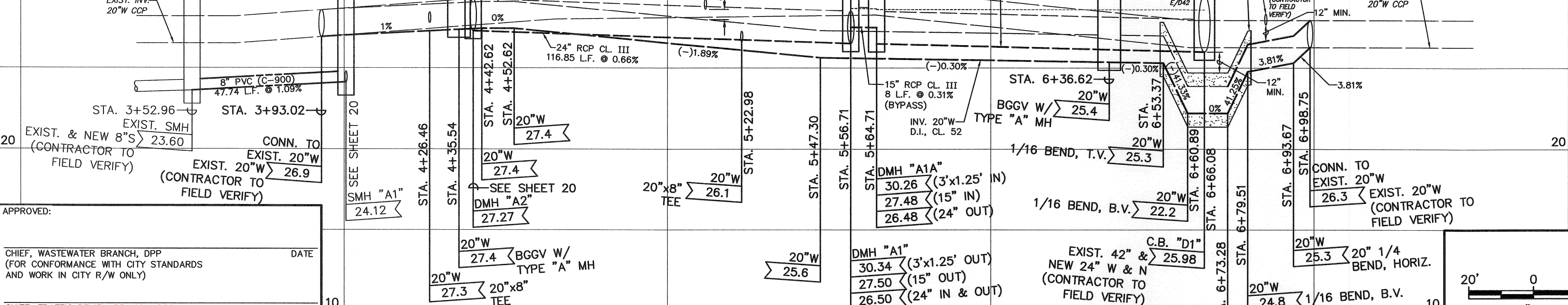
- W12 STA. 6+79.51 O/S 4.30' LT.
 Q. HIHIMANU ST.
 1 - 20" 1/16 BEND, M.J. (T.V.)
 W13 28.1 L.F. REINF. CONC. JACKET
 FOR 20" WATER
 W14 STA. 6+93.67 O/S 4.30' LT.
 Q. HIHIMANU ST.
 1 - 20" 1/4 TEE, M.J.
 1 - CONC. BLOCK
 W15 STA. 6+93.67 O/S 13.19' RT.
 Q. HIHIMANU ST.
 1 - 20" 1/8 BEND, M.J.
 1 - CONC. BLOCK
 W16 300'20" - 6.96'
 (CONN. TO 1/8 BEND)
 W17 345'20" - 86.00'
 (1/8 BEND TO 1/32 BEND)
 W18 356'35" - 17.47'
 (1/32 BEND TO 1/32 BEND)
 W19 345'20" - 192.59'
 (1/32 BEND TO TEE)
 W20 75'20" - 17.49'
 (TEE TO 1/8 BEND)
 W21 30'20" - 7.18'
 (1/8 BEND TO CONN.)
 W22 SEE SHEET 42 FOR EXTERNAL
 CORROSION PROTECTION PLAN

DRAIN NOTES

- D1 DMH "A2"
 SEE DETAIL D-18
 SEE SHT. 20
 D2 STA. 5+56.71 O/S 8.52' RT.
 Q. HIHIMANU ST.
 CONSTRUCT DMH "A1"
 SEE DETAIL D-18
 TOP = 33.71
 INV. = 30.34 (3'x1.25' OUT)
 INV. = 27.50 (15" OUT)
 INV. = 26.50 (24" IN & OUT)
 D3 STA. 5+64.71 O/S 8.52' RT.
 Q. HIHIMANU ST.
 CONSTRUCT DMH "A1A"
 SEE DETAIL D-18
 TOP = 33.75
 INV. = 30.26 (3'x1.25' IN)
 INV. = 27.48 (15" IN)
 INV. = 26.48 (24" OUT)
 D4 STA. 6+66.08 Q. HIHIMANU ST.
 CONSTRUCT SPECIAL TYPE "B"
 C.B. "D1" OVER EXIST. 42" DRAIN.
 DEMOLISH EXIST. D.I.
 INV. = 25.98 (EXIST. 42" &
 NEW 24" W & N, CONTRACTOR
 TO FIELD VERIFY)
 SEE DETAIL, SHT. 39
 D5 UNDERGROUND DETENTION
 BASIN, DHHL OWNED &
 MAINTAINED, SEE SHT. 29
 D6 SEE SHEET 29 FOR
 CONTINUATION

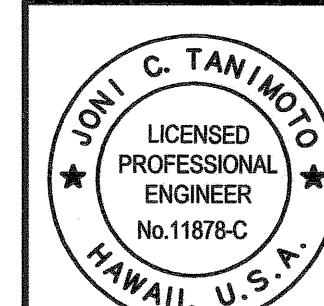
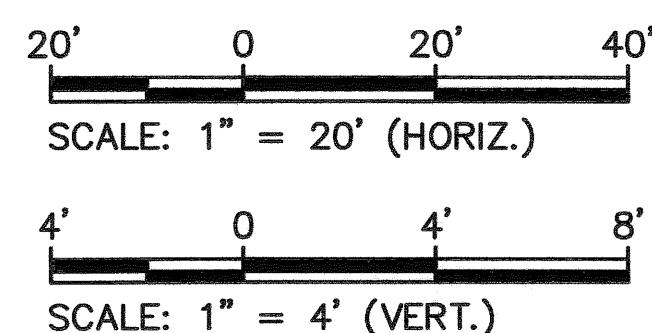
HYDRAULIC DATA (EXIST. SMH)

Qn = 0.072 MGD
 Vn = 2.0 fps
 n = 0.015
 Qf = 0.706 MGD
 Vf = 3.1 fps
 d = 1.72 in

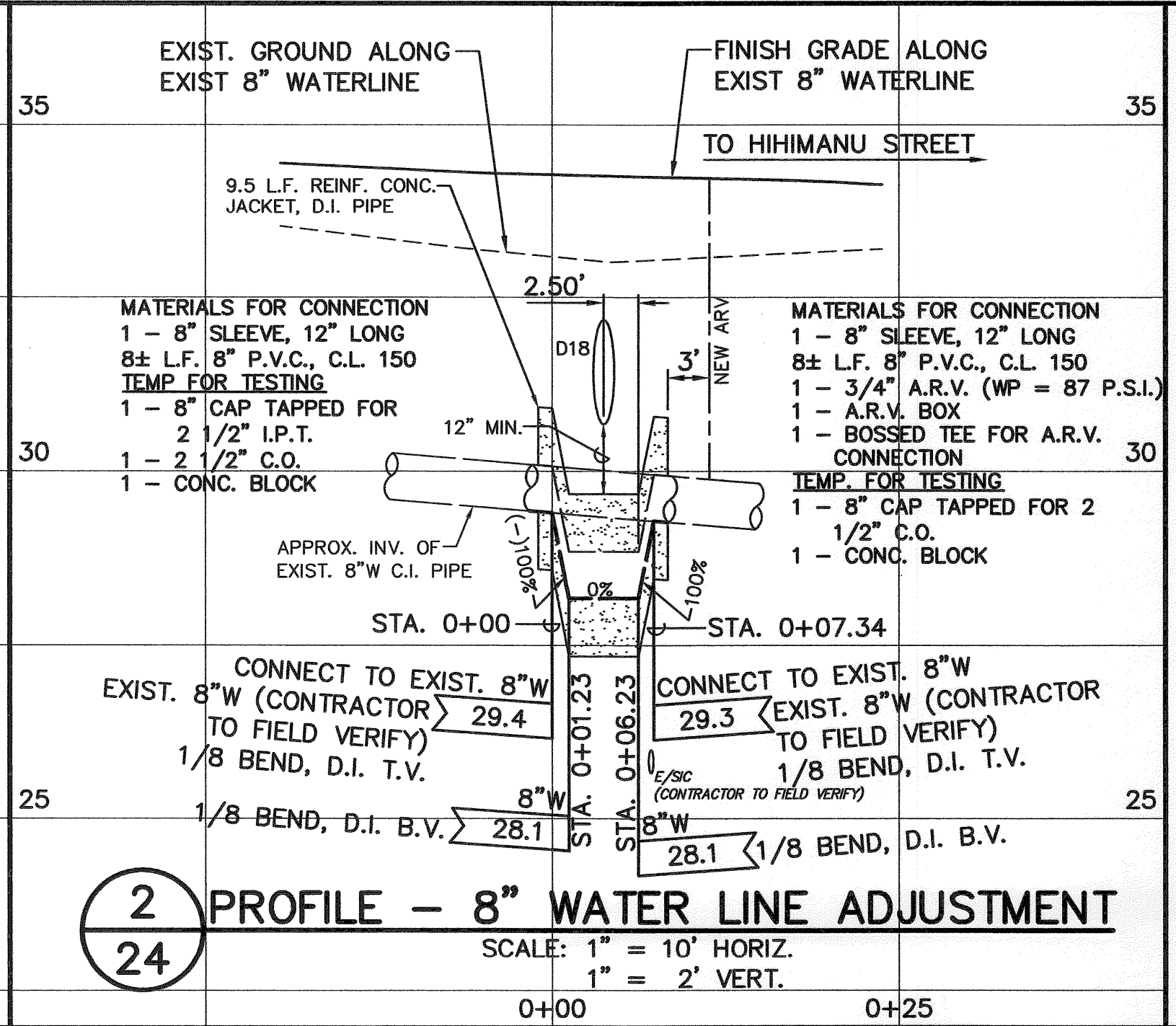
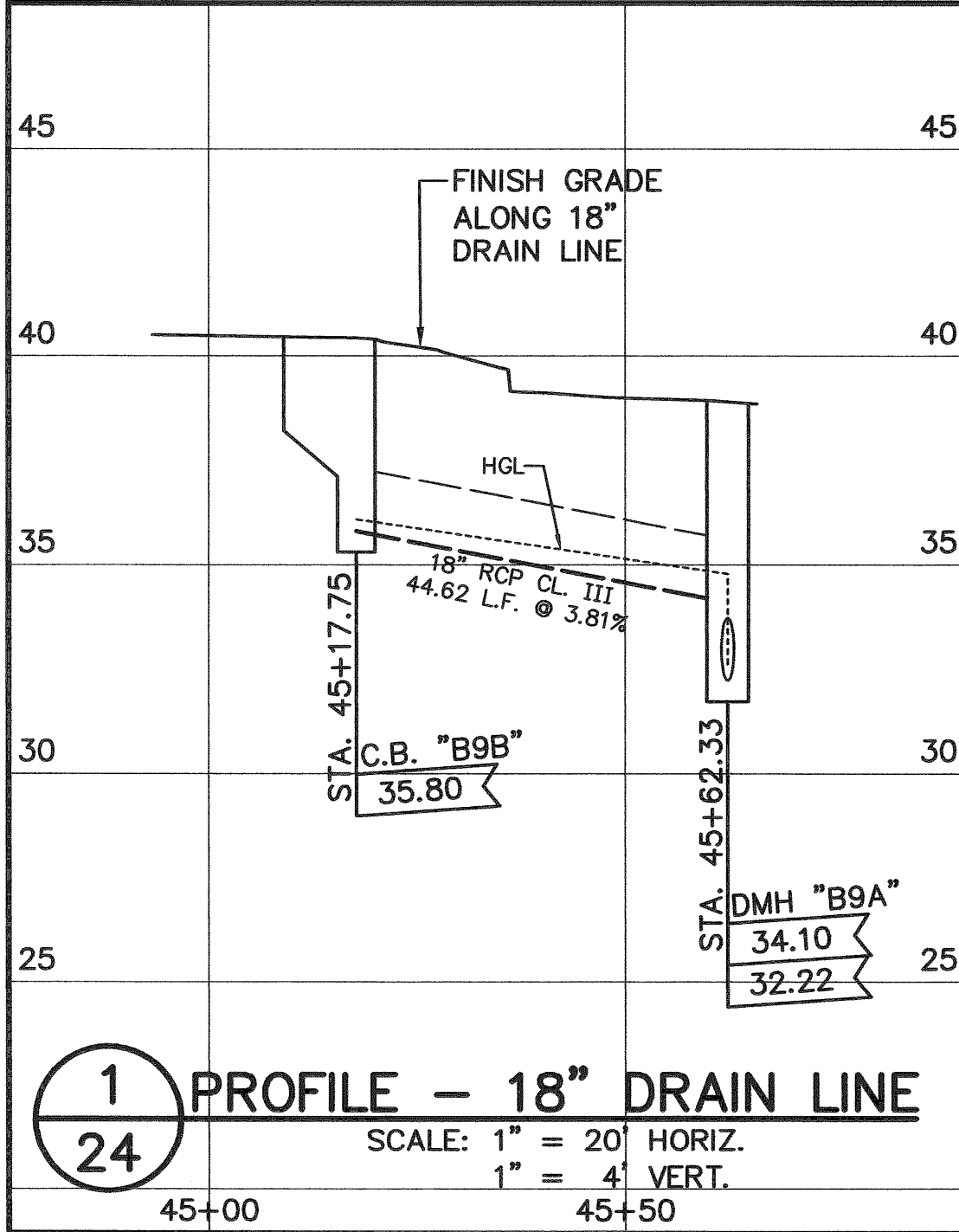
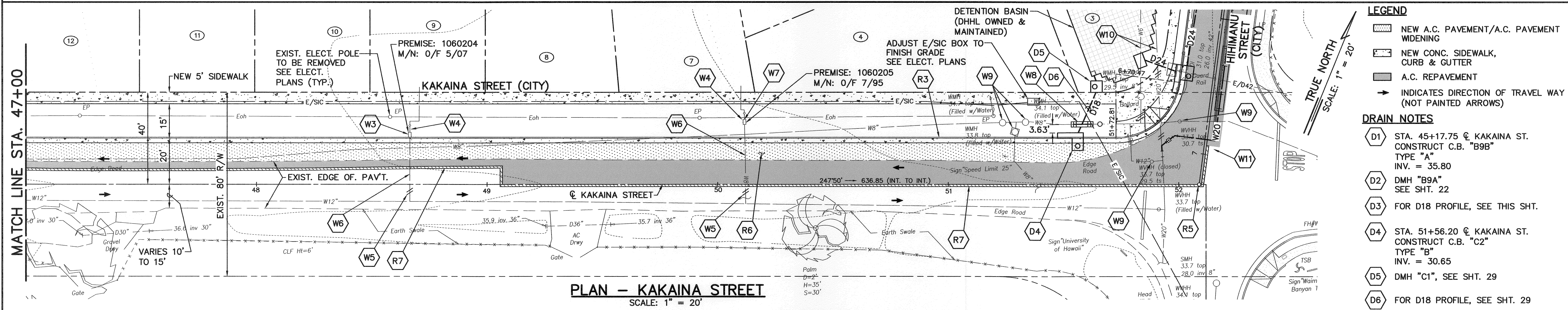
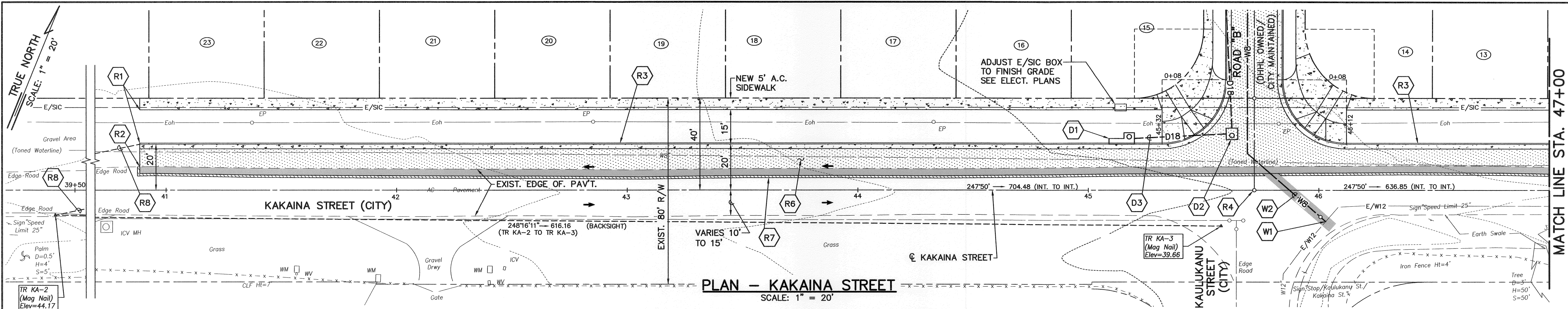


PROFILE - HIHIMANU STREET

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



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS			
KAKAINA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92			
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
PLAN & PROFILE			
HIHIMANU STREET			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



- ROAD NOTES**
- R1 STA. 40+88.59 O/S LT. @ KAKAINA ST. BEGIN NEW CURB, GUTTER & CONC. SIDEWALK PROVIDE 4' STD. DROP CURB
 - R2 STA. 40+88.59 O/S 10.2' LT. @ KAKAINA ST. MATCH NEW EDGE OF PAVEMENT TO EXIST. EDGE OF PAVEMENT
 - R3 CONSTRUCT STD. CONC. CURB & GUTTER
 - R4 P.I. STA. 45+72.00 @ KAKAINA ST. = STA. (-)0+40.00 @ ROAD "B" ST. SURVEY MON. SEE SHT. 22
 - R5 P.I. STA. 52+08.85 @ KAKAINA ST. = STA. 7+13.35 @ HIIMANU ST.
 - R6 CONSTRUCT NEW PAVEMENT SEE TYPICAL SECTION, SHT. 19
 - R7 PROVIDE SMOOTH-RIDING CONNECTION SEE DETAIL, SHT. 44
 - R8 TIE: TR KA-2 TO STA. 40+88.59 O/S 20' LT. @ KAKAINA ST. (BEGIN NEW CURB) 235°56'09" → 150.32

- WATER NOTES**
- W1 CONN. NEW 8"W TO EXIST. 12"W SEE SHT. 22
 - W2 FOR 8"W PROFILE, SEE SHT. 22
 - W3 PREMISE: 1060204 M/N: 0/F 5/07 CONTRACTOR TO CUT AND PLUG LATERAL AT MAIN. REMOVE AND DISPOSE OF EXIST. WATER METER.
 - W4 REMOVE EXIST. WM BOXES, VALVES & COVERS
 - W5 CUT & PLUG AT MAIN
 - W6 ABANDON EXIST. WATER LAT. IN PLACE
 - W7 PREMISE: 1060205 MIN: 0/F 7/95 CONTRACTOR TO CUT AND PLUG LATERAL AT MAIN. REMOVE AND DISPOSE OF EXIST. WATER METER.
 - W8 8" WATER LINE ADJUSTMENT, SEE PROFILE, THIS SHT.
 - W9 ADJUST EXIST. WATER VALVE BOXES TO FINISH GRADE

- NOTES:**
- 1. ALL WATER PIPE FITTINGS AND ALL WATER PIPE SECTIONS REQUIRING REINFORCED CONCRETE JACKETING SHALL BE DUCTILE IRON PIPE CLASS 52.
- APPROVED: _____ DATE _____
- CHIEF, TRAFFIC REVIEW BRANCH, DPP

MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

APPROVED: _____ DATE _____

CHIEF, CIVIL ENGINEERING BRANCH, DPP

REVISION DATE DESCRIPTION MADE BY APPROVED

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DEPARTMENT OF HAWAIIAN HOME LANDS
KAKAINA SUBDIVISION
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

PLAN - KAKAINA STREET & MISCELLANEOUS PROFILES

APPROVED: _____ DATE _____

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE POCKET FOLDER NO.

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ROAD NOTES

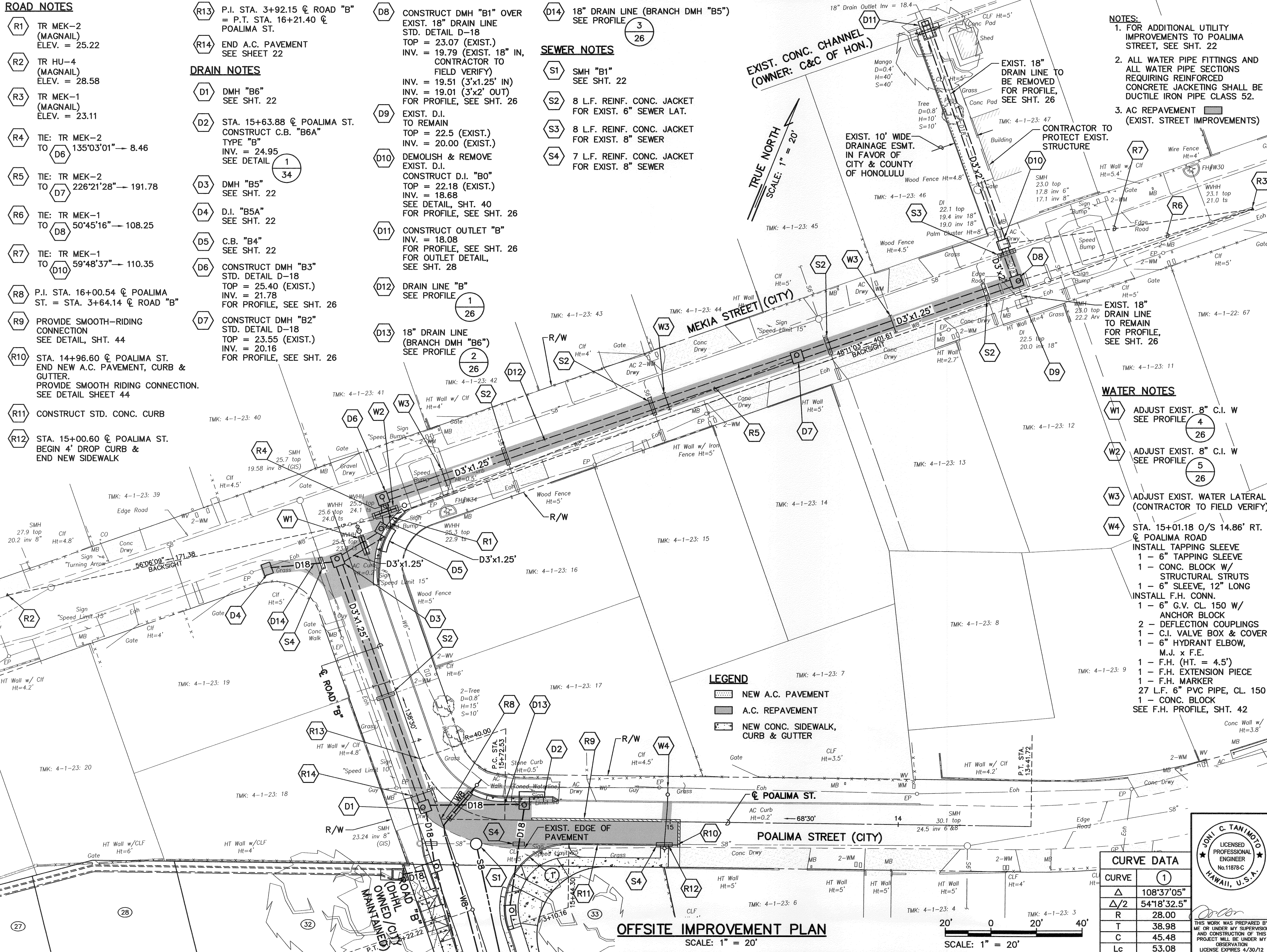
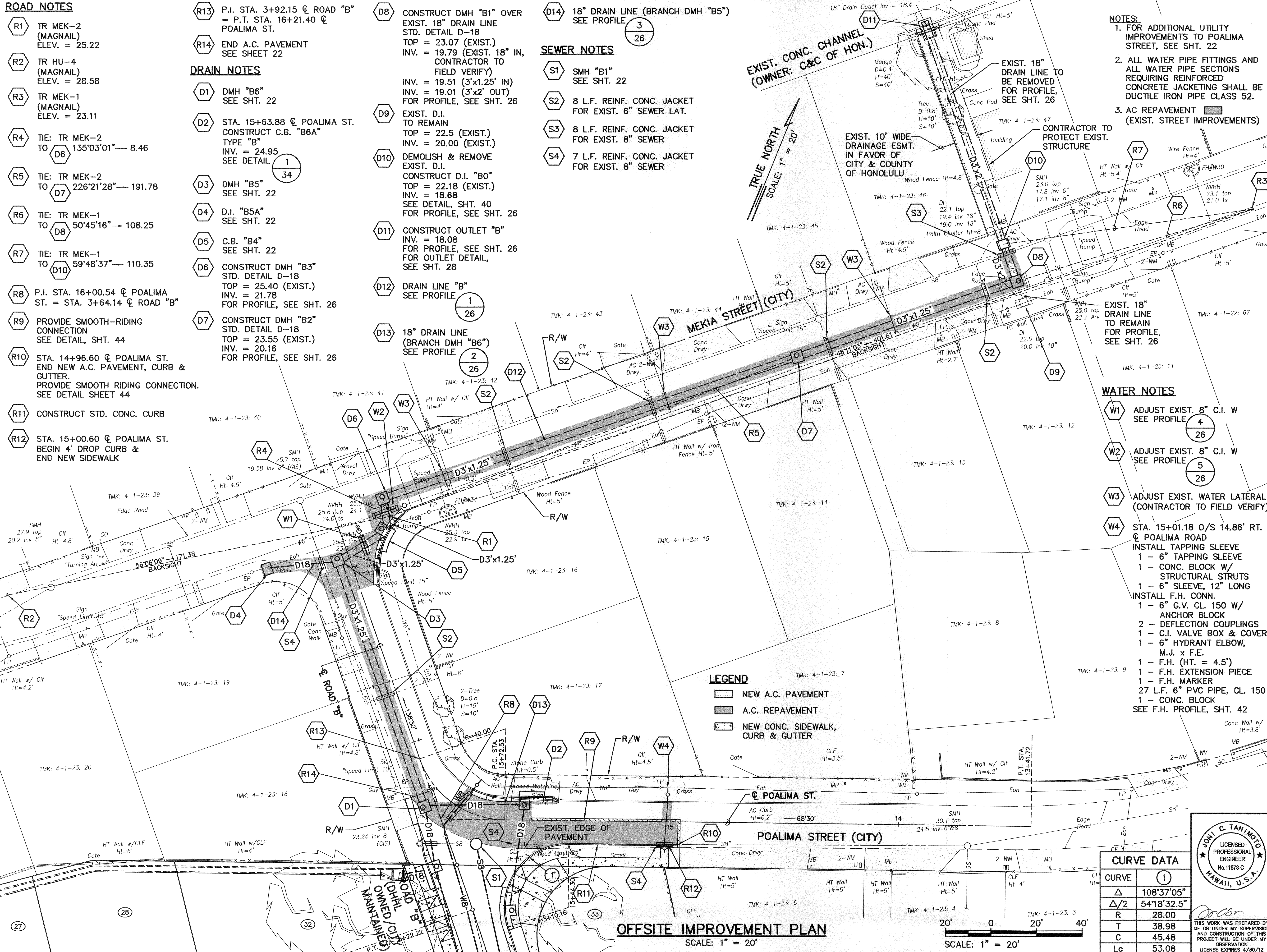
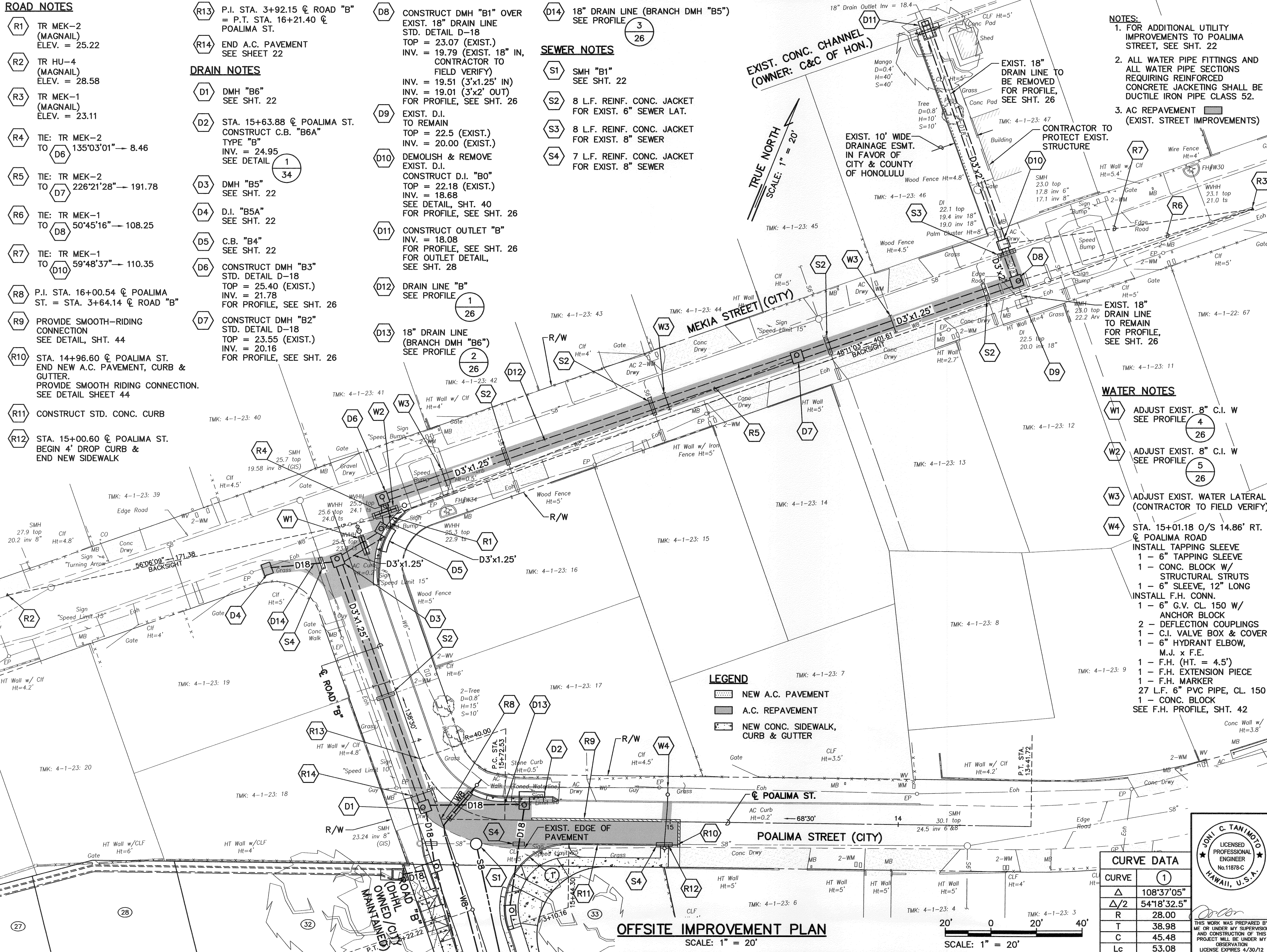
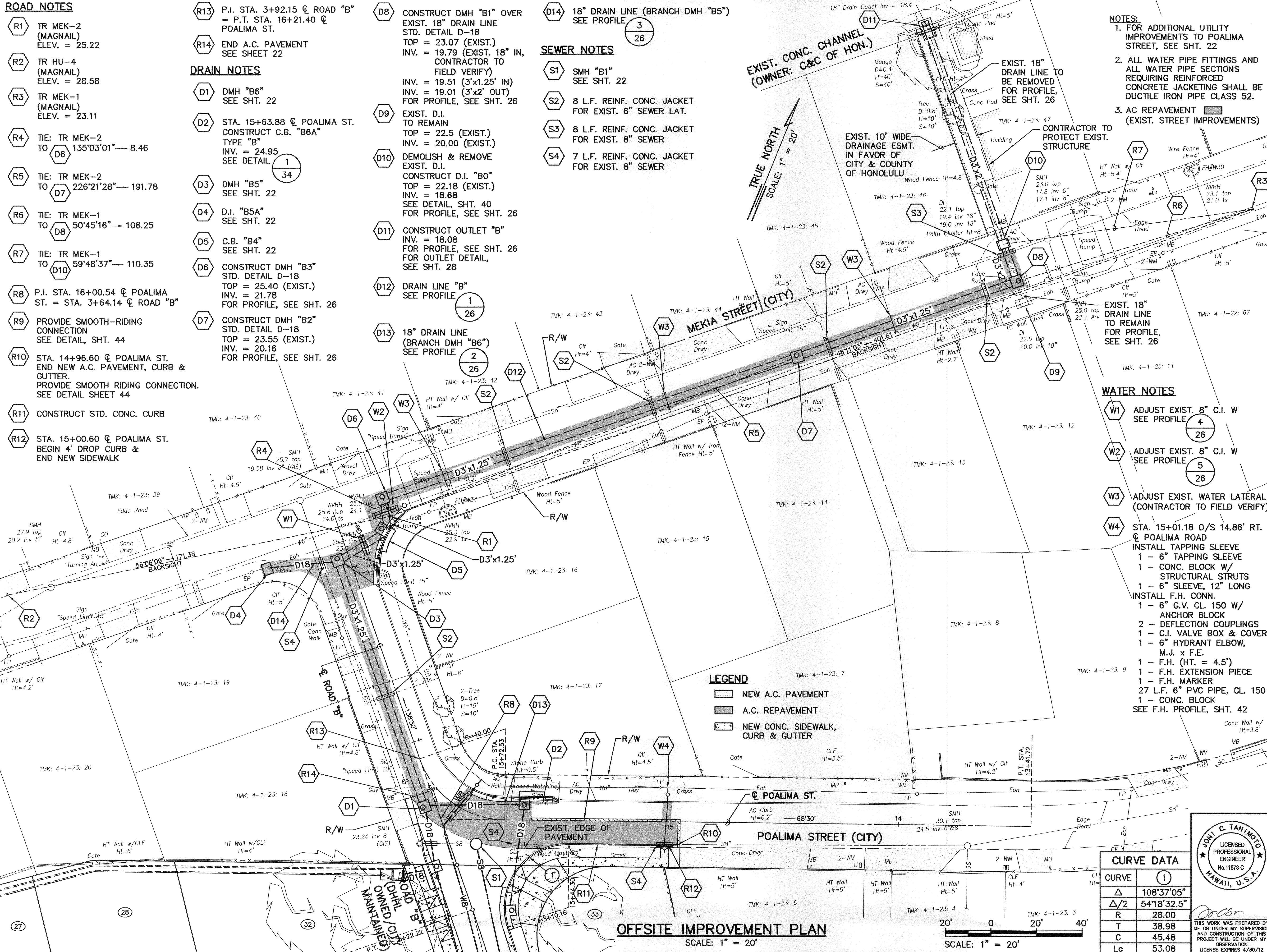
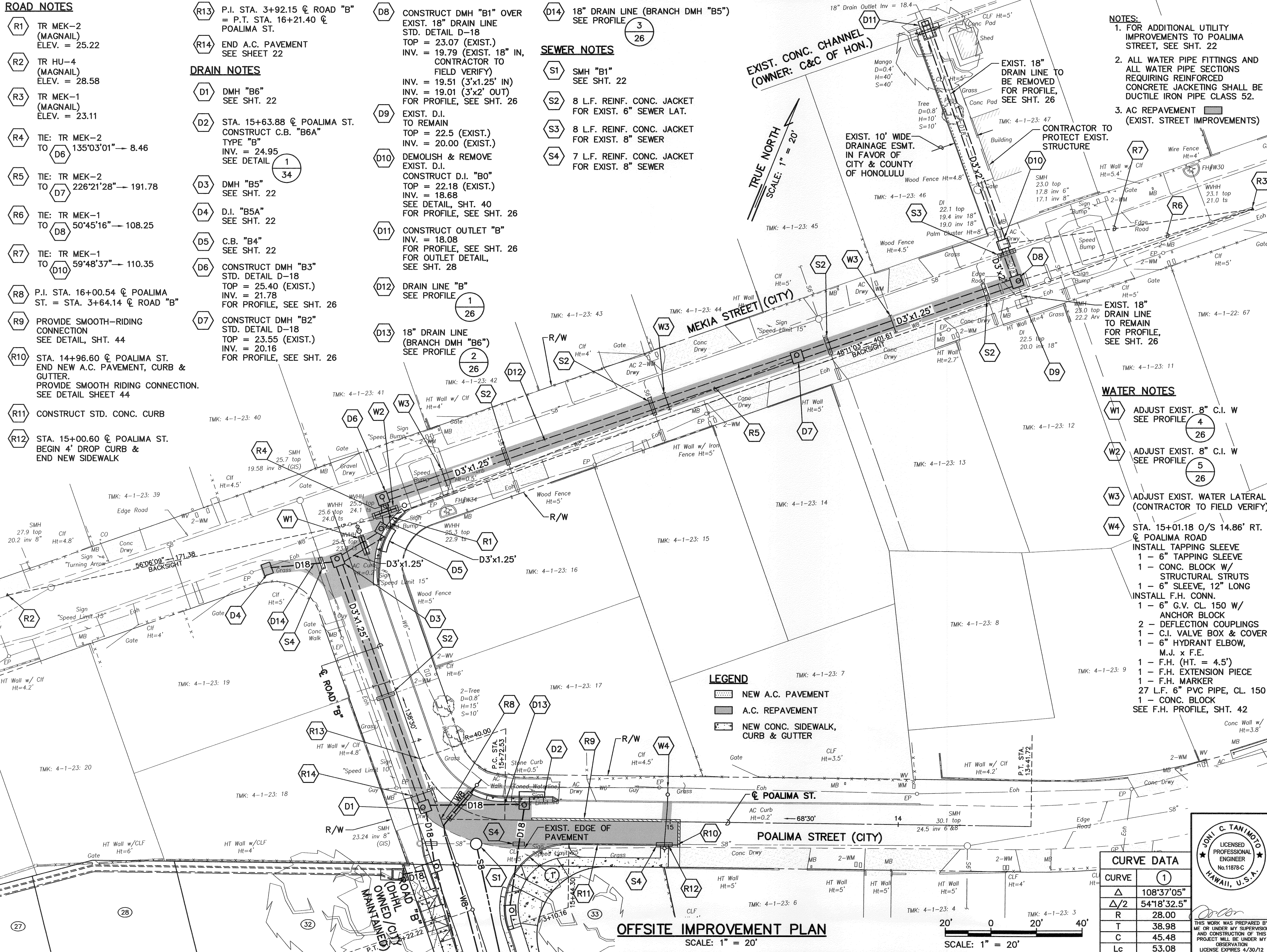
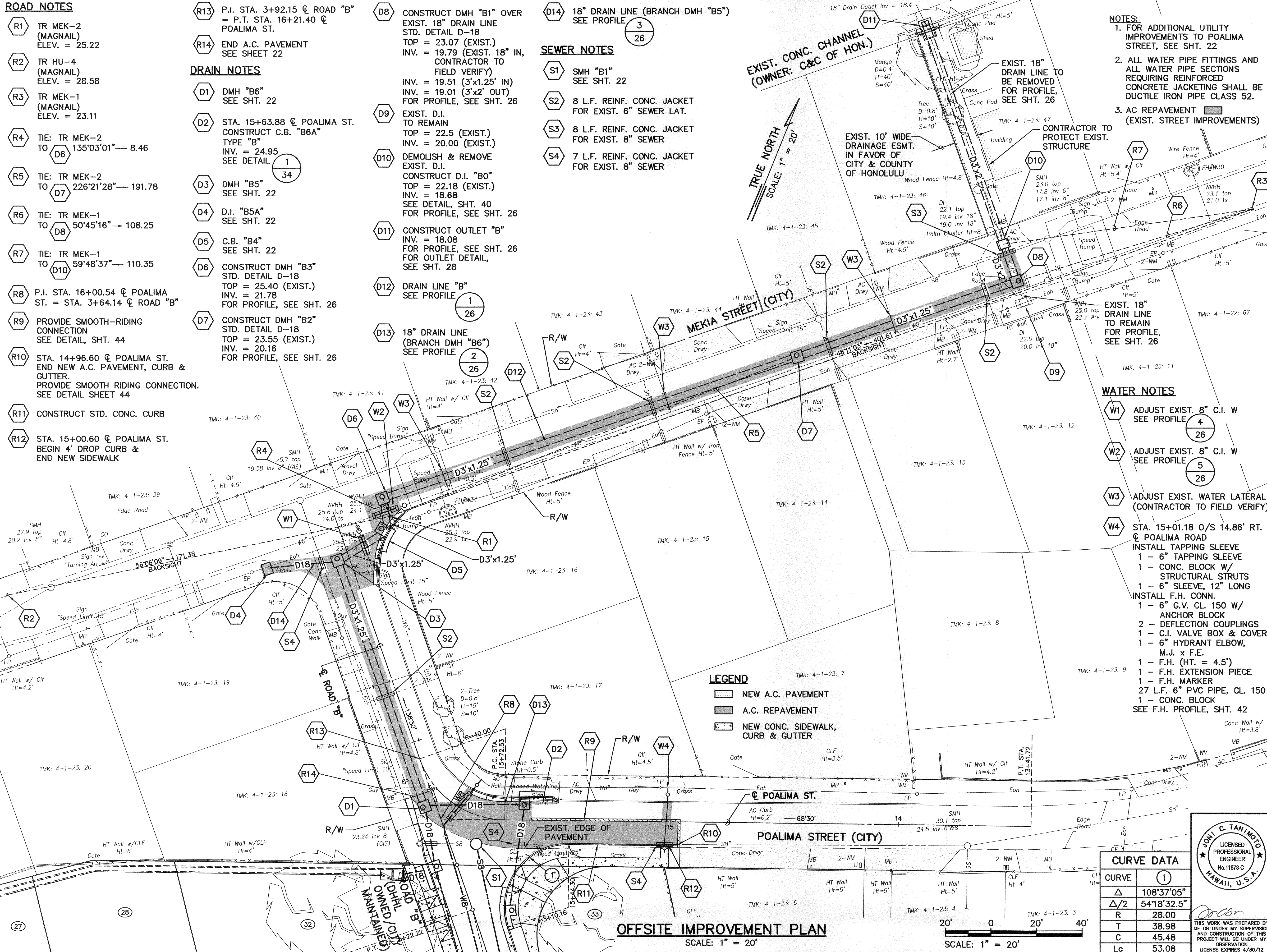
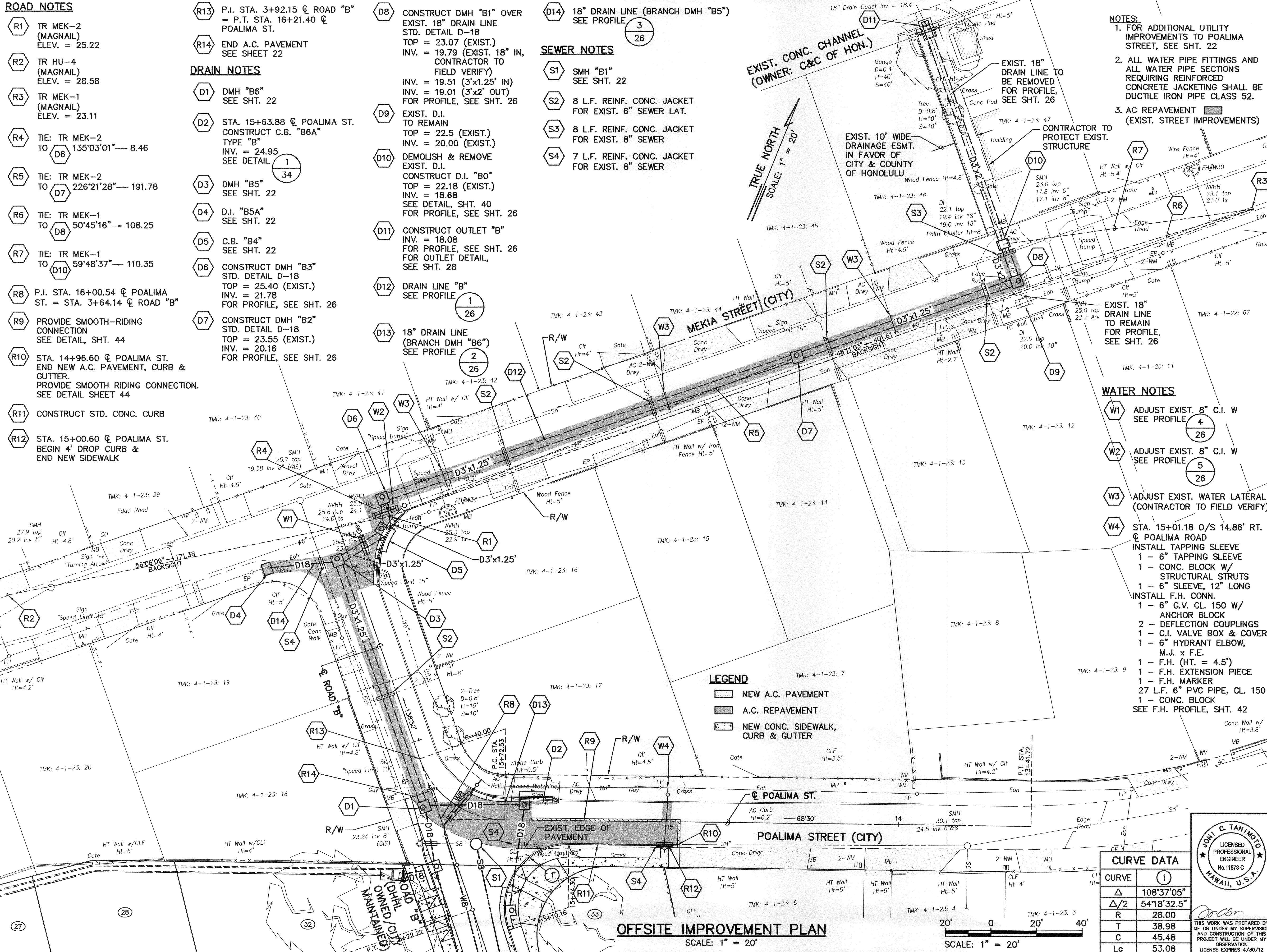
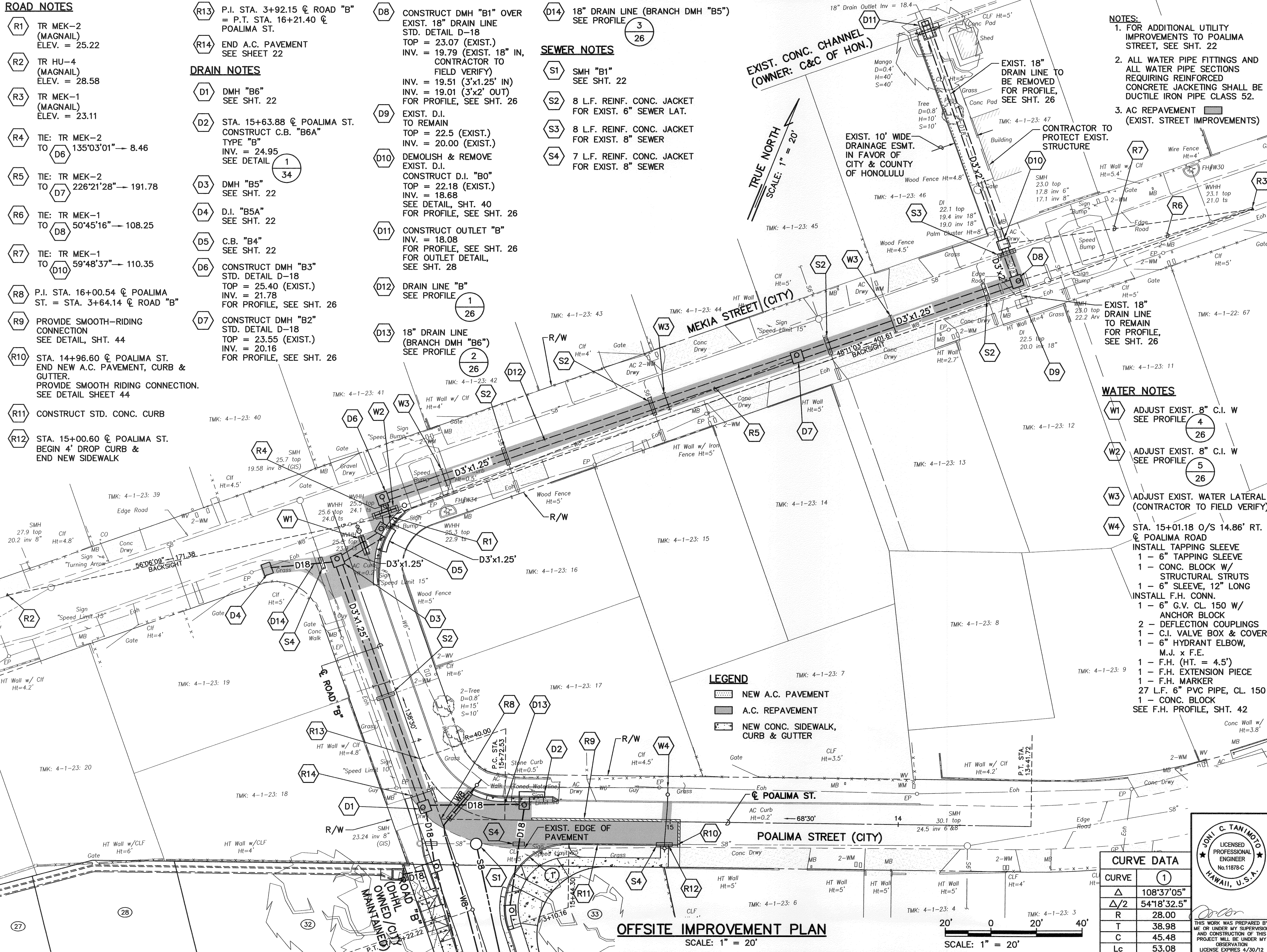
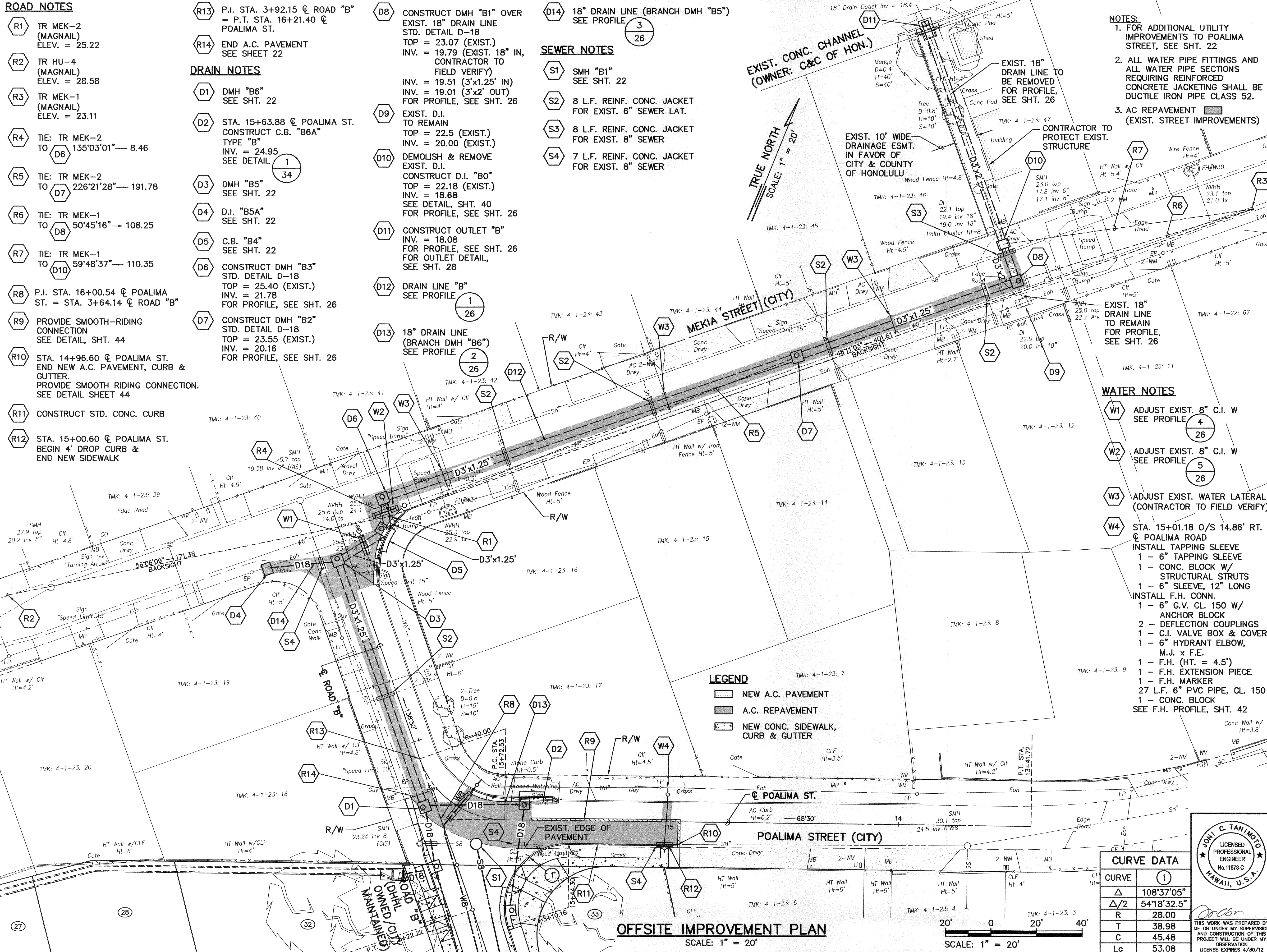
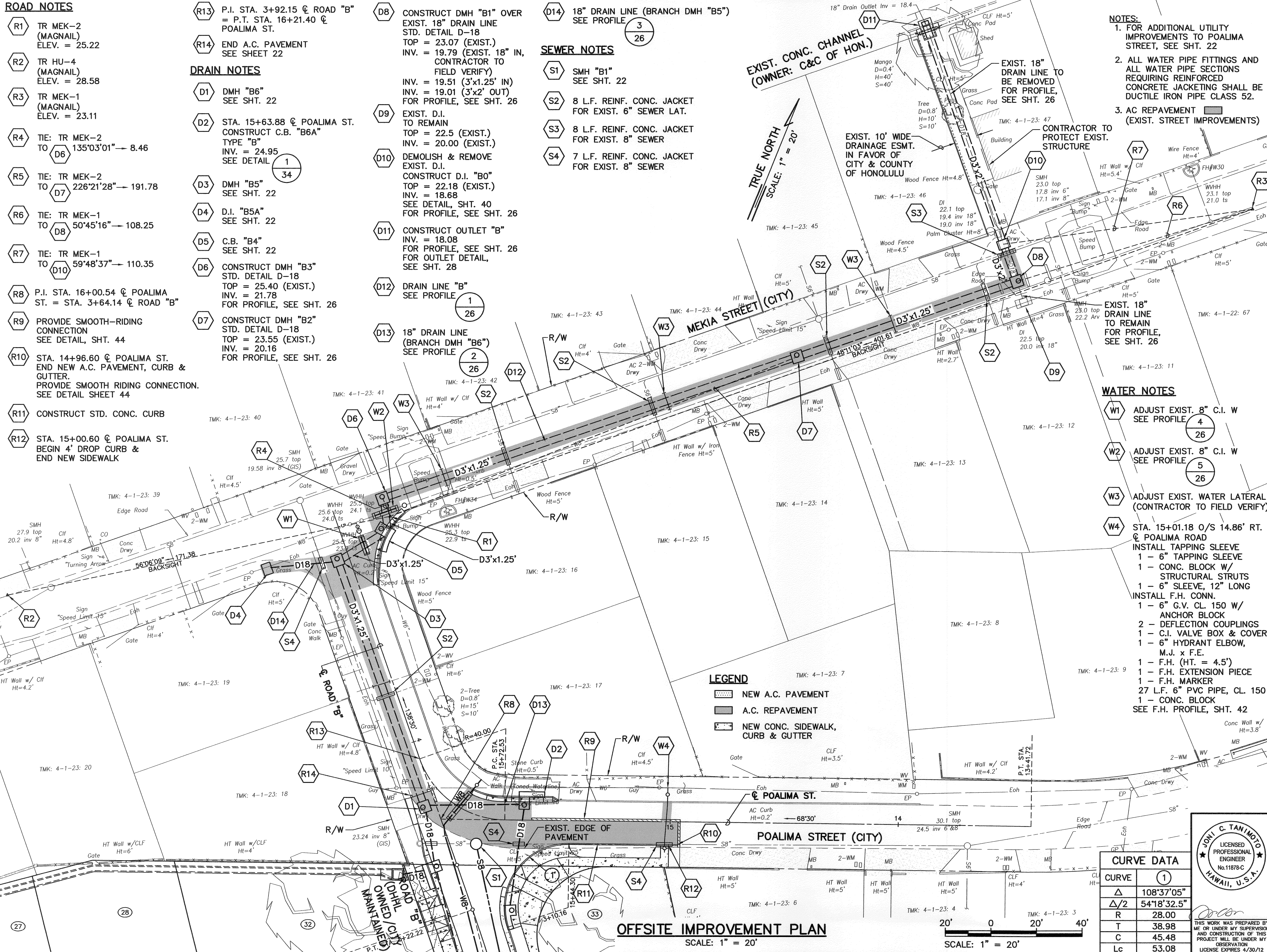
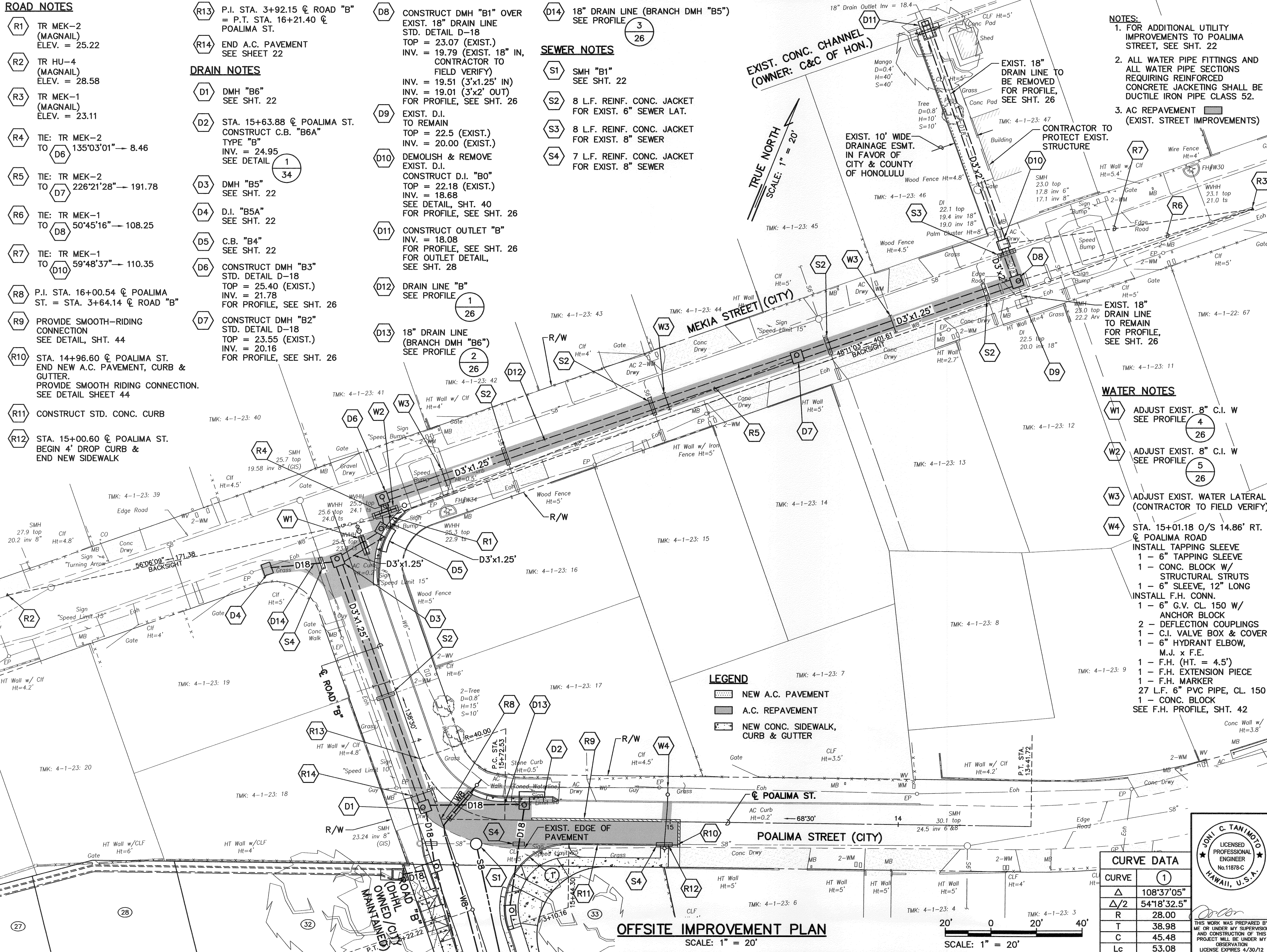
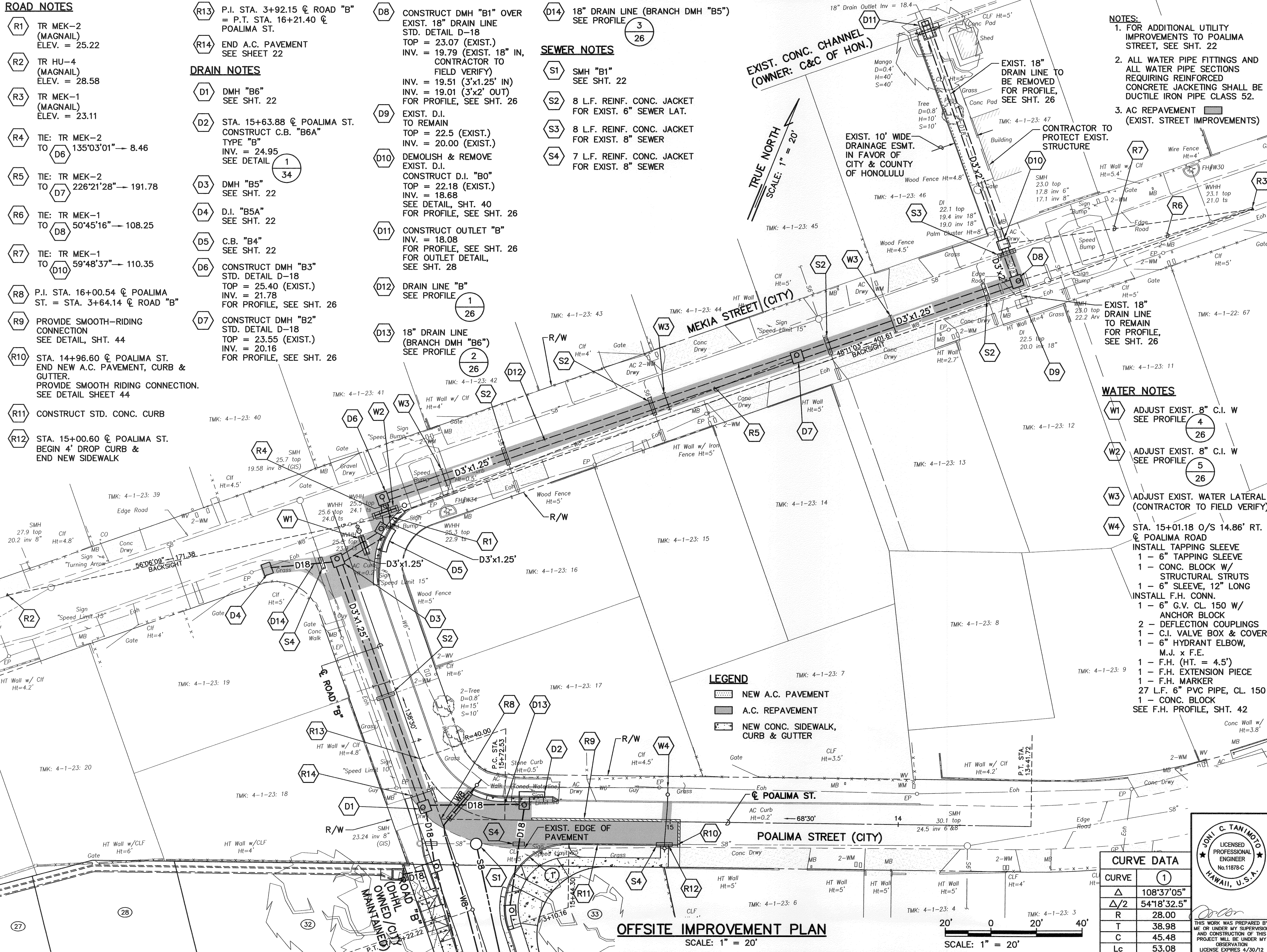
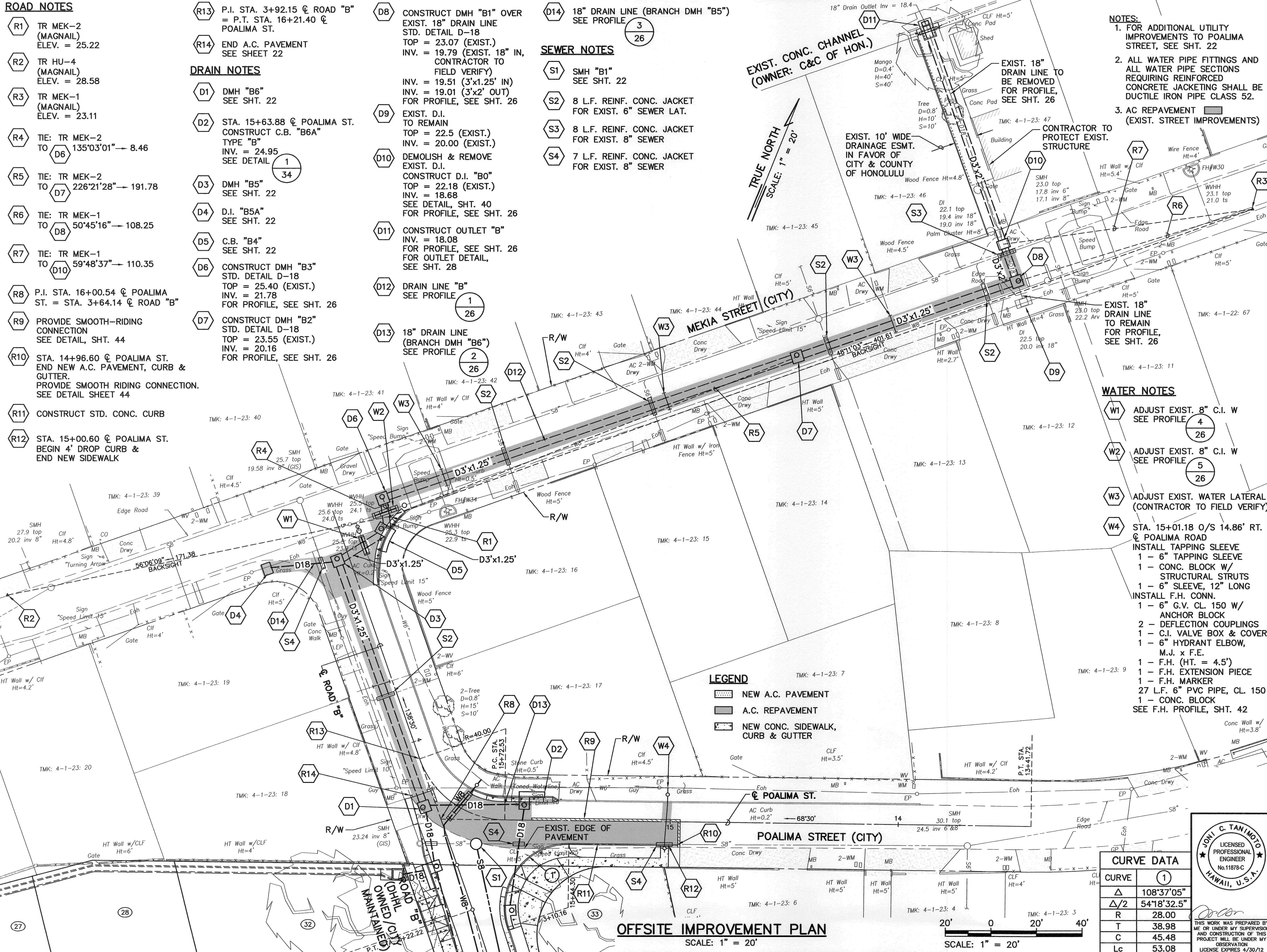
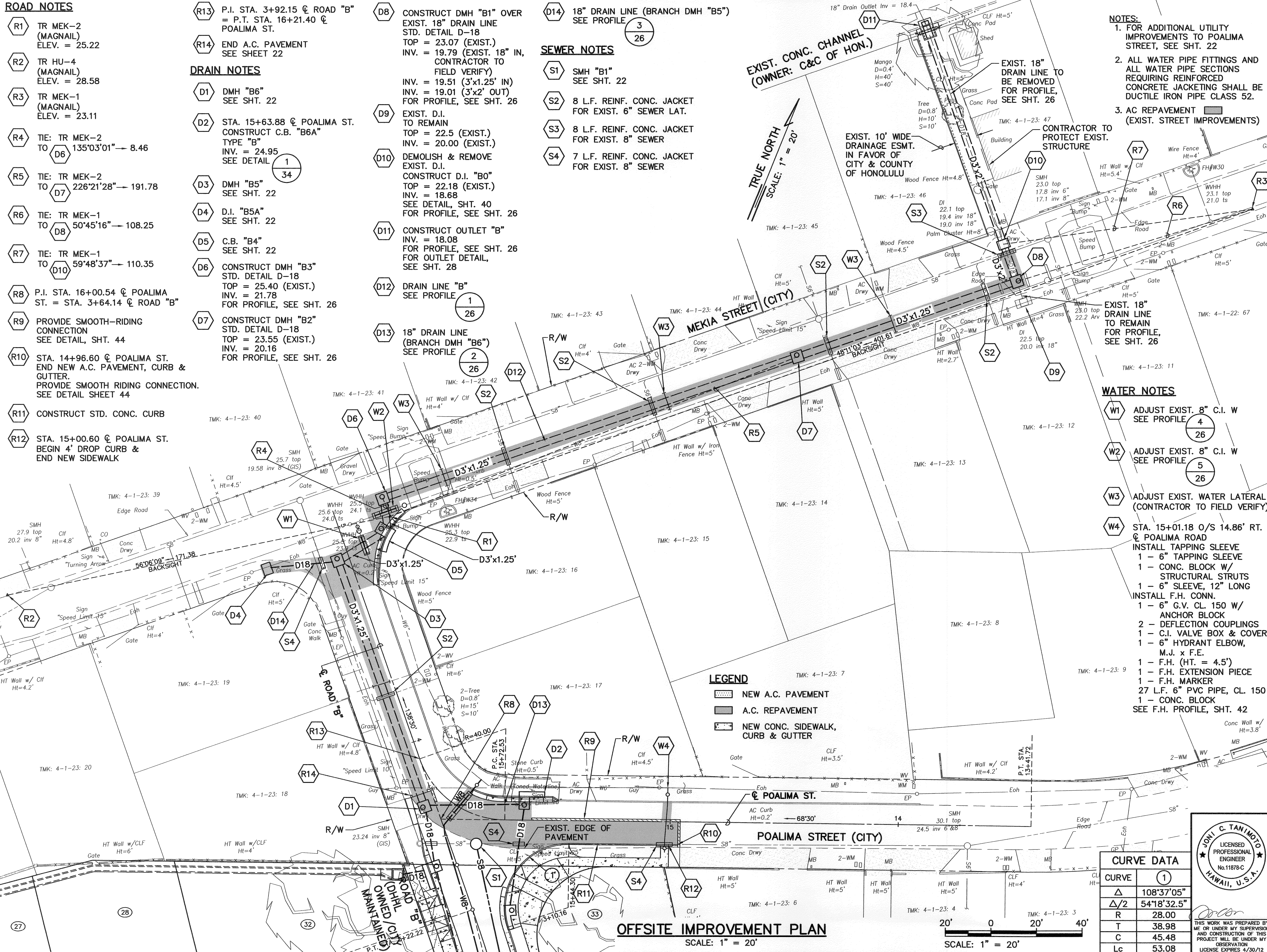
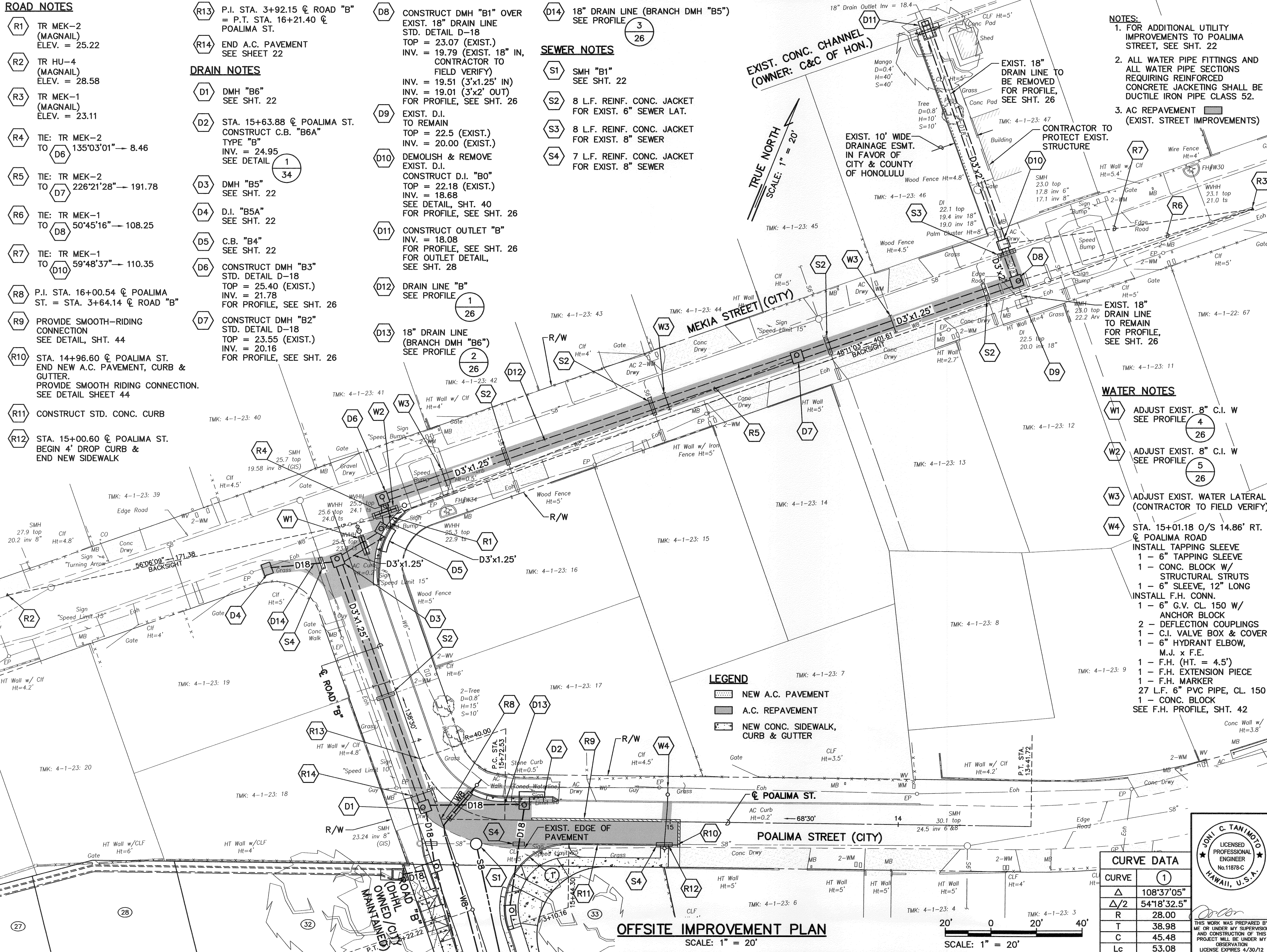
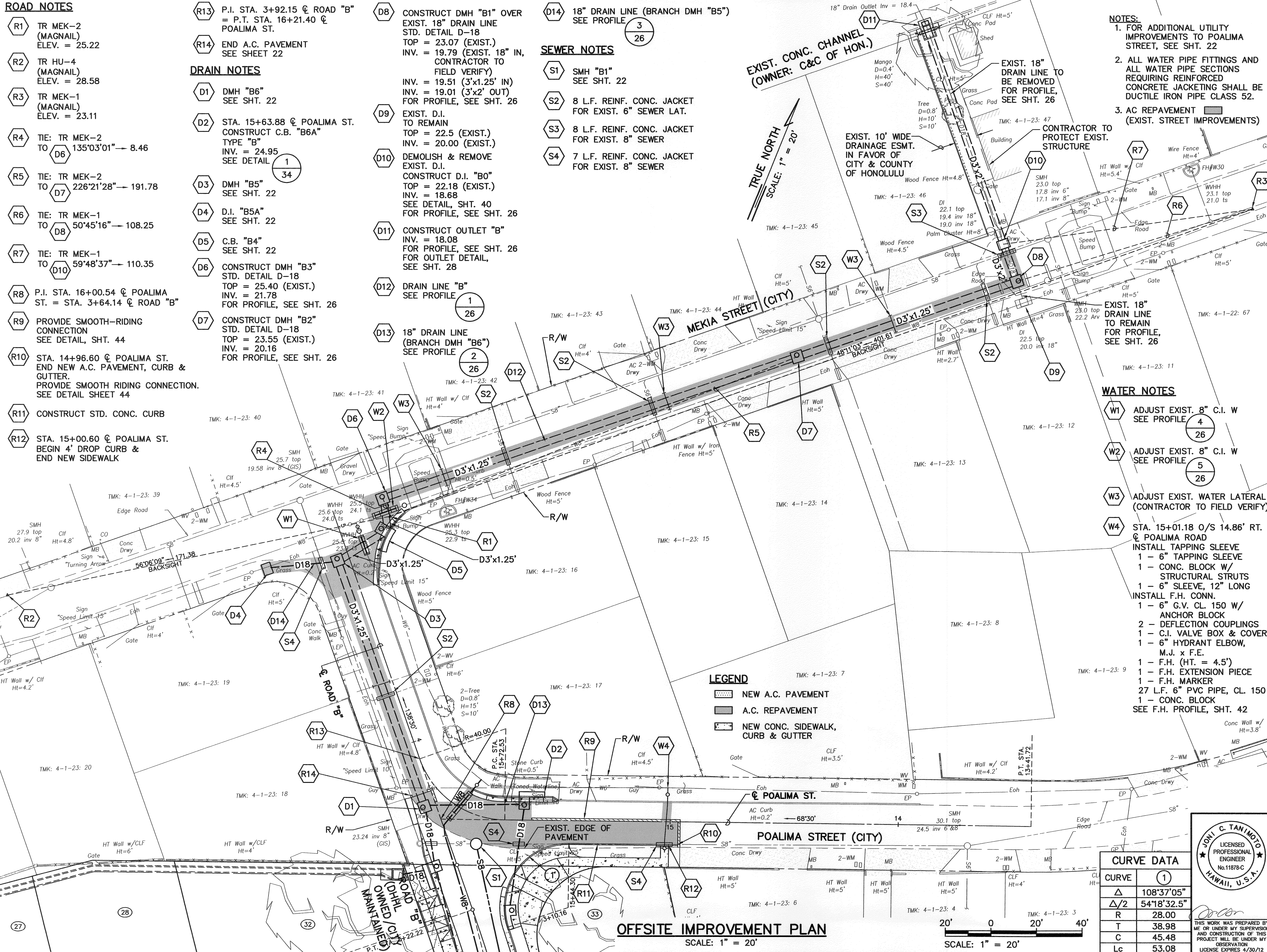
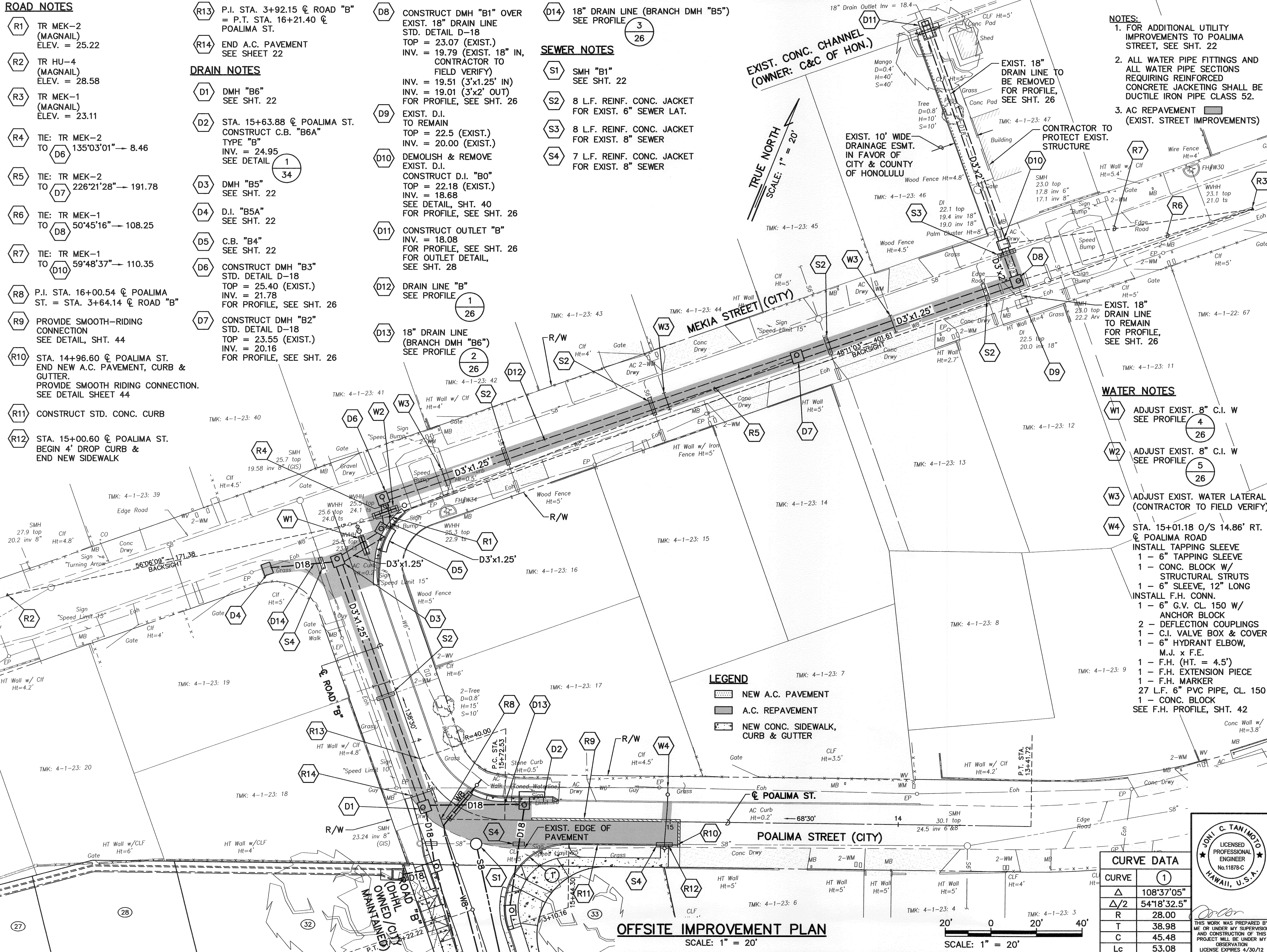
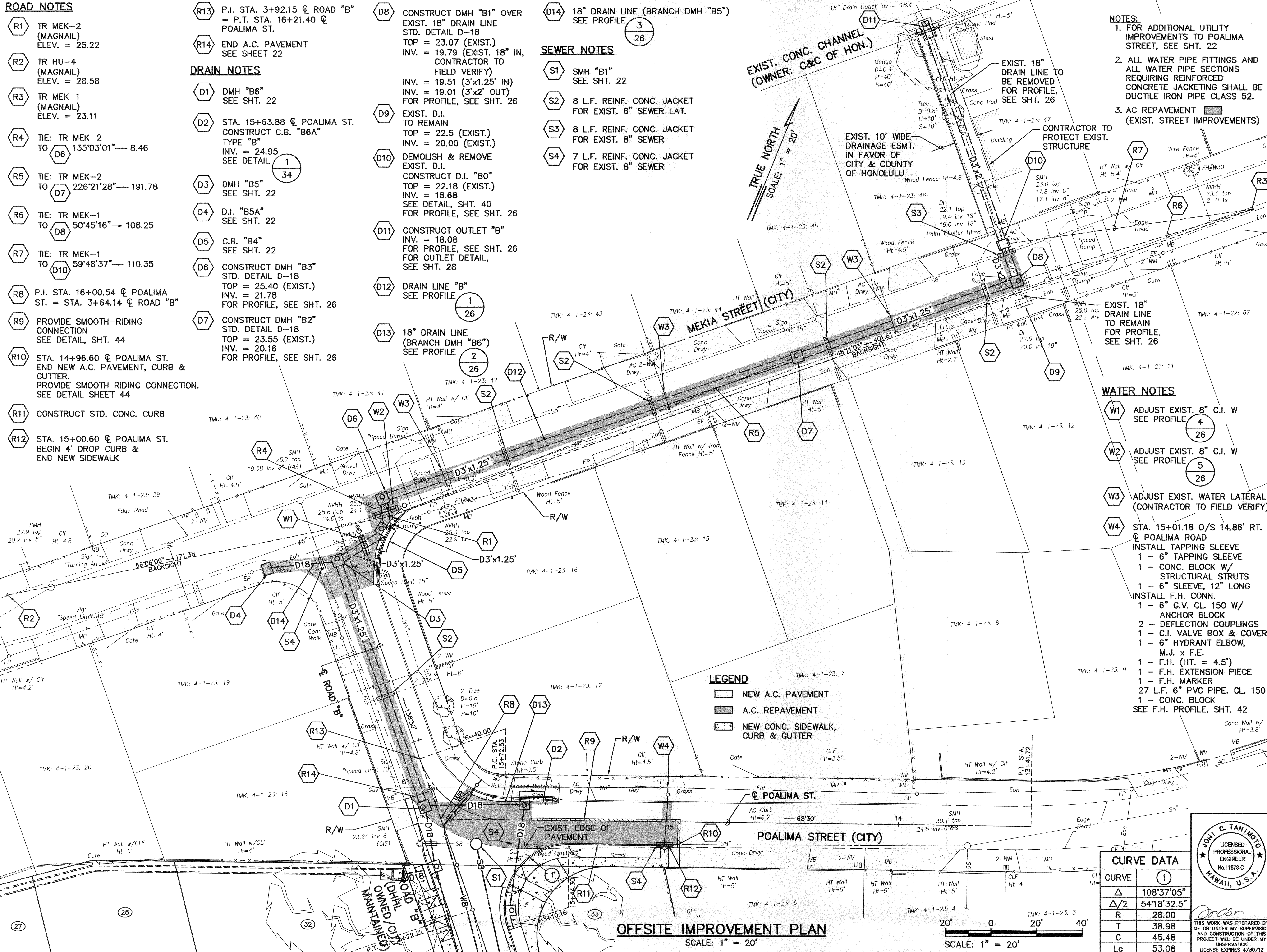
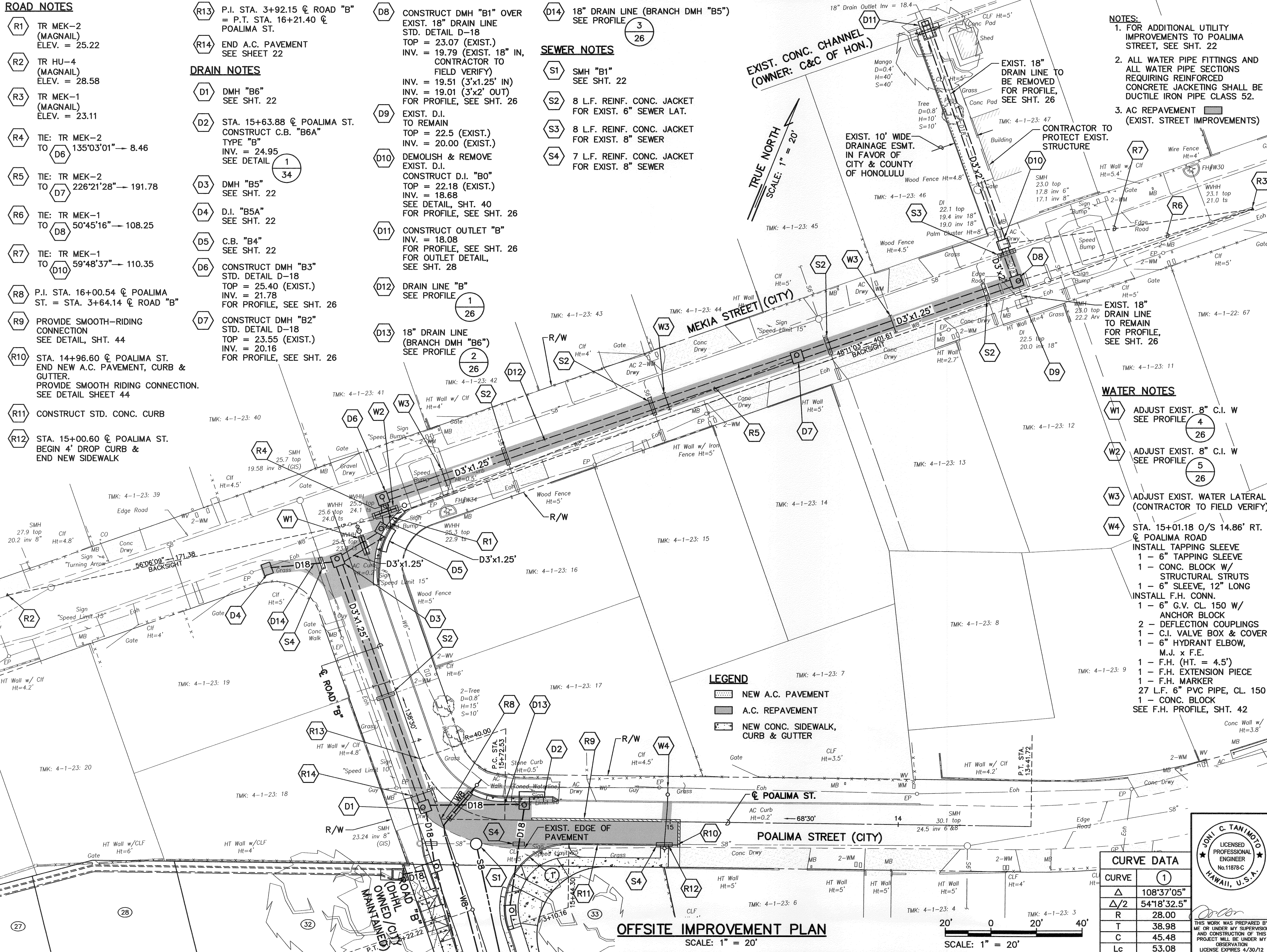
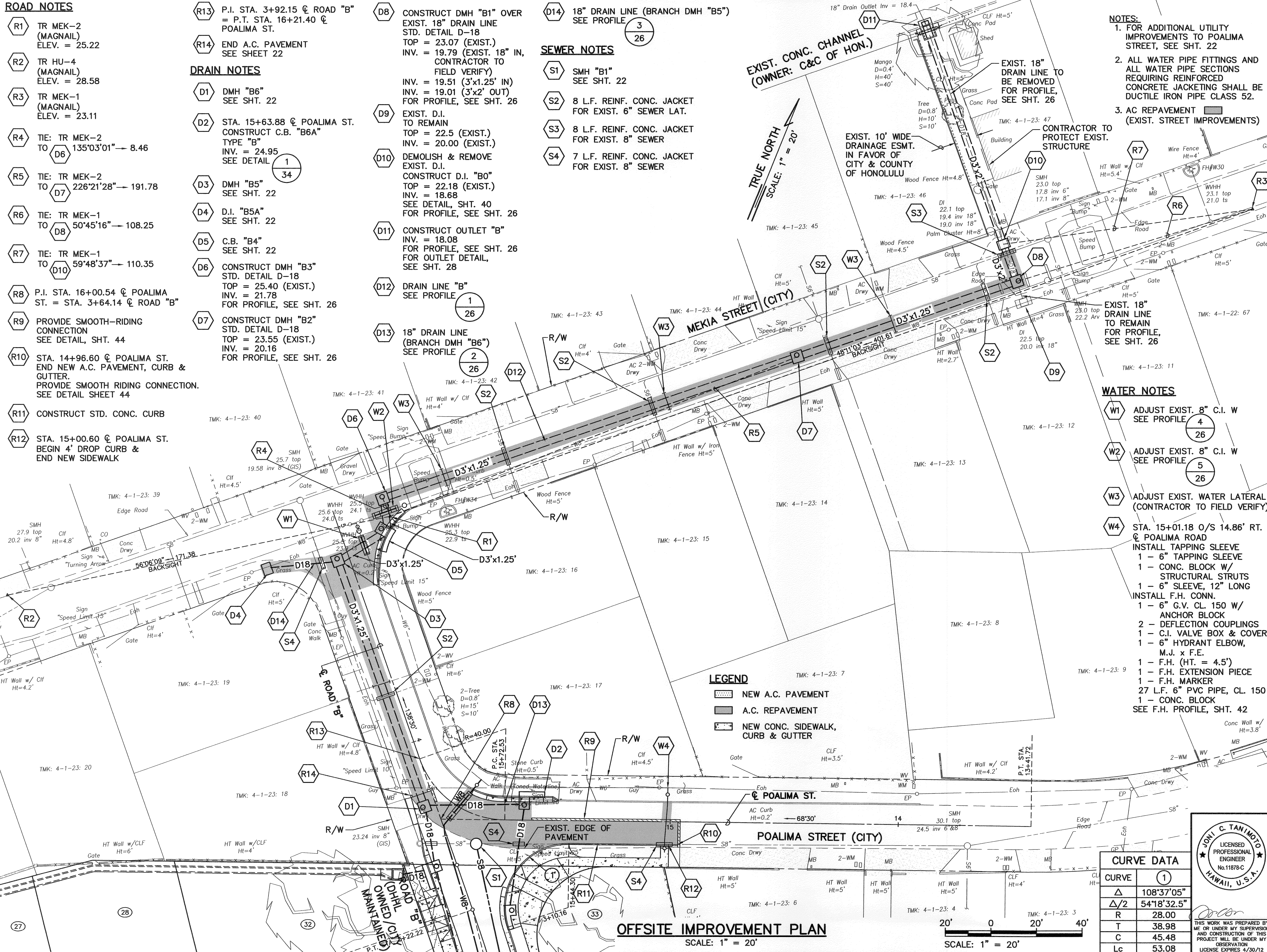
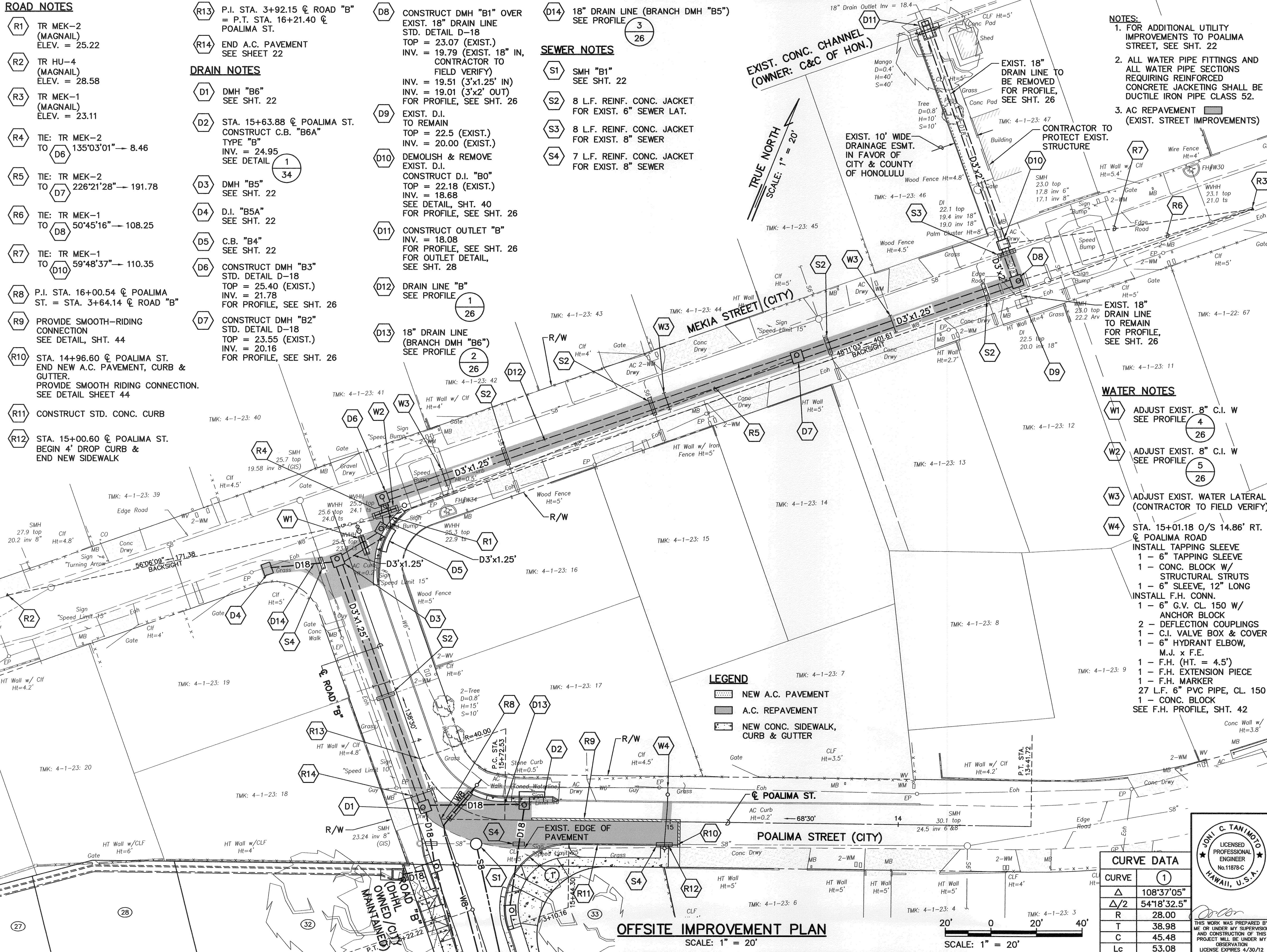
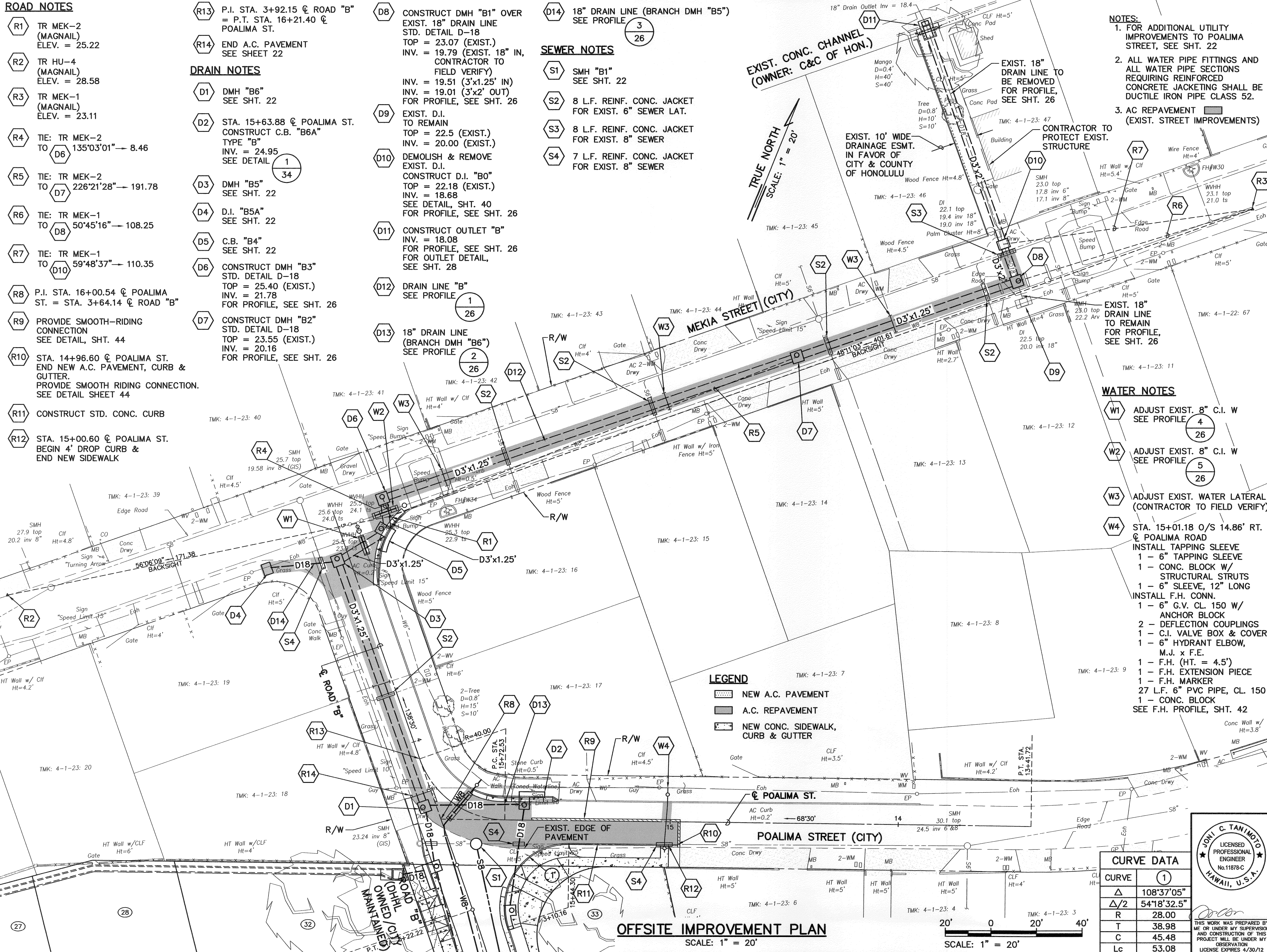
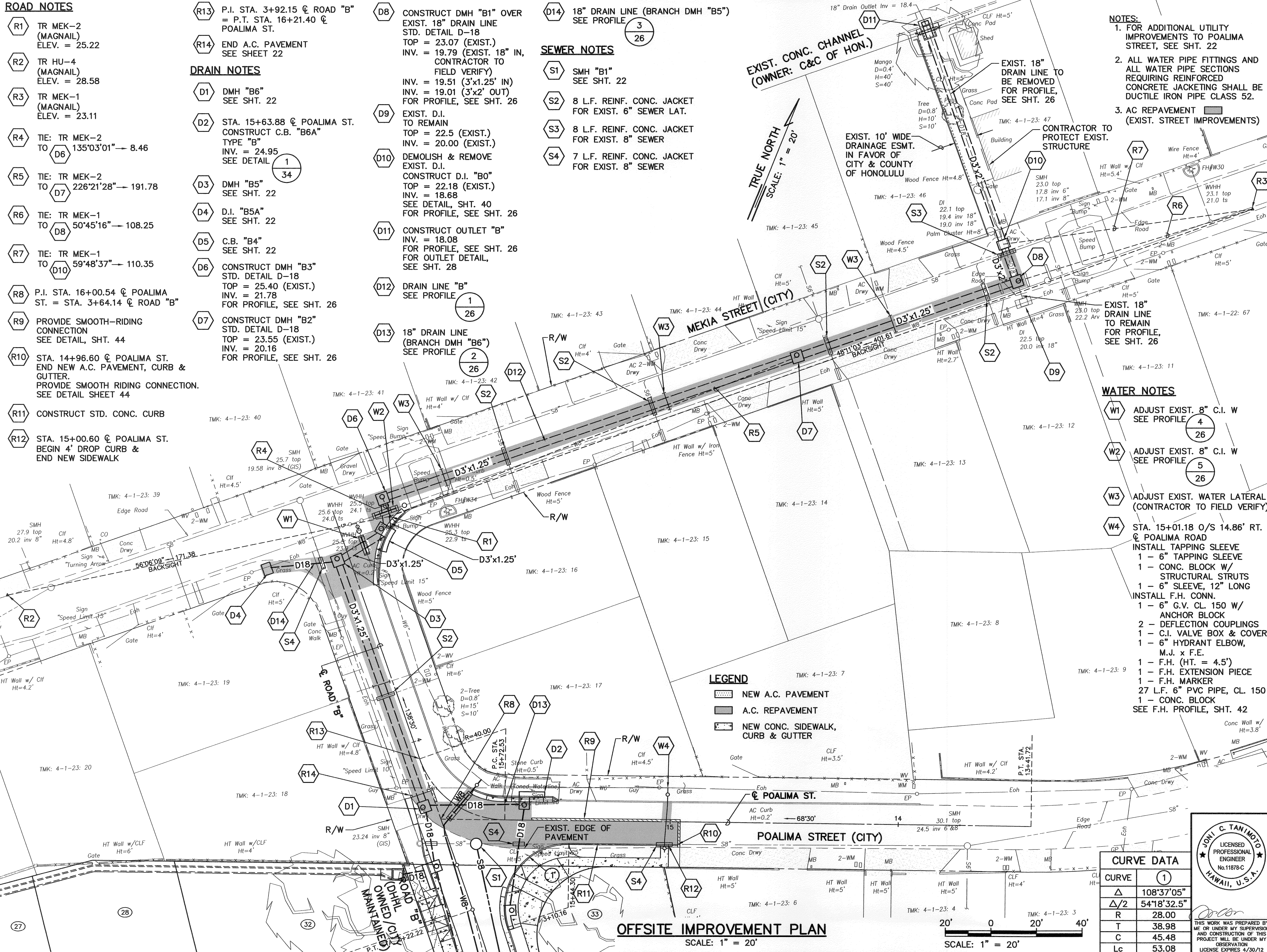
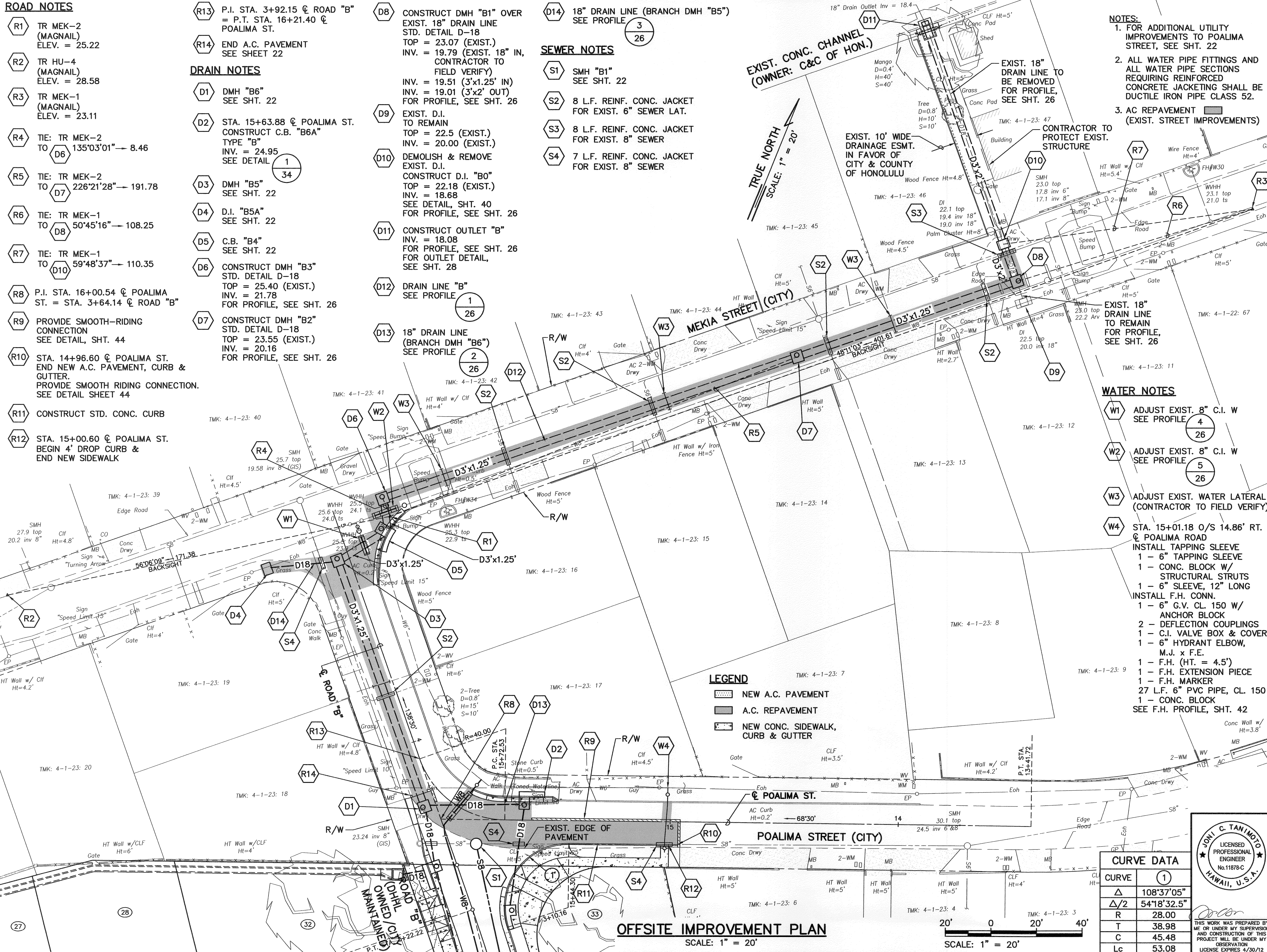
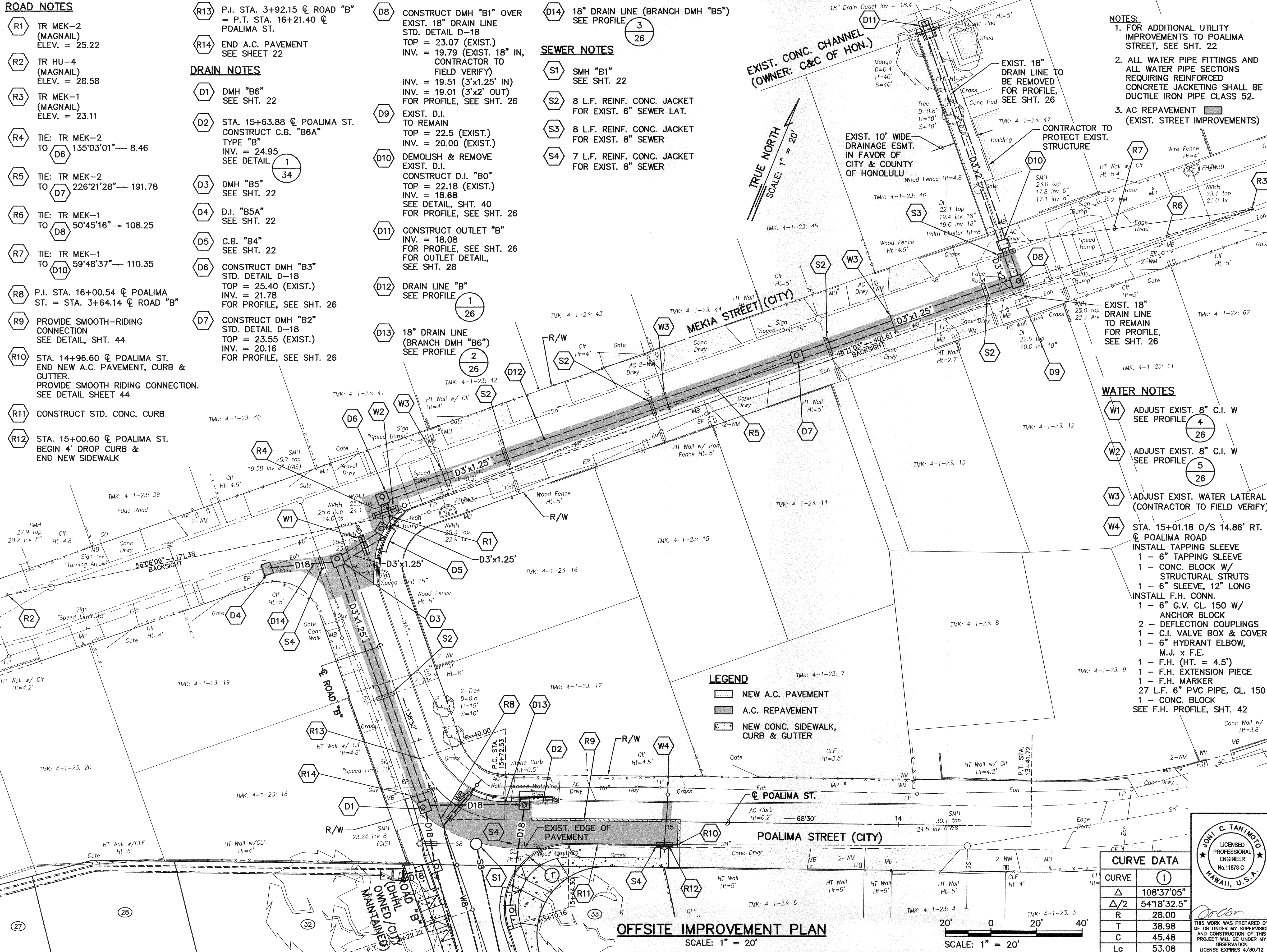
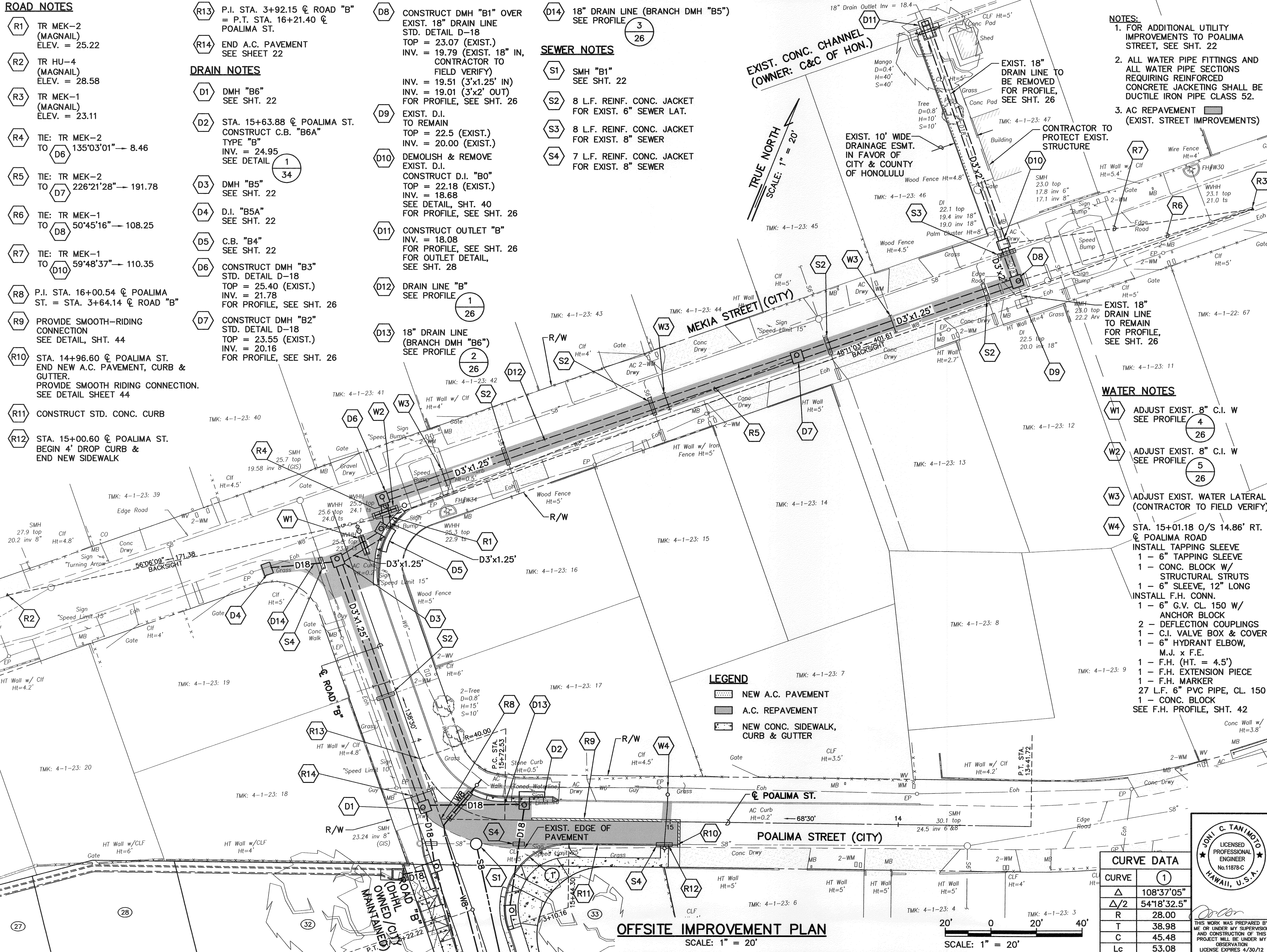
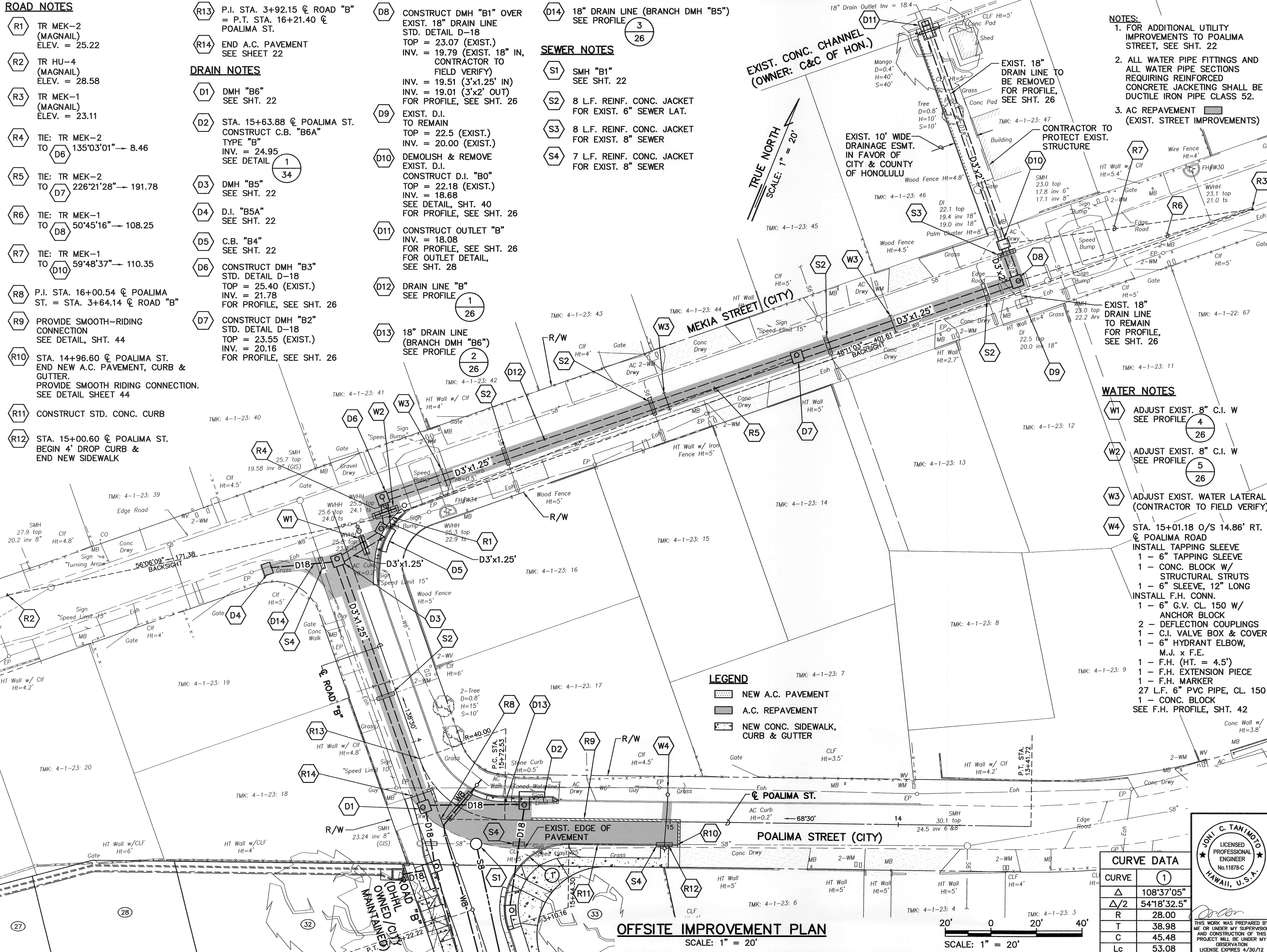
- R1 TR MEK-2 (MAGNAIL) ELEV. = 25.22
- R2 TR HU-4 (MAGNAIL) ELEV. = 28.58
- R3 TR MEK-1 (MAGNAIL) ELEV. = 23.11
- R4 TIE: TR MEK-2 TO D6 135'03"01" → 8.46
- R5 TIE: TR MEK-2 TO D7 226'21"28" → 191.78
- R6 TIE: TR MEK-1 TO D8 50'45"16" → 108.25
- R7 TIE: TR MEK-1 TO D10 59'48"37" → 110.35
- R8 P.I. STA. 16+00.54 @ POALIMA ST. = STA. 3+64.14 @ ROAD "B"
- R9 PROVIDE SMOOTH-RIDING CONNECTION SEE DETAIL, SHT. 44
- R10 STA. 14+96.60 @ POALIMA ST. END NEW A.C. PAVEMENT, CURB & GUTTER. PROVIDE SMOOTH RIDING CONNECTION. SEE DETAIL SHEET 44
- R11 CONSTRUCT STD. CONC. CURB
- R12 STA. 15+00.60 @ POALIMA ST. BEGIN 4' DROP CURB & END NEW SIDEWALK

- D13 P.I. STA. 3+92.15 @ ROAD "B" = P.T. STA. 16+21.40 @ POALIMA ST.
- D14 END A.C. PAVEMENT SEE SHEET 22
- D1 DMH "B6" SEE SHT. 22
- D2 STA. 15+63.88 @ POALIMA ST. CONSTRUCT C.B. "B6A" TYPE "B" INV. = 24.95 SEE DETAIL 1 34
- D3 DMH "B5" SEE SHT. 22
- D4 D.I. "B5A" SEE SHT. 22
- D5 C.B. "B4" SEE SHT. 22
- D6 CONSTRUCT DMH "B3" STD. DETAIL D-18 TOP = 25.40 (EXIST.) INV. = 21.78 FOR PROFILE, SEE SHT. 26
- D7 CONSTRUCT DMH "B2" STD. DETAIL D-18 TOP = 23.55 (EXIST.) INV. = 20.16 FOR PROFILE, SEE SHT. 26

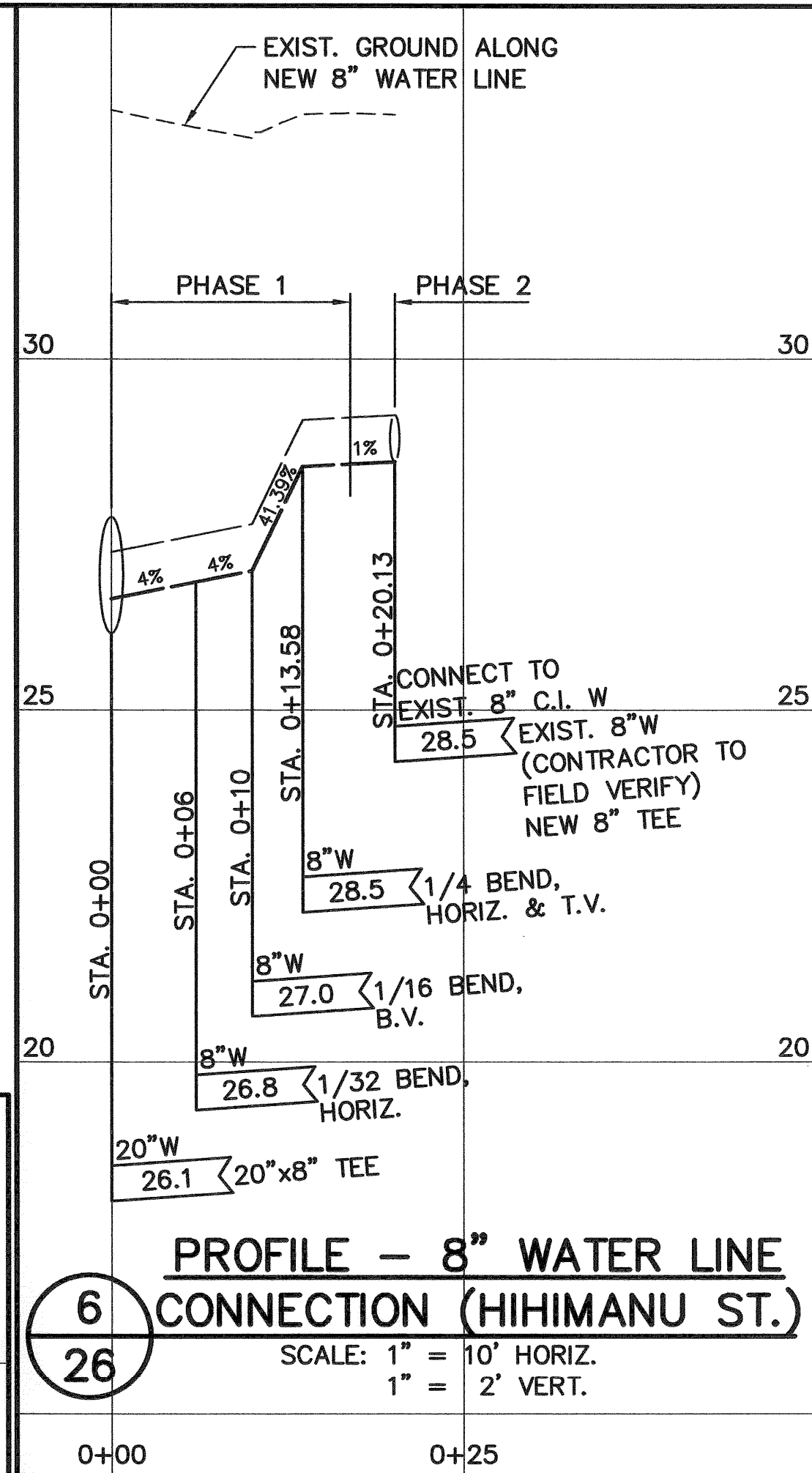
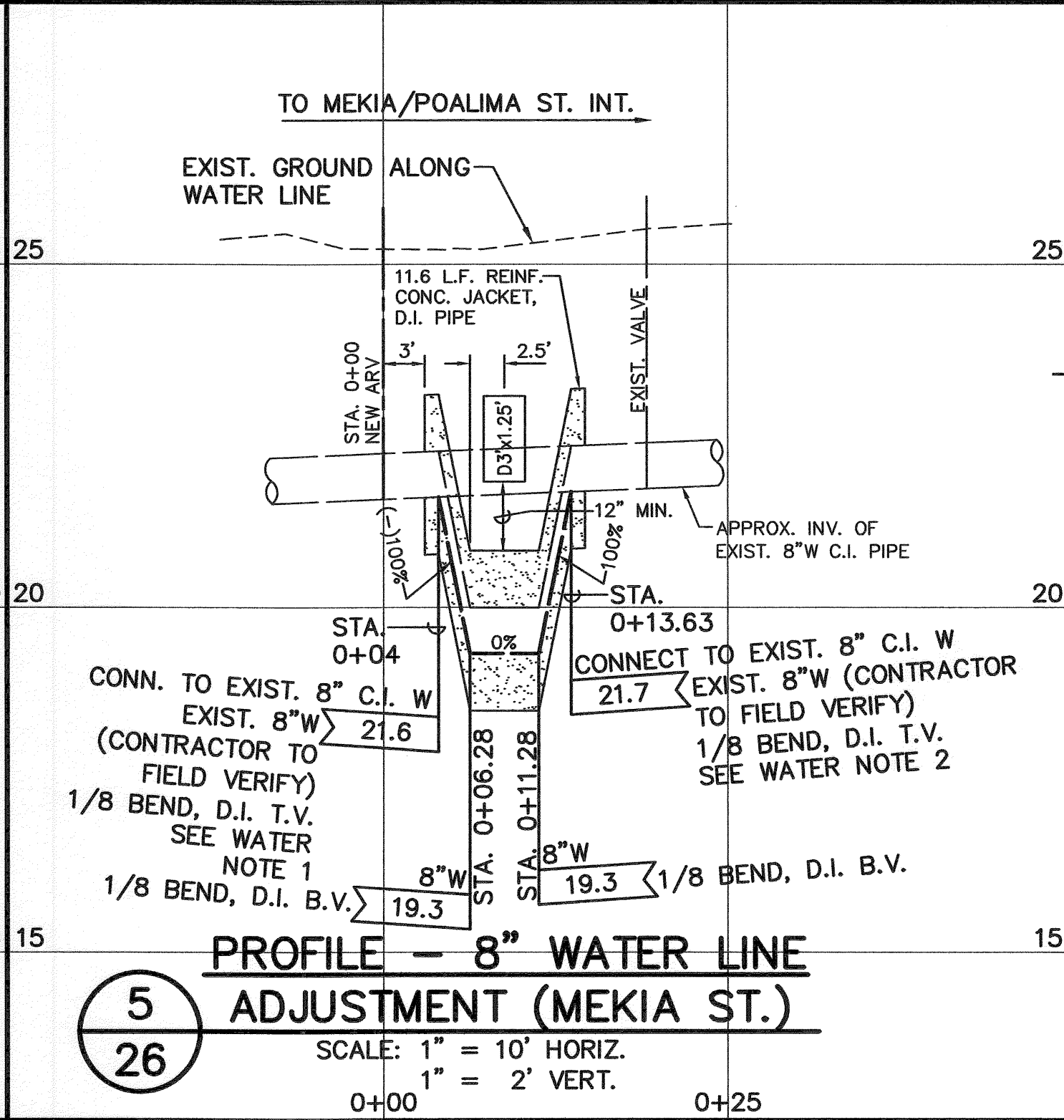
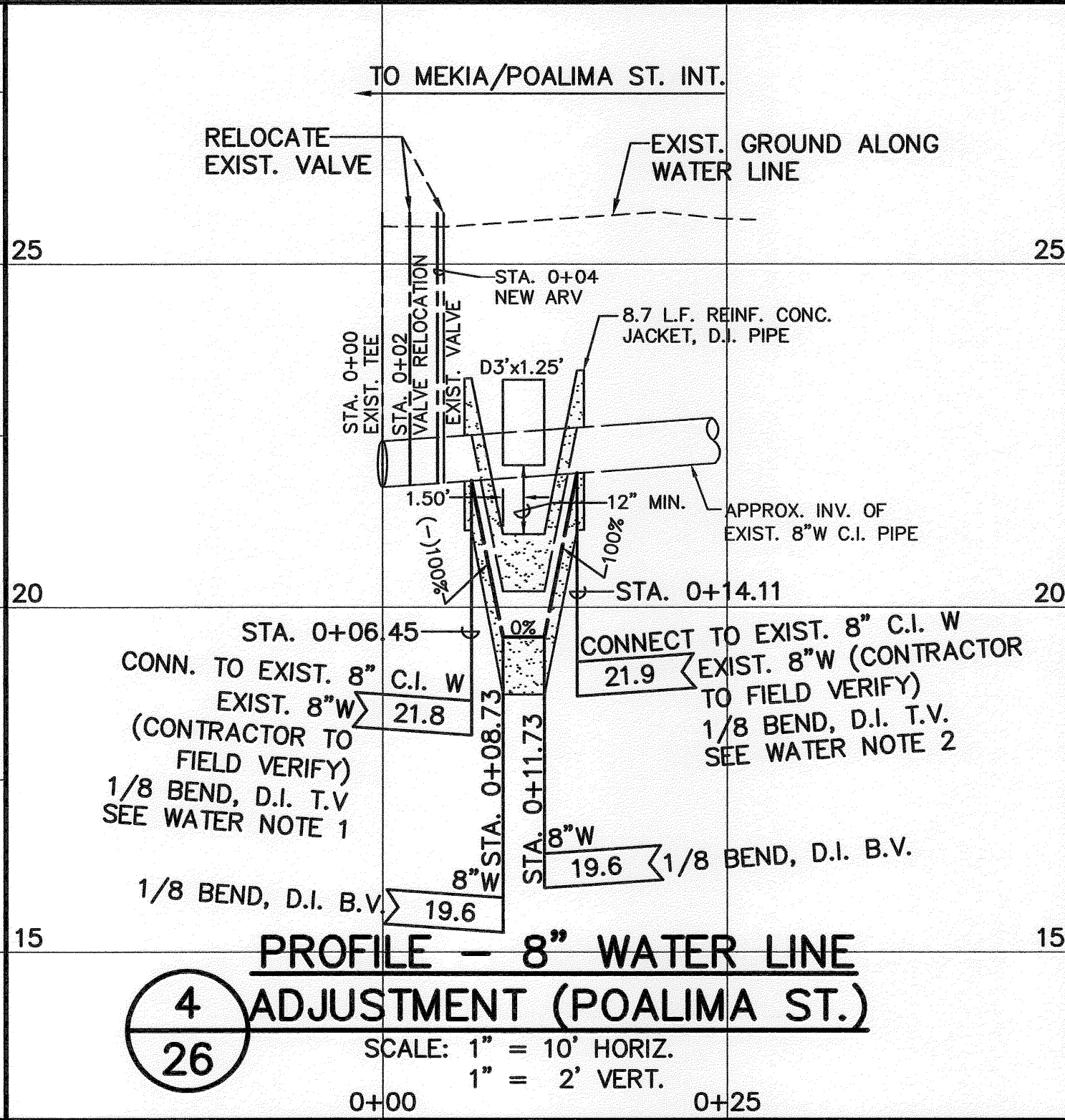
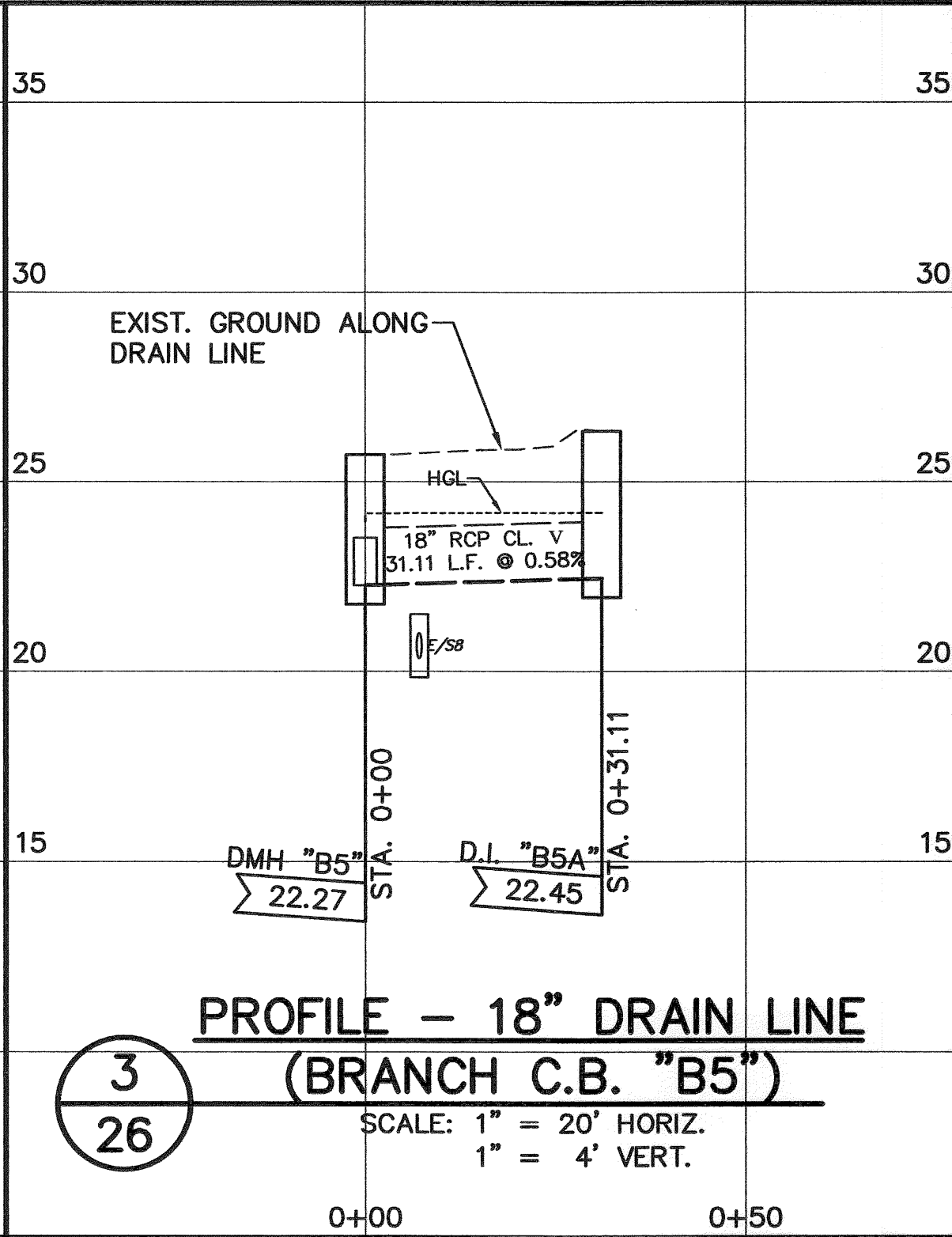
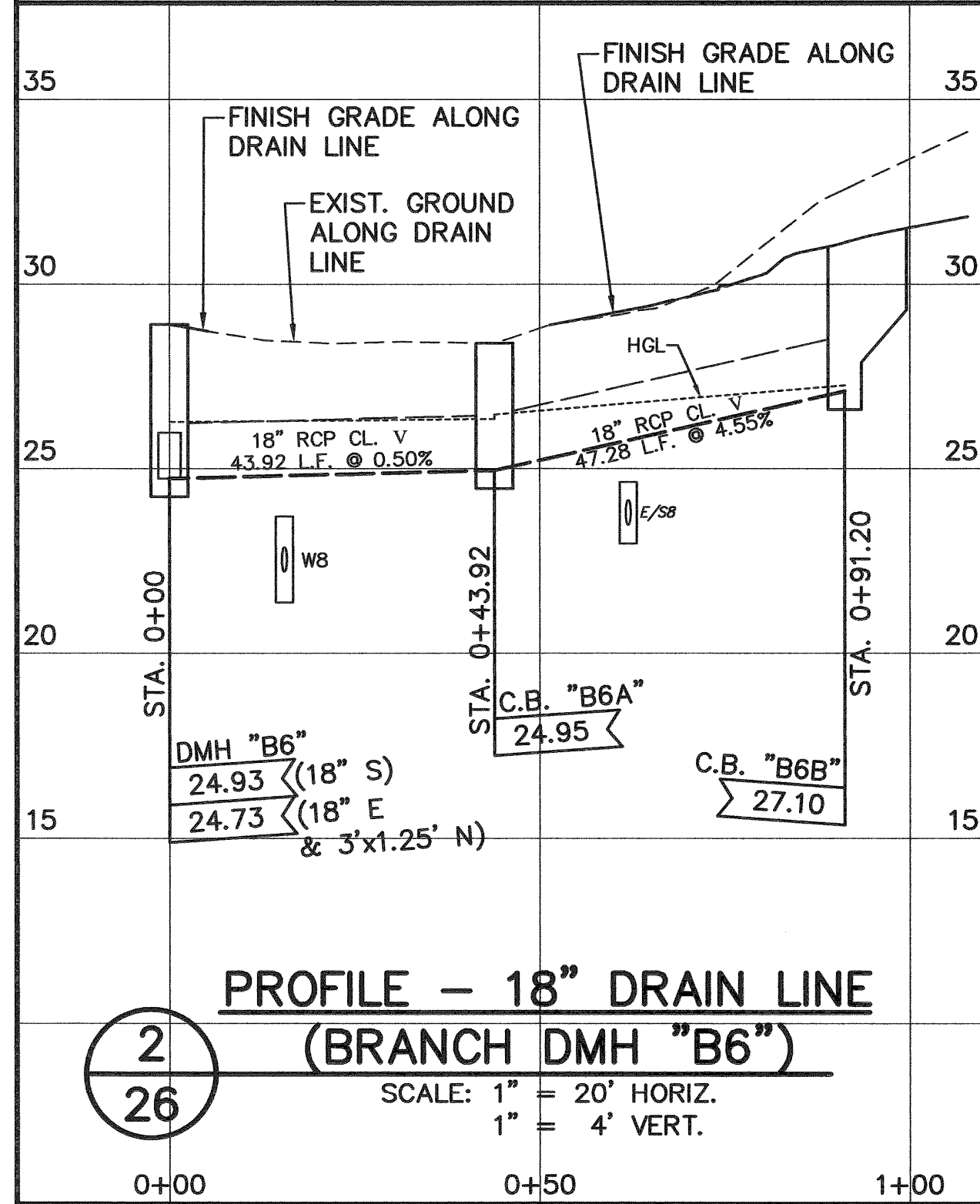
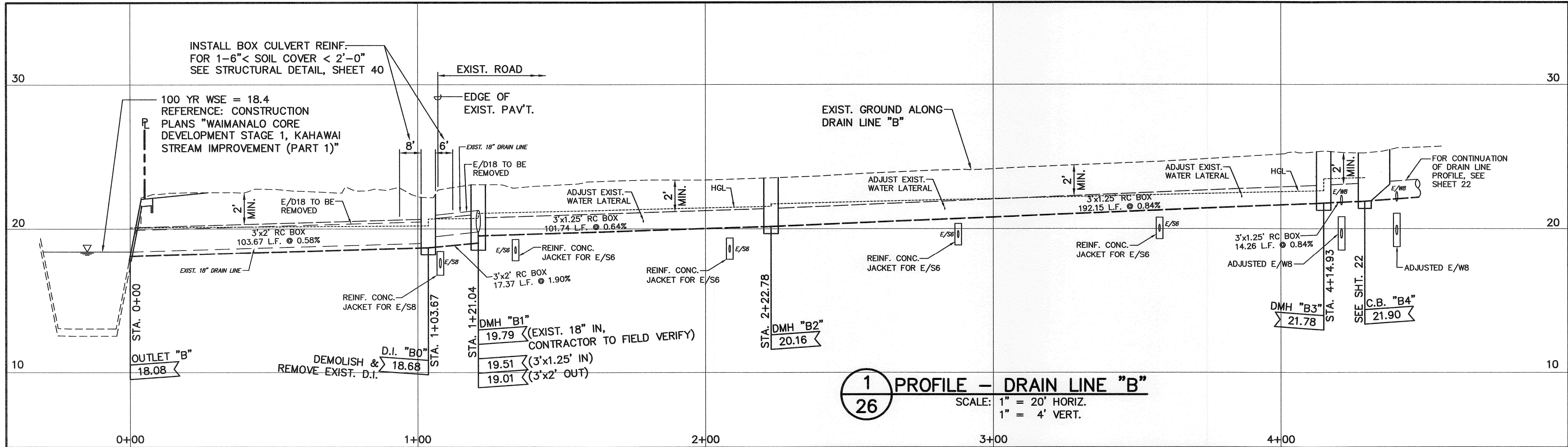
- D8 CONSTRUCT DMH "B1" OVER EXIST. 18" DRAIN LINE STD. DETAIL D-18 TOP = 23.07 (EXIST.) INV. = 19.79 (EXIST. 18" IN, CONTRACTOR TO FIELD VERIFY) INV. = 19.51 (3'x1.25' IN) INV. = 19.01 (3'x2' OUT) FOR PROFILE, SEE SHT. 26
- D9 EXIST. D.I. TO REMAIN TOP = 22.5 (EXIST.) INV. = 20.00 (EXIST.)
- D10 DEMOLISH & REMOVE EXIST. D.I. CONSTRUCT D.I. "B0" TOP = 22.18 (EXIST.) INV. = 18.68 SEE DETAIL, SHT. 40 FOR PROFILE, SEE SHT. 26
- D11 CONSTRUCT OUTLET "B" INV. = 18.08 FOR PROFILE, SEE SHT. 26 FOR OUTLET DETAIL, SEE SHT. 28
- D12 DRAIN LINE "B" SEE PROFILE 1 26
- D13 18" DRAIN LINE (BRANCH DMH "B6") SEE PROFILE 2 26

- D14 18" DRAIN LINE (BRANCH DMH "B5") SEE PROFILE 3 26
- S1 SMH "B1" SEE SHT. 22
- S2 8 L.F. REINF. CONC. JACKET FOR EXIST. 6" SEWER LAT.
- S3 8 L.F. REINF. CONC. JACKET FOR EXIST. 8" SEWER
- S4 7 L.F. REINF. CONC. JACKET FOR EXIST. 8" SEWER

SEWER NOTES



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WATER CONNECTION NOTES:

- MATERIALS FOR CONNECTION
1 - 8" SLEEVE, 12" LONG
8± L.F. 8" P.V.C., C.L. 150
1 - 3/4" A.R.V. (WP = 90 P.S.I.)
1 - A.R.V. BOX
1 - BOSSED TEE FOR A.R.V.
CONNECTION
TEMP. FOR TESTING
1 - 8" CAP TAPPED FOR 2
1/2" CLEANOUT
1 - CONC. BLOCK
- MATERIALS FOR CONNECTION
1 - 8" SLEEVE, 12" LONG
8± L.F. 8" P.V.C., C.L. 150
TEMP. FOR TESTING
1 - 8" CAP TAPPED FOR
2 1/2" I.P.T.
1 - 2 1/2" CLEANOUT
1 - CONC. BLOCK

0' 10' 20'
SCALE: 1" = 10' (HORIZ.)

2' 0' 2' 4'
SCALE: 1" = 2' (VERT.)

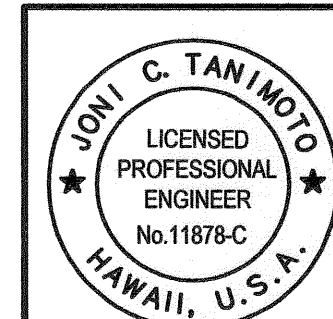
20' 0' 20' 40'
SCALE: 1" = 20' (HORIZ.)

4' 0' 4' 8'
SCALE: 1" = 4' (VERT.)

APPROVED:

CHIEF, WASTEWATER BRANCH, DPP
(FOR CONFORMANCE WITH CITY STANDARDS
AND WORK IN CITY R/W ONLY)

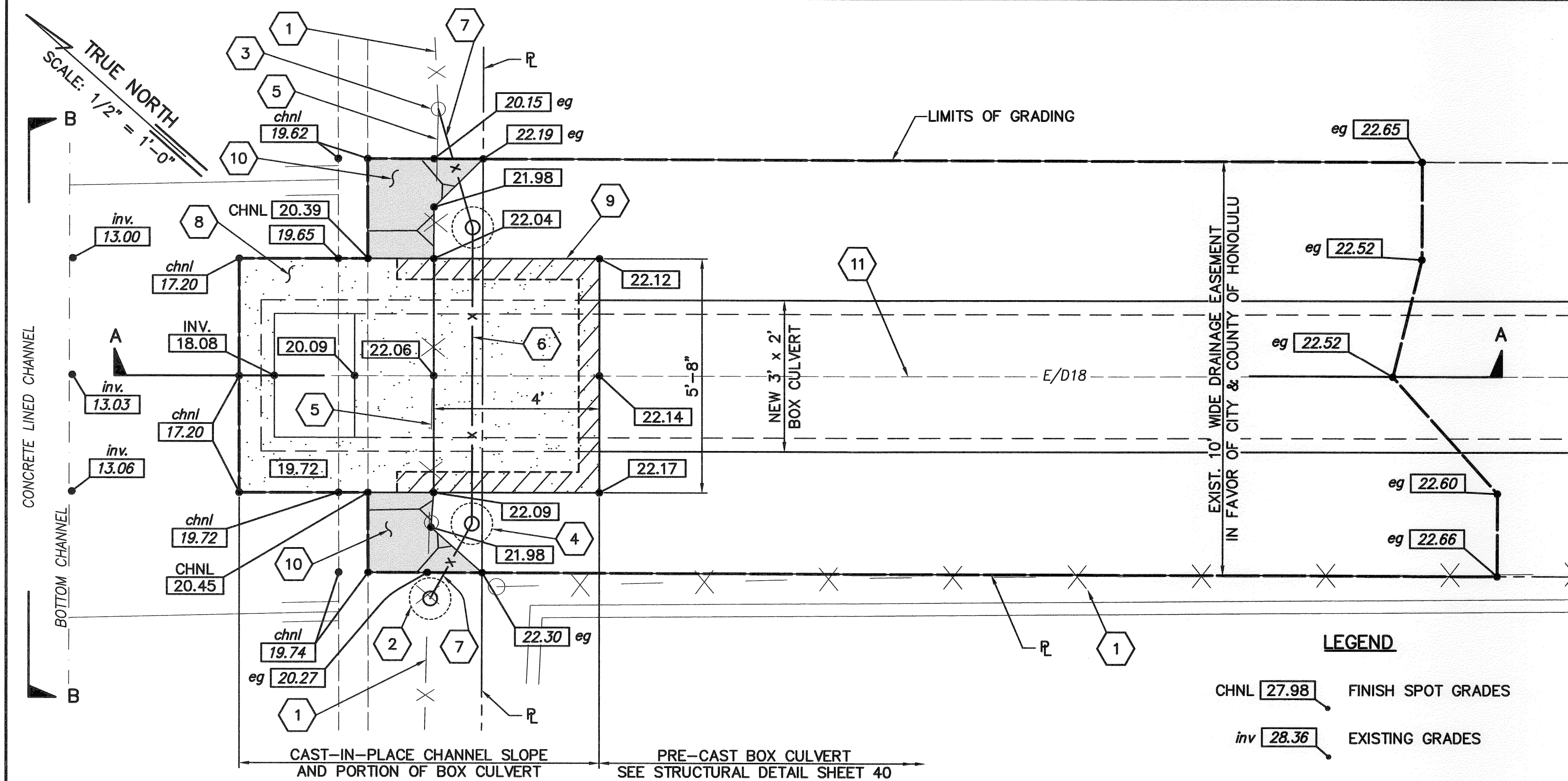
MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN
CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU



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AND CONSTRUCTION OF THIS
PROJECT WILL BE UNDER MY
OBSERVATION
LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
MISCELLANEOUS PROFILES - POALIMA & MEKIA STREET			
APPROVED:		DATE	
CHIEF, CIVIL ENGINEERING BRANCH, DPP		AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS	

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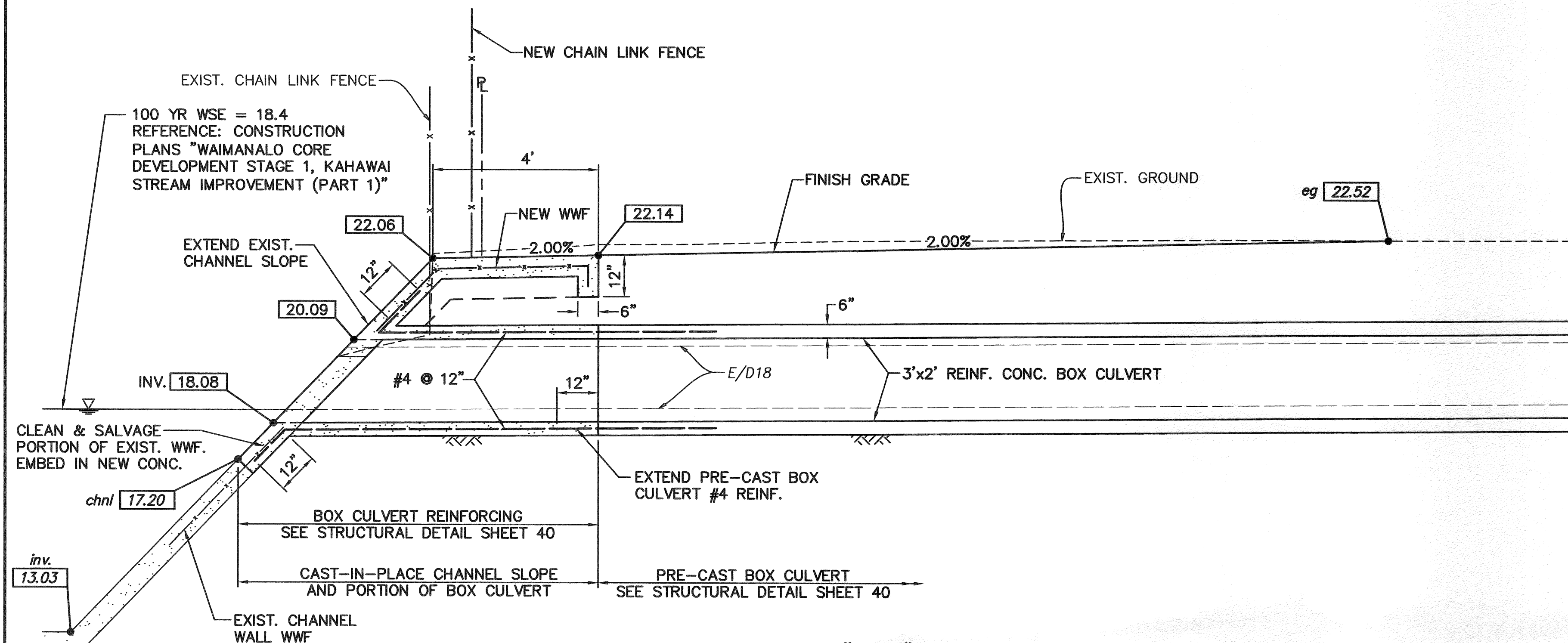
LEGEND

CHNL 27.98 FINISH SPOT GRADES
inv 28.36 EXISTING GRADES

- 1 EXIST. FENCE TO REMAIN
- 2 NEW FENCE POST. CONNECT NEW & EXIST. FENCE FABRIC TO NEW POST
- 3 EXIST. FENCE POST TO REMAIN. CONNECT NEW FENCE FABRIC TO EXIST. POST
- 4 NEW FENCE POST
- 5 REMOVE EXIST. FENCE WITHIN LIMITS OF NEW FENCE. APPROX. 12 L.F.
- 6 NEW 6" HIGH CHAIN LINK FENCE PER DPW STD. DET. R-19
- 7 NEW CHAIN LINK FENCE (MATCH TOP AND BOTTOM OF NEW AND EXIST. FENCE, SEE SECTION "B-B")
- 8 NEW 6" THICK CLASS "B" CONC. LINED CHANNEL WITH W/6"x6"-W2.9xW2.9 WWF
- 9 NEW CUT OFF WALL (6" WIDE x 12" DEEP)
- 10 INSTALL NAG C350 EROSION CONTROL FABRIC (ANCHOR SLOPE PROTECTION PER MANUFACTURER'S RECOMMENDATIONS)
- 11 REMOVE EXIST. 18" DRAIN LINE

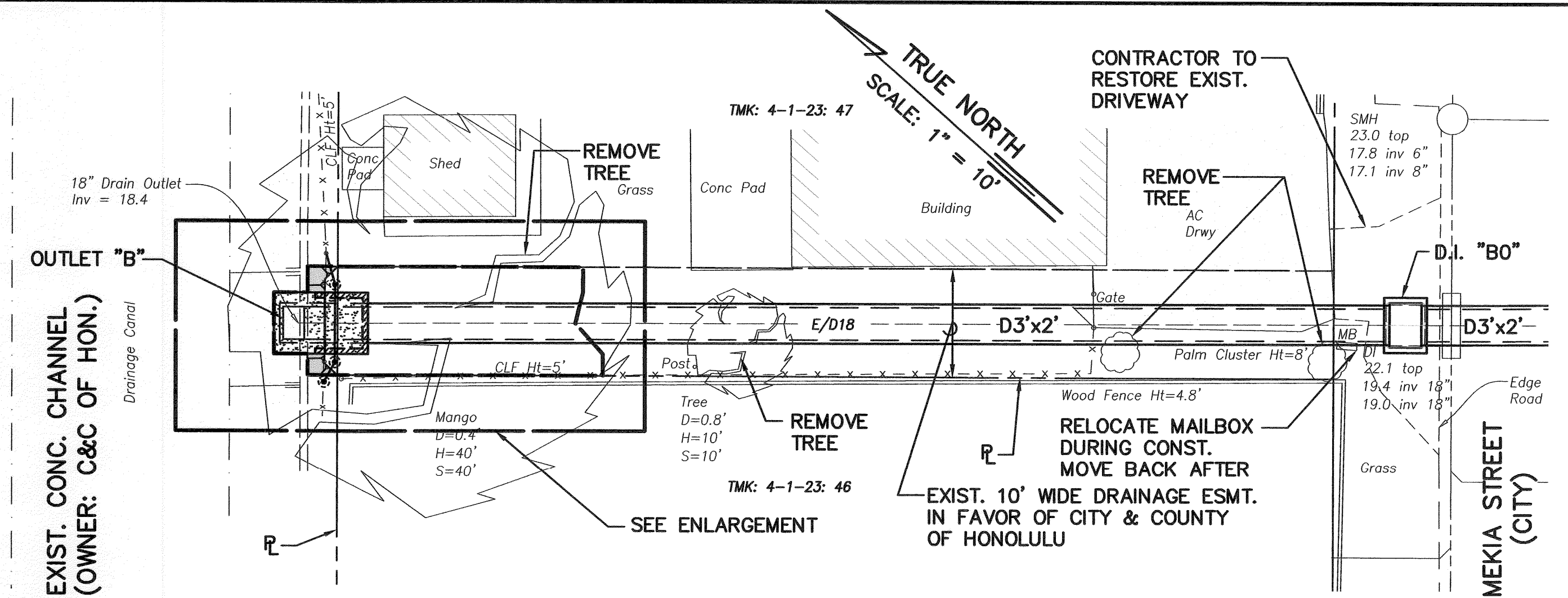
ENLARGEMENT

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



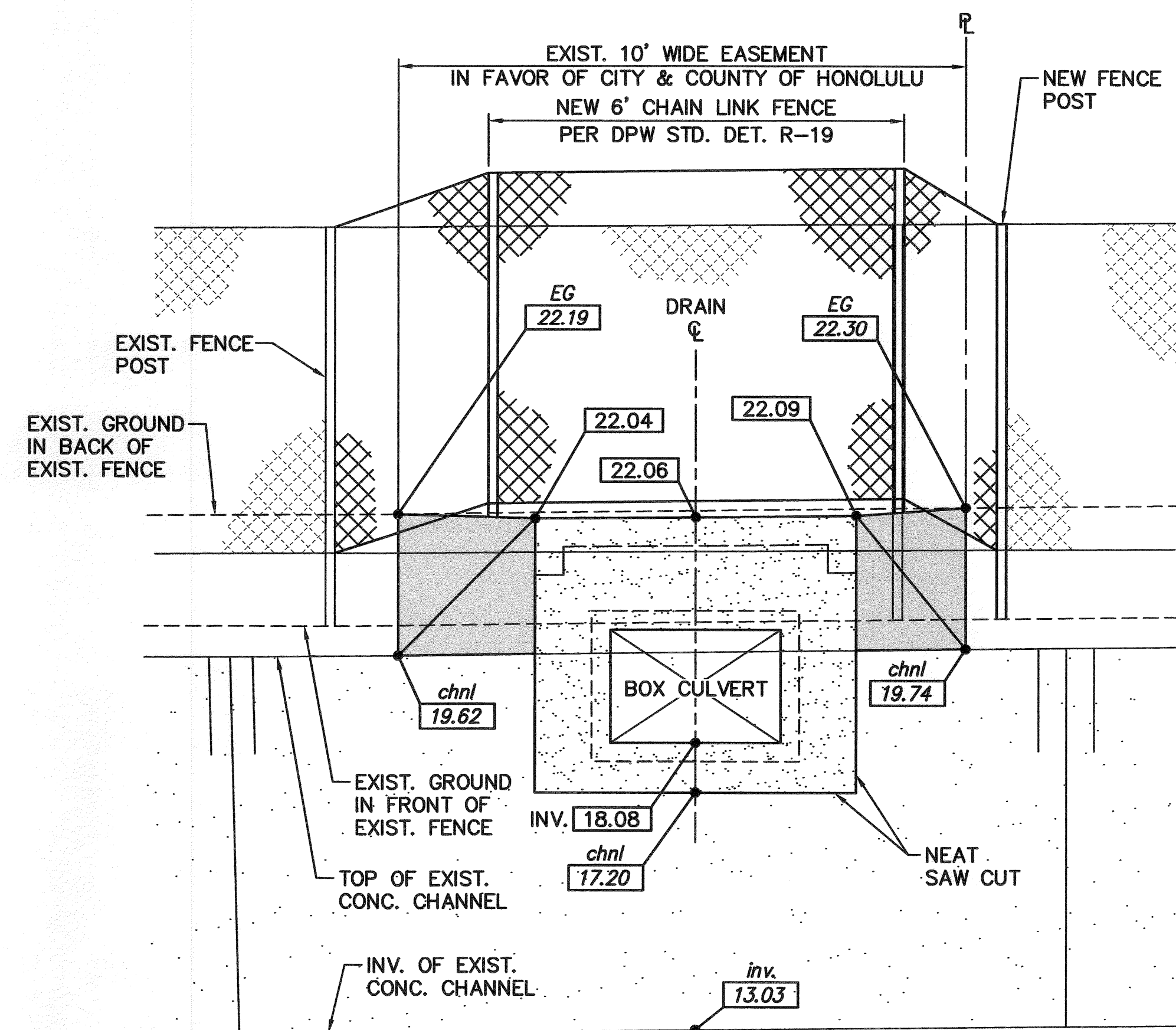
SECTION "A-A"

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



PLAN - OUTLET "B"

SCALE: 1" = 10'

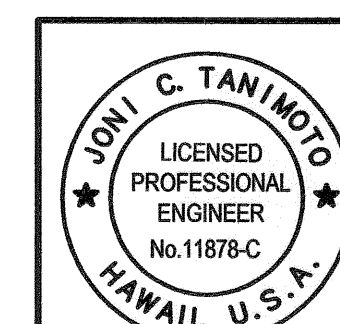


SECTION "B-B"

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

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

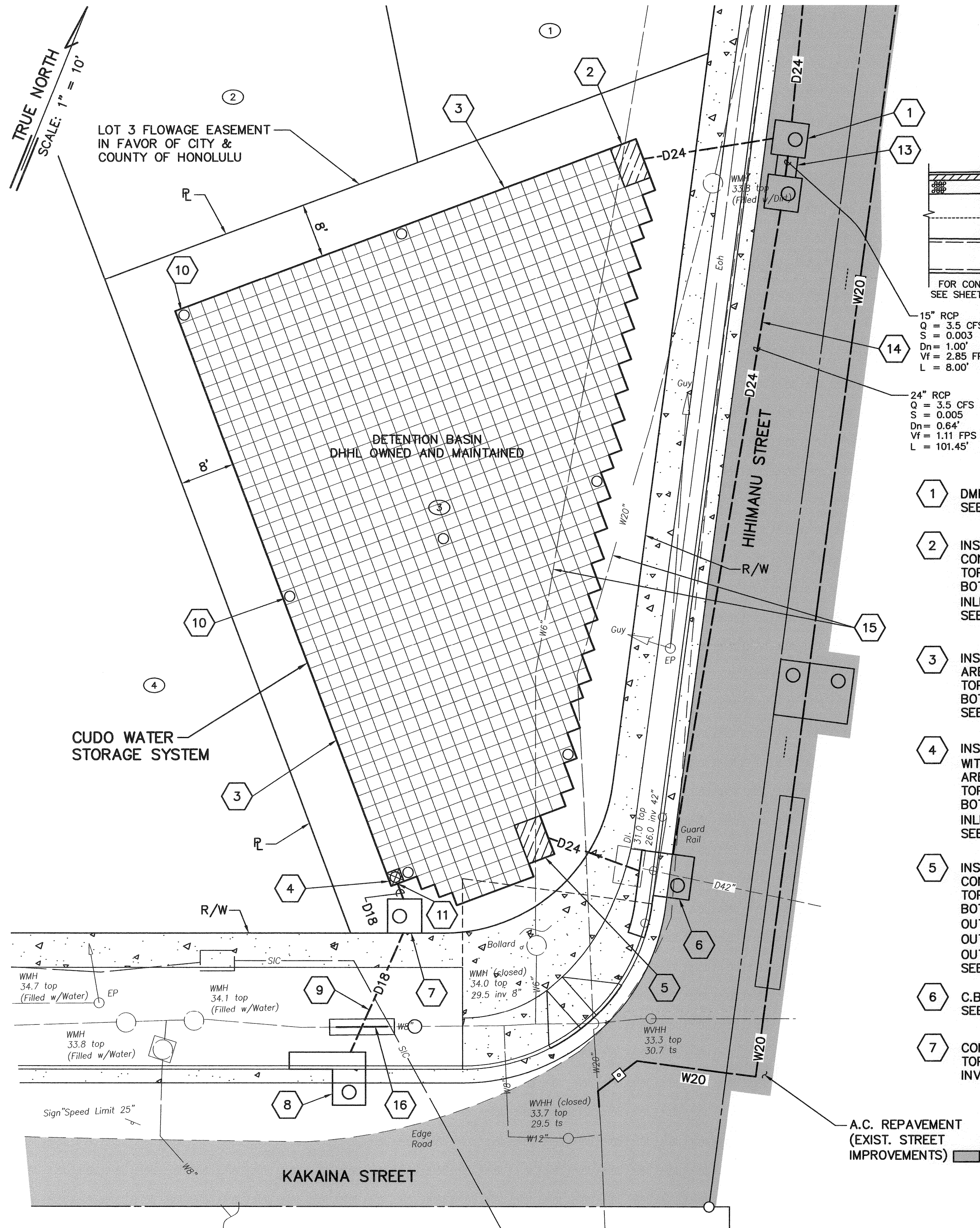
10' 0 10' 20'
SCALE: 1" = 10'



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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
DATE			

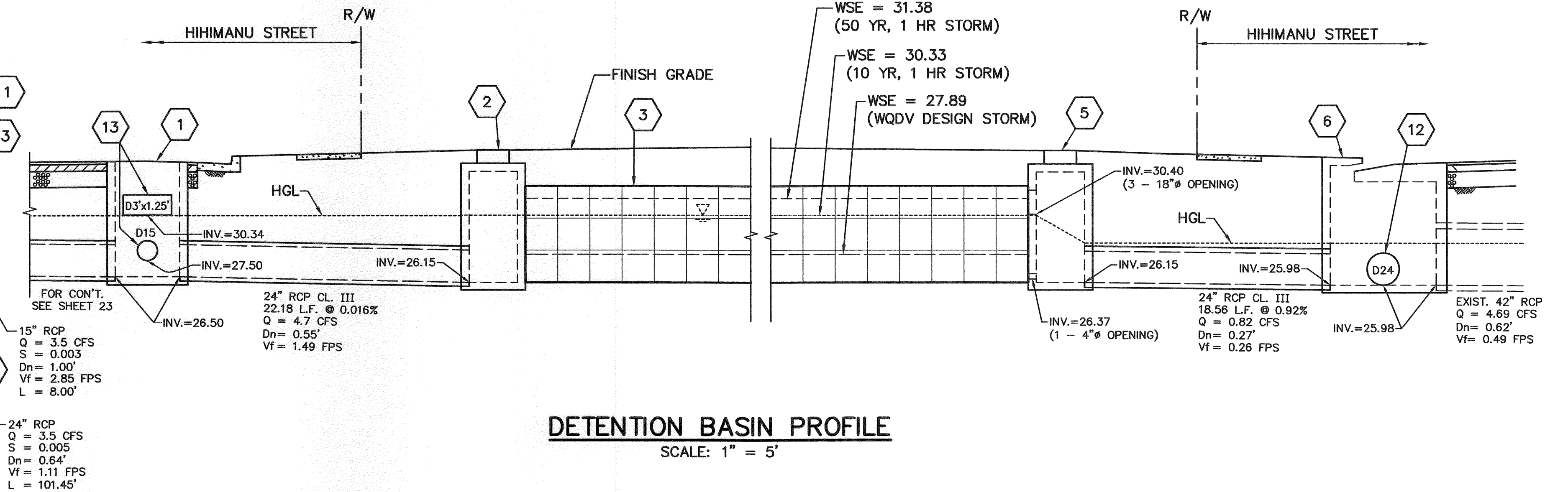
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Last Save by: MSM
Last Saved: 2/3/2012
Plotted on: 2/3/2012



**DETENTION BASIN
DHHL OWNED & MAINTAINED PLAN**
SCALE: 1" = 10'

- 1 DMH "A1"
SEE SHEET 23
- 2 INSTALL 4' x 6' PRECAST
CONC. INLET STRUCTURE
TOP = 34.31
BOTTOM = 25.65
INLET INV. = 26.15 (24")
SEE DETAIL SHEET 32
- 3 INSTALL CUDO 3 ASSEMBLY
AREA = 4,420 SQ. FT.
TOP = 32.15
BOTTOM = 26.15
SEE DETAIL SHEET 30
- 4 INSTALL CUDO 3 ASSEMBLY
WITH TRASH/DEBRIS GRATE
AREA = 4 SQ. FT.
TOP = 32.15
BOTTOM = 26.15
INLET INV. = 30.40 (18")
SEE DETAIL SHEET 30
- 5 INSTALL 4' x 6' PRECAST
CONC. OUTLET STRUCTURE
TOP = 34.36
BOTTOM = 25.65
OUTLET INV. = 30.44 (3 - 18" IN)
OUTLET INV. = 26.37 (4" IN)
OUTLET INV. = 26.15 (24" OUT)
SEE DETAIL SHEET 33
- 6 C.B. "D1"
SEE SHEET 23
- 7 CONSTRUCT SHALLOW DMH "C1"
TOP = 34.47
INV. = 30.44

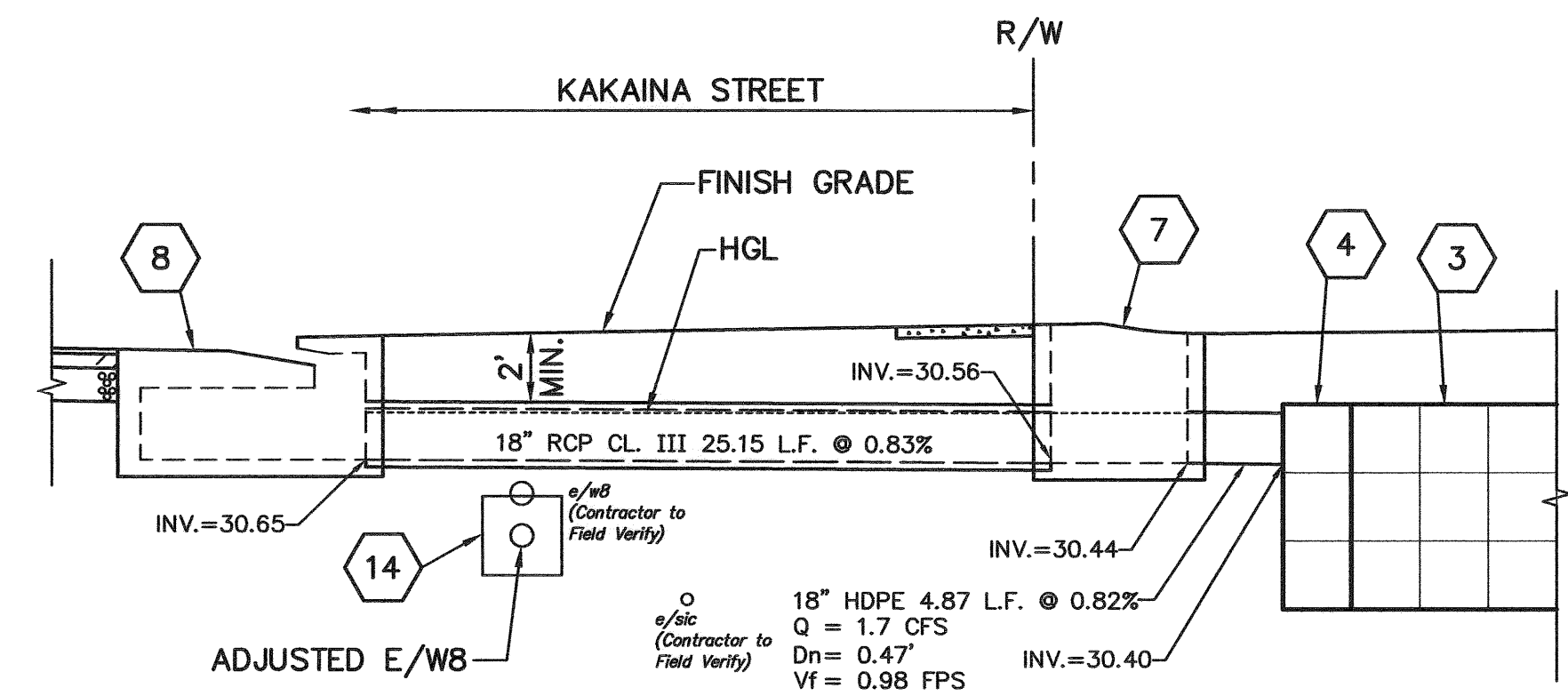
A.C. REPAVEMENT
(EXIST. STREET
IMPROVEMENTS)



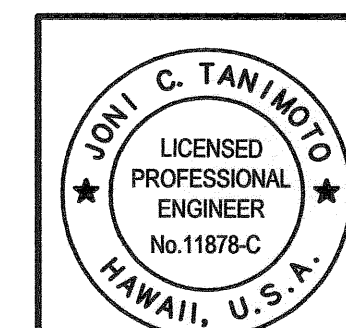
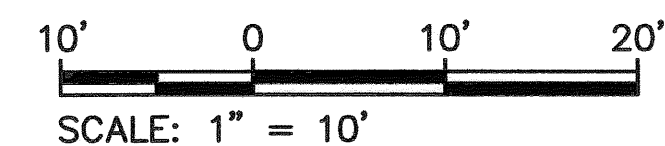
DETENTION BASIN PROFILE
SCALE: 1" = 5'

- 8 C.B. "C2"
SEE SHEET 24
- 9 DRAIN LINE "C"
SEE PROFILE THIS SHEET
- 10 INSTALL MAINTENANCE ACCESS
SEE DETAIL SHEET 31
- 11 CONNECT 18" HDPE PIPE TO CUDO ASSEMBLY
SEE DETAIL SHEET 31
- 12 DMH "A1A"
SEE SHEET 23
- 13 3'x1.25' RC BOX OVERFLOW
DRAIN LINE/15" BYPASS
DRAIN LINE
SEE SHEET 23
- 14 24" OVERFLOW DRAIN LINE
SEE SHEET 23
- 15 REMOVE EXIST. WATERLINES
SEE SHEET 23
- 16 8" WATER LINE ADJUSTMENT,
SEE SHEET 24

NOTE:
CONTRACTOR TO REMOVE
SILT/DEBRIS FROM CUDO SYSTEM
AT COMPLETION OF PROJECT.



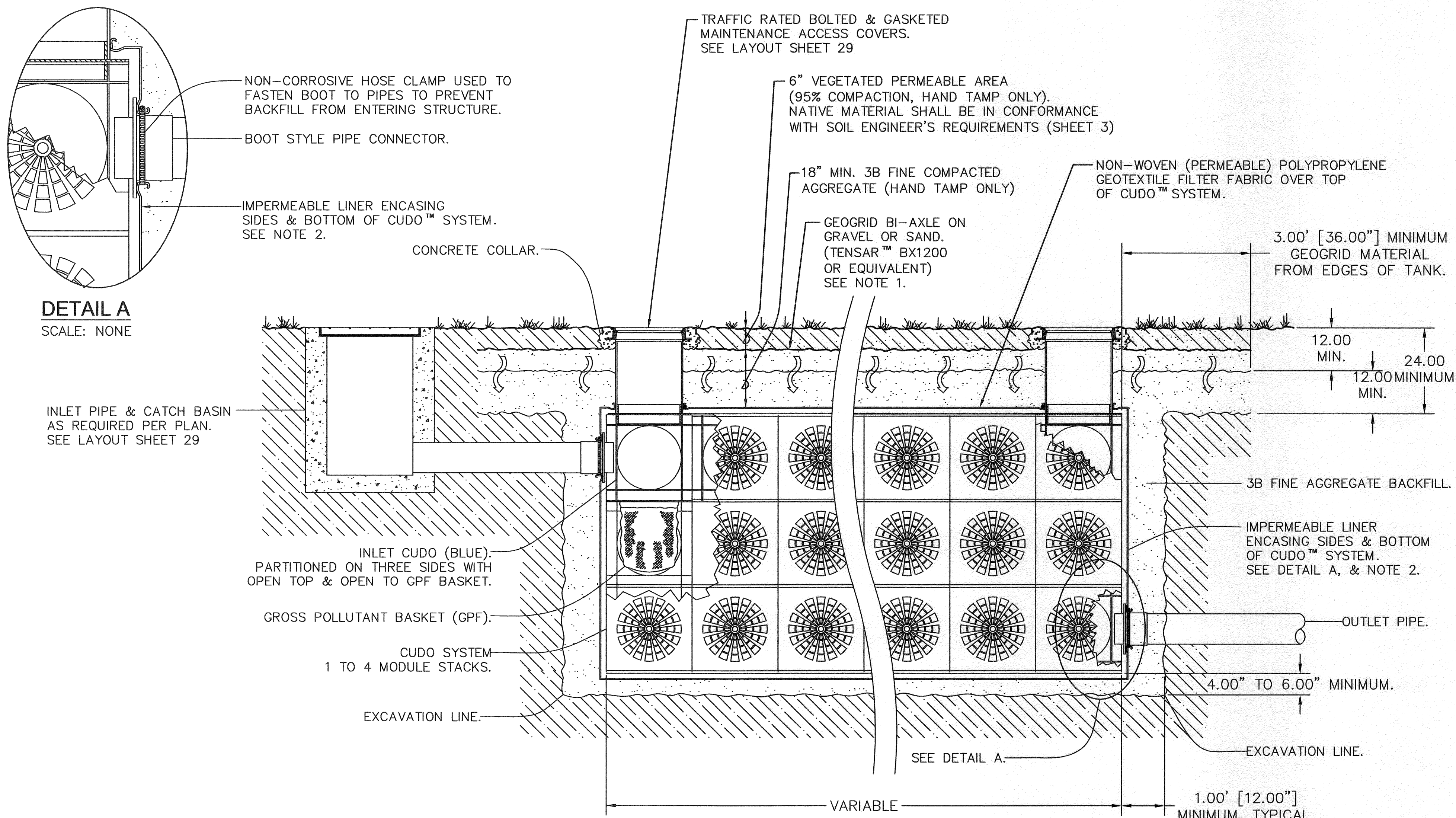
DRAIN LINE "C" PROFILE
SCALE: 1" = 5'



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PROJECT WILL BE UNDER MY
OBSERVATION
LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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Plotted on: 2/2/2012
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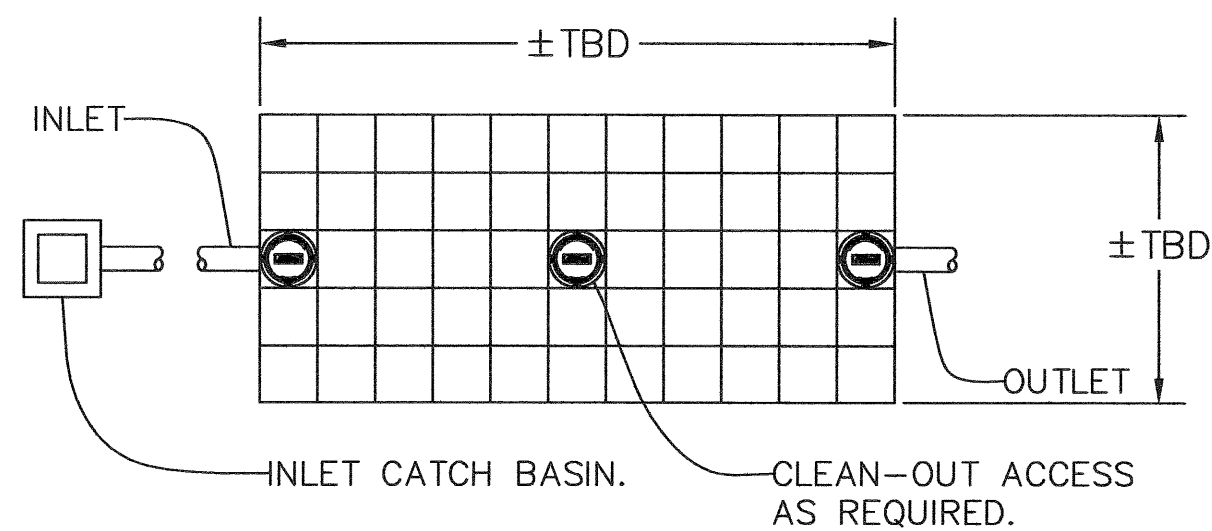


SECTION / CUTAWAY VIEW

SCALE: NONE

NOTES:

1. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC.
2. SYSTEM ENCASED ON SIDES & BOTTOM WITH 30-40 MIL PVC LINER OR 36 MIL RE-ENFORCED POLYETHYLENE AS REQUIRED.

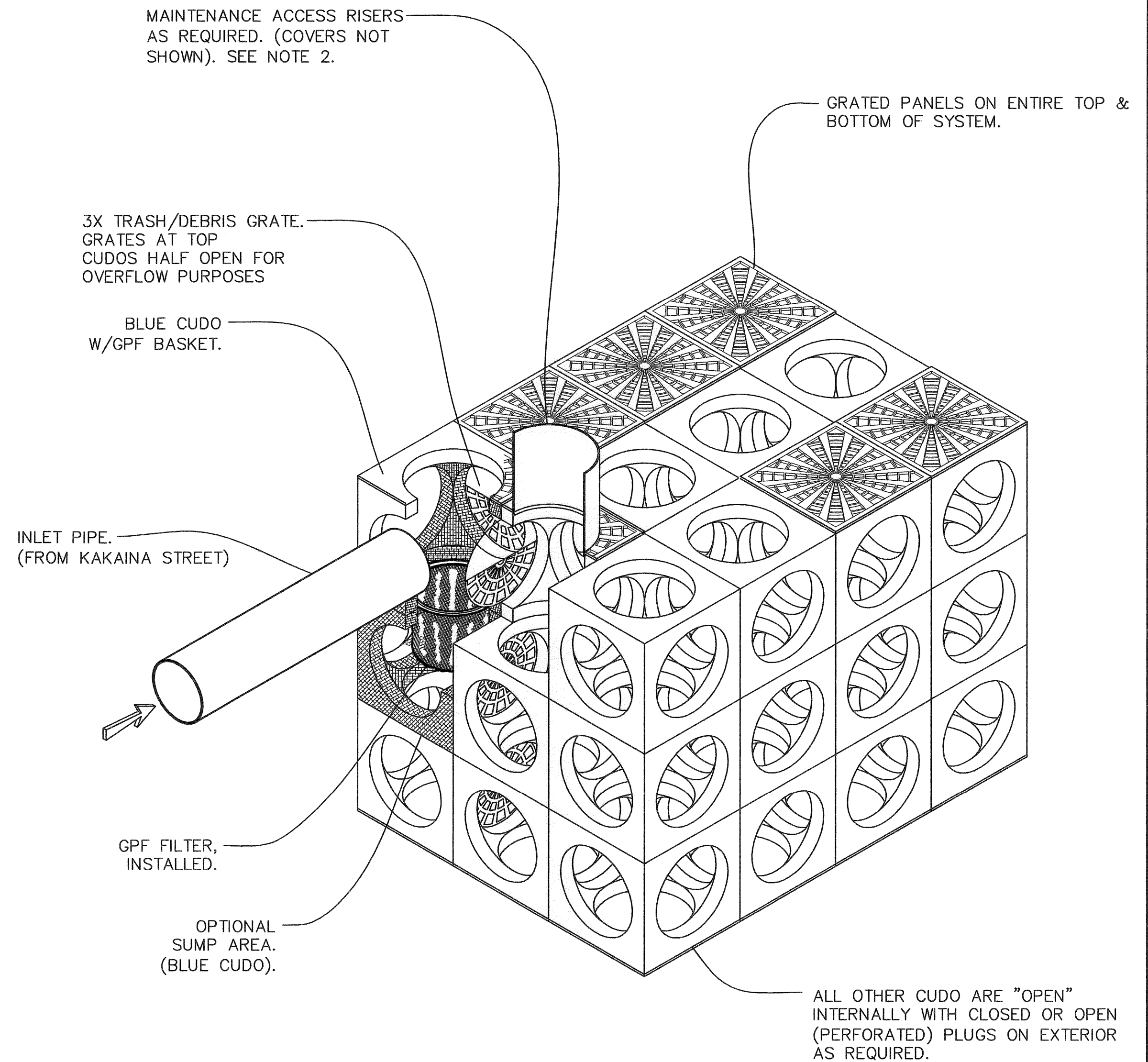


PLAN VIEW

1 TO 4 MODULE STACKS
SCALE: NONE

1 CUDO DETENTION INSTALLATION DETAIL (DHHL)

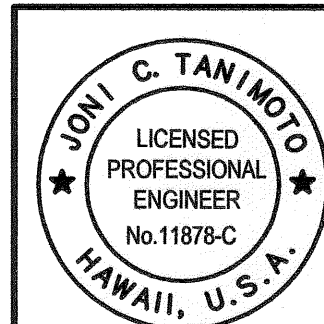
NOT TO SCALE



NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. SEE SHEET 31 FOR TYPICAL MAINTENANCE ACCESS CONFIGURATION.

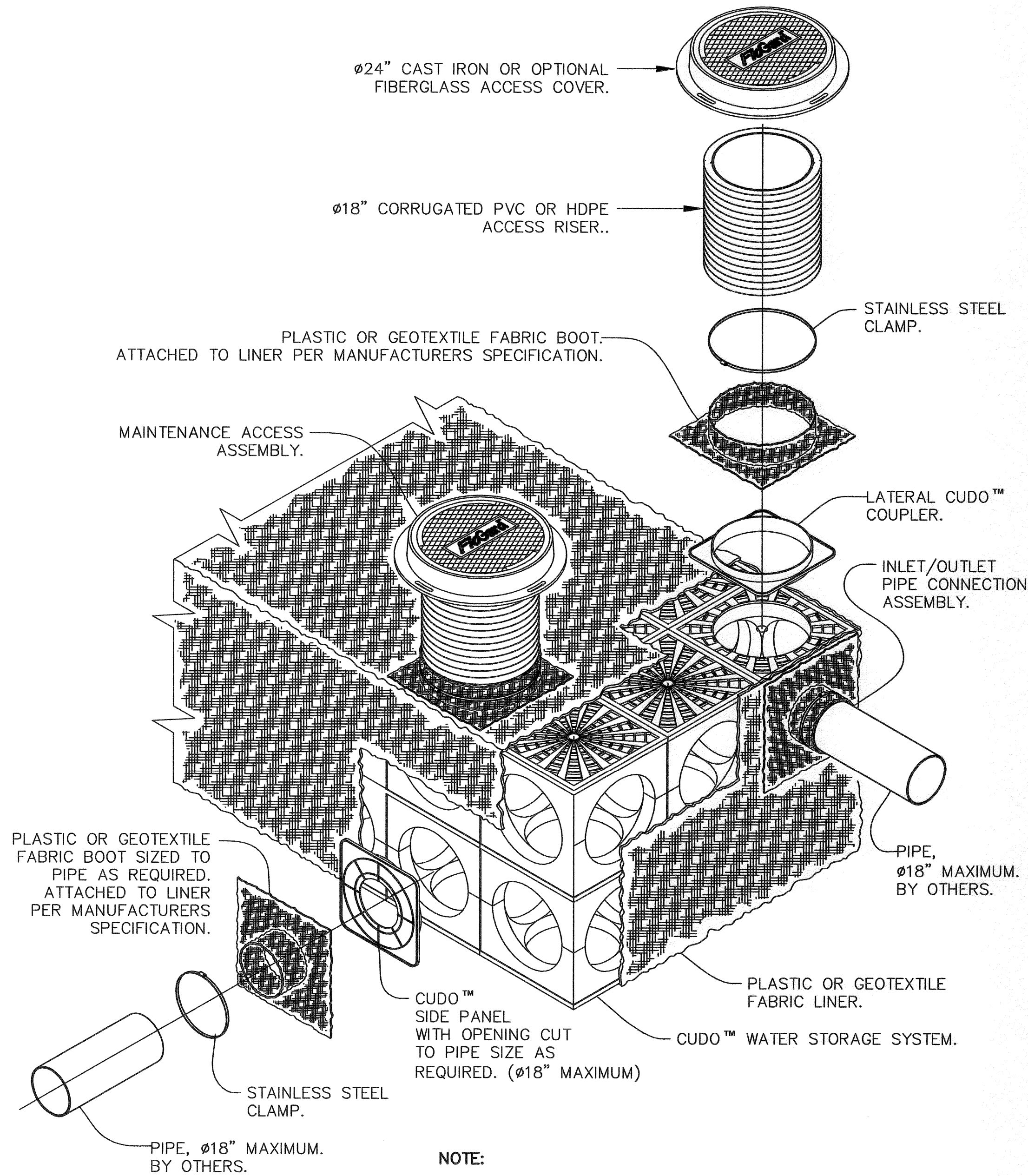
2 CUDO DETENTION WITH TRASH & DEBRIS COLLECTION
30 NOT TO SCALE



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REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

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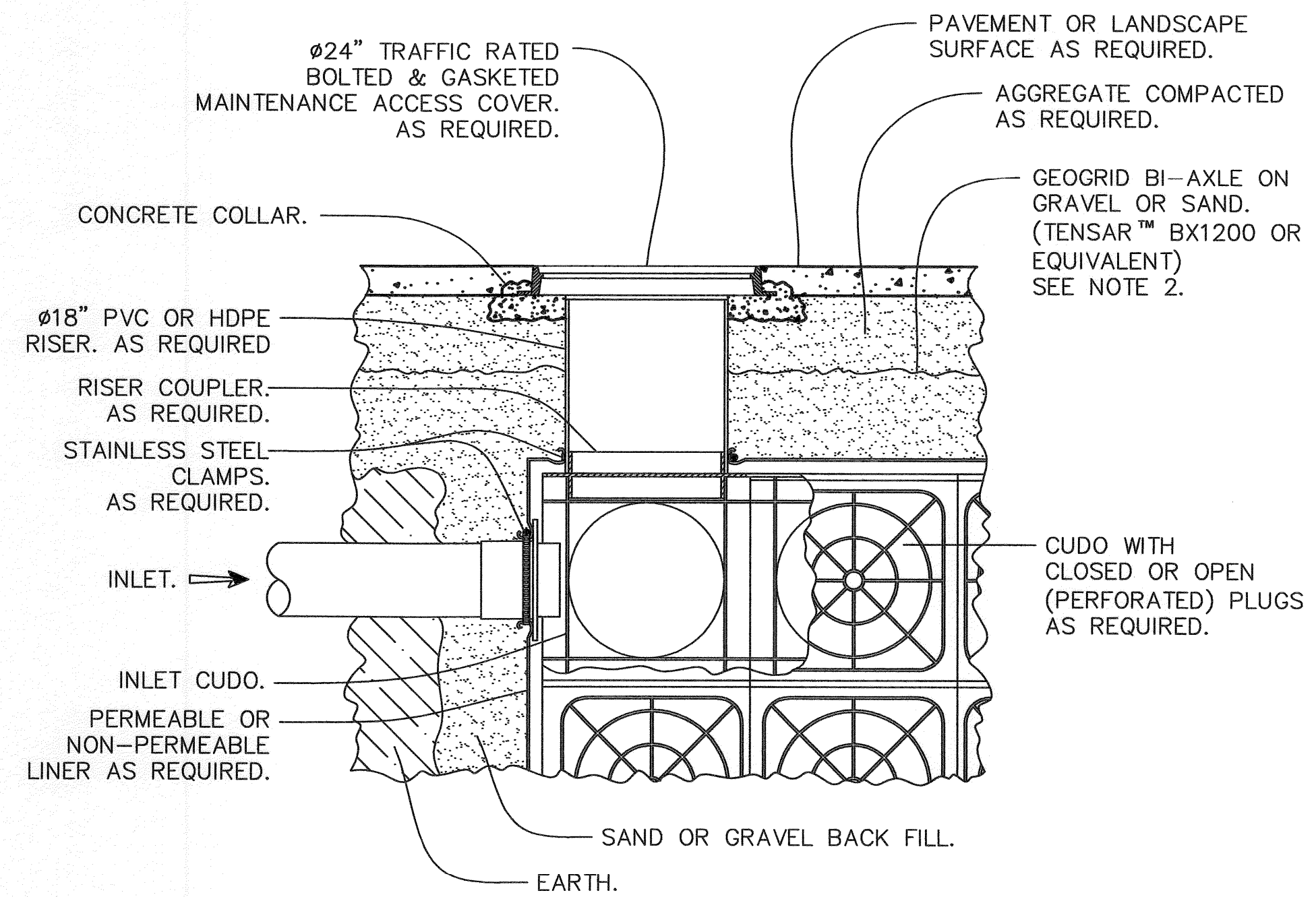
NOTE:

1. SEE SHEET 29 FOR LOCATIONS OF MAINTENANCE ACCESS AND INLET PIPE LOCATIONS

1
31

CUDO PIPE CONNECTION & MAINTENANCE ACCESS INSTALLATION DETAIL (DHHL)

NOT TO SCALE



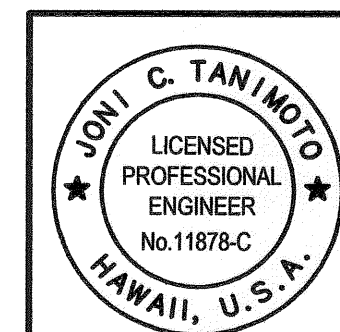
NOTES:

1. REFER TO CUDO INSTALLATION DETAILS.
2. INSTALL GEOGRID LAYER, (TENSAR™ BX1200 OR EQUIVALENT) IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS IN AREAS SUBJECT TO VEHICLE TRAFFIC,
3. SEE SHEET 29 FOR LOCATIONS OF MAINTENANCE ACCESS AND INLET PIPE LOCATIONS

2
31

CUDO TYPICAL MAINTENANCE ACCESS DETAIL (DHHL)

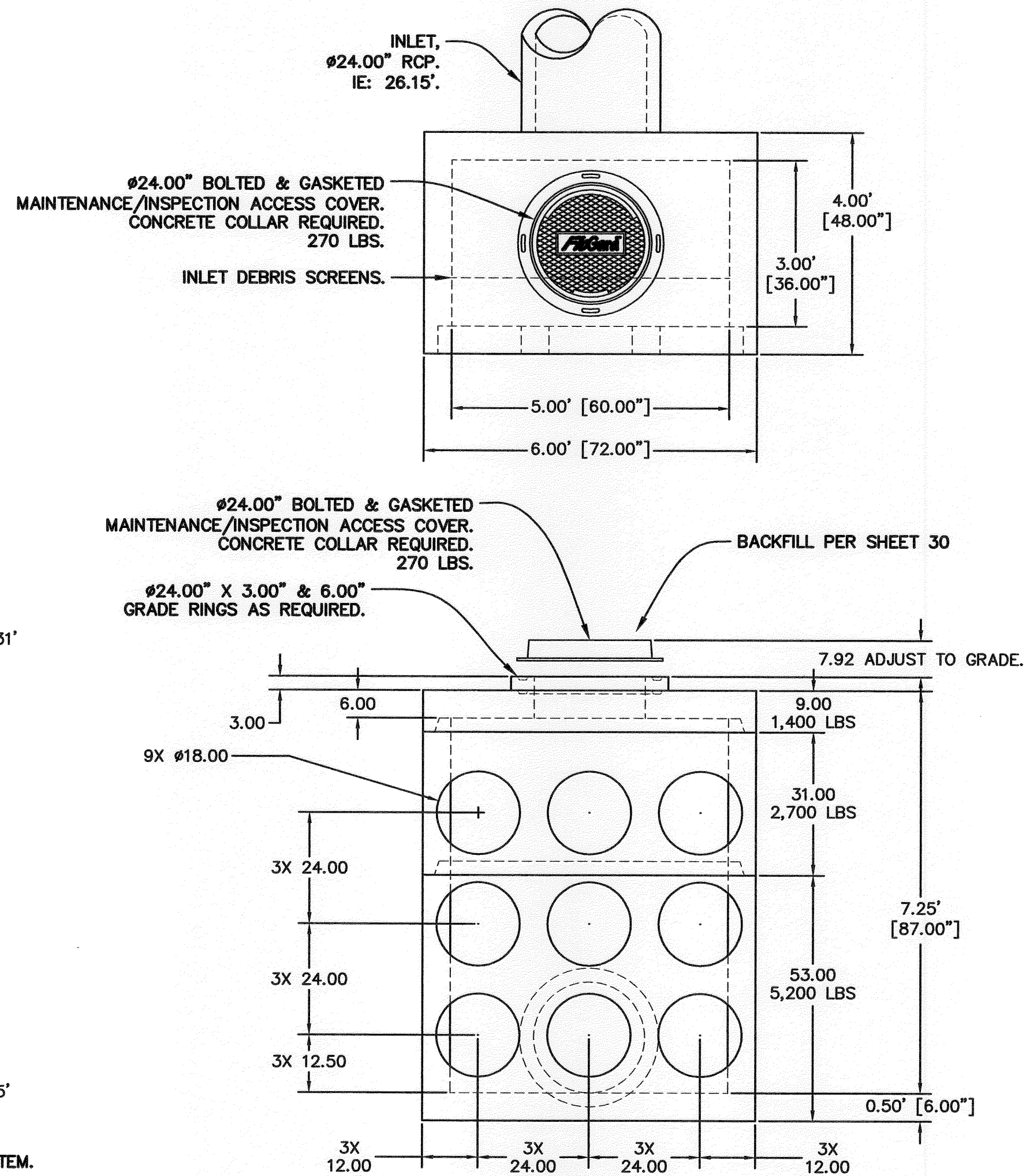
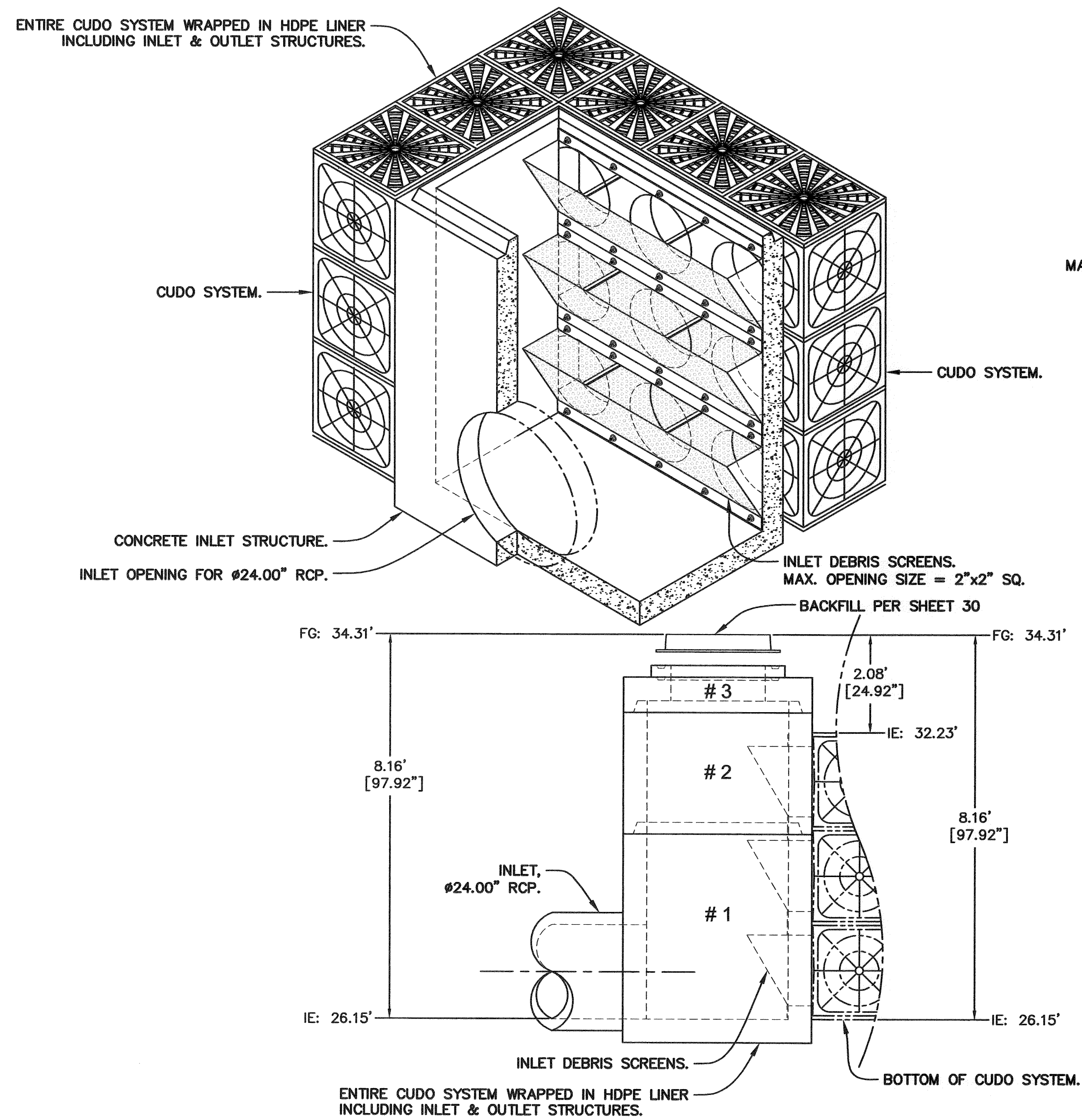
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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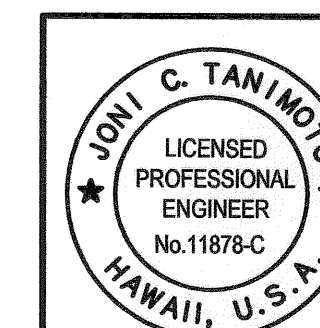
NOTE:

- SECTION HEIGHTS & SLAB THICKNESS'S ARE KRISTAR RECOMMENDED, ANY DEVIATION MUST BE APPROVED BY KRISTAR.
- OVERSIZED HOLES TO ACCOMMODATE SPECIFIC PIPE TYPE MUST BE CONCENTRIC TO PIPE ID.
- MARK INLET/OUTLET, ALL SECTIONS TO BE MARKED WITH STACKING NUMBERS, BEGINNING WITH BASE AS #1.
- STACK STRUCTURE SECTIONS WITH MATCH LINES ORIENTED AS INDICATED. PROPER COMPONENT ALIGNMENT IS CRITICAL TO THE INSTALLATION OF INTERNAL COMPONENTS.
- MAXIMUM PICK WEIGHT BASE = ~5,200 LBS [2.60 TONS]. (ALL LIGHTWEIGHT CONCRETE).

1
32

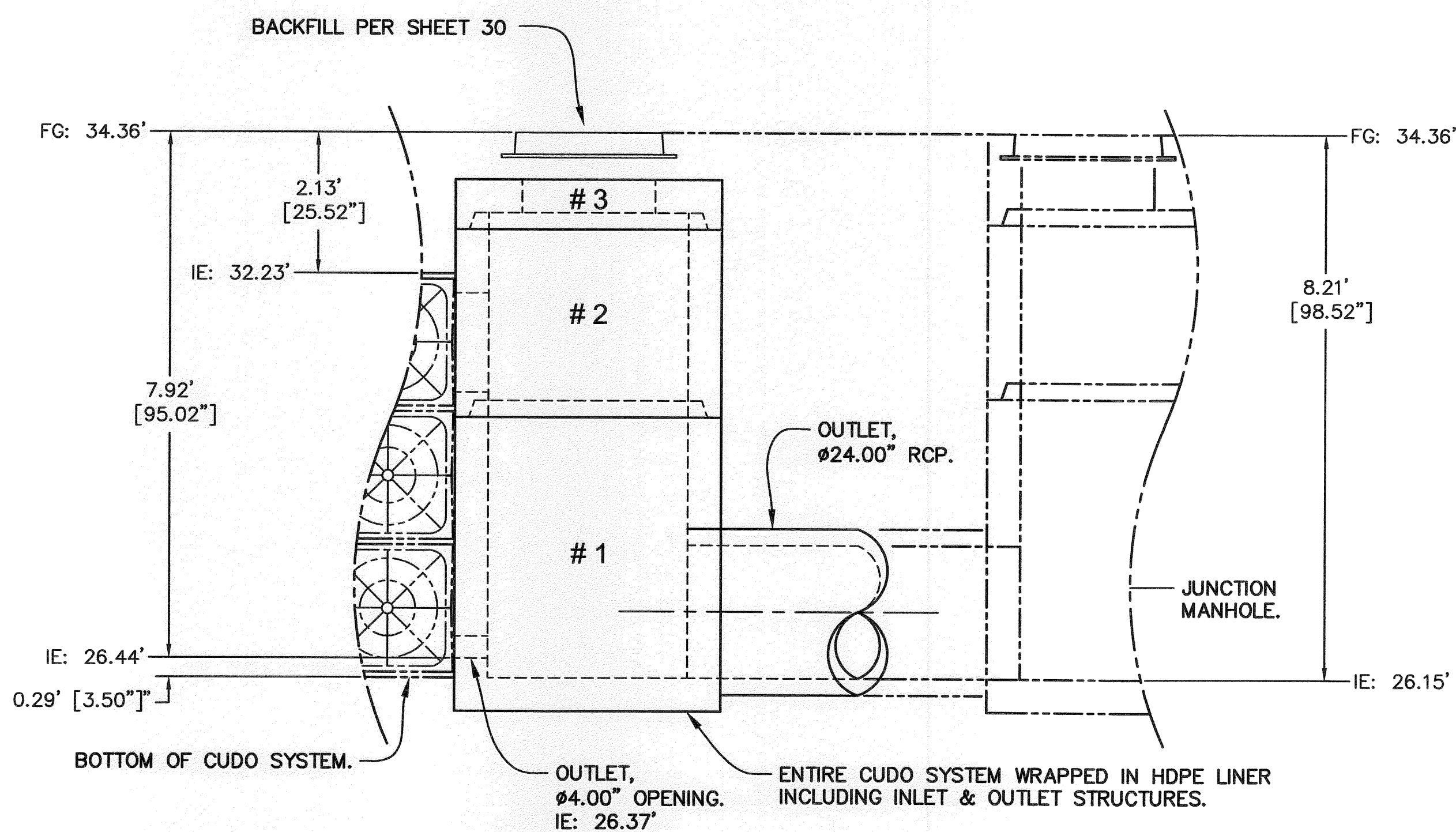
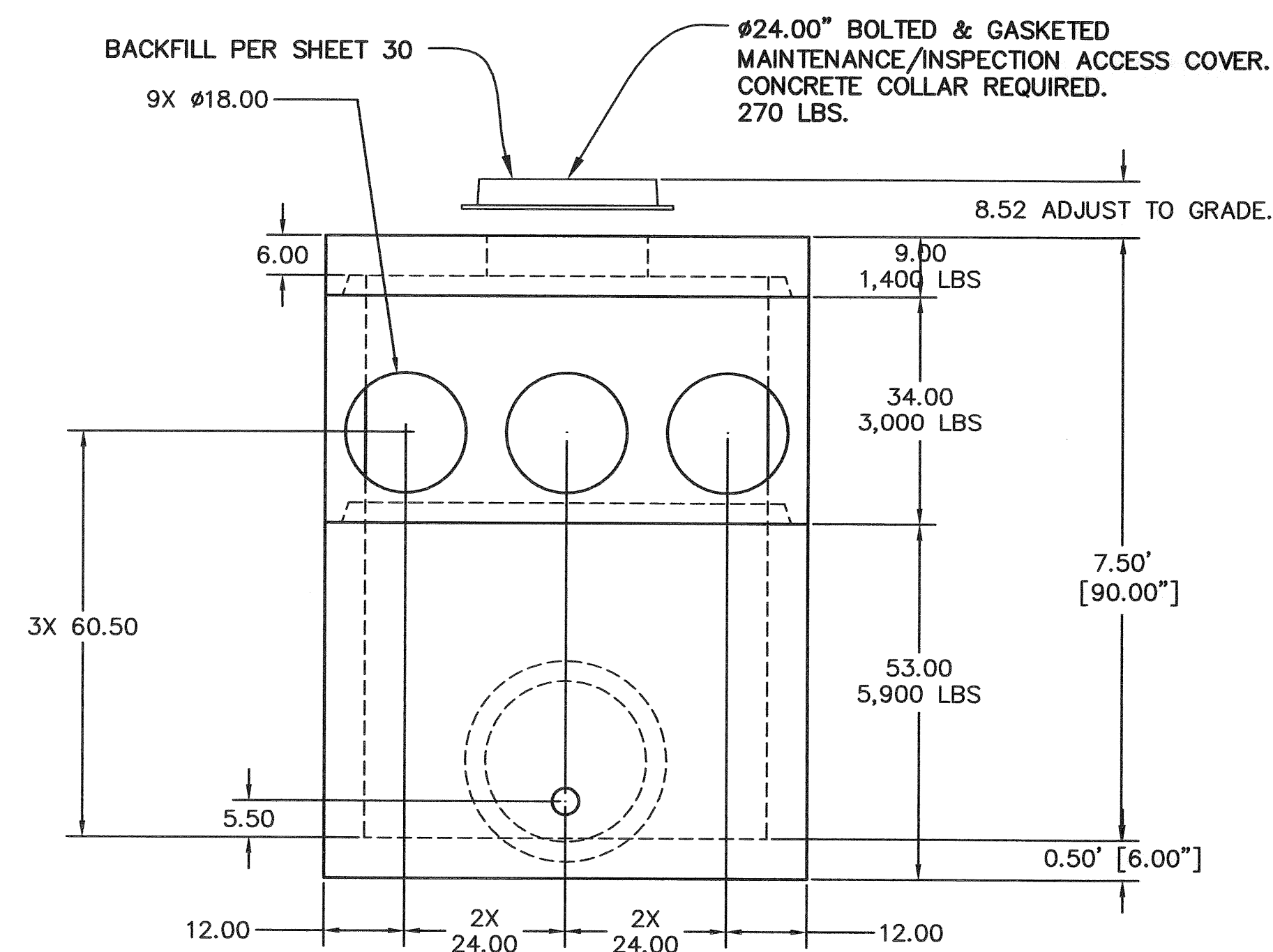
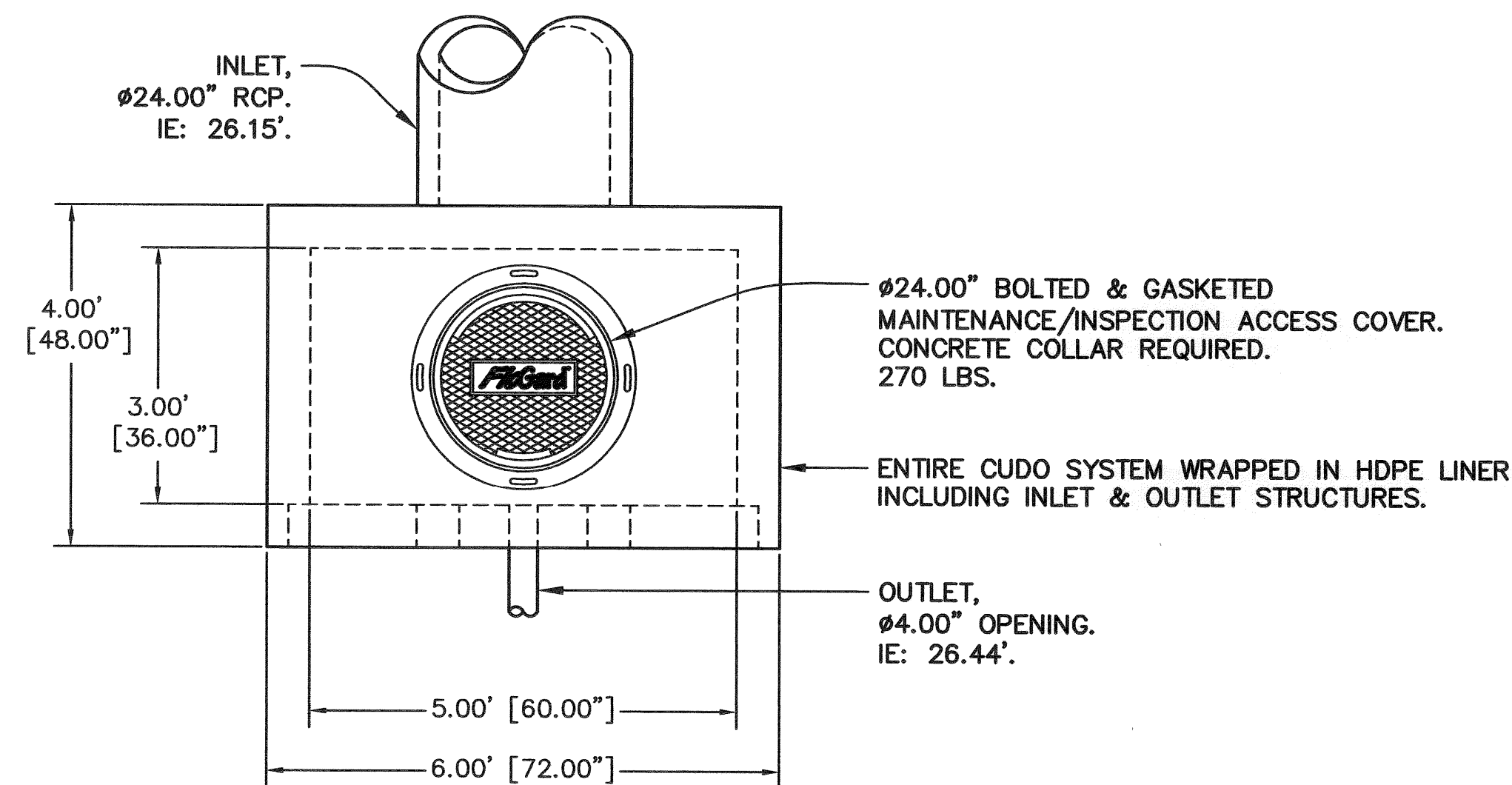
4' x 6' PRECAST CONC. INLET STRUCTURE (DHHL)

NOT TO SCALE



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AND CONSTRUCTION OF THIS
PROJECT WILL BE UNDER MY
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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



SPECIFICATIONS

LETTERING: HEIGHT OF LETTERS SHALL BE 3" HIGH AND 1/4" WIDE

PLACEMENT: THE STENCIL SHALL BE CENTERED ON THE TOP DECK OF THE DRAIN INLET AND SHALL BE A MINIMUM OF 3" AWAY FROM THE FRONT FACE OF THE INLET.

PAINT: USE THE AEROSOL CAN OR TRAFFIC-ZONE LATEX PAINT WITHOUT CHLOROFLUOROCARBONS (CFCs) THAT HARM THE OZONE.

3'-0"
DUMP NO WASTE

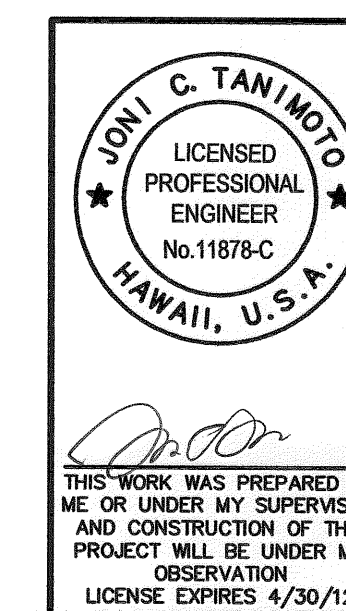
3'-0"
GOES TO OCEAN

2 33 STENCIL DETAIL FOR DRAIN INLETS "B0", "B5A" & "B7A" NOT TO SCALE

NOTE:

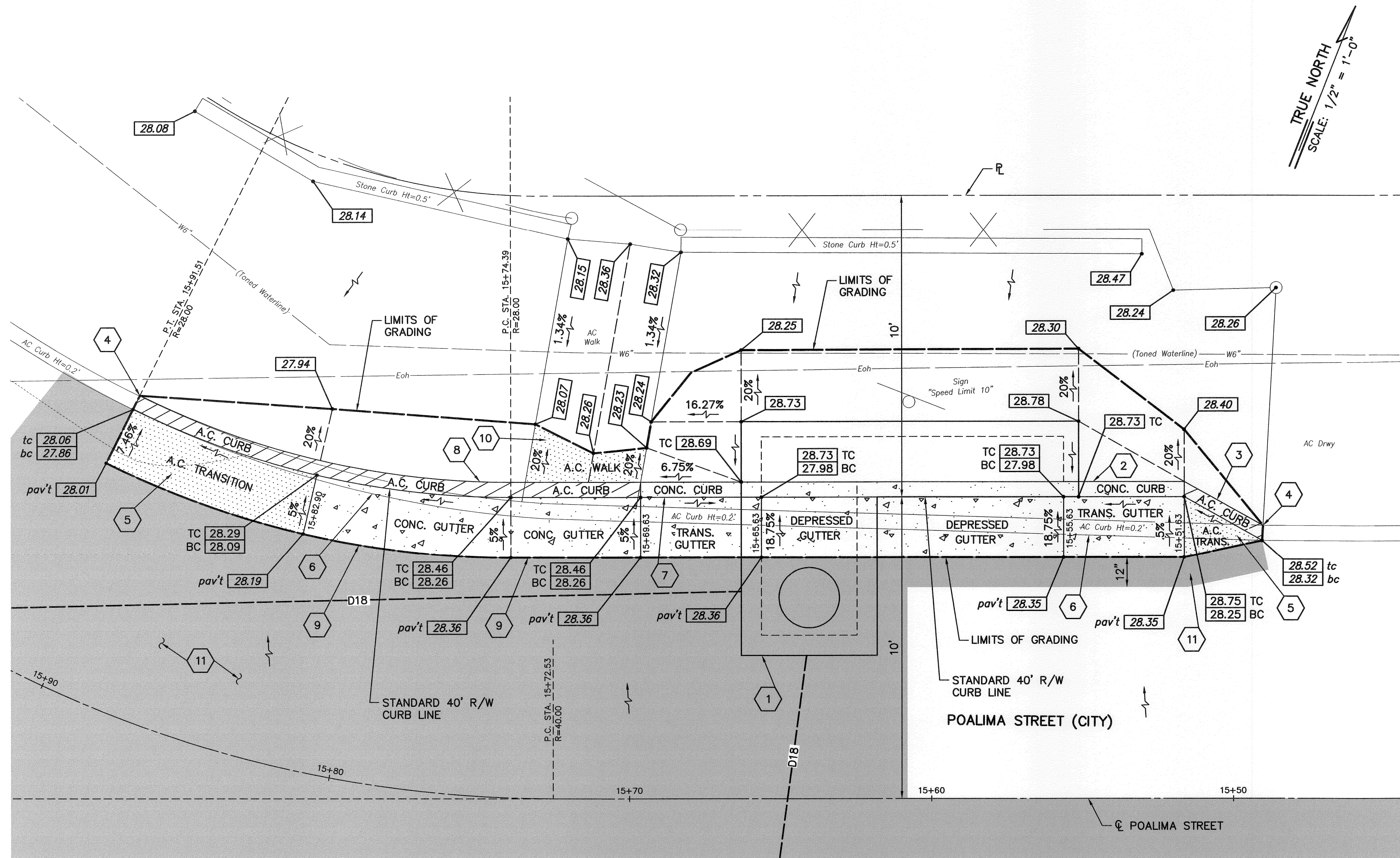
- SECTION HEIGHTS & SLAB THICKNESS'S ARE KRISTAR RECOMMENDED, ANY DEVIATION MUST BE APPROVED BY KRISTAR.
- OVERSIZED HOLES TO ACCOMMODATE SPECIFIC PIPE TYPE MUST BE CONCENTRIC TO PIPE ID.
- MARK INLET/OUTLET, ALL SECTIONS TO BE MARKED WITH STACKING NUMBERS, BEGINNING WITH BASE AS #1.
- STACK STRUCTURE SECTIONS WITH MATCH LINES ORIENTED AS INDICATED. PROPER COMPONENT ALIGNMENT IS CRITICAL TO THE INSTALLATION OF INTERNAL COMPONENTS.
- MAXIMUM PICK WEIGHT BASE SECTION = ~5,900 LBS [2.95 TONS]. (ALL LIGHTWEIGHT CONCRETE).

1 33 4' x 6' PRECAST CONC. OUTLET STRUCTURE (DHHL) NOT TO SCALE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

G:\DHL06-02 Kumuhau & Kakaia
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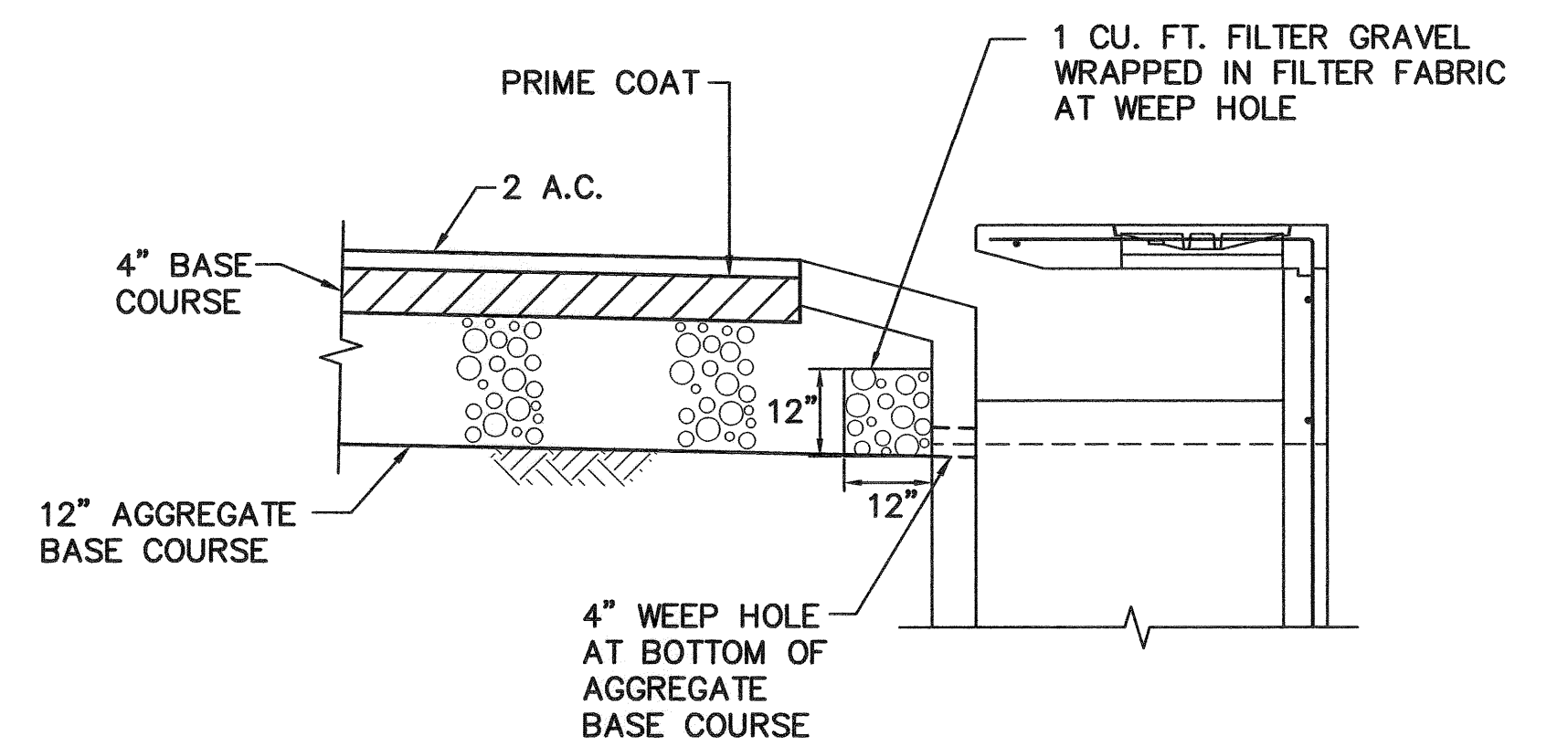


- 1 STA. 15+63.88 ϕ POALIMA ST. CONSTRUCT C.B. "B6A" TYPE "B" WITH STD. DEPRESSED GUTTER & STD. 4' TRANSITION GUTTER ON BOTH SIDES SEE SHEET 25 FOR INV.
- 2 CONSTRUCT STD. CONC. CURB HT. VARIES 0.75' TO 0.5'
- 3 CONSTRUCT A.C. CURB HT. VARIES 0.5' TO 0.2'
- 4 MATCH NEW A.C. CURB TO EXIST. A.C. CURB MATCH EXIST. CURB HT.
- 5 CONSTRUCT A.C. PAVEMENT TRANSITION MATCH INTO EXIST. A.C. PAVEMENT MATCH EXIST. A.C. PAVEMENT THICKNESS
- 6 REMOVE EXIST. A.C. CURB WITHIN LIMITS OF GRADING
- 7 CONSTRUCT STD. CONC. CURB HT. VARIES 0.75' TO 0.2'
- 8 CONSTRUCT A.C. CURB HT. = 0.2'
- 9 CONSTRUCT STD. CONC. GUTTER
- 10 CONSTRUCT A.C. WALK TRANSITION MATCH INTO EXIST. A.C. WALK MATCH EXIST. A.C. PAVEMENT WALK THICKNESS
- 11 A.C. REPAVEMENT FOR LIMITS, SEE SHEET 12

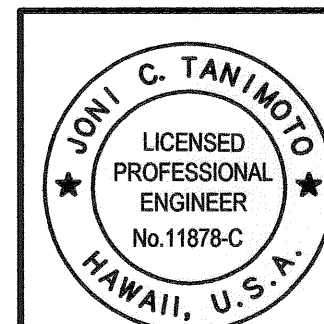
- LEGEND**
- RUN-OFF FLOW DIRECTION
- BC [27.98] FINISH SPOT GRADES
- pav't [28.36] EXISTING GRADES
- NEW A.C. PAVEMENT
- A.C. REPAVEMENT
- NEW CONC. CURB & GUTTER
- NEW A.C. CURB

1 CATCH BASIN "B6A" DETAIL
SCALE: 1/2" = 1'-0"

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



2 WEEP HOLE AT ALL CATCH BASINS
SCALE: 1/2" = 1'-0"



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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
DRAINAGE DETAILS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			DATE
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

Last Save by: KSHIBATA
Last Saved: 11/21/2011
Plotted on: 11/21/2011
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GENERAL:

- A. WORKMANSHIP AND MATERIALS SHALL CONFORM TO HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (2005), AND STANDARD PLANS (2008) BY THE HIGHWAYS DIVISION OF THE DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII. 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 NEW AND EXISTING 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. LIVE LOAD _____ HS-20
- B. FOUNDATION DESIGN
- a. BEARING CAPACITY STRENGTH LIMIT _____ 2000 psf (ASSUMED)
- C. RETAINING WALLS AND DRAINAGE STRUCTURES (ASSUMED):
- a. ACTIVE PRESSURE _____ 40 pcf
- b. AT REST PRESSURE _____ 60 pcf
- c. PASSIVE PRESSURE _____ 300 pcf
- D. REFERENCES:
- a. AASHTO LRFD FIFTH EDITION, 2010
- b. ACI 318-2005

FOUNDATION:

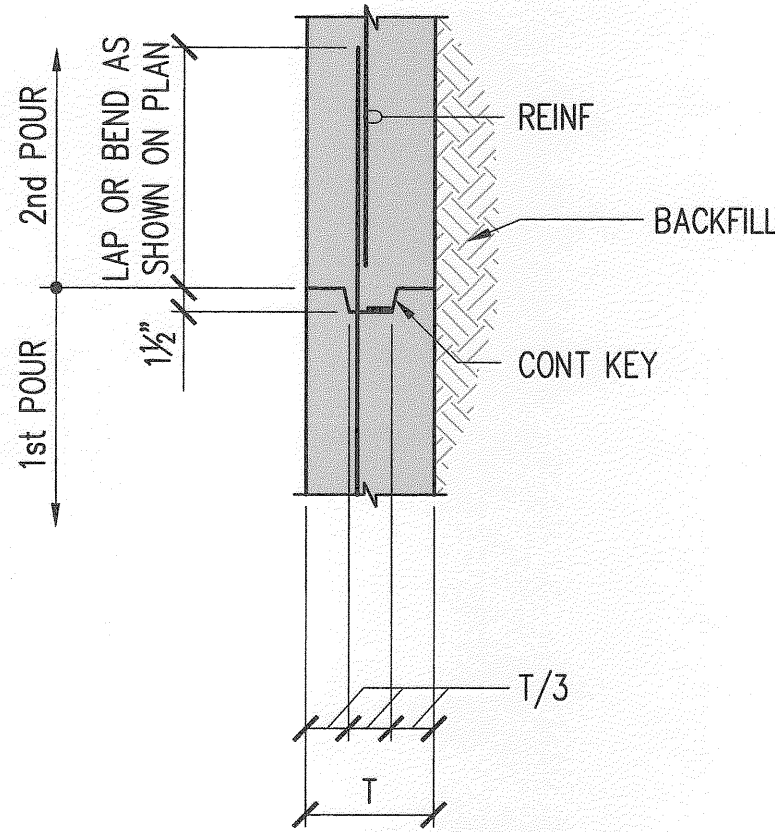
- A. CONTRACTOR SHALL PROVIDE FOR DE-WATERING OF EXCAVATION FROM SURFACE WATER, GROUND WATER OR SEEPAGE.
- B. CONTRACTOR SHALL PROVIDE FOR DESIGN AND INSTALLATION OF ALL CRIBBING, SHEETING, AND SHORING NECESSARY TO PRESERVE EXCAVATIONS AND EARTH BANKS.
- C. FOOTINGS SHALL BEAR ON UNDISTURBED IN-SITU 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-EXCAVATION 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.
- D. CONTRACTOR SHALL BRACE OR PROTECT ALL WALLS BELOW GRADE FROM LATERAL LOADS UNTIL ATTACHING FLOORS ARE COMPLETELY IN PLACE AND HAVE ATTAINED THEIR FULL DESIGN STRENGTH.

CONCRETE:

- A. CONCRETE CONSTRUCTION SHALL CONFORM TO AMERICAN CONCRETE INSTITUTE ACI 318-2005
- B. CONCRETE SHALL DEVELOP A MINIMUM 4000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
- 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. PIPES PASSING THROUGH A SLAB OR FOOTING AND NOT CONFORMING TO TYPICAL DETAILS SHALL BE LOCATED AND SUBMITTED TO THE ENGINEER FOR APPROVAL.

REINFORCING STEEL:

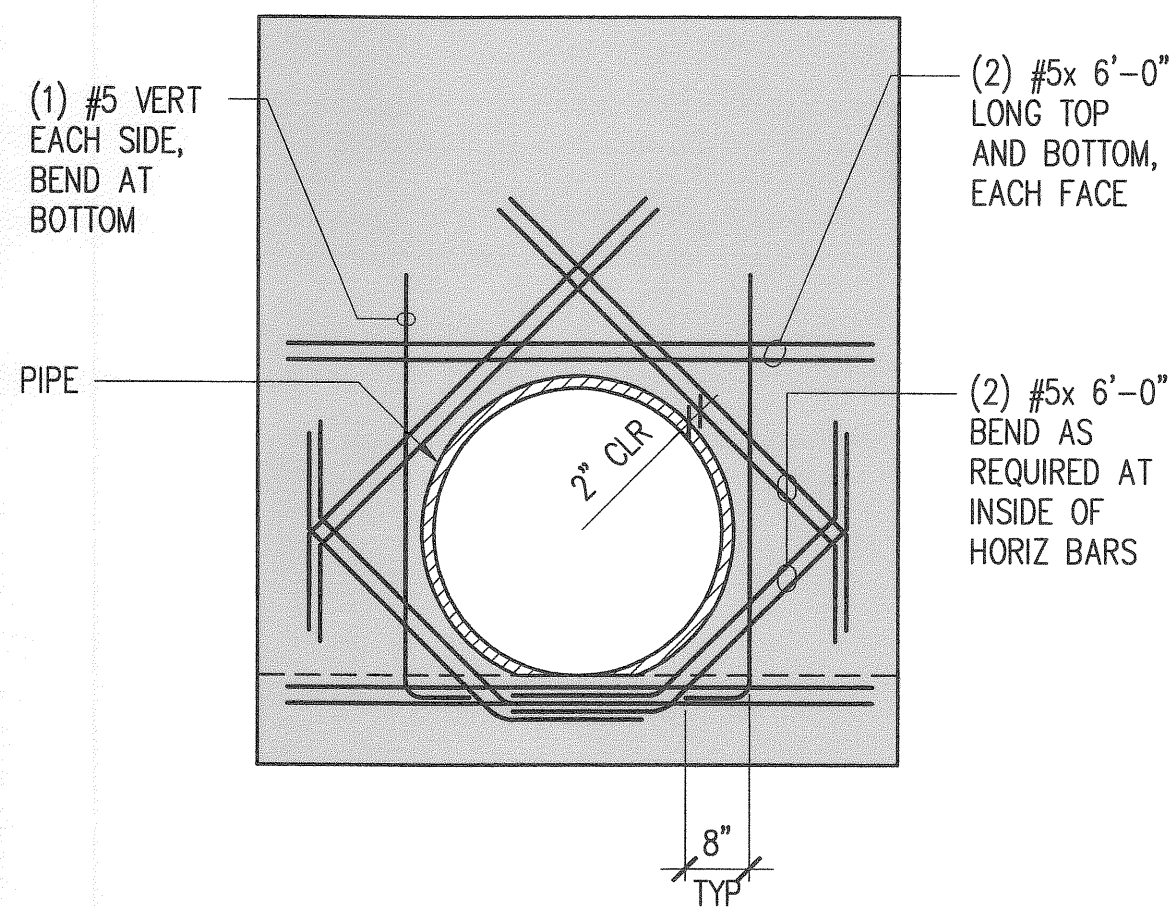
- A. REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60.
- B. CLEAR CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:
- a. CAST AGAINST EARTH _____ 3"
- b. FORMED AND EXPOSED TO EARTH OR WEATHER _____ 2"
- C. REINFORCING STEEL SHALL BE SPLICED WHERE 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 AND HAVE A CURRENT ICC REPORT.
- E. BAR BENDS AND HOOKS SHALL BE "STANDARD HOOKS" IN ACCORDANCE WITH ACI 318.



TYPICAL CONSTRUCTION JOINT DETAIL

1
S-1

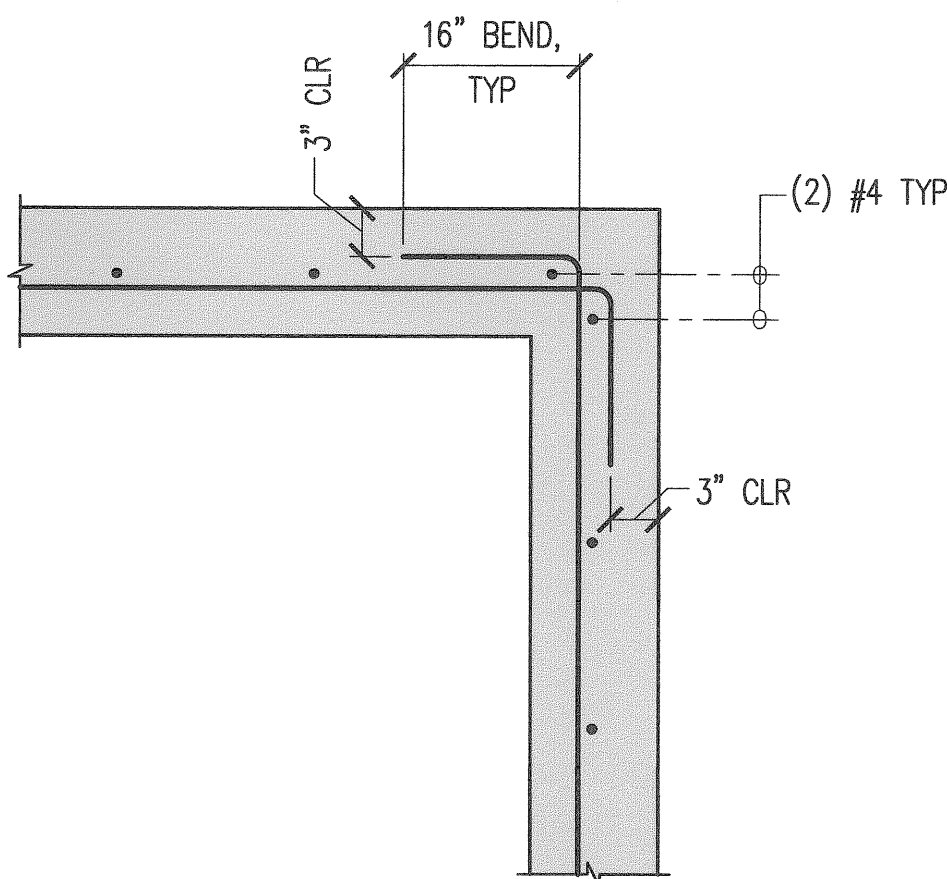
NOT TO SCALE



ADDED REINFORCING AT PIPE OPENINGS

2
S-1

NOT TO SCALE



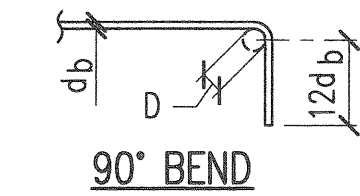
TYPICAL CORNER BEND DETAIL

3
S-1

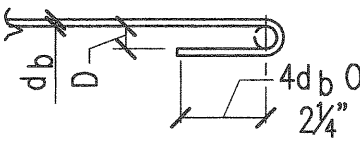
SCALE: 1" = 1'-0"

MINIMUM SPLICE AND DEVELOPMENT LENGTHS					
BAR SIZE	CONCRETE STRENGTH = 4,000 PSI				
	LAP SPlice		DEVELOPMENT		
	TOP BARS	OTHER BARS	TOP BARS	OTHER BARS	WITH STANDARD HOOK
#3	26"	20"	20"	16"	8"
#4	34"	26"	26"	20"	10"
#5	42"	32"	32"	24"	12"
#6	50"	38"	38"	30"	16"
#7	72"	54"	54"	42"	18"
#8	82"	62"	62"	48"	20"

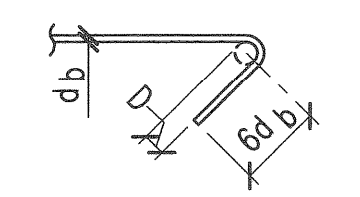
- NOTES:
1. LENGTHS ARE FOR CONCRETE WITH REBAR SPACE 6 BAR DIAMETERS MINIMUM. INCREASE 25% FOR BARS SPACED LESS THAN 6 BAR DIAMETERS.
2. "TOP BARS" ARE HORIZONTAL BARS WITH 12" OR MORE OF CONCRETE CAST BELOW.



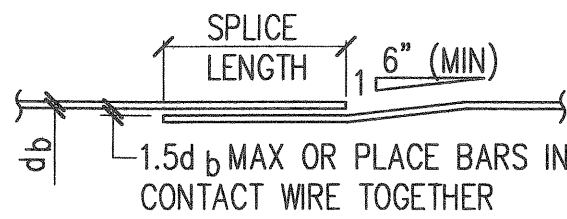
90° BEND



180° BEND



135° BEND



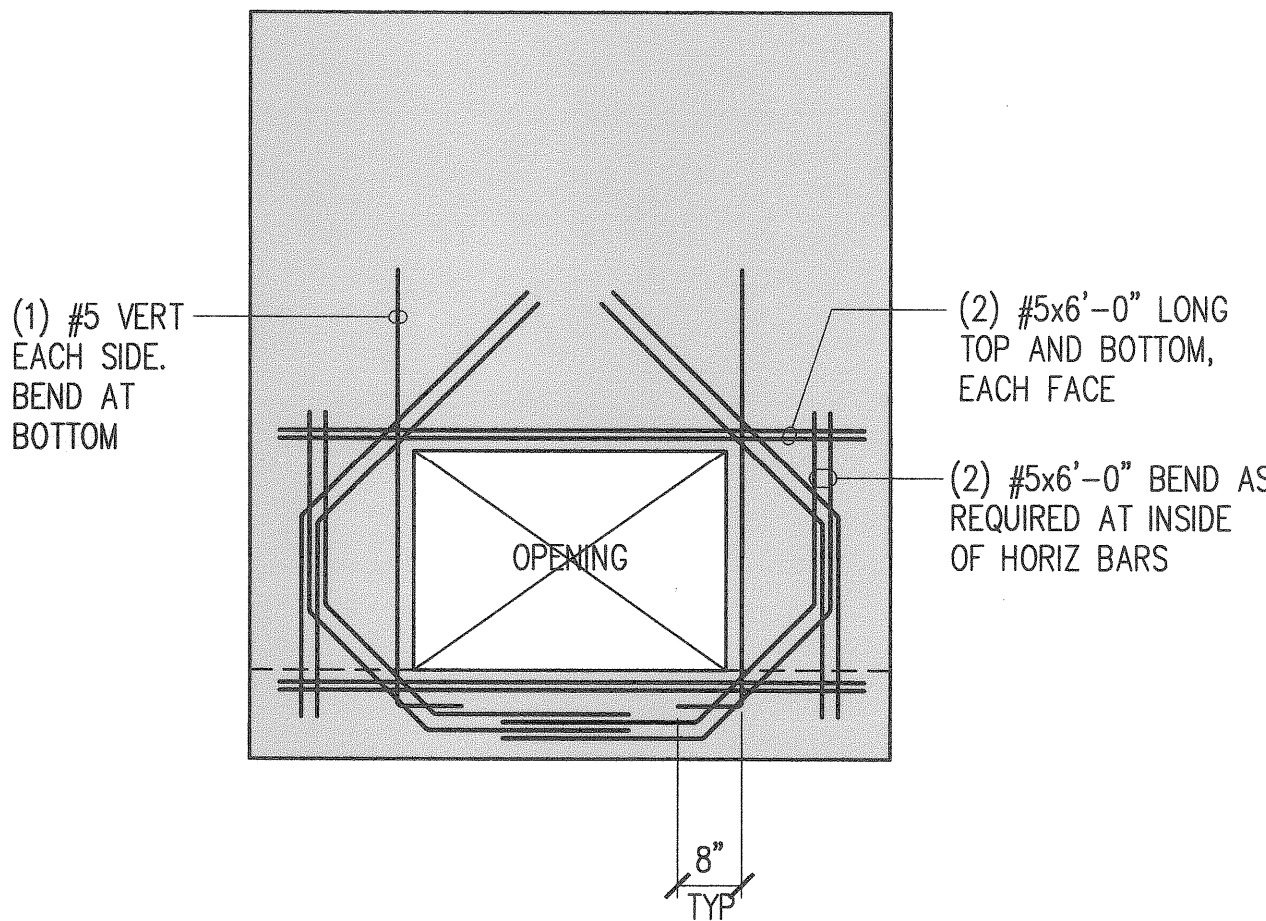
BAR LAP

D = 6d_b FOR #8 AND SMALLER
D = 8d_b FOR #9 TO #11

TYPICAL REBAR SPLICE AND EMBEDMENT LENGTH SCHEDULE

4
S-1

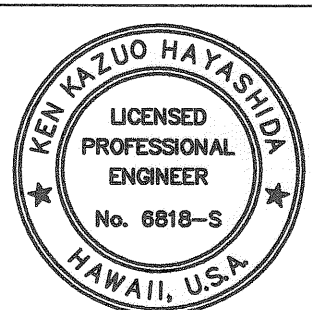
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ADDED REINFORCING AT RECTANGULAR OPENINGS

5
S-1

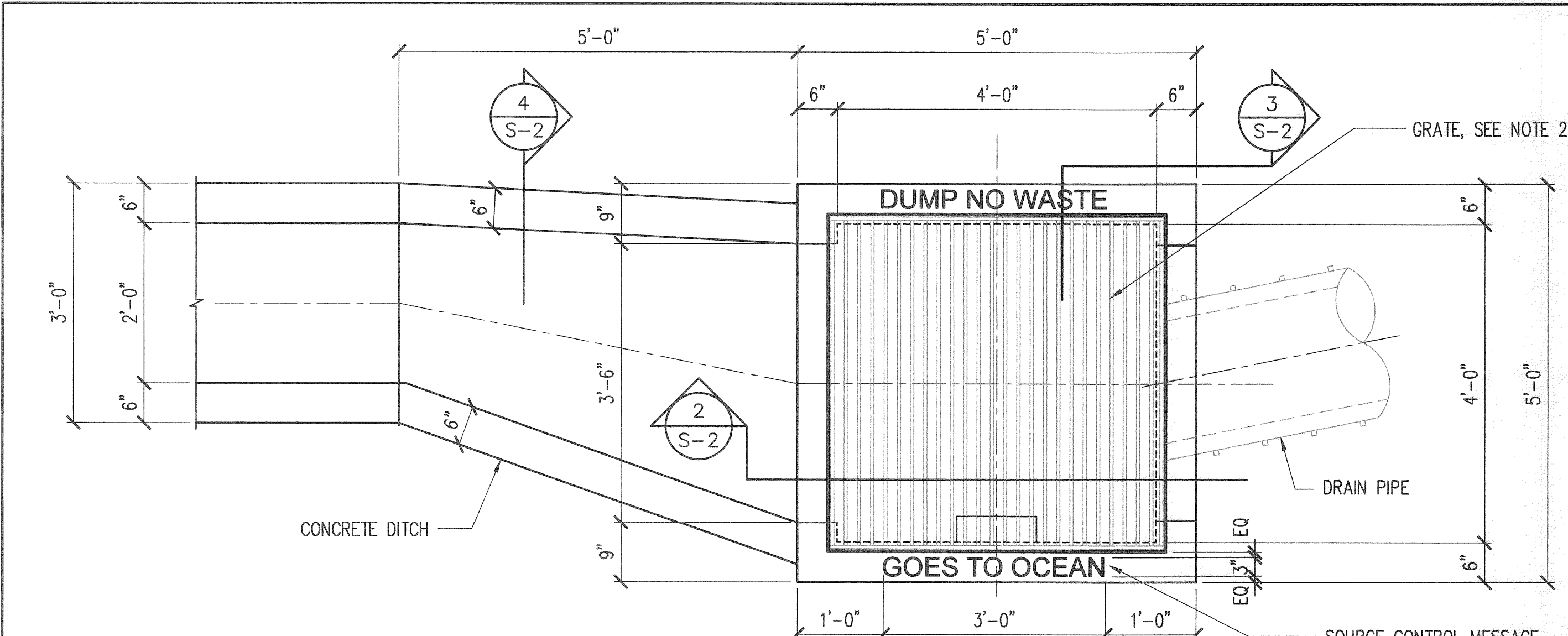
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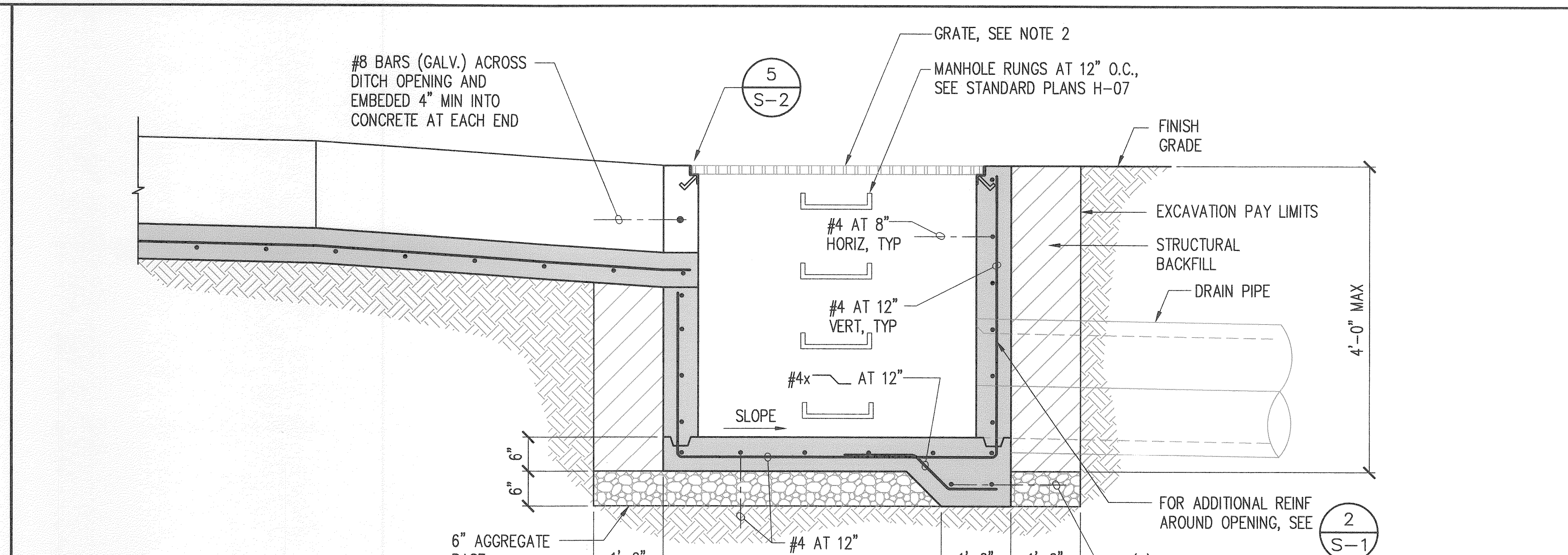
EXPIRATION DATE OF THE LICENSE 4/30/2012

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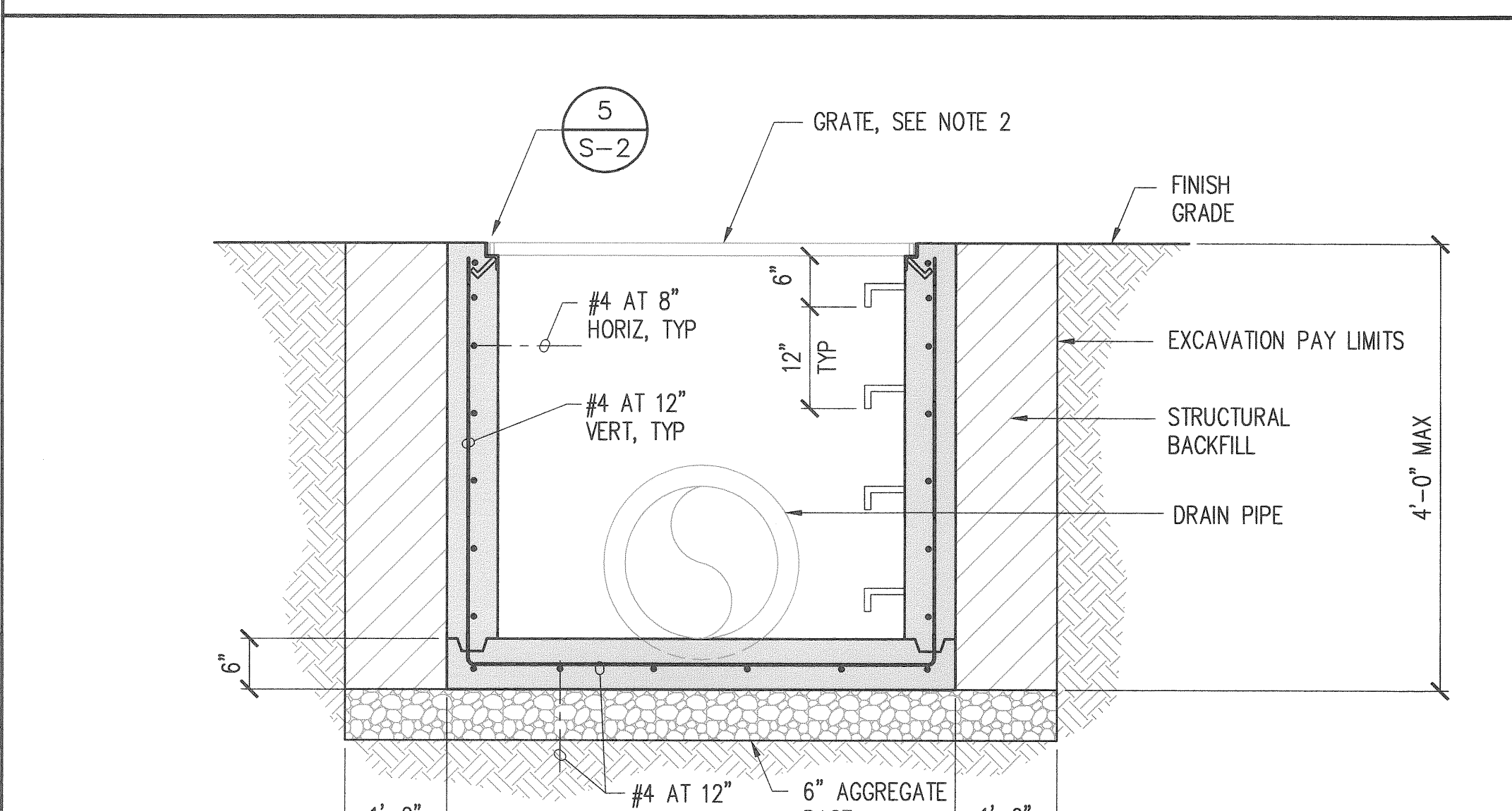
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
GENERAL NOTES AND TYPICAL DETAILS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



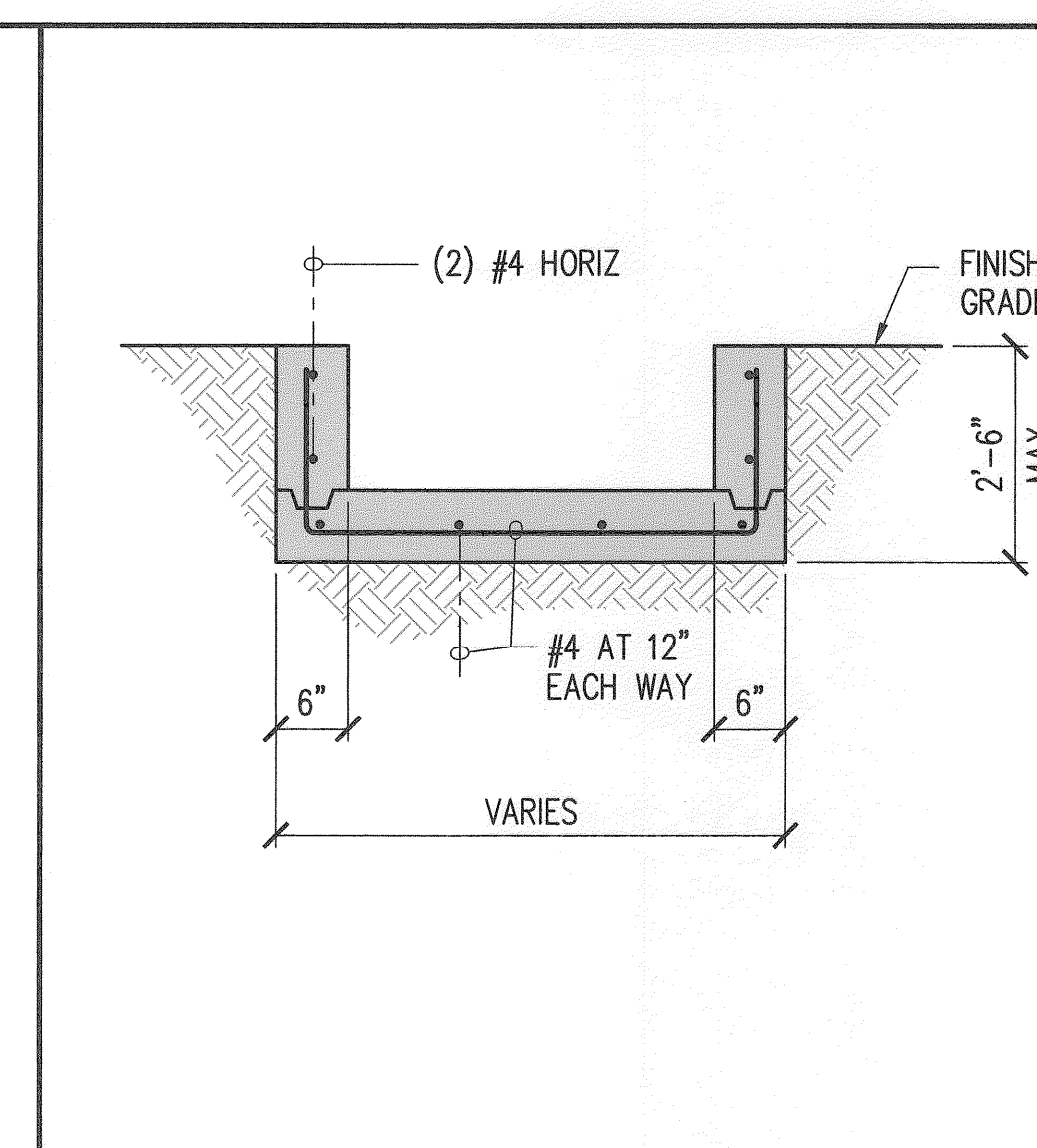
1 PLAN - CONCRETE DITCH AND DRAIN INLET B7A (PRIVATE)
SCALE: 3/4" = 1'-0"



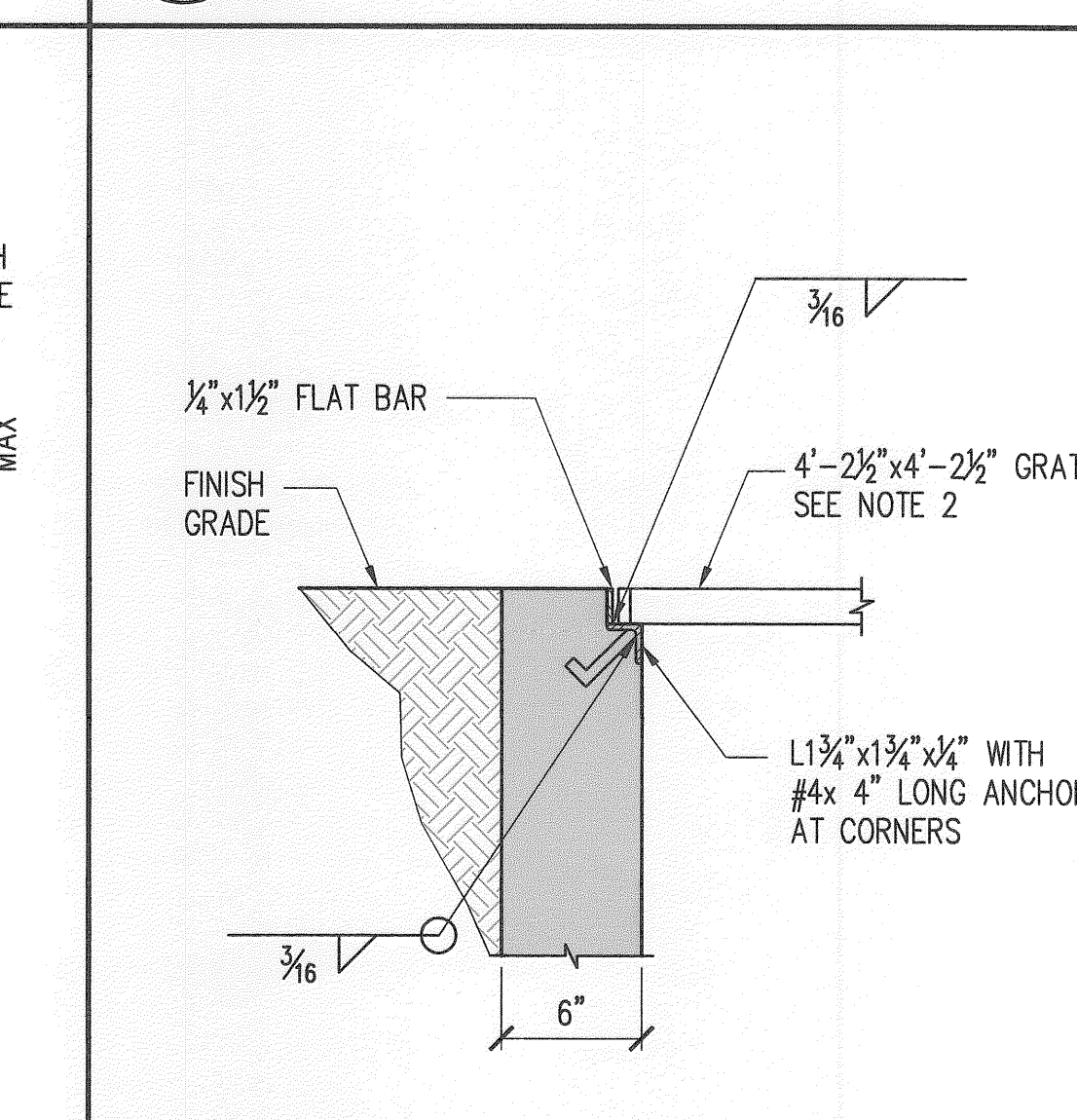
2 SECTION
SCALE: 3/4" = 1'-0"



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



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



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

NOTES:
1. REFERENCE CIVIL DRAWINGS FOR LOCATIONS OF CONCRETE DITCH AND DRAIN PIPES.
2. GRATE SHALL BE HS-20 TRAFFIC RATED. SUBMIT PRODUCT INFORMATION FOR APPROVAL. GRATE AND FRAME SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
3. LETTERS SHALL BE PAINTED WITH AEROSOL CAN OR TRAFFIC-ZONE LATEX PAINT FREE OF CHLOROFUORO CARBON (CFC). LETTERS SHALL BE STAMPED 1/4" DEEP INTO CONCRETE.

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

0' 6" 1' 2'
1 1/2" = 1'-0"

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

EXPIRATION DATE OF THE LICENSE 4/30/2012
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

REVISION DATE DESCRIPTION MADE BY APPROVED

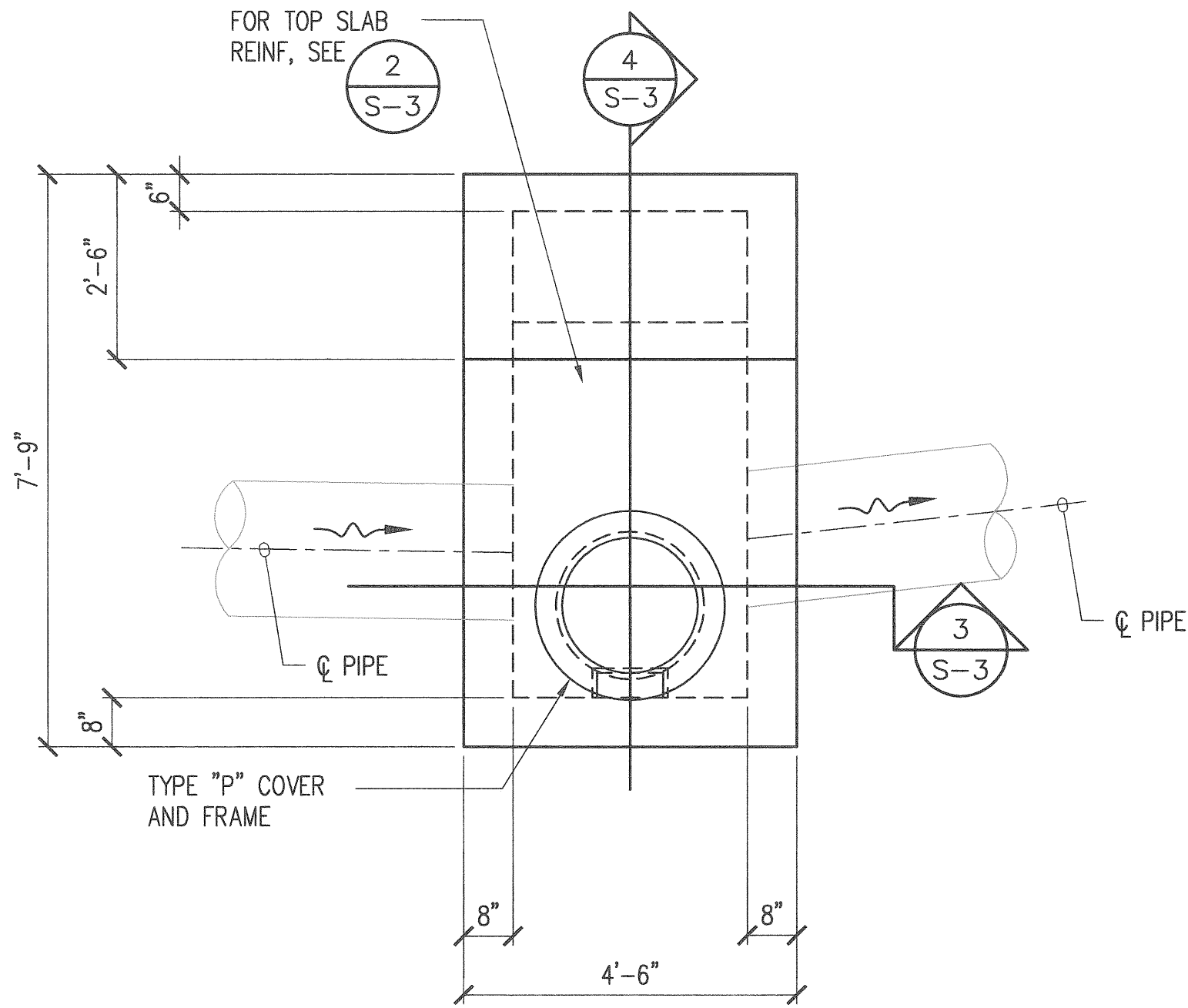
DEPARTMENT OF HAWAIIAN HOME LANDS
KAKAINA SUBDIVISION
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

CONCRETE DITCH AND DRAIN INLET B7A
PLAN AND SECTIONS

APPROVED: CHIEF, CIVIL ENGINEERING BRANCH, DPP DATE

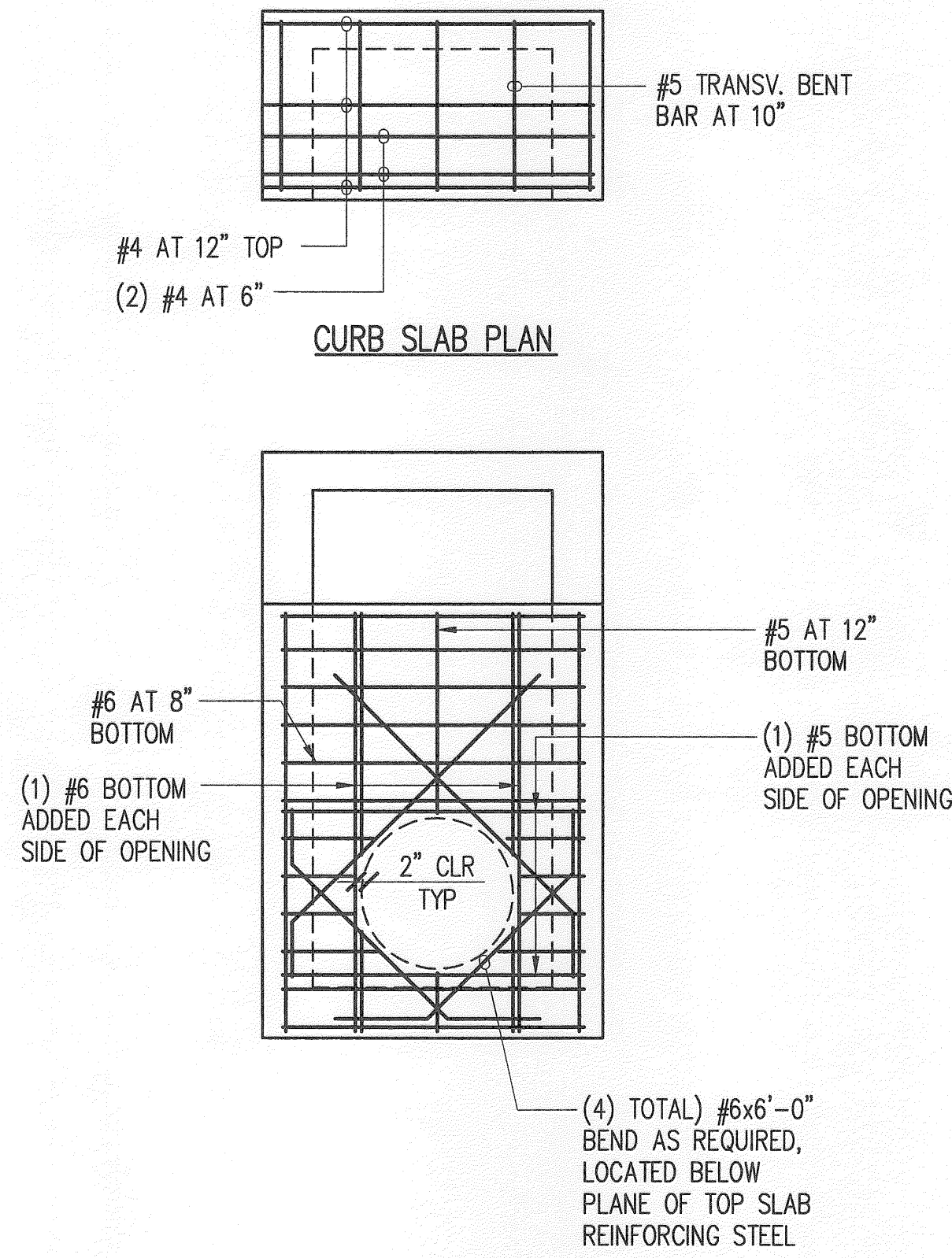
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE POCKET FOLDER NO.



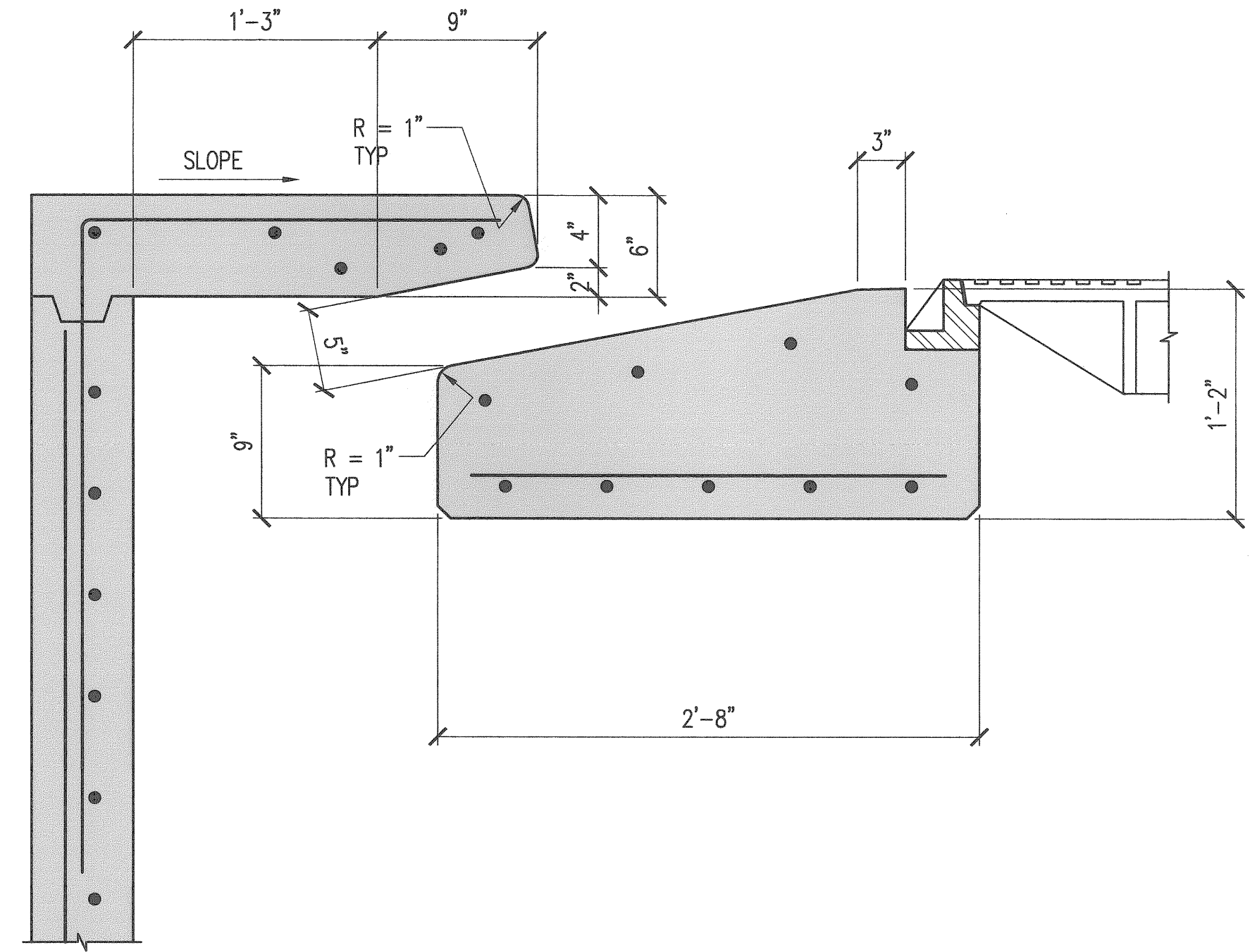
PLAN VIEW
SPECIAL CATCH BASIN CB B8

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



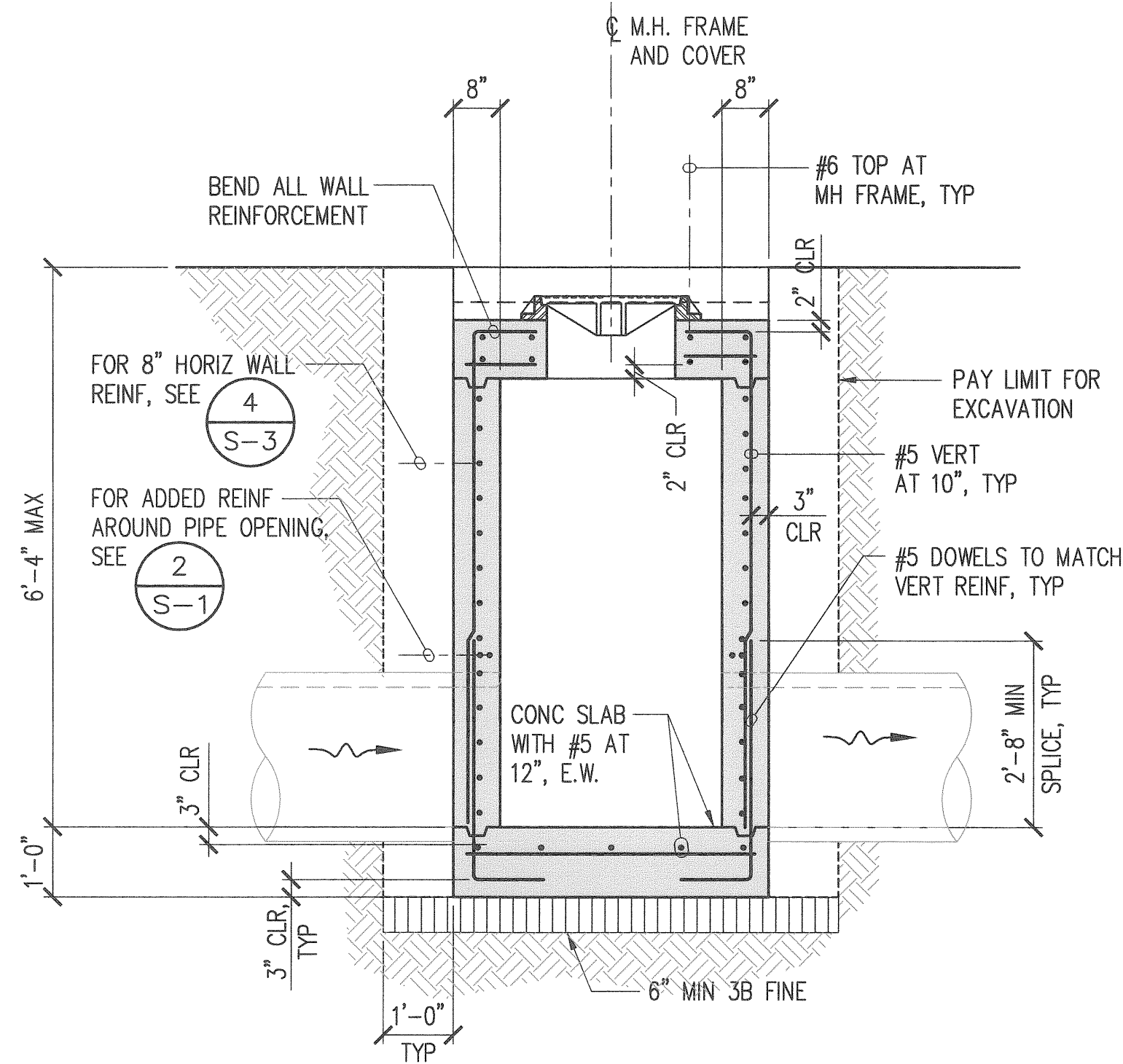
PLAN - TOP SLAB REINFORCING STEEL

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



DETAIL

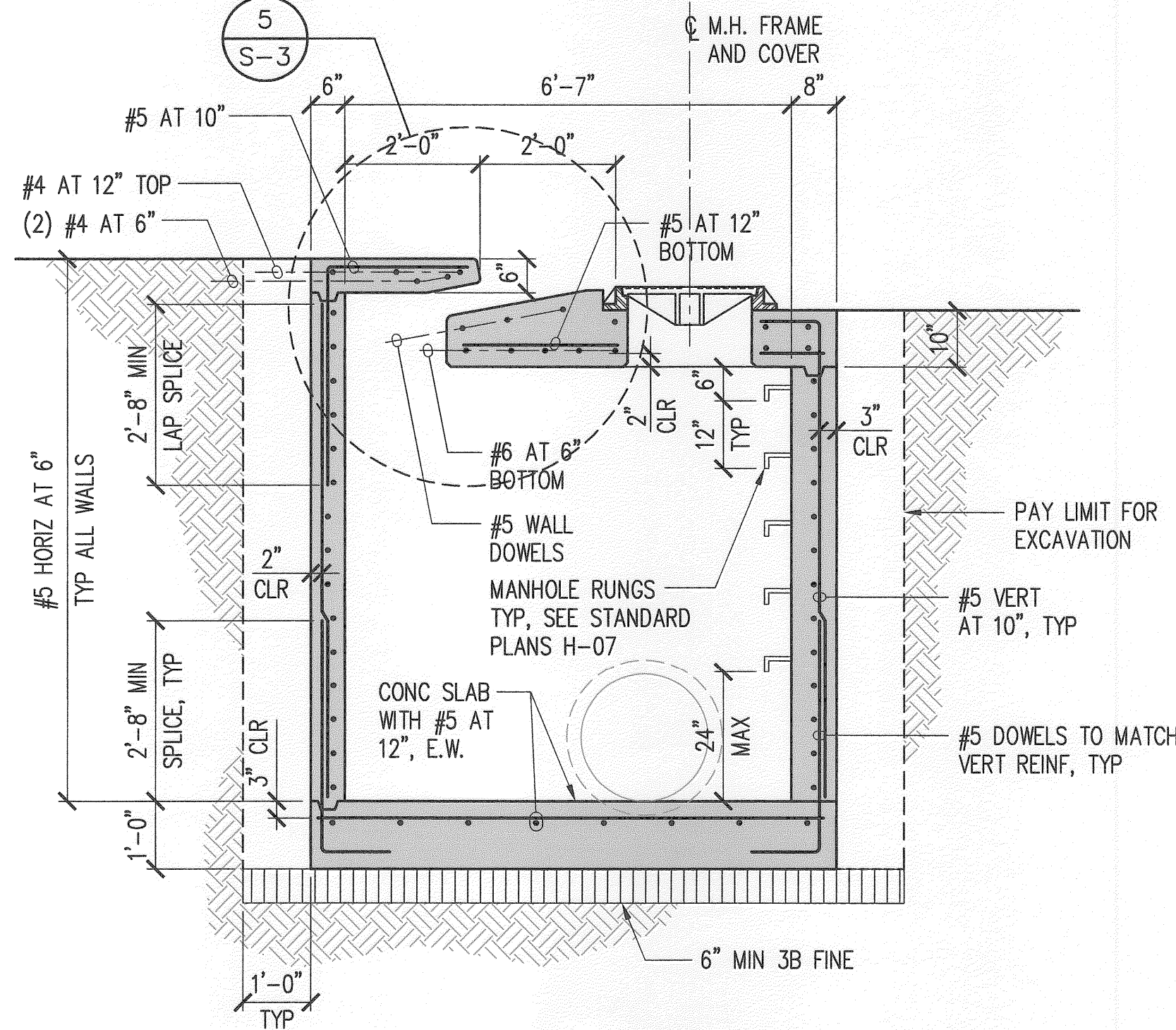
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S-3 SCALE: 1-1/2" = 1'-0"



SECTION

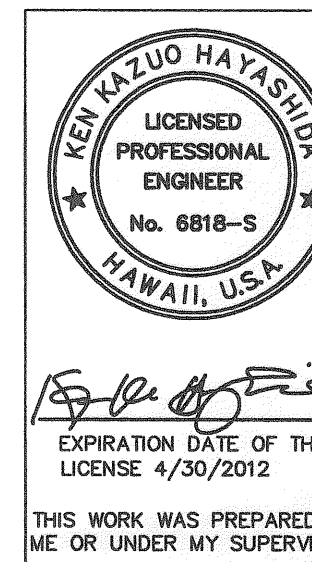
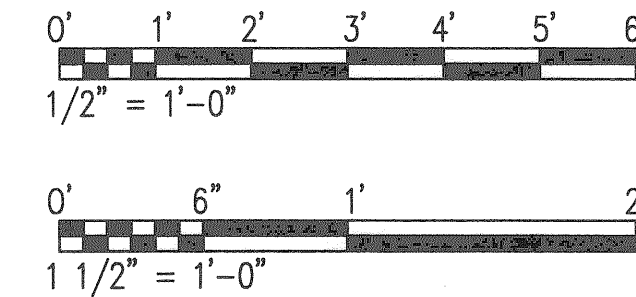
3
S-3 SCALE: 1/2" = 1'-0"

NOTE:
FOR CATCH BASIN ELEVATIONS,
SEE CIVIL DWGS



SECTION

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



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DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
SPECIAL CATCH BASIN CB B8 PLAN AND SECTIONS			
APPROVED:		DATE:	
CHIEF, CIVIL ENGINEERING BRANCH, DPP		AKINAKA & ASSOCIATES, LTD.	
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



1 SPECIAL CA
S-4 SCALE: 1/2" = 1'-0"



2 PLAN - TOP S
S-4 SCALE: 1/2" = 1'-0"

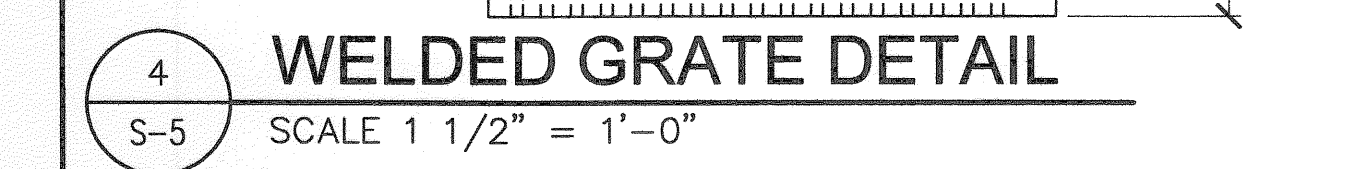
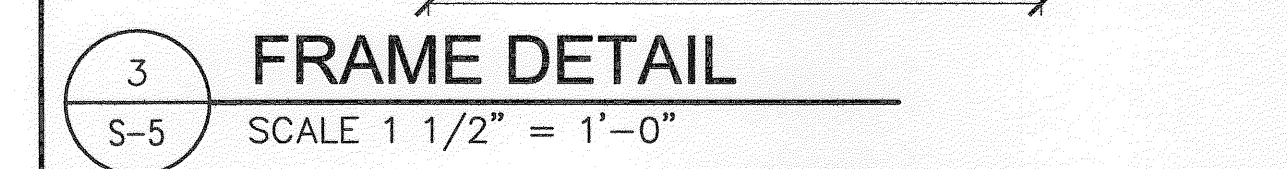
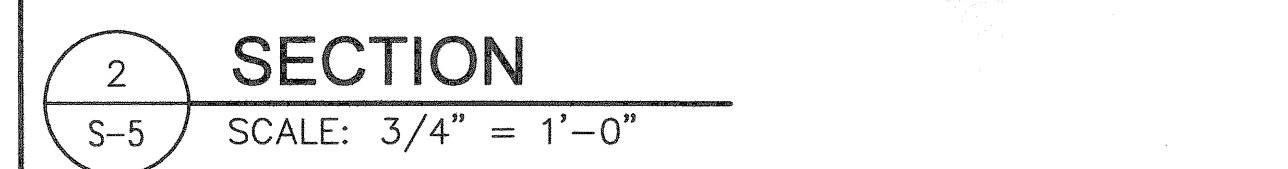
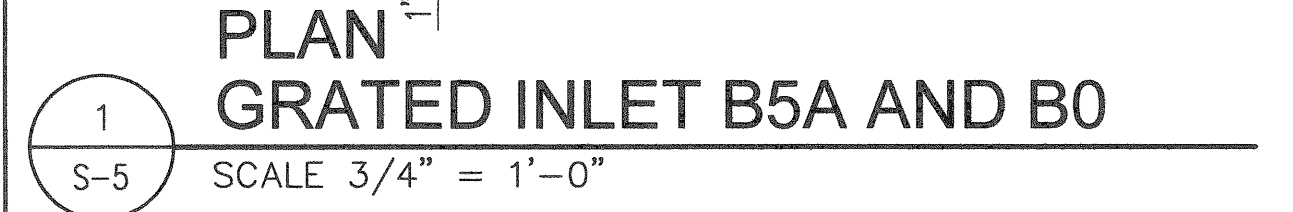


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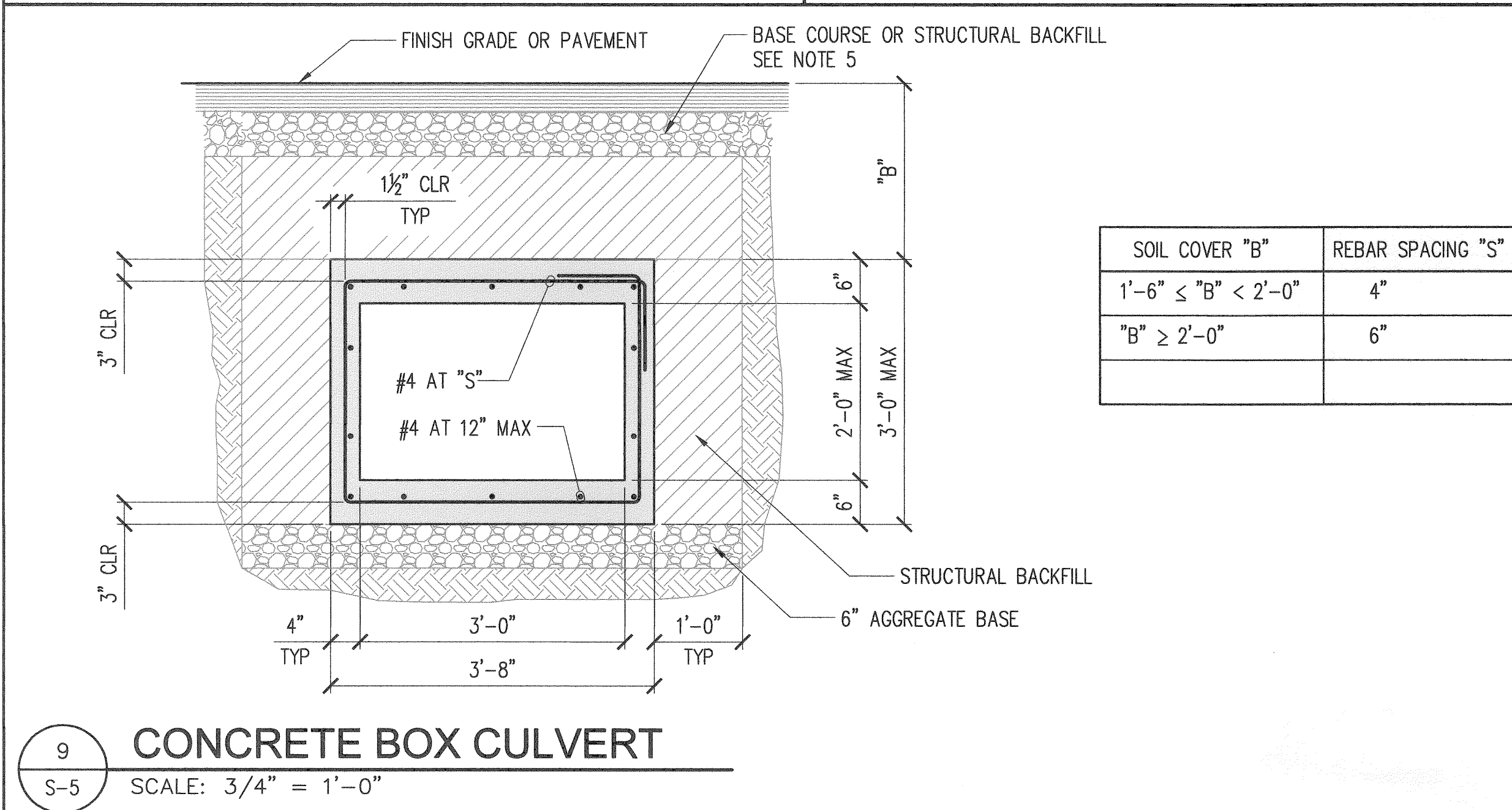
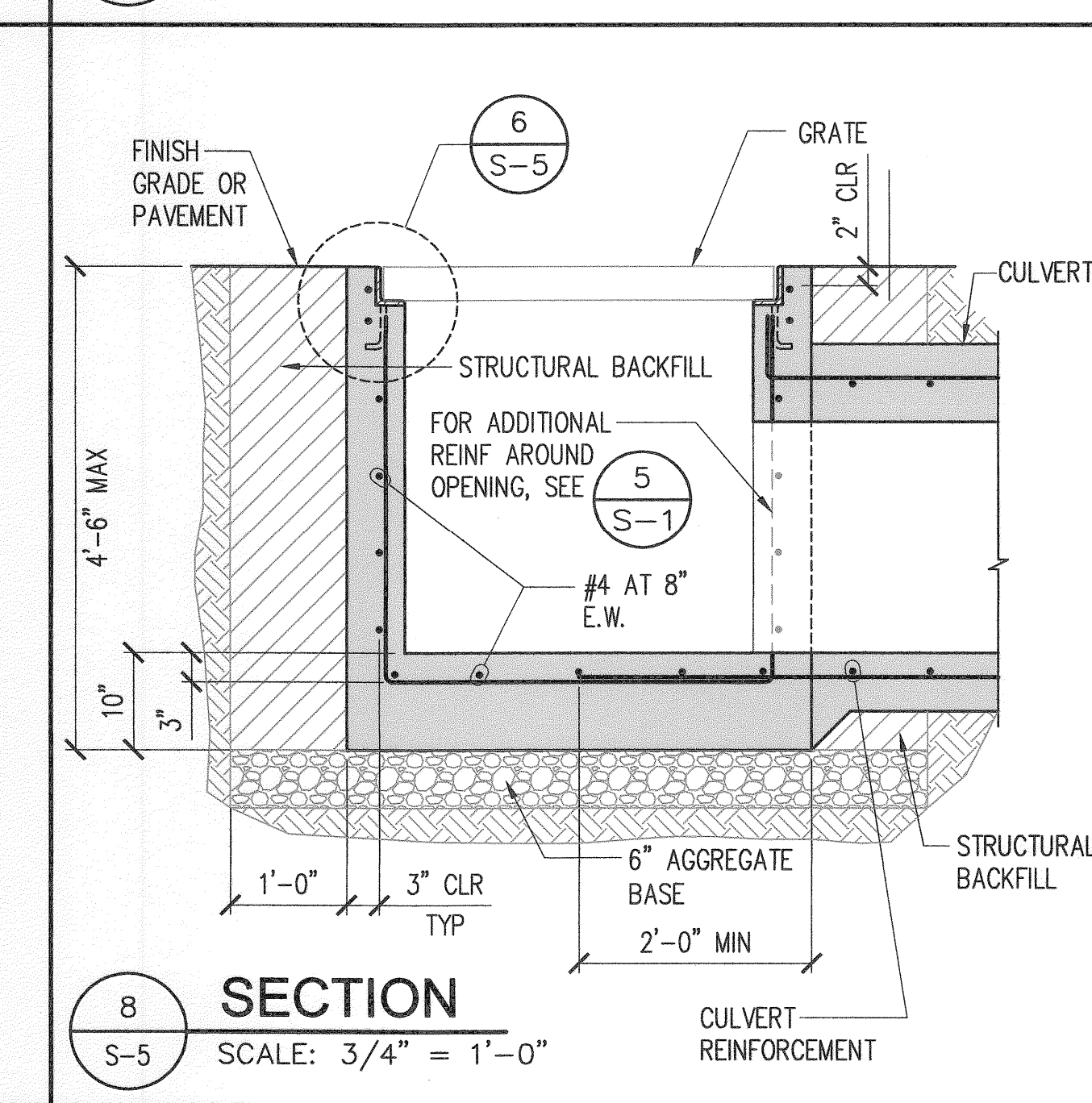
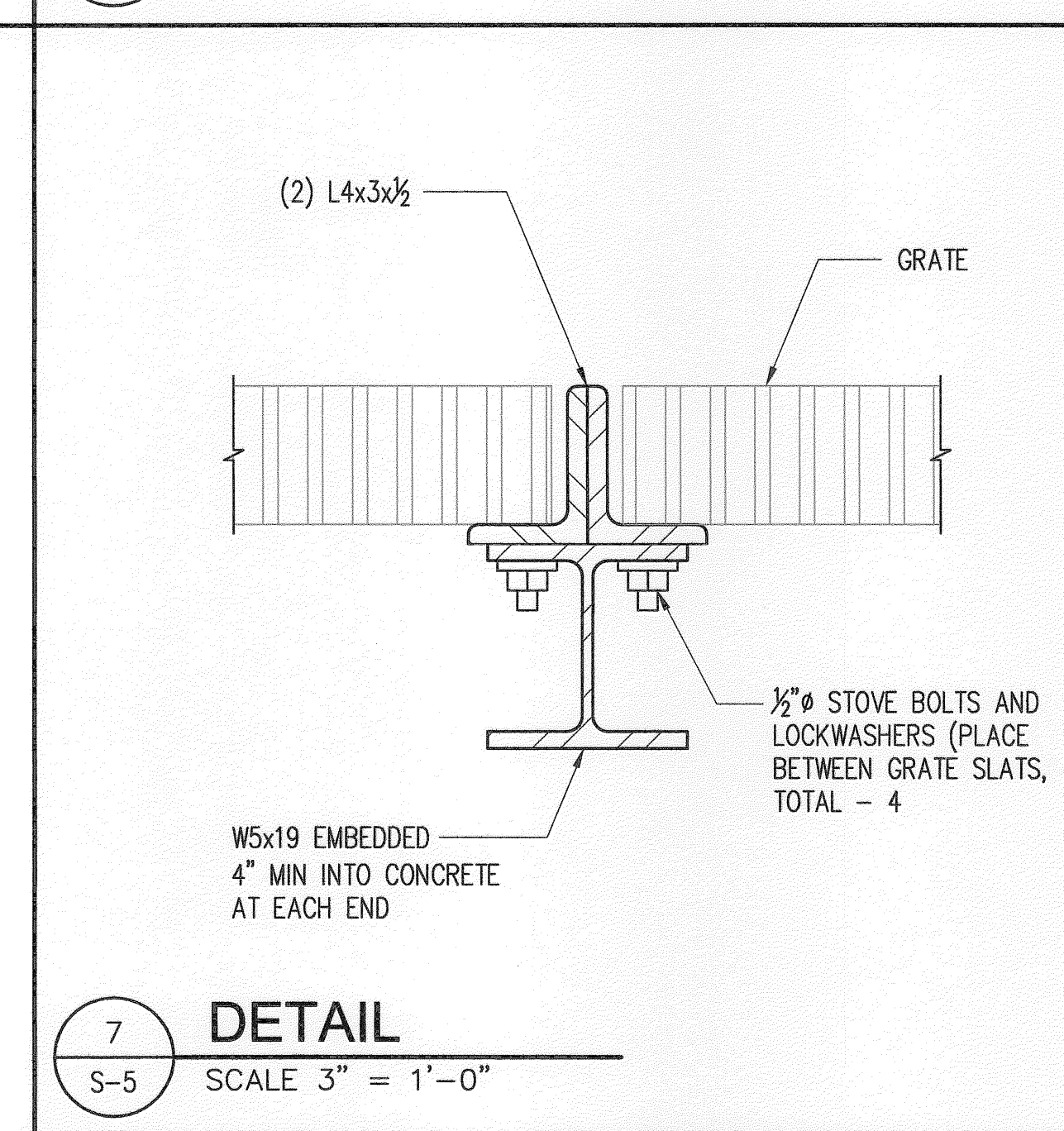
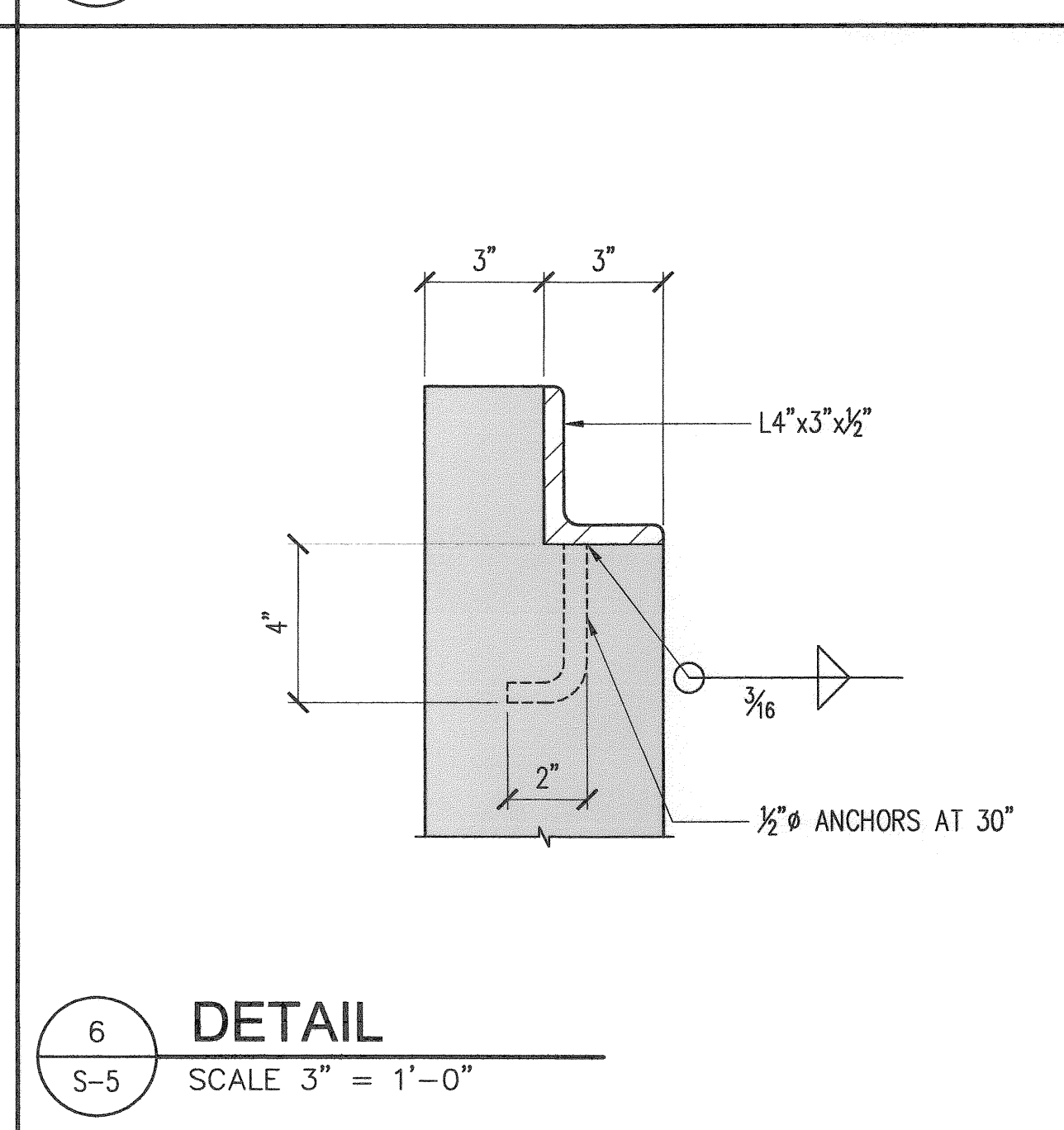


S-4 SCALE: 1/2" = 1'-0"

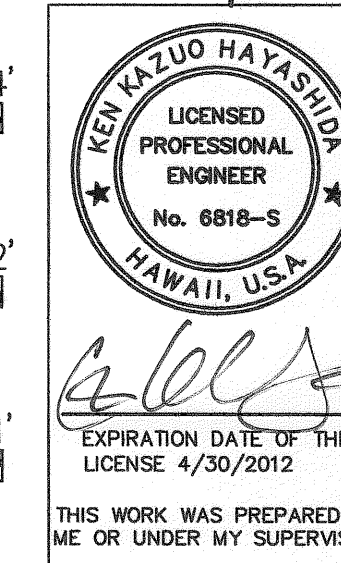
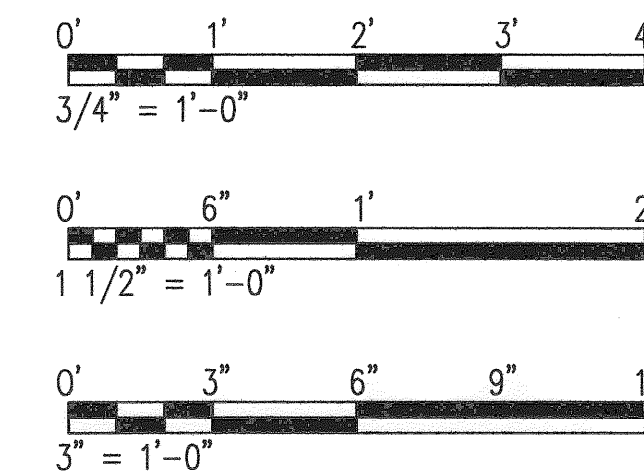
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
SPECIAL CATCH BASIN CB 01 PLAN AND SECTIONS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



-
- 5
S-5
- # SECTION
- SCALE 3" = 1'-0"



SOIL COVER "B"	REBAR SPACING "S"
$1'-6" \leq "B" < 2'-0"$	4"
$"B" \geq 2'-0"$	6"

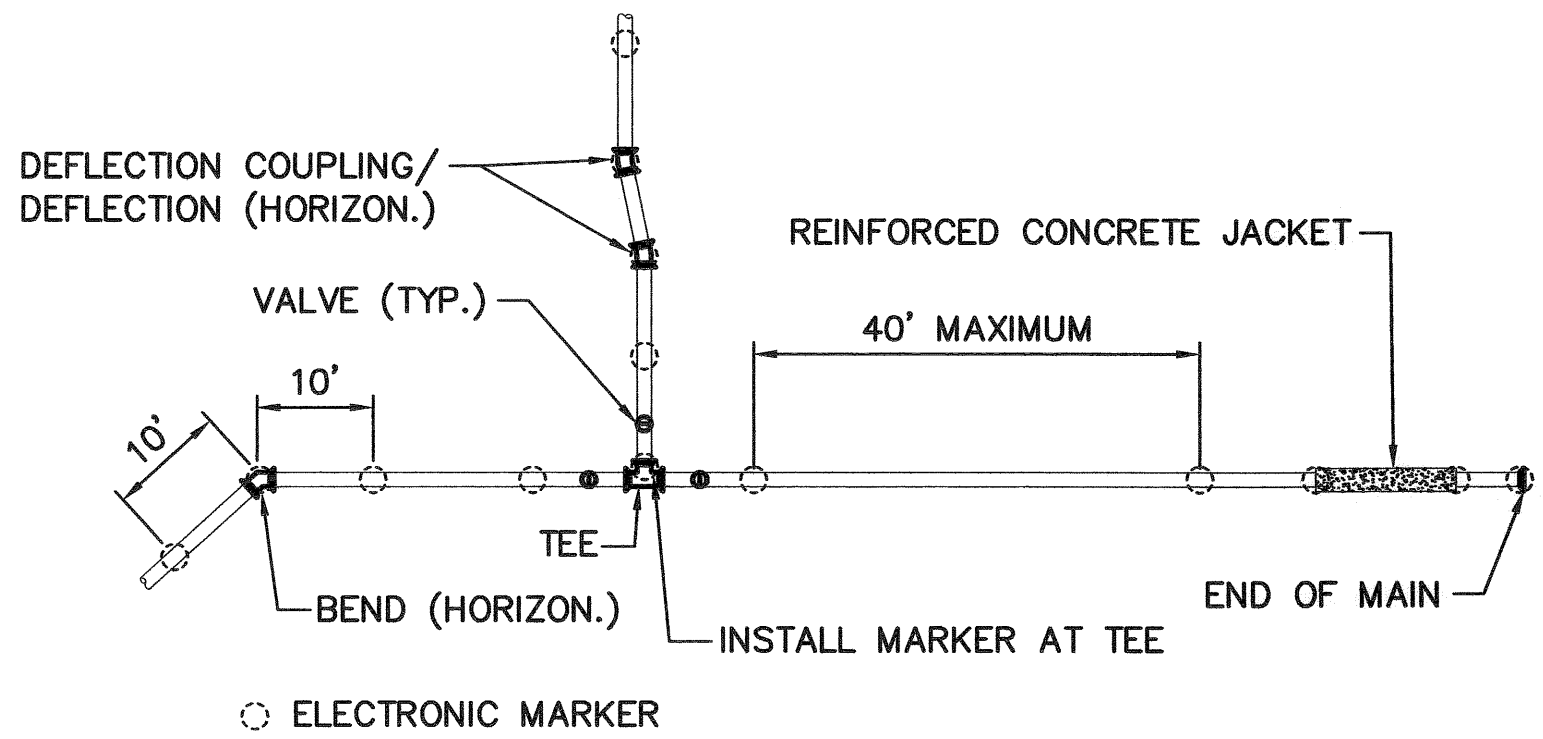
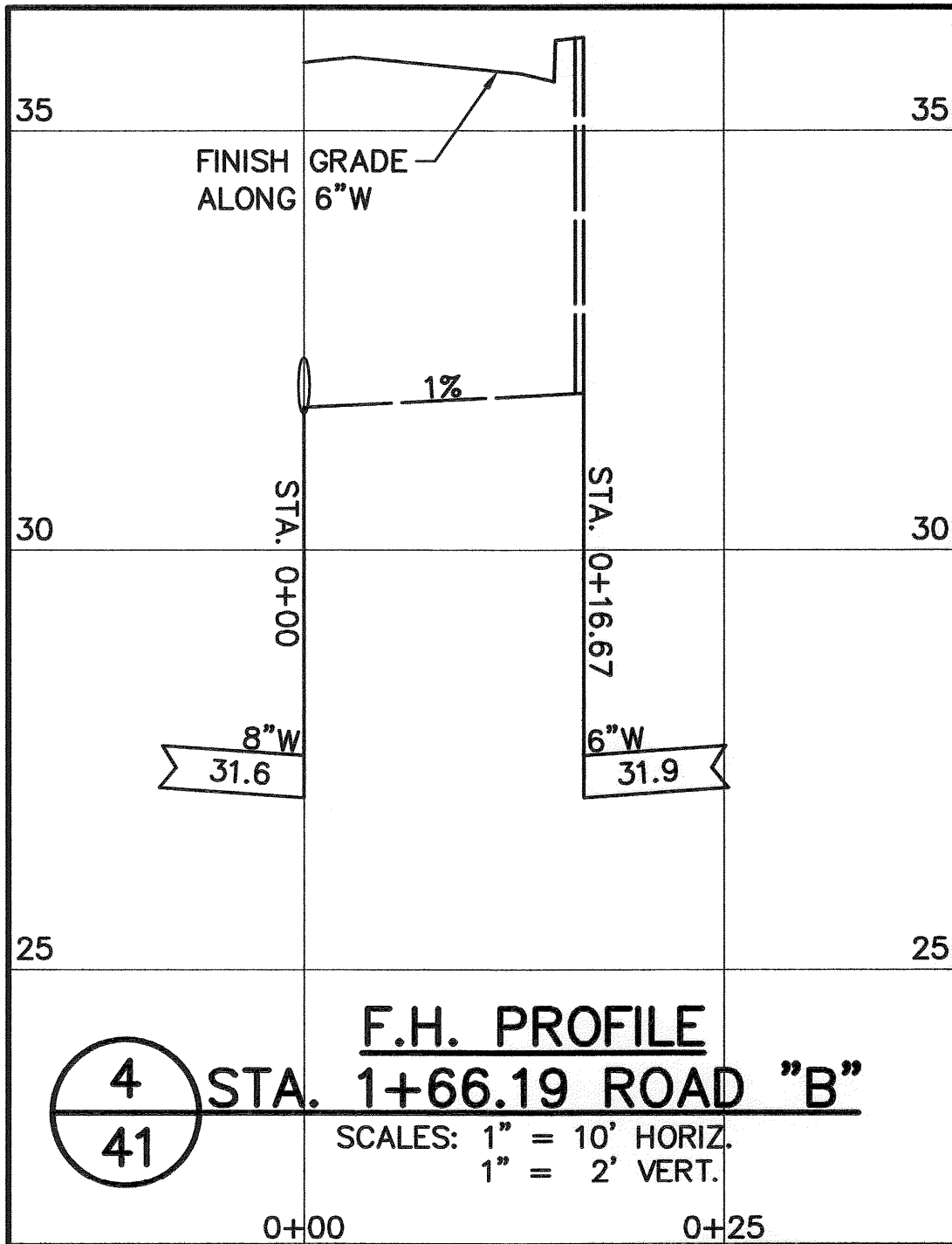
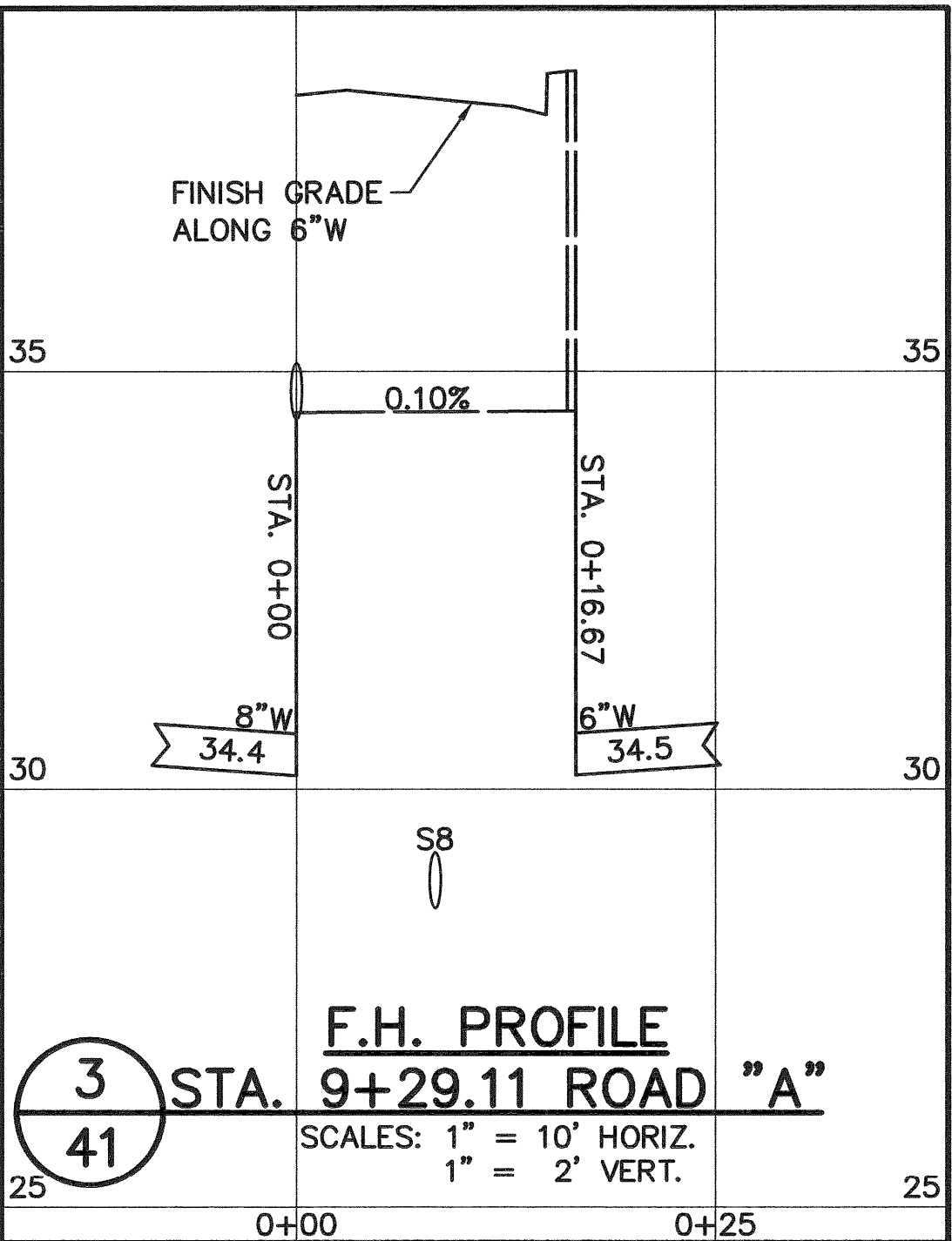
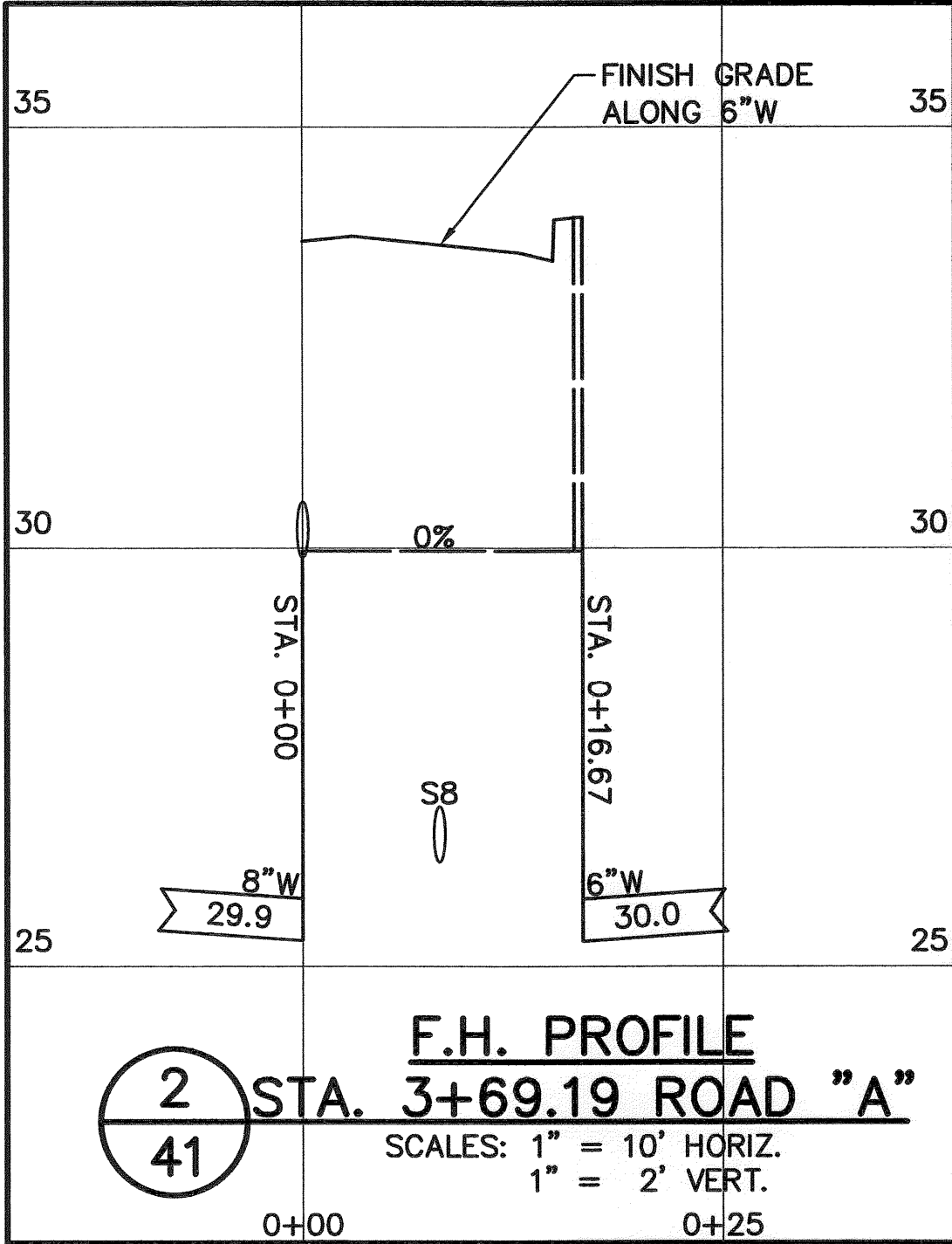
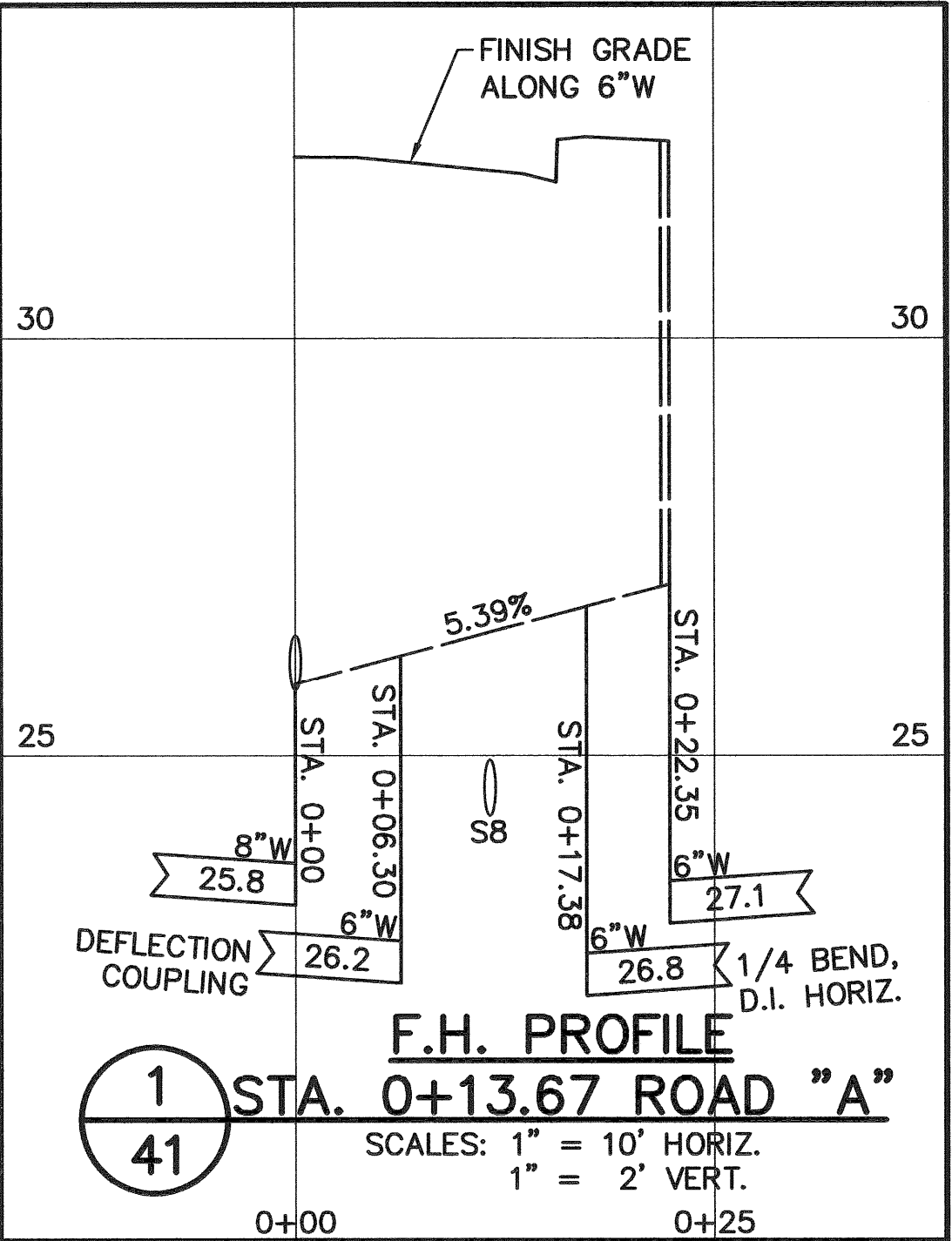


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p>KAKAINA SUBDIVISION</p> <p>TAX MAP KEY: 4-1-08: 10, 81, 91 & 92</p> <p>WAIMANALO, KOOLAUPOKO, OAHU, HAWAII</p> <p>SPECIAL GRATED INLET AND CONCRETE BOX CULVERT DETAILS</p>			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			DATE
<p>AKINAKA & ASSOCIATES, LTD.</p> <p>CONSULTING ENGINEERS</p>			

FILE	POCKET	FOLDER	NO.

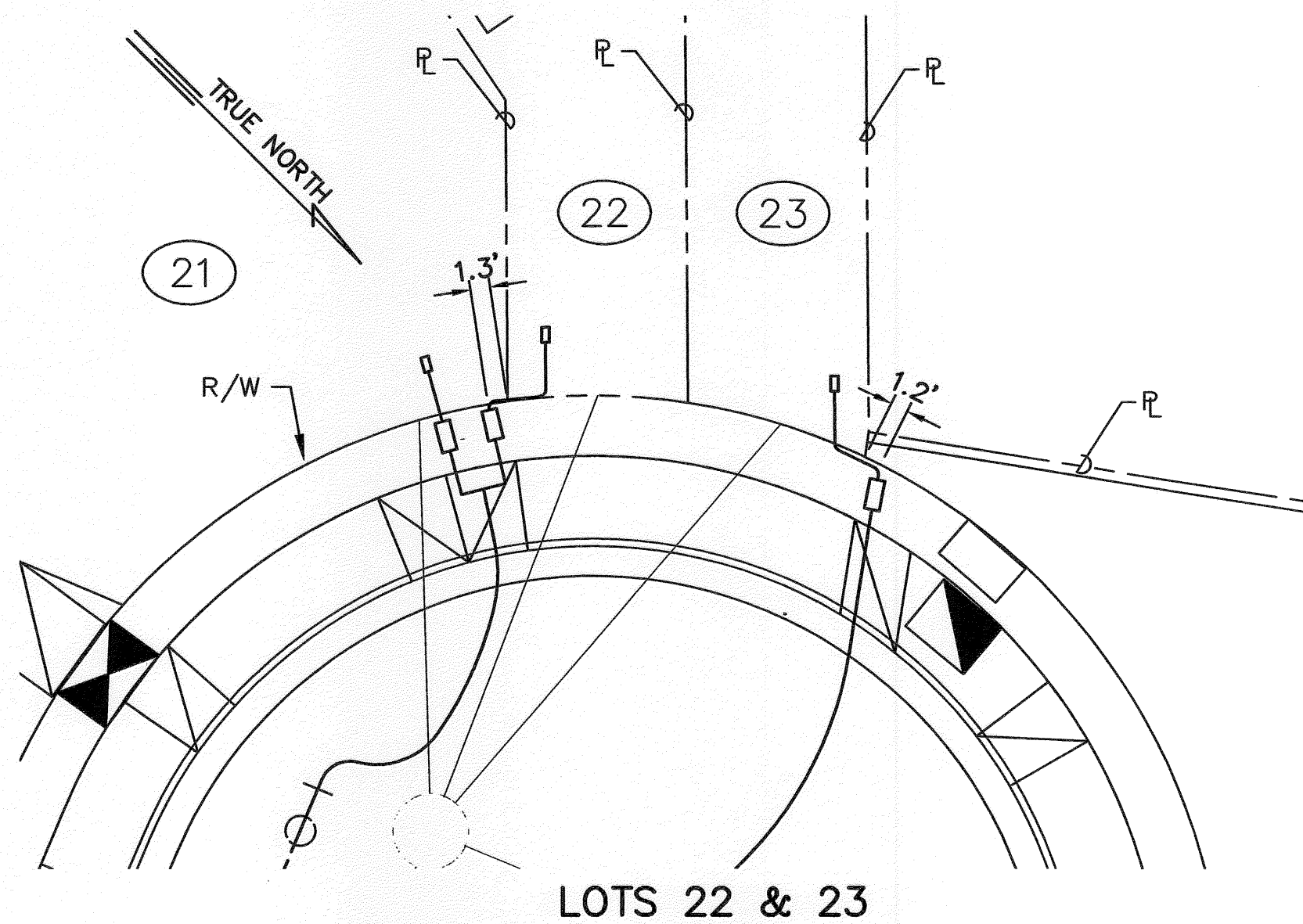
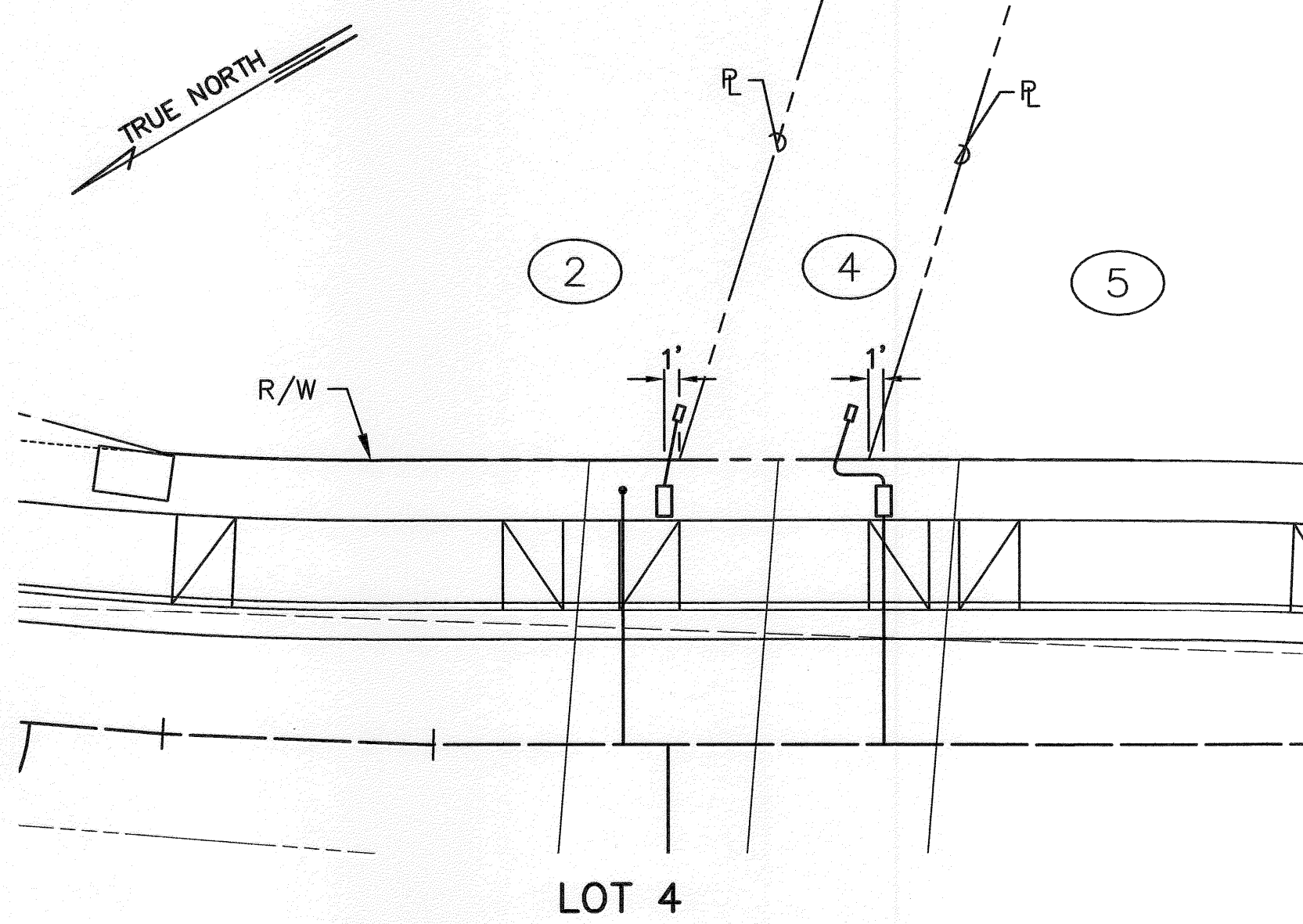
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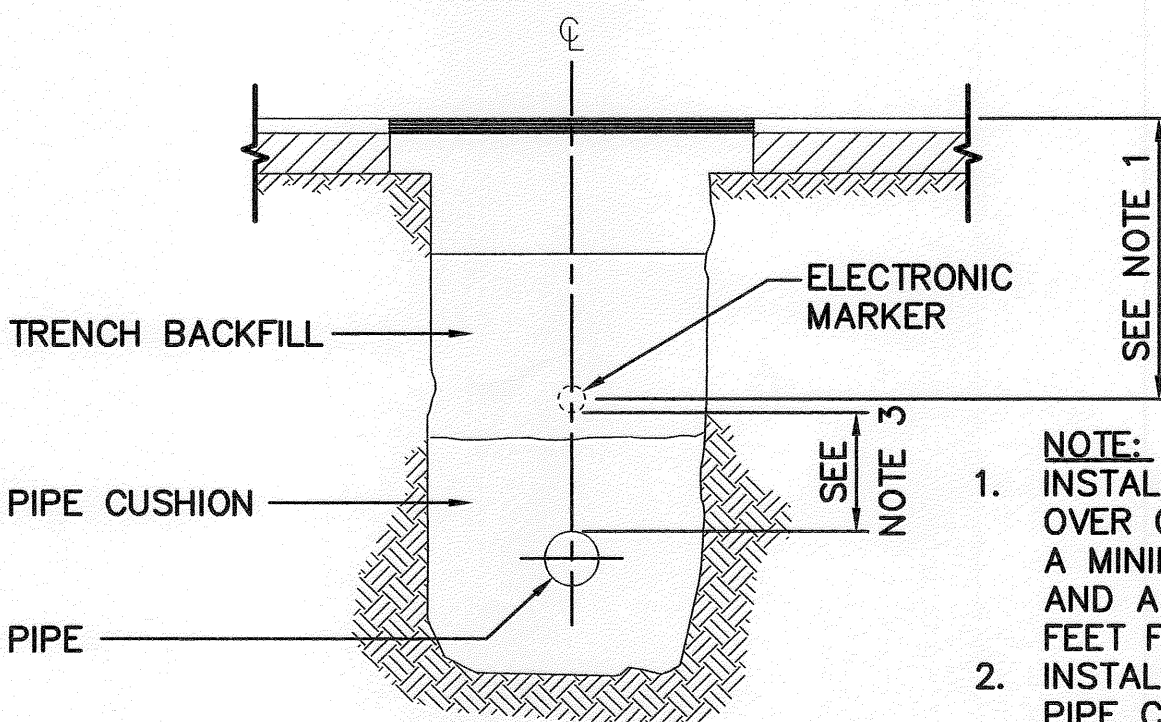
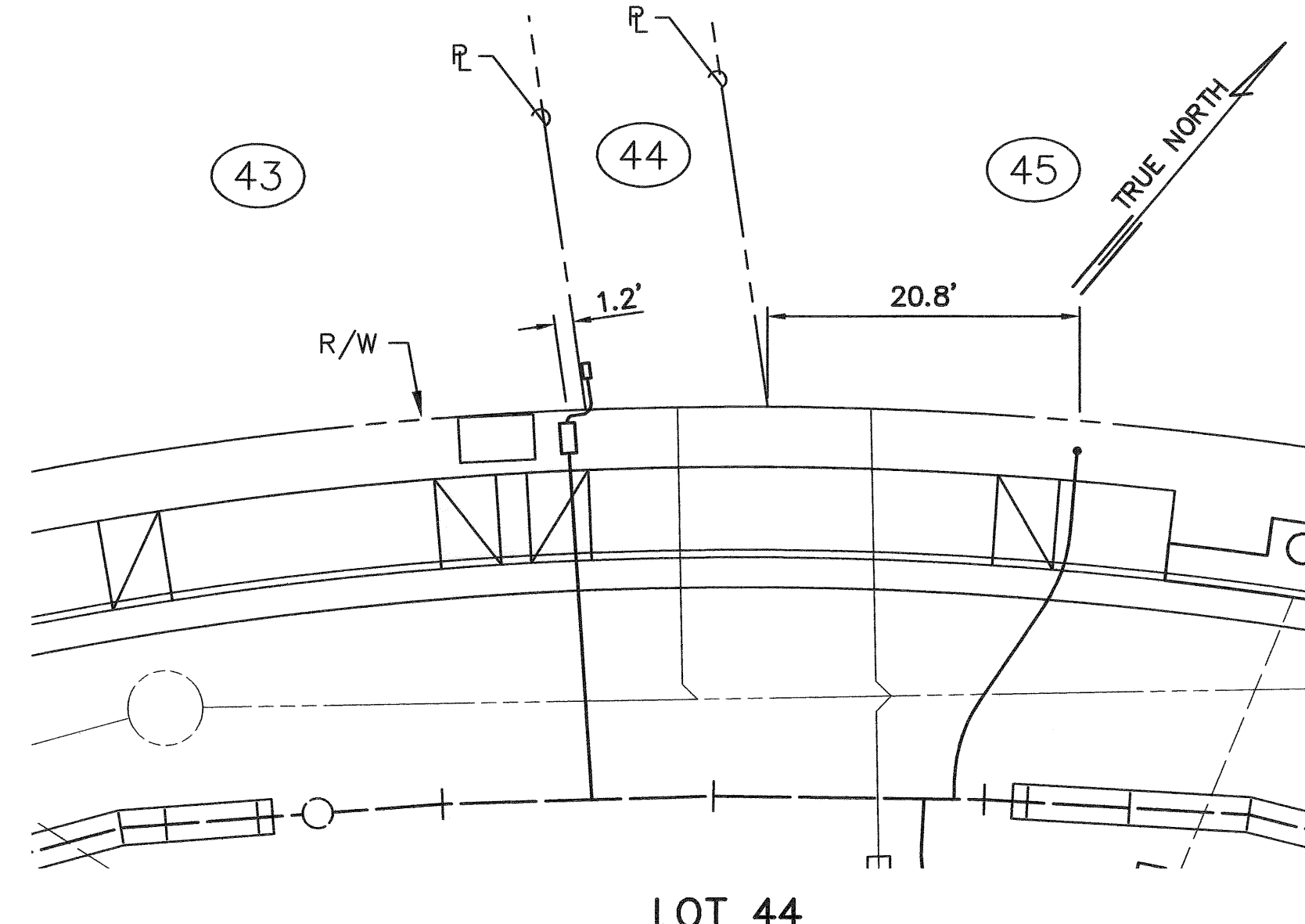
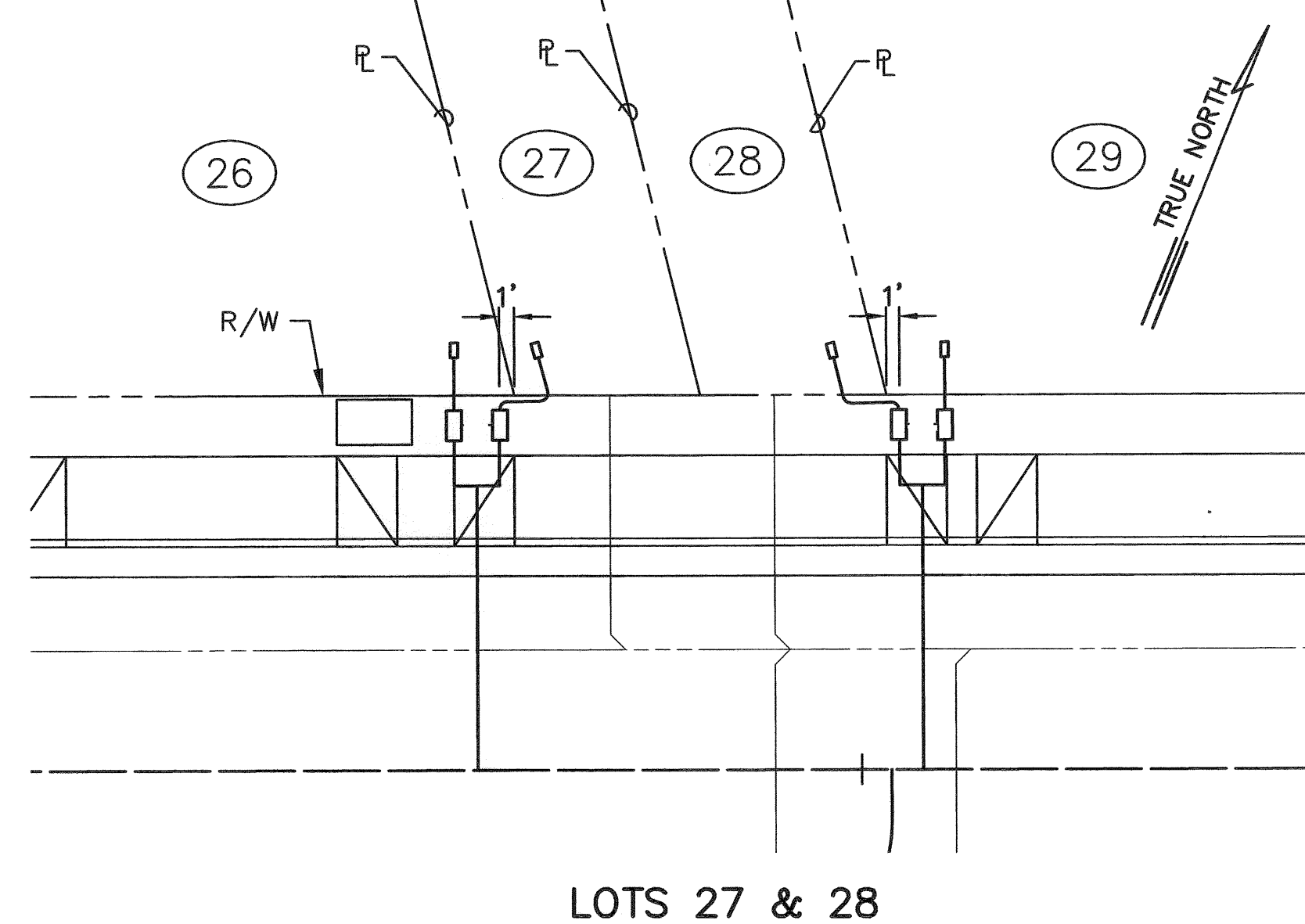


PLAN VIEW

6 TYPICAL ELECTRONIC MARKER INSTALLATION
41
NOT TO SCALE



NOTE:
PLEASE VERIFY THAT METER BOXES ARE
PLACED CLEAR OF DRIVEWAY ALIGNMENT

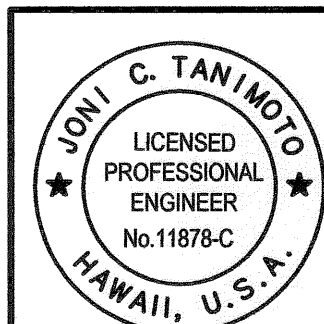


SECTION VIEW

- NOTE:
1. INSTALL ELECTRONIC MARKER OVER CENTER LINE OF PIPE AT A MINIMUM DEPTH OF 2 FEET AND A MAXIMUM DEPTH OF 3 FEET FROM FINISH GRADE.
2. INSTALL TRENCH BACKFILL AND PIPE CUSHION MATERIAL IN ACCORDANCE TO THE PLANS AND SPECIFICATIONS.
3. INSTALL ELECTRONIC MARKER AT A MINIMUM CLEARANCE OF 6-INCHES, WHERE POSSIBLE. INSTALL MARKERS ON OR ABOVE CONCRETE JACKETS.

10 0 10 20
SCALE: 1" = 10'

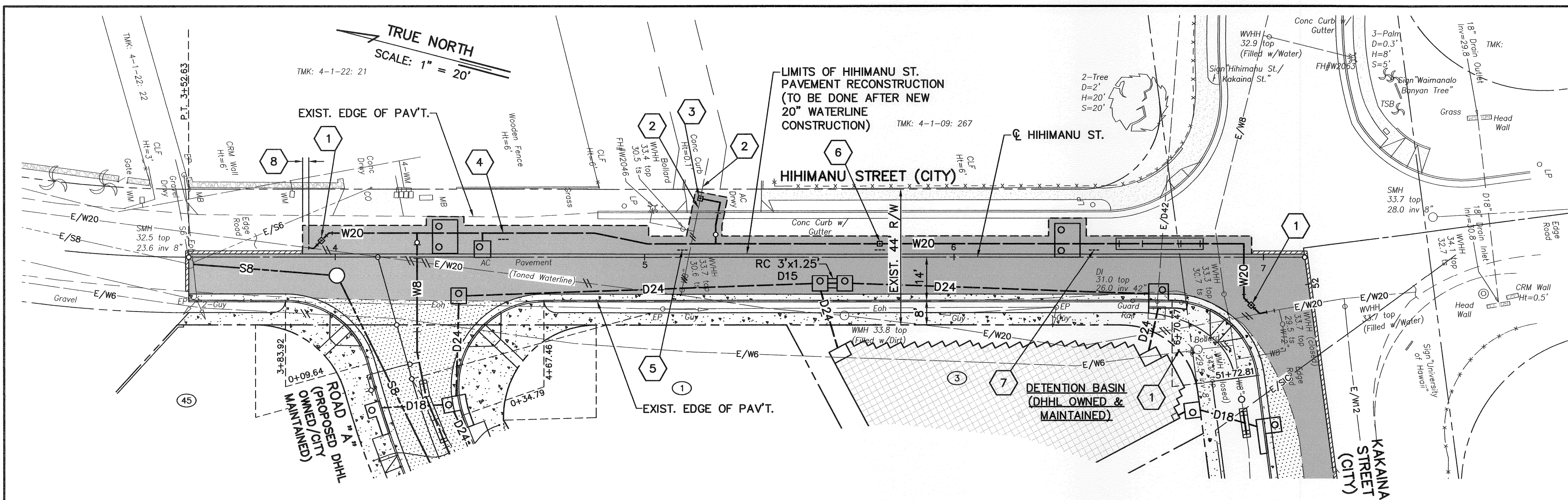
2 0 2 4
SCALE: 1/2" = 1'-0"



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LICENSE EXPIRES 4/30/12

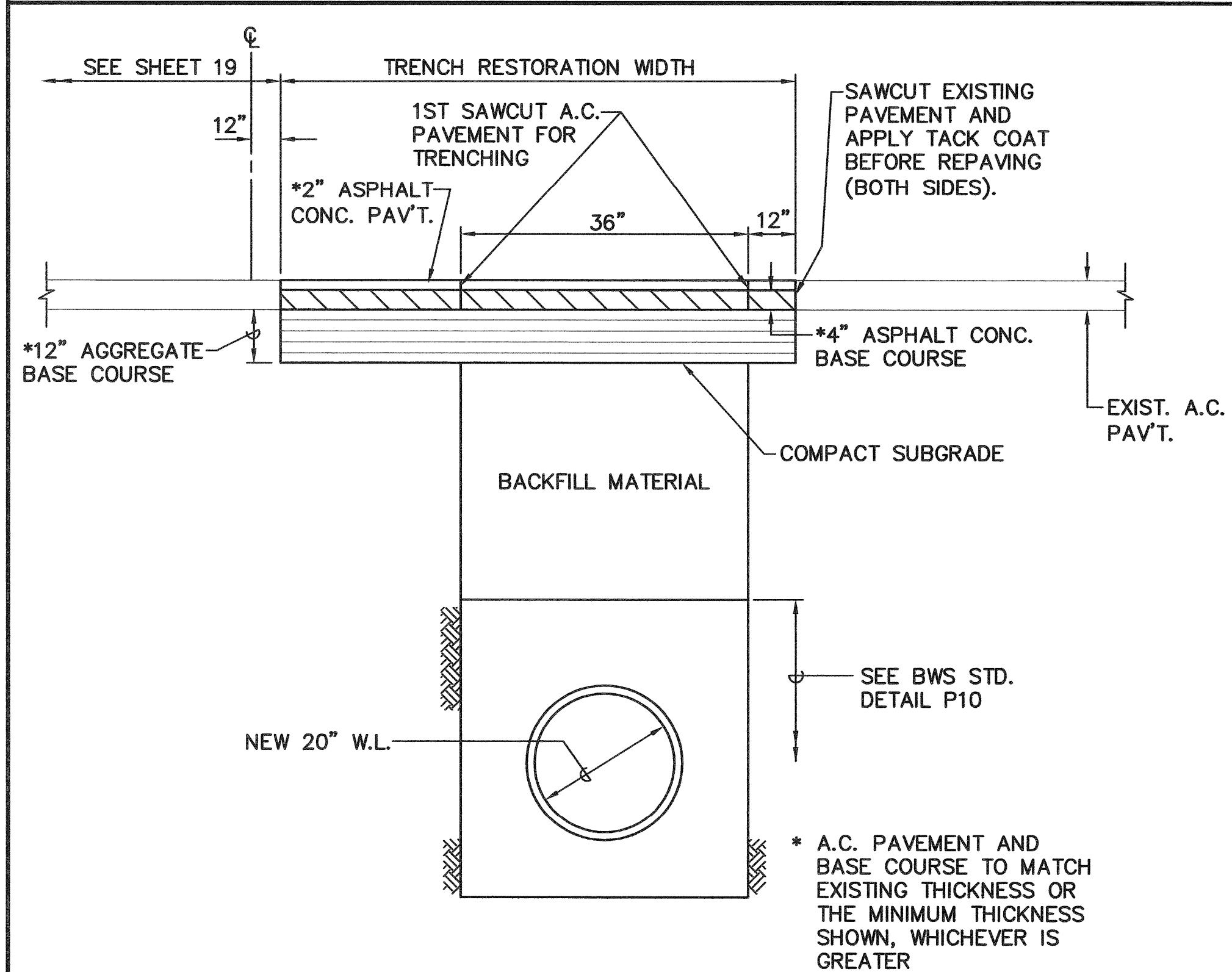
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
WATER DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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NEW 20" WATERLINE EXTERNAL CORROSION PROTECTION NOTES

- UNLESS OTHERWISE SPECIFIED, ALL EXTERNAL CORROSION MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CITY & COUNTY OF HONOLULU BOARD OF WATER SUPPLY'S "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", VOLUME 3, DATED 1991, AND ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
- DUCTILE IRON PIPES SHALL BE CLASS 52. ALL DUCTILE PIPES, FITTINGS AND VALVES SHALL BE BONDED COATING, WITH AN EXTERNAL CORROSION CONTROL SYSTEM APPLIED.
- TO FORM AN ELECTRICALLY CONTINUOUS PIPELINE AND ASSOCIATED VALVES AND FITTINGS, THE JOINTS OF ALL BURIED METALLIC PIPE, INCLUDING VAULT AND MANHOLE PIPE AND ALL FITTINGS SHALL BE ELECTRICALLY BONDED, EXCEPT JOINTS SPECIFIED TO BE THREADED, WELDED OR INSULATED.
- INSULATED JOINTS SHALL BE INSTALLED TO ELECTRICALLY ISOLATE THE PIPELINE FROM OTHER STRUCTURES.
- PROVIDE A CATHODIC PROTECTION SYSTEM PER THE CONSTRUCTION PLANS AND THE "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", DATED 1991.
- PROVIDE HIGH RESISTANCE CUSHION MATERIAL. SEE WATER NOTES, SHEET 5.



NOTES:

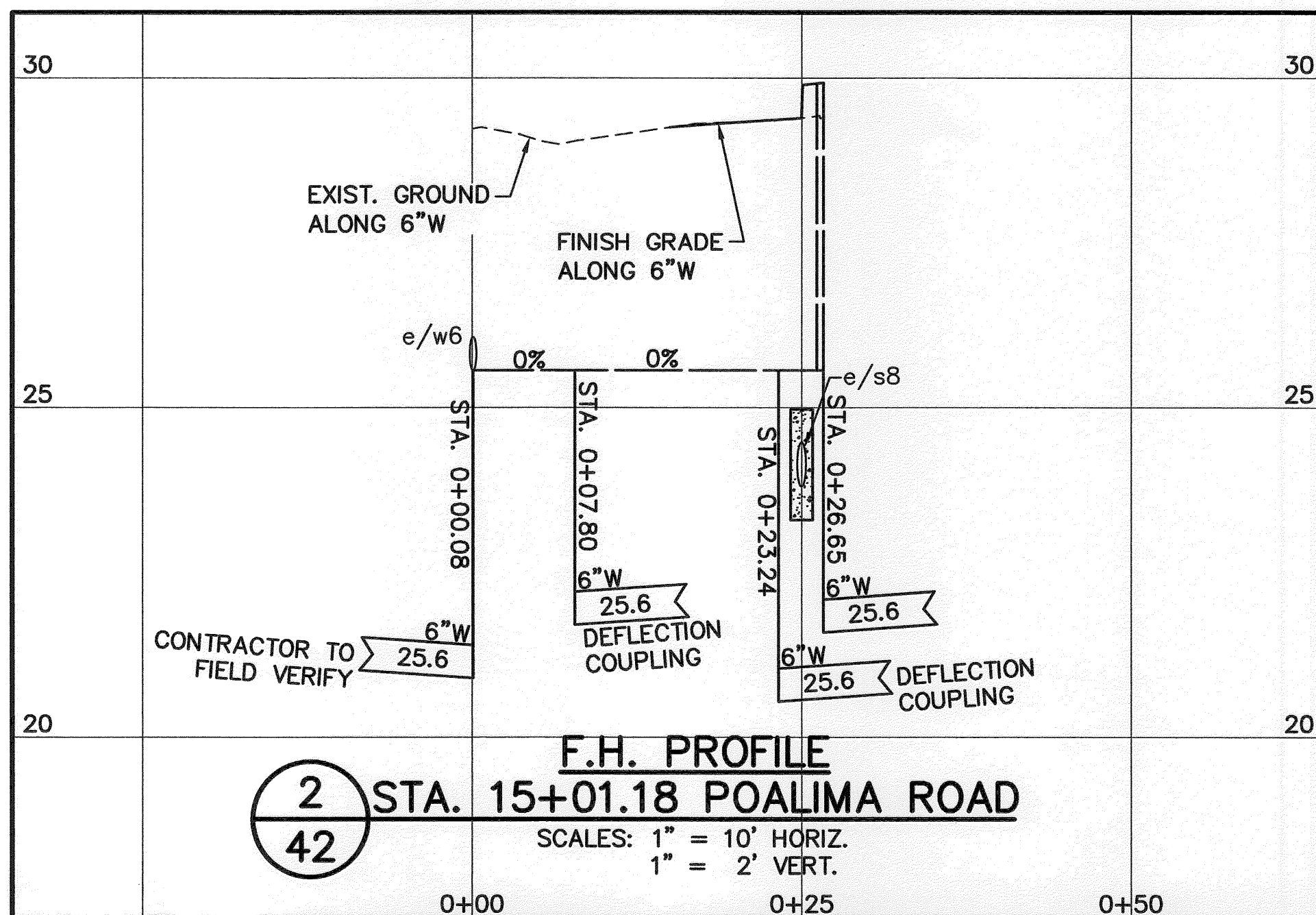
- PAVEMENT STRUCTURE SHALL BE EQUAL TO OR BETTER THAN EXISTING IN THICKNESS AND QUALITY.
- ALL DISTURBED PAVEMENT MARKINGS SHALL BE REPLACED AND ALL REQUIRED UTILITY ADJUSTMENTS SUCH AS MANHOLE COVERS ETC. SHALL BE DONE BY THE PERMITTEE.
- PERMITTEE SHALL COORDINATE WORK WITH ALL OTHER UTILITY ENTITIES AND DEPT. OF FACILITY MAINTENANCE.

1 TRENCH REPAVEMENT SECTION
42 FOR NEW 20" WATERLINE
NOT TO SCALE

- INSTALL FLUSH MOUNTED TEST STATION TYPE "I" PER BWS STD. CORROSION CONTROL DETAIL 9
1 - 20" INSULATED COUPLING FOR ELECTRICAL ISOLATION
SEE W.L. CONN. NOTES, SHEET 23
- 8" PVC PIPE FOR ELECTRICAL ISOLATION
SEE W.L. CONN. NOTES, SHEET 23
- INSTALL FLUSH MOUNTED TEST STATION TYPE "I" PER BWS STD. CORROSION CONTROL DETAIL 9

PLAN - HIIMANU STREET

SCALE: 1" = 20'



2 F.H. PROFILE
42 STA. 15+01.18 POALIMA ROAD
SCALES: 1" = 10' HORIZ.
1" = 2' VERT.

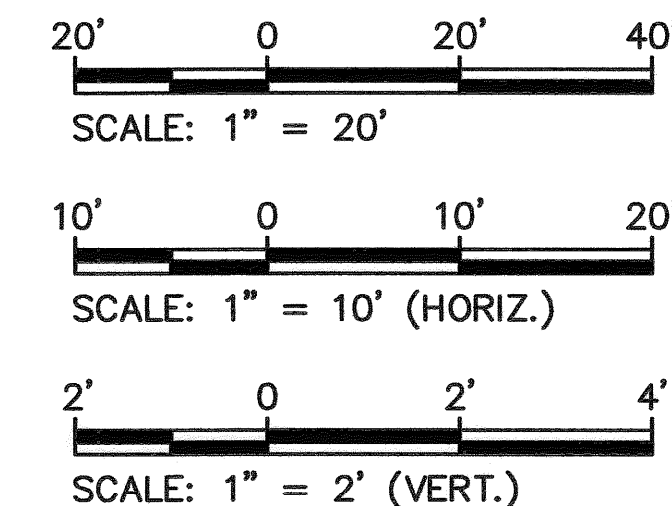
- STA. 4+54.36 @ HIIMANU ST. INSTALL GALVANIC ANODE PER BWS STD. CORROSION CONTROL ANODE = 18 LBS ZINC ANODE (1.4"x1.4"x36")
- STA. 5+12.19 @ HIIMANU ST. INSTALL GALVANIC ANODE PER BWS STD. CORROSION CONTROL ANODE = 18 LBS ZINC ANODE (1.4"x1.4"x36")

- STA. 5+76.02 @ HIIMANU ST. INSTALL FLUSH MOUNTED TEST STATION TYPE "T" WITH ANODE OVER NEW 20" WATERLINE PER BWS STD. CORROSION CONTROL DETAIL 8
ANODE = 18 LBS ZINC ANODE (1.4"x1.4"x36")
- STA. 6+45.21 @ HIIMANU ST. INSTALL GALVANIC ANODE PER BWS STD. CORROSION CONTROL DETAIL 13
ANODE = 18 LBS ZINC ANODE (1.4"x1.4"x36")
- EXTEND A.C. PAVEMENT FOR TRENCH RESTORATION 2' BEYOND EDGE OF TRENCH

LEGEND

A.C. REPAVEMENT
SEE TYPICAL SECTION, SHT. 19
SEE TRENCH REPAVEMENT DETAIL 1
42

NEW A.C. PAVEMENT
NEW CONC. SIDEWALK, CURB & GUTTER



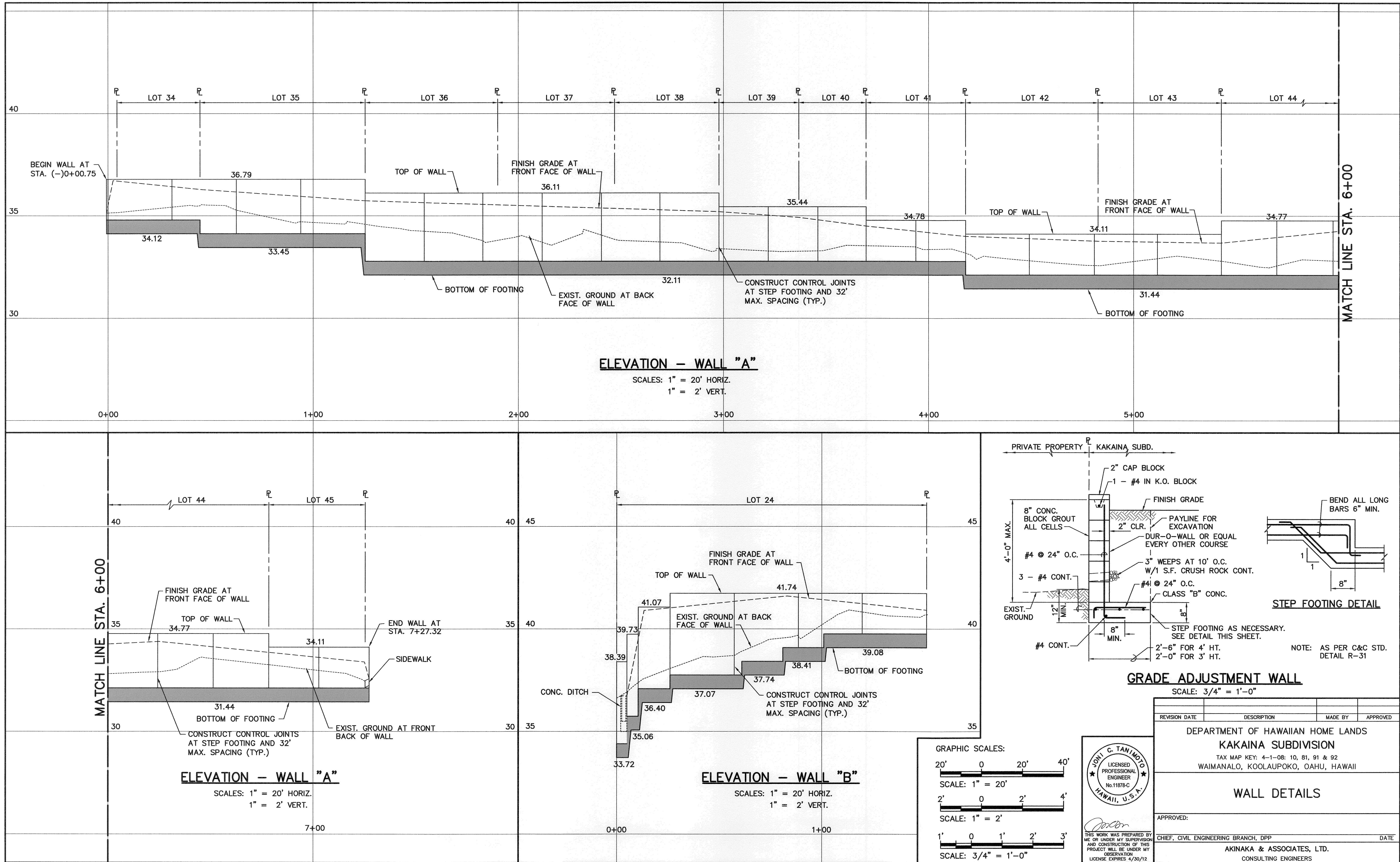
APPROVED:

CHIEF, TRAFFIC REVIEW BRANCH, DPP

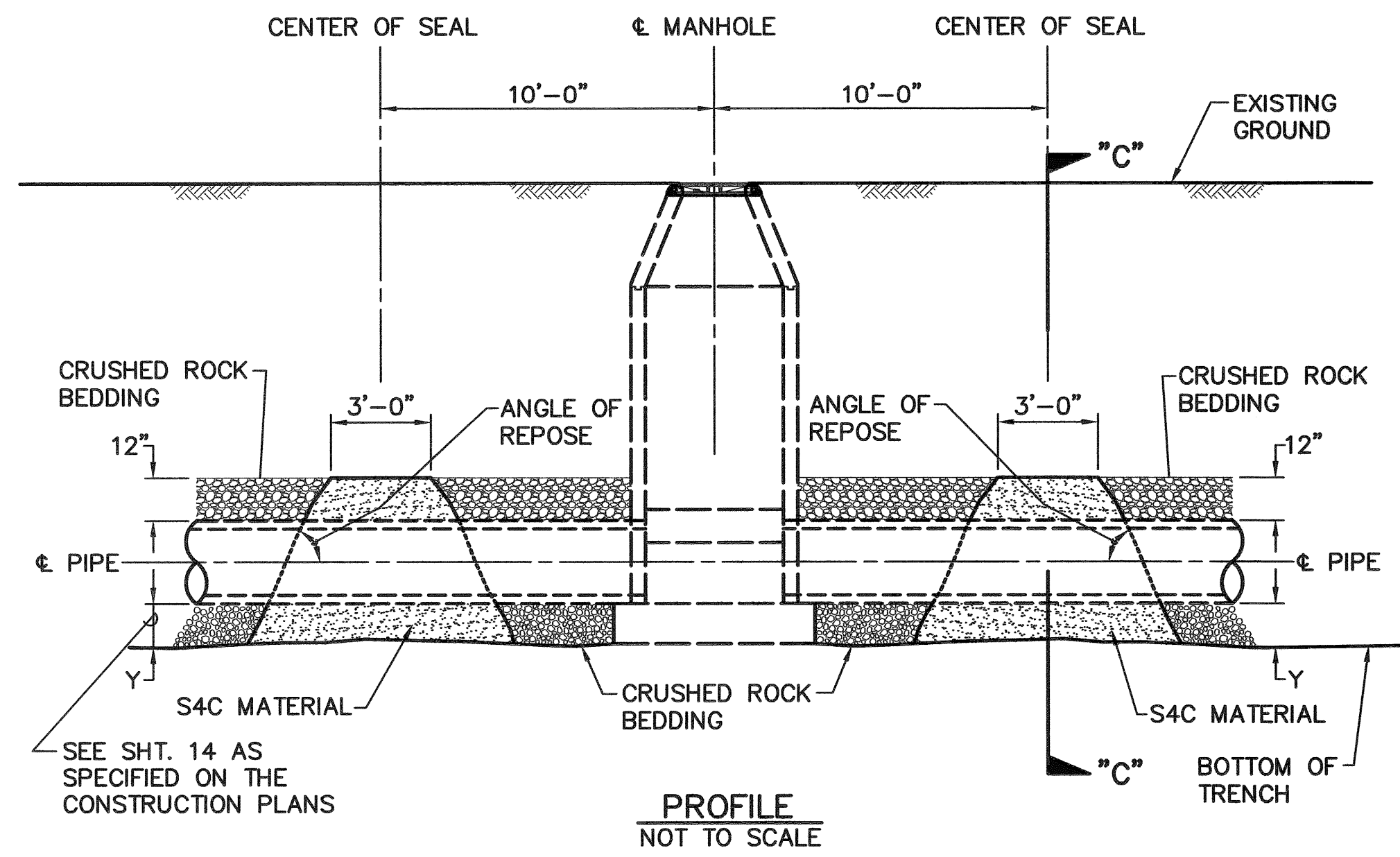
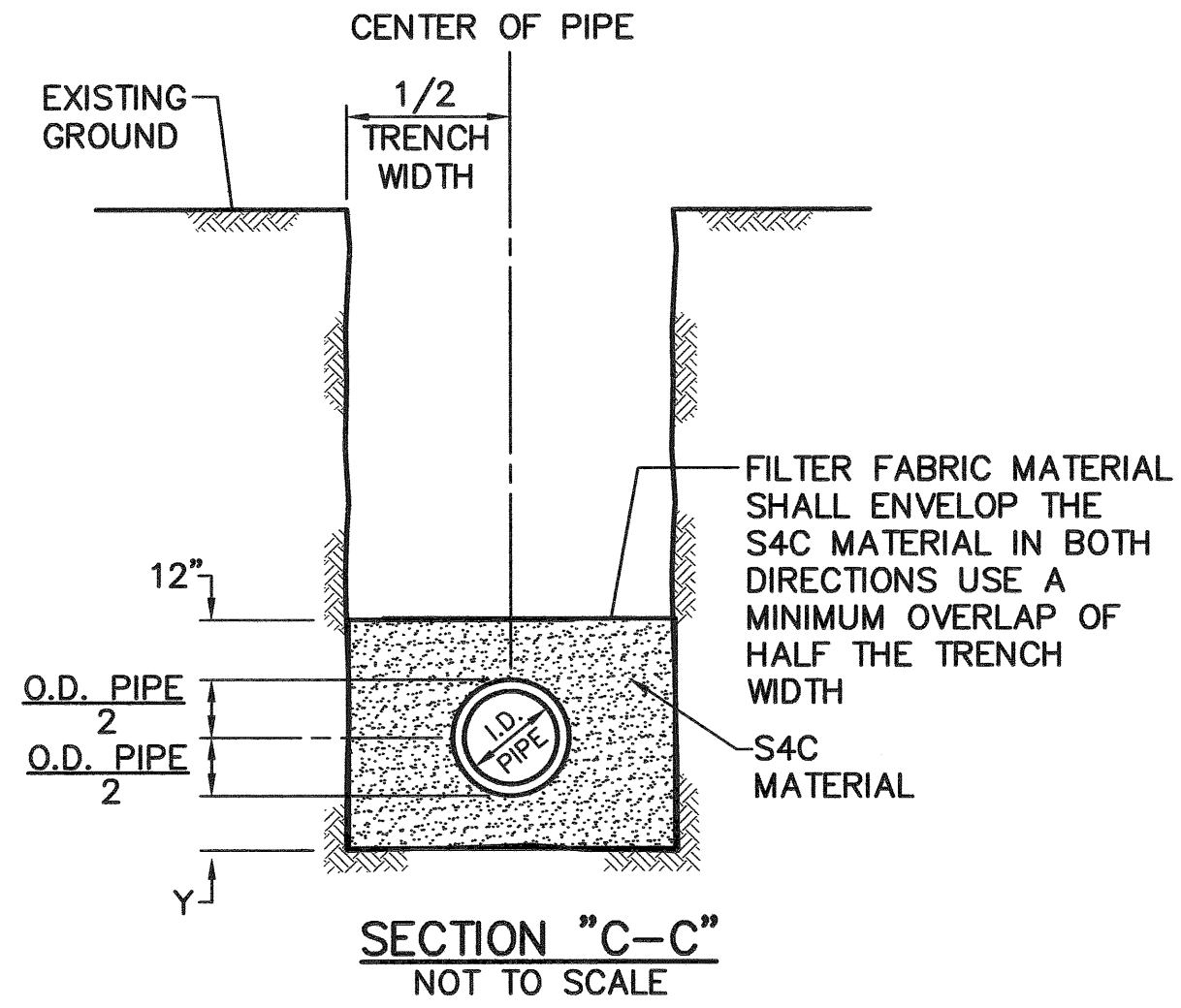
MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN CITY/STATE R/W AND BWS EASEMENTS ONLY)

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII WATER DETAILS 20" WATERLINE EXTERNAL CORROSION PROTECTION & TRENCH REPAVEMENT			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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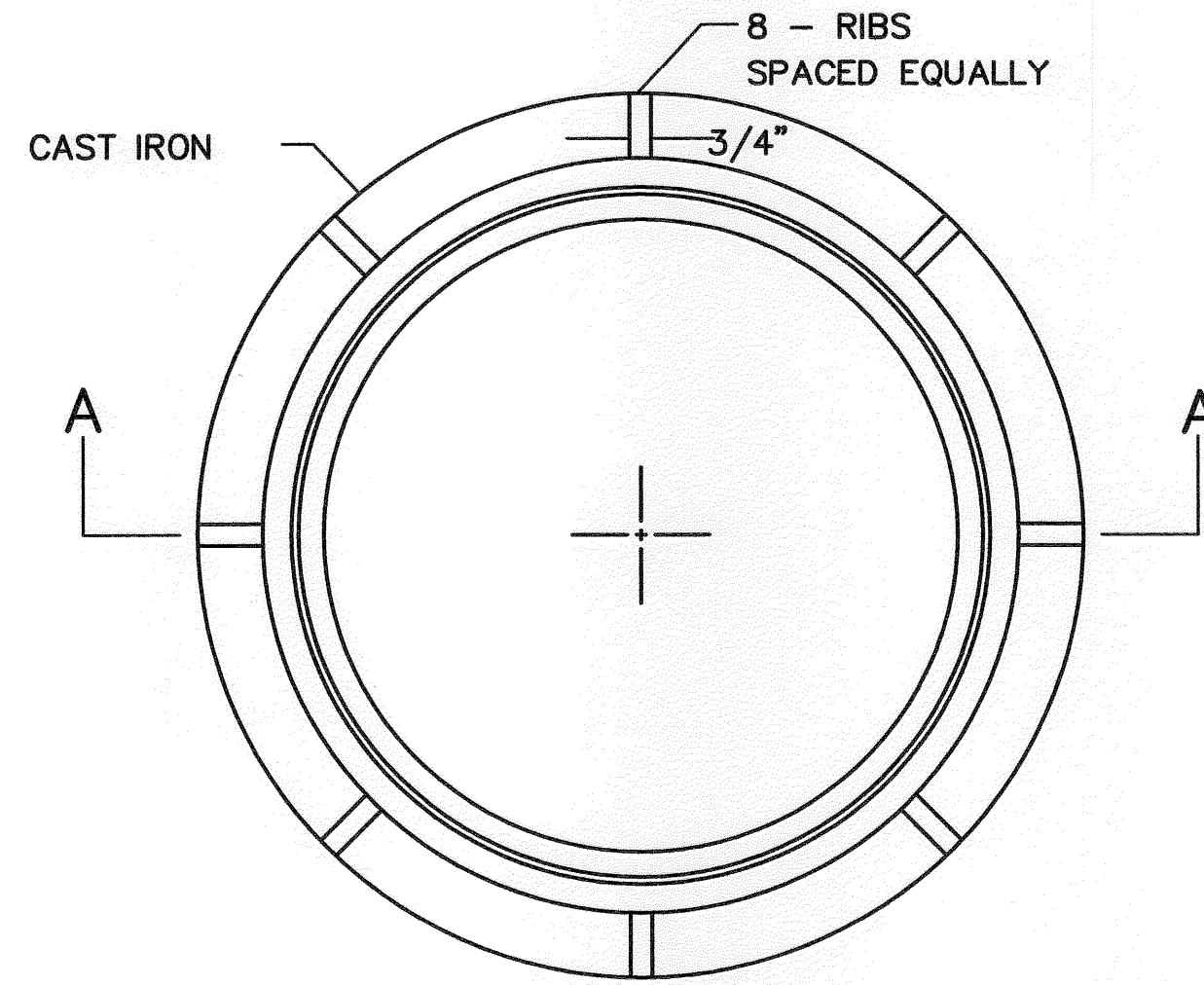


- NOTES:

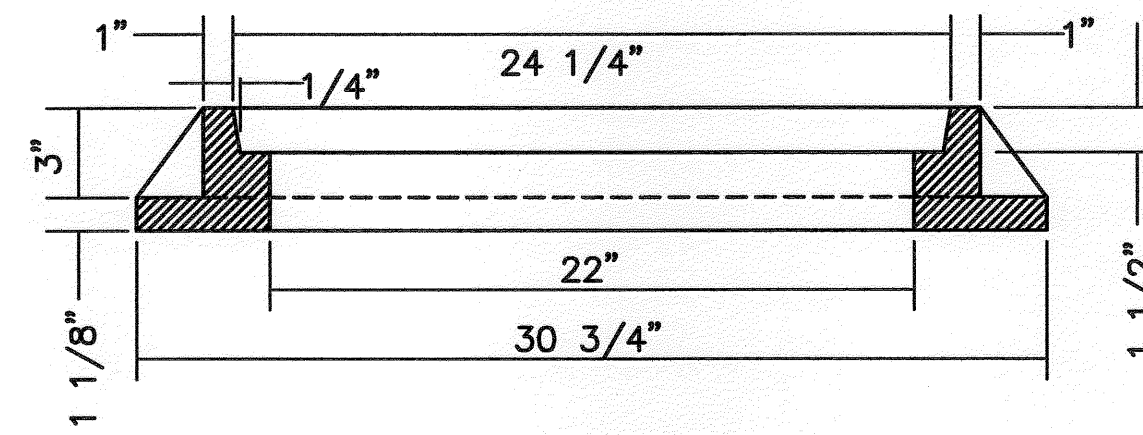
1. SEALS SHALL BE PLACED 10 FT. UPSTREAM AND DOWNSTREAM FROM EACH MANHOLE.
2. THE CONTRACTOR SHALL COMPACT S4C MATERIAL BY PONDING AND DRAINING, A VIBRATORY MACHINE SHALL BE USED UNTIL NO VISIBLE EVIDENCE OF FURTHER CONSOLIDATION EXISTS.
3. SEALS SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO CRUSHED ROCK CRADLE.

SEAL DETAILS FOR TRENCHED SEWER LINES

SCALES AS SHOWN



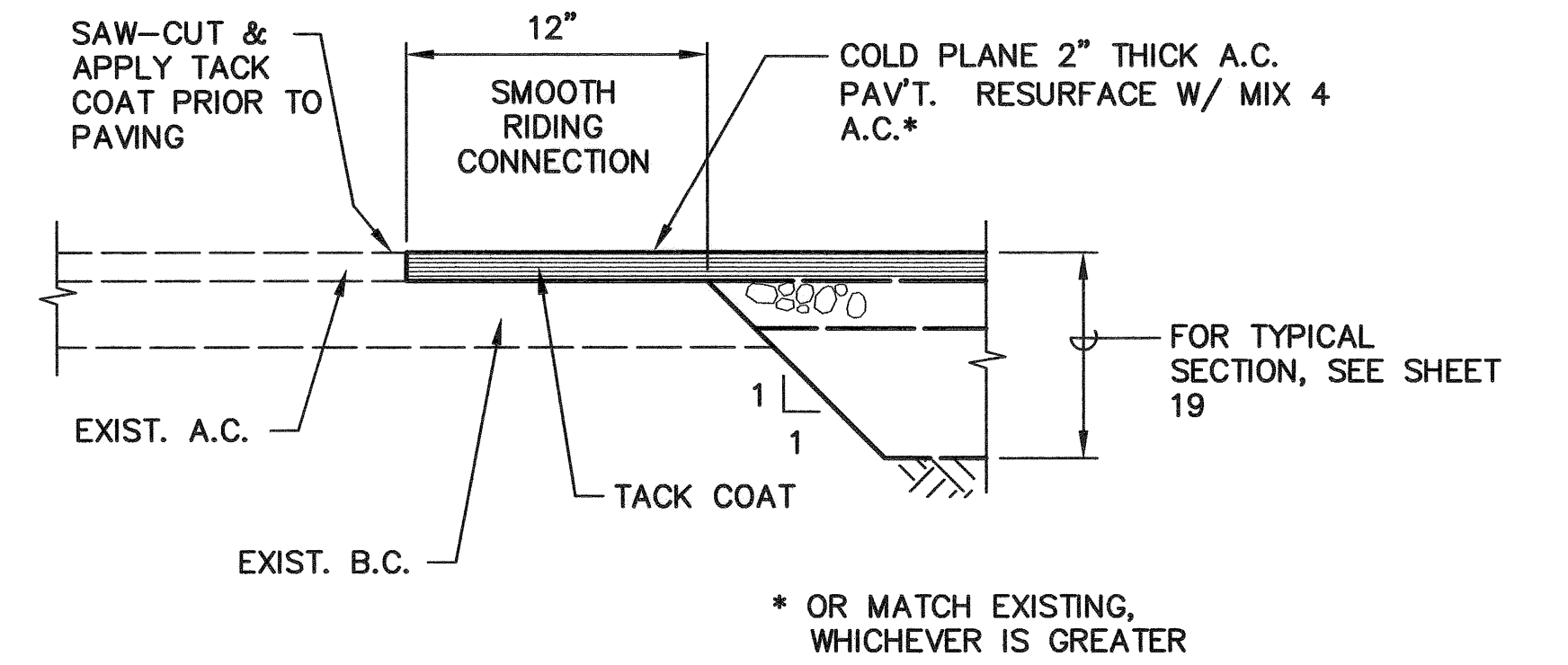
PLAN OF MANHOLE FRAME



SECTION A-A

MH FRAME TYPE SA

NOT TO SCALE



SMOOTH RIDING CONNECTION DETAIL

NOT TO SCALE

APPROVED:

CHIEF, WASTEWATER BRANCH, DPP DATE
 (FOR CONFORMANCE WITH CITY STANDARDS
 AND WORK IN CITY R/W ONLY)

MANAGER AND CHIEF ENGINEER, BWS
(FOR WORK AFFECTING BWS FACILITIES IN
CITY/STATE R/W AND BWS EASEMENTS ONLY)
CITY & COUNTY OF HONOLULU

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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DEPARTMENT OF HAWAIIAN HOME LANDS

KAKAINA SUBDIVISION

WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

MISCELLANEOUS DETAILS


APPROVED:

CHIEF, CIVIL ENGINEERING BRANCH, DPP	DATE
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AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

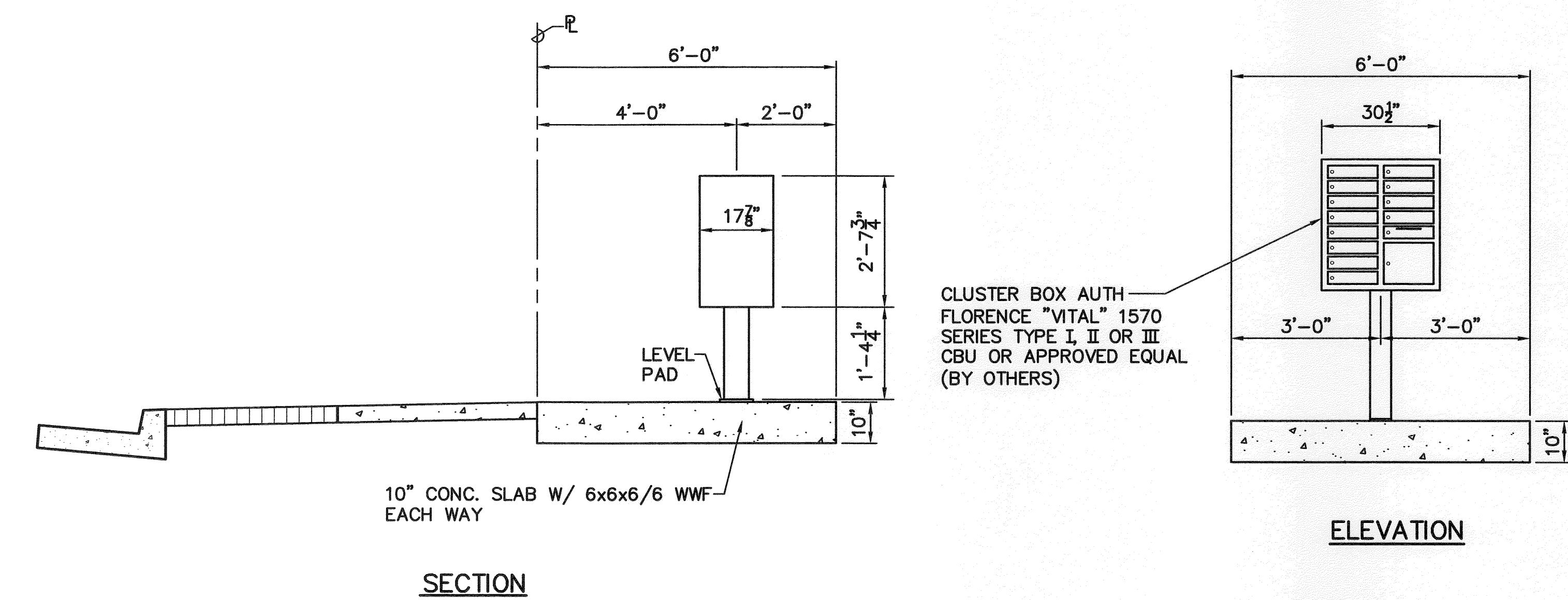
FILE	POCKET	FOLDER	NO.



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LICENSE EXPIRES 4/30/15

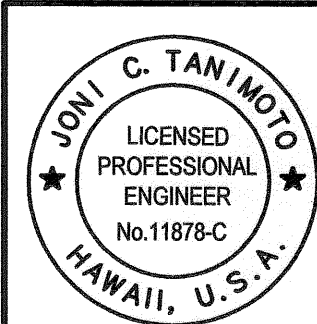
NOTES:

1. CLUSTER BOX UNITS (CBU) AND PEDESTALS SHALL BE BY AUTH-FLORENCE MANUFACTURING OR EQUAL.
2. FINISH SHALL BE ANODIZED ALUMINUM.
3. CONTRACTOR SHALL SUBMIT CATALOG DATA FOR POSTAL PRODUCTS PROVIDED FOR REVIEW AND APPROVAL.
4. CONTRACTOR SHALL COORDINATE SIZE OF LEVEL PAD FOR PEDESTALS AS PER MANUFACTURER'S REQUIREMENTS.
5. LOCKS AND OPERATING HARDWARE SHALL BE ADA COMPLIANT.
6. SEE SHEET 7 FOR MAIL BOX LOCATIONS.



1 MAIL BOX DETAILS
45 NOT TO SCALE

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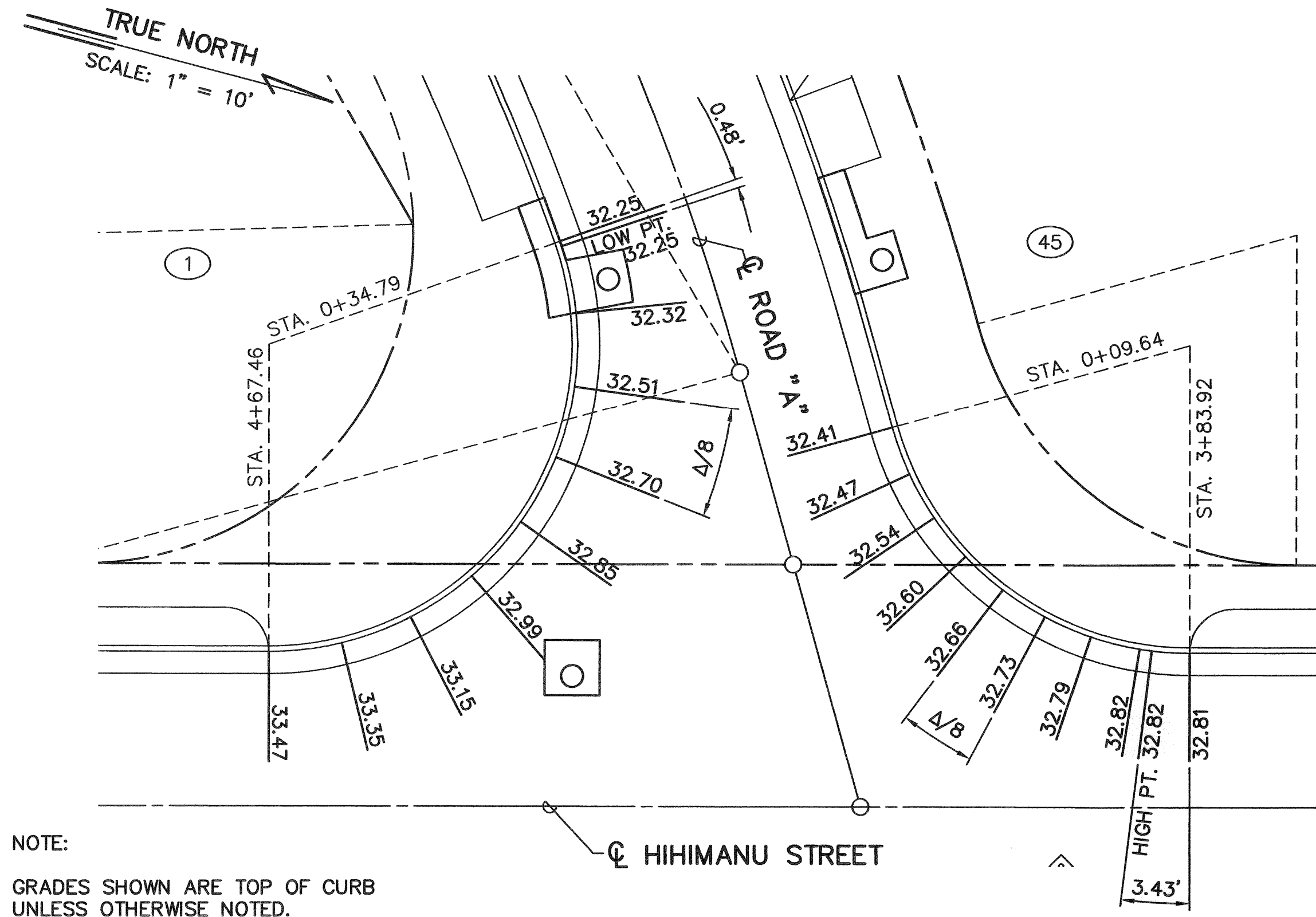


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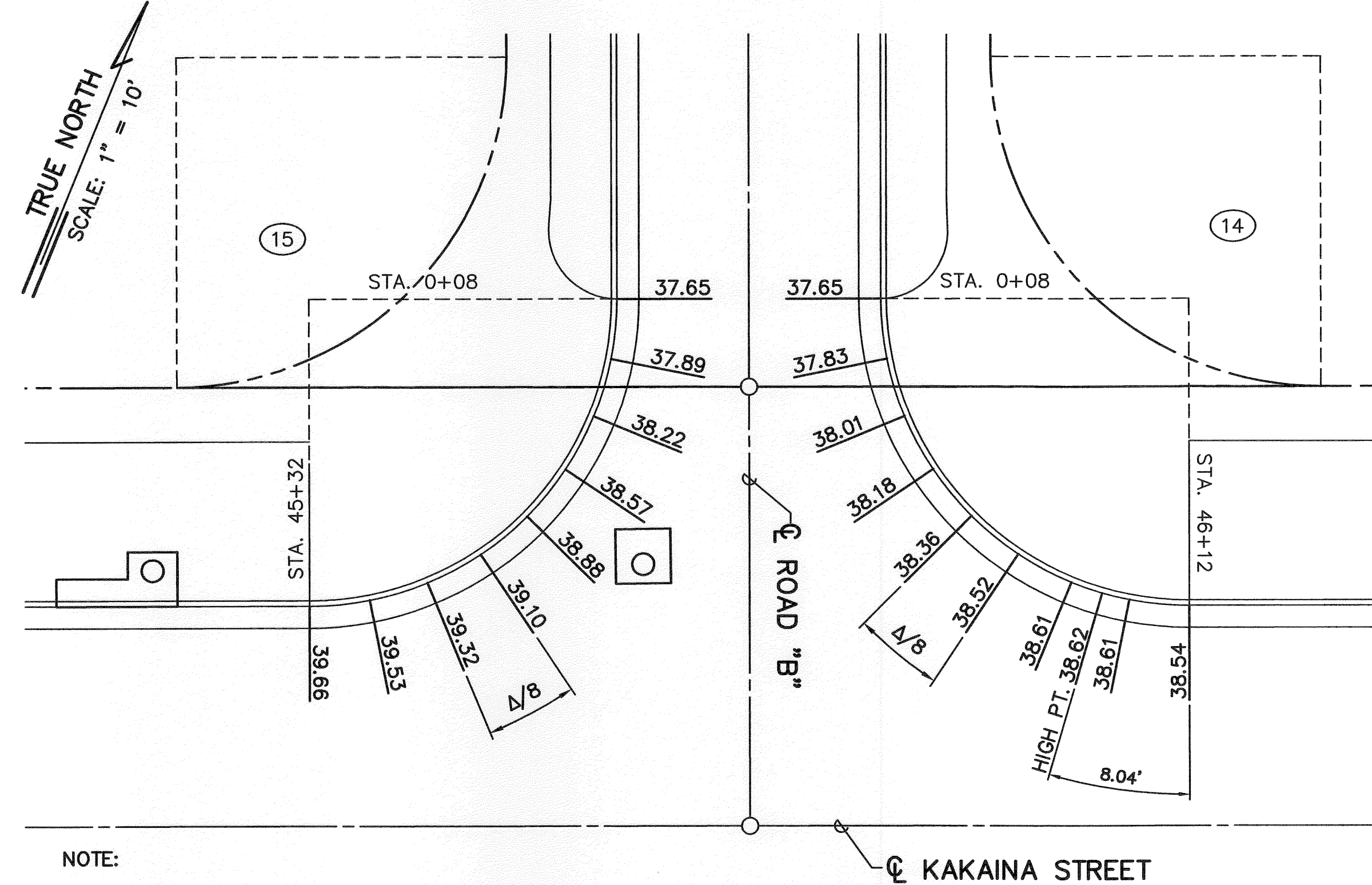
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MAILBOX DETAILS			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

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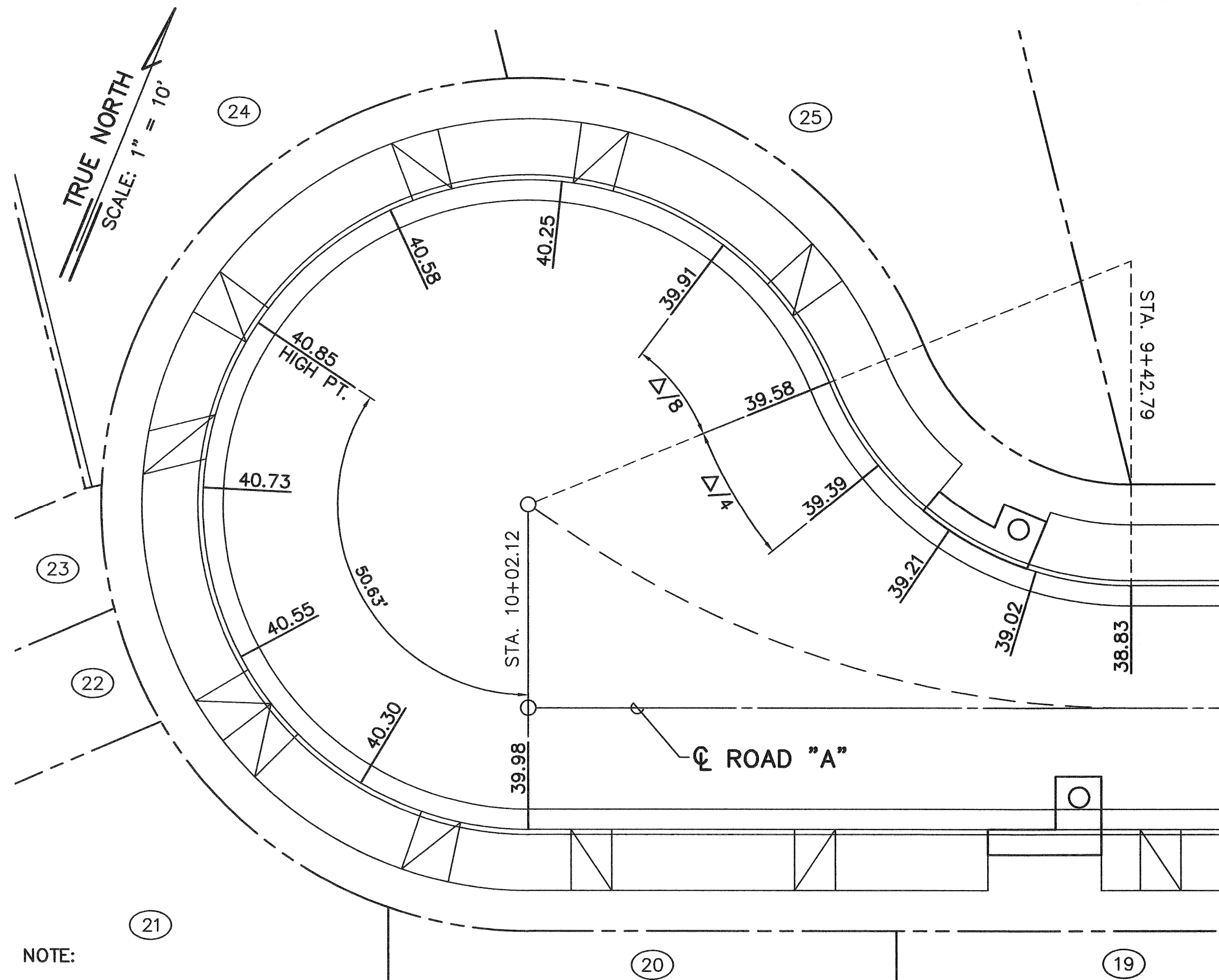
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Last Saved: 2/2/2012
Plotted on: 2/2/2012



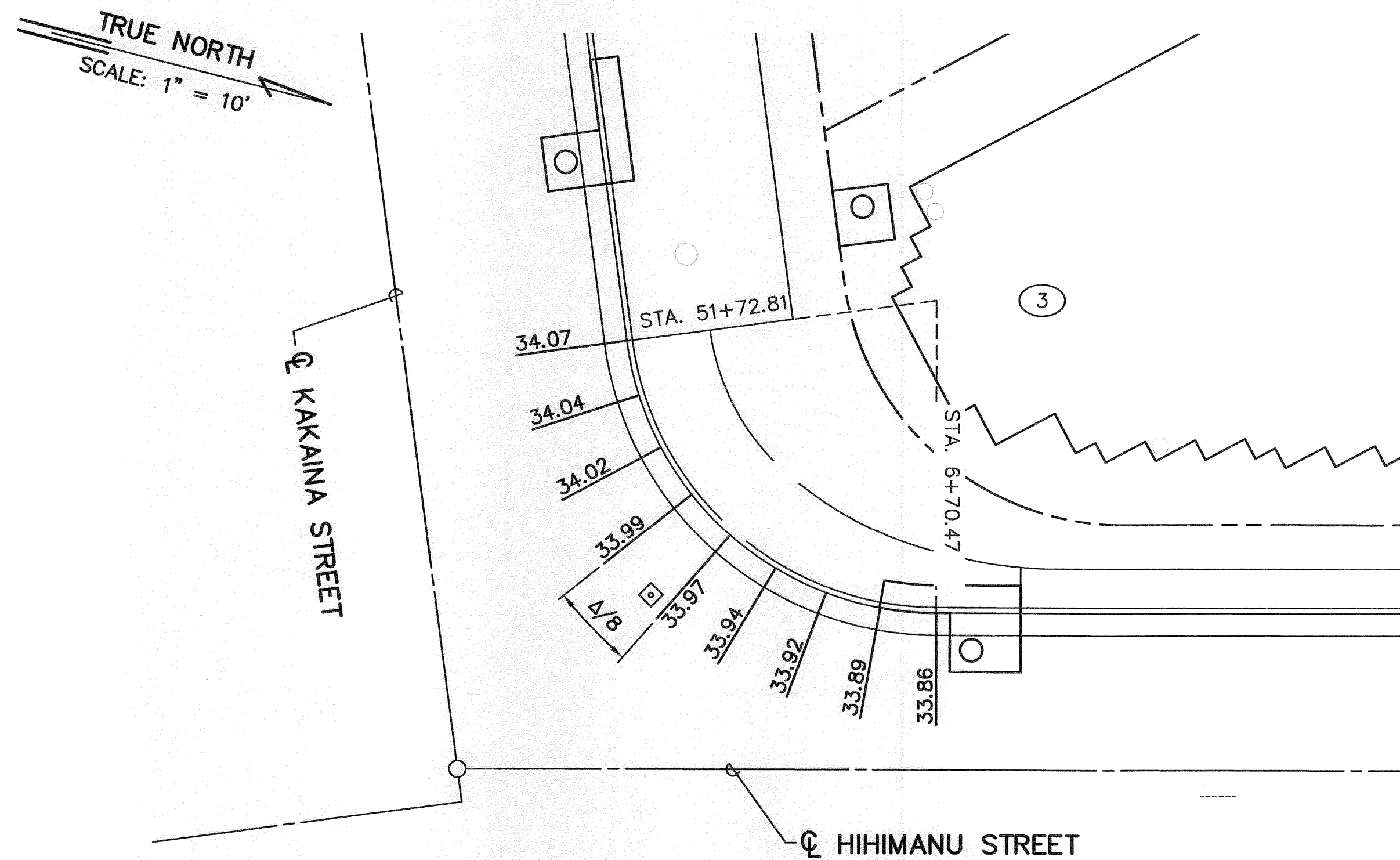
ROAD "A" & HIHIMANU ST. INTERSECTION
SCALE: 1" = 10'



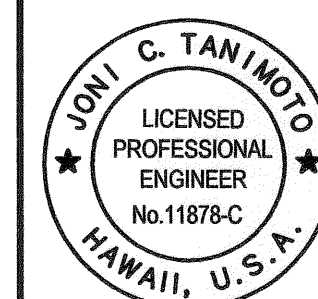
ROAD "B" & KAKAIA ST. INTERSECTION
SCALE: 1" = 10'



ROAD "A" CUL-DE-SAC
SCALE: 1" = 10'



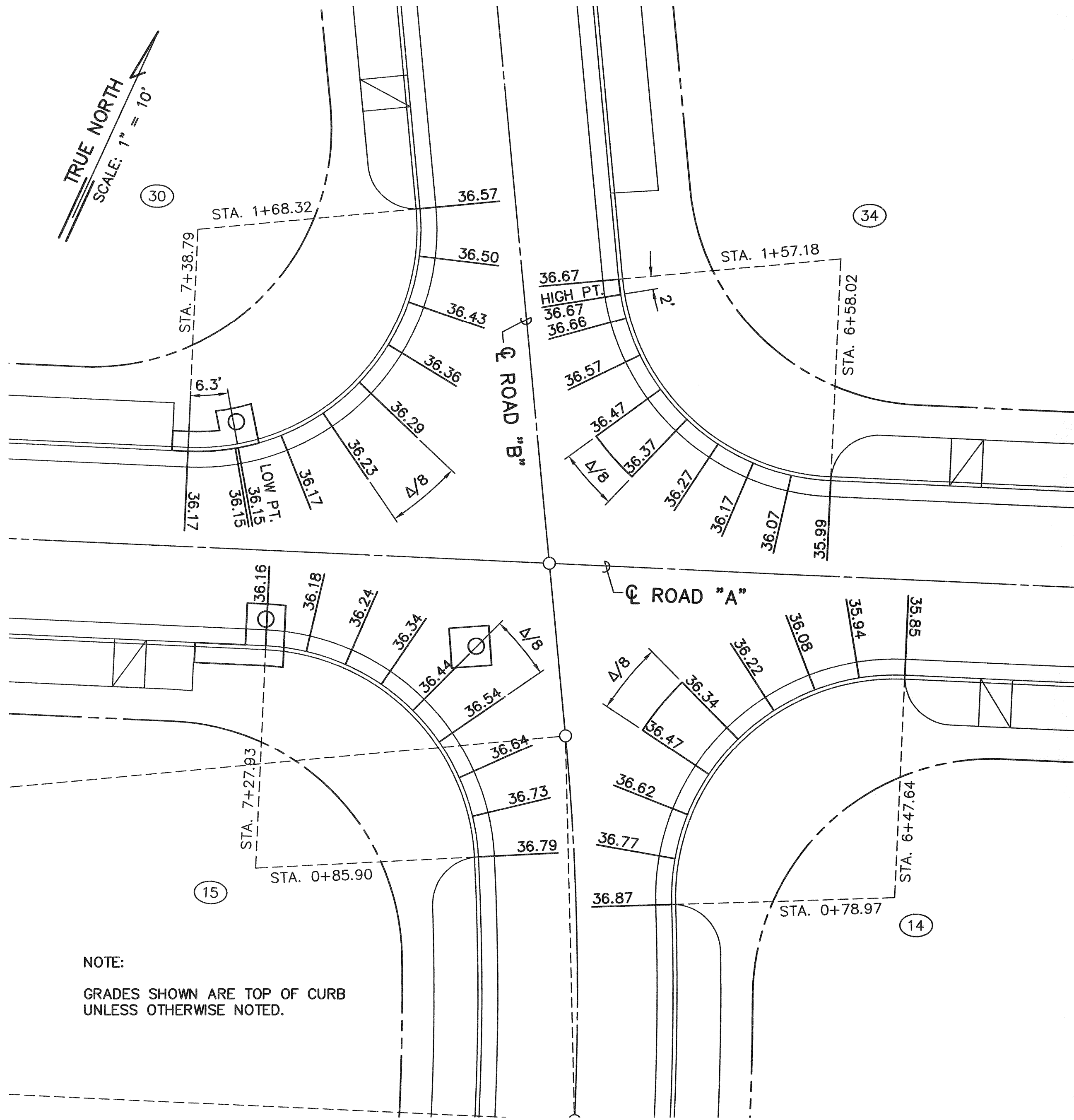
KAKAIA ST. & HIHIMANU ST. INTERSECTION
SCALE: 1" = 10'



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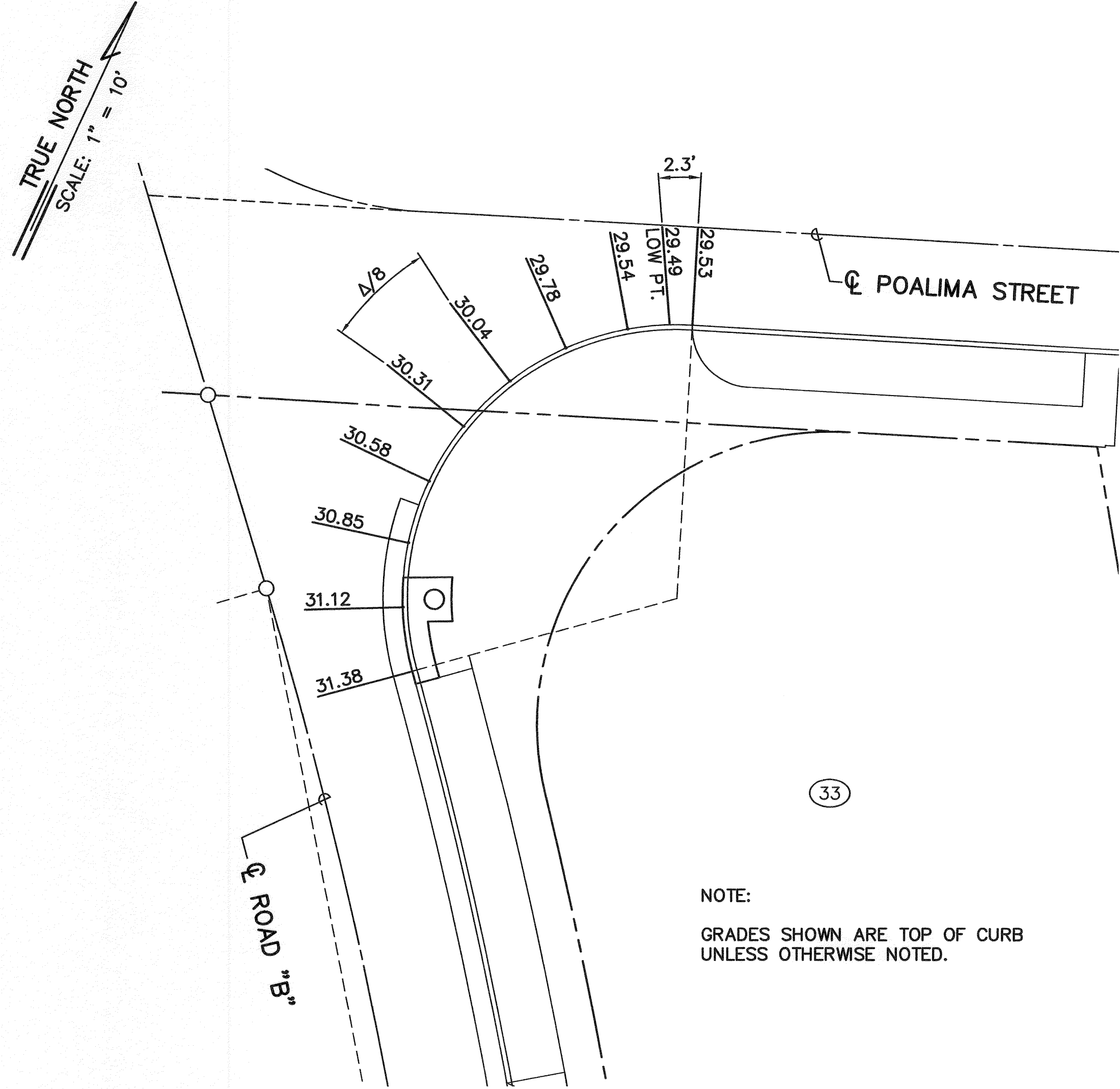
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CURB RETURN GRADES			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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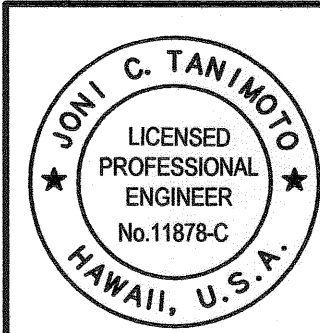
ROAD "A" & "B" INTERSECTION
SCALE: 1" = 10'

NOTE:
GRADES SHOWN ARE TOP OF CURB
UNLESS OTHERWISE NOTED.



ROAD "B" & POALIMA ST. INTERSECTION
SCALE: 1" = 10'

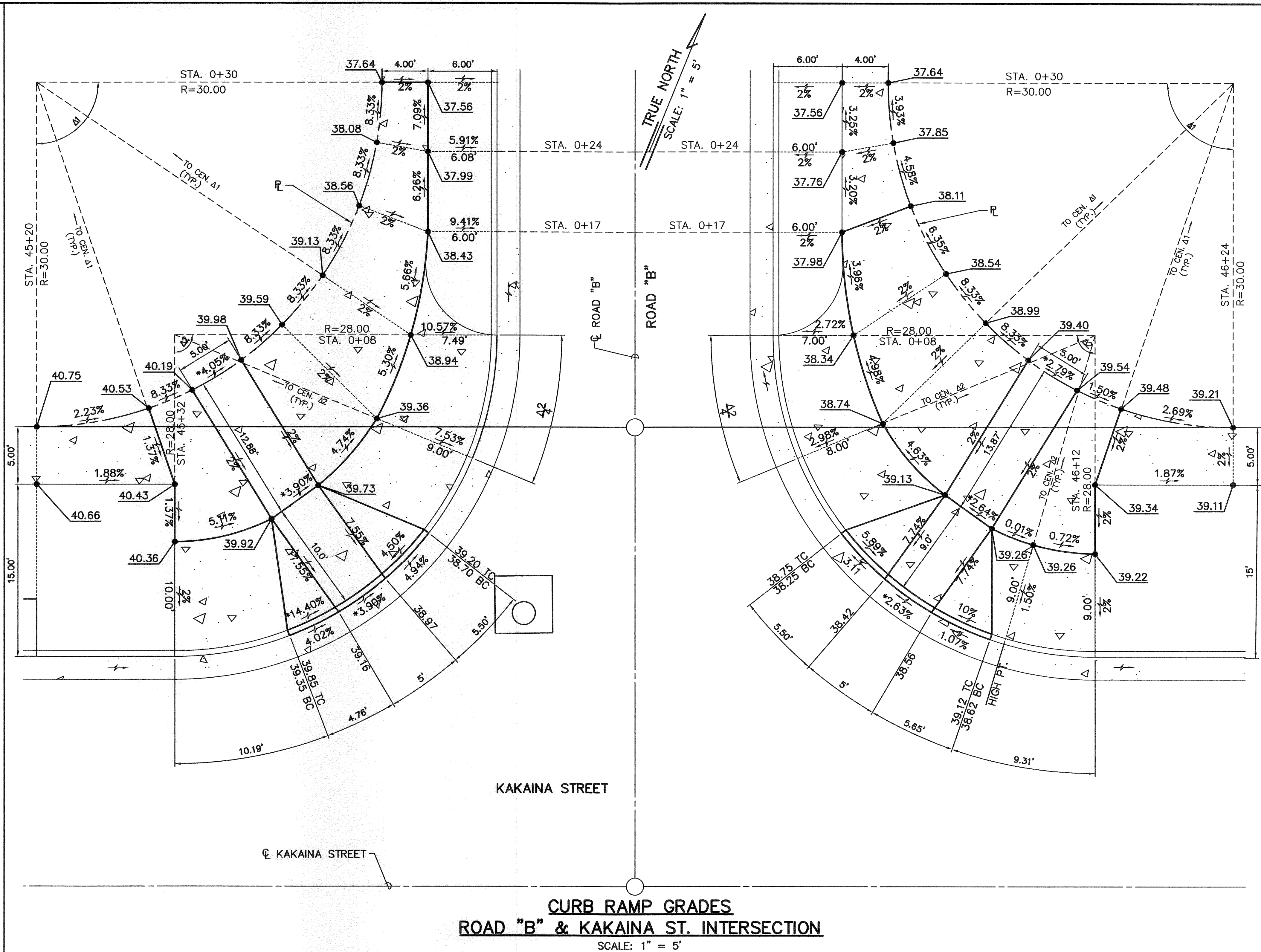
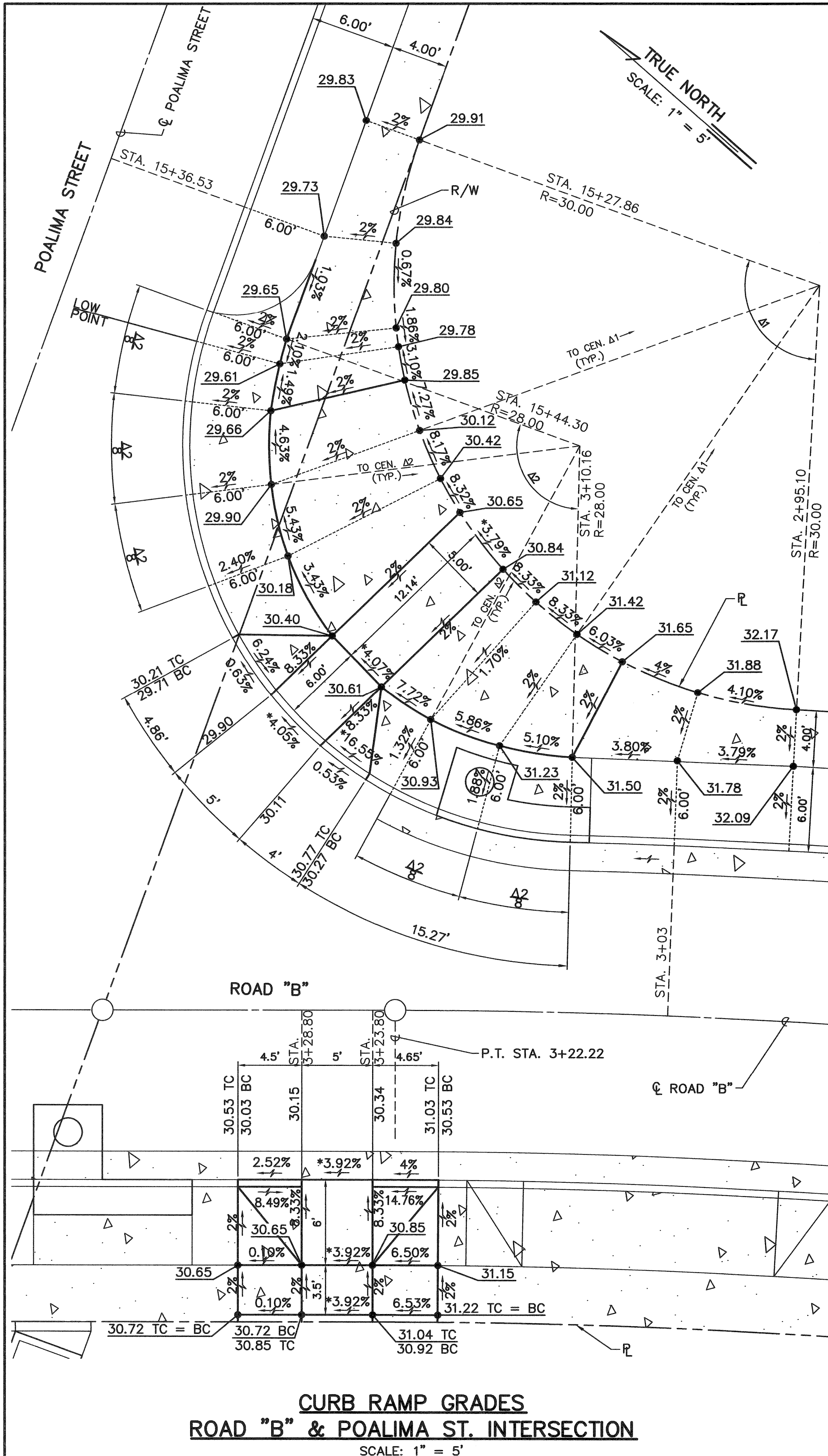
NOTE:
GRADES SHOWN ARE TOP OF CURB
UNLESS OTHERWISE NOTED.



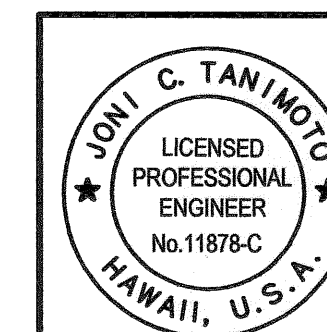
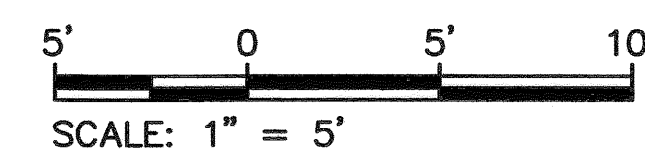
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OBSERVATION
LICENSE EXPIRES 4/30/12

REVISION	DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII				
CURB RETURN GRADES				
APPROVED:				
CHIEF, CIVIL ENGINEERING BRANCH, DPP				
AKINAKA & ASSOCIATES, LTD.				
CONSULTING ENGINEERS				
FILE	POCKET	FOLDER	NO.	

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"**" DENOTES A CONDITION OF TECHNICAL INFEASIBILITY
TECHNICAL INFEASIBILITY STATEMENT WAS FILED
WITH DISABILITY AND COMMUNICATION ACCESS BOARD.



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DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
CURB RAMP DETAILS			
APPROVED:			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
DATE			
FILE POCKET FOLDER NO.			

TRUE NORTH
SCALE: 1" = 40'

LEGEND

- NEW A.C. PAVEMENT
- A.C. REPAVEMENT
- NEW CONC. SIDEWALK, CURB & GUTTER

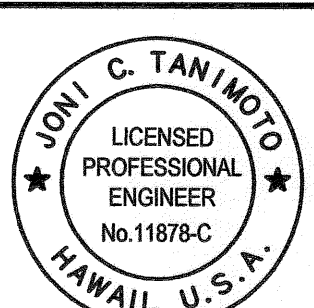
TRAFFIC SIGNING & STRIPING PLAN

SCALE: 1" = 40'

APPROVED:

CHIEF, TRAFFIC REVIEW BRANCH, DPP

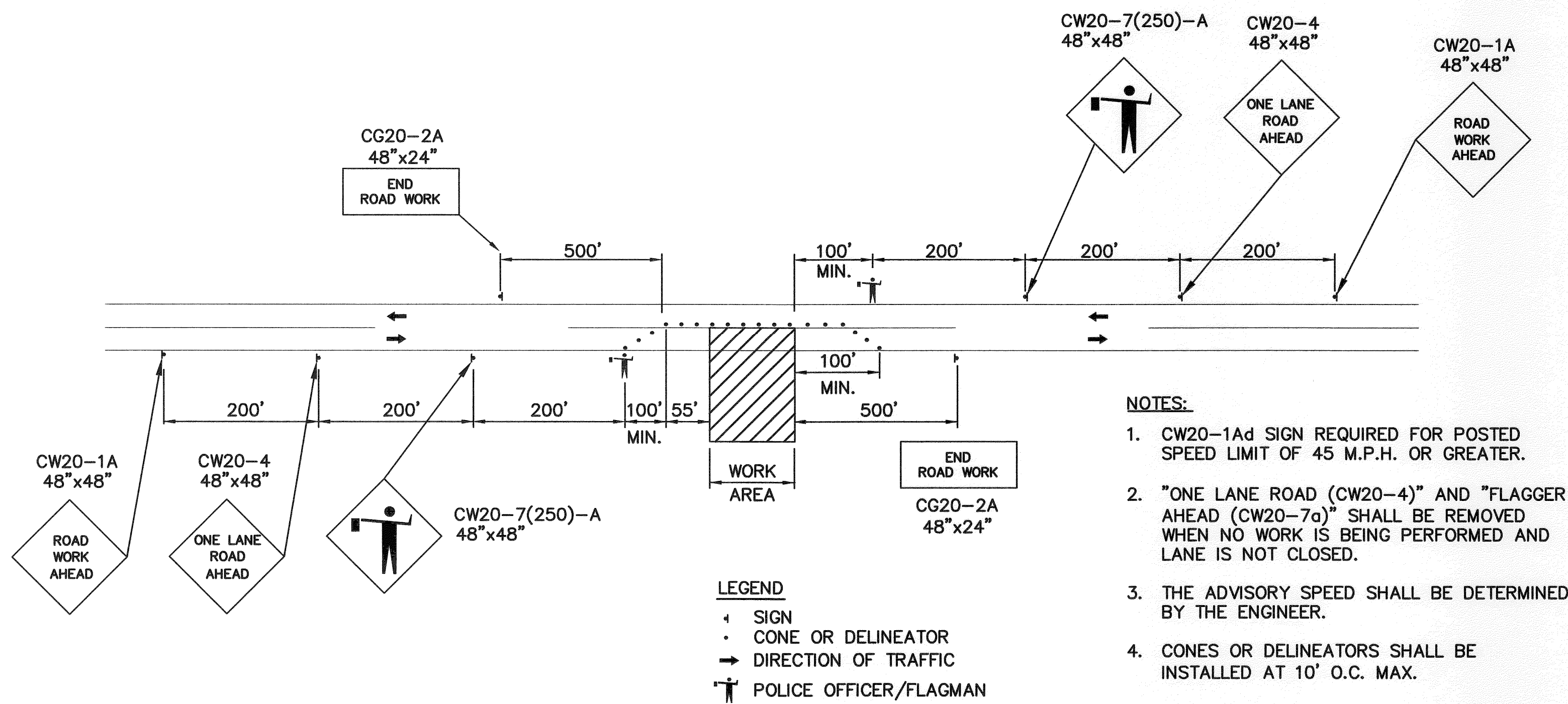
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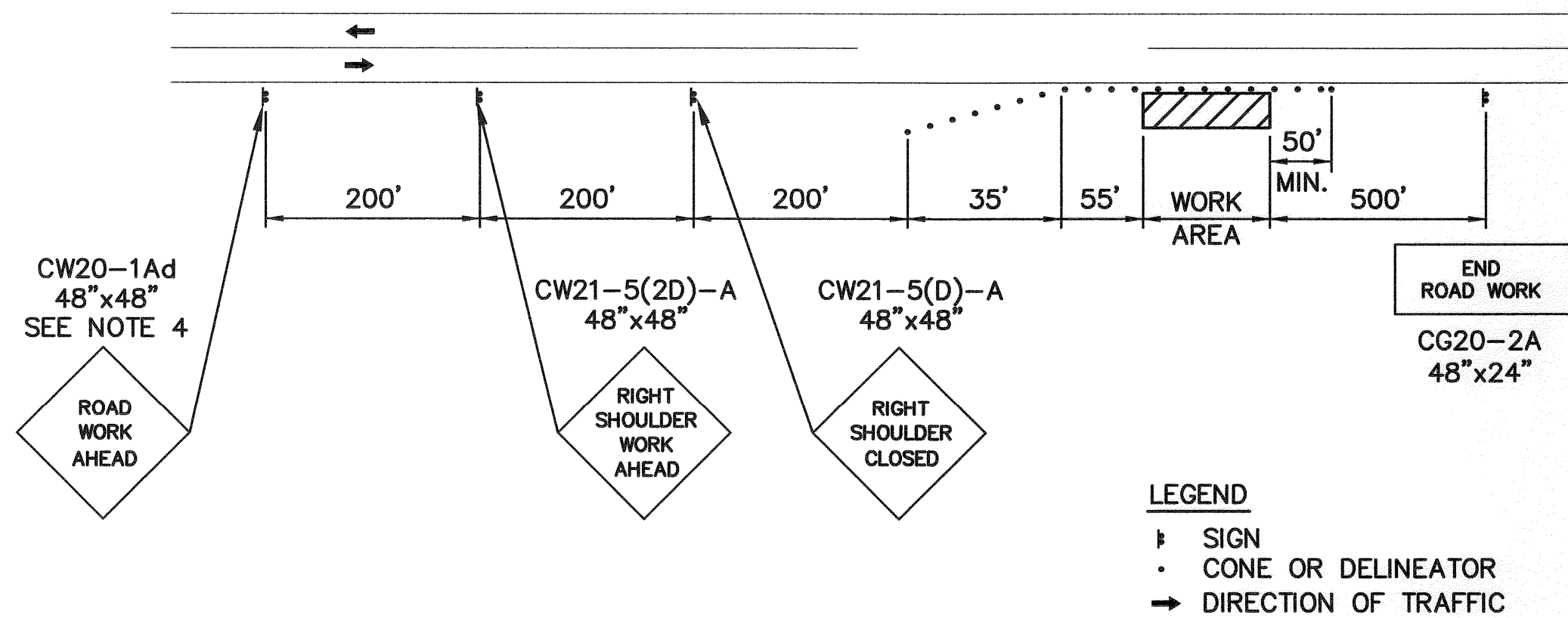
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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TRAFFIC SIGNING & STRIPING PLAN			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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TWO-LANE HIGHWAY – ONE LANE CLOSED
TRAFFIC CONTROL PLAN
NOT TO SCALE

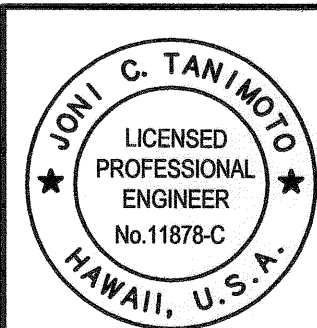


TWO-LANE ROAD – WORK ON SHOULDER
TRAFFIC CONTROL PLAN
NOT TO SCALE

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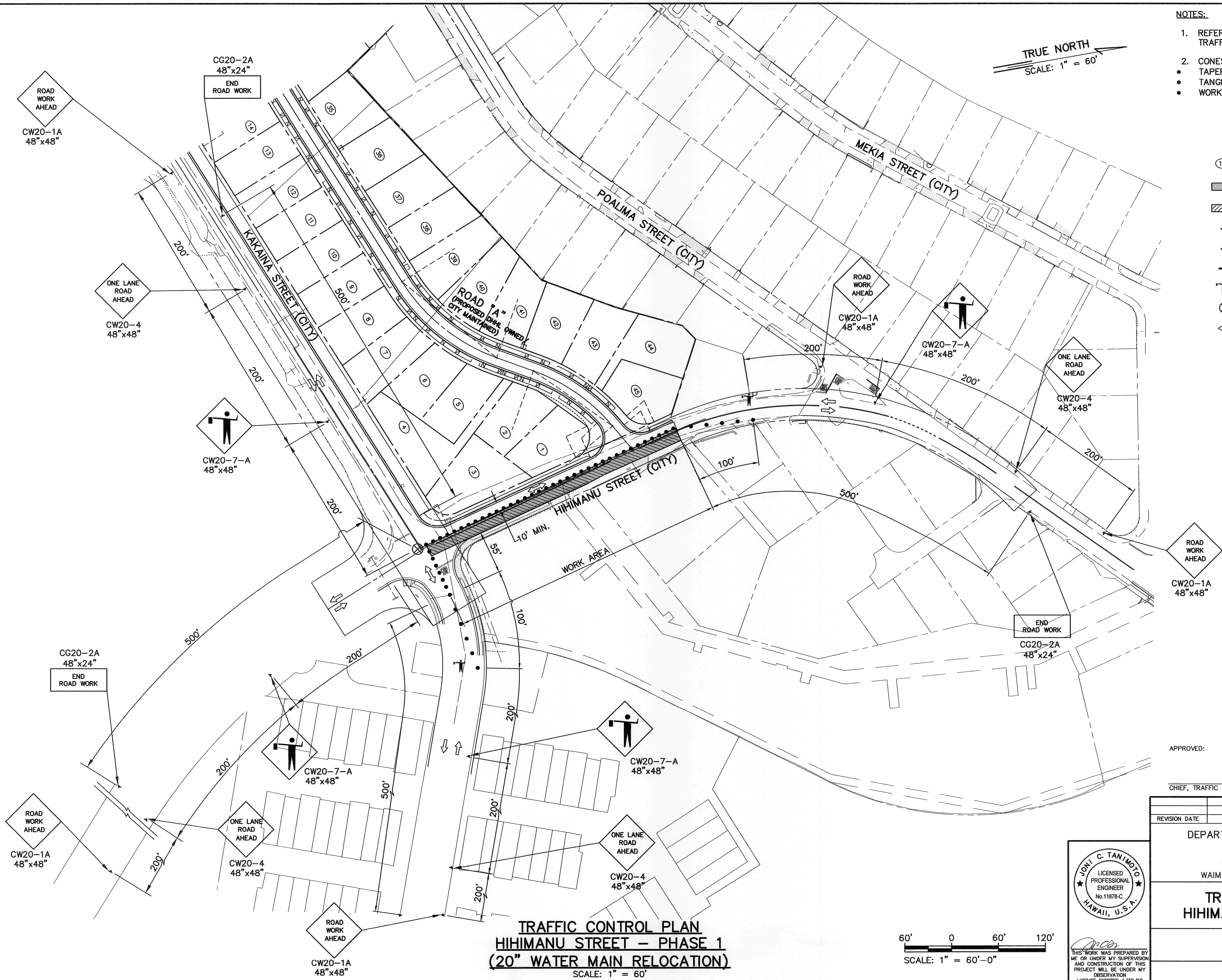
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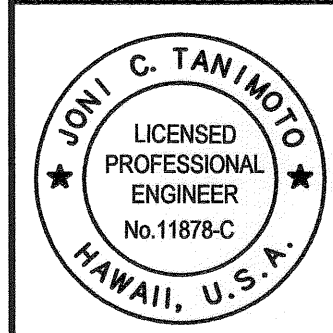
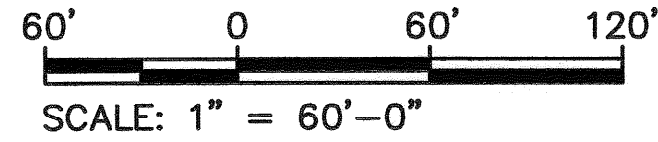
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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TRAFFIC CONTROL PLAN AND NOTES			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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Plotted on: 2/2/2012
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TRAFFIC CONTROL PLAN
HIHIMANU STREET – PHASE 1
(20" WATER MAIN RELOCATION)
SCALE: 1" = 60'

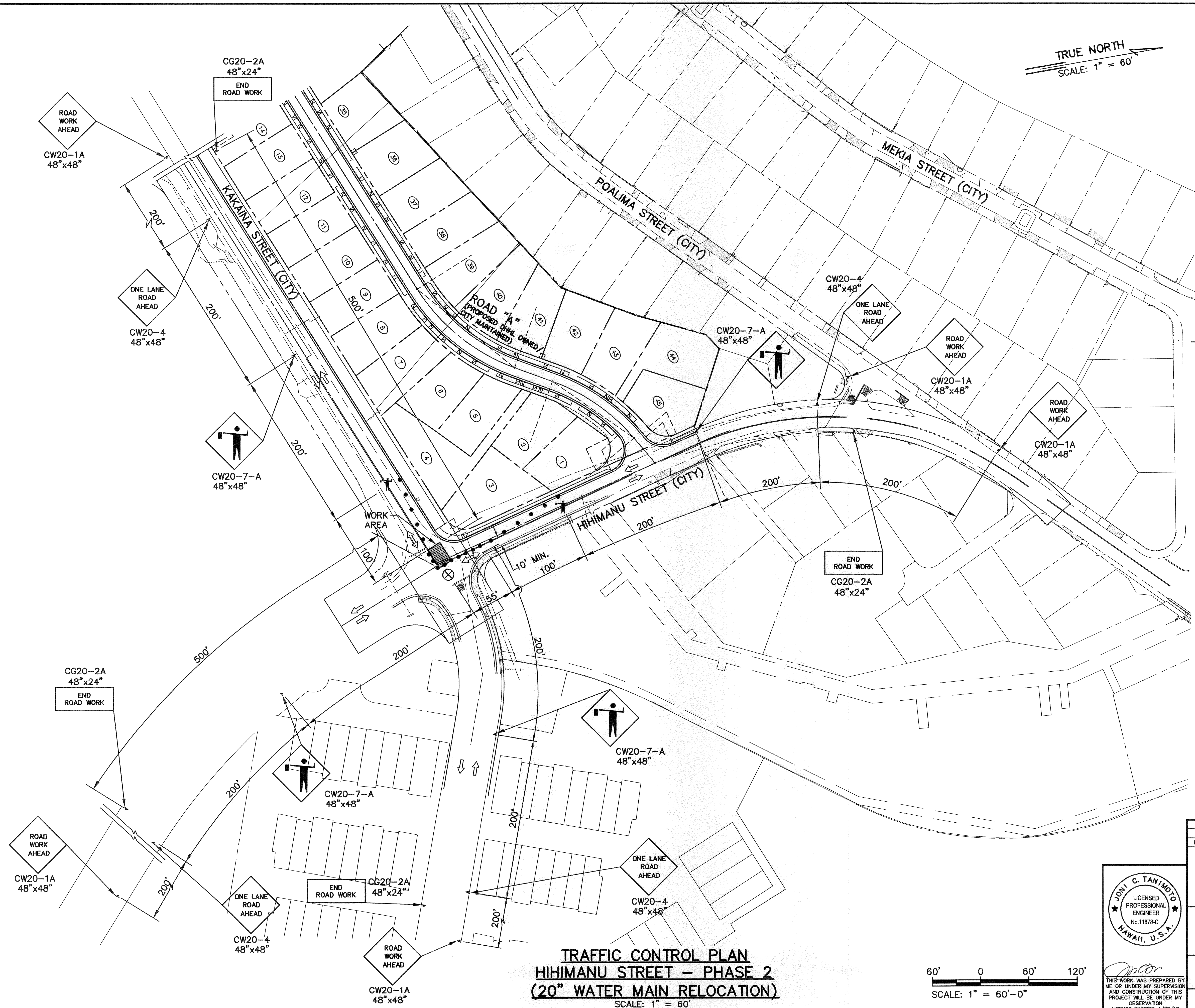


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APPROVED:
CHIEF, TRAFFIC REVIEW BRANCH, DPP
DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TRAFFIC CONTROL PLAN HIHIMANU STREET – PHASE 1			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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- NOTES:
1. REFER TO SHT. 6 FOR GENERAL NOTES FOR TRAFFIC CONTROL PLAN
 2. CONES OR DELINEATORS SHALL BE INSTALLED AT:
 - TAPER @ 20' MAX.
 - TANGENT @ 20' MAX.
 - WORK AREA @ 10' MAX.

- LEGEND
- (10) LOT NUMBER
 - [Hatched Box] NEW A.C. PAVEMENT
 - [Hatched Box] WORK AREA
 - [Diamond with T] SIGN
 - [Dot] CONE OR DELINEATOR
 - [Arrow] DIRECTION OF TRAFFIC
 - [Flagman Symbol] FLAGMAN
 - [Police Officer Symbol] POLICE OFFICER
 - [Arrow with Tail] TRAFFIC FLOW DIRECTION

APPROVED: _____ DATE: _____
CHIEF, TRAFFIC REVIEW BRANCH, DPP

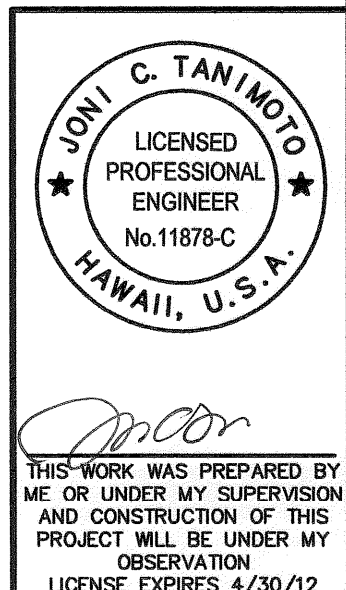
REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS
KAKAINA SUBDIVISION
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

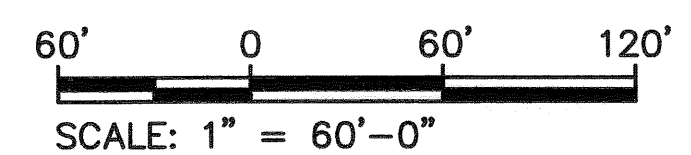
**TRAFFIC CONTROL PLAN
HIHIMANU STREET - PHASE 2**

AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.



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LICENSE EXPIRES 4/30/12



**TRAFFIC CONTROL PLAN
HIHIMANU STREET - PHASE 2
(20" WATER MAIN RELOCATION)**
SCALE: 1" = 60'

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Last Saved: 2/2/2012
Plotted on: 2/2/2012



NOTES:

1. REFER TO SHT. 6 FOR GENERAL NOTES FOR TRAFFIC CONTROL PLAN
2. CONES OR DELINEATORS SHALL BE INSTALLED AT:
 - TAPER @ 20' MAX.
 - TANGENT @ 20' MAX.
 - WORK AREA @ 10' MAX.

LEGEND

- ⑩ LOT NUMBER
- NEW A.C. PAVEMENT
- WORK AREA
- SIGN
- CONE OR DELINEATOR
- DIRECTION OF TRAFFIC
- FLAGMAN
- ⊗ POLICE OFFICER
- ← TRAFFIC FLOW DIRECTION

TRUE NORTH
SCALE: 1" = 60'

APPROVED:

CHIEF, TRAFFIC REVIEW BRANCH, DPP DATE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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DEPARTMENT OF HAWAIIAN HOME LANDS

KAKAINA SUBDIVISION

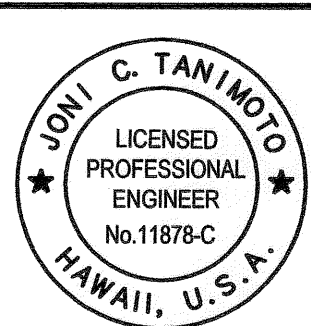
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

TRAFFIC CONTROL PLAN
HIIMANU & KAKAINA STREETS -
PHASE 3

AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.
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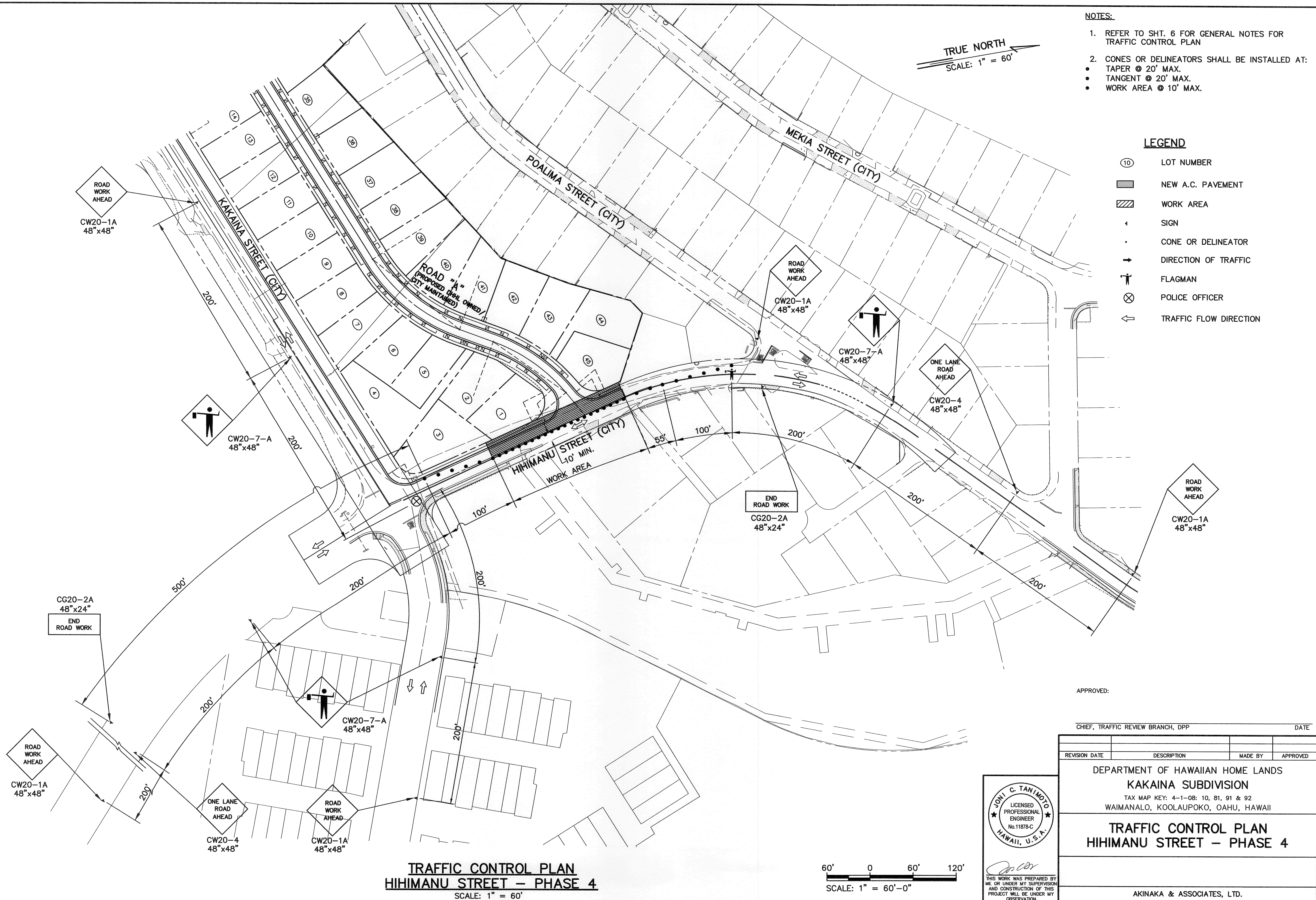


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LICENSE EXPIRES 4/30/12

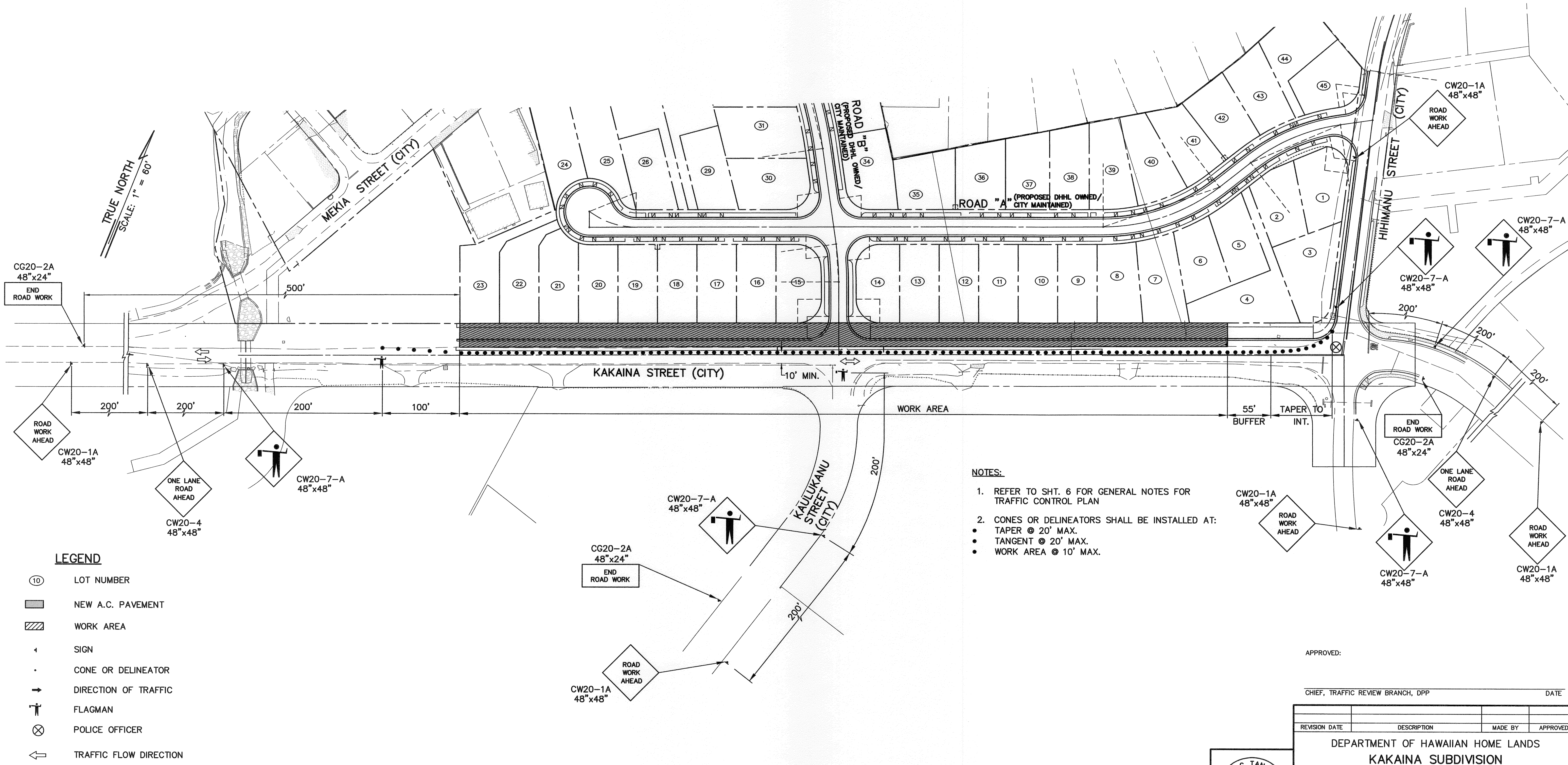
60' 0 60' 120'
SCALE: 1" = 60'-0"

TRAFFIC CONTROL PLAN
HIIMANU & KAKAINA STREETS - PHASE 3
SCALE: 1" = 60'

Last Save by: MSM
Last Saved: 2/2/2012
Plotted on: 2/2/2012
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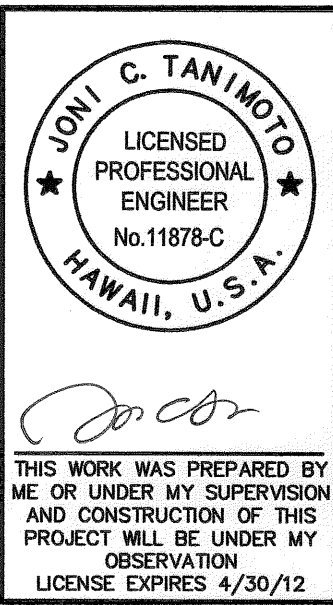
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Last Save by: MSM
Last Saved: 2/2/2012
Plotted on: 2/2/2012



- NOTES:
1. REFER TO SHT. 6 FOR GENERAL NOTES FOR TRAFFIC CONTROL PLAN
 2. CONES OR DELINEATORS SHALL BE INSTALLED AT:
 - TAPER @ 20' MAX.
 - TANGENT @ 20' MAX.
 - WORK AREA @ 10' MAX.

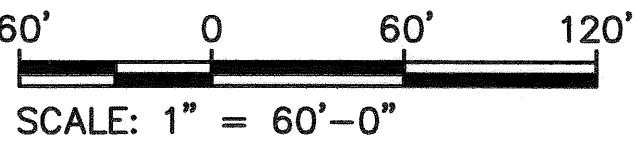
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CHIEF, TRAFFIC REVIEW BRANCH, DPP _____ DATE _____

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TRAFFIC CONTROL PLAN KAKAINA STREET - PHASE 5			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
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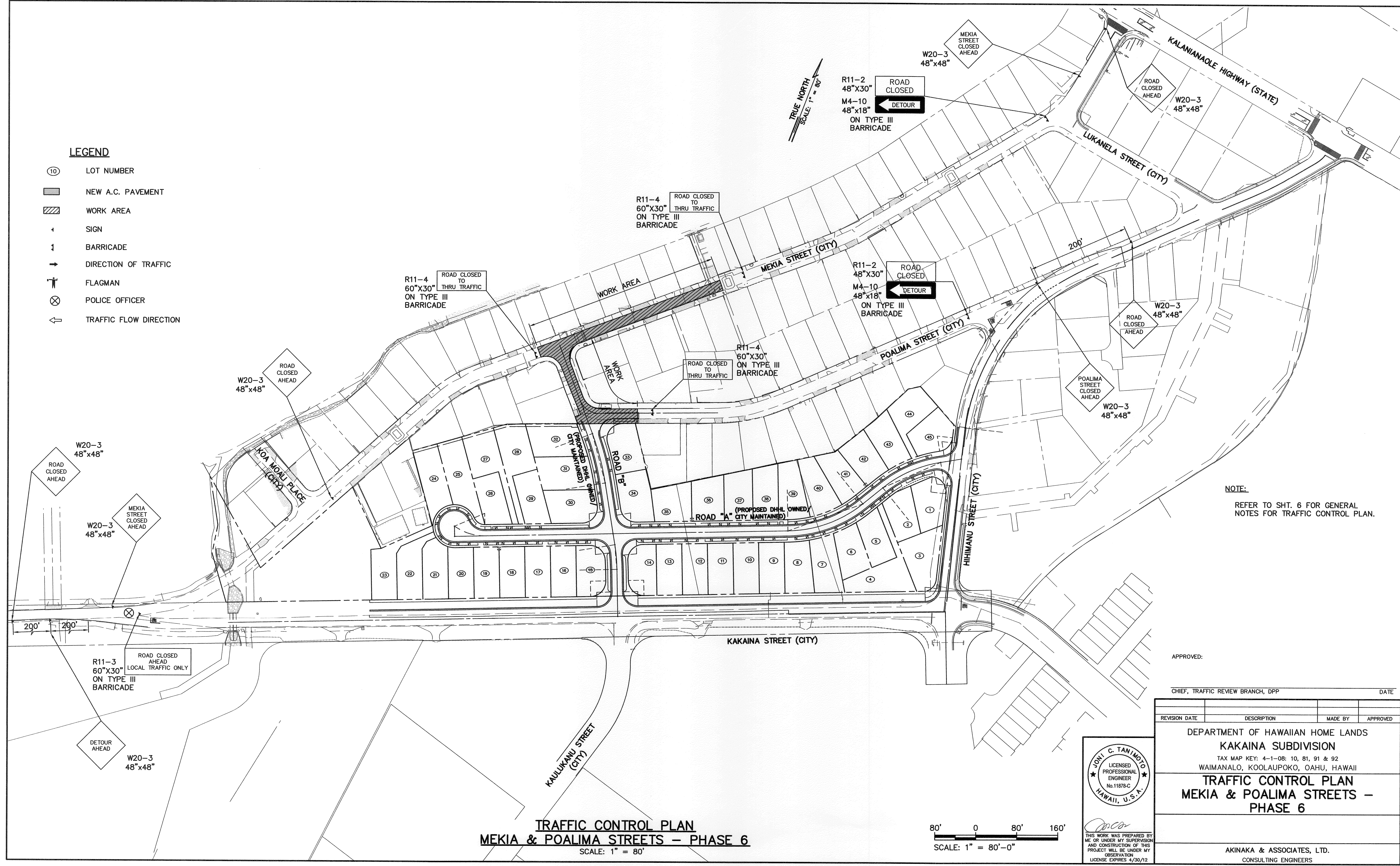


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LICENSE EXPIRES 4/30/12

TRAFFIC CONTROL PLAN
KAKAINA STREET - PHASE 5
SCALE: 1" = 60'

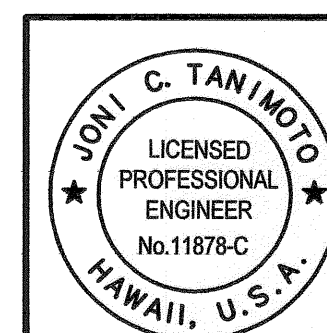
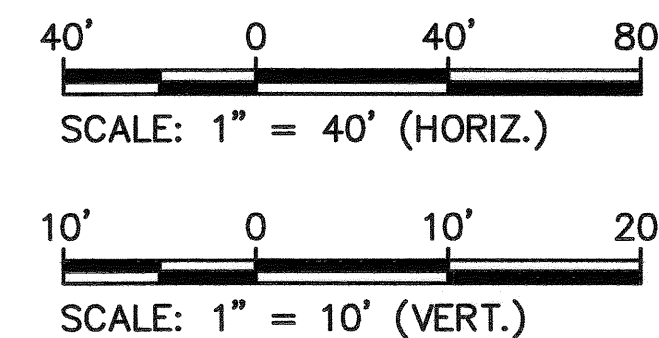
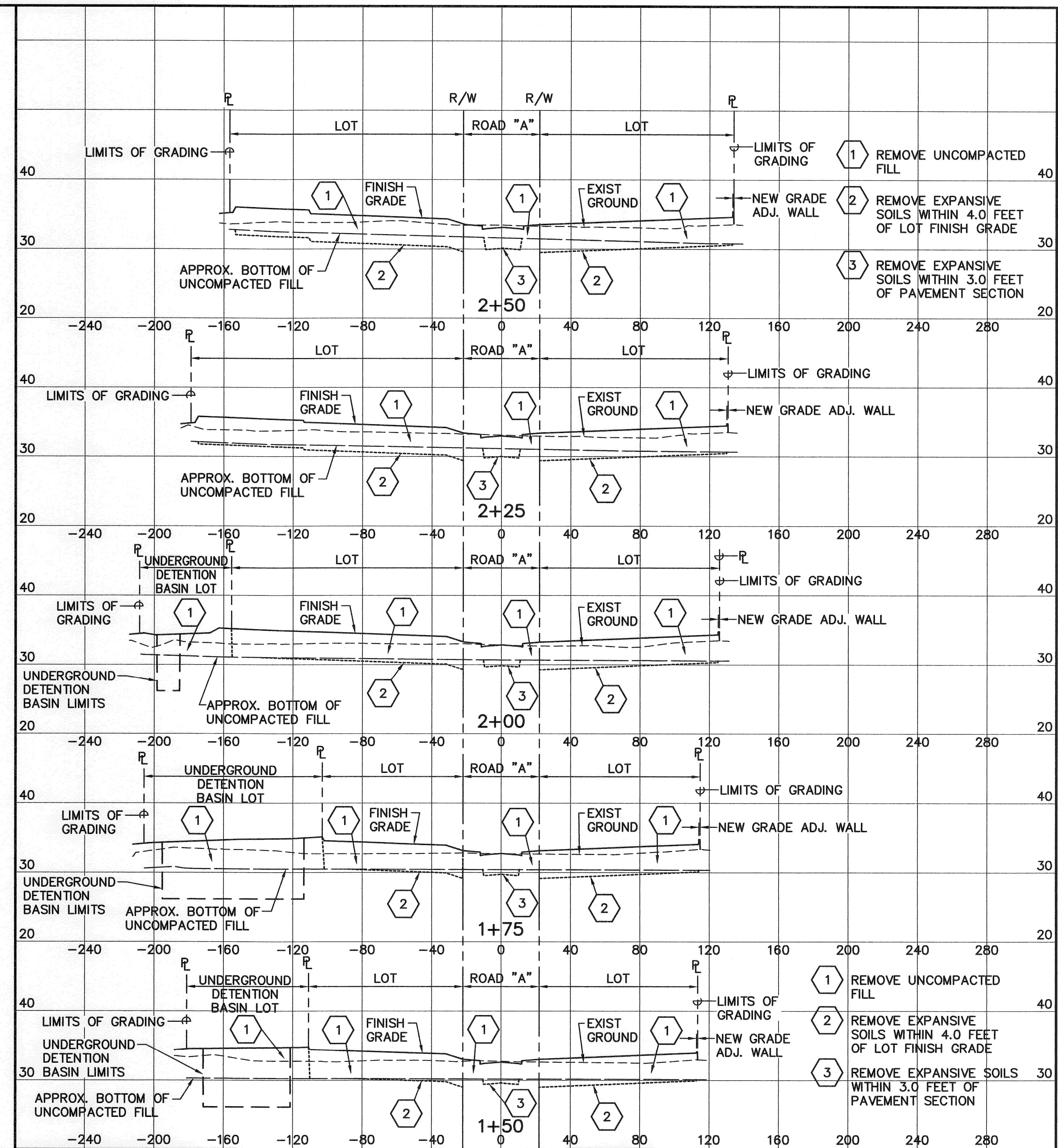
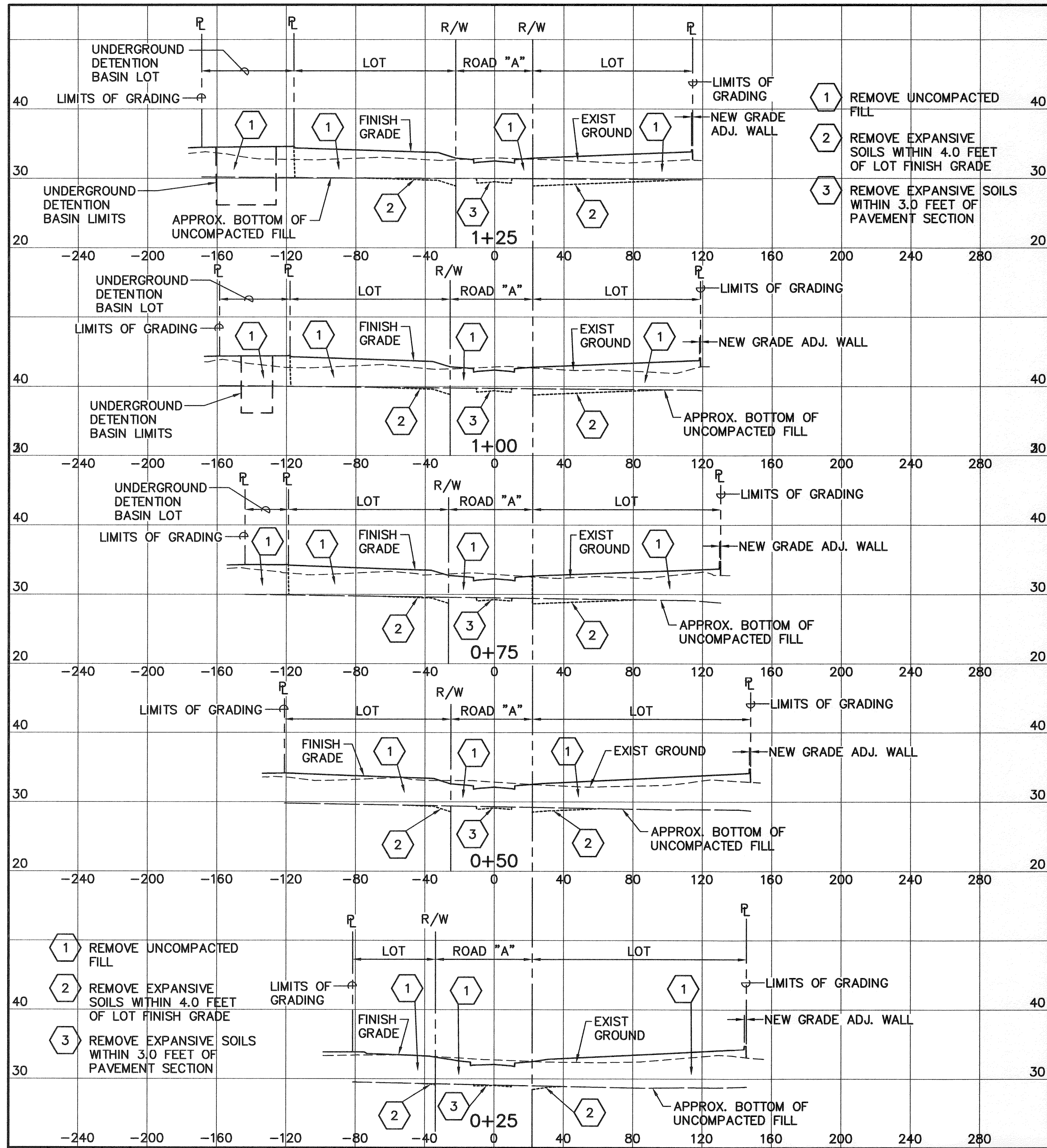


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Plotted on: 2/2/2012
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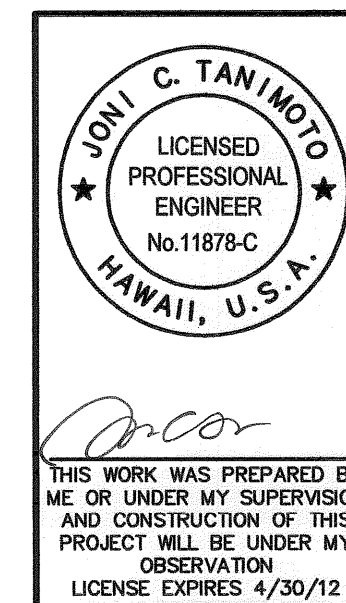
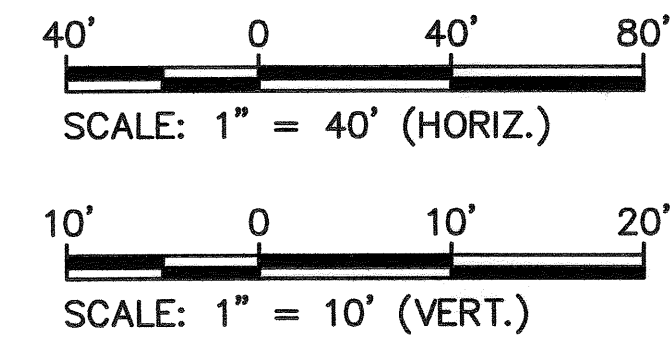
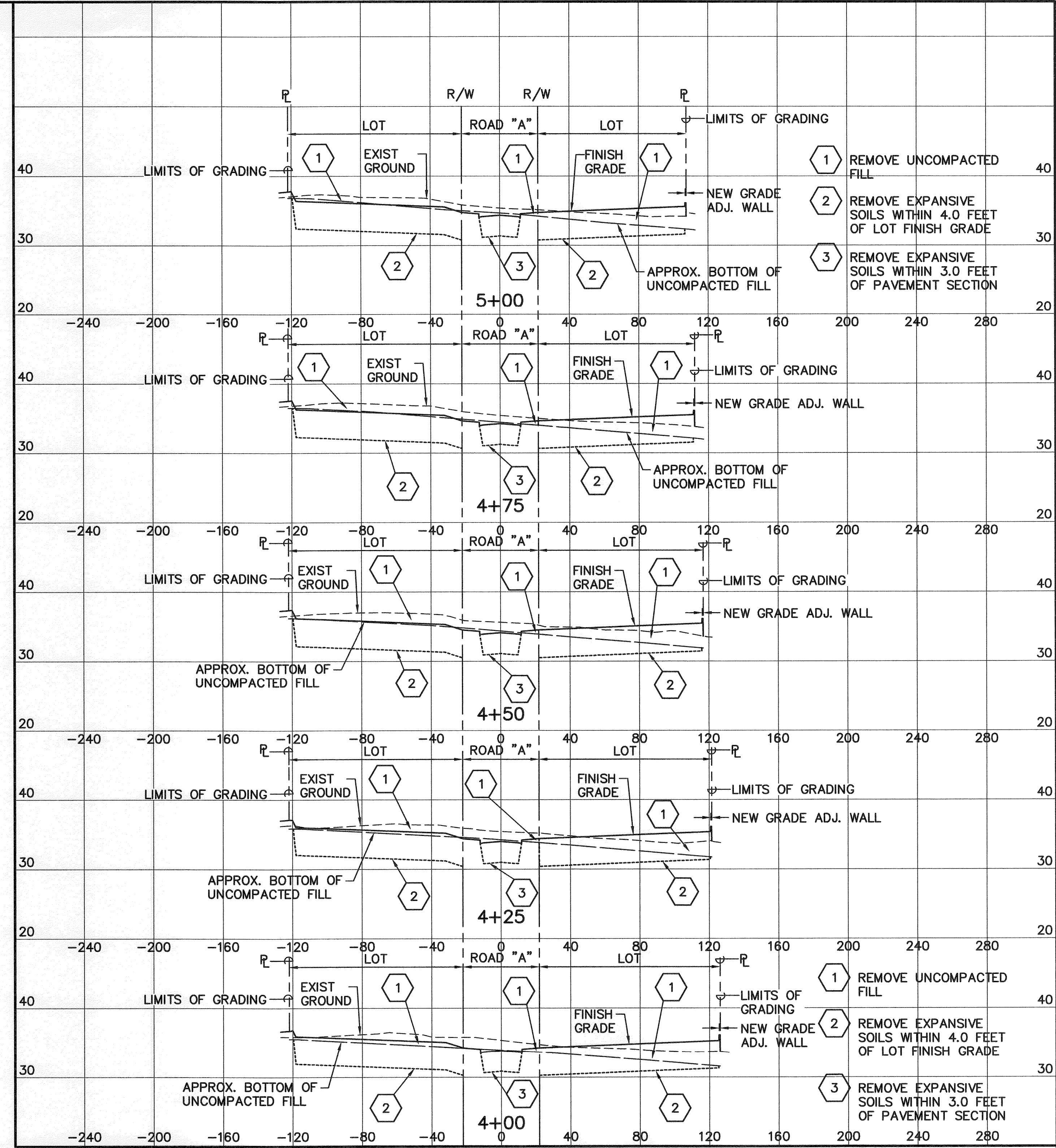
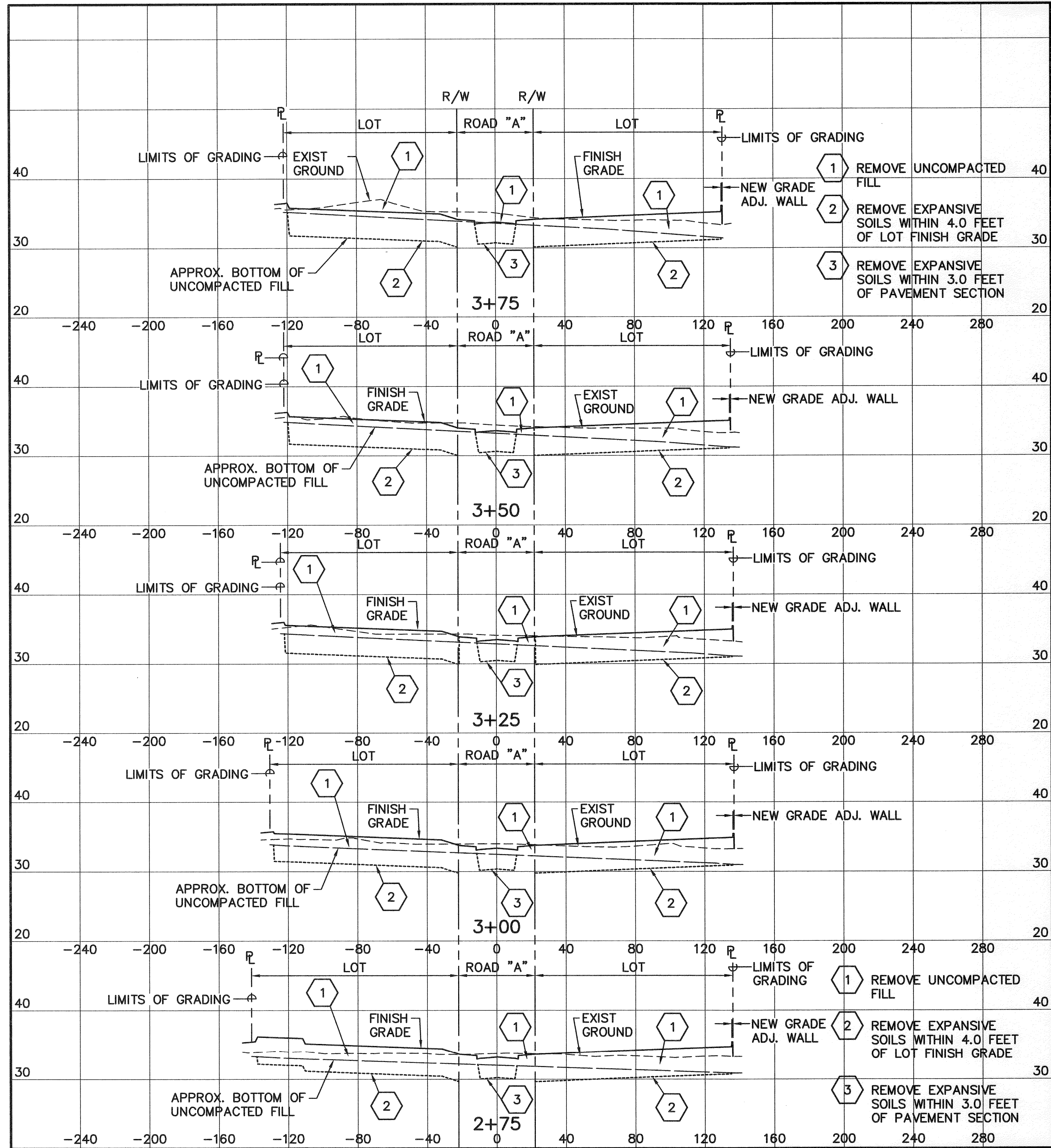


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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
CROSS SECTIONS STA. 0+25 TO 2+50			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

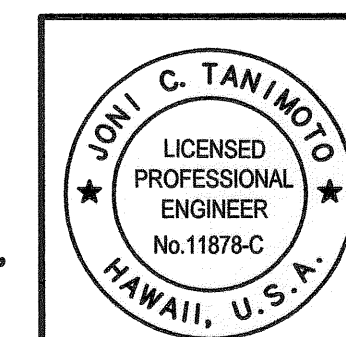
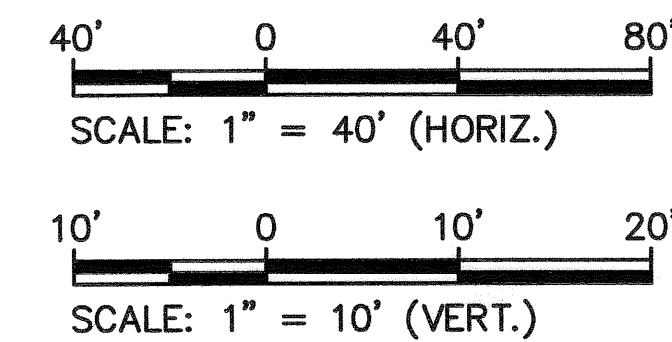
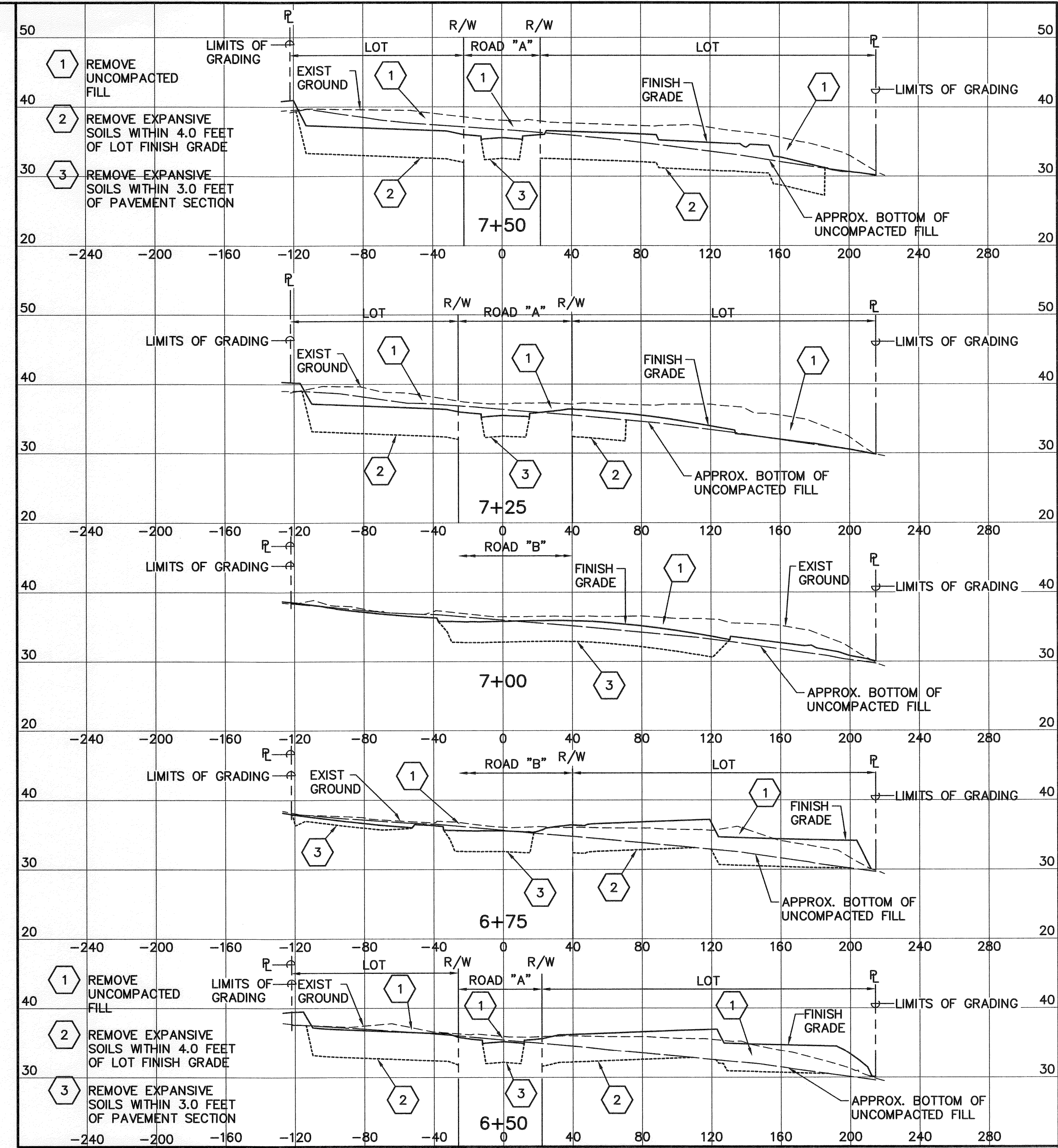
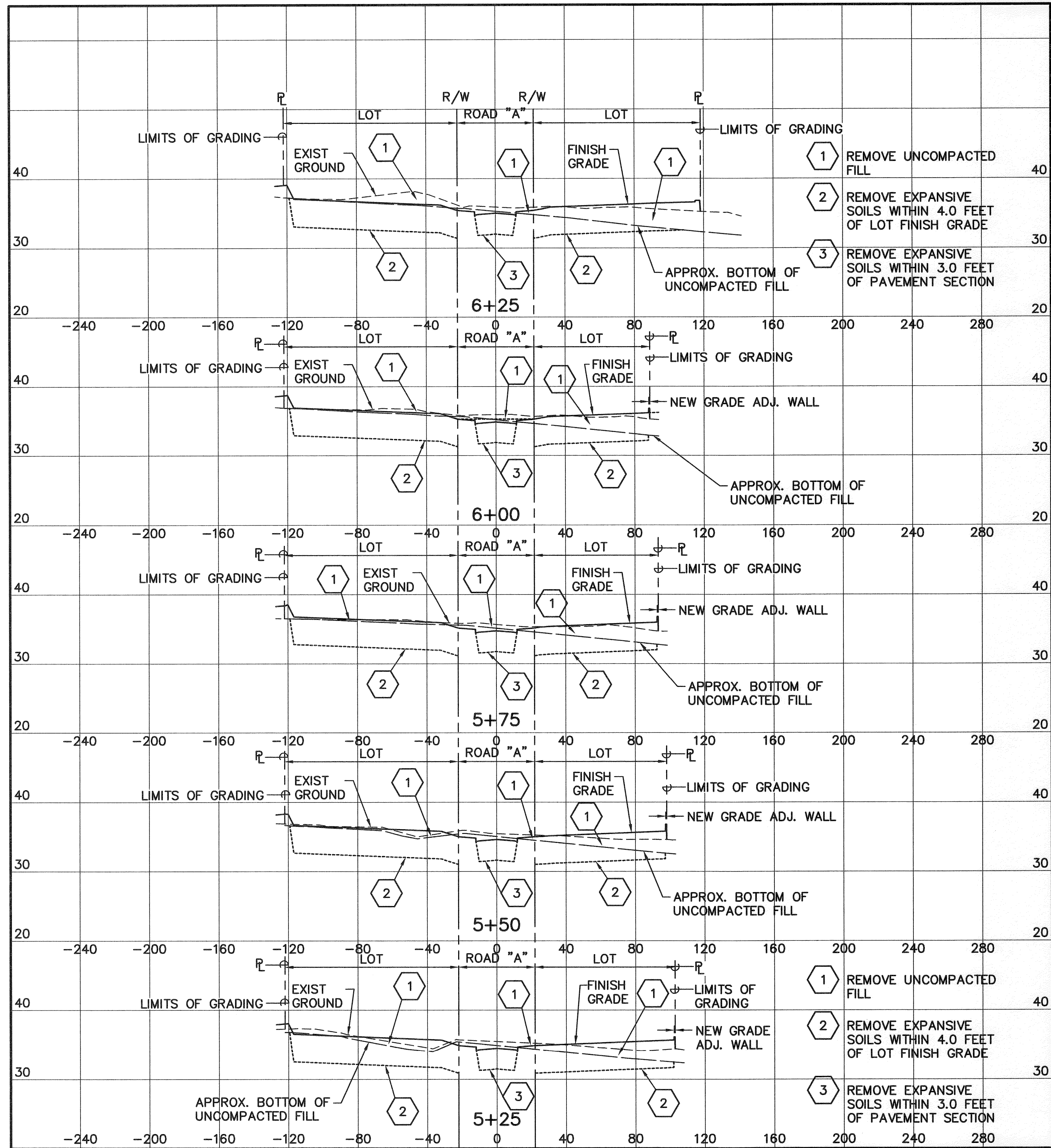
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Last Saved: 12/28/2011
Plotted on: 2/2/2012
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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CROSS SECTIONS STA. 2+75 TO 5+00			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

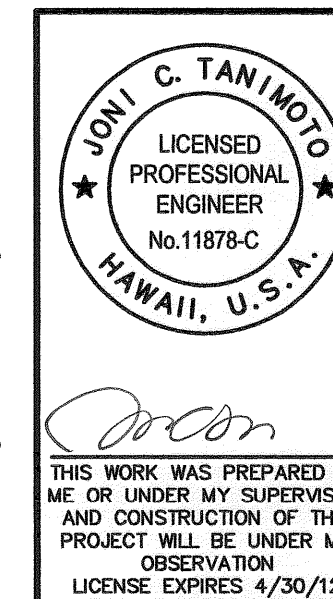
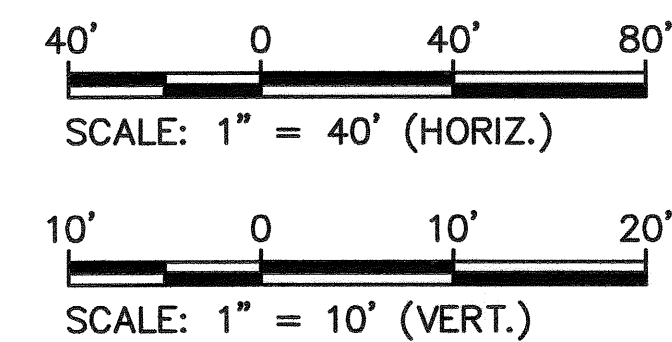
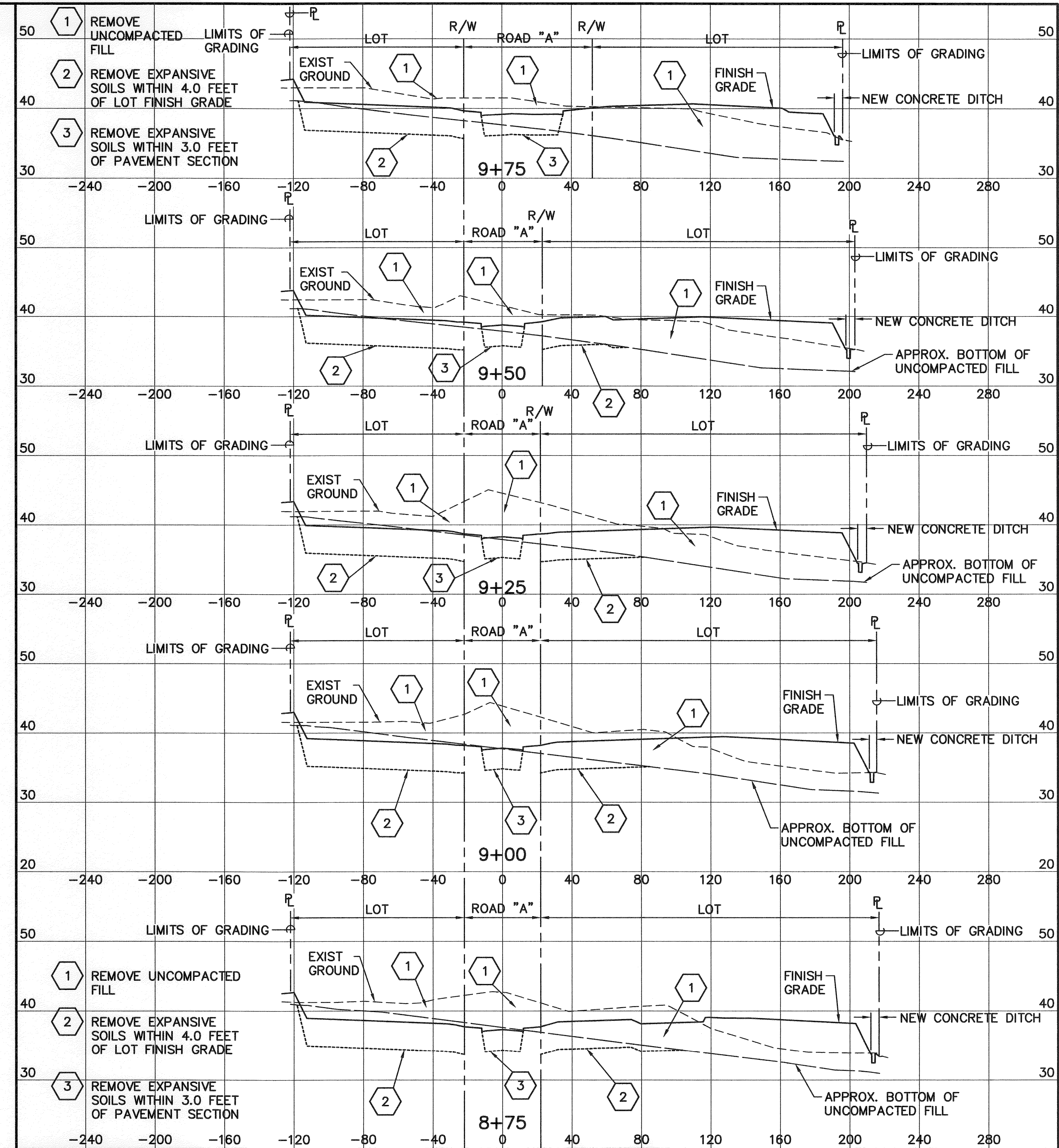
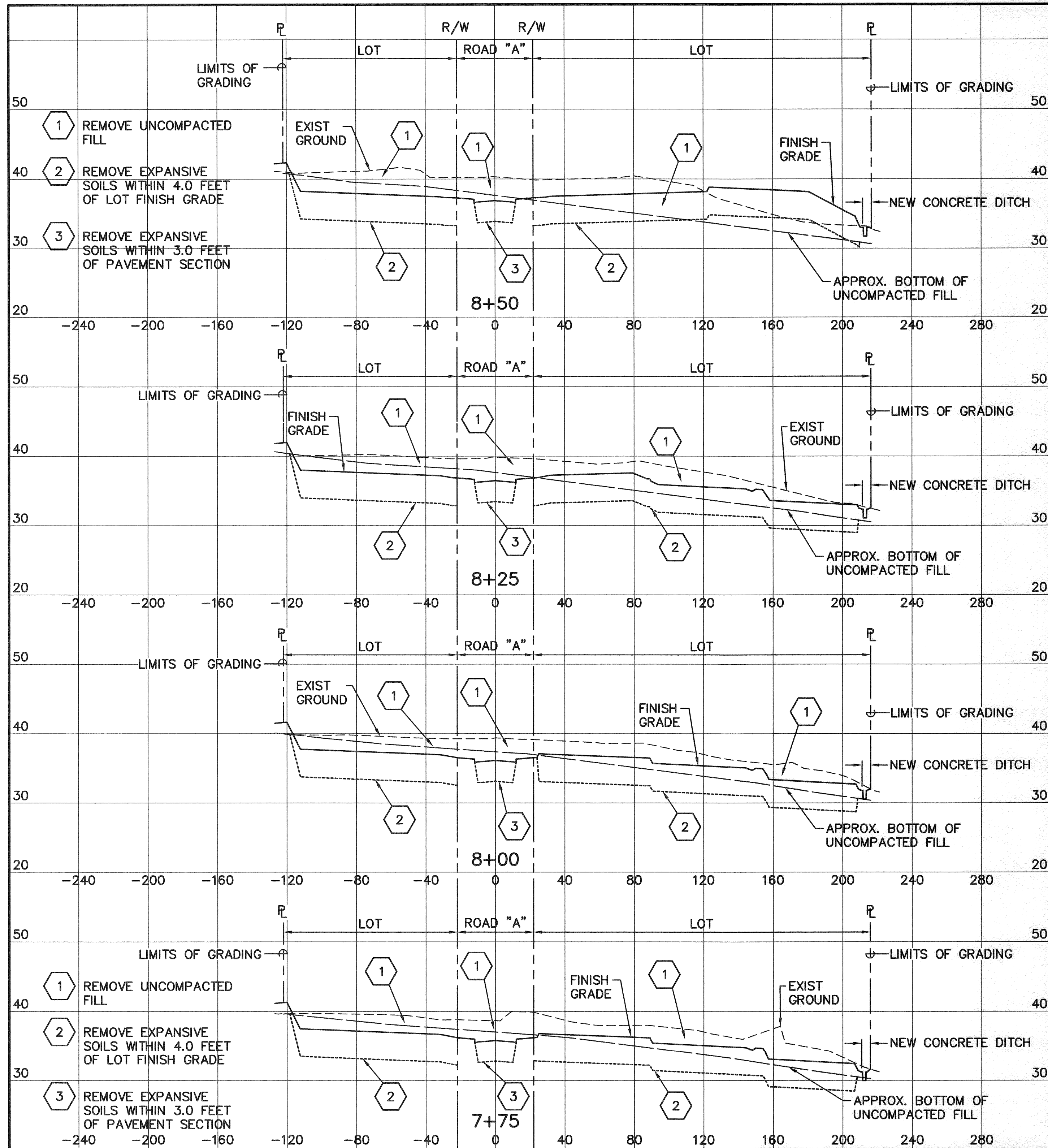
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Plotted on: 2/2/2012
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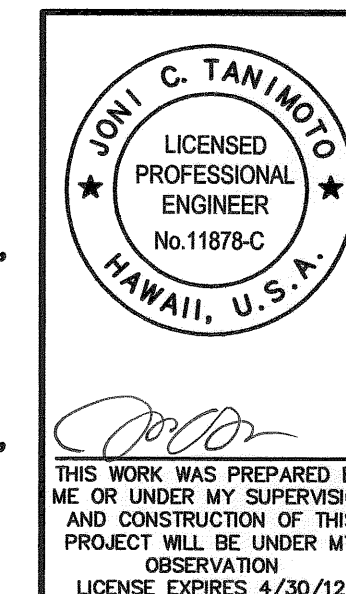
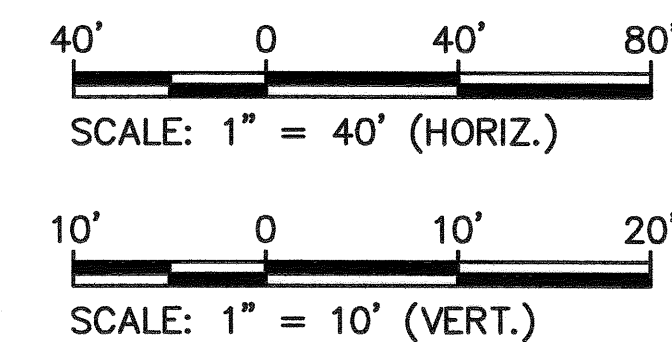
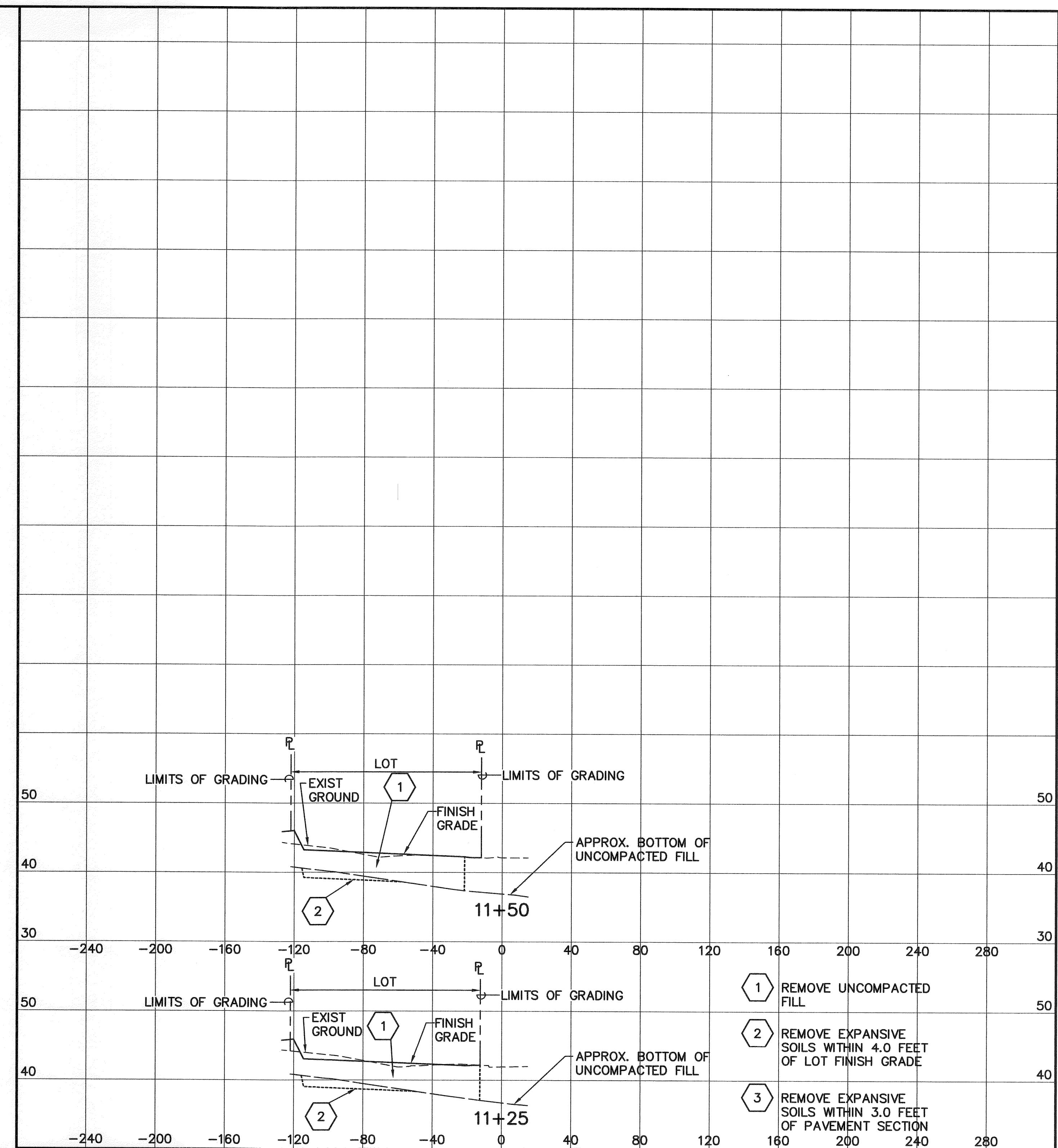
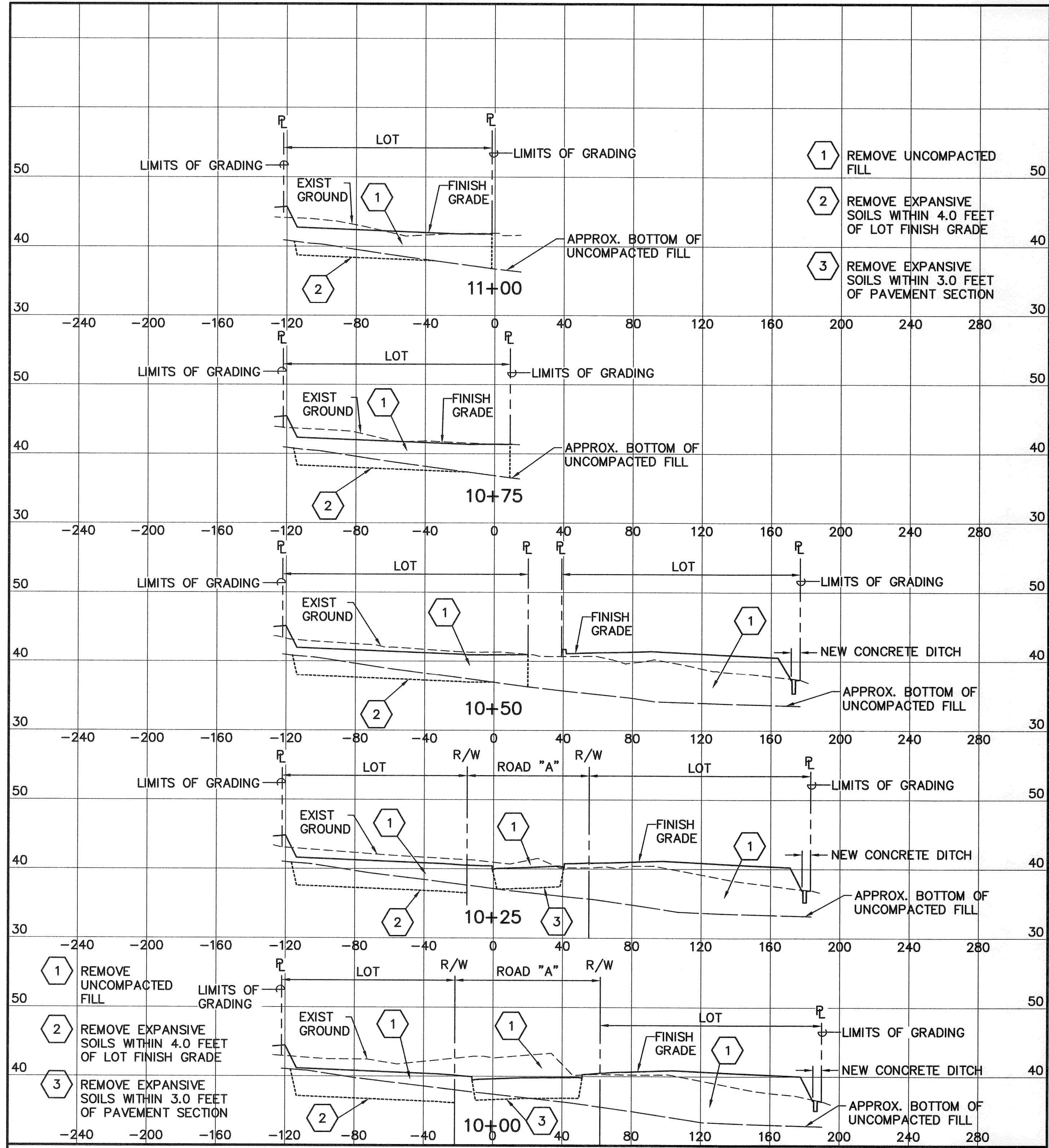
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
CROSS SECTIONS STA. 5+25 TO 7+50			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

Last Save by: MSM
Last Saved: 12/28/2011
Plotted on: 2/2/2012
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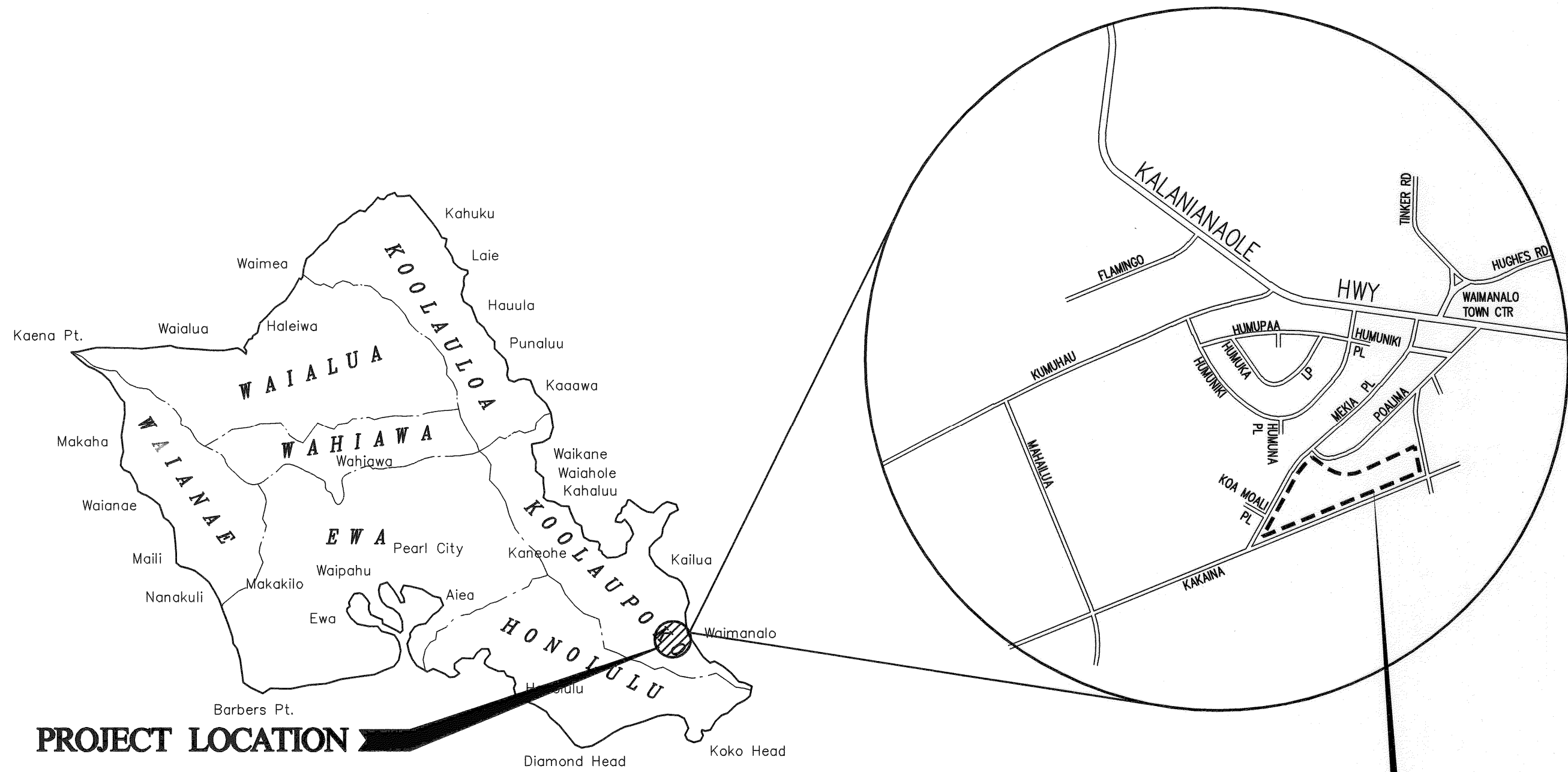


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CROSS SECTIONS STA. 7+75 TO 9+75			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

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Plotted on: 2/2/2012
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REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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CROSS SECTIONS STA. 10+00 TO 11+50			
APPROVED: _____ DATE: _____			
CHIEF, CIVIL ENGINEERING BRANCH, DPP			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



ISLAND MAP
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 3' MINIMUM HORIZONTAL CLEAR & 6" VERTICAL CLEAR BETWEEN WATER LINES & ALL ELECTRICAL SYSTEMS.
7. PROVIDE 12" MINIMUM HORIZONTAL CLEAR & 6" VERTICAL CLEAR BETWEEN DRAIN LINES & ALL ELECTRICAL SYSTEMS.
8. 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 (DOSH).
- 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 CITY AND COUNTY OF HONOLULU, 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.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	STREET LIGHT, 100W HIGH PRESSURE SODIUM, CUT-OFF LUMINAIRE, GALVANIZED STEEL POLE & BRACKET ARM, SEE DETAIL A/E-15		HECO 13' X 24' PULLBOX
	STREET LIGHT, 70W HIGH PRESSURE SODIUM, CUT-OFF LUMINAIRE, GALVANIZED STEEL POLE & BRACKET ARM, SEE DETAIL A/E-15		HECO 17' X 30' PULLBOX
	STREET LIGHT, 100W HIGH PRESSURE SODIUM, CUT-OFF LUMINAIRE & GALVANIZED BRACKET ARM MOUNTED ON UTILITY POLE, SEE DETAILS SHEET E-17		HECO 2' X 4' PULLBOX
	STREET LIGHT, 70W HIGH PRESSURE SODIUM, CUT-OFF LUMINAIRE & GALVANIZED BRACKET ARM MOUNTED ON UTILITY POLE, SEE DETAILS SHEET E-17		HECO 3' X 5' HANDHOLE
	EXST. STREET LIGHT, 70W HIGH PRESSURE SODIUM LUMINAIRE		HECO 4' X 6' HANDHOLE
	EXST. STREET LIGHT, 100W HIGH PRESSURE SODIUM LUMINAIRE		HECO 6' X 11' MANHOLE
	EXST. STREET LIGHT, 100W HIGH PRESSURE SODIUM LUMINAIRE, MOUNTED ON UTILITY POLE		EXST. HECO HANDHOLE
	EXST. STREET LIGHT, 70W HIGH PRESSURE SODIUM LUMINAIRE, MOUNTED ON UTILITY POLE		EXST. HECO MANHOLE
	GROUND ROD, 5/8" DIA. X 8'-0" (BMZ)		SIC 13' X 24' HANDHOLE
	BREAKLINE TO BEGIN & END DUCT SECTION TYPE		SIC 30' X 48' MANHOLE
	ELECTRIC/SIGNAL DUCTLINE WITH DESIGNATORS; INDICATES TYPE "A" DUCT SECTION WITH "2-2E" DUCTS. SEE SHEETS E-10, & E-11 FOR DUCT SECTIONS AND SHEET E-12 FOR CONDUIT SCHEDULE		SIC 3' X 5' HANDHOLE
	STUB, CAP, & MARK CONDUIT(S) WITH CONCRETE MARKER, SEE DETAIL B/E-12		EXST. SIC 3' X 5' MANHOLE
	SAWCUT EXST. A.C. PAVEMENT, CONC. SIDEWALK, CURB & GUTTER PRIOR TO TRENCH EXCAVATION. RESTORE SUBBASE, BASECOURSE, PAVEMENT, CONC. SIDEWALK, CURB & GUTTER PER CITY REQUIREMENTS, THICKNESS SHALL MATCH EXST ROAD DESIGN		CATV 2' X 4' PULLBOX
	STREET LIGHT DUCTS & WIRING		CATV 3' X 5' HANDHOLE
	TRAFFIC SIGNAL DUCT & PULLWIRE		EXST. CATV HANDHOLE
	EXST. UNDERGROUND DUCTLINE & WIRING		EXST. HECO MANHOLE
	EXST. UNDERGROUND TEL. CABLES		TYPE 'A' STREET LIGHT PULLBOX, SEE DETAIL A/E-16
	EXST. UNDERGROUND STREET LIGHT CABLES & CONDUITS		HECO TRANSFORMER PAD LOT, SEE DETAIL C/E-13
	EXST. UNDERGROUND TRAFFIC SIGNAL CONDUITS		HECO SWITCHING EASEMENT PAD LOT, SEE DETAIL A/E-12
	EXST. UNDERGROUND SECONDARY POWER CABLES AND CONDUIT		EXST. HECO XFMR EASEMENT PAD LOT
	NON-METERED STREET LIGHT I.D. TAG, 43 = AREA CODE NO., 888 = LIGHT NO., 66 = POLE NO., SEE DET D/E-15		EXST. HECO SWITCHING EASEMENT PAD LOT
	NON-METERED WOOD POLE STREET LIGHT I.D. TAG, 20 = AREA CODE NO., 999 = LIGHT NO., 77 = POLE NO., SEE DET B/E-16		
	UTILITY POLE PROVIDED BY HECO		
	EXISTING UTILITY POLE		
	UTILITY POLE TO BE REMOVED BY RESPECTIVE UTILITY CO.		
	ELECTRIC/COMMUNICATION OVERHEAD LINES PROVIDED BY RESPECTIVE UTILITY CO.		CONCRETE STUB OUT MARKER, SEE DETAIL B/E-12
	EXST. ELECTRIC/COMMUNICATION OVERHEAD LINES		CATV POWER SUPPLY EQUIP., 6' X 6' EASEMENT, SEE DETAIL B/E-14
	EXST. ELECTRIC/COMMUNICATION OVERHEAD LINES TO BE REMOVED BY RESPECTIVE UTILITY CO.		NOTE SYMBOL, SEE PLAN FOR NOTES
	ANCHOR GUYING PROVIDED BY UTILITY CO.		
	EXST. ANCHOR GUYING		
	EXST. ANCHOR GUYING TO BE REMOVED BY RESPECTIVE UTILITY CO.		

APPROVED BY:

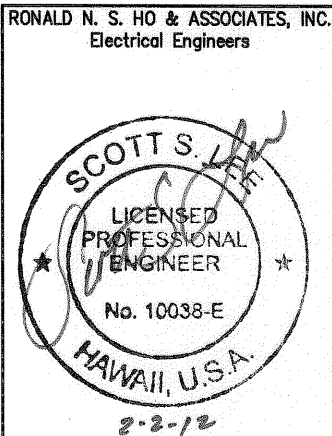
HAWAIIAN ELECTRIC COMPANY, INC. DATE

HAWAIIAN TELCOM DATE

OCEANIC TIME WARNER CABLE DATE

CHIEF, MECHANICAL/ELECTRICAL DIVISION
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU DATE

CHIEF, TRAFFIC REVIEW BRANCH
DEPT. OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU DATE



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LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
ELECTRICAL SYMBOLS, MAPS, NOTES			
Approved:		2-1-12	
SANDWICH ISLES COMMUNICATIONS		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

HAWAIIAN ELECTRIC COMPANY (HECO) NOTES

1. LOCATION OF HECO FACILITIES

THE LOCATION OF HECO'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 HECO'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 HECO'S TECHNICAL DIVISION (543-5654) LOCATED AT 820 WARD AVENUE, 4TH FLOOR, TWO WEEKS PRIOR TO STARTING CONSTRUCTION. PLEASE REFER TO OUR REQUEST NUMBER AT THAT TIME.

4. CAUTION!!! ELECTRICAL HAZARD!!!

EXISTING HECO OVERHEAD AND UNDERGROUND LINES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION UNLESS PRIOR SPECIAL ARRANGEMENTS HAVE BEEN MADE WITH HECO. ONLY HECO 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 HECO 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 ENCR OACH WITHIN THE MINIMUM REQUIRED CLEARANCE AT ANY TIME, THE CONTRACTOR SHALL NOTIFY HECO AT LEAST FOUR (4) WEEKS PRIOR TO THE PLANNED ENCR OACHMENT SO THAT, IF FEASIBLE, THE NECESSARY PROTECTIONS (E.G. RELOCATE, DE- ENERGIZE, OR BLANKET HECO LINES) CAN BE PUT IN PLACE. HECO'S COST OF SAFEGUARDING ITS LINES WILL BE CHARGED TO THE CONTRACTOR.

CONTACT HECO'S CUSTOMER INSTALLATIONS DEPARTMENT AT 543-7846 FOR ASSISTANCE IN IDENTIFYING AND SAFEGUARDING OVERHEAD POWER LINES.

REFER TO SECTION X OF HECO'S ELECTRIC SERVICE INSTALLATION MANUAL FOR ADDITIONAL GUIDELINES WHEN WORKING AROUND HECO'S FACILITIES. A COPY MAY BE OBTAINED FROM HECO'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 HECO BEFORE IMPLEMENTATION. FOR POLE BRACING INSTRUCTIONS, THE CONTRACTOR SHALL CALL THE HECO CONSTRUCTION AND MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT AT 543-4223 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. HECO'S EXISTING ELECTRICAL CABLES ARE ENERGIZED AND WILL REMAIN ENERGIZED DURING CONSTRUCTION. ONLY HECO PERSONNEL ARE TO BREAK INTO EXISTING HECO FACILITIES, HANDLE THESE CABLES, AND ERECT TEMPORARY GUARDS TO PROTECT THESE CABLES FROM DAMAGE. THE COST OF HECO'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 HECO'S 138KV UNDERGROUND LINES (SEE HECO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HECO'S UNDERGROUND 138KV LINES" FOR DETAILED REQUIREMENTS).

FOR VERIFICATION OF UNDERGROUND LINES, THE CONTRACTOR SHALL CALL HECO'S UNDERGROUND DIVISION AT 543-7049 A MINIMUM OF 72 HOURS IN ADVANCE.

FOR ASSISTANCE IN PROVIDING PROPER SUPPORT AND PROTECTION OF THESE LINES, THE CONTRACTOR SHALL CALL HECO'S CONSTRUCTION & MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT, AT 543-4223, 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 HECO'S UNDERGROUND FUEL OIL PIPELINES. SPECIAL PRECAUTIONS ARE REQUIRED WHEN EXCAVATING NEAR HECO'S UNDERGROUND FUEL OIL PIPELINES (SEE HECO INSTRUCTIONS TO CONSULTANTS/CONTRACTORS ON "EXCAVATION NEAR HECO'S UNDERGROUND FUEL PIPELINES" FOR DETAILED REQUIREMENTS).

9. EXCAVATIONS

WHEN TRENCH EXCAVATION IS ADJACENT TO OR BENEATH HECO'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR IS RESPONSIBLE FOR:

- a) 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.
- b) PROPERLY SUPPORTING EXISTING STRUCTURES OR FACILITIES WITH BEAMS, STRUTS, OR UNDER-PINNINGS TO FULLY PROTECT IT FROM DAMAGE.
- c) BACKFILLING WITH PROPER BACKFILL MATERIAL INCLUDING SPECIAL THERMAL BACKFILL WHERE EXISTING (REFER TO ENGINEERING DEPARTMENT FOR THERMAL BACKFILL SPECIFICATIONS).

10. RELOCATION OF HECO FACILITIES

ANY WORK REQUIRED TO RELOCATE OR MODIFY HECO FACILITIES SHALL BE DONE BY HECO, OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION, AND SHALL PROVIDE NECESSARY SUPPORT FOR HECO'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 HECO'S FACILITIES NOT SHOWN ON THE PLANS MAY BE CAUSE FOR LENGTHY DELAYS. THE CONTRACTOR ACKNOWLEDGES THAT HECO 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 HECO'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, HECO SHOULD BE NOTIFIED IMMEDIATELY UPON DISCOVERY OR IDENTIFICATION OF SUCH CONFLICT.

12. DAMAGE TO HECO FACILITIES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HECO SURFACE AND SUBSURFACE UTILITIES AND SHALL BE RESPONSIBLE FOR ANY DAMAGES TO HECO'S FACILITIES AS A RESULT OF HIS OPERATIONS. THE CONTRACTOR SHALL IMMEDIATELY REPORT SUCH DAMAGES TO HECO'S TROUBLE DISPATCHER AT 548-7961. REPAIR WORK SHALL BE DONE BY HECO OR BY THE CONTRACTOR UNDER HECO'S SUPERVISION COSTS FOR DAMAGES TO HECO'S FACILITIES SHALL BE BORNE BY THE CONTRACTOR.

IN CASE OF DAMAGE OR SUSPECTED DAMAGE TO HECO'S FUEL PIPELINE, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY HECO'S HONOLULU POWER PLANT SHIFT SUPERVISOR AT 533-2102 (A 24-HOUR NUMBER) SO HECO 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. HECO STAND-BY PERSONNEL

THE CONTRACTOR MAY REQUEST HECO TO PROVIDE AN INSPECTOR TO STAND-BY DURING CONSTRUCTION NEAR HECO'S FACILITIES. THE COST OF SUCH INSPECTION WILL BE CHARGED TO THE CONTRACTOR.

THE CONTRACTOR SHALL CALL THE HECO CONSTRUCTION AND MAINTENANCE DEPT., CUSTOMER & SYSTEM SUPERINTENDENT AT 543-4223 A MINIMUM OF 5 WORKING DAYS IN ADVANCE TO ARRANGE FOR HECO STAND-BY PERSONNEL.

14. CLEARANCES

THE FOLLOWING CLEARANCES SHALL BE MAINTAINED BETWEEN HECO'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 CLERANCE 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 & HECO 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 HECO'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 HECO 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 HECO.

16. SCHEDULE

CONTRACTOR SHALL FURNISH HIS CONSTRUCTION SCHEDULE ___ WORKING DAYS PRIOR TO STARTING WORK ON HECO FACILITIES. CONTRACTOR SHALL GIVE HECO, IN WRITING ___ WORKING DAYS NOTICE TO PROCEED WITH HECO'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 HECO'S UNDERGROUND FACILITIES SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST REVISIONS OF HECO SPECIFICATIONS CS7001, CS7003, CS7202, CS9301, AND CS9401 AND APPLICABLE HECO 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 HECO PRIOR TO EXCAVATION AND PRIOR TO PLACING CONCRETE. CONTRACTOR SHALL NOTIFY HECO'S INSPECTION DIVISION AT 543-4356 AT LEAST 48 HOURS PRIOR TO PLACING CONCRETE.

CONTRACTOR TO COORDINATE WORK TO BREAK INTO HECO'S EXISTING ELECTRICAL FACILITIES WITH HECO'S UNDERGROUND DIVISION AT 543-7871 AT LEAST 10 WORKING DAYS IN ADVANCE.

20. STAKEOUT

THE CONTRACTOR SHALL ARRANGE FOR TONEOUTS OF ALL UNDERGROUND FACILITIES AND SHALL STAKEOUT ALL PROPOSED HECO 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 HECO BEFORE PROCEEDING WITH HECO 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 HECO'S INSPECTOR USING HECO'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.

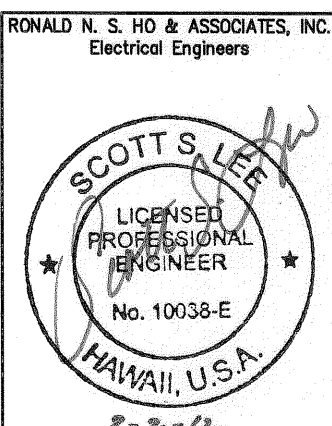
23. AS-BUILT PLANS

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

APPROVED BY:

HAWAIIAN ELECTRIC COMPANY, INC.

DATE



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION LICENSE EXPIRES 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
HECO NOTES			
Approved: _____			
DATE _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

FILE	POCKET	FOLDER	NO.

HAWAIIAN TELCOM (HTCO) NOTES

1.

THE CONTRACTOR SHALL PROCURE AND PAY FOR ALL LICENSES AND PERMITS AND SHALL GIVE ALL NOTICES NECESSARY AND INCIDENT TO THE DUE AND LAWFUL PROSECUTION OF THE WORK.
2.

THE CONTRACTOR SHALL OBTAIN AN EXCAVATION PERMIT AND TONING REQUEST FROM HAWAIIAN TELCOM'S EXCAVATION PERMIT SECTION. THE EXCAVATION DESK HAS DROP-OFF/PICK-UP SERVICE ONLY. COUNTER SERVICE IS NOT AVAILABLE. DROP-OFF/PICK-UP LOCATION IS 1177 BISHOP STREET, SECURITY DEPARTMENT LOCATED ON ADAMS LANE. DROP-OFF/PICK-UP HOURS ARE 8:00A.M. TO 11:00A.M. AND 1:00P.M. TO 4:00P.M. MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS. AT TIME OF DROP-OFF, THE CONTRACTOR MUST:

A)

PROVIDE A COPY OF YOUR STATE, CITY & COUNTY OR MILITARY TRENCHING PERMIT APPLICATION FORM (NOTE: IF YOU ARE EXCAVATING ON PRIVATE PROPERTY, THIS FORM IS NOT REQUIRED).

B)

PROVIDE 3 COPIES OF SITE PLANS, PREFERABLY HALF-SIZE (11"x17"), AND

C)

COMPLETED AND SIGNED HAWAIIAN TELCOM DROP-OFF FORM. THIS FORM IS AVAILABLE AT WWW.HAWAIIANTEL.COM/CUSTOMERSERVICE_EXCAVATION.HTM

D)

CONTRACTORS SHOULD SUBMIT DRAWINGS A MINIMUM OF 2 WEEKS PRIOR TO THE START OF CONSTRUCTION TO ALLOW ADEQUATE TIME FOR REVIEW OF THE PLANS PROVIDED.
3.

PRIOR TO THE EXCAVATION OF THE DUCTLINE, THE CONTRACTOR SHALL REQUEST HAWAIIAN TELCOM TO LOCATE EXISTING DUCTLINE WHEREVER REQUIRED. FOR UNDERGROUND CABLE LOCATING AND MARKING, FIVE (5) WORKING DAYS ADVANCE NOTICE IS REQUIRED FOR ANY INSPECTION BY A DESIGNATED REPRESENTATIVE.
4.

THE LOCATION OF EXISTING UTILITIES ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION AND SHALL MAINTAIN PROPER CLEARANCES WHENEVER CONSTRUCTION CROSSES OR IS IN CLOSE PROXIMITY OF HAWAIIAN TELCOM FACILITIES. THE CONTRACTOR SHALL VERIFY THEIR LOCATION AND SHALL BE LIABLE FOR ANY DAMAGES TO HAWAIIAN TELCOM FACILITIES. ANY DAMAGES SHALL BE REPORTED IMMEDIATELY TO HAWAIIAN TELCOM'S REPAIR SECTION AT #611 (24 HOURS) OR TO THE EXCAVATION PERMIT SECTION AT 546-7746 (NORMAL WORKING HOURS, MONDAY THROUGH FRIDAY, EXCEPT HOLIDAYS). AS A RESULT OF HIS OPERATIONS, ADJUSTMENTS TO THE NEW DUCTLINE ALIGNMENT, IF REQUIRED, SHALL BE MADE TO PROVIDE REQUIRED CLEARANCES.
5.

THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTION NOT TO DAMAGE EXISTING CABLES OR DUCTS. A HAWAIIAN TELCOM INSPECTOR OR DESIGNATED REPRESENTATIVE IS REQUIRED TO BE AT ANY JOB SITE WHENEVER THERE WILL BE BREAKAGE INTO OR ENTRY INTO ANY STRUCTURE THAT CONTAIN HAWAIIAN TELCOM FACILITIES. TEMPORARY CABLE AND DUCT SUPPORTS SHALL BE PROVIDED WHENEVER NECESSARY.
6.

THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM'S INSPECTOR OR DESIGNATED REPRESENTATIVE A MINIMUM OF 72 HOURS PRIOR TO EXCAVATION, BRACING OR BACKFILLING OF HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
7.

ALL APPLICABLE CONSTRUCTION WORK SHALL BE DONE IN ACCORDANCE WITH THE "HAWAIIAN TELCOM STANDARD SPECIFICATIONS FOR PLACING TELEPHONE SYSTEMS" DATED JANUARY 2007. ALL SUBSEQUENT AMENDMENTS AND ADDITIONS, AND ALL OTHER PERTINENT STANDARDS FOR TELEPHONE CONSTRUCTION. CONTRACTOR SHALL FAMILIARIZE HIS PERSONNEL BY OBTAINING APPLICABLE SPECIFICATIONS.
8.

WHEN EXCAVATION IS ADJACENT TO OR BENEATH HAWAIIAN TELCOM'S EXISTING STRUCTURES OR FACILITIES, THE CONTRACTOR SHALL:

A)

SHEET AND/OR BRACE THE EXCAVATION TO PREVENT SLIDES, CAVE-INS OR SETTLEMENT ENSURING NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.

B)

PROTECT EXISTING STRUCTURES AND/OR FACILITIES WITH BEAMS, STRUTS OR UNDERPINNINGS WHILE EXCAVATING BENEATH THEM TO ENSURE NO MOVEMENT TO HAWAIIAN TELCOM'S STRUCTURES OR FACILITIES.
9.

THE CONTRACTOR SHALL BRACE ALL POLES OR LIGHT STANDARDS NEAR THE NEW DUCTLINE, MANHOLE, OR HANDHOLE DURING HIS OPERATIONS.
10.

THE CONTRACTOR SHALL SAW-CUT A.C. PAVEMENT AND CONCRETE GUTTER WHEREVER NEW MANHOLES, HANDHOLES, OR DUCTLINES ARE TO BE PLACED AND SHALL RESTORE TO EXISTING CONDITION OR BETTER.
11.

THE CONTRACTOR SHALL COMPLY WITH THE POLICY ADOPTED BY THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, CONCERNING THE REPLACEMENT OF CONCRETE SIDEWALKS AFTER EXCAVATION WORK.
12.

THE UNDERGROUND PIPES, CABLES OR DUCTLINES KNOWN TO EXIST BY THE ENGINEER FROM HIS SEARCH OF RECORDS ARE INDICATED ON THE PLANS. THE CONTRACTOR SHALL VERIFY THE LOCATIONS AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THE AREA. WHEREVER CONNECTIONS OF NEW UTILITIES TO EXISTING UTILITES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINE AT THE PROPOSED CONNECTIONS TO VERIFY THEIR LOCATONS AND DEPTH PRIOR TO EXCAVATION FOR THE NEW LINES.
13.

WHEREVER CONNECTIONS TO EXISTING UTILITIES ARE SHOWN ON THE PLANS, THE CONTRACTOR SHALL EXPOSE THE EXISTING LINES PRIOR TO EXCAVATION OF THE MAIN TRENCHES TO VERIFY THEIR LOCATIONS AND DEPTHS.
14.

THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE COST FOR SUPPLEMENTARY MEASURES, WHICH WILL BE REQUIRED BY THE CITY AND COUNTY, SHALL BE BORNE BY THE CONTRACTOR.
15.

THE CONTRACTOR SHALL PUMP ALL MANHOLES DRY DURING FINAL INSPECTION.
16.

THE CONTRACTOR SHALL NOTIFY HAWAIIAN TELCOM INSPECTOR 24 HOURS PRIOR TO POURING OF CONCRETE OR BACKFILLING.

17.

WHEN CONNECTING TO MANHOLE WALLS, ALL EXISTING REINFORCING BARS SHALL BE LEFT INTACT. DUCTS SHALL BE ADJUSTED IN THE FIELD IN ORDER TO CLEAR REINFORCING.
18.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LAYING OUT ALL REQUIRED LINES AND GRADES AND SHALL PRESERVE ALL BENCH MARKS AND WORKING POINTS NECESSARY TO LAY OUT THE WORK CORRECTLY. THE NEW DUCTLINE SHALL BE ADJUSTED BY THE CONTRACTOR TO SUIT THE EXISTING CONDITIONS AND THE DETAILS AS DESCRIBED IN THE PLANS.
19.

MINIMUM CONCRETE STRENGTH SHALL BE:

FOR DUCTLINE

2500 PSI AT 28 DAYS

FOR MANHOLE

3000 PSI AT 28 DAYS OR AS SPECIFIED IN DESIGN NOTES
20.

BENDS IN THE DUCT ALIGNMENT, DUE TO CHANGES IN GRADE SHALL HAVE A MINIMUM RADIUS OF 25 FEET. ALL 90 DEGREE C-BENDS AT A POLE OR AT THE BUILDING FLOOR SLAB PENETRATION, SHALL HAVE A BEND RADIUS OF TEN TIMES THE DIAMETER OF THE DUCT OR GREATER.
21.

AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL WITH A SQUARE FRONT NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF 1/4" LESS THAN THE INSIDE DIAMETER OF THE DUCT, SHALL BE PULLED THROUGH EACH DUCT AFTER WHICH A BRUSH WITH STIFF BRISTLES SHALL BE PULLED THROUGH TO MAKE CERTAIN THAT NO PARTICLES OF EARTH, SAND OR GRAVEL HAVE BEEN LEFT INSIDE. DUCTS SHALL BE COMPLETELY DRY AND CLEAN.
22.

ALL DUCTS AND CONDUITS SHALL HAVE AN 1800# POLYESTER MULE-TAPE (NEPTCO, WP1800P, HAWAIIAN TELCOM MATERIAL CODE NO. 571154) INSTALLED THROUGHOUT ITS ENTIRE LENGTH. ALL DUCTS SHALL BE CAPPED TO PREVENT ENTRY OF FOREIGN MATERIAL DURING CONSTRUCTION AND AT THE COMPLETION OF INSTALLATION.

OCEANIC TIME WARNER CABLE NOTES

1.

THE LOCATION OF CATV FACILITIES ARE BASICALLY WITHIN EXISTING CATV CONDUITS. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN CLOSE PROXIMITY OF CATV FACILITIES.
2.

THE CONTRACTOR SHALL OBTAIN EXCAVATION PERMIT CLEARANCE FROM OCEANIC TIME WARNER CABLE'S ENGINEERING SECTION LOCATED AT 200 AKAMAINUI ST., MILILANI TECH. PARK. PHONE 625-8443.
3.

ANY WORK REQUIRED TO RELOCATE CATV FACILITIES SHALL BE DONE BY OCEANIC TIME WARNER CABLE AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COORDINATION REQUIREMENTS AND ASSOCIATED APPLICABLE COSTS.
4.

ANY DAMAGE TO CATV FACILITIES SHALL BE REPORTED IMMEDIATELY TO OCEANIC TIME WARNER CABLE'S REPAIR DISPATCH DEPARTMENT AT 625-8437.
5.

CONTACT OCEANIC TIME WARNER CABLE INSPECTOR 72 HOURS PRIOR TO STARTING WORK ON CATV INFRASTRUCTURE. CALL MOKI PLACE AT 625-8378.
6.

ALL CONDUITS SHALL ENTER THROUGH THE END OF THE PULLBOX AT 90 DEGREES TO THE WALL OF PULLBOX.
7.

ALL ENTRANCES INTO THE PULLBOX SHALL BE GROUTED AROUND THE CONDUITS AND THE INSIDE SURFACES SHALL BE SMOOTH AND FLUSH WITH THE EXISTING WALL.
8.

ALL 4" CONDUITS SHALL HAVE MULETAPE AND ALL OTHER SIZE CONDUITS SHALL HAVE PULLSTRING.
9.

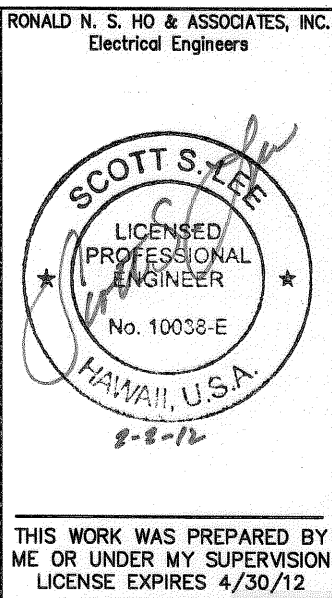
END BELS ARE REQUIRED ON ALL 4" AND 2" CONDUITS.
10.

AFTER DUCTLINE HAS BEEN COMPLETED, A MANDREL NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF 1/4" LESS THAN THE INSIDE DIAMETER OF DUCT SHALL BE PULLED THROUGH EACH DUCT.

APPROVED BY:

HAWAIIAN TELCOMDATE

OCEANIC TIME WARNER CABLEDATE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS			
KAKAINA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
HTCO & OCEANIC NOTES			
Approved:			
DATE			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

SANDWICH ISLES COMMUNICATIONS' NOTES
September 14, 2011

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 (HTTP://WWW.RURDEV.USDA.GOV/RUSTELECOMPROGRAMS.HTML) 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.

ALL WORK SHALL BE COORDINATED AND SCHEDULED WITH SIC AND/OR IT'S REPRESENTATIVE AND ANY OTHER AGENCY INVOLVED WITH THE PROJECT.

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

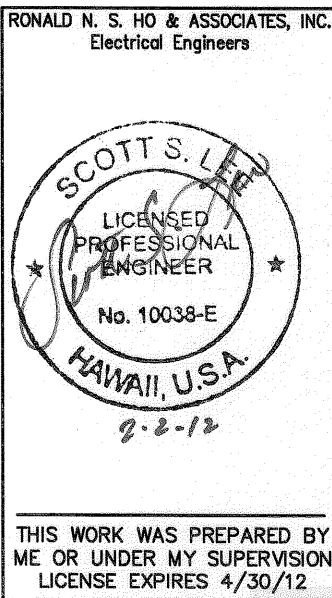
CONDUITS:

- ALL PVC CONDUITS, SWEEPS, COUPLINGS, ADAPTERS AND BELL ENDS SHALL BE SCHEDULE 40, UNLESS OTHERWISE SPECIFIED.
- ALL HIGH DENSITY POLYETHYLENE CONDUITS SHALL BE SDR 11. TYPICAL 4-PACK UNIT INCLUDES FOUR 1-1/2" SDR 11 RATED CONDUITS IN THE COLORS OF BLACK, RED, ORANGE, AND WHITE, 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 ETOC SPECIALTY PRODUCTS, INC.
- MAIN CONDUIT RUNS, EXCEPT RISER CONDUITS, SHALL BE CONSTRUCTED WITH MINIMUM 6-FOOT RADIUS CURVES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID MANDREL NOT LESS THAN 12" IN LENGTH AND HAVING A DIAMETER OF ∞" LESS THAN THE INSIDE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT. SUFFIXES LISTED IN RUS 515B FOR CONDUITS ARE APPLICABLE.
- INSTALL MULETAPE IN ALL PVC CONDUITS AND CAP ALL CONDUITS AFTER TESTING. THE NEPTCO (OR APPROVED EQUAL) MULETAPE 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. MULETAPE WILL NOT BE INSTALLED IN CONDUITS DESIGNATED FOR FIBER.
- ALL 4" DUCTS SHALL HAVE WATERTIGHT PLUGS TO KEEP THEM FREE OF MOISTURE & DEBRIS AND TO ACCOMMODATE CABLING PLACED ON FUTURE PROJECTS.
4" PLUGS SHALL CONSIST OF:
TYCO, QUADPLEX JACKMOON PLUGS, SERIES 136
TYCO, JACKMOON HOLE PLUGS & BUSHINGS, SERIES 136
ALL OTHER DUCTS SHALL HAVE TYCO, BLANK JACKMOON PLUGS TO KEEP THEM FREE OF WATER AND DEBRIS.
- CONDUIT STUBS FROM HANDHOLES TO INDIVIDUAL RESIDENTIAL LOTS SHALL BE SCHEDULE 40 PVC, 1" DIAMETER AND EXTENDED 5' BEYOND PROPERTY LINE. CAP AND SEAL END AND MARK LOCATIONS WITH ABOVE GROUND MARKER.
- 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" 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 ENGINEER.
- 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 ENGINEER.
- BACKFILL AND COMPACTION FOR DUCTLINE TRENCHES, MANHOLES AND HANDHOLES SHALL BE IN ACCORDANCE WITH:
 - 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.
 - THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 1986, 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

- BACKFILLING SHALL BE SUBJECT TO THE APPROVAL OF THE SIC INSPECTOR, 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.
- 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.
- 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.
 - TYPE A BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1" AND MIXTURE SHALL NOT CONTAIN MORE THAN 20 % BY VOLUME OF ROCK PARTICLES.
 - TYPE B BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1/2" AND MIXTURE SHALL NOT CONTAIN MORE THAN 20 % BY VOLUME OF ROCK PARTICLES.
- ALL CONDUIT RUNS SHALL HAVE A 3" NON-METALLIC WARNING TAPE PLACED 12 INCHES ABOVE THE CONDUIT RUN. THE TAPE SHALL READ "CAUTION BURIED FIBER OPTIC CABLE BELOW".

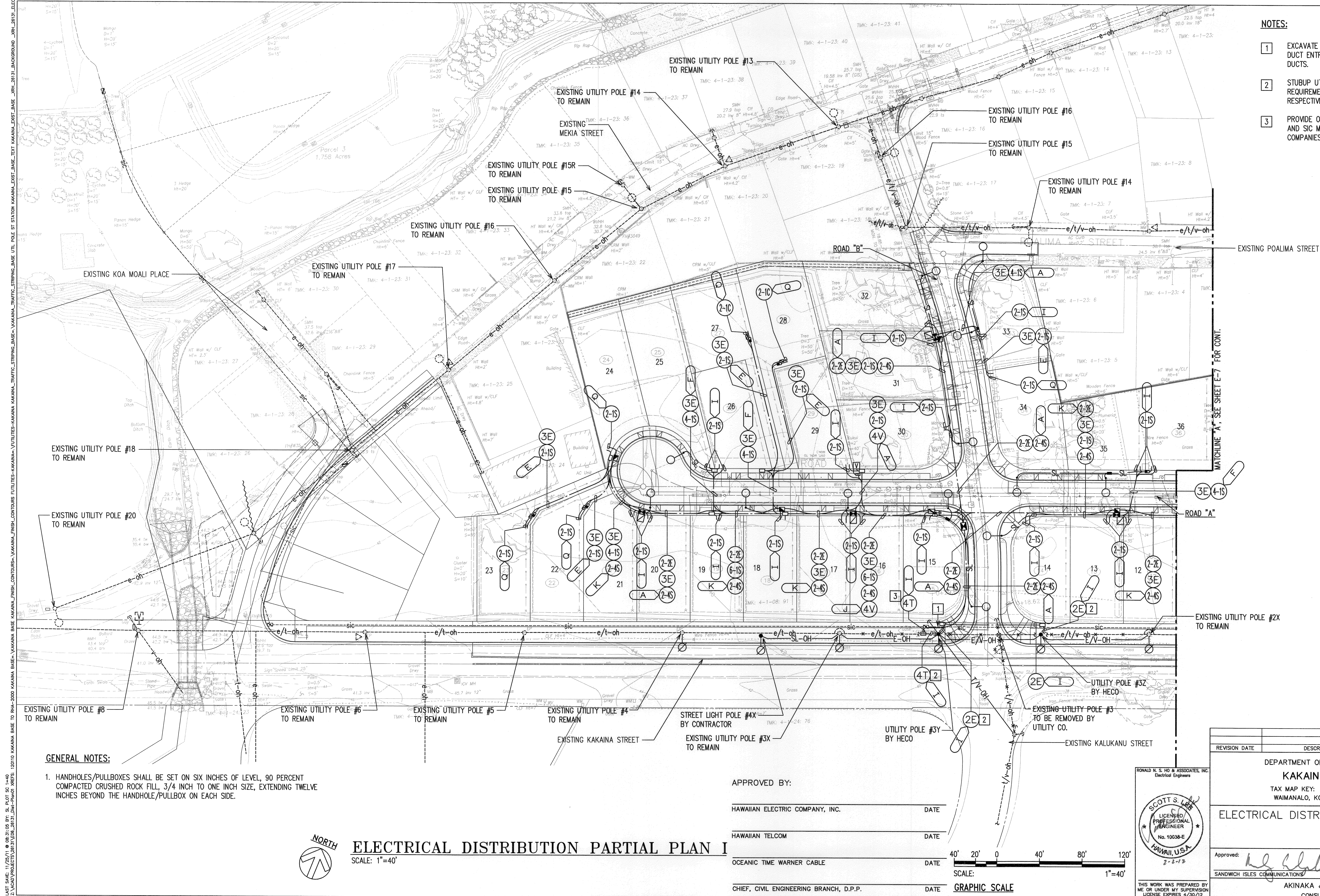
MANHOLES AND HANDHOLES:

- ALL MANHOLES SHALL HAVE HS20-44 TRAFFIC LOADING COVERS (UNLESS OTHERWISE NOTED). HANDHOLES SHALL HAVE 20K TRAFFIC LOAD RATED COVERS.
- ALL MANHOLE AND HANDHOLE COVERS SHALL HAVE COVER LOGO TO READ "SIC".
- ALL MANHOLE AND HANDHOLE COVER BOLTS SHALL BE STAINLESS STEEL U" PENTAHEAD, UNLESS OTHERWISE NOTED.
- ALL MANHOLES AND HANDHOLES ARE SPECIFIED AS FOLLOWS:
 - UM35 AND UM4X6 MANHOLE ASSEMBLY UNITS - HAWAII PRECAST, INC. AS PER MASTER PURCHASE AGREEMENT.
 - UHC30X48X33 HANDHOLE (PULLBOX) ASSEMBLY UNIT. THIS UNIT SHALL CONSIST OF ONE TWO TIER ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001430TA-SIC4) OR EQUIVALENT.
 - UHC13X24X36 HANDHOLE (PULLBOX) ASSEMBLY UNIT. THIS UNIT SHALL CONSIST OF ONE ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001946TA-SIC2) OR EQUIVALENT.
 - UH35 AND UH4X6 HANDHOLE ASSEMBLY UNITS - HAWAII PRECAST, INC. AS PER MASTER PURCHASE AGREEMENT.
- ALL MANHOLES AND HANDHOLES TO BE ORDERED WITH ALL HARDWARE, INCLUDING CABLE RACKS, STEPS AND LOCKS.
- SET MANHOLE OR HANDHOLE ON A LEVEL AREA, IN THE BOTTOM OF THE EXCAVATION, ON A 4" LAYER OF CRUSHED ROCK, FOR DRAINAGE PURPOSES.
- 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.
- BEFORE BACKFILLING AND COMPACTING, MAKE SURE COVERS ARE IN PLACE AND SECURE. LAYER 6" TO 8" 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.
- THE TOPS OF ALL MANHOLES AND HANDHOLES SHALL BE FLUSH TO GRADE IN PAVED AREAS OR 1" ABOVE FINISH GRADE IN NON-PAVED AREAS, UNLESS OTHERWISE SPECIFIED BY ENGINEER.
- PROVIDE A 5/8-INCH DIAMETER X 8 FT. COPPER CLAD GROUND ROD AT HANDHOLES AND MANHOLES, AS SPECIFIED ON THE DRAWINGS OR AS DIRECTED BY THE PROJECT MANAGER.



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
SIC NOTES			
Approved: <i>[Signature]</i>		2-1-12	
SANDWICH ISLES COMMUNICATIONS		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

FILE	POCKET	FOLDER	NO.



- ### NOTES:
- 1 EXCAVATE & EXPOSE MANHOLE WALL, PROVIDE DUCT ENTRY PER SIC REQUIREMENTS, & EXTEND DUCTS.
 - 2 STUBUP UTILITY POLE PER UTILITY COMPANY REQUIREMENTS. COORDINATE ALL WORK WITH RESPECTIVE UTILITIES.
 - 3 PROVIDE ONE 4" C TIE BETWEEN HTCO HANDHOLE AND SIC MANHOLE; VERIFY LOCATION WITH TELECOM COMPANIES AND PLUG ENDS.

GENERAL NOTES:

1. HANDHOLES/PULLBOXES SHALL BE SET ON SIX INCHES OF LEVEL, 90 PERCENT COMPACTED CRUSHED ROCK FILL, 3/4 INCH TO ONE INCH SIZE, EXTENDING TWELVE INCHES BEYOND THE HANDHOLE/PULLBOX ON EACH SIDE.

APPROVED BY:

HAWAIIAN ELECTRIC COMPANY, INC.


HAWAIIAN TELCOM

OCEANIC TIME WARNER CABLE

CHIEF, CIVIL ENGINEERING BRANCH, D.P.P.

DATE _____

SCALE: 1" = 40'



GRAPHIC SCALE

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

SCOTT S. LEE
LICENSED PROFESSIONAL
ENGINEER
No. 10038-E
HAWAII, U.S.A.
2-2-12

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
LICENSE EXPIRES 4/30/13


REVISION DATE	DESCRIPTION	MADE BY	APPROVED

DEPARTMENT OF HAWAIIAN HOME LANDS

KAKAINA SUBDIVISION

TAX MAP KEY: 4-1-08: 10, 81, 91 & 92
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII

ELECTRICAL DISTRIBUTION PARTIAL PLAN I

Approved:  *2-1-12*

SANDWICH ISLES COMMUNICATIONS DATE

AKINAKA & ASSOCIATES, LTD.

CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

SHEETS



SCALE: 1"=40'

GRAPHIC SCALE



SHEET E-7 OF 87 SHEETS

1. HANDHOLES/PULLBOXES SHALL BE SET ON SIX INCHES OF LEVEL, 90 PERCENT COMPACTED CRUSHED ROCK FILL, 3/4 INCH TO ONE INCH SIZE, EXTENDING TWELVE INCHES BEYOND THE HANDHOLE/PULLBOX ON EACH SIDE.

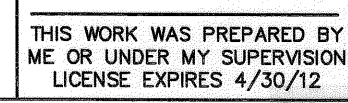
- 1 PROVIDE AND INSTALL STREET LIGHT AND STREET LIGHT CABLES ON UTILITY POLE AND PROVIDE CONNECTIONS. COORDINATE ALL WORK WITH UTILITY COMPANIES.
- 2 PROVIDE AND INSTALL WOOD POLE, STREET LIGHT, AND STREET LIGHT CABLES AND PROVIDE CONNECTIONS. COORDINATE ALL WORK WITH UTILITY COMPANIES.
- 3 OFFSET STREET LIGHT STANDARD TO PROVIDE 5' MIN. CLEARANCE TO EXISTING S8 SEWERLINE.

MATCHLINE "A", SEE SHEET E-9 FOR CONT.

CHIEF, CIVIL ENGINEERING BRANCH, D.P.P.

DATE _____

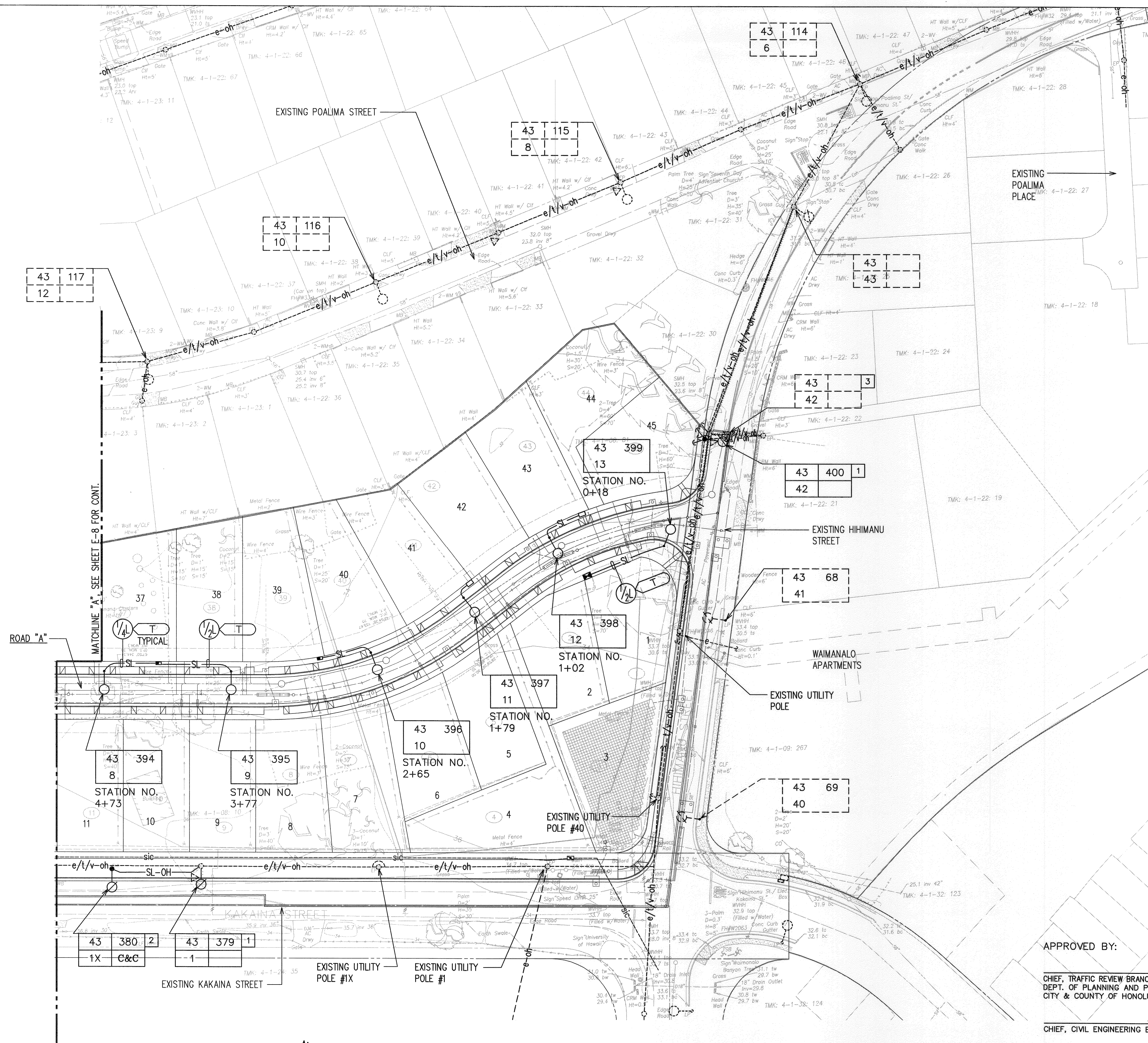
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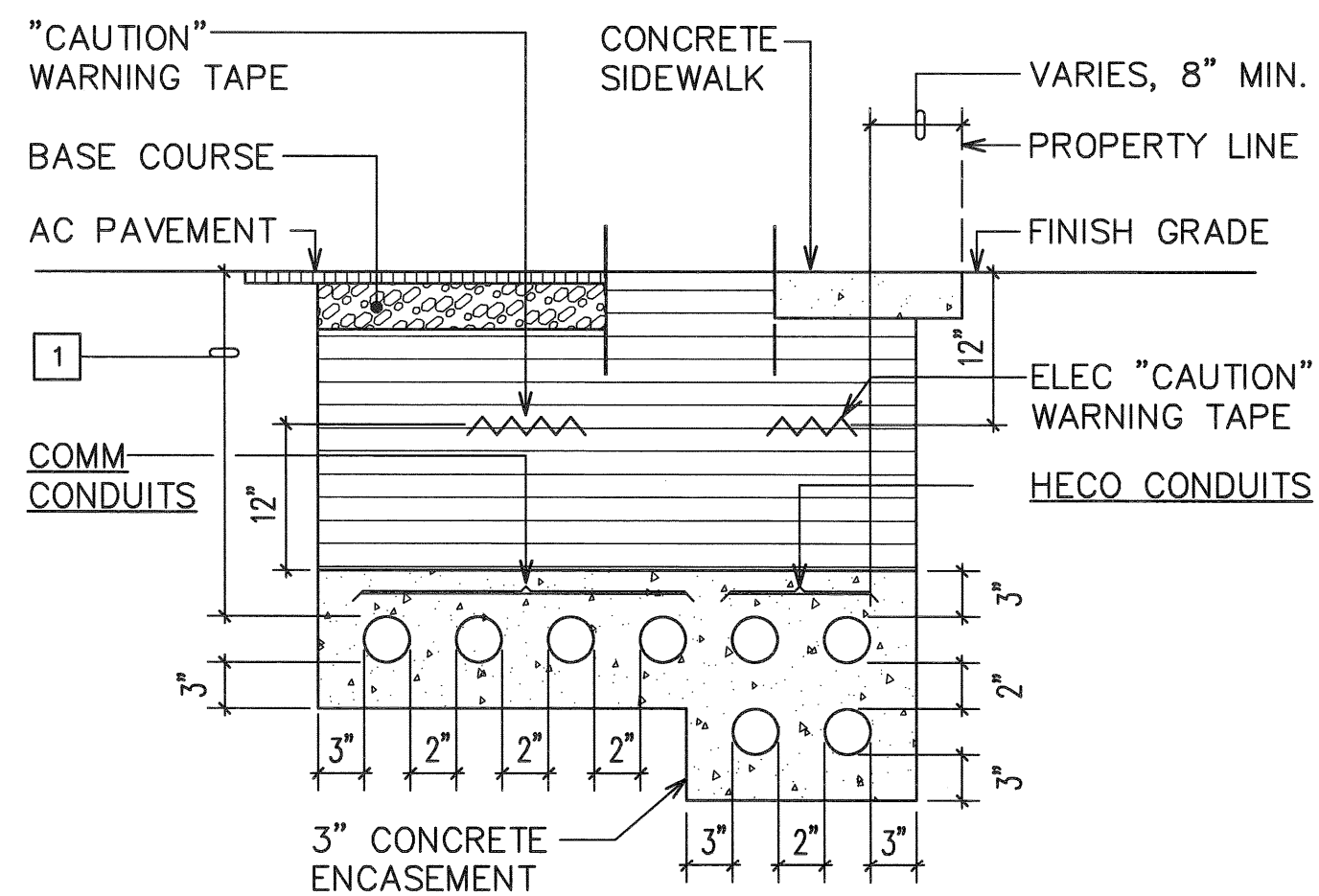
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>INC.</p> <p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p>KAKAINA SUBDIVISION</p> <p>TAX MAP KEY: 4-1-08: 10, 81, 91 & 92</p> <p>WAIMANALO, KOOLAUPOKO, OAHU, HAWAII</p>			
<p>STREET LIGHT PARTIAL PLAN I</p>			
<p>Approved: _____</p> <p>CHIEF, MECHANICAL/ELEC DIVISION, DDC _____ DATE _____</p>			
<p>AKINAKA & ASSOCIATES, LTD.</p> <p>CONSULTING ENGINEERS</p>			

SHEET E-8 OF 87 SHEETS

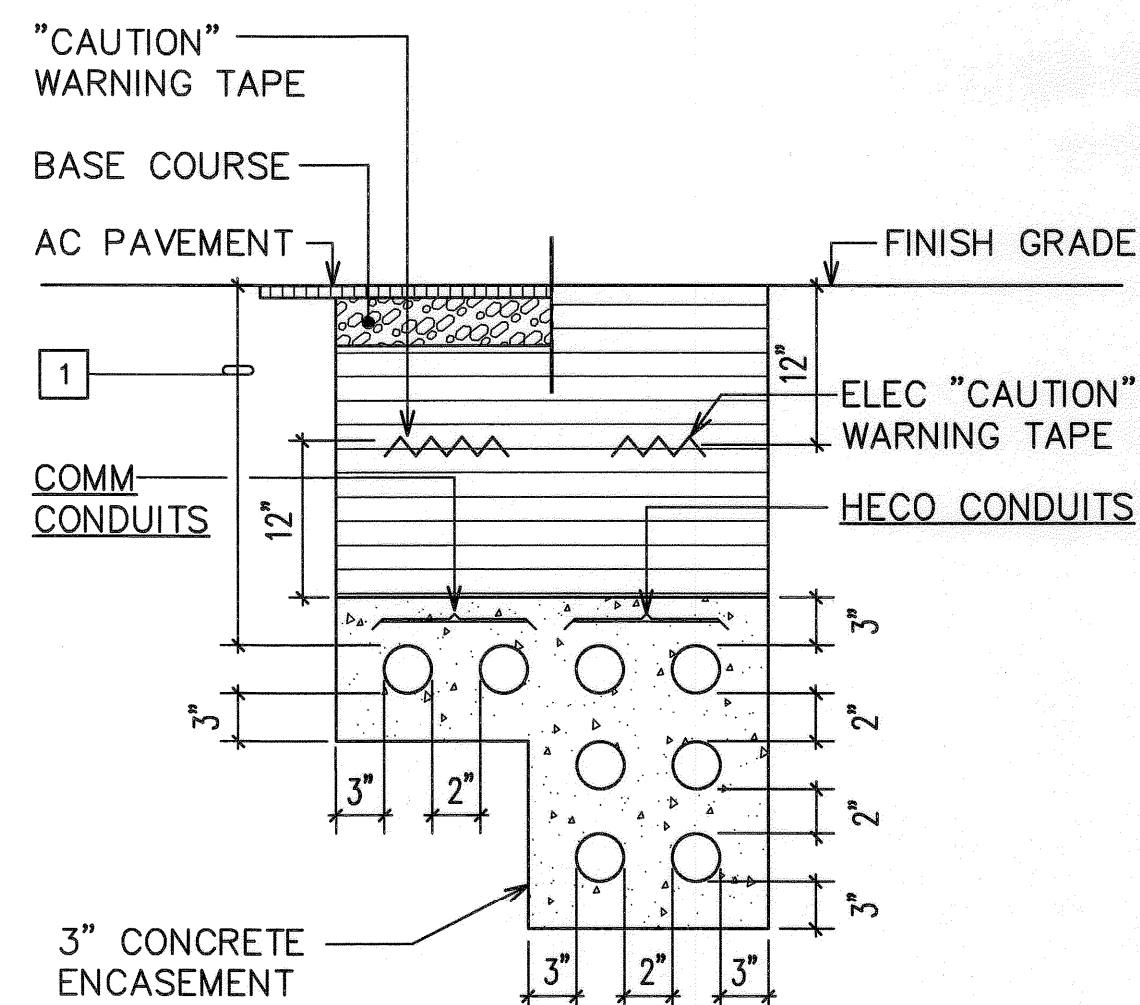
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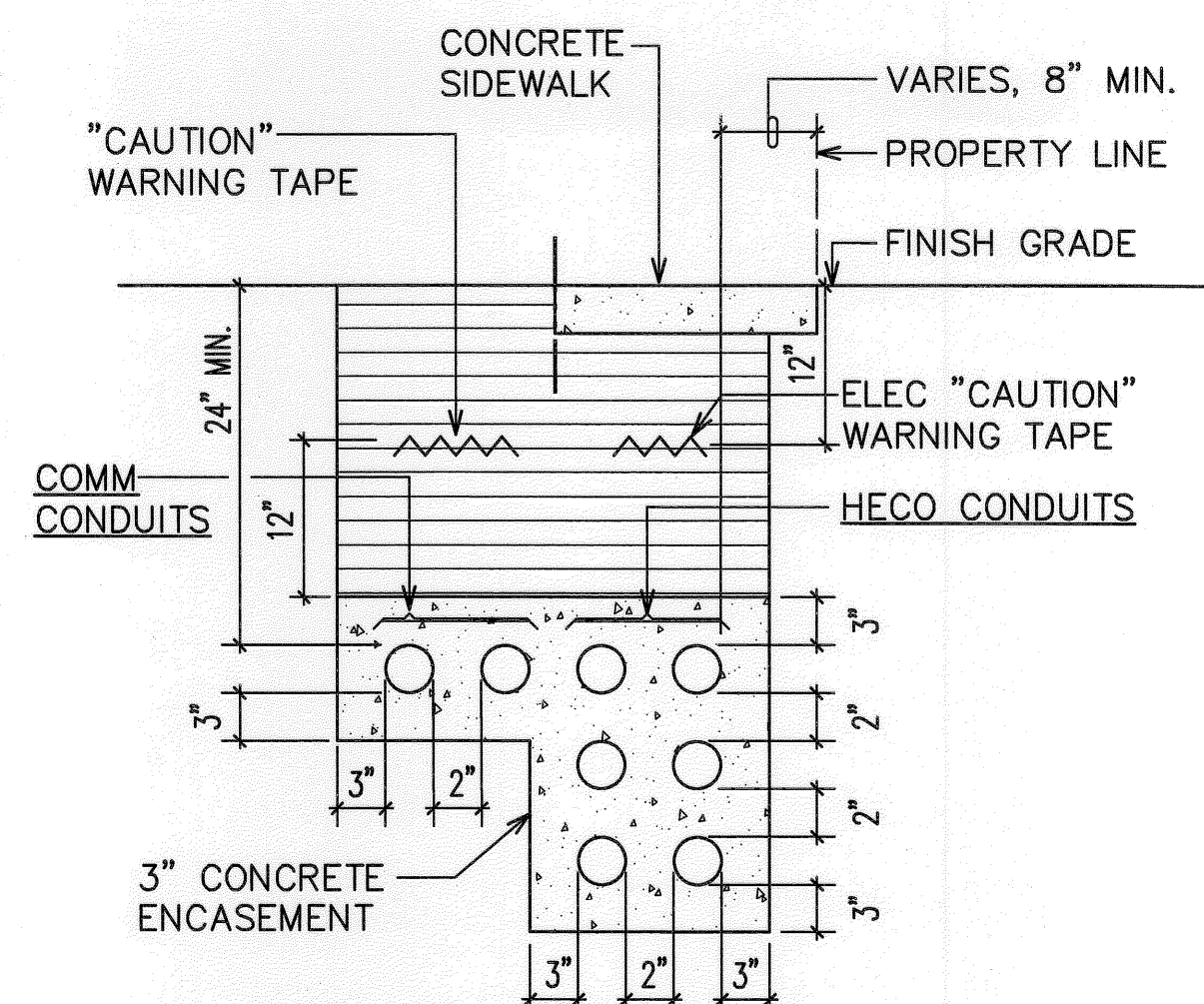
- | FILE | POCKET | FOLDER | NO. |
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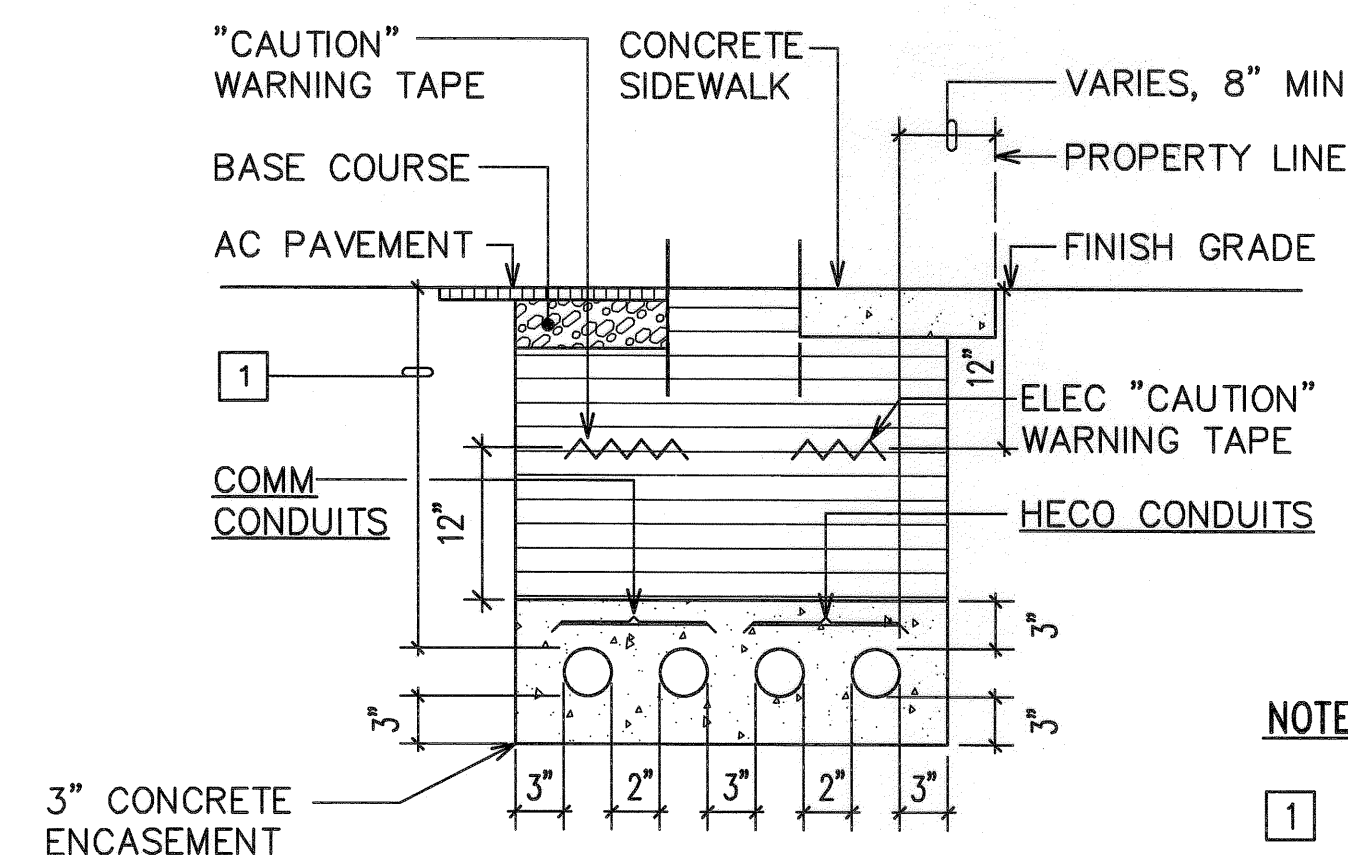
SECTION A



SECTION B



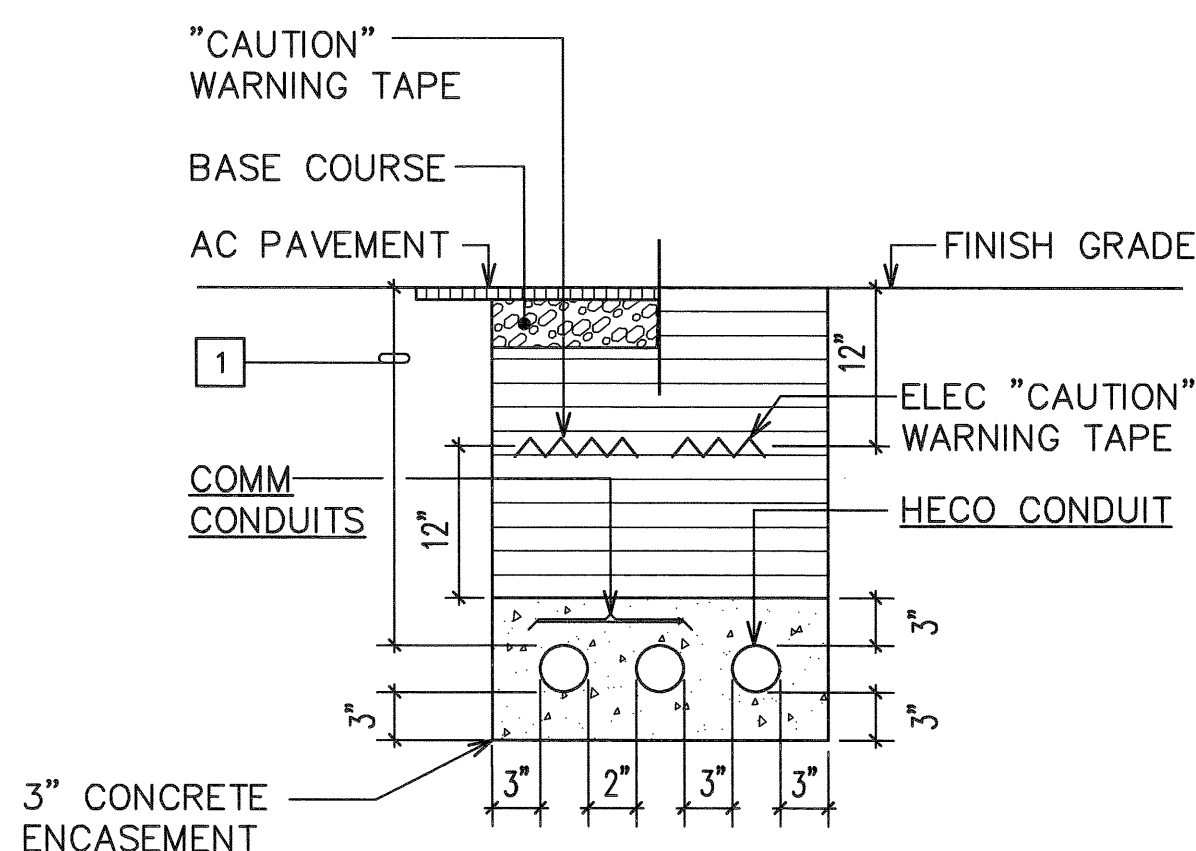
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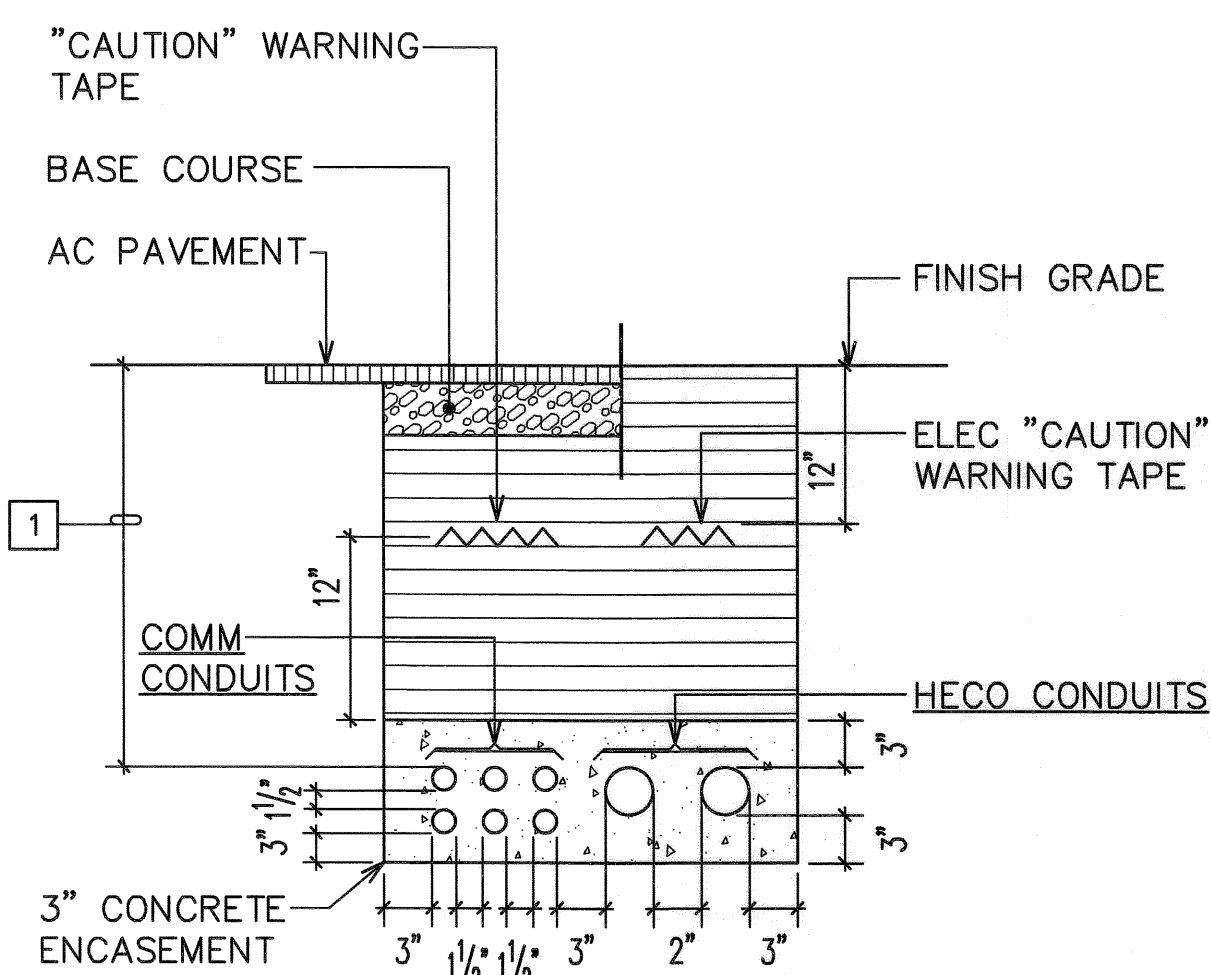
SECTION D

NOTES:

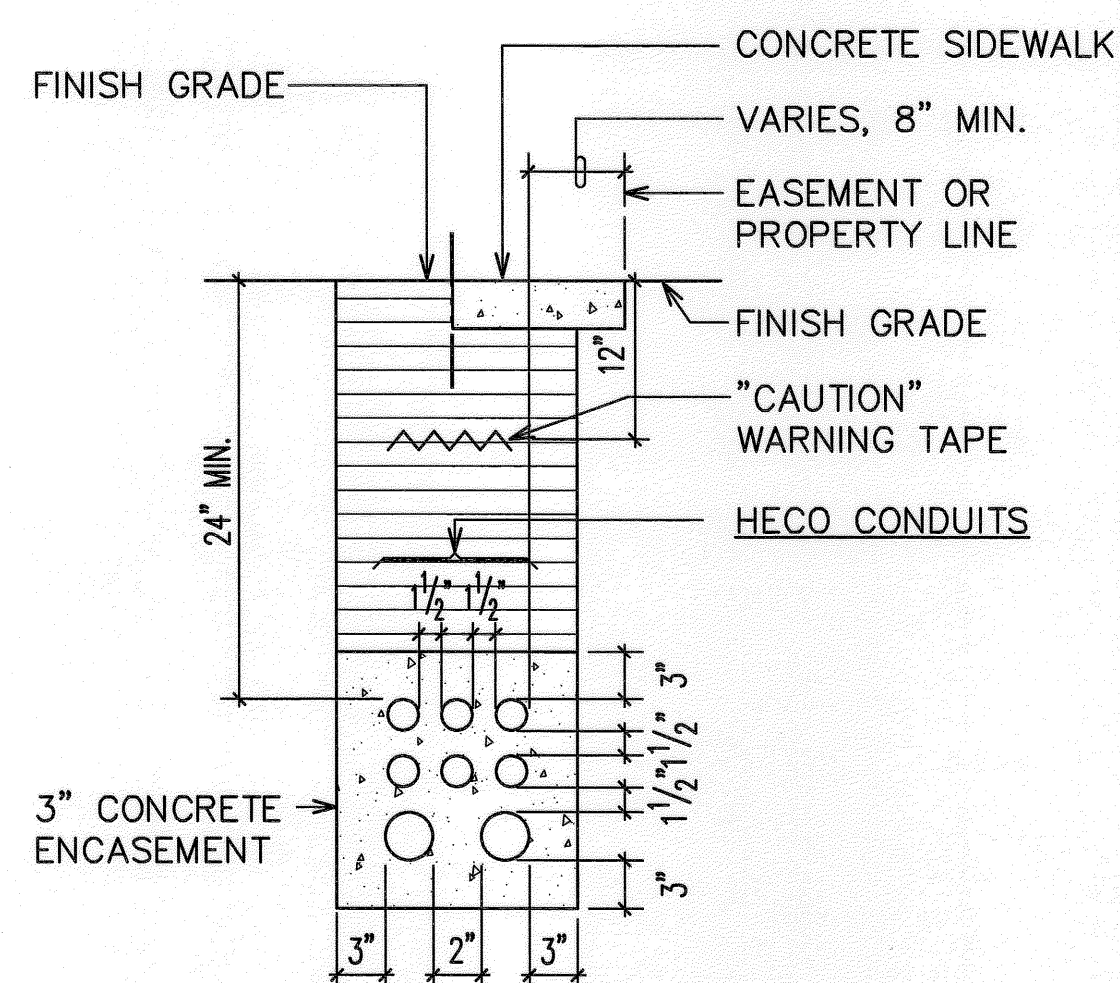
- 1 DEPTH VARIES; 36\"/>



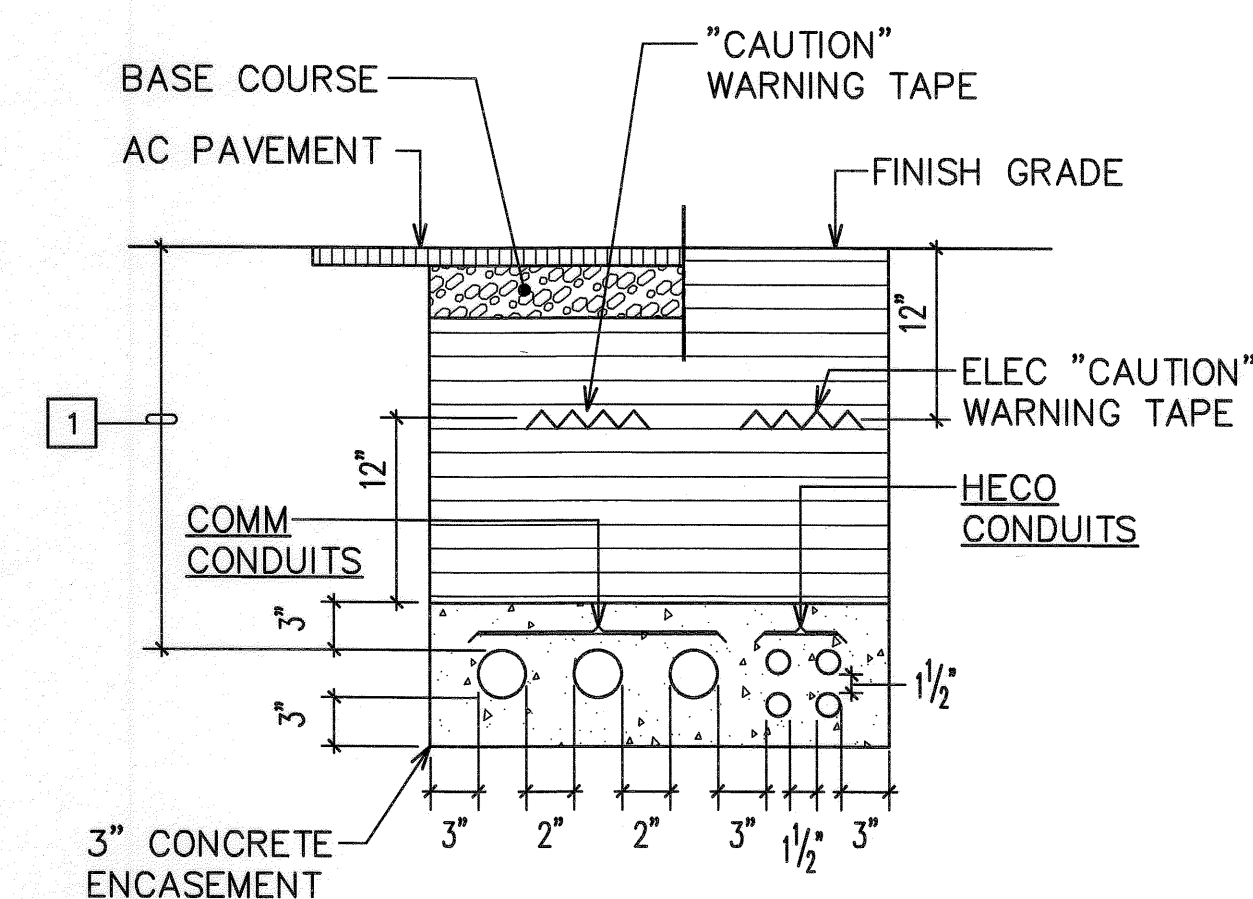
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SECTION F



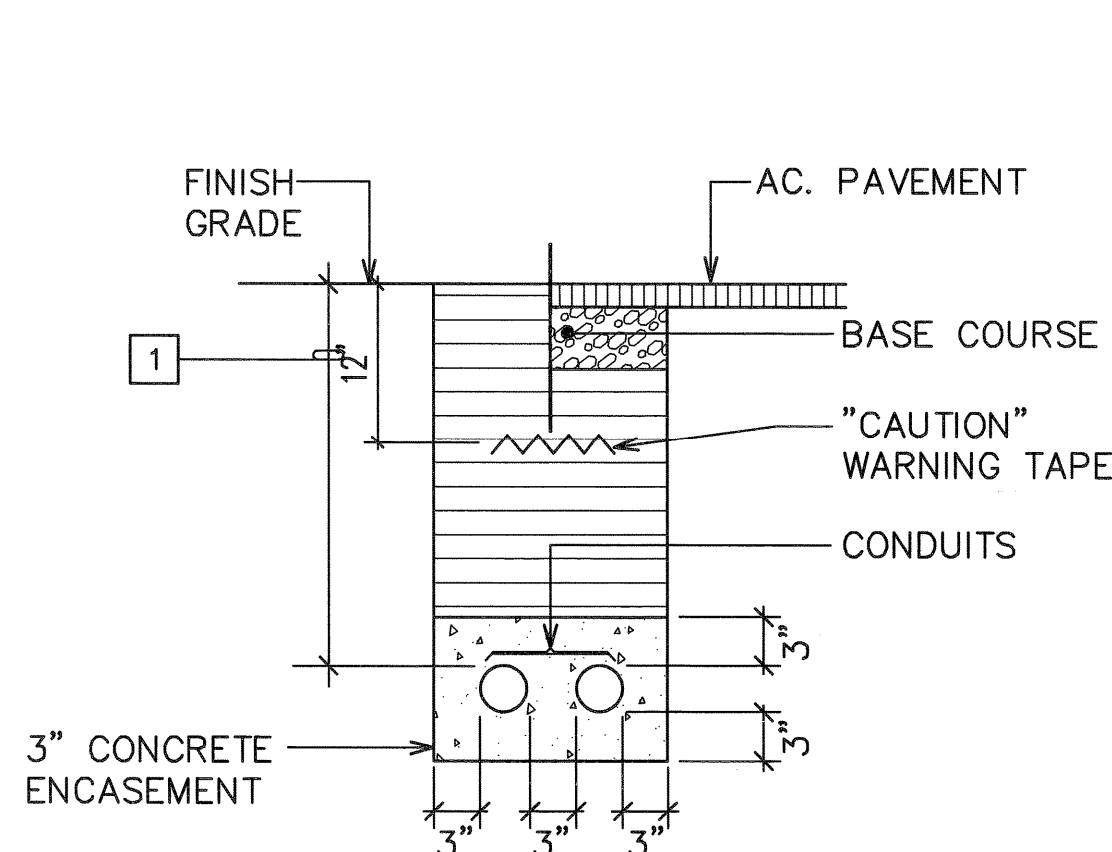
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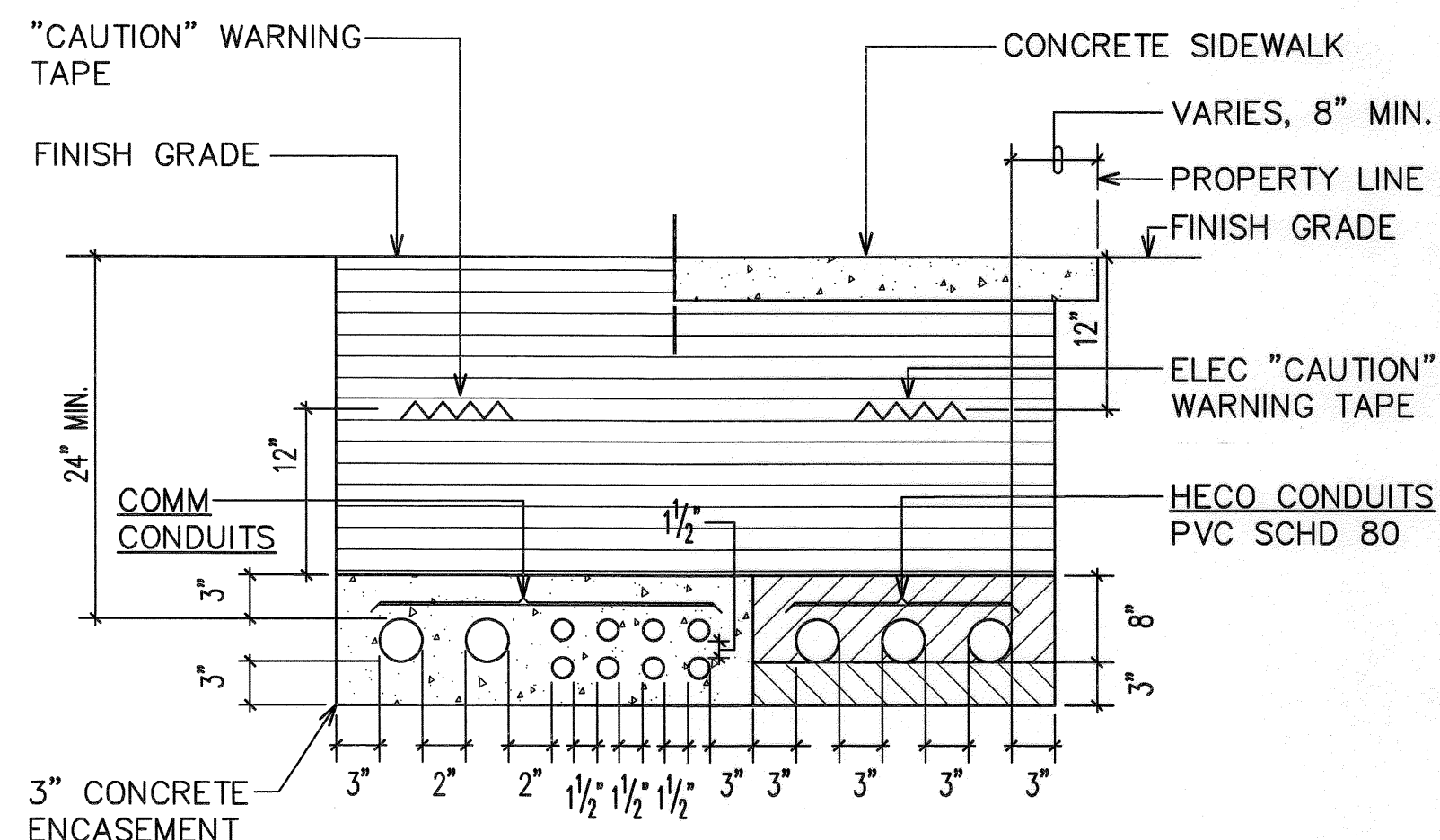
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BACKFILL NOTES:

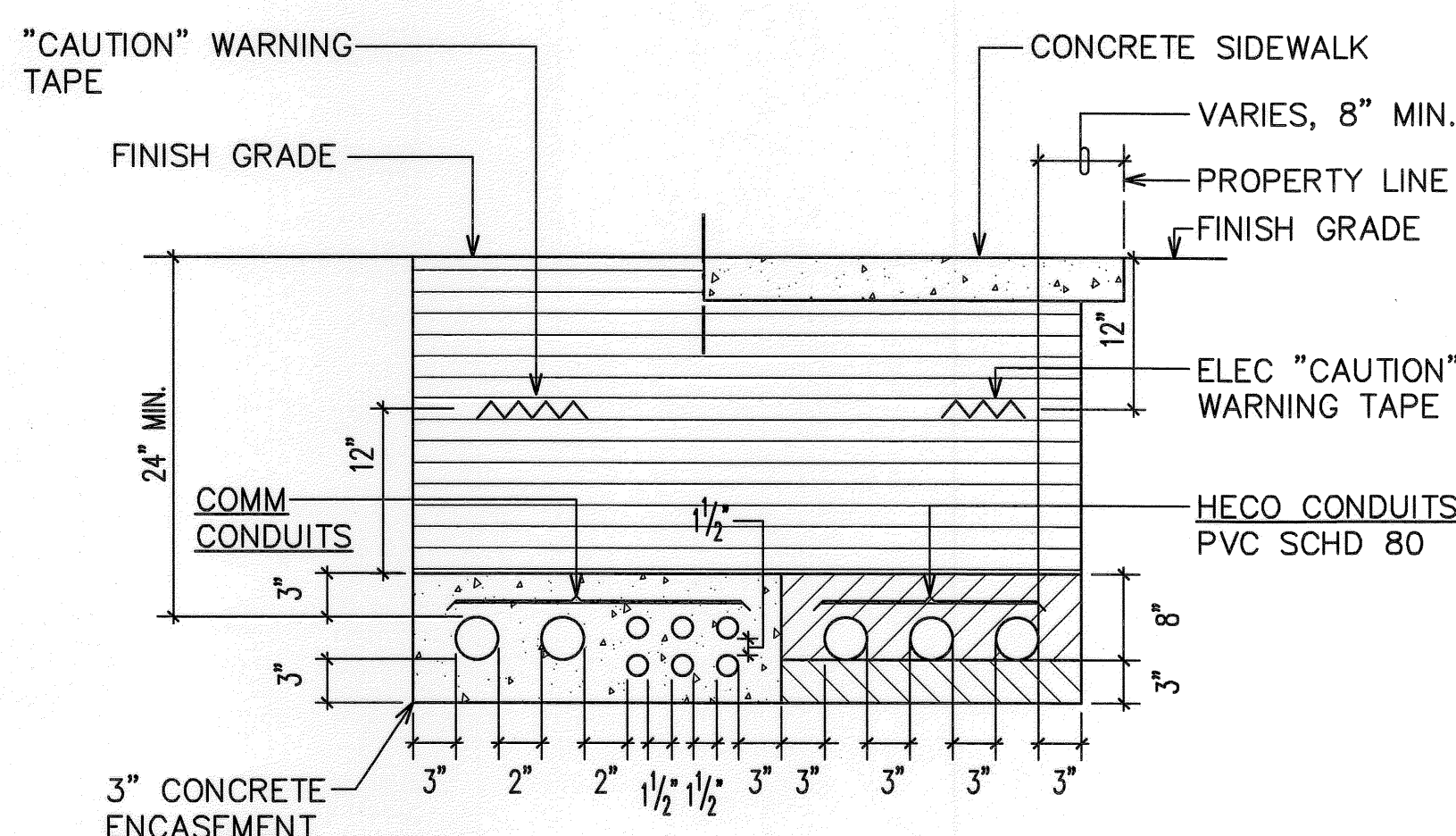
- TYPE "A" BACKFILL - EARTH & GRAVEL. ROCK SIZE TO BE 1\"/>



SECTION I



SECTION J



SECTION K

NOTE: SEE PLAN SHEETS FOR QUANTITY & SIZE OF CONDUITS

TYPICAL DUCT SECTIONS
NOT TO SCALE

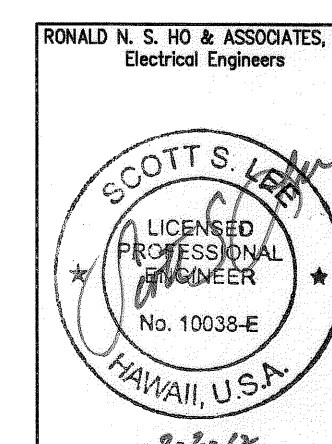
APPROVED BY:

HAWAIIAN ELECTRIC COMPANY, INC.

CHIEF, CIVIL ENGINEERING BRANCH, D.P.P.

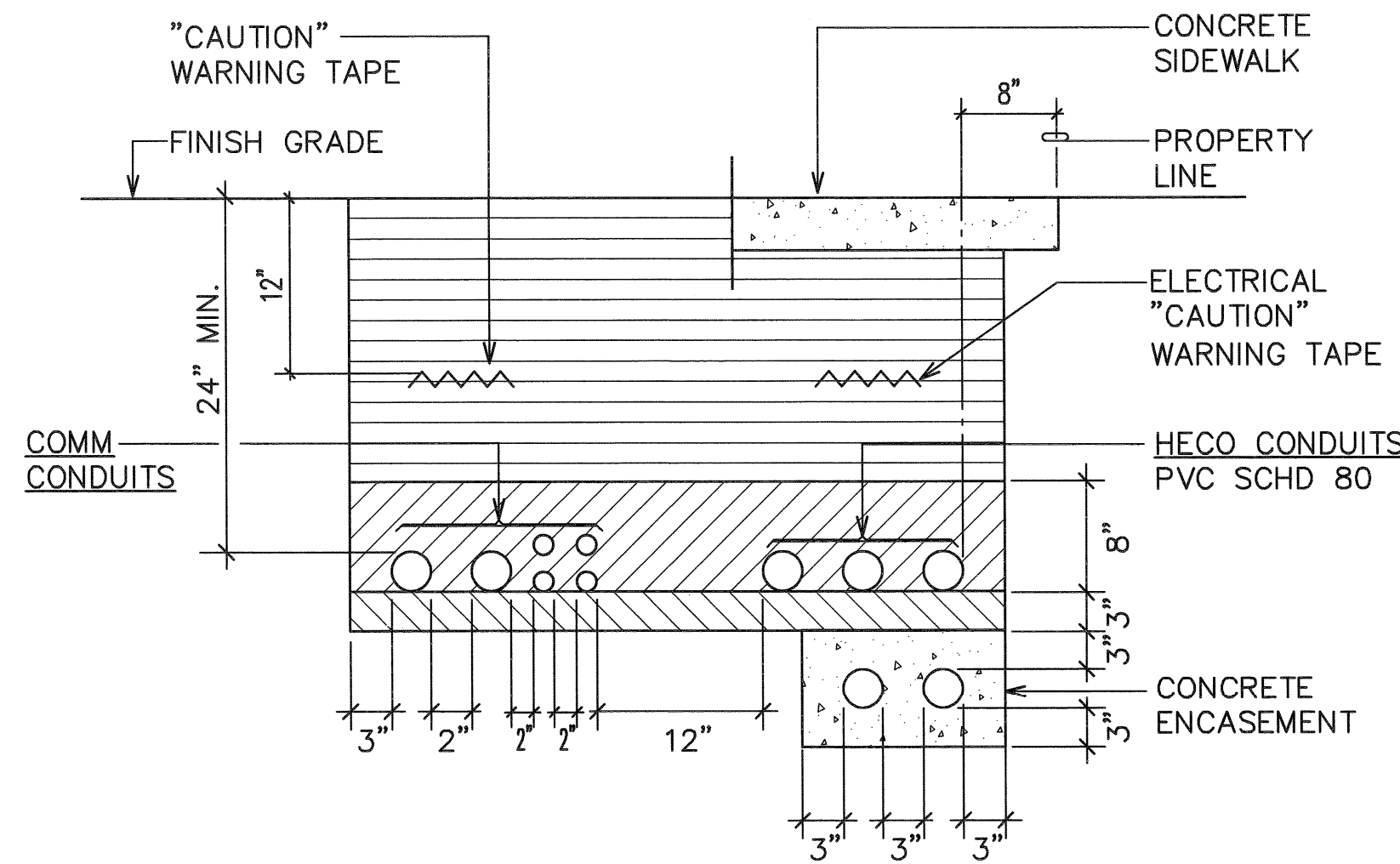
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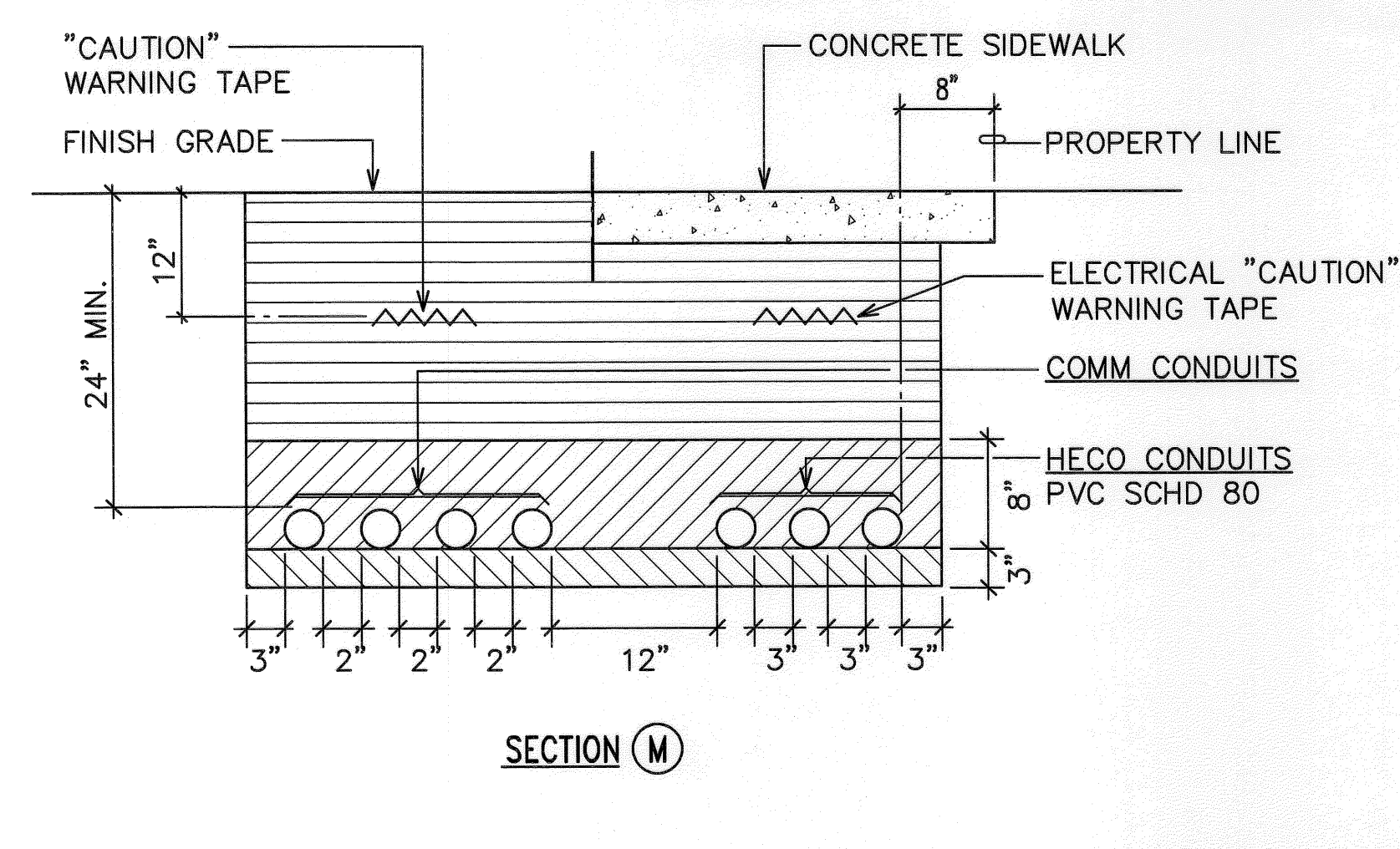


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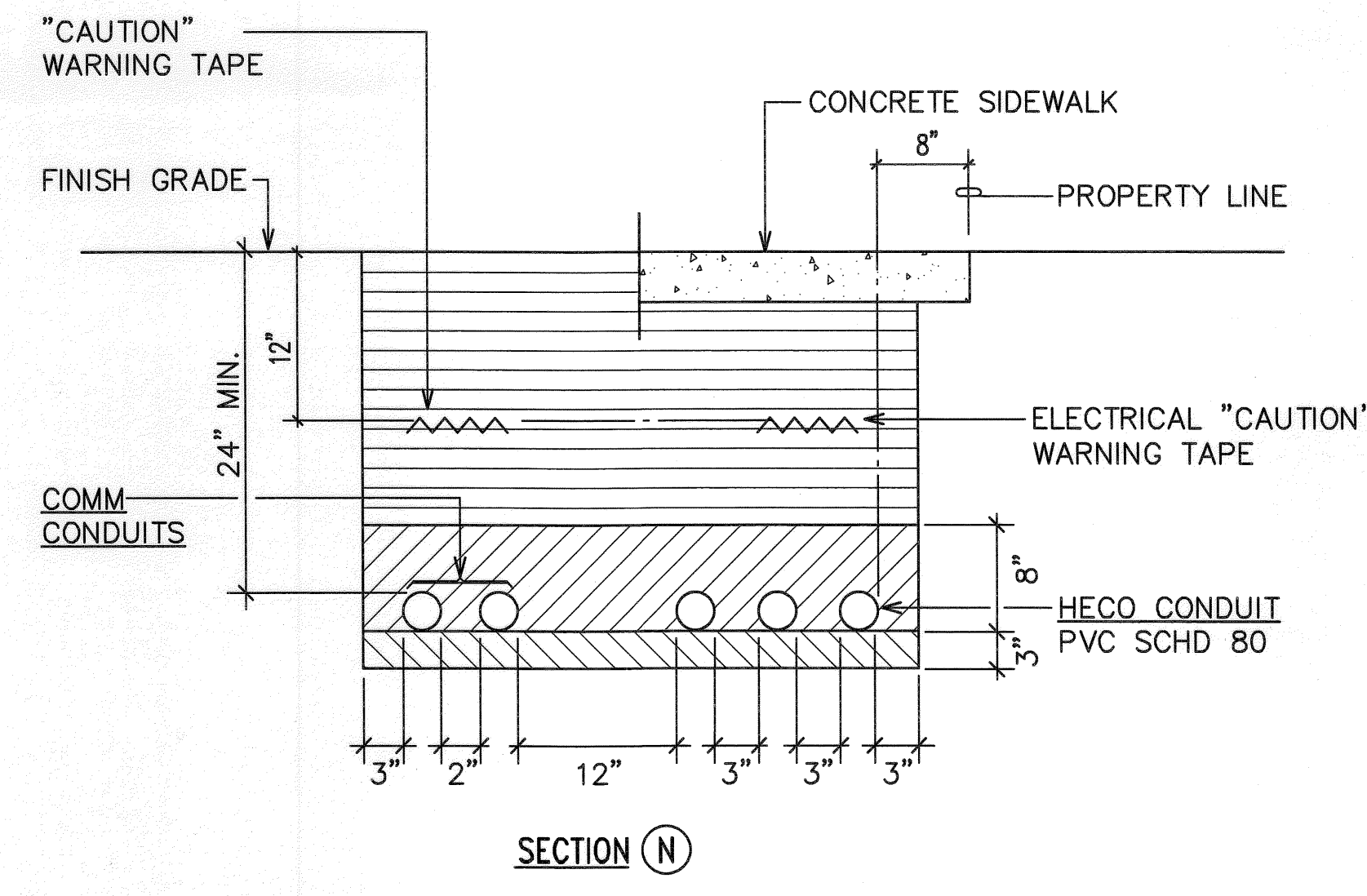
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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KAKAINA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92			
WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TYPICAL DUCT SECTIONS I			
Approved: <i>[Signature]</i> 2-1-12			
SANDWICH ISLES COMMUNICATIONS DATE			
AKINAKA & ASSOCIATES, LTD.			
CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



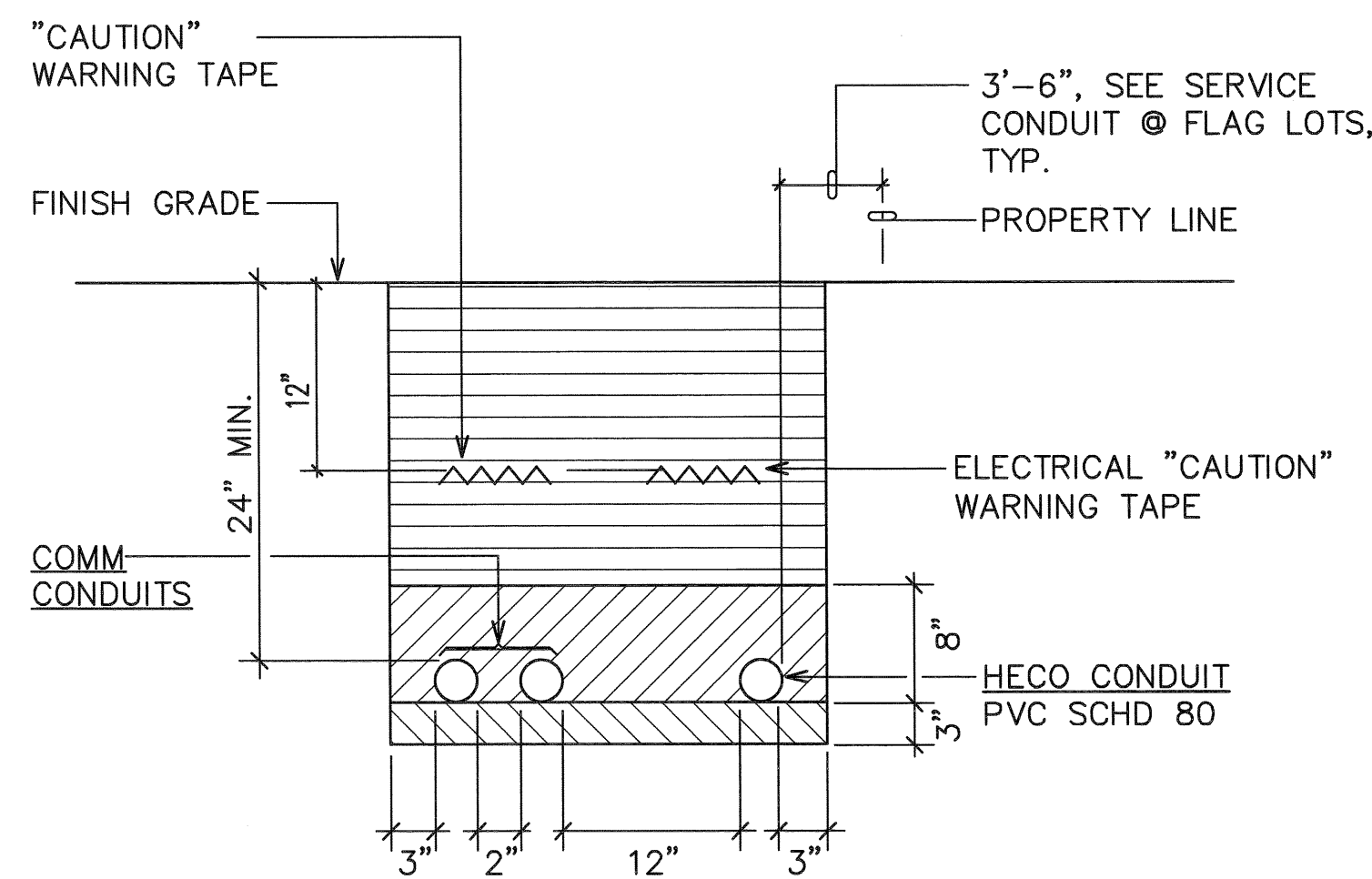
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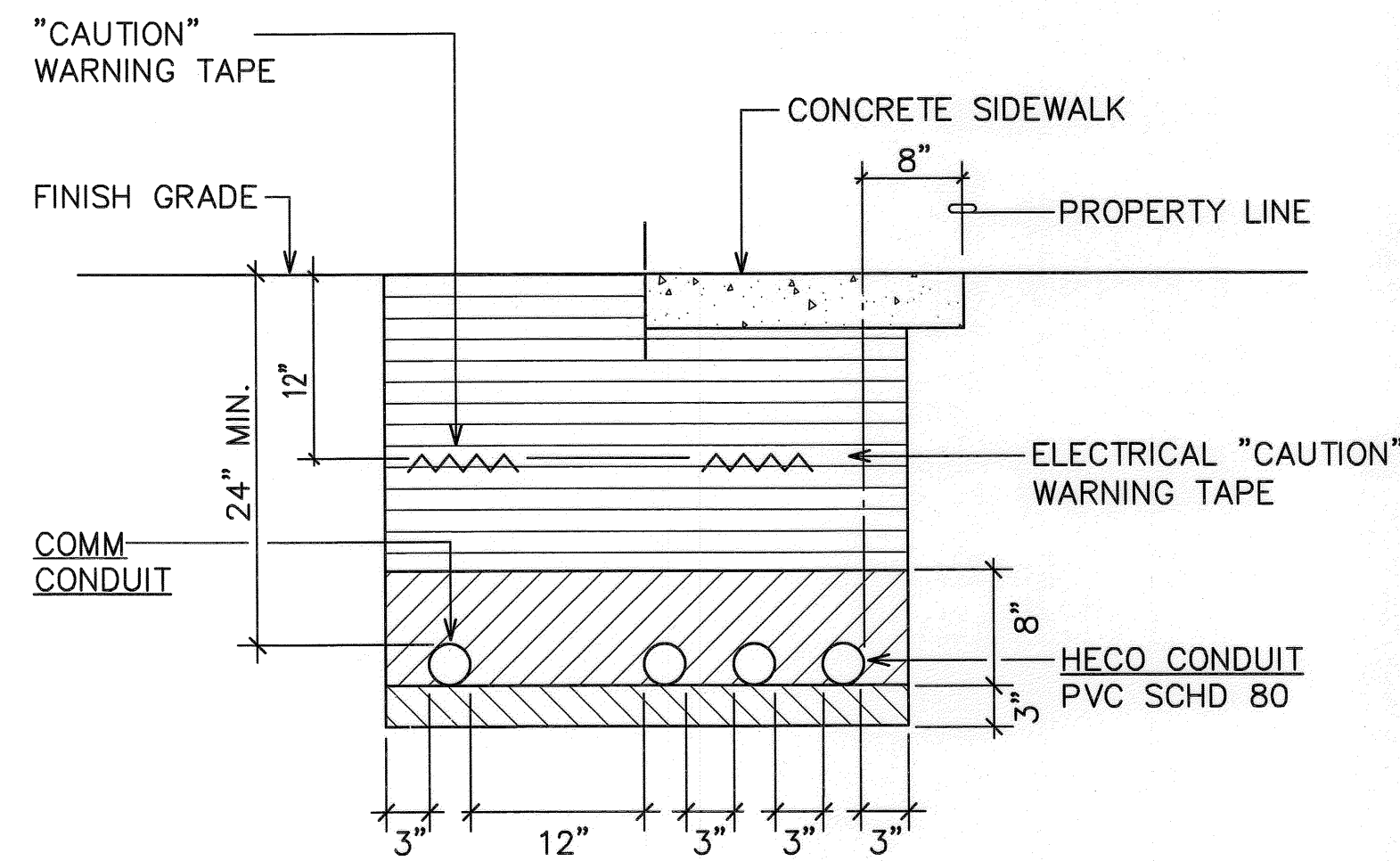
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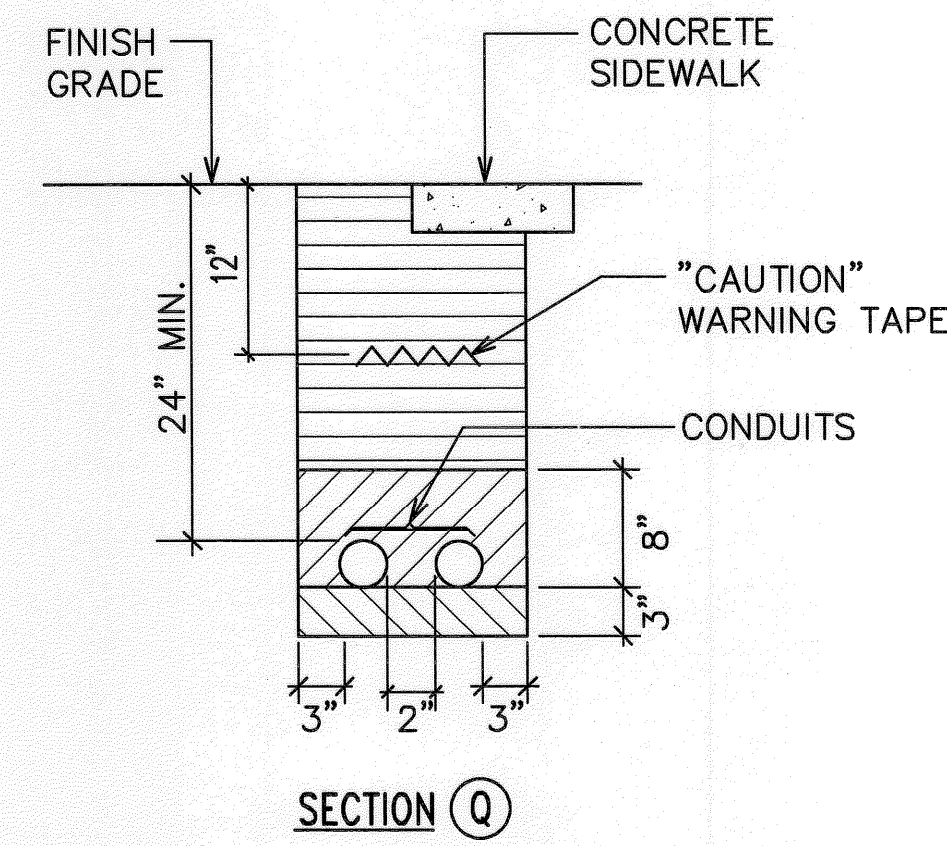
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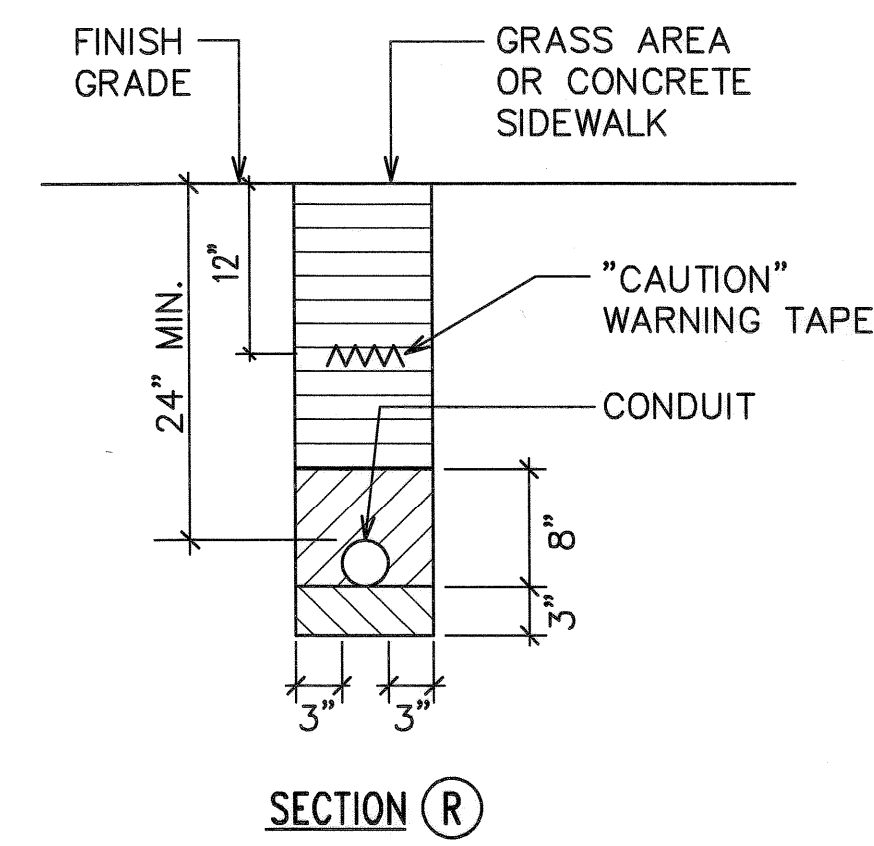
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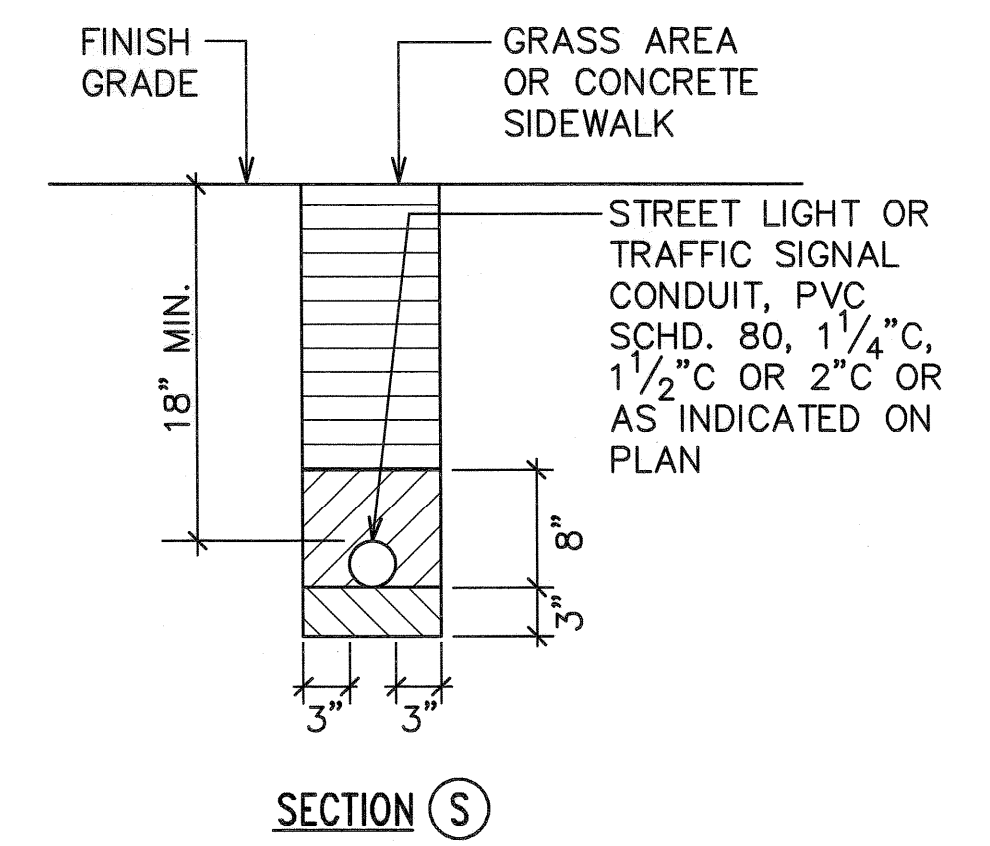
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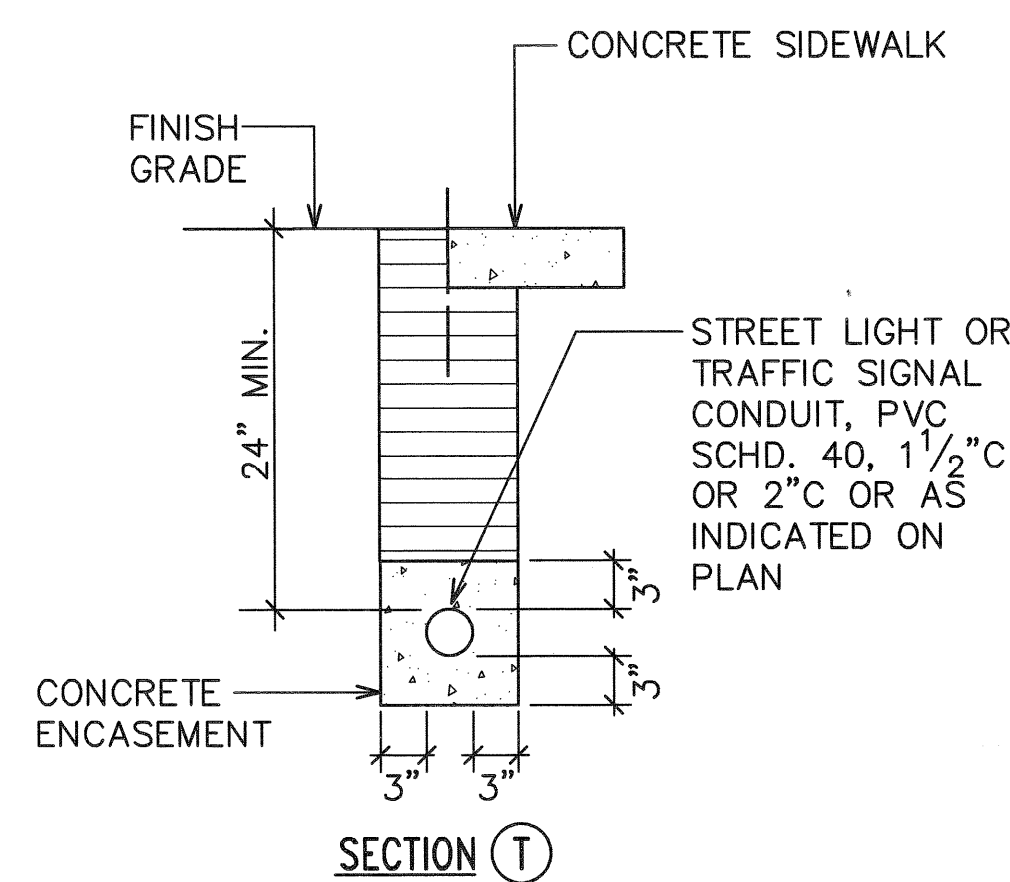
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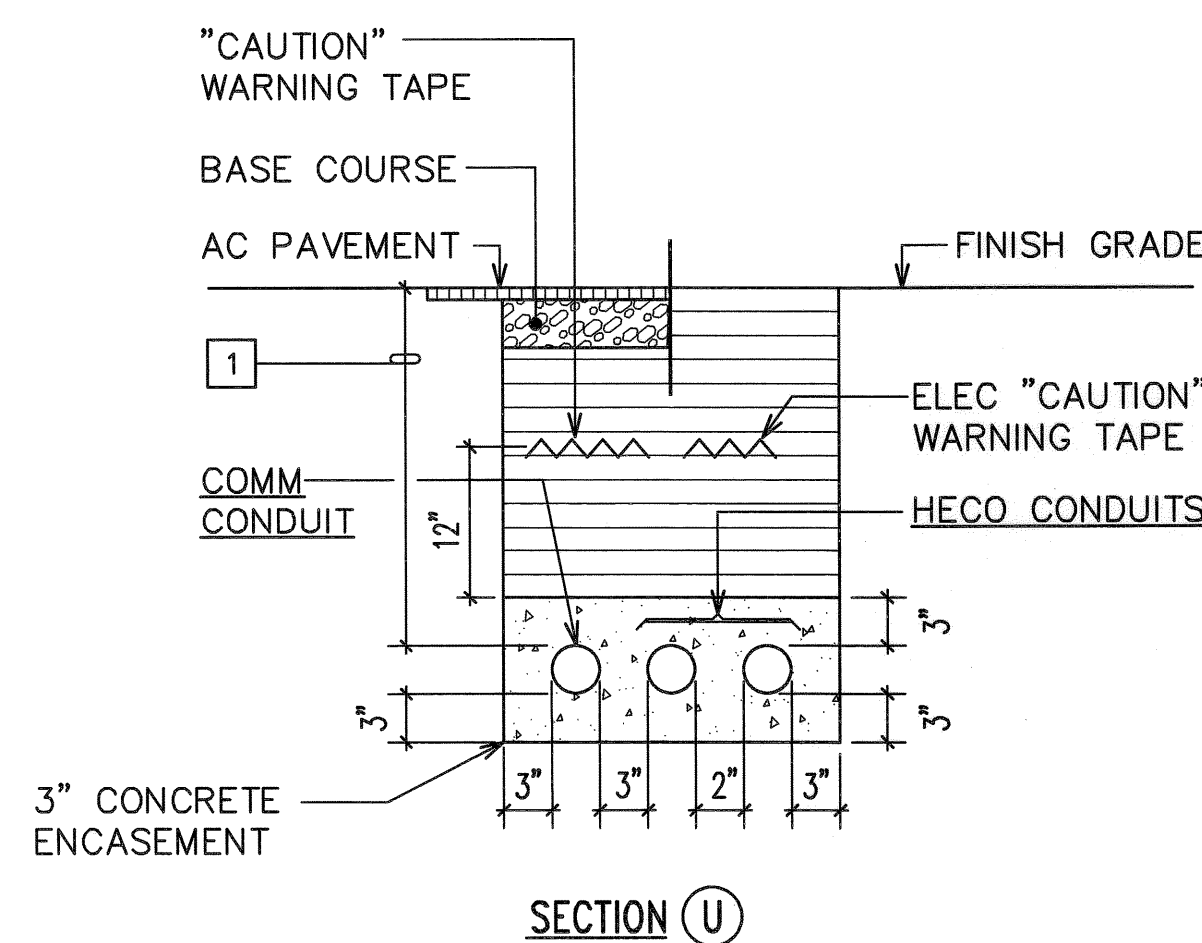
SECTION R



SECTION S



SECTION T



SECTION U

NOTE: SEE PLAN SHEETS FOR QUANTITY & SIZE OF CONDUITS

TYPICAL DUCT SECTIONS

NOT TO SCALE

APPROVED BY:

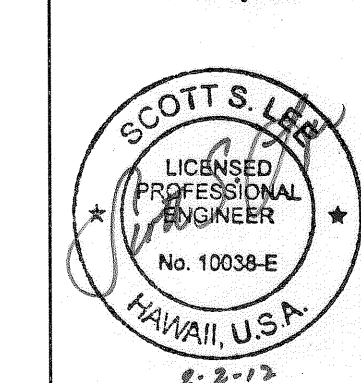
HAWAIIAN ELECTRIC COMPANY, INC. DATE

CHIEF, MECHANICAL/ELECTRICAL DIVISION
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU DATE

CHIEF, TRAFFIC REVIEW BRANCH
DEPT. OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU DATE

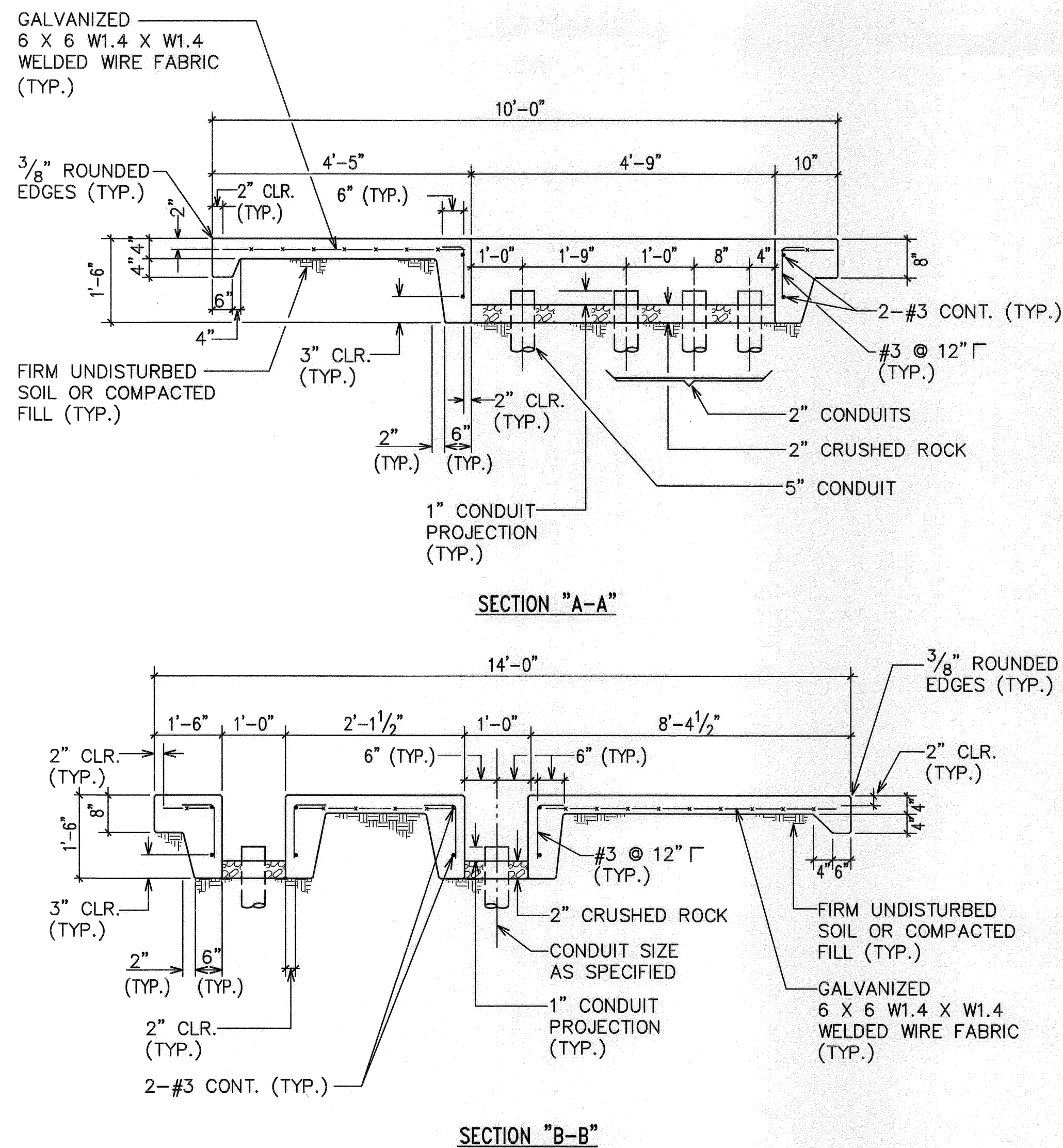
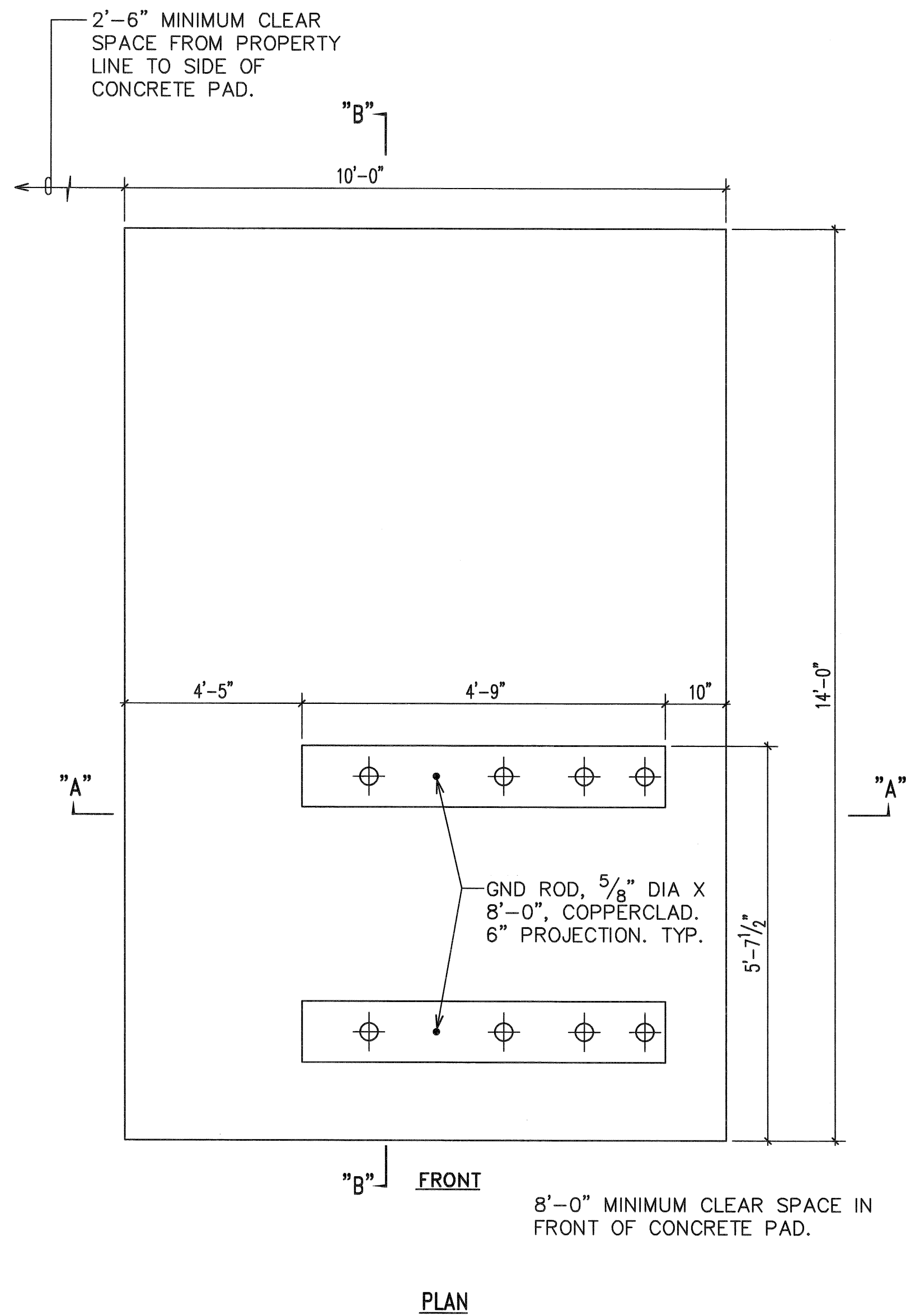
CHIEF, CIVIL ENGINEERING BRANCH, D.P.P. DATE

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



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ME OR UNDER MY SUPERVISION
LICENSE EXPIRES 4/30/12

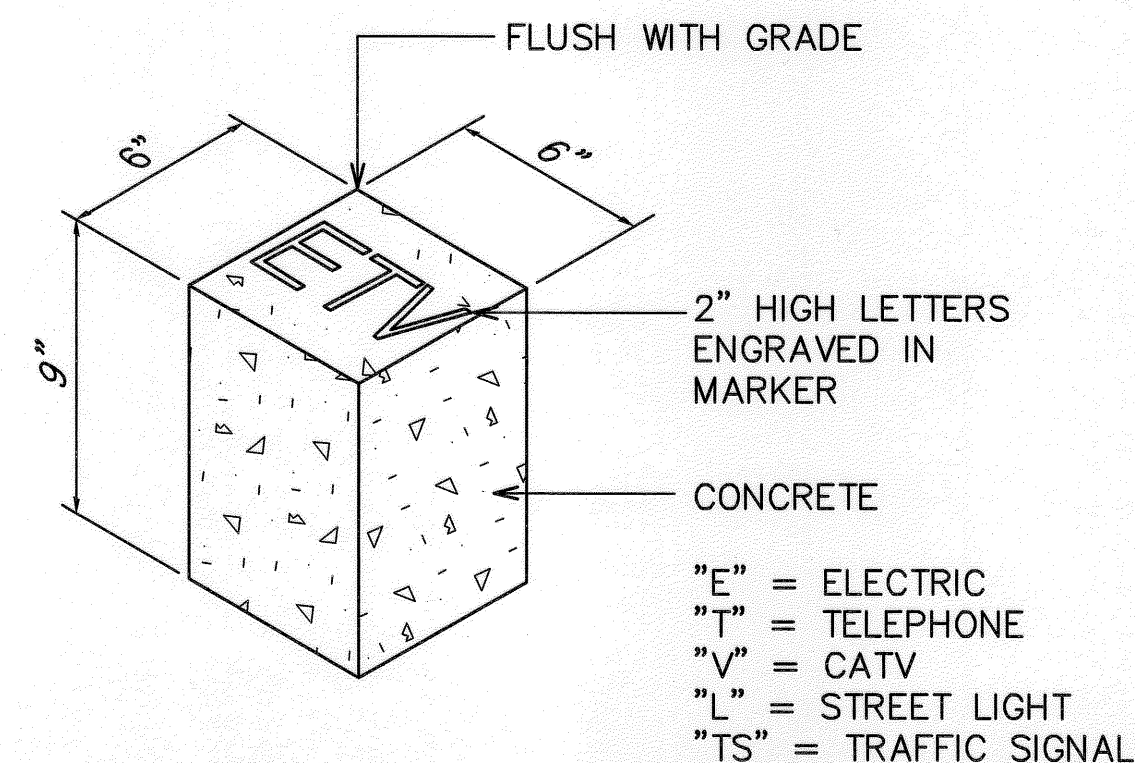
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
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KAKAIA SUBDIVISION			
TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
TYPICAL DUCT SECTIONS II			
Approved: <i>[Signature]</i> 2-1-12			
SANDWICH ISLES COMMUNICATIONS DATE			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



NOTES:

1. CONCRETE COMPRESSIVE STRENGTH: 3000 PSI 28 DAYS. HECO STD. SPECIFICATION CS7401.
2. REINFORCING: CLEAN AND NEW ROUND DEFORMED BARS (GR 40) AND GALVANIZED 6 X 6 W1.4 X W1.4 WELDED WIRE FABRIC.
3. TOP OF CONCRETE PAD TO BE SMOOTH AND TRUE. OTHER EXPOSED SURFACES TO BE SMOOTH AND FREE FROM DEFECTS.
4. CONSTRUCTION TO COMPLY WITH ACI 318 AS AMENDED.
5. WEIGHT OF SWITCHGEAR EQUALS 2,150 POUNDS.

A AUTOMATIC TRANSFER SWITCHING EQUIPMENT PAD
E-12 NOT TO SCALE



B CONCRETE STUB UP MARKER
E-12 NOT TO SCALE

CONDUIT SCHEDULE

ITEM	DESCRIPTION
(2-2)	HECO 2-2" CONDUITS
(3-2)	HECO 3-2" CONDUITS
(6-2)	HECO 6-2" CONDUITS
(3E)	HECO 3" CONDUIT
(2-4)	HECO 2-4" CONDUITS
(4-4)	HECO 4-4" CONDUITS
(2-5)	HECO 2-5" CONDUITS
(4-5)	HECO 4-5" CONDUITS
(4T)	HTCO 4" CONDUIT
(2-1S)	SANDWICH ISLES COMM UD(2x1-1")
(4-1S)	SANDWICH ISLES COMM UD(2x2-1")
(6-1S)	SANDWICH ISLES COMM UD(3x2-1")
(8-1S)	SANDWICH ISLES COMM UD(4x2-1")
(4-5)	SANDWICH ISLES COMM UD(1x1-4")
(2-4S)	SANDWICH ISLES COMM UD(2x1-4")
(4-4S)	SANDWICH ISLES COMM UD(2x2-4")
(6-4S)	SANDWICH ISLES COMM UD(3x2-4")
(1 1/4)	STREET LIGHT 1 1/4" CONDUIT WITH WIRING
(1 1/2)	STREET LIGHT 1 1/2" CONDUIT WITH WIRING
(2L)	STREET LIGHT 2" CONDUIT WITH WIRING
(2V)	CATV 2" CONDUIT
(4V)	CATV 4" CONDUIT
(2VS)	CATV 2" POWER SUPPLY CONDUIT

NOTE: DASHED SYMBOL INDICATES EXST

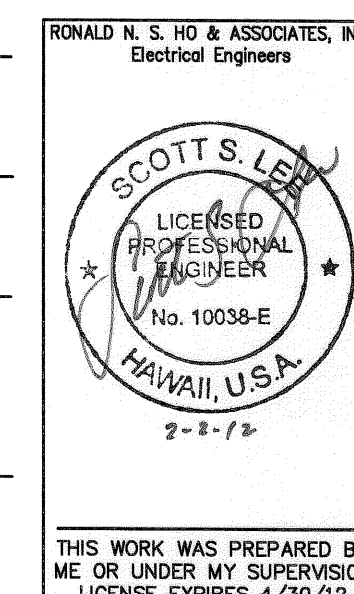
APPROVED BY:

HAWAIIAN ELECTRIC COMPANY, INC. DATE

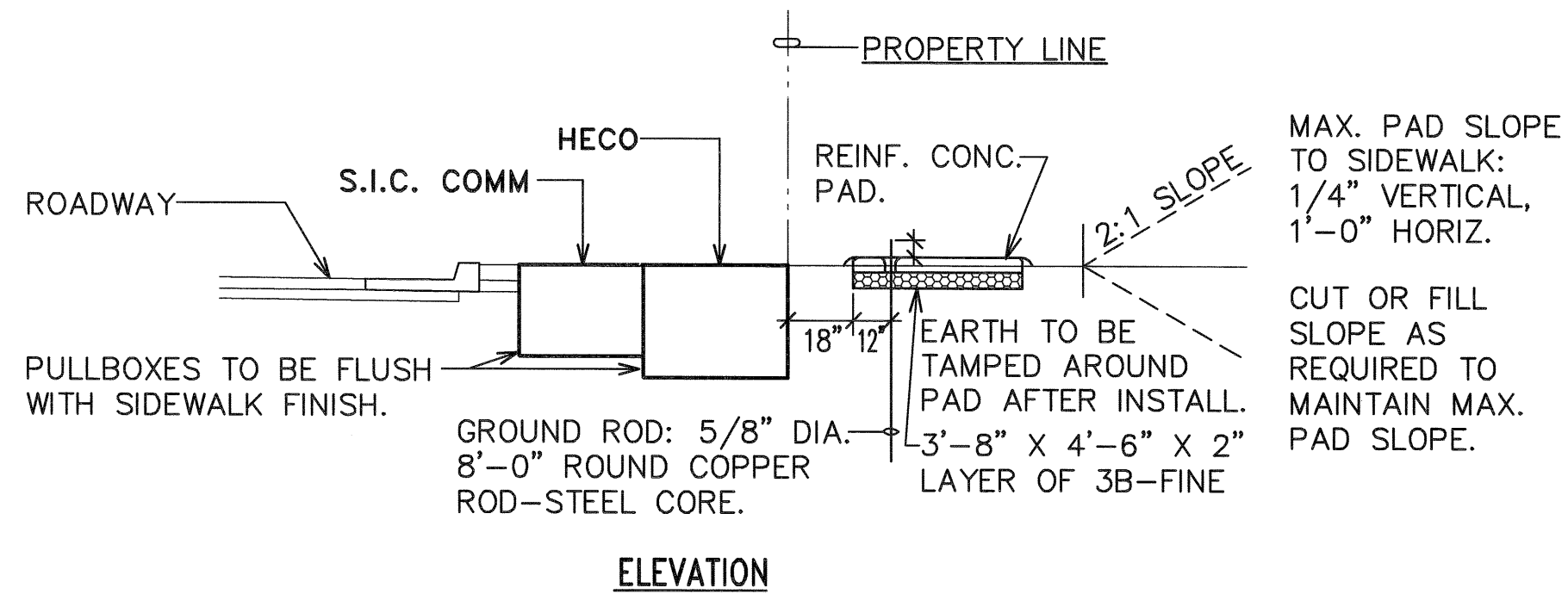
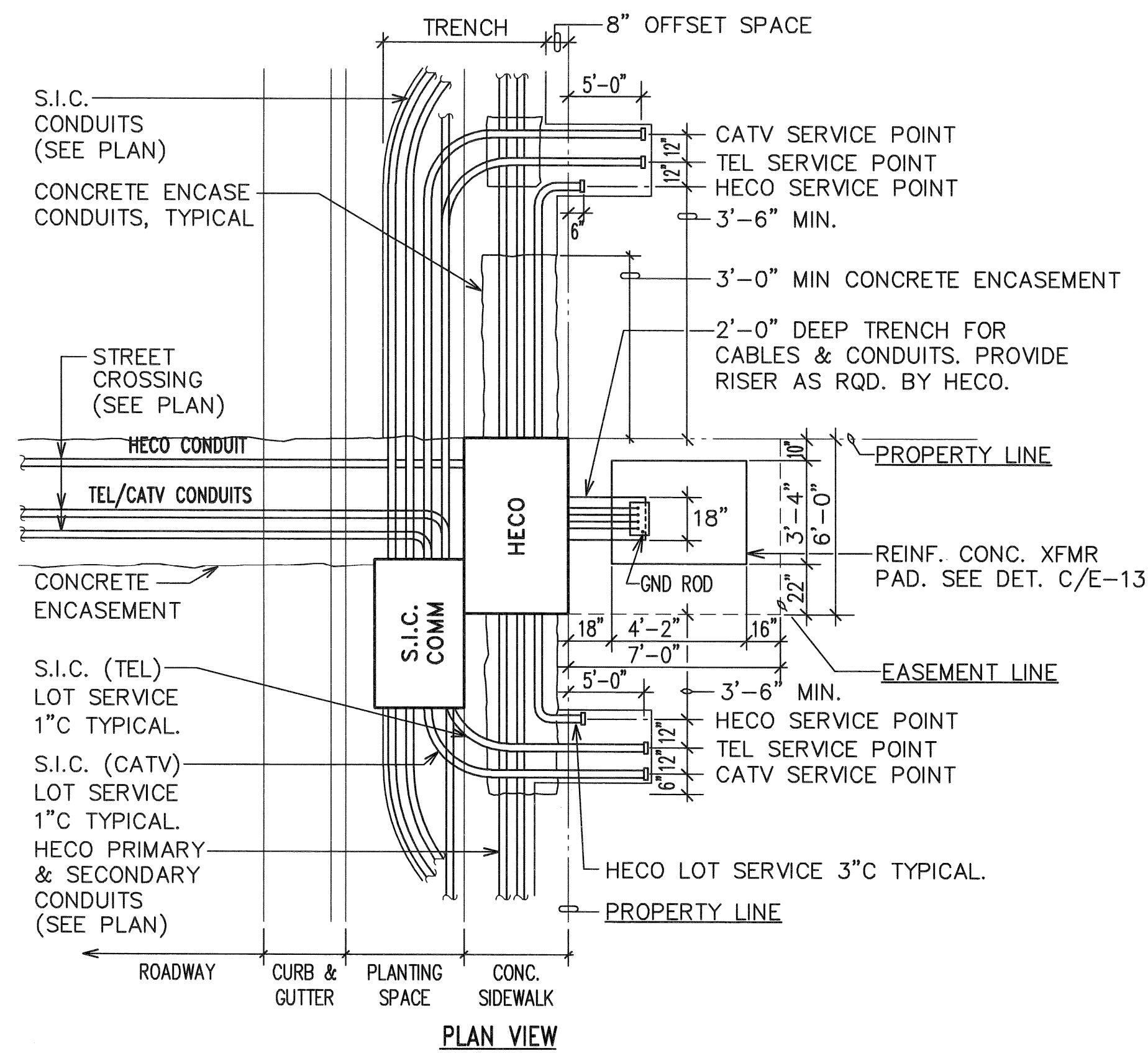
OCEANIC TIME WARNER CABLE DATE

CHIEF, MECHANICAL/ELECTRICAL DIVISION
DEPT. OF DESIGN AND CONSTRUCTION
CITY & COUNTY OF HONOLULU DATE

CHIEF, TRAFFIC REVIEW BRANCH
DEPT. OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU DATE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
MISCELLANEOUS DETAILS & SCHEDULES			
Approved: <i>[Signature]</i> 2-1-12 SANDWICH ISLES COMMUNICATIONS DATE			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			



NOTES:

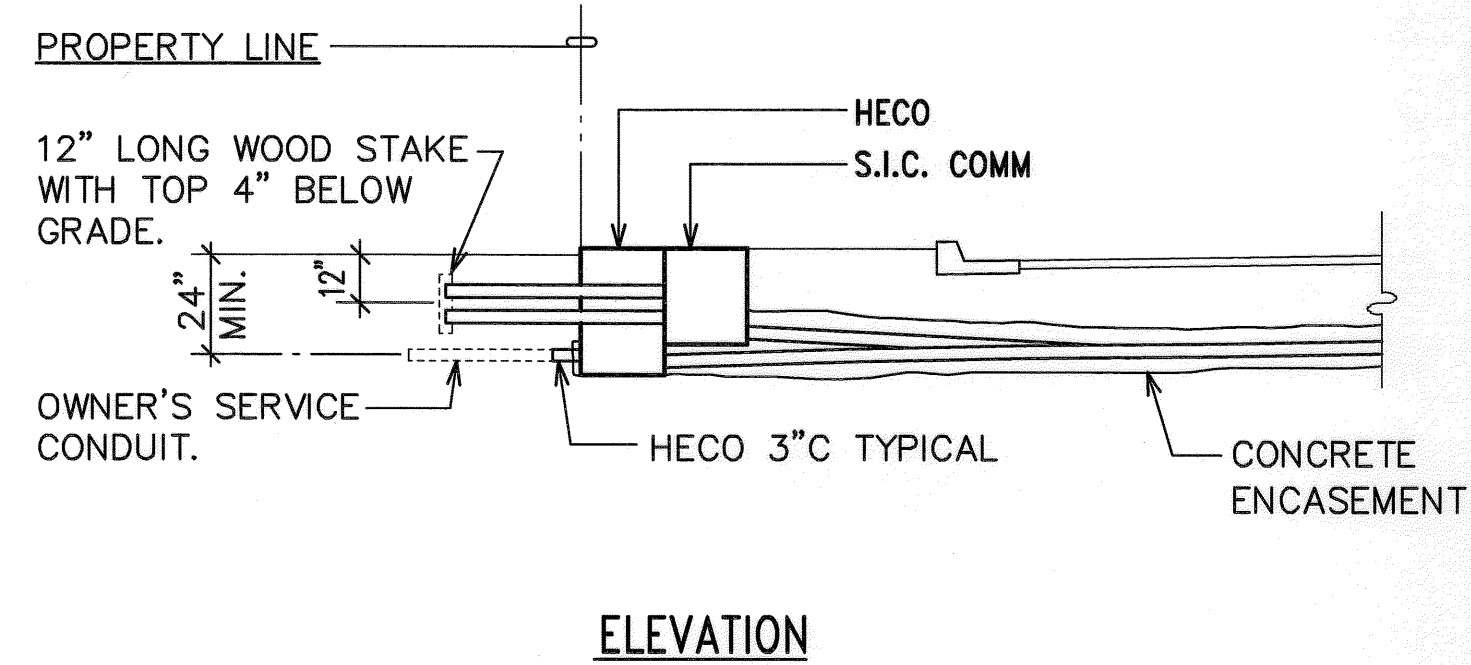
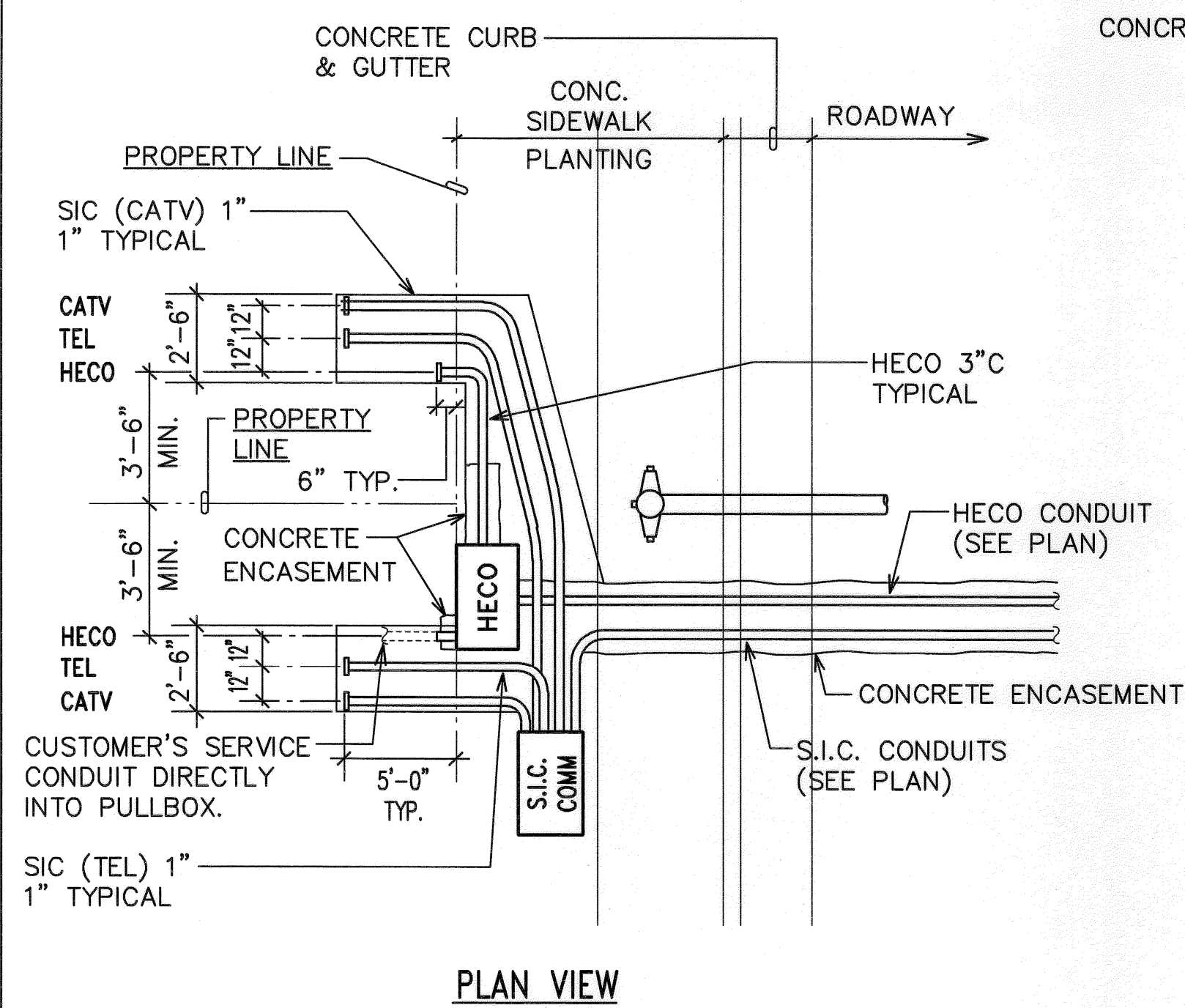
1. REINFORCED CONCRETE TRANSFORMER PAD TO BE CONSTRUCTED AS SHOWN ON THIS SHEET & HECO STANDARD DRAWING NO. 011249 & NO. 30-5001.
2. GRADE AND COMPACT LOT AS REQUIRED BY HECO.
3. HIGHEST FRONT CORNER OF TRANSFORMER PAD LOT SHALL MATCH FINAL SIDEWALK GRADE.
4. CONCRETE ENCASE ALL HECO PRIMARY DUCTS AND COMM 4" DUCTS THAT ARE NOT INSTALLED UNDER CONCRETE SIDEWALK.

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3. HIGHEST FRONT CORNER OF TRANSFORMER PAD LOT SHALL MATCH FINAL SIDEWALK GRADE.
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4. CONCRETE ENCASE ALL HECO PRIMARY DUCTS AND COMM 4" DUCTS THAT ARE NOT INSTALLED UNDER CONCRETE SIDEWALK.

(A) TYPICAL TRANSFORMER PAD LOT
(E-13) NOT TO SCALE

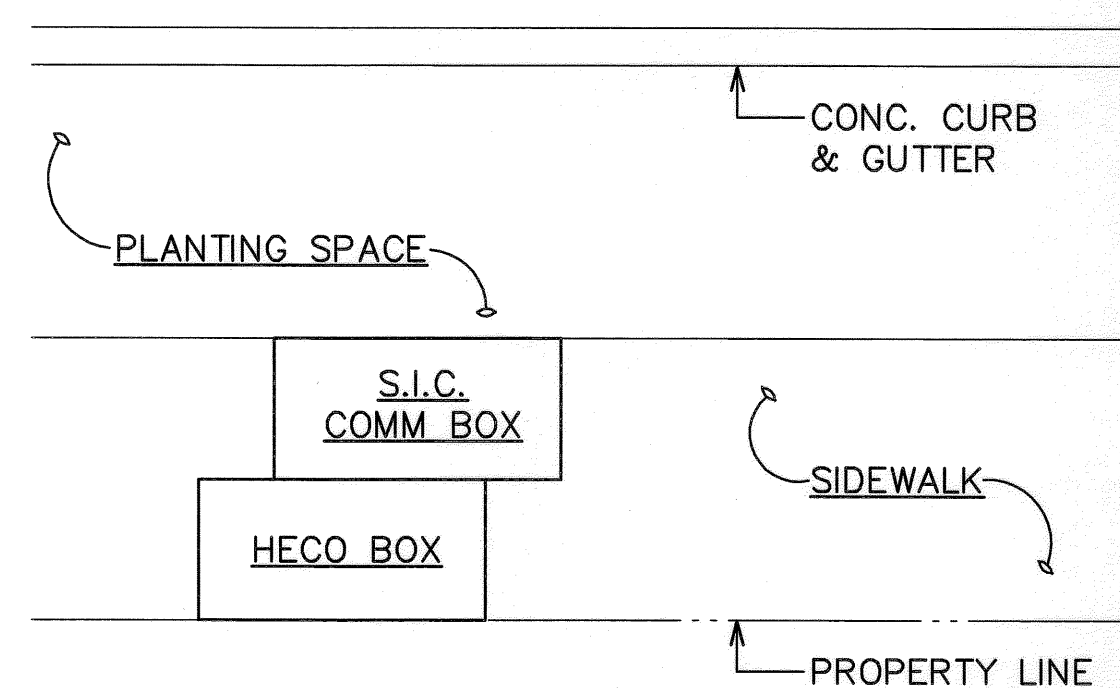


NOTES:

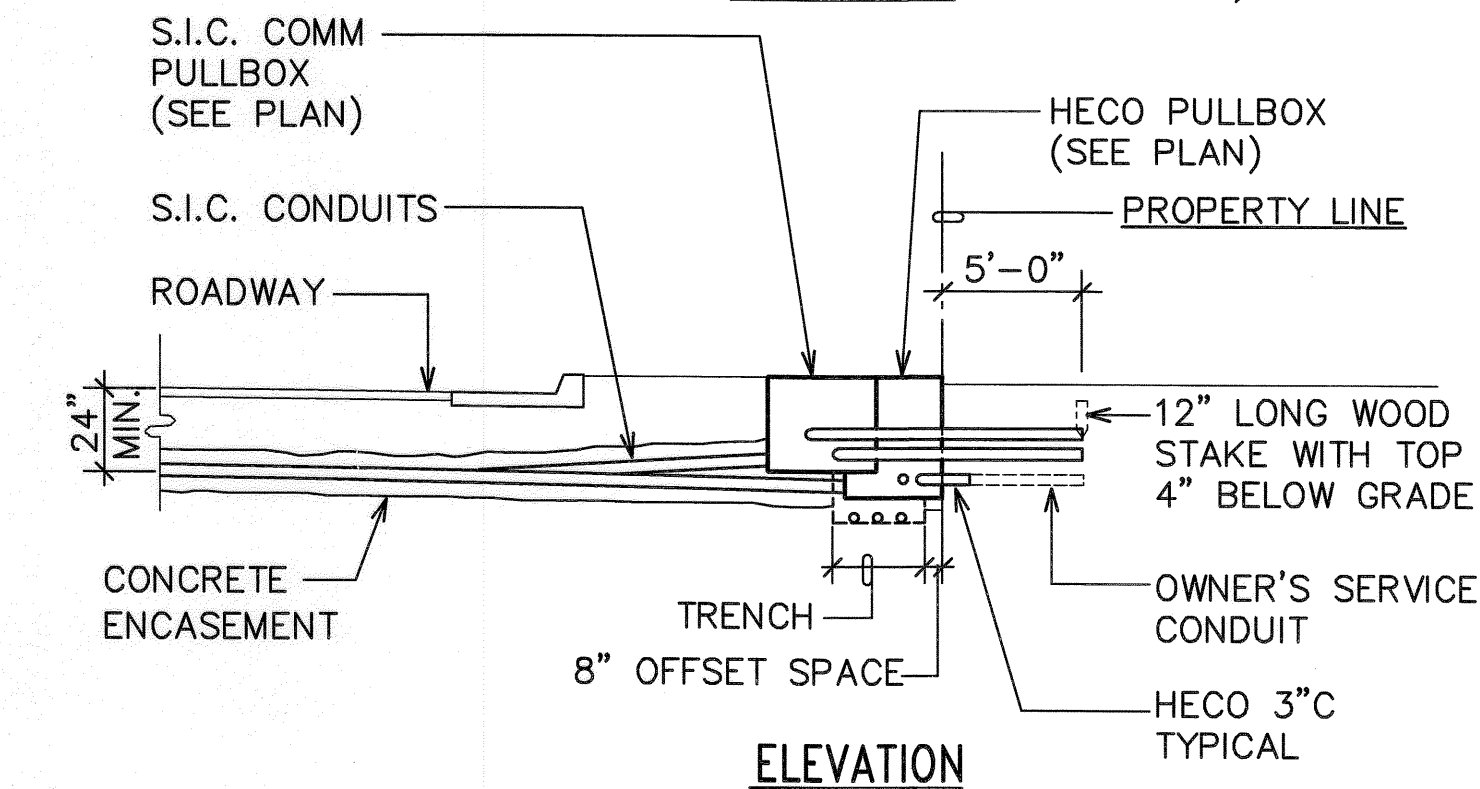
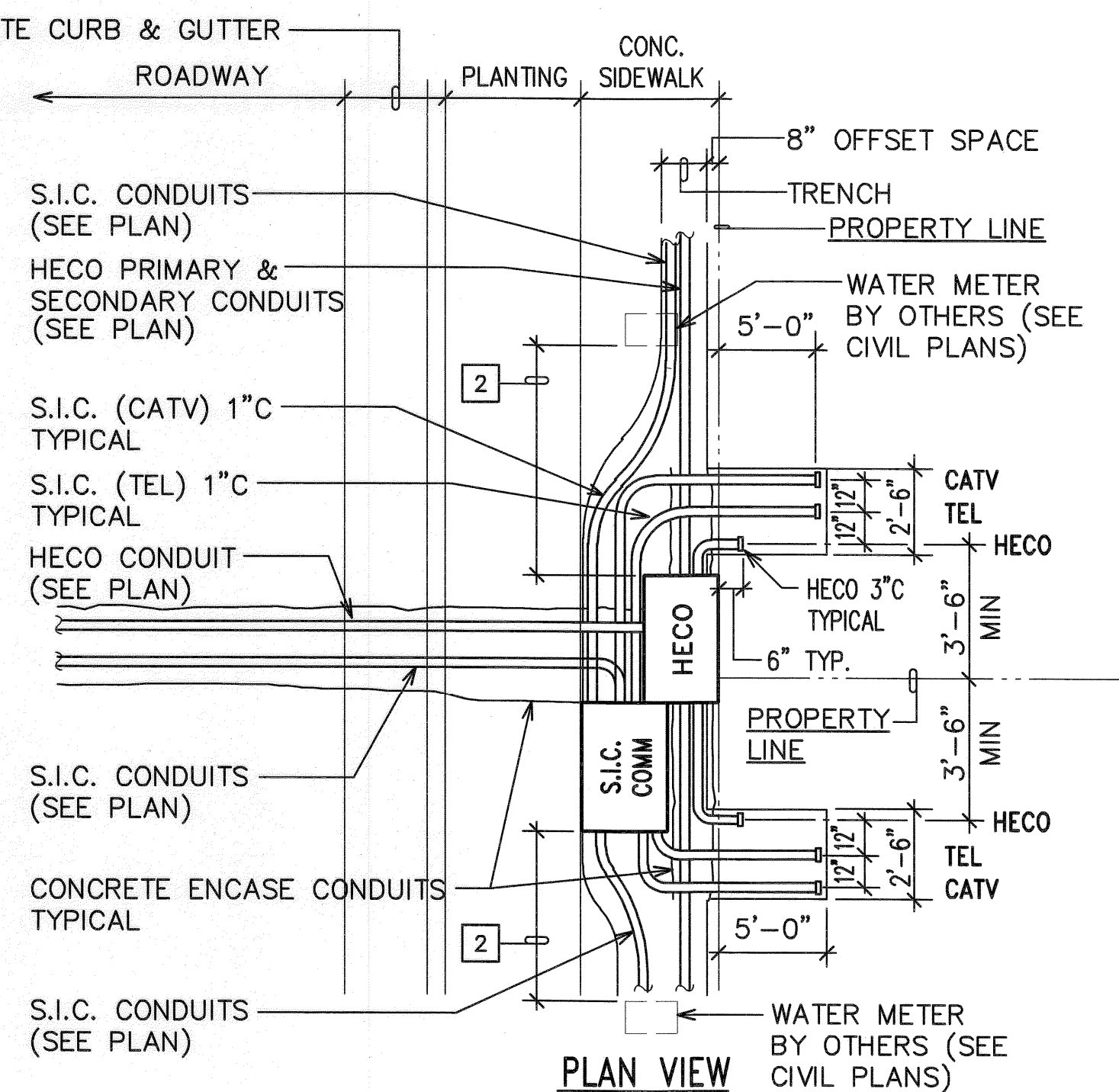
- 1 CONCRETE ENCASE ALL HECO PRIMARY DUCTS AND COMM 4" DUCTS THAT ARE NOT INSTALLED UNDER CONCRETE SIDEWALK.
- 2 MAINTAIN 3'-0" MIN. CLEARANCE. VERIFY CLEARANCE REQUIREMENTS AND ADJUST ELEC WORK AS NECESSARY.

- 2 MAINTAIN 3'-0" MIN. CLEARANCE. VERIFY CLEARANCE REQUIREMENTS AND ADJUST ELEC WORK AS NECESSARY.

TYPICAL LOT SERVICE



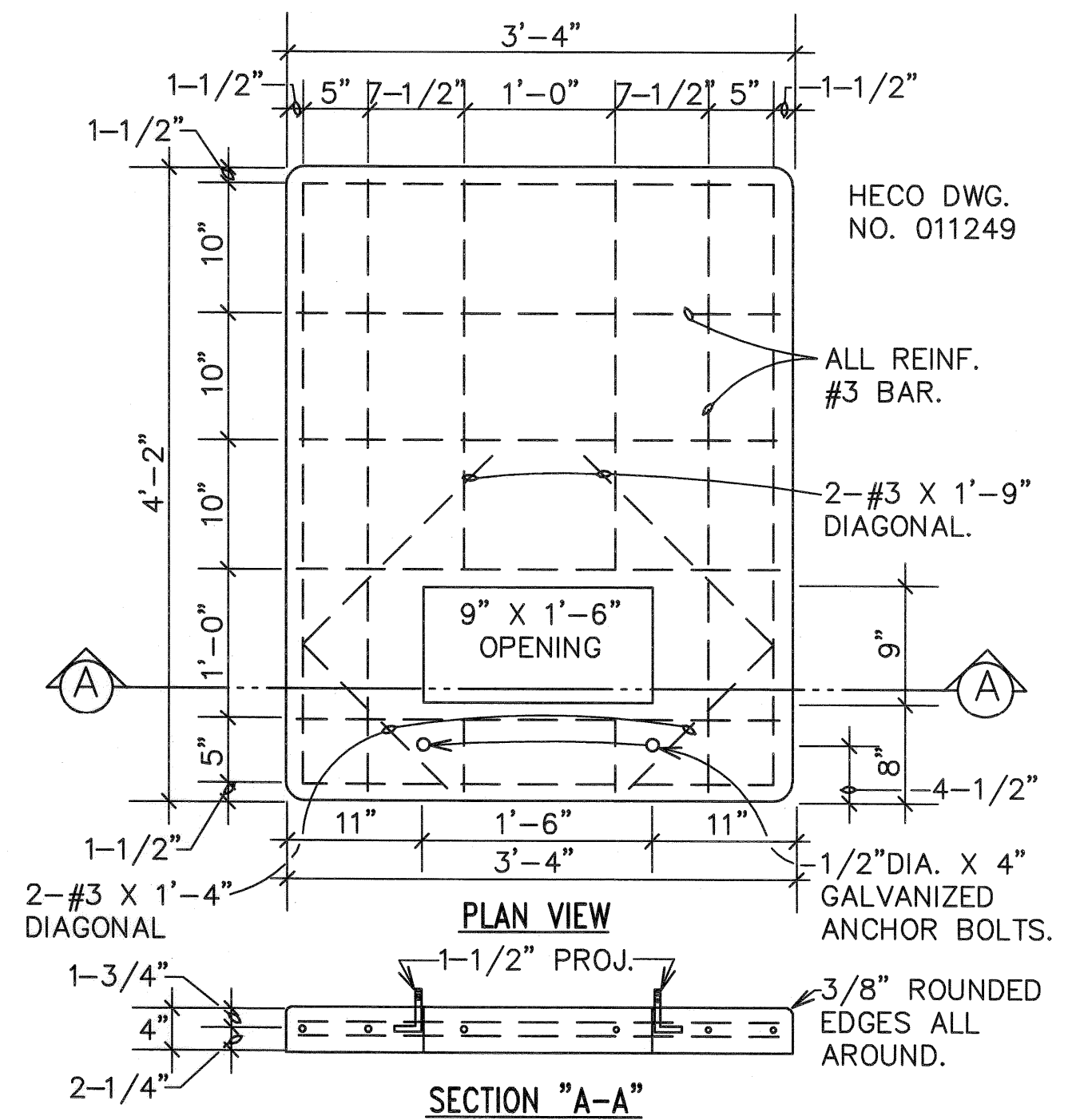
TYPICAL HANDHOLE GROUP ARRANGEMENT



APPROVED BY:

HAWAIIAN ELECTRIC COMPANY, INC.

DATE _____



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.


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3. CURE CONCRETE BY APPROVED METHOD.
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5. CONTRACTOR HAS OPTION OF FURNISHING CAST-IN-PLACE OR PRECAST.

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4. TOP OF CONC. PAD TO BE SMOOTH, TRUE & LEVEL, FREE FROM DEFECTS.

5. CONTRACTOR HAS OPTION OF FURNISHING CAST-IN-PLACE OR PRECAST.

C
E-13
**CONCRETE TRANSFORMER
PAD DETAIL**
 NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p>KAKAINA SUBDIVISION</p> <p>TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII</p>			
<p>TYPICAL TRANSFORMER PAD & LOT SERVICE DETAILS</p>			
<p>Approved: </p>		<p>2-1-12</p>	
SANDWICH ISLES COMMUNICATIONS		DATE	
<p>AKINA K. & ASSOCIATES, LTD. CONSULTING ENGINEERS</p>			

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

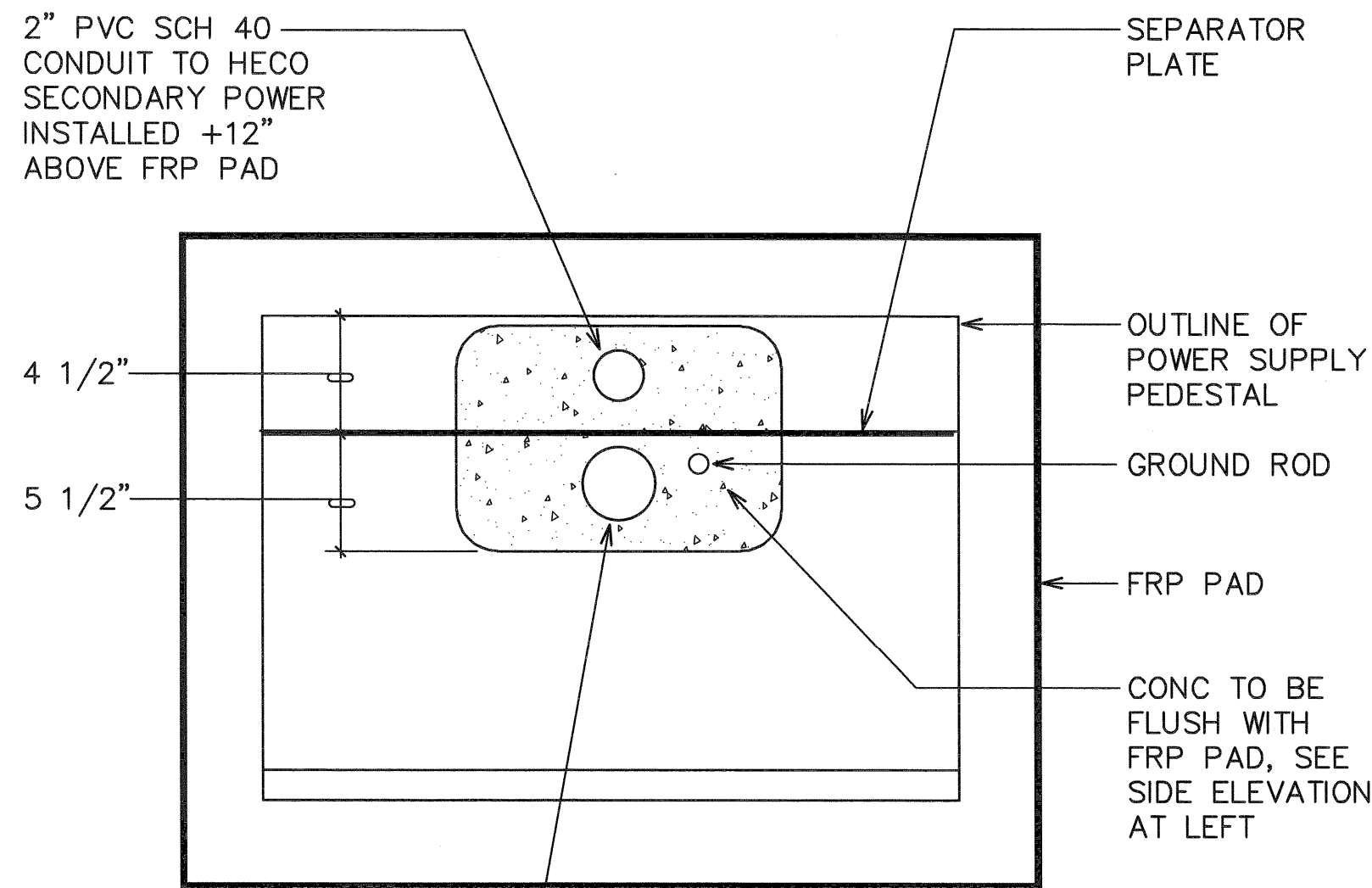
SCOTT S. LEE
LICENSED PROFESSIONAL ENGINEER
No. 10038-E
HAWAII, U.S.A.

2-2-12

THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
LICENSE EXPIRES 4/30/12

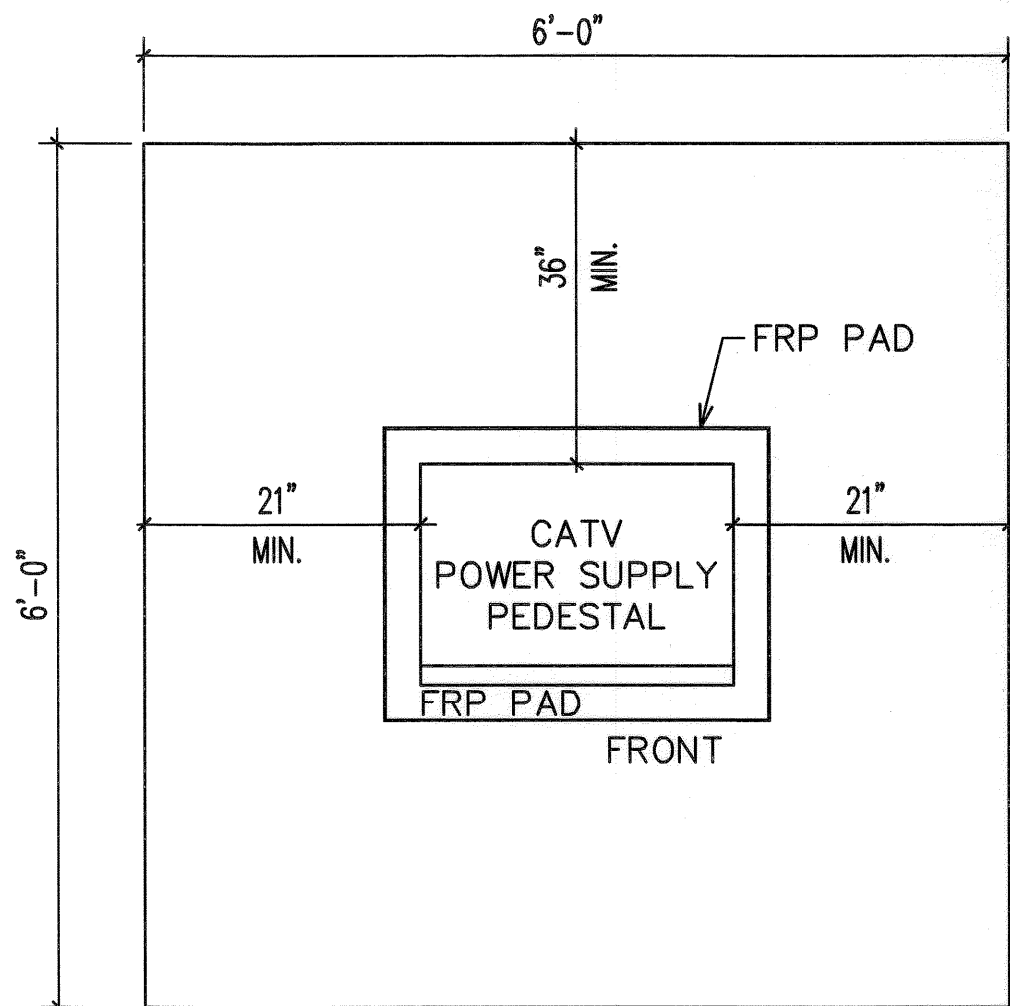
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS

LOT 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

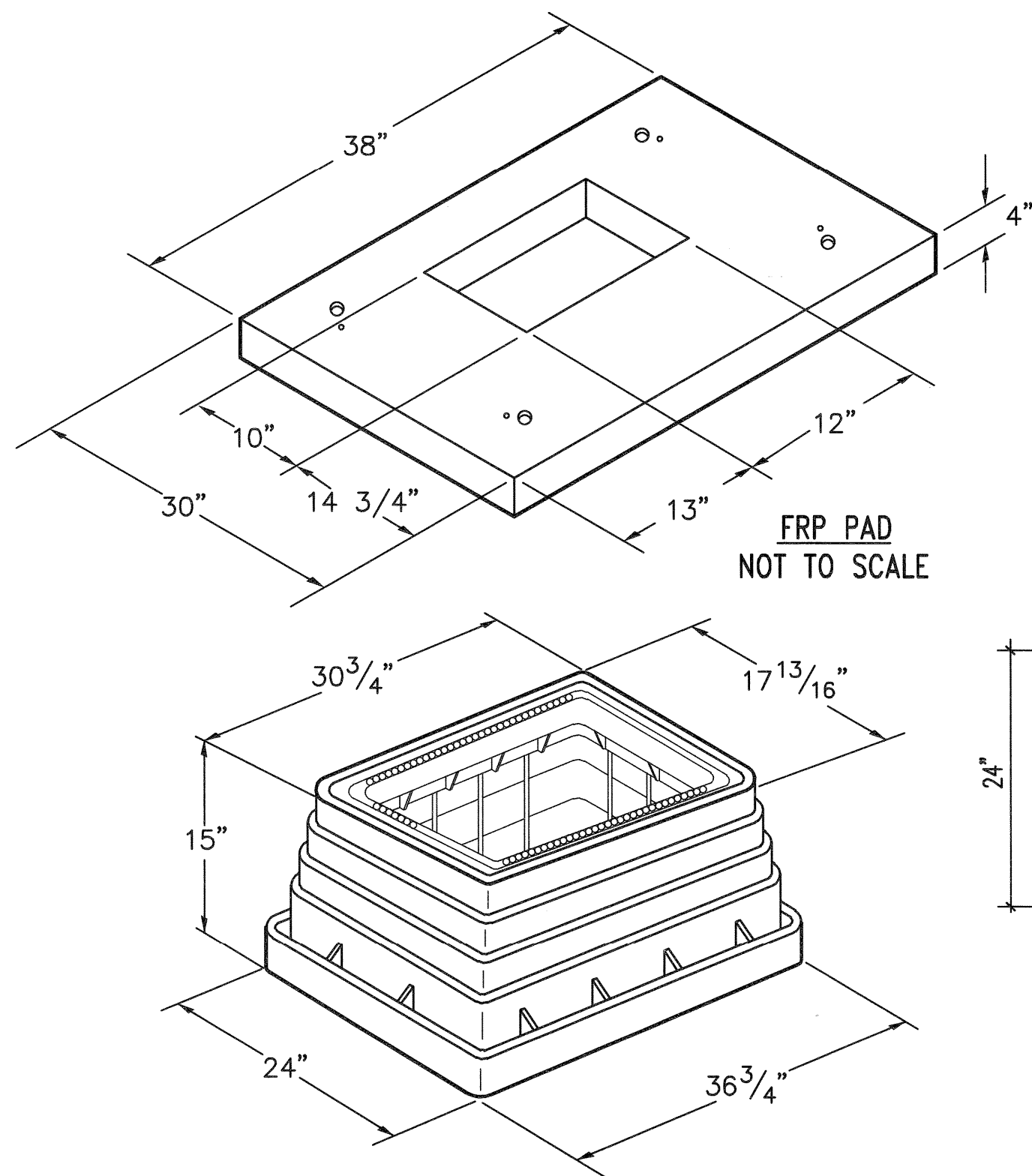


4" CATV PVC SCH 40 CONDUIT INSTALLED 4" ABOVE FRP PAD, TO CATV 2' X 4' HANDHOLE

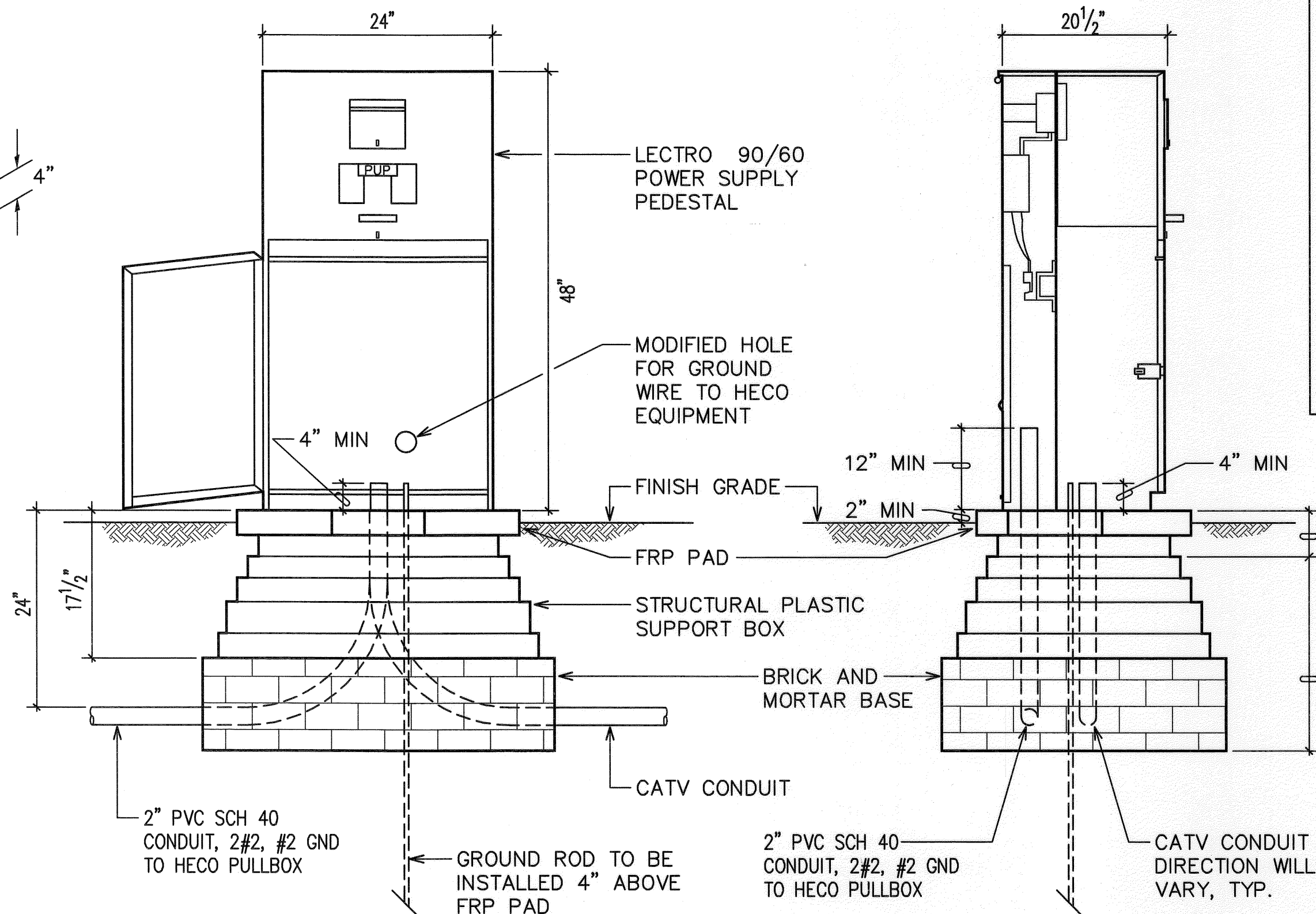
TOP VIEW OF FRP PAD
NOT TO SCALE



CATV 6'-0" X 6'-0" EASEMENT
EASEMENT SITE PLAN
NOT TO SCALE



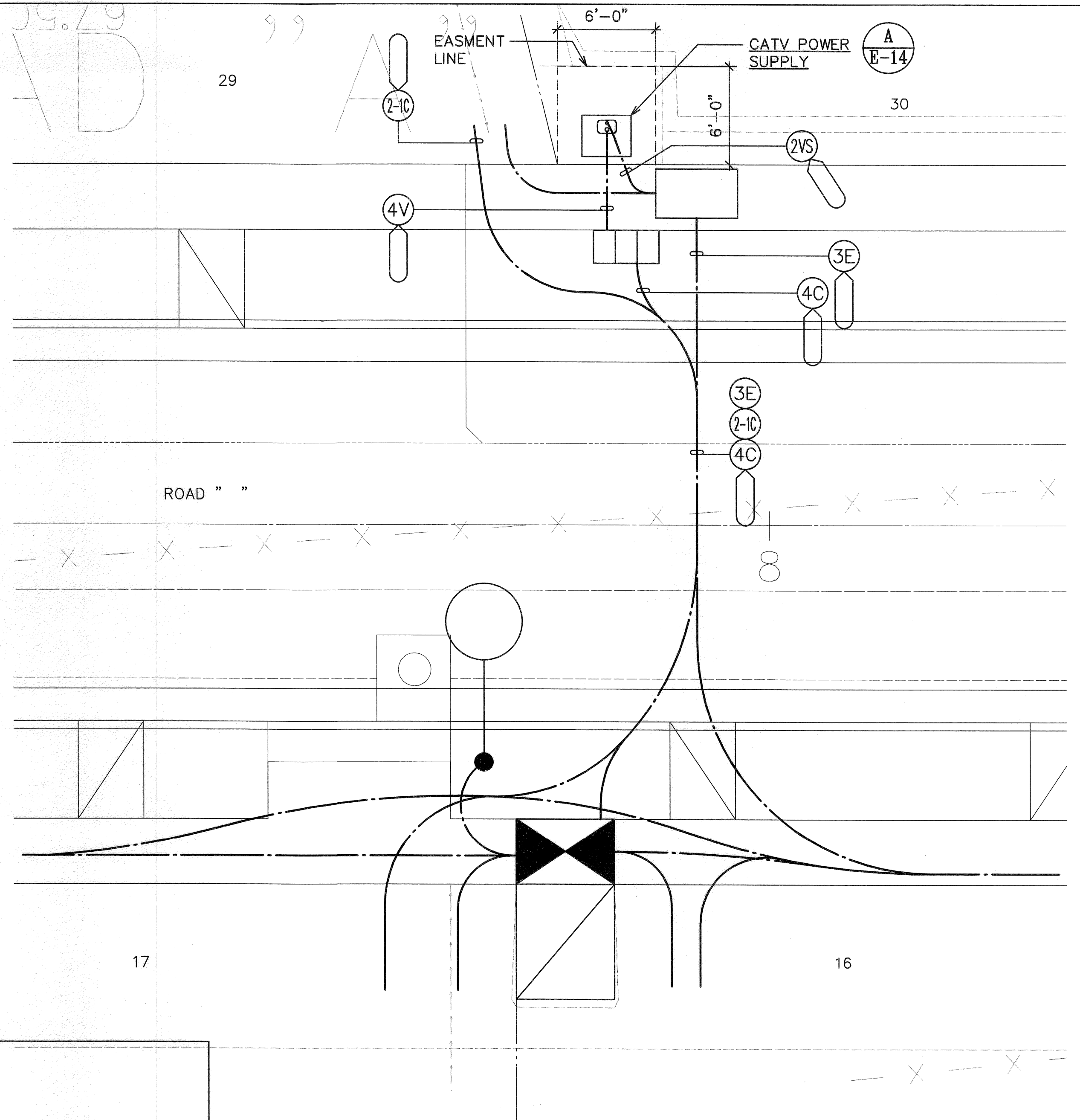
STRUCTURAL PLASTIC SUPPORT BOX
NOT TO SCALE



FRONT ELEVATION

SIDE ELEVATION

NOTE: POWER SUPPLY PEDESTAL, FRP PAD AND PLASTIC SUPPORT BOX TO BE FURNISHED BY OCEANIC CABLE AND INSTALLED BY CONTRACTOR. COORDINATE PICK UP AT OCEANIC CABLE BASEYARD WITH OCEANIC CABLE'S INSPECTOR. COORDINATE ENERGIZING OF POWER SUPPLY WITH HECO AND OCEANIC CABLE.



B ENLARGED EQUIPMENT PLAN
E-14 SCALE: 1"=5'

APPROVED BY:

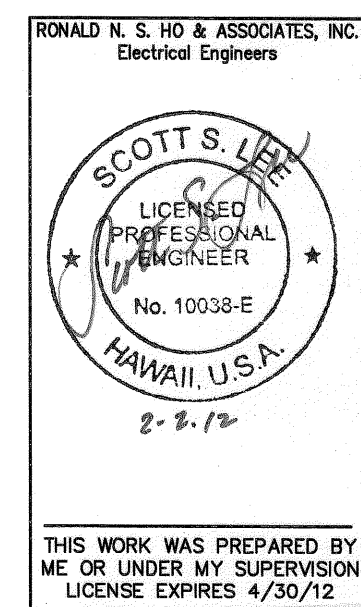
HAWAIIAN ELECTRIC COMPANY, INC.

DATE

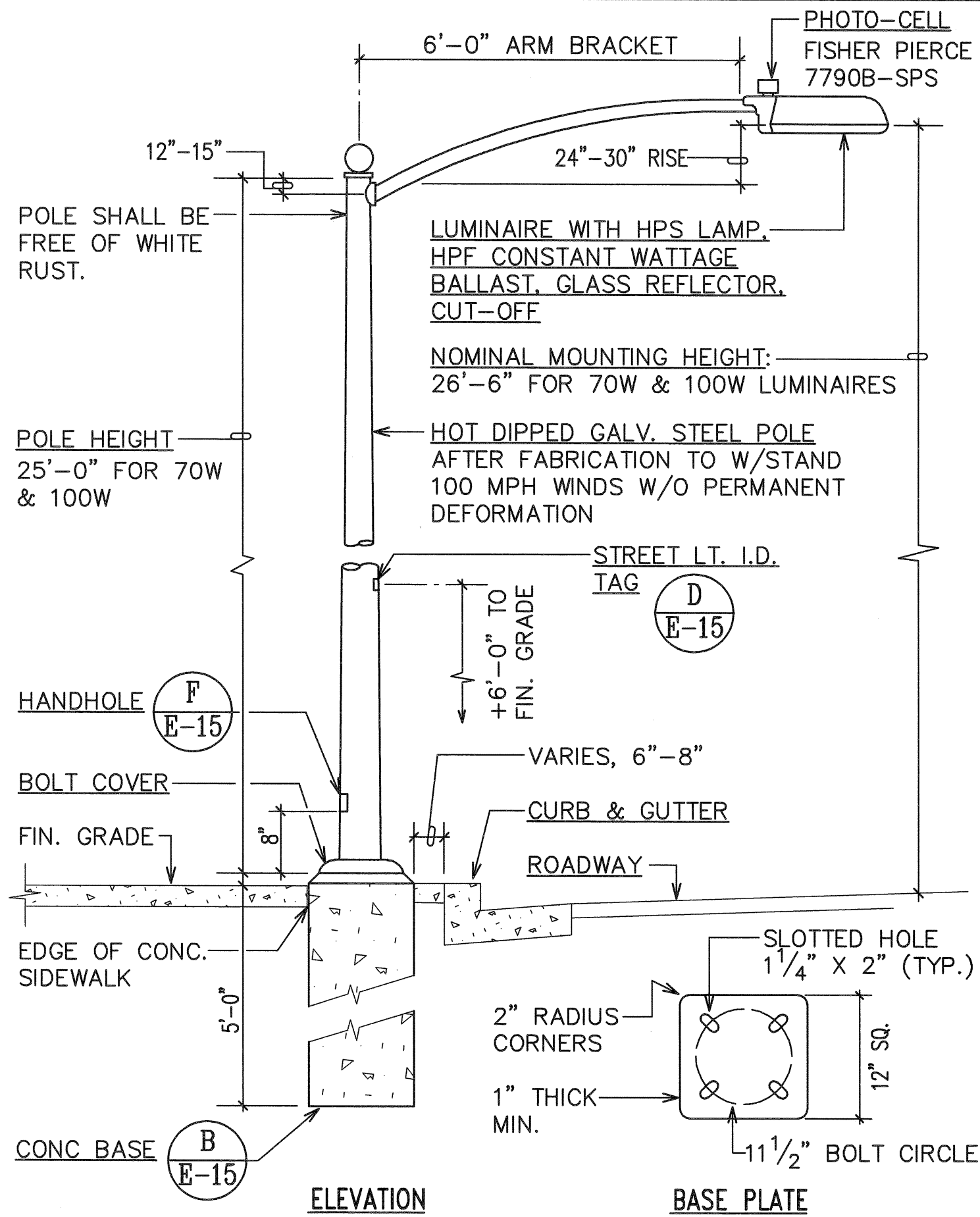
5' 2.5' 0 5' 10' 15'

SCALE: 1"=5'

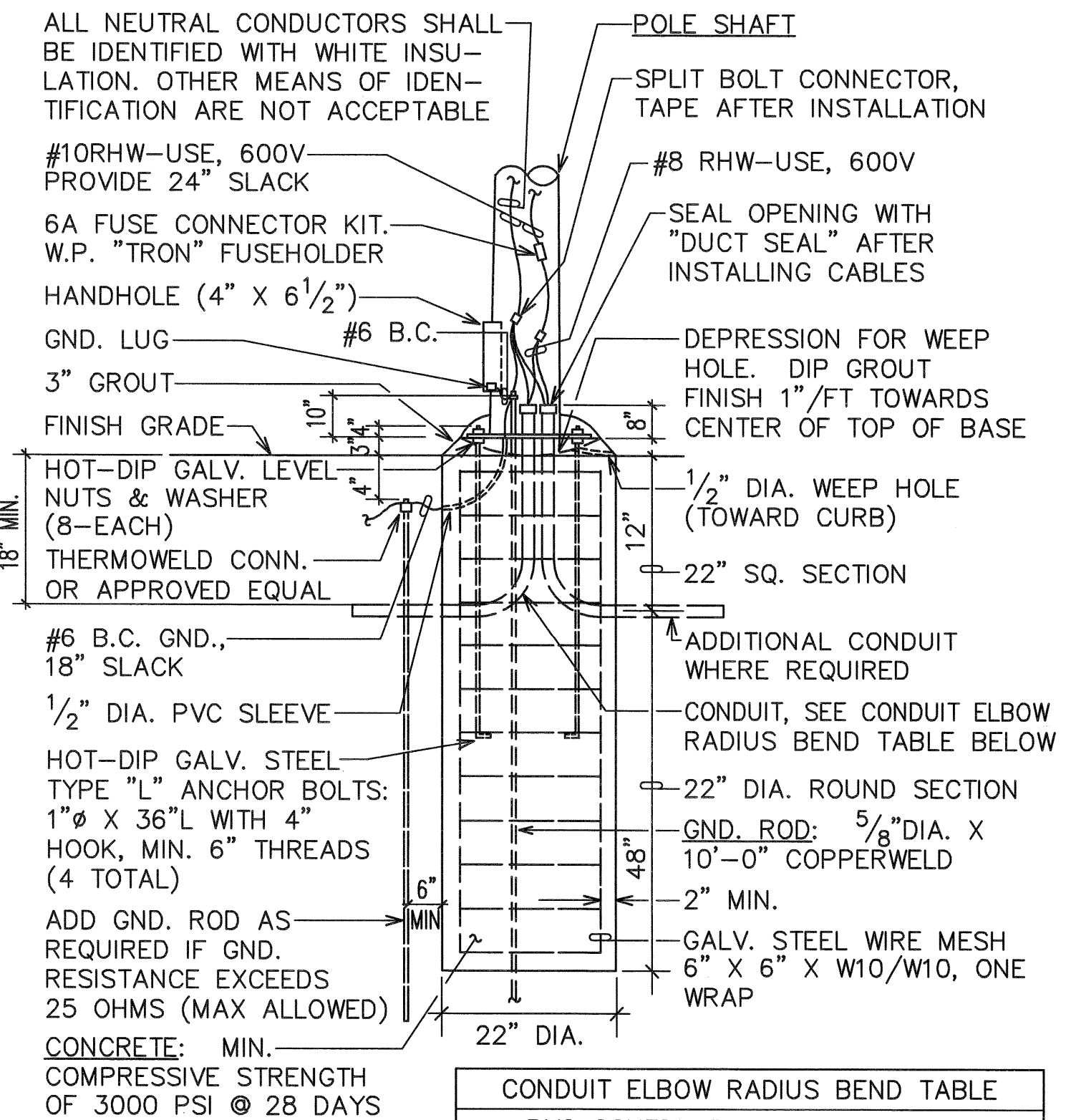
GRAPHIC SCALE



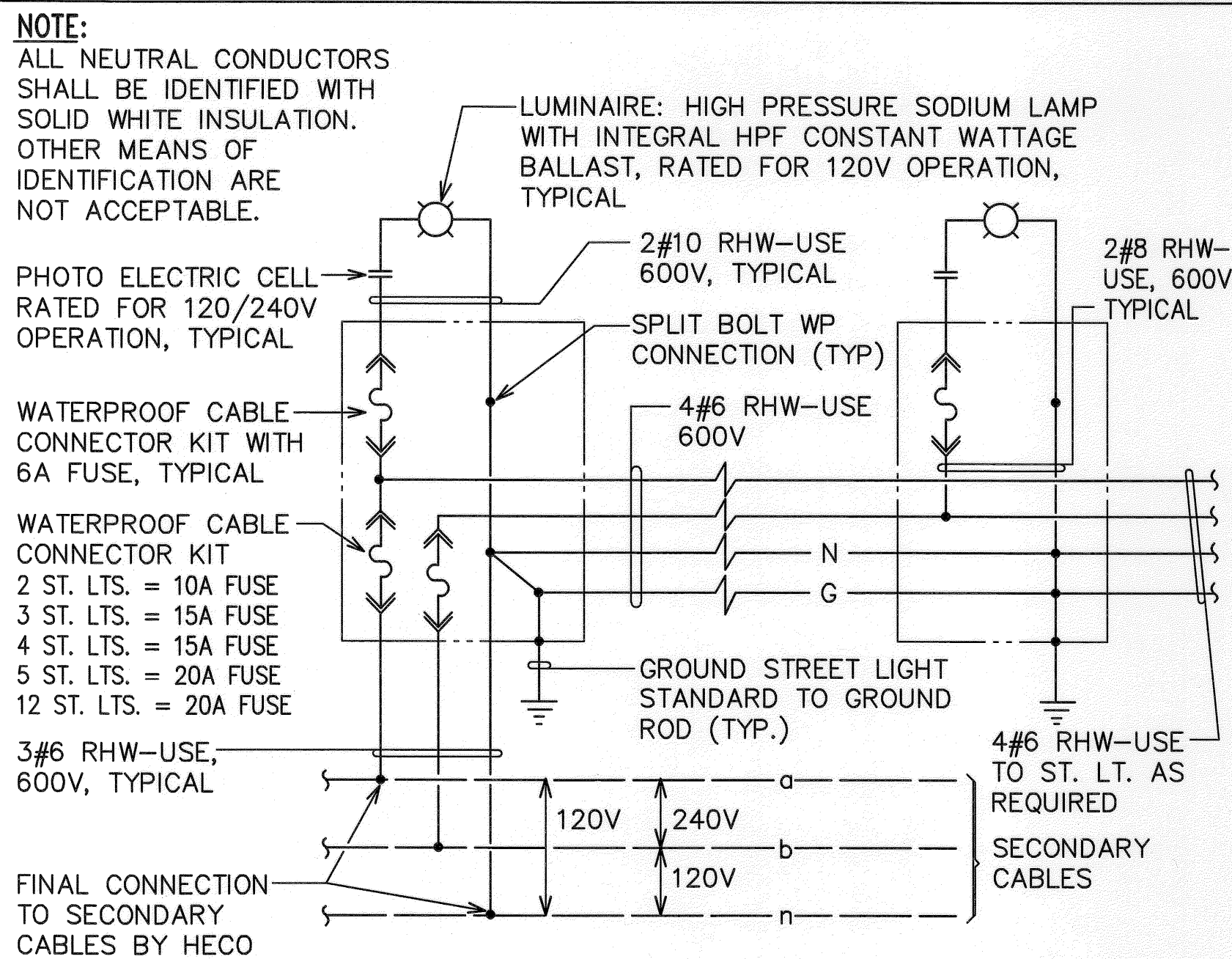
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
CATV POWER SUPPLY DETAILS			
Approved: _____			
DATE _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.



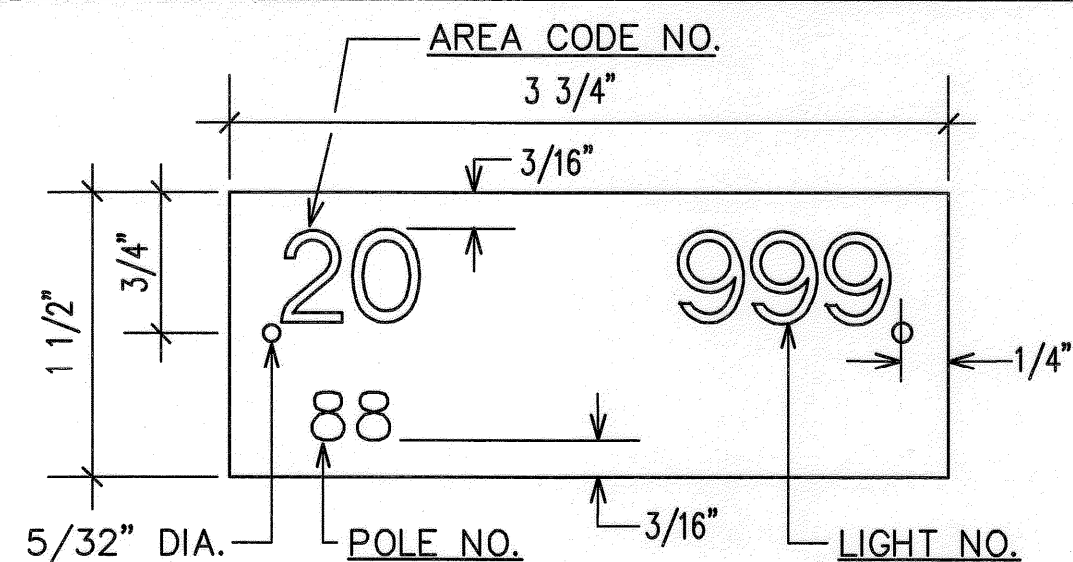
A STREET LIGHT STANDARD
E-15 NOT TO SCALE



B CONCRETE BASE ELEVATION
E-15 NOT TO SCALE

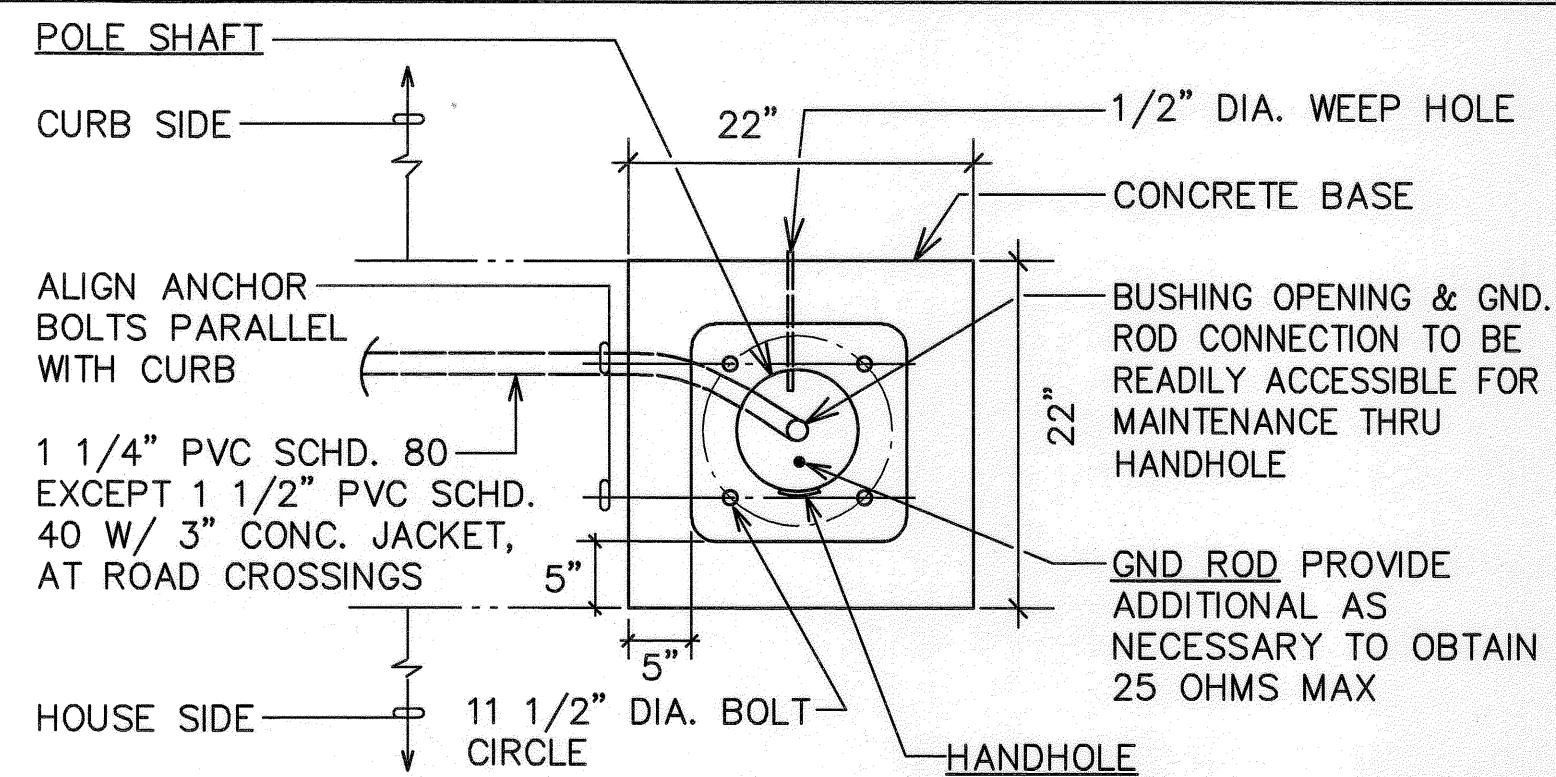


C STREET LIGHT MULTIPLE CONNECTION DIAGRAM
E-15

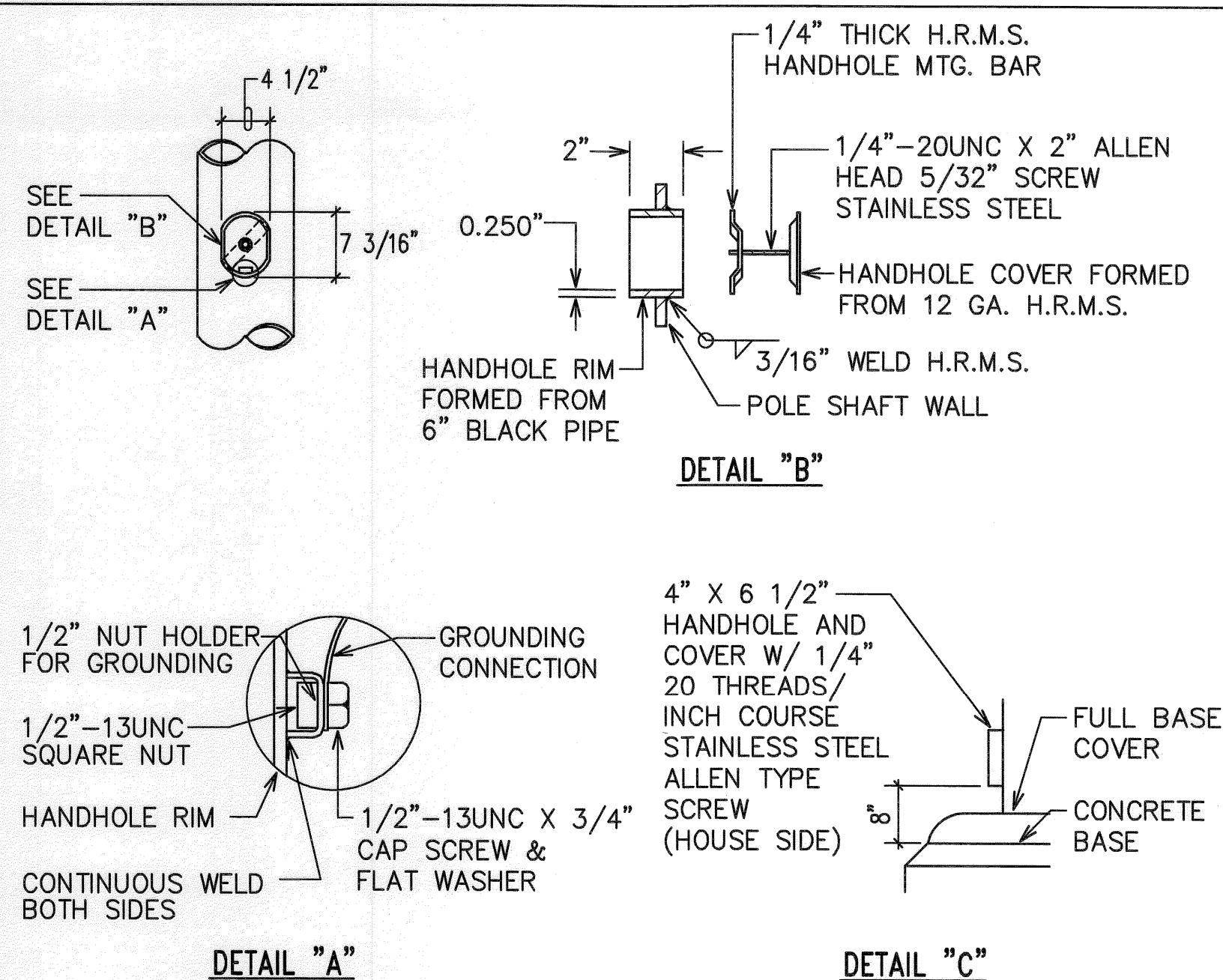


- NOTES:**
- USE 3 PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK THICKNESS: BLACK CAP SHEET-0.010", WHITE SHEET-0.052", BLACK BASE SHEET-0.010".
 - AREA CODE AND LIGHT NUMBER SHALL BE 5/8" HIGH, 1/8" STROKE, WHITE IN COLOR (NUMBER AS REQUIRED).
 - POLE NUMBER SHALL BE 1/4" HIGH, 1/16" STROKE, WHITE IN COLOR (NUMBER AS REQUIRED).
 - ATTACH TO STEEL POLES WITH NO. 8 STAINLESS STEEL, 1/2" LONG DRIVE SCREWS IN 1/8" DRILL HOLE.
 - NUMBERS ARE INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE" LETTERS.

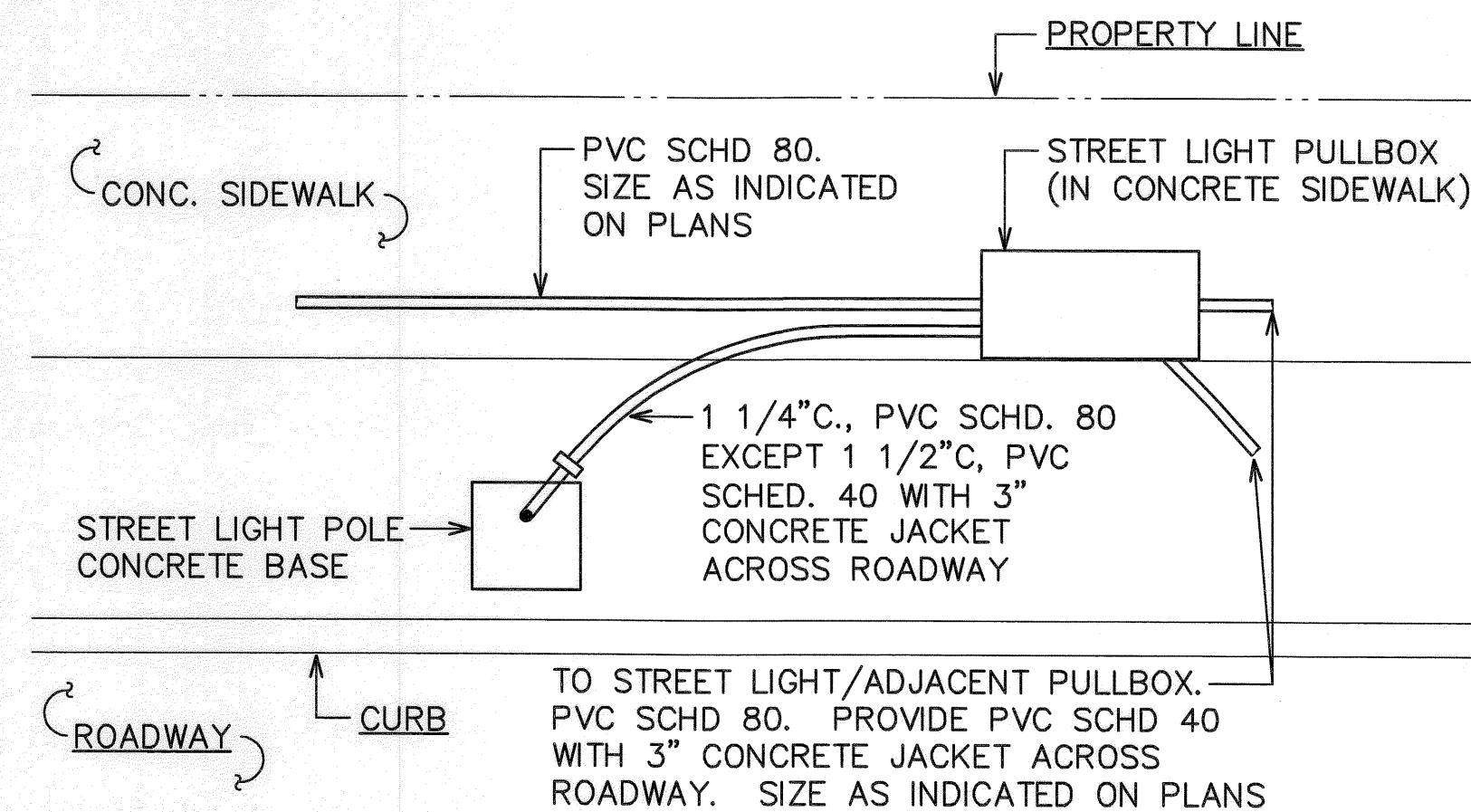
D STREET LIGHT I.D. TAG DETAIL
E-15 NOT TO SCALE (MULTIPLE SYSTEM)



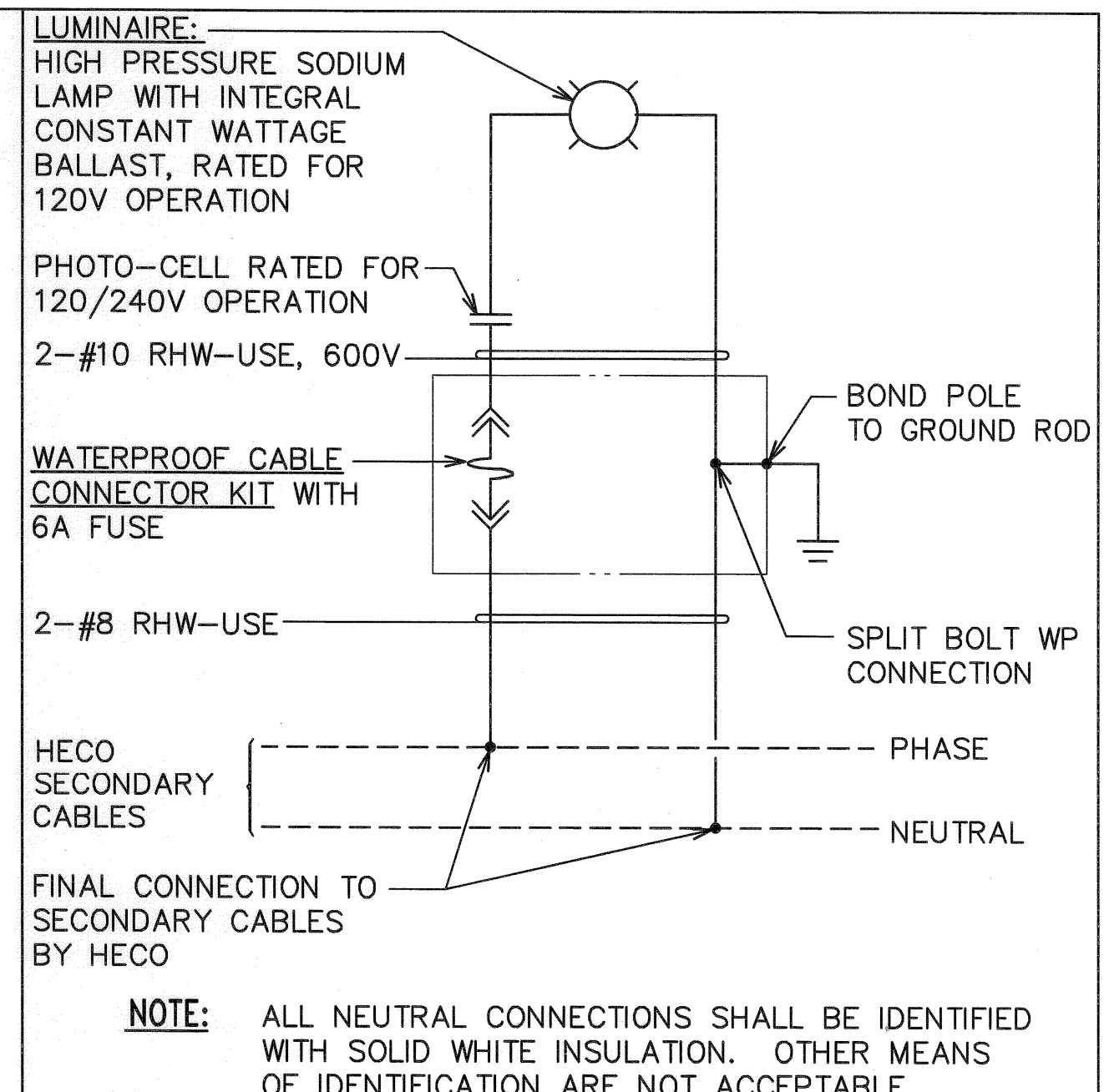
E CONCRETE BASE PLAN
E-15 NOT TO SCALE



F STREET LIGHT STANDARD HANDHOLE DETAILS
E-15 NOT TO SCALE



G TYPICAL STREET LIGHT/PULLBOX PLAN
E-15 NOT TO SCALE

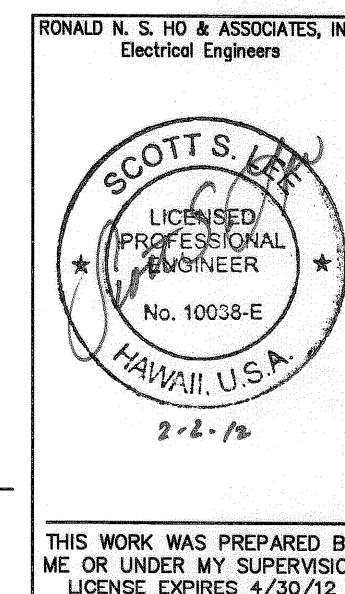


H STREET LIGHT CONNECTION DIAGRAM
E-15 (MULTIPLE SYSTEM)

APPROVED BY:

CHIEF, TRAFFIC REVIEW BRANCH
DEPT. OF PLANNING AND PERMITTING
CITY & COUNTY OF HONOLULU

DATE



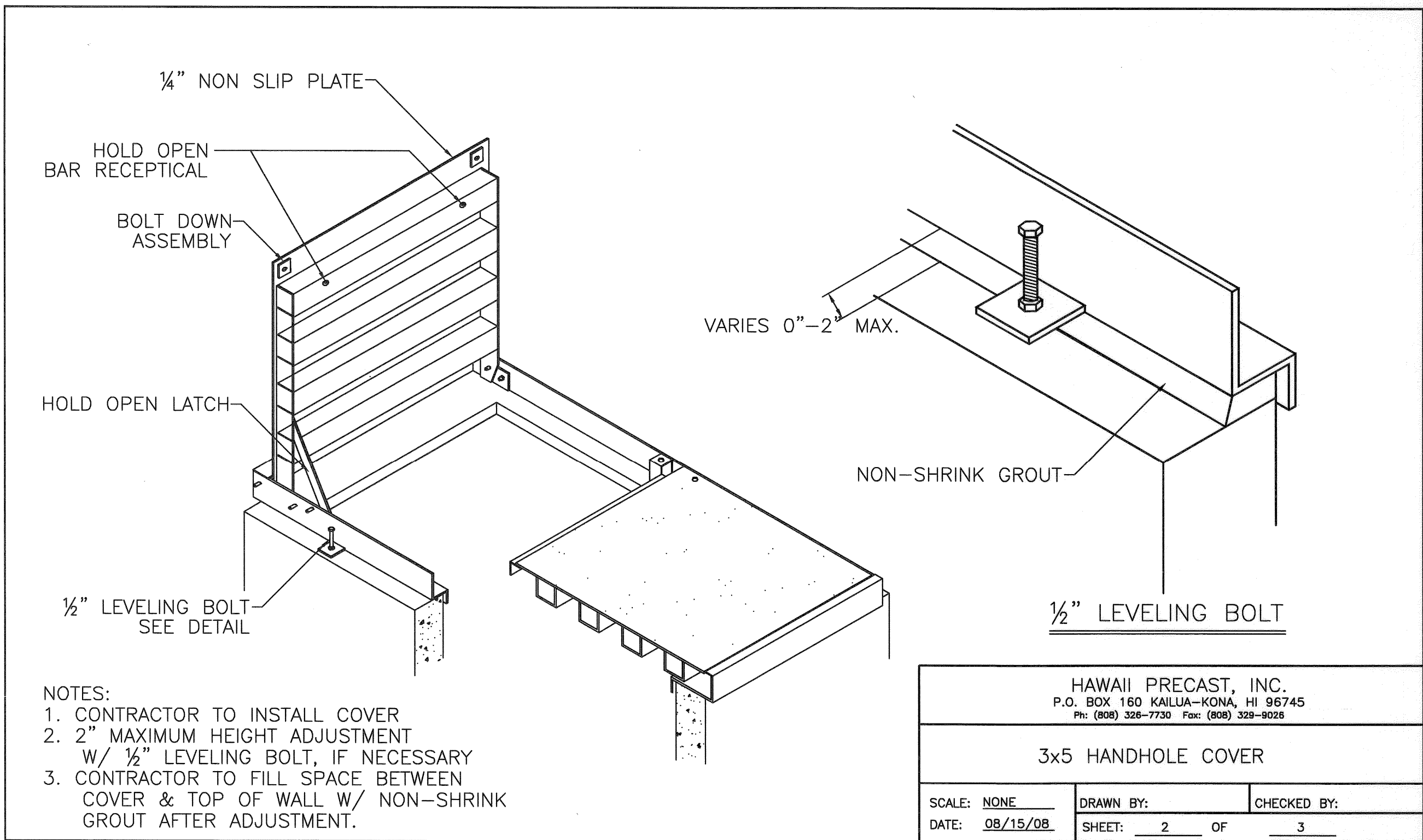
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION
LICENSE EXPIRES: 4/30/12

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
STREET LIGHT DETAILS I			
Approved: _____ CHIEF, MECHANICAL/ELEC DIVISION, DDC			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

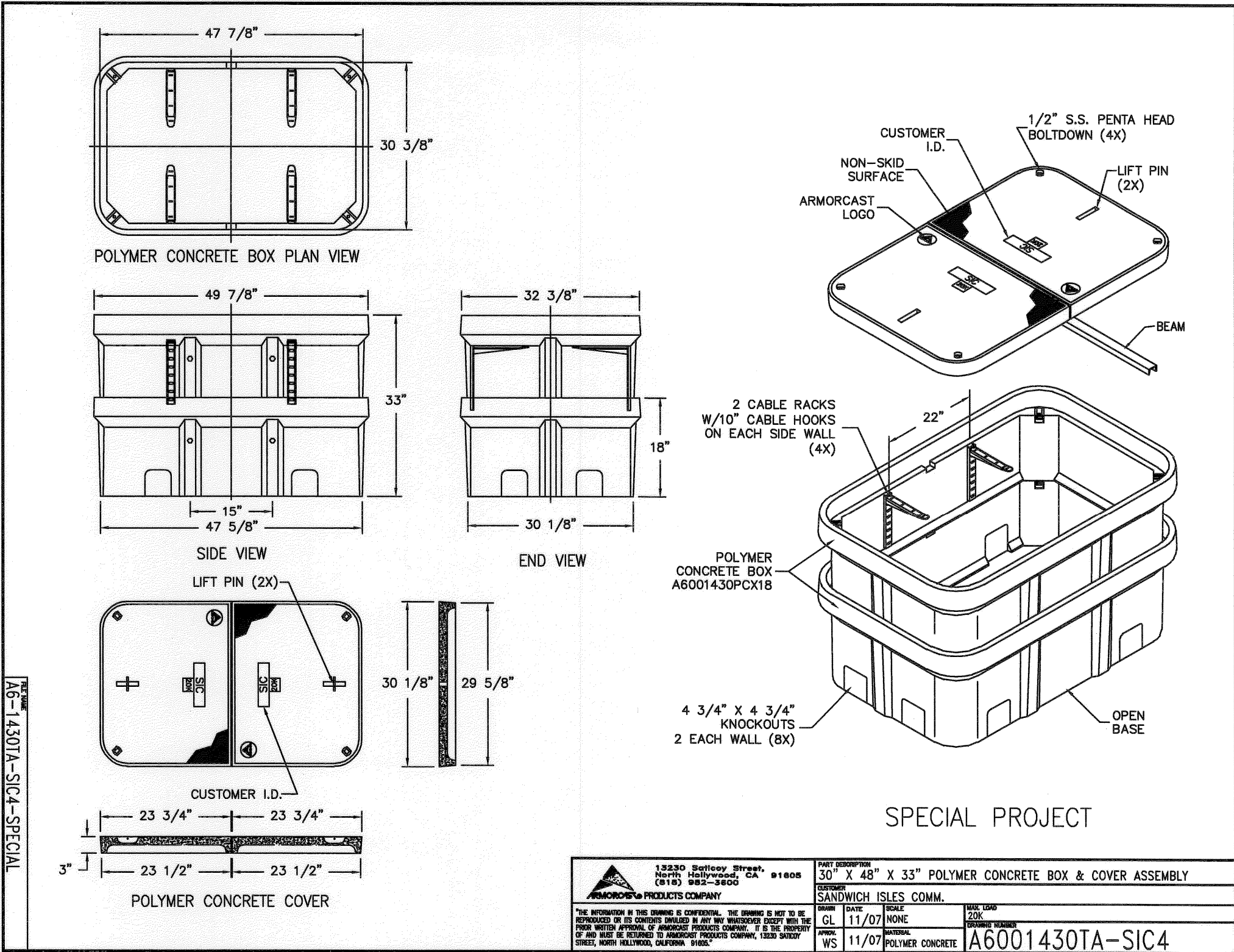


B E-16 POLYMER CONCRETE COVER

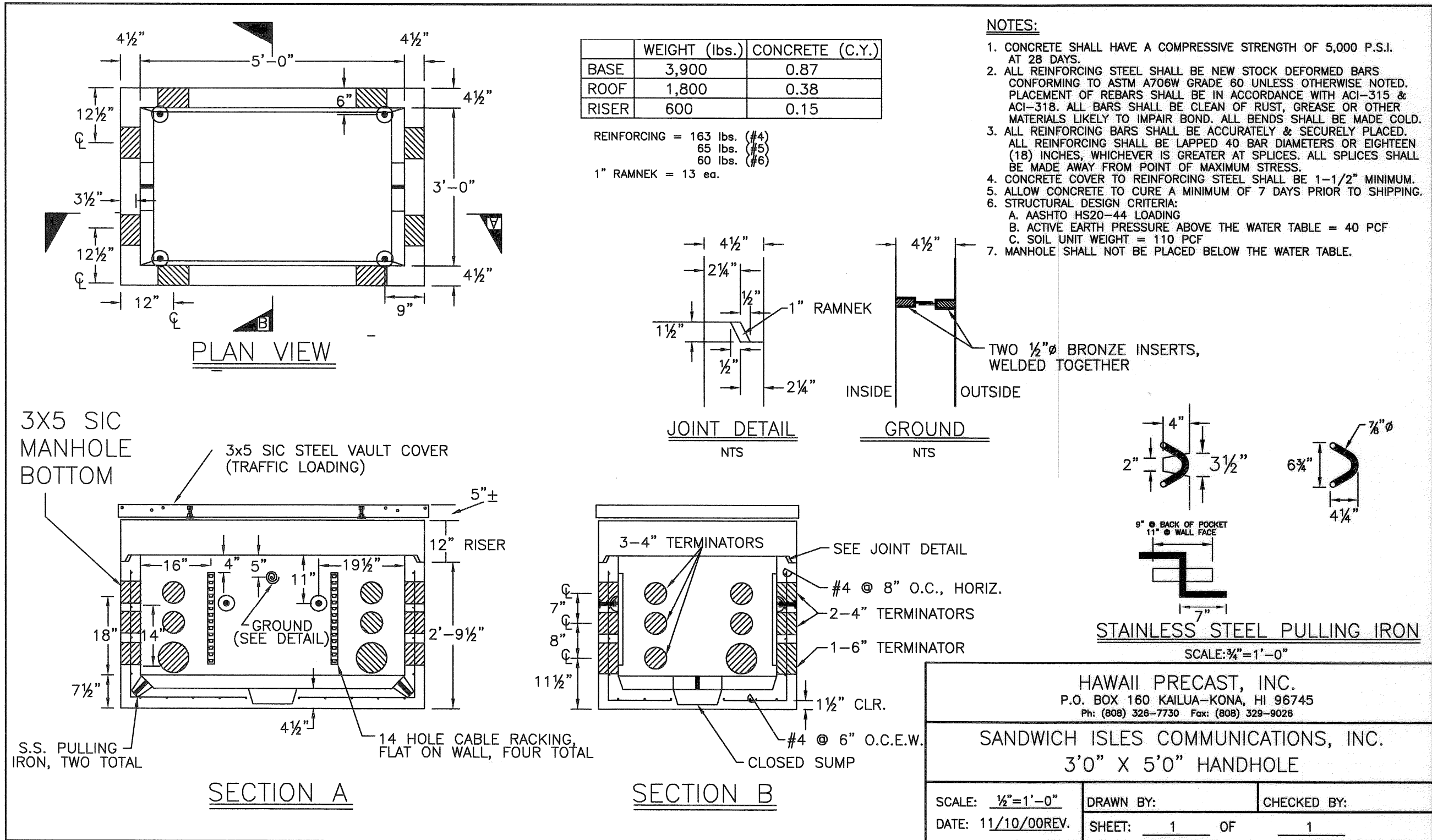




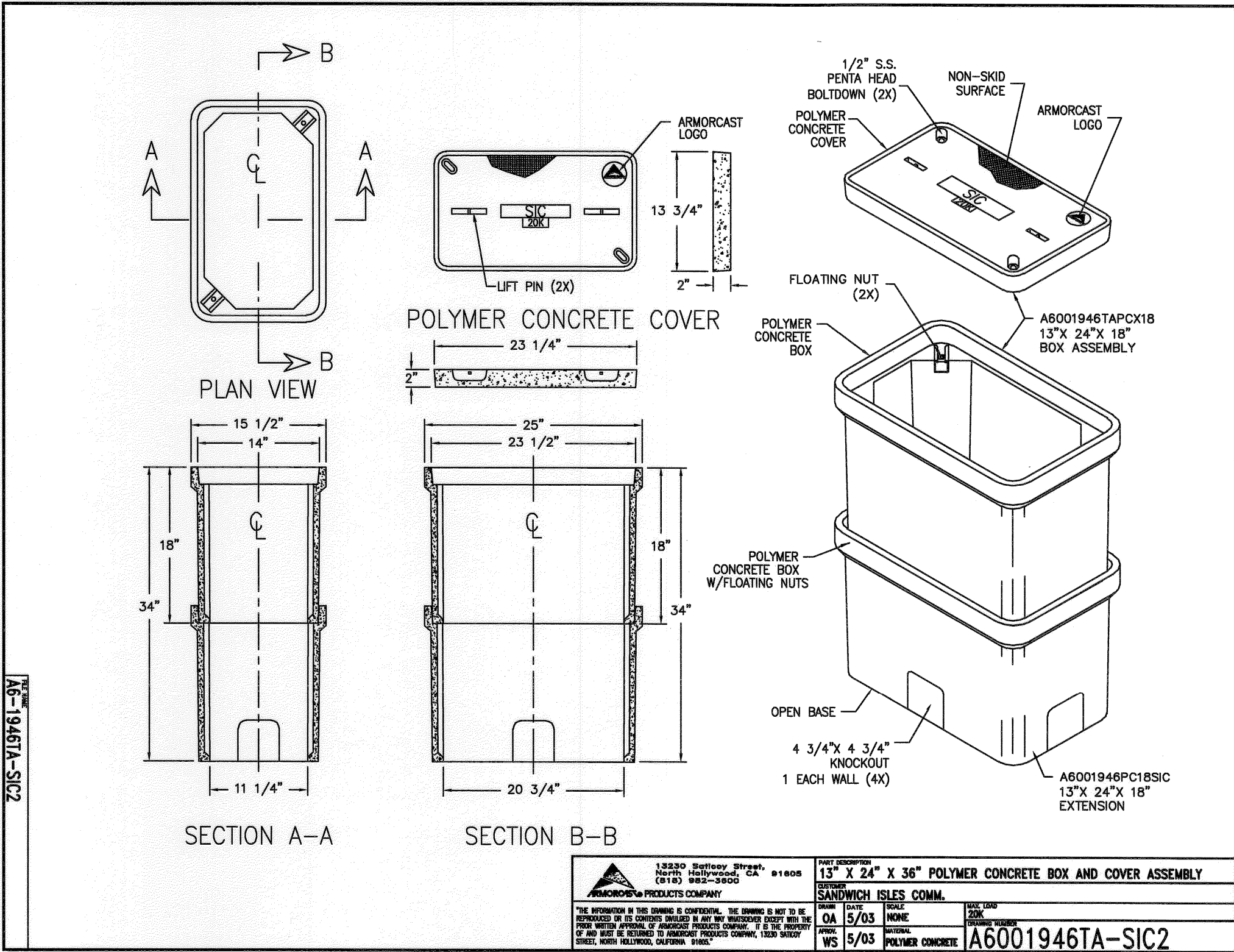
UH 3x5 COVER



UHC 30x48x33



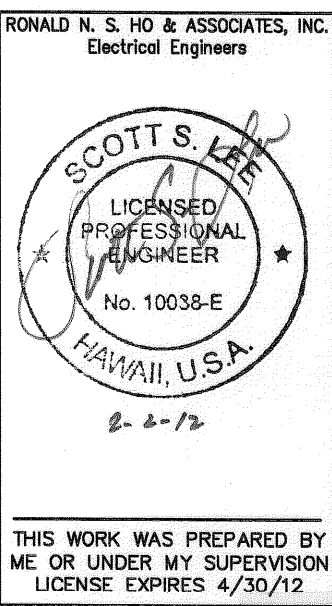
UH 3x5



UHC 13x24x36

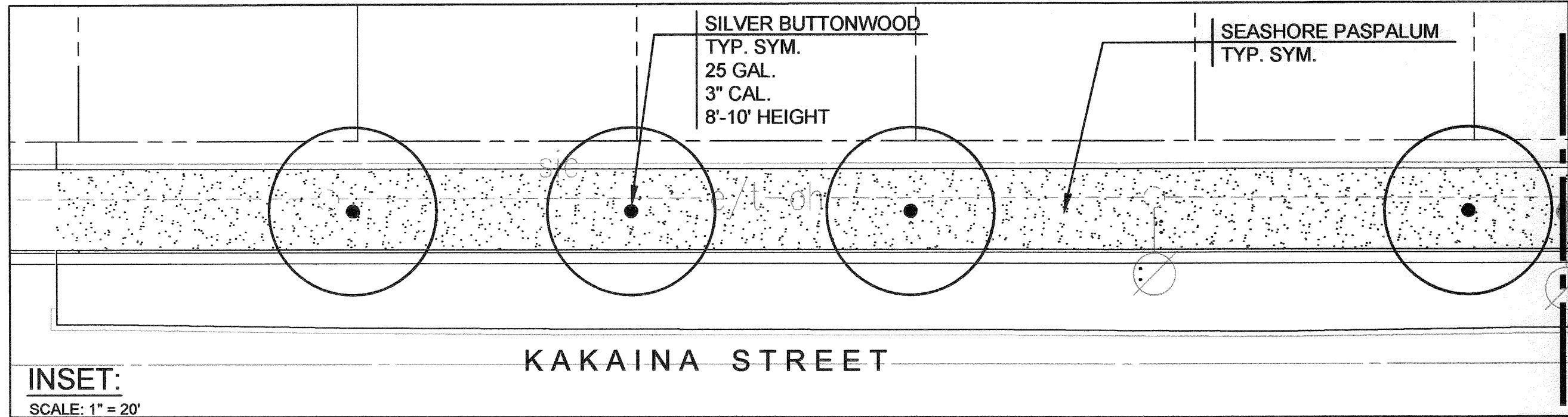
FOR REFERENCE ONLY

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
	DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: 4-1-08: 10, 81, 91 & 92 WAIMANALO, KOOLAUPOKO, OAHU, HAWAII		
	SIC REFERENCE DRAWINGS		
Approved:	<i>[Signature]</i>	2-1-12	
SANDWICH ISLES COMMUNICATIONS		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION LICENSE EXPIRES 4/30/12

Last Save by: RHIGA
Last Saved: 1/31/2012
Plotted on: 1/31/2012
P:\PROJECTS\OAHU\DHHL - Kakaina\CD\L-1
TO L-2.dwg

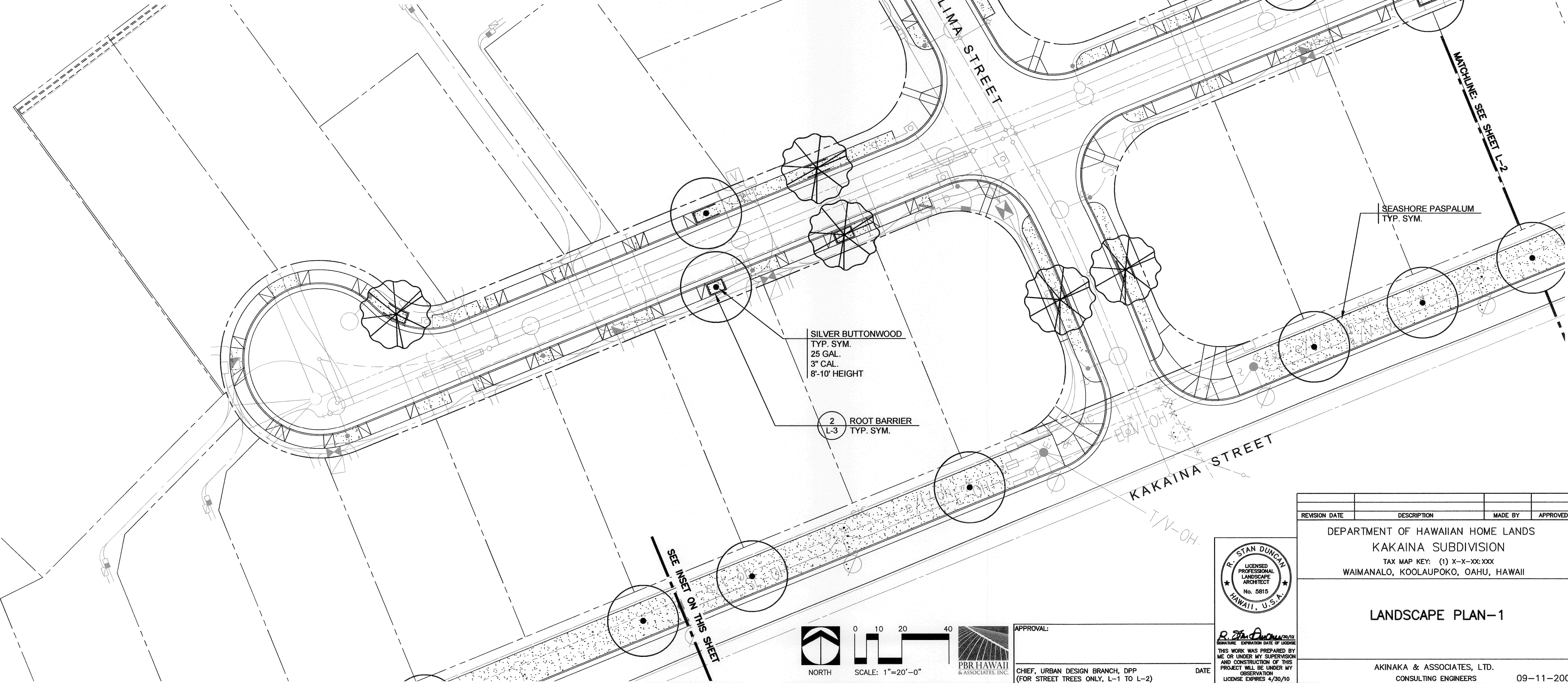


TEMPORARY IRRIGATION NOTES:

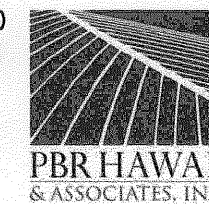
1. THE LANDSCAPE CONTRACTOR SHALL INSTALL A TEMPORARY AUTOMATIC IRRIGATION SYSTEM FOR THE DURATION OF THE MAINTENANCE PERIOD NOT TO EXCEED ONE YEAR. UPON COMPLETION OF THE MAINTENANCE PERIOD, THE LANDSCAPE CONTRACTOR SHALL REMOVE THE TEMPORARY IRRIGATION SYSTEM AND REPAIR/ REPLACE ALL DAMAGED LANDSCAPE AREAS TO THE ORIGINAL CONDITION.
2. THE LANDSCAPE CONTRACTOR SHALL GRADUALLY REDUCE THE AMOUNT OF WATER BEING APPLIED TO THE LANDSCAPE AREAS 4 WEEKS PRIOR TO THE END OF THE MAINTENANCE PERIOD TO ALLOW THE PLANT MATERIAL TIME TO ADJUST BEFORE THE IRRIGATION SYSTEM IS REMOVED.

TREE SPACING NOTES:

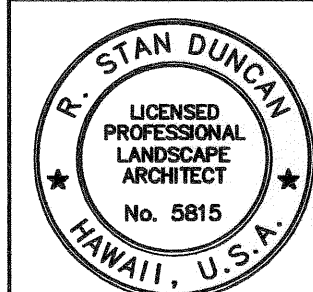
1. QTY OF TREES REQUIRED BASED ON THE CITY AND COUNTY 50' MAX SPACING = 28
2. QTY OF NET TREES AND PALMS PROVIDED ALONG THE ROADWAY = 40



0 10 20 40
SCALE: 1"=20'-0"



APPROVAL:
CHIEF, URBAN DESIGN BRANCH, DPP
(FOR STREET TREES ONLY, L-1 TO L-2)



SIGNATURE: R. Stan Duncan
EXPIRATION DATE OF LICENSE: 09/12
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAINA SUBDIVISION TAX MAP KEY: (1) X-X-XX:XXX WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
LANDSCAPE PLAN-1			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS 09-11-2009			
FILE	POCKET	FOLDER	NO.

SHEET L-1 OF 87 SHEETS

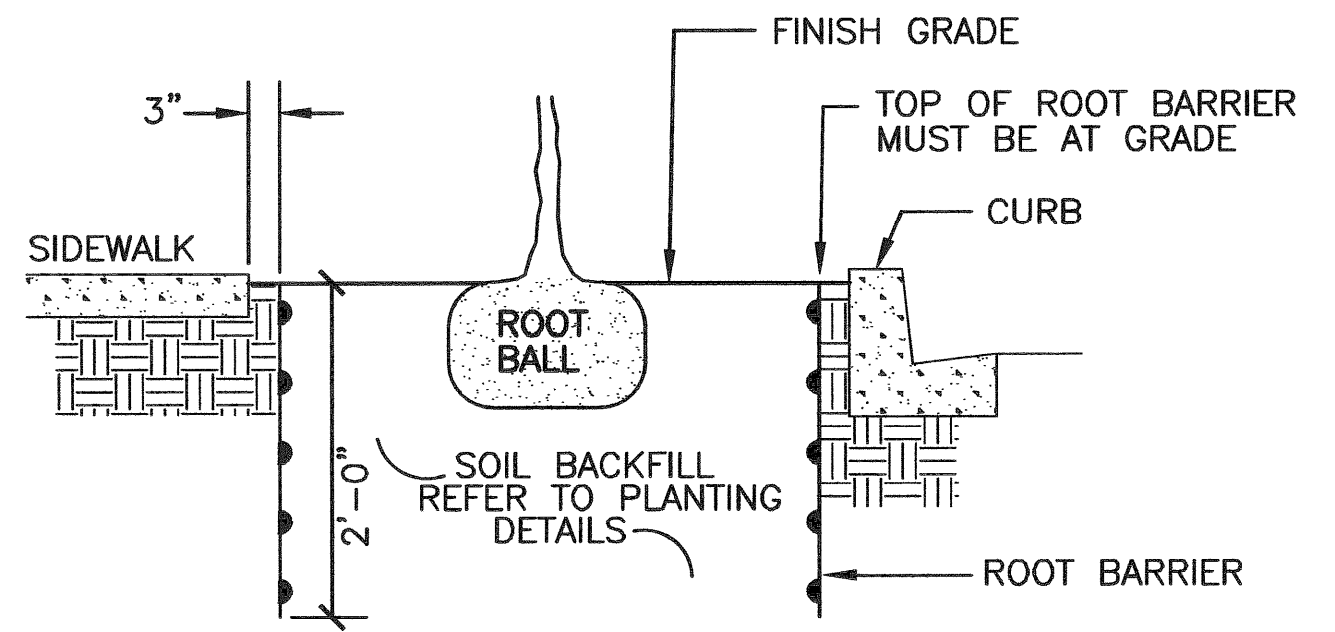
L-1

Plotted on: 1/31/2012

FILE	POCKET	FOLDER	NO.

Last Save by: RHGA
Last Saved: 1/31/2012
Plotted on: 1/31/2012
P:\PROJECTS\OAHU\DHHL - Kakaia\CD\L-1 TO L-2.dwg

1 STREET TREE PLANTING DETAIL
NOT TO SCALE



2 ROOT BARRIER
NOT TO SCALE



STREET TREE NOTES

- NEW TREES SHALL BE PRE-APPROVED AT THE NURSERY BY THE LANDSCAPE ARCHITECT CONSULTANT AND CONCURRED BY DUF TWO WEEKS PRIOR TO THEIR DELIVERY TO THE PROJECT SITE. CONTACT MR. BRANDON AU, PARKS GROUNDS IMPROVEMENT SUPERVISOR II OF DUF, AT 971-7196 OR 971-7151 TO SCHEDULE AN INSPECTION. TREES THAT DO NOT HAVE WELL ESTABLISHED ROOTS SYSTEMS WILL BE REJECTED.
- UPON INSTALLATION OF THE STREET TREES, THE INSTALLER/CONTRACTOR SHALL CONTACT DPR, DUF AT 971-7151 TO SCHEDULE AN INSPECTION OF THE TREE(S) INSTALLATION. NOTIFICATION MUST BE GIVEN AT LEAST SEVEN (7) DAYS PRIOR TO PRE-MAINTENANCE AND FINAL INSPECTIONS. A NOTICE OF ACCEPTANCE WILL BE ISSUED BY THE DPR WHEN THEY HAVE DETERMINED THE TREES HAVE BEEN PROPERLY INSTALLED AND MAINTAINED.
- THE STREET TREE MAINTENANCE PERIOD SHALL BE FOR NINETY (90) CALENDAR DAYS OR UNTIL PROJECT MAINTENANCE HAS BEEN ASSUMED BY ABUTTING PROPERTY OWNER.
- THE STANDARD CITY AND COUNTY OF HONOLULU, DEPARTMENT OF PARKS AND RECREATION SPECIFICATIONS FOR STREET TREE PLANTING AND LANDSCAPING SHALL BE MADE PART OF THE CONSTRUCTION DOCUMENTS.
- STREET TREE PLANS THAT HAVE BEEN REVISED OR PROJECTS THAT HAVEN'T STARTED CONSTRUCTION WITHIN TWO (2) YEARS OF THE DATE OF THE DEPARTMENT OF PLANNING AND PERMITTING (DPP) APPROVAL WILL BE SUBJECT TO RE-APPROVAL. WHEN SUBSTITUTION OF TREE TYPES ARE REQUESTED BY THE DEVELOPER OR CONTRACTOR DUE TO UNAVAILABILITY, THE PLANS SHALL BE REVISED (AFTER NOTIFICATION OF TREE SELECTION) AND (THE PLANS) SUBMITTED FOR RE-APPROVAL.
- PRIOR TO ACCEPTANCE OF THE TREE INSTALLATION BY THE DIVISION OF URBAN FORESTRY, DEPARTMENT OF PARKS AND RECREATION, THE STREET INSTALLER IS REQUIRED TO SUBMIT REPRODUCIBLE AS-BUILT PLANS TO THE DEPARTMENT OF PARKS AND RECREATION.
- APPROVAL IS FOR STREET TREE PLANTING WITHIN THE ROAD RIGHT-OF-WAY ONLY. IT IS NOT AN APPROVAL OF THE PLANTING AND IRRIGATION PLAN OUTSIDE OF THE ROAD RIGHT-OF-WAY.
- THE CITY SHALL BE RESPONSIBLE TO TRIM THE TREE(S). THE COMMUNITY ASSOCIATION, HOMEOWNER OR LOT OWNER IS RESPONSIBLE TO MAINTAIN THE TREE(S) AND ANY IRRIGATION SYSTEM AND TO PAY FOR WATER AND ELECTRICITY AS REQUIRED FOR MAINTENANCE OF THE STREET TREES AND PLANTING STRIPS WITHIN THE ROAD RIGHT-OF-WAYS ABUTTING THEIR PROPERTIES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A PERMIT TO EXCAVATE PUBLIC RIGHT-OF-WAY (TRENCHING PERMIT), PRIOR TO COMMENCING WORK.
- THE STREET LIGHTING SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION REQUIRED SHALL BE APPROVED BY THE MECHANICAL/ELECTRICAL DESIGN AND ENGINEERING DIVISION, DEPARTMENT OF DESIGN AND CONSTRUCTION, AND PAID FOR BY THE CONTRACTOR.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE CITY'S EXISTING STREET LIGHTING FACILITIES, TRAFFIC SIGNAL FACILITIES (INCLUDING THE TRAFFIC SIGNAL INTERCONNECT SYSTEM, COMMUNICATIONS FIBER OPTIC CABLE SYSTEM AND TRAFFIC SIGNAL FIBER OPTIC CABLE SYSTEM). ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

LANDSCAPE MATERIAL LIST

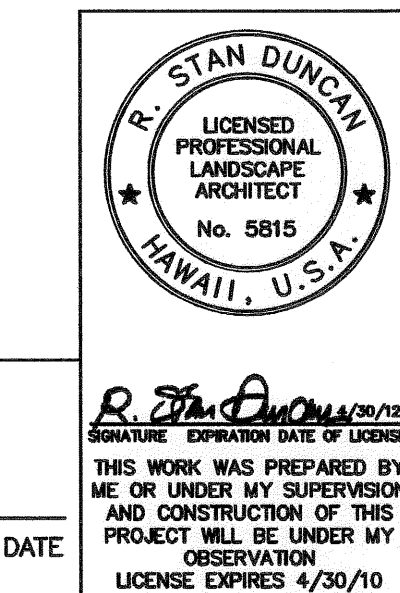
SYM	QTY		BOTANICAL NAME	COMMON NAME	SIZE	CALIPER	HEIGHT	SPACING	REMARKS
NEW TREES									
○	24	ea	Conocarpus erectus var argentea	SILVER BUTTONWOOD	25 gal	3" min	8'-10'	As shown	Well branched
⊗	15	ea	Harpullia pendula	TULIPWOOD	25 gal	3" min	8'-10'	As shown	Well branched
NEW GRASS									
	20,730	sf	Paspalum vaginatum	SEASHORE PASPALUM	Hydrosprigs				10 bushels/1000sf
NEW MISCELLANEOUS ITEMS									
	610	lf	ROOT BARRIER						Refer to details and specifications
	255	cy	IMPORTED/SCREENED TOPSOIL MIX (20,730 sf x 4" depth)						Refer to details and specifications

TREE LOCATION (CLEARANCES)

STREET FEATURE	SMALL TREES	MEDIUM TREES	LARGE TREES
STREET INTERSECTION	30	30	30
STORM DRAIN/WATER OR SEWER LINE	5	5	5
UTILITY POLE	5	10	10
FIRE HYDRANT	5	5	5
ELECTROLIER (STREET LIGHTS)	5	5	10
PEDESTRIAN CROSSWALK	5	5	10
DRIVEWAY	5	5	10
ANOTHER TREE	22	22	60



APPROVAL:
CHIEF, URBAN DESIGN BRANCH, DPP
(FOR STREET TREES ONLY, L-1 TO L-2)



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

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS KAKAIA SUBDIVISION TAX MAP KEY: (1) X-X-XX:XXX WAIMANALO, KOOLAUPOKO, OAHU, HAWAII			
LANDSCAPE DETAILS, NOTES, AND MATERIALS LIST			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS 09-11-2009			