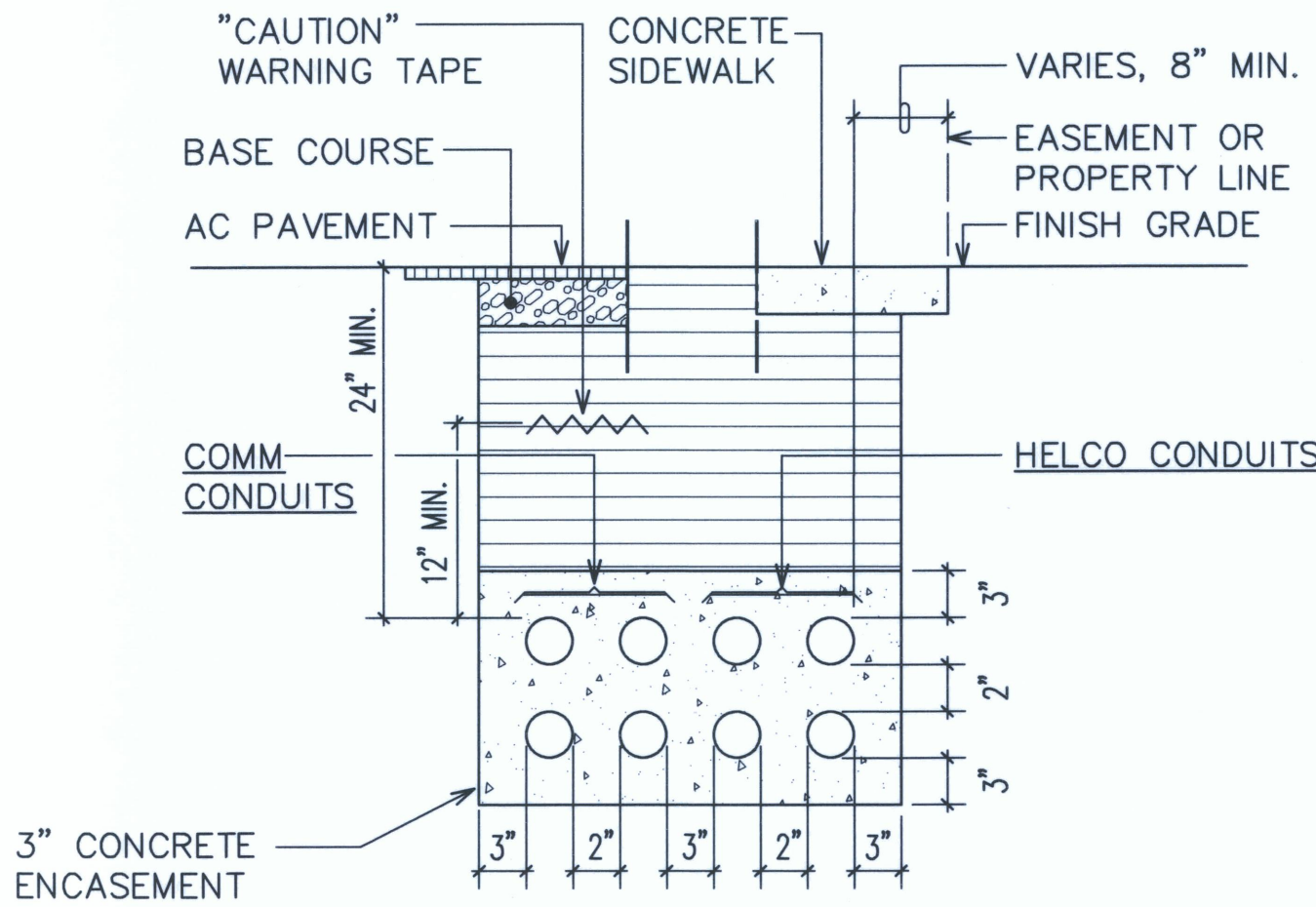
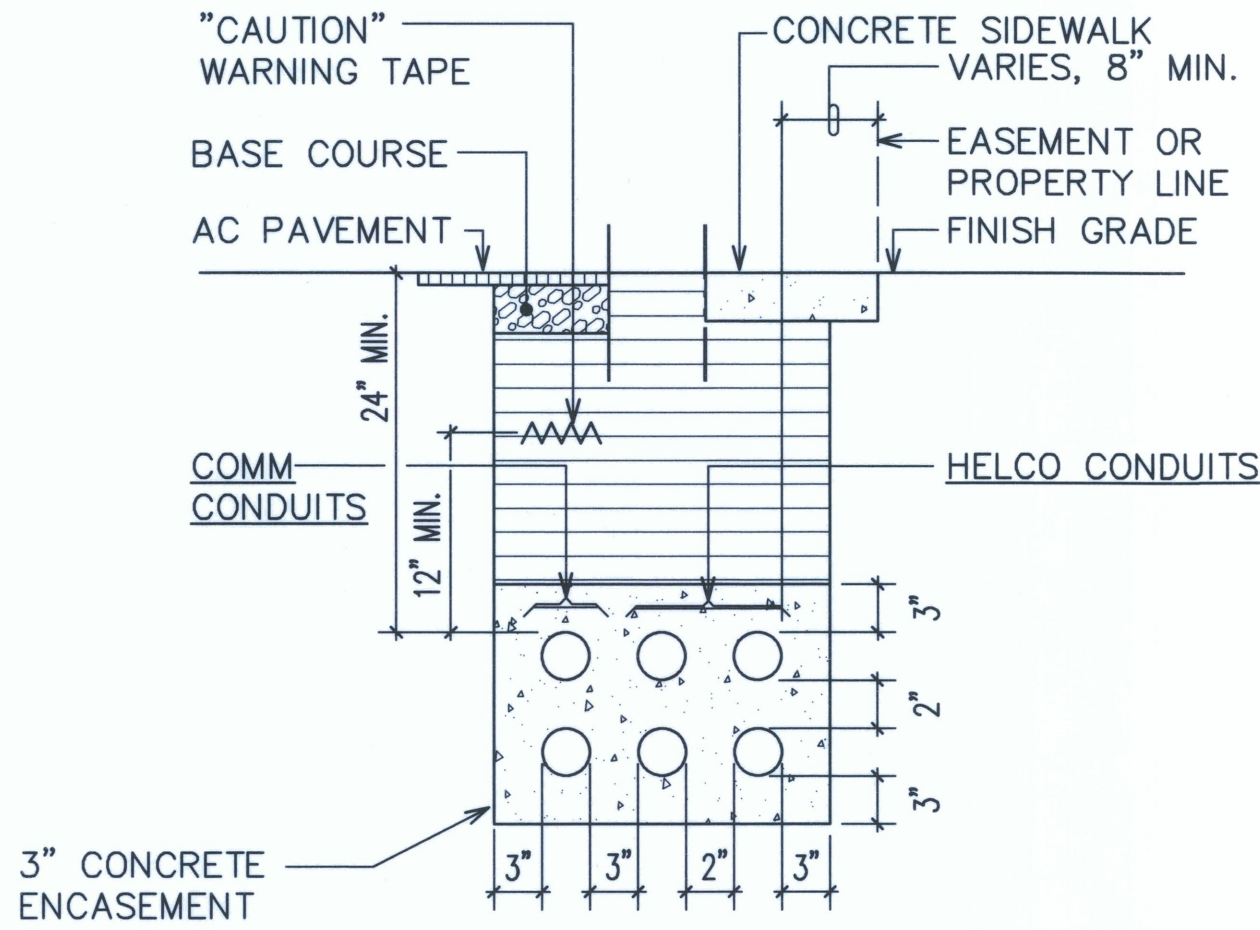


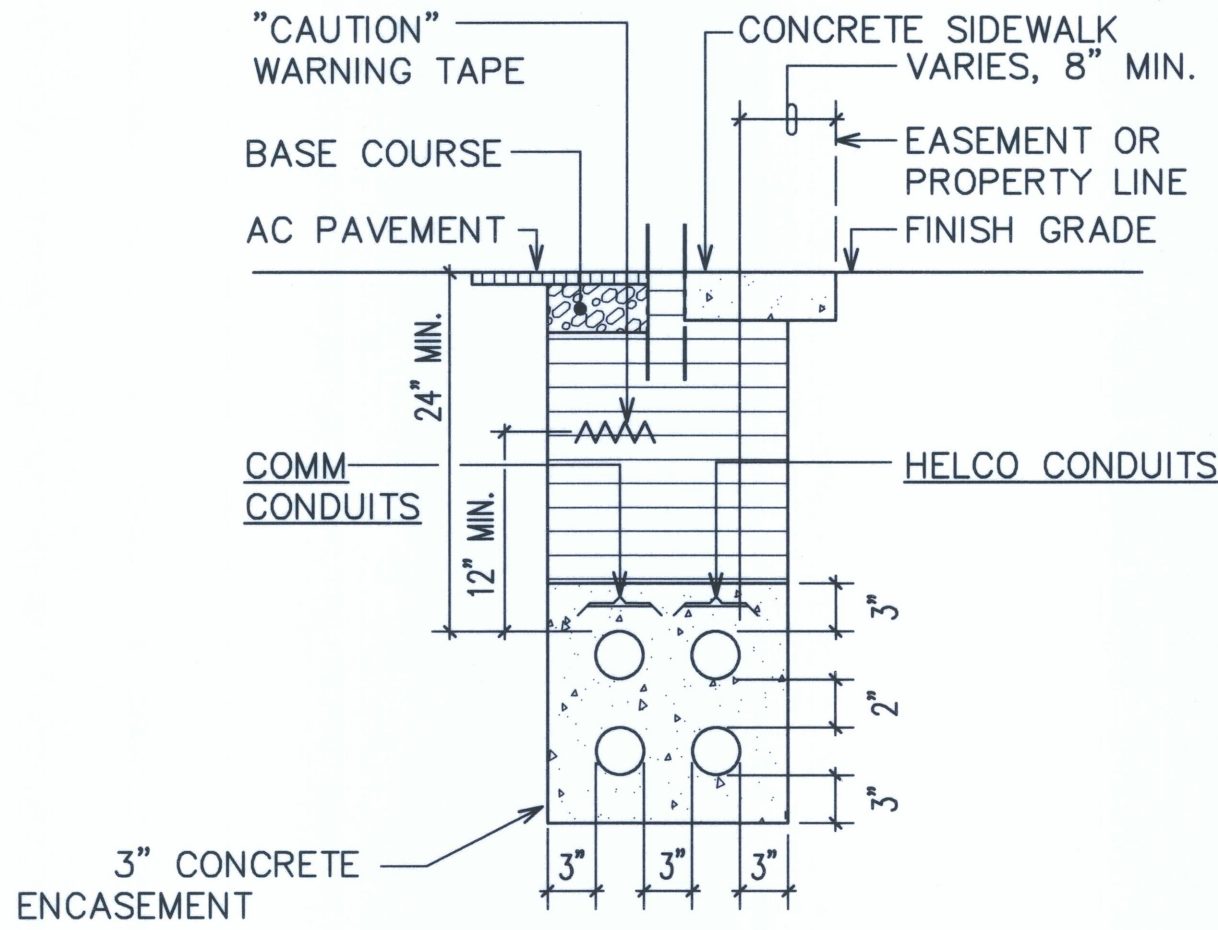
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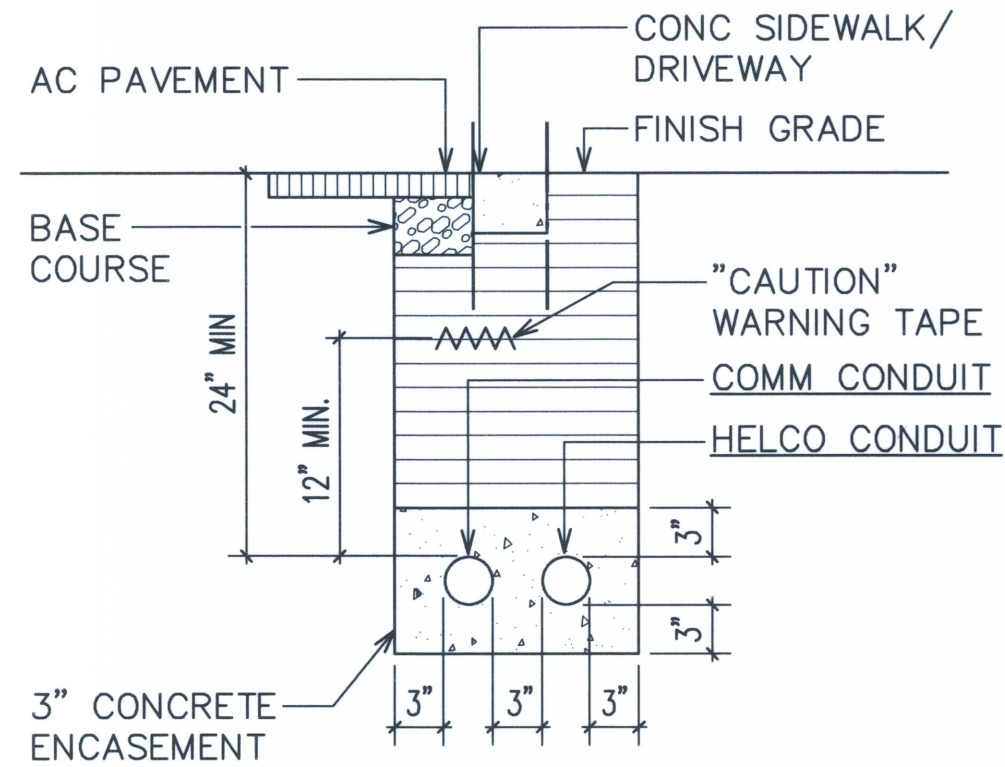
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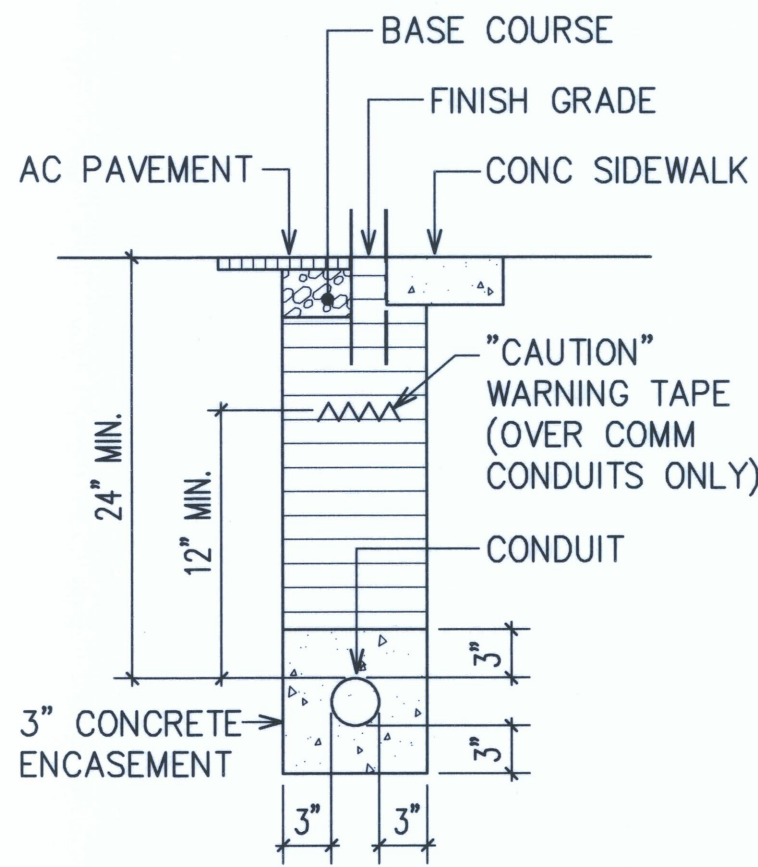
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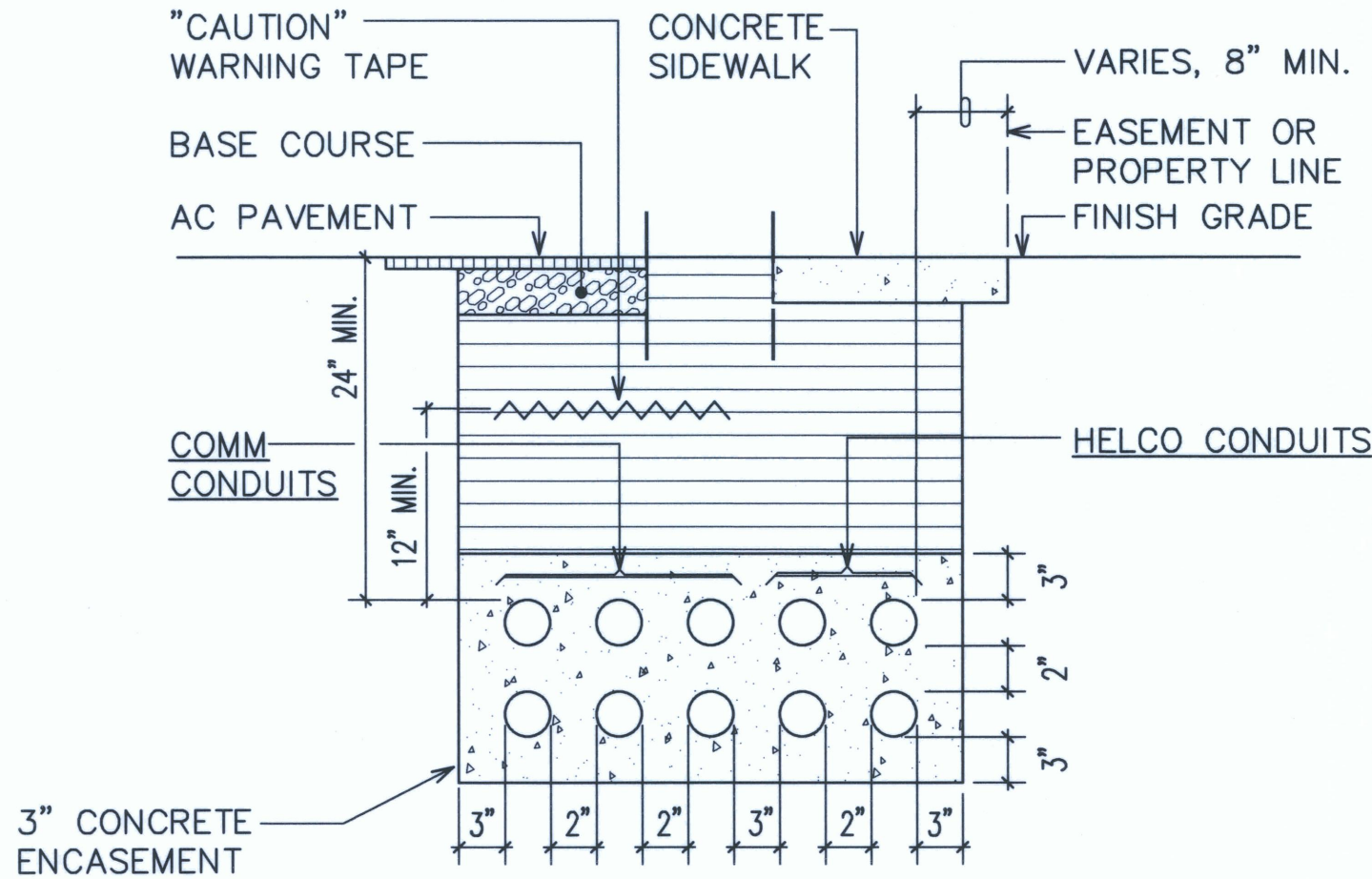
SECTION D



SECTION E



SECTION F



SECTION G

NOTES:

- ELECTRICAL WARNING TAPE—HEAVY GAUGE 4 MIL, RED WITH BLACK LETTERING, 3" WIDE, "BURIED ELECTRIC LINE BELOW—CAUTION" © DIRECT BURIED CONDUITS.
- "CAUTION" WARNING TAPE REQUIRED OVER ENTIRE LENGTH OF ALL VERIZON CONDUITS.
- 3" SEPARATION REQUIRED BETWEEN ELECTRICAL AND TELEPHONE CONDUITS WITHIN CONCRETE ENCASEMENT.

BACKFILL NOTES:

- TYPE "A" BACKFILL — EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. THE MATERIAL SHALL BE NONEXPANSIVE. 95% COMPACTION.
- TYPE "B" BACKFILL — EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

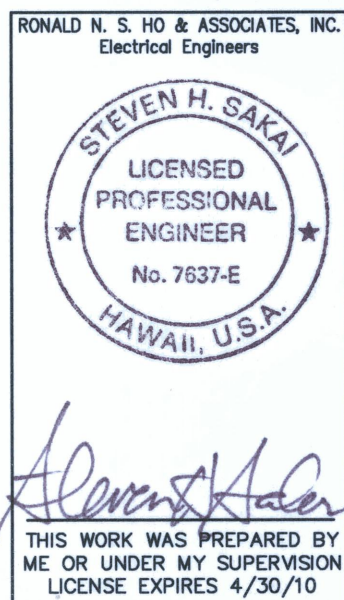
- NOTE — IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.
- CONCRETE — 3" ENCASEMENT, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

TYPICAL DUCT SECTIONS  
NOT TO SCALE

APPROVED BY:

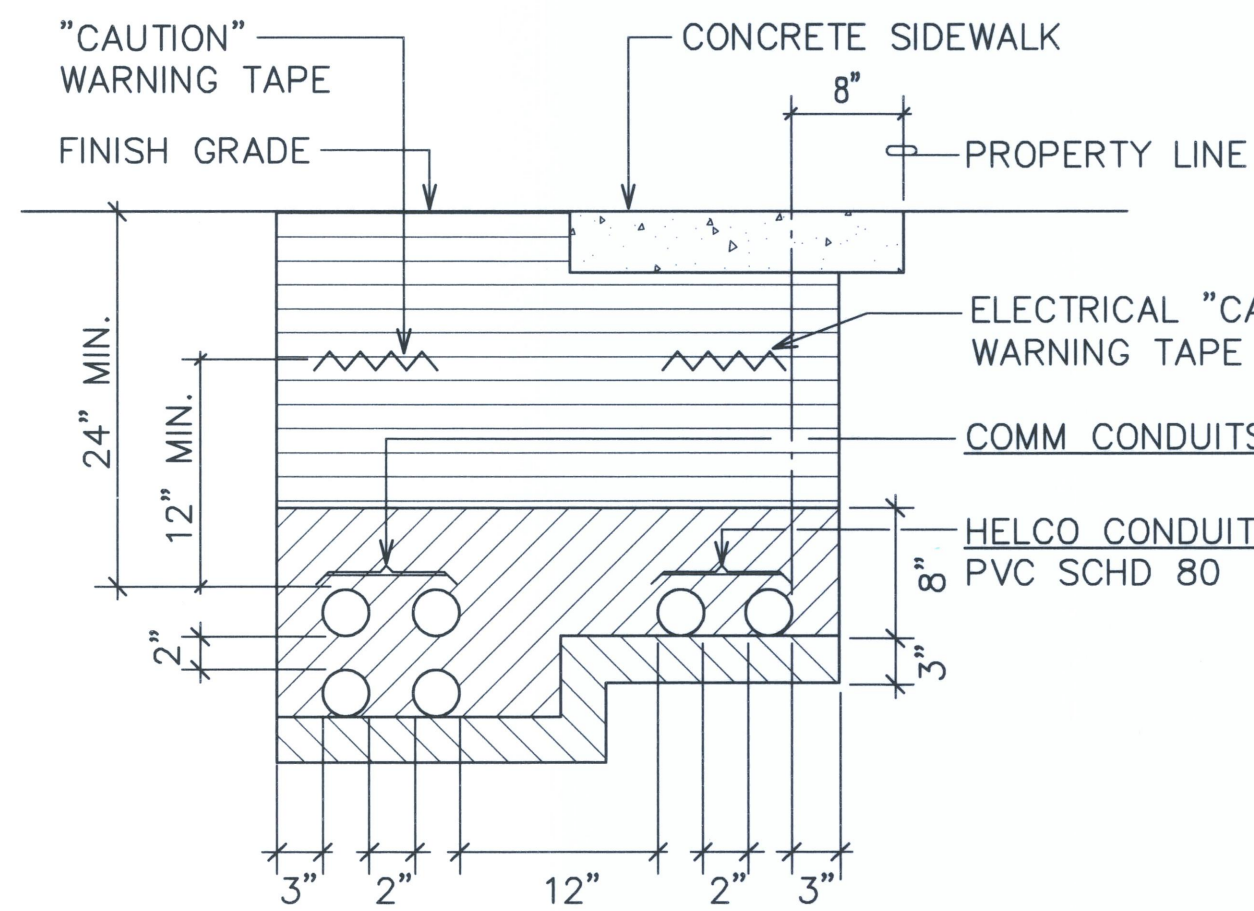
HAWAII ELECTRIC LIGHT COMPANY  
SANDWICH ISLES COMMUNICATIONS, INC.

5-29-09  
DATE  
5-6-09  
DATE

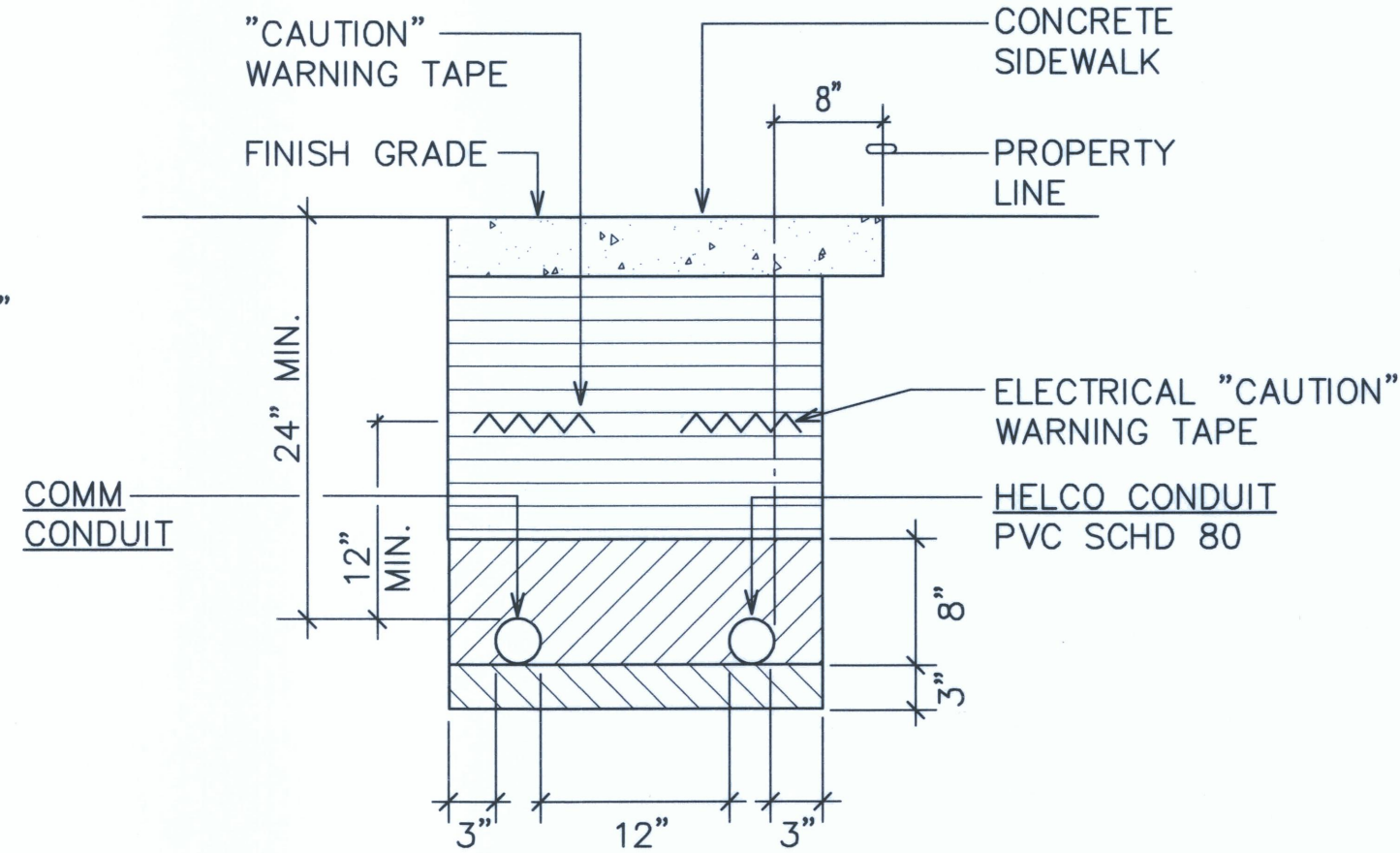


REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
TYPICAL DUCT SECTIONS			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

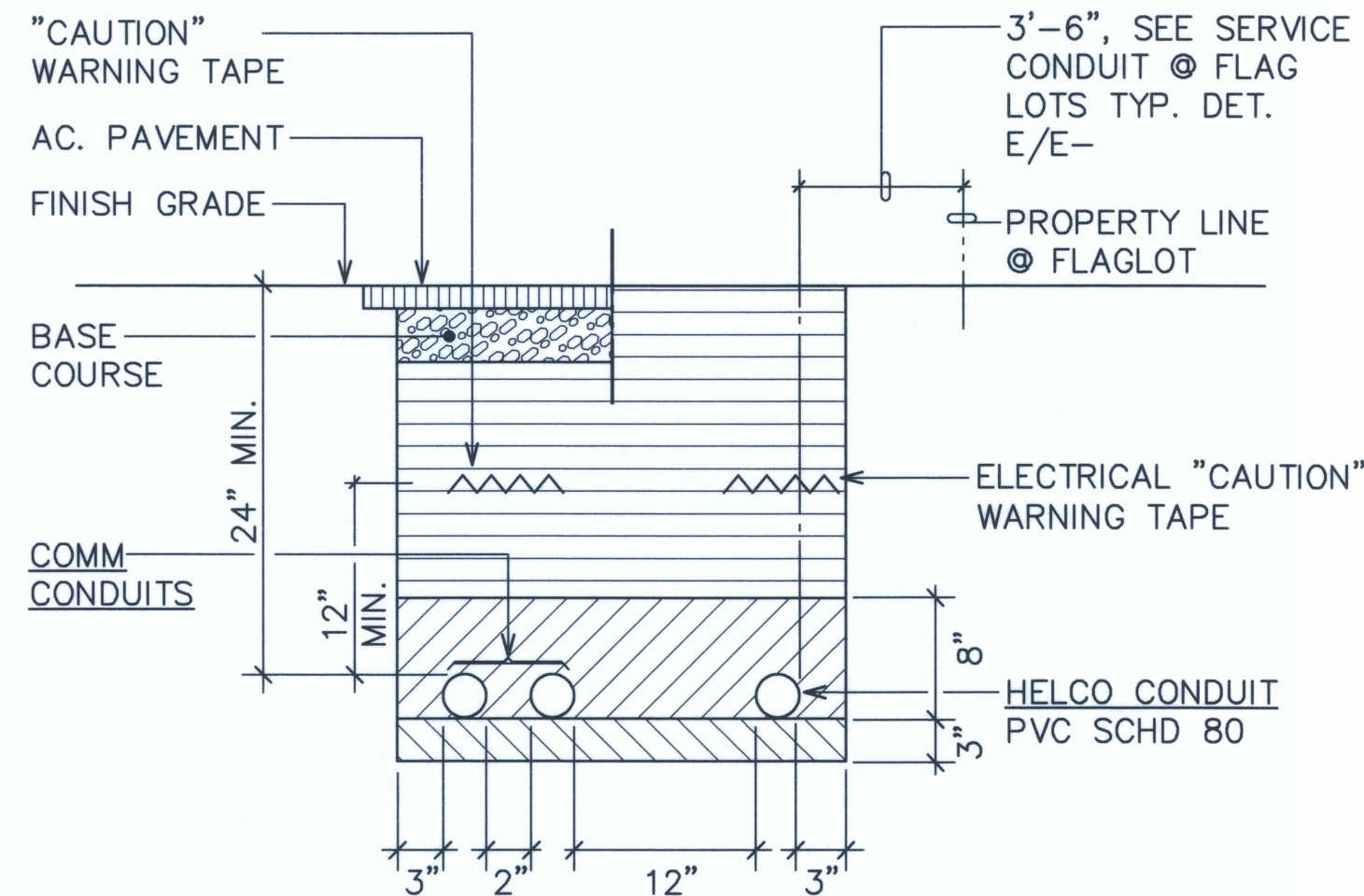




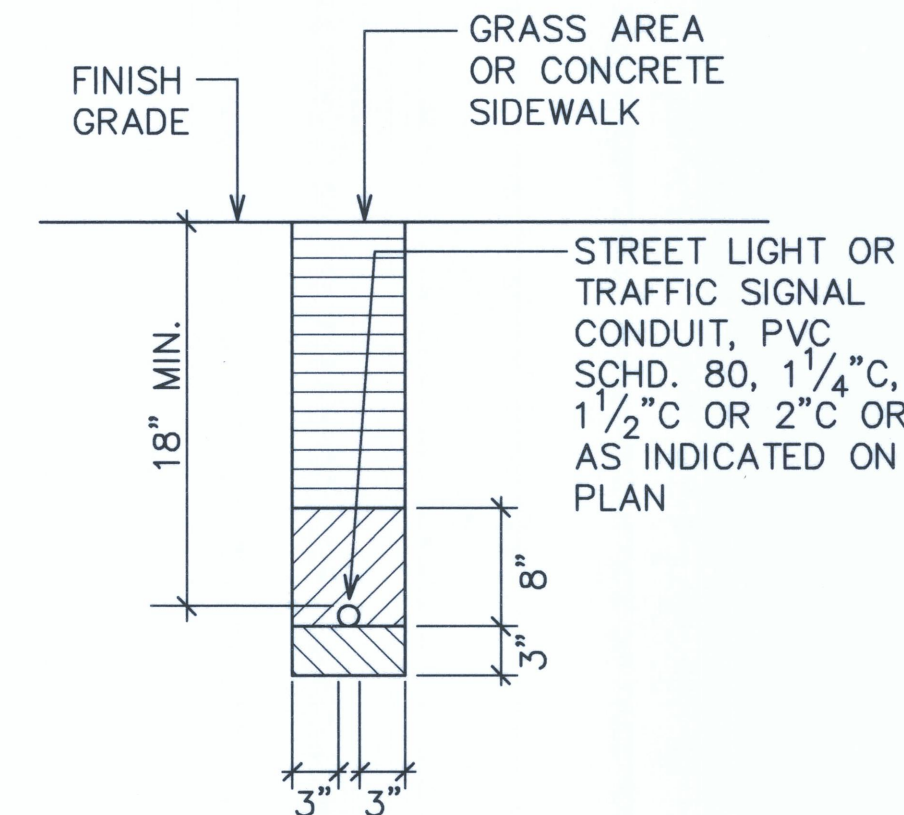
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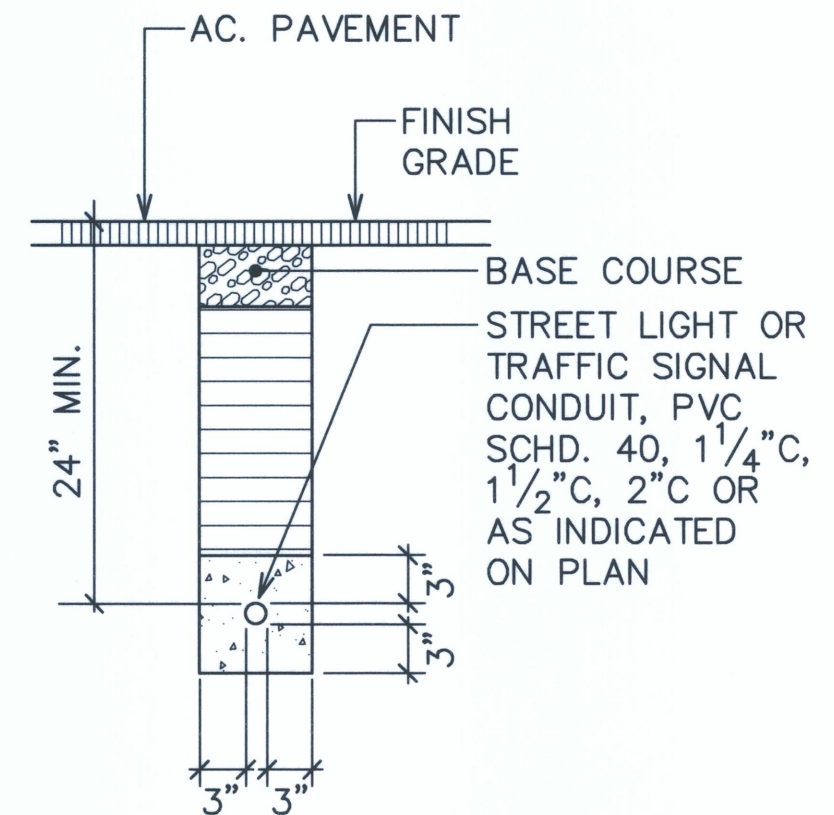
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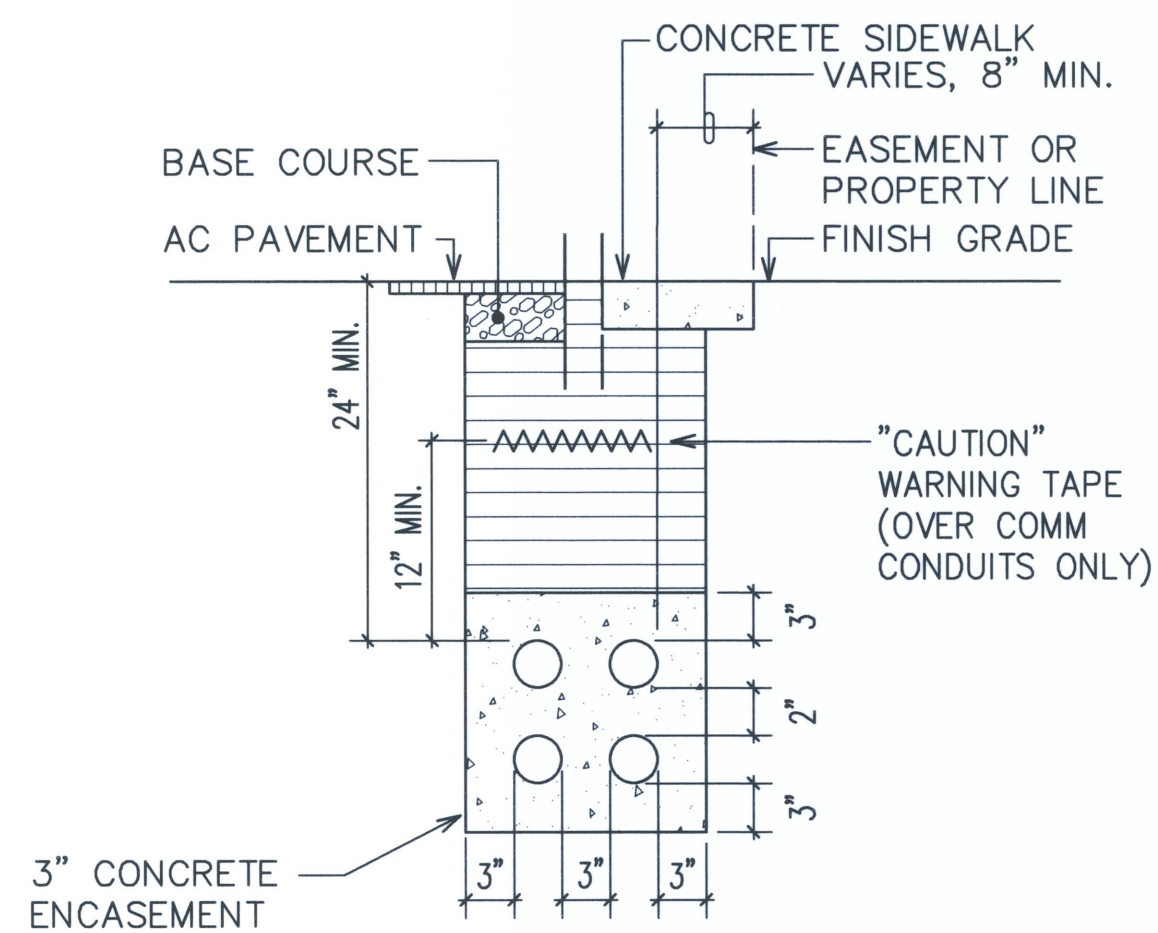
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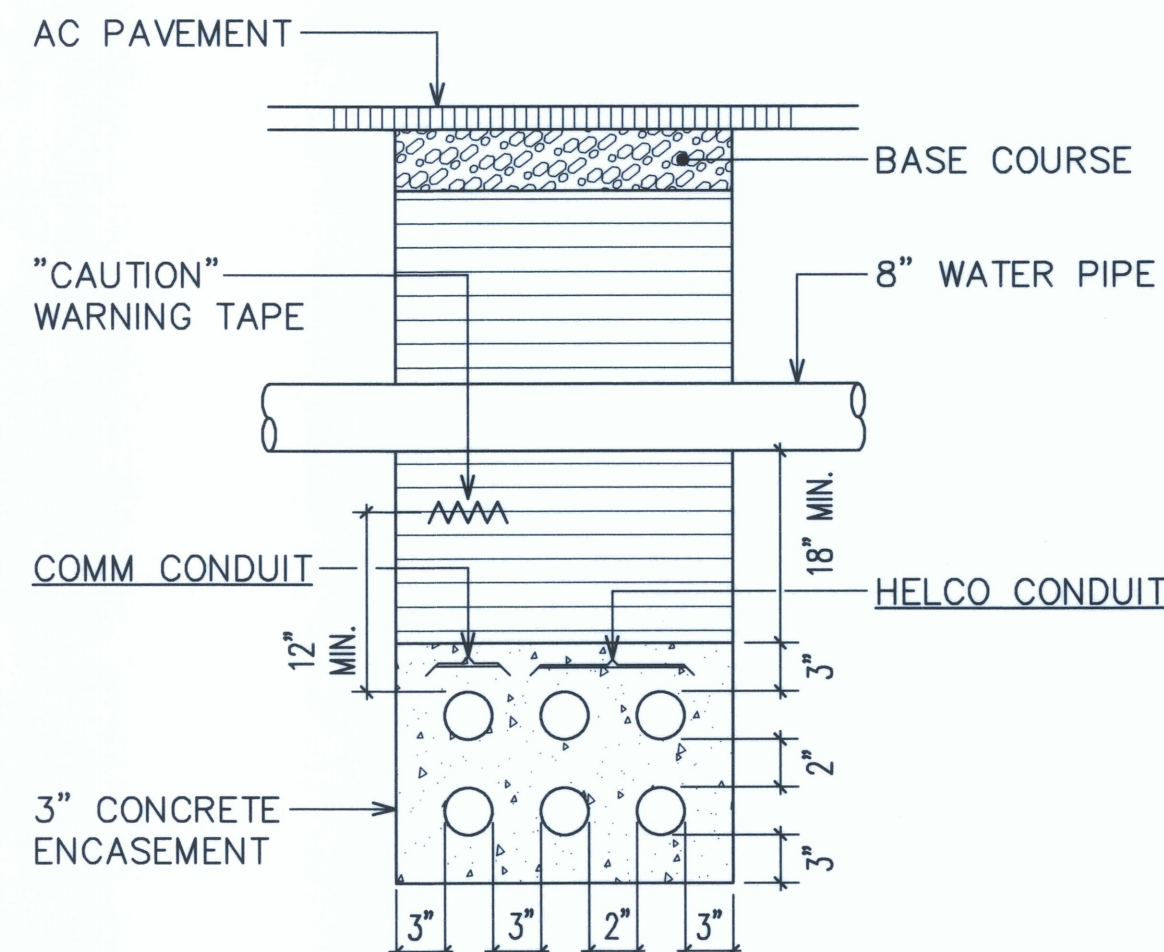
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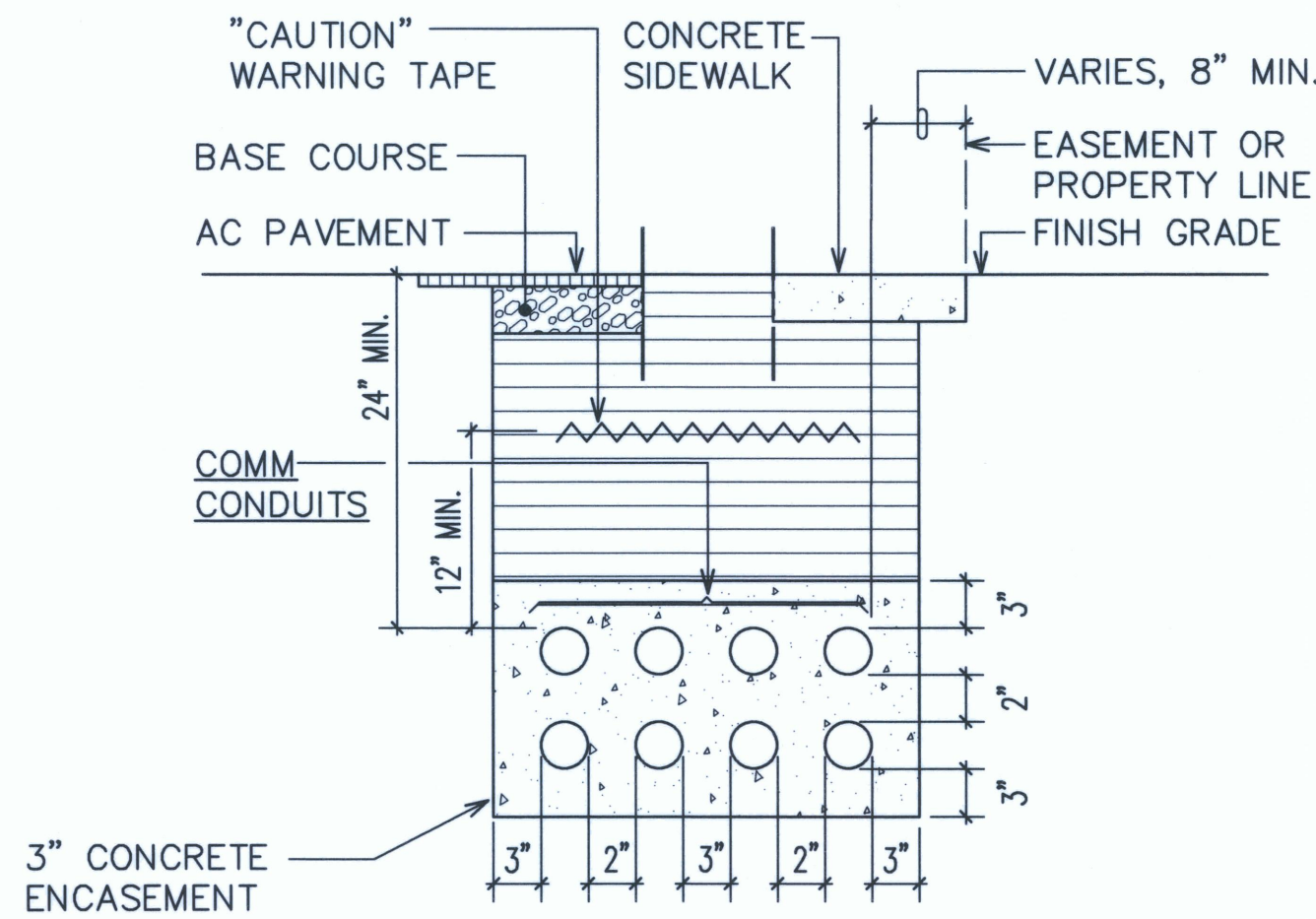
SECTION (L)



SECTION (M)



SECTION (N)



SECTION (O)

NOTES:

1. ELECTRICAL WARNING TAPE—HEAVY GAUGE 4 MIL, RED WITH BLACK LETTERING, 3" WIDE, "BURIED ELECTRIC LINE BELOW—CAUTION" @ DIRECT BURIED CONDUITS.
2. "CAUTION" WARNING TAPE REQUIRED OVER ENTIRE LENGTH OF ALL HAWAIIAN TELCOM CONDUITS.
3. 3" SEPARATION REQUIRED BETWEEN ELECTRICAL AND TELEPHONE CONDUITS WITHIN CONCRETE ENCASEMENT.

BACKFILL NOTES:

- TYPE "A" BACKFILL — EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. THE MATERIAL SHALL BE NONEXPANSIVE. 95% COMPACTION.
- TYPE "B" BACKFILL — EARTH & GRAVEL. MIXTURE MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.

- NOTE — IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED & TYPE "B" BACKFILL PROVIDED.
- CONCRETE — 3" ENCASEMENT, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

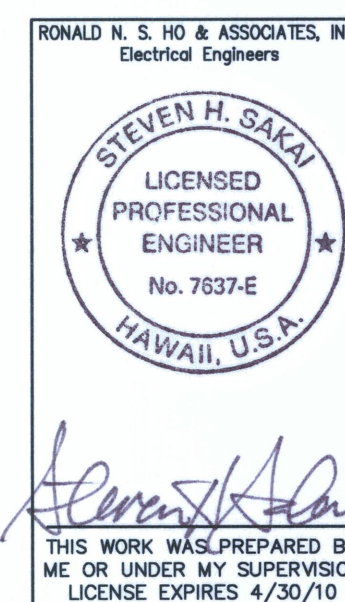
TYPICAL DUCT SECTIONS  
NOT TO SCALE

APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY  
SANDWICH ISLES COMMUNICATIONS, INC.

5-29-09  
DATE

5-6-09  
DATE



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'IOPIUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
TYPICAL DUCT SECTIONS			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII			DATE
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			

AS-BUILT

SHEET E-18 OF SHEETS










**SLD-1 STREET LIGHT PULLBOX DETAIL**  
 NOT TO SCALE



1. SUBMIT SHOP DRAWING FOR APPROVAL BEFORE PURCHASING POLYMER CONCRETE COVERS.
2. TYPICAL 435TB PULLBOX, REFER TO HTCO STANDARD DRAWING #34056.



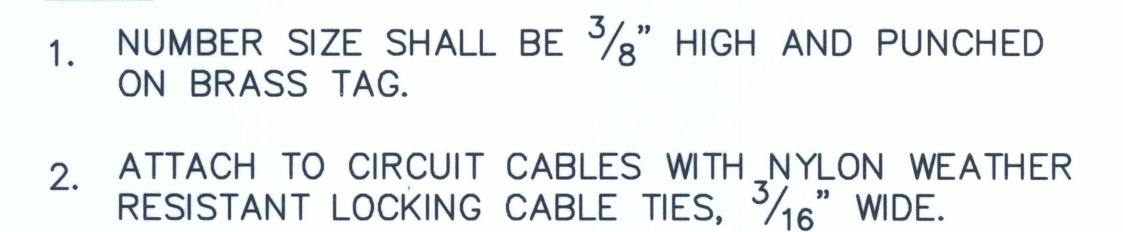

**STREET LIGHT PULLBOX "SLD-4"**  
 NOT TO SCALE

1. SIDES OF COVER ARE SLIGHTLY BEVELED TO FACILITATE INSTALLATION. BEVEL IS INWARD FROM TOP TO BOTTOM.
2. TO BE CAST FROM GREY IRON.
3. TOP OF COVER MUST BE FLUSH WITH FRAME. TO ENSURE PROPER FIT, GRIND SIDES OF COVER AS REQUIRED AND PAINT WITH BLACK ASPHALT PAINT.
4. COVER SHALL HAVE A CLEAN RUST-FREE APPEARANCE. COVER SHALL BE PAINTED WITH BLACK ASPHALT PAINT IF REQUIRED BY THE C&C STREET LIGHT INSPECTOR.
5. BOTTOM OF COVER SHALL BE FREE OF SHARP METAL EDGES OR BURRS.

1. CONCRETE EXTENSION RING, AS APPROVED BY C&C STREET LIGHT INSPECTOR, MAY BE SUBSTITUTED FOR BRICKS.
2. SUBMIT SHOP DRAWING FOR BOX, FRAME AND COVER FOR MATERIAL APPROVAL. INCLUDE CONCRETE EXTENSION RING IN SUBMITTAL IF SUBSTITUTED FOR BRICKS.
3. SEAL CAST IRON FRAME TO CONCRETE PULLBOX WITH EPOXY RESIN IF REQUIRED BY C&C STREET LIGHT INSPECTOR.
4. DUCT SEAL CONDUIT AFTER INSTALLATION OF WIRES.




**TYP CONNECTION TO EXST**  
**CONDUIT STUBOUT DETAIL**  
 NOT TO SCALE



**D STREET LIGHT CIRCUIT**  
**E-18 CABLE I.D. TAG DETAIL**  
 NOT TO SCALE

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p><b>LA'IOPIA VILLAGE 5 SUBDIVISION</b></p> <p>TAX MAP KEY: (3) 7-4-21:6</p> <p>KAILUA-KONA, NORTH KONA, HAWAII</p>			
<p>STREET LIGHT PULLBOX DETAILS, MISCELLANEOUS DETAILS</p>			
<p>Approved: _____</p>			
<p>COUNTY ENGINEER, DPW, COUNTY OF HAWAII</p>			<p>DATE</p>
<p>AKINAKA &amp; ASSOCIATES, LTD. CONSULTING ENGINEERS</p>			



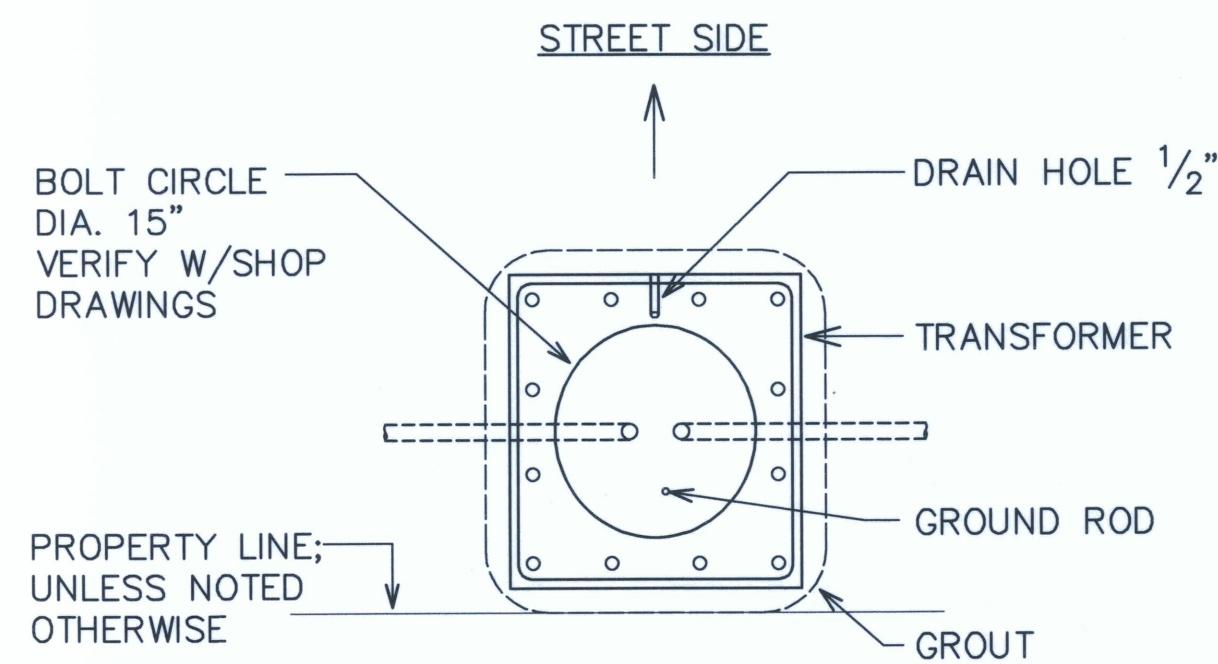


 **STREET LIGHT BASE DETAIL**  
NOT TO SCALE



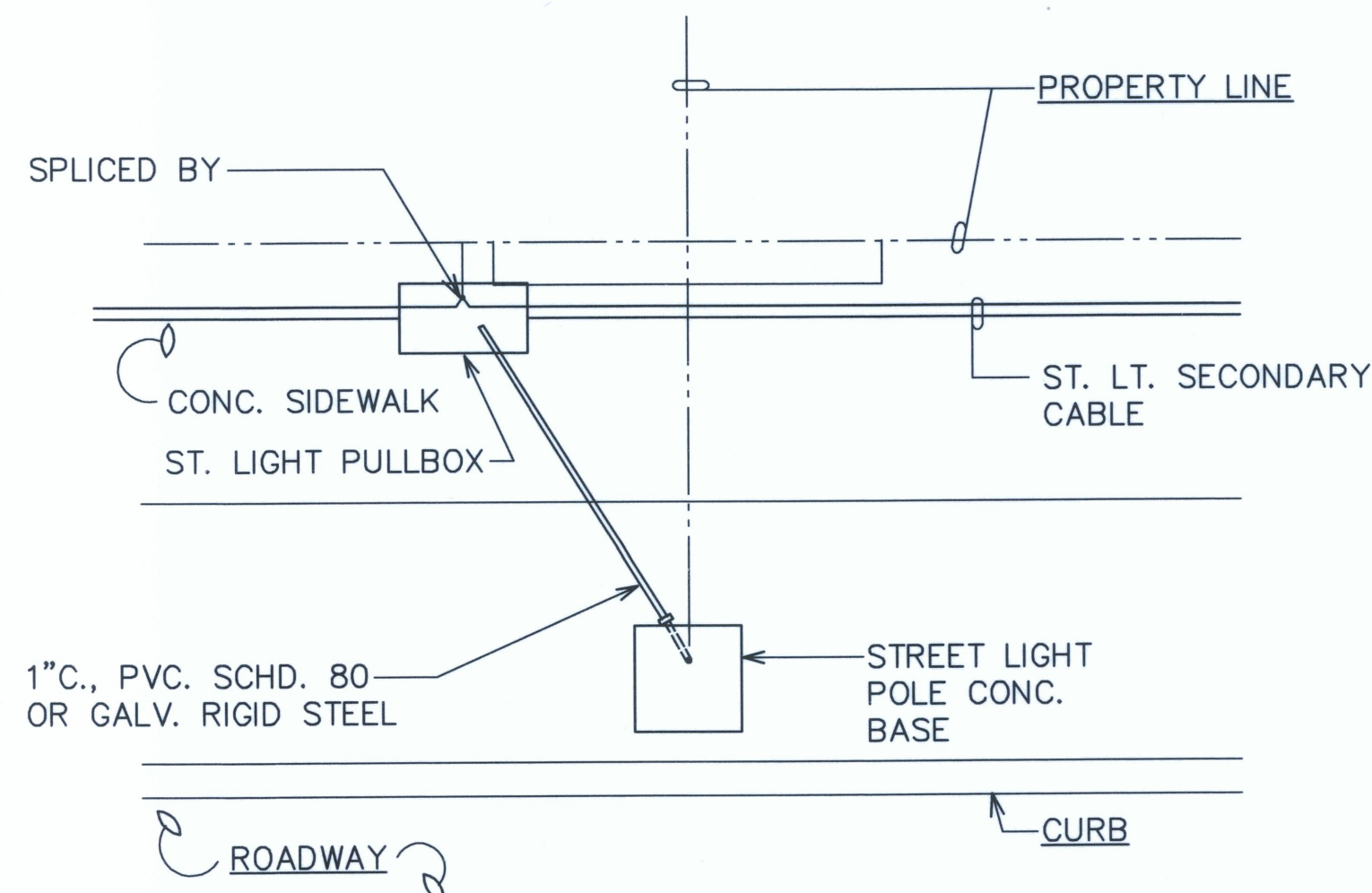
1. USE 2 PLY PLASTIC - BLACK, WHITE.
2. NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED 1/8" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
3. NOMENCLATURE SIZE SHALL BE 1/4" HIGH AND ENGRAVED 1/32" WIDE, WHITE IN COLOR (WATTAGE IES DISTRIBUTION AND VOLTAGE AS REQUIRED AS NOTED).
4. ATTACH TO STEEL POLES WITH NO.7 CADMIUM PLATE DRIVE SCREWS.  
(a) ATTACH TO ALUMINUM POLE WITH NO.7 ALUMINUM DRIVE SCREWS.

# STREET LIGHT I.D. TAG DETAIL



## D CONCRETE BASE PLAN

E-19 NOT TO SCALE



# STREET LIGHT SECONDARY CONNECTION



APPROVED BY:

HAWAII ELECTRIC LIGHT COMPANY

STREET LIGHT NOTES:

1. NO CHANGES WILL BE ALLOWED WITHOUT PRIOR APPROVAL FROM TRAFFIC DIVISION.
2. ALL STREET LIGHT IDENTIFICATION TAG NUMBERING FOR METAL POLES SHALL START WITH "1" AND CONTINUE NUMERICALLY FOR EACH STREET IN THE SUBDIVISION. ALL STREET LIGHT I.D. TAG NUMBERING FOR WOODEN POLES SHALL BE IN ACCORDANCE WITH HELCO'S NUMBERING SYSTEM.
3. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY SECONDARY CIRCUIT EXTENSIONS TO THE NEAREST HELCO SECONDARY. IF THE STREETLIGHTS ARE INSTALLED BEFORE HELCO INSTALLS THEIR SECONDARY, THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION AND INFORMING HELCO OF STREET LIGHT LOCATIONS AND POLE CONTACTS.
4. FOR FINAL INSPECTION APPROVAL: ANY SUBDIVISION WITH TWO (2) OR MORE UNDERGROUND SYSTEM LIGHTS—DEVELOPER SHALL SET UP ACCOUNT WITH HELCO—PROVIDING STREET NAME(S), POLE NUMBERS, WATTAGES, AND BILLING ADDRESS. TO ENERGIZE LIGHTS IN SUBDIVISION AND BE RESPONSIBLE FOR ENERGY COST UNTIL STREET(S) ARE DEDICATED TO COUNTY WHERE UPON BILLING WILL BE TRANSFERRED TO COUNTY.
5. THE CONTRACTOR SHALL INSCRIBE THE MONTH AND YEAR OF INSTALLATION OF PHOTOCELLS AND LAMPS. ALL P.E.'S SHALL HAVE THE NORTH INDEX FACING NORTH.
6. ALL LABOR AND MATERIALS SHALL BE WARRANTED FOR A MINIMUM OF ONE YEAR FROM DATE OF ENERGIZING OF STREETLIGHTS.
7. ACCEPTABLE STREET LIGHT MATERIALS:  
LUMINARIES, WITH PE RECEPTACLE AND 120-220 VOLT HPF BALLAST.  
AMERICAN ELECTRIC: SRX-55, SP2 90, SP2 135 & SP2 180 WITH POLYCARBONATE SEMI-CUTOFF LENS. NOT TO BE USED IN KONA AND KOHALA DISTRICTS.  
VISIONAIRE LIGHTING: RDW-1(55W), RDW-2(90W), RDW-3(180W). GREY FINISH (GY) AND REMOVABLE BALLAST TRAY (RBT). SPACING BETWEEN LIGHTS - 130'-160'. TO BE USED IN KONA AND KOHALA DISTRICTS.  
PHOTOCELLS, COMPLETELY SOLID STATE. FAIL "ON".
  - 1) FISHER PIERCE, FP-7790B SPSALUMINUM POLES:  
INTERNALLY MOUNTED VIBRATION DAMPER, MINIMUM .188 WALL THICKNESS. MUST BE APPROVED BY F.H.W.A. TO BE IN COMPLIANCE WITH THE 2001 AMENDED AND ADOPTED AASHTO SPECIFICATIONS. 10 TO 12 INCH BASE BOLT CIRCLE. ARM LENGTH SHALL BE PER PLANS.
  - 1) LEXINGTON: 2708-45806T4
  - 2) HAPCO: B78382-001, B78382-002, B76205-001, B76205-002 73892-001, 73892-002, 73892-003.TRANSFORMER BASES:  
ALUMINUM WITH 15-INCH BASE BOLT CIRCLE. MUST BE APPROVED BY F.H.W.A. TO BE IN COMPLIANCE WITH THE 2001 AMENDED AND ADOPTED AASHTO BREAKAWAY SPECIFICATIONS.
  - 1) LEXINGTON 08R-1315B-17
  - 2) AKRON FOUNDRY TB1-17FIBERGLASS POLES: COMPOSITE MATERIALS TECHNOLOGY MB33-K-50-SE8-0-HS-PC-MH
8. A SCALED DRAWING OF STREET LIGHT LOCATIONS (PREFER ON ONE SHEET) AND DETAILS OF FIXTURE MOUNTING, LUMINARIES TYPE, ARM LENGTH, IDENTIFICATION TAGS (AND CIRCUITS, FOUNDATION, BASE, AND POLE IF UNDERGROUND) SHALL BE SUBMITTED TO THE TRAFFIC DIVISION AFTER PLAN APPROVAL AND BEFORE CONSTRUCTION BEGINS.
9. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL BY TRAFFIC DIVISION.
10. ANY STREET LIGHT(S) REQUIRED ON EXISTING POLE(S) SHALL BE INSTALLED BY TRAFFIC DIVISION AT A COST OF \$2,000.00 PER LIGHT, DEVELOPER WILL SUBMIT DIVISION ALONG WITH SUBDIVISION NUMBER, DPW FOLDER NUMBER, TMK, AND POLE NUMBER(S).
11. WHEN STREET LIGHTS ARE INSTALLED ON ROADWAYS UNDER STATE JURISDICTION

- THE DEVELOPER SHALL SUBMIT PLANS TO THE STATE D.O.T. FOR APPROVAL. TRAFFIC DIVISION WILL INSTALL STREET LIGHTS ON EXISTING POLE(S) WITH COST DEPENDENT ON HEIGHT OF POLE.
12. ALL OVERHEAD WIRING STREET LIGHT FIXTURES SHALL BE BONDED TO THE NEUTRAL WIRE. ALL BONDED STREET LIGHT FIXTURES SHALL HAVE 2"x2" REFLECTORIZED GREEN STICKER PLACE AT THE BASE OF WIRING OPENING ON ALUMINUM ARM, SIGNIFYING THAT STREETLIGHTS ARE BONDED.
13. ALL UNDERGROUND WIRING STREETLIGHTS SHALL BE GROUNDED TO PROVIDE A MAXIMUM 25 OHMS TO GROUND
14. ALL WORK SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE.

DEPARTMENT OF HAWAIIAN HOME LANDS  
LA'I'OPUA VILLAGE 5 SUBDIVISION

## STREET LIGHT DETAILS

Approved:

COUNTY ENGINEER, DPW, COUNTY OF HAWAII

AKINAKA &amp; ASSOCIATES LTD

CONSULTING ENGINEERS

FILE	POCKET	FOLDER	NO.

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

STEVEN H. SAKAI  
LICENSED  
PROFESSIONAL  
ENGINEER  
No. 7637-E  
HAWAII, U.S.A.

*Steven H. Sakai*

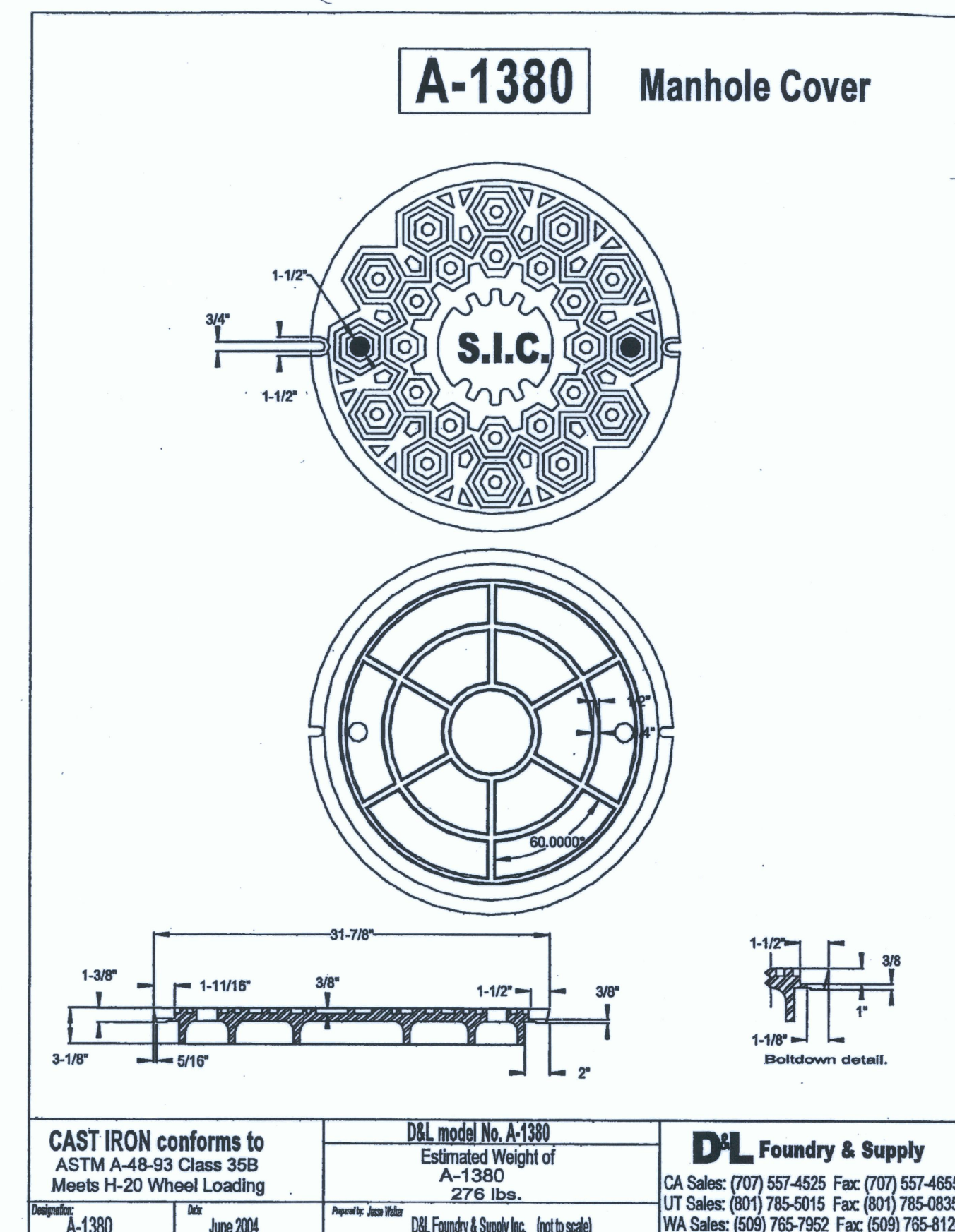
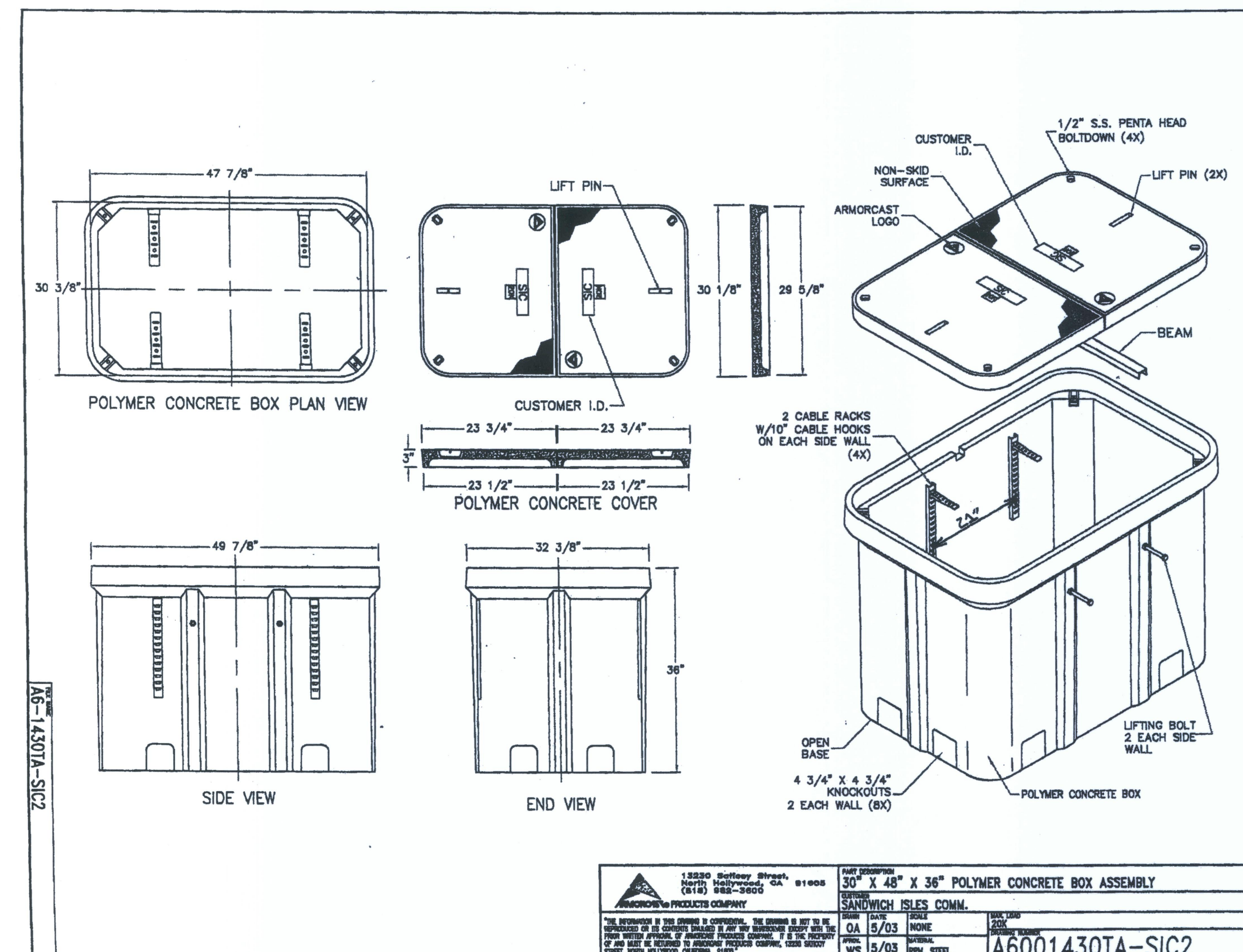
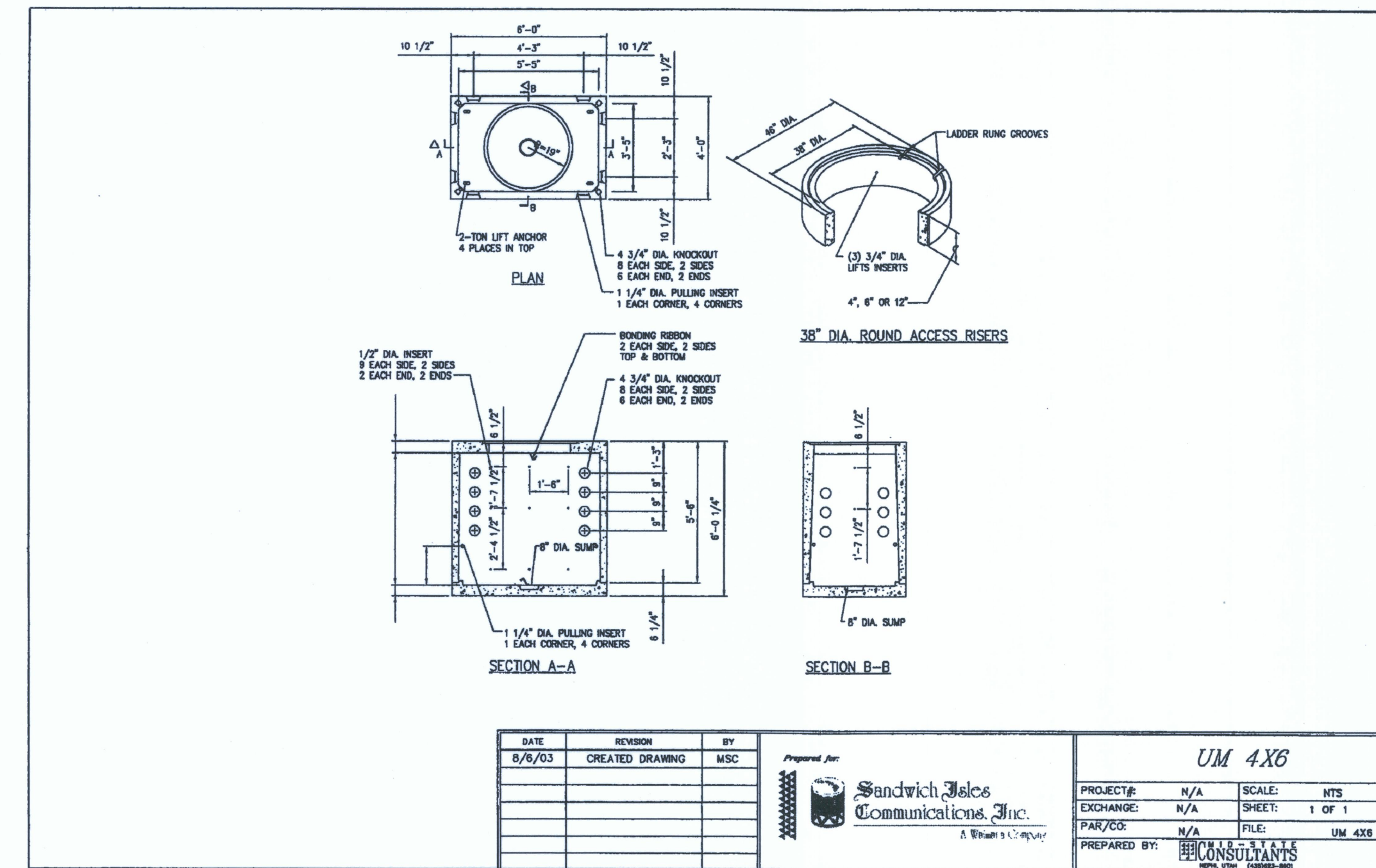
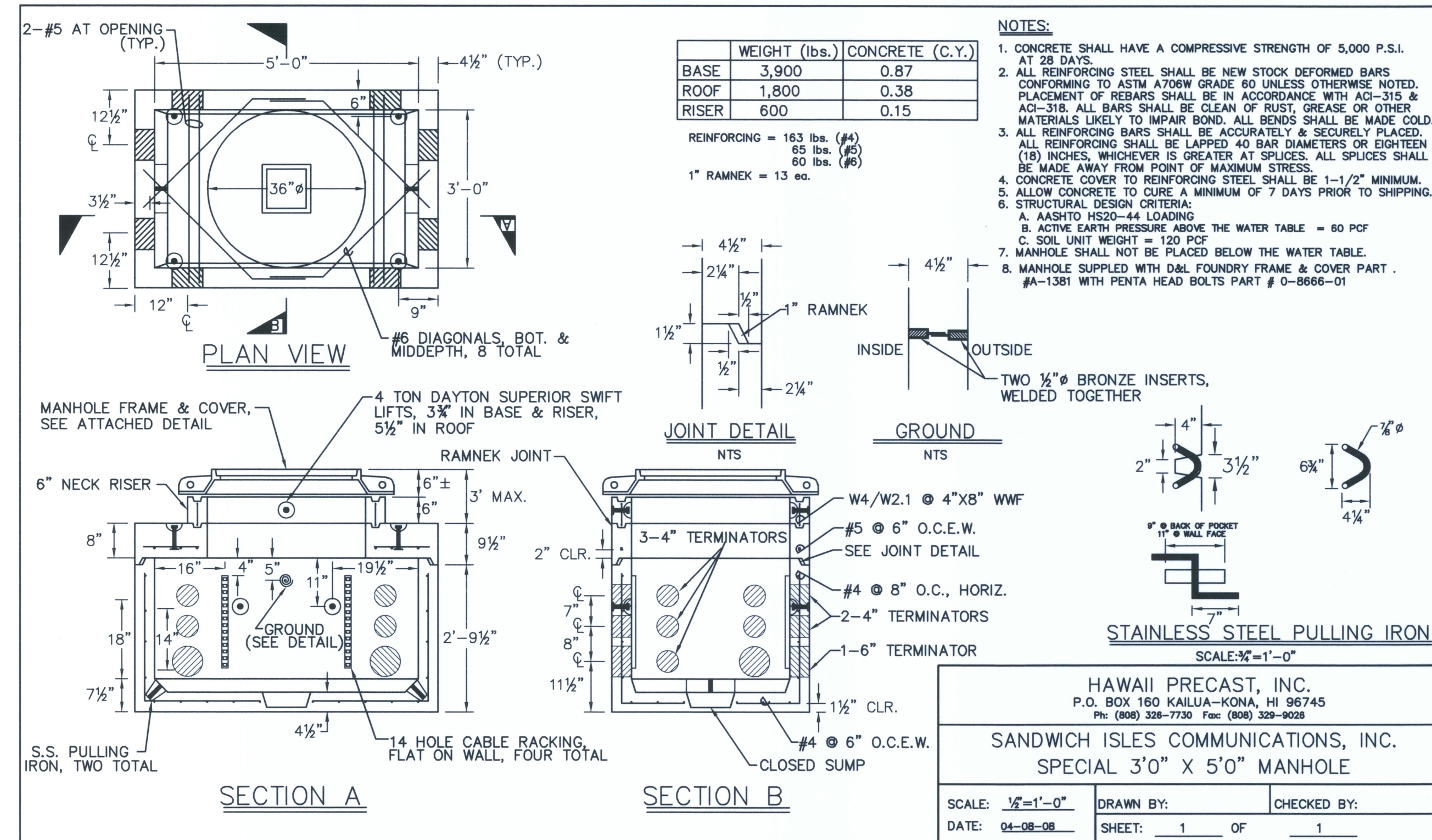
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

## AS-BUILT

SHEET E-19 OF        SHEETS





UHC 30x48x36 MANHOLE COVER  
FOR REFERENCE ONLY

APPROVED BY:

SANDWICH ISLES COMMUNICATIONS, INC.

DATE \_\_\_\_\_

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

STEVEN H. SAKAI  
LICENSED  
PROFESSIONAL  
ENGINEER  
No. 7637-E  
HAWAII, U.S.A.

*Steven H. Sakai*

THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
<p>INC.</p> <p>DEPARTMENT OF HAWAIIAN HOME LANDS</p> <p><b>LA'I'OPUA VILLAGE 5 SUBDIVISION</b></p> <p>TAX MAP KEY: (3) 7-4-21:6</p> <p>KAILUA-KONA, NORTH KONA, HAWAII</p>			
<p>★</p> <p>KALAMAZOO</p> <p><b>SIC REFERENCE DETAILS</b></p>			
<p>Approved:</p>			
COUNTRY ENGINEER, DPW, COUNTY OF HAWAII			DATE
<p>BY ION</p> <p>AKINAKA &amp; ASSOCIATES, LTD.</p> <p>CONSULTING ENGINEERS</p>			

## AS-BUILT

SHEET E-20 OF \_\_\_\_\_ SHEETS

FILE	POCKET	FOLDER	NO.



SANDWICH ISLES COMMUNICATIONS' NOTES

GENERAL

1.

ALL WORK SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF SANDWICH ISLES COMMUNICATIONS (SIC), WHICH COMPLIES WITH ALL APPLICABLE COUNTY AND STATE REQUIREMENTS.
2.

ALL MATERIALS USED ON SIC PORTION OF THE PROJECT MUST BE LISTED ON THE RURAL UTILITIES SERVICE (RUS), UNITED STATES DEPARTMENT OF AGRICULTURE LIST OF APPROVED MATERIALS.
3.

ALL PVC CONDUITS, SWEEPS, COUPLINGS, ADAPTERS AND BELL ENDS SHALL BE SCHEDULE 40, UNLESS OTHERWISE SPECIFIED.
4.

ALL HIGH DENSITY POLYETHYLENE CONDUITS SHALL BE SDR 11. TYPICAL 3-PACK UNIT INCLUDES TWO 1-1/2" SDR 11 RATED CONDUITS IN COLORS OF ORANGE AND RED; AND ONE 1-1/2" TONEABLE HDPE DUCT (CONTRACTOR IS REQUIRED TO CONFIRM CONTINUITY ON THE TONEABLE HDPE DUCT FROM MANHOLE TO MANHOLE), BLACK IN COLOR, UNLESS OTHERWISE SPECIFIED. ALL CONDUITS TO BE PRESSURE TESTED AT 120 PSI. AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID TEST MANDREL HAVING A DIAMETER OF ONE FOURTH-INCH LESS THAN THE INSIDE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT. SUFFIXES LISTED IN RUS SPEC 515B FOR CONDUITS ARE APPLICABLE. 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.
5.

MAIN CONDUIT RUNS EXCEPT RISER CONDUITS AND CROSS CONNECT PEDESTAL CONDUITS SHALL BE CONSTRUCTED WITH MINIMUM 6-FOOT RADIUS CURVES, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

CONDUITS

1.

INSTALL MULETAPE IN ALL CONDUITS DESIGNATED FOR COPPER CABLE AND CAP ALL CONDUITS AFTER TESTING. THE NEPTCO (OR APPROVED EQUAL) MULETAPE IS AVAILABLE IN 3000 FT., 6500 FT., AND 10,000 FT. REELS FROM WESTINGHOUSE ELECTRIC SUPPLY COMPANY (WESCO), THE NEPTCO MULETAPE IS PRELUBRICATED AND PRINTED WITH SEQUENTIAL FOOTAGE MARKINGS. MULETAPE WILL NOT BE INSTALLED IN CONDUITS DESIGNATED FOR FIBER.
2.

ALL DUCTS SHALL HAVE TEMPORARY WATERTIGHT PLUGS OR SEALS TO KEEP THEM FREE OF MOISTURE AND DEBRIS (JACKMOON PLUG OR EQUIVALENT). DUCT TAPE IS UNACCEPTABLE.
3.

WHEN INSTALLING THE TONEABLE HDPE DUCT IT SHALL BE NECESSARY TO PULL THE CONDUIT APPROXIMATELY FIVE (5) FEET INSIDE OF THE MANHOLE. PEEL BACK THE LOCATOR WIRE THE ENTIRE FIVE (5) FEET, TURN AND "J" HOOK IT TO THE INSIDE WALL. AT THE END OF THE LOCATOR WIRE, IT SHALL BE NECESSARY TO LEAVE A ONE (1) INCH LOOP TO ATTACH THE LOCATOR EQUIPMENT. CUT THE DUCT 18" FROM THE INSIDE WALL OF THE MANHOLE. THIS EXCESS DUCT, LABOR AND MATERIALS SHALL BE COMPENSATED UNDER THE UM UNIT.
4.

STUBOUT CONDUITS 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.
5.

ALL CONDUITS SHALL ENTER HANDHOLES AT 90 DEGREE ANGLE AND SHALL EXTEND INTO MANHOLE AS FOLLOWS: (A) BLACK CONDUIT: 18", (B) ALL OTHERS: 12". ANY EXCEPTIONS SHALL ONLY BE PERMITTED WHEN SPECIFIED BY THE ENGINEER.
6.

ALL CONDUITS ENTERING MANHOLES OR HANDHOLES SHALL BE GROUTED BETWEEN 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.
7.

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

A.

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

B.

THE STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, DATED 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.
8.

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.

9.

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

A.

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

B.

TYPE "B" BACKFILL IS DEFINED AS BEACH SAND, EARTH OR EARTH AND GRAVEL. MAXIMUM PARTICLE SIZE SHALL BE 1/2" AND MIXTURE SHALL NOT CONTAIN MORE THEN 20% BY VOLUME OF ROCK PARTICLES.
10.

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

MANHOLES AND HANDHOLES:

1.

ALL MANHOLES SHALL HAVE HS20-44 TRAFFIC LOADING COVERS (UNLESS OTHERWISE NOTED). HANDHOLES SHALL HAVE 20K TRAFFIC LOAD RATED COVER.
2.

ALL MANHOLE AND HANDHOLE COVERS SHALL HAVE COVER LOGO TO READ "SIC".
3.

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

ALL MANHOLES AND HANDHOLES ARE SPECIFIED AS FOLLOWS:

A.

UM35 AND UM4X6 MANHOLE ASSEMBLY UNITS - HAWAII PRECAST, INC. AS PER MASTER PURCHASE AGREEMENT.

B.

UHC 30X48X36 HANDHOLE (PULLBOX) ASSEMBLY UNIT. THIS UNIT SHALL CONSIST OF ONE ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001430TA-SIC2) OR EQUIVALENT.

C.

UHC 13X24X36 HANDHOLE (PULLBOX) ASSEMBLY UNIT. THIS UNIT SHALL CONSIST OF ONE ARMORCAST POLYMER CONCRETE BOX & COVER ASSEMBLY. PART NUMBER (A6001946TA-SIC2) OR EQUIVALENT.

D.

UH35 AND UH4X6 HANDHOLE ASSEMBLY UNIT - HAWAII PRECAST, INC. AS PER MASTER PURCHASE AGREEMENT.
5.

PROVIDE A 5/8-INCH DIAMETER X 8- FEET COPPER CLAD GROUND ROD AT ALL HANDHOLES AND MANHOLES, UNLESS OTHERWISE SPECIFIED.
6.

ALL MANHOLES AND HANDHOLES TO BE ORDERED WITH ALL HARDWARE, INCLUDING CABLE RACKS, STEPS AND PEGS.
7.

THE TOPS OF ALL MANHOLES AND HANDHOLES SHALL BE FLUSH TO GRADE WITH THE SIDEWALK OR ROADWAY, AND 1" ABOVE FINISH GRADE IN NON-PAVED AREAS.
8.

SET MANHOLE OR HANDHOLE ON A LEVEL AREA, IN THE BOTTOM OF THE EXCAVATION, ON A 4" LAYER OF CRUSHED ROCK, FOR DRAINAGE PURPOSES.
9.

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.
10.

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.

APPROVED BY:

5.6.09

DATE

SANDWICH ISLES COMMUNICATIONS, INC

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

STEVEN H. SAKAI

LICENSED  
PROFESSIONAL  
ENGINEER

No. 7637-E

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY  
ME OR UNDER MY SUPERVISION  
LICENSE EXPIRES 4/30/10

REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
SIC NOTES			
Approved:			
COUNTY ENGINEER, DPW, COUNTY OF HAWAII		DATE	
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

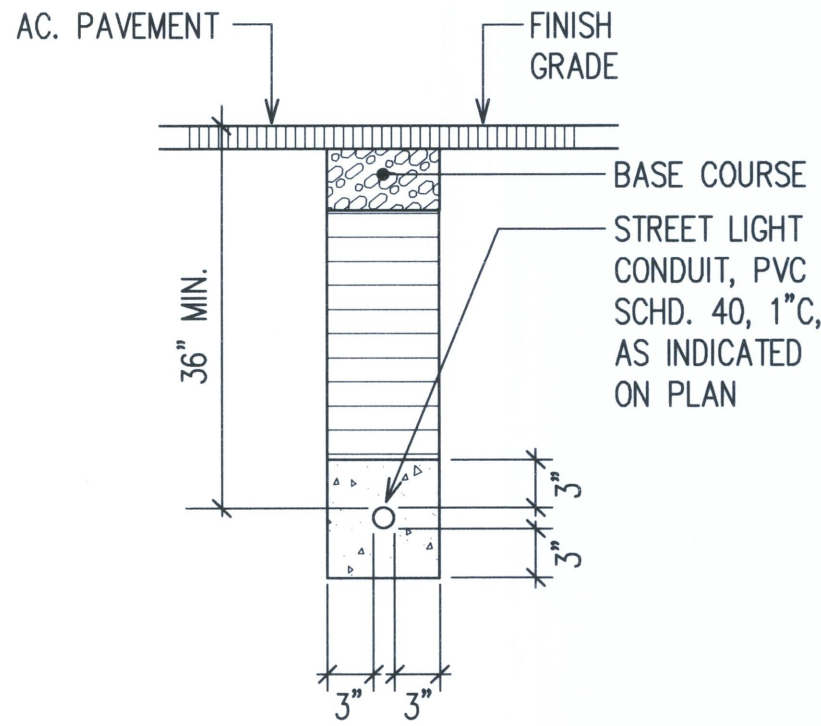
AS-BUILT

SHEET E-21 OF SHEETS

LAST SAVE: 05/05/09 @ 07:54:56 BY: GBT PLOT SC: 12.000000-12.000000  
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LAST SAVE: 05/05/09 @ 07:55:06 BY: GDT PLOT SIZE: 14.40  
Z:\ACAD\PROJECTS\24189\22\_24189\_Kealakehe\Key REF'S: BASE: TOPO BASE-EXISTING UTILITIES BASE-EXISTING TEXT ACAD-KEANALEHU DRIVE STATIONING ACAD-STREET STATIONING MALBOX LAYOUT MLI SCREEN EASEMENT KEALAKEHE\_OL LAOPUA\_TORPO UTILITIES LAOPUA DESIGN EXIST\_KEANALEHU \_JRH-24189-BACKGND \_JRH-24189-ELEC-ALL



CONDUIT SCHEDULE	
ITEM	DESCRIPTION
(1L)	STREET LIGHT 1-1"C
(1L)	EXST. STREET LIGHT 1-1"C
(2L)	EXST. STREET LIGHT 1-2"C

SECTION **P**

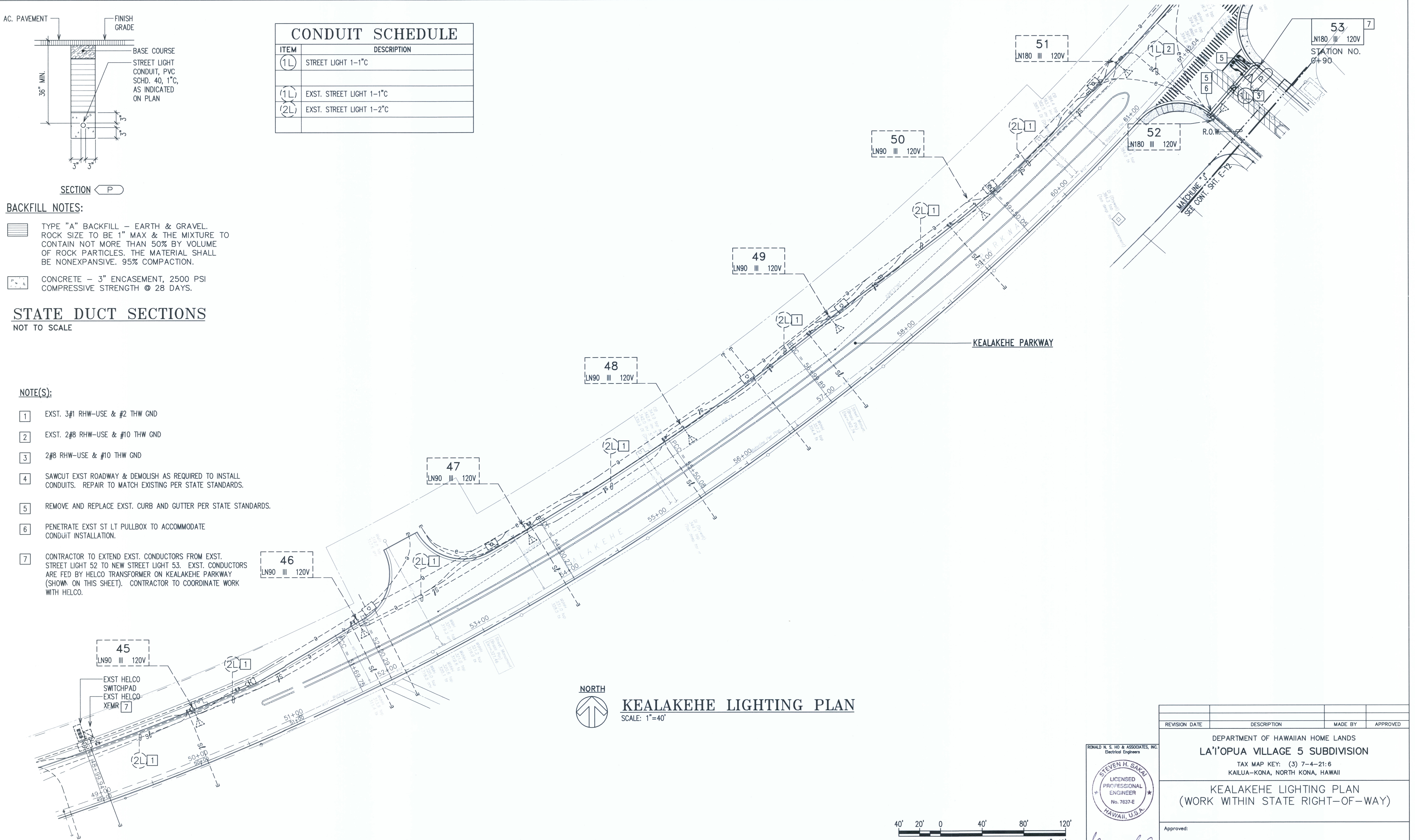
BACKFILL NOTES:

- TYPE "A" BACKFILL - EARTH & GRAVEL. ROCK SIZE TO BE 1" MAX & THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. THE MATERIAL SHALL BE NONEXPANSIVE. 95% COMPACTION.
- CONCRETE - 3" ENCASEMENT, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

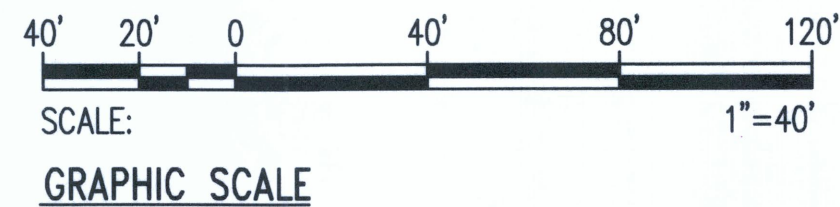
STATE DUCT SECTIONS  
NOT TO SCALE

NOTE(S):

- EXST. 3#1 RHW-USE & #2 THW GND
- EXST. 2#8 RHW-USE & #10 THW GND
- 2#8 RHW-USE & #10 THW GND
- SAWCUT EXST ROADWAY & DEMOLISH AS REQUIRED TO INSTALL CONDUITS. REPAIR TO MATCH EXISTING PER STATE STANDARDS.
- REMOVE AND REPLACE EXST. CURB AND GUTTER PER STATE STANDARDS.
- PENETRATE EXST ST LT PULLBOX TO ACCOMMODATE CONDUIT INSTALLATION.
- CONTRACTOR TO EXTEND EXST. CONDUCTORS FROM EXST. STREET LIGHT 52 TO NEW STREET LIGHT 53. EXST. CONDUCTORS ARE FED BY HELCO TRANSFORMER ON KEALAKEHE PARKWAY (SHOWN ON THIS SHEET). CONTRACTOR TO COORDINATE WORK WITH HELCO.



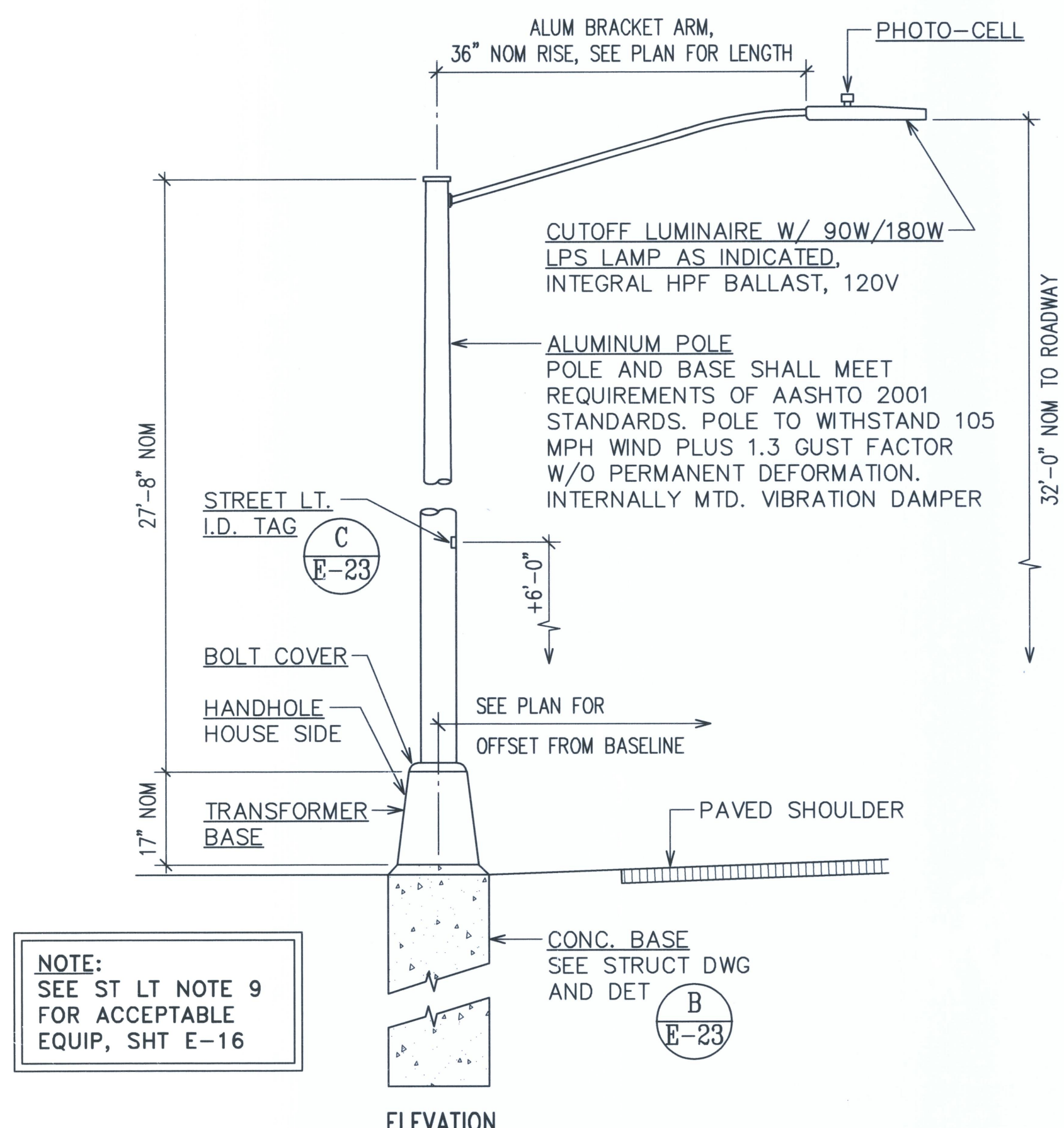
KEALAKEHE LIGHTING PLAN  
SCALE: 1"=40'



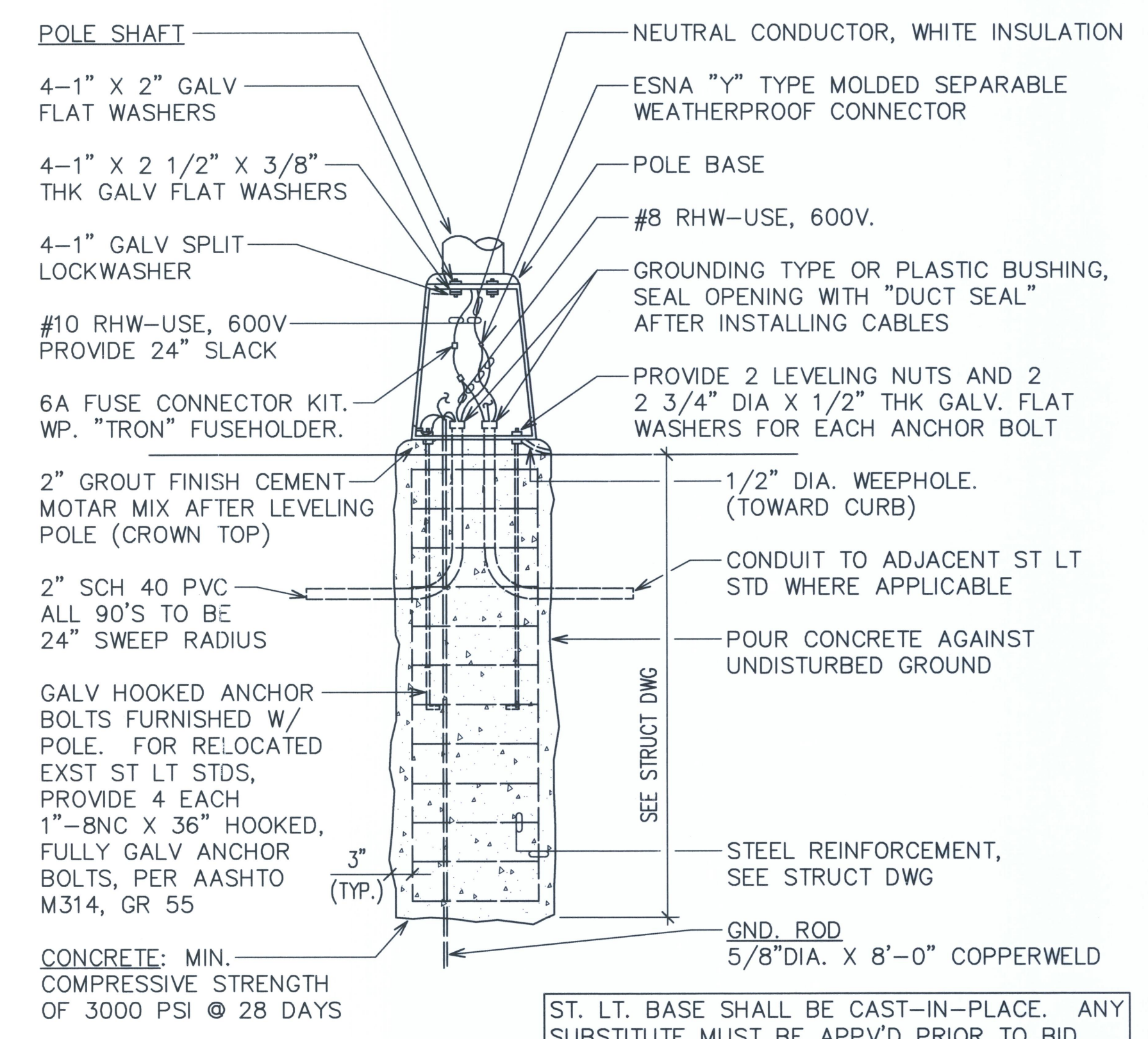
REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS LA'I'OPUA VILLAGE 5 SUBDIVISION TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
KEALAKEHE LIGHTING PLAN (WORK WITHIN STATE RIGHT-OF-WAY)			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.

AS-BUILT

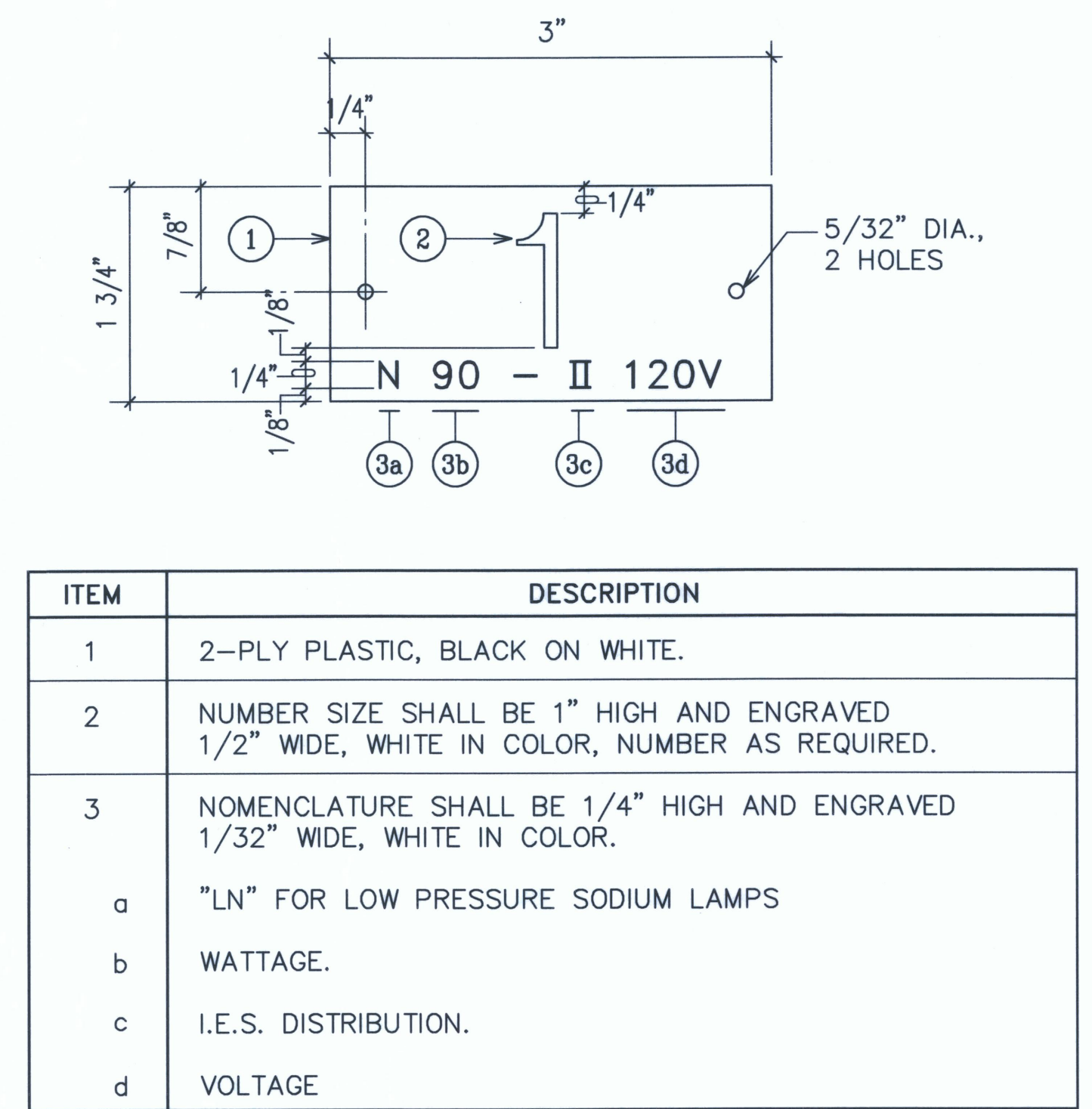




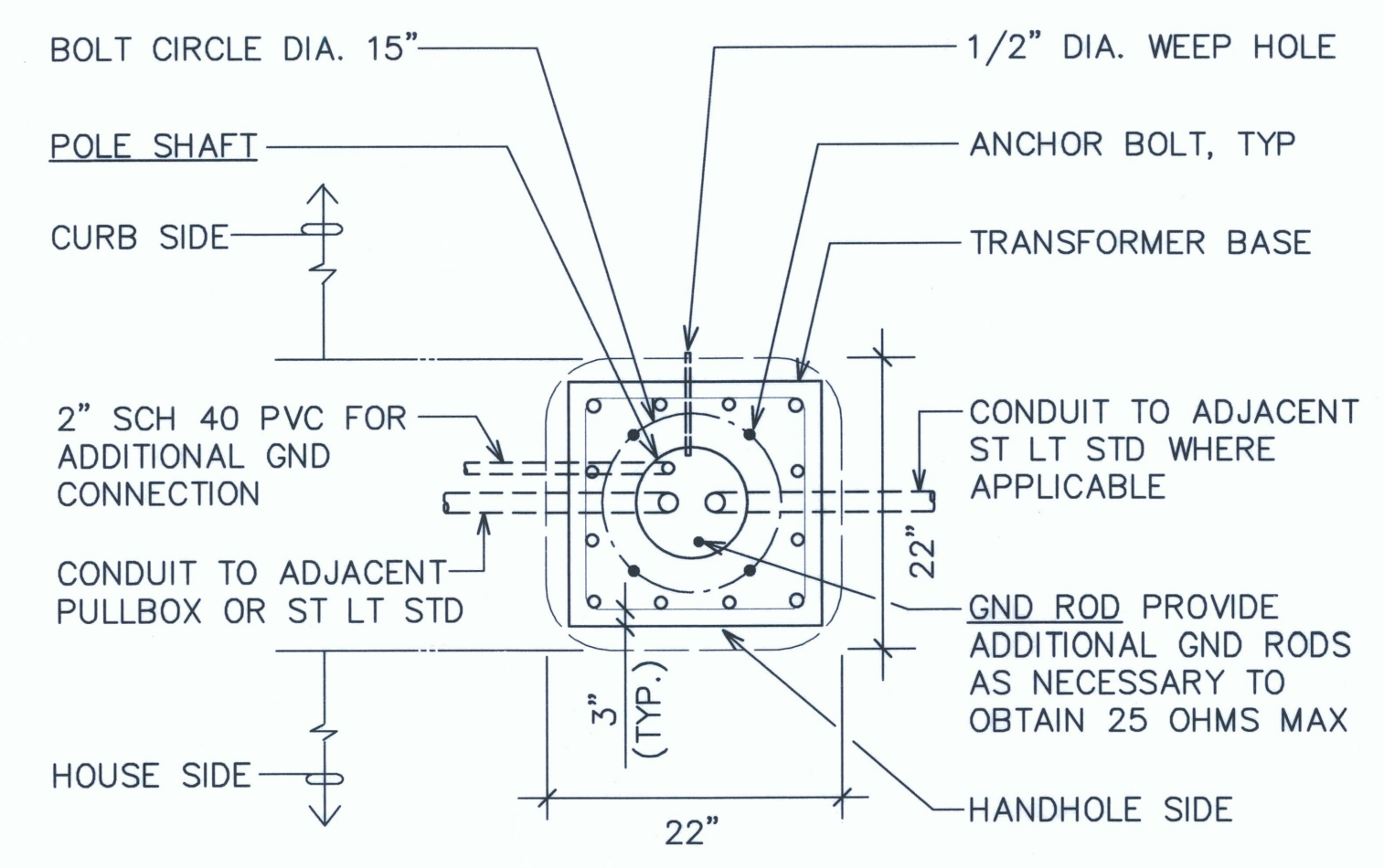
**A STREET LIGHT STANDARD**  
E-23 NOT TO SCALE



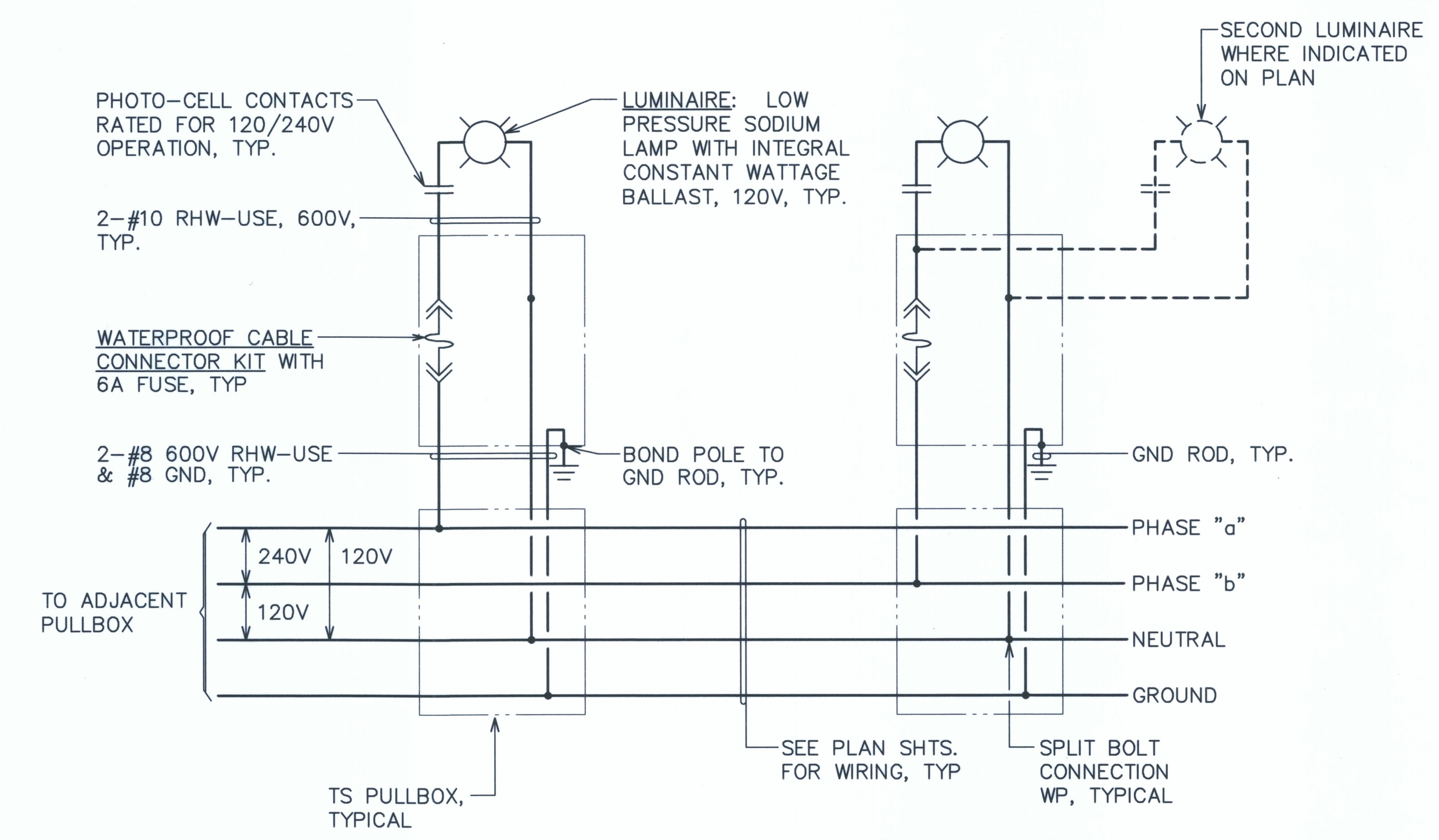
**B STREET LIGHT BASE DETAIL**  
E-23 NOT TO SCALE



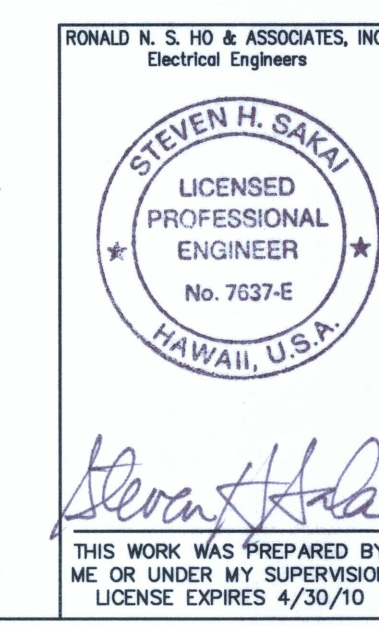
**C STREET LIGHT I.D. TAG DETAIL**  
E-23 NOT TO SCALE



**D CONCRETE BASE PLAN**  
E-23 NOT TO SCALE



**E TYPICAL STREET LIGHT CONNECTION DIAGRAM**  
E-23



REVISION DATE	DESCRIPTION	MADE BY	APPROVED
DEPARTMENT OF HAWAIIAN HOME LANDS <b>LA'I'OPUA VILLAGE 5 SUBDIVISION</b> TAX MAP KEY: (3) 7-4-21:6 KAILUA-KONA, NORTH KONA, HAWAII			
<b>STREET LIGHT DETAILS</b> (WORK WITHIN STATE RIGHT-OF-WAY)			
Approved: _____ COUNTY ENGINEER, DPW, COUNTY OF HAWAII DATE _____			
AKINAKA & ASSOCIATES, LTD. CONSULTING ENGINEERS			
FILE	POCKET	FOLDER	NO.