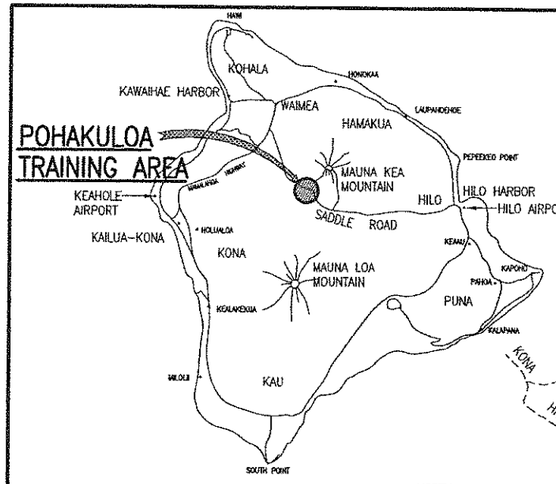
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R1	

PROJECT LOCATION
PROPOSED NEW REALIGNED SADDLE ROAD AT APPROXIMATE MILE POST MARKER 41
(PROVIDE ELECTRICAL WORK TO RELOCATE "PTA" COMM INFRASTRUCTURE.)

PROJECT LOCATION
PROPOSED NEW REALIGNED SADDLE ROAD AT PTA BASE CAMP.
(PROVIDE ELECTRICAL WORK TO RELOCATE "PTA" ELECTRIC, "PTA" COMM, AND HAWAIIAN TELCOM INFRASTRUCTURE AND FOR NEW INTERSECTION SIGNALING AND ROADWAY LIGHTING.)



ELECTRICAL PLAN – LOCATION/GENERAL WORK SCOPE

NOT TO SCALE

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

ELECTRICAL PLAN – LOCATION/GENERAL WORK SCOPE

Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

3200456B.dwg EB1

R1

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R2	

GENERAL NOTES:

1. ALL ELECTRICAL ITEMS INDICATED ON THE DRAWINGS ARE NEW AND SHALL BE PROVIDED BY THE CONTRACTOR UNLESS INDICATED AS "EXISTING", OR AS OTHERWISE NOTED.
2. ALL LOCATIONS SHOWN ON THE DRAWING FOR ITEMS OF WORK TO BE FURNISHED AND/OR INSTALLED ARE APPROXIMATE. SELECT LOCATIONS TO SUIT FIELD CONDITIONS SUBJECT TO APPROVAL OF THE CONTRACTING OFFICER.
3. INDICATE ALL FINAL LOCATIONS ON THE "AS-BUILT" DRAWINGS WHERE THEY DIFFER FROM THAT SHOWN ON THE DRAWINGS.
4. COORDINATE THE WORK AMONG THE VARIOUS TRADES AS NECESSARY TO AVOID CONFLICTS AND TO INSURE THE INSTALLATION OF ALL WORK WITHIN THE AVAILABLE SPACE.
5. CHECK AND MAINTAIN ORIGINAL PHASE ROTATION AND PHASE RELATIONSHIPS ON ALL CIRCUITS.
6. INVESTIGATE AND TONE AREA BEFORE DIGGING OR EXCAVATING.
7. ALL ELECTRICAL EQUIPMENT SHALL BE NEW AND WARRANTED BY THE MANUFACTURER.
8. ALL OUTAGES SHALL BE SCHEDULED AND LIMITED TO DURATION AS AUTHORIZED BY CONTRACTING OFFICER.
9. PROVIDE FOR THE ADDITIONAL COSTS TO PERFORM WORK DURING SCHEDULED AND AUTHORIZED OUTAGES AFTER NORMAL HOURS AND ON WEEKENDS AND HOLIDAYS AS APPLICABLE.
10. SCHEDULED OUTAGES MAY BE CANCELLED BY THE CONTRACTING OFFICER IF POWER RELIABILITY IS ENDANGERED.
11. EXISTING CONDITIONS, MATERIALS, SIZES, AND DIMENSIONS SHOWN ON THESE DRAWINGS REPRESENT THE BEST AVAILABLE INFORMATION OBTAINED FROM "AS- BUILT" DRAWINGS AND FIELD INVESTIGATION. PRIOR TO ORDERING MATERIALS AND EQUIPMENT, VERIFY ALL EXISTING CONDITIONS, MATERIALS, SIZES AND DIMENSIONS THAT AFFECT THE WORK. NOTIFY THE CONTRACTING OFFICER OF ALL QUESTIONS IN WRITING AND RESOLVE ALL QUESTIONS AND CONCERNS PRIOR TO PROCUREMENT AND START OF CONSTRUCTION.

GENERAL NOTES: (CONT'D)

12. EXISTING UNDERGROUND WATER, SEWER, DRAINAGE, GAS, ETC. LINES ARE NOT COMPLETELY INDICATED. PROVIDE FOR THE REQUIRED MAN-HOURS TO INVESTIGATE AND TONE ALL AFFECTED AREAS PRIOR TO DIGGING OR EXCAVATING. PROVIDE ALL NECESSARY MEANS TO LOCATE ALL EXISTING BURIED ITEMS INTERFERING WITH NEW WORK. REPAIR OR REPLACE ANY DAMAGED BURIED ITEM TO THE SATISFACTION AND ACCEPTANCE OF THE CONTRACTING OFFICER. TOPOGRAPHIC SURVEY NOT USED OR AVAILABLE TO INDICATE ABOVE GROUND FEATURES SUCH AS FENCES, SHRUBS, BUSHES, TREES, PLANTS ETC. CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THE SITE WORKING CONDITIONS AND PROVIDE THE REQUIRED MAN-HOURS TO REMOVE AND REPLACE AND/OR REPAIR ANY AND ALL EXISTING ABOVE GROUND FEATURES AFFECTED BY THE NEW WORK. REPLACEMENT/REPAIR SHALL MATCH EXISTING CONDITIONS AND SHALL BE DONE TO THE SATISFACTION OF THE CONTRACTING OFFICER.
13. ALL ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, NATIONAL ELECTRICAL SAFETY CODE, AND FEDERAL, STATE, AND COUNTY GOVERNMENT STANDARDS, REGULATIONS, AND ORDINANCES.
14. ALL EXPOSED CONDUITS AND FITTINGS, AND METAL PORTIONS OF EQUIPMENT ENCLOSURE SHALL BE FIELD PAINTED FOR CORROSION PROTECTION. REFER TO SPECIFICATION SECTION 563.
15. ALL EQUIPMENT SHALL BE PROPERLY MOUNTED, ANCHORED, AND SUPPORTED BY APPROVED METHODS FOR SEISMIC RESTRAINT.

DEFINITIONS

PROVIDE - FURNISH AND INSTALL.
REPLACE - REMOVE AND PROVIDE NEW.
RELOCATE- DISCONNECT, REMOVE, STORE, RE-INSTALL, RE-CONNECT, AND PLACE INTO CORRECT OPERATION ALL WITHOUT CAUSING ANY DAMAGE TO AFFECTED ITEMS.
WIRING - ALL CONDUITS, RACEWAYS, CONDUCTORS, FITTINGS, PULLBOXES, JUNCTION BOXES, OUTLET BOXES, DEVICES, AND OTHER MATERIALS OR ITEMS AS NECESSARY FOR A COMPLETED AND OPERATIONAL ELECTRICAL CIRCUIT OR SYSTEM; OR THAT WHICH COMPRISES AN ELECTRICAL CIRCUIT OR SYSTEM.
OUTLET - IN ADDITION TO DEFINITION IN THE NEC, OUTLET SHALL MEAN THE REQUIRED OUTLET BOXES, CONDUCTORS, TERMINATIONS, WIRING DEVICES, AND COVER PLATES, TO PROVIDE FOR THE INTENDED USE, APPLICATION, OR UTILIZATION EQUIPMENT.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

ELECTRICAL PLAN GENERAL NOTES

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456B.dwg EB2

R2

ABBREVIATIONS

A	AMPERE
AC	ALTERNATING CURRENT
__AF	AMPERE FRAME
AIC	AMPERE INTERRUPTING CAPACITY
AL	ALUMINUM
APPROX	APPROXIMATE
__AT	AMPERE TRIP
AUX	AUXILIARY
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CL	CENTERLINE
CMU	CONCRETE MASONARY UNIT
CO	CONDUIT ONLY
COMM	COMMUNICATIONS
CT	CURRENT TRANSFORMER
CU	COPPER
D	DEEP
DIST	DISTRIBUTION
DOIM	US ARMY DIRECTORATE OF INFORMATION MANAGEMENT
DWG	DRAWING
(E)	EXISTING
ED	ELECTRICAL DISTRIBUTION
E, ELEC	ELECTRIC, ELECTRICAL
EO	ELECTRICALLY OPERATED
EP	ELECTRICAL PRIMARY
ES	ELECTRICAL SECONDARY
FBO	FURNISHED BY OWNER OR OTHERS
G, GND	GROUND
GFIC	GROUND FAULT INTERRUPTING CAPABILITY
H	HORIZONTAL OR HIGH
HELCO	HAWAII ELECTRIC LIGHT COMPANY
HH	HANDHOLE
HHG_	HANDHOLE GROUP
HH/MHG_	HANDHOLE/MANHOLE GROUP _
HID	HIGH INTENSITY DISCHARGE
HPF	HIGH POWER FACTORY
HTI	HAWAIIAN TELCOM INC.
IBC	INSTALLED BY CONTRACTOR
IBO	INSTALLED BY OWNER OR OTHERS
INTLK	INTERLOCK
JBX	JUNCTION BOX
KV	KILO-VOLT
KVA	KILO-VOLT AMPERE
KW	KILO-WATT
KWH	KILO-WATT HOUR
L	LIGHTS, LIGHTING, LONG, LENGTH
LA	LIGHTNING ARRESTORS
MAN	MANUAL
MCM	THOUSAND CIRCULAR MILS
MH	MANHOLE
MO	MANUALLY OPERATED
M.P.R.C.	MULTI-PURPOSE RANGE COMPLEX
N	NEUTRAL
(N)	NEW
N.C.	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
N.O.	NORMALLY OPEN
OC	ON CENTER
OH	OVERHEAD
PBX	PULLBOX
PE	PHOTO-ELECTRIC
PF	POWER FACTOR
PFFB	PROVISIONS FOR FUTURE BREAKER
PH	PHASE
PNLBD	PANELBOARD
PT	POTENTIAL TRANSFORMER
PTA	POHAKULOA TRAINING AREA
PL	PROPERTY LINE
PURAL	PURAL WATER SPECIALTY COMPANY, INC.
R	RECEPTACLE
R/W	RIGHT-OF-WAY
SPEC	SPECIFICATION
SYM	SYMMETRICAL
SD	SERVICE DROP
STP	SHIELDED TWISTED PAIR
T, TEL	TELEPHONE
(TYP)	TYPICAL
THK	THICK
UG	UNDERGROUND
UL	UNDERWRITER'S LABORATORIES, INC.
USACE	UNITED STATES ARMY CORPS OF ENGINEERS
UTP	UNSHIELDED TWISTED PAIR
V	VOLTS, VERTICAL
W	WIRE(S), WIDE, WATTS
WH	WEATHERHEAD
WP	WEATHERPROOF
_W.x_H.x_L.	W.=WIDE, H.=HIGH, L.=LONG OR LENGTH
XFMR	TRANSFORMER

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R3	

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ELECTRICAL PLAN ABBREVIATIONS

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

32004568.dwg EB3

R3

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R4	

ELECTRICAL PLAN SYMBOLS

▭ *	* – EQUIPMENT AS IDENTIFIED
▬	PANELBOARD OR LOADCENTER AS IDENTIFIED
——— – – ———	UNDERGROUND DUCTLINE. CONCRETE ENCASED.
——— ——— ———	EMBEDDED CONDUIT BELOW EXTERIOR FINAL GRADE, CONCRETE ENCASED.
	WIRING AND ELECTRICAL ITEMS AS IDENTIFIED TO BE DISCONNECTED/REMOVED/RELOCATED AS INDICATED
—— ET,ED,ES,T,V,SD ——	OVERHEAD LINES, AS IDENTIFIED, ET – ELECTRIC TRANSMISSION, ED – ELECTRIC DISTRIBUTION, ES – ELECTRIC SECONDARY, T – TELEPHONE, V – CATV, SD – SERVICE DROP, COMM – COMMUNICATIONS (PTA)
EXISTING ○ ● NEW (A)	WOOD POLE. (A) DENOTE POLE/LINE CONSTRUCTION DETAIL INDICATOR.
○⟶	WOOD POLE WITH GUY WIRE AND ANCHOR
○△	WOOD POLE WITH TRANSFORMER(S)
○–◯	WOOD POLE WITH AREA LIGHTING
□–◯	ROADWAY LIGHTING STANDARD
○→ 1 (A / I)	INTERSECTION SIGNALING STANDARD A = INTERSECTION SIGNALING STANDARD DESIGNATION, I = TYPE OF STANDARD, 1 = SIGNAL ASSEMBLY DESIGNATION
(3) LA	LIGHTING ARRESTORS, (*) = QUANTITY
(3)	FUSED DISCONNECTS, (*) = QUANTITY

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ELECTRICAL PLAN SYMBOLS

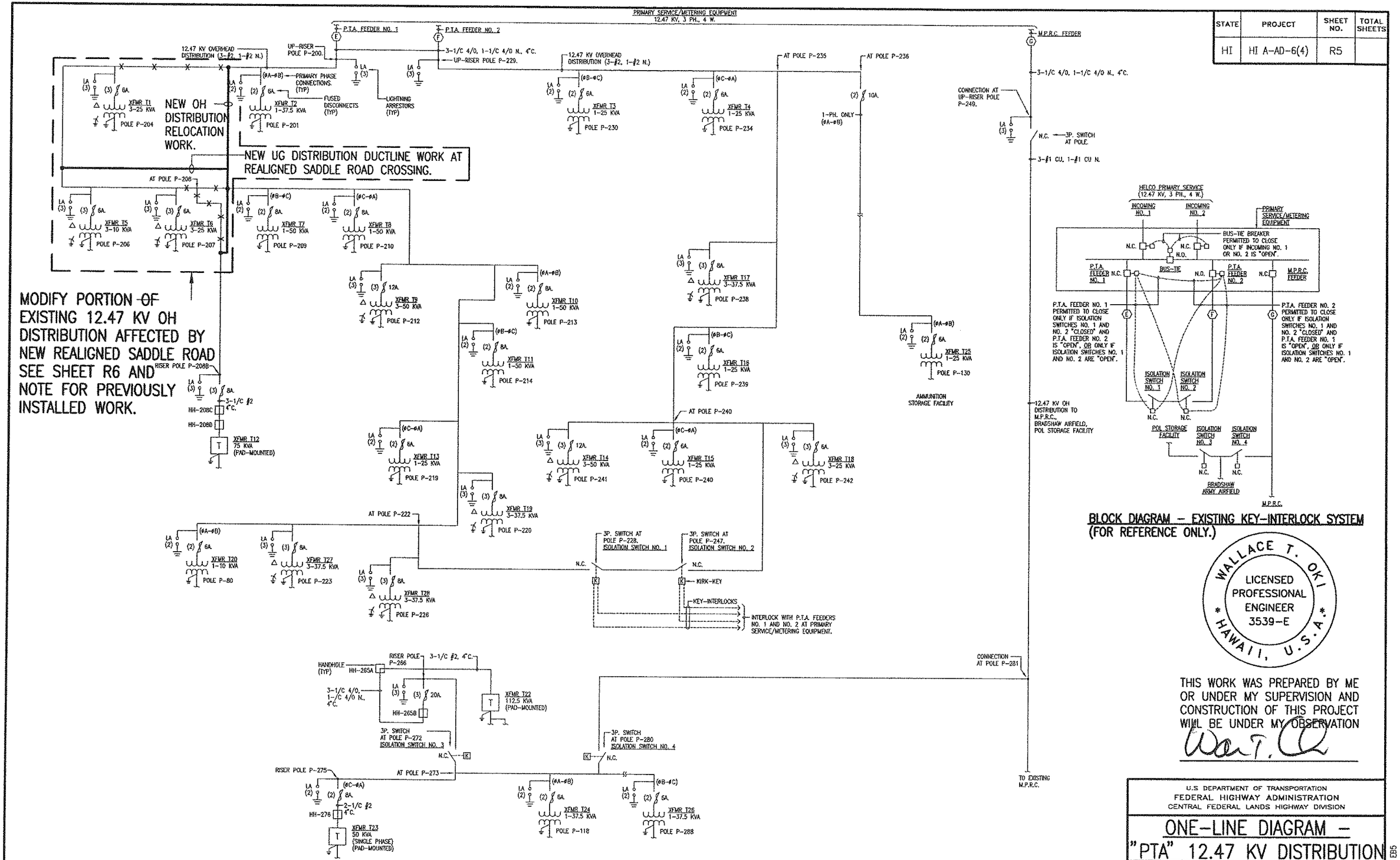
Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456B.dwg EB4

R4

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R5	



BLOCK DIAGRAM – EXISTING KEY-INTERLOCK SYSTEM (FOR REFERENCE ONLY.)

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ONE-LINE DIAGRAM – "PTA" 12.47 KV DISTRIBUTION EXISTING OVERALL

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456B.dwg EB5

R5

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R6	

EXISTING PRIMARY SERVICE/METERING EQUIPMENT
12.47 KV, 3 PH., 4 W.

P.T.A. FEEDER NO. 1 (E)

P.T.A. FEEDER NO. 2 (F)

UP-RISER POLE P-200 (EXISTING)

3-1/C 4/0, 1-1/C 4/0 N., 4"C. (E)

UP-RISER POLE P-229 (EXISTING)

LA (3)

LA (3)

REMOVE PORTION OF EXISTING 12.47 KV OVERHEAD DISTRIBUTION POLE/LINE CONSTRUCTION (TYP)

AT NEW POLE P-201A

EXISTING 12.47 KV OVERHEAD DISTRIBUTION (3-#2, 1-#2 N., CU) (TYP)

(ØA-ØB)

LA (2)

(2) 6A.

XFMR T2
1-37.5 KVA

POLE P-201
(EXISTING)

NEW 12.47 KV OVERHEAD DISTRIBUTION POLE/LINE CONSTRUCTION (3-#2, 1-#2 N., CU)

LA (3)

(3) 6A.

XFMR T1
3-25 KVA

POLE P-204
(EXISTING)
(WATER PUMP STATION)

(2) 10A.

POLE P-236(E)

1-PH. ONLY (ØA-ØB)

AMMUNITION STORAGE FACILITY

AT NEW RISER POLE P-203A

LA (3)

NEW UP-RISER POLE P-203A

LA (3)

(3) 100A.

NEW RISER POLE P-203

PORTION OF REQUIRED 12.47 KV OVERHEAD DISTRIBUTION PREVIOUSLY INSTALLED. OVERHEAD DISTRIBUTION FROM POLE P-201A TO P-203 INSTALLED AND ENERGIZED FOR 1-PH. ONLY. COMPLETE WORK FOR 3-PHASE CONSTRUCTION.

HH

HH

CABLE TERMINATORS

NEW ELECTRIC HANDHOLE (E/35V) (TYP OF 2)

NEW 3-1/C #2, 1-1/C #2 N., CU, 15 KV, UNGND N., SHIELDED, EPR INSULATION, PVC JACKET, 1-4"C., 1-4"C.O. (2-4"EP)

REMOVE PORTION OF EXISTING 12.47 KV OVERHEAD DISTRIBUTION POLE/LINE CONSTRUCTION. (TYP)

EXISTING ISOLATION SWITCH NO. 1 (AT POLE P-228)

EXISTING ISOLATION SWITCH NO. 2 (AT POLE P-247)

N.C.

N.C.

AT NEW POLE P-208

K — KIRK-KEY — K

KEY-INTERLOCKS

INTERLOCKED WITH P.T.A. FEEDERS NO. 1 AND NO. 2 AT PRIMARY SERVICE/METERING EQUIPMENT.

(ØB-ØC)

LA (3)

(3) 6A.

XFMR T5
3-10 KVA

POLE P-206
(EXISTING)

(WATER TREATMENT PLANT)

LA (3)

(3) 6A.

XFMR T6
3-25 KVA

POLE P-207
(EXISTING)

AT NEW POLE P-208A

LA (2)

(2) 8A.

XFMR T7
1-50 KVA

POLE P-209
(EXISTING)

LA (3)

(3) 8A.

RISER POLE P-208B (EXISTING)

(NO LOAD)

HH(E)

XFMR T12
75 KVA
(PAD-MOUNTED)
(EXISTING)
(PU'U POHAKOLOA)

HH(E)

3-1/C #2
4"C. (E)

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ONE-LINE DIAGRAM - "PTA" 12.47 KV DISTRIBUTION MODIFICATIONS

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456B.dwg EB6

R6

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R7	

EXISTING OH HELCO 138 KV TRANSMISSION AND HAWAIIAN TELCOM FIBER OPTICS TRUNK LINES. (TYP)

EXISTING OH HELCO 69 KV TRANSMISSION.

NEW UG COMM DUCTLINE (SEE SHEET R12.)

EXISTING HAWAIIAN TELCOM FIBER OPTICS SERVICE TO PTA.

MATCHLINE ON SHEETS R9 AND R10.

REMOVE PORTION OF EXISTING "PTA" OH 12.47 KV DISTRIBUTION. (TYP)

EXISTING OH FIBER OPTICS CABLE TO BE REROUTED IN NEW UG COMM DUCTLINE. (SEE SHEET R12.)

EXISTING TELEPHONE UTILITY EASEMENT.

EXISTING WATER TREATMENT PLANT

EXISTING OH "PTA" ELECTRIC, COMM INFRASTRUCTURE TO REMAIN FOR WATER SYSTEM SUPPORT FACILITIES. (TYP)

MATCHLINE ON SHEETS R8 AND R9.

PROPOSED NEW REALIGNED SADDLE ROAD RIGHT-OF-WAY. (PROVIDE ELECTRICAL WORK FOR "PTA" ELECTRIC, "PTA" COMM, AND HAWAIIAN TELCOM INFRASTRUCTURE RELOCATION AND FOR NEW INTERSECTION ROADWAY LIGHTING AND SIGNALING AS INDICATED.) (TYP)

PROPOSED 70 FT. WIDE EASEMENT FOR WATER, ELECTRIC, COMM UG CROSSING OF NEW REALIGNED SADDLE ROAD. (TYP)

EXISTING UG DUCTLINE TO PU'U POHAKULOA (TYP)

EXISTING HAWAIIAN TELCOM FIBER OPTICS CABLE ON "PTA" OH COMM INFRASTRUCTURE. (TYP)

NEW UG ELECTRIC AND COMM DUCTLINE CROSSING NEW REALIGNED SADDLE ROAD.

REMOVE PORTION OF EXISTING "PTA" OH 12.47 KV DISTRIBUTION. (TYP)

EXISTING HELCO OH TRANSMISSION (FOR TEMPORARY SUBSTATION) TO BE REMOVED BY HELCO. (TYP)

NEW ROADWAY LIGHTING STANDARD (180 W., LPS) (TYP OF 2)

EXISTING HELCO OH TRANSMISSION/ DISTRIBUTION (TYP)

EXISTING UTILITY POLES TO BE RELOCATED BY HELCO. (TYP) (SEPARATE AGREEMENT.)

NEW INTERSECTION SIGNALING STANDARD WITH FLASHING WARNING LIGHTS. (TYP OF 2)

AT ~STA 327+00

PORTION OF REQUIRED 12.47 KV OVERHEAD DISTRIBUTION PREVIOUSLY INSTALLED. OVERHEAD DISTRIBUTION FROM POLE P-201A TO P-203 INSTALLED AND ENERGIZED FOR 1-PH. ONLY. COMPLETE WORK FOR 3-PHASE CONSTRUCTION.

NEW "PTA" OH 12.47 KV DISTRIBUTION IMPROVEMENTS. (TYP)

NEW ELECTRICAL EQUIPMENT FOR NEW INTERSECTION SIGNALING AND ROADWAY LIGHTING.

EXISTING "PTA" OH 12.47 KV DISTRIBUTION TO REMAIN.

EXISTING POHAKULOA TRAINING AREA (PTA) BASE CAMP

EXISTING HELCO SUBSTATION

EXISTING PRIMARY SERVICE/METERING EQUIPMENT

MAUNA KEA
WAIMEA — HILO
MAUNA LOA

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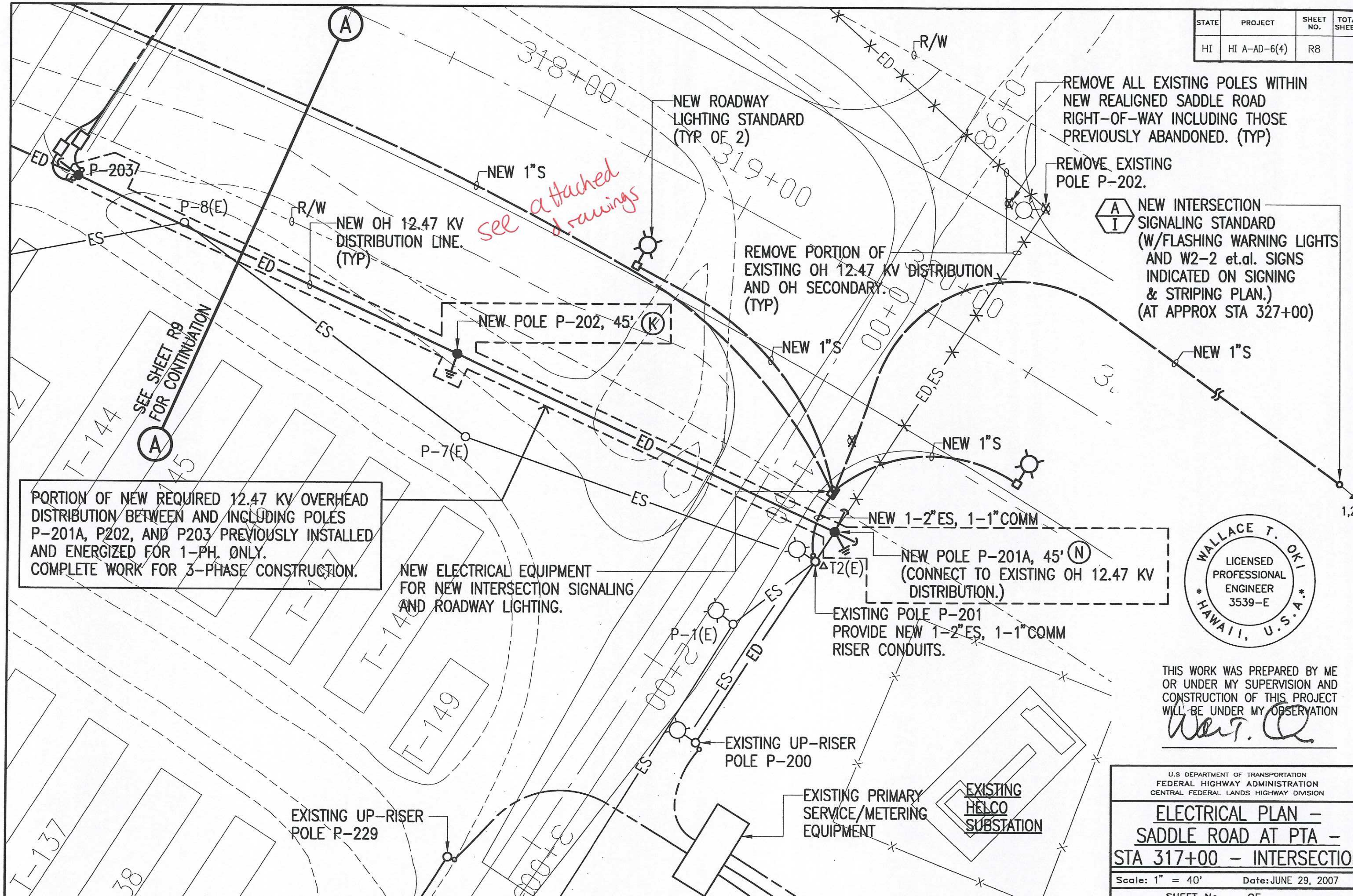
ELECTRICAL PLAN - SADDLE ROAD AT PTA - OVERALL WORK SCOPE

Scale: 1" = 100' Date: JUNE 29, 2007

SHEET No. OF

3200456A.dwg ED

R7



NEW ROADWAY LIGHTING STANDARD (TYP OF 2)
REMOVE ALL EXISTING POLES WITHIN NEW REALIGNED SADDLE ROAD RIGHT-OF-WAY INCLUDING THOSE PREVIOUSLY ABANDONED. (TYP)
REMOVE EXISTING POLE P-202.
NEW INTERSECTION SIGNALING STANDARD (W/FLASHING WARNING LIGHTS AND W2-2 et.al. SIGNS INDICATED ON SIGNING & STRIPING PLAN.) (AT APPROX STA 327+00)
R/W
318+00
319+00
P-203
P-8(E)
NEW 1"S
NEW OH 12.47 KV DISTRIBUTION LINE. (TYP)
see attached drawings
REMOVE PORTION OF EXISTING OH 12.47 KV DISTRIBUTION AND OH SECONDARY. (TYP)
NEW POLE P-202, 45' (K)
SEE SHEET R9 FOR CONTINUATION
P-7(E)
ES
ED
ED,ES
PORTION OF NEW REQUIRED 12.47 KV OVERHEAD DISTRIBUTION BETWEEN AND INCLUDING POLES P-201A, P202, AND P203 PREVIOUSLY INSTALLED AND ENERGIZED FOR 1-PH. ONLY. COMPLETE WORK FOR 3-PHASE CONSTRUCTION.
NEW ELECTRICAL EQUIPMENT FOR NEW INTERSECTION SIGNALING AND ROADWAY LIGHTING.
NEW 1-2"ES, 1-1"COMM
NEW POLE P-201A, 45' (N) (CONNECT TO EXISTING OH 12.47 KV DISTRIBUTION.)
T2(E)
EXISTING POLE P-201 PROVIDE NEW 1-2"ES, 1-1"COMM RISER CONDUITS.
P-1(E)
EXISTING UP-RISER POLE P-200
EXISTING UP-RISER POLE P-229
EXISTING PRIMARY SERVICE/METERING EQUIPMENT
EXISTING HELCO SUBSTATION
T-144
T-149
T-137
1,2
WALLACE T. OKI LICENSED PROFESSIONAL ENGINEER 3539-E HAWAII, U.S.A.

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R8	

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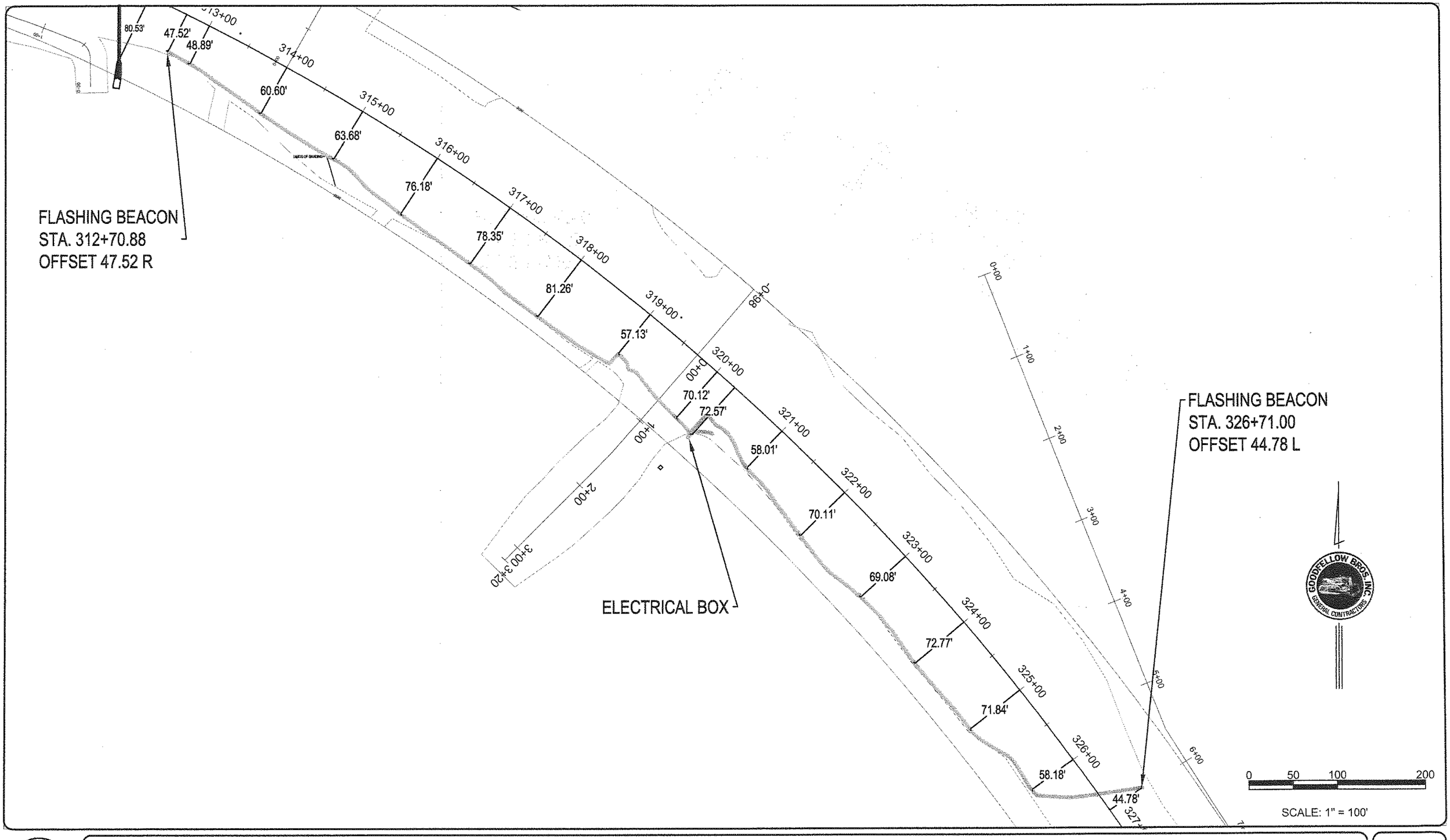
ELECTRICAL PLAN - SADDLE ROAD AT PTA - STA 317+00 - INTERSECTION

Scale: 1" = 40' Date: JUNE 29, 2007

SHEET No. OF

R8

3200456A.dwg E1



GOODFELLOW BROS., INC.

SADDLE ROAD HI A-AD/STP 6(4)

ELECTRICAL CONDUIT FOR FLASHING BEACONS

SHEET
1 of 1

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R9	

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ED
T5(E)
P-206(E)
P-28(E)
P-205(E)
EXISTING UG SERVICES
EXISTING WATER TREATMENT PLANT
SEE SHEET R10 FOR CONTINUATION
B
3+00
314+00
315+00
316+00
317+00
318+00
319+00
R/W
P-205A(E)
NEW POLE P-203A, 50'. (J)(G)(H)
PROVIDE 2-4" EP, 2-4" COMM RISER CONDUITS.
(CONNECT TO EXISTING OH 12.47 KV DISTRIBUTION.)
P-4(E)
ES
NEW HH/MHG-1B
COMM/MH46.5
E/35V
70 FT. WIDE EASEMENT FOR WATER, ELECTRIC, AND COMM CROSSING.
P-3A(E)
T1(E)
EXISTING STANDBY PUMP STATION
EXISTING POLE P-204.
PROVIDE NEW GUY CONSTRUCTION.
(B)(C)(D)
EXISTING PUMP STATION
See attached drawings
NEW 2-4" EP, 2-4" COMM
A
SEE SHEET R8 FOR CONTINUATION
REMOVE PORTION OF EXISTING OH 12.47 KV DISTRIBUTION. (TYP)
P-203B
NEW OH 12.47 KV DISTRIBUTION LINE. (TYP)
NEW 1"S
NEW HH/MHG-1A
COMM/MH46.5
E/35V
P-8(E)
P-10(E)
PORTION OF NEW REQUIRED 12.47 KV OVERHEAD DISTRIBUTION BETWEEN AND INCLUDING POLES P-201A, P202, AND P203 PREVIOUSLY INSTALLED AND ENERGIZED FOR 1-PH. ONLY. COMPLETE WORK FOR 3-PHASE CONSTRUCTION.
(I)(G)(H) NEW POLE P-203, 50'. PROVIDE 2-4" EP, 2-4" COMM RISER CONDUITS.

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

ELECTRICAL PLAN - SADDLE ROAD AT PTA - STA 314+00 - 317+00

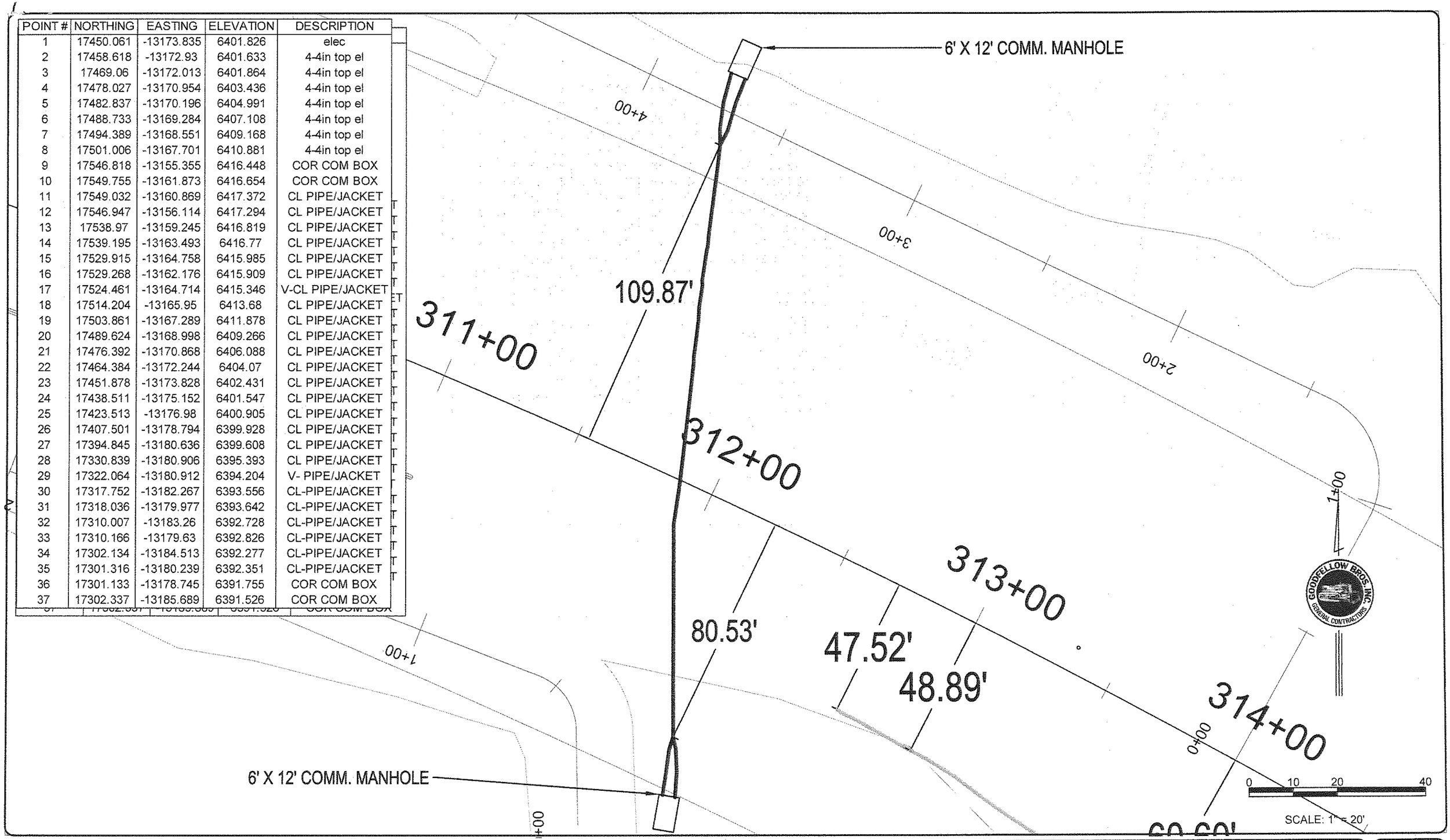
Scale: 1" = 40' Date: JUNE 29, 2007

SHEET No. OF

3200456A.dwg E2

R9

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	17450.061	-13173.835	6401.826	elec
2	17458.618	-13172.93	6401.633	4-4in top el
3	17469.06	-13172.013	6401.864	4-4in top el
4	17478.027	-13170.954	6403.436	4-4in top el
5	17482.837	-13170.196	6404.991	4-4in top el
6	17488.733	-13169.284	6407.108	4-4in top el
7	17494.389	-13168.551	6409.168	4-4in top el
8	17501.006	-13167.701	6410.881	4-4in top el
9	17546.818	-13155.355	6416.448	COR COM BOX
10	17549.755	-13161.873	6416.654	COR COM BOX
11	17549.032	-13160.869	6417.372	CL PIPE/JACKET
12	17546.947	-13156.114	6417.294	CL PIPE/JACKET
13	17538.97	-13159.245	6416.819	CL PIPE/JACKET
14	17539.195	-13163.493	6416.77	CL PIPE/JACKET
15	17529.915	-13164.758	6415.985	CL PIPE/JACKET
16	17529.268	-13162.176	6415.909	CL PIPE/JACKET
17	17524.461	-13164.714	6415.346	V-CL PIPE/JACKET
18	17514.204	-13165.95	6413.68	CL PIPE/JACKET
19	17503.861	-13167.289	6411.878	CL PIPE/JACKET
20	17489.624	-13168.998	6409.266	CL PIPE/JACKET
21	17476.392	-13170.868	6406.088	CL PIPE/JACKET
22	17464.384	-13172.244	6404.07	CL PIPE/JACKET
23	17451.878	-13173.828	6402.431	CL PIPE/JACKET
24	17438.511	-13175.152	6401.547	CL PIPE/JACKET
25	17423.513	-13176.98	6400.905	CL PIPE/JACKET
26	17407.501	-13178.794	6399.928	CL PIPE/JACKET
27	17394.845	-13180.636	6399.608	CL PIPE/JACKET
28	17330.839	-13180.906	6395.393	CL PIPE/JACKET
29	17322.064	-13180.912	6394.204	V- PIPE/JACKET
30	17317.752	-13182.267	6393.556	CL-PIPE/JACKET
31	17318.036	-13179.977	6393.642	CL-PIPE/JACKET
32	17310.007	-13183.26	6392.728	CL-PIPE/JACKET
33	17310.166	-13179.63	6392.826	CL-PIPE/JACKET
34	17302.134	-13184.513	6392.277	CL-PIPE/JACKET
35	17301.316	-13180.239	6392.351	CL-PIPE/JACKET
36	17301.133	-13178.745	6391.755	COR COM BOX
37	17302.337	-13185.689	6391.526	COR COM BOX



GOODFELLOW BROS., INC.

SADDLE ROAD HI A-AD/STP 6(4)

COMM. CONDUIT FOR RELOCATING AERIAL FIBER OPTIC

SHEET 1 of 1

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R10	

NEW POLE P-26, 40'. (H)
PROVIDE 4-4"COMM
RISER CONDUITS.

NEW
COMM/MH612-1

EXISTING POLE P-207.
PROVIDE NEW GUY
CONSTRUCTION. (B)

REMOVE EXISTING
POLE P-208A.

REMOVE EXISTING
POLE P-208.

REMOVE PORTION OF
EXISTING OH 12.47 KV
DISTRIBUTION. (TYP)

REMOVE ALL POLES WITHIN
NEW REALIGNED SADDLE ROAD
RIGHT-OF-WAY INCLUDING
THOSE PREVIOUSLY ABANDONED.
(TYP)

NEW 4-4"COMM
EXISTING OVERHEAD HAWAIIAN TELCOM
FIBER OPTICS CABLE.
(HAWAIIAN TELCOM TO REROUTE IN
NEW COMM UG DUCTLINE/MANHOLES.)

NEW INTERSECTION
SIGNALING STANDARD (B/I)
(W/FLASHING WARNING LIGHTS
AND W2-2 et.al. SIGNS
INDICATED ON SIGNING
& STRIPING PLAN.)

NEW POLE P-208A, 45'. (N)
(CONNECT TO EXISTING
OH 12.47 KV DISTRIBUTION.)

RELOCATE PORTION OF
EXISTING OH 12.47 KV DISTRIBUTION.
(TYP)

NEW POLE P-208, 45'. (O)
(CONNECT TO EXISTING
OH 12.47 KV DISTRIBUTION.)

EXISTING POLE P-208B

HH(E)

EXISTING UG
12.47 KV FEEDER TO
EXISTING PAD-MOUNT XFMR T12
AT PU'U POHAKULOA.
(TYP)

T7(E)

NEW
COMM/MH612-2

NEW POLE P-24, 40'. (H)
PROVIDE 4-4"COMM
RISER CONDUITS.

NEW POLE P-203B, 45'. (L)

T-199

ES,COMM

NEW 1"S

T6(E)

T5(E)

P-206(E)

ED

R/W

COMM

ES

309+00

310+00

311+00

312+00

314+00

SEE SHEET R9
FOR CONTINUATION

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CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY OBSERVATION

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

ELECTRICAL PLAN - SADDLE ROAD AT PTA - STA 309+00 - 314+00

Scale: 1" = 40' Date: JUNE 29, 2007

SHEET No. OF

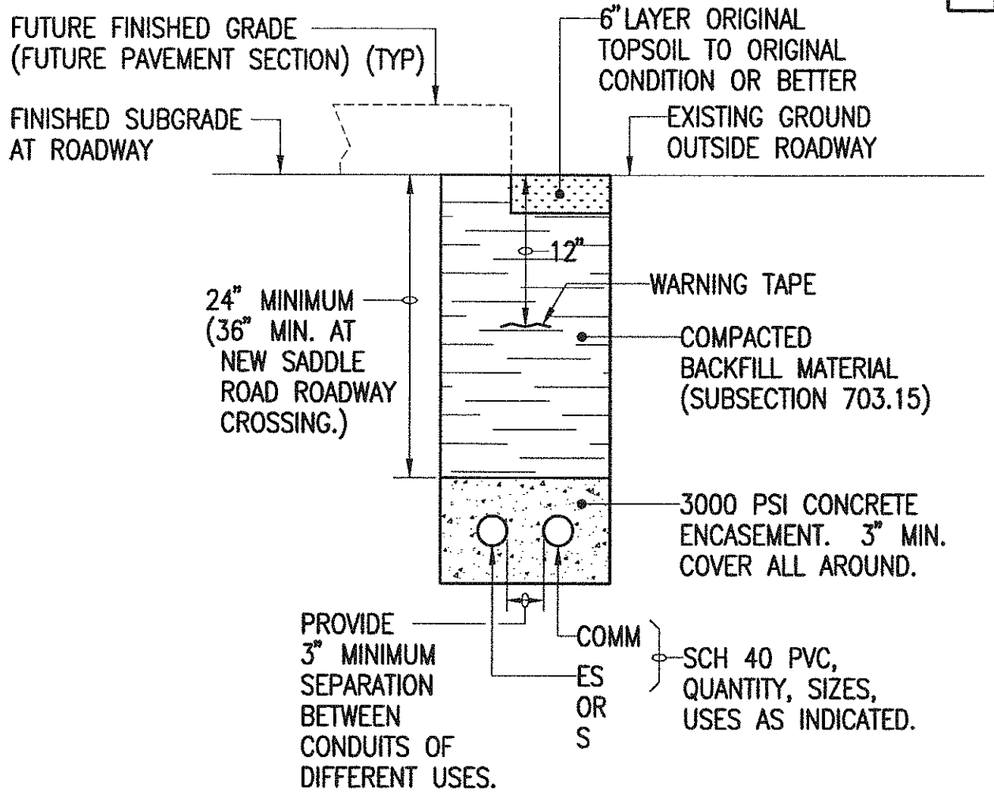
3200456A.dwg E3

R10

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R11	

UNDERGROUND INFRASTRUCTURE NOTES:

1. ALL DUCTLINE AND TRENCHING DETAILS SHOWN ARE TYPICAL. COORDINATE EXACT REQUIREMENTS WITH ELECTRICAL PLANS AND "DOIM" FURNISHED DRAWINGS AND/OR SPECIFICATIONS.
2. DUCTS SHALL BE SCH 40 PVC, SIZES AND QUANTITIES AS INDICATED ON THE PLANS.
3. PROVIDE 3" MINIMUM SEPARATIONS BETWEEN DUCTS OF DIFFERENT USES.
4. PROVIDE 1-1/2" MINIMUM SEPARATIONS BETWEEN DUCTS OF SAME USE.
5. PROVIDE 3" MINIMUM CONCRETE COVERING ALL AROUND DUCTS AT ALL TIMES.
6. ALL DUCTLINES SHALL BE ROUTED BELOW OR UNDERNEATH ALL WATER LINES. MINIMUM VERTICAL CLEARANCE AT CROSSINGS BETWEEN WATER LINES AND UTILITY DUCTLINES SHALL BE 12 INCHES IF ENCASED IN CONCRETE JACKETS AND 18 INCHES IF NOT CONCRETE ENCASED. MINIMUM HORIZONTAL CLEARANCE AT PARALLEL CONDITIONS BETWEEN WATER LINES AND UTILITY DUCTLINES SHALL BE 8 FEET.
7. MAIN DUCT RUNS SHALL BE CONSTRUCTED WITH MINIMUM 25 FEET RADIUS CURVES.
8. AFTER THE CONDUITS ARE INSTALLED, A ROUND SOLID TEST MANDREL NOT LESS THAN 12-INCHES LONG AND HAVING A DIAMETER OF ONE-FOURTH INCH LESS THAN THE DIAMETER OF THE CONDUIT SHALL BE PULLED THROUGH EACH CONDUIT 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 IN THE CONDUIT.
9. ALL TRENCHES MUST BE INSPECTED BY CONTRACTING OFFICER PRIOR TO BACKFILLING THE CONCRETE ENCASING OPERATIONS. ARRANGE FOR INSPECTION, AT LEAST 72 HOURS PRIOR TO POURING OF CONCRETE OR BACKFILLING.
10. INSTALL NEPTCO WP1800P MULETAPE IN ALL COMMUNICATIONS DUCTS. MEASURE DISTANCE OF ONE DUCT OF DUCTLINE AND PROVIDE MEASUREMENTS TO CONTRACTING OFFICER. (DO NOT SUBSTITUTE MULETAPE.)
11. DO NOT USE STONES, ROCKS, ETC. WITH BACKFILL MATERIAL, USE ONLY SELECT MATERIALS AS BACKFILL MATERIAL.
12. ALL DUCTS SHALL ENTER HANDHOLE/MANHOLE AT 90 DEGREE ANGLE AND FLUSH WITH FLARED OR BELL ENDS TO PREVENT CABLE DAMAGE.
13. ALL DUCTS ASSOCIATED WITH HANDHOLE/MANHOLE SHALL BE INSTALLED WITH ADEQUATE DRAINAGE TOWARD THE HANDHOLE/MANHOLE. (MINIMUM ONE-FOURTH PERCENT UNLESS OTHERWISE NOTED).
14. ALL DUCTS SHALL CONNECT TO HANDHOLE/MANHOLE AT ENDS ONLY. NO CONNECTIONS TO SIDES WILL BE ALLOWED.
15. THE TOP OF ALL HANDHOLE/MANHOLE COVER SHALL BE SET FLUSH WITH FINAL GRADE.
16. PROVIDE A 5/8-INCH DIAMETER BY 8-FT. GALVANIZED GROUND ROD IN ALL COMMUNICATIONS MANHOLE.



GENERAL ARRANGEMENT (TYP) - INTERSECTION SIGNALING/ROADWAY LIGHTING/ SERVICE DUCTLINE

NOT TO SCALE

(TYPICAL FOR CONDUIT TO ROADWAY LIGHTING STANDARD AND INTERSECTION SIGNALING STANDARD.)

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U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

GENERAL ARRANGEMENT - DUCTLINE DETAILS

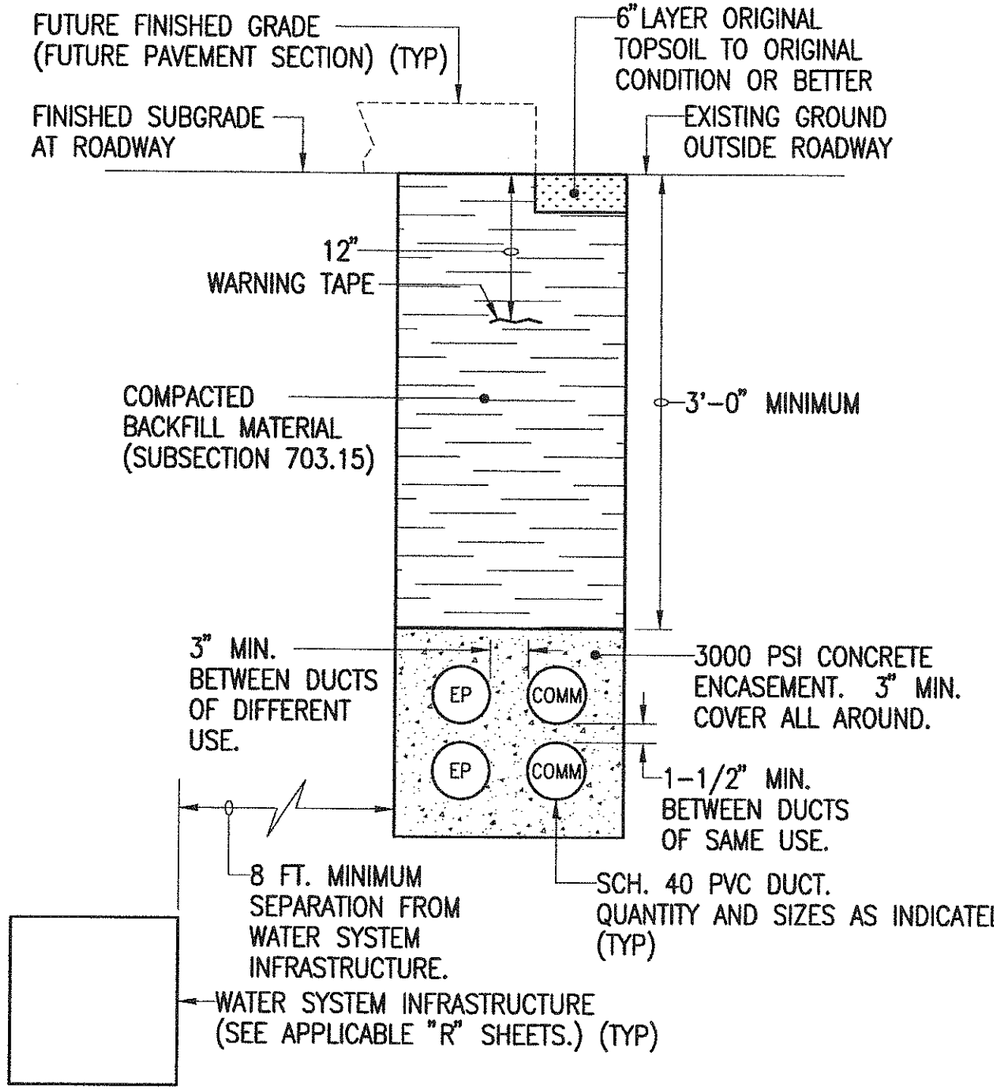
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

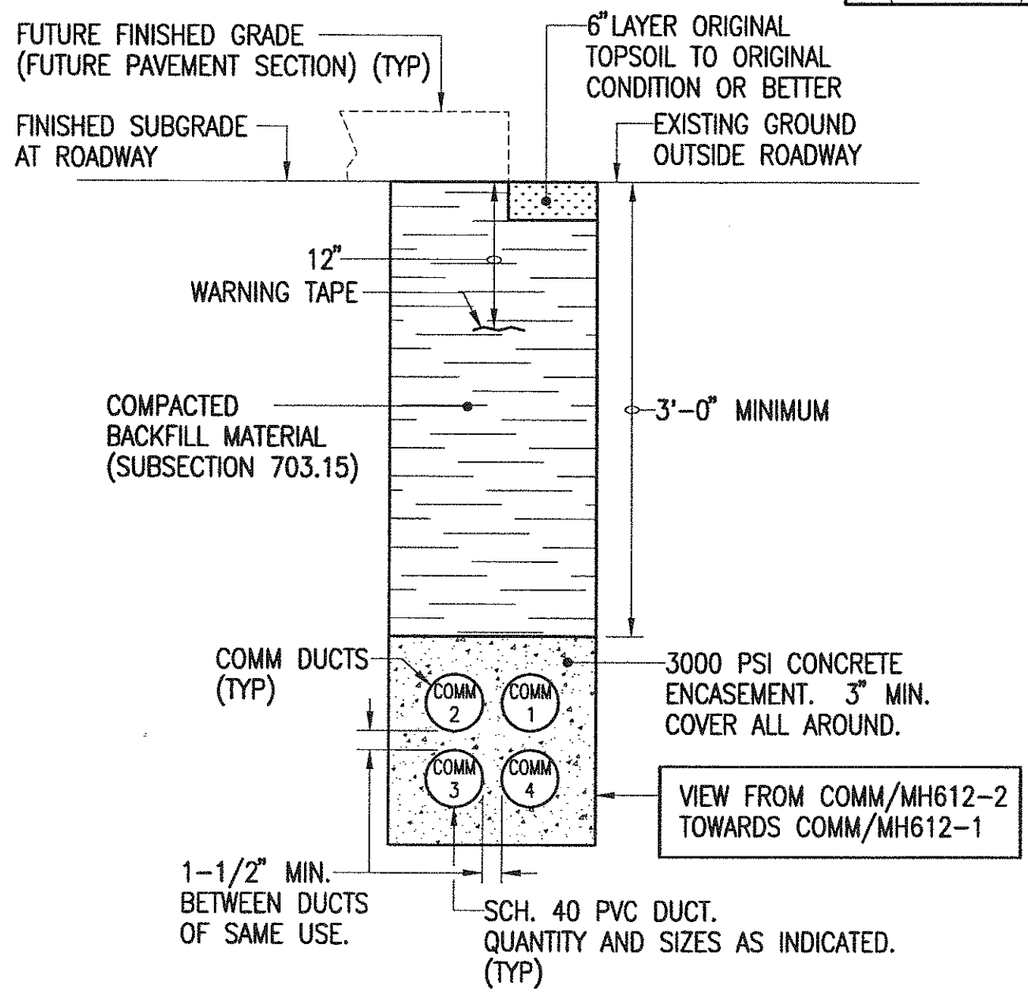
3200456A.dwg E4

R11

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R12	



AT 70 FT. EASEMENT (APPROX STA 316)



AT TELEPHONE UTILITY EASEMENT (APPROX STA 312)

GENERAL ARRANGEMENT (TYP) - DUCTLINE AND TRENCHING DETAIL

NOT TO SCALE

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GENERAL ARRANGEMENT - DUCTLINE DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456A.dwg E5

HANDHOLE/MANHOLE NOTES

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R13	

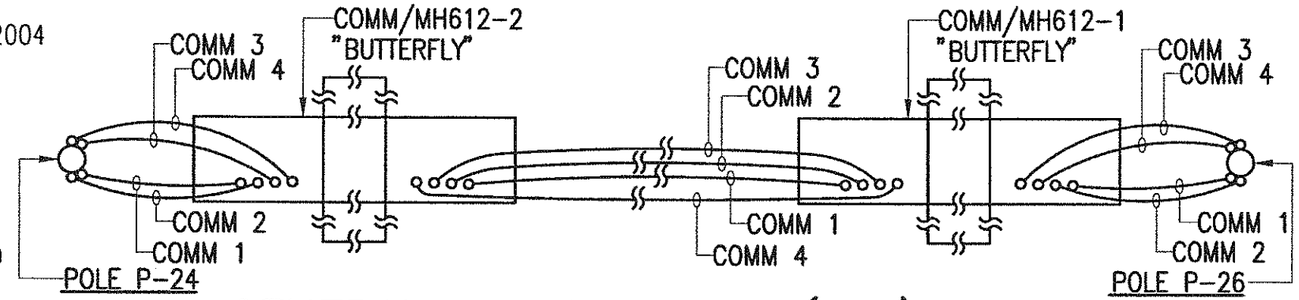
ELECTRIC ("PTA")

E/35V — 3'X5' NOMINAL, 4' DEEP, OPEN SUMP FOR DRAINAGE.
PROVIDE PER HELCO TYPE 35V, STANDARD DRAWINGS 892000 AND 892004 EXCEPT MARKED "ELECTRIC". REFER TO SHEET R40 AND R41.

COMMUNICATION ("PTA"/HAWAIIAN TELCOM)

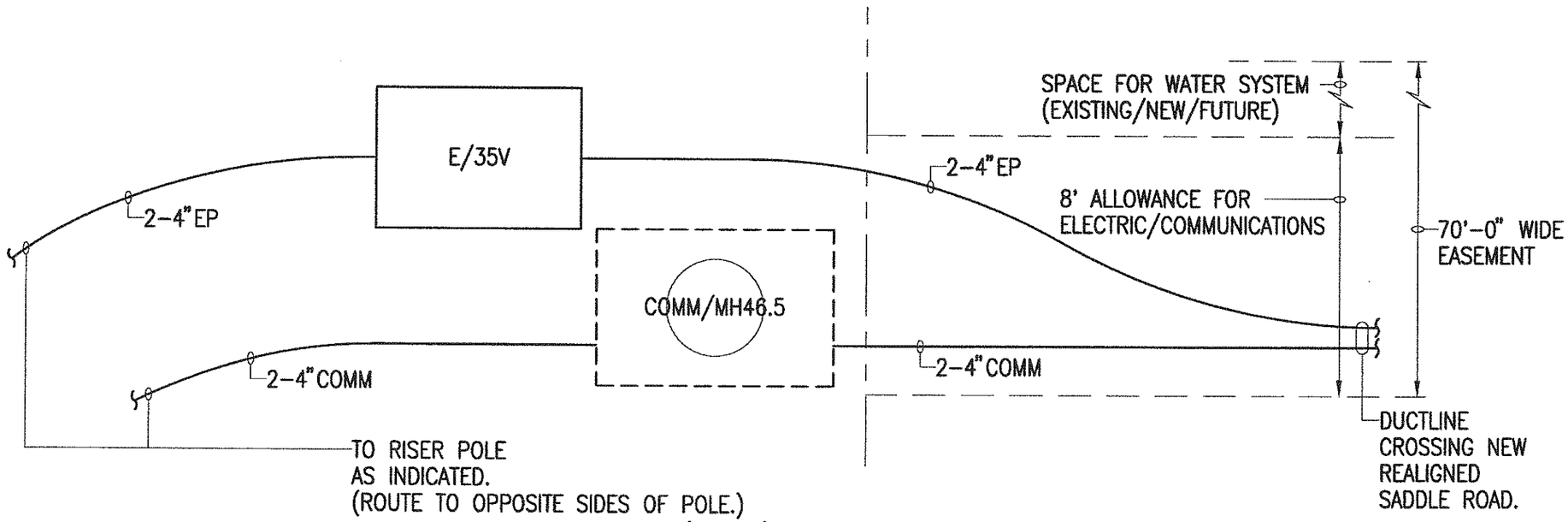
COMM/MH46.5 — 4'X6'-6" NOMINAL, 6'-6" HEADROOM MANHOLE.
PROVIDE PER HAWAIIAN TELCOM STANDARD DRAWINGS.
REFER TO SPECIFICATION GTS-8395, ITEMS IDENT 180014 AND 180015 ON SHEETS R42 AND R43.

COMM/MH612-1, COMM/MH612-2 — 6'X12' NOMINAL, 7'-0" HEADROOM MANHOLE.
PROVIDE PER HAWAIIAN TELCOM STANDARD DRAWINGS EXCEPT MARKED "USA SIGNAL CORPS".
REFER TO SPECIFICATION GTS-8395, ITEMS IDENT 180018 AND 180019 ON SHEETS R44 AND R45.



GENERAL ARRANGEMENT (TYP) - DUCT ASSIGNMENT - COMM/MH612

NOT TO SCALE



GENERAL ARRANGEMENT (TYP) - HANDHOLE/MANHOLE GROUP

NOT TO SCALE

NOTE: SHOWN FOR HH/MHG-1A, HH/MHG-1B SIMILAR.

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

NOTES AND GENERAL ARRANGEMENT - HANDHOLE/MANHOLE

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456A.dwg E6

R13

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R14	

EXISTING 12.47 KV
DISTRIBUTION SYSTEM

EXISTING XFMR T2
1-37.5 KVA
(240/120 V., 1 PH., 3 W.)
AT EXISTING POLE P-201

EXISTING OH SECONDARY
(1-3/C, #2, TRIPLEX)

NEW SPLICES
NEW WEATHERHEAD

EXISTING
POLE P-1

NEW 2-#2, 1-#2 N.,
2"C. (2"ES RISER CONDUIT)

1"C.O.
(1"COMM RISER CONDUIT)

NEMA 3R TYPE 316
STAINLESS STEEL
ENCLOSURE.

BY-PASS
METER AND
PROVIDE PLASTIC
WEATHERPROOF
METER SOCKET
COVER.

#6 G.

4 JAW
100A.

CHECK
METER SOCKET
WITH FACTORY
INSTALLED TEST
BY-PASS FACILITIES.

GND
(GND ROD,
UFER GND)

2-#2,
1-#2 N.,
1-#8 G.,
1¼"C.

LOADCENTER (6-CIRCUITS)
(W/PROVISIONS FOR PAD LOCKING.)
(•)

125 A., 240/120 V., 1 PH., 3 W., 10,000 AIC (MIN.) CB'S

1(L1) 2(L2) 3(L1) 4-6

1P. 20AT. | 1P. 20AT. | 1P. 30AT. | 3-PFFB'S (1-2P., 1-1P.)

COMM
TERMINAL
BOX
(8"X10"X4"D.)
(•)

#6 G.

GND

NEW
ELECTRICAL
EQUIPMENT
FOR
INTERSECTION
SIGNALING AND
ROADWAY
LIGHTING.

PROVIDE LOADCENTER
TYPEWRITTEN DIRECTORY:

CIR.	DESCRIPTION
1	ROADWAY LTG - HILO
2	ROADWAY LTG - WAIMEA
3	FLASHING LIGHTS CONTROLLER
4	(PFFB)
5	(PFFB)
6	(PFFB)

2-#10,
1-#10 G.,
1"C. (1"S)

2-#10,
1-#10 G.,
1"C.

FLASHING
LIGHTS
CONTROLLER

2-#10,
1-#10 G.,
1"C. (1"S)

INTERSECTION SIGNALING STANDARD (B / I)

Y B-1/I

Y B-2/II
#14'S

GND

INTERSECTION SIGNALING STANDARD (A / I)

Y A-1/I

Y A-2/II
#14'S

GND

SIGNAL
ASSEMBLY
(YELLOW)
(CONTINUOUS
FLASHING)
(TYP)

1"C.O.
STUB-OUT

#12'S (TYP)

(HILO SIDE OF
INTERSECTION)

(WAIMEA SIDE OF
INTERSECTION)

NEW ROADWAY
LIGHTING STANDARD
(180 W., LOW PRESSURE SODIUM)

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Wallace T. Oki

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ONE-LINE DIAGRAM - INTERSECTION SIGNALING AND ROADWAY LIGHTING

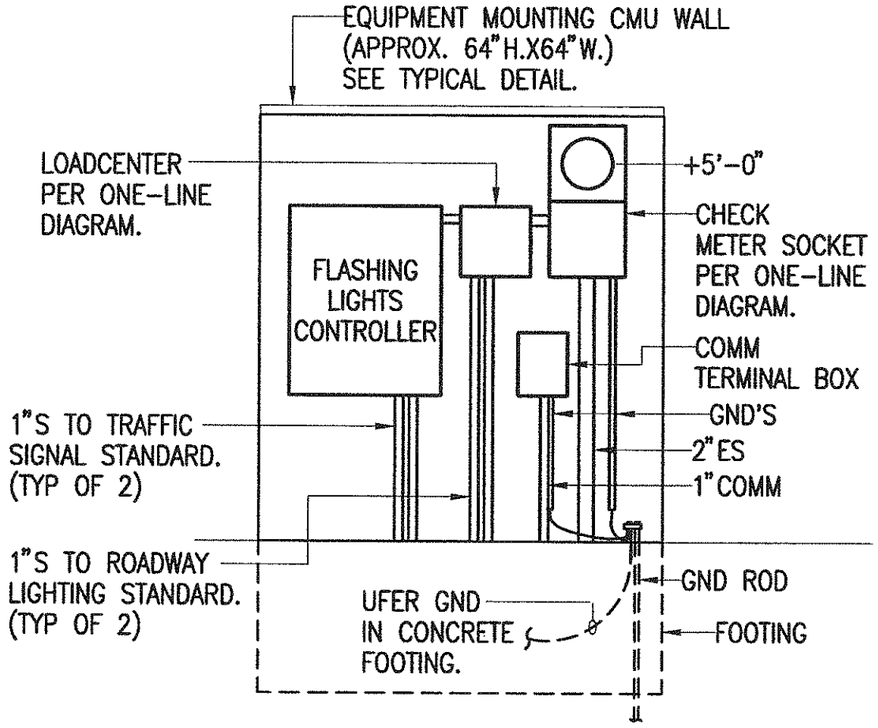
Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456C.dwg EX1

R14

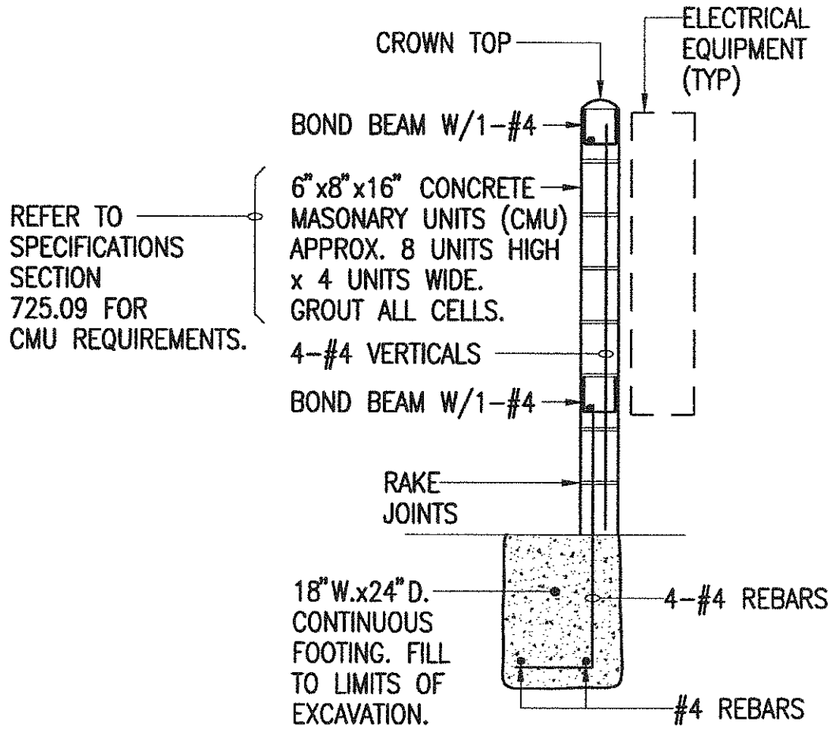
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R15	



GENERAL ARRANGEMENT (TYP)– ELECTRICAL EQUIPMENT FOR INTERSECTION SIGNALING AND ROADWAY LIGHTING

NOT TO SCALE

NOTE: ALL EQUIPMENT ENCLOSURES SHALL BE SUITABLE FOR OUTDOOR USE AND HAVE NEMA 3R TYPE 316 STAINLESS STEEL ENCLOSURES AS A MINIMUM REQUIREMENT.



GENERAL ARRANGEMENT (TYP) – EQUIPMENT MOUNTING CMU WALL

NOT TO SCALE

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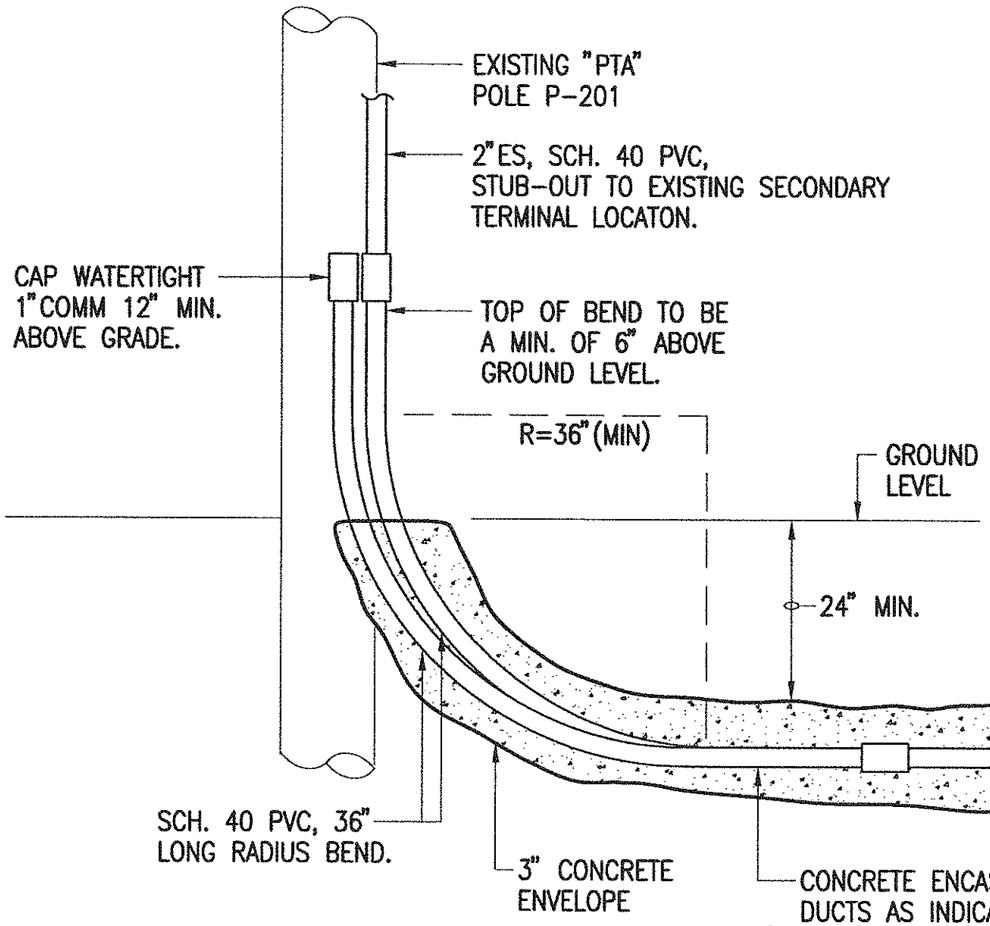
GENERAL ARRANGEMENTS – INTERSECTION SIGNALING AND ROADWAY LIGHTING

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

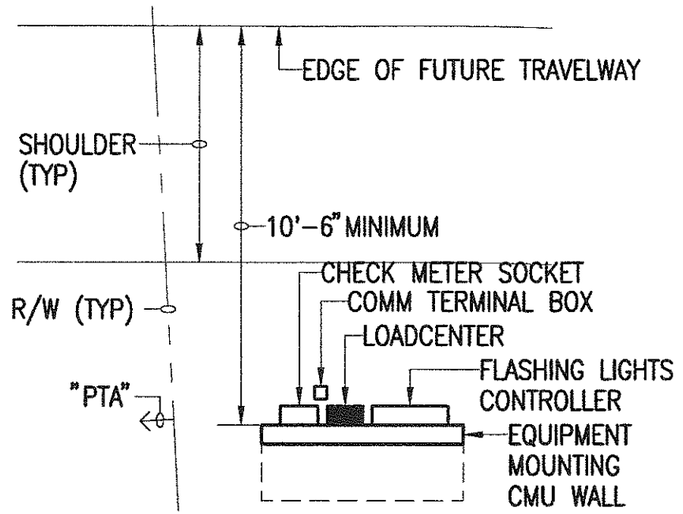
3200456C.dwg EX2

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R16	



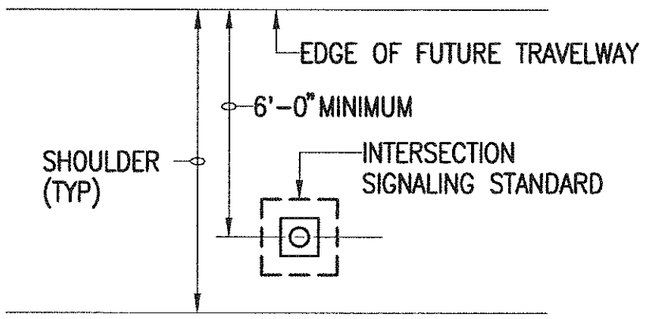
GENERAL ARRANGEMENT (TYP) – RISER CONDUIT DETAIL

NOT TO SCALE



GENERAL ARRANGEMENT (TYP) – CMU WALL LOCATION

NOT TO SCALE



GENERAL ARRANGEMENT (TYP) – INTERSECTION SIGNALING STANDARD LOCATION

NOT TO SCALE

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

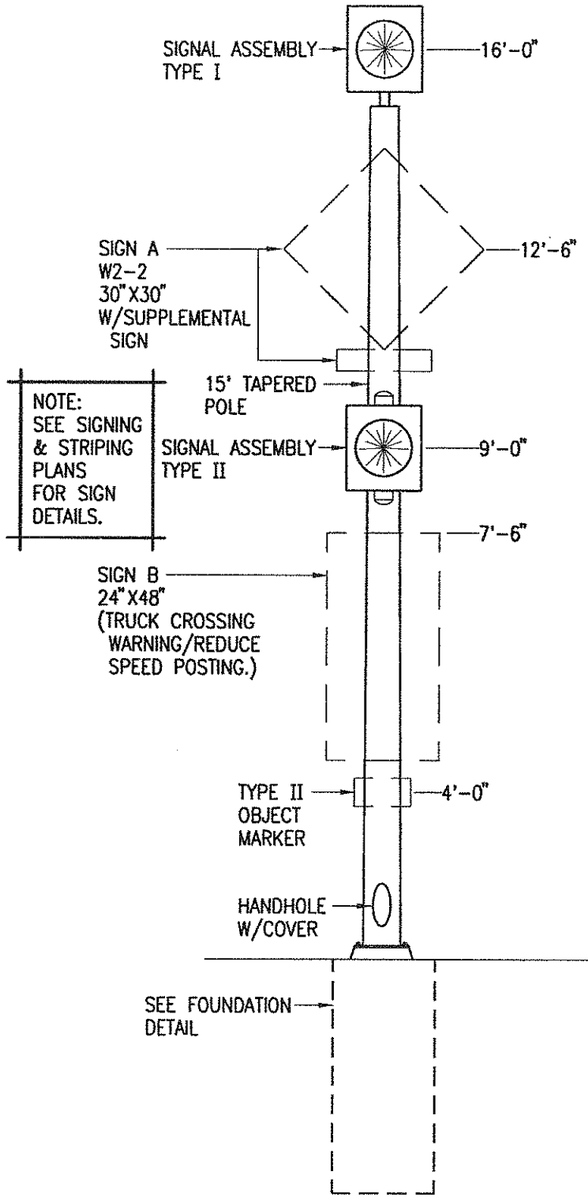
GENERAL ARRANGEMENTS – INTERSECTION SIGNALING AND ROADWAY LIGHTING

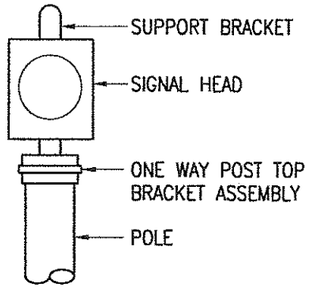
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

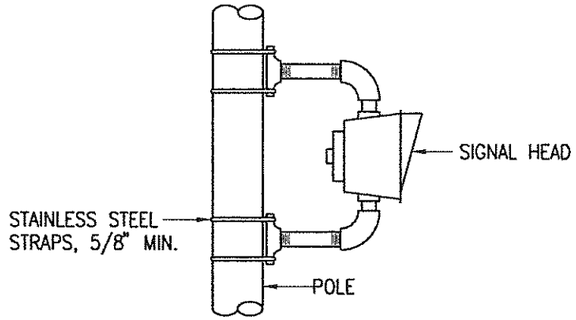
32004586.dwg EX3

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R17	





TYPE I
POST TOP MOUNTING, ONE WAY



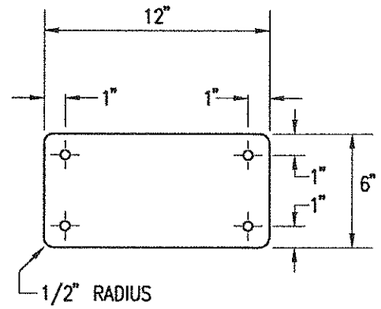
TYPE II
SIDE POLE MOUNTING, ONE WAY, WOOD AND METAL

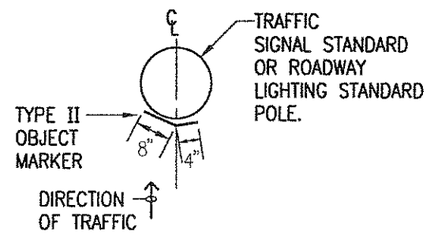
SIGNAL ASSEMBLY MOUNTING

NOT TO SCALE

NOTES:

1. ALL THREADED ITEMS, i.e. BOLTS, FITTINGS, SCREWS, ETC., TO BE COATED WITH AN APPROVED ANTI-SEIZE COMPOUND PRIOR TO ASSEMBLY OR INSTALLATION.
2. ALL CIRCULAR SIGNAL HEADS (EXCEPT FIBEROPTIC AND PROGRAMABLE) SHALL HAVE APPROVED GLASS LENSES.

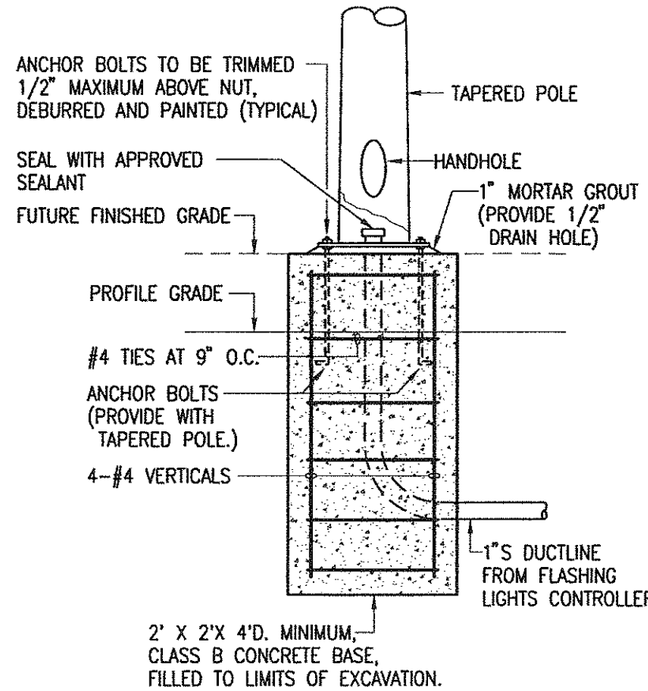




LOCATION

TYPE II OBJECT MARKER

1. ALL OBJECTS (ROADWAY LIGHTING STANDARD OR TRAFFIC SIGNAL STANDARD POLE) THAT ARE WITHIN THE STATE HIGHWAY RIGHT OF WAY AND WITHIN 30 FEET OF FUTURE EDGE OF TRAVELWAY SHALL BE MARKED AS DIRECTED BY THE ENGINEER.
2. THE CONTRACTOR SHALL PREPARE THE MOUNTING SURFACE OF EACH OBJECT AS DIRECTED BY THE ENGINEER AND PLACE THE TYPE II OBJECT MARKER AS SHOWN ON THIS PLAN.
3. TYPE II OBJECT MARKERS SHALL BE MOUNTED ON POLES WITH STAINLESS STEEL SCREWS.
4. TYPE II OBJECT MARKERS SHALL BE MADE OF AMBER REFLECTIVE SHEETING MATERIAL OVERLAID ON 0.020" ALUMINUM SHEETING.



FOUNDATION DETAIL

NOT TO SCALE

GENERAL ARRANGEMENT (TYP) – TYPE I INTERSECTION SIGNALING STANDARD

NOT TO SCALE

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

GENERAL ARRANGEMENTS – INTERSECTION SIGNALING AND ROADWAY LIGHTING

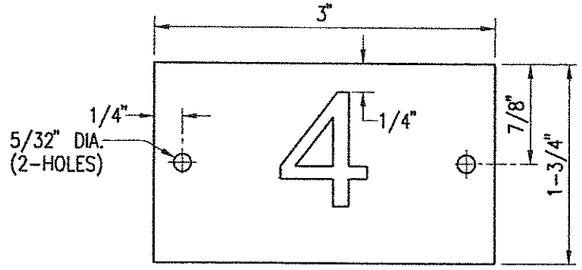
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456C.dwg EX4

R17

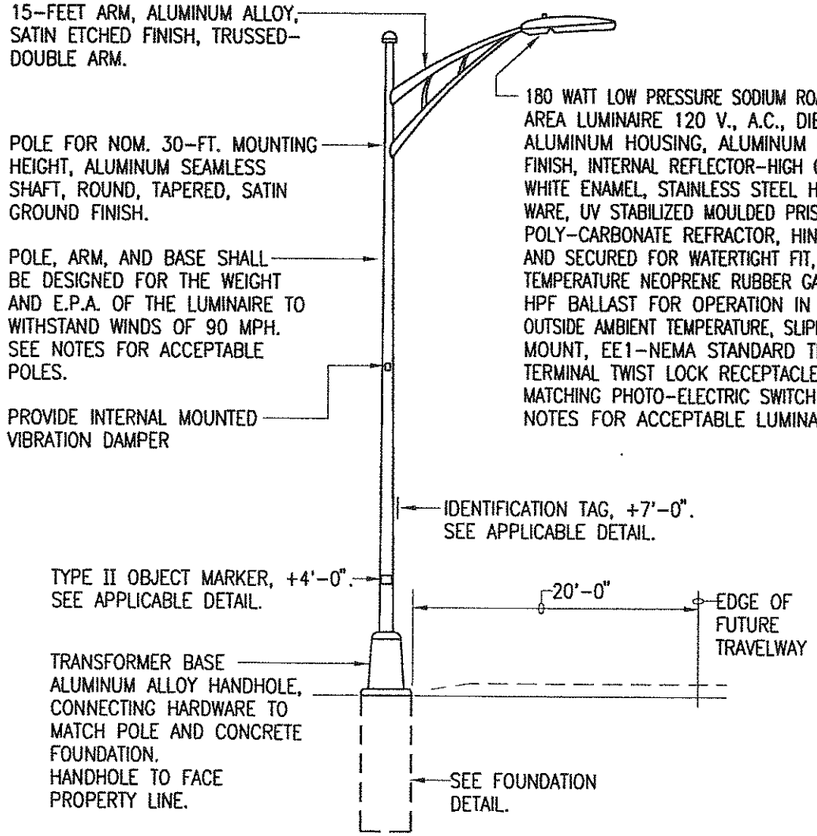
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R18	



NOTES:
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. ATTACH TO ALUMINUM POLES WITH NO. 7 STAINLESS STEEL DRIVE SCREWS.

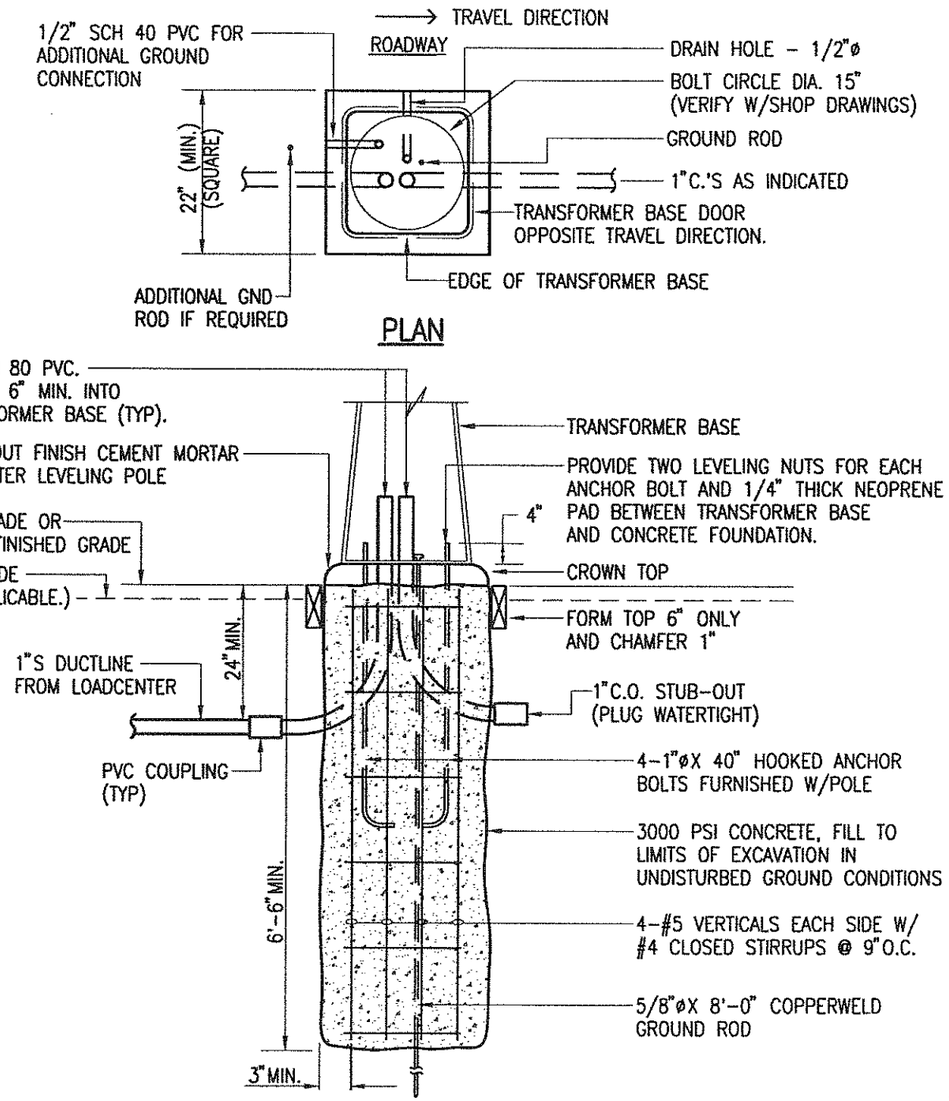
POLE NO. IDENTIFICATION TAG

NOT TO SCALE



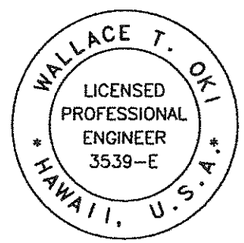
GENERAL ARRANGEMENT (TYP) - ROADWAY LIGHTING STANDARD

NOT TO SCALE



CONCRETE FOUNDATION

NOT TO SCALE



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GENERAL ARRANGEMENTS - INTERSECTION SIGNALING AND ROADWAY LIGHTING

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

32004566c.dwg EX5

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R19	

ROADWAY LIGHTING NOTES

1. ALL WORK SHALL CONFORM TO THE LATEST NATIONAL ELECTRICAL CODE.

2. SHOP DRAWINGS SHALL BE SUBMITTED TO CONTRACTING OFFICER FOR APPROVAL BY TRAFFIC DIVISION, DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII.

3. ACCEPTABLE ROADWAY LIGHTING MATERIALS:

   LUMINAIRES:
   WITH PE RECEPTACLE AND 120-220 VOLT HPF BALLAST.
   1) AMERICAN ELECTRIC SP2 180 WITH POLYCARBONATE SEMI-CUTOFF LENS.
   2) ALR SST PV, FAIL "ON". 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.

   ALUMINUM POLES:
   INTERNALLY MOUNTED VIBRATION DAMPER, MINIMUM .188 WALL THICKNESS. MUST BE APPROVED BY F.H.W.A. TO BE IN COMPLIANCE WITH AUGUST 1985 AMENDED AND ADOPTED AASHTO SPECIFICATIONS. 10 TO 12 INCH BASE BOLT CIRCLE. ARM LENGTH SHALL BE PER PLANS.
   1) LEXINGTON: 2708-45806T4, 2208-45806T4
   2) HAPCO: 21-305X, 21-307X, 21-585X, 21-588HD, 7389-0001, 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 AUGUST 1985 AMENDED AND ADOPTED AASHTO BREAKAWAY SPECIFICATIONS.
   1) LEXINGTON 08R-1315B-17
   2) AKRON FOUNDRY TB1-17

4. ALL ROADWAY LIGHTING IDENTIFICATION TAG NUMBERING FOR METAL POLES SHALL START WITH "1" AND CONTINUE NUMERICALLY.

5. TWO WEEKS NOTICE MUST BE GIVEN TO CONTRACTING OFFICER FOR INITIAL AND SUBSEQUENT RE-INSPECTIONS BY TRAFFIC DIVISION, DEPARTMENT OF PUBLIC WORKS, COUNTY OF HAWAII. PURSUANT TO SECTION 2-5 OF THE HAWAII COUNTY CODE, PAY FOR ALL COSTS ASSOCIATED WITH OVERTIME INSPECTIONS. ROADWAY LIGHTING SHALL BE ENERGIZED FOR A MINIMUM OF 6 HOURS FOR FINAL INSPECTION. ARRANGE WITH CONTRACTING OFFICER AND ASSUME ANY COST TO ENERGIZE ROADWAY LIGHTING FROM "PTA" ELECTRICAL SYSTEM.

ROADWAY LIGHTING NOTES (CONT'D)

6. ALL LABOR AND MATERIALS SHALL BE WARRANTED FOR A MINIMUM OF ONE YEAR FROM DATE ACCEPTED BY CONTRACTING OFFICER.

7. NO CHANGES WILL BE ALLOWED WITHOUT PRIOR APPROVAL FROM CONTRACTING OFFICER.

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

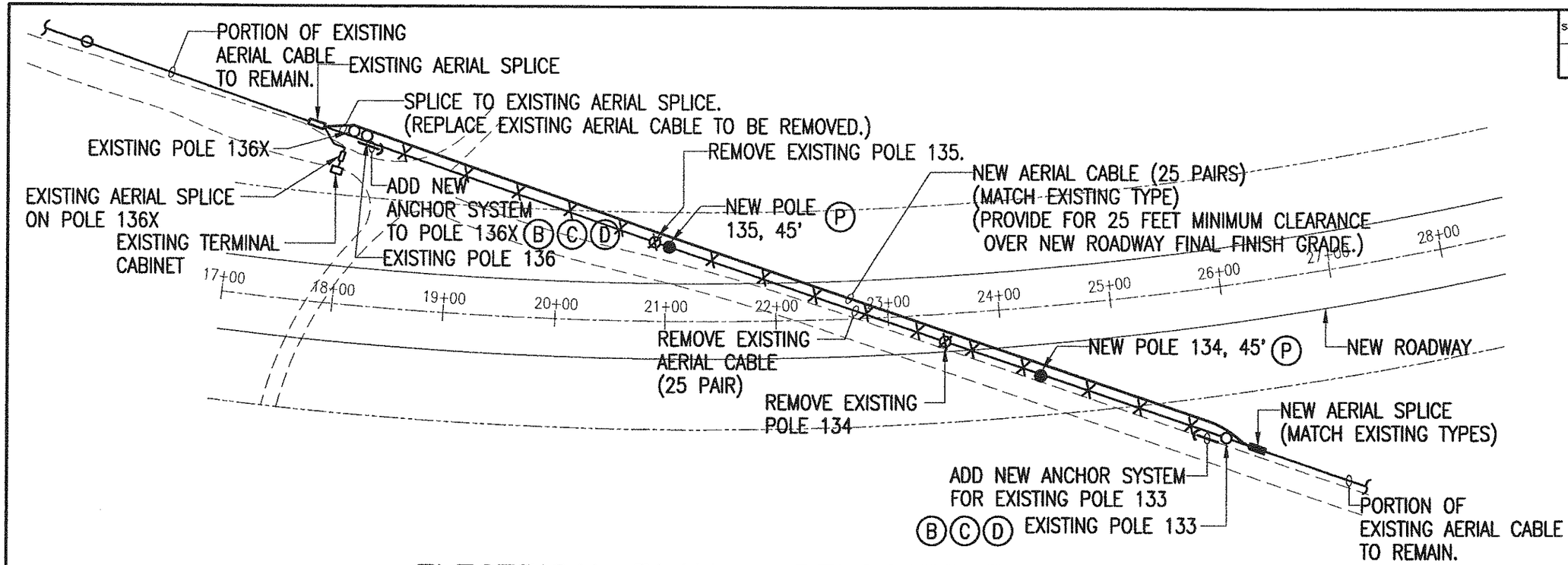
GENERAL ARRANGEMENTS - INTERSECTION SIGNALING AND ROADWAY LIGHTING

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456C.dwg EX6

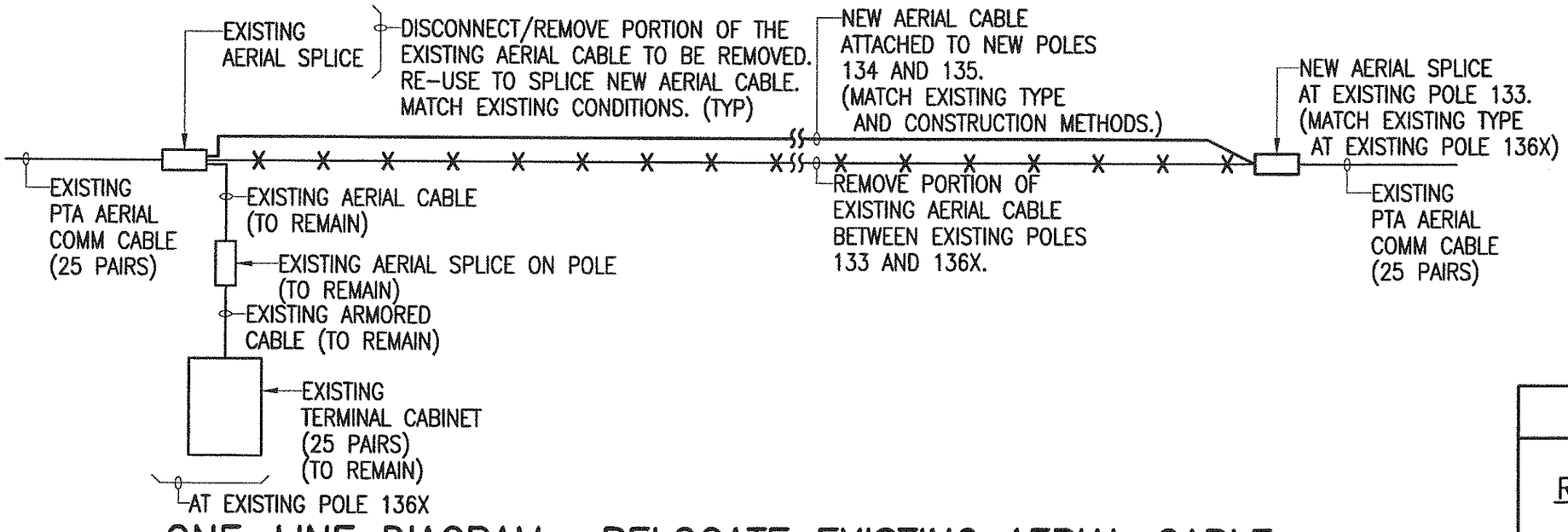
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R20	



ELECTRICAL PLAN – RELOCATE EXISTING AERIAL CABLE

~1" = 100'

(NOTE: ONLY APPLICABLE ITEMS ARE INDICATED.)



ONE-LINE DIAGRAM– RELOCATE EXISTING AERIAL CABLE

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FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

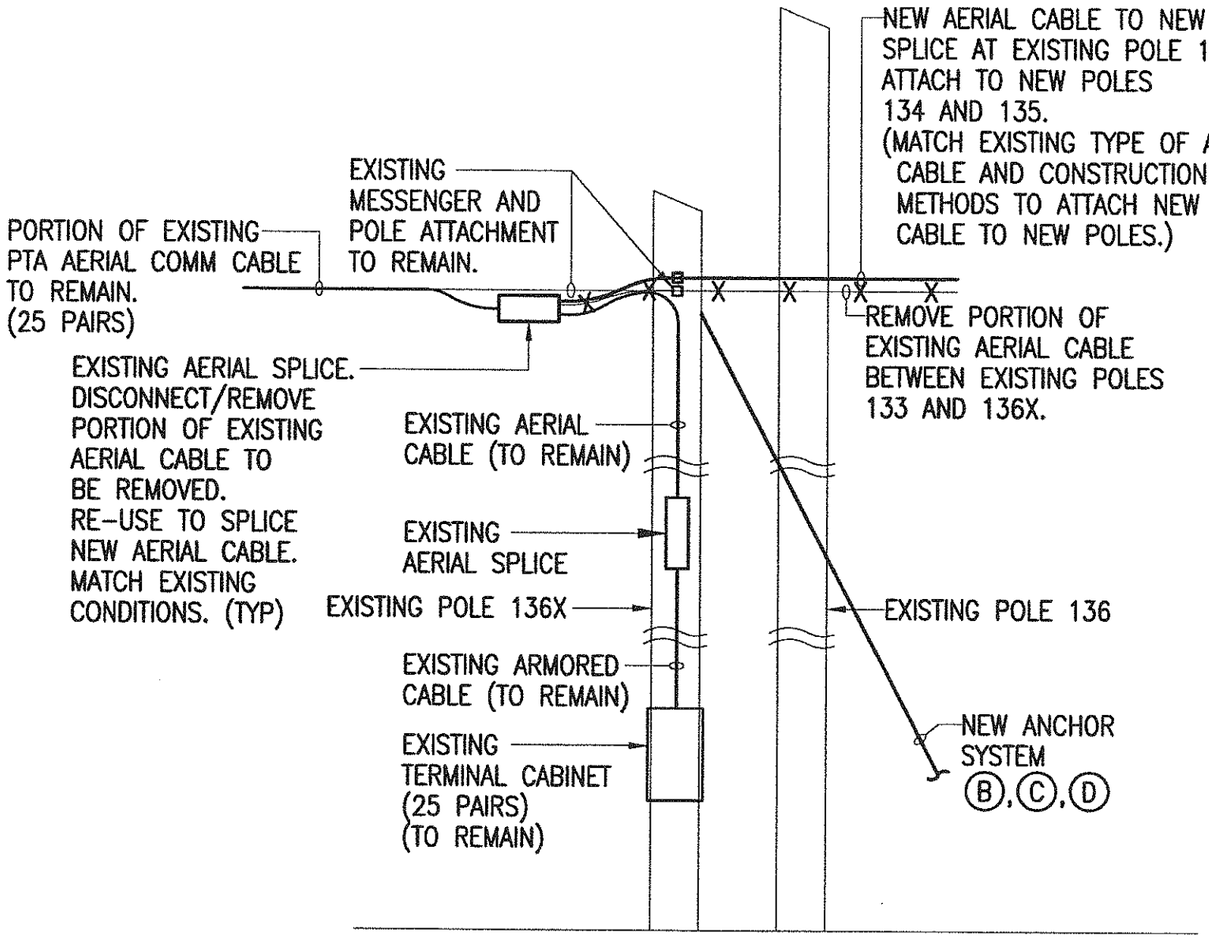
ELECTRICAL WORK
RELOCATE AERIAL CABLE
STA 17+00 – 28+00

Scale: AS NOTED Date: JUNE 29, 2007

SHEET No. OF

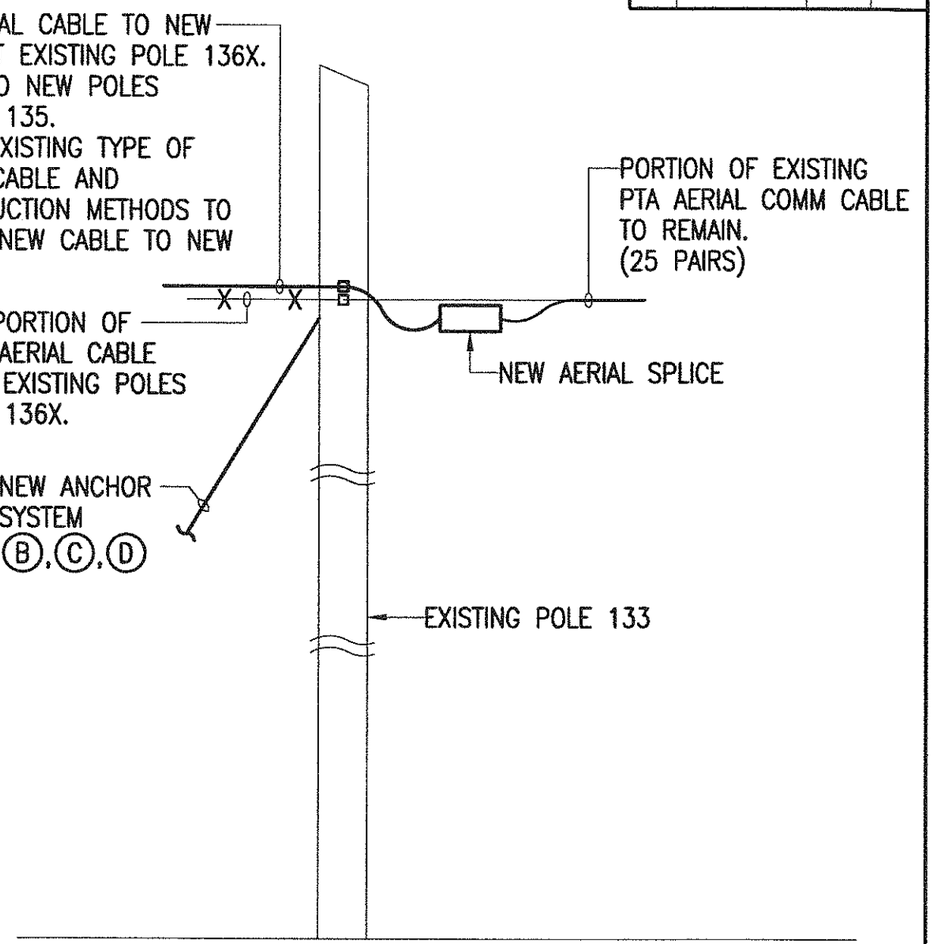
3200456E.dwg

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R21	



GENERAL ARRANGEMENT (TYP) - EXISTING POLES 136X/136

NOT TO SCALE



GENERAL ARRANGEMENT (TYP) - EXISTING POLE 133

NOT TO SCALE

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FEDERAL HIGHWAY ADMINISTRATION
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ELECTRICAL WORK
RELOCATE AERIAL CABLE
STA 17+00 - 28+00

Scale: AS NOTED Date: JUNE 29, 2007

SHEET No. OF

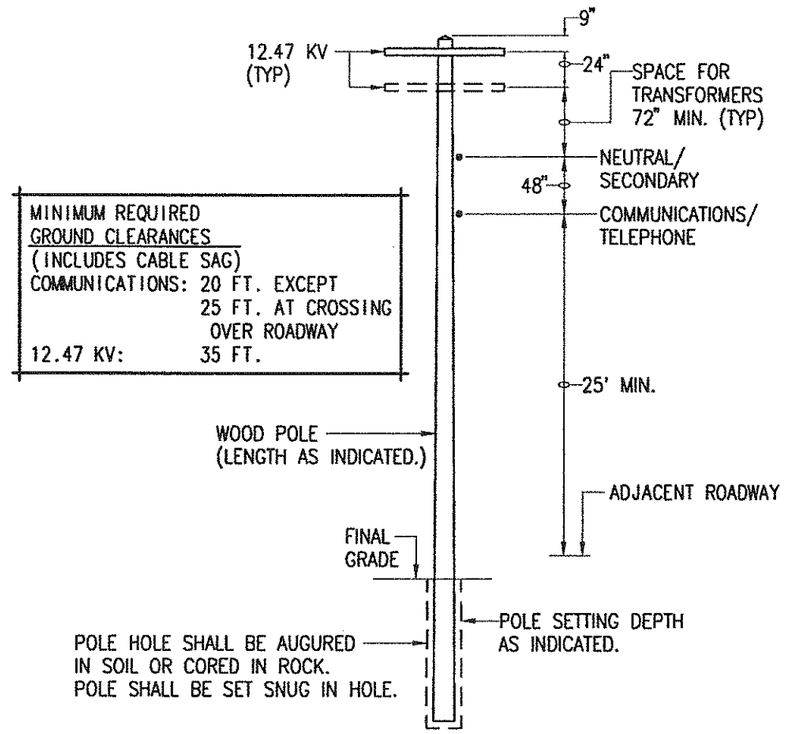
3200456E.dwg

R21

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R22	

NOTES – POLE/LINE CONSTRUCTION

1. PLANS INDICATE APPROXIMATE LOCATION FOR POLE PLACEMENTS. ALL POLE LOCATIONS ARE SUBJECT TO FIELD CHANGES. MAXIMUM ALLOWABLE DISTANCE BETWEEN POLES SHALL BE 270 FT. POLES WITH OVERHEAD DISTRIBUTION TRANSFORMER(S) SHALL BE LOCATED 25 FT. MINIMUM FROM BUILDINGS. POLE STAKEOUT SHALL BE BY CONTRACTOR SUBJECT TO ACCEPTANCE BY THE CONTRACTING OFFICER.
2. THE SCALED DISTANCES BETWEEN POLES ARE THE APPROXIMATE PLAN VIEW DISTANCES BETWEEN THE POLES. PROVIDE THE REQUIRED ALLOWANCES FOR DIFFERENCES IN ELEVATION AND FOR SAGS, TO OBTAIN THE CONDUCTOR LENGTHS.
3. USE OF GUY WIRE AND ANCHORS SHALL BE MINIMIZED EXCEPT WHERE INDICATED OR REQUIRED. WHERE POLES ARE SLIGHTLY "OUT OF LINE" (NO MORE THAN 5 DEGREES), "LEAN" POLES AGAINST LINE TENSION DURING POLE INSTALLATION SUCH THAT POLES WILL BE "PLUMB" AFTER LINES ARE INSTALLED.
4. THE MINIMUM CLEARANCE ABOVE GROUND FOR THE 12.47 KV LINE INCLUDING SAG SHALL BE 35 FEET.
5. UNLESS OTHERWISE INDICATED, ALL CONNECTIONS AND SPLICES OF CONDUCTORS SHALL BE DONE WITH APPROVED COMPRESSION FITTINGS.
6. STRING CONDUCTORS TO "INITIAL" SAG TABLE VALUES RECOMMENDED BY THE MANUFACTURER FOR THE CONDUCTOR TYPE AND SIZE AND SPAN INDICATED. LOADING DISTRICT SHALL BE "HEAVY".
7. SURGE ARRESTOR GROUND SHALL BE SEPARATE FROM ALL OTHER GROUNDS.
8. A GROUND ROD SHALL BE PROVIDED AT EVERY POLE. GROUND NEUTRAL CONDUCTOR AT EVERY POLE.
9. DEPTH OF HOLE FOR SLOPING GROUND SHALL BE MEASURED ON LOW SIDE OF POLE.



12.47 KV, NEUTRAL,
SECONDARY, TELEPHONE, COMMUNICATIONS

A POLE ARRANGEMENT – TYPICAL

NOT TO SCALE

NOTE: ALL NEW POLES SHALL BE PROVIDE WITH CLEARANCE REQUIREMENT FOR FUTURE COMMUNICATIONS/TELEPHONE CABLE.

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POLE/LINE CONSTRUCTION DETAILS

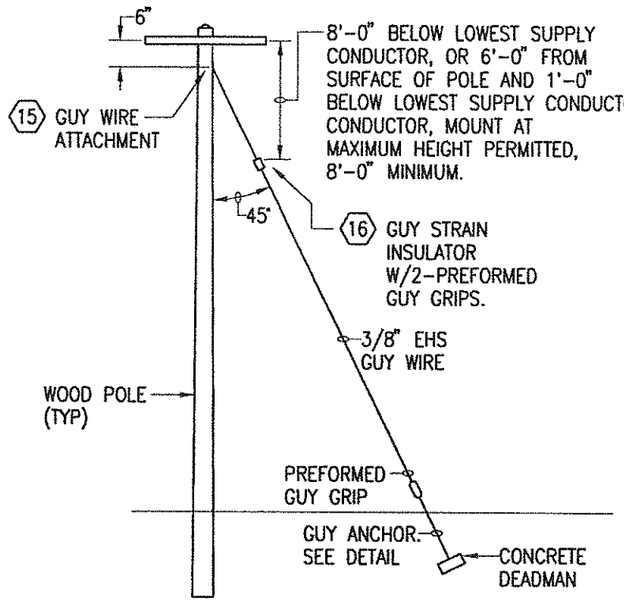
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

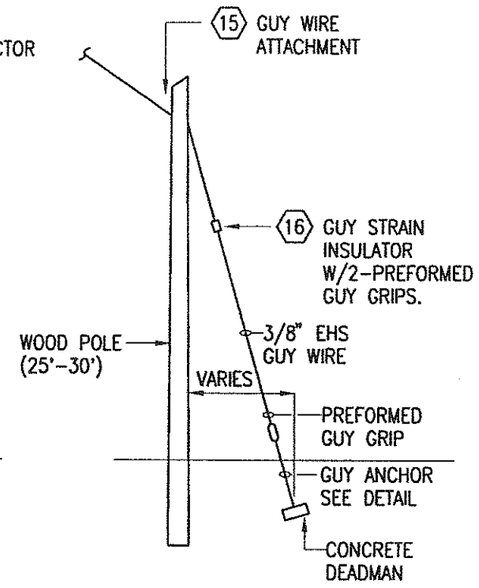
32004560.dwg ED1

R22

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R23	



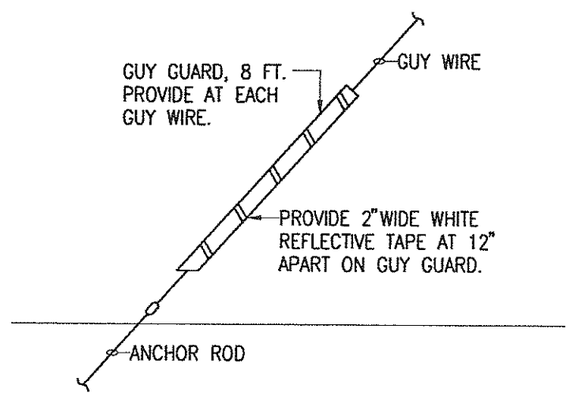
STANDARD



OVERHEAD TYPE

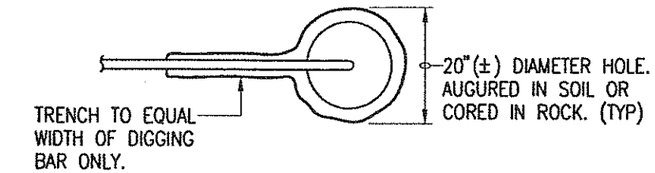
B GUY WIRE ARRANGEMENT – TYPICAL

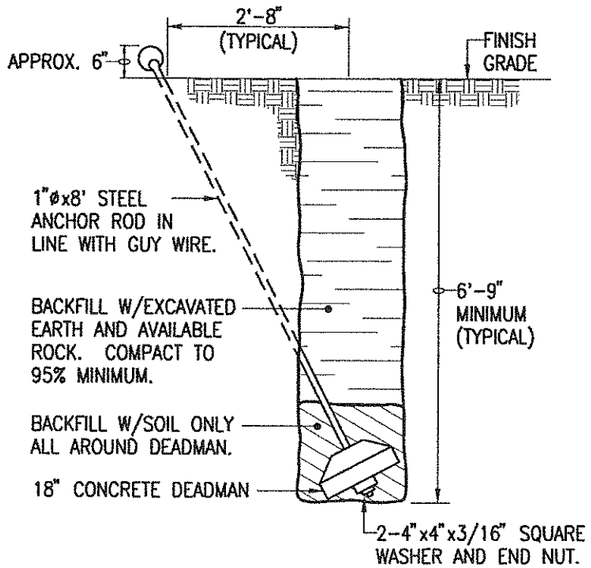
NOT TO SCALE



D GUY GUARD – TYPICAL

NOT TO SCALE





C GUY ANCHOR DETAIL – TYPICAL

NOT TO SCALE

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POLE/LINE CONSTRUCTION DETAILS

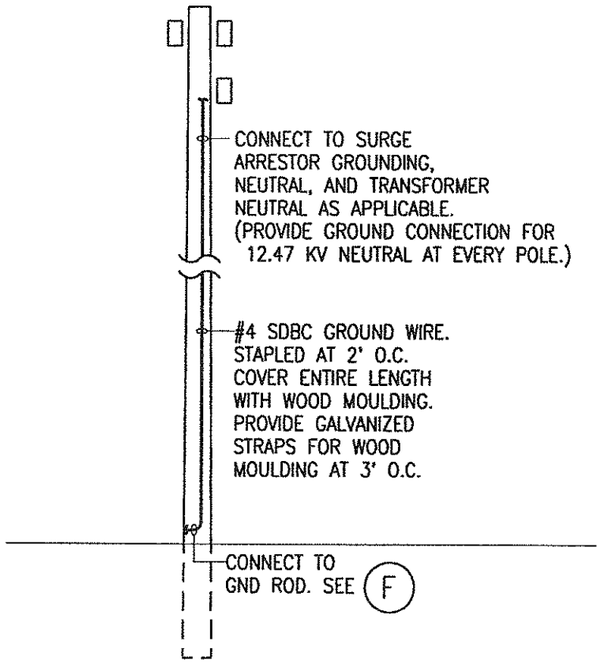
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

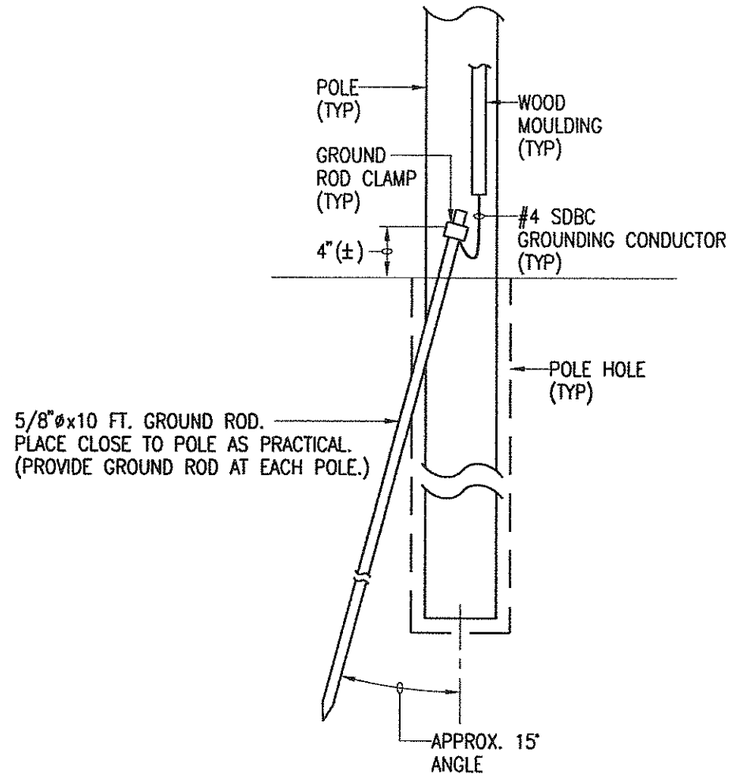
32004560.dwg ED2

R23

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R24	



E GROUNDING CONDUCTOR ON POLE – TYPICAL
NOT TO SCALE



F GROUND ROD DETAIL – TYPICAL
NOT TO SCALE

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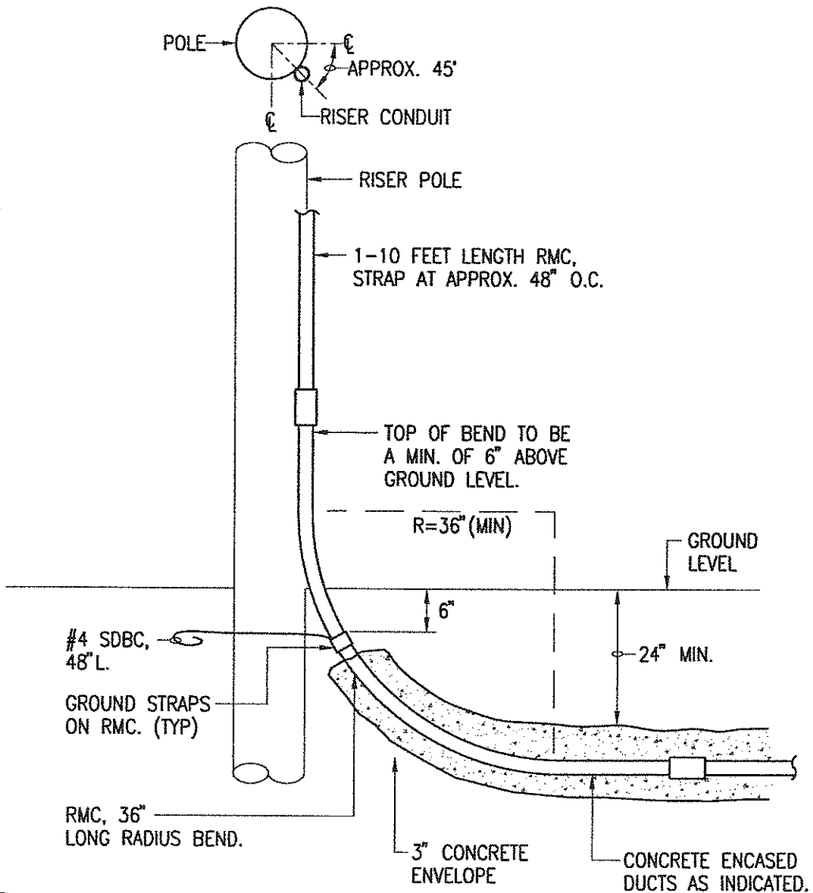
POLE/LINE CONSTRUCTION DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007
SHEET No. OF

32004560.dwg ED3

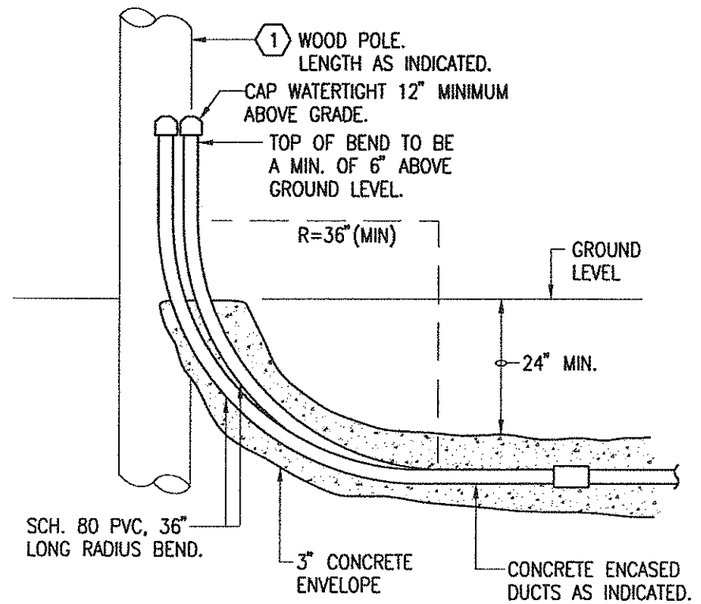
R24

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R25	



G GENERAL ARRANGEMENT (TYP) ELECTRIC PRIMARY RISER CONDUIT AT POLE

NOT TO SCALE
NOTE: PROVIDE QUANTITY AND SIZES AS INDICATED ON THE DRAWINGS.



H GENERAL ARRANGEMENT (TYP) COMMUNICATIONS RISER CONDUIT AT POLE

NOT TO SCALE
NOTES: 1. PROVIDE QUANTITY AS SIZES AS INDICATED.
2. WHERE APPLICABLE LOCATE OPPOSITE SIDE OF ELECTRIC PRIMARY RISER CONDUITS.

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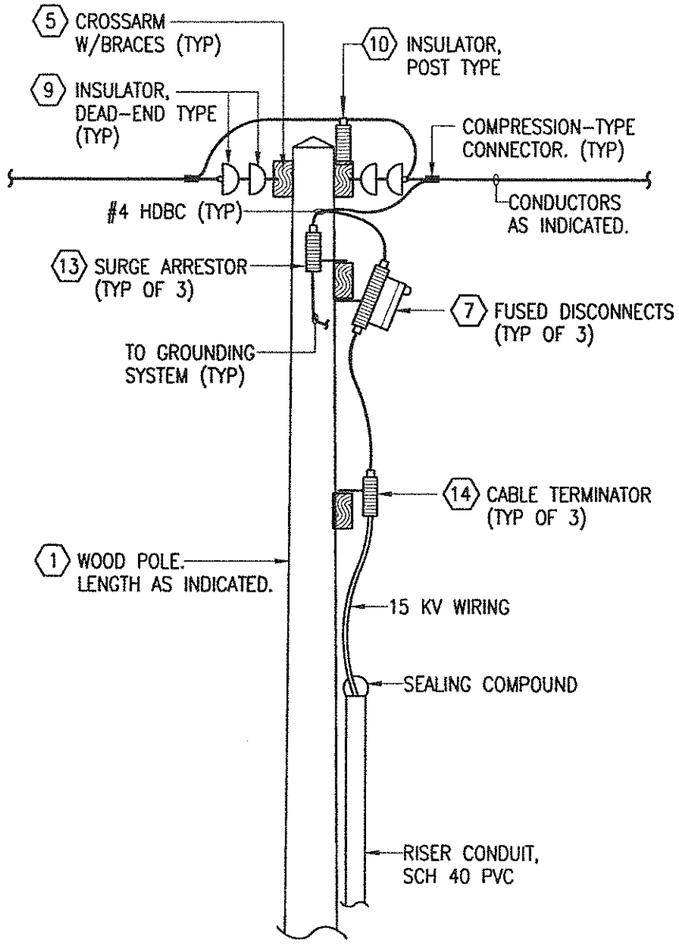
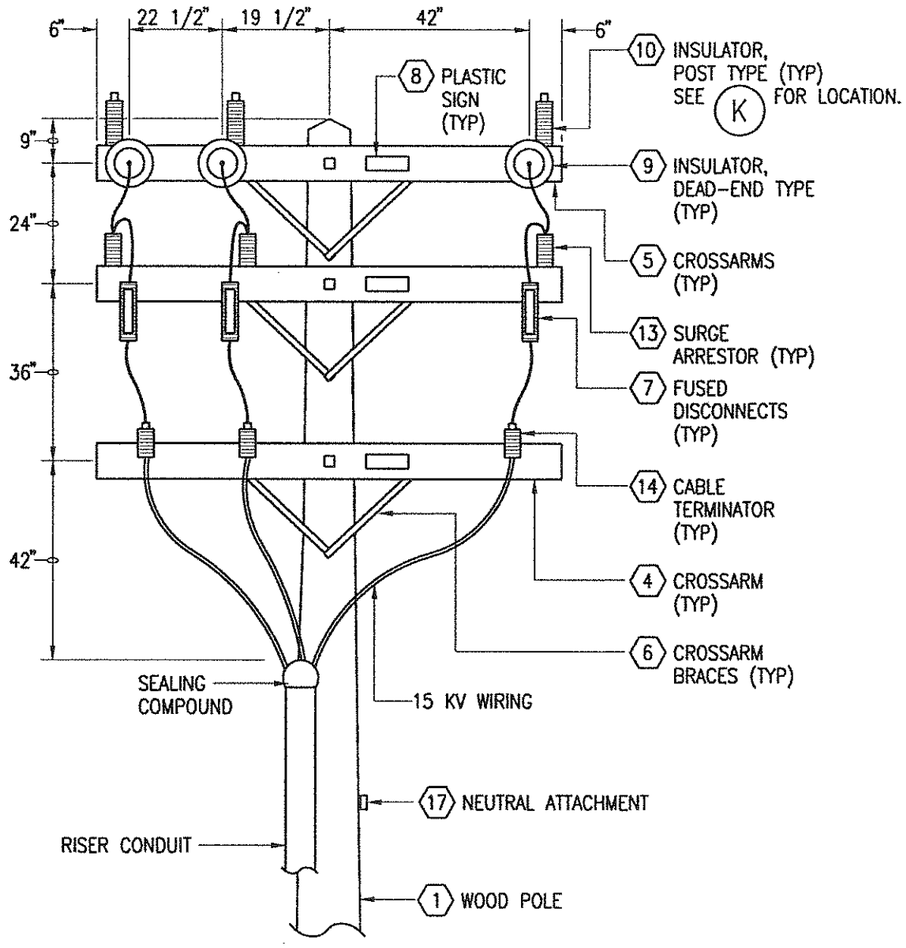
POLE/LINE CONSTRUCTION DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007
SHEET No. OF

3200456D.dwg ED4

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R26	





I RISER POLE W/FUSED DISCONNECTS/SURGE ARRESTORS TYPICAL ARRANGEMENT

NOT TO SCALE

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CENTRAL FEDERAL LANDS HIGHWAY DIVISION

POLE/LINE CONSTRUCTION DETAILS

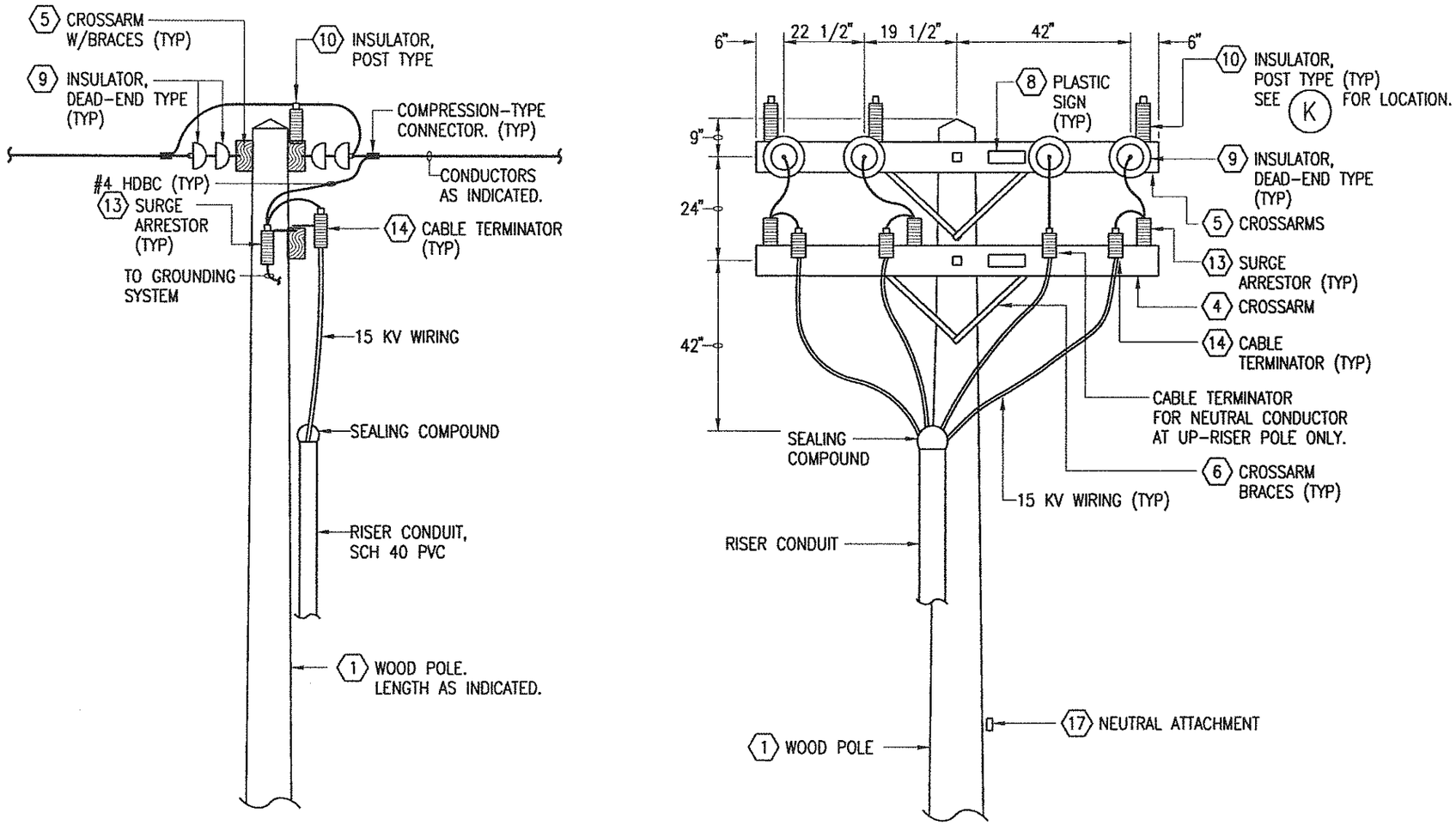
Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456D.dwg ED5

R26

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R27	



J UP-RISER POLE - TYPICAL ARRANGEMENT
NOT TO SCALE

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POLE/LINE CONSTRUCTION DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007

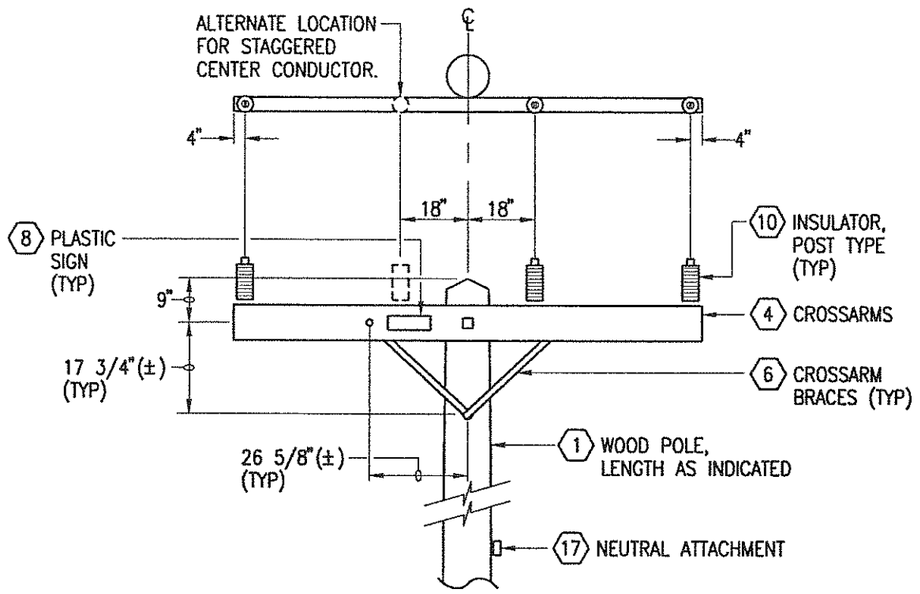
SHEET No. OF

32004560.dwg ED6

R27

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R28	

TOP VIEW



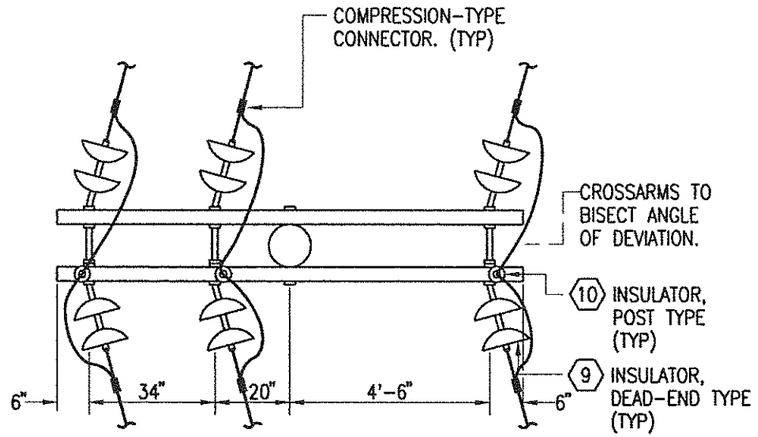
ELEVATION

K CROSSARM CONSTRUCTION – TYPICAL ARRANGEMENT STRAIGHT LINE AND ANGLE TO 5 DEGREES

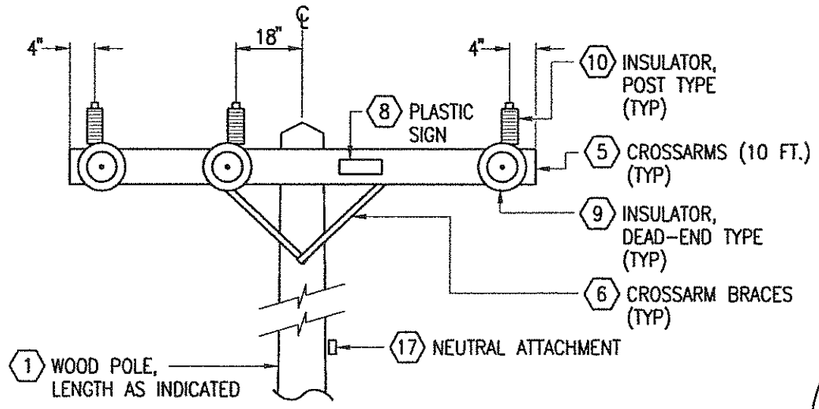
NOT TO SCALE

L CROSSARM CONSTRUCTION – TYPICAL ARRANGEMENT ANGLES BETWEEN 6 TO 10 DEGREES

PROVIDE DOUBLE CROSSARM ARRANGEMENT FOR ANGLES BETWEEN 6 TO 10 DEGREES.



TOP VIEW



ELEVATION

M CROSSARM CONSTRUCTION TYPICAL ARRANGEMENT 11°–59° ANGLE

NOT TO SCALE

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U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

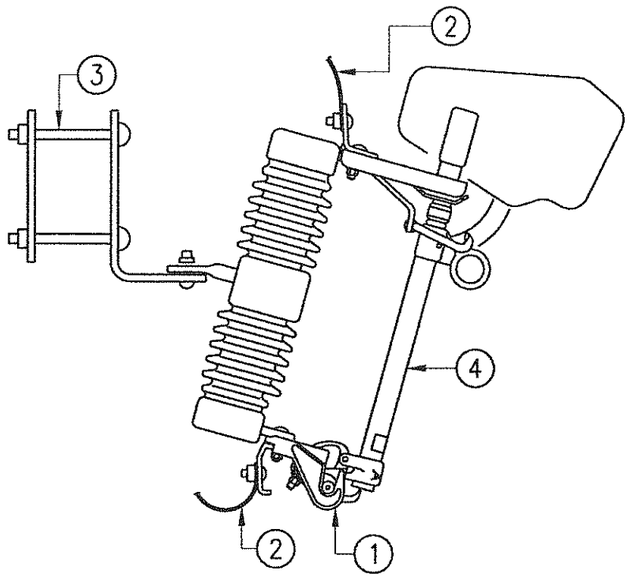
POLE/LINE CONSTRUCTION DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

3200456D.dwg ED7

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R32	



7 FUSED DISCONNECT

(1) FUSED DISCONNECT, LOADBREAK, W/TYPE T FUSE LINK, 100 A. CONTINUOUS, 15 KV, 95 BIL, 10,000 AIC, GALVANIZED HARDWARE.

(2) #4 HARD DRAWN BARE COPPER.

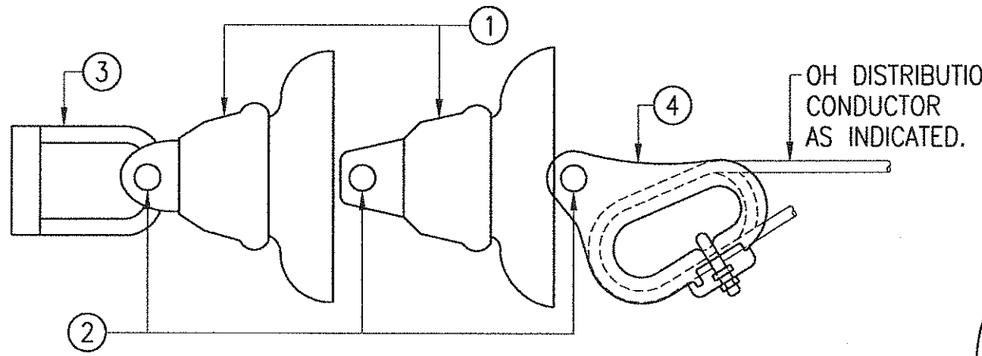
(3) CROSSARM MOUNTING BRACKET FOR FUSED DISCONNECT WITH ALL NECESSARY STRAPS, BOLTS, WASHERS AND NUTS. ALL GALVANIZED.

(4) TYPE T FUSE LINK. SEE ONE-LINE DIAGRAM FOR RATINGS.

8 PLASTIC SIGN

(1) "HIGH VOLTAGE" PLASTIC SIGN, YELLOW, PLASTIC. (PROVIDE 2 PER SINGLE CROSSARM AND 2 PER DOUBLE CROSSARM ARRANGEMENT.)

(2) NAIL, 1 1/4", ALUMINUM, 4 MINIMUM PER SIGN.



9 INSULATOR, DEAD-END TYPE

(1) INSULATOR, DEAD-END TYPE FERROUS CAP AND STUD, ANSI CLASS 52-4.

(2) COTTER BOLT, GALVANIZED, WITH STAINLESS STEEL PIN.

(3) EYELET CLEVIS, 5/8", GALVANIZED.

(4) FERROUS SNAIL SHELL DEAD END CLAMP PROVIDE AS APPLICABLE FOR CONDUCTOR TYPE AND SIZE.

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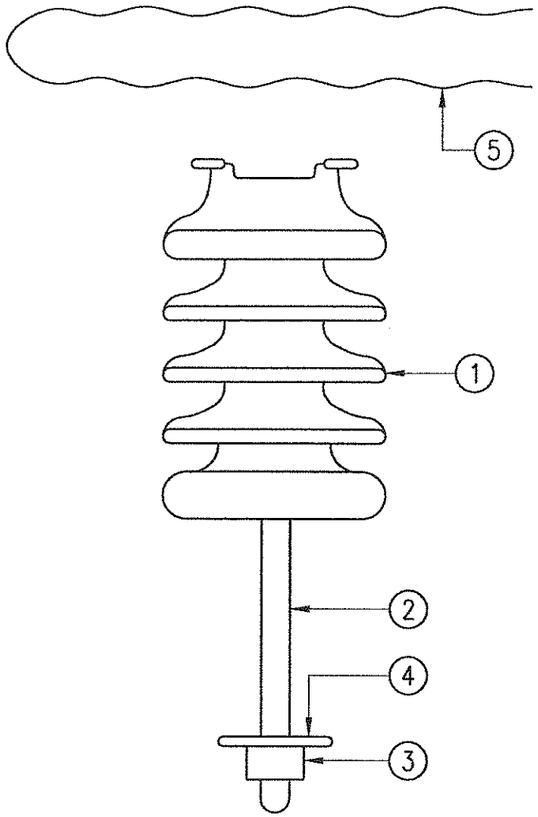
POLE/LINE CONSTRUCTION ASSEMBLY DETAILS

Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

32004560.dwg EA3

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R33	



(10) INSULATOR, POST TYPE

(1) INSULATOR, POST TYPE, TIE TOP, TYPE F NECK, ANSI CLASS 57-2 OR 57-12, 23 KV APPLICATION, TAPPED FOR 5/8"STUD.

(2) STUD FOR INSULATOR, POST TYPE, 5/8"ø X 7-1/2" LONG, CROSSARM MOUNTING, GALVANIZED.

(3) SQUARE NUT, 5/8", GALVANIZED.

(4) LOCKWASHER, 5/8", GALVANIZED.

(5) COPPER LINE TIES. PROVIDE AS APPLICABLE FOR CONDUCTOR TYPE AND SIZE, INSULATOR TYPE AND TOP OR SIDE MOUNTING.

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POLE/LINE CONSTRUCTION ASSEMBLY DETAILS

Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

32004560.dwg E44

R33

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
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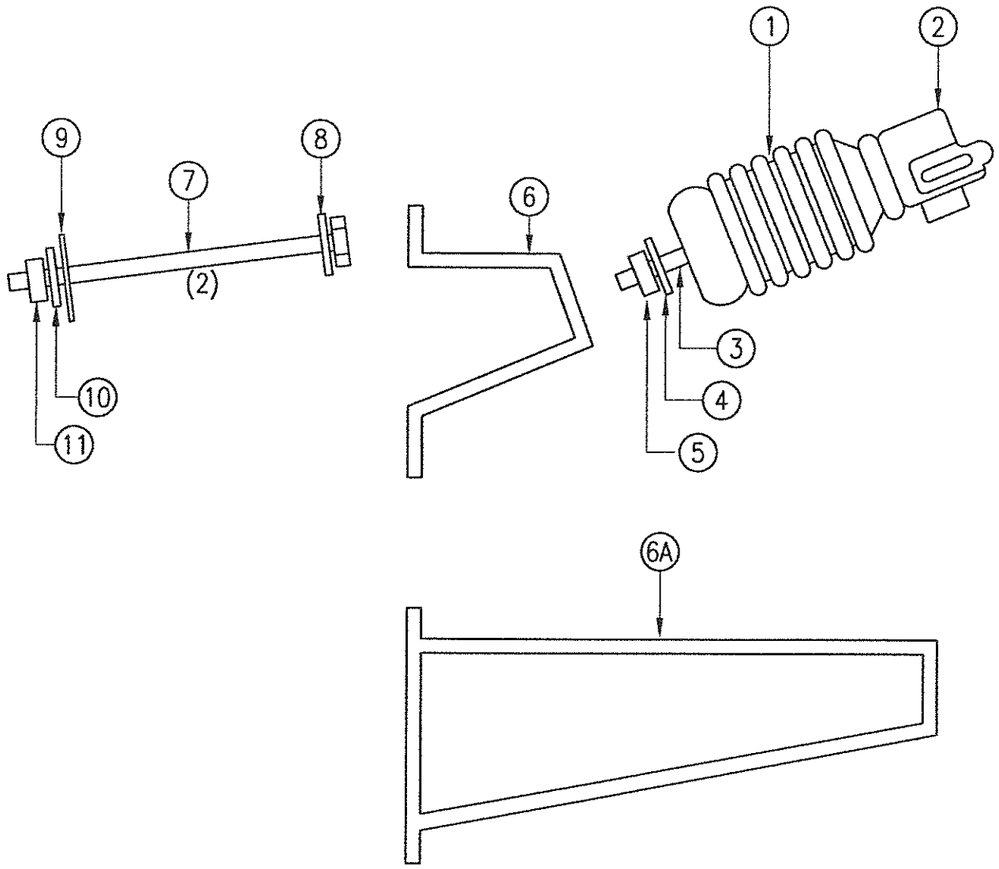

⟨11⟩ INSULATOR, HORIZONTAL LINE POST

(1) INSULATOR, HORIZONTAL LINE POST, W/LINE CLAMP, ANSI CLASS 57-12

(2) LINE CLAMP, SIZED TO SUIT

(3) STUD FOR INSULATOR, BRACKET MOUNTING, 3/4" X 1-3/4", GALVANIZED

(4) LOCKWASHER, 3/4", GALVANIZED

(5) SQUARE NUT, 3/4", GALVANIZED

(6) BRACKET, HORIZONTAL LINE POST INSULATOR, 9" X 15°

(6A) BRACKET, HORIZONTAL LINE POST INSULATOR, 20" X 15°

(7) MACHINE BOLT, 5/8"ø X REQUIRED LENGTH (12"), GALVANIZED

(8) WASHER, ROUND, 1-3/4" X 9/64", 11/16" HOLE, GALVANIZED

(9) WASHER, SQUARE, 2-1/4" X 3/16", 11/16" HOLE, GALVANIZED

(10) LOCKWASHER, 5/8", GALVANIZED

(11) NUT, SQUARE, 5/8", GALVANIZED

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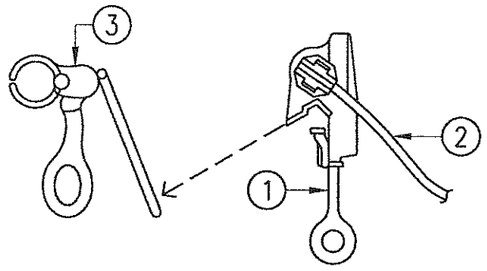
Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

3200456D.dwg EA5

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R35	

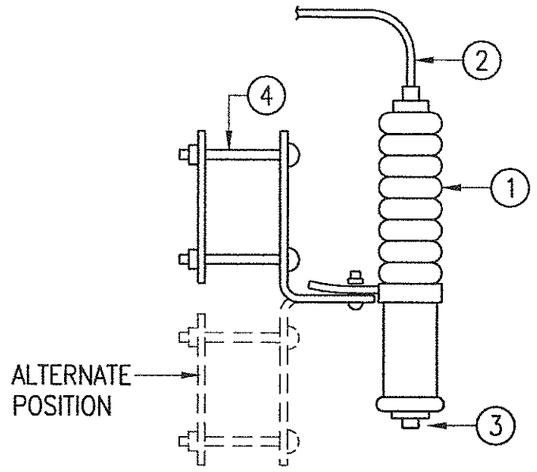


(12) HOT LINE CLAMP WITH COMPRESSION TYPE BAIL CLAMP

(1) HOT LINE CLAMP, COPPER TO COPPER. SEE ONE-LINE DIAGRAM FOR CONDUCTOR TYPE AND SIZE.

(2) #4 HARD DRAWN BARE COPPER.

(3) COMPRESSION-TYPE BAIL CLAMP, COPPER-TO-COPPER.



(13) SURGE ARRESTOR

(1) SURGE ARRESTOR, DISTRIBUTION TYPE, 15 KV.

(2) #4 HARD DRAWN BARE COPPER OR AS INDICATED.

(3) GROUND WIRE CONNECTION NUT.

(4) CROSSARM MOUNTING BRACKET FOR SURGE ARRESTOR WITH NECESSARY STRAPS, BOLTS, WASHERS AND NUTS. ALL GALVANIZED.

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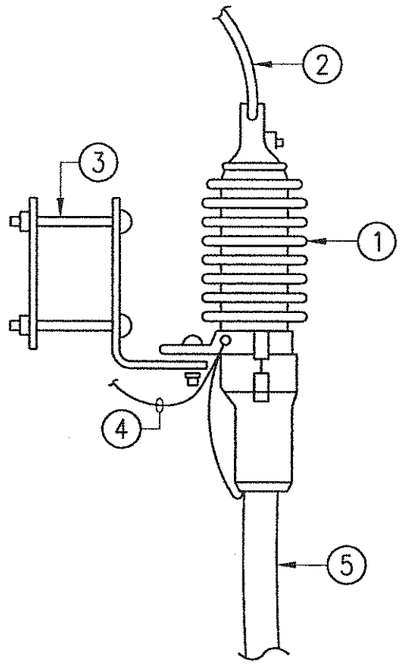
POLE/LINE CONSTRUCTION ASSEMBLY DETAILS

Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

32004560.dwg EA6

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R36	



⟨14⟩ CABLE TERMINATOR

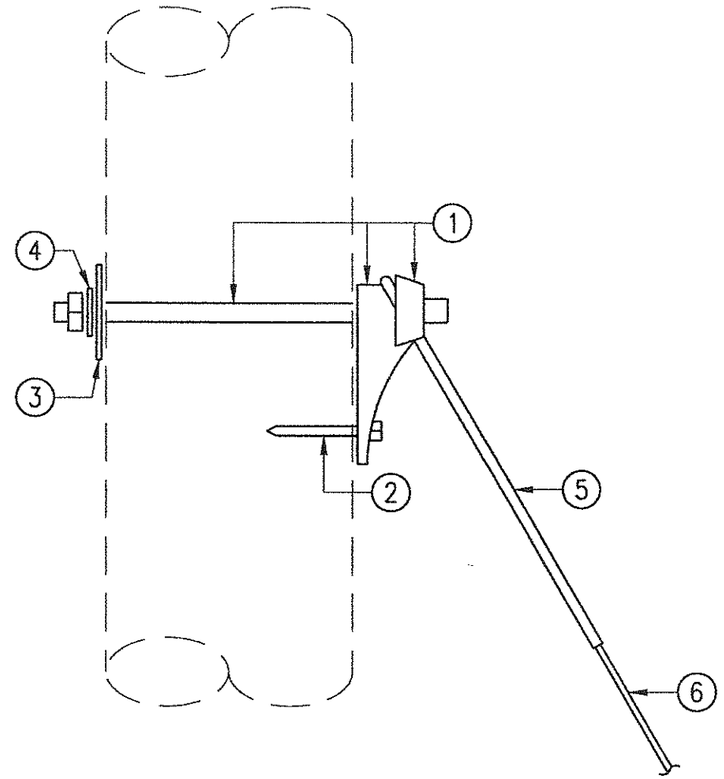
(1) CABLE TERMINATOR, SLIP-ON TYPE, PORCELAIN, 15 KV, SIZE AS REQUIRED TO MATCH 15 KV CABLE.

(2) #4 HARD DRAWN BARE COPPER OR AS INDICATED.

(3) CROSSARM MOUNTING BRACKET FOR CABLE TERMINATOR WITH ALL NECESSARY STRAPS, BOLTS, WASHERS AND NUTS. ALL GALVANIZED.

(4) #4 SOFT DRAWN BARE COPPER TO GROUNDING SYSTEM.

(5) 15 KV CABLE, SIZE AND TYPE AS INDICATED.



⟨15⟩ GUY WIRE ATTACHMENT

(1) ANCHOR GUY HOOK WITH THRU BOLT AND NUT FOR GUY WIRE (3/4"ø FOR 1/2", 5/8"ø FOR 3/8") GALVANIZED.

(2) LAG SCREW, 1/2"ø X 4" LONG, GALVANIZED.

(3) 4"SQ. CURVE RIBBED WASHER, GALVANIZED.

(4) LOCKWASHER TO MATCH THRU-BOLT, GALVANIZED.

(5) PREFORMED GUY WIRE GRIP.

(6) GUY WIRE. SEE ⟨3⟩

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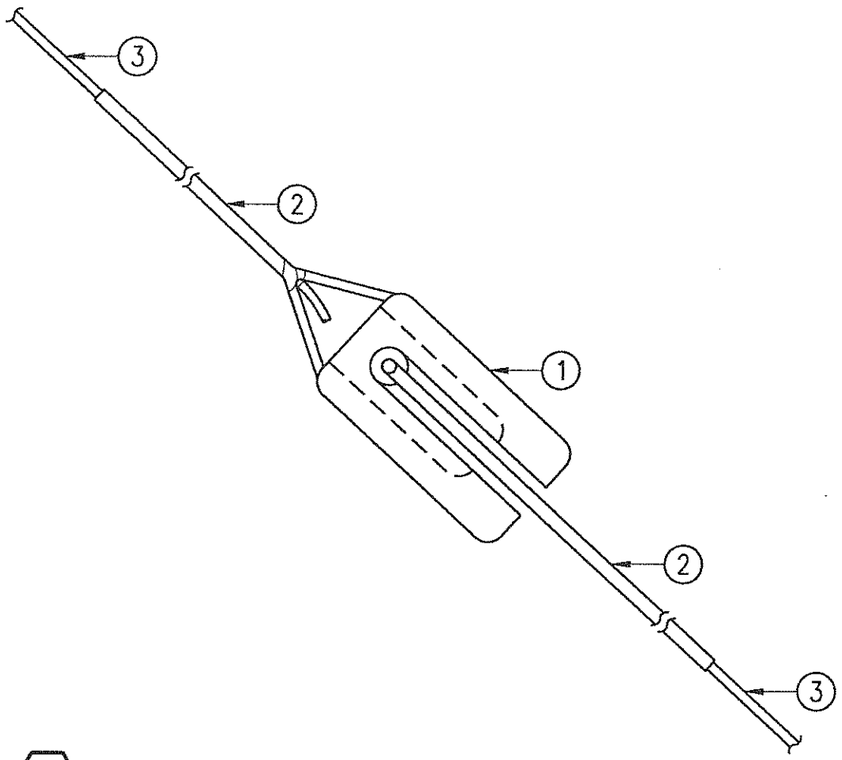
Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

3200456D.dwg EA7

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R37	

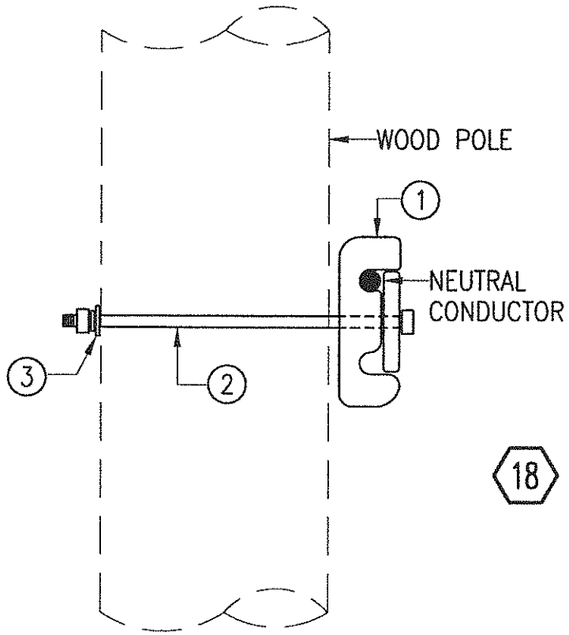


(16) GUY STRAIN INSULATOR

(1) GUY STRAIN INSULATOR, WET PROCESS, ANSI CLASS 54-3.

(2) PREFORMED GUY WIRE GRIP.

(3) GUY WIRE. SEE (3)

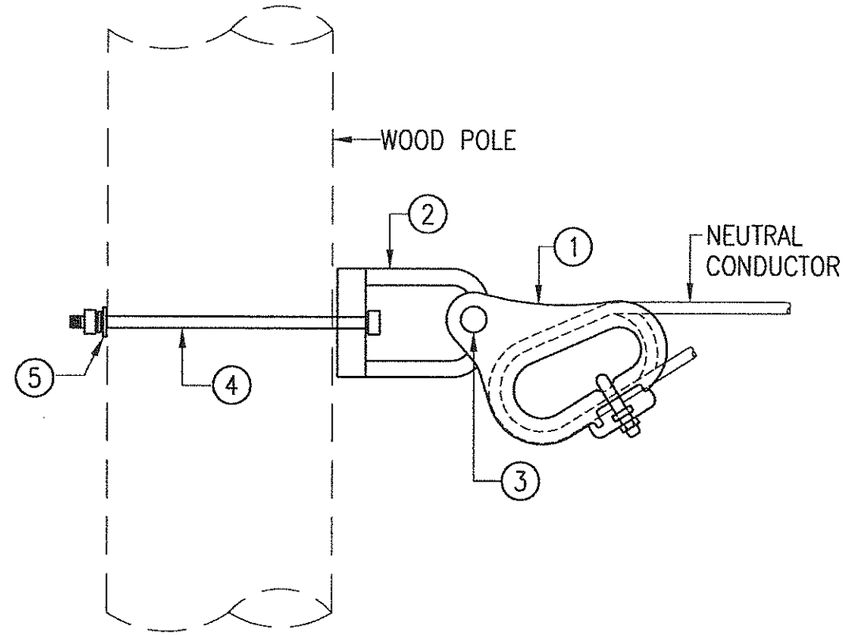


(17) NEUTRAL ATTACHMENT

(1) SUSPENSION CLAMP, 3-BOLT, STRAIGHT OR ANGLE AS APPLICABLE,

(2) MACHINE BOLT, 5/8"ø, LENGTH AS REQUIRED, WITH LOCK NUT AND NUT, GALVANIZED.

(3) WASHER, 2-1/4" SQUARE, GALVANIZED.



(18) NEUTRAL ATTACHMENT

(1) FERROUS SNAIL SHELL DEAD END CLAMP PROVIDE AS APPLICABLE FOR CONDUCTOR TYPE AND SIZE.

(2) EYELET CLEVIS, 5/8", GALVANIZED.

(3) COTTER BOLT, GALVANIZED, WITH STAINLESS STEEL PIN.

(4) MACHINE BOLT, 5/8"ø, LENGTH AS REQUIRED, WITH LOCK NUT AND NUT, GALVANIZED.

(5) WASHER, 2-1/4" SQUARE, GALVANIZED.

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POLE/LINE CONSTRUCTION ASSEMBLY DETAILS

Scale: NOT TO SCALE Date: JUNE 29, 2007

SHEET No. OF

32004560.dwg EA8

R37

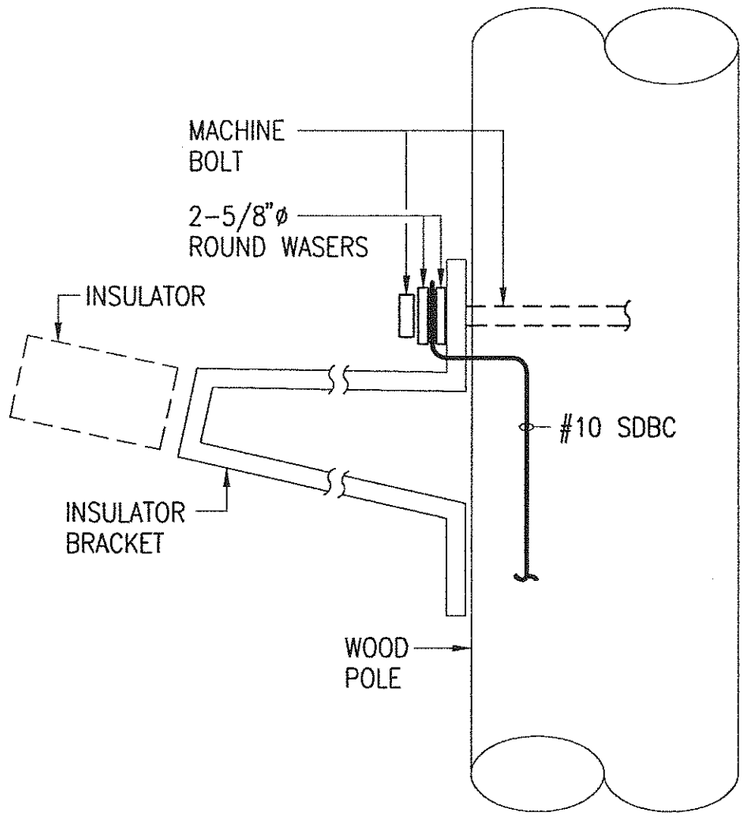
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R38	

BONDING DETAILS NOTES

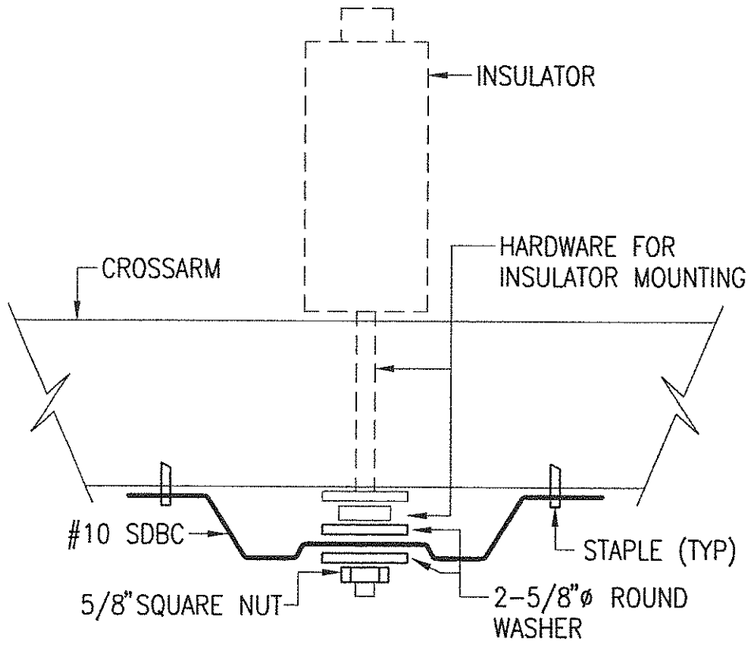
NOT TO SCALE

NOTES

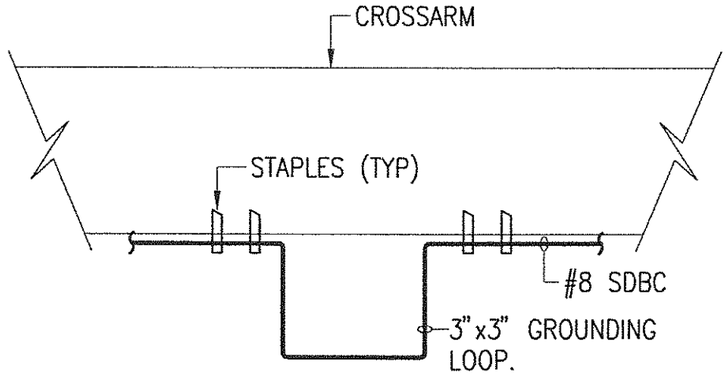
1. BOND ALL INSULATOR STUDS, DEADEND HARDWARE, AND MOUNTING BRACKETS FOR FUSED DISCONNECTS AND SURGE ARRESTORS.
2. BONDING CONDUCTOR SHALL BE #10 SDBC.
3. PROVIDE 1-1/2" MINIMUM SEPARATION BETWEEN BONDING CONDUCTOR AND ALL UNBONDED HARDWARE.
4. PROVIDE WOOD MOULDING COVER FOR BONDING CONDUCTOR INSTALLED ON WOOD POLE.
5. DO NOT INSTALL BONDING CONDUCTOR ON THE TOP SURFACE OF ANY CROSSARM.
6. PROVIDE GROUNDING LOOP AT ALL LOCATIONS WHERE CIRCUITS MAY BE SEPARATED SUCH AS FUSED DISCONNECTS, CIRCUIT ISOLATORS, ETC. BONDING CONDUCTOR AT THESE LOCATIONS SHALL BE #8 MINIMUM.



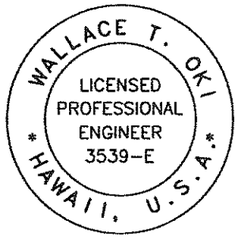
MOUNTING BRACKET – INSULATOR HORIZONTAL LINE POST



INSULATOR STUD



GROUNDING LOOP



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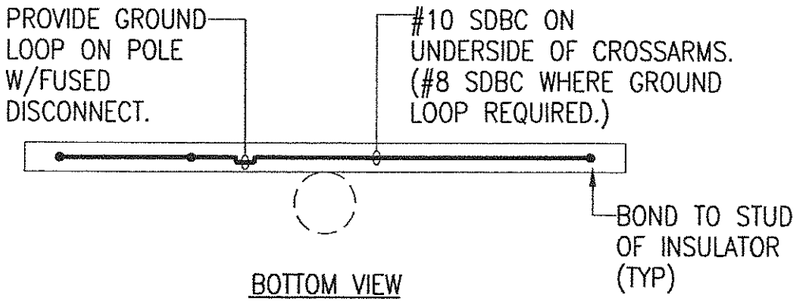
POLE/LINE CONSTRUCTION BONDING DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

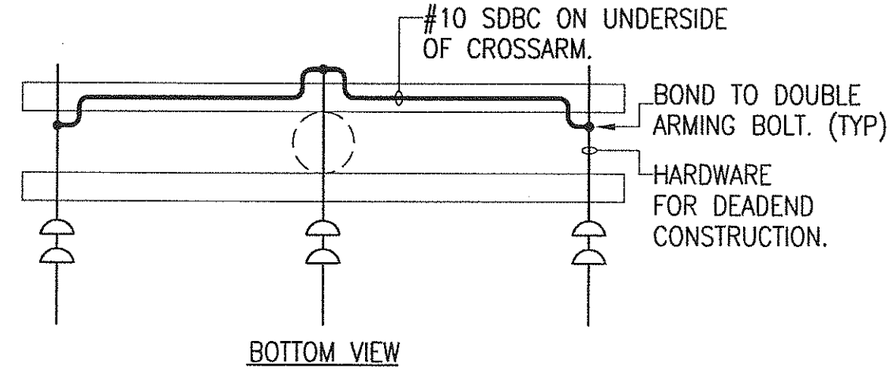
32004560.dwg EBD1

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R39	

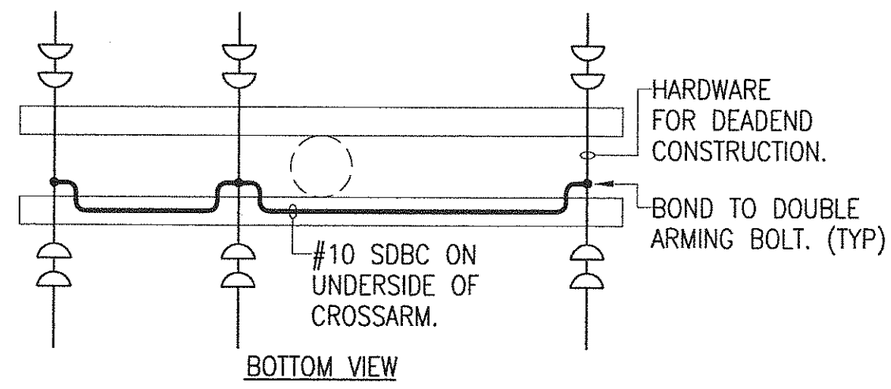


SINGLE CROSSARM W/INSULATORS

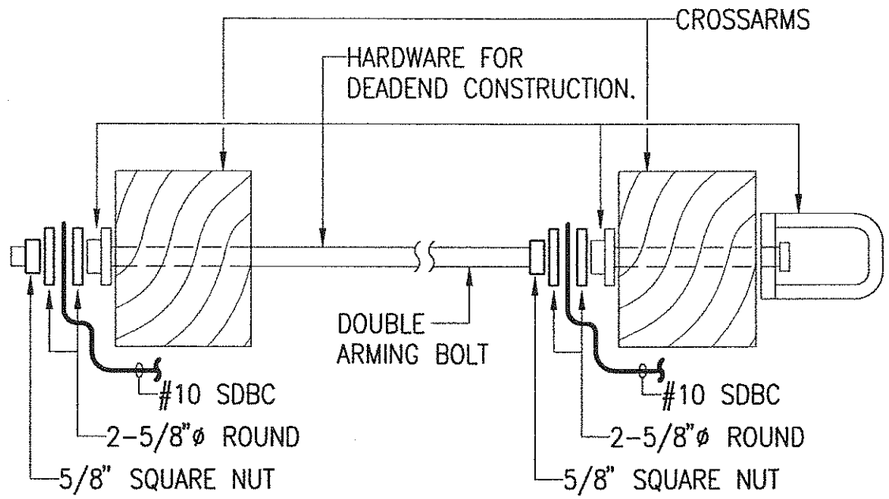
(TYPICAL FOR MOUNTING BRACKETS FOR FUSED DISCONNECTS AND SURGE ARRESTORS.)



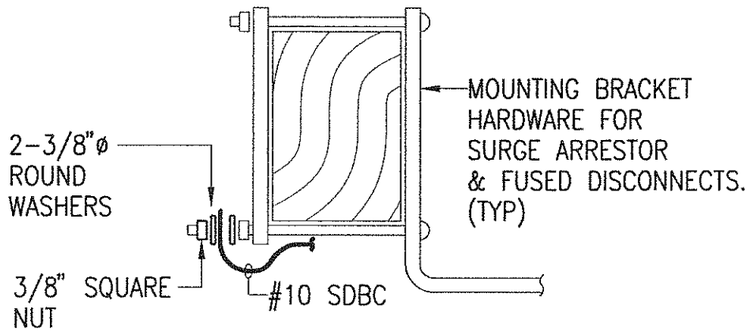
DOUBLE CROSSARM – DEADEND



DOUBLE CROSSARM



DEADEND HARDWARE



MOUNTING BRACKET

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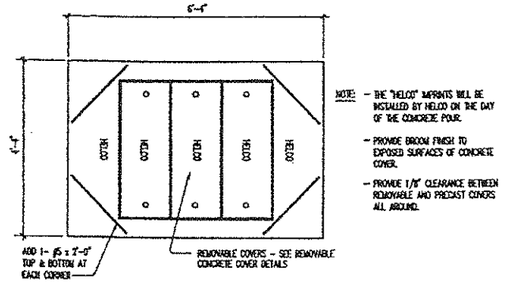
POLE/LINE CONSTRUCTION BONDING DETAILS

Scale: AS INDICATED Date: JUNE 29, 2007

SHEET No. OF

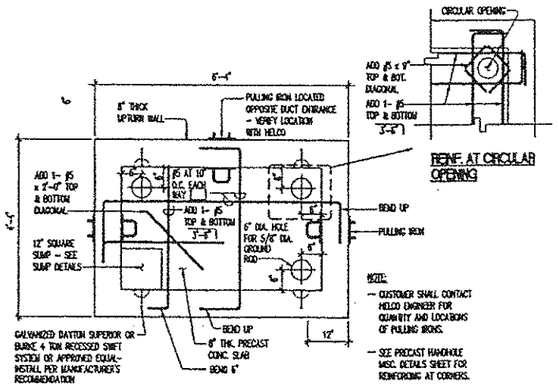
32004560.dwg EB02

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R40	



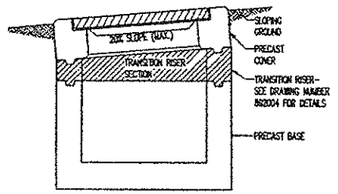
PRECAST CONCRETE COVER – PLAN

SCALE: 3/4" = 1' – 0" (FILE12)



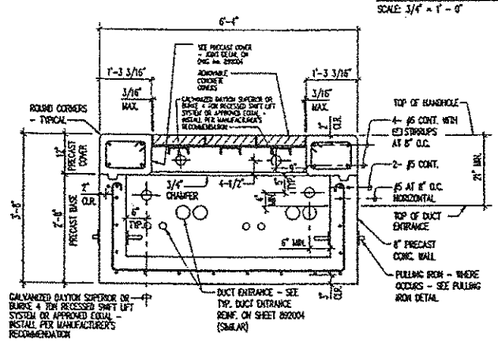
PRECAST BASE – PLAN

SCALE: 3/4" = 1' – 0" (FILE12)



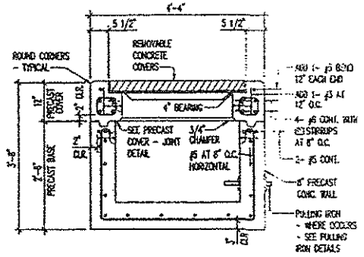
PRECAST HANDHOLE CONDITION AT SLOPING GROUND

SCALE: 3/4" = 1' – 0" (FILE12)



LONGITUDINAL SECTION

SCALE: 3/4" = 1' – 0" (FILE12)



TRANSVERSE SECTION

SCALE: 3/4" = 1' – 0" (FILE12)

GENERAL NOTES:

1. ALL CONCRETE AND REINFORCED CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE PROVISIONS OF THE AMERICAN CONCRETE INSTITUTE'S "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318 – CURRENT EDITION), SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301 – CURRENT EDITION) AND AS SPECIFIED HEREIN.
2. CONCRETE COMPRESSIVE STRENGTH: 5,000 PSI IN 28 DAYS. MINIMUM OF 7 DAYS SET TIME BEFORE TRANSPORTING HANDHOLES. MINIMUM OF 3 DAYS SET TIME BEFORE REMOVAL OF FORMS. CONCRETE SHALL BE KEPT IN MOIST CONDITION FOR AT LEAST THE FIRST 3 DAYS.
3. MAXIMUM AGGREGATE: 3/4"
4. CEMENT SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT "STANDARD SPECIFICATION FOR PORTLAND CEMENT" ASTM DESIGNATION C150
5. WATER SHALL BE CLEAN AND FREE OF HARMFUL AMOUNTS OF OIL, ACID, SALT, ALKALI, ORGANIC MATTER OR OTHER DELETERIOUS SUBSTANCE.
6. REINFORCING STEEL SHALL BE DEFORMED, CONFORMING TO THE CURRENT "STANDARD SPECIFICATIONS FOR BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", ASTM DESIGNATION A615, GRADE 60, EXCEPT STIRRUPS MAY BE GRADE 40, ASTM A 706.
7. REINFORCING STEEL BEFORE PLACED IN THE FORMS, SHALL BE THOROUGHLY CLEANED OF LOOSE MILL SCALE AND RUST, MORTAR, OIL, DIRT AND OF COATINGS OF CHARACTER THAT WILL DESTROY OR REDUCE THE BOND.
8. MIXING: READY MIXED ASTM C-94.
9. THE PRECAST FABRICATOR SHALL SUPPLY PULLING IRON ASSEMBLIES SEPARATELY. THE INSTALLATION CONTRACTOR SHALL INSTALL PULLING IRONS BEFORE UNITS ARE INSTALLED IN PLACE. VERIFY QUANTITY AND LOCATION BEFORE CASTING CONCRETE. COAT METAL SURFACES EXPOSED TO SOIL WITH QUSO-MASTIC PER MANUFACTURER'S RECOMMENDATIONS. PULLING IRONS SHALL BE HOT DIP GALVANIZED PER ASTM A123 AND/OR ASTM A153, AFTER FABRICATION.
10. AFTER REMOVAL OF THE FORMS, ALL CONCRETE SURFACES SHALL BE INSPECTED FOR HOLES, STONE POCKETS OR OTHER SUCH CONDITIONS, AND SUCH IMPERFECTIONS SHALL BE PATCHED IMMEDIATELY TO HELCO'S SATISFACTION.
11. FINISH: ALL SURFACES SMOOTH AND FREE OF DEFECTS.
    HANDHOLE COVER – BROOM FINISH.
    HANDHOLE FLOOR – STEEL TROWELED.
    HANDHOLE INTERIOR SURFACES – CEMENT WASH.
    SURFACES NOT EXPOSED TO VIEW – FORM FINISH
12. WELDING SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE CODE OF THE AMERICAN WELDING SOCIETY.
13. HELCO SHALL PREPARE EASTERFLEX DRAWING THAT SHOWS THE PLACEMENT AND SIZE OF END BELL WITH PVC DUCT SLEEVE PENETRATIONS AND PULLING IRON. THE PVC DUCT SLEEVE SELECTED SHALL FIT NEATLY WHEN INSERTED WITHIN THE END BELL TO AVOID DAMAGE TO ELECTRICAL WIRING DURING INSTALLATION.
14. ALL LIFTING INSERTS SHALL BE GALVANIZED AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. PATCH LIFTING INSERT DEPRESSIONS BY FIRST APPLYING A BONDING AGENT TO EXPOSED SURFACES BEING PATCHED. FILL WITH NON-SHRINK NON-METALLIC GROUT PATCHED AND FINISH SURFACE TO MATCH ADJOINING SURFACE.
15. SUMP WILL BE AN OPEN SUMP UNLESS OTHERWISE SPECIFIED BY HELCO.
16. PVC SLEEVES FOR GROUND ROD PENETRATIONS MAY BE USED AND LEFT IN PLACE. FILL HOLE WITH #3 GRAVEL.
17. SEAL FOR PRECAST JOINTS SHALL BE SUPPLIED BY THE PRECAST FABRICATOR. 1–1/2" RAM–NEK FLEXIBLE PLASTIC GASKET BY K.T. SNYDER, INC. OR EQUAL, AS DISTRIBUTED BY MCAD.
18. ALL WORK SHALL BE SUBJECT TO HELCO INSPECTION. CONTRACTOR SHALL GIVE HELCO 3 DAYS ADVANCE NOTICE FOR ANY INSPECTION SERVICE.
19. ALL HANDHOLES TO BE INSTALLED WITH THE FLOORS LEVEL, WALLS VERTICAL AND TOP FLUSH WITH FINISH GRADE.
20. SITE PREPARATION AND GRADING:
    - 20.1 PRIOR TO COMMENCEMENT OF CONSTRUCTION, THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITIES WHICH MAYBE AFFECTED BY HIS WORK.
    - 20.2 IN AREAS TO RECEIVE FILL, ALL VEGETATIONS, GRASS, ROOTS, BRUSH, TREES, STUMPS, RUBBISH, DEBRIS AND OTHER DELETERIOUS MATERIALS SHALL BE REMOVED. THE REMOVED MATERIALS SHALL BE DISPOSED OF OFF–SITE.
    - 20.3 THE EXPOSED SURFACE SHALL THEN BE PROOF–ROLLED WITH A HEAVY VIBRATORY TAMPER IN ORDER TO DETECT SOFT SPOT. IF ENCOUNTERED THE SOFT OR LOOSE SPOTS SHALL BE REMOVED TO FIRM MATERIAL AND THE RESULTING DEPRESSION SHALL BE FILLED WITH PROPERLY COMPACTED FILL.
    - 20.4 FILL MATERIAL SHALL BE IMPORTED NON–EXPANSIVE GRANULAR MATERIAL FREE OF ORGANICS AND DEBRIS AND WITH NO PARTICLE LARGER THAN 3 INCHES NOR SHALL FILL CONTAIN MORE THAN 25% FINES (PASSING THE #200 SIEVE).
    - 20.5 FILL SHALL BE PLACED IN RELATIVELY LEVEL LIFTS NOT EXCEEDING 8 INCHES IN LOOSE THICKNESS.
    - 20.6 EACH LAYER OF FILL SHALL BE COMPACTED TO AT LEAST 95% OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D1557 TEST PROCEDURE.
    - 20.7 GRADING WORK SHALL BE PERFORMED TO ELIMINATE PONDING OF WATER ON OR ADJACENT TO PULLBOX.

DESIGN DATA

A. LIVE LOAD – H20 LOADING, (1 WHEEL) AASHTO STD. FOR HIGHWAY BRIDGES
B. IMPACT – 30%
C. LATERAL EARTH PRESSURE – 45 PCF (EQUIVALENT FLUID UNIT PRESSURE)
D. CONCENTRATED PULLING IRON LOAD – 5,000 POUNDS.

APPROXIMATE WEIGHTS

BASE – 11,528 POUNDS
COVER – 2,628 POUNDS

THIS DRAWING AND THE DESIGN PRESENTED HEREON IS THE SOLE PROPERTY OF HELCO AND SHALL BE USED ONLY ON APPROVED HELCO UNDERGROUND INSTALLATIONS. THE DESIGN AND THE DRAWING IS SUBJECT TO RE–EXAMINATION AND APPROVAL BY THE ENGINEER ON OR BEFORE DECEMBER 31, 1996.

WESLEY R. SEGAWA — REGISTERED PROFESSIONAL ENGINEER — No. 8115–E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
Δ	2–26–96	RELOCATE LIFTING INSERTS FOR BASE	MAY	WS	WS
Δ	6–23–84	RELOCATE LIFTING INSERTS FOR BASE & COVER; PROVIDE DETAIL FOR PRECAST TRANSITION RISER; REVISE GENERAL NOTES; ADD C8x13 CHANNEL TO REMOVABLE COVER.	MAY	WS	WS

PRECAST HANDHOLE (3 x 5)
FOR LIGHT VEHICULAR TRAFFIC
UNDERGROUND STANDARD

DESIGNED	MAY	DRAWN	MAY	DATE	2/26/96	SCALE AS NOTED
CHECKED	R.M.C.	WSS				
APPROVAL						

ENGINEERING DEPARTMENT
HAWAIIAN ELECTRIC LIGHT CO., INC.
HILO, HAWAII
DRAWING NUMBER
892000

WALLACE T. OKI — LICENSED PROFESSIONAL ENGINEER 3539–E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

Wallace T. Oki

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

REFERENCE STANDARD DRAWINGS

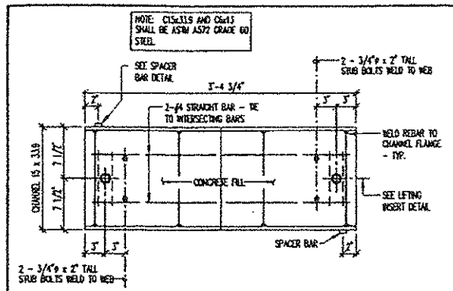
Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

320045SF.dwg

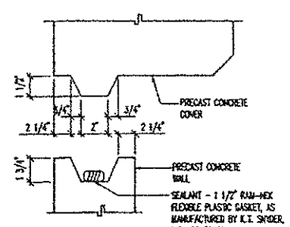
R40

STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R41	



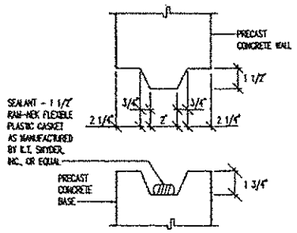
REINFORCING AND INSERT PLAN

SCALE 1 1/2" = 1'-0" (PR-FLO3)



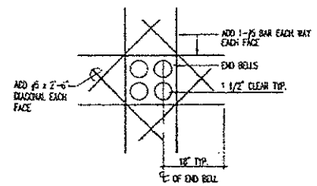
PRECAST COVER - JOINT DETAIL

SCALE 3" = 1'-0" (PR-FLE2)



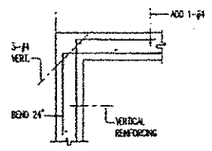
PRECAST WALL - JOINT DETAIL

SCALE 3" = 1'-0" (PR-FLE2)



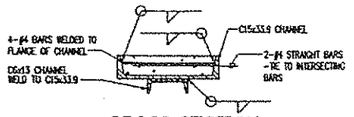
TYPICAL DUCT ENTRANCE REINFORCING

SCALE 3/4" = 1'-0" (PR-FLE5)



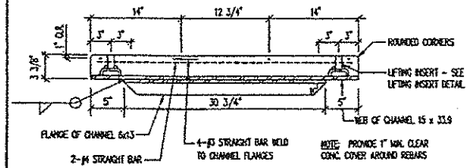
REINFORCING AT CORNERS

SCALE 3/4" = 1'-0" (PR-FLE8)



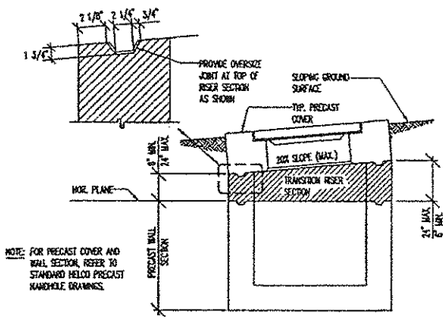
CROSS SECTION

SCALE 1 1/2" = 1'-0" (876550H)



LONGITUDINAL SECTION

SCALE 1 1/2" = 1'-0" (PR-FLE5)

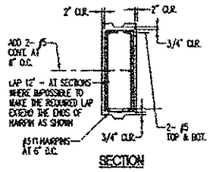


PRECAST HANDHOLE COND. AT SLOPING GROUND

NOT TO SCALE

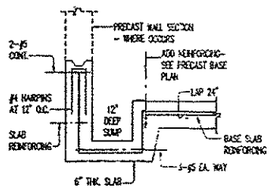
TRANSITION RISER FOR HANDHOLE	X DISTANCE
PRECAST HANDHOLE (3x5)	4"
PRECAST HANDHOLE (4x6)	6"
PRECAST HANDHOLE (5x7)	8"
PRECAST HANDHOLE (6x11)	8"

TABLE OF LIFTING INSERT LOCATION



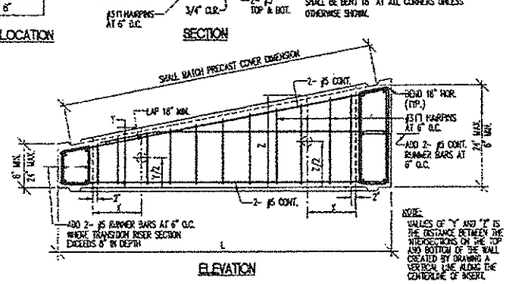
SECTION

NOTES:
ALL REINFORCING BARS MARKED CONTINUOUS SHALL BE BENT 18" AT ALL CORNERS UNLESS OTHERWISE SHOWN.

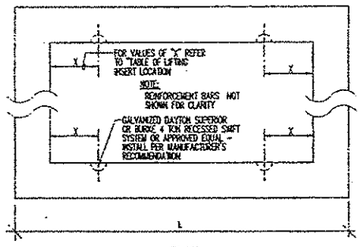


CLOSED SUMP DETAIL

SCALE 3/4" = 1'-0" (PR-FLE8)



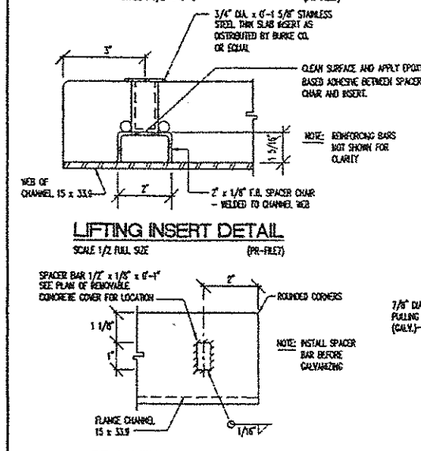
ELEVATION



PLAN

TRANSITION RISER REBAR ARRANGEMENT

NOT TO SCALE



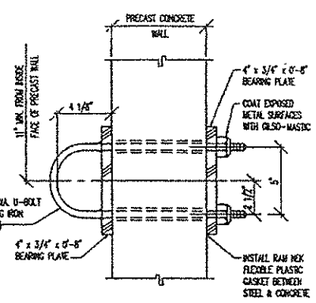
LIFTING INSERT DETAIL

SCALE 1/2 FULL SIZE (PR-FLE7)

SPACER BAR DETAIL

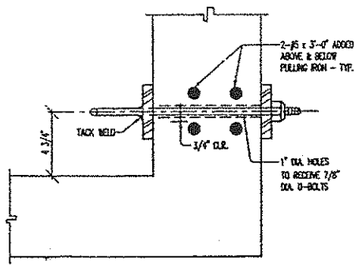
SCALE 1/2 FULL SIZE (PR-FLE7)

REMOVABLE CONCRETE COVER DETAILS



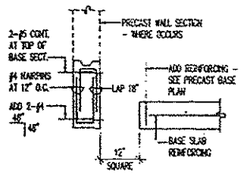
PULLING IRON - PLAN VIEW

SCALE 3" = 1'-0" (PR-FLE2)



PULLING IRON - SECTIONAL ELEV.

SCALE 3" = 1'-0" (PR-FLE2)



OPEN SUMP DETAIL

SCALE 3/4" = 1'-0" (PR-FLE8)

NO.	DATE	REVISIONS	BY	CHKD	APVD
3	8/23/94	PROVIDE LIFTING INSERTS FOR TRANSITION RISERS	MAW	WS	WS
2	1/21/94	ADD C6x13 CHANNEL TO REMOVABLE COVER	YWF	WS	WS

PRECAST HANDHOLE MISC. DETAILS FOR VEHICULAR TRAFFIC UNDERGROUND STANDARD

DESIGNED | DRAWN MAY 2/28/96 | SCALE AS NOTED
CHECKED | APPROVAL
ENGINEERING DEPARTMENT HAWAII ELECTRIC LIGHT CO., INC. HILO, HAWAII
DRAWING NUMBER 892004

WESLEY K. SOUZA REGISTERED PROFESSIONAL ENGINEER NO. 3916-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

WALLACE T. OKI LICENSED PROFESSIONAL ENGINEER 3539-E HAWAII, U.S.A.

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Wal T. O

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

REFERENCE STANDARD DRAWINGS

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200455F.dwg

R41

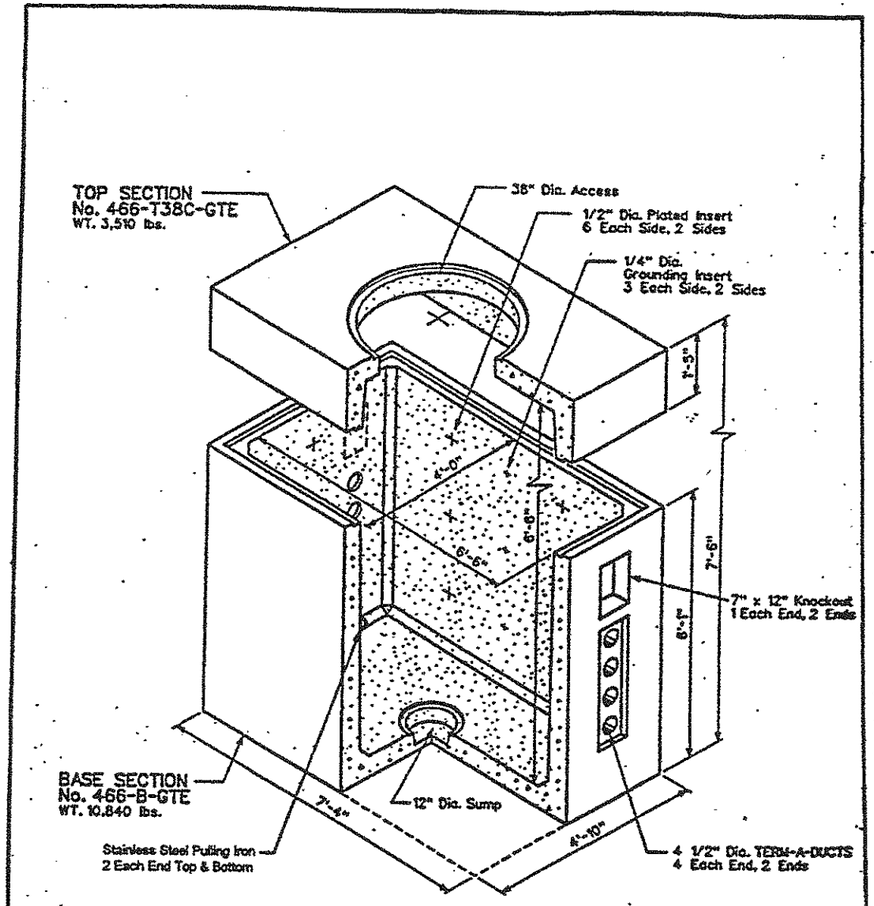
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R42	

4'-0" X 6'-6" X 6'-6"

PRECAST CONCRETE MANHOLES PER GTE SPECIFICATION GTS-8395

PSB #4924.2

Item ID:	Part #:
180014	GTE 4 x 6.5 x 6.5
180015	GTE 4 x 6.5 x 6.5-1



DRAWN BY: KCF/JAF	TITLE: 466-GTE MANHOLE GTE ITEM CODE: 180014	REV. NO. / BY / DATE: 1, 2, 3, 4, 5
CHECKED BY:		DGN NO.
APPROVED BY:		
SCALE: 3/8" = 1'-0"		
DATE: 07/01/94		

WALLACE T. OKI
LICENSED PROFESSIONAL ENGINEER
3539-E
HAWAII, U.S.A.

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Wae T. Oki

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

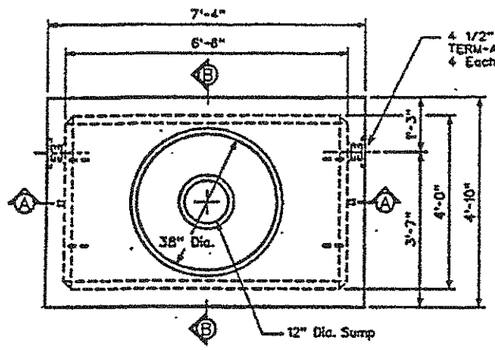
REFERENCE STANDARD DRAWINGS

Scale: NONE Date: JUNE 29, 2007

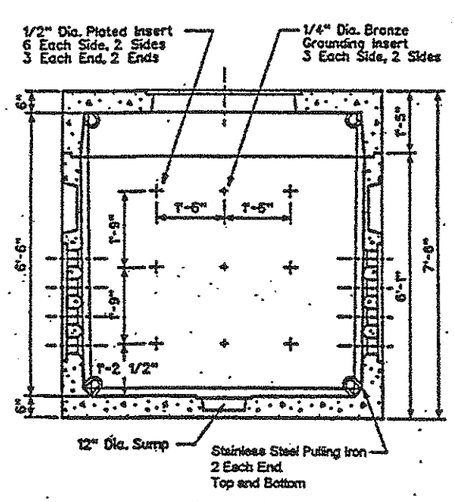
SHEET No. OF

3200456F.dwg

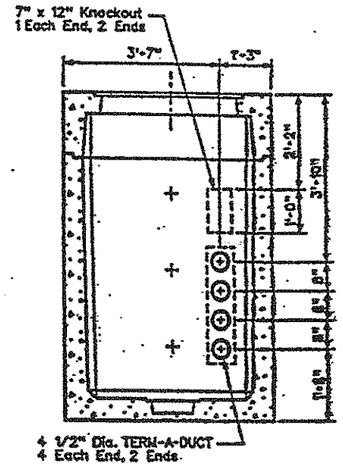
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R43	



PLAN VIEW



SECTION AA



SECTION BB

DRAWN BY: KCF/JAF	TITLE: 466-GTE MANHOLE GTE ITEM CODE: 180014	REV. NO. BY DATE
CHECKED BY:		1
APPROVED BY:		2
SCALE: 3/8" = 1'-0"		3
DATE: 07/01/94		4
		5
		DGN NO.

NOTE: STANDARD SIZE DRAWING (36" x 24") IS AVAILABLE UPON REQUEST

WALLACE T. OKI
LICENSED PROFESSIONAL ENGINEER
3539-E
HAWAII, U.S.A.

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Wal T. Oki

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

REFERENCE STANDARD DRAWINGS

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456F.dwg

R43

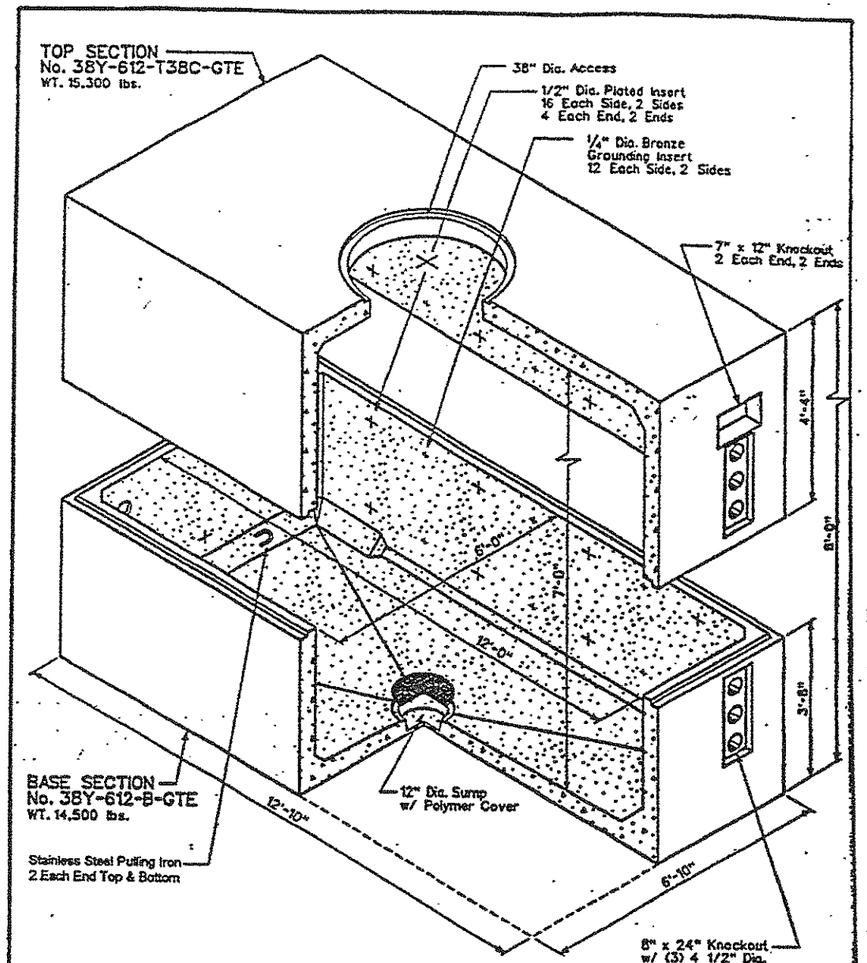
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R44	

6'-0" X 12'-0" X 7'-0"

PRECAST CONCRETE MANHOLES PER GTE SPECIFICATION GTS-8395

PSB #4924.2

Item ID:	Part #:
180018	GTE 6 x 12 x 7
180019	GTE 6 x 12 x 7-1



DRAWN BY: KCF/JAF	TITLE: 38Y-612-GTE GTE ITEM CODE: 180018	REV. NO. BY DATE 1 2 3 4 5 DGN NO.
CHECKED BY:		
APPROVED BY:		
SCALE: 3/8" = 1'-0"		
DATE: 07/01/94		

WALLACE T. OKI
LICENSED PROFESSIONAL ENGINEER
3539-E
HAWAII, U.S.A.

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U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

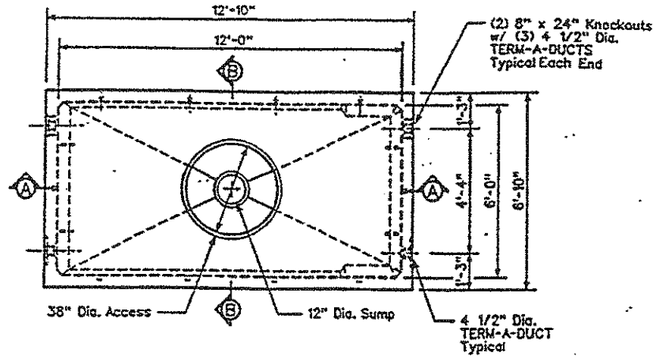
REFERENCE STANDARD DRAWINGS

Scale: NONE Date: JUNE 29, 2007

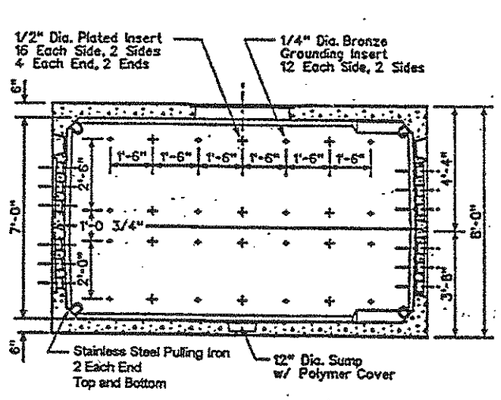
SHEET No. OF

3200456F.dwg

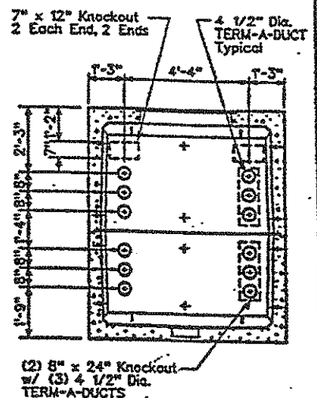
STATE	PROJECT	SHEET NO.	TOTAL SHEETS
HI	HI A-AD-6(4)	R45	



PLAN VIEW



SECTION AA



SECTION BB

DRAWN BY: KCF/JAF	TITLE: 38Y-612-GTE GTE ITEM CODE: 1800189	REV. NO. BY DATE 1 2 3 4 5 DGN NO.
CHECKED BY:		
APPROVED BY:		
SCALE: 1/4"=1'-0"		
DATE: 07/01/94		

NOTE: STANDARD SIZE DRAWING (36" x 24") IS AVAILABLE UPON REQUEST

WALLACE T. OKI
LICENSED PROFESSIONAL ENGINEER
3539-E
HAWAII, U.S.A.

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Wal T. Oki

U.S DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CENTRAL FEDERAL LANDS HIGHWAY DIVISION

REFERENCE STANDARD DRAWINGS

Scale: NONE Date: JUNE 29, 2007

SHEET No. OF

3200456F.dwg

R45