

MATCH LINE  
SEE 1/E-107

ZONE X

FLOOD ZONE ELEVATION  
BOUNDARY

ZONE AE  
(EL 8)

**NOTES:**

1. SEE PROPOSAL SCHEDULE FOR BID ITEM NUMBER DESCRIPTIONS.
2. ADDITIVE ALTERNATE BID ITEMS ONLY INDICATE CONDUIT RUNS. SEE E-603 FOR WIRING RUN BID ITEMS.

2'x4' ELECTRIC HANDHOLE,  
TYPICAL. SEE

2  
E-502

ADDITIVE ALTERNATE  
BID ITEM NO. 10

PROVIDE CONDUIT STUB, CAP, AND  
MARKER AS PART OF ADDITIVE ALTERNATE  
BID ITEM NO. 6 IF ADDITIVE ALTERNATE  
BID ITEM NO. 10 IS NOT AWARDED, TYPICAL.

P17

EHH-17

2  
1 1

P18

EHH-18

2 1

P19

EHH-19

CONDUIT STUB, CAP AND  
MARKER FOR FUTURE USE.

ADDITIVE ALTERNATE  
BID ITEM NO. 6

SHORELINE SETBACK

FLOOD ZONE ELEVATION  
BOUNDARY

ZONE AE  
(EL 9)

ZONE VE  
(EL 9)

ZONE VE  
(EL 9)

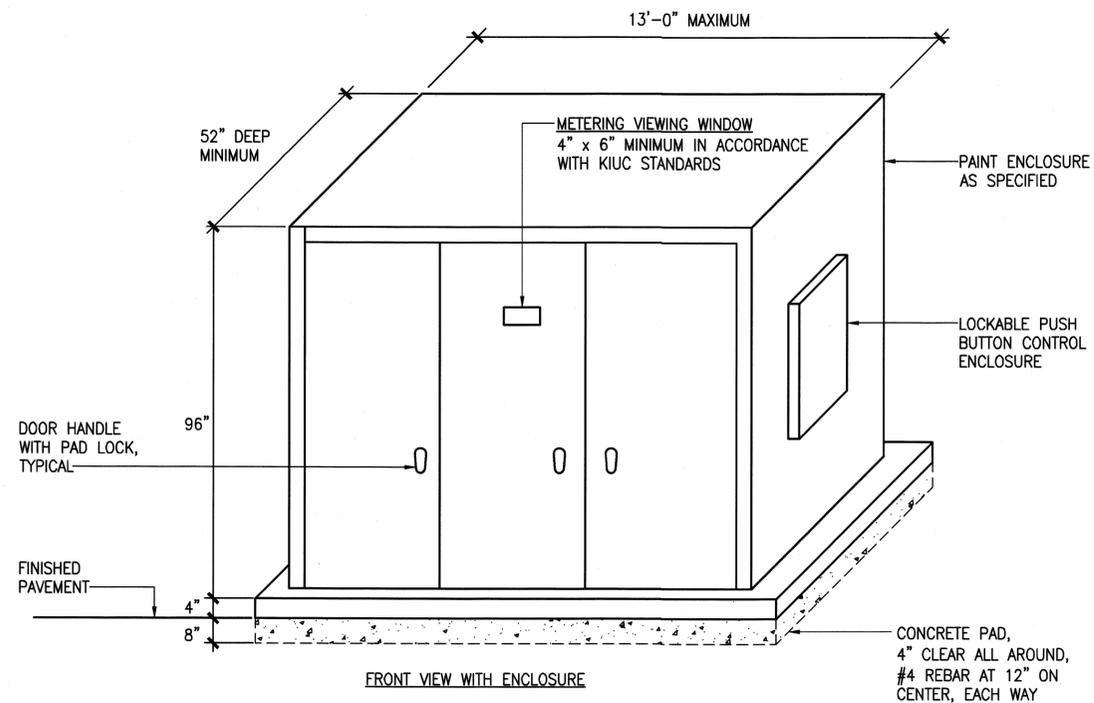
1  
E108 **ENLARGED ELECTRICAL PLAN - 8**  
SCALE: 1"=20'-0"



0 10' 20' 30' 40' 50' 60'  
SCALE: 1" = 20'

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
<p><b>INSYNERGY ENGINEERING</b>  <small>MECHANICAL ELECTRICAL &amp; FIRE PROTECTION            655 FORT STREET 6TH FLOOR SUITE 500, HAWAII, HAWAII 96713            PHONE: (808) 851-0775 FAX: (808) 851-0000</small></p> <p><b>GARRET A. MASUDA</b>  <small>LICENSED PROFESSIONAL ENGINEER            No. 9756-E            HAWAII, U.S.A.</small></p> <p>EXP. 04-30-2018</p> <p><i>Garret A. Masuda</i>  <small>THIS WORK WAS PREPARED BY ME            OR UNDER MY SUPERVISION AND            CONSTRUCTION OF THIS PROJECT            WILL BE UNDER MY OBSERVATION</small></p>					
<p>STATE OF HAWAII            DEPARTMENT OF LAND AND NATURAL RESOURCES            ENGINEERING DIVISION</p> <p>MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2            ELECTRICAL UPGRADES            KAUA'I, HAWAII</p> <p><b>ENLARGED ELECTRICAL PLAN - 8</b></p>					
DESIGNED:	KH	SUBMITTED:	<i>[Signature]</i>		
DRAWN:	KH	DATE:	APRIL 2016		
CHECKED:	GM	SCALE:	AS SHOWN		
APPROVED:	<i>[Signature]</i>	DATE:	APR 28 2016	DRAWING NO:	E-108
CHIEF ENGINEER					

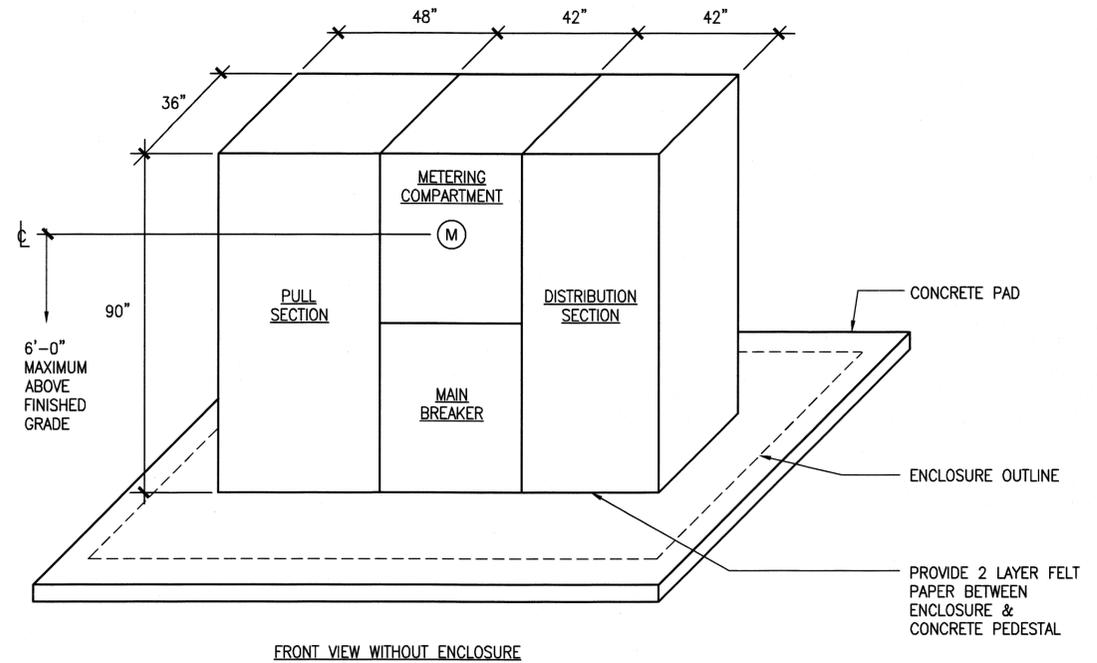
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**NOTES:**

1. WEATHERPROOF STAINLESS STEEL ENCLOSURE WITH HINGED DOORS.
2. PAD LOCKS SHALL BE KEYED ALIKE.
3. ALL HARDWARE SHALL BE 316 STAINLESS STEEL.
4. CHAMFER PERIMETER EDGES TO SLOPE AWAY WATER FROM ENCLOSURE.
5. CONCRETE PAD SHALL BE SLOPED 1% (MINIMUM) AWAY FROM EQUIPMENT

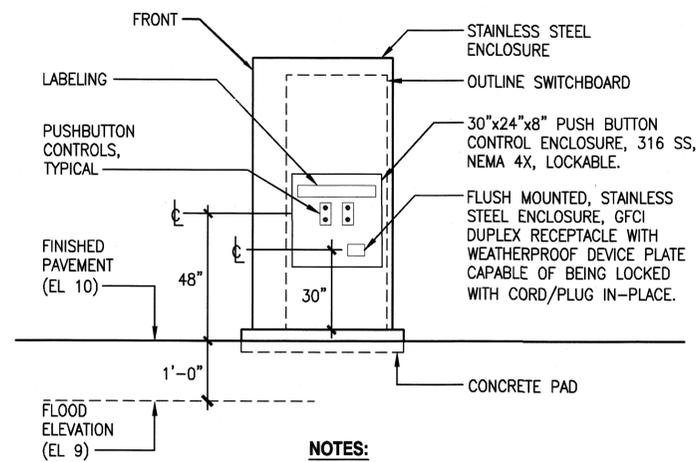
**1**  
E-301 **ELEVATION - STAINLESS STEEL SWITCHBOARD 4A ENCLOSURE**  
NOT TO SCALE



**NOTES:**

1. SWITCHBOARD ASSEMBLY CONSISTS OF A NEMA 1 SWITCHBOARD WITHIN A WEATHERPROOF STAINLESS STEEL ENCLOSURE. MAINTAIN THE FOLLOWING CLEARANCES BETWEEN SWITCHBOARD AND ENCLOSURE:
  - a. 16" CLEARANCE FROM FRONT OF SWITCHBOARD TO ENCLOSURE.
  - b. 9" CLEARANCE FROM BOTH SIDES OF SWITCHBOARD TO ENCLOSURE.

**2**  
E-301 **ELEVATION - MAIN SWITCHBOARD 4A**  
NOT TO SCALE



**NOTES:**

1. RECEPTACLE AND PUSH BUTTONS SHALL BE WIRED AND MOUNTED TO THE STAINLESS STEEL ENCLOSURE BY THE CONTRACTOR.

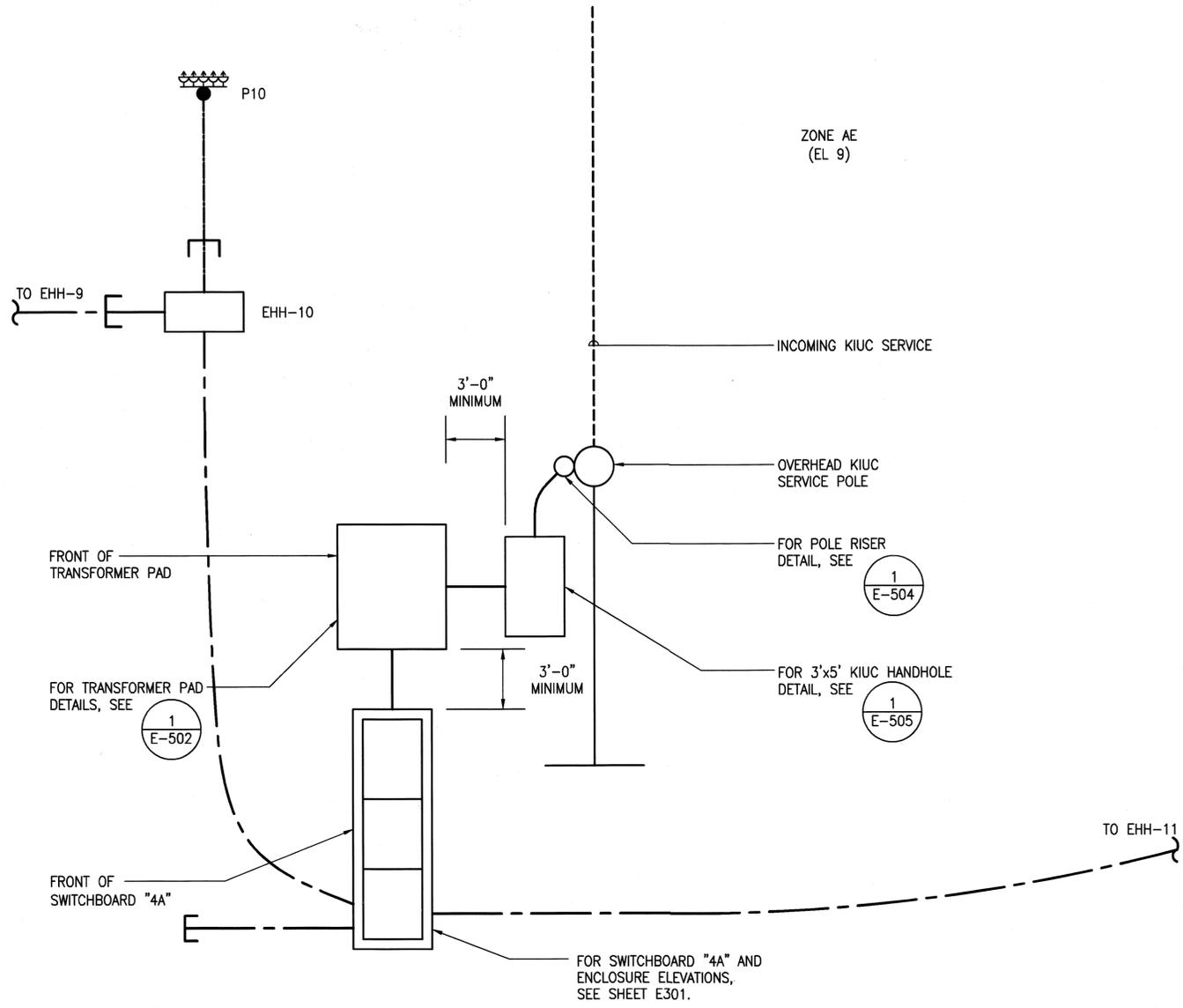
**3**  
E-301 **ELEVATION - SWITCHBOARD 4A END**  
NOT TO SCALE

**NOTES:**

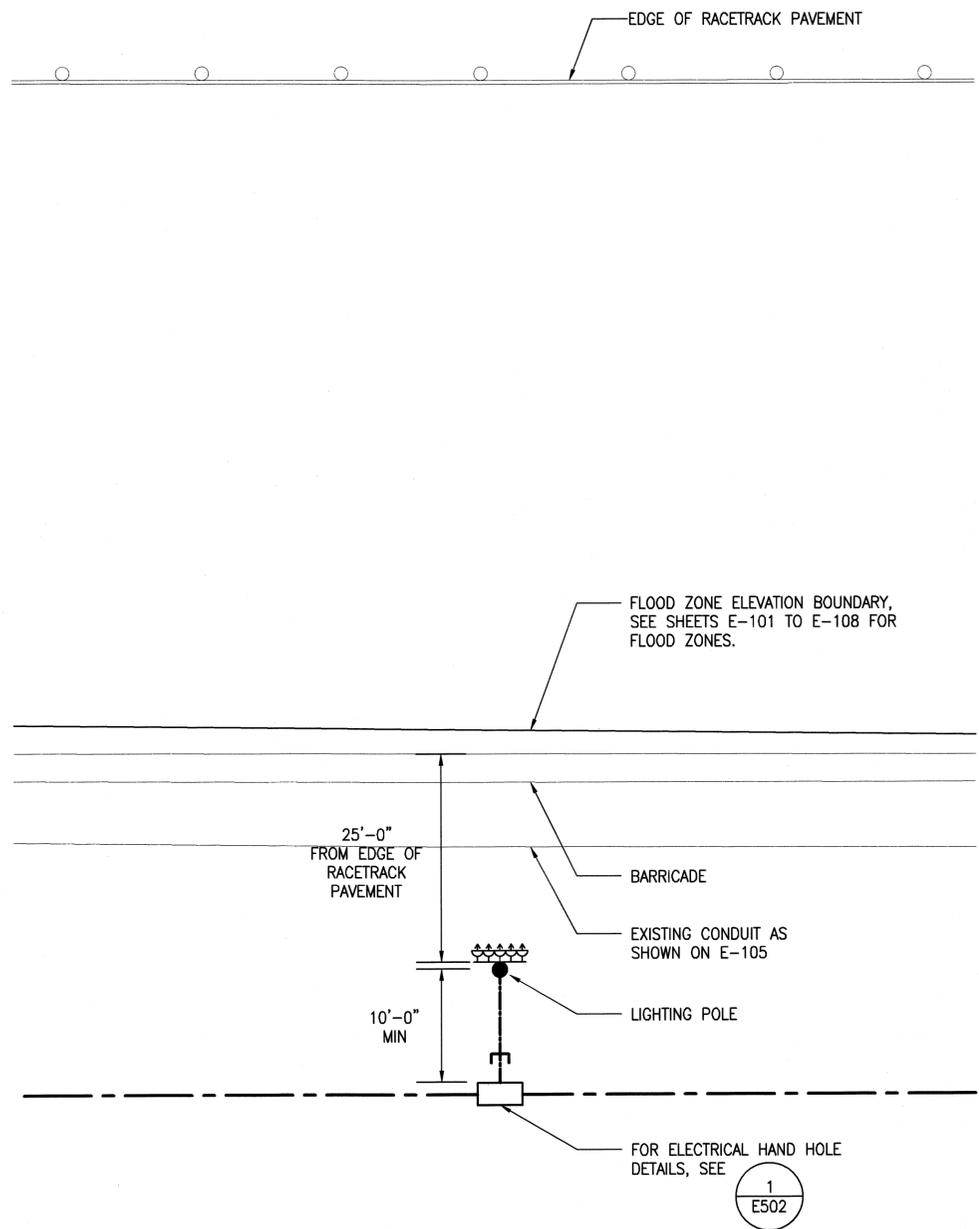
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OF SWITCHBOARD 4A, INCLUDING THE STAINLESS STEEL ENCLOSURE AND PUSH BUTTON CONTROL ENCLOSURE, FOR APPROVAL BY THE ENGINEER AND KIUC PRIOR TO ORDERING ANY EQUIPMENT.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
 STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUA'I, HAWAII <b>ELEVATIONS</b>					
DESIGNED:	KH	SUBMITTED:	[Signature]		
DRAWN:	KH	DATE:	APRIL 2016		
CHECKED:	GM	SCALE:	AS SHOWN		
APPROVED:	[Signature]		DRAWING NO.	E-301	
CHIEF ENGINEER		DATE	APR 28 2016		

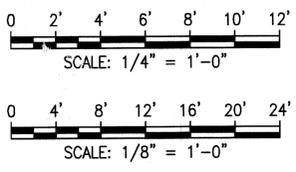
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**1**  
E-401 **ELECTRICAL EQUIPMENT LAYOUT**  
SCALE: 1/4" = 1'-0"



**2**  
E-401 **ENLARGED TYPICAL LIGHT POLE LAYOUT**  
SCALE: 1/8" = 1'-0"



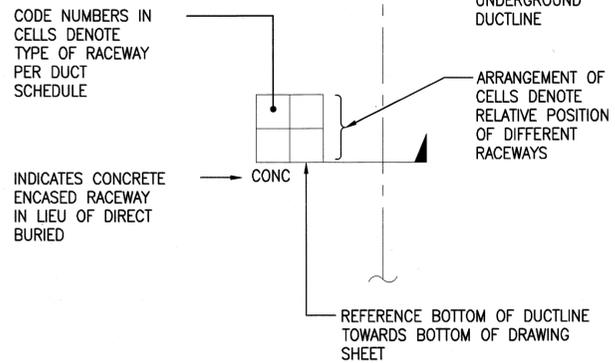
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

		STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION	
		MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII	
<b>ENLARGED ELECTRICAL PLANS</b>			
DESIGNED: KH	SUBMITTED:		
DRAWN: KH	DATE: APRIL 2016		
CHECKED: GM	SCALE: AS SHOWN		
APPROVED:	DATE: APR 28 2016	DRAWING NO. E-401	
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION			

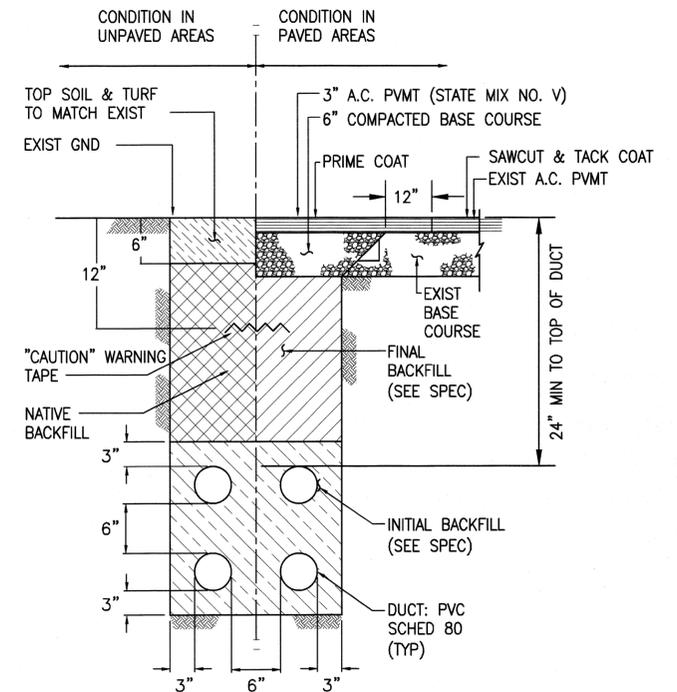
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DUCT SCHEDULE		
NO.	DESCRIPTION	CABLES
P	4" PVC SCHEDULE 40 WITH PULLSTRING	PROVIDED BY KIUC
S	4" PVC SCHEDULE 40	SEE ONE LINE DIAGRAM
1	2" PVC SCHEDULE 80	SEE ONE LINE DIAGRAM
2	2" PVC SCHEDULE 80 (SPARE)	WITH PULLSTRING
3	1 1/2" PVC SCHEDULE 80	SEE DISTRIBUTION DIAGRAM
4	1" PVC SCHEDULE 80	SEE ONE LINE DIAGRAM
5	NOT USED.	-
6	NOT USED.	-
7	NOT USED.	-

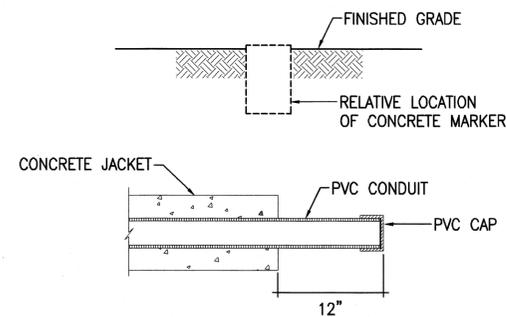


(NOTE: ALL DUCTLINES ARE DIRECT BURIED UNLESS OTHERWISE NOTED)

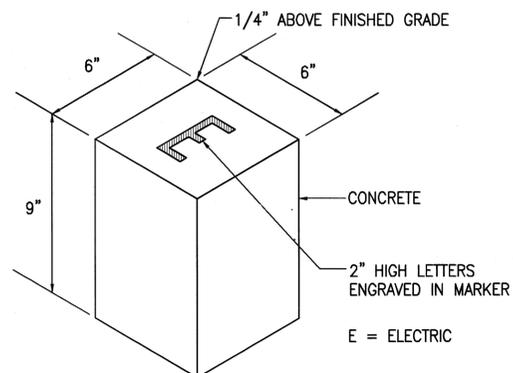
1 DUCT SECTION FLAG CODE  
E-501 NOT TO SCALE



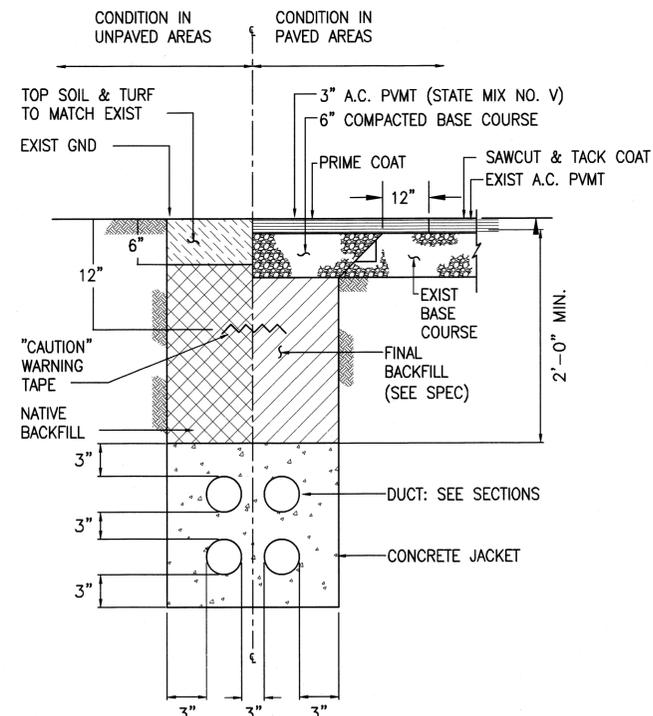
2 TYPICAL DUCT SECTION - DIRECT BURIED  
E-501 NOT TO SCALE



3 CONCRETE FOR STUB OUT DETAIL  
E-501 NOT TO SCALE



4 STUB OUT MARKER DETAIL  
E-501 NOT TO SCALE



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. 90% COMPACTION.

CONCRETE - 3" ENCASEMENT, 3,000 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

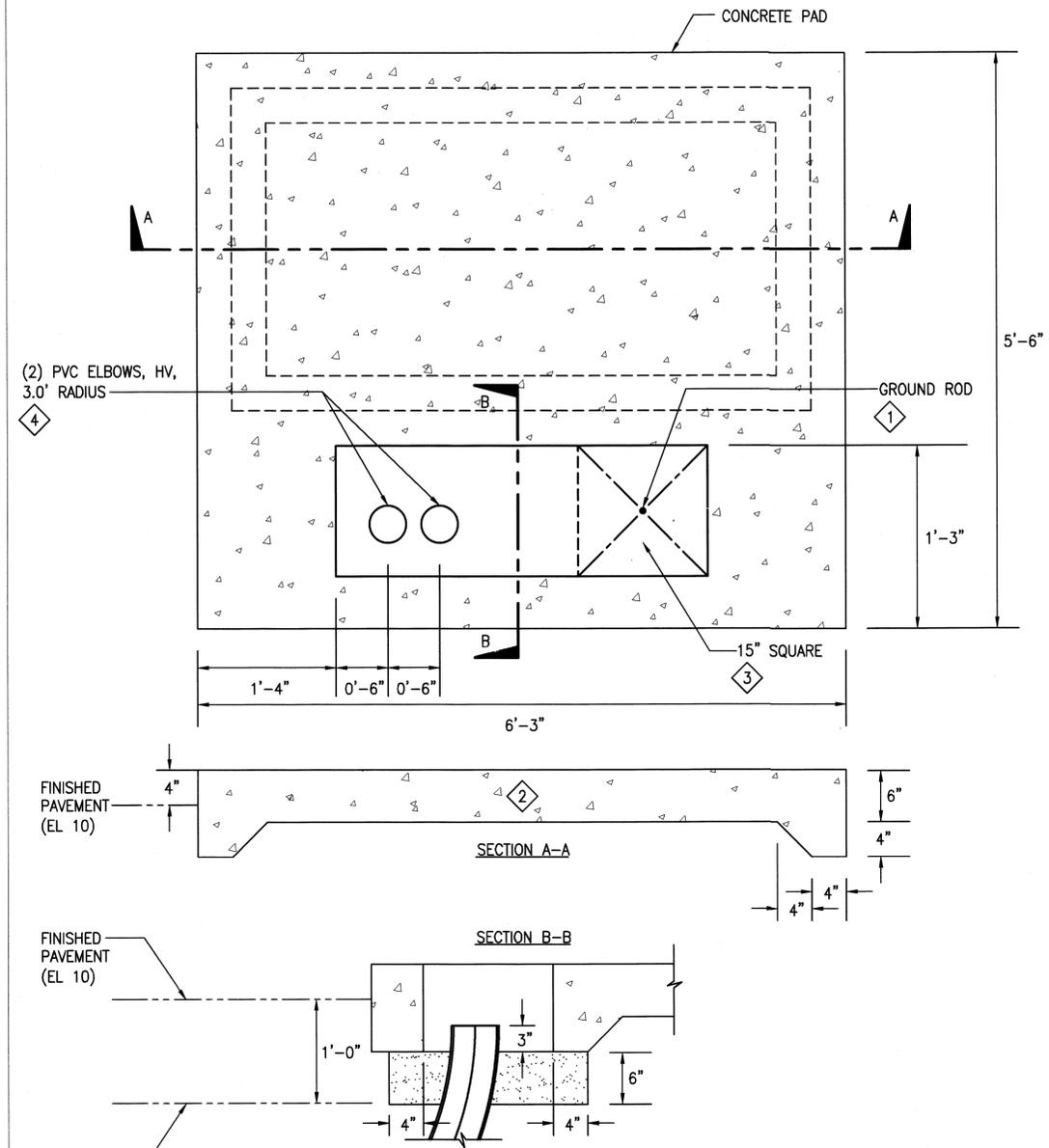
5 TYPICAL DUCT DETAIL - CONCRETE ENCASED  
E-501 NOT TO SCALE

NOTES:

- CONCRETE ENCASED CONDUITS SHALL BE PVC SCHEDULE 40.
- PROVIDE ALL EMPTY CONDUITS WITH PULLWIRE.
- AT LANDSCAPED AREAS RESTORE SURFACES TO MATCH EXISTING ADJACENT SURFACES.
- ORANGE COLORED PLASTIC WARNING TAPE, 3" WIDE, ENTIRE LENGTH OF DUCT. TAPE TO HAVE CONTINUOUS METALLIC BACKING AND CORROSION RESISTANT FOIL CORE. WARNING AND IDENTIFICATION TO BE IMPRINTED ON TAPE AND SHALL READ "CAUTION BURIED ELECTRICAL CABLE BELOW". MESSAGE SHALL BE REPEATED APPROXIMATELY EVERY 10 FEET.
- WHERE ELECTRICAL DUCTLINES CROSS OTHER UTILITIES MAINTAIN MINIMUM 12" VERTICAL SEPARATION BETWEEN ELECTRICAL DUCTS AND OTHER UTILITIES (GAS, WATER, SEWER, ETC.)

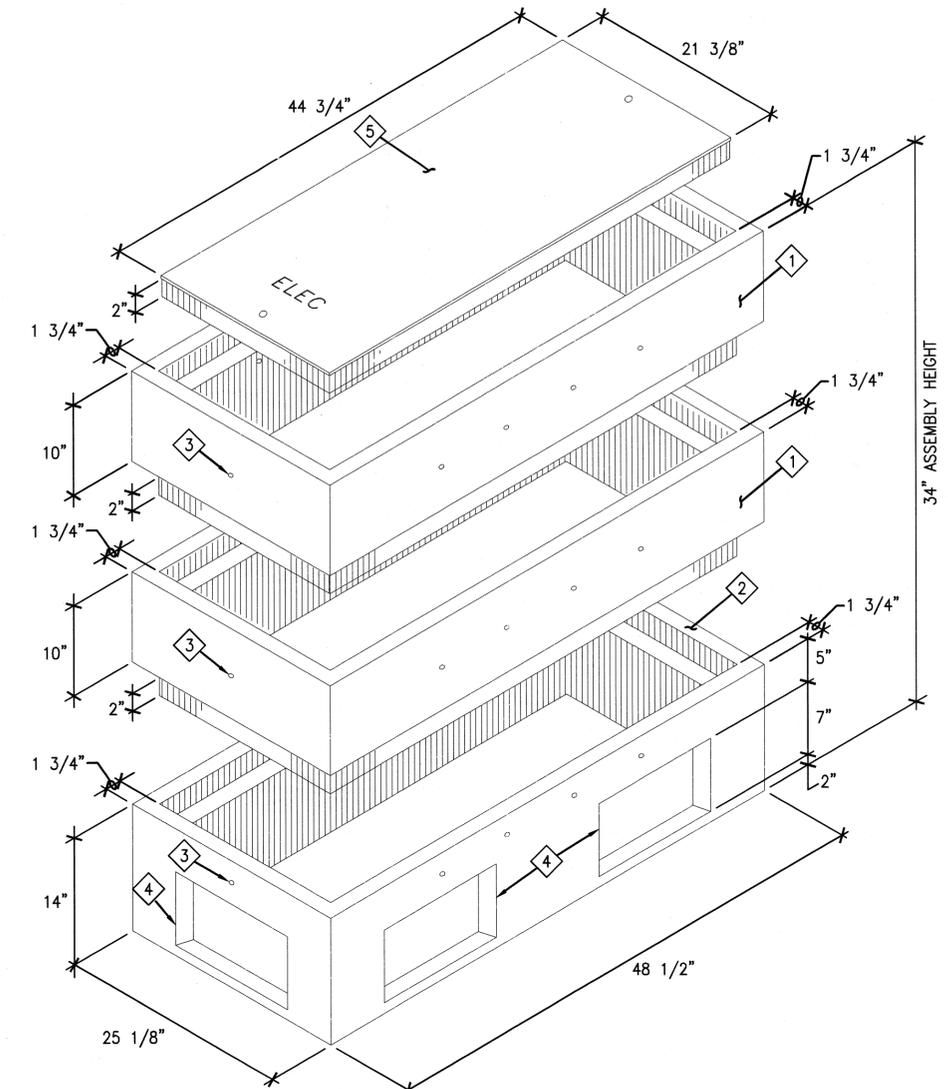
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
<p>INSYNERGY ENGINEERING</p> <p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p> <p>MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII</p> <p>ELECTRICAL DUCT DETAILS</p>					
DESIGNED: KH		SUBMITTED: [Signature]			
DRAWN: KH		DATE: APRIL 2016			
CHECKED: GM		SCALE: AS SHOWN			
<p>EXP. 04-30-2018</p> <p>[Signature]</p> <p>LICENSED PROFESSIONAL ENGINEER No. 9756-E HAWAII, U.S.A.</p>				DRAWING NO. E-501	
<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION</p>				<p>APR 28 2016</p> <p>DATE</p>	

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- NOTES:**
- 1 GROUND ROD, 5/8" DIA. x 8'-0", FURNISHED AND INSTALLED BY THE DEVELOPER/CONTRACTOR. IF THE RESISTANCE EXCEEDS 25-OHMS, INSTALL ADDITIONAL GROUND ROD.
  - 2 PAD TO BE INSTALLED ON FIRM, UNDISTURBED SOIL OR ON 95% COMPACTED BACKFILL.
  - 3 DEVELOPER/CONTRACTOR/CUSTOMER TO TERMINATE DUCTS WITHIN THE 15"-SQUARE AREA.
  - 4 CONTACT KIUC'S ENGINEERING DEPARTMENT FOR ELBOW SIZES.
  - 5. CONCRETE TO HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3000-LB PSI.
  - 6. CHAMFER PERIMETER EDGES TO SLOPE AWAY WATER FROM CABINET.
  - 7. CONCRETE PAD SHALL BE SLOPED 1% (MINIMUM) AWAY FROM EQUIPMENT

1 **KIUC TRANSFORMER PAD DETAIL**  
E-502 NOT TO SCALE



- NOTES:**
- 1. HANDHOLE DESIGNED IN ACCORDANCE WITH KIUC STANDARDS USING 4,000 PSI COMPRESSIVE STRENGTH CONCRETE AND 60,000 PSI YIELD STRENGTH ASTM A-615 STEEL REINFORCEMENT PER CALCS.
  - 2. ALL CONCRETE AND REINFORCED CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH APPLICABLE PROVISIONS OF THE AMERICAN CONCRETE INSTITUTE'S BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-87).
  - 3. HANDHOLE TO BE PLACED ON A 6" BASE OF CRUSHER RUN FOR EASE OF INSTALLATION AND EVEN LOAD DISTRIBUTION.
  - 4. PRODUCT TO BE STENCILED WITH MANUFACTURER NAME AND DATE OF POUR.
  - 5. ORDERING INFORMATION: 2'x4'x34" KIUC FOR ASSEMBLY AS SHOWN. APPROVED FOR KIUC SPECS. TOTAL WEIGHT OF ASSEMBLY SHOWN IS 1230 LBS.

- MATERIAL SCHEDULE**
- 1 TOP SECTION. WT. 400 LBS.
  - 2 BOTTOM SECTION W/KNOCKOUTS. WT. 430 LBS.
  - 3 1/2"Ø x 4" LIFTING HOLE (CONTRACTOR TO GROUT SOLID AFTER PLACEMENT OF SECTION).
  - 4 CONDUIT OPENING KNOCKOUT.
  - 5 CONCRETE COVER.

2 **2' x 4' ELECTRIC HANDHOLE DETAIL**  
E-502 NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED

INSYNERGY ENGINEERING  
MECHANICAL & ELECTRICAL ENGINEERING  
400 Fort Street, Suite 200, Honolulu, Hawaii 96813  
Phone: (808) 521-0777 Fax: (808) 521-0900

GARRET A. MASUDA  
LICENSED PROFESSIONAL ENGINEER  
No. 9756-E  
HAWAII, U.S.A.

EXP. 04-30-2018  
*Garret A. Masuda*  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION  
CHIEF ENGINEER

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2  
ELECTRICAL UPGRADES  
KAUAI, HAWAII

**TRANSFORMER AND  
HANDHOLE DETAILS**

DESIGNED: KH  
DRAWN: KH  
CHECKED: GM  
APPROVED: *Cyly*  
DATE: APR 28 2016

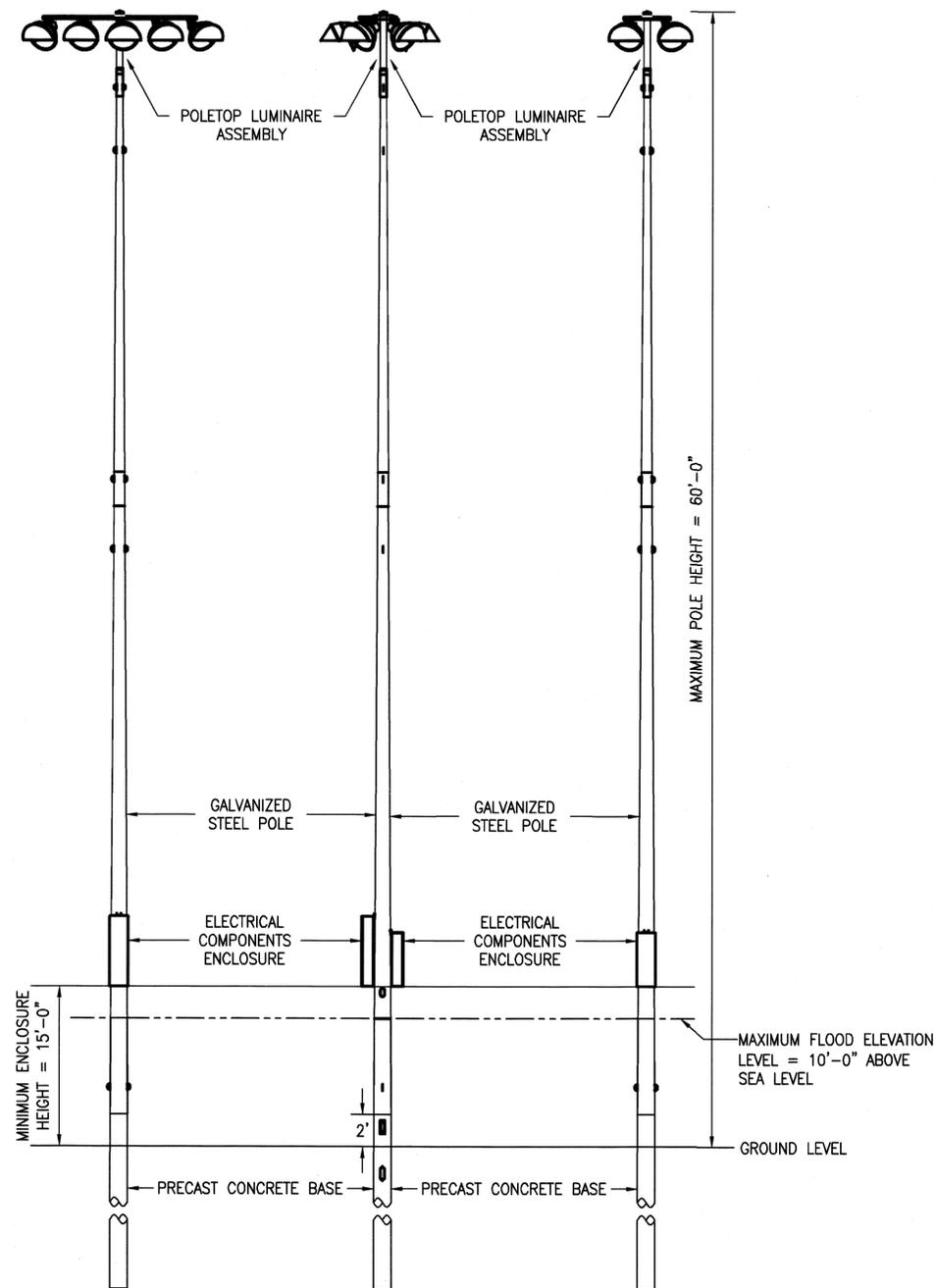
SUBMITTED: *a*  
DATE: APRIL 2016  
SCALE: AS SHOWN

DRAWING NO.  
E-502

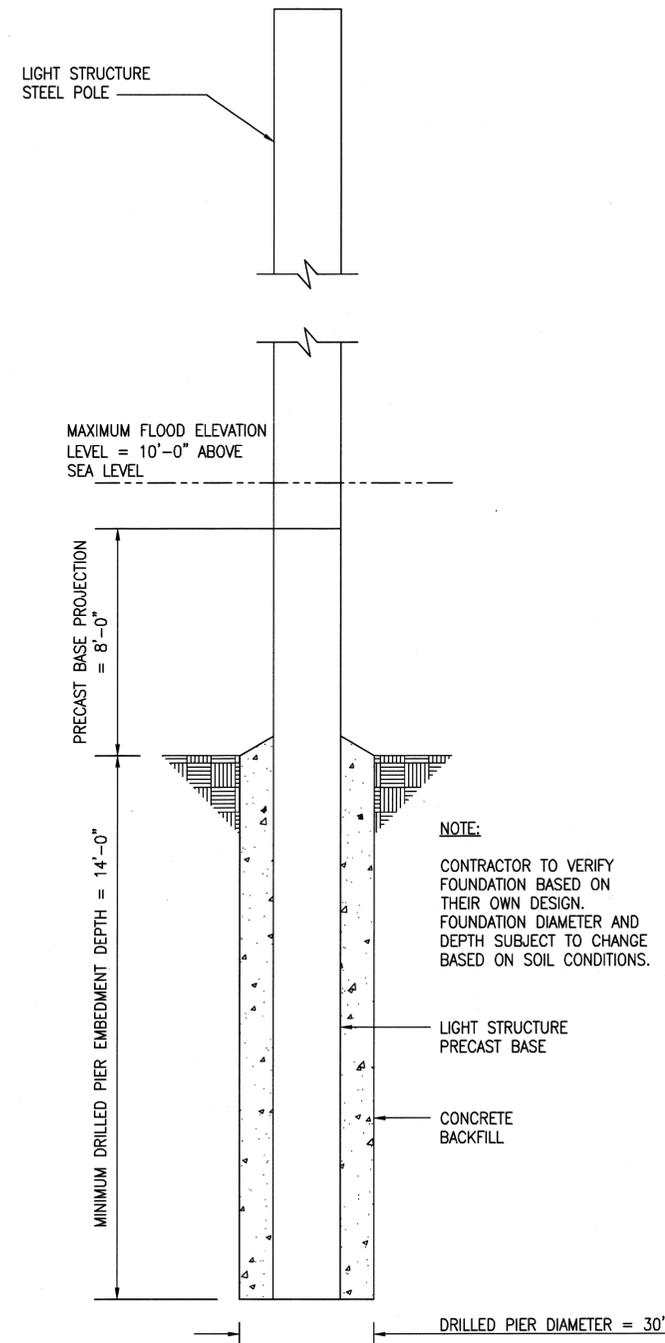
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### LUMINAIRE SCHEDULE

SYMBOL	LAMP	DESCRIPTION	MOUNTING	LUMEN OUTPUT	COLOR TEMPERATURE	BALLAST	VOLTS	INPUT WATTS
	1500W METAL HALIDE	SPORTS FLOODLIGHT WITH SPILL AND GLARE LIGHT CONTROL VISOR	POLE	134,000 LUMENS	4200K	CONSTANT WATTAGE AUTOTRANSFORMER	480V 3P	1564W



**1 LIGHT POLE ELEVATION**  
E-503 NOT TO SCALE



**2 POLE FOUNDATION ELEVATION**  
E-503 NOT TO SCALE

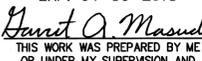
### POLE AND LUMINAIRE SUMMARY

POLE DESIGNATION	MOUNTING HEIGHT	LAMP TYPE	# OF LUMINAIRES PER POLE	TOTAL LOAD (AMPS)
P1	60'-0"	1500W MH	5	18.5
P2 - P6, P10, P11	60'-0"	1500W MH	5	18.5
P7 - P9	60'-0"	1500W MH	5	18.5
P12	60'-0"	1500W MH	4	14.8
P13, P18	60'-0"	1500W MH	4	14.8
P14, P16, P19	60'-0"	1500W MH	4	14.8
P15	60'-0"	1500W MH	4	14.8
P17	60'-0"	1500W MH	4	14.8

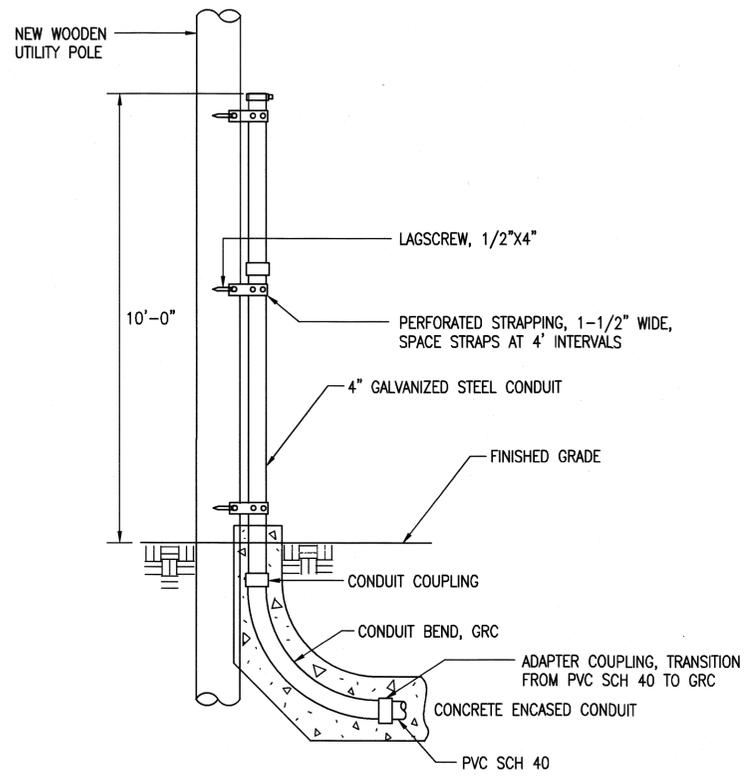
**NOTES:**

1. GEOTECHNICAL INVESTIGATION IS REQUIRED. REFER TO THE SPECIFICATIONS.
2. CONTRACTOR TO DESIGN POLE FOUNDATIONS BASED ON GEOTECHNICAL TESTING. REFER TO THE SPECIFICATIONS.

**NOTE:**  
CONTRACTOR TO VERIFY FOUNDATION BASED ON THEIR OWN DESIGN. FOUNDATION DIAMETER AND DEPTH SUBJECT TO CHANGE BASED ON SOIL CONDITIONS.

REVISION NO.	SYM.	DESCRIPTION	SHT. / OF	DATE	APPROVED
 STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MANA DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII <b>LUMINAIRE, POLE, AND FOUNDATION DETAILS</b>					
DESIGNED:	KH		SUBMITTED:		
DRAWN:	KH		DATE:	APRIL 2016	
CHECKED:	GM		SCALE:	AS SHOWN	
APPROVED:			DATE:	APR 28 2016	
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION			CHIEF ENGINEER	DRAWING NO. <b>E-503</b>	

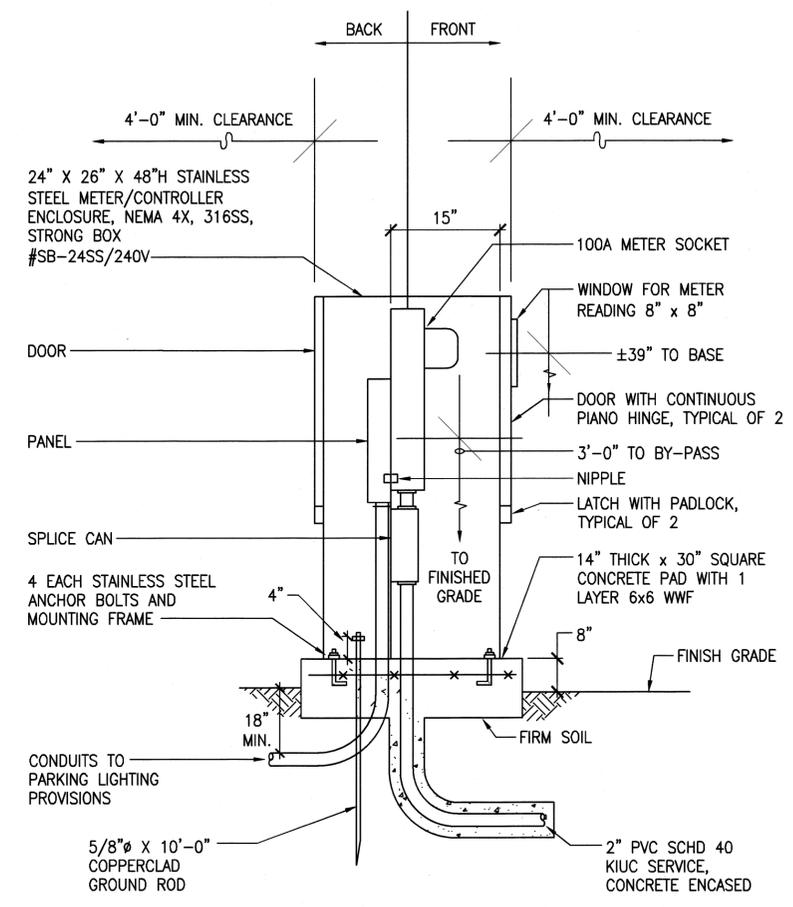
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**NOTES:**

- CONTRACTOR SHALL COORDINATE REQUIREMENTS WITH KIUC.

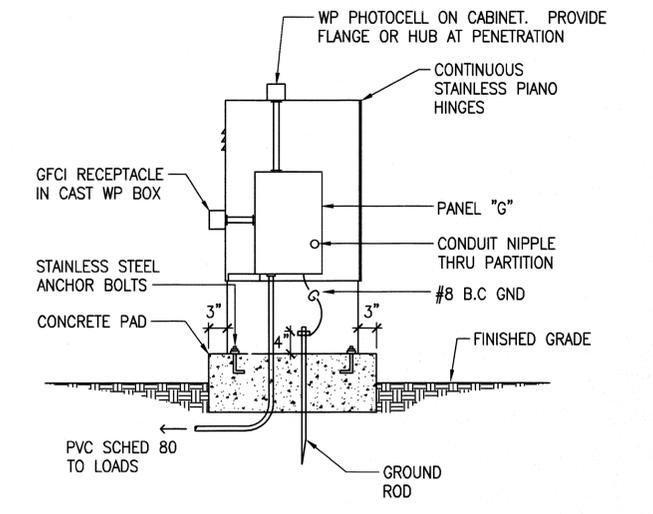
**1 RISER POLE DETAIL**  
E-504 NOT TO SCALE



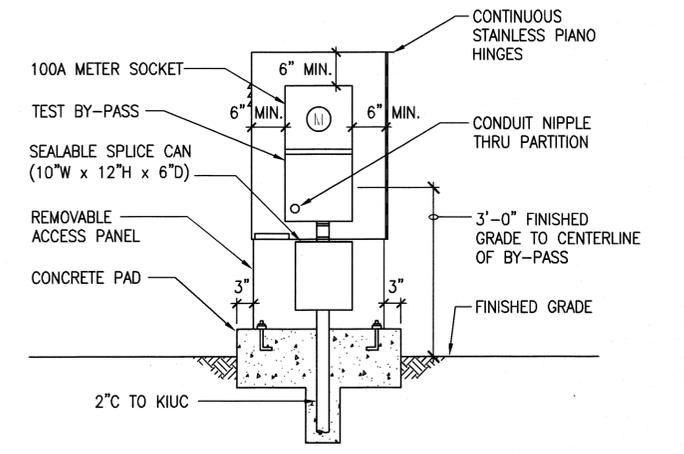
**NOTES:**

- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR APPROVAL BY THE ENGINEER AND KIUC PRIOR TO ORDERING ANY EQUIPMENT.

**2 METER CABINET DETAIL**  
E-504 NOT TO SCALE



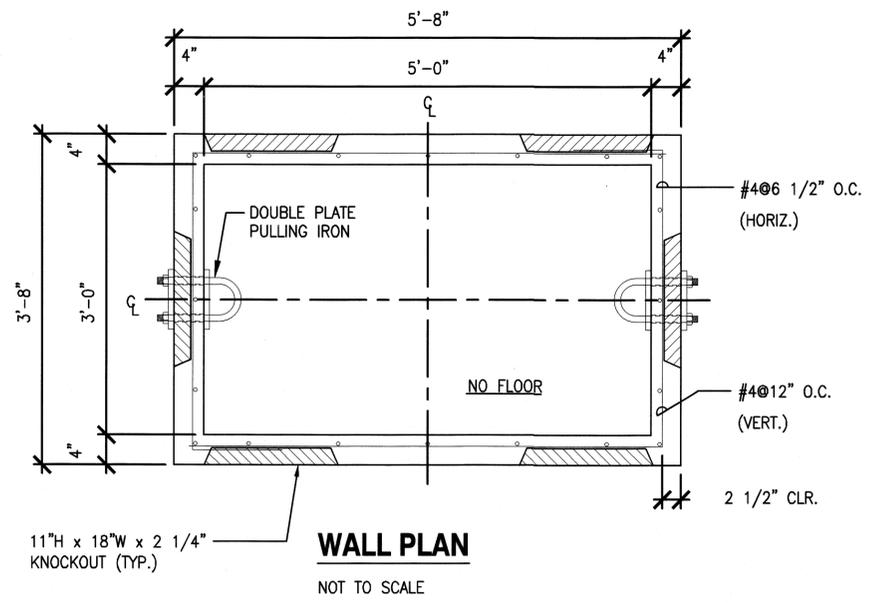
**BACK ELEVATION**  
SCALE: 3/4" = 1'-0"



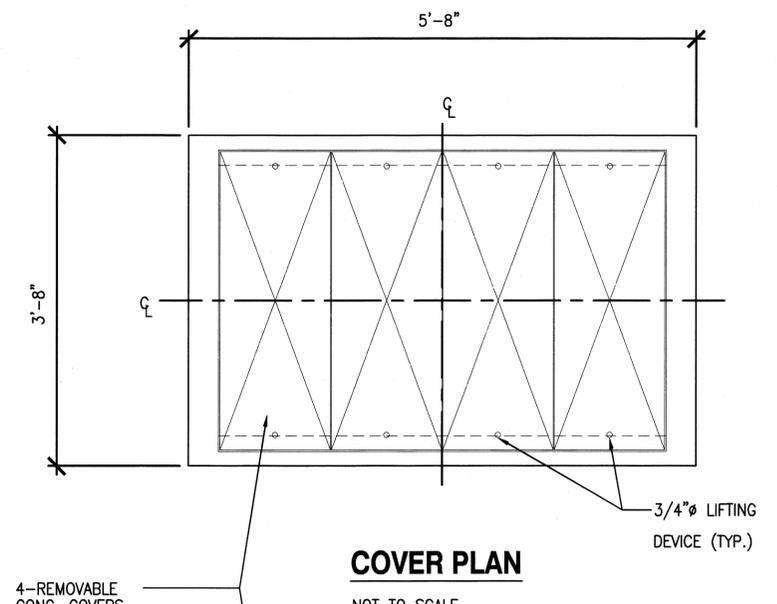
**FRONT ELEVATION**  
SCALE: 3/4" = 1'-0"

REVISION NO.	SYM.	DESCRIPTION	SHT. / OF	DATE	APPROVED
<p><b>INSYNERGY ENGINEERING</b> ELECTRICAL &amp; ELECTRONIC ENGINEERING 488 First Street, Suite 300, Honolulu, Hawaii 96813 Phone: (808) 821-9773 Fax: (808) 821-9909</p> <p><b>GARRET A. MASUDA</b> LICENSED PROFESSIONAL ENGINEER No. 9756-E HAWAII, U.S.A. EXP. 04-30-2018</p> <p>Garret A. Masuda THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION</p>					
<p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p> <p>MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII</p> <p><b>METER ENCLOSURE AND RISER DETAILS</b></p>					
DESIGNED:	KH	SUBMITTED:	[Signature]		
DRAWN:	KH	DATE:	APRIL 2016		
CHECKED:	GM	SCALE:	AS SHOWN		
APPROVED:	[Signature]	DATE:	APR 28 2016		
CHIEF ENGINEER		DRAWING NO.	E-504		

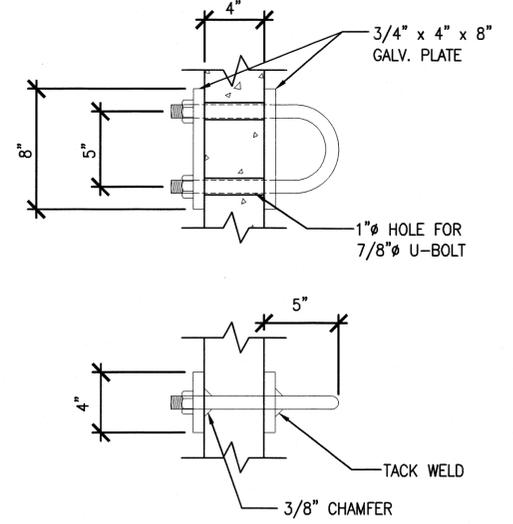
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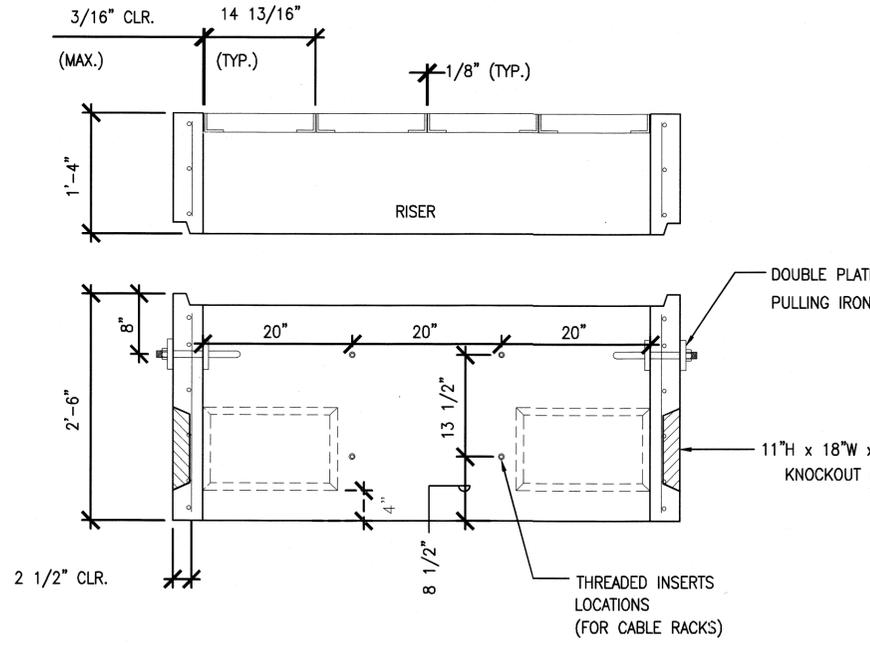
**WALL PLAN**  
NOT TO SCALE



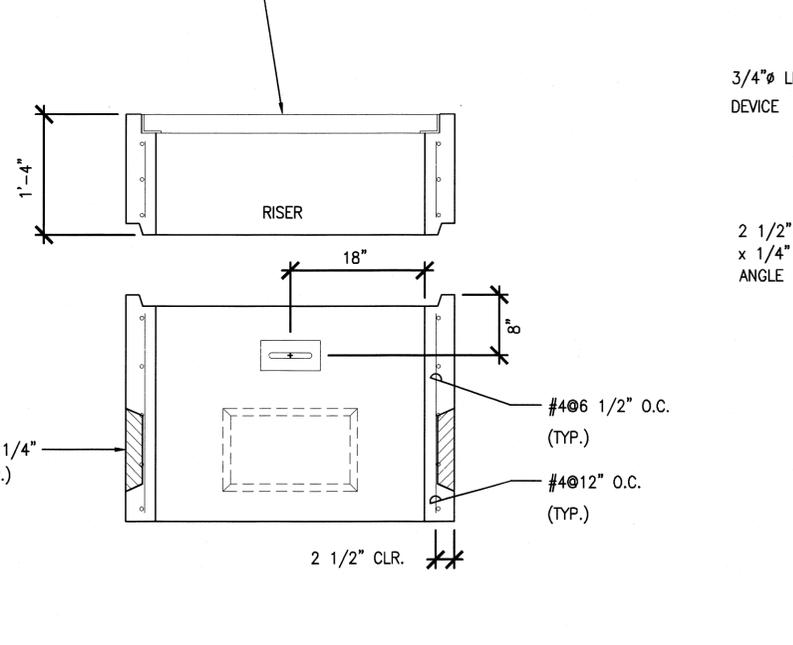
**COVER PLAN**  
NOT TO SCALE



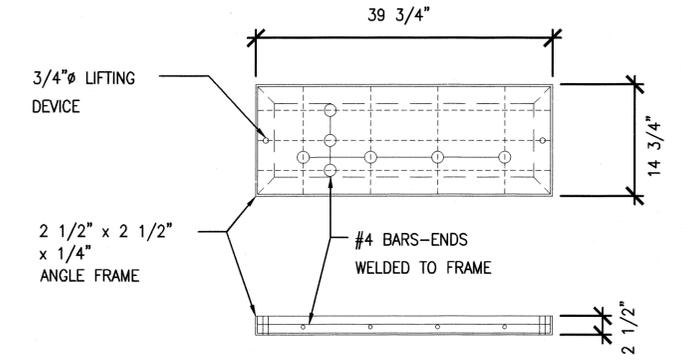
**PULLING IRON DETAILS**  
NOT TO SCALE



**SECTION "A-A"**  
NOT TO SCALE



**SECTION "B-B"**  
NOT TO SCALE

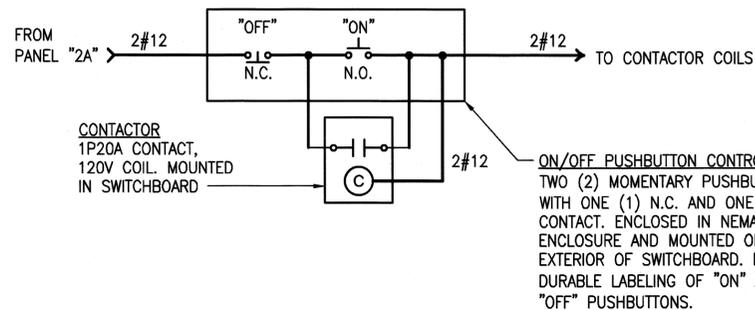
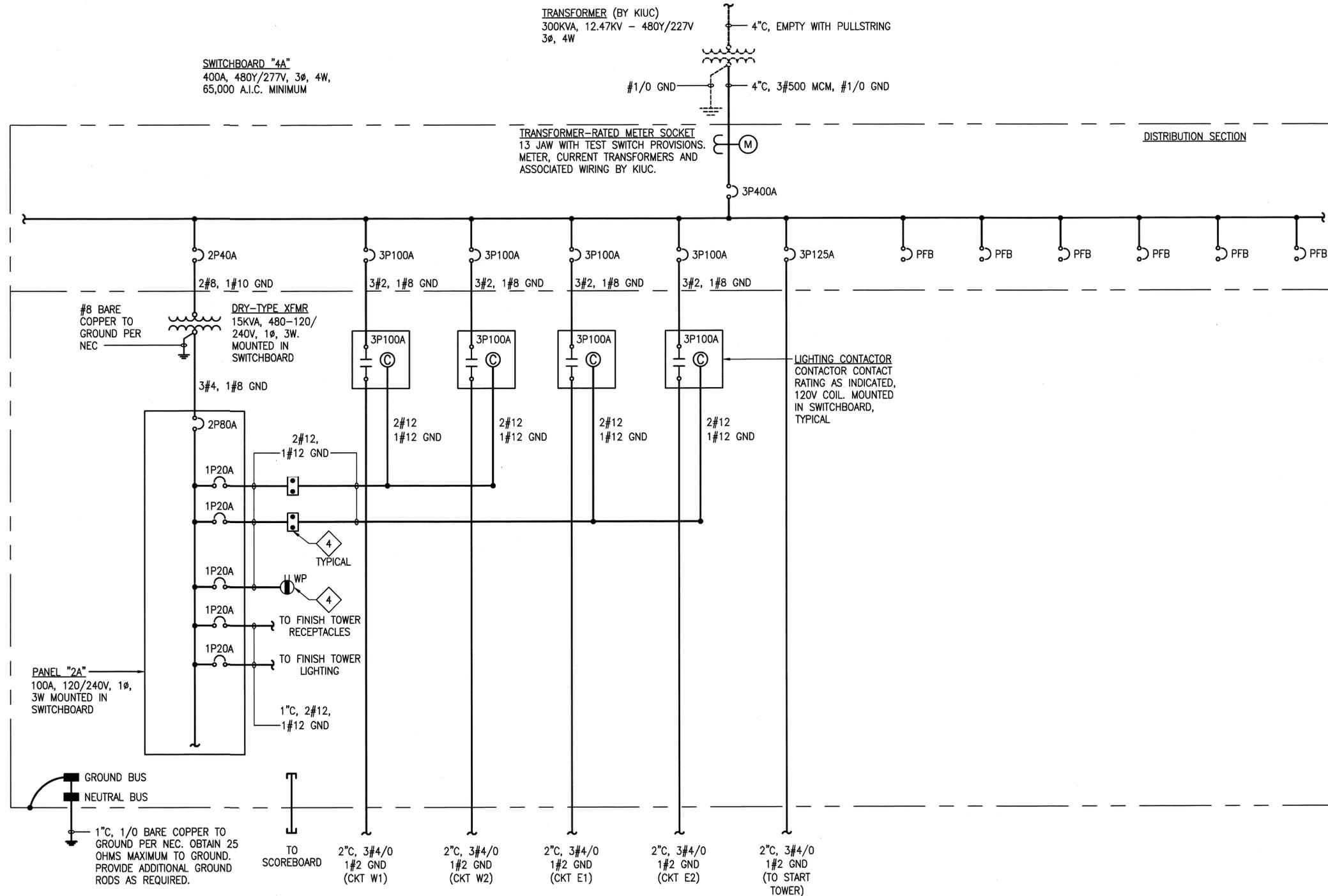


**PULLING IRON DETAILS**  
NOT TO SCALE

**1**  
E505 **3'-0" X 5'-0" KIUC HANDHOLE**  
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
<p>INSYNERGY ENGINEERING MECHANICAL, ELECTRICAL &amp; FIRE PROTECTION 288 Kua'i Road, Suite 200, Honolulu, Hawaii 96814 Phone: (808) 821-9770 Fax: (808) 821-3009</p> <p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII</p> <p><b>3'-0" X 5'-0" KIUC HANDHOLE DETAILS</b></p> <p>DESIGNED: KH SUBMITTED: <i>[Signature]</i> DRAWN: KH DATE: APRIL 2016 CHECKED: CM SCALE: AS SHOWN</p> <p>APP. BY: <i>[Signature]</i> DATE: APR 28 2016 CHIEF ENGINEER</p> <p>EXP. 04-30-2018</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION</p>					
					DRAWING NO. <b>E-505</b>

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**2**  
E601 **PUSH-BUTTON CONTROLS WIRING DIAGRAM**  
NOT TO SCALE

**1**  
E601 **SWITCHBOARD 4A ONE-LINE DIAGRAM - NEW WORK**  
NOT TO SCALE

- NOTES:**
1. PROVIDE LABELLING FOR EACH CIRCUIT BREAKER, PANELBOARD, LIGHTING CONTACTOR AND ON/OFF PUSHBUTTON CONTROLS. LABELLING SHALL CONSIST OF A 0.125 INCH THICK BLACK LAMINATED PLASTIC PLATE WITH WHITE CORE. ENGRAVE MINIMUM 0.25 INCH HIGH LETTERING IN PLATE TO EXPOSE WHITE CORE. SECURE LABEL TO SWITCHBOARD WITH STAINLESS STEEL FASTENERS.
  2. PROVIDE TYPEWRITTEN DIRECTORIES FOR BREAKERS LOCATED IN PANELBOARD.
  3. FOR CONTINUATION OF CIRCUITS, SEE SWITCHBOARD 4A DISTRIBUTION DIAGRAM ON SHEET E-602.
  4. MOUNT DEVICE ON EXTERIOR OF SWITCHBOARD.

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**INSYNERGY ENGINEERING**  
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**GARET A. MASUDA**  
LICENSED PROFESSIONAL ENGINEER  
No. 9756-E  
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EXP. 04-30-2018  
*Garet A. Masuda*  
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STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2  
ELECTRICAL UPGRADES  
KAUAI, HAWAII

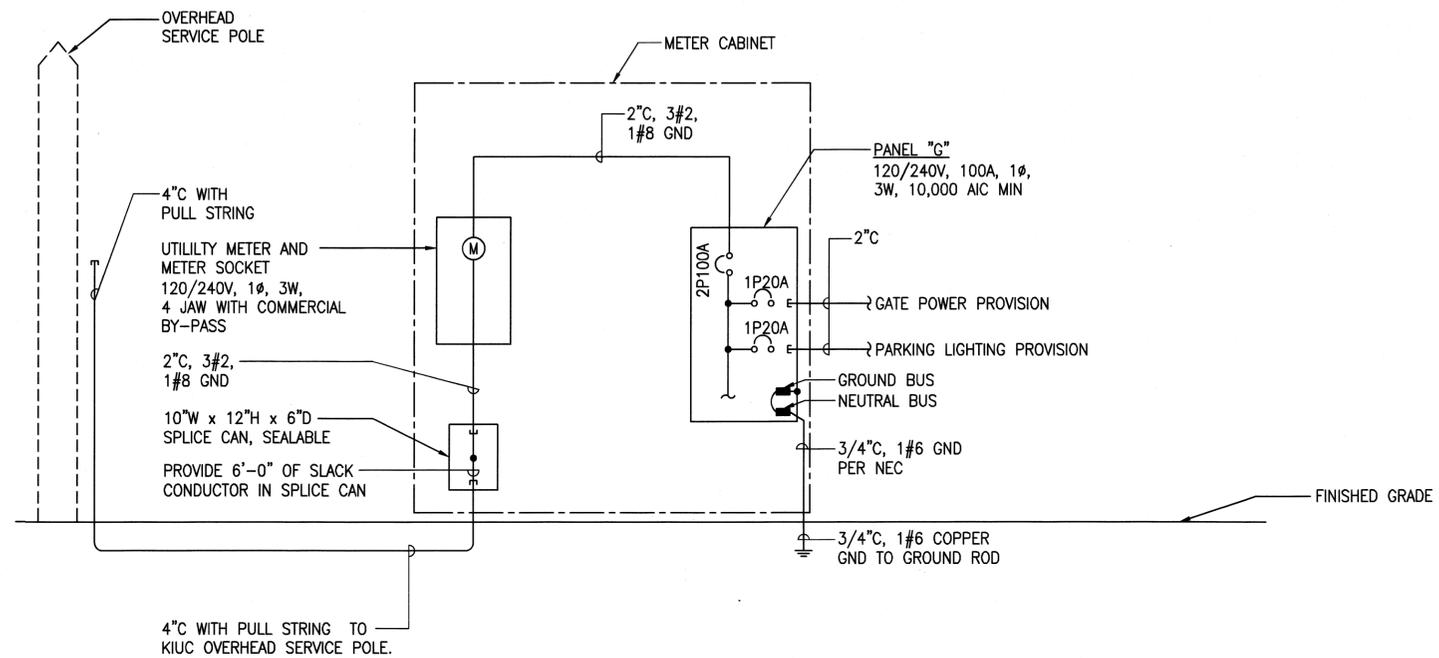
**SWITCHBOARD ONE-LINE DIAGRAM**

DESIGNED: KH  
DRAWN: KH  
CHECKED: GM  
APPROVED: *[Signature]*  
CHIEF ENGINEER

SUBMITTED: *[Signature]*  
DATE: APRIL 2016  
SCALE: AS SHOWN

DRAWING NO.  
**E-601**

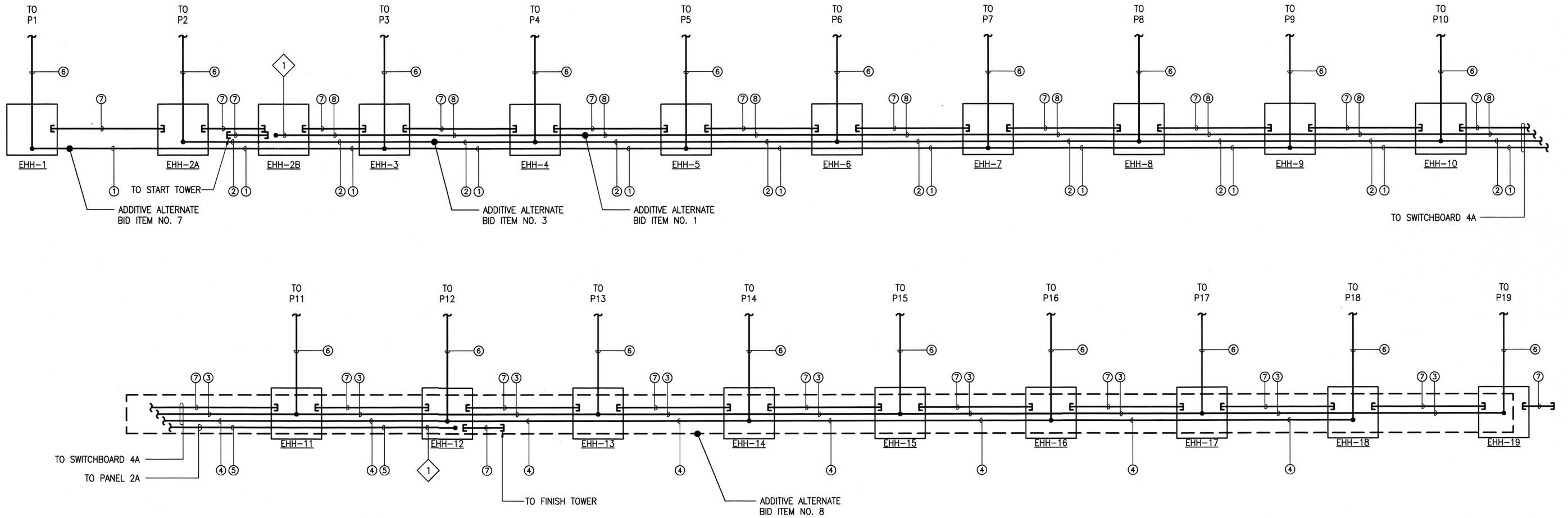
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1 METER CABINET ONE-LINE DIAGRAM  
E602 NOT TO SCALE

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		 STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MANA DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUA'I, HAWAII			
		 LICENSED PROFESSIONAL ENGINEER No. 9756-E HAWAII, U.S.A.			
		METER CABINET ONE-LINE DIAGRAM			
DESIGNED: KH		SUBMITTED: <i>de</i>			
DRAWN: KH		DATE: APRIL 2016			
CHECKED: GM		SCALE: AS SHOWN			
APPROVED:  CHIEF ENGINEER		APR 28 2016 DATE		DRAWING NO. E-602	

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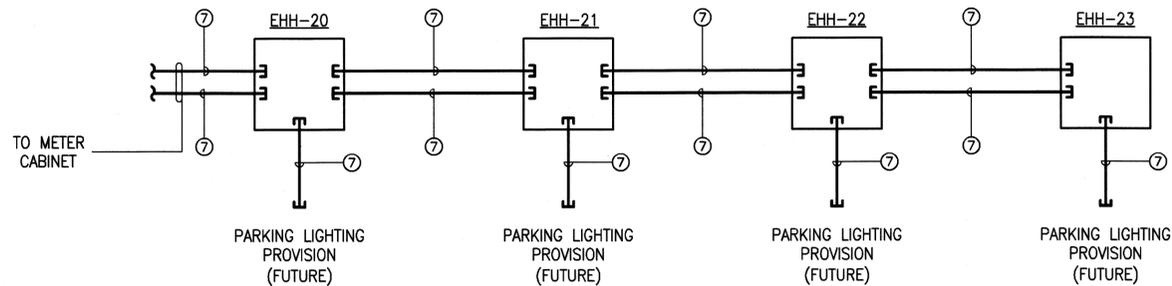


**NOTES:**

- 1 COIL 10' OF SLACK CONDUCTOR INSIDE HANDHOLE.
- 2. ADDITIVE ALTERNATE BID ITEMS ONLY INDICATE WIRING RUNS. SEE E-101 TO E-108 FOR CONDUIT RUN BID ITEMS.

**1 SWITCHBOARD 4A DISTRIBUTION DIAGRAM**  
E603 NOT TO SCALE

SYMBOL LEGEND	
1	CIRCUIT W1
2	CIRCUIT W2
3	CIRCUIT E1
4	CIRCUIT E2
5	FINISH TOWER
6	(1) 1 1/2" C, 3#3, 1#8 GND
7	(1) 2" C WITH PULLSTRING
8	START TOWER
9	NOT USED.
10	NOT USED.



**2 SPECTATOR AREA DISTRIBUTION DIAGRAM**  
E603 NOT TO SCALE

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CHIEF ENGINEER

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2  
ELECTRICAL UPGRADES  
KAUAI, HAWAII

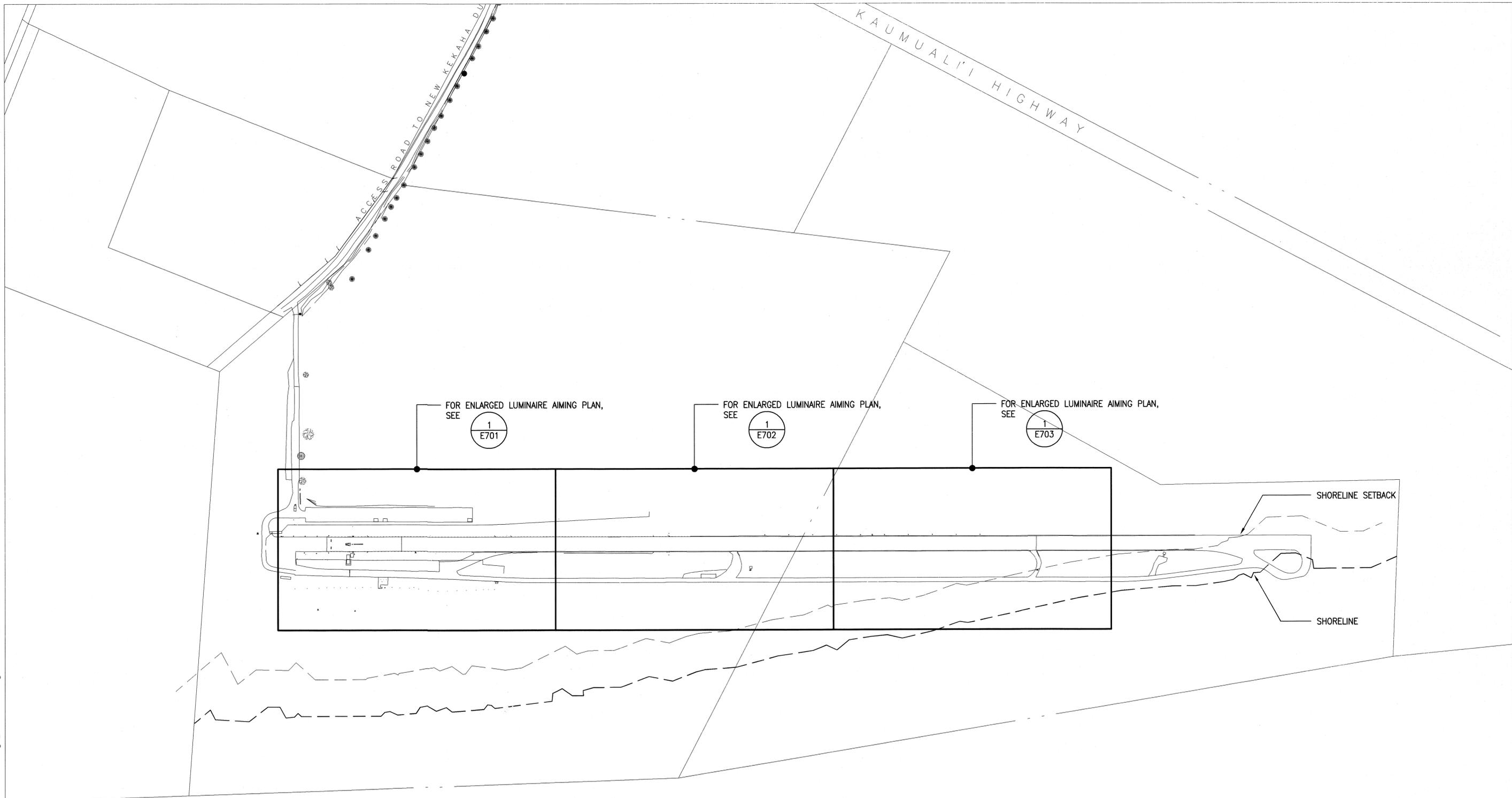
**DISTRIBUTION DIAGRAM**

DESIGNED: KH	SUBMITTED: <i>OK</i>
DRAWN: KH	DATE: APRIL 2016
CHECKED: GM	SCALE: AS SHOWN

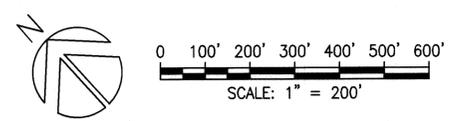
APPROVED: *[Signature]* DATE: APR 28 2016

DRAWING NO: E-603

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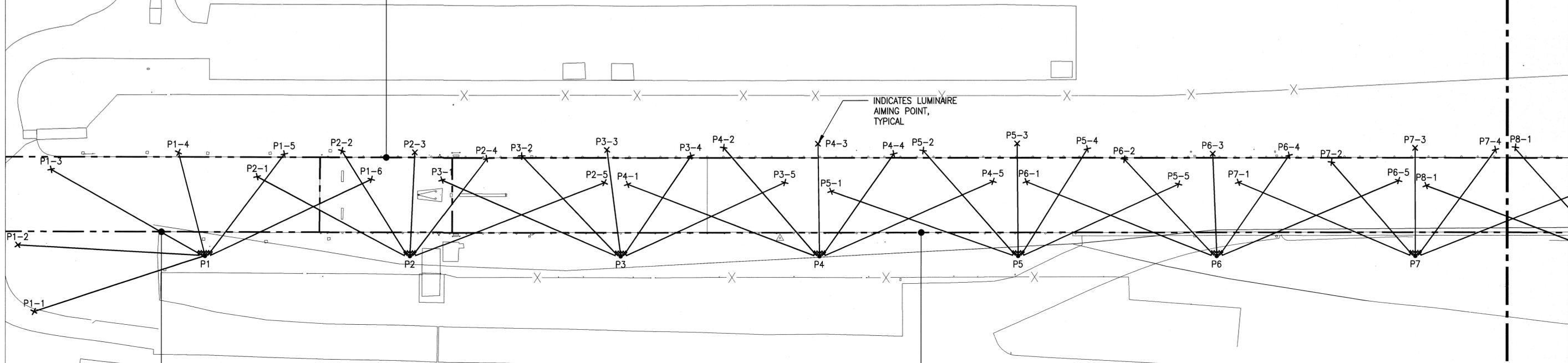
**1** OVERALL LUMINAIRE AIMING PLAN  
E700 SCALE: 1"=200'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. / OF	DATE	APPROVED
<p>STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION</p> <p>MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUAI, HAWAII</p> <p><b>OVERALL LUMINAIRE AIMING PLAN</b></p>					
<p>EXP. 04-30-2018</p> <p><i>Garrett A. Masuda</i> THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION</p>			<p>DESIGNED: KH</p> <p>DRAWN: KH</p> <p>CHECKED: GM</p>	<p>SUBMITTED: <i>[Signature]</i></p> <p>DATE: APRIL 2016</p> <p>SCALE: AS SHOWN</p>	<p>DRAWING NO. E-700</p> <p>DATE: APR 28 2016</p>

**ILLUMINATION SUMMARY -  
BURNOUT ZONE**

HORIZONTAL FOOTCANDLES	
AVERAGE	30.40
MAXIMUM	34
MINIMUM	25
AVERAGE/MINIMUM	1.38
MAXIMUM/MINIMUM	1.27



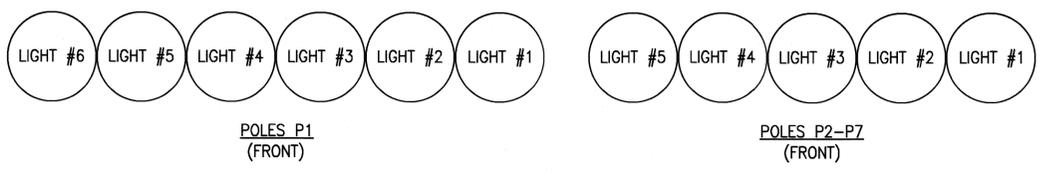
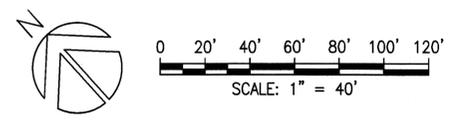
**ILLUMINATION SUMMARY -  
STAGING AREA**

HORIZONTAL FOOTCANDLES	
AVERAGE	15.44
MAXIMUM	30
MINIMUM	2
AVERAGE/MINIMUM	6.45
MAXIMUM/MINIMUM	12.73

**ILLUMINATION SUMMARY -  
1/4 MILE ZONE**

HORIZONTAL FOOTCANDLES	
AVERAGE	32.90
MAXIMUM	40
MINIMUM	23
AVERAGE/MINIMUM	1.42
MAXIMUM/MINIMUM	1.71

**1 LUMINAIRE AIMING PLAN - 1**  
E701 SCALE: 1"=40'-0"



**2 LUMINAIRE AIMING POINTS**  
E701 NOT TO SCALE

- NOTES:**
- CONTRACTOR SHALL COORDINATE LIGHT FIXTURE ARRANGEMENT ON POLES WITH LIGHTING MANUFACTURER.
  - CONTRACTOR SHALL PROVIDE AIMING ANGLES AND COORDINATES IN TABLE FORMAT FOR EACH LUMINAIRE AS PART OF LIGHTING SUBMITTAL.
  - CONTRACTOR SHALL PERFORM COMMISSIONING OF LIGHTING TO VERIFY LIGHTING LEVELS AND AIMING MEET IES REQUIREMENTS.
  - SEE SPEC SECTION 16531 FOR TRACK LIGHTING REQUIREMENTS.

REVISION NO.	SYM.	DESCRIPTION	SHT. / OF	DATE	APPROVED

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LICENSED PROFESSIONAL ENGINEER  
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EXP. 04-30-2018

*Garret A. Masuda*  
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STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2  
ELECTRICAL UPGRADES  
KAUAI, HAWAII

**LUMINAIRE AIMING PLAN - 1**

DESIGNED: KH	SUBMITTED: [Signature]
DRAWN: KH	DATE: APRIL 2016
CHECKED: GM	SCALE: AS SHOWN

APPROVED: *[Signature]* CHIEF ENGINEER DATE: APR 28 2016

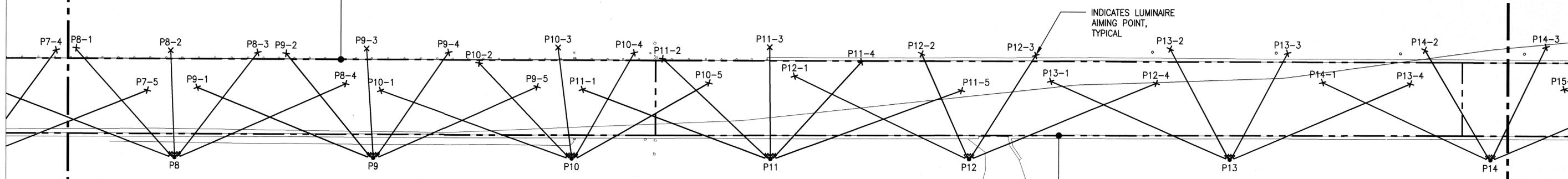
DRAWING NO. E-701

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MATCH LINE  
SEE 17/E701

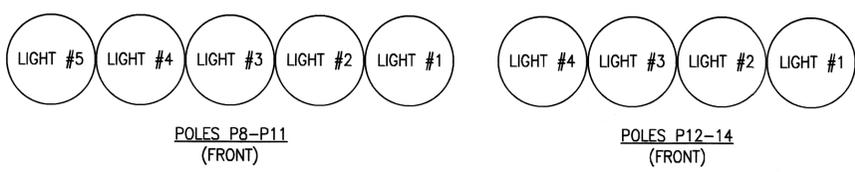
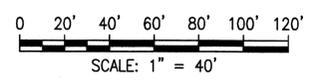
MATCH LINE  
SEE 17/E703

ILLUMINATION SUMMARY - 1/4 MILE ZONE	
	HORIZONTAL FOOTCANDLES
AVERAGE	32.90
MAXIMUM	40
MINIMUM	23
AVERAGE/MINIMUM	1.42
MAXIMUM/MINIMUM	1.71



ILLUMINATION SUMMARY - 1ST DECELERATION ZONE	
	HORIZONTAL FOOTCANDLES
AVERAGE	21.49
MAXIMUM	32
MINIMUM	15
AVERAGE/MINIMUM	1.40
MAXIMUM/MINIMUM	2.08

1  
E702 LUMINAIRE AIMING PLAN - 2  
SCALE: 1" = 40'-0"



2  
E702 LUMINAIRE AIMING POINTS  
NOT TO SCALE

- NOTES:
- CONTRACTOR SHALL COORDINATE LIGHT FIXTURE ARRANGEMENT ON POLES WITH LIGHTING MANUFACTURER.
  - CONTRACTOR SHALL PROVIDE AIMING ANGLES AND COORDINATES IN TABLE FORMAT FOR EACH LUMINAIRE AS PART OF LIGHTING SUBMITTAL.
  - CONTRACTOR SHALL PERFORM COMMISSIONING OF LIGHTING TO VERIFY LIGHTING LEVELS AND AIMING MEET IES REQUIREMENTS.
  - SEE SPEC SECTION 16531 FOR TRACK LIGHTING REQUIREMENTS.

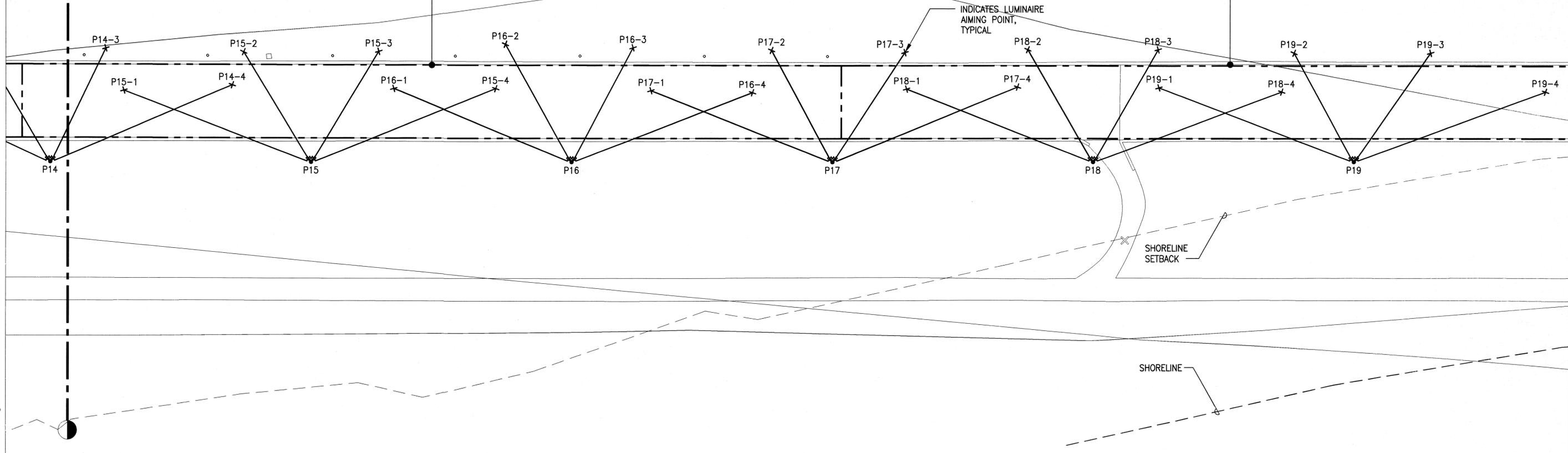
REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUA'I, HAWAII					
LUMINAIRE AIMING PLAN - 2					
DESIGNED:	KH	SUBMITTED:	[Signature]		
DRAWN:	KH	DATE:	APRIL 2016		
CHECKED:	GM	SCALE:	AS SHOWN		
APPROVED:	 Garret A. Masuda LICENSED PROFESSIONAL ENGINEER No. 9756-E HAWAII, U.S.A. EXP. 04-30-2018		THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION	DRAWING NO.	E-702
		DATE:	APR 28 2016		

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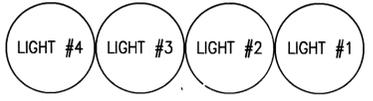
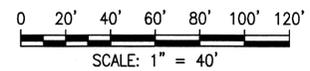
MATCH LINE  
SEE 17 E702

ILLUMINATION SUMMARY - 2ND DECELERATION ZONE	
	HORIZONTAL FOOTCANDLES
AVERAGE	17.54
MAXIMUM	21
MINIMUM	13
AVERAGE/MINIMUM	1.37
MAXIMUM/MINIMUM	1.61

ILLUMINATION SUMMARY - SHUTDOWN ZONE	
	HORIZONTAL FOOTCANDLES
AVERAGE	6.66
MAXIMUM	21
MINIMUM	3
AVERAGE/MINIMUM	2.22
MAXIMUM/MINIMUM	7



1 LUMINAIRE AIMING PLAN - 3  
E703 SCALE: 1"=40'-0"



POLES P15-19  
(FRONT)

2 LUMINAIRE AIMING POINTS  
E703 NOT TO SCALE

- NOTES:**
- CONTRACTOR SHALL COORDINATE LIGHT FIXTURE ARRANGEMENT ON POLES WITH LIGHTING MANUFACTURER.
  - CONTRACTOR SHALL PROVIDE AIMING ANGLES AND COORDINATES IN TABLE FORMAT FOR EACH LUMINAIRE AS PART OF LIGHTING SUBMITTAL.
  - CONTRACTOR SHALL PERFORM COMMISSIONING OF LIGHTING TO VERIFY LIGHTING LEVELS AND AIMING MEET IES REQUIREMENTS.
  - SEE SPEC SECTION 16531 FOR TRACK LIGHTING REQUIREMENTS.

REVISION NO.	SYM.	DESCRIPTION	SHT./OF	DATE	APPROVED
STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES ENGINEERING DIVISION MĀNĀ DRAG RACING STRIP IMPROVEMENTS PHASE 2 ELECTRICAL UPGRADES KAUA'I, HAWA'I					
<b>LUMINAIRE AIMING PLAN - 3</b>					
DESIGNED:	KH	SUBMITTED:			
DRAWN:	KH	DATE:	APRIL 2016		
CHECKED:	GM	SCALE:	AS SHOWN		
		EXP. 04-30-2018 THE WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION		APPROVED:  CHIEF ENGINEER	
		APR 28 2016 DATE		DRAWING NO. <b>E-703</b>	

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