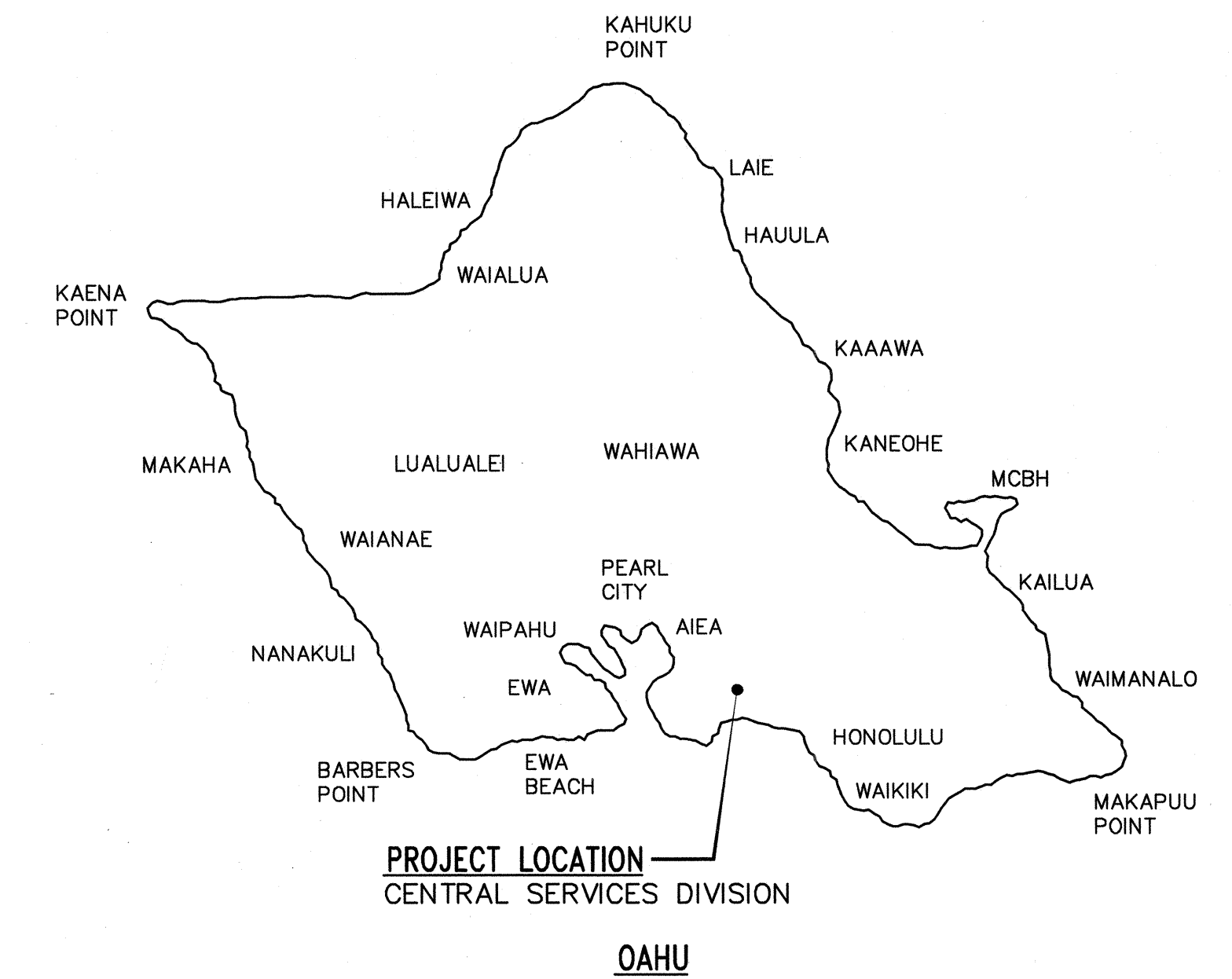


INDEX OF DRAWINGS	
SHEET NO.	SHEET TITLE
T-1	TITLE SHEET, INDEX TO DRAWINGS, VICINITY MAP, AND LOCATION MAP
A-1	BUILDING NO. 5 OVERALL ROOF AND PARTIAL ROOF PLAN
A-2	MISCELLANEOUS DETAILS
E-1	ELECTRICAL SYMBOLS AND GENERAL NOTES
E-2	ELECTRICAL SITE PLAN
E-3	ELECTRICAL PLAN I
E-4	ELECTRICAL PLAN II
E-5	ROOF PLAN
E-6	NEW ONE-LINE DIAGRAM
E-7	PHOTOVOLTAIC THREE-LINE DIAGRAM I
E-8	PHOTOVOLTAIC THREE-LINE DIAGRAM II
E-9	MISCELLANEOUS DETAILS
E-10	ELEVATION AND PANEL SCHEDULE

CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM

DAGS JOB NO.: 52-10-0642

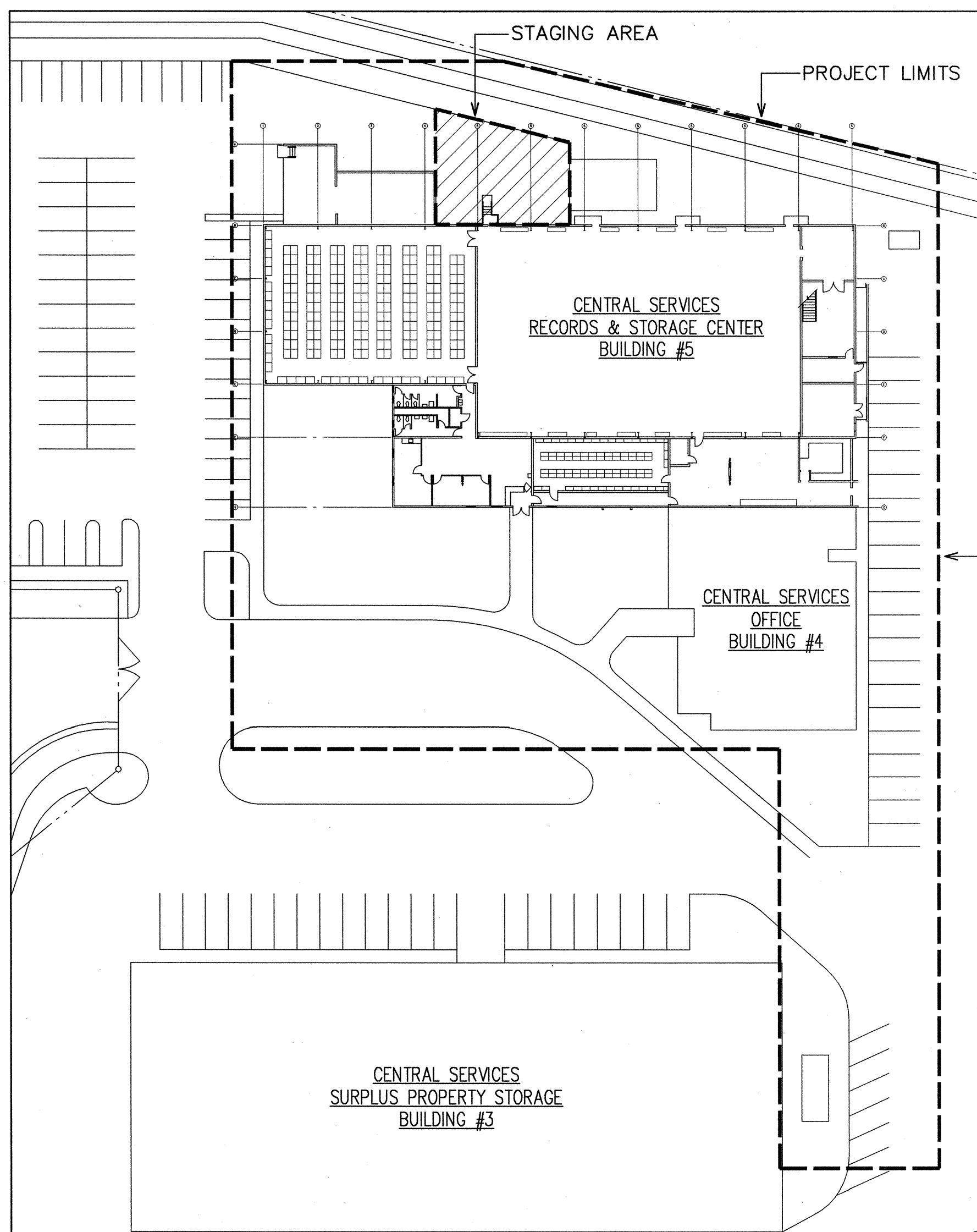
T.M.K.: 8-5-02:42



FOR THE: DEPARTMENT OF ACCOUNTING & GENERAL SERVICES
CENTRAL SERVICES DIVISION
STATE OF HAWAII

BY THE: DEPARTMENT OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

ELECTRICAL ENGINEER: RONALD N.S. HO AND ASSOCIATES, INC.
ARCHITECT: ARCHITECTS PACIFIC, INC.
STRUCTURAL ENGINEER: SHIGEMURA, LAU, SAKANASHI, HIGUCHI AND ASSOCIATES, INC.
ENVIRONMENTAL ENGINEER: MURANAKA ENVIRONMENTAL CONSULTANTS, INC.



PROJECT SITE
CENTRAL SERVICES DIVISION
729 KAKOI ST.
HONOLULU, OAHU, HAWAII



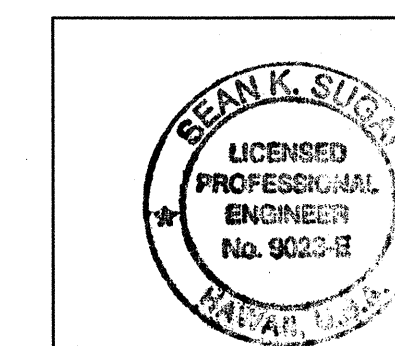
APPROVALS

Russ K. Saiki 9/27/10
COMPTROLLER DEPARTMENT OF ACCOUNTING & GENERAL SERVICES STATE OF HAWAII DATE

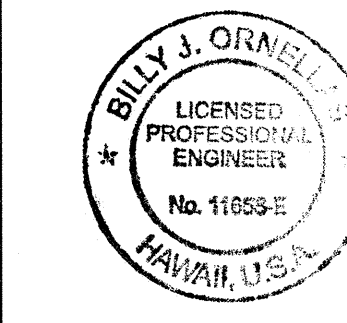
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CHIEF, CENTRAL SERVICES DIVISION DEPARTMENT OF ACCOUNTING & GENERAL SERVICES STATE OF HAWAII DATE

[Signature] 9/23/10
PUBLIC WORKS ADMINISTRATOR DEPARTMENT OF ACCOUNTING & GENERAL SERVICES STATE OF HAWAII DATE

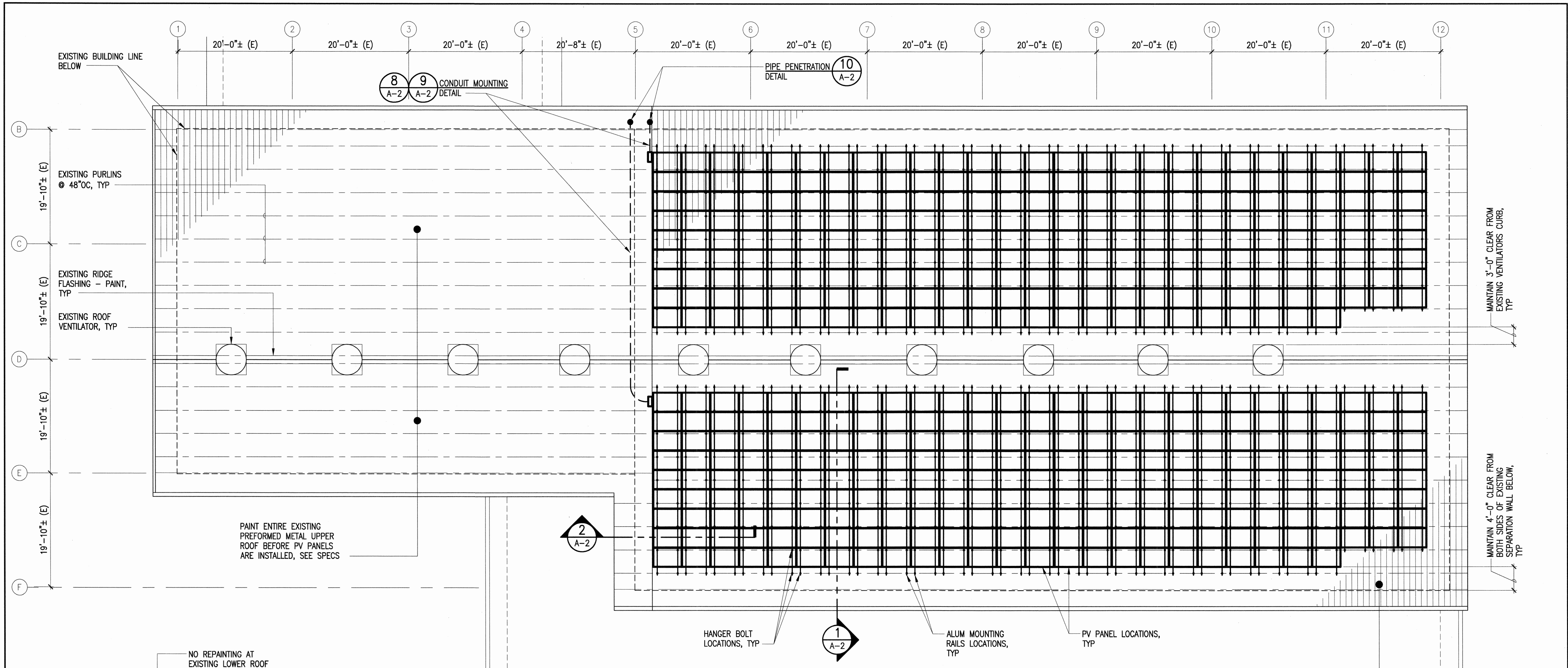
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DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII					
CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM					
HONOLULU		OAHU		HAWAII	
TITLE SHEET, INDEX OF DRAWINGS, VICINITY MAP AND LOCATION MAP					
RONALD N. S. HO & ASSOCIATES		DAGS JOB NO.		DRAWING NO.	
DESIGNED BY: LJK	CHECKED BY: BO	52-10-0642	T-1		
DRAWN BY: CAD	APPROVED BY: SKS	DATE	SHEET		
SCALE: AS SHOWN	SEP 2010	1 OF 13 SHTS			



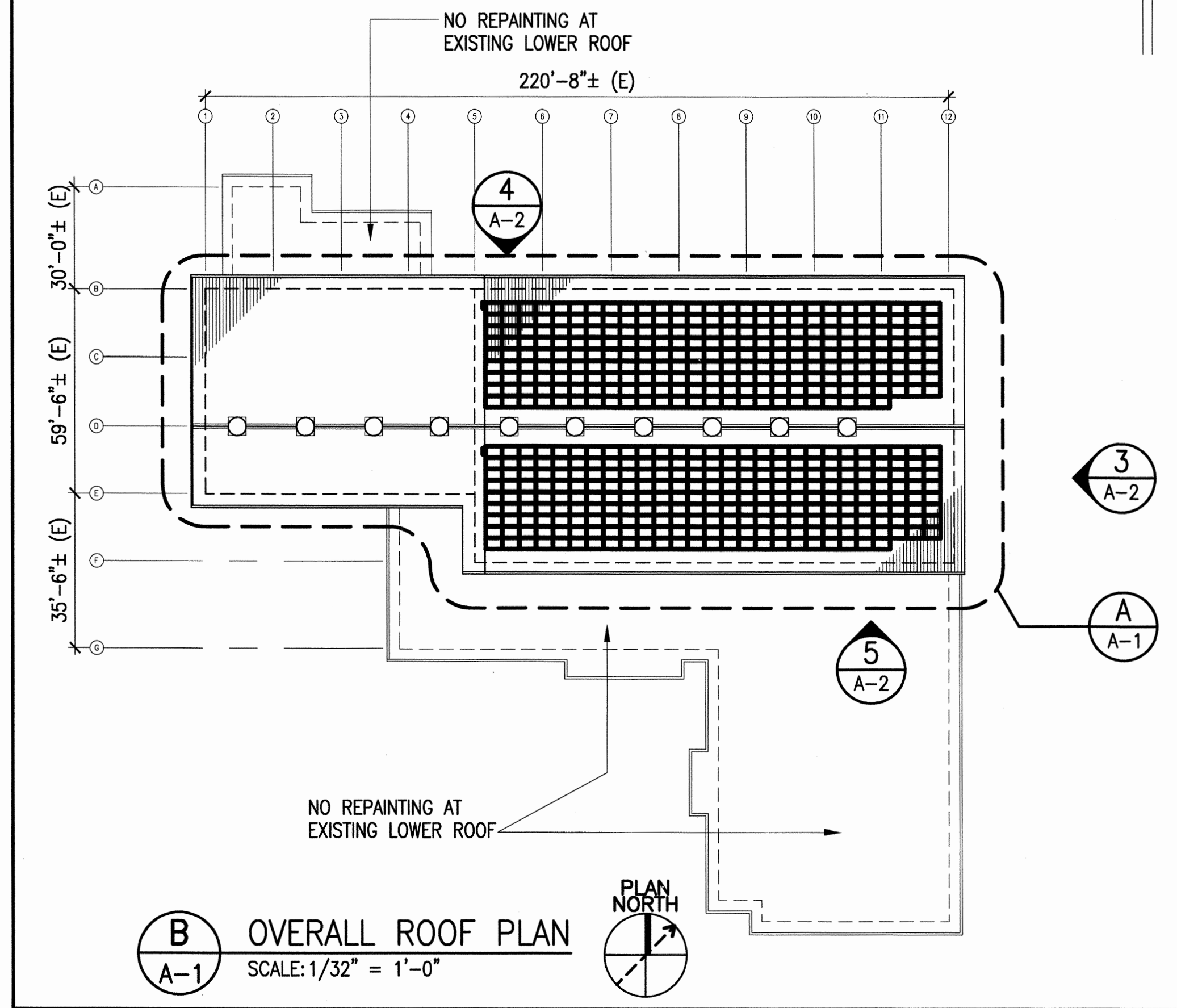
PRINCIPAL-IN-CHARGE
RONALD N. S. HO & ASSOC., INC.
Electrical Engineers
Expiration Date: 4/30/12



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9/23/10 4-30-12 EXP. DATE

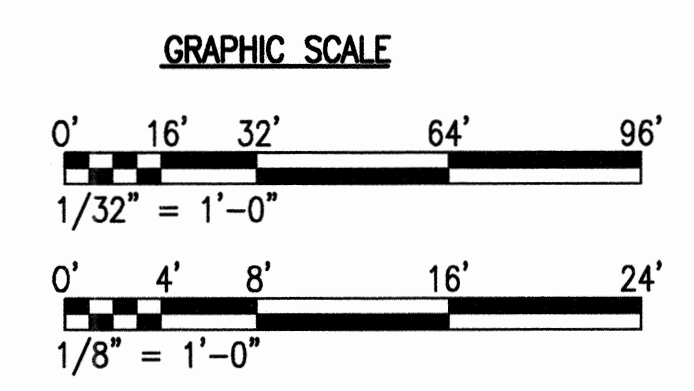


A PARTIAL ENLARGED ROOF PLAN
 SCALE: 1/8" = 1'-0"



B OVERALL ROOF PLAN
 SCALE: 1/32" = 1'-0"

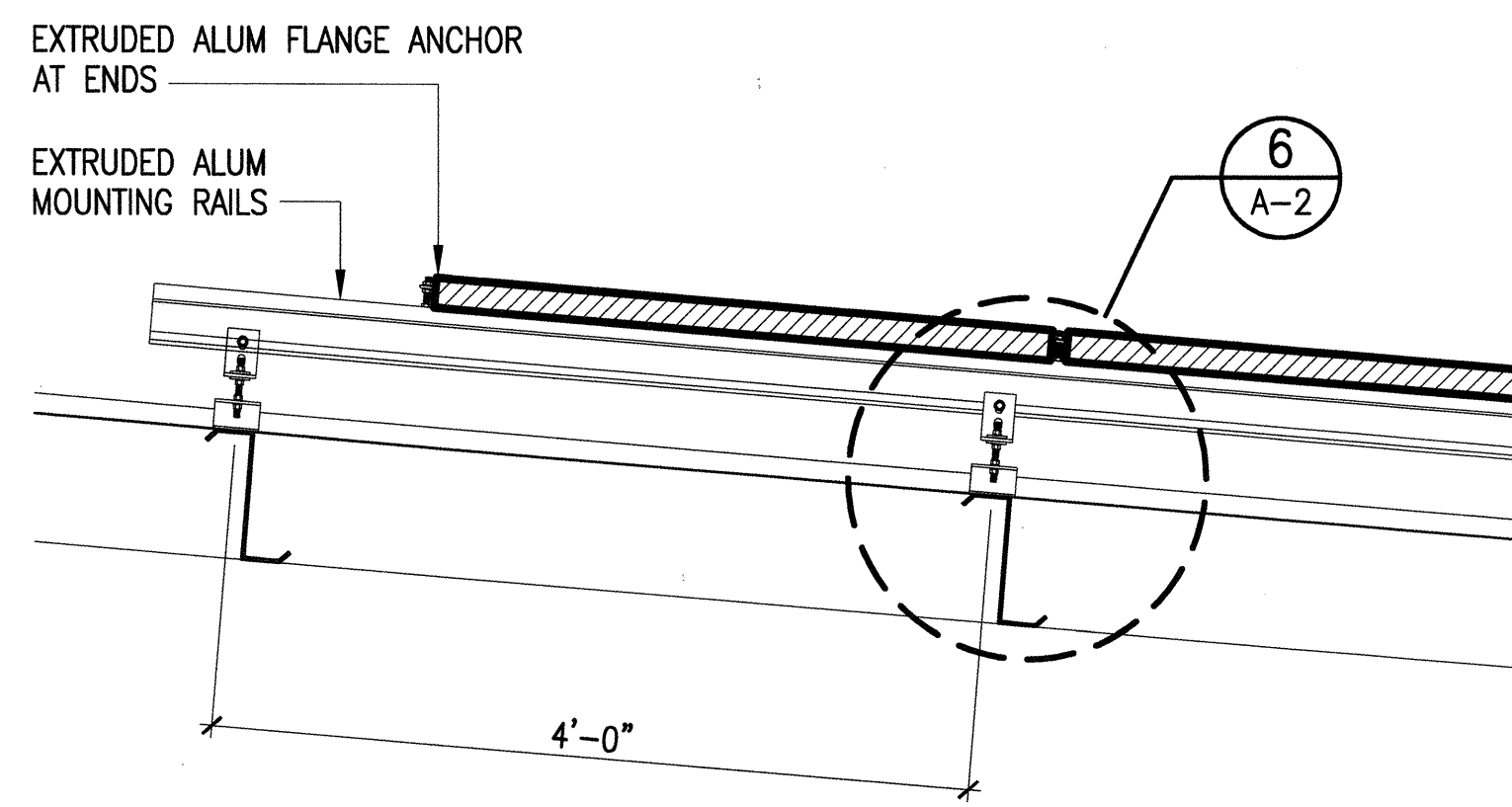
- NOTES:**
1. INCLUDE COST TO PROVIDE AND REPLACE EXISTING METAL ROOFING FASTENERS THAT ARE MISSING AND CORRODED. SEE SPEC SECTION 01270-VARIABLE QUANTITY UNIT PRICES.
 2. EXISTING ROOF REPAINT FINISH COLOR SHALL BE WHITE UNLESS INSTRUCTED OTHERWISE BY THE STATE.



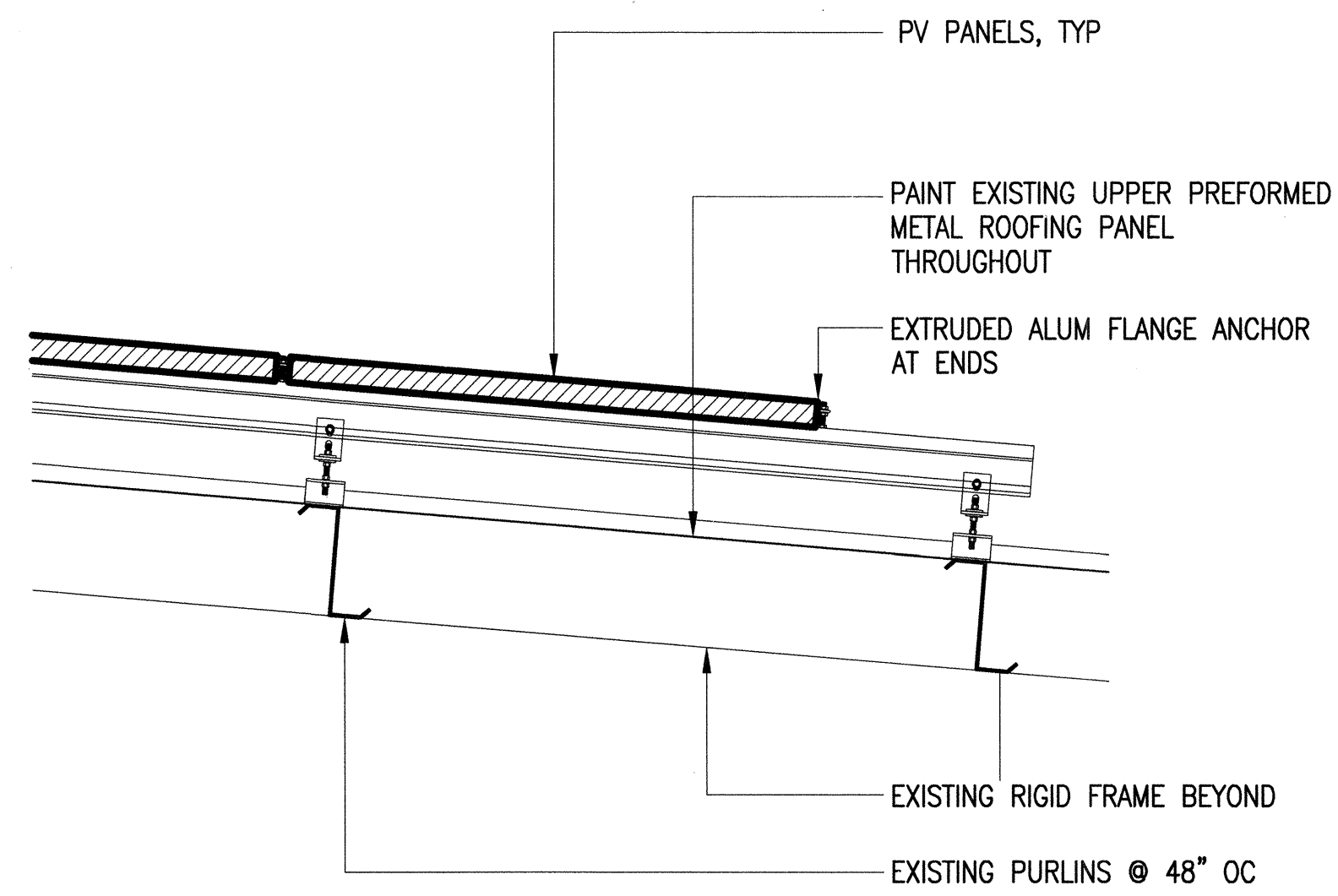
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					DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII
					CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM
					HONOLULU OAHU HAWAII
					BUILDING NO 5 OVERALL ROOF AND PARTIAL ENLARGED ROOF PLAN
DESIGNED BY: NV	CHECKED BY: CN	DAGS JOB NO: 52-10-0642	DRAWING NO: A-1		
DRAWN BY: NV	APPROVED BY: JA	DATE: SEP 2010	SHEET 2 OF 13 SHTS		
SCALE: AS SHOWN					FILE: DRAWER: FOLDER:



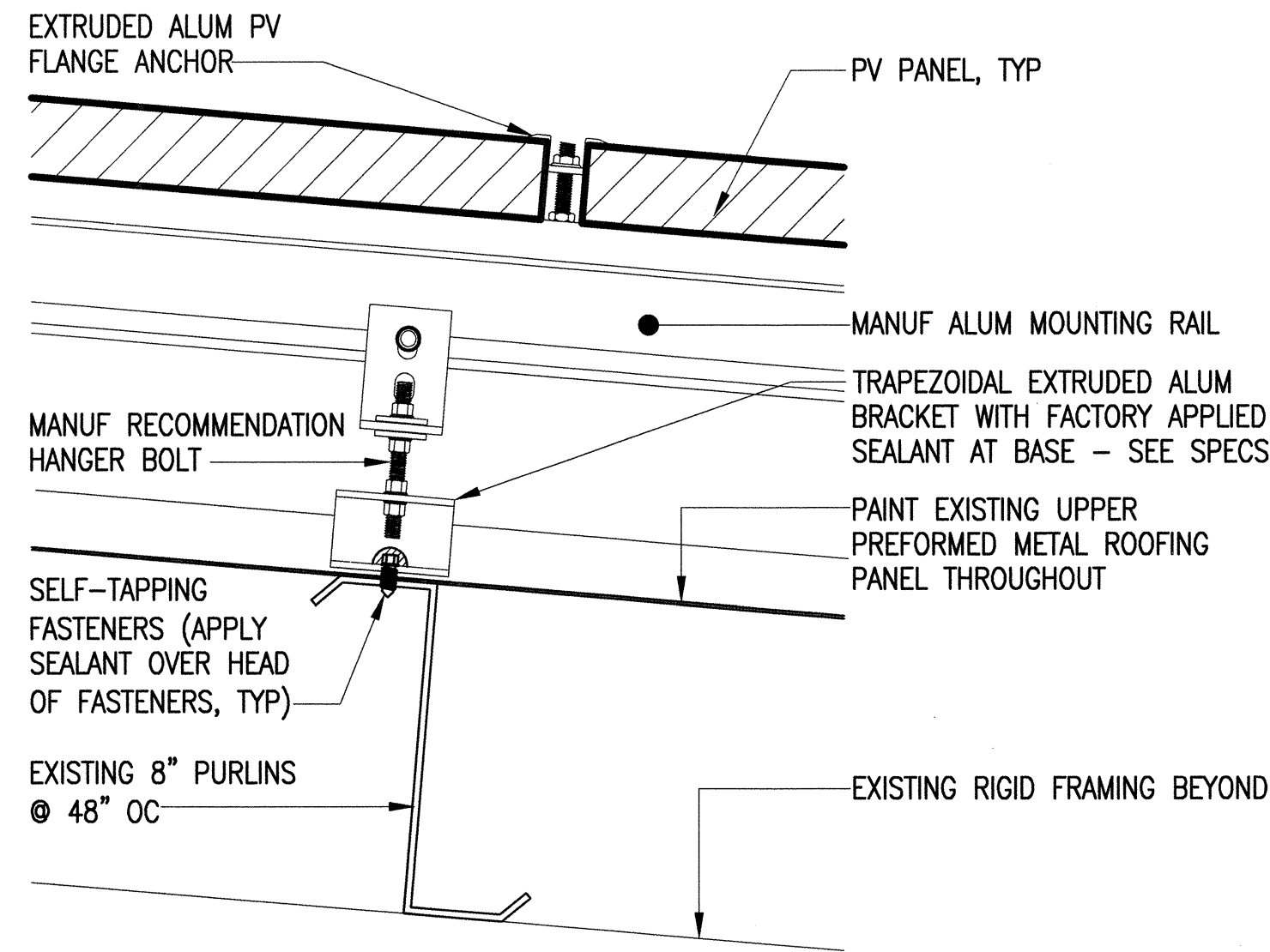
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 EXP. DATE: 10-30-12



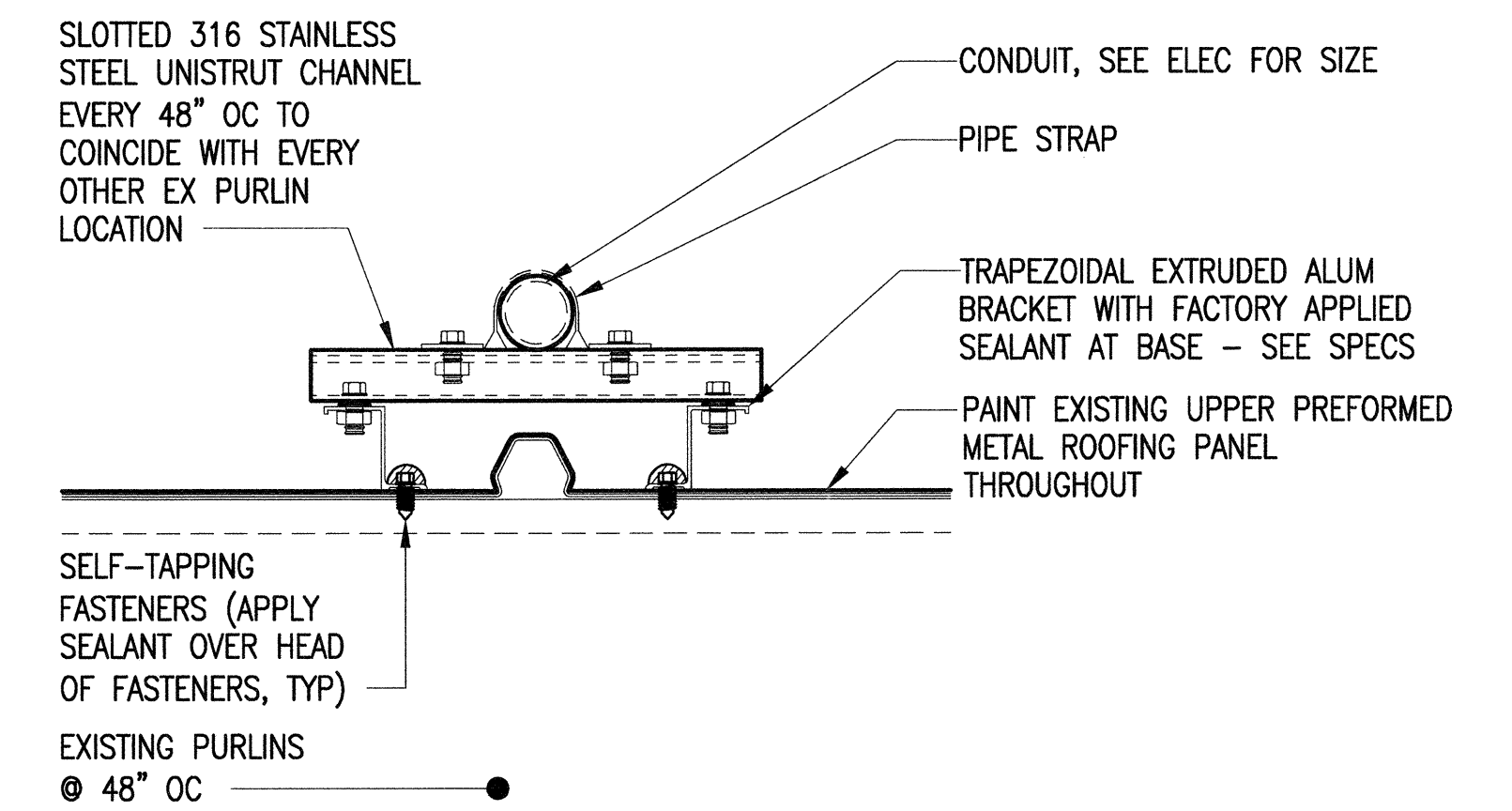
1 PV PANEL MOUNTING DETAIL
A-2 SCALE: 1" = 1'-0"



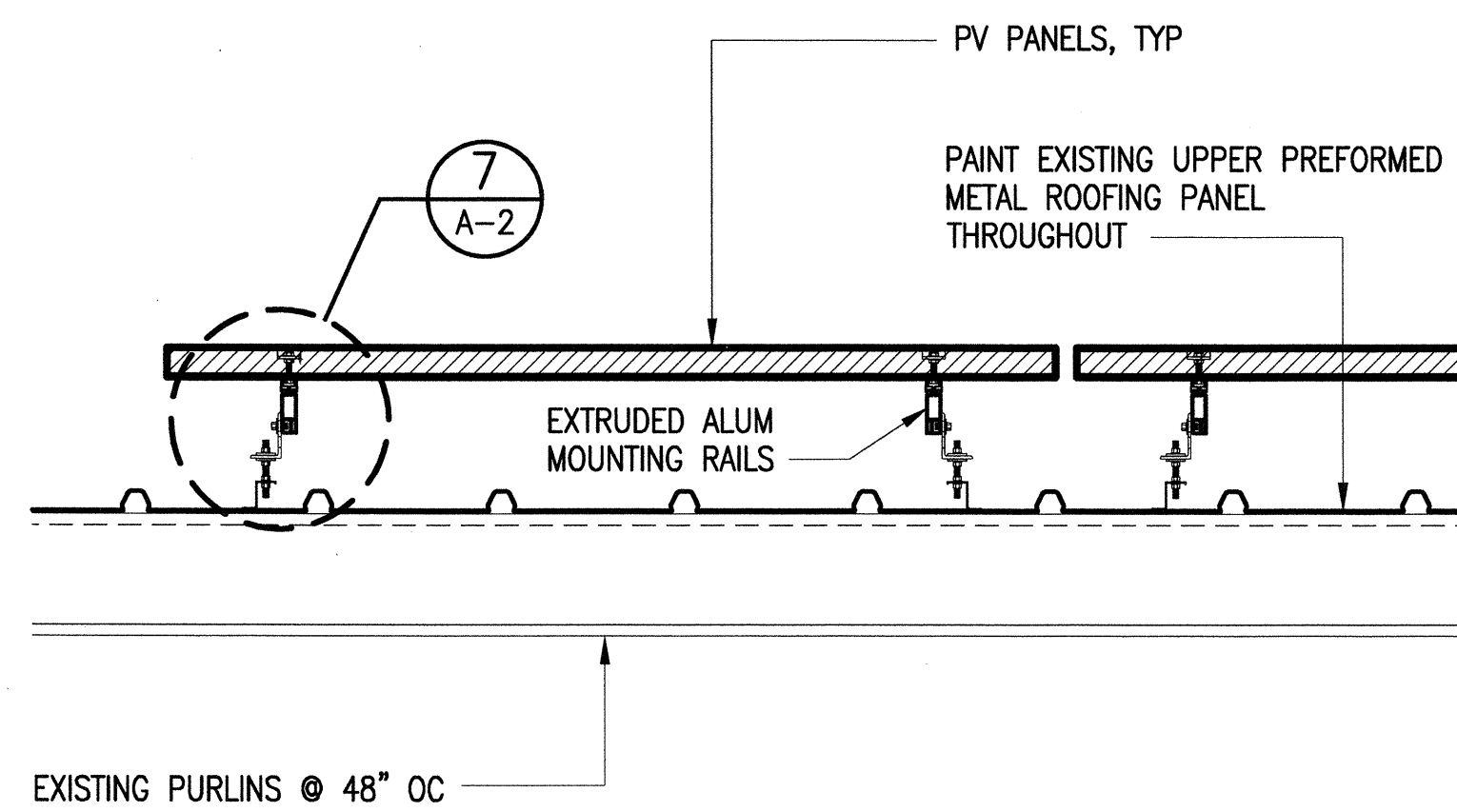
6 PV MOUNTING DETAIL
A-2 SCALE: 3" = 1'-0"



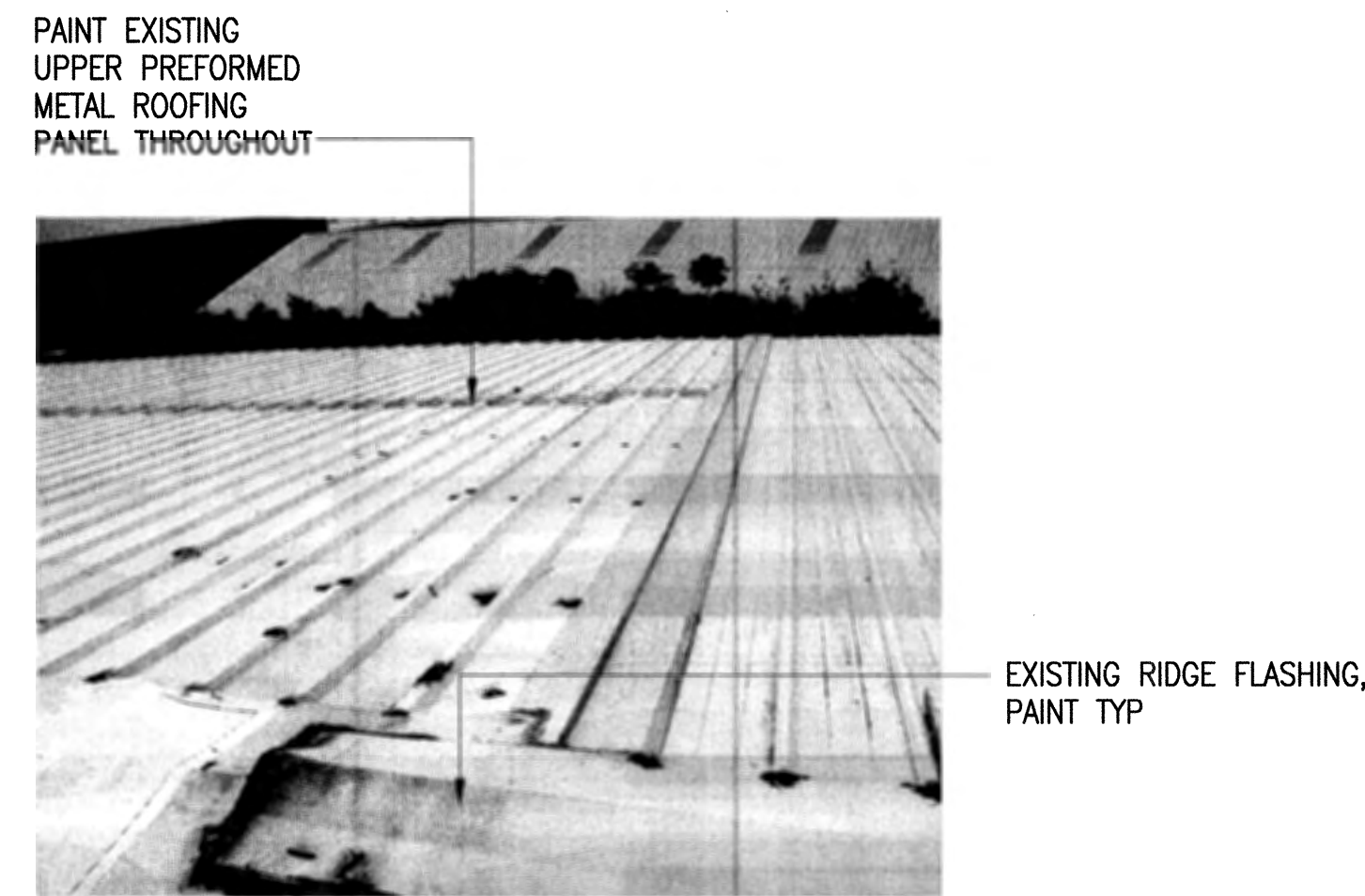
7 PV MOUNTING DETAIL
A-2 SCALE: 3" = 1'-0"



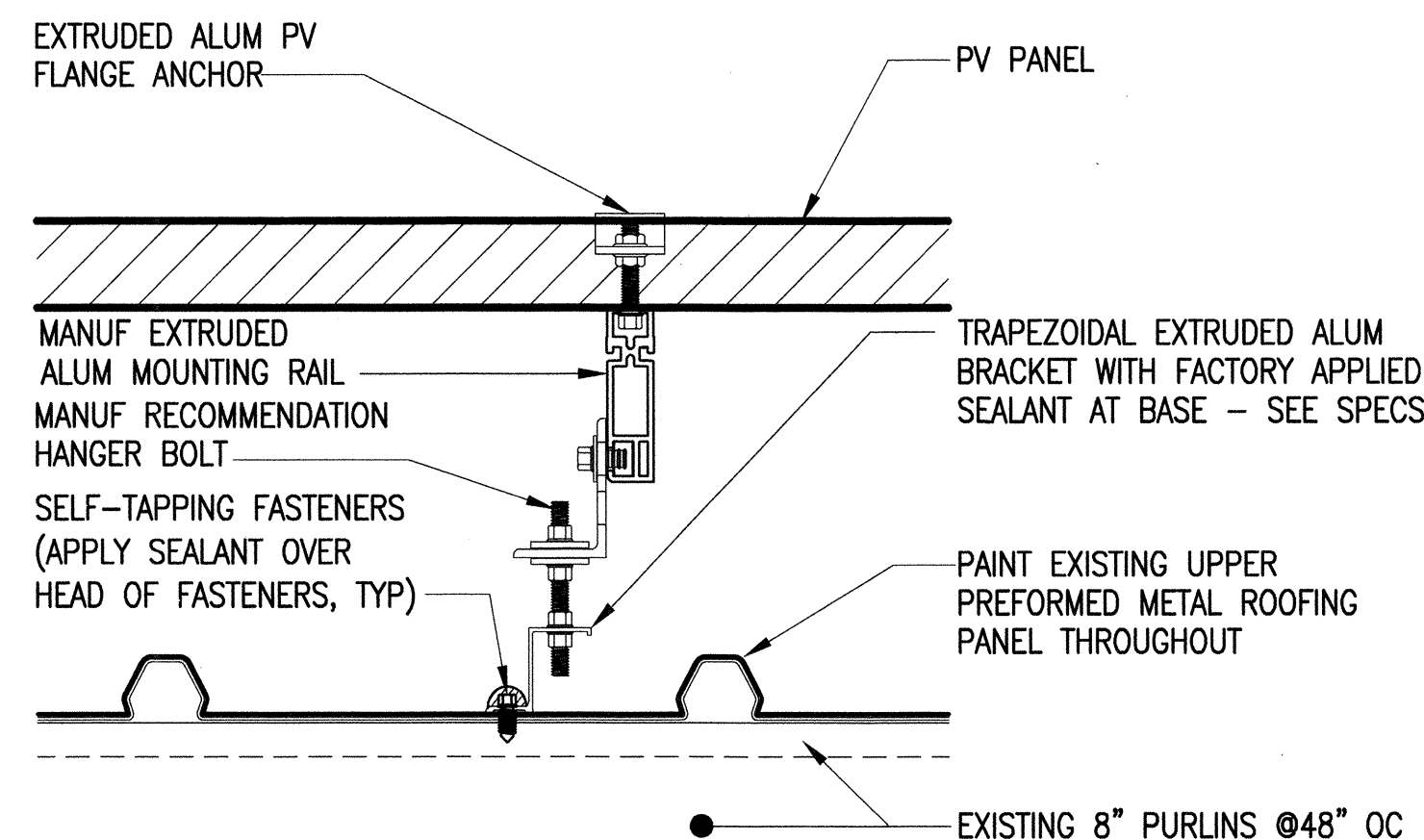
9 CONDUIT SUPPORT DETAIL
A-2 SCALE: 3" = 1'-0"



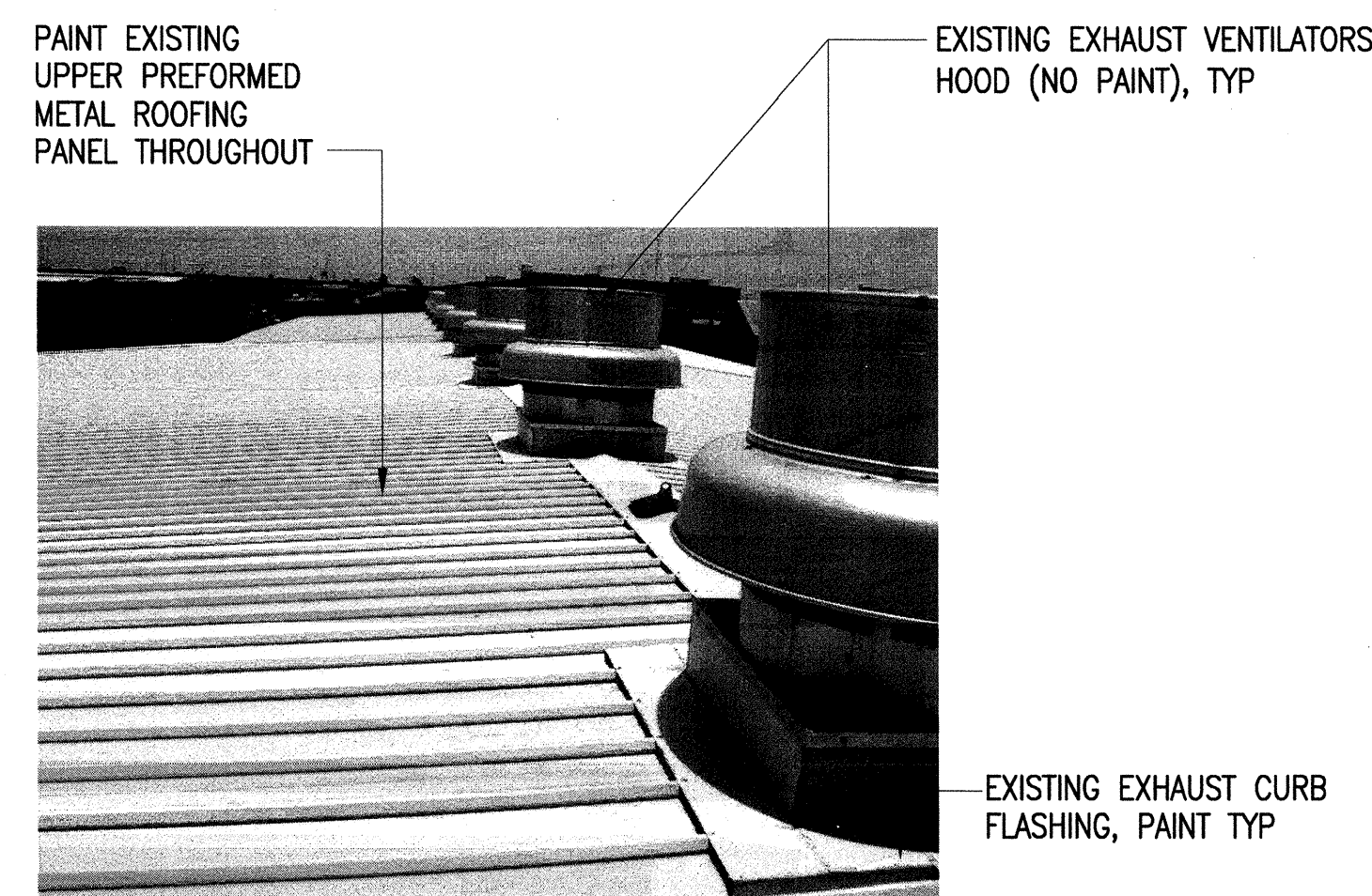
2 PV PANEL MOUNTING DETAIL
A-2 SCALE: 1" = 1'-0"



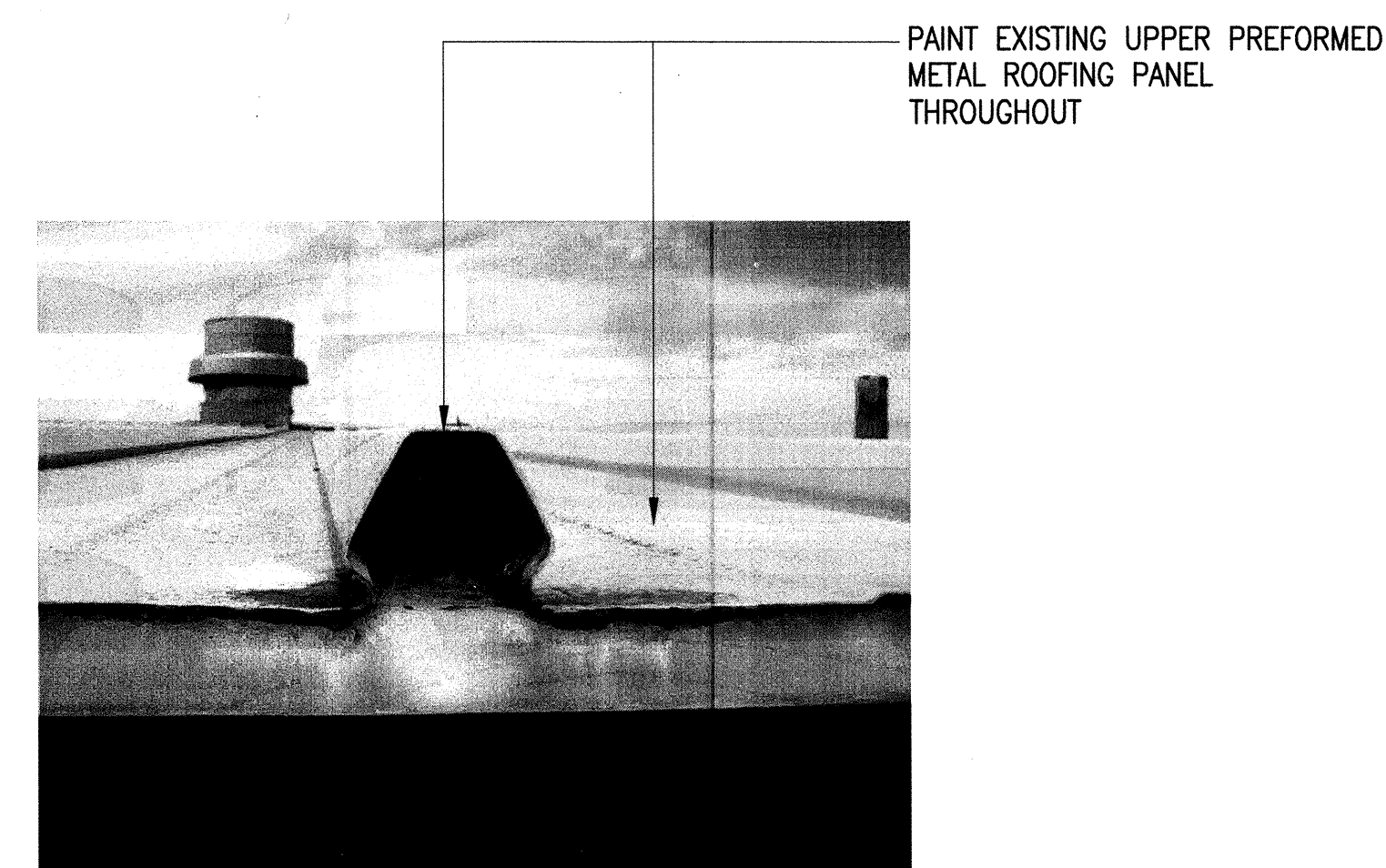
4 EXISTING TYPICAL ROOFING
A-2 SCALE: NOT TO SCALE



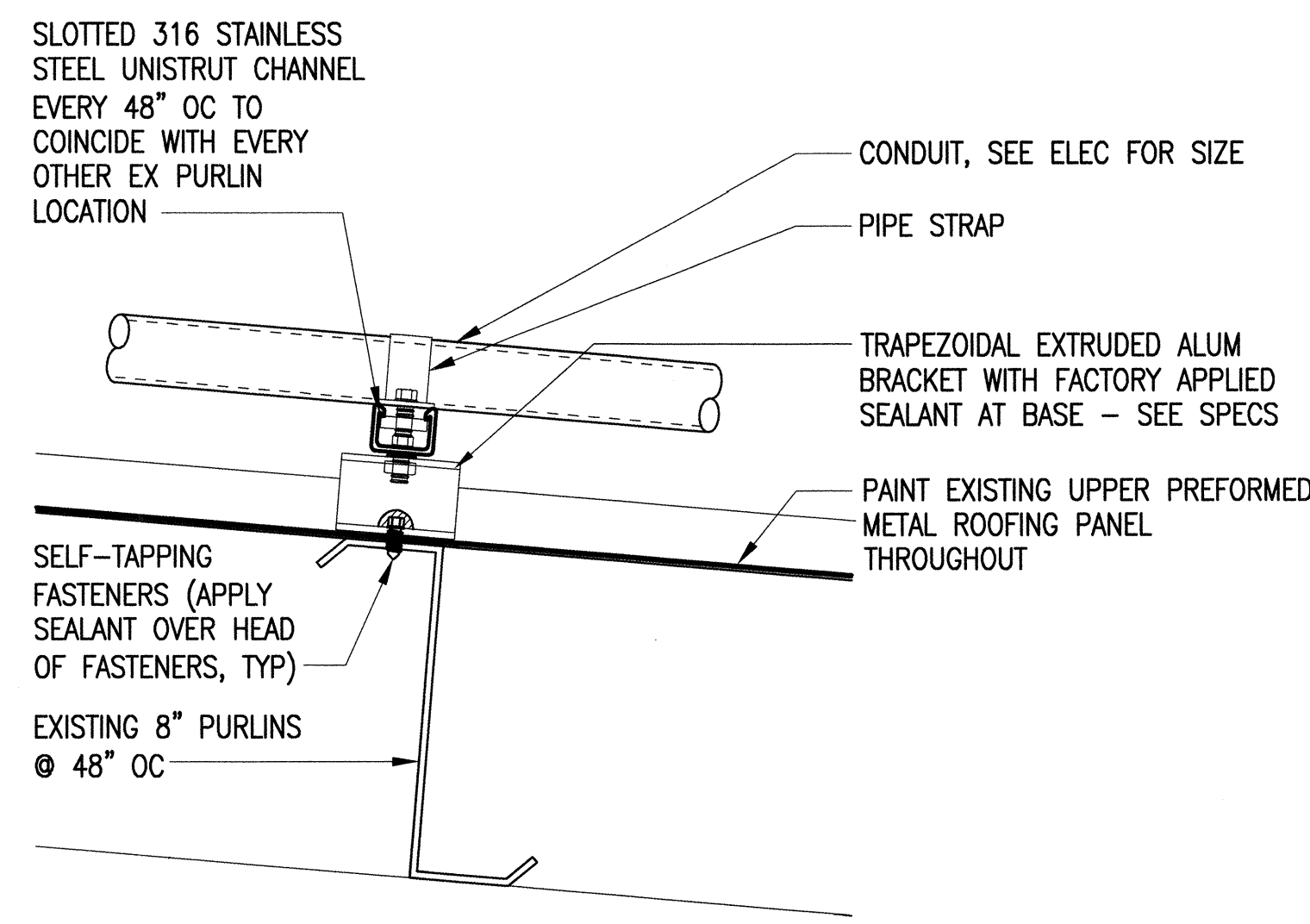
10 ROOF PENETRATION DETAIL
A-2 SCALE: 3" = 1'-0"



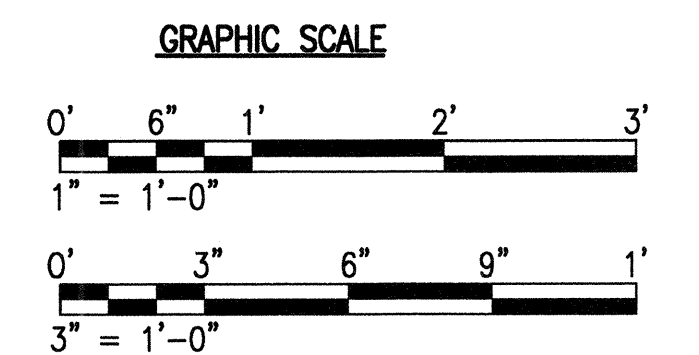
3 EXISTING ROOFING & VENTILATORS
A-2 SCALE: NOT TO SCALE



5 EXISTING TYPICAL ROOFING RIB PROFILE
A-2 SCALE: NOT TO SCALE



8 CONDUIT SUPPORT DETAIL
A-2 SCALE: 3" = 1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED; PUBLIC WORKS ADMINISTRATOR

JOHN ALLAN ADVERSALO
LICENSED PROFESSIONAL ARCHITECT
No. 5709
HAWAII, U.S.A.

DEPT. OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

CENTRAL SERVICES DIVISION
NEW PHOTOVOLTAIC SYSTEM

HONOLULU OAHU HAWAII

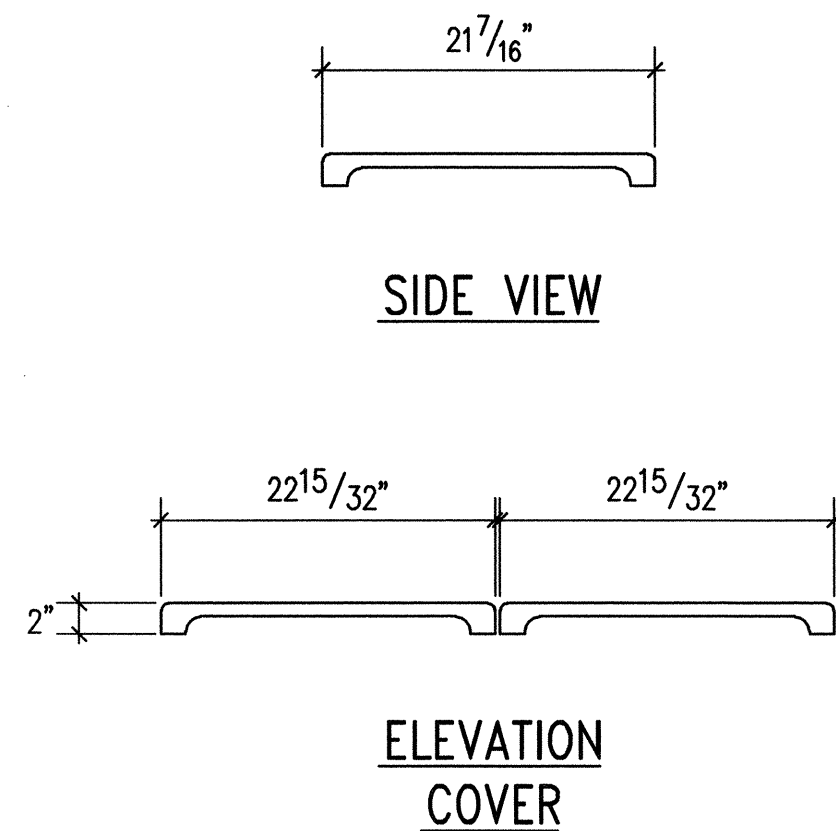
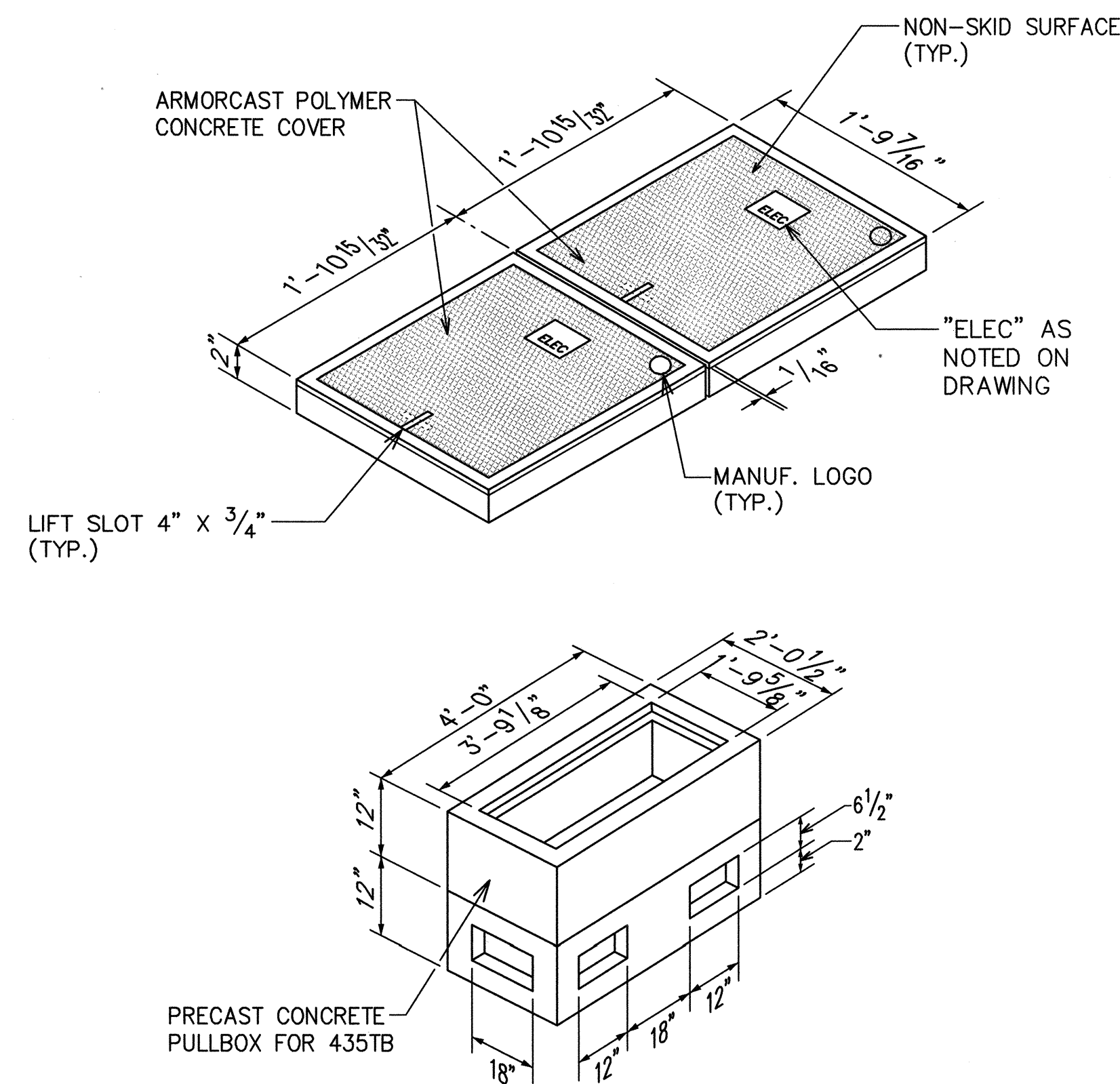
MISCELLANEOUS DETAILS

DESIGNED BY: NV	CHECKED BY: CN	DAGS JOB NO. 52-10-0642	DRAWING NO. A-2
DRAWN BY: NV	APPROVED BY: JA	DATE: SEP 2010	SHEET 3 OF 13 SHITS

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

4-30-12
EXP. DATE

FILE DRAWER FOLDER.....



- NOTES:**
1. INSTALL ON 6" BED OF #3 CRUSHED ROCK.
 2. PROVIDE GROUND ROD, 5/8" X 8'-0" COPPERWELD, 25 OHMS TO GROUND (AS REQUIRED BY CONTRACT DRAWINGS).

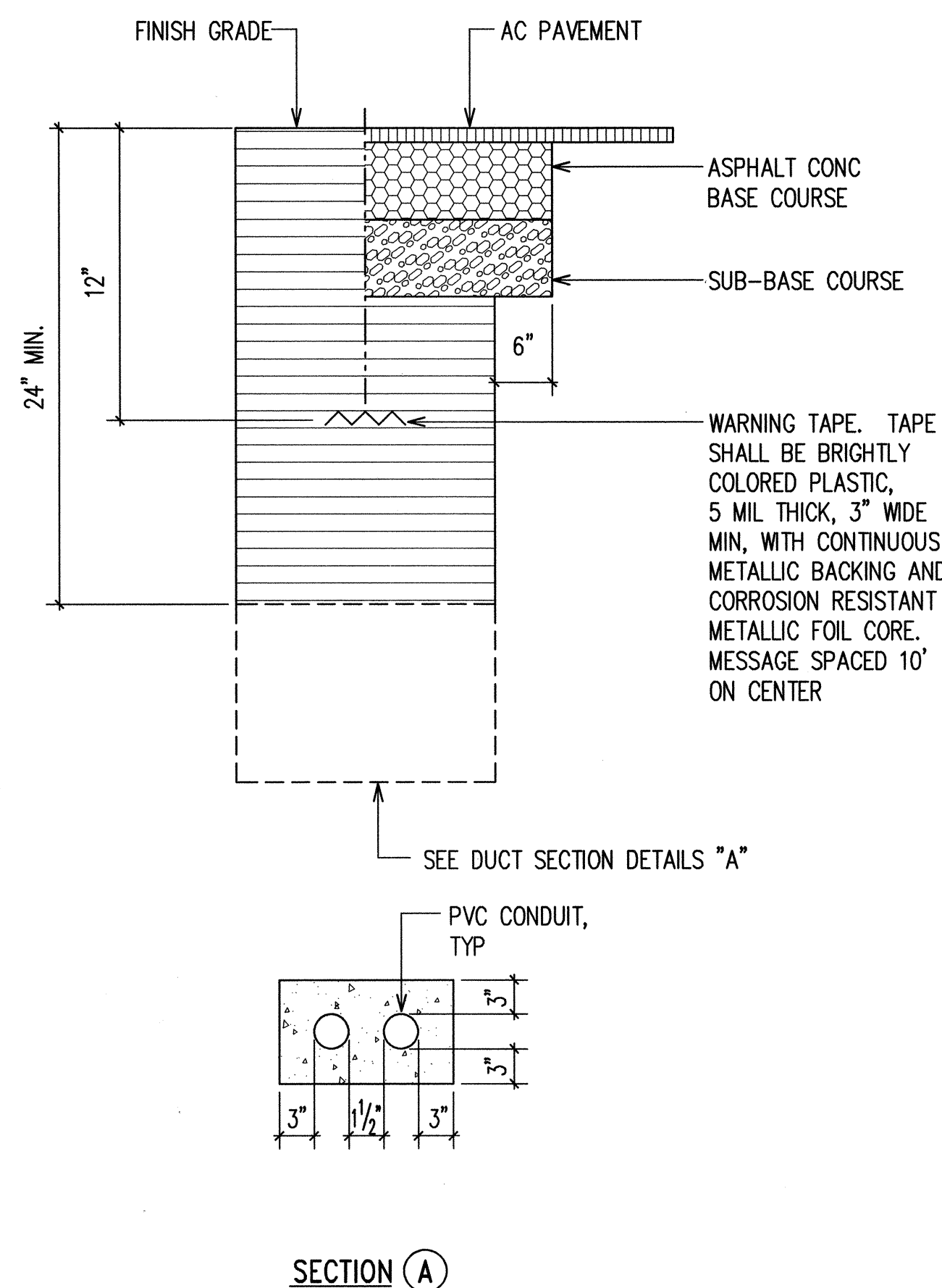
1
E-1 **TYPICAL 2' X 4' ELECTRICAL HANDHOLE DETAIL**
NOT TO SCALE

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. 95% COMPACTION.
- CONCRETE - 3" ENCASEMENT, 3000 psi COMPRESSIVE STRENGTH @ 28 DAYS.

NOTES:

1. BASE COURSE AND SUB-BASE COURSE PER 1994 STATE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
2. THICKNESS OF A/C PAVEMENT, BASE COURSE & SUB-BASE COURSE TO MATCH EXISTING CONDITIONS.
3. CONTRACTOR RESPONSIBLE TO RESTORE GRASSING TO EXISTING CONDITION OR BETTER.



DUCT SECTION DETAILS

GENERAL NOTES

1. PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. VISIT JOBSITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF DEMOLITION AND NEW WORK PRIOR TO THE START OF WORK.
2. REPORT ANY DISCREPANCIES AND/OR DIFFERENCES IN DRAWINGS, IN RESPECT TO EXISTING CONDITIONS, TO THE ENGINEER.
3. RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.
4. ALL POWER OUTAGES SHALL BE COORDINATED AND APPROVED BY THE ENGINEER. OUTAGES SHALL BE SCHEDULED AND LIMITED PER THE FACILITY'S REQUIREMENTS.
5. WHERE POSSIBLE CONCEAL ALL RACEWAYS IN WALLS OR ABOVE CEILINGS. GROUT, PATCH AND PAINT AFFECTED AREAS TO MATCH ADJACENT FINISH. WHERE RACEWAYS AND BOXES ARE EXPOSED, PAINT RACEWAYS AND BOXES TO MATCH ADJACENT FINISH AND COLOR.
6. A NEW ROOF COATING WILL BE INSTALLED PRIOR TO THE INSTALLATION OF THE PV SYSTEM. THE CONTRACTOR SHALL MAKE PROVISIONS TO PROTECT THE NEW ROOF COATING DURING THE PV SYSTEM INSTALLATION AND REPAIR ALL DAMAGES TO THE COATING AFTER INSTALLATION OF THE PV SYSTEM IS COMPLETE AT NO ADDITIONAL COST TO THE STATE.

ELECTRICAL SYMBOLS

EXISTING SYMBOL	NEW SYMBOL	DESCRIPTION
		ELECTRICAL PANELBOARD
	⊕	JUNCTION BOX, 4" SQ MIN., WALL MTD.
	⊕/⊕	LARGE JUNCTION BOX, SIZE AS NOTED, WALL/CEILING MTD RESPECTIVELY.
	⊕	WEB SERVER DEVICE, WALL MTD.
	⊕	DUPLEX RECEPTACLE, WALL MTD. +18" OR AS NOTED.
	⊕	DUPLEX RECEPTACLE, GFI TYPE, WALL MTD. +18" OR AS NOTED.
	⊕	DATA OUTLET, WALL MTD. +18" OR AS NOTED.
	---	EXPOSED CONDUIT, 3/4" MIN.
⊕	⊕	CONDUIT CONCEALED IN WALL OR ABOVE CEILING, 3/4" MIN. 3 WIRES AND 1 GROUND WIRE INDICATED. NO HASHMARKS DENOTES 2 WIRES.
	---	CONDUIT CONCEALED IN SLAB OR BELOW GRADE.
	⊕	CONDUIT RISER DOWN/UP RESPECTIVELY.
	1	NOTE DESIGNATOR, NOTE "1" INDICATED
	GND	DENOTES "GROUND"
	CKT	DENOTES "CIRCUIT"
	EXIST	DENOTES "EXISTING"
	MTD	DENOTES "MOUNTED"
	MTG	DENOTES "MOUNTING"
	PNL	DENOTES "PANEL"
	WP	DENOTES "WEATHERPROOF"
	XFMR	DENOTES "TRANSFORMER"
	ELEC HH	DENOTES "ELECTRICAL HANDHOLE"
	PV	DENOTES "PHOTOVOLTAIC"
	TYP	DENOTES "TYPICAL"

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: PUBLIC WORKS ADMINISTRATOR

PRINCIPAL-IN-CHARGE
RONALD N. S. HO & ASSOC., INC.
Electrical Engineers
Expiration Date: 4/30/12

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.
9/30/10
4-30-12
EXP. DATE

DEPT. OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

CENTRAL SERVICES DIVISION
NEW PHOTOVOLTAIC SYSTEM

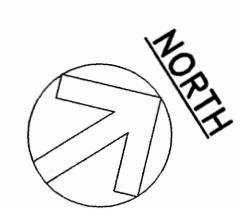
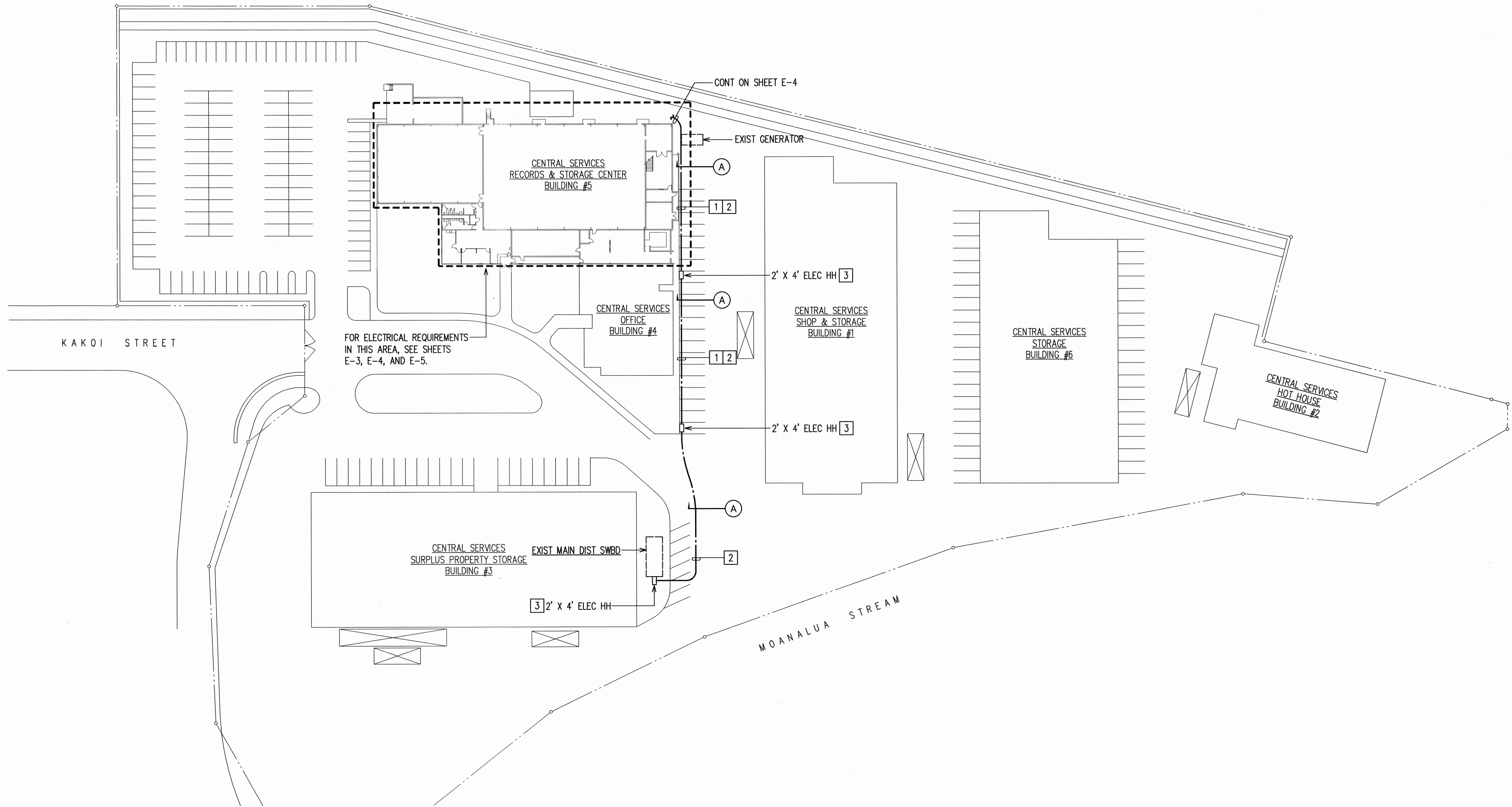
HONOLULU OAHU HAWAII

ELECTRICAL SYMBOLS AND GENERAL NOTES

DESIGNED BY: IJK	CHECKED BY: BO	DAGS JOB NO. 52-10-0642	DRAWING NO. E-1
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 4 OF 13

SCALE: AS SHOWN

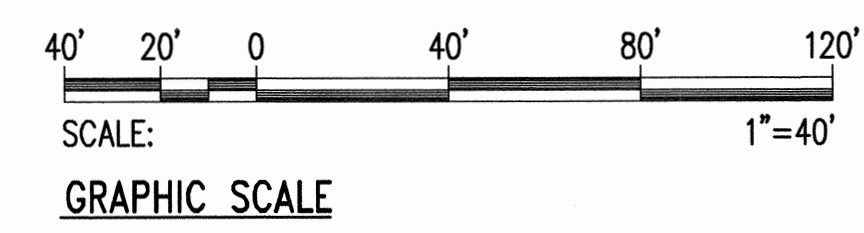
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 RECORD-STORAGE-BLDG CENTRAL SERVICES SITE PLAN



ELECTRICAL SITE PLAN
SCALE: 1"=40'

NOTES:

1. [1] ROUTE CONDUIT AS CLOSE TO CURB AS POSSIBLE.
2. [2] SAWCUT & PATCH AC PAVEMENT TO INSTALL NEW CONDUITS.
3. [3] FOR ELEC HH DETAIL SEE [1] E-1

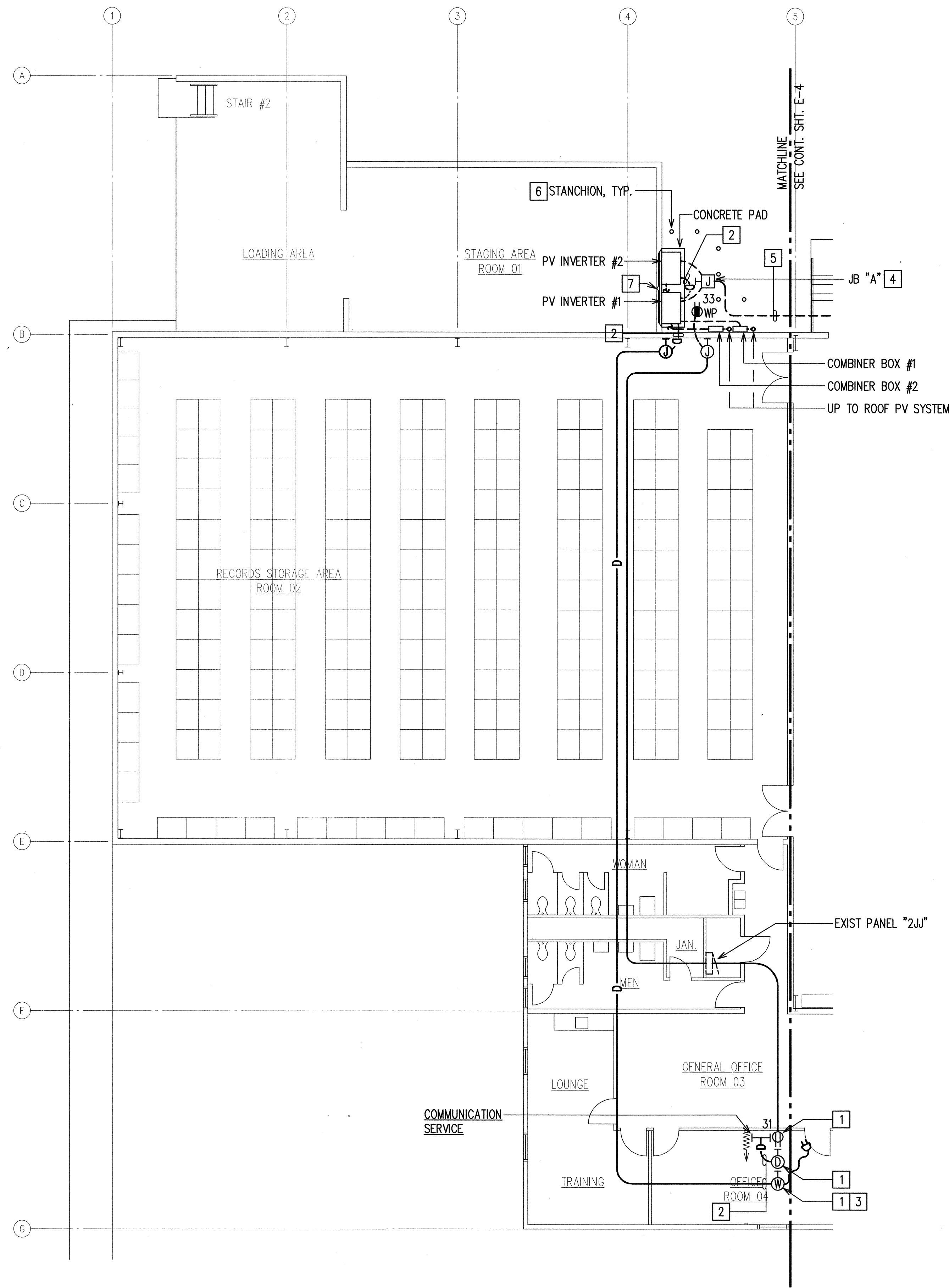


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PRINCIPAL-IN-CHARGE
 RONALD N. S. HO & ASSOC., INC.
 Electrical Engineers
 Expiration Date: 4/30/12

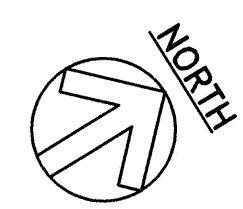
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 4-30-12
 EXP. DATE

DEPT. OF ACCOUNTING & GENERAL SERVICES
 PUBLIC WORKS DIVISION
 STATE OF HAWAII
**CENTRAL SERVICES DIVISION
 NEW PHOTOVOLTAIC SYSTEM**
 HONOLULU OAHU HAWAII
ELECTRICAL SITE PLAN
 RONALD N. S. HO & ASSOCIATES
 DESIGNED BY: IJK
 DRAWN BY: CAD
 CHECKED BY: BO
 APPROVED BY: SKS
 DATED: 4-30-12
 SCALE: AS SHOWN
 DASH JOB NO. 52-10-0642
 DRAWING NO. E-2
 SHEET 5 OF 13 SHITS

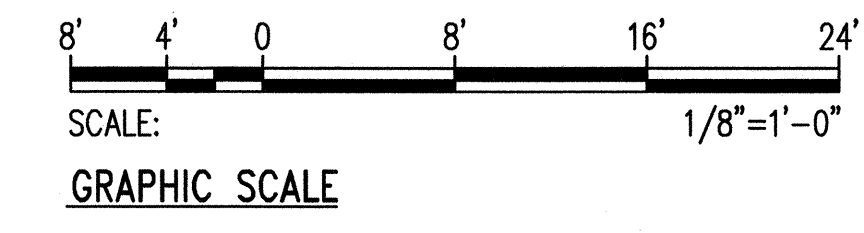


NOTES:

1. [1] MTD APPROXIMATELY 96" AFF, NEAR EXISTING COMMUNICATIONS EQUIPMENT.
- [2] 1" C, 1-CATEGORY 6 UTP.
- [3] PROVIDE 1" C, 1-CATEGORY 6 UTP PATCH CABLE TO DATA OUTLET. STUB-OUT CONDUIT AT SWITCH AND COORDINATE FINAL CONNECTION WITH THE CENTRAL SERVICES DIVISION.
- [4] JUNCTION BOX MTD APPROXIMATELY 13' ABOVE GRADE.
- [5] ROUTE CONDUIT ALONG WALL BELOW LIGHT FIXTURES. PROVIDE STAINLESS STEEL MTG BRACKETS AS REQUIRED.
- [6] FOR STANCHION DETAIL SEE 3
E-9
- [7] FOR ELEVATION SEE 1
E-10



ELECTRICAL PLAN I
SCALE: 1/8"=1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: PUBLIC WORKS ADMINISTRATOR

LICENSED PROFESSIONAL ENGINEER
 No. 9023-E
 HAWAII, U.S.A.

PRINCIPAL-IN-CHARGE
AS 11/3/10
 RONALD N. S. HO & ASSOC., INC.
 Electrical Engineers
 Expiration Date: 4/30/12

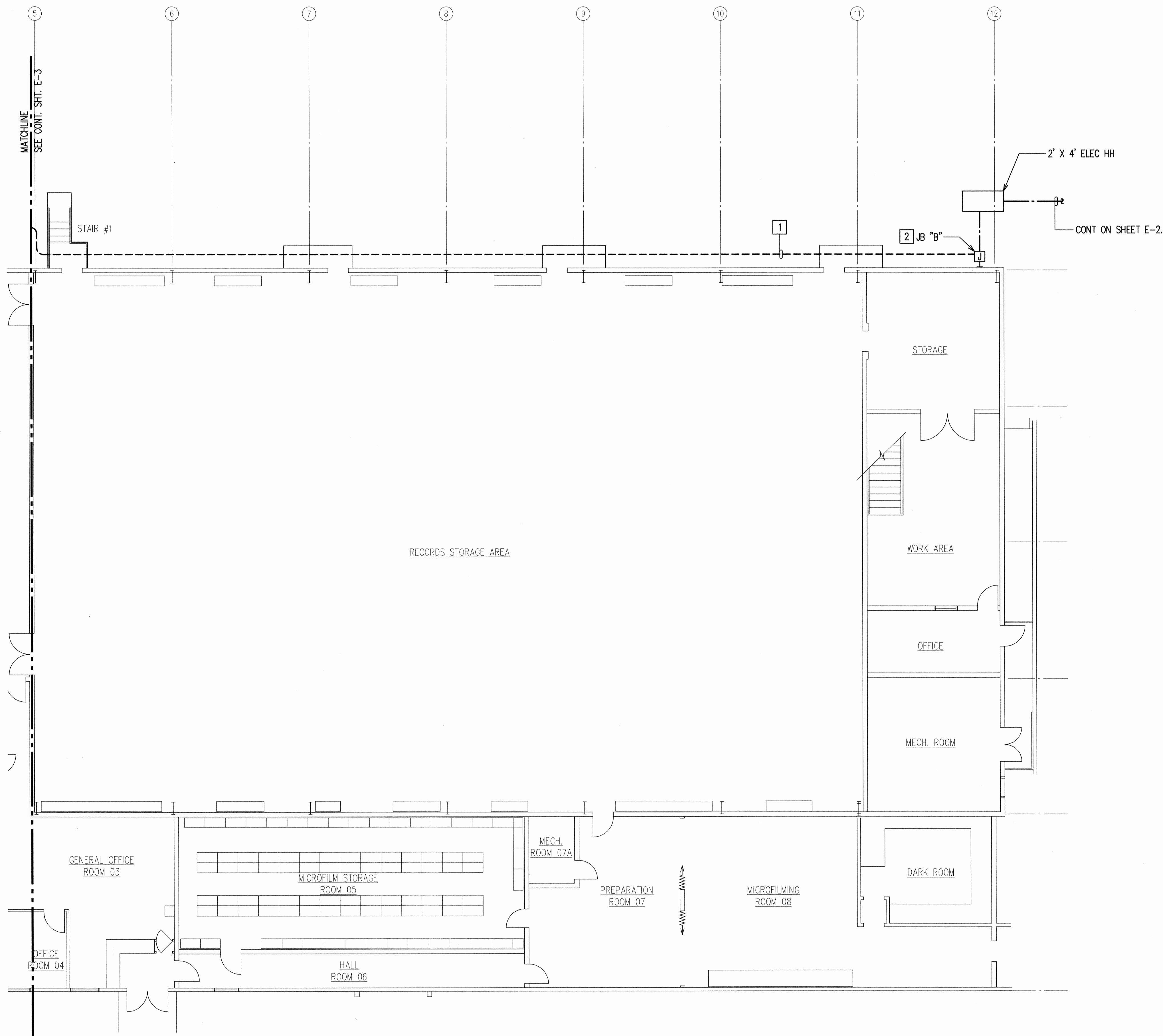
LICENSED PROFESSIONAL ENGINEER
 No. 11656-E
 HAWAII, U.S.A.

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BO 4-30-12
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DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII					
CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM					
HONOLULU		OAHU		HAWAII	
ELECTRICAL PLAN I					
DESIGNED BY: IJK		CHECKED BY: BO		DAGS JOB NO. 52-10-0642	DRAWING NO. E-3
DRAWN BY: CAD		APPROVED BY: SKS		DATE: SEP 2010	SHEET 6 OF 13 SHTS
SCALE: AS SHOWN					

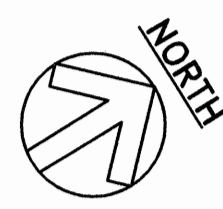
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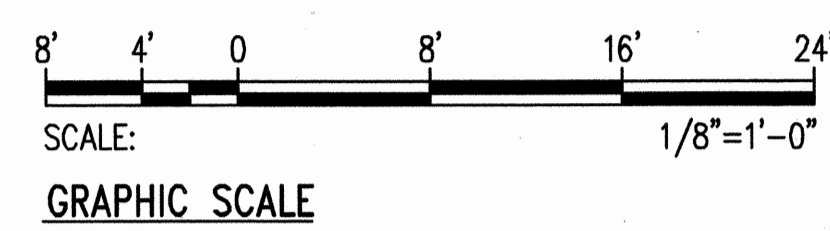


NOTES:

- 1. [1] ROUTE CONDUIT BELOW LIGHT FIXTURES. PROVIDE STAINLESS STEEL MTC BRACKETS AS REQUIRED.
- 2. [2] JUNCTION BOX MTD APPROXIMATELY 13' ABOVE GRADE.



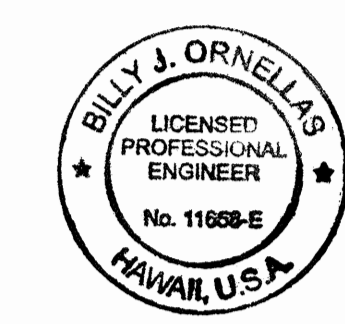
ELECTRICAL PLAN II
SCALE: 1/8"=1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: PUBLIC WORKS ADMINISTRATOR



PRINCIPAL-IN-CHARGE
RONALD N. S. HO & ASSOC., INC.
Electrical Engineers
Expiration Date: 4/30/12

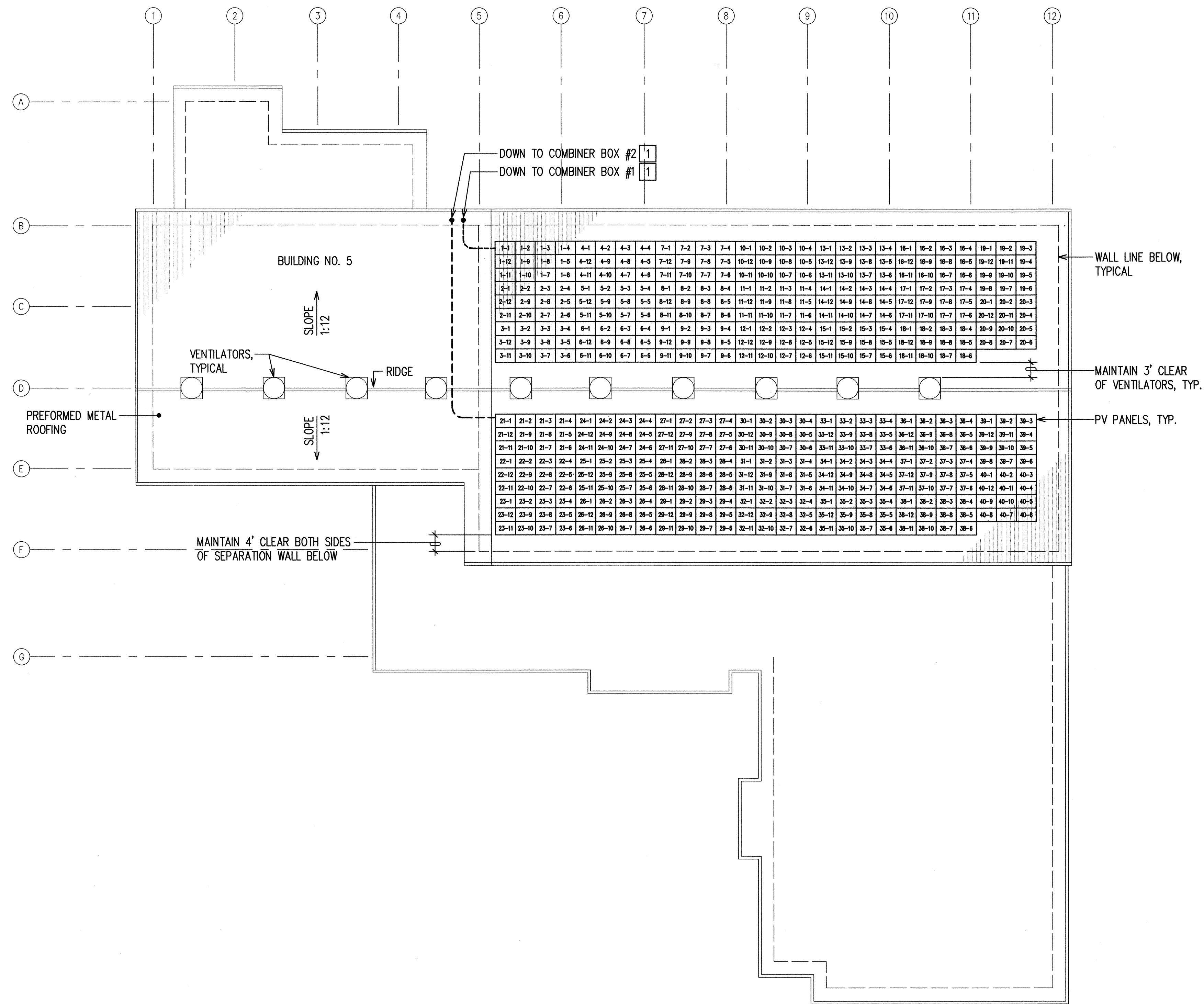


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9/20/10

DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII			
CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM			
HONOLULU	OAHU	HAWAII	
ELECTRICAL PLAN II			
DESIGNED BY: IJK	CHECKED BY: BO	DAGS JOB NO. 52-10-0642	DRAWING NO. E-4
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 7 OF 13 SHTS
SCALE: AS SHOWN		EXP. DATE: 4-30-12	

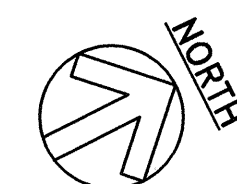
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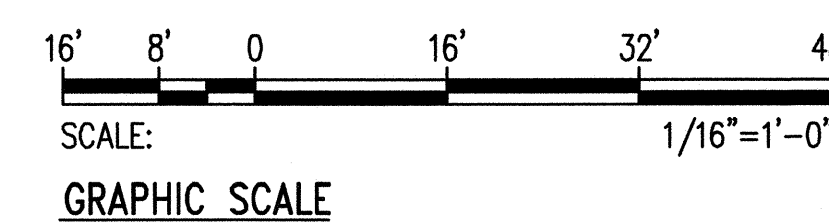


NOTES:

1. 1 PENETRATE THROUGH ROOF EAVE.



ROOF PLAN
SCALE: 1/16"=1'-0"



REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED; PUBLIC WORKS ADMINISTRATOR

SEAN K. SUGAI
LICENSED PROFESSIONAL ENGINEER
No. 9023-E
HAWAII, U.S.A.

PRINCIPAL-IN-CHARGE
9/30/10

RONALD N. S. HO & ASSOC., INC.
Electrical Engineers
Expiration Date: 4/30/12

BILLY J. ORNELLAS
LICENSED PROFESSIONAL ENGINEER
No. 11658-E
HAWAII, U.S.A.

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4-30-12
9/26/10 EXP. DATE

DEPT. OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

**CENTRAL SERVICES DIVISION
NEW PHOTOVOLTAIC SYSTEM**

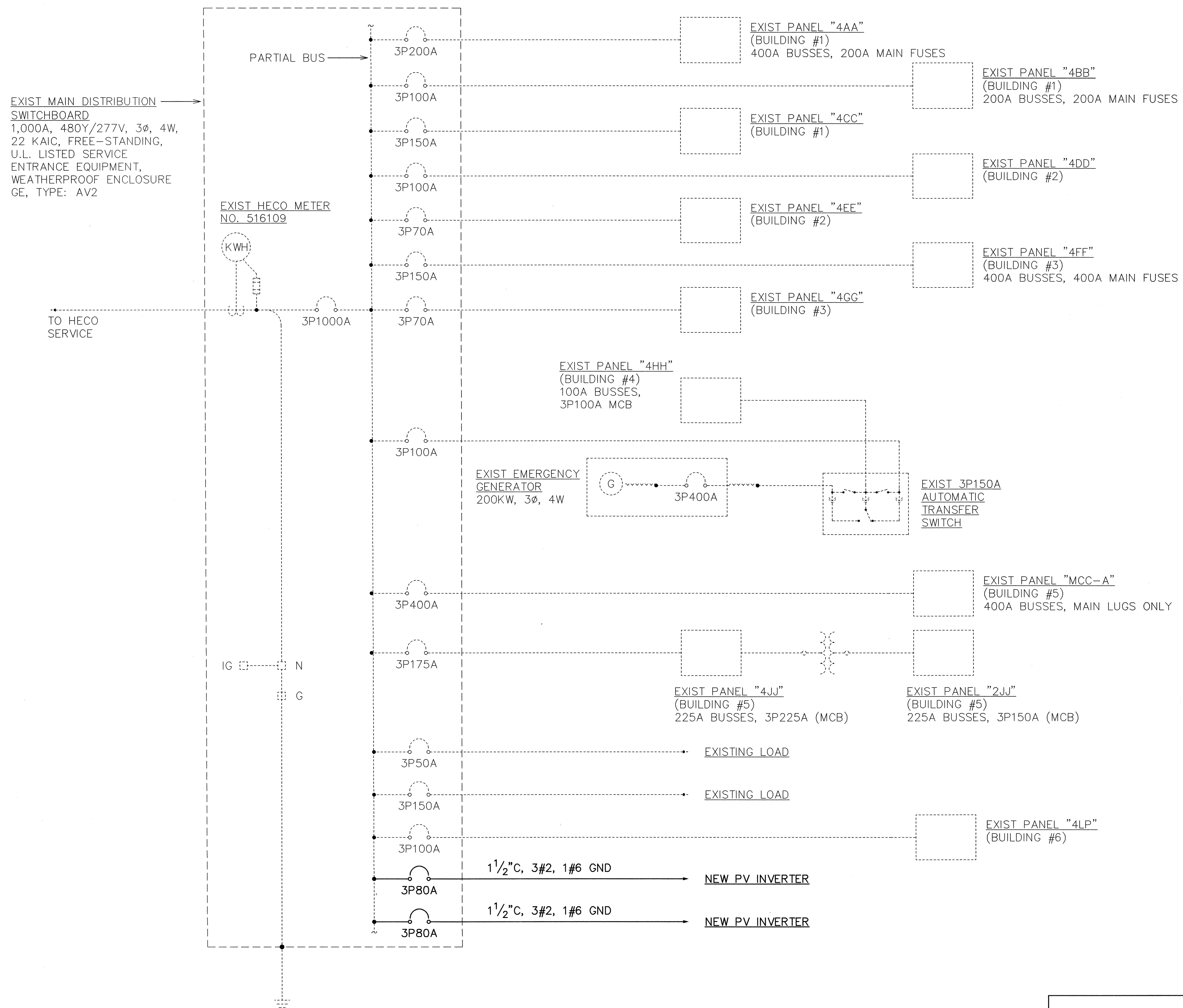
HONOLULU OAHU HAWAII

ROOF PLAN

DESIGNED BY: IJK	CHECKED BY: BO	DATE: 9/26/10	DRAWING NO. E-5
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 8 OF 13 SHTS

SCALE: AS SHOWN

LAST SAVE: 09/20/10 @ 08:11:46 BY: JLF PLOT SC: 1/16"=1' Z:\A00\PROJECTS\210301\210301_849-5_Roof.dwg PLOT: 9/20/10



NEW ONE-LINE DIAGRAM

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: PUBLIC WORKS ADMINISTRATOR

SEAN K. SUGAI
 LICENSED PROFESSIONAL ENGINEER
 No. 9023-E
 HAWAII, U.S.A.

PRINCIPAL-IN-CHARGE
 9/30/10
 RONALD N. S. HO & ASSOC., INC.
 Electrical Engineers
 Expiration Date: 4/30/12

BILLY J. ORNELLAS
 LICENSED PROFESSIONAL ENGINEER
 No. 11658-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.
 9/30/10
 4-30-12
 EXP. DATE

DEPT. OF ACCOUNTING & GENERAL SERVICES
 PUBLIC WORKS DIVISION
 STATE OF HAWAII

**CENTRAL SERVICES DIVISION
 NEW PHOTOVOLTAIC SYSTEM**

HONOLULU OAHU HAWAII

NEW ONE-LINE DIAGRAM

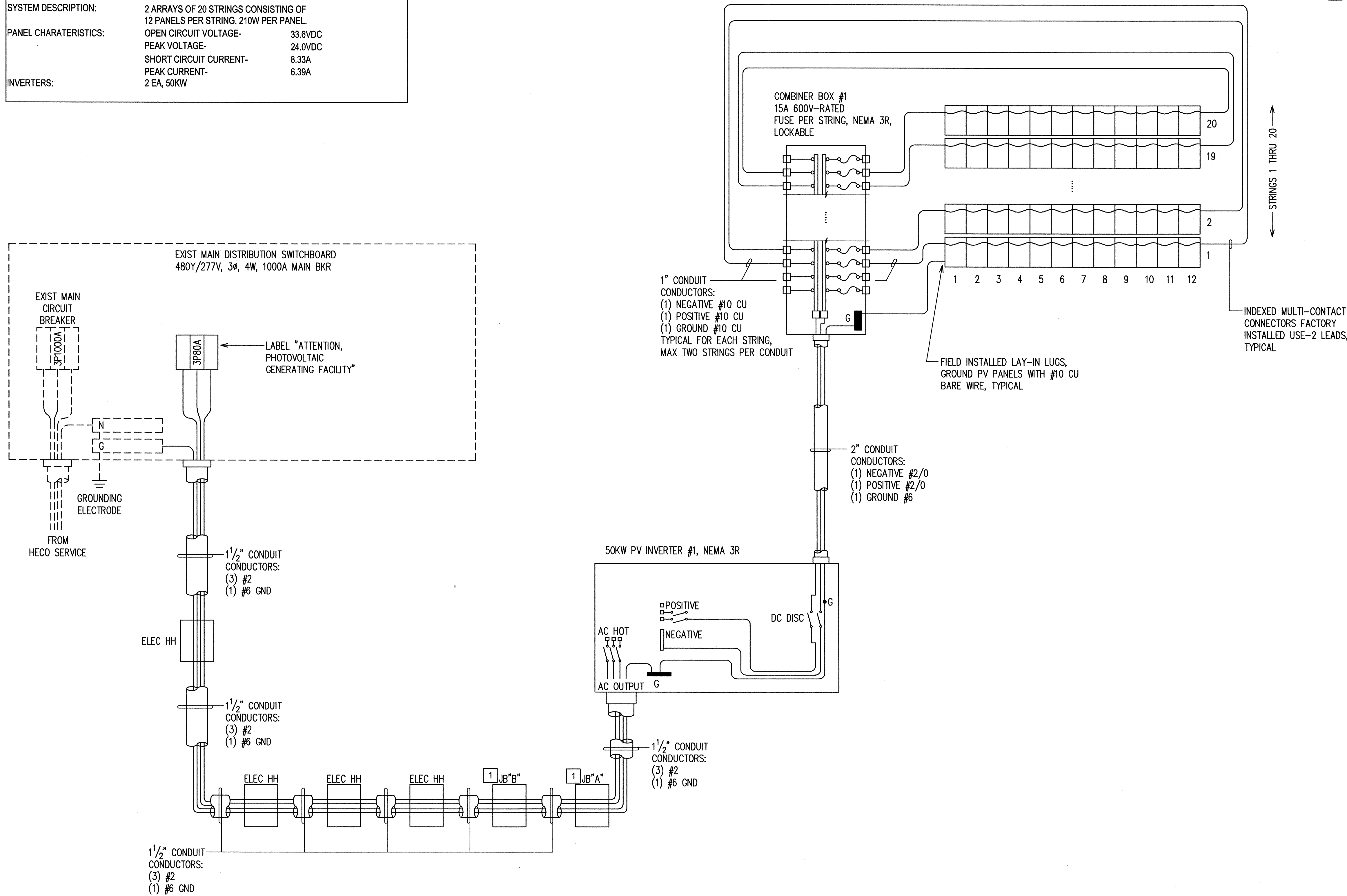
DESIGNED BY: LJK	CHECKED BY: BO	DAGS JOB NO. 52-10-0642	DRAWING NO. E-6
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 9 OF 13 SHITS
SCALE: AS SHOWN		FILE DRAWER FOLDER.....	

LAST SAVE: 09/20/10 @ 08:15:04 BY: LK
 Z:\VAD\PROJECTS\210031\210031_01.dwg

PHOTOVOLTAIC SYSTEM "PV"	
SYSTEM CAPACITY:	100 KW
SYSTEM DESCRIPTION:	2 ARRAYS OF 20 STRINGS CONSISTING OF 12 PANELS PER STRING, 210W PER PANEL.
PANEL CHARACTERISTICS:	OPEN CIRCUIT VOLTAGE- 33.6VDC PEAK VOLTAGE- 24.0VDC SHORT CIRCUIT CURRENT- 8.33A PEAK CURRENT- 6.39A
INVERTERS:	2 EA, 50KW

NOTES:

- CONTRACTOR SHALL VERIFY EXACT LOCATION AND REQUIREMENTS FOR ALL EQUIPMENT BEFORE INSTALLING.
- 1 14" X 12" X 6"D NEMA 4XSS JB.



PHOTOVOLTAIC THREE-LINE DIAGRAM I
NOT TO SCALE

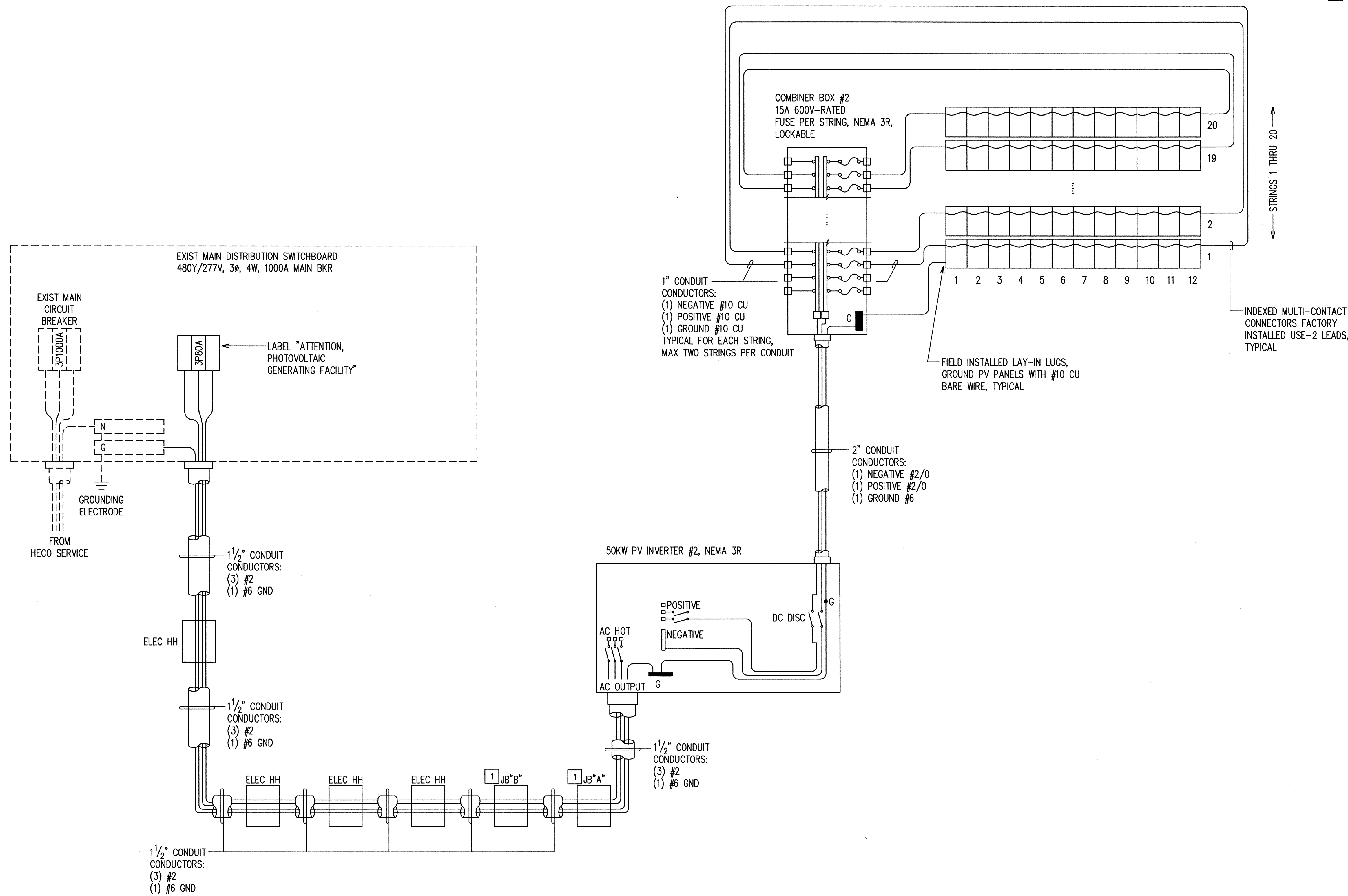
REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED: PUBLIC WORKS ADMINISTRATOR

				DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII	
PRINCIPAL-IN-CHARGE <i>[Signature]</i> 9/30/10 RONALD N. S. HO & ASSOC., INC. Electrical Engineers Expiration Date: 4/30/12		THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. <i>[Signature]</i> 9/30/10 4-30-12 EXP. DATE		CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM HONOLULU OAHU HAWAII PHOTOVOLTAIC THREE-LINE DIAGRAM I	
DESIGNED BY: IJK DRAWN BY: CAD SCALE: AS SHOWN		CHECKED BY: BO APPROVED BY: SKS		DADS JOB NO.: 52-10-0642 DATE: SEP 2010 SHEET 10 OF 13 SHTS	

LAST SAVE: 09/20/10 @ 08:15:17 BY: LK PLOT SC: 1-0-1
Z:\CAD\PROJECTS\21001\0907_21001_1.dwg

NOTES:

- CONTRACTOR SHALL VERIFY EXACT LOCATION AND REQUIREMENTS FOR ALL EQUIPMENT BEFORE INSTALLING.
- 1 14" X 12" X 6"D NEMA 4XSS JB.

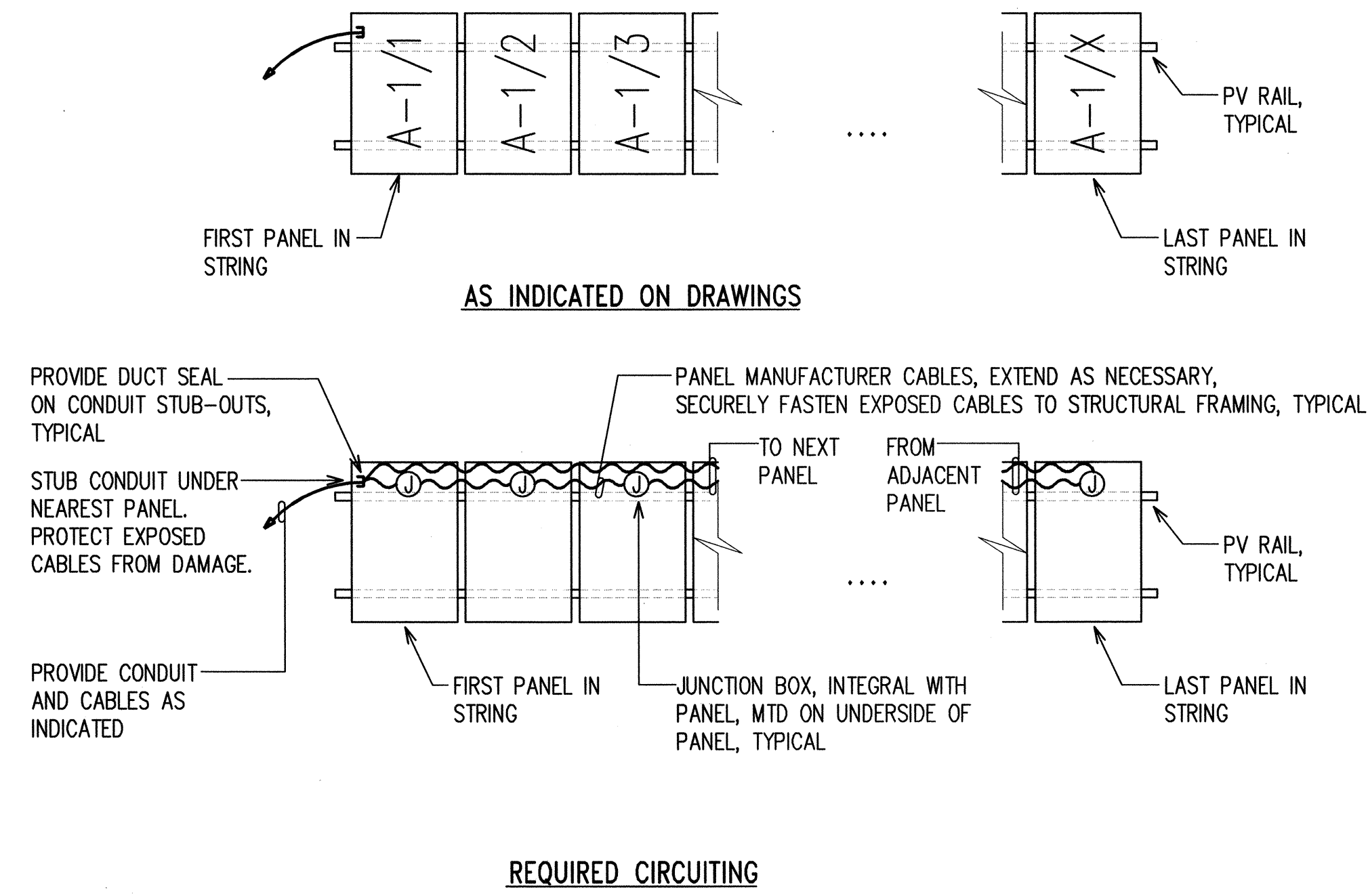


PHOTOVOLTAIC THREE-LINE DIAGRAM II
NOT TO SCALE

REVISION NO.	SYM.	DESCRIPTION	SHT. OF	DATE	APPROVED; PUBLIC WORKS ADMINISTRATOR

PRINCIPAL-IN-CHARGE 9/30/10 RONALD N. S. HO & ASSOC., INC. Electrical Engineers Expiration Date: 4/30/12		THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. 4-30-12 EXP. DATE 9/30/10	
DEPT. OF ACCOUNTING & GENERAL SERVICES PUBLIC WORKS DIVISION STATE OF HAWAII CENTRAL SERVICES DIVISION NEW PHOTOVOLTAIC SYSTEM HONOLULU OAHU HAWAII PHOTOVOLTAIC THREE-LINE DIAGRAM II			
DESIGNED BY: IJK	CHECKED BY: BO	DACS JOB NO. 52-10-0642	DRAWING NO. E-8
DRAWN BY: CAD	APPROVED BY: SKS	DATE SEP 2010	SHEET 11 OF 13 SHTS
SCALE: AS SHOWN		FILE DRAWER FOLDER.....	

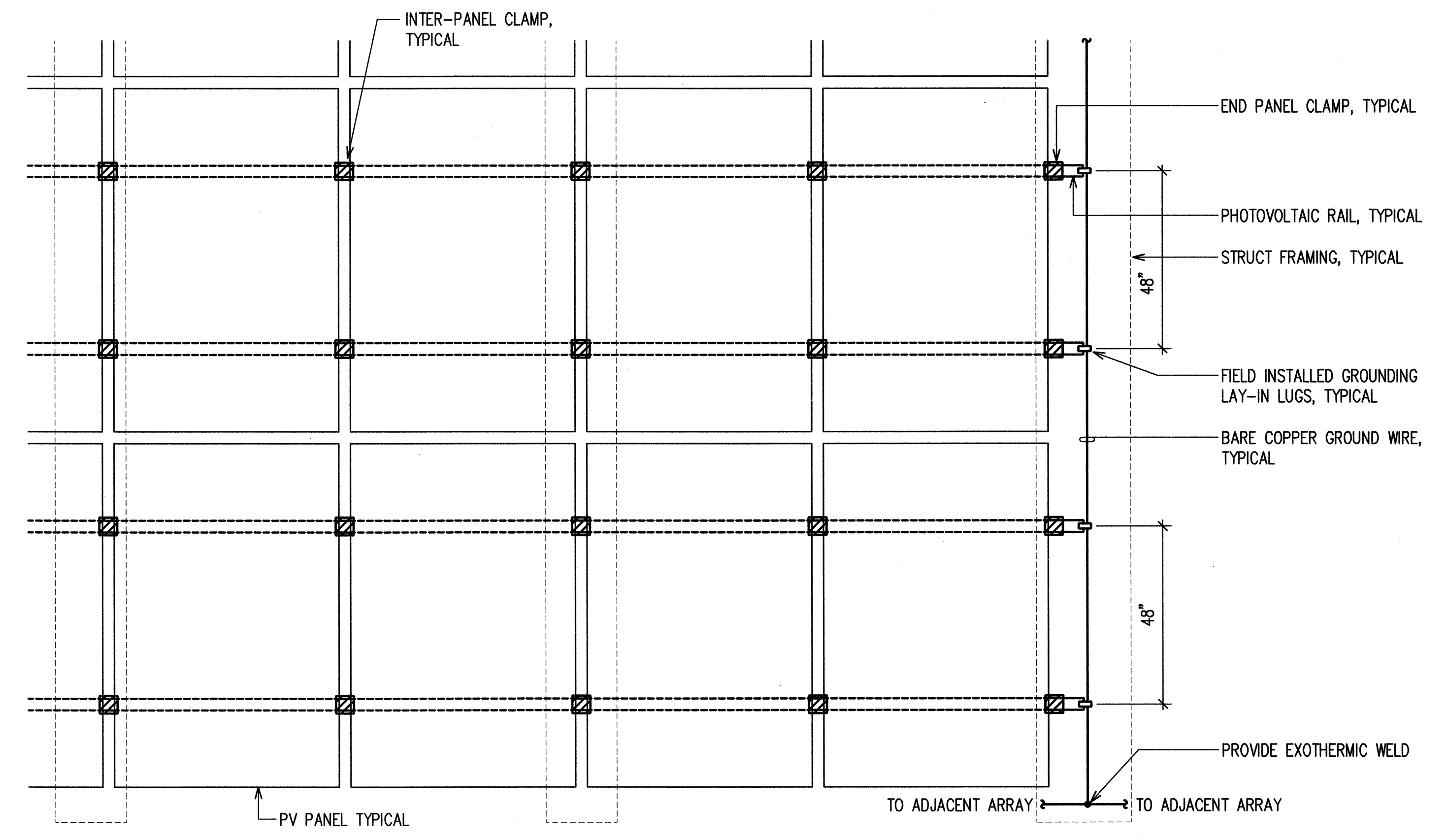
LAST SAVE: 09/20/10 @ 08:12:28 BY: M. PIOT SC: 1-10-11
 Z:\CAD\PROJECTS\210031\0508_210031_Theve.dwg\$902



NOTE(S):

1. EXPOSED WIRING BETWEEN PANELS SHALL BE IN CONDUIT. EXTEND WIRING BETWEEN PANELS AS NECESSARY.

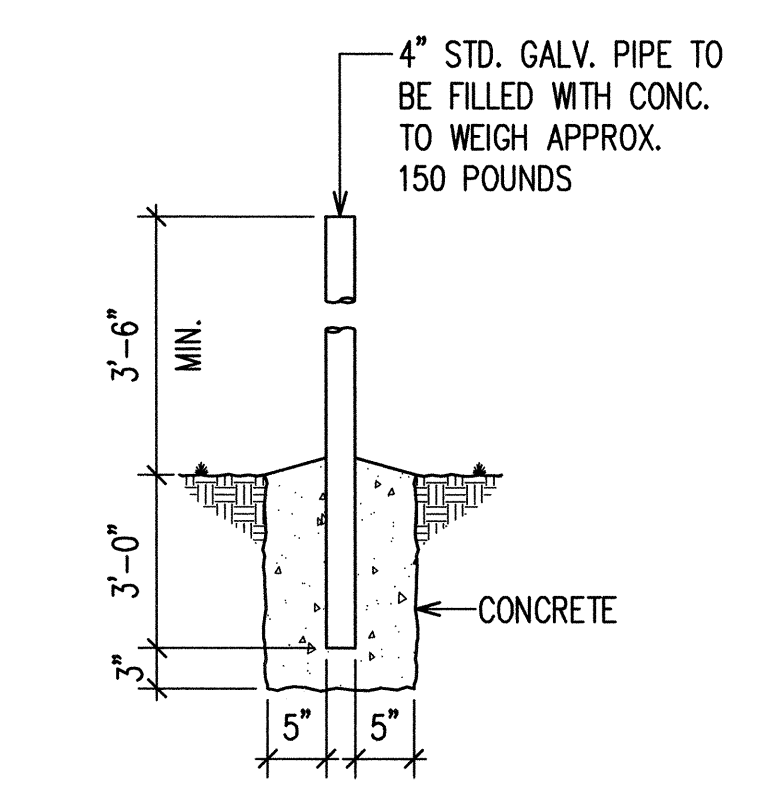
2 TYPICAL PHOTOVOLTAIC STRING CONNECTION DETAIL
E-9 NOT TO SCALE



NOTE(S):

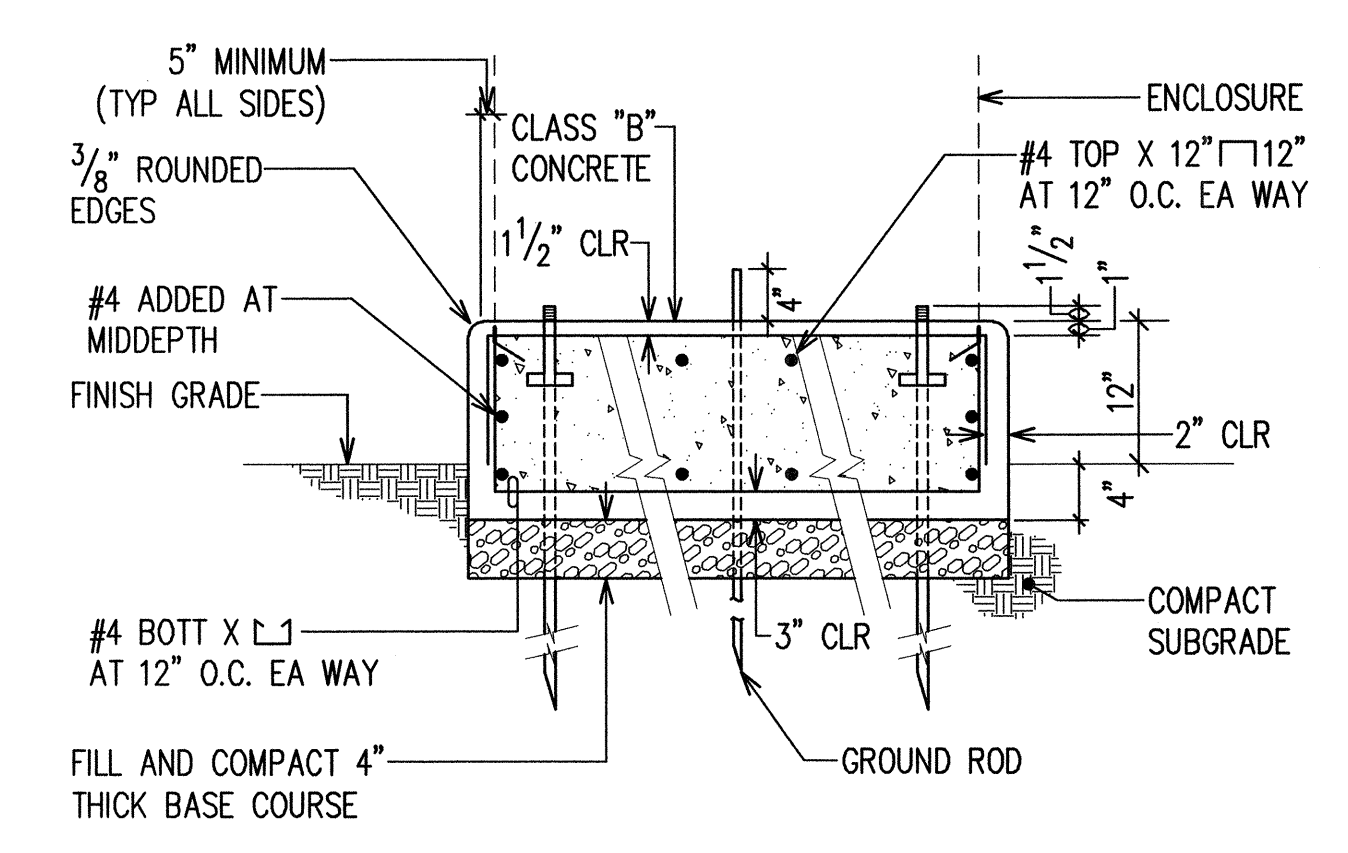
1. THE INTENT OF THIS DETAIL IS TO SHOW THE MINIMUM REQUIREMENTS FOR SUPPORT SYSTEM OF THE PHOTOVOLTAIC PANELS. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE THE ADDITIONAL HARDWARE AS NECESSARY FOR A COMPLETE PHOTOVOLTAIC SUPPORT SYSTEM.
2. NEW PHOTOVOLTAIC PANELS SHALL BE SECURED TO THE PV RAILS BY A MINIMUM OF 4 PANEL CLAMPS.
3. PROVIDE GROUNDING STRAP BETWEEN SECTIONS OF THE PV RAILS. TO ENSURE ELECTRICAL CONTINUITY.
4. SECURELY ATTACH PV RAILS TO STRUCTURAL FRAMING.

1 TYPICAL PHOTOVOLTAIC PANEL MOUNTING DETAIL
E-9 NOT TO SCALE



NOTE:
BARRIER POSTS ARE TO BE PAINTED YELLOW ACCORDING TO ANSI SPEC Z53.1 TO COMPLY WITH OSHA STANDARDS FOR COLORING CODE.

3 BARRIER POST (STANCHION) DETAIL
E-9 NOT TO SCALE



NOTE: CONCRETE PAD SHALL BE ADJUSTED TO FIT INVERTER ENCLOSURES AT NO EXTRA CHARGE TO THE STATE.

4 CONCRETE PAD DETAIL
E-9 NOT TO SCALE

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PRINCIPAL-IN-CHARGE
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Electrical Engineers
Expiration Date: 4/30/12

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4-30-12
EXP. DATE

DEPT. OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

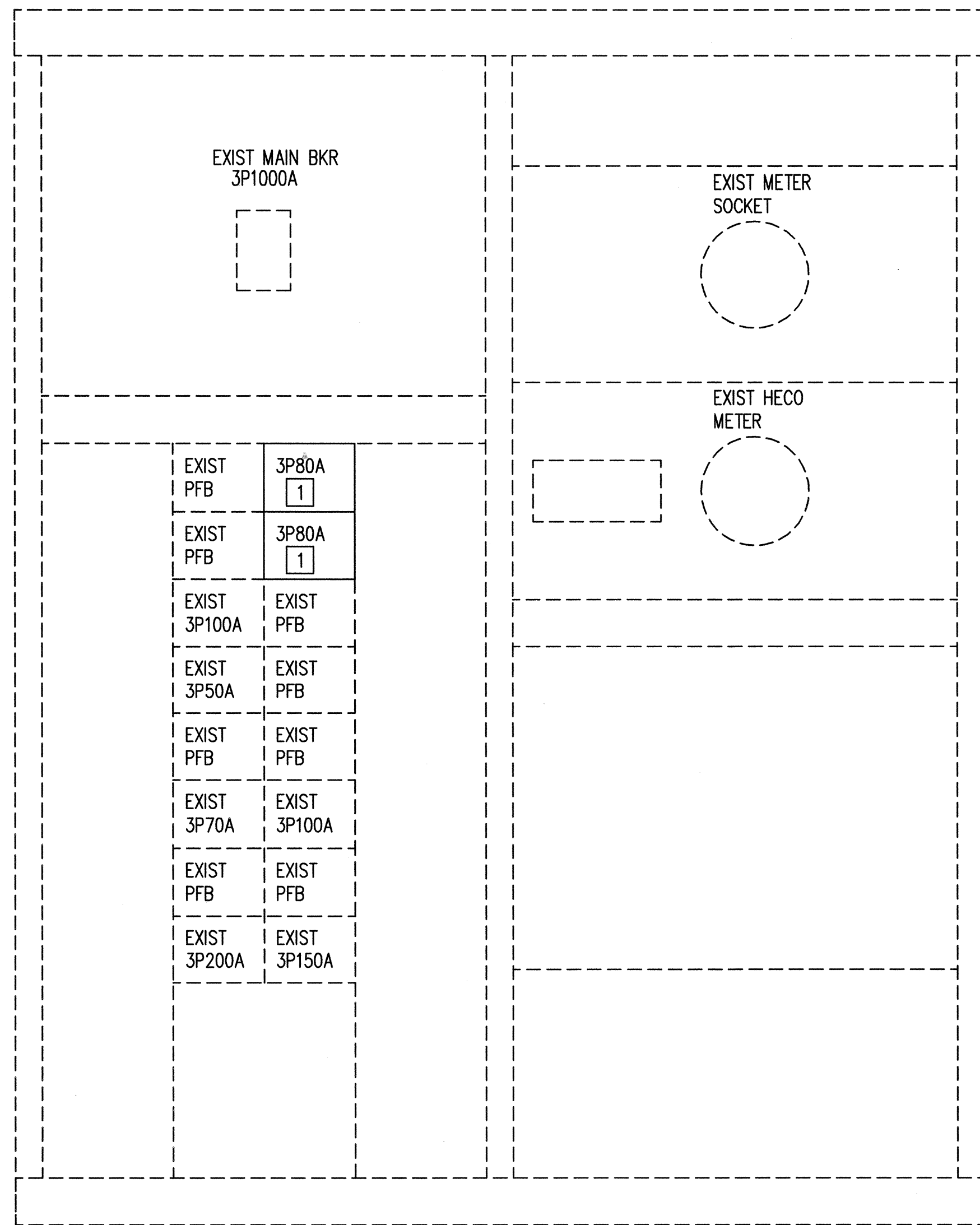
CENTRAL SERVICES DIVISION
NEW PHOTOVOLTAIC SYSTEM

HONOLULU OAHU HAWAII

MISCELLANEOUS DETAILS

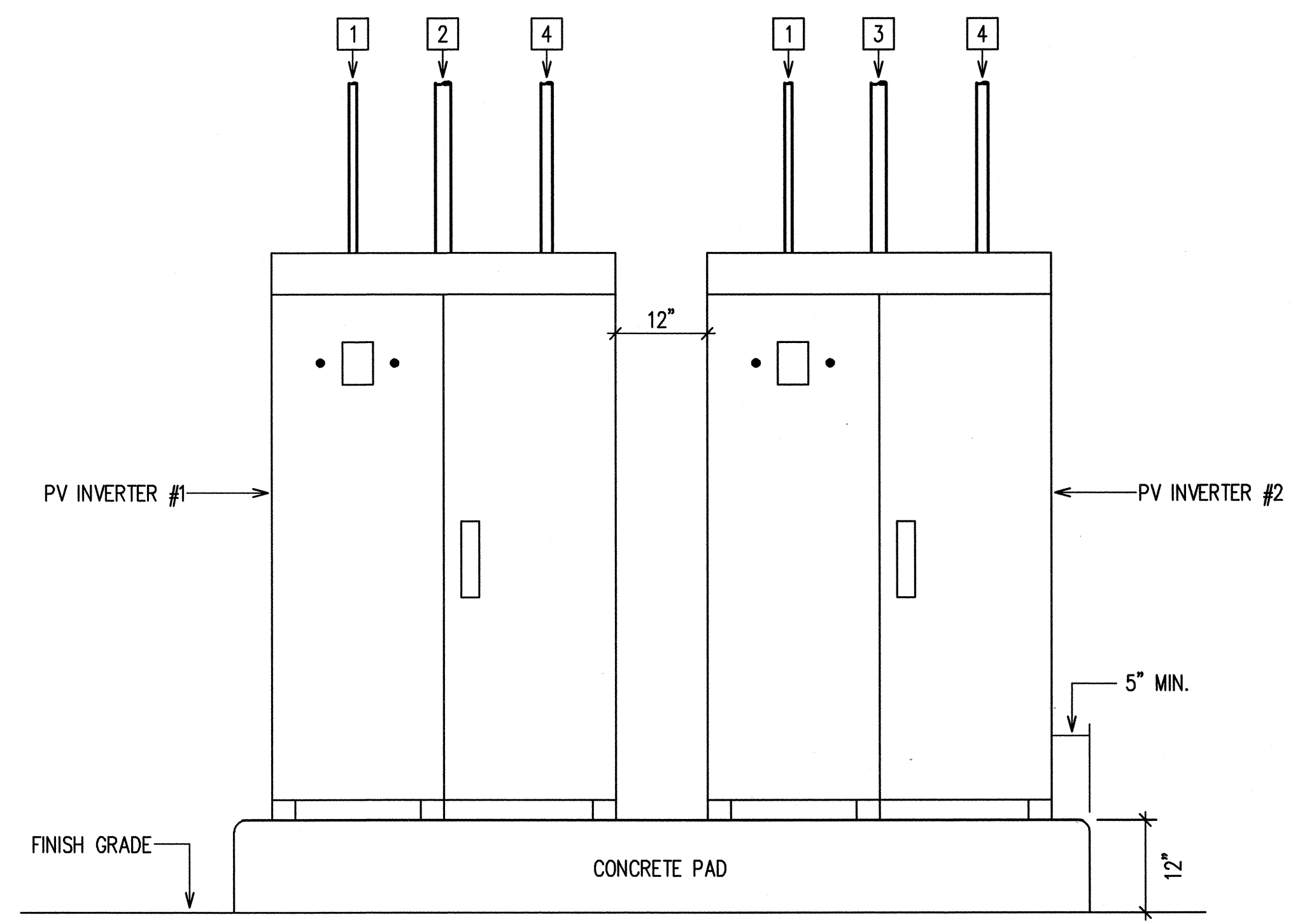
DESIGNED BY: IJK	CHECKED BY: BO	DAGS JOB NO.: 52-10-0642	DRAWING NO.: E-9
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 12 OF 13 SHTS
SCALE: AS SHOWN		FILE DRAWER FOLDER	

LAST SAVE: 09/29/10 @ 08:38:15 BY: LJK PLOT SC: 1'-0"=1' Z:\CAD\PROJECTS\210031\ED09_210031.dwg Details



- NOTES:**
1. [1] PROVIDE NEW CIRCUIT BREAKER IN EXISTING PFB LOCATION.

PARTIAL MAIN DISTRIBUTION SWITCHBOARD ELEVATION
NOT TO SCALE



- NOTES:**
1. [1] 1" C TO WEB SERVER DEVICE.
 2. [2] 2" C TO COMBINER BOX #1.
 3. [3] 2" C TO COMBINER BOX #2.
 4. [4] 1 1/2" C TO DISTRIBUTION SWITCHBOARD.

1 ELECTRICAL EQUIPMENT ELEVATION
E-10 NOT TO SCALE

EXIST PANEL "2JJ"		150A MAIN BREAKER, 208Y/120V, 3 PHASE, 4 WIRE, 225A BUS		10,000 A.I.C. INDUSTRIAL-BOLTED TYPE, SURFACE MOUNTED									
CKT. NO.	USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	BREAKER		WIRE SIZE	KVA ON BUSES			WIRE SIZE	BREAKER		USE: L-LTS, R-RECEP, PFB-PROVISION FUTURE BKR., S-SPARE, F-FAN, W-WARMER	CKT. NO.	
		POLE	AMPS		PHASE A	PHASE B	PHASE C		POLE	AMPS			
1	R-RM 501 & 502	1	20		0.8	0.8			1	20	R-RM 510, 512, 512	2	
3	R-RM 501 & 502	1	20			0.8	0.8		1	20	R-RM 510, 512, 512	4	
5	R-RM 516	1	20				0.8	0.8	1	20	R-RM 510, 512, 512	6	
7	R-RM 516	1	20		0.8	0.8			1	20	R-RM 511	8	
9	EWC RM 515	1	20			0.8	0.8		1	20	R-RM 511	10	
11	R-RM 510	1	20				0.8	1.0	1	20	R-REFRIGERATOR RM 511	12	
13	R-RM 510 & 511	1	20		0.8	0.8			1	20	R-RM 501	14	
15	R-RM 510	1	20			0.8	0.8		1	20	R-RM 501	16	
17	R-RM 502 & 522	1	20				0.8	0.8	1	20	R-RM 501	18	
19	L-RM 520	1	20		0.8	0.8			1	20	L-RM 506	20	
21	L-RM 521	1	20			0.8	1.0		1	20	XEROX MACHINE - RM 510	22	
23	L-RM 523	1	20				0.8	1.0	1	20	R-TEL CAB, "T-JJ" RM 506	24	
25	FA-RM 510	1	20		0.8	0.8			1	20	L-RM 502	26	
27	HALON CONTROL	1	20			1.0	0.8		1	20	SHUNT TRIP - RM 510	28	
29	PFB	1						1.0	1.0	1	20	ROLL UP DOOR	30
31	R-WEB SERVER (*)	1	20		0.4	1.0			1		PFB	32	
33	R-PV INVERTERS (*)	1	20			0.4	0.8		1	20	SHREDDER	34	
35	CONSTRUCTION TEMP (TAPED OFF)	1	20				0.0	1.0	1		PFB	36	
37	CONSTRUCTION TEMP (TAPED OFF)	1	20		0.0	1.0			1	20	NEW ROLL UP DOOR	38	
39	CONSTRUCTION TEMP (TAPED OFF)	1	20			0.0	1.0		1		PFB	40	
41	PFB	1					1.0	1.0	1		PFB	42	
CONNECTED LOAD PER PHASE					10.4	10.6	11.8	TOTAL CONNECTED LOAD (KVA)				32.8	

- NOTE:**
1. * DENOTES PROVIDE NEW CIRCUIT BREAKER IN PFB SPACE.

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Electrical Engineers
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DEPT. OF ACCOUNTING & GENERAL SERVICES
PUBLIC WORKS DIVISION
STATE OF HAWAII

**CENTRAL SERVICES DIVISION
NEW PHOTOVOLTAIC SYSTEM**

HONOLULU OAHU HAWAII

ELEVATION AND PANEL SCHEDULE

DESIGNED BY: IJK	CHECKED BY: BO	DAGS JOB NO.: 52-10-0642	DRAWING NO.: E-10
DRAWN BY: CAD	APPROVED BY: SKS	DATE: SEP 2010	SHEET 13 OF 13 SHTS
SCALE: AS SHOWN		DRAWER: FOLDER:	

LAST SAVE: 09/29/10 @ 09:56:48 BY: LK PLOT TO: I:\000000-12\00000 Z:\ADD\PROJECTS\210031\010_210031_Elevation.dwg and Plot.