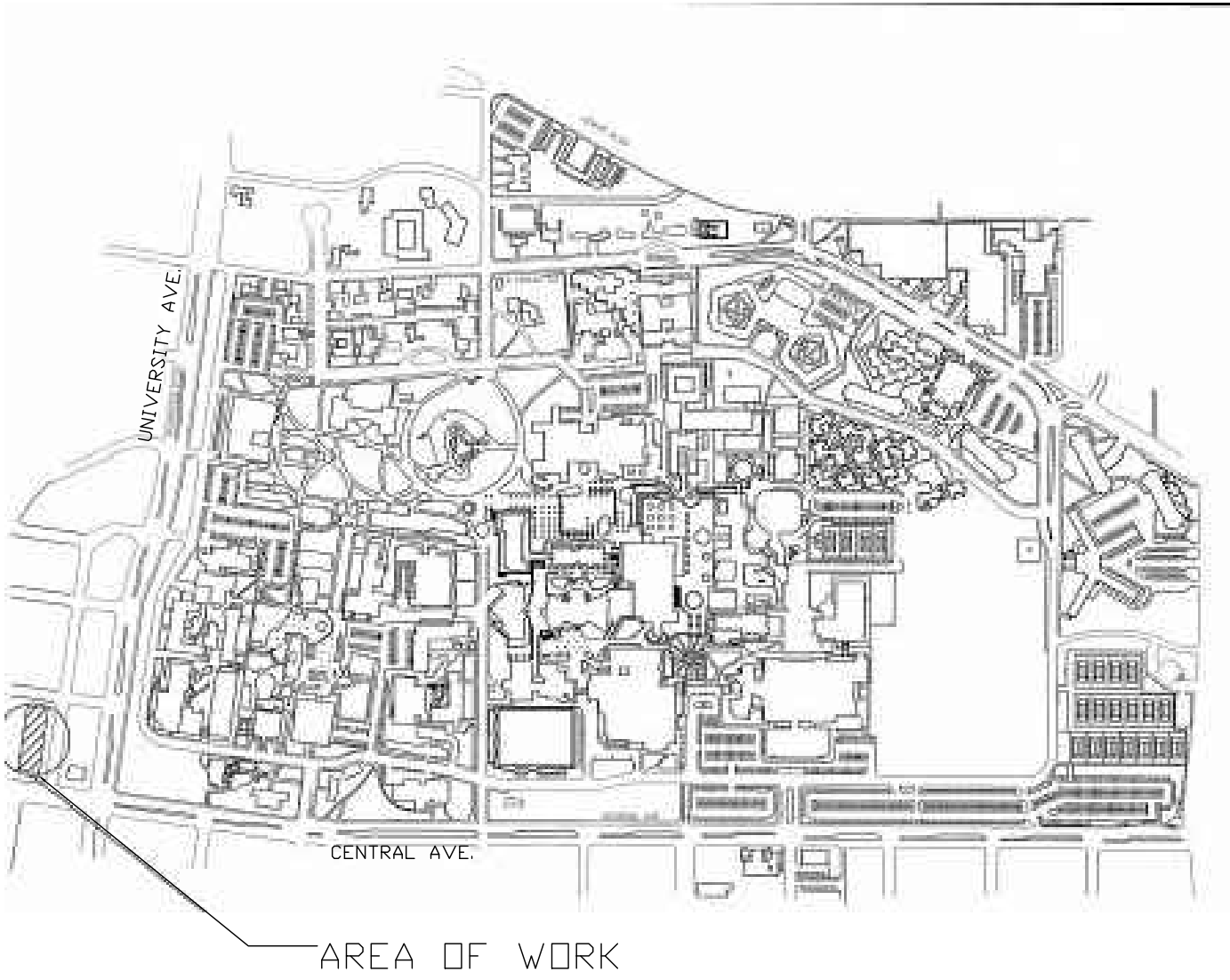


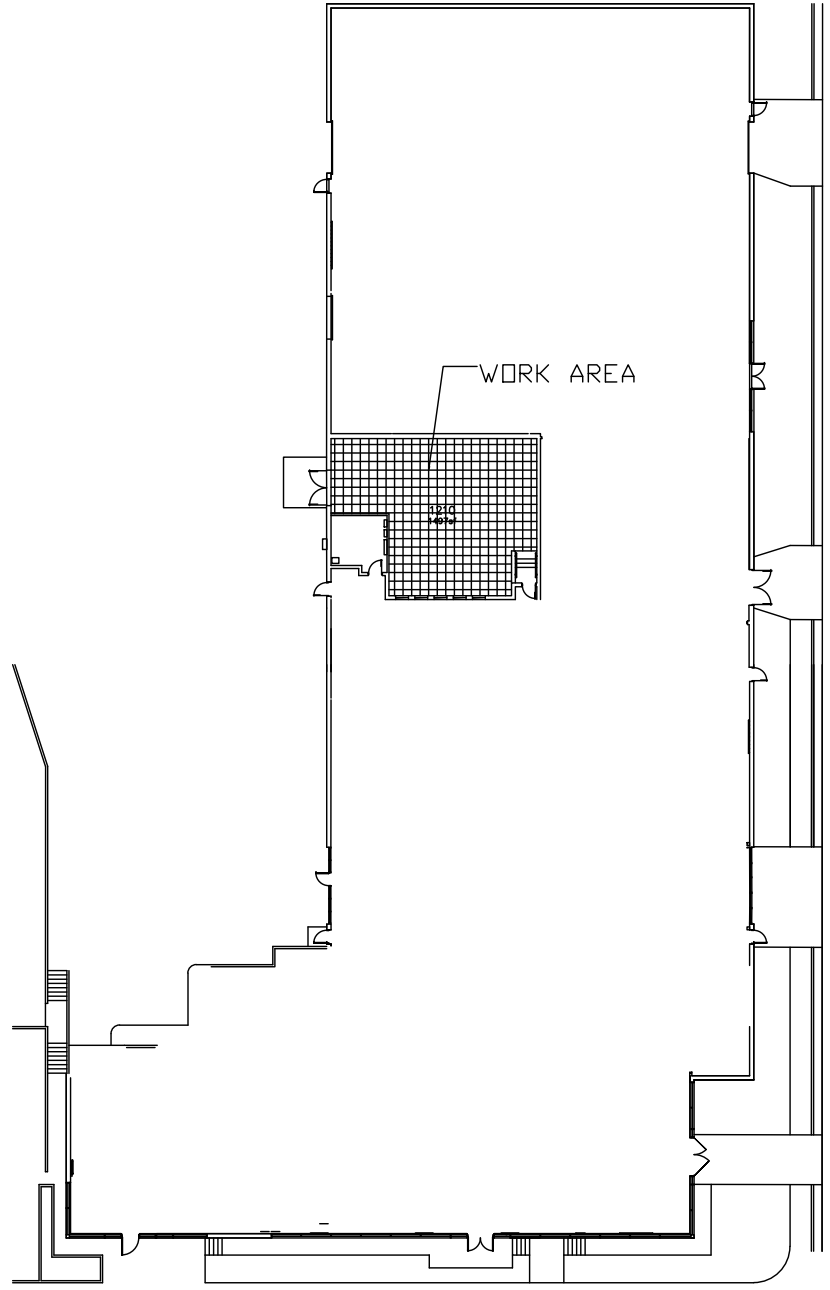
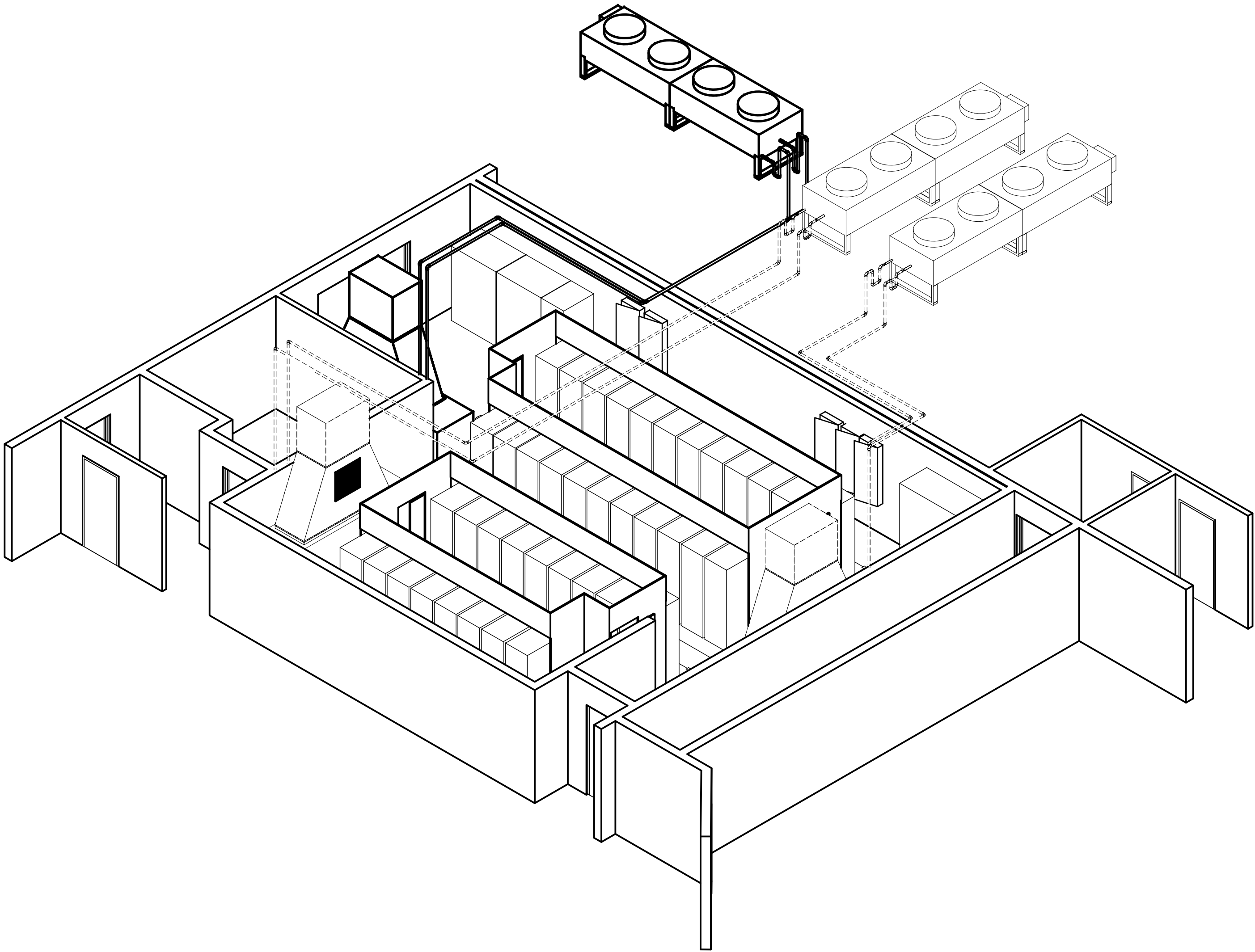
1/20/2020 5:50:39 PM

PROJECT INFORMATION		
A.	PROJECT IDENTIFICATION	UNIVERSITY OF NEW MEXICO (UNM) CENTER FOR ADVANCED RESEARCH COMPUTING (CARC) MMR UPGRADE
B.	PROJECT ADDRESS AND LOCATION	1601 CENTRAL NE, ALBUQUERQUE, NEW MEXICO 87106 SEE VICINITY MAP AND WORK AREA LOCATION THIS SHEET
C.	DESIGN PROFESSIONALS	ASSURANCE ENGINEERING INC 7850 JEFFERSON STREET NE SUITE 110 ALBUQUERQUE, NEW MEXICO 87109 505 246-4331
D.	PRIME DESIGN PROFESSIONAL	ELECTRICAL DAVID EXE, PE NM 17593 MECHANICAL EDWARD HENDERSON PE NM 17053 EDWARD HENDERSON, PE 505 353-0229
E.	APPLICABLE CODES	IEBC 2009 LEVEL II ADDITION OF EQUIPMENT TO AN EXISTING FACILITY. STRUCTURE, OCCUPANCY AND USE ARE EXISTING TO REMAIN. SECTION 702.1 SPECIAL USE AND OCCUPANCY 704.2.2.2 AUTOMATIC SPRINKLER SYSTEMS GROUP B 705.3.1.1(1) SINGLE EXIT ONE STORY NATIONAL ELECTRIC CODE (NEC) 2014 NFPA 70
F.	DESIGN CRITERIA LIST	
F.1.	TYPE OF BUILDING	IBC 2009 IIA SECTION 602.2 NFPA 220 II (111)
F.2.	SQUARE FOOTAGE	PROJECT AREA 1,447 TOTAL BUILDING 31,200
F.3.	GROUP/OCCUPANCY	B NFPA 101-2009 39 EXISTING
F.4.	OCCUPANT LOAD	100 GROSS IBC-2009 TABLE 1004.1.1
F.5.	ALLOWABLE AREA	UNLIMITED IBC-2009 507.3
F.6.	EXITING REQUIREMENTS	EXISTING TO REMAIN
F.7.	PLUMBING FIXTURE	EXISTING TO REMAIN
F.8.	FIRE SPRINKLERS	FM 200 EXISTING TO REMAIN
F.9.	HEIGHT AND NUMBER OF STORIES	EXISTING TO REMAIN
F.10.	LAND ZONE USE	NA NO CHANGE
F.11.	LOCATION OF PROPERTY	AS ABOVE 1601 CENTRAL NE ALBUQUERQUE, NEW MEXICO 87106
F.12.	SEISMIC LOCATION	ZONE C IBC 1613.5(2) 0.2g 2% PROBABILITY OF EXCEEDANCE IN 50 YEARS

THE UNIVERSITY OF NEW MEXICO CENTER FOR ADVANCED RESEARCH COMPUTING (CARC) MMR UPGRADE



1 VACINITY MAP
SCALE: NTS



2 WORK AREA
SCALE: NTS

3 WORK AREA ISOMETRIC
SCALE: NTS

DRAWING NUMBER	DESCRIPTION
MEP000	COVER SHEET
M101	EXISTING HVAC LAYOUT
M102	NEW HVAC LAYOUT
M501	MECHANICAL SCHEDULES
E101	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL BUILDING POWER PANEL LAYOUT
E202	ELECTRICAL POWER PLAN
E301	ELECTRICAL FACILITY 1-LINE DIAGRAM
E302	ELECTRICAL PANEL SCHEDULES
E303	ELECTRICAL EQUIPMENT GROUNDING PLAN
E401	EMERGENCY POWER OFF (EPO) WIRING DIAGRAM

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			2	2/29/15	DE	AS-BUILT			PLDT	SIZE				
									1 = 1	24x36				
									SCALE	CADD NO.				
			NO.	DATE	BY	DESCRIPTION			as shown					

GENERAL NOTES

A. REFERENCE DRAWING AS PROVIDED BY UNM; SEE TELCK-HENSLEY M1.1 DATED 4/20/2014.

B. EXISTING MEMBRANE ROOF SHOWS DAMAGE UNDER CU-1, AND CU-2. CONTRACTOR TO CONFIRM REPAIR PRIOR TO INSTALLATION OF CU-3.

C. CONTRACTOR TO FIELD VERIFY:

- EXISTING OPERATIONAL CONDITION OF AC-1, CU-1
- AC-2, CU-2 AND ASSOCIATED REFRIGERANT LINES INCLUDING INSULATION
- EXISTING ROOF ATTACHMENT OF CU-1, AND CU-2

KEY NOTES M101

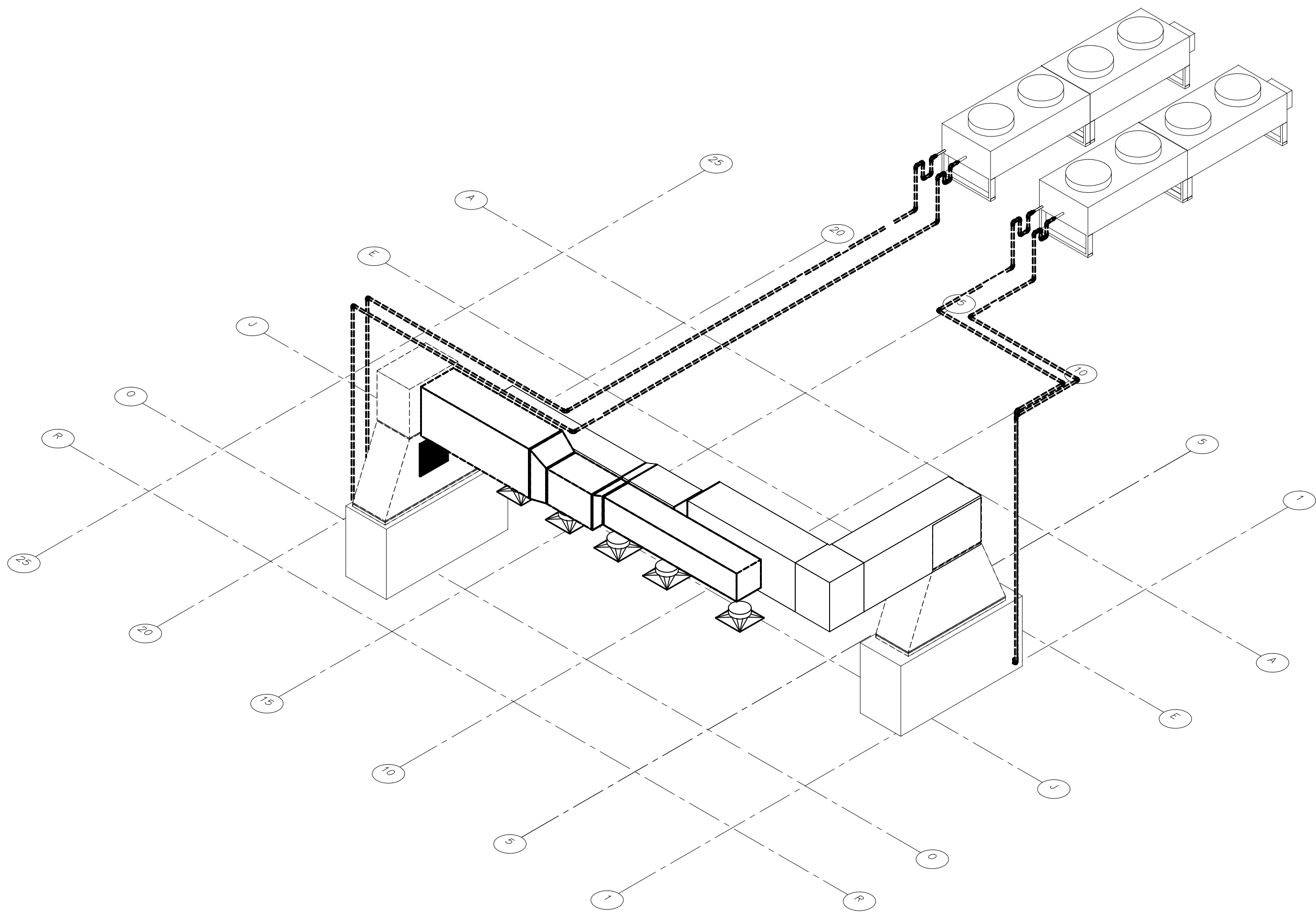
1. CONTRACTOR TO REMOVE EXISTING DUCTWORK AND RETURN GRILLES. PRESERVE RETURN GRILLES FOR RE-USE. CLEAN AND REPAIR AS REQUIRED. CAP AND SEAL EXISTING RETURN AIR CONNECTION AT AC-2.

2. EXISTING TO REMAIN.

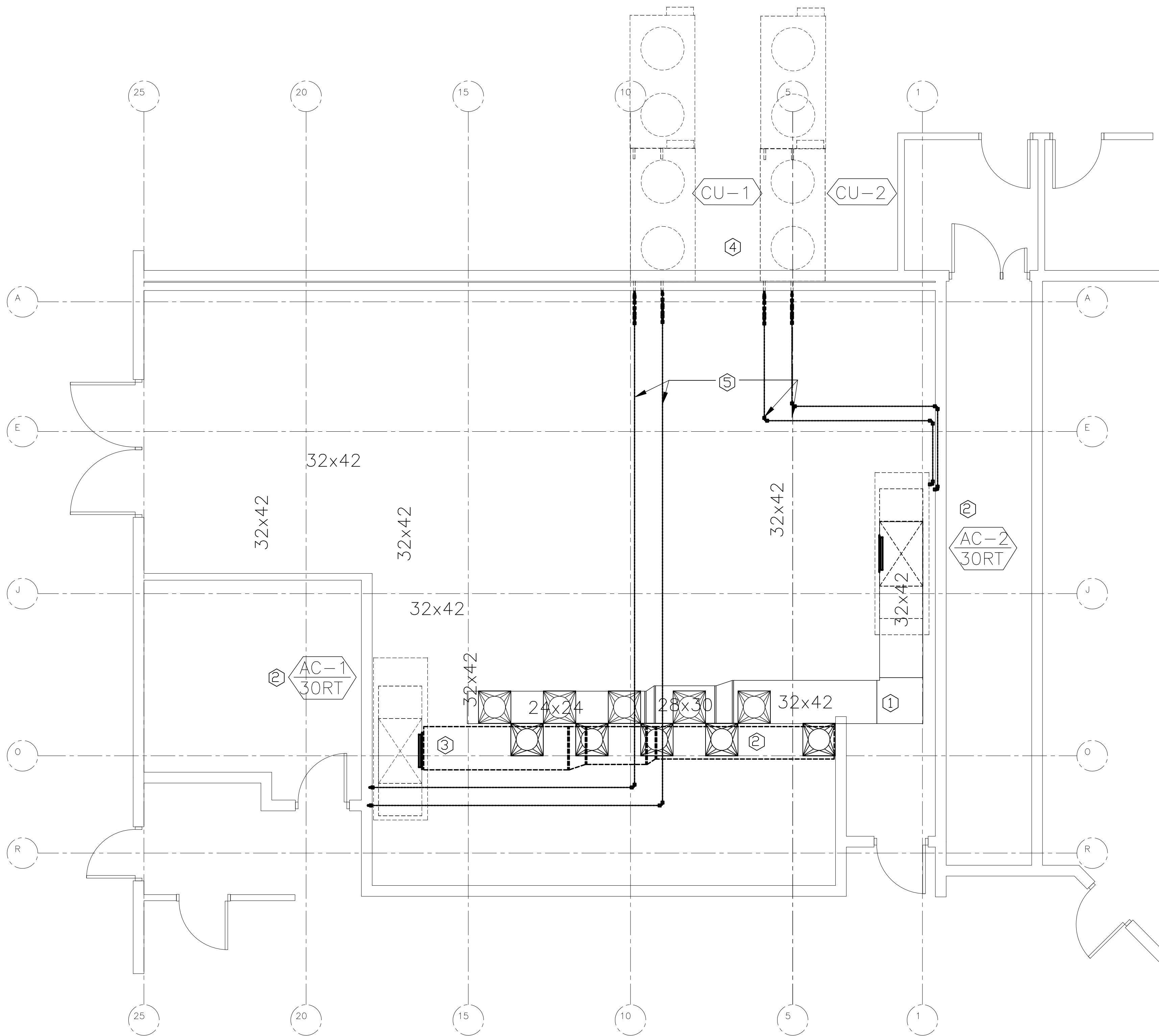
3. BLANK OFF ANY FACE MOUNTED RETURN AIR PATH AT EACH GRILLE.

4. EXISTING ROOF-MOUNTED CONDENSER.

5. EXISTING REFRIGERATION SUPPLY AND RETURN LINES.



2 CARC EXISTING MACHINE ROOM HVAC LAYOUT ISOMETRIC VIEW
M101 SCALE: NTS



1 CARC EXISTING MACHINE ROOM HVAC LAYOUT
M101 SCALE: NTS

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2	2/29/15	DE	AS-BUILT

INDUSTRIAL ENGINEERING, INC.
3210 23RD AVE SE
RIO RANCHO, NM 87124



DWG DATE 09/03/15	JOB NO. 70602
PLDT 1 = 1	SIZE 24x36
SCALE as shown	CADD NO.

OWNER
The University of New Mexico
Center for Advanced Research Computing (carc)
1601 central Avenue NE
Albuquerque, NM

PROJECT
MMR UPGRADE

TITLE
EXISTING HVAC LAYOUT

DWG. NO.
M101

- GENERAL NOTES
- A.

REFERENCE DRAWING AS PROVIDED BY UNM; SEE TELCK-HENSLEY M1. DATED 4/20/2014.
- B.

EXISTING MEMBRANE ROOF SHOWS DAMAGE UNDER CU-1, AND CU-2. CONTRACTOR TO CONFIRM REPAIR PRIOR TO INSTALLATION OF CU-3.
- C.

CONTRACTOR TO FIELD VERIFY:
 - EXISTING OPERATIONAL CONDITION OF AC-1, CU-1
 - AC-2, CU-2 AND ASSOCIATED REFRIGERANT LINES INCLUDING INSULATION
 - EXISTING ROOF ATTACHMENT OF CU-1, AND CU-2

- KEY NOTES M102
1.

CONTRACTOR TO REMOVE AND PRESERVE FOR RE-USE EXISTING DUCTWORK AND RETURN GRILLES. REPAIR AS REQUIRED. CLEAN AND SEAL TO SMACNA SEAL CLASS B, LEAK CLASS 12.
- 1.1.

CALCULATED LEAKAGE RATE (F) = 42.88 CFM / 100 SQ FT
- 1.1.1.

C = 21
- 1.1.2.

SP = <3 "WC
- 1.1.3.

N = 0.65
2.

CONTRACTOR TO INSTALL OWNER-FURNISHED CRAC AND ASSOCIATED ROOF-MOUNTED CONDENSER AS PER OEM INSTRUCTIONS.
3.

CONTRACTOR TO FABRICATE AND INSTALL NEW DUCTWORK CONNECTING MAIN RETURN DUCTWORK TO EXISTING DUCTWORK AS SHOWN. CLEAN AND SEAL TO SMACNA SEAL CLASS B, LEAK CLASS 12. PROVIDE BALANCING DAMPERS AS REQUIRED TO ASSURE EQUAL LOADING TO EACH CRAC.
4.

EXISTING TO REMAIN.
5.

RELOCATE EXISTING DUCT TO THIS LOCATION, CLEAN, RE-SEAL AND ATTACH TO CRAC-2.
6.

TURNING VANES ARE REQUIRED AT ALL 90 DEGREE BENDS.
7.

CONTRACTOR TO CONFIRM LOCATION OF CONDENSATE AND DOMESTIC COLD WATER AT AC-1.
- 7.1.

ROUTE NEW CONDENSATE DRAIN FOR AC-3 TO NEAREST ACTIVE DRAIN LOCATED BELOW EXISTING AC-1, ATTACH VIA AIR GAP.
- 7.2.

ROUTE NEW WATER CONNECTION FROM NEAREST AVAILABLE DOMESTIC COLD WATER TO AC-3.
8.

BALANCE DUCTED RETURN AIR TO MATCH OEM SPECIFICATIONS AT EACH EXISTING CRAC AND NEW CRAC.
9.

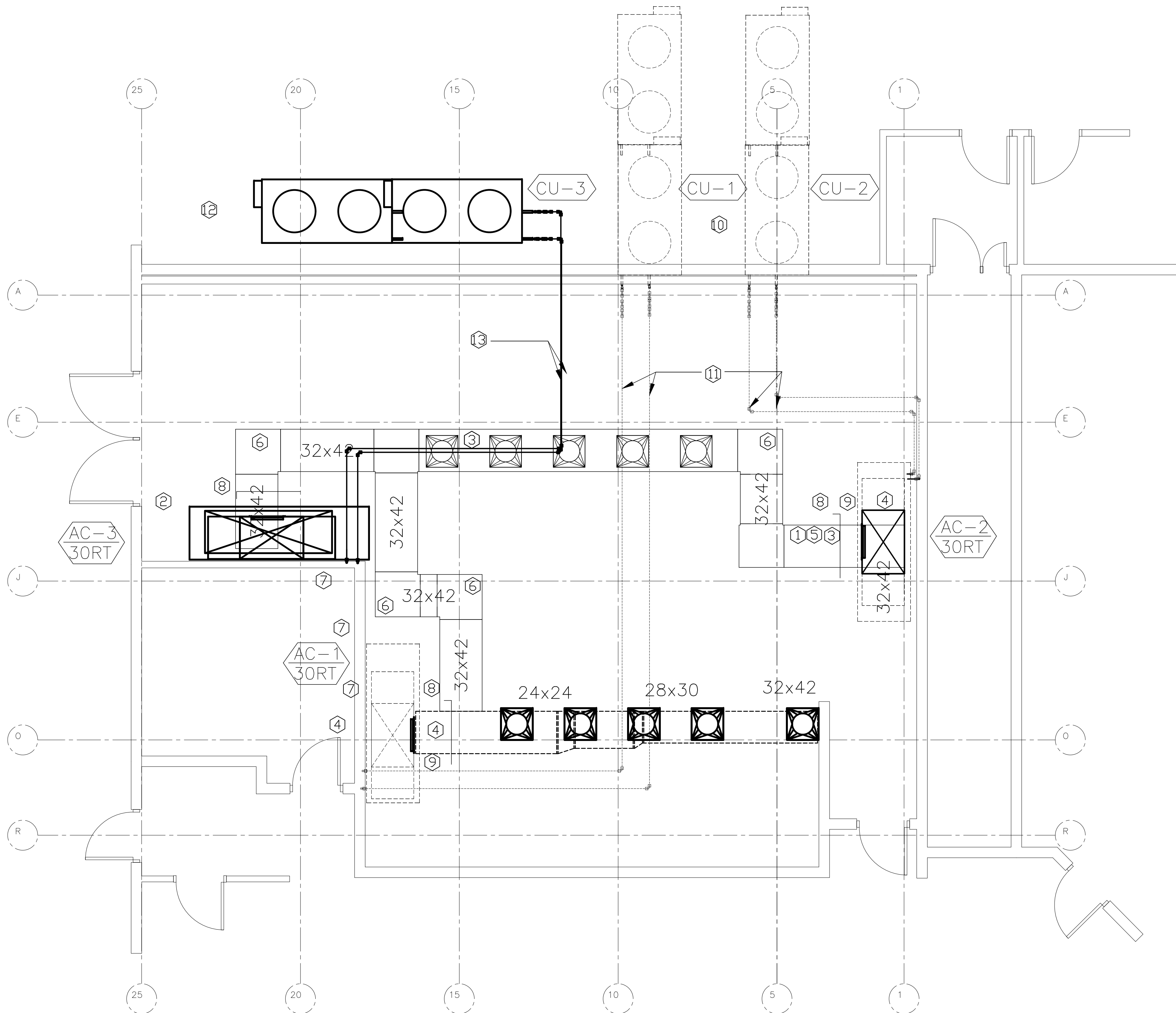
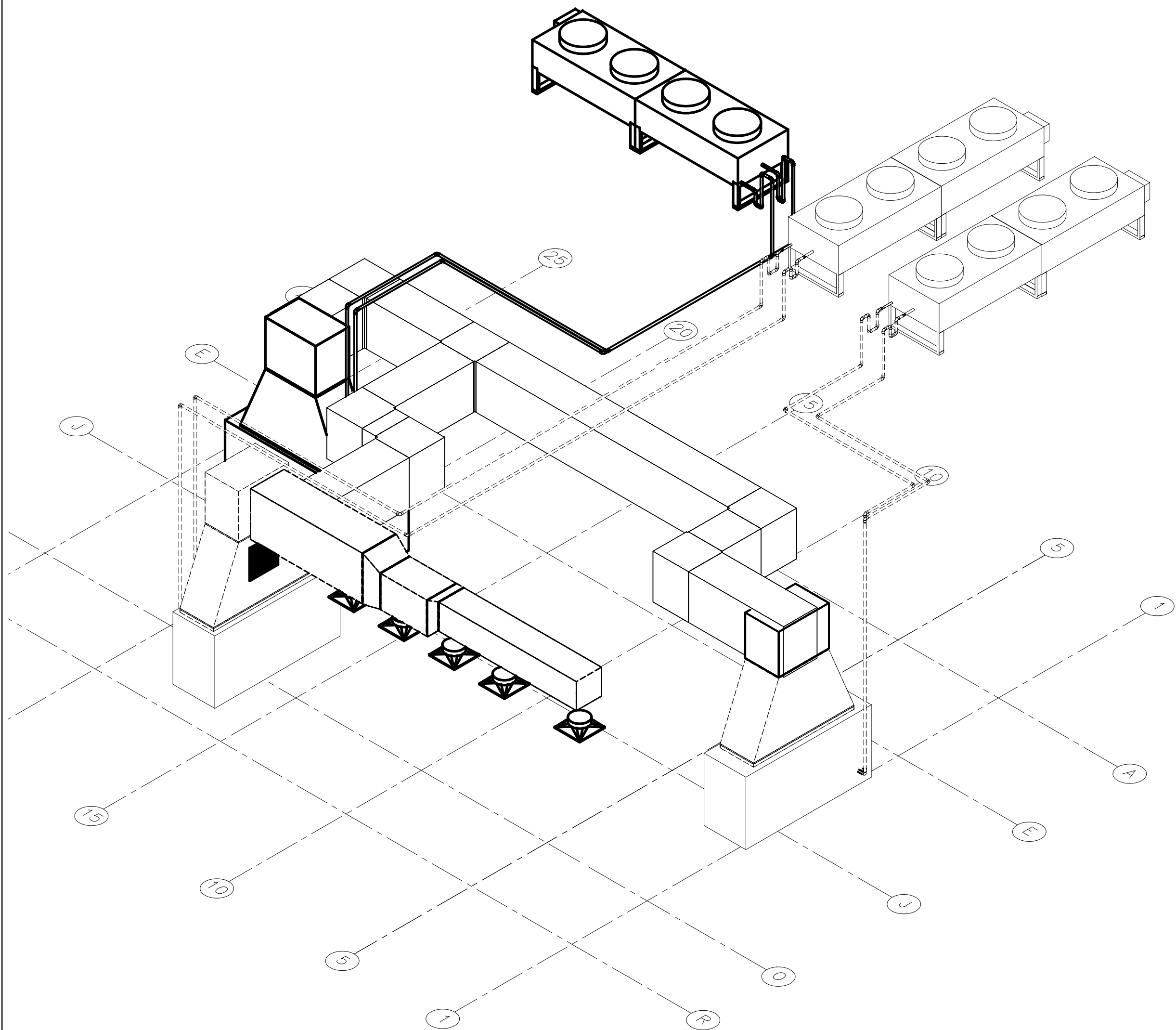
BLANK OFF ANY FACE MOUNTED RETURN AIR PATH AT EACH CRAC.
10.

EXISTING ROOF-MOUNTED CONDENSER.
11.

EXISTING REFRIGERATION SUPPLY AND RETURN LINES.
12.

NEW OWNER FURNISHED ROOF-MOUNTED CONDENSER.
13.

NEW REFRIGERANT SUPPLY AND RETURN LINES. SEE DETAIL ON M601 FOR PIPE SIZING AND ROOF LAYOUT. INSULATE WITH 1" CLOSED CELL FOAM AND PROTECT WITH ALUMINUM ALL SERVICE JACKET.



2

NEW HVAC LAYOUT ISOMETRIC

M102

SCALE: N.T.S.


1

NEW HVAC LAYOUT

M102

SCALE: 0' 4'

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09/03/15
PLDT
1 = 1
SCALE
as shown

JOB NO.
70602
SIZE
24x36
CADD NO.

OWNER
The University of New Mexico
Center for Advanced Research Computing (carc)
1601 central Avenue NE
Albuquerque, NM

PROJECT
MMR UPGRADE

TITLE
NEW HVAC LAYOUT

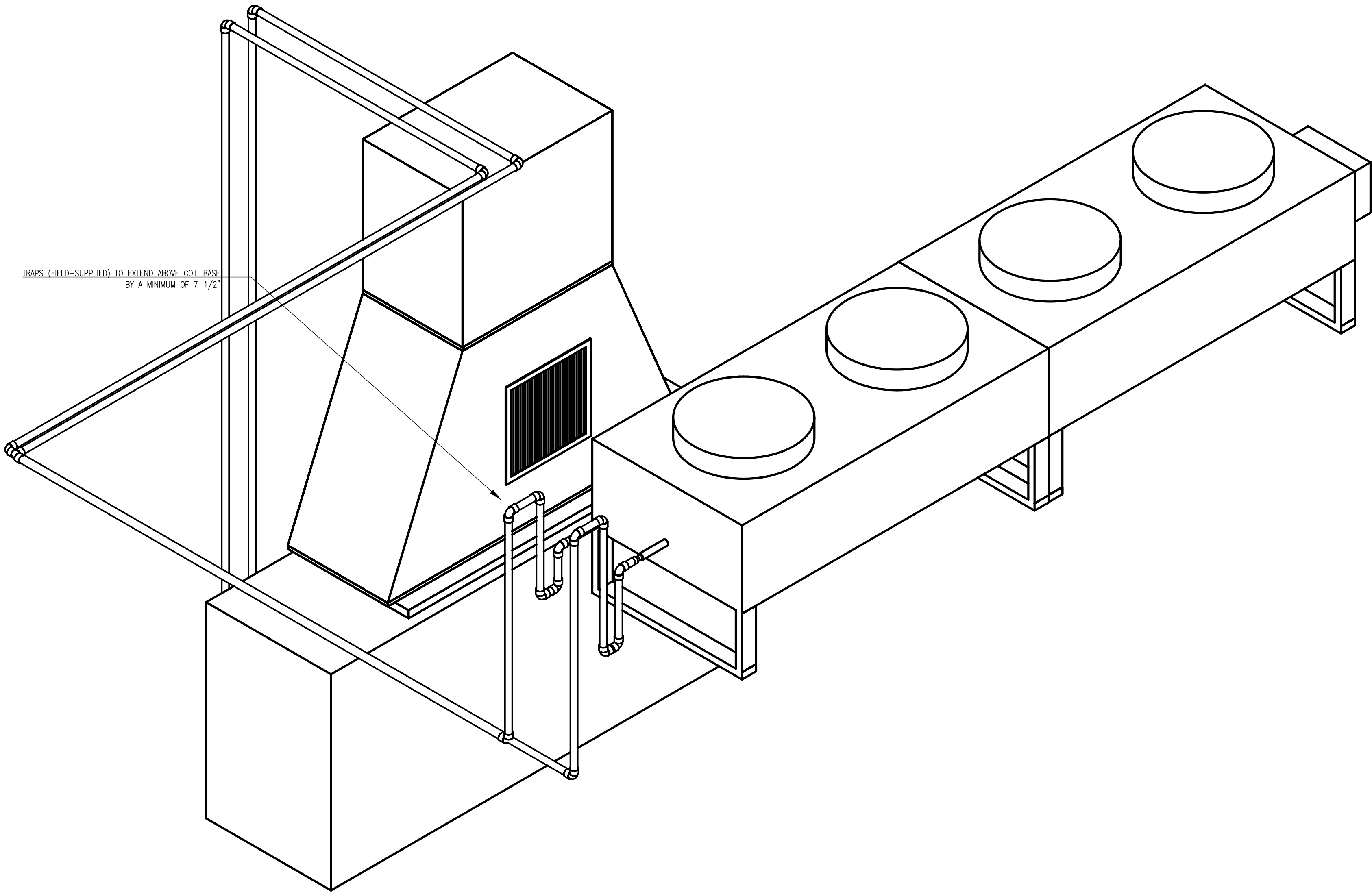
DWG. NO.
M102

COMPUTER ROOM AIR-CONDITIONING UNITS (CRAC)

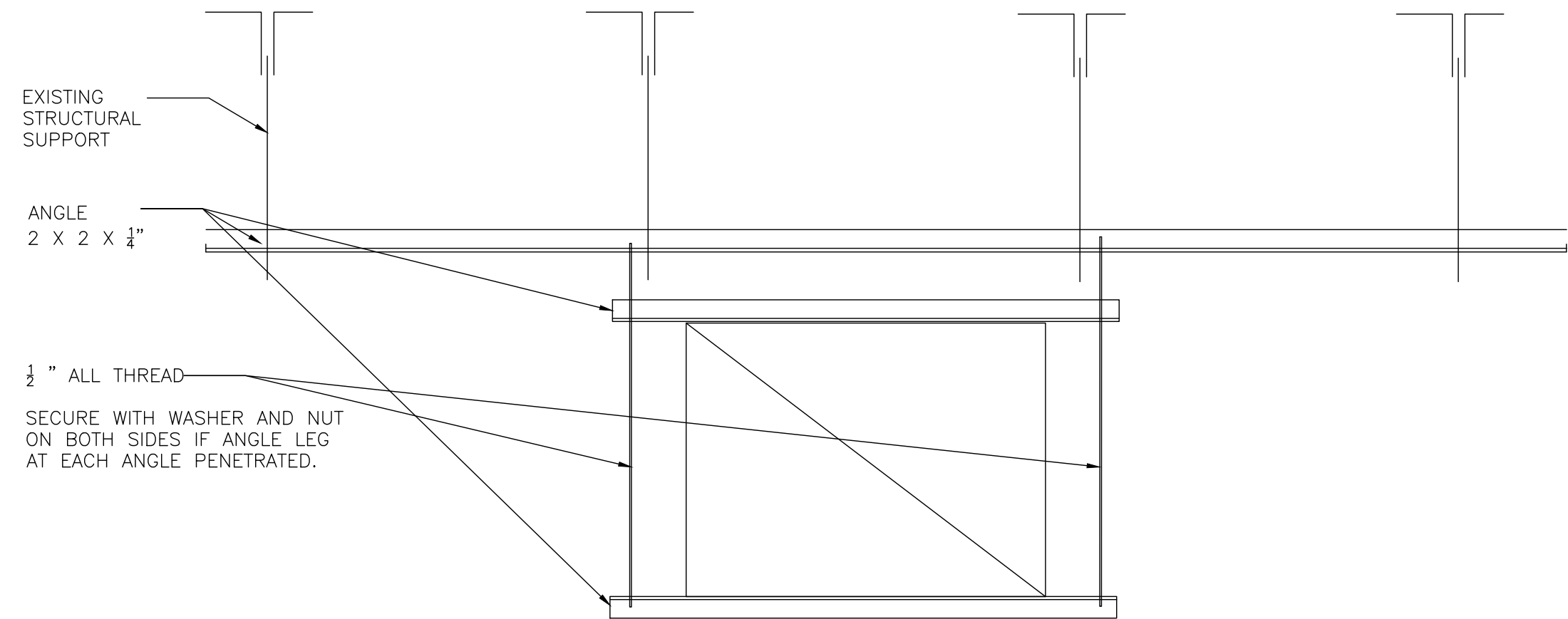
AC-3	FURNISHED BY UNM	LEIBERT	MODEL	DS105AMAGEI324S	SERIAL	C07E8E0150	NAMEPLATE DATA
			DS	DOWN FLOW			
			105	30 RTons			
			A	AIR COOLED			
			M				
			A	460 3ph 60hz			
			O	CENTRIFUGAL FAN			
			E	3-STAGE ELECTRIC REHEAT			
			I	INFRARED HUMIDIFICATION			
			345S	MFG CONFIGURATION			
TOTAL SYSTEM	INPUT AMPS	96.8	MINIMUM SUPPLY CIRCUIT AMPACITY	110			
	MAXIMUM FUSE OR CIRCUIT BREAKER SIZE			125			
	HUMIDIFIER	FLA	11.6				
	ELECTRIC REHEAT	FLA	39.1	STAGES 3		AMPS per ELEMENT	22.6
	EVAPORATOR FAN	FLA	15.0	Hp 15			
	COMPRESSOR 1	RLA	32.1	LRA 187			
	COMPRESSOR 2	RLA	32.1	LRA 187			
	REFRIGERANT	R-22					
	DESIGN PRESSURE	300 PSIG	HIGH150 PSIG	LOW			

CU-3	FURNISHED BY UNM	LEIBERT	MODEL	DCDF415-A	SERIAL	0723C00282	NAMEPLATE DATA	STANDARD MODEL
TOTAL SYSTEM	INPUT AMPS	96.8	MINIMUM SUPPLY CIRCUIT AMPACITY	110	MAXIMUM FUSE OR CIRCUIT BREAKER SIZE	125	D	DISCONNECT SWITCH
							C	CONDENSER
							F	FAN SPEED CONTROL
							415	MODEL SIZE
							A	4 FANS
								1 CIRCUIT
								HOT GAS CONNECTION 1 3/8" OD LIQUID 1 3/8" OD
								840 LBS
MECHANICAL CONTRACTOR TO PROVIDE CONDUIT AND CONDUCTOR BETWEEN CRAC AND ROOF-MOUNTED CONDENSER. ELECTRICAL CONTRACTOR TO INSTALL AND LAND CONTROL WIRES.	QTY	FLA	Hp	VOLTS	Ph			
PSC	1	2.5	0.75	460	1			
POLYPHASE	3	1.7	0.75	460	3			
DESIGN PRESSURE	320 PSIG	HIGH	165 PSIG	LOW				

DE-#	FURNISHED BY UNM	TATE	QTY	SP	AIR VOLUME
1	RockAir	40	0.20	797	
2	PERF 800	0	0.20	756	
3	PERF 1250	10	0.20	756	



1 NEW CRAC LAYOUT ISOMETRIC
M501 SCALE: N.T.S.



2 RETURN DUCT TRAPEZE
M501 SCALE: N.T.S.

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DWG DATE	JOB NO.
09/03/15	70602
PLDT	SIZE
1 = 1	24x36
SCALE	CADD NO.
as shown	

DWNER	PROJECT
The University of New Mexico	MMR UPGRADE
Center for Advanced Research Computing (carc)	
1601 central Avenue NE	
Albuquerque, NM	

TITLE
MECHANICAL SCHEDULES

DWG. NO.
M501

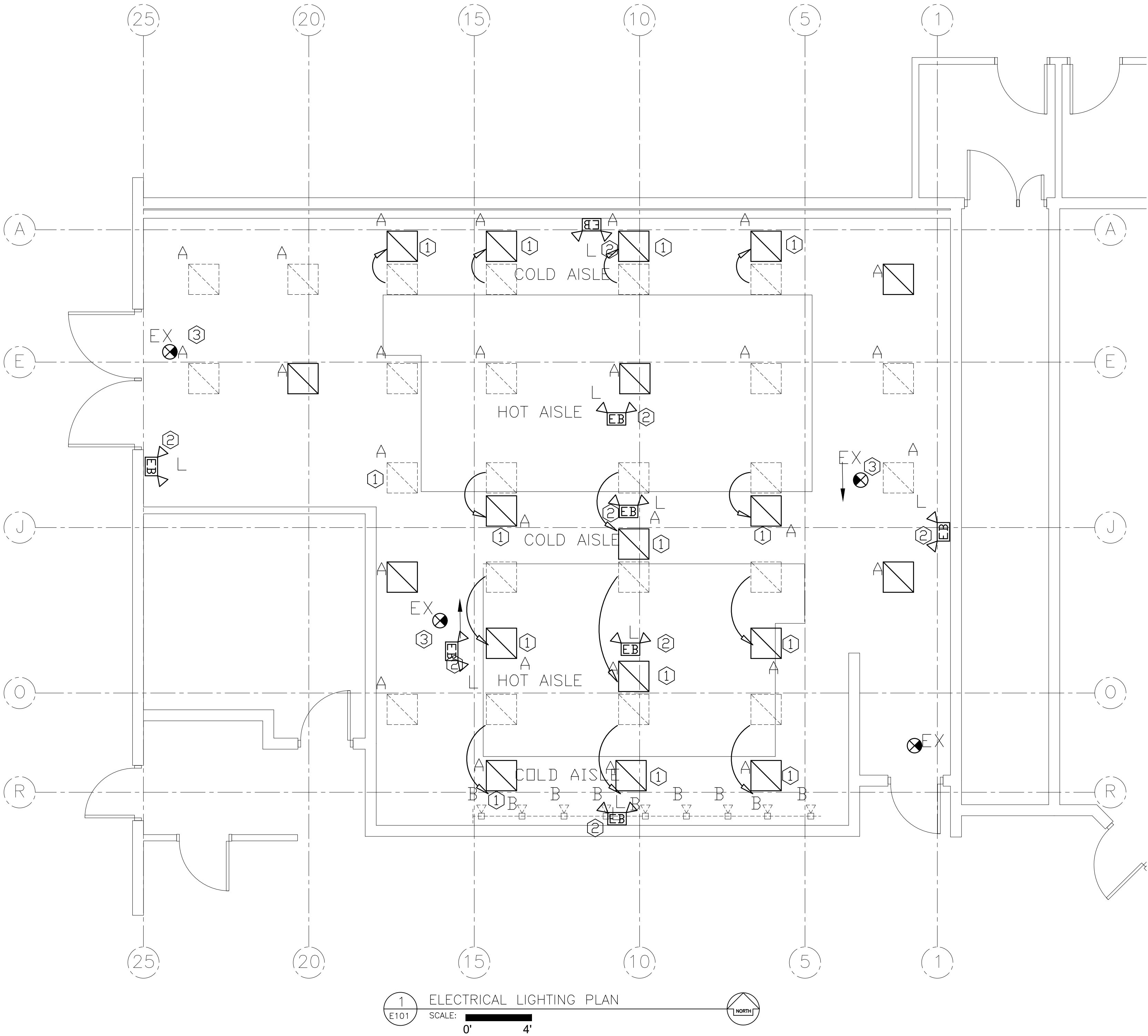
LIGHT FIXTURE SCHEDULE												
Quantity	KEY	ID	DESCRIPTION	ELECTRICAL DATA		LAMP DATA		BASIS OF DESIGN				NOTES
				VOLTAMP	VOLTAGE	QTY	WATT	MFG 1	CAT 1	MFG 2	CAT 2	
7	☐	A	EXISTING 2X2 LAYIN					EXISTING	EXISTING			
3	⊗	EX	EXIT LIGHT	5	120	1	5	DUALITE	EVCURW			
8	↕↕	L	DUAL HEAD EMERGENCY LIGHT	8	120	2	4	DUALITE	EV4-I			

- Ⓢ KEY NOTES
1.

CONTRACTOR TO ALLOW FOR REPOSITIONING THESE FIXTURES TO ADJOINING GRID LOCATIONS FOR PROPER LIGHT DISTRIBUTION ON THE WORKING SURFACES. LIGHTS SHALL BE CENTERED ON THE HOT AND COLD ISLES SUCH THAT THEY DO NOT PUT THE FACE OF THE CABINET IN SHADOW AND SHINE AS MUCH LIGHT AS POSSIBLE ON THE SURFACE OF THE FACE, OR REAR OF THE CABINET. THIS MAY REQUIRE ALTERNATING LOCATIONS INSTEAD OF A CONTINUOUS ROW OF LIGHTS. NO NEW LIGHTS WILL BE ADDED AND NO MODIFICATIONS TO EXISTING SWITCHING. CEILING GRID IS 2X4 WHILE LIGHTS ARE 2X2. VERIFY FINAL LOCATION WITH OWNER.
2.

PROVIDE 2 LAMP EMERGENCY FIXTURE MOUNTED AT CEILING ON 4X4 J-BOX. CONNECT TO LIGHTING CIRCUIT PER NEC.
3.

CONTRACTOR TO PROVIDE AND INSTALL NEW EXIT LIGHTS AS SHOWN.



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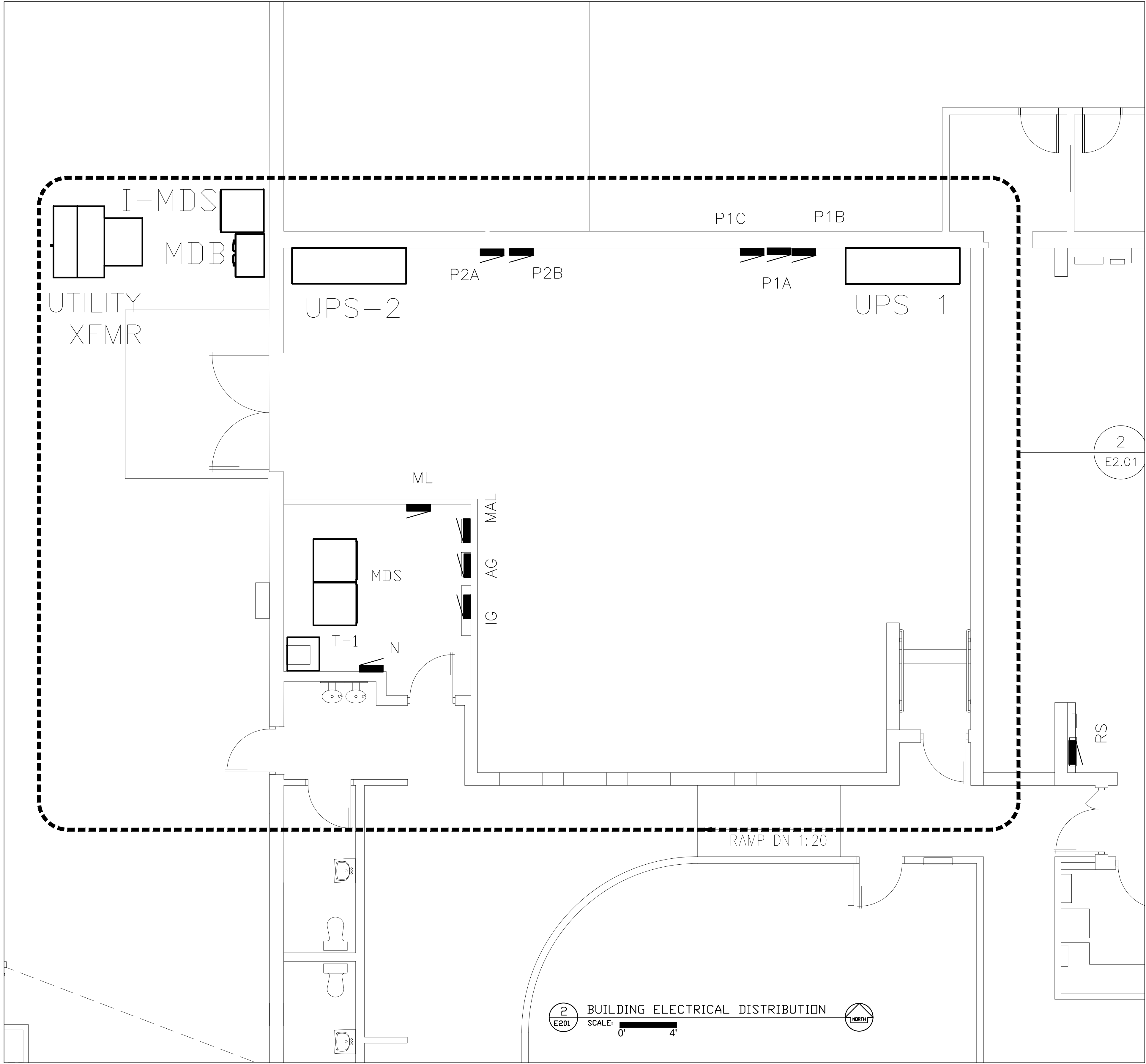
OWNER
The University of New Mexico
Center for Advanced Research Computing (carc)
1601 central Avenue NE
Albuquerque, NM

PROJECT
MMR UPGRADE

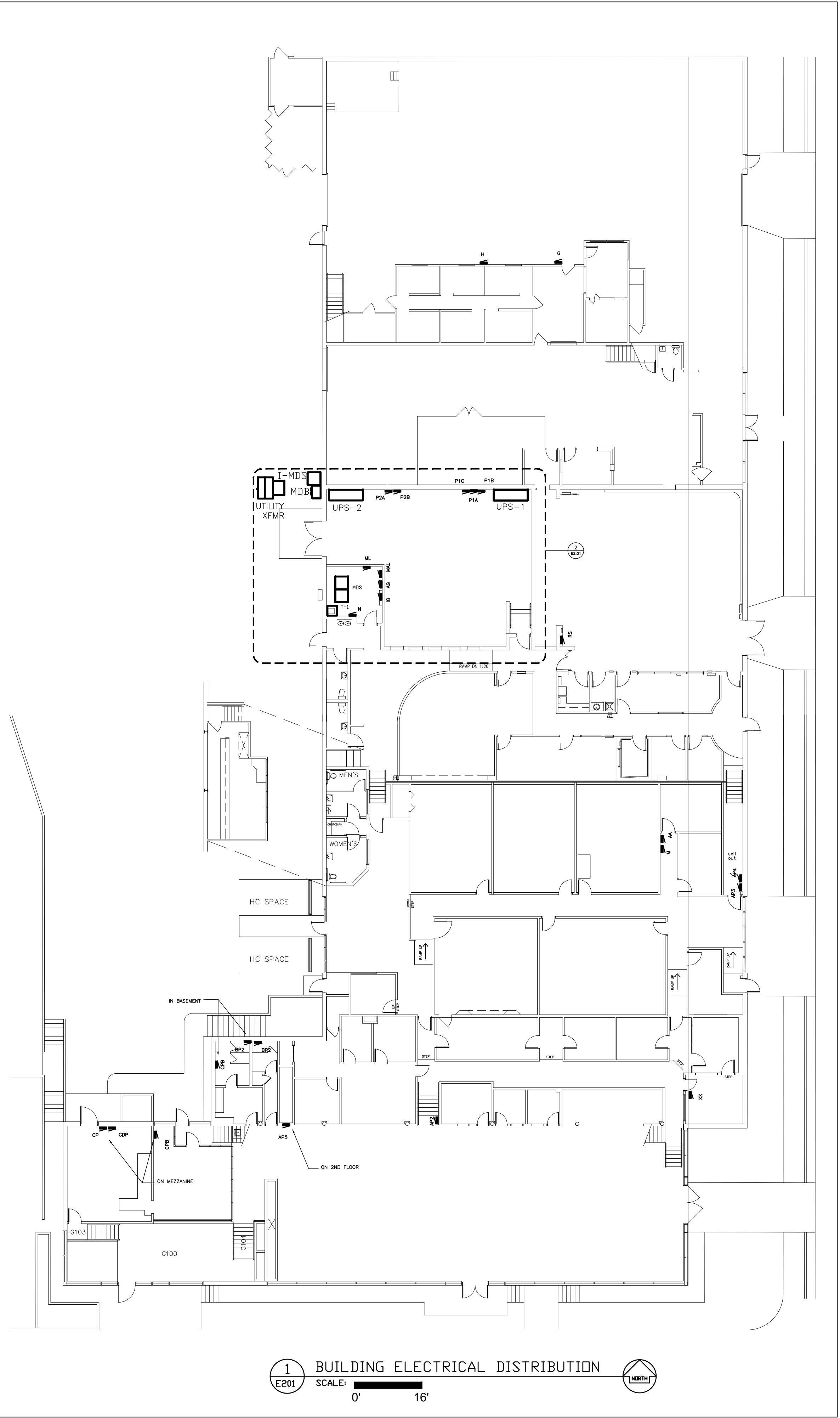
TITLE
ELECTRICAL LIGHTING PLAN

DWG. NO.
E101

1/20/2020 5:51:30 PM



2 BUILDING ELECTRICAL DISTRIBUTION
SCALE: 0' 4'



1 BUILDING ELECTRICAL DISTRIBUTION
SCALE: 0' 16'

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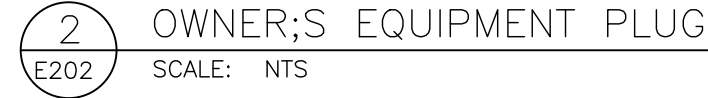
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PROJECT
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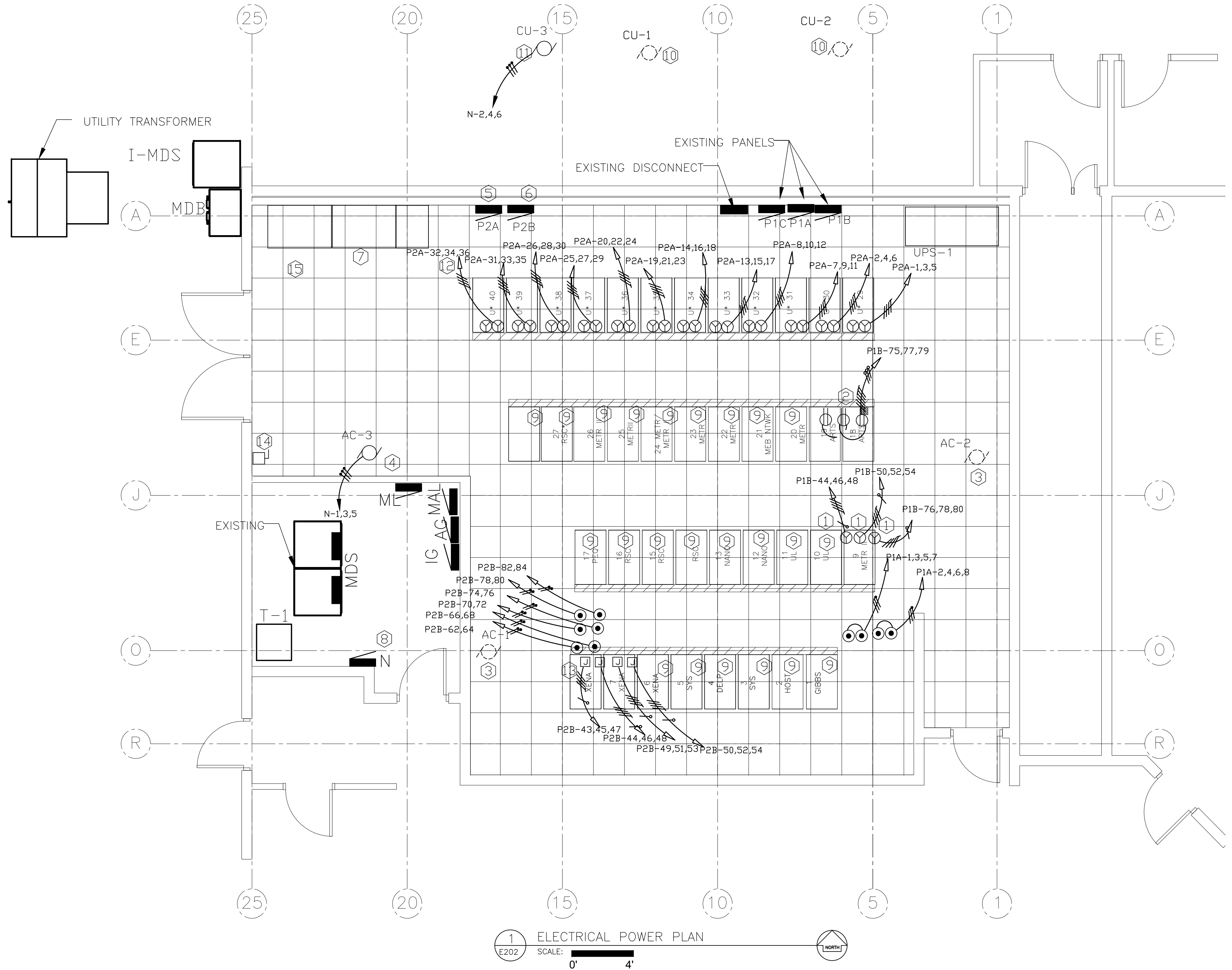
TITLE
ELECTRICAL POWER PLAN


DWG. NO.
E201

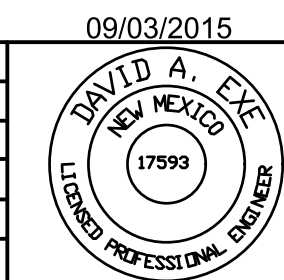
1. PROJECT CONSISTS OF INSTALLING USED (UNMURNISHED) 130KVA UPS AND PROVIDING 2 NEW 42 CKT, 400A, 208V/3P/4W PANELS WITH CIRCUITS AS SHOWN. PROVIDE POWER FOR USED (UNMURNISHED) 480V/3S LIEBERT COOLING SYSTEM AS SHOWN, INCLUDING INSTALLING NEW 480V/3S (400 AMP) STEP DOWN TRANSFORMER AND PROVIDING A 480V PANEL PROVIDE AND/OR RELOCATE OTHER CIRCUITS AND GROUNDING AS SHOWN ON PLANS.
2. VERIFY LOCATION OF NEW RECEPTACLES WITH OWNER PRIOR TO WORK. LOCATION SEVERAL FEET FROM EXISTING ONE. PROVIDE 4' OF EXTRA LENGTH FOR RELOCATION IN THE FUTURE.
3. ALL COMPUTER POWER BRANCH CIRCUITS SHALL BE INSTALLED BENEATH THE RAISED FLOOR FROM THE RESPECTIVE RECEPTACLE TO THE PANEL USING LIQUID TUFF COMPUTER GRADE BLUE UL LISTED FLEXIBLE METAL CONDUIT, TYPE LFMC CABLE, AS MANUFACTURED BY AFC CABLE SYSTEMS, INC., OR APPROVED EQUAL. THE BRANCH CIRCUIT SHALL BE CONTINUOUS FROM OUTLET TO PANEL (NON-INTERRUPTED). INSTALL IN A NEAT AND ORGANIZED MANNER.
4. THE GREEN GROUNDING CONDUCTOR IN THE BRANCH CIRCUIT OF EACH COMPUTER OUTLET SHALL BE EXTENDED THROUGH A GROUNDING BUSHING TYPE CONNECTOR AT THE OUTLET BOX AND SHALL BE PROVIDED WITH A PIGTAIL GROUNDING CONNECTOR TO GROUNDE BOTH THE GROUNDING PIN OF THE OUTLET AND THE OUTLET BOX.
5. THE BRANCH CIRCUIT CONDUIT OF EACH COMPUTER RECEPTACLE, WHERE TERMINATED AT THE PANEL, SHALL BE PROVIDED WITH A GROUNDING BUSHING TYPE CONNECTOR AT THE PANEL CAN AND THE GREEN WIRE GROUNDING CONDUCTOR SHALL EXTEND THROUGH AND ATTACH TO THE GROUNDING CONNECTOR OF THE GROUND BUS IN THE PANEL.
6. CONDUCTORS FOR 60A CIRCUITS SHALL BE #6 STRANDED COPPER.
7. CONTRACTOR SHALL VERIFY THAT NEW PANEL BREAKERS ARE COMPATIBLE WITH EXISTING PANELS INSTALLED.



1. DISCONNECT CIRCUIT IN PANELBOARD. REMOVE CIRCUIT AS REQUIRED BY CODE. DO NOT REMOVE FROM UNDER FLOOR. REMOVE BREAKERS AND REPLACE WITH 30A/3P BREAKERS FOR 3 NEW CIRCUITS. REPLACE EMPTY POSITIONS WITH BLANK COVER. RECEPTACLES TO BE L21-30 TYPE. CIRCUIT WITH 1/2" C, #1 THINW + #10 GND.
2. RELOCATE EXISTING "ARTS" RECEPTACLES TO NEW LOCATION FROM A LOCATION APPROXIMATELY 6' CLOSER TO THE PANEL. VERIFY EXACT LOCATION WITH OWNER PRIOR TO ROUGH-IN.
3. EXISTING LIEBERT COOLING UNIT. NO WORK ON THIS UNIT.
4. NEW LIEBERT COOLING UNIT. CIRCUIT TO NEW PANEL "N" LOCATED IN ADJACENT ELECTRICAL ROOM. INSTALL CONDUIT. CONDUIT TO ROOF TOP CONDENSING UNIT.
5. NEW 400A/208V/3P/4W/42CKT MCB PANEL BOARD WITH 400A M.C.B. BY EATON, OR APPROVED EQUAL.
6. NEW 400A/208V/3P/4W/42CKT MLO PANEL BOARD BY EATON, OR APPROVED EQUAL. FEED FROM PANEL P2A WITH FEED THROUGH LUGS.
7. POSITION UPS IMMEDIATELY ADJACENT TO EXISTING FIRE PROTECTION PANELS. APPROXIMATELY 4' FROM ALL. UNIT INCLUDES MAINTENANCE BYE-PASS PANEL.
8. TRANSFORMER T-1 STEP UP 208V-480V/3P/4W/150KVA. INSTALL OWNER FURNISHED TRANSFORMER IN SW CORNER OF ROOM AND WIRE COMPLETE.
9. EXISTING RACKS TO BE SHIFTED BY THE OWNER FOR ALIGNMENT WITH TRANSFORMER. NO ELECTRICAL WORK ANTICIPATED.
10. EXISTING ROOF TOP CONDENSERS. NO ELECTRICAL WORK ANTICIPATED.
11. EXISTING ROOF TOP CONDENSERS. NO WORK. SHOWN FOR REFERENCE ONLY.
12. USE (UNN FURNISHED) ROOF TOP CONDENSER UNIT. CIRCUIT FROM PANEL "N", CONNECT TO EQUIPMENT GROUND BUS.
13. 1" C, #1 THINW + #10 GND. 60A CIRCUITS WITH 12 (12) LOCATIONS OF 2" 60 AMP, 4 WIRE, IN-LINE RECEPTACLES COMPATIBLE WITH ME 4609PW-1109 PLUGS FROM OWNER'S EQUIPMENT. SEE DETAILS 2/201 AND 3/201 PROVIDE AN 8"x12"x8" (APPROXIMATE) FLOOR BOX WITH SCREW COVER FOR SPLITTING CIRCUIT TO 2 RECEPTACLES. BOX SHALL CONTAIN A SPLICING OF THE CIRCUIT WIRES TO PROVIDE ONE LINE RUN THAT IS USED TO FEEDS FLOOR BOX RECEPTACLE. SEE DETAIL 4/201. THE IN-LINE RECEPTACLES SHALL BE CONNECTED TO THE SPLICE BOX WITH 4" OF CABLE. SPLICES TO BE POLARIS ELECTRICAL CONNECTORS MODEL IPMLD, OR EQUAL AND APPROVED. CONTRACTOR SHALL SUBMIT 1 ASSEMBLED UNIT FOR APPROVAL PRIOR TO COMPLETING ALL ASSEMBLIES.
13. 1" C, #1 THINW + #10 GND. TERMINATE IN 4"x4" J-BOX. LABEL CIRCUIT WIRES AND CIRCUIT ON J-BOX.
14. LABEL DISCONNECT "INADEQUATE WORKING CLEARANCE - DO NOT OPEN UNDER LOAD" - DEPENDENT ON ELECTRICAL CODE.
15. MAINTENANCE BYPASS. VERIFY LOCATION WITH OWNER PRIOR TO ROUGH-IN.



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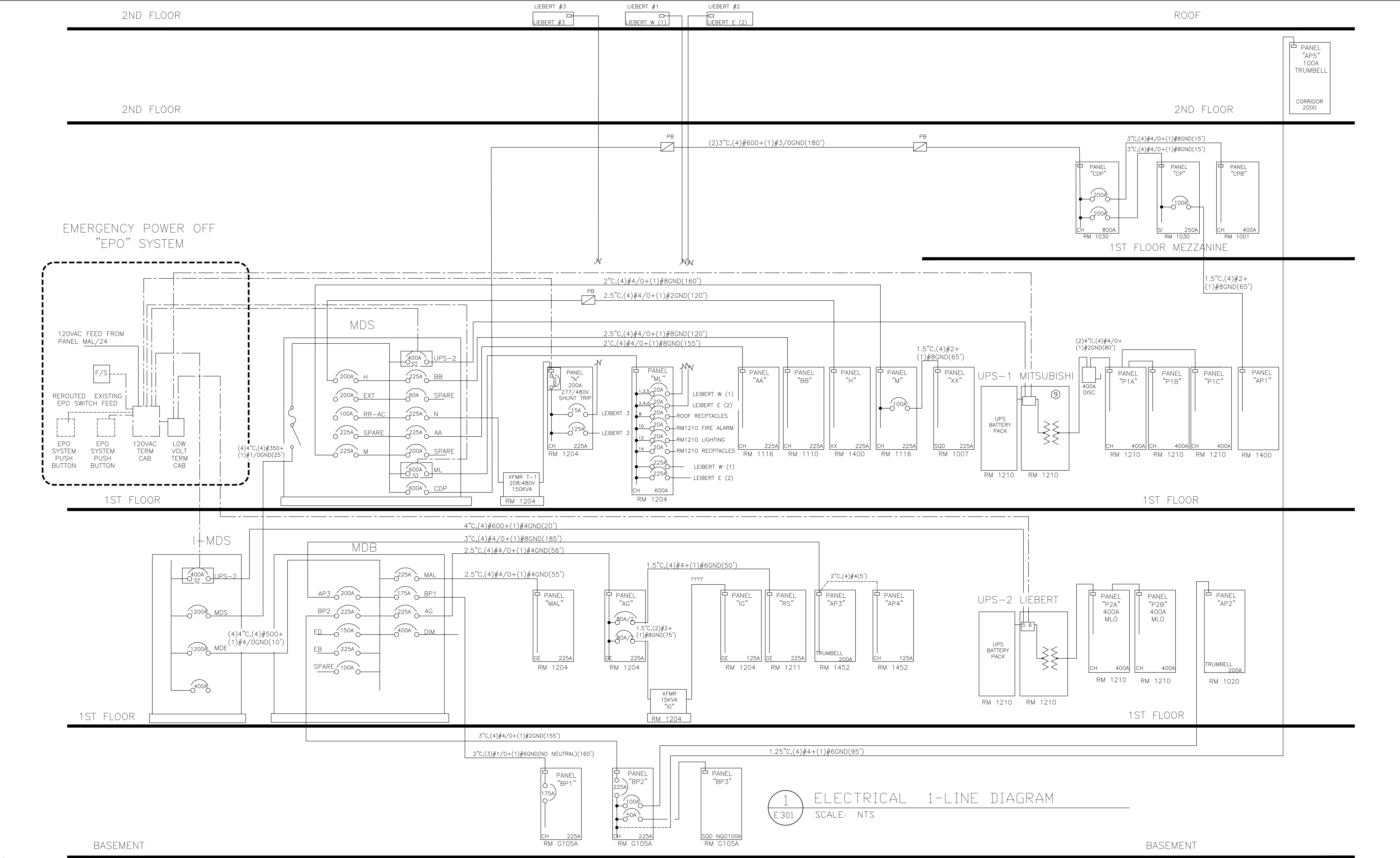
JOB NO.
70602
SIZE
24x36
CADD NO.

PROJECT

MMR UPGRADE

DWG. NO.
E202

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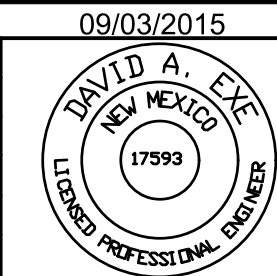
1 ELECTRICAL 1-LINE DIAGRAM
SCALE: NTS

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INDUSTRIAL ENGINEERING, INC.
3210 23RD AVE SE
RIO RANCHO, NM 87124



DWG DATE
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PLDT
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SCALE
as shown

JOB NO.
70602
SIZE
24x36
CADD NO.

OWNER
The University of New Mexico
Center for Advanced Research Computing (carc)
1601 central Avenue NE
Albuquerque, NM

PROJECT
MMR UPGRADE

TITLE
ELECTRICAL 1-LINE DIAGRAM
AS-BUILT

DWG. NO.
E301

PANEL P2A													
VOLTAGE (L-N):				120				ENCLOSURE TYPE:				NEMA 1	
VOLTAGE (L-L):				208				MOUNTING:				SURFACE	
PHASES, WIRES:				3 ϕ 4 W				AIC RATING (A):				35000	
MINIMUM BUS CAPACITY (A):				400 A				NOTES:				-----	
MAIN O.C. DEVICE (A):				400 A									
CKT NO	DESCRIPTION	TRIP AMPS	POLE	PHASE LOADS (VA)						POLE	TRIP AMPS	DESCRIPTION	CKT NO
				A		B		C					
1,3,5	ULAM-29	60	3	2000	2000					3	60	ULAM-30	2,4,6
1,3,5		60	3			2000	2000			3	60		2,4,6
1,3,5		60	3					2000	2000	3	60		2,4,6
7,9,11	ULAM-31	60	3	2000	2000					3	60	ULAM-32	8,10,12
7,9,11		60	3			2000	2000			3	60		8,10,12
7,9,11		60	3					2000	2000	3	60		8,10,12
13,15,17	ULAM-33	60	3	2000	2000					3	60	ULAM-34	14,16,18
13,15,17		60	3			2000	2000			3	60		14,16,18
13,15,17		60	3					2000	2000	3	60		14,16,18
19,21,23	ULAM-35	60	3	2000	2000					3	60	ULAM-36	20,22,24
19,21,23		60	3			2000	2000			3	60		20,22,24
19,21,23		60	3					2000	2000	3	60		20,22,24
25,27,29	ULAM-37	60	3	2000	2000					3	60	ULAM-38	26,28,30
25,27,29		60	3			2000	2000			3	60		26,28,30
25,27,29		60	3					2000	2000	3	60		26,28,30
31,33,35	ULAM-39 HEAD END	60	3	2000	2000					3	60	ULAM 40	32,34,36
31,33,35		60	3			2000	2000			3	60		32,34,36
31,33,35		60	3					2000	2000	3	60		32,34,36
37,39,41	SPARE	60	3	0	0					3	60	SPARE	38,40,42
37,39,41		60	3			0	0			3	60		38,40,42
37,39,41		60	3					0	0	3	60		38,40,42
FTL	PANEL P2B	400	3	20800	-----					-----	-----		-----
FTL		400	3		20800	-----			20800	-----	-----		-----
FTL		400	3						20800	-----	-----		-----
				CONNECTED LOAD PHASE TOTALS (VA)									
				44800		44800		44800					
Equipment				CONNECTED LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)				DEMAND LOAD	
				134.4		1.00		134.4				134.4 KVA	
												SPARE CAPACITY	
												-10.8 KVA	
												SPARE CAPACITY	
												-30.1 AMPS	
												-9%	
												PHASE BALANCE	
												A TO B	
												100%	
												B TO C	
												100%	
												C TO A	
												100%	
TOTAL:				134.4				134.4					
LOAD (AMPS):				373.1				373.1					

PANEL P1A													
VOLTAGE (L-N):				120				ENCLOSURE TYPE:				NEMA 1	
VOLTAGE (L-L):				208				MOUNTING:				SURFACE	
PHASES, WIRES:				3 ϕ 4 W				AIC RATING (A):				35000	
MINIMUM BUS CAPACITY (A):				400 A				NOTES:				-----	
MAIN O.C. DEVICE (A):				400 A									
CKT NO	DESCRIPTION	TRIP AMPS	POLE	PHASE LOADS (VA)						POLE	TRIP AMPS	DESCRIPTION	CKT NO
				A	B	C							
1,3	RSC EXPANSION	30	2	875	875					2	30	RSC EXPANSION	2,4
1,3		30	2			875	875			2	30		2,4
5,7	RSC EXPANSION	30	2					875	875	2	30	RSC EXPANSION	6,8
5,7		30	2	875	875					2	30		6,8
9,11,13		60	3			825	825			3	60	SPARE	10,12,14
9,11,13	RECPT 3	60	3					825	825	3	60	SPARE	10,12,14
9,11,13		60	3	825	825					3	60	SPARE	10,12,14
15,17,19		60	3			825	825			3	60		16,18,20
15,17,19	SPARE	60	3					825	825	3	60	RECPT 13	16,18,20
15,17,19		60	3	825	825					3	60		16,18,20
21,23,25		60	3			1363	1363			3	60		22,24,26
21,23,25	RECPT 5	60	3					1363	1363	3	60	RECPT 14	22,24,26
21,23,25		60	3	1363	1363					3	60		22,24,26
27,29,31		60	3			1363	1363			3	60		28,30,32
27,29,31	RECPT 6	60	3					1363	1363	3	60	RECPT 15	28,30,32
27,29,31		60	3	1363	1363					3	60		28,30,32
33	RECPT 7	30	1			144	2500			1	20	RECPT 16	34
35	RECPT 8	30	1					144	2500	1	20	RECPT 17	36
37	RECPT 9	20	1	1666	875					3	20		38,40,42
39	RECPT 10	20	1			1666	875			3	20	-----	38,40,42
-----	-----	400	3	17942	-----	-----	875	-----	875	3	20	-----	38,40,42
FTL		400	3			19458	-----	-----	-----	-----	-----	-----	-----
FTL	PANEL P1B	400	3					16959		-----	-----	-----	-----
				CONNECTED LOAD PHASE TOTALS (VA)									
				32735		35145		30980					
Equipment				CONNECTED LOAD (KVA)		DEMAND FACTOR		DEMAND LOAD (KVA)		DEMAND LOAD		98.9 KVA	
				98.9		1.00		98.9		SPARE CAPACITY		15.0 KVA	
										SPARE CAPACITY		41.6 AMPS	
										SPARE CAPACITY		13 %	
										PHASE BALANCE		93 %	
										A TO B		88 %	
										B TO C		95 %	
										C TO A			
TOTAL:				98.9				98.9					
LOAD (AMPS):				274.4				274.4					

PANEL P2B														
VOLTAGE (L-N):				120				ENCLOSURE TYPE:				NEMA 1		
VOLTAGE (L-L):				208				MOUNTING:				SURFACE		
PHASES, WIRES:				3 ϕ 4 W				AIC RATING (A):				35000		
MINIMUM BUS CAPACITY (A):				400 A				NOTES:				-----		
MAIN G.C. DEVICE (A):				400 A MAIN LUG ONLY										
CKT NO	DESCRIPTION	TRIP AMPS	POLE	PHASE LOADS (VA)						POLE	TRIP AMPS	DESCRIPTION	CKT NO	
				A		B		C						
43.45.47	XENA	60	3	4000	4000					3	60		44,46.48	
43.45.47			60	3			4000	4000			3	60	XENA	44,46.48
43.45.47			60	3					4000	4000	3	60		44,46.48
49.51.53	XENA	60	3	4000	4000					3	60		50,52.54	
49.51.53			60	3			4000	4000			3	60	XENA	50,52.54
49.51.53			60	3					4000	4000	3	60		50,52.54
55.57.59	SPARE	20	3	0	0					3	20		56,58.60	
55.57.59			20	3			0	0			3	20	ULAM 41	56,58.60
55.57.59			20	3					0	0	3	20		56,58.60
61.63.65	SPARE	20	3	0	1200					2	30		62.64	
61.63.65			20	3			0	1200			2	30	XENA	62.64
61.63.65			20	3					0	1200	2	30		66.68
67.69.71	SPARE	20	3	0	1200					2	30		66.68	
67.69.71			20	3			0	1200			2	30	XENA	70.72
67.69.71			20	3					0	1200	2	30		70.72
73.75.77	SPARE	20	3	0	1200					2	30		74.76	
73.75.77			20	3			0	1200			2	30	XENA	74.76
73.75.77			20	3					0	1200	2	30		78.80
79.81.83	SPARE	20	3	0	1200					2	30		78.80	
79.81.83			20	3			0	1200			2	30	XENA	82.84
79.81.83			20	3					0	1200	2	30		82.84
				CONNECTED LOAD PHASE TOTALS (VA)										
				20800		20800		20800						
Equipment				CONNECTED LOAD (KVA) 62.4		DEMAND FACTOR 1.00		DEMAND LOAD (KVA) 62.4		DEMAND LOAD SPARE CAPACITY SPARE CAPACITY PHASE BALANCE A TO B B TO C C TO A		62.4 KVA 61.2 KVA 169.8 AMPS 50 % 100 % 100 % 100 %		
TOTAL LOAD (AMPS):				62.4 173.2				62.4 173.2						

1

KEY NOTES

1.

EXISTING #2 BARE SOLID TINED COPPER GROUNDING CONDUCTOR INSTALLED BENEATH THE FLOOR.

2.

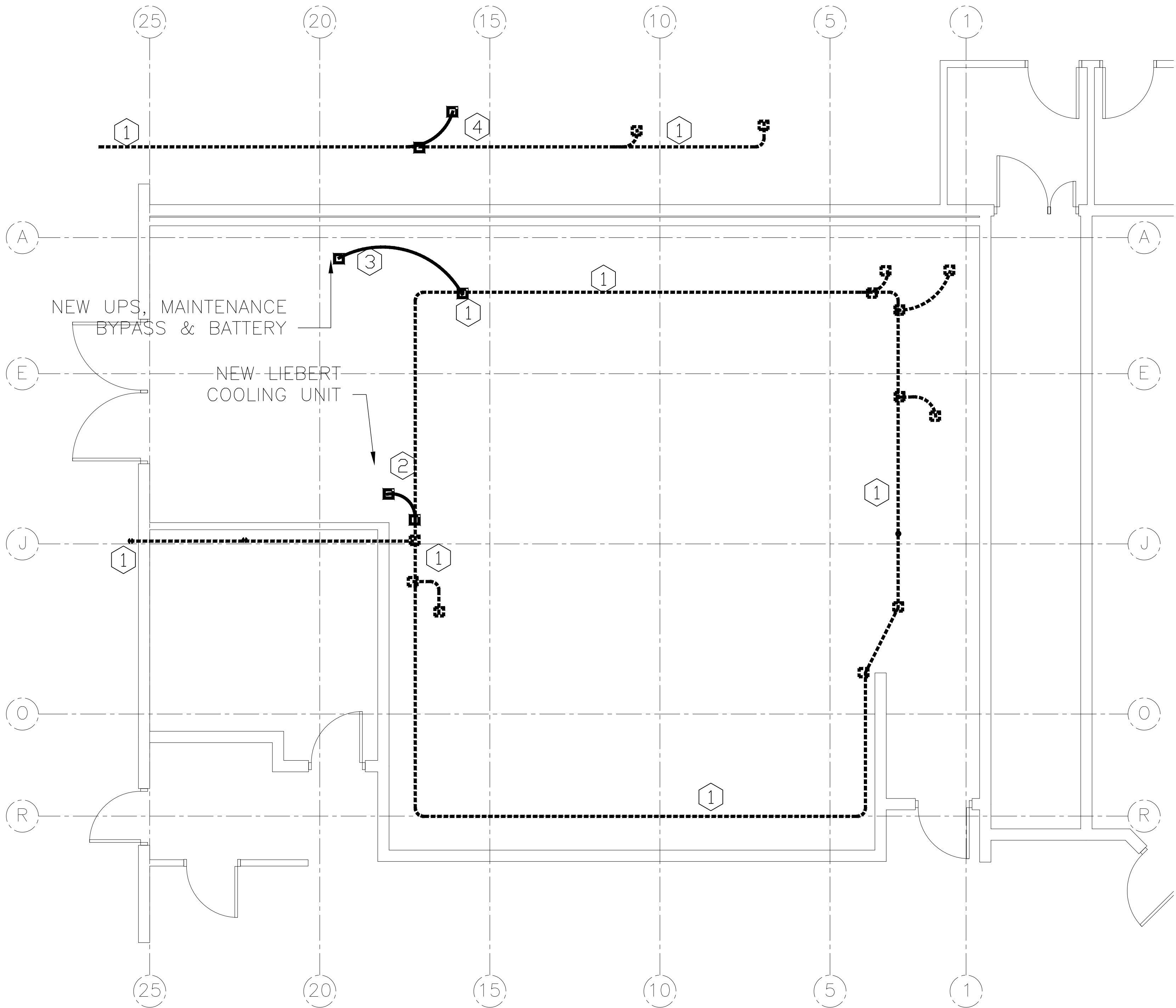
BOND THE METALLIC FRAME OF THE A/C UNIT WITH TWO-HOLE BONDED TONGUE CONNECTOR WITH #6 STRANDED COPPER CONDUCTOR. ATTACH TO THE #2 GROUND WITH A COMPRESSION TYPE GROUNDING CONNECTOR.

3.

BOND THE METALLIC FRAME OF THE UPS CABINET, MAINTENANCE BYPASS CABINET & BATTERY CABINET WITH TWO-HOLE BONDED TONGUE CONNECTOR WITH #6 STRANDED COPPER CONDUCTOR. ATTACH TO THE #2 GROUND WITH A COMPRESSION TYPE GROUNDING CONNECTOR.

4.

BOND THE METALLIC FRAME OF THE ROOF MOUNTED CONDENSOR WITH TWO-HOLE BONDED TONGUE CONNECTOR WITH #6 STRANDED COPPER CONDUCTOR. ATTACH TO THE #2 GROUND WITH A COMPRESSION TYPE GROUNDING CONNECTOR.



1

E303

ELECTRICAL EQUIPMENT GROUNDING

SCALE: 0' 4'

1

NORTH

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09/03/2015



INDUSTRIAL ENGINEERING, INC.
3210 23RD AVE SE
RIO RANCHO, NM 87124



DWG DATE
09/03/15
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CADD NO.

OWNER
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Center for Advanced Research Computing (carc)
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Albuquerque, NM

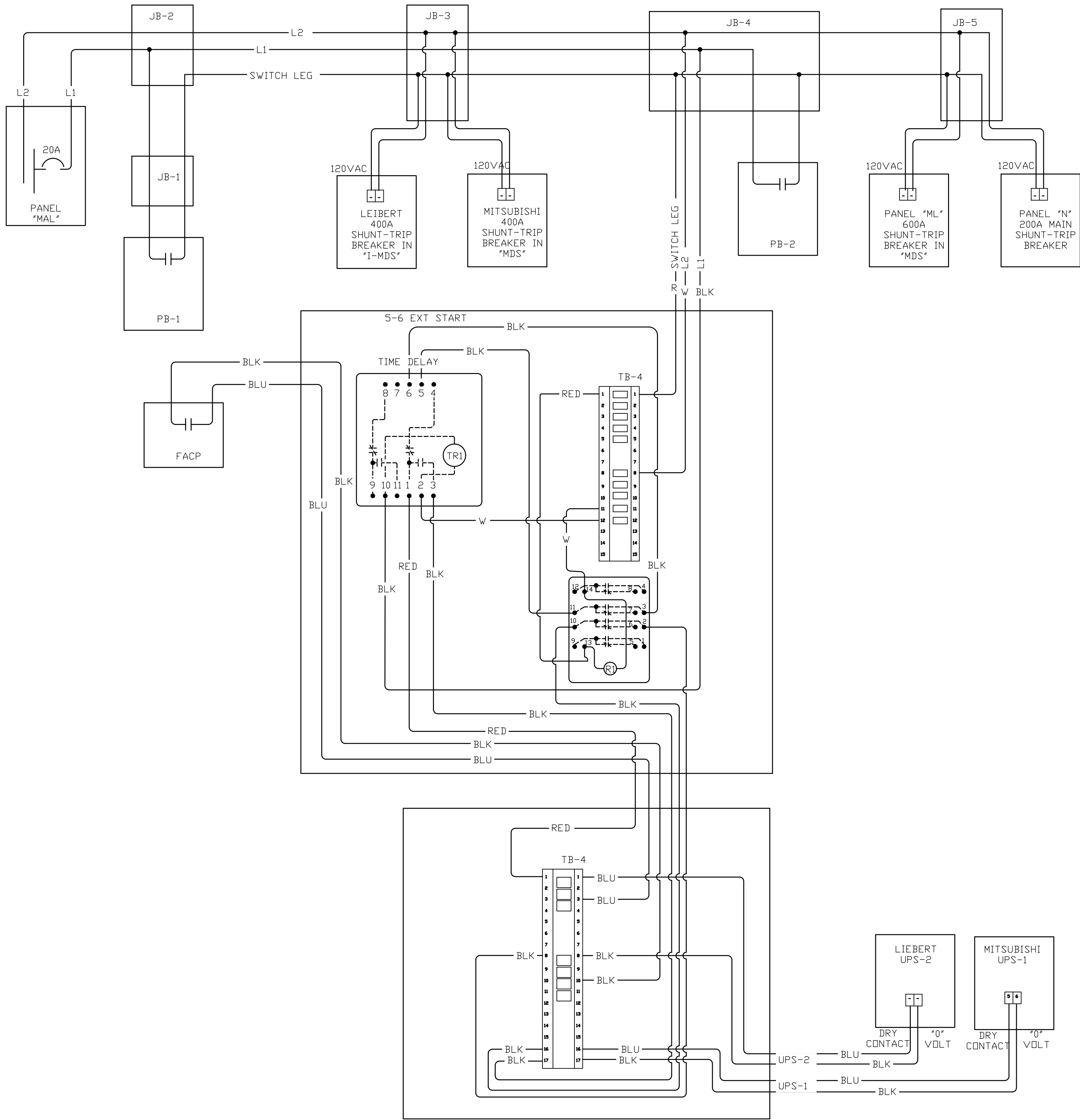
PROJECT
MMR UPGRADE

TITLE
ELECTRICAL EQUIPMENT
GROUNDING PLAN

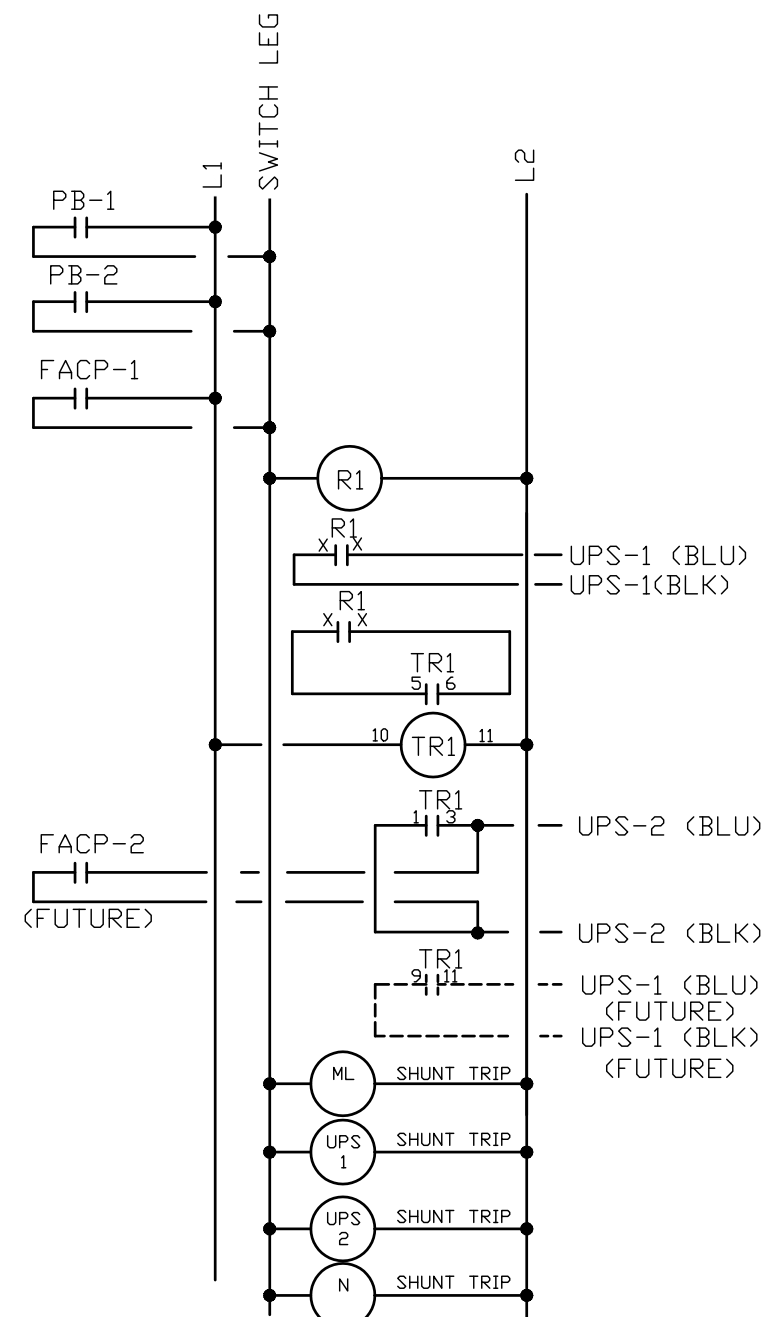
DWG. NO.

E303

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2 EPO WIRING
E401 SCALE: NTS



3 EPO LADDER LOGIC
E401 SCALE: NTS

SEQUENCE OF OPERATION:

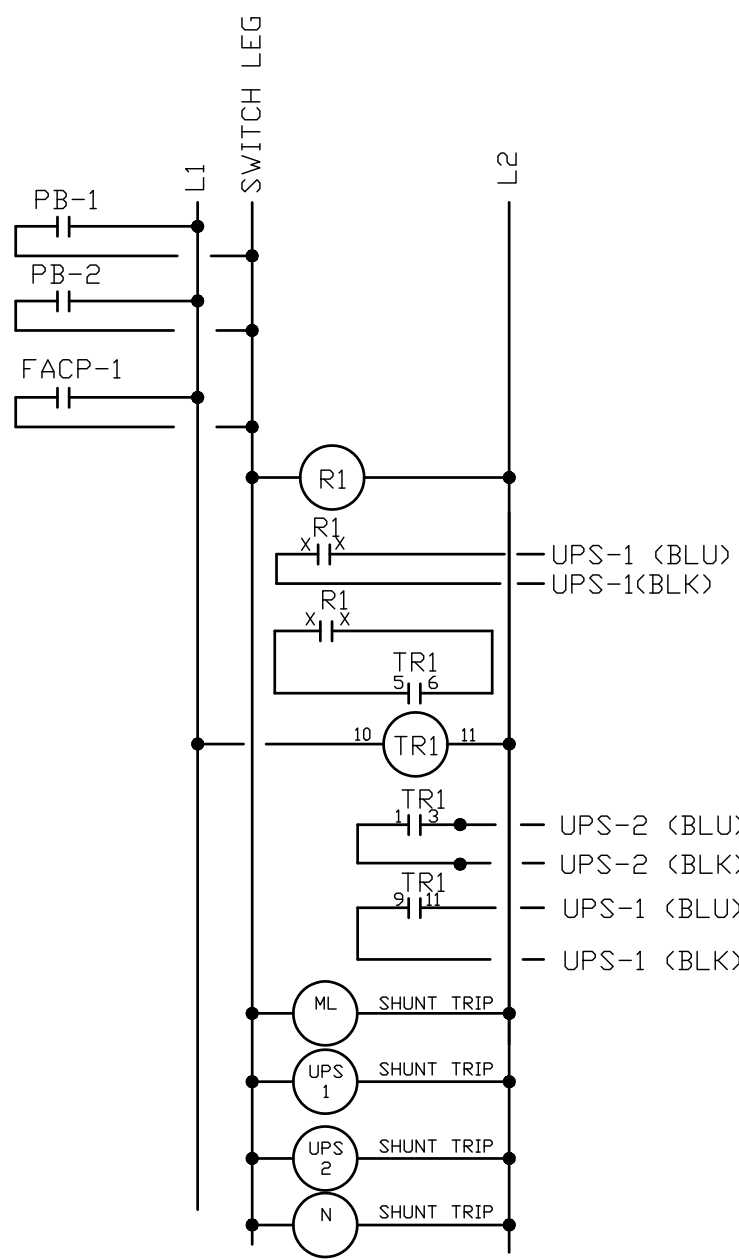
ACTIVATION OF ANY EPO ENABLE (PB-1, P-B-1 OR FACP-1) ACTIVATES RELAY R1 AND ACTIVATES SHUNT TRIPS IN ML, UPS-1, UPS-2 AND N. THIS REMOVES POWER TO THE HVAC, ROOM POWER AND LIGHTING, UPS-1 AND UPS-2. IT DOES NOT REMOVE BATTERY POWER FROM UPS-1 OR UPS-2.

RELAY R1 ACTIVATES TIME DELAY RELAY TR1. TR1 LOCKS IN AND PROVIDES A DRY CONTACT TO UPS-1 AND UPS-2. THIS REMOVES BATTERY POWER FROM UPS-1 AND UPS-2 THROUGH INTERNAL ACTION OF UPS-1 AND UPS-2.

FUTURE MODIFICATION:

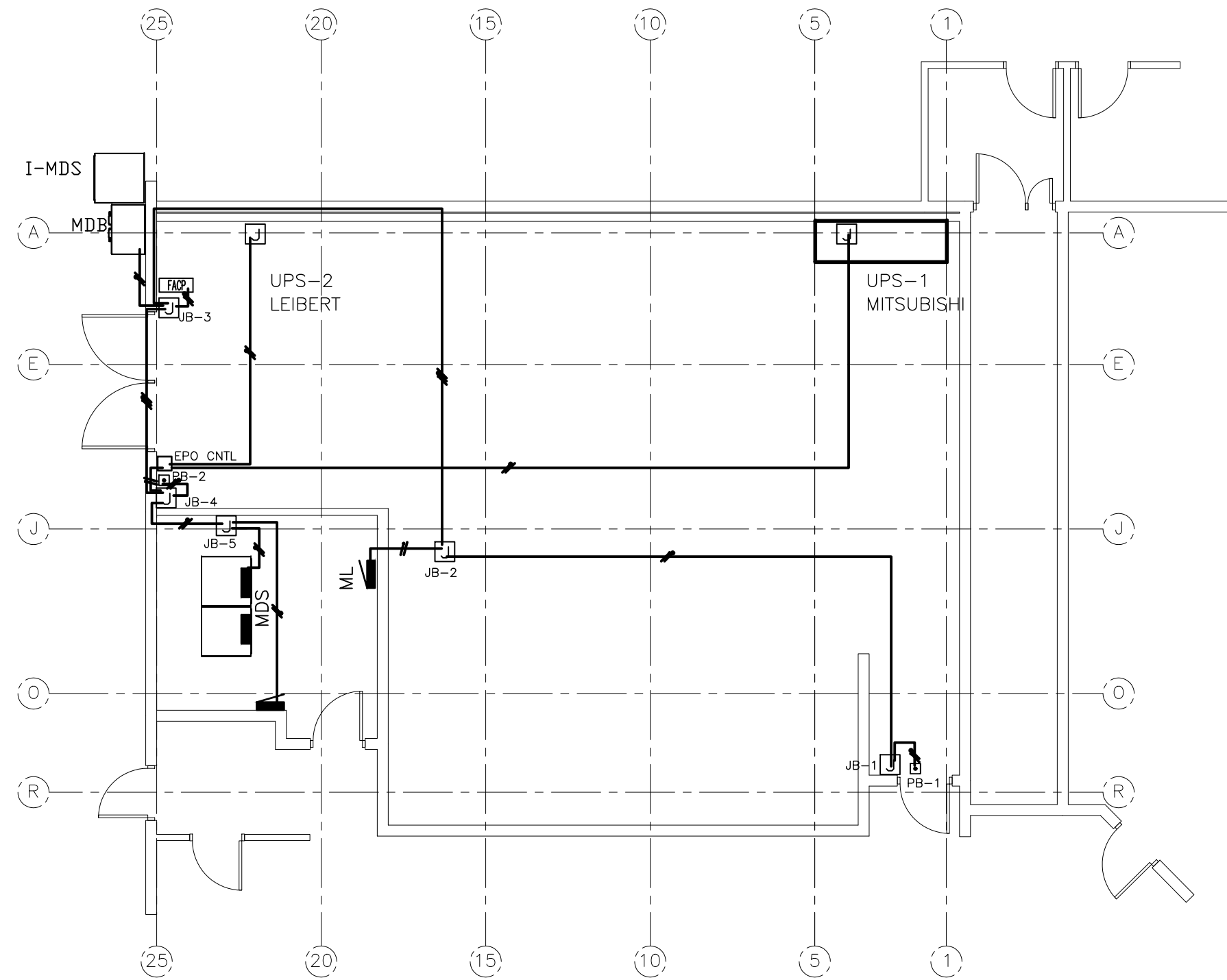
AT A SCHEDULED TIME WHEN ALL POWER IS REMOVED FROM THE COMPUTERS, UPS-1 & UPS-2 THE FOLLOWING MODIFICATIONS SHOULD BE COMPLETED. THIS REMOVES THE REDUNDANT CONTACTS IN THE FACP FROM INADVERTENTLY ACTIVATING THE SYSTEM IF POWER IS REMOVED FROM THE FACP AND IT PROVIDES TIME DELAY CONTACT FOR UPS-1.

FACP-2 REMOVED FROM UPS-2 - IT IS REDUNDANT AND NOT NECESSARY.
UPS-1 MOVED FROM RELAY R1 TO CONTACTS ON TR1 TO TAKE ADVANTAGE OF TR1 HOLDING CAPACITY.



3A EPO LADDER LOGIC
E401 SCALE: NTS

EPO LADDER LOGIC
AFTER MOFICATION



1 EPO LAYOUT
E401 SCALE: 0' 8'

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RIO RANCHO, NM 87124



DWG DATE 09/03/15	JOB NO. 70602
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Center for Advanced Research Computing (carc)
1601 central Avenue NE
Albuquerque, NM

PROJECT
MMR UPGRADE

TITLE
EMERGENCY POWER OFF (EPO)
WIRING DIAGRAM

DWG. NO.
E401