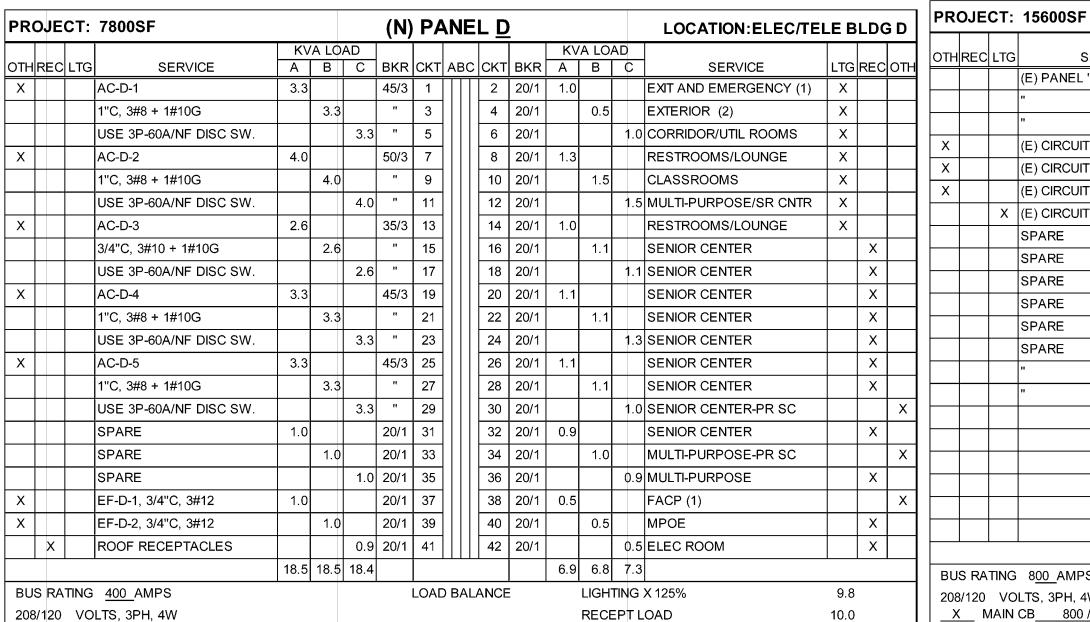
	ABBRE	VIATIO	NS	
A AFF CKT	AMPS OR AMPERES ABOVE FINISHED FLOOR CIRCUIT	(N) N NO/NC NIC NL	NEW NORMALLY OPEN/NORMALLY CLOSED NOT IN CONTRACT NIGHT LIGHT	
CB C.O. CU	CIRCUIT BREAKER CONDUIT CONDUIT ONLY (EMPTY CONDUIT) COPPER	NTS OC OL PH, ø	NOT TO SCALE ON CENTER OVERLOAD	
(D) D DF	DEMOLISH DEMAND FACTOR	PNL		
(E) E EM	EXISTING EMERGENCY	(RL) RL (R) (RN)	RELOCATED REMOVE RENAME	
FA FSD	FIRE ALARM FIRE SMOKE DAMPER	R	REUSED	
G GFCI	FURNISHED BY OTHERS GROUND FAULT CIRCUIT INTERRUPTER	SAD SMD SPD	SEE ARCHITECTURAL DRAWINGS SEE MECHANICAL DRAWINGS SEE PLUMBING DRAWINGS	
HOA JB	HAND/OFF/AUTO JUNCTION BOX	TTB TYP TVSS	TELEPHONE TERMINAL BOARD TYPICAL TRANSIENT SURGE SUPPRESSOR SYSTEM	
LED L	LIGHT EMITTING DIODE LOCKABLE	T/S TS	TIME SWITCH	
MCC MTD MLO	MOTOR CONTROL CENTER MOUNTED MAIN LUG/S ONLY	UON V VIF W WP	UNLESS OTHERWISE NOTED VOLTS VERIFY IN FIELD WIRE WEATHERPROOF	

PΕ	DESCRIPTION	CATALOG NO.	LAMPS	VOLTS	WATTS	MOUNTINGS	REMARKS
1	ELECTRONIC BALLAST SUITABLE FOR BI-LEVEL	LITHONIA # 2AV-G28T5-MDRMVOLT GEB10PS	2- F028/T5/835	120	60	RECESSED	
)		LITHONIA # 2AV-G14T5-MDRMVOLT GEB10PS	2- F014/T5/835	120	30	RECESSED	
	6" APERTURE COMPACT FLUORESCENT DOWNLIGHT WITH ELECTRONIC BALLAST.	LITHONIA # AF-126-DTT-6AR-LD-MVOLT GEB10IS	1- 26DTT	120	30	RECESSED	
		LITHONIA # AF-226-DTT-6AR-LD-CGL-MVOLT GEB10IS	2- 26DTT	120	54	RECESSED	
<u> </u>	NOT USED.						
i	NOT USED.						
,	2-T5 LAMP FLUORESCENT STRIP LUMINAIRE WITH SYMMETRIC REFLECTOR AND WIRE GUARD.	LITHONIA # Z5SMR-46-MVOLT-GEB10PS	2- F028/T5/835	120	60	48" CHAIN- HUNG	
	NOT USED.						
1		LITHONIA # MRW-226-DTT-MD-MVOLT- GEB10LPI-	2- 26DTT	120	54	WALL	
		HUNTER SONIC # 21585	1- 18WCFL	120	110	SURFACE CEILING	BLACK/MAPLE BLADES
(LED-TYPE EXIT SIGNAGE ARROWS, MOUNTING TYPE AND FACES AS SHOWN ON PLAN.	LITHONIA # EDG1/2-G-120/277-ELN	INCLUDED	120	5	CEILING/WALL	

		IDC:	LEGEND
	SYM	<u>IBOL</u>	DESCRIPTION
	1 G	€	POWER DUPLEX RECEPTACLE OUTLET, NEMA 5–20R, WALL MOUNTED +18" AFF UON. G (GFCI) =GROUND FAULT CIRCUIT INTERRUPTER TYPE 1=ASSOCIATED CIRCUIT. D=DEDICATED CIRCUIT
	€	₽	DUPLEX RECEPTACLE — WALL MOUNTED ABOVE COUNTER
	_	-	DOUBLE DUPLEX (QUAD) RECEPTACLE, NEMA 5-20R, WALL MTD +18"AFF 1,3 ASSOCIATED CIRCUIT
	€	€	DUPLEX RECEPTACLE OUTLET — FLUSH MOUNTED ON CEILING
	E		DUPLEX RECEPTACLE OUTLET — FLUSH FLOOR MOUNTED
			<u>LIGHTING</u>
	\triangleright		2X4 FLUORESCENT LUMINAIRE — RECESSED MOUNTED
	<u> </u>	<u> </u>	2X2 FLUORESCENT LUMINAIRE — RECESSED MOUNTED
)	FLUORESCENT DOWNLIGHT LUMINAIRE — RECESSED MOUNTED
			FLUORESCENT DOWNLIGHT LUMINAIRE — SURFACE MOUNTED
	Щ.)—	FLUORESCENT STRIP — SURFACE OR CEILING MOUNTED
	Q	\langle	PADDL FAN/LIGHT — SURFACE CEILING MOUNTED
	5	5	COMPACT FLUORESCENT LUMINAIRE - WALL MOUNTED
	-) • □	POLE MOUNTED PARKING LOT LIGHTING LUMINAIRE — SINGLE OR TWIN HEAD.
			<u>SWITCHES</u>
	\$	\$ a	SINGLE POLE SWITCH, LOWER CASE LETTER INDICATES CIRCUIT OR LAMPS CONTROLLED BY SWITCH, +48"AFF U.O.N. "L" DENOTES LOCKABLE "PS" PROJECTION SCREEN "3" DENOTES THREE-WAY "D" DIMMER TYPE
	Ç	\$т	MOTOR RATED SWITCH WITH THERMAL OVERLOAD ELEMENT.
	09	<u> </u>	OCCUPANCY SENSOR SWITCH — WALL MOUNTED: SUITABLE UP TO 300SF BI-LEVEL OR SINGLE LEVEL TYPE
	09	a	OCCUPANCY SENSOR SWITCH - CEILING MOUNTED: SUITABLE UP TO 1000SF
			<u>MISCELLANEOUS</u>
	<u>L</u>	<u>1</u>	LIGHTING FIXTURE TAG, "L1" = FIXTURE TYPE
	(1		SHEET NOTES TAG
	\sqrt{S}	SF 1	EQUIPMENT IDENTIFICATION
		/	EQUIPMENT NUMBER CONVENTIONS
	1, 3,	5	INDIVIDUAL CIRCUITS TO INDIVIDUAL OR MULTI-POLE BREAKERS
	- T	D 1	PANELBOARD NOMENCLATURE:
	Ī	 	PANEL SEQUENCE
			BUILDING VOLTAGE I.D.
			_ = 120/208 VOLTS
	NO.	DWG. 1	DRAWING INDEX DESCRIPTION
,	1	E-0.0	
-	2	E-0.1	
	3	E-0.2	ELECTRIC SITE PLAN
	4	E-1.1	
	5	E-1.2	
	6 7	E-1.3 E-2.1	
	/	L ⁻ Z.1	31 LOII IOATIONS
_			

	LEGEND	REVISIONS BY
SYMBOL	DESCRIPTION	ISSUE FOR PERMIT 10-28-11
	PANELBOARDS AND TERMINALS	
	DISTRIBUTION BOARD OR MOTOR CONTROL CENTER	
	BRANCH CIRCUIT PANEL, FLUSH OR SURFACE MOUNTED, (120/208V, 3ø, 4W)	
\$	TERMINAL CABINET (TYPE AS INDICATED), FLUSH OR SURFACE MTD.	
*	TERMINAL BOARD. 3/4" THICK MARINE PLYWOOD	
	<u>EQUIPMENT CONNECTION</u>	
(M) (J)+ (J)	MOTOR JUNCTION BOX, WALL OR CEILING MOUNTED	IYER & ASSOCIATES
P	PULLBOX. MOUNTING AND SIZE AS INDICATED	Architecture Interiors Planning 1100 Montgomery Street SAN FRANCISCO, CA 94133
	P = POWER; T = TELECOMM	1100 Montgomery Street SAN FRANCISCO, CA 94133 415 362-4937 (IYER) FAX 415 362-8158 2011©IYER & ASSOCIATES
	MAGNETIC STARTER	ZOTTO TIEN & ASSOCIATES
A15	SAFETY DISCONNECT SWITCH—30A SIZE. LETTER DENOTES OTHER SIZES: A = 30 AMPS 15 = 15 AMP FUSES _ = NON-FUSIBLE TYPE	
	B = 60 AMPS $30 = 30 AMP FUSESC = 100 AMPS$ $40 = 40 AMP FUSES$	Ajmani & Pamidi Inc. Mechanical & Electrical Engineers
⊠ ₁	COMBINATION STARTER — FVNR HOA, NUMBER INDICATES NEMA SIZE	101 California St. Suite 2025 San Francisco, California 94111 Ph (415) 543-9344 Fax (415) 543-0670
⊠ _{FBO}	PACKAGE CONTROLLER OR STARTER FURNISHED AND INSTALLED UNDER ANOTHER SECTION BUT WIRED UNDER THIS SECTION.	E-mail: Mail@APincSF.com 09021(D)
PVI	PHOTO-VOLTAIC INVERTER	ay.a
	KILOWATT-HOUR METER WITH CURRENT AND POTENTIAL TRANSFORMERS.	ayanc
FSD	FIRE SMOKE DAMPER, SMD	Narı
		Namo
	CIONIAI	Om O
	SIGNAL_ TELECOMM WALL OUTLET, +18" AFF U.O.N.; RING AND STRING ONLY	481
	TELECOMM WALL OUTLET, MOUNTED ABOVE COUNTER	y aya
	TELECOMM CEILING OUTLET, FACE DOWN	th Shi
	TELECOMM FLOOR OUTLET	Name
FANN	FIRE ALARM REMOTE ANNUNCIATOR	Om C
FACP	FIRE ALARM CONTROL PANEL	ER
(SD _R	SMOKE DETECTOR, CEILING MOUNTED. "R" DENOTES WITH RELEASING CONTACT	Z
(S)—	SMOKE DETECTOR, DUCT MOUNTED. FURNISHED AND WIRED BY DIV 16, INSTALLED BY DIV 15	SCHEDULES JRAL CE
\oplus	HEAT DETECTOR, CEILING MOUNTED.	HEDU AL
SI ⊣	FIRE ALARM STROBE UNIT +80"AFF	·)
HSH	FIRE ALARM HORN/STROBE UNIT +80"AFF	DEX V" LTU
M\$-I	FIRE ALARM MINI-HORN/STROBE UNIT +80"AFF	
Ē⊣	FIRE ALARM PULL STATION +48"AFF	AL LEGEND, DRAWING INDEX, BUILDING "D" AMUNITY and CULT 1200 ARROWHEAD AVE. LIVERMORE, CA
TSH	FIRE ALARM TAMPER SWITCH	RAWIN DIN and AVE. LIN
WS <u></u> ⊣	FIRE ALARM WATER FLOW SWITCH	O, D] TY EAD,
	DACEWAYC	ENI BI OWH
	RACEWAYS CONDUIT RUN EXPOSED IN CEILING OR WALL	LEG MU
	CONDUIT RUN CONCEALED IN CEILING OR WALL	TRICAL DE COMIN 1200
	CONDUIT RUN CONCEALED IN SLAB, UNDERSLAB OR GROUND	TRIC CO
	CONDUIT HOMERUN, CONTINUOUS RUN TO PANEL OR EQUIPMENT CABINET CONDUIT UP	ELECTRICAL LEGEND, DRAWING INDEX, BUILDING "D" JU COMMUNITY and CULTU 1200 ARROWHEAD AVE. LIVERMORE, CA
-	CONDUIT DOWN	
	CONDUIT OR DUCT STUB	
	GROUND WIRING, SIZE AS INDICATED CROSSMARKS (SHOWN IN HOMERUN ONLY) INDICATE THE FOLLOWING:	- ·
#10	1. NUMBER ADJACENT TO CROSSMARKS INDICATES WIRE SIZES.	DATE 10/28/11 SCALE:
	NO NUMBER INDICATES SIZE #12 WIRE. 2. NO CROSSMARKS INDICATES 2#12 AWG CONDUCTORS.	SCALE: NONE DRAWN BY:
	3. SHORT CROSSMARK IS PHASE WIRE, LONG CROSSMARK IS NEUTRAL WIRE, AND LONG WITH DOT IS ISOLATED GREEN GROUND CONDUCTOR.	LA PROJECT:
	NORMAL GROUND WIRE IS USUALLY NOT SHOWN.	ARROWHEAD
	4. 3/4" EMT CONDUIT MINIMUM. UPSIZE AS REQUIRED FOR CIRCUITS WITH OVERSIZED NEUTRAL.	E O O
$ \sim$	FLEXIBLE WIRING CONNECTION TO LUMINAIRE OR EQUIPMENT	E-0.0



PHASE A: 25.7

PHASE B: 25.7

PHASEC: 25.7

TOTAL (SEC1) 77

TOTAL (SEC2+SEC3) 57

TOTAL

X MAIN CB 300 /3P AMPS

NOTES: (1) LOCK ON HANDLE

(2) VIA TS #1D

MAIN LUGS ONLY ____ DOUBLE LUGS

TRIM STYLE: FLUSH X SURFACE

BAL OF RECEPT LOAD X 50%DL

SUB - TOTAL

MISC LOADS

TOTAL LOAD

TOTAL AMPS

HEATING/COOLING

17.0 36.8 KVA

59.1

106

294

10.0 KVA

1		- 1			l K A	A LO	AD						l .	l v	A LO	70		1	i 1	
l	ОТН	REC	LTG	SERVICE	Α	В	С	BKR	CKT	ΑВ	C	СКТ	BKR	Α	В	С	SERVICE	LTG	REC	OTH
				(E) PANEL "C"	34.0			300/3	1			2	300/3	35.0			(N) PANEL "D" (1)			
l				u .		34.0		"	3			4	"		35.0		"			
				11			34.0	"	5			6	н			35.0	u .			
l	Х			(E) CIRCUIT	1.0			20/1	7			8	20/2	1.0			(E) CIRCUIT	Х		
l	Х			(E) CIRCUIT		1.0		20/1	9			10	"		1.0		11			
	Х			(E) CIRCUIT			1.0	20/1	11			12	20/2			1.0	(E) CIRCUIT	Х		
			Х	(E) CIRCUIT	1.0			20/1	13			14	"	1.0			"			
				SPARE		1.0		20/1	15			16	20/2		1.0		(E) CIRCUIT	Х		
				SPARE			1.0	20/1	17			18	"			1.0	"			
				SPARE				20/1	19			20	20/2	1.0			(E) CIRCUIT	Х		
				SPARE				20/1	21			22	11		1.0		"			
				SPARE				20/1	23			24	20/1			1.0	SPARE			
				SPARE				200/3	25			26	20/1				SPARE			
				II .				"	27			28	20/1				SPARE			
				III				"	29			30	20/1				SPARE			
									31			32								
									33			34								
									35			36								
									37			38								
									39			40								
									41			42								
		•			36.0	36.0	36.0					•		38.0	38.0	38.0		•		
	BU	S RA	TING	8 <u>00</u> AMPS					LOAE) BA	۱L	ANCE			LIGH	TING :	X 125%	68.3		
				LTS, 3PH, 4W											RECE			10.0		
				CB 800 /3P AMPS	ICC							74.0 74.0					ECEPT LOAD X 50%DL	10.6	KVA	
				JGS ONLY DOUBLE LU FLUSH _X_ SURFAC								74.0			SUB HEAT		AL COOLING	88.9 78.0		
	1			(E) 300A CB				·				222					DS/SPARE		KVA	
			(6)										-		- · -		OT 1 101 ITIN 10 37 40 507	40.0		

(E) PANEL MS2

KVA LOAD

LOCATION: UTILITY PAD

KVA LOAD

PARKING LOT LIGHTING X 125%

TOTAL LOAD

TOTAL AMPS

13.8

243

675

	OJECT	: 7800SF				(N)	PA	N	<u> EL D</u>	<u> </u>				LOCATION:ELEC/TE	LE BL	.DG	i D
HTC	REC LT	G SERVICE	KV A	A LO	AD C	BKR	CKT	AR	CCKT	BKR	KV A	A LO	AD C	SERVICE	LTGR	?FC	OTI
X	1.20 21	PV#1 13.2KW				50/3	+		44	20/1	1.3			MULTI-PURPOSE	+ +	X	<u>= </u>
		GRID-TIED INVERTER				"	45		46	20/1		1.1		MULTI-PURPOSE	1	X	
		н				11	47		48	20/1			1.1	MULTI-PURPOSE		х	
Χ		PV#2 13.2KW				50/3	49		50	20/1	1.4			RESTROOMS/JANITOR/EXT		х	
		GRID-TIED INVERTER				**	51		52	20/1		1.0		DRINKING FOUNTAIN			Χ
		H				"	53		54	20/1			1.1	MULTI-PURPOSE		Х	
X		PV#3 13.2KW				50/3	55		56	20/1	1.1			MULTI-PURPOSE		х	
		GRID-TIED INVERTER				11	57		58	20/1		1.1		MULTI-PURPOSE		X	
		и				11	59		60	20/1			1.1	MULTI-PURPOSE		X	
Χ		PV#4 13.2KW				50/3	61		62	20/1	1.1			SENIOR LOUNGE		Х	
		GRID-TIED INVERTER				"	63		64	20/1		1.1		SENIOR LOUNGE		Х	
		н				"	65		66	20/1			1.1	SENIOR LOUNGE		Х	
	Х	PRIEST LOUNGE	1.1			20/1	67		68	20/1	1.1			SENIOR LOUNGE		Х	
	Х	PRIEST LOUNGE		1.1		20/1	69		70	20/1		1.1		SENIOR LOUNGE		Х	
	Х	PRIEST LOUNGE			1.1	20/1	71		72	20/1			1.1	SENIOR LOUNGE		Х	
	Х	CLASSROOM	1.1			20/1	73		74	20/1	1.1			PRIEST LOUNGE		X	
	Х	CLASSROOM		0.9		20/1	75		76	20/1		1.1		PRIEST LOUNGE		Х	
	Х	CLASSROOM			0.9	20/1	77		78	20/1			1.1	PRIEST LOUNGE		X	
Χ		CLASSROOM	1.0			20/1	79		80	15/1	0.8			CONTROLS			Χ
	Х	CLASSROOM		0.9		20/1	81		82	15/1		0.8		CP-2			Χ
		SPARE			1.0	20/1	83		84	20/1			0.5	FIRE/SMOKE DAMPER (1)			Χ
			3.2	2.9	3.0						7.8	7.2	7.0				

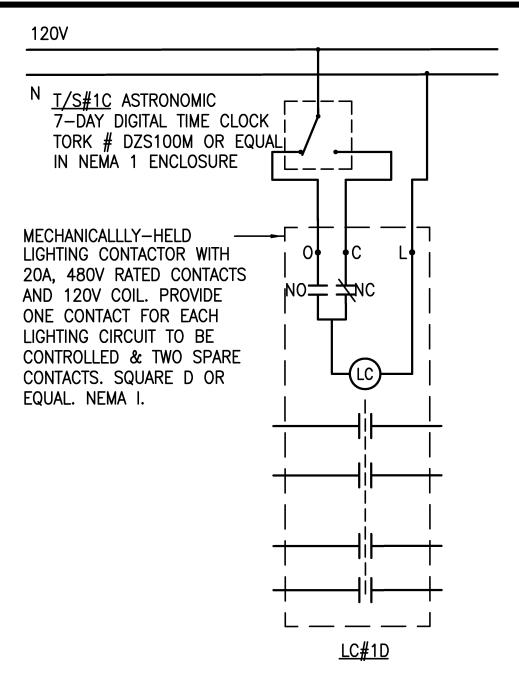
BLDGD		PR	OJE	CT:	7800SF				(N)	PA	NE	EL Į	2				LOCATION: ELEC/TELE BLDG D				
	r					KV	A LO	AD						KV	A LOA	۷D					
TG REC OTH		ОТН	REC	LTG	SERVICE	Α	В	С	BKR	СКТ	ABC	СК	T BKR	Α	В	С	SERVICE	LTG	REC	OTH	
Х			X		CLASSROOM	1.1			20/1	85		86	20/1	1.4			CLASSROOM		X		
X			Х		CLASSROOM		0.9		20/1	87		88	20/1		1.1		CLASSROOM		Х		
X			Х		CLASSROOM			0.9	20/1	89		90	20/1			1.1	CLASSROOM		Х		
X		Х			CLASSROOM	1.0			20/1	91		92	20/1	1.0			CLASSROOM			Х	
X			Х		CLASSROOM		0.9		20/1	93		94	20/1		0.9		CLASSROOM		Х		
X					ACC-D-1 208V 1PH 10FLA			1.2	15/2	95		96	20/1			1.0	SPARE				
X					3/4"C, 2#12 + 1#12G	1.2			11	97		98	1		ĺ		SPARE				
X					ACC-D-2 208V 1PH 10FLA		1.2		15/2	99		10)		Ì		SPARE				
Х					3/4"C, 2#12 + 1#12G			1.2	"	101		10	2		Ì		SPARE				
Х					ACC-D-3 208V 1PH 10FLA	1.2			15/2	103		10	4				SPACE				
X					3/4"C, 2#12 + 1#12G		1.2		"	105		10	3				SPACE				
Х					ACC-D-4 208V 1PH 10FLA			1.2	15/2	107		10	3				SPACE				
X					3/4"C, 2#12 + 1#12G	1.2			"	109		11)				SPACE				
X					SPARE		1.0		20/1	111		11:	2				SPACE				
X	r				SPARE			1.0	20/1	113		114	4				SPACE				
X					SPACE					115		110	3				SPACE				
X					SPACE					117		11	3		Ì		SPACE				
X					SPACE					119		12	ו		Ì		SPACE				
X					SPACE					121		12:	2				SPACE				
X					SPACE					123		12	1				SPACE				
X	T				SPACE					125		120	3				SPACE				
	T					5.6	5.1	5.4						2.4	2.0	2.1		I		I	

SEC 3/3

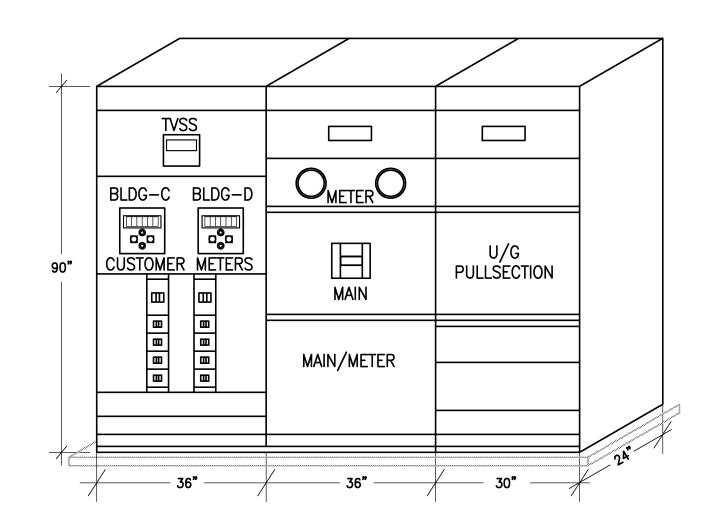
FEEDER	FEEDER DESCRIPTION	CONDUIT	CDADE	CONDUCTORS (7	'5℃ — THW)	DEMARKS
TAG	FEEDER DESCRIPTION	CONDUIT	SPARE CONDUIT	PHASE/NEUTRAL	GROUND	REMARKS
603	60AMP, 3 PHASE, 4 WIRE	1-11/4°C		4-#6	1-#8	
1003	100AMP, 3 PHASE, 4 WIRE	1-11/4°C		4-#2	1-#8	
2003	200AMP, 3 PHASE, 4 WIRE	1-3 1/2°C		4-3/0	1-#6	
3003	300AMP, 3 PHASE, 4 WIRE	1-3"C	1-3"C EA	4-300KCM	1-#4	1

POWER SHEET NOTES:

- (1) (E) SYSTEM GROUND
- 2 (N) SECONDARY SURGE ARRESTOR
- (3) GRID—TIED PHOTO—VOLTAIC SYSTEM IS DESIGN—BUILD <u>UNDER SEPARATE PERMIT</u>. EQUIPMENT AND FEEDER SHOWN FOR INFORMATION ONLY. VERIFY ALL COMPONENTS WITH PV CONTRACTOR.
- PROVIDE SYSTEM GROUND AS FOLLOWS:
 #3/0 CONCRETE ENCASED ELECTRODE 100FT MIN, #3/0
 BOND TO COLD WATER MAIN, GAS MAIN AND BUILDING STEEL.
 RESISTANCE TO SOLID EARTH GROUND SHALL NOT EXCEED 5
 OHMS. PROVIDE ADDITIONAL DRIVEN GROUND RODS AS
 REQUIRED.

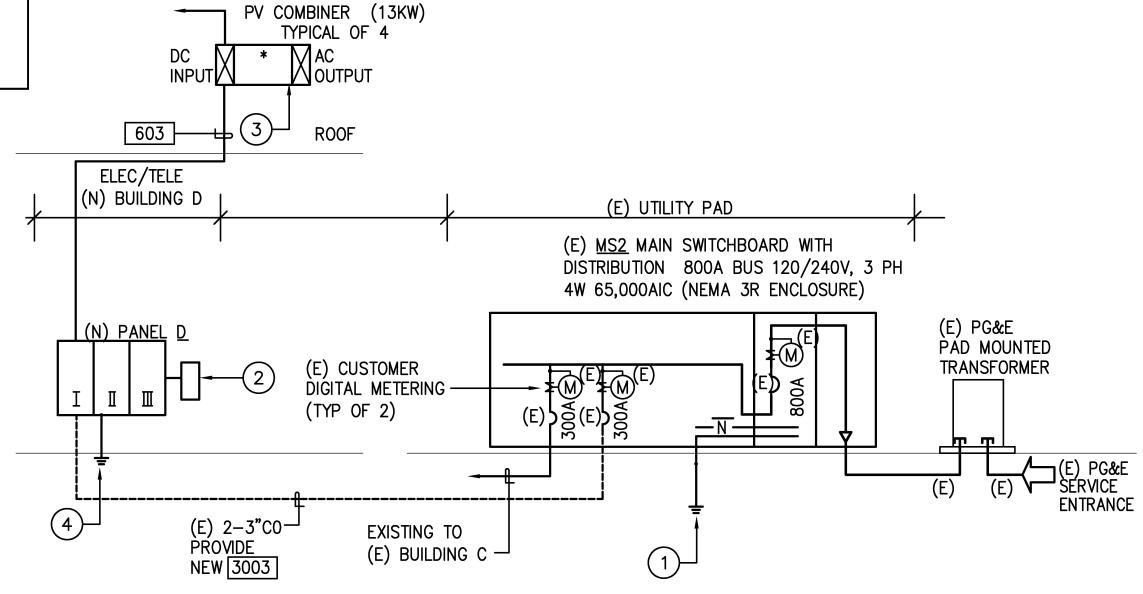


BUILDING MOUNTED EXTERIOR LIGHTING CONTROLLER



2 ELEVATION - MAIN SWITCHBOARD "MS2" (EXISTING)
NOT TO SCALE

TO PV <u>PVI#1D</u> INTERGRATED PANELS INVERTER 24"HT WITH



ELECTRICAL ONE-LINE DIAGRAM

PROFESS IONAL SERVICE STATE OF CALIFORNIA

IYER & ASSOCIATES

Architecture Interiors Planning
1100 Montgomery Street
SAN FRANCISCO, CA 94133

REVISIONS

10-28-11

ISSUE FOR PERMIT

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CER Com Namah Shivaya Om Namo Nara

DIAGRAMS & SCHEDULES

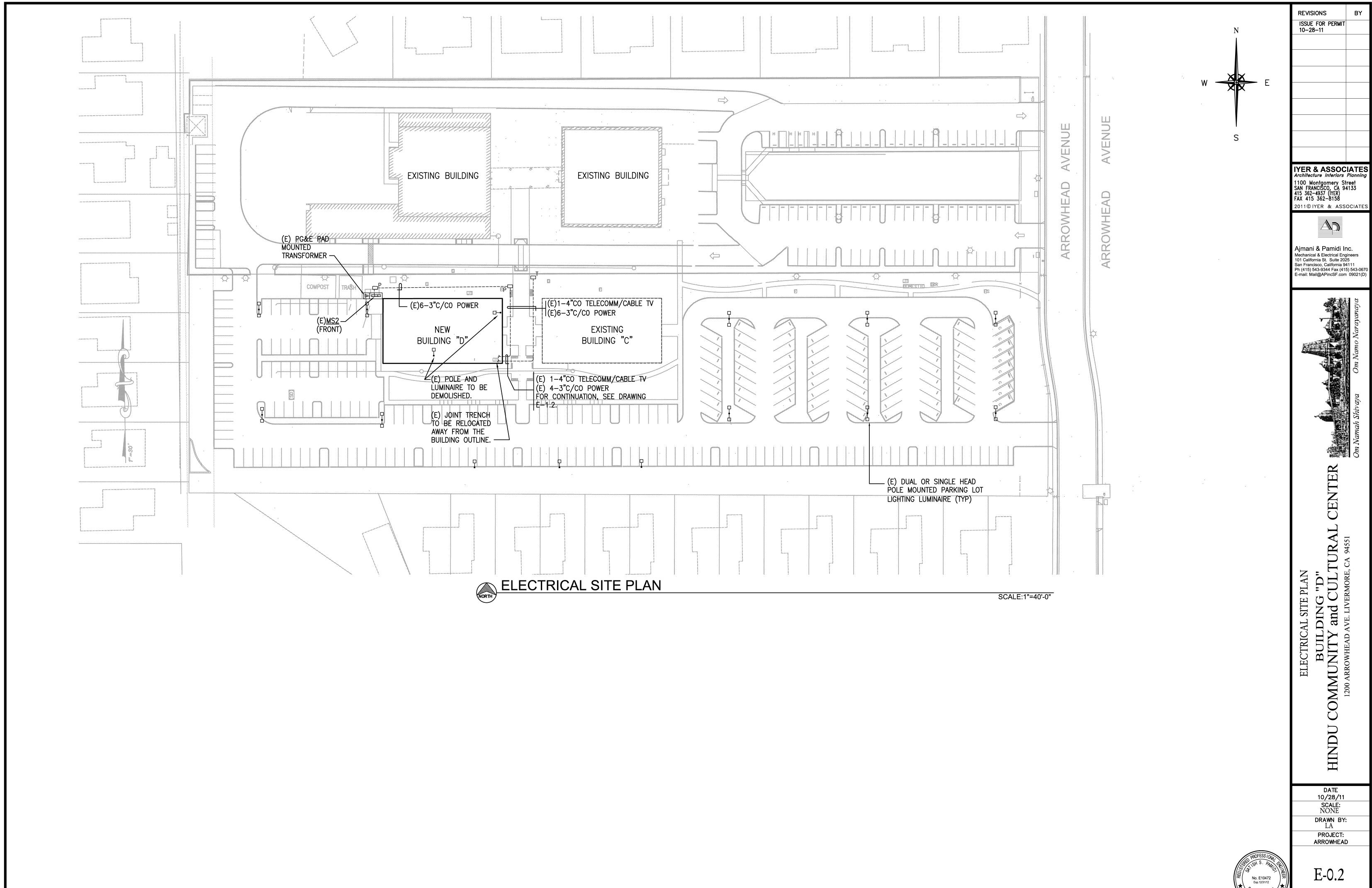
BUILDING "D"

U COMMUNITY and CULTURAL CENTE

DATE
10/28/11
SCALE:
NONE
DRAWN BY:
LA
PROJECT:

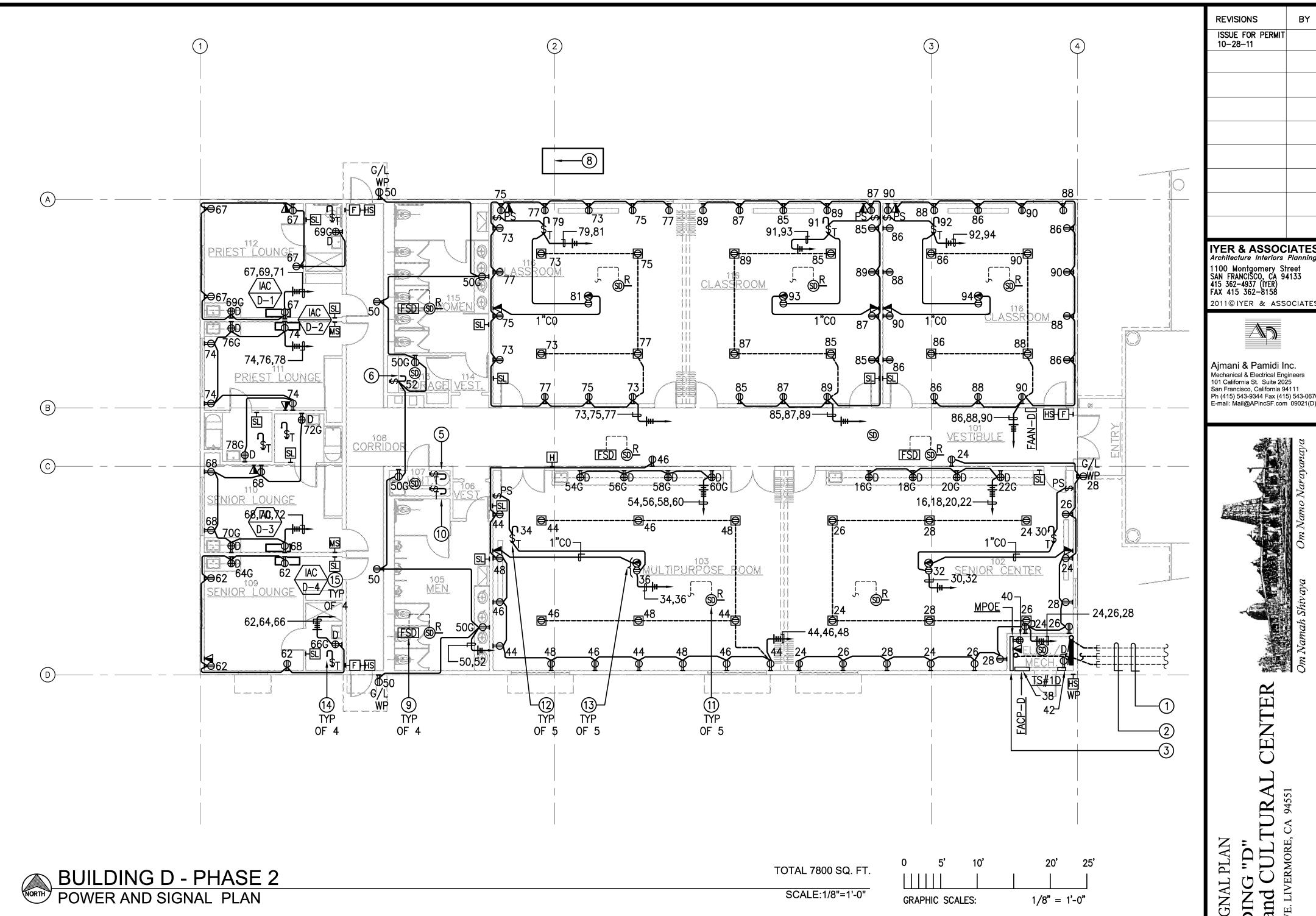
E-0.1

ARROWHEAD



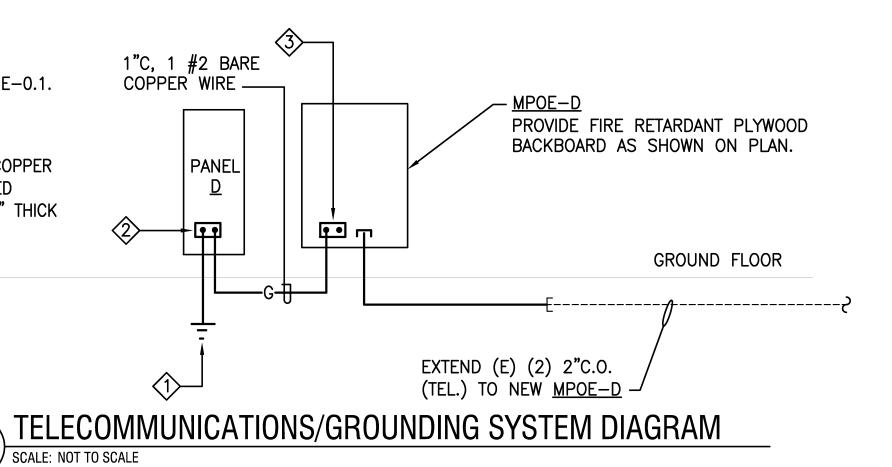


- (E) 4-2°CO (TELECOMM/CABLE TV) AND (E) 2-3°CO (POWER) PLUS (E) 2-3"CO SPARE CONDUITS. FOR CONTINUATION, SEE DRAWING E-0.2.
- (2) EXTEND SYSTEM CONDUITS RESPECTIVELY AS SHOWN.
- 3 FOR MPOE, PROVIDE AS FOLLOWS:
 - PROVIDE 8'HX PLYWOOD BACKBOARD (+6"AFF BOTTOM OF PLYWOOD ON WALL AS SHOWN) FIRE RETARDANT-TYPE PAINTED TO MATCH ROOM OR BIEGE. EDGES OF BOARD SHALL BE SMOOTH AND SPLINTER FREE.
 - ◆ PROVIDE 2-4"øCO SLEEVE TO RUN FROM 6" BELOW CEILING TO 6" ABOVE CEILING. COORDINATE EXACT LOCATION WITH TENANT AND CABLING VENDOR
- 4 ALL CIRCUITS ARE SUPPLIED FROM PANEL "D". THE CIRCUITING OF LUMINAIRES, WIRING DEVICES AND CONTROL DEVICES, WITHIN EACH INTENDED CONTROL SCHEME, SHALL BE FULLY IMPLEMENTED USING THE PROPER TYPE AND NUMBER OF WIRES WITH CONNECTIONS AS REQUIRED. "ROUNDHOUSE" METHOD SHALL BE USED FOR ALL MULTI-CIRCUIT RUNS IN COMMON CONDUIT
- 5 FOR HOT WATER HEATER CONTROLS. USE CIRCUIT D-80.
- 6 FOR DRINKING FOUNTAIN.
- (7) FOR FIRE DOOR OPERATOR. PROVIDE CONNECTION TO RELEASING CONTACT OF NEAREST SMOKE DETECTOR/S.
- 8 ALL HOMERUNS TO LEFT OF THIS GRID LINE SHALL BE #10 MIN.
- 9 LOOP FIRE/SMOKE DAMPERS INTO ONE 120V CONTROL CIRCUIT. USE D-84. PROVIDE FSD CONNECTION TO RELEASING CONTACT OF ASSOCIATED DUCT MOUNTED SMOKE DETECTOR.
- 10 FOR CP-1D, SPD. USE CIRCUIT D-82.
- 11) DUCT MOUNTED SMOKE DETECTOR WITH RELEASING CONTACT TO SHUT DOWN ASSOCIATED ROOFTOP UNIT ON ACTIVATION. PROVIDE CONNECTION TO SHUT-DOWN CIRCUIT OF ROOFTOP UNIT.
- 12 FOR MOTORIZED PROJECTION SCREEN WITH WALL MOUNTED PROJECTION SCREEN CONTROLLER.
- 13 FACE DOWN ON CEILING FOR LCD PROJECTOR.
- 14) FOR EXHAUST FAN, BEF-1, SMD. CONNECT TO CIRCUIT FOR LIGHTING IN ROOM.
- 15) FOR CIRCUITING AND CONTROLS, SEE DETAIL 3/E-1.3.



TELECOMM SHEET NOTES:

- SYSTEM GROUND. SEE DETAIL 1 SHEET E-0.1.
- ② GROUND BUS IN PANEL.
- 3 EQUIPMENT GROUND BUS. 1/4"x4"x12" COPPER GROUND BUS WITH 20-1/4" PRE-DRILLED HOLES, MOUNTED TO THE BOARD WITH 1" THICK RUBBER/PORCELAIN SPACERS.



darkappa initiation and notification loops $oxedsymbol{4}$ SMOKE DAMPER CONTROL MODULE 5 <u>FAAN-D</u> 1 2 3 6 GROUND FLOOR

> FIRE ALARM SYSTEM DIAGRAM SCALE: NOT TO SCALE

FIRE ALARM SYSTEM SHEET NOTES:

- ALL INSTALLATION SHALL BE IN CONDUIT. WIRING SHALL BE PER MANUFACTURER'S RECOMMENDATION. MINIMUM CONDUIT SIZE SHALL BE 3/4".
- SUBMIT SHOP DRAWINGS TO LOCAL FIRE MARSHAL FOR APPROVAL PRIOR TO START OF ANY WORK.
- NO WORK SHALL BE STARTED WITHOUT THE APPROVAL OF THE FIRE MARSHAL.
- 4 PROVIDE FIRE ALARM SYSTEM DEVICES AS SHOWN ON PLAN AND REQUIRED BY AUTHORITY HAVING JURISDICTION.
- 5 FOR LOCATION AND QUANTITY OF DEVICES, SMD.
- 6 <u>FIRE ALARM SYSTEM SHALL BE UNDER DEFERRED PERMITTING.</u>

CENTE G "D" CULTURAL POWER & SIGNAL PLAN
BUILDING "D"
J COMMUNITY and CULTI
1200 ARROWHEAD AVE. LIVERMORE, CA HINDU

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Architecture Interiors Planı

Ajmani & Pamidi Inc. Mechanical & Electrical Engineers 101 California St. Suite 2025

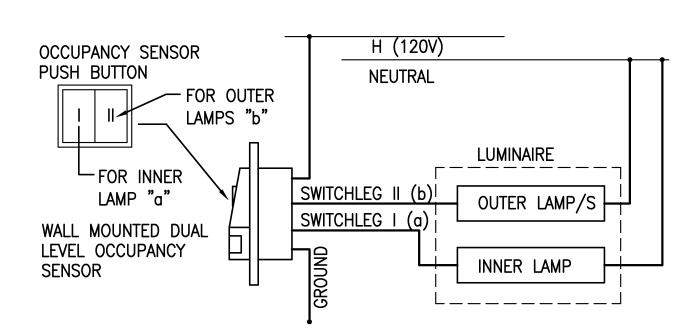
an Francisco, California 94111

DATE 10/28/11 SCALE: AS SHOWN DRAWN BY: PROJECT: ARROWHEAD

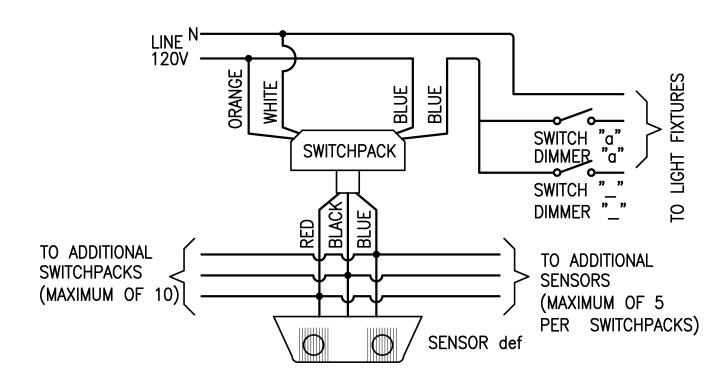
E-1.1

SHEET NOTES

- 1) FOR CONTROLS OF BUILDING MOUNTED EXTERIOR LIGHTING, SEE DETAIL 3 DRAWING E-0.1.
- FOR EGRESS LUMINAIRE WITH BATTERY PACK SHOWN SWITCHED, CONNECT SWITCHLEG AHEAD OF BATTERY CHARGER.
- PROVIDE WALL OR CEILING MOUNTED BI-LEVEL OCCUPANCY SENSOR AS SHOWN. CEILING MOUNTED OCCUPANCY SENSORS SHALL HAVE WALL MOUNTED BI-LEVEL OVERRIDE SWITCHES. SEE DETAIL 2 AND 3 THIS SHEET.
- 4 ALL CIRCUITS ARE SUPPLIED FROM PANEL "D". THE CIRCUITING OF LUMINAIRES, WIRING DEVICES AND CONTROL DEVICES, WITHIN EACH INTENDED CONTROL SCHEME, SHALL BE FULLY IMPLEMENTED USING THE PROPER TYPE AND NUMBER OF WIRES WITH CONNECTIONS AS REQUIRED. "ROUNDHOUSE" METHOD SHALL BE USED FOR ALL MULTI-CIRCUIT RUNS IN COMMON CONDUIT.
- 5 WALL OR CEILING MOUNTED

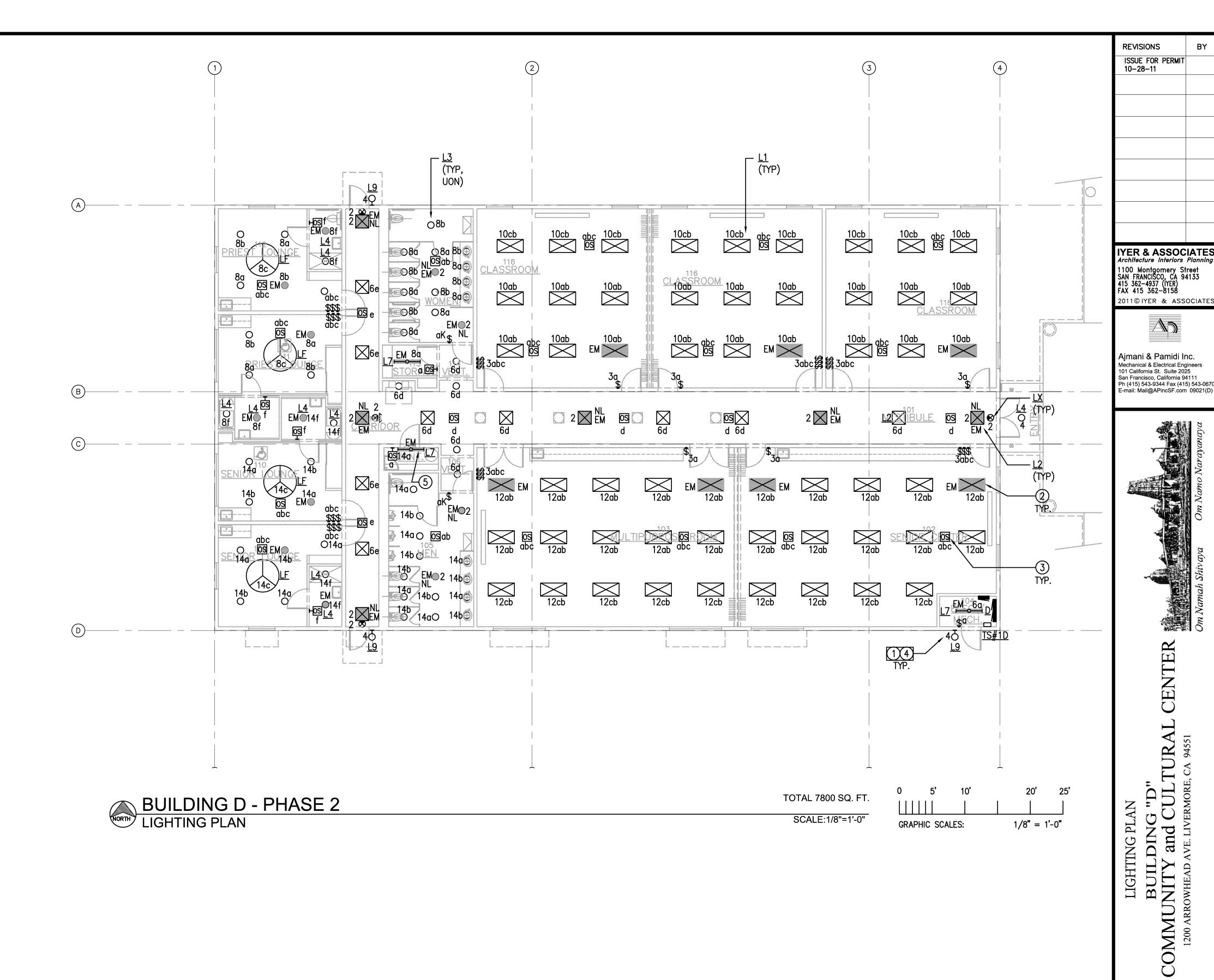


WALL MOUNTED OCCUPANCY SENSOR WIRING DIAGRAM SCALE: NOT TO SCALE



CEILING MOUNTED OCCUPANCY SENSOR WIRING DIAGRAM

SCALE: NOT TO SCALE



PROFESS /ONAL SHEET SHEE

E-1.2

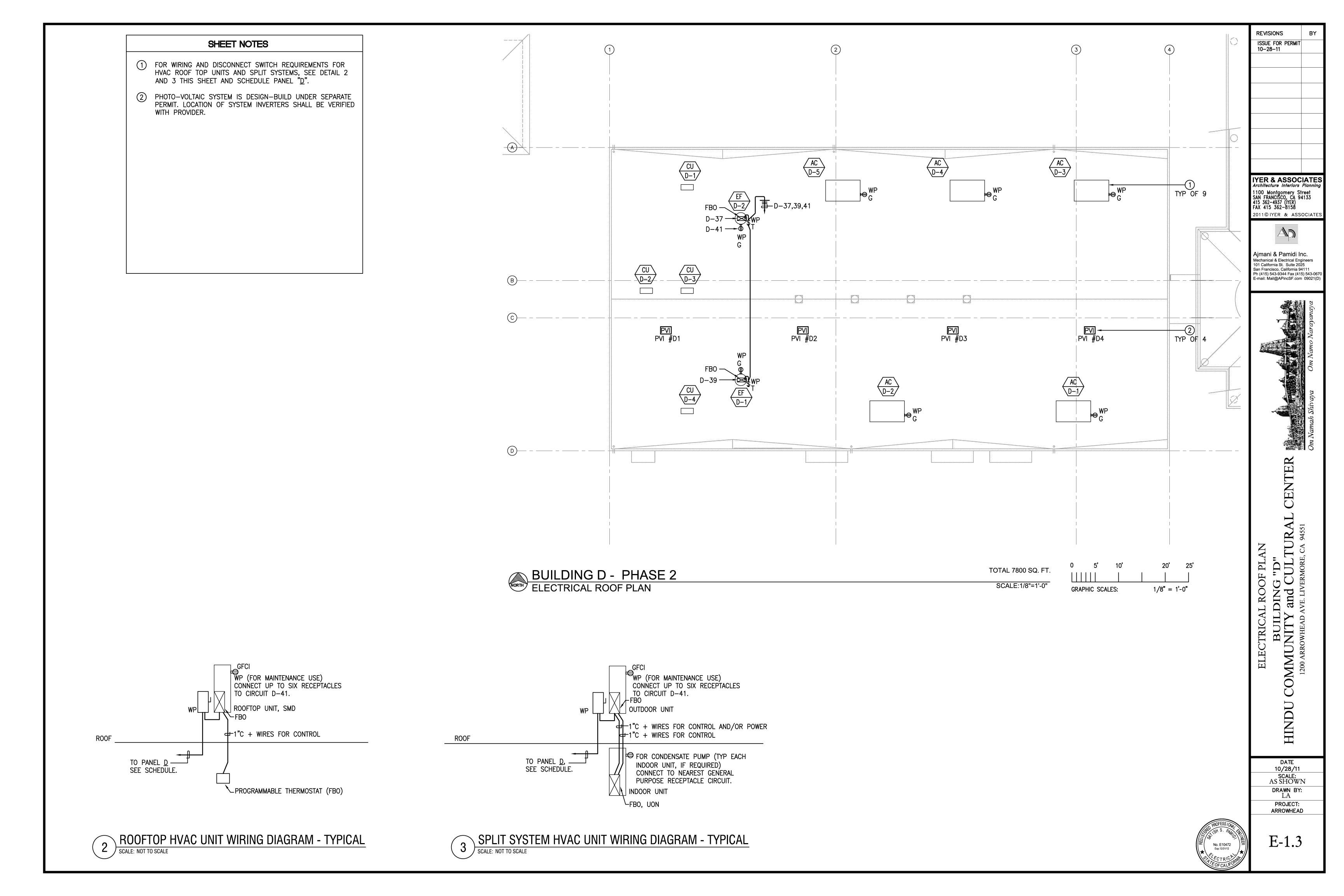
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DATE 10/28/11

DRAWN BY:

PROJECT: ARROWHEAD

SCALE: AS SHOWN



SPECIFICATIONS

- A. GENERAL
- PRIOR TO SUBMISSION OF BID. THE ELECTRICAL CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS.
- 2. ALL ELECTRICAL SERVICE WORK SHALL COMPLY WITH PG&E REQUIREMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE ALL COMPONENTS, MEANS AND METHODS OF INSTALLATION AS REQUIRED BY PG&E GREENBOOK AND PUC REQUIREMENTS.
- BRING TO THE ATTENTION OF THE ARCHITECT ANY CONFLICTING INFORMATION. OR MISSING INFORMATION FROM THE DOCUMENTS PRIOR TO START OF CONSTRUCTION.
- PROVIDE REQUIRED COOPERATION AND COORDINATION WITH OTHER TRADES TO MAXIMIZE CONSTRUCTION EFFICIENCY.
- ORDINANCES AND REGULATIONS: ALL SYSTEMS SHALL BE INSTALLED WITHIN STRICT ACCORDANCE WITH ALL APPLICABLE CITY, STATE AND NATIONAL CODES AND ORDINANCES.
- TESTING AND ADJUSTING: UPON COMPLETION FO THE WORK. TEST AND REGULATE ALL SYSTEMS TO THE INTENT OF THEIR DESIGN AND TO THE OWNER'S SATISFACTION.
- WARRANTEE: ALL MATERIALS, AND EQUIPMENT FURNISHED AND INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED, AND FREE OF ALL DEFECTS AND SHALL BE WARRANTED FOR ONE YEAR FROM DATE OF ACCEPTANCE.
- 8. LICENSES, PERMITS AND FEES: PROVIDE, PROCURE AND PAY FOR ALL PERMITS SERVICES, LICENSES, FEES, ETC., REQUIRED FOR PERFORMANCE OF THIS WORK UPON COMPLETION OF THE WORK, DELIVER TO THE OWNER, ALL CERTIFICATES OF APPROVAL SIGNED BY THE CONTROLLING AUTHORITIES.
- 9. SUBMITTAL:
 - A. SIX CATALOG CUTS FOR ALL MATERIALS AND EQUIPMENT. B. FIRE ALARM: SHOP DRAWINGS AS REQUIRED BY FIRE MARSHALL
- 10. COORDINATE EXACT HVAC LOCATION AND VERIFY ELECTRICAL LOADS WITH THE MECHANICAL CONTRACTOR PRIOR TO INSTALLATION.
- 11. INSTALL ALL DEVICES AND EQUIPMENT PER MANUFACTURERS' RECOMMENDATIONS.
- 12. PROVIDE SUPPORTS, VIBRATION ISOLATION, AND SEISMIC BRACING.
- 13. FIRE ALARM: DEVICES SHOWN ON PLANS TO SHOW MINIMUM REQUIREMENTS FOR THIS BUILDING. IT IS THE RESPONSIBILITY OF THE DESIGN-BUILD CONTRACTOR TO PROVIDE REQUIRED AND COMPLETE DOCUMENTS FOR DEFERRED PERMIT SUBMITTAL
- 14. THE TERM PROVIDE AS USED IN THESE DOCUMENTS IS DEFINED AS TO FURNISH AND INSTALL.
- MATERIAL AND METHODS
- 1. ALL EQUIPMENT SHALL BE LISTED BY AN ACCEPTED TESTING LABORATORY AND SHALL BE INSTALLED PER LISTING OR LABELING.
- 2. CONDUIT ROUTING SHOWN IS DIAGRAMMATIC. CONTRACTOR SHALL LAY OUT RUNS TO SUIT FIELD CONDITIONS AND THE COORDINATION REQUIREMENTS OF OTHER TRADES.
- 3. PROVIDE A CODE SIZE GROUND WIRE IN ALL CONDUITS UNLESS OTHERWISE NOTED.
- 4. ALL OUTLETS AND JUNCTION BOXES MOUNTED IN RATED WALL SHALL BE FIRE RATED.
- 5. MOUNTING HEIGHT SHOWN ARE FROM FINISHED FLOOR TO CENTERLINE OF THE OUTLET OR RACEWAY. ALL MOUNTING HEIGHTS SHALL BE AS SHOWN ON THE SYMBOL LIST UNLESS OTHERWISE NOTED.
- 6. REFER TO ARCHITECTURAL DOCUMENTS FOR CEILING TYPES AND DETAILS. PROVIDE REQUIRED LIGHTING FIXTURE ENCLOSURE, TRIMS AND MOUNTING ACCESSORIES. REFER TO APPLICABLE BUILDING CODES. PROVIDE REQUIRED FIXTURE SUPPORTS. MAINTAIN CEILING FIRE RATINGS.
- RUN ALL CONDUITS CONCEALED. IF CONDUITS ARE RUN EXPOSED, RUN PARALLEL WITH BUILDING LINES, GROUPED TOGETHER IN ORDERLY AND WORKMANLIKE MANNER, AND FANNED-OUT OF ELECTRICAL ROOM AND OR RESPECTIVE PANELBOARDS TO INDIVIDUAL DEVICES. THE ROUTING SHALL BE APPROVED BY ARCHITECT.
- 8. ALL WIRES SHALL BE COPPER #12 AWG MINIMUM.
- 9. ALL WIRING SHALL BE IN CONDUIT. 3/4" MINIMUM.
 - FLEXIBLE CONDUIT: STEEL
 - EMT CONNECTORS: SET SCREW (NO COMPRESSION)
 - PULL CORD IN ALL EMPTY CONDUIT.
 - EMT: STEEL
 - INSULATION BUSHING ON 1-1/4" AND LARGER CONDUITS. EXTERIOR AND CONCRETE EMBEDS" PVC SCH. 40.
 - METALLIC CLAD CABLE MAYBE USED WHERE SUITABLE, EXCEPT FOR FIRE ALARM SYSTEM.
- 10. THE WIRING OF LUMINAIRES, WIRING DEVICES AND CONTROL DEVICES, WITHIN EACH INTENDED CONTROL SCHEME, SHALL BE FULLY IMPLEMENTED USING THE PROPER TYPE AND NUMBER OF WIRES WITH CONNECTIONS AS REQUIRED.

С. PRODUCTS

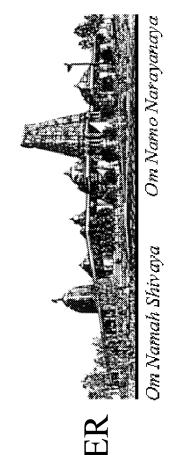
- 1. MAIN SWITCHBOARD EXISTING
 - MANUFACTURERS: SQUARE D
 - MAIN BREAKERS: MOLDED CASE 65,000AIC MIN BRANCH BREAKERS: 42,000AIC MIN
- 2. PANELBOARDS:
 - MANUFACTURERS: SIEMENS, GENERAL ELECTRIC, SQUARE D
 - OR CUTLER-HAMMER.
 - BRANCH BREAKERS: 10,000AIC MIN
 - NEUTRAL BUS: COPPER FULL LENGTH WITH LUGS
 - GROUND BUS: FULL SIZE OTHERS: 60HZ, 10,000AMP BUS BRACINGS
- 2. CONDUITS:
 - MANUFACTURERS: ALLIED TUBE & CONDUIT CORP., TRIANGLE PWC INC., WHEATLAND TUBE CO., INC. OR APPROVED EQUAL.
- METALLIC TYPE: RSC, IMC, EMT AND FLEXIBLE. NON-METALLIC TYPE: PVC SCHEDULE 40.
- 3. CONDUCTORS: COPPER MINIMUM 75—DEG.C INSULATION (THW, THWN). MANUFACTURED BY ROME CABLE, GRAYBAR
- METALLIC CLAD CABLE: ALUMINUM-CLAD. COPPER MINIMUM 75-DEG.C INSULATION (THW, THWN) MEETS UL STANDARD 1569 AND NEC 334. MANUFACTURED BY ALFLEX CORP.
- 5. BOXES:
- MANUFACTURERS: T&B STEEL CITY, WIREMOLD WALKERBOX
- TYPE: STEEL-STAMPED. SUITABLE FOR ENVIRONMENT.
- EXTERIOR AND SITE BOXES: CHRISTY OR FORNI
- 6. DEVICES:
 - SWITCHES 15A-120V: LUTRON MAESTRO OR EQUAL.
 - RECEPTACLES 15A/20A-120V: LEVITON DECORA PLUS OR
 - WALL PLATES: LEVITON DECORA PLUS OR EQUAL.
 - D. SPECIALTY TYPE: NEMA CONFIGURATIONS AS SHOWN ON PLANS.
- 7. OCCUPANCY SENSOR:
 - A. WALL BI-LEVEL: WATTSTOPPER WI-300
 - B. CEILING: WATTSTOPPER A-1000/A-2000 WITH RELAY MODULE
- 8. LUMINAIRES: AS SCHEDULED

REVISIONS ISSUE FOR PERMIT

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Aimani & Pamidi Inc. Mechanical & Electrical Engineers 101 California St. Suite 2025 San Francisco, California 94111 Ph (415) 543-9344 Fax (415) 543-06 E-mail: Mail@APincSF.com 09021(E



EN AL COMMUNITY and CUL SPECIFICATIONS

> 10/28/11 DRAWN BY: PROJECT:

> > ARROWHEAD

INDU



E-2.1

GENERAL NOTES

- 1. WORK PROVIDED UNDER THIS DIVISION SHALL BE IN CONFORMANCE WITH THE APPLICABLE PORTION OF THE 2007 CBC, CMC, CFC, NEC, 2008 TITLE—24 ENERGY STANDARDS, AND THE CITY OF LIVERMORE AND THE COUNTY REQUIREMENTS.
- 2. PROVIDE U.L. 555 LISTED FIRE DAMPERS AT ALL DUCT PENETRATION THROUGH THE FIRE RATED ASSEMBLIES. PROVIDE UL-555S LISTED COMBINATION FIRE-SMOKE DAMPERS AT ALL THE OCCUPANCY SEPARATION WALLS AND DUCTS PENETRATING RATED CORRIDOR WALLS & SHAFT ASSEMBLIES IN ACCORDANCE WITH 2007 CBC SECTION 713.10/11. PROVIDE PROPER SLEEVE LENGTHS TO MATCH THE WALL DEPTH. MOUNT ACTUATORS, END SWITCHES, HEAT DETECTOR, SMOKE DETCTORS, ETC. ON ACCESSIBLE SIDE OF FSD.
- FIRE AND FIRE—SMOKE DAMPERS SHALL BE INSTALLED STRICTLY IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS. THE MANUFACTURER'S SPECIFICATIONS SHALL BE MADE AVAILABLE TO THE INSPECTING AUTHORITY.
- 4. ALL PENETRATIONS AT WALLS, CEILINGS, FLOORS, ETC. BY THE DUCTWORK, PIPING, CONDUITS, ETC. SHALL BE SEALED WITH APPROVED U.L. LISTED FIRE STOPPING ASSEMBLIES TO MAINTAIN THE INTEGRITY OF THE FIRE RATING OF THOSE ASSEMBLIES. REFER TO ARCHITECTURAL FLOOR PLANS FOR WALL TYPES & LOCATIONS.
- 5. ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING, CONDUITS, TANKS, PACKAGED EQUIPMENT, ETC. SHALL BE SEISMICALLY ANCHORED AND BRACED IN ACCORDANCE WITH CBC, SMACNA REQUIREMENTS.
- DIVISION—15 CONTRACTOR SHALL COORDINATE THE POWER REQUIREMENT WITH THE DIVISION—16 WORK, INCLUDING THE VOLTAGE, PHASE, AMP REQUIREMENT, OVERLOAD PROTECTION REQUIREMENT, LOCATION OF STARTERS, DISCONNECTS, INTERLOCK WIRING, POWER WIRING TO FSD'S, WIRING TO SMOKE DETECTORS, ACTUATORS, ETC.
- 7. INSTALL FANS, FIRE DAMPERS & FIRE/SMOKE DAMPERS AND OTHER MECHANICAL COMPONENTS REQUIRING PERIODIC SERVICE & MAINTENANCE ACCESS TO BE COMPLETELY ACCESSIBLE FROM THE CEILING ACCESS PANELS. PROVIDE CODE MANDATED CLEARANCES AT ALL EQUIPMENT & ELECTRICAL PANELS.
- DIVISION—15 CONTRACTOR SHALL COORDINATE THE LOCATION, SIZE & ELEVATION OF THE CONCRETE HOUSEKEEPING PADS WITH THE CONCRETE WORK BASED ON THE ACTUAL MECHANICAL EQUIPMENT PROPOSED FOR THE PROJECT. CONTRACTOR SHALL ALSO COORDINATE THE LOCATION, SIZE OF THE CONCRETE WALL AND SLAB PENETRATIONS WITH THE RESPECTIVE TRADE CONTRACTORS.
- THIS DIVISION CONTRACTOR SHALL PROVIDE COMPLETE COOPERATION IN COMMISSIONING OF ALL THE MECHANICAL, ELECTRICAL, PLUMBING AND CONTROL SYSTEMS BY PROVIDING FULLY QUALIFIED PERSONNEL, EQUIPMENT, TESTING TOOLS, MANPOWER AS NECESSARY TO COMPLETE THE COMMISSIONING, TESTING & DOCUMENTATION TASKS AS NECESSARY LEED V2.2 FUNDAMENTAL COMMISSIONING REQUIREMENT.
- ALL MATERIALS OF CONSTRUCTION INCLUDING SELANTS; WALL, ROOF, & CEILING ELEMENTS; INSULATION; WIRING & CABLES; DEVICES AND EQUIPMENTS; TUBING, ETC. THAT COMES IN CONTACT WITH SUPPLY AIR, OUTSIDE AIR AND RETURN AIR SHALL HAVE A FLAME SPREAD RATING OF NOT MORE THAN 25 AND SMOKE DEVELOPED RATING OF NOT MORE THAN 50.
- FOR DUCTWORK, PIPING & CONDUIT PENETRATIONS THROUGH SOUND—RATED WALLS REFER TO DETAILS AND LOCATION OF SOUND—RATED WALLS REFER TO ARCHITECTURAL PLANS.
- AIR-MOVING SYSTEMS SUPPLYING AIR IN EXCESS OF 2,000 CFM TO ENCLOSED SPACES WITHIN THE BUILDING SHALL BE EQUIPPED WITH AN AUTOMATIC SHUTOFF IN COMPLIANCE WITH UMC SECTION 609. THE AUTOMATIC SHUTOFF SHALL BE ACCOMPLISHED BY INTERRUPTING THE POWER SOURCE OF THE AIR-MOVING EQUIPMENT WHEN SMOKE IS DETECTED IN THE MAIN SUPPLY DUCT CONNECTED TO THE EQUIPMENT.
- 13. DIVISION-15 CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE T-24 MANDATORY POST-INSTALLATION TESTING AND COMPLIANCE VERIFICATION AND DOCUMENTING, THE ECONOMIZER OPERATION, OUTSIDE AIR MEASUREMENT FOR EACH EACH, DUCT LEAKAGE TESTING AND DOCUMENTATION AND CONTROL SYSTEM OPERATION PER THE 2008 T-24 REQUIREMENTS.
- 14. LEED COMPLIANCE REQUIREMENTS: COMPLY WITH THE MANDATORY REQUIREMENTS AND OPTIONAL LEED COMPLIANCE REQUIREMENTS AS OUTLINED BELOW FOR MECHANICAL AND PLUMBING SYSTEMS. REFER TO OTHER LEED COMPLIANCE REQUIREMENTS SPECIFIED IN THE LEED CHECKLIST TITLED "LEED FOR NEW CONSTRUCTION v2.2 WORKSHEET FOR HINDU COMMUNITY AND CULTUREAL CENTER PHASE—1B BUILDING—C ADMINISTRATION BUILDING, ADDRESS:1232 ARROWHEAD AVENUE".

	CREDIT#	POINTS	<u>DESCRIPTION</u>
_	WEc3.1	1	WATER USE REDUCTION, 20% REDUCTION
_	EAcP1	MANDATORY	FUNDAMENTAL COMMISSIONING OF THE BUILDING ENERGY SYSTEMS
_	EAp2	MANDATORY	MINIMUM ENERGY PEFORMANCE 9TITLE-24 COMPLIANCE)
_	EAp3	MANDATORY	FUNDAMENTAL REFRIGERANT MANAGEMENT (NO CFC & HCFC)
_	EAc1	2	OPTIMIZE ENERGY PERFORMANCE (14% BETTER THAN 2008 TITLE-24)
_	EQp1	MANDATORY	MINIMUM IAQ PERFORMANCE. COMPLY WITH ASHRAE 62.1 FOR VENTILATION.
_	EQc3.1	1	CONSTRUCTION IAQ MANAGEMENT PLAN, DURING CONSTRUCTION.
_	EQc3.2	1	CONSTRUCTION IAQ MANAGEMENT PLAN, BEFORE OCCUPANCY.
_	EQc5	1	INDOOR CHEMICAL & POLLUTANT SOURCE CONTROL.

	DRAWING LIST — BUILDING "D"
DWG. NO.	DESCRIPTION
M-10.0	MECHANICAL LEGEND, DRAWING INDEX, GENERAL NOTES
M-11.1	MECHANICAL EQUIPMENT SCHEDULES
M-11.2	MECHANICAL EQUIPMENT SCHEDULES
M-11.3	SPECIFICATIONS
M-11.4	SPECIFICATIONS
M-13.0	MECHANICAL PLAN — BUILDING D
M-14.0	MECHANICAL ROOF PLAN — BUILDING D
M-15.0	MECHANICAL DETAILS — BUILDING D
T-24.1	TITLE-24 COMPLIANCE FORMS
T-24.2	TITLE-24 COMPLIANCE FORMS
T-24.3	TITLE-24 COMPLIANCE FORMS
T-24.4	TITLE-24 COMPLIANCE FORMS
T-24.5	TITLE-24 COMPLIANCE FORMS

A 1	
ABBR	BBREVIATIONS DESCRIPTION
ACU AD	AIR CONDITIONING UNIT ACCESS DOOR (DUCT)
AFMD	AIR FLOW MEASURING DEVICE
AFF AHU	ABOVE FINISHED FLOOR AIR HANDLING UNIT
AP ARCH	ACCESS PANEL (WALL OR CEILING) ARCHITECTURAI
AS	AIR SEPARATOR
ASD AVD	AUTOMATIC SMOKE DAMPER AUTOMATIC VOLUME DAMPER
BDD	BACKDRAFT DAMPER
BHP BOD	BRAKE HORSEPOWER BOTTOM OF DUCT
BAS	BUILDING AUTOMATION SYSTEM
BTUH CBBD	BRITISH THERMAL UNITS PER HOUR COUNTER BALANCED BACKDRAFT DAMPER
CC CFF	COOLING COIL CAPPED FOR FUTURE
CFM	CUBIC FEET PER MINUTE
CU DB	OUTDOOR CONDENSER UNIT DRY BULB
DDC	DIRECT DIGITAL CONTROL
DEFL E	DEFLECTION EXISTING
EA,OA	EXHAUST AIR, OUTSIDE AIR
EAT EF	ENTERING AIR TEMPERATURE EXHAUST FAN
ET	EXPANSION TANK
FCU EWT	FAN COIL UNIT ENTERING WATER TEMPERATURE
FA FACP	FIRE ALARM FIRE ALARM CONTROL PANEL
FLA	FULL LOAD AMPS
FPM FPS	FEET PER MINUTE FEET PER SECOND
FSG	FLOOR SUPPLY GRILLE
FT GPM	FEET GALLONS PER MINUTE
HW	HEATING HOT WATER
HC HP	HEATING COIL HORSE POWER
HWP HV	HEATING WATER PUMP HEATING & VENTILATING
KW	KILOWATT
LAT LEED	LEAVING AIR TEMPERATURE LEADERSHIP IN ENERGY AND
	ENVIRONMENTAL DESIGN (USGBC)
LRA LVL	LOCKED ROTOR AMPS LEVEL
LWT MBH	LEAVING WATER TEMPERATURE THOUSAND BTU PER HOUR
MCC	MOTOR CONTROL CENTER
MCP MFR	MOTOR CONTROL PANEL MANUFACTURER
NC	NORMALLY CLOSED OR NOISE CRITERIA
NIMC NO	NOT IN MECHANICAL CONTRACT NORMALLY OPEN
OBD OPER WT	OPPOSED BLADE DAMPER OPERATING WEIGHT
OPP	OPPOSITE
PCD PD	PRIMARY CONDENSATE DRAIN PRESSURE DROP
PH	PHASE
PRESS PSIG	PRESSURE POUNDS PER SQUARE INCH
RA,SA REF	RETURN AIR, SUPPLY AIR REFERENCE
RF	RETURN FAN
RHC RPM	REHEAT COIL REVOLUTIONS PER MINUTE
SAD SCD	SEE ARCHITECTURAL DRAWINGS SECONDARY CONDENSATE DRAIN
SF	SUPPLY FAN
S.F. SN	SQUARE FEET SHEET NOTES
SP	STATIC PRESSURE
ST STR	SOUND TRAP STRAINER
TCV TCP	TEMPERATURE CONTROL VALVE TEMPERATURE CONTROL PANEL
TD	TEMPERATURE DIFEERENCE
tef temp	TOILET EXHAUST FAN TEMPERATURE
TDH	TOTAL DYNAMIC HEAD
TYP UON	TYPICAL UNLESS OTHERWISE NOTED
V VEL	VAV TERMINAL OR VOLT VELOCITY
VFD	VARIABLE FREQUENCY DRIVE
VIB WB	VIBRATION ISOLATOR WET BULB
WG	WATER GAUGE
WMS XFMR	WIRE MESH SCREEN TRANSFORMER
OA	OUTSIDE AIR

OUTSIDE AIR

DUCT SMOKE DETECTOR

SD

	LEGE	ND		LEGEN	<u> </u>
SYMBOL	ABBR	DESCRIPTION	SYMBOL	ABBR	DESCRIPTION
STWIDOL	ABBIX	DESCRIPTION	STWIDOL	ADDIX	DESCRIPTION
$1 \over M-1$		DETAIL NUMBER DRAWING NUMBER		R (D)	DUCT RISE OR DROP
A		DRAWING NOMBER	===OR	AL(PL)	ACOUSTICAL LINING (PLENUM LINING)
M7.01		SECTION NUMBER DRAWING NUMBER			DUCT ENCLOSED IN GYP. BOARD ENCLOSURE (SEE ARCHITECTURAL DWGS)
AC		EQUIPMENT IDENTIFICATION			DIRECTION OF AIRFLOW
		EQUIPMENT NUMBER		FC	FLEXIBLE DUCT CONNECTION
(E) (N)		EXISTING NEW			FLEXIBLE DUCT FOR SUPPLY (FLEXIBLE
4		INLW	₽AVD	A) /D	DUCT CONNECTION FOR EXHAUST)
- □	CSD/CMS	CEILING SUPPLY DIFFUSER	CBBDD	AVD ASD(SD) CBBDD	AUTOMATIC VOLUME DAMPER AUTOMATIC SMOKE DAMPER COUNTER BALANCED BACK DRAFT DAMPER
	CER (G)	CEILING EXHAUST REGISTER(GRILLE)	FD FD	FD	FIRE DAMPER
	CRR/CMR (G)	CEILING RETURN REGISTER(GRILLE)	→ □ BDD	BDD	
─	WSR (6)	WALL SUPPLY REGISTER (ORILLE)	FSD		BACK DRAFT DAMPER
	WER (G) WRR (G)	WALL EXHAUST REGISTER (GRILLE) WALL RETURN REGISTER (GRILLE)	T T T	FSD	COMBINATION FIRE/SMOKE DAMPER WITH ACTUATOR
		SECTION THRU SUPPLY OR OUTSIDE AIR DUCT		VD	VOLUME DAMPER
		SECTION THRU RETURN DUCT		VD	VOLUME DAMPER WITH REMOTE REGULATOR
		SECTION THRU EXHAUST DUCT	OR A	TV	TURNING VANES
CODE CFM	FSR	AIR OUTLET DESIGNATION CODE (SEE SCHEDULE) FLOOR SUPPLY REGISTER		BP	BEAM PENETRATION
SIZE DIFFUSER TYPE (SEE SCHEDULES)	1 31(TEOOK SOFFET KEGISTEK			ACCESS PANEL
CODE CFM		AIR OUTLET DESIGNATION			SQUARE TO ROUND DUCT
VECK SIZE (SEE PLANS) ✓OR CER1/CRR1/ CRG1			OR		REDUCING TRANSITION
CEG1 CFM	EXHAUST/RETURN				REDUCING TRANSITION
DUCT SIZE	OUTLET		→ UC		UNDERCUT DOOR — SEE ARCH. DWGS. THERMOSTAT
CODE CFM		LINEAR DIFFUSER DESIGNATION			TEMPERATURE SENSOR
1-3.0-5		EINER BITTOSER BESIGNATION	DSD, SD——	SD	DUCT SMOKE DETECTOR
LENGTH(FT.) SLOT WIDTH NO. OF SLOT				CFF UP DN SL LL CD	LINE CONTINUED CAPPED FOR FUTURE PIPING UP PIPING DOWN REFRIGERANT SUCTION LINE REFRIGERANT LIQUID LINE CONDENSATE DRAIN
			——————————————————————————————————————	G	NATURAL GAS
			D	D	DRAIN
			T	TF	TEST FITTING UNION
			<u> </u>	PG	PRESSURE GAUGE
			<u> </u>	TH	THERMOMETER
				GV BV	GATE VALVE BUTTERFLY (2 1/2" OR LARGER), (BALL VALVE 2" OR SMALLER)



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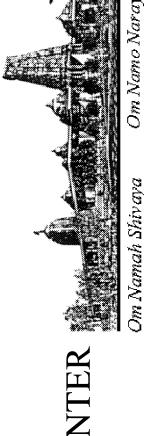
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LEGEND, NOTES & DRAWING INDEX

BUILDING "D"

HINDU COMMUNITY and CULTURAL CE

1200 ARROWHEAD AVE. LIVERMORE, CA 94551

DATE
10/28/11
SCALE:
NONE
DRAWN BY:
PT
PROJECT:
ARROWHEAD

M-10.0

											PAC	KAGE	D F	200	FTO	² AIR	COND	ITION	ING U	NIT	SCHEDUI	LE								MANUFAC	TURER: Trane,	Carrier or App	proved Equal	
	MODEL	COOL	ING CAPA	CITY			COOLIN	G COIL	GAS HEATIN	IG CAPACITY		S	SUPPLY	FAN					FILTE	IRS .			POWER	EXHAUST	FAN				UNIT ELI	ECTRICAL	0550 (4545	OPER. WEIGHT	DEM	44040
ODE	MODEL	TONS	SENS MBH	TOTA MBH	AL EAT DB	EAT WB	LAT DB	LAT WB	INPUT (MBH)	OUTPUT (MBH)	CFM	ESP (In.W.G.)	RPM	BHP	HP	MIN. OA CFM	TYPE	QTY	CLEAN F	PD DIRTY	EFF/MERV	TYPE & MODEL NO.	CFM	SP (In.W.G	S.) BHP	HP	RPM	I MCA	МОСР	V/PH/HZ	SEER/AFUE	LBS.	KEM	MARKS
;-D-1	YHC-060	5	48.4	62.4	4 80	67	60	57.6	60	48	2000	0.6	1057	0.99	1	600	2"	-	0.35	1"	85/MERV-13	TRANE	2000	0.375	5 0.42	0.31 k	xW	28.8	45	208/3PH/60	12 / 81	1,300	①THRU①	13
-D-2	YHC-072	6	55.6	72.	5 80	67	60	57.6	80	64	2,500	0.6	850	0.95	1	690	2"	-	0.35	1"	85/MERV-13	TRANE	2,500	0.375	5 0.42	0.31 k	kW	34.80	50	208/3PH/60	12 / 81	1,750		13
-D-3	YHC-048	4	39.4	49.4	4 80	67	60	57.6	60	48	1,600	0.6	973	0.7	1	600	2"	-	0.35	1"	85/MERV-13	TRANE	1,600	0.375	5 0.42	0.31 k	W	22.8	35	208/3PH/60	12 / 81	1,200		
-D-4	YHC-060	5	45.4	61.4	4 80	67	60	57.6	60	48	1850	0.6	1000	0.81	1	630	2"	-	0.35	1"	85/MERV-13	TRANE	1850	0.375	5 0.42	0.31 k	xW	28.8	45	208/3PH/60	12 / 81	1,300		13
−D−5	YHC-060	5	45.4	61.4	4 80	67	60	57.6	60	48	1850	0.6	1000	0.81	1	660	2"	-	0.35	1"	85/MERV-13	TRANE	1850	0.375	5 0.42	0.31 k	W	28.8	45	208/3PH/60	12 / 81	1,300	V	13

NOTE

- 1) UNIT LOCATED ON MAIN ROOF ON 14" ROOF CURB.
- 2 UNIT WITH R-410A REFRIGERANT, AI/CU COND & EVAP COILS
- 3 SEER LISTED AT STANDARD CONDITIONS.
- 4 UNIT SELECTION BASED ON 95 F AMBEINT.
- 5 BOTTOM SUPPLY AND RETURN DISCHARGE.
- 6 FACTORY INSTALLED OSA ECONOMIZER CONTROL & POWER EXHAUST & SINGLE-POINT POWER SUPPLY.
- 7 PROVIDE 14" TALL WELDED STEEL CURB, 2007 CBC COMPLIANT, MICROMETL CORP. SERIES OR EQUAL TO MATCH THE AC UNIT SIZE.

- 8 PROVIDE HINGED AND INSULATED ACCESS DOOR AND 2-INCH THICK MERV 13 FILTERS.
- 9 PROVIDE MATCHING ELECTRONIC PROGRAMMABLE, T-24 COMPLIANT 7-DAY WALL THERMOSTAT.
- 10 PROVIDE FACTORY FURNISHED OUTSIDE AIR HOOD AND EXHAUST AIR HOOD AT AC UNIT AIR INLET AND EXHAUST (TYP).
- (1) PROVIDE GAS PRESSURE REGULATOR IF REQUIRED.
- AC UNITS SHALL BE PROVIDED WITH DEMAND CONTROL VENTILATION OPTIONAL PACKAGE AND ROOM CO2 SENSOR TO MODULATE OPEN THE OUTSIDE AIR DAMPER BETWEEN MINIMUM AND MAX SETTINGS (ADJUSTABLE) TO LIMIT THE AMOUNT OF CO2 LEVEL IN THE OCCUPIED SPACE PER T-24.
- 13) PROVIDE SMOKE DETECTOR(S) FOR AUTO SHUT-DOWN OF UNIT.

				25.1	TOTAL			MODEL		ROOF CURB	PO	WER REQUIREME	NT	OPER.	SOUND	
CODE	SYSTEM	SERVICE	LOCATION	CFM	SP IN. WC	RPM	BHP	NO./ SIZE	TYPE	THROAT SIZE LXWXH	MTR HP	VFD	V/PH/HZ	- WT LBS	CRITERIA (SONE)	REMARKS
EF-D-1		BLDG-D, MENS TOILET ROOM EXH.	ROOF	625	0.375	1550	0.12	G-95-D	MUSHROOM	14X14	1/8	NO	120V/1ø	150	8.7	123
EF-D-2		BLDG-D, WOMENS TOILET ROOM EXH.	ROOF	575	0.375	1500	0.12	G-95-D	MUSHROOM	14X14	1/8	NO	120V/1ø	150	8.7	123
BEF-D-1		BLDG-D, LOUNGE TOILET	CEILING	80/30	0.20	_	_	FV-08VKS3	CABINET	_	10 WATTS	_	120V/1ø	15	0.3	56 PANASONIC
BEF-D-2		BLDG-D, LOUNGE TOILET	CEILING	80/30	0.20	_	_	FV-08VKS3	CABINET	_	10 WATTS	_	120V/1ø	15	0.3	56 PANASONIC
BEF-D-3		BLDG-D, LOUNGE TOILET	CEILING	80/30	0.20	_	_	FV-08VKS3	CABINET	_	10 WATTS	_	120V/1ø	15	0.3	56 PANASONIC
BEF-D-4		BLDG-D, LOUNGE TOILET	CEILING	80/30	0.20	_	_	FV-08VKS3	CABINET	_	10 WATTS	_	120V/1ø	15	0.3	56 PANASONIC

RFMARK

- 1 PROVIDE FACTORY MATCHED 8" ROOF CURB, FLASHING AND COUNTERFLASHING. SECURE CURB TO THE ROOF STRUCTURE WITH GALV. STEEL ANCHOR BOLTS.
- 2 EXHAUST FANS SHALL BE FACTORY FURNISHED WITH BACKDRAFT DAMPER. FURNISHED SPEED CONTROLLER TO BE MOUNTED IN NEMA 3R ENCLOUSURE BY MECHANICAL AND WIRED BY ELECTRICAL CONTRACTOR.
- 3 EXHAUST FANS SHALL BE CONTROLLED FROM A CENTRALLY LOCATED ELECTRONIC PROGRAMMABLE TIME CLOCK.
- (4) EXHAUST FANS SHALL BE CONTROLLED ON/OFF BY LIGHT SWITCH.
- PANASONIC "WHISPER GREEN" EXHAUST FAN WITH VARIABLE SPEED CONTROL & INTEGRAL HIGH/LOW DELAY TIMER, ENERGY STAR, UL LISTED FOR TUB/SHOWER ENCLOSURE. EXHAUST FAN WIRED BY ELECTRICAL, SUPPLIED & INSTALLED BY MECHANICAL.
- 6 WHEN FAN SWITH IS IN OFF MODE, EXH FAN SHALL RUN AT LOW SPEED TO PROVIDE CONTINUOUS 30 CFM EXH. WHEN SWITCH IS IN "ON" MODE, IT SHALL EXHAUST 100% FULL CAPACITY.



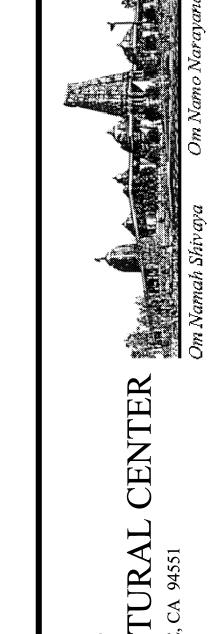
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		VIBRAT	ION ISOL	ATOR	SCH	EDUL	E		MANUF	: MASON OR APPROVED EQUAL
EQUIPMENT	TYPE	SERVICE	LOCATION	ISOL	ATOR	BA	SE	SEISMIC	MODEL NO. ISOLATOR/SEISMIC	REMARKS
EQUIT MEI41	IIFC	SLIVICE	LOCATION	CODE	S.D.	CODE	WT#	RESTRAINTS		NEWANS
AC-D-1	ROOFTOP ACU	BUILDING D	ROOF	N-1	1/4"	_	_	ANCHOR BOLTS	_	1234
AC-D-2	ROOFTOP ACU	BUILDING D	ROOF	N-1						
AC-D-3	ROOFTOP ACU	BUILDING D	ROOF	N-1						
AC-D-4	ROOFTOP ACU	BUILDING D	ROOF	N-1						
AC-D-5	ROOFTOP ACU	BUILDING D	ROOF	N-1	V	V	V	V	V	V
	MICHEON	TOURT EVIL	POOF	N 4	1/8"			ANCHOR BOLTS		
EF-D-1	MUSHROOM	TOILET EXH	ROOF	N-1	· ·	_				14
EF-D-2	MUSHROOM	TOILET EXH	ROOF	N-1	1/8"	_	_	ANCHOR BOLTS		14
						_	_			
						_				

NOTES

- 1 FANS LOCATED INSIDE THE EQUIPMENT SHALL BE INTERNALLY ISOLATED.
- 2 ANCHOR BOLTS AND ISOLATORS EXPOSED TO WEATHER SHALL BE HOT-DIPPED GALVANIZED OR PROTECTED WITH EXTERIOR GRADE ENAMEL PAINT.
- 3 NEOPRENE SUPER-W PAD ISOLATORS SHALL BE LOCATED BETWEEN THE ROOF CURB AND THE UNIT BASE TO SEAL AND ISOLATE. INSTALL PER MANUFACTURERS' GUIDELINES.
- 4 UNITS WITH FACTORY FURNISHED MATCHING ROOF CURB. SEE EQUIPMENT SCHEDULE.

SPLIT SYSTEM HEAT PUMP SCHEDULE (INDOOR) MFR: FUJI												MFR: FUJITSU				
CODE	CODE MODEL/TYPE TONS SERVICE		CED 40E	LOCATION	NOM. CAPACITY (MBH)		SUPPLY FAN			INDOOR UN		IT ELEC	TRICAL	- WEIGHT	REMARKS	
CODE	MODEL/TIPE	TONS	SERVICE	LOCATION	COOLING	HEATING	MIN. CFM	MAX. CFM	HP	FUSE	WSA	HFCB	VOLT/ø		INLW/INING	
IAC-D-1	12RLS / WALL MOUNTED	1	PRIEST LOUNGE RM # 112	RM. # 112	12.0	16.0	177	430	_	15A	_	_	208/1	50	1234	
IAC-D-1	12RLS / WALL MOUNTED	1	PRIEST LOUNGE RM # 111	RM. # 111	12.0	16.0	177	430	-	15A	_	_	208/1	50	1234	
IAC-D-1	12RLS / WALL MOUNTED	1	SENIOR LOUNGE RM # 110	RM. # 112	12.0	16.0	177	430	_	15A	_	_	208/1	50	1234	
IAC-D-1	12RLS / WALL MOUNTED	1	SENIOR LOUNGE RM # 109	RM. # 112	12.0	16.0	177	430	_	15A	_	_	208/1	50	1234	

<u>REMARKS</u>

- PROVIDE INDOOR FAN COIL UNIT WITH MATCHING OUTDOOR UNITS.
- 2 PROVIDE REFRIGERANT PIPES TO EACH FAN COIL UNIT.
- 3 CONFIRM REFRIGERANT PIPE SIZES WITH FACTORY PRIOR TO INSTALLATION.
- 4 INSULATE SUCTION PIPE WITH FOAM INSULATION (TYP).

	SPLIT SYSTEM HEAT PUMP UNIT SCHEDULE (OUTDOOR)									MFR: FUJITSU			
CODE	SERVICE	LOCATION	MODEL			OUTDO	OOR UNIT	ELECTRICA	L		WEIGHT	REMARKS	
CODE	CODE SERVICE	LOCATION	NO.	VOLT	PHASE	Hz	MCA	FLA	WSA	FUSE	WEIGHT	REMARNS	
ACC-D-1	IAC-D-1	ROOF	AOU12RLS	208	1	60	10A	_	_	15A	120 LBS.	EER=14.5, HSPF=12.00	
ACC-D-2	IAC-D-2	ROOF	AOU12RLS	208	1	60	10A	_	_	15A	120 LBS.	EER=14.5, HSPF=12.00	
ACC-D-3	IAC-D-3	ROOF	AOU12RLS	208	1	60	10A	_	_	15A	120 LBS.	EER=14.5, HSPF=12.00	
ACC-D-4	IAC-D-4	ROOF	AOU12RLS	208	1	60	10A	_	_	15A	120 LBS.	EER=14.5, HSPF=12.00	

		AIR OUTLET SCHEDULE MFR: TITUS U.O.N.
CODE	MODEL 2	DESCRIPTION (1)3(4)
CSD1	PSS	PERFORATED FACE, MODULAR CORE CEILING SUPPLY DIFFUSER, 24"x24" FACE, STEEL CONSTRUCTION. BORDER TYPE TO MATCH CEILING TYPE. PROVIDE OBD WHERE REQUIRED FOR BALANCING AND AS INDICATED ON DRAWINGS. PROVIDE SQUARE TO ROUND TRANSITION FOR CONNECTION TO ROUND DUCT.
CSD2	PSS	SAME AS CSD1 EXCEPT 12"x12" FACE.
CER1, CEG1 CRR1, CRG1	PAR	PERFORATED FACE EXHAUST OR RETURN REGISTER OR GRILLE, 24"x24" FACE, STEEL CONSTRUCTION. BORDER TYPE TO MATCH CEILING TYPE. PROVIDE OBD FOR REGISTERS. PROVIDE LINED PLENUM WITH TOP OR SIDE OUTLET FOR DUCT CONNECTION. PROVIDE ACOUSTICAL BOOT WITH VOLUME DAMPER WHERE SHOWN.
CER2, CEG2 CRR2, CRG2	PAR	SAME AS CER1, CEG1, CRR1, CRG1, EXCEPT 12"x12" OR 18"X18" FACE.
WSG1	350FL	LOUVERED WALL SUPPLY GRILLE, 3/4" BLADE SPACING, ALUMINUM CONSTRUCTION.

NOTES:

- 1) FINISHES AS SELECTED BY AND APPROVED BY ARCHITECT.
- ② SUFFIX "-A" DESIGNATES ALUMINUM CONSTRUCTION.
- 3 ALL AIR OUTLETS SHALL BE SELECTED FOR NC-25, UNLESS MENTIONED OTHERWISE.
- 4) ALL BRANCH DUCT INLET CONNECTION SIZES SHALL BE THE SAME SIZE AS THE AIR OUTLET DUCT CONNECTION SIZES UNLESS OTHERWISE NOTED. PROVIDE SQUARE TO ROUND DUCT TRANSITION AS REQUIRED.

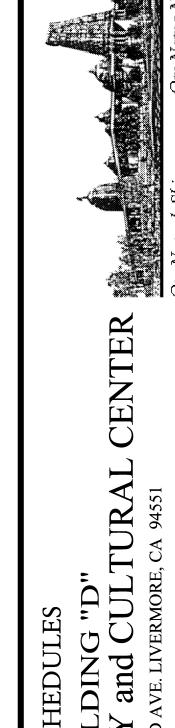
		FIRE SMOKE DAMPERS SCHEDULE	MFR: RUSKIN
CODE	MODEL NO.	DESCRIPTION	
FSD-1	FSD-60	COMBINATION FIRE/SMOKE DAMPER UL 555S CLASSIFIED AND CLASS I LEAK TESTED. PROVIDE 120V ELECTRIC MOTOR ACTUATOR TS 150 FIRESTAT AND FSD TO HAVE PRIMARY HEAT SENSING DEVICE SET AT 165°F AND SECONDAF DEVICE SET AT 350°F. POWER OPEN, FAIL CLOSE TYPE. CALIFORNIA STATE LISTING NUMBER 3225-245-102. FSD SHALL INCLUDE REMOTE POSITION IN PLATE AFFIXED TO THE CEILING TILE.	MOUNTING ANGLES. RY HEAT SENSING E FIRE MARSHAL

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M-11.2

PLUMBING SPECIFICATIONS:

I. GENERAL

- 1.01 CONDITIONS AND REQUIREMENTS:
 - A. THE GENERAL CONDITIONS AND GENERAL REQUIREMENTS OF THE CONTRACT DOCUMENT ARE HEREBY MADE A PART OF THIS SECTION AS FULLY AS IF REPEATED HEREIN.
- 1.02 DESCRIPTION OF WORK:
 - A. EXTENT OF PLUMBING SYSTEM WORK REQUIRED BY THIS SECTION IS INDICATED ON DRAWINGS, SCHEDULES AND BY REQUIREMENTS OF THIS SECTION.
 - B. TYPE OF WORK SPECIFIED INCLUDE THE FOLLOWING:
 - 1. SANITARY DRAINAGE AND VENT SYSTEMS COMPLETE TO POINT OF CONNECTION.
 - 2. POTABLE WATER SYSTEMS COMPLETE TO POINT OF CONNECTION.
 - 3. DOMESTIC HOT WATER SYSTEMS AS SHOWN TO POINT.
 - PIPING. VALVES AND INSULATION. 4. PLUMBING FIXTURES AND TRIM AS SPECIFIED HERE
 - REQUIRED ACCESSORIES. 5. ACCESS PANELS AS REQUIRED FOR WALL, FLOOR AND GRADE CLEANOUTS AND VALVES.

AND THE ARCHITECTURAL DRAWINGS INCLUDING ALL

- 6. SECURE AND PAY FEES FOR PERMIT, LICENSES, INSPECTIONS AND ROYALTIES REQUIRED FOR WORK OF THIS SECTION.
- 7. OTHER NECESSARY ITEMS REQUIRED AND INCIDENTAL TO COMPLETING ALL PLUMBING WORK AS INDICATED ON THE DRAWINGS AND DESIGNATED HEREIN.
- C. FLASHING REQUIRED IN CONJUNCTION WITH WASTE, VENT AND WATER SYSTEMS ARE INCLUDED AS WORK OF THIS SECTION.
- 1.03 QUALITY ASSURANCE:
 - A. MANUFACTURER'S QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN MANUFACTURE OF PLUMBING SYSTEMS, PRODUCTS, OF TYPE, MATERIALS AND SIZES REQUIRED, WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS.
 - B. INSTALLER'S QUALIFICATIONS: FIRM WITH AT LEAST 3 YEARS OF SUCCESSFUL INSTALLATION EXPERIENCE ON PROJECTS WITH PLUMBING SYSTEMS WORK SIMILAR TO THAT REQUIRED FOR THIS PROJECT.
 - CODES AND STANDARDS:
 - 1. 2008 CALIFORNIA PLUMBING CODE COMPLIANCE: COMPLY WITH APPLICABLE PORTIONS OF LOCAL PLUMBING CODE PERTAINING TO SELECTION AND INSTALLATION OF PLUMBING MATERIALS AND PRODUCTS.
 - 2. CCR COMPLIANCE: COMPLY WITH APPLICABLE STATE ENERGY REGULATIONS REQUIREMENTS.
 - 3. AGA COMPLIANCE: ALL GAS APPLIANCES AND EQUIPMENT SHALL COMPLY WITH REQUIREMENTS OF AMERICAN GAS ASSOCIATION.
 - 4. USGBC LEED v2.2 REQUIREMENTS FOR WATER EFFICIENCY AND WATER SAVINGS.

1.04 SUBMITTALS:

- A. OF ALL PLUMBING EQUIPMENT, PLUMBING FIXTURES CUT SHEETS AND PLUMBING MATERIALS FOR OWNER AND OR ARCHITECTS' APPROVAL.
- B. PLUMBING PIPING SHOP DRAWINGS AT 1/4"=1'-0" SCALE MINIMUM.

PRODUCTS:

- 2.01 PIPING:
 - A. DOMESTIC WATER HOT AND COLD: TYPE "L" HARD DRAWN COPPER WITH 95/5 SOLDER JOINTS.
 - B. SOIL, WASTE AND VENT ABOVEGROUND: CAST IRON SOIL. PLAIN END (HUBLESS) SERVICE WEIGHT WITH NEOPRENE SLEEVE AND STAINLESS STEEL SHIELD JOINTS.
- 2.02 VALVES:
 - A. BALL VALVES: STOCKHAM S-217-BR-R-S, EPT SEAT. THREADED, STOCKHAM FIG. S-214-BR-R-T
 - B. CHECK VALVES: THREADED STOCKHAM FIG. B-319 SWEAT, STOCKHAM FIG. B-309
 - C. WATER PRESSURE REDUCING VALVES: WATTS, AW CASH, CLAYTON OR APPROVED SUBSTITUTE. CASH FIGURE EB-24U. SET PRESSURE AT 60 PSI.
- 2.03 PIPING INSULATION:
 - A. GENERAL IN ACCORDANCE WITH TITLE 24 ENERGY REGULATIONS.
 - B. MANUFACTURER: OWEN-CORNING FIBERGLASS, ARMSTRONG, MANVILLE OR CETAIN-TEED.
 - C. PRE-MOLDED 1" FIBERGLASS WITH ASJ, R-4 MINIMUM.

- 2.04 DRAINAGE AND PIPING SPECIALTIES:
 - A. MANUFACTURERS: SMITH, JOSAM, WADE, JONESPEC OR ZURN. 100% USA MANUFACTURED COMPONENTS
 - B. CLEANOUTS: PROVIDE WHERE SHOWN; TYPES AND SIZES AS SCHEDULED.
 - C. AIR CHAMBERS: PROVIDE ON ALL COLD AND HOT WATER CONNECTIONS WITHOUT A WATER HAMMER ARRESTOR. 18" HIGH AND DIAMETER SAME SIZE AS SUPPLY. NIBCO MODEL 620L.
 - D. TRAP PRIMER: INSTALL WHERE SHOWN OR REQUIRED BY CODE. PRECISION PLUMBING PRODUCTS OR MIFAB: TYPE AND SIZES AS SCHEDULED.
 - E. FLOOR DRAINS: PROVIDE WHERE SHOWN: TYPE AND SIZES AS SCHEDULED.
 - F. TRAPS; PROVIDE FOR DRAINS, SHOWERS AND SIMILAR TYPE FIXTURES. PROVIDE CLEAN-OUT PLUG IN ALL SINK P-TRAPS.
 - G. HOSE BIBBS: WOODFORD OR APPROVED EQUAL HB-1 - MODEL 24P, CHROME FINISH, VACUUM BREAKER HB-2 - MODEL 24P, BRASS FINISH, VACUUM BREAKER
- 2.05 FIXTURE SUPPORTS:
 - A. GENERAL: PROVIDE PLUMBING FIXTURE CARRIERS. SUPPORTS, AND DEVICES TO CARRY LOADS INDEPENDENTLY OF WALLS OR PARTITIONS. SECURELY BOLT SUPPORTS TO FLOOR WITH POWDER-DRIVEN OR DRILLED INSERTS OR STUDS.
 - B. MANUFACTURER: JOSAM, J.R. SMITH, WADE OR ZURN. SELECTION BASED ON J.R. SMITH.
- 2.06 ACCESS DOORS AND PANELS: (CEILINGS AND WALLS)
 - WHERE REQUIRED: WHEREVER A PIECE OF EQUIPMENT OR VALVE AND OPERATOR IS INACCESSIBLE AND REQUIRES ACCESS FOR MAINTENANCE, REPAIR OR ADJUSTMENT.
 - SIZE: SIZE IS DEPENDENT UPON THE RELATIONSHIP OF THE DOOR TO THE PRODUCT BEING SERVICED; THEREFORE, THE SIZE OF THE DOOR SHALL BE SELECTED TO PROVIDE CONVENIENT ACCESS TO ITS CONTENTS. SUBMIT SIZES FOR REVIEW.
 - MANUFACTURER: INRYCO/MILCOR, OR EQUAL BILCO, CESCO. KARP OR NYSTROM.
- 2.07 FIXTURE SUPPLIES AND STOPS
 - A. LAVATORIES: SPEEDWAY CRSST-1912-A OR APPROVED SUBSTITUTE.
 - SINKS: SPEEDWAY CRSST-1912-K OR APPROVED SUBSTITUTE.
 - C. WALL MOUNTED FAUCETS: SCREWDRIVER STOPS OR FAUCETS MAY HAVE INTEGRAL STOPS IN LIEU OF SEPARATE STOPS.
 - D. TANK WATER CLOSETS: SPEEDWAY CRSST-1912-DL
- 2.08 FIXTURE FLOW CONTROLS: TO COMPLY WITH TITLE 24 AT EACH FIXTURE AS FOLLOWS: MODEL ARE FOR DOLE:
 - A. LAVATORIES: TYPE FMB, 0.5 GPM EXCEPT FAUCETS WITH 0.5 GPM FLOW.
 - SINKS: TYPE SR, 2.0 GPM.
- 2.14 PLUMBING FIXTURES:
 - GENERAL: PROVIDE FACTORY—FABRICATED FIXTURES OF TYPE, STYLE AND MATERIAL. FOR EACH TYPE FIXTURE. PROVIDE MANUFACTURER'S STANDARD TRIM CARRIER, SEATS AND VALVES AS INDICATED BY THEIR PUBLISHED PRODUCT INFORMATION; EITHER AS DESIGNED AND CONSTRUCTED, OR AS RECOMMENDED BY THE MANUFACTURER, AND AS REQUIRED FOR A COMPLETE INSTALLATION. WHERE MORE THAN ONE TYPE IS INDICATED, SELECTION IS INSTALLER'S OPTION BUT ALL FIXTURE OF THE SAME TYPE MUST BE FURNISHED BY A SINGLE MANUFACTURER OR AS INSTRUCTED BY THE OWNER OR THE ARCHITECT.
 - B. OTHER MATERIALS:

ALL OTHER MATERIALS NOT SPECIFICALLY DESCRIBED BUT REQUIRED FOR A COMPLETE AND PROPER INSTALLATION SHALL BE NEW, FIRST QUALITY OF THEIR RESPECTIVE KINDS, AND SUBJECT TO THE APPROVAL OF THE ARCHITECT.

III. EXECUTION:

3.01 GENERAL:

A. INSPECTIONS:

- 1. PRIOR TO ALL WORK OF THIS SECTION, CAREFULLY INSPECT THE INSTALLED WORK OF ALL OTHER TRADES AND VERIFY THAT ALL SUCH WORK IS COMPLETE TO THE POINT WHERE THIS INSTALLATION MAY PROPERLY COMMENCE.
- 2. VERIFY THAT ALL PLUMBING MAY BE INSTALLED IN STRICT ACCORDANCE WITH ALL PERTINENT CODES AND REGULATIONS AND THE APPROVED SHOP DRAWINGS.
- **B. DISCREPANCIES:**
- 1. IN THE EVENT OF DISCREPANCIES, IMMEDIATELY NOTIFY THE ARCHITECT.
- 2. DO NOT PROCEED WITH INSTALLATION IN AREAS OF DISCREPANCY UNTIL ALL SUCH DISCREPANCIES HAVE BEEN FULLY RESOLVED.

C. COORDINATION:

- 1. COORDINATE WORK WITH RELATED TRADES TO PREVENT UNDUE DELAY IN JOB PROGRESS.
- 2. CONTRACTOR SHALL PROVIDE A PERSON TO BE RESPONSIBLE FOR MAINTAINING PROPER POSITIONING AND ALIGNMENT OF ALL ITEMS DURING CONCRETE POURING.
- 3. PROVIDE MATERIALS IN SUFFICIENT QUANTITIES ON JOB SITE TO COMPLETE THE WORK AND TO ACCOMMODATE MINOR UNFORESEEN CHANGES AND ADDITIONS IN THE SCOPE OF WORK.

3.02 PIPING:

A. GENERAL:

1. SYSTEM LAYOUTS AS INDICATED ON DRAWINGS ARE GENERALLY DIAGRAMMATIC. BUT SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION WILL PERMIT.

B. PIPING:

- 1. ANY SECTION OF PIPE FOR WHICH SIZE IS NOT SHOWN OR ANY INTERMEDIATE SECTION ERRONEOUSLY SHOWN OBVIOUSLY UNDERSIZED SHALL BE THE SAME SIZE AS THE LARGEST LINE CONNECTING TO IT.
- 2. INSTALL UNIONS AT CONNECTIONS TO EQUIPMENT, ON SERVICE SIDE OF VALVES AND ELSEWHERE AS REQUIRED OR SHOWN TO FACILITATE MAINTENANCE.
- 3. INSTALL DIELECTRIC INSULATING CONNECTIONS BETWEEN ALL DISSIMILAR METALS UNLESS OTHERWISE INDICATED.
- 4. ARRANGE PIPING AND HANGERS TO ALLOW FOR EXPANSION. CONTRACTION AND STRUCTURAL SETTLEMENT. DO NOT INSTALL PIPING IN CONTACT WITH THE BUILDING STRUCTURE.
- 5. UNLESS SPECIFICALLY INDICATED OTHERWISE, INSTALL PIPING CONCEALED ABOVE CEILINGS, BENEATH THE FLOORS OR IN WALLS.
- 6. SLOPING, VENTING AND DRAINAGE:

SLOPE PIPING AS INDICATED, TRUE TO LINE AND GRADE FREE OF TRAPS AND AIR POCKETS. UNLESS INDICATED OTHERWISE, SLOPE PING IN DIRECTION OF FLOW AS FOLLOWS:

<u>SERVICE</u>	INCLINATION	<u>SLOPE</u>
DOMESTIC WATER	LEVEL	
SANITARY VENT	UP	1/8" PER FT (MIN.)
SANITARY WASTE	DOWN	1/4" PER FT (MIN.)
CONDENSATE DRAIN	DOWN	1/4" PER FT (MIN.)

- 7. RUN ALL PIPING GENERALLY LEVEL, FREE OF UNNECESSARY TRAPS AND BENDS. ARRANGE TO CONFORM TO THE BUILDING REQUIREMENTS AND TO SUIT NECESSITIES OF CLEARANCE FOR OTHER WORK.
- 8. DOMESTIC WATER: CONNECT COPPER TUBING TO FIXTURES WITH COPPER FITTINGS: CHROME PLATED WHERE EXPOSED. PROVIDE 12" HIGH AIR CHAMBERS AT FIXTURE CONNECTIONS. PREVENT DAMAGE TO FINISHED SURFACES.
- 9. COPPER: CRIMPING OF COPPER TUBING IS PROHIBITED. ISOLATE COPPER PIPE AND TUBING FROM CONTACT WITH STEEL.
- 10. THREADED JOINTS: APPLY TEFLON TAPE TO MALE THREADS.
- 11. SOLDERED JOINTS: CLEAN SURFACES TO BE JOINT OF OIL, GREASE, RUST AND OXIDES. CLEAN SOCKET OF FITTING AND END OF PIPE THOROUGHLY WITH EMERY CLOTH SO AS TO REMOVE RUST AND OXIDES. AFTER CLEANING, APPLY AND END OF PIPE THOROUGHLY WITH EMERY CLOTH SO AS FLUX TO JOINT SURFACE AND SPREAD EVENLY BEFORE ASSEMBLY OR HEATING.

- 12. DO NOT COVER OR ENCLOSE THE PIPING WORK BEFORE IT HAS BEEN TESTED. INSPECTED AND APPROVED.
- 13. SEAL ALL PIPING PENETRATING THE ROOF WITH 4 LB. SHEET LEAD FLASHING WITH 8" SKIRT AND COUNTER FLASHING RIM SEALED WITH A NON HARDENING MASTIC.

C. PIPE CLEANING:

. DURING INSTALLATION, PIPING SHALL BE KEPT CLEAN AND DRY. THE PLUMBING CONTRACTOR SHALL PHYSICALLY PRE-CLEAN ALL WATER SYSTEM PIPING TO REMOVE DIRT. DEBRIS, GRASE, OIL AND CORROSION PRODUCTS THAT MAY HAVE ACCUMULATED DURING CONSTRUCTION

D. PIPE TESTING:

1. TEST PIPING AS NOTED BELOW WITH NO LEAK OR LOSS OF PRESSURE. EPAIR OR REPLACE DEFECTIVE PIPING UNTIL TESTS ARE ACCOMPLISHED SUCCESSFULLY.

TEST SCHEDULE:

<u>SYSTEM</u>	<u>MEDIUM</u>	<u>PRESSURE</u>	TEST TIME
DOMESTIC WATER	WATER	150 PSIG	4 HOURS
SANITARY VENT	WATER	15 FEET	2 HOURS
SANITARY WASTE	WATER	15 FEET	2 HOURS
PROPANE GAS	AIR	50 PSIG	1 HOUR

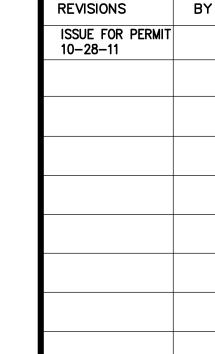
- E. STERILIZATION OF DOMESTIC WATER PIPING:
- 1. AFTER PRELIMINARY PURGING, CLEANING, AND FLUSHING OF THE SYSTEM. CHLORINATE THE ENTIRE POTABLE DOMESTIC WATER SYSTEM IN ACCORDANCE WITH THE CURRENT RECOMMENDATIONS OF THE AMERICAN WATER WORKS ASSOCIATION AND IN ACCORDANCE WITH ALL PERTINENT STATE AND LOCAL HEALTH CODES AND REGULATIONS.
- 2. CHLORINATE ONLY WHEN PRESCHEDULED AND PROVIDE PROPER WARNING SIGNS AT OUTLETS.
- 3. UPON COMPLETION OF THE STERILIZATION, THOROUGHLY FLUSH THE ENTIRE POTABLE WATER SYSTEM AND IMMEDIATELY FILL THE SYSTEM.
- 4. WHEN STERILIZATION AND FLUSHING ARE COMPLETE, ARRANGE WITH PERTINENT AGENCIES FOR ALL REQUIRED TESTS ON MAINS AND SYSTEMS.
- 3.03 FIXTURE INSTALLATIONS AND CONNECTIONS:

A. GENERAL:

- 1. SET FIXTURES TO EQUAL HEIGHT. PLUMB OR AT RIGHT ANGLES TO WALL. CONNECT TO WASTE AND WATER SUPPLIES IN NEAT, UNIFORM AND FINISHED MANNER. PROVIDE NECESSARY TRIM AND APPURTENANCES FOR COMPLETE INSTALLATION. SEE ARCHITECTURAL DRAWINGS FOR FIXTURE HEIGHTS, SPACING, ARRANGEMENTS, ETC.
- B. CLEANING AND PROTECTION:
- 1. CLEAN PLUMBING FIXTURES OF DIRT AND DEBRIS UPON COMPLETION OF INSTALLATION.
- 2. PROTECT INSTALLED FIXTURES FROM DAMAGE DURING THE REMAINDER OF CONSTRUCTION PERIOD.
- C. FIELD QUALITY CONTROL:
- 1. UPON COMPLETION OF INSTALLATION OF PLUMBING FIXTURES AND AFTER UNITS ARE WATER PRESSURIZED, TEST FIXTURES TO DEMONSTRATE CAPABILITY AND COMPLIANCE WITH REQUIREMENTS. WHEN POSSIBLE, CORRECT MALFUNCTIONING UNITS AT SITE, THEN RE-TEST TO DEMONSTRATE COMPLIANCE; OTHERWISE REMOVE AND REPLACE WITH NEW UNITS AND PROCEED WITH RETESTING.
- 2. INSPECT EACH INSTALLED UNIT FOR DAMAGE TO FINISH. IF FEASIBLE, RESTORE AND MATCH FINISH TO ORIGINAL AT SIRE: OTHERWISE. REMOVE FIXTURE AND REPLACE WITH NEW UNIT. FEASIBILITY AND MATCH TO BE JUDGED BY THE ARCHITECT. REMOVE CRACKED OR DENTED UNITS AND REPLACE WITH NEW UNITS.

3.04 CLEANING UP:

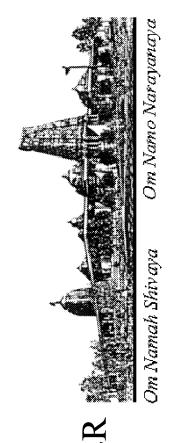
- A. PRIOR TO ACCEPTANCE OF THE BUILDINGS, THOROUGHLY CLEAN ALL EXPOSED PORTIONS OF THE PLUMBING INSTALLATION, REMOVING ALL LABELS AND ALL TRACES OF FOREIGN SUBSTANCE, USING ONLY A CLEANING SOLUTION APPROVED BY THE MANUFACTURER OF THE PLUMBING ITEM AND BEING CAREFUL TO AVOID ALL DAMAGE TO FINISHED SURFACES.
- B. SUBMIT A SIGNED COPY OF ALL TEST REPORTS TO THE ARCHITECTS.



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SECTION 15000

GENERAL REQUIREMENTS - MECHANICAL

PART 1 - GENERAL

1.01 CONDITIONS AND REQUIREMENTS:

A. THE GENERAL CONDITIONS, SUPPLEMENTARY GENERAL CONDITIONS, AND DIVISION 1 GENERAL REQUIREMENTS OF THE CONTRACT DOCUMENTS ARE HEREBY MADE A PART
OF THIS SECTION OF THE SPECIFICATIONS AS FULLY AS IF REPEATED HEREIN.

1.02 DESCRIPTION OF WORK:

- A. PROVIDE ALL LABOR, EQUIPMENT AND MATERIALS THAT ARE REQUIRED, TO PROVIDE A COMPLETE, PROPERLY OPERATING AND SAFE MECHANICAL, PLUMBING, AND FIRE PROTECTION INSTALLATION. THE EXTENT OF THE WORK IS INDICATED ON THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS, SHALL INCLUDE ALL THAT MAY BE REASONABLY INFERRED TO BE REQUIRED FOR PROPER EXECUTION OF INSTALLATION WORK AND/OR SYSTEMS' OPERATION.
- B. VERIFY SIZES, CAPACITIES, AND LOCATION OF ALL SERVICES AND UTILITIES BEFORE PROCEEDING WITH CONSTRUCTION.
- C. PROVIDE CUTTING AND PATCHING AS REQUIRED FOR EXECUTION OF WORK PERFORMED UNDER THIS SECTION UNLESS SPECIFICALLY PROVIDED FOR, UNDER OTHER SECTIONS.
- D. REPAIR OR REPLACE, TO THE SATISFACTION OF THE OWNER, ANY DAMAGE TO WORK OF THIS SECTION, DAMAGE CAUSED BY LEAKS OR BREAKS IN SYSTEMS OF THIS SECTION, AND DAMAGE CAUSED BY WORK OF THIS SECTION.
- E. COORDINATE WITH WORK PERFORMED BY OTHER SECTIONS, IN ORDER TO ACCOMMODATE THE REQUIREMENTS OF THIS SECTION, AND TO ASSURE ADEQUATE SPACE AND PROPER LOCATION FOR ALL NECESSARY WORK OF THIS PROJECT WHETHER OR NOT WORK IS UNDER THIS SECTION.
- F. PROVIDE ALL NECESSARY RIGGING EQUIPMENT AND MANPOWER TO SET NEW EQUIPMENT AND MATERIALS IN PLACE.
- G. PROVIDE ALL SEISMIC RESTRAINTS REQUIRED BY CODE, OR THIS SPECIFICATION, FOR ALL EQUIPMENT, DUCT, PIPE, AND MATERIALS FURNISHED UNDER THIS SECTION. THIS CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE RESTRAINTS AND FOR PROOF OF ADEQUACY OF THE RESTRAINTS. EQUIPMENT, DUCTWORK, AND PIPING SHALL BE RESTRAINED IN ALL DIRECTIONS TO HANDLE 0.5G LOAD.
- H. PREPARE AND SUBMIT TO THE ARCHITECT LARGE SCALE (MINIMUM 1/4" = 1'-0") COORDINATION DRAWINGS OF ALL CONGESTED AREAS SHOWING LOCATION AND ELEVATIONS OF ALL DUCTS, PIPING, CONDUITS, STRUCTURAL, AND OTHER ITEMS IN THE AREA. THESE DRAWINGS SHALL BE <u>FULLY</u> COORDINATED WITH OTHER TRADES. CHECK ROUTING AND ELEVATIONS OF ALL DUCTWORK AND EQUIPMENT BEFORE FABRICATING. REPORT ANY CONFLICTS THAT CANNOT BE SOLVED IN THE FIELD TO THE ARCHITECT. EXTRA CHARGES SHALL NOT BE ALLOWED DUE TO LACK OF COORDINATION PRIOR TO, OR DURING, CONSTRUCTION.
- I. VALVES AND TRIM NOT SPECIFICALLY INDICATED BUT REQUIRED FOR PROPER FUNCTIONING AND BALANCING OF EQUIPMENT SHALL BE FURNISHED AND INSTALLED BY THE CRAFT FURNISHING THE EQUIPMENT.
- J. PROVIDE ALL LABOR AND MATERIAL REQUIRED TO SET AND ADJUST THE INSTALLATION SO THAT IT PERFORMS IN ACCORDANCE WITH THE DESIGN INTENT INCLUDED IN THE DRAWINGS AND THESE SPECIFICATIONS.
- K. T-24 & LEED COMPLIANCE: COMPLY WITH THE COMPLIANCE REQUIREMENTS OF T-24 AND LEED FOR NEW CONSTRUCTION v2.2 (USGBC), INCLUDING THE PRE-REQUISITE AND THE OPTIONAL CREDIT POINT REQUIREMENTS UNDER WATER EFFICIENCY, ENERGY & ATMOSPHERE, AND INDOOR ENVIRONMENTAL QUALITY CATEGORIES TO ACHIEVE TARGETTED CERTIFICATION GOALS FOR THE BUILDING PER THE ATTACHED CHECKLIST. CONTRACTOR SHALL INCLUDE IN THE BID PRICE TO PROVIDE MATERIAL. LABOR, TESTING, COMMISSIONING, DOCUMENTATION, CERTIFICATION AS REQUIRED BY CEC, USGBC & CITY OF LIVERMORE.

1.03 CODES AND STANDARDS

- A. THE WORK INSTALLED UNDER THIS SECTION SHALL CONFORM TO ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES, REGULATIONS, AND STANDARDS.
- B. DO NOT CONSTRUE ANYTHING CONTAINED IN THESE SPECIFICATIONS OR DRAWINGS TO PERMIT WORK TO BE INSTALLED THAT DOES NOT CONFORM TO CODE.
- C. CONSIDER INTERPRETATIONS AND RULINGS OF THE ENFORCING AGENCIES AS PART OF THESE SPECIFICATIONS IF COMMONLY KNOWN TO THE TRADE.
- COMPLY WITH DRAWINGS AND SPECIFICATIONS SHOWING WORK EXCEEDING MINIMUM CODE REQUIREMENTS.
- E. THE CONTRACTOR SHALL FURNISH, WITHOUT ANY EXTRA CHARGE, ADDITIONAL MATERIALS AND LABOR REQUIRED FOR THE COMPLIANCE WITH ANY RULES AND
- F. CEC/T-24, LEED V2.2 REQUIREMENTS AND CITY OF LIVERMORE REQUIREMENTS.

1.04 QUALITY ASSURANCE:

- A. MANUFACTURER'S QUALIFICATIONS: FIRMS REGULARLY ENGAGED IN MANUFACTURE OF THE SPECIFIED PRODUCTS, OF TYPES, MATERIALS, AND SIZES REQUIRED, AND WHOSE PRODUCTS HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR NOT LESS THAN 5 YEARS.
- B. CONTRACTOR'S QUALIFICATIONS: REGULARLY ENGAGED IN CONSTRUCTION ON PROJECTS OF SIMILAR SIZES USING TYPES OF EQUIPMENT, MATERIAL AND METHODS AS SPECIFIED HEREIN FOR MINIMUM OF 5 YEARS. A LETTER FROM THE CONTRACTOR CERTIFYING THESE QUALIFICATIONS MUST BE PROVIDED TO THE OWNER/ARCHITECT BEFORE SIGNING THE CONSTRUCTION CONTRACT.
- C. BY ACCEPTING TO WORK, THE CONTRACTOR AGREES THAT HE HAS UNDERSTOOD THE INTENT OF THE DESIGN AND IS REASONABLY SURE THAT IT CAN BE ACCOMPLISHED BY PROCEEDING IN ACCORDANCE WITH THESE DRAWINGS AND SPECIFICATIONS.

1.05 DRAWINGS AND SPECIFICATIONS:

- A. CONSIDER ALL DRAWINGS AND ALL DIVISIONS OF THIS SPECIFICATION AS A WHOLE AND PROVIDE WORK OF THIS DIVISION SHOWN ANYWHERE THEREIN.
- B. ABSOLUTE ACCURACY OF THE DRAWINGS AND SPECIFICATIONS IS NOT GUARANTEED. WHILE REASONABLE EFFORT HAS BEEN MADE TO COORDINATE THE LOCATION OF EQUIPMENT AND MATERIALS WITH THE STRUCTURE AND OTHER TRADES, IT IS THE RESPONSIBILITY OF THIS CONTRACTOR TO COORDINATE EXACT REQUIREMENTS AND LOCATIONS AS GOVERNED BY ACTUAL JOB CONDITIONS, MANUFACTURER'S RECOMMENDATIONS ETC. CHECK ALL INFORMATION AND REPORT ANY DISCREPANCIES TO THE ARCHITECT BEFORE FABRICATION OR PURCHASING ANY EQUIPMENT AND IN TIME TO AVOID UNNECESSARY WORK.

1.06 LICENSES, PERMITS AND FEES:

- A. PROVIDE, PROCURE, AND PAY FOR ALL PERMITS, SERVICES, METERS, LICENSES, FEES, ETC., REQUIRED FOR PERFORMANCE OF WORK OF THIS SECTION.
 - B. UPON COMPLETION OF THE WORK, DELIVER TO THE ARCHITECT, ALL CERTIFICATES OF APPROVAL SIGNED BY THE CONTROLLING AUTHORITIES.

1.07 VISIT TO PREMISES:

A. PRIOR TO SUBMISSION OF BID, VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS. NO EXTRA PAYMENT WILL BE MADE FOR ADDITIONAL WORK THAT WOULD HAVE BEEN MADE NECESSARY BY CONTRACTOR'S FAILING TO PROPERLY OBSERVE THE EXISTING CONDITIONS.

1.08 SUBMITTAL DATA:

A. PRODUCT DATA

- SUBMIT MANUFACTURER'S SPECIFICATIONS, DATA SHEETS, CERTIFIED DRAWINGS, AND INSTALLATION INSTRUCTIONS FOR EQUIPMENT, MATERIALS, AND FIXTURES SPECIFIED. INCLUDE PHYSICAL AND PERFORMANCE DATA SUCH AS WEIGHTS, SIZES, CAPACITIES, REQUIRED CLEARANCES, PERFORMANCE CURVES, ACOUSTICAL CHARACTERISTICS, FINISHES, COLOR SELECTION, AND ACCESSORIES. INCLUDE CERTIFIED DRAWINGS ON MAJOR EQUIPMENT SUCH AS AC-UNITS, WATER HEATERS, PUMPS, TANKS, BOILERS AND CONTROLS.
- 2. SUBMIT ALL ITEMS FROM EACH SECTION OF THE WORK AT ONE TIME, IF POSSIBLE, BUT DO NOT DELAY SUBMITTALS FOR LACK OF ONE OR TWO ITEMS.

- 3. PREPARE BINDERS FOR PRODUCT DATA, BROCHURES, CATALOG CUTS, ETC., IN THE FOLLOWING SEQUENCE:
- a) INDEX SHEET (WITH EACH ITEM CROSS-IDENTIFIED WITH REFERENCE TO CONTRACT DOCUMENTS AND THE DIVIDER TAB NUMBER).
- b) DIVIDED TAR #4 (AVITH ITEM IDENTIFICATION CHICH AS HAC 41)
- b) DIVIDER TAB #1 (WITH ITEM IDENTIFICATION, SUCH AS "AC-1").
- d) THE REPEAT b) AND c), ABOVE FOR EACH ITEM OF THE SUBMITTAL (SUCH AS "P-2",

c) THE BROCHURE, PRODUCT DATA SHEET, OR CATALOG CUT FOR THE ITEM.

- 4. PRODUCT DATA
- a) SUBMIT MANUFACTURER'S SPECIFICATIONS, DATA SHEETS & CERTIFIED DRAWINGS.
- b) SUBMIT PRODUCTS THAT MEET OR EXCEED THE SPECIFIED MINIMUM ENERGY EFFICIENCY REQUIREMENTS.

B. SHOP DRAWINGS:

- PREPARE AND SUBMIT PLANS, SECTIONS, DETAILS, AND DIAGRAMS TO REQUIRED SCALES FOR SPECIFIED AREAS. DRAWINGS SHALL BE COORDINATED, DIMENSIONED, AND INDICATE EQUIPMENT, PIPE, DUCT, FIRE PROTECTION, AND ELECTRICAL IN RELATION TO ARCHITECTURAL AND STRUCTURAL FEATURES. INCLUDE MINOR PIPING, DRAINS, AIR VENTS, ETC. INDICATE EXACT LOCATIONS AND ELEVATIONS OF ALL VALVES, PIPING SPECIALTIES, ACCESS DOORS, DAMPERS, ETC. HIGHLIGHT ANY DEVIATIONS IN WORK FROM WHAT IS INDICATED ON THE CONTRACT DRAWINGS.
- 2. REQUIRED DRAWINGS HVAC: SUBMIT DRAWINGS, MINIMUM SCALE 1/8" = 1'-0" UNLESS
- 3. REQUIRED DRAWINGS PLUMBING: SUBMIT DRAWINGS, MINIMUM SCALE 1/4" = 1'-0".
- SUBMITTALS MAY BE RETURNED MARKED "NO EXCEPTIONS TAKEN" OR "EXCEPTIONS

TAKEN" IN WHICH CASE, RESUBMITTALS ARE NOT REQUIRED, AND WILL NOT BE ACCEPTED.

- 2. CORRECT AND RESUBMIT IN THE ORIGINAL QUANTITIES REQUIRED ALL SUBMITTALS MARKED "EXCEPTIONS AS NOTED".
- 3. SUBMITTALS MARKED "NOT ACCEPTABLE" ARE SO MARKED BECAUSE THE SUBMITTAL IS EITHER SO INCORRECT, INCOMPLETE, OR ILLEGIBLE AS TO PREVENT REVIEW; OR CONTAINS INFERIOR PRODUCT NOT COMPLYING WITH THE SPECIFICATIONS. RESUBMIT REJECTED SUBMITTALS ONLY AFTER APPROPRIATE CORRECTIVE MEASURES ARE TAKEN OR EQUAL PRODUCT SUBSTITUTED.
- 4. SUBMITTALS MARKED "NOT REVIEWED" SHALL INDICATE EXTRA SUBMITTALS THAT WERE NOT REQUIRED TO BE SUBMITTED IN THE FIRST PLACE. THIS ACTION DOES NOT IMPLY ACCEPTANCE OR REJECTION AND CONTRACTOR REMAINS OBLIGATED TO ENSURE THAT THE PRODUCT MEETS DRAWINGS AND SPECIFICATIONS.
- IDENTIFY ALL RESUBMITTALS AS BEING RESUBMITTALS AND IDENTIFY WITH THE ORIGINAL ARCHITECT'S TRANSMITTAL NUMBER.

1.09 SUBSTITUTIONS

A. GENERAL:

- 1. WHERE POSSIBLE, MORE THAN ONE MANUFACTURER OR VENDOR ARE LISTED FOR ACCEPTABLE MATERIALS AND/OR EQUIPMENT TO BE USED IN THE WORK. THE MATERIAL AND/OR EQUIPMENT OF ONE OF THE MANUFACTURERS OR VENDORS MAY BE CITED AND SPECIFIED BY MODEL NAME, NUMBER, OR DESCRIPTION AS THE ESTABLISHED STANDARD. BIDS SHALL BE BASED ON USING ONE OF THE SPECIFIED BRANDS. THE TERM "PRODUCTS" USED BELOW REFERS TO MATERIALS AND EQUIPMENT. WHERE MANUFACTURERS ARE LISTED WITH "OR EQUAL", OR "OR APPROVED SUBSTITUTE", ADDITIONAL MANUFACTURERS MAY BE ACCEPTABLE USING THE SUBSTITUTION PROCEDURES IN THE FOLLOWING PARAGRAPHS.
- 2. ADJACENT MATERIALS AND SYSTEMS HAVE BEEN DESIGNED AND DETAILED TO ACCOMMODATE THE ESTABLISHED STANDARD MANUFACTURER'S PRODUCTS.

 ESTABLISHED STANDARD MANUFACTURERS ARE THE ONES LISTED BY NAME ON THE SCHEDULES OR IN THE DRAWINGS. IF ONE OF THE OTHER ACCEPTABLE MANUFACTURERS IS SELECTED BY THE CONTRACTOR, THE CONTRACTOR SHALL DESIGN AND DETAIL ALL CHANGES IN ALL ADJACENT MATERIALS NECESSARY TO ACCOMMODATE THE SELECTED PRODUCTS, AND WHEN APPROVED, SHALL MAKE SUCH CHANGES TO HIS AND OTHER TRADES' WORK AT NO EXTRA COST TO THE OWNER.

B. SUBSTITUTIONS:

- 1. THE SUCCESSFUL BIDDERS MAY, WITHIN FIFTEEN (15) CALENDAR DAYS AFTER AWARD OF CONTRACT, PROPOSE A SUBSTITUTION OF A MATERIAL OR APPARATUS OTHER THAN THOSE SPECIFIED. PROPOSAL SHALL BE IN <u>WRITING</u> AND SHALL INCLUDE CHANGE IN PRICE, DESCRIPTION, AND SPECIFICATION DATA. ARCHITECT SHALL BE THE SOLE JUDGE AS TO THE MERITS OF THE PROPOSED SUBSTITUTE AND RESERVES THE RIGHT TO ACCEPT OR REJECT IT BASED ON PRICE, QUALITY, PAST PERFORMANCE OR DELIVERY, ETC. AND HIS DECISION CAN NOT BE CHALLENGED. SUBSTITUTION PROPOSALS MADE AFTER FIFTEEN DAYS AFTER AWARD OF CONTRACT WILL NOT BE ACCEPTED.
- 2. PRESENT EACH SUBSTITUTION INDIVIDUALLY. IF A PROPOSED SUBSTITUTE IS NOT FOUND TO BE ACCEPTABLE, THEN THE SPECIFIED ITEM MUST BE SUPPLIED.
- 3. FAILURE BY THE CONTRACTOR TO ORDER MATERIALS OR EQUIPMENT IN A TIMELY MANNER WILL NOT CONSTITUTE JUSTIFICATION FOR SUBSTITUTION.
- 4. IF CHANGES TO ADJACENT MATERIALS ARE REQUIRED TO ACCOMMODATE A SUBSTITUTED PRODUCT, ALL THE REQUIREMENTS OF A2 ABOVE APPLY.

1.10 SPACE REQUIREMENTS:

- A. CONSIDER ALL SPACE REQUIREMENTS FOR ALL WORK INDICATED IN THE CONTRACT DOCUMENTS AND SUBSEQUENT DRAWINGS BEFORE INSTALLING ANY PORTIONS OF THE WORK. SPACE CONFLICTS WHICH OCCUR DURING OR AFTER INSTALLATION OF WORK, CAUSED BY FAILURE TO CONSIDER ALL SUCH REQUIREMENTS, SHALL BE RESOLVED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT AT THE CONTRACTOR'S EXPENSE..
- B. INSTALL EQUIPMENT AND MATERIALS WITH ALL WORKING PARTS READILY ACCESSIBLE FOR INSPECTION, REPAIR, AND RENEWAL. THE RIGHT IS RESERVED TO MAKE REASONABLE CHANGES IN LOCATIONS OF EQUIPMENT ON THE DRAWINGS PRIOR TO ROUGH-IN WITHOUT INVOLVING
- C. CONFER WITH THE OWNER/ARCHITECT TO ESTABLISH EXACT LOCATIONS, MOUNTING HEIGHTS, AND ARRANGEMENTS OF ALL THE FINISH WORK PRIOR TO ROUGHING IN.

1.11 WORKMANSHIP AND MATERIALS:

- A. WORKMANSHIP SHALL BE FIRST CLASS THROUGHOUT AND PERFORMED ONLY BY COMPETENT AND EXPERIENCED WORKMEN IN A MANNER SATISFACTORY TO THE OWNER. CONSTANT SUPERVISION OF THE WORK, EITHER BY THE CONTRACTOR OR HIS COMPETENT REPRESENTATIVE, SHALL BE MAINTAINED.
- B. ALL WORK SHALL BE PERFORMED BASED UPON DIMENSIONED AND ACCURATE SHOP DRAWINGS THAT HAVE BEEN APPROVED.
- C. WORK SHALL BE INSTALLED SO AS NOT TO DELAY THE PROGRESS OF CONSTRUCTION AND SHALL BE PROPERLY COORDINATED WITH OTHER TRADES.
- D. USE ONLY NEW MATERIALS IN PERFECT CONDITION. INSPECT ALL MATERIALS UPON ARRIVAL AT JOB SITE AND IMMEDIATELY REMOVE DEFECTIVE ITEMS FROM SITE.

1.12 CUTTING AND REPAIRING:

INCLUDE ALL CUTTING AND REPAIRING NECESSARY AND REQUIRED FOR THIS INSTALLATION
THAT IS NOT COVERED BY OTHER TRADES. <u>STRUCTURAL MEMBERS SHALL NOT BE CUT EXCEPT</u>
WITH THE WRITTEN APPROVAL OF THE ARCHITECT. REPAIRING SHALL BE PERFORMED BY
WORKMEN SKILLED IN THE TRADES INVOLVED IN A MANNER SATISFACTORY TO THE ARCHITECT.

1.13 PROTECTION:

- A. THROUGHOUT THE PROGRESS OF THE WORK, PROTECT ALL PIPE, CONDUIT, DUCTS, FIXTURES, AND EQUIPMENT FROM INTRUSION BY RAIN, DIRT, AND FOREIGN MATTER, AND FROM DAMAGE OF ANY KIND. THOROUGHLY CLEAN ALL METALLIC, PLASTIC, AND PAINTED SURFACES OF
- EQUIPMENT PRIOR TO FINAL INSPECTION.

 B. REPLACE WITH NEW MATERIALS ANY DAMAGED WORK, WITHOUT ADDITIONAL COST TO THE OWNER, SO THAT THE ENTIRE INSTALLATION WILL BE LEFT IN NEW CONDITION.
- COMPLY WITH THE LEED v2.2 REQUIREMENTS FOR INDOOR ENVIRONMENTAL QUALITY (ITEMS EQ3.1 & EQ3.2) DURING CONSTRUCTION AND PREOCCUPANCY.

1.14 NOISE AND VIBRATION:

- THE LIMITING OF TRANSMISSION OF NOISE AND VIBRATION IS <u>EXTREMELY IMPORTANT</u>. THIS CONTRACTOR IS TO PAY PARTICULAR ATTENTION THAT PIPING, EQUIPMENT, AND DUCTWORK IS INSTALLED SO AS NOT TO CHATTER OR RUB AGAINST OTHER MATERIALS, EQUIPMENT, AND THE BUILDING STRUCTURE. PROVIDE ISOMODE PADS, INSULATION, OR OTHER SUITABLE MATERIALS TO AVOID DIRECT CONTACT AND NOISE CONDITIONS UNACCEPTABLE TO THE OWNER OR TENANTS. CONSIDER, IN PARTICULAR, PROPER SHIELDS AT PIPE HANGERS AND PIPE AND DUCT PENETRATIONS OF WALLS AND FLOORS.
- B. ANY OBJECTIONAL NOISE AND VIBRATION FROM THE POOR MATERIAL AND INSTALLATION SHALL BE CORRECTED TO THE SATISFACTION OF THE OWNER AT NO ADDITIONAL COST, AS DIRECTED BY THE ARCHITECT.
- C. COMPLY WITH THE LOCAL RULES AND REGULATIONS FOR NOISE CONTROL AT THE PROPERTY

1.15 MANUFACTURER'S INSTALLATION DETAILS:

D. FOLLOW MANUFACTURER'S INSTALLATION DETAILS EXCEPT AS SPECIFICALLY MODIFIED ON THE DRAWINGS, AND PROVIDE ANY VALVES OR SPECIAL FITTINGS OR OTHER SPECIALTY ITEMS CALLED FOR BY THEM AS REQUIRED IN ORDER TO MAKE THE EQUIPMENT PERFORM AS INTENDED. IF THERE IS ANY DISCREPANCY BETWEEN MANUFACTURER'S IN INSTALLATION DETAILS AND WORK SHOWN ON THE DRAWINGS NOTIFY THE ARCHITECT IMMEDIATELY AND AWAIT FOR FURTHER DIRECTIONS BEFORE PROCEEDING WITH THE INSTALLATION.

1.16 CLEANING:

- A. FLUSH PIPES AND DUCTS FREE FROM FOREIGN SUBSTANCES BEFORE INSTALLING VALVES, STOPS, OR MAKING FINAL CONNECTIONS.
- B. AFTER ALL OTHER WORK HAS BEEN ACCOMPLISHED, CLEAN ALL EXPOSED PIPING, DUCTWORK, FIXTURES, EQUIPMENT, AND SUPPORTS. REMOVE ALL DEBRIS OF WORK OF THIS SECTION FROM

1.17 TESTING, ADJUSTING AND BALANCING (TAB):

- A. UPON COMPLETION OF THE WORK, TEST AND REGULATE ALL SYSTEMS TO THE INTENT OF THEIR DESIGN AND TO THE OWNER'S SATISFACTION. FURNISH THE OWNER A BINDER OF THE EQUIPMENT DATA AND INSTRUCT HIS REPRESENTATIVES AS TO THE PROPER OPERATION OF ALL SYSTEMS.
- BALANCE AIR QUANTITIES TO DIFFUSERS AND GRILLES AS SHOWN ON THE DRAWINGS.
- C. PIPING SYSTEMS FOR GAS, WATER AND DRAINAGE PIPING SHALL BE TESTED TO BE LEAK PROOF. SUBMIT LEAKAGE TEST. DATA FOR OWNER'S RECORDS.
- D. WATER FLOWS FOR PUMPS, COILS, VALVES ETC. SHALL BE BALANCED AS SHOWN ON THE
- E. TAB WORK SHALL BE PERFORMED BY AN INDEPENDANT AIR BALANCING CONTRACTOR PER AABC
- F. SUBMIT AIR BALANCE REPORT AND OUTSIDE AIR CERTIFICATION PER T-24 REQUIREMENTS FOR EACH SYSTEM AND EACH ZONE.

1.18 FINAL OBSERVATION:

A. ARCHITECT SHALL MAKE FINAL OBSERVATION OF THE JOB AND NOTE UNACCEPTABLE ITEMS IN A PUNCH LIST. FINAL ACCEPTANCE SHALL NOT BE MADE UNTIL ALL ITEMS ON THIS LIST HAVE BEEN CORRECTED.

1.19 GUARANTEE/WARRANTY

- A. ALL MATERIALS, PARTS, EQUIPMENT, MODIFICATIONS MADE, AND WORKMANSHIP SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF THE WORK.
- B. SHOULD SUCH PARTS, MATERIALS, OR WORKMANSHIP BE FOUND TO BE DEFECTIVE DURING THIS PERIOD, THEY WILL BE RECTIFIED AT NO COST TO THE OWNER. ALL LABOR REQUIRED TO RECTIFY SUCH DEFECTS WILL BE PERFORMED DURING THE NORMAL WORKING HOURS OF THE TRADE INVOLVED.
- C. THIS GUARANTEE IS CONTINGENT UPON THE SYSTEM BEING PROPERLY MAINTAINED BY A QUALIFIED MECHANIC FAMILIAR WITH THIS EQUIPMENT AND THAT THE EQUIPMENT IS NOT ABUSED. EXCLUDED IS NORMAL WEAR AND TEAR, REPLACEMENT OF FILTERS AND BELTS, AND
- A WRITTEN GUARANTEE TO THIS EFFECT SHALL BE SUBMITTED PRIOR TO FINAL PAYMENT AND ACCEPTANCE.
- IF THE MANUFACTURER PROVIDES FOR A LONGER GUARANTEE PERIOD, IT SHALL ALSO BE SUBMITTED.

1.20 RECORD DRAWINGS:

- A. RECORD OF JOB PROGRESS: KEEP AN ACCURATE, DIMENSIONED RECORD OF THE AS-BUILT LOCATIONS OF ALL WORK. KEEP AN UP-TO-DATE ON BLUELINE PRINTS AS THE JOB PROGRESSES AND MAKE THEM AVAILABLE FOR INSPECTION AT ALL TIMES.
- B. FINAL <u>AS-BUILT</u>, REPRODUCIBLE DRAWINGS AND IN ELECTRONIC FILE FORMAT SHALL BE SUBMITTED PRIOR TO FINAL ACCEPTANCE AND SHALL INCLUDE THE FOLLOWING:
 - MAIN SHUT-OFF VALVES PLAINLY MARKED AND IDENTIFIED.
- POSITION OF ALL BURIED OR CONCEALED MAINS ACCURATELY DIMENSIONED, BOTH HORIZONTALLY AND VERTICALLY.
- 3. LOCATIONS OF PIPING, DUCT, AND EQUIPMENT INCLUDING HEIGHT OF MAIN DUCTS, PIPES, AND EQUIPMENT IN THE ATTIC AND ON ROOF.
- 4. CEILING ACCESS PANEL LOCATIONS.

1.21 OPERATION MANUALS AND MAINTENANCE INSTRUCTIONS:

- A. FURNISH THREE (3) COMPLETE SETS OF OPERATING AND MAINTENANCE INSTRUCTIONS FOR ALL EQUIPMENT (OF ALL TYPES) AND CONTROL SYSTEMS BOUND IN A HARDBOARD BINDER AND INDEXED. SUBMIT NO LATER THAN THIRTY (30) CALENDAR DAYS PRIOR TO SUBSTANTIAL
- B. IN ADDITION TO SPECIFIC REQUIREMENTS SPECIFIED IN THE VARIOUS SECTIONS OF WORK,
- INCORPORATE THE FOLLOWING:
- COMPLETE OPERATING INSTRUCTIONS FOR EACH ITEM OF EQUIPMENT.

REQUIRED, ADJUSTMENTS, ETC.

- TEST DATA AND OTHER REPORTS THAT MAY BE SPECIFIED.
 TYPEWRITTEN MAINTENANCE INSTRUCTIONS FOR EACH ITEM OF EQUIPMENT, LISTING IN DETAIL THE LUBRICANTS TO BE USED, FREQUENCY OF LUBRICATION, INSPECTIONS
- 4. MANUFACTURER'S BULLETINS WITH PARTS' NUMBERS, INSTRUCTIONS, ETC., FOR EACH ITEM OF EQUIPMENT, PROPERLY STRIPPED AND ASSEMBLED.
- 5. SPECIAL DIAGRAMS AND LITERATURE THAT MAY BE REQUIRED.
- 6. A COMPLETE LIST OR SCHEDULE OF ALL MAJOR VALVES GIVING THE NUMBER OF THE VALVE, LOCATION, AND THE ROOMS OR AREAS CONTROLLED BY THE VALVE. PERMANENTLY TAG EACH VALVE WITH BRASS PLATE NUMBER TO MATCH SCHEDULE.
- 7. POWER & CONTROL DIAGRAM, DESCRIPTIONS, AND SEQUENCE OF CONTROLS FOR EACH SYSTEM.
- INCLUDE TELEPHONE NUMBERS AND ADDRESSES OF SERVICE COMPANIES.

 AT COMPLETION OF JOB, CONTRACTOR AND MANUFACTURER'S REPRESENTATIVES FOR MAJOR EQUIPMENT INCLUDING THE ROOFTOP AC UNITS, BOILER, WATER HEATERS AND CONTROLS

SYSTEMS SHALL MEET WITH THE OWNER'S REPRESENTATIVES TO INSTRUCT OWNER'S

PROVIDE FUNDAMENTAL COMMISSIONING FOR ALL THE SYSTEMS PER ASHRAE GUIDELINES AND LEED REQUIREMENTS. SUBMIT COMMISSIONING REPORTS FOR ALL EQUIPMENT AND SYSTEMS COMMISSIONED.

REPRESENTATIVES IN OPERATION AND MAINTENANCE PROCEDURES OF THEIR RESPECTIVE

PART 2 - MATERIALS

2.01 UNIFORMITY

A. ALL ITEMS OF SIMILAR NATURE SHALL BE BY THE SAME MANUFACTURER. TRIM FOR MAJOR ITEMS SHALL BE FURNISHED BY THE SAME MANUFACTURER AS THE ITEM.

2 FINISHES AND PAINTING:

EQUIPMENT AND SYSTEMS.

- PROVIDE ALL EQUIPMENT WITH A FACTORY FINISH.
- 3. TOUCH UP SCRATCHES IN FACTORY FINISHED SURFACES TO MATCH ORIGINAL. OBTAIN TOUCH-UP PAINT FROM THE MANUFACTURER OF THE PIECE OF EQUIPMENT.

2.03 PIPES AND FITTING:

A. COPPER PRESSURE TYPE L; HARD TEMPER: JOINTS 95/5 SOLDER

1. TUBING: ASTM A88.

- 2. FITTINGS: ANSI B16.22, WROUGHT COPPER.
- 3 FLANGES: ANSI B16 24 150 PSIG BATIN
- 3. FLANGES: ANSI B16.24, 150 PSIG RATING.
- 4. SOLDER: ASTM B32, ALLOY GRADE; 95% TIN, 5% ANTIMONY OR OTHER LEAD FREE SOLDER.
- B. ALL OUTDOOR FERROUS SURFACES SHALL BE HOT-DIP GALVANIZED OR CORROSIONPROOF COATED WITH EXTERIOR GRADE ENAMEL PANIT.
- C. GAS PIPING: INDOOR SCH-40 BLCK STEEL, OUTDOOR SCH-40 GALVANIZED. 2.5" AND BELOW SCREWED AND 3" AND ABOVE WELDED. BELOW GRADE SCH-40 BLCK STEEL WITH CORROSSION BROTECTION.

2.04 DIELECTRIC CONNECTIONS:

- B. GENERAL: ISOLATE FERROUS FROM NONFERROUS MATERIALS IN PIPING SYSTEMS AND EQUIPMENT CONNECTIONS WITH DIELECTRIC UNIONS.
- C. DIELECTRIC UNIONS:
- 5. 2" AND SMALLER: EPCO MODEL FX, OR APPROVED SUBSTITUTE, 250 WOG, WITH STANDARD GASKETS FOR PLUMBING AND HIGH TEMPERATURE GASKETS FOR HEATING.
- 6. 2-1/2" AND LARGER: EPCO MODEL X, OR APPROVED SUBSTITUTE, BRASS HALF-UNION, ANSI B16.1, 175 WOG, TO FLANGE.

2.05 GENERAL USE VALVES

- A. PROVIDE JENKINS, STOCKHAM, DEMCO, GRINNELL, DEZURIK, OR NIBCO VALVES. ALL BALL OR BUTTERFLY VALVES FOR GENERAL USE SHALL HAVE EPT SEATS. VALVE HANDLES, EXCEPT IN GROUND, SHALL BE INFINITE THROTTLING WITH MEMORY STOP.
- B. GATE VALVES:
- 1. 1/2" THROUGH 2" THREADED: STOCKHAM FIGURE B-105.
- 2. 1/2" THROUGH 2" SWEAT: B-109, SCREW BONNET.
- 3. 2-1/2" AND ABOVE FLANGED: STOCKHAM FIGURE G-623 BRONZE FITTED.

1. 1/2" THROUGH 2" - BALL VALVE - THREADED: STOCKHAM FIGURE S-214-BR-R-T.

 1/2" THROUGH 2" - BALL VALVE - SWEAT: STOCKHAM FIGURE S-214-BR-R-S.
 2-1/2" AND ABOVE - BUTTERFLY VALVE: DEMCO SERIES NE, LUG TYPE. PROVIDE INFINITE THROTTLING AND MEMORY STOP HANDLE. VALVES TO PERMIT REMOVAL OF PIPING ON

EITHER SIDE WITH VALVE IN PLACE.

- D. BALANCE VALVES:1. 1/2" THROUGH 2" BALL VALVE: SAME AS HAND VALVE.
- 2. 2" AND ABOVE PLUG VALVE: HOMESTEAD FIGURE 1522 (SEMI-STEEL BODY).

1. 1/2" THROUGH 4" - BELL & GOSSETT CIRCUIT SETTER: PROVIDE ONE PORTABLE MODEL

RO-2 DIFFERENTIAL PRESSURE METER ASSEMBLY WITH QUICK CONNECTORS.

ELOW BALANCING DEVICES:

- F. CHECK VALVES:
- 2" AND SMALLER THREADED: STOCKHAM FIGURE B-319.
 2" AND SMALLER SWEAT: STOCKHAM FIGURE B-309.
- 3. 2-1/2" AND LARGER FLANGED: STOCKHAM FIGURE G-931

2.06 PIPING SPECIALTIES:

- A. THERMOMETERS AND WELLS: WEKSLER TYPE AF, "ADJUST-ANGLE", 5" DIAL BIMETAL THERMOMETER. STAINLESS STEEL CASE AND STEM, EXTERNAL ADJUSTMENT, AND MATCHING BRASS WELL. STEM LENGTH SHALL BE OF THE LENGTH REQUIRED TO OBTAIN AN ACCURATE READING. USE LAYING EXTENSION WHERE PIPE IS INSULATED.
- SCALE: DOMESTIC HOT WATER AND HEATING WATER 30 TO 240 DEGREES F; CONDENSER WATER
- 30 TO 160 DEGREES F. CHILLED WATER 30 TO 100 DEGREES F.

 B. PRESSURE GAUGES: WEKSLER MODEL BA13P OR EQUAL MARSH OR ASHCROFT, 3-1/2" DIAMETER PHENOLASE WITH BLACK NUMERALS ON WHITE FACE. INSTALL WITH TYPE 35 GAUGE COCKS. SELECT DIAL RANGE SO THAT THE NORMAL OPERATING PRESSURE WILL OCCUR AS CLOSE TO THE MIDPOINT OF THE DIAL RANGE AS POSSIBLE. PROVIDE PRESSURE, VACUUM, OR COMPOUND
- GAUGES AS REQUIRED.

 C. TEMPERATURE AND PRESSURE TEST STATION: PETERSON ENGINEERING COMPANY, 1/4" OR 1/2" MPT "PETE'S PLUG" WITH SOLID BRASS FITTING CAP. USE NORDEL VALVE CORE FOR WATER,
- AND NEOPRENE VALVE CORE FOR AIR.

 D. AIR VENTS: HOFFMAN #79 WHERE AUTOMATIC TYPE IS SHOWN UNLESS SPECIFIED OTHERWISE. INSTALL WITH SHUT-OFF VALVES OR COCKS AND DRAIN TO A FLOOR SINK OR DRAIN. PROVIDE LUNKENHEIMER #1778-3/8 INCH COCK FOR MANUAL AIR VENT AT COILS AND AT EACH HIGH POINT
- IN PIPING SYSTEMS, PIPE OUTLET TO FLOOR SINK OR FLOOR DRAIN.

 E. STRAINERS: CHARLES M. BAILEY #100A FOR FERROUS AND #100B OR #100BSJ FOR NON-FERROUS PIPING. ARMSTRONG, OR MUESSCO "Y" PATTERN, STAINLESS STEEL SQUARE MESH OR 3/64" PERFORATIONS. BASKET-TYPE STRAINER MUELLER #155 WITH 5/32" PERFORATED STAINLESS STEEL SCREEN. INSTALL ALL STRAINERS WITH A BLOW-OFF HOSE

VALVE WITH HOSE ADAPTER. 2.07 PIPE HANGERS AND SUSPENDED EQUIPMENT, SUPPORTS AND PENETRATIONS:

- SUPPORTS AND HANGERS:
 USE SUPER STRUT, UNISTRUT, B-LINE, ELCEN OR GRINNELL CHANNELS, HANGERS AND STRUCTURAL ATTACHMENTS TO PROPERLY SUPPORT THE PIPING SYSTEM AND SUSPENDED EQUIPMENT ACCORDING TO GOOD STANDARD PRACTICE AND ACCORDING TO
- 2. NO WATER PIPING (HVAC OR DOMESTIC WATER) SHALL HAVE DIRECT CONTACT WITH THE HANGING AND SUPPORT SYSTEM OR THE STRUCTURE. ON PIPES THAT ARE INSULATED, RUN THE INSULATION CONTINUOUS THROUGH THE HANGER AND PROVIDE SHEETMETAL SHIELDS OF PROPER LENGTH AND GAGES UNDER THE INSULATION TO PREVENT CRUSHING. ON UNINSULATED COPPER PIPING, USE STONEMAN "TRISOLATOR" OR SIMILAR

THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM SAFETY FACTOR OF 5.0.

- UNISTRUT OR SUPER-STRUT DEVICE AT EACH HANGER OR SUPPORT POINT.

 3. SIZE HANGERS PROPERLY TO FIT AROUND BARE PIPE, ISOLATOR, HANGER SHIELD, OR
- 4. SPACE HANGERS FOR HORIZONTAL STEEL PIPES WITH THE MAXIMUM DISTANCE BETWEEN

HANGERS AS FOLLOWS:								
NOMINAL SIZE	MAXIMUM SPAN (FEET)	MINIMUM ROD SIZE (INCHES)						
1/2"	5	3/8						
3/4"	6	3/8						
1"	7	3/8						
1 1/4"-1 1/2"	9	3/8						
2"	10	3/8						
2 1/2"	11	1/2						
3"	12	1/2						

INSULATION AS REQUIRED.

6. SPACE HANGERS FOR HORIZONTAL COPPER TUBE/PIPE WITH THE MAXIMUM DISTANCE BETWEEN HANGERS AS FOLLOWS:

NOMINAL SIZE	MAXIMUM SPAN (FEET)	MINIMUM ROD SIZE (INCHES)
3/4"	6	3/8
1"	7	3/8
1-1/4" - 1-1/2"	9	3/8
2"	10	3/8
2-1/2"	11	1/2
3"	12	1/2
4"	14	5/8

- 7. TRAPEZE SUSPENSION (TRAPEZE HANGERS MAY BE USED FOR PARALLEL LINES IF PIPES PITCH SAME DIRECTION): SIZE CHANNEL ASSEMBLY IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED LOAD RATINGS. NO DEFLECTIONS SHALL EXCEED 1/180 OF A SPAN WITH A SAFETY FACTOR OF 5.
- USE CADMIUM PLATED OR GALVANIZED HANGERS, ATTACHMENTS, RODS, NUTS, BOLTS AND OTHER ACCESSORIES.
- 9. DO NOT USE WIRE, PLUMBER'S TAPE, OR OTHER MAKE-SHIFT DEVICES FOR HANGERS.
- 10. DO NOT BURN OR WELD ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE OWNER OR ARCHITECT.
- 11. NO VALVE OR PIECE OF EQUIPMENT SHALL BE USED TO SUPPORT THE WEIGHT OF ANY PIPE FOR PIPES 1-1/2" AND LARGER.
- 12. PROVIDE A SUPPORT OR HANGER CLOSE TO EACH CHANGE OF DIRECTION THE PIPE, EITHER HORIZONTAL OR VERTICAL.
- 13. WHEN PIPING IS INSTALLED USING A TRAPEZE HANGER, BOLT THE PIPE TO THE TRAPEZE USING A PIPE CLAMP, STRAP OR "U" BOLT. DO NOT WELD THE PIPE TO THE TRAPEZE.
- A. ATTACHMENTS TO BUILDING STRUCTURE: (FIGURE NUMBERS INCLUDED ARE GRINNELL UNLESS OTHERWISE NOTED.)
- UNLESS OTHERWISE NOTED.)
- BEAM SUPPORTS: SUPPORT EQUIPMENT AND PIPING LARGER THAN 4" DIAMETER BENEATH CENTERLINE OF BEAM. DO NOT CAUSE ECCENTRIC LOADS ON BEAMS.

METAL DECKING WITHOUT CONCRETE: 75 POUNDS

- 2. HANGING FROM METAL DECKING: LOAD AT EACH SUPPORT POINT NOT TO EXCEED:

 CONCRETE ON METAL DECKING: 200 POUNDS
- DISTANCE BETWEEN SUPPORT POINTS NOT TO BE LESS THAN 3 FEET. PROVIDE INTERMEDIATE BEAMS OR CHANNELS IF LOADS ARE IN EXCESS OF THE ABOVE (MINIMUM SAFETY FACTOR OF 5.0).
- 2.07 PIPE HANGERS AND SUSPENDED EQUIPMENT, SUPPORTS AND PENETRATIONS:

A. SUPPORTS AND HANGERS:

- USE SUPER STRUT, UNISTRUT, B-LINE, ELCEN OR GRINNELL CHANNELS, HANGERS AND STRUCTURAL ATTACHMENTS TO PROPERLY SUPPORT THE PIPING SYSTEM AND SUSPENDED EQUIPMENT ACCORDING TO GOOD STANDARD PRACTICE AND ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM SAFETY FACTOR OF 5.0.
- 2. NO WATER PIPING (HVAC OR DOMESTIC WATER) SHALL HAVE DIRECT CONTACT WITH THE HANGING AND SUPPORT SYSTEM OR THE STRUCTURE. ON PIPES THAT ARE INSULATED, RUN THE INSULATION CONTINUOUS THROUGH THE HANGER AND PROVIDE SHEETMETAL SHIELDS OF PROPER LENGTH AND GAGES UNDER THE INSULATION TO PREVENT CRUSHING. ON UNINSULATED COPPER PIPING, USE STONEMAN "TRISOLATOR" OR SIMILAR UNISTRUT OR SUPER-STRUT DEVICE AT EACH HANGER OR SUPPORT POINT.
- 3. SIZE HANGERS PROPERLY TO FIT AROUND BARE PIPE, ISOLATOR, HANGER SHIELD, OR INSULATION AS REQUIRED.
- 4. SPACE HANGERS FOR HORIZONTAL STEEL PIPES WITH THE MAXIMUM DISTANCE BETWEEN HANGERS AS FOLLOWS:

	MAXIMUM	MINIMUM R
NOMINAL SIZE	SPAN (FEET)	SIZE (INCHE
1/2"	5	3/8
3/4"	6	3/8
1"	7	3/8
1 1/4"-1 1/2"	9	3/8
2"	10	3/8
2 1/2"	11	1/2
3"	12	1/2
4"	14	5/8

6. SPACE HANGERS FOR HORIZONTAL COPPER TUBE/PIPE WITH THE MAXIMUM DISTANCE BETWEEN HANGERS AS FOLLOWS:

THEEN WINDERS NOT DEED NO.		
NOMINAL SIZE	MAXIMUM SPAN (FEET)	MINIMUM ROD SIZE (INCHES)
3/4"	6	3/8
1"	7	3/8
1-1/4" - 1-1/2"	9	3/8
2"	10	3/8
2-1/2"	11	1/2
3"	12	1/2
4"	14	5/8

A SPAN WITH A SAFETY FACTOR OF 5.

PIPE FOR PIPES 1-1/2" AND LARGER.

- 7. TRAPEZE SUSPENSION (TRAPEZE HANGERS MAY BE USED FOR PARALLEL LINES IF PIPES PITCH SAME DIRECTION): SIZE CHANNEL ASSEMBLY IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED LOAD RATINGS. NO DEFLECTIONS SHALL EXCEED 1/180 OF
- 9. DO NOT USE WIRE, PLUMBER'S TAPE, OR OTHER MAKE-SHIFT DEVICES FOR HANGERS.

8. USE CADMIUM PLATED OR GALVANIZED HANGERS, ATTACHMENTS, RODS, NUTS, BOLTS

10. DO NOT BURN OR WELD ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL

- OF THE OWNER OR ARCHITECT.

 11. NO VALVE OR PIECE OF EQUIPMENT SHALL BE USED TO SUPPORT THE WEIGHT OF ANY
- PROVIDE A SUPPORT OR HANGER CLOSE TO EACH CHANGE OF DIRECTION THE PIPE, EITHER HORIZONTAL OR VERTICAL.
- 13. WHEN PIPING IS INSTALLED USING A TRAPEZE HANGER, BOLT THE PIPE TO THE TRAPEZE USING A PIPE CLAMP, STRAP OR "U" BOLT. DO NOT WELD THE PIPE TO THE TRAPEZE.
 - (GRINNELL) UNLESS OTHERWISE NOTED.)

 1. BEAM SUPPORTS: SUPPORT EQUIPMENT AND PIPING LARGER THAN 4" DIAMETER

ATTACHMENTS TO BUILDING STRUCTURE: (FIGURE NUMBERS INCLUDED ARE ANVIL

BENEATH CENTERLINE OF BEAM. DO NOT CAUSE ECCENTRIC LOADS ON BEAMS.

2. HANGING FROM METAL DECKING: LOAD AT EACH SUPPORT POINT NOT TO EXCEED:

CONCRETE ON METAL DECKING: 200 POUNDS

METAL DECKING WITHOUT CONCRETE: 75 POUNDS

DISTANCE BETWEEN SUPPORT POINTS NOT TO BE LESS THAN 3 FEET. PROVIDE

INTERMEDIATE BEAMS OR CHANNELS IF LOADS ARE IN EXCESS OF THE ABOVE

4. CONCRETE INSERTS: FIGURE 282. PLACE REINFORCING STEEL THROUGH INSERT AS

- (MINIMUM SAFETY FACTOR OF 5.0).

 3. ANCHOR BOLTS: MATERIAL, DIAMETERS, AND LENGTHS FOR 3,000 PSI.
- RECOMMENDED BY MANUFACTURER FOR RECOMMENDED LOADS.

 5. POURED-IN-PLACE CONCRETE ON METAL DECKING: SUPERSTRUT FIGURE C-475.
- 6. BEAM CLAMPS: FIGURE 87, 227, OR 228.

(MINIMUM SAFTY FACTOR OF 5.0)

WELDED BEAM ATTACHMENT: FIGURE 66.

- 8. SIDE BEAM BRACKETS: FIGURE 202 OR 203.9. HANGER RODS: ASTM A107, HOT ROLLED STEEL WITH ANSI B1.1 THREADS.
- TURNBUCKLES: FIGURE 230.
 LINKED EYE ROD: FIGURE 278X.

CLEVIS: FIGURE 299.

C. HANGER ROD FIXTURES:

D. PIPE ATTACHMENTS: (FIGURE NUMBERS BY GRINNELL)

ADJUSTABLE CLEVIS: FIGURE 260 OR 300.

- 2. U-BOLT: FIGURE 137.
- 3. STANCHION: FIGURE 259.
- 4. VERTICAL PIPE SUPPORTS: FIGURE 261.



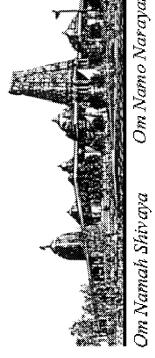
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SPECIFICATIONS
BUILDING "D"
MMUNITY and CULTURAL CENT

DATE
10/28/11
SCALE:
NONE
DRAWN BY:
PT
PROJECT:
ARROWHEAD

M-11.

SECTION 15000 (CONTINUED)

E. PENETRATIONS AND ESCUTCHEONS: WHERE WORK OF THIS DIVISION PASSES THROUGH FIRE RATED PARTITIONS, WALLS, FLOORS, CONCRETE SLABS OR EXTERIOR WALLS. PACK SPACE BETWEEN PIPING AND PENETRATION OPENING WITH MATERIAL APPROVED BY UNDERWRITER LABORATORIES FOR IN THROUGH PENETRATION FIRE STOP SYSTEMS. MATERIALS, METHODS AND INSTALLATION SHALL BE IN ACCORDANCE WITH UL APPROVED LISTING AND SHALL BE DESIGNED TO ACT AS A FIRESTOP AS WELL AS A COLD SMOKE, NOXIOUS GAS AND WATER SEALANT.

> FOR NON-RATED WALLS, SLEEVES SHALL BE A MINIMUM OF 2" LARGER THAN THE PIPE AND EXTEND 2" ABOVE FLOOR SLABS. USE PIPE SHIELDS, INC., UNLESS OTHERWISE NOTED. PROVIDE SLEEVES AS

NONINSULATED PIPING:

A. NONRATED WALL: SEAL ANNULAR SPACE WITH FIBERGLASS

INSULATED PIPING:

A. NONRATED WALL: MODEL WFB-CS AND WFB-CS-CW.

3. PIPES THROUGH EXTERIOR WALL: SEAL ANNULAR SPACE WITH FIBERGLASS AND CAULK

PROVIDE ESCUTCHEON PLATES THAT ARE NEAT, RIGID, SECURELY ATTACHED WHERE WORK OF THIS SECTION PENETRATES THE STRUCTURE. PROVIDE STAINLESS STEEL OR CHROME PLATED BRASS IN FINISHED AREAS OR WHERE REQUIRED FOR PROPER APPEARANCE AND GALVANIZED STEEL ELSEWHERE.

2.08 PIPE AND EQUIPMENT INSULATION:

1. THE TERM PIPING HEREIN, SHALL INCLUDE HOT WATER PIPES, PUMPS, VALVES, STRAINERS AND FITTINGS. APPLY HI-LO TEMP INSULATION TO THE FITTINGS AND COVER WITH "ZESTON" FITTING CLOSURES. TUCK THE ENDS OF THE HI-LO TEMP INSULATION INTO THE THROAT OF THE FITTING AND THE EDGES ADJACENT TO THE PIPE COVERING TUFTED AND TUCKED IN, FULLY INSULATING THE FITTING BEFORE APPLYING FITTING COVER. SECURE THE FITTING COVER BY BANDING OR TAPING THE ENDS TO THE ADJACENT PIPE COVERING. EXTEND THE INSULATION ON THE VALVES UP TO THE VALVE BONNET. LEAVE STRAINER CLEANOUT PLUGS ACCESSIBLE. AT UNIONS: MITER INSULATION AT 45 DEGREES AND COAT EXPOSED INSULATION WITH INSULATING CEMENT. HEATING WATER VALVES DO NOT HAVE TO BE

- 2. INSULATE ALL HOT WATER SUPPLY AND RETURN PIPING, AND PIPING SYSTEM COMPONENTS.
- 3. USE MASTICS AND ADHESIVES UNDILUTED UNLESS NOTED OTHERWISE. DILUTE FOSTER 30-36 NO
- 4. BUTT INSULATION AT EACH END AND SEAL THE JOINTS WITH PRESSURE SENSITIVE TAPE.

GREATER THAN 1 PART WATER TO 5 PARTS 30-36.

- 5. INSTALL ALL INSULATION TO ALLOW FOR THE OPERATION OF ALL MOVING PARTS AND TO PERMIT VIEWING OF ALL NAME PLATES, CONTROLS, INSTRUMENTS, DAMPERS AND VALVE BONNETS AND STEMS.
- 6. THOROUGHLY CLEAN, TEST AND HAVE APPROVED, ALL PIPING AND EQUIPMENT BEFORE INSTALLING
- 7. INSTALL INSULATION WITH THE HIGHEST QUALITY WORKMANSHIP. ALL ENDS SHALL BE NEATLY TRIMMED
- 8. MANUFACTURER: OWENS-CORNING FIBERGLASS, ARMSTRONG, MANVILLE, OR CERTAIN-TEED.

B. TYPE AND THICKNESS:

1. GENERAL: IN ACCORDANCE WITH 2008 TITLE 24 ENERGY REGULATIONS.

2.09 EQUIPMENT SUPPORTS:

- A. ALL ROTATING EQUIPMENT AND EQUIPMENT CAPABLE OF TRANSMITTING VIBRATION INTO THE SPACE SHALL BE MOUNTED ON VIBRATION ISOLATORS. ISOLATORS SHALL BE PROPERLY SIZED BY THE ISOLATOR MANUFACTURER, TAKING INTO ACCOUNT THE PIECE OF EQUIPMENT, ITS CENTER OF GRAVITY, ANCHOR POINTS, AND THE STRUCTURE UPON WHICH IT IS SETTING, SO THAT VIBRATION TRANSMITTED TO THE STRUCTURE IS HELD TO A LEVEL ACCEPTABLE TO THE OWNER.
- B. ISOLATORS SHALL BE AS REQUIRED TO LIMIT THE TRANSFER OF VIBRATION AND NOISE TO THE STRUCTURE
- THE ISOLATORS SHALL BE FASTENED TO THE STRUCTURE AND TO THE EQUIPMENT WITH PROPERLY SIZED AND STRUCTURALLY ENGINEERED ANCHORS AND BOLTS. IF STRUCTURAL CALCULATIONS ARE REQUIRED BY THE BUILDING INSPECTORS OR BY CODE, THEY SHALL BE PROVIDED BY THE ISOLATOR MANUFACTURER OR
- D. ISOLATORS SHALL BE AS MANUFACTURED BY MASON, KINETICS, OR AMBER-BOOTH. OTHER MANUFACTURERS NOT ALLOWED
- E. ISOLATOR SPRINGS SHALL BE AS FOLLOWS:
- 1. CADMIUM-PLATED HELICAL STEEL SPRINGS WITH MINIMUM DIAMETER 0.8 OF OPERATING HEIGHT.
- 2. RESERVE DEFLECTION (FROM OPERATING TO SOLID HEIGHT) 50% OF SPECIFIED DEFLECTION.
- 3. RATIO OF HORIZONTAL TO VERTICAL SPRING CONSTANTS SHALL BE WITHIN RANGE OF 0.90 TO 1.10.
- 4. PROVIDE CORROSION RESISTANT PROTECTION FOR ALL SPRINGS AND THEIR HOUSINGS, FOR OUT-OF-DOORS INSTALLATIONS, AND ALSO FOR MATERIALS EXPOSED TO OUT-OF-DOORS DURING CONSTRUCTION. HOT-DIPPED GALVANIZED OR COATED WITH NEOPRENE OR POLYVINYLCHLORIDE.
- F. THE EQUIPMENT MANUFACTURER SHALL FURNISH THE WEIGHT OF THE EQUIPMENT AT EACH POINT OF
- G. ALL ISOLATORS SHALL BE PROPERLY ADJUSTED SO THAT EQUIPMENT IS LEVEL, SNUBBERS AND SEISMIC TYPE MOUNTS ARE CENTERED, AND NO SHORT CIRCUITING OCCURS. THEY WILL BE READJUSTED AS NECESSARY DURING THE WARRANTY PERIOD, AT NO COST TO THE OWNER, TO ASSURE PROPER OPERATION.
- H. ALL CONNECTIONS TO VIBRATING EQUIPMENT SUCH AS PIPING, CONDUITS, AND DUCTWORK SHALL BE INSTALLED SO THAT SHORT CIRCUITING DOES NOT OCCUR.
 - 1. CONDUITS SHALL HAVE FLEXIBLE CONNECTIONS LOOPED IN AT 90 DEGREES TO ALLOW FOR MOVEMENT.
 - 2. PIPING SHALL HAVE FLEXIBLE CONNECTORS WHERE SPECIFIED OR SHALL HAVE SUFFICIENT SPRING LEGS OR CHANGES IN DIRECTION BEFORE THE FIRST HANGER TO DAMPEN VIBRATION AND ASSURE THAT PIPING IS NOT WORK HARDENED.

2.10 SEISMIC RESTRAINTS:

GENERAL: PROVIDE SEISMIC RESTRAINTS PER APPLICABLE CODE AND STANDARDS AS SPECIFIED AND/OR INDICATED. DESIGN AND PROVIDE RESTRAINTS TO PREVENT PERMANENT DISPLACEMENT IN ANY DIRECTION CAUSED BY LATERAL MOTION, OVERTURNING OR UPLIFT. RESTRAINTS SHALL NOT SHORT CIRCUIT VIBRATION ISOLATED EQUIPMENT UNDER NORMAL OPERATION.

B. REQUIREMENTS:

1. CRITERIA: DESIGN RESTRAINTS FOR PIPING AND DUCTWORK PER SMACNA "SEISMIC RESTRAINT MANUAL GUIDELINES FOR MECHANICAL SYSTEMS" OR ANY SIMILAR PREAPPROVED HANGER MANUFACTURER'S DETAILS. SUBMIT REQUIRED STRUCTURAL CALCULATIONS FOR RIGIDLY ATTACHED EQUIPMENT.

- 2. SEISMIC FORCE CRITERIA: RIGIDLY ATTACHED: 1.0G FLEXIBLY ATTACHED: 1.0G
- 3. CONTRACTOR TO SUBMIT SEISMIC RESTRAINT CALCULATIONS THAT ARE SIGNED BY A STRUCTURAL ENGINEER REGISTERED IN CALIFORNIA. CALCULATION MUST CONFIRM THE ADEQUACY OF THE RESTRAINTS AND THEIR ANCHORING TO THE BUILDING STRUCTURAL ELEMENTS.
- 4. AFTER INSTALLATION, CONTRACTOR SHALL ISSUE IN WRITING, AND SIGNED BY A REGISTERED STRUCTURAL ENGINEER THAT ALL SEISMIC RESTRAINTS HAVE BEEN INSTALLED TO MEET THE APPLICABLE CODES AND CONTRACT DOCUMENTS.
- 5. SEISMICALLY ANCHOR ALL EQUIPMENT WHICH ARE MOUNTED 4 OR MORE FEET ABOVE THE FLOOR OR WEIGHS MORE THAN 400 POUNDS. SUBMIT SEISMIC ANCHORAGE CALCULATIONS FOR SEISMIC CATEGORY D FOR BOTH FLEXIBLY & RIGIDLY SUPPORTED EQUIPMENT PREPARED BY A REGISTERED STRUCTURAL ENGINEER IN THE STATE OF CALIFORNIA. USE ap = 2.5 AND Rp = 6.0 FOR HVAC EQUIPMENT CONSTRUCTED OF SHEET METAL FRAMING.
- 6. REFER TO STRUCTURAL PLANS FOR SEISMIC CALCULATIONS FOR ROOFTOP AC UNITS AND FOR STRUCTURAL FRAMING. SUBMIT FINAL EQUIPMENT LOCATIONS, WEIGHTS AND ANCHORAGE REQUIREMENTS TO THE PROJECTY STRUCTURAL ENGINEER-OF-RECORD AND OBTAIN APPROVALS BEFORE PROCEEDING WITH THE INSTALLATION.
- 7. OSHPD PRE-APPROVED SEISMIC SUPPORT & BRACING SYSTEM MAY BE USED IN-LIEU OF CUSTOM DESIGN. ACCEPTABLE MANUFACTURERS - MASON, NUSIG. TOLCO OR APPROVED EQUAL.

- 5. RESTRAINT TO INCLUDE THE FOLLOWING:
- FANS, AIR HANDLING UNITS, ROOFTOP AC UNITS. PIPING, EXPANSION TANKS, AND ASSOCIATED EQUIPMENT AND PIPING.
- DUCTS (SUPPLY, RETURN, EXHAUST, RELIEF). WATER HEATERS, HEAT EXCHANGERS AND HOT WATER STORAGE TANKS.

2.11 ACCESS DOORS AND PANELS:

- WHERE REQUIRED: WHEREVER A PIECE OF EQUIPMENT OR VALVE AND OPERATOR IS INACCESSIBLE AND REQUIRES ACCESS FOR MAINTENANCE, REPAIR OR ADJUSTMENT.
- SIZE: SIZE IS DEPENDENT UPON THE RELATIONSHIP OF THE DOOR TO THE PRODUCT BEING SERVICED; THEREFORE, THE SIZE OF THE DOOR SHALL BE SELECTED TO PROVIDE CONVENIENT ACCESS TO ITS
- C. MANUFACTURER: INRYCO/MILCOR, OR EQUAL BILCO, CESCO, OR KARP.

2.14 SPECIAL TOOLS:

F. FURNISH TO OWNER THE FOLLOWING: ONE SET OF ANY SPECIAL TOOLS REQUIRED TO OPERATE, ADJUST, DISMANTLE. OR REPAIR ANY EQUIPMENT IN THIS DIVISION. "SPECIAL TOOLS" MEANS THOSE NOT NORMALLY POSSESSED BY MECHANICS OR MAINTENANCE PERSONNEL.

2.15 ROOFTOP AIR CONDITIONING UNITS:

- ROOFTOP AC UNITS SHALL BE GAS ELECTRIC PACKS AS SCHEDULED. ACCEPTABLE MANUFACTURERS SHALL BE TRANE, CARRIER, MCQUAY, YORK OR EQUAL. TRANE IS THE BASIS OF DESIGN.
- B. AC UNITS SHALL USE R-410A (NO CFC AND HCFC UNITS ALOOWED) AND CALIFORNIA ENERGY
- C. UNITS SHALL BE PROVIDED WITH MATCHING 12' ROOF CURB AND ISOLATION PADS.
- UNITS SHALL BE SEISMICALLY ANCHORED TO THE ROOF STRUCTURE. SUBMIT SEISMIC CALCULATIONS PREPARED BY A REGISTERED STRUCTURAL ENGINEER IN THE STATE OF CALCIFORNIA. COORDINATE WITH THE ROOF STRUCTURE PROVIDER AND ROOFING CONTRACTOR FOR FLASHING AND
- PROVIDE T-24 COMPLIANT MATCHING ELECTRONIC ROOM THERMOSTAT. THERMOSTATS SHALL BE ADAPTABLE FOR FUTURE INTEGRATION TO A BUILDING CONTROL SYSTEM. FOR UNITS SERVING ASSEMBLY OCCUPANCIES AND CONFERENCE ROOMS, PROVIDE MATCHING CARBON DIOXIDE (CO2) SENSORS AND CONTROLS TO ADJUST THE OUTSIDE AIR AUTOMATICALLY PER THE T-24 REQUIREMENTS.
- F. PROVIDE MOTORIZED OUTSIDE AIR AND RELIEF AIR DAMPERS.
- G. UNITS SHALL BE STARTED-UP AND COMMISSIONED BY A FACTORY TRAINED TECHNICIAN AND A COMMISSIONING REPORT SHALL BE SUBMITTED TO SATISFY THE LEED BASIC COMMISSIONING
- PROVIDE ALL UTILITIES POWER, CONTROLS, GAS, CONDENSATE DRAIN CONNECTIONS PER THE MANUFACTURER INSTALLATION GUIDELINES. PROVIDE UL LISTED FLEX CONNECTORS FOR GAS, POWER, CONTROLS. TERMINATE THE CONDENSATE DRAINS TO THE JANITOR SINK INDIRECTLY.
- PROVIDE ACOUSTICALLY LINED SUPPLY AND RETURN MAIN DUCTS IN THE CEILING PLENUM BELOW. COORDINATE DUCT SIZE AND ROUTING WITH THE ARCHITECTURAL REFLECTED CEILING PLANS, ROOF STRUCTURE, SPRINKLER PIPING AND LIGHTING.

- GENERAL: FABRICATE DUCTWORK OF G60 GALVANIZED SHEET METAL IN ACCORDANCE WITH LATEST EDITION OF THE SMACNA, DUCT MANUAL, AND ASHRAE GUIDE. SEAL AND TAPE ALL DUCT JOINTS AIRTIGHT.
- ACOUSTICAL LINING: ACOUSTICAL LINING SHALL BE 1" THICK, COATED FLEXIBLE DUCT LINER AND SHALL MEET UL-181 REQUIREMENTS. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
- FLEXIBLE ROUND DUCTS: UL CLASS 1 AIR DUCTS WITH HELICAL SUPPORT WIRE, SCRIM CLOTH INNER LINER, R-4 INSULATION AND OUTER PLASTIC LINER: CODY/WEST OR
- M. FLEXIBLE DUCT CONNECTOR: VENTFABRICS, INSTALL TO MAINTAIN NOT LESS THAN 2" METAL TO METAL SEPARATION.

- A. BALANCING DAMPERS: PER SMACNA PROVIDE HARD LOCKING QUADRANT. WITH RAISED CHAIR FOR INSULATED DUCTS.
- B. CONTROL DAMPERS: PER SMACNA, RUSKIN FSD-60 OR EQUAL.
- C. BACKDRAFT DAMPERS: RUSKIN CBD6 OR EQUAL.

2.18 ELECTRIC MOTORS:

- A. PREMIUM EFFICIENCY, VOLTAGE AND PHASE TO MATCH THE APPLICATION, WEATHER ENCLOSURE TO MATCH THE APPLICATION AND LOCATION.
- B. MANUFACTURER: BALDOR SUPER-E, RELIANCE, GE, WESTINGHOUSE OR APPROVED

2.19 VARIABLE FREQUENCY DRIVES:

A. MANUFACTURERS: ABB, DANFOSS, SAFTRONICS, YASKAWA, RELIANCE, GE OR APPROVED EQUAL

2.20 AIR BALANCE AND WATER BALANCE

- PERSONNEL PERFORMING BALANCING AND TESTING SHALL BE FULLY QUALIFIED, EXPERIENCED, AND NORMALLY ENGAGED IN THIS TYPE OF WORK. IF THE CONTRACTOR DOES NOT HAVE SUCH PERSONNEL AVAILABLE FROM HIS OWN COMPANY, HE SHALL HIRE, AT HIS OWN EXPENSE, SUBCONTRACTORS WHO ARE QUALIFIED.
- B. PROVIDE ALL LABOR, EQUIPMENT, AND MATERIALS REQUIRED TO PERFORM TESTS AND
- C. SUBMIT FINAL AIR BALANCE REPORT TO BUILDING INSPECTION DIVISION PRIOR TO FINAL INCEPTION.

2.21 DUCT LINER AND PLENUM LINER

- FLEXIBLE, COATED, FIBERGLASS DUCT LINER, 1" THICK (2" FOR OUTDOOR DUCTS), 1.5 PCF DENSITY, 0.24 BRUH/SQ.FT.DEG F/IN. AT 75 °F, NOISE REDUCTION COEFFICIENT OF 0.6 FOR 1", #6 MOUNTINGS, OWNES CORNING AEROFLEX PLUS OR EQUAL. DUCT LINING MATERIAL SURFACE THAT COMES IN CONTACT WITH THE AIR FLOW SHALL BE RESISTANT TO MOLD, HUMIDITY AND ERROSION AND COMPLY WITH CMC SECTION 605.
- COMPLY WITH CMC AND SMACNA DUCT LINER APPLICATION STANDARD.
- C. MANUFACTURER: KNAUF, CERTAIN-TEED CORP., MANVILLE, OWENS-CORNING OR

2.22 FLEXIBLE DUCTS

- A. FLEXIBLE DUCT SHALL BE CLASS-I AIR DUCT PER UL 181 AND SHALL COMPLY WITH NFPA 90A AND 90B AND CALIFORNIA MECHANICAL CODE. SHALL HAVE A FLAME SPREAD RATING OF LESS THAN 25 AND A SMOKE DEVELOPED RATING OF LESS THAN 50.
- B. MANUFACTURER: MODULAR FLEX, THERMAFLEX OR EQUAL.
- MODULAR FLEX, POLY CORE, R-4.2, UNIVERSAL DUCT CLAMP DAMPER, POLYETHYLENE JACKET, PERMEABILITY = 0.17, R 4.2 FIBERGLASS INSULATION (ASTM C-518), FIBERGLASS THEREADED MESHA SCRIM, CORE-POLY LINER, HELIX- ENCAPSULATED HARD DRAWN SPRING WIRE, 2" ± W.C. PRESSURE RATING, 200° F, 4000 FT/MIN VELOCITY, UL181 CLASS
- D. ATTACH THE FLEX DUCTS USING FACTORY-MADE 器"-WIDE STAINLESS STEEL CLAMPS. THE OUTER JACKET SHALL BE SECURED USING 0.35"-WIDE SELF-LOCKING NYLON STRAPS-PANDUIT CORP. OR EQUAL. THE JACKET ENDS TAPED WITH APPROVED TYPE MASTIC TAPE.

2.23 HVAC CONTROL SYSTEM

- PROVIDE PROGRAMMABLE T-24 COMPLIANT ELECTRONIC ROOM THERMOSTAT COMPATIBLE WITH THE ROOFTOP AC UNIT INSTALLED. THE THERMOSTAT SHALL HAS SET-UP AND SET-BACK FEATURES, DIGITAL TEMPERATURE DISPLAY, NETWORKABLE IN FUTURE.
- MANUFACTURERS: HONEYWELL, TRANE, CARRIER OR APPROVED EQUAL.
- PROVIDE LOCKABLE, SEE THRU, HEAVY DUTY PLASTIC THERMOSTAT GUARD, ONE FOR EACH THERMOSTAT
- PART 3 EXECUTION
- 3.01 PIPING INSTALLATION:
- SYSTEM LAYOUTS AS INDICATED ON DRAWINGS ARE GENERALLY DIAGRAMMATIC, BUT SHALL BE FOLLOWED AS CLOSELY AS ACTUAL CONSTRUCTION AND WORK OF OTHER TRADES WILL PERMIT.
- DRAWINGS AND ARRANGEMENT: INSTALL EQUIPMENT AND MATERIALS WITH ALL WORKING PARTS READILY ACCESSIBLE FOR INSPECTION, REPAIR, AND REMOVAL.

- ANY SECTION OF PIPE FOR WHICH SIZE IS NOT SHOWN OR ANY INTERMEDIATE SECTION ERRONEOUSLY SHOWN OBVIOUSLY UNDERSIZED SHALL BE THE SAME SIZE AS THE LARGEST LINE CONNECTING TO IT.
- THOROUGHLY CLEAN ALL PIPE AND MAINTAIN IN SUCH CONDITION THROUGHOUT CONSTRUCTION. TEMPORARILY CAP
- INSTALL UNIONS AT CONNECTIONS TO EQUIPMENT, ON SERVICE SIDE OF VALVES AND ELSEWHERE AS REQUIRED OR
- SHOWN TO FACILITATE MAINTENANCE. INSTALL DIELECTRIC INSULATING CONNECTIONS BETWEEN ALL DISSIMILAR METALS UNLESS OTHERWISE INDICATED.
- RUN ALL PIPING GENERALLY LEVEL, FREE OF UNNECESSARY TRAPS AND BENDS, AND ARRANGE TO CONFORM TO THE BUILDING REQUIREMENTS AND TO SUIT NECESSITIES OF CLEARANCE FOR OTHER WORK.
- ARRANGE PIPING AND HANGERS TO ALLOW FOR EXPANSION, CONTRACTION, AND STRUCTURAL SETTLEMENT. DO NOT INSTALL PIPING IN CONTACT WITH THE BUILDING STRUCTURE.
- MAKE CHANGES IN SIZE OR DIRECTION WITH MANUFACTURED FITTINGS. THE USE OF BUSHINGS, REDUCING FLANGES, OR BENDING OF A PIPE IS NOT ALLOWED. INSTALL PIPING FULL SIZE THROUGH SHUT-OFF VALVES, BALANCING VALVES, ETC. CHANGE PIPE SIZE WITHIN THREE
- UNLESS SPECIFICALLY INDICATED OTHERWISE, INSTALL PIPING CONCEALED ABOVE CEILINGS, BENEATH THE FLOORS, OR IN WALLS. ROUTE PIPING TO LINEAR BEAMS, COLUMNS, OBSTRUCTIONS AND THE WORK OF OTHER TRADES.
- 10. SLOPING, AIR VENTING, AND DRAINAGE:

OFF PLUG ENDS OF UNPROTECTED PIPE.

A. SLOPE PIPING AS INDICATED, TRUE TO LINE AND GRADE AND FREE OF TRAPS AND AIR POCKETS. UNLESS INDICATED OTHERWISE, SLOPE PIPING IN DIRECTION OF FLOW AS FOLLOWS:

SERVICE INCLINATION SLOPE CONDENSATE DRAIN HOT & COLD WATER

PIPE SIZE DIAMETERS OF THE FINAL CONNECTION TO FIXTURES AND EQUIPMENT.

- PROVIDE AIR VENTS AT HIGH POINTS IN HEATING WATER PIPING.
- 11. COPPER: CRIMPING OF COPPER TUBING IS PROHIBITED. ISOLATE COPPER PIPE AND TUBING FROM CONTACT WITH STEEL. FOR BRANCH DROPS AND RISES TO PLUMBING FIXTURES, ANCHOR BRANCH TO WASTE AND VENT PIPING.
- PIPE ENDS: PERFORM PIPE CUTTING AND END PREPARATION SO AS TO RESULT IN CLEAN ENDS WITH FULL INSIDE DIAMETER. GRIND AND REAM AS NECESSARY.
- 13. THREADED JOINTS: APPLY TEFLON TAPE TO MALE THREADS.
- WELDING OF PRESSURE PIPING SHALL BE DONE BY NCPWB QUALIFIED WELDERS. PERFORM WELDING PER APPLICABLE CODES, INCLUDING ASME BOILER CONSTRUCTION CODE AND ANSI CODE FOR PRESSURE PIPING.
- WHERE REQUIRED, PEEN AND WHEEL-GRIND WELDS. ENDS OF PIPE MAY BE BURNED FOR WELDING, HOWEVER, GRIND-BEVEL AND REMOVE SCALE BEFORE WELDING JOINT. RAGGED EDGES WITH METAL BEADS, POOR ALIGNMENT, AND OTHER INFERIOR WORK WILL BE REJECTED.
- PERFORM WELDING WITH OXYACETYLENE OR ELECTRIC-ARC PROCESS.
- 15. SOLDERED JOINTS: CLEAN SURFACES TO BE JOINTED OF OIL, GREASE, RUST, AND OXIDES. CLEAN SOCKET OF FITTING AND END OF PIPE THOROUGHLY WITH EMERY CLOTH SO AS TO REMOVE RUST AND OXIDES. AFTER CLEANING AND BEFORE ASSEMBLY OR HEATING, APPLY FLUX TO JOINT SURFACE AND SPREAD EVENLY. CLEAN REFRIGERANT
- PIPING AS RECOMMENDED BY AIR CONDITIONING EQUIPMENT MANUFACTURER. 16. CAULKED CAST IRON BELL AND SPIGOT JOINTS:
- MAKE JOINTS WITH LEAD AND TARRED OAKUM. USE JOINT RUNNER SO THAT, AFTER POURING, LEAD WILL FINISH FLUSH WITH BELL. PROVIDE 1" MINIMUM DEPTH LEAD SEAL.
- MAKE JOINTS BETWEEN CAST IRON PIPE AND STEEL WITH FITTINGS MADE ESPECIALLY FOR THAT PURPOSE, SUCH AS TAPPED SPIGOTS, TUCKER CONNECTIONS, ETC..

- FABRICATE AND INSTALL DUCTWORK AND ACCESSORIES IN ACCORDANCE WITH THE CALCIFORNIA MECHANICAL CODE,
- SEISMICALLY SUPPORT AND BRACE ALL DUCTWORK PER SMACNA. FLEXIBLE DUCT SHALL BE INSTALLED WITHOUT KINKS AND SHARP BENDS THAT RESTRICT AIR FLOW. INSTALL AND SUPPORT PER CALIFORNIA MECHANICAL CODE. INSTALL TURNS WITH A MINIMUM OF 1.5 TIMES DIAMETER RADIUS. WHEN THER IS NO HEADROOM TO MAKE TURNS TO CONNECT TO THE DIFFUSERS, PROVIDE ACOUSTICALLY LINED PLENUMS AT THE AIR OUTLETS TO SIDE CONNECT THE FLEX. DUCT.
- D. COMPLY WITH THE INDOOR AIR QUALITY REQUIREMENTS DURING CONSTRUCTION, STORAGE OF MATERIALS AND POST CONSTRUCTION AS REQUIRED BY LEED-NC v2.2. KEEP THE DUCT OPENINGS COVERED DURING CONSTRUCTION TO PREVENT ENTRY OF CONSTRUCTION DUST AND DEBRIS.
- DUCTWORK SHALL BE FABRICATED AND SEALED TO MINIMIZE AIR LEAKAGE THROUGH SEAMS AND JOINTS AND CONNECTION TO THE EQUIPMENT AND OUTLETS TO A MAX. OF 6% OF THE TOTAL SYSTEM CAPACITY AT THE RATED
- UNLINED SUPPLY AND RETURN DUCTS SHALL BE INSULATED PER T-24 WITH DUCT WRAP INSULATION, MIN. R-6 WITH

ASJ VAPOR JACKET

- INSTALL EQUIPMENT PLUMB AND LEVEL. COORDINATE EQUIPMENT LOCATION AND SERVICE ACCESS WITH THE ARCHITECTURAL PLANS. PROVIDE ROOF CURBS, SUPPLEMENTAL SUPPORT FRAMING SEISMIC ANCHORAGE AND VIBRATION ISOLATION AS NECESSARY TO PROPERLY SUPPORT THE EQUIPMENT.
- COORDINATE WITH THE ROOFING CONTRACTOR FOR REQUIRED ROOFDECK OPENING FOR DUCTWORK, CURB
- ANCHORAGE TO STRUCTURE AND FLACHING. CEILING SUPPORTED EQUIPMENT SHALL BE SUPPORTED FROM HANGERS VIBRATION ISOLATORS AND SEISMIC CABLE BRACING. THE FORCES DUE TO GRAVITY SUPPORT AND SEISMIC FORCES TRANSMITTED TO THE BUILDING STRUCTURE SHALL NOT EXCEED THE MAXIMUM ALLOWABLE LIMITS SPECIFIED IN THE STRUCTURAL PLANS. FOR

SUPPORTING FROM WOOD STRUCTURE PROVIDE PROPER TYPE OF SIMPSON SUPPORTS BRACKETS AND SUPPORTS.

USGBC-LEED NC v2.2 COMPLIANCE REQUIREMENTS

1.0 GENERAL:

- A. COMPLY WITH THE CITY OF LIVERMORE, CA REGULATIONS GREEN DESIGN AND MEET THE ALL THE PREREQUISTE AND OPTIONAL LEED POINT CHECKLIST SELECTED FOR THE PROJECT. REFER TO THE ATTACHED CHECK LIST FOR THE TARGETTED LEED CREDIT POINTS TITLED "LEED FOR NEW CONSTRUCTION v2.2 WORKSHEET FOR HCCC PHASE-1B BUILDING-C ADMINISTRATION BUILDING LOCATED AT 1200 ARROWHEAD AVENUE,
- B. THE SELECTED USGBC LEED CREDIT POINTS SHALL FOLLOW THE PROCEDURES AND CRITERIA ESTABLISHED BY USBGC AND SHALL INCLUDE THE DESIGN PHASE CREDITS, CONSTRUCTION PHASE CREDITS AND THE POST CONSTRUCTION PHASE CREDITS.
- C. THE DESIGN TEAM WILL SPECIFY AND/OR INDICATE THE REQUIREMENTS FOR THE DESIGN PHASE CREDITS. THE CONTRACTORS SHALL MEET THE REQUIREMENTS FOR THE CONSTRUCTION PHASE AND THE POST CONSTRUCTION PHASE REQUIREMENTS TO EARN THE TARGETTED LEED CREDIT POINTS. THE RESPECTIVE TRADE CONTRACTOR SHALL INCLUDE IN THE BID PRICE FOR INCLUDING ALL NECESSARY MATERIALS, RESOURCES, MAN-HOURS AND DOCUMENTATION NECESSARY TO COMPLY WITH EACH CREDIT POINTS PER THE USGBC GUIDELINES AND THE CITY OF LIVERMORE REQUIREMENTS.
- D. THE CONTRACTOR SHALL <u>NOT</u> USE MATERIALS AND RESOURCES THAT ARE KNOWN TO HAVE HARMFUL EFFECTS ON THE ENVIRONMENT AND THE OCCUPANTS AND THOSE THAT ARE PROHIBITED BY USGBC. NO EQUIPMENT OR SYSTEMS SHALL BE INSTALLED IN THE BUILDING WHICH USES CFC AND HCFC REFRIGERANTS FOR HEATING, COOLING & REFRIGERATION. ALL SEALANTS, ADHESIVES, FINISHES ETC. USED IN THE MANUFACTURED PRODUCTS, EQUIPMENT, MATERIALS OF CONSTRUCTION SHALL BE FREE OF FORMALDEHYDE AND OTHER BANNED VOCs.
- E. DURING CONSTRUCTION AND OCCUPANCY, CONTRACTOR SHALL IMPLEMENT THE USGBC REQUIREMENTS FOR THE "INDOOR AIR QUALITY MANAGEMENT PLAN" FOR EACH TRADE WORK. NECESSARY INSPECTION, DOCUMENTATION AND REPORTING SHALL BE PROVIDED ALONG WITH SUBMITTING THE LEED LETTER TEMPLATES TO THE CITY FOR APPROVAL.
- F. EQUIPMENT EFFICIENCY: CONTRACTOR SHALL PROVIDE EQUIPMENT AND SYSTEMS THAT MEET OR EXCEED THE ENERGY EFFICIENCY SPECIFIED IN THE RESPECTIVE DIVISION SCOPE OF WORK AND AS REFLECTED IN THE TITLE-24 REPORT AND ACHIEVE THE TARGETED OVERALL BUILDING ENERGY SAVINGS BETTER THAN THE STANDARD T-TLE-24. PROVIDE ALL NECESSARY CONTROLS FOR THE HVAC, PLUMBING & LIGHTING PER THE T-24 AND THE RESPECTIVE LEED POINT CHECKLISTS.
- G. PROVIDE FUNDAMENTAL COMMISSIONING OF THE BUILDING ENERGY SYSTEMS, INCLUDING BUT NOT LIMITED TO - HVAC AND CONTROL SYSTEMS, OUTSIDE AIR DELIVERY, PLUMBING SYSTEMS. LIGHTING AND CONTROLS PER THE ASHRAE COMMISSIONING STANDARDS AND USGBC GUIDELINES, PROVIDE NECESSARY MANPOWER, TOOLS, MATERIALS, EQUIPMENT, TECHNICAL SUPPORT AS NECESSARY TO CONDUCT THE COMMISSIONING. SUBMIT COMMISSIONING REPORT FOR EACH EQUIPMENT, ZONE, DEVICE, AND EACH SYSTEM.
- H. REFER TO OTHER REQUIREMENTS IN THE FOLLOWING AND INCLUDE WORK SCOPE
- CONTAINED IN THESE DOCUMENTS AS IT RELATES TO WORK OF THIS DIVISION:
- SECTION 01400 PROJECT SUSTAINABILITY REQUIREMENTS. SECTION 01515 - CONSTRUCTION WASTE MANAGEMENT.
- 01810 FUNDAMENTAL COMMISSIONING OF BUILDING ENERGY SYSTEMS. LEED-NC v2.2 CHECKLIST FOR HCCC 1200 ARROWHEAD AVENUE, BUILDING-C.
- DIVISION-15 & DIVISON 16 SPECIFICATION SECTIONS AND DRAWINGS. ARCHITECTURAL, STRUCTURAL, CIVIL, STRUCTURAL PLANS AND SPECS. 2.00 THE MECHANICAL, PLUMBING & ELECTRICAL TRADE CONTRACTORS SHALL BE RESPONSIBLE

FOR COMPLYING WITH THE LEED REQUIREMENTS FOR THE FOLLOWING SELECTED CREDIT

- A. SSc8 LIGHT POLLUTION REUCTION. B. WEC3.1 AND WEc3.2 - WATER USE REDUCTION.
- C. EACP1 PREREQUISITE #1 FUNDAMENTAL COMMISSIONING OF THE BUILDING ENERGY
- D. EAcP2 MINIMUM ENERGY PERFORMANCE.
- E. EAcP3 FUNDAMENTAL REFRIGERANT MANAGEMENT.
- F. EAC1 OPTIMIZE ENERGY PERFORMANCE. BUILDING ENERGY T-24 ENERGY USE SHALL BE
- G. F. EAC2 OPTIMIZE ENERGY PERFORMANCE. BUILDING ENERGY T-24 ENERGY USE SHALL BE 15.6% BELOW T-24 PER THE T-24 COMPLIANCE FORMS ATTACHED.

J. EQc3.1 - CONSTRUCTION IAQ MANAGEMENT PLAN DURING CONSTRUCTION.

- H. EQCP1 MINIMUM IAQ PERFORMANCE.
- EQc1 OUTDOOR AIR DELIVERY MONITORING
- K. EQc3.2 CONSTRUCTION IAQ MANAGEMENT PLAN BEFORE OCCUPANCY.

L. EQc4.1 - LOW-EMITTING MATERIALS, ADHESIVES & SEALANTS.

M. EQc5 - INDOOR CHEMICAL & POLLUTANT SOURCE CONTROL.

N. EQc6.1 - CONTROLLABILITY OF SYSTEMS - LIGHTING.

REVISIONS

ISSUE FOR PERMIT

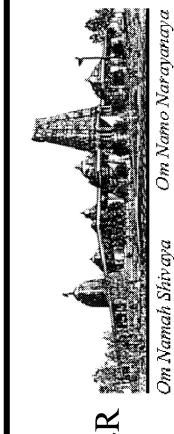
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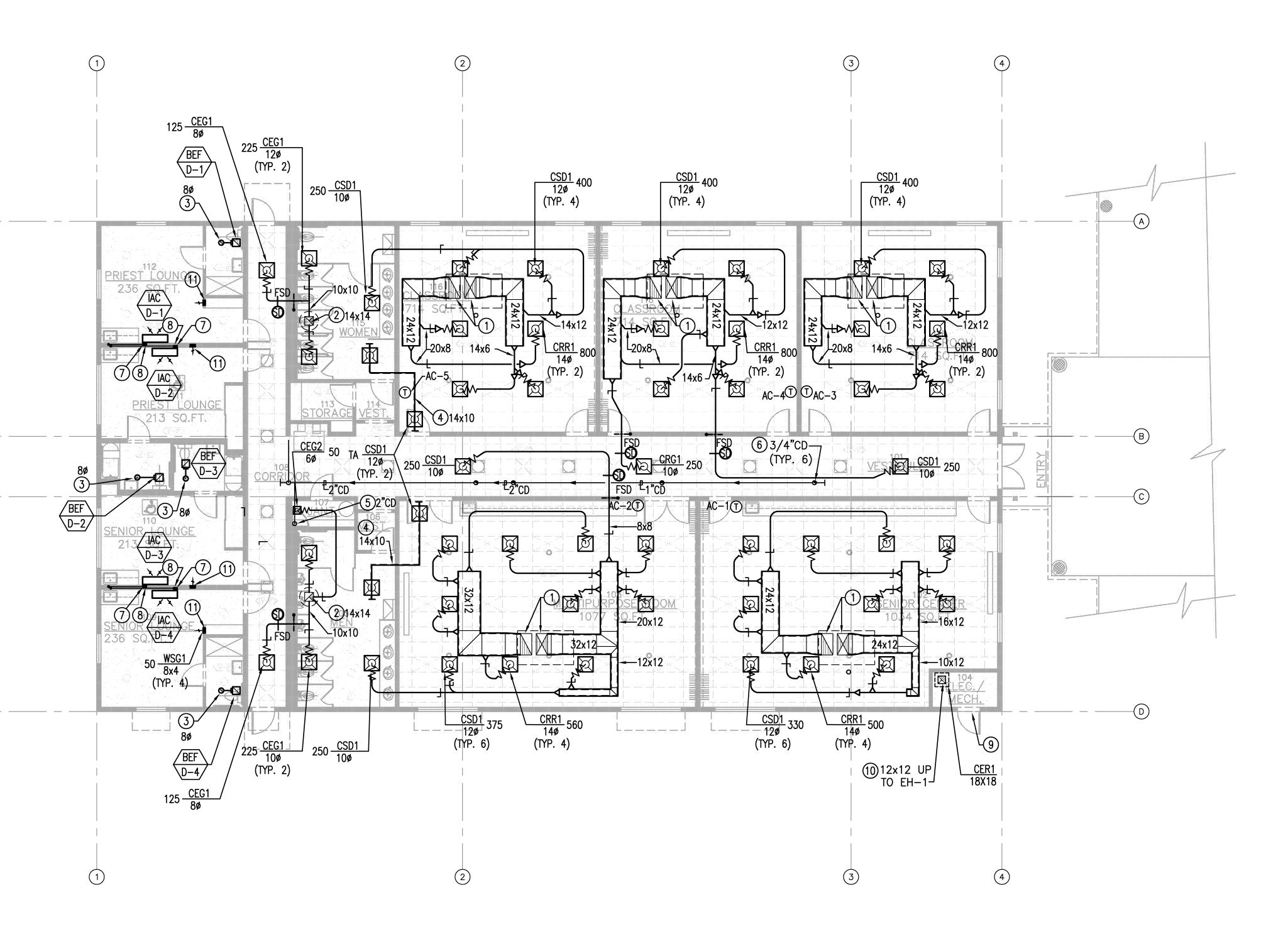
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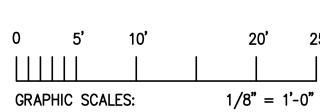
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DRAWN BY: ARROWHEAD

10/28/11





GENERAL NOTES

- A. ALL INSTALLATIONS SHALL COMPLY WITH THE CURRENT TENANT BUILDING STANDARDS AND ALL APPLICABLE CALIFORNIA AND LOCAL CODES.
- B. ALL NEW WORK SHALL COMPLY WITH CURRENT SMACNA DUCT CONSTRUCTION STANDARDS.
- C. PROVIDE VOLUME DAMPERS IN EACH BRANCH DUCTS FOR AIR BALANCING.
- D. PROVIDE TRANSFER AIR BOOT ABOVE CEILING AT ALL FULL-HEIGHT PARTITIONS.

SHEET NOTES

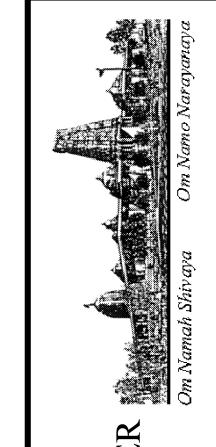
- 1) SUPPLY AND RETURN AIR DUCTS WITH ACOUSTICAL LINING FROM ROOFTOP AC UNIT IN THE ROOF. SEE ROOF PLANS FOR CONTINUATION.
- 2 14x14 EXHAUST AIR DUCT UP TO TOILET EXHAUST FANS IN THE ROOF. SEE ROOF PLANS FOR CONTINUATION.
- (3) 6¢ EXHAUST DUCT UP TO GOOSENECK EXHAUST IN THE ROOF. (TYPICAL OF 4).
- (4) 14x10 TRANSFER AIR DUCT WITH ACOUSTICAL LINING. (TYPICAL OF 2).
- 5 TERMINATE 2" CONDENSATE DRAIN LINE OVER THE JANITOR'S SINK.
- 6 3/4" CONDENSATE DRAIN LINE FROM ROOFTOP AC UNITS IN THE ROOF. TYPICAL OF 6. PROVIDE MINIMUM 1/8" PER FOOT SLOPE DOWN TO THE JANITOR; S SINK IN THE MOP ROOM.
- 7) 3/4" CONDENSATE DRAIN LINE FROM INDOOR AC UNIT. TERMINATE DRAIN LINE AT LAVATORY WASTE LINE IN THE ROOM WITH INDIRECT FITTING. INSTALL DRAIN LINE INSIDE WALL SPACE. (TYP.)
- 8 REFRIGERANT LINES & CONTROL WIRINGS TO OUTDOOR AIR-COOLED CONDENSING UNIT ON ROOF.(TYP.)
- 9 SIGHT-PROOF 18x12 EXTERIOR GRADE DOOR LOUVER WITH INSECT SCREEN.
- 10 12x12 EXHAUST AIR DUCT UP TO EXHAUST HOOD (EH-1) ON THE ROOF FOR GRAVITY EXHAUST VENTILATION. PROVIDE 18X18 EXHAUST GRILLE.
- 11) 8x3 SUPPLY DUCT FROM ROOF. INSTALL WSR1 24" ABOVE FINISH FLOOR(TYP)

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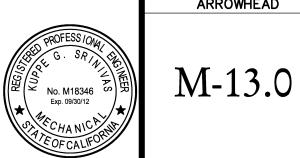
CENTE G "D"
CULTURAL MECHANICAL PLAN

BUILDING "D"

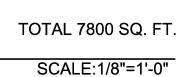
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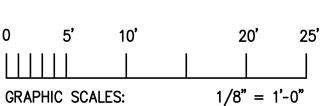
1200 ARROWHEAD AVE. LIVERMORE, CA HINDU

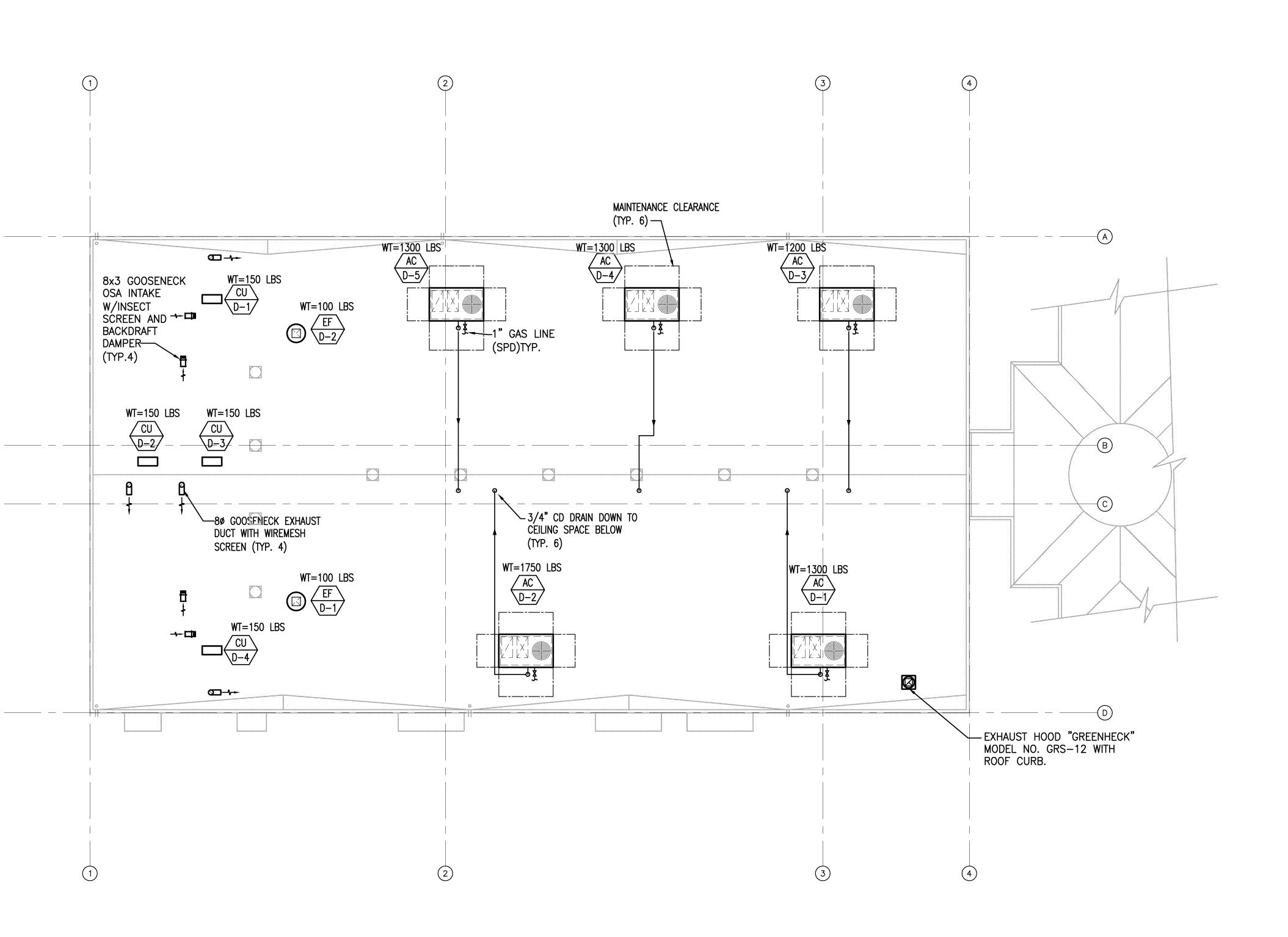
10/28/11 SCALE: AS NOTED DRAWN BY: PROJECT: ARROWHEAD











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CENTE MECHANICAL ROOF PLAN

BUILDING "D"

HINDU COMMUNITY and CULTURAL

1200 ARROWHEAD AVE. LIVERMORE, CA 94551

DATE
10/28/11
SCALE:
AS NOTED
DRAWN BY:
PT PROJECT: ARROWHEAD

M-14.0



