



Lab Tech Bachelors Program Bakersfield College Kern Community College District 550-0047

Date: February 12, 2024

To: All Bidders

Total Addendum includes: [2] 8.5x11 [14] 30X42

Subject: Addendum #2

NOTICE TO CONTRACTORS FIGURING THIS WORK

You are hereby notified of the following changes in the Plans and Specifications, which shall take precedence over anything to the contrary therein.

Item # Description

2.1 Refer to Sheets E1.00, E1.01, E2.00, E2.01, E3.00, E4.00, E4.01:

2.1.1 Replace Sheets in their entirety. All changes from previous version have been clouded (see Delta 1)

2.2 Refer to Sheets M0.00, M1.01, M1.02:

2.2.1 Replace Sheets in their entirety. All changes from previous version have been clouded (see Delta 1)

2.3 Refer to Sheets P0.00, P1.01, P1.02, P2.00:

2.3.1 Replace Sheets in their entirety. All changes from previous version have been clouded (see Delta 1)

2.4 Refer to Sheet A8.20:

2.4.1 Replace Detail 33 on Sheet A8.20 with attached Detail 33. Fume hoods and supporting steel base cabinets to be provided by Owner and installed by Contractor as noted in Specification Section 011000. Fume hoods are pre-wired and pre-plumbed. See Mechanical, Electrical and Plumbing Sheets for additional information. Balance of steel cabinets with epoxy tops in Room 27A to be provided and installed by Contractor.

End of addendum

MECHANICAL ABBREVIATIONS				SY	'MBOLS		
&	AND ANGLE	HB HD	HOSE BIBB	SYMBOL	DESCRIPTION		SECTION 1 BASIC MECHANICAL MATERIALS AND METHODS
@ ଜ	AT CENTER LINE	HDWE HI.	HARDWARE HIGH		SUPPLY AIR CEILING DIFFUSER	PART 1 - GENERAL	
ピ Ø (E)	PROPERTY LINE DIAMETER or ROUND EXISTING	HORIZ HP HW	HORIZONTAL HORSEPOWER HOT WATER			1.1 SUMMARY A. LABOR, MATERIALS, TOOLS, AN WITHIN THE CONTRACT DOCUM	ID SERVICES FOR A COMPLETE INSTALLATION OF EQUIPMENT AND SYSTEM CONTAINED
	NEW PERPENDICULAR POUND or NUMBER THERMOSTAT	HWR HWS HVAC	HOT WATER RETURN HOT WATER SUPPLY HEATING, VENTILATING, AIR CONDITIONING		SUPPLY VARIBLE AIR CEILING DIFFUSER HEAT & COOL	B. PRINCIPAL FEATURES OF THE V 1. HEATING, VENTILATING 2. ROOF CURBS FOR HVA SET UNDER THIS DIVIS	WORK INCLUDED ARE: G, AIR CONDITIONING SYSTEMS, CONTROLS, AND MECHANICAL SYSTEM INSULATION. AC SYSTEMS, INTAKE HOODS, LOUVERS, SUPPLY FANS, AND RELIEF VENTS FURNISHED AND SION.
A/C AC	AIR CONDITIONING ACCESSIBLE	ID INSUL	INSIDE DIAMETER (DIM.)	SIZE	RETURN AIR CEILING REGISTER	 REFRIGERANT PIPING, EXCAVATING AND BAC ANCHOR BOLTS, SLEE 	, CONNECTIONS, REFRIGERANT AND REFRIGERANT CHARGES. CKFILLING FOR MECHANICAL WORK; COORDINATE WITH APPROPRIATE TRADE. CVES. SUPPORTS AND SIMILAR ITEMS TO BE BUILT INTO CONCRETE OR MASONRY.
AP ABV	ACCESS PANEL ABOVE	INT	INTERIOR	СГМ		6. PREPARATION FOR TES 7. PREPARATION AND SU 8. MAINTAINING A RECOR	STING AND BALANCE OF MECHANICAL SYSTEMS AND CORRECTING DEFICIENCIES. JBMITTAL OF SHOP DRAWING AND PRODUCT DATA. RD SET OF BLUE LINE PRINTS AND MAKING THEM TO INDICATE LOCATIONS OF CONCEALED
AFF AE AGGR	ABOVE FINISH FLOOR ADJUSTABLE EXTRACTOR AGGREGATE	LBS LPG MACH	POUNDS LIQUID PETROLEUM GAS MACHINE	SIZE CFM	EXHAUST AIR CEILING REGISTER	1.2 JOB CONDITIONS.	NS MADE TO SUIT CONDITIONS AND PRODUCTION OF MECHANICAL AS-BUILT (RECORD)
alum Approx Appt Arch.	ALUMINUM APPROXIMATE APPOINTMENTS ARCHITECTURAL	MATL MAX. MBH MCA	MATERIAL MAXIMUM BTU PER HOUR (THOUSANDS) MINIMUM CIRCUT AMPS	SIZE	SUPPLY AIR WALL DIFFUSER	1.3 LOCAL CONDITIONS A. CONFORM WITH LOCAL CONDIT	TIONS. COORDINATE WITH LOCAL UTILITIES ON SIZE OF UTILITY SERVICE.
ARI ASPH ASST	AMERICAN REFRIGERATION INSTITUTE ASPHALT ASSISTANT	MECH MTL MFGR	MECHANICAL METAL MANUFACTURER	- P		1.4 INTENT A. THE CONTRACT DOCUMENTS (E	DRAWINGS AND SPECIFICATIONS) DESCRIBE THE MECHANICAL WORK OF THIS PROJECT ANY
AUTO. BD BDD (BE)	AUTOMATIC BALANCING DAMPER BACKDDRAFT SAMPER	MH MIN MISC MUA	MANHOLE MINIMUM MISCELLANEOUS MAKE UP AIR	SIZE CFM	RETURN AIR WALL REGISTER	B. THE CONTRACT DOCUMENTS F NECESSARY BUT NOT SPECIFIC FOR A COMPLETE SYSTEM, PRC	T SHALL BE AS BINDING AS THOUGH MENTIONED IN BOTH. FORM A GUIDE FOR A COMPLETE MECHANICAL INSTALLATION. WHERE AN ITEM IS REASONABLY CALLY MENTIONED, SUCH AS DUCT HANGERS OR TRANSITIONS, PIPING OFFSETS, DRAINS, ETC., OVIDE SAME. TED ON DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS OF DUCTS, AND FOURDMENT.
(BF) (BG) BLDG	BELOW FINISH FLOOR BELOW FINISH GRADE BUILDING	(N) NIC NO. or #	NEW NOT IN CONTRACT NUMBER	SIZE CFM	EXHAUST AIR WALL REGISTER	SHALL BE GOVERNED BY THE D	DRAWINGS ARE DIAGRAMMATIC ONLT. EXACT LOCATIONS OF DOCTS, AND EQUIPMENT DRAWINGS OF RELATED TRADES.
BLKG BM BTUH	BLOCKING BEAM BRITISH THERMAL UNIT/ HOUR	NOM NTS	NOMINAL NOT TO SCALE	 h		A. NO DEVIATIONS FROM SPECIFIC FROM THE DIVISION OF THE ST B. SHOULD CONTRACTOR FIND, D	CATIONS AND DRAWINGS SHALL BE MADE WITHOUT FULL KNOWLEDGE AND WRITTEN CONSENT ATE ARCHITECT. URING PROGRESS OF WORK, CONDITIONS WHICH DICTATE A MODIFICATION OF ANY PARTICULAR
BV	BALL VALVE	OBD OC	OVERALL OPPOSED BLADE DAMPER ON CENTER	SIZE	TRANSFER GRILLE	C. EQUIPMENT OR MATERIALS MA	H ITEM PROMPTLY FOR DECISION OF INSTRUCTIONS. Y NOT VARY FROM THE APPROVED PLANS.
CAP CD CED	CAPACITY CONDENSATE DRAIN CEILING FIRE DAMPER	OSA OVHD PTN	OVERHEAD PARTITION	BDD - E = = -	BACKDRAFT DAMPER	A. COMPLY WITH APPLICABLE LOC B. COMPLY WITH APPLICABLE REC THE VARIOUS TRADES (SEE DIV	CAL, STATE AND FEDERAL CODES. QUIREMENTS OF RECOGNIZED INDUSTRY ASSOCIATIONS WITH PROMULGATE STANDARDS FOR VISIONS 21 THRU 23)
CFM CHW CHWR	CUBIC FEET PER MINUTE CHILLED WATER CHILLED WATER RETURN	PHYS PR PVC	PHYSICAL PRESSURE RELIEF POLY-VINYL CLORIDE PIPE		DUCTWORK (RECTANGULAR)	C. EMPLOY ONLY QUALIFIED JOUR WORK.	RNEYMEN FOR THIS WORK. EMPLOY COMPETENT, QUALIFIED MECHANICS TO SUPERVISE THE
CHWS CJ CLG	CHILLED WATER SUPPLY CONTROL JOINT CEILING	PLAS PLYWD POC PREFAB	PLASTER PLYWOOD POINT OF CONNECTION PREFABRICATED		DUCTWORK (ROUND)	1.7 CODES AND STANDARDS A. PERFORM WORK SPECIFIED IN BELOW, AND SUCH STANDARDS STRINGENT, THEY TAKE PRECE	DIVISIONS 21 THRU 23 IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS LISTED S THAT MAY BE SPECIFIED IN OTHER SECTIONS. WHEN THESE SPECIFICATIONS ARE MORE EDENCE. IN CASE OF CONFLICT, OBTAIN A DECISION FROM THE MECHANICAL ENGINEER.
CLRG CLR CO	CAULKING CLEAR CLEANOUT	PREP PSI PW	PREPARATION POUNDS PER SQUARE INCH PROCESSED WATER			1. NFPA 54: NATIONAL FU 2. NFPA 90A: AIR CONDITI 3. NEPA 101: LIFE SAFETY	JEL AND GAS CODE. TIONING AND VENTILATION SYSTEMS.
COL COMP CONC	COLUMN COMPRESSED CONCRETE	R RA	RISER RETURN AIR		LINED DUCTWORK	4. APPLICABLE STATE BU 5. APPLICABLE STATE ME 6. ACCESSIBILITY REQUIR	JILDING CODE. ECHANICAL CODE. REMENTS ANSI A117.1. ADA. AND CBC CHAPTER 11-B
CONF CONN CONST	CONFERENCE CONNECTION CONSTRUCTION	RAD. RAG REF	RADIUS RETURN AIR GRILLE REFERENCE			 APPLICABLE STATE EN AGA: AMERICAN GAS A ANSI: AMERICAN NATION 	NERGY CODE. ASSOCIATION. ONAL STANDARDS INSTITUTE.
CONT CORR CTR	CONTINUOUS CORRIDOR CENTER	REINF REQD RM	REINFORCED REQUIRED ROOM			10. ARI: AMERICAN REFRIC 11. ASHRAE: AMERICAN SC 12. ASME: AMERICAN SOC	GERATION INSTITUTE. OCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS. CIETY FOR MECHANICAL ENGINEERS.
DBL DB	CHECK VALVE DOUBLE DRY BULD (TEMPERATURE)	S SA	SOUTH SUPPLY AIR		FLEXIBLE CONNECTION	14. MSS: MANUFACTURER' 15. NFPA: NATIONAL FIRE F 16. SMACNA: SHEET META	I'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY. PROTECTION ASSOCIATION. AL AND AIR CONDITIONING CONTRACTOR'S NATIONAL ASSOCIATION.
DEPT DET DF	DEPARTMENT DETAIL DRINKING FOUNTAIN	SAD SAG SAR	SUPPLY AIR DIFFUSER SUPPLY AIR GRILLE SUPPLY AIR REGISTER			17. UL: UNDERWRITERS' LA 18. TITLE 24 CODES: SEE S	ABORATORIES. INC. SHEET E-0.01
DHW DHWR DIA or Ø DIR	DOMESTIC HOT WATER DOMESTIC HOT WATER RETURN DIAMETER DIRECTOR	SCHD SD SEER SECT.	SCHEDULE SMOKE DETECTOR SEASONAL ENERGY EFFICIENCY SECTION	╽╼ᠮ╾╞╤╤╡	MANUAL AIR VOLUME DAMPER	A. CAREFULLY EXAMINE SPECIFIC CONNECTIONS AND COORDINA B. COORDINATE WITH OTHER DIVI SUPPORTS PRIOR TO POURING	CATIONS AND DRAWINGS TO BE THOROUGHLY FAMILIAR WITH ITEMS WHICH REQUIRE HVAC ITION. ISIONS TO LEAVE PROPER CHASES AND OPENINGS. PLACE OUTLETS, ANCHORS, SLEEVES, AND
DN DR DS	DOWN DOOR DOWNSPOLIT	SHT SIM SQ	SHEET SIMILAR SQUARE		FIRE DAMPER	1.9 SUBMITTALS A. SUBMITTALS ARE ONLY REQUIE	RED FOR SPECIFIC ITEMS OF EQUIPMENT OR MATERIAL LISTED IN INDIVIDUAL SECTIONS OF
DSP DTR DTW	DRY STANDPIPE DUCT THRU ROOF DUCT THRU WALL	SPEC SP SOV	SPECIFICATION STATIC PRESSURE SHUT-OFF VALVE SERVICE SINK	SFD SFD		THESE SPECIFICATIONS. B. WITHIN 15 DAYS AFTER AWARD EQUIPMENT OR MATERIAL TO B PRODUCT DATA, AND OBTAIN A	O OF CONTRACT FOR THIS WORK, SUBMIT A LIST OF PROPOSED MANUFACTURERS (OF BE USED) FOR APPROVAL. SUBMIT THIS LIST BEFORE SUBMITTAL OF SHOP DRAWINGS AND APPROVAL BEFORE SUBMITTING REQUIRED ITEMS.
DWG E EA	DRAWING EAST EXHAUST AIR	SS SST STD STI	SERVICE SINK STAINLESS STEEL STANDARD STEEL	│ ─╂─ ┆╂┊	SMORE FIRE DAMIFER	C. SHOP DRAWINGS (NOT REQUIR 1.10 DELIVERY AND STORAGE	RED FOR OWNER FURNISHED EQUIPMENT).
EAG EDB EER	EXHAUST AIR GRILLE ENTERING DRY BUBL ENERGY EFFICIENCY RATIO	STOR	STORAGE STRUCTURAL	OAI 500	OUTSIDE AIR INTAKE MIN. CFM	A. INSOFAR AS POSSIBLE, DELIVER PRACTICAL. COVER ITEMS WITH TRANSPORT, UNLOADING, AND	H TIEMS IN MANUFACTURER'S ORIGINAL UNOPENED PACKAGING. WHERE THAT IS NOT H PROTECTIVE MATERIALS TO KEEP THEM FROM BEING DAMAGED. USE CARE IN LOADING, STORAGE TO KEEP ITEMS FROM BEING DAMAGED.
ELEC ELEV EMER	ELECTRICAL ELEVATION EMERGENCY	SUPV SUSP S&W	SUPERVISOR SUSPENDED SOIL & WASTE			1.11 FIRE RATINGS A. MATERIALS USED ANYWHERE II 1. FLAME SPREAD - NOT (N THE WORK MUST HAVE NFPA RATINGS AS FOLLOWING: OVER 25
ENCL EP EQ	ENCLOSURE ELECTRICAL PANEL EQUAL	TC TEL TER	TOP OF CURB TELEPHONE TERRAZZO	A/C-1	SENSOR, SUBSCRIPT INDICATES UNIT	2. SMOKE DEVELOPED - N 3. FUEL CONTRIBUTED - N B. MATERIALS SHALL BE "SELF EX	NOT OVER 50 NOT OVER 25 (TINGUISHING".
EQUIP (E) ESP	EQUIPMENT EXISTING EXTERNAL STATIC PRESSURE	TG THK TOC	TRANSFER GRILLE THICK TOP OF CONCRETE	ВТ	BYPASS TIMER	1.12 PERMITS AND FEES A. OBTAIN, PAY FOR, AND DELIVER AUTHORITIES HAVING JURISDIC	R PERMITS, CERTIFICATION OF INSPECTION, AND OTHER SUCH ITEMS REQUIRED BY THE CTION DELIVER CERTIFICATION TO THE CONSTRUCTION MANAGER PRIOR TO FINAL
EWB EXPO. EXT	ENTERING WET BULB EXPOSED EXTERIOR	TP TRANS TREAT.	TRAP PRIMER TRANSCRIPTION TREATMENT			ACCEPTANCE OF THE WORK. A SUBMITTED PRIOR TO OR WITH APPLICATION FOR THE INSPEC	AN INSPECTION CERTIFICATE FOR EACH CLASS OF WORK REQUIRING INSPECTION MUST BE I THE FINAL PAYMENT INVOICE. THE RESPONSIBLE TRADE CONTRACTOR MUST MAKE TION, COORDINATE SAME AND PAY THE REQUIRED INSPECTION FEE.
FA FC FD	FIRE ALARM FLEXIBLE CONNECTION FIRE DAMPER	TYP TV UL	TYPICAL TEMPERING VALVE UNDERWRITERS LABORATORIES	ТС	TIME CLOCK	1.13 EXTENDED WARRANTIES A. WORK FURNISHED UNDER THE FURNISHED) MATERIALS FOR A	CONTRACT SHALL BE WARRANTED AGAINST DEFECTS IN WORKMANSHIP AND (CONTRACTOR PERIOD OF NOT LESS THAT ONE (1) YEAR, OR AS OTHERWISE SPECIFIED, FROM THE DATE OF
FDN FHC	FOUNDATION FIRE HOSE CAB.	UON UR	UNLESS OTHERWISE NOTED URINAL			FINAL ACCEPTANCE OF THE INS REMEDIED, AND DEFECTIVE MA WORK CAUSES DAMAGE TO TH	STALLATION, DEFECTS OF WORKMANSHIP DEVELOPING DURING THIS PERIOD SHALL BE ATERIAL REPLACED, WITHOUT ADDITIONAL COST. WHEN DEFECTS IN A TRADE CONTRACTOR'S IE WORK OF THE OTHER TRADE CONTRACTORS, SUCH DAMAGE SHALL BE REPAIRED BY THE
FLA FM	FULL LOAD AMPS FIRE MAIN	VD VTR VSAD	VOLUME DAMPER VENT THRU ROOF			TRADE CONTRACTOR CAUSING CONTRACTOR THAT CAUSED TH	G DAMAGE AND WORK RESTORED TO ITS ORIGINAL CONDITION, AT THE EXPENSE OF THE TRADE HE DAMAGE.
FPM FSD FSL	FEET PER MINUTE FIRE/SMOKE DAMPER FIRE SPRINKLER LINE	W W/	WASTE LINE WITH		POINT OF CONNECTION	2.1 MATERIALS AND EQUIPMENT	
FTR FURR	FLUE THRU ROOF FURRING	WFD WH	WALL FIRE DAMPER WATER HEATER		CEILING EXHAUST FAN	A. WITHIN THE CONTRACT DOCUM OTHER PROPRIETARY REFERENT THE STANDARDS OF QUALITY A	MENTS RELATING TO MECHANICAL WORK, MANUFACTURER'S NAMES, CATALOG NUMBERS, AND NCES TO MATERIALS AND EQUIPMENT ARE MADE. SUCH REFERENCES ARE MADE TO ESTABLISH AND TYPE REQUIRED, AND NOT TO LIMIT COMPETITION. ACCEPTABLE MANUFACTURER'S OF
GA	GAUGE OR GAGE	WHA W/O	WATER HAMMER ARRESTOR WITHOUT			SUBSTITUTION OR ADDITIONS T OF ACCEPTABILITY OF ITEMS PI	TO "APPROVED EQUALS" WILL BE CONSIDERED, BUT THE ARCHITECT WILL BE THE SOLE JUDGE ROPOSED AS SUBSTITUTES.
GALV GEN GI	GALVANIZED GENERAL GALVANIZED IRON	WMF WP	WASHING MACHINE FITTING WATERPROOF	CO	CO2 SENSOR	TESTING LABORATORY LABEL V	WHEN SUCH LABELS ARE AVAILABLE.
GPM G	GALLONS PER MINUTE GAS LINE	VVI	WEIGHT	PLC	GENERIC FOR CONTROL PANEL OR PLC	PART 3 - EXECUTION	
		τ ΛΝΙ		.⊏			
THE F 1617A 1. A	THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 2022 CBC SECTIONS 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26 AND 30: 1 ALL PERMANENT FOLLIPMENT AND COMPONENTS						
2. TI W 3. TI	 TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH AS ELECTRICITY, GAS OR WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A FLEX CABLE. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEFT OR MORE ABOVE THE ADJACENT FLOOR 						
OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA. THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE DESIGN COMPLIANCE WITH SIZE RAG - RETURN AIR RETURN/EXHAUST 'T'BAR CEILING #PSAEC5TB							
THE R AND C A. C	THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATED DUCTWORK, PIPING AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS: A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR BOOF LEVEL THAT.						
B. C	DIRECTLY SUPPORT THE COMPONENT. B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LEES THAN 5 POUNDS PER FOOT, WHICH ARE SUSPENDED FROM A ROOF OR ELOOR OR HUNG EROM A WALL						
THE A	THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSIONAL IN GENERAL RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIEV THAT ALL COMPONENTS.						
AND E							CFM CEILING DIFFUSER LIGHTING.
PIPI	PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE						

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SECTION 13.3 AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25, AND 1617A.1.26 THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW.

WHEN BRACING AND ATTACHMENTS ARE BASED ON A PRE-APPROVED INSTALLATION GUIDE (EG. OSHPOD OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SYSTEM INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEMS. THE STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE THE LOADS. MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEM (E):

MP MD PP E OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

□ MP □ MD □ PP □ E OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVED (OPM #) #____

SECTION ' BASIC MECHANICAL MATERIALS AND METHODS

REGISTER SCHEDULE

DUCT SIZING REQUIREMENTS

0-90 CFM	600 FPM	.08 LOSS PER 100FT	6" DIAMETER
90-200 CFM	600 FPM	.08 LOSS PER 100FT	8" DIAMETER
200-375 CFM	700 FPM	.08 LOSS PER 100FT	10" DIAMETER
375-600 CFM	800 FPM	.08 LOSS PER 100FT	12" DIAMETER
600-900 CFM	875 FPM	.08 LOSS PER 100FT	14" DIAMETER
900-1200 CFM	900 FPM	.08 LOSS PER 100FT	16" DIAMETER
1200-1600 CFM	900 FPM	.08 LOSS PER 100FT	18" DIAMETER
1600-2000 CFM	900 FPM	.08 LOSS PER 100FT	20" DIAMETER
2000-2400 CFM	900 FPM	.08 LOSS PER 100FT	22" DIAMETER

ALL ELBOWS TO BE SMOOTH RADIUS 2. ALL FITTINGS TO BE OF INDUSTRY STANDARD TYPE WITH COEFFICIENTS PUBLISHED IN MANUAL Q

GENERAL MECHANICAL NOTES

2.4 DUCTWORK SPECIALTIES 3.1 LOCATIONS A. MECHANICAL LAYOUTS INDICATED ON DRAWINGS ARE DIAGRAMMATIC. EXACT LOCATIONS OF DUCT, AND EQUIPMENT MAY VARY BECAUSE OF CONFLICTS WITH WORK OF OTHER TRADES. WORK OUT CONFLICTS WHERE RELOCATION'S WILL NOT AFFECT OPERATION OR APPEARANCE OF SYSTEMS. B. LOCATE EQUIPMENT REQUIRING PERIODIC SERVICING SO THAT IT IS READILY ACCESSIBLE. DO NOT BACK UP SERVICE SIDES

TO WALLS, NOR PLACE IT TOO CLOSE TO OTHER EQUIPMENT TO MAKE SERVICE IMPRACTICAL. EQUIPMENT SERVICE CLEARANCE SHALL MEET MINIMUM ACCEPTABLE DISTANCE AS RECOMMENDED BY EQUIPMENT MANUFACTURER.

3.2 UTILITIES EXCAVATING AND BACKFILLING A. PERFORM TRENCHING, EXCAVATING, BACKFILLING FOR MECHANICAL WORK IN ACCORDANCE WITH THE APPROPRIATE SECTIONS AND AS SET FORTH BELOW PERFORM WORK NECESSARY FOR INSTALLATION OF MECHANICAL UTILITIES. ABOVE PIPE WIT SAND OR CLASS "B" CRUSHED STONE TAMPED FIRM AND EVEN. SEPARATE TOPSOIL DURING WITH BATTER BOARDS PLACED EVERY 25'. BACKFILLING SHALL BE DONE TO EXCLUDE USE OF ROCK OR STONE ABOVE SAND OR CRUSHED STONE.

3.3 CUTTING AND PATCHING A. REPAIR OR REPLACE ROUTINE DAMAGE CAUSED BY CUTTING IN PERFORMANCE OF CONTRACT. B. CORRECT UNNECESSARY DAMAGE CAUSED DUE TO INSTALLATION OF MECHANICAL WORK. PERFORM REPAIRS WITH MATERIALS WHICH MATCH EXISTING AND INSTALL IN ACCORDANCE WITH THE APPROPRIATE SECTION OF THESE SPECIFICATIONS OR THE BEST STANDARDS OF THE INDUSTRY.

3.4 CONNECTION TO EQUIPMENT A. CONNECT OR INSTALL EQUIPMENT SHOWN ON MECHANICAL DRAWINGS THAT REQUIRE MECHANICAL HOOKUPS.

3.5 SERVICE OF SYSTEM A. IF EQUIPMENT IS PLACED IN SERVICE PRIOR TO ACCEPTANCE OF THE PROJECT, OPERATE EQUIPMENT STRICTLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. INSTALL NEW FILTERS IN EQUIPMENT PRIOR TO OWNER OCCUPYING

BUILDING B. EMPLOY COMPETENT, QUALIFIED PERSONNEL IN OPERATION OF THE EQUIPMENT. . PROVIDE FOR PROPER OPERATION AND CLEANLINESS.

D. OPEN UP EQUIPMENT FOR INSPECTION AS DIRECTED BY THE SUPERINTENDENT . LUBRICATE EQUIPMENT AND PERFORM SUCH OTHER MAINTENANCE AS REQUIRED TO PLACE IT IN FIRST CLASS OPERATING CONDITION

DURING MANUFACTURING DUCT OPENINGS AND MECHANICAL EQUIPMENT SHALL BE PROTECTED THROUGH SHIPMENT AND START UP TO REDUCE THE AMOUNT OF DUST. WATER AND DEBRIS ENTERING THE SYSTEM.

> END OF SECTION SECTION 2

PART 1 - GENERAL

1.1 RELATED DOCUMENTS A. REFER TO DRAWINGS AND CONTRACT FOR MATERIALS FURNISHED BY OWNER, INSTALLED BY CONTRACTOR OR FURNISHED AND INSTALLED BY OWNER. 1.2 SCOPE OF WORK

A. FURNISH ALL LABOR, SUPERVISION, AND EQUIPMENT (UNLESS EQUIPMENT IS SPECIFICALLY NOTED AS 'OWNER FURNISHED') FOR THE COMPLETE INSTALLATION OF HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM TOGETHER WITH ALL NECESSARY AUXILIARIES AND APPURTENANCES.

- **1.3 QUALITY ASSURANCE** A. MANUFACTURER'S QUALIFICATIONS - INSTALL PACKAGED UNITS, AS INDICATED IN THE DRAWINGS, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND REQUIREMENTS. PROVIDE RELATED PRODUCTS AND ACCESSORIES FROM ONE MANUFACTURER. STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION PROTECTING FROM DIRT MOISTURE, CONTAMINANTS, AND WEATHER. B. CODES AND STANDARDS - PERFORM ALL INSTALLATION IN ACCORDANCE WITH THE LATEST STANDARDS AS RECOGNIZED BY ASHRAE, SMACNA AND ALL APPLICABLE STATE AND LOCAL CODES AND ORDINANCES. C. WORKMANSHIP - EXPERIENCED. WELL - TRAINED WORKERS. COMPETENT TO COMPLETE THE WORK AS SPECIFIED. SHALL PERFORM LABOR IN CONFORMANCE WITH GENERALLY ACCEPTED TRADE STANDARDS. INSTALL ALL EQUIPMENT SQUARE AND
- PLUMB ALLOWING ACCESS FOR PROPER OPERATION, ADJUSTMENT AND SERVICE.

1.4 STRUCTURAL AND SPACE CONDITIONS A. ALL WORK SHALL AVOID OBSTRUCTIONS AND INTERFERENCE WITH OTHER TRADES. PRESERVE HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR AND FREE.

1.5 VIBRATION AND NOSE A. INSTALL EACH OF THE VARIOUS PIECES OF EQUIPMENT TO OPERATE WITHOUT OBJECTIONABLE VIBRATION OR NOISE.

1.6 CUTTING AND PATCHING A. CUTTING OR PATCHING NECESSARY TO PERMIT THE INSTALLATION OF ANY WORK UNDER THIS CONTRACT SHALL BE THE RESPONSIBILITY OF THIS TRADE. CUTTING AND PATCHING SHALL BE COORDINATED WITH OTHER TRADES SO AS NOT TO IMPACT OTHER WORK

SHALL BE AN NEBB COMPANY

- **1.7 BALANCING AND TESTING** A. TEST AND BALANCE SHALL BE PERFORMED BY A NATIONALLY QUALIFIED TEST AND BALANCE COMPANY. BALANCE COMPANY B. CONTRACTOR SHALL COORDINATE TESTING WITH THE TESTING AND BALANCE COMPANY. ALL SYSTEMS SHALL BE FULLY OPERATIONAL PRIOR TO COMMENCEMENT OF TESTING. CORRECT ALL DEFICIENCIES NOTED IN THE TEST AND BALANCE REPORT WITHIN THREE DAYS OR PRIOR TO ACCEPTANCE OF THE PROJECT C. ASSUME RESPONSIBILITY FOR CORRECTING ALL ITEMS DETERMINED TO BE THE RESULT OF IMPROPER OR INCOMPLETE INSTALLATION. EXTRA TESTING REQUIRED DUE TO SUCH DEFICIENCIES WILL BE AT CONTRACTOR'S EXPENSE. D. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEST REPORTS TO THE LOCAL BUILDING AND HEALTH DEPARTMENTS AS REQUIRED FOR CERTIFICATE OF OCCUPANCY. E. OUTSIDE AIR SETTING ON A HVAC UNIT SHALL BE PERFORMED BY AN INDEPENDENT CERTIFIED COMPANY. COMPANY SHALL BE AN NEBB COMPANY
- PART 2 PRODUCTS

2.1 AIR CONDITIONING UNITS, FANS AND AIR DEVICES A. SHALL BE AS INDICATED ON THE DRAWINGS.

- 2.2 DUCTWORK A. FABRICATION AND INSTALLATION, GENERAL - EXCEPT AS OTHERWISE INDICATED, FABRICATE AND INSTALL RECTANGULAR AND ROUND DUCTS IN ACCORDANCE WITH 2022 CMC CHAPTER 6 DUCT SYSTEMS. CONFORM TO THE REFERENCED SMACNA HVAC DUCT CONSTRUCTION STANDARDS FOR METAL AND FLEXIBLE DUCTS. AN APPROVED FLEXIBLE DUCT MAY BE USED FOR THE LAST 5 FT CONNECTION TO REGISTERS. B. DUCT INSTALLATION AND PLENUMS SHALL MEET THE REQUIREMENTS OF ENERGY CODE SECTION 120.4 AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. ALL CONNECTIONS BETWEEN HVAC EQUIPMENT, PLENUMS AND DUCTS SHALL BE SEALED USING UL 181 TAPE OR MASTIC. HORIZONTAL FLEX DUCTS SHALL BE SUPPORTED AT A MAX. 4 FT. INTERVALS W/ HANGING STRAPS A MIN. 1-1/2" WIDE. FLEX DUCTS MUST BE PULLED TIGHT W/ A MAX. SAG OF 1/2" PER FOOT OF HORIZONTAL
- RUN. FLEX DUCTS SHALL USE A DRAW-BAND TO ATTACH THE INNER CORE TO A METAL COLLAR. FLEX DUCTS SHALL NOT BE KINKED OR CRUSHED.

C. FOR ROOF MOUNTED HVAC UNITS A GASKET SHALL BE PLACED BETWEEN THE CURB AND THE HVAC UNIT. MASTIC SEALANT SHALL BE USED TO SEAL ALL SEAMS BETWEEN THE HVAC UNIT AND THE CURB. THE SUPPLY AND RETURN DUCTS SHALL BE ATTACHED TO THE CURB AND MASTIC SHALL BE USED TO SEAL THE DUCTS TO THE CURB. D. THE SUPPLY AND RETURN DUCTS SHALL BE THE SAME SIZE AND ALIGN WITH THE HVAC UNIT.

2.3 DUCT ACCESS PANELS AND DOORS A. IN SHEET METAL WORK, HOLLOW CORE DOUBLE CONSTRUCTION OF SAME OR HEAVIER GAGE MATERIAL AS DUCT IN WHICH INSTALLED, PRODUCTS BY CESCO, VENT PRODUCTS, AIR BALANCE, OR EQUIVALENT.

DOORS AND 333 SERIES ON HIGH PRESSURE SYSTEMS.

- SPONGE RUBBER, FIT LARGER DOORS AGAIN 1-1/2" BY 1/8" FLAT STOCK OR ANGLE FRAME AND GASKET WITH 3/4" BY 1/8" SPONGE RUBBER OR FELT
- 3. DOOR SWING TO BE OPPOSITE OF AIRFLOW.

Note!

THE CALIFORNIA ENERGY CODE SECTION 10-103 REQUIRES ON ALL NEWLY INSTALLED LIGHTING CONTROLS, MECHANIC ENVELOPES, AND PROCESS EQUIPMENT AFTER INSTALLATION PROJECT COMPLETION. AN ACCEPTANCE TEST IS A FUNCTI TEST TO HELP ENSURE THAT NEWLY INSTALLED EQUIPMEN COMPLIANCE WITH THE ENERGY CODE.

LIGHTING CONTROLS ACCEPTANCE TESTS MUST BE PERFOR LIGHTING CONTROLS ACCEPTANCE TEST TECHNICIAN (ATT)

MECHANICAL SYSTEM ACCEPTANCE TESTS MUST BE PERFC MECHANICAL ATT FOR PROJECTS SUBMITTED ON OR AFTER A LISTING OF CERTIFIED ATT'S CAN BE FOUND AT: https://www.energy.ca.gov/programs-and-topics/programs/acceptar

-technician-certification-provider-program/acceptance THE ACCEPTANCE TESTING PROCEDURES MUST BE REPEAT MUST BE CORRECTED BY THE BUILDER OR INSTALLING CON CONSTRUCTION/INSTALLATION OF THE SPECIFIED SYSTEMS

PROJECT INSPECTORS WILL BE COLLECTING THE FORMS TO REQUIRED ACCEPTANCE TESTS HAVE BEEN COMPLETED.

THE REQUIRED ACCEPTANCE CRITERIA.

ACCEPTANCE TESTS SHALL BE COMPLETED ON NEWLY INST REPLACEMENT OF MECHANICAL SYSTEMS BEFORE PROJEC CALIFORNIA ENERGY CODE SECTION 10-103. ACCEPTANCE PERFORMED BY A CERTIFIED ACCEPTANCE TEST TECHNICIA ACCEPTANCE TESTING PROCEDURES MUST BE REPEATED, CORRECTED UNTIL THE INSTALLATION OF THE SPECIFIED S PASS THE REQUIRED ACCEPTANCE CRITERIA. COMPLETED I SUBMITTED TO THE PROJECT INSPECTOR AND THE DISTRIC

- DEPTH OF EXCAVATION TO PROVIDE A MINIMUM OF 3' ABOVE TOP OF PIPE. EXCAVATION TO BE CARRIED TO A DEPTH OF AT LEAST 6" BELOW BOTTOM OF PIPE ELEVATION. FILL BELOW PIPE (6"), AROUND PIPE, AND A MINIMUM OF 12" EXCAVATION. FINAL LAYER OR DIRT (12" MINIMUM) TO BE TOPSOIL. TRENCHES TO BE AT LEAST 18" WIDER THAN PIPE

 - HEATING, VENTILATION AND AIR CONDITIONING

- PROVIDE VENTLOK OR APPROVED HINGES AND LATCHES ON ALL DOORS; 100 SERIES HINGES AND LATCHES ON LOW PRESSURE SYSTEM DOORS UP TO 18" MAXIMUM DIMENSION, 200 SERIES ON LARGER LOW PRESSURE SYSTEM CONSTRUCT DOORS UP TO 18" MAXIMUM DIMENSION WITH ONE INCH OVERLAP FIT AND GASKET WITH 3/4" BY 1/8"

A. VOLUME AND SPLITTER DAMPERS GALVANIZED SHEET METAL BLADE AND FRAME WITH VENTFABRICE INC. VENTLOK OPERATING HARDWARE. FOR ACCESSIBLE DAMPERS. PROVIDE #641 SELF - LOCKING DIAL REGULATORS AND #644 SELF - LOCKING DIAL REGULATORS FOR INSULATED DUCTWORK, #637 SQUARE END BEARING, AND #635 SPRING END BEARING, AS

- APPLICABLE FOR INACCESSIBLE DAMPERS, PROVIDE #666 OR #667 CONCEALED LOCKING DAMPER REGULATOR WITH BEARING AS ABOVE. FOR STATIC PRESSURES ABOVE 3" W.G., PROVIDE #640 HIVEL DIAL REGULATOR AND #609 HIVEL END BEARING FOR ACCESSIBLE DAMPERS. B. MULTI - LOUVER VOLUME DAMPERS
- 1. 16 GAUGE GALVANIZED STEEL FRAME. OPPOSED, 6" WIDE, 16 GAUGE GALVANIZED STEEL BLADES. CONCEALED LINKAGE IN FRAME. TITUS #AG - 35 - B, RUSKIN #CD35/ OBD OR EQUAL C. FLEXIBLE CONNECTIONS
- PROVIDE FLEXIBLE CONNECTORS AT THE DISCHARGE AND INLET OF FANS, AIR HANDLERS, ROTATING MECHANICAL EQUIPMENT, AND WHERE SHOWN AN THE DRAWINGS FOR PROPER VIBRATION ISOLATION. NEOPRENE IMPREGNATED GLASS CLOTH WITH 24 - GAUGE GALVANIZED METAL FRAME. MINIMUM DIMENSIONS - 3" METAL, 3" FABRIC, 3" METAL. DURO DYNE #MFN4, VENT FABRICS #VENTGLAS, Q INDUSTRIES, CONSOLIDATED KINETICS, ELGEN, OR EQUAL D. BACKDRAFT DAMPERS
- PROVIDE COUNTERWEIGHT TYPE COMPLETE WITH FRAME, END BEARING, COUNTERBALANCE ASSEMBLY, BLADES AND LINKAGE. INSTALL AT OUTSIDE AIR INTAKE, EXHAUST OUTLETS, AND WHERE SHOWN ON DRAWINGS. PACIFIC AIR PRODUCTS #PRD - 100AL, RUSKIN #CBS - 7 OR EQUAL BY AMERICAN WARMING. OR VENT PRODUCTS. E. TURNING VANES
- PROVIDE TURNING VANES AT ALL 90° AND 45° SQUARE ELBOWS. TURNING VANES SHALL BE DOUBLE WALL AIR FOIL TYPE CONSTRUCTED AND INSTALLED AS PER SMACNA. 2.5 DUCT INSULATION
- A. ACCEPTABLE MANUFACTURERS: PROVIDE PRODUCTS OF THE FOLLOWING MANUFACTURES, COMPLYING WITH SPECIFIED REQUIREMENTS. EQUIVALENT PRODUCTS OF OTHER MANUFACTURERS WILL BE CONSIDERED. OWENS - CORNING FIBERGLAS CORP. MANVILLE PRODUCTS CORP. CERTAINTEED CORP.
- B. ALL INSULATION MATERIAL SHALL COMPLY WITH APPLICABLE ENERGY CONSERVATION REGULATION FOR PROJECT LOCATION. C. PROVIDE COMPOSITE MECHANICAL INSULATION (INSULATION, JACKET, COVERINGS, SEALERS, MASTICS, AND ADHESIVES) WITH FLAME - SPEED INDEX OF 25 OR LESS, AND SMOKE - DEVELOPED INDEX OF 50 OR LESS, AS TESTED BY ASTM E84 (NFPA 255)
- METHOD D. PROVIDE STAPLES, BANDS, WIRES, TAPE, ANCHORS, CORNER ANGLES AND SIMILAR ACCESSORIES AS RECOMMENDED BY INSULATION MANUFACTURER FOR APPLICATIONS INDICATED. E. PROVIDE CEMENTS, ADHESIVES, COATINGS, SEALERS, PROTECTIVE FINISHES, AND SIMILAR COMPOUNDS AS RECOMMENDED
- BY INSULATION MANUFACTURER FOR APPLICATIONS INDICATED. 2.6 REFRIGRANT PIPING A. REFRIGERANT PIPING TO BE COPPER SEAMLESS, VACUUM PACKED TUBING.
- B. ALL SUCTION LINES TO SLOPE BACK TOWARDS CONDENSING UNIT. C. ALL SUCTION LINES HEADING UP TOWARDS CONDENSING UNIT SHALL HAVE A 'P' TRAP.
- D. PROVIDE SIGHT GLASS AND FILTER DRIER ON LIQUID LINES AT CONDENSING UNITS. E. ALL REFRIGERANT PIPING UNDERGROUND TO BE CONTAINED IN A PVC SLEEVE. F. REFRIGERANT PIPING TO BE SIZED AND INSTALLED AS PER EQUIPMENT MANUFACTURERS RECOMMENDATIONS.
- G. REFRIGERANT PIPING TO BE INSULATED WITH ARMAFLEX INSULATION. H. INSTALL AIREX PRO-SYSTEM KIT AIR-TIGHT SEALING WITH A WALL-MOUNTED PIPING OUTLET AND A UV/VAPOR RETARDER PIPING INSULATION PROTECTOR FOR EXTERIOR APPLICATIONS OF HVAC REFRIGERANT PIPING WALL PENETRATIONS AND OUTDOOR INSULATION. NO "ARMAFLEX" ALLOWED
- 2.7 HVAC CONTROLS A. SHALL BE AS INDICATED ON THE DRAWINGS.
- B. ELECTRIC AND ELECTRONIC HVAC CONTROLS COMPONENTS AND OPERATING FEATURES AS INDICATED ON THE DRAWINGS. MINIMUM OUTDOOR AIR IN CLASSROOM IS DESIGNED TO 0.38 CFM PER SF OR 15 CFM PER OCCUPANT, WHICHEVER IS GREATER. WITH OCCUPANT SENSOR VENTILATION CONTROL DEVICE PER CEC 120.2(E)3.
- C. THERMOSTAT SHALL BE PROGRAMMED ON SITE TO ENSURE MINIMUM AIR RATE IS SUPPLIED TO SPACE AT ALL OCCUPIED TIMES AND PROVIDE PRE-OCCUPANCY PURGE ONE HOUR PRIOR TO BUILDING BEING OCCUPIED PER CEC 120.1(D)1. D. UPON SITE PLACEMENT THE OPERATION AND MAINTENANCE DOCUMENTATION FOR ALL MECHANICAL SYSTEMS AND CONTROLS
- SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR AND CONTROLS CONTRACTOR OR GENERAL CONTRACTOR TO THE FACILITIES O&M OR OWNERS REP. E. HEAT PUMPS USING SUPPLEMENTARY ELECTRIC RESISTANCE HEATING MUST USE A THERMOSTAT DESIGNED FOR HEAT PUMPS PER SECTION 110.2(B). THERMOSTAT SHALL BE PROGRAMMED TO PREVENT SUPPLEMENTARY HEATER OPERATION WHEN THE HEATING LOAD CAN BE MET BY THE HEAT PUMP ALONE. THE CUT-ON TEMPERATURE FOR COMPRESSION HEATING MUST BE HIGHER THAN THE CUT-ON TEMPERATURE FOR SUPPLEMENTARY HEATING. AND THE CUT-OFF TEMPERATURE FOR COMPRESSION HEATING MUST BE HIGHER THAN THE CUT-OFF TEMPERATURE FOR SUPPLEMENTARY HEATING.
- PART 3 EXECUTION

3.1 HVAC SYSTEM INSTALLATION, GENERAL SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF MECHANICAL SYSTEMS, MATERIALS, AND EQUIPMENT, COMPLY WITH THE FOLLOWING REQUIREMENTS A. COORDINATE MECHANICAL SYSTEMS, EQUIPMENT, AND MATERIALS WITH OTHER BUILDING COMPONENTS.

- B. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS. . ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR MECHANICAL INSTALLATIONS. D. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SLEEVES TO BE SET IN POURED IN PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS AS THEY ARE (E. SEQUENCE, COORDINATE, AND INTEGRATE INSTALLATIONS OF MECHANICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. GIVE PARTICULAR ATTENTION TO LARGE EQUIPMENT REQUIRING POSITIONING PRIOR TO CLOSING IN THE
- BUII DING F. WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE. G. COORDINATE CONNECTION OF MECHANICAL SYSTEMS WITH EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND
- SERVICES. COMPLY WITH REQUIREMENTS OF GOVERNING REGULATIONS, FRANCHISED SERVICE COMPANIES, AND CONTROLLING AGENCIES. PROVIDE REQUIRED CONNECTION FOR EACH SERVICE. H. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO CONFORM WITH DRAWINGS AND SPECS. TO GREATEST EXTENT POSSIBLE CONFORM TO ARRANGEMENTS INDICATED BY THE CONTRACT DOCUMENTS, RECOGNIZING THAT PORTIONS OF THE WORK ARE SHOWN ONLY IN DIAGRAMMATIC FORM. WHERE COORDINATION REQUIREMENTS CONFLICT WITH INDIVIDUAL SYSTEM REQUIREMENTS, REFER CONFLICT TO THE CONTRACTOR FOR RESOLUTION PRIOR TO INSTALLATION.
- INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, WHERE INSTALLED EXPOSED IN FINISHED SPACES OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL
- J. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT

	HVAC EQUIPMENT SCHEDULE
DOAS 1	AAON #RN-010-8-0-EB09-3L9:M000-U00-DCD-AGC-0DV0H0F-00-F000000VB DEDICATED OUTSIDE AIR SYSTEM 3,200 CFM @1"WC ESP - DUCT SMOKE DETECTOR - DX COOLING 126.5 MBH TOTAL COOLING 12.1 EER 15.2 IEER 105.0/72.0 EAT 66.4/69.5 LAT - DX-REHEAT 28.3 MBH 75.0/62.6 LAT - GAS HEAT 210 MBH NATURAL GAS 168 MBH OUT 81%TE - 45 FLA 53 MCA 80 MOCP - THYBAR SPRING ISOLATED CURB - 1,588 LBS
(EF)	GREENHECK #USF-15-B6 LABORATORY HOOD EXHAUST FAN 1,000 CFM 1"WC ESP - DIRECT 1/2HP 208V 3PH MOTOR - SPARK RESISTANT CLASS C - ALL STAINLESS STEEL CONSTRUCTION UB DISCHARGE CW WHEEL - FACTORY BASE ISOLATION HARDWARE - DANFOSS VLT DRIVE FC BASIC 101 & EMI FILTERS - 2.4 FLA 3 MCA 15 MOCP - 351 LBS
EF 2	GREENHECK #USF-10 LABORATORY EXHAUST FAN 600 CFM 1.8"WC ESP - DIRECT 1/2HP 208V 3PH MOTOR - UB DISCHARGE CW WHEEL - FACTORY BASE ISOLATION HARDWARE - DANFOSS VLT DRIVE FC BASIC 101 - 2.4 FLA 3 MCA 15 MOCP - 268 LBS
	$\frac{\overline{\text{DOAS}}}{1}$









N.T.S.



DETAIL SHOWN FOR REFERENCE ONLY-CONTRACTOR

LAB HOOD

ENLARGED FLOOR PLAN - HVAC 1/4"

EXISTING MULTI-ZONE AIR HANDLER SHALL HAVE ALL PNEUMATIC CONTROLS CHANGED OUT TO -JOHNSON CONTROLS DIRECT DIGITAL CONTROLS (DDC)

EXISTING MULTI-ZONE AIR HANDLERIN BASEMENT SHALL HAVE ALL PNEUMATIC CONTROLS CHANGED OUT TO JOHNSON -CONTROLS DIRECT DIGITAL CONTROLS



Ductwork Note!





ROOF PLAN - HVAC 1/4"

STEEL DUCT W/ALL DUCT THRU FORM - TYP. EF/1 IRE EYE IRCRAFT				
	EX SLOPE			
NS TO ZING	EX SLOPE			
	\downarrow			



PL	UMBING ABE	BRE\	/IATIONS	S	YMBOLS
			GLASS	SYMPOL	
& ∠	AND ANGLE	GR	GRADE	STMBOL	DESCRIPTION
@ ¢	AT CENTER LINE	HB	HOSE BIBB	$-\cdot - \phi - \cdot -$	BALL VALVE
۴. Ø	PROPERTY LINE	HD HDWF	HEAD HARDWARE		BRANCH TOP CONNECTION
(E)	EXISTING	HI.	HIGH	<u> </u>	BRANCH BOTTOM CONNECTION
	PERPENDICULAR	HP	HIGH PRESSURE	-	
# A/C		HR HT	HOUR HEIGHT		CAPPED PIPE
AC	ACCESSIBLE	HVAC	HEATING, VENTILATING, AIR CONDITIONING		CHECK VALVE
AD.	ACCESS PANEL AREA DRAIN	ID	INSIDE DIAMETER (DIM.)	<u> </u>	CLEANOUT
ADJ ADMIN	ADJUSTABLE ADMINISTRATION	INSUL INT	INSULATION INTERIOR		CLEANOUT TO GRADE
AGGR AL	AGGREGATE ALUMINUM	IW	IRIGATION WATER	•	
APPROX APPT	APPROXIMATE APPOINTMENTS	LAV LPG	LAVATORY LIQUID PETROLEUM GAS		CIRCULATING PUMP
ARCH. ASB	ARCHITECTURAL ASBESTOS	М	MEN		CONDENSATE DRAIN
ASPH ASST	ASPHALT	MACH MATL	MACHINE MATERIAL	G +- -	CONDENSATE "P" TRAP
AUTO.	AUTOMATIC	MAX. MECH	MAXIMUM MECHANICAL		
BD (BF)	BOARD BELOW FINISH FLOOR	MS MTL	MOP SINK METAL		DOMESTIC COLD WATER
(BG) BLDG	BELOW FINISH GRADE BUII DING	MFGR MH			DOMESTIC HOT WATER
BLKG	BLOCKING	MIN			DOMESTIC HOT WATER RETURN
BOT	BOTTOM	MISC	MONITOR		EXISTING WASTE OR SOIL & WASTE
BV		N		44	
CD	CONDENSATE DRAIN	NO. or #			FIRE HYDRANT
		NOM NTS	NOMINAL NOT TO SCALE	Φ	FLOOR CLEANOUT
CI CJ	CAST IRON CONTROL JOINT	OA			FLOOR SINK
CLG CLKG	CEILING CAULKING				GAS
CLR CO	CLEAR CLEANOUT	OVHD OX.	OVERHEAD OXYGEN	G	GAS
COL	COLUMN	PTN	PARTITION	⊶ ₩-	GAS COCK
CONC	CONCRETE	PHYS PR	PHYSICAL PRESSURE REGULATOR	,	GAS PRESSURE REGULATOR
CONF CONN	CONFERENCE	PVC PLAS	POLY-VINYL CLORIDE PIPE PLASTER		GATE VALVE
CONST CONT	CONSTRUCTION CONTINUOUS	PLYWD POC	PLYWOOD POINT OF CONNECTION		
CORR COTG	CORRIDOR CLEANOUT TO GRADE	PREFAB	PREFABRICATED	<u>○</u> +-	HOSE BIBB
CP CKS	CIRCULATING PUMP	PT	PLUGGED TEE	·	PIPE RISER (ELBOW)
CTR	CENTER	PVV R	RISER		PIPE DROP (ELBOW)
DBL	DOUBLE	RAD.	RADIUS		
DCW DEPT	DOMESTIC COLD WATER DEPARTMENT	REF	REFERENCE		FIFE DROF OR RISER
DET DF	DETAIL DRINKING FOUNTAIN	REQD	REQUIRED	—	POINT OF CONNECTION
	DOMESTIC HOT WATER	RM RWL	ROOM RAINWATER LEADER		PROCESS WASTE
DIA or Ø	DIAMETER	S	SINK or SOUTH		SHUT-OFF VALVE
DIR DN	DOWN	SA SB	SPLASH BLOCK		
DR DS	DOOR DOWNSPOUT	SCHD SDL	SCHEDULE STORM DRAIN LINE		SHUT-OFF VALVE IN YARDBOX
DSP DTW	DRY STANDPIPE DOMESTIC TEMPERED WATER	SECT. SH	SECTION SHOWER	·	SOIL & WASTE
DWG		SHT SIM	SHEET SIMILAR		TRAP ARM
EA	EACH	SL	SPRINKLER LINE		TRAP PRIMER
EDF	ELECTRIC DRINKING FOUNTAIN ELECTRICAL	SOV	SHUT-OFF VALVE		VENT
ELEV EMER	ELEVATION EMERGENCY	SS	STAINLESS STEEL		
ENCL EO	ENCLOSURE FLECTRICAL OUTLET	STD STL	STANDARD STEEL		VENTOFFSET
EP FQ	ELECTRICAL PANEL	STOR STRUCT	STORAGE STRUCTURAL	۲	VENT THRU ROOF
		SUPV SUSP	SUPERVISOR SUSPENDED	Q _y	WALL CLEANOUT
	EXPANSION	S&W	SOIL & WASTE		WASTE
EXPO. EXT	EXPOSED	TA TC	TRAP ARM TOP OF CURB		WATER HAMMER
FA		TEL	TELEPHONE TERRAZZO		
FD		THK			
FUN FE	FOUNDATION FIRE EXTINGUISHER	TP	TRAP PRIMER		
FEC FH	FIRE EXTINGUISHER CABINET FIRE HYDRANT	TRANS TREAT.	TRANSCRIPTION TREATMENT		
FHC FHMS	FIRE HOSE CAB.	TYP TV	TYPICAL TEMPERING VALVE		
FIN.		UL	UNDERWRITERS LABORATORIES		
FL FLASH.	FLASHING	UON UR	UNLESS OTHERWISE NOTED URINAL		
FM FOC	FIRE MAIN FACE OF CONCRETE	V	VENT		
FOF FR	FACE OF FINISH FRAME	VA VC	VALVE VITRIFIED CLAY		
FRPF	FIREPROOFING FLOOR SINK	VTR VO	VENT THRU ROOF VENT OFFSET		
FSH		W	WASTE LINE		
FTR	FLUE THRU ROOF	W/ WC	WITH WATER CLOSET		
FUNC FURR	FUNCTION FURRING	WCO WH	WALL CLEANOUT WATER HEATER		
FUT		WHA	WATER HAMMER ARRESTOR		
GA	GAO LLINE GAUGE	WMF	WASHING MACHINE FITTING		
GALV GC	GALVANIZED GAS COCK	WP ۱۸/۲	WEIGHT		
GEN GI	GENERAL GALVANIZED IRON	YD	YARD		

MEP COMPONENT ANCHORAGE NOTE

ALL MECHANICAL, PLUMBING, AND ELECTRICAL COMPONENTS SHALL BE ANCHORED AND INSTALLED PER THE DETAILS ON THE DSA APPROVED CONS THE FOLLOWING COMPONENTS SHALL BE ANCHORED OR BRACED TO MEET THE FORCE AND DISPLACEMENT REQUIREMENTS PRESCRIBED IN THE 202 1617A.1.18 THROUGH 1617A.1.26 AND ASCE 7-16 CHAPTERS 13, 26 AND 30:

- 1. ALL PERMANENT EQUIPMENT AND COMPONENTS. 2. TEMPORARY, MOVABLE OR MOBILE EQUIPMENT THAT IS PERMANENTLY ATTACHED (E.G. HARD WIRED) TO THE BUILDING UTILITY SERVICES SUCH WATER. "PERMANENTLY ATTACHED" SHALL INCLUDE ALL ELECTRICAL CONNECTIONS EXCEPT PLUGS FOR 110/220 VOLT RECEPTACLES HAVING A TEMPORARY, MOVABLE OR MOBILE EQUIPMENT WHICH IS HEAVIER THAN 400 POUNDS OR HAS A CENTER OF MASS LOCATED 4 FEET OR MORE ABO
- OR ROOF LEVEL THAT DIRECTLY SUPPORT THE COMPONENT IS REQUIRED TO BE RESTRAINED IN A MANNER APPROVED BY DSA. THE FOLLOWING MECHANICAL AND ELECTRICAL COMPONENTS SHALL BE POSITIVELY ATTACHED TO THE STRUCTURE BUT NEED NOT DEMONSTRATE THE REFERENCES NOTED ABOVE. THESE COMPONENTS SHALL HAVE FLEXIBLE CONNECTIONS PROVIDED BETWEEN THE COMPONENT AND ASSOCIATION AN
- AND CONDUIT. FLEXIBLE CONNECTIONS MUST ALLOW MOVEMENT IN BOTH TRANSVERSE AND LONGITUDINAL DIRECTIONS: A. COMPONENTS WEIGHING LESS THAN 400 POUNDS AND HAVING A CENTER OF MASS LOCATED 4 FEET OR LESS ABOVE THE ADJACENT FLOOR OR F DIRECTLY SUPPORT THE COMPONENT. B. COMPONENTS WEIGHING LESS THAN 20 POUNDS, OR IN THE CASE OF DISTRIBUTED SYSTEMS, LEES THAN 5 POUNDS PER FOOT, WHICH ARE SUSF
- FLOOR OR HUNG FROM A WALL. THE ANCHORAGE OF ALL MECHANICAL, ELECTRICAL AND PLUMBING COMPONENTS SHALL BE SUBJECT TO THE APPROVAL OF THE DESIGN PROFESSION

RESPONSIBLE CHARGE OR STRUCTURAL ENGINEER DELEGATED RESPONSIBILITY AND ACCEPTANCE BY DSA. THE PROJECT INSPECTOR WILL VERIFY AND EQUIPMENT HAVE BEEN ANCHORED IN ACCORDANCE WITH THE ABOVE REQUIREMENTS.

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEM BRACING NOTE

PIPING, DUCTWORK AND ELECTRICAL DISTRIBUTION SYSTEMS SHALL BE BRACED TO COMPLY WITH THE FORCES AND DISPLACEMENTS PRESCRIBED IN ASCE 7-16 SEC AS DEFINED IN ASCE 7-16 SECTIONS 13.6.5, 13.6.6, 13.6.7, 13.6.8; AND 2022 CBC, SECTIONS 1617A.1.24, 1617A.1.25, AND 1617A.1.26 THE METHOD OF SHOWING BRACING AND ATTACHMENTS TO THE STRUCTURE FOR THE IDENTIFIED DISTRIBUTION SYSTEM ARE AS NOTED BELOW.

WHEN BRACING AND ATTACHMENTS ARE BASED ON A PRE-APPROVED INSTALLATION GUIDE (EG. OSHPOD OPM FOR 2013 CBC OR LATER), COPIES OF THE BRACING SY INSTALLATION GUIDE OR MANUAL SHALL BE AVAILABLE ON THE JOBSITE PRIOR TO START OF AND DURING THE HANGING AND BRACING OF THE DISTRIBUTION SYSTEM STRUCTURAL ENGINEER OF RECORD SHALL VERIFY THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE HANGER AND BRACE THE LOADS.

MECHANICAL PIPING (MP), MECHANICAL DUCTS (MD), PLUMBING PIPING (PP), ELECTRICAL DISTRIBUTION SYSTEM (E):

□ MP □ MD □ PP □ E OPTION 1: DETAILED ON THE APPROVED DRAWINGS WITH PROJECT SPECIFIC NOTES AND DETAILS.

□ MP □ MD □ PP □ E OPTION 2: SHALL COMPLY WITH THE APPLICABLE OSHPD PRE-APPROVED (OPM #) #____

VERAL PLUMBING NOTES

1.13 EXTENDED WARRANTIES

PART 2 - PRODUCTS

PART 3 - EXECUTION

3.1 LOCATIONS

2.1 MATERIALS AND EQUIPMENT

WHEN SUCH LABELS ARE AVAILABLE.

3.2 UTILITIES EXCAVATING AND BACKFILLING

SET FORTH BELOW

SECTION 1	
BASIC PLUMBING MATERIALS AND METHODS	

PART 1 - GENERAL

1.1 SUMMARY A. LABOR, MATERIALS, TOOLS, AND SERVICES FOR A COMPLETE INSTALLATION OF EQUIPMENT AND SYSTEM CONTAINED WITHIN THE CONTRACT DOCUMENTS

B. PRINCIPAL FEATURES OF THE WORK INCLUDED ARE:

- PLUMBING SYSTEM AND RELATED PIPING INSULATION. DOMESTIC WATER PIPING, VALVES, CONNECTIONS AND RELATED PIPING INSULATION.
- LIMITED AREA FIRE PROTECTION (SPRINKLER SYSTEMS)
- EXCAVATING AND BACKFILLING FOR MECHANICAL WORK; COORDINATE WITH APPROPRIATE TRADE. ANCHOR BOLTS, SLEEVES. SUPPORTS AND SIMILAR ITEMS TO BE BUILT INTO CONCRETE OR MASONRY.
- PREPARATION AND SUBMITTAL OF SHOP DRAWING AND PRODUCT DATA.
- MAINTAINING A RECORD SET OF BLUE LINE PRINTS AND MAKING THEM TO INDICATE LOCATIONS OF CONCEALED ITEMS, AND DEVIATIONS MADE TO SUIT CONDITIONS AND PRODUCTION OF MECHANICAL AS-BUILT (RECORD) DRAWINGS.

1.2 JOB CONDITIONS. A. SUBMITTAL OF BID IMPLIES BIDDER HAS READ APPLICABLE PARAGRAPHS OF THE SPECIFICATIONS AND WILL BE BOUND BY THEIR CONDITIONS.

1.3 LOCAL CONDITIONS

- A. CONFORM WITH LOCAL CONDITIONS. COORDINATE WITH LOCAL UTILITIES ON SIZE OF UTILITY SERVICE.
- 1.4 INTENT A. THE CONTRACT DOCUMENTS (DRAWINGS AND SPECIFICATIONS) DESCRIBE THE PLUMBING WORK OF THIS PROJECT ANY ITEMS MENTIONED IN ONE
- PART SHALL BE AS BINDING AS THOUGH MENTIONED IN BOTH. B. THE CONTRACT DOCUMENTS FORM A GUIDE FOR A COMPLETE PLUMBING INSTALLATION. WHERE AN ITEM IS REASONABLY NECESSARY BUT NOT SPECIFICALLY MENTIONED, SUCH AS PIPING OFFSETS, DRAINS, ETC., FOR A COMPLETE SYSTEM, PROVIDE SAME,
- C. PLUMBING LAYOUTS INDICATED ON DRAWINGS ARE DIAGRAMMATIC ONLY. EXACT LOCATIONS OF PIPES, AND EQUIPMENT SHALL BE GOVERNED BY THE DRAWINGS OF RELATED TRADES.
- 1.5 DEVIATIONS A. NO DEVIATIONS FROM SPECIFICATIONS AND DRAWINGS SHALL BE MADE WITHOUT FULL KNOWLEDGE AND WRITTEN CONSENT FROM THE DIVISION
- OF STATE ARCHITECT. B. SHOULD CONTRACTOR FIND. DURING PROGRESS OF WORK. CONDITIONS WHICH DICTATE A MODIFICATION OF ANY PARTICULAR REQUIREMENTS.

- REPORT SUCH ITEM PROMPTLY FOR DECISION OF INSTRUCTIONS. C. EQUIPMENT OR MATERIALS MAY NOT VARY FROM THE APPROVED PLANS.

1.6 QUALITY ASSURANCE

A. COMPLY WITH APPLICABLE LOCAL, STATE AND FEDERAL CODES. B. COMPLY WITH APPLICABLE REQUIREMENTS OF RECOGNIZED INDUSTRY ASSOCIATIONS WITH PROMULGATE STANDARDS FOR THE VARIOUS TRADES. (SEE DIVISIONS 21 THRU 23) C. EMPLOY ONLY QUALIFIED JOURNEYMEN FOR THIS WORK. EMPLOY COMPETENT, QUALIFIED PLUMBERS TO SUPERVISE THE WORK.

- 1.7 CODES AND STANDARDS A. PERFORM WORK SPECIFIED IN DIVISIONS 21 THRU 23 IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS LISTED BELOW, AND SUCH STANDARDS THAT MAY BE SPECIFIED IN OTHER SECTIONS. WHEN THESE SPECIFICATIONS ARE MORE STRINGENT, THEY TAKE PRECEDENCE. IN CASE OF CONFLICT. OBTAIN A DECISION FROM THE PLUMBING ENGINEER.
 - 1. NFPA 54: NATIONAL FUEL AND GAS CODE.
 - NFPA 101: LIFE SAFETY CODE.
 - APPLICABLE STATE BUILDING CODE. NATIONAL STANDARD PLUMBING CODE (OR APPLICABLE STATE PLUMBING CODE).
 - ACCESSIBILITY REQUIREMENTS ANSI A117.1, ADA, AND CBC CHAPTER 11-B APPLICABLE STATE ENERGY CODE.
 - AGA: AMERICAN GAS ASSOCIATION.
 - ANSI: AMERICAN NATIONAL STANDARDS INSTITUTE. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS.
 - MSS: MANUFACTURER'S STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY.
 - NEMA: NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
 - NFPA: NATIONAL FIRE PROTECTION ASSOCIATION. 13. UL: UNDERWRITERS' LABORATORIES. INC.

1.8 COORDINATION

- A. BEFORE STARTING ANY WORK CONTRACTOR SHALL CAREFULLY EXAMINE SPECIFICATIONS AND DRAWINGS TO BE THOROUGHLY FAMILIAR WITH ITEMS WHICH REQUIRE PLUMBING AND COORDINATION.
- B. BEFORE STARTING ANY WORK SITE CIVIL ENGINEER SHALL PROVIDE UTILITIES TO THE BUILDING LOCATION BASED ON CAPACITY OF CALCULATIONS LISTED ON DRAWINGS. HE SHALL THOROUGHLY EXAMINE THE BUILDING SPECIFICATIONS AND DRAWINGS FOR COORDINATION OF ALL WORK AND REPORT TO THE ARCHITECT IN WRITING ANY AND ALL CONDITIONS WHICH MIGHT ADVERSELY AFFECT THIS PROJECT. C. COORDINATE WITH OTHER DIVISIONS TO LEAVE PROPER CHASES AND OPENINGS. PLACE OUTLETS, ANCHORS, SLEEVES, AND SUPPORTS PRIOR TO
- POURING CONCRETE OF INSTALLATION OF MASONRY WORK.
- 1.9 SUBMITTALS
- A. SUBMITTALS ARE ONLY REQUIRED FOR SPECIFIC ITEMS OF EQUIPMENT OR MATERIAL LISTED IN INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. B. WITHIN 15 DAYS AFTER AWARD OF CONTRACT FOR THIS WORK, SUBMIT A LIST OF PROPOSED MANUFACTURERS (OF EQUIPMENT OR MATERIAL TO BE USED) FOR APPROVAL. SUBMIT THIS LIST BEFORE SUBMITTAL OF SHOP DRAWINGS AND PRODUCT DATA, AND OBTAIN APPROVAL BEFORE SUBMITTING REQUIRED ITEMS.
- C. SHOP DRAWINGS (NOT REQUIRED FOR OWNER FURNISHED EQUIPMENT).

1.10 DELIVERY AND STORAGE

A. INSOFAR AS POSSIBLE, DELIVER ITEMS IN MANUFACTURER'S ORIGINAL UNOPENED PACKAGING. WHERE THAT IS NOT PRACTICAL. COVER ITEMS WITH PROTECTIVE MATERIALS TO KEEP THEM FROM BEING DAMAGED. USE CARE IN LOADING, TRANSPORT, UNLOADING, AND STORAGE TO KEEP ITEMS FROM BEING DAMAGED.

1.11 FIRE RATINGS

- A. MATERIALS USED ANYWHERE IN THE WORK MUST HAVE NFPA RATINGS AS FOLLOWING: FLAME SPREAD - NOT OVER 25
 - SMOKE DEVELOPED NOT OVER 50
- FUEL CONTRIBUTED NOT OVER 25 B. MATERIALS SHALL BE "SELF EXTINGUISHING"

1.12 PERMITS AND FEES

A. OBTAIN, PAY FOR, AND DELIVER PERMITS, CERTIFICATION OF INSPECTION, AND OTHER SUCH ITEMS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION. DELIVER CERTIFICATION TO THE CONSTRUCTION MANAGER PRIOR TO FINAL ACCEPTANCE OF THE WORK. AN INSPECTION CERTIFICATE FOR EACH CLASS OF WORK REQUIRING INSPECTION MUST BE SUBMITTED PRIOR TO OR WITH THE FINAL PAYMENT INVOICE. THE

RESPONSIBLE TRADE CONTRACTOR MUST MAKE APPLICATION FOR THE INSPECTION, COORDINATE SAME AND PAY THE REQUIRED INSPECTION FEE.

3.3 CUTTING AND PATCHING A. REPAIR OR REPLACE ROUTINE DAMAGE CAUSED BY CUTTING IN PERFORMANCE OF CONTRACT. SPECIFICATIONS OR THE BEST STANDARDS OF THE INDUSTRY. 3.4 CONNECTION TO EQUIPMENT

A. CONNECT OR INSTALL EQUIPMENT SHOWN ON MECHANICAL DRAWINGS THAT REQUIRE PLUMBING. ROUGH - IN PIPING AND CONNECT EQUIPMENT 2. PROVIDE PIPING, SHUTOFF VALVES, AND UNIONS REQUIRED FOR A COMPLETE INSTALLATION

3.5 SERVICE OF SYSTEM

A. EMPLOY COMPETENT, QUALIFIED PERSONNEL IN OPERATION OF THE EQUIPMENT. B. PROVIDE FOR PROPER OPERATION AND CLEANLINESS. C. OPEN UP EQUIPMENT FOR INSPECTION AS DIRECTED BY THE SUPERINTENDENT

PART 1 - GENERAL

11

SCOP		2K
0001		MA
Α.	FURNISH	NG OF ALL LABOR, MATERIALS, TOOLS, TRANSPOR
	OF THE P	LUMBING SYSTEM AS ILLUSTRATED ON THE DRAW
	3.	HOT & COLD WATER SYSTEM WITH COMPLETE
		WATER CONNECTIONS
	4.	SOIL, WASTE, VENT AND CONDENSATE SYSTEM
	5.	TRENCHING AND BACKFILLING.

FINAL PLUMBING CONNECTIONS TO HEATING AND AIR CONDITIONING EQUIPMENT.

PART 2 - PRODUCTS

2.1 DESCRIPTION

- A. ALL SOIL, WASTE, AND VENT PIPING TO BE ABS OR PVC-DWV SCHEDULE 40 PIPE & FITTINGS. YARD PIPING, PIPE AND FITTINGS OR P.V.C. SCHEDULE 40 PIPE AND FITTINGS (AS APPROVED BY LOCAL AUTHORITY). EXCEPTION: ALL SOIL, WASTE & VENTS LOCATED WITHIN A FIRE RATED WALL SHALL BE METALLIC (STEEL, CAST IRON ECT., NO PVC). IT SHALL BE THE RESPONSIBILITY OF THE PLUMBER TO VERIFY ALL FIRE RATED WALLS AND CONSTRUCTION AS SHOWN ON THE ARCHITECTURAL DRAWINGS AND COORDINATE WITH THE GENERAL CONTRACTOR. ALL SOIL, WASTE AND VENTS SHALL BE INSTALLED AS PER CPC AND LOCAL CODES.
- B. HOT & COLD WATER PIPING ABOVE FLOOR: TYPE "L" COPPER, HARD DRAWN. BELOW GROUND OUTSIDE OF BUILDING: TYPE "K" SOFT DRAWN
- COPPER TUBING WITH OUT JOINTS.

APPROVED BY LOCAL AUTHORITY.

- C. CONDENSATE DRAIN PIPING: TYPE "M" COPPER WITH 95-5 TIN ANTIMONY SOLDER AND ROUGH COPPER FITTINGS OR EQUAL. D. INDIRECT WASTE PIPING: TYPE "M" COPPER WITH 95-5 TIN ANTIMONY SOLDER AND WROUGHT COPPER FITTINGS OR P.V.C. SCHEDULE 40, AS
- E. UNDERGROUND GAS PIPING: SCHEDULE 40 BLACK STEEL PIPE WITH LONG RADIUS STEEL WELDING FITTINGS INCLUDING CATHODIC PROTECTION OR POLYETHYLENE AS APPROVED BY LOCAL GAS COMPANY AND AUTHORITY HAVING JURISDICTION. INSTALLATION OF GAS SERVICE PIPING IN VENTED

2022 CALIFORNIA ADMINISTRATIVE CODE (CAC) (PART 1, TITLE 24 CCR)	
3TRUCTION DOCUMENTS. 2022 CALIFORNIA BUILDING CODE (CBC)	
AS ELECTRICITY, GAS OR FLEX CABLE. SOVE THE ADJACENT ELOOR	IENTS)
2022 CALIFORNIA MECHANICAL CODE (CMC) (PART 4, TITLE 24 CCR) (2021 IAPMO UNIFORM MECHANICAL CODE AND 2022 CALIFORNIA AMENDMENT	ГS)
DESIGN COMPLIANCE WITH TED DUCTWORK, PIPING (2022 CALIFORNIA PLUMBING CODE (CPC))
ROOF LEVEL THAT 2022 CALIFORNIA ENERGY CODE (CEC)	
2022 CALIFORNIA FIRE CODE (CFC)	NTS)
ONAL IN GENERAL THAT ALL COMPONENTS 2022 CALIFORNIA EXISTING BUILDING CODE (CEBC) (PART 10, TITLE 24 CCR) (2021 INTERNATIONAL EXISTING BUILDING CODE AND 2022 CALIFORNIA AMENDMENT	S)
2022 CALIFORNIA GREEN BUILDING STANDARDS CODE (PART 11, TITLE 24 CCR)	
TITLE 19 CCR, PUBLIC SAFETY, STATE FIRE MARSHAL REGULATIONS.	
2019 ASME A17.1/CSA B44-13 SAFETY CODE FOR ELEVATORS AND ESCALATORS.	
CTION 13.3 CTION	
GYSTEM UL 300 - 2005 EDITION (R2010) UL 464 - 2003 EDITION MS. THE UL 521 - 1999 EDITION UL 1971 - 2002 EDITION ICC 300 - 2017 EDITION UL 1971 - 2002 EDITION	
REFERENCED CODE SECTIONS FOR APPLICABLE STANDARDS 2022 CBC, CHAPTER 35 & 2022 CFC, CHAPTER 80	

A. WORK FURNISHED UNDER THE CONTRACT SHALL BE WARRANTED AGAINST DEFECTS IN WORKMANSHIP AND (CONTRACTOR FURNISHED) MATERIALS FOR A PERIOD OF NOT LESS THAT ONE (1) YEAR, OR AS OTHERWISE SPECIFIED, FROM THE DATE OF FINAL ACCEPTANCE OF THE INSTALLATION, DEFECTS OF WORKMANSHIP DEVELOPING DURING THIS PERIOD SHALL BE REMEDIED, AND DEFECTIVE MATERIAL REPLACED, WITHOUT ADDITIONAL COST. WHEN DEFECTS IN A TRADE CONTRACTOR'S WORK CAUSES DAMAGE TO THE WORK OF THE OTHER TRADE

- CONTRACTORS, SUCH DAMAGE SHALL BE REPAIRED BY THE TRADE CONTRACTOR CAUSING DAMAGE AND WORK RESTORED TO ITS ORIGINAL CONDITION, AT THE EXPENSE OF THE TRADE CONTRACTOR THAT CAUSED THE DAMAGE.
- A. WITHIN THE CONTRACT DOCUMENTS RELATING TO PLUMBIMG WORK, MANUFACTURER'S NAMES, CATALOG NUMBERS, AND OTHER PROPRIETARY REFERENCES TO MATERIALS AND EQUIPMENT ARE MADE. SUCH REFERENCES ARE MADE TO ESTABLISH THE STANDARDS OF QUALITY AND TYPE REQUIRED, AND NOT TO LIMIT COMPETITION. ACCEPTABLE MANUFACTURER'S OF COMPETITIVE PRODUCTS ARE LISTED IN APPLICABLE SECTIONS AS "APPROVED EQUALS". REASONABLE REQUESTS FOR SUBSTITUTION OR ADDITIONS TO "APPROVED EQUALS" WILL BE CONSIDERED, BUT THE MECHANICAL ENGINEER WILL BE THE SOLE JUDGE OF ACCEPTABILITY OF ITEMS PROPOSED AS SUBSTITUTES.
- B. MATERIALS AND EQUIPMENT USED IN CARRYING OUT THESE SPECIFICATIONS SHALL BEAR UL OR OTHER RECOGNIZED TESTING LABORATORY LABEL
- A. PLUMBING LAYOUTS INDICATED ON DRAWINGS ARE DIAGRAMMATIC. EXACT LOCATIONS OF PIPES, AND EQUIPMENT MAY VARY BECAUSE OF CONFLICTS WITH WORK OF OTHER TRADES. WORK OUT CONFLICTS WHERE RELOCATION'S WILL NOT AFFECT OPERATION OR APPEARANCE OF SYSTEMS PER APPROVAL OF THE ARCHITECT & ENGINEER OF RECORD.
- B. LOCATE EQUIPMENT REQUIRING PERIODIC SERVICING SO THAT IT IS READILY ACCESSIBLE. DO NOT BACK UP SERVICE SIDES TO WALLS, NOR PLACE IT TOO CLOSE TO OTHER EQUIPMENT TO MAKE SERVICE IMPRACTICAL. EQUIPMENT SERVICE CLEARANCE SHALL MEET MINIMUM ACCEPTABLE DISTANCE AS RECOMMENDED BY EQUIPMENT MANUFACTURER.
- A. PERFORM TRENCHING, EXCAVATING, BACKFILLING FOR MECHANICAL WORK IN ACCORDANCE WITH THE APPROPRIATE SECTIONS AND AS
- PERFORM WORK NECESSARY FOR INSTALLATION OF MECHANICAL UTILITIES. 2. DEPTH OF EXCAVATION TO PROVIDE A MINIMUM OF 3' ABOVE TOP OF PIPE. EXCAVATION TO BE CARRIED TO A DEPTH OF AT LEAST 6" BELOW BOTTOM OF PIPE ELEVATION. FILL BELOW PIPE (6"), AROUND PIPE, AND A MINIMUM OF 12" ABOVE PIPE WIT SAND OR CLASS "B" CRUSHED STONE TAMPED FIRM AND EVEN. SEPARATE TOPSOIL DURING EXCAVATION. FINAL LAYER OR DIRT (12" MINIMUM) TO BE TOPSOIL. TRENCHES TO BE AT LEAST 18" WIDER THAN PIPE WITH BATTER BOARDS PLACED EVERY 25'. BACKFILLING SHALL BE DONE TO EXCLUDE USE OF ROCK OR STONE ABOVE SAND OR CRUSHED STONE.
- B. PERFORM REPAIRS WITH MATERIALS WHICH MATCH EXISTING AND INSTALL IN ACCORDANCE WITH THE APPROPRIATE SECTION OF THESE

 - END OF SECTION
 - SECTION 2 PLUMBING
 - ORTATION. SERVICE, AND RELATED ITEMS NECESSARY TO COMPLETE THE INSTALLATION WING AND AS INCLUDING BUT NOT LIMITED TO THE FOLLOWING: CONNECTIONS FROM METER TO ALL PLUMBING FIXTURES & EQUIPMENT REQUIRING
 - EM LINES INSIDE AND OUTSIDE THE BUILDING.
- GAS PIPING TO HEATING, WATER HEATERS AND ALL OTHER GAS BURNING EQUIPMENT.

CONDUIT AND MEETING WITH THE LOCAL GAS COMPANY'S APPROVAL.

- F. GAS PIPING ABOVE GROUND: SCHEDULE 40 BLACK STEEL WITH 150 POUND BLACK MALLEABLE IRON SCREWED FITTINGS. GAS PIPING COMPOUND AT JOINTS IN COMPLIANCE WITH NFPA BULLETIN #45 AND LOCAL APPLICABLE CODES AND SUITABLE FOR NATURAL GAS SERVICE. INSTALL MOISTURE TRAPS ON HVAC UNITS, WATER HEATERS, AND KITCHEN EQUIPMENT.
- G. STORM PIPING BELOW GROUND: STANDARD WEIGHT COATED CAST IRON PIPE AND STAINLESS STEEL/ NEOPRENE GASKET FITTING, LOCATIONS. H. STORM PIPING ABOVE GROUND: STANDARD WEIGHT COATED CAST IRON PIPE AND STAINLESS STEEL/ NEOPRENE GASKET FITTING.
- I. TRAPS AND VENTS FOR SERVICE SINK: A.B.S. OR P.V.C. SCHEDULE 40, AS APPROVED BY LOCAL AUTHORITY.
- 2.2 INSULATION A. INSULATE ALL HOT AND COLD WATER COPPER PIPING WITH AT LEAST 1/2" THICK FOAM RUBBER OR FOAM PLASTIC TYPE PIPE INSULATION. B. ALL PIPE SYSTEMS SHALL BE INSULATED: SPACE COOLING SYSTEMS (ALL REFRIGERANT SUCTION, CHILLED WATER & FLUID DISTRIBUTION), SPACE HEATING SYSTEMS (ALL REFRIGERANT, STEAM, STEAM CONDENSATE & HOT WATER FLUID DISTRIBUTION) & SERVICE WATER-HEATING SYSTEMS. C. ALL WATER HEATERS TO HAVE R7.7 INSULATION ON HOT & COLD LINES FOR FIRST 8 FEET FROM WATER HEATER (TANK TYPE AND INSTANT).
- D. ALL RE-CIRCULATING LINES TO BE INSULATED.
- 2.3 FIXTURES F. ALL FIXTURES: AS INDICATED ON DRAWINGS WITH EQUAL PRODUCTS FURNISHED BY AMERICAN STANDARD, KOHLER, ELJER OR EQUAL.
- 2.4 CLEANOUTS, FLOOR DRAINS, FLOOR SINKS, AND ROOF DRAINS. A. ALL ACCESSORIES, AS INDICATED ON DRAWING WITH EQUAL PRODUCTS FURNISHED BY WADE, JOSAM, OR ZURN BEING ACCEPTABLE.
- 2.5 EQUIPMENT A. SHUTOFF VALVES UNDERNEATH LAVATORIES, TANK TYPE WATER CLOSETS, AND KITCHEN EQUIPMENT WITH CHROME PLATED ANGLE STOP VALVES WITH CHROME PLATED ESCUTCHEON PLATES. B. HOSE BIBBS - AS SCHEDULED ON DRAWINGS.
- C. VACUUM BREAKERS AS SCHEDULED ON DRAWINGS.
- D. BACKFLOW PREVENTERS AS SCHEDULED ON DRAWINGS. E. GAS COCK - PLUG VALVE IRON BODY, BRONZE TAPERED PLUG, LUBRICATED, THREADED ENDS. RATED FOR 200 CWP, AGA AND UL LISTED.
- PART 3 INSTALLATION
- 3.1 PIPING A. RUN ALL PIPING CONCEALED EXCEPT WHERE OTHERWISE INDICATED ON DRAWINGS B. INSTALL VALVES TRAPS CLEANOUT AND OTHER APPARATUS IN AN EASILY ACCESSIBLE LOCATION
- C. INSTALL SOIL, WASTE VENT OFFSETS AND CONDENSATE DRAINS WITH A MINIMUM UNIFORM GRADE OF ONE QUARTER INCH TO THE FOOT. D. MAINTAIN HOT AND COLD WATER LINES AT LEAST 6 INCHES APART WHERE PIPING IS PARALLEL. E. PROVIDE ESCUTCHEON PLATES WHERE ALL PIPES PASS THROUGH A FINISHED WALL.
- 3.2 PLUMBING FIXTURES A. FURNISH AND INSTALL ALL PLUMBING FIXTURES COMPLETE WITH ALL EQUIPMENT FITTINGS, TRIMMING, AND ACCESSORIES. B. ALL FIXTURES: GRADE A, WHITE. C. EXPOSED PIPING TO FIXTURES: A PRODUCT OF THE FIXTURE MANUFACTURE.
- D. PROVIDE STOPS AS MANUFACTURED BY THE FIXTURE MANUFACTURER, WITH METAL TO SEAT FOR ALL FIXTURES AND EQUIPMENT. 3.3 TEST
- A. THE PLUMBING SYSTEM AND ASSOCIATED SYSTEM IS SUBJECT TO FINAL APPROVAL OF THE OWNER'S REPRESENTATIVE AND CODE AUTHORITIES HAVING JURISDICTION. PERFORM ALL TESTS REQUIRED TO SHOW CODE COMPLIANCE AS DIRECTED.
- 3.4 CLEANING AND PROTECTION A. AFTER THE PLUMBING PIPING HAS BEEN INSTALLED, INSPECTED, AND APPROVED, FLUSH THE PIPING SYSTEM TO REMOVED ANY FOREIGN MATTER FROM THE PIPES.
- 3.5 MAINTENANCE A. MAINTAIN ALL PARTS OF THE PLUMBING FIXTURES AND ASSOCIATED EQUIPMENT THROUGHOUT THE GUARANTEE

END OF SECTION







FLOOR PLAN - PLUMB. 1/4"

1/2"AIR RISER FROM CRAWL SPACE UP TO GROUND FLOOR	1/2"AIR RISER FROM CRAWL SPACE UP TO GROUND FLOOR SEAL AL PIPE THRU FLOOR PENETRATIONS w/SIKA HYDROTITE - TYP.	
A		
<u>AWL SPACE - F</u> 1/4"	PLUMB.	LABORATORY GAS PIPING HELIUM PIPING SHALL BE HARD DRAWN STANDARD WT. UPC APPROVED TYPE K COPPER w/BRAZED FITTINGS. AIR, & NATURAL GAS SHALL BE UPC APPROVED SC 40 CARBON STEEL w/WROUT IRON FITTINGS NPT THREADS AND UPC APPROVED TYPE K COPPER w/COMPRESSION FITTINGS. DOMESTIC WATER SHALL BE HARD DRAWN STANDARD WT. UPC APPROVED TYPE L COPPER w/LEAD FREE SOLDERE FITTINGS. NO CONNECTIONS IN THE FIELD SHALL BE MADE BETWEEN DISSIMILAF METALS EG. COPPER TO STAINLESS STEEL. ALL LABORATORY UTILITY PIPING IN SCOPE OF WORK SHALL BE PERMANENTLY IDENTIFIED AS PER ANSI STANDARD A13.1 - 4mil VINYL STICKERS WITH DIRECTION APPOWS AND TEXT PEADING "COMPRESSED AIR" "NATURAL GAS" "COLD WATER
		"HELIUM". <u>LABORATORY GAS CONNECTIONS</u> THE FUME HOOD SHALL BE SHIPPED PRE-PLUMBED FROM THE FACTORY WITH COPPER STUB-OUTS FOR CLEAN CONNECTIONS TO THE UTILITY PIPING INSIDE T CASEWORK. COUNTER TOP AND WALL LABORATORY OUTLETS SHALL BE QUICK CONNECT TY WITH FACTORY INSTALLED COPPER STUB-OUTS FOR CLEAN CONNECTIONS TO T UTILITY PIPING.
·····		





ROOF PLAN - PLUMB. 1/4"

EX SLOPE		
X SLOPE		





	PLUMBING FIXTURE SCHEDULE (LEEDS CERTIFIED LOW FLOW)							
MARK	FIXTURE	DCW	DHW	S&W	TRAP	VENT	DESCRIPTION	
TP 1	TRAP PRIMER	1/2"	-	-	-	-	PRECISION PLUMBING #PR-500 TRAP PRIMER MOUNTED IN WALL BOX - COPPER PRIMER LINE CONNECT TO FUNNEL DRAIN P-TRAP	
FD 1	FUNNEL DRAIN	-	-	1-1/2"	1-1/2"	1-1/2"	J.R.SMITH #3950 FUNNEL MOUNTED IN WALL BOX ON P-TRAP - FIXED AIR GAP - TRAP PRIMER CONNECTION - 1" INLET PIPE	



(4) <u>HELIUM CYLINDERS - TYP.</u>





Applicable Code: 2022 CBC

Piping, Ductwork, and Electrical Distribution System Bracing Note

Piping, ductwork, and electrical distribution systems shall be braced to comply with the forces and 13.6.7, 13.6.8; and 2022 CBC, Sections 1617A.1.24, 1617A.1.25 and 1617A.1.26.

MP MD PP E Option 2: Shall comply with HCAi (OSHPD) Preapproval (OPM #) #____ as included in these drawings with project-specific notes and details.

- displacements prescribed in ASCE 7-16 Section 13.3 as defined in ASCE 7-16 Sections 13.6.5, 13.6.6,
- The method of showing bracing and attachments to the structure for the identified distribution system are as noted below. When bracing and attachments are based on a preapproved installation guide (e.g., HCAi OPM for 2013 CBC or later), copies of the bracing system installation guide or manual shall be available on the jobsite prior to the start of and during the hanging and bracing of the distribution systems. The Structural Engineer of Record shall verify the adequacy of the structure to support the hanger and brace loads.
- Mechanical Piping (MP), Mechanical Ducts (MD), Plumbing Piping (PP), Electrical Distribution Systems (E):
- MP MD PP E X Option 1: Detailed on the approved drawings with project specific notes and details.

DEMO LIGHTING PLAN NOTES:

- (1) REMOVE EXISTING LIGHTS AND RELATED CONDUIT AND WIRING.
- (2) REMOVE EXISTING EMERGENCY LIGHT AND RELATED CONDUIT AND WIRING.
- NEW FURRED WALL. REFER TO LIGHTING PLAN FOR REQUIREMENT.
- 4 LIGHT FIXTURES TO BE RETROFITTED WITH LED LIGHT KIT. EXISTING CONDUIT, WIRING AND CONTROLS TO REMAIN.
- 5 REMOVE EXISTING LIGHT SWITCH. REPLACE WITH NEW SWITCHES ON FURRED WALL. REFER TO LIGHTING PLAN FOR REQUIREMENT.
- 6 REMOVE EXISTING LIGHT SWITCH. REPLACE WITH DIMMER SWITCH. REFER TO LIGHTING PLAN FOR REQUIREMENT. (7) EXISTING SWITCHES AND RELATED CONDUIT AND WIRING TO REMAIN.
- 8 REMOVE SURFACE CONDUIT, SWITCH BOX AND RELATED CONDUIT AND WIRING THAT IS NO LONGER BEING USED. VERIFY WORK REQUIRED IN FIELD.
- 9 EXISTING OCCUPANCY SENSOR TO RMAIN.
- (10) SURFACE WIREMOLD AND WIRING TO REMAIN.

GENERAL ELECTRICAL DEMOLITION NOTES:

- DEMOLITION WORK REQUIRED. ALL ELECTRICAL DEMOLITION WORK SHALL BE DONE AS DIRECTED BY ARCHITECT AND/OR OWNER. VERIFY ALL WORK REQUIRED IN FIELD PRIOR TO SUBMITTING BID AND PRIOR TO STARTING WORK.
- ALL EXISTING ELECTRICAL IN REMODEL AREA, INCLUDING BUT NOT LIMITED TO LIGHTING FIXTURES, ELECTRICAL DEVICES, OUTLET BOXES, CONDUITS AND WIRING, WHETHER OR NOT SHOWN ON DRAWINGS, IF NOT NOTED ON
- DRAWINGS TO BE REUSED SHALL BE REMOVED. 3. ALL EXISTING FIXTURES NOT REUSED SHALL BE RETURNED TO OWNER, OR DISPOSED OF, AND REMOVED FROM SITE AS DIRECTED BY OWNER.
- WHERE EXISTING LIGHTING FIXTURES, ELECTRICAL DEVICES AND EQUIPMENT THAT REMAIN ARE NOTED TO BE RECONNECTED, CONTRACTOR SHALL BE PERMITTED TO REUSE EXISTING CONDUITS IF AVAILABLE. OTHERWISE PROVIDE NEW CONDUITS AND WIRING AS REQUIRED.
- 5. U.O.N., WHERE EXISTING ELECTRICAL IS TO BE AND/OR NOTED TO BE REMOVED, CONTRACTOR SHALL REMOVE ALL EXISTING CONNECTION, DEVICES, OUTLET BOXES, CONDUITS AND WIRING. PATCH WALLS AND/OR CEILINGS AS DIRECTED BY ARCHITECT. WHERE LOCATED IN BLOCK WALLS, CONTRACTOR SHALL REMOVE EXISTING DEVICES AND WIRING, BLANK OFF EXISTING OUTLETS. WHERE EXISTING CONDUITS ARE RUN UNDERGROUND, CONTRACTOR SHALL REMOVE EXISTING WIRING AND REMOVE PORTION OF CONDUITS ABOVE GRADE. EXISTING UNDERGROUND CONDUITS SHALL BE ABANDONED IN PLACE.



3 REMOVE EXISTING EMERGENCY EXIT SIGN WITH TWIN EMERGENCY LIGHT. REPLACE WITH NEW EMERGENCY LIGHT ON

1. ELECTRICAL CONTRACTOR SHALL REFER TO ALL CONSTRUCTION DOCUMENTS FOR ADDITIONAL ELECTRICAL





\Box	
2	TYPICAL: TYPE 'E2' SHALL BE EMERGENCY EXIT SIGN WITH BATTERY PACK AND TWIN HEADS. MOUNT ON WALL ABOVE DOOR. CONNECT TO UNSWITCHED LIGHTING CIRCUIT.
3	TYPICAL: TYPE 'E5' SHALL BE EMERGENCY LIGHT FIXTURE. MOUNT ON WALL. CONNECT TO UNSWITCHED LIGH CIRCUIT.
4	TYPICAL: TYPE 'AE' AND 'BE' ARE LIGHTS WITH INTEGRAL BATTERY PACK TO BE USED AS EMG LIGHTING. CONNEMERGENCY BATTERY PACK ON UNSWITCHED HOT LEG OF THE LIGHTING CIRCUIT.
5	TYPICAL OF TYPE 'C' FIXTURES: RETROFIT WITH LED LIGHT KIT PER FIXTURE SCHEDULE. EXISTING CONDUIT, WIRING AND CONTROLS TO REMAIN.
6	TYPICAL: VERIFY EXISTING CONDUIT, WIRING, AND CIRCUITING IN FIELD. PROVIDE NEW CONDUIT AND WIRING REQUIRED.
7	TYPICAL: TYPE 'AE', 'B' AND 'BE' FIXTURES SHALL HAVE 0-10V DIMMING DRIVER. FIXTURE SHALL ALSO HAVE INTEGRATED INIGHT CONTROLS.
8	LOW VOLTAGE WALL DIMMER SWITCHES SHALL BE SENSOR SWITCH nPODMA-DX.
9	PROVIDE 3/4"C FROM DIMMER INTO ACCESSIBLE ATTIC. RUN CAT-5E CABLE WITH RJ45 CONNECTORS BETWEE DIMMER SWITCH AND LIGHT FIXTURE. nLIGHT CAT-5E CABLING TO BE RUN IN 3/4" CONDUIT IN NON-ACCESSIBL ATTIC.
10	TYPICAL: PROVIDE CAT-5E CABLE WITH RJ45 CONNECTORS BETWEEN nLIGHT DEVICES. nLIGHT CAT-5E CABLIN BE RUN IN 3/4" CONDUIT WHEN ATTIC IS NOT ACCESSIBLE.
(1)	LOW VOLTAGE WALL DIMMER SWITCH WITH OCCUPANCY SENSOR SHALL BE SENSOR SWITCH nWSX-PDT-LV-D SET OCCUPANCY SENSOR TIME DELAY TO 20-MINUTES.

\bigcirc	EXISTING PANEL TO REMAIN AND TO BE REUS
2	EXISTING RECEPTACLE AND RELATED CONDUIT
3	TYPICAL: EXISTING TOMBSTONE RECEPTACLES INDICATED. RUN NEW CIRCUITS AND WIRING TO GFI.
4	RUN NEW WIRING IN EXISTING CONDUIT. VERIFY CONDUIT IF REQUIRED. VERIFY WORK REQUIRE
5	CONNECT NEW FUME HOOD. VERIFY CONNECTI
6	PROVIDE 250V, 30A RECEPTACLE. VERIFY POWE OWNER.
\bigcirc	3/4"C - 3#10 + 1#10 GND.
8	TYPICAL OF ALL NEW COMBINATION TEL/DATA O WALL. RUN 1"C FROM OUTLET INTO ACCESSIBLE OUTLET. PROVIDE TWO CAT6 CABLES FOR EACH VERIFY DATA RACK LOCATION IN FIELD. VERIFY
9	EXISTING FIRE ALARM PULL STATION AND RELA
(10)	EXISTING FIRE ALARM STROBE LIGHT AND RELA
(11)	PROVIDE RECEPTACLE AND PROJECTOR OUTLE PROJECTOR OUTLET SHALL BE 6" X 6" X 2-1/2"D
12	A/V CONTROL SWITCH TO BE PROVIDED BY OWI OUTLET. PROVIDE CABLES, JACKS, AND WALL P
13	SPEAKER TO BE PROVIDED BY OWNER. PROVID CABLES, JACKS AND WALL PLATE AS DIRECTED
14	FLOOR BOX SHALL BE WIREMOLD POKE-THRU F DUPLEX RECEPTACLES, AND DATA/TEL COMPAF CONDITION PRIOR TO ORDERING. PROVIDE JAC MATCH FLOORING. FINISH TO BE SELECTED BY. ACCESS TO CRAWL SPACE BELOW FOR INSTAL
(15)	PROVIDE 4-11/16" X 2-1/8"D OUTLET BOX WITH 1-
(16)	RUN ONE 1-1/4"C FROM TEL/DATA COMPARTMEN
17	RUN ONE 1-1/4"C INTO ACCESSIBLE ATTIC. RUN CONTINUOUS TO IDF. LEAVE 6-FT SLACK AT IDF.
(18)	RUN ONE 1-1/4"C BETWEEN WALL TEL/DATA OUT FROM FLOOR BOX TO TEL/DATA WALL OUTLET O PROJECTOR OUTLET.
(19)	VFD FOR CONTROL OF HOOD EXHAUST FANS TO SEE ROOF PLAN FOR CONDUIT AND WIRING FRO THAT WILL ALLOW FOR 36" FRONT WORKING SP
20	MAINTAIN 36" FRONT WORKING SPACE IN FRONT
21	THE FRONT OF HOOD SHALL HAVE TWO DUPLE? VERIFY WITH EQUIPMENT SUPPLIER.
22	STUBOUT ONE 1-1/4"C WITH PULL WIRE INTO AC
23	PROVIDE EMERGENCY PUSH BUTTON FOR SHU BUTTON SHALL BE SQ. D TYPE K NORMALLY OP RED MUSHROOM CAP. LOCATE IN WP KNOX BO RED TRIANGLE ON COVER. VERIFY LOCATION O 2#12 + 1#12 GROUND TO SHUNT TRIP MAIN BRE/

PLAN NOTES:

ING RECEPTACLE AND RELATED CONDUIT AND WIRING TO REMAIN.

AL: EXISTING TOMBSTONE RECEPTACLES AT LAB TABLES TO BE RECONNECTED TO NEW CIRCUITS ATED. RUN NEW CIRCUITS AND WIRING TO LAB TABLES. PROVIDE NEW GFI RECEPTACLES IF NOT ALREADY

NEW WIRING IN EXISTING CONDUIT. VERIFY CONDUIT ROUTING IN FIELD. PROVIDE NEW UNDERGROUND DUIT IF REQUIRED. VERIFY WORK REQUIRED PRIOR TO BIDDING.

NECT NEW FUME HOOD. VERIFY CONNECTION LOCATION AND REQUIREMENT WITH EQUIPMENT SUPPLIER. VIDE 250V, 30A RECEPTACLE. VERIFY POWER REQUIREMENTS AND RECEPTACLE CONFIGURATION WITH

- 3#10 + 1#10 GND.

CAL OF ALL NEW COMBINATION TEL/DATA OUTLETS: PROVIDE 4-11/16" X 2-1/8"D BOX WITH 1-GANG RING IN . RUN 1"C FROM OUTLET INTO ACCESSIBLE ATTIC. PROVIDE TWO JACKS AND A WALL PLATE FOR EACH T. PROVIDE TWO CAT6 CABLES FOR EACH OUTLET TO EXISTING DATA RACK. LEAVE 6-FT SLACK AT IDF. ZEATA RACK LOCATION IN FIELD. VERIFY REQUIREMENT WITH OWNER.

ING FIRE ALARM PULL STATION AND RELATED CONDUIT AND WIRING TO REMAIN.

TING FIRE ALARM STROBE LIGHT AND RELATED CONDUIT AND WIRING TO REMAIN.

DE RECEPTACLE AND PROJECTOR OUTLET IN WALL. VERIFY MOUNTING HEIGHT WITH ARCHITECT. CTOR OUTLET SHALL BE 6" X 6" X 2-1/2"D BOX WITH 1-GANG RING AND BLANK PLATE IN WALL.

NTROL SWITCH TO BE PROVIDED BY OWNER. PROVIDE 4S BOX IN WALL. RUN ONE 1"C TO PROJECTOR T. PROVIDE CABLES, JACKS, AND WALL PLATE AS DIRECTED BY OWNER.

KER TO BE PROVIDED BY OWNER. PROVIDE 4S BOX IN WALL. RUN ONE 1"C TO PROJECTOR OUTLET. PROVIDE ES, JACKS AND WALL PLATE AS DIRECTED BY OWNER.

R BOX SHALL BE WIREMOLD POKE-THRU FLOOR BOX #6ATC2P WITH FLUSH STYLE COVER PLATE, TWO 20A X RECEPTACLES, AND DATA/TEL COMPARTMENT. VERIFY POKE-THRU IS SUITABLE FOR EXISTING FLOOR ITION PRIOR TO ORDERING. PROVIDE JACKS AS DIRECTED BY OWNER. PROVIDE FLOOR BOX COVER TO H FLOORING. FINISH TO BE SELECTED BY ARCHITECT. COORDINATE WITH OWNER AND ARCHITECT FOR SS TO CRAWL SPACE BELOW FOR INSTALLATION OF FLOOR BOX.

VIDE 4-11/16" X 2-1/8"D OUTLET BOX WITH 1-GANG RING AND BLANK PLATE IN WALL FOR RUNNING OF CABLES. ONE 1-1/4"C FROM TEL/DATA COMPARTMENT OF FLOOR BOX TO WALL TEL/DATA OUTLET.

ONE 1-1/4"C INTO ACCESSIBLE ATTIC. RUN TWO CAT-6 CABLES FROM FLOOR BOX TO WALL TEL/DATA OUTLET INUOUS TO IDF. LEAVE 6-FT SLACK AT IDF.

ONE 1-1/4"C BETWEEN WALL TEL/DATA OUTLET TO PROJECTOR OUTLET. RUN ONE HDMI CABLE CONTINUOUS FLOOR BOX TO TEL/DATA WALL OUTLET CONTINUOUS TO PROJECTOR OUTLET. LEAVE 6-FT SLACK AT ECTOR OUTLET.

FOR CONTROL OF HOOD EXHAUST FANS TO BE PROVIDED BY MECHANICAL AND CONNECTED BY ELECTRICAL. ROOF PLAN FOR CONDUIT AND WIRING FROM ROOF EXHAUST FAN TO VFD. VERIFY VFD LOCATION IN ROOM WILL ALLOW FOR 36" FRONT WORKING SPACE IN FRONT OF VFD.

TAIN 36" FRONT WORKING SPACE IN FRONT OF ELECTRICAL PANELS AND VFDS.

FRONT OF HOOD SHALL HAVE TWO DUPLEX RECEPTACLES FOR CONNECTION OF TWO HOT PLATES EACH. Y WITH EQUIPMENT SUPPLIER. BOUT ONE 1-1/4"C WITH PULL WIRE INTO ACCESSIBLE ATTIC FOR FUTURE.

IDE EMERGENCY PUSH BUTTON FOR SHUT OFF OF SHUNT TRIP MAIN BREAKER IN MAIN PANEL 'FH3'. PUSH

ON SHALL BE SQ. D TYPE K NORMALLY OPEN, MAINTAINED CONTACT PUSH BUTTON WITH 1-3/8" DIAMETER IUSHROOM CAP. LOCATE IN WP KNOX BOX. KNOX BOX TO BE PROVIDED BY GENERAL CONTRACTOR. PAINT RIANGLE ON COVER. VERIFY LOCATION OF THE EMERGENCY PUSH BUTTON WITH ARCHITECT. RUN 3/4"C -+ 1#12 GROUND TO SHUNT TRIP MAIN BREAKER IN MAIN SWITCHBOARD.

EXISTING FIRE ALARM APPLICATION NUMBER:

1. CAMUS WIDE FIRE ALARM SYSTEM REPAIR: DSA #03-116379

Roof Electrical Plan

RC	OF ELECTRICAL PLAN NOTES:
1	ELECTRICAL CONTRACTOR SHALL PROVIDE POWER AND HVAC EQUIPMENT AS DIRECTED BY MECHANICAL CONTR REQUIREMENT PRIOR TO ROUGH-IN. PROVIDE WP FUSEI
2	HOUSING. RECEPTACLE SHALL BE LISTED WEATHER-RES "WEATHERPROOF WHILE IN USE EXTRA-DUTY HOOD". A EQUIPMENT.
3	PROVIDE WEATHERPROOF/GFI RECEPTACLE. VERIFY MO SHALL BE LISTED WEATHER-RESISTANT TYPE. RECEPTA EXTRA-DUTY HOOD".
4	PROVIDE JUNCTION BOX IN ACCESSIBLE ATTIC. RUN ALL
5	RUN SEPARATE HOT AND NEUTRAL FOR DUCT SMOKE D
6	120V DUCT SMOKE DETECTOR AT SUPPLY AIR PLENUM S CONTRACTOR. VERIFY LOCATION AND CONNECTION REC
7	PROVIDE NEW ADDRESSABLE MONITOR MODULE IN ATT MODULE SHALL BE COMPATIBLE WITH EXITING FIRE ALA EXISTING FIRE ALARM CONTROL PANEL FOR THE ADDRE VERIFY WORK REQUIRED PRIOR TO BIDDING.
8	RUN 1"C WITH TWO ADDRESSABLE CABLE (LOOP) TO EXI TO BIDDING.
9	CONNECT EXHAUST FAN. PROVIDE WP FUSED DISCONN
10	RUN CONDUIT AND WIRING TO VFD IN ELECTRICAL ROOM REQUIRED WITH MECHANICAL.
(11)	1-1/4"C - 3#2 + 1#8 GND.
12	TYPICAL: REUSE ROOF JUNCTION BOX AND CONDUIT IN WORK REQUIRED IN FIELD.

AND CONTROL CONDUITS, WIRING AND CONNECTION FOR NTRACTOR. VERIFY LOCATION AND CONNECTION SED DISCONNECT SWITCH ON AC UNIT HOUSING.

RESISTANT TYPE. RECEPTACLE SHALL HAVE A RECEPTACLE SHALL BE WITHIN 25-FT OF ALL ROOF TOP

MOUNTING AND LOCATION WITH OWNER. RECEPTACLE TACLE SHALL HAVE "WEATHERPROOF WHILE IN USE

L CONDUITS FOR ROOF EQUIPMENT IN ATTIC.

DETECTOR CIRCUIT.

SHALL BE FURNISHED AND INSTALLED BY CONTROL EQUIREMENT IN FIELD.

ITIC AT DUCT SMOKE DETECTOR LOCATION. MONITOR LARM SYSTEM. INCLUDE IN BID THE PROGRAMMING AT RESSABLE DEVICE BY SCHOOLS FIRE ALARM CONTRACTOR.

XISTING INITIATION DEVICE. VERIFY WORK REQUIRED PRIOR

NECT SWITCH ON UNIT AS DISCONNECT.

OM. SEE SHEET E2.01 FOR LOCATION. VERIFY WORK

NTO ROOF FOR CONNECTION OF NEW EXHAUST FAN. VERIFY

- CONDUITS: CONNECTION AND FITTINGS. 5. MC CABLE IS NOT ACCEPTABLE TO BE USED ON THIS PROJECT. LIGHT SWITCHES: 15A/20A QUIET TYPE, MATCH RECEPTACLE'S FINISH. ELEMENT TYPE AS RECOMMENDED BY EQUIPMENT SUPPLIER.

FIRE RATED AREAS NOTES: DISTANCE OF NOT LESS THAN 24". APPROVAL PRIOR TO INSTALLATION.

HANGER ROD -----MASON CLEVIS TYPE HANGER WITH CCB CLEVIS -----CROSS BOLT CONDUIT-CONDUIT SIZ

CONDUIT HANGER DETAIL

1/2" TO 4"

5" TO 8" 10" TO 12"

ELECTRICAL MATERIAL SPECIFICATIONS:

1. ALL UNDERGROUND CONDUITS SHALL BE PVC SCHEDULE 40. ALL UNDERGROUND CONDUITS RUN UNDERNEATH BLDGS SHALL BE RUN BELOW SLAB. ALL UNDERGROUND CONDUITS RUN OUTSIDE OF BLDGS SHALL HAVE MIN 24" COVER. 2. ALL CONDUITS IN BLDGS SHALL BE CONCEALED IN WALL OR ATTICS. CONDUITS SHALL BE EMT, OR METALLIC FLEX CONDUITS FOR CONNECTION TO LIGHTING FIXTURES IN SUSPENDED ACCESSIBLE CEILINGS, MOTORS OR MOTORIZED EQUIPMENT. 3. ALL CONDUITS RUN ON ROOF OR EXPOSED TO WEATHER SHALL BE EMT OR LIQUID-TIGHT FLEX CONDUITS WITH WATER-TIGHT

4. ALL CONDUIT PENETRATION THROUGH ROOF SHALL HAVE ROOF JACKS WITH LEAD FLASHINGS FOR WATER-TIGHT INSTALLATION.

CONDUCTORS: ALL CONDUCTORS SHALL BE THHN/THWN-2, COPPER, 90-DEGEES CELSIUS TEMPERATURE RATED CONDUCTORS. OUTLET BOXES: ALL OUTLETS BOXES SHALL BE STANDARD ONE OR TWO PIECE GALVANIZED STEEL KNOCK-OUT OUTLET BOXES. CONVENIENCE OUTLETS: 15A/20A 3P GROUNDING DUPLEX RECEPTACLES WITH GREY FINISH. VERIFY FINISH WITH ARCHITECT.

WALL PLATES: 0.04-INCH THICK, TYPE 302, SATIN-FINISHED STAINLESS STEEL. VERIFY FINISH WITH ARCHITECT.

DISCONNECT SWITCHES: HORSEPOWER RATED FUSIBLE TYPE WITH EXTERNAL OPERABLE HANDLE, U.O.N. FUSES SHALL BE DUAL

MC CABLE WITH AN INTERNAL GROUND BOND MAY BE USED ONLY WHERE USE OF EMT OR FLEX IS NOT PRACTICAL OR POSSIBLE E.G. IN MILLWORK, ETC. MC CABLE SHALL NOT BE UTILIZED FOR ANY BRANCH CIRCUITRY IN THIS BUILDING.

				F	IXTURE SCHEDUL	.E		
TYPE	WATT	LAMP	VOLT	MANUFACTURER	CATALOG No.	MTG	NOTES	
AE	47	LED	120	LITHONIA	2ALL4-60L-EZ1-LP840-N100- E10WLCP	REC.	10W INTEGRAL EMERGENCY BATTERY PACK	1
В					2ALLS4-60L-EZ1-LP840-N100	SURF.		
BE					2ALLS4-60L-EZ1-LP840-N100-EL14L		1400 LUMEN EMERGENCY BATTERY PACK	1
С	38	V		ORACLE	24-OVHP-RTK-LED-3000L/4000L/5000L -DIM10-MVOLT-35K/40K/50K-85	V		2
E1	10	INCL		LITHONIA	LHQM-LED-R-HO	WALL		\bigcirc
E2			V		ELM6L			1
	ALL EME	RGENCY L OF STOR	IGHTING	G AND EXIT SIGNS SHALL E FTERIES AND SHALL BE IN	BE PROVIDED FOR A MINIMUM OF 90 MINUTES ACCORDANCE WITH CBC CHAPTER 27.	AND SHALL		

(2) TYPICAL: TYPE 'C' FIXTURES TO BE RETROFITTED WITH LED LIGHT KIT. VERIFY NEW RETROFIT KIT COMPATIBILITY WITH EXISTING FIXTURE PRIOR TO BIDDING.

Έ	ROD SIZE
	3/8"Ø
	1/2"Ø
	5/8"Ø

NTS

NOTES:

- THE WALL.

PROVIDE MIN 1 #8 SMS IN OPPOSITE SIDES

T-BAR CEILING GRIDS BY CEILING CONTRACTOR

SPRING NUTS -

JOIST

CEILING FINISH -

1. THE CAULK IS TO BE FORCED INTO THE ANNULAR SPACE TO THE MAXIMUM EXTENT POSSIBLE FLUSH WITH THE EXTERIOR OF THE PENETRATION SURFACE 2. FINISH CAULKING WITH A 1/4" (6mm) MINIMUM BEAD OF CP-25WB+ CAULK APPLIED TO THE PERIMETER OF THE CONDUIT/PIPE AT ITS EGRESS FROM

3. THE MAXIMUM ANNULAR SPACE IS NOT TO EXCEED 3/16" (5mm). 4. INSTALL 3M FIRESTOP ON BOTH SIDES OF THE WALL.

THESE RECOMMENDATIONS ARE BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL THROUGH-PENETRATION FIRESTOP SYSTEM #147

FIRE RATED ASSEMBLY DETAIL

	FLECTRICAL SYMBOLS
$\langle A \rangle$	
A_3	ELECTRICAL HOMERUN (TO PANEL A, CIRCUTT#3), 3/4°C MINIMUM, U.O.N.
	(1/2°C - 2#12 + 1#12 GND, THHN/THWN-CU) CONDUIT RUN IN FLOOR OR UNDERGROUND
<u>ب</u> بر	(1/2"C - 2#12 + 1#12 GND, THHN/THWN-CU) HASH LINES DENOTE NUMBER OF #12 + 1#12 GND (THHN/THWN-CU).
	U.O.N. 1/2"C FOR UP TO 5#12 + 1#12 GND, 3/4"C FOR 6#12 TO 10#12 + 1#12 GND.
	FLEXIBLE CONDUIT CONNECTION
	ELECTRICAL PANEL
	TERMINAL CABINET
•	DUPLEX RECEPTACLE IN WALL (+15" BOTTOM OF BOX AFF)
	QUADRUPLEX RECEPTACLE IN WALL (+15" BOTTOM OF BOX AFF)
	220V, 20A, 2P, 3W RECEPTACLE IN WALL (+15" BOTTOM OF BOX AFF)
	SPECIAL OUTLET AS NOTED ON DRAWING (+15" BOTTOM OF BOX AFF)
	TELEPHONE OUTLET IN WALL (+15" BOTTOM OF BOX AFF)
	COMBINATION TELEPHONE/DATA OUTLET, (+15" BOTTOM OF BOX AFF)
	DATA OUTLET, (+15" BOTTOM OF BOX AFF)
ŏ ŏ ∩	
 	JUNCTION BOX WITH FLEX CONNECTION
$\overrightarrow{\mathcal{A}}$	MOTOR OUTLET
	FUSED DISCONNECT SWITCH, BY ELECTRICAL CONTRACTOR, U.O.N.
0	CEILING MOUNTED LIGHTING FIXTURE WITH LIGHTING OUTLET
<u>Ŷ</u>	WALL MOUNTED LIGHTING FIXTURE WITH LIGHTING OUTLET
	RECESSED MOUNTED LIGHTING FIXTURE WITH LIGHTING OUTLET
	LIGHTING FIXTURE
	LIGHTING FIXTURE WITH LIGHTING OUTLET
$\overset{\text{la}}{=}\overset{\text{la}}{=}\overset{\text{la}}{\bullet}\overset{\text{la}}{\bullet}^{1}$	"1" DENOTES CIRCUIT NUMBER, "a" DENOTES SWITCHING
\$	SINGLE POLE SWITCH (+48" TOP OF BOX AFF)
\$3	3-WAY SWITCH (+48" TOP OF BOX AFF)
\$ <u>\$</u> \$	TWO SINGLE POLE SWITCHES, GANGED IN SAME BOX (+48" TOP OF BOX AFF)
	ELECTRICAL NOTE #1 (REFER TO ELECT NOTES ON SAME SHEET)
WP	
U.O.N.	UNLESS OTHERWISE NOTED
NL	NIGHT LIGHT (LIGHT TO REMAIN ON 24/7)
ENI	
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF)
GFI	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER
GFI	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR
GFI AFF (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING
GFI AFF (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT
GFI AFF (E) H@	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF)
GFI AFF (E) Hogo Hogo	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF)
GFI AFF (E) Hogo Hogo	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF)
GFI AFF (E) M M M M M M M M M M M M M M M M M M M	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEVED SWITCH, (+48" TOP OF BOX AFF)
GFI AFF (E) ↓ ♥ ♥ ♥ ♥ ♥ K ♥ ♥ K	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR CEILING MOUNTED
GFI AFF (E) (E) (E) (E) (E) (E) (E) (E) (E) (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED
GFI AFF (E) ↓ (E) (E) (E) (E) (E) (E) (E) (E) (E) (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC
GFI AFF (E) (E) (E) (E) (E) (E) (E) (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC
GFI AFF (E) (E) (E) (E) (E) (E) (E) (E)	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXITERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING FI ECTRICAL
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING ELECTRICAL EXISTING CONDUIT & WIRING
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING ELECTRICAL EXISTING CONDUIT & WIRING 'R DENOTES EXISTING ELECTRICAL TO BE REMOVED
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PUUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING ELECTRICAL EXISTING ELECTRICAL TO BE REMOVED 'R' DENOTES EXISTING ELECTRICAL TO BE REMOVED 'RL'DENOTES EXISTING ELECTRICAL TO BE REMOVED
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PUWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING ELECTRICAL EXISTING ELECTRICAL TO BE REMOVED 'RL'DENOTES EXISTING ELECTRICAL TO BE REMOVED
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) KEYED SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX A.F.F.) EXISTING CONDUIT & WIRING 'R' DENOTES EXISTING ELECTRICAL TO BE REMOVED 'RL'DENOTES EXISTING ELECTRICAL TO BE REMOVED
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX AFF.) EXISTING ELECTRICAL EXISTING ELECTRICAL TO BE REMOVED 'R' DENOTES EXISTING ELECTRICAL TO BE REMOVED 'R' DENOTES EXISTING ELECTRICAL TO BE RELOCATED
	EXTERIOR NIGHT LIGHT (CONTROLLED VIA PHOTOCELL ON, PHOTOCELL OFF) GROUND FAULT CIRCUIT INTERRUPTER ABOVE FINISHED FLOOR EXISTING EXTERIOR WALL MOUNTED WP EMERGENCY LIGHT WALL DIMMER SWITCH WITH OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, (+48" TOP OF BOX AFF) DIMMER SWITCH, (+48" TOP OF BOX AFF) VACANCY SENSOR SWITCH, (+48" TOP OF BOX AFF) LIGHTING CONTROL OCCUPANCY SENSOR, CEILING MOUNTED AUTOMATIC DAYLIGHTING SENSOR, CEILING MOUNTED LIGHTING CONTROL POWER PACK, ACCESSIBLE ATTIC PLUG LOAD POWER PACK, ACCESSIBLE ATTIC POWER OUTLET WITH ONE CONTROLLED DUPLEX RECEPTACLE AND ONE NON-CONTROLLED DUPLEX RECEPTACLE (+15" BOTTOM OF BOX AF.F.) EXISTING ELECTRICAL EXISTING ELECTRICAL TO BE REMOVED 'RL'DENOTES EXISTING ELECTRICAL TO BE RELOCATED

-	225 42 SIEMEN	A. A.	BUSSING RCUIT	<u></u> PI NO	A MAIN BREAKER	(4) FH2	FLUSH	MAX.	ENCL. [
CIR	BKR	LC	DAD (VA)				LO	AD (VA)	
NO.	AMP POLE	PHASE A	PHASE	PHASE C	- DESCRIPTION	DESCRIPTION	PHASE	PHASE	PHASE
1	20 1	540			ROOM 26 WALL RECEPTACIES	ROOM 26 EAST	1400		
3			1000		PROJECTOR RM. 26			1400	
- 5				360	FLOOR BOX RM. 26				1400
7		300			CONTROLLED ENVIRON. RM WEST WALL		1400		
9					SPARE	ROOM 24 LIGHTS		500	
11				864	ROOM 26 EXHAUST FAN				500
13		864			ROOM 29 EXHAUST FAN	ROOM 26 CENTER	1400		
15			360		ROOM 26 RECEPTACLES			1400	
17				360					1400
19		360					1400		
21			360		ROOM 26 OVEN SOUTH WALL			1400	
23				360	ROOM 24 OVEN SOUTH WALL	RECEPTACLES- HOOD COUNTER			600
25		360			ROOM 26 & 24 SOUTH WALL RECEPT.	CONTROLLED ENVIRON.	300		
27					SPARE	SPARE			
29				1000	STORAGE RM. COMPRESSOR	ROOM 26 WEST ISLAND COUNTER			1400
31		1000					1400		
33			360		STORAGE RM. RECEPTACLE			1400	
35				360					1440
37					SPARE	SPARE			
39									
41									
PH	IASE A	= 9324		VA, PH	HASE $B = 9580$	VA, PHASE C =	10084	VA	

(1) EXISTING BREAKER, EXISTING LOAD.

(2) NEW BREAKER, NEW LOAD. NEW CIRCUIT BREAKERS ADDED TO THE EXISTING PANEL SHALL BE OF THE SAME MANUFACTURE AND PROVIDED WITH THE OCPD AIC TO MATCH THE EXISTING PANEL'S AIC RATING. (3) PROVIDE BREAKER TIE FOR MULTIWIRE BRANCH CIRCUITS.

(4) FIELD VERIFY EXISTING LOADS AND SPACE AVAILABILITY. PROVIDE NEW TYPEWRITTEN CIRCUIT DIRECTORY INSIDE PANEL COVER.

(5) EXISTING BREAKER, NEW LOAD.

	_	400 42	A. CIR	BUSSING CUIT	NO	A. MAIN BREAKER	(4)		MAX.	ENCL. DE	:PTH & V _ MOUN	WIDTH TING
	_	SQUARE	-D			$(E) PANEL_$	4F2					
- [CIR	BKR	LO	AD (VA)		DESCRIPTION	DESCRIPTION	LO	AD (VA)		BKR	CIR
	NO.	AMP	PHASE A	PHASE B	PHASE	DESCRIPTION	DESCRIPTION	PHASE	PHASE	PHASE	AMP	NO.
	1	20 1	1000			RECEPTACLES- RM 19	RECEPTACLES- RM 18	1000			20 1	2
	3			500		LTS- RM 26			1000			4
Űμ	5				500		V V			1000		6
	7		500			LTS- RM 12	RECEPTACLES- RM 26	1000				8
	9			500			ANDOVER CONTROLS		400			10
	11				500		REFRIGERATOR/ CHEMICAL-STORAGE			1000		12
	13		500			LTS- RM 1	RM 17 CAB FAN	600				14
	15			500								16
	17					SPARE						18
	19		500			LTS- RM 19	RECEPTACLES- RM 17	1000				20
	21			500					1000			22
	23				1400	FUME HOOD RM 27A				1000		24
"[_	25		1400									26
	27			1400			RECEPTACLES RM 27B		1000			28
″Ц	29				1400							30
	31	30 2	1000			250V RECEPTACLE RM. 27B	DRINKING FOUNTAIN	700				32
	33			1000			RECEPTACLES RM 27B		1000			34
	35	30 2			1000	250V RECEPTACLE RM 27B				1000		36
	37		1000				V	1000				38
	39	30 2		1000		250V RECEPTACLE RM 27B	SPECTROMETER		1000		15 2	40
	41				1000					1000		42

(1) EXISTING BREAKER, EXISTING LOAD.

(2) NEW BREAKER, NEW LOAD. NEW CIRCUIT BREAKERS ADDED TO THE EXISTING PANEL SHALL BE OF THE SAME MANUFACTURE AND PROVIDED WITH THE OCPD AIC TO MATCH THE EXISTING PANEL'S AIC RATING.

(3) PROVIDE BREAKER TIE FOR MULTIWIRE BRANCH CIRCUITS.

(4) FIELD VERIFY EXISTING LOADS AND SPACE AVAILABILITY. PROVIDE NEW TYPEWRITTEN CIRCUIT DIRECTORY

INSIDE PANEL COVER. (5) EXISTING BREAKER, NEW LOAD.

_	120/208		VOLTS _	3Pł	HASE4WIRE					Bre	AKER /	4.I.C.
-	42	A.	BUSSING	225	A. MAIN BREAKER	(1)		5 <u>-3/4" x 20"</u> FLUSH	MAX.	ENCL. DE	PTH & V	WIDTH
	BOLT-ON				(E) PANEL_	FH1						TING
CIR	BKR	LO	AD (VA)			DECODI	DTION	LO	AD (VA)		BKR	CIR
NO.	AMP POLE	phase A	phase B	PHASE C	- DESCRIPTION	DESCRI	PHON	PHASE A	phase B	PHASE C	AMP	NO.
1	20 1	1130			HOOD #1- EF	HOOD #5- N	IUF	670			20 1	2
3			1130		HOOD #2- EF	HOOD #6- N	IUF		670			4
5				1130	HOOD #3- EF	HOOD #5- E	F			1130		6
7		1130			HOOD #4- EF	HOOD #6- E	F	1130				8
9			670		HOOD #1- MUF	FLAMABLE EXH-FAN	CABINET		830			10
11				670	HOOD #2- MUF					830		12
13		670			HOOD #3- MUF			830				14
15			670		HOOD #4- MUF				830			16
17				1200	REFRIG.					830		18
19		1200			ICE MACHINE			830				20
21					SPARE				830			22
23										830		24
25								830				26
27												28
29												30
31												32
33												34
35												36
37						PANEL FH2		9324			100 3	38
39									9580			40
41										10084	\square	42
PH	ASE A	= 17744	4	VA, PH	IASE B = 15210	VA, PHA	SEC =	= 16704	VA			
T0	TAL CO	NNECTE	D (49	9658	VA) + 25% LCL (- VA	(x) = 49	9658	VA (138	AMP)	

(1) EXISTING PANEL SHEDULE, SHOWN FOR REFERENCE ONLY.

	120/208 400 42 SQUARE	A. CIR(_D	. Volts _ Bussing Cuit	<u>3</u> Pł <u>NO</u>	HASE <u>4</u> WIRE _ A. MAIN BREAKER (E) PANEL_	(4) 4F1	FLUSH	MAX.	Bre Encl. De	EAKER & PTH & W _ MOUN	A.I.C. /IDTH TING
	BKR	LO	AD (VA)		DESCRIPTION	DESCRIPTION	LO	AD (VA)	DUMOE	BKR	CIR
NU.	POLE	A	B	C				B		POLE	
1	20 1					PANEL 'FH3'	7540			3	2
3			300		BASEMENT LIGHTS	§		6200			4
5						8			5960		6
7		600			CORR. LTG.	EXHAUST FAN	600	~~~~		20 1	8
9			600			CORR. LTG.		600			10
11				600	V				600		12
13						TIMECLOCK FOR EXHAUST FAN	100				14
15	15 3		300		HOOD EF-1 FOR RM. 27A	AC UNIT RM 17		2700		40 3	16
17	\square			300					2700	\square	18
19		300					2700			\square	20
21	20 1		600		HOODS RM 17	SPARE				20	22
23						HOOD EF-1 FOR RM. 27A			300	15 3	24
25		600			HOODS RM 17		300				26
27			360		RECEPTACLES- ROOF			300			28
29				50	DUCT SMOKE DETECTOR	RECEPTACLES- RM 19			720	20	30
31	15 3	300			HOOD EF-1 FOR RM. 27A	EF-2, 1/2HP FOR SNORKEL	300			15 3	32
33			300					300			34
35				300					300		36
37	15 3	300			HOOD EF-1 FOR RM. 27A	DOAS-1, 45FLA	5400			80 3	38
39	\square		300					5400			40
41				300					5400		42
PH/	ASE A :	= 19040) \	/A, PH	IASE B = 18860	VA, PHASE C =	18730	VA			

(2) PROVIDE SHUNT TRIP BREAKER.

(1) EXISTING BREAKER, EXISTING LOAD.

(2) NEW BREAKER, NEW LOAD. NEW CIRCUIT BREAKERS ADDED TO THE EXISTING PANEL SHALL BE OF THE SAME MANUFACTURE AND PROVIDED WITH THE OCPD AIC TO MATCH THE EXISTING PANEL'S AIC RATING.

(3) PROVIDE BREAKER TIE FOR MULTIWIRE BRANCH CIRCUITS.

(4) FIELD VERIFY EXISTING LOADS AND SPACE AVAILABILITY. PROVIDE NEW TYPEWRITTEN CIRCUIT DIRECTORY

INSIDE PANEL COVER.

(5) EXISTING BREAKER, NEW LOAD.

LINE DIAGRAM NOTES: 1 TYPICAL: UNLESS NOTED OTHERWISE, EXISTING ELECTRICAL TO REMAIN.

2 1-1/2"C - 4#1 + 1#6 GND.

GENERAL ELECTRICAL FIELD MARKING REQUIREMENT: ARC-FLASH HAZARD WARNING:

PER CEC 110-16, ELECTRICAL EQUIPMENT SUCH AS SWITCHBOARDS, SWITCHGEAR, PANELBOARDS, INDUSTRIAL CONTROL PANELS., METER SOCKET ENCLOSURES, AND MOTOR CONTROL CENTERS, THAT ARE LIKELY TO REQUIRE EXAMINATION, ADJUSTMENT, SERVICING OR MAINTENANCE WHILE ENERGIZED SHALL BE FIELD OR FACTORY MARKED TO WARN QUALIFIED PERSONS OF POTENTIAL ELECTRICAL ARC FLASH HAZARDS. THE MARKING SHALL MEET THE REQUIREMENTS IN 110.21(B) AND SHALL BE LOCATED SO AS TO BE CLEARLY VISIBLE TO QUALIFIED PERSONS BEFORE EXAMINATION, ADJUSTMENT, SERVICING OR MAINTENANCE OF THE EQUIPMENT.

110.21(B) FIELD-APPLIED HAZARD MARKINGS: WHERE CAUTION, WARNING, OR DANGER SIGNS OR LABELS ARE REQUIRED BY THE CEC, THE LABELS SHALL MEET THE FOLLOWING REQUIREMENTS:

(1) THE MARKING SHALL ADEQUATELY WARN OF THE HAZARD USING EFFECTIVE WORDS AND/OR COLOR AND/OR SYMBOLS.

(2) THE LABEL SHALL BE PERMANENTLY AFFIXED TO THE EQUIPMENT OR WIRING METHOD NAD SHALL NOT BE HAND WRITTEN.

EXCEPTION TO (2): PORTIONS OF LABELS OR MARKINGS THAT ARE VARIABLE, OR THAT COULD BE SUBJECT TO CHANGES, SHALL BE PERMITTED TO BE HAND WRITTEN AND SHALL BE LEGIBLE. (3) THE LABEL SHALL BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.

AVAILABLE FAULT CURRENT FIELD MARKING:

PER CEC ARTICLE 110.24(A) FIELD MARKING. SERVICE EQUIPMENT SHALL BE LEGIBLY MARKED IN THE FIELD WITH THE MAXIMUM AVAILABLE FAULT CURRENT. THE FIELD MARKING(S) SHALL INCLUDE THE DATE THE FAULT-CURRENT CALCULATION WAS PERFORMED AND BE OF SUFFICIENT DURABILITY TO WITHSTAND THE ENVIRONMENT INVOLVED.

PER CEC ARTICLE 110.24(B) MODIFICATIONS. WHEN MODIFICATIONS TO THE ELECTRICAL INSTALLATION OCCUR THAT AFFECT THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SERVICE, THE MAXIMUM AVAILABLE FAULT CURRENT SHALL BE VERIFIED OR RECALCULATED AS NECESSARY TO ENSURE THEE SERVICE EQUIPMENT RATINGS ARE SUFFICIENT FOR THE MAXIMUM AVAILABLE FAULT CURRENT AT THE LINE TERMINALS OF THE EQUIPMENT THE REQUIRED FIELD MARKING(S) IN 110.24(A) SHALL BE ADJUSTED TO REFLECT THE NEW LEVEL OF MAXIMUM AVAILABLE FAULT CURRENT.

EXCEPTION: THE FIELD MARKING REQUIREMENTS IN 110.24(A) AND 110.24(B) SHALL NOT BE REQUIRED IN INDUSTRIAL INSTALLATIONS WHERE CONDITIONS OF MAINTENANCE AND SUPERVISION ENSURE THAT ONLY QUALIFIED PERSONS SERVICE THE EQUIPMENT.

			2% V	oltage		3% Vol	anet					
Circu	it Volts (V)	Droj	o (V)		Drop	(V)		Total	Loss (V)	
	120		2.	4		3.6				6.0		
	208		4.	2		6.2				10.4		
	240		4.	8		7.2			12.0			
	277 5.5					9.2				3.0		
	480		0	<u> </u>		14.4	[24.0		
Table 9	-5 Voltar		J.	0		17.7				.4.0		
anie o	-5 VOILag			omme		phei M	lie Ga	uges		urrent	Loads	
	Circuit	ſ	Aaximu	m Feed	er Lengt	:h	Ma	ximum	Branch	Circuit L	.ength	
Wire	Amps	120	208	240	277	480	120	208	240	277	480	
14*	12	39	67	78	90	156	58	101	117	135	233	
12*	16	46	80	93	107	185	69	120	139	160	278	
10	24	48	83	96	111	192	72	125	144	166	288	
8	32	57	99	115	132	229	86	149	172	199	344	
6	40	73	127	146	169	293	110	190	220	253	439	
4	52	89	154	178	206	356	134	232	267	309	535	
2	72	103	178	206	237	412	154	267	309	356	617	
0	96	123	212	245	283	490	184	319	368	424	735	
00	108	137	238	274	317	549	206	357	412	475	823	
0000	144	163	283	327	377	654	245	425	490	566	980	
250 (kcmil)	164	170	294	340	392	679	255	441	509	588	1019	
300	184	181	314	362	418	725	272	471	543	627	1087	
350	200	195	338	390	450	779	292	506	584	675	1169	
500	248	224	388	448	517	896	336	582	672	776	1344	

RE		_	22K (SERIES) BREAKER A.I.C.					
REAKER (2))	_	3-3/4" x 14	<u> </u>	ENCL. DE	EPTH & V	/IDTH	
	EH3	-	FLUSH			_ MOUN	TING	
<u> </u>	ГПЗ							
	DESOBI		LO	AD (VA)		BKR	CIR	
IUN	DESCRI	TUN	PHASE A	PHASE B	PHASE C	AMP POLE	NO.	
COUNTER	ROOM 24 WEST ISLAI	ND COUNTER	1400			20	2	
				1400			4	
					1400		6	
		1	1400				8	
	SPARE						10	
	ROOM 24 C	ENTER UNTER			1400		12	
<u>}-</u>			1400				14	
				1400			16	
		1			1400		18	
	SHUNT TRI	0	100				20	
	SPARE						22	
							24	
							26	
							28	
							30	
							32	
							34	
							36	
							38	
							40	
		1					42	
200	VA, PHA	SE C = 10700	5960	VA	55			
LUL (- VA	y = 19700		VA (ວວ	AMP)		

