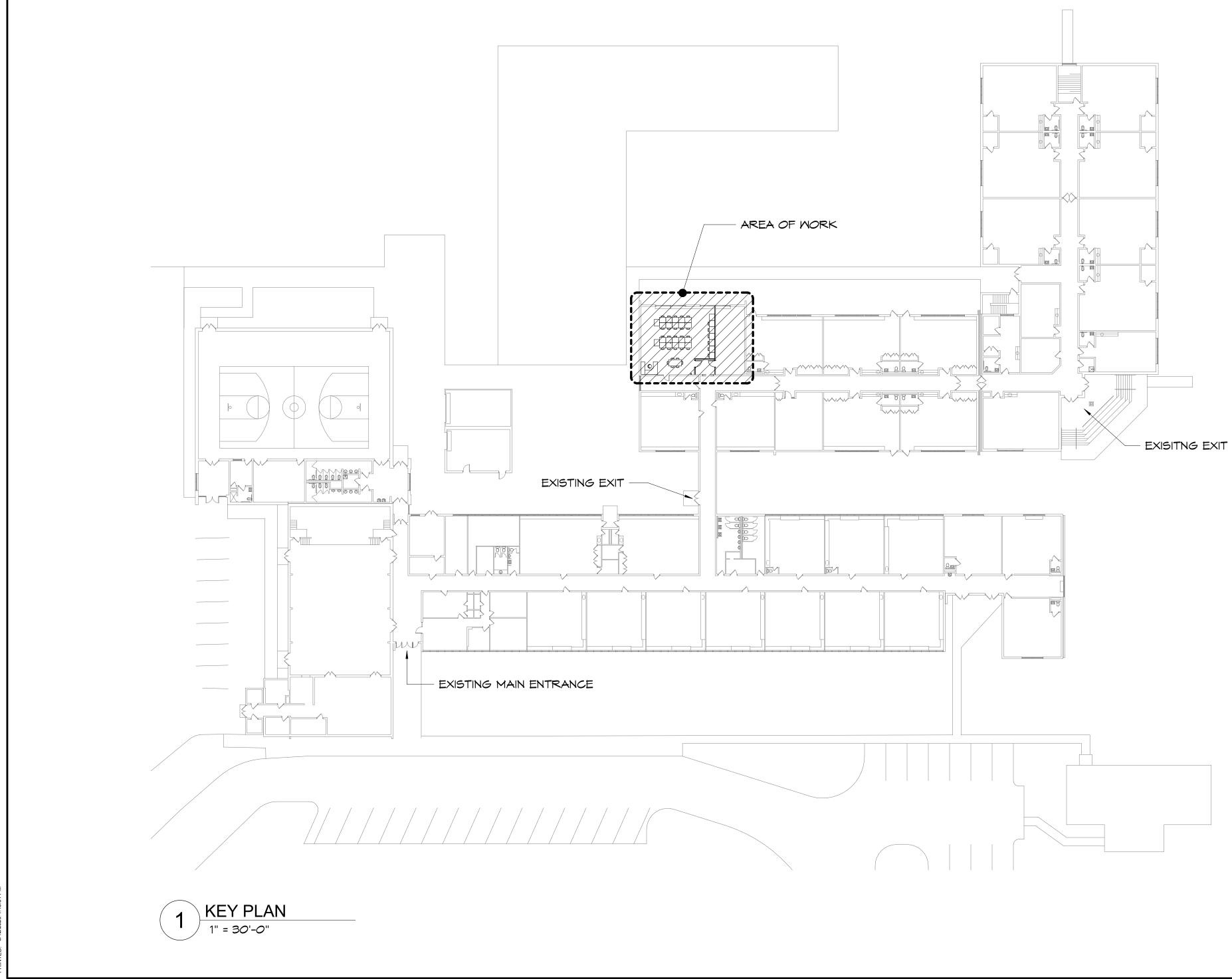
MEDIA CENTER ALTERATIONS AT HALEYVILLE-MAURICETOWN SCHOOL

1308 NORTH AVE., PORT NORRIS, NJ 08349 100% CD SET



SITE MAP: N.T.S.



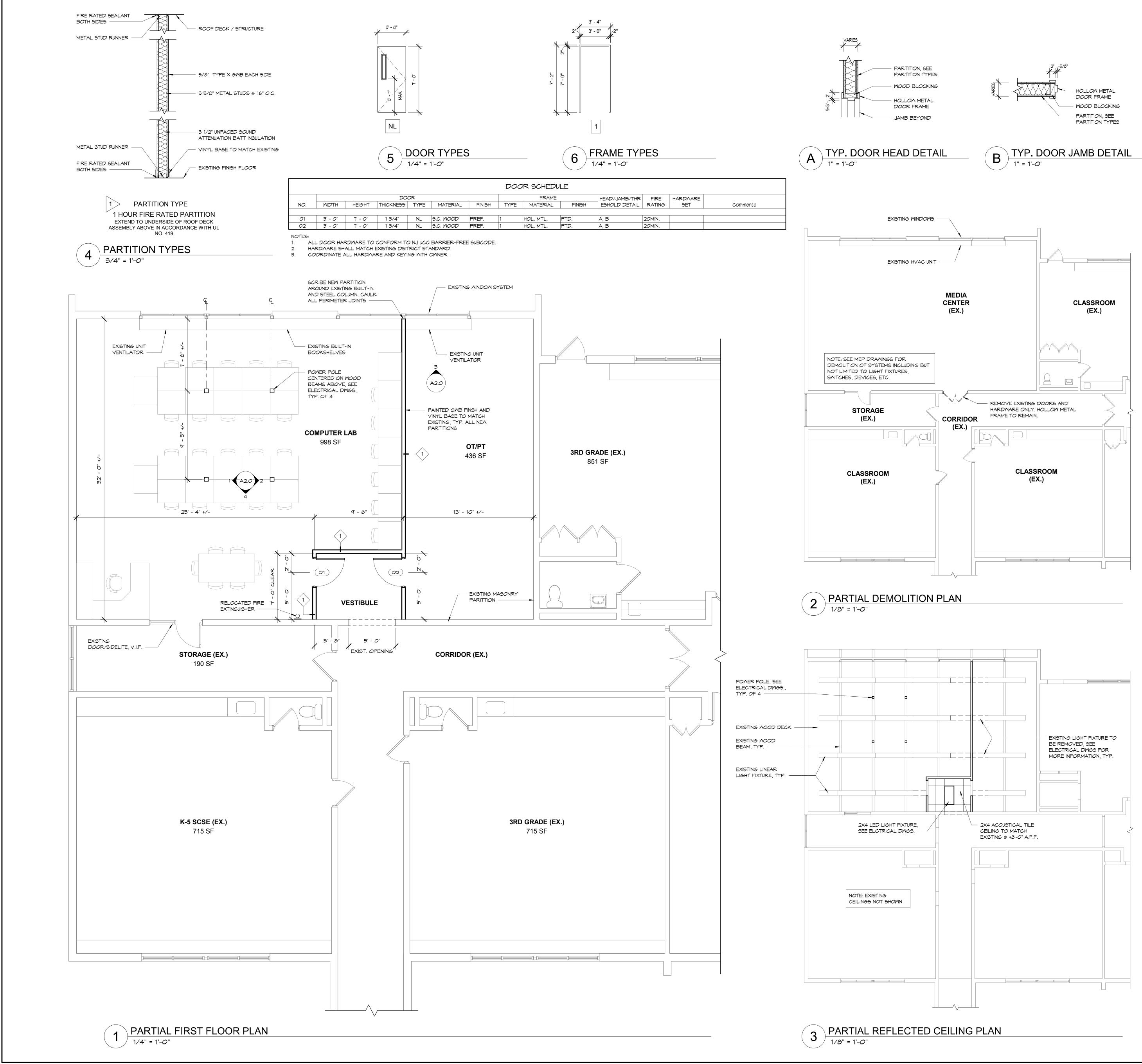
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MMPFA PROJECT #: 20.046

	DRAWING LIST		
			ISSUED
SHEET NO.	SHEET NAME	NO.	DATE
GENERAL			
CO.O	COVER SHEET, KEY PLAN, DRAWING LIST, BUILDING DATA	1	05/12/20
ARCHITECTUR	AL		
A1.0	PARTIAL FLOOR PLANS, SCHEDULES, NOTES, AND DETAILS	1	05/12/20
A2.0	INTERIOR ELEVATIONS	1	05/12/20
MECHANICAL			
M0.0	MECHANICAL COVER SHEET	1	05/12/20
M1.0	MECHANICAL FLOOR PLANS	1	05/12/20
M2.0	MECHANICAL SCHEDULES AND DETAIL SHEET	1	05/12/20
M3.0	MECHANICAL SPECIFICATIONS	1	05/12/20
M3.1	MECHANICAL SPECIFICATIONS	1	05/12/20
ELECTRICAL			
E0.0	ELECTRICAL COVER SHEET	1	05/12/20
E1.0	ELECTRICAL FLOOR PLANS	1	05/12/20
E2.0	ELECTRICAL SPECIFCATIONS	1	05/12/20

PROJECT SUMMARY	BUILDING DATA
 THIS PROJECT IS CLASSIFIED AS ALTERATIONS AND RENOVATIONS PER THE NJ REHABILITATION CODE NJAC 5:23-6. THE PRIMARY SCOPE OF WORK INVOLVES CONVERTING THE MEDIA CENTER INTO A COMPUTER LAB ON ONE SIDE AND AN OT/PT ROOM ON THE OTHER SIDE WITH A SMALL VESTIBULE-LIKE SPACE ADJOINING THE EXISTING CORRIDOR. THE EXISTING MEDIA CENTER HAS A HIGHER OCCUPANCY COUNT AS COMPARED TO THE PROPOSED COMPUTER LAB AND OT/PT COMBINED. REPLACEMENT OF EGRESS COMPONENTS SUCH AS DOORS STILL MEETS EGRESS REQUIREMENTS FOR THE PROPOSED SPACES. NEM FIRERATED PARTITIONS AND DOORS CREATE SEPARATION BETWEEN THE CORRIDOR EXTENSION AND THE NEW SPACES. INTERIOR FINISHES FOR THE NEW PARTITIONS, DOORS, ETC. ARE SPECIFIED TO MATCH EXISTING EVALLS IN THE WORK AREA SHALL BE PAINTED. EXISTING MECHANICAL SYSTEMS WILL REMAIN IN PLACE WITH SUPPLEMENTAL AIR SUPPLIED TO THE COMPUTER LAB. EXISTING ELECTRICAL SYSTEMS WILL BE MODIFIED TO ACCOMMODATE THE NEW ROOM FUNCTIONS INCLUDING POWER POLES FOR THE COMPUTER TABLES. APPLICABLE CODES 2018 INTERNATIONAL BUILDING CODE - NJ EDITION 2018 NATIONAL STANDARD PLUMBING CODE 2017 NATIONAL ELECTRIC CODE; NFPA 70 2016 ASHRAE 90.1-2016 2018 INTERNATIONAL BUILDING KODE - NJ EDITION 2018 NATIONAL LECTRIC CODE; NFPA 70 2016 ASHRAE 90.1-2016 2018 INTERNATIONAL FUEL GAS CODE 	2018 INTERNATIONAL BUILDING CODE - NJ EDITION ICC/ANSI 117.1 - 2009 BARRIER FREE CODE PROJECT LOCATION BLOCK(S): 198 LOT(S): DIC(S): 7.01 & 8

0.51			
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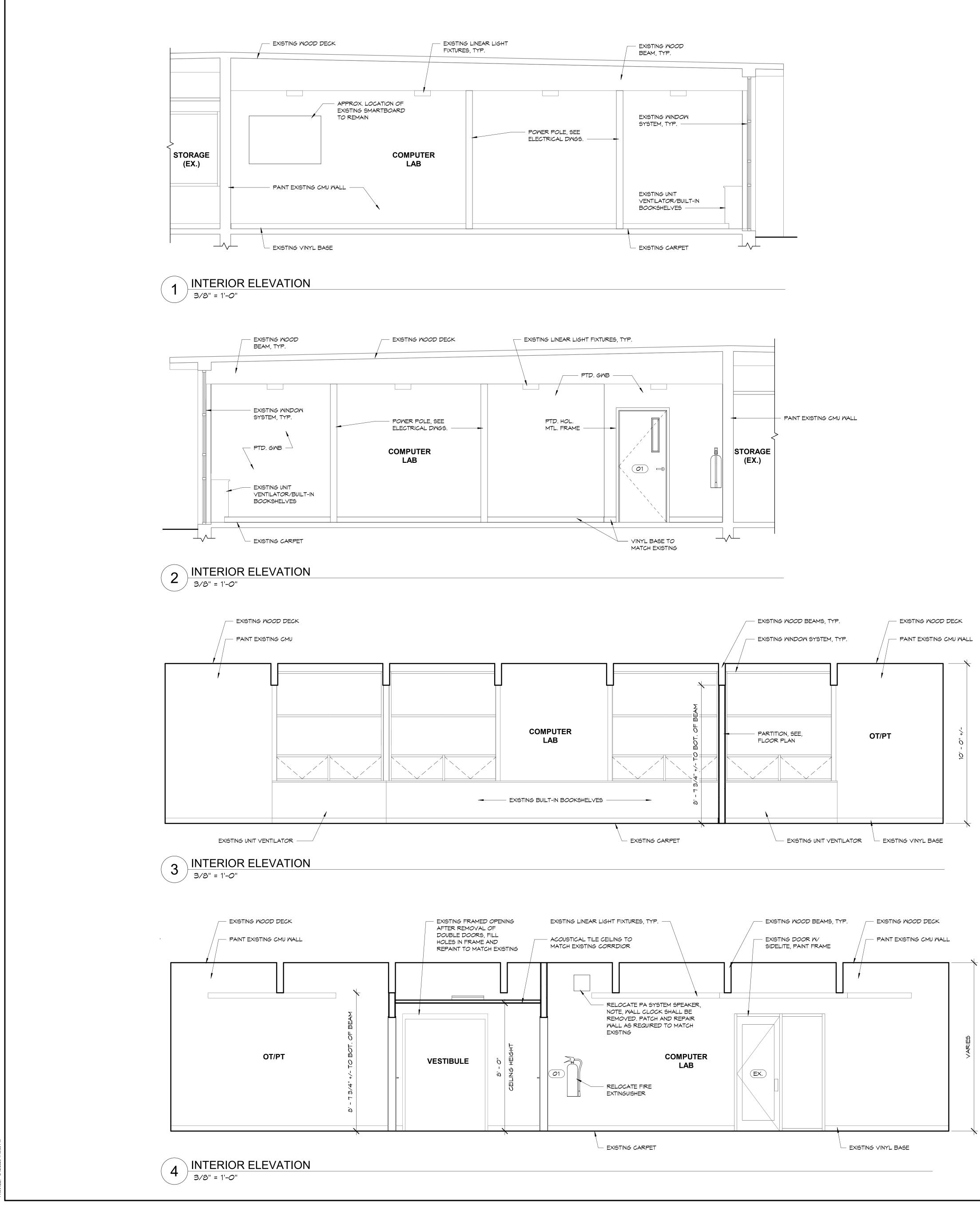
DEMOLITION GENERAL NOTES

- THE INTENT OF THE DEMOLITION PLAN IS TO SHOW THE GENERAL NATURE OF THE DEMOLITION SCOPE, THE GENERAL CONTRACTOR IS RESPONSIBLE FOR VISITING THE JOB SITE AND VERIFYING THE EXISTING CONDITIONS. THE GENERAL CONTRACTOR SHOULD NOTIFY THE ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES.
- DEMOLITION WORK SHALL INCLUDE REMOVAL OF INTERIOR FINISHES AS INIDCATED, INCLUDING BUT NOT LIMITED TO ALL FURRING, HANGERS, UNUSED ATTACHMENTS, CEILING TILE & GRID, FLOOR FINISHES, ETC. WHERE DEMOLITION ACTIVITIES INVOLVE STRUCTURAL ELEMENTS ETC., DEMOLITION WORK SHALL BE CLOSELY COORDINATED WITH NEW CONSTRUCTION WORK. NO WORK SHALL COMMENCE WITHOUT ADEQUATE BRACING OR SHORING AS REQUIRED TO PREVENT MOVEMENT OR SETTLING IN THE EXISTING STRUCTURE. REMOVALS OF A STRUCTURAL NATURE; BEARING WALLS, ROOFS, FOOTINGS ETC., SHALL BE MADE ONLY UNDER THE DIRECT SUPERVISION
- OF QUALIFIED PERSONNEL AND SHALL BE SECURED OR OTHERWISE BRACED WHERE EVER FEASIBLE, BY INCORPORATION INTO PROPOSED NEW WORK INCLUDING BUT NOT LIMITED TO INSTALLATION OF NEW LINTELS, NEW INFILL OF CONCRETE BLOCK TO FORM NEW OPENINGS, AND NEW STEEL AT FLOOR STRUCTURE AND OPENINGS. AS MUCH AS POSSIBLE NEW CONSTRUCTION IN KEEPING WITH THE PROPOSED CONDITIONS SHALL BE INSTALLED IN LIEU OF TEMPORARY BRACING.
- PRIOR TO COMMENCEMENT OF ANY DEMOLITION WORK, THE CONTRACTOR SHALL MEET WITH THE OWNER TO DETERMINE WHICH ITEMS, IF ANY, ARE OF SALVAGEABLE VALUE TO THE OWNER. THE CONTRACTOR IS ENCOURAGED TO ALSO DOCUMENT ANY EXISTING DAMAGE OR DEFICIENCIES, IN BOTH WRITTEN AND PHOTOGRAPHIC FORMS AS REQUIRED, WHICH ARE EVIDENT IN THE EXISTING BUILDING. ALL ITEMS DESIGNATED TO BE OF SALVAGEABLE VALUE TO
- THE OWNER SHALL BE REMOVED AS DIRECTED BY THE OWNER. ALL ITEMS DESIGNATED FOR DEMOLITION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED COMPLETELY FROM THE SITE AND DISPOSED OF AS NECESSARY, IN ACCORDANCE WITH ALL REGULATIONS IN EFFECT.
- CONFORM TO APPLICABLE CODES FOR DEMOLITION WORK, SAFETY OF STRUCTURE AND DUST CONTROL. NOTIFY AFFECTED UTILITY COMPANIES BEFORE STARTING WORK AND COMPLY WITH THEIR REQUIREMENTS. DO NOT CLOSE OR OBSTRUCT EGRESS TO EXITS. DO NOT DISRUPT BUILDING, FIRE, OR LIFE SAFETY SYSTEMS WITHOUT (3) DAYS PRIOR WRITTEN NOTICE TO THE OWNER.
- MAINTAIN TEMPORARY PARTITIONS TO PREVENT THE SPREAD OF DUST, ODORS, AND NOISE, AND TO PERMIT CONTINUED OWNER OCCUPANCY. PROTECT EXISTING MATERIALS WHICH ARE NOT TO BE DEMOLISHED. ALL DEBRIS SHALL BE REMOVED FROM THE CONSTRUCTION SITE DAILY.
- IN AREAS OF DEMOLITION, PATCH, LEVEL, AND INFILL ALL WALL AND FLOOR SURFACES AS REQUIRED FOR INSTALLATION OF NEW FINISHES. THIS INCLUDES LEVELING OF ALL FLOORS AND INFILLING OF ANY TRENCHED AREAS.
- CONTRACTOR SHALL REVIEW ALL HAZARDOUS MATERIAL ABATEMENT REPORTS BEFORE DEMOLITION OCCURS AND PERFORM TESTING AS REQUITED TO COMPLETE THE SCOPE OF WORK. THE CONTRACTOR SHALL TAKE THE APPROPRIATE ACTIONS REGARDING TESTING, NOTIFICATIONS, MEASUREMENTS, ABATEMENT, AND DISPOSAL OF ANY ASBESTOS CONTAINING MATERIAL LIKELY TO BE DAMAGED OR AFFECTED BY THE CONSTRUCTION ACTIVITIES OR EFFORTS.
- REFER TO MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR SPECIFIC DEMOLITION NOTES REGARDING THESE DISCIPLINES. ALL HVAC, ELECTRICAL AND PLUMBING ITEMS REMOVED SHALL BE CAPPED AND IDENTIFIED.

GENERAL NOTES

- ALL WORK INCLUDED IN THIS CONTRACT SHALL CONFORM TO ALL STATE, NATIONAL AND OTHER CODES, REGULATIONS, AND RESTRICTIONS WHICH APPLY TO THIS PROJECT. THE GENERAL CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE ARCHITECT. THE GENERAL
- CONTRACTOR SHALL PROCEED WITH THE WORK ONLY AFTER ALL DISCREPANCIES HAVE BEEN RESOLVED BY THE ARCHITECT. ALL DIMENTIONS ARE TO FINISHED FACE OF WALL, UNLESS
- NOTED OTHERWISE. WORK FROM GIVEN DIMENSIONS AND LARGE SCALE DETAILS
- ONLY. DO NOT SCALE DRAWINGS. BUILDING OR SITE COMPONENTS WHICH ARE AFFECTED BY NEW WORK, DEMOLITION OR WHICH MAY BE DAMAGED BY THE GENERAL CONTRACTOR OR ANY SUBCONTRACTORS SHALL BE REPLACED OR RESTORED TO ORIGINAL CONDITION AND COLOR BY METHODS DESCRIBED IN THIS CONTRACT, OR AS
- APPROVED BY THE ARCHITECT. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE COORDINATION OF THE WORK OF ALL TRADES. THE GENERAL CONTRACTOR SHALL NOTIFY THE ARCHITECT IN WRITING OF ANY AND ALL CONFLICTS BETWEEN THE TRADES AND SHALL OBTAIN A WRITTEN RESOLUTION FROM THE ARCHITECT PRIOR TO PROCEEDING WITH CONSTRUCTION IN
- ALL AREAS AFFECTED BY THE CONFLICT. ALL MATERIALS & EQUIPMENT SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- ALL MATERIAL USED FOR THE CONSTRUCTION OF THIS PROJECT, WHETHER BUILDING MATERIALS OR APPURTENANCES, SHALL BE NON-ASBESTOS CONTAINING
- MATERIAL. SEAL AND CAULK AROUND ALL PENETRATIONS, CRACKS AND CREVICES AND ANY OPENINGS CAPABLE OF HARBORING
- INSECTS/RODENTS. REFERENCE PLANS AND INTERIOR ELEVATIONS FOR ALL NEW INTERIOR FINISHES.
- REFERENCE PARTITION TYPES ON SHEET A1.0 FOR ALL INTERIOR WALL TYPES.

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© 20)18, MA	NDERS ME	RIGHI PORTADIN FARRE	LL ARCHITECTS, LLC
			î	nmpf
				architects
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1138	B East C	Chestnut Av		nd, New Jersey 08360 www.mmpfa.com
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HVAC BASIC PIPING SYMBOLS (NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT)

(NOT ALL SYMBOLS ARE NECESSARIL	Y USED ON THIS PROJECT)
>	PIPE DROP
	PIPE RISE
►	PITCH UP IN DIRECTION OF FLOW
₽►	PITCH DOWN IN DIRECTION OF FLOW
	UNION
	CONCENTRIC REDUCER
N	ECCENTRIC REDUCER - FLAT BOTTOM
V	ECCENTRIC REDUCER - FLAT TOP
	FLANGED CONNECTION
	FLANGED END
	EXPANSION LOOP
[]	PIPE EXPANSION JOINT
	PIPE ALIGNMENT GUIDE
——————————————————————————————————————	PIPE ANCHOR
——————————————————————————————————————	GATE OR SHUTOFF VALVE (AS NOTED)
	ANGLE VALVE
	GLOBE VALVE
	ANGLE GLOBE VALVE
——————————————————————————————————————	NEEDLE VALVE COCK
—	DRAIN VALVE
	LOCK SHIELD VALVE
	CHECK VALVE, SWING OR LIFT
	SILENT CHECK VALVE
	FLEXIBLE CONNECTOR
>	BUTTERFLY VALVE
_	BALL VALVE
	SQUARE HEAD COCK
\bigcirc	CALIBRATED BALANCING VALVE
	PLUG VALVE (TYPE AS NOTED)
	AUTOMATIC CONTROL VALVE
K	THREE-WAY AUTOMATIC CONTROL VALVE
	"Y" TYPE STRAINER W/BLOW OFF VALVE
<u>П</u>	THERMOMETER AND WELL
Ŷ	PRESSURE GAUGE
	PUMP

	SINGLE LINE DUCTWORK OR EQUIPMENT - NEW	AAV	AUTOMATIC AIR VENT	IN.	INCH OR INCH
	SINGLE LINE DUCTWORK OR EQUIPMENT - EXISTING	AC	AIR CONDITIONING	LAT	LEAVING AIR TE
<u>xx</u>	SINGLE LINE DUCTWORK OR EQUIPMENT - DEMOLITION	ACU AD	AIR CONDITIONING UNIT ACCESS DOOR	LD LF	LINEAR DIFFUSI LINEAR FEET
		AFF	ABOVE FINISHED FLOOR	LWB	LEAVING WET E
$\sim \sim \sim$	FLEXIBLE DUCT	AHU	AIR HANDLING UNIT	LWT	LEAVING WATER
─────────	TRANSITION	BCU	BLOWER COIL UNIT	MBH	THOUSAND BTU
		BHP	BRAKE HORSEPOWER	MER	MECHANICAL EC
	DUCTWORK WITH ACOUSTIC LINING	BR	BOTTOM REGISTER	MIN	MINIMUM
)		BT BTU	BOTTOM THROAT BRITISH THERMAL UNIT	MOD (N)	MOTOR OPERAT
~ ~		BTUH	BTU PER HOUR	NC	NORMALLY CLO
R R	CEILING DIFFUSER	CD	CEILING DIFFUSER	NIC	NOT IN CONTRA
Ø	RETURN/EXHAUST_GRILLE	CFM	CUBIC FEET PER MINUTE	NO	NORMALLY OPE
\leq		CG	CEILING GRILLE	NO.	NUMBER
	SUPPLY AIR DUCT UP	CLG	CEILING	NTS	NOT TO SCALE
	RETURN AIR DUCT UP	CO	CLEANOUT	OA	OUTSIDE AIR
$\sim <$	SUPPLY AIR DUCT DN	COND CR	CONDENSATE CEILING REGISTER	OAI OED	OUTSIDE AIR IN OPEN END DUG
		CUH	CABINET UNIT HEATER	PSI	POUNDS PER S
	RETURN AIR DUCT DN	CV	CONSTANT VOLUME	PSIA	PSI ABSOLUTE
BDD	BACK DRAFT DAMPER	DB	DRY BULB	PSIG	PSI GAUGE
M	MOTORIZED DAMPER	DDC	DIRECT DIGITAL CONTROL	RA	RETURN AIR
		DIAM	DIAMETER	(RE)	RELOCATED EX
М́SMК	AUTOMATIC SMOKE DAMPER	DMPR	DAMPER	RF	RETURN FAN
R	RISE IN DUCTWORK (IN DIRECTION OF AIR FLOW)	DN DX	DOWN DIRECT EXPANSION	RG RH	RETURN GRILLE RELATIVE HUMI
D	DROP IN DUCTWORK (IN DIRECTION OF AIR FLOW)	(E)	EXISTING TO REMAIN	RHC	REHEAT COIL
b		(ER)	EXISTING TO BE REMOVED	RLA	RUNNING LOAD
Ę	CENTER LINE	(ERR)	EXISTING TO BE REMOVED & RELOCATED	RPM	REVOLUTIONS F
§ OR CFM	CUBIC FEET PER MINUTE	EA	EXHAUST AIR	RR	RETURN REGIS
Ø	DIAMETER	EAT	ENTERING AIR TEMPERATURE	(RRO)	EXISTING TO B AND RETURN T
¢	SQUARE FEET	EDB	ENTERING DRY BULB TEMPERATURE	RTU	ROOFTOP AIR I
μ A	SQUARE FEET	EF EG	EXHAUST FAN EXHAUST GRILLE	SA	SUPPLY AIR
	POINT OF CONNECTION	EL	ELEVATION	SD	SMOKE DAMPE
	POINT OF DISCONNECTION	EMS	ENERGY MANAGEMENT SYSTEM	SF	SUPPLY FAN
		ER	EXHAUST REGISTER	SP	STATIC PRESSU
- \-	DIRECTION OF RETURN AIR	ESP	EXTERNAL STATIC PRESSURE	SQFT SPEC	SQUARE FEET SPECIFICATION
	DIRECTION OF SUPPLY AIR	EWB	ENTERING WET BULB	TDH	TOTAL DYNAMIC
F/S ┣──	COMBINATION FIRE & SMOKE DAMPER W/ ACCESS DOOR	EWT	ENTERING WATER TEMPERATURE	ТЕМР	TEMPERATURE
FD 🛌	FIRE DAMPER (WALL) W/ ACCESS DOOR	EXH °F	EXHAUST DEGREES FAHRENHEIT	TG	TRANSFER GRIL
FD 🔶	FIRE DAMPER (CEILING) W/ ACCESS DOOR	FA	FREE AREA (SQ.FT.)	TR	TOP REGISTER
VD	VOLUME DAMPER	FC	FLEXIBLE CONNECTION	TRANS	TRANSITION
		FCU	FAN COIL UNIT	T-STAT	THERMOSTAT
©	CARBON DIOXIDE SENSOR	FD	FIRE DAMPER	TYP UH	TYPICAL UNIT HEATER
\bigcirc	THERMOSTAT	FIN FL	FINISHED FLOOR	VD	VOLUME DAMPE
\oplus	HUMIDISTAT	FLA	FULL LOAD AMPERES	VFD	VARIABLE FREQ
S	TEMPERATURE SENSOR	FPM	FEET PER MINUTE	VAV	VARIABLE AIR \
		GAL GPH	GALLON GALLONS PER HOUR	VIV	VARIABLE INLET
\otimes	STEAM TRAP	GPM	GALLONS PER MINUTE	W	WIDTH
\$ <u> </u>	DUCT SMOKE DETECTOR	GRD	GRILLES, REGISTERS & DIFFUSERS	W/	WITH
- UC -	DOOR UNDERCUT	HT	HEIGHT	WB	WET BULB
		HP	HORSEPOWER	W.C.	WATER COLUMN
	SECTION DESIGNATION	HR	HOUR	W.G. WH	WATER GAUGE WATER HEATER
		HV	HEATING AND VENTILATING	WMS	WIRE MESH SC
<u> </u>		HX	HEAT EXCHANGER		
		L /			
	DETAIL DESIGNATION	HZ HX	FREQUENCY HEAT EXCHANGER		

MECHANICAL EQUIPMENT TAG

PROPORTIONAL SPLIT OR EQUAL SPLIT. RADIUS ELBOWS (REFER TO SPECIFICATIONS)

RADIUS ELBOWS OR SQUARE ELBOWS w/TURNING VANES (REFER TO SPECIFICATIONS)

PROPORTIONAL SPLIT OR EQUAL SPLIT. RADIUS ELBOWS (REFER TO SPECIFICATIONS)

ROUND BRANCH TAKE-OFF w/SPIN FITTING

BRANCH TAKE-OFF w/HEEL

ROUND BRANCH TAKE-OFF w/BELLMOUTH

TEE-ON-TAPER (DUST COLLECTION ONLY)

DUCT ELBOW UP

DUCT ELBOW DN

VCHES FUSER L EQUIPMENT ROOM CLOSED OPEN ALE DUCT GISTER R HANDLING UNIT MPER SSURE FT AMIC HEAD GRILLE MPER UMN IGE ATER

MECHANICAL NOTES

- R TEMPERATURE
- BULB TEMPERATURE ATER TEMPERATURE BTU PER HOUR
- ERATED DAMPER
- NTRACT
- INTAKE
- ER SQUARE INCH
- EXISTING
- IUMIDITY
- _OAD AMPS PER MINUTE
- O BE REMOVED TO OWNER

- REQUENCY DRIVE
- R VOLUME NLET VANES
- SCREEN

ALL DRAWINGS AND SPECIFICATIONS AND VISIT THE SITE TO BECOME ACQUAINTED WITH THE CONSTRUCTION AND THE EXTENT OF THE WORK. NO EQUIPMENT OR MATERIAL IS TO BE ORDERED OR FABRICATED PRIOR TO FIELD VERIFICATION OF ALL MEASUREMENTS, CLEARANCES, POTENTIAL CONFLICTS WITH EXISTING CONDITIONS OR THAT OF OTHER TRADES ON THE JOB.

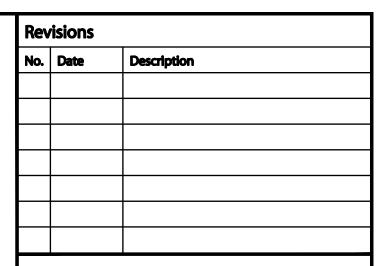
1. PRIOR TO SUBMITTING A BID THE CONTRACTOR SHALL EXAMINE

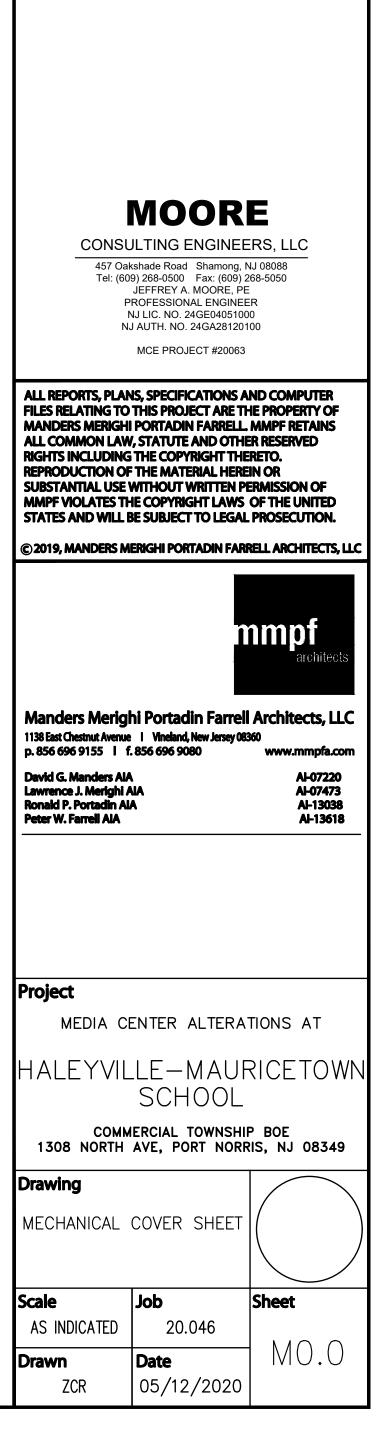
- 2. CONTRACTOR SHALL PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE, WHETHER SPECIFIED OR IMPLIED.
- 3. CONTRACTOR SHALL VISIT THE JOB PRIOR TO SUBMITTING A
- 4. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST APPLICABLE INTERNATIONAL BUILDING CODE, MECHANICAL CODE, FUEL GAS CODE, PLUMBING CODE, NEC CODE AND ALL OTHER STATE AND LOCAL AUTHORITIES HAVING JURISDICTION.
- 5. CONTRACTOR SHALL GIVE ALL NOTICES, OBTAIN AND PAY FOR ALL PERMITS, DEPOSITS AND FEES NECESSARY.
- 6. DO NOT SCALE THE DRAWINGS FOR EXACT DIMENSIONS. THE DESIGN DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LAYOUT AND CONNECTIONS. CONTRACTOR SHALL VERIFY ALL CONDITIONS, DIMENSIONS, ETC. AT THE JOB SITE.
- 7. CONTRACTOR SHALL REVIEW THE WORK OF OTHER TRADES TO PREVENT INTERFERENCE BETWEEN BEAMS, STRUCTURES, PIPING, LIGHTING FIXTURES ETC. BEFORE PROCEEDING WITH NEW WORK.
- 8. CONTRACTOR SHALL GUARANTEE THE ENTIRE JOB AGAINST DEFECTS IN WORKMANSHIP AND MATERIALS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE. THIS GUARANTEE SHALL BE BINDING REGARDLESS OF MANUFACTURER'S GUARANTEE AND CONTRACTOR SHALL REMOVE AND REPLACE ALL DEFECTIVE MATERIAL REGARDLESS OF CAUSE (EXCEPT FOR DEFECTS TRACEABLE TO IMPROPER MAINTENANCE OR MALICIOUS DESTRUCTION OCCURRING AFTER THE SYSTEM HAS BEEN TURNED OVER).
- 9. ALL MATERIALS USED ANYWHERE IN THE WORK SHALL HAVE NFPA RATING AS FOLLOWS: A. FLAME SPREAD- NOT OVER 25
- B. SMOKE DEVELOPED- NOT OVER 50 C. FUEL CONTRIBUTED- NOT OVER 25 ALL MATERIALS SHALL BE "SELF-EXTINGUISHING"
- 10. CONTRACTOR SHALL SUBMIT 1/4" SCALE SHEET METAL SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
- 11. SUBMIT TO THE ARCHITECT FOR APPROVAL, SPECIFICATION SHEETS OF ALL EQUIPMENT SUPPLIED OR INSTALLED. INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- A. AIR CONDITIONING UNITS B. GRILLES, REGISTERS, AND DIFFUSERS
- C. CONTROLS D. PIPING
- E. INSULATION F. FANS
- 12. ALL MECHANICAL EQUIPMENT AND APPLIANCES INSTALLED SHALL BEAR THE LABEL OF AN APPROVED AGENCY.
- 13. EQUIPMENT AND MATERIALS ARE SPECIFIED TO ESTABLISH A STANDARD OF QUALITY. ALL MATERIALS AND EQUIPMENT USED FOR THIS CONTRACT SHALL BE NEW AND UNUSED AND OF THE LATEST MODEL OR DESIGN AVAILABLE.
- 14. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT INSULATION IS APPLIED.
- 15. CONTRACTOR SHALL PROVIDE 1–INCH THICK (R–5) FOAM BOARD INSULATION PAINTED TO MATCH THE ROOM'S FINISH FOR ALL THERMOSTAT'S MOUNTED ON MASONRY WALLS.
- 16. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL STEEL, SUPPORTS, BRACES, HANGERS, ETC. REQUIRED FOR HIS CONTRACT UNLESS OTHERWISE NOTED. CONTRACTOR SHALL COORDINATE ALL EQUIPMENT SUPPORT LOCATION AND INSTALLATION WITH ROOFING AND STRUCTURAL CONTRACTORS.
- 17. ALL DUCT SIZES SHOWN ARE INSIDE CLEAR.
- 18. MAXIMUM ALLOWABLE LENGTH FOR FLEXIBLE DUCT IS SIX (6')
- 19. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR ALL CUTTING AND PATCHING EITHER ENGAGING HIS OWN GENERAL SUBCONTRACTOR OR ONE QUALIFIED BY THE OWNER.
- 20. CONTRACTOR SHALL INFORM THE ENGINEER OF ANY QUESTIONS OR DISCREPANCIES PRIOR TO PRECURSOR AND/OR FABRICATION OF ANY MATERIALS AND INSTALLATION.
- 21. INSTALL ALL EQUIPMENT IN ACCORDANCE TO THE MANUFACTURER'S WRITTEN GUIDELINES.
- 22. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONNECTIONS, SUPPORTS, TERMINATIONS & ACCESSORIES ASSOCIATED WITH AIR HANDLING UNITS, FANS, ETC.

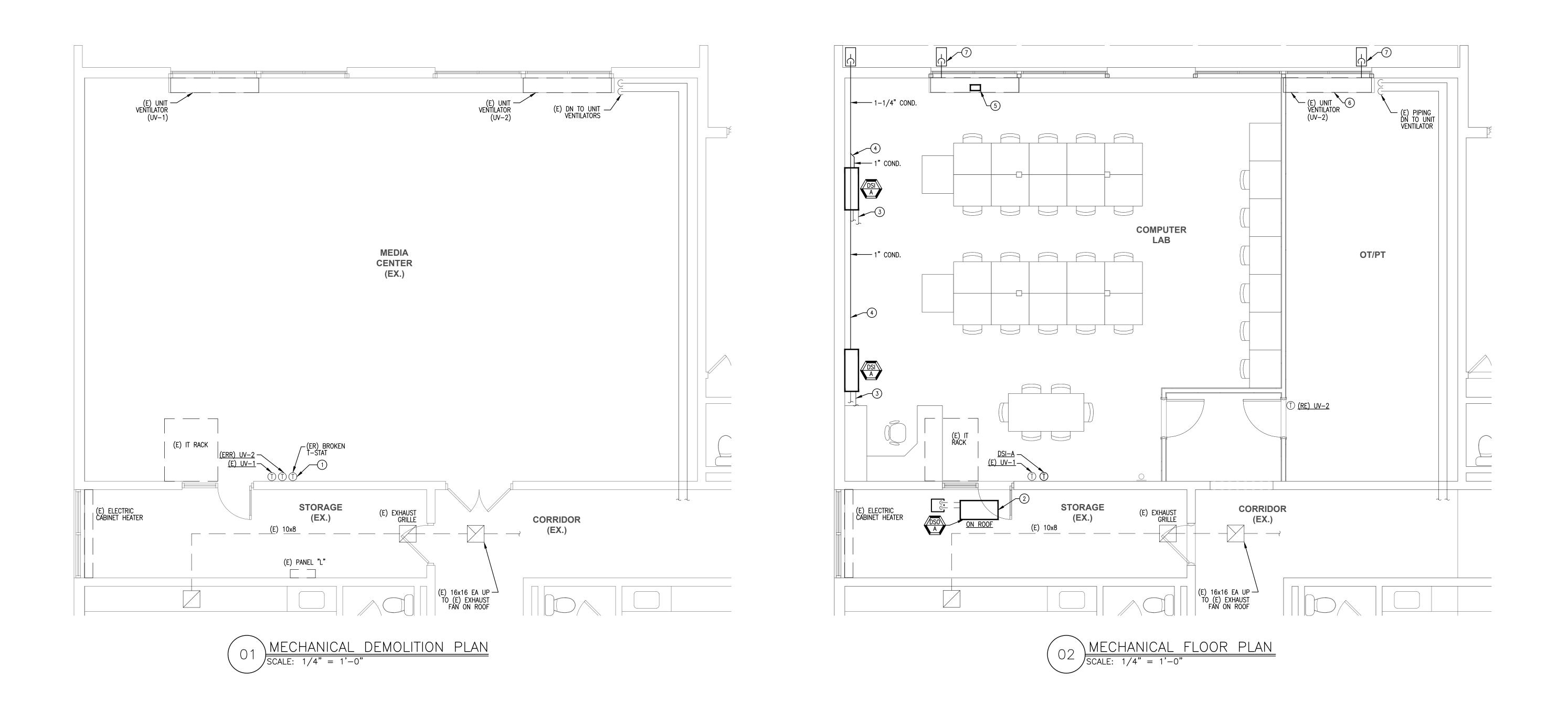
- 23. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR WHO WILL PROVIDE POWER WIRING TO ALL MECHANICAL EQUIPMENT. MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL AND INTERLOCK WIRING AND ALL THERMOSTATS AND ACCESSORIES.
- 24. SUPPORT ALL EQUIPMENT, PIPING AND DUCTWORK WITH VIBRATION ISOLATION HANGERS AS REQUIRED TO PROVIDE A VIBRATION FREE INSTALLATION.
- 25. ALL EXTERIOR WALL OPENINGS SHALL BE SLEEVED, PROPERLY CAULKED AND SEALED WITH A HIGH QUALITY SEALANT TO PREVENT INFILTRATION OF MOISTURE AND OUTSIDE AIR. 26. PROVIDE VOLUME DAMPERS AT ALL DUCT BRANCHES AND
- RUNOUTS. PROVIDE OPPOSED BLADE VOLUME DAMPERS AT ALL REGISTERS, GRILLES AND DIFFUSER NECKS IN SUPPLY, RETURN AND EXHAUST DUCTWORK WHETHER SHOWN ON DRAWINGS OR NOT
- 27. PROVIDE AT MINIMUM 10 GAUGE STEEL SLEEVES FOR ALL DUCT PENETRATIONS THROUGH FIRE WALLS, FLOORS AND PARTITIONS. PROVIDE PIPE SLEEVES FOR ALL MECHANICAL PIPING PENETRATING THROUGH FIRE WALLS, FLOORS AND PARTITIONS. SEAL ALL ANNULAR SPACE BETWEEN SLEEVES AND DUCTWORK OR PIPING WITH A FIRE BARRIER MATERIAL.
- 28. PROVIDE FLEXIBLE CONNECTIONS ON ALL DUCTS AND PIPING CONNECTIONS TO ANY MOTOR DRIVEN MECHANICAL EQUIPMENT (I.E. FANS, AIR HANDLERS, PUMPS, ETC.) INSTALL FLEXIBLE COPPER GROUNDING STRAPS ACROSS ALL FLEXIBLE CONNECTIONS.
- 29. THE INSIDE OF ALL DUCTWORK VISIBLE THROUGH A GRILLE OR DIFFUSER SHALL BE PAINTED FLAT BLACK.
- 30. ACCESS PANELS SHALL BE PROVIDED TO SERVICE ALL VALVES, DAMPERS, HEATERS, CONCEALED MECHANICAL EQUIPMENT, TRAPS, CLEANOUTS AND DISCHARGE SIDE OF ELECTRIC HEATERS.
- 31. FINAL LOCATIONS FOR MOUNTING ALL THERMOSTATS SHALL BE COORDINATED WITH THE ENGINEER PRIOR TO INSTALLING ANY CONTROL WORK. ALL COMMON AREA THERMOSTATS SHALL BE EQUIPPED WITH A LOCKING COVERS. MOUNT ALL THERMOSTATS TO COMPLY WITH ADA REQUIREMENTS.
- 32. UPON COMPLETION OF THE WORK, REMOVE ALL EXCESS MATERIAL, DEBRIS, TOOLS AND EQUIPMENT FROM THE SITE, AND LEAVE THE PREMISES IN A BROOM CLEAN CONDITION.
- 33. CONTRACTOR SHALL PROVIDE THREE (3) COMPLETE SETS OF BOUND OPERATING AND MAINTENANCE INSTRUCTIONS. CONTRACTOR SHALL INSTRUCT THE OWNER OR HIS AGENT WITH REGARD TO THE PROPER USE OF THE SYSTEM UNTIL SUCH INSTRUCTION IS COMPLETE TO THE OWNER'S SATISFACTION.
- 34. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC OR NEBB STANDARDS.
- 35. CONTRACTOR SHALL ENSURE THAT ALL MECHANICAL DEVICES WILL BE INSTALLED IN LOCATIONS WHICH AFFORD ACCESSIBILITY FOR MAINTENANCE AND REPAIR. COORDINATE INSTALLATION AMONG ALL TRADES TO AVOID INTERFERENCES AND LOCATE EQUIPMENT TO PROVIDE CLEARANCES WHICH EXCEED THOSE RECOMMENDED BY THE EQUIPMENT MANUFACTURER.
- 36. CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO ENSURE SAFETY OF EXISTING STRUCTURE.
- 37. THERMOSTAT WIRING SHALL BE INSTALLED IN CONCEALED SPACE, WALL OR CHASE - COORDINATE WITH THE OWNER REPRESENTATIVE.
- 38. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION SCHEDULING AND ASSOCIATED HOISTING STAGING AND ERECTING OF MATERIALS. ALL ELEMENTS OF THE EXISTING PROPERTY SHALL BE PROTECTED AGAINST DAMAGE RESULTING FROM THESE ACTIVITIES.
- 39. THE LOCATION OF EXISTING SYSTEMS AND SYSTEM COMPONENTS WAS OBTAINED THROUGH EXISTING DRAWINGS AND FIELD SURVEYS. ONLY SYSTEM ELEMENTS THAT WERE CLEARLY VISIBLE HAVE BEEN IDENTIFIED. LOCATIONS AND SIZES OF EXISTING SYSTEMS MUST BE FIELD VERIFIED BY THE CONTRACTOR. PRIOR TO THE REMOVAL OF ANY EXISTING SYSTEM COMPONENTS AND CONNECTING NEW SYSTEMS TO EXISTING.
- 40. THESE DRAWINGS HAVE BEEN MADE BASED ON A VISUAL INSPECTION OF THE EXISTING SURFACES. SOME ASSUMPTIONS HAVE BEEN MADE AS TO ACTUAL CONSTRUCTION, MATERIALS, AND METHODS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL ACTUAL FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES, CONFLICTS, AND UNFORESEEN CONDITIONS. IN ADDITION, THESE DRAWINGS ASSUME THAT ALL EXISTING MATERIALS ARE IN GOOD STRUCTURAL SHAPE, GOOD WORKING ORDER, AND MEET ALL APPLICABLE CODES. THE GENERAL CONTRACTOR IS RESPONSIBLE TO INSPECT ALL THE EXISTING ELEMENTS OF THE STRUCTURE AND REPORT TO THE CLIENT AND TO THE ARCHITECT OF ANY SIGNS OF POTENTIAL PROBLEMS WITH THE STRUCTURE INCLUDING, BUT NOT LIMITED TO, WOOD DECAYING ORGANISMS, WATER PENETRATION, STRUCTURAL FRACTURES. STRESSED SURFACES, BRICK AND MASONRY WEAKENING AND WEAK STRUCTURAL CONNECTIONS.

GENERAL FIRESTOPPING NOTE

CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING OR EXCEEDING WALL/CEILING/FLOOR ASSEMBLY RATINGS FOR ALL PENETRATIONS. CONTRACTOR SHALL VERIFY LOCATION AND RATING OF ALL FIRE ASSEMBLIES AND PROVIDE INTUMESCENT COLLARS AT ALL PENETRATIONS AND FIRE RATED CAULKING AS REQUIRED.







DEMOLITION NOTES:

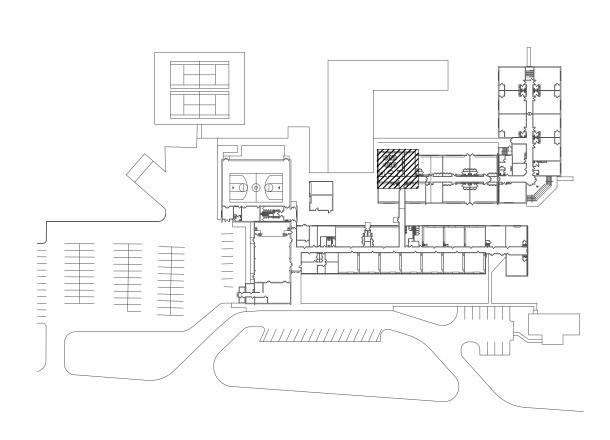
- 1. THE CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL COSTS ASSOCIATED WITH REMOVALS AND RELOCATIONS OF HVAC WORK AS DESCRIBED ON THE DRAWINGS AND IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN DIFFICULTIES WHEN CONCEALED WORK HAS BEEN OPENED. NO CLAIMS FOR ADDITIONAL WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, EXCEPT IN CERTAIN CASES CONSIDERED JUSTIFIABLE BY THE OWNER/ENGINEER.
- THE CONTRACTOR SHALL PERFORM DEMOLITION AND REMOVAL WORK WITH MINIMUM INTERFERENCE WITH FUNCTIONING HVAC SYSTEMS. ALL AFFECTED SYSTEMS SHALL BE RECONNECTED AND RESTORED.
- 3. DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGINAL CONDITION. PATCH ALL EXISTING INTERIOR AND EXTERIOR WALLS, LEFT BY DEMOLITION, TO MATCH EXISTING.
- 4. THE CONTRACTOR SHALL REMOVE ALL DUCT & PIPING SUPPORTS, ETC. FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING PIPING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL AND PROVIDE BYPASS CONNECTIONS NECESSARY.
- 5. ALL PIPING WHICH BECOMES EXPOSED DURING THE ALTERATION WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
- PORTIONS OF PIPING & DUCTWORK TO BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ACTIVE, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED.
- ALL EXISTING MATERIAL AND EQUIPMENT IN USABLE CONDITION, WHICH IS TO BE REMOVED UNDER THIS CONTRACT, SHALL BE DISPOSED OF BY THE MECHANICAL CONTRACTOR.
- 8. ARRANGE TO WORK CONTINUOUSLY, INCLUDING OVER TIME, IF REQUIRED, TO ASSURE THAT SYSTEMS WILL BE SHUT DOWN ONLY DURING THE TIME ACTUALLY REQUIRED TO MAKE THE NECESSARY CONNECTIONS TO THE EXISTING SYSTEMS.
- 9. THE SHUTDOWN OF EXISTING BUILDING HVAC SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE ARRANGEMENTS AT LEAST 5 BUSINESS DAYS PRIOR TO A SHUTDOWN.
- 10. CONTRACTOR SHALL COMPLY WITH ALL FEDERAL STATE & LOCAL REQUIREMENTS REGARDING DISPOSAL OF REFRIGERANTS.
- 11. CONTRACTOR SHALL CLEAN THE EXISTING UNIT VENTILATORS, COILS, CONDENSATE PIPING, FANS, ETC, SO THAT EQUIPMENT IS IN PROPER WORKING CONDITION. REPLACE ALL AIR FILTERS AND BELTS, ADJUST BELTS AS REQUIRED. VERIFY HYDRONIC PIPING AND VALVES ARE IN PROPER WORKING CONDITION AND REPLACE IN KIND AS REQUIRED.

DRAWING NOTES:

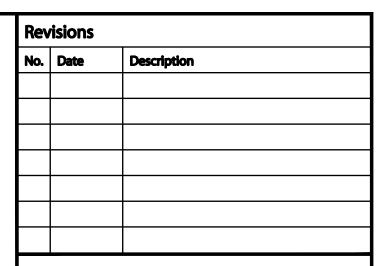
- 1. DRAWINGS ARE DIAGRAMMATIC. PROVIDE ADDITIONAL OFFSETS, TRANSITIONS, ETC. AS REQUIRED TO AVOID INTERFERENCES ENCOUNTERED.
- 2. CONTRACTOR SHALL PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AND ACCESS TO ALL EQUIPMENT. COORDINATE LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS.
- 3. SPACE ABOVE CEILING IS VERY LIMITED. COORDINATE WITH ALL TRADES FOR DUCTWORK ROUTING PRIOR TO FABRICATION AND INSTALLATION.

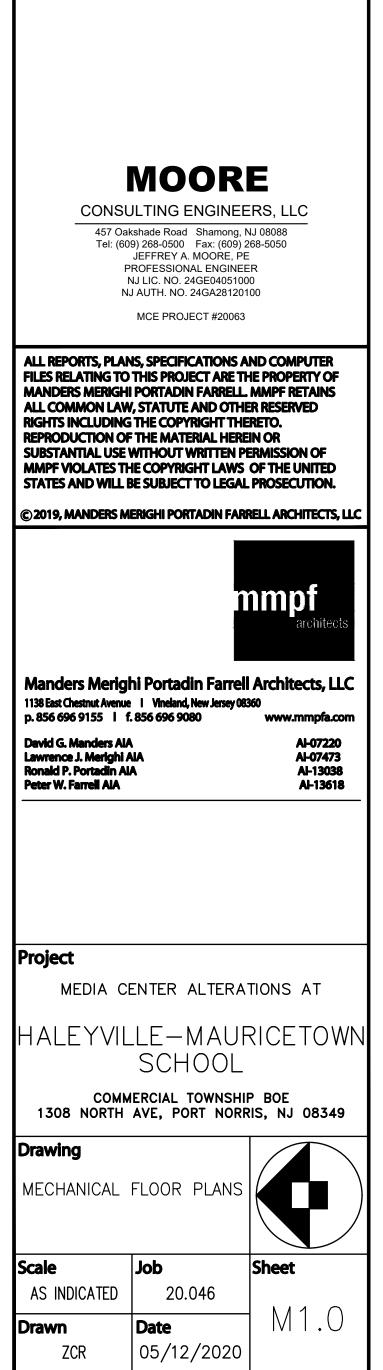
KEY NOTES:

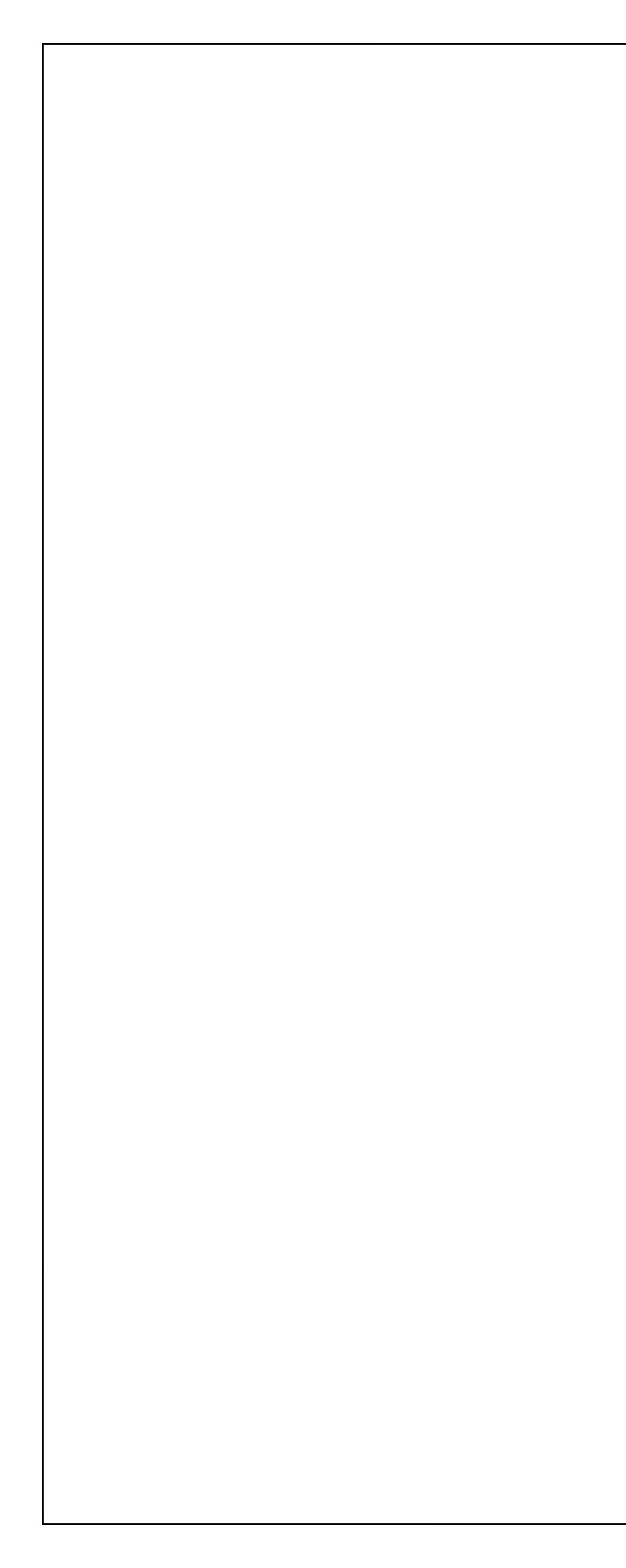
- 1 EXISTING THERMOSTAT FOR UV-1 TO REMAIN. EXISTING THERMOSTAT FOR UV-2 TO BE REMOVED AND REPLACED IN NEW OT/PT ROOM AS INDICATED ON NEW WORK PLAN PROVIDE ALL CONTROL WIRING AS REQUIRED. FIELD VERIFY THERMOSTAT/UV PAIRS. EXISTING BROKEN THERMOSTAT TO BE REMOVED IN ITS ENTIRETY AND PATCH WALL TO MATCH EXISTING.
- (2) MOUNT CONDENSING UNIT ON ROOF WITH EQUIPMENT RAILS (PATE MODEL ESNJ OR SIMILAR) TIED INTO ROOF STRUCTURE. INSTALL UNIT MINIMUM OF 10' FROM EDGE OF ROOF. ROUTE REFRIGERANT PIPING TO INDOOR UNITS THROUGH PIPE BOOT CURB (PATE PIPE CURB ASSEMBLY OR SIMILAR).
- 3 ROUTE REFRIGERANT PIPING FROM INDOOR UNIT TO CONDENSING UNIT ON ROOF. PROVIDE WITH PROTECTIVE COVERS AND FITTINGS FOR REFRIGERANT LINESETS AND CONDENSATE (DIVERSITECH SPEEDICHANNEL OR SIMILAR)
- (4) ROUTE CONDENSATE PIPING MAIN TIGHT TO WALL AND TERMINATE AT EXTERIOR WITH SPLASH BLOCK.
- 5 PROVIDE AIR PURIFICATION SYSTEM (ATMOSAIR MODEL FC400) INSIDE CASING OF EXISTING UNIT VENTILATOR.
- 6 EXACT LOCATION OF EXISTING UNIT VENTILATOR SHALL BE FIELD VERIFIED AND COORDINATED WITH INSTALLATION OF NEW PARTITION WALL. RELOCATE UNIT VENTILATOR AS REQUIRED.
- PROVIDE NEW SPLASH BLOCK FOR EXISTING UNIT VENTILATOR CONDENSATE DISCHARGE.



 $(05) \frac{\text{KEY PLAN}}{\text{SCALE: 1/128"} = 1'-0'}$



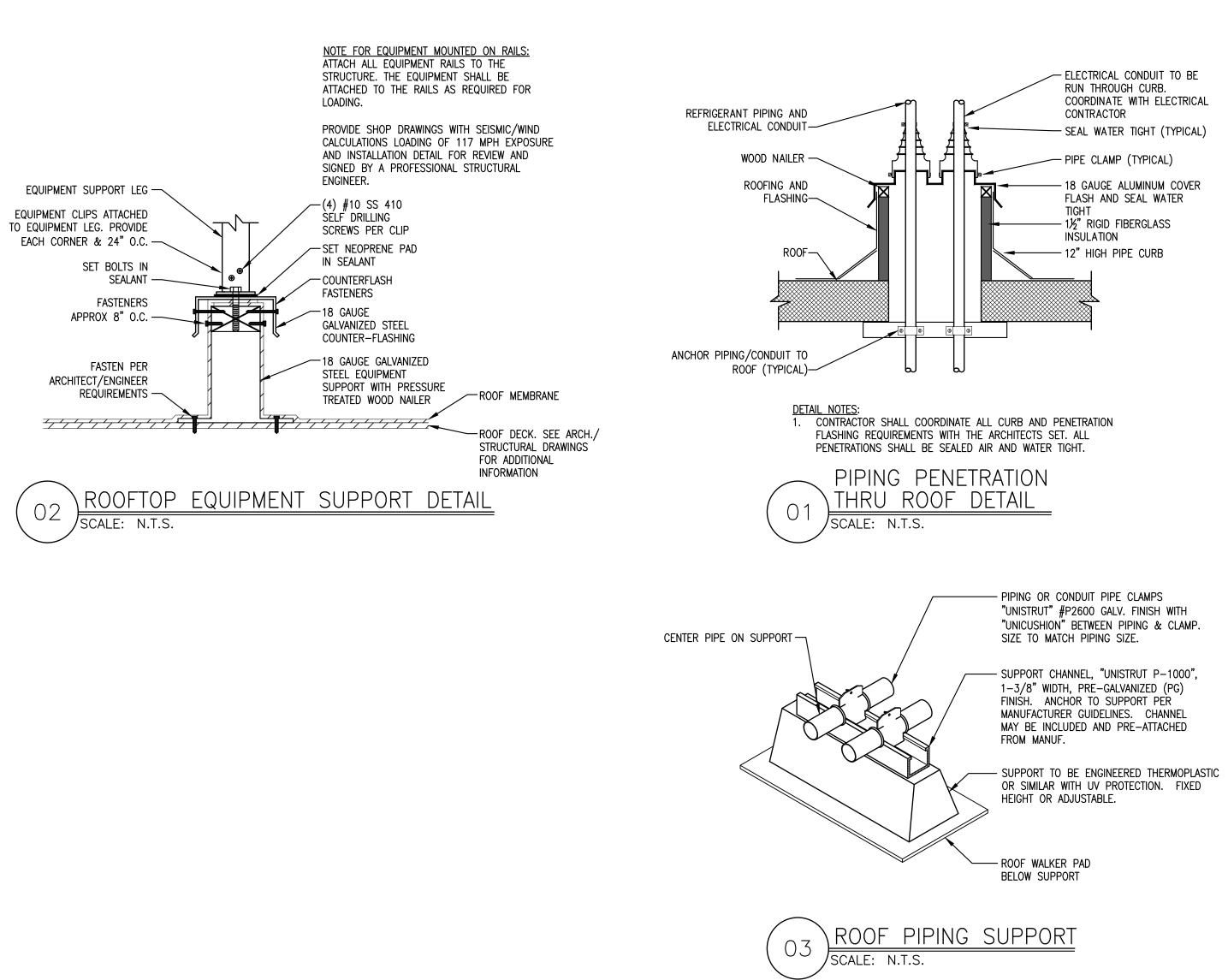


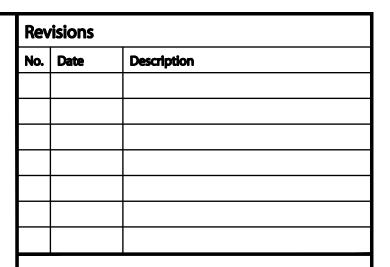


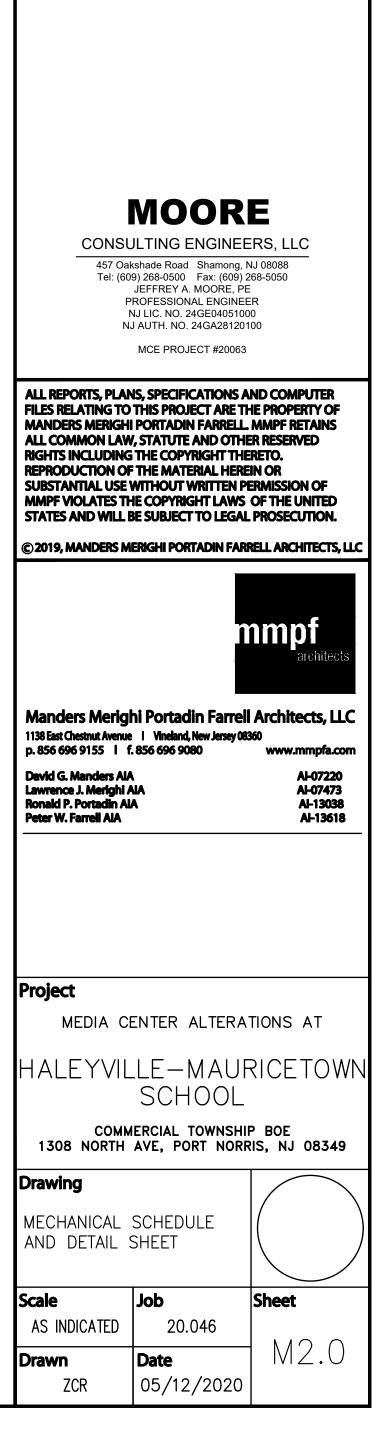
DUCTL	ESS SPLIT HEAT	PUMP S	YSTEM SCHEDULE													DSI -
		BASIS OF	MODEL No.		04		FAN DAT	Ā	INDOOR (CAPACITIES	OUTDOOR	CAPACITIES	ELEC	FRICAL DATA		
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DSI-A	COMPUTER ROOM	DAIKIN	FXAQ24PVJU	2.0	-	635	N/A	47	22,735	27,500	44,000	45,420	208/1¢/60	0.6	15	ALL
			TRACTOR FOR EACH ITEM. COORDINATE P	OWER &	WIRING RE	QUIREMENTS WITH E	LECTRICA	L CONTRACTOR.								

3. UNIT SHALL BE SURFACE MOUNTED, PROVIDE MOUNTING ACCESSORIES AS REQUIRED FOR MOUNTING TYPE. 4. PROVIDE WITH WIRED 7-DAY PROGRAMMABLE REMOTE CONTROLLER/THERMOSTATS CAPABLE OF AUTO SWITCH-OVER. CONTROLS (2) INDOOR UNITS (DAIKIN BRC1E73 CONTROLLER OR SIMILAR)

		BASIS OF	MODEL NO.	NOMINAL CAPACITY (TONS)	E	ELECTRICAL DATA					
TAG	SERVICE	DESIGN MANUF.			VOLTAGE	FLA	МСА	MOCP	WEIGHT (LBS)	EER	REMARKS
DSO-A	COMPUTER ROOM DSI UNITS	DAIKIN	RXTQ48TAVJUA	4.0	208/1/60	_	29.1	35	200	10.3	ALL
RIGERANT PIF ONNECT SWI	RANKCASE HEATER, TIME OFF CONTR PE SIZES ARE O.D. AC&R COPPER T TCH SHALL BE FURNISHED AND INST SHALL SERVE (2) INDOOR UNITS.	UBING. <u>LENGTH A</u>	<u>ND SIZES SHALL BE VER</u>	I	I FACTURER.		<u> </u>				







GENERAL

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION." AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- INVESTIGATE EACH SPACE THOROUGHLY WHERE EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AT WHAT TIMES OF DAY EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. FXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES. DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75 PERCENT OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER. PROVIDE SEISMIC RESTRAINTS AS REQUIRED BY CODE.
- F. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION. MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES, WHICH INVOLVE EXTRA COST, SHALL NOT BE MADE WITHOUT APPROVAL.
- REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES IN MAKING UP THE WORK PROPOSAL
- CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR
- J. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS. WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL.
- K. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- ALL PRESENT MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT AND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- M. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- N. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL B PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS. SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS. AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR.
- R. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES. HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR; EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
- INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
- V. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
- W. DEFINITIONS
- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION. INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
- 6) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

ENGINEER AND ARCHITECT. 2. SCOPE OF WORK A. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER. B. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN TWO YEARS FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR. THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

7) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN

AND EFFICIENCY OF SPECIFIED PRODUCT AS DETERMINED BY THE

PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT PROVIDE COMPLETE SET OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, DUCTWORK, PIPING AND CONTROL SYSTEMS INDICATING CAPACITY DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

3. SHOP DRAWINGS

- INDICATE ON EACH SUBMISSION: PROJECT NAME AND LOCATION. ARCHITECT Α. AND ENGINEER, ITEM IDENTIFICATION AND APPROVAL STAMP OF PRIME CONTRACTOR.
- B. SUBMISSIONS
- 1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
- 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT THREE PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ENGINEER.
- C. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
- 1) DUCTWORK LAYOUT DRAWINGS AND SHEET METAL DESIGNS.
- SHEETMETAL CONSTRUCTION STANDARDS.
- 3) AIR OUTLETS.
- 4) AIR BALANCE REPORT.
- AC UNITS AND FANS.
- 6) PIPING LAYOUT.
- OPERATING SEQUENCES.
- 8) VIBRATION ISOLATION AND SEISMIC RESTRAINTS.

D. COORDINATION

- 1) THE CONTRACTOR SHALL ASSURE FULL COOPERATION OF ALL TRADES AND SHALL FURNISH IN WRITING ALL INFORMATION NECESSARY TO PERMIT THE WORK OF ALL TRADES TO BE INSTALLED SATISFACTORILY AND WITH LEAST POSSIBLE INTERFERENCE OR DELAY.
- 2) PREPARE COORDINATED COMPOSITE DRAWINGS AT A SUITABLE SCALE NOT LESS THAN 1/4-INCH EQUALS ONE FOOT, ZERO INCHES. CLEARLY SHOWING HOW THE WORK OF THIS DIVISION IS TO BE INSTALLED IN RELATION TO THE WORK OF ALL TRADES. ANY WORK INSTALLED IN CONFLICT WITH THE WORK OF OTHER TRADES SHALL
- BE CORRECTED AT NO ADDITIONAL COST TO THE OWNER. THE CONTRACTOR MAY, SUBJECT TO THE ACCEPTANCE OF THE ARCHITECT AND WITHOUT EXTRA CHARGE, MAKE REASONABLE MODIFICATIONS IN THE LAYOUT AS NEEDED TO PREVENT CONFLICT WITH WORK OF ALL TRADES OR FOR THE PROPER EXECUTION OF THE WORK.
- MECHANICAL DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. COORDINATE WITH THE ARCHITECTURAL DRAWINGS AND DETAILS FOR EXACT LOCATION OF DUCTWORK, PIPING AND FOUIPMENT
- 5) THE CONTRACTOR SHALL FOLLOW DRAWINGS IN LAYOUT WORK AND SHALL COORDINATE ALL TRADES TO VERIFY SPACES IN WHICH WORK SHALL BE INSTALLED. MAINTAIN MAXIMUM HEADROOM OR SPACE CONDITIONS. WHERE SPACE CONDITIONS APPEAR INADEQUATE, THE ARCHITECT SHALL BE NOTIFIED BEFORE INSTALLATION. DO NOT PROCEED WITH THE INSTALLATION UNTIL RECEIVING CLARIFYING INSTRUCTIONS
- RECORD DRAWINGS AND EQUIPMENT OPERATION INSTRUCTIONS
- A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
- B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
- C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.
- RECORD (AS-BUILT) DRAWINGS INDICATING AS INSTALLED CONDITIONS SHALL D. BE PROVIDED TO THE ENGINEER AFTER COMPLETION OF THE INSTALLATION.
- 5. SHEET METAL WORK
 - EXCEPT AS OTHERWISE SHOWN OR NOTED. ALL DUCTWORK AND OTHER SHEET METAL WORK SHALL BE GALVANIZED SHEET STEEL AND SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC. DUCT CONSTRUCTION STANDARDS, PRESSURE CLASSIFICATION 2 IN. W.G.
 - 1) FOR RECTANGULAR DUCTS, THE MINIMUM GAUGES SHALL BE: a. 24 GAUGE FOR DUCTS 30" (MAXIMUM DIMENSION) AND
 - SMALLER. b. 22 GAUGE FOR DUCTS WITH A MAXIMUM DIMENSION BETWEEN
 - 31" AND 54". c. 20 GAUGE FOR DUCTS WITH A MAXIMUM DIMENSION BETWEEN
 - 55" AND 84". d. 18 GAUGE FOR DUCTS WITH A MAXIMUM DIMENSION LARGER
 - THAN 84".
 - 2) MAXIMUM REINFORCING DISTANCES SHALL BE: a. 7'-10" FOR DUCTS WITH A MAXIMUM DIMENSION OF 30" OR SMALLER.
 - b. 3'-9" FOR DUCTS WITH A MAXIMUM DIMENSION LARGER THAN

- 3) PROVIDE MILL PHOSPHATIZED FINISH WHERE DUCTS ARE EXPOSED.
- B. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR DIMENSIONS.
- C. ALL DUCTWORK SHALL BE FREE FROM PULSATION. CHATTER AND VIBRATION. IF ANY OF THESE DEFECTS APPEAR AFTER A SYSTEM IS IN OPERATION, CORRECT BY REMOVING AND REPLACING, OR REINFORCING THE DUCTWORK AT NO ADDITIONAL COST TO THE OWNER.
- ROUND SINGLE AND DOUBLE-WALL DUCTWORK: APPROVED MANUFACTURERS: MCGILL AIRFLOW, SEMCO, LINDAB, AND EASTERN SHEET MFTA
- PROVIDE FACTORY-FABRICATED ROUND DUCTS. GAUGES AND CONSTRUCTION DETAILS SHALL COMPLY WITH THE REFERENCED SMACNA HVAC DUCT CONSTRUCTION STANDARDS AND SMACNA ROUND INDUSTRIAL DUCT CONSTRUCTION STANDARDS.
- FOR DUCTWORK DIAMETERS UP TO AND INCLUDING 60 INCHES, PROVIDE SPIRAL LOCK-SEAM CONSTRUCTION. FOR DUCTWORK DIAMETERS OVER 60 INCHES, PROVIDE WELDED LONGITUDINAL SEAMS.
- 3) PROVIDE DUCTS OF SPIRAL LOCK-SEAM CONSTRUCTION.
- 4) USE SLIP JOINTS, JOINTS WITH A DOUBLE-LIPPED EPDM JACKET, OR THE FOLLOWING JOINING SYSTEM FOR TRANSVERSE DUCT JOINTS AND FITTINGS
- a. UP TO 20" DIAMETER: INTERIOR SLIP COUPLING BEADED AT CENTER AND FASTENED TO DUCT WITH SCREWS SHALL BE USED TO JOIN DUCTS. SEAL JOINT WITH A SEALING COMPOUND, CONTINUOUSLY APPLIED AROUND JOINT PRIOR TO ASSEMBLING AND AFTER FASTENING, MAKING CERTAIN THAT
- MAJORITY OF SEALANT RESIDES ON INTERIOR OF THE JOINT. b. 21" DIAMETER & ABOVE: INSTALL USING A THREE-PIECE, GASKETED FLANGED-JOINT CONSISTING OF TWO INTERNAL FLANGES, WITH INTEGRAL MASTIC SEALANT, AND ONE EXTERNAL CLOSURE BAND TO COMPRESS THE GASKET BETWEEN THE INTERNAL FLANGES. APPROVED SYSTEMS: DUCTMATE SPIRAL MATE.
- 5) ELBOWS FOR 3 THROUGH 12 INCH DIAMETER AND 90° BENDS SHALL BE TWO-SECTION STAMPED WITH WELDED SEAMS. ALL OTHER ELBOWS SHALL BE CONSTRUCTED OF MITERED SECTIONS WITH ALL SEAMS AND JOINTS WELDED IN ACCORDANCE WITH THE FOLLOWING SCHEDULE:
- a. THRU 35 DEGREES/2 GORES
- b. 36 THRU 71 DEGREES/3 GORES c. OVER 71 DEGREES/5 GORES
- 6) ELBOWS SHALL BE TWO-SECTION STAMPED WITH WELDED SEAMS.
- 7) CONSTRUCT ALL ELBOWS WITH A CENTERLINE RADIUS EQUAL TO 1.5 TIMES THE DIAMETER.
- 8) MAKE ALL TAKE-OFF CONNECTIONS TO DUCT HEADERS USING TEE (90°), LATERAL (45°), TEE CROSS, LATERAL CROSS AND "Y" BRANCH FITTINGS OF THE CONICAL TYPE. ALL FITTINGS FABRICATED AS SEPARATE FITTINGS SHALL HAVE CONTINUOUS WELDS ALONG ALL SEAMS AND JOINTS.
- 9) THE USE OF TWO-PIECE, MITERED, VANED ELBOWS SHALL NOT BE PERMITTED.
- 10) THE USE OF BULLHEAD TEE FITTINGS IS NOT PERMITTED.
- 11) THE USE OF SQUARE THROAT RADIUS HEEL ELBOWS IS NOT
- 12) SHOP-FABRICATED AND CONTRACTOR-DESIGNED FITTINGS ARE NOT PERMITTED.
- E. DUCTWORK SCHEDULE

PERMITTED.

-) SUPPLY AIR: +2", 3% LEAKAGE RETURN AIR:
- -2", 3% LEAKAGE 3) EXHAUST AIR: -2", 3% LEAKAGE
- F. DUCT LEAKAGE TESTING
 - 1) DISASSEMBLE, REASSEMBLE, AND SEAL SEGMENTS OF SYSTEMS TO ACCOMMODATE LEAKAGE TESTING AND FOR COMPLIANCE WITH TEST REQUIREMENTS. SEAL ALL DUCTWORK WITH UL181 MASTIC OR APPROVED EQUAL.
 - 2) CONDUCT LEAKAGE TESTS, ON ALL DUCTWORK, AT STATIC PRESSURES EQUAL TO MAXIMUM DESIGN PRESSURE OF SYSTEM BEING TESTED. IF PRESSURE CLASSES ARE NOT INDICATED, TEST ENTIRE SYSTEM AT MAXIMUM SYSTEM DESIGN PRESSURE. DO NOT PRESSURIZE SYSTEMS ABOVE MAXIMUM DESIGN OPERATING PRESSURE. GIVE SEVEN DAYS' ADVANCE NOTICE FOR TESTING.
 - MAXIMUM ALLOWABLE LEAKAGE: DUCTWORK LEAKAGE SHALL NOT EXCEED 4 PERCENT OF TOTAL SUPPLY AIRFLOW.
 - 4) REMAKE LEAKING JOINTS; APPLY ADDITIONAL SEALANT AND RETEST UNTIL LEAKAGE IS EQUAL TO OR LESS THAN MAXIMUM ALLOWABLE. ALL TESTS MUST BE WITNESSED AND RESULTS VERIFIED BY THE OWNER'S REPRESENTATIVE. SUBMIT FIELD TEST REPORT CERTIFYING THAT THE DUCTWORK DOES NOT EXCEED THE MAXIMUM ALLOWABLE LEAKAGE.
- G. VOLUME DAMPERS: GALVANIZED STEEL, PER SMACNA "LOW VELOCITY MANUAL," EXCEPT PROVIDE BEARING AT ONE END OF DAMPER ROD AND QUADRANT. WITH LEVER AND LOCKSCREW AT THE OTHER END. FOR INSULATED DUCTS, QUADRANTS MOUNTED ON COLLAR TO CLEAR INSULATION. INSTALL WITH LEVERS ACCESSIBLE.
- H. ACCESS DOORS: INSULATED OR UNINSULATED, SAME AS DUCT
- PROVIDE MINIMUM 20 IN. X 14 IN. ON MAIN DUCTS, AND 12 IN. X 6 IN. ON BRANCH DUCTS, UNLESS OTHERWISE APPROVED, AT FIRE DAMPERS, AND AT ALL DUCT ACCESSORIES SUCH AS HUMIDIFIERS, DUCT SMOKE DETECTORS, AUTO DAMPERS, AND LOUVERS.
- 2) ALL ACCESS DOORS TO BE HINGED, WITH LATCH SIMILAR TO VENTLOCK NO. 100.
- FLEXIBLE CONNECTIONS: NEOPRENE-COATED GLASS FABRIC, 30 OUNCES PER SQ. YD. WITH SEWED AND CEMENTED SEAMS, SIMILAR TO VENT FABRICS. PROVIDE WITH METAL COLLARS. ALLOW MINIMUM MOVEMENT OF 1 IN.
- J. TURNING VANES: GALVANIZED STEEL SMALL DOUBLE-THICKNESS VANES WITH 2 IN. INSIDE RADIUS.
- K. ALL DUCT DIMENSIONS INDICATED ON PLANS ARE INSIDE CLEAR

DIMENSIONS.

- WIRE MESH SCREEN (WMS): NO. 16 USSG, 3/4 SQUARE MESH, IN 1 IN. WIDE GALVANIZED STEEL ENCLOSING FRAME. FLANGED DUCT OPENING TO RECEIVE FRAME.
- M. LOW-PRESSURE FLEXIBLE DUCT: SHALL BE CONSTRUCTED WITH A CPE INNER FILM LINER LOCKED TO GALVANIZED STEEL HELIX WITH 1" THICK FIBERGLASS ENCLOSED WITH A REINFORCED FOIL/MYLAR SLEEVE. UL 181 LISTED AS CLASS 1 AIR DUCT COMPLYING WITH NFPA STANDARD 90A. SIMILAR TO FLEXMASTER TYPE 1M.
- N. FIRE DAMPERS: UL LISTED, GALVANIZED STEEL CONSTRUCTION, DYNAMIC CURTAIN TYPE, SPRING LOADED, EQUIPPED WITH FUSIBLE LINK AND SLEEVE, CONFORMING TO NFPA STANDARD 90A. SIMILAR TO RUSKIN DIBD2 OR DIBD23, RATED AS REQUIRED. SEE INSTALLATION ON DRAWING.
- COMBINATION FIRE AND SMOKE DAMPERS: UL LISTED, GALVANIZED STEEL 0. CONSTRUCTION MULTI-BLADED TYPE WITH SLEEVE. EQUIPPED WITH FUSIBLE LINK CONFORMING TO NFPA STANDARD 90A. SIMILAR TO RUSKIN MODEL FSD 60.

Ρ.	MUL	KE DAMPERS: UNLISTED GALVANIZED STEEL CONSTRUCTION TI-BLADED TYPE WITH SLEEVE. EQUIPPED WITH PNEUMATIC OPERATOR E/P SWITCH. SIMILAR TO RUSKIN MODEL SD50.		H.	THE PERFORMANCE AND CAPACITY OF ALL SYSTEM DEMONSTRATED BY THE CONTRACTOR.
			9.	INSU	LATION – GENERAL REQUIREMENTS
Q.	. CLEA	ANING NEW SYSTEMS			
	1)	 MARK POSITION OF DAMPERS AND AIR-DIRECTIONAL MECHANICAL DEVICES BEFORE CLEANING, AND PERFORM CLEANING BEFORE AIR BALANCING. a. USE SERVICE OPENINGS, AS REQUIRED, FOR PHYSICAL AND MECHANICAL ENTRY AND FOR INSPECTION. b. CREATE OTHER OPENINGS TO COMPLY WITH DUCT STANDARDS. c. DISCONNECT FLEXIBLE DUCTS AS NEEDED FOR CLEANING AND INSPECTION. 		Α.	ALL INSULATION MATERIALS, INCLUDING JACKETS, F COATINGS, AND ACCESSORIES ARE TO BE FIRE HAX BY UNDERWRITERS LABORATORIES, INC. USING STEI METHOD FOR FIRE HAZARD CLASSIFICATION OF BUI STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963 MAXIMUM IS 25 AND FUEL CONTRIBUTED AND SMO IS 50. FLAMEPROOFING TREATMENTS SUBJECT TO MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.
		d. REMOVE AND REINSTALL CEILING SECTIONS TO GAIN ACCESS DURING THE CLEANING PROCESS.		В.	DEFINITIONS
	2)	VENT VACUUMING SYSTEM TO THE OUTSIDE. INCLUDE FILTRATION TO CONTAIN DEBRIS REMOVED FROM HVAC SYSTEMS, AND LOCATE EXHAUST DOWN WIND AND AWAY FROM AIR INTAKES AND OTHER POINTS OF ENTRY INTO BUILDING.			 EXPOSED: INDOOR DUCTS, PIPING OR EQUI MECHANICAL EQUIPMENT ROOMS AND IN ARE VISIBLE WITHOUT REMOVING CEILINGS OR OF CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT
					EXPOSED.
	3)	CLEAN THE FOLLOWING METAL DUCT SYSTEMS BY REMOVING SURFACE CONTAMINANTS AND DEPOSITS:	10.	DUCT	WORK INSULATION
		 a. AIR OUTLETS AND INLETS (REGISTERS, GRILLES, AND DIFFUSERS). b. SUPPLY, RETURN, AND EXHAUST FANS INCLUDING FAN HOUSINGS, PLENUMS (EXCEPT CEILING SUPPLY AND RETURN PLENUMS), SCROLLS, BLADES OR VANES, SHAFTS, BAFFLES, DAMPERS, AND DRIVE ASSEMBLIES. c. AIR-HANDLING UNIT INTERNAL SURFACES AND COMPONENTS 		A.	INSULATE ALL NEW DUCTWORK IN ACCORDANCE WI EXCEPT AS OTHERWISE NOTED. 1) DUCTWORK INSULATION SCHEDULE
		INCLUDING MIXING BOX, COIL SECTION, AIR WASH SYSTEMS, SPRAY ELIMINATORS, CONDENSATE DRAIN PANS, HUMIDIFIERS AND DEHUMIDIFIERS, FILTERS AND FILTER SECTIONS, AND CONDENSATE COLLECTORS AND DRAINS.			a. CONCEALED SUPPLY /OUTSIDE AIR SI D—1 WITH VAPORSEAL. MINIMUM R—V/
		 d. COILS AND RELATED COMPONENTS. e. RETURN-AIR DUCTS, DAMPERS, AND ACTUATORS EXCEPT IN CEILING PLENUMS AND MECHANICAL EQUIPMENT ROOMS. f. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES. 			 EXPOSED AND UNCONDITIONED AREAS EQUIPMENT ROOMS) AND OUTSIDE TH SUPPLY/RETURN/OUTSIDE AIR SHALL WITH VAPORSEAL. MINIMUM R-VALUE
				В.	NON-INSULATED DUCTWORK
	4)	MECHANICAL CLEANING METHODOLOGY: a. CLEAN METAL DUCT SYSTEMS USING MECHANICAL CLEANING METHODS THAT EXTRACT CONTAMINANTS FROM WITHIN DUCT SYSTEMS AND REMOVE CONTAMINANTS FROM BUILDING.			1) WHERE SOUNDLINING IS OF MINIMUM THICKN SPECIFIED FOR INSULATION.
		b. USE VACUUM-COLLECTION DEVICES THAT ARE OPERATED			2) AIR CONDITIONING RETURN AIR DUCTWORK E

- CONTINUOUSLY DURING CLEANING. CONNECT VACUUM DEVICE TO DOWNSTREAM END OF DUCT SECTIONS SO AREAS BEING CLEANED ARE UNDER NEGATIVE PRESSURE
- USE MECHANICAL AGITATION TO DISLODGE DEBRIS ADHERED TO INTERIOR DUCT SURFACES WITHOUT DAMAGING INTEGRITY OF
- METAL DUCTS, DUCT LINER, OR DUCT ACCESSORIES. d. CLEAN FIBROUS-GLASS DUCT LINER WITH HEPA VACUUMING

P SMOKE DAMPERSY LINUISTED GAI VANIZED STEEL CONSTRUCTION

- EQUIPMENT; DO NOT PERMIT DUCT LINER TO GET WET. e. CLEAN COILS AND COIL DRAIN PANS ACCORDING TO NADCA 2013. KEEP DRAIN PAN OPERATIONAL. RINSE COILS WITH CLEAN WATER TO REMOVE LATENT RESIDUES AND CLEANING MATERIALS: COMB AND STRAIGHTEN FINS.
- f. CLEANLINESS VERIFICATION: VISUALLY INSPECT METAL DUCTS FOR CONTAMINANTS.
- WHERE CONTAMINANTS ARE DISCOVERED, RE-CLEAN AND REINSPECT DUCTS.

A. GENERAL

6. AIR OUTLETS

- MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL DIFFUSERS, GRILLES AND REGISTERS SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS.
- FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.
- 3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL
- SUITABLE FOR OPERATION AT 20 PERCENT EXCESS AND 20 PERCENT LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20 PERCENT EXCESS AND 60 PERCENT LESS THAN NOTED CAPACITY FOR VARIABLE VOLUME SYSTEMS. MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.
- DIFFUSERS, GRILLES AND REGISTERS SHALL BE SELECTED TO ACHIEVE NC 30 OR LESS WHEN INSTALLED.
- 6) ALL REGISTERS AND DIFFUSERS SHALL BE PROVIDED WITH OPPOSED BLADE VOLUME DAMPERS. DAMPER OPERATING LEVERS SHALL BE ACCESSIBLE AT THE FACE OF AIR OUTLETS.
- REFER TO DRAWING SCHEDULES FOR SPECIFIC MODELS AND REQUIREMENTS. PROVIDE SCHEDULED MANUFACTURER AND MODELS OR COMPARABLE MODELS BY MANUFACTURER APPROVED BY ENGINEER.

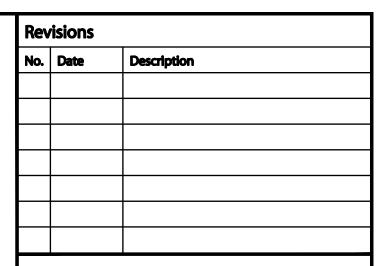
7. NOISE CONTROL

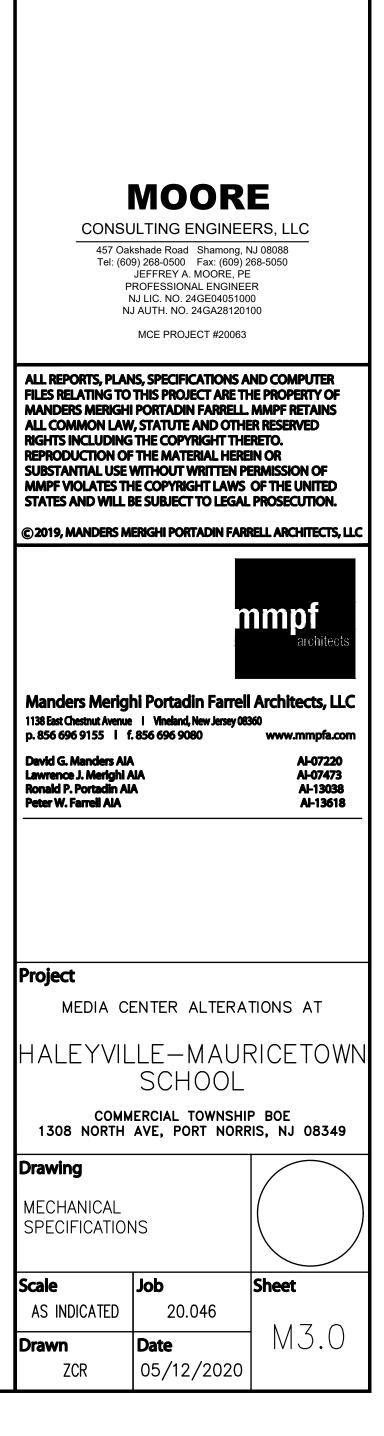
- A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.
- B. PROVIDE SOUNDLINING FOR THE FOLLOWING DUCTWORK.
- 1) ALL DUCTWORK WITHIN MECHANICAL ROOMS AND NOT LESS THAN 10 FT. ON EACH SIDE OF ALL FANS AND AC UNITS.
- 2) AIR TRANSFER DUCTS.
- 3) ALSO, WHERE NOTED ON A DRAWING.
- C. SOUNDLINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1/2 IN. THICKNESS, MAXIMUM 0.25 K FACTOR AT 75 DEGREES F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071, ASTM C 423 AND ASTM G21/G22. SIMILAR TO JOHNS MANVILLE LINACOUSTIC RC
- D. ALL SOUNDLINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.
- 8. TESTING AND BALANCING
- A. ALL AIR AND WATER BALANCING SHALL BE IN ACCORDANCE WITH AABC AND NEBB STANDARDS.
- B. AIR BALANCING SHALL BE ACCOMPLISHED BY ADJUSTMENT OF FANS AND BRANCH DAMPERS FOR MAJOR ADJUSTMENTS. ADJUSTMENT OF TERMINAL DAMPERS AND DEVICES SHALL BE FOR TRIM OR MINOR ADJUSTMENT ONLY. THIS SHALL BE DONE TO PERMIT THE LEAST NOISE GENERATION IN THE TERMINAL AREAS AND UTILIZE MINIMUM FAN ENERGY.
- C. UPON COMPLETION OF THE INSTALLATION. THE CONTRACTOR SHALL REBALANCE ANY EXISTING PORTIONS OF AIR DISTRIBUTION SYSTEM AND WATER DISTRIBUTION SYSTEM AFFECTED BY THE RENOVATION AND ALSO BALANCE ALL NEW WORK.
- D. THE CONTRACTOR SHALL PROVIDE ALL LABOR, PRESSURE GAUGES, FLOW METERS, SHEAVES, AND BELTS REQUIRED TO BALANCE SYSTEMS.
- E. BALANCING REPORT SHALL BE PROVIDED ON AABC-TYPE FORMS.
- F. FANS, AIR HANDLING UNITS AND COILS SHALL BE BALANCED TO WITHIN +5 PERCENT OF THEIR DESIGN CAPACITIES. ALL OTHER AIR AND WATER QUANTITIES SHALL BE BALANCED TO WITHIN +10 PERCENT OF THE DESIGN QUANTITIES.
- G. BALANCING AND TESTING SHALL BE PERFORMED AND SUPERVISED BY A CERTIFIED NEBB OR AABC TECHNICIAN.

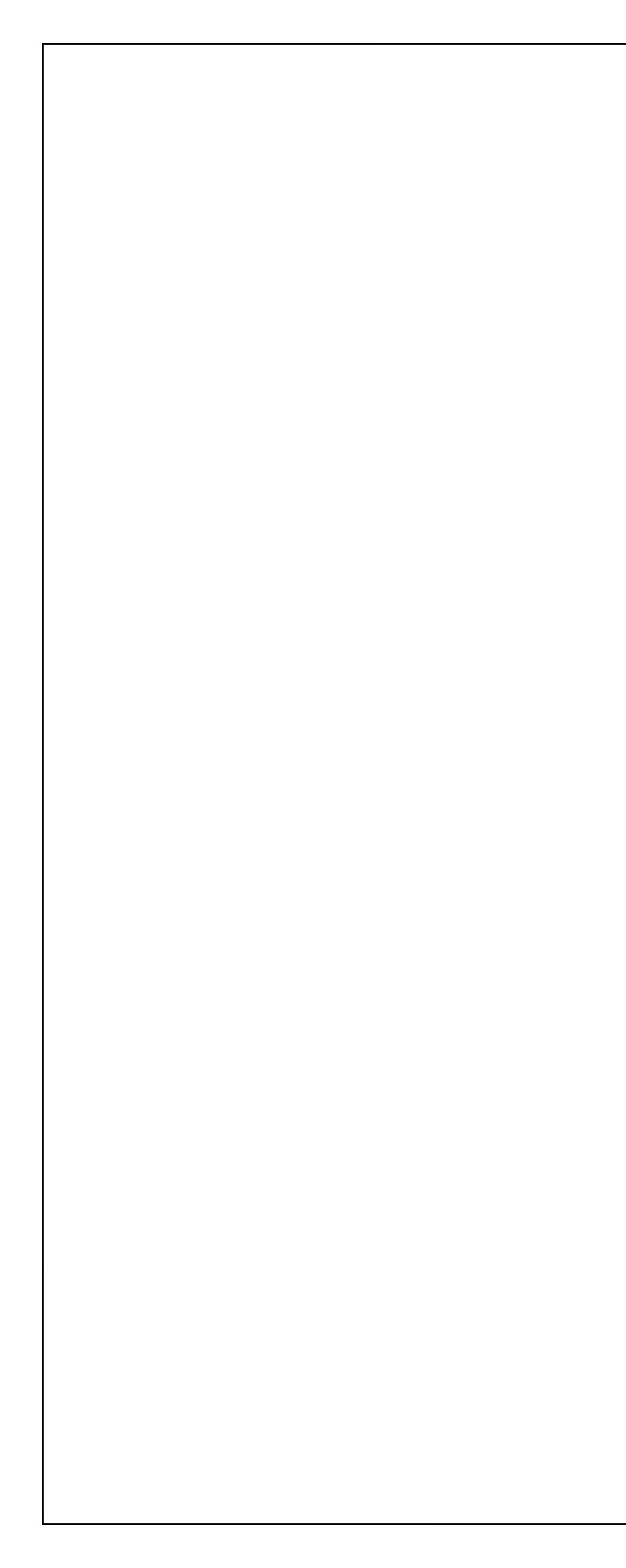
- H. THE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT TO BE
- FACING, ADHESIVE, HAZARD RATED AND LISTED TEINER TUNNEL TEST BUILDING MATERIALS, 63). FLAMESPREAD MOKE DEVELOPED MAXIMUM TO DETERIORATION FROM
- QUIPMENT LOCATED IN AREAS, WHICH WILL BE OPENING ACCESS PANELS.
- EQUIPMENT, WHICH IS NOT
- WITH INSULATION SCHEDULE
 - SHALL BE 1.5 IN., TYPE -VALUE OF 6.
 - AS (INCLUDING MECHANICAL THE BUILDING ENVELOPE BE 2 IN., TYPE D-1 OF 6.3.
 - CKNESS AND R-VALUE
 - EXPOSED IN AIR-CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.
- C. MATERIAL
 - TYPE D-1: MINIMUM 1.5-LB DENSITY FIBERGLASS BLANKET WITH FACTORY-APPLIED FOIL SKRIM-KRAFT FACING SIMILAR TO JOHNS MANVILLE MICROLITE FSK.
- 2) TYPE D-2: 3 LB. FIBERGLASS BOARD WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION SHALL BE PROVIDED WITH A FACTORY-APPLIED ALL-PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO JOHNS MANVILLE TYPE 814 SPIN-GLAS AP.
- TYPE D-3: MINIMUM 6 LB FIBERGLASS BOARD WITH FACTORY APPLIED ALL-PURPOSE OR ALL SERVICE FACING. SIMILAR TO JOHNS MANVILLE 817 SPIN-GLAS AP.
- D. INSTALLATION
 - 1) FIBERGLASS BLANKET: 2 IN. LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 IN. WIDE WITH MIN. 2 ROWS OF WELD PINS 12 IN. ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.
 - FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 IN. WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 IN. WIDE TAPE AT CORNERS; WELD PINS ON TOP, SIDES AND BOTTOM.
- 11. PIPING INSULATION
 - A. INSULATE ALL NEW PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.
 - 1) PIPING INSULATION SCHEDULE
 - a. LOW TEMP 40 TO 100 DEGREES F, UP TO 4 IN., SHALL BE 1-IN. THICK, TYPE P-1 WITH VAPORSEAL.
 - b. LOW TEMP FITTINGS & VALVES 40 TO 100 DEGREES F, UP TO 4-IN., SHALL BE 1-IN. THICK, TYPE P-4 WITH VAPORSEAL AND F-1 FINISH.
 - c. ALL REFRIGERANT LIQUID & SUCTION LINES SHALL BE ½-IN. THICK, TYPE P-6 WITH VAPORSEAL.
- 12. PIPING, VALVES AND FITTINGS TO BE INSULATED
- A. LOW TEMPERATURE PIPING SYSTEMS 40 TO 100 F INCLUDING:
- CONDENSATE DRAIN PIPING.
- B. MATERIAL
 - 1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.23 K-FACTOR AT 75 DEGREES F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO JOHNS MANVILLE MICRO-LOK HP.
 - 2) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.28 K-FACTOR AT 75 DEGREES F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS
 - 3) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K-FACTOR AT 75 DEGREES F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.
- C. FINISH
- 1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
- 2) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
- D. OUTDOOR PIPING

E. INSTALLATION

- FOR ALL PIPING, FITTINGS AND VALVES LOCATED OUTDOORS INCREASE SCHEDULED INSULATION THICKNESS BY A MINIMUM OF 1 IN. AND PROVIDE F-4 FINISH. PROVIDE VAPORSEAL ON ALL OUTDOOR PIPES, VALVES AND FITTINGS SUBJECT TO CONDENSATION.
- 1) BEFORE APPLYING INSULATION, ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.
- 2) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.
- 3) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION.
- 4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.
- 13. VIBRATION ISOLATION, WIND AND SEISMIC RESTRAINTS







A. GENERAL

- PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK.
 INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
 PROVIDE LEVELING DEVICES AND APPROVED RESILIENT RESTRAINING DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4 IN.
- 4) ACCEPTABLE MANUFACTURERS
- a. MASON INDUSTRIES, INC.b. VIBRATION ELIMINATOR CO.
- c. KORFUND DYNAMICS CORP.

B. CEILING-HUNG FANS AND EQUIPMENT

- 1) PROVIDE SPRING HANGER ROD ISOLATORS. STEEL COMPRESSION SPRING AND NEOPRENE SOUND PAD WITHIN A STEEL RETAINER BOX. SIMILAR TO MASON TYPE PCHS.
- 1 IN. MINIMUM STATIC DEFLECTION. 1/2 IN. MINIMUM RESERVE DEFLECTION. FACTORY-PRELOADED TO 75 PERCENT OF RATED LOAD.
- 3) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR STRUCTURE CANNOT SUPPORT POINT LOADS.
- C. SEISMIC RESTRAINTS
 - 1) PROVIDE SEISMIC RESTRAINTS FOR ALL MECHANICAL EQUIPMENT AS REQUIRED BY CODE. SEISMIC RESTRAINTS SHALL BE CAPABLE OF SAFELY ACCEPTING EXTERNAL FORCES AS REQUIRED BY CODE WITHOUT FAILURE, AND SHALL MAINTAIN EQUIPMENT, PIPING, CONDUIT, DUCT AND PRESSURE REDUCING BOXES IN A CAPTIVE POSITION. SEISMIC RESTRAINTS SHALL NOT SHORT CIRCUIT ISOLATION SYSTEMS OR TRANSMIT OBJECTIONABLE VIBRATION OR NOISE, AND SHALL BE PROVIDED ON ALL EQUIPMENT SCHEDULES ON DRAWINGS.
- D. WIND RESTRAINTS

1) ALL ROOF AND GROUND MOUNTED EQUIPMENT SHALL BE FASTENED TO STRUCTURE OR BASE PER MANUFACTURERS MOUNTING RECOMMENDATIONS. PROVIDE INSTALLATION DETAILS SIGNED BY LICENSED PROFESSIONAL STRUCTURAL ENGINEER TO MEET 100 MPH WIND LOADING.

- 14. PIPING GENERAL REQUIREMENTS
 - A. COMPLETE WITH PIPE, FITTINGS, VALVES, STRAINERS, MOTORIZED VALVE OPERATORS, STRAINERS, HANGERS, SUPPORTS, GUIDE, SLEEVES, AND ACCESSORIES.
- B. ALL ITEMS SHALL BE FURNISHED AND INSTALLED IN ACCORDANCE WITH THE LATEST EDITIONS OF THE FOLLOWING CODES AND STANDARDS.
- 1) AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME).
- 2) AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM).
- 3) AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI).
- 4) MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTING INDUSTRY (MSS).
- C. ALL PRESSURIZED PIPING TO BE TESTED HYDROSTATICALLY TO 150 PSI OR 150 PERCENT OF OPERATING PRESSURE, WHICHEVER IS GREATER, BUT NEVER EXCEED TEST PRESSURE ANSI B16.1 BASIS. TEST DURATION TO BE 2 HOURS WITH NO PRESSURE CHANGE CORRECTED FOR TEMPERATURE CHANGE. REPAIR OR REPLACE LEAKS OR DEFECTS WITHOUT ADDITIONAL COST.
- D. PROVIDE DIELECTRIC FITTINGS WHERE DISSIMILAR METALS ARE TO BE JOINED.
- 15. CONDENSATE DRAIN PIPING
- A. PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE "L".
- B. FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.
- C. PITCH, EXCEPT AS NOTED.
- 1) 1 IN. IN 4 FT. PREFERRED.
- 2) 1 IN. IN 8 FT. MINIMUM.
- D. SWING CHECK VALVES: AT CONDENSATE PUMP DISCHARGE. 300 LB WOG, BRONZE BODY SOLDER ENDS, REGRIND BRONZE DISC TO BE USED WITH COPPER TUBING. JENKINS FIG. 1222.
- 16. REFRIGERANT PIPING
 - 1) PIPE: COPPER ACR IN ACCORDANCE WITH ASTM B280.
 - FITTINGS: WROUGHT COPPER WITH SILVER BRAZING ALLOY SOLDER SIMILAR TO HANDY AND HARMAN EASY-FLO.
 - 3) INSTALL REFRIGERANT PIPING ACCORDING TO ASHRAE 15.
 - 4) INSTALL PIPING AS SHORT AND DIRECT AS POSSIBLE, WITH A MINIMUM NUMBER OF JOINTS, ELBOWS, AND FITTINGS.
 - 5) INSTALL PIPING WITH ADEQUATE CLEARANCE BETWEEN PIPE AND ADJACENT WALLS AND HANGERS OR BETWEEN PIPES FOR INSULATION INSTALLATION. USE SLEEVES THROUGH FLOORS, WALLS, OR CEILINGS, SIZED TO PERMIT INSTALLATION OF FULL-THICKNESS INSULATION.
 - 6) SLOPE REFRIGERANT PIPING AS FOLLOWS:
 - a. INSTALL HORIZONTAL HOT-GAS DISCHARGE PIPING WITH A
 - UNIFORM SLOPE DOWNWARD AWAY FROM COMPRESSOR. b. INSTALL HORIZONTAL SUCTION LINES WITH A UNIFORM SLOPE
 - DOWNWARD TO COMPRESSOR. c. INSTALL TRAPS AND DOUBLE RISERS TO ENTRAIN OIL IN
 - VERTICAL RUNS. d. LIQUID LINES MAY BE INSTALLED LEVEL.
 - 7) INSTALL UNIONS TO ALLOW REMOVAL OF SOLENOID VALVES, PRESSURE-REGULATING VALVES, AND EXPANSION VALVES AND AT CONNECTIONS TO COMPRESSORS AND EVAPORATORS.
 - 8) INSTALL HANGERS FOR COPPER TUBING WITH THE FOLLOWING

MAXIMUM SPACING AND MINIMUM ROD SIZES:

- a. NPS 1/2: MAXIMUM SPAN, 60 INCHES; MINIMUM ROD SIZE,
- 1/4 INCH.b. NPS 5/8: MAXIMUM SPAN, 60 INCHES; MINIMUM ROD SIZE,
- 1/4 INCH. c. NPS 1: MAXIMUM SPAN, 72 INCHES; MINIMUM ROD SIZE, 1/4
- INCH. d. NPS 1–1/4: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD
- SIZE, 3/8 INCH. e. NPS 1–1/2: MAXIMUM SPAN, 96 INCHES; MINIMUM ROD
- SIZE, 3/8 INCH.
- 9) CHARGE SYSTEM USING THE FOLLOWING PROCEDURES:a. INSTALL CORE IN FILTER-DRYER AFTER LEAK TEST BUT
- BEFORE EVACUATION.
 EVACUATE ENTIRE REFRIGERANT SYSTEM WITH A VACUUM PUMP TO A VACUUM OF 500 MICROMETERS. IF VACUUM HOLDS FOR 12 HOURS, SYSTEM IS READY FOR CHARGING.
- c. BREAK VACUUM WITH REFRIGERANT GAS, ALLOWING PRESSURE TO BUILD UP TO 2 PSIG.

d. CHARGE SYSTEM WITH A NEW FILTER-DRYER CORE IN CHARGING LINE. PROVIDE FULL-OPERATING CHARGE.

A. MOTORS (UNDER HVAC WORK): IN ACCORDANCE WITH NEMA, IEEE AND

- 1) STANDARD EFFICIENCY UNLESS OTHERWISE NOTED.
- 2) 1.15 SERVICE FACTOR.

ANSI C 50 STANDARDS.

3) SQUIRREL CAGE INDUCTION; OPEN DRIP-PROOF TYPE, 1750 RPM, NEMA TYPE B INSULATION CLASS AND CONTINUOUS DUTY, EXCEPT

18. MOTOR CONTROLLERS

AS NOTED.

A. PROVIDED BY HVAC CONTRACTOR AND INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.

B. NEMA ENCLOSURE, WEATHERPROOF WHERE MOUNTED OUTDOORS.

WITH OVERLOAD PROTECTION. COORDINATE ALL MOTOR CONTROLLER TYPES

D. 1/3 HP AND SMALLER: PROVIDE MANUAL STARTER EXCEPT USE MAGNETIC

1) MANUAL TYPE: 2-POLE TOGGLE SWITCH WITH OVERLOAD

E. 1/2 HP AND LARGER: PROVIDE MAGNETIC STARTER.

AND SIZES WITH MOTOR TYPES AND SIZES.

TYPE WHERE AUTOMATICALLY CONTROLLED.

PROTECTION AND PILOT LIGHT.

- 1) COMBINATION UNFUSED DISCONNECT SWITCH AND MAGNETIC STARTER EXCEPT AS NOTED.
- 2) OVERLOAD PROTECTION IN EACH PHASE LEG WITH RESET IN ENCLOSURE.

3) HOA SELECTOR SWITCH FOR AUTOMATICALLY OPERATED MOTORS. SAFETY CONTROLS COMMON TO BOTH CONTROLS.

- 4) RED, GREEN AND AMBER PILOT LIGHTS.
- 5) SWITCHES: HORSE-POWER-RATED, EXTERNAL PADLOCKING TYPE.
- 6) HOLDING COILS: 10 WATT, 120 VOLT.
- 7) CONTACTS: MAIN LINE AND MINIMUM (2) NORMALLY OPEN, (2) NORMALLY CLOSED 10 AMP AUXILIARIES, IN ADDITION TO CONTACTS REQUIRED FOR CONTROLS SPECIFIED.

8) CONTROL TRANSFORMER: FOR MOTORS OVER 120 VOLTS, TO STEP DOWN CONTROL VOLTAGE TO 120 VOLTS; OF THE REQUIRED CAPACITY, WITH FUSE AND GROUND CONNECTION ON VOLTAGE SIDE.

- 9) FUSES: SIMILAR TO BUSSMAN.
- 10) RELAYS TO SUPPLEMENT AUXILIARY CONTACTS IN CONTROLLER. MINIMUM 10-WATT COIL AND TWO 10 AMP CONTACTS.
- 11) TERMINALS: SUITABLE FOR CONDUCTORS NOTED AND AS APPROVED.

F. ACCEPTABLE MANUFACTURERS

- 1) CUTLER-HAMMER.
- 2) SQUARE D.
- 3) ALLEN BRADLEY.

19. EQUIPMENT

A. DUCTLESS AIR-COOLED SPLIT SYSTEM AIR CONDITIONING/HEAT PUMP UNITS

- PROVIDE DUCTLESS AIR-COOLED SPLIT SYSTEM AIR CONDITIONING/HEAT PUMP UNITS CONSISTING OF WALL OR CEILING CASSETTE FAN/EVAPORATOR COIL UNITS, REMOTE OUTDOOR AIR-COOLED CONDENSING UNIT, INTERCONNECTED REFRIGERANT PIPING AND REMOTE WALL MOUNTED MICROPROCESSOR BASED WIRED THERMOSTAT.
- 2) INDOOR FAN COIL SHALL BE WALL MOUNTED.
- 3) INDOOR FAN/COIL UNIT SHALL INCLUDE AN INTEGRAL INTERNAL CONDENSATE PUMP.
- 4) SYSTEM SHALL BE CAPABLE OF OPERATION DOWN TO MINUS O DEGREES F (LOW AMBIENT) AND SHALL BE PROVIDED WITH ALL NECESSARY CONTROLS, OPTIONS AND ACCESSORIES INCLUDING WINTER START CONTROL AND CRANKCASE HEATERS.
- 5) UNIT COMPRESSORS SHALL BE HERMETIC SCROLL TYPE INVERTER DRIVEN COMPRESSORS AND SHALL HAVE A 5-YEAR MANUFACTURER'S WARRANTY.

20. AUTOMATIC CONTROLS - GENERAL REQUIREMENTS

A. FURNISH AND INSTALL A COMPLETE ELECTRIC OR ELECTRONIC CONTROL SYSTEM TO PROVIDE TEMPERATURE CONTROL AS SPECIFIED UNDER DESCRIPTION OF OPERATION.

WORK SHALL INCLUDE ALL WIRING, CONTROL EQUIPMENT, AND ACCESSORIES NECESSARY TO MAKE THIS SYSTEM COMPLETE. ALL WIRING SHALL BE 24 VOLT. COORDINATE WITH MANUFACTURER FOR INTERCONNECTION WITH CONTROLS INCLUDED IN EQUIPMENT. ALL CONTROL WORK SHALL BE INSTALLED BY THE HVAC CONTRACTOR.

ACCEPTABLE MANUFACTURERS

- 1) JOHNSON CONTROLS.
- 2) HONEYWELL, INC.
- 3) OR APPROVED EQUAL
- D. OPERATION OF TYPICAL CONTROL SAFETY DEVICES.
- EXHAUST FANS, SUCH AS GENERAL OR TOILET (OPERATING INDEPENDENTLY): ALL SAFETY DEVICES SHALL BE INTERLOCKED WITH "HAND" AND "AUTOMATIC" POSITIONS IN SERIES WITH MOTOR CONTROLLER HOLDING COIL CIRCUIT. REMOTE STARTING SHALL BE THROUGH AUTOMATIC POSITION ONLY. "HAND" POSITION SHALL BE FOR MAINTENANCE OPERATION ONLY.

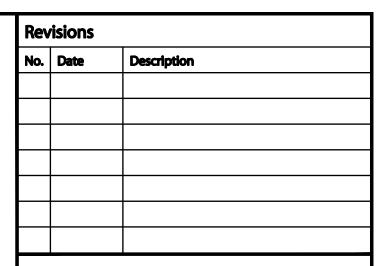
2) SAFETY DEVICES FOR ALL SYSTEMS, EXCEPT AS OTHERWISE NOTED BELOW.

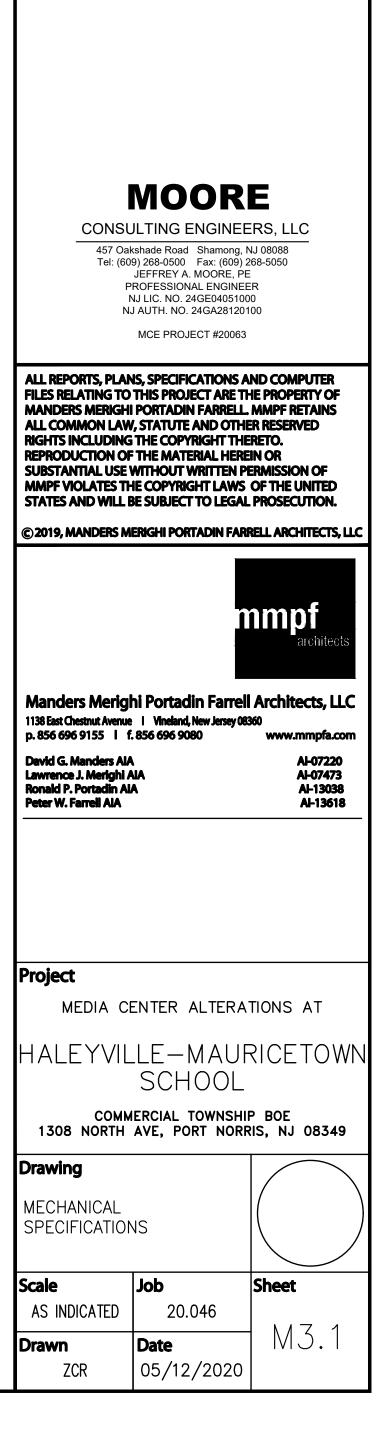
- a. ONE FREEZE PROTECTION THERMOSTAT PER COIL SECTION, WIRED TO STOP SUPPLY FAN. THERMOSTAT SHALL BE AUTOMATIC RESET TYPE.
- b. FOR SYSTEMS OVER 2,000 CFM, A DUCT MOUNTED SMOKE DETECTOR OF THE IONIZATION TYPE LOCATED IN THE RETURN DUCT SHALL STOP THE SUPPLY FAN AND ASSOCIATED INTERLOCKED EQUIPMENT SHOULD PRODUCTS OF COMBUSTION BE SENSED.

E. SEQUENCE

1) CONSTANT VOLUME SYSTEM

a. A 7/24 PROGRAMMABLE THERMOSTAT SHALL BE CAPABLE OF RUNNING THE TWO WALL MOUNTED UNITS AT BOTH OCCUPIED AND UNOCCUPIED MODES. WHILE IN OCCUPIED MODE, THE FAN SHALL RUN CONTINUOUSLY. IN UNOCCUPIED MODE, THE FAN SHALL CYCLE AS REQUIRED TO MAINTAIN THE SPACE TEMPERATURE SETPOINT.





ELECTRICAL SYMBOLS LIST (NOT ALL SYMBOLS ARE NECESSARILY USED ON THIS PROJECT) LIGHTING SYMBOLS

<u>LIGHTING SYMBO</u>	<u>LS</u>		
	2'x4'/2'x2'/1'x4' RECESSED CEILING MOUNTED LIGHT FIXTURE		SPECIAL PURPOSE
	A = FIXTURE TYPE a = CONTROLLED BY SWITCH a NL = NIGHT LIGHT		SPECIAL PURPOSE A = TYPE
a		-⊕ <mark>-</mark> -	WALL MOUNTED CL D = DOUBL
	SIMILAR TO ABOVE WITH EMERGENCY BACKUP	\boxtimes	MOTOR CONTROLLE
	A = FIXTURE TYPE a = CONTROLLED BY SWITCH a	100/3	COMBINATION MOTO POLES, VOLTAGE R
		30/3 	UNFUSED DISCONN SWITCH AMPS/# O
	WALL MOUNTED LIGHT FIXTURE A = FIXTURE TYPE a = CONTROLLED BX SWITCH a	100/60/3	FUSED DISCONNEC SWITCH AMPS/FUS
	a = CONTROLLED BY SWITCH a NL = NIGHT LIGHT	100/3 CB	ENCLOSED CIRCUIT TRIP AMPS/# OF
A	STRIP LIGHT FIXTURE – TYPE AS NOTED A = FIXTURE TYPE	\boxtimes	POWER POLE
' 'a	a = CONTROLLED BY SWITCH a		SURFACE MOUNTEE
A	SIMILAR TO ABOVE WITH EMERGENCY BACKUP A = FIXTURE TYPE		FLUSH MOUNTED L
a	a = CONTROLLED BY SWITCH a		SURFACE MOUNTED
A	UNDERCABINET LIGHT FIXTURE A = FIXTURE TYPE		FLUSH MOUNTED F
O_a^A	CEILING MOUNTED/RECESSED FIXTURE	J	CEILING MOUNTED
Ga	A = FIXTURE TYPE a = CONTROLLED BY SWITCH a	ΗŪ	FLUSH WALL MOUN
$\boldsymbol{\varphi}_{a}^{A}$	SIMILAR TO ABOVE WITH EMERGENCY BACKUP A = FIXTURE TYPE	J	FLUSH FLOOR MOU
	a = CONTROLLED BY SWITCH a	C	CAP
O d	WALL MOUNTED LIGHT FIXTURE A = FIXTURE TYPE a = CONTROLLED BY SWITCH a	۰K	PUSH BUTTON K = KEY OPERA H = HOLD UP P = PANIC
	SIMILAR TO ABOVE WITH EMERGENCY BACKUP A = FIXTURE TYPE a = CONTROLLED BY SWITCH a	<u> </u>	EPO = EM. POW EXISTING CONDUIT
٨			UNDERGROUND CO
<0 [↓]	ACCENT LIGHT OR WALL WASHER A = FIXTURE TYPE	•	POINT OF CONNEC
	a = CONTROLLED BY SWITCH a	${}^{\bullet}$	POINT OF DISCONN
	SIMILAR TO ABOVE WITH EMERGENCY BACKUP A = FIXTURE TYPE		
ŭ	a = CONTROLLED BY SWITCH a		<u>ARM SYMBO</u>
$- \bigcirc, A' , O, O$	LIGHT TRACK—TYPE 'A' WITH TRACK MOUNTED FIXTURE TYPE 'B'	\$	CEILING MOUNTED F = MOUN
ВВ	MOUNTED FIXTORE TIPE D		DUCT SMOKE DET
×	CEILING MOUNTED EXIT LIGHT - DIRECTIONAL ARROWS WHERE	(B) (SA)	CEILING MOUNTED SINGLE/MULTI ST/
× w	$ \begin{array}{llllllllllllllllllllllllllllllllllll$	(CA)	SINGLE/MULTI ST
	E = END MOUNTED C = CEILING MOUNTED		·
		©/\$	SINGLE/MULTI ST
	EMERGENCY BATTERY LIGHT UNIT	Æ	F = FIXED
	A = FIXTURE TYPE	$\langle W \rangle$	SPRINKLER WATE
Pa ₽b	REMOTE LIGHT HEADS FOR EMERGENCY BATTERY LIGHT UNIT	(PS)	SPRINKLER PRES
	– TYPE AS NOTED	$\langle \overline{1} \rangle$	SPRINKLER TAMP
POWER SYMBOLS	$\frac{1}{2}$	F	FIRE ALARM PULL

		—	
POWER	SYMBOLS	F	FIRE ALARM PULL
S₫	SINGLE POLE SWITCH	Þ	FIRE ALARM TELEF
-	2 = DOUBLE POLE 3 = THREE-WAY 4 = FOUR-WAY	F	Combination fire Flush wall mou
	a = CONTROLS SWITCH LEG 'a' D = DIMMER DR = DOOR	FK	FIRE ALARM SPEA C = CEILIN
	K = KEY OPERATED MO = MOMENTARY CONTACT T = TIMER SWITCH P = PILOT LIGHT	H	COMBINATION FIRE WALL MOUNTED
	LV = LOW VOLTAGE	ΗK	FIRE ALARM HORN C = CEILIN
\$ _T	DISCONNECT SWITCH – TOGGLE TYPE WITH THERMAL OVERLOAD – HP RATED	L H	LOW FREQUENCY C = CEILIN
\$ _M	DISCONNECT SWITCH – TOGGLE TYPE MOTOR RATED, 20A, 1P, UON	B	COMBINATION FIRE
H VS	VACANCY SENSOR, WALL MOUNTED		WALL MOUNTED
VS	VACANCY SENSOR, CEILING MOUNTED	BD	FIRE ALARM BELL,
OS	OCCUPANCY SENSOR, CEILING MOUNTED	ММ	FIRE ALARM MONI
Hos	OCCUPANCY SENSOR, WALL MOUNTED	СМ	FIRE ALARM CONT
HPC	PHOTOCELL SENSOR, WALL MOUNTED	DH	DOOR HOLDERS
=	20A, 125V DUPLEX RECEPTACLE - FLUSH WALL MOUNTED	DR	ELECTROMAGNETIC
-	CONTROLLED FROM WALL SWITCH "a" 20A, 125V DUPLEX RECEPTACLE – FLUSH WALL MOUNTED, TAMPER	ER	ELEVATOR RECALL
₩TR	RESISTANT	ΗĒ	FLUSH WALL MOU
€u	20A, 125V DUPLEX RECEPTACLE WITH DUAL USB CHARGING OUTLETS FLUSH WALL MOUNTED	Ē	CEILING MOUNTED
⇔c	20A, 125V DUPLEX RECEPTACLE – FLUSH WALL MOUNTED,	(RIL)	REMOTE INDICATOR
<i>н</i>	CONTROLLED	<u>VOICE/D</u>	ATA/P.A. SI
\Rightarrow	20A, 125V QUADRUPLEX RECEPTACLE – FLUSH WALL MOUNTED	S	WALL MOUNTED P
\Rightarrow	20A, 125V ISOLATED GROUND, DUPLEX RECEPTACLE, FLUSH WALL MOUNTED	_	D = DUAL CEILING MOUNTED
-	20A, 125V DUPLEX RECEPTACLE, FLUSH WALL MOUNTED, GFI TYPE	S	D = DUAL
-	20A, 125V EMERGENCY DUPLEX RECEPTACLE, FLUSH WALL MOUNTED	▼ #/#	VOICE & DATA OU A 90 DEG. BEND #/# = #(
\rightarrow	SINGLE RECEPTACLE, FLUSH WALL MOUNTED	₩#	VOICE OUTLET LO DEG. BEND 6" IN
⇔	20A, 125V DUPLEX RECEPTACLE, FLUSH FLOOR MOUNTED	▼ π	P = PUBLIONF = FAXW = WALL
\bigoplus	20A, 125V QUADRUPLEX RECEPTACLE, FLUSH FLOOR MOUNTED	_#	# = # OF DATA OUTLET LOC DEG. BEND 6" IN
\square	PEDESTAL MOUNTED 20A, 125V DUPLEX RECEPTACLE		# = # OF TELEVISION OUTLE
	PEDESTAL MOUNTED 20A, 125V QUADRUPLEX RECEPTACLE	TV	90 DEG. BEND 6'
_			CLOSED CAPTION TERMINATED IN A

AL PURPOSE RECEPTACLE, FLUSH FLOOR MOUNTED, A = TYPE
AL PURPOSE RECEPTACLE, FLUSH WALL MOUNTED, TYPE
$\begin{array}{l} MOUNTED \ CLOCK \\ D \ = \ DOUBLE \ \ FACE \end{array}$
R CONTROLLER
INATION MOTOR CONTROLLER AND DISCONNECT SWITCH AMPS/ $\#$ OF 5, VOLTAGE RATING AS REQUIRED
SED DISCONNECT SWITCH H AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED D DISCONNECT SWITCH H AMPS/FUSE AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED DSED CIRCUIT BREAKER AMPS/# OF POLES, VOLTAGE RATING AS REQUIRED R POLE
ACE MOUNTED LIGHTING PANELBOARD
I MOUNTED LIGHTING PANELBOARD
ACE MOUNTED POWER PANELBOARD
I MOUNTED POWER PANELBOARD
IG MOUNTED JUNCTION BOX
I WALL MOUNTED JUNCTION BOX
I FLOOR MOUNTED JUNCTION BOX
BUTTON • KEY OPERATED • HOLD UP • PANIC = EM. POWER OFF
NG CONDUIT/EQUIPMENT TO BE REMOVED RGROUND CONDUIT/WIRING
OF CONNECTION
OF DISCONNECTION
SYMBOLS
ING MOUNTED SPACE SMOKE DETECTOR F = MOUNTED UNDER RAISED FLOOR I SMOKE DETECTOR ING MOUNTED CARBON MONOXIDE DETECTOR LE/MULTI STATION SMOKE ALARM LE/MULTI STATION CARBON MONOXIDE ALARM LE/MULTI STATION SMOKE/CARBON MONOXIDE ALARM RMAL DETECTOR RATE-OF-RISE F = FIXED TEMPERATURE
NKLER WATERFLOW SWITCH
NKLER PRESSURE SWITCH
NKLER TAMPER SWITCH
ALARM PULL STATION
ALARM TELEPHONE JACK
BINATION FIRE ALARM SPEAKER AND STROBE LIGHT UNIT — SH WALL MOUNTED
ALARM SPEAKER – FLUSH WALL MOUNTED C = CEILING MOUNTED
BINATION FIRE ALARM HORN AND STROBE LIGHT UNIT, FLUSH _ MOUNTED
ALARM HORN – FLUSH WALL MOUNTED C = CEILING MOUNTED
FREQUENCY SOUNDER (520 HZ) – FLUSH WALL MOUNTED $C = CEILING MOUNTED$
BINATION FIRE ALARM BELL AND STROBE LIGHT UNIT, FLUSH $_{\rm L}$ MOUNTED
ALARM BELL, FLUSH WALL MOUNTED
ALARM MONITOR MODULE
ALARM CONTROL MODULE
R HOLDERS
TROMAGNETIC DOOR RELEASE
ATOR RECALL TIE-IN POINT
SH WALL MOUNTED STROBE LIGHT LINIT

LL MOUNTED STROBE LIGHT UNIT NOUNTED STROBE LIGHT UNIT NDICATOR LIGHT

A. SYMBOLS

INTED PUBLIC ADDRESS SPEAKER = DUAL HORN

OUNTED PUBLIC ADDRESS SPEAKER DUAL HORN

DATA OUTLET LOCATION WITH 3/4" CONDUIT TERMINATED IN BEND 6" INTO NEAREST ACCESSIBLE CEILING # = # OF VOICE JACKS/# OF DATA JACKS

TLET LOCATION WITH 3/4" CONDUIT TERMINATED IN A 90 6" INTO NEAREST ACCESSIBLE CEILING PUBLIC

FAX WALL MOUNTED # OF JACKS

LET LOCATION WITH 3/4" CONDUIT TERMINATED IN A 90 D 6" INTO NEAREST ACCESSIBLE CEILING = # OF JACKS

OUTLET LOCATION WITH 3/4" CONDUIT TERMINATED IN A BEND 6" INTO NEAREST ACCESSIBLE CEILING CAPTION TV CAMERA OUTLET LOCATION WITH 3/4" CONDUIT TERMINATED IN A 90 DEG. BEND 6" INTO NEAREST ACCESSIBLE CLG CARD ACCESS STATION OUTLET LOCATION WITH 3/4" CONDUIT TERMINATED IN A 90 DEG. BEND 6" INTO NEAREST ACCESSIBLE CLG

1P SINGLE POLE IPX ISOLATED POWER CENTER-X-RAY 2P TWO POLE JB JUNCTION BOX 3P THREE POLE KCMIL THOUSAND CIRCULAR MILS A AMPERE KV KILOVOLT AC ABOVE COUNTER KV KUOVOLT AC ABOVE COUNTER KV KUOVOLT AC ABOVE FINISHED FLOOR KW KULOWATT AFG ABOVE FINISHED GRADE LFMC LIQUIDTIGHT FLEXIBLE AHJ AUTHORTY HAVING JURISDICTION METALLIC CONDUIT METALLIC CONDUIT ALG AMPERE INTERRUPTING CAPACITY LFNC LIQUIDTIGHT FLEXIBLE AL ALUMINUM LIM LINE ISOLATION MONITOR ALM ALARM LIM LINE ISOLATION MONITOR ARF ABOVE RAISED FLOOR MAP MEDICAL GAS ALARM PANEL ATS AUTOMATIC TRANSFER SWITCH MAX MAXIMUM AUTO AUTOMATIC TRANSFER SWITCH MAX MAXIMUM AUTO AUTOMATIC TRANSFER SWITCH MAX MAXIMUM AUTO AUTOMATIC TRANSFER SWITCH MAX MAXIMUM<		<u>(IATIONS</u> bbreviations are necessarily used on this proje	ECT)	
2P TWO POLE 4B JUNITON BOX 3P THE POLE KNL THOUSAN CRULER MILES A AMPER KN KLUMATT HOUR AGE AR CRULT BEAKER KN KLUMATT HOUR AFE ASO ENSIED FLOOR KN KLUMATT HOUR AFE ASO ENSIED FLOOR KN KLUMATT HOUR ALL ALLINGT THREE LIG LOUIDINGT LEXELE ALL ALLINGT THREE LIG LOUIDINGT LEXELE ALL ALLINGT THREE LIG LOUIDINGT LEXELE ALL ALLINGT THREE LIG LIG LIGHING ALL ALLINGT THREE LIG LIGHING MARE THREE ALL LIGHING MARE THREE LIGHING MARE THREE ALLINGT THREE LIG LIGHING MARE THREE LIGHING ALLINGT THREE LIGHING MARE THREE LIGHING MARE THREE ALLINGT THREE LIGHING MARE THREE MARE THREE MARE THREE ALLINGT THREE M				ISOLATED POWER CENTER-X-RAY
A AMPERE KV RUDVLT AURULE AC ABOC COUNTRE KVA RUDVLT AURULE RUDVLT AURULE AURULE <t< td=""><td>2P</td><td>TWO POLE</td><td>JB</td><td>JUNCTION BOX</td></t<>	2P	TWO POLE	JB	JUNCTION BOX
Add Addy E CONTR KVA KUCNUT HALPACE ACS AR COULT BREAKER KVA KUCNUT HALPACE AFF ADDE FINSHED LODG KVA KUCNUT HALPACE AFF ADDE FINSHED LODG KVA KUCNUT HALPACE AL ALMANIMA LINC LUDUTOHT CONUT AL ALMANIMA LINC LUDUTOHT CONUT AL ALMANIMA LINC LUDUTOHT CONUT AL ALMANIMA LINC LINC LUDUTOHT CONUT ALMONIMIC MALANIMA MAX MAXUNIMA MAXUNIMA ALMONIMIC MALANIMA MAX MAXUNIMA MAXUNIMA ALMONIMIC MALANIMA MAXUNIMA MAXUNIMA MAXUNIMA ALT ALMONIMIC MALANIMA MAXUNIMA MAXUNIMA ALT ALMONIMIC MALANIMA MAXUNIMA MAXUNIMA ALT ALMONIMIC MALANIMA MAXUNIMA MAXUNIMA				
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ALC ALLERGUETRRUPTING CAPACITY LINC LUQUIDIGHT PLABUE ALM ALAM NON-METALLE CONDUCT NON-METALLE CONDUCT ALM ALAM LIM LIME ISOLATOM MONITOR ALM ALAM LIM LIME ISOLATOM MONITOR ALTO ALTOWATIC TRANSFER SWITCH MAX MAXMMM AUTO ALTOWATIC TRANSFER SWITCH MAX MAXMMM AUTO ALTOWATIC CAPACITY MAX MAXMMM AUTO ALTOWATIC CAPACITY MAX MAXMMM AUTO ALTOWATIC TRANSFER SWITCH MAX MAXMMM AUTO ALTOWATIC CAPACITY MAX MAXMMM AUTOWATIC CAPACITY MAX MAXMMM MAXMMM COT CARCONTRAL MAXMMM MAXMMM COT CARCONTRAL MAXMMMM MAXMMMM COT CARC			LFMC	
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GENERAL FIRESTOPPING NOTE

CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING OR EXCEEDING WALL/CEILING/FLOOR FIRE ASSEMBLY RATINGS FOR ALL PENETRATIONS. CONTRACTOR SHALL VERIFY LOCATION AND RATING OF ALL FIRE ASSEMBLIES AND PROVIDE INTUMESCENT COLLARS AT ALL PENETRATIONS AND/OR FIRE RATED CAULKING AS REQUIRED.

GENERAL ELECTRICAL NOTES:

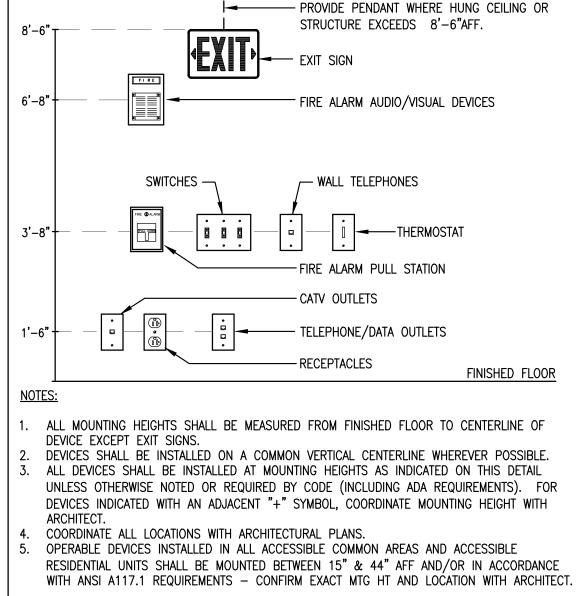
- 1. DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. FOLLOW DRAWINGS IN LAYING OUT WORK AND CHECK DRAWINGS AND FIELD DIMENSIONS OF OTHER TRADES TO VERIFY SPACE CONDITIONS. MAINTAIN HEADROOM AND SPACE REQUIREMENTS.
- 2. PERFORM ALL WORK IN STRICT ACCORDANCE WITH NATIONAL ELECTRICAL CODE (N.E.C.-2014) AS ADOPTED BY THE STATE OF NEW JERSEY, OSHA REQUIREMENTS, ALL FEDERAL, STATE, AND LOCAL CODES AND ALL OWNER REQUIREMENTS.
- 3. INCLUDE ALL TEMPORARY POWER AND LIGHTING, PERMIT, LICENSE, AND INSPECTION COSTS IN BID.
- 4. CONTRACTOR SHALL ISSUE IN WRITING TO ARCHITECT/ENGINEER ANY SCOPE OF WORK DISCREPANCIES AND/OR QUESTIONS PRIOR TO SUBMISSION OF BID.
- 5. CONTRACTOR SHALL EXAMINE ALL DRAWINGS AND SPECIFICATIONS AND VISIT THE SITE TO BECOME ACQUAINTED WITH THE CONSTRUCTION, SITE AND THE EXTENT OF THE WORK PRIOR TO SUBMISSION OF BID.
- 6. COORDINATE ALL REQUIRED SHUTDOWNS WITH THE OWNER (AND UTILITY COMPANY WHERE APPLICABLE) A MINIMUM OF FOURTEEN (14) DAYS IN ADVANCE. INCLUDE OVERTIME COSTS IN BID TO PERFORM ALL SHUTDOWNS (INCLUDING SHUTDOWNS FOR AREAS WHICH MAY BE UNOCCUPIED DURING CONSTRUCTION) AFTER NORMAL WORKING HOURS AS COORDINATED WITH THE OWNER. NO EXTRA CLAIMS OR COMPENSATION SHALL BE GRANTED FOR OVERTIME COSTS ASSOCIATED WITH PERFORMING SHUTDOWNS.
- 7. SECURE ALL SUPPORTS TO BUILDING STRUCTURE BY STEEL FOR VERTICAL SUPPORT AND BY MEANS OF TOGGLE BOLTS ON HOLLOW MASONRY UNITS, EXPANSION SHIELDS IN CONCRETE OR BRICK. MACHINE SCREWS ON METAL SURFACE, AND WOOD SCREWS ON WOOD CONSTRUCTION. NAILS, RAWL OR WOOD PLUGS NOT PERMITTED. SUPPORT HORIZONTAL RUNS OR METALLIC CONDUITS NOT MORE THAN 10 FT. APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
- 8. PASS RACEWAYS OVER WATER, STEAM, OR OTHER PIPING WHEN PULL BOXES ARE NOT REQUIRED. NO RACEWAY WITHIN 3 IN. OF STEAM OR HOT WATERS PIPES, OR APPLIANCES, EXCEPT CROSSINGS WHERE RACEWAY SHALL BE AT LEAST 1 IN. FROM PIPE COVER.
- 9. FURNISH FISH WIRE IN EACH RACEWAY RUN OVER 10 FT IN WHICH WIRING IS NOT INSTALLED.
- 10. CUT STEEL CONDUIT ENDS SQUARE, REAM SMOOTH, PAINT MALE THREADS OF FIELD THREADED CONDUIT WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH CONDUIT COUPLINGS. 11. HORIZONTAL OR CROSS RUNS IN PARTITIONS AND WALLS NOT
- 12. ROUTE ALL CONDUITS AND CABLES PARALLEL OR PERPENDICULAR TO BUILDING LINES WHERE POSSIBLE.

PERMITTED.

- 13. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
- 14. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF NORMAL AND EMERGENCY CIRCUITS. COMMON BOXES: PROVIDE BARRIERS BETWEEN EMERGENCY AND NORMAL WIRING.
- 15. LEAVE WIRE SUFFICIENTLY LONG TO PERMIT MAKING FINAL CONNECTIONS
- 16. WIRE COLOR CODING: PER CODE. WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION FOR OVERLAP COLOR TAPING OF CONDUCTORS (MINIMUM LENGTH 6") IN ACCESSIBLE LOCATIONS. COLOR CODING, ONCE SELECTED, MUST BE USED CONSISTENTLY FOR THE ENTIRE PROJECT
- 17. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32°F (0°C). PROVIDE CABLE SUPPORTS FOR WIRE IN RISER CONDUITS AS REQUIRED BY CODE.

- 18. SET BOXES SQUARE AND TRUE WITH BUILDING FINISH. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRONS.
- 19. VERIFY EXACT LOCATIONS AND MOUNTING HEIGHT OF ALL LIGHT FIXTURES, SWITCHES, RECEPTACLES, OUTLETS, FIRE ALARM DEVICES, VOICE/DATA DEVICES AND OTHER EQUIPMENT WITH ARCHITECTURAL DRAWINGS AND IN THE FIELD PRIOR TO ROUGH-IN. IN CENTERING OUTLETS AND LOCATION BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE, AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
- 20. A "+" SYMBOL NEXT TO A DEVICE INDICATES A NON-STANDARD DEVICE MOUNTING HEIGHT - CONTRACTOR SHALL COORDINATE EXACT MOUNTING HEIGHT PRIOR TO ROUGH-IN.
- 21. LOCATIONS INDICATED FOR LOCAL WALL SWITCHES ARE SUBJECT TO MODIFICATIONS AT OR NEAR DOORS. COORDINATE WITH ARCHITECT AND INSTALL SWITCH ON SIDE OPPOSITE HINGE. VERIFY FINAL HINGE LOCATIONS IN FIELD PRIOR TO SWITCH OUTLET INSTALLATION.
- 22. PROVIDE PULL BOXES AS INDICATED AND WHEREVER NECESSARY TO FACILITATE PULLING OF WIRE AND COORDINATE LOCATIONS WITH OTHER TRADES.
- 23. FOR EMPTY RACEWAY RUNS, PROVIDE PULL BOXES EVERY 100FT AND AS INDICATED. COORDINATE LOCATIONS WITH OTHER TRADES.
- 24. JUNCTION AND PULL BOXES: LOCATE GENERALLY NOT EXPOSED IN FINISHED SPACES. WHERE NECESSARY, REROUTE CONDUITS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. COVERS OF JUNCTION AND PULL BOXES SHALL BE ACCESSIBLE.
- 25. SUPPORT JUNCTION AND PULL BOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON CONDUITS. 26. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY
- ARCHITECT PRIOR TO INSTALLATION.
- 27. FIRESTOPPING SHALL BE INSTALLED WHENEVER WIRING OR RACEWAYS CROSS FIRE RATED CONSTRUCTION.
- 28. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCES THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION, SHOP AND RECORD DRAWINGS AND APPROVALS.
- 29. DEMONSTRATE PERFORMANCE AND CAPACITY OF ALL SYSTEMS AND EQUIPMENT.
- 30. AT COMPLETION OF PROJECT, PROVIDE NEW UPDATED TYPE WRITTEN PANELBOARD DIRECTORIES FOR ALL NEW PANELBOARDS AND ANY EXISTING PANELBOARDS THAT HAVE BEEN MODIFIED.
- 31. PROVIDE REPRODUCIBLE "AS BUILT" DRAWINGS INDICATING AS-INSTALLED CONDITIONS AFTER COMPLETION OF THE INSTALLATION.
- 32. THE CONTRACTOR SHALL GUARANTEE AND SERVICE THE ENTIRE INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE OF THE INSTALLATION.
- 33. THE CONTRACTOR SHALL, DURING THE PERIOD OF THE GUARANTEE, REPLACE OR REPAIR AT HIS OWN EXPENSE ANY PIECE OF EQUIPMENT AND/OR MATERIAL WHICH IS FOUND TO BE DEFECTIVE. THE REPLACEMENT OR REPAIR SHALL BE DONE AS SOON AS NOTIFIED BY THE ENGINEER OR AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ALSO REPAIR ALL DAMAGE TO SURROUNDING WORK CAUSED BY THE FAILURE, REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT.
- 34. THE CONTRACTOR SHALL COORDINATE LOCATION(S) OF ALL PLENUM RATED SPACE(S) WITH THE MC. EC SHALL PROVIDE METAL CONDUIT OR MC CABLE WITHIN PLENUM RATED SPACE(S).
- 35. THESE DRAWINGS HAVE BEEN DESIGNED AND ENGINEERED BASED ON VISUAL INSPECTIONS OF THE EXISTING BUILDING AND INFRASTRUCTURE PRIOR TO ANY DEMOLITION. SOME ASSUMPTIONS HAVE BEEN MADE AS TO ACTUAL CONSTRUCTION, MATERIALS, AND METHODS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL ACTUAL FIELD CONDITIONS AND SHALL NOTIFY THE OWNER AND ENGINEER OF ANY DISCREPANCIES, CONFLICTS, AND UNFORESEEN CONDITIONS.



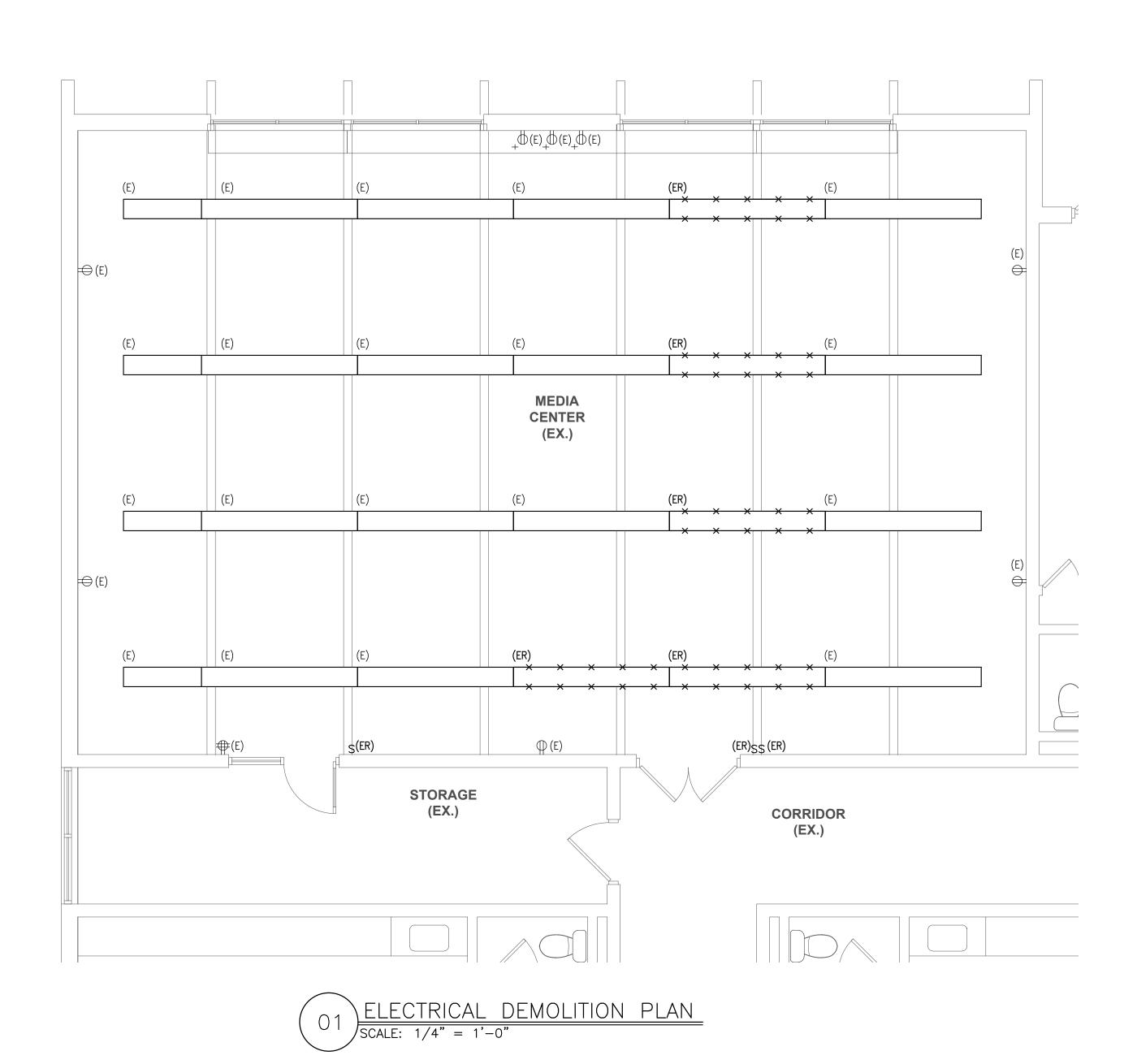


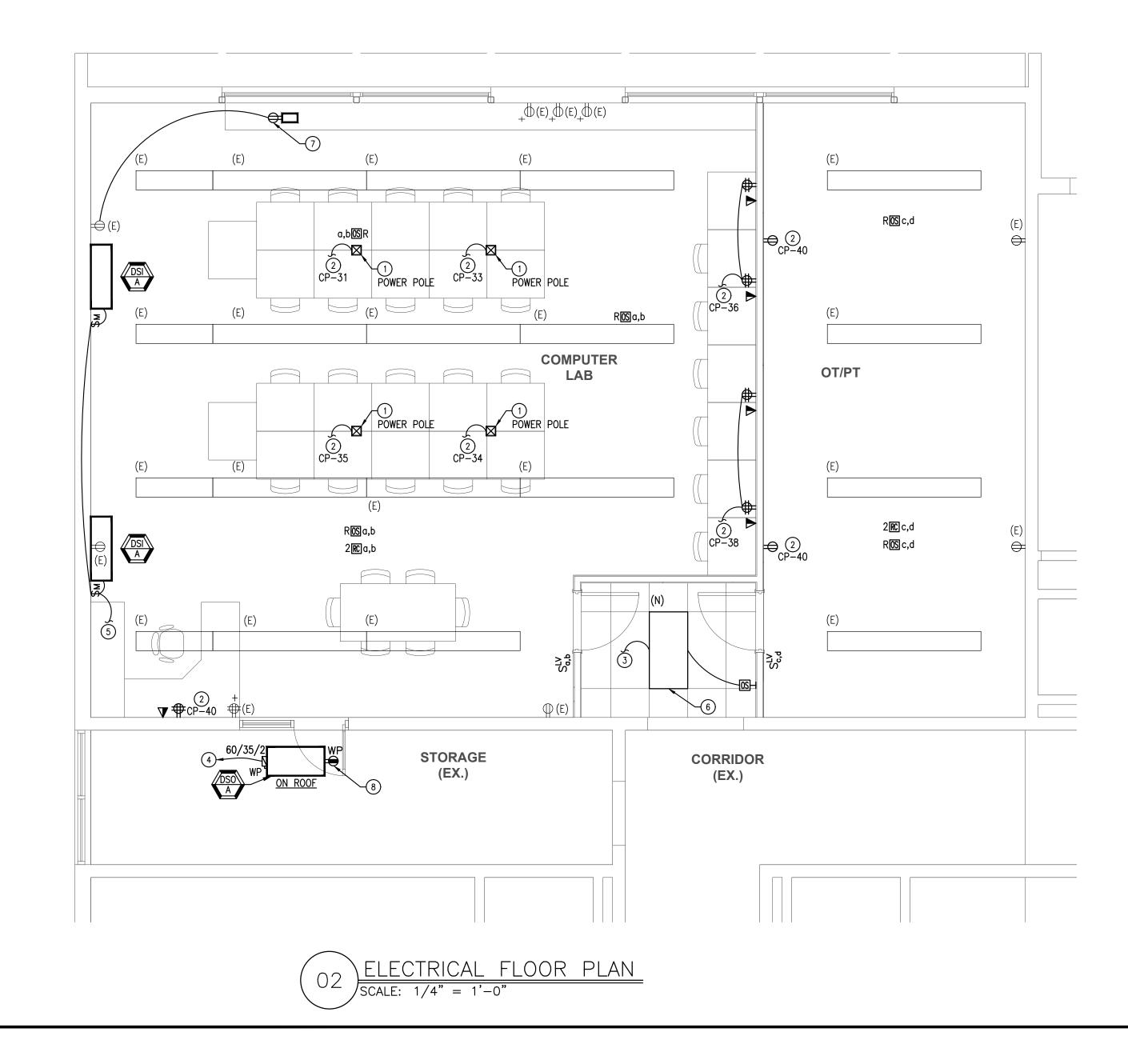
Revisions				
No.	Date	Description		



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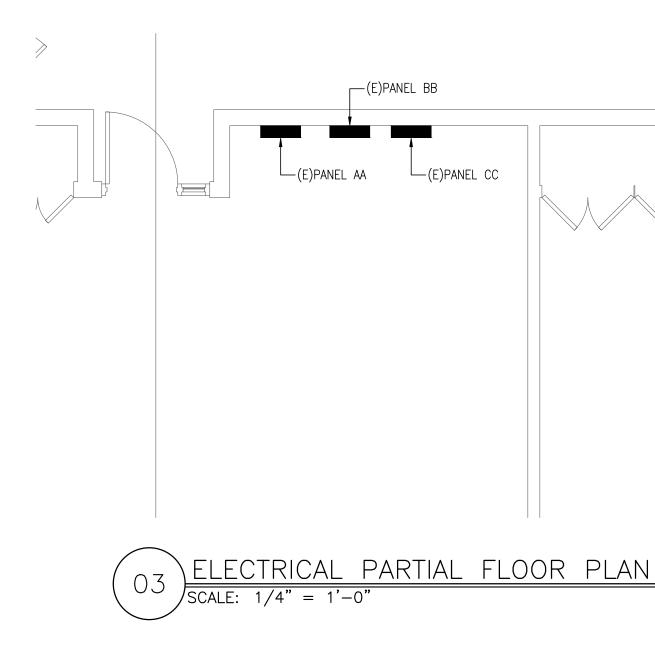


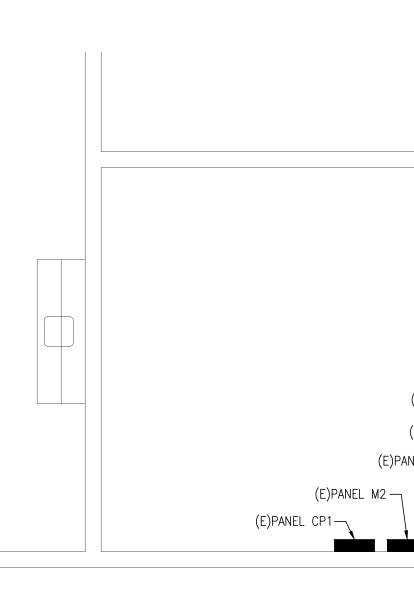


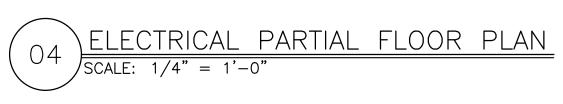
LIGH	HTING CONTROL	DEVICE SCHED
SYMBOL	WATTSTOPPER CAT #	NOTES
<u>OS</u> H	DW-100	LINE-VOLTAGE WALL-MT TECHNOLOGY W/MANUAL BUTTON. COLOR BY ARC
D <u>05</u> H	DW-311	LINE-VOLTAGE WALL-MT TECHNOLOGY W/MANUAL BUTTON AND 0-10V D CAPABILITIES. COLOR BY A
DR OSH	DW-200	DUAL-RELAY LINE-VOLTAGE DUAL TECHNOLOGY W/MANUA BUTTON. COLOR BY ARC
L [05]-H	DW-100-24	LOW-VOLTAGE WALL-MT TECHNOLOGY W/MANUAL BUTTON. COLOR BY ARC
OS	DT-355	LINE VOLTAGE CLG MTD. D SENSOR. COLOR BY AR
LOS	DT-300	LOW VOLTAGE CLG MTD. D SENSOR. COLOR BY AR
N2	DW-103	LINE-VOLTAGE WALL-MT TECHNOLOGY W/MANUAL BUTTON. COLOR BY ARC ADJUST DIP SWITCH FOR M "VACANCY "OPERATI
DIZ	DW-311	LINE-VOLTAGE WALL-MT TECHNOLOGY W/MANUAL BUTTON AND 0-10V DI CAPABILITIES. COLOR BY A ADJUST DIP SWITCH FOR M "VACANCY "OPERATI
L VS	DT-300	LOW VOLTAGE CLG MTD. D SENSOR. COLOR BY AR
PP	BZ-250	UNIVERSAL POWER PACK LOW-VOLTAGE VACANCY SEN POWER PACK TO MANUAL ON
1 <u>RC</u>	LMRC-101	SINGLE RELAY 0-10V CEILIN ROOM CONTROLLE
2 RC	LMRC-102	DUAL-RELAY 0-10V CEILING ROOM CONTROLLE
3 RC	LMRC-103	3-RELAY 0-10V CEILING ROOM CONTROLLE
RVS	LMDC-100	LOW VOLTAGE CLG MTD. D ROOM CONTROLLER SENSOF MANUAL-ON OPERATION C ARCHITECT.
R OS	LMDC-100	LOW VOLTAGE CLG MTD. D ROOM CONTROLLER SENSOF AUTO-ON OPERATION. CO ARCHITECT.
	LVSW-101	LOW VOLTAGE SWITCH FOR (POWER PACK BZ-2
SLV	LMSW-100	LOW VOLTAGE SWITCH FOR (ROOM CONTROLLER. PROV BUTTONS AS REQUIF
S ^{LV,D}	LMDM-101	DIMMING LOW VOLTAGE SW CONTROL OF ROOM CON
ELCU	ELCU-200	EMERGENCY LIGHTING CON
R PS	LMLS-400	SINGLE ZONE SWITCHING AN CLOSED LOOP ROOM CON PHOTOSENSOR FOR CONTRO CONTROLLER.

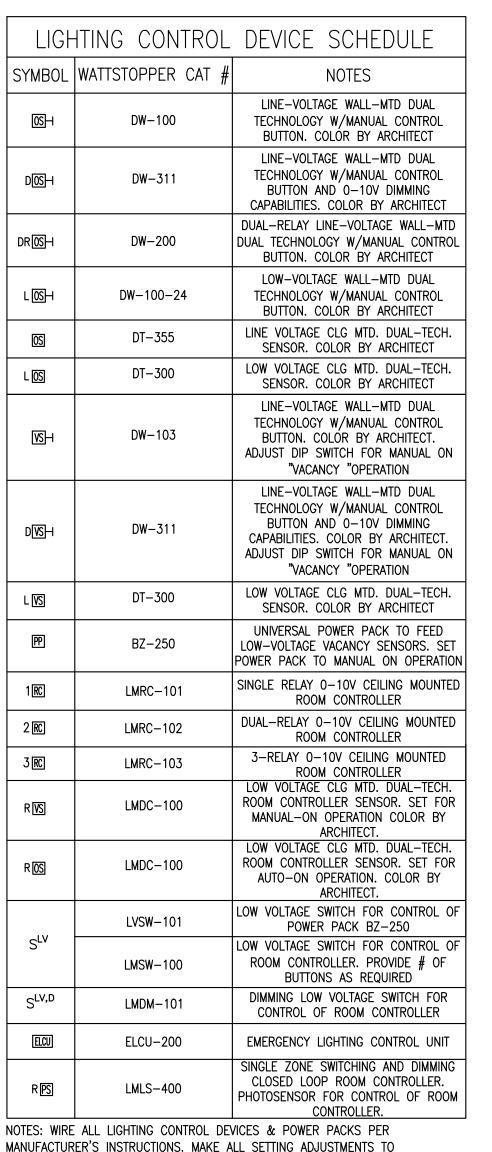
OCCUPANCY/VACANCY SENSORS NECESSARY FOR PROPER OPERATION PER

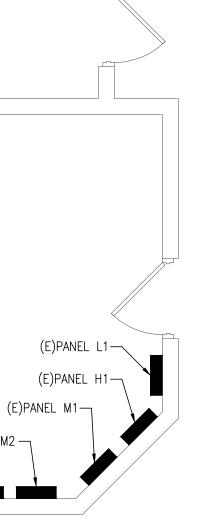
MANUFACTURER'S INSTRUCTIONS AND OWNER'S PREFERENCES.











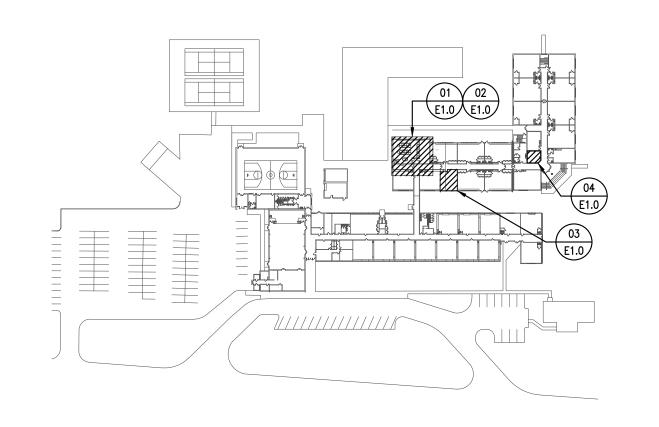
- ELECTRICAL DEMOLITION NOTES
- 1. THE CONTRACTOR SHALL INCLUDE IN HIS BID ALL COSTS ASSOCIATED WITH RELOCATION AND REMOVAL OF ELECTRICAL WORK AS DESCRIBED IN THE SPECIFICATIONS WITH ALLOWANCES FOR EXPECTED OR UNFORESEEN ISSUES WHEN CONCEALED WORK HAS BEEN EXPOSED. NO ADDITIONAL CLAIMS FOR WORK ASSOCIATED WITH DEMOLITION WILL BE ACCEPTED, UNLESS, IN CERTAIN CASES, CONSIDERED JUSTIFIABLE BY THE ARCHITECT.
- 2. THE CONTRACTOR SHALL PERFORM REMOVAL AND DEMOLITION WORK WITH MINIMAL INTERFERENCE WITH EXISTING ELECTRICAL SYSTEMS. ALL AFFECTED ELECTRICAL SYSTEMS SHALL BE RESTORED AND RECONNECTED.
- 3. DEMOLITION AND REMOVAL WORK SHALL BE PERFORMED IN A NEAT AND WORKMANLIKE MANNER. THE CONTRACTOR SHALL PATCH, REPAIR, PAINT OR OTHERWISE RESTORE ANY DAMAGED INTERIOR OR EXTERIOR BUILDING SURFACE TO ITS ORIGIANL CONDITION.
- 4. THE CONTRACTOR SHALL REMOVE ALL ELECTRICAL OUTLETS, SWITCHES, ETC., INCLUDING ASSOCIATED WIRING, CONDUITS, ETC., FROM PARTITIONS THAT ARE TO BE REMOVED. WHERE THE REMOVAL OF THESE ITEMS DISRUPTS EXISTING WIRING THAT IS TO REMAIN, THE CONTRACTOR SHALL INSTALL JUNCTION BOXES AND OTHER DEVICES AND PROVIDE BYPASS CONNECTIONS NECESSARY TO MAKE CIRCUITS AFFECTED CONTINUOUS AND READY FOR OPERATION. OTHERWISE, WIRING SHALL BE REMOVED BACK TO THE NEAREST ELECTRICAL JUNCTION BOX THAT IS TO REMAIN OR TO PANELBOARD.
- 5. THE CONTRACTOR SHALL REMOVE AND/OR RELOCATE ALL EXISTING ELECTRICAL WORK WHICH INTERFERES WITH THE NEW ELECTRICAL AND ARCHITECTURAL LAYOUTS IN FULL COORDINATION WITH THE ARCHITECT'S DEMOLITION PLANS. ALL SYSTEMS WHICH ARE NO LONGER REQUIRED TO FUNCTION SHALL BE DE-ENERGIZED AND DISCONNECTED AT THE POWER SUPPLY SOURCE.
- 6. EXISTING PANELBOARD DIRECTORIES AFFECTED BY THE ALTERATION WORK SHALL BE CHANGED TO REFLECT THE BRANCH CIRCUIT WIRING MODIFICATIONS.
- 7. ALL UNUSED OUTLET BOXES OR CAPPED FLOOR OUTLETS SHALL BE PROVIDED WITH MATCHING BLANK COVERS.
- 8. ALL RACEWAYS WHICH ARE EXPOSED AS A RESULT OF NEW WORK SHALL BE REMOVED AND REROUTED CONCEALED BEHIND FINISHED SURFACES.
- 9. PORTIONS OF FEEDER RUNS THAT SHALL BE REMOVED OR ABANDONED AS A RESULT OF DEMOLITION WORK, BUT WHICH ARE REQUIRED TO REMAIN ENERGIZED, SHALL BE CUT AT CONVENIENT LOCATIONS, REROUTED AND RECONNECTED. NEW FEEDER EXTENSIONS SHALL MATCH EXISTING FEEDER EXTENSIONS IN ALL ASPECTS INCLUDING BUT NOT LIMITED TO CABLE TYPE, CONDUIT SIZES, CONDUCTOR AMPACITY, ETC.
- 10. AS DIRECTED BY THE OWNER, ALL EXISTING EQUIPMENT AND MATERIAL IN USABLE CONDITION THAT IS REMOVED UNDER THIS CONTRACT SHALL REMAIN THE PROPERTY OF THE OWNER OR BE DISPOSED BY THE ELECTRICAL CONTRACTOR.
- 11. THE CONTRACTOR SHALL NOTIFY THE OWNER AT THE APPROPRIATE TIME OF THE PROJECTED DEMOLITION AND PHASING SCHEDULE SO THAT REMOVAL OR RELOCATION OF AFFECTED UTILITIES MAY BE CARRIED OUT IN COORDINATION WITH THE PROJECT REQUIREMENTS. THE CONTRACTOR SHALL FOLLOW CLOSELY THE ARCHITECT'S DEMOLITION AND PHASING SCHEDULE AND PROCEED IN THE SPECIFIED SEQUENCE.
- 12. THE SHUTDOWN OF EXISTING BUILDING ELECTRICAL SERVICES SHALL BE COORDINATED WITH THE OWNER. MAKE APPROPRIATE ARRANGEMENTS AT LEAST 14 DAYS PRIOR TO A SHUTDOWN.

DRAWING NOTES:

- 1. CONNECT ALL EXIT SIGNS AND EMERGENCY WALL PACKS TO LOCAL CONSTANT HOT EMERGENCY FEED AHEAD OF ANY SWITCHING UON.
- 2. REFER TO DWG E0.00 FOR THE LIGHTING FIXTURE AND SENSOR SCHEDULES.
- 3. CONFIRM ALL DEVICE AND EQUIPMENT LOCATIONS WITH THE ARCHITECT AND OWNER PRIOR TO ANY PURCHASE OR ROUGH-IN.
- 4. CONFIRM ALL POWER OVERCURRENT PROTECTION, WIRING AND DEVICE/DISCONNECT REQUIREMENTS FOR ALL EQUIPMENT PRIOR TO ROUGH-IN AND REPORT ANY DISCREPANCY WITH THE DESIGN TO THE ARCHITECT AND OWNER FOR RESOLUTION.
- 5. PRE-MANUFACTURED METAL-CLAD CABLE (MC) SHALL BE UTILIZED FOR ALL NORMAL BRANCH CIRCUITS IN DRY HOLLOW STUD WALL LOCATIONS, ABOVE ACCESSIBLE CEILINGS AND WHERE PERMITTED BY ARTICLE #330 OF THE NATIONAL ELECTRICAL CODE ONLY. MINIMUM CONDUCTOR SIZE SHALL BE NO. 12 AWG COPPER WITH INTEGRAL GREEN INSULATED CONTINUOUS GROUND CONDUCTOR AND BARE BONDING CONDUCTOR IN DIRECT CONTACT WITH OUTER METAL JACKET.
- 6. EC SHALL FIRE CAULK ALL EXISTING AND NEW CONDUIT PENETRATIONS IN FIRE WALLS WITHIN CONTRACT AREA TO MAINTAIN FIRE WALL RATING.
- 7. LIGHTING CONTROLS SHALL BE TESTED BY THE EC IN ACCORDANCE WITH ASHRAE 90.1 SECTION 9.4.3
- 8. PROVIDE ALL DISCONNECT SWITCHES AS HEAVY-DUTY TYPE RATED WITH VOLTAGE AS REQUIRED AND AMPS, FUSING AND POLES AS INDICATED. DISCONNECT SWITCHES FOR INTERIOR EQUIPMENT SHALL BE NEMA 1 RATED UON. DISCONNECT SWITCHES FOR EXTERIOR EQUIPMENT SHALL BE WEATHERPROOF LOCKABLE HEAVY DUTY TYPE, NEMA 3R UON.
- 9. COORDINATE ALL MECHANICAL AND PLUMBING EQUIPMENT LOCATIONS AND CONNECTIONS PRIOR TO ANY PURCHASE OR ROUGH-IN.
- 10. CONTRACTOR SHALL CLOSELY COORDINATE AND ADJUST ALL HVAC EQUIPMENT LOCATIONS WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN SUCH THAT LIGHTING LAYOUT REMAINS AS INDICATED.
- 11. THESE DRAWINGS HAVE BEEN MADE BASED ON A VISUAL INSPECTION OF THE EXISTING SURFACES. SOME ASSUMPTIONS HAVE BEEN MADE AS TO ACTUAL CONSTRUCTION, MATERIALS, AND METHODS. THE INSTALLER SHALL BE RESPONSIBLE FOR VERIFYING ALL ACTUAL FIELD CONDITIONS AND SHALL NOTIFY THE ARCHITECT OF ANY DISCREPANCIES, CONFLICTS, AND UNFORESEEN CONDITIONS.
- 12. COORDINATE FINAL LOCATIONS OF ALL TELECOM OUTLETS AND RECEPTACLES FOR DESKS WITH ARCH, OWNER AND OWNERS FURNITURE PACKAGE PROVIDER PRIOR TO PURCHASE OR ROUGH-IN.
- 13. ALL CONDUITS TRAVELING FROM OUTDOORS TO INDOORS AND FROM A WARM ENVIRONMENT TO COLD SHALL BE VAPOR SEALED TO PREVENT CONDENSATION BUILDUP. THE SEAL SHALL BE A CONDUIT BODY OR JUNCTION BOX LOCATED ON THE HIGH TEMPERATURE SIDE OF THE TRANSITION SEALED WITH ELECTRICAL DUCT SEAL OR A NON-LATEX, CLOSED CELL, EXPANDING FOAM SEALANT LISTED FOR THE PURPOSE, INSTALLED IN THE CONDUIT ENTERING THE COLDER SPACE.
- 14. UON AS "(E)", ALL EQUIPMENT AND DEVICES SHOWN SHALL CONSIDERÈD NEW.
- 15. BRANCH CIRCUITS LOCATED INSIDE THE COMPUTER ROOM FEEDING POWER POLES SHALL BE IN WIREMOLD SERIES 2300 SINGLE COMPARTMENT RACEWAY. RACEWAY SHALL BE PROVIDED WITH ALL REQUIRED FITTINGS AND MOUNTED ALONG THE WOOD BEAMS AND RAN CLOSELY TO CEILING.

KEY NOTES:

- (1) PROVIDE LEGRAND WIREMOLD #NP800 SERIES 2 COMPARTMENT TELE-POWER POLES (COLOR BY ARCH). PROVIDE WITH (5) 20A DUPLEX RECEPTACLES, CONFIRM FINAL SELECTION AND COMMUNICATION REQUIREMENTS WITH OWNER AND OWNER'S TELECOM VENDOR PRIOR TO PURCHASE OR ROUGH-IN.
- (2) FED FROM AN EXISTING 20A/1P CB LOCATED IN PANEL CP1 VIA 2#12 + 1#12 GROUND WIRING IN 3/4" CONDUIT.
- 3 FED FROM EXISTING UNSWITCHED HOT CURRENTLY SERVING LIGHTING IN THIS AREA.
- (4) FED FROM A (N)35A/2P CB LOCATED IN (E)PANEL AA (CIRCUITS #36 AND #38) VIA 3#8 + 1#10 GROUND WIRING IN 3/4" CONDUIT.
- (5) FED FROM A (N)15A/2P CB LOCATED IN (E)PANEL AA (CIRCUITS #38 AND #40) VIA 3#12 + 1#12 GROUND WIRING IN 3/4" CONDUIT. PROVIDE BOTH UNITS WITH 30A/2P FLUSH MOUNTED TOGGLE MOTOR RATED DISCONNECT SWITCHES WITH COVER PLATES.
- (6) PROVIDE 2'X4' LED RECESSED TROFFER. (LITHONIA LIGHTING CAT#2BLT4-40LHE-ADP-LP840 OR APPROVED EQUAL). CONFIRM FINAL SELECTION WITH OWNER PRIOR TO PURCHASE OR ROUGH-IN.
- (7) RECEPTACLE SERVING ATMOS AIR IONIZATION SYSTEM SHALL BE FED FROM LOCAL RECEPTACLE CIRCUIT AS INDICATED AND WIRED PER THE MANUFACTURER'S
- (8) ROOFTOP GFCI TYPE RECEPTACLE SHALL BE FED FROM LOCAL RECEPTACLE CIRCUIT SERVING EXISTING ROOF TOP EQUIPMENT.







Revisions				
No.	Date	Description		



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 NAM NAM Series and series and series			ELECTRICAL SPECIFICATIONS	В.	thes Thre	E INSTRUCTIONS SHALL BE TYPED ON 8–1/2 IN. X 11 IN. PAPER AND BOUND E RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THRI
 A. Arthors Lange A. Bankers A. A. Bankers A. B. B	1.		THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS	C.	Copii The	ES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
 Alter and an and an an an antipart of a second and a second a		В.	ALL APPLICABLE CODES, LAWS, REGULATIONS AND UTILITY REQUIREMENTS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND	D.	CAD)	FORMAT SHALL BE PROVIDED TO THE OWNER INDICATING THE AS INSTALLED
 Address of a second seco			OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIAL WHICH VIOLATES ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION		RAL PI	ROVISIONS FOR ELECTRICAL WORK
 biological and provide submatrix status and submatrix statu		C.	INVESTIGATE EACH SPACE THROUGH WHICH EQUIPMENT MUST BE MOVED. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH AVAILABLE RESTRICTIVE SPACES. ASCERTAIN FROM BUILDING OWNER AND TENANT AT WHAT TIMES OF DAY EQUIPMENT MAY BE		Wori "Pro Defin	DS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," VIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY. IITIONS
 Method 1. Solutions Particle 1. Solutions Particle 2. Solutions<td></td><td>D.</td><td>DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING</td><td></td><td></td><td>SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED. "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED</td>		D.	DRAWINGS ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING			SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED. "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED
 Deckin And Start Carl Start Carl Mark Marks. Deckin And Start Carl Start Carl Mark Marks. Deckin And Start Carl Mark Marks. Deckin Marks. <		E.	AND SPACE CONDITIONS. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND			COMPLETE WITH RELATED ACCESSORIES.
 A Brack A, Martin M, Martin		F.	CHANGES, WHICH INVOLVE EXTRA COST, SHALL NOT BE MADE WITHOUT APPROVAL. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE		•	AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
 A. Source of an an an analysis of a start of a		G.	AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING		6)	FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHE
 Control and a lattice of an and a lattice of a l			OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES, AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED		•	ABOVE. "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT AS DETERMINED BY THE ENGINEER AND
 Actic 4. Bits in Linker 5. Mit für Strauber 2015 (E. 1997). Bits Carling and Strauber 2015 (E. 1997). Control 1. Strauber 2015 (E. 1997). Control 2. Strauber 2015 (E			RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.	C.		RAL THE DRAWING SHOWS THE APPROXIMATE LOCATIONS OF ALL APPARATUS, THE
 Hundra between the operational and a superior operation of the construction operation of the construction operation operation of the construction operation o			WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF			WHO RESERVES THE RIGHT TO MAKE ANY REASONABLE CHANGES IN THE LOCATION INDICATED WITHOUT EXTRA COST. WHILE THE GENERAL RUN OF CONDUIT AND CABLES ARE INDICATED ON THE DRAWING, IT IS NOT INTENDED
 b) do not set to the second of the second of			FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR		2)	DETERMINED THEREFROM. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REQUIRED
 Prove L, LERDER M, LEVER N, LEVER N		J.	OTHER NONCOMBUSTIBLE MATERIAL. ALL PENETRATIONS THROUGH NEW AND EXISTING RATED FIRE AND SMOKE PARTITIONS AND/OR FLOORS SHALL BE COMPLETELY SEALED			RESPONSIBILITY OF THE CONTRACTOR TO INSTALL HIS WORK TO CONFORM TO THE STRUCTURE, MAINTAIN HEADROOM AND KEEP OPENINGS AND PASSAGEWAY
 L. A. AND LAND AND LAND AND AND AND AND AND AND AND AND AND		K.	SPECIFICATIONS SECTIONS. PROVIDE ALL NECESSARY FLASHING AND COUNTERFLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR			WIRE ALL FIXTURES, DEVICES, ETC., TO RESPECTIVE PANEL AND CONTROLS AS
 B. Sandard, M. Barti, M. Landard, S. M. Bart, M. Sandard, M. Sandard,		L.	ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE		5)	THE SITE OF RESULTING DEBRIS UPON COMPLETION OF WORK UNDER THIS
 A. ALVA TO ALL ALL ALL ALL ALL ALL ALL ALL ALL AL		м	REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.		6)	VOLT POWER AND CONTROL WIRING AND FOR EMERGENCY AND NORMAL POWE
 J. Landon C. Market M. C. Carlon L. A. Market M. J. A. Market M. J. Market			THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.		7)	RELOCATIONS. AT OR NEAR DOORS INSTALL SWITCH INSIDE OPPOSITE HINGE, VERIFY FINAL DOOR HINGE LOCATION IN FIELD PRIOR TO SWITCH OUTLET
 Bernet, Bernet, P. C. CHERCHE MARK, M. C. P. L. CHER, AND MARK MARK MERKEN AND MA		0.	WORKMANSHIP IN ELECTRICAL CONSTRUCTION".		8)	HEIGHTS OF OUTLET FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS SHAL
 A Math one-set entropy of a set of			PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE		9)	OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN
 A. LANCE AND CANNEL TABLE TARGET AND AND ALL A. LANCE AND CANNEL TABLE TARGET AND AND ALL AN		Ρ.	PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL			ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND. PROVIDE BARRIERS BETWEEN NORMAL ONLY AND NORMAL/EMERGENCY SWITCHES INSTALLED WITHIN A
 Departing the Park Works of the Charles A subject of the Park A subject of			BE IN ACCORDANCE WITH BUILDING STANDARDS.		10)	PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERI
 Address of December 2 (1997) And Control of December 2 (1			EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL			CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILIN CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION.
 Berner Der Kannen (1996) An Green (1997) And Annen (1997) And Annen (1997) An Annen (CONDITIONS PRIOR TO SUBMITTAL OF BID. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER			ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTO BRANCH CIRCUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.
 IN THE REVEALS IN LARSE NOT THE CONNECT IN A LOTTER OF ALLER PRE- CONNECT THE ANALYSIS OF ALL DATA THE CONNECT IN A LOTTER OF ALL DATA THE ALL DATA THE			BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING CONDUIT (SIZES, CLEARANCES, ETC) AND CONDITIONS.	D.		PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES A
 Regiments of the sensets and productions when by function 4 in the function			HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS			PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING HOURS OF ALL TRADES. OWNER WILL PAY FOR COST OF ENERGY. PROVIDE ALL REQUIRED
 A CONST DE VENU SHALL CONST DE PROBLE LAS SET REVEALUES IN PERMISSION DE PROBLEMENT AND THE WORK ON DE PROBLEMENT AND ALL CONTRACT DE VENU SHALL CO	2.	SCOP	REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.	E.		QUALITY AND GAUGE OF MATERIALS: NEW, BEST OF THEIR RESPECTIVE KINDS
 Howas Justicetina, Ka Indocetina on Bennans was Herther Structure. A. La Bonnac, Shan, Frank, Samelina Ka, Marcha, Markan Ka, Barton Markan, Ka Kashan, Kang Kashan, Kang Kashan, Kang Kashan, Kasha		A.	SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMITY WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ALL OTHER APPLICABLE		0)	MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
 COMPACT LALES OFFENDER AND ESC. WORKED SAFELINED OF SPECIDE PERIOD C. THE CONSCIPTOR SALL PRIMED A WATER DARAWELE TO REPLACE OR REPART WORKED AND ALL CONSCIPTOR SALL PERIOD OF ALL PRIMED AND ALL CONSCIPTOR SALL PERIOD OF ALL PRIMED AND ALL CONSCIPTOR SALL PERIOD OF ALL PRIMED AND ALL CONSCIPTOR SALL PERIOD OF ALL PRIME AND ALL PRIME AND ALL CONSCIPTOR SALL PERIOD OF ALL PRIME AND ALL CONSCIPTOR ALL PERIOD OF ALL PRIME AND ALL CONSCIPTOR ALL PERIOD OF ALL PRIME AND ALL CONSCIPTOR ALL PERIOD OF ALL PRIME AND ALL PRIME AN		В.	HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE		2)	FREE FROM GROUNDS, SHORT CIRCUITS, OPENS, OVERLOADS AND IMPROPER VOLTAGES AND THOROUGH TEST SHALL BE MADE. FURNISH ALL LABOR AND
 PROJUCT: MO ASSUE SERVICES INCREMENT FOR ALL DEPUGES INCREMENT AND AND THE AREA OF THE AR		C.	CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLEMENTED OR SPECIFIED HEREIN.			PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE.
 Brand Dir Berner, Mark Berner, Mark			PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE		7)	a. SERVICE: 277/480 VOLT (AND 120/208 VOLT), 3 PHASE, 4 WIRE, 60
 DETETS, REMARS OR REPLACEDENTS IN LOWINGT SAFELDS TO THE CONTRACTOR. THE CONTROL BALL, ORAN DESSARY MODEL, THE DARVIDS, 400 PAIL LESS THE REPORTATIONS OF LEXENSE RESSARY MODEL THE DARVID AND UTILY COMPANIS, 0FMA PERDING TO THE WARK IF ON REQUERT OF THE WARK AND PAIL LESS THE REPORTE TO THE WARK IF ON REQUERT DI YL ALTIONITOS NO. 1977 ALL AND AND PAIL AL LESS THE REPORT. SHEP CONTROLS SHALL PAIL LOCIST FIRS, AND PAIL AL LESS THE REPORT. THE CONTRACTOR SHALL PAIL ALL COSTS TRY, AND PAIL AL LESS THE REPORT. THE CONTRACTOR SHALL PAIL ALL COSTS TRY, AND PAIL AL LESS THE REPORT. THE CONTRACTOR SHALL PAIL ALL COSTS TRY, AND PAIL AL LESS THE REPORT. SHEP CONTRACTS SHALL PAIL ALL COSTS TRY, AND PAIL ALL LESS THE REPORT. SHEP CONTRACTS SHALL PAIL ALL COSTS TRY, AND PAIL ALL LESS THE REPORT. THE CONTRACTOR SHALL PAIL ALL COSTS TRY, AND PAIL TO THE STOKE. SHEP CONTROLS SHALL PERDINATION OF ANY WORK AND PAIL ALL LESS NOTED OF ENTROL OF PERMAND. STATUS OF MERICIPATION OF COULDE AND CONTRACTOR ALL HER AN ARCHITEL APPROVE. CONTRET TO THE STOKE. MALL BER DARKES SUMMITTEE 1) FROMET WARK AND LOCATION MALL DE CONTRACTOR SHALL PERDING STOKE THE ALL OF MARK OF PERMAND. STATUS OF MARKES SUMMITTEE 1) FROMET WARK AND LOCATION MALL BER DEFENSIONES SUMMITTEE 1) DEDITFRATION OF ANY WORK AND PROVIDED BERTON. CONTRETOR SHALL PAIL AND AND CONTRACTOR MALL BERTHFATTON OF ANY WORK AND PROVIDED BERTON. CONTRACTOR SHALL PERDING AND AND CONTRACTOR ALL HER WARK PAIL PERDING AND AND CONTRACTOR C. SUBMISSIONE HERE THE AND AND AND CONTRACTOR C. SUBMISSIONE HERE THE AND AND AND CONTRACTOR SHALL BE REPORTED. THE AND AND AND CONTRACTOR SHALL BE AND AND CONTRACTOR SHALL PERDING AND AND CONTRACTOR SHALL BE AND AND CONTRACTOR SHALL PERDI			PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES		5)	60 HERTZ WITH GROUNDED NEUTRAL.
 OR LICENESS NET DO SARTY OF THIS WORK AND FAY ALL FIEST INFECTION. THE CONTRACTOR SHALL RAVER FOR INSECTION. TO THE OWNER THAN DO SALE PARTS OF THE CONTRACTOR SHALL RAVER FOR AND TRIVING TO THE OWNER REFILE CONTRACTOR SHALL RAVER ALL CONTRACTORS THE APPLY TO THIS WORK. S. MOP DRAWINGS A. PEPOR TO THE INSTALLTORS WHERE THEY APPLY TO THIS WORK. S. MOPORTON FOR WITHIN A REQUIRED THEY APPLY TO THIS WORK. A. PEPOR TO THE INSTALLTORS OF AN EXPOSITE OF CONTRACTORS SHALL EXPORT OF CONTRACTORS AND SECURICE OCONTRACTOR SHALL RAVER OF DRAVEL THEY APPLY TO THIS WORK. A. PEPOR TO THE INSTALLTOR OF ANY EXPONENT OF TEODERSHIP OF CONTRACTORS AND SECURICE OCONTRACTOR SHALL RAVER OF DRAVEL THEY APPLY TO THIS WORK. B. NOCATE ON DE AND PROVILE THE APPLY TO THE BRAVES. B. NOCATE ON DE AND PROVILE THE APPLY TO THE BRAVES. C. SUBJECTION FOR WITHIN A MODIAN CONTRACTOR A. PERCONT SHALL RAVE AND DEADTHOM A. MORE A CONTRACTOR B. NOCATE ON DE AND PROVIL THE THE SECONDARY OF DRAVES AND SECONDARY A. PERCONT STALL REPORT AND ENABLER C. SUBJECTION OF AND PROVILE THE APPLY AT THE THE DRAVES. C. SUBJECTION TO A THE DRAVES AND THE PROVILE THE APPLY AT THE THE DRAVES. C. SUBJECTION OF AND EXAMINE AND ADDITION OF DETECHING AND SECONDARY AND PROVILE THE APPLY AT THE ADDITION OF DETECHING AND SECONDARY AND ADDITION OF DETECHING AND SECONDARY AND ADDITION OF DETECHING AND ADDITION OF DETECHING AND SECONDARY AND ADDITION OF DETECHING AND ADDITION OF DETECHING AND ADDITION OF DETECHING AND ADDITION OF DRAVES AND ADDITION OF DETECHING AND ADDITIO		D.	DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS			b. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
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 A. PROR TO THE INSTALLATION OF ANY YORK AND PROCURENT OF EQUIPMENT, CONTRACTOR SMALL PROVIDE CONFECTE SITE CONFECTED. B. MOLATE ON ELON SHOE DURALINES INDUCTING CARACITY, DARKISTANS, AND BEQUENCE OF DEPARTMENT APPROVL OF THE ARCHITECT MOL ENABLING. AND BEQUENCE OF DEPARTMENT APPROVL OF THE ARCHITECT MOL ENABLING. AND BEQUENCE OF DEPARTMENT APPROVL OF THE ARCHITECT MOL ENABLING. I. PROJECT NALL BOUND CORT NUML BURNER I. PROJECT NALL BOUND CORTING CONTROL I. DEVIDENTIFICATION I. MARE OF ARCHITECT AND ENABLIESE SUBMITEDE I. DEVIDENTIFICATION I. SUBMISSIONS 11 IN X 17 IN OR SMALLER: IF THE SUBJESION IS A CATADG OTHERWISE, HE SHALL SUBMIT THERE CORTEST SUBMISSIONS 11 IN X 17 IN OR SMALLER: IF THE SUBJESION IS A CATADG OTHERWISE, HE SHALL SUBMIT THERE CORTEST SUBMISSIONS 11 IN X 17 IN OR SMALLER: IF THE SUBJESION IS A CATADG OTHERWISE, HE SHALL SUBMIT THERE CORTEST SUBMISSIONS 11 IN X 17 IN OR SMALLER: IF THE SUBJESION IS A CATADG OTHERWISE, HE SHALL SUBMIT THERE CORTEST SUBMISSIONS 11 IN X 17 IN OR SMALLER: IF HE ARCHITECT MUL FORMARD THE ORDITAL AND ONE OPERITY IN THINK X 17 IN SUBMIT THERE PROTEST TO THE ARCHITECT MUL FORMARD THE ORDITAL THE RECORDER. SUBMISSIONS 11 IN THE X 17 IN SUBMIT THERE PROTEST TO THE ENDINER. SUBMISSIONS 11 IN SUBMIT THERE CORTEST DI DESCONNECT SWICHES SUBMIT SHOP DEWARNS FOR THE FOLLOWING: MALL SWITCHES MALL SWITCHES MALL SWITCHES MALL SWITCHES SUBMIT SOURCES SWICH SO CONTRACTOR MALL SWITCHES MALL SWITCH	3.	SHOP	CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.			(4) MOTOR CONTROLLERS: 5 FT0 IN.
B. INDICATE ON EACH SHOP DRAWINGS SUBMITED: DRAWINGS. I) PROJECT NAME AND LOCATION PROJECT NAME AND LOCATION 2) NAME OF ARCHITECT AND ENGNEER Image: Status in the intermination of intermination intermination of the intermination of the intermination of the intermination of intermination of the intermination of the intermination of the intermination of the intermination of intermination of the intermination of the intermination of the intermination of the intermination of intermination of the intermination intermination of the intermination of the intermination of the intermination intermination of the intermination intermination of the intermina		A.	CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE			MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED. d. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND
 SUBJUSTICATION APPROVAL STANP OF PRIVE CONTRACTOR SUBJUSTICATION APPROVAL STANP OF PRIVE CONTRACTOR SUBJUSTICATIONS SUBJUSTICATIONS AND CECUPTANCES SUBJUSTICATIONS AND CECUPTANCE OF WORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHE CAREMACK SUBJUSTICATIONS AND CECUPTANCE OF MORK, CONTRACTOR SHALL FURNISTING UTHER SUBJUSTICATIONS AND CECUPTANCE OF ALL PLANCED SUBJUSTICATIONS AND CECUPTANCE OF A		В.		F.	PROE	DRAWINGS.
C. SUBMISSIONS ARE NOT PERMISSINE WITHOUT EVERY. GROUP CONCLALED ELECTRICAL CUPHINES IN X 17 IN. OR SMALLER. IF THE SUBMISSION IS A CATALOG CUP, THEN THE CONTRACTOR SHALL SUBMIT THREE COPES. THE ARCHITECT WILL FORWARD THE ORTHANLA AND ONE COPY (TWO COPES. THE ARCHITECT WILL FORWARD THE ORTHANLA AND ONE COPY (TWO COPYES. THE ARCHITECT WILL FORWARD THE ORTHANLA AND ONE COPY (TWO COPYES WITH A WHITE LATENTS) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT THREE PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ENGINEER. J. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING: J. DISCONNECT SWITCHES J. DISCONNECT SWITCHES J. DISCONNECT SWITCHES J. ORCUTT BREAKERS J. ORCUTT BREAKERS J. ORCUTT BREAKERS J. WRE AND CABLE J. WRE AND CABLE J. WRE AND CABLE J. WRE AND CABLE J. SUBMITS HOP DRAWINGS FOR THE FOLLOWING: J. DISCONNECT SWITCHES J. DISCONNECT SWITCHES J. DISCONNECT SWITCHES J. ORCUTT BREAKERS J. URFITING CONTROLS J. WRE AND CABLE J. URFITING CONTROLS J. URFITING CONTROLS J. URFITING CONTROLS J. URFITING CONTROLS J. SUBMIT SHOP DRAWINGS AND EQUIPMENT FILTENTS J. URFITING CONTROLS			3) ITEM IDENTIFICATION		,	SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES. ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATION
 CUT, THEN THE CONTRACTOR SHALL SUBMIT TAREE CONFIRES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPES. THE ARCHITECT WILL FORWARD TO THE ENGINEER. ALL CATALOS CUTS SHALL BE COMPLETE. 2) SUBMISSINS LARCER THAIN 11 IN, X. TI N: SUBMIT TREE PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ENGINEER. 2) SUBMIT SHOP DRAWINGS FOR THE FOLLOWING: 1) DISCONNECT SWITCHES 2) FUSES 3) CIRCUIT BREAKERS 4) RACEWAYS 5) WIRE AND CABLE 6) WALL SWITCHES 7) INSERTION RECEPTACLES 8) LIGHTING CONTROLS 9) SURFACE METAL RACEWAY 10) LIGHT FIXTURES 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT OPERATIONAL INSTRUCTIONS A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT OPERATIONAL INSTRUCTIONS A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE ORIGINE THE INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE ORIGINES THE PROFER OPERATION AND MUSCING AND APPARATUS FURNISHED 6) MALL DRAWINGS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 6) CALL DRAWINGS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 7) SUBJECTION AND ADACEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 6) MALL DRAWINGS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 6) MALL DRAWINGS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 7) SUBJECTION SAND EQUIPMENT MANUALS AND APPARATUS FURNISHED 7) SUBJECTION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND APPARATUS FURNISHED 7) SUBJECTION AND ACCEPTANCE O		C.	SUBMISSIONS			ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH
 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN:: SUBMIT THREE PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ENGINEER. D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING: USUBMIT SHOP DRAWINGS FOR THE FOLLOWING: DISCONNECT SWITCHES FUSES CIRCUIT BREAKERS UMAL SWITCHES MIRE AND CABLE WIRE AND CABLE SUBRIC CONTROLLES INSERTION RECEPTACLES UGHTING CONTROLS UGHTING CONTROLS UGHTING CONTROLS UGHT FIXTURES UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FUNISH WRITTEN INSTRUCTIONS A UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FUNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE OWNER THE SURPLICE MAXIMUM LOADING 75 PERCENT OF RATING 			CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED)	G.		NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERIN
 bisconnect switches circuit breakers wall switches wall switches wall switches wall switches wall switches insertion receptacles biscritors circuit breakers circuit breakers circuit breakers circuit breakers wall switches wall switches insertion receptacles bill of this controls controls circuit breakers circuit breakers circuit breakers circuit breakers circuit breakers circuit breakers wall switches circuit breakers circuit break			2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT THREE PRINTS TO THE ARCHITECT. THE ARCHITECT WILL FORWARD TWO PRINTS TO THE ENGINEER.			BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF
3) CIRCUIT BREAKERS a. INSERTS AND SUPPORTS 4) RACEWAYS a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED. 5) WIRE AND CABLE (1) SINGLE ROD: SIMILAR TO GRINNELL FIG. 281. 6) WALL SWITCHES (2) MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH ENCAPS AND CLOSURE STRIPS. 7) INSERTION RECEPTACLES (3) CLIP FORM NAILS FLUSH WITH INSERTS. 8) LIGHTING CONTROLS (4) MAXIMUM LOADING 75 PERCENT OF RATING. 9) SURFACE METAL RACEWAY b. STRUT: GALVANIZED U-CHANNEL (SIMILAR TO UNISTRUT OR KINDORF) 10) LIGHT FIXTURES (1) COLD FORMED FROM LOW-CARBON STEEL WITH HOT-DIPPED GALVANIZED U-CHANNEL (SIMILAR TO UNISTRUT OR KINDORF) 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS (2) MAXIMUM LOADING 75 PERCENT OF RATING 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS (2) MAXIMUM LOADING 75 PERCENT OF RATING 4. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INISTRUCTIONS AND EQUIPMENT MANULALAD DEMONSTRATE TO THE OWNER THE PROPER OF PERCENT OF RATING (3) ASSOCIATED FITTINGS (SPRING NUTS, PIPE STRAPS, ETC.) SHALL BE BY SAME MANUFACTURER AS STRUT. <td></td> <td>D.</td> <td>1) DISCONNECT SWITCHES</td> <td></td> <td>2)</td> <td>WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF</td>		D.	1) DISCONNECT SWITCHES		2)	WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF
 b) WIRE AND CABLE c) WIRE AND CABLE c) WALL SWITCHES c) INSERTION RECEPTACLES d) LIGHTING CONTROLS e) SURFACE METAL RACEWAY f) LIGHT FIXTURES d) UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT OF WAILAS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED (1) SINGLE ROD. SIMILAR TO UNISTRUCT OR KINDORF) (2) MAXIMUM LOADING 75 PERCENT OF RATING (3) ASSOCIATED FINISH (ASTM 653 33) (2) MAXIMUM LOADING 75 PERCENT OF RATING (3) ASSOCIATED FITTINGS (SPRING NUTS, PIPE STRAPS, ETC.) SHALL BE BY SAME MANUFACTURER AS STRUT. 			3) CIRCUIT BREAKERS		3)	a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
 insertion receptacles ilighting controls ilight fixtures ilight fixtures			5) WIRE AND CABLE			(2) MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH EN
 10) LIGHT FIXTURES 4. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS 4. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED (1) COLD FORMED FROM LOW-CARBON STEEL WITH HOT-DIPPED GALVANIZED FINISH (ASTM 653 33) (2) MAXIMUM LOADING 75 PERCENT OF RATING (3) ASSOCIATED FITTINGS (SPRING NUTS, PIPE STRAPS, ETC.) SHALL BE BY SAME MANUFACTURER AS STRUT. 			7) INSERTION RECEPTACLES			
 AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED (2) MAXIMUM LOADING 75 PERCENT OF RATING (3) ASSOCIATED FITTINGS (SPRING NUTS, PIPE STRAPS, ETC.) SHALL BE BY SAME MANUFACTURER AS STRUT. 			9) SURFACE METAL RACEWAY			(1) COLD FORMED FROM LOW-CARBON STEEL WITH HOT-DIPPED
PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED BE BY SAME MANUFACTURER AS STRUT.	4.		UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE			(2) MAXIMUM LOADING 75 PERCENT OF RATING(3) ASSOCIATED FITTINGS (SPRING NUTS, PIPE STRAPS, ETC.) SHALL
			PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED			

RACEWAYS

a. RIGID STEEL CONDUIT: FULL-WEIGHT PIPE, GALVANIZED, THREADED.

X 11 IN. PAPER AND BOUND IN CONTRACTOR SHALL GIVE THREE IE COPY TO THE ENGINEER. DDRESS AND TELEPHONE	(4) FILE ALL CUT ENDS SMOOTH AND APPLY COLD GALVANIZING COMPOUND SPRAY (ZRC COLD GALVANIZING COMPOUND SPRAY EQUAL)	 b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS. c. RIGID NON-METALLIC CONDUIT (PVC): POLYVINYL CHLORIDE, SCHEDULE 40 OR 80, UL STANDARD ANSI/UL 651
MPUTER AIDED DRAFTED (AUTO	c. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OTHER MEANS. SUBMIT FOR REVIEW.	OR d. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.
icating the as installed Drawing file shall be Installation.	 d. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANG OR CHANNELS. e. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONA FRAMING. SUBMIT FOR REVIEW. 	CORE WITH OL BONDED STRIP, WITH A FLAME RETARDANT, SUNLIGHT RESISTANT PVC JACKET. UL LISTED AS LIQUIDTIGHT. f. WIREWAYS: DIMENSIONS AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH
E INCOMPLETE SENTENCES. LL," "SHALL BE," "FURNISH," FOR BREVITY.	H. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEAL CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZE IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIP	D 2) FITTINGS AND ACCESSORIES PED g. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON.
UP COMPLETE AND READY FOR WORK REFERRED TO UNLESS	GALVANIZED OR DIPPED IN ZINC CHROMATE FOR: OUTLET BOXES, JUNCTION BOXI CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. RED LEAD OR ZINC CHROMA WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES STEEL EQUIPMENT AND RACEWAYS. A FIELD—APPLIED ZINC CHROMATE PRIME COA SHALL BE UTILIZED FOR STEEL OR IRONWORK.	ES, ZINC-PLATED STEEL ONLY - ZINC DIE CAST NOT PERMITTED. TE DF b. ELECTROMETALLIC TUBING: COMPRESSION TYPE 2 IN. AND UNDER. SET
DMPLETE WITH RELATED	I. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND	PERMITTED. EXTERIOR EMT FITTINGS SHALL BE RAIN-TIGHT TYPE. c. PVC: SLIP-ON TYPE, UL CATEGORY DWTT, INSTALLED WITH MANUFACTURER
JRE, ACQUIRE AND DELIVER ATUS, CONTROLS, ACCESSORIES	OUTSIDE OF MATERIAL AND EQUIPMENT. J. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES/CONTROLS,	d. FLEXIBLE METALLIC CONDUIT: SQUEEZE TYPE COMPRESSION FITTING WITH INSULATED THROAT. ZINC–PLATED STEEL ONLY – ZINC DIE CAST NOT
COMPLETE INSTALLATION.	RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT, PRIOR TO ROUGH IN. K. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO	e. LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT: THREADED GASKETED MALLEABLE IRON, STEEL OR ALUMINUM WITH INSULATED THROAT, UL LISTED FOR WET
ER CONSTRUCTION, INSTALLED IN HUNG CEILINGS, IN TRENCHES,	INSTALLATION. 6. DEMOLITION	LOCATIONS. f. BUSHINGS: METALLIC INSULATED TYPE.
"CONCEALED" AS DEFINED	A. "SELECTIVE DEMOLITION": IS HEREBY DEFINED TO INCLUDE BUT IS NOT NECESSAF LIMITED TO THE REMOVAL OF THE FOLLOWING EXISTING MATERIALS, ITEMS AND EQUIPMENT.	a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE
EIGHT, SIZE, DESIGN AND NED BY THE ENGINEER AND	 REFER TO ELECTRICAL DEMOLITION PLAN AND RELATED NOTES FOR EXTENT DEMOLITION. REFER TO EXISTING DRAWINGS AND SITE CONDITIONS FOR ALL REMOVAL OF 	IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE $2-3/4$ IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE $1-1/2$ IN DEEP. FURNISH
NS OF ALL APPARATUS, THE HE APPROVAL OF THE OWNER,	WORK NECESSARY FOR COMPLETION OF NEW WORK AS SHOWN. EACH BIDI SHALL CAREFULLY EXAMINE THE PREMISES AND DOCUMENTS DURING THE BIDDING PERIOD AND ASCERTAIN THE EXTENT OF REMOVAL OF EXISTING WO IF THE CONTRACTOR NOTES ADDITIONAL WORK, CALL IT TO THE ATTENTION OF	DER WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. RK. (1) WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET
DNABLE CHANGES IN THE LE THE GENERAL RUN OF RAWING, IT IS NOT INTENDED DNDUIT AND CABLES BE	THE ARCHITECT PRIOR TO SUBMITTING BID. BY SUBMITTING A BID, THE CONTRACTOR WILL HAVE DEEMED TO PROVIDE SUCH EXAMINATION, TO HAVE ACCEPTED SUCH CONDITIONS, AND TO HAVE MADE ALLOWANCES IN PREPARI HIS BID.	(2) ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND NG FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY
ISIBLE FOR ALL REQUIRED NS. IT SHALL BE THE HIS WORK TO CONFORM TO OPENINGS AND PASSAGEWAYS	3) ITEMS OF SALVAGE SHALL BE CAREFULLY REMOVED WITHOUT DAMAGE; NAILS AND OTHER FASTENERS REMOVED THAT ARE NOT INTEGRAL TO THEIR CONSTRUCTION; AND STORED AND PROTECTED AT LOCATIONS DIRECTED BY OWNER. IDENTIFY AND TAG ALL SALVAGE MATERIALS REGARDING LOCATION EXISTING BUILDING AND RELATIONSHIP OF PARTS.	THE DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR
OORDINATE WITH ALL TRADES. IVE PANEL AND CONTROLS AS	 ALL DEMOLISHED AND/OR REMOVED MATERIALS NOT REQUIRED BY OWNER S BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FRO THE PREMISES AND DISPOSED OF IN A LEGAL MANNER, OFF-SITE. 	CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN RENOVATED BOXES BETWEEN
CLEAN-UP AND REMOVAL FROM ION OF WORK UNDER THIS	5) CARE MUST BE TAKEN NOT TO DISTURB EXISTING WIRING, WHICH IS NOT AFFECTED BY DEMOLITION. RESTORE ALL CIRCUITS AND EQUIPMENT DISRUF OR DISTURBED BY THE REMOVAL OF ONLY PARTS OF EXISTING SYSTEMS. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AFFECTED BY THIS	c. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER
FOR 120/208 AND 277/480 IERGENCY AND NORMAL POWER. PTABLE.	 WORK. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK T INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE 	WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND
S/CONTROLS ARE SUBJECT TO TCH INSIDE OPPOSITE HINGE, RIOR TO SWITCH OUTLET	 7) CONNECT NEW WORK TO EXISTING IN A NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY BUILDING OWNER. 	LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON OR GALVANIZED STEEL CHANNEL SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE
CENTERLINE OF OUTLETS SHALL IS OTHERWISE NOTED. OF FURRING AND FIREPROOFING.	 ALL RACEWAYS TO BE ABANDONED SHALL BE REWORKED AS DEFINED WITHIN THE DEMOLITION NOTES. WHERE IT IS IMPRACTICAL TO REMOVE RACEWAY E TO SOURCE, DISCONNECT WIRING AT LOAD (EQUIPMENT) AND AT LINE SIDE, AND CAP, FLUSH TO SURFACE. REMOVE CONDUCTORS FROM EXISTING 	BACK SHALL BE RUN CONCEALED, EXCEPT AS NOTED.
E WITH BUILDING FINISH. E STRAP IRON OR GROUT IN FINISHED SPACES WITH AND FINISHES. PROVIDE	RACEWAYS TO BE REWIRED. CLEAN RACEWAY AS REQUIRED PRIOR TO REWI 9) TEMPORARY SHUTDOWNS WHEN REQUIRED ARE TO BE MADE ONLY WITH WRI	RING. WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER TTEN CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB.
FFERENT PHASES FOR PROVIDE BARRIERS BETWEEN ES INSTALLED WITHIN A	CONSENT OF OWNER AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION AND NO ADDITIONAL CHARGE. 10) ALL REQUIRED WORK FOR TIE-IN TO THE EXISTING EQUIPMENT SHALL BE	HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS, TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN
OCATED CLEAR OF OTHER IN FINISHED SPACES. WHERE R ARRANGEMENTS FOR	ACCOMPLISHED AFTER HOURS, THE EXACT DAY AND TIME SHALL BE DIRECTI BY OWNER, AND AT NO ADDITIONAL CHARGE. 7. CUTTING AND PATCHING	UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR. 2) SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS.
SUPPORT BOXES FROM . PROVIDE FLOOR-TO-CEILING HTWEIGHT CONSTRUCTION. IG CEILINGS SHALL BE	A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CUTTING AND PATCHING OF TI EXISTING AND NEW CONSTRUCTION WORK, WHICH MAY BE REQUIRED FOR THE PRO INSTALLATION OF THE ELECTRICAL WORK. ALL PATCHING SHALL BE OF THE SAME MATERIALS, WORKMANSHIP, AND FINISH, AND SHALL ACCURATELY MATCH ALL SUPPORTUNING WORK	PPER METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING
Moval of Fixture. Secure Dxes: Coordinate with Motor Where Required.	SURROUNDING WORK. B. CORE BORING OF CONCRETE FLOORS AND/OR WALLS IF REQUIRED, IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.	BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAW PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.
S AT EARLIEST POSSIBLE DATE UIREMENTS OF ALL TRADES AS CONSTRUCTION AS SOON AS	 8. COORDINATION A. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EQUIPMENT WITH ARCHITECTUR DRAWINGS. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW F 	OR 3 IN SEDADATION EDOM STEAM AND HOT WATER DIDES EVOEDT 1 IN EDOM
G WORKING HOURS OF ALL GY. PROVIDE ALL REQUIRED	OVERHEAD PIPES, DUCTS, AND MECHANICAL EQUIPMENT, VARIATIONS IN FIRE PROO AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS, AND THE AND CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSES TO THE OWNER 9. EQUIPMENT FURNISHED BY OTHERS	
OF THEIR RESPECTIVE KINDS, TERS LABORATORIES, INC., OR AND BEARING THEIR LABEL.	A. THE CONTRACTOR SHALL FURNISH AND INSTALL WIRING FOR EQUIPMENT FURNISHE OTHERS, AS SHOWN ON DRAWINGS. COORDINATE WITH ALL OTHER TRADES OR DE FOR INSTALLATION. THE TERM "WIRING" AS USED HERE—IN, INCLUDES, BUT IS NO	TAILS
ION SHALL BE OF SAME	LIMITED TO, FURNISHING AND INSTALLING CONDUIT, WIRE, JUNCTION BOXES, DISCONNECTS AND MAKING CONNECTIONS. CONTRACTOR SHALL CHECK ARCHITECTURAL, MECHANICAL, AND PLUMBING DRAWINGS AND SPECIFICATIONS FOR EQUIPMENT TO BE INSTALLED BY OTHERS. CONTRACTOR SHALL BE RESPONSIBLE	OR NYLON ROPE. 6) RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS DAINT MALE THREADS OF FIELD THREADED CONDUIT WITH
OVERLOADS AND IMPROPER . FURNISH ALL LABOR AND	PROPER WIRING AND NECESSARY ELECTRICAL ADJUSTMENTS TO EQUIPMENT TO CONFORM TO SPECIFIED REQUIREMENTS OF THE EQUIPMENT. 10. LOW-VOLTAGE DISTRIBUTION EQUIPMENT	 GRAPHILE—BASE PIPE COMPOUND AND BUIL CONDUCT ENDS. TOUCH UP MARRED SURFACES AND FIELD—CUT THREADS, CRC—COLD GALVANIZED. 7) EMT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS, IN DRY
SHALL BE GUARANTEED FOR A CE.	A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS PANELS AND TRANSFORMERS.	LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED , SPACES. EMT SHALL BE PERMITTED FOR FEEDERS WHERE HIDDEN OR NOT EXPOSED TO POTENTIAL DAMAGE. WHERE DAMAGE IS A POSSIBILITY (I.E. WAREHOUSE WALL) USE RIGID ONLY. EMT SHALL NOT BE PERMITTED IN RAISED
VOLT), 3 PHASE, 4 WIRE, 60 208 VOLT), 3 PHASE, 4 WIRE,	 B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS. C. DISCONNECT SWITCHES SHALL BE FUSED OR NON-FUSED AS NOTED. VOLTAGE SI BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORDERDWED HOLDER HEAVY DUTY, EXCEPT AS NOTED, AND 	FLOORS.
200 VOLI), J FRASE, 4 WIRE,	HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NON-FUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 30 AMP AT 600 VOLTS AN ALUMINUM NEMA 1 ENCLOSURE UON. TWO-POLE SWITCHES SHALL BE SIMILAF HUBBELL #HBL1372D. THREE-POLE SWITCHES SHALL BE SIMILAR TO HUBBELL	IN DAMAGE) OR LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT. R TO 9) FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE
TAIL ON DRAWINGS. OUTLETS FOR: FT6 IN. UNLESS NOTED	#HBL1379D. 1) KNIFE—BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK—MAKE—QUICK—BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATI	RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT. AND MAXIMUM 6 FT. LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR.
-0 IN.	EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROV SWITCHES SHALL BE SIMILAR TO SQUARE D CLASS 3110. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.	IDED. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.
ESS NOTED OTHERWISE	D. FUSES: DUAL ELEMENT FUSES FOR MOTOR LOADS SHALL BE TIME DELAY HAVING MAXIMUM RATING OF 600 AMP AT REQUIRED VOLTAGE. 200,000 AMP IC FUSES S BE SIMILAR TO LIMITRON FUSETRON FRN OR FRS (UL CLASS R). CURRENT LIMITI FUSES SHALL BE UTILIZED FOR OTHER LOADS. 200,000 AMP IC SHALL BE SIMIL	HALL THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT NG WITH RACEWAY COUPLING.
WALL FINISH MATERIALS, ON	TO LIMITRON KTN, KTS, OR KTU (UL CLASS R UP TO 600 AMP; CLASS L OVER 6 AMP). ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER. PROVIDE 1 SI MATCHING FUSE FOR EACH SET OF 3.	00 TT) ALL COUPLINGS ON EMI RACEWAYS SHALL BE COMPRESSION TYPE UP TO AND
COORDINATING AND ARCHITECT AND ARCHITECTURAL	E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL—MAGNETIC, QUICK—MAKE—QUICK—BREAK, BOLT—ON TYPE, MANUALLY OPERATED WITH INSULATEI TRIP—FREE HANDLE. MULTI—POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALLMINIUM CABLE. FURNI	2) EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE
IIP IN CARTED SECTIONS OF PACES.	BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNI AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT TRIPPING, OPEN AND CLOSE MO OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA T 1, AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS,	TOR TEMPERATURE VARIATION.
ND REPAIR. MINOR DEVIATIONS OR INVOLVING EXTRA COST CONCEALED ELECTRICAL EREELY ACCESSIBLE THROUGH	UNLESS OTHERWISE NOTED: 1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE. 2) 240 VOLTS, 100 AMP FRAME: 18,000 AMPS, 2 AMP, 3 POLES	CONSTRUCTION. 14) PROVIDE INTERNAL VAPOR SEALING OF ALL CONDUITS PASSING FROM EXTERIOR
FREELY ACCESSIBLE THROUGH	 240 VOLTS, 100-AMP FRAME: 18,000 AMPS, 2 AND 3 POLES. 3) 240 VOLTS, 200-AMP FRAME: 50,000 AMPS, 2 AND 3 POLES WITH INTERCHANGEABLE TRIP. 	TO CONDITIONED INTERIOR SPACES. 15) PROVIDE RACEWAYS CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS
WITH 3/4 IN. WHITE LETTERING, DNNECT SWITCH, CIRCUIT DSURE, MOTOR CONTROLLER DE NAME AND NUMBER OF	 4) 277 VOLTS, 100-AMP FRAME: 14,000 AMPS, 1 POLE. 5) 480 VOLTS, 100-AMP FRAME: 20,000 AMPS, 2 AND 3 POLES. 	MAXIMUM RESISTANCE SHALL BE 25 OHMS. 13. WIRE AND CABLE A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE
THE NAME AND NUMBER OF	 6) CIRCUIT BREAKERS INSTALLED IN EXISTING PANEL BOARDS, SHALL BE OF TH SAME MANUFACTURER, TYPE AND A.I.C. RATING AS PRESENTLY IN USE. F. BALANCE THE LOAD OVER PHASES WHEN NEW CIRCUITS ARE ADDED TO NEW OR 	
ORIGIN AND TERMINATION OF	F. BALANCE THE LOAD OVER PRASES WHEN NEW CIRCUITS ARE ADDED TO NEW OR EXISTING PANELS. PROVIDE MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGG SHALL NOT BE PERMITTED. MOUNTING HEIGHT SHALL BE A MAXIMUM OF 6 FT6 FROM FLOOR TO TOP SWITCH UNIT. UPDATE DIRECTORIES ON EXISTING PANELBOA WHERE CIRCUITING IS CHANGED.	GING 12 MINIMUM. AT 120 VOLTS AND OVER 100 [°] FT. CIRCUIT LENGTH PROVIDE NO. 10 N. MINIMUM. AT 277 VOLTS AND OVER 200 FT. CIRCUIT LENGTH PROVIDE NO. 10 RDS MINIMUM.
/ PAINTED. _ FIG. 281.	G. TESTS: OPEN AND CLOSE LOAD BREAK SWITCHING DEVICES UNDER LOAD. 11. GROUNDING	 CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT. CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO
MASON SERIES 9000 WITH END RTS.	a. AN EQUIPMENT—GROUNDING CONDUCTOR, COMMONLY DESCRIBED AS A "GREEN WIF SHALL BE PROVIDED FOR ALL BRANCH CIRCUITS PROTECTED BY OVERCURRENT DEVICES. "GREEN GROUND" WIRE SHALL ALSO BE PROVIDED FOR FLEXIBLE COND	MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED. UIT C. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA
RATING. R TO UNISTRUT OR KINDORF)	AND MOTOR CIRCUITS. 12. RACEWAYS	STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMPIENT TEMPERATURES OF CONTINUOUS FLUORESCENT FIXTURES AND IN
STEEL WITH HOT-DIPPED	 PROVIDE RACEWAYS COMPLETE WITH BOXES, FITTINGS AND ACCESSORIES. CONDUI TUBING SIZES REFERRED TO IN SPECIFICATIONS AND ON DRAWINGS ARE NOMINAL DIAMETERS. MINIMUM DIAMETER SHALL BE 3/4 IN. MATERIALS 	T OR AMBLENT REMPERATORES OVER 90 DEGREES C. FOR ONOROONDED ISOEALED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).
RATING	B. MATERIALS	

- D. PRE-MANUFACTURED STEEL ARMOR. SPECIFICATION GRADE METAL CLAD CABLE (MC-TUFF) MAY BE UTILIZED FOR ALL NORMAL BRANCH CIRCUITS IN DRY HOLLOW STUD WALL LOCATIONS. ABOVE ACCESSIBLE CEILING AND WHERE PERMITTED BY ARTICLE #330 & #517 OF THE NATIONAL ELECTRICAL CODE (APPLICABLE EDITION) ONLY, EXCEPT EXPOSED, UNLESS SPECIFICALLY OTHERWISE NOTED IN THE CONTRACT DOCUMENTS. MINIMUM CONDUCTOR SIZE SHALL BE NO. 12 AWG COPPER WITH INTEGRAL GREEN INSULATED CONTINUOUS GROUND CONDUCTOR AND BARE BONDING CONDUCTOR IN DIRECT CONTACT WITH THE OUTER METAL JACKET.
- E. THE INSULATION OF ALL CONDUCTORS SHALL BE 90 DEGREES C RATED THERMOPLASTIC WITH COLOR CODING AS FOLLOWS:
- 1) 120/208 VOLT SYSTEM a. BLACK FOR A PHASE
- b. RED FOR B PHASE
- c. BLUE FOR C PHASE
- 2) 277/480 VOLT SYSTEM a. BROWN FOR A PHASE
- b. ORANGE FOR B PHASE
- c. YELLOW FOR C PHASE
- NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT. a. WHERE COLOR-CODED CABLE IS NOT AVAILABLE. CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.
- F. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR
- ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS. G. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG
- CONNECTIONS TO BUS BARS: USE ANTI-SEIZE COMPOUND ON TANG. H. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEGREES F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 277/480 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.
- K. PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.
- 14. POWER WIRING A. PROVIDE ALL POWER WIRING TO ALL MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS ON THE PROJECT. INCLUDE EXTENSIONS FROM CONTROLLERS TO MOTORS AND MOTOR CONNECTIONS. MOUNT AND WIRE ALL CONTACTORS AND POWER DEVICES FURNISHED UNDER ALL CONTRACTS.
- 15. CONTROL WIRING PROVIDE ALL CONTROL WIRING FOR MOTORS AND EQUIPMENT FURNISHED UNDER ALL CONTRACTS AND AS SPECIFICALLY SHOWN ON THE DRAWINGS. EXCEPT AS NOTED FOR MECHANICAL/PLUMBING EQUIPMENT. INCLUDE MOUNTING AND WIRING OF ALL CONTROL DEVICES FURNISHED WITH EQUIPMENT.
- B. CONTROL WIRING LESS THAN 120 VOLTS FOR MOTORS, ALARMS FOR EQUIPMENT FURNISHED UNDER MECHANICAL/PLUMBING WILL BE PROVIDED UNDER DIVISION 15 CONTRACT.
- 16. DEVICES A. LOCAL SWITCHES

- CONVENTIONAL QUITE TOGGLE TYPE, RATED AT 20 AMP, 120/277 VOLT AC SIMILAR TO LEVITON #1221-2, 1223-2, 1224-2 OR EQUAL BY HUBBELL OR PASS & SEYMOUR. THE OWNER OR ARCHITECT SHALL SELECT TOGGLE COLOR.
- 2) PILOT LIGHT TOGGLE TYPE WITH NEON LAMP, RATED AT 20 AMP, 120/277 VOLT AC SIMILAR TO LEVITON #1221-PLC. B. MANUAL MOTOR STARTERS
- 1) FLUSH OR SURFACE MOUNTED TYPE WITH INTEGRAL THERMAL OVERLOAD PROTECTION AND PILOT LIGHT. SIMILAR TO SQUARE D CLASS 2510 AND 2512 TYPE F.
- C. MOTOR-RATED SWITCHES 1) FLUSH OR SURFACE MOUNTED TYPE WITH PILOT LIGHT. SIMILAR TO SQUARE D CLASS 2510, 2511 AND 2512 TYPE F.
- D. INSERTION RECEPTACLES CONVENTIONAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLT, 2 POLE, 3 WIRE, 20 AMP WITH U GROUND SLOT GROUNDED, EXCEPT AS NOTED. DEVICE SHALL MEET OR EXCEED:
 - a. UL 488
 - b. UL FEDERAL SPECIFICATION WC-596 LISTING. c. NEMA WD-1 AND WD-6
 - d. DEVICE SHALL BE SIMILAR TO HUBBELL HBL5362 OR EQUAL BY LEVITON, PASS & SEYMOUR OR GE. OWNER OR ARCHITECT SHALL SELECT FACE COLOR. DEVICES USED ON EMERGENCY BRANCH CIRCUITS SHALL BE RED FACE ONLY.
- 2) LIGHTING CONTROLS (SEE SCHEDULES/NOTES ON DRAWINGS)
- 3) RECEPTACLE ORIENTATION CONTRACTOR SHALL COORDINATE ORIENTATION OF DEVICE WITH
- ARCHITECT. E. DEVICE PLATES

17.

- 1) BRUSHED 302 STAINLESS STEEL WITH ENGRAVED CIRCUIT IDENTIFICATION PLATE
- 2) REINFORCED THERMOPLASTIC BY SAME MANUFACTURER OF DEVICES. F. DEVICE WIRING
 - ALL DEVICES SHALL BE SIDE-WIRED VIA SCREW TERMINALS PUSH-IN WIRING (AKA "QUICKWIRE") THROUGH THE BACK OF THE DEVICE IS NOT AN ACCEPTABLE WIRING METHOD.
- LIGHTING FIXTURES MANUFACTURE AND INSTALL LIGHTING FIXTURES IN ACCORDANCE WITH NEC ARTICLE
- B. PROVIDE ALL LIGHTING FIXTURES INDICATED, COMPLETE WITH LAMPS. INCLUDE ALL
- INTERIOR LIGHTING FIXTURES, AND ALL EXTERIOR FIXTURES MOUNTED ON THE BUILDING.
- C. FURNISH ALL PLASTER FRAMES OR DRY WALL AND DELIVER TO PROJECT SITE FOR INSTALLATION UNDER FINISHES, DIVISION 9.
- USE FIXTURES CONFORMING TO UL STANDARDS, AND BEARING UL LABEL AND UNION
- E. ALL FLUORESCENT ELECTRONIC BALLASTS SHALL MEET OR EXCEED THE REQUIREMENTS
- 1) ANSI/IEEE C62.41 (AMERICAN NATIONAL STANDARDS INSTITUTE).
- 2) FCC PART 18 (RFI AND EMI).
- CBM (CERTIFIED BALLAST MANUFACTURERS).
- UL (UNDERWRITERS LABORATORIES).
- 5) PUBLIC LAW #100-357 (MINIMUM EFFICIENCY STANDARDS). 6) NAECA (NATIONAL APPLIANCE ENERGY CONSERVATION AMENDMENTS).
- 7) NEC (NATIONAL ELECTRIC CODE).
- F. GENERAL CONSTRUCTION
- PLASTICS: 100 PERCENT VIRGIN ACRYLIC, REFER TO FIXTURE LIST FOR FURTHER DESCRIPTION.
- a. METAL (1) MATERIAL: STEEL, ALUMINUM OR OTHER TYPES MENTIONED.
- (2) B & S GAUGE: NO. 22 MINIMUM FOR HOUSINGS, WITH APPROPRIATE CROSS-SECTIONAL CONFIGURATION FOR FIXTURE HOUSING; THINNER SHEET METAL ACCEPTABLE FOR BALLAST ENCLOSURES AND INCIDENTAL PURPOSES. b. FINISHES
- (1) CORROSION PROTECTION: PLATING, BONDERIZING, PRIMING, ELECTROSTATIC PAINTING, OR OTHER APPROVED MEANS.
- (2) COLORS: FACTORY STANDARD UNLESS OTHERWISE NOTED.
- (3) FINAL COATING: BAKED PAINT OR ENAMEL ON STEEL AND ALUMINUM; BAKED CLEAR LACQUER OR OTHER DURABLE TRANSPARENT FILM ON POLISHED METAL SURFACES.
- EXTERIOR FIXTURES: ENCLOSED AND GASKETED, UNLESS OTHERWISE
- d. FLUORESCENT LAMP SOCKETS: WHITE FINISH, SILVER-PLATED CONTACT SURFACES.
- e. LATCHES: QUICK-OPERATING TYPE WITHOUT NEED FOR TOOLS, UNLESS
- OTHERWISE NOTED; STAINLESS STEEL OR CADMIUM PLATED STEEL. EXPOSED HARDWARE: NOT ACCEPTABLE ON VISIBLE SURFACES OF FIXTURES IN FINISHED AREAS UNLESS OTHERWISE NOTED.

- OPERATING TEMPERATURE: NOT TO EXCEED 25 DEGREES C TEMPERATURE RISE OVER 40 DEGREES C. A MAXIMUM 90 DEGREES C BALLAST HOT SPOT WHEN FLUORESCENT FIXTURE IS OPERATED IN 25 DEGREES C AMBIENT. MAXIMUM CASE TEMPERATURE SHALL NOT EXCEED 85 DEGREES C.
- PROVIDE APPROPRIATE MOUNTING ACCESSORIES FOR EACH FIXTURE, COMPATIBLE WITH THE VARIOUS STRUCTURAL CONDITIONS THAT WILL BE ENCOUNTERED. PROVIDE FASTENING CLIPS (EARTHQUAKE CLIPS) FOR LIGHTING FIXTURES THAT ARE SUPPORTED FROM FRAMING MEMBERS OF SUSPENDED CEILINGS.
- ASSEMBLE, WIRE AND INSTALL ALL LIGHTING FIXTURES AT THEIR RESPECTIVE OUTLETS AS INDICATED AND ASSUME RESPONSIBILITY FOR THEIR CONDITION UNTIL ACCEPTANCE BY OWNER. INSTALL PROPER LAMPS IN EACH FIXTURE.
- FIXTURE CONNECTIONS TO BRANCH CIRCUITS SHALL BE MADE USING STRANDED WIRE WITH INSULATION TEMPERATURE RATING EQUAL TO OR HIGHER THAN THAT OR WIRE SUPPLIED WITH THE FIXTURE, OR SPECIFIED BY FIXTURE MANUFACTURER. FIXTURES ARE TO BE CONNECTED TO BRANCH CIRCUITS VIA JUNCTION BOX USING FLEXIBLE CONDUIT OF LENGTHS BETWEEN 4 FT. MINIMUM AND 6 FT. MAXIMUM.
- THE USE OF FLEXIBLE CONDUIT, TO FIXTURES IN ANY LENGTH OVER 6 FT. IS PERMITTED ONLY WHEN A SEPARATE GROUND WIRE IS INSTALLED ALONG WITH THE CONDUCTORS INSIDE THE FLEXIBLE CONDUIT. IN THIS APPLICATION THE GROUND WIRE MUST BOND THE LIGHTING FIXTURE HOUSINGS TO EACH OTHER AND/OR TO THE JUNCTION BOX. ALL FLEXIBLE CONDUIT SHALL BE SUPPORTED AS REQUIRED BY NEC AND SHALL BE INSTALLED IN A WORKMANLIKE MANNER.
- NOTE THAT SPECIFICATIONS FOR RECESSED FIXTURES GENERALLY DO NOT INCLUDE MOUNTING ACCESSORIES, AND THAT EACH FIXTURE TYPE MAY BE USED IN SEVERAL DIFFERENT CEILINGS, SUCH AS LAY-IN EXPOSED GRID, CONCEALED SPLINE TILE, OR DRYWALL. VERIFY MOUNTING DETAILS FOR EACH SPACE BEFORE ORDERING FIXTURES SO THAT PROPER QUANTITIES FOR EACH CONDITION WILL BE DELIVERED IN TIME TO AVOID CONSTRUCTION DELAYS.
- SECURELY FASTEN LIGHTING FIXTURES TO FRAMING MEMBERS OF SUSPENDED CEILINGS WITH FASTENING CLIPS, AS SPECIFIED. CLIP EACH FIXTURE TO ALL ADJOINING FRAMING MEMBERS TO PREVENT MOVEMENT OF THE MEMBERS AWAY FROM THE FIXTURES.
- M. SUPPORT EXIT SIGNS IN TILE CEILINGS WITH RAILS THAT SPAN BETWEEN RUNNERS OF CEILING SUSPENSION SYSTEM. USE FLANGED FIXTURES FOR FINISHED APPEARANCE. SUPPORT FLUORESCENT FIXTURES IN DRYWALL CEILINGS FROM PLASTER FRAMES, WITH ADJUSTABLE LUGS ON SIDE OF FIXTURE OR YOKE MOUNTING AS RECOMMENDED BY
- FIXTURE MANUFACTURER. USE FLANGED FIXTURES FOR FINISHED APPEARANCE, UNLESS OTHERWISE NOTED. 0. LOCATE FIXTURE IN CENTER OF PANEL WHERE USED IN MODULAR TILE CEILINGS, UNLESS OTHERWISE NOTED. REFER TO REFLECTED CEILING PLAN.
- P. FLUORESCENT BALLASTS 1) REFER TO LIGHTING FIXTURE LIST. UNLESS OTHERWISE NOTED, ALL FLUORESCENT BALLASTS SHALL BE ELECTRONIC HIGH POWER FACTOR WITH LESS THAN 10% THD.
- 18. EMPTY RACEWAY SYSTEMS
 - A COMPLETE EMPTY RACEWAY SYSTEM CONSISTING OF BLANK 4-11/16 IN. SQ. X 2-1/8 INCHES DEEP OUTLET BOXES WITH SINGLE OR DOUBLE GANG DRYWALL FINISH COLLAR AS NOTED. METALLIC RACEWAY WITH PULL STRING SHALL BE PROVIDED AND INSTALLED WHERE SHOWN FOR THE FOLLOWING SYSTEMS. 1) TELEPHONE/DATA (SINGLE GANG)
 - 2) CABLE TELEVISION (SINGLE GANG) RACEWAY SIZE SHALL BE A MINIMUM OF 3/4 IN. OR AS DOCUMENTED IN PLANS AND DETAILS.
 - ALL METALLIC RACEWAY SYSTEMS SHALL BE STUBBED UP AND TERMINATE IN ACCESSIBLE CEILING. END BUSHINGS AND PULL WIRES SHALL BE PROVIDED. BONDING OF ALL RACEWAY SYSTEMS TO PROVIDE A COMMON GROUND PATH SHALL BE PROVIDED.
- ACTUAL DEVICES, CONNECTORS, WIRING COMPLETE WITH TERMINATIONS AND BOX D. COVERS SHALL BE PROVIDED BY THE OWNER. 19. FIRE STOPPING
- DRAWINGS AND GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND DIVISION SPECIFICATION SECTIONS, APPLY TO WORK OF THIS SECTION. PROVIDE ALL REQUIRED FIRE STOPPING. WORK INCLUDES FIRE-STOPPING
- PENETRATIONS OF FIRE-RESISTANCE RATED FLOORS, WALLS AND PARTITIONS IN NEW CONSTRUCTION, AS WELL AS PRE-EXISTING PENETRATIONS IN RENOVATION AREAS OF EXISTING CONSTRUCTION.
- PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA FOR EACH FIRE-STOPPING PRODUCE REQUIRED, INCLUDING INSTRUCTIONS FOR SUBSTRATE PREPARATION AND FIRE-STOPPING INSTALLATION. FIRE RESISTANT JOINT SEALERS: PROVIDE MANUFACTURER'S STANDARD FIRE-STOPPING
- SEALANT WITH ACCESSORY MATERIALS, HAVING FIRE RESISTANCE RATINGS INDICATED AS ESTABLISHED BY TESTING IDENTICAL ASSEMBLIES PER ASTM E814 BY UNDERWRITERS LABORATORY, INC. OR OTHER TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION. E. MATERIALS – PROVIDE THE FOLLOWING:
- ONE-PART FIRE-STOPPING SEALANT: ONE PART LATEX BASED INTUMESCENT SEALANT FORMULATED FOR USE IN A THROUGH-PENETRATION FIRE-STOP SYSTEM FOR SEALING OPENINGS AROUND CABLES, CONDUIT, PIPES AND SIMILAR PENETRATIONS THROUGH WALLS AND FLOORS. ACCEPTABLE PRODUCTS/MANUFACTURERS INCLUDE THE FOLLOWING:
- a. SPEC SEAL LC150 SERIES b. HILTI FS ONE MAX
- 20. TESTS BEFORE MAKING TESTS, COMPLETE ALL CONNECTIONS AT PANELS, FIXTURES AND OTHER EQUIPMENT. INSTALL FUSES AND HAVE ALL WIRING CONTINUOUS FROM SERVICE EQUIPMENT TO UTILIZATION OUTLETS. CORRECT ALL UNDESIRABLE GROUND, OPEN AND SHORT CIRCUIT CONDITIONS.
 - PROVIDE SOURCE OF TEMPORARY POWER FOR MAKING TESTS IF NORMAL BUILDING
- POWER IS NOT AVAILABLE AT THE TIME. C. TAKE AND RECORD THE FOLLOWING READINGS ON SYSTEMS 600 VOLTS AND BELOW:
- 1) MEGGER TESTS OF ALL FEEDER CIRCUIT CONDUCTORS, GROUND CONDUCTORS, AND CONDUIT GROUND.
- 2) AMMETER READINGS ON ALL PHASES AND NEUTRAL OF EACH FEEDER TO
- INDICATE BALANCE. 3) AMMETER READINGS ON ALL PHASES OF EACH POLYPHASE MOTOR. INCLUDE
- NAMEPLATE FULL LOAD CURRENT OF EACH MOTOR ON DATA SHEET. 4) CERTIFY THAT ALL OVERLOAD DEVICES HAVE BEEN SET IN ACCORDANCE WITH DATA SHOWN ON THE DRAWINGS AND/OR MANUFACTURER'S RECOMMENDED SETTING.
- SEND FINAL CERTIFIED TEST REPORTS AND CERTIFICATIONS TO THE ARCHITECT FOR APPROVAL AND TRANSMITTAL TO THE OWNER.
- E. PROVIDE FUNCTIONAL TESTING FOR OCCUPANT SENSORS AND AUTOMATIC TIME SWITCH IN ACCORDANCE WITH ARTICLE 9.4.3 OF THE 2013 EDITION OF ASHRAE STANDARD
- 21. DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS
- A. SUBMIT WRITTEN CERTIFICATION THAT ELECTRICAL SYSTEMS ARE COMPLETE AND OPERATIONAL. SUBMIT CERTIFICATION WITH CONTRACTOR'S REQUEST FOR FINAL REVIEW. 1) AT THE TIME OF FINAL REVIEW OF ELECTRICAL WORK, DEMONSTRATE THE
- OPERATION OF ELECTRICAL SYSTEMS. FURNISH LABOR, APPARATUS AND EQUIPMENT FOR SYSTEMS' DEMONSTRATION. THE VARIOUS TEST SHALL BE WITNESSED BY AND THE OWNER OR HIS REPRESENTATIVE.
- THE CONTRACTOR SHALL FURNISH ALL TEST EQUIPMENT, MATERIALS, LABOR, AND TEMPORARY POWER HOOK-UPS TO PERFORM START-UP AND ALL TESTS AS REQUIRED TO OBTAIN FINAL FIELD ACCEPTANCE FROM OWNER. ALL TESTS SHALL BE CONDUCTED IN THE PRESENCE OF THE OWNER OR HIS REPRESENTATIVE. ALL TEST PROCEDURES SHALL CONFORM TO THIS SPECIFICATION AND APPLICABLE STANDARDS THE ANSI, IEEE NEMA, OSHA, NEPA, ETC.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TESTS AND TEST RECORD. TESTING SHALL BE PERFORMED BY AND UNDER THE IMMEDIATE SUPERVISION OF THE CONTRACTOR. TEST RECORD SHALL BE KEPT FOR EACH PIECE OF EQUIPMENT. COPIES SHALL BE FURNISHED TO THE ENGINEER FOR REVIEW AND/OR APPROVAL.
- D. A VISUAL INSPECTION OF ALL ELECTRICAL EQUIPMENT, TO CHECK FOR THE FOREIGN MATERIAL, TIGHTNESS OR WIRING AND CONNECTION, PROPER GROUNDING, MATCHING NAMEPLATE CHARTS WITH SPECIFICATION, ETC., SHALL BE MADE PRIOR TO ACTUAL E. A COMPLETE OPERATIONAL TEST SHALL BE MADE ON THE REVISED LIFE SAFETY FIRE
- ALARM SYSTEM. THE CONTRACTOR SHALL CONSULT WITH THE EQUIPMENT VENDORS AND THEN SUBMIT FOR APPROVAL A STEP-BY-STEP PROCEDURE DESCRIBING THE METHOD OF MAKING THE TESTS, THE EQUIPMENT TO BE UTILIZED AND THE FEATURE TO BE CHECKED BY THE TEST. ALL INTERLOCKS AND PROTECTIVE FEATURES SHALL BE CHECKED OUT.
- 22. SPECIAL ENGINEERING SERVICES A. IN THE INSTANCE OF COMPLEX OR SPECIALIZED ELECTRICAL SYSTEMS SUCH AS EMERGENCY SYSTEM FIRE ALARM OR SIMILAR MISCELLANEOUS SYSTEMS, THE INSTALLATION. FINAL CONNECTIONS AND TESTING OF SUCH SYSTEMS SHALL BE MADE UNDER THE DIRECT SUPERVISION OF COMPETENT AUTHORIZED SERVICE ENGINEERS WHO SHALL BE IN THE EMPLOY OF THE RESPECTIVE EQUIPMENT MANUFACTURER.
- ANY AND ALL EXPENSES INCURRED BY THESE EQUIPMENT MANUFACTURERS' REPRESENTATIVES RELATED TO THIS PROJECT, SHALL BE BORNE BY THE ELECTRICAL CONTRACTOR. 23. DESIGN MODIFICATIONS
- THE DRAWINGS SHOW ELECTRICAL SYSTEMS, WHICH SUPPLY, CONTROL, AND/OR MONITOR SYSTEMS SPECIFIED ELSEWHERE. THE ELECTRICAL SYSTEM SHOWN HAS BEEN BASED ON SPECIFIC MANUFACTURERS DATA OR INFORMATION CONVEYED TO THE ELECTRICAL DESIGNER. WHERE ANY AGREEMENT OR CHANGE IS MADE TO SUPPLY EQUIPMENT OF LARGER CAPACITY OR DIFFERENT ELECTRICAL CHARACTERISTICS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING THE ELECTRICAL SYSTEM TO EFFECT SUCH CHANGES WITHIN THE INTENT OF THESE SPECIFICATIONS AND TO INFORM THE ENGINEER, IN WRITING, OF SUCH CHANGE. FOR EXAMPLE, IF HVAC COMPRESSORS AND/OR MOTORS ARE ALLOWED TO BE CHANGED TO 230 VOLTS RATHER THAN THE ORIGINALLY SPECIFIED 208 VOLTS, BOOSTING OR BUCKING TRANSFORMERS SHALL BE SUPPLIED, INSTALLED, AND WIRED TO ACCOMMODATE THE CHANGE AT NO ADDITIONAL COST.

Revisions			
Date	Description		



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