				٦
	MECHANICAL SYM	BOLS L	_IST	LOMABARD, ILLINOIS BUILDING DEPARTM
AC-1 TXF-1	EQUIPMENT SYMBOL	MECHAI	NICAL ABBREVIATIONS	ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 20 INTERNATIONAL BUILDING CODE AND ALL AMENDMENTS AND RUL AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.
XX		AC	AIR CONDITIONING UNIT	-
X	RISER SYMBOL	ACC	AIR COOLED CONDENSING UNIT	1. THE CONTRACTOR SHALL ENGAGE THE THE SERVICES OF PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPEC
	AIR DEVICES	AL	ACOUSTIC LINING	INSPECTIONS AND TESTS.
			CRAVITY DAMPER	2. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTH PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIEN
\boxtimes	CEILING DIFFUSER SUPPLY	GD CEM	CUBIC FEFT OF AIR PER MINUTE	- SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTE
		COP	COEFFICIENT OF PERFORMANCE	REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH T
		СР	CONDENSATE PUMP	3 TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED
ł	SIDEWALL SUPPLY GRILLE	CD	CONDENSATE DRAIN PIPE	ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE 20
		DN	DOWN	A. VENTILATION SYSTEM BALANCING MC 403.3.1.5.
1		DX	DRYER EXHAUST RISER	B. SMOKE CONTROL SYSTEMS - MC 513.3
↓	SIDEWALL RETURN GRILLE	DXF	DRYER EXHAUST FAN	4. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIA CAPACITIES, ETC, SHALL COMPLY WITH THE REFERENCED CC
, 		EDH	ELECTRIC DUCT HEATER	OR STANDARD:
	ICT ACCESSORIES	EER	ENERGY EFFICIENCY RATIO	B. STANDARDS OF HEATING – 2018 IMC, 309.1
		EUH	ELECTRIC UNIT HEATER	C. SMOKE DETECTORS AND FIRE AND SMOKE DAMPERS – 2018 IMC 606 & 607 RESPECTIVELY
J – Į – J		EG		D. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FO AIR DISTRIBUTION SYSTEMS - 2018 IMC, 513
<u>}</u> −−	FIRE DAMPER W/ ACCESS DOOR	FC		5 MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPAC
М		FD/AD	FIRE DAMPER W/ACCESS DOOR	DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
	MOTORIZED DAMPER W/ ACCESS DOOR	FD	FIRE DAMPER W/FUSIBLE LINK	6. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2018 II
		FSD	FIRE SMOKE DAMPER	- CHAPTER 4.
Г^Т , Т		GXF	GENERAL EXHAUST FAN	7. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT
	VOLUME DAMPER W/ ACCESS DOOR	HSPF	HEATING SEASONAL	CONTINUOUS OPERATION AT ALL TIMES DURING THE NORM OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2018 II
LVT AD T AD			PERFORMANCE FACTOR	403.3
		IEER	INTEGRATED ENERGY	8. HVAC DUCTS AND PLENUMS INSULATED IN ACCORDANCE W
	DUCT HEATER W/ ACCESS DOOR		EFFICIENCY RATIO	403.11.1 AND CONSTRUCTED IN ACCORDANCE WITH SECT
			MOTORIZED DAMPER	FOUNDATION INSPECTION.
Į_ <mark>₽</mark> _Į			OUTSIDE AIR INTAKE RISER	9. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICA
FF	FIRE SMORE DAMPER W ACCESS PANEL	RFF	REFRIGERANT PIPING	ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTE SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDER
	H_{Λ}	RG	RETURN GRILLE	AS BEING APPROVED OR IN ACCORDANCE WITH APPLICAE CODES.
			SEASONAL ENERGY	
CP	NEW CONDENSATE PIPING	SEER	EFFICIENCY RATIO	ASHRAE/ACCA 183.
REF	NEW REFRIGERANT PIPING	SG	SUPPLY GRILLE	11. SMOKE DETECTOR SHALL MEET UL268A.
	Rols and sensors	TR	TRANSFER DUCT	12. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT
		ТХ	TOILET EXHAUST RISER	POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT CONTINUOUS OPERATION AT ALL TIMES DURING THE NORM
<u>(U)</u>	THERMOSTAT	TXF	TOILET EXHAUST FAN	OCCUPANCY OF THE STRUCTURE AS REQUIRED BY MC 403.3
(T) ^R	TEMPERATURE SENSOR	VD	VOLUME DAMPER	13. FIRE DAMPERS SHALL BE MANUFACTURED AND INSTALLED
S	MANUAL ON/OFF SWITCH	VFD	VARIABLE FREQUENCY DRIVE	ACCORDANCE WITH UL 555, STANDARDS FOR FIRE DAMPE AND CEILING DAMPERS.
$\langle S \rangle$	SMOKE DETECTOR	W.M.S.	WIRE MESH SCREEN	
	Ductwork		BACK DRAFT DAMPER	DAMPERS AND CEILING DAMPERS LOCATED WITHIN THE DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL
				- INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS
======	AIR DUCT W/ 1.5" ACOUSTICAL LINING	- BD	RETURN DIFFUSER	
<u> </u>	FLEXIBLE DUCT	EG	EXHAUST GRILLE	FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION A
	FLEXIBLE CONNECTION		I	LUCATION.
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)			16. EQUIPMENT USE PERMIT SHALL BE OBTAINED BY CONTRACTOR
ø12	ROUND DUCT (DIAMETER)	1		
\mathbb{S}	ROUND DUCT CROSS SECTION	-		
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION	-		
	RETURN AIR RECTANGULAR DUCT	1		SCOPE OF WORK
	CROSS SECTION			

ENERGY CODE COMPLIANCE STATEMENT

TO THE	BEST	OF MY	PROFES	SIONAL K	NOWLEDGE	AND
JUDGEME	NT, TH	ESE PLA	NS AND	SPECIFIC	ATION AR	E IN
COMPLIAN	ICE W	ITH THE	2018	INTERNA1	TONAL EI	NERGY
CONSERV	ATION CO	DDE.				

	ME	ECHANICAL DRAWING LIST
1	M0.1	MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS
2	M0.2	MECHANICAL SPECIFICATIONS(1 OF 3)
3	M0.3	MECHANICAL SPECIFICATIONS(2 OF 3)
4	M1.0	MECHANICAL FLOOR PLAN
5	M1.1	MECHANICAL ROOF PLAN
6	М3.0	MECHANICAL DETAILS
7	M3.1	MECHANICAL DETAILS
8	M4.0	HOOD DATA
9	M4.1	HOOD DATA
10	M4.2	HOOD DATA
11	M4.3	HOOD DATA
12	M4.4	HOOD DATA
13	M4.5	HOOD DATA
14	M4.6	HOOD DATA
15	M4.7	HOOD DATA
16	M5.0	EQUIPMENT SCHEDULE

- EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL
- AFFECTED BY DEFECTS. REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

ARD, ILLINOIS BUILDING DEPARTMENT NOTES

SHALL COMPLY WITH APPLICABLE SECTIONS OF 2018 BUILDING CODE AND ALL AMENDMENTS AND RULES FIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

NTRACTOR SHALL ENGAGE THE THE SERVICES OF A ONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL ONS AND TESTS.

TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES HEATING SEASON: 68 DEG. FAHRENHEIT. ON FOR ALL AREA SHALL COMPLY WITH 2018 IMC.

SCOPE OF WORK

1. KITCHEN HOOD, EXHAUST FAN & MAKEUP AIR UNIT TO BE PROVIDED FOR KITCHEN VENTILATION. 2. EXISTING RTU SUPPLY AND RETURN DUCTING TO BE MODIFIED AS PER THE NEW RCP LAYOUT.

NOTE TO CONTRACTOR

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS ANI APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER. 2. 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

REGULATIONS WHERE THEY APPLY TO THIS WORK. 3. 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 ONE YEAR 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

4.CONTRACTOR SHALL SAFELY SUPPLY INSTALL TEST AND COMMISSION HVAC SYSTEM OF THE BUILDING. FOLLOWING HVAC SYSTEM SHALL BE PROVIDED TO VARIOUS FLOOR OF THE BUILDING. A VRF SYSTEM FOR CATERING HEATING AND COOLING REQUIREMENTS OF THE BUILDING.

GENERAL NOTES

- I. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON 27. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE DRAWINGS
- 2. 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 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.
- AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES APPLY. DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS ORDEFINITIONS: ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- 4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS1) DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- 5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE RELATED ACCESSORIES. PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE 5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH 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.
- 6. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- 7. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT COORDINATION WITH THE EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES IS REQUIRED.
- 8. 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
- 9. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- 10. 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% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- 11. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING 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.
- 12. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIA (FIBERGLASS INSULATION IS NOT ACCEPTABLE
- 13. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- 14. 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.
- 15. ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.

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 GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY

LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.

- 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.
- 18. 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.
- 19. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 20. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
- 21. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
- 23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
- 24. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
- 25. 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.

- 26. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF SPECIFIED AND AS REQUIRED BY CODE.
- INSPECTION AND APPROVAL. 2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, 28. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY. "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR 3. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR BREVITY. CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY

<u>GENERAL:</u>

BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED 29. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS. THE

"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

AND DELIVER COMPLETE WITH RELATED ACCESSORIES.



CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE 1. PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS

GENERAL HVAC NOTES

- DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
- 4. WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT. IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
- ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
- 6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. CONTRACT DOCUMENTS, AND APPLICABLE CODES AND **REGULATIONS.**
- 7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL
- 3. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND ROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR INAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
- 9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.
- 10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.
- 11. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FT. OF, ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS. DO THE SAME FOR SUPPORTS OF STEAM MAINS WITHIN 50 FT. OF BOILER OR PRESSURE-REDUCING VALVES.
- 12. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS OF STEAM MAINS WITHIN 50 FT. OF BOILERS AND PRESSURE-REDUCING VALVES.
- 13. MAINTAIN A MINIMUM 6'-8" CLEARANCE TO THE UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC., THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
- 14. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
- 15. ALL MECHANICAL ROOM DOORS SHALL BE A MINIMUM OF 4'-0" WIDE.
- 16. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.
- 17. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
- 18. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.
- 19. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT 21. PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, BE SUPPORTED FROM A METAL DECK.
- 20. ALL EQUIPMENT. PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE 22. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE A VIBRATION-FREE INSTALLATION.
- 21. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
- 22. ALL ROOF-MOUNTED EQUIPMENT CURBS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
- 23. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
- 24. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
- 25. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT AND ROOFTOP UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
- 26. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.
- 27. REINFORCEMENT, DETAILING, AND PLACEMENT OF CONCRETE SHALL CONFORM TO ASTM 315 AND ACI 318. CONCRETE SHALL CONFORM TO ASTM C94. CONCRETE WORK SHALL CONFORM TO ACI 318 PART ENTITLED "CONSTRUCTION REQUIREMENTS".COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 3.000 PSI. TOTAL AIR CONTENT OR EXTERIOR CONCRETE SHALL BE BETWEEN 5 AND 7 PERCENT BY VOLUME. SLUMP SHALL BE BETWEEN 3 AND 4 IN. CONCRETE SHALL BE CURED FOR 7 DAY AFTER PLACEMENT.
- 28. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 6 IN. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 6 IN. ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR
- 29. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
- 30. 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 STANDARDS.

- HVAC DUCTWORK SHEET METAL
- 1. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK. ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.
- 2. CONTRACTOR TO CHECK AND CORRECT ANY AND ALL DEFICIENCIES IN EXISTING DUCTS. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAF
- 3. PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.
- 4. PROVIDE R-12 ACOUSTICAL LINING FROM AC UNIT UPTO 20'.
- 5. RE-INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.
- 6. CONTRACTOR SHALL SUPPLY AND INSTALL ALL NECESSARY SUPPLY DIFFUSERS AND RETURN AIR REGISTERS WHERE INDICATED ON THE DRAWING. COORDINATE LOCATION OF DIFFUSERS AND REGISTERS WITH REFLECTED CEILING PLAN.
- 7. IN CORRIDORS WHERE CEILING SPEAKERS AND AIR DIFFUSERS ARE INDICATED BETWEEN THE SAME LIGHT FIXTURES, INSTALL BOTH DEVICES AT THE QUARTER POINTS BETWEEN THE FIXTURES.
- 8. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS AND HUMIDISTAT 4'-0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
- 9. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
- 10. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.
- 11. PROVIDE ALL 90-DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN DISHWASHER, KITCHEN, AND LAUNDRY EXHAUSTS SHALL BE OF UN-VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1-1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.
- 12. COORDINATE DIFFUSER, REGISTER, AND GRILL LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
- 13. FIELD-ERECTED AND FACTORY-ASSEMBLED AIR HANDLING UNIT COILS SHALL BE ARRANGED FOR REMOVAL FROM THE UPSTREAM SIDE WITHOUT DISMANTLING SUPPORTS. PROVIDE GALVANIZED STRUCTURAL STEEL SUPPORTS FOR ALL COILS (EXCEPT THE LOWEST COIL) IN BANKS OVER TWO COILS HIGH TO PERMIT THE INDEPENDENT REMOVAL OF ANY COIL.
- 14. ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.
- 15. LOCATE ALL MECHANICAL EQUIPMENT (SINGLE DUCT, DUAL DUCT, VARIABLE VOLUME, CONSTANT VOLUME, AND FAN-POWERED BOXES, FAN COIL UNITS, CABINET HEATERS, UNIT HEATERS, UNIT VENTILATORS, COILS, STEAM HUMIDIFIERS, ETC.) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS. CONTROLS, AND VALVING.
- 16. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS (SUPPLY, RETURN, AND EXHAUST) CONNECTED TO AIR HANDLING UNITS, FANS, AND OTHER EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.
- 17. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.
- 18. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.
- 19. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
- 20. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, HUMIDIFIERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
- ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
- CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
- 23. SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY THE ELECTRICAL CONTRACTOR. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR MOUNTING THE SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.
- 24. TERMINATE GAS VENTS FOR UNIT HEATERS, WATER HEATERS, HIGH-PRESSURE PARTS WASHERS, HIGH-PRESSURE CLEANERS, AND OTHER GAS APPLIANCES A MINIMUM OF 30 IN. ABOVE THE ROOF WITH RAIN CAP (EDIT ANY APPLIANCES AND THE HEIGHT ABOVE THE ROOF TO MEET THE CODE AND SUIT PROJECT REQUIREMENTS).
- 25. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.
- 26. EXTERIOR LOUVERS ARE INDICATED FOR SIZE, GENERAL LOCATION AND PERFORMANCE ONLY. DETAILED LOUVER DESCRIPTIONS ARE PROVIDED IN THE ARCHITECTURAL SPECIFICATIONS.



SPECIFICATIONS

SECTION 0001 - NOTICE TO BIDDERS

- 1.1 BIDDERS REPRESENTATIONS A. THE BIDDER BY MAKING A BID REPRESENTS THAT: THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.
- B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.
- C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.
- D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.
- E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.

1.2 EXISTING CONDITIONS AND COORDINATION

- A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.
- B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.

1.3 RESPONSIBILITIES

- A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.
- B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON-TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.
- C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT-DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT-DOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK

1.1 WORKMANSHIP

- A. ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE HVAC PIPING YEAR FROM DATE OF FINAL ACCEPTANCE.
- B. ALL DEFECTS WHICH DEVELOP OR ARE DISCOVERED WITHIN THIS PERIOD SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE ARCHITECT OR BUILDING MANAGER AT NO ADDITIONAL COST TO THE OWNER.
- C. UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL

1.2 CODE COMPLIANCE A. ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

END OF SECTION 0101

SECTION 0102 - REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.

1.2 SUBMITTALS

- A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.
- 1.3 RECORD DRAWINGS
- A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

1.4 EQUIPMENT OPERATING 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 ELECTRONIC 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.

END OF SECTION 0102

- SECTION 078413-PENETRATION FIRE-STOPPING 1.1 QUALITY ASSURANCE
- A. INSTALLER QUALIFICATIONS: FM AN GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
- B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL
- 1.2 PENETRATION FIRESTOPPING A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
- B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND
- T-RATINGS PER ASTM E 814 OR UL 1479: C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER
- UL 1479.
- D. W-RATINGS: PER UL 1479.
- 1.3 INSTALLATION A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
- 1.4 FIELD QUALITY CONTROL A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
- 1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE
- WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED. THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES. MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:

- a. LATEX SEALANT
- b. SILICONE SEALANT c. INTUMESCENT PUTTY
- d. MORTAR
- h. SILICONE FOAM
- i. PILLOWS/BAGS . INTUMESCENT WRAP STRIPS
- k. INTUMESCENT COMPOSITE SHEET

1.6 MANUFACTURERS

- 1. HILTI CONSTRUCTION CHEMICAL, INC
- 2. TREMCO INC.
- 3. 3M FIRE PROTECTION PRODUCTS

END OF SECTION 078413

SECTION 230517 – SLEEVES AND SLEEVE SEALS FOR

1.1 SLEEVE-SEAL SYSTEMS

- C. FIELD-ASSEMBLED. MODULAR SEALING FOR FILLING ANNULAR SPACE BETWE SLEEVE.
- 1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
- 2. PRESSURE PLATES: CARBON STEEL, PLASTIC,
- STAINLESS STEEL. 3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS
- STEEL B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- 1. ADVANCE PRODUCTS & SYSTEMS, INC.
- 2. CALPICO, INC.
- 3. METRAFLEX COMPANY (THE).
- 4. PIPELINE SEAL AND INSULATOR, INC.
- 5. PROCO PRODUCTS, INC.

1.2 SLEEVE-SEAL FITTINGS A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.

1.3 GROUT A. NON-SHRINK, FACTORY PACKAGED.

- 1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE A. USE SLEEVES AND SLEEVE SEALS FOR THE
- FOLLOWING PIPING-PENETRATION APPLICATIONS: 1. INTERIOR PARTITIONS:
 - a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES, PVC-PIPE
 - SLEEVES. b. PIPING NPS 6 (DN 150) AND LARGER:

GALVANIZED-STEEL-SHEET SLEEVES.

END OF SECTION 230517



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- 1.2 SUBMITTALS A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
- 1.3 QUALITY ASSURANCE A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE -STEEL."
- 1.4 COMPONENTS A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL

STEEL

SECTION 230518 - ESCUTCHEONS FOR HVAC

PRODUCTS PART 2 –

PIPING

- 2.1 ESCUTCHEONS A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED AND ROUGH-BRASS FINISH AND SETSCREW FASTENER.
- B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
- C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS.
- 2.2 FLOOR PLATES
- A. ONE-PIECE FLOOR PLATES: CAST-IRON FLANGE WITH HOLES FOR FASTENERS.
- PART 3 -EXECUTION
- 3.1 INSTALLATION A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS. B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.
 - 1. ESCUTCHEONS FOR NEW PIPING:
 - a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL: ONE-PIECE, DEEP-PATTERN TYPE.
 - b. INSULATED PIPING ONE-PIECE. STAMPED-STEEL TYPE. c. BARE PIPING AT WALL AND FLOOR
 - PENETRATIONS IN FINISHED SPACES: ONE-PIECE. CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
 - d. BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.
- 3.2 FIELD QUALITY CONTROL
- A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS. END OF SECTION 230518
- SECTION 230529 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
 - ORMANCE REQUIREMENTS ELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS ND EQUIPMENT SUPPORTS, INCLUDING OMPREHENSIVE ENGINEERING ANALYSIS BY A
 - UALIFIED PROFESSIONAL ENGINEER, USING ERFORMANCE REQUIREMENTS AND DESIGN CRITERIA IDICATED.
 - TRUCTURAL PERFORMANCE: HANGERS AND UPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL ITHSTAND THE EFFECTS OF GRAVITY LOADS AND TRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
 - 1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
 - 2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.
 - 3. DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
- B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS C. FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY
- COMPOSITES, COOPER B-LINE D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
- E. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE F. THERMAL-HANGER SHIELD INSERTS:
- G. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE,
- HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYPE
- I. EQUIPMENT SUPPORTS.

- BALANCING FOR HVAC
- 1.1 SUMMARY A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
 - 1. AIR SYSTEMS: CONSTANT-VOLUME.
 - 2. CONDENSING UNITS.
 - HEAT-TRANSFER COILS.
- 4. EXISTING SYSTEMS TOILET AND KITCHEN EXHAUST.
- 1.2 QUALITY ASSURANCE A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.
- 1.3 EXECUTION
- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S **RECOMMENDATIONS.**
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.
- END OF SECTION 230593
- SECTION 230713 DUCT INSULATION
- 1.1 QUALITY ASSURANCE
- SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTME 84.
- 1.2 FIELD QUALITY CONTROL
- A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.
- INDOOR DUCT AND PLENUM INSULATION SCHEDULE;
- A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
- B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS: UNCONDITIONED SPACES WITHIN BUILDING: R-6 WITHIN BUILDING ENVELOPE ASSEMBLY: R-6 OUTSIDE OF BUILDING: R-12
- 1.4 ITEMS NOT INSULATED:
- 1. FIBROUS-GLASS DUCTS. 2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT
- THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
- 3. FACTORY-INSILATED FLEXIBLE DUCTS. 4. FACTORY-INSULATED PLENUMS AND CASINGS.
- 5. FLEXIBLE CONNECTORS.
- 6. VIBRATION-CONTROL DEVICES.
- 7. 'FACTORY-INSULATED ACCESS PANELS AND DOORS. 8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.
- 1.5 PRODUCTS
- A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
- 1. JOHNS-MANVILLE 2. OWENS-CORNING
- 1.6 ACOUSTICAL TREATMENT 1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH R-12 INSULATION AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,
- 2. ALL AIR-CONDITIONING DUCT WORKS. RUNNING IN THE OPEN CEILING AREA SHALL HAVE INTERNAL LINING.
- END OF SECTION 230713

SECTION 230593 - TESTING, ADJUSTING, AND SECTION 233113 - METAL DUCTS 1.1 CONSTRUCTION

- A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2-1/2INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.
- B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA KITCHEN EXHAUST DUCTWORK: 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:
- 1. DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES, FORMED FROM 1-1/2"X1-1/2"X1/8" GALVANIZED ANGLES, TACK-WELDED OR RIVETED TO THE DUCT THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO UPRIGHT OF ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M-1202 OR APPROVED EQUAL.
- 2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
- 3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6' CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
- 4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30-03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30-02 AND COVERED WITH APPROVED SEALING TAPE.
- 5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
- 6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.
- WHERE LATEST EDITION OF SMACNA DOES NO CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE C. ALL EXHAUST DUCT WORK FROM DISHWASHERS, POT SINKS USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:



WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS: 1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.

2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.

FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS.

- ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.
- 1.2 MATERIALS A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
- B. DOUBLE-WALL RECTANGULAR DUCTS AND FITTINGS. 1. FIBROUS-GLASS OR FLEXIBLE ELASTOMERIC DUCT
- LINER FOR INTERSTITIAL INSULATION.
- 2. PERFORATED INNER DUCT. C. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND
- FITTINGS. D. DOUBLE-WALL ROUND AND FLAT-OVAL DUCTS AND
- FITTINGS.
- 1. FIBROUS-GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION. 2. PERFORATED INNER DUCT.
- E. SHEET METAL MATERIALS:
- 1. GALVANIZED SHEET STEEL. 2. PVC-COATED, GALVANIZED SHEET STEEL.
- 3. CARBON-STEEL SHEETS.

1. FIBROUS GLASS, TYPE I, FLEXIBLE

1. TWO-PART TAPE SEALING SYSTEM.

6. ROUND DUCT JOINT O-RING SEALS.

4. STAINLESS-STEEL SHEETS

5. ALUMINUM SHEETS.

COATING.

3. NATURAL FIBER

G. SEALANT MATERIALS:

2. FLEXIBLE ELASTOMERIC.

4. FLANGED JOINT SEALANT.

B. STAINLESS-STEEL RESTRAINT CABLES

CLAMPED TO HANGER ROD.

ADJUSTING, AND BALANCING.

1. AIR OUTLETS AND INLETS.

B. CLEAN THE FOLLOWING ITEMS:

5. FLANGE GASKETS.

A. CHANNEL SUPPORT SYSTEM.

1.3 SEISMIC-RESTRAINT DEVICES

1.4 DUCT CLEANING

F. DUCT LINER:

- ON 8 FOOT ANGLES

- 6. FACTORY-APPLIED ANTI-MICROBIAL COATING.
- a. WITH ANTI-MICROBIAL EROSION-RESISTANT
- 2. WATER-BASED JOINT AND SEAM SEALANT.
- 3. SOLVENT-BASED JOINT AND SEAM SEALANT.
- C. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS OR REINFORCING STEEL ANGLE
- A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING,
- 2. SUPPLY, RETURN, AND EXHAUST FANS.

- 3. AIR-HANDLING UNITS. 4. COILS AND RELATED COMPONENTS.
- 5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- 6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- 7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
- A. ALL HORIZONTAL AND VERTICAL KITCHEN EXHAUST DUCTWORK SHALL BE CONSTRUCTED OF 16 GAUGE MINIMUM BLACK IRON OR PREFABRICATED DOUBLE WALL GREASE DUCTWORK APPROVED FOR KITCHEN EXHAUST APPLICATION WITH ETL LISTED TO UL 1978 AND UL 2221 SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER INSTALLATION INSTRUCTIONS AND LOCAL CODES. ALL SEAMS AND JOINTS SHALL HAVE A LIQUID TIGHT CONTINUOUS EXTERNAL WELD AS PER NFPA 96 FOR BLACK IRON DUCTWORK. THE EXTERIOR OF ALL KITCHEN RANGE BLACK IRON EXHAUST DUCTS SHALL HAVE 1-1/2" X 1-1/2" X 1/8"WELDED ANGLES, PUNCHED FOR SECURING BLOCK INSULATION. WHERE KITCHEN RANGE BLACK IRON EXHAUST DUCT RISER PASSED VERTICALLY THROUGH FLOORS OF THE BUILDING, PROVIDE ANGLE CLIPS WELDED TO THE DUCT OF REQUIRED SIZES TO SUPPORT THE WEIGHT OF THE RISER SECTIONS ON THE BUILDING STRUC--CTURE AT EACH OF THE FLOOR LEVELS. PROVIDE AND INSTALL ALL SUPPLEMENTARY STRUCTURAL STEEL IN SHAFTS TO PROPERLY SUPPORT EXHAUST DUCTWORK FROM BUILDING CONSTRUCTION. PROVIDE MINIMUM 12"X12" ACCESE DOOR ON SIDE OF HORIZONTAL DUCTS AT 12' SPACING, ACCESS DOORS SHALL BE SIMILAR TO DESCRIPTION IN "ACCESS DOORS IN SHEET METAL WORK WORK" EXCEPT THAT DOOR GAUGE SHALL BE THE SAME AS DUCT GAUGE. ALL HORIZONTAL DUCTS SHALL BE PITCHED BACK TO HOODS 1/4 " PER FOOT OR MAXIMUM PITCH ATTAINABLE. THIS TRADE SHALL DRILL OR CUT ALL REQUIRED OPENING AS REQUIRED BY THE DUCTS EXTINGUISHING SYSTEM AND AS COORDINATED WITH THE TRADE SUPPLYING THE EXTINGUISHING SPRAY HEADS. MAINTAIN 6" CLEARANCE BETWEEN SHEET METAL DUCT AND ANY SURFACE SUCH AS SLAB . BEAM OR SHAFT ENCLOSURE.
- B. ALL HORIZONTAL AND VERTICAL KITCHEN RANGE BLACK IRON EXHAUST DUCTWORK GAUGES SHALL BE AS FOLLOWS. SIZE GAUGE BLACK IRON
 - S THEN 1

OVENS. OR OTHER KITCHEN APPARATUS EMITTING HEAT OR VAPOR (OTHER THEN RANGE HOOD EXHAUST) SHALL BE CONSTRUCTED OF ALUMINUM WITH WELDED JOINTS (USING MACNA STANDARDS) AND MADE WATERTIGHT. THIS INCLUDES ALL DUCTWORK FROM THE EQUIPMENTS TO THE EXHAUST FAN AND FROM THE EXHAUST FAN TO THE DISCHARGE AIR LOUVERS. THE DUCTS SHALL PITCH BACK TO THE DISHWASHER FROM THE VERTICAL RISER OR WHERE THE RUN OF DUCT IS TOO LONG SHALL CHANGE PITCH TO DRAIN TO THE BOTTOM OF THE RISER. WHERE DUCTS LEAVE SHAFT TO ENTER THE EXHAUST FAN THEY SHALL ALSO BE PITCHED TO A LOW POINT AWAY FROM THE RISER. WELD 3/4 " DRAINS AT ALL LOW POINTS AND RUN TO THE NEAREST DRAIN. THIS TRADE SHALL BE HELD RESPONSIBLE) PROVIDE A WATERTIGHT AND DRAINED SYSTEM. REGARDLESS OF THE QUANTITY OF STEAM OR WATER VAPOR LEAVING THE EQUIPMENTS.

END OF SECTION 233113

DUCTWORK INSULATION

A. INSULATE ALL DUCTWORK IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

INS	SULATION SCHE	DULE - DUCT	WORK	
SERVICE	LOCATION	<u>THICKNESS</u>	TYPE	<u>FINISH</u>
SUPP/RET	CONCEALED	1.5"	D-1	VAPORSEAL
INTAKE	ALL	2"	D-3	VAPORSEAL
SUPP/RET	EXPOSED	1.5"	D-2	VAPORSEAL
SUPPLY	EXTERIOR	2"	D-3	VAPORSEAL

- B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING TO REMAIN AND WAS DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS.
- C. NON-INSULATED DUCTWORK:
- 1) WHERE SOUND LINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.
- 2) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACES IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.
- D. MATERIAL:
- 1) TYPE D-1: MINIMUM 1-LB DENSITY FIBERGLASS BLANKET, MAXIMUM 0.28 K-FACTOR AT 75 ADEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FOIL-SKRIM-KRAFT FACING SIMILAR TO MANVILLE MICROLITE.
- 2) TYPE D-2: 3 LB. FIBERGLASS BOARD. THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE 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 MANVILLE TYPE 814 SPIN-GLAS AP.
- 3) TYPE D-3: MINIMUM 6 LB FIBERGLASS BOARD. MAXIMUM 0.22 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY APPLIED ALL PURPOSE OR ALL SERVICE FACING. SIMILAR TO MANVILLE 817 SPIN-GLAS AP.
- E. INSTALLATION: 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.

KITCHEN EXHAUST DUCT:

- A MINIMUM INSULATION COVERING OF 2 INCHES (51 MM) OF MAGNESIUM OR CALCIUM SILICATE BLOCK. WITH STAGGERED JOINTS, ATTACHED WITH GALVANIZED STEEL WIRE OR MATERIAL ASSEMBLY EQUIVALENT IN INSULATING AND FIRE-RESISTANT QUALITIES WHICH CANNOT BE PENETRATED BY GREASE SHALL BE APPLIED TO ALL KITCHEN EXHAUST DUCTS INSIDE THE BUILDING.
- A. NON-INSULATED DUCTWORK:
- 1) WHERE SOUND LINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION. 2) KITCHEN EXHAUST DUCT RUNNING OUTDOOR SHALL BE PROTECTED BY PAINT OR OTHER WEATHERPROOF PROTECTIVE COATING. STAINLESS STEEL DUCTS SHALL NOT
- REQUIRE PAINT OR WEATHERPROOF PROTECTIVE COATING.
- B) **PIPING INSULATION**
- A. INSULATE ALL PIPING IN ACCORDANCE WITH INSULATION SCHEDULE EXCEPT AS OTHERWISE NOTED.

	INSULATION	<u>SCHEDULE – PIF</u>	<u>PING</u>
SERVICE	SIZE	THICKNESS	MATERIAL FINISH
REFRIGERANT	PIPING	1.5"	P-6

- 1.0" CONDENSER DRAIN PIPING P-6 (IF RUNNING THROUGH EXTERIOR WALL)
- B. PIPING, VALVES AND FITTINGS TO BE INSULATED: 1) LOW TEMPERATURE PIPING SYSTEMS - 0 TO 60 DEG F INCLUDING: a.CONDENSATE DRAIN PIPING.
- 3)PROTECTIVE COVERINGS SHALL BE INSTALLED ON AREAS OF INSULATION THAT ARE EXPOSED TO WEATHER OR SUBJECT TO MECHANICAL DAMAGE. THE PROTECTIVE COVERING SHALL
- a.ARMA-CHEK SILVER" MULTI-LAYER LAMINATE OF ALUMINUM. COATED WITH A UV PROTECTIVE FILM AND BACKED WITH A FLEXIBLE PVC FILM. THE MATERIAL SHOULD BE ADHERED WITH ARMAFLEX 520 ADHESIVE OR EQUIVALENT, AND ALL JOINS AND SEAMS SECURED WITH "ARMA-CHEK SILVER TAPE". INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS.
- OR b.HIGH DENSITY RUBBER CLADDING OF THE "ARMA-CHECK R" TYPE BONDED USING AN APPROPRIATE FULL CONTACT ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A WEATHER-PROOF MASTIC SEALANT SHALL BE APPLIED OVER ALL SEAMS AND JOINTS. ALL MATERIAL SHALL BE OVERLAPPED AND STAGGERED IN SUCH A WAY AS TO ENSURE A WATERSHED IS ALWAYS PROVIDED. INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.
- c.METAL CLADDING, COMPRISED OF COATED SHEET METAL, WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER-PROOF WITH SILICONE SEALANT. C. MATERIAL:
- 1) TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.24 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 ASJ.
- 2) TYPE P-3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING, MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLUX HAMFAB MOLDED FITTINGS.
- 3) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO MANVILLE HI-LO TEMP INSULATION INSERTS.
- 4) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.
- D. 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-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS. POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL 3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN.
- WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS 4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.
- E. INSTALLATION:
- 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. LAMP 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 CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC. OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR
- PROTECTION AT ALL HANGINGS. 4) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.



SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

- 1.1 PRODUCTS A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
- B. MANUFACTURERS: TITUS
- 1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS. PROVIDE PRODUCT BY ONE OF THE FOLLOWING: a. CARNES.
- b. HART & COOLEY INC.
- c. KRUEGER.
- d. METALAIRE, INC.
- e. NAILOR INDUSTRIES INC.
- C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
- D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

- C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
- D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED. END OF SECTION 233713

VIBRATION ISOLATION

A. GENERAL:

- 1) PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK. 2) INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. 3) PROVIDE LEVELING DEVICES AND APPROVED RESILIENT RESTRAINING DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4". 4) ACCEPTABLE MANUFACTURERS:
- a.MASON INDUSTRIES, INC.
- b. VIBRATION ELIMINATOR CO.
- c.KORFUND DYNAMICS CORP.
- C. FLOOR MOUNTED EQUIPMENT HAVING INTERNAL ISOLATION:

2) PROVIDE 5/16 IN.-THICK NEOPRENE ACOUSTICAL BASE PADS OF RIB.

THERMOSTATIC CONTROLS:

A. GENERAL:

- THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE INDIVIDUALLY CONTROLLED BY THERMOSTATIC CONTROLS RESPONDING TO TEMPERATURE WITHIN THE ZONE. B. DEAD BAND:
- WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEAD BAND OF AT LEAST 5°F WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.
- EXCEPTIONS: THERMOSTATS THAT REQUIRE MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.
- C. SETBACK CONTROLS:
 - HEATING SYSTEMS LOCATED IN CLIMATE ZONES 2-8 SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES ABOVE A HEATING SETPOINT ADJUSTABLE DOWN TO 55°F OR LOWER. COOLING SYSTEMS LOCATED IN CLIMATE ZONES 1B, 2B, AND 3B SHALL BE EQUIPPED WITH CONTROLS THAT HAVE THE CAPABILITY TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES BELOW A COOLING SETPOINT ADJUSTABLE UP TO 90°F OR HIGHER OR TO PREVENT HIGH SPACE HUMIDITY LEVELS.

D. AUTOMATIC SHUTDOWN:

HVAC SYSTEMS SHALL BE EQUIPPED WITH AT LEAST ONE OF THE FOLLOWING:CONTROLS THAT CAN START AND STOP THE SYSTEM UNDER DIFFERENT TIME SCHEDULES FOR SEVEN DIFFERENT DAY-TYPES PER WEEK, ARE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING LOSS OF POWER FOR A PERIOD OF AT LEAST TEN HOURS, AND INCLUDE AN ACCESSIBLE MANUAL OVERRIDE, OR EQUIVALENT FUNCTION, THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO TWO HOURS. EXCEPTION:

RESIDENTIAL OCCUPANCIES MAY USE CONTROLS THAT CAN START AND STOP THE SYSTEM UNDER TWO DIFFERENT TIME SCHEDULES PER WEEK.

- E. SETPOINT OVERLAP RESTRICTION:
- WHERE HEATING AND COOLING TO A ZONE ARE CONTROLLED BY SEPARATE ZONE THERMOSTATIC CONTROLS LOCATED WITHIN THE ZONE, MEANS (SUCH AS LIMIT SWITCHES, MECHANICAL STOPS, OR, FOR DDC SYSTEMS, SOFTWARE PROGRAMMING) SHALL BE PROVIDED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT MINUS ANY APPLICABLE PROPORTIONAL BAND.

F. HEAT PUMP SUPPLEMENTARY HEAT :

HEAT PUMPS HAVING SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL HAVE CONTROLS THAT, EXCEPT DURING DEFROST, PREVENT SUPPLEMENTARY HEAT OPERATION WHERE THE HEAT PUMP CAN PROVIDE THE HEATING LOAD.

HVAC SEQUENCE OF OPERATION:

PROVIDE ALL NECESSARY SENSORS, DAMPER ACTUATORS, CONTROL TRANSFORMERS WITH SECONDARY OVERLOAD PROTECTION, WIRING AND CONDUIT TO ACCOMPLISH FOLLOWING SEQUENCE OF OPERATION: ROOFTOP UNIT:

THERMOSTATS SHALL BE SET TO DETERMINE OCCUPIED AND UNOCCUPIED HOURS OF OPERATION. HOURS SHALL BE COORDINATED WITH OWNER. ROOFTOP UNITS SHALL BE INTERLOCKED WITH KITCHEN EXHAUST FANS TO PROVIDE MAKE-UP AIR FOR HOODS.

OCCUPIED MODE:

AIR DAMPER SHALL OPEN TO MINIMUM POSITION TO DELIVER SCHEDULED QUANTITY OF VENTILATION AIR. SUPPLY FAN SPEED SHALL VARY AIRFLOW AS A

STAGE COOLING, AND NON-HEATING TIMES, SUPPLY FAN SHALL RUN AT MINIMUM SPEED. DURING SECOND STAGE COOLING AND HEATING TIMES, SUPPLY FAN SHALL RUN AT FULL SPEED. OUTSIDE AIR DAMPER SHALL MODULATE POSITION TO MAINTAIN REQUIRED QUANTITY OF OUTSIDE AIR AS SUPPLY FAN VARIES SPEED.

COOLING: WHEN SPACE TEMPERATURE RISES ABOVE OCCUPIED COOLING SET POINT, PACKAGED DIRECT EXPANSION COOLING SHALL BE ENERGIZED AND STAGE AS REQUIRED TO MAINTAIN SPACE TEMPERATURE.

<u>ECONOMIZER:</u> WHEN OUTDOOR AIR TEMPERATURE IS BELOW 65°F (ADJUSTABLE), ECONOMIZER SHALL MODULATE BETWEEN ITS MINIMUM SET POINT AND FULL OPEN TO MAINTAIN SPACE COOLING SET POINT, SUBJECT TO A MIXED AIR TEMPERATURE LOW LIMIT CONTROLLER SET POINT OF 55°F. IF OUTDOOR TEMPERATURE IS ABOVE COMPRESSOR LOCKOUT THERMOSTAT SETTING, MECHANICAL COOLING SHALL BE ENABLED AS SECOND STAGE OF COOLING.

DEHUMIDIFICATION (WHERE APPLICABLE): WHEN SPACE HUMIDITY READING EXCEEDS 55%RH (ADJUSTABLE), REFRIGERATION SYSTEM SHALL OPERATE AND INITIATE HOT GAS REHEAT AS REQUIRED TO MAINTAIN SPACE HUMIDITY.

WHEN SPACE TEMPERATURE FALLS BELOW OCCUPIED HEATING SET POINT, GAS HEATER SHALL BE ENERGIZED IN STAGES (WHERE APPLICABLE) TO MAINTAIN SPACE TEMPERATURE.

UNOCCUPIED MODE:

<u>HEATING:</u>

<u>COOLING:</u> UPON SIGNAL FROM THERMOSTAT. SUPPLY FAN SHALL BE DEENERGIZED AND OUTSIDE AIR DAMPER SHALL CLOSE. IF SPACE TEMPERATURE RISES 2 DEGREES OR MORE ABOVE UNOCCUPIED SET POINT, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, SUPPLY FAN SHALL BE ACTIVATED AND DX COOLING SHALL BE STAGED AS REQUIRED TO MAINTAIN UNOCCUPIED SPACE TEMPERATURE. WHEN TEMPERATURE FALLS 2 DEGREES BELOW SET POINT, COMPRESSOR SHALL BE DE-ENERGIZED AND SUPPLY FAN SHALL SHUT

HEATING:

FAN SHALL BE DE-ENERGIZED AND OUTSIDE AIR DAMPER SHALL CLOSE. IF SPACE TEMPERATURE FALLS 2 DEGREES OR MORE BELOW SET POINT, OUTSIDE AIR DAMPER SHALL REMAIN CLOSED, SUPPLY FAN SHALL BE ACTIVATED AND GAS HEAT SHALL BE ENERGIZED UNTIL UNOCCUPIED SPACE TEMPERATURE IS SATISFIED. WHEN TEMPERATURE RISES 2 DEGREES ABOVE SET POINT, GAS HEAT SHALL BE DISABLED AND SUPPLY FAN SHALL BE DE-ENERGIZED.

MORNING WARM-UP/COOL DOWN: CONTROLS SHALL BE CAPABLE OF AUTOMATICALLY ADJUSTING DAILY START TIME OF UNIT IN ORDER TO BRING EACH SPACE TO DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

OCCUPIED COOLING SET POINT 75 DEGREES OCCUPIED HEATING SET POINT: 70 DEGREES UNOCCUPIED COOLING SET POINT: 85 DEGREES UNOCCUPIED HEATING SET POINT: 55 DEGREES

A SMOKE DETECTOR SHALL DE-ENERGIZE ROOFTOP UNIT SUPPLY FAN AND CLOSE OUTSIDE AIR DAMPER IN BOTH OCCUPIED AND UNOCCUPIED MODES WHENEVER SMOKE IS SENSED BY SMOKE DETECTORS.

SUPPLY FAN SHALL RUN CONTINUOUSLY AND OUTSIDE FUNCTION OF LOAD. DURING NON-COOLING, FIRST

UPON A SIGNAL FROM THERMOSTAT, SUPPLY







1) MECHANICAL FLOOR PLAN SCALE: 1/4" = 1'-0"





PROVIDE SMOKE TEST TO PROOF TIGHTNESS OF THE GREASE DUCT.

- CLEANOUT OPENINGS SHALL BE PROVIDED AT EVERY CHANGE IN DIRECTION, WITHIN 3 FEET OF THE EXHAUST FAN.

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GREASE DUCT BRACING AND SUPPORTS SHALL BE OF NON-COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LADS WITHIN THE STREET LIMITATIONS OF THE NEW YORK CITY BUILDING CODE. BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE DUCT WALLS. – A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EACH VERTICAL RISER WITH PROVISION FOR CLEANOUT IN ACCORDANCE WITH NFPA 96.

- A GREASE DUCT SERVING THE TYPE-1 HOOD THAT PENETRATED A CEILING, WALL OR FLOOR SHALL BE ENCLOSED FROM THE FIRE POINT OF PENETRATION TO THE OUTLET TERMINAL. DUCT ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THAT OF THE FIRE-RESISTANCE RATED ASSEMBLY PENETRATED BUT NEED NOT EXCEED 2 HOURS. - KITCHEN-EXHAUST OUTLETS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM PARTS OF THE SAME OR CONTIGUOUS BUILDINGS, ADJACENT BUILDINGS AND ADJACENT PROPERTY LINE. THIS EXHAUST OUTLETS SHALL BE LOCATED NOT LESS THAN 10 FEET HORIZONTALLY FROM AND NOT LESS THAN 3 FEET ABOVE AIR INTAKE OPENINGS INTO ANY BUILDING.



GENERAL FLOOR PLAN NOTES:

- . COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND WITH A
- STRUCTURAL ENGINEER. . EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
- 3. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION. 4. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL
- EQUIPMENT SELECTED.
- 5. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER. 6. COORDINATE ALL EQUIPMENT WITH STRUCTURAL.
- 7. MAINTAIN ALL CODE AND MANUFACTURERS RECOMMENDED CLEARANCE AROUND ALL ROOF EQUIPMENT.
- 8. PROVIDE 1" CONDENSATE DRAIN FOR MAKE-UP AIR UNITS.
- 9. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR DUCTING.

FLOOR PLAN KEY NOTES:

- EXISTING 8.0 TON RTU TO REMAIN. CONTRACTOR TO CHECK ITS WORKING CONDITION, REPAIR IT IF NEEDED. TO ACHIEVE FULL PERFORMANCE OF THE UNIT. RE-BALANCE THE OUTSIDE AIR TO 550 CFM AND SUPPLY AIR TO 3200 CFM.
- (2) coordinate final location of equipment with structural drawings.
- (3) CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE SHOULD BE AT LEAST 10' AWAY FROM THE RTU'S OUTSIDE AIR INTAKE.
- CONTRACTOR TO RUN CONDENSATE DRAIN FROM RTU'S TO NEAREST ROOF DRAIN OR DOWN SPOUT. COORDINATE IN FIELD.
- EXHAUST FOR KITCHEN. HOOD IS REQUIRED AT THE COOKING STATION. RUN SHEET METAL DUCT FROM CONNECTION ON HOOD TO RESPECTIVE EXHAUST FANS. OFFSET AND TRANSITION AT CONNECTIONS AS NEEDED. VERIFY DIMENSIONS PRIOR TO FABRICATION OR INSTALLATION. VERIFY LOCATION ON SITE WITH MOST RECENT KITCHEN PLANS.
- (6) COORDINATE FINAL LOCATION OF EQUIPMENT WITH A STRUCTURAL ENGINEER
- THE ROOF SURFACE, 3 FEET AWAY FROM OPENING INTO BUILDING AND 10 FEET AWAY FROM ANY OUTSIDE AIR INTAKES.
- B PROVIDE CURB ADAPTOR TO INSTALL THE NEW MAKE-UP AIR UNIT ON THE EXISTING GENERATOR DUNNAGE.

DEMOLITION KEY NOTES:

CONTRACTOR TO VERIFY THE CONNECTION OF EXISTING EXHAUST FAN. IF HAS BEEN PROVIDED FOR OUR SPACE, THEN REMOVE AND SCRAP IT.















FOR QUESTIONS, CALL THE	
Chicago Foodservice Division REGION 55	
PHONE: (630) 377 - 2611 EMAIL: reg55@captiveaire.com	

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() '	TAG M	MODEL MANUFACTUR	ER LENGTH	MAX COOKING T	YPE APPLIANCE			<u>E</u>	EXHAUST RISF	Γ PLENUM ER(S)		- TOTAL - SUPPLY	HOOD	HOOD CC	BOW						
		4830		TEMP 600				H LENG HEIC	AHT DI	IA CFM	VEL SP	CFM	430 SS	END							AINLESS STE
	H-1FL ND	-2-PSP-F CAPTIVEAIRI	E 7' 6"	DEG	I HEAVY	200	1500 10"	14" 4'		1500	1543 -0.575"	1380	WHERE EXPOSED		FRONT				COMPONENTS GREASE EXTR		
ŀ	H-2FR ND	-2-PSP-F CAPTIVEAIRI	Ξ 7'6"	DEG	I HEAVY	200	1500 10"	14" 4	," 	1500	1543 -0.575"	1380	WHERE EXPOSED	, RIGHT	FRONT				PARTICLES FIN LARGER, WITH	- MICRONS A CORRESF	IN SIZE, AND ONDING PR
ŀ	H-3BL ND	4030 CAPTIVEAIRI	E 7' 6"	600 DEG	I HEAVY	200	1500 10"	14" 4	,"	1500	1543 -0.575"	1380	430 SS WHERE EXPOSED	, LEFT	BACK				THE CAPTRAT MANUFACTUR	GREASE-ST	DP SOLO W
ŀ	H-4BR ND	4830 CAPTIVEAIRI	Ξ 7' 6"	600 DEG	I HEAVY	200	1500 10"	14" 4	r"	1500	1543 -0.575"	1380	430 SS WHERE EXPOSED	, RIGHT	BACK				EFFICIENCY V		
	INFORM	ATION	FILTER(S)				LIGHT((S)					UTILITY CAB	INET(S)					80		
)	TAG	TYPE	QTY HEIGHT	LENGTH EFFI	ICIENCY @ 7 MICRO	NS QTY	TYPE	VG		LOCATION	SIZE	TYPE	FIRE SYSTEM		ELECTRICAL MODEL #	SWITCHES QUANTITY		HOOD I HANGING WEIGHT	NCY (%)		
-			5 00"															443			
	H-1FL C	CAPTRATE SOLO FILTER	5 20"	16" 85	% SEE FILTER SPEC	; 3	RECESSED R	OUND	NO								YES	LBS	H TYZO 40		
ŀ	H-2FR C	CAPTRATE SOLO FILTER	5 20"	16" 85	5% SEE FILTER SPEC	3	RECESSED R	OUND	NO	RIGHT	12"x48"x30"	TANK FS	4.0/4.0)/4.0			YES	1024 LBS	ED EXACT		
										LEFT	12"x48"x30"										
ŀ	H-3BL C	CAPTRATE SOLO FILTER	5 20"	16" 85	3% SEE FILTER SPEC	; 3	RECESSED R	OUND	NO	WALL MNT	12"x42"x24"				DCV-2211	1 LIGHT	YES	524 LBS	0	PARTIC	1.0 LE DIAMET
+																1 FAN		441	CAPTRATE FIL	ERS ARE BL	JILT IN CON
ŀ	H-4BR C	CAPTRATE SOLO FILTER	5 20"	16" 85	3% SEE FILTER SPEC	; 3	RECESSED RO	OUND	NO	WALL MNT	12"x54"x24"						YES	LBS	NFPA #96. NSF STANDAR UL STANDARD	⊭#2. #1046.	
) <u>D</u> D	OPTION	S																	INT. MECH. CC ULC-S649.)E (IMC).	
-	TAG FIE	ELD WRAPPER 6.00" HIG	OPTION H FRONT, LEFT.																	MBERS	
	H-1FL BAI	LANCE DAMPERS.	PLEN								1/2" - 13 TPI		HOOD COP <u>HANGIN</u> G AI	≀NER NGLE					AC-PSP (UNIT AC-PSP WALL AC-PSP ISLAN) (CANADA) - () (CANADA)	CA PATENT - CA PATEN
+	FIE	ELD WRAPPER 6.00" HIG	H FRONT, RIGHT								GRADE 5 (MIN STEEL HEX NU	IMUM) JTS.	(HARDWARE BY IN	VSTALLER)						, . <i></i>	
	H-2FR BAI RIS	LANCE DAMPERS. SER SENSOR INSTALL 6IN F	PLEN.								(MINIMUM) ST FLAT WASHEF	EEL .			9						
	FIE H-3BL BAI	LD WRAPPER 6.00" HIG LANCE DAMPERS.	H FRONT, LEFT.								1/2" - 13 TPI										
	RIS	SER SENSOR INSTALL 6IN F	PLEN.								GRADE 5 (MIN STEEL ALL-TH 1/2" - 13 TPI	IMUM) READ.									
	H-4BR BAI	LANCE DAMPERS.	п гколт, RIGHT								GRADE 5 (MIN STEEL HEX NI	IMUM) JT.	HOOD CORNER								
	RIS תיידיית ר	SER SENSOR INSTALL 6IN F	PLEN.								(MINIMUM) ST FLAT WASHEF	EEL	HANGING ANGLE (WEIGHT BEARIN ANCHOR POINT FOR HOOD).	iG ,							
. <i>F 0</i> D	TAG	POS LENGTH WIDTH		E	RISER(S)		_						1/2" GRADE 5								
1			MU	- WIDTH L A 12"	-ENG DIA CFW 24" 690	1 SP 0.210"	_						(MINIMUM) STEEL FLAT WASHER.								
	H-1FL F	Front 90" 16"	6" MU	A 12"	24" 690 24" 600	0.210	-						المالية 1/2" - 13 TPI GRADE 5 (MINIMI STEEL HEX NUT؟	UM) S.				-			
	H-2FR F	Front 102" 16"	6" MU	A 12"	24" 690) 0.210"	_				م	ASSEMBLY	NSTRUCTIONS								
	H-3BL F	Front 102" 16"	6" MU	н 12" А 12"	24 690 24" 690) 0.210"	_				HANGIN	G ANGLE MU	ST BE SUPPORTED) WITH 1/2" - 1	3 TPI GRADE 5		FI E				
	H-4BR F	Front 90" 16"	6" MU MU	A 12" A 12"	24" 690 24" 690	0.210") 0.210"	_					MI) ALL-THRE/ R POINTS WIT	AD. SANDWICH HA H 1/2" GRADE 5 (M DE 5 (MINIMUM) / /	INGING ANGL IINIMUM) STE	ES AND CEILING EL FLAT WASHERS			E MANUAL			>
<u>L-</u>	MOUNT	UTILITY CABINI	<u>דר</u>		(S)						DOUBLE AND ABO	D HEX NUT C	ONFIGURATION BI	ENEATH HOO AIN 1/4" OF F	D HANGING ANGLES						
		SIZE TV	FIRE SYSTI	EM SIZE	ELECTRICAL MODEL #		SWITCHES QUANTITY	WEIGHT			BENEAT	H BOTTOM H	EX NUT. TORQUE #	ALL HEX NUT	S TO 57 FT-LBS.		SERVICE	E DOOR		$\underbrace{\overset{LP}{1}}^{LP}$	
כ	LOOATION	1 1	-				1 LIGHT		_												
D					DCV-2211		1 FAN	140 LBS	_										42"		
)D)	WALL MNT	12"x42"x24"				1		1	1												12"
	WALL MNT	12"x42"x24" 12"x54"x24"						100 LBS													
	WALL MNT	12"x42"x24" 12"x54"x24"						100 LBS													
	WALL MNT	12"x42"x24" 12"x54"x24"						100 LBS									UTI F1	ILITY CABIN LUSH WITH	IET SHOULD BE I THE FINISHED C	IOUNTI	ED
	WALL MNT	12"x42"x24" 12"x54"x24"						100 LBS	_							C	UTI F1 WALL	ILITY CABIN LUSH WITH L. <u>MOUN</u>	NET SHOULD BE I THE FINISHED (TED UTILITI	IOUNTI EILING	ED
	WALL MNT WALL MNT	12"x42"x24" 12"x54"x24"	<u>ION — JOB</u>	<i>#5944837</i>	<u> </u>			100 LBS	 N							C	UTI F. WALI	ILITY CABIN LUSH WITH <u>MOUN</u> <u>42" L</u>	IET SHOULD BE I THE FINISHED (TED UTILITI Y 24"H X 1	IOUNTI EILING <u>CAB</u> <u>2" W</u>	ed ' <u>/NE7</u>
	WALL MNT WALL MNT WALL MNT	12"x42"x24" 12"x54"x24" G TYPE	<u>ION – JOB</u>	#5944837 SIZE	 ۲ F	FLOW POINTS	SYSTEM	100 LBS INSTALLATIO)					C	UTI F WALI	LITY CABIN LUSH WITH <u>MOUN</u> <u>42 [°] L</u>	NET SHOULD BE I THE FINISHED (TED UTILITI Y 24"H X 1	IOUNT EILING <u>CAB</u> <u>2" W</u>	ed ? <u>///E'7</u>
	WALL MNT WALL MNT WALL MNT WALL MNT	12"x42"x24" 12"x54"x24" 12"x54"x24" G TYPE 1 TANK FS	<u>ION – JOB</u>	<u>#5944837</u> SIZE 4.0/4.0/4.0 4.0/4.0/4.0	2 	FLOW POINTS 92	SYSTEM FIRE CABINET FIRE CABINET	INSTALLATIO	N LOCATI RIG⊢ LEF	ION ON HOOD 1T, HOOD 2 T, HOOD 3)					C	UTI F WALI	ILITY CABIN LUSH WITH <u>LUSH WITH</u> <u>42" L</u>	VIRED ELECTRICAL PANEL	IOUNT EILING <u>CAB</u> <u>2" W</u>	ED ? <u>///E7</u>
	WALL MNT WALL MNT WALL MNT WALL MNT	12"x42"x24" 12"x54"x24" 12"x54"x24" TYPE 1 TANK FS E(S)		#5944837 SIZE 4.0/4.0/4.0 4.0/4.0/4.0	γ F	FLOW POINTS 92	SYSTEM FIRE CABINET FIRE CABINET	INSTALLATIO	N LOCATI RIGH LEF	ION ON HOOD 1T, HOOD 2 T, HOOD 3)					Ċ	UTI F. WALI	LITY CABIN LUSH WITH <u>A2"L</u>	NET SHOULD BE I THE FINISHED (<u>TED UTILITI</u> <u>X 24"H X 1</u> VIRED ELECTRICAL PANEL AN CONTROLLERS AND LY FAN SHUT-DOWN RELAY	IOUNT EILING <u>CAB</u> <u>2" W</u>	ed ? <u>///E7</u>
FI FI SY GA	WALL MNT WALL MNT WALL MNT WALL MNT WALL MNT I FIRE NO 1 FIS- SYSTEM I SYSTEM I	12"x42"x24" 12"x54"x24" 12"x54"x24" G TYPE 1 TANK FS E(S) TAG TYPE	ION – JOB	#5944837 SIZE 4.0/4.0/4.0 4.0/4.0/4.0 SUF	? PLIED BY	FLOW POINTS 92	SYSTEM FIRE CABINET FIRE CABINET	INSTALLATIO)N LOCATI RIGH LEF	ION ON HOOD IT, HOOD 2 T, HOOD 3)					C	UTI F. WALI	ILITY CABIN LUSH WITH <u>A2"L</u>	NET SHOULD BE IN THE FINISHED CONTINUED CONTROLLERS AND AN CONTROLLERS AND AN SHUT-DOWN RELAY	IOUNT EILING <u>CAB</u> <u>2" W</u> VITH	ED <u>PINE 7</u>
OD O S FI SY GA S	WALL MNT WALL MNT WALL MNT WALL MNT I I SYSTEM FIRE SYSTEM NO I I FIRE SYSTEM NO I	12"x42"x24" $12"x54"x24"$ $12"x54"x24"$ TEM $I2"x54"x24"$ $I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"I2"x54"x24"x24"I2"x54"x24"x24"I2"x54"x24"x24"I2"x54"x24"x24"I2"x54"x24"x24"x24"I2"x54"x24"x24"I2"x54"x$	<u>ION – JOB</u> SIZE 1.500	#5944837 SIZE 4.0/4.0/4.0 4.0/4.0/4.0 SUF CAPTIVE	7 F	FLOW POINTS 92	SYSTEM FIRE CABINET FIRE CABINET	INSTALLATIO	DN LOCATI RIGH LEF GAS	ION ON HOOD T, HOOD 2 T, HOOD 3 VALVE SI	D 2 2 2 2 2 2 2 2 2 2 2 2						UTI F WALI	ILITY CABIN LUSH WITH <u>A2"L</u>	NET SHOULD BE I THE FINISHED (TED UTILITI X 24" H X 1	IOUNT: EILING <u>CAB</u> <u>2</u> "W	ED <u>27NE7</u>
OD O 3 4 <i>FI</i> SY <i>GA</i> S	WALL MNT WALL MNT WALL MNT WALL MNT WALL MNT WALL MNT I FIRE NO 1 FIS- SYSTEM NO 1 FIS- SYSTEM NO	12"x42"x24" 12"x54"x24" 12"x54"x24" 3 TYPE 1 TANK FS <i>E(S)</i> TAG TYPE	<u>ION – JOB</u> SIZE	#5944837 SIZE 4.0/4.0/4.0 4.0/4.0/4.0 SUF	7 F _	FLOW POINTS 92	SYSTEM FIRE CABINET FIRE CABINET	INSTALLATIO	JN LOCATI RIGH LEF	ION ON HOOD T, HOOD 2 T, HOOD 3	D ZE					C	UTI F WALI	LITY CABIN LUSH WITH <u>A2"L</u>	NET SHOULD BE I THE FINISHED (<u>TED UTILITI</u> <u>X 24" H X 1</u> VIRED ELECTRICAL PANEL AN CONTROLLERS AND LY FAN SHUT-DOWN RELAY	IOUNT EILING <u>CAB</u> <u>2" W</u> VITH	

00L) INFO	RMATION	<u> </u>	<u>#5944</u>	837			1			1	E,	YHAUS.				1	НООГ					A UNIC TO DE	UE S-BAFFLE D	ESIGN IN CONJ NAL FILTRATIO	JNCT N EFF
OOD NO	TAG	MODEL	MANUFACT		LENGTH	MAX COOKING TEMP	TYPE	APPLIANCE DUTY	DESIGN CFM/FT	TOTAL EXH CFM				ER(S)	VEL SP	— TOTAL — SUPPLY CFM	HOOD CONSTRUCTIO		0 ROW				FILTER 2-INCF	IS STAINLESS { DEEP HOOD C	STEEL CONSTRU HANNEL(S).	JCTIC
1	H-1FL	4830	CAPTIVE	AIRE	7' 6"	600	I	HEAVY	200	1500	10" 1	4" 4"		1500	1543 -0.575	" 1380	430 SS	LEFT	FRONT				UNITS COMP	SHALL INCLUDE ONENTS WHEN	STAINLESS ST ASSEMBLED.	EEL H
2	H-2FR	ND-2-PSP-F 4830	CAPTIVE	AIRE	7' 6"	600	1	HEAVY	200	1500	10" 1	4" 4"		1500	1543 -0.575	" 1380	WHERE EXPOSI 430 SS	ED 	FRONT				GREAS PARTIC	SE EXTRACTION	EFFICIENCY PE DNS IN SIZE, AN	RFOR
3	H-3BL	ND-2-PSP-F 4830	CAPTIVE	AIRE	7' 6"	600		HEAVY	200	1500	10" 1	4" 4"		1500	1543 -0.575	" 1380	WHERE EXPOSI 430 SS	ED LEFT	BACK				LARGE THE C/	.R, WITH A CORF	RESPONDING PI	IESSU
а А	H-4BB	ND-2-PSP-F 4830	CAPTIVE		7' 6"	DEG 600		ΗΕΔΥΥ	200	1500	10" 1	Δ" Δ"		1500	1543 -0.575	1380	WHERE EXPOSI 430 SS	ED BIGHT					MANUF EFFICI	-ACTURER APPF ENCY VS. PARTI(OVED FOR USE LE DIAMETER	IN SO
		ND-2-PSP-F			70	DEG	1		200	1500		4 4		1500	1545 -0.575	1300	WHERE EXPOSI	ED	BACK				100			
<u>001</u> 00D		<u>RMAIION</u>	·		FILTER(S))					LIGHT(S)		//DE				UTILITY CA	BINET(S)	ELECTRICAL	SWITCH	FIRE	HOOD	80			_
NO	TAG	יד	YPE	QTY	HEIGHT	LENGTH	EFFICIENC	CY @ 7 MICRC	NS QTY		TYPE	GU	JARD	LOCATION	SIZE	TYPE	S	IZE	MODEL #	QUANTI	ITY PIPING		09 DENCY			
1	H-1FL	CAPTRATE	SOLO FILTER	3 5	20"	16"	85% SEE	E FILTER SPE	С З	RECES	SSED ROUND	٦	NO								YES	443 LBS	DI EFFIC			
					0.01	4.01																1024	ACTION			
2	H-2FR	CAPIRATE	SOLO FILTER	1 5	20"	16"	85% SEE	FILTER SPE		RECE	SSED ROUND	r		RIGHT	12"X48"X30"		5 4.0/	1.0/4.0			YES	LBS	월 20			•
3	H-3BI	CAPTBATE	SOLO FILTER	3 5	20"	16"	85% SEF	F FII TER SPE	C 3	RECES	SSED BOUND			LEFT	12"x48"x30"					1 LIGH	IT YES	524	0	0.1	1.0	
U		0/1 110112					00,0021							WALL MNT	12"x42"x24"				DCV-2211	1 FAN	1	LBS		PA	RTICLE DIAMET	ER (µi
4	H-4BR	CAPTRATE	SOLO FILTER	۹ 5	20"	16"	85% SEE	E FILTER SPE	С 3	RECES	SSED ROUND	٢	NO	WALL MNT	12"x54"x24"						YES	441 LBS	CAPTR/ NFPA ≠ NSE S ⁻	ATE FILTERS AR #96. TANDARD #2	E BUILT IN COM	PLIAN
	 וידיקה (ONS																					UL STA INT. MI	NDARD #1046. ECH. CODE (IMC).	
<u>001</u> 00D NO	TAG			OPTIO	N																		ULC-Se PATE	349. ENT NUMBE!	S	
1	H-1FI	FIELD WRAP	PPER 6.00" H	HIGH FRO	ONT, LEFT.												HOOD C	ORNER					AC-PS	P (UNITED STAT	ES) - US PATEN A) - CA PATENT	T 796
•		RISER SENSC	OR INSTALL 6	IN PLEN.											1/2" - 13 TP GRADE 5 (I	INIMUM)	HANGING (HARDWARE B)	<u>ANGLE</u> (INSTALLER)					AC-PSI	P ISLAND (CANA	DA) - CA PATEN	T 252
2	H-2FR	FIELD WRAP BALANCE DA	PPER 6.00" F MPERS.	HIGH FRO	ONT, RIGH	Γ.									1/2" GRADE (MINIMUM)	5 STEEL			Â							
		RISER SENSO	OR INSTALL 6 PPER 6.00" F	IN PLEN. HIGH FRO	ONT. LEFT.										FLAT WASH	ER.		e								
3	H-3BL	BALANCE DA	MPERS.												1/2" - 13 TP GRADE 5 (I STEEL ALL											
		FIELD WRAP	OR INSTALL 6 PPER 6.00" H	IN PLEN. HIGH FRO	ONT, RIGH ⁻	Г.									1/2" - 13 TP GRADE 5 (I											
4	H-4BR	BALANCE DA	MPERS. OR INSTALL 6	IN PLEN.											STEEL HEX 1/2" GRADE (MINIMUM)	STEEL	HOOD CORN HANGING AN									
ERF	- FORATE	D SUPPI	LY PLEN	VUM(S)										FLAT WASH	ER.	(WEIGHT BEA ANCHOR POI FOR HOOD).	RING NT								
OOD NO	TAG	POS LI	ENGTH WIE		GHT TY		H LENG	RISER(S)	M SP								1/2" GRADE 5 (MINIMUM) S	TEEL								•
1	H-1FI	Front	90" 16	6" 6	S" ML	JA 12"	24"	69	0 0.210"	u							FLAT WASHE	۹.								_
-					<u>м</u>	JA 12" JA 12"	24" 24"	69 69	0 0.210" 0 0.210"	u u							GRADE 5 (MII STEEL HEX N	IIMUM) UTS.								
2	H-2FR	Front	102" 16	6" 6	5" ML MI	JA 12" JA 12"	24"	69	0 0.210"	u u						ASSEMBLY	INSTRUCTION	S								` ~ _
3	H-3BL	Front	102" 16	6" 6	6" ML	JA 12"	24"	69	0 0.210	u u					HANGI		JST BE SUPPORT	ED WITH 1/2	2" - 13 TPI GRADE	5						```
4	H-4BR	Front	90" 16	6" 6	6" MU	JA 12" JA 12"	24	69	0 0.210	u					ANCH	OR POINTS WI	TH 1/2" GRADE 5	(MINIMUM) S	STEEL FLAT WAS	HERS		E MANUAL N STATION				
4 <i>LL</i>	-MOUN	<u>NT UTILII</u>	TY CABL	NET	U		NET(S)								DOUBL AND A	ED HEX NUT		BENEATH H	100D HANGING A	ANGLES	DEMO:					
	LOCATI	ON SIZ	۲E.	TYPE	FIRE SYST	EM SIZE		ELECTRICAL	-	SWITCHES	W	VEIGHT			BENEA	TH BOTTOM H	IEX NUT. TORQUI	E ALL HEX N	IUTS TO 57 FT-LB	S.	SERVIC	E DOOR				[
										1 LIGHT			_													
3	WALL M	INT 12"x42'	."x24"					DCV-2211		1 FAN	1	40 LBS											42	2"		
4	WALL M	INT 12"x54'	"x24"								1	00 LBS													12"	-
																										
																					UT	'ILITY CABIN FLUSH WITH	JET SHOULD) BE MOUN	NTED NG	
																					WAL	L MOUN	TED UTH	LITY C	 1 <i>BINE1</i>	7
Ĩ	FIRE S	<u>SYSTEM I</u>	INFORMA	ATION	— JOE	8#59448	837				INIC											42"L _	<u>X 24"H .</u>	<u>X 12" I</u>		
	SYSTEM NO	TAG	TYPE			SIZE			FLOW – POINTS	Ş	GYSTEM		LOCAT	ION ON HOC	DD											
-	1	FS-1	TANK FS			4.0/4.0/4	4.0		92 -	FIRE C	ABINET RIGHT	r	RIGH	HT, HOOD 2								PREV	NIRED ELECTRICAL	PANEL WITH		
		UVE(S)				4.0/4.0/4	4.0			FIRE C	ABINET LEFT		LEF	T, HOOD 3								SUPPI	AN CONTROLLERS / LY FAN SHUT-DOWI	AND N RELAY.		
	FIRE SYSTEM	TAG	TYPE		SIZE		SUPPLIED) BY		\sim	\sim														\rightarrow	
-	NO	FO 4			4 500				— Ç	VERI	FY	ERIFY (GAS	VALVE S	SIZE											>
	1	FS-1			1.500	CAP		SYSTEMS				LQUIKE	D												\leq	>
																		/ 、						\sim		\geq
_																										



MOR NO.

1

















FAN UNIT	TAG		FAN		 DEL #	<u> </u>	MANUE	ACTUR	ER	CFM	ESP	,	RPM	M	OTOR
NO														E	
1	EF-1 FE-2	1		CASRE20L	טנ 				:	3000	1.000))	1235	TEFC,	
CONI	FNSE	R DE'	TAILS				0,11		-		1.000		1200	0,	
FAN UNIT	TAG			MODEL #		CC	ONDENSER	TON	INAGE	VOL	TAGE	Ρ	HASE	FREG	UENCY
NO							1		5	208	3-230	3 F	PHASE	60) HZ
3	MPU-1		A2-D.500)-20D-MPU			2		5	208	3-230 3-230	3 F 3 F	PHASE	60) HZ
MUA	FAN	 INFOF	RMATION	– JO.	B#59	4483	37			200	200		TI/ (OL		5112
FAN UNIT	TAG	QTY	FAN		DEL #		BLOW	'ER	HOUS	NG	MIN CEM	DES	SIGN FM	ESP	RPM
NO	MDI 1	1		D 500 20D	MDU		20ME 2	мор	۸ <u>م</u> ۸۷	500	3600	1	140	0.375	1608
			~~~~	-D.300-20D			201011 -2-		AZ-D.			4	140	0.575	1000
4	MPU-2	1	A1	-D.250-15D	-MPU		15MF-1-	MOD	A1-D.2	250	1100	13	380	0.375	1577
COIL	$\frac{S - J}{ }$	<u>0B#59</u>	944837												
FAN UNIT	TAG	COIL	DESIGN												COC
NO		TYPE	CFM	ENTERIN TEM	IG DB P	ENTE T	RING WB EMP	LEA\ T	/ING DB EMP	LE	AVING W	/В	ENT FLUII	ERING D TEMP	LEAVIN TE
3	MPU-1	DX	4140	95.0°	'F	7	3.0°F	70	6.3°F		66.2°F				
4	MPU-2	DX	1380	95.0°	°F	7	3.0°F	78	8.2°F		67.0°F				
<u>GAS</u> FAN	FIREL		<u>E-UPA</u> ut outf	<u>IR UN.</u> NJT	<u>IT(S)</u>										
UNIT NO	TAG	BTU	Js BTL	Js TE	MP RISE			RE	QUIRED	INPUT	GAS PRE	SSUR	RE		G
3	MPU-1	3498	359 3218	70	75°F				7 IN.	W.C 1	4 IN. W.C	C.			N
4	MPU-2		934 1048	19	73°F				7 IN.	W.C 1	4 IN. W.C	). 			N
<u>FAN</u> FAN															
NO	TAG							L		TION					
1	EE-1	1	RE20DD - H	IGH TEMPE	ERATURE	E HEAT	& SMOKE (	OPTION							
1		1	RE20 - DISC	HARGE EX	TENSIO	N ASSE	EMBLY WITH	I HARD	WARE						
					NTY										
		1	UTILITY SET	GREASE (											
2	EF-2	1 1 1 1	UTILITY SET RE20DD - H RE20 - DISC	GREASE ( IGH TEMPE CHARGE EX	INTY CUP ERATURE TENSIOI	E HEAT N ASSE	& SMOKE ( EMBLY WITH	OPTION I HARD'	WARE						
2	EF-2	1 1 1 1 1	UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAF	GREASE ( IGH TEMPE CHARGE EX RTS WARRA	INTY CUP ERATURE ITENSIOI INTY IGE 0-35	E HEAT N ASSE	& SMOKE ( EMBLY WITH	DPTION I HARD'	WARE						
2	EF-2	1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD	GREASE ( IGH TEMPE CHARGE EX RTS WARRA SSURE GAU PRESSURE	INTY CUP ERATURE ITENSIOI INTY IGE, 0-35 I GAUGE	E HEAT N ASSE 5" 5, -5 TO	& SMOKE ( EMBLY WITH 15" WC	DPTION I HARD'	WARE						
2	EF-2	1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS	GREASE ( IGH TEMPE CHARGE EX RTS WARRA SSURE GAU PRESSURE MOD VALV E GAS STR	INTY CUP ERATURE ITENSIOI INTY JGE, 0-35 GAUGE GAUGE /E OPTIC AINER 1'	E HEAT N ASSE 5" :, -5 TO DN FOF	⁷ & SMOKE ( EMBLY WITH 15" WC R MOD SIZE	DPTION I HARD 2 (1" M	WARE OD VALY	/E)					
2	EF-2	1 1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA	NTY CUP ERATURE TENSIOI NTY IGE, 0-35 GAUGE GAUGE /E OPTIC AINER 1'	E HEAT N ASSE 5" :, -5 TO DN FOF " IPER FC	* & SMOKE ( EMBLY WITH 15" WC R MOD SIZE	DPTION I HARD 2 (1" M USING			CLASS 1/	A RAT	TING		
2	EF-2 MPU-1	1 1 1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT BEOL	GREASE ( IGH TEMPE CHARGE EX STS WARRA SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA RCUIT (5/5 000 CFM),	INTY CUP ERATURE TENSIOI INTY JGE, 0-35 GAUGE Z GAUGE Z GAUGE /E OPTIC AFT DAM ) MODUL 208V/230 PROPER	E HEAT N ASSE 5" 	⁷ & SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. COO ATION	DPTION I HARD 2 (1" M USING DOLING LING TH	WARE OD VALY - MEETS OPTIOI IERMOS	/E) S AMCA N FOR S STAT OF	CLASS 1/ IZE 2 DF/	A RAT ÆH M	TING IUA ABLE		
2	EF-2 MPU-1	1 1 1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT REQU	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA RCUIT (5/5 000 CFM), IRED FOR SIDE HEAT	INTY CUP ERATURE TENSIOI INTY IGE, 0-35 GAUGE GAUGE /E OPTIC AINER 1' AFT DAM ) MODUL 208V/230 PROPER ER CON	E HEAT N ASSE 5" 	* & SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. COOL ATION	DPTION I HARD' 2 (1" M' USING DOLING LING TH	WARE OD VAL - MEETS - OPTION - IERMOS	/E) S AMCA N FOR S STAT OF	CLASS 1/ IZE 2 DF/	A RAT ÆH M	TING IUA ABLE		
2	EF-2 MPU-1	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT REQU OPPOSITE SEPARATE VFD) - THRE	GREASE ( IGH TEMPE CHARGE EX STS WARRA SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA BACKDRA IRCUIT (5/5 000 CFM), IRED FOR SIDE HEAT 120V WIRIN E PHASE (	INTY CUP ERATURE TENSIOI INTY JGE, 0-35 GAUGE GAUGE ZE OPTIC AFT DAM MODUL 208V/230 PROPER ER CON IG PACK ONLY	E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA 0V, 3 PH A OPER, trols TROLS CAGE (F	A SMOKE C MBLY WITH 15" WC MOD SIZE DR A2-D HO CKAGED CO HASE. COO ATION REQUIRED A	2 (1" M USING DOLING LING TH	WARE OD VAL - MEETS - OPTION HERMOS	/E) S AMCA N FOR S STAT OF	CLASS 1/ IZE 2 DF/ PROGRA	A RAT (EH M AMMA REWII	TING IUA ABLE RE WITH	H	
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2 3	EF-2 MPU-1	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT REQU OPPOSITE S SEPARATE VFD) - THRE 2 YEAR PAP INLET PRES MANIFOLD SHIP LOOS CASLINK BU MOTORIZED 3 TON SING TO 1,800 CF FOR PROPE SEPARATE VFD) - THRE 2 YEAR PAP	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA BACKDRA SIDE HEAT 120V WIRIN E PHASE ( SURE GAU PRESSURE E GAS STR JILDING MO D BACKDRA SURE GAU PRESSURE E GAS STR JILDING MO D BACKDRA SURE CIRCUI FM), 208V/2 ER OPERAT 120V WIRIN E PHASE ( STS WARRA	INTY CUP ERATURE TENSIOI INTY IGE, 0-35 GAUGE /E OPTIC AFT DAM ) MODUL 208V/230 PROPER ER CON IG PACK ONLY IGE, 0-35 GAUGE AINER 3/ DNITORI AFT DAM T MODU 30V, 3 P ION IG PACK ONLY IG PACK ONLY	E HEAT N ASSE 5" :, -5 TO DN FOF PER FC LAR PA OV, 3 PH OPER, TROLS CAGE (F 5" :, -5 TO (4" NG SYS PER FC LAR PA HASE. CAGE (F	* & SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. COOL ATION REQUIRED A 15" WC STEM - INTE DR A1-D HO ACKAGED CO COOLING T REQUIRED A	DPTION I HARD 2 (1" M USING DOLING LING TH ND USI RNET C USING DOLING HERMC	WARE OD VALY - MEETS - OPTIOI - MEETS - MEETS - MEETS - MEETS - MEETS - OPTIO - STAT O ED ONLY	/E) S AMCA N FOR S STAT OF Y FOR D ULAR C S AMCA N FOR S R PROG Y FOR D	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI ONNECT CLASS 1/ SIZE 1 DF BRAMMAE	A RAT (EH M AMMA REWII ION F A RAT /EH M 3LE S REWII	TING IUA ABLE RE WITH RE WITH TING IUA (1,1 TAT REG RE WITH	ED IOO QUIRED	
2 3 4 <i>FAN</i>	EF-2 MPU-1 MPU-2	1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT REQU OPPOSITE S SEPARATE VFD) - THRE 2 YEAR PAP INLET PRES MANIFOLD SHIP LOOS CASLINK BU MOTORIZED 3 TON SING TO 1,800 CI FOR PROPE SEPARATE VFD) - THRE 2 YEAR PAP	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA RCUIT (5/5 000 CFM), IRED FOR SIDE HEATI 120V WIRIN E PHASE ( SURE GAU PRESSURE E GAS STR JILDING MO D BACKDRA GLE CIRCUI FM), 208V/2 E OPERATI 120V WIRIN E PHASE ( STS WARRA	INTY CUP ERATURE TENSIOI INTY JGE, 0-38 GAUGE /E OPTIC AFT DAM ) MODUL 208V/230 PROPER ER CON JG PACK ONLY IGE, 0-38 GAUGE AINER 3, ONITORI AFT DAM T MODU 230V, 3 P ION IG PACK ONLY	E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA 0V, 3 PH A OPER, TROLS GAGE (F 5, -5 TO /4" NG SYS PER FC LAR PA HASE. GAGE (F	* & SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO ATION REQUIRED A 15" WC STEM - INTE DR A1-D HO ACKAGED CO COOLING T REQUIRED A	2 (1" M USING DOLING LING TH ND USI RNET C USING DOLING HERMC	WARE OD VALY - MEETS OPTION ED ONLY - MEETS OPTIO STAT O ED ONLY	/E) S AMCA N FOR S STAT OF Y FOR D ULAR C S AMCA N FOR S R PROG Y FOR D	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CLASS 1/ SIZE 1 DF BRAMMAE	A RAT (EH M AMMA REWII ION R A RAT /EH M 3LE S REWII	TING IUA ABLE RE WITH RE WITH TAT REG RE WITH		
2 3 4 <u>FAN</u>	EF-2 MPU-1 MPU-2	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2 YEAR PAP UTILITY SET RE20DD - H RE20 - DISC 2 YEAR PAP INLET PRES MANIFOLD BUTTERFLY SHIP LOOS MOTORIZED 10 TON 2 CI (3,600 TO 5, STAT REQU OPPOSITE S SEPARATE VFD) - THRE 2 YEAR PAP INLET PRES MANIFOLD SHIP LOOS CASLINK BU MOTORIZED 3 TON SING TO 1,800 CF FOR PROPE SEPARATE VFD) - THRE 2 YEAR PAP	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA D BACKDRA SIDE HEAT 120V WIRIN E PHASE ( SURE GAU PRESSURE GAS STR JILDING MO D BACKDRA SURE CIRCUI M, 208V/2 E OPERAT 120V WIRIN E PHASE ( STS WARRA	INTY CUP ERATURE TENSION INTY IGE, 0-35 GAUGE /E OPTIC AFT DAM ) MODUL 208V/230 PROPER ER CON IG PACK ONLY IGE, 0-35 E GAUGE AINER 3/ DNITORIN AFT DAM T MODU 30V, 3 P ION IG PACK ONLY INTY	E HEAT N ASSE 5" ; -5 TO DN FOF PER FC LAR PA OV, 3 PH OPER TROLS GAGE (F 5" ; -5 TO /4" NG SYS PER FC LAR PA HASE. CAGE (F	* & SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. COOL ATION REQUIRED A 15" WC STEM - INTE DR A1-D HO ACKAGED CO COOLING T REQUIRED A SUPI	DPTION I HARD 2 (1" M USING DOLING LING TH ND USI RNET C USING DOLING HERMC DOLING	WARE OD VALY - MEETS OPTION ED ONLY - MEETS OPTIO OSTAT O ED ONLY	/E) S AMCA N FOR S STAT OF Y FOR D ULAR C S AMCA N FOR S R PROG Y FOR D	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CV OR PI SIZE 1 DF RAMMAE CV OR PI	A RAT (EH M AMMA REWII ION F A RAT /EH N 3LE S REWII	TING IUA ABLE RE WITH RE WITH TING IUA (1,1 TAT REI RE WITH	ED I00 QUIRED	
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2 3 3 <i>FAN</i> UNIT NO 1 2 3 4 <i>CURH</i>	EF-2 MPU-1 MPU-2 ACCES TAG EF-1 EF-2 MPU-1 EF-2 MPU-1 SASS	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td< td=""><td>2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 CI         (3,600 TO 5,         STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         EXHAUST         SE         GRAVITY         DAMPER         DAMPER         IND</td><td>GREASE (     IGH TEMPE     CHARGE EX     TS WARRA     SURE GAU     PRESSURE     MOD VALV     E GAS STR     D BACKDRA     RCUIT (5/5     000 CFM),     IRED FOR     SIDE HEATI     120V WIRIN     E PHASE (     RTS WARRA     SURE GAU     PRESSURE     E GAS STR     JILDING MC     D BACKDRA     GLE CIRCUI     FM), 208V/2     R OPERAT     120V WIRIN     E PHASE (     RTS WARRA     SURE GAU     PRESSURE     E GAS STR     JILDING MC     D BACKDRA     SURE CIRCUI     FM), 208V/2     R OPERAT     120V WIRIN     E PHASE (     MALL     MOUNT     MOUNT</td><td>INTY CUP ERATURE TENSION ITENSION INTY IGE, 0-38 GAUGE /E OPTIC AFT DAM I MODUL 208V/230 PROPER ER CON I MODUL 208V/230 PROPER ER CON IG PACK ONLY INTY IGE, 0-38 GAUGE AINER 3/ DNITORI I GAUGE AINER 3/ DNITORI I GAUGE AIN</td><td>E HEAT N ASSE 5" 5, -5 TO DN FOF " IPER FC LAR PA 0V, 3 PH A OPER, TROLS GAGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4) 1000000000000000000000000000000000000</td><td>* SMOKE ( EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. 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COOL ATION REQUIRED A 15" WC STEM - INTE DR A1-D HO ACKAGED CO COOLING T REQUIRED A SUPI GRAVITY DAMPER	DPTION I HARD' 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC DOLING	WARE OD VALY - MEETS - OPTION - MEETS - OPTION - MEETS - OPTIO - MEETS - OPTIO - MEETS - OPTIO - ONLY - MEETS - OPTIO - ONLY - ORIZED MPER	/E) S AMCA N FOR S STAT OF V FOR D ULAR C S AMCA N FOR S R PROG Y FOR D V FOR D V FOR D	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI	A RAT (EH M AMMA REWII ION R A RAT /EH M 3LE S REWII			
2 3 3 <i>FAN</i> UNIT NO 1 2 3 4 <i>CURE</i> NO	EF-2 MPU-1 MPU-2 ACCES TAG EF-1 EF-2 MPU-1 MPU-2 3 A.S'.S'. ON FAN	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td< td=""><td>2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 CI (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRI         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRI         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRI         2 YEAR PAP         EXHAUST         SE         GRAVITY         DAMPER         I         I         I         I         I         I</td><td>GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA RCUIT (5/5 000 CFM), IRED FOR SIDE HEAT 120V WIRIN E PHASE ( RTS WARRA SURE GAU PRESSURE GAS STR JILDING MC D BACKDRA SURE GAU PRESSURE E GAS STR JILDING MC D BACKDRA SURE CIRCUI MOUNT E PHASE ( R OPERAT 120V WIRIN E PHASE ( R OPERAT</td><td>INTY CUP ERATURE TENSION ITENSION ITENSION ITENSION IGE, 0-38 GAUGE AINER 1' AFT DAM I MODUL 208V/230 PROPER ER CON' IG PACK ONLY IGE, 0-38 GAUGE AINER 3/ ONITORI AFT DAM T MODU 30V, 3 P ION IG PACK ONLY INTY IGE, 0-38 GAUGE AINER 3/ ONITORI I AFT DAM T MODU 30V, 3 P ION IG PACK ONLY INTY IGE ALS IC ION IG PACK ONLY INTY IG PACK ONLY INTY</td><td>E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA 0V, 3 PH A OPER, TROLS</td><td>&amp; SMOKE ( EMBLY WITH      15" WC      R MOD SIZE      DR A2-D HO      CKAGED CO      HASE. COOI      ATION      EQUIRED A      15" WC      STEM - INTE      DR A1-D HO      ACKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM</td><td>DPTION I HARD' 2 (1" M' USING DOLING LING TH ND USI RNET ( USING DOLING HERM() DOLING HERM() ND USI PLY MOT( DAI PLY</td><td>WARE OD VALY - MEETS OPTION ED ONLY ED ONLY CR CELL - MEETS OPTIO DSTAT O ED ONLY ED ONLY CR CELL - MEETS OPTIO DSTAT O ED ONLY</td><td>/E) S AMCA N FOR S STAT OF Y FOR D ULAR C S AMCA N FOR S R PROG Y FOR D Y FOR D WALL MOUN</td><td>CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI</td><td>A RAT /EH M AMMA REWII</td><td></td><td></td><td>SIZE</td></td<>	2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 CI (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRI         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRI         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRI         2 YEAR PAP         EXHAUST         SE         GRAVITY         DAMPER         I         I         I         I         I         I	GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE MOD VALV E GAS STR D BACKDRA RCUIT (5/5 000 CFM), IRED FOR SIDE HEAT 120V WIRIN E PHASE ( RTS WARRA SURE GAU PRESSURE GAS STR JILDING MC D BACKDRA SURE GAU PRESSURE E GAS STR JILDING MC D BACKDRA SURE CIRCUI MOUNT E PHASE ( R OPERAT 120V WIRIN E PHASE ( R OPERAT	INTY CUP ERATURE TENSION ITENSION ITENSION ITENSION IGE, 0-38 GAUGE AINER 1' AFT DAM I MODUL 208V/230 PROPER ER CON' IG PACK ONLY IGE, 0-38 GAUGE AINER 3/ ONITORI AFT DAM T MODU 30V, 3 P ION IG PACK ONLY INTY IGE, 0-38 GAUGE AINER 3/ ONITORI I AFT DAM T MODU 30V, 3 P ION IG PACK ONLY INTY IGE ALS IC ION IG PACK ONLY INTY IG PACK ONLY INTY	E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA 0V, 3 PH A OPER, TROLS	& SMOKE ( EMBLY WITH      15" WC      R MOD SIZE      DR A2-D HO      CKAGED CO      HASE. COOI      ATION      EQUIRED A      15" WC      STEM - INTE      DR A1-D HO      ACKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM	DPTION I HARD' 2 (1" M' USING DOLING LING TH ND USI RNET ( USING DOLING HERM() DOLING HERM() ND USI PLY MOT( DAI PLY	WARE OD VALY - MEETS OPTION ED ONLY ED ONLY CR CELL - MEETS OPTIO DSTAT O ED ONLY ED ONLY CR CELL - MEETS OPTIO DSTAT O ED ONLY	/E) S AMCA N FOR S STAT OF Y FOR D ULAR C S AMCA N FOR S R PROG Y FOR D Y FOR D WALL MOUN	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI	A RAT /EH M AMMA REWII			SIZE
2 3 3 <i>FAN</i> UNIT NO 1 2 3 4 <i>CURE</i> NO 1 2	EF-2 MPU-1 MPU-2 MPU-2 ACCES TAG EF-1 EF-2 MPU-1 EF-2 MPU-1 MPU-2 3 ASS ON FAN # 1	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td< td=""><td>2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 Cl (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         EXHAUST         SE         G         -1         -1</td><td>T GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE C MOD VALV E GAS STR D BACKDRA C C C C C C C C C C C C C C C C C C C</td><td>INTY CUP ERATURE TENSION INTY IGE, 0-38 GAUGE /E OPTIC AFT DAM I MODUL 208V/230 PROPER ER CON I MODUL 208V/230 PROPER ER CON I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I MODU 30V, 3 P I ON I G PACK ONLY I MODU I G PACK ONLY</td><td>E HEAT N ASSE 5" 5, -5 TO DN FOF " IPER FC LAR PA 0V, 3 PH A OPER, TROLS GAGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4) 100 FOR AGE (F) 100 FOR AGE (</td><td>&amp; SMOKE ( EMBLY WITH      15" WC      R A2-D HO      CKAGED CO      HASE. COOI      ATION      REQUIRED A      15" WC      STEM - INTE      DR A1-D HO      ACKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM      CURE      CUR</td><td>DPTION I HARD' 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC I SING VI I ND USI</td><td>WARE OD VALY - MEETS OPTION ED ONLY - MEETS OPTIO DR CELL - MEETS OPTIO STAT O ED ONLY ED ONLY - MEETS - MEETS</td><td>/E) 3 AMCA 3 FOR S 5 TAT OF 4 FOR D 4 FOR D 4 FOR D 5 AMCA 1 FOR S 1 FOR D 5 AMCA 1 FOR S 1 FOR D 1 FOR D 1 FOR D 1 FOR D 1 FOR S 1 FOR D 1 FOR D</td><td>CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI CV OR PI</td><td>A RAT (EH M AMMA REWII ION R A RAT /EH M 3LE S REWII</td><td></td><td></td><td></td></td<>	2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 Cl (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         EXHAUST         SE         G         -1         -1	T GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE C MOD VALV E GAS STR D BACKDRA C C C C C C C C C C C C C C C C C C C	INTY CUP ERATURE TENSION INTY IGE, 0-38 GAUGE /E OPTIC AFT DAM I MODUL 208V/230 PROPER ER CON I MODUL 208V/230 PROPER ER CON I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I GE, 0-38 GAUGE AINER 3/ ONITORI I G PACK ONLY I MODU 30V, 3 P I ON I G PACK ONLY I MODU I G PACK ONLY	E HEAT N ASSE 5" 5, -5 TO DN FOF " IPER FC LAR PA 0V, 3 PH A OPER, TROLS GAGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5" 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4) 100 FOR AGE (F) 100 FOR AGE (	& SMOKE ( EMBLY WITH      15" WC      R A2-D HO      CKAGED CO      HASE. COOI      ATION      REQUIRED A      15" WC      STEM - INTE      DR A1-D HO      ACKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM      CURE      CUR	DPTION I HARD' 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC I SING VI I ND USI	WARE OD VALY - MEETS OPTION ED ONLY - MEETS OPTIO DR CELL - MEETS OPTIO STAT O ED ONLY ED ONLY - MEETS - MEETS	/E) 3 AMCA 3 FOR S 5 TAT OF 4 FOR D 4 FOR D 4 FOR D 5 AMCA 1 FOR S 1 FOR D 5 AMCA 1 FOR S 1 FOR D 1 FOR D 1 FOR D 1 FOR D 1 FOR S 1 FOR D 1 FOR D	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI CV OR PI	A RAT (EH M AMMA REWII ION R A RAT /EH M 3LE S REWII			
2 3 3 4 <u>FAN</u> VNIT NO 1 2 3 4 <u>CURH</u> NO 1 2 3	EF-2 MPU-1 MPU-2 ACCES ACCES TAG EF-1 EF-2 MPU-1 MPU-2 3 ASS S ON FAN 4 1 4 2 4 3	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1 <td< td=""><td>2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 Cl (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET         MANIFOLD         SHIP LOOS         G         MOTORIZED</td><td>T GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE C MOD VALV E GAS STR D BACKDRA C BACKDRA C D BACKDRA C C C C C C C C C C C C C C C C C C C</td><td>INTY CUP ERATURE TENSION ITENSION INTY IGE, 0-38 GAUGE AINER 1' AFT DAM I MODUL 208V/230 PROPER ER CON' I MODUL 208V/230 PROPER ER CON' I GPACK ONLY I GE, 0-38 GAUGE AINER 3, ONITORI I GPACK ONLY I GPACK ONLY</td><td>E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA DV, 3 PH AOPER, TROLS GAGE (F 5, -5 TO (4" NG SYS FAGE (F C LAR PA HASE. CAGE (F C C C AGE (F C C C C C C C C C C C C C C C C C C C</td><td>&amp; SMOKE ( EMBLY WITH      15" WC      R ADD SIZE      DR A2-D HO      CKAGED CO      HASE. COOI      ATION      EQUIRED A      TO      CKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM      ITEM      CURE      RAIL</td><td>2 (1" M 2 (1" M 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC 1 3 3</td><td>WARE OD VALY - MEETS - OPTIO - ONLY - OPTIO - ONLY - OPTIO - OPTIO</td><td>/E) 3 AMCA 5 FOR S 5 TAT OF 7 FOR D 4 FOR D 5 AMCA N FOR S 8 PROG 7 FOR D 4 FOR D 4 FOR D 4 FOR D 4 FOR S 8 PROG 7 FOR D 4 FOR D 4 FOR D 4 FOR S 8 PROG 7 FOR S 8 PROG 7 FOR D 7 FOR S 8 PROG 7 FOR S 7 FOR S</td><td>CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI 26.500"L 1.000"L X</td><td>A RAT /EH M AMMA REWII ION R A RAT /EH N 3LE S REWII</td><td></td><td></td><td></td></td<>	2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 Cl (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BU         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET         MANIFOLD         SHIP LOOS         G         MOTORIZED	T GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE C MOD VALV E GAS STR D BACKDRA C BACKDRA C D BACKDRA C C C C C C C C C C C C C C C C C C C	INTY CUP ERATURE TENSION ITENSION INTY IGE, 0-38 GAUGE AINER 1' AFT DAM I MODUL 208V/230 PROPER ER CON' I MODUL 208V/230 PROPER ER CON' I GPACK ONLY I GE, 0-38 GAUGE AINER 3, ONITORI I GPACK ONLY I GPACK ONLY	E HEAT N ASSE 5" 5, -5 TO DN FOF " PER FC LAR PA DV, 3 PH AOPER, TROLS GAGE (F 5, -5 TO (4" NG SYS FAGE (F C LAR PA HASE. CAGE (F C C C AGE (F C C C C C C C C C C C C C C C C C C C	& SMOKE ( EMBLY WITH      15" WC      R ADD SIZE      DR A2-D HO      CKAGED CO      HASE. COOI      ATION      EQUIRED A      TO      CKAGED CO      COOLING T      REQUIRED A      SUPI      GRAVITY      DAMPER      ITEM      ITEM      CURE      RAIL	2 (1" M 2 (1" M 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC 1 3 3	WARE OD VALY - MEETS - OPTIO - ONLY - OPTIO - ONLY - OPTIO - OPTIO	/E) 3 AMCA 5 FOR S 5 TAT OF 7 FOR D 4 FOR D 5 AMCA N FOR S 8 PROG 7 FOR D 4 FOR D 4 FOR D 4 FOR D 4 FOR S 8 PROG 7 FOR D 4 FOR D 4 FOR D 4 FOR S 8 PROG 7 FOR S 8 PROG 7 FOR D 7 FOR S 8 PROG 7 FOR S 7 FOR S	CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI 26.500"L 1.000"L X	A RAT /EH M AMMA REWII ION R A RAT /EH N 3LE S REWII			
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COOL ATION REQUIRED A 15" WC STEM - INTE DR A1-D HO CCAGED CO COOLING T REQUIRED A SUPI GRAVITY DAMPER GRAVITY DAMPER ITEW CURE CURE CURE CURE</td><td>DPTION I HARD 2 (1" M USING DOLING LING TH ND USI RNET C USING OOLING HERMC DOLING HERMC DOLING HERMC I SING OOLING HERMC I SING I SI SI SI SI SI SI SI SI SI SI SI SI S</td><td>WARE OD VALY - MEETS - MEETS - OPTION - MEETS - MET</td><td>/E) 5 AMCA 5 FOR S 5 TAT OF 7 FOR D 0 0 0 0 0 0 0 0 0 0 0 0 0</td><td>CLASS 1/ IZE 2 DF/ PROGR/ CV OR PI CV OR PI CV OR PI CLASS 1/ SIZE 1 DF RAMMAE CV OR PI CV OR PI</td><td>A RAT (EH M AMMA REWII ION F A RAT /EH N 3LE S REWII C 20.00 X 20.0 X 20.0 X 20.0</td><td>TING IUA ABLE RE WITH RE WITH AUA (1,1 TAT RE MUA (1,1 TAT RE RE WITH DO0"H I DO0"H I DO0"H I</td><td></td><td></td></td<>	2 YEAR PAP         UTILITY SET         RE20DD - H         RE20 - DISC         2 YEAR PAP         INLET PRES         MANIFOLD         BUTTERFLY         SHIP LOOS         MOTORIZED         10 TON 2 Cl (3,600 TO 5, STAT REQU         OPPOSITE S         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SEPARATE         VFD) - THRE         2 YEAR PAP         INLET PRES         MANIFOLD         SHIP LOOS         CASLINK BL         MOTORIZED         3 TON SING         TO 1,800 CF         FOR PROPE         SEPARATE         VFD) - THRE         2 YEAR PAP         EXHAUST         SE         G         -1         J-1         J-2	T GREASE ( IGH TEMPE CHARGE EX SURE GAU PRESSURE C MOD VALV E GAS STR D BACKDRA C BACKDRA C BACKDRA C BACKDRA C BACKDRA C C C C C C C C C C C C C C C C C C C	NTY CUP ERATURE TENSION NTY IGE, 0-38 GAUGE /E OPTIC AFT DAM ) MODUL 208V/230 PROPER ER CON IG PACK ONLY NTY IGE, 0-38 GAUGE AINER 3/ ONITORI AFT DAM T MODU 230V, 3 P ION IG PACK ONLY NTY IGE, 0-38 GAUGE AINER 3/ ONITORI AFT DAM T MODU 230V, 3 P ION IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY IG PACK ONLY NTY	E HEAT N ASSE 5" 5, -5 TO DN FOF " IPER FC LAR PA 0V, 3 PH ACCES FAGE (F 5)" 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4" NG SYS AGE (F 5) 5, -5 TO (4) -5	* SMOKE C EMBLY WITH 15" WC R MOD SIZE DR A2-D HO CKAGED CO HASE. 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Light Wash 1 2 3 4 5 6 7 7 8	OB NO 5944 TANK ELECTRICIAN: 1. WIRE MAIN C 2. WIRE ALL F 3. WIRE SHUNT 4. WIRE UDS A 5. WIRE GAS V SHUNT TR CONTR UDS APPLIANC REMOTE 120VAC (	B37 PRDTEC CONTROL PANEL PI ANS PER INCLUDE TRIP BREAKER (I PPLIANCE KILL S' /ALVE ITEM RIP BREAKER (OPT ROL PANEL POWER CE KILL SWITCH ( ANSUL AUTOMAN (I GAS VALVE	ONITOR & CO.	DEL NUMBER DCV 3 NAME Weber Grill AC ELECTRIC SCHEMATIC IPPED (OPTIONAL) CONNECTION IN PANE ST & NI H1 & N1 + GROUND KTS & NI H1 & N1 + GROUND KTS & NI LGV & NID (JF 24 VI GAS & NI (JF 120 VAC	-2211 Pademy - Lombard A L DET L CONNECTION BREAN (A1 CIRCUIT KT: SOL C) RED/RE	ELECTRICA ELECTRICA N IN DEVICE ER CUIL & A2) BREAKER S & N1 ENUID ENUID ED/GREEN	DRAWN DATE B/3/2 DATE DATE DATE DATE DATE DATE DATE DATE	ву 2023 JR REQUIREI АМРЕRАС 4 АМ 15 АМР 4 4 АМ 5 АМ 5 АМ 5 АМ 5 АМ 5 АМ 5 АМ 5 АМ 5	Z22 23 24 24 ECP #1 WENT FE PS PS PS PS	3 PHASE           208-230           20 Amps           20 Amps           9           9           120 V           120 V           15           120 V	ESCRIPTION C POPU-2 System #1 TANK FS - 4.0/ System #1 TANK FS - 4.0/ I DN SHUNT BREA ITROL PANEL POV KILL SWITCH TEI TO AU1, AU2 TO //// - 2 WIRES &	COND 1 COND 1 COND 1 COMM KER COIL, AND 1 KER COIL, AND 1 KER COIL, AND 1 KER MUST NOT B RMINALS MUST BI ANSUL ELECTRIC GROUND, NID T0 1 GROUND GAS T0 F	J: IENTS IENTS E RL E RL E IN AUT RED, RED,
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Light Wash 1 1 2 3 4 5 6 6 7 7 8 9 9 10 11	OB NO 5944 TANK ELECTRICIAN: 1. WIRE MAIN C 2. VIRE ALL 7. WIRE MAIN C 2. VIRE ALL 7. WIRE UDS A 5. WIRE GAS V SHUNT TR CONTR UDS APPLIANC REMOTE 120VAC (	B37 PRDTEC CONTROL PANEL PANEL PANE PER INCLUDE ANS PER INCLUDE TRIP BREAKER (I PPLIANCE KILL SY ALVE ITEM RIP BREAKER (OPT ROL PANEL POWER CE KILL SWITCH ( ANSUL AUTOMAN (I GAS VALVE	MO JOE TIDNAL) DTIDNAL) DTIDNAL)	DEL NUMBER DCV 3 NAME Weber Grill AC ELECTRIC SCHEMATIC IPPED (OPTIONAL) CONNECTION IN PANE ST & NI HI & NI + GROUND KTS & NI AUI, AU2 LGV & NID (IF 24 VI GAS & NI (IF 120 VAC I	-2211 ademy - Lombard A L DET CONNECTION BREAN (A1 CIRCUT KT SDL CONNECTION BREAN (A1 CIRCUT CIRCUT CIRCUT	ELECTRICA N IN DEVICE (ER COIL & A2) BREAKER S & N1 ENDID ID/GREEN	DRAWN DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 8/3/3 DATE 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC	BY 2023 JR REQUIREI AMPERAC ( 4 AM ( 4 AM) ( 4 AM) ( 4 AM ( 4 AM) (	22 23 24 24 24 24 24 24 24 24 24 24 24 25 20 27 27 27 27 27 27 27 27 27 27 27 27 27	3 PHASE           208-230           20 Amps           YPE           B           3           ST           TD           AI           CDN           IF           120 V           IF           IF           IF           IF           IF	ESCRIPTION C system #1 TANK FS - 4.0/ system #1 TANK FS - 4.0/ I DN SHUNT BREA ITRDL PANEL PDV KILL SWITCH TEI TD AU1, AU2 TD 1 /DC - 2 WIRES & /AC - 2 WIRES &	COND 1	J: IENTS VEUT E RL E IN AUT RED, F
Light Wash 1 1 2 3 4 5 6 7 7 8 8 9 9 10 11 12 13	OB NO 5944 TANK ELECTRICIAN: I. WIRE MAIN ( 2. WIRE ALL F 3. WIRE MAIN 4. WIRE UDS A 5. WIRE GAS V SHUNT TR CONTF UDS APPLIANC REMOTE 120VAC	B37 PRDTEC CONTROL PANEL PI ANS PER INCLUDE TRIP BREAKER (I PPLIANCE KILL SY /ALVE ITEM RIP BREAKER (OPT ROL PANEL POWER CE KILL SWITCH ( ANSUL AUTOMAN (I GAS VALVE	MO JOE TIDNAL) DTIDNAL) DTIDNAL) DTIDNAL)	DEL NUMBER DCV 3 NAME Weber Grill AC ELECTRIC SCHEMATIC IPPED (OPTIONAL) CONNECTION IN PANE ST & NI HI & NI + GROUND KTS & NI AUI, AU2 LGV & NID (IF 24 VI GAS & NI (IF 120 VAC	-2211 ademy - Lombard A L DE T CONNECTION BREAN (A1 CIRCUI KT SOL CIRCUI CIRCUI CIRCUI	ELECTRICA ELECTRICA N IN DEVICE ER COIL & A2) BREAKER S & NI ENDID ID/GREEN	DRAWN DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DATE 120 VAC 120 VAC	вү 2023 JR REQUIREI АМРЕКАС < 4 АМ 15 АМР < 4 АМ 15 АМР < 4 АМ < 6 АМ < 10 АМ	Z2 Z3 Z4 SCHEMATIC INSTALL DWG NO ECP #1 MENT EE PS PS PS PS PS	3 PHASE           208-230           20 Amps           20 Amps           9           9           120V           1F           120V           1F           120V	ESCRIPTION C System #1 TANK FS - 4.0 System #1 TANK FS - 4.0 I DN SHUNT BREA ITRDL PANEL PDV KILL SWITCH TEI TD AU1, AU2 TD /DC - 2 WIRES & /AC - 2 WIRES &	COND 1 COND 1 COND 1 COMM COMMENT COMM KER COIL, AND 1 VER MUST NOT B RMINALS MUST BI ANSUL ELECTRIC GROUND GAS TO F	J: 
Light Wash 1 1 2 3 4 5 6 7 7 8 8 9 9 10 11 11 12 13 14	OB NO 5944 TANK ELECTRICIAN: I. WIRE MAIN ( 2. WIRE ALL F 3. WIRE ALL F 3. WIRE ALL F 3. WIRE ALL F 3. WIRE GAS V SHUNT TRI UDS APPLIANC REMOTE 120VAC ( SHUNT TRIP BRE, 120VA ST TD AI DNS REMOTE 120VAC ( SHUNT TRIP BRE, 120VA ST TD AI DNS SHUNT TRIP BRE, 120VA ST TD AI DNS	AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) ALVE	MO JOE TIDNAL)	DEL NUMBER DCV 3 NAME Weber Grill AC ELECTRIC SCHEMATIC IPPED (OPTIONAL) CONNECTION IN PANE ST & NI HI & NI + GROUND KTS & NI AUI, AU2 LGV & NID (IF 24 VI GAS & NI (IF 120 VAC	-2211 ademy - Lombard A L DET (A CONNECTION BREAK (A1 CIRCUT SOL (A1 CIRCUT (A1 (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1 CIRCUT (A1	ELECTRICA ELECTRICA IN DEVICE ER COIL BREAKER S & NI ENDID D/GREEN	DRAWN DATE 8/3/2 DATE 8/3/2 DATE 8/3/2 DED	ву 2023 JR REQUIREI АМРЕКАС < 4 АМІ 15 АМГ < 4 АМІ < 6 АМІ < 1.0 АМ	Z2 Z3 Z4 SCHEMATIC INSTALL DWG NO ECP #1 MENT EE PS PS PS PS PS	3 PHASE           208-230           20 Amps           20 Amps           Fire           3           ST TO A1           CON           120V           IF 120 V           IF 120 V	ESCRIPTION C System #1 TANK FS -4.0 System #1 TANK FS -4.0 I DN SHUNT BREA ITRDL PANEL POX KILL SWITCH TEI TD AU1, AU2 TD //DC - 2 WIRES & //AC - 2 WIRES &	COND 1	J: 
Light Wash 1 1 2 3 4 5 6 7 7 8 8 9 9 10 11 11 12 13 14 15	OB NO 5944 TANK ELECTRICIAN: 1. WIRE MAIN C 2. WIRE ALL F 3. WIRE ALL F 3. WIRE SHUNT 4. WIRE MAIN C 2. WIRE SHUNT 4. WIRE USD A 5. WIRE GAS V SHUNT TRIP UDS APPLIANC REMOTE 120VAC ( SHUNT TRIP UDS APPLIANC REMOTE 120VAC ( SHUNT TRIP UDS APPLIANC REMOTE 120VAC ( SHUNT TRIP BREAKER	AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) AKER (OPTIONAL) HUNT BREAKER ON SHUNT TRIP	MO JOE TIDNAL SCHEMAL WITCH, IF EQU IDNAL DTIDNAL DTIDNAL DTIDNAL	DEL NUMBER DCV 3 NAME Weber Grill AC ELECTRIC SCHEMATIC IPPED (OPTIONAL) CONNECTION IN PANE ST & NI H1 & N1 + GROUND KTS & NI AU1, AU2 LGV & NID (JF 24 VI GAS & NI (JF 120 VAC	-2211 Pademy - Lombard ALDET LCONNECTION BREAN CIRCUT CIRCUT SOL CIRCUT SOL CIRCUT CIRCUT CIRCUT	ELECTRICA ELECTRICA N IN DEVICE ER COIL BREAKER S & NI ENDID D/GREEN EXHAUST HE	DRAWN DATE B/3/2 DATE B/3/2 DATE B/3/2 DATE B/3/2 DIC DR 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC 120 VAC	ву 2023 JR REQUIREI АМРЕRАС < 4 АМ 15 АМР < 4 АМ 15 АМР < 4 АМ < 6 АМ < 10 АМ	Z22 Z3 Z4 SCHEMATIC INSTALL DWG NO ECP #1 MENT E PS PS PS PS PS	3 PHASE           208-230           20 Amps           20 Amps           3           5           120V           121           121           121	ESCRIPTION C System #1 TANK FS - 4.0/ System #1 TANK FS - 4.0/ I ON SHUNT BREA ITROL PANEL POV KILL SWITCH TEI TO AU1, AU2 TO /DC - 2 WIRES & AC - 2 WIRES &	COND 1 COND 1 COND 1 COND 1 COND 1 COMM KER COIL, AND 1 KER COIL, AND 1 KER MUST NOT B RMINALS MUST BI ANSUL ELECTRIC GROUND, NID TO F GROUND GAS TO F	J: 
Light Wash 1 1 2 3 4 5 5 6 7 7 8 9 9 10 11 12 13 14 15 16 17	OB NO 5944 TANK ELECTRICIAN: 1. WIRE MAIN C 2. WIRE ALL F 3. WIRE ALL F 3. WIRE ALL F 3. WIRE SHUNT 4. WIRE MAIN C 2. WIRE GAS V SHUNT TRIP BREAKER SHUNT TRIP UDS APPLIANC REMOTE 120VAC A ST TD AI DN SI -NEUTRAL TD A2 BREAKER	AKER (OPTIONAL) AKER (OPTIONAL) CANSUL AUTOMAN (I GAS VALVE	MO JOE CONITOR & CO. 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	EF-2	EXHAUST 3	3.000 2	208 8.5										
_	MPU-1	SUPPLY 3	5.000 2	208 15.0 208 3.1										
			1.000 2											
R DOV and		DRAWN BY S	SCHEMATIC TYPE	DESCRI	PTION OF OPERA	TION:				JOB NO		MODEL N		
DCV-221 Weber Grill Academy	l - Lombard	DATE E 8/3/2023	INSTALL DWG NO ECP #1-1	Demand Contro 3 PHASE MOTO could apply if d	Ventilation, w/ control for 2 Exha R REQUIRED FOR USE WITH VF tance exceeds 50 feet.	aust Fans, 2 Supply Fans, Exhaus FD. Room temperature sensor sh	st on in Fire, Lights out in Fire, Fans mo nipped loose for field installation.Verify	dulate based on duct temperature distance between VFD and Motor;	re. INVERTER DUTY r; additional cost		5944837	JOB NAM	/E Weber Grill Acader	ny - Lom
-,			NO									HOT TO SHUNT COI	SHUNT COIL	
ΞL		IROL PANEL TO FA sponsibility: Electrician	NS	FANS	CONTR		EL TO ACCESSORY onsibility: Electrician		,	CONTROL P SIGNAL F 3 EXTERN SHUNT TI	ANEL SI OFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFFF	IEUTRAL FROM SHUNT COI AL IS ENERGIZED NDITION.	]	
DITION PANEL	Load Wiring U1	LOAD LEG 1F	AN: 01	EF-1 	0 CONTROL PA		IRECTLY TO CONTROL BOARD			4 CONTROL PA	anel <u>KS</u> or <u>N1</u> <u>NE</u> U			
GND		UST HAVE ITS OWN CONDU	лт		REMOTE MOUNTE SWITCHE	E PLAC	CE END OF LINE PLUG MPTY JACK. PN: EOL120A	EOL120A 2		5 CONTACTO	DR COIL IN FIRE CO	NDITION.		
	Load Wiring U2		AN: 02	EF-2 	CONTROL P/	ANEL <u>B1 O</u>	BI			6 CONTROL P DRY CONT	ANEL <u>SFC1</u> ACT <u>SF01</u> ITH <u>SFC2</u>	COMMON NORMALLY OPEN COMMON		
L2 L3 )GND	WIRE TO W2 VFD QUICK GND CONNECTOR			0 	HOOD LIGI 1400 W M	HTS GND IAX	GF O J-BOX ON TOP OF HOOD			'         SUPPLY F           GROUP            8	AN SF02 SPARE CONT/ COMMON TO WHEN SUPPL	NORMALLY OPEN CTS WILL MAKE NORMALLY OPEN ( FAN IS ON.	<u>-</u>	
<u>L4</u>	Load Wiring U3		AN: 03	MPU-1 FLA: 15		ANEL COMM CAT-5 E WIRE DI	THERNET CONNECTION			9 DCV SPE 9 0-10V OUT			⁺ то вмз	
L6 GND	SM-3         V3            wire to         W3             VFD QUICK         H1	LOAD_LEG.2	BLACK BLACK RED WHITE		WORLD W WEB	MODULI UDP PO OUTBOI	E. NET REQUIRES 1) DHCP 2) DRT 1444 & 1445 OPEN FOR UND TRAFFIC ONLY.			10 (TOTAL VFD ANAL		LE OUTPUT. OWNERS MANUAL.	+ - TO BMS	
<u>L7</u>	IF VFD MOUNTED IN 2ND PANEL, WIRE SF			<u>N1</u>  □	CONTROL PA	ANEL T <u>1A O</u>	D CONTROL BOARD. INSTALL			0-10V OUT	PUT 2 IN VFD WIRE TO VFD PROPORTION SEE VFD OWN	TERMINAL STRIP. AL TO FREQUENCY. IERS MANUAL.		
L9 GND	SIGNAL FROM PANEL WITH ECPM03.			24V	ROOM TE SENSOR	MP SENSOR R SOURCE ON THE	R IN ROOM AWAY FROM HEAT ES. DO NOT INSTALL SENSOR CEILING GRID, SEE MANUAL.	GROUPS:		12 CONTROL PA TO EXTERNA				
<u>L10</u> L11	SIGNAL SFC10 TO MUA BOARD MPU-1	24VAC	C *WI IN	UI* IRE TO UNIT	CONTROL P/ TO CAPTURE \ SENSO	ANEL T2A O T2B O- VOLUME SENSOR	D CONTROL BOARD. R MOUNTED IN HOOD CAPTURE			15 SWITCH				
L12 GND	Load Wiring U4		AN: 04 BLACK BLACK	MPU-2 	0 CONTROL P/	ANEL T3A 0	<b>-</b> .			15 CONTROL PA		POSITIVE TO GAS VALVE NEGATIVE GIZED THROUGH LCD		
	WIRE TO W4 VFD QUICK H1 O CONNECTOR N1 O	LOAD_LEG 3 A	BLACK RED WHITE		TO CAPTURE \ SENSOF	VOLUME SENSO R VOLUMI	D CONTROL BOARD. R MOUNTED IN HOOD CAPTURE E.	HOOD 2 CAPTURE 1		24V DC OI	VL HMI WHEN VLY (NOT NEED GAS VALVE	FIRE SYSTEM ARMED. ED IF USING 120V ).		
	IF VFD MOUNTED IN 2ND PANEL, WIRE SF SIGNAL FROM PANEL	UUST HAVE ITS OWN CONDU	JIT	u	CONTROL P/ TO	ANEL <u>T4A O</u>				17 CONTR	CONTROL PANI Responsibility: A ROL PANEL	EL TO FIRE SYSTEM		
FANS	FAN START SFO2	24VAC		<u>24V</u>						18 CONTROL P			BUILDING ALARM PANEL FIRE INPUT	
ONDENSER	TO MUA BOARD MPU-2		*WI IN	IRE TO UNIT	TO CAPTURE V SENSOR	VOLUME R	D CONTROL BOARD. R MOUNTED IN HOOD CAPTURE E.	HOOD 4 CAPTURE 1		19 SIGNAL F BUILDIN 20 FIRE ALA	J9 OR J9 G AL1 AL2 WIRE DIRECT			
OWER TO ONDENSER	MAKE UP AIR ON PCB DAMPER IL1A PROVING IL1B	REMOVE JUMPER	ми. 	A ZONE 1 0 D3 0 D7		ANEL GAS O	HOT TO GAS V	GAS SOLENOID		21	BOARD. AL1 V CONDITION.	/ILL MAKE AL2 IN FIRE	BUILDING ALARM PANEL	
DWER TO DNDENSER	INTERLOCK LC DA MM ZC HA	W VOLTAGE CONNECTION F MPER INTERLOCK. WIRE JLTIPLE SUPPLY ON THE SAI ONE IN SERIES. SHOULD WE CONTINUITY WHEN DAM	PER	RMINAL NAMES 30 NOT APPLY MUA BY OTHERS	GAS VALV 120V ONI	VE ONLY LY HMIW	ENERGIZED THROUGH LCD /HEN FIRE SYSTEM ARMED.			SIGNAL F 22 BUILDIN TROUBL		COMMON NORMALLY CLOSEI	P⊘	
	NC SE	TREQUIRED FOR ALL UNITS E MAKE-UP AIR SCHEMATIC	S.			TH	IE FOLLOWING CONNECTION MAY OR MAY NOT BE EQUIRED BASED ON JOBSITE SPECIFICATIONS	S		23 ALARM	MAKE TBC TC CONDITION.	TBL IN TROUBLE		
										24				
			B NO		мс	DDEL NUMBER	DCV-2211		DRAWN BY	SCHEMATIC TYPE	DESCRIPTION OF (			
		1	59	44837	JO	B NAME Weber C	Grill Academy - Lombard		DATE 8/3/2023	DWG NO ECP #1-4	Fire System # I TAINK FS - 4.0/4.0/4.	) / Hemote - 4.0/4.0/4.0 (PS-1).		
02/10/	′2021 Rev. 2	2	TAN	K PRO	TECTION	$\Box \cup - \lor$	OLTAGE	DETAIL					027	10/202
1: MAST	ER	3	1. WIRE M 2. COMPLE 3. VERIFY	INTRACTOR: IANUAL ACTUATI ETE FINAL HODI Y FINAL FIRE S	IN DEVICE(S), REMD UP DF SYSTEM (STEM TEST	ITE FIRESTAT(S), CO	RE INTERLOCK(S), FIRE	SENSOR(S) AND FIR	RE ALARM CONTACTS				FS-1: MAST	'ER
		4							RACTOR REQUIRE	MENT		COMMENTS		
ON SHUNT TRIP	BREAKER CDIL	5	MANUA	L ACTUATION I	EVICE(S)	101 AND 104 102 AND 103		× 2	24 VDC < 1.0 A	MPS WIRE MANU	JAL ACTUATION DEVICE JAL ACTUATION DEVICE ER 101 TO 104 AND 102	TERMINAL 1 BETWEEN TERMINAL 2 BETWEEN TO 103 IF NO MANUAL	CORE PANEL TERMINA CORE PANEL TERMINA ACTUATION DEVICE I:	_S 102 _S 101 _S INST
SHUNT TRIP BRE	AKER SWITCHES	7	MANUAL	ACTUATION DEV		N/A 21 AND 24	RI ACK AN			A WIRE	MANUAL ACTUA IF SURFACE M FIRE SENSUR WHITE W FIRE SENSUR BLACK V	TION DEVICE COVER M DUNTED, USE COVER E TRES BETWEEN HOOD (TRE BETWEEN HOOD C	UST BE INSTALLED XTENSION STI-6531B CORE PANEL TERMINAL ORE_PANEL_TERMINALS	S 22 A
L SOLENDID TO N , AND GREEN TO C AND GREEN TO GRE	NEUTRAL	8	F	TRE ALARM CON	TACT	22 AND 23 AL1, AL2	VA	RIES	50V MAX (AC/DC) UP TO 1	AMP	(842°F) #CW04427 (WHT DD; DTHERWISE BELDEN ALARM RELAY CONTACTS CORI	) & #CW04427B (BLK) #6320UL DR SIMILAR FDR BUILDING FIRE 4 ELECTRICAL CONTROL	WIRE OR SIMILAR ONL PLENUM RATED WIRE; LARM LOCATED IN TH _ PANEL	SEE F
NEL POWER		9		CORE INTERLOC	((S)	ILA, ILB, IL	C ILA,	LB, ILC	S-485 COMMUNICATIONS		STEM (1) ILA, TO CORE SYSTEM (1) ILC, TO CO	SYSTEM (2) ILA, CORE RE SYSTEM (2) ILC, U	SYSTEM (1) ILB, TO ( SE BELDEN# 88760 D	ORE S ? SIMIL
GROUND 5 AMP SERVICE 1 AND N1, GROUNI T_NOT_DRIGINATE	)	10	CORE (		CABLE	RJ-45 Jack	IIK VA	DNNECTION	SIGNAL <1.0 AN	NPS TYPICAL	RE TU TBL & TBC NURM CONNECTION CAT5 CAP WIRELESS RD	LE TO LOCAL AREA N UTER WITH VALID INT	ELUSES IN TRUUBLE C ETWORK VIA ETHERNE ERNET CONNECTION	TIW2 T
IKIN RKFUKEK		11	FIRE ALA -2 VIRE	ARM CONTACT S WIRED TO NE	RMALLY							C_		
		12	FIRE CON -CORE CI AND AL2 -SEE FIC	NDITION) ONTROL PANEL	AL1								E FIGURE 3	SIMILA
		14	TROUBLE	CONTACT S_TO_NORMALLY									RE_COMMUNICATIONS C	ABLE
RE TO LGV & N1D RE TO GAS & N1		15	UPEN CUI IN TROUE -CORE PA TBL AND	NTACTS (CLUSE BLE CONDITION) ANEL TERMINAL TBC						MANUAL ACTUATION			AIS CABLE ST BE INSTALLED TO TWORK WITH VALID IN A ETHERNET SWITCH I	A LOCA ITERNE JR WIR
		16	SUPERVI: -4 WIRE	SED LOOP S, 24VDC CONN	CT BLACK			EXHAUST HOD	D	DEVICE 10 TD 20 ◄ FEET FRDM ► HOOD LOCATED				
		17	CONNECT BETWEEN -ADDITIO SUPERVI:	WHITE (DR RE I 22 AND 23 IN INAL FIRESTATS SED LOOP	PANEL WIRED IN		E			NEAR POINT OF EGRESS FROM HOOD				
MUST BE JPSTREAM		19	-USE HIC (WHT) & IF RAN D DTHERVI:	GH TEMP (842°F) #CW04227B (BI VER TOP OF HOI SE BELDEN #63	» #CW04427 K)WIRE DNLY D; 20UL DR							MAI -4 BE -W	VUAL ACTUATION DEVI WIRES, 24VDC WIRE TWEEN 102 AND 103 IRE (TERMINAL 2) BE	CE WIR (TERM
		20	SIMILAR -SEE FIC	JURE 1	WIRE							-A SU -U: -S	DDITILINAL PULL STAT PERVISED LOOP SE BELDEN #6320UL E EE FIGURE 2	INS W
		21	36 INCHE DF ALL U THE PANE	S CLEARANCE I UTILITY CABINE EL SHALL ALSO	EQUIRED IN FRONT DOORS BE LOCATED IN AN		ELECTR	С БАS		ABDVE ABDVE CENTER I	FLOOR FLOOR IL TO JF PUSH	MA PA PR	NUAL ACTUATION DEVI RT #STI-SS2431 JTECTIVE COVER MUS	CE T BE I
		22	VISUAL 4	ALARMS CAN BE	HEARD AND SEEN		/	UH3		STAT				
		23	A TTC											
		24	BE ROU NOTE: SEE	JTED IN SE INSTALLATION, OP	VILIAGE DU L PARATE CONDU RATION, AND MAINTENAN	JIT FROM ALL JIT FROM ALL CE MANUAL FOR FURTHER	WIKE SHUULD AC SOURCES R INSTRUCTIONS	_				_		
	•													

FANS CONTROLLED











			1								R	ROOF	TOP UN	IIT SCI	HEDULE (E	XISITN	IG)				
								NOMINA		SU	PPLY FA	AN		ELE	CTRIC HEATE	ER			COOL	ING	_
UNITID	MANUFA	CTURER	EFFICIEN	CY MC	DEL			TONS	TOTAL	OUTSI	DE EX	TERNA	LSTATIC	i	CAPACITY	Т	OTAL /	AMBIE	NT	ENTERING	- 7
								10113	CFM	AIR CF	M PRE	SSURE(	IN. W.G.		KW	٦	ИВН	DB (°I	F)	DB/WB(°F)	1
RTU-2(E)	AAC	N	S.A.E.	S./	<b>\.Е.</b>	SE	EPLAN	8	3200	550		S.A.	.E.		S.A.E	S	S.A.E	S.A.		S.A.E	$\bot$
IOTES / AC	CESSORIES -		VICTING																		
	1 S.A.E- SA																				
	2 CONTRAC	TOR TO						ΚΕΌΣΕΖ. % ΒΔΤΕΓΙ ΓΔ	PACITY REP		FEDED										
	4 CONTRAC	CTOR TO	D FIELD VER	IFY EXACT LOC	ATION AN	ID CONI	GURAT	ION OF RTU	ON SITE.			•									
	5 CONTRAC	CTOR TO	O REBALAN	CE OUTSIDE AIF	& RETUR	N AIR D	AMPERS	ON EXISTIN	IG RTU TO M	1ATCH VA	LUES M	IENTIO	NED IN A	BOVE TA	BLE.						
	6 REPLACE	NEW FI	LTERS.																		
									FAN		ILE										
UNITID	MANUFAC	TURER	HOOD	MODEL	CFM	TYPE	DRIVE	FAN RPM	WEIGHT	E.S.P.	МОТО	OR			SERV	ICE	11	NTERLO	CKED	NOT	ES
			LENGTH						(LBs)	(IN. W.G.	HP		VOLTS	PHASE				WITI	H		
EF-1 (N)	CAPTIVE	-AI RE	15'-0"	CASRE20DD	3000	ROOF	DIRECT	1235	482	1.0	3		208	3	KITCH	IEN	но	OD CO	NTROL		:
	CADTIVE		151.0"	CASPEZODD	2000	DOOL	DIRECT	1005	490	1.0	2		20.9	2	KITCI						
EF-2 (N)	CAPTIVE	AIRE	15-0	CASREZUDD	3000	RUUF	DIRECT	1235	482	1.0	5		208	3	KITC	1EIN	HU		NIROL		
NOTES / /	ACCESSORIES:																				
	1. REFER SHE	ET M-4.0	TO M-4.7 F	OR FURTHER DETA	AILS.			5.	AMCA SEAL &	UL CERTIF	IED										
	2. WEATHER	PROOF	ISCONNECT	SWITCH, VARIAB	E SPEED C	ONTROL															
	3. SPEED CON	ITROL SV	VITCH																		
	4. THERMAL (	OVERLOA	D PROTECTI	ON																	
																	1				
/IAU-1(N)	4140 0.8	9	7.9 5	208/3 15.0	18.8 30	) CAF	TIVEAIR	E A2-D.500-	20D-MPU	1511	16.1	1 E	END DISC	HARGE	MAU-1(N)	4140	5TR (EA	ACH)	14 2	.08-230/3 17	7 <mark>.</mark> 4
1AU-2(N)	1380 0.8	2	9.2 1	208/3 3.1	3.9 15	6 CAF	TIVEAIR	EA1-D.250-	15D-MPU	984	12.7	1 E	END DISC	HARGE	MAU-2(N)	1380	3TR	2	14 2	.08-230/3	
OTES:										I		11		I			1	I	I		
) UNIT TO BE	E PROVIDED W	ITH CLAS	S 1A LOW L	AKAGE MOTORIZ	ED DAMPE	R, NEMA	<b>3R DISCO</b>	NNECT, FAN	WITH VFD, VIE	BRATION IS	OLATIO	N SPRIN	G SUPPOR	TED BLO	VER, INTAKE I	HOOD, SC	REEN INTA	KE, AND	MERV	-8 FILTER	
) DOUBLE W	ALL CONSTRUC	TION W	ITH WEATHE	R PROOF COATIN	G WITH 1	INCH FIB	ERGLASS I	NSULATION A	ALL AROUND T	HE UNIT											
) CONTRACT	OR TO PROVID	E CURB	FOR MAU-2	AND CURB ADAPT	OR FOR M	AU-1 FO	RINSTALLA	ATION. CURB	TO BE SUPPOI	RTED FROM	1 BUILDI	ING STRU	JCTURAL N	IEMBER I	N CONSULTAT		A STRUC	TURAL E	NGINE	ER.	
) ALL MISC. I	TEMS, MECHA	NICAL W	IRING, CON	NECTIONS, SUPPO	RTS ETC. T	O BE PRO	VIDED BY	GC WHICH A	RE REQUIRED	FOR INSTA	LLATION	N.									
) INTEGRATIO	ON AND CONT	ROLOF	HOODS, KITC	HEN EXHAUST FA	NS AND M	AU SHALL	BE UNDER	R KITCHEN VE	NDOR SCOPE.	ALSO SUP	PLY AND	INSTALL	ATION OF	ANSUL SY	STEM SHALL	BE DONE E	BY KITCHEN	N VEND	OR.		
								FRMINA	IS SCHED	ULE											
							/								1						
UNIT ID M	IANUFACTUREF		MODEL	SIZE		DESCR	IPTION	CC	ONSTRUCTION	1	FINISH		QTY	(NOS)		RE	MARKS				
А	TITUS		PAS	24x24	PERFORA	ted face	CEILING I	DIFFUSER	ALUMINIUM		WHITE			4		1,	2,4,5				
в	TITUS		350RI	24x24		CELLING	GRILLE		ΔΗΜΙΝΙΗΜ		WHITE			3		1	245				
	1105		SSORE	24724		CETEIN					vvinit					1,	2,7,3				
IOTES:													NECK SIZE	:S:							
MAXIMUM	I NOISE CRITER	ION RAT	ING < 35 DB	A.									Up To	100 Cfm	- 6" DIA						
	SUALL PERINGH, C		BE SELECTE			NC							101 10 226 To	225 Cfm	- 8" DIA						
	S FRAME TYPE		COORD W	TH CELLING / WA			TYPE						376 To	600 Cfm	- 10 DIA						
. NECK SIZE S	SHALL BE AS SC	HEDULE	D.	in celente / wA	LL CONSTR	ochon							601 To	900 Cfm	- 14" DIA						
													901 To	1100 Cfm	- 15" DIA						
AIR BALA	ANCE																				
	ARFA	SERVED	<b>SUPPLY ΔΙ</b>		RETURN		HAUSTAIR	2													
							0.051 AIN	-													
RTU-2 (	E) DI	NING	3200	550	2650		U CFM														
EF-1 (N	N) KIT	CHEN	-	-	-	3	000 CFM														

UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-2 (E)	DINING	3200	550	2650	0 CFM
EF-1 (N)	KITCHEN	-	-	-	3000 CFM
EF-2 (N)	KITCHEN	-	-	-	3000 CFM
MAU-1	KITCHEN	-	4140 CFM	-	-
MAU-2	KITCHEN	-	1380 CFM	-	-
TOTAL:		3200 CFM	6070 CFM	2650 CFM	6000 CFM
BUILDING PRESSURE:			•	70 CFM	POSITIVE

S.A	۱.E	S.	A.E	S.A.E	S.A.E	S./	A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	1-6	
						1								]
INTERL	OCKEE	D	N	OTES / ACCESS	ORIES									
W	ITH													
HOOD	ONTRO	DL		1,2,3,4,5										
HOOD	ONTRO	DL		1,2,3,4,5										
	14	200.22	0/2	17 4 ( 5 4 6 1 1)	21 4/5		h	240.0	221.0	1 7	-	7 14		02
	14	208-23	20/3	17.4 (EACП) 11 Q	21.4 (C/ 1/	<u>чсп)</u> 5	2	549.9 112.0	321.9 104.8	73	2	7-14 7-1/		92
JIN	14	200-2.		11.5	14.	5	1	115.5	104.0	/.		/-14	NATURAL	52
INTAKE, A	ND ME	RV -8 FII	TER											
IRUCIURA	LENGI	NEER.												
CHEN VEN	DOR.													

 ELECTRICAL
 OPERATING

 STAGES
 VOLTS
 PHASE
 MCA(A)
 MOCP(A)
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 OPERATING

 (LBS)
 VOLTS
 VOLTS
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 VOLTS
 MCA(A)
 MOCP(A)
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 VOLTS





	ANY AND ALL "BUILDING STANDARDS" AND/OR "BUILDING SPECIFICATIONS" SHALL BE CONSIDERED AN INTEGRAL PART OF THESE DOCUMENTS AND THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN A COPY OF THESE REQUIREMENTS/THIS DOCUMENT AND COMPLY WITH ALL REQUIREMENTS AND STANDARDS CONTAINED WITHIN.
	THESE DRAWINGS ARE GENERALLY DIAGRAMMATIC AND ARE INTENDED TO CONVEY THE SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT OF LIGHTING FIXTURES, DEVICES, CONTROLS, ELECTRICAL FIXTURES, MOTORS, PANELBOARDS, EQUIPMENT, ETC. THE LOCATIONS OF ALL ITEMS SHOWN ON THESE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED AT THE PROJECT. ALL LOCATIONS OF WORK EXPOSED TO VIEW ARE SUBJECT TO APPROVAL OF THE ARCHITECT PRIOR TO INSTALLATION.
	THE ELECTRICAL CONTRACTOR SHALL VERIFY EXISTING CONDITIONS TO INSURE THAT ALL NEW WORK WILL FIT INTO THE EXISTING STRUCTURE IN THE MANNER INTENDED AND AS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/OWNERS REPRESENTATIVE PRIOR TO ANY ROUGH—INS, FABRICATIONS, OR PERFORMING ANY WORK IN THE AREA INVOLVING DIFFERENCES. NOTIFICATION SHALL BE IN THE FORM OF A DRAWING OR SKETCH INDICATING FIELD MEASUREMENTS AND NOTES RELATED TO THE AREA.
	ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS SHALL BE PROMPTLY BROUGHT TO THE ATTENTION OF THE ENGINEER FOR CLARIFICATION DURING THE BIDDING PERIOD. NO ALLOWANCE SHALL SUBSEQUENTLY BE MADE TO THE CONTRACTOR BY REASON OF HIS FAILURE TO HAVE BROUGHT SAID DISCREPANCIES TO THE ATTENTION OF THE ENGINEER DURING THE BIDDING PERIOD OR OF ANY ERROR ON THE CONTRACTOR'S PART.
	ALL EQUIPMENT SHALL BE INSTALLED IN A NEAT, PROFESSIONAL AND WORKMANLIKE MANNER, RECTILINEAR TO BUILDING STRUCTURE.
	ALL COMPONENTS SHOWN ON THE RISER/ONE—LINE DIAGRAMS BUT NOT ON THE PLAN OR VICE VERSA, SHALL BE INCLUDED AS IF SHOWN ON BOTH.
	REVIEW ALL TRADES' CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR ELECTRICAL EQUIPMENT. COORDINATE EXACT MOUNTING LOCATIONS WITH THE ARCHITECT.
	REFER TO ARCHITECTURAL ELEVATIONS TO DERIVE EXACT LOCATIONS OF ALL RECEPTACLES, OUTLETS/JACKS, SWITCHES, ETC. LUMINAIRES AND CEILING MOUNTED EQUIPMENT SHALL BE COORDINATED WITH THE ARCHITECTURAL REFLECTED CEILING PLANS.
	EXACT LOCATION OF MECHANICAL EQUIPMENT THAT REQUIRE ELECTRICAL CONNECTION ARE SHOWN ON THE MECHANICAL DRAWINGS. FIELD VERIFY EXACT LOCATIONS WITH MECHANICAL CONTRACTOR PRIOR TO ANY ROUGH-INS.
	ALL CIRCUITING SHALL BE RUN CONCEALED UNLESS SPECIFIED OTHERWISE.
A E	LL RACEWAYS RUNNING THROUGH BUILDING EXPANSION JOINTS SHALL BE QUIPPED WITH EXPANSION FITTINGS.
	CONDUIT HOME RUNS SHOWN ON THE DRAWING WITH MORE THAN (3) CURRENT CARRYING CONDUCTORS ARE SHOWN DIAGRAMATICALLY. THIS CONTRACTOR SHALL NOT INSTALL MORE THAN (3) CURRENT CARRYING CONDUCTORS IN A RACEWAY UNLESS NATIONAL ELECTRIC CODE (N.E.C), ARTICLE 310.15 DERATING FACTORS ARE APPLIED.
	ALL LIGHTING AND GENERAL POWER BRANCH CIRCUITS SHALL INCLUDE A SEPARATE NEUTRAL CONDUCTOR, UNLESS SPECIFICALLY NOTED OTHERWISE.
	THE ELECTRICAL CONTRACTOR SHALL REFER TO THE ELECTRICAL SPECIFICATIONS FOR ACCEPTABLE CONDUIT TYPES/LOCATIONS. ALL CONDUIT SIZES ON THE DRAWINGS ARE BASED ON THE LATEST EDITION OF THE N.E.C. CONDUIT FILL TABLES FOR ELECTRICAL METALLIC TUBING (E.M.T). CONDUIT SIZES SHALL BE REVISED TO THE SIZE REQUIRED, RELATIVE TO THE ACTUAL CONDUIT TYPE TO BE INSTALLED.
	IT IS NOT INTENDED THAT THE PLANS INDICATE ALL THE NECESSARY BENDS, OFFSETS, PULL BOXES AND OBSTRUCTIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO INSTALL HIS WORK TO CONFORM TO THE STRUCTURE, MAINTAIN HEADROOM AND KEEP OPENINGS AND PASSAGEWAYS CLEAR. REFER TO THE ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AS REQUIRED.
	IT IS NOT INTENDED THAT THE PLANS INDICATE ALL CONDUIT ROUTES, PULL BOXES, ETC. CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ACTUAL CONDUIT ROUTING, QUANTITY AND LOCATION OF PULL BOXES WITHIN ACCESSIBLE LOCATIONS.
	PROVIDE SCREW-COVER PULL BOXES IN CONDUIT RUNS AS REQUIRED TO LIMIT THE NUMBER OF BENDS TO NO MORE THAN THREE (3) OR 270 DEGREES TOTAL. SIZE PULL BOXES IN ACCORDANCE WITH NEC, ARTICLE 314.28. DOCUMENT ON RECORD DRAWINGS, SIZE AND LOCATION OF PULL BOXES USED IN FEEDER CONDUIT RUNS.
	ALL OUTLET BOXES IN WALLS SHALL HAVE A MINIMUM OF ONE (1) DEDICATED VERTICAL CONDUIT ENTERING AT THE TOP OF THE BOX. HORIZONTAL CONDUIT CONNECTIONS SHALL ONLY BE PERMITTED UNDER WINDOWS OR UNLESS OTHERWISE NOTED ON DRAWINGS.
	WHERE MULTIPLE DEVICES ARE INDICATED IN A COMMON LOCATION, GANG INTO A SINGLE COVER PLATE.
	ALL EXISTING PANELS SHALL BE PROVIDED WITH ENGRAVED NAMEPLATES AS DESIGNATED ON PANEL SCHEDULES SECURED TO PANEL FACE AND NEW ENGRAVED NAMEPLATES DENOTING ORIGIN OF FEEDER FROM WHICH PANEL IS SERVED

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

- a. 2021 DUPAGE COUNTY BUILDING CODE
- b. 2018 ILLINOIS ENERGY CONSERVATION CODE
- c. 2021 DUPAGE COUNTY MECHANICAL CODE
- d. 2014 ILLINOIS PLUMBING CODE
- e. 2020 DUPAGE COUNTY ELECTRICAL CODE
- f. 2021 DUPAGE COUNTY FUEL GAS CODE

	SYMBOL LEGEND		ABBREVIA	TIONS
¢		А	AMPERES	EF
$\ominus$	LED LIGHTING FIXTURE	AFF	ABOVE FINISHED FLOOR	EM
	- LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE	AS	AMP SWITCH	EMT
	SCHEDULE.	AIC	AMPS INTERRUPTING CAPACITY	EQUI
	- CIRCUIT NUMBER : INDICATED BY NUMBER	AT	AMP TRIP	ER
^A O _a ²	- SWITCHING INDICATED BY LOWER CASE LETTERS.	AWG	AMERICAN WIRE GAUGE	FDR
		С	CONDUIT	FIXT
4 <b>•</b>	COMBINATION OF FXIT SIGN AND EMERGENCY BUG-EYE FIXTURE.	C/B,CB	CIRCUIT BREAKER	FL
⊗ EX	EMERGENCY BATTERY UNIT WITH ATTACHED EMERGENCY FIXTURES AND	СКТ	CIRCUIT	G
	OUTLET BOX.	CLG	CEILING	GFI
\$ _a	LIGHT SWITCH. SINGLE POLE, 20A	CU	COPPER	GP
\$xxx	"a" CONTROL OF SPECIFIED LUMINAIRES "3" 3-WAY TYPE	DWG	DRAWING	HP
	"OS" LINE VOLTAGE MULTI TECHNOLOGY WALL SWITCH OCCUPANCY SENSOR WITH MANUAL ON/OFF SWITCH.	KCMIL	ONE THOUSAND CIRCULAR MILS	HZ
	"VS" LINE VOLTAGE MULTI TECHNOLOGY WALL SWITCH VACANCY SENSOR WITH MANUAL ON/OFF SWITCH.	KVA	KILOVOLT-AMPERES	IC
\$ ^D	DIMMER SWITCH	KW	KILOWATTS	PP
Φ	DUPLEX CONVENIENCE RECEPTACLE	LTG	LIGHTING	REC
Φ	DUPLEX CONVENIENCE GFCI RECEPTACLE	MAX	MAXIMUM	NIC
		МСВ	MAIN CIRCUIT BREAKER	NTS
	DATA OUTLET	MIN	MINIMUM	Р
	CEILING MOUNTED DUPLEX RECEPTACLE AND DATA OUTLET	N	NEUTRAL	PNL
JSB		TYP	TYPICAL	IG
⊖≓ GFI	DUPLEX GFI RECEPTACLE WITH USB PORT	UON	UNLESS OTHERWISE NOTED	w
SB		V	VOLT/VOLTAGE	EX
€	DUPLEX RECEPTACLE WITH USB PORT	WP	WEATHER PROOF	VA



F EXISTING MDP ELECTRICAL RISER GENERAL NOTES: EXACT A.I.C. RATING IF REQUIRED. ELECTRICAL RISER KEYED NOTES: ACCORDINGLY.

# 1 ELECTRICAL RISER DIAGRAM SCALE: NTS

EXISTING HINGED CVER CABLE

PULL/TAP BOX FOR "KP" PANELS



EXISTING CABLE



![](_page_16_Picture_15.jpeg)

ROOF

EXISTING EXISTING EXISTING EXISTING

#### PART I - ELECTRICAL GENERAL PROVISIONS 1.1 <u>RELATED DOCUMENTS</u>

- A. THE PROVISIONS OF THE INSTRUCTIONS TO BIDDERS, GENERAL CONDITIONS, SUPPLEMENTARY CONDITIONS, ALTERNATES, ADDENDA'S', AND DIVISION 1 ARE A PART OF THIS SPECIFICATION. CONTRACTORS AND SUBCONTRACTORS SHALL EXAMINE SAME AS WELL AS OTHER DIVISIONS OF THE SPECIFICATIONS WHICH AFFECT WORK UNDER THIS DIVISION.
- A. THIS SECTION INCLUDES GENERAL ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS FOR ELECTRICAL INSTALLATIONS COMMON TO ALL SECTIONS OF DIVISION 16. THE ADMINISTRATIVE AND PROCEDURAL REQUIREMENTS IN THIS SECTION EXPAND AND SUPPLEMENT THE REQUIREMENTS SPECIFIED IN DIVISION
- 1.3 DESCRIPTION OF WORK
- A. ELECTRICAL, ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, STRUCTURAL, ETC., AND ALL OTHER DRAWINGS AS WELL AS THE SPECIFICATIONS FOR ALL THE DIVISIONS ARE A PART OF THE CONTRACT DOCUMENTS B. DRAWINGS AND SPECIFICATIONS ARE TO BE CONSIDERED AS SUPPLEMENTING EACH OTHER. WORK SPECIFIED BUT NOT SHOWN, OR SHOWN BUT
- NOT SPECIFIED, SHALL BE PERFORMED OR FURNISHED AS THOUGH MENTIONED IN BOTH SPECIFICATIONS AND DRAWINGS. C. VISIT THE SITE OF THE WORK AND BECOME FAMILIAR WITH CONDITIONS AFFECTING THE INSTALLATION. SUBMISSION OF A PROPOSAL SHALL PRESUPPOSE KNOWLEDGE OF SUCH CONDITIONS AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED WHERE EXTRA LABOR OR MATERIALS ARE REQUIRED BECAUSE OF IGNORANCE OF THESE CONDITIONS.
- 1.4 WORK INCLUDES
- A. INCLUDE ALL LABOR, MATERIAL, EQUIPMENT, SERVICES, AND PERMITS NECESSARY FOR THE PROPER COMPLETION OF ALL ELECTRICAL WORK SHOWN. ITEMS OMITTED, BUT NECESSARY TO MAKE THE ELECTRICAL SYSTEM COMPLETE AND WORKABLE, SHALL BE UNDERSTOOD TO FORM
- B. IT IS THE PURPOSE OF THE ELECTRICAL DRAWINGS TO INDICATE THE APPROXIMATE LOCATION OF ALL EQUIPMENT, OUTLETS, ETC. ASCERTAIN EXACT LOCATIONS AND ARRANGE WORK ACCORDINGLY. THE RIGHT IS RESERVED TO EFFECT REASONABLE CHANGES IN THE LOCATION OF OUTLETS UP TO THE TIME OF ROUGHING-IN, WITHOUT ADDITIONAL COST TO THE OWNER. CHANGES IN LOCATION OF OUTLETS OR EQUIPMENT NECESSITATED BY INTERFERENCE WITH THE WORK OF OTHER TRADES SHALL BE MADE ONLY WITH THE CONSENT OF THE ARCHITECT AND ENGINEER OR OWNER'S REPRESENTATIVE, AND AT NO ADDITIONAL COST
- C. AS USED IN THIS SPECIFICATION, PROVIDE" MEANS "FURNISH AND INSTALL" AND "HVAC" MEANS "HEATING, VENTILATING AND AIR CONDITIONING AND "POS" MEANS "PROVIDED UNDER OTHER SECTIONS". "FURNISH" MEANS "TO PURCHASE AND DELIVER TO THE PROJECT SITE COMPLETE WITH EVERY NECESSARY APPURTENANCE AND SUPPORT," AND "INSTALL" MEANS "TO UNLOAD AT THE DELIVERY POINT AT THE SITE AN PERFORM EVERY OPERATION NECESSARY FOR PROPER INSTALLATION PER CODES AND MANUFACTURERS REQUIREMENTS, TO ESTABLISH SECURE MOUNTING AND CORRECT OPERATION AT THE PROPER LOCATION IN THE PROJECT."
- D. WORK INCLUDES, BUT IS NOT LIMITED TO: 1. RE-USE OF AND NEW PANELBOARDS AND CIRCUIT BREAKERS 2. FEEDERS AND BRANCH CIRCUIT WIRING
- 3. HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS 4. ELECTRICAL IDENTIFICATION 5. CONDUCTORS AND CABLES
- 5. GROUNDING AND BONDIN 7. RACEWAYS AND BOXES 8. WIRING DEVICES
- 9. LIGHTING CONTROL DEVICES 10.LUMINAIRES, INCLUDING LAMPS AND BALLAST
- 1.RE-WORKING AND NEW DEVICES TO THE EXISTING FIRE ALARM SYSTEM 2 FIRE STOPPIN 13. ELECTRICAL CONNECTIONS TO MECHANICAL HVAC AND PLUMBING EQUIPMENT
- 14 NAMEPLATES LABELS, AND TAGS 15.COORDINATION DRAWINGS 16.SHOP DRAWING
- 7. OPERATION AND MAINTENANCE INSTRUCTIONS AND MANUALS
- E. THE ELECTRICAL DESIGN IS BASED ON THE CURRENT ADOPTED EDITION NFPA 70 "THE NATIONAL ELECTRICAL CODE". THE CONTRACTOR SHALL INCLUDE IN THEIR BID THE COST OF INSTALLING MATERIALS AND EQUIPMENT NECESSARY TO SATISFY ALL LOCAL, AND/OR STATE CODES. 1.5 WORK OR MATERIALS NOT INCLUDED
- A. THE EXACT WIRING REQUIREMENTS SHALL BE AS RECOMMENDED BY THE MANUFACTURER OF THE EQUIPMENT AND SHALL BE VERIFIED BY THE ELECTRICAL CONTRACTOR WITH THE EQUIPMENT MANUFACTURER BEFORE SUBMITTING THE BID. B. STARTERS SUPPLIED AS AN INTEGRAL PART OF THE EQUIPMENT SHALL BE FURNISHED UNDER THE DIVISION PROVIDING THE EQUIPMENT
- POWER WIRING DISCONNECT SHALL BE UNDER DIVISION 16. ALL OTHER STARTERS AND AUXILIARY CONTROL EQUIPMENT SHALL BE SUPPLIED AND WIRED UNDER DIVISION 16, UNLESS OTHERWISE SHOWN. 1.6 RELATED WORK SPECIFIED ELSEWHERE
- A. DIVISION 13 SPECIAL CONSTRUCTION B. DIVISION 15 - MECHANICAL
- 1.7 CODES, PERMITS, AND FEES
- A. INSTALL WORK IN FULL ACCORDANCE WITH RULES AND REGULATIONS OF STATE, COUNTY, AND CITY AUTHORITIES HAVING JURISDICTION (AH. OVER PREMISES. THIS SHALL INCLUDE SAFETY REQUIREMENTS OF THE STATE OF NEW YORK DEPARTMENTS OF COMMERCE AND NATURA RESOURCES. DO NOT CONSTRUE THIS AS RELIEVING CONTRACTOR FROM COMPLIANCE WITH ANY REQUIREMENTS OF SPECIFICATION WHICH AR IN EXCESS OF CODE REQUIREMENTS AND NOT IN CONFLICT THEREWITH. WORK SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABL PROVISIONS OF THE NATIONAL ELECTRICAL CODE, AS INTERPRETED BY THE LOCAL AUTHORITY HAVING JURISDICTION, AS WELL AS ANY FURTHER MODIFICATIONS OR REGULATIONS PUBLISHED BY LOCAL OR STATE AUTHORITIES
- B. GIVE PROPER AUTHORITIES NOTICE AS REQUIRED BY LAW RELATIVE TO THE WORK IN THEIR CHARGE. COMPLY WITH THE REGULATIONS REGARDING TEMPORARY ENCLOSURES, OBSTRUCTIONS, OR EXCAVATIONS AND PAY ALL LEGAL FEES INVOLVED. C SECLIPE AND PAY FOR PERMITS AND CERTIFICATES OF INSPECTIONS INCIDENTAL TO THIS WORK AS REQUIRED BY ALL FORECOING ALITHORITIES BE RESPONSIBLE FOR PAYMENTS TO ALL PUBLIC UTILITIES FOR WORK PERFORMED BY THEM IN CONNECTION WITH PROVISION OF SERVICI ONNECTIONS REQUIRED UNDER THIS DIVISION OF SPECIFICATIONS. TURN OVER CERTIFICATES OF APPROVAL TO THE CONSTRUCTION MANAGEF
- AND/OR OWNER PROMPTLY WHEN RECEIVED, AND BEFORE PAYMENT IS MADE FOR THE WORK. DELIVER ALL CERTIFICATES TO ARCHITECT IN D. PROVISIONS OF THE LATEST REVISIONS TO THE FOLLOWING CODES AND STANDARDS SHALL BE FOLLOWED WHERE APPLICABLE: 1. NFPA 70 - NATIONAL ELECTRIC CODE (NEC)
- 2. NFPA 101 LIFE SAFETY CODE 3. TIA/EIA - 568, 569, AND J-STD-607 4. AMERICANS WITH DISABILITIES ACT (AD
- 5. FEDERAL OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA)
- 1.8 COORDINATION WITH OTHER TRADES A. CONSULT THE DRAWINGS, PRODUCT DATA, AND SHOP DRAWINGS COVERING THE WORK FOR VARIOUS OTHER TRADES, THE FIELD LAYOUTS OF THE CONTRACTORS FOR THE TRADE AND MAKE ADJUSTMENTS ACCORDINGLY IN LAYING OUT THE ELECTRICAL WORK.
- B. KEEP FULLY INFORMED OF THE PROGRESS OF THE GENERAL CONSTRUCTION. INSTALL WORK THAT IS TO BE CONCEALED WITHIN THE BUILDING CONSTRUCTION IN SUFFICIENT TIME TO SECURE PROPER LOCATION WITHOUT DELAY TO THE WORK OF OTHER TRADES. ALL CONDUIT AN DUTLET BOXES CONCEALED IN MASONRY CONSTRUCTION SHALL BE INSTALLED DURING WALL CONSTRUCTION. ATTEND TO ELECTRICAL WORK During the progress of building—in to prevent misalignments and damages to the electrical work.
- C. EXAMINE THE WORK OF OTHER TRADES WHEN IT COMES IN CONTACT WITH, OR IS COVERED BY WORK IN THIS DIVISION. DO NOT ATTACH TO COVER UP, OR FINISH AGAINST ANY DEFECTIVE WORK, OR INSTALL WORK IN A MANNER WHICH WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES.
- D. ALL OUTLETS, SWITCHES, AND RECEPTACLES SHALL BE CENTERED WITH REGARD TO PANELING, WALL COVERINGS, TRIM, EQUIPMENT, ETC. SHALL LINE UP WITH EITHER BOTTOM OR TOP OF MASONRY COURSES. CHANGES TO THE SPECIFIED MOUNTING HEIGHTS OF ANY DEVICE SHALL BE APPROVED BY THE OWNER'S REPRESENTATIVE BEFORE ROUGH-IN. E. TAKE ALL FIELD MEASUREMENTS NECESSARY AND ASSUME RESPONSIBILITY FOR THEIR ACCURACY.
- F. BEFORE BEGINNING CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE TO THE MECHANICAL CONTRACTOR, MARKED-UP PRINTS INDICATING ALL ELECTRICAL ITEMS WHICH AFFECT THE LOCATION OF HEATING, VENTILATING, AIR CONDITIONING, PLUMBING, PIPING, AND DUCTWORK. THESE SHALL INCLUDE BUT NOT BE LIMITED TO PULL BOXES, CONDUIT, ETC.
- 1.9 EQUIPMENT AND MATERIALS A. ALL EQUIPMENT, DEVICES, AND MATERIALS USED ON THIS PROJECT SHALL BE NEW AND U.L. LISTED AND LABELED FOR THE APPLICATION.
- B. PROVIDE MATERIAL AND LABOR WHICH IS NEITHER DRAWN NOR SPECIFIED, BUT WHICH IS OBVIOUSLY A COMPONENT PART OF, AND NECESSARY TO COMPLETE WORK AND WHICH IS CUSTOMARILY A PART OF WORK OF SIMILAR CHARACTER.
- C. EQUIPMENT AND MATERIALS FOR THE CONSTRUCTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PROTECTED BY SAME UNTIL FORMALLY ACCEPTED BY THE OWNER.
- D. ALL MANUFACTURERS OF ELECTRICAL EQUIPMENT SHALL VERIFY TO THE SATISFACTION OF THE CONTRACTOR AND ENGINEER THAT THEIR EQUIPMENT WILL FUNCTION PROPERLY UNDER THE CONDITIONS OF USE, AS SHOWN ON THE DRAWINGS AND AS SPECIFIED HEREIN. DIMENSIONS, WEIGHTS, OPERATING CHARACTERISTICS AND ALL OTHER RELATED APPURTENANCES SHALL BE VERIFIED BEFORE SUBMITTAL OF SHOP DRAWINGS. 1.10 MATERIAL SUBSTITUTIONS
- A. BIDS SHALL BE BASED UPON THE SPECIFIED PRODUCTS OR LISTED ALTERNATIVES. DRAWINGS AND SPECIFICATIONS ARE BASED ON THE PRODUCTS SPECIFIED BY TYPE, MODEL, AND SIZE AND THUS ESTABLISH MINIMUM QUALITIES, WHICH SUBSTITUTES MUST MEET TO QUALIFY FOR
- B. SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS, EQUIPMENT, AND DEVICES, OTHER THAN THOSE SPECIFIED AND LISTED, THE CONTRACTOR SHALL SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS, TO THE ENGINEER AT LEAST TEN (10) BUSINESS DAYS PRIOR TO BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID AND SHALL INCLUDE AND BE ACCOMPANIED WITH COMPLETE SPECIFICATIONS CUT SHEET SUBMITTAL AS OUTLINED IN THIS SPECIFICATION SECTION, COMPLETE WITH DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. INDICATE ANY ADDITIONS OR DEDUCTIONS TO THE CONTRACT PRICE WITH THE SUBSTITUTION SUBMITTAL AND ON THE BID FORM. C. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL BE SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER.
- REQUESTED, THE CONTRACTOR SHALL SUBMIT INSPECTION SAMPLES OF BOTH THE SPECIFIED AND THE PROPOSED SUBSTITUTE ITEMS. D. IF ANY SUBSTITUTIONS ARE APPROVED, AN ADDENDUM LISTING THE APPROVED ITEM(S) WILL BE ISSUED TO ALL BIDDING CONTRACTORS PRIOR TO THE BID DATE.
- E. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE EQUALITY OF THE MATERIAL AND EQUIPMENT TO BE INSTALLED.
- F. WHERE ONLY ONE MAKE IS NAMED IN THE SPECIFICATIONS OR ON THE DRAWINGS, IT SHALL BE PROVIDED.
- G. VERBAL REQUESTS OR APPROVALS SHALL NOT BE BINDING ON THE ENGINEER OR OWNER. 1.11 QUALITY ASSURANCE

A. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: UNDERWRITER LABORATORIES, INC. (UL) LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE. 1.12 <u>SUBMITTALS</u>

- A. SHOP DRAWINGS AND PRODUCT DATA
- 1. PREPARE SHOP DRAWINGS AND PRODUCT DATA FOR ELECTRICAL EQUIPMENT WITH ADEQUATE DETAILS AND SCALES AS NECESSARY CLEARLY SHOW CONSTRUCTION. INDICATE OPERATING CHARACTERISTICS FOR EACH REQUIRED ITEM AND DESIGN CONDITIONS FOR EACH. CLEARLY IDENTIFY EACH ITEM ON THE DRAWINGS AS TO MARK, LOCATION, AND USE. 2. THIS CONTRACTOR SHALL REVIEW, STAMP WITH APPROVAL AND SUBMIT, WITH REASONABLE PROMPTNESS AND IN ORDERLY SEQUENCE AS TO CAUSE NO DELAY IN WORK OR IN THE WORK OF ANY OTHER CONTRACTOR, ALL SHOP DRAWINGS AND SAMPLES REQUIRED BY 1
- ONTRACT DOCUMENTS. SHOP DRAWINGS NOT STAMPED WITH CONTRACTOR APPROVAL WILL BE RETURNED FOR REPROCESSING. 1 UBMITTALS WILL BE REVIEWED ONLY FOR GENERAL COMPLIANCE AND NOT FOR DIMENSIONS, QUANTITIES, ETC 3. IF THE SUBMITTAL SHOWS VARIATIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS FOR ANY REASON, THE CONTRACTOR SHALL MAKE MENTION OF SUCH VARIATION IN A LETTER OF TRANSMITTAL. THE CONTRACTOR SHALL NOTE IN RED ON THE SUBMITTAL ANY CHANGE
- IN DESIGN OR DIMENSION ON THE ITEMS SUBMITTED INCLUDING CHANGES MADE BY THE MANUFACTURER WHICH MAY DIFFER FROM CATALOG
- 4. CONTRACTOR FURTHER AGREES THAT IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS IN THE FORM OF DESIGN DRAWING AND SPECIFICATIONS ARE DISCOVERED, EITHER PRIOR TO OR AFTER SHO DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS, AND SPECIFICATIONS SHALL CONTROL AND SHALL BE
- 5. THE SUBMITTALS THAT ARE RETURNED SHALL BE USED FOR PROCUREMENT. THE RESPONSIBILITY OF CORRECT PROCUREMENT REMAINS SOLELY WITH THE CONTRACTOR. THE SUBMITTAL REVIEW SHALL NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR ERRORS OR OMISSIONS AND DEVIATIONS FROM THE CONTRACT REQUIREMENTS. 6. IN CHECKING SHOP DRAWINGS, THE ARCHITECT AND ENGINEER WILL MAKE EVERY EFFORT TO DETECT AND CORRECT ERRORS, OMISSIONS, AND INACCURACIES IN SUCH DRAWINGS. HOWEVER, FAILURE TO DETECT ERRORS, OMISSIONS, AND INACCURACIES SHALL NOT RELIEVE TH
- CONTRACTOR OF RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE INTENT OF THE CONTRACT DOCUMENTS. 7. CONTRACTOR AGREES THAT SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS; THAT THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN, THAT THEY DEMONSTRATE THEIR UNDERSTANDING BY INDICATING WHICH EQUIPMENT AND MATERIAL THEY INTEND TO FURNISH AND INSTALL, AND BY DETAILING THE FABRICATION AND INSTALLATION METHODS THEY INTEND TO USE.
- 8. SHOP DRAWINGS SHALL CLEARLY INDICATE ALL DIMENSIONAL DATA FOR ALL PARTS OF THE ITEM, TYPES AND MATERIALS FOR ALL CONNECTIONS, FINISHES, THE EXACT RELATION OF THE ITEM TO ADJACENT MATERIALS AND EQUIPMENT IN THE COMPLETED STRUCTURE INCLUDING CLEARANCE, ANY NECESSARY ISOLATION AND FASTENING METHODS AND DEVICES AND MECHANICAL AND ELECTRICAL CONNECTIONS.
- 9. SUBMIT NEWLY PREPARED INFORMATION, DRAWN TO ACCURATE SCALE. HIGHLIGHT, ENCIRCLE. OR OTHERWISE INDICATE DEVIATIONS FROM THE CONTRACT DOCUMENTS. DO NOT REPRODUCE CONTRACT DOCUMENTS OR COPY STANDARD INFORMATION AS THE BASIS OF SHOP DRAWINGS. TANDARD INFORMATION PREPARED WITHOUT SPECIFIC REFERENCE TO THE PROJECT IS NOT CONSIDERED SHOP DRAWINGS AND WILL BE CAUSE FOR REJECTION
- 10.SHOP DRAWINGS AND PRODUCT DATA SHALL BE SUBMITTED AS FOLLOWS: a. CONFORM TO SUBMITTAL REQUIREMENTS OUTLINED IN DIVISION 1 OF THESE SPECIFICATIONS.
- b. WHERE CONTENTS OF SUBMITTAL LITERATURE INCLUDE DATA NOT PERTINENT TO THE SUBMITTAL, CLEARLY INDICATE WHICH PORTION OF CONTENT IS BEING SUBMITTED FOR REVIEW.

- SIMILAR DRAWINGS. ALSO, INCLUDE THE FOLLOWING INFORMATION:
- a. DIMENSIONS b. IDENTIFICATION OF PRODUCTS AND MATERIALS INCLUDED. . COMPLIANCE WITH SPECIFIED STANDARI
- I. NOTATION OF COORDINATION REQUIREMENTS e. NOTATION OF DIMENSIONS ESTABLISHED BY FIELD MEASUREMENT.

- FINAL ACCEPTANCE OF COMPLETE WORK
- SHALL BE OF THE SAME MANUFACTURER.
- THE WORK, INCLUDING REQUIREMENTS OF THE OPERATING MANUAL.
- 17.SHOP DRAWINGS AND PRODUCT DATA INCLUDES: a. WIRING DEVICES
- b. LIGHTING CONTROL DEVICES 2. LUMINAIRES, LAMPS, AND BALLASTS d. FIRE ALARM DEVICES AND SYSTEM MODIFICATION DRAWINGS DESIGNED AND STAMPED BY A STATE CERTIFIED FIRE ALARM SYSTEM DESIGNER, INCLUDING BUT NOT LIMITED TO THE FOLLOWING:
- BATTERY CALCULATIONS i. FLOOR PLANS INDICATING LOCATION OF ALL FIRE ALARM DEVICES. iii. VOLTAGE DROP CALCULATIONS FOR ALL WIRING AND WIRE TYPE iv. MANUFACTURER MODEL NUMBER AND LISTING INFORMATION FOR ALL DEVICES AND WIRING BEING PROVIDED. . LOCATION OF ALL REQUIRED SYNCHRONIZATION UNITS IF REQUIRED. i. POWER EXTENDER PANELS, ADDRESSABLE MODULES, ETC.
- **B. DESIGN DRAWINGS**
- ACTUAL WORK.
- C. COORDINATION DRAWINGS
- PROTECTION, AND DUCTWORK. REFER TO DIVISION 1 AND DIVISION 15 FOR RELATED WORK.
- SHOW THE FOLLOWING: a. CEILING SUSPENSION ASSEMBLY MEMBERS b. METHOD OF ATTACHING HANGERS TO BUILDING STRUCTURE.
- CHANGES IN:
- a. SIZE, TYPE, CAPACITY, ETC. OF ANY MATERIAL, DEVICE, OR PIECE OF EQUIPMENT. b. LOCATION OF ANY DEVICE OR PIECE OF EQUIPMENT. c. LOCATION OF ANY OUTLET OR DEVICE AND ASSOCIATED WIRING. d. ROUTING OF FEEDER CONDUITS e. BRANCH CIRCUIT NUMBER ASSIGNMENTS
- DEVIATIONS FROM WORKING DRAWINGS
- BE BORNE BY THE CONTRACTOR AND SHALL BE INCLUDED IN THE BID. 4. REFER TO DIVISION 1 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS RELATED TO RECORD DRAWINGS

- 7. PREPARE RECORD DOCUMENTS IN ACCORDANCE WITH THE REQUIREMENTS IN DIVISION 1 SECTION PROJECT CLOSEOUT.
- AND CONCEALED), DIMENSIONED FROM PROMINENT BUILDING LINES.
- 13 OPERATING/MAINTENANCE MANUALS EQUIPMENT AND CONTROLS
- B. SERVICE MANUALS SHALL BE ASSEMBLED INTO ONE VINYL COVERED THREE RING D TYPE BINDER WITH HARD COVER AND WITH WRITTEN INSTRUCTIONS FOR EACH SYSTEM LISTED IN THE SPECIFICATIONS.
- AS FOLLOWS: ENGINEER.
- 2. SECOND PAGE --- INDEX 3. FIRST SECTION --- WRITTEN DESCRIPTION OF SYSTEM CONTENTS WHERE ACTUALLY LOCATED IN BUILDING, HOW EACH PART FUNCTIONS
- AND A COPY OF EACH MANUFACTURER'S START UP REPORT FOR (FIRE ALARM, ETC.)
- 6. FOURTH SECTION --- A COPY OF ALL TEST RESULTS, IN CHART FORM, PERFORMED BY THE CONTRACTOR 7. FIFTH SECTION --- COPIES OF ALL WARRANTIES, APPROVALS, ETC.
- 4 PRODUCT DELIVERY, STORAGE, AND HANDLING
- SHIPMENT. STORAGE AND HANDLING.
- PROBLEM DUE TO SIZE AND WEIGHT
- 15 PROTECTION OF WORK AND PROPERT AS OTHERS, WITH WHICH HE MAY COME INTO CONTACT IN THE PERFORMANCE OF HIS WORK.
- INSTRUCTION.
- .16 CUTTING AND PATCHING
- CONTRACTOR.
- INSTALL NEW WORK. 2. UNCOVER WORK TO PROVIDE FOR INSTALLATION OF ILL-TIMED WORK. 3. REMOVE AND REPLACE DEFECTIVE WORK. 4. REMOVE AND REPLACE WORK NOT CONFORMING TO REQUIREMENTS OF THE CONTRACT DOCUMENTS. 5. INSTALL EQUIPMENT AND MATERIALS IN EXISTING STRUCTURE 6. UPON WRITTEN INSTRUCTIONS FROM THE ENGINEER, UNCOVER AND RESTORE WORK TO PROVIDE FOR ENGINEER OBSERVATION OF CONCEALED WORK.
- OBSOLETE BY THE NEW WORK.

COMPONENTS BEING PATCHED.

7 FIRE STOPPING

.18 INTERFERENCES

INSTALLATIONS PER ALL NFPA AND UL REQUIREMENTS.

WORK IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.

WORK WITHOUT ADDITIONAL COST TO OWNER.

# 11.SHOP DRAWINGS SHALL INCLUDE FABRICATION AND INSTALLATION DRAWINGS, SETTING DIAGRAMS, SCHEDULES, PATTERNS, TEMPLATES AND

12. WHERE ADDITIONAL INSTALLATION DRAWINGS, WIRING DIAGRAMS OR OTHER DRAWINGS ARE SPECIFIED AS A PART OF THE SUBMITTAL, THEY SHALL BE SUBMITTED AT THE SAME TIME WITH SHOP DRAWINGS AND PRODUCT DATA. PARTIAL SUBMITTALS ARE NOT ACCEPTABLE. 13.SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL MATERIAL ITEMS AS OUTLINED IN THESE SPECIFICATIONS. ANY DEVIATIONS FROM CONTRACT REQUIREMENTS MUST BE CLEARLY INDICATED ON SHOP DRAWINGS AND JUSTIFICATION FOR THEIR CONSIDERATION MUST BE INCLUDED. 14.APPROVAL OF SUBMITTAL ITEMS SHALL NOT PRECLUDE REJECTION OF THOSE ITEMS UPON DISCOVERY OF DEFECTS IN THEM PRIOR TO 15. WHEN TWO OR MORE ITEMS OF THE SAME EQUIPMENT ARE REQUIRED (I.E. - LUMINAIRES, WIRING DEVICES, ETC.), EQUIPMENT ITEMS 16.SUBMIT A MINIMUM OF SIX (6) COPIES OF SHOP DRAWINGS TO THE ARCHITECT. THE ARCHITECT AND ENGINEER SHALL EACH RETAIN ONE (1) COPY AND RETURN THE REMAINDER TO THE CONTRACTOR WHO SHALL DISTRIBUTE COPIES AS REQUIRED TO PROPERLY CONDUCT

THE DESIGN DRAWINGS, AS SUBMITTED, ARE DIAGRAMMATIC AND ARE NOT INTENDED TO SHOW EXACT LOCATION OF EQUIPMENT, CONDUIT ETC. UNLESS DIMENSIONS ARE GIVEN. DRAWINGS ARE NOT TO BE SCALED. EQUIPMENT, CONDUIT, ETC. TO BE INSTALLED ALONG TH GENERAL PLANS SHOWN ON THE DRAWINGS, BUT KEEPING IN MIND ACTUAL BUILDING CONDITIONS WHICH MUST BE CONFIRMED WITHIN THE

2. IF THIS CONTRACTOR PROPOSES TO INSTALL EQUIPMENT REQUIRING SPACE CONDITIONS OTHER THAN THOSE AS SPECIFIED AND/OR SHOWN ON THE DESIGN DRAWINGS, OR TO REARRANGE THE EQUIPMENT, HE SHALL ASSUME FULL RESPONSIBILITY FOR THE REARRANGEMENT OF THE SPACE AND SHALL OBTAIN THE FULL APPROVAL OF THE ARCHITECT BEFORE PROCEEDING WITH THE WORK.

I. BEFORE BEGINNING CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL PROVIDE TO THE MECHANICAL CONTRACTOR MARKED UP PRINTS INDICATING ALL ELECTRICAL WORK WHICH AFFECTS LOCATION OF HEATING, VENTILATING, AIR CONDITIONING, PLUMBING PIPING, FIRE 2. COORDINATION DRAWINGS: REFLECTED CEILING PLANS DRAWN TO SCALE AND COORDINATING PENETRATIONS AND CEILING-MOUNTED ITEMS.

C. CEILING-MOUNTED ITEMS INCLUDING LIGHTING FIXTURES, EXIT SIGNAGE, FIRE ALARM DEVICES, CCTV, SPEAKERS, ACCESS PANELS, ETC.

1. EACH CONTRACTOR OR SUBCONTRACTOR FOR ELECTRICAL WORK SHALL KEEP ONE COMPLETE SET OF THE CONTRACT WORKING DRAWINGS ON THE PROJECT SITE ON WHICH THEY SHALL RECORD ANY DEVIATIONS OR CHANGES FROM SUCH CONTRACT DRAWINGS MADE DURING CONSTRUCTION. THESE CHANGES SHALL BE ACCURATELY RECORDED IN RED INK ON THE PRINTS. RECORD DRAWINGS SHALL SHOW

2. RECORD DRAWINGS SHALL BE KEPT CLEAN AND UNDAMAGED, AND SHALL NOT BE USED FOR ANY PURPOSE OTHER THAN RECORDING 3. AFTER THE PROJECT IS COMPLETED, RECORD SETS OF DRAWINGS SHALL BE DELIVERED TO THE TENANT AND BUILDING MANAGEMENT IN GOOD CONDITION, AS A PERMANENT RECORD OF THE INSTALLATION AS CONSTRUCTED. ALL COSTS FOR PRODUCTION, PRINTING, ETC. SHALL

5. THIS CONTRACTOR SHALL RECORD ALL CHANGES FROM ORIGINAL DESIGN DRAWINGS WHICH WERE THE INSTALLATION OF THE WORK. THESE CHANGES SHALL BE RECORDED IN RED INK ON THE PRINTS. CHANGES SHALL BE ACCURATELY DIMENSIONE 6. THIS CONTRACTOR SHALL KEEP AN UPDATED SET OF PRINTS, INCLUDING CHANGES, ON THE JOB SITE AT ALL TIMES AND SHALL SUBMIT ONE (1) SET OF UPDATED AND LEGIBLE "AS-BUILT" PRINTS TO THE ARCHITECT WHEN THE WORK IS COMPLETE.

8. IN ADDITION TO THE REQUIREMENTS SPECIFIED IN DIVISION 1, INDICATE THE FOLLOWING INSTALLED CONDITIONS (ACCURATELY DIMENSIONED): a. CONCEALED EQUIPMENT, UNITS, DEVICES, ETC., REQUIRING PERIODIC MAINTENANCE OR REPAIR.

9. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED. EQUIPMENT LOCATIONS (EXPOSED

A. PREPARE "FOUR (4) COMPLETE BOUND SETS OF OPERATING/MAINTENANCE MANUALS IN ACCORDANCE WITH DIVISION 1 SECTION PROJECT CONTAINING OPERATING AND MAINTENANCE INSTRUCTIONS, AND MANUFACTURER START-UP REPORTS FOR ALL ELECTRICAL

C. WRITTEN OPERATING INSTRUCTIONS, SUBMITTAL DRAWINGS, WIRING DIAGRAMS, EQUIPMENT CATALOG DATA SHEETS AND MANUFACTURER'S INSTRUCTIONS SHALL BE ACCOMMODATED INTO 8-1/2" X 11" AND/OR 11' X 17' SIZE. EACH SECTION SHALL BE TABULATED AND INDEXED

1. FIRST PAGE --- TITLE OF PROJECT, OWNER, ADDRESS, DATE OF SUBMITTAL, NAME OF CONTRACTOR, AND NAME OF ARCHITECT AND

INDIVIDUALLY, AND HOW SYSTEM WORKS AS A WHOLE. CONCLUDE WITH A LIST OF ITEMS REQUIRING SERVICE AND EITHER STATE THE SERVICE NEEDED OR REFER TO THE MANUFACTURER'S DATA IN THE BINDER THAT DESCRIBES THE PROPER SERVICE. 4. SECOND SECTION --- A COPY OF EACH SUBMITTAL DRAWING WITH AN INDEX AT THE BEGINNING OF THE SECTION.

5. THIRD SECTION --- A COPY OF EACH MANUFACTURER'S OPERATING INSTRUCTIONS WITH AN INDEX AT THE BEGINNING OF THE SECTION,

D. SUBMIT ONE (1) COPY TO THE ENGINEER FOR APPROVAL. AFTER APPROVAL, SUBMIT THREE (3) COPIES TO THE ARCHITECT FOR DELIVERY TO

A. DELIVER PRODUCTS TO THE PROJECT PROPERLY IDENTIFIED WITH NAMES, MODEL NUMBERS, TYPES, COMPLIANCE LABELS AND SIMILAR INFORMATION NEEDED FOR IDENTIFICATION. MATERIALS MUST BE ADEQUATELY PACKAGED OR PROTECTED TO PREVENT DETERIORATION DURING

. THE CONTRACTOR SHALL MAKE PROVISIONS FOR THE DELIVERY AND SAFE STORAGE OF HIS MATERIALS AND EQUIPMENT IN COORDINATION WITH THE WORK OF OTHERS. MATERIALS AND EQUIPMENT SHALL BE DELIVERED AT SUCH STAGES OF THE WORK AS WILL EXPEDITE THE WORK AS A WHOLE AND SHALL BE MARKED AND STORED IN SUCH A WAY AS TO BE EASILY CHECKED AND INSPECTED. THE ARRIVAL AND PLACING F LARGE EQUIPMENT ITEMS SHALL BE SCHEDULED EARLY ENOUGH TO PERMIT ENTRY AND SETTING WHEN THERE IS NO RESTRICTION OR

MATERIALS SHALL BE STORED TO PROTECT THEM FROM INJURY PRIOR TO INSTALLATION. MATERIAL SHOULD NOT BE STORED DIRECTLY ON T GROUND OR FLOOR AND SHALL BE KEPT AS CLEAN AND DRY AS POSSIBLE AND FREE FROM DAMAGE OR DETERIORATING ELEMENTS. D. IN GENERAL, DO NOT DELIVER ITEMS OF ELECTRICAL EQUIPMENT TO THE PROJECT SUBSTANTIALLY BEFORE THE TIME OF INSTALLATION. LIMIT EACH SHIPMENT OF BULK AND MULTIPLE-USE MATERIALS TO THE QUANTITIES NEEDED FOR INSTALLATION WITHIN 3-WEEKS OF RECEIPT.

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SAFEGUARDING WORK, PROPERTY, AND FACILITIES AGAINST DAMAGE, BOTH HIS OWN AS WEL B. STORED MATERIALS SHALL BE PROTECTED AGAINST DAMAGE FROM WEATHER. PIPE AND DUCT OPENINGS SHALL BE CLOSED WITH CAPS OR PLUGS DURING INSTALLATION. ALL FIXTURES AND EQUIPMENT SHALL BE COVERED AND PROTECTED AGAINST DAMAGE. ANY MATERIALS OR EQUIPMENT DAMAGED AT ANY STAGE IN THE CONSTRUCTION SHALL BE REPLACED OR REPAIRED AND AT THE FINAL COMPLETION, ALL WORK

C. FURNISH INFORMATION TO GENERAL CONTRACTOR AS TO SIZE AND LOCATION OF ALL BUILT-IN OPENINGS REQUIRED. DO NOT CUT, REMOVE OR PIERCE: GENERAL OR MECHANICAL INSULATION; FIRE RATED WALLS OR CEILINGS; OR STEEL WORK; WITHOUT PRIOR PERMISSION AND

A. GENERAL: ALL CUTTING AND PATCHING FOR THE INSTALLATION OF THIS BRANCH OF THE WORK SHALL BE THE RESPONSIBILITY OF THIS B. PERFORM CUTTING AND PATCHING IN ACCORDANCE WITH DIVISION 1 SECTION "PROCEDURES, SEPARATE PRIMES." IN ADDITION TO THE REQUIREMENTS SPECIFIED IN DIVISION 1, PERFORM CUTTING, FITTING AND PATCHING OF MECHANICAL EQUIPMENT AND MATERIALS REQUIRED

7. CUT, REMOVE AND LEGALLY DISPOSE OF SELECTED ELECTRICAL EQUIPMENT, COMPONENTS AND MATERIALS AS INDICATED, INCLUDING BUT NOT LIMITED TO REMOVAL OF CONDUITS AND CONDUCTORS, JUNCTION BOXES, LUMINAIRES AND TRIM, AND OTHER ELECTRICAL ITEMS MADE C. PROTECTION OF INSTALLED WORK: DURING CUTTING AND PATCHING OPERATIONS, PROTECT ADJACENT INSTALLATIONS.

D. PROVIDE AND MAINTAIN TEMPORARY PARTITIONS OR DUST BARRIERS ADEQUATE TO PREVENT THE SPREAD OF DUST AND DIRT TO ADJACENT E. ALL OPENINGS REQUIRED FOR THIS BRANCH OF WORK SHALL BE ACCOMPLISHED IN TIME TO BE INCORPORATED IN, AND BE COMPATIBLE WITH THE CONSTRUCTION PROGRAM, OTHERWISE THIS CONTRACTOR SHALL BE RESPONSIBLE AND PAY FOR ALL CHANGES MADE NECESSARY FOR HIS FAILURE TO DO SO. PIPE HOLES IN FLOORS AND WALLS SHALL BE CORE DRILLED.

F. PATCH EXISTING FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS AND EXPERIENCED INSTALLERS. FOR INSTALLERS' QUALIFICATIONS, REFER TO THE MATERIALS AND METHODS REQUIRED FOR THE SURFACE AND BUILDING

A. ANY CORE DRILLING OR CUTTING OF FIRE RATED FLOORS, SHAFTS AND WALLS SHALL BE FIRE STOPPED PRIOR TO FINISH PATCHING. ALL FIRE STOPPING MATERIALS SHALL BE U.L. "CLASSIFIED", INTUMESCING COMPOUND, DEVICE, OR SHEET RATED TO FUNCTION FOR THIS PURPOSE. ACCORDING TO INSTRUCTIONS PROVIDED. ALL PENETRATIONS IN 1-HOUR, 2-HOUR, AND 3-HOUR FIRE RATED WALLS. FLOORS OR PARTITION ASSEMBLIES SHALL BE SEALED WITH 3M BRAND FIRE BARRIER CAULK, CP-25, OR COMPOSITE SHEET CS-195, OR EQUIVALENT. ALL PENETRATIONS SHALL BE SEALED IN ACCORDANCE WITH UL FIRE RESISTANCE VOLUME II. 1. CAULK P-25 FILL MATERIAL TO COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE INDIVIDUAL CONDUIT AND GYPSUM WALLBOARD WITH A

MINIMUM 1/4 DIAMETER BEAD OF CAULK APPLIED TO THE PERIMETER OF CONDUIT (UL SYSTEM WL1001). 2. MULTIPLE CONDUITS SHALL BE CONTAINED WITHIN A 28 GAUGE STEEL SLEEVE. CAULK CP-25 FILL MATERIAL TO A DEPTH OF 1 COMPLETELY AROUND THE STEEL SLEEVE. A NOMINAL ¼ DIAMETER BEAD SHALL BE APPLIED ON BOTH SIDES OF WALL ASSEMBLE. A MINIMUM 1 THICKNESS OF MINERAL WOOL BATT INSULATION SHALL BE PACKED FIRMLY INTO THE STEEL SLEEVE ON BOTH SIDES OF WALL ASSEMBLY AS A PERMANENT FORM. PACKING MATERIAL SHALL BE RECESSED 5/8 FROM SURFACE OF WALL ON BOTH SIDES OF WALL ASSEMBLY. FILL RECESSED CAVITY WITH 1 OF CP-25 CAULK (UL SYSTEMS WL1016). 3. A MINIMUM 1" THICKNESS OF MINERAL WOOL BATT INSULATION SHALL BE PACKED FIRMLY INTO THE MAXIMUM 2" ANNULAR SPACE AS A PERMANENT FORM. A MINIMUM OF 1 OF CP-25 CAULK SHALL FILL THE RECESSED CAVITY, (FOR WALLS, THIS SHALL BE APPLIED ON BOTH SIDES OF THE WALL) (UL SYSTEM CAJ1044). 4. COORDINATE WITH THE ARCHITECT FOR ALL EXACT MATERIAL AND RATINGS AND EXACT DETAILS FOR FIRE STOPPING MATERIALS AND

A. BEFORE INSTALLING ANY WORK, THIS CONTRACTOR SHALL SEE THAT IT DOES NOT INTERFERE WITH CLEARANCE REQUIRED FOR LIGHTS, CONDUIT, AND CEILINGS AND FOR FINISH ON BEAMS, COLUMNS, PILASTERS, WALLS OR OTHER STRUCTURAL OR ARCHITECTURAL MEMBERS, AS SHOWN ON CONTRACT DRAWINGS. IF ANY WORK IS SO INSTALLED AND IT LATER DEVELOPS THAT ORIGINAL DESIGN CANNOT BE FOLLOWED THIS CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE SUCH CHANGES IN HIS WORK AS ARCHITECT MAY DIRECT TO PERMIT COMPLETION OF

B. INSTALL ADDITIONAL OFFSETS ON PIPING OR DUCTWORK WHERE REQUIRED TO OBTAIN MAXIMUM HEADROOM OR TO AVOID CONFLICT WITH OTHER

1.19 INTERRUPTION OF SERVICE

- A. WHEN WORK PROGRESS MAKES TEMPORARY SHUTDOWN OF SERVICES UNAVOIDABLE, SHUTDOWN SHALL BE COORDINATED WITH AND APPROVED BY OWNER SO AS TO CAUSE MINIMUM DISRUPTION TO ESTABLISHED OPERATING ROUTINE. ARRANGE TO WORK AS NECESSARY TO RE-ESTABLISH SERVICE WITHIN SHORTEST POSSIBLE DOWNTIME. IN THOSE INSTANCES WHERE THE LENGTH OF TIME REQUIRED FOR THE SERVICE INTERRUPTION IS NOT ACCEPTABLE TO THE OWNER, UNLESS OTHERWISE INDICATED, FURNISH AND INSTALL TEMPORARY CONNECTIONS AS REQUIRED TO REDUCE THE LENGTH OF TIME OF SERVICE INTERRUPTION TO AN ACCEPTABLE LEVEL.
- B. REPORT ANY INTERFERENCE BETWEEN WORK UNDER THIS DIVISION AND THAT OF ANY OTHER CONTRACTORS TO ARCHITECT AS SOON AS THEY ARE DISCOVERED. ARCHITECT WILL DETERMINE WHICH EQUIPMENT SHALL BE RELOCATED, REGARDLESS OF WHICH WAS FIRST INSTALLED, AND HIS DECISION SHALL BE FINAL.
- A. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE AND IN A WORK LIKE MANNER AND SHALL NEAT AND RECTILINEAR TO FINISHES. B. ELECTRICAL WORK SHALL BE INSTALLED BY JOURNEYMEN ELECTRICIANS UNDER THE SUPERVISION OF A COMPETENT FOREMAN
- 1.20 WORKMANSHI A. WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE BEST PRACTICES OF THE TRADE AND IN A WORK LIKE MANNER AND SHALL NEAT AND RECTILINEAR TO FINISHES
- B. ELECTRICAL WORK SHALL BE INSTALLED BY JOURNEYMEN ELECTRICIANS UNDER THE SUPERVISION OF A COMPETENT FOREMAN. 1.21 DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEM
- A. BEFORE FINAL PAYMENT, DEMONSTRATE TO THE OWNER'S SATISFACTION THE PROPER OPERATION OF EACH OF THE SYSTEMS COMPRISING THIS B. INSTRUCT THE OWNER'S MAINTENANCE PERSONNEL IN THE OPERATION AND MAINTENANCE OF ALL ELECTRICAL EQUIPMENT AND CONTROLS
- C. DELIVER TO THE OWNER ALL SPECIAL TOOLS AND APPURTENANCES FOR PROPER OPERATION AND MAINTENANCE OF THE EQUIPMENT PROVIDED AND REQUEST RECEIPT FOR SAME. ATTACH TO THE CONTRACTOR'S REQUEST FOR FINAL PAYMENT. 1.22 CLEANING AND FINISHING
- A. GENERAL: FOLLOW THE REQUIREMENTS SPECIFIED IN DIVISION 1 SECTION "PROJECT CLOSEOUT."
- B. IN SO FAR AS THIS DIVISION IS CONCERNED, AT ALL TIMES KEEP PREMISES AND BUILDING IN A NEAT AND ORDERLY CONDITION, FOLLOW EXPLICITLY ANY INSTRUCTIONS OF ARCHITECT AND OWNER IN REGARD TO STORING OF MATERIALS, PROTECTIVE MEASURES, CLEANING-UP OF DEBRIS. ETC.
- C. UPON COMPLETION OF WORK, THIS CONTRACTOR SHALL THOROUGHLY CLEAN ALL EQUIPMENT LEAVING EVERYTHING IN WORKING ORDER AT THE COMPLETION OF THIS COMPLETED THEIR WORK. CLEAN LUMINAIRES, OUTLET BOX PLATES, PANEL AND CABINET INTERIORS AND EXTERIORS, ETC., OF DIRT, DUST, DEBRIS, PAINT, ETC. 1.23 GUARANTEE AND WARRANTIES
- A. WARRANT THAT EQUIPMENT AND ALL WORK IS INSTALLED IN ACCORDANCE WITH GOOD ENGINEERING PRACTICE AND THAT ALL EQUIPMENT V MEET REQUIREMENTS SPECIFIED. ANY EQUIPMENT FAILING TO PERFORM OR FUNCTION AS SPECIFIED SHALL BE REPLACED WITH COMPLYING EQUIPMENT WITHOUT COST TO THE OWNER.
- 3. THIS CONTRACTOR SHALL GUARANTEE AGAINST DEFECTS OF ALL MATERIALS, WORKMANSHIP AND THE COMPLETE OPERATION OF ALL EQUIPMENT AND APPARATUS INSTALLED BY HIM FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE OF THE ENTIRE WORK AND SHALL GUARANTEE TO REPAIR OR REPLACE AT HIS OWN EXPENSE ANY PART OF THE APPARATUS WHICH MAY SHOW DEFECT DURING THAT TIME PROVIDED SUCH DEFECT IS, IN THE OPINION OF THE ARCHITECT, DUE TO IMPERFECT MATERIAL OR WORKMANSHIP AND NOT TO CARELESSNESS OR IMPROPER USE

<u>PART 2 – PRODUCTS</u> 2.1 RACEWAYS

- A. ELECTRICAL METALLIC TUBING (EMT) SHALL BE ELECTRO-GALVANIZED AND MANUFACTURED IN ACCORDANCE WITH ANSI C80.3
- B. FLEXIBLE METAL CONDUIT (FMC) SHALL CONSIST OF CONTINUOUS LENGTHS OF SPIRALLY WOUND AND INTERLOCKED GALVANIZED STEEL, MANUFACTURED IN ACCORDANCE WITH UL 1. LIQUID TIGHT FLEXIBLE METAL CONDUIT (LFMC) SHALL BE USED IN WET LOCATIONS. C. CONDUIT EXPANSION FITTINGS SHALL BE THREADED HOT—DIPPED GALVANIZED MALLEABLE IRON WITH INTERNAL BONDING ASSEMBLY
- D. PROVIDE THREADED MALLEABLE IRON OR STEEL CONNECTORS AND COUPLINGS WITH INSULATED THROATS; MANUFACTURED ELBOWS; LOCKNUTS AND PLASTIC OR BAKELITE BUSHINGS AT TERMINATIONS, AS NECESSARY, COUPLINGS AND CONNECTORS SHALL BE GLAND AND RING COMPRESSION OR STAINLESS STEEL MULTIPLE POINT LOCKING OR STEEL CONCRETE-TIGHT SET SCREW. COMPRESSION COUPLINGS AND CONNECTORS SHALL FORM POSITIVE GROUND. SET-SCREW CONNECTORS AND COUPLINGS SHALL HAVE WALL THICKNESS EQUAL TO CONDUT CASE-HARDENED, HEX-HEAD SCREWS AND SEPARATE GROUND WIRE. BUSHINGS FOR RIGID STEEL AND CONNECTORS FOR EMT SHALL HAV INSULATING INSERTS THAT MEET REQUIREMENTS OF UL 514 FLAME TEST. E. ACCEPTABLE MANUFACTURER FOR METALLIC RACEWAY SHALL BE AS FOLLOWS:
- 2. ELECTRI-FLEX
- . GRINNEL C 4. O-Z GEDNEY
- 2.2 OUTLET BOXES A. OUTLET BOXES ON CONCEALED WORK SHALL BE AT LEAST 4 11/16" SQUARE OR OCTAGONAL, GALVANIZED PRESSED STEEL WITH PLASTER RINGS AS REQUIRED. OUTLET BOXES FOR EXPOSED CONDUIT WORK SHALL BE CAST ALUMINUM ALLOY WITH CAST ALUMINUM ALLOY COVE
- B. WHERE INSTALLED IN PLASTER, BOXES SHALL BE FITTED WITH GALVANIZED STEEL PLASTER COVERS OF REQUIRED DEPTH TO FINISH FLUS WITH FINISHED WALL OR CEILING. C. SWITCH BOXES, RECEPTACLE BOXES AND OTHER OUTLET BOXES SHALL BE STANDARD 4 11/16" SQUARE WITH PLASTER RINGS OR GANG COVER AS REQUIRED.
- D. OUTLET BOXES FOR VARIOUS SYSTEMS AND COMPONENTS SHALL BE AS REQUIRED BY EQUIPMENT MANUFACTURER. E. PROVIDE ONLY ENOUGH CONDUIT OPENINGS TO ACCOMMODATE CONDUITS AT INDIVIDUAL LOCATION. EACH BOX SHALL BE LARGE ENOUGH ACCOMMODATE NUMBER AND SIZES OF CONDUITS, WIRES AND SPLICES TO MEET NEC REQUIREMENTS, BUT SHALL BE AT LEAST SIZE SHOWN
- OR SPECIFIED. NECESSARY VOLUME SHALL BE OBTAINED BY USING BOXES OF PROPER DIM<mark>EN</mark>SIONS. 2.3 JUNCTION BOXES AND PULL BOXES A. PROVIDE CODE GAUGE GALVANIZED STEEL JUNCTION AND PULL BOXES FOR CONDUIT 1-1/4" TRADE SIZE AND LARGER, WHERE NECESSARY TO
- FACILITATE INSTALLATION, OF REQUIRED DIMENSIONS, WITH ACCESSIBLE, REMOVABLE SCREW-ON COVERS. PROVIDE JUNCTION AND PULL BOXES IN SPECIAL SIZES AND SHAPES DETERMINED IN FIELD WHERE NECESSARY. 3. JUNCTION BOX COVERS SHALL BE ACCESSIBLE. DO NOT INSTALL JUN<mark>CTION BOXES ABOVE SUS</mark>PENDED CEILINGS EXCEPT WHERE CEILING IS REMOVABLE OR WHERE ACCESS PANEL IS PROVIDED.
- C. PULL BOXES SHALL BE SUPPORTED ADEQUATELY TO MAINTAIN SHAPE. LARGER BOXES SHALL HAVE STRUCTURAL STEEL BRACING WELDED INTO RIGID ASSEMBLY FORMED ADEQUATELY TO MAINTAIN ALIGNMENT IN SHIPMENT AND INSTALLATION. SECURE COVERS WITH CORROSION-RESISTANT SCREWS. 1. PULL BOXES EXPOSED TO RAIN OR IN WET LOCATIONS SHALL BE WEATHERPROO
- 2. PROVIDE CLAMPS, GRIDS AND OTHER APPURTENANCES TO SECURE CABLES WITHIN PULL BOX. NO CABLE SHALL BE UNSUPPORTED FOR MORE THAN 30". 3. PULL BOXES CONNECTED TO CONCEALED CONDUITS SHALL BE MOUNTED WITH COVERS FLUSH WITH FINISHED WALL OR CEILING.
- 2.4 WIRE AND CABL A. PROVIDE SINGLE-CONDUCTOR, ANNEALED COPPER WIRE AND CABLE WITH INSULATION RATED 600 V, OF SIZES SPECIFIED AND SCHEDULED ON DRAWINGS, FOR SECONDARY SERVICE, FEEDERS, BRANCH AND SYSTEM WIRING.
- B. WIRE 10-AWG AND LARGER SHALL BE STRANDED; 12-AWG AND SMALLER SHALL BE SOLID. WIRE AND CABLE SHALL HAVE THWN-THHN OR XHHW INSULATION.
- C. MOTOR CONTROL CIRCUITS AND SIGNAL WIRING MAY BE 14-AWG IF NEC REQUIREMENTS ARE MET. BRANCH CIRCUITS LONGER THAN 75' FOR 120 V AND 175' FOR 277 V SHALL BE AT LEAST 10-AWG FROM PANEL TO LAST OUTLET.
- D. WIRING WITHIN LUMINAIRES AND OTHER HIGH-TEMPERATURE EQUIPMENT SHALL HAVE 150°C INSULATION AS REQUIRED BY NEC. <u>r.</u> Make splices in br<mark>anch</mark> circuit wirin<mark>g wi</mark>th ul—listed, solderless connectors rated 600 V, of sizes and types required b MANUFACTURER'S RECOMMENDATIONS WITH TEMPERATURE RATINGS EQUAL TO THOSE OF WIRES. SPLICE CONNECTORS SHALL BE SCREW-ON NSULATE SPLICES WITH INTEGRAL COVERS OR WITH PLASTIC OR RUBBER FRICTION TAPE TO PRESERVE CHARACTERISTICS OF WIRE AND CABLE

. Make terminations and splices for conductors 6-awg and larger with corrosion-resistant, high-conductivity pressure inden IEX SCREW OR BOLT-CLAMP CONNECTORS, WITH OR WITHOUT TONGUES, DESIGNED SPECIFICALLY FOR INTENDED SERVICE. CONNECTORS FOR CABLES 250 KCMIL AND LARGER SHALL HAVE TWO CLAMPING ELEMENTS OR COMPRESSION INDENTS. TERMINALS FOR BUS CONNECTIONS

AMPACITY OF SPLICES AND CONNECTORS SHALL BE EQUAL TO THOSE OF ASSOCIATED WIRES AND CABLES.

COLOR CODING

SHALL HAVE TWO BOLT HOLES.

NFUTRAL: WHIT

A. COLOR CODE SECONDARY SERVICE, FEEDERS AND BRANCH CIRCUIT CONDUCTORS AS FOLLOWS:

PHASE A: BLACH PHASE E PHASE C:

GROUND: GREEI ISO GROUND: GREEN W/ YELLOW STRIPE

- . BRANCH CIRCUIT CONDUCTORS 12-AWG AND 10-AWG SHALL HAVE SOLID COLOR COMPOUND, SOLID COLOR COATING. NEUTRALS AND EQUIPMENT GROUNDS SHALL HAVE SOLID COMPOUND OR SOLID COLOR COATING (WHITE, GRAY AND GREEN). C. ACCEPTABLE MANUFACTURER FOR WIRE AND CABLE SHALL BE AS FOLLOWS: . AMERICAN INSULATED WIRE CORP.; A LEVITON COMPAN
- . SENATOR WIRE & CABLE COMPANY 3. SOUTHWIRE COMPANY
- 2.6 WIRE PULLING EQUIPMENT
- A. PROVIDE POLYETHYLENE ROPES FOR PULLING WIRE B. PROVIDE FISH WIRES IN TELEPHONE CONDUITS AND OTHER EMPTY CONDUIT SYSTEMS REQUIRED, WITHOUT SPLICES AND WITH AMPLE EXPOSED LENGTHS AT EACH END.
- C. PROVIDE WIRE PULLING LUBRICANTS THAT MEET APPLICABLE UL REQUIREMENTS AS NECESSARY.
- 2.7 WIRING DEVICES <u>RECEPTACLES</u>
- A. CONVENIENCE RECEPTACLES
- STRAIGHT BLADE CONVENIENCE RECEPTACLE DEVICES SHALL BE EXTRA HEAVY DUTY INDUSTRIAL SPECIFICATION GRADE AND SHALL AT A MINIMUM INCORPORATE THE FOLLOWING FEATURES AND BENEFITS. COLOR BY ARCHITECT. 1. RECEPTACLES, 20 A, 125V, 2-POLE, 3-WIRE, GROUNDING TYPE WITH SELF GROUNDING FEATURE: COMPLY WITH NEMA WD 1, NEMA WD 6 CONFIGURATION 5-20R, AND UL 498.
- STRAIGHT BLADE GFCI TYPE RECEPTACLE DEVICES SHALL BE, NON-FEED-THROUGH TYPE. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498 AND UL 943, CLASS A, GROUP I SOLID STATE SENSING AND SIGNALING WITH FIVE (5) MILLI-AMPERE FAULT TRIP LEVEL AND INCLUDE INDICATOR LIGHT THAT IS LIGHTED WHEN DEVICE IS TRIPPED. 1. DUPLEX GFCI RECEPTACLES, 20 A, 125V, 2-POLE, 3-WIRE, GROUNDING TYPE WITH SELF GROUNDING FEATURE.
- SWITCHES

A. AC TOGGLE SWITCHES AC TOGGLE SWITCHES SHALL BE EXTRA HEAVY DUTY INDUSTRIAL (COMMERCIAL) SPECIFICATION GRADE QUIET TYPE, AND SHALL AT A MINIMUM INCORPORATE THE FOLLOWING FEATURES AND BENEFITS AND COMPLY WITH NEMA WD1 AND U.L. 20 ACCEPTABLE MANUFACTURERS/DEVICE NUMBERS FOR RECEPTACLES AND SWITCHES:

RECEPTACLES - INDUSTRIAL SPECIFICATION GRAD

HUBBELL CONVENIENCE HBL5362 GFR5362 GF20 GFCI

AC SWITCHES 201, 120/277 VAC AC SWITCHES - INDUSTRIAL SPECIFICATION GRADE TOGGLE TYPE HUBBELL SINGLE POLE HBL1201 COOPER THREE-WAY HBL1203 1223–2 1224–2 FOUR-WAY HBL1204

## INSTALLATION

A. WIRING DEVICES AND WALL PLATES

1. SINGLE AND COMBINATION TYPES TO MATCH CORRESPONDING WIRING DEVICES.

a. SMOOTH HIGH-IMPACT THERMOPLASTIC MATERIAL FOR FINISHED SPACES: b GALVANIZED STEEL MATERIAL FOR UNFINISHED SPACES: c. VOICE/DATA JACKS SHALL UTILIZE THE SAME TYPE OF PLATE USED FOR RECEPTACLES

d. DEVICÉS PLATES SHALL BE BY THE SAME MANUFACTURER AS THE WIRING DEVICE. e. DEVICE/PLATE COLOR SELECTED BY ARCHITECT.

#### B. RECEPTACLE ORIENTATION:

1. INSTALL GROUND PIN OF VERTICALLY MOUNTED RECEPTACLES UP AND ON HORIZONTALLY MOUNTED RECEPTACLES TO THE RIGHT C. DO NOT USE OVERSIZED OR EXTRA-DEEP PLATES. REPAIR WALL FINISHES AND REMOUNT OUTLET BOXES WHEN STANDARD DEVICE PLATES DO NOT FIT FLUSH OR DO NOT COVER ROUGH WALL OPENING D. ARRANGEMENT OF DEVICES: UNLESS OTHERWISE INDICATED, MOUNT FLUSH, WITH LONG DIMENSION VERTICAL GROUP ADJACENT SWITCHES UNDER A SINGLE, MULTI-GANG WALL PLATE.

#### 2.8 WIRING DEVICE PLATES

A. PROVIDE TYPE AND COLOR AS DIRECTED BY ARCHITECT.

B. VOICE/DATA OUTLET PLATES SHALL BE SAME AS USED FOR RECEPTACLES.

C. DEVICE PLATES SHALL BE BY MANUFACTURER OF WIRING DEVICES. D. OUTLETS SHALL BE FLUSH TO SURFACE.

2.9 LUMINAIRES

A. PROVIDE LUMINAIRES, EQUIPMENT, AND COMPONENTS WHERE SHOWN ON DRAWINGS, AS LISTED IN LUMINAIRE SCHEDULE, AND AS SPECIFIED, WIRED AND ASSEMBLED. PROVIDE APPROVED ALIGNERS, CANOPIES, HANGERS AND OTHER APPURTENANCES AS REQUIRED FOR A COMPLETE SYSTEM PER MANUFACTURER'S INSTRUCTIONS AND N.E.C. REQUIREMENTS.

B. REFER TO LUMINAIRE SCHEDULE FOR SPECIFIC LAMP AND BALLAST TYPE AND MANUFACTURER REQUIREMENTS. C. PROVIDE POLYESTER COVERS TO PROTECT FLUORESCENT LUMINAIRES WITH LOUVERS, BASKETS, OR LENSES DURING CONSTRUCTION

2.10 FUSIBLE SWITCHES

A. MANUFACTURERS 1. CUTLER HAMME

2. GENERAL ELECTRIC

B. QUICK-MAKE/QUICK-BREAK FUSIBLE SWITCHES

1. PROTECTIVE DEVICES SHALL BE QUICK-MAKE/QUICK-BREAK FUSIBLE SWITCHES AS MANUFACTURED BY CUTLER HAMMER TYPE FDP. FUSIBLE SWITCHES 30 AMPERES THROUGH 600 AMPERES FRAMES SHALL BE FURNISHED WITH REJECTION CLASS "R" OR "J" TYPE FUSE CLIPS UNLESS OTHERWISE SCHEDULED. FUSIBLE SWITCHES 800 AMPERES THROUGH 1200 AMPERES SHALL BE FURNISHED WITH CLASS "L" FUSE CLIPS. SWITCHES SHALL INCORPORATE SAFETY COVER INTERLOCKS TO PREVENT OPENING THE COVER WITH THE SWITCH IN THE "ON" POSITION OR PREVENT PLACING THE SWITCH IN THE "ON" POSITION WITH THE COVER OPEN. PROVIDE DEFEATER FOR AUTHORIZED PERSONNEL. ANDLES SHALL HAVE PROVISIONS FOR PADLOCKING AND SHALL CLEARLY INDICATE THE "ON" OR "OFF" POSITION. FRONT COVER DOORS SHALL BE PADLOCKABLE IN THE CLOSED POSITION.

. PROVIDE ARC-FLASH HAZARD WARNING LABEL FOR EACH SWITCH PER NATIONAL ELECTRIC CODE (N.E.C.) ARTICLE 110.16.

<u>PART 3 – EXECUTION</u>

3.1 TESTING, INSPECTION, AND CLEANING

C. WARNING LABEL

A. TEST WIRING AND CONNECTIONS FOR CONTINUITY AND GROUNDS BEFORE EQUIPMENT IS CONNECTED; DEMONSTRATE INSULATION RESISTANCE BY MEGGER TEST AS REQUIRED. INSULATION RESISTANCE BETWEEN CONDUCTORS AND GROUNDS FOR SECONDARY DISTRIBUTIONS SYSTEMS SHALL MEET NEC REQUIREMENTS. B. VERI<mark>FY AND</mark> CORRE<mark>CT AS</mark> NECESS<mark>ARY</mark>: VOLTAGES, TAP SETTINGS, TRIP SETTINGS AND PHASING ON EQUIPMENT FROM SECONDARY IN SYSTEM TO POINTS OF USE. TEST SECONDARY VOLTAGES AT BUS IN MAIN SWITCHBOARD, AT PANELBOARDS, AND A HER LOCATIONS ON DISTRIBUTION SYSTEMS AS NECESSARY. TEST SECONDARY VOLTAGES UNDER NO-LOAD AND FULL-LOAD CONDITIONS. TEST LUMINAIRES WITH SPECIFIED LAMPS IN PLACE FOR 10 HOURS. DO NOT OPERATE LAMPS OTHER THAN FOR TESTING BEFORE

FINAL INSPECTION BY ARCHITECT. REPLACE LAMPS THAT FAIL WITHIN 90 DAYS AFTER ACCEPTANCE BY ARCHITECT. PROVIDE NECESSARY TESTING EQUIPMENT AND TESTING. FAILURE OR DEFECTS IN WORKMANSHIP OR MATERIALS REVEALED BY TESTS OR INSPECTION SHALL BE CORRECTED PROMPTLY AND

RETESTED. REPLACE DEFECTIVE MATERIAL. EAN PANELS AND OTHER EQUIPMENT. PANELBOARD INTERIORS SHALL BE CLEANED AND VACUUMED. EQUIPMENT WITH DAMAGE TO PAINTED FINISH SHALL BE REPAIRED TO ARCHITECT'S SATISFACTION. 3.2 <u>NAMEPLATES</u>

A. PROVIDE NAMEPLATES ON SWITCHBOARDS, PANELBOARDS, JUNCTION BOXES AND CABINETS, AND FOR SPECIAL PURPOSE SWITCH MOTOR DISCONNECT SWITCHES, REMOTE CONTROL STATIONS, STARTERS OR OTHER CONTROLS FURNISHED OR INSTALLED UNDER THIS SECTION. NAMEPLATES SHALL DESIGNATE EQUIPMENT CONTROLLED AND FUNCTION. 3.3 ACCESS AND ACCESS PANELS

PROVIDE PROPER ACCESS TO MATERIAL OR EQUIPMENT THAT REQUIRE INSPECTION, REPLACEMENT, REPAIR OR SERVICE AND COORDINATE THEIR DELIVERY WITH THE INSTALLING TRADE. IF PROPER ACCESS CANNOT BE PROVIDED, CONFER WITH ARCHITECT AS TO BEST METHOD OF APPROACH TO MINIMIZE EFFECTS OF REDUCED ACCESS. B. ACCESS PANELS SHALL HAVE SAME FIRE RATING CLASSIFICATION AS SURFACE PENETRATED.

C. PANELS SHALL BE AT LEAST 12" X 12"; ACCESS PANELS AT EQUIPMENT SHALL BE 18" X 18"

#### 3.4 WIRING METHODS

A. ALL RACEWAYS, CABLE ASSEMBLIES, BOXES, CABINETS, FITTINGS, ETC. SHALL BE SECURED AND SUPPORTED IN ALL ASSEMBLIES AS REQUIRED PER N.E.C. ARTICLE 300.1 B. INSTALL WIRE AND CABLE AS SPECIFIED AND AS APPROVED BY AUTHORITIES HAVING JURISDICTION. ALL CONDUITS OR RACEWAYS SHALL BE CONCEALED WHERE POSSIBLE, EXCEPT FOR UNFINISHED AREAS, SUCH AS EQUIPMENT ROOMS. PROVIDE STAND-OFF CLIPS WHERE CONDUITS ARE INSTALLED ON MASONRY WALLS. C. RUN CONCEALED CONDUIT IN AS DIRECT LINES AS POSSIBLE WITH MINIMUM NUMBER OF BENDS OF LONGEST POSSIBLE RADIUS. RUN CONDUIT PARALLEL TO OR AT RIGHT ANGLES TO BUILDING LINES TIGHT TO BUILDING STRUCTURE. D. CONDUIT RUNS SHALL BE MECHANICALLY AND ELECTRICALLY CONTINUOUS FROM SERVICE ENTRANCE TO OUTLETS. CONDUIT SHALL ENTER AND BE SECURED TO CABINET, JUNCTION BOX, PULL BOX OR OUTLET BOX WITH LOCKNUT OUTSIDE AND BUSHING INSIDE. E. ALL RACEWAY SHALL BE 3/4" TRADE SIZE MINIMUM, AS INDICATED ON THE DRAWINGS OR AS REQUIRED BY THE NEC AND SHALL CONTAIN AN EQUIPMENT GROUNDING CONDUCTOR. PROVIDE INSERTS, HANGERS, ANCHORS AND STEEL SUPPORTS AS NECESSARY. F. INSTALL CONDUIT SYSTEMS COMPLETE BEFORE DRAWING IN CONDUCTORS. BLOW THROUGH AND SWAB AFTER PLASTER IS FINISHED AND DRY, AND BEFORE CONDUCTORS ARE INSTALLED. WIRE FROM POINT OF SERVICE CONNECTION TO RECEPTACLES, LUMINAIRES, DEVICES, EQUIPMENT, AND OTHER ELECTRICAL APPARATUS AS SHOWN ON DRAWINGS. PROVIDE SLACK WIRE FOR CONNECTIONS. H. CONDUCTORS 10-AWG AND SMALLER IN BRANCH CIRCUIT PANELBOARDS, SIGNAL CABINETS, SIGNAL CONTROL BOARDS, SWITCHBOARDS AND MOTOR CONTROL CENTERS SHALL BE BUNDLED. CONDUCTORS LARGER THAN 10-AWG IN SWITCHBOARDS, MOTOR CONTROL CENTERS, AND PULL BOXES SHALL BE CABLED IN INDIVIDUAL CIRCUITS. FOLLOW HOMERUN CIRCUIT NUMBERS SHOWN ON DRAWINGS TO CONNECT CIRCUITS TO PANELBOARDS. CONNECT EACH BRANCH CIRCUIT HOMERUN WITH TWO OR MORE CIRCUITS AND COMMON NEUTRAL TO CIRCUIT BREAKER OR SWITCH IN THREE—WIRE OR FOUR—WIRE BRANCH CIRCUIT PANELBOARD SO THAT NO TWO CIRCUITS ARE FED FROM SAME BUS. WHERE PANELBOARD CABINETS ARE RECESSED ROVIDE CONDUITS WITH SUFFICIENT CAPACITY FOR FUTURE CONDUCTORS FOR SPARE BRANCH CIRCUIT PROTECTIVE DEVICES AND SPACES IN PANELBOARD; STUB UP CONCEALED TO JUNCTION BOX. PROVIDE EXTENSIONS ABOVE CEILING. J. ELECTRICAL METALLIC TUBING (EMT) MAY BE USED FOR INTERIOR APPLICATIONS ABOVE GRADE, WHERE PERMITTED BY CODES, FOR

LUMINAIRE AND RECEPTACLE CIRCUITS, TELEPHONE, INTER-COMMUNICATIONS, SIGNAL AND INSTRUMENTATION CIRCUITS, AND FOR CONTROL CIRCUITS. EMT MAY BE USED ABOVE HUNG CEILINGS, IN EQUIPMENT ROOMS, IN MECHANICAL AND ELECTRICAL CHASES AND CLOSETS, IN EXPOSED LOCATIONS ALONG CEILINGS OR WALLS ABOVE NORMAL TRAFFIC LEVEL AND WHERE NOT SUBJECT TO ACCIDENTAL DAMAGE OR ABUSE. K. INSTALL CONNECTORS AND COUPLINGS AS RECOMMENDED BY MANUFACTURERS. COMPRESSION FITTINGS SHALL BE USED IN AREAS

. FLEXIBLE METAL CONDUIT (FMC) SHALL BE USED FOR CONNECTIONS TO ELECTRICAL EQUIPMENT AND TO EQUIPMENT FURNISHEI UNDER DIVISIONS 14 AND 15 THAT ARE SUBJECT TO MOVEMENT AND VIBRATION. FMC SHALL BE LIMITED TO LENGTHS OF 6 FEET AND SHALL CONTAIN GROUNDING CONDUCTOR.

N. ALL LOW VOLTAGE CABLE NOT IN CONDUIT AND INSTALLED IN RETURN AIR PLENUM SHALL BE U.L. LISTED PLENUM TYPE CABLE.

0. OPENINGS AROUND ELECTRICAL PENETRATIONS THROUGH FIRE RESISTANT RATED WALLS, PARTITIONS, FLOORS, OR CEILINGS SHALL BE FIRESTOPPED USING U.L. APPROVED METHODS PER MANUFACTURES GUIDELINES (HILTI FIRE STOP SYSTEMS OR 3M FIRE PROTECTION PRODUCTS) TO MAINTAIN THE FIRE RESISTANCE RATING OF STRUCTURE. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATINGS REQUIREMENTS TO BE MAINTAINED.

#### 3.5 INSTALLATION OF LUMINAIRES

STRUCTURAL BUILDING MEMBERS ONLY.

410.36(B).

3.6 GROUNDING

SUBJECT TO MOISTURE

A. THE ELECTRICAL CONTRACTOR SHALL VERIFY ALL CEILING CONSTRUCTION TYPES, HEIGHTS, CEILING SPACE CLEARANCES, ETC. WITH THE ARCHITECTURAL, MECHANICAL, PLUMBING, AND FIRE PROTECTION PLANS, ELEVATIONS, AND DETAILS. PROVIDE PROPER FRAMES, ROUGH-IN KITS, TRIM RINGS, MOUNTING HARDWARE, N.E.C. REQUIRED ACCESS, ANCILLARY ACCRESSORIES, ETC. FOR A COMPLETE N.E.C. AND U.L. LISTED INSTALLATION PER ALL MANUFACTURER'S REQUIREMENTS B. COORDINATE INSTALLATION OF ALL LUMINAIRES WITH ALL TRADES AND THE INSTALLATION OF CEILING MATERIALS AND SUSPENSION

SYSTEMS PRIOR TO ANY ROUGH-INS. C. DO NOT INSTALL LUMINAIRES UNTIL WORK OF OTHER TRADES THAT MAY DAMAGE LUMINAIRES IS COMPLETED.

D. INVESTIGATE LUMINAIRE LOCATIONS AND SUPPORTS TO ENSURE THAT NO INTERFERENCE EXISTS WITH HANGERS, DUCTS, SPRINKLERS PIPES AND ALL OTHER EQUIPMENT.

E. PROVIDE PROPER PLASTER FRAMES FOR LUMINAIRES RECESSED IN GYPSUM BOARD OR PLASTER CEILING. F. DO NOT SUSPEND OR SUPPORT LUMINAIRES OR SAFETY CHAINS FROM HUNG CEILING, CONDUIT OR DUCT. SUPPORT LUMINAIRES FROM

G. FRAMING MEMBERS OF SUSPENDED CEILING SYSTEMS USED TO SUPPORT LUMINAIRES SHALL BE SECURELY FASTENED TO EACH OTHER AND SHALL BE SECURELY ATTACHED TO THE BUILDING STRUCTURE AT APPROPRIATE INTERVALS. LUMINAIRES SHALL BE SECURELY FASTENED TO THE CEILING FRAMING MEMBER BY MECHANICAL MEANS SUCH AS BOLTS, SCREWS, OR RIVETS, LISTED CLIPS IDENTIFIED FOR USE WITH THE TYPE OF CEILING FRAMING MEMBER(S) AND LUMINAIRE(S) SHALL ALSO BE PERMITTED PER N.E.C. ARTICLE

H. PROVIDE STRUT BELOW DUCTS WHERE LUMINAIRE LOCATIONS COINCIDE WITH DUCT RUNS. PROVIDE A COMPLETE THREADED ROD SYSTEM TO SUPPORT STRUT.

I. PATCH ALL EXISTING SPRAY-ON FIREPROOFING DAMAGED DURING INSTALLATION. J. SUPPORT SURFACE-MOUNTED LUMINAIRES AT LEAST TWO CONCEALED POINTS TO PREVENT ROTATION.

K. LOCATE CEILING AND WALL MOUNTED LUMINAIRES AS SHOWN ON ARCHITECTURAL REFLECTED CEILING PLANS AND ELEVATIONS.

A. PROVIDE EQUIPMENT GROUNDING SYSTEM AS SHOWN ON DRAWINGS, EQUIPMENT GROUNDING SYSTEM SHALL BE DESIGNED SO METALLIC STRUCTURES, ENCLOSURES, RACEWAYS, JUNCTION BOXES, OUTLET BOXES, CABINETS, MACHINE FRAMES, PORTABLE EQUIPMENT AND OTHER CONDUCTIVE ITEMS IN CLOSE PROXIMITY WITH ELECTRICAL CIRCUITS OPERATE CONTINUOUSLY AT GROUND POTENTIAL AND PROVIDE LOW IMPEDANCE PATH FOR POSSIBLE GROUND FAULT CURRENTS.

B. SYSTEM SHALL MEET NEC REQUIREMENTS, MODIFIED AS SHOWN ON DRAWINGS AND AS SPECIFIED.

C. PROVIDE SEPARATE GREEN INSULATED EQUIPMENT GROUNDING CONDUCTOR FOR EACH BRANCH CIRCUIT. INSTALL GROUNDING CONDUCTOR IN COMMON CONDUIT WITH RELATED PHASE OR NEUTRAL CONDUCTORS, OR BOTH. PARALLEL FEEDERS INSTALLED IN MORE THAN ONE RACEWAY SHALL HAVE INDIVIDUAL FULL SIZE GREEN INSULATED EQUIPMENT GROUND CONDUCTORS. D. DETERMINE NUMBERS AND SIZES OF SCREW TERMINALS FOR EQUIPMENT GROUNDING BARS IN PANELBOARDS AND OTHER ELECTRICAL EQUIPMENT. PROVIDE SCREW TERMINALS FOR ACTIVE CIRCUITS, SPARES AND SPACES.

E. PROVIDE GREEN INSULATED GROUNDING CONDUCTOR IN NONMETALLIC CONDUITS OR DUCTS UNLESS SPECIFIED OTHERWISE. 3.7 TELECOMMUNICATIONS CONDUIT SYSTEM

A. PROVIDE SYSTEM OF EMPTY CONDUIT, OUTLETS AND MOUNTING BOARDS, AS SPECIFIED AND AS SHOWN ON DRAWINGS. B. NYLON PULL-IN WIRE SHALL BE INSTALLED IN TELECOMMUNICATIONS CONDUITS FOR USE BY OWNER.

![](_page_17_Picture_232.jpeg)

![](_page_18_Figure_0.jpeg)

LUMINAIRE SCHE	<u>DULE:</u>					
Fixture Type	LAMP	WATTAGE	VOLTAGE	DESCRIPTION	CATALOG NUMBER	REN
L1	DOME PENDANT	40 (MAX)	120	E26 PENDENT DIMMABLE LIGHT	SKU: 7121525-V1-OB-30-8059042	COORDINAT WITH LIGH
L2	TRACK LIGHT	11	120	LED TRACK LIGHT WITH CUT PHASE DIMMING	SOLAIS LCS-1-NFL-8-25K-600-1200-BK-J	COORDINAT WITH LIGH

![](_page_18_Figure_2.jpeg)

## <u>LIGHTING GENERAL NOTES:</u>

- 1. ALL WORK SHALL COMPLY WITH ALL LOCAL AND STATE CODES AND AUTHORITIES HAVING JURISDICTION.
- 2. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND ARRANGE ALL REQUIRED INSPECTIONS.
- 3. THE CONTRACTOR SHALL COORDINATE HIS WORK OTHER CONTRACTOR AND TRADES.
- 4. THESE DRAWINGS, AS PREPARED, ARE DIAGRAMMATIC BUT SHALL BE FOLLOWED AS CLOSELY AS CONSTRUCTION OF THE PROJECT AND THE WORK OF THE TRADES WILL PERMIT. EQUIPMENT LOCATIONS INDICATED ARE APPROXIMATE. COORDINATE EXACT LOCATIONS AND REQUIRED CLEARANCES WITH EQUIPMENT SUPPLIER AND ALL TRADES PRIOR TO INSTALLATION.
- 5. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL THE EQUIPMENT INDICATED WITHIN THESE DRAWINGS UNLESS OTHERWISE NOTED. VERIFY LOCATION AND DIMENSIONS IN THE FIELD PRIOR TO
- 6. E.C SHALL PROVIDE DEDICATED NEUTRAL FOR ALL THE LIGHT FIXTURES REQUIRED DIMMING. BASE BID ACCORDINGLY.

# <u>ELECTRICAL LIGHTING PLAN KEYED WORK NOTES:</u>

FABRICATION AND / OR INSTALLATION.

- E.C SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LOCATION OF DIMMER SWITCH BANK AND PROVIDE NEW DIMMER SWITCHES IN PLACE OF EXISTING DIMMERS SWITCHES. NEW DIMMER SWITCHES SHALL BE COMPATIBLE FOR THE NEW LIGHT FIXTURE MODELS. BASE BID ACCORDINGLY.
- 2 E.C SHALL VERIFY THE EXISTING ELECTRICAL CONNECTION FOR THE EXISTING EXIT SIGNS WITH EMERGENCY LAMPS. REPLACE IF IN OPERABLE. BASE BID ACCORDINGLY.
- E.C SHALL RECONNECT/REUSE THE EXISTING ELECTRICAL CONNECTION FOR THE NEW EMERGENCY LIGHT. BASE BID ACCORDINGLY. LIGHT CIRCUIT SHALL BE CONNECTED SUCH A WAY THAT THE EM LIGHT IS ENERGIZED ALL THE TIME.
- E.C SHALL PROVIDE ELECTRICAL CONNECTION REQUIRED FOR THE LIGHTING CIRCUIT UNDER THE HOOD. THE LIGHTING SHALL BE CONNECTED FROM THE NEAREST LIGHTING CIRCUIT OR AS REQUIRED BY THE HOOD MANUFACTURER.
- 5 E.C SHALL VERIFY THE OPERABLE CONDITION AND COMPATIBILITY OF EXISTING TIME CONTROL RELAY AND RECONNECT THESE NEW DIMMER SWITCH CIRCUIT AS REQUIRED. IF THE EXISTING TIME CONTROL RELAY IS IN OPERABLE, PROVIDE NEW TIMER CONTROL AS REQUIRED FOR THE TENANT UPGRADE SPACE. BASE BID ACCORDINGLY.

![](_page_18_Figure_16.jpeg)

![](_page_18_Figure_17.jpeg)

![](_page_18_Picture_18.jpeg)

08Y/120	VOLTS,		3	PHASE	4	WIRE					
1LO	400A		BUS:	EX	MIN,						
OTE: M - I	MOTOR										
		DESCRIPTION OF			MINIMUM BRANCH	PE	R PHASE (K)	/A)	MINIMUM BRANCH		
CKI NO.	THE AWES	LOAD	LOAD TIPE		CIRCUIT	А	В	С	CIRCUIT		LUAD TIP
1	EX	EXISTING			EXISTING	EX			EXISTING		
3	EX	EXISTING			EXISTING		EX		EXISTING		
5	EX	EXISTING			EXISTING			EX	EXISTING		
7						EX			EXISTING		
9	EX	RTU-2(EX)			EXISTING		EX		EXISTING		
11								EX	EXISTING		
13	EX	EXISTING			EXISTING	EX			EXISTING		
15	EX	EXISTING			EXISTING		EX		EXISTING		
17	EX	EXISTING			EXISTING			EX	EXISTING		
19	EX	EXISTING			EXISTING	EX			EXISTING		
21	EX	EXISTING			EXISTING		EX		EXISTING		
23	EX	EXISTING			EXISTING			EX	EXISTING		
25	EX	EXISTING			EXISTING	EX			EXISTING		
27	EX	EXISTING			EXISTING		EX		EXISTING		
29	EX	EXISTING			EXISTING			EX	EXISTING		
31	EX	EXISTING			EXISTING	EX			EXISTING		
33	EX	EXISTING			EXISTING		EX		EXISTING		
35	EX	EXISTING			EXISTING			EX	EXISTING		
37	EX	EXISTING			EXISTING	EX				1.27	М
39	EX	EXISTING			EXISTING		EX		3#12, #12G, 3/4"C	1.27	М
/11											

МСВ	60A		BUS:	EX	MIN,						
NOTE: H- H	IVAC, M- MO	TOR, R - RECEPTACLE	•								-
		DESCRIPTION OF			MINIMUM BRANCH	P	ER PHASE (K	VA)	MINIMUM BRANCH		Γ
CKT NO.	TRIP AMPS	LOAD	LOAD TYPE	LUAD (KVA)	CIRCUIT	А	В	С	CIRCUIT	LOAD (KVA)	
1	EX	EXISTING			EXISTING	EX			EXISTING		Ī
3	EX	EXISTING			EXISTING		EX		EXISTING		Γ
5	EX	EXISTING			EXISTING			EX	EXISTING		Γ
7	EX	EXISTING			EXISTING	EX			EXISTING		Γ
9	EX	EXISTING			EXISTING		EX		EXISTING		Γ
11	EX	EXISTING			EXISTING			EX	EXISTING		Ī
13	EX	EXISTING			EXISTING	EX			EXISTING		Γ
15	EX	EXISTING			EXISTING		EX		EXISTING		Γ
17	EX	EXISTING			EXISTING			EX	EXISTING		Ī
19	EX	EXISTING			EXISTING	EX			EXISTING		Γ
21	EX	EXISTING			EXISTING		EX		EXISTING		Γ
23	EX	EXISTING			EXISTING			1.44	2#12, #12G, 3/4"C	1.44	Γ
25			М	1.27		1.74				0.47	Γ
27	3P-20	EF-1	М	1.27	3#12, #12G, 3/4"C		1.74		3#12, #12G, 3/4"C	0.47	Γ
29	1		М	1.27				1.74		0.47	Γ
		•	•								-
EXISTIN	G CONNEC	CTED LOAD:		NEWLY A	DDED CONNECTED I	LOAD:				UPDATED T	-(
	P P P	HASE A = 3750 HASE B = 3750 HASE C = 37501125	) VA ) VA <u>)</u> VA 50 VA		PHASE A = PHASE B = PHASE C =	1740 1740 <u>3810</u> 7290	VA VA VA VA				

4 WIRE

EXISTING CONNECTED LOAD:		NEW
PHASE A = 127800 PHASE B = 117510 PHASE C = <u>117390</u> 362700	VA VA VA VA	

3 PHASE

PANEL: CP-KE (EXISTING)

208Y/120 VOLTS,

WLY ADDED CONNECTED LOAD: PHASE A = 8410 + 11857 VA PHASE B = 8410 + 11767 VA  $\begin{array}{r} \text{PHASE C} = \underline{8410 + 14017} \\ \underline{25230 + 37641} \\ \text{VA} \end{array}$ = 62871 VA

UPDATED TOTAL CONNECTED LOAD: 425571 VA

н

PANEL:	MDP (EXI	STING)										MOUNTING:	SURFACE	
208Y/120	VOLTS,		3	PHASE	4	WIRE						PANEL LOCATION:	EXISTING	
												1		
MLO	1200A		BUS:	1200A	MIN,							FED FROM:	METER	
NOTE: H - I	HVAC	r				1		- 1		1	i	1		
CKT NO.	TRIP AMPS	DESCRIPTION OF	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH	PE	R PHASE (KV	A)		LOAD (KVA)	LOAD TYPE	DESCRIPTION OF	TRIP AMPS	CKT NO.
					CIRCUIT	A	В	C	CIRCUIT					
1	EX	EXISTING			EXISTING	EX			EXISTING			EXISTING	EX	2
3	EX	EXISTING			EXISTING		EX		EXISTING			EXISTING	EX	4
5	EX	EXISTING			EXISTING			EX	EXISTING			EXISTING	EX	6
7	EX	EXISTING			EXISTING	EX			EXISTING			EXISTING	EX	8
9	EX	EXISTING			EXISTING		EX		EXISTING			EXISTING	EX	10
11	EX	EXISTING			EXISTING			EX	EXISTING			EXISTING	EX	12
13	EX	EXISTING			EXISTING	EX			EXISTING			EXISTING	EX	14
15	EX	EXISTING			EXISTING		EX		EXISTING			EXISTING	EX	16
17	EX	EXISTING			EXISTING			EX	EXISTING			EXISTING	EX	18
19	EX	EXISTING			EXISTING	EX			EXISTING			EXISTING	EX	20
21	EX	EXISTING			EXISTING		EX		EXISTING			EXISTING	EX	22
23	EX	EXISTING			EXISTING			EX	EXISTING			EXISTING	EX	24
25			Н	2.57		4.82				2.26	н			26
27	3P-30	CONDENSER-1-MAU-1	Н	2.57	3#10, #10G, 3/4"C		4.82		3#10, #10G, 3/4"C	2.26	н	MAU-1	3P-30	28
29	1	CONDENSER-1-WAO-1	Н	2.57				4.82		2.26	н			30
31			Н	2.57		4.31				1.74	н			32
33	1 3 ³⁰		Н	2.57	3#10, #10G, 3/4"C		4.31		3#12, #12G, 3/4"C	1.74	н	CONDENSER-MAU-2	2,20	34
35	- ['] 2'		Н	2.57				4.31		1.74	н	1	<u>י</u> ס'	36
		-	-	· •						-		•		

![](_page_19_Figure_6.jpeg)

MOUNTING: SURFACE

PANEL: KP-A (EXISTING)

CKT NO. TRIP AMPS DESCRIPTION OF

1 EX EXISTING

3 EX EXISTING

5 EX EXISTING

7EXEXISTING9EXEXISTING

11 EX EXISTING

13 EX EXISTING

15 EX EXISTING

 17
 EX
 EXISTING

 17
 EX
 EXISTING

 19
 EX
 EXISTING

21 EX EXISTING

23EXEXISTING25EXEXISTING27EXEXISTING29EXEXISTING24EXEXISTING

31 EX EXISTING

33 EX EXISTING

35 EX EXISTING

37 EX EXISTING

39EXEXISTING41EXEXISTING

EXISTING CONNECTED LOAD:

PANEL: LP-A (EXISTING)

PHASE A = 11915 VA

PHASE B = 9225 VA

PHASE C =  $\frac{11130}{32270}$  VA

LOAD

3 PHASE

LOAD TYPE LOAD (KVA)

BUS: EX MIN,

MINIMUM BRANCH

NEWLY ADDED CONNECTED LOAD:

208Y/120 VOLTS,

MCB 150A

NOTE: R - RECEPTACLE

							MOUNTING	SURFACE		
4	WIRE						PANEL LOCATION	:		
MIN,							FED FROM	: MDP		
NIMUM BRANCH CIRCUIT	PE	ER PHASE (KV B	/A) C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.	
EXISTING	EX			EXISTING			EXISTING	EX	2	
EXISTING		EX		EXISTING			EXISTING	EX	4	
EXISTING			EX	EXISTING			EXISTING	EX	6	
EXISTING	EX			EXISTING			EXISTING	EX	8	
EXISTING		EX	EV	EXISTING				EX EX	10	
EXISTING	EX			EXISTING			EXISTING	EX	14	
EXISTING		EX		EXISTING			EXISTING	EX	16	
EXISTING			EX	EXISTING			EXISTING	EX	18	
EXISTING	EX			EXISTING			EXISTING	EX	20	
EXISTING		EX		EXISTING	_		EXISTING	EX	22	
EXISTING			EX	EXISTING				EX	24	
	EX	EV		EXISTING				EX EV	26	
EXISTING		EX	FY	EXISTING			EXISTING	FX	30	
EXISTING	EX			EXISTING				EX	32	
EXISTING		EX		EXISTING			EXISTING	EX	34	
EXISTING			EX	EXISTING			EXISTING	EX	36	
EXISTING	EX			EXISTING			EXISTING	EX	38	
EXISTING		0.18		2#12, #12, 3/4"C	0.18	R	REC- PVT. DINING	20	40	
EXISTING			0.36	2#12, #12, 3/4"C	0.36	R	REC- TV	20	42	
CONNECTED PHASE A = PHASE B = PHASE C =	LOAD: 0 V 180 V <u>360 V</u> 540 V	I /A /A /A			UPDATED	TOTAL C	ONNECTED LOAD	): 32810 [•]	VA	
CONNECTED PHASE A = PHASE B = PHASE C =	LOAD: 0 V 180 V <u>360 V</u> 540 V	I /A /A /A			UPDATED	TOTAL C	ONNECTED LOAE	): 32810 MOUNTING:	VA	
CONNECTED PHASE A = PHASE B = PHASE C =	LOAD: 0 V 180 V <u>360 V</u> <u>360 V</u> <u>540 V</u>	I /A /A /A			UPDATED	TOTAL C	ONNECTED LOAD	): 32810 MOUNTING:	SURFACE	
CONNECTED PHASE A = PHASE B = PHASE C =	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V	I			UPDATED	TOTAL C	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION:	SURFACE	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN,	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V	I			UPDATED	TOTAL C	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION: FED FROM:	VA SURFACE EXISTING MDP	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN, NIMUM BRANCH CIRCUIT	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V WIRE PE A	I /A /A /A ER PHASE (KV B	/A) C	MINIMUM BRANCH CIRCUIT	UPDATED	LOAD TYPE	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION: FED FROM: DF LOAD	VA SURFACE EXISTING MDP TRIP AMPS	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN, NIMUM BRANCH CIRCUIT EXISTING	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V F A EX	I /A /A /A ER PHASE (KV B	(A) C	MINIMUM BRANCH CIRCUIT EXISTING	UPDATED	LOAD TYPE	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION: FED FROM: DF LOAD	VA SURFACE EXISTING MDP TRIP AMPS EX	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN, NIMUM BRANCH CIRCUIT EXISTING EXISTING	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V WIRE PE A EX	/A /A /A /A ER PHASE (KV B EX	(A) C	MINIMUM BRANCH CIRCUIT EXISTING EXISTING	UPDATED	LOAD TYPE	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION: FED FROM: DF LOAD	VA SURFACE EXISTING MDP TRIP AMPS EX EX	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN, NIMUM BRANCH CIRCUIT EXISTING EXISTING EXISTING	LOAD: 0 V 180 V <u>360 V</u> 540 V 540 V F F A EX	/A /A /A /A ER PHASE (KV B EX	(A) C	MINIMUM BRANCH CIRCUIT EXISTING EXISTING EXISTING	UPDATED	LOAD TYPE	ONNECTED LOAD	D: 32810 MOUNTING: HEL LOCATION: FED FROM: DF LOAD	VA SURFACE EXISTING MDP TRIP AMPS EX EX EX	
CONNECTED PHASE A = PHASE B = PHASE C = 4 MIN, NIMUM BRANCH CIRCUIT EXISTING EXISTING EXISTING EXISTING	LOAD: 0 V 180 V <u>360 V</u> <u>540 V</u> 540 V FAD V EX	/A /A /A /A ER PHASE (KV B EX	(A) C EX	MINIMUM BRANCH CIRCUIT EXISTING EXISTING EXISTING EXISTING EXISTING	UPDATED	LOAD TYPE	ONNECTED LOAD	D: 32810 MOUNTING: IEL LOCATION: FED FROM: DF LOAD	VA SURFACE EXISTING MDP TRIP AMPS EX EX EX EX EX	
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UPDATED TOTAL CONNECTED LOAD: 40691 VA

![](_page_19_Picture_13.jpeg)

PLUMBI	NG LEGEND
SYMBOL	DESCRIPTION
SAN	SANITARY WASTE (ABOVE FLOOR)
— — SAN — —	SANITARY SEWER (UNDER FLOOR)
— — EX.SAN— —	EXISTING SEWER
—— -EX.CW - ——	EXISTING COLD WATER
	VENT PIPING
G	GAS PIPING
	COLD WATER
	HOT WATER
	EXISTING VENT
	PIPE UP OR DOWN
O	PIPE UP
	POINT OF NEW CONNECTION
	SHUTOFF VALVE

## PLUMBING ABBREVIATIONS

СО	CLEANOUT			
CODP	CLEAN OUT DECK PLATE			
CW	COLD WATER			
HW	HOT WATER			
HWR	HOT WATER RETURN			
SAN	SANITARY			
S	SOIL			
W	WASTE			
LAV	LAVATORY			
WC	WATER CLOSET			
TYP.	TYPICAL			
DN	DOWN			
EXIST.	EXISTING			
AFF	ABOVE FINISH FLOOR			
FD	FLOOR DRAIN			
BFP	BACK FLOW PREVENTER			
WH	HOT WATER HEATER			
SV	SHUTOFF VALVE			
RCP	RECIRCULATION PUMP			
ET	EXPANSION TANK			
DF	DRINKING FOUNTAIN			
MS	MOP SINK			
FCO	FLOOR CLEANOUT			

#### PLUMBING DRAWING LIST

- PO.1 PLUMBING NOTES, SYMBOLS ABBREVIATIONS &
- SPECIFICATION P1.1 PLUMBING FLOOR & ROOF PLAN
- P5.0 PLUMBING DETAILS
- P6.0 PLUMBING RISERS AND SCHEDULES

#### CODE COMPLIANCE

ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:

- a. 2021 DUPAGE COUNTY BUILDING CODE
- b. 2018 ILLINOIS ENERGY CONSERVATION CODE
- c. 2021 DUPAGE COUNTY MECHANICAL CODE
- d. 2014 ILLINOIS PLUMBING CODE
- e. 2020 DUPAGE COUNTY ELECTRICAL CODE
- f. 2021 DUPAGE COUNTY FUEL GAS CODE

## BUILDING DEPARTMENT PLUMBING NOTES

- 1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2014 ILLINOIS STATE PLUMBING CODE, 2021 DUPAGE COUNTY FUEL GAS CODE & 2018 ILLINOIS ENERGY CONSERVATION CODE
- 2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SUBPART J, ILLINOIS PLUMBING CODE.
- 3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION 890.1130, ILLINOIS PLUMBING CODE.
- 4. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 890.210, ILLINOIS PLUMBING CODE. 5. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE
- IN ACCORDANCE WITH THE REQUIREMENTS OF SUBPART C OF ILLINOIS PLUMBING CODE. 6. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED
- AS PER SECTION 890.210, ILLINOIS PLUMBING CODE. 7. DRAINAGE PIPE CLEANOUTS AS PER SECTION 890.420,
- ILLINOIS PLUMBING CODE. 8. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 890.920 & 890.930 ILLINOIS PLUMBING CODE.
- 9. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBPART I OF ILLINOIS PLUMBING CODE.
- 10. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBPART J OF ILLINOIS PLUMBING CODE.
- 11. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SUBPART K OF ILLINOIS PLUMBING CODE
- 12. INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH SUBPART M OF ILLINOIS PLUMBING CODE.
- 13. GAS PIPING INSTALLATION SHALL BE IN ACCORDANCE WITH 2021 DUPAGE COUNTY FUEL GAS CODE CHAPTER 4.

## PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS 1.01 SCOPE

- A. PROVIDE ALL MATERIAL. TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.
- B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING AND NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.
- C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.
- D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.
- E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK. THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING

CONDITIONS.

- F. N ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.
- G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.
- H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS. INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT
- . MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.
- K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. 1.02 SUBMITTALS
- A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION. UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW. 1. PIPE AND FITTINGS
- VALVES HANGERS AND SUPPORTS
- PLUMBING PIPING LAYOUT TESTS
- PLUMBING FIXTURES WATER HEATERS & ACCESSORIES FLOOR DRAINS
- . MIXING VALVES 10. ALL SCHEDULED PLUMBING EQUIPMENT
- B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED
- C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.
- D. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT
- E. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
- F. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
- G. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

## 1.03 SUBSTITUTIONS

A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED. THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS. B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS. 1.04 DEFINITIONS A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES. B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES. C. PROVIDE: TO FURNISH AND INSTALL. D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS. E. REFER TO THE 2014 ILLINOIS STATE PLUMBING CODE FOR ADDITIONAL DEFINITIONS. 1.04 DRAWINGS A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE. B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED. C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS. D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS. E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER. F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS. 1.05 PRODUCTS A. SANITARY AND VENT PIPING: ABOVE GRADE/ UNDERGROUND PIPING SHALL BE CAST IRON PIPE WHICH SHOULD COMPLY WITH ASTM A 74 STANDARD/CISPI 301. 2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). 3. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES. 4. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL. B. DOMESTIC WATER PIPING: ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE. OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, 2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE COPPER OR COPPER ALLOY. 3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER. 4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC. F. VALVES: 5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER. RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED 6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2018 INTERNATIONAL ENERGY CONSERVATION CODE. REFER BELOW TABLE C403.11.3 FOR MINIMUM PIPE INSULATION THICKNESS. MINIMUM PIPE INSULATION THICKNESS NOMINAL PIPE OR TUBE FLUID INSULATION CONDUCTIVITY SIZE (INCHES) OPERATING TEMPERATURE CONDUCTIVITY | MEAN RATING RANGE AND BTU·IN./ | TEMPERATURE, | USAGE (°F) (H· FT2· *F) ۰F 105-140 0.21-0.28 0.5 | 1.0 | 1.0 | 1.0 40–60 0.21-0.27 7. AS PER ILLINOIS ENERGY CONSERVATION CODE 2018 EDITION, C404.6 WATER DISTRIBUTION SYSTEM HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM.PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING: THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE. 2. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F(40°C). HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER ILLINOIS ENERGY CONSERVATION CODE 2018 C404.5, THE HW PIPE LENGTH FROM THE NEAREST SOURCE HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE. MIXIMUM PIPING LENGTH

NOMINAL PIPE SIZE	(FEET)					
(INCHES)	PUBLIC LAV	OTHER FIXTURES				
1/2"	2'	43'				
3⁄4"	0.5'	21'				
1"	0.5'	13'				
1¼"	0.5'	8'				
1½"	0.5'	6'				
2" OR LARGER	0.5'	4'				

9. AS PER IECC 2018, C404.6.1, CONTROLS ARE INSTALLED THAT LIMIT OPERATION OF A RECIRCULATION PUMP INSTALLED TO MAINTAIN TEMPERATURE OF A STORAGE TANK. SYSTEM RETURN PIPE IS A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. AUTOMATIC TIME SWITCHES INSTALLED TO AUTOMATICALLY SWITCH OFF THE RE-CIRCULATING HOT HOT WATER SYSTEM OR HEAT TRACE.

C. GAS PIPING

#### PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS FIRED EQUIPMENT AND EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON DRAWINGS AS PER 2021 DUPAGE FUEL GAS CODE ..

B. NATURAL GAS PIPING SHALL BE AS FOLLOWS:

- 1. ASTM A-53 SCHEDULE 40 STEEL PIPE PAINTED WITH YELLOW ANTI-CORROSIVE PAINT, SCREWED OR WELDED IN ACCORDANCE WITH CODE REQUIREMENT (FITTINGS FOR LINES LARGER THAN 2" SHALL BE WELDED STEEL FITTINGS FOR LINES 2" AND SMALLER, EXCEPT WHEN LOCATED IN AIR PLENUMS, SHALL BE SCREWED STANDARD WEIGHT BLACK MALLEABLE).
- PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY NFPA-54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND
- EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM
- PAINT ALL GAS PIPING EXPOSED TO WEATHER WITH ONE COAT OF PRIMER, AND TWO COATS OF RUST-PROOF PAINT. COLOR OF PIPE ON ROOF SHALL BE YELLOW. COORDINATE COLOR OF PIPE ON EXTERIOR OF BUILDING WITH GC TO MATCH BUILDING COLORS
- F. GAS COCKS 1-1/2" AND SMALLER SHALL BE ALL BRONZE. SCREWED, FLAT HEAD, BRASS PLUG AND WASHER 200 LB NOG PROVIDE LINE SIZE 6" LONG DIRT LEG DOWN STREAM OF GAS COCK AT ALL EQUIPMENT CONNECTIONS.
- G. NO VALVES ARE TO BE LOCATED IN AIR PLENUMS
- H. PROVIDE GAS PIPE SUPPORTS IN ACCORDANCE WITH 2015 IFGC CODE REQUIREMENTS.

#### D. MIXING VALVES

- 1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
- 2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM, AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 5GPM @ 45 PSIG DIFFERENTIAL.
- 3. TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP, OR EXPANSION BELLOWS: TYPE B-SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C- PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D- BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.
- 4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.
- E. HANGERS AND SUPPORTS:
- 1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
- 2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
- 3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORT

SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

GATE VALVES, BUTTERFLY OR BALL VALVES FOR PROVIDE UT-OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT-OFF DUTY.

- 2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.
- 3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
- 4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.
- ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.

PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

G. SLEEVES AND ESCUTCHEONS:

- SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAUGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.
- 2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAUGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

H. DRAINAGE ACCESSORIES

1. GENERAL:

- a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.
- b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

ON THE SANITARY AND VENT STACKS.

UNIONS.

SPACES.

#### 2. DEVICES:

SURFACES.

a. CLEANOUT & CLEANOUT PLUG

• THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG

• PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.

• LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI-SEIZE LUBRICANT BEFORE FINAL INSTALLATION. b. CLEANOUT WALL PLATE

• IT SHOULD BE ROUND, STAINLESS STEEL OR POLISHED CHROME PLATED BRONZE COVER PLATE WITH STAINLESS STEEL VANDAL RESISTANT FASTENER TO SECURE TO CLEANOUT PLUG. c. CLEANOUT DECK PLATE

• IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.

I. INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING J. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

K. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOU STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'-0" IN LENGTH.

L. IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED

M. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL. REMOVE PROTECTIVE COATINGS PRIOR TO INSTALLATION.

N. REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

0. IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER APPROVED INDIRECT WASTE SOURCE.

R. PROVIDE ACCESS DOORS/PANELS FOR SERVICE AND ACCESS TO ALL VALVES AND OTHER SYSTEM COMPONENTS ENCLOSED IN WALLS AND CELLINGS ACCESS DOORS SHALL BE FURNISHED BY THIS CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR.

S. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR

CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL

RATED FIRE BARRIER CAULK OR APPROVED EQUAL. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH

THE FLUSHING. V. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY

W. ALL PIPING INSTALLED ON THE ROOF SHALL BE SUPPORTED BY "PILLOW BLOCK" PIPE STANDS AS MANUFACTURED BY MIRO INDUSTRIES, OR APPROVED EQUAL. WOOD PIPE SUPPORTS SHALL NOT BE ACCEPTABLE. PROVIDE TRAFFIC/WALK PADS BELOW ALL PIPE STANDS. X. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION.

SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH. Y. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL

FLUSHOMETER VALVES AND QUICK-CLOSING VALVES. Z. UNLESS OTHERWISE INDICATED, TRAPS SEALS AT ALL FLOOR DRAINS

SHALL BE MAINTAINED BY AN APPROVED TRAP PRIMING DEVICE. AA. MAINTAIN ALL REQUIRED AND RECOMMENDED CLEARANCES FOR ALL

PLUMBING SYSTEM COMPONENTS AND EQUIPMENT.

AB. MAINTAIN MINIMUM 10'-0" CLEARANCE BETWEEN ALL PLUMBING V.T.R.S. AND ALL OUTDOOR AIR INTAKES. OFFSET VENT STACKS AND STACK VENTS IF AND AS REQUIRED BELOW ROOF TO MAINTAIN SUCH CLEARANCE WHETHER OR NOT SUCH OFFSET IS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED SEISMIC SUPPORTS.

2. INSTALLATION 2.01 GENERAL

A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.

B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT. D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK

AND THE CONSTRUCTION SCHEDULE. E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND

FERROUS END PIPE. F. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE,

BEFORE ASSEMBLY. G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND

H. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED

J. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED. K. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS. CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL

CONNECTION TO EXISTING SYSTEMS. I. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS

OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND

2.02 ABOVE GRADE

- A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.
- B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES AND ALL LOW POINTS IN PIPING.
- USE EXISTING CONNECTIONS AT MAINS WHERE AVAILABLE FOR NEW BRANCH PIPING. LOCATE ALL RISERS AND PIPING BEFORE CONSTRUCTION COMMENCES AND TAKE CARE NOT TO DAMAGE SAME. ANY DAMAGE OCCURRING TO THE EXISTING PIPING WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

2.03 INSULATION

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 11/2" AND 11/2" THICK FOR PIPE SIZE GREATER THAN 1½". INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL PIPE INSULATION SHALL COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE 2018 EDITION.

3. TESTING

- AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.
- RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE. B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.
  - THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM. OR PORTION OF THE SYSTEM. HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.
  - D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.
  - ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.
  - WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.
  - ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN
  - H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.
  - I. ALL EQUIPMENT WILL BE FACTORY TESTED
  - CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE
  - REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

M. TESTING REQUIREMENTS a. ALL TESTS SHALL BE PERFORMED AS PER IPC 2021 SECTION 312 TESTS AND INSPECTION. b. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.

- c. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.
- N. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.
- O. THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.
- 4. WARRANTY A. EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL.

THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY CORRECT AND REPAIR ANY AND ALL BREAKS, FAILURES OR WEAR DUE TO FAULTY MATERIALS, WORKMANSHIP OR EQUIPMENT. ALL SETTLEMENTS OF SURFACES THAT MAY OCCUR WITHIN THAT PERIOD SHALL ALSO BE PROMPTLY REPAIRED.

5. FIRE PROTECTION SCOPE OF WORK-NEW

THE FIRE PROTECTION SYSTEM WORK SHALL BE DESIGN BUILD. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR. MATERIALS. DESIGN. CALCULATIONS AND COORDINATE WITH ALL LOCAL AUTHORITIES HAVING JURISDICTION TO PRODUCE A COMPLETE AND USABLE SYSTEM WHICH COMPLIES WITH ALL APPLICABLE CODES, LAWS AND REGULATIONS INCLUDING NFPA13 AND THE LOCAL BUILDING CODE. COORDINATE ALL INSTALLATIONS WITH THE GC AND OTHER TRADES TO AVOID CONFLICTS. THE FP SUBCONTRACTOR SHALL BE OBLIGATED TO RELOCATE/REDESIGN ANY PIPE WHICH COME INTO CONFLICT WITH OTHER TRADES AT NO ADDITIONAL COST TO THE OWNER, UNDER ALL CIRCUMSTANCES.

SYSTEM TYPE:

WET PIPE WATER SPRINKLER, NFPA 13. SEE PLUMBING DRAWINGS FOR LOCATION. WATER SERVICE/RISER:

CONFIGURE AND INSTALL NEW SERVICE. 6" SIZE IS PRELIMINARILY SELECTED. TO BE VERIFIED BY DESIGN BUILDERS CALCULATIONS. ADJUST THIS SIZE AS REQUIRED BY CALCULATIONS.

DESIGN:

THE DESIGN BUILD CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR THE SURVEY OF EXISTING, FLOW TEST, DESIGN, CALCULATIONS, DETAILING, SUBMITTAL, APPROVAL, COORDINATION, LABOR MATERIAL, TESTING AND FINAL PRODUCT. IF REQUIRED, THE CONTRACTOR SHALL INCLUDE ANY REQUIRED FLOW TEST. AN RPZ BACK FLOW PREVENTER SHALL BE INCLUDED (DOUBLE DETECTOR CHECK WILL NOT BE ACCEPTABLE). PROVIDE CALCULATIONS TO DOCUMENT AND CONFIRM CAPACITY IS ADEQUATE. CONTRACTOR SHALL LOCATE HEADS IN THE BUILDING AS NEEDED FOR DESIGN/COVERAGE.

#### MATERIALS:

PIPE SHALL BE BLACK STEEL. 2" AND SMALLER SHALL BE SCH40 WITH THREADED FITTINGS. 2-1/2" AND LARGER MAY BE SCH10 WITH MECHANICAL COUPLINGS OR BUTT WELD FITTINGS.

## HEADS:

IN FINISHED AREAS, HEADS SHALL BE CONCEALED TYPE, HEADS DO NOT HAVE TO BE CENTERED IN TILE. OTHER AREAS SHALL APPLY HEADS APPROPRIATE TO THE PARTICULAR CASE.

![](_page_20_Picture_163.jpeg)

![](_page_21_Figure_0.jpeg)

![](_page_21_Picture_1.jpeg)

![](_page_21_Picture_2.jpeg)

![](_page_21_Picture_3.jpeg)

	<u>KEY NOTES:</u>
	CONNECT NEW 3" WASTE PIPE TO EXISTING WASTE LINE. CONTRACTOR TO VERIFY IN FIELD EXACT LOCATIONS.
2	NEW $\frac{1}{2}$ " CW & HW CONNECT TO EXISTING CW & HW PIPE LINE
$\overline{3}$	NEW 1 $\frac{1}{2}$ " VENT CONNECT TO EXISTING VENT LINE
4	CONTRACTOR TO COORDINATE WITH CIVIL CONTRACTOR AND PROVIDE TRENCH FOR $1\frac{1}{2}$ " GAS PIPE RUNNING THROUGH THE FLOOR.
5	CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING HW PIPE AND PROVIDE HEAT TRACING IF DEVELOPED LENGTH OF NEW HW PIPE IS MORE THAN 25 FEET,
6	CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF EXISTING GAS PIPE AND CONNECT NEW 2" PIPE TO EXISTING 2" SERVICE. COORDINATE WITH ARCHITECT FOR FINAL POINT OF CONNECTION.
$\widehat{\mathcal{D}}$	CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND GAS LOAD. PROVIDE MINIMUM GAS PRESSURE AND GAS LOAD TO ALL GAS EQUIPMENTS. CONTRACTOR TO COORDINATE WITH GAS UTILITY COMPANY FOR AVAILABLE GAS LOAD AND PRESSURE AND CONFIRM PIPE SIZES AS REQUIRED.
8	1½" ANSUL VALVE FITTED VERTICALLY ON GAS PIPE, PROVIDE ACCESS. COORDINATE WITH HOOD CONTRACTOR.

- GENERAL NOTES: 1. CW/HW PIPING TO BE PROVIED WITH INSULATION AS PER 2018 ILLINOIS ENERGY CONSERVATION CODE. REFER SHEET P-0.1. 2. PROVIDE ACCESS PANEL FOR SHUT OFF VALVES AS REQUIRED. 3. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI. 4. FOR ALL PIPE SIZES, REFER TO RISER DIAGRAM.
- 5. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- 6. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.

![](_page_21_Figure_9.jpeg)

5 PRESSURE 5 GAS LOAD 5 WITH GAS 5SURE AND

![](_page_21_Picture_11.jpeg)

![](_page_21_Picture_12.jpeg)

![](_page_22_Figure_0.jpeg)

![](_page_22_Picture_1.jpeg)

			-	<u>PLUMBI</u>	<u>ng fixtu</u>	<u>re schee</u>	DULE		
LEGEND PLUMBING FIXTURE		CONNECTION SIZE - INCHES							
		TRAP	SOIL/WASTE		VENT	COLD	нот	THERMOSTATIC	
			DIRECT	INDIRECT		WATER	WATER	MIXING VALVE	
HS	HAND SINK	1½"	2"	-	1½"	1/2"	1/2"	PROVIDE	P-TRAP

 $\bigcirc$ 

01 SANITARY RISER DIAGRAM

![](_page_23_Picture_3.jpeg)

02 WATER RISER DIAGRAM

MARKS
HT INSTALLATION.

![](_page_23_Figure_6.jpeg)

 $03 \frac{\text{GAS RISER DIAGRAM}}{\text{NO SCALE}}$ 

![](_page_23_Figure_8.jpeg)

$\triangle$	11/2"	GAS	PIPE	RUN	NING	AT	ROC	DF.	CONT	RACT	OR T	o fiel	_D VE	RIF
Ч	SIZE	AND	LOCA	TION	OF	EXIST	ING	GAS	PIPE	: AN	D CO	NNECT	NEW	11/2
	PIPE	TO	EXISTI	NG	2" 3	SERVIO	CE.	C00	RDINA	ΛTE	WITH	ARCHI	TECT	FOI
	FINA	l poi	NT OF	CON	INEC	FION.								
•														

- CONTRACTOR TO FIELD VERIFY LOCATION OF EXISTING HW PIPE AND PROVIDE HEAT TRACING IF DEVELOPED LENGTH OF NEW HW PIPE IS MORE THAN 25 FEET,
- CONTRACTOR TO FIELD VERIFY EXISTING AVAILABLE GAS PRESSURE AND GAS LOAD. PROVIDE MINIMUM GAS PRESSURE AND GAS LOAD TO ALL GAS EQUIPMENTS. CONTRACTOR TO COORDINATE WITH GAS UTILITY COMPANY FOR AVAILABLE GAS LOAD AND PRESSURE. CONFIRM PIPE SIZES AS REQUIRED.

# GAS NOTE:

- PROVIDE SHUT-OFF VALVE AN ACCESSIBLE LOCATION. PROVIDE GAS PRESSURE REGULATOR FOR ALL GAS EQUIPMENT IF REQUIRED.
   CONTRACTOR SHALL VERIFY ACTUAL GAS
- 2. CONTRACTOR SHALL VERIFY ACTUAL GAS PRESSURE AND LONGEST LENGTH OF RUN TO FARTHEST APPLIANCE PRIOR TO INSTALLATION AND NOTIFY ENGINEER IF CONDITION DIFFER THAN SHOWN ON THIS PLAN.

GAS LOAD	SUMMARY
EQUIPMENT	CFH LOAD
GRILL-1	72
GRILL-2	72
GRILL-3	72
GRILL-4	72
MAU-1	350
MAU-2	114
TOTAL	752

#### GAS PIPE SIZING PER TABLE 402.4(1) DUPAGE FUEL GAS CODE 2021 <u>GAS INLET PRESSURE</u>– LESS THAN 2 PSI.

PRESSURE DROP 0.5" WC

SPECIFIC GRAVITY- 0.60

<u>EQUIVALENT LENGTH OF PIPE =</u> 120 FT

![](_page_23_Picture_20.jpeg)

![](_page_23_Picture_21.jpeg)