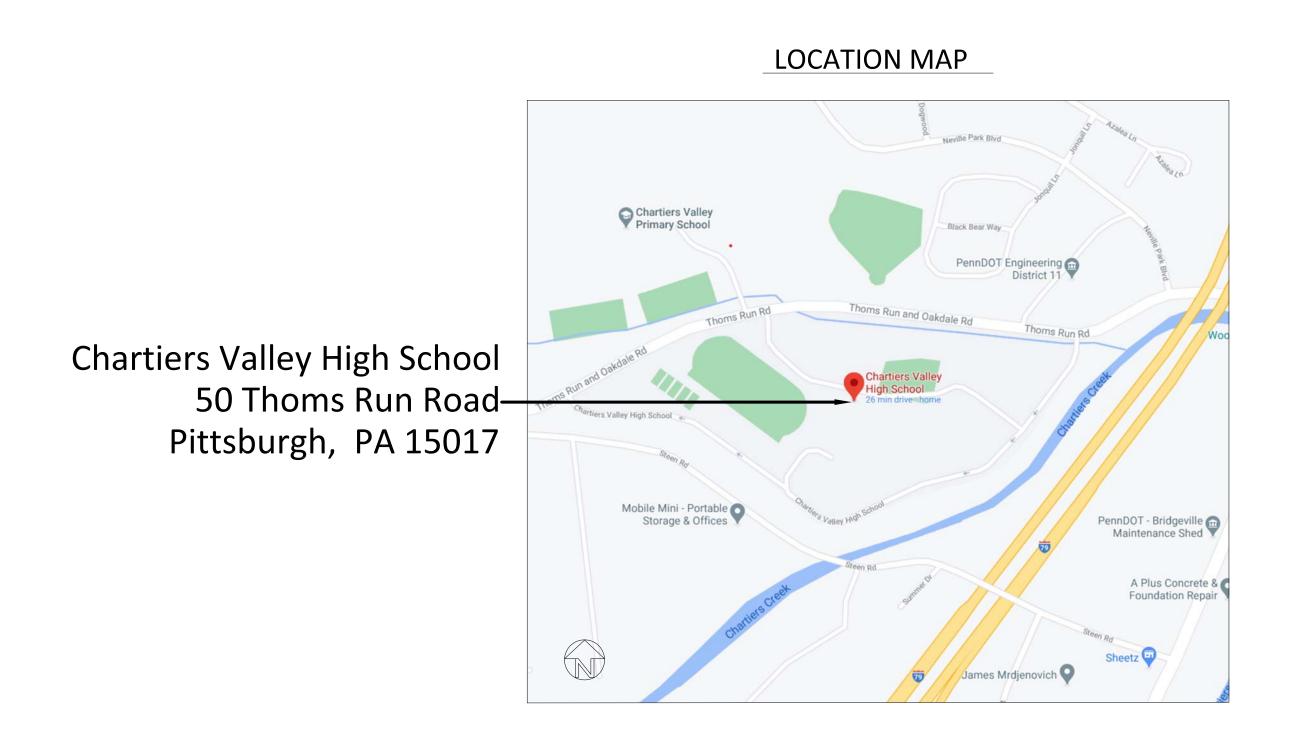
CHARTIERS VALLEY SCHOOL DISTRICT

2030 SWALLOW HILL ROAD, PITTSBURGH PA 15220

CHARTIERS VALLEY HIGH SCHOOL KITCHEN MAKE UP UNIT REPLACEMENT





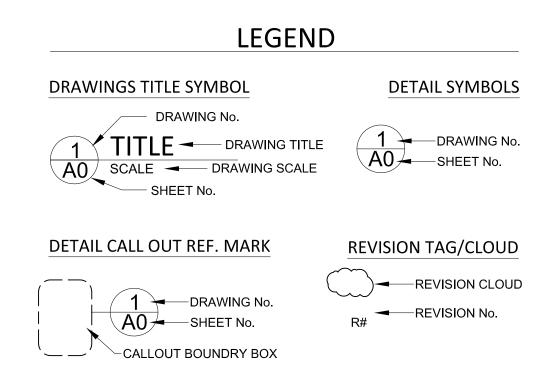
PROGRAM MANAGER:

Thomas & Williamson Program Management 3270 Babcock Boulevard Pittsburgh, PA 15237 P: (412) 630-9416

F: (412) 630-9425 Project No: 20026

Engineer:

BDA Engineering, Inc 395 E Waterfront Drive #200 Homestead, PA 15120 P: (412) 461-4935 Project No: 200801



	ABBREVIATIONS								
APPROX	= Approximate	EA =	Each	MAX =	Maximum	PSI=	Pounds Per Square	TWP =	Township
BC =	Bottom of curb	EJ=	Expansion Joint	MFR =	Manufacturer	R, RAD =		TYP =	Typical
BM =	Bench Mark	EL =	Elevation	MH =	Manhole	REF =	Reference		Unless Otherwise Noted
BLDG =	Building	EQ =	Equal	MIN =	Minimum	REINF =	Reinforced	W = \	
CJ =	Control Joint	EQUIP =	Equipment	MISC	Miscellaneous	REL =	Relocated	W/= \	
CONC =	Concrete	ETR =	Existing To Remain	N =	North		Required	•	
CONST =	Construction	FF =	Finished Floor	NIC =	Not in Contract		•	W/O =	Without
CONT =	Continuous	FT =	Foot/Feet	NO =	Number	S = SCHED =	South Schedule	YD = \	'ard
CTR =	Center	GC =	General Contractor	NTS =	Not to Scale	SPEC =	Specification		
DEMO =	Demolish	IN =	Inches	OC =	On Center		·		
DIA =	Diameter	INV =	Invert	OPP =	Opposite	STD =	Standard		
DN =	Down	JB =	Junction Box	PSF =	Pounds Per Square	STM =	Symmetrical		
DWG =	Drawing	MAINT =	Mainenance		Foot	THK =	Thick		
E =	East	MATL -	Material			TC=	Top of curb		

DRAWING INDEX

CS	Cover Sheet
M0	Mechanical Cover Sheet
M1	Mechanical Demolition and New Work Plan
M2	Mechanical Schedules and Details





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230 SWALLOW HILL ROAD	TIERS VALLEY HIGH SCHOOL	50 THOMS RUN ROAD
PITTSBURGH, PA 15220	I MAKE UP UNIT REPLACEMENT	PITTSBURGH, PA 15017

UCTWORK P	RESSURE CLASS A	ND MATERIAL S	CHEDUL
RVICE	SMACNA PRESSURE CLASS	STANDARD	

LOW PRESSURE SUPPLY & RETURN AIR ASTM A653 GALVANIZED STEEL

1. ALL DUCTWORK SHALL BE INSTALLED AND SEALED IN ACCORDANCE WITH SMACNA METAL AND FLEXIBLE HVAC DUCT CONSTRUCTION STAND 2. ALL DUCTWORK SHALL BE SEALED TO SMACNA LISTED CLASSES. 3. ALL DUCTWORK HANGERS AND SUPPORTS SHALL BE PROVIDED IN ACCORDANCE WITH SMACNA STANDARDS.

4. ALL THREADED ROD DUCTWORK SUPPORTS SHALL BE PROVIDED WITH DOUBLE NUTS AND LOCKWASHERS. 5. ALL FLEXIBLE DUCTWORK SHALL BE CONNECTED TO RIGID METAL DUCTWORK IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 6. TEMPORARY SHEET METAL OR POLYETHYLENE CLOSURES SHALL BE PROVIDED ON ALL OPEN DUCTWORK DURING CONSTRUCTION. 7. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, REINFORCING, BRACING, AND OTHER REQUIREMENTS.

DUCT	WORK INSULATION SCHEDULE	
DUCTWORK SERVICE	INSULATION	R VALUE
LOW PRESSURE SUPPLY	1" FIBERGLASS INSULATION WRAP	4.3
EXHAUST AIR	3" FIBERGLASS INSULATION WITHIN 10FT OF TERMINATION	8.0
ES:	WINDS ARE OLEAR INCIDE DIMENSIONS REQUIRED FOR REGION AIREI OW	DUOTIVODIA CIZE CI

1. DUCTWORK DIMENSIONS INDICATED ON THE DRAWINGS ARE CLEAR INSIDE DIMENSIONS REQUIRED FOR DESIGN AIRFLOW. DUCTWORK SIZE SHALL BE INCREASED TO ALLOW FOR INSULATION LINER THICKNESS. 2. DUCTWORK SIZES MUST BE VERIFIED FOR CLEARANCE PRIOR TO FABRICATION. DUCTWORK SIZES MAY BE CHANGED TO ACCOMMODATE CONSTRUCTION AS LONG AS EFFECTIVE CROSS—SECTIONAL AREA IS MAINTAINED. ALL DEVIATIONS FROM ORIGINAL DRAWINGS SHALL BE REVIEWED

BY THE ENGINEER DURING THE SHOP DRAWING PROCESS. 3. ALL TRANSVERSE DUCTWORK LINER JOINTS SHALL BE NEATLY BUTTED TO PREVENT INTERRUPTIONS OR GAPS. ALL TRANSVERSE DUCT JO AND EXPOSED EDGES SHALL BE COATED. 4. ALL DUCTWORK INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

5. ALL DUCTWORK INSULATION SHALL COMPLY WITH 25/50 FLAME AND SMOKE HAZARD RATINGS PER ASTM E-84. NFPA 255 AND UL 723. 6. ALL DUCTWORK SHALL BE PURGED WITH COMPRESSED AIR AFTER INSTALLATION TO REMOVE ALL REMAINING FOREIGN MATERIALS. COORDINATE DUCTWORK PURGE WITH OWNER AND GENERAL CONTRACTOR TO PROTECT INTERIOR BUILDING FINISHES AND FURNISHINGS. 7. SECURE INSULATION TO DUCTWORK WITH IMPACT DRIVEN OR WELD FASTENERS NO FEWER THAN INDICATED BY MANUFACTURER'S INSTRUCTIONS. 8. DUCT INSULATION COVERINGS AND LININGS SHALL NOT FLAME, GLOW, SMOLDER OR SMOKE WHEN TESTED IN ACCORDANCE WITH ASTM C4TT. 9. FLEXIBLE DUCTS AND CONNECTORS SHALL BE TESTED IN ACCORDANCE WITH UL 181 AND LIMITED TO 10 FEET IN LENGTH.

F	RECTAN	GULAR D	UCTWORK	SUPPOR	RT SCHEDI	JLE	
		4 FT. SUPP	ORT SPACING	5 FT. SUPP	ORT SPACING	8 FT. SUPF	PORT SPACING
Ductwork Size	Support Type	HANGER ROD SIZE	Strap Size	HANGER ROD SIZE	Strap Size	HANGER ROD SIZE	Strap Size
P/2 ≤ 30"	TRAPEZE	2 @ 1/4"ø	2 @ 1"x 22 GA.	2 @ 1/4"ø	2 @ 1"x 22 GA.	2 @ 1/4 " ø	2 @ 1"x 22 GA.
P/2 = 31 TO 72"	TRAPEZE	2 @ 1/4"ø	2 @ 1"x 22 GA.	2 @ 1/4"ø	2 @ 1"x 22 GA.	2 @ 1/4 " ø	2 @ 1"x 20 GA.
P/2 = 71 TO 96"	TRAPEZE	2 @ 1/4 " ø	NOT PERMITTED	2 @ 3/8"ø	NOT PERMITTED	2 @ 3/8 " ø	NOT PERMITTED
P/2 = 97 TO 120"	TRAPEZE	2 @ 1/4 " ø	NOT PERMITTED	2 @ 3/8"ø	NOT PERMITTED	2 @ 3/8 " ø	NOT PERMITTED
P/2 = 121 TO 168"	TRAPEZE	2 @ 3/8"ø	NOT PERMITTED	2 @ 3/8"ø	NOT PERMITTED	2 @ 1/2 " ø	NOT PERMITTED
P/2 = 169 TO 192"	TRAPEZE	2 @ 3/8 " ø	NOT PERMITTED	2 @ 3/8"ø	NOT PERMITTED	2 @ 1/2 " ø	NOT PERMITTED
P/2 ≥ 193"	TRAPEZE		SEE	DUCTWORK SUP	PORT DETAILS		

1. P = PERIMETER LENGTH OF DUCTWORK IN INCHES.

2. PROVIDE THREE (3) SUPPORTS AT EACH BRANCH DUCT CONNECTION. 3. PROVIDE A MINIMUM OF 1" HORIZONTAL RETURN FOR SUPPORT STRAPS AT BOTTOM OF DUCT. 4. SECURE STRAPS TO DUCT WITH MINIMUM NO. 8 SELF-TAPPING HEXAGON HEAD SHEETMETAL SCREWS.

HORIZONTAL SUPPORT RAILS SHALL BE MINIMUM A1000 UNISTRUT CHANNEL OR APPROVED EQUAL.. . PROVIDE DOUBLE HEXAGON NUTS WITH LOCKWASHERS WITH EACH HANGER ROD.

THE CONTRACTOR SHALL COORDINATE ALL UTILITY SHUTDOWNS. WORK OR TEMPORARY SHUTDOWNS AFFECTING BUILDING							
SERVICES AND UTILITIES SHALL BE SCHEDULED AND APPROVED WITH THE OWNER AND TENANT.	ROUND DUCTWORK SUPPORT SCHEDULE						
THE MECHANICAL CONTRACTOR SHALL REMOVE AND/OR REINSTALL CEILING, TILE AND GRID AS REQUIRED FOR THE PROJECT SCOPE REQUIREMENTS. WHERE CEILINGS ARE BEING REPLACED, PROVIDE RELOCATION OF HVAC SYSTEMS	DUCTWORK SIZE	MAXIMUM SPACING	HANGER SUPPORT TYPE TRAP			TRAPEZE SUPPORT	
WITHIN NEW CEILING AS REQUIRED. DAMAGED OR BROKEN TILES SHALL BE REPLACED IN KIND.	DOCTWORK SIZE	MAXIMUM SPACING	DUCT BAND SIZE STRAP SUF	STRAP SUPPORT SIZE	ROD SUPPORT SIZE	HANGER ROD SIZE	
CONTACTOR SHALL INCLUDE IN HIS BID THE SCHEDULING OF WORK WITHIN OCCUPIED AREAS. ALL WORK SHALL BE PERFORMED DURING SCHEDULED WORKING HOURS. COORDINATE WITH PHASING PLANS AND ALL TRADES.	10"ø and under	8 FT.	1 @ 1"x 22 GA.	1 @ 1"x 22 GA.	1 @ 1/4"ø	2 @ 1/4 " ø	
THE CONTRACTOR SHALL SUBMIT A WRITTEN METHOD OF PROCEDURE FOR THIS PROJECT INCLUDING SCHEDULING WORK	11" TO 18"ø	8 FT.	1 @ 1"x 22 GA.	1 @ 1"x 22 GA.	1 @ 1/4 " ø	2 @ 1/4 " ø	
HOURS, UTILITY SHUTDOWNS AND ANY BUILDING OWNER/TENANT SCHEDULING REQUIREMENTS.	19" TO 24"ø	8 FT.	1 @ 1"x 22 GA.	1 @ 1"x 22 GA.	1 @ 1/4 " ø	2 @ 1/4"ø	

1. PROVIDE THREE (3) SUPPORTS AT EACH BRANCH DUCT CONNECTION. 2. SECURE STRAPS TO BANDS WITH MINIMUM NO. 8 SELF-TAPPING HEXAGON HEAD SHEETMETAL SCREWS. 3. HORIZONTAL SUPPORT RAILS SHALL BE MINIMUM A1000 UNISTRUT CHANNEL OR APPROVED EQUAL.

DIFFUSER & RUNOUT DUCTWORK SCHEDULE						
CFM RANGE	DIFFUSER NECK SIZE	MAXIMUM LENGTH OF RIGID DUCTWORK	MAXIMUM LENGTH OF FLEXIBLE DUCTWORK			
UP TO 100	6 " ø	8 FEET	5 FEET			
101 TO 230	8 " ø	8 FEET	5 FEET			
231 TO 420	10 " ø	8 FEET	5 FEET			
421 TO 500	12 " ø	8 FEET	5 FEET			

1. ALL RIGID AND FLEXIBLE DUCTWORK SIZES SHALL BE EQUAL TO DIFFUSER NECK SIZE. PROVIDE VOLUME CONTROL DAMPER AT EACH DIFFUSER, REGISTER OR GRILLE.

4. PROVIDE DOUBLE HEXAGON NUTS WITH LOCK WASHERS WITH EACH HANGER ROD.

PIPE SUPPORT AND HANGER SPACING SCHEDULE						
PIPE SIZE	COPPER MAX. SPACING	STEEL MAX. SPACING	CPVC MAX. SPACING	COPPER ROD DIAMETER	STEEL ROD DIAMETER	
3/4"	5 FEET	7 FEET	3 FEET	3/8 INCHES	3/8 INCHES	
1"	6 FEET	7 FEET	3 FEET	3/8 INCHES	3/8 INCHES	
1-1/4"	7 FEET	7 FEET	3 FEET	3/8 INCHES	3/8 INCHES	
1-1/2"	8 FEET	9 FEET	3 FEET	3/8 INCHES	3/8 INCHES	
2"	8 FEET	10 FEET	3 FEET	3/8 INCHES	3/8 INCHES	
2-1/2"	9 FEET	11 FEET	3 FEET	1/2 INCHES	1/2 INCHES	
3"	10 FEET	12 FEET	4 FEET	1/2 INCHES	1/2 INCHES	
4"	12 FEET	14 FEET	4 FEET	1/2 INCHES	1/2 INCHES	

1. 20 FEET MAXIMUM SPACING, MINIMUM OF ONE HANGER FOR EACH PIPE SECTION CLOSE TO JOINT BEHIND BELL. PROVIDE HANGER AT EACH CHANGE OF DIRECTION AND EACH BRANCH CONNECTION. FOR PIPE SIZES 6 INCHES AND SMALLER, SUBJECTED TO LOADINGS OTHER THAN WEIGHT OF PIPE AND CONTENTS, LIMIT SPAN TO MAXIMUM SPACING FOR WATER SERVICE STEEL PIPE.

AD	ABBREVIATIONS
AD A.F.F.	ACCESS DOOR ABOVE FINISHED FLOOR
A.P.D.	ABOVE FINISHED FLOOR AIR PRESSURE DROP
A.T.C.	AUTOMATIC TEMPERATURE CONTROL
BHP	BRAKE HORSEPOWER
BTU	BRITISH THERMAL UNITS
BTUH	BTU PER HOUR
CAP.	CAPACITY
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB
IA. or ø	DIAMETER
DX	DIRECT EXPANSION
EA	EXHAUST AIR
E.A.T.	ENTERING AIR TEMPERATURE
E.S.P.	EXTERNAL STATIC PRESSURE
E.W.T.	ENTERING WATER TEMPERATURE
*F	DEGREES FAHRENHEIT
FD	FIRE DAMPER
FLA	FIRE DAMPER FULL LOAD AMPS
FPM	FULL LUAD AMPS FEET PER MINUTE
FT.	FEET FEET OF WATER CALICE
FT. W.G.	FEET OF WATER GAUGE
GPH	GALLONS PER HOUR
GPM	GALLONS PER MINUTE
HP	MOTOR HORSEPOWER
I.D.	INSIDE DIAMETER
IN.	INCHES
N. W.G.	INCHES OF WATER GAUGE
KW	1,000 WATTS
L	LENGTH
LAT.	LATENT
L.A.T.	LEAVING AIR TEMPERATURE
LRA	LOCK ROTOR AMPS
L.W.T.	LEAVING WATER TEMPERATURE
MCA	MINIMUM CIRCUIT AMPS
MIN.	MINIMUM
MOCP	MAX OVERCURRENT PROTECTION AMPS
N.C.	NORMALLY CLOSED
N.I.C.	NOT IN CONTRACT
N.O.	NORMALLY OPEN
N.T.S.	NOT TO SCALE
OA	OUTDOOR AIR
0.D.	OUTSIDE DIAMETER
RA	RETURN AIR
RLA	RUNNING LOAD AMPS
RPM	REVOLUTION PER MINUTE
SA	SUPPLY AIR
SENS.	SENSIBLE
SQ. FT.	SQUARE FEET
TD	TRANSFER DUCT (LINED)
TEMP.	TEMPERATURE
TYP.	TYPICAL
VD	VOLUME DAMPER
//PH/HZ	VOLTS/PHASE/HERTZ
W	WATTS
W	WIDTH
WB	WET BULB
110	
WGT.	WEIGHT

DUCTWORK SYMBOLS

— DUCTWORK TRANSITION — SINGLE LINE

DUCTWORK SIZE - WIDTH x DEPTH (FREE AREA)

DUCTWORK TRANSITION - SINGLE LINE

FLEXIBLE DUCTWORK - SINGLE LINE

SUPPLY AIR UP

SUPPLY AIR DOWN

SUPPLY DIFFUSER

CEILING SUPPLY REGISTER

RETURN / EXHAUST AIR UP

RETURN / EXHAUST AIR DOWN

DIRECTION OF SUPPLY AIR FLOW

DIRECTION OF RETURN/EXHAUST AIR FLOW

BOTTOM MOUNTED DUCT SUPPLY REGISTER

SIDE MOUNTED DUCT SUPPLY REGISTER

CEILING EXHAUST / RETURN REGISTER

SIDE MOUNTED DUCT RETURN REGISTER

CEILING RETURN GRILLE

LINEAR DIFFUSER

VOLUME DAMPER

MOTORIZED DAMPER

FIRE DAMPER

SMOKE DAMPER

FIRE/SMOKE DAMPER

BACKDRAFT DAMPER

SOUND ATTENUATOR

ACCESS DOOR

LOUVERED DOOR

UNDERCUT DOOR

_====

(L)—V—

SPIN-IN WITH VOLUME DAMPER

AIR FLOW MEASURING STATION

STATIC PRESSURE SENSOR

DUCT SMOKE DETECTOR

CONTROL SYMBOLS

THERMOSTAT/TEMPERATURE SENSOR

-WAY BLOW, UNHATCHED AREA INDICATES BLOW PATTERN

BOTTOM MOUNTED DUCT EXHAUST / RETURN REGISTER

EXISTING TO REMAIN

DEMOLITION WORK

PIPING SYMBOLS

AUTOMATIC CONTROL VALVE (BUTTERFLY TYPE)

AUTOMATIC CONTROL VALVE (2-WAY GLOBE TYPE)

AUTOMATIC CONTROL VALVE (3-WAY GLOBE TYPE)

BALL VALVE WITH HOSE END ADAPTER

AUTOMATIC AIR VENT

Ball valve

BALANCING VALVE

BUTTERFLY VALVE

CHECK VALVE

CIRCUIT SETTER

FLOW SENSOR

GATE VALVE

GAUGE COCK

PLUG VALVE

MANUAL AIR VENT

PRESSURE SENSOR

PRESSURE GAUGE (WATER) WITH SNUBBER

PRESSURE/TEMPERATURE TEST STATION

STRAINER WITH BLOWDOWN VALVE

TEMPERATURE SENSOR

THERMOMETER

VACUUM BREAKER

CONCENTRIC REDUCER

ECCENTRIC REDUCER

EXPANSION LOOP

PIPE ELBOW TURNED DOWN

PIPE ELBOW TURNED UP

PIPE TEE TURNED DOWN

PIPE TEE TURNED UP

PIPE ANCHOR

PIPE GUIDE

CAPPED PIPE

UNION

FLEXIBLE CONNECTOR

FLOW MEASURING STATION

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	PIPING LEGEND
∽ с ⊸	NATURAL GAS
└── D 	CONDENSATE DRAIN
	REFRIGERANT LIQUID
 RS	REFRIGERANT SUCTION

A	NNOTATION SYMBOLS				
\otimes	DEMOLITION — POINT OF DISCONNECT				
•	NEW WORK — CONNECT NEW TO EXISTING				
X	NUMBERED DEMOLITION WORK DRAWING NOTE				
X	NUMBERED NEW WORK DRAWING NOTE				
X-X	EQUIPMENT DESIGNATION				
CFM—XXX MARK—XXX—DIA.	DIFFUSER OR REGISTER IDENTIFICATION CFM / MARK & NUMBER				
CFM XXX MARK X X SIZE	EXHAUST REGISTER IDENTIFICATION — CFM / MARK & NUMBER				

PIPING MATERIALS SCHEDULE PIPING APPLICATION STANDARD MATERIAL HARD DRAWN TYPE L COPPER ASTM B88 CONDENSATE

MECHANICAL PROJECT NOTES

THE CONTRACT DOCUMENT DRAWINGS ARE DIAGRAMMATIC ONLY, AND ARE INTENDED TO CONVEY THE SCOPE AND

THE MECHANICAL CONTRACTOR SHALL CHECK AND VERIFY ALL EXISTING CONDITIONS AT THE PROJECT SITE. $\,$ THE MECHANICAL CONTRACTOR SHALL NOTE ALL INTERFERENCE AND INCLUDE IN HIS BASE PRICE THE COST OF RELOCATING

THE MECHANICAL CONTRACTOR SHALL GIVE ALL NOTICES, OBTAIN ALL PERMITS, AND PAY ALL TAXES, FEES, AND OTHER COSTS

ASSOCIATED WITH HIS WORK. THE MECHANICAL CONTRACTOR SHALL FILE ALL APPROVALS OF ALL REQUIRED CERTIFICATES OF

FINAL PAYMENT FOR THE WORK. THE MECHANICAL CONTRACTOR SHALL INCLUDE IN HIS SCOPE OF WORK, WITHOUT EXTRA COS

THE MECHANICAL CONTRACTOR SHALL FURNISH ALL EQUIPMENT, MATERIALS, APPLIANCES, TOOLS, RIGGING, AND ACCESSORIES,

THE MECHANICAL CONTRACTOR SHALL FIELD VERIFY THE EXACT LOCATION AND HEIGHT OF ALL HVAC EQUIPMENT AND

THE MECHANICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES INVOLVED. ALL RISERS, DROPS, OFFSETS,

AND TRANSITIONS IN DUCTWORK AND PIPING AROUND OBSTACLES SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

THE MECHANICAL CONTRACTOR SHALL FURNISH ALL CURBS AND RAILS FOR ROOF MOUNTED EQUIPMENT. THE

MECHANICAL CONTRACTOR SHALL INSTALL THE ROOF CURBS AND EQUIPMENT RAILS UNLESS OTHERWISE NOTED.

THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF ALL FLOOR, WALL, AND ROOF

OPENINGS. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL OPENINGS, CUTTING AND PATCHING TO MATCH

THE MECHANICAL CONTRACTOR SHALL VERIFY THE VOLTAGE OF ALL HVAC EQUIPMENT WITH THE ELECTRICAL

THE MECHANICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES FOR ALL HVAC EQUIPMENT, INCLUDING

OR JOIST SHALL BE MADE AT PANEL POINTS WITH BEAM CLAMPS MEETING MSS STANDARDS.

ADJUSTMENT, AND MAINTENANCE OF MECHANICAL EQUIPMENT MOUNTED IN DUCTWORK,.

OPERATION, ADJUSTMENT, AND MAINTENANCE OF MECHANICAL EQUIPMENT.

THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND SIZE OF ALL EQUIPMENT, DUCTWORK, AND

THE MECHANICAL CONTRACTOR SHALL SUPPORT ALL EQUIPMENT, DUCTWORK, AND PIPING DIRECTLY FROM THE BUILDING

STRUCTURE PROVIDING ALL SUPPLEMENTARY STRUCTURAL STEEL REQUIRED AND/OR AS SPECIFIED OR SHOWN. ALL

SUPPORTS SHALL BE PROVIDED TO ASSURE A VIBRATION FREE INSTALLATION. ALL ATTACHMENTS TO BEAMS, TRUSSES,

THE MECHANICAL CONTRACTOR SHALL PROVIDE MOTORS AND STARTERS FOR ALL HVAC EQUIPMENT. THE ELECTRICAL

THE MECHANICAL CONTRACTOR SHALL MOUNT ALL DUCT MOUNTED SMOKE DETECTORS IN DUCTWORK IN ACCORDANCE

WITH MFG'S RECOMMENDATIONS. THE ELECTRICAL CONTRACTOR SHALL WIRE THE SMOKE DETECTOR TO THE BUILDINGS

ALL CONTROL WIRING AND CONDUIT PROVIDED BY THE AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR SHALL BE IN

THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED ACCESS DOORS IN DUCTWORK FOR OPERATION,

THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED CEILING ACCESS PANELS WHERE REQUIRED FOR

ALL DUCTWORK AND PIPING SHALL BE ROUTED AS CLOSE TO AND PARALLEL TO THE BUILDING STRUCTURE AS

THE MECHANICAL CONTRACTOR SHALL BALANCE ALL AIR DISTRIBUTION SYSTEMS TO SATISFY THE MINIMUM SUPPLY,

MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ROOF WORK REQUIRED UNDER THIS SCOPE OF WORK. WORK

SHALL BE PERFORMED BY AN APPROVED CONTRACTOR IN ORDER TO MAINTAIN ANY EXISTING ROOFING WARRANTIES.

2 | RETURN, OUTDOOR, AND EXHAUST AIR CODE REQUIREMENTS. AN INDEPENDENT ENGINEER SHALL PERFORM THE AIR

POSSIBLE TO MAINTAIN GRADIENT AND BE INSTALLED AT A COMMON ELEVATION WHEREVER PRACTICAL.

5. EXTERIOR PIPING SHALL INCLUDE A 0.020" THICKNESS PVC OR ABS PROTECTIVE JACKET.

6. PENETRATIONS OF RATED ASSEMBLIES SHALL BE FIRE SEALED WITH UL RATED MATERIALS.

7. PROVIDE PROVISIONS FOR THERMAL EXPANSION INCLUDING SUPPORTS AND RESTRAINTS.

AND PERFORM ALL LABOR REQUIRED TO PROVIDE, INSTALL, CONNECT, AND TEST COMPLETE HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT AND SYSTEMS IN ACCORDANCE WITH THE SPECIFICATIONS, DRAWINGS, AND THE APPLICABLE CODES.

THE MECHANICAL CONTRACTOR SHALL INSTALL ALL HVAC EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. THE MECHANICAL CONTRACTOR SHALL VERIFY ALL EQUIPMENT CONNECTIONS WITH

COORDINATED WITH ALL OTHER MECHANICAL, ELECTRICAL, ARCHITECTURAL, AND STRUCTURAL SYSTEMS.

INSPECTION FOR HIS WORK JURISDICTION, AND DELIVER SAME TO THE ARCHITECT BEFORE REQUEST FOR ACCEPTANCE AND

TO THE OWNER, ALL LABOR, MATERIALS, SERVICES, APPARATUS, DRAWINGS (IN ADDITION TO CONTRACT AND DOCUMENTS) IN

ALL ITEMS THAT INTERFERE WITH THE WORK INCLUDING THOSE OF OTHER TRADES.

MANUFACTURER'S CERTIFIED DRAWINGS AND EXISTING CONDITIONS FOR EACH UNIT.

ADJACENT SURFACES AND FINISHES UNLESS OTHERWISE NOTED.

PIPING SUSPENDED FROM THE BUILDING STRUCTURE.

CONTRACTOR PRIOR TO ORDERING EQUIPMENT.

CONTRACTOR SHALL PROVIDE ALL POWER WIRING.

ACCORDANCE WITH NEC AND ELECTRICAL SPECIFICATIONS.

WEATHERPROOF UNITS AS REQUIRED.

BALANCE AND SUBMIT A REPORT.

ORDER TO COMPLY WITH ALL APPLICABLE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS.

GENERAL ARRANGEMENT OF THE OF WORK.

CONDENSATE	SCHEDULE 40 PVC	ASTM D2665	
NATURAL GAS	SCHEDULE 40 BLACK STEEL	ASTM A53	
NOTES: 1. ALL PIPE PENETRATIONS THROUGH FLOORS, WALLS, 2. ROUTE PIPING PARALLEL TO BUILDING STRUCTURE A 3. GROUP PIPING WHENEVER PRACTICAL AT COMMON E 4. PROVIDE GALVANIC PROTECTION AT ALL CONNECTION	nd maintain slope. Levations.	LEEVES.	

PIPING INSULATION SCHEDULE								
PIPING APPLICATION		APPLICABLE PIPE SIZES	INSULATION THICKNESS	insulation Type	MINIMUM "K" VALUE	MANUFACTURER		
HVAC CONDENSATE		ALL	1/2 INCH	FOAMED PLASTIC	0.27	ARMAFLEX		

1. ALL PIPE INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 2. ALL INSULATION SHALL BE APPLIED OVER CLEAN, DRY PIPE WITH ALL JOINTS BUTTED FIRMLY TOGETHER. SEAL AND FINISH INSULATION AT ALL PROTRUSIONS, INTERRUPTIONS, AND SUPPORTS. 3. ALL PIPING CONVEYING FLUIDS WITH TEMPERATURES LESS THAN 70 DEGREES FAHRENHEIT SHALL BE PROVIDED WITH INSULATION HAVING CONTINUOUS REINFORCED VAPOR BARRIER. 4. ALL FIBERGLASS PIPE INSULATION SHALL BE INSTALLED WITH FACTORY PRECUT INSERTS FOR ALL FITTINGS. THICKNESS OF INSERTS SHALL BE EQUAL TO ADJOINING INSULATION. PROVIDE INSERTS WITH VAPOR RETARDANT EQUAL TO ADJOINING INSULATION. INSTALL INSERTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. 5. ALL PIPE INSULATION SHALL COMPLY WITH 25/50 FLAME AND SMOKE HAZARD RATING PER ASTM E-84, NFPA 255, AND UL 723. 6. ALL EXTERIOR PIPE INSULATION SHALL INCLUDE A PROTECTIVE JACKETING.

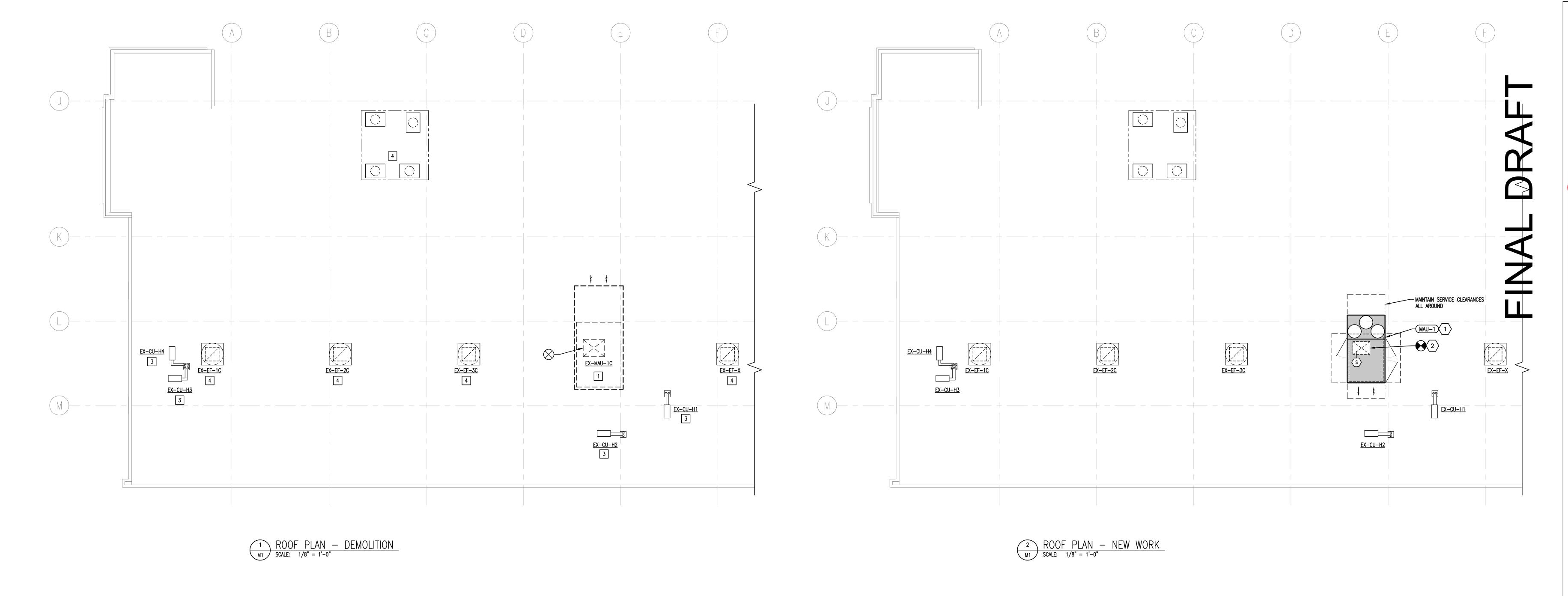
FOR REVIEW 12/17/2020





DISTRICT

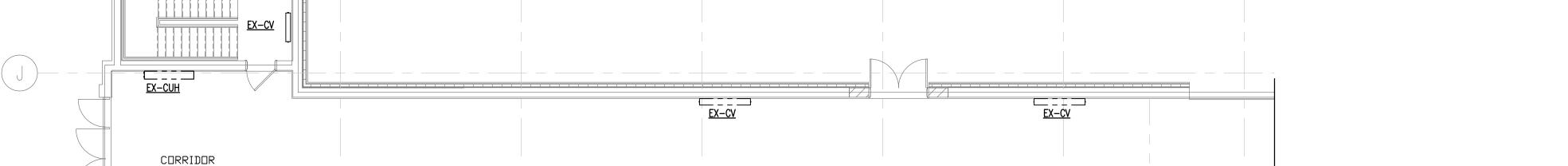




EX-SG

FOOD COURT 1302

OFFICE 1303



1311 DRY STORAGE WOMEN 1309 EX-UH WALK-IN COOLER DISHWASHING _ 1308 RECEIVING 950 EX – 15"ø SA EXI 19"ø SA __ 20x10 EA ____ EX-RG 20x10 EA 22x10 EA EX-SG 15x15 EA FROM 50x40 SA FROM 28x28 EA FROM HOOD UP TO EX-EF-3C ABOVE 28x28 EA FROM HOOD UP TO HOOD TO MAU-1 ABOVE — EX-EF-2C ABOVE — EX-EF-1C ABOVE — 15"ø SA 15 Ø SA 9 9 SA

KITCHEN

3 FIRST FLOOR PLAN — DEMOLITION AND NEW WORK

M1 SCALE: 1/8" = 1'-0"

KEYED DEMOLITION NOTES

REMOVE EXISTING MAKEUP AIR HANDLING UNIT, CURB AND ALL ASSOCIATED PIPING, WIRING AND CONTROLS. REMOVE PORTION OF SUPPLY AIR DUCTWORK DOWN THRU ROOF TO FACILITATE UNIT REMOVAL. COORDINATE

EXISTING DISTRIBUTION DUCTWORK, DAMPERS, REGISTERS, GRILLES AND ALL ASSOCIATED HANGERS, SUPPORTS AND CONTROLS TO REMAIN UNLESS NOTED OTHERWISE.

3 EXISTING SPLIT SYSTEM CONDENSING UNIT, REFRIGERANT PIPING TO REMAIN.

4 EXISTING EXHAUST FAN, DUCTWORK, DAMPERS TO REMAIN.

KEYED NEW WORK NOTES

1 SECURELY ANCHOR UNIT TO 24" HIGH INSULATED CURB BY UNIT MFG. PROVIDE CONDENSATE TRAP FULL OUTLET SIZE AND TERMINATE 6" ABOVE PAD. RECONNECT TO EXISTING NATURAL GAS PIPING AND EXTEND TO UNIT CONNECTION. PROVIDE UNIT SERVICE CLEARANCES IN ACCORDANCE WITH MFG'S RECOMMENDATIONS. COORDINATE FINAL UNIT LOCATION WITH ARCH DWGS AND EXISTING BLDG STEEL FRAMING MEMBERS. UNIT INSTALLATION AND PIPING CONNECTIONS SHALL BE IN ACCORDANCE WITH MFGS RECOMMENDATIONS.

COORDINATE EXACT SIZE AND LOCATION OF EXISTING DUCTWORK ROOF PENETRATION. MODIFY EXISTING DUCTWORK AND ROOF OPENING TO SUIT NEW DUCTWORK PENETRATION. PROVIDE SUPPLEMENTAL STEEL FRAMING AT PERIMETER OF ROOFTOP UNIT CURB AND DUCT PENETRATION. FLASH AND SEAL CURB IN ACCORDANCE WITH ROOFING MFG RECOMMENDATIONS. ALL ROOF WORK SHALL BE PERFORMED BY AN APPROVED CONTRACTOR TO MAINTAIN EXISTING WARRANTY.

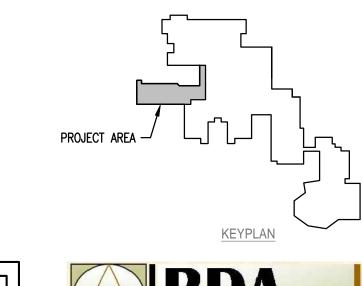
RECONNECT TO EXISTING DISTRIBUTION DUCTWORK. TRANSITION AS REQUIRED FOR RECONNECTION. PROVIDE ALL FITTINGS AND OFFSETS TO ALLOW DUCTWORK TO BE INSTALLED TIGHT TO THE BUILDING STRUCTURE AND/OR WITHIN THE BEAM CAVITIES AS REQUIRED.

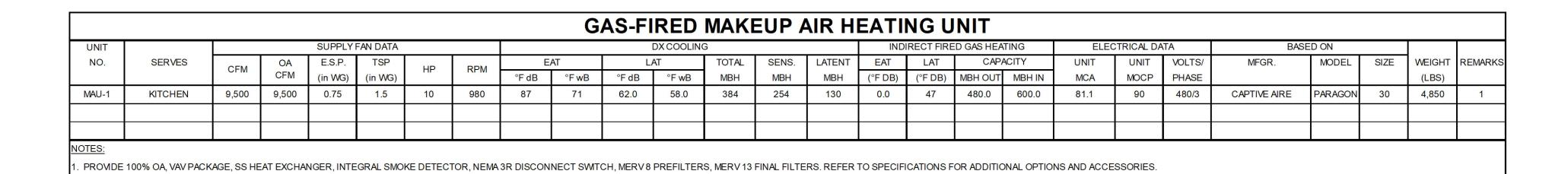
4 REBALANCE THE EXISTING DISTRIBUTION SYSTEM TO PROVIDE THE AIRFLOWS AS INDICATED.

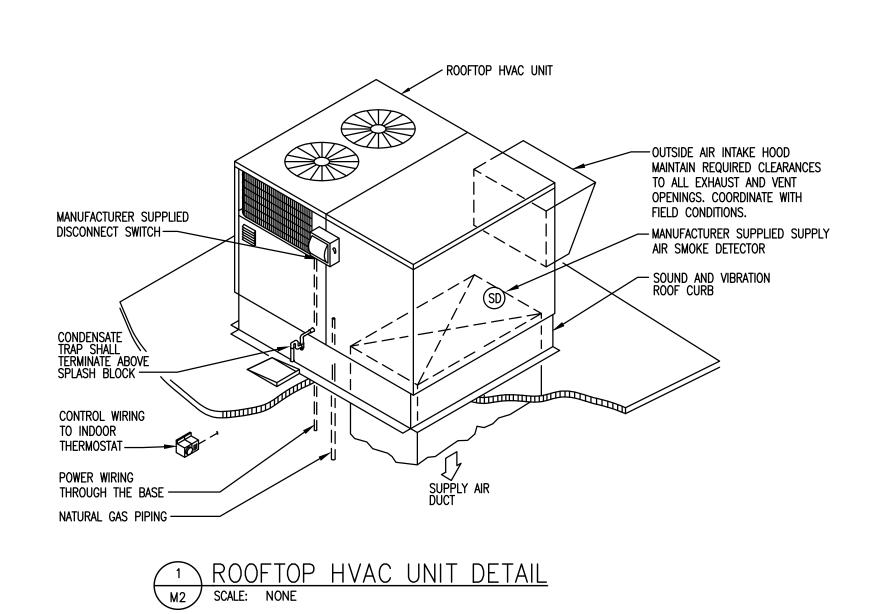
FOR REVIEW 12/17/2020

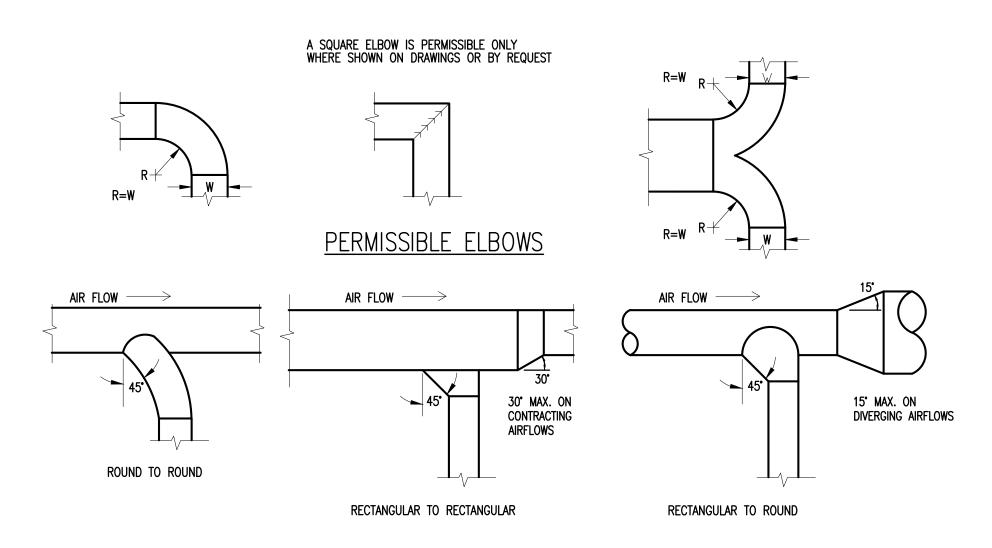
MODIFY EXISTING CONTROL SYSTEM AS REQUIRED TO INCLUDE INTERLOCKS FOR KITCHEN HOODS AND ASSOCIATED EXHAUST FANS EF-1C, EF-2C & EF-3C. PROVIDE SPACE SENSOR AND STATIC PRESSURE SENSOR INPUTS FOR MAU OPERATION.

REMOVE EXISTING MAKE-UP AIR DUCTWORK INSULATION AND RE-INSULATE THE ENTIRE MAU-1 SUPPLY DUCTWORK SYSTEM, EXISTING AND NEW WORK, WITH 1" FIBERGLASS WRAP INSULATION WITH VAPOR BARRIER.





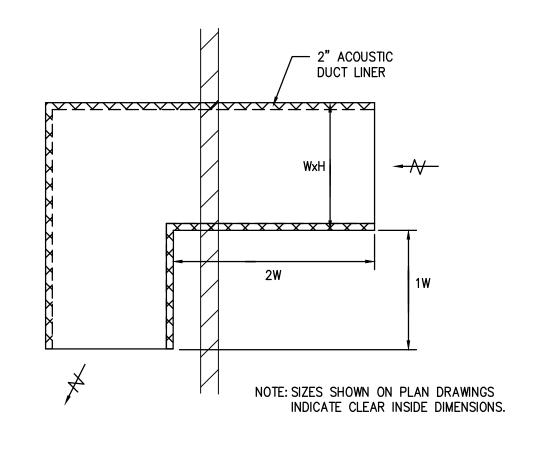




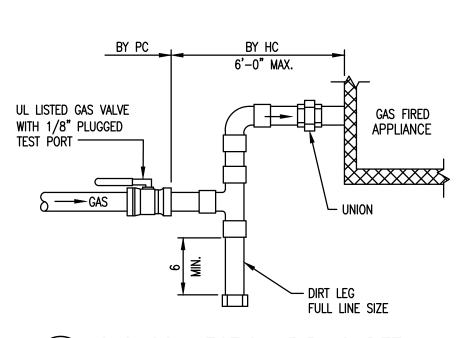
PERMISSIBLE DUCT BRANCH TAKEOFF

PERMISSIBLE DUCT BRANCH TAKEOFF

M2 SCALE: NONE







SCOPE OF WORK - PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPURTENANCES AND SERVICES TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS. ALL ELECTRICAL WORK SHALL BE IN ACCORD WITH ALL APPLICABLE ORDINANCES, CODES AND REGULATIONS OF ALL AUTHORITIES HAVING JURISDICTION. ALL ELECTRICAL WORK SHALL BE INSPECTED AND APPROVED BY THE LOCAL ELECTRICAL INSPECTION AGENCY. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY FEES AND PERMITS, INCLUDING THE CERTIFICATE OF ELECTRICAL INSPECTION.

NOTHING CONTAINED IN THE CONTRACT DOCUMENTS SHALL BE CONSTRUED TO CONFLICT WITH ANY NATIONAL, STATE, MUNICIPAL. OR LOCAL LAWS OR REGULATIONS GOVERNING THE WORK INDICATED OR SPECIFIED. THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER SHALL SATISFY ALL SUCH REQUIREMENTS.

THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION SAFETY. ARCHITECT AND/OR ENGINEER SHALL ASSUME NO RESPONSIBILITY FOR WORKMAN'S, OR PEDESTRIAN'S SAFETY. NOTHING IN THE CONTRACT DOCUMENTS SHALL BE CONSTRUED TO INSTRUCT PROCEDURES OR COMPONENTS FOR PROJECT SAFETY.

WHERE A CONFLICT ARISES BETWEEN PLANS, SPECIFICATIONS, DETAILS, SCHEDULES, APPLICABLE CODES OR REGULATIONS, THE MOST STRINGENT SHALL APPLY.

THE CONTRACT DOCUMENTS ARE COMPRISED OF DRAWINGS AND SPECIFICATIONS. EACH ELECTRICAL BIDDER SHALL VISIT SITE TO FULLY INFORM HIMSELF OF ALL THE EXISTING CONDITIONS. WHICH IN ANY WAY WILL AFFECT THE EXECUTION OF HIS WORK PRIOR TO SUBMITTING BID PROPOSAL. BIDS SHALL BE BASED ON THE COMPLETE EXAMINATION OF THE DRAWINGS, SPECIFICATIONS AND EXISTING CONDITIONS. NO CONSIDERATION WILL BE GIVEN ANY CONTRACTOR WHO FAILS TO DO SO. LACK OF KNOWLEDGE OF EXISTING CONDITIONS WILL NOT BE CONSIDERED A BASIS FOR CHANGE ORDERS.

THE ELECTRICAL CONTRACTOR AT THE SITE SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS PERTAINING TO THE INSTALLATION OF THE ELECTRICAL SYSTEMS. WHERE A CONTRACTOR UNCOVERS CONDITIONS NOT INDICATED ON THE PLANS OR IN THE SPECIFICATIONS, HE SHALL NOTIFY THE ARCHITECT PRIOR TO PROCEEDING WITH ANY WORK. FAILURE TO NOTIFY THE ARCHITECT WILL MAKE THE CONTRACTOR RESPONSIBLE FOR ALL COSTS AND CONSEQUENCES OF SUCH FAILURE.

ALL WIRING SHALL BE CONCEALED IN FINISHED AREAS AS SPECIFIED. WHERE PERMITTED IN THE SPECIFICATIONS, USE OF MC CABLE IN CONCEALED AREAS SHALL BE PER N.E.C., LOCAL CODES, AND INSPECTION AGENCY APPROVAL. OTHERWISE, USE EMT CONDUIT, MINIMUM 3/4" UNLESS NOTED OR SPECIFIED OTHERWISE.

COORDINATION: THE ELECTRICAL CONTRACTOR SHALL COORDINATE HIS WORK WITH ALL OTHER TRADES. DURING THE BIDDING PROCESS, ELECTRICAL CONTRACTOR SHALL REVIEW DRAWINGS AND SPECIFICATIONS OF ALL OTHER TRADES (GENERAL, HVAC, FIRE PROTECTION AND PLUMBING). ALL ITEMS REQUIRING POWER OR FIRE ALARM CONNECTION INDICATED ON THESE DRAWINGS BUT NOT INDICATED ON THE ELECTRICAL DRAWINGS SHALL BE CONSIDERED A PART OF THE ELECTRICAL CONTRACTORS WORK. THIS WORK SHALL BE INSTALLED AS PER NEC AT NO ADDITIONAL COST TO THE OWNER. THE SCHEDULE OF THE ELECTRICAL WORK SHALL BE ARRANGED TO SUIT THE PROGRESS OF WORK BY THE OTHER TRADES AND SHALL IN NO WAY RETARD PROGRESS OF CONSTRUCTION OF THE PROJECT.

RECORD DRAWINGS: SECURE AN EXTRA SET OF ELECTRICAL DRAWINGS TO BE KEPT ON SITE AND MARK. DAILY. THE DRAWINGS IN RED IN A NEAT MANNER AS THE PROJECT PROGRESSES IN ORDER TO KEEP AN ACCURATE RECORD OF ALL DEVIATIONS BETWEEN THE WORK SHOWN ON THE DRAWINGS AND THE WORK WHICH IS ACTUALLY INSTALLED. THESE MARKED DRAWINGS SHALL REFLECT ANY AND ALL CHANGES AND REVISIONS TO THE ORIGINAL DESIGN WHICH EXISTS IN THE COMPLETED WORK. WHEN ALL REVISIONS HAVE BEEN SHOWN ON THESE PRINTS TO INDICATE THE WORK AS FINALLY INSTALLED, THE PRINTS SHALL BE DELIVERED TO THE ENGINEER, BEFORE FINAL PAYMENT.

TESTS: TEST ALL WIRING FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OR DEVICES. PERFORM INSULATION RESISTANCE TESTS ON ALL WIRING #8 OR LARGER TO ENSURE THAT ALL PORTIONS ARE FREE FROM SHORT-CIRCUITS AND GROUNDS.

<u>INSPECTIONS:</u> ARRANGE ALL NECESSARY INSPECTIONS. DELIVER ALL REQUIRED INSPECTION CERTIFICATES TO THE

GROUNDING: PROVIDE GROUNDING IN ACCORDANCE WITH THE NEC FOR THE ELECTRICAL SYSTEM INCLUDING EQUIPMENT FRAMES CONDUITS, SWITCHES, CONTROLLERS, WIRE-WAYS, NEUTRAL CONDUCTORS, AND OTHER EQUIPMENT. PROVIDE A GROUNDING CONDUCTOR IN ALL POWER CIRCUITS.

LABELS: PROVIDE LABELS FOR ALL PANELBOARDS, CABINETS, SAFETY SWITCHES, MOTOR-DISCONNECT SWITCHES, AND MOTOR CONTROLLERS. LABELS SHALL BE MACHINE ENGRAVED, LAMINATED PLASTIC, PERMANENTLY ATTACHED WITH SELF-TAPPING SCREWS OR RIVETS. DO NOT USE SELF-ADHESIVE LABELS. ALL COMPONENT PARTS OF EACH ITEM OF EQUIPMENT OR DEVICE SHALL BEAR THE MANUFACTURER'S NAMEPLATE, GIVING NAME OF MANUFACTURER, DESCRIPTION, SIZE TYPE, SERIAL AND MODEL NUMBER AND ELECTRICAL CHARACTERISTICS IN ORDER TO FACILITATE MAINTENANCE OR

J-BOX LABELING: LABEL ALL JUNCTION BOXES WITH PERMANENT MARKER IDENTIFYING CIRCUIT NUMBER AND PANELBOARD OF CIRCUITS WITHIN.

PANEL DIRECTORY: PROVIDE TYPEWRITTEN PANELBOARD DIRECTORY CARD IN EACH PANELBOARD INCLUDING EXISTING PANELBOARDS MODIFIED FOR THIS PROJECT WITH CIRCUIT LOAD INFORMATION AND ROOM NUMBER CLEARLY IDENTIFIED. USE ACTUAL ROOM NUMBERS IN THE BUILDING, NOT THE ROOM NUMBERS SHOWN ON THE CONTRACT DRAWINGS, AS

MOTOR COORDINATION: MOTORS, MOTOR STARTERS, CONTROLLERS, INTEGRAL DISCONNECT SWITCHES. AND CONTACTORS SHALL BE PROVIDED WITH THEIR RESPECTIVE PIECES OF EQUIPMENT BY THE EQUIPMENT SUPPLIER. COMMUNICATE WITH THE TRADES PROVIDING THE EQUIPMENT, VERIFYING ALL REQUIREMENTS, PROVIDE ALL ELECTRICAL CONNECTIONS REQUIRED THEREIN, AND INSTALL MOTOR STARTERS.

MOTOR DISCONNECTS: ALL MOTORS SHALL HAVE DISCONNECTING MEANS.

MOTOR FUSE PROTECTION: WHERE FUSE PROTECTION IS SPECIFICALLY REQUIRED BY THE EQUIPMENT MANUFACTURER, PROVIDE FUSE SWITCHES IN LIEU OF NON-FUSE SWITCHES OR IN LIEU OF ENCLOSED CIRCUIT BREAKERS, OR OTHER DEVICES INDICATED.

CONNECTION DETAILS: SECURE APPROVED SHOP DRAWINGS SHOWING WIRING DIAGRAMS, ROUGH-IN AND HOOK UP DETAILS FROM OTHER INVOLVED CONTRACTORS FOR EQUIPMENT WHICH MUST BE CONNECTED ELECTRICALLY.

EQUIPMENT DETAILS: MECHANICAL EQUIPMENT WILL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR. THE LOCATIONS SHOWN ON THE ELECTRICAL DRAWINGS ARE APPROXIMATE. COORDINATE WITH THE MECHANICAL CONTRACTOR TO DETERMINE THE EXACT LOCATION OF EACH PIECE OF EQUIPMENT AND DETERMINE THE EXACT ROUGH-IN AND CONNECTION REQUIREMENTS.

STARTER MOUNTING: WHERE AN INDIVIDUALLY MOUNTED SAFETY SWITCH, STARTER OR CIRCUIT BREAKER IS SHOWN ADJACENT TO ITS RESPECTIVE LOAD AND NOT MOUNTED ON A WALL, PROVIDE ALL SUPPORTS, BRACKETS, ANCHORING, ETC. NECESSARY TO PROPERLY SUPPORT THE DEVICE.

MOUNTING HEIGHTS: MOUNTING HEIGHTS INDICATED ARE FROM THE FINISHED FLOOR TO THE CENTERLINE OF THE WIRING DEVICE UNLESS OTHERWISE NOTED.

<u>DEVICE LOCATIONS:</u> THE ELECTRICAL DRAWINGS ARE DIAGRAMMATIC AND REPRESENT THE DESIGN/LAYOUT INTENT ONLY. THE ELECTRICAL CONTRACTOR SHALL DETERMINE CIRCUITING, ROUTING, WIRING ETC.., AS REQUIRED BY THE SITE CONDITIONS, AND ALL APPLICABLE CODES.

FIRE PROOFING: WHERE CONDUIT, CABLES, DUCTWORK, OR PIPING PASSES THROUGH FIRE RATED FLOORS OR WALLS THE SLEEVES SHALL BE COMPLETELY SEALED WITH A FIRESTOP MATERIAL THAT IS UL LISTED, AND ACCEPTED BY THE BUILDING DEPARTMENT AND FIRE DEPARTMENT AS BEING SUITABLE FOR THIS SERVICE. THIS MATERIAL SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF THE MANUFACTURER TO MAINTAIN THE FIRE RATING OF THE PENETRATED WALL OR FLOOR.

<u>CLEAN UP:</u> DAILY AND WHEN DIRECTED BY THE OWNER OR ENGINEER REMOVE ALL DEBRIS FROM THE PREMISES. ON PROJECT CLOSE—OUT, CLEAN ALL ELECTRICAL DEVICES, LIGHTING FIXTURES, LAMPS AND LENSES, AND REMOVE ALL PAINT SPATTERS FROM DEVICES, FIXTURES, AND PLATES.

CONDUIT: ALL CONDUIT RUN OVERHEAD SHALL BE RUN AT THE BOTTOM OF THE FLOOR, ROOF STRUCTURE, OR LOWEST CHORD OF JOIST SPACE (AS APPLICABLE) ABOVE IN ORDER TO AVOID CONFLICTS WITH OTHER TRADES. WHERE CONDUIT SIZES HAVE BEEN OMITTED, THE CONTRACTOR SHALL INSTALL THE CORRECT SIZES REQUIRED BY THE

N.E.C. AS DETERMINED BY THE NUMBER OF WIRES TO BE INSTALLED. WHERE THE NUMBER AND OR SIZES OF HAVE BEEN OMITTED, THE CONTRACTOR SHALL INSTALL THE REQUIRED NUMBER AND OR SIZES AS DETERMINED BY THE EQUIPMENT REQUIREMENTS OR FROM ADJACENT SECTIONS AND CIRCUIT NUMBERS.

ALL EMPTY CONDUITS TO BE PROVIDED WITH PULL WIRE.

- THE FOLLOWING CONDUCTORS SHALL BE RUN IN HEAVY WALL CONDUIT: ALL FEEDERS RUN IN SLAB - MAY BY SCHEDULE 40 PVC.
- WHERE REQUIRED BY THE N.E.C. EXPOSED WIRING ON A ROOF — SEAL PROPERLY.
- EXTERIOR, ABOVE GRADE WIRING. FOLLOWING FEEDERS SHALL BE IN EMT:

 BRANCH FEEDERS TO PANELS. BRANCH RACEWAY RUN EXPOSED.

WIRING DEVICES: ALL RECEPTACLES AND SWITCHES SHALL BE LABELED WITH PLASTIC LAMINATED LABEL WITH THE PANELBOARD DESIGNATION AND CIRCUIT NUMBER FROM WHICH IT IS FED.

EQUIPMENT DEMONSTRATION: PROVIDE A DEMONSTRATION OF THE OPERATION OF ALL ELECTRICAL COMPONENTS UPON REQUEST OF THE OWNER.

CEILING PLENUM: ALL WIRING THAT WILL NOT BE RUN IN CONDUIT SHALL BE PLENUM RATED. <u>VOLTAGE DROP:</u> INCREASE CONDUCTORS SIZES BY AN ADDITIONAL ONE SIZE FOR OVER 100FT LINEAR AND AN ADDITIONAL TWO SIZES FOR OVER 200FT LINEAR.

GENERAL SPECIAL SYSTEM NOTES:

FIRE ALARM SYSTEM

(ADA) AND NFPA 72.

ALL FIRE ALARM NOTIFICATION DEVICES SHALL MEET THE REQUIREMENTS OF THE AMERICANS WITH DISABILITIES ACT

ALL WIRING SHALL BE RUN IN CONDUIT (3/4" MINIMUM). MAKE ALL WIRE CONNECTIONS TO DEVICES PER MANUFACTURER'S RECOMMENDATION AND NFPA 72.

MANUFACTURER, IN CONJUNCTION WITH THE CONTRACTOR, SHALL DETERMINE CONDUIT AND WIRING REQUIREMENTS AND DOCUMENT ALL ADDITIONS AND CHANGES ON AS-BUILT RECORD DRAWINGS.

<u>PART 1 — GENERAL</u>

- 1. CODES AND STANDARDS: THE LATEST EFFECTIVE PUBLICATIONS OF ALL APPLICABLE STANDARDS, CODES, ETC., AS THEY APPLY, FORM PART OF THESE SPECIFICATIONS AS IF WERE WRITTEN FULLY HEREIN AND CONSTITUTE MINIMUM REQUIREMENTS. THE FOLLOWING WILL BE REFERRED TO THROUGHOUT IN ABBREVIATED FORMS:
- NATIONAL ELECTRICAL CODE (NEC) [NFPA 70]
- INSTITUTE OF ELECTRICAL AND ELECTRONIC ENGINEERS (IEEE)
- NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
- AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) APPLICABLE STATE AND LOCAL CODES
- APPLICABLE STANDARDS OF UNDERWRITER'S LABORATORIES, INC. (UL) APPLICABLE STANDARDS OF NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
- THE INTERNATIONAL BUILDING CODE (IBC)
- THE INTERNATIONAL FIRE CODE (IFC)
- THE AMERICANS WITH DISABILITIES ACT (ADA) INTERNATIONAL ELECTRICAL TESTING ASSOCIATION (NETA)
- THE INTERNATIONAL ENERGY CONSERVATION CODE (IECC) ASHRAE STANDARD 90.1: ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS
- 2. SCOPE OF WORK: PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, APPURTENANCES AND SERVICES TO PROVIDE A COMPLETE ELECTRICAL INSTALLATION AS SHOWN ON THE DRAWINGS AND AS DESCRIBED IN THESE SPECIFICATIONS.
- 3. APPROVAL DOCUMENTS: CONTRACTOR SHALL SUBMIT FOUR (4) COPIES OF SHOP DRAWINGS, AND EQUIPMENT CATALOG CUTS TO THE ARCHITECT FOR SUBMISSION AND APPROVAL OF THE CODE ENFORCEMENT OFFICIAL PRIOR TO COMMENCING
- 4. DRAWINGS AND SPECIFICATIONS: THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL EXTENT, CHARACTER AND ARRANGEMENT OF EQUIPMENT. FIXTURES AND CONDUIT AND WIRING SYSTEMS. IT IS THE INTENTION OF THESE SPECIFICATIONS AND DRAWINGS TO FULLY COVER ALL WORK AND MATERIALS FOR A COMPLETE ELECTRICAL INSTALLATION PER THE NEC. ANY DEVICES SUCH AS PULL BOXES AND DISCONNECT SWITCHES, USUALLY EMPLOYED IN THIS CLASS OF WORK THOUGH NOT SPECIFICALLY MENTIONED OR SHOWN ON THE DRAWINGS OR IN THIS SPECIFICATION. BUT WHICH MAY BE NECESSARY FOR THE SATISFACTORY COMPLETION OF THE WORK, SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AS A PART OF HIS TOTAL WORK UNDER THIS DIVISION. CONSULT THE SPECIFICATIONS AND DRAWINGS OF ALL OTHER TRADES AND PERFORM ALL ELECTRICAL WORK REQUIRED THEREIN. COOPERATE WITH ALL OTHER CONTRACTORS OR SUBCONTRACTORS TO FURNISH COMPLETE WORKABLE SYSTEMS.
- 5. PERMITS, INSPECTION AND TESTS: THE RIGHT IS RESERVED TO INSPECT AND TEST ANY PORTION OF THE INSTALLATION/EQUIPMENT DURING THE PROGRESS OF ITS ERECTION. THIS CONTRACTOR SHALL TEST ALL WIRING FOR CONTINUITY AND GROUNDS BEFORE CONNECTING ANY FIXTURES OR DEVICES. THIS CONTRACTOR SHALL TEST THE ENTIRE SYSTEM WHEN THE WORK IS FINALLY COMPLETED TO INSURE THAT ALL PORTIONS ARE FREE FROM SHORT CIRCUITS AND
- 6. SECURE AND PAY: FOR ALL REQUIRED PERMITS AND INSPECTIONS. INSPECTION CERTIFICATES FROM LOCAL AUTHORITIES HAVING JURISDICTION SHALL BE DELIVERED TO THE OWNER BEFORE FINAL PAYMENT.
- 7. SUBMITTALS: SUBMIT SHOP DRAWINGS. PRODUCT DATA AND SAMPLES WITHIN THIRTY (30) DAYS OF AWARD OF CONTRACT AND IN ACCORDANCE WITH THE GENERAL CONDITIONS AND SUPPLEMENTARY CONDITIONS. SUBMITTALS ARE REQUIRED FOR ALL SAFETY SWITCHES, PANELBOARDS, LIGHTING FIXTURES, FIRE ALARM SYSTEM, AND SPECIALTY DEVICES PROVIDED UNDER THIS SPECIFICATION. REVIEW OF SUBMITTALS BY THE ENGINEER AND ANY ASSOCIATED ACTION TAKEN BY THE ENGINEER DOES NOT RELIEVE THE CONTRACTOR OF ANY REQUIREMENTS SET FORTH BY THE CONTRACT DOCUMENTS.
- 8. PROVIDE ALL CUTTING, PATCHING, PAINTING AND REFINISHING REQUIRED FOR INSTALLATION OF THE ELECTRICAL WORK.
- 9. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL EQUIPMENT VOLTAGES WITH MECHANICAL CONTRACTORS PRIOR TO EQUIPMENT ORDER.
- 10. DEFINITIONS:
- "FURNISH" SHALL MEAN TO PURCHASE, DELIVER TO JOB SITE, AND UNLOAD FROM TRUCK AT JOB SITE. • "INSTALL" SHALL MEAN TO MOUNT IN PLACE, MAKE ALL NECESSARY CONNECTIONS AS SPECIFIED ON PLANS, AND
- ON SHOP DRAWINGS. • "PROVIDE" SHALL MEAN TO FURNISH AND INSTALL.

PART 2 - PRODUCTS

- . MANUFACTURING STANDARDS: MATERIAL SHALL BE NEW AND APPROVED AND LABELED BY UL WHEREVER STANDARDS HAVE BEEN ESTABLISHED BY THAT AGENCY. DEFECTIVE EQUIPMENT OR EQUIPMENT DAMAGED IN THE COURSE OF INSTALLATION OR TEST SHALL BE REPLACED OR REPAIRED IN A MANNER MEETING THE APPROVAL OF THE OWNER. ALL ITEMS OF THE SAME TYPE AND RATING SHALL BE IDENTICAL.
- 2. TRADE NAMES: UNLESS SPECIFICALLY IDENTIFIED OTHERWISE, MANUFACTURERS' NAMES AND CATALOG NUMBERS INDICATED HEREIN AND ON THE DRAWINGS ARE NOT INTENDED TO BE PROPRIETARY DESIGNATIONS. THEY ARE TO INDICATE GENERAL TYPE AND QUALITY OF MATERIALS AND EQUIPMENT REQUIRED. EQUIPMENT AND MATERIAL BY OTHER MANUFACTURERS WHICH IN THE OPINION OF THE ENGINEER ARE OF EQUAL QUALITY AND WHICH WILL PRODUCE THE SAME 2. SPARE PARTS: PROVIDE ONE EACH SPARE PART (OR AS OTHERWISE NOTED) AS FOLLOWS: RESULTS WILL BE CONSIDERED ACCEPTABLE.
- 3. MOTORS: MOTORS SHALL BE PROVIDED WITH DISCONNECTING MEANS.
- 4. POWER WIRING: UP TO AND INCLUDING MOTOR CONNECTIONS FOR ALL EQUIPMENT PROVIDED UNDER OTHER DIVISIONS OF THIS SPECIFICATION SHALL BE INCLUDED IN THIS DIVISION. WHERE MANUAL MOTOR CONTROL SWITCHES FOR SINGLE PHASE MOTORS ARE INDICATED, THEY SHALL BE PROVIDED AND WIRED COMPLETE UNDER THIS DIVISION. MOTOR CONTROLLERS AND MOTOR STARTERS FURNISHED UNDER OTHER DIVISIONS SHALL BE SET IN PLACE AND CONNECTED TO SOURCE AND LOAD UNDER THIS DIVISION. IN GENERAL, MOTORS WILL BE PROVIDED WITH THE EQUIPMENT THEY DRIVE AND ARE NOT PART OF THIS WORK UNDER THIS DIVISION, EXCEPT THAT THEY SHALL BE CONNECTED HEREUNDER.
- 5. OBTAIN APPROVED SHOP DRAWINGS: SHOWING WIRING DIAGRAMS, CONNECTION DIAGRAMS, ROUGH-IN AND HOOKUP DETAILS, FROM ALL CONTRACTORS FOR ALL EQUIPMENT AND COMPLY THEREWITH.
- 6. CONTROL, INTERLOCK AND INTERNAL EQUIPMENT: WIRING REGARDLESS OF VOLTAGE SHALL BE PROVIDED BY OTHERS UNLESS SPECIFICALLY SHOWN HERE.
- 7. GROUNDING: THE ENTIRE ELECTRICAL SYSTEM, INCLUDING EQUIPMENT FRAMES, CONDUIT, SWITCHES, CONTROLLERS WIREWAYS, NEUTRAL CONDUCTORS, AND ALL OTHER SUCH EQUIPMENT SHALL BE PERMANENTLY AND EFFECTIVELY GROUNDED IN ACCORDANCE WITH THE NEC. GROUNDING OF EACH TRANSFORMER SECONDARY SHALL BE PROVIDED AND EACH SHALL BE CONSIDERED AS A SEPARATE SERVICE GROUND. PROVIDE A SEPARATE GROUND CONDUCTOR IN ALL BRANCH CIRCUIT CONDUITS SIZED IN ACCORDANCE WITH THE NEC.
- B. WORK UNDER THIS DIVISION: SHALL PROCEED IN ADVANCE OF THE WORK OF OTHERS WHENEVER POSSIBLE, ELIMINATING ALL CUTTING AND PATCHING. WHEN SUCH PROCEDURE IS IMPOSSIBLE, CUTTING AND PATCHING SHALL BE DONE IN AN APPROVED MANNER. CUTTING SHALL NOT ENDANGER STRUCTURAL INTEGRITY IN ANY WAY. PATCHING SHALL EXACTLY MATCH CONTIGUOUS WORK. ACTUAL WORK OF CUTTING AND PATCHING OF EXISTING SURFACES SHALL BE PERFORMED BY THE SUBCONTRACTOR WHO ORIGINALLY PREPARED THESE SURFACES, E.G., CUTTING AND PATCHING OF MASONRY WALL WILL BE PERFORMED BY THE MASONRY SUBCONTRACTOR. COSTS OF SUCH CUTTING AND PATCHING SHALL BE BORNE B THE ELECTRICAL SUBCONTRACTOR. CUTTING SHALL BE CAREFULLY DONE AND DAMAGE TO BUILDING, PIPING, WIRING OR EQUIPMENT AS A RESULT OF CUTTING SHALL BE REPAIRED BY SKILLED MECHANICS OF TRADE INVOLVED.
- 9. STORAGE AND MATERIALS: SPACE WILL BE ASSIGNED TO THE CONTRACTOR BY THE OWNER FOR THE STORAGE OF MATERIAL. THIS CONTRACTOR WILL BE RESPONSIBLE FOR THE PROTECTION AND SAFEKEEPING OF MATERIALS, TOOLS, AND EQUIPMENT. ALL MATERIALS AND EQUIPMENT SHALL BE KEPT IN ITS ASSIGNED PLACE UNTIL THE TIME OF ITS INSTALLATION. EXCESS MATERIALS, DIRT AND REFUSE SHALL BE PROMPTLY REMOVED FROM THE WORK SITE.
- 10. GUARANTEE OF WORK: CONTRACTOR GUARANTEES BY HIS ACCEPTANCE OF THE CONTRACT THAT ALL WORK INSTALLED IS FREE FROM ANY AND ALL DEFECTS IN WORKMANSHIP AND/OR MATERIALS. AND THAT THE APPARATUS WILL DEVELOP CAPACITIES AND CHARACTERISTICS SPECIFIED, AND THAT IF, DURING THE PERIOD OF ONE YEAR OR AS OTHERWISE SPECIFIED, FROM DATE OF CERTIFICATE OF COMPLETION AND ACCEPTANCE OF THE WORK ANY SUCH DEFECTS IN WORKMANSHIP, MATERIAL OR PERFORMANCE APPEAR, HE WILL, WITHOUT COST TO THE OWNER, REMEDY SUCH DEFECTS WITHIN A REASONABLE TIME TO BE SPECIFIED IN NOTICE. IN DEFAULT THEREOF, THE OWNER MAY HAVE SUCH WORK DONE AND CHARGE COST TO CONTRACTOR. EQUIPMENT GUARANTEES FROM DATE OF "START-UP" WILL NOT BE RECOGNIZED.

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

. ALL ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES SHALL BE UL LISTED, LABELED, AND MARKED FOR ITS

INTENDED USE. COMPLY WITH UL 467 FOR GROUNDING AND BONDING MATERIALS.

- . Provide insulated grounding conductors for interior installations. Insulated grounding conductors shall BE SOFT DRAWN. ANNEALED COPPER WITH 600 VOLT COLOR CODED INSULATION.
- 3. CONDUCTORS SHALL BE SOLID FOR WIRE SIZES #8 AWG AND SMALLER AND SHALL BE STRANDED FOR #6 AWG AND
- 4. INSTALL GROUND WIRES WITH SWEEPING BENDS.
- 5. TEST COMPLETED GROUNDING SYSTEM PRIOR TO ENERGIZATION OF PERMANENT ELECTRICAL CIRCUITS. SYSTEM SHALL BE TESTED AT SERVICE DISCONNECT ENCLOSURE GROUNDING TERMINAL AND AT GROUND TEST WELL. PERFORM TESTS BY FALL-OF-POTENTIAL METHOD ACCORDING TO IEEE 81.

RACEWAY, FITTINGS AND BOXES

- 1. RACEWAYS: CONDUIT SHALL BE HOT-DIPPED, ZINC COATED OR SHERARDIZED RIGID STEEL (RS), INTERMEDIATE METAL CONDUIT (IMC) OR ELECTRICAL METALLIC TUBING (EMT).
- 2. FLEXIBLE CONDUIT: SHALL BE GALVANIZED, CONTINUOUS SPIRAL, SINGLE STRIP TYPE. FLEXIBLE CONDUIT SHALL BE
- COVERED WITH PVC JACKET IN WET OR DAMP LOCATIONS. PROVIDE SUITABLE FITTINGS WITH GROUND CONNECTOR. 3. FITTINGS: ALL CONDUIT ENTERING OR LEAVING OUTLET, JUNCTION OR PULL BOXES, AND CABINETS AND ALL CONDUIT STUBS SHALL HAVE BUSHINGS. PROVIDE INSULATING BUSHINGS WHERE REQUIRED BY NEC. PROVIDE EXPANSION

FITTINGS WITH BONDING JUMPER WHERE CONDUITS CROSS EXPANSION JOINTS.

- FITTINGS FOR RS AND IMC SHALL BE THREADED TYPE. FITTINGS FOR EMT SHALL BE THREADLESS, APPROVED FOR THE CONDITIONS ENCOUNTERED AND MAY BE CAST SET SCREW TYPE 2" AND LARGER AND COMPRESSION TYPE FOR ALL OTHERS.
- 4. OUTLET BOXES AND JUNCTION BOXES: OUTLET BOXES SHALL BE PRESSED STEEL, ELECTRO—GALVANIZED OR CADMIUM PLATED WITH CLEAN CUT. EASILY REMOVABLE KNOCKOUTS. EXCEPT AS NOTED HEREINAFTER MINIMUM SIZE OUTLET BOX SHALL BE 4" SQUARE, 2 1/8" DEEP, AND SHALL BE INCREASED IN DIMENSIONS TO ACCOMMODATE CONDUCTORS, CONDUITS, AND DEVICES AS REQUIRED BY THE NEC. SHALLOWER BOXES MAY BE USED WHERE REQUIRED BY STRUCTURAL CONDITIONS. PROVIDE SUITABLE PLASTER-RINGS TO MATCH WALL CONSTRUCTION AND DEVICE. CEILING AND BRACKET OUTLET BOXES SHALL BE NOT LESS THAN 4" OCTAGONAL, 1 1/2" DEEP EXCEPT THAT SMALLER BOXES MAY BE USED WHERE REQUIRED BY PARTICULAR FIXTURE TO BE INSTALLED. JUNCTION BOXES SHALL HAVE REMOVABLE COVERS AND SHALL BE ACCESSIBLE AFTER COMPLETION OF WORK. OUTLET BOXES IN WET OR DAMP LOCATIONS SHALL BE CAST-METAL, THREADED HUB-TYPE WITH GASKETS.
- 5. RACEWAY AND FITTING INSTALLATION—RUN CONDUITS: CONCEALED WITHIN FINISHED WALLS. CEILINGS AND FLOORS. CONDUITS MAY BE RUN EXPOSED IN MECHANICAL ROOMS AND SPACES WITH EXPOSED CONSTRUCTION. CONDUIT SHALL BE SUPPORTED AT INTERVALS OF NOT MORE THAT 8' OR AS REQUIRED PER NEC. RUN EXPOSED CONDUIT PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES AND CEILING. CONDUIT LARGER THAT 1" NOMINAL DIAMETER SHOWN IN FLOOR SLAB SHALL BE RUN UNDER THE SLAB. CONDUIT 1" AND SMALLER MAY BE RUN IN THE FLOOR SLAB WHERE APPROVED BY ARCHITECT OR STRUCTURAL ENGINEER.

- SUPPORT CONDUITS BY PIPE STRAPS, WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE.
- 7. DO NOT INSTALL EMT OUTDOORS, UNDERGROUND, ENCASED IN CONCRETE, IN HAZARDOUS AREAS, OR IN AREAS SUBJECT TO SEVERE PHYSICAL DAMAGE.
- 8. SLEEVES: ALL ELECTRICAL SYSTEM CONDUIT SHALL HAVE SLEEVES WHERE CONDUIT PASSES THROUGH CONCRETE SLABS EXCEPT CONCRETE SLABS IN CONTACT WITH GRADE. ALL CONDUIT 1 1/4 INCH AND LARGER RUNNING CONCEALED ABOVE CEILING SHALL HAVE SLEEVES WHERE THE CONDUIT PASSES THROUGH MASONRY, TILE AND GYPSUM WALL CONSTRUCTION. SLEEVES SHALL BE CONSTRUCTED OF GALVANIZED STEEL PIPE, SCHEDULE 40. PROVIDE ESCUTCHEON PLATES FOR ALL EXPOSED CONDUIT PASSING THROUGH MASONRY, TILE AND GYPSUM WALL CONSTRUCTION. WHERE PLATES ARE PROVIDED FOR CONDUITS PASSING THROUGH SLEEVES, WHICH EXTEND ABOVE THE FLOOR SURFACE, PROVIDE DEEP RECESSED PLATES TO CONCEAL THE SLEEVES. TERMINATE SLEEVES FLUSH WITH WALL, PARTITIONS AND CEILINGS. IN AREAS WHERE CONDUITS ARE CONCEALED, AS IN CHASES, TERMINATE SLEEVES FLUSH WITH FLOOR. IN FINISHED AREAS, WHERE CONDUITS ARE EXPOSED, EXTEND SLEEVES ½ INCH ABOVE FINISHED FLOOR, EXCEPT IN ROOMS HAVING FLOOR DRAINS EXTEND SLEEVES 1 INCH ABOVE FLOOR. FASTEN SLEEVES SECURELY IN FLOORS, WALLS, SO THAT THEY WILL NOT BECOME DISPLACED WHEN CONCRETE IS POURED OR WHEN OTHER CONSTRUCTION IS BUILT AROUND THEM. WHERE sleeves pass through floors or fire rated walls provide proper sealant around conduit to maintain fire
- 9. NON-METALLIC SURFACE RACEWAY SHALL BE TWO PIECE CONSTRUCTION, MANUFACTURED OF RIGID PVC WITH TEXTURE AND COLOR SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLORS. NON-METALLIC SURFACE RACEWAY SHALL BE WIREMOLD 2300 SERIES OR EQUAL BY HUBBELL OR WALKER SYSTEMS, INC.

<u>CONDUCTORS</u>

CONDUCTORS AND INSULATION: WIRE AND CABLE SHALL BE SOFT DRAWN, ANNEALED COPPER WITH 600 VOLT COLOR CODED INSULATION. MINIMUM WIRE SIZE SHALL BE #12 AWG. INSULATION FOR CONDUCTORS SHALL BE TYPE THHN/THWN FOR INSTALLATION IN ORDINARY DRY LOCATIONS AND TYPE THWN FOR INSTALLATION IN WET LOCATIONS. WET LOCATIONS WILL INCLUDE RACEWAYS INSTALLED IN CONCRETE FLOOR SLABS IN DIRECT CONTACT WITH THE EARTH AND RACEWAYS REGULARLY SUBJECT TO MOISTURE OR CONDENSATION. CONDUCTORS NO. 8 AWG AND LARGER DIAMETER SHALL BE STRANDED. CONDUCTORS NO. 10 AWG AND SMALLER DIAMETER SHALL BE SOLID, EXCEPT THAT CONDUCTORS FOR REMOTE CONTROL AND SIGNAL CIRCUITS, CLASSES 1, 2, AND 3, MAY BE STRANDED. MC CABLE SHALL NOT BE UTILIZED WITHOUT WRITTEN CONSENT OF OWNER'S REPRESENTATIVE, AND THEN ONLY WHERE SPECIFICALLY APPROVED DUE TO EXTREME INSTALLATION CIRCUMSTANCES.

- PROVIDE A SEPARATE GROUND CONDUCTOR IN ALL RACEWAYS SIZED IN ACCORDANCE WITH THE NEC.
- 3. JOINTS AND TERMINATIONS: FOR CONDUCTORS #12 AND #10 ALL FIXTURE AND BRANCH CIRCUITS JOINTS IN JUNCTION AND OUTLET BOXES SHALL BE MADE WITH UL LISTED PRESSURE TYPE CONNECTORS RATED AT 600 VOLTS AND 105 DEGREES C. CONNECTORS SHALL BE IDEAL INDUSTRIES "WING-NUT" OR BUCHANNAN "B-COP", "SCOTCH-LOK" CONNECTORS OR EQUAL. WIRE #8 AND LARGER SHALL BE JOINED OR TERMINATED WITH SOLDERLESS PRESSURE CONNECTORS PROPERLY TAPED IN LAYERS TO FORM A MOISTURE-TIGHT JOINT.
- 4. TESTS: AFTER INSTALLING CONDUCTORS AND CABLES AND BEFORE ELECTRICAL CIRCUITRY HAS BEEN ENERGIZED, TEST SERVICE ENTRANCE AND FEEDER CONDUCTORS. PERFORM EACH VISUAL AND MECHANICAL INSPECTION AND ELECTRICAL TEST STATED IN NETA ACCEPTANCE TESTING SPECIFICATION. CERTIFY COMPLIANCE WITH TEST PARAMETERS. AFTER SUBSTANTIAL COMPLETION, BUT NOT MORE THAN 60 DAYS AFTER FINAL ACCEPTANCE, PERFORM AN INFRARED SCAN OF EACH SPLICE IN CABLES AND CONDUCTORS NO. 3 AWG AND LARGER. REMOVE BOX AND EQUIPMENT COVERS SO SPLICES ARE ACCESSIBLE TO PORTABLE SCANNER. PROVIDE A WRITTEN REPORT TO RECORD THE FOLLOWING: 1. TEST PROCEDURES USED; 2. TEST RESULTS THAT COMPLY WITH REQUIREMENTS; 3. TEST RESULTS THAT DO NOT COMPLY WITH REQUIREMENTS AND CORRECTIVE ACTION TAKEN TO ACHIEVE COMPLIANCE WITH REQUIREMENTS. REMOVE AND REPLACE MALFUNCTIONING UNITS AND RETEST AS SPECIFIED ABOVE.

<u>WIRING DEVICES</u>

- WEATHERPROOF RECEPTACLES SHALL BE GROUND FAULT CIRCUIT INTERRUPTING TYPE IN CAST METAL BOX WITH GASKETED, WEATHERPROOF, "IN-USE" COVER.
- GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLES SHALL CONFORM TO NEC, SHALL BE UL LISTED, PLASTIC AND SHALL HAVE A "PUSH-TO-TEST" BUTTON AND VISIBLE INDICATION OF A TRIPPED CONDITION. VERIFY RECEPTACLE COLOR WITH ARCHITECT PRIOR TO ORDERING.
- WIRING DEVICES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY LEVITON, HUBBELL, OR PASS & SEYMOUR. <u>FIRE ALARM SYSTEM — ADDRESSABLE</u>
- . Description: Provide modifications to the existing addressable digital fire alarm system installed as shown ON DRAWINGS AND DESCRIBED HEREIN. THE OPERATION SHALL BE SUCH THAT ACTUATION OF ANY MANUAL FIRE ALARM Station or any other initiation device shall cause audible/visible signal devices throughout the building to OPERATE. SHALL CAUSE THE MAIN ANNUNCIATOR TO DISPLAY THE "ADDRESS" OF THE INITIATING DEVICE UNTIL THE DEVICE is restored to its normal position and the control panel is reset and shall cause an alarm signal to be transmitted to a central station. All initiating devices shall be fully compatible with existing systems and SHALL BE PER MANUFACTURER'S RECOMMENDATIONS. ALL COMPONENTS SHALL BE ADDRESSABLE OR BE PROVIDED WITH

FOR A PERIOD OF 12 MONTHS FROM THE DATE OF SUBSTANTIAL COMPLETION.

- WARRANTY: THE CONTRACTOR AND MANUFACTURER SHALL GUARANTEE ALL ADDED MATERIALS AND WORKMANSHIP FOR A PERIOD OF 12 MONTHS. THIS WARRANTY SHALL INCLUDE ALL PARTS, LABOR, MAINTENANCE, AND SOFTWARE UPGRADES
- 4. STANDARDS AND CODES:
- INTERNATIONAL FIRE CODE (IFC) NFPA 72 NATIONAL FIRE ALARM CODE

ADDRESSABLE ZONE INTERFACE MODULES.

 NFPA 70 NATIONAL ELECTRICAL CODE AMERICANS WITH DISABILITIES ACT

DUCT SMOKE DETECTOR

WIRING: WIRING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE AND NFPA 72, AND ALL OTHER APPLICABLE STATE AND LOCAL CODES. THE CONTRACTOR SHALL PROVIDE, IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, ALL WIRING. CONDUIT, AND OUTLET BOXES REQUIRED FOR THE ERECTION OF THE COMPLETE SYSTEM AS DESCRIBED HEREIN AND AS SHOWN ON THE DRAWINGS. CONDUIT AND WIRE SHALL CONFORM TO THE APPLICABLE REQUIREMENTS FOR LIGHTING AND RECEPTACLE BRANCH CIRCUITS. THE SIZES OF THE DIFFERENT WIRES

SHALL BE AS REQUIRED FOR SYSTEM OPERATION. COLOR—CODED WIRES SHALL BE USED.

ALL WALL MOUNTED DEVICES WITH OPERABLE PARTS (SWITCHES. CONTROLS, RECEPTACLES, ETC) TO BE INSTALLED PER ICC A117.1-2009 1004.9 AND ALL ADA SPACING, MOUNTING AND CLEARANCE REQUIREMENTS. COORDINATE LOCATIONS WITH ARCHITECT PRIOR TO ROUGH IN. 1'-6" (4) ELECTRICAL RECEPTACLES (UON) 0'-0" — FINISHED FLOOR

MOUNTING HEIGHT SCHEDULE

ABOVE FINISHED FLOOR AUTHORITY HAVING JURISDICTION AMPERE INTERRUPTING CURRENT CIRCUIT BREAKER CIRCUIT ELECTRICAL CONTRACTOR ENCLOSED CIRCUIT BREAKER EXISTING TO REMAIN GENERAL CONTRACTOR GROUND FAULT CIRCUIT INTERRUPTER GROUND MINIMUM CIRCUIT AMPS MAIN CIRCUIT BREAKER MANUFACTURER MAIN LUGS ONLY MOUNTED MAKE-UP AIR UNIT

NATIONAL ELECTRICAL CODE NON-FUSED NOT IN CONTRACT NOT TO SCALE

HEATING, VENTILATING, AND AIR CONDITIONING MECHANICAL CONTRACTOR / METAL CLAD CABLE

PHASE UNLESS OTHERWISE NOTED VOLTS WATTS/WIRE

WEATHERPROOF

GENERAL

ABBREVIATIONS

GFI INDICATES GROUND FAULT INTERRUPTING TYPE. WP,GFI INDICATES "WEATHER-RESISTANT" TYPE, GROUND FAULT INTERN TYPE, WITH COOPER MODEL WIU-1D (OR EQUAL) "WHILE-IN-USE" WEATHERPROOF COVER, 18"AFG UON. RECEPTACLE SHALL HA "WR" STAMPED ON FACE OF DEVICE. PROVIDER, CONNECTED BY EC.

DISCONNECT SWITCH INTEGRAL TO EQUIPMENT, FURNISHED BY EQUIPMENT ELECTRICAL PANELBOARD

KEYED DEMOLITION OR NEW WORK NOTE.

DUPLEX RECEPTACLE, 20A, 120V, 18"AFF, UON.

PANEL NAME ------ XXIPY ----- CIRCUIT NUMBER

DEVICE SYMBOL X DEVICE NOMENCLAT

ELECTRICAL CIRCUIT RUN IN CONDUIT AND CIRCUIT HOMERUN TO PANELBOARD OR (PANEL AND CIRCUIT DESIGNATION AS INDICATED). AS A MINIMUM CONDITION, XX-XX EACH SINGLE PHASE CIRCUIT SHALL HAVE 1 #12 PHASE CONDUCTOR, 1 #12 NEUTRAL CONDUCTOR, AND 1 #12 GROUNDING CONDUCTOR IN 3/4"_CONDUIT_ PROVIDE ADDITIONAL PHASE CONDUCTORS AS REQUIRED FOR "MULTIPLE PHASE ELECTRICAL LOADS. PROVIDE ADDITIONAL "SWITCH LEG" CONDUCTORS TO

THE LIGHT FIXTURE CONTROL INDICATED. MULTIPLE SINGLE PHASE COLUCT F

CONDUCTORS SHALL BE SHARED AS ALLOWED BY THE NEC. CONDUIT LANGED

SHALL BE GROUPED TOGETHER IN A COMMON CONDUIT IN ACCORDANCE

NEC AND AT THE CONTRACTOR'S DISCRETION. NEUTRAL AND GROUNDING

⊞:

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T.W.

THAN 3/4" AND CONDUCTORS LARGER THAN #12 SHALL BE AS INDICATE XX/XX/XX INDICATES MULTIPLE POLE BREAKER

GROUND CONNECTION.

O DISCONNECT SWITCH - SIZE AS INDICATED ON PLANS 30/2/20/3R —— NEMA RATING (IF OTHER THAN 1 FUSE SIZE (AMPS), N.F. INDICATES NON-FUSED --- No. OF POLES - SIZE (AMPS)

D DUCT-MOUNTED ADDRESSABLE FIRE ALARM SYSTEM PHOTO-ELECTRIC SMOKE

FIRF ALARM

FACP FIRE ALARM CONTROL PANEL, SURFACE MOUNTED, TOP 5'-9" AFF. FAAP FIRE ALARM ANNUNCIATOR PANEL, RECESSED, TOP 5'-0" AFF.

EQUIPMENT ELECTRICAL CONNECTION SCHEDULE

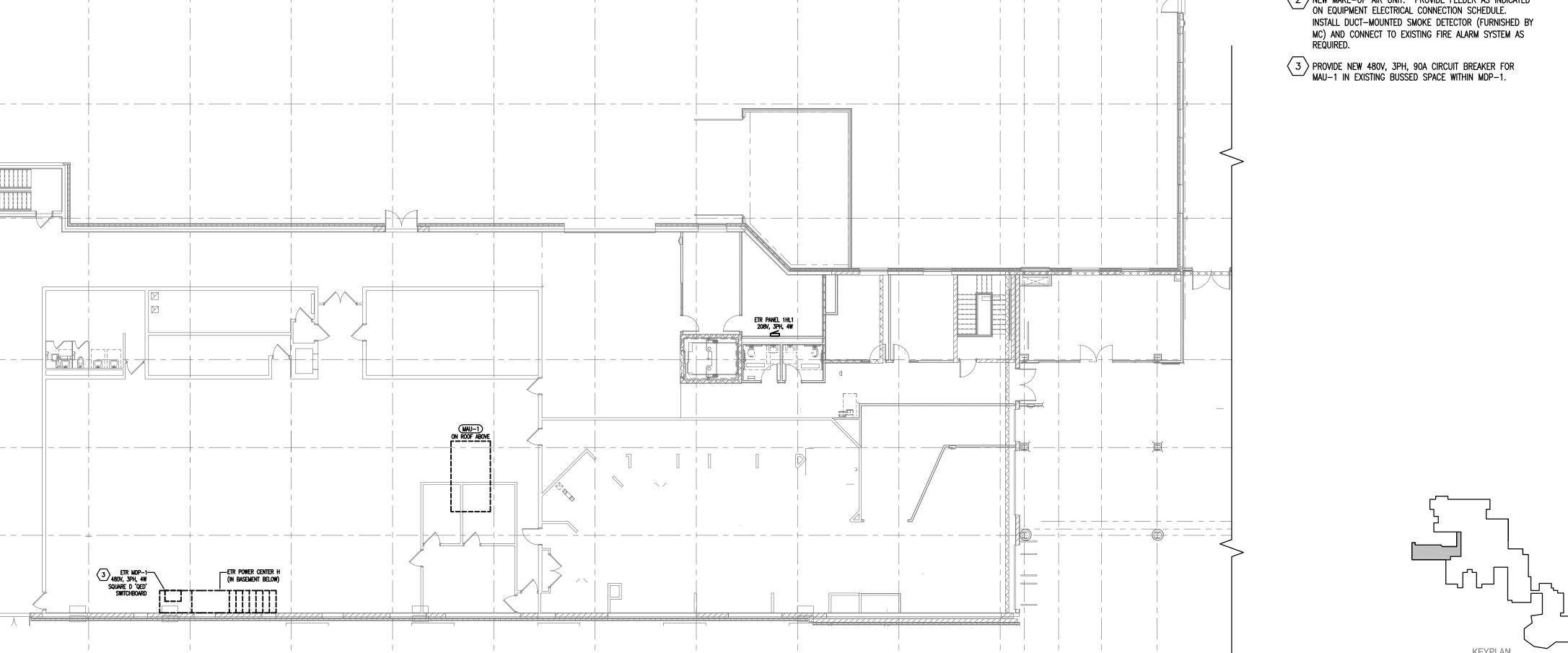
MCA MOCP NOTES TAG DESCRIPTION WIRE & CONDUIT CIRCUIT PHASE MUA-1 MAKE UP AIR UNIT 480/3 4#3, 1#8G, 1-1/4"C MDP 1-3

 UNIT PROVIDED WITH INTEGRAL DISCONNECT SWITCH. COORDINATE CONNECTIONS WITH ACTUAL EQUIPMENT PROVIDED. FINAL MOCP BASED ON NAMEPLATE INFORMATION ACCORDING TO THE NEC.

KEYED NEW WORK NOTES

EXISTING MAU TO BE REMOVED. DISCONNECT AND REMOVE

FEEDER AND CONDUIT FROM EXISTING UNIT TO SOURCE. (2) NEW MAKE-UP AIR UNIT. PROVIDE FEEDER AS INDICATED ON EQUIPMENT ELECTRICAL CONNECTION SCHEDULE. INSTALL DUCT-MOUNTED SMOKE DETECTOR (FURNISHED BY MC) AND CONNECT TO EXISTING FIRE ALARM SYSTEM AS



FIRST FLOOR PLAN - NEW WORK

1 PARTIAL ROOF PLAN — NEW WORK

KEYPLAN

395 E WATERFRONT DRIVE #200 TEL (412) 461-4935

BDA PROJECT # 200801

FOR REVIEW

12/17/2020

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