

## MECHANICAL SYMBOLS LIST

AC-1	TXF-1	EQUIPMENT SYMBOL
AIR DEVICES		
		CEILING DIFFUSER SUPPLY
		CEILING DIFFUSER RETURN
DUCT ACCESSORIES		
		VOLUME CONTROL DAMPER
CONTROLS AND SENSORS		
		THERMOSTAT
		EMERGENCY MANUAL DEVICE FOR HOOD
DUCTWORK		
		AIR DUCT W/ 1.5" ACOUSTICAL LINING
		FLEXIBLE DUCT
		FLEXIBLE CONNECTION
		RECTANGULAR DUCT (WIDTH X DEPTH)
		ROUND DUCT (DIAMETER)
		ROUND DUCT CROSS SECTION
		SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
		RETURN AIR RECTANGULAR DUCT CROSS SECTION
MECHANICAL ABBREVIATIONS		
AL	ACOUSTIC LINING	
CDS	CEILING DIFFUSER SUPPLY	
CDR	CEILING DIFFUSER RETURN	
CFM	CUBIC FEET OF AIR PER MINUTE	
DN	DOWN	
EG	EXHAUST GRILLE	
FC	FLEXIBLE CONNECTION	
FD/AD	FIRE DAMPER W/ACCESS DOOR	
MD	MOTORIZED DAMPER	
MAU	MAKE-UP AIR UNIT	
OA	OUTSIDE AIR	
RTU	ROOF TOP UNIT	
RG	RETURN GRILLE	
RA	RETURN AIR	
SEER	SEASONAL ENERGY EFFICIENCY RATIO	
SG	SUPPLY GRILLE	
SA	SUPPLY AIR	
VD	VOLUME DAMPER	
EF	EXHAUST FAN	
WT	WEIGHT	
(N)	NEW	
(E)	EXISTING	
DN	DOWN	
MECHANICAL DRAWING LIST		
M0.0	MECHANICAL NOTES & SYMBOLS	
M1.0	MECHANICAL FLOOR PLAN	
M1.1	MECHANICAL ROOF PLAN	
M2.0	MECHANICAL SCHEDULES	
M3.0	MECHANICAL DETAILS (1 OF 3)	
M3.1	MECHANICAL DETAILS (2 OF 3)	
M3.2	MECHANICAL DETAILS (3 OF 3)	
M4.0	MECHANICAL ENERGY COMPLIANCE FORMS (1 OF 2)	
M4.1	MECHANICAL ENERGY COMPLIANCE FORMS (2 OF 2)	
M5.0	MECHANICAL SPECIFICATIONS (1 OF 2)	
M5.1	MECHANICAL SPECIFICATIONS (2 OF 2)	
ENERGY CONSERVATION CODE OF NEW YORK STATE COMPLIANCE		
TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS, HVAC SYSTEMS AND SPECIFICATION ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CODE OF NEW YORK STATE 2020.		

## BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2020 BUILDING CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018, AND ALL RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
2. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018, CHAPTER 4.
3. AS PER C408.2.5 OF INTERNATIONAL ENERGY CONSERVATION CODE 2018, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS OF THE ACTUAL INSTALLATION BE PROVIDED TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER.
4. AS PER C408.3.2 OF INTERNATIONAL ENERGY CONSERVATION CODE 2018, CONSTRUCTION DOCUMENT SHALL REQUIRE THAT AN OPERATING MANUAL AND A MAINTAINED MANUAL BE PROVIDED TO THE BUILDING OWNER WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.

5. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2020 BUILDING CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018, REQUIREMENTS AS OUTLINES IN SECTION.

6. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.

7. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018 CHAPTER 4 AND CHAPTER 5.

8. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:

- A. STANDARDS OF HEATING - 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018.
- B. DUCT CONSTRUCTION AND INSTALLATION-SECTION 603 OF 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018.
- C. AIR INTAKES, EXHAUSTS AND RELIEF-SECTION 401 OF 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018.
- D. AIR-FILTERS-SECTION 605 OF 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018.
- E. MANUAL AND AUTOMATIC FIRE AND SMOKE CONTROLS FOR AIR DISTRIBUTION SYSTEMS-SECTION 510 OF 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018.

9. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.

10. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018 CHAPTER 4 SECTION 403.3. HVAC SYSTEM SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS AS REQUIRED BY INTERNATIONAL ENERGY CONSERVATION CODE 2018, SECTION 408.2.2.

11. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION 606, 2020 MECHANICAL CODE OF NEW YORK STATE; BASE CODE ICC IMC 2018, TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.

12. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.

13. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET, ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.

14. 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-8  
OUTSIDE OF BUILDING: R-8

## GENERAL NOTES

1. 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 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 OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER PRIOR TO SUBMITTING A PROPOSAL OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.

4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS 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 PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

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. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.

8. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.

9. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER, RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
10. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.

11. 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. MULTI-ROD SHALL BE SIMILAR TO FE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPACITY, WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

12. 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.

13. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).

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.

16. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VENTILATION AND FIRE DAMPERS, AUTOMATIC DAMPERS, AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.

17. 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. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

26. 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.

27. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

28. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.

29. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES, WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.

30. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

## DEFINITIONS:

- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

## SCOPE OF WORK

### SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR (PLAN) DESIGN, DETAIL DRAWINGS, NOTES, RFIS, 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 THEREFOR. 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

## GENERAL NOTES

- A. ALL WORK SHALL COMPLY WITH ALL LOCAL AND STATE CODES AND AUTHORITIES HAVING JURISDICTION.
- B. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL REQUIRED PERMITS AND ARRANGE ALL REQUIRED INSPECTIONS.
- C. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER CONTRACTORS AND TRADES.
- D. THESE DRAWINGS, AS PREPARED, ARE DIAGRAMMATIC BUT SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. 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.
- E. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL THE EQUIPMENT INDICATED WITHIN THE MECHANICAL DRAWINGS UNLESS OTHERWISE NOTED. ALL EQUIPMENT SHALL BE UL LISTED. VERIFY EQUIPMENT LOCATION AND DIMENSIONS IN THE FIELD PRIOR TO FABRICATION AND / OR INSTALLATION.
- F. EACH UNIT GENERATING CONDENSATE SHALL BE PROVIDED WITH A CONDENSATE DRAIN WITH EXTERNAL 4" DEEP P-TRAP. EXTEND DRAIN TO A ROOF MOUNTED SPLASH PAD OR AN ACCEPTABLE LOCATION REQUIRED BY CODE.
- G. DUCT SIZES SHOWN ON DRAWINGS ARE CLEAR INSIDE DIMENSION.
- H. ALL METAL DUCT AND AIR DISTRIBUTION DEVICES SHALL BE INSULATED WITH R-6, 75 DENSITY FOIL-BACKED INSULATION WITH FIRE AND SMOKE RATING 25-50).
- I. ALL DUCTWORK SHALL BE FABRICATED, INSTALLED, SEALED, AND INSULATED PER THE LATEST ISSUE OF THE SMACNA LOW-VELOCITY DUCT MANUAL.
- J. ALL FLEX DUCT SHALL BE UL LISTED, R-6. FOIL-BACKED, CLASSIFIED AS A CLASS 1 AIR DUCT. MAXIMUM LENGTH IS TO BE 14'-0" PER DROP OR PER LOCAL CODE.
- K. THE CONTRACTOR SHALL COORDINATE DIFFUSER LOCATIONS ON SITE WITH THE MOST RECENT REFLECTED CEILING PLAN.
- L. THE CONTRACTOR IS TO MAKE ALL LOW-VOLTAGE WIRING CONNECTIONS FOR ALL HVAC EQUIPMENT INCLUDING TEMPERATURE CONTROLS, ROOF TOP UNITS, SMOKE DETECTORS AND CONTRACTOR PANEL.
- M. PROVIDE AND INSTALL SMOKE DUCT DETECTORS IN EACH AIR CONDITIONING UNIT RETURN DUCTS GREATER THAN 2000 CFM. CONTRACTOR SHALL PROVIDE INTERCONNECTION AND WIRE TO THE FIRE ALARM CONTROL PANEL IF REQUIRED. DUCT DETECTORS SHALL HAVE REMOTE TEST STATIONS LOCATED IN THE OFFICE NEAR THE RESPECTIVE THERMOSTATS. VERIFY CODE REQUIREMENTS FOR DUCT DETECTORS IN BOTH THE SUPPLY AND RETURN AIR STREAMS.
- N. THE ENTIRE INSTALLATION SHALL BE GUARANTEED FREE OF DEFECTS AND CONTRACTOR SHALL REPAIR AND / OR REPLACE ANY DEFECTIVE MATERIALS OR EQUIPMENT AT NO COST TO THE OWNER FOR A MINIMUM PERIOD OF ONE YEAR FROM THE DATE OF ACCEPTANCE BY ARCHITECT OR ENGINEER.
- O. ALL WORK SHALL BE SUBJECT TO THE ACCEPTANCE AND APPROVAL OF THE ARCHITECT AND OWNER. THE ARCHITECT SHALL BE NOTIFIED OF ANY AND ALL DISCREPANCIES BETWEEN FIELD CONDITIONS AND THE CONTRACT DOCUMENTS BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. FAILURE TO GIVE PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY DEFECTS AND ALL WORK ARISING FROM SUCH FAILURE TO COORDINATE DISCREPANCIES TO THE SATISFACTION OF THE ARCHITECT WITHOUT ADDITIONAL COST TO THE OWNER.
- P. THE CONTRACTOR SHALL, UPON COMPLETION OF PROJECT, PERFORM A COMPLETE TEST AND BALANCE OF ALL EQUIPMENT. PROVIDE A WRITTEN REPORT TO THE ARCHITECT. ALL CAPACITIES MUST BE SET TO WITHIN  $\pm 10\%$  OF AMOUNTS INDICATED ON THE FLOOR PLAN AND SCHEDULES.
- Q. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/ROOF BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWING FOR FIRE RATING OF THE WALLS/ROOFS.
- R. CONTRACTOR TO PROVIDE CORD OPERATED DAMPERS IN INACCESSIBLE CEILINGS.
- S. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.

## KEYED NOTES

1. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
2. PROVIDE PROGRAMMABLE THERMOSTAT FOR RTU-1 WITH LOCKING COVER. COORDINATE FINAL LOCATION OF THERMOSTAT WITH ARCHITECT/OWNER. SEAL WALL OPENINGS WITH CAULK. AVOID LOCATING NEAR OR ABOVE SOURCES OF HEAT. PROVIDE REMOTE SENSOR IN RETURN AIR DUCT & WIRE BACK TO T-STAT.
3. PROVIDE PROGRAMMABLE THERMOSTAT FOR EDH-1 WITH LOCKING COVER. COORDINATE FINAL LOCATION OF THERMOSTAT WITH ARCHITECT/OWNER.
4. THE HATCHED AREA IS NOT IN THE PROJECT SCOPE. MECHANICAL CONTRACTOR SHALL COORDINATE THE EXACT SCOPE OF WORK WITH ARCHITECT/OWNER.
5. INSTALL THE ELECTRIC DUCT HEATER (EDH-1) AS PER MANUFACTURER RECOMMENDATION. CONTRACTOR TO VERIFY THE EXACT LOCATION IN FIELD BEFORE INSTALLATION.

The diagram illustrates a detailed HVAC system layout for a building. Key components include:

- Supply Air Ducts:** A large duct system on the left, labeled with dimensions and labels like [440] 10X10 UP 1, 14X6 (400), 12X6 (300), 24X6 (800), and 32X8 (7200).
- Return Air Ducts:** A duct system on the right, labeled with dimensions and labels like 20X12 (1600), 14X6 (400), 12X6 (300), and 32X20 (2000).
- Equipment:** Various pieces of HVAC equipment are shown, including a central fan unit labeled RG-1 [1600], a 5.0 TON RTU-1 unit, and a 15KW EDH-1 unit.
- Control Components:** Components like CDS-1 (400) and EG-1 (300) are labeled, along with a fire detector labeled EG-2 [140].
- Annotations:** Red text overlays "Property of" and "Engineers" are prominently displayed across the diagram. A note at the bottom right states: "ELECTRIC WATER HEATER BY PLUMBING CONTRACTOR. REFER TO PLUMBING DRAWINGS FOR MORE DETAILS."

# MECHANICAL FLOOR PLAN

1/4" = 1'-0"

# Y ENGINEERS

BY DATE

# MECHANICAL FLOOR PLAN

SHEET  
M1 0

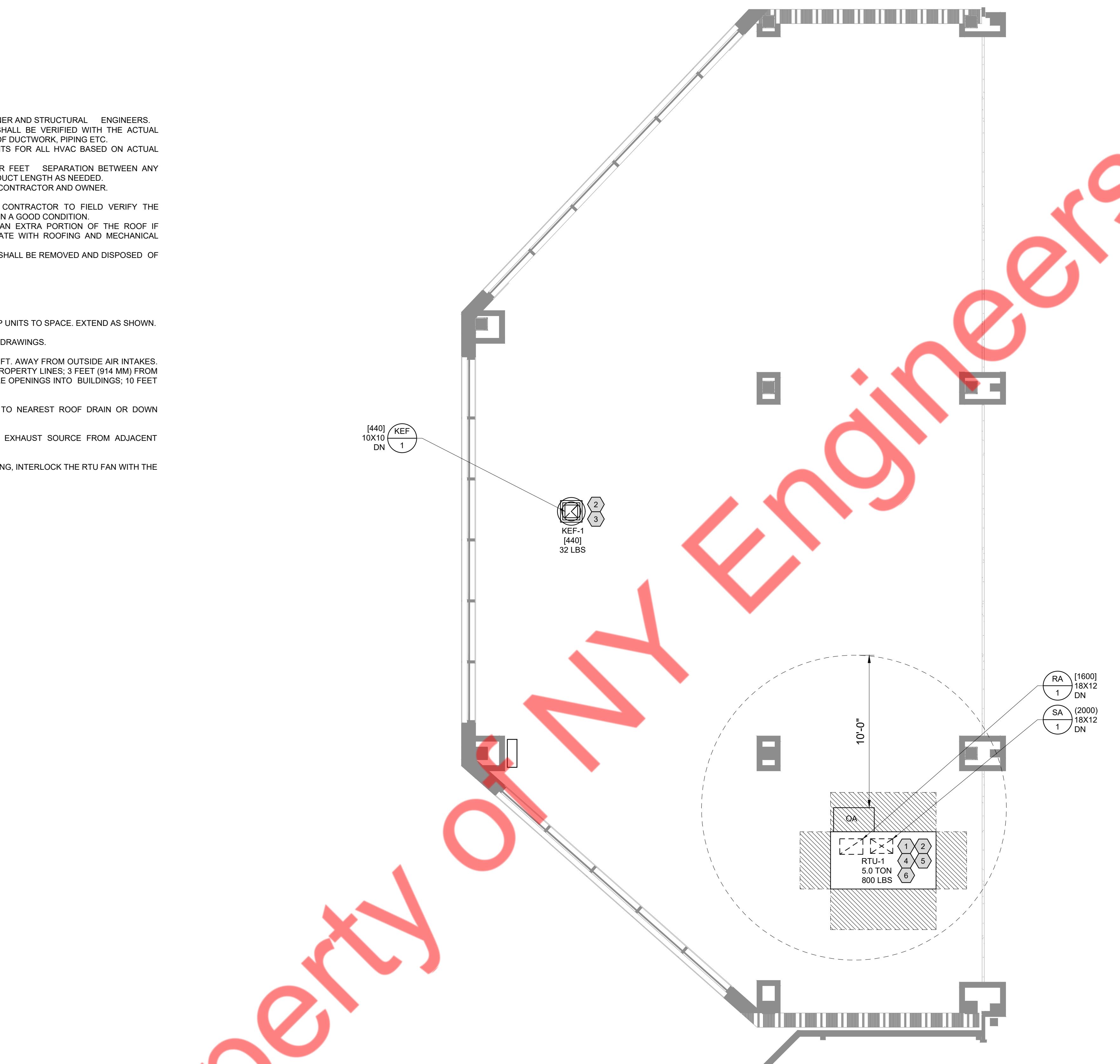
B STORE#:  
E#:  
TE:  
OJ. MGR.

## GENERAL NOTES

- A. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
- B. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
- C. CONTRACTOR TO COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PROVIDED BY ALL CONTRACTORS.
- D. ALL SOURCE OF EXHAUST MECHANICAL INTAKE SHALL MAINTAIN 10 LINEAR FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.
- E. TEST AND BALANCE AIR SYSTEMS, PROVIDE REPORT TO GENERAL CONTRACTOR AND OWNER.
- F. MAU WEIGHT IS INCLUDING ROOF CURBS AND/OR ADAPTERS.
- G. EXISTING ROOF CURBS TO BE REUSED WHEREVER POSSIBLE. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING CURBS. REPLACE EXISTING CURBS IF NOT IN A GOOD CONDITION.
- H. PATCH THE EXTRA PENETRATIONS AS & IF REQUIRED OR CUT AN EXTRA PORTION OF THE ROOF IF EXISTING PENETRATION IS NOT FEASIBLE/WORKABLE. COORDINATE WITH ROOFING AND MECHANICAL CONTRACTOR.
- I. MATERIAL FROM EXISTING SYSTEM WHICH IS RENDERED USELESS SHALL BE REMOVED AND DISPOSED OF OFF SITE.

## KEYED NOTES

1. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK FROM ROOFTOP UNITS TO SPACE. EXTEND AS SHOWN.
2. COORDINATE FINAL LOCATION OF EQUIPMENT WITH STRUCTURAL DRAWINGS.
3. ALL EXHAUST AIR SOURCES ON THE ROOF SHALL BE MINIMUM 10 FT. AWAY FROM OUTSIDE AIR INTAKES. EXHAUST TERMINATION SHALL BE 10 FEET (3048 MM) FROM THE PROPERTY LINES; 3 FEET (914 MM) FROM EXTERIOR WALLS AND ROOFS; 10 FEET (3048 MM) FROM OPERABLE OPENINGS INTO BUILDINGS; 10 FEET (3048 MM) ABOVE ADJOINING GRADE.
4. CONTRACTOR TO CONNECT CONDENSATE DRAIN FROM RTU-1 TO NEAREST ROOF DRAIN OR DOWN SPOUTS. COORDINATE IN FIELD.
5. CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF ANY EXHAUST SOURCE FROM ADJACENT TENANTS SHOULD BE AT LEAST 10' AWAY FROM THE RTU-1.
6. THE UNIT SHALL BE USED EXCLUSIVELY FOR COOLING. FOR HEATING, INTERLOCK THE RTU FAN WITH THE DUCT HEATER (EDH-1).



MECHANICAL ROOF PLAN

1  
M1.1

1/4" = 1'-0"

SHEET  
**M1.1**  
EBB STORE#: \_\_\_\_\_  
FILE#: \_\_\_\_\_  
DATE: \_\_\_\_\_  
PROJ. MGR. \_\_\_\_\_

JOB LOCATION: \_\_\_\_\_

MECHANICAL ROOF PLAN

NY ENGINEERS

REVISIONS  
NO. DESCRIPTION BY DATE

ROOF TOP UNIT SCHEDULE																							
UNIT ID	MANUFACTURER	EFFICIENCY	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			GAS HEAT			COOLING			ELECTRICAL				NOTES				
						TOTAL CFM	OUTSIDE AIR CFM	EXTERNAL STATIC PRESSURE (IN. W.G.)	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	AMBIENT DB (°F)	ENTERING DB / WB (°F)	VOLTS	PHASE	MCA(A)	MOPC(A)					
RTU-1	YORK	STANDARD	ZE060H10B2A1AAA1A4	SEE PLAN	5	2000	400	0.6	-	-	59.6	45.1	95	80/67	208-230	3	27.1	35	11.80	14	-	800	1-17

**NOTES / ACCESSORIES -**

- 1 ALL EQUIPMENT MUST BE HIGH EFFICIENT, MEETING OR EXCEEDING THE BRANDS MINIMUM REQUIREMENTS.
- 2 ELECTRICAL CONNECTION TO BE SINGLE POINT AND TO BE THROUGH THE BOTTOM OF THE UNIT.
- 3 PROVIDE DISCONNECT SWITCH AND AN UNPOWERED GFCI RECEPTACLE.
- 4 14" ROOF CURB - CONTRACTOR SHALL FIELD INSULATE. SHIP ASAP AHEAD OF THE UNIT.
- 5 CONDENSATE DRAIN WITH 2" DEEP VENTED TRAP DISCHARGE TO SPLASH BLOCK ON ROOF.
- 6 CABINET WITH 1/2" FIBERGLASS INSULATION.
- 7 THE UNIT SHALL BE USED EXCLUSIVELY FOR COOLING. FOR HEATING, INTERLOCK THE RTU FAN WITH THE DUCT HEATER (EDH-1).
- 8 ENTHALPY ECONOMIZER WITH BAROMETRIC RELIEF. PROVIDE FDD.
- 9 PROVIDE 8-WIRE, 24 VAC, AUTOMATIC CHANGEOVER, 2-STAGE HEAT / COOL, REMOTELY PROGRAMMABLE THERMOSTAT.
- 10 REMOTE SENSORS SHALL BE PROVIDED IN SPACE WIRED BACK TO PROGRAMMABLE, 24 HOUR, 7 DAY, THERMOSTATS.
- 11 ANTI SHORT CYCLE TIMER.
- 12 THROWAWAY 2" FILTERS (MERV 8).
- 13 PROVIDE LOW AMBIENT COOLING CAPABILITY DOWN TO 0 DEGREES F.
- 14 PROVIDE ALL COMPRESSORS WITH 5 YEAR WARRANTY.
- 15 RETURN AIR SMOKE DETECTOR - UNIT MOUNTED.
- 16 VFD SUPPLY FAN.
- 17 PROVIDE HOT GAS REHEAT WITH ASSOCIATED CONTROLS AND SENSORS FOR DEHUMIDIFICATION CONTROL.

AIR TERMINAL DEVICE SCHEDULE									
TAG	MANUFACTURER	MODEL	TYPE	CFM RANGE	NECK SIZE	NOMINAL FACE SIZE			
						6"Ø	8"Ø	10"Ø	24X24
CDS-1	TITUS	TMSA	SUPPLY DIFFUSER	0-105	6"Ø				24X24
	TITUS	TMSA	SUPPLY DIFFUSER	150-350	8"Ø				24X24
	TITUS	TMSA	SUPPLY DIFFUSER	350-500	10"Ø				24X24
	TITUS	TMSA	SUPPLY DIFFUSER	500-600	12"Ø				24X24
RG-1	TITUS	350RL	RETURN GRILLE	0-1400	22X22				24X24
EG-1	TITUS	350RL	EXHAUST GRILLE	0-300	12X12/24x24	12X12/24x24			

**NOTES:**

- 1) ALL DIFFUSERS : CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS TO
- 2) REFER ARCHITECTURAL DRAWINGS FOR CEILING TYPE.
- 3) COORDINATE COLOR/FINISH WITH ARCHITECT.
- 4) NOISE CRITERIA: <30 dBA
- 5) PROVIDE VOLUME CONTROL DAMPER AS ACCESSORY FOR ALL AIR TERMINAL FOR AIR BALANCING.

EXHAUST FANS SCHEDULE													
TAG	QUANTITY	FLOW RATE	EXTERNAL		FAN SPEED	ELECTRIC DATA			SONES	BASIS OF DESIGN		WEIGHTS (LBS)	REMARK
			STATIC PRESSURE	IN. W.G.		V/PH/HZ	MOTOR HP	FLA (AMPS)		MANUFACTURER	MODEL		
KEF-1	1	440	0.8	1704	115/60/1	1/6	2.8	10.7	GREENHECK	G-095-VG	31	1,2,3	

**NOTES:**

1. PROVIDE ALL NECESSARY ACCESSORIES AS PER MANUFACTURER'S RECOMMENDATIONS.
2. PROVIDE ROOF CURB, NEMA 3R DISCONNECT SWITCH, UL CERTIFIED, THERMAL OVERLOAD PROTECTION.
3. INTERLOCK OPERATION OF KEF-1(N) WITH RTU-1.

AIR BALANCE				
UNIT	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
RTU-1	2325	400	1925	0 CFM
KEF-1	-	-	-	440 CFM
TOTAL:	2325 CFM	400 CFM	1925 CFM	440 CFM
PRESSURE:	(KITCHEN SPACE)	-40 CFM	NEGATIVE	

ELECTRIC DUCT HEATER SCHEDULE														
UNIT TAG	LOCATION	DUCT SIZE			DUCT HEATER DIMENSIONS (INCH)			ELECTRICAL SELECTION			MANUFACTURER: GREENHECK			
		W	H	W	H	D	KW	AMPS	V	PH	Hz	MODEL	HEATER TYPE	REMARKS
EDH-1	SEE PLAN	32	20	32	20	6	15	18.0	480	3	60	IDHE	FLANGE	INTERLOCK WITH RTU-1

**NOTES:**

1. INSTALL ELECTRIC DUCT HEATER AS PER MANUFACTURER'S RECOMMENDATION.
2. PROVIDE T-STAT AND WIRE TO DUCT HEATER.
3. PROVIDE SCR CONTROLLER, DISCONNECT SWITCH, VAPOR BARRIER, DUST TIGHT BOX, AUTOMATIC THERMAL CUTOUT, AIR FLOW SWITCH & FAN INTERLOCK SWITCH.

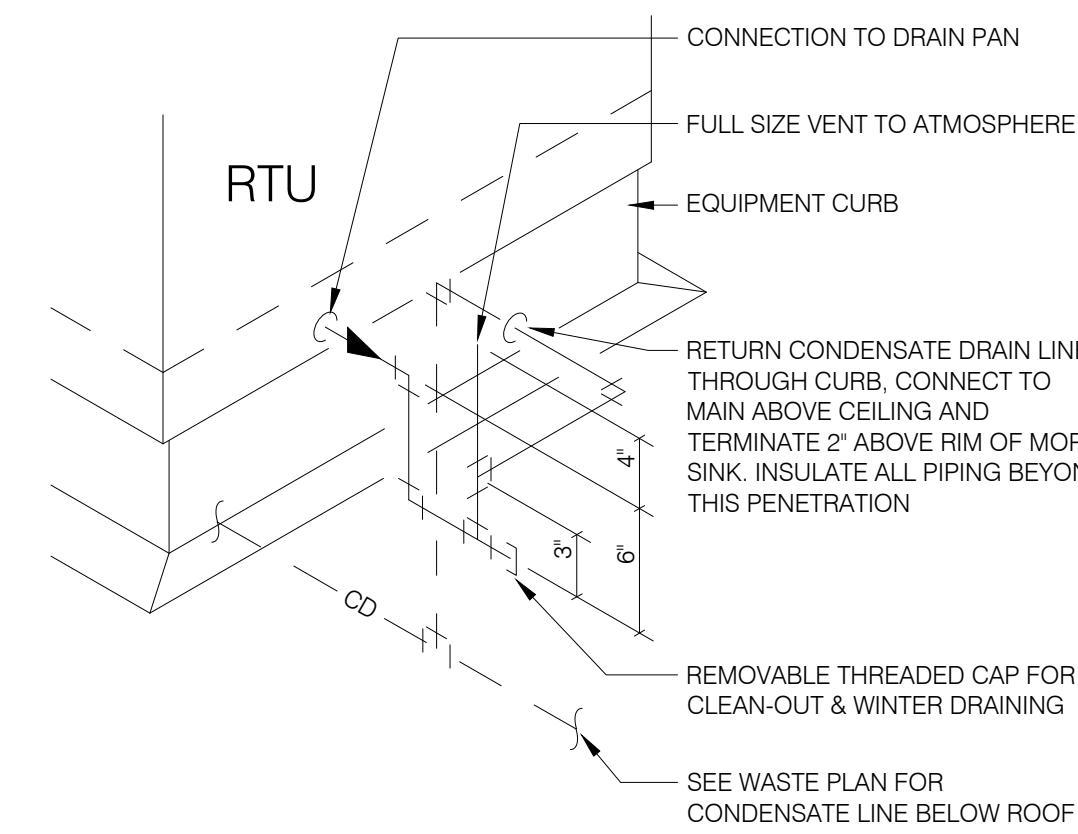
NY ENGINEERS

NO.	DESCRIPTION	BY	DATE

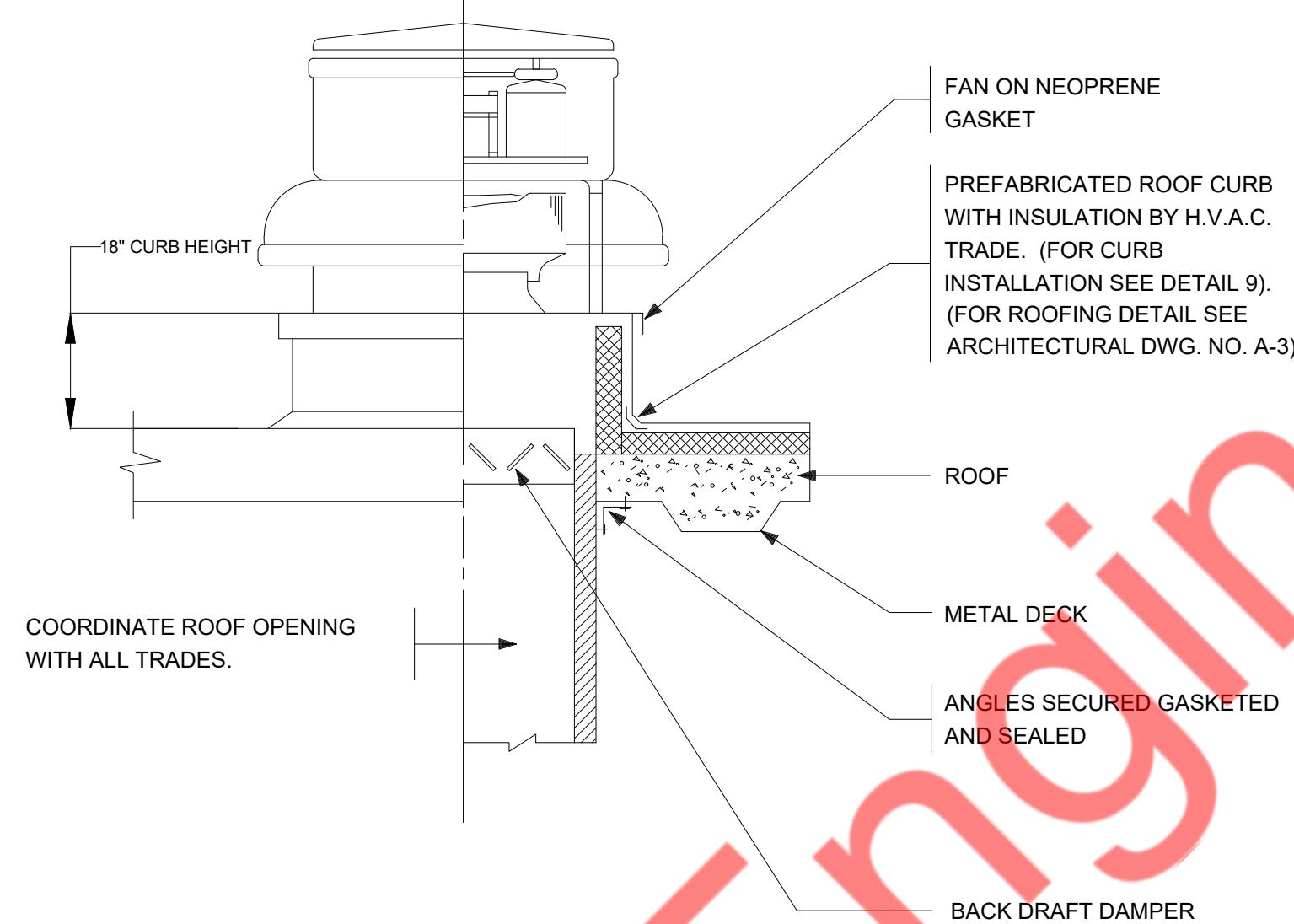
JOB LOCATION:

MECHANICAL SCHEDULES

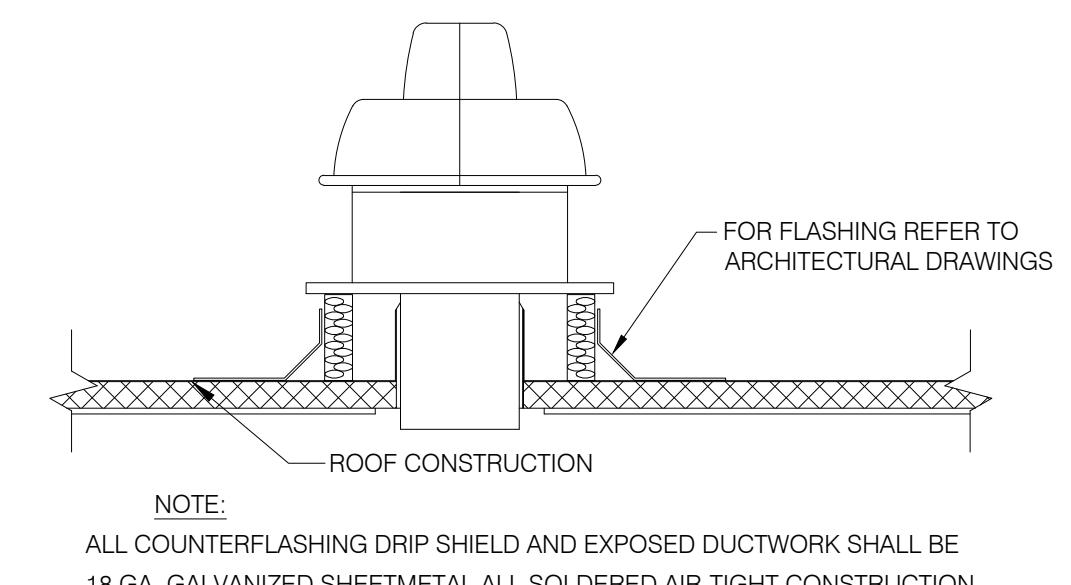
SHEET  
**M2.0**  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.



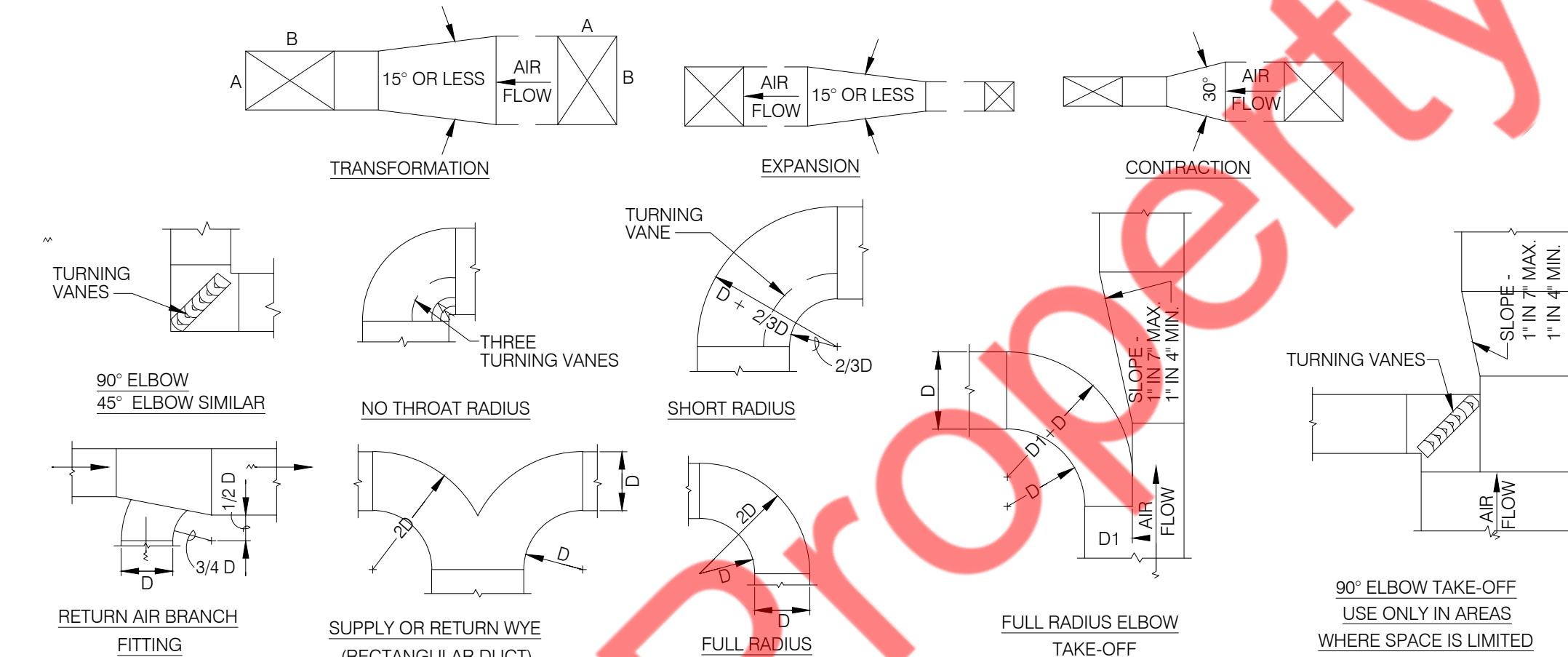
# **RTU CONDENSATE DRAIN**



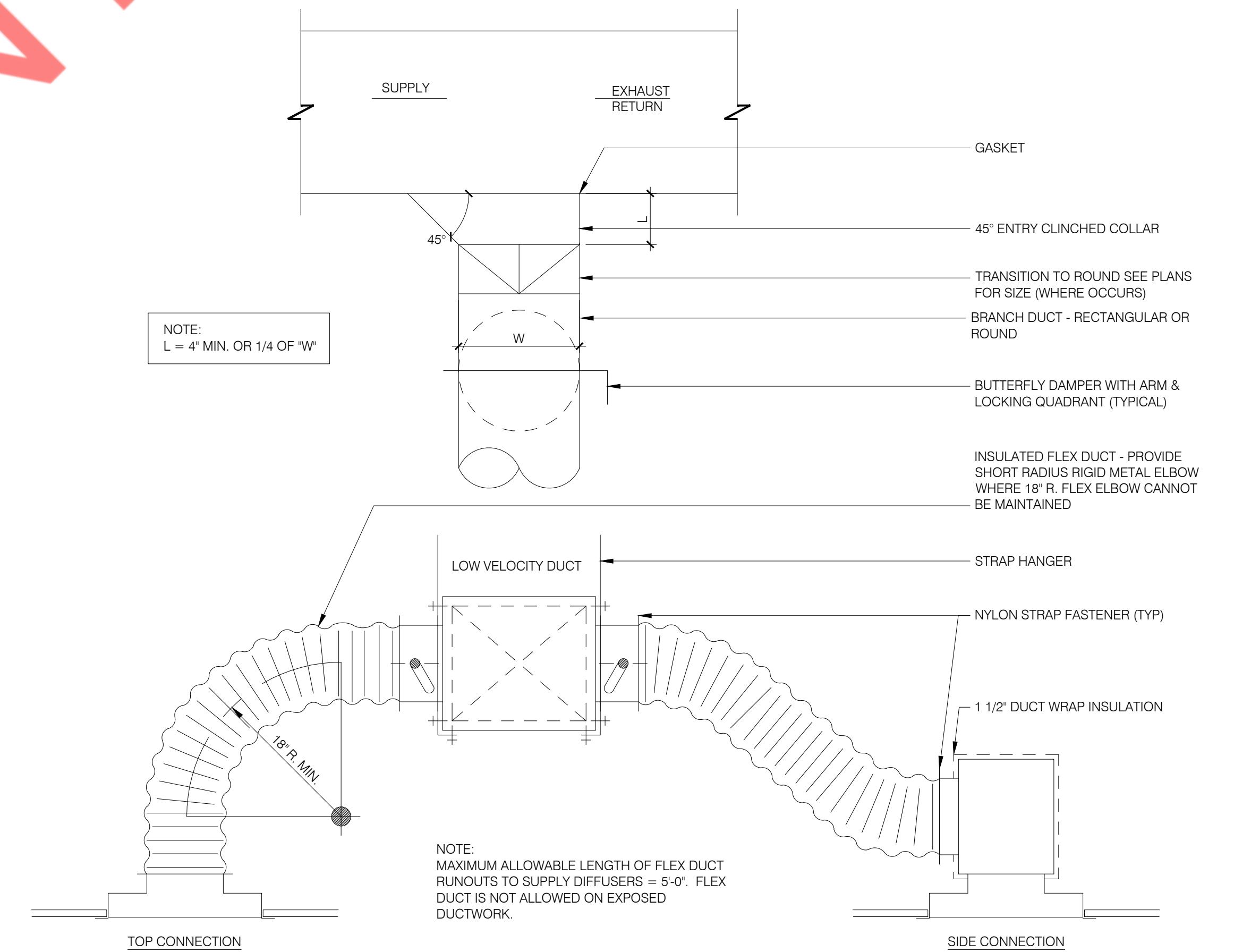
**DOWN BLAST FAN** N.T.S. **2**



## **ROOF MOUNTED EXHAUST CAP** N.T.S. **1**



## **TYPICAL DUCTWORK DETAILS** N.T.S.



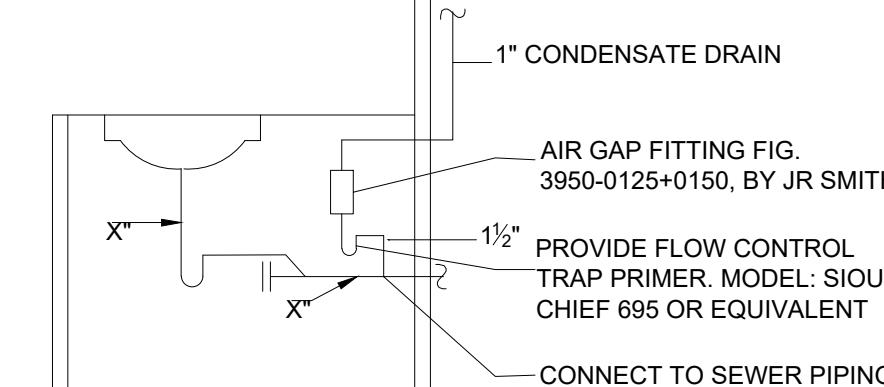
## **CEILING DIFFUSER CONNECTIONS** N.T.S. **4**

OB LOCATION:

## MECHANICAL DETAILS (1 OF 3)

SHEET

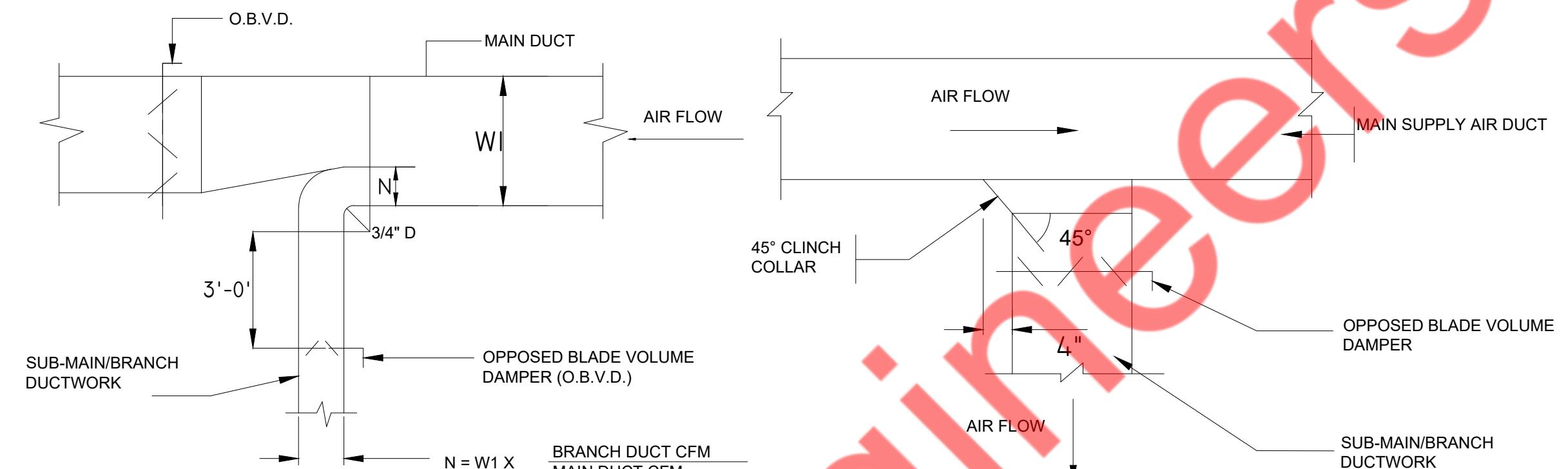
# M3.0



NOTE:  
LOCATE AIR GAP FITTING AND PIPING  
WITHIN SINK/LAVATORY ENCLOSURE.

AIR GAP FITTING DETAIL N.T.S.

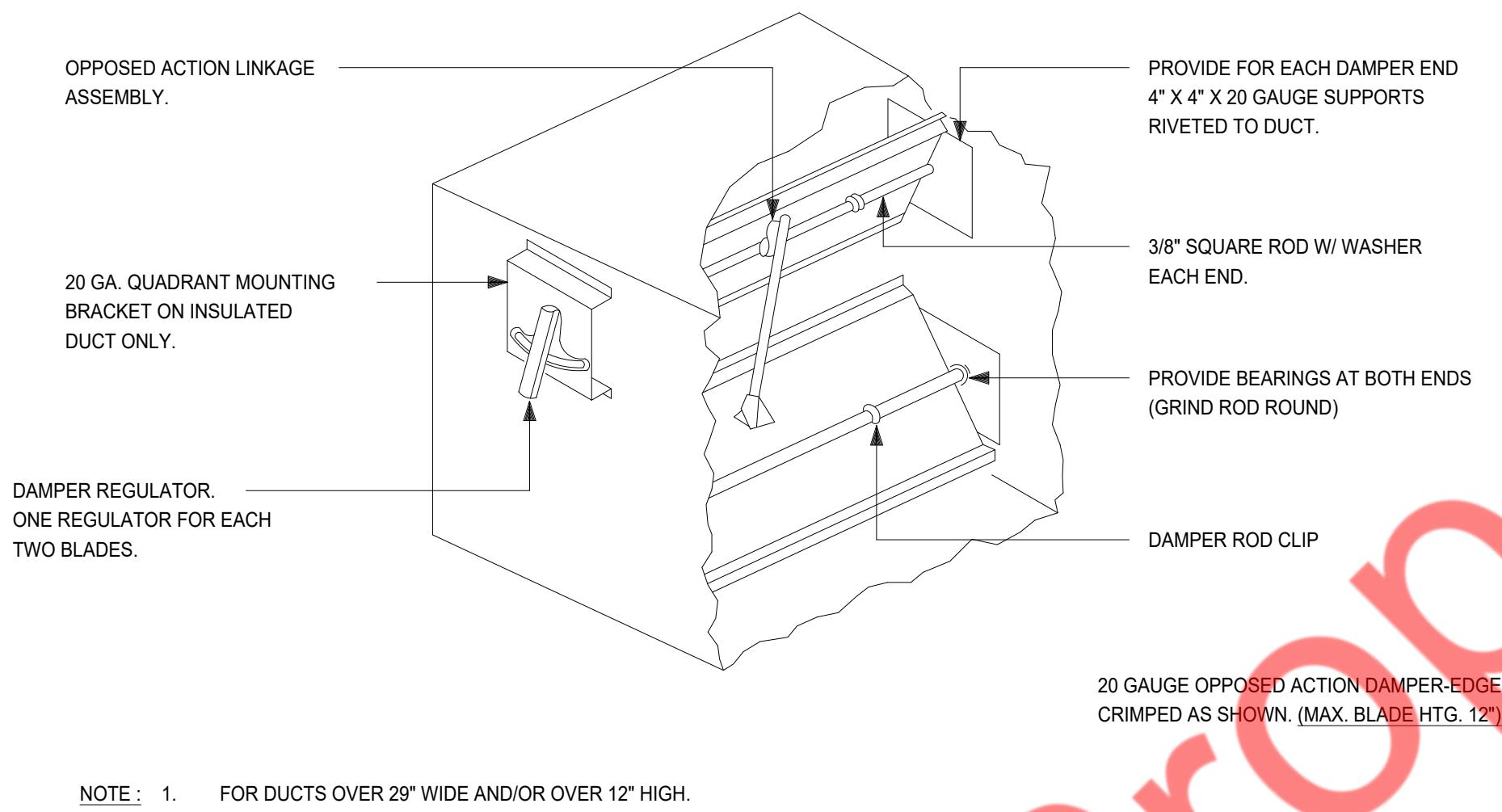
2



NOTE:  
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE  
DUCTWORK IS INDICATED AS THIS

SUPPLY AIR DUCTWORK SUBMAIN/BRANCH DUCT CONNECTION N.T.S.

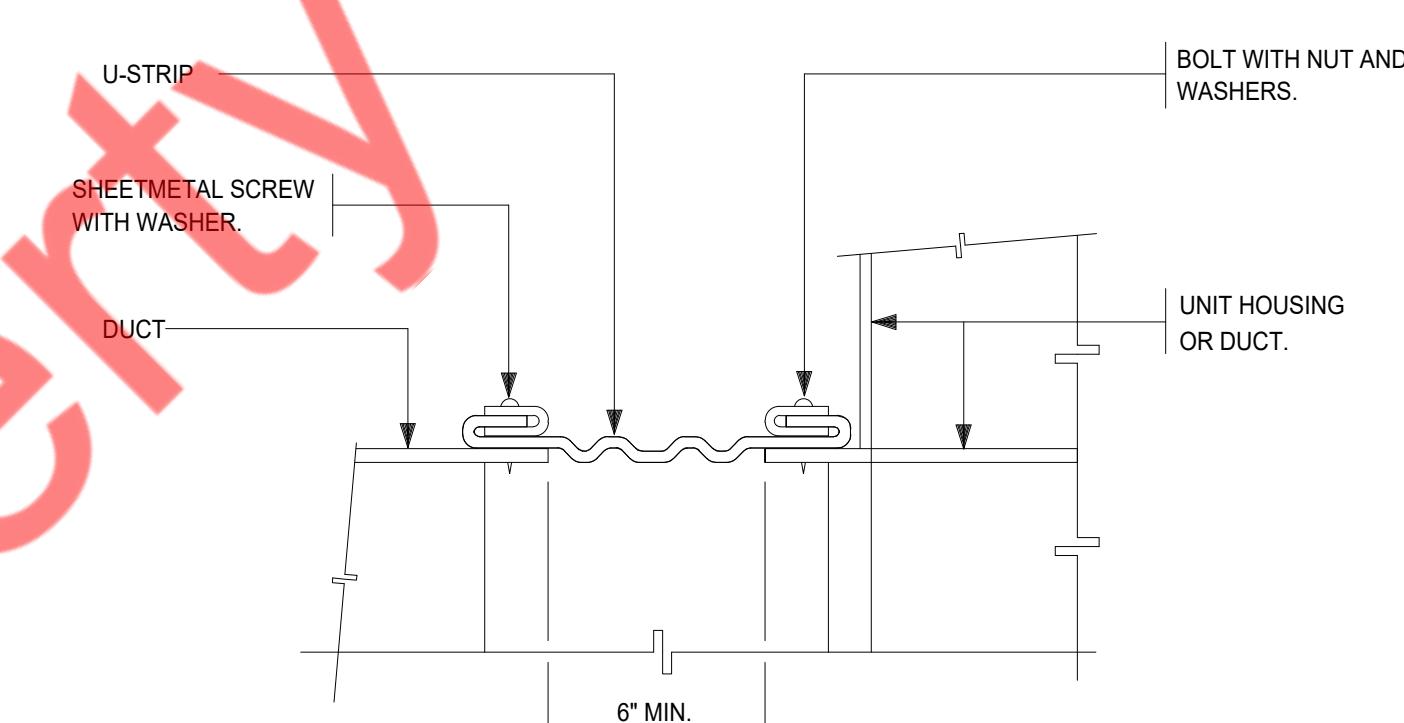
1



NOTE: 1. FOR DUCTS OVER 28" WIDE AND/OR OVER 12" HIGH.

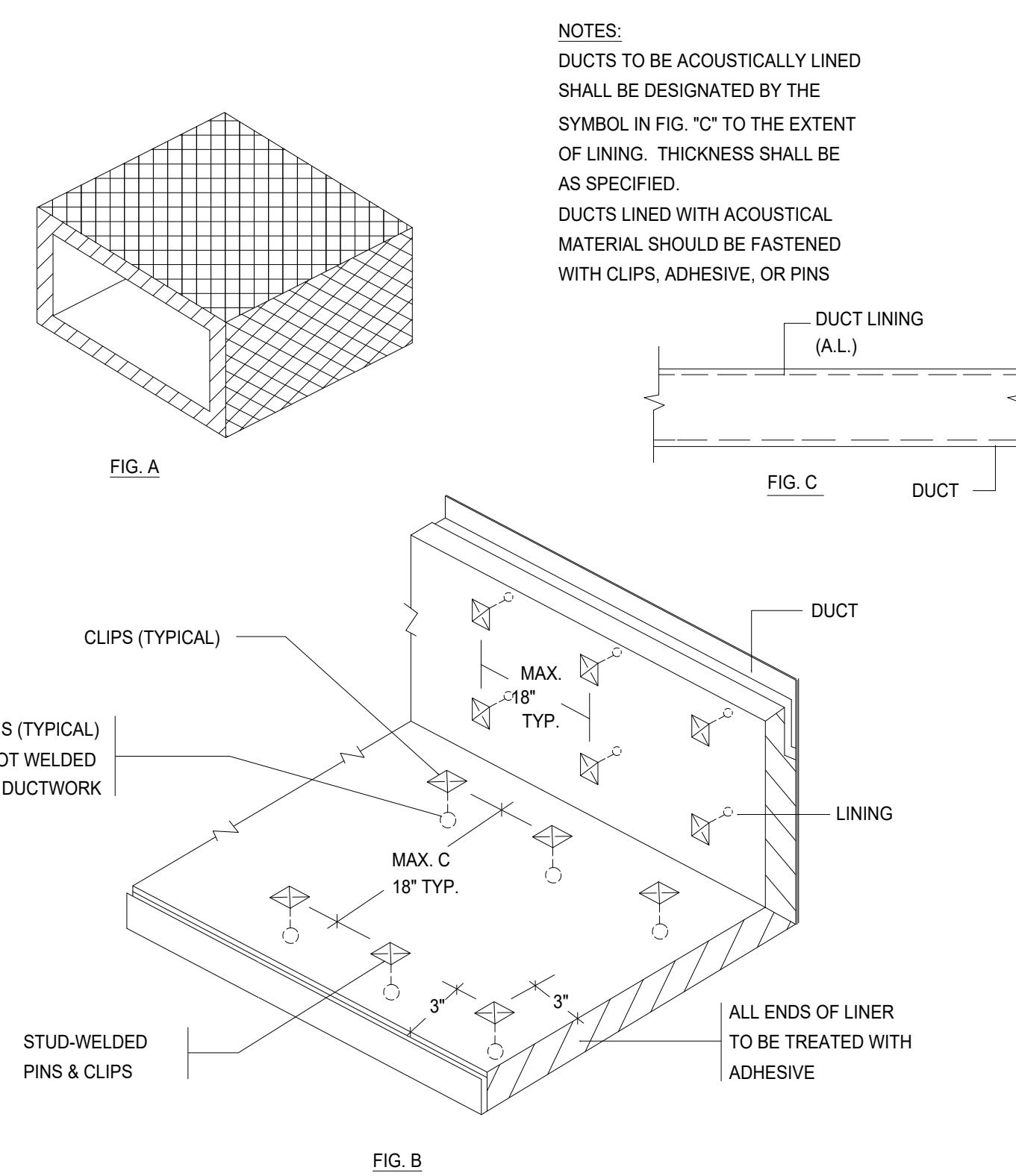
LOW PRESSURE BALANCING DAMPER N.T.S.

5



FLEXIBLE CONNECTION (DUCT EQUIPMENT) N.T.S.

4



ACOUSTICAL TREATMENT DUCT LINING N.T.S.

3

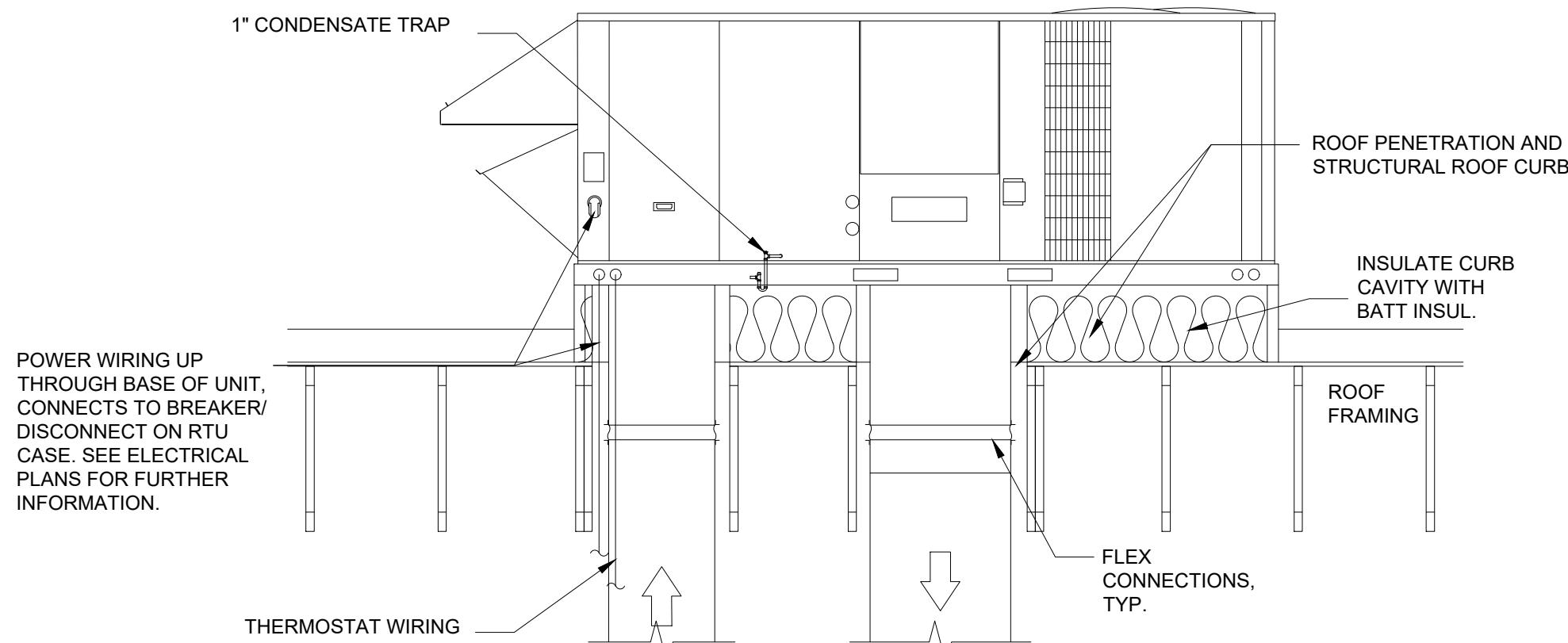
NY ENGINEERS

REVISIONS  
NO. DESCRIPTION  
BY  
DATE

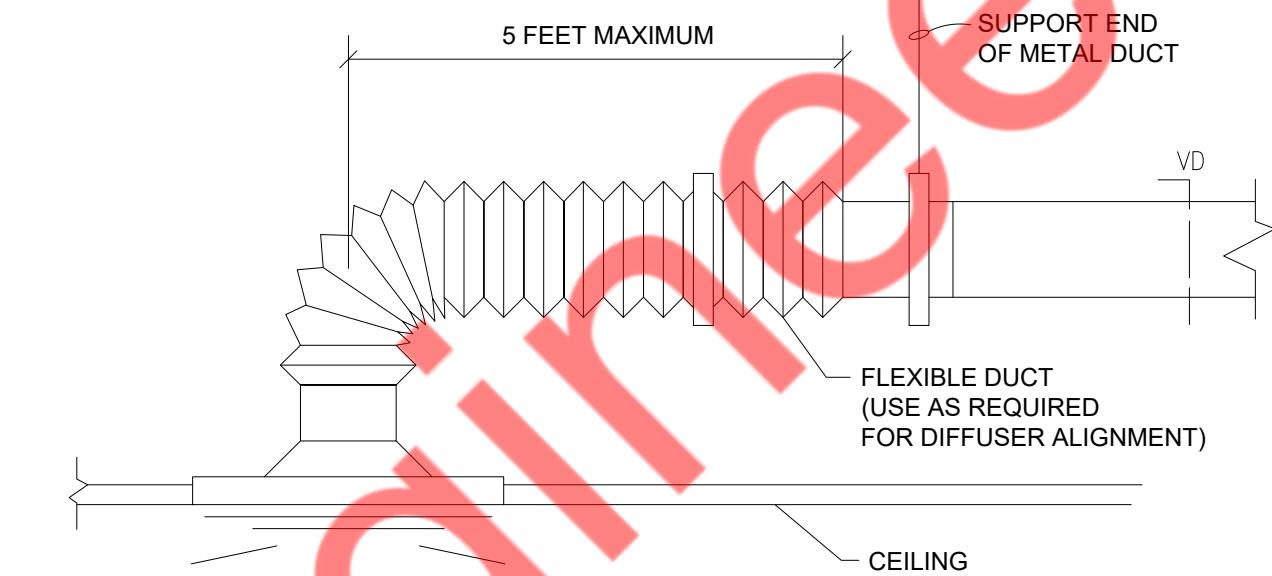
JOB LOCATION:

MECHANICAL DETAILS (2 OF 3)

SHEET  
M3.1  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.



**TYPICAL ROOF TOP UNIT DETAIL** N.T.S. | 2



**CEILING DIFFUSER CONNECTION DETAIL** N.T.S. | 1

Property of NY Engineers

NY ENGINEERS

NO.	DESCRIPTION	BY	DATE
-----	-------------	----	------

JOB LOCATION:

MECHANICAL DETAILS (3 OF 3)

**SHEET**  
**M3.2**

EBB STORE#:
FILE#:
DATE:
PROJ. MGR.

## MECHANICAL SPECIFICATION:

### HVAC DUCTWORK - SHEET METAL

- 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.
- 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 ASHRAE.
- PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.
- SUPPLY AND RETURN DUCTWORK 10' FROM ALL HVAC UNITS SHALL BE LINED WITH 1.5" ACOUSTICAL LINING.
- RE-INSULATE ALL DUCTWORK AND PIPING IN WHICH INSULATION HAS BEEN REMOVED OR DAMAGED WITH INSULATION EQUAL TO THE EXISTING INSULATION.
- 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.
- 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.
- UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 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.
- ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.
- ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.
- 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.
- COORDINATE DIFFUSER, REGISTER, AND GRILL LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING, AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
- ALL AIR HANDLING UNITS SHALL OPERATE WITHOUT MOISTURE CARRYOVER.
- LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVING.
- 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.
- UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.
- RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.
- 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.
- PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL SMOKE DETECTORS, FIRE DAMPERS, SMOKE DAMPERS, VOLUME DAMPERS, COILS, AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.
- PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS, VALVES, AND MECHANICAL EQUIPMENT.
- ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.
- 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.
- SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

### SECTION 0101 - QUALITY OF WORK

#### 1.1 WORKMANSHIP

- ALL WORK SHALL BE FREE FROM DEFECTS IN MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE.
- 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.
- UPON COMPLETION OF THE WORK THE CONTRACTOR SHALL REMOVE FROM THE SITE, ALL TOOLS, DEMOLISHED APPLIANCES AND ANY SURPLUS MATERIAL.

#### 1.2 CODE COMPLIANCE

- ALL WORK SHALL MEET ALL STATE AND LOCAL CODES HAVING JURISDICTION.

#### END OF SECTION 0101

### SECTION 0102 - REQUIRED DOCUMENTS

#### 1.1 SHOP DRAWINGS

- 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

- 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

- 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

- 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.

- 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.

- 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

- INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
- FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

#### 1.2 PENETRATION FIRESTOPPING

- PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
- PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479.
- PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
- D- R-RATINGS: PER UL 1479.

#### 1.3 INSTALLATION

- IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.

#### 1.4 FIELD QUALITY CONTROL

- 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 ONE OR MORE THE FOLLOWING MATERIALS:

- LATEX SEALANT
- SILICONE SEALANT
- INTUMESCENT PUTTY
- MORTAR
- SILICONE FOAM
- PILLOWS/BAGS
- INTUMESCENT WRAP STRIPS
- INTUMESCENT COMPOSITE SHEET

#### 1.6 MANUFACTURERS

- HILTI CONSTRUCTION CHEMICAL, INC
- TREMO CO.
- 3M FIRE PROTECTION PRODUCTS

#### END OF SECTION 078413

### SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

#### PART 1 - GENERAL

##### 1.1 COMPONENTS

###### A. VIBRATION ISOLATORS:

- ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
- MOUNTS: DOUBLE-DEFLECTION TYPE.
- RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
- SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
- RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
- HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
- ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
- SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
- SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
- PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.

###### 11. RESILIENT PIPE GUIDES.

###### B. AIR-MOUNTING SYSTEMS:

- AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWS.
- RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWS.

###### C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.

###### D. VIBRATION ISOLATION EQUIPMENT BASES:

- STEEL BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS.
- INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE

#### 1.2 FIELD QUALITY CONTROL

- TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

#### PART 2 - PRODUCTS

##### 1.1 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES

- AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

- ACE MOUNTINGS CO., INC.
- AMBER/BOOTH COMPANY, INC.
- CALIFORNIA DYNAMICS CORPORATION.
- HILTI, INC.
- ISOLATION TECHNOLOGY, INC.
- KINETICS NOISE CONTROL.
- LOOS & CO.: CABLEWARE DIVISION.
- MASON INDUSTRIES.
- TOLCO INCORPORATED: A BRAND OF NIBCO INC.
- 10UNISTRUT: TYCO INTERNATIONAL, LTD.

#### END OF SECTION 230548

### SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

#### 1.1 SUMMARY

- TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

##### 1. AIR SYSTEMS: CONSTANT AND VARIABLE VOLUME SYSTEMS.

##### 2. MOTORS.

#### 1.2 QUALITY ASSURANCE

- 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

- THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDROSTATIC 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.
- THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDROSTATIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

#### 1.4 DUCT SCHEDULE

- ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

- THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.

- PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.

- 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.

- 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.

- ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.

- TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES

- INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.

- 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 ASTM E 84.

#### 1.2 FIELD QUALITY CONTROL

##### A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

##### 1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:

- CONCEALED, RECTANGULAR, ROUND AND FLAT-oval, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:

- FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

##### UNCONDITIONED SPACES WITHIN BUILDING:

##### WITHIN BUILDING ENVELOPE ASSEMBLY:

##### OUTSIDE OF BUILDING:

##### 1.4 ITEMS NOT INSULATED:

- FIBROUS-GLASS DUCTS.
- METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE AND ASHRAE/IESNA 90.1.
- FACTORY-INSULATED FLEXIBLE DUCTS.
- FACTORY-INSULATED PLENUMS AND CASINGS.
- FLEXIBLE CONNECTORS.
- VIBRATION-CONTROL DEVICES.
- FACTORY-INSULATED ACCESS PANELS AND DOORS.
- DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

#### 1.5 PRODUCTS

- THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

##### 1. JOHNS-MANVILLE

8. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.

END OF SECTION 233113

#### 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: METALAIR

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:

- a. CARNES.
- b. HART & COOLEY INC.
- c. KRUEGER.
- d. TITUS, INC.
- e. NAILOR INDUSTRIES INC.
- f. RUSKIN

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

#### THERMOSTATIC CONTROLS:

C403.4.1 THERMOSTATIC CONTROLS (MANDATORY)  
THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, NOT FEWER THAN ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

EXCEPTION: INDEPENDENT PERIMETER SYSTEMS THAT ARE DESIGNED TO OFFSET ONLY BUILDING ENVELOPE HEAT LOSSES, GAINS OR BOTH SERVING ONE OR MORE PERIMETER ZONES ALSO SERVED BY AN INTERIOR SYSTEM PROVIDED THAT BOTH OF THE FOLLOWING CONDITIONS ARE MET:

1. THE PERIMETER SYSTEM INCLUDES NOT FEWER THAN ONE THERMOSTATIC CONTROL ZONE FOR EACH BUILDING EXPOSURE HAVING EXTERIOR WALLS FACING ONLY ONE ORIENTATION (WITHIN  $\pm 45$  DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15240 MM).

2. THE PERIMETER SYSTEM HEATING AND COOLING SUPPLY IS CONTROLLED BY THERMOSTATS LOCATED WITHIN THE ZONES SERVED BY THE SYSTEM.

C403.4.1.2 DEADBAND (MANDATORY)  
WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEADBAND OF NOT LESS THAN 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.  
EXCEPTIONS:

1. THERMOSTATS REQUIRING MANUAL CHANGEOVER BETWEEN HEATING AND COOLING MODES.

2. REQUIRING PRECISION IN INDOOR TEMPERATURE CONTROL AS APPROVED BY THE CODE OFFICIAL.

C403.4.1.3 SETPOINT OVERLAP RESTRICTION (MANDATORY)  
WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE CONFIGURED TO PREVENT THE HEATING SETPOINT FROM EXCEEDING THE COOLING SETPOINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF-HOUR CONTROLS (MANDATORY)  
EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.  
EXCEPTIONS:

1. ZONES THAT WILL BE OPERATED CONTINUOUSLY.

2. ZONES WITH A FULL HVAC LOAD DEMAND NOT EXCEEDING 6,800 BTU/H (2 KW) AND HAVING A MANUAL SHUTOFF SWITCH LOCATED WITH READY ACCESS.

C403.4.2.1 THERMOSTATIC SETBACK (MANDATORY)  
THERMOSTATIC SETBACK CONTROLS SHALL BE CONFIGURED TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN (MANDATORY)  
AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR NOT FEWER THAN 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CONFIGURED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC START (MANDATORY)  
AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

Property of NY Engineers

NY ENGINEERS

REVISIONS  
NO. DESCRIPTION BY DATE

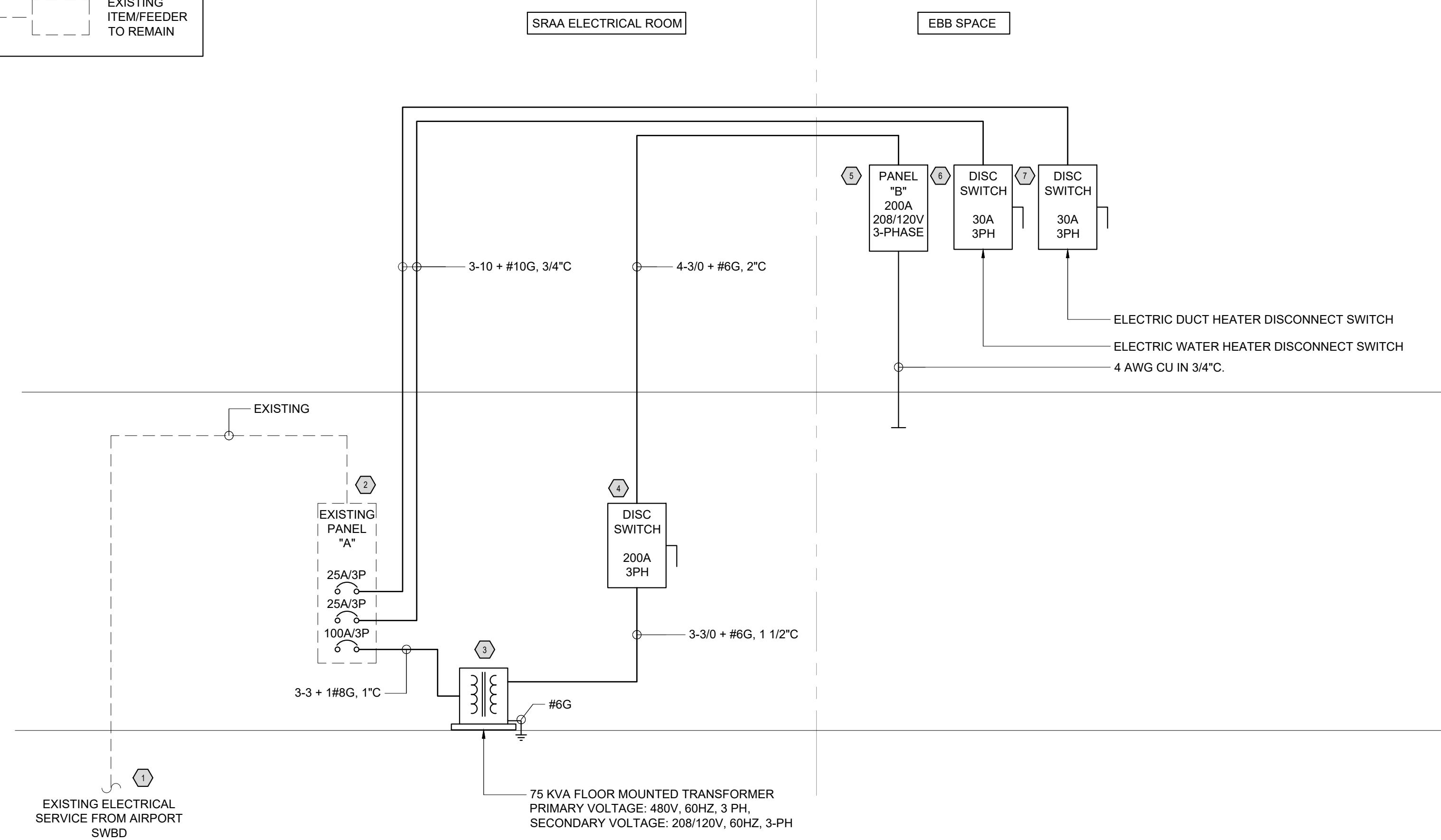
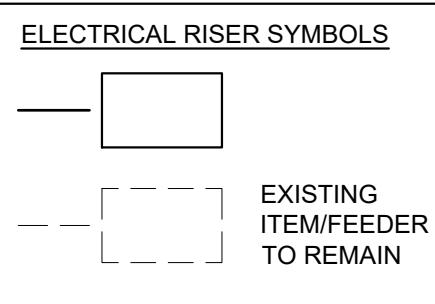
JOB LOCATION:

MECHANICAL SPECIFICATIONS  
(2 OF 2)

SHEET  
M5.1

EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.

# ELECTRICAL RISER



## RISER GENERAL NOTE:

- ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO BID.
- ABOVE RISER FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
- E.C. SHALL VERIFY RATINGS AND OPERABLE CONDITIONS OF ALL EXISTING ELECTRICAL EQUIPMENTS BEING REUSED.
- E.C. TO COORDINATE AND VERIFY SCOPE OF WORKS WITH OWNER/LANDLORD AND BASE BID ACCORDINGLY.

## ELECTRICAL RISER KEYED WORK NOTES:

- E.C. SHALL FIELD VERIFY THE EXACT ELECTRICAL SERVICE RATING, VOLTAGE, PHASE & LOCATION AND COORDINATE WITH ARCHITECT/OWNER/BASE BUILDING MANAGEMENT. PROVIDE ELECTRICAL FEEDER/CONNECTIONS TO PROJECT SPACE ELECTRICAL PANELS AS SHOWN ON THE RISER DIAGRAM.
- EXISTING 277/480V, 3 PHASE, ELECTRICAL PANEL "A" FOR THE PROJECT SPACE SHALL REMAIN. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL IN FIELD. E.C. SHALL BE RESPONSIBLE TO COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT RATING OF PANEL AND ENSURE THAT THE EXISTING PANEL IS CAPABLE TO BEAR THE NEWLY ADDED LOAD IN FIELD PRIOR TO BID. INFORM ENGINEER IN CASE FOUND ANY DISCREPANCY. BASE BID ACCORDINGLY.
- PROVIDE NEW 75kVA (FLOOR MOUNTED), STEP DOWN 277/480V TO 208/120V, 3 PHASE, TRANSFORMER FOR THE PROJECT SPACE LOCATED IN SRAA SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION IN FIELD.
- PROVIDE NEW 200AMP, 120/208V, 3 PHASE, DISCONNECT SWITCH FOR THE PROJECT SPACE LOCATED IN SRAA SPACE. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL FIELD.
- PROVIDE NEW 200AMP(MCB), 120/208V, 3 PHASE, ELECTRICAL PANEL "B". E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL IN FIELD.
- PROVIDE 30AMP, 480/277V, 3-PHASE DISCONNECT SWITCH FOR ELECTRIC WATER HEATER. CONTRACTOR TO PROVIDE ELECTRICAL CONNECTION PER MANUFACTURER'S SPECIFICATION. FIELD VERIFY EXACT MOUNTING LOCATION WITH RESPECTIVE CONTRACTOR.
- PROVIDE 30AMP, 480/277V, 3-PHASE DISCONNECT SWITCH FOR ELECTRIC DUCT HEATER. CONTRACTOR TO PROVIDE ELECTRICAL CONNECTION PER MANUFACTURER'S SPECIFICATION. FIELD VERIFY EXACT MOUNTING LOCATION WITH RESPECTIVE CONTRACTOR.

## GENERAL NOTES:

- EXIT SIGNS AND EMERGENCY LIGHTS SHALL HAVE THEIR OWN SELF-CONTAINED STANDBY BATTERY POWER SUPPLY. IF LOCAL CODE REQUIRES A DIRECT TAP BEFORE ANY CIRCUIT BREAKERS THEN INCORPORATE INTO THE FEEDER DIAGRAM.
- LUMINAIRES INSTALLED IN CONTINUOUS ROWS SHALL BE GROUNDED WITH A CONDUCTOR Routed FROM LUMINAIRE TO LUMINAIRE, MOUNTED TO EACH WITH GROUNDING LUG OR SCREW. ALIGNING CLIPS ARE NOT ACCEPTABLE. LUMINAIRE GROUNDING SHALL BE INSTALLED IN COMPLIANCE WITH NATIONAL ELECTRICAL CODE, ARTICLE 410-21.
- CEILING LIGHTS ARE TO BE WIRED TO THE BATT JOIST MEMBERS AT THE DIAGONAL CORNERS.
- COORDINATE LIGHTING WITH SPRINKLER & MECHANICAL DRAWINGS.
- REFERENCE TO HEIGHT OF OUTLET OR RECEPTACLE SHALL BE MEASURED FROM FINISHED FLOOR TO CENTER OF OUTLET OR RECEPTACLE.
- ALL RECEPTACLES AND SWITCHES SHALL HAVE TWO (2) REVOLUTIONS OF ELECTRICAL TAPE (SCOTCH 33+) OVER ALL THE TERMINALS, TO PREVENT ACCIDENTAL CONTACT WITH THE JUNCTION BOX OR OUTLET BOX.
- CONDUT SIZE TO BE PER NEC. PVC CONDUIT AND FITTINGS ARE ACCEPTABLE ONLY BELOW SUBBASE MATERIAL OF GROUND BEARING FLOOR SLABS WHERE SUCH USE IS ACCEPTABLE TO THE AUTHORITY HAVING JURISDICTION.
- ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX AND CONDUIT STUB-UP ABOVE CEILING FOR ALL LOW VOLTAGE CABLING.
- DIMENSION IS FROM FINISHED WALL, SEE ARCHITECTURAL FOR WALL THICKNESS.
- FIELD COORDINATE EXACT LOCATION OF OUTLETS AS DETERMINED BY THE ACTUAL FURNITURE LAY OUT. VERIFY WITH FIXTURE PLAN.
- COORDINATE WITH OTHER DISCIPLINES FOR ELECTRICAL REQUIREMENTS OF EQUIPMENT NOT SHOWN ON DETAILS (i.e. ROOF-TOP UNITS, UNIT HEATERS, FANS, ETC.).
- E.C. SHALL VERIFY IN FIELD ALL KITCHEN EQUIPMENT CONNECTIONS AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. VERIFY ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH FOOD SERVICE CONTRACTOR. E.C. SHALL MAKE ADJUSTMENTS IN FIELD TO MATCH ACTUAL EQUIPMENT BEING INSTALLED, AS DIRECTED BY THE FOOD SERVICE CONTRACTOR.

## LEGEND: (NOT ALL SYMBOLS ARE USED WITHIN THIS SET OF DRAWINGS)

### LIGHTING

- EXIT LIGHT (HATCHING DENOTES FACE)
- SURFACE MOUNTED OR RECESSED EMERGENCY LIGHTING FIXTURE
- SWITCH (P) PILOT LIGHT (R) ROTARY SWITCH
- MOTOR RATED SWITCH
- SWITCH (x) DENOTES CONTROL LABEL, (D) DENOTES DIMMER
- OCCUPANCY SENSOR
- WALL SWITCH, OCCUPANCY SENSOR COMBINATION
- PHOTOCELL OR DAYLIGHT SENSOR
- TIMECLOCK
- SPEAKER

### POWER

- SINGLE RECEPTACLE
- DUPLEX RECEPTACLE
- QUADRUPLEX RECEPTACLE
- CEILING MOUNTED RECEPTACLE
- LINE THRU CENTER OF RECEPTACLE DENOTES ABOVE COUNTER
- CENTER SHADING IN RECEPTACLE DENOTES ISOLATED GROUND
- TOP SHADING IN RECEPTACLE DENOTES GFCI PROTECTED
- SPECIAL PURPOSE RECEPTACLE (AS NOTED)
- TELEPHONE OUTLET
- DATA OUTLET
- VOICE/DATA COMBINATION OUTLET
- JUNCTION BOX
- MOTOR, FAN, PUMP OR AIR CONDITIONING UNIT
- PANEL BOARD
- FUSED DISCONNECT SWITCH, RATING AS NOTED.
- NON-FUSED DISCONNECT SWITCH, RATING AS NOTED.

### LOW VOLTAGE

- TELEPHONE OUTLET
- DATA OUTLET
- VOICE/DATA COMBINATION OUTLET
- SECURITY CAMERA, COORDINATE EXACT LOCATION WITH SECURITY VENDOR.
- WAP

## ABBREVIATIONS

WP	WEATHERPROOF
AFF	ABOVE FINISHED FLOOR
UNO	UNLESS NOTED OTHERWISE
GFI	GROUND FAULT INTERRUPT
O.C.	ON CENTER
ETR	EXISTING TO REMAIN
TR	TAMPER RESISTANT

## STANDARD MOUNTING HEIGHTS

A.F.F (IN.)	DESCRIPTION
48"	AUDIBLE APPLIANCES
48"	ALARMS
48"	ANNUNCIATOR PANELS
84"	CLOCK OUTLETS (CENTERLINE)
48"	CONTROLS (CENTERLINE)
80"	EXIT SIGNS (WALL MOUNTED, BOTTOM)
60"	FIRE ALARM ANNUNCIATOR PANEL (DISPLAY)
120"	FIRE ALARM BELL (EXTERIOR)
60"	FIRE ALARM CONTROL PANEL/UNIT (DISPLAY)
36"	INTERCOM (AREA ONLY)
48"	INTERCOMS
72"	PANELS/PANELBOARDS (TOP)
48"	PULL STATIONS (TOP OF BOX)
144"	PHOTOCELLS
18"	RECEPTACLES (CENTERLINE)
24"	RECEPTACLES (EXTERIOR)
26"	RECEPTACLES (GARAGES)
48"	RECEPTACLES IN EQUIPMENT ROOMS
48"	REMOTE INDICATING LIGHT (EQUIPMENT ROOMS)
48"	CEILING INDICATING LIGHT (FINISHED AREAS)
48"	SAFETY SWITCHES
48"	STARTERS
48"	SWITCHES (TOP OF BOX)
1@48" 1@36"	TELEPHONES (PUBLIC)
18"	TELEPHONE DATA OUTLETS (CENTERLINE)
6"	TELEPHONE TERMINAL BOARD (BOTTOM)
18"	TELEVISION OUTLETS
84"	VISIBLE APPLIANCES (CENTERLINE)

NY ENGINEERS

REVISIONS	BY	DATE
NO. / DESCRIPTION		

JOB LOCATION:

LEGENDS, GENERAL NOTES & RISER DIAGRAM

## SHEET LIST

SHEET NUMBER	SHEET TITLE
ELECTRICAL	
E0.0	LEGENDS, GENERAL NOTES AND RISER DIAGRAM
E1.0	ELECTRICAL PLAN - LIGHTING
E2.0	ELECTRICAL PLAN - POWER
E2.1	ELECTRICAL PLAN - ROOF
E3.0	ELECTRICAL SCHEDULES
E4.0	LIGHTING COMPLIANCE
E5.0	ELECTRICAL SPECIFICATIONS (1 OF 3)
E5.1	ELECTRICAL SPECIFICATIONS (2 OF 3)
E5.2	ELECTRICAL SPECIFICATIONS (3 OF 3)

**E0.0**

EBB STORE#:	
FILE#:	
DATE:	
PROJ. MGR.	

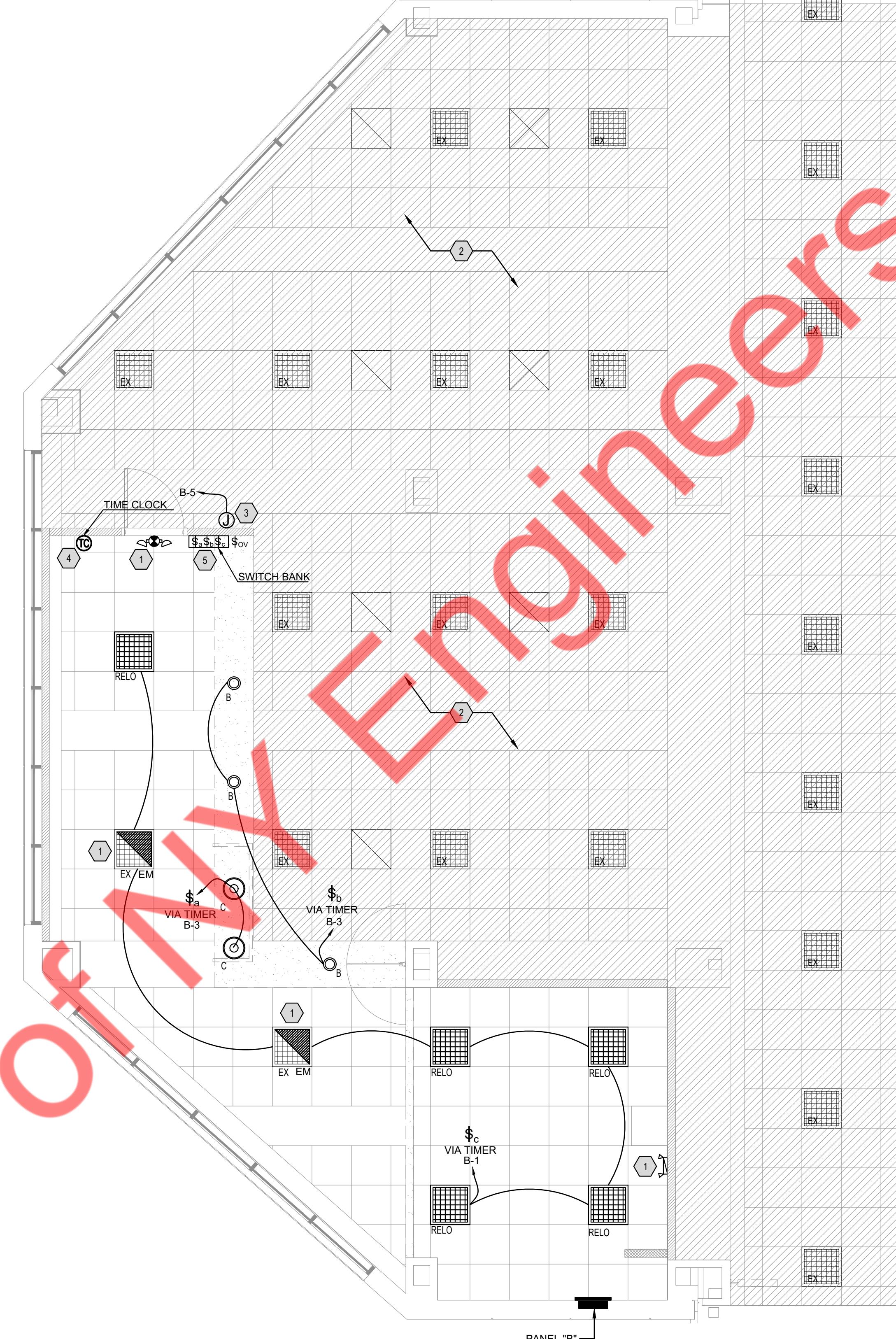
## GENERAL NOTES

- A. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR THE EXACT LIGHTING FIXTURE SELECTION, COLOR, MOUNTING, MANUFACTURER, CONTROLS, DIMMING REQUIREMENTS & SPECIFICATION IN FIELD.
- B. CONTRACTOR IS ADVISED THAT ADJUSTMENTS TO EMERGENCY AND EXIT LIGHT FIXTURE LOCATIONS/QUANTITIES MAY BE REQUIRED BY AHJ UPON FINAL INSPECTION.

## KEYED NOTES

1. EMERGENCY EGRESS/EXIT/EMERGENCY FIXTURES SHALL BE ON A NON-SWITCHED LEG OF LOCAL AREA CIRCUIT. CIRCUIT BREAKERS CLEARLY MARKED WITH THE INTENDED USE AND HAVE A LOCK-ON DEVICE INSTALLED.
2. THE HATCHED AREA IS NOT IN THE PROJECT SCOPE. E.C. SHALL COORDINATE THE EXACT SCOPE OF WORK WITH ARCHITECT/OWNER.
3. PROVIDE JUNCTION BOX FOR EXTERIOR SIGNAGE FIELD. VERIFY EXACT MOUNTING LOCATION OF JUNCTION BOX WITH SIGNAGE INSTALLER/OWNER PRIOR TO ROUGH-IN. JUNCTION BOX SHALL BE MOUNTED CENTERED BEHIND SIGN, HIGH UP ON THE INTERIOR OF THE BUILDING, ON THE EXTERIOR WALL. EXTERIOR SIGNAGE INSTALLATION BY SIGNAGE VENDOR INSTALLER. FINAL CONNECTION FROM JUNCTION BOX TO SIGNAGE SHALL BE COORDINATE WITH SIGNAGE INSTALLER AND PROVIDED IN ACCORDANCE WITH LOCAL JURISDICTION REQUIREMENTS. CONTRACTOR TO CIRCUIT EXTERIOR SIGNAGE AS INDICATED.
4. APPROXIMATE LOCATION OF TIMER CLOCK. COORDINATE EXACT LOCATION WITH OWNER/ARCHITECT.
5. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION AND CONFIGURATION OF SWITCH BANK.

LIGHTING LEGEND		
NOTES: NOT ALL FIXTURES MAY BE INDICATED ON PLAN; REF. ELEC DWGS FOR SCHEDULES		
SYMBOL	DESCRIPTION	MOUNTING
	EMERGENCY LIGHT WITH TWO 1.1W LED HEADS	WALL OR CEILING MOUNT
	SINGLE/DOUBLE FACE LED EXIT SIGN WITH EMERGENCY HEADS	WALL OR CEILING MOUNT
	RECESSED 2X2' LED TROFFER COOPER 22GR-LD5-32-A-UN V-L835-EL14-CD-1U1400 LUMENS	RECESSED
	RECESSED DOWNLIGHT, HOUSING / TRIM CREE RC6UNI / LRX-10L-35K 1000 LUMENS / 14.5 WATTS	RECESSED
	20" DAVID TRUBRIDGE KOURA PENDANT, FINISH: NATURAL/RED	SOFFIT MOUNT
NOTE: ALL EMERGENCY LIGHT FIXTURES IN BACK-OF-HOUSE AREAS TO BE WHITE FINISH.		



## GENERAL NOTES

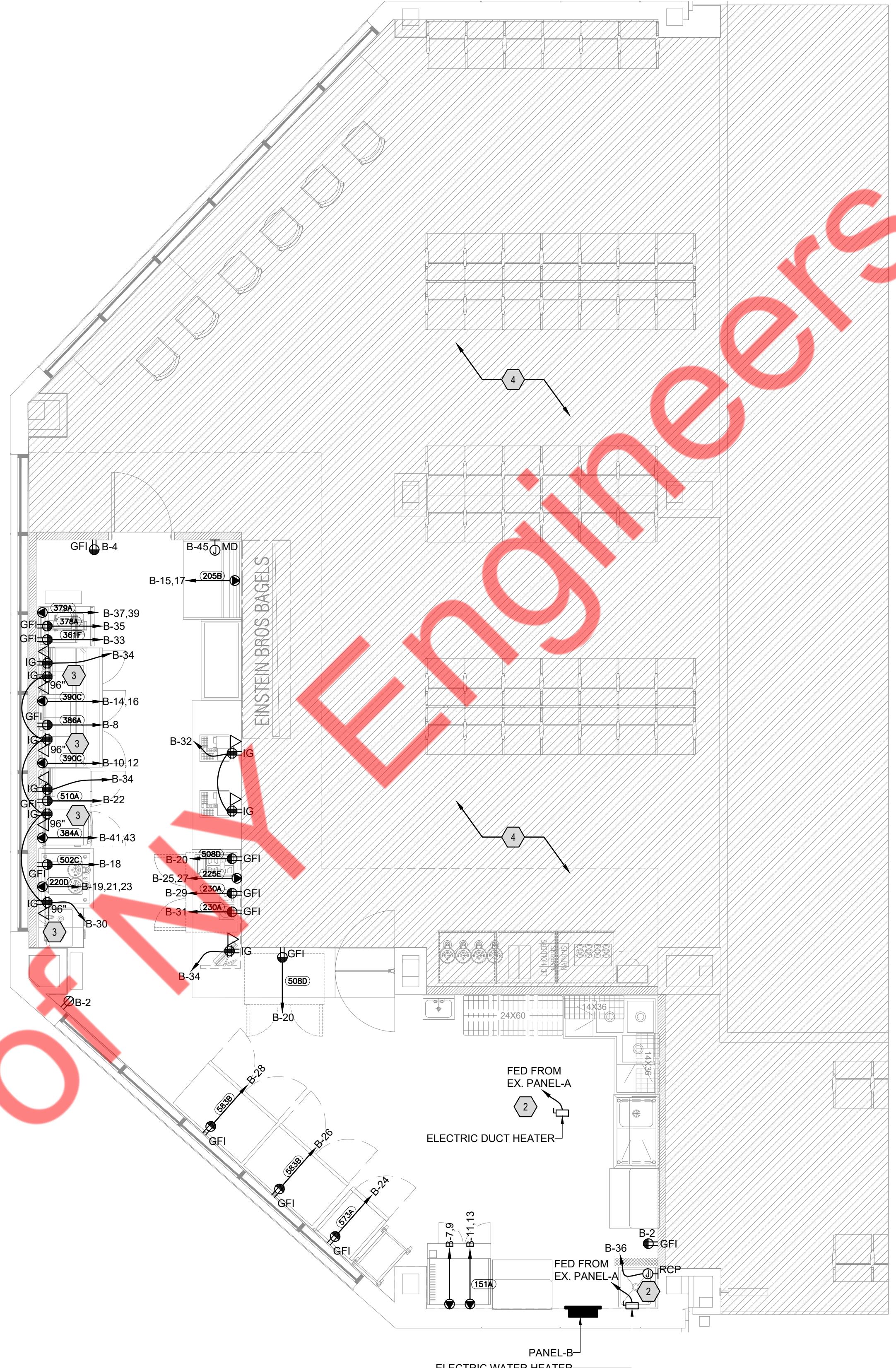
- A. FOR ELECTRICAL SPECIFICATION, REFER TO SHEET E3.0.
- B. ALL CONDUIT DROPS ARE INSIDE WALLS U.O.N. SEE ARCH. DWGS FOR WALL DIMENSIONS.
- C. FOR EXACT LOCATIONS OF KITCHEN EQUIPMENT, MECHANICAL EQUIPMENT AND POINTS OF CONNECTION, REFER TO KITCHEN & MECHANICAL DRAWINGS AND MANUFACTURER'S SHOP DRAWINGS.
- D. ALL CIRCUIT FEEDERS AND DISCONNECTS SHALL BE SIZED PER NEC.
- E. CONTRACTOR SHALL VERIFY CIRCUIT BREAKER, DISCONNECT SWITCH, STARTER AND FUSE SIZES WITH SELECTED EQUIPMENT MANUFACTURER'S SHOP DRAWINGS/SPECIFICATION SHEET PRIOR TO PLACING ORDER AND PROVIDE AS REQUIRED.
- F. ELECTRICAL CONTRACTOR SHALL LABEL ALL OUTLETS WITH EQUIPMENT NAME IN COOKING, PREP, & SERVICE AREAS. LABELS SHALL BE SELF-ADHESIVE WITH BLACK TEXT ON WHITE BACKGROUND IN 3/8" MINIMUM TEXT HEIGHT. LABELS ARE TO BE APPLIED HORIZONTALLY TO THE OUTLET COVERPLATE IN A NEAT AND PROFESSIONAL MANNER. HAND WRITTEN LABELS ARE NOT ACCEPTABLE.
- G. ELECTRICAL EQUIPMENT ENCLOSURES SHALL BE NEMA-1 FOR INTERIOR AND NEMA 3R FOR EXTERIOR. IN COASTAL REGIONS THE STANDARD FOR OUTSIDE SHALL BE NEMA-4X.
- H. TO COORDINATE ALL LOW VOLTAGE LOCATIONS AND REQUIREMENTS WITH TENANT & TENANT LV SUBCONTRACTOR.

## KEYED NOTES

1. E.C. SHALL COORDINATE EXACT ELECTRICAL REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE ELECTRICAL CONNECTIONS ACCORDINGLY.
2. ELECTRIC DUCT HEATER & WATER HEATER TO BE FED BY 100AMP, 480/277V, 3-PHASE PANEL. REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION. CONTRACTOR TO PROVIDE ELECTRICAL CONNECTION PER MANUFACTURER'S SPECIFICATION. FIELD VERIFY EXACT MOUNTING LOCATION WITH RESPECTIVE CONTRACTOR.
3. PROVIDE A RECEPTACLE AND JUNCTION BOX FOR MENU BOARD. RECEPTACLE AND JUNCTION BOX SHALL BE MOUNTED BEHIND NON POWERED MENU BOARD PANELS, CONCEALED FROM VIEW. FIELD VERIFY EXACT MOUNTING LOCATION WITH CONSTRUCTION MANAGER.
4. THE HATCHED AREA IS NOT IN THE PROJECT SCOPE. E.C. SHALL COORDINATE THE EXACT SCOPE OF WORK WITH ARCHITECT/OWNER.

## GENERAL NOTES - KITCHEN EQUIPMENTS

1. E.C. SHALL VERIFY IN FIELD ALL KITCHEN EQUIPMENT CONNECTIONS AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. VERIFY ALL DEVICE LOCATIONS AND MOUNTING HEIGHTS WITH FOOD SERVICE CONTRACTOR. E.C. SHALL MAKE ADJUSTMENTS IN FIELD TO MATCH ACTUAL EQUIPMENT BEING INSTALLED, AS DIRECTED BY THE FOOD SERVICE CONTRACTOR.
2. CONTRACTOR IS REQUIRED TO INSTALL STANDARD RECEPTACLES FOR CIRCUITS DEDICATED TO SPECIFIC EQUIPMENT. SUBJECT TO THE APPROVAL OF CODE ENFORCING AGENCY.
3. ALL SINGLE-PHASE RECEPTACLES RATED 150 VOLTS TO GROUND OR LESS, 50 AMPERES OR LESS AND THREE-PHASE RECEPTACLES RATED 150 VOLTS TO GROUND OR LESS, 100 AMPERES OR LESS INSTALLED IN THE FOLLOWING LOCATIONS SPECIFIED IN NEC ART 210.8 (B)(1) - (8) SHALL HAVE GROUND FAULT CIRCUIT INTERRUPTER PROTECTION.
4. NOTE THAT THE ISOLATED GROUNDING TYPE RECEPTACLES AND CLOCK TYPE RECEPTACLES LOCATED IN THE KITCHEN/SERVING AREA SHALL BE PROTECTED BY GROUND FAULT TYPE CIRCUIT BREAKERS RATHER THAN GROUND FAULT TYPE RECEPTACLES SINCE THESE RECEPTACLES ARE NOT AVAILABLE AS GROUND-FAULT TYPE RECEPTACLES. GFCI BREAKERS REQUIRE A DEDICATED NEUTRAL (NOT SHARED) TO OPERATE PROPERLY.

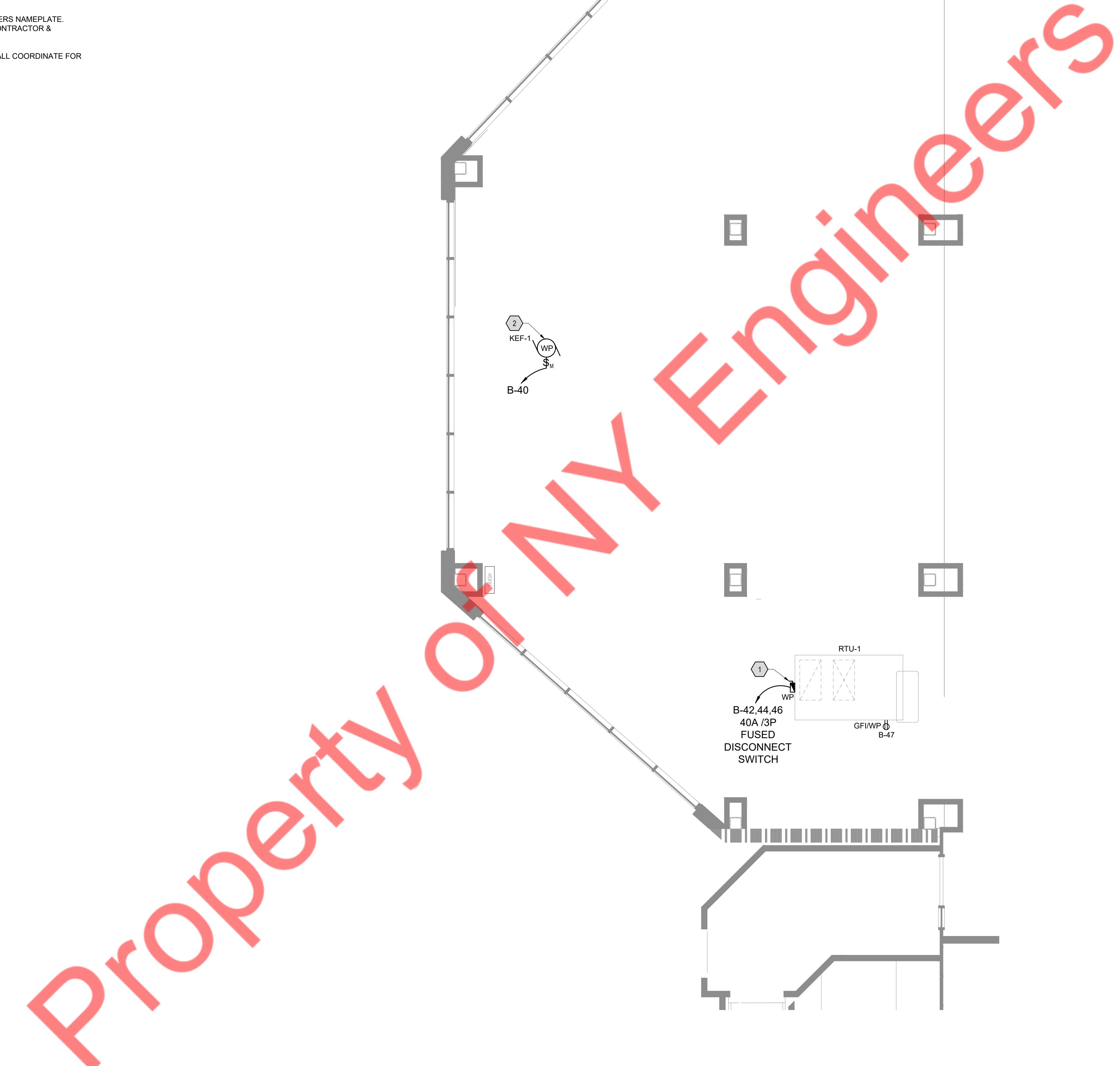


ELECTRICAL PLAN -  
POWER

SHEET  
**E2.0**  
EBB STORE#: \_\_\_\_\_  
FILE#: \_\_\_\_\_  
DATE: \_\_\_\_\_  
PROJ. MGR. \_\_\_\_\_

### KEYED NOTES

1. PROVIDE NEMA 3R DISCONNECT SWITCH (SIZE AS NOTED). FUSE PER MANUFACTURERS NAMEPLATE. PROVIDE & COORDINATE EXACT ELECTRICAL REQUIREMENTS WITH MECHANICAL CONTRACTOR & MANUFACTURER. BASE BID ACCORDINGLY.
2. EXHAUST FANS FURNISHED AND INSTALLED BY MECHANICAL CONTRACTOR. E.C. SHALL COORDINATE FOR SWITCHING AND CONTROLS AND PROVIDE ALL NECESSARY WIRING REQUIRED



1  
E2.1 **ELECTRICAL PLAN - ROOF**  
SCALE: 1/4" = 1'-0"

SHEET  
**E2.1**  
EBB STORE#: \_\_\_\_\_  
FILE#: \_\_\_\_\_  
DATE: \_\_\_\_\_  
PROJ. MGR. \_\_\_\_\_

**NY ENGINEERS**

REVISIONS  
NO. DESCRIPTION BY DATE

JOB LOCATION:

ELECTRICAL PLAN - ROOF

PANEL SCHEDULE :-

PANEL:	B	(NEW)	Sections:					MOUNTING:	RECESSED	
208V/120 VOLTS			3	PHASE	4	WIRE		PANEL LOCATION:	BOH	
MCB	400A		BUS:	440A			INTERRUPTING RATING:	V.I.F.		FED FROM:
										112.5KVA TRANSFORMER
PANEL NOTES	CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA)	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE
1	20		LIGHTING	L	0.50	2#12, #12G, 3/4" C	0.86	2#12, #12G, 3/4" C	0.36	R
3	20		LIGHTING	L	0.50	2#12, #12G, 3/4" C	0.86	2#12, #12G, 3/4" C	0.36	R
5	20		EXTERIOR SIGNAGE	L	1.20	2#12, #12G, 3/4" C		1.38	2#12, #12G, 3/4" C	0.18
7	50/2P		151A_DOUBLE CONVECTION OVEN	K	4.99	2#8, #10G, 3/4" C	6.19	2#12, #12G, 3/4" C	1.20	K
9				K	4.99			2#12, #12G, 3/4" C	1.20	K
11	50/2P		151A_DOUBLE CONVECTION OVEN	K	4.99	2#8, #10G, 3/4" C	6.72	2#12, #12G, 3/4" C	1.73	K
13				K	4.99			2#12, #12G, 3/4" C	1.73	K
15	20/2P		205B_UPRIGHT MERCH CASE	K	1.35	2#12, #12G, 3/4" C	3.08	2#12, #12G, 3/4" C	1.73	K
17				K	1.35			2#12, #12G, 3/4" C	1.73	K
19				K	4.14			2#12, #12G, 3/4" C	1.51	K
21	40/3P		220D_COFFEE MAKER	K	4.14	3#8, #10G, 3/4" C	4.86	2#12, #12G, 3/4" C	0.72	K
23				K	4.14			2#12, #12G, 3/4" C	0.38	K
25	30/2P		225E_AUTOMATIC ESPRESSO	K	2.52	2#10, #10G, 3/4" C	4.09	2#12, #12G, 3/4" C	0.56	K
27				K	2.52			2#12, #12G, 3/4" C	1.58	K
29	20		230A_BLENDER	K	1.80	2#12, #12G, 3/4" C	2.80	2#12, #12G, 3/4" C	1.00	R
31	20		230A_BLENDER	K	1.80	2#12, #12G, 3/4" C	2.49	2#12, #12G, 3/4" C	0.69	R
33	20		361F_72" SANDWICH UNIT	K	1.14	2#12, #12G, 3/4" C	1.89	2#12, #12G, 3/4" C	0.75	R
35	20		378A_BAGEL SLICER W/RETURN CHUTE	K	0.78	2#12, #12G, 3/4" C	0.88	2#12, #12G, 3/4" C	0.10	M
37				K	1.65					RCP
39	20/2P		379B_TOASTER, CONVEYOR	K	1.65	2#12, #12G, 3/4" C	1.65			SPARE
41				K	1.65					20
43	40/2P		384A_OVEN, MICROWAVE/CONVECTION	K	3.12	2#8, #10G, 3/4" C	1.98	2#12, #12G, 3/4" C	0.33	M
45	30		MOTORIZED DAMPER	R	0.18	2#12, #12G, 3/4" C	3.43	2#8, #10G, 3/4" C	3.25	H
47	20		ROOF RECEPTACLE	R	0.18	2#12, #12G, 3/4" C			3.25	H
49	20		SPARE				0.18			RTU-1
51	20		SPARE				0.00			
53	20		SPARE				0.00			
					33.24	26.57	25.89			
LOAD CLASSIFICATION	CONNECTED LOAD (KVA)	DEMAND	DEMAND LOAD (KVA)	PANEL TOTAL LOAD						
LIGHTING	L		2.20	125%	2.75					
RECEPTACLE	R		3.70	100%	3.70					
HVAC/PLUMBING	H		9.75	100%	9.75					
MOTOR	M		0.43	100%	0.43					
EQUIPMENTS	E		0.00	100%	0.00					
KITCHEN LOAD	K		69.62	65%	45.25					

NY ENGINEERS

EQUIPMENT SCHEDULE:-

ITEM NO.	DESCRIPTION	VOLTAGE	PHASE	QUANTITY	AMPS AS PER CUTSHEET
151A	DOUBLE CONVECTION OVEN	208	1	1	48
151A	DOUBLE CONVECTION OVEN	208	1	1	48
205E	UPRIGHT MERCH CASE 72" HIGH	208	1	1	13
220D	COFFEE MAKER	208	3	1	34.5
225G	AUTOMATIC ESPRESSO	208	1	1	24.2
230A	BLENDER	120	1	2	15
361F	72" SANDWICH UNIT	115	1	1	9.9
378A	BAGEL SLICER W/RETURN CHUTE	115	1	1	6.8
379B	TOASTER, CONVEYOR	208	1	1	15.9
384A	OVEN, MICROWAVE/CONVECTION	208	1	1	30
386A	EGG HOLDER	120	1	1	10
390C	MICROWAVE OVEN	208	1	2	16.6
502C	ICE MAKER W/O BIN	115	1	1	13.1
508B	REFRIGERATOR, UNDERCOUNTER, COMPACT	115	1	2	6.3
510A	REFRIGERATED WORK TABLE	115	1	1	3.3
583B	3 DOOR REACH IN FREEZER	115	1	2	13.7
573A	2 DOOR REACH IN REFRIGERATOR	115	1	1	4.9
860L	POS RH WALL	120	1	1	3

NO	DESCRIPTION	REVISED
BY		
DATE		

JOB LOCATION:

ELECTRICAL SCHEDULES

SHEET  
E3.0  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.

## DIVISION 26 - ELECTRICAL SPECIFICATIONS

1. GENERAL INFORMATION	CLEANED AND WIPE TO REMOVE GREASE, SMUDGES, FINGERPRINTS, DUST AND OTHER SPOTS AND LEFT SMOOTH AND CLEAN.	5. EXISTING CONDITIONS	RE-SUBMITTAL OF THE SAME PRODUCT, THEN NO MORE REVIEWS OF THAT PRODUCT WILL BE PERFORMED WITHOUT DIRECT COMPENSATION TO THE ENGINEER BEING PAID FOR THE ADDITIONAL SERVICES REQUIRED FOR THE THIRD REVIEW AND ANY FURTHER REVIEWS.	“OR EQUAL” OR “SUBSTITUTE” PRODUCT SHALL BE DULY CONSIDERED AND PRICED ACCORDINGLY PRIOR TO BIDDING OR PRICING.	REQUIREMENTS SHALL BE MADE BY TESTING LABORATORY SELECTED BY THE OWNER AT THE EXPENSE OF THE CONTRACTOR. TESTS SHALL BE MADE EVERY 100 FEET OR LESS, MINIMUM TWO TESTS PER SITE. IF ANY TEST RESULTS ARE UNSATISFACTORY,
1.1. PROVIDE ALL SUPPLIES, MATERIAL, LABOR, EQUIPMENT, AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION AND FULL OPERATION OF ALL ELECTRICAL AND ELECTRICAL RELATED WORK, INDICATED HEREINAFTER ON DRAWINGS AND SPECIFICATIONS, FOR A SAFE AND FULLY OPERATIONAL SYSTEM.	1.10.5. CLEAN THE EXTERIOR OF ELECTRICAL COMPONENTS PRIOR TO ACCEPTANCE OF WORK.	5.1. ATTENTION IS CALLED TO THE FACT THAT THE WORK IS TO BE PERFORMED WITHIN AN EXISTING OPERATIONAL FACILITY.	6.8.6. THE DECISION AS TO WHETHER OR NOT A PROPOSED SUBSTITUTE OR “EQUAL” PRODUCT IS ACTUALLY EQUAL TO THAT SPECIFIED SHALL REST SOLELY WITH THE ENGINEER.	7.7.3.4. THE CONTRACTOR SHALL RE-EXCAVATE AND RE-COMPACT THE BACKFILL AT HIS EXPENSE UNTIL THE DESIRED COMPACTION IS OBTAINED.	
1.1.1. THE INSTALLED SYSTEM SHALL BE COMPLETE IN EVERY WAY AND FUNCTIONING ACCORDING TO THE DESIGN INTENT, WHETHER OR NOT ALL SUCH MATERIALS AND APPURTENANCES ARE SHOWN ON THE DRAWINGS OR DESCRIBED IN THE SPECIFICATIONS.	1.10.6. FOR ALL MATERIALS AND DEVICES REMOVED, THE CONTRACTOR SHALL DISPOSE OFF-SITE IN AN APPROVED MANNER. PROVIDE WRITTEN DOCUMENTATION FOR DISPOSAL OF ALL ITEMS.	5.2. THE FOLLOWING GENERAL PROVISIONS OF THE CONTRACT, INCLUDING THE GENERAL & SUPPLEMENTAL CONDITIONS AND GENERAL REQUIREMENTS, SHALL APPLY TO THE WORK IN THIS DRAWING AND SPECIFICATION SET.	6.5. IN ADDITION TO THE OTHER REQUIREMENTS IN PARAGRAPHS ABOVE, THE FOLLOWING APPLIES TO SUBMITTALS OF THIS DIVISION:	7.7.4. PAVEMENT OR ROADWAY SURFACES CUT OR DAMAGED SHALL BE REPLACED IN EQUAL OR BETTER CONDITION THAN THE ORIGINAL, INCLUDING STABILIZATION, BASE COURSE, SURFACE COURSE, CURB AND GUTTER, OR OTHER APPURTENANCES.	
1.2. PERFORM ALL OPERATIONS INCLUDING EXCAVATION & BACKFILLING, SHORING, CUTTING, CHANNELING & CHASING, DE-WATERING, ETC. NECESSARY FOR INSTALLATION OF FULLY OPERATIONAL SYSTEM, WHETHER OR NOT SHOWN ON THE DRAWINGS.	1.11. PROVIDE ALL LABOR, INSTRUMENTS, AND OTHER SERVICES REQUIRED FOR COMPLETE AND SATISFACTORY TEST AND ADJUSTMENT OF ELECTRICAL SYSTEMS AND RELATED WORK.	5.2.1. VISIT THE SITE OF THE WORK AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING CONDITIONS, AND THOROUGHLY REVIEW ALL DRAWINGS, SPECIFICATIONS AND ADDENDA PRIOR TO BIDDING ON THIS WORK. NO EXTRA PAYMENTS TO THE CONTRACT AMOUNT WILL BE ALLOWED FOR FAILURE TO COMPLY WITH THIS REQUIREMENT.	6.5.1. DO NOT INSTALL OR ORDER ELECTRICAL EQUIPMENT OR PROCEED WITH THE WORK UNTIL SUBMITTALS HAVE BEEN ACCEPTABLY REVIEWED BY THE OWNER'S REPRESENTATIVE AND STAMPED ACCORDINGLY. EQUIPMENT OR WORK WHICH IS ORDERED OR INSTALLED WITHOUT PRIOR APPROVED SUBMITTALS SHALL, AT THE ENGINEER'S DISCRETION, BE REMOVED AT NO COST TO THE OWNER. NO ALLOWANCES WILL BE MADE FOR REWORK OR DELAY DUE TO NEGLECT OF REQUIRED APPROVAL PROCESS.	7.7.4.1. WHERE EXISTING PAVEMENT IS REMOVED, THE SURFACING SHALL BE MECHANICALLY SAW CUT PRIOR TO TRENCH EXCAVATION, LEAVING A UNIFORM AND STRAIGHT EDGE OR OPEN CIRCUITS.	
1.3. DEFINITION OF TERMS	1.11.1. FURNISH, SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS.	5.2.2. TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED FOR THE INSTALLATION OF WORK.	6.5.2. MAKE ALL ELECTRICAL SUBMITTALS AT ONE TIME AND WITHIN FOURTEEN (14) CALENDAR DAYS OF OWNER'S NOTICE TO PROCEED.	7.7.4.2. THE WIDTH OF THE PAVEMENT REMOVAL SHALL BE THE MINIMAL NECESSARY TO ALLOW FOR INSTALLATION OF THE NEW UTILITIES.	
1.3.1. FURNISH, SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS.	1.11.2. CHECK ALL MOTORS AND ROTATING EQUIPMENT FOR PROPER ROTATION.	5.2.3. FIELD DIMENSIONS ARE REASONABLY ACCURATE AND SHOULD GOVERN IN SETTING OUT WORK.	6.5.3. SUBMITTAL DATA WILL BE PROVIDED AND REVIEWED IN PDF FORMAT ELECTRONICALLY VIA EMAIL.	7.7.4.3. THE PAVING WORK SHALL BE GUARANTEED FROM DEFECTS IN WORKMANSHIP INCLUDING SETTLING, FOR TWO YEARS.	
1.3.2. INSTALL - OPERATION AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS.	1.11.4. CHECK ALL ELECTRICAL POWER AND CONTROL WIRING, INTERLOCKS, ETC., RELATED TO MECHANICAL EQUIPMENT TO DETERMINE THAT ALL WIRING IS CORRECT.	5.2.4. WHERE DETAILED METHOD OF INSTALLATION IS NOT INDICATED OR WHERE VARIATIONS EXIST BETWEEN DESCRIBED WORK AND APPROVED PRACTICE, DIRECTION OF THE OWNERS REPRESENTATIVE ON JOB SITE SHALL BE FOLLOWED.	6.5.4. SUBMITTAL DATA WILL NOT BE ACCEPTED FOR REVIEW UNLESS THEY: 6.5.4.1. COMPLY WITH THE REQUIREMENTS OF DIVISION 1.	7.8. ALL WIRING SHALL BE IN CONDUIT. THE USE OF E.N.T., BX, NM, ETC. OR PRE-MANUFACTURED CABLE ASSEMBLIES OR ALUMINUM WIRE WILL NOT BE PERMITTED.	
1.3.3. PROVIDE - FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.	1.11.5. IMMEDIATELY REMEDIATE ALL EQUIPMENT PROVIDED UNDER THIS DIVISION THAT TESTS PROVE TO BE DEFECTIVE OR OPERATING IMPROPERLY AS A PART OF THE CONTRACT.	5.3. CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	6.5.4.2. INCLUDE COMPLETE INFORMATION PERTAINING TO ALL APPURTENANCE AND ACCESSORIES.	7.9. VERIFY FINAL LOCATIONS FOR ROUGH-INS WITH SHOP DRAWING SUBMITTALS, FIELD MEASUREMENTS, AND WITH REQUIREMENTS OF THE ACTUAL EQUIPMENT TO BE CONNECTED PRIOR TO ROUGH-IN.	
1.3.4. U.N.O. - UNLESS NOTED OTHERWISE.	1.12. GUARANTEE ALL ELECTRICAL SYSTEM EQUIPMENT, MATERIALS, AND WORKMANSHIP TO BE FREE FROM DEFECTS FOR A PERIOD OF ONE (1) YEAR FROM THE DATE OF FINAL ACCEPTANCE AND PROPERLY CORRECT LATENT DEFECTS ARISING DURING THIS PERIOD UPON NOTIFICATION BY THE OWNER'S REPRESENTATIVE WITHOUT ADDITIONAL COMPENSATION AND TO THE SATISFACTION OF THE ENGINEER AND OWNER'S REPRESENTATIVE.	5.3.1. SHOULD ANY CONDITIONS EXIST THAT ARE CONTRARY TO THOSE SHOWN ON THE DRAWINGS, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO FABRICATION OR PERFORMING ANY WORK IN THE AREA INVOLVING THE DIFFERENCES.	6.5.4.3. ARE SUBMITTED AS COMPLETE PACKAGES WHICH PERTAIN TO ALL RELATED ITEMS IN DIVISION 26.	7.9.1. REFER TO EQUIPMENT SPECIFICATIONS AND DIMENSIONS SPECIFIED FOR ROUGH-IN REQUIREMENTS.	
1.3.5. M.S.D.S. - MATERIAL SAFETY DATA SHEET	1.12.1. CONTRACTOR - APPEARANCE ON DRAWINGS OR IN SPECIFICATIONS FOR ELECTRICAL WORK SHALL REFER TO ELECTRICAL SUB-CONTRACTOR.	5.3.2. NOTIFICATION SHALL BE IN THE FORM OF A DRAWING OR SKETCH INDICATING FIELD MEASUREMENTS OR NOTES RELATING TO THE AREA.	6.5.4.4. ARE PROPERLY MARKED WITH EQUIPMENT, SERVICE OR FUNCTION IDENTIFICATION AS RELATED TO THE PROJECT AND ARE MARKED WITH PERTINENT SPECIFICATION PARAGRAPH NUMBER.	7.10. PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL WORK.	
1.3.6. CONTRACTOR - DISCONNECT ELECTRICAL FEEDER, MAKE SAFE (INCLUDING LOCK OUT/TAG OUT), STORE AND PROTECT DEVICE, REINSTALL REWORK AND EXTEND CONDUIT & WIRE TO NEW LOCATION, RE-ENERGIZE AND TEST.	1.12.2. ALL EQUIPMENT, ETC., SHALL BE NEW UNLESS OTHERWISE NOTED, AND AS SPECIFIED FREE OF DEFECTS. ALL ELECTRICAL EQUIPMENT SHALL BE U.L. OR E.T.L. LISTED.	5.4. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND WORKMANLIKE MANNER. WHERE AN EXISTING STRUCTURE MUST BE CUT OR EXISTING UTILITIES INTERFERE, SUCH OBSTRUCTION SHALL BE BYPASSED, REMOVED, REPLACE OR RELOCATED, PATCH AND REPAIR.	6.5.5. IF ANY ITEM IN THE SUBMITTAL IS “NOT ACCEPTABLE” FOR ANY REASON, IT AUTOMATICALLY VOIDS THE ENTIRE SET, AND A RE-SUBMIT OF ALL IS REQUIRED TO OBTAIN ACCEPTANCE OF ALL ITEMS.	7.10.1. PATCH EXISTING FINISHED AND DISTURBED NEW FINISHED SURFACES AND BUILDING COMPONENTS USING NEW MATERIALS MATCHING EXISTING MATERIALS & EXPERIENCED INSTALLERS. INSTALLERS' QUALIFICATIONS REFER TO THE MATERIALS AND METHODS REQUIRED OR THE SURFACE AND BUILDING COMPONENTS BEING PATCHED.	
1.3.7. EQUAL AND EQUIVALENT - TO MEAN OF THE SAME QUALITY, SIZE, NUMBER, VALUE, DEGREE, INTENSITY AND THE ITEMS ARE SIMILAR IN ALL RESPECTS.	1.12.3. THE FINAL DECISION OF ACCEPTANCE OF THESE ITEMS WILL BE MADE BY THE ENGINEER.	5.4.1. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND WORKMANLIKE MANNER. WHERE AN EXISTING STRUCTURE MUST BE CUT OR EXISTING UTILITIES INTERFERE, SUCH OBSTRUCTION SHALL BE BYPASSED, REMOVED, REPLACE OR RELOCATED, PATCH AND REPAIR.	6.5.6. IN CASE OF DISCREPANCIES BETWEEN SETS OF SUBMITTALS, THE SET RETAINED BY THE OWNER'S REPRESENTATIVE SHALL HAVE PRECEDENCE.	7.10.2. NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED FOR CUTTING AND PATCHING WORK THAT IS NECESSITATED BY ILL-TIMED, DEFECTIVE OR NON-COMFORMING INSTALLATIONS. ANY DAMAGE DONE BY THIS CONTRACTOR TO THE BUILDING DURING THE PROGRESS OF WORK SHALL BE MADE GOOD AT CONTRACTOR'S OWN EXPENSE.	
1.3.8. 1.3.8.1. IT SHALL BE UNDERSTOOD THAT FOR ANY SPECIFIED ITEM ON THE DRAWINGS AND/OR IN THE SPECIFICATION, THIS TERM SHALL APPLY.	2. CODES & PERMITS	5.4.2. WORK DISTURBED OR DAMAGED SHALL BE REPLACED OR REPAIR TO ITS PRIOR CONDITION.	6.6. THE FOLLOWING REQUIREMENTS HELP TO IDENTIFY, TRACK AND KEEP THE PROJECT ORGANIZED FOR ALL PARTIES INVOLVED. THEY ARE NECESSARY TO ENSURE A TIMELY TURNAROUND AND AN APPROPRIATE TECHNICAL REVIEW. SUBMITTALS THAT DO NOT CONFORM TO THE ADMINISTRATIVE REQUIREMENTS ARE REJECTED AND RETURNED, WITHOUT TECHNICAL REVIEW.	7.10.3. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS	
1.4. ALL WORK SHALL BE PERFORMED UNDER THE PERSONAL SUPERVISION OF A PROJECT SUPERINTENDENT ON-SITE, MAINTAIN A COMPLETE SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES DURING THE PROJECT.	2.1. ENTIRE INSTALLATION (INCLUDING EQUIPMENT, DEVICES, AND WIRING) SHALL BE IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF THE NATIONAL ELECTRICAL CODE (N.E.C.), NATIONAL FIRE PROTECTION ASSOCIATION (NFPA 70 & NFPA 101), OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (O.S.H.A.), INTERNATIONAL BUILDING CODE (I.B.C.), INTERNATIONAL ENERGY CONSERVATION CODE (I.E.C.C.), AND ALL LAWS & ORDINANCES APPLICABLE TO WORK AT THIS SITE. IN ADDITION, INSTALLATION SHALL MEET APPROVAL OF LOCAL INSPECTION AUTHORITY HAVING JURISDICTION. REFER TO COVER SHEET FOR LIST OF CURRENT APPLICABLE CODE EDITIONS.	5.5. PRIOR TO THE START OF ANY DEMOLITION OR CONSTRUCTION, CONTRACTOR SHALL REVIEW THE EXISTING SITE AND SECURE THE SERVICES OF A QUALIFIED, EPA CERTIFIED ASBESTOS ABATEMENT AGENCY IF NEEDED TO CHECK THE EXISTING INSULATION, ETC. FOR ASBESTOS. SHOULD ASBESTOS BE FOUND, DO NOT PROCEED WITH DEMOLITION OR CONSTRUCTION; NOTIFY THE ARCHITECT IN ANY CASE IN WRITING OF THE AGENCY'S FINDING.	6.6.1. SUPPLY SUBMITTALS FOR EACH SECTION: SUBMITTALS SHALL BE SUPPLIED ON A SECTION-AND SECTION-TYPE BASIS. FOR EXAMPLE, INDEPENDENT PRODUCT DATA SUBMITTALS. INDEPENDENT SHOP DRAWING SUBMITTALS SHALL BE FURNISHED FOR EACH SECTION THAT SECTION THAT REQUIRES PRODUCT DATA SUBMITTALS. INDEPENDENT SHOP DRAWING SUBMITTALS SHALL BE FURNISHED FOR EACH SECTION THAT REQUIRES SHOP DRAWINGS. SEPARATE PDF FILE PACKAGES SHALL BE SUPPLIED FOR EACH SECTION, FOR EACH SUBMITTAL TYPE. EACH PDF SHALL REPRESENT A SINGLE STANDALONE SUBMITTAL.	7.10.4. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS	
1.5. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SUITABLE FOR THE CONDITIONS AND DUTIES IMPOSED ON THEM AFTER INSTALLATION.	2.2. SECURE AND PAY ALL FEES ASSOCIATED WITH ALL PERMITS AND LICENSES REQUIRED FOR EXECUTION OF THE CONTRACT. ARRANGE FOR ALL INSPECTIONS REQUIRED BY CITY, COUNTY, STATE AND OTHER AUTHORITIES HAVING JURISDICTION, AND DELIVER CERTIFICATES OF APPROVAL TO THE ARCHITECT.	5.6. FOR RENOVATION PROJECTS - PROVIDE ALL DEMOLITION, PATCHING, SAW CUTTING, EXCAVATION, TRENCHING, SHORING, COMPACTING, DE-WATERING, ETC. REQUIRED FOR THE PROJECT, WHETHER OR NOT SHOWN ON THE DRAWINGS.	7.10.5. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.5.1. ALL MATERIALS, APPARATUS AND EQUIPMENT SHALL BEAR THE SEAL OF UNDERWRITERS LABORATORIES INC. (UL), OR A SIMILAR CREDIBLE TESTING AGENCY, LABEL WHERE NECESSARY SUPPLIED.	2.3. INFORMATION WAS TAKEN FROM VARIOUS ARCHIVE DRAWINGS AND LIMITED FIELD OBSERVATION. FIELD VERIFICATION OF EXISTING CONDITIONS AND POINTS OF CONNECTIONS ARE REQUIRED.	5.7. EXISTING SYSTEMS TO REMAIN - WHERE EXISTING SYSTEMS ARE INDICATED TO REMAIN, THEY SHALL BE ASSUMED TO BE IN GOOD WORKING ORDER REQUIRING NO WORK UNLESS SPECIFICALLY NOTED.	7.10.6. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.5.2. CERTAIN MANUFACTURERS OF MATERIAL AND EQUIPMENT ARE SPECIFIED AND PLANS ARE DETAILED ACCORDING TO THIS MATERIAL. CONTRACTOR SHALL BASE BID ON FURNISHING AND INSTALLING THIS MAKE OF MATERIAL AND EQUIPMENT.	2.4. THE CODE REQUIREMENTS ARE STRICTLY A MINIMUM AND SHALL BE MET WITHOUT INCURRING ADDITIONS TO THE CONTRACT. WHERE REQUIREMENTS OF THE DRAWINGS OR SPECIFICATIONS EXCEED THE CODE REQUIREMENTS, THE WORK SHALL BE PROVIDED IN ACCORDANCE WITH THESE DRAWINGS OR SPECIFICATIONS. IN THE EVENT OF CONFLICT OR AMBIGUITY BETWEEN THE VARIOUS CODES, THE MOST STRINGENT REQUIREMENTS SHALL GOVERN.	5.7.1. IF DURING THE CONSTRUCTION DEFICIENCIES ARE NOTED, THEN BRING THESE TO THE ATTENTION OF THE OWNER AND SEEK DIRECTION.	7.10.7. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.5.3. WHERE MORE THAN ONE MAKE OF MATERIAL OR EQUIPMENT IS SPECIFIED, CONTRACTOR SHALL STATE IN BID WHICH MAKE THEY PROPOSE TO FURNISH. SHOP DRAWINGS SHALL BE SUBMITTED ON MATERIAL AND EQUIPMENT TO BE FURNISHED BY CONTRACTOR FOR ENGINEER'S APPROVAL.	2.5. THIS APPROVAL TO BE OBTAINED PRIOR TO SHIPMENT OF EQUIPMENT.	6.6.6. SUPPLY COMPLETE SUBMITTALS: COMPLETE SUBMITTALS OF EACH TYPE ARE REQUIRED. PARTIAL SUBMITTALS WILL BE REJECTED. WHERE A SECTION REQUIRES A PRODUCT DATA SUBMITTAL, ALL PRODUCT DATA FOR THAT SECTION SHALL BE SUPPLIED TOGETHER, AT ONE TIME, AS ONE COMPLETE SUBMITTAL. WHEN RE-SUBMITTAL IS REQUIRED (I.E. REVISE AND RESUBMIT) THE REVISED SUBMITTAL SHALL BE MORE COMPLETE, MORE ACCURATE, AND MORE CONTRACT-COMPATIBLE THAN ITS REJECTED PREDECESSOR. THE SUBMITTAL NUMBER (FOR EACH SECTION AND TYPE) SHALL INCREMENT FOR EACH SUBSEQUENT SUBMITTAL (DO - ORIGINAL SUBMISSION, 01 - FIRST RESUBMISSION, 02 - SECOND RESUBMISSION, ETC.). RE-SUBMITTALS SHALL INCLUDE A COPY OF THE REVIEWER'S COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWER'S COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.10.8. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.6. COORDINATE CONNECTION OF SECONDARY ELECTRICAL SYSTEMS WITH EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES. COMPLY WITH REQUIREMENTS OF GOVERNING REGULATIONS, FRANCHISED SERVICE COMPANIES, AND CONTROLLING AGENCIES. PROVIDE REQUIRED CONNECTION FOR EACH SERVICE.	3. SAFETY	6.6.7. IF EXPRESSLY PERMITTED BY THE OWNER AND THE TERMS OF THE CONTRACT, EDITABLE ELECTRONIC VERSIONS OF PUBLISHED TWO-DIMENSIONAL PLAN DRAWINGS MAY BE MADE AVAILABLE FOR THE CREATION OF SHOP AND AS-BUILT DRAWINGS.	7.10.9. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.6.1. CONTRACTOR SHALL VERIFY TRANSFORMER LOCATION AND METERING SCHEME WITH LOCAL UTILITY CO.	3.1. THE CONTRACTOR SHALL MAINTAIN A SAFE WORK ENVIRONMENT AT ALL TIMES. 3.1.1. COMPLY WITH ALL O.S.H.A., N.I.O.S.H., D.O.T., STATE & LOCAL REQUIREMENTS REGARDING SAFE HANDLING, STORING, TRANSPORTING, AND DISPENSING OF CHEMICALS.	6.6.8. DUE TO THE PROPRIETARY NATURE OF INTERNAL DESIGN SYSTEMS, EDITABLE NATIVE-SOFTWARE VERSIONS OF SOME DRAWINGS INCLUDING BUT NOT LIMITED TO SYSTEM DIAGRAMS AND DETAILS WILL NOT BE MADE AVAILABLE IN AN EDITABLE FORM. IN THESE CASES, ELECTRONIC VERSIONS OF THE DRAWINGS MAY BE MADE AVAILABLE ONLY IN PDF, JPG OR SIMILAR NON-EDITABLE ELECTRONIC FORM. AT THE SOLE DISCRETION OF THE DESIGN PROFESSIONAL.	7.10.10. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.7. ALL MATERIALS SHALL BE FABRICATED AND INSTALLED IN A NEAT AND WORKMANLIKE MANNER.	3.2. MAINTAIN AND DISPLAY M.S.D.S. INFORMATION FOR ALL CHEMICAL PRODUCTS. 3.2.1. PROVIDE ALL NECESSARY MEANS TO MAINTAIN SAFE WORKING CONDITIONS, INCLUDING VENTILATION FANS, FIRE EXTINGUISHERS, EYE PROTECTION, RESPIRATORS, PROTECTIVE CLOTHING, VENTILATION, ETC.	6.6.9. EQUIPMENT AND DESIGN OF SYSTEMS INDICATED ON THE DESIGN DRAWINGS AND WITHIN THESE SPECIFICATIONS SHALL BE CONSIDERED AS SPECIFIED STANDARD OF QUALITY.	7.10.11. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.7.1. THE OWNER AND ENGINEER SHALL DETERMINE WHETHER WORKMANSHIP IS ACCEPTABLE. NO ALLOWANCES WILL BE MADE FOR REWORK OR DELAY DUE TO POOR WORKMANSHIP, COORDINATION DIFFICULTIES, OR INTERFERENCES BETWEEN INVOLVED TRADES.	3.3. MAINTAIN AND DISPLAY M.S.D.S. INFORMATION FOR ALL CHEMICAL PRODUCTS. 3.3.1. PROVIDE ALL NECESSARY MEANS TO MAINTAIN SAFE WORKING CONDITIONS, INCLUDING VENTILATION FANS, FIRE EXTINGUISHERS, EYE PROTECTION, RESPIRATORS, PROTECTIVE CLOTHING, VENTILATION, ETC.	6.7.1. NO SUBSTITUTIONS SHALL BE MADE WITHOUT PRIOR WRITTEN APPROVAL OF THE ENGINEER.	7.10.12. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.7.2. PERFORM ALL WORK NECESSARY TO PREPARE THE STRUCTURE FOR THE INSTALLATION OF THE WORK. ALL HOLES, OPENINGS AND DAMAGED MATERIALS CREATED DURING CONSTRUCTION SHALL BE REPAVED AND FINISHED BY EXPERIENCED WORKMEN.	3.4. ALL EQUIPMENT AND MATERIALS USED TO IMPLEMENT THE WORK SHALL BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, INCLUDING ALL RECOMMENDED SAFETY PRECAUTIONS.	6.7.2. ALL COSTS ARISING FROM A SUBSTITUTION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR MAKING THE SUBSTITUTION, INCLUDING VERIFICATION OF FIT AND ACCESS, FIELD-INSTALLED ACCESSORIES, SUPPORTS, ELECTRICAL REQUIREMENTS, AND REVISIONS TO DOCUMENTS (DESIGN COSTS).	7.10.13. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.7.3. COORDINATE AND SCHEDULE THE WORK WITH THE OWNER TO MINIMIZE DISRUPTIONS TO THE NORMAL OPERATIONS AT THE BUILDING.	3.5. MAINTAIN A PROPER FIRE WATCH FOR ALL OPERATIONS WHERE SPARKS, FLAMES, OR OTHER SOURCES OF FIRE ARE PRODUCED.	6.7.3. WHERE MATERIAL OR EQUIPMENT IS IDENTIFIED BY PROPRIETARY NAME, MODEL NUMBER AND/OR MANUFACTURER, FURNISH THE NAMED ITEM OR EQUAL THEREOF. SUBSTITUTED ITEMS SHALL BE EQUAL OR BETTER IN QUALITY AND PERFORMANCE AND MUST BE SUITABLE FOR THE AVAILABLE SPACE, REQUIRED ARRANGEMENT AND APPLICATION.	7.10.14. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.7.3.1. AFTER HOURS WORK IS REQUIRED ON THIS PROJECT.	3.6. FOR ALL MATERIALS CONTAINING SOLVENTS, MAINTAIN THE RECOMMENDED VENTILATION OF THE AREA TO PREVENT THE ACCUMULATION OF VAPORS WHICH POSE A HEALTH OR FIRE HAZARD.	6.7.4. MANUFACTURER'S NAME, SERIES AND MODEL NUMBERS, AS NOTED OR SPECIFIED, ARE FOR THE PURPOSE OF DESCRIBING TYPE, CAPACITY, AND QUALITY OF EQUIPMENT, MATERIALS AND PRODUCTS TO BE USED.	7.10.15. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.8. RELATED WORK SPECIFIED ELSEWHERE:	4. INTENT OF DRAWINGS AND SPECIFICATIONS	6.7.5. UNLESS “OR EQUAL” IS SPECIFICALLY STATED, BIDS SHALL BE BASED ONLY ON THE SPECIFIED “BASIS OF DESIGN” MANUFACTURER.	7.10.16. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.8.1. ALL DIVISION 1 REQUIREMENT, AND ALL TERMS AND CONDITIONS OF CONTRACT.	4.1. THE IMPLIED AND STATED INTENT OF THE DRAWINGS & SPECIFICATIONS ARE TO ESTABLISH MINIMUM ACCEPTABLE STANDARDS FOR MATERIALS, EQUIPMENT, WORKMANSHIP, AND TO PROVIDE OPERABLE SYSTEMS THAT ARE COMPLETE IN EVERY RESPECT.	6.7.6. THE LISTING OF A PARTICULAR MANUFACTURER AS AN “EQUAL” OR “ACCEPTABLE SUBSTITUTE” MANUFACTURER SHALL NOT BE MISCONSTRUED AS APPROVING NOR ALLOWING THE SUBSTITUTION OF THAT MANUFACTURER'S STANDARD PRODUCT IN PLACE OF THE BASIS DESIGN.	7.10.17. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.8.2. REFER TO MECHANICAL SPECIFICATION FOR MECHANICAL WORK TO BE DONE IN CONJUNCTION WITH THE ELECTRICAL WORK. CONTRACTOR IS RESPONSIBLE FOR ALL CONDUIT, WIRING, JUNCTION BOXES, ETC. REQUIRED FOR HVAC CONTROLS, UNLESS SPECIFICALLY NOTED OTHERWISE.	4.2. ENGINEERING DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT AND SIZES OF SYSTEM COMPONENTS, AND SHALL NOT BE SCALLED.	6.7.7. NO CONSIDERATION WILL BE GIVEN TO A PRODUCT WHICH WOULD REQUIRE DIMENSIONAL, SPATIAL OR AESTHETIC CHANGES TO THE PROJECT.	7.10.18. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.8.3. ALL ELECTRICAL EQUIPMENT AND WIRING PROVIDED UNDER DIVISION 23 SHALL COMPLY WITH THE ELECTRICAL SYSTEM CHARACTERISTICS INDICATED ON THE ELECTRICAL DRAWINGS AND SPECIFIED DIVISION 26.	4.3. ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL GOVERN SPACE CONSTRAINTS, DIMENSIONS AND FINISHES.	6.7.8. “ACCEPTABLE SUBSTITUTE” AND “EQUAL” MANUFACTURERS SHALL ONLY BID THOSE PRODUCTS WHICH EXACTLY MATCH THE SIZE AND OTHER CHARACTERISTIC OF THE SPECIFIED BASIS OF DESIGN.	7.10.19. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.8.4. ELECTRIC CONTROLS, CONTACTORS, STARTERS, PILOT LIGHTS, PUSH BUTTONS, ETC. SHALL BE PROVIDED COMPLETE AS PART OF THE MOTOR, HATER OR OTHER EQUIPMENT WHICH IT OPERATES. ALL ELECTRICAL COMPONENTS SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND DIVISION 26.	4.4. LOCATIONS OF EQUIPMENT INDICATED ON PLANS SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE TO THE PLANS SUBJECT TO BUILDING CONSTRUCTION AND INTERFERENCES WITH OTHER TRADES.	6.7.9. ANY CHANGES TO OTHER DISCIPLINES AND TRADES OF WORK REQUIRED BY AN	7.10.20. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.9. WHERE EQUIPMENT SPECIFICATIONS INDICATE THAT A FACTORY-AUTHORIZED SERVICE ENGINEER OR TECHNICIAN SHALL OBSERVE INSTALLATION, TEST & ADJUST, OR START-UP OF EQUIPMENT, ETC., SUCH SERVICES WILL BE CONTRACTED BY OWNER AS PART OF THE EQUIPMENT PURCHASE.	4.5. MAINTAIN MINIMUM SERVICE CLEARANCE AS REQUIRED BY THE EQUIPMENT MANUFACTURER AND N.E.C.	6.7.10. RE-SUBMITTAL OF THE SAME PRODUCT, THEN NO MORE REVIEWS OF THAT PRODUCT WILL BE PERFORMED WITHOUT DIRECT COMPENSATION TO THE ENGINEER BEING PAID FOR THE ADDITIONAL SERVICES REQUIRED FOR THE THIRD REVIEW AND ANY FURTHER REVIEWS.	7.10.21. EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS		
1.9.1. CONTRACTOR SHALL ARRANGE FOR, SCHEDULE, AND COORDINATE SUCH FIELD SERVICES AS WORK INCLUDED IN THE CONTRACT.	4.6. PROVIDE THE OWNER A COMPLETE SET OF RECORD DRAWINGS AT THE END OF THE PROJECT. PROJECT WILL NOT BE COMPLETE UNTIL ACCURATE RECORD DRAWINGS ARE DELIVERED.	6.7.11. THE DECISION AS TO WHETHER OR NOT A PROPOSED SUBSTITUTE OR “EQUAL” PRODUCT IS ACTUALLY EQUAL TO THAT SPECIFIED SHALL REST SOLELY WITH THE ENGINEER.	7.10		

## DIVISION 26 - ELECTRICAL SPECIFICATIONS

# ENGINEERS

# ELECTRICAL SPECIFICATIONS 2 OF 3

SHEET

# E5.1

DIVISION 26 - ELECTRICAL SPECIFICATIONS

13.5.8.	WET-LOCATION, WEATHERPROOF COVER PLATES - NEMA 250, COMPLYING WITH TYPE 3R WEATHER-RESISTANT, DIE-CAST ALUMINUM OR THERMOPLASTIC WITH HINGED LOCKABLE COVER.	15.8.	PHASES ARE CORRECTLY CONNECTED BY CHECKING ROTATION OF MOTOR. DRAWINGS INDICATE MINIMUM MOTOR HORSEPOWER RATINGS.	15.14.2.	WITH FIXTURE PLAN AND EQUIPMENT INSTALLER. COORDINATE ELECTRICAL REQUIREMENTS OF EQUIPMENT NOT SHOWN ON DETAILS, I.E. ROOF-TOP UNITS, UNIT HEATERS, FANS, ETC, AND EQUIPMENT/DEVICES REQUIRING AN ELECTRICAL CIRCUIT AND CONTROL.	16.17.6.	ALL RECESSED LUMINAIRES SHALL BE EQUIPPED WITH NECESSARY PLASTER FRAMES AND SURFACE TRIM.
13.5.9.	REFER TO ARCHITECTURAL FINISH SCHEDULES AND OWNER REPRESENTATIVE FOR ADDITIONAL INFORMATION.	15.8.1.	BRAKE HORSEPOWER SHALL NOT EXCEED MOTOR HORSEPOWER, I.E. MOTORS SHALL NOT OPERATE IN THEIR SERVICE FACTORS.	15.8.2.	MINIMUM MOTOR EFFICIENCIES SHALL NOT BE LESS THAN THAT SET FORTH IN THE LOCAL ENERGY CODE.	16.1.	LIGHTING FIXTURES FURNISH AND INSTALL A COMPLETE LIGHTING FIXTURE FOR EACH LIGHTING FIXTURE SYMBOL SHOWN ON THE DRAWINGS, OF THE TYPE AND QUALITY DESCRIBED HEREIN.
13.6.	FLOOR SERVICE FITTINGS	15.9.	MOTOR CHARACTERISTICS, SUCH AS INSULATION CLASS, SPEED/TORQUE CURVE, BEARING DESIGN LIFE, SHAFT MATERIAL, BODY MATERIAL, ETC. SHALL BE SELECTED BY THE EQUIPMENT MANUFACTURER BASED UPON THE INTENDED SERVICE OF THE EQUIPMENT.	16.1.1.	FIXTURES SHALL BE INSTALLED COMPLETE WITH LAMPS OF THE WATTAGE INDICATED, SOCKETS, HOUSING, BALLAST (IF REQUIRED), SHADES, DIFFUSERS, SUPPORTS, ETC., AND WIRED FOR OPERATION.	16.17.8.	STEM LENGTHS OF ALL PENDANT FIXTURES SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
13.6.1.	TYPE - MODULAR, FLUSH-TYPE, FLAP-TYPE, OR ABOVE-FLOOR, DUAL-SERVICE UNITS SUITABLE FOR WIRING METHOD USED.	15.9.1.	MOTORS SHALL BE SELECTED BY THE EQUIPMENT MANUFACTURER SUCH THAT THE MOTOR SURFACE TEMPERATURE IS NOT EXCESSIVE.	16.2.	CONTRACTOR SHALL BE COMPLETELY RESPONSIBLE FOR THE PROPER AND ACCURATE POSITION OF SOCKETS IN ALL FIXTURES SO THAT THE FILAMENT OF THE SIZE AND TYPE LAMPS SPECIFIED, WHEN INSTALLED IN SUCH SOCKETS, WILL BE IN CORRECT RELATION TO THE CENTER OF THE FIXTURE AS SPECIFIED BY THE MANUFACTURER OF THE VARIOUS LIGHTING FIXTURES AND GLASS UNITS SPECIFIED.	16.17.9.	ALL FASTENERS, HANGERS AND METHOD OF HANGING EXPOSED WORK IN FINISHED AREAS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW BEFORE INSTALLATION.
13.6.2.	COMPARTMENTS - BARRIER SEPARATES POWER FROM VOICE AND DATA COMMUNICATION CABLING.	15.9.1.1.	SURFACE TEMPERATURES OVER 150 DEG F, WITH SURROUNDING AIR OF 100 DEG F SHALL BE CONSIDERED EXCESSIVE AND UNACCEPTABLE.	16.3.	ALL SOCKETS SHALL BE APPROVED BY UNDERWRITERS LABORATORIES, INC. FLUORESCENT SOCKETS SHALL BE THRU-SLOT TYPE AND INCANDESCENT LAMP SOCKETS SHALL BE 250 VOLT CODE STANDARD, MEDIUM BASE FOR LAMPS UP TO 200 WATTS INCLUSIVE AND MOGUL BASE FOR LAMPS 300 WATTS AND LARGER.	16.17.10.	FASTENERS SHALL BE ZINC-COATED, TYPE, GRADE, AND CLASS AS REQUIRED FOR A NEAT FINISHED INSTALLATION.
13.6.3.	SERVICE PLATE - RECTANGULAR OR ROUND, DIE-CAST ALUMINUM OR SOLID BRASS WITH SATIN FINISH.	15.9.1.2.	MOTORS FOUND TO OPERATE AT EXCESSIVE TEMPERATURES SHALL BE REPLACED WITH COOLER-RUNNING MOTORS, AT NO ADDITIONAL COST TO THE OWNER.	16.4.	ALL FIXTURES SHALL BE WIRED FOR POLARIZED SYSTEM WITH ONE WIRE IN EACH FIXTURE TO BE DISTINCTLY MARKED FOR ITS ENTIRE LENGTH.	16.18.	LIGHTING CONTROL DEVICES OCCUPANCY SENSORS, DUAL TECHNOLOGY WALL SWITCHES.
13.6.4.	POWER RECEPTACLE - NEMA WD 6 CONFIGURATION 5-20R, GRAY FINISH, UNLESS OTHERWISE INDICATED.	15.9.1.2.	MOTORS FOUND TO OPERATE AT EXCESSIVE TEMPERATURES SHALL BE REPLACED WITH COOLER-RUNNING MOTORS, AT NO ADDITIONAL COST TO THE OWNER.	16.4.1.	WIRE SHALL BEAR THE LABEL OF APPROVAL OF THE UNDERWRITERS LABORATORIES, INC.	16.18.1.	PROVIDE WATTSTOPPER DW-100 WALL SWITCH (OR EQUIVALENT) AND CONFIGURE AS MANUAL, AUTO OFF (VACANCY SENSOR) UNLESS OTHERWISE SPECIFIED ON DRAWINGS. PROVIDE WITH TIME DELAY AS SPECIFIED ON DRAWINGS, IF NO TIME DELAY IS SPECIFIED, PROGRAM TO 10 MINUTES.
13.6.5.	VOICE AND DATA COMMUNICATION OUTLET - BLANK COVER WITH BUSHED CABLE OPENING OR TWO MODULAR, KEYED, COLOR-CODED, RJ-45 CATEGORY 5E JACKS FOR UTP CABLE.	15.10.	PROVIDE INHERENT THERMAL PROTECTION FOR ALL FRACTIONAL HORSEPOWER MOTORS.	16.4.2.	TYPE AF WIRE SHALL ONLY BE USED FOR INTERIOR INCANDESCENT FIXTURE WIRING.	16.18.2.	OCCUPANCY SENSORS, DUAL TECHNOLOGY CEILING SENSORS: PROVIDE WATTSTOPPER DT-300 CEILING MOUNTED OCCUPANCY SENSOR (OR EQUIVALENT). PROVIDE WITH TIME DELAY AS SPECIFIED ON DRAWINGS. IF NO TIME DELAY IS SPECIFIED, PROGRAM TO 20 MINUTES. ADJUST SENSITIVITY BASED ON FIELD CONDITIONS AND OCCUPANCY OF ROOM TO PROVIDE 100% COVERAGE WITHOUT NUISANCE TRIPPING.
13.7.	PROVIDE GROUNDED ("NEUTRAL") CONDUCTORS IN ALL WALL SWITCH, DIMMER, AND OTHER LIGHTING CONTROL OUTLET BOXES, EVEN IF NOT IMMEDIATELY UTILIZED.	15.11.	DISCONNECT SWITCHES AND SAFETY SWITCHES	16.5.	ALL FIXTURES SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL AND STATE REQUIREMENTS GOVERNING SAME AND SHALL BE U.L. APPROVED.	16.18.3.	PROVIDE WATTSTOPPER BZ-50 UNIVERSAL VOLTAGE PACK(S) AS REQUIRED TO PROPERLY POWER ALL OCCUPANCY SENSORS AND PROVIDE SWITCHING PER THE DESIGN INTENT.
13.8.	ALL DEVICE WALL PLATES SHALL BE STANDARD SIZE: "MIDWAY", "OVERSIZED" ("JUMBO") OR "EXTRA DEEP" WALL PLATES SHALL NOT BE ACCEPTABLE.	15.11.1.	ACCEPTABLE MANUFACTURERS	16.6.	EACH FIXTURE SHALL BE COMPLETELY EQUIPPED WITH LAMPS OF THE SIZE, TYPE, WATTAGE AND SHAPE INDICATED AND SPECIFIED.	16.18.4.	IN AREAS WHERE MULTIPLE OCCUPANCY SENSORS CONTROL A SINGLE ZONE TOGETHER, INTERLOCK OCCUPANCY SENSORS/POWER PACKS PER MANUFACTURER INSTRUCTIONS TO MEET CONTROL INTENT.
13.9.	SCREW HEADS COLORED TO MATCH FINISH OF PLATES.	15.11.1.1.	SQUARE D COMPANY	16.6.1.	ALL LAMPS SHALL OF STANDARD SCHEDULE MAKE.	16.19.	OCCUPANCY ADJUSTMENTS: WHEN REQUESTED WITHIN 12 MONTHS OF DATE OF SUBSTANTIAL COMPLETION, PROVIDE ON-SITE ASSISTANCE IN ADJUSTING AIMABLE LUMINAIRES TO SUIT ACTUAL OCCUPIED CONDITIONS. PROVIDE UP TO TWO VISITS TO PROJECT DURING OTHER-THAN-NORMAL OCCUPANCY HOURS FOR THIS PURPOSE. SOME OF THIS WORK MAY BE REQUIRED AFTER DARK. ADJUST AIMABLE LUMINAIRES IN THE PRESENCE OF OWNER'S REPRESENTATIVE AND DESIGN PROFESSIONALS.
13.10.	GROUND, PHASE AND NEUTRAL CONDUCTORS SHALL BE PIG-TAILED IN OUTLET BOXES, OR MULTI-OUTLET ASSEMBLY FOR RECEPTACLES, SO THAT GROUND AND ELECTRICAL SERVICE WILL NOT BE DISTURBED DUE TO OTHER RECEPTACLES ON THE SAME MULTI-WIRE CIRCUIT IF RECEPTACLE IS REMOVED.	15.11.1.2.	EATON/CUTLER HAMMER	16.6.2.	LUMEN OUTPUT AND LIFE OF LAMPS SHALL BE PROPER VOLTAGE FOR THE BUILDING.		
14.	PANEL BOARDS	15.11.1.3.	SIEMENS	16.6.3.	EXACT VOLTAGE SHALL BE CHECKED BEFORE ORDERING FIXTURES.		
14.1.	PROVIDE PANELS MATCHING VOLTAGES, PHASE AND WIRES AS NOTED ON THE PANEL SCHEDULES.	15.11.3.	PROVIDE SWITCHES WITH ELECTRICAL CHARACTERISTICS INDICATED:	16.7.	AT THE LOCATION OF OUTLETS INDICATED ON THE VARIOUS DRAWINGS, THE TYPE OF FIXTURE REQUIRED IS DESIGNATED BY A TYPE LETTER. ALL FIXTURES SHALL BE FURNISHED IN THE QUANTITIES, SIZES AND TYPES AS INDICATED ON THE DRAWINGS.		
14.2.	AS A BASIS OF DESIGN, USE SQUARE-D TYPE "NO", "NF" UNLESS OTHERWISE NOTED ON THE PANEL SCHEDULE OR AS A NOTE ASSOCIATED WITH THE PANEL.	15.11.3.1.	SWITCHES SHALL BE EQUIPPED WITH FUSE CONTACTS AND JAWS WHICH INSURE POSITIVE FUSE AND JAW CONTACT BY MEANS OF REINFORCING SPRING CLIPS OR OTHER APPROVED MEANS.	16.8.	HANDLE LIGHTING FIXTURES CAREFULLY TO PREVENT DAMAGE, BREAKING AND SCORING. DO NOT INSTALL DAMAGED FIXTURES OR COMPONENTS, REPLACE WITH NEW.		
14.3.	ACCEPTABLE MANUFACTURERS	15.11.3.2.	HINGES SHALL BE NON-CURRENT CARRYING.	16.9.	STORE LIGHTING FIXTURES IN A CLEAN DRY PLACE. PROTECT FROM WEATHER, DIRT, FUMES, WATER CONSTRUCTION DEBRIS AND PHYSICAL DAMAGE.		
14.3.1.	SQUARE D CO. (BOLT ON BREAKERS)	15.11.3.3.	SWITCHES SHALL BE SO DESIGNED THAT THEY CAN BE LOCKED IN EITHER OPEN OR CLOSED POSITION.	16.10.	SHIP FIXTURES FACTORY ASSEMBLED, WITH PARTS REQUIRED FOR A COMPLETE INSTALLATION.		
14.3.2.	SIEMENS (BOLT ON BREAKERS)	15.11.3.4.	SWITCHES SHALL HAVE REJECTION CLIP PROVISIONS SO THAT ONLY CLASS RK-1 CURRENT LIMITING FUSES CAN BE INSTALLED.	16.11.	AT DATE OF SUBSTANTIAL COMPLETION REPLACE LAMPS IN ALL FIXTURES WHICH ARE OBSERVED TO BE INOPERATIVE OR NOTICEABLY DIMMED AFTER CONSTRUCTION USE AS JUDGED BY THE OWNER'S REPRESENTATIVE.		
14.3.3.	EATON/CUTLER HAMMER (BOLT ON BREAKERS)	15.11.3.5.	ALL SAFETY SWITCHES SHALL BE QUICK-MAKE, QUICK-BREAK, AND HAVE INTERLOCKING COVER WITH HANDLE THAT MAY EITHER BE FRONT OR SIDE OPERATING.	16.12.	ALL LUMINAIRES UTILIZED FOR EMERGENCY AND/OR EGRESS LIGHTING SHALL BE CONNECTED AHEAD OF SWITCHING.		
14.4.	PROVIDE DEAD-FRONT, SAFETY CONSTRUCTED, FACTORY-ASSEMBLED CIRCUIT BREAKER TYPE PANEL BOARDS IN SIZES AND RATINGS AS INDICATED.	15.11.3.6.	SWITCH BLADE SHALL BE VISIBLE IN OFF POSITION WITH THE DOOR OPEN.	16.13.	ALL BALLASTS OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND CATALOG.		
14.4.1.	ALL PANEL BOARDS INTERIORS SHALL BE FACTORY ASSEMBLED COMPLETE WITH CIRCUIT BREAKERS AS SCHEDULED ON THE DRAWINGS. ALL CIRCUIT BREAKERS SHALL BE QUICK-MAKE AND SHALL BE TRIP INDICATING.	15.11.3.7.	EQUIP WITH OPERATING HANDLE THAT IS AN INTEGRAL PART OF ENCLOSURE BASE AND WHOSE OPERATING POSITION IS CLEARLY INDICATED AND IS PADLOCKABLE IN THE OFF POSITION.	16.14.	ALL LAMPS OF THE SAME TYPE SHALL BE OF THE SAME MANUFACTURER AND CATALOG NUMBER.		
14.4.2.	EACH BOLT-ON PANEL BOARD SHALL BE PROVIDED WITH AN EQUIPMENT GROUND BUS BONDED TO THE PANEL BACK BOX. IN ADDITION, PROVIDE 200% NEUTRAL BUS AND ISOLATED GROUND BUS WHERE INDICATED.	15.11.3.8.	CONSTRUCT CURRENT CARRYING PARTS OF HIGH-CONDUCTIVITY COPPER AND SILVER-TUNGSTEN TYPE SWITCH CONTACTS.	16.15.	LED (LIGHT EMITTING DIODE) LIGHT FIXTURES		
14.4.3.	EQUIP PANEL BOARD UNIT DEVICES WITH TYPES, RATINGS AND CHARACTERISTICS INDICATED.	15.11.3.9.	PROVIDE NEMA TYPE 1 FOR INTERIOR AND NEMA TYPE 3R FOR EXTERIOR AND PROVIDE TYPE INDICATED FOR SPECIAL CASES.	16.15.1.	PROVIDE FACTORY INSTALLED LED MODULES THAT ARE SPECIFICALLY DESIGNED FOR, AND MATCHED AND MATED TO, THE RESPECTIVE LUMINAIRE IN WHICH THEY ARE USED.		
14.4.4.	BUS STRUCTURE AND MAIN LUGS OR MAIN BREAKER SHALL HAVE CURRENT RATINGS AS SHOWN ON THE PANEL BOARD SCHEDULE.	15.11.3.10.	PROVIDE FUSIBLE SWITCHES WITH FUSES REQUIRED.	16.15.1.1.	PROVIDE LED MODULES THAT CAN EASILY BE REPLACED IN THE FIELD AND ARE READILY ACCESSIBLE FOR REPLACEMENT.		
14.4.4.1.	SUCH RATINGS SHALL BE ESTABLISHED BY TEST CONDUCTED IN ACCORDANCE WITH UNDERWRITERS LABORATORIES STANDARD UL 67. THE USE OF CONDUCTOR DIMENSIONS WILL NOT BE ACCEPTED IN LIEU OF ACTUAL HEAT TEST.	15.11.3.10.1.	FUSES SHALL BE U.L. LISTED CLASS RK-1 CURRENT LIMITING TYPE. PROVIDE BUSSMAN "LOW PEAK" OR APPROVED EQUAL.	16.15.1.2.	PROVIDE COLOR TEMPERATURE AS INDICATED IN LUMINAIRE SCHEDULE.		
14.4.5.	BUS BAR CONNECTIONS TO THE BRANCH CIRCUIT BREAKERS SHALL BE "PHASE-SEQUENCE" TYPE.	15.11.3.11.	PROVIDE CONTROL INTERLOCKS WHEN INDICATED.	16.15.2.	PROVIDE FACTORY INSTALLED DRIVER(S) FOR THE LED SOURCE UTILIZED THAT ARE SPECIFICALLY COORDINATED TO THE LED SOURCE AND LUMINAIRE IN WHICH THEY ARE USED.		
14.4.6.	THREE-PHASE, FOUR WIRE BUSING SHALL BE SUCH THAT ANY THREE ADJACENT SINGLE-POLE BREAKERS ARE INDIVIDUALLY CONNECTED TO EACH OF THE THREE DIFFERENT PHASES IN SUCH A MANNER THAT TWO OR THREE-POLE BREAKERS CAN BE INSTALLED AT ANY LOCATION.	15.11.4.	HEAVY-DUTY SAFETY SWITCHES - PROVIDE SURFACE MOUNTED, HEAVY DUTY TYPE, SHEET STEEL ENCLOSED SWITCHES THAT ARE PAINTED WITH PRIME COATS AND FINAL ENAMEL COATS THAT IS SUITABLE FOR EXPOSURE TO EXTERIOR ELEMENTS WITHOUT CORROSION.	16.15.2.1.	PROVIDE DRIVER(S) HAVING SPECIFIC OPERATING CHARACTERISTICS DEFINED IN THE LUMINAIRE SCHEDULE.		
14.4.7.	ALL CURRENT CARRYING PARTS OF THE BUSS ASSEMBLY SHALL BE PLATED COPPER WITH CONDUCTIVITY OF NOT LESS THAN 98%.	15.12.	MOTOR STARTERS	16.15.2.2.	PROVIDE DRIVER(S) THAT CAN EASILY BE REPLACED IN THE FIELD AND ARE READILY ACCESSIBLE FOR REPLACEMENT.		
14.5.	PANEL BOARD ENCLOSURE	15.12.1.	STARTERS AND CONTROL DEVICES FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 26 - ELECTRICAL WHERE SHOWN ON THE DRAWINGS.	16.15.2.3.	PROVIDE SPECIFICATION SHEET FOR THE SPECIFIC DRIVER AS PART OF THE LUMINAIRE SUBMITTAL.		
14.5.1.	PROVIDE GALVANIZED SHEET STEEL CABINET TYPE ENCLOSURES, IN SIZES AND NEMA TYPES AS INDICATED, CODE GAUGE MINIMUM 16-GAUGE THICKNESS.	15.12.2.	UNLESS SPECIFIED OTHERWISE UNDER OTHER DIVISION 23 SPECIFICATIONS, MECHANICAL DRAWINGS, OR INDIVIDUAL EQUIPMENT SECTIONS, MOTOR STARTERS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS:	16.15.3.	PROVIDE TOTAL HARMONIC DISTORTION (THD) RATING OF LESS THAN 20 PERCENT.		
14.5.2.	ENCLOSURES SHALL BE SURFACE MOUNTED UNLESS OTHERWISE INDICATED.	15.12.2.1.	STARTERS FOR MOTORS 1/3 HORSEPOWER OR SMALLER SHALL BE MANUAL UNLESS REMOTE OR AUTOMATIC STARTING IS REQUIRED, IN WHICH CASE THE STARTERS SHALL BE MAGNETIC, FULL VOLTAGE, NON-REVERSING, SINGLE-SPEED, UNLESS OTHERWISE INDICATED. ALL OTHER STARTERS SHALL BE MAGNETIC.	16.15.3.1.	PROVIDE FACTORY-INSTALLED INTEGRAL FILTERING SYSTEM TO ENSURE THD DOES NOT EXCEED 20 PERCENT REGARDLESS OF QUANTITIES AND/OR MIXES WITH OTHER MANUFACTURED LED SYSTEMS.		
14.5.3.	PANEL BOARDS AND ENCLOSING CABINETS SHALL CONFORM TO STANDARDS ESTABLISHED BY UNDERWRITERS' LABORATORIES, INC., AND REQUIREMENTS OF THE NEC.	15.12.2.2.	EACH STARTER FOR A THREE-PHASE MOTOR SHALL BE FURNISHED WITH THREE (3) OVERLOAD RELAYS SIZED FOR THE FULL LOAD RUNNING CURRENT OF THE MOTOR ACTUALLY PROVIDED.	16.16.	INCANDESCENT LIGHT FIXTURES		
14.5.4.	CONSTRUCT WITH MULTIPLE KNOCKOUTS AND WIRING GUTTERS.	15.12.2.2.1.	PROVIDE AN EXTERNAL "HAND-OFF-AUTO" SELECTOR SWITCH WITH RED "RUNNING" LIGHT.	16.16.1.	PROVIDE INCANDESCENT LAMPS IN THE SIZES AND RATED AS INDICATED AND 130 VOLT RATED.		
14.5.5.	PROVIDE FRONTS WITH ADJUSTABLE TRIM CLAMPS, AND DOORS WITH FLUSH LOCKS AND KEYS. ALL PANEL BOARD ENCLOSURES KEYED ALIKE WITH CONCEALED PANEL DOOR HINGES.	15.12.2.2.2.	PROVIDE A GREEN LIGHT TO INDICATE MOTOR "STOPPED".	16.17.	MOUNTING		
14.5.6.	EQUIP WITH INTERIOR CIRCUIT DIRECTORY FRAME, AND CARD WITH CLEAR PLASTIC COVERING.	15.12.2.2.3.	EACH PILOT LIGHT SHALL HAVE A LEGEND PLATE INDICATING REASON FOR SIGNAL.	16.17.1.	ALL SURFACE AND RECESSED CEILING LUMINAIRES INSTALLED ON GRID OR TILE CEILINGS SHALL BE INSTALLED TO AGREE WITH MODULE OF CEILING EITHER DISPLACING A TILE, OR UNIT ON CENTER OF TILE, OR CENTERED ON GRID LINES.		
14.5.7.	PROVIDE BAKED GRAY ENAMEL FINISH OVER A RUST INHIBITOR COATING.	15.12.2.3.	EACH OVERLOAD RELAY SHALL HAVE A NORMAL OPEN ALARM CONTACT WHICH WILL CLOSE ONLY WHEN ACTUATED BY AN OVERLOAD (NOT TO BE CONFUSED WITH N.O. OR N.C. AUXILIARY CONTACTS). THESE CONTACTS SHALL BE PROPERLY WIRED TO THEIR RESPECTIVE BLUE PILOT LIGHT PROVIDED ON THE STARTER FRONT COVER AND HAVING A "TRIPPED" LEGEND PLATE.	16.17.2.	RECESSED INCANDESCENT AND FLUORESCENT FIXTURES IN CEILINGS MAY NOT BE SUPPORTED FROM THE SUSPENDED CEILING CONSTRUCTION. BOX AND FIXTURE SUPPORTS SHALL BE FASTENED SECURELY TO CONCRETE SLAB OR BAR JOIST EXCEPT AS NOTED. WHERE FIXTURES ARE SURFACE MOUNTED, NEAT HOLES SHALL BE CUT IN THE HUNG CEILINGS AS REQUIRED FOR THE FIXTURE SUPPORTS. ALL SUPPORT HANGERS, CHANNELS, BOLTS, ETC, SHALL BE GALVANIZED OR GALV-KROM.		
14.5.8.	MINIMUM DEPTH OF 5-3/4" & MINIMUM WIDTH OF 20" FOR PANELS.	15.12.2.3.	INDIVIDUAL MOUNTED MOTOR STARTERS SHALL BE IN A NEMA TYPE 1 GENERAL PURPOSE ENCLOSED IN UNFINISHED AREAS AND SHALL BE FLUSH MOUNTED IN ALL FINISHED AREAS. ALL STARTERS MOUNTED IN EXTERIOR AREAS SHALL HAVE A NEMA 3R ENCLOSURE. EACH STARTER SHALL HAVE A LAMINATED NAMEPLATE TO INDICATE EQUIPMENT UNIT NUMBER, FUNCTION AND CIRCUIT NUMBER.	16.17.3.	PROVIDE ADEQUATE SUPPORTS FOR ALL FIXTURES SEPARATE FROM THE SUSPENDED CEILING SYSTEM. CONTRACTOR SHALL FURNISH AND INSTALL ALL NECESSARY ACCESSORIES, AS REQUIRED, TO SUPPORT THE FIXTURES. PROVIDE A MINIMUM OF TWO (2) GALVANIZED STEEL #12 GAUGE HANGER WIRES (ALTERNATE CORNERS) ON ALL RECESSED FIXTURES. PROVIDE LUMINAIRES AND/OR LUMINAIRE OUTLET BOXES WITH HANGERS TO PROPERLY SUPPORT LUMINAIRE WEIGHT. ALL LUMINAIRES INSTALLED IN OR ON SUSPENDED CEILING SYSTEMS SHALL BE ANCHORED DIRECTLY TO THE BUILDING STRUCTURAL SYSTEM ABOVE. SUCH ANCHORING SHALL BE INDEPENDENT OF THE CEILING SUPPORT SYSTEM.		
14.5.9.	SEE PANEL SCHEDULE NOTES FOR SPECIFIED ALTERNATE SPECIAL CONDITIONS.	15.12.2.4.	ALL MOTORS STARTERS PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.	16.17.4.	ALL LUMINAIRES SHALL BE INSTALLED PLUMB AND SUPPORT SURFACE MOUNTED LUMINAIRES GREATER THAN 2 FEET IN LENGTH AT A POINT IN ADDITION TO THE OUTLET BOX LUMINAIRE STUD.		
14.6.	BALANCE AMPERES OF CIRCUITS AFTER ACTIVE LOADS ARE ENERGIZED TO WITHIN 10% MAXIMUM AND PROVIDE TYPEWRITTEN PANEL BOARD SCHEDULE WITH CORRECTED LOADS.	15.12.2.5.	ALL MOTORS STARTERS PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.	16.17.5.	INSTALL FLUSH MOUNTED FIXTURES TO ELIMINATE LIGHT LEAKAGE BETWEEN FRAME AND FINISHED SURFACE.		
14.7.	PROVIDE PANEL BOARD WITH CIRCUIT BREAKERS HAVING THE SHORT CIRCUIT RATING (SCCR) INDICATED.	15.12.3.	MOTOR STARTERS FOR THE FOLLOWING EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 23 BY THE MANUFACTURER OF THE EQUIPMENT:				
14.7.1.	PROVIDE CIRCUIT BREAKERS HAVING THE AIC RATING INDICATED AND IF THE PANEL BOARD IS "SERIES RATED", MANUFACTURER SHALL PROVIDE LABELING REQUIRED BY N.E.C. RELATIVE TO THIS RATING, AND SHALL SUBMIT DATA WITH THE PANEL BOARD AND CIRCUIT BREAKER SUBMITTAL.	15.12.3.1.	PACKAGED AIR CONDITION EQUIPMENT				
14.7.2.	ALL AUTOMATIC TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23 - MECHANICAL, UNLESS INDICATED OR SPECIFIED OTHERWISE. ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL STARTERS AND MAKE ALL POWER CONNECTIONS.	15.1					

Property of

#### GENERAL NOTES

1. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY FITTINGS AS REQUIRED BY ALL APPLICABLE CODES AND GOVERNING AUTHORITIES.
2. CONTRACTOR SHALL VERIFY AND CORRECT AS REQUIRED TO MEET ALL CODES AND REGULATIONS ANY POSSIBLE DISCREPANCIES BETWEEN TYPE AND SIZE OF CONNECTION SPECIFIED IN PLUMBING FIXTURE SCHEDULE AND FIXTURES ACTUALLY INSTALLED ON THE SITE.
3. ALL SANITARY 1/8" AND GREASE WASTE PIPING SHALL HAVE A 1/4" PER FOOT SLOPE UNLESS OTHERWISE NOTED OR PER LOCAL CODE.
4. VENT PIPING SHOWN ON FLOOR PLANS IS ONLY INDICATIVE EXCEPT FOR VTR LOCATIONS.
5. VALVES AND FITTINGS SHALL BE OF SAME SIZE OF LINE ON WHICH THEY ARE LOCATED, UNLESS OTHERWISE INDICATED ON DRAWINGS.
6. CONTRACTOR SHALL COORDINATE ALL WORK WITH OTHER TRADES.
7. CONTRACTOR SHALL FIELD VERIFY ALL GIVEN MEASUREMENTS PRIOR TO LAYING AND CONNECTING ALL SANITARY AND WASTE PIPING AND NOTIFY ARCHITECT OF ANY DISCREPANCIES.
8. AIR CHAMBERS SHALL NOT BE CONSIDERED AN EQUAL TO WATER ARRESTORS AS SPECIFIED.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING FIRE RATING AND WEATHERPROOFING INTEGRITY OF ALL PIPING AND PENETRATIONS.
10. ALL WATER SUPPLY AND SANITARY LINES SHALL BE RUN AS CLOSE TO PLANS AS POSSIBLE WITH NO CHANGES IN SIZING.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL NECESSARY SUPPORTING DEVICES FOR ALL FIXTURES INCLUDED IN CONTRACT OR HEREIN SPECIFIED OR OTHERWISE.
12. CHANGES IN THE DIRECTION OF SANITARY PIPING SHALL NOT BE MADE WITH FITTINGS WHICH WILL CAUSE EXCESSIVE REDUCTION IN THE VELOCITY OF FLOW OR CREATE ANY OTHER ADVERSE EFFECT UNLESS PHYSICALLY IMPOSSIBLE (IE: USE OF SANITARY TEE IN A HORIZONTAL CONNECTION, USE OF A DOUBLE SANITARY TEE IN A VERTICAL STACK, IN GENERAL, USE OF SHORT-RADIUS FITTINGS FOR BRANCH TO HOUSE DRAIN OR STACK CONNECTION).
13. ALL DRAINAGE PIPING SHALL BE MARKED WITH THE SEAL OF APPROVAL OF THE NATIONAL SANITATION FOUNDATION.
14. PROVIDE ACCESS PANELS TO ALL VALVES WITHIN CHASES OR ABOVE NONACCESSIONABLE CEILINGS. REFER TO ARCHITECTURAL DRAWINGS FOR CEILING TYPES.
15. SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATIONS OF PLUMBING FIXTURE MOUNTING HEIGHTS, AND DIMENSIONS.
16. CONTRACTOR SHALL VERIFY INVERT ELEVATIONS OF SANITARY AND GREASE TRAPS TO WHICH NEW SEWER LINES ARE TO BE CONNECTED BEFORE INSTALLATION OF NEW SEWER LINE.
17. ALL VENTS THROUGH ROOF SHALL BE MIN. 10'-0" FROM ANY AIR INTAKES.
18. CONTRACTOR SHALL INSTALL DIELECTRIC UNIONS AT CONNECTIONS OF DISSIMILAR METALS.
19. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS (INCLUDING PIPE ROUTING, AND EQUIPMENT LOCATIONS) TO ARCHITECT/ENGINEER FOR REVIEW AND APPROVAL PRIOR TO THE INSTALLATION OR PURCHASING OF ANY PIPING AND/OR EQUIPMENT.
20. CLEANOUTS SHALL BE PROVIDED AT THE LOCATIONS INDICATED AND A MINIMUM WHERE REQUIRED BY CODE. FLOOR CLEANOUTS SHALL BE A MINIMUM OF 4" AND SHALL BE COMPLETE WITH A FLUSH PLUG AND REMOVABLE SCORIATED BRONZE FLOOR PLATE, PROVIDE CARPET BUTTONS IN CARPETED AREAS.

#### FOOD SERVICE NOTES

1. ALL SERVICE LINES FOR WATER AND GAS SIZED TO PROVIDE FULL FLOW VOLUME FOR ALL ITEMS SUPPLIED ON RESPECTIVE MAINS AND BRANCHES. IDENTIFY ALL LINES WITH PERMANENT LABELS FOR THE SERVICE THEY PROVIDE.
2. FUEL GAS SERVICES SHALL BE SIZED TO SUPPLY THE REQUIRED BTUH INDICATED AT THE EQUIPMENT AT LOW PRESSURE OF APPROXIMATELY 7"-11" WATER COLUMN. PROVIDE PRESSURE REGULATORS AS REQUIRED.
3. ALL HOT AND COLD WATER SERVICE LINES, EXCEPT SHORT BRANCHES EXTENDED AND CONNECTED TO FIXTURES, SHALL BE INSULATED. ALL EXPOSED INSULATED LINES SHALL BE COVERED WITH PROTECTIVE COVERING TO SUIT THE APPLICATION.
4. ALL HORIZONTAL PIPING LINES EXTENDED AND CONNECTED TO EQUIPMENT, BELOW EQUIPMENT, SHALL BE RUN AT THE HIGHEST POSSIBLE ELEVATION ABOVE FLOOR, TO PROVIDE CLEARANCE FOR CLEARING. NO LINES SHALL LAY ON FLOOR.
5. ALL PIPING ROUTED THROUGH OR NEAR EQUIPMENT OR COUNTERS SHALL NOT INTERFERE WITH THE INTENDED USE OF, OR SERVICING OF, EQUIPMENT OR COUNTERS.
6. ALL EXPOSED PIPING AND FITTINGS SHALL BE CHROME PLATED OR STAINLESS STEEL. TALL PIECES FOR SINKS SHALL BE 17 GAUGE CHROME PLATED FLARED BRASS TUBING FOR CONNECTION TO 1-1/2" I.P.S. MALE THREAD FITTING. "P" TRAPS SHALL BE CHROME PLATED BRASS, UNIFORM CODE PATTERN.
7. STOPS SHALL BE FURNISHED AND INSTALLED ON ALL HOT AND COLD WATER LINES AT EQUIPMENT. PROVIDE ALL REQUIRED SHUT-OFF VALVES, CHROME FINISH.
8. KITCHEN EQUIPMENT DIVISION SHALL PROVIDE ALL FOOD SERVICE EQUIPMENT FAUCETS. PLUMBING CONTRACTOR SHALL INSTALL AND CONNECT EQUIPMENT SINKS ARE PROVIDED WITH 1-1/2" WASTE CONNECTIONS.
9. ALL WASTES, DIRECT OR INDIRECT, SHALL BE FURNISHED AND INSTALLED BY THE PLUMBING CONTRACTOR EXCEPT AS NOTED ON UTILITY PLANS.
10. MINIMUM SIZE INDIRECT WASTES SHALL BE 1", REGARDLESS OF SIZE OF CONNECTION AT EQUIPMENT.
11. ADEQUATE CLEAN-OUT PROVISION SHALL BE MADE FOR ALL WASTE LINES BY MEANS OF PLUGGED "T" FITTING EXTENDED TO ACCESSIBLE POSITION.
12. PLUMBING CONTRACTOR SHALL FURNISH AND INSTALL DRAIN LINES FROM COLD STORAGE ROOM EVAPORATORS TO DRAIN LOCATIONS WITH MINIMAL PITCH AND "P" TRAP IN END OVER FLOOR RECEPTOR DRAIN LINES SHALL BE 1" MINIMUM. EACH EVAPORATOR SHALL HAVE A SEPARATE DRAIN LINE.
13. GAS AND WATER SERVICES FOR PORTABLE AND COUNTER TOP APPLIANCES SHALL BE CONNECTED TO EQUIPMENT WITH STAINLESS STEEL FLEXIBLE HOSES AND QUICK DISCONNECT FITTINGS. GAS FITTINGS AND HOSES SHALL BE A.G.A. APPROVED FOR COMMERCIAL KITCHEN EQUIPMENT. GAS AND WATER HOSES SHALL BE COVERED WITH A THICK FIRE RESISTANT PLASTIC OR POLY COATING.
14. PLUMBING CONTRACTOR SHALL COORDINATE WITH KITCHEN CONSULTANT DRAWINGS FOR ROUGH IN LOCATIONS, SIZES AND HOOK-UP REQUIREMENTS FOR ALL KITCHEN EQUIPMENT. ROUGH IN EQUIPMENT PER MANUFACTURERS RECOMMENDATIONS.

#### SHEET LIST

SHEET NUMBER	SHEET TITLE
PLUMBING	
P0.0	GENERAL NOTES AND LEGEND
P1.0	SANITARY AND VENT PLAN
P2.0	WATER SUPPLY PLAN
P4.0	PLUMBING SCHEDULES
P5.0	PLUMBING DETAILS (1 OF 2)
P5.1	PLUMBING DETAILS (2 OF 2)
P6.0	RISER DIAGRAMS
P7.0	PLUMBING ENERGY COMPLIANCE FORMS
P8.0	PLUMBING SPECIFICATIONS (1 OF 2)
P8.1	PLUMBING SPECIFICATIONS (2 OF 2)

#### FIELD VERIFY ALL CONDITIONS

NOTE: AS NOTED IN THE SPECIFICATIONS, ALL WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING. ALL SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT HE HAS THOROUGHLY REVIEWED AND COORDINATED ALL LOCATIONS AND ROUTINGS WITH ALL OTHER TRADES PRIOR TO FABRICATION OF CONDUITS, DUCTS, OR PIPING, AND START OF INSTALLATION OF SAME (INCLUDING SPRINKLER PIPING WHEN PRESENT ON JOB). ANY INSTALLATION OR CONSTRUCTION CONFLICTS WHICH OCCUR IN THE FIELD SHALL BE RESOLVED BY THE TRADE CONTRACTOR TO THE SATISFACTION OF THE OWNER AND ARCHITECT AND AT NO EXPENSE TO THE OWNER, ARCHITECT AND/OR GENERAL CONTRACTOR.

THE CONTRACTOR SHALL CONTACT THE ARCHITECT, ENGINEER OR OWNER PRIOR TO BIDDING FOR INTERPRETATIONS AND CLARIFICATIONS OF THE DESIGN AND INCLUDE IN HIS BID ALL COSTS TO MEET THE DESIGN INTENT. CLARIFICATIONS MADE BY THE ARCHITECT, ENGINEER OR OWNER AFTER BIDDING WILL BE FINAL AND SHALL BE IMPLEMENTED AT CONTRACTORS COST.

BIDDING CONTRACTORS SHALL HAVE A WORKING KNOWLEDGE OF LOCAL CODES AND ORDINANCES AND SHALL INCLUDE IN THEIR BIDS THE COSTS FOR ALL WORK INSTALLED IN STRICT ACCORDANCE WITH GOVERNING CODES. THE PLANS AND SPECIFICATIONS NOT WITHSTANDING, THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT.

#### PLUMBING LEGEND

→	DIRECTION OF FLOW IN PIPE
→	PITCH PIPE DOWN IN DIRECTION OF ARROW
○○	PIPE UP
○○	PIPE DOWN
●○	BALL VALVE
→	CHECK VALVE / SECONDARY BFP
□	BALANCING VALVE
○→	VALVE IN VERTICAL
	UNION
—	HOSE END VALVE
—	SANITARY SEWER (BELOW GRADE)
—	DOMESTIC COLD WATER (CWS)
—	DOMESTIC HOT WATER (HWS)
—	DOMESTIC HOT WATER RETURN (HWR)
—	DOMESTIC TEMPERED HOT WATER
—	CONDENSATE DRAIN
—	GREASE WASTE
—	FILTERED WATER
—	VENT
○	POINT OF CONNECTION NEW TO EXISTING
□	FS-1 (FLOOR SINK 1/2 GRATE)
○	FLOOR DRAIN
○	HUB DRAIN
—	HORIZONTAL CLEANOUT

#### ABBREVIATIONS

CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
GW	GREASE WASTE
V	VENT
AFF/AFG	ABOVE FINISHED FLOOR/GRADE
AHJ	AUTHORITY HAVING JURISDICTION
BFP	BACKFLOW PREVENTER
ETR	EXISTING TO REMAIN
FCO	FLOOR CLEANOUT
GC	GENERAL CONTRACTOR
IW	INDIRECT WASTE
PC	PLUMBING CONTRACTOR
WCO	WALL CLEANOUT
EWH	ELECTRIC WATER HEATER
ET	EXPANSION TANK
RCP	RE-CIRCULATION PUMP
FD	FLOOR DRAIN
HD	HUB DRAIN
FS	FLOOR SINK
F	FRANCHISE
EV	EQUIPMENT VENDOR
CC	CONTRACTORS CHOICE
OC	OWNERS CHOICE
VLL	VERIFY WITH LANDLORD
SPS	SEE PLUMBING SCHEDULE
GAL	GALLONS
GPM	GALLON PER MINUTE
GPH	GALLON PER HOUR
HB	HOSE BIBB
CD	CONDENSATE DRAIN
FW	FILTER WATER
NTS	NOT TO SCALE
TYP	TYPICAL
SE	SEWAGE EJECTOR PUMP
TS	TRAP SEAL

JOB LOCATION:

GENERAL NOTES AND LEGEND

NY ENGINEERS

REVISIONS BY DATE

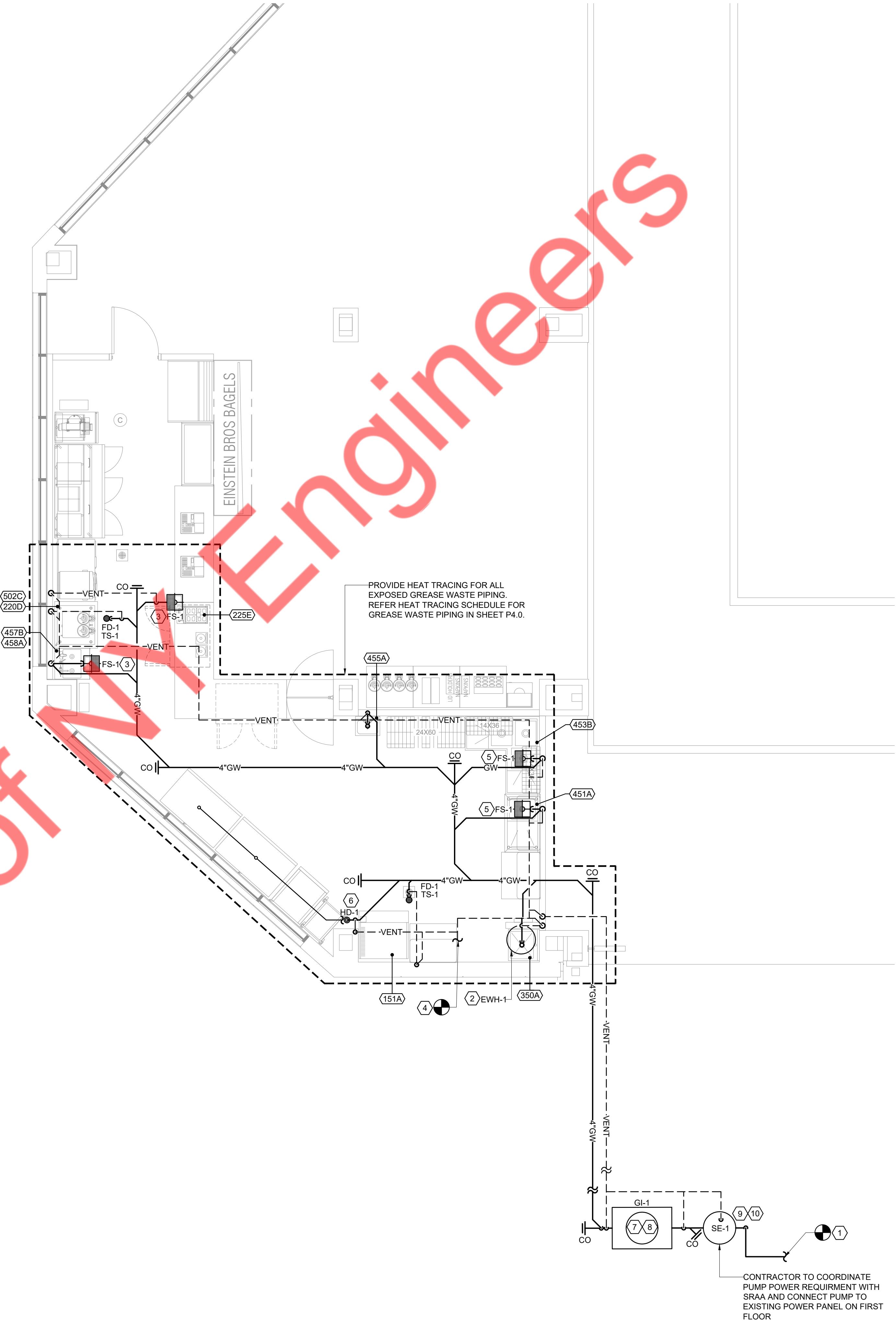
SHEET  
**P0.0**  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.

KEYED NOTES 

1. CONTRACTOR TO FILED VERIFY AND CONNECT 2" SEWAGE PUMP DISCHARGE TO EXISTING SANITARY LINE. PLUMBING CONTRACTOR SHALL FIELD VERIFY LOCATION OF EXISTING SANITARY PIPING, SIZE, AND INVERT. PRIOR TO ANY PLUMBING NEW CONNECTION. NOTIFY THE ENGINEER IF INVERT CAN NOT BE MET.
2. ROUTE WATER HEATER T&P DRAIN LINES TO MOP SINK WITH AIR GAP.
3. CONTRACTOR TO ROUTE INDIRECT DRAIN FROM DUMP SINK, COFFEE MAKER, AUTOMATIC ESPRESSO & ICE MAKER TO ADJACENT FLOOR SINK WITH PROPER AIR GAP.
4. CONNECT NEW 3" VENT PIPE TO EXISTING VENT PIPE. CONTRACTOR TO FIELD VERIFY EXACT LOCATION OF POINT OF CONNECTION, ROUTING AND EXISTING CONDITION OF EXISTING PIPING & ROUTE THE VENT PIPE AS PER EXISTING SITE CONDITIONS.
5. ROUTE INDIRECT DRAIN FROM 1 AND 3 COMPARTMENT SINK TO ADJACENT FLOOR SINK WITH AN APPROVED AIR GAP AS PER LOCAL CODE.
6. CONTRACTOR TO ROUTE CONDENSATE LINES FROM COOLER/FREEZER EVAPORATORS TO HUB DRAIN WITH PROPER AIR GAP AS PER LOCAL AHJ. PROVIDE WITH HEAT TRACE TAPE IF REQUIRED.
7. NEW GB-75 FLOOR MOUNTED GREASE TRAP IN THE BELOW FLOOR, LOCATION SHOWN APPROX. IN THE PLAN. CONTRACTOR SHALL VERIFY IN FIELD & COORDINATE WITH EXISTING TENANT & AIRPORT AUTHORITY FOR EXACT LOCATION OF EXISTING SANITARY LINE TIE IN POINT. CONTRACTOR TO FIELD VERIFY & SHALL INCLUDE ADDING ADDITIONAL BOLLARDS & POTENTIALLY RELOCATING THE EXISTING BOLLARDS TO ALLOW FOR NEW PIPING RUN DOWN.
8. DUE TO SITE CONSTRAINTS INDOOR GREASE TRAP INSTALLATION IS PROVIDED. CONTRACTOR TO COORDINATE WITH CLIENT AND BUILDING DEPARTMENT TO GET APPROVAL/ VARIANCE FOR THE SAME.
9. CONTRACTOR TO FIELD VERIFY AND PROVIDE ONE SEPARATE CONNECTION FROM SEWAGE EJECTOR PUMP (SE-1) CONTROL PANEL TO KITCHEN AREA AND INSTALL THE ALARM INDICATOR WITH LABEL.
10. PROVIDE ONE SPARE SEWAGE EJECTOR PUMP. STORE THE SPARE PUMP FOR CLIENT'S STOCK.

GENERAL NOTES

1. ALL PIPING SHALL BE SNAKE CLEAN PRIOR TO CONNECTION.
2. ANY CHANGES AND/ OR UPGRADES TO TENANT'S EXISTING PLUMBING SYSTEMS SHALL COMPLY WITH ALL CODES. EXISTING SYSTEMS SHALL POSSESS THE CAPACITY TO HANDLE ANY AND ALL CHANGES IN LOAD.
3. ALL DRAIN, WASTE AND VENT FITTINGS SHALL BE CAST IRON PIPE.
4. PLUMBING IS NOT PERMITTED IN ANY DEMISING PARTITIONS. FURROUT THE WALL AS NECESSARY.
5. EXHAUST AND PLUMBING VENTS SHALL BE LOCATED A MINIMUM OF 10'-0" AWAY FROM ANY OUTSIDE AIR INTAKE, AND 5'-0" FROM ANY DEMISING WALL VERTICAL PLANE.
6. ALL FLOOR DRAINS ARE REQUIRED TO HAVE TRAP SEAL PROTECTION DEVICE.
7. ANY UNUSED PLUMBING EQUIPMENT, PIPING, ETC., WITHIN OR SERVING THE PREMISES MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN. DO NOT ABANDON IN PLACE.
8. ALL FLOOR PENETRATIONS MUST BE CORE BORED, SLEVED, GROUTED, SEALED AND MADE WATERPROOF. FLOOR DRAIN MASTIC MUST BE PROVIDED TO PROTECT FOR LEAKS BELOW. SLEEVES MUST EXTEND A MINIMUM OF 4" ABOVE THE FLOOR.
9. IF NOT ALREADY EXISTING, INSTALL A SHUT OFF VALVE ON DOMESTIC WATER LINE INSIDE SPACE.
10. TENANT IS REQUIRED TO INSTALL A WATERPROOF MEMBRANE IN ALL WET AREAS OF THE SPACE. TENANT SHALL USE A 30 MIL POLYETHYLENE CLEAVAGE MEMBRANE (EQUAL TO NOBLESEAL TS) INSTALLED PER MANUFACTURERS RECOMMENDATIONS AND ANSI A108. MEMBRANE MUST BE EXTENDED UP THE WALL A MINIMUM OF 6' OR EQUAL TO THE HEIGHT OF THE FLOOR BASE.
11. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8 PER FOOT FOR SANITARY & 1/4" PER FOOT OF RUN FOR GREASE WASTE FOR PIPE 3" AND ABOVE, 1/4" PER FOOT OF RUN FOR PIPE LESS THAN 3". VENT PIPING SHALL BE PITCHED TO DRAIN.
12. PROVIDE ACCESS PANEL FOR CLEANOUTS AND ALL CONCEALED EQUIPMENTS THAT REQUIRE MAINTENANCE ACCESS. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR LOCATION.
13. PROVIDE WALL CLEANOUTS WHEREVER POSSIBLE FOR EACH CHANGE IN DIRECTION OF MORE THAN 45DEG.
14. REFER RISER DIAGRAMS FOR PIPE SIZES.



1  
P1.0 1/4" = 1'-0"  
SANITARY AND VENT PLAN

JOB LOCATION:  
SANITARY AND VENT  
PLAN

SHEET  
P1.0  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.

NO. DESCRIPTION BY DATE  
REVISIONS

NY ENGINEERS

KEYED NOTES 

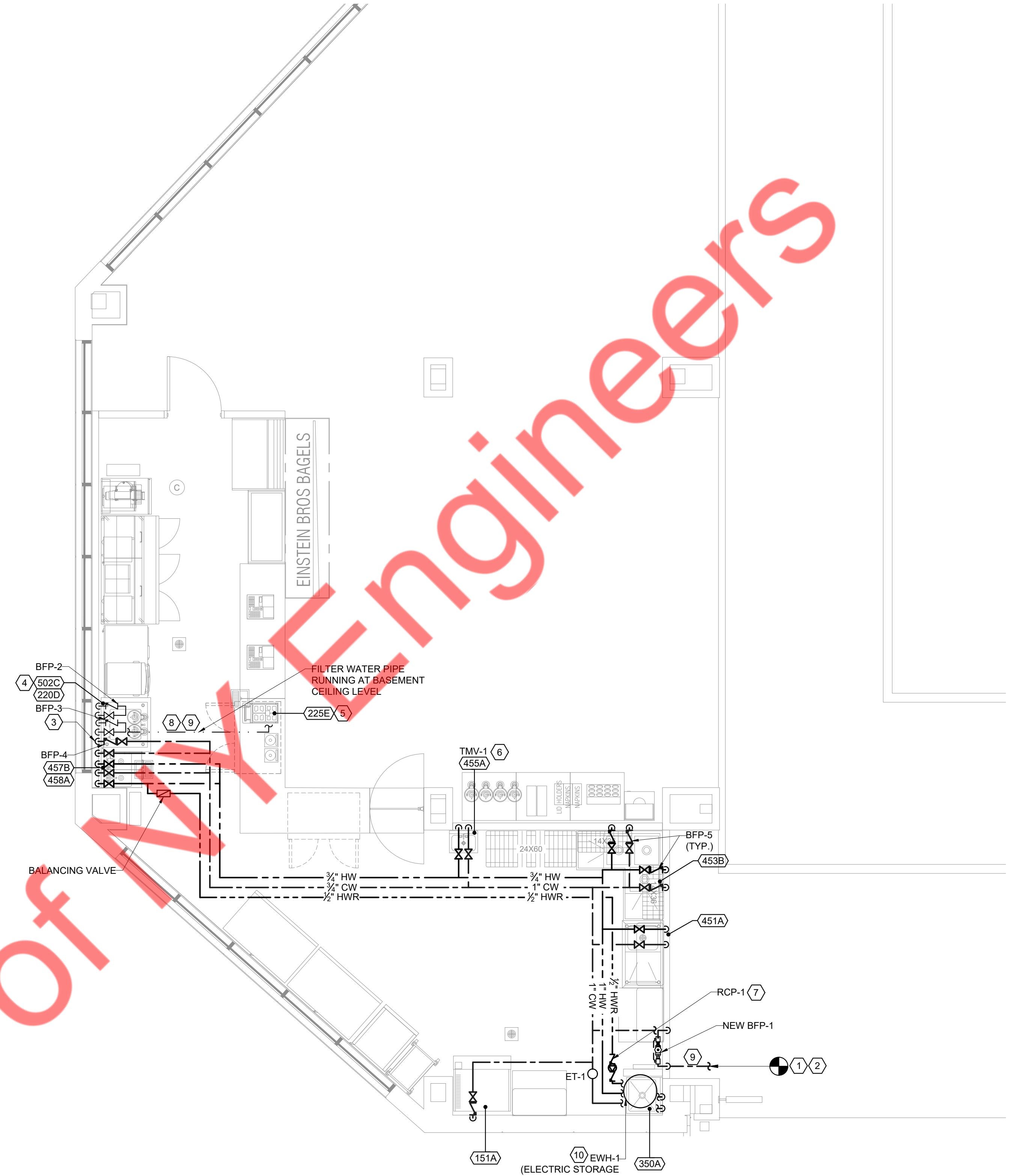
- FIELD VERIFY AND TAKE TAP OFF FROM EXISTING HOT TAP/ ACTIVE LINE. CONNECT NEW 1" CW TO EXISTING PIPING. FIELD VERIFY EXISTING PIPING IS EQUAL TO OR GREATER THAN THE NEW PIPING CONNECTED TO IT. PROVIDE NEW BFP-1 AS REQUIRED BY LOCAL AND STATE CODES. NOTIFY ARCHITECT OF ANY CONFLICTS.
- ROUTE WATER LINE AFTER FIELD VERIFYING EXACT LOCATION OF POINT OF CONNECTION.
- ROUTE 3/4" CW DOWN IN WALL. STUB OUT TO WATER FILTER CONNECTION SERVING COFFEE MAKER, AUTOMATIC ESPRESSO AND ICE MAKER.
- 3/4" FILTERED WATER CONNECTION TO COFFEE MAKER AND ICE MAKER EQUIPMENTS. COORDINATE WITH MENTIONED EQUIPMENT COMPANY FOR CONNECTIONS TO TAKE PLACE INSIDE THE CABINET. PROVIDE 1022 BACKFLOW PREVENTER AND SHUT OFF VALVE AT EACH UNIT.
- CONTRACTOR TO FIELD VERIFY AND CONNECT 1/2" FILTERED WATER LINE TO AUTOMATIC ESPRESSO MACHINE. COORDINATE WITH MANUFACTURER FOR CONNECTIONS TO TAKE PLACE INSIDE THE CABINET.
- PROVIDE MIXING VALVE WATT'S SERIES TO HAND SINK FAUCETS CONFORMING TO ASSE 1070 (TMV-1).
- RE-CIRCULATION PUMP SHALL BE LOCATED IN AN ACCESSIBLE LOCATION ABOVE THE CEILING. PROVIDE TIME CLOCK FOR RECIRCULATING PUMP BASED ON HOURS OF OPERATION FOR TENANT. INCLUDE RETURN WATER TEMPERATURE SENSOR TO PAUSE PUMP WHEN RETURN WATER IS HOT. PROVIDE BALL VALVES, CHECK VALVE, AND BALANCING VALVE (CIRCUIT SETTER CALIBRATED BALANCE VALVE).
- CONTRACTOR TO FIELD VERIFY AND CONNECT THE PIPE AS PER THE SITE CONDITIONS.
- PROVIDE HEAT TRACING FOR ALL EXPOSED COLD WATER SUPPLY, FILTER WATER SUPPLY PIPING. CONTRACTOR TO FIELD VERIFY THE EXACT LENGTH AND LOCATION OF EXPOSED PIPING. REFER HEAT TRACING SCHEDULE FOR WATER SUPPLY PIPING IN SHEET P4.0.
- CONTRACTOR TO CREATE PLATFORM FOR THE ELECTRIC STORAGE WATER HEATER ABOVE MOP SINK. MAINTAIN MANUFACTURER SPECIFIED CLEARANCE FOR THE WATER HEATER. SPILL T&P RELIEF DRAIN OVER MOP SINK.

NOTES FOR PLUMBER

1. NEW BFP-1 LOCATION TO BE IN EINSTEIN KITCHEN AREA.
2. WATER FILTERS ACCESSIBLE IN THE KITCHEN AREA.

GENERAL NOTES

1. ANY WORK SHOWN ON THE DRAWINGS AND NOT PARTICULARLY DESCRIBED IN THE SPECIFICATIONS OR DETAILS, OR ANY WORK WHICH MAY BE DEEMED NECESSARY TO COMPLETE THE CONTRACT SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS CONTRACT.
2. CW HW PIPING TO BE PROVIDED WITH INSULATION AS PER NYS ENERGY CONSERVATION CODE 2020, TABLE C403.1.3.
3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF FLOOR SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
5. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
6. FOR HAND SINK PROVIDE HOT WATER AT 110°F. PROVIDE POINT OF USE MIXING VALVE IF REQUIRED.
7. PROVIDE MINIMUM PRESSURE REQUIRED FOR WATER LINES AT EXTREME FIXTURE AS PER TABLE NO 604.5 FROM NYS PLUMBING CODE 2020. PROVIDE BRANCH PRV IF PRESSURE INCREASES 80 PSI.
8. PROVIDE HOT WATER RETURN AS PER MAXIMUM PIPE LENGTH TABLE FROM NYS ENERGY CONSERVATION CODE 2020, TABLE C404.5.1.
9. EXISTING STORM WATER SYSTEM WITH ALL ASSOCIATED PIPING & EQUIPMENT TO REMAIN.
10. REFER BACKFLOW PREVENTERS DEVICE SCHEDULE IN SHEET P-4.0.



GREASE INTERCEPTOR CALCULATIONS																		
SYMBOL	Fixture Type	COMPARTMENT QUANTITY	L	W	D	VOLUME (CU. IN.)	VOLUME (GALLONS)	% FULL	DRAIN TIME (MINUTES)	DRAINAGE LOAD (GALLONS)								
350A	MOP SINK	1	21	18	10	3780	16.4	0.75	2	6.1								
453A	3-COMP SINK	1	28	20	14	23520	101.8	0.75	2	38.18								
451A	1-COMP SINK	1	24	14	6	2016	8.727273	0.75	2	3.27								
458A	DROP-IN DUMP SINK	1	14	10	6	840	3.636364	0.75	2	1.36								
457B	DROP-IN HAND SINK	1	14	10	6	840	3.636364	0.75	2	1.36								
455A	HAND SINK	1	16	10	6	960	4.155844	0.75	2	1.56								
*TOTAL FIXTURE FLOW RATE (GPM):																		
51.9																		
SYMBOL	Fixture Type			QUANTITY	Flow Capacity (GPM)			Flow Rate (GPM)										
FD-1	FLOOR DRAIN			2	2.5			5.00										
HD-1	HUB DRAIN			1	2.5			2.50										
MAXIMUM FLOW RATE (GPM):																		
59																		
REQUIRED VOLUME (GALLONS):																		
59																		

BACKFLOW DEVICE SCHEDULE										
TAG	SERIES	SIZE	TYPE	USAGE			APPROVAL			
BFP-1	009QT	1"	REDUCED PRESSURE BACKFLOW PREVENTER	DOMESTIC WATER CONNECTION				ASSE 1015, AWWA 1013		
BFP-2	SD-3	3/8"	DUAL CHECK VALVE W/ ATMOSPHERIC VENT	CARBONATED BEVERAGE				ASSE 1022		
BFP-3	9D	1/2"	BACKFLOW PREVENTER W/ ATMOSPHERIC VENT	TEA MAKER, COFFEE MACHINE, JUICE DISPENSER, ETC				ASSE 1012		
BFP-4	007QTS	1/2"	DUAL CHECK VALVE	NON-CARBONATED BEVERAGE, SOFT SERVE ICE CREAM, WATER FILTER, HUMIDIFIER, EYE WASH, ETC				ASSE 1015		
BFP-5	008PCQT	1/2"	SPILL RESISTANT VACUUM BREAKER	SOAP DISPENSER, SPECIALTY SINK, CLEANING EQUIPMENT, DISHWASHER				ASSE 1056		

NOTES:  
CONTRACTOR TO VERIFY EXACT REQUIREMENTS OF ALL REQUIRED BACKFLOW DEVICES AND FIXTURES WITH AUTHORITIES HAVING JURISDICTION PRIOR TO BID.

PIPING MATERIALS					
SERVICE	SIZE	PIPE	FITTINGS	UNIONS & FLANGES	JOINTS
WASTE AND VENT (ABOVE GRADE)	ALL	CAST IRON PIPE HUBLESS, ASTM A 888, CISPI 301, PVC	-	-	-
WASTE AND VENT (BELOW GRADE)	ALL	CAST IRON PIPE HUBLESS, ASTM A 888, CISPI 301, PVC	-	-	-
DOMESTIC COLD WATER AND HOT WATER INSIDE BUILDING	ALL	COPPER PIPING TYPE "L", CPVC	-	-	-
DOMESTIC COLD WATER AND HOT WATER INSIDE BUILDING (BELOW GRADE)	ALL	CROSS LINKED PEX PIPING	NO FITTINGS ALLOWED BELOW GRADE	NO FITTINGS ALLOWED BELOW GRADE	NO FITTINGS ALLOWED BELOW GRADE
GAS PIPING (ABOVE GRADE)	-	BLACK STEEL SCHEDULE 40 ASTM A 120 LAP	1/16 BLACK MALLEABLE IRON SCREWED ANSI B16.3 BUSHINGS PROHIBITED	-	THREADED UP TO 2" WELDED OVER 4", CONFORM WITH LOCAL CODES
CONDENSATE WALK-IN REFRIGERATION AND FREEZER EVAPORATORS	ALL	SCHEDULE 40 CPVC	SCHEDULE 40 CPVC	SCHEDULE 40 CPVC	SCHEDULE 40 CPVC
EXPOSED WATER PIPING FROM COMPARTMENT SINK	ALL	COPPER "M"	-	-	-

WATER HAMMER ARRESTOR SCHEDULE					
(BASED ON SOUIX CHIEF HYDRA-RESTOR) OR (BASE ON ZURN MODEL Z-1700), PER PDI STANDARDS					
SR NO.	MODEL NO.	UNIT SIZE	CONNECTI ON SIZE	LOCATION	REMARKS
1	652-A	A	1/2"	CONTRACTOR TO LOCATE IN FIELD	LOCATE AT HIGH POINTS
2	653-B	B	3/4"	CONTRACTOR TO LOCATE IN FIELD	LOCATE AT HIGH POINTS
3	653-C	C	1/4"	CONTRACTOR TO LOCATE IN FIELD	LOCATE AT HIGH POINTS

DRAINAGE FIXTURE UNITS SCHEDULE					
TYPE OF FIXTURE	QTY.	FIX. UNITS (EACH)	MINIMUM FIX. TRAP AND DRAIN SIZE	TOTAL FIX. UNITS	
FLOOR SINK	4	5.0	3"	20.0	
FLOOR DRAIN	2	5.0	3"	10.0	
HUB DRAIN	1	5.0	3"	5.0	
HAND SINK	3	1.0	2"	3.0	
MOP BASIN	1	2.0	3"	2.0	
3-COMP SINK / PREP SINK	1	2.0	1-1/2"	2.0	
1-COMP SINK/ PREP SINK	1	2.0	1-1/2"	2.0	
TOTAL DRAINAGE FIXTURE UNITS:				44.0	
SERVICE SIZE:				4"	

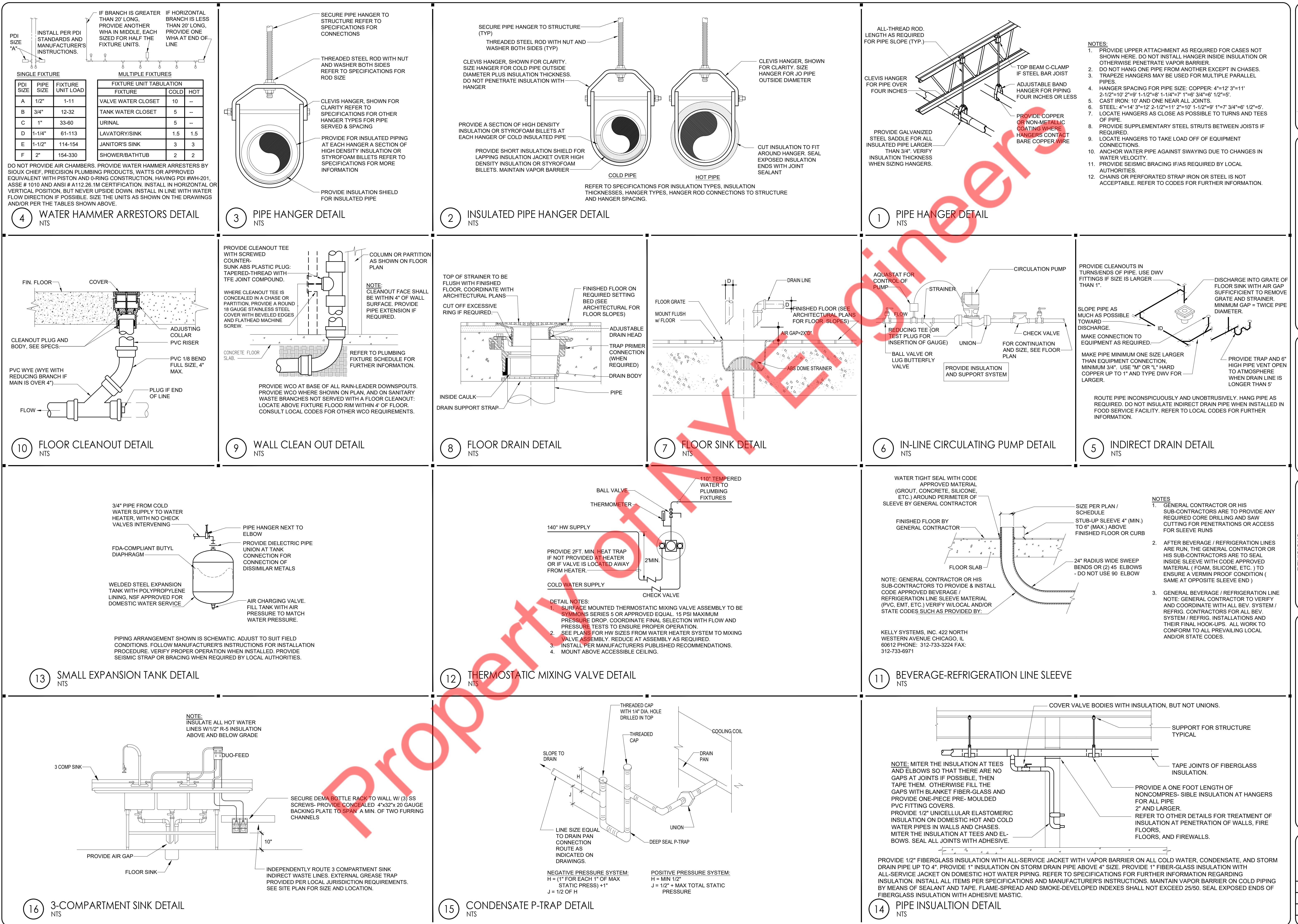
SE-1 (PUMP SCHEDULE)										
MARK	TAG DESCRIPTION	QUANTITY	MODEL NUMBER & DESCRIPTION	ELECTRICAL DATA			FLOW RATE IN GPM	HEAD IN FEET	PLUMBING REMARKS	
				VOLTAGE	PHASE	HP				
SE-1	SEWAGE EJECTOR	1 + (1 SPARE PUMP)	FLOOR MOUNTED SUBMERSIBLE SEWAGE SIMPLEX PACKAGE (MANUFACTURER: LIBERTY PUMPS, MODEL P382LE71 #380 SERIES)	115	1	3/4	75	18		

NOTES:  
1. PROVIDE CLEARANCES AS PER MANUFACTURER RECOMMENDATIONS.  
2. PROVIDE ONE SPARE PUMP FOR EBB STOCK.  
3. PROVIDE ONE SEPARATE CONNECTION FROM SEWAGE EJECTOR PUMP (SE-1) CONTROL PANEL TO KITCHEN AREA AND INSTALL THE ALARM INDICATOR WITH LABEL.

ELECTRIC HEAT TRACING CABLE SCHEDULE FOR GREASE WASTE PIPING										
MAKE	MODEL	ELECTRICAL DATA			DISCIPLINE	FLOOR (AREA)	REMARK			
		VOLTAGE	LENGTH (FT.)	WATTS/FT			AMPS			
RAYCHEM	5XL1-CR	120	130	4.5 W/FT	20	PLUMBING	REFER PLAN	-	-	-

NOTES:  
1. PROVIDE CLEARANCES AS PER MANUFACTURER RECOMMENDATIONS.

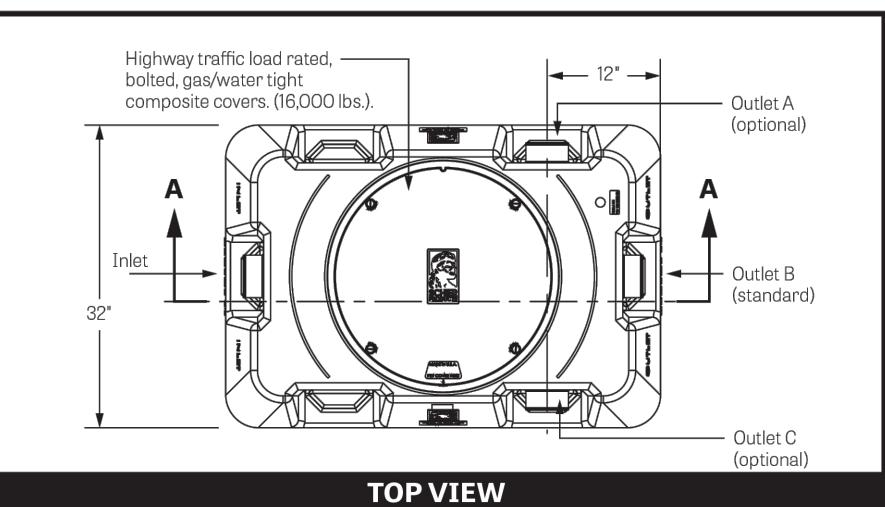
PLUMBING FIXTURE SCHEDULE					
MARK	Fixture Type	DESCRIPTION</			



## SPECIFICATIONS

### NOTES

1. 4" plain end inlet/outlet
2. Unit weight - w/complete cover 190 lbs. w/o cast iron
3. Maximum operating temperature: 140°F continuous
4. Capacities - Liquid: 125 gal; Grease: 616 lbs. (36 gal); Solids: 19.2 gal
5. Electronic float control
6. For grease discharge applications only.
7. Do not use for pressure applications.
8. Cover placement allows full access to tank for proper maintenance.
9. Cover placement is required unless per local code.
10. Engineered inlet and outlet diffusers are removable to inspect/clean piping.
11. Integral air relief / Anti-siphon.



### DIFFUSION FLOW TECHNOLOGY

The inlet diffuser splits influent into three paths, creating laminar flow and utilizing the entire liquid volume of the tank for efficient grease separation. The calibrated openings greatly reduce effluent turbulence. The effluent enters the main chamber without disturbing the existing grease or sludge.

The integral air relief / anti-siphon in the top of the outlet diffuser allows pressure stabilization within the unit during operation. The bottom of the outlet diffuser can only be attached to a static water line to allow grease to exit the tank. It can easily be attached to any of the three outlets to provide ease of site piping layouts.

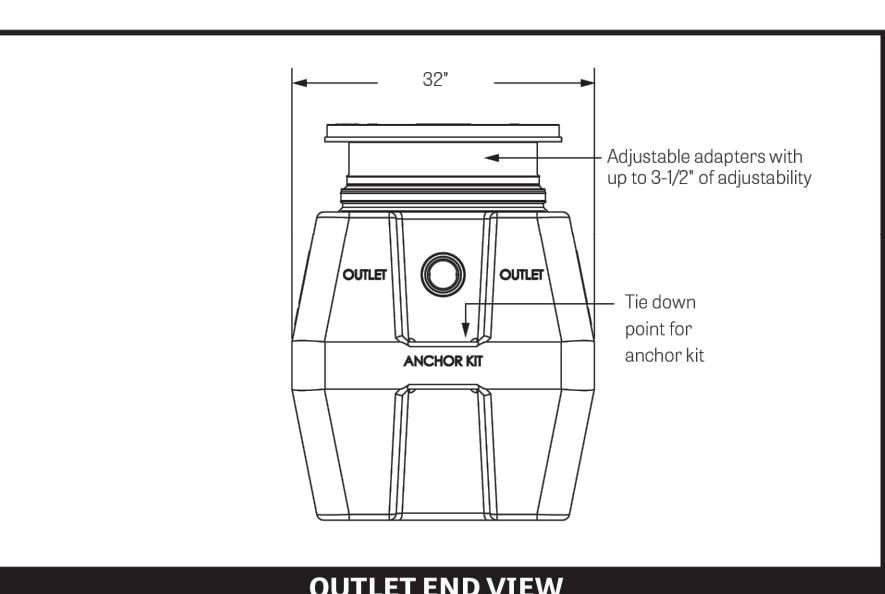
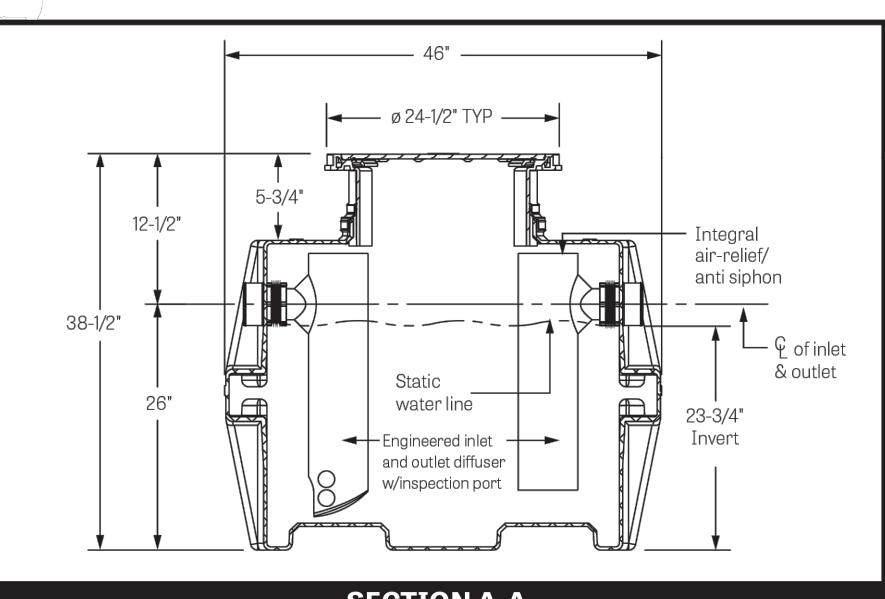
### ENGINEER SPECIFICATION GUIDE

Schier Basin™ grease interceptor model # GB-75 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene. Interceptor shall be furnished for above or below grade installation. Interceptor shall be furnished for Schier Basin™ model #CSA-8421, with field adjustable riser system, built-in flow control, built-in test caps and three outlet options. Interceptor flow rate shall be 75 GPM. Interceptor grease capacity shall be 616 lbs. Cover shall provide water/gas-tight seal and have minimum 10,000 lbs load capacity.

### CERTIFIED PERFORMANCE

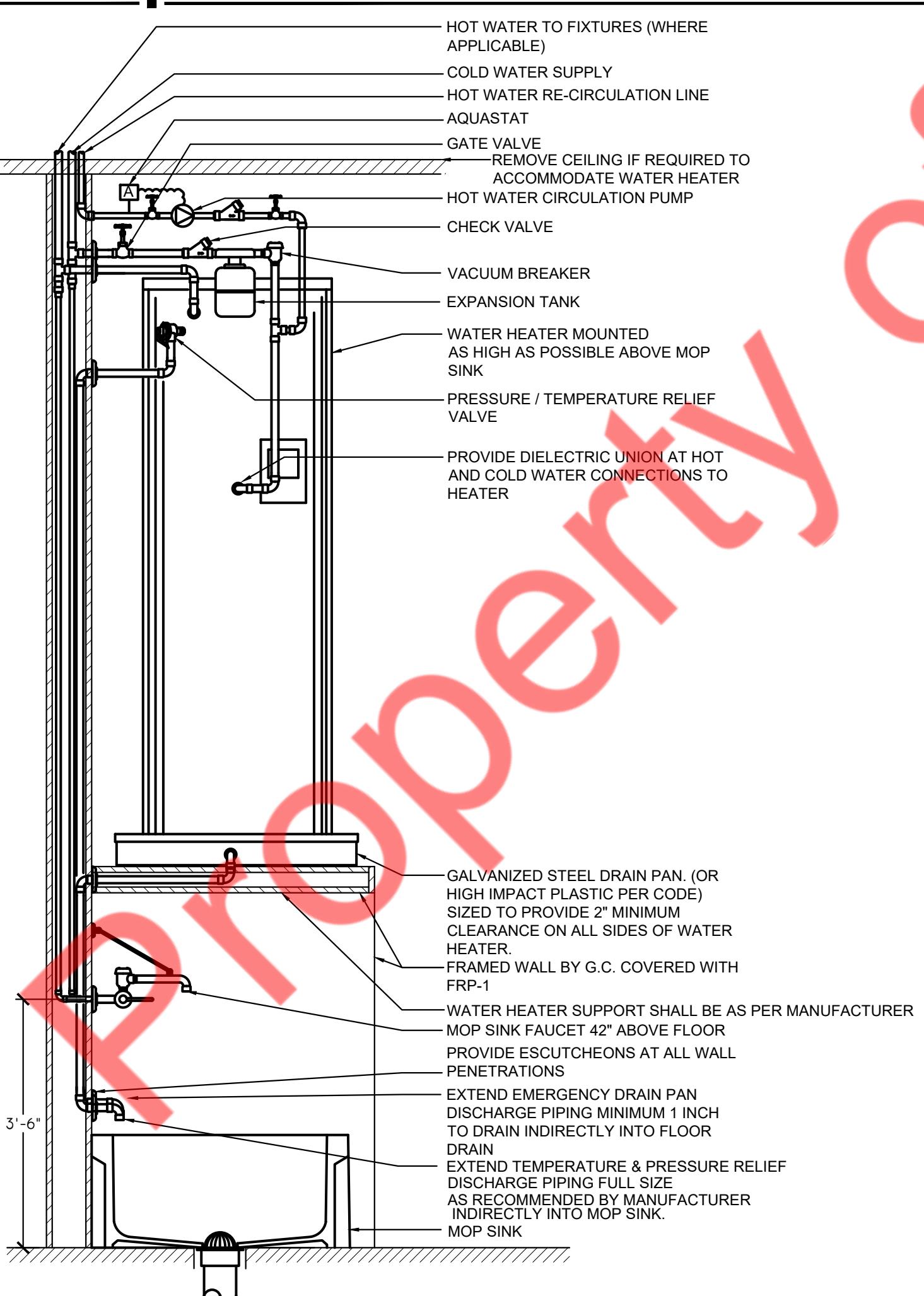
Great Basin™ grease interceptors are third party performance tested and listed by APWA to ASME A112.19.2 and CSA B45.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.

### UPC & CSA



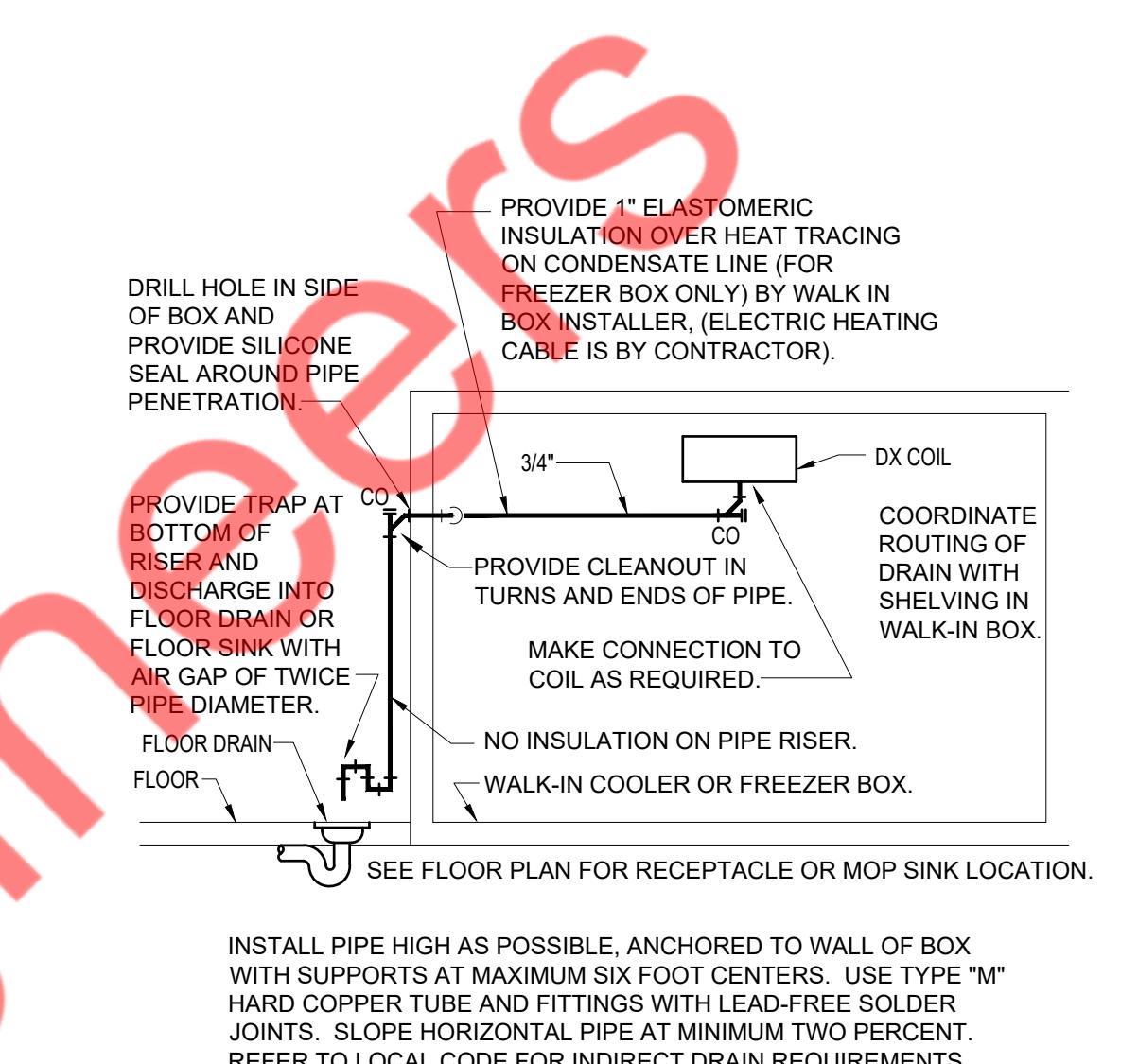
3 SUBMERSIBLE SEWAGE SIMPLEX PACKAGE DETAIL  
NTS

2 GREASE INTERCEPTOR DETAIL  
NTS



5 WATER HEATER PIPING DETAIL  
NTS

1 WALK-IN CONDENSATE DRAIN DETAIL  
NTS

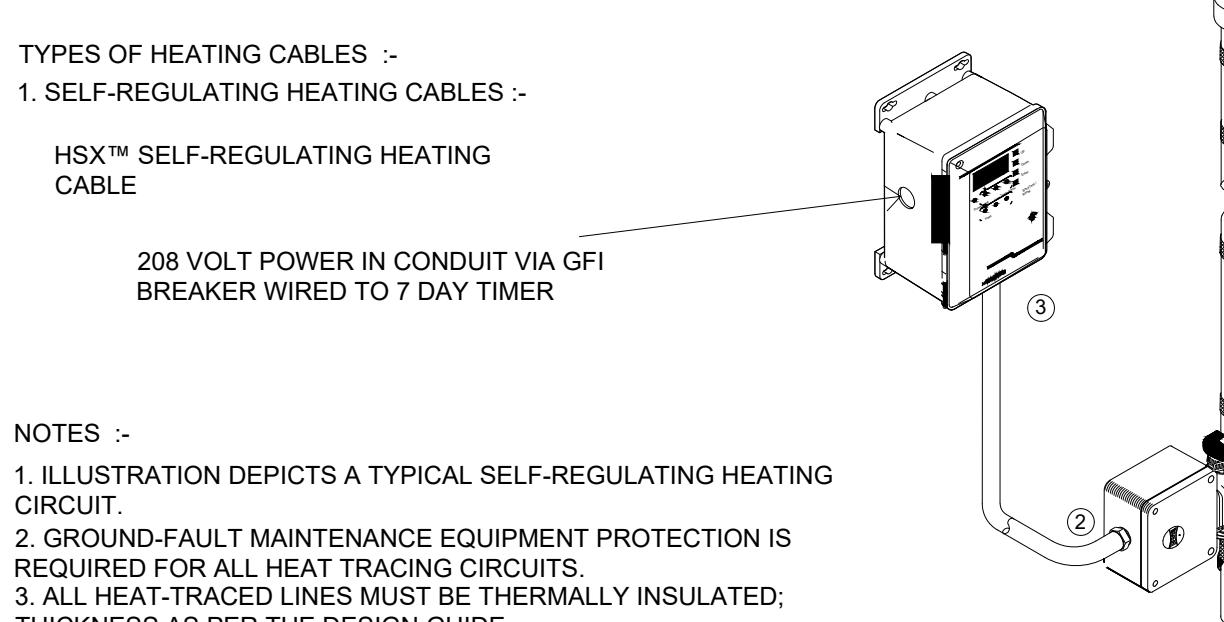
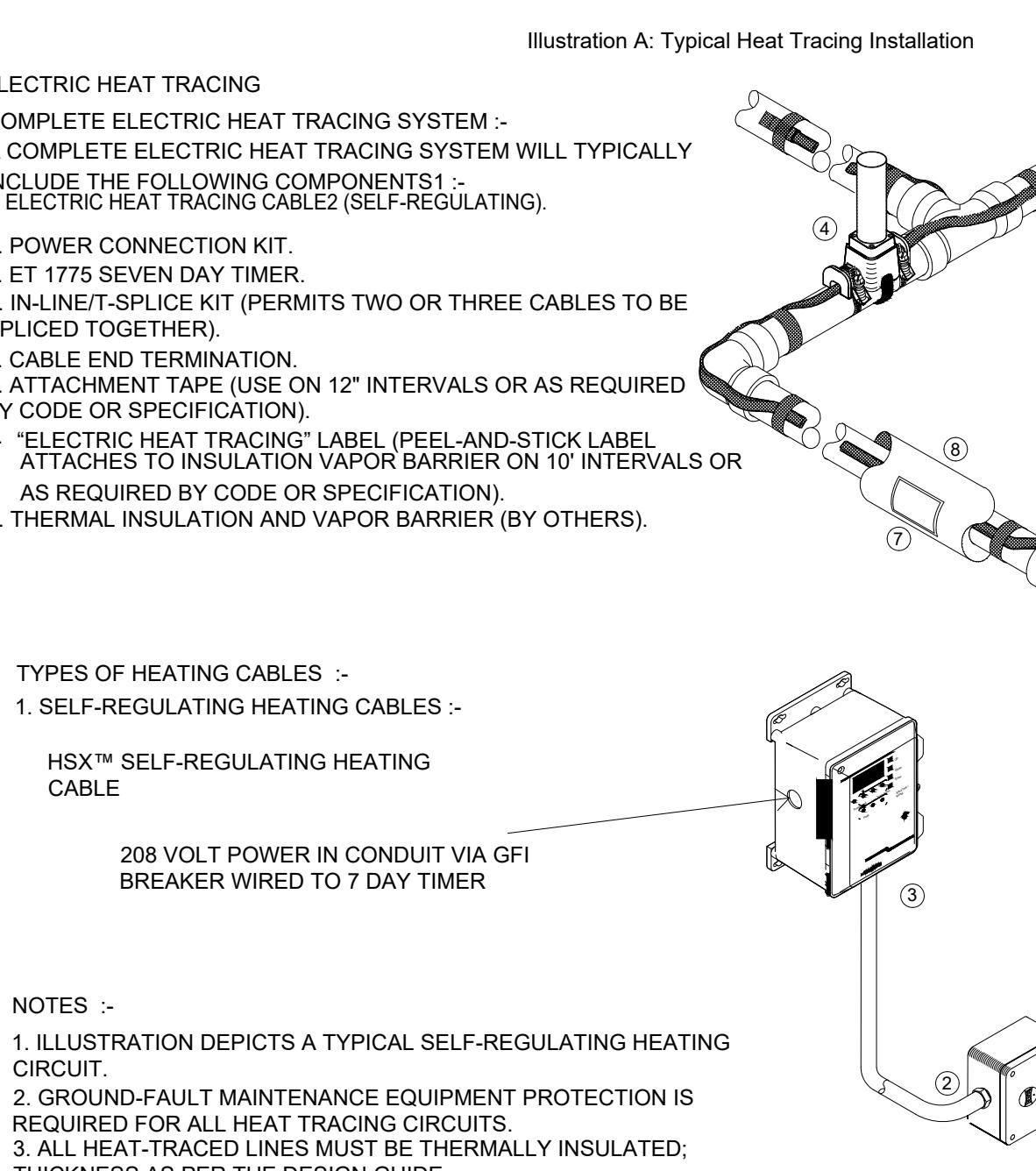


NY ENGINEERS

REVISIONS  
NO. / DESCRIPTION  
BY / DATE

PLUMBING DETAILS  
(2 OF 2)

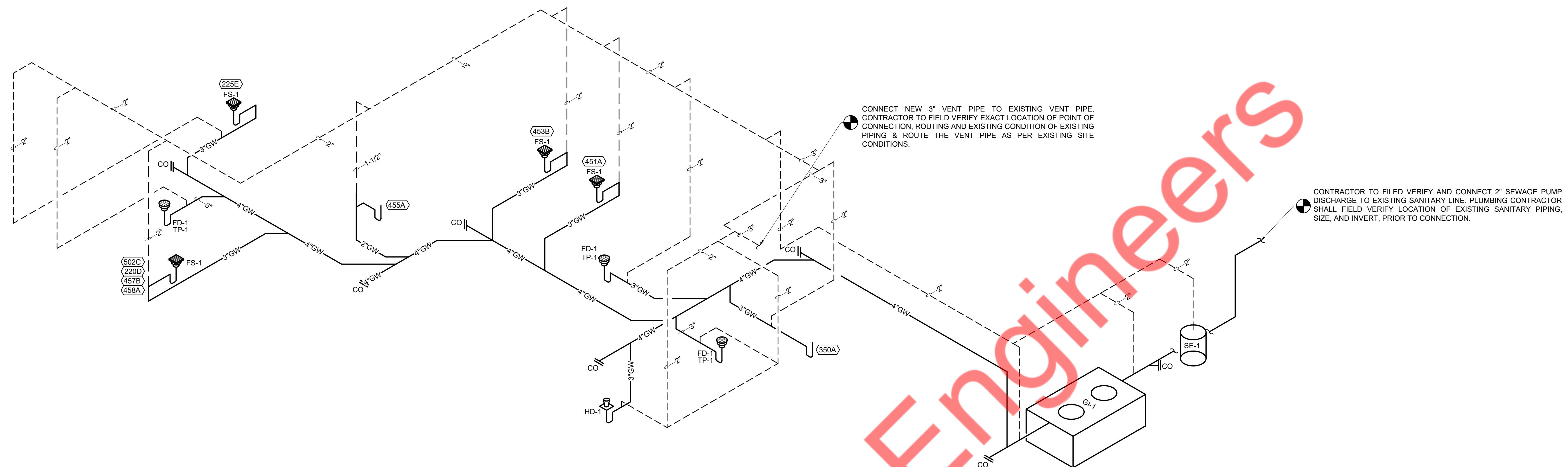
JOB LOCATION:



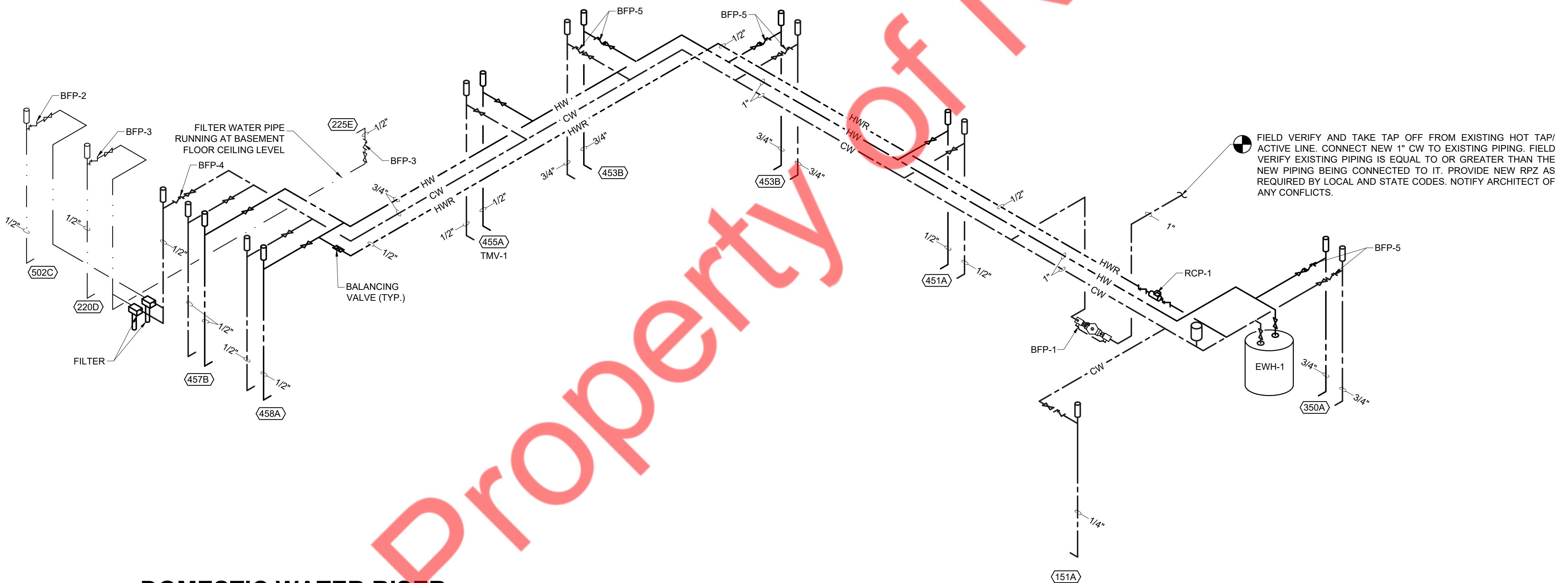
NOTES :-  
1. ILLUSTRATION DEPICTS A TYPICAL SELF-REGULATING HEATING CIRCUIT.  
2. GROUND-FAULT MAINTENANCE EQUIPMENT PROTECTION IS REQUIRED FOR ALL HEAT TRACING CIRCUITS.  
3. ALL HEAT-TRACED LINES MUST BE THERMALLY INSULATED; THICKNESS AS PER THE DESIGN GUIDE.

4 ELECTRIC HEAT TRACING DETAIL  
NTS

SHEET  
P5.1  
EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.



1 SANITARY & GREASE WASTE RISER DIAGRAM  
P6.0 N.T.S



2 DOMESTIC WATER RISER  
P6.0 N.T.S

NO.	DESCRIPTION	BY	DATE

JOB LOCATION:

RISER DIAGRAMS

SHEET

**P6.0**

EBB STORE#:  
FILE#:  
DATE:  
PROJ. MGR.

A. THIS DIVISION 22 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISION OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORM ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION OF THE PLUMBING SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN.

B. THE GENERAL PROVISION AND DIVISION 1, INCLUDING THE GENERAL, SUPPLEMENTARY AND OTHER CONDITION AND OTHER DIVISION, AS APPROPRIATE, APPLY TO WORK SPECIFIED IN THIS DIVISION.

A. ATTENTION IS CALLED TO THE FACT THAT THE WORK IS TO BE PERFORMED WITHIN AN EXISTING, OPERATIONAL FACILITY, PRIOR TO THE SUBMISSION OF BIDS, EACH BIDDER SHALL VISIT THE PROJECTS SITE, THOROUGHLY INVESTIGATE AND BE FAMILIAR WITH ALL THE EXISTING CONDITION WHICH WILL AFFECT THEIR WORK.

B. CONNECT NEW WORK TO EXISTING WORK IN A NEAT AND WORKMANLIKE MANNER, WHERE AN EXISTING STRUCTURE MUST BE CUT OR EXISTING UTILITIES INTERFERE, SUCH OBSTRUCTIONS SHALL BE BYPASSED, REMOVED, REPLACED OR RELOCATED, PATCHED AND REPAIRED, WORK DISTURBED OR DAMAGED SHALL BE REPLACED OR REPAIRED TO ITS PRIOR CONDITION.

C. PRIOR TO THE START OF ANY DEMOLITION OR CONSTRUCTION, CONTRACTOR SHALL REVIEW THE EXISTING SITE AND SECURE THE SERVICES OF A QUALIFIED, EPA CERTIFIED, ASBESTOS ABATEMENT AGENCY IF NEEDED TO CHECK THE EXISTING INSULATION, ETC. FOR ASBESTOS. SHOULD ASBESTOS BE FOUND, DO NOT PROCEED WITH DEMOLITION OR CONSTRUCTION; NOTIFY THE ARCHITECT IN ANY CASE IN WRITING OF THE AGENCY'S FINDINGS.

A. THE IMPLIED AND STATED INTENT OF THE DRAWINGS AND SPECIFICATIONS IS TO ESTABLISH MINIMUM ACCEPTABLE STANDARDS FOR MATERIALS, EQUIPMENT AND WORKMANSHIP, AND TO PROVIDE OPERABLE MECHANICAL SYSTEMS COMPLETE IN EVERY ASPECT.

B. THE ENGINEERING DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT AND SIZES OF SYSTEM COMPONENTS, AND SHALL NOT BE SCALED. RATHER, THE ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL GOVERN SPACE CONSTRAINTS, DIMENSIONS AND FINISHES. ALL OFFSETS AND FITTINGS WHICH WILL BE NECESSARY TO ACCOMPLISH THE FINISHED INSTALLATION SHALL BE PROVIDED AT NO ADDITIONAL COST OR INCREASE IN THE CONTRACT.

A. ENSURE OPTIMUM USE OF AVAILABLE SPACE FOR MATERIALS AND EQUIPMENT INSTALLED ABOVE CEILINGS. ALLOCATE SPACE IN THE ORDER OF PRIORITY AS LISTED BELOW EXCEPT AS OTHERWISE DETAILED. ITEMS ARE LISTED IN THE ORDER OF PRIORITY, WITH ITEMS OF EQUAL IMPORTANCE LISTED UNDER A SINGLE PRIORITY NUMBER.

1. GRAVITY FLOW PIPING SYSTEMS
2. VENT PIPING SYSTEMS
3. RECESSED LIGHTING FIXTURES
4. CONCEALED HVAC TERMINALS AND EQUIPMENT
5. AIR DUCT SYSTEMS
6. SPRINKLER PIPING SYSTEMS
7. PRESSURIZED PIPING SYSTEMS
8. ELECTRICAL CONDUIT, WIRING, CONTROL AIR TUBING

B. ORDER OF SPACE PRIORITY DOES NOT DICTATE INSTALLATION SEQUENCE. INSTALLATION SEQUENCE SHALL BE AS REQUIRED TO INSTALL ALL AFFECTED TRADES.

C. THE WORK OF THIS DIVISION 22 SHALL NOT OBSTRUCT ACCESS FOR INSTALLATION, OPERATION AND MAINTENANCE OF THE WORK OF ANY OTHER DIVISION.

D. ALL MAJOR ITEMS OF EQUIPMENT SHALL BE ARRANGED SO AS TO PROVIDE A MINIMUM OF 28" CLEAR AGILE SPACE. ADDITIONAL SPACE SHALL BE PROVIDED BETWEEN AND AROUND EQUIPMENT FOR MAINTENANCE AND PROPER OPERATION AS SHOWN IN THE EQUIPMENT MANUFACTURER'S LITERATURE.

A. COORDINATE ALL WORK UNDER THIS DIVISION 22 WITH WORK UNDER ALL OTHER DIVISIONS, PROVIDING ADJUSTMENT AS NECESSARY.

B. ALL FIRE SUPPRESSION, PLUMBING, HEATING, VENTILATING, AND AIR CONDITIONING MATERIALS AND WORKMANSHIP SHALL COMPLY WITH THE FOLLOWING CODES AND STANDARDS AS MINIMUM REQUIREMENTS:

1. 2020 BUILDING CODE OF NYS.
2. 2020 PLUMBING CODE OF NYS.
3. 2020 MECHANICAL CODE OF NYS.
4. 2020 ENERGY CODE OF NYS.
5. 2020 FIRE CODE OF NYS.

C. SECURE AND PAY ALL FEES ASSOCIATED WITH ALL PERMITS AND LICENSES REQUIRED FOR EXECUTION OF THE CONTRACT. ARRANGE FOR ALL INSPECTIONS REQUIRED BY CITY, COUNTY, STATE AND OTHER AUTHORITIES HAVING JURISDICTION, AND DELIVER CERTIFICATES OF APPROVAL TO THE ARCHITECT.

D. THE CODE REQUIREMENTS ARE STRICTLY A MINIMUM AND SHALL BE MET WITHOUT INCURRING ADDITIONS TO THE CONTRACT. WHERE REQUIREMENTS OF THE DRAWINGS OR SPECIFICATIONS EXCEED THE CODE REQUIREMENTS, THE WORK SHALL BE PROVIDED IN ACCORDANCE WITH THESE DRAWINGS OR SPECIFICATIONS. IN THE EVENT OF CONFLICT OR AMBIGUITY BETWEEN THE VARIOUS CODES, THE MOST STRINGENT REQUIREMENT SHALL GOVERN.

A. ALL ELECTRICAL EQUIPMENT AND WIRING PROVIDED UNDER THIS DIVISION 22 SHALL COMPLY WITH THE ELECTRICAL SYSTEM CHARACTERISTICS INDICATED ON THE ELECTRICAL DRAWINGS AND SPECIFIED IN DIVISION 26.

B. ELECTRIC CONTROLS, CONTRACTORS, STARTERS, PILOT LIGHTS, PUSH BUTTONS, ETC., SHALL BE PROVIDED COMPLETE AS PART OF THE MOTOR, HEATER OR OTHER EQUIPMENT WHICH IT OPERATES. ALL ELECTRICAL COMPONENTS SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRIC CODE AND DIVISION 26. REFERENCE DIVISION 26 AND THE ELECTRICAL ENGINEERING DRAWINGS FOR THOSE MOTOR STARTERS PROVIDED UNDER THAT DIVISION 26. ALL STARTS NOT SHOWN SHALL BE PROVIDED UNDER THIS DIVISION 22, UNLESS SPECIFIED OTHERWISE UNDER OTHER INDIVIDUAL EQUIPMENT SECTIONS. MOTOR STARTERS SHALL CONFORM TO THE FOLLOWING MINIMUM REQUIREMENTS:

1. STARTERS FOR MOTORS 1/3 HPSEPOWER OR SMALLER SHALL BE MANUAL UNLESS REMOTE OR AUTOMATIC STARTING IS REQUIRED, IN WHICH CASE THE STARTERS SHALL BE MAGNETIC, FULL VOLTAGE, NON-REVERSING, SINGLE-SPEED, UNLESS OTHERWISE

INDICATED. ALL OTHER STARTERS SHALL BE MAGNETIC. EACH STARTER FOR A THREE-PHASE MOTOR SHALL BE FURNISHED WITH THREE (3) OVERLOAD RELAYS SIZED FOR THE FULL LOAD RUNNING CURRENT OF THE MOTOR ACTUALLY PROVIDED. PROVIDE AN EXTERNAL "HAND-OFF AUTO" SELECTOR SWITCH WITH RED "RUNNING" LIGHT. PROVIDE A GREEN PILOT LIGHT TO INDICATE MOTOR "STOPPED". EACH PILOT LIGHT SHALL HAVE A LEGEND PLATE INDICATING REASON FOR SIGNAL.

3. EACH OVERLOAD RELAY SHALL HAVE A NORMALLY OPEN ALARM CONTACT WHICH WILL CLOSE ONLY WHEN ACTUATED BY AN OVERLOAD (NOT TO BE CONFUSED WITH N.O. OR N.C. AUXILIARY CONTACTS). THESE CONTACTS SHALL BE PROPERLY WIRED TO THEIR RESPECTIVE BLUE PILOT LIGHT PROVIDED ON THE STARTER FRONT COVER AND HAVING A "TRIPPED" LEGEND PLATE.

4. INDIVIDUALLY MOUNTED MOTOR STARTERS SHALL BE IN A NEMA TYPE 1 GENERAL PURPOSE ENCLOSURE IN UNFINISHED AREAS AND SHALL BE FLUSH MOUNTED IN ALL FINISHED AREAS. ALL STARTERS MOUNTED IN EXTERIOR AREAS SHALL HAVE A NEMA 3R ENCLOSURE. EACH STARTER SHALL HAVE A LAMINATED NAMEPLATE TO INDICATE THE EQUIPMENT UNIT NUMBER, FUNCTION AND CIRCUIT NUMBER.

5. ALL MOTOR STARTERS, PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD AND SHALL BE GENERAL ELECTRIC, SQUARE D, SIEMENS I.T.E., OR WESTINGHOUSE.

C. MOTOR STARTERS FOR THE FOLLOWING EQUIPMENT SHALL BE PROVIDED UNDER THIS DIVISION 22 BY THE MANUFACTURER OF THE EQUIPMENT:

1. PACKAGED BOOSTER PUMP SYSTEMS.

2. OTHER EQUIPMENT HEREINAFTER SPECIFIED IN OTHER SECTIONS TO BE PROVIDED WITH INTEGRAL STARTERS.

D. UNLESS OTHERWISE NOTED OR SPECIFIED IN INDIVIDUAL SECTIONS, ALL 3-PHASE MOTORS SHALL BE STANDARD NEMA CONTINUOUS DUTY "B" TYPE, WITH CLASS B INSULATION, OPEN Drip-PROOF FRAME FOR INDOOR SERVICE, TEFC FOR HI-EFFICIENCY MODEL OR RELIANCE XE HI-EFFICIENCY MODEL.

E. ALL POWER WIRING AND FINAL CONNECTIONS TO EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 26.

F. CONTROL COMPONENTS, ALL INTERLOCKS (MOTOR-OPERATED DAMPERS, FIRE ALARM MOTORS, ETC.) AND CONTROL WIRING (120 VOLT, SINGLE PHASE AND LESS) SHALL BE PROVIDED UNDER THIS DIVISION 22 AS REQUIRED TO ACHIEVE THE SPECIFIED CONTROL SEQUENCES.

G. ALL CONTROL WIRING OVER 30 VOLTS SHALL BE INSTALLED BY A LICENSED ELECTRICIAN WORKING UNDER THIS DIVISION 22.

A. SLEEVES SHALL BE PROVIDED THROUGH ALL PIPE PENETRATIONS OF CONCRETE OR MASONRY WALLS, ELEVATED FLOORS AND ROOFS, EXCEPT THOSE PLUMBING PENETRATIONS FOR FIXTURES, VENTS, ETC.

B. SLEEVES SHALL BE FABRICATED FROM SCHEDULE 40 STEEL PIPE THROUGH 10" AND STANDARD WALL STEEL PIPE FOR SLEEVE SIZES 12" AND LARGER. ALL SLEEVES PENETRATING EXTERIOR WALLS, UNDERGROUND WALLS, PIT OR VAULT WALLS SHALL BE PROVIDED WITH A 3" X 3/8" THICK WATERSTOP RING WELDED COMPLETED TO THE MIDPOINT OF THE SLEEVE.

C. ALL SLEEVES PENETRATING EXTERIOR WALLS, UNDERGROUND WALLS, PIT OR VAULT WALLS AND ELEVATED FLOORS SHALL BE PACKED AND SEALED WATERTIGHT.

D. SLEEVES THROUGH ROOFS SHALL EXTEND ABOVE THE ROOF SURFACE AND BE FLASHED WATERTIGHT.

E. SLEEVES THROUGH WALLS SHALL BE CUT AND FINISHED FLUSH WITH EACH SURFACE OF THE WALL IN WHICH THEY ARE INSTALLED.

F. SLEEVES SHALL BE SIZED TO PROVIDE A MINIMUM OF 1/2" CLEARANCE BETWEEN THE INSIDE SURFACE OF THE SLEEVE AND THE OUTSIDE FINISHED SURFACE OF THE PIPE PLUS ANY INSULATION SPECIFIED.

G. FIRE-STOPS SHALL BE PROVIDED AS SPECIFIED HEREIN. ALL ANNULAR SPACES BETWEEN PIPING AND SLEEVES WHICH DO NOT REQUIRE FIRE-STOPS SHALL BE PACKED WITH MINERAL WOOL AND CAULKED.

H. PROVIDE ROUND, CHROME PLATED ESCUTCHEONS ON ALL EXPOSED PIPING PENETRATIONS PASSING THROUGH WALLS, FLOORS, PARTITIONS AND CEILINGS.

A. CUTTING OF HOLES THROUGH CONCRETE AND MASONRY SHALL BE BY DIAMOND CORE OR CONCRETE SAW, PNEUMATIC HAMMER, IMPACT ELECTRIC AND HAND OR MANUAL HAMMER TYPE DRILLS. WILL NOT BE ALLOWED, EXCEPT AS PERMITTED BY THE ARCHITECT WHERE REQUIRED BY LIMITED WORKING SPACE. LOCATE HOLES SUCH THAT THEY WILL NOT AFFECT STRUCTURAL SYSTEMS SUCH AS RIBS OR BEAMS. HOLES SHALL BE LAID OUT IN ADVANCE OF THE INSULATION. THESE LAYOUT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO DRILLING.

A. MANUFACTURERS NAMES, SERIES AND MODEL NUMBERS AS NOTED OR SPECIFIED, ARE FOR THE PURPOSE OF DESCRIBING TYPE, CAPACITY, AND QUALITY OF MATERIALS, MATERIALS AND PRODUCTS TO BE USED, UNLESS "OR EQUAL" IS SPECIFICALLY STATED. BIDS SHALL BE BASED ONLY ON THE SPECIFIED "BASIC OF DESIGN" MANUFACTURER, AS WELL AS THE "SPECIFIED SUBSTITUTE" MANUFACTURER, AS AN "EQUAL" OR APPROXIMATE SUBSTITUTE". MANUFACTURER SHALL NOT BE MISCONSTRUED AS APPROVED NOR ALLOWING THE SUBSTITUTION OF THAT MANUFACTURER'S STANDARD PRODUCT IN PLACE OF THE BASIS OF DESIGN. NO CONSIDERATION WILL BE GIVEN TO A PRODUCT WHICH WOULD REQUIRE DIMENSIONAL, SPATIAL OR AESTHETIC CHANGES TO THE PROJECT. "ACCEPTABLE SUBSTITUTE" AND "EQUAL" MANUFACTURERS SHALL ONLY Bid THOSE PRODUCTS WHICH EXACTLY MATCH THE SIZE AND OTHER CHARACTERISTICS OF THE SPECIFIED BASIS OF DESIGN. ANY CHANGES TO OTHER DISCIPLINES AND TRADE OF WORK REQUIRED BY AN "OR EQUAL" OR "SUBSTITUTE" PRODUCT SHALL BE DULY CONSIDERED AND PRICED ACCORDINGLY PRIOR TO BIDDING OR PRICING. THE DECISION AS TO WHETHER OR NOT A PROPOSED SUBSTITUTE OR "EQUAL" PRODUCT IS ACTUALLY EQUAL TO THAT SPECIFIED SHALL REST SOLELY WITH THE ARCHITECT.

B. REQUEST TO PROVIDE "EQUAL" PRODUCTS IN LIEU OF THOSE SPECIFIED SHALL BE SUBMITTED TO THE ARCHITECT IN WRITING AT LEAST TEN (10) DAYS PRIOR TO FINAL PRICING AND EXECUTION OF THE CONTRACT. NO CONSIDERATION WILL BE GIVEN TO SUBSTITUTE PRODUCTS AFTER FINAL PRICING AND EXECUTION OF THE CONTRACT.

C. ANY "OR EQUAL" PRODUCT OR PROPOSED PRODUCT SUBSTITUTION WHICH WILL CAUSE A CHANGE IN THE APPEARANCE, DIMENSIONS OR DESIGN OF ANY PART OF THE BUILDING, ITS STRUCTURE, ELECTRICAL SYSTEM OR ANY OTHER ENGINEERING SYSTEMS SHALL BE ACCOMPANIED BY A SCALDED DRAWING AND WRITTEN DESCRIPTION OF THE REQUIRED CHANGE(S) FOR APPROVAL BY THE ARCHITECT, IF DEEMED NECESSARY BY THE ARCHITECT, DESIGN CHANGES SHALL BE SIGNED AND SEALED BY A REGISTERED PROFESSIONAL ENGINEER, CURRENTLY LICENSED IN THIS STATE.

A. EVERY PIECE OF ENERGY CONSUMING EQUIPMENT, ALL FIRE

SUPPRESSION PRODUCTS AND LIFE SAFETY EQUIPMENT SHALL COMPLY WITH THE FOLLOWING STANDARDS AS APPLICABLE; ESPECIALLY IN REGARD TO PREVAILING CODES:

1. FACTORY MUTUAL LABORATORIES (FM)
2. INDUSTRIAL RISK INSURERS (IRI)
3. UNDERWRITING LABORATORIES, INC. (UL)
4. ADC: AIR DIFFUSION COUNCIL
5. AGA: AMERICAN GAS ASSOCIATION
6. AMCA: AMERICAN MOVING AND CONDITIONING ASSOCIATION, INC.
7. ANSI: AMERICAN NATIONAL STANDARDS INSTITUTE
8. API: AMERICAN PETROLEUM INSTITUTE
9. ARI: AMERICAN REFRIGERATION INSTITUTE
10. ASHRAE: AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
11. ASME: AMERICAN SOCIETY OF MECHANICAL ENGINEERS
12. ASTM: AMERICAN SOCIETY OF TESTING AND MATERIALS
13. AWWA: AMERICAN WATER WORKS ASSOCIATION
14. IBR: INSTITUTE OF BOILER AND RADIATOR MANUFACTURERS
15. MSS: MANUFACTURERS STANDARDIZATION SOCIETY
16. NBPV: NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS
17. NEMA: NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
18. OSHA: OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
19. PDI: PLUMBING DRAINAGE INSTITUTE
20. PPI: PLASTIC PIPE INSTITUTE
21. SMACNA: SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC.

- A. BEFORE PREPARING SUBMITTALS, STUDY ALL CONTRACT DRAWINGS AND SPECIFICATIONS IN DETAIL, OBTAIN MANUFACTURER'S RECOMMENDED INSTRUCTIONS, AND HAVE SUBMITTALS PREPARED BASED ON SPECIFIC EQUIPMENT AND MATERIAL PROPOSED FOR INSTALLATION. AN OFFICER OF THE CONTRACTING FIRM SHALL SIGN ALL SHOP DRAWINGS (CERTIFY CONFORMANCE WITH PLANS AND SPECIFICATIONS) BEFORE SUBMITTING TO THE ARCHITECT OR RELEASING TO THE FIELD.
- B. THE SUBMITTAL PROCESS SHALL NOT BE UTILIZED AS AN AVENUE TO SUBSTITUTE PRODUCTS AFTER THE EXECUTION OF THE CONTRACT. CONTRACTOR SHOULD APPROVE OR REJECT THE SUBSTITUTED PRODUCT BEING SUBMITTED. IF THE SECOND ATTEMPT AT SUBSTITUTION IS MADE DURING THE RESUBMITAL OF THE SAME PRODUCT, THERE ARE NO MORE REVIEWS OF THE PRODUCT THAT WILL BE PERFORMED WITHOUT DIRECT COMPENSATION TO THE ENGINEER BEING PAID FOR THE ADDITIONAL SERVICES REQUIRED FOR THE THIRD REVIEW AND ANY FURTHER REVIEW.
- C. ALL UNCOATED AND UNINSULATED STEEL SURFACES EXPOSED TO SIGHT INSIDE THE BUILDING, SUCH AS PIPING, EQUIPMENT HANGERS AND SUPPORTS WHICH ARE NOT PROVIDED WITH FACTORY PRIME COAT OR GALVANIZING, SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER AND TWO COATS OF ASPHALTIC BASE ALUMINUM PAINT. INSULATED STEEL PIPES OUTSIDE THE BUILDING SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER BEFORE INSTALLING.
- D. FACTORY PAINTED EQUIPMENT THAT HAS BEEN SCRATCHED OR MARRED SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY COLOR.

- A. PERFORM ALL EXCAVATION, TRENCHING AND BACKFILLING FOR UNDERGROUND WORK UNDER THIS DIVISION 22. DURING EXCAVATION, THE EXCAVATED MATERIAL SHALL BE FILLED BACK FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING, SLIDES OR CAVE-INS. DO NOT EXCEDE THE ANGLE OF REPOSE UNLESS WRITTEN APPROVAL IS OBTAINED IN ADVANCE FROM THE ARCHITECT OR OWNER FOR SHORING, BRACING OR OTHER ALTERNATE EXCAVATION METHODS. ALL EXCAVATED MATERIAL NOT USED FOR BACKFILLING SHALL BE REMOVED FROM THE BUILDING AND DISPOSED OF AS INDICATED OR DIRECTED BY THE OWNER OR LANDLORD. TAKE MEASURES TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES AND OTHER EXCAVATIONS AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING. ALL EXCAVATION SHALL BE MADE BY OPEN CUT. TUNNELING SHALL NOT BE ALLOWED.
- B. THE BOTTOM OF ALL TRENCHES SHALL BE EVENLY GRADED TO PROVIDE FIRM SUPPORT AND AN EVEN BEARING SURFACE. PIPE SHALL BE LAID ON FIRM SOIL, LAID IN STRAIGHT LINES AND ON UNIFORM GRADES. PROVIDE BELL HOLES SO THAT THE BARREL OF THE PIPE RESTS EVENLY ON THE BOTTOM OF THE TRENCH ALONG THE ENTIRE LENGTH OF THE PIPE.

- C. PIPE SHALL BE INSPECTED AND TESTED PRIOR TO BACKFILLING. TRENCH SHALL BE FILLED TO A MINIMUM OF 12" ABOVE THE TOP OF PIPE WITH SUITABLE EARTH (FREE OF ROCKS, TRASH, LARGE CLODS AND ORGANIC MATERIAL) AND COMPACTED TO A MINIMUM 95% PROCTOR. AFTER THE FIRST LAYER IS COMPLETED, SUBSEQUENT LAYERS SHALL BE FILLED AND COMPACTED THE SAME AS THE FIRST LAYER. SETTLING THE BACKFILL WITH WATER SHALL NOT BE PERMITTED.

- A. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT CONFORMANCE WITH THE RECOMMENDATIONS OF THE EQUIPMENT MANUFACTURER, AS INDICATED ON THE DRAWINGS AND AS SPECIFIED.
- B. PROVIDE INSTALLATION MANUALS FOR EACH PIECE OF EQUIPMENT. SUBMIT IN SEPARATELY BOUND VOLUMES AFTER REVIEW OF SUBMITTALS.
- C. PROVIDE SUPPLEMENTARY STEEL FRAMING AND WELDED STEEL EQUIPMENT SUPPORT STANDS AS REQUIRED FOR PROPER HANGING AND SUPPORT OF THE MECHANICAL SYSTEMS. STEEL ANGLES, CHANNELS AND TUBING UTILIZED FOR SUCH FRAMING

- A. THE EXTERIOR SURFACES OF ALL MECHANICAL EQUIPMENT, PIPING, CONDUIT, ETC., SHALL BE CLEANED AND FREE OF ALL DIRT, GREASE, OIL, PAINT SPATTER, AND OTHER CONSTRUCTION DEBRIS.
- B. BEARINGS THAT REQUIRE LUBRICATIONS SHALL BE LUBRICATED IN STRICT ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.
- C. ALL CONTROL EQUIPMENT SHALL BE ADJUSTED TO THE SETTINGS REQUIRED FOR THE PERFORMANCE SPECIFIED.
- D. ALL COILS SHALL BE THOROUGHLY CLEANED AND COMBED PRIOR TO FINAL INSPECTION.

- A. ALL UNCOATED AND UNINSULATED STEEL SURFACES EXPOSED TO SIGHT INSIDE THE BUILDING, SUCH AS PIPING, EQUIPMENT HANGERS AND SUPPORTS WHICH ARE NOT PROVIDED WITH FACTORY PRIME COAT OR GALVANIZING, SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER AND TWO COATS OF ASPHALTIC BASE ALUMINUM PAINT. INSULATED STEEL PIPES OUTSIDE THE BUILDING SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER BEFORE INSTALLING.
- B. STEEL ITEMS EXPOSED OUTSIDE THE BUILDING, SUCH AS EQUIPMENT SUPPORTS, UNINSULATED PIPING AND HANGERS WHICH ARE NOT FACTORY PAINTED OR GALVANIZED SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER AND TWO COATS OF ASPHALTIC BASE ALUMINUM PAINT. INSULATED STEEL PIPES OUTSIDE THE BUILDING SHALL BE CLEANED AND PAINTED WITH ONE COAT OF RUST INHIBITING PRIMER BEFORE INSTALLING.
- C. FACTORY PAINTED EQUIPMENT THAT HAS BEEN SCRATCHED OR MARRED SHALL BE REPAINTED TO MATCH THE ORIGINAL FACTORY COLOR.

- A. SOIL, WASTE, STORM AND VENT PIPING SHALL BE TESTED WITH WATER BEFORE INSTALLATION. WATER TEST SHALL BE APPLIED TO THE PIPING SYSTEM EITHER IN ITS ENTIRE LENGTH OR IN INDIVIDUAL SECTIONS. EACH OPENING EXCEPT THE HIGHEST OPENING OF THE SECTION UNDER TEST SHALL BE PLUGGED, AND THE SECTION SHALL BE FILLED WITH WATER AND TESTED WITH A HEAD OF WATER OF AT LEAST TEN (10) FEET ABOVE THE HIGHEST POINT IN THE SYSTEM. THE WATER SHALL BE KEPT IN THE PORTION UNDER TEST FOR AT LEAST THIRTY (30) MINUTES; NO DROPOUT IN THE WATER LEVEL WILL BE ACCEPTABLE.
- B. THE WATER PIPING SYSTEMS SHALL BE TESTED AT A MINIMUM PRESSURE OF 125 PSI AND PROVED TIGHT AT THIS PRESSURE FOR NOT LESS THAN THIRTY (30) MINUTES OR LONGER IF REQUIRED TO PERMIT INSPECTION OF ALL POINTS. NO LOSS IN PRESSURE WILL BE PERMITTED.
- C. ALL GAS PIPING SHALL BE TESTED PNEUMATICALLY AND PROVED TIGHT AT A PRESSURE OF NOT LESS THAN 100 PSI FOR A PERIOD OF NOT LESS THAN TWO (2) HOURS. NO LOSS IN PRESSURE WILL BE PERMITTED.
- D. ALL LEAKS SHALL BE REPAIRED BY TIGHTENING, REMAKING JOINTS, OR REPLACING PIPE AND FITTINGS. CAULKING OF JOINTS SHALL NOT BE PERMITTED.

- A. AT THE COMPLETION OF THE PROJECT, PROVIDE A SET OF REPRODUCIBLE PRINTS TO THE ARCHITECT WHICH REFLECT ALL CHANGES, DEVIATIONS AND REVISIONS MADE TO THE ORIGINAL DESIGN DOCUMENTS. LOCATIONS OF ALL UNDERGROUND PIPING AND UTILITIES SHALL BE CLEARLY SHOWN AND DIMENSIONED FROM PERMANENT

Property of NY Engineers

## SECTION 22400

### PLUMBING FIXTURES AND TRIM

#### 1.0 GENERAL

##### 1.01 DESCRIPTION

- A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE MECHANICAL GENERAL SECTION 22010.
- B. THIS SECTION 15450 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISIONS OF ALL LABOR, FIXTURES, EQUIPMENT, APPLIANCES AND MATERIALS, AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION AND INSTALLATION OF THE PLUMBING FIXTURES AND TRIM AS SPECIFIED HEREIN AND AS SHOWN.
- C. ALL EXPOSED PIPING, VALVES, STOPS, P-TRAPS, ETC. SHALL BE CHROME-PLATED. ALSO, ALL EXPOSED PIPING PENETRATIONS THROUGH WALLS, FLOORS OR CEILINGS SHALL BE PROVIDED WITH CHROME-PLATED BRASS ESCUTCHEONS.
- D. ALL P-TRAPS SHALL BE MINIMUM 17-GAUGE BRASS.
- E. FLUSH VALVES SHALL HAVE NON-HOLD OPEN FEATURE, VACUUM BREAKERS AND COVER CAP ON ANGLE-TYPE STOP.
- F. PROVIDE ALL FINAL CONNECTIONS TO ALL EQUIPMENT AND FIXTURES FURNISHED BY OWNER.
- G. UNLESS OTHERWISE SPECIFIED IN AN INDIVIDUAL FIXTURE DESCRIPTION, ALL ENAMELED CAST-IRON AND PORCELAIN FIXTURES SHALL BE WHITE.

#### 1.02 INTENT

- A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE COMPLETE, OPERABLE, ADJUSTED, CLEAN PLUMBING FIXTURES AS SHOWN AND SPECIFIED, WHICH ARE FREE OF LEAKS, NOISE, AIR, VIBRATION AND WATERFLOW FLUCTUATIONS.

#### 1.03 BASIS OF DESIGN

- A. THE BASIS OF DESIGN IS AS OUTLINED FOR EACH FIXTURE IN THE 2.0 PRODUCTS SUBSECTION. ANY PROPOSED SUBSTITUTIONS SHALL BE PROVEN EQUAL IN ALL RESPECTS TO THE EQUIPMENT SPECIFIED AS THE BASIS OF DESIGN.

#### 1.04 ACCEPTABLE MANUFACTURERS

- A. ACCEPTABLE FIXTURE MANUFACTURERS ARE AMERICAN STANDARD, ELjer AND KOHLER PROVIDED THAT THEIR UNITS ARE EQUAL IN ALL RESPECTS FOR THIS SPECIFIC PROJECT. FAUCETS AND TRIM MAY BE EQUAL PRODUCTS AS MANUFACTURED BY CHICAGO, DELANY, ZURN, T&S BRONZE, BRASS WORKS OR SPEAKMAN.
- B. FLUSH VALVES MAY BE EQUAL PRODUCTS BY ZURN OR DELANY. STAINLESS STEEL SINKS AND DRINKING FOUNTAINS SHALL BE AS MANUFACTURED BY THOSE COMPANIES SPECIFIED FOR EACH SPECIFIC ITEM OUTLINED UNDER SUBSECTION 2.0 PRODUCTS.

#### 2.0 PRODUCTS

(SEE FIXTURE SCHEDULE ON PLUMBING DRAWINGS)

#### 3.0 EXECUTION

##### 3.01 INSTALLATION

- A. UNITS SHALL BE INSTALLED AS INDICATED AND IN CONFORMANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. COORDINATE THE ACTUAL UNITS TO BE PROVIDED WITH ALL TRADES.
- B. ALL PLUMBING FIXTURES SHALL BE FREE OF LEAKS. PROVIDED COMPLETELY FINISHED, TRIMMED, AND ADJUSTED, CLEANED AND READY FOR USE. THEY SHALL BE PROPERLY SECURED TO THE STRUCTURE BY THE USE OF THRU-BOLTING, BACKPLATES, CARRIERS, EXPANSION SHIELDS (FOR FLOOR MOUNTING ONLY) OR TOGGLE BOLTS.
- C. FIXTURES ON STEEL STUD WALLS SHALL HAVE A 1/4" X 4" WIDE STEEL BACKPLATE WIRED WITH 1/16" STEEL WIRE TO THE STUDS. BOLTS NOT LESS THAN 3/8" SHALL SECURE THE FIXTURES THROUGH THE FIXTURE HANGER AND THE BACKPLATE.
- D. ALL MOUNTING HOLES PROVIDED IN FIXTURES SHALL BE USED FOR SUPPORT. IN ADDITION TO THE MAIN HANGERS, 1/4" TOGGLE BOLTS SHALL SECURE THE BOTTOM OF ALL WALL HUNG FIXTURES AT EACH DRILLING PROVIDED FOR THIS PURPOSE.
- E. MOUNT WALL-HUNG FIXTURES AT THE HEIGHTS INDICATED ON THE ARCHITECTURAL DRAWINGS OR AS PRESCRIBED BY LOCAL CODE. SPECIAL ATTENTION IS CALLED TO THE INSTALLATION REQUIREMENTS OF THE ANSI OR ANY OTHER ADA HANDICAP CODE.

#### 3.02 CLEANING AND ADJUSTMENT

- A. THE UNIT SHALL BE CLEANED, TESTED AND FIELD-ADJUSTED TO PROVIDE OPTIMUM FLOW AND DRAINAGE.

END OF SECTION

#### 3.02 UNDERGROUND WATER PIPING

- A. ALL UNDERGROUND DOMESTIC WATER PIPING SHALL HAVE A MINIMUM COVER OF 3'-0".
- B. PROVIDE CONCRETE THRUST BLOCKS AT ALL CHANGES OF DIRECTION AND SECURE ALL MECHANICAL JOINTS WITH RESTRAINING RODS.
- C. ALL UNDERGROUND COPPER WATER LINES SHALL BE PROTECTED FROM CORROSION WITH A CONTINUOUS PLASTIC SHEATHING OR COATING AND WRAPPING. THIS SHEATHING OR COATING AND WRAPPING SHALL BE EXTENDED 6' TO 12' ABOVE FINISHED FLOOR.

#### 3.03 MINIMUM HANGER SPACING

- A. PIPE HANGERS OR SUPPORTS SHALL BE PROVIDED WITHIN 18" OF EACH HORIZONTAL FITTING, EQUIPMENT CONNECTION, VALVE, ETC. AND AT NOT MORE THAN 10 FT. SPACINGS ALONG HORIZONTAL RUNS OF STRAIGHT, COPPER PIPING EQUAL TO OR GREATER THAN 1 1/2" DIAMETER, 6 FT. SPACING FOR COPPER PIPING EQUAL TO OR LESS THAN 1 1/4" DIAMETER, AND 4 FT. SPACING FOR PVC PIPING IN ACCORDANCE WITH TABLE 308.5 IN THE IPC. FOLLOW MIDSTORY GUIDE FOR MAXIMUM VERTICAL SPACING OF PVC PIPE 2 INCHES AND SMALLER.
- B. RISER CLAMPS SHALL BE PROVIDED AT EACH FLOOR PENETRATION.

#### 3.04 INSULATION INSTALLATION

- A. PROVIDE BLANKET INSULATION OVER ALL HORIZONTAL ROOF DRAIN PIPING.
- 1. ALL JOINTS AND TEARS SHALL BE SEALED WITH MATCHING WHITE VAPOR BARRIER TAPE.
- B. PROVIDE INSULATION OVER ALL ABOVE GROUND HOT AND COLD WATER PIPING, EXCEPT THAT NO INSULATION IS REQUIRED ON COLD WATER LINES INSTALLED INSIDE INTERIOR PLUMBING CHASES (THOSE CHASES WITH NO EXTERIOR WALL).
- 1. ALL JOINTS AND TEARS SHALL BE SEALED WITH MATCHING WHITE VAPOR BARRIER TAPE.

END OF SECTION

## SECTION 22424

### WATER HEATERS AND ACCESSORIES

#### 1.0 GENERAL

##### 1.01 DESCRIPTION

- A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE PLUMBING GENERAL SECTION 22010.
- B. THIS SECTION 22424 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISIONS OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION OF THE WATER HEATING SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN. THESE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

#### 1.02 WATER HEATERS

#### 1.03 HOT WATER CIRCULATOR

#### 2.0 PRODUCTS

##### 2.01 STORAGE WATER HEATER

- A. WATER HEATER SHALL BE UL LISTED FOR THE US AND NSF CERTIFIED.
- B. UNIT SHALL BE PROTECTED BY A SHEET METAL HOUSING. HEAT EXCHANGER SHALL BE RATED FOR MAXIMUM WORKING PRESSURE NOT LESS THAN 150 PSIG.
- C. ALL ASPECTS OF INSTALLATION OF WATER HEATER SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS. MATERIALS SHALL CONFORM TO ALL MANUFACTURER RECOMMENDATION INCLUDING ELECTRICAL CONNECTONS AND WIRING.
- D. WATER HEATER PIPING SHALL BE FIELD CONSTRUCTED OF MATERIALS AS SPECIFIED. WATER HEATER SHALL BE INSTALLED WITH INDIVIDUAL ISOLATING SHUTOFF VALVES FOR SERVICE AND MAINTENANCE.

#### 2.09 HOT WATER CIRCULATOR

- A. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
- B. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.
- C. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE- BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.
- D. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS. BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.

#### 3.0 EXECUTION

##### 3.01 INSTALLATION

- A. THE WATER HEATERS AND ACCESSORIES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND THE CONTRACT DOCUMENTS.
- B. ALL TEMPERATURE AND PRESSURE RELIEF VALVES SHALL BE PIPED FULL SIZE TO AN INDIRECT WASTE SUCH AS THE NEAREST FLOOR DRAIN, SERVICE SINK, SINK TAILPIECE, ETC.

END OF SECTION

NY ENGINEERS

REVISIONS BY DATE  
NO. DESCRIPTION

JOB LOCATION:

PLUMBING SPECIFICATIONS  
(2 OF 2)

SHEET  
**P8.1**

EBB STORE#: \_\_\_\_\_  
FILE#: \_\_\_\_\_  
DATE: \_\_\_\_\_  
PROJ. MGR. \_\_\_\_\_