

MECHANICAL SYMBOLS LIST

<div>AC-1</div> <div>TXF-1</div>	EQUIPMENT SYMBOL
AIR DEVICES	
<div><div><div></div></div><div><div></div></div></div>	CEILING DIFFUSER SUPPLY
<div><div><div></div></div><div><div></div></div></div>	CEILING DIFFUSER RETURN
DUCT ACCESSORIES	
<div><div><div></div></div><div><div></div></div></div>	VOLUME CONTROL DAMPER
CONTROLS AND SENSORS	
<div><div><div></div></div><div><div></div></div></div>	THERMOSTAT
<div><div><div></div></div><div><div></div></div></div>	EMERGENCY MANUAL DEVICE FOR HOOD
DUCTWORK	
<div><div><div></div></div><div><div></div></div></div>	AIR DUCT W/ 1.5" ACOUSTICAL LINING
<div><div><div></div></div><div><div></div></div></div>	FLEXIBLE DUCT
<div><div><div></div></div><div><div></div></div></div>	FLEXIBLE CONNECTION
<div><div><div></div></div><div><div></div></div></div>	RECTANGULAR DUCT (WIDTH X DEPTH)
<div><div><div></div></div><div><div></div></div></div>	ROUND DUCT (DIAMETER)
<div><div><div></div></div><div><div></div></div></div>	ROUND DUCT CROSS SECTION
<div><div><div></div></div><div><div></div></div></div>	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
<div><div><div></div></div><div><div></div></div></div>	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 /WACCESS 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 IBC 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 ENRGY 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 IBC 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:

A.

MECHANICAL VENTILATION - SECTION 403.

B.

SMOKE CONTROL SYSTEMS - SECTION 513.

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 513 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 FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.

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 VOLUME 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(S) 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 FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3.

THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.
- GENERAL HVAC NOTES
- GENERAL:
1.

PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.

2.

CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.

3.

THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.

4.

WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.

5.

COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

6.

INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.

7.

WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.

8.

COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.

9.

ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.

10.

PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.

11.

LOCATE ALL TEMPERATURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP, AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.

12.

WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.

13.

ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR DUCTWORK AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

14.

PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.

15.

MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.

16.

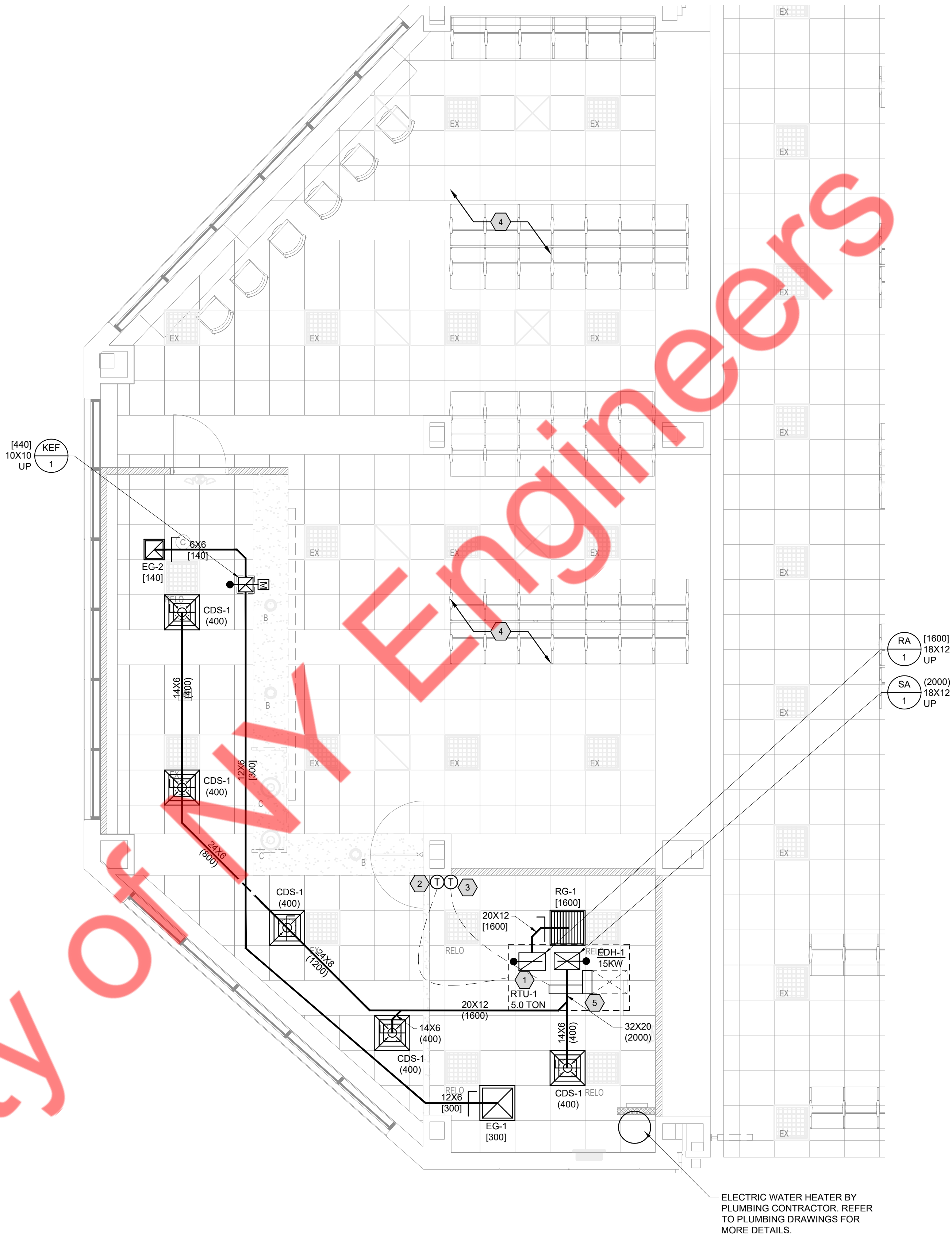
ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
- NY ENGINEERS
- | NO. | REVISIONS | |
|-----|-------------|---------|
| | DESCRIPTION | BY DATE |
- JOB LOCATION:
- MECHANICAL GENERAL NOTES & SYMBOLS
- SHEET
- M0.0
- EBB STORE#:
- FILE#:
- DATE:
- PROJ. MGR.

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 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 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 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 DUCT 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 OF PROPER NOTIFICATION DOES NOT RELIEVE THE CONTRACTOR. THE CONTRACTOR SHALL CORRECT ANY 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 ±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/ 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 RECOMMENDATIONS. CONTRACTOR TO VERIFY THE EXACT LOCATION IN FIELD BEFORE INSTALLATION.



1
M1.0

MECHANICAL FLOOR PLAN

1/4" = 1'-0"

REVISIONS		
NO.	DESCRIPTION	BY DATE

JOB LOCATION:

MECHANICAL FLOOR PLAN

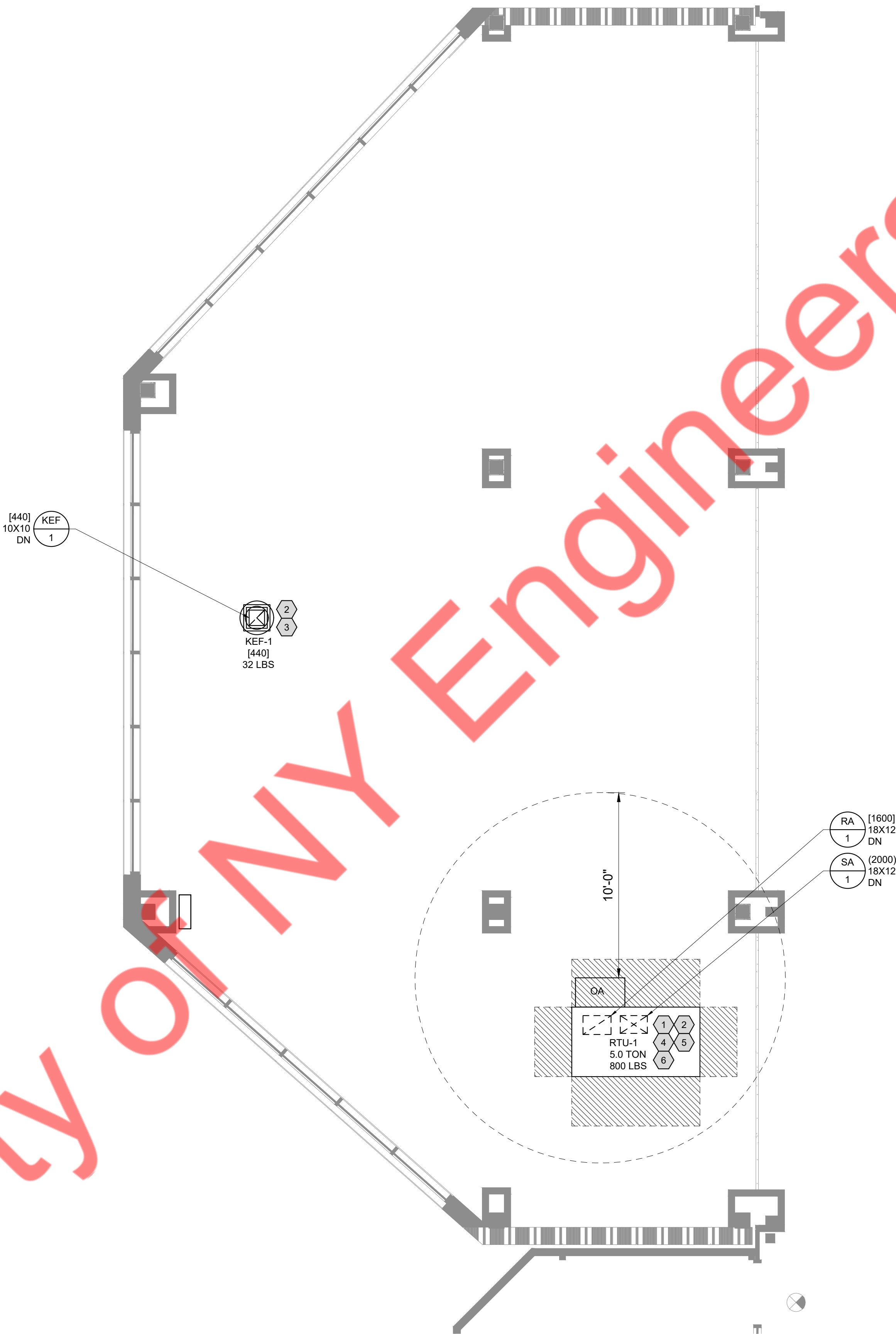
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DATE:	
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GENERAL NOTES

- 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 SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
D. ALL SOURCE OF 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).



1
M1.1

MECHANICAL ROOF PLAN

1/4" = 1'-0"

REVISIONS			
NO.	DESCRIPTION	BY	DATE

JOB LOCATION:

MECHANICAL ROOF PLAN

SHEET

M1.1

EBB STORE#:

FILE#:

DATE:

PROJ. MGR.

NY ENGINEERS

ROOF TOP UNIT SCHEDULE																							
UNIT ID	MANUFACTURER	EFFICIENCY	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN			GAS HEAT		COOLING				ELECTRICAL				EER	IEER / SEER	STEADY STATE EFFICIENCY	OPERATING WEIGHT (LBS)	NOTES
						TOTAL	OUTSIDE	EXTERNAL STATIC	INPUT	OUTPUT	TOTAL	SENSIBLE	AMBIENT	ENTERING	VOLTS	PHASE	MCA(A)	MOCp(A)					
						CFM	AIR CFM	PRESSURE(IN. W.G.)	MBH	MBH	MBH	MBH	DB (°F)	DB / WB(°F)									
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
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
<div>NOTES:</div> <div>1) ALL DIFFUSERS : CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS TO</div> <div>2) REFER ARCHITECTURAL DRAWINGS FOR CEILING TYPE.</div> <div>3) COORDINATE COLOR/FINISH WITH ARCHITECT.</div> <div>4) NOISE CRITERIA: <30 dBA</div> <div>5) PROVIDE VOLUME CONTROL DAMPER AS ACCESSORY FOR ALL AIR TERMINAL FOR AIR BALANCING.</div>						

EXHAUST FANS SCHEDULE												
TAG	QUANTITY	FLOW RATE	EXTERNAL	FAN SPEED	ELECTRIC DATA			SONES	BASIS OF DESIGN		WEIGHTS (LBS)	REMARK
			STATIC PRESSURE		V/PH/HZ	MOTOR HP	FLA (AMPS)		MANUFACTURER	MODEL		
		CFM	IN W.G.	RPM								
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.														

VENTILATION CALCULATION													
ROOM NAME	AREA (SQ. FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER IMC 2018	NUMBER OF PEOPLE AS PER IMC 2018	NUMBER OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2018		REQ. OA (CFM)	REQ. OA (CFM) WITH EFFECTIVENESS	Provided OA (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR /FIXT.)	TOTAL EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
						CFM/PEOPLE	CFM/SQ.FT						
KITCHEN	195	20	4	-	4	7.5	0.12	53	67	200	0.7	136.5	140
BOH	420	20	9	-	8	0	0.12	50	63	200	0.7	294	300
						TOTAL		104		400	-	Total	440

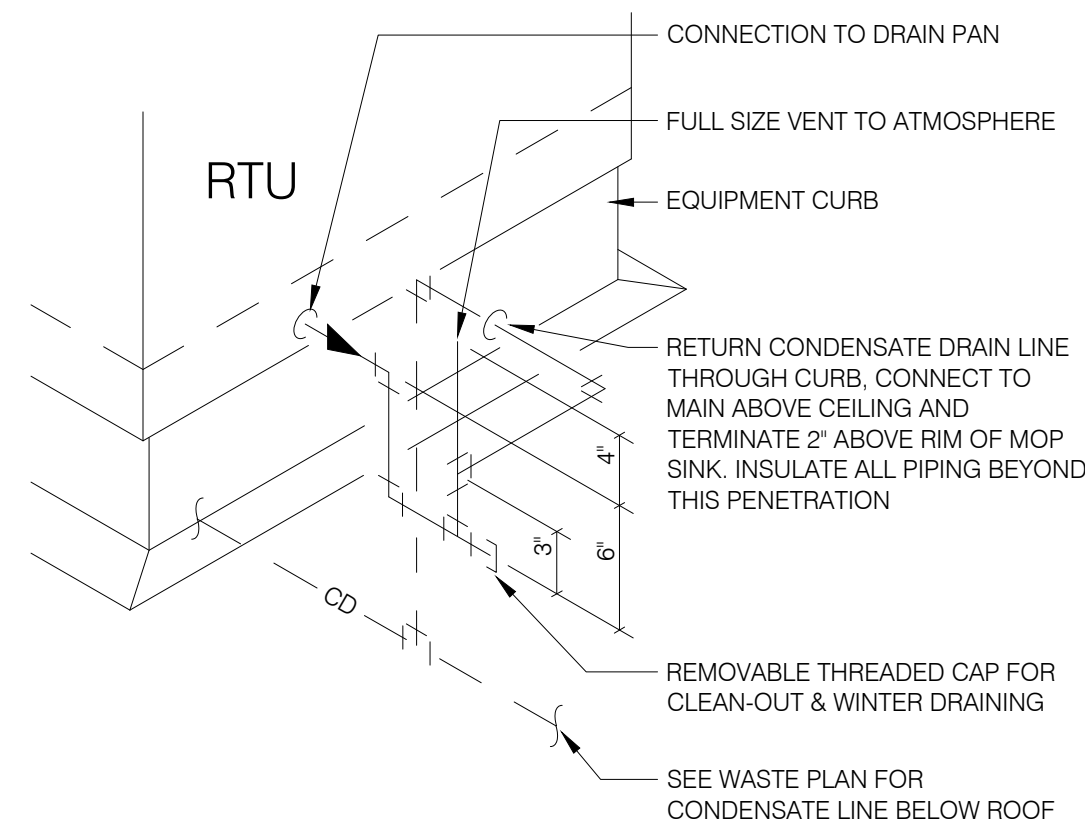
NY ENGINEERS

REVISIONS			
NO	DESCRIPTION	BY	DATE

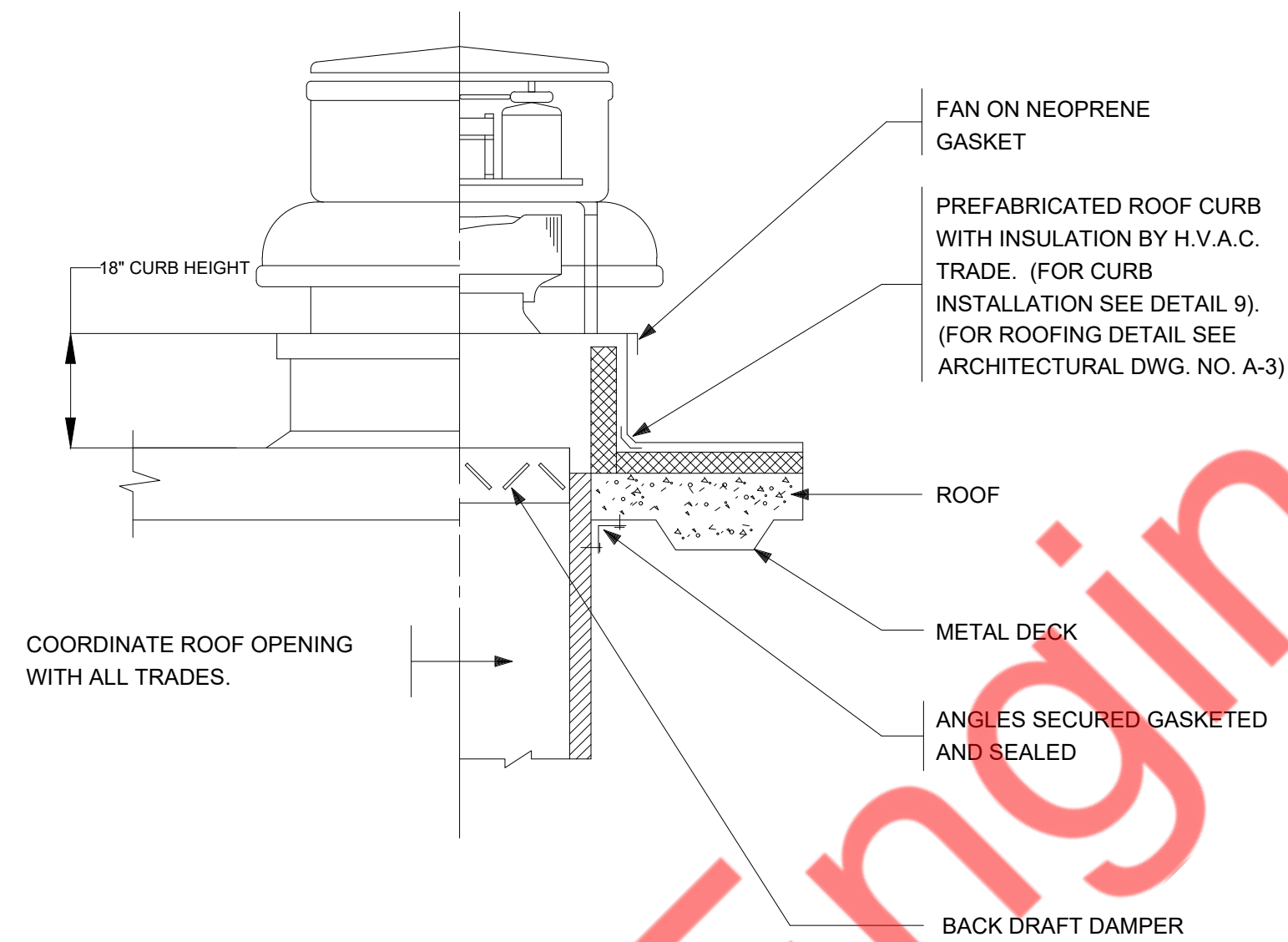
JOB LOCATION:

MECHANICAL SCHEDULES

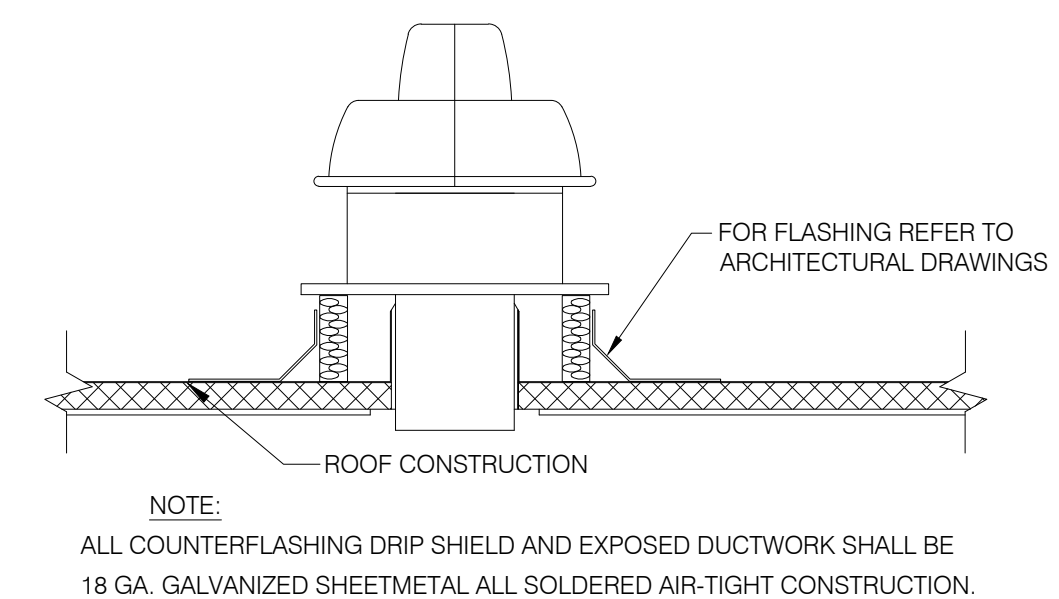
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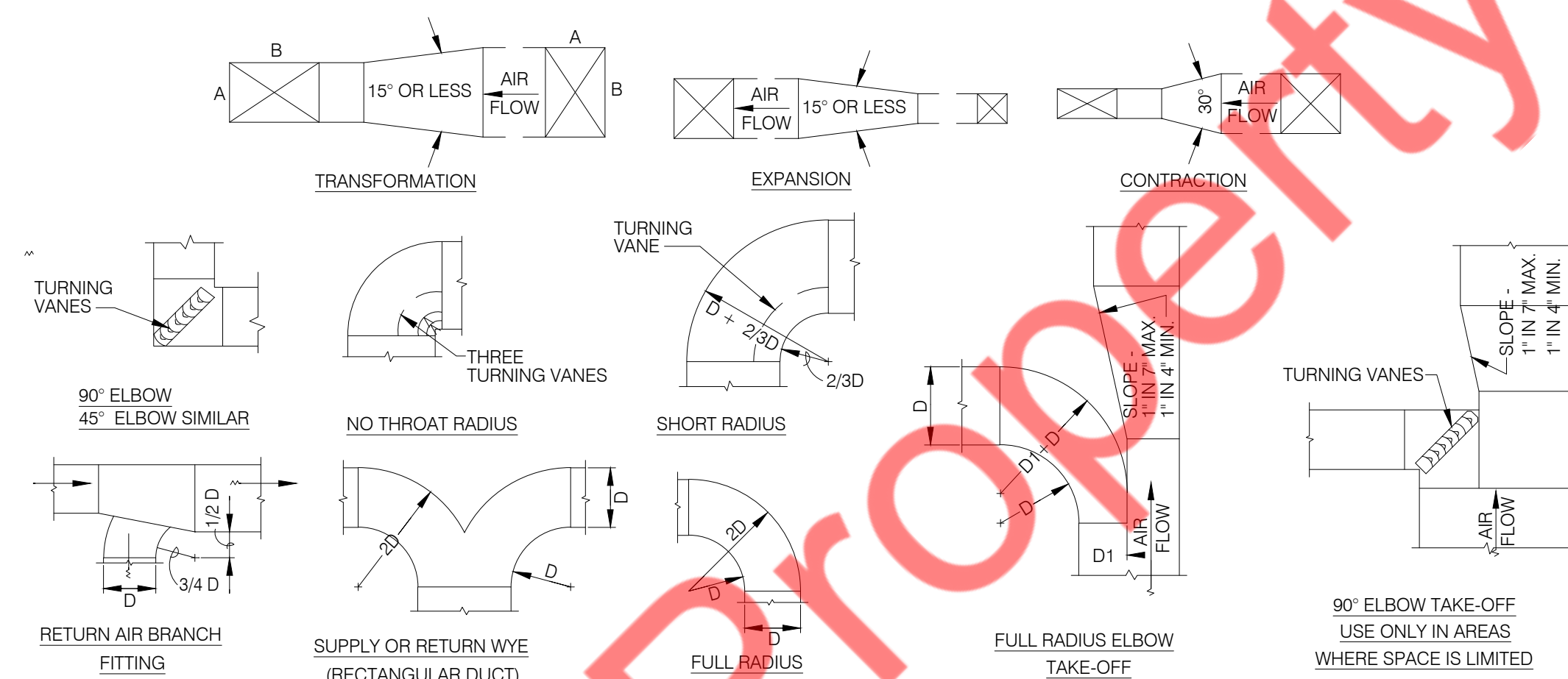
RTU CONDENSATE DRAIN N.T.S. **3**



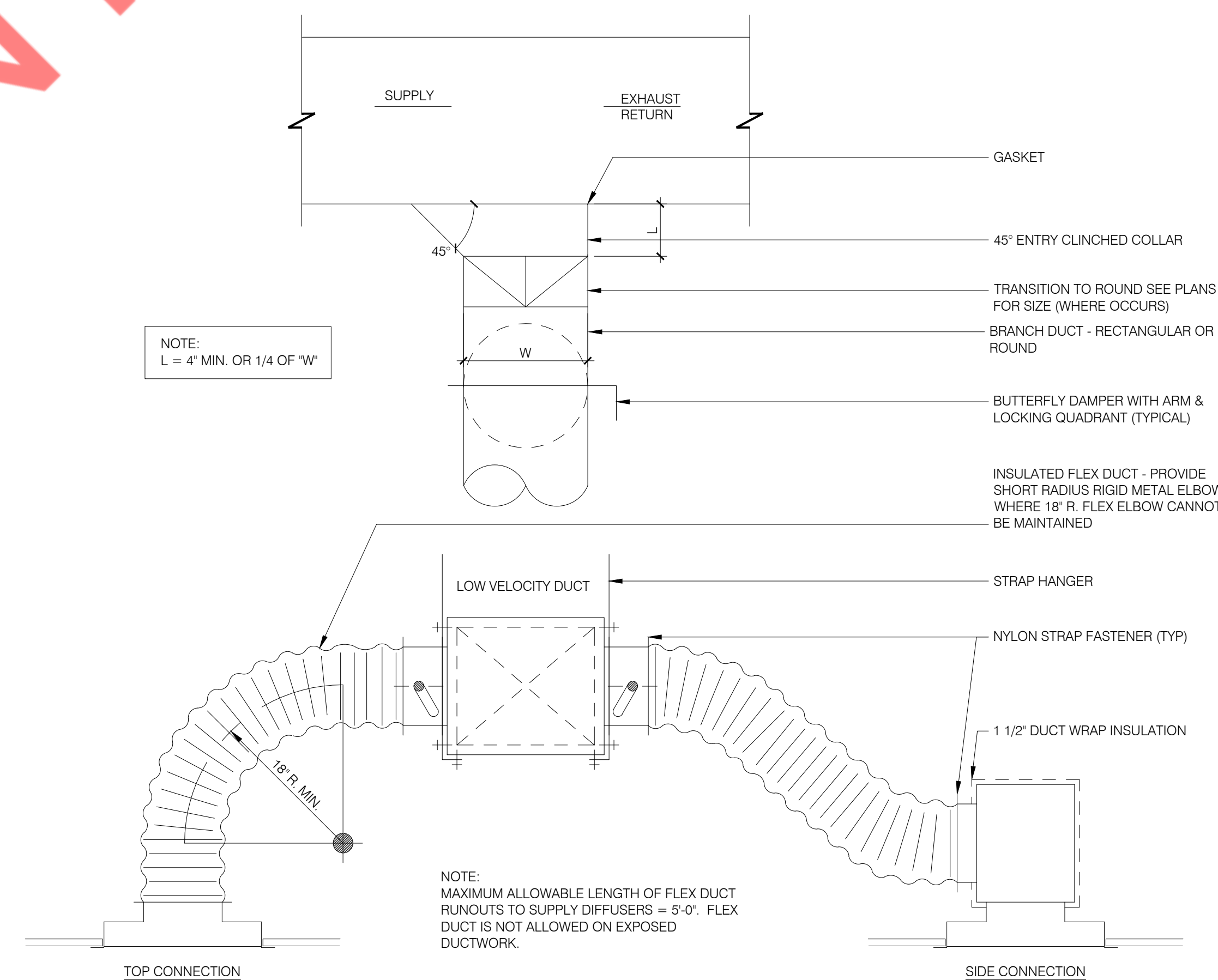
DOWN BLAST FAN N.T.S. **2**



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



TYPICAL DUCTWORK DETAILS N.T.S. **5**



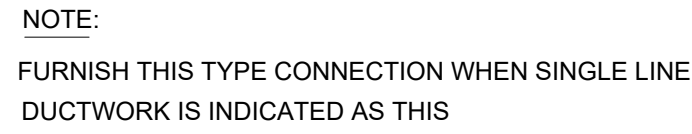
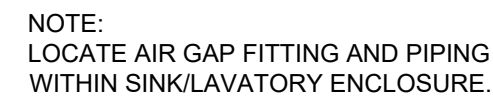
CEILING DIFFUSER CONNECTIONS N.T.S. **4**

REVISIONS			
NO.	DESCRIPTION	BY	DATE

JOB LOCATION:

MECHANICAL DETAILS (1 OF 3)

SHEET
M3.0
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PROJ. MGR.



2

N.T.S.

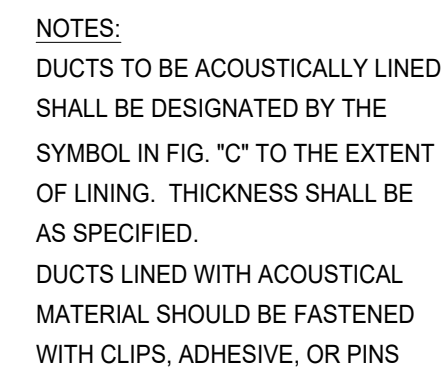
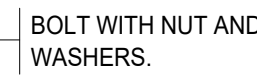


FIG. A

FIG. C

FIG. B

5

N.T.

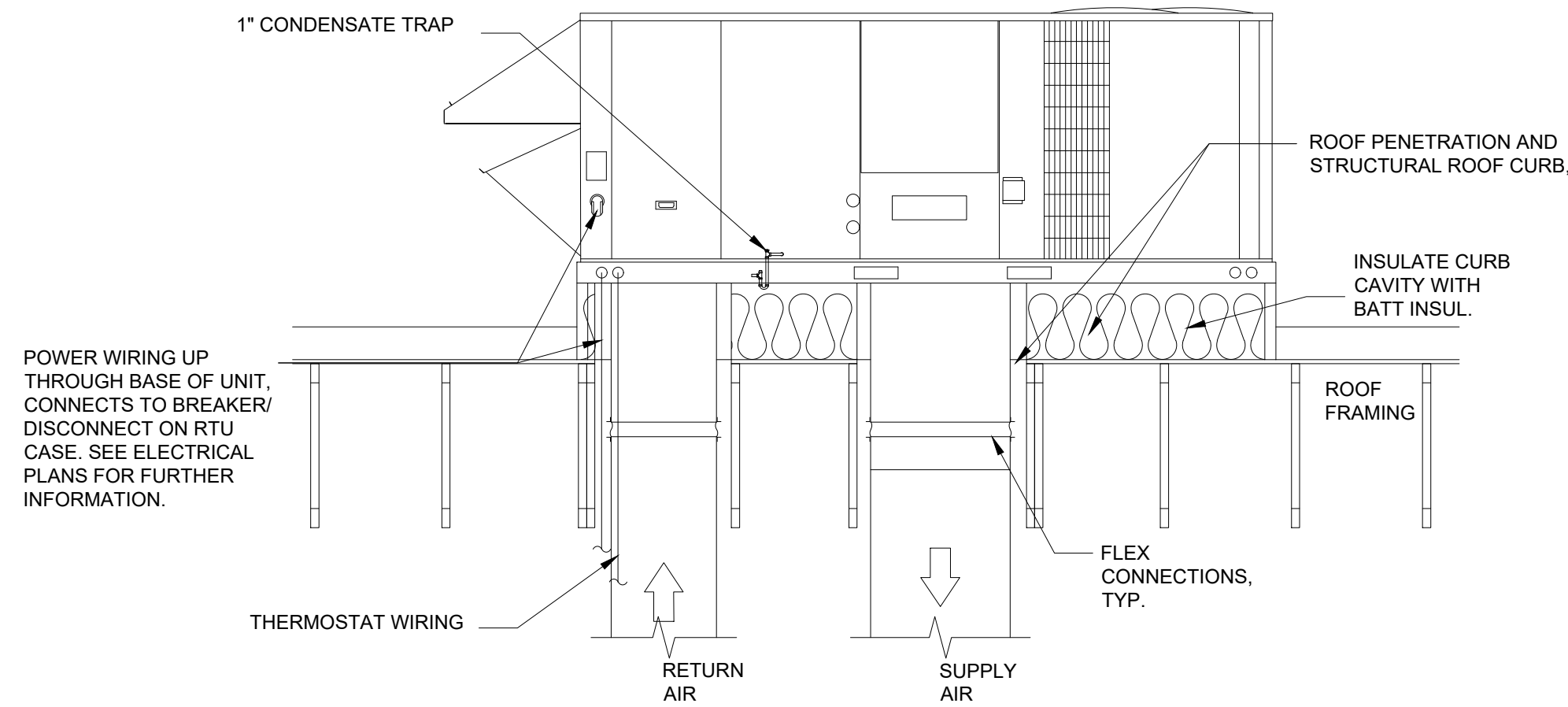
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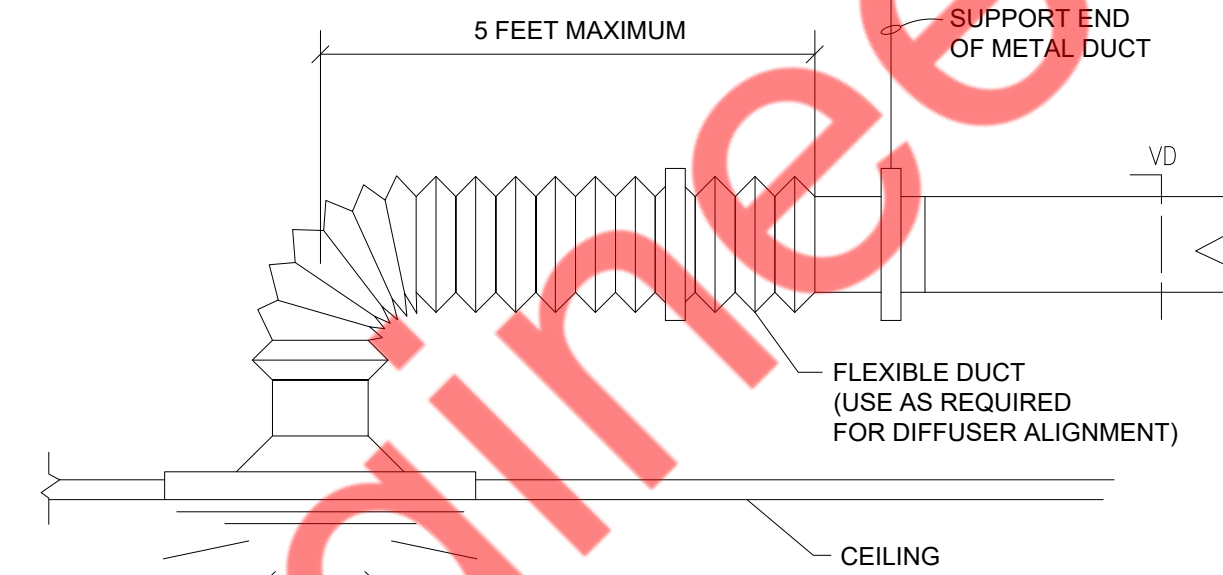
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TYPICAL ROOF TOP UNIT DETAIL N.T.S. **2**



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

NY ENGINEERS

REVISIONS			
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

- 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.

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

END OF SECTION 0101

SECTION 0102-REQUIRED DOCUMENTS

- 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.
- 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.
- 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.
- 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

- 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
- 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.
 - W-RATINGS: PER UL 1479.
- INSTALLATION
 - IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
- FIELD QUALITY CONTROL
 - INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
- THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE

WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:

- METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:
- LATEX SEALANT
 - SILICONE SEALANT
 - INTUMESCENT PUTTY
 - MORTAR
 - SILICONE FOAM
 - PILLOWS/BAGS
 - INTUMESCENT WRAP STRIPS
 - INTUMESCENT COMPOSITE SHEET

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

END OF SECTION 078413

SECTION 230548 - VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

- COMPONENTS
 - 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.
 - RESILIENT PIPE GUIDES.
- AIR-MOUNTING SYSTEMS:
 - AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWES.
 - RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWES.
 - 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.
- 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

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

PART-2 PRODUCTS

- 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.
 - UNISTRUT; TYCO INTERNATIONAL, LTD.

END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

- SUMMARY
 - TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
 - AIR SYSTEMS: CONSTANT AND VARIABLE VOLUME SYSTEMS.
 - MOTORS.
- 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.
- EXECUTION
 - THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC 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 HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

- 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 S3ECTION 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

- 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.
- FIELD QUALITY CONTROL
 - FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.
- 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: R-6
 - WITHIN BUILDING ENVELOPE ASSEMBLY: R-8
 - OUTSIDE OF BUILDING: R-8

- ITEMS NOT INSULATED:
 - FIBROUS-GLASS DUCTS.
 - METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/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.

- PRODUCTS
 - THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
 - JOHNS-MANVILLE
 - OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

- WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE FIBERGLASS DUCT LINER. LINING SHALL COMPLY WITH NFPA 90A AND SHALL HAVE A FLAME SPREAD CLASSIFICATION OF NOT MORE THAN 25 AND A SMOKE DEVELOPED RATING NOT MORE THAN 50. DUCT SIZES WHERE LINING IS INDICATED ON PLANS ARE MINIMUM INSIDE CLEAR DIMENSIONS REQUIRED,

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

- CONSTRUCTION
 - EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".
 - ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:
 - CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH, USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
 - SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY-COATED (GALVANNEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC-COATED BY HOT DIP PROCESS. ALL ANGLE

- IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
- USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3, WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31. USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT-RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.
- WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
- PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRIGHT TAPS WILL NOT BE ACCEPTED.
- BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
- ROUND DUCTS MAY BE SUBSTITUTED FOR RECTANGULAR DUCTS IF SIZED IN ACCORDANCE WITH ASHRAE TABLE OF EQUIVALENT RECTANGULAR AND ROUND DUCTS. NO VARIATION OF DUCT CONFIGURATION OR SIZES PERMITTED EXCEPT BY WRITTEN PERMISSION OF THE ENGINEER.

C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION, THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED:

USG	MAX. SIDE INCHES BRACING	TRANSVERSE JOINTS AND
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22 13 TO 24	1"x1"x1/8"	ANGLES ON 4 FOOT CENTERS
20 25 TO 35	1"x1"x1/8"	ANGLES ON 2 FOOT CENTERS

- PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
 - UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
 - DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.
- FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS SHOWN IN FIG. 3-6 AND AS SHOWN IN FIG. 3-1 AND 3-2 FOR ROUND DUCTWORK.

- ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.

- MATERIALS
 - SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
 - SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
 - SHEET METAL MATERIALS:
 - GALVANIZED SHEET STEEL.
 - STAINLESS-STEEL SHEETS.
 - ALUMINUM SHEETS.
 - FACTORY-APPLIED ANTI-MICROBIAL COATING.

- DUCT LINER:
 - FIBROUS GLASS, TYPE I, FLEXIBLE.
 - WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
 - FLEXIBLE ELASTOMERIC.
 - NATURAL FIBER.

- SEALANT MATERIALS:
 - TWO-PART TAPE SEALING SYSTEM.
 - WATER-BASED JOINT AND SEAM SEALANT.
 - SOLVENT-BASED JOINT AND SEAM SEALANT.
 - FLANGED JOINT SEALANT.
 - FLANGE GASKETS.
 - ROUND DUCT JOINT O-RING SEALS.

- DUCT CLEANING
 - CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
 - CLEAN THE FOLLOWING ITEMS:
 - AIR OUTLETS AND INLETS.
 - SUPPLY, RETURN, AND EXHAUST FANS.
 - AIR-HANDLING UNITS.
 - COILS AND RELATED COMPONENTS.
 - RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
 - SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
 - DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

- DUCT SCHEDULE
 - ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:

REVISIONS
NO DESCRIPTION BY DATE

JOB LOCATION:

MECHANICAL SPECIFICATIONS
(1 OF 2)

SHEET
M5.0
EBB STORE#:
FILE#:
DATE:
PROJ. MGR.

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: METALAIRE
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 ± 45 DEGREES) (0.8 RAD) FOR MORE THAN 50 CONTIGUOUS FEET (15 240 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 FIGURED 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.

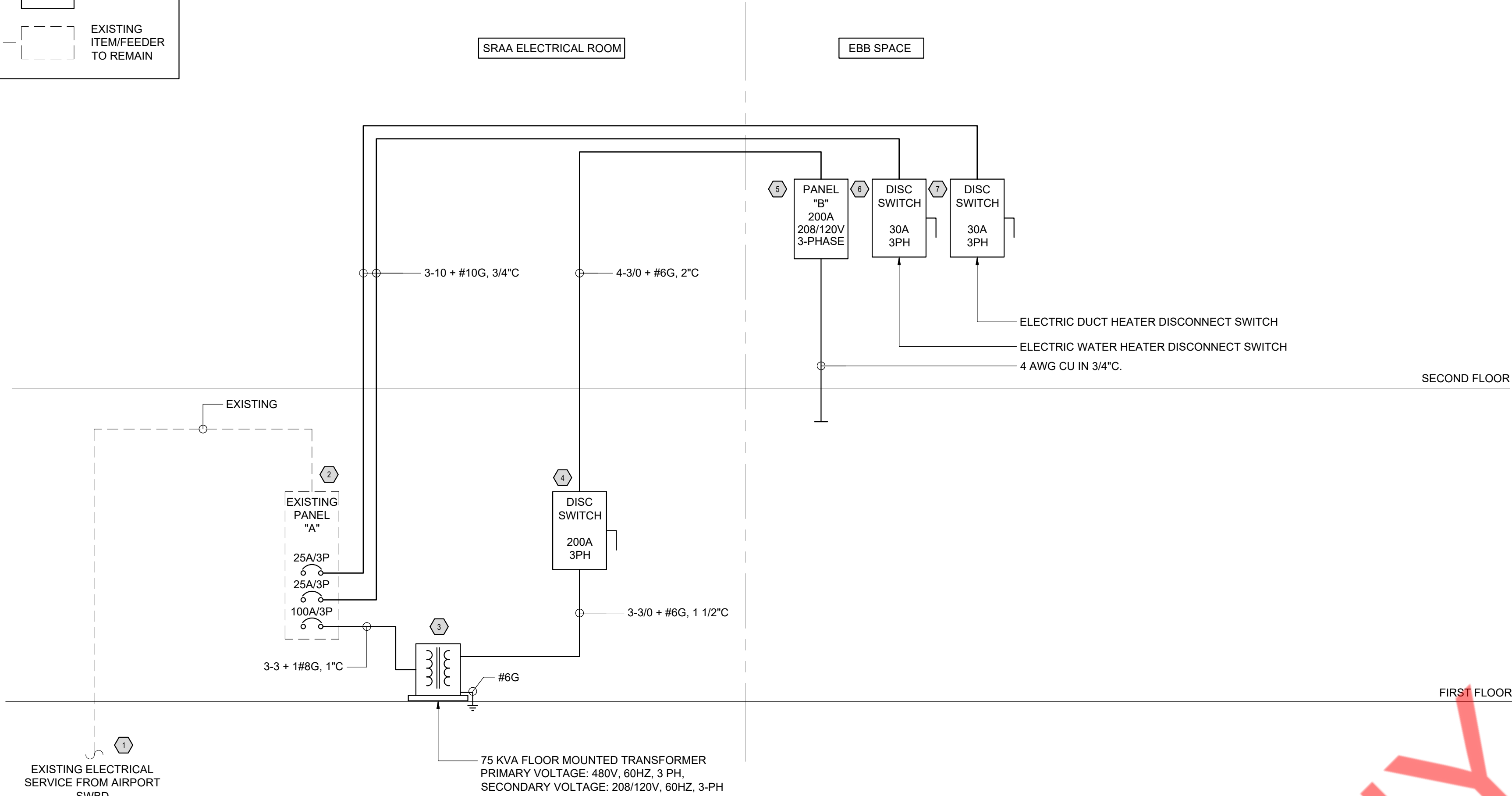
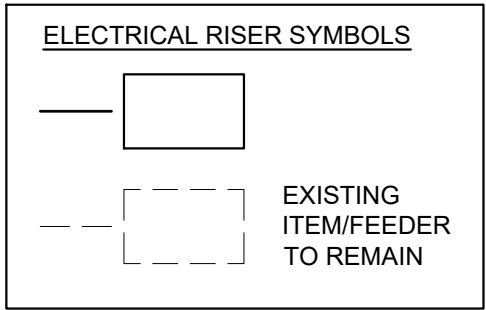
NY ENGINEERS

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:

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

ELECTRICAL RISER KEYED WORK NOTES:

- 1. 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.
- 2. 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 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.
- 3. 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.
- 4. 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.
- 5. 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.
- 6. 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.
- 7. 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:

- 1. 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.
- 2. 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.
- 3. CEILING LIGHTS ARE TO BE WIRED TO THE BAR JOIST MEMBERS AT THE DIAGONAL CORNERS.
- 4. COORDINATE LIGHTING WITH SPRINKLER & MECHANICAL DRAWINGS.
- 5. REFERENCE TO HEIGHT OF OUTLET OR RECEPTACLE SHALL BE MEASURED FROM FINISHED FLOOR TO CENTER OF OUTLET OR RECEPTACLE.
- 6. 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.
- 7. CONDUIT 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.
- 8. ELECTRICAL CONTRACTOR TO PROVIDE JUNCTION BOX AND CONDUIT STUB-UP ABOVE CEILING FOR ALL LOW VOLTAGE CABLING.
- 9. DIMENSION IS FROM FINISHED WALL, SEE ARCHITECTURAL FOR WALL THICKNESS.
- 10. FIELD COORDINATE EXACT LOCATION OF OUTLETS AS DETERMINED BY THE ACTUAL FURNITURE LAY OUT. VERIFY WITH FIXTURE PLAN.
- 11. COORDINATE WITH OTHER DISCIPLINES FOR ELECTRICAL REQUIREMENTS OF EQUIPMENT NOT SHOWN ON DETAILS (i.e. ROOF-TOP UNITS, UNIT HEATERS, FANS, ETC.).
- 12. EC 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. EC SHALL MAKE ADJUSTMENTS IN FIELD TO MATCH ACTUAL EQUIPMENT BEING INSTALLED, AS DIRECTED BY THE FOOD SERVICE CONTRACTOR.

- 13. CONTRACTOR IS REQUIRED TO INSTALL STANDARD RECEPTACLES FOR CIRCUITS DEDICATED TO SPECIFIC EQUIPMENT. SUBJECT TO THE APPROVAL OF CODE ENFORCING AGENCY.
- 14. ALL 125V, SINGLE PHASE 15 AMP AND 20 AMP RATED RECEPTACLES INSTALLED IN THE LOCATIONS SPECIFIED IN NEC.ART 210.8 (B)(1) - (8) SHALL HAVE GROUND FAULT CIRCUIT INTERRUPTER PROTECTION.
- 15. 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.
- 16. SERVICE CONDUCTORS ARE DESIGNED BASED ON THE SERVICE DISTANCE OF 100' TO MEET THE 2% VOLTAGE DROP PER NEC. IF SERVICE CONDUCTOR IS BETWEEN: 100' TO 150' - E.C. SHALL INCREASE THE CONDUCTOR BY ONE SIZE(S) LARGER THAN DESIGN 150' TO 200' - E.C. SHALL INCREASE THE CONDUCTOR BY TWO SIZE(S) LARGER THAN DESIGN 200' TO 250' - E.C. SHALL INCREASE THE CONDUCTOR BY THREE SIZE(S) LARGER THAN DESIGN
- 17. BRANCH CONDUCTORS ARE DESIGNED BASED ON A DISTANCE OF 100' TO MEET THE 3% VOLTAGE DROP PER NEC. IF BRANCH CONDUCTOR IS BETWEEN: 100' TO 150' - E.C. SHALL INCREASE THE CONDUCTOR BY ONE SIZE(S) LARGER THAN DESIGN 150' TO 200' - E.C. SHALL INCREASE THE CONDUCTOR BY TWO SIZE(S) LARGER THAN DESIGN 200' TO 250' - E.C. SHALL INCREASE THE CONDUCTOR BY THREE SIZE(S) LARGER THAN DESIGN
- 18. E.C. IS TO VERIFY WITH LOCAL AHJ FOR REQUIREMENT OF EXTERIOR EMERGENCY EGRESS LIGHTING AND ADJUST BID TO INCORPORATE AS NEEDED.
- 19. A.I.C OF PANELS AND SERVICE ENTRANCE EQUIPMENT IS BASED ON TYPICAL TRANSFORMER SPECIFICATIONS. CONTRACTOR SHALL FIELD VERIFY EXACT UTILITY A.I.C RATING AND MAKE EQUIPMENT ADJUSTMENTS AS REQUIRED IN THE FIELD AT NO EXTRA COST TO OWNER. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY FIELD CHANGES BASED ON UTILITY EQUIPMENT DATA.

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
	QUADRUPLX 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
	PANELBOARD
	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.
	WIRELESS ACCESS POINT, PROVIDE CAT6 CABLE

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
84"	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)
CEILING	REMOTE 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)

FIELD VERIFY ALL CONDITIONS:

NOTE! ALL WIRING LAYOUTS, PIPING LAYOUTS AND DUCT LAYOUTS ARE SCHEMATIC. EXACT LOCATIONS SHALL BE DETERMINED BY THE CONSTRUCTION AND STRUCTURE OF THE BUILDING AND SHALL BE VERIFIED AND COORDINATED IN THE FIELD. EACH TRADE CONTRACTOR SHALL VERIFY WITH THE GENERAL CONTRACTOR THAT A THOROUGHLY REVIEWED AND COORDINATION OF 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 PROVIDER TO THE SATISFACTION OF THE OWNER AND/OR 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 THE 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 ALL CODES, REGULATIONS, UTILITY REQUIREMENTS, LAWS AND ORDINANCES APPLICABLE TO THIS SITE AND SHALL INCLUDE IN THE BID THE COSTS FOR ALL WORK PROVIDED IN STRICT ACCORDANCE WITH THESE GOVERNING ITEMS, THE PLANS AND SPECIFICATIONS NOT WITHSTANDING, THE CONTRACTOR SHALL ALERT ARCHITECT, ENGINEER AND/OR OWNER OF ANY APPARENT DISCREPANCIES BETWEEN GOVERNING CODES AND DESIGN INTENT FOR DIRECTIONS.

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)

REVISIONS		
NO.	DESCRIPTION	DATE

JOB LOCATION:

LEGENDS, GENERAL NOTES & RISER DIAGRAM

SHEET	
E0.0	
EBB STORE#:	
FILE#:	
DATE:	
PROJ. MGR.	

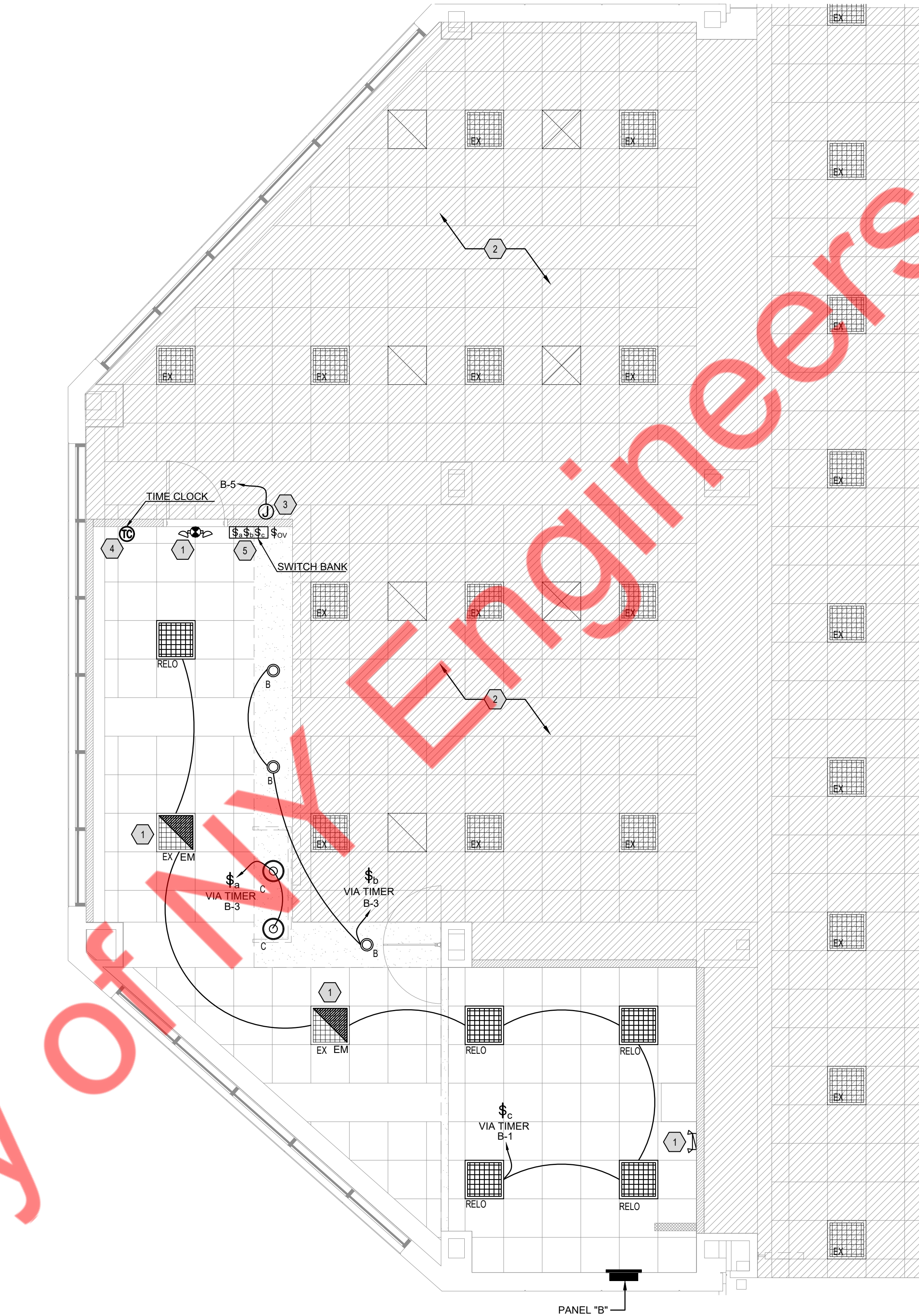
GENERAL NOTES

- 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 2'X2' LED TROFFER COOPER 22GR-LD5-32-A-UN V-L835-EL14-CD-1U1400 LUMENS	RECESSED
	RECESSED DOWNLIGHT, HOUSING / TRIM CREE RC&UNI / 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.		



1
E1.0
ELECTRICAL PLAN - LIGHTING
SCALE: 1/4" = 1'-0"

REVISIONS			
NO.	DESCRIPTION	BY	DATE

JOB LOCATION:	ELECTRICAL PLAN - LIGHTING
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SHEET
E1.0
EBB STORE#:
FILE#:
DATE:
PROJ. MGR.

GENERAL NOTES

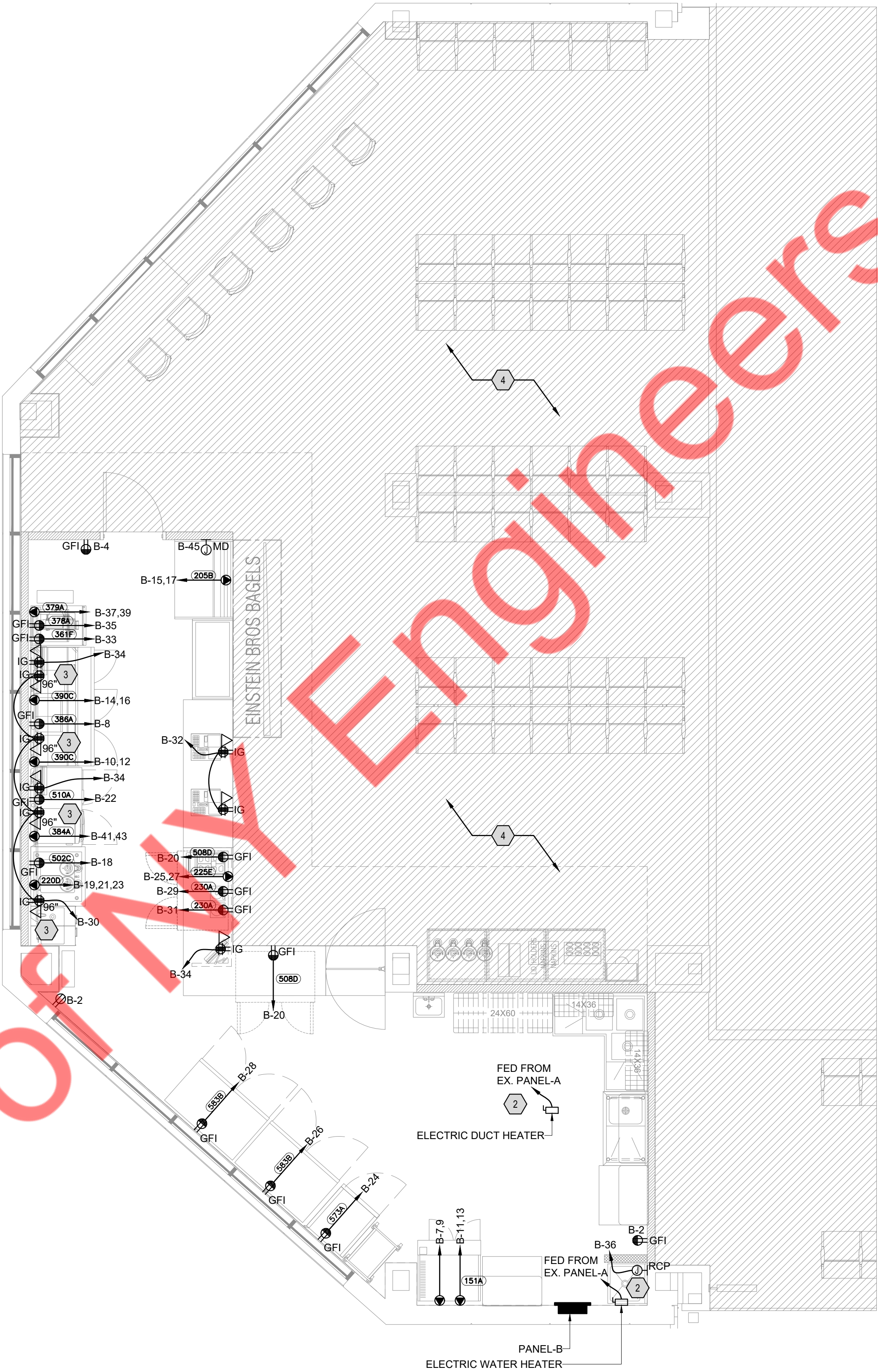
- A. FOR ELECTRICAL SPECIFICATION, REFER TO SHEET E3.0.
- B. ALL CONDUIT DROPS ARE INSIDE WALLS U.O.N. SEE ARCH. DWGS FOR WALL DIMENSIONS.
- C. FOR EXACT LOCATIONS OF KITCHEN EQUIPMENT, MECHANICAL EQUIPMENT AND POINTS OF CONNECTION, REFER TO KITCHEN & MECHANICAL DRAWINGS AND MANUFACTURER'S SHOP DRAWINGS.
- 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.

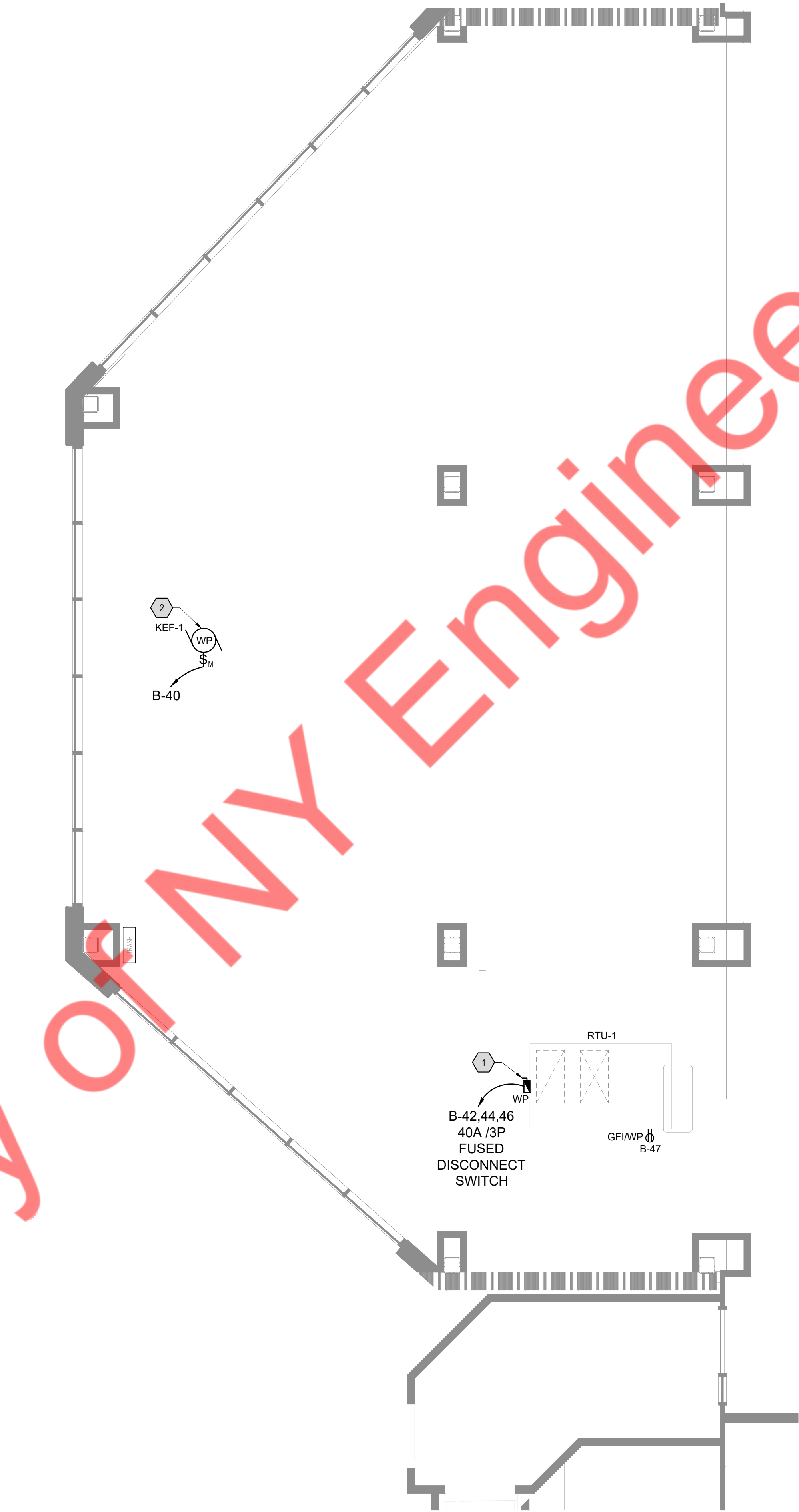
GENERAL NOTES - KITCHEN EQUIPMENTS

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.



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



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

REVISIONS			
NO.	DESCRIPTION	BY	DATE

JOB LOCATION:	ELECTRICAL PLAN - ROOF
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SHEET
E2.1
EBB STORE#:
FILE#:
DATE:
PROJ. MGR.

PANEL:		B	(NEW)	Sections:										MOUNTING:		RECESSED																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
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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	DESCRIPTION OF LOAD	TRIP AMPS	CKT. NO.	PANEL NOTES																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
							A	B	C									1	20	LIGHTING	L	0.50	2#12, #12G, 3/4"	0.86			2#12, #12G, 3/4"	0.36	R	GENERAL RECEPTACLES	20	2			3	20	LIGHTING	L	0.50	2#12, #12G, 3/4"		0.86		2#12, #12G, 3/4"	0.36	R	GENERAL RECEPTACLES	20	4			5	20	EXTERIOR SIGNAGE	L	1.20	2#12, #12G, 3/4"		1.38		2#12, #12G, 3/4"	0.18	R	ROOF RECEPTACLES	20	6			7	50/2P	151A_DOUBLE CONVECTION OVEN	K	4.99	2#8, #10G, 3/4"	6.19			2#12, #12G, 3/4"	1.20	K	386A_EGG HOLDER	20	8			9			K	4.99			6.72		2#12, #12G, 3/4"	1.73	K	390C_MICROWAVE OVEN	20/2P	10			11	50/2P	151A_DOUBLE CONVECTION OVEN	K	4.99	2#8, #10G, 3/4"		6.72		2#12, #12G, 3/4"	1.73	K			12			13			K	4.99					2#12, #12G, 3/4"	1.73	K	390C_MICROWAVE OVEN	20/2P	14			15	20/2P	205B_UPRIGHT MERCH CASE	K	1.35	2#12, #12G, 3/4"		3.08		2#12, #12G, 3/4"	1.73	K			16			17	20/2P		K	1.35			2.86		2#12, #12G, 3/4"	1.51	K	502C_I CE MAKER W/O BIN	20	18			19			K	4.14		4.86			2#12, #12G, 3/4"	0.72	K	508B_REFRIGERATOR, UNDERCOUNTER, COMPACT	20	20			21	40/3P	220D_COFFEE MAKER	K	4.14	3#8, #10G, 3/4"		4.52		2#12, #12G, 3/4"	0.38	K	510A_REFRIGERATED WORK TABLE	20	22			23			K	4.14				4.70	2#12, #12G, 3/4"	0.56	K	573A_REACH IN FREEZER	20	24			25	30/2P	225E_AUTOMATIC ESPRESSO	K	2.52	2#10, #10G, 3/4"	4.09			2#12, #12G, 3/4"	1.58	K	583B_REACH IN FREEZER-1	20	26			27			K	2.52			4.09		2#12, #12G, 3/4"	1.58	K	583B_REACH IN FREEZER-2	20	28			29	20	230A BLENDER	K	1.80	2#12, #12G, 3/4"		2.80		2#12, #12G, 3/4"	1.00	R	MENU BOARDS	20	30			31	20	230A BLENDER	K	1.80	2#12, #12G, 3/4"	2.49			2#12, #12G, 3/4"	0.69	R	POS STATION	20	32			33	20	361F_72" SANDWICH UNIT	K	1.14	2#12, #12G, 3/4"		1.89		2#12, #12G, 3/4"	0.75	R	KDS MONITOR	20	34			35	20	378A_BAGEL SLICER W/RETURN CHUTE	K	0.78	2#12, #12G, 3/4"		0.88		2#12, #12G, 3/4"	0.10	M	RCF	20	36			37	20/2P	379B_TOASTER, CONVEYOR	K	1.65	2#12, #12G, 3/4"	1.65			2#12, #12G, 3/4"	0.33	M	SPARE	20	38			39			K	1.65			1.98			3.25	H	KEF-1	20	40			41			K	3.12				6.37	3#8, #10G, 3/4"	3.25	H			42			43	40/2P	384A_OVEN, MICROWAVE/CONVECTION	K	3.12	2#8, #10G, 3/4"		6.37			3.25	H	RTU-1	35/3P	44			45	30	MOTORIZED DAMPER	R	0.18	2#12, #12G, 3/4"		3.43							46			47	20	ROOF RECEPTACLE	R	0.18	2#12, #12G, 3/4"			0.18				SPARE	20	48			49	20	SPARE				0.00						SPARE	20	50			51	20	SPARE					0.00					SPARE	20	52			53	20	SPARE						0.00				SPARE	20
	1	20	LIGHTING	L	0.50	2#12, #12G, 3/4"	0.86			2#12, #12G, 3/4"	0.36	R	GENERAL RECEPTACLES	20	2																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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	5	20	EXTERIOR SIGNAGE	L	1.20	2#12, #12G, 3/4"		1.38		2#12, #12G, 3/4"	0.18	R	ROOF RECEPTACLES	20	6																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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	27			K	2.52			4.09		2#12, #12G, 3/4"	1.58	K	583B_REACH IN FREEZER-2	20	28																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	29	20	230A BLENDER	K	1.80	2#12, #12G, 3/4"		2.80		2#12, #12G, 3/4"	1.00	R	MENU BOARDS	20	30																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	31	20	230A BLENDER	K	1.80	2#12, #12G, 3/4"	2.49			2#12, #12G, 3/4"	0.69	R	POS STATION	20	32																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	33	20	361F_72" SANDWICH UNIT	K	1.14	2#12, #12G, 3/4"		1.89		2#12, #12G, 3/4"	0.75	R	KDS MONITOR	20	34																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	35	20	378A_BAGEL SLICER W/RETURN CHUTE	K	0.78	2#12, #12G, 3/4"		0.88		2#12, #12G, 3/4"	0.10	M	RCF	20	36																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	37	20/2P	379B_TOASTER, CONVEYOR	K	1.65	2#12, #12G, 3/4"	1.65			2#12, #12G, 3/4"	0.33	M	SPARE	20	38																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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	41			K	3.12				6.37	3#8, #10G, 3/4"	3.25	H			42																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	43	40/2P	384A_OVEN, MICROWAVE/CONVECTION	K	3.12	2#8, #10G, 3/4"		6.37			3.25	H	RTU-1	35/3P	44																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	45	30	MOTORIZED DAMPER	R	0.18	2#12, #12G, 3/4"		3.43							46																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
	47	20	ROOF RECEPTACLE	R	0.18	2#12, #12G, 3/4"			0.18				SPARE	20	48																																																																																																																																																																																																																																																																																																																																																																																																																																																																										
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ITEM NO.	DESCRIPTION	VOLTAGE	PHASE	QUANTITY	AMPS AS PER CUSHEET
151A	DOUBLE CONVECTION OVEN	208	1	1	48
151A	DOUBLE CONVECTION OVEN	208	1	1	48
205E	UPRIGHT MERCH CASE 78" 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

GENERAL NOTES	
1. E.C. TO VERIFY ALL EXISTING EQUIPMENT TO REMAIN IS IN GOOD WORKING ORDER. VERIFY EXISTING GROUNDING COMPLIES WITH NEW TABLE 250-122. CHECK THAT ALL TERMINATIONS ARE TIGHTENED, CONTACT SURFACES ARE CLEAN, VERIFY SWITCHES, DOORS, AND COVERS ARE INSTALLED CORRECTLY. ALL EXISTING SYSTEMS ARE TO BE RESTORED TO GOOD WORKING ORDER BY THE E.C. REPAIR ALL GROUNDING CONNECTIONS WHICH APPEAR TO BE DAMAGED NOTIFY ARCHITECT OF ANY DISCREPANCIES WITH FIELD CONDITIONS TO THIS RISER DIAGRAM.	5. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFICATION OF ALL CONDITIONS AND REPORTING ANY CONFLICTS TO THE ENGINEER PRIOR TO THE START OF WORK.
2. ELECTRICAL EQUIPMENT AND MATERIAL TO BE U.L. LISTED, LABELED AND INSTALLED PER NEC. PROVIDE ARC FAULT LABEL PER UTILITY COMPANY'S ESTABLISHED LEVEL AT EACH POINT IN DISTRIBUTION SYSTEM. VERIFY ALL NEW AND EXISTING TO REMAIN BREAKERS ARE RATED ACCORDING TO AVAILABLE FAULT CURRENT LEVEL AT THEIR RESPECTIVE POINTS. COORDINATE NEW LOAD ON SERVICE WITH POWER COMPANY.	6. ALL MAIN SERVICE ENTRANCE EQUIPMENT SHALL BE U.L. LABELED AND LISTED TO MEET AVAILABLE FAULT CURRENT FROM LOCAL UTILITY COMPANY.
3. COORDINATE MECHANICAL HVAC PACKAGE WITH MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. VERIFY LOADS SCHEDULED IS CONSISTANT WITH EQUIPMENT NAMEPLATE DATA AT TIME OF CONSTRUCTION.	7. CONDUCTORS ARE BASED ON 75° COPPER TYPE THWN UNLESS OTHERWISE SPECIFIED.
4. CONTRACTOR SHALL COORDINATE PLANS AND SPECIFICATIONS WITH LOCAL AUTHORITY HAVING JURISDICTION FOR LOCAL CODE COMPLIANCE WHERE ANY MODIFICATION TO PLANS OR SPECIFICATIONS IS REQUIRED. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND INCLUDE ALL PRICE ESCALATIONS IN BID.	8. EQUIPMENT SHALL BE IN ACCORDANCE WITH N.E.C. ARTICLE 250.
	9. ELECTRICAL CONTRACTOR SHALL SELECT FUSE (A.I.C.) TO MATCH OR EXCEED UTILITY CO. AVAILABLE FAULT CURRENT AND INSTALL IN DISCONNECT.

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860L	POS RH WALL	120	1	1	3

REVISIONS		
NO.	DESCRIPTION	DATE

JOB LOCATION:

ELECTRICAL SCHEDULES

E3.0

PROJ. MGR

DIVISION 26 - ELECTRICAL SPECIFICATIONS

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.	1.1.0.5.	CLEANED AND WIPED TO REMOVE GREASE, SMUDGES, FINGERPRINTS, DUST AND OTHER SPOTS AND LEFT SMOOTH AND CLEAN.	5.1.	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.	6.8.6.	"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,
1.1.1.	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.	1.1.0.6.	CLEAN THE EXTERIOR OF ELECTRICAL COMPONENTS PRIOR TO ACCEPTANCE OF WORK.	5.2.	ATTENTION IS CALLED TO THE FACT THAT THE WORK IS TO BE PERFORMED WITHIN AN EXISTING, OPERATIONAL FACILITY.	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.	6.8.7.	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.	THE CONTRACTOR SHALL RE-EXCAVATE AND RE-COMPACT THE BACKFILL AT HIS EXPENSE UNTIL THE DESIRED COMPACTION IS OBTAINED.
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.	1.1.1.	FOR ALL MATERIALS AND DEVICES REMOVED, THE CONTRACTOR SHALL DISPOSE OFF-SITE IN AN APPROVED MANNER. PROVIDE WRITTEN DOCUMENTATION FOR DISPOSAL OF ALL ITEMS.	5.2.1.	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.	DO NOT INSTALL OR ORDER ELECTRICAL EQUIPMENT OR PROCEED WITH THE WORK UNTIL SUBMITTALS HAVE BEEN ACCEPTABLY REVIEWED BY THE OWNERS REPRESENTATIVE AND STAMPED ACCORDINGLY. EQUIPMENT OR WORK WHICH IS ORDERED OR INSTALLED WITHOUT PRIOR APPROVED SUBMITTALS SHALL, AT THE ENGINEERS 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.	6.8.8.	ANY "OR EQUAL" PRODUCT OR PROPOSED PRODUCTION SUBSTITUTION WHICH WILL CAUSE A CHANGE IN THE APPEARANCE, DIMENSIONS OR DESIGN OF ANY PART OF THE BUILDING, IF STRUCTURE, ELECTRICAL SYSTEM OR ANY OTHER ENGINEERED SYSTEM SHALL BE ACCOMPANIED BY A SCALED DRAWING AND WRITTEN DESCRIPTION OF THE REQUIRED CHANGE(S) FOR APPROVAL BY THE ARCHITECT.	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.
1.3.	DEFINITION OF TERMS	1.1.1.1.	PROVIDE ALL LABOR, INSTRUMENTS, AND OTHER SERVICES REQUIRED FOR COMPLETE AND SATISFACTORY TEST AND ADJUSTMENT OF ELECTRICAL SYSTEMS AND RELATED WORK.	5.2.2.	TAKE MEASUREMENTS AND BE RESPONSIBLE FOR EXACT SIZE AND LOCATIONS OF ALL OPENINGS REQUIRED FOR THE INSTALLATION OF WORK.	MAKE ALL ELECTRICAL SUBMITTALS AT ONE TIME AND WITHIN FOURTEEN (14) CALENDAR DAYS OF OWNERS' NOTICE TO PROCEED".	6.8.9.	IF DEEMED NECESSARY BY ARCHITECT, DESIGN CHANGES SHALL BE SIGNED AND SEAL BY A REGISTERED PROFESSIONAL ENGINEER, CURRENTLY LICENSED IN THIS STATE.	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 WITH MINIMUM DISTURBANCE TO THE REMAINING ADJACENT SURFACING.
1.3.1.	FURNISH - SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS. INSTALL - OPERATIONS AT THE PROJECT SITE INCLUDING THE ACTUAL UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS.	1.1.1.2.	CHECK ALL MOTORS AND ROTATING EQUIPMENT FOR PROPER ROTATION.	5.2.3.	FIELD DIMENSIONS ARE REASONABLY ACCURATE AND SHOULD GOVERN IN SETTING OUT WORK.	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.			7.7.4.2.	THE WIDTH OF THE PAVEMENT REMOVED SHALL BE THE MINIMAL NECESSARY TO ALLOW FOR INSTALLATION OF THE NEW UTILITIES.
1.3.2.	UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS.	1.1.1.3.	TEST ALL FEEDERS WITH MEGGER PRIOR TO ENERGIZING TO ASSURE CODE RESISTANCE IS MET, (AND WITHOUT "SHORTS" OR "OPEN CIRCUITS").	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.	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.
1.3.3.	PROVIDE - FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE.	1.1.1.4.	CHECK ALL FUSES AND OVERLOADS FOR PROPER SIZING. VERIFY FUSE LABELS ARE VISIBLE.	5.3.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	SUBMITTAL DATA WILL NOT BE ACCEPTED FOR REVIEW UNLESS THEY 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.
1.3.4.	U.N.O. - UNLESS NOTED OTHERWISE.	1.1.1.5.	IMMEDIATELY REMEDIATE ALL EQUIPMENT PROVIDED UNDER THIS DIVISION THAT TESTS PROVE TO BE DEFECTIVE OR OPERATING IMPROPERLY AS A PART OF THIS CONTRACT.	5.3.1.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	INCLUDE COMPLETE INFORMATION PERTAINING TO ALL APPURTENANCE AND ACCESSORIES.	7.	INSTALLATION		
1.3.5.	M.S.D.S. - MATERIAL SAFETY DATA SHEET	1.1.2.	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 OWNERS REPRESENTATIVE WITHOUT ADDITIONAL COMPENSATION AND TO THE SATISFACTION OF THE ENGINEER AND OWNERS REPRESENTATIVE.	5.3.2.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	ARE SUBMITTED AS COMPLETE PACKAGES WHICH PERTAIN TO ALL RELATED ITEMS IN DIVISION 26.	7.1.	PROVIDE ALL EQUIPMENT FOR THIS CONTRACT NEATLY AND WITH WORKMANSHIP AS DEFINED BY N.E.C.A. STANDARD PRACTICES FOR GOOD WORKMANSHIP IN ELECTRICAL CONSTRUCTION: LEVEL AND PLUMB, AND SECURELY SUPPORTED.	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.
1.3.6.	CONTRACTOR - APPEARANCE ON DRAWINGS OR IN SPECIFICATIONS FOR ELECTRICAL WORK SHALL REFER TO ELECTRICAL SUB-CONTRACTOR.	1.1.3.	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.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	ARE PROPERLY MARKED WITH EQUIPMENT, SERVICE OR FUNCTION IDENTIFICATION AS RELATED TO THE PROJECT AND ARE MARKED WITH PERTINENT SPECIFICATION PARAGRAPH NUMBER.	7.1.1.	THE ENTIRE INSTALLATION, AND MANNER OF INSTALLATION SHALL MEET THE COMPLETE SATISFACTION OF THE OWNERS REPRESENTATIVE OR IT SHALL BE REMOVED AND REWORKED AS DIRECTED BY THE OWNERS REPRESENTATIVE AS INCLUDED IN THE CONTRACT AMOUNT.	7.10.	PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR INSTALLATION OF ELECTRICAL WORK.
1.3.7.	RELOCATE - 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.	2.	CODES & PERMITS	5.4.1.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	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.	7.2.	CONTRACTOR SHALL CONSULT PLUMBING, HVAC, AND STRUCTURAL PLANS (WHERE APPLICABLE) IN ALL INSTANCES BEFORE INSTALLING WORK SO THAT WORK WILL NOT INTERFERE WITH THOSE BRANCHES.	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.
1.3.8.	EQUAL AND EQUIVALENT - TO MEAN OF THE SAME QUALITY, SIZE, NUMBER, VALUE, DEGREE, INTENSITY AND THE ITEMS ARE SIMILAR IN ALL RESPECTS.	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.	5.4.2.	CONTRACTOR SHALL VERIFY PROJECT CONDITIONS TO ENSURE THAT THE WORK WILL FIT INTO THE STRUCTURE IN THE MANNER INTENDED ON THE DRAWINGS.	IN CASE OF DISCREPANCIES BETWEEN SETS OF SUBMITTALS, THE SET RETAINED BY THE OWNERS REPRESENTATIVE SHALL HAVE PRECEDENCE.	7.2.1.	IN THE EVENT OF A CONFLICT, CONTRACTOR SHALL REPORT TO THE OWNERS REPRESENTATIVE AT ONCE AND DO NO FURTHER WORK UNTIL A SATISFACTORY ARRANGEMENT IS DECIDED UPON.	7.10.2.	NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED FOR CUTTING AND PATCHING WORK THAT IS NECESSITATED BY ILL-TIMED, DEFECTIVE OR NON-CONFORMING INSTALLATIONS. ANY DAMAGE DONE BY THIS CONTRACTOR TO THE BUILDING DURING THE PROGRESS OF WORK SHALL BE MADE GOOD AT CONTRACTORS OWN EXPENSE.
1.3.8.1.	THE FINAL DECISION OF ACCEPTANCE OF THESE ITEMS WILL BE MADE BY THE ENGINEER.	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.	5.5.	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.	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.	7.2.2.	ANY WORK DONE, OR EQUIPMENT PLACED IN POSITION, BY CONTRACTOR THAT CREATES A CONFLICT IN VIOLATION HEREOF, SHALL BE READJUSTED TO THE SATISFACTION OF THE OWNERS REPRESENTATIVE AT THE EXPENSE OF THE CONTRACTOR. THE DECISION OF THE OWNERS REPRESENTATIVE SHALL BE FINAL IN REGARD TO CHANGES DUE TO CONFLICTING CONDITIONS.	7.11.	EQUIPMENT IDENTIFICATION FOR ELECTRICAL SYSTEMS
1.3.8.2.	IT SHALL BE UNDERSTOOD THAT FOR ANY SPECIFIED ITEM ON THE DRAWINGS AND/OR IN THE SPECIFICATION, THIS TERM SHALL APPLY.	2.3.	A CERTIFICATE OF APPROVAL FOR WORK FROM INSPECTION AUTHORITY SHALL BE GIVEN TO THE OWNER BEFORE FINAL ACCEPTANCE WILL BE GIVEN BY OWNERS REPRESENTATIVE.	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.	SUPPLY SUBMITTALS FOR EACH SECTION: SUBMITTALS SHALL BE SUPPLIED ON A SECTION-BY-SECTION AND TYPE-BY-TYPE BASIS. FOR EXAMPLE, INDEPENDENT PRODUCT DATA SUBMITTALS SHALL BE FURNISHED FOR EACH 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.	7.2.3.	CONTRACTOR SHALL COMPLETE WORK OR ANY PART THEREOF AT SUCH TIME AS MAY BE DESIGNATED BY THE OWNER, SO THAT IT CAN BE USED FOR TEMPORARY OR PERMANENT USE AND SUCH USE OF THE SYSTEM SHALL NOT BE CONSTRUED AS AN ACCEPTANCE OF SAME BY OWNER.	7.11.1.	PROVIDE MANUFACTURER'S STANDARD SELF-ADHESIVE VINYL TAPE NOT LESS THAN 3 MILS THICK BY 1-1/2" WIDE, WHERE APPLICABLE. INSTALL ON ALL CONCEALED RACEWAYS AT CONNECTION TO ALL JUNCTION BOXES, PULL BOXES, EQUIPMENT, WALL/FLOOR/DOOR PENETRATIONS, ETC. UNLESS OTHERWISE INDICATED OR REQUIRED BY GOVERNING REGULATIONS.
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.	2.4.	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.	5.6.1.	INFORMATION WAS TAKEN FROM VARIOUS ARCHIVE DRAWINGS AND LIMITED FIELD OBSERVATION. FIELD VERIFICATION OF EXISTING CONDITIONS AND POINTS OF CONNECTIONS ARE REQUIRED.	INCLUDE A TRANSMITTAL: TRANSMITTALS SHALL ENUMERATE EACH SUBMITTAL FOR EACH SECTION OF EACH TYPE AND ITERATION.	7.2.4.	VERIFY VOLTAGE AND ALL ELECTRICAL REQUIREMENTS OF MECHANICAL EQUIPMENT AND SYSTEMS WITH DIV. 23 CONTRACTOR PRIOR TO ORDERING.	7.11.1.1.	PROVIDE ORANGE TAPE WITH BLACK LETTERS.
1.5.	ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND SUITABLE FOR THE CONDITIONS AND DUTIES IMPOSED ON THEM AFTER INSTALLATION.	2.5.	A CERTIFICATE OF APPROVAL FOR WORK FROM INSPECTION AUTHORITY SHALL BE GIVEN TO THE OWNER BEFORE FINAL ACCEPTANCE WILL BE GIVEN BY OWNERS REPRESENTATIVE.	5.6.2.	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.	INCLUDE COVER SHEET/ TITLE PAGE: THE COVER SHEET SHALL INCLUDE THE INFORMATION IDENTIFIED IN THE CONTRACT DOCUMENTS. IT SHALL BE INCLUDED AS THE FIRST PAGE OF EACH ELECTRONIC AND/OR HARD COPY DOCUMENT-BASED SUBMITTAL.	7.2.5.	COORDINATION OF SPACE REQUIREMENTS WITH RESPECT TO DIVISION 23 SHALL BE PERFORMED SUCH THAT:	7.11.1.2.	PROVIDE CIRCUIT IDENTIFICATION BANDS FOR ALL CABLES AND CONDUCTORS. PROVIDE MANUFACTURERS STANDARD COLOR CODING FOR CABLE/CONDUCTOR JACKET AND/OR INSULATION FOR ALL CABLES AND CONDUCTORS OF ALL 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 REGULARLY SUPPLIED.	2.6.	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.	IF DURING THE CONSTRUCTION DEFICIENCIES ARE NOTED, THEN BRING THESE TO THE ATTENTION OF THE OWNER AND SEEK DIRECTION.	INCLUDE AN INDEX: THE INDEX SHALL ENUMERATE THE CONTENTS OF THE SUBMITTAL.	7.2.5.1.	NO EQUIPMENT, PIPING OR DUCTWORK, OTHER THAN ELECTRICAL, SHALL BE INSTALLED WITHIN 42" OF SWITCHBOARDS OR PANELBOARDS.	7.11.1.3.	MATCH IDENTIFICATION WITH MARKING SYSTEM USED IN EXISTING SYSTEMS (WHERE APPLICABLE). SHOP DRAWINGS, CONTRACT DOCUMENTS, AND SIMILAR PREVIOUSLY ESTABLISHED IDENTIFICATION FOR ELECTRICAL WORK. PROVIDE ON ALL CONDUCTORS OF ALL 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.	3.	SAFETY	6.	SHOP DRAWINGS, SUBMITTALS, AND SUBSTITUTIONS	INCLUDE CHECKLISTS: WHERE CHECKLISTS ARE INCLUDED WITH THE SPECIFICATIONS, COMPLETE AND INCLUDE THEM WITHIN THE APPROPRIATE SUBMITTAL.	7.2.5.2.	NO PIPING OR DUCTWORK WHICH EVER OPERATES AT A TEMPERATURE IN EXCESS OF 120 DEGREES F.	7.11.2.	PROVIDE ENGRAVED PLASTIC/LAMINATE SIGN ON MAJOR UNITS OF ELECTRICAL EQUIPMENT, INCLUDING PANELBOARDS, DISCONNECTS, STARTERS, CONTROL PANELS, ETC. EXCEPT AS OTHERWISE INDICATED.
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 ENGINEERS APPROVAL.	3.1.	THE CONTRACTOR SHALL MAINTAIN A SAFE WORK ENVIRONMENT AT ALL TIMES.	6.1.	ENGINEER OF RECORD SHALL BE PROVIDED WITH SHOP DRAWINGS, COORDINATION DRAWINGS, AND MANUFACTURER'S DATA OF ANY CONTRACTOR FURNISHED MATERIALS AND EQUIPMENT, PRIOR TO PURCHASE AND/OR FABRICATION, AND SHALL VERIFY, BY STAMPING AND SIGNING THE DATA AND DRAWINGS BEFORE RETURNING THEM TO THE CONTRACTOR, THAT THE ITEMS FURNISHED BY THE CONTRACTOR FIT THE SPACES AND DIMENSIONS DESCRIBED IN AND CONFORM TO THE SPIRIT AND INTENT OF THE CONTRACT DOCUMENTS.	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-COMPLIANT 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 REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.3.	TWO SETS OF ELECTRICAL DRAWINGS SHALL BE PROVIDED AS RECORD DRAWINGS WHICH SHALL BE SEPARATE, CLEAN, COPIES RESERVED FOR THE PURPOSE OF SHOWING A COMPLETE PICTURE OF THE WORK AS ACTUALLY INSTALLED.	7.11.2.1.	PROVIDE SINGLE LINE OF TEXT, 1/2" HIGH LETTERING, ON 1-1/2" HIGH SIGN (2" HIGH WHERE 2 LINES ARE REQUIRED).
1.5.3.1.	THIS APPROVAL TO BE OBTAINED PRIOR TO SHIPMENT OF EQUIPMENT.	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.	6.2.	ENGINEER SHALL, WITHIN FIVE (5) WORKING DAYS OF RECEIPT OF SHOP DRAWINGS AND PRODUCT DATA, NOTIFY THE CONTRACTOR OF ANY DISCREPANCY OR INCOMPLIANCE WITH THE CONTRACT DOCUMENTS, AND SHALL RETURN THE SHOP DRAWINGS TO THE CONTRACTOR APPROPRIATELY ANNOTATED.	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-COMPLIANT 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 REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.3.1.	DRAWINGS SHALL ALSO SERVE AS WORK PROGRESS REPORT SHEETS AND THE ELECTRICAL CONTRACTOR SHALL MAKE ANY NOTATIONS, NEAT AND LEGIBLE THEREON DAILY AS WORK PROCEEDS.	7.11.2.2.	MAKE NAMEPLATES FROM WHITE ENGRAVING STOCK WITH BLACK LETTERS AND BLACK FOUR EDGE BEVEL.
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.	3.1.2.	MAINTAIN AND DISPLAY M.S.D.S. INFORMATION FOR ALL CHEMICAL PRODUCTS.	6.3.	REVIEW OF SUBMITTALS SHALL NOT BE CONSTRUED AS AUTHORIZING ANY DEVIATIONS FROM THE PLANS AND SPECIFICATIONS UNLESS SUCH DEVIATIONS ARE CLEARLY IDENTIFIED AND SEPARATELY SUBMITTED IN THE FORM OF A LETTER THAT IS ENCLOSED WITH THE SUBMITTALS.	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.	7.3.2.	DRAWINGS SHALL BE AVAILABLE FOR INSPECTION AT ALL TIMES AND SHALL BE KEPT AT THE JOB AT A LOCATION DESIGNATED BY THE OWNERS REPRESENTATIVE.	7.11.2.3.	WORDING SHALL SUITABLY DESCRIBE ITEMS SUCH AS PANEL ID, SOURCE OVER CURRENT PROTECTION DEVICE, AND VOLTAGE.
1.6.1.	CONTRACTOR SHALL VERIFY TRANSFORMER LOCATION AND METERING SCHEME WITH LOCAL UTILITY CO.	3.1.3.	PROVIDE ALL NECESSARY MEANS TO MAINTAIN SAFE WORKING CONDITIONS, INCLUDING VENTILATION FANS, FIRE EXTINGUISHERS, EYE PROTECTION, RESPIRATORS, PROTECTIVE CLOTHING, VENTILATION, ETC.	6.4.	SUBMIT SHOP DRAWING CUT SHEETS AND TECHNICAL DATA ON THE FOLLOWING ITEMS: LIGHTING EQUIPMENT, PANELS, WIRING DEVICES-SWITCHES AND RECEPTACLES, DISCONNECT SWITCHES, SAFETY SWITCHES, MOTOR STARTERS, TRANSFORMERS, AND ANY OTHER ITEM REQUIRED BY NOTES.	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.	7.3.3.	AT THE COMPLETION OF THE WORK, THESE RECORD DRAWINGS SHALL BE SIGNED BY THE ELECTRICAL CONTRACTOR, DATED AND RETURNED TO THE OWNERS REPRESENTATIVE. FINAL PAYMENT OF CONTRACT WILL NOT BE MADE UNTIL RECEIPT AND REVIEW OF SAID DRAWINGS.	7.11.2.4.	NAMEPLATES SHALL BE ATTACHED USING PROPER SIZE AND TYPE STAINLESS STEEL BOLTS, LOCK WASHERS AND NUTS. GLUE ON.
1.7.	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.	3.1.4.	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.	6.5.	SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS, FIELD INSTALLATION DRAWINGS AND CERTIFICATIONS AS REQUIRED FOR COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OF EQUIPMENT. THE SUBMITTAL DATA SHALL PROVIDE AMPLE, UNQUESTIONABLE COMPLIANCE WITH THE CONTRACT DOCUMENTS.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.4.	PROVIDE ALL ROOF, WALL, AND FLOOR PENETRATIONS REQUIRED TO COMPLETE INSTALLATION AND REMOVAL OF WORK (MAINTAIN FIRE RATINGS OF EXISTING STRUCTURE).	7.11.2.5.	TAPE ON, OR TAPE TYPE NAMEPLATES ARE NOT ACCEPTABLE FOR THE EQUIPMENT.
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.	3.1.5.	MAINTAIN A PROPER FIRE WATCH FOR ALL OPERATIONS WHERE SPARKS, FLAMES, OR OTHER SOURCES OF FIRE ARE PRODUCED.	6.6.	ENGINEER SHALL, WITHIN FIVE (5) WORKING DAYS OF RECEIPT OF SHOP DRAWINGS AND PRODUCT DATA, NOTIFY THE CONTRACTOR OF ANY DISCREPANCY OR INCOMPLIANCE WITH THE CONTRACT DOCUMENTS, AND SHALL RETURN THE SHOP DRAWINGS TO THE CONTRACTOR APPROPRIATELY ANNOTATED.	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.	7.4.1.	ALL PENETRATIONS SHALL BE PATCHED AND FINISHED TO MATCH SURROUNDING SURFACES AND FINISHES.	7.11.2.6.	PROVIDE CIRCUIT NUMBERS (PANEL #) ON EACH RECEPTACLE USING TAPE TYPE IDENTIFICATION AT EACH RECEPTACLE OR OTHERS WHERE IDENTIFIED.
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 REPAIRED AND FINISHED BY EXPERIENCED WORKMEN.	3.1.6.	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.	SUBMIT SHOP DRAWING CUT SHEETS AND TECHNICAL DATA ON THE FOLLOWING ITEMS: LIGHTING EQUIPMENT, PANELS, WIRING DEVICES-SWITCHES AND RECEPTACLES, DISCONNECT SWITCHES, SAFETY SWITCHES, MOTOR STARTERS, TRANSFORMERS, AND ANY OTHER ITEM REQUIRED BY NOTES.	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.	7.4.2.	ALL EQUIPMENT OR PIPE PENETRATIONS THROUGH WALL, ROOF AND FLOORS SHALL BE SLEEVED AND SEALED SO AS TO BE WATER AND AIR TIGHT.	7.11.2.7.	PROVIDE TEXT MATCHING TERMINOLOGY AND NUMBERING OF THE CONTRACT DOCUMENTS AND SHOP DRAWINGS.
1.7.3.	COORDINATE AND SCHEDULE THE WORK WITH THE OWNER TO MINIMIZE DISRUPTIONS TO THE NORMAL OPERATIONS AT THE BUILDING.	4.	INTENT OF DRAWINGS AND SPECIFICATIONS	6.8.	SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS, FIELD INSTALLATION DRAWINGS AND CERTIFICATIONS AS REQUIRED FOR COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OF EQUIPMENT. THE SUBMITTAL DATA SHALL PROVIDE AMPLE, UNQUESTIONABLE COMPLIANCE WITH THE CONTRACT DOCUMENTS.	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.	7.4.3.	ALL ROOF CUTS AND REPAIRS SHALL BE PERFORMED BY OWNER APPROVED ROOFING CONTRACTOR IN ORDER TO MAINTAIN ROOF WARRANTY.	7.11.2.8.	SECURE TO SUBSTRATE WITH FASTENERS, EXCEPT USE ADHESIVE WHERE FASTENERS SHOULD NOT OR CANNOT PENETRATE SUBSTRATE.
1.7.3.1.	AFTER HOURS WORK IS REQUIRED ON THIS PROJECT.	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.	6.9.	SUBMIT PROPOSED CONTROL SYSTEM FOR REVIEW BY THE ENGINEER PRIOR TO EQUIPMENT PURCHASE OR FABRICATION. DO NOT PROCEED WITH THE WORK WITHOUT APPROVED SUBMITTALS.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.5.	CUTTING OF HOLES THROUGH CONCRETE AND MASONRY SHALL BE BY DIAMOND CORE CONCRETE SAW.	7.11.3.	ALL EQUIPMENT AND SYSTEM IDENTIFICATION NOMENCLATURE SHOWN ON DRAWINGS OR LISTED HEREIN IS SHOWN FOR GENERAL DESIGN AND INSTALLATION REFERENCE ONLY. THE ACTUAL NAMEPLATE, ETC. NOMENCLATURE FOR THIS PROJECT SHALL BE VERIFIED BY ELECTRICAL CONTRACTOR IN FIELD PRIOR TO FABRICATION AND WHERE APPLICABLE, SHALL BE AN EXTENSION OF EXISTING NOMENCLATURE USED ON THE SITE AS DETERMINED IN FIELD BY ELECTRICAL CONTRACTOR.
1.7.3.2.	INCLUDE IN THE CONTRACT PRICE THE COST OF AFTER-HOURS WORK AND TEMPORARY PROVISIONS TO MINIMIZE DOWN TIME AND TO MAINTAIN FACILITY IN OPERATING CONDITION. COORDINATE WITH THE OWNER TO DETERMINE THE EXTENT OF THESE REQUIREMENTS PRIOR TO BID.	4.2.	ENGINEERING DRAWINGS ARE DIAGRAMMATIC, INTENDED TO SHOW GENERAL ARRANGEMENT AND SIZES OF SYSTEM COMPONENTS, AND SHALL NOT BE SCALED.	6.10.	WHERE QUALIFICATIONS AND/OR QUALITY ASSURANCE REQUIREMENTS ARE SPECIFIED, THE SUBMITTAL SHALL INCLUDE EVIDENCE THAT THE STATED REQUIREMENTS HAVE BEEN MET. INCLUDE QUALIFICATIONS AND CERTIFICATIONS OF PROPOSED TEST AND VERIFIED SUBCONTRACTOR.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.5.1.	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.	7.11.4.	EQUIPMENT TO BE LABELED:
1.8.	RELATED WORK SPECIFIED ELSEWHERE:	4.2.1.	ARCHITECTURAL AND STRUCTURAL DRAWINGS SHALL GOVERN SPACE CONSTRAINTS, DIMENSIONS AND FINISHES.	6.11.	ENGINEER SHALL, WITHIN FIVE (5) WORKING DAYS OF RECEIPT OF SHOP DRAWINGS AND PRODUCT DATA, NOTIFY THE CONTRACTOR OF ANY DISCREPANCY OR INCOMPLIANCE WITH THE CONTRACT DOCUMENTS, AND SHALL RETURN THE SHOP DRAWINGS TO THE CONTRACTOR APPROPRIATELY ANNOTATED.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.5.2.	LOCATE HOLES SUCH THAT THEY WILL NOT AFFECT STRUCTURAL SECTIONS SUCH AS RIBS OR BEAMS. HOLES SHALL BE LAID OUT WELL IN ADVANCE OF THE INSTALLATION. THESE LAYOUT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO DRILLING.	7.11.4.1.	ALL ENCLOSURES FOR ALL ELECTRICAL EQUIPMENT FURNISHED OR INSTALLED UNDER DIVISIONS 26 AND 28
1.8.1.	ALL DIVISION 1 REQUIREMENT, AND ALL TERMS AND CONDITIONS OF CONTRACT.	4.2.2.	ALL OFFSETS AND FITTINGS THAT SHALL BE NECESSARY TO ACCOMPLISH A FINISHED INSTALLATION SHALL BE PROVIDED AT NO ADDITIONAL COST OR INCREASE THE CONTRACT.	6.12.	REVIEW OF SUBMITTALS SHALL NOT BE CONSTRUED AS AUTHORIZING ANY DEVIATIONS FROM THE PLANS AND SPECIFICATIONS UNLESS SUCH DEVIATIONS ARE CLEARLY IDENTIFIED AND SEPARATELY SUBMITTED IN THE FORM OF A LETTER THAT IS ENCLOSED WITH THE SUBMITTALS.	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.	7.6.	PROVIDE ALL EXCAVATION AND TRENCHING TO THE CORRECT ELEVATIONS, FOR THE INSTALLATION OF ALL PIPING, MANHOLES, CATCH BASINS AND FOUNDATIONS INCLUDED UNDER THIS DIVISION OF THE WORK.	7.11.4.2.	REMOTE-CONTROLLED SWITCHES
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.	4.2.3.	WORK INTENDED, BUT HAVING MINOR DETAILS OBVIOUSLY OMITTED, SHALL BE PROVIDED COMPLETE AS A REQUIREMENT OF THIS CONTRACT.	6.13.	SUBMIT SHOP DRAWING CUT SHEETS AND TECHNICAL DATA ON THE FOLLOWING ITEMS: LIGHTING EQUIPMENT, PANELS, WIRING DEVICES-SWITCHES AND RECEPTACLES, DISCONNECT SWITCHES, SAFETY SWITCHES, MOTOR STARTERS, TRANSFORMERS, AND ANY OTHER ITEM REQUIRED BY NOTES.	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.	7.7.	PROVIDE ALL BACKFILL IN STRICT ACCORDANCE WITH THE EXCAVATION AND BACKFILL SECTION OF DIVISION 1 SPECIFICATIONS.	7.11.4.3.	DIMMER MODULES
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.	4.2.4.	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.	6.14.	SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS, FIELD INSTALLATION DRAWINGS AND CERTIFICATIONS AS REQUIRED FOR COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS OF EQUIPMENT. THE SUBMITTAL DATA SHALL PROVIDE AMPLE, UNQUESTIONABLE COMPLIANCE WITH THE CONTRACT DOCUMENTS.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.7.1.	EXCAVATE PIPE TRENCH. HAND DIG IN ALL AREAS WHERE EXISTING UTILITIES EXIST. HAND TRIM EXCAVATION FOR ACCURATE PLACEMENT OF PIPE TO ELEVATIONS INDICATED.	7.11.4.4.	CONTROL DEVICES VIA ENGRAVED WALL PLATES
1.8.4.	ELECTRIC CONTROLS, CONTACTORS, 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 ELECTRICAL CODE AND DIVISION 26.	4.2.5.	MAINTAIN MINIMUM SERVICE CLEARANCE AS REQUIRED BY THE EQUIPMENT MANUFACTURER AND N.E.C.	6.15.	SUBMIT PROPOSED CONTROL SYSTEM FOR REVIEW BY THE ENGINEER PRIOR TO EQUIPMENT PURCHASE OR FABRICATION. DO NOT PROCEED WITH THE WORK WITHOUT APPROVED SUBMITTALS.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.7.1.1.	PROVIDE NECESSARY SHEETING AND SHORING TO COMPLY WITH O.S.H.A. REGULATIONS FOR SAFETY IN THE TRENCH.	7.11.4.5.	MISCELLANEOUS CONTROL STATIONS
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.	4.3.	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.	6.16.	WHERE QUALIFICATIONS AND/OR QUALITY ASSURANCE REQUIREMENTS ARE SPECIFIED, THE SUBMITTAL SHALL INCLUDE EVIDENCE THAT THE STATED REQUIREMENTS HAVE BEEN MET. INCLUDE QUALIFICATIONS AND CERTIFICATIONS OF PROPOSED TEST AND VERIFIED SUBCONTRACTOR.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.7.1.2.	PLACE BEDDING MATERIAL AT TRENCH BOTTOM, LEVEL, MATERIALS IN CONTINUOUS LAYER NOT EXCEEDING 6 INCHES COMPACTED DEPTH, COMPACT TO 95 PERCENT.	7.11.4.6.	ACCESS DOORS AND PANELS FOR CONCEALED ELECTRICAL ITEMS
1.9.1.	CONTRACTOR SHALL ARRANGE FOR, SCHEDULE, AND COORDINATE SUCH FIELD SERVICES AS WORK INCLUDED IN THE CONTRACT.	4.4.	THE RECORD DRAWINGS SHALL BE MACHINE DRAFTED, AND SHALL BE PROVIDED ON MAGNETIC MEDIA CAD FILES TO THE ARCHITECT WHICH REFLECT ALL CHANGES, DEVIATIONS AND REVISIONS MADE TO THE ORIGINAL DESIGN DOCUMENTS.	6.17.	EQUIPMENT PERFORMANCE SHALL BE VERIFIED BY THE EQUIPMENT MANUFACTURER AS PART OF THE SUBMITTAL, PRIOR TO ORDERING.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF THE SPECIFIC ACTION TAKEN TO COMPLY WITH THE REVIEWERS COMMENTS. THE ABSENCE OF THIS ON RE-SUBMITTAL IS CAUSE FOR REJECTION.	7.7.2.	MAINTAIN OPTIMUM MOISTURE CONTENT OF BEDDING MATERIAL TO ATTAIN REQUIRED COMPACTION DENSITY.	7.11.4.7.	OTHER SIMILAR EQUIPMENT DESIGNATED BY OWNER'S REPRESENTATIVE, ARCHITECT OR ENGINEER IN FIELD.
1.9.2.	CONTRACTOR SHALL FURNISH ALL LABOR AND MATERIALS NECESSARY TO SUPPORT ALL SUCH FACTORY REPRESENTATIVE'S FIELD SERVICES.	4.5.	LOCATIONS OF ALL UNDERGROUND PIPING AND UTILITIES SHALL BE CLEARLY SHOWN AND DIMENSIONED FROM PERMANENT REFERENCE POINTS SUCH AS BUILDING COLUMN LINES.	6.18.	VERIFY EQUIPMENT VOLTAGE AND ELECTRICAL REQUIREMENTS OF THE EQUIPMENT WITH ELECTRICAL CONTRACTOR PRIOR TO ORDERING EQUIPMENT.	INCLUDE A COPY OF THE REVIEWERS COMMENTS SUPPLIED WITH THE PRIOR SUBMITTAL REJECTION AND SHALL BE AMENDED WITH A DESCRIPTION OF				

DIVISION 26 - ELECTRICAL SPECIFICATIONS

7.17.2.	NO ADDITIONAL CHARGE IN CONTRACT PRICE. ALL FASTENERS, HANGERS, AND METHODS OF HANGING EXPOSED WORK IN FINISHED AREAS SHALL BE SUBMITTED TO THE OWNERS REPRESENTATIVE FOR APPROVAL BEFORE INSTALLATION.	8.11.5.	ALL JOINTS SHALL BE MADE TIGHT WITH WATERTIGHT COUPLINGS MATCHING CONDUIT AND ALL CORNERS SHALL BE MADE WITH LONG RADIUS ELBOWS. THE ENDS OF ALL CONDUITS SHALL BE CUT SQUARE AND REAMED AND ALL JOINTS BROUGHT TO A SHOULDER. CONDUIT SHALL BE CONTINUOUS BETWEEN OUTLETS LO MAKE A COMPLETE INSTALLATION AND TO PROVIDE A CONTINUOUS GROUND.	9.6.3.	FASTENERS SHALL BE LEAD EXPANSION SHIELDS IN BLOCK OR CONCRETE. TOGGLE BOLTS IN HOLLOW WALLS, MACHINE SCREWS ON METAL SURFACES AND WOOD SCREWS ON WOOD CONSTRUCTION.	9.22.	HOLES FOR EXPANSION ANCHORS IN CONCRETE: DRILL AT LOCATIONS AND TO DEPTHS THAT AVOID REINFORCING BARS.	12.4.	BONDING JUMPERS SHALL BE PROVIDED WHERE REQUIRED BY THE NATIONAL ELECTRICAL CODE.
7.17.3.	WHERE MOUNTING HEIGHTS ARE NOT DETAILED OR DIMENSIONED, INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT TO PROVIDE THE MAXIMUM HEADROOM POSSIBLE.	8.11.6.	MECHANICALLY FASTEN TOGETHER METAL CONDUITS, ENCLOSURES, AND RACEWAYS FOR CONDUCTORS TO FORM A CONTINUOUS ELECTRICAL CONDUCTOR. CONNECT BONDS TO ELECTRICAL BOXES, FITTINGS AND CABINETS TO PROVIDE ELECTRICAL CONTINUITY AND FIRM MECHANICAL ASSEMBLY.	9.6.4.	FASTEN PIPE STRAPS AND HANGERS TO CONCRETE USING INSERTS OR EXPANSION BOLTS AND TO HOLLOW MASONRY USING TOGGLE BOLTS. WOODEN PLUGS AND SHIELDS WILL NOT BE PERMITTED. ALL SUPPORTS IN BAR JOIST CONSTRUCTION SHALL BE ATTACHED TO THE TOP CORD OF THE JOISTS USING SUITABLE CLAMPS APPROVED FOR THE PURPOSE.	9.23.	MOUNTING TO MASONRY: APPROVED TOGGLE-TYPE BOLTS ON HOLLOW MASONRY UNITS AND EXPANSION ANCHOR FASTENERS ON SOLID MASONRY UNITS.	12.4.1.	BOND ALL STRUCTURAL STEEL OF THE BUILDING TO THE MAIN SERVICE GROUND BUS.
7.18.	INSTALL ELECTRICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.	8.11.7.	AVOID USE OF DISSIMILAR METALS THROUGH SYSTEM TO ELIMINATE POSSIBILITY OF ELECTROLYSIS.	9.7.	AT BUILDING EXPANSION JOINTS AND WHERE DEFLECTION IS EXPECTED, CONDUITS SHALL BE PROVIDED WITH EXPANSION FITTINGS WITH BONDING JUMPERS.	9.24.	MOUNTING TO STEEL: WELDED THREADED STUDS COMPLYING WITH AWS D11.1/D1M, WITH LOCK WASHERS AND NUTS, OR BEAM CLAMPS (MSS TYPE 19, 21, 23, 25, OR 27) COMPLYING WITH MSS SP-69, CLAMPED TO FLANGES OF BEAMS OR ON UPPER TRUSS CHORDS OF BAR JOISTS.	12.4.2.	BOND THE NATURAL GAS SERVICE TO THE GROUND ELECTRODE SYSTEM.
7.19.	INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT GIVING RIGHT-OF-WAY PRIORITY TO SYSTEMS REQUIRED TO BE INSTALLED AT A SPECIFIED SLOPE.	8.11.8.	PROVIDE EXPANSION FITTINGS IN RACEWAYS EVERY 200' LINEAR RUN OR WHEREVER STRUCTURAL EXPANSION JOINTS ARE CROSSED.	9.8.	STRUCTURAL STEEL FOR FABRICATED SUPPORTS AND RESTRAINTS: ASTM A 36/A 36M, STEEL PLATES, SHAPES, AND BARS; BLACK AND GALVANIZED.	9.25.	MOUNTING TO LIGHT SHEET: SHEET METAL SCREWS.	12.5.	CONTRACTOR SHALL PROVIDE A GROUNDING SYSTEM CONSISTING OF DRIVEN GROUND RODS WITH INTERCONNECTING CABLES.
7.20.	ALL NEW ELECTRICALLY RELATED WORK SHALL BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURAL MEMBERS. NEW ELECTRICAL RELATED WORK SHALL NOT BE SUPPORTED FROM DUCTWORK, DUCTWORK HANGER, CEILING SUPPORTS, EXISTING CONDUIT SUPPORT, ETC.	8.11.9.	PROVIDE NYLON PULL CORD IN ALL EMPTY CONDUITS. (MINIMUM 90# TENSILE STRENGTH).	9.9.	USE OF SYNTHETIC OR PLASTIC "TIE-WRAPS", "ZIP TIES", "WIRE LIES" AND SIMILAR PRODUCTS ARE NOT PERMITTED AS A PERMANENT MEANS OF ANCHORING, SECURING, SUPPORTING OR OTHERWISE INSTALLING ANY CABLES, CONDUCTORS, CONDUITS, RACEWAYS, DEVICES, EQUIPMENT OR OTHER ELECTRICAL WORK.	9.26.	ITEMS MOUNTED ON HOLLOW WALLS AND NONSTRUCTURAL BUILDING SURFACES: MOUNT CABINETS, PANELBOARDS, DISCONNECT SWITCHES, CONTROL ENCLOSURES, PULL AND JUNCTION BOXES, TRANSFORMERS, AND OTHER DEVICES ON SLOTTED-CHANNEL RACKS ATTACHED TO SUBSTRATE.	12.5.1.	GROUND RODS SHALL BE INSTALLED WITH TWO FEET OF COVER AND CABLES EXOTHERMICALLY WELDED.
7.21.	TOUCH-UP PAINTING: CLEAN FIELD WELDS AND ABRADED AREAS OF SHOP PAINT. PAINT EXPOSED AREAS IMMEDIATELY AFTER ERRECTING HANGERS AND SUPPORTS. USE SAME MATERIALS AS USED FOR SHOP PAINTING.	8.11.10.	CONDUIT INSTALLATION (EXCEPT AS NOTED) USE:	9.10.	CUT, FIT, AND PLACE MISCELLANEOUS METAL FABRICATIONS ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR ELECTRICAL MATERIALS AND EQUIPMENT.	9.27.	FABRICATED METAL EQUIPMENT SUPPORT ASSEMBLIES: WELDED OR BOLTED, STRUCTURAL-STEEL SHAPES, SHOP OR FIELD FABRICATED TO FIT DIMENSIONS OF SUPPORTED EQUIPMENT.	12.5.2.	GROUND RODS SHALL BE 3/4" DIAMETER BY 10 FEET LONG COPPER CLAD STEEL, ONE PIECE, COPPERWELDED #4/50, OR APPROVED EQUAL.
8.	RACEWAYS	8.11.10.1.	RIGID METAL CONDUIT (RMC) FOR ALL WEATHER EXPOSED WORK, FOR ALL STUB-UPS IN WET/DAMP AREAS, FOR ALL ROOF PENETRATIONS AND FOR ANY FREEZER COOLER PENETRATIONS.	9.11.	PLACE AND SECURE ANCHORAGE DEVICES. USE SUPPORTED EQUIPMENT MANUFACTURERS SETTING DRAWINGS, TEMPLATE, DIAGRAMS, INSTRUCTIONS, AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED.	9.28.	ROOF DECKS: DO NOT SUSPEND OVERHEAD HANGERS, OR SUPPORT ANY OTHER OVERHEAD ELECTRICAL WORK, FROM ROOF DECKS.	12.5.3.	GROUND GRID CONDUCTORS SHALL BE #10 BARE DIRECT BURIED.
8.1.	EXTENT OF RACEWAY WORK IS INDICATED DIAGRAMMATICALLY ON THE DRAWINGS OR IN THE SCHEDULES. CONTRACTOR SHALL ONLY PROVIDE TYPE REQUIRED FOR APPLICATION.	8.11.10.2.	E.M.T. FOR ALL INTERIOR CONCEALED AND FOR INTERIOR EXPOSED WORK NOT SUBJECT TO MECHANICAL INJURY.	9.11.1.	INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.	9.29.	ACCESS DOORS.	12.5.4.	GROUND SYSTEM SHALL BE SO CONSTRUCTED THAT THE RESISTANCE BETWEEN THE EQUIPMENT AND THE GROUND SHALL NOT EXCEED 25 OHMS.
8.2.	INSTALL ALL WIRING IN CONDUIT (EXCEPT WHERE NOTED UNDER WIRE AND CABLE) AND PROVIDE EMPTY CONDUIT FOR SPECIAL SYSTEMS DESCRIBED ELSEWHERE.	8.11.10.3.	P.V.C. FOR ALL UNDERGROUND WORK OR WORK INSTALLED IN CONCRETE AND USE RIGID METAL CONDUIT ELBOW AT STUB-UP LOCATIONS.	9.11.2.	PROVIDE FEMALE EXPANSION ANCHORS, AND INSTALL STUDS AND NUTS AFTER EQUIPMENT IS POSITIONED.	9.29.1.	DO NOT USE ACCESS DOORS UNLESS SPECIFIC PRIOR WRITTEN PERMISSION IS GRANTED FROM THE OWNERS REPRESENTATIVE.	13.	WIRING DEVICES
8.3.	ALL CONDUIT EMBEDDED IN CONCRETE SHALL BE 3/4" MINIMUM. ALL EXTERIOR UNDERGROUND CONDUIT SHALL BE 1" MINIMUM.	8.11.10.4.	FLEXIBLE METAL CONDUIT FROM OUTLET BOXES TO RECESSED LIGHTING FIXTURE AND FINAL 24" OF CONNECTION TO ITEMS SUBJECT TO MOVEMENT OR VIBRATION.	9.11.3.	PROVIDE BUSHINGS FOR FLOOR/WALL-MOUNTED EQUIPMENT ANCHORS TO ALLOW FOR RESILIENT MEDIA BETWEEN ANCHOR BOLTS/STUDS AND MOUNTING HOLE IN CONCRETE.	9.29.2.	INSTALL PULL BOXES, JUNCTION BOXES, ETC. IN AREAS WHICH ARE ACCESSIBLE AFTER COMPLETION OF CONSTRUCTION DO NOT INSTALL PULL BOXES OR JUNCTION BOXES ABOVE GYPSUM BOARD OR SIMILAR INACCESSIBLE CEILING SYSTEMS.	13.1.	THE EXTENT OF WIRING DEVICE WORK IS INDICATED BY THE DRAWINGS AND SCHEDULES. COORDINATE PLATE COLORS WITH ARCHITECTURAL REQUIREMENTS.
8.4.	SUPPORT ALL CONDUIT NOT EMBEDDED IN CONCRETE OR MASONRY SO THAT STRAIN IS NOT TRANSMITTED TO OUTLET BOXES AND PULL BOXES. ETC. SUPPORTS TO BE SUFFICIENTLY RIGID TO PREVENT DISTORTION OF CONDUITS DURING WIRE PULLING.	8.11.10.5.	LIQUID-TIGHT FLEXIBLE CONDUIT FOR FINAL 24" CONNECTION TO ITEMS WHERE SUBJECT TO ONE OR MORE OF THE FOLLOWING CONDITIONS:	9.12.	CONCRETE INSERTS: STEEL OR MALLEABLE-IRON, SLOTTED SUPPORT SYSTEM UNITS SIMILAR TO MSS TYPE 18, COMPLYING WITH MFMA-4 OR MSS SP-58.	9.29.3.	WHERE THERE IS NO OTHER RECOURSE BUT TO PROVIDE AN ACCESS DOOR/PANEL, AND WHERE APPROVAL OF OWNER'S REPRESENTATIVE HAS BEEN OBTAINED, PROVIDE REQUIRED ACCESS DOORS/PANELS AS REQUIRED FOR A COMPLETE CODE-COMPLIANT ELECTRICAL INSTALLATION.	13.2.	PROVIDE WIRING DEVICES WHICH ARE U.L. LISTED AND LABELED.
8.5.	WHEN SIZE IS NOT INDICATED ON PLANS, CONDUIT SHALL BE SIZED FOR CONDUCTORS IN ACCORDANCE WITH TABLES 3(A)(B)(C), CHAPTER 9 OF THE N.E.C.	8.11.10.5.1.	EXTERIOR LOCATION.	9.13.	MECHANICAL-EXPANSION ANCHORS: INSERT-WEDGE-TYPE1 ZINC-COATED STEEL, FOR USE IN HARDENED PORTLAND CEMENT CONCRETE WITH TENSION, SHEAR, AND PULLOUT CAPACITIES APPROPRIATE FOR SUPPORTED LOADS AND BUILDING MATERIALS IN WHICH USED.	9.29.4.	PROVIDE ACCESS DOORS IN FIRE/SMOKE RATINGS THAT MEET OR EXCEED THE SURROUNDING SURFACE THAT IS BEING PENETRATED.	13.3.	ACCEPTABLE MANUFACTURERS
8.6.	THE ROUTING AND METHOD OF INSTALLATION OF CONDUITS SHALL BE COORDINATED WITH ALL TRADES PRIOR TO INSTALLATION SO AS NOT TO INTERFERE WITH OTHER EQUIPMENT INSTALLATIONS. COORDINATED INSTALLATION SHALL MEET THE COMPLETE SATISFACTION OF THE OWNERS REPRESENTATIVE OR SHALL BE REINSTALLED AT NO COST TO THE OWNER.	8.11.10.5.2.	MOIST OR HUMID ATMOSPHERE WHERE CONDENSATE CAN BE EXPECTED TO ACCUMULATE.	9.14.	CLAMPS FOR ATTACHMENT TO STEEL STRUCTURAL ELEMENTS: MSS SP-58, TYPE SUITABLE FOR ATTACHED STRUCTURAL ELEMENT.	10.	CONDUCTORS	13.3.1.	HARVEY HUBBELL CO.
8.7.	THE USE OF INTERMEDIATE METAL CONDUIT (IMC), ELECTRICAL NON-METALLIC TUBING (ENT), ARMORED CABLE (AC), METAL CLAD (MC), OR MANUFACTURED CABLE ASSEMBLIES SHALL NOT BE INCORPORATED INTO THE WORK, UNLESS NOTED OTHERWISE. SHOULD CONTRACTOR FAIL TO UTILIZE APPROVED RACEWAYS, OWNERS REPRESENTATIVE CAN REQUEST THE REMOVAL AND REPLACEMENT OF ALREADY INSTALLED RACEWAY AT NO COST TO THE OWNER.	8.11.10.5.3.	CORROSIVE ATMOSPHERE.	9.14.1.	THROUGH BOLTS: STRUCTURAL TYPE, HEX HEAD, AND HIGH STRENGTH. COMPLY WITH ASTM A 325.	10.1.	BUILDING WIRE, UNLESS OTHERWISE INDICATED, SHALL BE 600 VOLT, TYPE THHN/THWN/THWN-2 INSULATION FOR INTERIOR USE AND EXTERIOR USE WITHIN CONDUIT. PROVIDE TYPE XHHW-2 INSULATION FOR ALL WIRING BELOW GRADE. CONDUCTORS SHALL BE SIZED AND RUN AS INDICATED.	13.3.2.	LEGRAND-PASS AND SEYMOUR.
8.8.	USE ONLY THE TYPES OF RACEWAYS SPECIFIED HEREIN.	8.11.10.5.4.	SUBJECTED TO WATER SPRAY OR DRIPPING OIL, WATER OR GREASE.	9.14.2.	TOGGLE BOLTS: ALL-STEEL, GALVANIZED SPRINGHEAD TYPE, 3/16" X 4".	10.2.	CONDUCTORS SHALL BE SOFT DRAWN COPPER OF NOT LESS THAN 99% CONDUCTIVITY.	13.3.3.	LEVITON MFG. CO.
8.8.1.	TYPES OF RACEWAYS SPECIFIED IN THIS SECTION INCLUDE THE FOLLOWING:	8.11.10.5.5.	FINAL CONNECTION TO ROTATING OR VIBRATING EQUIPMENT.	9.14.3.	HANGER RODS: THREADED STEEL, GALVANIZED STEEL RODS, 1/2" DIA. MIN.	10.3.	NO WIRE SMALLER THAN NUMBER TWELVE (12) AWG SHALL BE USED UNLESS OTHERWISE INDICATED. USE OF #14 COLOR CODED WIRE WILL BE ALLOWED FOR CONTROL CIRCUITS ONLY.	13.4.	FABRICATED WIRING DEVICES
8.8.1.1.	ELECTRICAL METALLIC TUBING (EMT); GALVANIZED STEEL; MINIMUM TRADE SIZE 3/4".	8.11.11.	CUT CONDUITS STRAIGHT, PROPERLY REAM AND CUT THREADS FOR HEAVY WALL CONDUIT DEEP AND CLEAN INTERIOR AND EXTERIOR THREADS, FIELD GALVANIZE THREADS WITH APPROVED COMPOUND FOR THE PURPOSE.	9.14.4.	MINIMUM HANGER ROD SIZE FOR RACEWAY: MINIMUM ROD SIZE SHALL BE 1/4" INCH IN DIAMETER.	10.4.	CONDUCTORS SHALL BE CONTINUOUS FROM OUTLET TO OUTLET AND FROM TERMINAL BOARD TO POINT OF FINAL CONNECTION, AND NO SPLICE SHALL BE MADE EXCEPT WITHIN OUTLET OR JUNCTION BOXES.	13.4.1.1.	SNAP SWITCHES
8.8.1.2.	FLEXIBLE METAL CONDUIT (FMC); MINIMUM TRADE SIZE 3/4".	8.11.12.	FIELD BEND CONDUIT WITH BENDERS DESIGNED FOR THE PURPOSE TO PREVENT DISTORTION NOR VARY INTERNAL DIAMETER.	9.14.5.	CLEVIS HANGERS: GALVANIZED STEEL; WITH 1/2" DIA. HOLE FOR ROUND STEEL ROD.	10.5.	KEEP CONDUCTOR SPLICES TO MINIMUM.	13.4.1.1.1.	COMPLY WITH NEMA WD 1 AND UL 20. SILENT MECHANICAL TYPE.
8.8.1.3.	LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LFMC), (SEALTIGHT) MINIMUM TRADE SIZE 3/4".	8.11.13.	ONLY INSTANT CONDUIT EXPOSED ON ROOFTOPS WHEN IT IS IMPOSSIBLE TO DO OTHERWISE, OR ONLY IF SPECIFICALLY INDICATED FOR SUCH INSTALLATION CASE-BY-CASE ELSEWHERE IN DOCUMENTS. INSTALLATION CONVENIENCE, FINANCIAL CONSIDERATIONS, LACK OF COORDINATION WITH OTHER TRADES AND SIMILAR RATIONALE ARE NOT SUFFICIENT REASONS FOR DOING SO.	9.14.6.	GALVANIZED STEEL ROD REDUCING COUPLINGS, 1/12" X 5/8".	10.6.	PULL CONDUCTORS SIMULTANEOUSLY WHERE MORE THAN ONE IS BEING INSTALLED IN SAME RACEWAY. USE U.L. LISTED PULLING COMPOUND OR LUBRICANT.	13.4.1.1.2.	THREE AND FOUR-WAY SWITCHES SHALL BE OF THE SAME MANUFACTURER AND GRADE.
8.8.1.4.	RIGID METAL CONDUIT (RMC); MINIMUM TRADE SIZE 3/4".	8.11.13.1.	IN CASES WHERE CONDUITS MUST BE INSTALLED ON ROOFTOPS, DE-RATE CONDUCTORS AND MODIFY CONDUIT SIZES AS NEEDED TO ACCOMMODATE THIS CONDITION.	9.14.7.	GALVANIZED STEEL CLAMPS: 1/12" ROD SIZE.	10.7.	WHERE NECESSARY INCREASE WIRE SIZES TO OFFSET VOLTAGE DROP AS/IF REQUIRED.	13.4.1.2.	PILOT LIGHT SWITCHES, 20 A:
8.8.1.5.	RIGID NONMETALLIC CONDUIT (PVC), SCHEDULE 40, MINIMUM TRADE SIZE 3/4".	8.11.13.2.	PROVIDE EXPANSION FITTINGS, WHICH ARE UL LISTED AND LABELED FOR THE RESPECTIVE APPLICATIONS, AT ALL BUILDING EXPANSION JOINTS AND AT MAXIMUM DISTANCES OF 100 FEET.	9.14.8.	GALVANIZED STEEL, LEAD EXPANSION ANCHORS, 1/2".	10.8.	ALL CONDUIT/STOPS SHALL BE RATED FOR 90 DEG. C. MINIMUM. PROVIDE WITH FULL PARTLY SIZED GREEN INSULATED EQUIPMENT GROUND CONDUCTOR. PROVIDE COMPATIBLE STEEL FITTINGS WITH INTEGRAL RED PLASTIC INSULATED THROAT BUSHINGS. CABLES SHALL BE 90 DEG. C. RATED WITH ALL COMPONENTS AND FITTINGS LISTED FOR GROUNDING AND COMPLIANT WITH THE FOLLOWING: UL STD.4 AND UL STD. 83,ANSI E119 AND E814; NFPA 70.	13.4.1.2.1.	SINGLE POLE, WITH NEON-LIGHTED HANDLE, ILLUMINATED WHEN SWITCH IS "ON".
8.9.	TYPE MC (METAL-CLAD) CABLE: FORM FROM CONTINUOUS LENGTH OF SPIRALLY WOUND, INTERLOCKED ZINC-COATED OR GALVANIZED (INSIDE AND OUTSIDE) STRIP STEEL OR ALUMINUM JACKET, WITH STRANDED COPPER CONDUCTORS WITH 90 DEG. C THHN INSULATION SYSTEM.	8.11.13.3.	PAINT ALL SUCH CONDUITS WITH AT LEAST TWO COATS OF UV-RESISTANT WEATHERPROOF PAINT. PROVIDE WHITE PAINT ON FLAT ROOFTOPS THAT HAVE FINISHES WHITE IN COLOR, AND FOR OTHERWISE-COLORED ROOF FINISHES THAT ARE NOT VISIBLE FROM THE BUILDING INTERIOR OR FROM THE GROUND OUTDOORS. ELSEWHERE SELECT COLORS TO MATCH SURROUNDINGS SURFACES. SUBMIT COLORS TO ARCHITECT FOR REVIEW IN ADVANCE OF PROCURING PAINT.	9.15.	COORDINATE INSTALLATION OF ROOF CURBS, EQUIPMENT SUPPORTS, AND ROOF PENETRATIONS.	10.9.	INSULATION VALUE OF JOINTS SHALL BE 100%, IN EXCESS OF WIRE. PROVIDE ADEQUATE LENGTH OF CONDUCTORS WITHIN ELECTRICAL ENCLOSURES AND TRAIN THE CONDUCTORS TO TERMINAL POINTS WITH NO EXCESS.	13.4.1.3.	SINGLE-POLE, DOUBLE-THROW, MOMENTARY CONTACT, CENTER-OFF SWITCHES, 120/277 V, 20 A; FOR USE WITH MECHANICALLY HELD LIGHTING CONTACTORS.
8.9.1.	PROVIDE FOR FINAL CONNECTIONS TO LIGHT FIXTURES THAT ARE INSTALLED IN ACCESSIBLE TILE CEILING SYSTEMS (LIMITED TO 6' MAXIMUM IN LENGTH AND LIMITED TO "WHIPS" FROM BUILDING ELECTRICAL SYSTEM JUNCTION BOXES DOWN TO LIGHT FIXTURES).	8.11.14.	CONDUITS PASSING THROUGH STRUCTURAL MEMBERS SHALL BE PROVIDED WITH STUB AND COUPLING OR SLEEVE IN THE MEMBER.	9.16.	STEEL, SLOTTED SUPPORT SYSTEMS COMPLY WITH MFMA-4, FACTORY-FABRICATED COMPONENTS FOR FIELD ASSEMBLY.	10.10.	BUNDLE MULTIPLE CONDUCTORS, WITH CONDUCTORS NO LARGER THAN 10 AWG CABLED IN INDIVIDUAL CIRCUITS.	13.4.1.4.	KEY-OPERATED, SINGLE-POLE, DOUBLE-THROW, MOMENTARY CONTACT, CENTER-OFF SWITCHES, 120/277 V, 20 A; FOR USE WITH MECHANICALLY HELD LIGHTING CONTACTORS, WITH FACTORY-SUPPLIED KEY IN LIEU OF SWITCH HANDLE.
8.9.1.1.	DO NOT INSTALL TYPE MC CABLE FROM FIXTURE TO FIXTURE UNLESS A SPECIAL, PROPERLY LISTED AND LABELED UL APPROVED SYSTEM IS SPECIFICALLY INDICATED.	8.11.15.	WHERE MOISTURE CONDITIONS ARE ENCOUNTERED, A HOLE SHALL BE DRILLED AT THE LOWEST POINT IN THE CONDUIT RUN.	9.16.1.	CONSTRUCT WITH 9/16" DIA. HOLES, NOMINAL 2" O.C. ON TOP SURFACE, WITH STANDARD FACTORY FINISH, AND WITH THE ALL NECESSARY FITTINGS WHICH MATE AND MATCH WITH UCHANNEEL.	10.11.	DO NOT USE ARMORED AC, BX, NM, OR ANY MANUFACTURED CABLE ASSEMBLY, UNLESS NOTED OTHERWISE.	13.4.1.5.	WALL-BOX DIMMERS
8.9.2.	PROVIDE FOR NEW 15 AND 20 AMPERE BRANCH CIRCUIT DROPS TO OUTLETS IN EXISTING HOLLOW PARTITIONS FOR REMODELING WORK. THIS APPLIES ONLY UNDER ALL OF THE FOLLOWING CIRCUMSTANCES AND CONDITIONS:	8.11.16.	PROVIDE SLEEVES FOR ALL FIRE WALL AND SMOKE PARTITION PENETRATIONS (SEALED ACCORDINGLY).	9.16.2.	PROVIDE METALLIC COATINGS THAT ARE HOT-DIP GALVANIZED AFTER FABRICATION AND APPLIED ACCORDING TO MFMA-4.	10.12.	ALL WIRING SHALL BE IN CONDUIT, UNLESS NOTED OTHERWISE.	13.4.1.5.1.	DIMMER SWITCHES: MODULAR, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES, WITH AUDIBLE FREQUENCY AND EMIRFI SUPPRESSION FILTERS.
8.9.2.1.	BASIS OF DESIGN INCLUDES CUTTING AND PATCHING FOR SUCH APPLICATIONS. TYPE MC CABLE MAY BE USED ONLY WHERE OWNER OR ARCHITECT SPECIFICALLY DIRECTS INSTALLER CASE-BY-CASE NOT TO SLOT WALLS (LIMITED TO 10 FEET MAXIMUM CABLE LENGTH FROM OVERHEAD CONDUIT SYSTEM JUNCTION BOX TO RESPECTIVE WALL OUTLET BOX); PROVIDE ONLY WHERE CONCEALED (INSTALL WIRING FOR EXPOSED APPLICATIONS IN RACEWAY).	8.11.17.	OVERHEAD ELECTRIC WORK: INSTALL WORK SO THAT NO RACEWAY OR CABLE IS WITHIN SIX INCHES BELOW ROOF DECK(S) SUSPEND AND SUPPORT OVERHEAD ELECTRICAL WORK FROM ROOF TRUSSES AND JOISTS/JOIST GIRDERS ONLY AT PANEL POINTS, AT TOP CORD ONLY, UNLESS OTHERWISE INDICATED.	9.16.3.	PROVIDE CHANNEL DIMENSIONS THAT ARE SELECTED FOR APPLICABLE LOAD CRITERIA.	10.13.	COLOR CODING OF CONDUCTORS SHALL BE AS FOLLOWS FOR VOLTAGES WHEN PRESENT:	13.4.1.5.2.	CONTROL: CONTINUOUSLY ADJUSTABLE SLIDER, TOGGLE SWITCH, OR ROTARY KNOB, WITH SINGLE-POLE OR THREE-WAY SWITCHING, COMPLY WITH UL 1472.
8.9.3.	PROVIDE FOR NEW 15 THROUGH 30 AMPERE BRANCH CIRCUIT WORK. THIS APPLIES ONLY UNDER ALL OF THE FOLLOWING CIRCUMSTANCES AND CONDITIONS:	8.11.17.1.	STRENGTH OF SUPPORT ASSEMBLIES: WHERE NOT INDICATED, SELECT SIZES OF COMPONENTS SO STRENGTH WILL BE ADEQUATE TO CARRY PRESENT AND FUTURE STATIC LOADS WITHIN SPECIFIED LOADING LIMITS. MINIMUM STATIC DESIGN LOAD USED FOR STRENGTH DETERMINATION SHALL BE WEIGHT OF SUPPORTED COMPONENTS PLUS 200 LBS.	9.16.4.	COMPLY WITH NECA 1 AND NECA 101 UNLESS REQUIREMENTS IN THIS OR OTHER SPECIFICATION SECTIONS ARE STRICTER.	10.14.	AWG #10 AND SMALLER SHALL BE SOLID. AWG #8 AND LARGER SHALL BE STRANDED.	13.4.1.5.3.	INCANDESCENT LAMP DIMMERS: 120 V; CONTROL SHALL FOLLOW SQUARE-LAW DIMMING CURVE. ON-OFF SWITCH POSITIONS SHALL BYPASS DIMMER MODULE.
8.9.3.1.	PROVIDE ONLY WHERE CONCEALED (INSTALL WIRING FOR EXPOSED APPLICATIONS IN RACEWAY)	9.	HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS	9.17.	FOR SUPPORTING RIGID METAL:	10.15.	MAINTAIN A UNIFORM ELEVATION FOR ALL CABLE RUNS WHEREVER POSSIBLE. ALL CABLES SHALL BE SUPPORTED/ANCHORED AT MAXIMUM 4 FOOT INTERVALS AND WITHIN 12" OF BOX OR OUTLET AND SHALL NOT SAG.	13.4.1.5.4.	600 W; DIMMERS SHALL REQUIRE NO DERATING WHEN GANGED WITH OTHER DEVICES. ILLUMINATED WHEN "OFF."
8.10.	RACEWAY FITTINGS	9.1.	PROVIDE SUPPORTS FOR MULTIPLE RACEWAYS CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, EQUIPMENT, CONNECTED SYSTEMS AND ASSOCIATED COMPONENTS/CONTENTS. PROVIDE SUPPORTS ADEQUATE IN TENSION, SHEAR, AND PULLOUT FORCE TO RESIST MAXIMUM LOADS CALCULATED OR IMPOSED FOR THIS PROJECT, WITH A MINIMUM STRUCTURAL SAFETY FACTOR OF FIVE TIMES THE APPLIED FORCE.	9.17.1.	RISER CLAMPS: GALVANIZED STEEL; WITH 2 BOLTS AND NUTS, AND 4" EARS.	10.16.	INSTALL CABLES IN A MANNER THAT PREVENTS OVERHEATING.	13.4.2.	FAN SPEED CONTROLS
8.10.1.	FITTINGS FOR EMT SHALL BE STEEL SET SCREW OR COMPRESSION TYPE WITH FACTORY INSTALLED INSULATED THROAT CONNECTORS. DIE CAST OR POT METAL FITTINGS ARE NOT ACCEPTABLE.	9.12.	IT SHALL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR TO SUPERVISE THE INSTALLATION OF AND PAY FOR ALL ADDITIONAL MATERIAL, WOOD OR METAL, AND LABOR WHICH MAY BE REQUIRED TO SUPPORT ANY TYPE OF PERMANENT OR TEMPORARY ELECTRICAL APPARATUS EMPLOYED IN THE EXECUTION OF THE ELECTRICAL CONTRACTOR'S WORK.	9.17.2.	CLEVIS HANGERS: GALVANIZED STEEL WITH 1/2" DIA. HOLE FOR ROUND STEEL ROD.	10.17.	CABLES SHALL BE FASTENED DIRECTLY TO THE STRUCTURE USING FACTORY CLAMPS/CLIPS SPECIFICALLY DESIGNED FOR THE RESPECTIVE CABLE.	13.4.2.1.	MODULAR, 120-V, FULL-WAVE, SOLID-STATE UNITS WITH INTEGRAL, QUIET ON-OFF SWITCHES AND AUDIBLE FREQUENCY AND EMIRFI FILTERS.
8.10.2.	FITTINGS FOR FLEXIBLE CONDUIT SHALL BE STEEL OR CAST IRON.	9.13.	ELECTRICALLY RELATED WORK SHALL NOT BE SUPPORTED FROM DUCTWORK, DUCTWORK HANGERS, CEILING SUPPORTS, EXISTING CONDUIT SUPPORTS, ETC.	9.17.3.	TWO-HOLE CONDUIT STRAPS: GALVANIZED STEEL; 3/4" STRAP WIDTH; AND 2-1/8" BETWEEN CENTER OF SCREW HOLES.	10.18.	WIRE CONNECTIONS	13.4.2.1.1.	COMPLY WITH UL 1917
8.10.3.	FITTINGS FOR RIGID CONDUIT SHALL BE STEEL, THREADED TYPE.	9.14.	ALL PARTS AND HARDWARE USED FOR SUPPORT OF EQUIPMENT, CONDUITS AND FITTINGS, SHALL BE GALVANIZED.	9.17.4.	OFFSET CONDUIT CLAMPS: GALVANIZED STEEL.	10.18.1.	FOR EACH ELECTRICAL CONNECTION INDICATED, PROVIDE COMPLETE ASSEMBLY OF MATERIALS, INCLUDING BUT NOT LIMITED TO, PRESSURE CONNECTORS, TERMINALS (LUGS), ELECTRICAL INSULATING TAPE, HEAT-SHRINKABLE INSULATING TUBING, CABLE TIES, SOLDERLESS WIRE-NUTS, AND OTHER ITEMS AND ACCESSORIES AS NEEDED TO COMPLETE SPLICES AND TERMINATIONS OF TYPES INDICATED.	13.4.2.1.2.	CONTINUOUSLY ADJUSTABLE SLIDER, TOGGLE SWITCH, OR ROTARY KNOB, 5 A OR 1.5 A
8.10.4.	FITTINGS FOR PVC SHALL BE SCHEDULE 40 GLUE-ON TYPE.	9.15.	MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE-TYPE SUPPORTS FABRICATED WITH STEEL, SLOTTED "KINDORF" CHANNELS, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 50 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS, SINGLE-BOLT CONDUIT CLAMPS, OR SINGLE-BOLT CONDUIT CLAMPS USING SPRING FRICTION ACTION FOR RETENTION IN SUPPORT CHANNEL AS APPLICABLE.	9.18.	SUPPORT FOR CONDUCTORS: IN VERTICAL CONDUIT, FACTORY-FABRICATED ASSEMBLY CONSISTING OF THREADED BODY AND INSULATING WEDGING PLUG OR PLUGS FOR NON-ARMORED ELECTRICAL CONDUCTORS OR CABLES IN RISER CONDUITS. PLUGS SHALL HAVE NUMBER, SIZE, AND SHAPE OF CONDUCTOR GRIPPING PIECES AS REQUIRED TO SUIT INDIVIDUAL CONDUCTORS OR CABLES SUPPORTED BODY SHALL BE MALLEABLE IRON.	10.19.	MAKE TIGHT CONNECTIONS BETWEEN MEMBERS. INSTALL FASTENERS WITHOUT SPLITTING WOOD MEMBERS. ATTACH TO SUBSTRATES AS REQUIRED TO SUPPORT APPLIED LOADS.	13.4.3.	OCCUPANCY SENSORS
8.11.	INSTALLATION OF RACEWAYS	9.16.	CONDUIT SHALL BE SUPPORTED INDEPENDENTLY FROM ALL OTHER BUILDING SYSTEMS AND SHALL BE SUPPORTED DIRECTLY FROM STRUCTURAL COMPONENTS.	9.19.	MOUNTING TO WOOD:	10.20.	MOUNTING TO NEW CONCRETE: PROVIDE CHANNEL-TYPE CONCRETE INSERTS AND BOLT TO INSERTS, OR PROVIDE EXPANSION ANCHORS FOR APPLICATIONS WHERE INSERTS ARE NOT PRACTICAL.	13.4.3.1.	WALL-SWITCH SENSORS:
8.11.1.	PROVIDE ALL CONDUITS CONCEALED, EXCEPT IN EQUIPMENT ROOM, CHASES OR AS INDICATED ON THE DRAWINGS. ALL CONDUITS, EXPOSED AND CONCEALED SHALL BE RUN PARALLEL AND PERPENDICULAR TO BUILDING LINES AND GROUPED TOGETHER AS MUCH AS POSSIBLE, EVEN ABOVE LAY-IN CEILINGS.	9.17.	ELECTRICALLY RELATED WORK SHALL NOT BE SUPPORTED FROM DUCTWORK, DUCTWORK HANGERS, CEILING SUPPORTS, EXISTING CONDUIT SUPPORTS, ETC.	9.19.1.	FASTEN WITH LAG SCREWS OR THROUGH-BOLTS.	10.21.	ATTACHMENTS TO WOOD STRUCTURAL MEMBERS: PROVIDE BOLTS INSTALLED THROUGH MEMBERS.	13.4.3.1.1.	PASSIVE-INFRARED TYPE, 120/277 V, ADJUSTABLE TIME DELAY UP TO 30 MINUTES, 180-DEGREE FIELD OF VIEW, WITH A MINIMUM COVERAGE AREA OF 900 SQ. FT.
8.11.2.	HOLD ROUTING OF NEW RACEWAYS IN NEW AND EXISTING BUILDINGS AS TIGHTLY AS POSSIBLE TO THE STRUCTURE ABOVE. OBTAIN APPROVAL OF OWNERS REPRESENTATIVE PRIOR TO INSTALLATION. DO NOT INSTALL ANY ELECTRICAL WORK WITHIN 6 INCHES OF ROOF DECKING.	9.18.	ALL PARTS AND HARDWARE USED FOR SUPPORT OF EQUIPMENT, CONDUITS AND FITTINGS, SHALL BE GALVANIZED.	9.19.2.	PROVIDE STANDARD GRADE, LIGHT-FRAMING-SIZE LUMBER OF ANY SPECIES, NUMBER 3 COMMON OR STANDARD GRADE BOARDS COMPLYING WITH WCLB OR AWWA RULES, OR NUMBER 3 BOARDS COMPLYING WITH SPIB RULES.	10.22.	ALL BRANCH WIRING CONNECTIONS SHALL BE 3M SCOTCH LOCK CONNECTORS OR ACCEPTABLE EQUIVALENT.	13.4.3.1.2.	ADAPTIVE-TECHNOLOGY TYPE, 120/277 V, ADJUSTABLE TIME DELAY UP TO 20 MINUTES, 180-DEGREE FIELD OF VIEW, WITH A MINIMUM COVERAGE AREA OF 900 SQ. FT.
8.11.3.	CONDUIT SHALL BE CLEANED INSIDE BEFORE ANY WIRES ARE PULLED. CONDUIT ENDS SHALL BE CAPPED AND PLUGGED WITH STANDARD ACCESSORIES AS SOON AS CONDUIT HAS BEEN PERMANENTLY INSTALLED. ALL RACEWAYS SHALL BE ENTIRELY FREE OF PLASTER, MORTAR, WATER AND OTHER FOREIGN MATTER BEFORE INSTALLING CONDUCTORS OR CABLES.	9.19.	MULTIPLE RACEWAYS OR CABLES: INSTALL TRAPEZE-TYPE SUPPORTS FABRICATED WITH STEEL, SLOTTED "KINDORF" CHANNELS, SIZED SO CAPACITY CAN BE INCREASED BY AT LEAST 50 PERCENT IN FUTURE WITHOUT EXCEEDING SPECIFIED DESIGN LOAD LIMITS. SECURE RACEWAYS AND CABLES TO THESE SUPPORTS WITH TWO-BOLT CONDUIT CLAMPS, SINGLE-BOLT CONDUIT CLAMPS, OR SINGLE-BOLT CONDUIT CLAMPS USING SPRING FRICTION ACTION FOR RETENTION IN SUPPORT CHANNEL AS APPLICABLE.	9.19.3.	LUMBER SHALL BE PRESERVATIVE TREATED IN ACCORDANCE WITH AWPB LP-2, AND KILN DRIED TO A MOISTURE CONTENT OF NOT MORE THAN 19 PERCENT.	10.23.	WHERE CABLE CONNECTIONS REQUIRE INSULATION, SCOTCH #33, ELECTRICAL TAPE SHALL BE USED FOR WRAPPING.	13.4.4.	RECEPTACLES SHALL BE HEAVY DUTY GROUNDING TYPE, 20 AMP 125 VOLT RATED, HUBBELL #5362 - IVORY OR BROWN, AND/OR SELECTED BY ARCHITECT TO MATCH FINISHES. FOR OTHER TYPES/STYLES ETC. AND APPLICATIONS SEE DRAWINGS.
8.11.4.	A SEPARATE GROUNDING CONDUCTOR SHALL BE INSTALLED IN ALL RUNS. WHERE SIZES LARGER THAN #12 AWG ARE REQUIRED BY THE NEC, THE CONDUCTOR SHALL BE SIZED AS INDICATED IN THE NEC. ALL GROUNDING CONDUCTORS SHALL HAVE A GREEN OUTER COVERING, OR GREEN MARKING TAPE OVER THEIR ENTIRE EXPOSED LENGTHS.	9.20.	CONDUIT SHALL BE SUPPORTED BY APPROVED STRAPS, FASTENERS AND HANGERS.	9.19.4.	PROVIDE MARINE GRADE PRODUCTS WHERE SUBJECT TO MOISTURE CONDITIONS.	10.24.	THE CONDUCTORS TERMINATING AT EACH WIRED OUTLET SHALL BE LEFT NO LESS THAN 8" LONG AT THE IR OUTLET FITTINGS TO FACILITATE INSTALLMENT OF DEVICES OR LUMINAIRES.	13.4.4.1.	GFCI RECEPTACLES - STRAIGHT BLADE, FEED OR NON-FEED THROUGH TYPE. COMPLY WITH NEMA WD 1, NEMA WD 6, UL 498, AND UL 943, CLASS A, AND INCLUDE INDICATOR LIGHT THAT IS LIGHTED WHEN DEVICE IS TRIPPED.
		9.21.	PERFORATED STRAPS WILL NOT BE ACCEPTABLE.	9.19.5.	PROVIDE SIMPSON STRONG TIE (OR EQUAL) EXPANSION SCREW ANCHORS.	10.25.	MAKE TERMINATIONS SO THERE IS NO BARE CONDUCTOR AT THE TERMINAL.	13.4.5.	COMMUNICATIONS OUTLETS
		9.6.1.	HANGERS SHALL BE SUSPENDED FROM THREADED RODS.	9.19.6.	CUT, FIT, AND PLACE WOOD JOISTS, NAILERS, BLOCKING, AND ANCHORAGE ACCURATELY IN LOCATION, ALIGNMENT, AND ELEVATION TO SUPPORT AND ANCHOR ELECTRICAL MATERIALS AND EQUIPMENT.	10.26.	GROUND AND BONDING CONDUCTORS FOR ELECTRICAL SYSTEMS	13.4.5.1.	TELEPHONE OUTLET - SINGLE RJ-45 JACK FOR TERMINATING 100-OHM, BALANCED, FOUR-PAIR UTP; TIA/EIA-568-B.1; COMPLYING WITH CATEGORY 5E. COMPLY WITH UL 1063.
		9.6.2.		9.19.7.	SELECT FASTENER SIZES THAT WILL NOT PENETRATE MEMBERS WHERE OPPOSITE SIDE WILL BE EXPOSED TO VIEW OR WILL RECEIVE FINISH MATERIALS.	10.27.	ALL METALLIC CONDUIT, SURFACE RACEWAYS, WIREWAYS, SUPPORTS, CABINET AND EQUIPMENT SHALL BE GROUNDING.	13.4.5.2.	COMBINATION 5E AND TELEPHONE OUTLET - SINGLE RJ-45 JACK FOR 100-OHM, BALANCED, FOUR-PAIR UTP; TIA/EIA-568-B.1; COMPLYING WITH CATEGORY 5E; AND ONE TYPE F COAXIAL CABLE CONNECTOR.
				9.19.8.	MAKE TIGHT CONNECTIONS BETWEEN MEMBERS. INSTALL FASTENERS WITHOUT SPLITTING WOOD MEMBERS. ATTACH TO SUBSTRATES AS REQUIRED TO SUPPORT APPLIED LOADS.	10.28.	DO NOT SHARE NEUTRALS WHEN AMONGST MULTIPLE BRANCH CIRCUITS OR WITH MULTI-WIRE BRANCH CIRCUITS.	13.4.6.	UNLESS SPECIFICALLY INDICATED OTHERWISE, OR DIRECTED OTHERWISE IN FIELD, PROVIDE ALMOND COLOR FOR NORMAL UTILITY WIRING DEVICES.
				9.19.9.	ATTACHMENTS TO WOOD STRUCTURAL MEMBERS: PROVIDE BOLTS INSTALLED THROUGH MEMBERS.	10.29.	UNLESS SPECIFICALLY INDICATED OTHERWISE ON DRAWINGS, PROVIDE	13.5.	PROVIDE SMOOTH FINISH PLATES FOR ALL DEVICES WITH APPROPRIATE MOUNTING ARRANGEMENTS FOR GAUGED DEVICES.
				9.20.	MOUNTING TO NEW CONCRETE: PROVIDE CHANNEL-TYPE CONCRETE INSERTS AND BOLT TO INSERTS, OR PROVIDE EXPANSION ANCHORS FOR APPLICATIONS WHERE INSERTS ARE NOT PRACTICAL.	10.30.		13.5.1.	FOR TELEPHONE, COMPUTER, AND MICROPHONE OUTLETS PROVIDE BUSHED HOLE COVER PLATES.
				9.21.	MOUNTING TO EXISTING CONCRETE: EXPANSION ANCHOR FASTENERS. INSTEAD OF EXPANSION ANCHORS, POWDER/GAS-ACTUATED DRIVEN THREADED STUDS PROVIDED WITH LOCK WASHERS AND NUTS MAY BE USED IN EXISTING STANDARD-WEIGHT CONCRETE 4 INCHES THICK OR GREATER. DO NOT USE FOR ANCHORAGE TO LIGHTWEIGHT-AGGREGATE CONCRETE OR FOR SLABS LESS THAN 4 INCHES THICK. DO NOT USE FOR WORK ANCHORED TO NEWLY INSTALLED CONCRETE. ONLY USE THIS METHOD WHERE OTHER METHODS CANNOT OR SHOULD NOT BE USED, AND ONLY AFTER RECEIVING CASE-BY-CASE PERMISSION FROM	10.31.		13.5.2.	PLATES SHALL BE IVORY, BROWN, OR GRAY STAINLESS STEEL.
						10.32.		13.5.2.1.	WALL PLATES IN FINISHED AREAS SHALL BE COMMERCIAL SPECIFICATION GRADE, SATIN FINISH STAINLESS STEEL, WITH BEVELED EDGES, EQUAL TO LEVITON TYPE 430 SERIES.
						10.33.		13.5.3.	GRAY STAINLESS STEEL PLATES FOR SERVICE AREAS, KITCHEN STORAGE, AND RESTROOMS.
						10.34.		13.5.4.	IVORY DEVICES WHERE 302 STAINLESS STEEL OR IVORY PLATES ARE USED.
						10.35.		13.5.5.	IVORY PLATES FOR ALL OTHER AREAS EXCEPT BROWN PLATES ON WOOD OR DARK SURFACES.
						10.36.		13.5.5.1.	BROWN DEVICES WHERE BROWN PLATES ARE USED.
						10.37.		13.5.6.	PROVIDE WALL PLATES WITH ENGRAVED LEGENDS WHERE INDICATED ON DRAWINGS AND/OR WHERE REQUIRED.

DIVISION 26 - ELECTRICAL SPECIFICATIONS

	WET-LOCATION, WEATHERPROOF COVER PLATES - NEMA 250, COMPLYING WITH TYPE 3R WEATHER-RESISTANT, DIE-CAST ALUMINUM OR THERMOPLASTIC WITH HINGED LOCKABLE COVER.		PHASES ARE CORRECTLY CONNECTED BY CHECKING ROTATION OF MOTOR.		WITH FIXTURE PLAN AND EQUIPMENT INSTALLER.		ALL RECESSED LUMINAIRES SHALL BE EQUIPPED WITH NECESSARY PLASTER FRAMES AND SURFACE TRIM.	
		15.8.	DRAWINGS INDICATE MINIMUM MOTOR HORSEPOWER RATINGS.		15.14.2.	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.	16.17.7.	ALL JUNCTION BOXES AND SERVICEABLE COMPONENTS FOR RECESSED LUMINAIRES SHALL BE READILY ACCESSIBLE FOR SERVICE OR REPLACEMENT FROM BELOW THE CEILING, WITHOUT REMOVING ANY CEILING COMPONENTS (OTHER THAN TILES).
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.		16.	LIGHTING FIXTURES	16.17.8.	STEM LENGTHS OF ALL PENDANT FIXTURES SHALL BE AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
13.6.	FLOOR SERVICE FITTINGS	15.8.2.	MINIMUM MOTOR EFFICIENCIES SHALL NOT BE LESS THAN THAT SET FORTH IN THE LOCAL ENERGY CODE.		16.1.	FURNISH AND INSTALL A COMPLETE LIGHTING FIXTURE FOR EACH LIGHTING FIXTURE SYMBOL SHOWN ON THE DRAWINGS, OF THE TYPE AND QUALITY DESCRIBED HEREIN.	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.
13.6.1.	TYPE - MODULAR, FLUSH-TYPE, FLAP-TYPE, OR ABOVE-FLOOR, DUAL-SERVICE UNITS SUITABLE FOR WIRING METHOD USED.	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.	16.17.10.	FASTENERS SHALL BE ZINC-COATED, TYPE, GRADE, AND CLASS AS REQUIRED FOR A NEAT FINISHED INSTALLATION.
13.6.2.	COMPARTMENTS - BARRIER SEPARATES POWER FROM VOICE AND DATA COMMUNICATION CABLEING.	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.	16.18.	LIGHTING CONTROL DEVICES
13.6.3.	SERVICE PLATE - RECTANGULAR OR ROUND, DIE-CAST ALUMINUM OR SOLID BRASS WITH SATIN FINISH.	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.	16.18.1.	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.	ALL FIXTURES SHALL BE WIRED FOR POLARIZED SYSTEM WITH ONE WIRE IN EACH FIXTURE TO BE DISTINCTLY MARKED FOR ITS ENTIRE LENGTH.	16.18.1.1.	PROVIDE WATTSTOPPER DW-100 WALL SWITCH (OR EQUIVALENT) AND CONFIGURE AS MANUAL ON, 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.		16.4.1.	WIRE SHALL BEAR THE LABEL OF APPROVAL OF THE UNDERWRITERS LABORATORIES, INC.	16.18.2.	OCCUPANCY SENSORS, DUAL TECHNOLOGY CEILING SENSORS:
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		16.4.2.	TYPE AF WIRE SHALL ONLY BE USED FOR INTERIOR INCANDESCENT FIXTURE WIRING.	16.18.3.	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.
13.8.	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		16.5.	ALL FIXTURES SHALL BE IN ACCORDANCE WITH ALL LOCAL MUNICIPAL AND STATE REQUIREMENTS GOVERNING SAME AND SHALL BE U.L. APPROVED.	16.18.4.	PROVIDE WATTSTOPPER BZ-50 UNIVERSAL VOLTAGE PACK(S) AS REQUIRED TO PROPERLY POWER ALL OCCUPANCY SENSORS AND PROVIDE SWITCHING PER THE DESIGN INTENT.
13.9.	SCREW HEADS COLORED TO MATCH FINISH OF PLATES.	15.11.1.1.	SQUARE D COMPANY		16.6.	EACH FIXTURE SHALL BE COMPLETELY EQUIPPED WITH LAMPS OF THE SIZE, TYPE, WATTAGE AND SHAPE INDICATED AND SPECIFIED.	16.18.5.	IN AREAS WHERE MULTIPLE OCCUPANCY SENSORS CONTROL A SINGLE ZONE TOGETHER, INTERLOCK OCCUPANCY SENSORS/POWER PACKS PER MANUFACTURER INSTRUCTIONS TO MEET CONTROL INTENT.
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		16.6.1.	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.
		15.11.1.3.	SIEMENS		16.6.2.	LUMEN OUTPUT AND LIFE OF LAMPS SHALL BE PROPER VOLTAGE FOR THE BUILDING.		
14.	PANEL BOARDS	15.11.2.	FURNISH AND INSTALL SAFETY SWITCHES WHERE INDICATED AND AS REQUIRED FOR MOTOR OUTLETS OR OTHER EQUIPMENT. SWITCHES SHALL BE OF SIZE, NUMBER OF POLES AND FUSED OR NON-FUSED, AS REQUIRED FOR JOB CONDITIONS AND THE NATIONAL ELECTRICAL CODE.		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 "NQ", "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 BUSSING 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.	PROVIDE AN EXTERNAL "HAND-OFF-AUTO SELECTOR SWITCH WITH RED "RUNNING" LIGHT.		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.	PROVIDE A GREEN LIGHT TO INDICATE MOTOR "STOPPED".		16.16.	INCANDESCENT LIGHT FIXTURES		
14.5.4.	CONSTRUCT WITH MULTIPLE KNOCKOUTS AND WIRING GUTTERS.	15.12.2.3.	EACH PILOT LIGHT SHALL HAVE A LEGEND PLATE INDICATING REASON FOR SIGNAL.		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 PIANO DOOR HINGES.	15.12.2.4.	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.	MOUNTING		
14.5.6.	EQUIP WITH INTERIOR CIRCUIT DIRECTORY FRAME, AND CARD WITH CLEAR PLASTIC COVERING.	15.12.2.5.	ALL MOTORS STARTERS, PUSH BUTTONS AND PILOT LIGHTS SHALL BE OF THE SAME MANUFACTURER AS THE SWITCHBOARD.		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 REPLACING 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.	15.12.3.	MOTOR STARTERS FOR THE FOLLOWING EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 23 BY THE MANUFACTURER OF THE EQUIPMENT:		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.	PROVIDE ENCLOSURES FABRICATED BY SAME MANUFACTURER AS PANELBOARDS.	15.12.3.1.	PACKAGED AIR CONDITION EQUIPMENT		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.		
14.5.9.	MINIMUM DEPTH OF 5-3/4" & MINIMUM WIDTH OF 20" FOR PANELS.	15.12.3.2.	PACKAGED BOOSTER PUMP SYSTEM			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.		
14.5.10.	SEE PANEL SCHEDULE NOTES FOR SPECIFIED ALTERNATE SPECIAL CONDITIONS.	15.12.3.3.	OTHER EQUIPMENT HEREINAFTER IN OTHER SECTIONS TO BE PROVIDED WITH INTEGRAL STARTERS.		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.	15.13.	UNLESS OTHERWISE NOTED OR SPECIFIED IN INDIVIDUAL SECTION, 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 OUTDOOR SERVICES AND A SERVICE FACTOR OF 1.15. ALL MOTORS 5 HP AND LARGER SHALL BE U.S. MOTORS HI-EFFICIENCY MODEL OR RELIANCE XE HI-EFFICIENCY MODEL.		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.	15.14.	EQUIPMENT CONNECTION COORDINATION					
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.	15.14.1.	COORDINATE EXACT LOCATION OF OUTLETS, EQUIPMENT CONNECTIONS, AND REQUIREMENTS PRIOR TO ROUGH-IN AND INSTALLATION OF DEVICES. AS DETERMINED BY THE ACTUAL EQUIPMENT AND FURNITURE LAY OUT. VERIFY					
15.	MOTOR LOAD CONNECTIONS							
15.1.	PROVIDE ALL POWER WIRING AND CONNECTIONS FROM SOURCE TO STARTER, STARTER TO DISCONNECT, AND DISCONNECT TO MOTOR OR DEVICE, EXCEPT WHERE SUCH WIRING IS PROVIDED BY EQUIPMENT MANUFACTURER.	15.12.3.	MOTOR STARTERS FOR THE FOLLOWING EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 23 BY THE MANUFACTURER OF THE EQUIPMENT:					
15.2.	ALL AUTOMATIC TEMPERATURE CONTROL WIRING SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23 - MECHANICAL, UNLESS INDICATED OR SPECIFIED OTHERWISE. HOWEVER, ELECTRICAL CONTRACTOR SHALL PROVIDE AND INSTALL ALL STARTERS AND MAKE ALL POWER CONNECTIONS.	15.12.3.1.	PACKAGED AIR CONDITION EQUIPMENT					
15.3.	MANUAL CONTROL SWITCHES SHALL BE FURNISHED AND/OR INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED.	15.12.3.2.	PACKAGED BOOSTER PUMP SYSTEM					
15.4.	VARIABLE FREQUENCY DRIVES (VFD) SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR.	15.12.3.3.	OTHER EQUIPMENT HEREINAFTER IN OTHER SECTIONS TO BE PROVIDED WITH INTEGRAL STARTERS.					
15.5.	FURNISH AND INSTALL A DISCONNECT FOR EACH MOTOR (UNLESS PROVIDED INTEGRAL BY MANUFACTURER).							
15.6.	DISCONNECTS SHALL BE FUSED OR UNFUSED SAFETY SWITCHES AS REQUIRED.							
15.7.	UPON COMPLETION OF MOTOR INSTALLATION WORK, CONTRACTOR SHALL ENSURE							

NY ENGINEERS

REVISIONS

NO. DESCRIPTION BY DATE

JOB LOCATION:

ELECTRICAL SPECIFICATIONS 3 OF 3

SHEET

E5.2

EBB STORE#:

FILE#:

DATE:

PROJ. MGR.

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 NONACCESSIBLE 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 SCORRIATED 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. TAIL PIECES FOR SINKS SHALL BE 17 GAUGE CHROME PLATED FLARED BRASS TUBING FOR CONNECTION TO 1-1/2" I.P.S. MALE THREAD FITTINGS. "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)










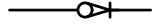
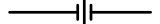













FIELD VERIFY ALL CONDITIONS

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 AND 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
EWB	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 SCHDULE
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

REVISIONS
NO. DESCRIPTION BY DATE

JOB LOCATION:

GENERAL NOTES AND
LEGEND

SHEET

P0.0

EBB STORE#:

FILE#:

DATE:

PROJ. MGR.

KEYED NOTES

- 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.
- ROUTE WATER HEATER T&P DRAIN LINES TO MOP SINK WITH AIR GAP.
- CONTRACTOR TO ROUTE INDIRECT DRAIN FROM DUMP SINK, COFFEE MAKER, AUTOMATIC ESPRESSO & ICE MAKER TO ADJACENT FLOOR SINK WITH PROPER AIR GAP.
- 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.
- ROUTE INDIRECT DRAIN FROM 1 AND 3 COMPARTMENT SINK TO ADJACENT FLOOR SINK WITH AN APPROVED AIR GAP AS PER LOCAL CODE.
- 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.
- 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.
- 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.
- 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.
- PROVIDE ONE SPARE SEWAGE EJECTOR PUMP. STORE THE SPARE PUMP FOR CLIENT'S STOCK.

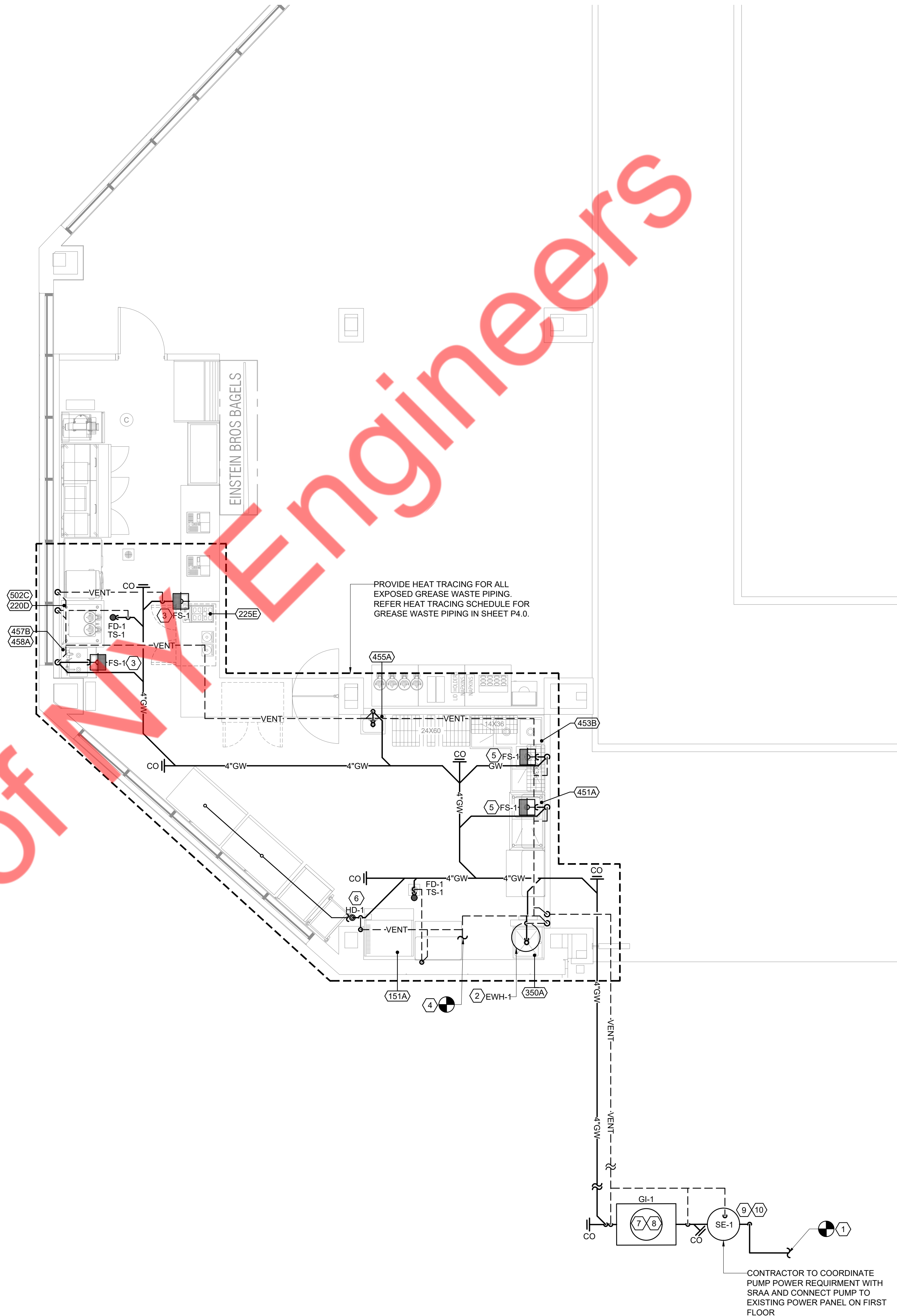
GENERAL NOTES

- ALL PIPING SHALL BE SNAKE CLEAN PRIOR TO CONNECTION.
- 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.
- ALL DRAIN, WASTE AND VENT FITTINGS SHALL BE CAST IRON PIPE.
- PLUMBING IS NOT PERMITTED IN ANY DEMISING PARTITIONS. FURROUT THE WALL AS NECESSARY.
- 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.
- ALL FLOOR DRAINS ARE REQUIRED TO HAVE TRAP SEAL PROTECTION DEVICE.
- ANY UNUSED PLUMBING EQUIPMENT, PIPING, ETC., WITHIN OR SERVING THE PREMISES MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN. DO NOT ABANDON IN PLACE.
- ALL FLOOR PENETRATIONS MUST BE CORE BORED, SLEEVED, GROUTED, SEALED AND MADE WATERPROOF. FLOOR DRAIN MASTIC MUST BE PROVIDED TO PROTECT FOR LEAKS BELOW. SLEEVES MUST EXTEND A MINIMUM OF 4" AFF.
- IF NOT ALREADY EXISTING, INSTALL A SHUT OFF VALVE ON DOMESTIC WATER LINE INSIDE SPACE.
- 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.
- 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.
- PROVIDE ACCESS PANEL FOR CLEANOUTS AND ALL CONCEALED EQUIPMENTS THAT REQUIRE MAINTENANCE ACCESS. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR LOCATION.
- PROVIDE WALL CLEANOUTS WHEREVER POSSIBLE FOR EACH CHANGE IN DIRECTION OF MORE THAN 45 DEG.
- REFER RISER DIAGRAMS FOR PIPE SIZES.

1
P1.0

SANITARY AND VENT PLAN

1/4" = 1'-0"



REVISIONS
NO. DESCRIPTION BY DATE

JOB LOCATION:

SANITARY AND VENT
PLAN

SHEET

P1.0

EBB STORE#:

FILE#:

DATE:

PROJ. MGR.

KEYED NOTES 

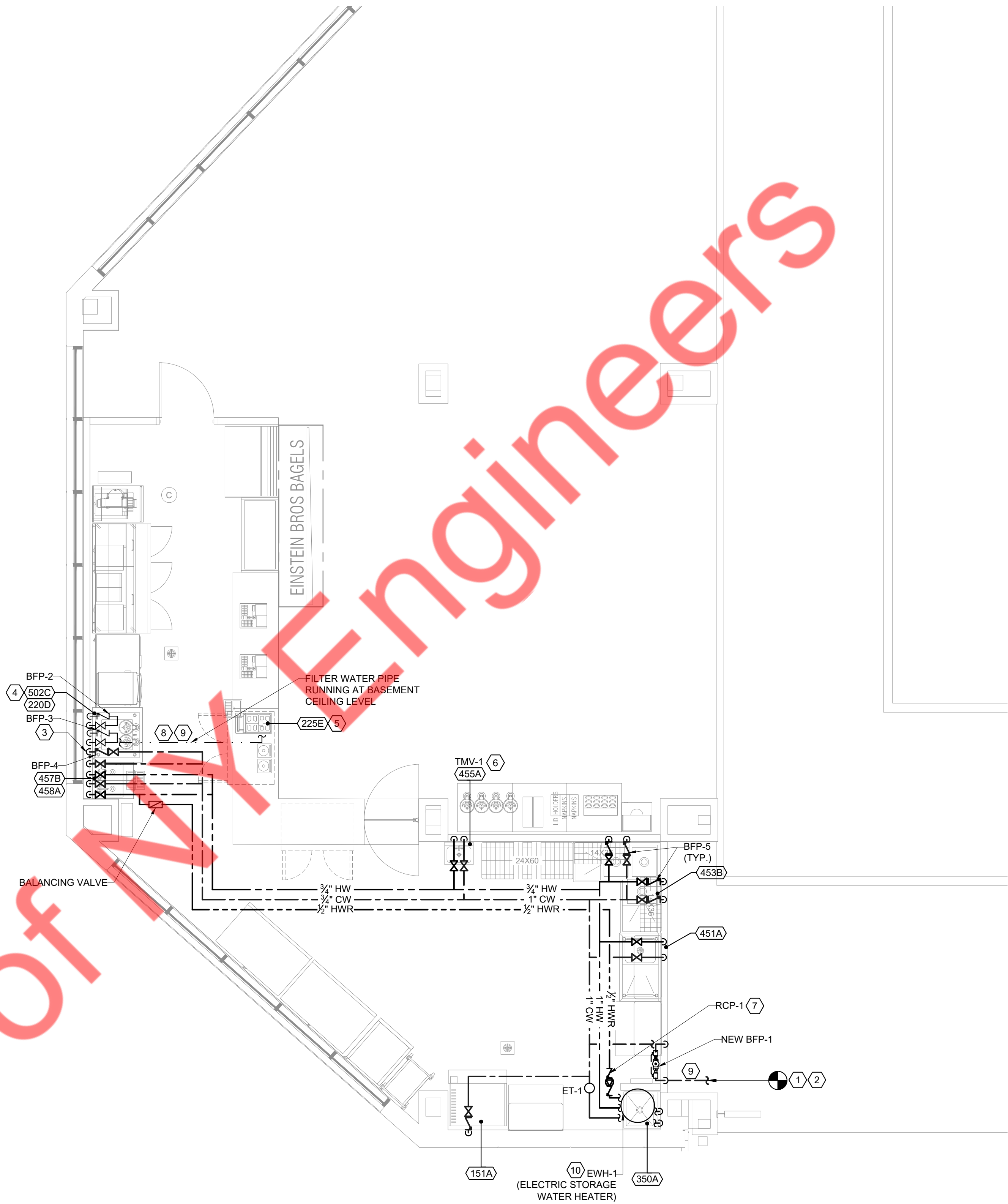
1. FIELD VERIFY AND TAKE TAP OFF FROM EXISTING HOT TAP/ ACTIVE LINE. CONNECT NEW 1" CW TO EXISTING PIPING. FIELD VERIFY EXISTING PIPING IS EQUAL TO OR GREATER THAN THE NEW PIPING BEING CONNECTED TO IT. PROVIDE NEW BFP-1 AS REQUIRED BY LOCAL AND STATE CODES. NOTIFY ARCHITECT OF ANY CONFLICTS.
2. ROUTE WATER LINE AFTER FIELD VERIFYING EXACT LOCATION OF POINT OF CONNECTION.
3. ROUTE 3/4" CW DOWN IN WALL. STUB OUT TO WATER FILTER CONNECTION SERVING COFFEE MAKER, AUTOMATIC ESPRESSO AND ICE MAKER.
4. 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.
5. 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.
6. PROVIDE MIXING VALVE WATT'S SERIES TO HAND SINK FAUCETS CONFORMING TO ASSE 1070 (TMV-1).
7. 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).
8. CONTRACTOR TO FIELD VERIFY AND CONNECT THE PIPE AS PER THE SITE CONDITIONS.
9. 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.
10. 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 C403.11.3.
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.



REVISIONS		
NO.	DESCRIPTION	DATE

JOB LOCATION:

WATER SUPPLY PLAN

SHEET	
P2.0	
EBB STORE#:	
FILE#:	
DATE:	
PROJ. MGR.	

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-CABONATED 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	#160 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			HEAD IN FEET
				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	¾	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)
		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.							-PROVIDE CONNECTION KITS AND ACCESSORIES, SPICES, POWER CONNECTIONS, TEE KITS CROSS CONNECTIONS, TAPE, ETC., -PROVIDE AN AMBIENT THERMOSTAT SENSING RTD-200 BY RAYCHEM -PROVIDE ONE CONTROLLER ACS-30 FOR ALL DATA ELECTRIC CIRCUITS. -PROVIDE MAX. FIVE(5) CIRCUITS PER PANEL ACS-PCM2-5

MARK	FIXTURE TYPE	DESCRIPTION	FIXTURE CONNECTIONS				MANUFACTURER: MODEL NUMBER
			CW	HW	W	V	
FD-1	FLOOR DRAIN	TYPE "N" STRAINER. PROVIDE WITH COMPLETE BODY ASSEMBLY WITH TRAP PRIMER CONNECTION.	-	-	3" / 4"	2"	ZURN: MODEL #Z-415
FS-1	FLOOR SINK	TYPE "K" FLOOR SINK IN KITCHEN AND FOOD SERVICE AREAS SHALL BE J.R. SMITH 3000 SERIES WITH SEDIMENT BUCKET AND 12 1/2" NICKEL BRONZE SQUARE TOP 10" DEEP 1/2 GRATE. PROVIDE WITH PERMADRAIN LOW PRO LOCKING DOME STRAINER KIT. SEE PLAN FOR LOCATION.	-	-	3"	2"	J.R.SMITH: 3000 SERIES
HD-1	HUB DRAIN	HUB DRAIN	-	-	3"	2"	-
TS-1	TRAP SEAL	PROVIDE WITH DISTRIBUTION UNIT AS REQUIRED	-	-	-	-	ZURN: Z1072
TMV-1	MIXING VALVE	THERMOSTATIC MIXING VALVE. MOUNT VALVE BELOW FIXTURE. SET TEMPERATURE TO 110°F	-	-	-	-	POWERS: LFE480
RCP-1	RECIRCULATING PUMP	1/15 HP, 120V/1PH, 2 GPM @ 8 FT. HEAD	1"	-	-	-	BELL&GOSSETT: MODEL NBF-8S/LW
CO	CLEANOUT	SIZE PER PIPING	-	-	-	-	-
EWH-1	ELECTRIC TYPE STORAGE WATER HEATER	STORAGE ELECTRIC WATER HEATER, 50 GALLONS STORAGE WITH 61 GPM RECOVERY AT 100°F RISE, 15 KW, 480V, 3 PHASE INPUT, 66.19" HEIGHT & 22" DIA REFER MANUFACTURER RECOMMENDATIONS FOR CLEARANCES	1"	1"	-	-	AO SMITH: DSE-50A
GI-1	GREASE INTERCEPTOR	INTERIOR SCHIER GB-75 GREASE INTERCEPTOR, REFER MANUFACTURER INSTALLATION MANUAL	-	-	4"	2"	SCHIER GB-75
ET-1	EXPANSION TANK	AMTROL ST-5 EXPANSION TANK, 2 GALLON TANK VOLUME, 0.9 ACCEPTANCE VOLUME WITH PRESSURE RATING 150 PSI.	-	-	-	-	AMTROL ST-5
NOTES: 1. THERMAL EXPANSION TANK FURNISHED AND INSTALLED BY CONTRACTOR. 2. SET DISCHARGE TEMPERATURE OF WATER HEATER TO OPERATE AT 140 DEG F. 3. TEMPERATURE AND PRESSURE RELIEF VALVE FURNISHED AND INSTALLED BY CONTRACTOR. 4. REFER TO DETAIL FOR ADDITIONAL COMPONENTS AND CONFIGURATION. 5. PROVIDE MANUFACTURER'S VENT TERMINATION KIT FOR COMBUSTION AIR AND DISCHARGE OF FLUE GASES. 6. ALL TEMPERATURE AND PRESSURE RELIEF VALVES SHALL BE PIPED FULL SIZE TO INDIRECT WASTE SUCH AS THE NEAREST FLOOR DRAIN.							

EQUIPMENT SCHEDULE									
ITE M NO.	QT Y.	EQUIPMENT CATEGORY	COLD WATER SIZE (IN)	HOT WATER SIZE (IN)	DIRECT DRIAN SIZE (IN)	INDIRECT DRIAN SIZE (IN)	MBTUH	GAS SIZE (IN)	PLUMBING REMARKS
453A	1	3-COMPARTMENTS	3/4	3/4	-	(3)1-1/2	-	-	RUN IW TO FLOOR SINK; MANIFOLD DRAINS
451A	1	SINK, SCULLERY, 1 COMPARTMENT SINK	1/2	1/2	-	-	-	-	-
350A	1	MOP SINK	3/4	3/4	3	-	-	-	VERIFY REQUIREMENTS WITH LOCAL JURISDICTION
151A	1	DOUBLE CONVECTION OVEN	1/4	-	-	-	-	-	-
-	-	-	1/4	-	-	-	-	-	-
220D	1	COFFEE MAKER	1/2	-	-	3/4	-	-	RUN IW TO FLOOR SINK; MANIFOLD DRAINS
225E	1	AUTOMATIC ESPRESSO	1/2	-	-	3/4	-	-	RUN IW TO FLOOR SINK; MANIFOLD DRAINS
455A	1	WALL MOUNTED HAND SINK	1/2	1/2	2	-	-	-	-
457B	1	DROP-IN HAND SINK	1/2	1/2	-	1-1/2	-	-	PC TO RUN IW TO FLOOR SINK
458A	1	DROP-IN DUMP SINK	1/2	1/2	-	1-1/2	-	-	PC TO RUN IW TO FLOOR SINK
502C	1	ICE MAKER W/O BIN	1/2	-	-	3/4	-	-	PC TO RUN IW TO FLOOR SINK

DOMESTIC WATER SUPPLY FIXTURE UNITS								
TYPE OF FIXTURE	TYPE OF SUPPLY CONTROL	QUANTITY	HW (EACH)	HW (TOTAL)	CW (EACH)	CW (TOTAL)	TOTAL (EACH)	TOTAL (F.U.'S) (TOTAL)
HAND SINK	FAUCET	3	1.5	4.50	1.5	4.50	2.0	6.00
MOP BASIN	FAUCET	1	2.25	2.25	2.25	2.25	3.0	3.00
3-COMPARTMENT SINK FAUCET / PREP SINK	FAUCET	1	3.0	3.00	3.0	3.00	4.0	4.00
1-COMPARTMENT SINK FAUCET	FAUCET	1	3.0	3.00	3.0	3.00	4.0	4.00
COFFEE MAKER	VALVE	3	0.0	0.00	0.5	1.50	0.5	1.50
ICE MAKER	VALVE	1	0.0	0.00	0.5	0.50	0.5	0.50
						HW	CW	TOTAL (FIXTURE UNITS) (TOTAL)
SERVICE TOTAL FIXTURE UNITS:						12.75	14.75	19.00
SERVICE TOTAL GPM:						16.375 GPM	18.04 GPM	19.2 GPM
SERVICE SIZE:						1"		

ELECTRIC HEAT TRACING CABLE SCHEDULE FOR WATER SUPPLY PIPING							
MAKE	MODEL	ELECTRICAL DATA			DISCIPLINE	FLOOR (AREA)	REMARK
		VOLTAGE	LENGTH (FT.)	WATTS/FT			
RAYCHEM	HWAT-R2	208	17	12 W/FT	PLUMBING	REFER PLAN	-PROVIDE CONNECTION KITS AND ACCESSORIES, SPICES, POWER CONNECTIONS, TEE KITS CROSS CONNECTIONS, TAPE, ETC., -PROVIDE ONE CONTROLLER HWAT-ECO-GF FOR ALL DATA ELECTRIC CIRCUITS.
NOTES: 1. PROVIDE CLEARANCES AS PER MANUFACTURER RECOMMENDATIONS.							

NY ENGINEERS

NO.	DESCRIPTION	BY	DATE

JOB LOCATION:	PLUMBING SCHDULES

SHEET
P4.0
EBB STORE#:
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IF BRANCH IS GREATER THAN 20' LONG, PROVIDE ANOTHER WHA IN MIDDLE, EACH SIZED FOR HALF THE FIXTURE UNITS.

IF HORIZONTAL BRANCH IS LESS THAN 20' LONG, PROVIDE ONE WHA AT END OF LINE.

INSTALL PER PDI STANDARDS AND MANUFACTURERS' INSTRUCTIONS.

PDI SIZE "A"

SINGLE FIXTURE

PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

MULTIPLE FIXTURES

FIXTURE	COLD	HOT
VALVE WATER CLOSET	10	--
TANK WATER CLOSET	5	--
URINAL	5	--
LAVATORY/SINK	1.5	1.5
JANITOR'S SINK	3	3
SHOWER/BATHTUB	2	2

DO NOT PROVIDE AIR CHAMBERS. PROVIDE WATER HAMMER ARRESTERS BY SIXIX CHIEF, PRECISION PLUMBING PRODUCTS, WATTS OR APPROVED EQUIVALENT WITH PISTON AND O-RING CONSTRUCTION, HAVING PDI #WH-201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. INSTALL IN LINE WITH WATER FLOW DIRECTION IF POSSIBLE. SIZE THE UNITS AS SHOWN ON THE DRAWINGS AND/OR PER THE TABLES SHOWN ABOVE.

4 WATER HAMMER ARRESTORS DETAIL NTS

SECURE PIPE HANGER TO STRUCTURE REFER TO SPECIFICATIONS FOR CONNECTIONS

THREADED STEEL ROD WITH NUT AND WASHER BOTH SIDES (TYP)

CLEVIS HANGER, SHOWN FOR CLARITY REFER TO SPECIFICATIONS FOR OTHER HANGER TYPES FOR PIPE SERVED & SPACING

PROVIDE FOR INSULATED PIPING AT EACH HANGER A SECTION OF HIGH DENSITY INSULATION OR STYROFOAM BILLETS REFER TO SPECIFICATIONS FOR MORE INFORMATION

PROVIDE INSULATION SHIELD FOR INSULATED PIPE

3 PIPE HANGER DETAIL NTS

SECURE PIPE HANGER TO STRUCTURE (TYP)

THREADED STEEL ROD WITH NUT AND WASHER BOTH SIDES (TYP)

CLEVIS HANGER, SHOWN FOR CLARITY. SIZE HANGER FOR COLD PIPE OUTSIDE DIAMETER PLUS INSULATION THICKNESS. DO NOT PENETRATE INSULATION WITH HANGER

PROVIDE A SECTION OF HIGH DENSITY INSULATION OR STYROFOAM BILLETS AT EACH HANGER OF COLD INSULATED PIPE

PROVIDE SHORT INSULATION SHIELD FOR LAPPING INSULATION JACKET OVER HIGH DENSITY INSULATION OR STYROFOAM BILLETS. MAINTAIN VAPOR BARRIER

COLD PIPE

HOT PIPE

REFER TO SPECIFICATIONS FOR INSULATION TYPES, INSULATION THICKNESSES, HANGER TYPES, HANGER ROD CONNECTIONS TO STRUCTURE AND HANGER SPACING.

2 INSULATED PIPE HANGER DETAIL NTS

ALL-THREAD ROD, LENGTH AS REQUIRED FOR PIPE SLOPE (TYP.)

CLEVIS HANGER FOR PIPE OVER FOUR INCHES

TOP BEAM C-CLAMP IF STEEL BAR JOIST

ADJUSTABLE BAND HANGER FOR PIPING FOUR INCHES OR LESS

PROVIDE COPPER OR NON-METALLIC COATING WHERE HANGERS CONTACT BARE COPPER WIRE

PROVIDE GALVANIZED STEEL SADDLE FOR ALL INSULATED PIPE LARGER THAN 3/4". VERIFY INSULATION THICKNESS WHEN SIZING HANGERS.

NOTES:

1. PROVIDE UPPER ATTACHMENT AS REQUIRED FOR CASES NOT SHOWN HERE. DO NOT INSTALL HANGER INSIDE INSULATION OR OTHERWISE PENETRATE VAPOR BARRIER.
2. DO NOT HANG ONE PIPE FROM ANOTHER EXCEPT IN CHASES. TRAPEZE HANGERS MAY BE USED FOR MULTIPLE PARALLEL PIPES.
3. HANGER SPACING FOR PIPE SIZE: COPPER: 4"=12' 3"=11' 2-1/2"=10' 2"=9' 1-1/2"=8' 1-1/4"=7' 1"=6' 3/4"=6' 1/2"=5'.
4. CAST IRON: 10' AND ONE NEAR ALL JOINTS.
5. STEEL: 4"=14' 3"=12' 2-1/2"=11' 2"=10' 1-1/2"=9' 1"=7' 3/4"=6' 1/2"=5'.
6. LOCATE HANGERS AS CLOSE AS POSSIBLE TO TURNS AND TEES OF PIPE.
7. PROVIDE SUPPLEMENTARY STEEL STRUTS BETWEEN JOISTS IF REQUIRED.
8. LOCATE HANGERS TO TAKE LOAD OFF OF EQUIPMENT CONNECTIONS.
9. ANCHOR WATER PIPE AGAINST SWAYING DUE TO CHANGES IN WATER VELOCITY.
10. PROVIDE SEISMIC BRACING IF/AS REQUIRED BY LOCAL AUTHORITIES.
11. CHAINS OR PERFORATED STRAP IRON OR STEEL IS NOT ACCEPTABLE. REFER TO CODES FOR FURTHER INFORMATION.

1 PIPE HANGER DETAIL NTS

FIN. FLOOR

COVER

CLEANOUT PLUG AND BODY, SEE SPECS.

ADJUSTING COLLAR

PVC RISER

PVC WYE (WYE WITH REDUCING BRANCH IF MAIN IS OVER 4")

PLUG IF END OF LINE

FLOW

10 FLOOR CLEANOUT DETAIL NTS

PROVIDE CLEANOUT TEE WITH SCREWED COUNTER-SUNK ABS PLASTIC PLUG: TAPERED-THREAD WITH TFE JOINT COMPOUND.

WHERE CLEANOUT TEE IS CONCEALED IN A CHASE OR PARTITION, PROVIDE A ROUND 18 GAUGE STAINLESS STEEL COVER WITH BEVELED EDGES AND FLATHEAD MACHINE SCREW.

CONCRETE FLOOR SLAB

COLUMN OR PARTITION AS SHOWN ON FLOOR PLAN

NOTE: CLEANOUT FACE SHALL BE WITHIN 4" OF WALL SURFACE. PROVIDE PIPE EXTENSION IF REQUIRED.

REFER TO PLUMBING FIXTURE SCHEDULE FOR FURTHER INFORMATION.

PROVIDE WCO AT BASE OF ALL RAIN-LEADER DOWNSPOUTS. PROVIDE WCO WHERE SHOWN ON PLAN, AND ON SANITARY WASTE BRANCHES NOT SERVED WITH A FLOOR CLEANOUT. LOCATE ABOVE FIXTURE FLOOD RIM WITHIN 4' OF FLOOR. CONSULT LOCAL CODES FOR OTHER WCO REQUIREMENTS.

9 WALL CLEAN OUT DETAIL NTS

TOP OF STRAINER TO BE FLUSH WITH FINISHED FLOOR, COORDINATE WITH ARCHITECTURAL PLANS

CUT OFF EXCESSIVE RING IF REQUIRED

FINISHED FLOOR ON REQUIRED SETTING BED (SEE ARCHITECTURAL FOR FLOOR SLOPES)

ADJUSTABLE DRAIN HEAD

TRAP PRIMER CONNECTION (WHEN REQUIRED)

DRAIN BODY

PIPE

INSIDE CAULK

DRAIN SUPPORT STRAP

8 FLOOR DRAIN DETAIL NTS

FLOOR GRATE

MOUNT FLUSH W/ FLOOR

DRAIN LINE

FINISHED FLOOR (SEE ARCHITECTURAL PLANS FOR FLOOR SLOPES)

AIR GAP=2X"D"

ABS DOME STRAINER

7 FLOOR SINK DETAIL NTS

AQUASTAT FOR CONTROL OF PUMP

FLOW

REDUCING TEE (OR TEST PLUG FOR INSERTION OF GAUGE)

STRAINER

CIRCULATION PUMP

UNION

CHECK VALVE

FOR CONTINUATION AND SIZE, SEE FLOOR PLAN

PROVIDE INSULATION AND SUPPORT SYSTEM

6 IN-LINE CIRCULATING PUMP DETAIL NTS

PROVIDE CLEANOUTS IN TURNS/ENDS OF PIPE. USE DWV FITTINGS IF SIZE IS LARGER THAN 1".

SLOPE PIPE AS MUCH AS POSSIBLE TOWARD DISCHARGE.

MAKE CONNECTION TO EQUIPMENT AS REQUIRED.

MAKE PIPE MINIMUM ONE SIZE LARGER THAN EQUIPMENT CONNECTION. MINIMUM 3/4". USE "M" OR "L" HARD COPPER UP TO 1" AND TYPE DWV FOR LARGER.

ROUTE PIPE INCONSPICUOUSLY AND UNOBTUSIVELY. HANG PIPE AS REQUIRED. DO NOT INSULATE INDIRECT DRAIN PIPE WHEN INSTALLED IN FOOD SERVICE FACILITY. REFER TO LOCAL CODES FOR FURTHER INFORMATION.

DISCHARGE INTO GRATE OF FLOOR SINK WITH AIR GAP SUFFICIENT TO REMOVE GRATE AND STRAINER. MINIMUM GAP = TWICE PIPE DIAMETER.

PROVIDE TRAP AND 6" HIGH PIPE VENT OPEN TO ATMOSPHERE WHEN DRAIN LINE IS LONGER THAN 5'

5 INDIRECT DRAIN DETAIL NTS

3/4" PIPE FROM COLD WATER SUPPLY TO WATER HEATER, WITH NO CHECK VALVES INTERVENING

PIPE HANGER NEXT TO ELBOW

PROVIDE DIELECTRIC PIPE UNION AT TANK CONNECTION FOR CONNECTION OF DISSIMILAR METALS

FDA-COMPLIANT BUTYL DIAPHRAGM

WELDED STEEL EXPANSION TANK WITH POLYPROPYLENE LINING, NSF APPROVED FOR DOMESTIC WATER SERVICE

AIR CHARGING VALVE. FILL TANK WITH AIR PRESSURE TO MATCH WATER PRESSURE.

PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. FOLLOW MANUFACTURERS' INSTRUCTIONS FOR INSTALLATION PROCEDURE. VERIFY PROPER OPERATION WHEN INSTALLED. PROVIDE SEISMIC STRAP OR BRACING WHEN REQUIRED BY LOCAL AUTHORITIES.

13 SMALL EXPANSION TANK DETAIL NTS

140° HW SUPPLY

140° TEMPERED WATER TO PLUMBING FIXTURES

BALL VALVE

THERMOMETER

2" MIN.

CHECK VALVE

COLD WATER SUPPLY

PROVIDE 2FT. MIN. HEAT TRAP IF NOT PROVIDED AT HEATER OR IF VALVE IS LOCATED AWAY FROM HEATER.

DETAIL NOTES:

1. SURFACE MOUNTED THERMOSTATIC MIXING VALVE ASSEMBLY TO BE SYMMONS SERIES 5 OR APPROVED EQUAL. 15 PSI MAXIMUM PRESSURE DROP. COORDINATE FINAL SELECTION WITH FLOW AND PRESSURE TESTS TO ENSURE PROPER OPERATION.
2. SEE PLANS FOR HW SIZES FROM WATER HEATER SYSTEM TO MIXING VALVE ASSEMBLY. REDUCE AT ASSEMBLY AS REQUIRED.
3. INSTALL PER MANUFACTURERS PUBLISHED RECOMMENDATIONS.
4. MOUNT ABOVE ACCESSIBLE CEILING.

12 THERMOSTATIC MIXING VALVE DETAIL NTS

WATER TIGHT SEAL WITH CODE APPROVED MATERIAL (GROUT, CONCRETE, SILICONE, ETC.) AROUND PERIMETER OF SLEEVE BY GENERAL CONTRACTOR

FINISHED FLOOR BY GENERAL CONTRACTOR

FLOOR SLAB

SIZE PER PLAN / SCHEDULE

STUB-UP SLEEVE 4" (MIN.) TO 6" (MAX.) ABOVE FINISHED FLOOR OR CURB

24" RADIUS WIDE SWEEP BENDS OR (2) 45 ELBOWS - DO NOT USE 90 ELBOW

NOTE: GENERAL CONTRACTOR OR HIS SUB-CONTRACTORS TO PROVIDE & INSTALL CODE APPROVED BEVERAGE / REFRIGERATION LINE SLEEVE MATERIAL (PVC, EMT, ETC.) VERIFY W/LOCAL AND/OR STATE CODES SUCH AS PROVIDED BY:

KELLY SYSTEMS, INC. 422 NORTH WESTERN AVENUE CHICAGO, IL 60612 PHONE: 312-733-3224 FAX: 312-733-6971

NOTES:

1. GENERAL CONTRACTOR OR HIS SUB-CONTRACTORS ARE TO PROVIDE ANY REQUIRED CORE DRILLING AND SAW CUTTING FOR PENETRATIONS OR ACCESS FOR SLEEVE RUNS
2. AFTER BEVERAGE / REFRIGERATION LINES ARE RUN, THE GENERAL CONTRACTOR OR HIS SUB-CONTRACTORS ARE TO SEAL INSIDE SLEEVE WITH CODE APPROVED MATERIAL (FOAM, SILICONE, ETC.) TO ENSURE A VERMIN PROOF CONDITION (SAME AT OPPOSITE SLEEVE END)
3. GENERAL BEVERAGE / REFRIGERATION LINE NOTE: GENERAL CONTRACTOR TO VERIFY AND COORDINATE WITH ALL BEV. SYSTEM / REFRIG. CONTRACTORS FOR ALL BEV. SYSTEM / REFRIG. INSTALLATIONS AND THEIR FINAL HOOK-UPS. ALL WORK TO CONFORM TO ALL PREVAILING LOCAL AND/OR STATE CODES.

11 BEVERAGE-REFRIGERATION LINE SLEEVE NTS

NOTE: INSULATE ALL HOT WATER LINES W/1/2" R-5 INSULATION ABOVE AND BELOW GRADE

3 COMP SINK

DUO-FEED

SECURE DEMA BOTTLE RACK TO WALL W/ (3) SS SCREWS- PROVIDE CONCEALED 4"x32"x 20 GAUGE BACKING PLATE TO SPAN A MIN. OF TWO FURRING CHANNELS

PROVIDE AIR GAP

FLOOR SINK

INDEPENDENTLY ROUTE 3 COMPARTMENT SINK INDIRECT WASTE LINES. EXTERNAL GREASE TRAP PROVIDED PER LOCAL JURISDICTION REQUIREMENTS. SEE SITE PLAN FOR SIZE AND LOCATION.

16 3-COMPARTMENT SINK DETAIL NTS

THREADED CAP WITH 1/4" DIA. HOLE DRILLED IN TOP

THREADED CAP

SLOPE TO DRAIN

LINE SIZE EQUAL TO DRAIN PAN CONNECTION ROUTE AS INDICATED ON DRAWINGS.

NEGATIVE PRESSURE SYSTEM: H = (1" FOR EACH 1" OF MAX STATIC PRESS) + 1" J = 1/2 OF H

COOLING COIL

DRAIN PAN

UNION

DEEP SEAL P-TRAP

POSITIVE PRESSURE SYSTEM: H = MIN 1/2" J = 1/2" + MAX TOTAL STATIC PRESSURE

15 CONDENSATE P-TRAP DETAIL NTS

COVER VALVE BODIES WITH INSULATION, BUT NOT UNIONS.

SUPPORT FOR STRUCTURE TYPICAL

TAPE JOINTS OF FIBERGLASS INSULATION.

PROVIDE A ONE FOOT LENGTH OF NONCOMPRES-SIBLE INSULATION AT HANGERS FOR ALL PIPE 2" AND LARGER.

REFER TO OTHER DETAILS FOR TREATMENT OF INSULATION AT PENETRATION OF WALLS, FIRE FLOORS, AND FIREWALLS.

NOTE: MITER THE INSULATION AT TEES AND ELBOWS SO THAT THERE ARE NO GAPS AT JOINTS IF POSSIBLE, THEN TAPE THEM. OTHERWISE FILL THE GAPS WITH BLANKET FIBER-GLASS AND PROVIDE ONE-PIECE PRE- MOULDED PVC FITTING COVERS. PROVIDE 1/2" UNICELLULAR ELASTOMERIC INSULATION ON DOMESTIC HOT AND COLD WATER PIPES IN WALLS AND CHASES. MITER THE INSULATION AT TEES AND ELBOWS. SEAL ALL JOINTS WITH ADHESIVE.

PROVIDE 1/2" FIBERGLASS INSULATION WITH ALL-SERVICE JACKET WITH VAPOR BARRIER ON ALL COLD WATER, CONDENSATE, AND STORM DRAIN PIPE UP TO 4". PROVIDE 1" INSULATION ON STORM DRAIN PIPE ABOVE 4" SIZE. PROVIDE 1" FIBER-GLASS INSULATION WITH ALL-SERVICE JACKET ON DOMESTIC HOT WATER PIPING. REFER TO SPECIFICATIONS FOR FURTHER INFORMATION REGARDING INSULATION. INSTALL ALL ITEMS PER SPECIFICATIONS AND MANUFACTURER'S INSTRUCTIONS. MAINTAIN VAPOR BARRIER ON COLD PIPING BY MEANS OF SEALANT AND TAPE. FLAME-SPREAD AND SMOKE-DEVELOPED INDEXES SHALL NOT EXCEED 25/50. SEAL EXPOSED ENDS OF FIBERGLASS INSULATION WITH ADHESIVE MASTIC.

14 PIPE INSUALTION DETAIL NTS

NY ENGINEERS

REVISIONS

NO.	DESCRIPTION	BY	DATE
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JOB LOCATION:

PLUMBING DETAILS (1 OF 2)

SHEET

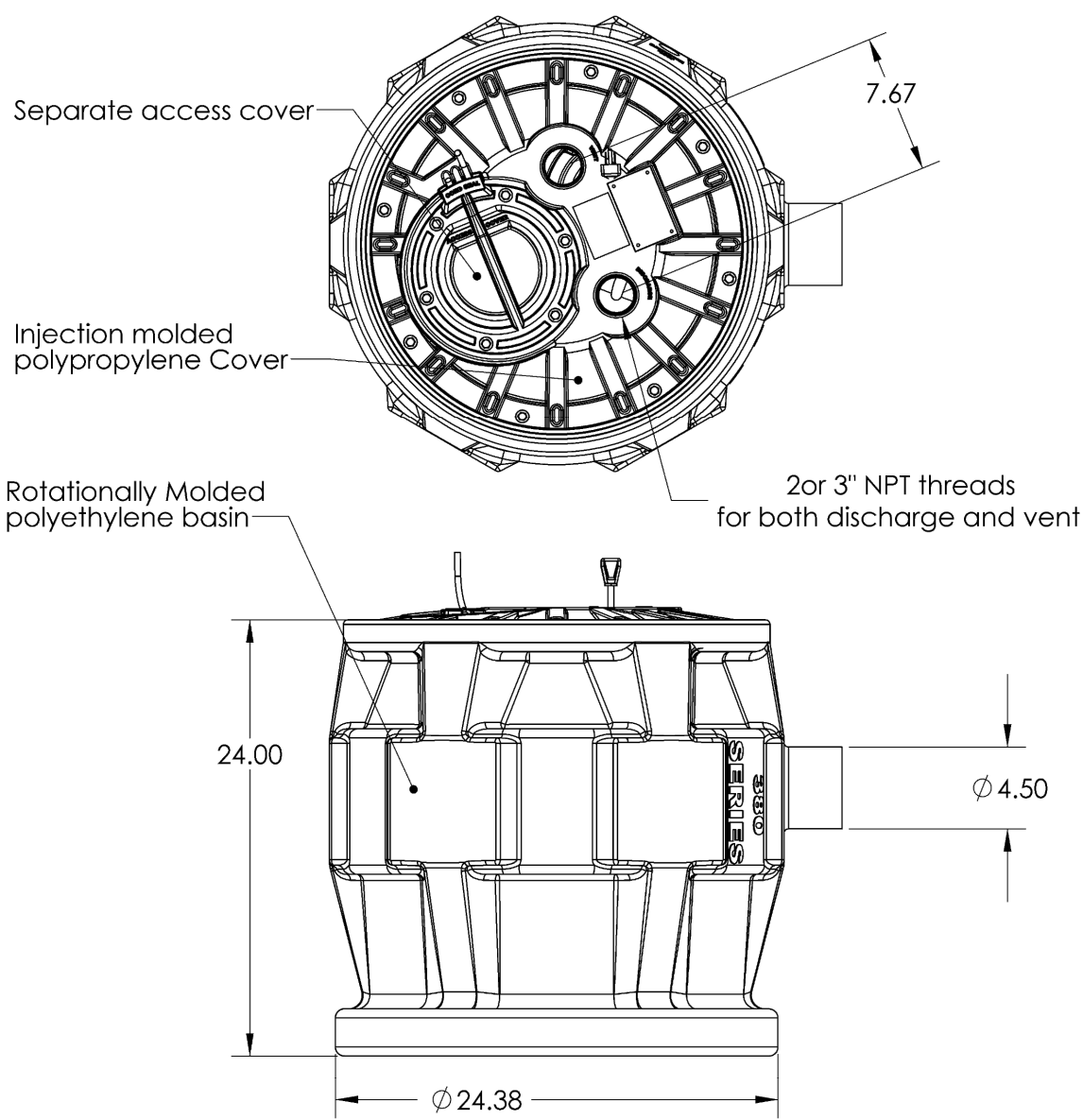
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3 SUBMERSIBLE SEWAGE SIMPLEX PACKAGE DETAIL
NTS

SPECIFICATIONS

NOTES

- 4" plain end inlet/outlet
- Unit weight - w/composite cover: 130 lbs.; w/cast iron cover: 210 lbs. (For wet weight add 104 lbs.)
- Maximum operating temperature: 140° F continuous
- Capacities - Liquid: 125 gal.; Grease: 616 lbs. (88 gal.); Solids: 19.2 gal.
- Built-in Flow control.
- For gravity drainage applications only.
- Do not use for pressure applications.
- Cover placement allows full access to tank for proper maintenance.
- Vent not required unless per local code.
- Engineered inlet and outlet diffusers are removable to inspect/clean piping.
- 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 sediment layers.

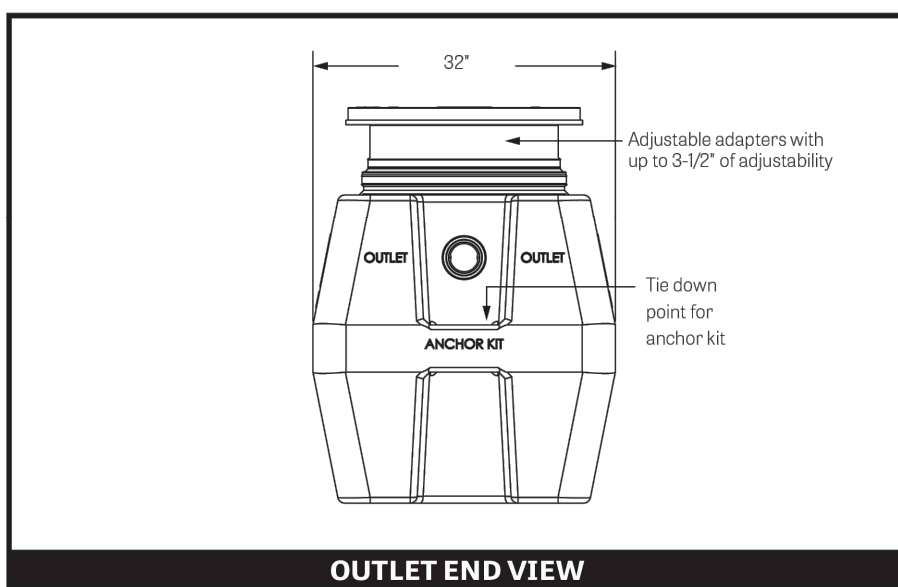
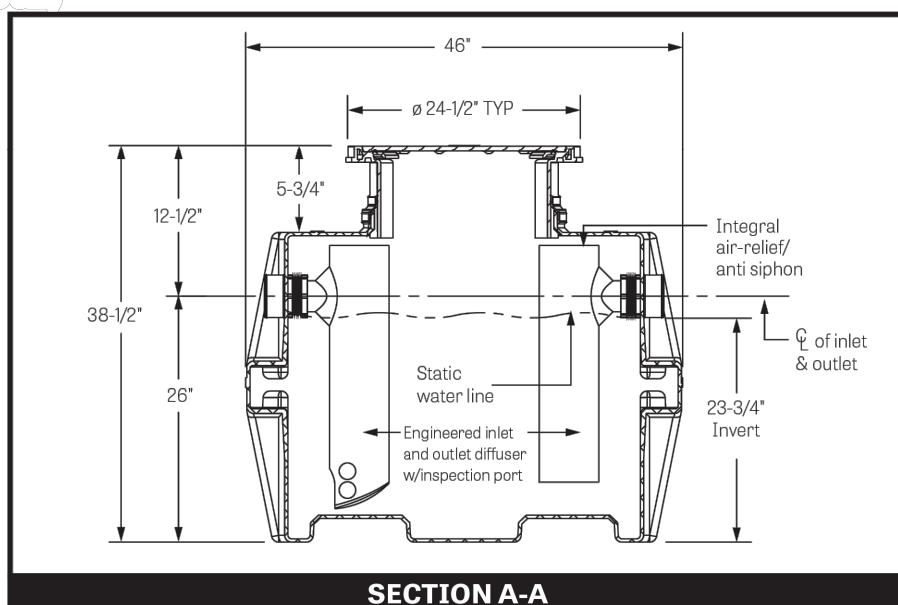
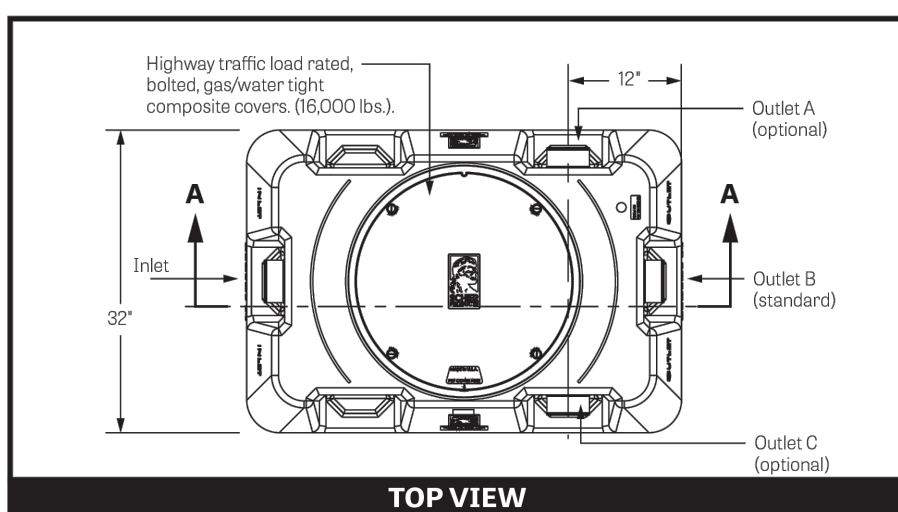
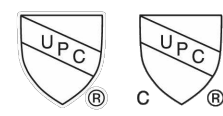
The integral air relief / anti-siphon in the top of the outlet diffuser allows pressure stabilization within the unit during operation. The bottom of the outlet diffuser allows only effluent which is free of grease to exit the tank. It can easily be attached to any of the three outlets provided to ease jobsite piping layouts.

ENGINEER SPECIFICATION GUIDE

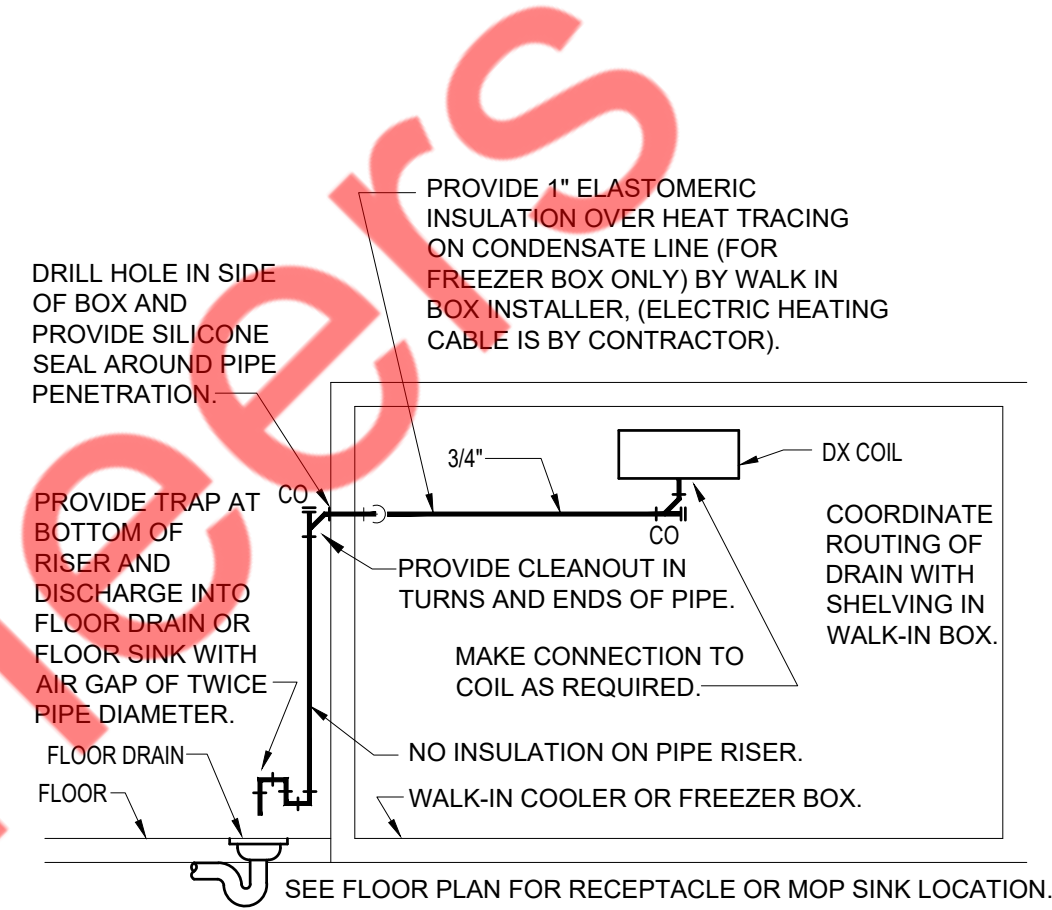
Schieff Great Basin™ grease interceptor model # GB-75 shall be lifetime guaranteed and made in USA of seamless, rotationally-molded polyethylene. Interceptor shall be furnished for above or below grade installation. Interceptor shall be certified to ASME A112.14.3 (type C) and CSA B481.1, with field adjustable riser systems, 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 16,000 lbs. load capacity.

CERTIFIED PERFORMANCE

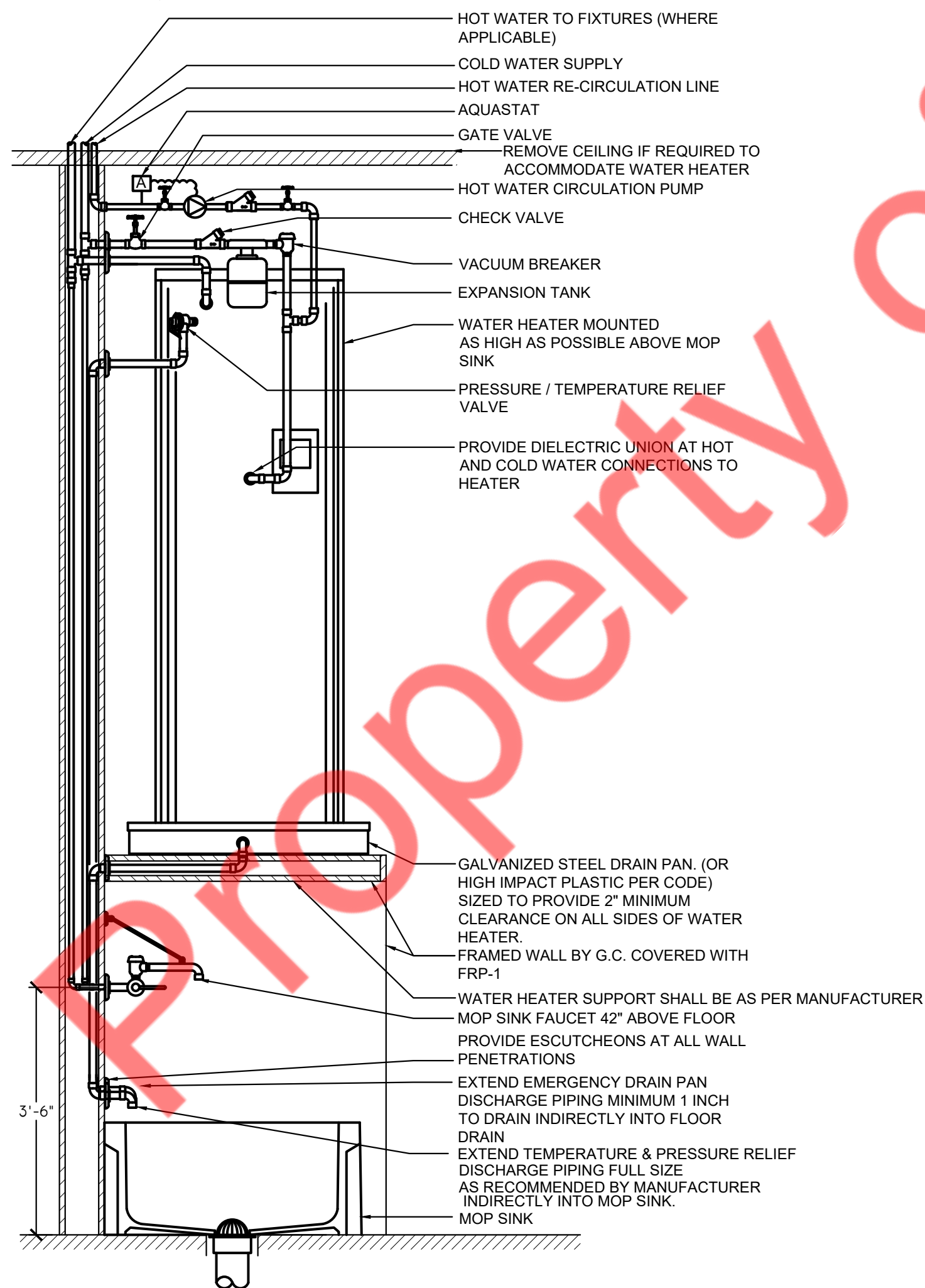
Great Basin hydromechanical grease interceptors are third party performance-tested and listed by IAPMO to ASME A112.14.3 and CSA B481.1 grease interceptor standards and greatly exceed requirements for grease separation and storage. They are compliant to the Uniform Plumbing Code and the International Plumbing Code.



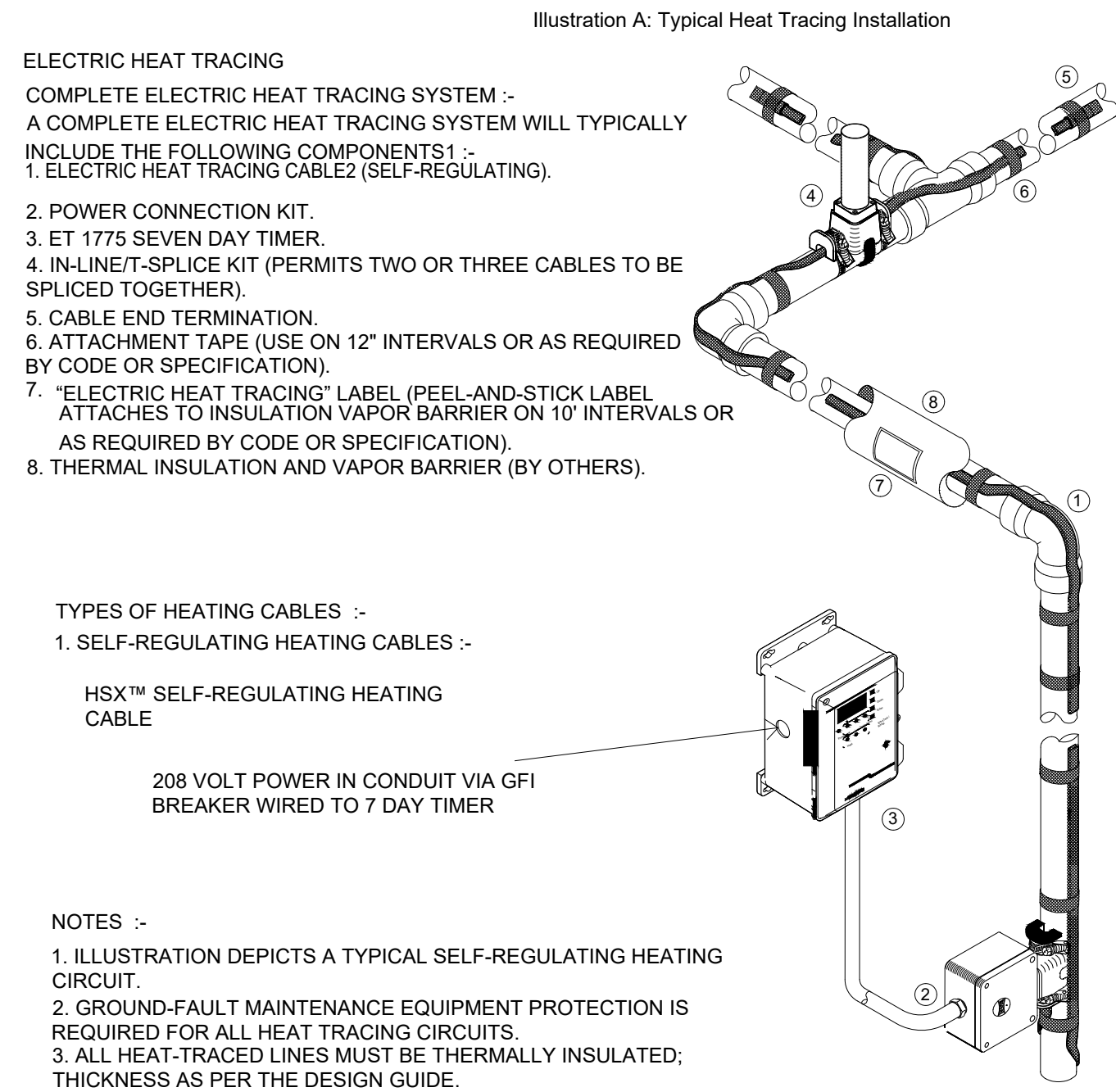
2 GREASE INTERCEPTOR DETAIL
NTS



1 WALK-IN CONDENSATE DRAIN DETAIL
NTS



5 WATER HEATER PIPING DETAIL
NTS



4 ELECTRIC HEAT TRACING DETAIL
NTS

NY ENGINEERS

REVISIONS

NO. DESCRIPTION BY DATE

JOB LOCATION:

PLUMBING DETAILS
(2 OF 2)

SHEET

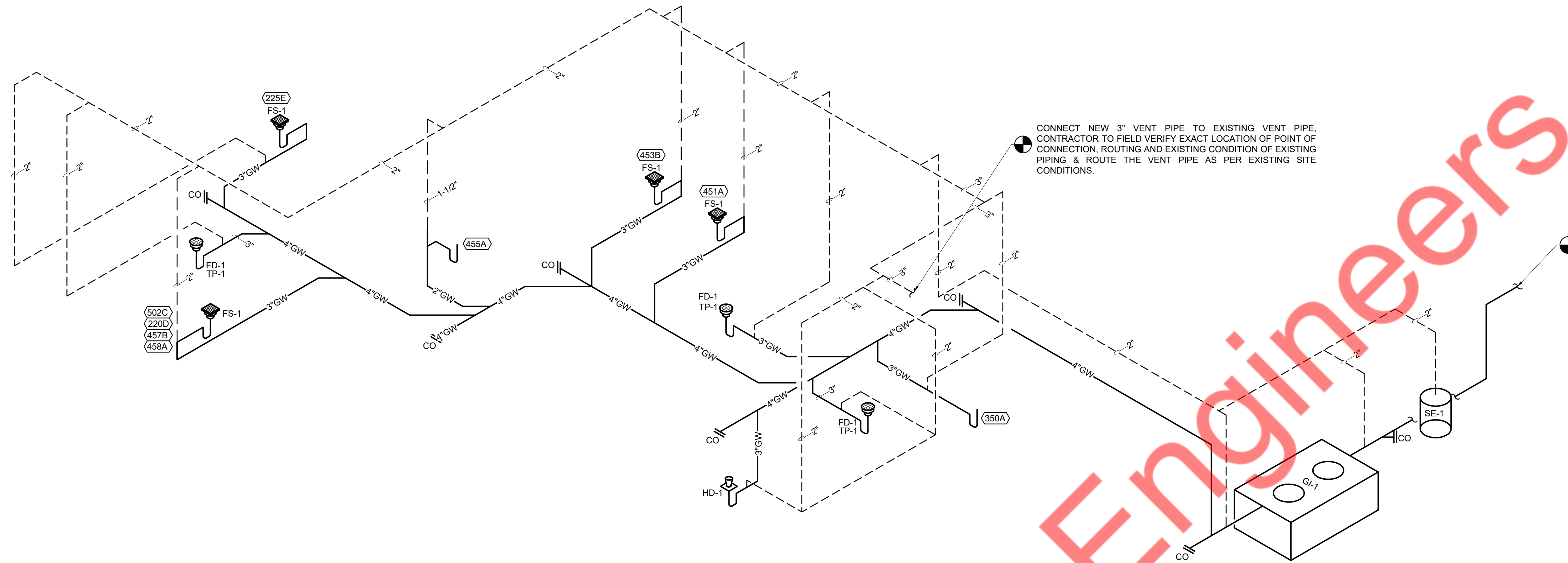
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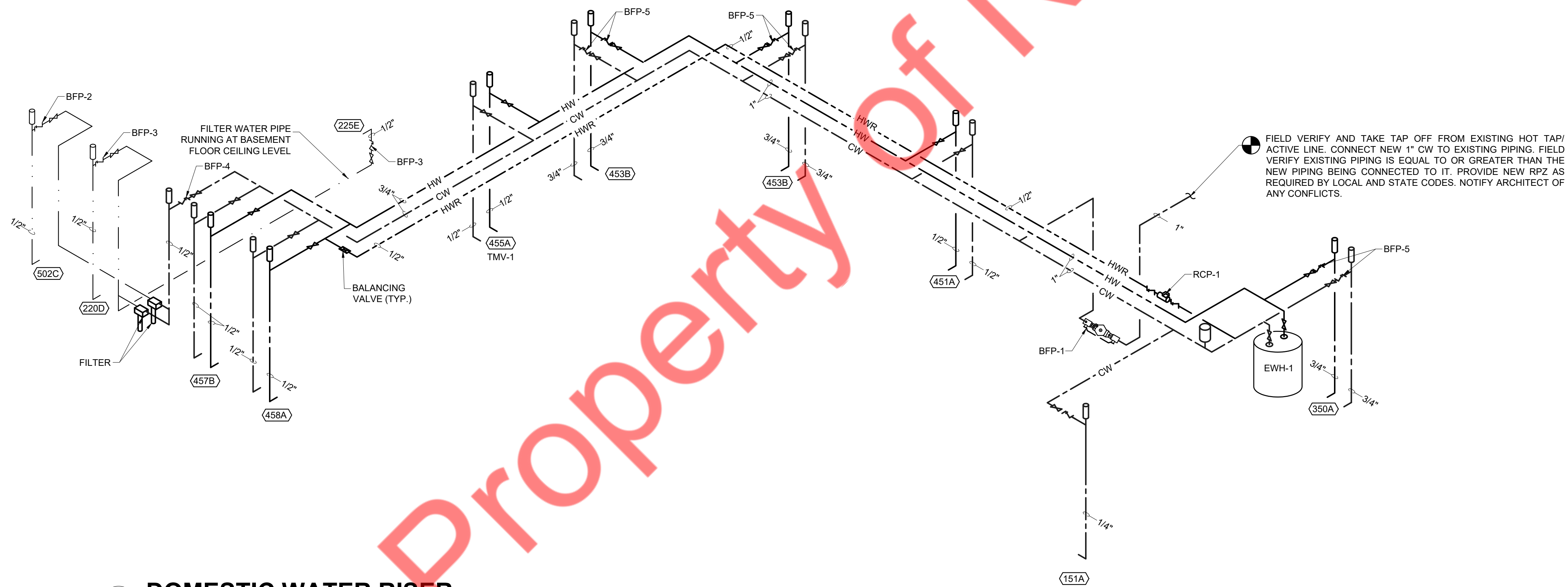
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1 SANITARY & GREASE WASTE RISER DIAGRAM
P6.0 N.T.S



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

NY ENGINEERS

REVISIONS
NO. DESCRIPTION BY DATE

JOB LOCATION:

RISER DIAGRAMS

SECTION 2210

PLUMBING GENERAL

1.0 GENERAL

1.01 DESCRIPTION

- 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.

1.02 EXISTING CONDITIONS

- 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 PROJECT'S 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.

1.03 INTENT OF DRAWINGS AND SPECIFICATIONS

- 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.

1.04 SPACE PRIORITY

- 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.
- GRAVITY FLOW PIPING SYSTEMS
 - VENT PIPING SYSTEMS
 - RECESSED LIGHTING FIXTURES
 - CONCEALED HVAC TERMINALS AND EQUIPMENT
 - AIR DUCT SYSTEMS
 - SPRINKLER PIPING SYSTEMS
 - PRESSURIZED PIPING SYSTEMS
 - 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 AISLE SPACE. ADDITIONAL SPACE SHALL BE PROVIDED BETWEEN AND AROUND EQUIPMENT FOR MAINTENANCE AND PROPER OPERATION AS SHOWN IN THE EQUIPMENT MANUFACTURER'S LITERATURE.

1.05 COORDINATION

- 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:
- 2020 BUILDING CODE OF NYS.
 - 2020 PLUMBING CODE OF NYS.
 - 2020 MECHANICAL CODE OF NYS.
 - 2020 ENERGY CODE OF NYS.
 - 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.

1.07 ELECTRICAL REQUIREMENTS AND INTERFACE

- 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:
- 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.
- 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 OR 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:
- PACKAGED BOOSTER PUMP SYSTEMS.
 - OTHER EQUIPMENT HEREINAFTER SPECIFIED IN OTHER SECTIONS TO BE PROVIDED WITH INTEGRAL STARTERS.
 - 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.
 - ALL POWER WIRING AND FINAL CONNECTIONS TO EQUIPMENT SHALL BE PROVIDED UNDER DIVISION 26.
 - 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.
 - ALL CONTROL WIRING OVER 30 VOLTS SHALL BE INSTALLED BY A LICENSED ELECTRICIAN WORKING UNDER THIS DIVISION 22.

1.08 SLEEVES, SEALS AND ESCUTCHEONS

- A. SLEEVES SHALL BE PROVIDED THROUGH ALL PIPE PENETRATIONS OF CONCRETE OR MASONRY WALLS, ELEVATED FLOORS AND ROOFS, EXCEPT THOSE PLUMBING PIPING 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-STOPPS SHALL BE PROVIDED AS SPECIFIED HEREIN. ALL ANNULAR SPACES BETWEEN PIPING AND SLEEVES WHICH DO NOT REQUIRE FIRE-STOPPS 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.

1.09 CORE DRILLING

- A. CUTTING OF HOLES THROUGH CONCRETE AND MASONRY SHALL BE BY DIAMOND CORE OR CONCRETE SAW. PNEUMATIC HARD 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 SECTIONS SUCH AS RISBS OR BEAMS. HOLES SHALL BE LAID OUT WELL IN ADVANCED OF THE INSULATION. THESE LAYOUT LOCATIONS SHALL BE APPROVED BY THE ARCHITECT PRIOR TO DRILLING.

2.0 PRODUCTS

2.01 BID BASIS AND SUBSTITUTION PROCESS

- A. MANUFACTURERS NAMES, 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. UNLESS "OR EQUAL" IS SPECIFICALLY STATED, BIDS SHALL BE BASED ONLY ON THE SPECIFIED "BASIS OF DESIGN" MANUFACTURER. THE LISTING OF A PARTICULAR MANUFACTURER AS AN "EQUAL" OR "ACCEPTABLE 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, MATERIAL 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" OF "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 SCALED DRAWING AND WRITTEN DESCRIPTION OF THE REQUIRED CHANGES) 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.

2.02 MINIMUM STANDARDS

- 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:

- FACTORY MUTUAL LABORATORIES (FM)
- INDUSTRIAL RISK INSURERS (IRI)
- UNDERWRITING LABORATORIES, INC. (UL)
- ADC: AIR DIFFUSION COUNCIL
- AGA: AMERICAN GAS ASSOCIATION
- AMCA: AIR MOVING AND CONDITIONING ASSOCIATION, INC.
- ANSI: AMERICAN NATIONAL STANDARDS INSTITUTE
- API: AMERICAN PETROLEUM INSTITUTE
- ARI: AMERICAN REFRIGERATION INSTITUTE
- ASHRAE: AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR CONDITIONING ENGINEERS
- ASME: AMERICAN SOCIETY OF MECHANICAL ENGINEERS
- ASTM: AMERICAN SOCIETY OF TESTING AND MATERIALS
- AWWA: AMERICAN WATER WORKS ASSOCIATION
- IBR: INSTITUTE OF BOILER AND RADIATOR MANUFACTURERS
- MSS: MANUFACTURERS STANDARDIZATION SOCIETY
- NBBPVI: NATIONAL BOARD OF BOILER AND PRESSURE VESSEL INSPECTORS
- NEMA: NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
- OSHA: OCCUPATIONAL SAFETY & HEALTH ADMINISTRATION
- POI: PLUMBING DRAINAGE INSTITUTE
- PPI: PLASTIC PIPE INSTITUTE
- SMAQNA: SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION, INC.

3.0 EXECUTION

3.01 SUBMITTALS

- 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 (CERTIFYING 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. SHOULD AN UNSPECIFIED OR UNQUALIFIED PRODUCT BE SUBMITTED, IT WILL BE REJECTED. IF A SECOND ATTEMPT AT SUBSTITUTION IS MADE DURING THE RESUBMITTAL 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. NO MORE THAN FOUR (4) COPIES OF SUBMITTAL DATA WILL BE REVIEWED. ANY ADDITIONAL COPIES WILL BE RETURNED UNMARKED. THE RESPONSIBILITY OF COPYING REVIEW COMMENTS ON ANY ADDITIONAL COPIES WILL REST SOLELY WITH THE CONTRACTOR.
- D. SUBMITTALS WILL NOT BE ACCEPTED FOR REVIEW UNLESS THEY:
- COMPLY WITH THE REQUIREMENTS OF DIVISION 1.
 - INCLUDE COMPLETE INFORMATION PERTAINING TO ALL APPURTENANCES AND ACCESSORIES.
 - ARE SUBMITTED AS COMPLETE PACKAGES WHICH PERTAIN TO ALL RELATED ITEMS IN DIVISION 22. SEPARATE PACKAGES SHALL BE SUBMITTED AS FOLLOWS:
 - ALL PLUMBING EQUIPMENT, FIXTURES AND COMPONENTS
 - THE AUTOMATIC CONTROLS AND EMS
 - ARE PROPERLY MARKED WITH EQUIPMENT, SERVICE OR FUNCTION IDENTIFICATION AS RELATED TO THE PROJECT AND ARE MARKED WITH PERTINENT SPECIFICATION PARAGRAPH NUMBER.
 - SUBMIT CATALOG INFORMATION, FACTORY ASSEMBLY DRAWINGS, FIELD INSTALLATION DRAWINGS AND CERTIFICATIONS AS REQUIRED FOR COMPLETE EXPLANATION AND DESCRIPTION OF ALL ITEMS FOR EQUIPMENT. THE SUBMITTAL DATA SHALL PROVIDE AMPLE, UNQUESTIONABLE COMPLIANCE WITH THE CONTRACT DOCUMENTS.
 - REVIEW OF SUBMITTALS SHALL NOT BE CONSTRUED AS AUTHORIZING ANY DEVIATIONS FROM THE PLANS AND SPECIFICATIONS UNLESS SUCH DEVIATIONS ARE CLEARLY IDENTIFIED AND SEPARATELY SUBMITTED IN THE FORM OF A LETTER THAT IS ENCLOSED WITH THE SUBMITTALS.
 - SUBMITTALS ARE REQUIRED ON ALL MANUFACTURED EQUIPMENT, ESPECIALLY ENERGY CONSUMING EQUIPMENT. SUBMITTALS SHALL INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING ITEMS OF EQUIPMENT:
 - PIPING SPECIALTIES
 - INSULATION
 - PUMPS
 - WATER HEATERS
 - PLUMBING FIXTURES

3.02 EXCAVATION, TRENCHING AND BACKFILLING

- A. PERFORM ALL EXCAVATION, TRENCHING AND BACKFILLING FOR UNDERGROUND WORK UNDER THIS DIVISION 22. DURING EXCAVATION, THE EXCAVATED MATERIAL SHALL BE PILED BACK FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING, SLIDES OR CAVE-INS. DO NOT EXCEED 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 HAND 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 LATER IS COMPLETED, SUBSEQUENT LAYERS SHALL BE FILLED AND COMPACTED THE SAME AS THE FIRST LAYER. SETTLE THE BACKFILL WITH WATER SHALL NOT BE PERMITTED.

3.03 INSTALLATION REQUIREMENTS

- 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

SHALL BE SELECTED FOR A MAXIMUM DEFLECTION OF 1/360TH OF THE SPAN.

3.04 CLEANING, LUBRICATION AND ADJUSTMENT

- A. THE EXTERIOR SURFACES OF ALL MECHANICAL EQUIPMENT, PIPING, CONDUIT, ETC., SHALL BE CLEANED AND FREE OF ALL DIRT, GREASE, OIL, PAINT SPALLER, AND OTHER CONSTRUCTION DEBRIS.
- B. BEARINGS THAT REQUIRE LUBRICATIONS HALL 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.

3.05 PAINTING

- 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. IN ADDITION, ALL SURFACES IN FINISHED SPACES SHALL ALSO BE PAINTED WITH TWO COATS OF FINISH PAINT IN A COLOR SELECTED BY THE ARCHITECT.
- 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.

3.06 PIPING LEAK TESTING

- A. SOIL, WASTE, STORM AND VENT PIPING SHALL BE TESTED WITH WATER BEFORE INSTALLING FIXTURES. WATER TEST SHALL BE APPLIED TO THE SYSTEM EITHER IN ITS ENTIRETY OR TO THE 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 THIRY (30) MINUTES; NO DROP 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.

3.07 RECORD (AS-BUILT) DRAWINGS

- 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 REFERENCE POINTS SUCH AS BUILDING COLUMN LINES.

3.08 OPERATING AND MAINTENANCE AND INSTRUCTIONS

- A. COMPLETE OPERATING AND MAINTENANCE MANUALS SHALL BE PROVIDED TO THE OWNER. FOUR COPIES SHALL BE PROVIDED. EACH COPY SHALL BE BOUND IN SEPARATE 3-RING, LOOSE LEAF NOTEBOOK. OPERATING INSTRUCTIONS SHALL BE PROVIDED FOR EACH MECHANICAL SYSTEM, AND SHALL EACH INCLUDE A BRIEF SYSTEM DESCRIPTION, A SIMPLE SCHEMATIC AND A SEQUENCE OF OPERATION. OPERATING AND MAINTENANCE INSTRUCTIONS SHALL BE PROVIDED FOR EACH PIECE OF EQUIPMENT. A CONTROL SYSTEM WIRING DIAGRAM SHALL BE INCLUDED IN EACH OPERATING AND MAINTENANCE MANUAL.
- B. PRIOR TO FINAL ACCEPTANCE OR BENEFICIAL OCCUPANCY, PROVIDE THE SERVICES OF A COMPETENT TECHNICIAN FOR NOT LESS THAN ONE (1) DAY TO INSTRUCT THE OWNER IN THE OPERATION OF THE MECHANICAL SYSTEMS.

END OF SECTION

SECTION 22100

PLUMBING SYSTEMS

1.0 GENERAL

1.01 DESCRIPTION

- A. ALL WORK SPECIFIED IN THIS SECTION IS GOVERNED BY THE PLUMBING GENERAL SECTION 22010.
- B. THIS SECTION 22100 AND THE ACCOMPANYING DRAWINGS COVER THE PROVISION OF ALL LABOR, EQUIPMENT, APPLIANCES, AND MATERIALS AND PERFORMING ALL OPERATIONS IN CONNECTION WITH THE CONSTRUCTION OF THE PLUMBING SYSTEMS AS SPECIFIED HEREIN AND AS SHOWN. THESE SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
- SANITARY WASTE AND VENT SYSTEMS.
 - DOMESTIC WATER SYSTEMS.
 - NATURAL GAS SYSTEMS.
- C. PROVIDE ALL FINAL PLUMBING CONNECTIONS TO ALL EQUIPMENT FURNISHED BY OWNER.
- D. PROVIDE GATE VALVE AND REDUCED PRESSURE BACKFLOW PREVENTER OR VACUUM BREAKER AT THE SERVICE ENTRANCE AND AT THOSE CONNECTIONS (ESPECIALLY TO KITCHEN EQUIPMENT) REQUIRED BY LOCAL PLUMBING CODE.

1.02 INTENT

- A. IT IS THE INTENT OF THIS SECTION OF THE SPECIFICATIONS TO PROVIDE COMPLETE AND OPERABLE PLUMBING SYSTEMS AS SHOWN AND SPECIFIED WHICH ARE FREE OF LEAKS, PROPERLY

VENTED, FREE OF UNREASONABLE NOISE, VIBRATION AND SWEATING, AND FABRICATED SO AS TO FIT THE SPACE ALLOTTED AND TO EXHIBIT A MINIMUM RESISTANCE TO FLUID FLOW.

- B. THE WORD "PIPING" IS DEFINED TO MEAN ALL PIPING, FITTINGS, JOINTS, HANGERS, COATINGS, VALVES, COCKS, INSULATION AND ACCESSORIES NECESSARY FOR THE PLUMBING SYSTEMS DESCRIBED, SHOWN AND SPECIFIED.

1.03 GENERAL REQUIREMENTS

- A. PROVIDE ALL REDUCING FITTINGS, FLANGES, COUPLINGS AND UNIONS OF THE SIZE AND TYPE OF MATERIAL TO MATCH THE PIPING CONNECTIONS AT EACH FIXTURE, PIECE OF EQUIPMENT, VALVE AND ACCESSORY.
- B. UNION JOINTS, COUPLINGS OR FLANGES SHALL BE PROVIDED IN EACH PIPE LINE CONNECTED TO EACH PIECE OF EQUIPMENT, FIXTURE AND ELSEWHERE AS INDICATED AND SPECIFIED. UNIONS SHALL MATCH THE PIPING SYSTEM IN WHICH THEY ARE INSTALLED.
- C. UNIONS OR FLANGES SHALL BE PROVIDED BETWEEN ALL COPPER TO STEEL CONNECTIONS. THESE UNIONS SHALL BE DIELECTRIC, INSULATING TYPE.
- D. ALL CHANGES IN DIRECTION AND BRANCHES SHALL BE MADE WITH MANUFACTURED FITTINGS.
- E. IN ALL WATER PIPING SYSTEMS, CHANGES IN HORIZONTAL PIPE LINE SIZES SHALL BE MADE WITH ECCENTRIC REDUCERS. INSULATED FLAT TOP FOR PROPER AIR VENTING. REDUCING TEES, REDUCING ELBOWS AND CONCENTRIC REDUCERS SHALL ONLY BE ALLOWED IN WATER PIPING SYSTEM FOR CHANGING PIPE SIZES IN VERTICAL RISERS AND FOR MAKING CONNECTIONS TO EQUIPMENT AND ACCESSORIES FROM VERTICAL RISERS.
- F. ALL PIPE JOINTS SHALL BE CUT SQUARE AND ALL BURRS SHALL BE REMOVED.
- G. OPEN ENDS OF PIPE LINES NOT CURRENTLY BRING HANDLED SHALL BE PLUGGED DURING INSTALLATION TO KEEP DIRT, WATER AND FOREIGN MATERIAL OUT OF THE SYSTEM.
- H. SANITARY WASTE AND STORM DRAINAGE PIPING SHALL SLOPE DOWN IN THE DIRECTION OF FLOW AS SHOWN ON THE DRAWINGS OR AS PRESCRIBED BY CODE, NOT LESS THAN 1 PERCENT.
- I. ALL CENTS THROUGH ROOF (VTRS) SHALL BE OFFSET JUST BELOW THE ROOF SUCH THAT THEIR TERMINATION POINTS ARE AT LEAST 10 FT. FROM ANY OUTSIDE AIR INTAKE OF ANY HVAC UNIT. SPECIAL ATTENTION IS CALLED TO PACKAGED ROOFTOP UNITS.
- J. TRAP PRIMERS SHALL BE PROVIDED AT ALL RESTROOM FLOOR DRAINS AND ANY HUB DRAIN.

1.04 IDENTIFICATION PIPING

- A. ALL ABOVEGROUND PLUMBING SYSTEMS PIPING AND VALVES SIZED 1/2" AND LARGER WHICH ARE INSTALLED IN ACCESSIBLE LOCATIONS (INCLUDING PIPING ABOVE REMOVABLE CEILINGS AND BEHIND ACCESS PANELS) SHALL BE IDENTIFIED IN STRICT CONFORMANCE WITH THE "SCHEME FOR THE IDENTIFICATION OF PIPING SYSTEMS" (ANSI A13.1 - 1981).
- B. EACH IDENTIFICATION MARKER SHALL INCLUDE THE FOLLOWING:
- PROPER COLOR-CODED BACKGROUND.
 - PROPER COLOR OF LEGEND IN RELATION TO BACKGROUND COLOR.
 - PROPER LEGEND LETTER SIZE.
 - PROPER MARKER LENGTH.
 - DIRECTION OF FLOW ARROW SHALL BE INCLUDED ON EACH MARKER.
- C. LOCATIONS FOR PIPE MARKERS SHALL BE AS FOLLOWS:
- ADJACENT TO EACH VALVE AND FITTING.
 - AT EACH BRANCH AND RISER TAKE OFF.
 - AT EACH PIPE PASSAGE THROUGH WALLS, FLOORS AND CEILINGS.
 - ON ALL STRAIGHT PIPE RUNS EVERY 25 FEET.
- D. IDENTIFICATION MARKERS MAY BE STENCILED OR SHALL BE SET/MARK PIPE MAKERS, AS MANUFACTURED BY SETON NAME PLATE CORPORATION.
- E. ALL VALVES SHALL BE IDENTIFIED WITH THE APPROPRIATE SERVICE DESIGNATION AND VALVE NUMBER BRASS VALVE TAGS. EACH VALVE TAG SHALL BE 19 GAUGE BRASS WITH 1/2" BLACK-FILLED LETTERS OVER 1/2" BACK-FILLED NUMBERS. TAGS SHALL BE FASTENED TO VALVES WITH BRASS "S" HOOKS OR BRASS JACK CHAIN. BRASS RAGS AND FASTENERS SHALL BE AS MANUFACTURED BY SETON NAME PLATE CORPORATION.
- F. PROVIDE CHARTS OF ALL VALVES. VALVE CHARTS SHALL INCLUDE THE FOLLOWING ITEMS:
- VALVE IDENTIFICATION NUMBER
 - LOCATION
 - PURPOSE/MATERIAL

2.0 PRODUCTS

2.01 SANITARY WASTE AND VENT SYSTEMS

- A. ALL UNDERGROUND SANITARY WASTE AND VENT PIPING SHALL BE PVC, DWV SCHEDULE 40 WITH SOCKET-TYPE SOLVENT WELDED JOINTS.
- B. CLEANOUTS SHALL BE PROVIDED AT THE LOCATIONS INDICATED AND, AS 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.
- C. ALL ABOVEGROUND SANITARY, WASTE AND VENT PIPING SHALL BE PVC DWV SCHEDULE 40 WITH SOCKET-TYPE, SOLVENT WELDED JOINTS; EXCEPT THAT SANITARY, WASTE AND VENT PIPING LOCATED WITHIN RETURN AIR PLENUMS SHALL BE HUBLESS CAST IRON SOIL PIPE. HUBLESS CAST IRON PIPE AND FITTINGS SHALL BE MANUFACTURED FROM GRAY CAST IRON AND SHALL CONFORM TO ASTM A 888 AND CISPI STANDARD 301. ALL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK FO THE CAST IRON SOIL PIPE INSTITUTE® AND LISTED BY NSP® INTERNATIONAL.

2.03 DOMESTIC WATER SYSTEM

- A. UNDERGROUND DOMESTIC WATER SERVICE ENTRANCE PIPING 3" AND SMALLER IN SIZE SHALL BE TYPE K HARD DRAWN COPPER TUBING WITH WROUGHT COPPER FITTINGS. ALL JOINTS SHALL BE BRAZED.
- B. ALL UNDERGROUND COPPER BRANCH LINES (1/2" AND 3/4" ONLY) SHALL BE CONTINUOUS LENGTHS OF SOFT TYPE K COPPER TUBING WITH NO JOINTS ALLOWED UNDERGROUND.
- C. UNDERGROUND DOMESTIC WATER SERVICE ENTRANCE PIPING ABOVE 3" IN SIZE SHALL BE CLASS 150 DUCTILE IRON PIPE WITH MECHANICAL JOINTS.
- D. ABOVEGROUND DOMESTIC WATER SYSTEM PIPING 3" IN SIZE AND SMALLER SHALL BE TYPE L HARD DRAWN COPPER RUBBING WITH WROUGHT COPPER FITTINGS AND SOLDERED JOINTS.
- E. ABOVEGROUND DOMESTIC WATER PIPING 4" AND LARGER SHALL BE TYPE L HARD DRAWN COPPER TUBING WITH ROLLED GROOVED JOINTS AND FITTINGS.
- F. GATE VALVES 3" OR LESS IN SIZE SHALL BE CONSTRUCTED WITH A BRONZE BODY, NON-RISING STEM, NON-FLAME BRONZE ASTM B-62 OR SILICON BRONZE ASTM B-371 WITH MALLEABLE IRON

HANDWHEELS. VALVE SHALL MEET MSS-SP80. VALVE SHALL BE MANUFACTURED BY MILWAUKEE, HAMMOND, NIBCO OR STOCKHAM.

- G. BALL VALVES 2 INCH AND SMALLER:

- BALL VALVES SHALL BE TWO PIECE BRONZE BODY, LARGE PORT WITH SOLID, SMOOTH BORE CHROME PLATED BRASS BALL MEETING MSS-SP110. SEATS SHALL BE REINFORCED FITE WITH TEFLON PACKING RING AND THREADED ADJUSTABLE STACKING NUT. VALVES ON INSULATED LINES WILL BE PROVIDED WITH PEEK INSULATION. VALVES TO BE APOLLO 70, HAMMOND 8501 OR WATTS B-6000.
- NON-FREEZE WALL HYDRANTS (CFWH) SHALL BE NON-FREEZE, BRONZE BOX TYPE WITH VACUUM BREAKER, LOOSE KEY AND WALL CLAMP. FINISH SHALL BE ROUGH BRONZE. WALL HYDRANTS SHALL BE SMITH 5509QTPB OR APPROVED EQUAL BY JOSAM OR ZURN.
- BACKFLOW PREVENTERS SHALL BE WATTS SERIES 909 REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTERS COMPLETE WITH STRAINER AND SHUT-OFF VALVES. AIR GAP DRAIN SHALL BE PIPED INTO NEAREST FLOOR DRAIN OR OUTSIDE OF BUILDING TO A CONCRETE SPLASHBLOCK.
- WATER PRESSURE REDUCING VALVES (PRV) SHALL BE THE SELF-CONTAINED DIRECT OPERATING TYPE WITH BRONZE BODY, STAINLESS STEEL SEAT, STAINLESS STEEL SPRING, AND SEALED SPRING CASE. THE STRAINER SHALL HAVE BRONZE BODY WITH 20 MESH STAINLESS STEEL SCREEN. STRAINER SHALL BE ATTACHED WITH A BRONZE NIPPLE. THE UNIT SHALL BE CONSTRUCTED IN ACCORDANCE WITH ASSE STANDARD 1003 AND SHALL BEAR THE SEAL OF APPROVAL. THE CAPACITIES SHALL BE BASED ON MAXIMUM REDUCED PRESSURE FALL OFF, AS DEFINED IN THE ASSE STANDARD, OF 10 POUND. PRESSURE REGULATORS SHALL BE WATTS REGULATOR COMPANY'S SERIES 2235 OR APPROVED EQUAL.
- MIXING VALVES SHALL BE AS INDICATED ON DRAWINGS OR AN APPROVED EQUAL WITH THE 1/2" BYPASS PIPED INTO THE SMALLER TM025 VALVE. MIXING VALVE SHALL BE SIZED BY THE MANUFACTURER FOR THE FIXTURES SERVED. SECURE THE ASSEMBLY TO THE ADJACENT WALL.
- ALL WATER HAMMER ARRESTERS (WHA) SHALL BE PDI CERTIFIED, SIZE A, D, C, D, E OR F, AS INDICATED FOR THE FIXTURE UNITS SERVED; JOSAM, JAY R. SMITH OR SURN.
- THE HOSE BIBS (HB) SHALL BE COMPLETE WITH VACUUM BREAKER AND HANDLE.
- SOLDERED JOINTS SHALL BE MADE WITH TIN-ANTIMONY/SILVER SOLDER. SOLDER CONTAINING LEAD SHALL NOT BE PERMITTED

2.04 NATURAL GAS PIPING

- A. NATURAL GAS PIPING SHALL BE SCHEDULE 40 BLACK STEEL COMPLYING WITH ANSI B36.10. FITTINGS SHALL BE STEEL OR MALLEABLE IRON. JOINTS SHALL BE THREADED OR WELDED.

- B. GAS COCKS SHALL MEET ANSI B16.33.

2.05 PLUMBING INSULATION

- A. ALL PIPE INSULATION PRODUCTS SHALL HAVE A PERMANENT COMPOSITE INSULATION, JACKET AND ADHESIVE FIRE AND SMOKE HAZARD RATING AS TESTED BY PROCEDURES ASTM-84, NFPA 255 AND UL 723 NOT EXCEEDING FLAME SPREAD 25 OR SMOKE DEVELOPED 50.
- B. BLANKET-TYPE INSULATION SHALL HAVE AN AVERAGE THERMAL CONDUCTIVITY NOT TO EXCEED 0.27 BTU-IN. PER SQ. FT. PER DEGREES F. PER HOUR AT A MEAN TEMPERATURE OF 75 DEGREES F. INSULATION SHALL HAVE A MINIMUM DENSITY OF 1 LB./CU.FT. AND SHALL BE 2" THICK.
- C. PREFORMED INSULATION FOR ALL DOMESTIC HOT AND COLD WATER PIPING SHALL BE MINIMUM 1" THICK PLUS ONE (1) THICK FIBERGLASS PIPE INSULATION WITH WHITE ALL-SERVICE JACKET. ALL LONGITUDINAL JOINTS SHALL BE LAPPED, SELF-STICKING TYPE WITH ALL BUTT JOINTS, TEARS, ETC. SEALED WITH A MATCHING WHITE VAPOR BARRIER TAPE. ELBOWS SHALL BE MITERED OR MAY BE ZESTON COVERS FILLED WITH EQUIVALENT FIBERGLASS INSULATION. THE MINIMUM K VALUE OF THE INSULATION SHALL BE 0.23 AT 70 DEGREES F. ALL PIPING IN UNCONDITIONED AREAS SHALL BE INSULATED WITH A MINIMUM R VALUE OF 6.5 IN ACCORDANCE WITH THE IPC SECTION 305.6.

2.06 PIPE HANGERS AND SUPPORTS

- A. PIPE HANGERS, HANGER RODS, TRAPEZE TYPE HANGERS, UPPER ATTACHMENTS AND OTHER SUPPORTS SHALL BE SELECTED BASED ON PIPE SIZE (PLUS INSULATION OF THE PIPE) SIZED TO BE INSULATED) AND THE WEIGHT OF THE MEDIUM BEING TRANSPORTED OR THE MEDIUM USED FOR TESTING, WHICHEVER IS GREATER. PROVIDE ALL HANGERS AND RODS, TURNBUCKLES, ANGLES, CHANNELS, AND OTHER STRUCTURAL SUPPORTS TO SUPPORT THE PIPING SYSTEMS. RODS FOR PIPE HANGERS SHALL BE FULL SIZE OF THE HANGER MANUFACTURER'S CATALOG LISTED ROD SIZE FOR EACH TYPE OF HANGER SPECIFIED. HANGERS AND SUPPORTS SHALL BE MICHIGAN, ITI GINNELL OR B-LINE.
- B. ALL MATERIAL UTILIZED FOR THE HANGING AND SUPPORT OF THE PIPING SYSTEMS SHALL BE MANUFACTURED PRODUCTS WHICH ARE SPECIFICALLY INTENDED FOR THE PURPOSE OF HANGING PIPING SYSTEMS. THE USE OF WIRE, STEEL STRAPS, PLASTIC TIES, ETC. IS STRICTLY PROHIBITED.
- C. PIPE HANGERS SELECTED FOR SUPPORTING HORIZONTAL INSULATED PIPING SHALL BE SIZED TO FIT AROUND THE OUTSIDE OF THE PIPE INSULATION. INSULATED PIPING SHALL BE SUPPORTED ON GALVANIZED SHIELDS.

1. SHIELDS SHALL BE AS FOLLOWS:
- PIPES 2" AND SMALLER: 18 GAUGE X 12" LONG.
 - PIPES 2 1/2" AND LARGER: 16 GAUGE X 18" LONG.

SECTION 22400

PLUMBING FIXTURES AND TRIM

1.0	<u>GENERAL</u>
1.01	<u>DESCRIPTION</u>
	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	<u>INTENT</u>
	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	<u>BASIS OF DESIGN</u>
	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	<u>ACCEPTABLE MANUFACTURERS</u>
	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	<u>PRODUCTS</u>
	(SEE FIXTURE SCHEDULE ON PLUMBING DRAWINGS)
3.0	<u>EXECUTION</u>
3.01	<u>INSTALLATION</u>
	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 1/2" 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, 1/2" 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	<u>CLEANING AND ADJUSTMENT</u>
	A. THE UNIT SHALL BE CLEANED, TESTED AND FIELD-ADJUSTED TO PROVIDE OPTIMUM FLOW AND DRAINAGE.
	END OF SECTION

3.02	<u>UNDERGROUND WATER PIPING</u>
	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	<u>MINIMUM HANGER SPACING</u>
	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 1/2" 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	<u>INSULATION INSTALLATION</u>
	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
	<u>SECTION 22424</u>
	<u>WATER HEATERS AND ACCESSORIES</u>
1.0	<u>GENERAL</u>
1.01	<u>DESCRIPTION</u>
	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. WATER HEATERS
	2. HOT WATER CIRCULATOR
2.0	<u>PRODUCTS</u>
2.01	<u>STORAGE WATER HEATER</u>
	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 CONNECTIONS 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	<u>HOT WATER CIRCULATOR</u>
	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	<u>EXECUTION</u>
3.01	<u>INSTALLATION</u>
	A. THE WATER HEATERS AND ACCESSORIES SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURERS 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

NO. DESCRIPTION BY DATE

JOB LOCATION:

PLUMBING SPECIFICATIONS
(2 OF 2)