MECHANICAL SYMBOLS LIST

Symbol	Description
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN/EXHAUST
T	THERMOSTAT
CO2	CO2 SENSOR
TS	REMOTE TEMPERATURE SENSOR
P	MANUAL PULL STATION
SD	DUCT MOUNTED SMOKE DETECTOR
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
Ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	POINT OF NEW CONNECTION
	SUPPLY AIR RECTANGULAR DUCT GOING UP/DOWN
	RETURN AIR RECTANGULAR DUCT GOING UP/DOWN
BD	BACKDRAFT DAMPER
VD VD	VOLUME DAMPER W/ ACCESS DOOR

MECHANICAL ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACCU	AIR COOLED CONDENSING UNIT
ACH	AIR CURTAIN
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
BD	GRAVITY DAMPER
CD	CONDENSATE DRAIN
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
DN	DOWN
E	EXISTING
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
FD	FIRE DAMPER W/FUSIBLE LINK
FSD	FIRE SMOKE DAMPER
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
KEF	KITCHEN EXHAUST FAN
MAU	MAKE-UP AIR UNIT
N	NEW
OA	OUTSIDE AIR
RA	RETURN AIR
RAD	RETURN AIR DUCT
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SAD	SUPPLY AIR DUCT
SEER	SEASONAL ENERGY EFFICIENCY RATIO
TEF	TOILET EXHAUST FAN
VD	VOLUME CONTROL DAMPER
EG	EXHAUST GRILLE
FG	FLOOR GRILLE
RG	RETURN GRILLE
SG	SUPPLY GRILLE

MECHANICAL DRAWING LIST

M-0.1	MECHANICAL SYMBOL, ABBREVIATIONS, NOTES & SPECIFICATIONS
M-1.0	MECHANICAL FLOOR PLAN - FIRST FLOOR
M-1.1	MECHANICAL ROOF PLAN
M-2.0	MECHANICAL DETAILS
M-3.0	MECHANICAL SCHEDULE
M-4.0	EXISTING HOOD DETAILS

APPLICABLE CODES

A. 2021 INTERNATIONAL BUILDING CODE
B. 2021 INTERNATIONAL MECHANICAL CODE
C. 2021 NATIONAL STANDARD PLUMBING CODE, NJ ED.
D. 2020 NATIONAL ELECTRICAL CODE
E. 2021 INTERNATIONAL FUEL GAS CODE
F. ENERGY CODE - ASHRAE 90.1-2019

THERMOSTATIC CONTROL NOTES

A. 6.4.3.1.1 GENERAL
THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE INDIVIDUALLY CONTROLLED BY THERMOSTATIC CONTROLS RESPONDING TO TEMPERATURE WITHIN THE ZONE. FOR THE PURPOSES OF THIS SECTION, A DWELLING UNIT SHALL BE PERMITTED TO BE CONSIDERED A SINGLE ZONE.

B. 6.4.3.1.2 DEAD BAND
WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF AND CONFIGURED TO PROVIDE A TEMPERATURE RANGE OR DEAD BAND OF AT LEAST 5°F WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS SHUT OFF OR REDUCED TO A MINIMUM.

C. 6.4.3.2 SET-POINT OVERLAP RESTRICTION
WHERE HEATING AND COOLING TO A ZONE ARE CONTROLLED BY SEPARATE ZONE THERMOSTATIC CONTROLS LOCATED WITHIN THE ZONE, MEANS (SUCH AS LIMIT SWITCHES; MECHANICAL STOPS; OR, FOR DDC SYSTEMS, SOFTWARE PROGRAMMING) SHALL BE PROVIDED TO PREVENT THE HEATING SET POINT FROM EXCEEDING THE COOLING SET POINT, MINUS ANY APPLICABLE PROPORTIONAL BAND.

D. 6.4.3.3 OFF-HOUR CONTROLS
HVAC SYSTEMS SHALL HAVE THE OFF-HOUR CONTROLS REQUIRED BY SECTIONS 6.4.3.3.1 THROUGH 6.4.3.3.5.

E. 6.4.3.3.1 AUTOMATIC SHUTDOWN
HVAC SYSTEMS SHALL BE EQUIPPED WITH AT LEAST ONE OF THE FOLLOWING:
a. CONTROLS THAT CAN START AND STOP THE SYSTEM UNDER DIFFERENT TIME SCHEDULES FOR SEVEN DIFFERENT DAY TYPES PER WEEK, ARE CAPABLE OF RETAINING PROGRAMMING AND TIME SETTING DURING LOSS OF POWER FOR A PERIOD OF AT LEAST TEN HOURS, AND INCLUDE AN ACCESSIBLE MANUAL OVERRIDE OR EQUIVALENT FUNCTION THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO TWO HOURS.
b. AN OCCUPANCY SENSOR THAT IS CAPABLE OF SHUTTING THE SYSTEM OFF WHEN NO OCCUPANT IS SENSED FOR A PERIOD OF UP TO 30 MINUTES.
c. A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO TWO HOURS.
d. AN INTERLOCK TO A SECURITY SYSTEM THAT SHUTS THE SYSTEM OFF WHEN THE SECURITY SYSTEM IS ACTIVATED.

F. 6.4.3.3.2 SETBACK CONTROLS
HEATING SYSTEMS SHALL BE EQUIPPED WITH CONTROLS CAPABLE OF AND CONFIGURED TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES ABOVE AN ADJUSTABLE HEATING SET POINT AT LEAST 10°F BELOW THE OCCUPIED HEATING SET POINT. COOLING SYSTEMS SHALL BE EQUIPPED WITH CONTROLS CAPABLE OF AND CONFIGURED TO AUTOMATICALLY RESTART AND TEMPORARILY OPERATE THE MECHANICAL COOLING SYSTEM AS REQUIRED TO MAINTAIN ZONE TEMPERATURES BELOW AN ADJUSTABLE COOLING SET POINT AT LEAST 5°F ABOVE THE OCCUPIED COOLING SET POINT OR TO PREVENT HIGH SPACE HUMIDITY LEVELS.

BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF INTERNATIONAL BUILDING CODE 2021 WITH ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTION AND TESTS.
2. 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 INTERNATIONAL BUILDING CODE 2021.
3. 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.
4. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE INTERNATIONAL MECHANICAL CODE 2021:
   A. VENTILATION SYSTEM IMC 2021 - 401
   B. GREASE DUCT TEST IMC 2021 - 506.3.2.5
5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. STANDARDS OF HEATING IMC 2021 - 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION IMC 2021 - 603
   C. AIR INTAKES, EXHAUSTS AND RELIEF IMC 2021 - 401.5
   D. AIR FILTERS IMC 2021 - 605
6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
7. VENTILATION FOR ALL AREA SHALL COMPLY WITH INTERNATIONAL MECHANICAL CODE 2021, CHAPTER 4.
8. VENTILATION SYSTEM SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATES AS SHOWN IN VENTILATION REQUIREMENT TABLE. THE SYSTEM SHALL BE BALANCED BY APPROVED METHOD. CONTRACTOR TO SUBMIT THE AIR BALANCE REPORT TO INSPECTOR OF RESPECTIVE BUILDING DEPARTMENT PRIOR TO FINAL INSPECTION.
9. 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 INTERNATIONAL MECHANICAL CODE 2021 - 403.
10. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
11. 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.
12. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
13. SMOKE DETECTOR SHALL MEET UL268A.

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. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE OTHER TRADES IS REQUIRED.
8. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
9. 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.
10. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
11. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
12. 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.
13. 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.
14. 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.
15. 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.
16. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
17. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
18. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
19. 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.
20. 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.
21. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
22. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
23. 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.
24. 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.
25. 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.

GENERAL HVAC NOTES

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, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.
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 PIPING, 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.
17. ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.
18. ALL ROOF-MOUNTED EQUIPMENT CURBS/STEEL RAILS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.
19. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
20. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.
21. ALL AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.
22. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

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, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS 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 OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

EXISTING CONDITION

DESIGN DRAWINGS ARE SCHEMATIC. THIS CONTRACTOR SHALL VISIT THE SITE PRIOR TO BIDDING OR AWARD OF CONTRACT TO INSPECT EXISTING FIELD CONDITIONS. THIS CONTRACT SHALL INCLUDE ALL LABOR AND MATERIALS NECESSARY FOR FIELD MODIFICATIONS DUE TO EXISTING CONDITIONS. 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.

SPECIFICATIONS

SECTION 0001 - NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS
A. THE BIDDER BY MAKING A BID REPRESENTS THAT:
B. THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.
C. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.
D. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.
E. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.
F. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.
1.2 EXISTING CONDITIONS AND COORDINATION
A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED, AND HAS CORRELATED THE BIDDER'S OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.
B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.
1.3 RESPONSIBILITIES
A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST, OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.
B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON-TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.
C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUTDOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE-ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUTDOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0101 - QUALITY OF WORK

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

END OF SECTION 0101

SECTION 0102 -REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS
A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.
1.2 SUBMITTALS
A. EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES, AND CHOICES SHALL BE CHECKED, PRINTED, OR OTHERWISE INDICATED ON THE SUBMITTALS.
1.3 RECORD DRAWINGS
A. UPON COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.
1.4 EQUIPMENT OPERATING INSTRUCTIONS
A. ON COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS, EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.
B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE-RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.
C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.

END OF SECTION 0102

SECTION 078413-PENETRATION FIRE-STOPPING

1.1 QUALITY ASSURANCE
A. INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.
B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL
1.2 PENETRATION FIRESTOPPING
A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479:
C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
D. W-RATINGS: PER UL 1479.
1.3 INSTALLATION
A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
1.5 FIELD QUALITY CONTROL
A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE:
A. WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.
B. FOR THE FOLLOWING SYSTEMS: METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS, INSULATED PIPES, GROUPINGS OF PENETRANTS, USE ONE OR MORE OF THE FOLLOWING MATERIALS:
a. LATEX SEALANT
b. SILICONE SEALANT
c. MORTAR
d. SILICONE FOAM
e. PILLOWS/BAGS
f. INTUMESCENT WRAP STRIPS
1.6 MANUFACTURERS
A. HILTI CONSTRUCTION CHEMICAL, INC
B. 3M FIRE PROTECTION PRODUCTS
END OF SECTION 078413

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING

1.1 SLEEVE-SEAL SYSTEMS
A. FIELD-ASSEMBLED, MODULAR SEALING-ELEMENT UNIT FOR FILLING ANNULAR SPACE BETWEEN PIPING AND SLEEVE.
1. SEALING ELEMENTS: EPDM RUBBER OR NBR.
2. PRESSURE PLATES: CARBON STEEL, PLASTIC, STAINLESS STEEL.
3. CONNECTING BOLTS AND NUTS: CARBON STEEL WITH CORROSION-RESISTANT COATING, STAINLESS STEEL.
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, AVAILABLE MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
1. ADVANCE PRODUCTS & SYSTEMS, INC.
2. CALPICO, INC.
3. METRAFLEX COMPANY (THE).
4. PIPELINE SEAL AND INSULATOR, INC.
1.2 SLEEVE-SEAL FITTINGS
A. MANUFACTURED PLASTIC, SLEEVE-TYPE, PLASTIC OR RUBBER WATER-STOP ASSEMBLY MADE FOR IMBEDDING IN CONCRETE SLAB OR WALL.
1.3 GROUT
A. NON-SHRINK, FACTORY PACKAGED.
1.4 SLEEVE AND SLEEVE-SEAL SCHEDULE
A. USE SLEEVES AND SLEEVE SEALS FOR THE FOLLOWING PIPING-PENETRATION APPLICATIONS:
1. INTERIOR PARTITIONS:
a. PIPING SMALLER THAN NPS 6 (DN 150): GALVANIZED-STEEL-PIPE SLEEVES, PVC-PIPE SLEEVES.
b. PIPING NPS 6 (DN 150) AND LARGER: GALVANIZED-STEEL-SHEET SLEEVES.
END OF SECTION 230517

SECTION 230529 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS
A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.
B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.
1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND
3. DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.
1.2 SUBMITTALS
A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER
1.3 QUALITY ASSURANCE
A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE - STEEL."
1.4 COMPONENTS
A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL
B. FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY COMPOSITES, COOPER B-LINE
D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER
E. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE
F. THERMAL-HANGER SHIELD INSERTS:
G. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS
H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYP EQUIPMENT SUPPORTS.
END OF SECTION 230529

SECTION 230548 - VIBRATION CONTROLS FOR PIPING AND HVAC EQUIPMENT

PART 1 - GENERAL
1.1 PERFORMANCE REQUIREMENTS
A. SEISMIC-RESTRAINT LOADING:
1. SITE CLASS AS DEFINED IN THE IBC: A, B
2. ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC: I II III
a. COMPONENT IMPORTANCE FACTOR: 1.0
b. COMPONENT RESPONSE MODIFICATION FACTOR: 2.5
c. COMPONENT AMPLIFICATION FACTOR: 2.5.
3. DESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND) 18%
4. DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND PERIOD: 8%
1.2 COMPONENTS
A. VIBRATION ISOLATORS:
1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE-DEFLECTION TYPE.
3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
5. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN-SPRING TYPE WITH SEISMIC RESTRAINT.
6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING, WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS.
7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
8. SPRING HANGERS: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
10. PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
11. RESILIENT PIPE GUIDES.
B. AIR-MOUNTING SYSTEMS:
1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWS.
2. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWS.
C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.
D. VIBRATION ISOLATION EQUIPMENT BASES:
1. STEEL BASE: FACTORY- FABRICATED, WELDED, STRUCTURAL- STEEL BASES AND RAILS.
2. INERTIA BASE: FACTORY- FABRICATED, WELDED, STRUCTURAL- STEEL BASES AND RAILS READY FOR FIELD-APPLIED, CAST-IN-PLACE CONCRETE
1.3 FIELD QUALITY CONTROL
A. TESTING: BY EITHER OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.

PART-2 PRODUCTS

1.4 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES
A. 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:
B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. COOPER B-LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
5. HILTI, INC.
6. ISOLATION TECHNOLOGY, INC.
7. KINETICS NOISE CONTROL.
END OF SECTION 230548

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY
A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
1. MOTORS.
2. CONDENSING UNITS.
3. AIR SYSTEM: CONSTANT VOLUME
1.2 QUALITY ASSURANCE
A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.
1.3 EXECUTION
A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR 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.
B. 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.
C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS S3ECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
G. ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.
END OF SECTION 230593

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS
A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
B. MANUFACTURERS: TITUS
1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
a. HART & COOLEY INC.
b. KRUEGER.
c. METALAIRE, INC.
d. 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

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION
A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".
B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:
1. 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.
2. SHEET STEEL SHALL COMPLY WITH ASTMA653 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.
3. 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.
4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
5. 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 TRAIGHT TAPS WILL NOT BE ACCEPTED.
6. BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
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:

SUPPORT SCHEDULE - DUCTWORK

USG	MAX SIDE INCHES	TRANSVERSE JOINT AND BRACING
22	UP TO 12	S SLIP, DRIVE, ONE INCH POCKET ON 8 FOOT
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

D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX.
2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.
E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU OF RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS
F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.
1.2 MATERIALS
A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
B. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTINGS.
C. SHEET METAL MATERIALS:
1. GALVANIZED SHEET STEEL.
2. STAINLESS-STEEL SHEETS.
3. ALUMINUM SHEETS.
4. FACTORY-APPLIED ANTI-MICROBIAL COATING.
D. DUCT LINER:
1. FIBROUS GLASS, TYPE I, FLEXIBLE WITH ANTI-MICROBIAL EROSION-RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.
E. SEALANT MATERIALS:
3. TWO-PART TAPE SEALING SYSTEM.
4. WATER-BASED JOINT AND SEAM SEALANT.
5. SOLVENT-BASED JOINT AND SEAM SEALANT.
6. FLANGED JOINT SEALANT.
7. FLANGE GASKETS.
8. ROUND DUCT JOINT O-RING SEALS.
1.3 DUCT CLEANING
A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
B. CLEAN THE FOLLOWING ITEMS:
1. AIR OUTLETS AND INLETS.
2. SUPPLY, RETURN, AND EXHAUST FANS.
3. AIR-HANDLING UNITS.
4. COILS AND RELATED COMPONENTS.
5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
1.4 DUCT SCHEDULE
A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM.
END OF SECTION 233113

SECTION 230713 - INSULATION

INSULATION - GENERAL REQUIREMENTS

A. ALL INSULATION MATERIALS, INCLUDING JACKETS, FACING, ADHESIVE, COATINGS, AND ACCESSORIES ARE TO BE FIRE HAZARD RATED AND LISTED BY UNDERWRITERS LABORATORIES, INC. USING STEINER TUNNEL TEST METHOD FOR FIRE HAZARD CLASSIFICATION OF BUILDING MATERIALS, STANDARD UL 723 (ASTM E-84), (ASA A2.5-1963). FLAMESPREAD: MAXIMUM 25. FUEL CONTRIBUTED AND SMOKE DEVELOPED: MAXIMUM 50. FLAMEPROOFING TREATMENTS SUBJECT TO DETERIORATION FROM MOISTURE OR HUMIDITY ARE NOT ACCEPTABLE.
B. DEFINITIONS:
1) EXPOSED: INDOOR DUCTS, PIPING OR EQUIPMENT LOCATED IN MECHANICAL EQUIPMENT ROOMS AND IN AREAS WHICH WILL BE VISIBLE WITHOUT REMOVING CEILINGS OR OPENING ACCESS PANELS.
2) CONCEALED: INDOOR DUCTS, PIPING OR EQUIPMENT WHICH IS NOT EXPOSED.
3) OUTDOOR: DUCTS, PIPING OR EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

DUCTWORK INSULATION

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

INSULATION SCHEDULE - DUCTWORK

SERVICE	LOCATION	R-VALUE	TYPE	FINISH
SUPPLY/RETURN	CONCEALED	R-6	D-1	VAPORSEAL
SUPPLY/RETURN	EXPOSED	R-8	D-1	VAPORSEAL
INTAKE	ALL	R-8	D-1	VAPORSEAL
SUPPLY	EXTERIOR	R-8	D-1	VAPORSEAL
KITCHEN EX.	INTERIOR	1.5" (2 LAYER)		3M FIRE MASTER DUCT WRAP

B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING TO REMAIN AND WAS DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS.
C. NON-INSULATED DUCTWORK:
1) WHERE SOUND LINING IS OF MINIMUM THICKNESS SPECIFIED FOR INSULATION.
2) AIR CONDITIONING RETURN AIR DUCTWORK EXPOSED IN AIR CONDITIONED SPACES AND INSTALLED IN HUNG CEILINGS WHERE SPACE IMMEDIATELY ABOVE AND BELOW ARE BOTH AIR CONDITIONED.MATERIAL:
D. MATERIAL:
1) TYPE D-1: MINIMUM 1-LB DENSITY FIBERGLASS BLANKET, MAXIMUM 0.28 K-FACTOR AT 75 ADEG F MEAN TEMPERATURE WITH FACTORY-APPLIED FOIL-SKRIM-KRAFT FACING SIMILAR TO MANVILLE MICROLITE.
2) TYPE D-2: 3 LB. FIBERGLASS BOARD. THE MAXIMUM K FACTOR SHALL BE 0.23 AT 75 DEG F MEAN TEMPERATURE WITH A MINIMUM DENSITY OF 3 LB. THE INSULATION
SHALL BE PROVIDED WITH A FACTORY-APPLIED ALL PURPOSE OR ALL SERVICE FACING. THE INSULATION SHALL BE EQUAL TO MANVILLE TYPE 814 SPIN-GLAS AP.
3) TYPE D-3: MINIMUM 6 LB FIBERGLASS BOARD. MAXIMUM 0.22 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH FACTORY APPLIED ALL PURPOSE OR ALL SERVICE FACING. SIMILAR TO MANVILLE 817 SPIN-GLAS AP
E. FINISH:
1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1, MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON.
2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO FOSTER TITE-FIT, UL LABEL.
3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.
F. INSTALLATION:
a. FIBERGLASS BLANKET: 2 IN. LAP STRIPS AT ALL SEAMS. SECURE BOTTOM OF ALL DUCTS OVER 24 IN. WIDE WITH MIN 2 ROWS OF WELD PINS 12 IN. ON CENTER. SECURE ALL SEAMS WITH FOIL VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE.
b. FIBERGLASS BOARD: SEAL JOINTS AND BREAKS IN FACING WITH 3 IN. WIDE TAPE TO MATCH FACING AND ADHERE WITH VAPOR SEAL ADHESIVE. APPLY 5 IN. WIDE TAPE AT CORNERS, WELD PINS ON TOP, SIDES AND BOTTOM.
G. ACOUSTICAL TREATMENT
PROVIDE ACOUSTICAL LINER FOR FIRST 10 FEET OF BOTH SUPPLY AND RETURN DUCTWORK, 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

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PROJECT INFORMATION:
FORD'S GARAGE

DRAWING TITLE:
MECHANICAL SYMBOL, ABBREVIATION, NOTES & SPECIFICATIONS

DRAWING NO.:
M-0.1

DEMAND CONTROL VENTILATION

SEQUENCE OF OPERATION:
THE CO2 SENSOR SHALL MODULATE THE RTU OUTSIDE AIR DAMPER TO MAINTAIN 1000 PPM CO2 OR LESS
OCCUPIED MODE:

1. FAN SHALL RUN CONTINUOUSLY WHILE BRINGING IN MINIMUM DCV OUTSIDE AIR AS INDICATED IN SCHEDULE.
2. IF CO2 SENSOR READING IS BELOW THE SET-POINT, THE DAMPER SHALL OPEN TO THE CALCULATED DCV MINIMUM OUTSIDE AIR.
3. IF CO2 SENSOR READING EXCEEDS THE SET POINT, OUTSIDE AIR DAMPER SHALL MODULATE TO MAINTAIN 1000 PPM NOT TO EXCEED THE CALCULATED DESIGN MAXIMUM OUTSIDE AIR.
4. UPON CO2 CONCENTRATION FALLING BELOW THE SET-POINT OF 1000 PPM, THE OUTSIDE AIR DAMPER SHALL RETURN TO DCV MINIMUM OUTSIDE AIR.

UNOCCUPIED MODE:

1. FAN SHALL CYCLE WITH HEATING AND COOLING. OUTSIDE AIR DAMPER SHALL BE SET TO DCV MINIMUM. OUTSIDE DAMPER SHALL NOT BE CYCLED WITH CO2 PPM SET-POINT.
2. HEATING AND COOLING MODES SHALL CYCLE AS CALLED FOR BY THE THERMOSTAT.

OUTSIDE AIR DAMPER CONTROL LIMIT FOR RTU-2(E)	
MINIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING UNOCCUPIED HOURS	735 CFM
MAXIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING OCCUPIED HOURS	2200 CFM

OUTSIDE AIR DAMPER CONTROL LIMIT FOR RTU-3(E)	
MINIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING UNOCCUPIED HOURS	275 CFM
MAXIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING OCCUPIED HOURS	800 CFM

OUTSIDE AIR DAMPER CONTROL LIMIT FOR RTU-4(E)	
MINIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING UNOCCUPIED HOURS	200 CFM
MAXIMUM OUTSIDE AIR REQUIRED IN THE SPACE DURING OCCUPIED HOURS	1000 CFM

GENERAL NOTES:

A. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.

B. NEW DUCTWORK SHOWN ON PLAN ARE SCHEMATIC ONLY. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES FOR PIPING AND DUCTWORK ROUTING, OFFSET AND RUN PIPING, DUCTWORK INSIDE THE STRUCTURE IF REQUIRED. PROVIDE ANY EXTRA PIPING, DUCTWORK, FITTINGS, INSULATIONS AND OTHER ACCESSORIES IN ORDER TO COMPLETE THE INSTALLATION.

C. ALL EXPOSED DUCTWORK, SUPPLY DIFFUSER AND RETURN GRILLE LOCATED IN THE SERVICE AND/OR DINING AREA SHALL BE PAINTED TO MATCH THE CEILING BY THE GENERAL CONTRACTOR. CONTRACTOR SHALL COORDINATE ALL DUCT AND DIFFUSER/GRILLE LOCATION WITH LIGHTING LAYOUT AS REQUIRED.

D. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

E. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS.

F. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

G. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

H. COORDINATE WITH ALL TRADES FOR MATERIALS IN RATED AND PLENUM SPACES.

I. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.

J. PROVIDE INTERNAL INSULATION FOR ALL EXPOSED DUCTWORK AND EXTERNAL FOR ALL DUCTWORK IN CONCEALED AREAS.

K. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR FIRE RATINGS OF THE WALLS.

L. ARCHITECTURAL LAYOUT AND DIMENSIONS FOR EQUIPMENT TO TAKE PRECEDENCE OVER MEP.

M. LIMIT FLEXIBLE DUCT LENGTH TO 5 LINEAR FEET. MAKE SURE DUCT IS FULLY STRETCHED OUT WITH NO KINKS & SHARP BENDS.

N. PROVIDE CORD OPERATED DAMPER IN INACCESSIBLE CEILING.

O. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN DUCTS.

P. 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.

Q. 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.

R. 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.

S. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND LL ROOFING CONTRACTOR. PROVIDE NEW OPENING IF REQUIRED AND CLOSE USED OPENINGS.

T. COORDINATE ALL EQUIPMENT WITH STRUCTURAL DRAWING.

U. MAINTAIN ALL CODE AND MANUFACTURERS RECOMMENDED CLEARANCE AROUND ALL ROOF EQUIPMENT.

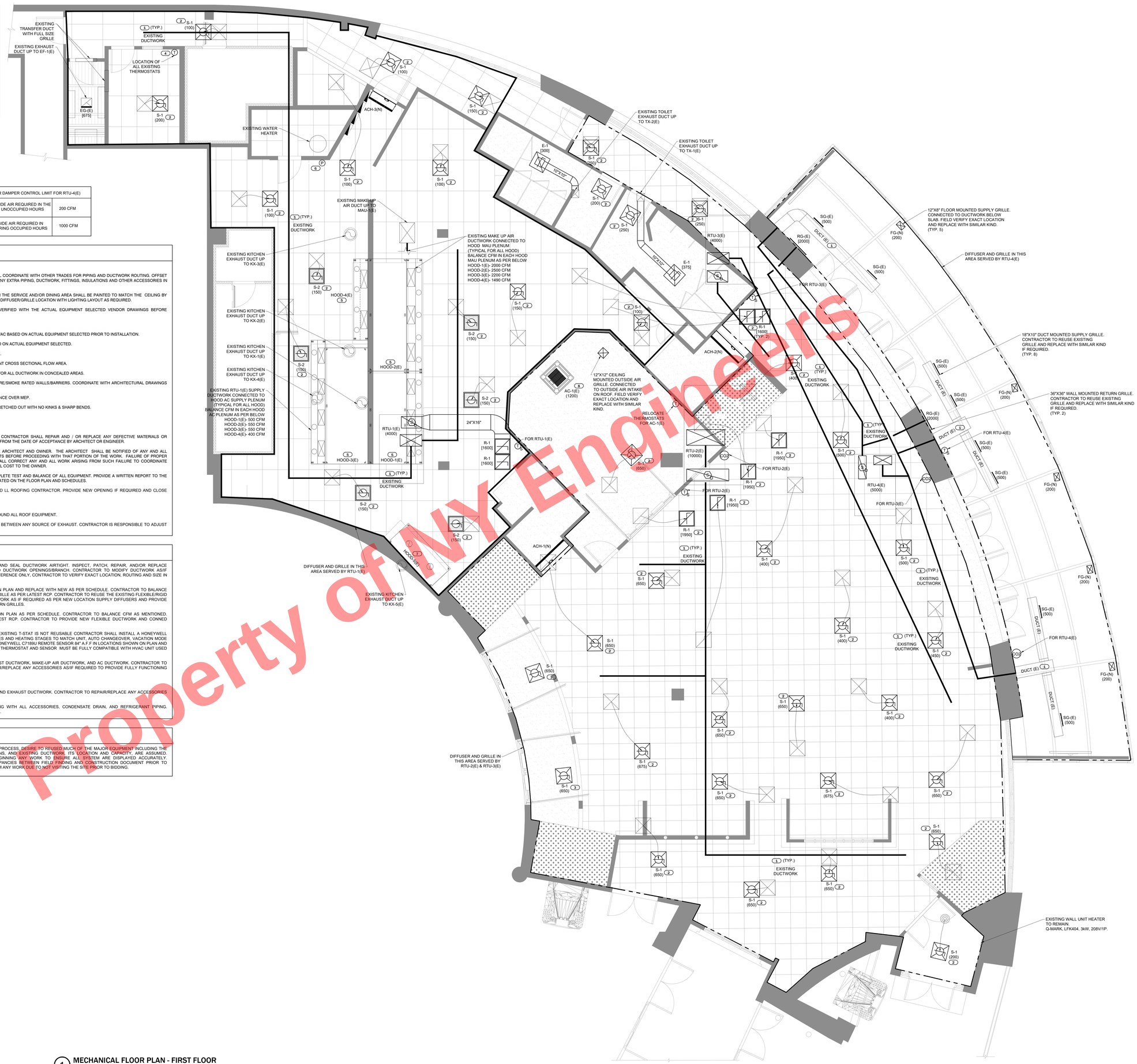
V. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.

KEY NOTES: (#)

1. EXISTING DUCTWORK TO REMAIN. CONTRACTOR SHALL CLEAN, PATCH AND SEAL DUCTWORK AIRTIGHT. INSPECT, PATCH, REPAIR, AND/OR REPLACE INSULATION AS REQUIRED. CONTRACTOR SHALL CLOSE ALL UN-UTILIZED DUCTWORK OPENINGS/BRANCH. CONTRACTOR TO MODIFY DUCTWORK AS/IF REQUIRED. EXISTING DUCTWORK ROUTING SHOWN ON DRAWING IS FOR REFERENCE ONLY, CONTRACTOR TO VERIFY EXACT LOCATION, ROUTING AND SIZE IN FIELD. COORDINATE IN FIELD PRIOR TO BID
2. CONTRACTOR TO RELOCATE DIFFUSER/ GRILLE IN LOCATION AS SHOWN ON PLAN AND REPLACE WITH NEW AS PER SCHEDULE. CONTRACTOR TO BALANCE CFM AS MENTIONED. CONTRACTOR TO COORDINATE LOCATION DIFFUSER GRILLE AS PER LATEST RCP. CONTRACTOR TO REUSE THE EXISTING FLEXIBLE/RIGID DUCTWORK AS MUCH AS POSSIBLE. PROVIDE ADDITIONAL FLEXIBLE DUCTWORK AS IF REQUIRED AS PER NEW LOCATION SUPPLY DIFFUSERS AND PROVIDE ADDITIONAL RIGID DUCTWORK AS IF REQUIRED AS PER NEW LOCATION RETURN GRILLES.
3. CONTRACTOR TO PROVIDE DIFFUSER/ GRILLE IN LOCATION AS SHOWN ON PLAN AS PER SCHEDULE. CONTRACTOR TO BALANCE CFM AS MENTIONED. CONTRACTOR TO COORDINATE LOCATION DIFFUSER GRILLE AS PER LATEST RCP. CONTRACTOR TO PROVIDE NEW FLEXIBLE DUCTWORK AND CONNED DIFFUSER WITH EXISTING DUCTWORK.
4. CONTRACTOR REUSE THERMOSTAT IN LOCATION AS SHOWN ON PLAN. IF EXISTING T-STAT IS NOT REUSABLE CONTRACTOR SHALL INSTALL A HONEYWELL TH8000 SERIES 7 DAY PROGRAMMABLE THERMOSTAT WITH COOLING STAGES AND HEATING STAGES TO MATCH UNIT, AUTO CHANGEOVER, VACATION MODE AND TEMPERATURE OVERRIDE WHILE OCCUPIED. FURNISH AND INSTALL A HONEYWELL C7189U REMOTE SENSOR 84" A.F.F IN LOCATIONS SHOWN ON PLAN AND CONNECT TO THERMOSTAT. COORDINATE EXACT LOCATIONS WITH TENANT. THERMOSTAT AND SENSOR MUST BE FULLY COMPATIBLE WITH HVAC UNIT USED FOR PROJECT.
5. EXISTING TYPE-I HOOD TO REMAIN ALONG WITH ALL ACCESSORIES, EXHAUST DUCTWORK, MAKE-UP AIR DUCTWORK, AND AC DUCTWORK. CONTRACTOR TO BALANCE MAKE-UP AIR AND AC CFM AS PER PLAN. CONTRACTOR TO REPAIR/REPLACE ANY ACCESSORIES AS/IF REQUIRED TO PROVIDE FULLY FUNCTIONING OF HOOD.
6. EXISTING MANUAL PULL STATION TO REMAIN AS IT IS.
7. EXISTING DISHWASHER HOOD TO REMAIN ALONG WITH ALL ACCESSORIES AND EXHAUST DUCTWORK. CONTRACTOR TO REPAIR/REPLACE ANY ACCESSORIES AS/IF REQUIRED TO PROVIDE FULLY FUNCTIONING OF HOOD.
8. EXISTING CEILING MOUNTED CASSETTE UNIT TO REMAIN AS IT IS ALONG WITH ALL ACCESSORIES, CONDENSATE DRAIN, AND REFRIGERANT PIPING. CONTRACTOR TO RELOCATE AND ADJUST UNIT AS PER NEW CEILING LAYOUT.

CONTRACTOR NOTE:

DUE TO MINIMAL EXISTING CONDITION AVAILABLE AT THE TIME OF THE DESIGN PROCESS, DESIRE TO REUSED MUCH OF THE MAJOR EQUIPMENT INCLUDING THE ROOFTOP UNIT, KITCHEN EXHAUST HOOD, MAKE UP AIR UNIT, EXHAUST FANS, AND EXISTING DUCTWORK. ITS LOCATION AND CAPACITY, ARE ASSUMED. MECHANICAL CONTRACTOR SHALL PERFORM DUE DILIGENCE PRIOR TO BEGINNING ANY WORK TO ENSURE ALL SYSTEM ARE DISPLAYED ACCURATELY. COORDINATE WITH ENGINEER OF RECORD OR ARCHITECT FOR ANY DISCREPANCIES BETWEEN FIELD FINDING AND CONSTRUCTION DOCUMENT PRIOR TO BEGINNING ANY WORK. MECHANICAL CONTRACTOR SHALL NOT BE OMITTED FROM ANY WORK DUE TO NOT VISITING THE SITE PRIOR TO BIDDING.



1 MECHANICAL FLOOR PLAN - FIRST FLOOR

1/4"=1'-0"

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PROJECT INFORMATION:

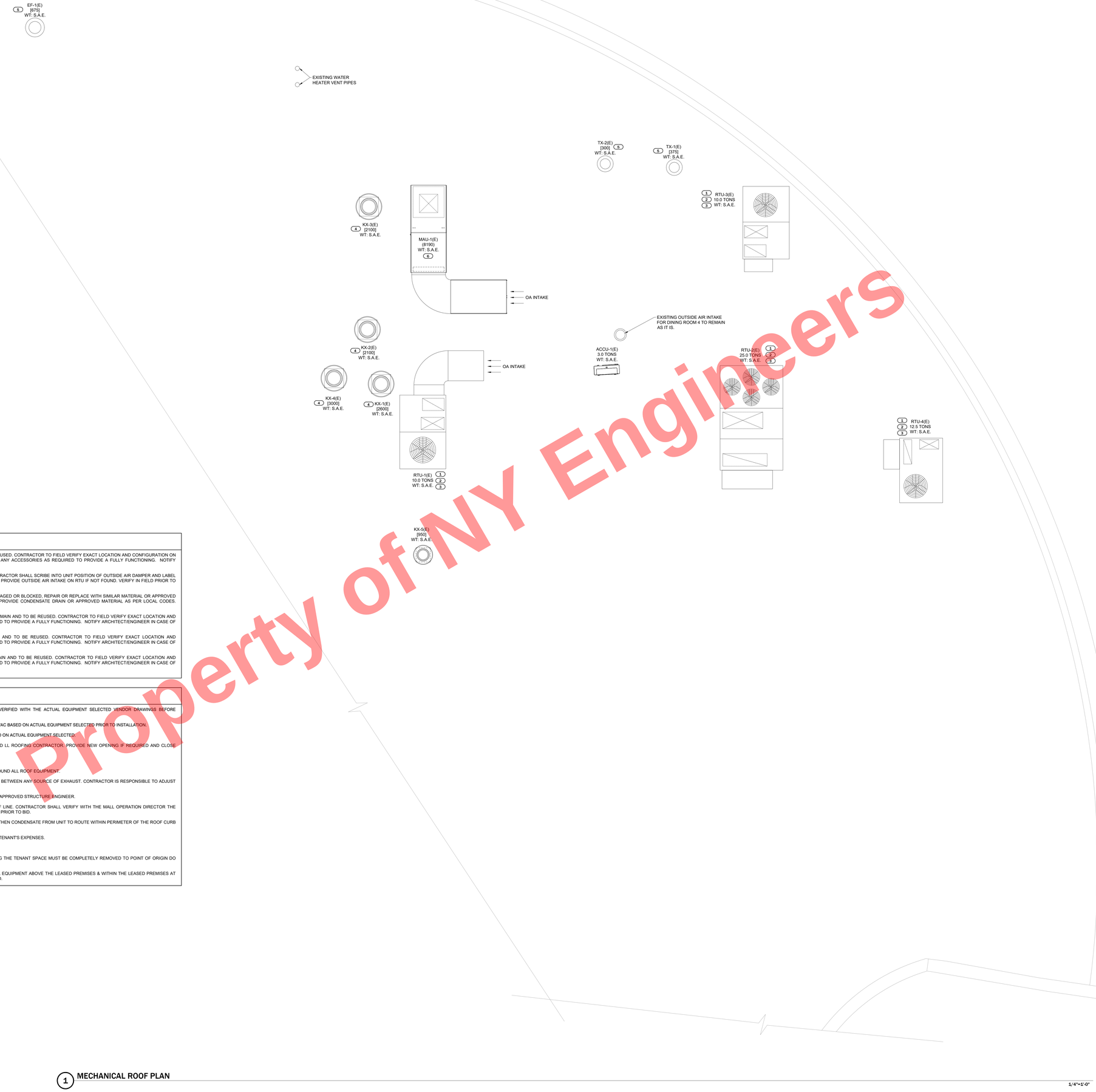
FORD'S GARAGE

DRAWING TITLE:

MECHANICAL FLOOR PLAN - FIRST FLOOR

DRAWING NO.:

M-1.0



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KEY NOTES: (#)

1. EXISTING RTU ALONG WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE. CLEAN AND REFURBISH TO "LIKE-NEW" CONDITION. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING. NOTIFY ARCHITECT/ENGINEER IN CASE OF ANY DISCREPANCY.
2. CONTRACTOR TO SET OUTSIDE AIR AS INDICATED ON RTU SCHEDULE. CONTRACTOR SHALL SCRIBE INTO UNIT POSITION OF OUTSIDE AIR DAMPER AND LABEL OUTSIDE AIR VOLUME AND PERCENTAGE OF OUTSIDE AIR. CONTRACTOR TO PROVIDE OUTSIDE AIR INTAKE ON RTU IF NOT FOUND. VERIFY IN FIELD PRIOR TO BID.
3. EXISTING CONDENSATE DRAIN OF RTU TO REMAIN AS IT IS. IF PIPING IS DAMAGED OR BLOCKED, REPAIR OR REPLACE WITH SIMILAR MATERIAL OR APPROVED MATERIAL AS PER LOCAL CODES. IF CONDENSATE DRAIN NOT PROVIDED PROVIDE CONDENSATE DRAIN OR APPROVED MATERIAL AS PER LOCAL CODES. TERMINATE TO NEAREST APPROVED PLACE OF DISPOSAL.
4. EXISTING KITCHEN EXHAUST FAN ALONG WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING. NOTIFY ARCHITECT/ENGINEER IN CASE OF ANY DISCREPANCY.
5. EXISTING EXHAUST FAN ALONG WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING. NOTIFY ARCHITECT/ENGINEER IN CASE OF ANY DISCREPANCY.
6. EXISTING MAKE UP AIR UNIT ALONG WITH ALL ITS ACCESSORIES TO REMAIN AND TO BE REUSED. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION ON SITE. REPAIR/REPLACE ANY ACCESSORIES AS REQUIRED TO PROVIDE A FULLY FUNCTIONING. NOTIFY ARCHITECT/ENGINEER IN CASE OF ANY DISCREPANCY.

GENERAL NOTES:

A. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.

B. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

C. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.

D. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND LL ROOFING CONTRACTOR. PROVIDE NEW OPENING IF REQUIRED AND CLOSE USED OPENINGS.

E. COORDINATE ALL EQUIPMENT WITH STRUCTURAL DRAWING.

F. MAINTAIN ALL CODE AND MANUFACTURERS RECOMMENDED CLEARANCE AROUND ALL ROOF EQUIPMENT.

G. ALL SOURCE OF MECHANICAL INTAKE SHALL MAINTAIN 10 FEET SEPARATION BETWEEN ANY SOURCE OF EXHAUST. CONTRACTOR IS RESPONSIBLE TO ADJUST DUCT LENGTH AS NEEDED.

H. ALL EQUIPMENT'S LOCATION TO BE LOCATED IN AREAS DESIGNATED BY A LL APPROVED STRUCTURE ENGINEER.

I. ALL CONDENSATE PIPING SHALL BE COPPER AND INSULATED BELOW ROOF LINE. CONTRACTOR SHALL VERIFY WITH THE MALL OPERATION DIRECTOR THE CORRECT METHOD AND LOCATION OF CONDENSATE DISCHARGE FROM UNIT, PRIOR TO BID.

J. IF MALL CRITERIA CALL FOR CONDENSATE TO DRAIN WITHIN TENANT SPACE THEN CONDENSATE FROM UNIT TO ROUTE WITHIN PERIMETER OF THE ROOF CURB AND NOT THROUGH ROOF.

K. ALL ROOF WORK TO BE PERFORM BY LANDLORD ROOFING CONTRACTOR AT TENANT'S EXPENSES.

L. ALL UNIT MUST INCLUDE A HAIL GUARD ON CONDENSER COIL.

M. ANY UNUSED PLUMBING, HVAC EQUIPMENT, PIPING ETC WITHIN OR SERVING THE TENANT SPACE MUST BE COMPLETELY REMOVED TO POINT OF ORIGIN DO NOT ABANDON IN PLACE.

N. CONTRACTOR TO REMOVE ALL ABANDONED ROOFTOP AND/OR MECHANICAL EQUIPMENT ABOVE THE LEASED PREMISES & WITHIN THE LEASED PREMISES AT CONTRACTOR EXPENSES. PATCH AND REPAIR AS NEED. VERIFY PRIOR TO BID.

1 MECHANICAL ROOF PLAN

1/4"=1'-0"

PROJECT INFORMATION:

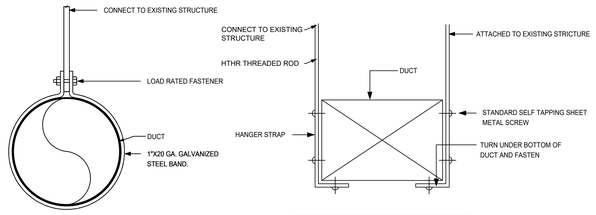
FORD'S GARAGE

DRAWING TITLE:

MECHANICAL ROOF PLAN

DRAWING NO.:

M-1.1



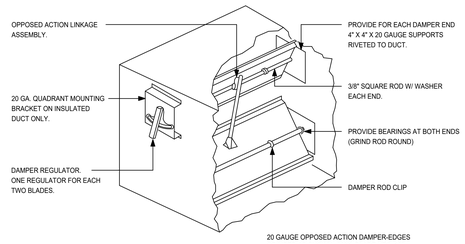
NOTES :

1. DUCT CONSTRUCTION SHALL CONFORM TO LOW PRESSURE MATCNA CONSTR. STD.
2. DUCTS SHALL BE FABRICATED WITH LONGITUDINAL SEAMS.
3. PROVIDE ONE PRIME-COAT PAINT FOR ROUND DUCTS INSTALLED IN EXPOSED AREAS.

DUCT HANGER SCHEDULE

DUCT CROSS SECTIONAL AREA	STRAP HANGER SIZE	MAX. SPACING
UNDER 2 SQ FT.	1" X 1/16"	6'-0" O.C.
2 TO 4 SQ FT.	1" X 1/8"	8'-0" O.C.
4 TO 8 SQ FT.	1" X 1/8"	6'-0" O.C.
OVER 8 SQ FT.	1" X 1/8"	4'-0" O.C.

1 DUCT WORK HANGING DETAIL
N.T.S.



NOTE : 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

2 LOW PRESSURE BALANCING DAMPER
N.T.S.

NOTES:
DUCTS TO BE ACOUSTICALLY LINED SHALL BE DESIGNATED BY THE SYMBOL IN FIG. "C" TO THE EXTENT OF LINING. THICKNESS SHALL BE AS SPECIFIED.
DUCTS LINED WITH ACOUSTICAL MATERIAL SHOULD BE FASTENED WITH CLIPS, ADHESIVE, OR PINS

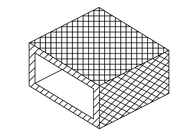


FIG. A

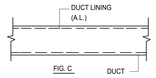


FIG. C

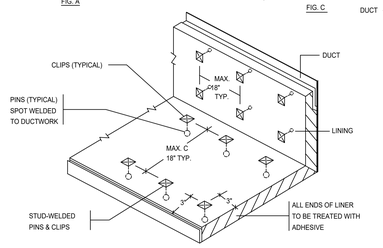
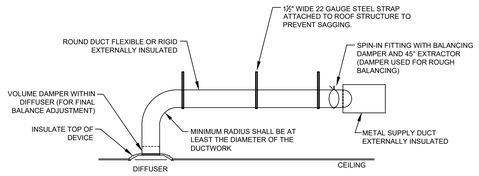


FIG. B

3 ACOUSTICAL TREATMENT DUCT LINING
N.T.S.



4 TYPICAL DIFFUSER CONNECTION DETAIL
N.T.S.

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

5 SUPPLY AIR DUCTWORK SUB-MAIN BRANCH DUCT CONNECTION
N.T.S.

6 LOW VELOCITY DUCTWORK ELBOWS
N.T.S.

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PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

MECHANICAL DETAILS

DRAWING NO.:

M-2.0

OUTDOOR AIR VENTILATION SCHEDULE (IMC 2021) CONSTANT VOLUME SYSTEM

ROOM NAME	OCCUPANCY DESCRIPTION	OCCUPANT DENSITY (#/1000 SQFT.)	Az	Pz	Rp	Ra	Ez	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR CFM/FIXT.)	CODE TOTAL EXHAUST (CFM)	EXHAUST SPECIFIED ON DRAWINGS	Voz=(Rp*Pz+Ra*Az)/Ez	PROVIDED OUTSIDE AIR (CFM)
			SQFT.	# PEOPLE	CFM/PERSON	CFM/AREA	ZONE AIR DISTANCE EFFECTIVENESS				MINIMUM OUTSIDE AIR REQUIRED	
VESTIBULE	CORRIDORS	-	85	-	-	0.06	0.8	-	-	-	6	3000
WAITING AREA	SALES	15	560	8	7.5	0.12	0.8	-	-	-	163	
DINING ROOM-1	DINING ROOMS	70	2870	160	7.5	0.18	0.8	-	-	-	2146	
DINING ROOM-2	DINING ROOMS	70	240	12	7.5	0.18	0.8	-	-	-	167	
DINING ROOM-3	DINING ROOMS	70	450	28	7.5	0.18	0.8	-	-	-	364	
HALLWAY	CORRIDORS	-	865	-	-	0.06	0.8	-	-	-	65	
MEN'S RESTROOM	TOILET ROOMS -PUBLIC	-	175	-	-	-	0.8	70	290	375	-	
WOMEN'S RESTROOM	TOILET ROOMS -PUBLIC	-	150	-	-	-	0.8	70	280	300	-	
DINING ROOM-4	DINING ROOMS	70	1100	76	7.5	0.18	0.8	-	-	-	960	1000
OFFICE	OFFICE SPACES	5	115	1	5	0.06	0.8	-	-	-	12	800
KITCHEN AREA	KITCHEN	20	2000	40	7.5	0.12	0.8	0.7	1400	10750	675	
ELECTRICAL ROOM	STORAGE	-	55	-	-	0.12	0.8	-	-	675	8	
UTILITY ROOM	STORAGE	-	70	-	-	0.12	0.8	-	-	-	11	
	TOTAL		**8735**							**12100**	**4576**	**4800**

ROOF TOP UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL	AREA SERVED	NOMINAL TONS	SUPPLY FAN DATA			HEATING DATA		COOLING DATA		ELECTRICAL DATA				EER	SEER	THERMAL EFFICIENCY	MAXIMUM WEIGHT (LBS)
					TOTAL CFM	OUTSIDE AIR CFM	E.S.P. (IN W.G.)	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	VOLTS	PHASE	MCA(A)	MOCP(A)				
RTU-1(E)	TRANE (V.I.F.)	YHC120F3RHA0L (V.I.F.)	SEE PLAN	10.0 (V.I.F.)	4000 (V.I.F.)	800	S.A.E.	250 (V.I.F.)	200 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	47.7 (V.I.F.)	60 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.
RTU-2(E)	CARRIER (V.I.F.)	48TCFD28BCM6A (V.I.F.)	SEE PLAN	25.0 (V.I.F.)	10000 (V.I.F.)	2200	S.A.E.	400 (V.I.F.)	324 (V.I.F.)	S.A.E.	S.A.E.	460 (V.I.F.)	3 (V.I.F.)	66.0 (V.I.F.)	80 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.
RTU-3(E)	TRANE (V.I.F.)	YHC120F3RHA0L (V.I.F.)	SEE PLAN	10.0 (V.I.F.)	4000 (V.I.F.)	800	S.A.E.	250 (V.I.F.)	200 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	47.7 (V.I.F.)	60 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.
RTU-4(E)	CARRIER (V.I.F.)	48TCFD14B3M6A (V.I.F.)	SEE PLAN	12.5 (V.I.F.)	5000 (V.I.F.)	1000	S.A.E.	250 (V.I.F.)	205 (V.I.F.)	S.A.E.	S.A.E.	460 (V.I.F.)	3 (V.I.F.)	33.0 (V.I.F.)	40 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.

NOTES FOR EXISTING UNIT:

1. EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
2. S.A.E. : SAME AS EXISTING , V.I.F.: VERIFY IN FIELD
3. CONTRACTOR TO FIELD VERIFY IF ALL RTUs ARE WORKING AT THEIR 100% RATED CAPACITY. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.
5. IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPERATURE SENSOR COMPATIBLE WITH EXISTING RTU. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECTOWNER.
6. CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPER ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLES.
7. REPLACE FILTERS, IF REQUIRED.
8. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKER, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

MAKE-UP AIR UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL	CFM	ESP(IN W.G.)	HEATING DATA		ELECTRICAL DATA				WEIGHT (LBS)
					INPUT MBH	OUTPUT MBH	VOLTS	PHASE	MCA(A)	MOCP(A)	
MAU-1(E)	CAPTIVEAIRE (V.I.F.)	A4-D.1000-920 (V.I.F.)	8190 (V.I.F.)	S.A.E.	624.9 (V.I.F.)	574.9 (V.I.F.)	208 (V.I.F.)	3 (V.I.F.)	20 (V.I.F.)	30 (V.I.F.)	S.A.E.

NOTES:

1. EXISTING FAN WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
2. S.A.E. : SAME AS EXISTING. V.I.F. : VERIFY IN FIELD
3. CONTRACTOR SHALL FIELD-VERIFY THAT ALL FANS ARE OPERATING AT THEIR FULL RATED CAPACITIES AND LOADS. IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.
5. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

KITCHEN EXHAUST FAN SCHEDULE

UNIT ID	MANUFACTURER	MODEL	CFM	RPM	E.S.P. (IN W.G.)	ELECTRICAL DATA			WEIGHT (LBS)
						VOLTS (V)	PHASE	FLA (A)	
KX-1(E)	CAPTIVEAIRE (V.I.F.)	NCA18HPFA (V.I.F.)	2600 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	5.9 (V.I.F.)	S.A.E.
KX-2(E)	CAPTIVEAIRE (V.I.F.)	NCA16HPFA (V.I.F.)	2100 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	4.6 (V.I.F.)	S.A.E.
KX-3(E)	CAPTIVEAIRE (V.I.F.)	NCA16HPFA (V.I.F.)	2100 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	4.6 (V.I.F.)	S.A.E.
KX-4(E)	CAPTIVEAIRE (V.I.F.)	NCA16FA (V.I.F.)	3000 (V.I.F.)	S.A.E.	S.A.E.	208 (V.I.F.)	3 (V.I.F.)	4.6 (V.I.F.)	S.A.E.
KX-5(E)	CAPTIVEAIRE (V.I.F.)	DU50HFA (V.I.F.)	950 (V.I.F.)	S.A.E.	S.A.E.	115 (V.I.F.)	1 (V.I.F.)	8.1 (V.I.F.)	S.A.E.

NOTES:

1. EXISTING FAN WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
2. S.A.E. : SAME AS EXISTING. V.I.F. : VERIFY IN FIELD
3. CONTRACTOR SHALL FIELD-VERIFY THAT ALL FANS ARE OPERATING AT THEIR FULL RATED CAPACITIES AND LOADS. IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.
5. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

EXHAUST FAN SCHEDULE

UNIT ID	MANUFACTURER	MODEL	CFM	RPM	E.S.P. (IN. W.G.)	ELECTRICAL DATA			WEIGHT (LBS)
						VOLTS (V)	PHASE	FLA (A)	
TX-1(E)	GREENHECK (V.I.F.)	CUE-090 (V.I.F.)	375 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E	S.A.E.	S.A.E.
TX-2(E)	GREENHECK (V.I.F.)	CUE-085 (V.I.F.)	300 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E	S.A.E.	S.A.E.
EF-1(E)	GREENHECK (V.I.F.)	CUE-099-4 (V.I.F.)	675 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E	S.A.E.	S.A.E.

NOTES:

1. EXISTING FAN WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
2. S.A.E. : SAME AS EXISTING. V.I.F. : VERIFY IN FIELD
3. CONTRACTOR SHALL FIELD-VERIFY THAT ALL FANS ARE OPERATING AT THEIR FULL RATED CAPACITIES AND LOADS. IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF UNIT ON SITE.
5. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONNECTIONS, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO ORDERING AND BID.

KITCHEN AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(CFM)
RTU-1(E)	SEE PLAN	4000	800	3200	-
MAU-1(E)	SEE PLAN	8190	8190	-	-
KX-1(E)	SEE PLAN	-	-	-	2600
KX-2(E)	SEE PLAN	-	-	-	2100
KX-3(E)	SEE PLAN				2100
KX-4(E)	SEE PLAN				3000
KX-5(E)	SEE PLAN				950
TOTAL:		12190	8990	3200	10750
BUILDING PRESSURE:			**-1760**	**NEGATIVE**	

NOTES:

1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON OUTSIDE AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

DINING AIR BALANCE

UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR(CFM)
RTU-2(E)	SEE PLAN	10000	2200	7800	-
RTU-3(E)	SEE PLAN	4000	800	3200	-
RTU-4(E)	SEE PLAN	5000	1000	4000	-
TX-1(E)	SEE PLAN	-	-	-	375
TX-2(E)	SEE PLAN	-	-	-	300
EF-1(E)	SEE PLAN				675
TOTAL:		19000	4000	15000	1350
BUILDING PRESSURE:			**2650**	**POSITIVE**	

NOTES:

1. CONTRACTOR TO ADJUST MOTORIZED DAMPER ON OUTSIDE AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.

OUTDOOR UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL NO.	LOCATION	INDOOR UNIT SERVED	CAP. TONS	COOLING MBH	HEATING MBH	ELECTRICAL DATA			DIMENSIONS (HXWXD)(INCH)	PIPING DIMENSION		WEIGHT (LBS)			
								VOLT/PH/H	MCA (A)	MOP (A)		LIQUID (INCH)	GAS (INCH)		EER	IEER/SEER	COP/HSPF
ACCU-1(E)	MITSUBISHI ELECTRIC (V.I.F.)	LZ-A36NHA6 (V.I.F.)	SEE ON PLAN	AC-1(E)	3.0 (V.I.F.)	S.A.E.	S.A.E.	8/1/60 (V.I.	25 (V.I.F.)	40 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.

NOTES FOR EXISTING UNIT:-

1. EXISITNG SYSTEM WITH ALL ACCESSORIES TO REMAIN SAME TO BE REUSED.
2. S.A.E. : SAME AS EXISTING & V.I.F. : VERIFY IN FIELD.
3. CONTRACTOR TO FIELD VERIFY OF AC AND ACCU IN WORKING AT THEIR 100% RATED CAPACITY. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.
4. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONDITION, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO OPENING BID.

AC UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL NO.	LOCATION	AREA SERVED	TYPE	CAP. (TON)	COOLING MBH	HEATING MBH	TOTAL SUPPLY CFM	ELECTRICAL DATA			DIMENSIONS (HXWXD) (INCH)	PIPE SIZE (INCH)			WEIGHT (LBS.)
										VOLT/HZ/PH	MCA	MOCP	UNIT	LIQ.	SUCTION	DRAIN (ID)	
AC-1(E)	MITSUBISHI ELECTRIC (V.I.F.)	S.A.E.	SEE ON PLAN	SEE PLAN	CASSETTE	3.0 (V.I.F.)	S.A.E.	S.A.E.	1200 (V.I.F.)	208/60/1 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.

NOTES:-

1. EXISITNG SYSTEM WITH ALL ACCESSORIES TO REMAIN SAME TO BE REUSED.
2. S.A.E. : SAME AS EXISTING & V.I.F. : VERIFY IN FIELD.
3. CONTRACTOR TO FIELD VERIFY OF AC AND ACCU IN WORKING AT THEIR 100% RATED CAPACITY. INFORM TO DESIGN ENGINEER IF ANY DISCREPANCIES ARE FOUND IN PERFORMANCE PRIOR TO CONSTRUCTION.
4. PROVIDE NEW THERMOSTAT COMPATIBLE WITH THE EXISTING AC UNIT, IF EXISTING THERMOSTAT IS NOT REUSABLE AND COORDINATE THE FINAL LOCATION WITH THE ARCHITECTOWNER.
6. REPLACE FILTER WITH NEW FILTER IF REQUIRED.
7. CONTRACTOR SHALL VERIFY EXACT ELECTRICAL CONDITION, WIRE SIZES, BREAKERS, DISCONNECT ETC. PRIOR TO OPENING BID.

AIR CURTAIN SCHEDULE

UNIT ID	MANUFACTURER	MODEL	LENGTH (IN.)	CFM	HEATING MODE	V/PH/HZ	MCA	MOCP
ACH-1(N)	BERNER	CLC08-1060A	60	1632	UNHEATED	120/1/60	3.4	15
ACH-2(N)	BERNER	CLC08-1060A	60	1632	UNHEATED	120/1/60	3.4	15
ACH-3(N)	BERNER	CLC08-1042A	42	1176	UNHEATED	120/1/60	3.4	15

NOTES / ACCESSORIES:-

1. PROVIDE MANUFACTURER RECOMMENDED ACCESSORIES.
2. COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER REQUIREMENT.
3. COORDINATE WITH OWNER/ARCHITECT FOR FINAL REQUIREMENT.

SCHEDULE OF GRILLES/DIFFUSER

TAG	MANUFACTURER	MODEL	TYPE	FACE SIZE(IN)	NECK SIZE(IN)	FRAME TYPE	MAX NC dBA
S-1	METALAIRE	5500	SUPPLY DIFFUSER	24X24	REFER TABLE-A	LAY-IN/ SURFACE	30
S-2	METALAIRE	7900	PERFORATED SUPPLY DIFFUSER	24X24	REFER TABLE-A	LAY-IN	30
R-1	METALAIRE	RH	LOUVERED RETURN GRILLE	24X24	REFER TABLE-A	LAY-IN/ SURFACE	30

NOTES:

1. CONTRACTOR SHALL COORDINATE WITH LATEST ARCHITECTURAL REFLECTED CEILING PLANS PLANS TO ENSURE PROPER AIR DEVICE BORDER SELECTION.
2. COORDINATE COLOR/FINISH WITH ARCHITECT
3. ALL AIR DISTRIBUTION SHALL INCLUDE ALUMINUM CONSTRUCTION.
4. PROVIDE OPPOSED BLADE DAMPER.

TABLE -A

ROUND NECK SIZES SCHEDULE:	SQUARE NECK SIZE SCHEDULE:
6" DIA : Up To 100 CFM	6"X6" : 0 - 115 CFM
8" DIA : 101 To 180 CFM	8"X8" : 116 - 220 CFM
10" DIA : 181 To 285 CFM	10"X10" : 221 - 350 CFM
12" DIA : 286 To 400 CFM	12"X12" : 351 - 520 CFM
14" DIA : 401 To 550 CFM	14"X14" : 521 - 730 CFM
	16"X16" : 731 - 840 CFM
	18"X18" : 840 - 1035 CFM
	20"X20" : 1036 - 1285 CFM
	22"X22" : 1286 - 1570 CFM

Property of NY Engineers

PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

MECHANICAL SCHEDULE

DRAWING NO.:

M-3.0

PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

EXISTING HOOD DETAILS

DRAWING NO.:

M-4.0

Property of Engineers

SWITCHES AND CONTROLS

S_a	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
S^d	DIMMER SWITCH
S_{OV}	OVERRIDE SWITCH
OC	CEILING MOUNTED OCCUPANCY SENSOR
DS	DAYLIGHT SENSOR

POWER DISTRIBUTION

	DISTRIBUTION PANELBOARD, SURFACE OR FLUSH MOUNTED.

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT , CENTER LINE TO FINISHED FLOOR
#	KEYED NOTE REFERENCE
#	EQUIPMENT TAG

WIRING SYSTEMS

	EXISTING
	NEW

POWER AND TELECOMMUNICATION

J	JUNCTION BOX
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
CL	CEILING MOUNTED DUPLEX RECEPTACLE
	QUAD RECEPTACLE
	SPECIAL PURPOSE RECEPTACLE
	DATA WALL OUTLET - PROVIDE SINGLE GANG BOX WITH 3/4" CONDUIT WITH PULL WIRE AND INSULATING BUSHING STUBBED INTO CEILING SPACE. MOUNT BOX 18" AFF UON.
	COMBINATION TELEPHONE/DATA WALL OUTLET - PROVIDE SINGLE GANG BOX WITH 3/4" CONDUIT WITH PULL WIRE AND INSULATING BUSHING STUBBED INTO CEILING SPACE. MOUNT BOX 18" AFF UON.

MOTORS AND CONTROLS

S_M	MANUAL MOTOR SWITCH
	CONTACTOR
A	30A NON FUSED DISCONNECT SWITCH
B	60A NON FUSED DISCONNECT SWITCH
C	100A NON FUSED DISCONNECT SWITCH
D	200A NON FUSED DISCONNECT SWITCH

ELECTRICAL DRAWING LIST

E-0.1	ELECTRICAL SYMBOL LIST, ABBREVIATION & GENERAL NOTES
E-0.2	ELECTRICAL SPECIFICATIONS
E-1.0	LIGHTING PLAN - FIRST FLOOR
E-2.0	ELECTRICAL POWER PLAN - FIRST FLOOR
E-2.1	ELECTRICAL COMMUNICATION & DATA PLAN - FIRST FLOOR
E-2.2	ELECTRICAL ROOF PLAN
E-3.0	ELECTRICAL & HOOD WIRING DETAILS
E-4.0	ELECTRICAL PANEL SCHEDULE & RISER DIAGRAM

APPLICABLE CODES

A.	2021 INTERNATIONAL BUILDING CODE, NJED.
B.	2021 INTERNATIONAL MECHANICAL CODE
C.	2021 NATIONAL STANDARD PLUMBING CODE, NJ ED.
D.	2020 NATIONAL ELECTRICAL CODE
E.	2021 INTERNATIONAL FUEL GAS CODE
F.	ENERGY CODE - ASHRAE 90.1-2019

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AUTO	AUTOMATIC	ER	EXISTING TO BE RELOCATED
AWG	AMERICAN WIRE GAUGE	ETR	EXISTING TO REMAIN
C	CONDUIT	EWF	ELECTRIFIED WORKSTATION FURNITURE
C/B,CB	CIRCUIT BREAKER	EWH	ELECTRIC WATER HEATER
CKT	CIRCUIT	FA	FIRE ALARM
CLG	CEILING	FBO	FURNISHED BY OTHERS, INSTALLED & WIRED BY EC
COMM	COMMUNICATION	FDR	FEEDER
CT	CURRENT TRANSFORMER	FIBO	FURNISHED & INSTALLED BY OTHERS, WIRED BY EC
CU	COPPER	FIXT	FIXTURE
°C	DEGREE CELSIUS	FL	FLOOR
°F	DEGREE FAHRENHEIT	FLUOR	FLUORESCENT
DIA	DIAMETER	G	GROUND
DISC	DISCONNECT	GFI	GROUND FAULT INTERRUPTER
DN	DOWN	GP	GENERAL PURPOSE
DWG	DRAWING	HC	HUNG CEILING
JB	JUNCTION BOX	HP	HORSEPOWER
KCMIL	ONE THOUSAND CIRCULAR MILS	HWH	HOW WATER HEATER
KV	KILOVOLT	HZ	HERTZ
KVA	KILOVOLT-AMPERES	IC	INTERRUPTING CAPACITY
KW	KILOWATTS	PP	POWER PANEL
LP	LIGHTING PANEL	PVC	POLYVINYL CHLORIDE
LTG	LIGHTING	PWR	POWER
MAX	MAXIMUM	R	REMOVE
MC	MOTOR CONTROLLER	RE	RELOCATED EXISTING
MCB	MAIN CIRCUIT BREAKER	REC	RECEPTACLE
MER	MECHANICAL EQUIPMENT ROOM	RR	REMOVE & RELOCATE
MIN	MINIMUM	SECT	SECTION
MLO	MAIN LUGS ONLY	SPDT	SINGLE POLE DOUBLE THROW
MTD	MOUNTED	SPST	SINGLE POLE SINGLE THROW
N	NEUTRAL	SPEC	SPECIFICATION
NE	NEW DEVICE TO REPLACE EXISTING	SW	SWITCH
NIC	NOT IN CONTRACT	SWBD	SWITCHBOARD
NL	NIGHT LIGHT	SYM	SYMMETRICAL
NTS	NOT TO SCALE	SYS	SYSTEMS
OC	ON CENTER	TELE	TELEPHONE
P	POLES	TEMP	TEMPERATURE
PB	PULLBOX	TXF	TOILET EXHAUST FAN
PC	PERSONAL COMPUTER	TYP	TYPICAL
Ø	PHASE	UON	UNLESS OTHERWISE NOTED
PNL	PANEL	V	VOLT/VOLTAGE
W	WATT	VA	VOLT AMPERE
W	WIRE	VFD	VARIABLE FREQUENCY DRIVE
WH	WALL HEATER	WP	WEATHER PROOF
E	EXISTING	XFMR	TRANSFORMER
		IG	ISOLATED GROUND

GENERAL NOTES

(APPLY TO ALL "E" DRAWINGS)

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE 2020 VERSION NATIONAL ELECTRIC CODE WITH NEW JERSEY AMENDMENTS, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ½", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE-RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE-RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOACTIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

Property of Engineers

PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

ELECTRICAL SYMBOL LIST, ABBREVIATION & GENERAL NOTES

DRAWING NO.:

E-0.1

ELECTRICAL SPECIFICATION

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTANANCE AND REPAIR, MINOR DEVIATIONS FROM DRAWING MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE NECESSARY FOR THE PERFORMANCE OF THE GENERAL WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.

F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES. AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABL MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.

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

H. 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.

I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.

J. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.

K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.

L. 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 DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR 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.

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

O. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. 2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.

6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES

7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.

C. QUALITY ASSURANCE

1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3) CURRENT CHARACTERISTICS:

a. SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL.

4) HEIGHTS OF OUTLETS:

a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:

- RECEPTACLES AND TELEPHONES: 1 FT-6 IN.
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT-0 IN.
- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN

b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.

2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.

2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.

- SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
- MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
- CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING.

b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS,STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.

c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.

d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER INORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

G. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ARCHITECT.

H. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE 2020 NATIONAL ELECTRIC CODE WITH LOCAL ADOPTIONS, AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

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

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT,INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1) PROJECT NAME AND LOCATION

2) NAME OF ARCHITECT AND ENGINEER

3) ITEM IDENTIFICATION

4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SAFETY/DISCONNECT SWITCHES

2) FUSES

3) CIRCUIT BREAKERS

4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).

5) RACEWAYS

6) WIRE AND CABLE

7) WALL SWITCHES

8) INSERTION RECEPTACLES
9) MOMENTARY CONTACT SWITCHES

10) TIME SWITCHES

11) LIGHTING FIXTURES.

12) TRANSFORMER.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

A. UPON COMPLETION AND ACCEPTANCE OF WORK, CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS AND EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER A BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

7. FUSES:

A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

B. MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULLLOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITINGBUSSMANN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN AND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS OTHERWISE NOTED:

1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.

2) 120/240 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, CIRCUIT BREAKER TYPE:

A. THREE PHASE, 4 OR 5 WIRE, COPPER BUS BARS, WITH 2, 3, OR 4 WIRE BRANCHES, AS NOTED. CAPACITY OF PANEL AND CIRCUITS, AS NOTED BELOW. PANELBOARD TO HAVE GROUND BUS SAME SIZE AS PHASE BUSES.

B. CABINETS: CODE GAUGE GALVANIZED SHEET STEEL PRIMED AND PAINTED WITH TRIM AND DOOR, TYPE AS NOTED, LAP AND RIVET CORNERS OR FORM AS APPROVED.

C. TRIM: ONE PIECE FULL FINISH PRIMED AND PAINTED SHEET STEEL. TRIM SHALL BE MOUNTED WITH A CONTINUOUS PIANO HINGE CONFIGURED IN SUCH A MANNER THAT IT SHALL BE POSSIBLE TO GAIN FULL ACCESS TO CIRCUIT BREAKERS AND WIRING GUTTERS WITHOUT REMOVING THE TRIM. PROVIDE A MULTI-PIN CYLINDER LOCK (YALE, CORBIN OR EQUAL) TO LATCH THE TRIM. KEYS SHALL BE MILLED.

D. HARDWARE: MULTI-PIN, CYLINDER LOCKS WITH MILLED KEYS. ALL PANELS SHALL BE KEYED ALIKE. DOOR OVER 48″ HIGH SHALL BE EQUIPPED WITH A CHROME PLATED VAULT HANDLE, BUILT-IN LOCK AND 3-POINT CATCH FASTENING DOOR AT TOP, BOTTOM AND CENTER.

E. HINGES: CONCEALED, CONTINUOUS PIANO HINGE AS DESCRIBED ABOVE.

F. DIRECTORY HOLDER: MEAL FRAME WITH NONBREAKABLE TRANSPARENT COVER AND DIRECTORY CARD. ENTRIES TO BE TYPEWRITTEN BY ELECTRICAL CONTRACTOR. PROVIDE AN ENGRAVED LAMINATED NAMEPLATE ADJACENT TO EACH BRANCH BREAKER. MOUNT WITH SELF TAPPING MACHINE SCREWS.

G. FURNISH MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING NOT PERMITTED. SECURE LUGS TO BUS BY STUD BOLTS.

H. PANELBOARD CONSTRUCTION FOR BOLTED TYPE BREAKERS. MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, RMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. INDIVIDUAL CIRCUIT BREAKERS SHALL HAVE MINIMUM 100A FRAME, TRIPS SIZED AS SHOW ON THE PLANS.

I. MINIMUM GUTTER SPACES: PANELS WITH 225 AMPERE MAINS, 5-¾″ MINIMUM, 400 AMPERES AND OVER, MINIMUM GUTTERS 8″. FOR PANELS WITH THROUGH FEEDERS, INCREASE GUTTER WIDTH BY 2″ MINIMUM AND PROVIDE A SHEET STEEL BARRIER BETWEEN THE PANEL GUTTER AND THE THROUGH FEEDER PORTION OF THE BACK BOX. BRANCH CIRCUIT BREAKERS SHALL BE MECHANICALLY INTERLOCKED WHEN SHOWN ON DRAWINGS.

J. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

9. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.

B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.

C. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.

D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).

E. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

F. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANCIALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

H. IDENTIFICATION

1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.

2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF ¼″ HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

M. MATERIALS

1) RACEWAYS:

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

b. ELECTROMETALLIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREADLESS.

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.

d. WIREWAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.

e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.

2) FITTINGS AND ACCESSORIES:

a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.

b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.

c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH

INSULATED THROAT.

d. BUSHINGS: METALLIC INSULATED TYPE.

3) BOXES:

a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 VOLT AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT AND DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE: BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.

N. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

PROVIDE RACEWAY SUPPORT UTILIZING CEILING TRAPEZE, STRAP HANGERS, OR WALL BRACKETS. PROVIDE U-BOLTS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND CONNECTED TO ACCEPTABLE SUPPORTS. PROVIDE RISER CLAMPS AT EACH FLOOR LEVEL OF RISER RACEWAYS AND RESTING ON SLAB. FOR THROUGH-THE-FLOOR SYSTEMS, UTILIZE AN ASSEMBLY SIMILAR TO HUBBELL FIRE RATED POKE-THROUGH-FLOOR BOX SYSTEM. FOR ABOVE FLOOR FITTINGS TELEPHONE SHALL BE BUSHED HOLE AND POWER SHALL BE DUPLEX RECEPTACLE OR OTHER AS NOTED. PROVIDE SEPARATION BARRIER BETWEEN POWER AND TELEPHONE COMPARTMENTS. PROVIDE JUNCTION BOX ON UNDERSIDE OF FLOOR. PACK FITTING TO RESTORE FIRE RATING OF FLOOR.

SECURE ALL RACEWAYS TO SUPPORTS WITH PIPE STRAPS OR U-BOLTS. SPACING OF SUPPORTS SHALL BE A MINIMUM OF 10 FT ON CENTER FOR METALLIC RACEWAY AND AS REQUIRED FOR NONMETALLIC RACEWAY. SPACING SHALL BE 5 FT ON CENTER FOR WIREWAYS AND PER CODE AND AS NOTED FOR OTHERS. MOUNT SUPPORTS TO STRUCTURE MASONRY WITH TOGGLE BOLTS ON HOLLOW MASONRY, EXPANSION SHIELDS OR INSERTS IN CONCRETE AND BRICK, MACHINE SCREWS ON METAL, BEAM CLAMPS ON FRAMEWORK, WOOD SCREWS ON WOOD, AND PAN THROUGH STRAPS IN METAL DECK. NAILS, RAWL PLUGS OR WOOD PLUGS SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPLATES.

EXPOSED RACEWAYS SHALL BE RUN PARALLEL WITH OR AT RIGHT ANGLES TO WALLS. PROVIDE CLEARANCE WITH WATER, STEAM OR OTHER PIPING (MINIMUM 3 IN. SEPARATION FROM STEAM AND HOT WATER PIPES, EXCEPT 1 IN. FROM PIPE COVER AT CROSSINGS AND 18 IN. FOR PARALLEL RUNS). FOR HUNG CEILING OUTLETS, RUN IN HUNG CEILING AND CONNECT TO CEILING SUPPORT CHANNELS. IN MASONRY AND POURED CONCRETE, RUN VERTICALLY ONLY.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE,

GALVANIZED OR NYLON ROPE.

RIGID STEEL CONDUIT SHALL BE PERMITTED FOR FEEDERS AND BRANCH CIRCUITS. PAINT MALE THREADS OF FIELD-THREADED CONDUIT WITH GRAPHITE-BASE PIPE COMPOUND AND BUTT CONDUIT ENDS. TOUCH UP MARRED SURFACES AND FIELD-CUT THREADS, CRC-COLD GALVANIZED. EMT SHALL BE PERMITTED FOR BRANCH CIRCUITS ONLY, IN DRY LOCATIONS, DRY WALLS, HUNG CEILINGS, HOLLOW BLOCK WALLS AND FURRED SPACES. EMT SHALL NOT BE PERMITTED IN RAISED FLOORS. FLEXIBLE STEEL CONDUIT SHALL BE UTILIZED FOR SHORT CONNECTIONS WHERE RIGID CONDUIT IS IMPRACTICAL. FROM OUTLET BOX TO RECESSED LIGHTING FIXTURE: PROVIDE MINIMUM 4 FT AND MAXIMUM 6 FT LENGTHS. FOR FINAL CONNECTION TO MOTOR TERMINAL BOX, TRANSFORMER AND OTHER VIBRATING EQUIPMENT: PROVIDE WITH POLYVINYL SHEATHING AND GROUND CONDUCTOR. MINIMUM LENGTH: 18 IN. WITH SLACK. CONNECT GROUND CONDUCTOR TO ENCLOSURE OR RACEWAY AT EACH END. FOR EXPANSION JOINT CROSSINGS, CROSS AT RIGHT ANGLES AND ANCHOR ENDS.

CUT CONDUIT ENDS SQUARE. REAM SMOOTH. PAINT MALE THREADS OF FIELD THREADED RACEWAYS WITH GRAPHITE BASE PIPE COMPOUND. DRAW UP TIGHT WITH RACEWAY COUPLING.

ALL COUPLINGS SHALL BE COMPRESSION TYPE. NO SET SCREW FITTINGS.

EXPANSION FITTINGS SHALL BE INSTALLED AT RIGHT ANGLES WITH CLIP JOINT CENTERED IN EXPANSION JOINT. PROVIDE A LENGTH OF RUN IN ACCORDANCE MANUFACTURER'S RECOMMENDATIONS. PRESET FITTINGS SHALL ALLOW FOR TEMPERATURE VARIATION.

RACEWAYS PASSING THROUGH FIRE-RATED CONSTRUCTION: SEAL OPENING WITH FIRE SEALANT.

O. PROVIDE CABLE SUPPORTS IN ACCORDANCE WITH NATIONAL ELECTRIC CODE ARTICLE 300.19. CABLE SUPPORTS SHALL UTILIZE A ONE-PIECE PLUG WITH POZI-GRIP WEDGING PLUG AS MANUFACTURED BY OZ-GEDNEY. TYPE SF SHALL BE USED FOR ARMORED CABLE.

INSTALL CABLE SUPPORTS AT THE TOP OF A VERTICAL RISE AND PROVIDE INTERMEDIATE ADDITIONAL SUPPORTS AS REQUIRED TO LIMIT SUPPORTED CONDUCTOR LENGTHS TO NOT GREATER THAN THOSE SPECIFIED IN TABLE 300.19(A).

P. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIER BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.

Q. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR-TO-CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

R. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.

S. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

10. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C.FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).

E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE 'BX'.

F. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM:	277/480 VOLT SYSTEM:
BLACK FOR A PHASE	BROWN FOR A PHASE
RED FOR B PHASE	ORANGE FOR C PHASE
BLUE FOR C PHASE	YELLOW FOR C PHASE

1) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.

G. WHERE COLOR-CODED CABLE IS NOT AVAILABLE, CERTIFY IN WRITING AND REQUEST PERMISSION TO OVERLAP CONDUCTORS WITH 6 IN. OF COLOR TAPING IN ACCESSIBLE LOCATIONS.

H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING BELOW MANUFACTURER'S STANDARDS.

11. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).

C. STRAIGHT BLADE RECEPTACLES SHALL BE RESIDENTIAL GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE: TAMPER RESISTANT,

D. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

E. COLORS: COORDINATE COLORS WITH ARCHITECT.

F. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

12. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.

F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.

G. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.

13. TELEPHONE CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

14. GROUNDING AND BONDING:

A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH 2020 NATIONAL ELECTRIC CODE (NEC) WITH NEW JERSEY ADOPTIONS, AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.

B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.

C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.

D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.

E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:
1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE , OR AS OTHER WISE NOTED ON DRAWINGS.

3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES

4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.

15. PANELBOARDS:

A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE.

B. CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5-3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.

C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.

D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.

E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR-IN-DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.

F. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.

H. FURNISH ALL PANELBOARDS WITH FEED-THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.

I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.

J. THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.

K. TIE-BARS SHALL NOT BE USED TO CREATE MULTI-POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.

L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG.

M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM AND 14,000 AMPERES R.M.S. SYMMETRICAL FOR 480Y/277 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.

16. INTERCOM CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF INTERCOM MANUFACTURER.

C. OUTLETS SHALL BE:

1)WALL: 4 IN. SQUARE WITH SINGLE GANG COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM EACH APARTMENT TO MAIN INTERCOM CONTROLLER AT ENTRANCE.

PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

ELECTRICAL SPECIFICATIONS

DRAWING NO.:

E-0.2

Property of NV Engineers

GENERAL NOTES:

1. VERIFY ALL LUMINAIRE COLORS, TRIMS, LENGTHS, ETC. WITH THE ARCHITECT PRIOR TO PLACING FINAL PURCHASE ORDERS. SUBMISSION PF SHOP DRAWINGS WILL BE INTERPRETED AS HAVING BEEN COORDINATED WITH THE ARCHITECTURAL DRAWINGS .
2. PROVIDE ALL LENGTHS, FEEDS, ACCESSORIES, CONNECTORS, WIRING, POWER SUPPLIES, DRIVERS ETC. FOR A COMPLETE INSTALLATION. THE E.C. SHALL VERIFY THE COMPLETE BILL OF MATERIAL WITH MANUFACTURER'S REPRESENTATIVE AND ENSURE ALL EQUIPMENT ARE INCLUDED IN BID PRICE. COORDINATE INSTALLATION WITH ARCHITECTURAL DETAILS.
3. VERIFY FINAL LUMINAIRE LOCATIONS WITH OTHER CEILING MOUNTED EQUIPMENTS SUCH AS DIFFUSER WITH ARCHITECTURAL REFLECTED CEILING PLANS.
4. VERIFY EXACT MOUNTING HEIGHT AND LOCATIONS OF ALL WALL MOUNTED LUMINAIRE WITH ARCHITECTURAL PLANS AND ELEVATIONS PRIOR TO ROUGH-IN.
5. ANY PROPOSED ALTERNATE LUMINAIRES SHALL BE APPROVED BY THE ARCHITECT PRIOR TO FINAL BID PRICING.
6. EXIT SIGNS SHALL BE DUAL VOLTAGE WITH RED FACE LETTERING.
7. VERIFY FINAL SELECTION OF THE FIXTURES WITH THE WITH ARCHITECTIOWNER.
8. PLACEMENT OF LIGHT FIXTURES SHALL BE SET AS DIMENSIONED & AS SCHEDULED.
9. LIGHT FIXTURES SHALL BE SUPPLIED AS SCHEDULED WITH NO EXCEPTIONS.
10. ALL EMERGENCY LIGHTS AND EXIT LIGHTS SHALL BE CONNECTED TO NEAREST LIGHTING CIRCUIT IN THE AREA AHEAD OF ALL LIGHTING CONTROL MEANS IN ORDER TO BE ENERGIZED AT ALL TIME.

KEY NOTES: (#)

1. ALL EMERGENCY AND EXIT FIXTURES SHALL BE CONNECTED TO NEAREST LIGHTING CIRCUIT AHEAD OF ANY SWITCHING. PROVIDE ADDITIONAL FIXTURES AS NEEDED TO MEET THE CODE REQUIREMENTS PER LOCAL AUTHORITIES HAVING JURISDICTION.
2. PROVIDE LOW VOLTAGE OCCUPANCY SENSOR EQUAL TO WATTSTOPPER DT-305. PROVIDE WATTSTOPPER BZ POWER PACK(S) AS REQUIRED. INTERCONNECT OCCUPANCY SENSORS SO THAT ANY SENSOR WILL TRIGGER ALL LIGHTS. SET OFF TIME FOR 20 MINUTES.
3. LIGHTING IN THIS AREA SHALL BE CONTROLLED VIA DAY LIGHT SENSOR. E.C. SHALL COORDINATE EXACT MAKE/MODEL OF DAYLIGHT SENSOR WITH ARCHITECT/OWNER IN FIELD. BASE BID ACCORDINGLY.
4. TIME CLOCK OVERRIDE SWITCH.
5. PROPOSED LOCATION OF LIGHTING SWITCH BANKS. E.C. TO VERIFY EXACT LOCATION WITH ARCHITECT/OWNER PRIOR ROUGH-IN.
6. EXISTING WALK-IN FREEZER/COOLER LIGHT FIXTURE & ITS ELECTRICAL CONNECTION SHALL BE REMAIN E.C. SHALL VERIFY THE OPERABLE CONDITION OF EXISTING LIGHTS. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
7. PROVIDE CONTROL RELAY PANEL AS SPECIFIED BY THE LIGHTING VENDOR. PROVIDE AND INSTALL DIGITAL SWITCH(ES) AS REQUIRED.E.C SHALL COORDINATE AND VERIFY LOCATIONS WITH ARCHITECT/OWNER.
8. EXTERNAL SIGNAGE, LIGHTS AND SHOW WINDOW RECEPTACLE CONTROL BY PHOTOCELL AND TIME CLOCK. E.C. TO COORDINATE WITH ARCHITECT FOR EXACT LOCATION OF TIME CLOCK.
9. EXISTING HOOD LIGHTS & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF HOOD LIGHTS IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY/ UNOPERABILITY. BASE BID ACCORDINGLY.
10. PROVIDE CURRENT LIMITER FOR TRACK LIGHT. E.C. TO COORDINATE WITH LIGHTING MANUFACTURER FOR SUITABLE MODEL OF CURRENT LIMITER FOR TRACK LIGHTS. BASE BID ACCORDINGLY.
11. LIGHT FIXTURE NEAR ELECTRICAL PANEL SHALL NOT BE CONTROLLED BY AUTOMATIC MEANS ONLY AS PER NEC 110.26(D).
12. E.C. SHALL VERIFY THE AVAILABILITY OF EXISTING LIGHTING CONTROL RELAY PANEL IN FIELD IF NOT FOUND. PROVIDE NEW AS SHOWN ON PLAN. DO POWER PROVISION ACCORDINGLY. BASE BID ACCORDINGLY.
13. NEMA 3R J-BOX FOR CONNECTION TO CAR DISPLAY LIGHTS. E.C. SHALL COORDINATE THE EXACT LOCATION AND ELECTRICAL REQUIREMENTS WITH EQUIPMENT SUPPLIER/ARCHITECT IN FIELD PRIOR TO BID. BASE BID ACCORDINGLY.
14. E.C. SHALL COORDINATE THE EXACT HEIGHT AND LOCATION OF ELECTRICAL DEVICES FOR TELEVISION EQUIPMENT WITH AV SUPPLIER/ARCHITECT/FRANCHISEE PRIOR TO ROUGH IN. BASE BID ACCORDINGLY.
15. E.C. SHALL VERIFY EXACT POWER & OUTLET REQUIREMENT FOR TAPE LIGHTS WITH LIGHTING FIXTURE MANUFACTURER IN FIELD, MAKE POWER PROVISION ACCORDINGLY. BASE BID ACCORDINGLY.

BANK #1

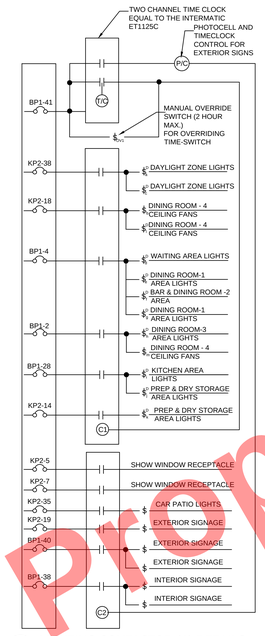
a DAYLIGHT ZONE LIGHTS KP2-38	b DINING ROOM - 4 CEILING FANS KP2-18	c DAYLIGHT ZONE LIGHTS KP2-38	d WAITING AREA LIGHTS BP1-4	e DINING ROOM-1 AREA LIGHTS BP1-4	f BAR & DINING ROOM -2 AREA LIGHTS BP1-4
g DINING ROOM-1 AREA LIGHTS BP1-2	h DINING ROOM-3 AREA LIGHTS BP1-2	i KITCHEN AREA LIGHTS BP1-28	j PREP & DRY STORAGE AREA LIGHTS BP1-28	k PREP & DRY STORAGE AREA LIGHTS KP2-14	l DINING ROOM - 4 CEILING FANS KP2-16
m DINING ROOM - 4 CEILING FANS BP1-2	OV1 OVERRIDE SWITCH BP1-41				

1. PROVIDE PERMANENT LABELS FOR ALL SWITCHES IDENTIFYING ZONE OF CONTROL.
2. ALL SWITCHES SHALL BE LUTRON SLIDE TYPE RATED AS INDICATED IN DIMMER SCHEDULE.
3. ALL SWITCHES SHALL BE COMPATIBLE WITH LED DRIVERS.

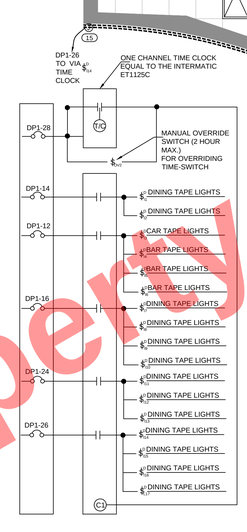
BANK #2

S1 DINING TAPE LIGHTS DP1-14	S2 DINING TAPE LIGHTS DP1-14	S3 CAR TAPE LIGHTS DP1-12	S4 BAR TAPE LIGHTS DP1-12	S5 BAR TAPE LIGHTS DP1-12	S6 BAR TAPE LIGHTS DP1-12
S7 DINING TAPE LIGHTS DP1-16	S8 DINING TAPE LIGHTS DP1-16	S9 DINING TAPE LIGHTS DP1-16	S10 DINING TAPE LIGHTS DP1-16	S11 DINING TAPE LIGHTS DP1-24	S12 DINING TAPE LIGHTS DP1-24
S13 DINING TAPE LIGHTS DP1-24	S14 DINING TAPE LIGHTS DP1-26	S15 DINING TAPE LIGHTS DP1-26	S16 DINING TAPE LIGHTS DP1-26	S17 DINING TAPE LIGHTS DP1-26	OV2 OVERRIDE SWITCH BP1-41

1. PROVIDE PERMANENT LABELS FOR ALL SWITCHES IDENTIFYING ZONE OF CONTROL.
2. ALL SWITCHES SHALL BE LUTRON SLIDE TYPE RATED AS INDICATED IN DIMMER SCHEDULE.
3. ALL SWITCHES SHALL BE COMPATIBLE WITH LED DRIVERS.



2 LIGHTING CONTACTOR (1) DETAILS N.T.S.



3 LIGHTING CONTACTOR (2) DETAILS N.T.S.

LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER'S CATLOG	VOLTAGE	LAMPS	WATTS	DIMMING	MOUNTING
A	TWO-CIRCUIT TRACK WITH GU10 LAMP HOLDER AND LED LAMP	PLT-10051 BLACK CYLINDER TRACK HEAD PLT-11248 LED LAMP (80%) TCP - 7MRR 16 GU1027KNFL (20%)	120	500 LUMEN 3000°K	5.5	LEADING EDGE	OVER THE BAR COUNTER
B	DIMMABLE LED DOWNLIGHT	HALO - PC615EC010PDM6A92761VCRMB22	120	1092 LUMEN 2700°K	17	0-10	RECESSED IN CEILING
C	DECORATIVE PENDENT PROVIDED BY OWNER	TBD	120	SCREW-IN LCD	12	LEADING EDGE	PENDANT HUNG AS FER ARCHITECT
D	2x4 LED TROFFER	METALUX- 24CX2-50-UNV-L835-A3/8-2/18G	120	5049 LUMEN LED 3500°K	40	NONE	RECESSED IN CEILING
D1	2x2 LED TROFFER	METALUX- 24CX1-25-UNV-L835-A3/8-2/18G	120	5049 LUMEN LED 3500°K	40	NONE	RECESSED IN CEILING
EM	EMERGENCY LIGHT	SURELITES - SELW29BFSD	120	LED	2	NONE	MOUNT 7'-6" AFF
EM/CLG	EMERGENCY LIGHT	PARALUCE INDOOR- PLSEUNVB	120	LED	4.5	NONE	MOUNT IN CEILING
F1	72" 6-BLADE CEILING FAN	HUNTER- HFC-72-MOISTURE RESISTANT	120				PENDANT MOUNT
EX EX/CLG	UNIVERSAL MOUNT POLYCARBONATE EXIT LIGHT WITH GREEN LETTER STENCIL	SURELITES- LPX7-SD	120	LED		NONE	CEILING- OR WALL-MOUNTED
K	ROUND PENDENT LED STEM-MOUNTED	CONTECH- CY35-2-35K-12DI-RS-M-BZ	120	1400 LUMEN LED 3500° K	14	DMX	MOUNTING HEIGHT AS PER ARCHITECT
R	RGBW LED TAPE LIGHT WITH DMX CONTROLLER AND DIMMING	SMART LED - SLC-24-UL-RGBW-1P20-SD-UF-DMX CONTROLLER & MM-LRS-350-24V	120 TO 24	18 LEDs PER FOOT	4.4 W/FT	DMX	MOUNT TO FLAT ALUM. MOUNTING TRACK
S1	WARM WHITE TAPE LIGHT	SMART LED CONCEPTS- CLT-KNSF241410T10-8A 39	120 TO 24	LED 2700° K	4.4 W/FT	NONE	UNDER BAR COUNTER

1 LIGHTING PLAN - FIRST FLOOR

1/4"=1'-0"

Property of NY Engineers

PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

LIGHTING PLAN - FIRST FLOOR

DRAWING NO.:

E-1.0

GENERAL NOTES:

1. E.C. TO PROVIDE CORD & PLUG CONNECTIONS FOR EQUIPMENT AS REQUIRED.
2. ALL CIRCUITS FOR P.O.S. (POINT OF SALE) EQUIPMENT SHALL BE CONNECTED TO THE SAME PHASE OF POWER IN THE PANEL. ALL BRANCH CIRCUIT BREAKERS SUPPLYING P.O.S. EQUIPMENT SHALL HAVE LOCKING HANDLES DEVICES.
3. EACH RECEPTACLE TYPE (LOCKING OR STRAIGHT BLADE) SHALL MATCH THAT OF THE EQUIPMENT FURNISHED.
4. COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS ON ROOF WITH MECHANICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT AND FUSE REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH MANUFACTURER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
6. ELECTRICAL CONTRACTOR SHALL FURNISH AND INSTALL CORDS AND PLUGS ON ALL APPLIANCE TYPE EQUIPMENT WHEN CORDS ARE NOT FURNISHED WITH EQUIPMENT. CORDS SHALL BE OF THE HEAVY DUTY TYPE AND BE WATER/OIL RESISTANT.
7. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL LOAD DATA WITH ACTUAL NAMEPLATE RATINGS OF ALL TENANT FURNISHED EQUIPMENT. WHERE CONFLICTS OCCUR, NOTIFY ARCHITECT.
8. MATCH RECEPTACLE TYPES AND MOUNTING HEIGHTS TO MANUFACTURER'S EQUIPMENT CONNECTION REQUIREMENTS.
9. 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 SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL: KITCHENS, FOOD PREP AREAS AND BARS/BEVERAGE SERVICE AREAS PER NEC ART. 210.8(B)(2).
10. ALL RECEPTACLES IN KITCHEN AREA SHALL BE GFCI PROTECTED IN ACCORDANCE WITH NEC ART. 210.8(B). GFCI-TYPE CIRCUIT BREAKERS ARE PREFERRED. IF USED, GFCI-TYPE RECEPTACLES SHALL BE READILY ACCESSIBLE. IF NOT READILY ACCESSIBLE, RATED GFCI MODULE WITH MANUAL RESET IN READILYACCESSIBLE LOCATION AHEAD OF FIRST RECEPTACLE ON CIRCUIT.
11. SEE SHEET E-3.0 FOR ELECTRICAL FOOD SERVICE EQUIPMENT SCHEDULE. SEE FOOD SERVICE DRAWINGS FOR ADDITIONAL WORK BY THIS CONTRACTOR.

KEY NOTES: (#)

1. EXISTING WALK-IN COOLER/FREEZER EVAPORATOR/CONDENSER & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/ OPERABILITY OF DISCONNECT SWITCH FOR THE EXISTING WALK-IN COOLER/FREEZER EVAPORATOR/ CONDENSER IN THE FIELD. PROVIDE NEW DISCONNECT SWITCH IN CASE OF UNAVAILABILITY / UNOPERABILITY. BASE BID ACCORDINGLY.
2. E.C. SHALL VERIFY EXACT ELECTRICAL CONNECTION REQUIREMENT & MOUNTING HEIGHT WITH KITCHEN EQUIPMENT MANUFACTURER. MAKE POWER PROVISION ACCORDINGLY. BASE BID ACCORDINGLY.
3. EXISTING HOOD AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF EXISTING HOOD AND ITS ELECTRICAL CONNECTION IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY /UNOPERABILITY.
4. EXISTING MECHANICAL EQUIPMENTS & ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF THE EXISTING DISCONNECT SWITCH FOR EXISTING MECHANICAL EQUIPMENTS IN THE FIELD , PROVIDE NEW IN CASE OF UNAVAILABILITY / UNOPERABILITY . E.C. SHALL ALSO VERIFY EXACT ELECTRICAL REQUIREMENT FOR NEW DISCONNECT SWITCH OF EXISTING MECHANICAL EQUIPMENTS AS PER THE MANUFACTURER'S CUT-SHEET. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY PRIOR TO BID. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
5. PROVIDE PVC J-BOX RECESSED IN WALL WITH STAINLESS STEEL COVER PLATE. MAKE FINAL CONNECTION TO EQUIPMENT WITH LFMC/RAIN-TIGHT FITTINGS.
6. EXISTING WATER HEATER SHALL REMAIN. E.C. SHALL RECONNECT THE EXISTING WATER HEATER TO THE NEW CIRCUIT AS SHOWN IN PLAN. E.C. SHALL VERIFY AVAILABILITY/ OPERABILITY OF JUNCTION BOX FOR THE EXISTING WATER HEATER IN THE FIELD. PROVIDE NEW JUNCTION BOX IN CASE OF UNAVAILABILITY / UNOPERABILITY. BASE BID ACCORDINGLY.
7. DISCONNECT SWITCH FOR DISHWASHER. COORDINATE LOCATION AND ALL REQUIREMENTS WITH EQUIPMENT INSTALLER PRIOR TO ROUGH-IN.
8. EXISTING RECIRCULATION PUMP AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/ OPERABILITY OF JUNCTION BOX FOR THE EXISTING RECIRCULATION PUMP IN THE FIELD. PROVIDE NEW JUNCTION BOX IN CASE OF UNAVAILABILITY / UNOPERABILITY. BASE BID ACCORDINGLY.
9. NEMA 3R J-BOX FOR CONNECTION TO EXTERIOR GAS PUMP. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH EQUIPMENT SUPPLIER AND TENANT CONSTRUCTION MANAGER PRIOR TO INSTALLATION.
10. ROUTE CIRCUIT(S) VIA LIGHTING CONTROL. SEE LIGHTING CONTROL DIAGRAM ON SHEET E-1.0.
11. SHOW WINDOW RECEPTACLE. E.C. TO PROVIDE SHOW WINDOW RECEPTACLES AS PER NEC 210.62.
12. JUNCTION BOX WITH TOGGLE DISCONNECT PER NEC FOR CONNECTION TO SIGNAGE. VERIFY EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURE'S INSTRUCTION. ROUTE CIRCUIT TO PANEL VIA EXTERIOR LIGHTING/SIGNAGE.
13. HUBBELL #USB20X2BK (OR EQUAL) USB/DUPLEX RECEPTACLE MOUNT HORIZONTALLY. COORDINATE MOUNTING HEIGHTS AND FINAL DEVICE LOCATION PRIOR TO ROUGH-IN.
14. ROUTE RECEPTACLE CIRCUITS UNDER HOOD (CIRCUITS AS INDICATED ON PLAN) VIA CONTACTOR(S) TO SHUT DOWN WHEN ANSUL SYSTEM IS ACTIVATED. PROVIDE MINIMUM OF 12-POLE CONTACTOR(S) W/120V COIL IN NEMA 1 ENCLOSURE. CONNECT CONTACTOR COIL TO HOOD PRIMARY CONTROL TERMINALS KS-N1. SEE HOOD CONTROL DETAILS, SHEET E-3.0.
15. ROUTE 2#12, 1#12 EGC IN 1/2"C. BETWEEN 120V GAS SOLENOID AND GAS-N1 TERMINALS IN HOOD CONTROL PANEL. SEE HOOD CONTROL DETAILS ON SHEET E-3.0. BOND EGC TO GAS PIPE. REF: NEC 250.104(B)(1).
16. EXISTING AV ROOM RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF EXISTING AV ROOM RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY /UNOPERABILITY.
17. E.C. SHALL PROVIDE THE RECEPTACLES TO NEAREST WALL. BASE BID ACCORDINGLY.
18. EXISTING DINING ROOM-4 RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF EXISTING DINING ROOM-4 RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION IN THE FIELD. THE E.C. SHALL TRACE AND VERIFY THE EXISTING CIRCUIT AND UPDATE THE PANEL SCHEDULE ACCORDINGLY. PROVIDE NEW IN CASE OF UNAVAILABILITY /UNOPERABILITY.
19. EXISTING OUTSIDE ENTRANCE RECEPTACLES AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF OUTSIDE ENTRANCE RECEPTACLES AND ITS ELECTRICAL CONNECTION IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY /UNOPERABILITY.
20. EXISTING OFFICE AREA RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF EXISTING OFFICE AREA RECEPTACLES/DATA POINT AND ITS ELECTRICAL CONNECTION IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY /UNOPERABILITY.
21. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT, FUSE/MANUAL MOTOR SWITCH REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER FOR FINAL SELECTION PRIOR TO ROUGH-IN. E.C. COORDINATE LOCATION OF DISCONNECT SWITCH/JUNCTION BOX WITH MANUFACTURER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
22. RECEPTACLE FOR ENGINE WALL. E.C. SHALL COORDINATE THE EXACT LOCATION AND HEIGHT WITH ARCHITECT AND OWNER PRIOR TO ROUGH IN. BASE BID ACCORDINGLY.
23. JUNCTION BOX FOR HAND DRYER. E.C. TO COORDINATE JUNCTION BOX AND ITS POWER DETAILS AS PER ADA REQUIREMENT.

Property of ANY Engineers

1 ELECTRICAL POWER PLAN - FIRST FLOOR

1/4"=1'-0"

PROJECT INFORMATION:

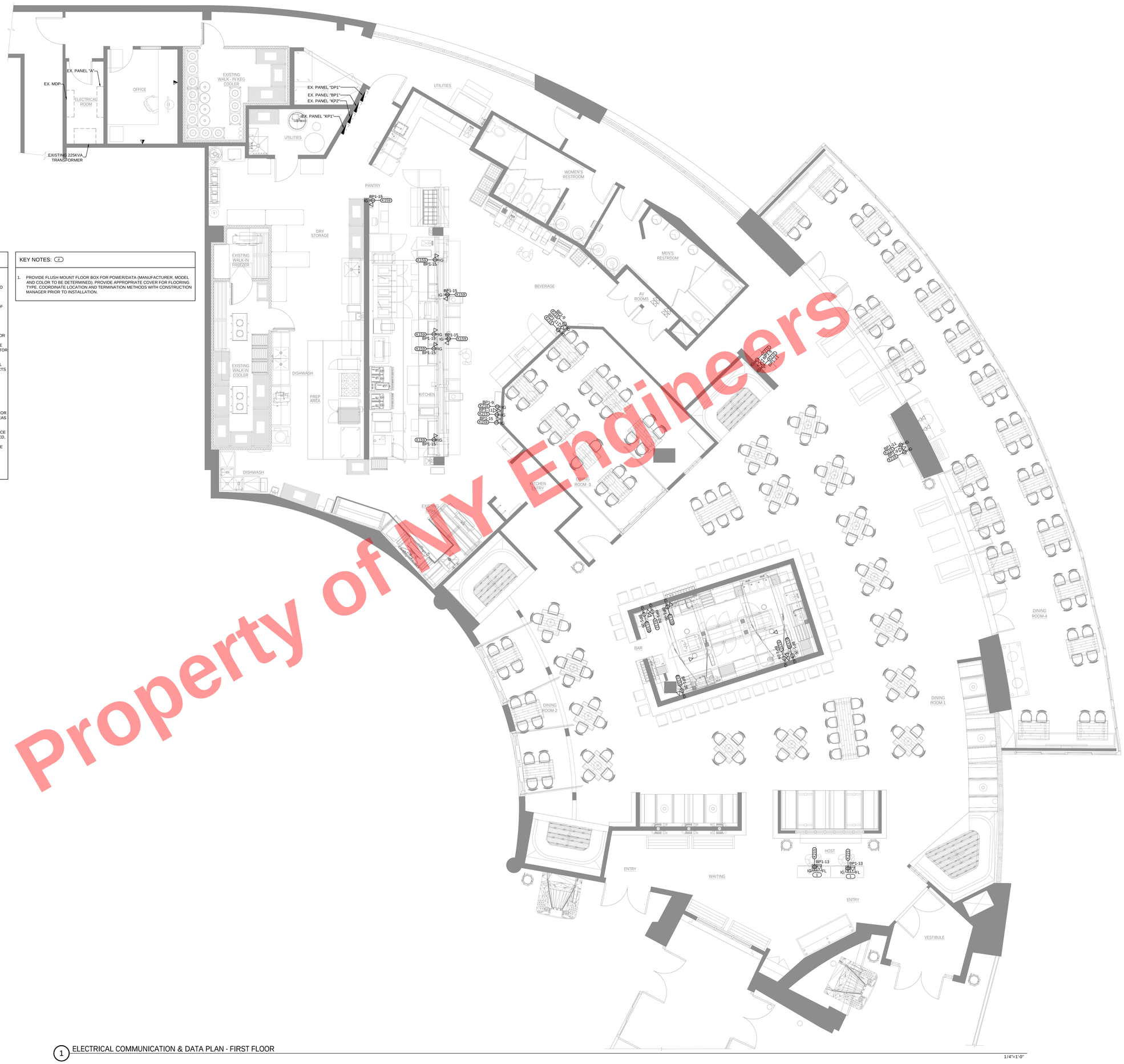
FORD'S GARAGE

DRAWING TITLE:

ELECTRICAL POWER PLAN - FIRST FLOOR

DRAWING NO.:

E-2.0



Property of NY Engineers

GENERAL NOTES:

1. E.C. TO PROVIDE CORD & PLUG CONNECTIONS FOR EQUIPMENT AS REQUIRED.
2. ALL CIRCUITS FOR P.O.S. (POINT OF SALE) EQUIPMENT SHALL BE CONNECTED TO THE SAME PHASE OF POWER IN THE PANEL. ALL BRANCH CIRCUIT BREAKERS SUPPLYING P.O.S. EQUIPMENT SHALL HAVE LOCKING HANDLES DEVICES.
3. EACH RECEPTACLE TYPE (LOCKING OR STRAIGHT BLADE) SHALL MATCH THAT OF THE EQUIPMENT FURNISHED.
4. COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS ON ROOF WITH MECHANICAL CONTRACTOR.
5. ELECTRICAL CONTRACTOR SHALL COORDINATE DISCONNECT REQUIREMENT FOR MECHANICAL UNIT WITH MECHANICAL CONTRACTOR AND EQUIPMENT MANUFACTURER PRIOR TO ROUGH-IN AND PROVIDE AS REQUIRED. COORDINATE LOCATION OF DISCONNECT WITH MANUFACTURER AND MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.
6. ELECTRICAL CONTRACTOR SHALL VERIFY ELECTRICAL LOAD DATA WITH ACTUAL NAMEPLATE RATINGS OF ALL TENANT FURNISHED EQUIPMENT. WHERE CONFLICTS OCCUR, NOTIFY ARCHITECT.
7. MATCH RECEPTACLE TYPES AND MOUNTING HEIGHTS TO MANUFACTURER'S EQUIPMENT CONNECTION REQUIREMENTS.
8. 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 SHALL HAVE GROUND-FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL: KITCHENS, FOOD PREP AREAS AND BARS/BEVERAGE SERVICE AREAS PER NEC ART. 210.8(B)(2).
9. ALL RECEPTACLES IN KITCHEN AREA SHALL BE GFCI PROTECTED IN ACCORDANCE WITH NEC ART. 210.8(B). GFCI-TYPE CIRCUIT BREAKERS ARE PREFERRED. IF USED, GFCI-TYPE RECEPTACLES SHALL BE READILY ACCESSIBLE. IF NOT READILY ACCESSIBLE, RATED GFCI MODULE WITH MANUAL RESET IN READILYACCESSIBLE LOCATION AHEAD OF FIRST RECEPTACLE ON CIRCUIT.
10. SEE SHEET E-3.0 FOR ELECTRICAL FOOD SERVICE EQUIPMENT SCHEDULE. SEE FOOD SERVICE DRAWINGS FOR ADDITIONAL WORK BY THIS CONTRACTOR.

KEY NOTES: (#)

1. PROVIDE FLUSH MOUNT FLOOR BOX FOR POWER/DATA (MANUFACTURER, MODEL AND COLOR TO BE DETERMINED). PROVIDE APPROPRIATE COVER FOR FLOORING TYPE. COORDINATE LOCATION AND TERMINATION METHODS WITH CONSTRUCTION MANAGER PRIOR TO INSTALLATION.

1 ELECTRICAL COMMUNICATION & DATA PLAN - FIRST FLOOR

1/4"=1'-0"

PROJECT INFORMATION:

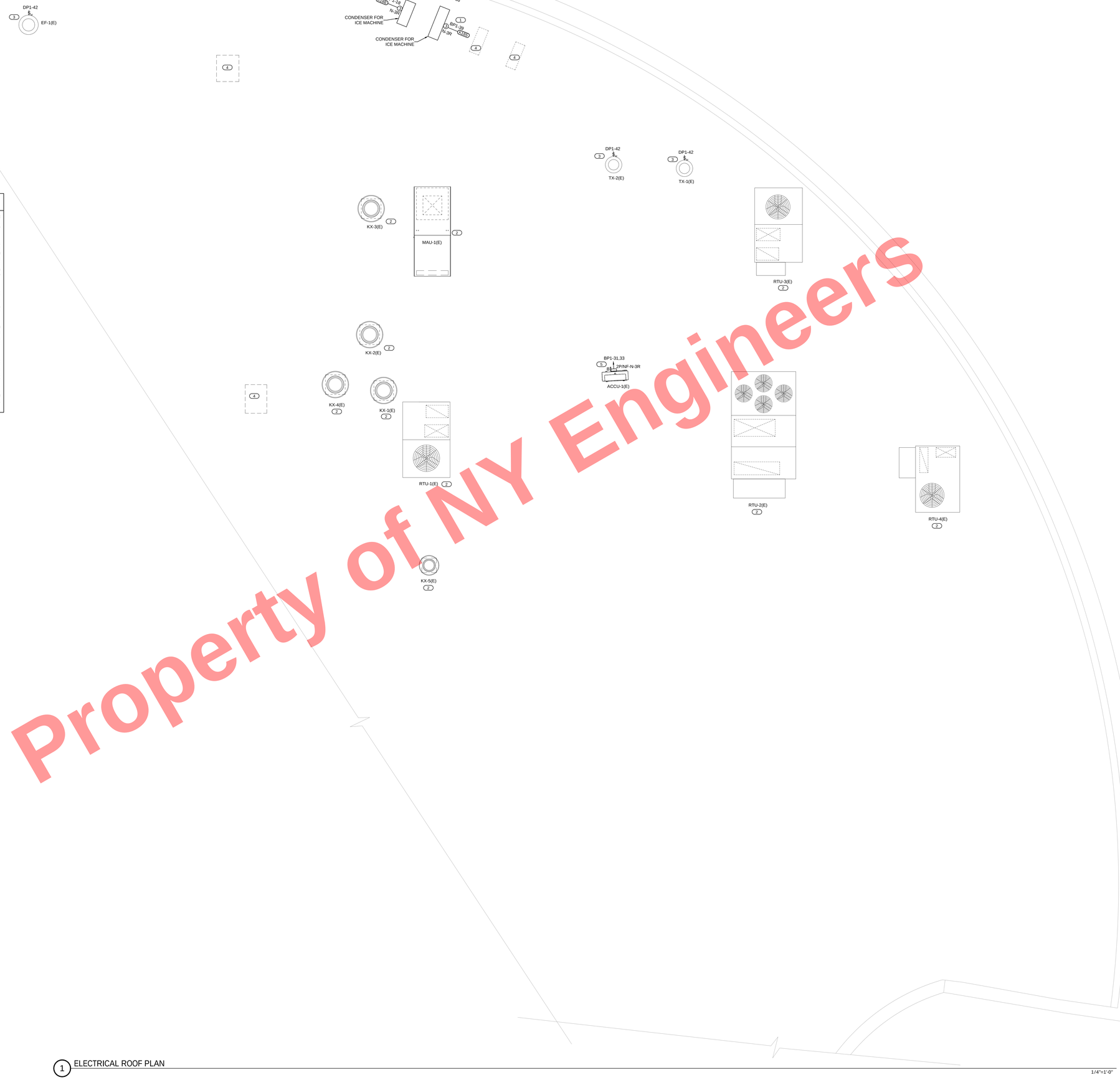
FORD'S GARAGE

DRAWING TITLE:

ELECTRICAL COMMUNICATION & DATA PLAN - FIRST FLOOR

DRAWING NO.:

E-2.1



Property of NY Engineers

KEY NOTES: 4

1. 20A/1P CIRCUIT FOR ICE MACHINE CONDENSER. E.C SHALL COORDINATE WITH EQUIPMENT MANUFACTURER FOR EXACT LOCATION AND ELECTRICAL REQUIREMENTS IN FIELD. MAKE POWER PROVISION ACCORDINGLY. BASE BID ACCORDINGLY.
2. EXISTING MECHANICAL EQUIPMENTS ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF THE EXISTING DISCONNECT SWITCH FOR EXISTING MECHANICAL EQUIPMENTS IN THE FIELD , PROVIDE NEW IN CASE OF UNAVAILABILITY / UNOPERABILITY . E.C. SHALL ALSO VERIFY EXACT ELECTRICAL REQUIREMENT FOR NEW DISCONNECT SWITCH OF EXISTING MECHANICAL EQUIPMENTS AS PER THE MANUFACTURER'S CUT-SHEET. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY PRIOR TO BID. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.
3. EXISTING TOILET EXHAUST FAN SHALL REMAIN. E.C. SHALL RECONNECT THE EXISTING TOILET EXHAUST FAN TO THE NEW CIRCUIT AS SHOWN IN PLAN. IF EXISTING CIRCUIT CANNOT BE IDENTIFIED. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF EXISTING TOILET EXHAUST FAN AND ITS ELECTRICAL CONNECTION IN THE FIELD. PROVIDE NEW IN CASE OF UNAVAILABILITY/UNOPERABILITY.
4. EXISTING WALK-IN COOLER/FREEZER CONDENSER ELECTRICAL CONNECTION SHALL REMAIN. E.C. SHALL VERIFY AVAILABILITY/ OPERABILITY OF DISCONNECT SWITCH FOR THE EXISTING WALK-IN COOLER/FREEZER CONDENSER IN THE FIELD. PROVIDE NEW DISCONNECT SWITCH IN CASE OF UNAVAILABILITY / UNOPERABILITY. BASE BID ACCORDINGLY.
5. EXISTING MECHANICAL EQUIPMENTS SHALL REMAIN. E.C. SHALL RECONNECT THE EXISTING MECHANICAL EQUIPMENT TO THE NEW CIRCUIT AS SHOWN IN PLAN. IF EXISTING CIRCUIT CANNOT BE IDENTIFIED. E.C. SHALL VERIFY AVAILABILITY/OPERABILITY OF THE EXISTING DISCONNECT SWITCH FOR EXISTING MECHANICAL EQUIPMENTS IN THE FIELD , PROVIDE NEW IN CASE OF UNAVAILABILITY / UNOPERABILITY . E.C. SHALL ALSO VERIFY EXACT ELECTRICAL REQUIREMENT FOR NEW DISCONNECT SWITCH OF EXISTING MECHANICAL EQUIPMENTS AS PER THE MANUFACTURER'S CUT-SHEET. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY PRIOR TO BID. REPLACE IF FOUND IN OPERABLE. BASE BID ACCORDINGLY.

1 ELECTRICAL ROOF PLAN

1/4"=1'-0"

PROJECT INFORMATION:

FORD'S GARAGE

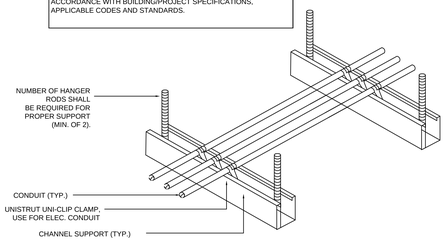
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ELECTRICAL ROOF PLAN

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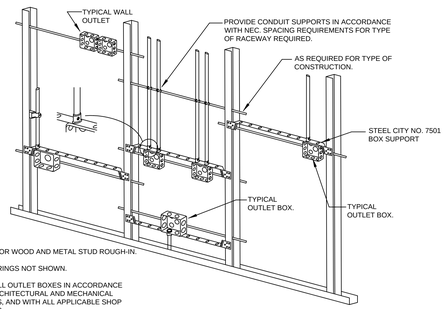
E-2.2

NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



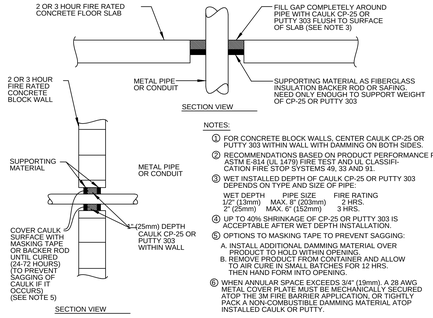
NOTES:
1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

1 CONDUIT SUPPORT DETAIL
N.T.S.



NOTES:
1. TYPICAL FOR WOOD AND METAL STUD ROUGH-IN.
2. PLASTER RINGS NOT SHOWN.
3. LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.
4. IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

2 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
N.T.S.



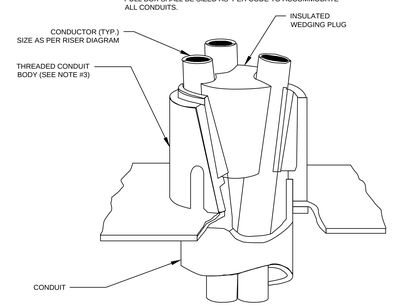
NOTES:
1. FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.
2. RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFICATION FIRE STOP SYSTEMS 49, 33 AND 91.
3. WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

WET DEPTH	PIPE SIZE	FIRE RATING
1/2" (13mm)	MAX. 8" (203mm)	2 HRS.
2" (25mm)	MAX. 6" (152mm)	3 HRS.

4. UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.
5. OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
   A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
   B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.
6. WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

3 FIRE SUPPORT DETAIL
N.T.S.

NOTES:
1. ALL CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED IN ACCORDANCE WITH ARTICLE 300.19 OF NEC. CABLE SUPPORTS SHALL BE LOCATED AT THE INTERVALS REQUIRED BY THE NEC.
2. CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH pOzI-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
3. FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
4. PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.



4 VERTICAL CABLE SUPPORT DETAIL
N.T.S

PROJECT INFORMATION:

FORD'S GARAGE

OAC AND VAC MANUAL MODE OPERATION:

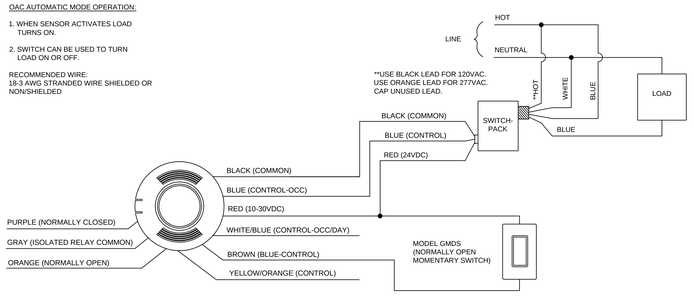
1. SWITCHES ARE REQUIRED TO TURN LOAD ON.
2. LOAD TURNS OFF WHEN SENSOR TIMES OUT OR WITH SWITCH.

OAC AUTOMATIC MODE OPERATION:

1. WHEN SENSOR ACTIVATES LOAD TURNS ON.
2. SWITCH CAN BE USED TO TURN LOAD ON OR OFF.

RECOMMENDED WIRE:
18-3 AWG STRANDED WIRE SHIELDED OR NON/SHIELDED

NOTES
1. SP20-RD4 SWITCHPACK SHOWN. 120/277VAC 20AMP RATING.



5 LOW VOLTAGE WALL SWITCH SENSOR(NEUTRAL CONNECTION) OCCPANCY/VACANCY-SINGLE LEVEL
N.T.S

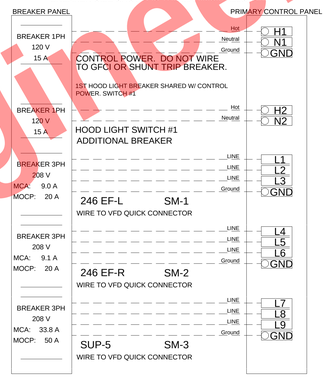
EQUIPMENT SCHEDULE: (#)

ITEM NO.	DESCRIPTION	QUANTITY	VOLTAGE	PHASE	AMPS	kW	CONNECTION TYPE	ELEC. AFF(")	REMARK
K101	CONVECTION OVEN, GAS (DOUBLE)	1	120	1	7.7	0.92	NEMA 5-15	24	
			120	1	7.7	0.92	NEMA 5-15	36	
K104	RETHERMALIZER, WATER TANK, GAS	1	115	1	1	0.12	NEMA 5-15	24	
K105	TIMER, ELECTRONIC	1	120	1	1.5	0.18	NEMA 5-15	30	
K107	2 COMPARTMENT SINK WITH OVERSHELF	1	120	1	1.5	0.18	NEMA 5-20	6	
K112	SLICER	1	115	1	4	0.46	NEMA 5-15	30	
K114	PATTY MAKER	1	110	1	13.8	1.52	HARDWIRED	24	
K121	OVEN, COMBI	1	208	3	-	10.25	HARDWIRED	24	NEED A DATA CONNECTION
K123	WORKTOP REFRIGERATOR	1	115	1	2.4	0.28	NEMA 5-15	24	
K125	HOT FOOD WELL, COUNTERTOP	2	120	1	15	1.80	NEMA 5-20	DFA	
K126	2 PLATEN CLAM SHELL GRIDDLE	1	208	3	48	17.00	NEMA 15-60	24	
K127	3 PLATEN CLAM SHELL GRIDDLE	1	208	3	38	12.50	NEMA 15-50	24	
			208	3	38	12.50	NEMA 15-50	24	
K129	HEATED HOLDING/WARMING BIN	1	120	1	5.8	0.69	NEMA 5-15	36	
K130	CHEESEMELTER, ELECTRIC	1	208	1	17.6	3.66	NEMA 6-30	36	
K132	FRENCH FRY WARMER	1	120	1	12	1.44	NEMA 5-15	36	
K133	FRYER BATTERY, GAS	1	120	1	10	1.20	NEMA 5-15	24	
K134	FRYER BATTERY, GAS	1	120	1	10	1.20	NEMA 5-15	24	
K137	REACH-IN FREEZER	1	115	1	8.46	0.97	NEMA 5-15	24	
K140	FRY/COMBI REFRIGERATOR	2	115	1	4.7	0.54	NEMA 5-15	DFA	
K141	MICROWAVE OVEN	2	208	1	16.6	1.70	NEMA 6-20	DFA	
K143	REFRIGERATED WORKTOP	1	115	1	3	0.35	NEMA 5-15	24	
K145	TOASTER, CONTACT GRILL	1	208	1	16	3.33	NEMA 6-20	DFA	
K146	BURGER BUILD REFRIGERATOR	1	115	1	6.5	0.75	NEMA 5-15	DFA	
K151	HEAT LAMP WITH LIGHTS	4	120	1	11.3	1.36	NEMA 5-15	DFA	
K152	HEAT LAMP WITH LIGHTS	1	120	1	13.6	1.63	NEMA 5-15	DFA	
K159	KDS SCREENS	2	120	1	1.5	0.18	NEMA 5-20	36	
K160	CHEST FREEZER	1	115	1	1.1	0.13	NEMA 5-15	24	
K162	SPINDLE MIXER	1	120	1	-	0.90	NEMA 5-15	48	
K165	MEGA TOP SANDWICH/SALAD PREP REFRIGERATOR	1	115	1	6	0.69	NEMA 5-15	DFA	
K166	REFRIGERATOR/FREEZER, DUAL TEMP	1	115	1	5.5	0.63	NEMA 5-15	DFA	
K171	COFFEE BREWER	1	208	1	25.8	5.37	NEMA 6-35	48	
K172	ICED TEA BREWER	2	120	1	14.4	1.73	NEMA 5-15	48	
K176	SODA DISPENSER	2	120	1	15	1.80	NEMA 5-15	24	
K183	ICE MACHINE	1	208	3	20.6	4.28	HARDWIRED	96/124	
K184	ICE MACHINE	1	208	3	10.7	2.23	HARDWIRED	96/124	
K185	REMOTE CONDENSER FOR ICE MACHINE	1	115	1	8	0.92	HARDWIRED	87/115	FOR K183
K186	REMOTE CONDENSER FOR ICE MACHINE	1	115	1	8	0.92	HARDWIRED	87/115	FOR K184
K189	BAG N BOX	2	120	1	1.5	0.18	NEMA 5-20	84	
K193	DISHWASHER	1	208	3	48.75	17.56	HARDWIRED	72	
K194	BOOSTER HEATER	1	120	1	3	0.36	NEMA 5-15	24	
K210	BUG LIGHT	3	120	1	1.5	0.18	NEMA 5-20	96	
K215	POS	6	120	1	3	0.36	NEMA 5-20	48	
K216	POS PRINTER	4	120	1	1.5	0.18	NEMA 5-20	48	
K222	BULK CO2 TANK	2	120	1	1.5	0.18	NEMA 5-20	24	
K223	NITROGEN GENERATOR/MIXER	1	120	1	1.5	0.18	NEMA 5-20	48	
K230	HEATED CABINET	1	120	1	16.7	2.00	NEMA 5-20	24	
K502	GAS PUMPS	7	120	1	15	1.80	NEMA 5-20	12	
B105	FROSTERS/CHILLER	2	120	1	3.8	0.46	NEMA 5-15	24	
B121	ISLAND OASIS DRINK MACHINE	1	110	1	5.3	0.58	NEMA 5-15	12	
B123	BOTTLE COOLER	1	120	1	1.9	0.23	NEMA 5-15	24	
B124	1-DOOR REFRIGERATOR	1	120	1	1.53	0.18	NEMA 5-15	24	
B132	POS	2	120	1	3	0.36	NEMA 5-20	15	
B133A	PRINTER	1	120	1	1.5	0.18	NEMA 5-20	36.5	
B133B	PRINTER	3	120	1	1.5	0.18	NEMA 5-20	36.5	
B148	KEGERATOR (FOR RED WINE)	1	115	1	1.5	0.17	NEMA 5-15	15	
B150	BACK BAR CABINET, REFRIGERATED, PASS-THRU	1	115	1	4.8	0.55	NEMA 5-15	15	
B151	LIQUOR DISPLAYS	1	120	1	1.5	0.18	NEMA 5-20	15	
B152	LIQUOR DISPLAY	1	120	1	1.5	0.18	NEMA 5-20	15	
B154	ENGINE WALL	1	120	1	5	0.20	HARDWIRED	FLR	
B155	GLYCOL SYSTEM	2	208	1	14.5	3.02	NEMA 6-20	48	
B156	INSIDE CAR	2	120	1	1.5	0.18	NEMA 5-20	FLR	
B158	BACK BAR CABINET, REFRIGERATED, PASS-THRU	1	115	1	2.8	0.32	NEMA 5-15	15	
B160	TV DISPLAYS - 75" TV	2	120	1	1.5	0.18	NEMA 5-20	15	
C.O.	CONVENIENCE OUTLET	3	120	1	1.5	0.18	NEMA 5-20	48	
C.O.1	CONVENIENCE OUTLET	5	120	1	1.5	0.18	NEMA 5-20	36 1/2	MOUNT RECEPTACLE HORIZONTALLY
C.O.2	CONVENIENCE OUTLET	1	120	1	1.5	0.18	NEMA 5-20	48	DEDICATED OUTLET
C.O.3	CONVENIENCE OUTLET	2	120	1	1.5	0.18	NEMA 5-20	24	
C.O.4	CONVENIENCE OUTLET	1	120	1	1.5	0.18	NEMA 5-20	18	
C.O.5	CONVENIENCE OUTLET	1	120	1	1.5	0.18	NEMA 5-20	DFA	
C.O.6	DUPLEX CONVENIENCE OUTLET	2	120	1	1.5	0.18	NEMA 5-20	DFA	DOWN FROM CEILING
C.O.7	4-PLEX CONVENIENCE OUTLET	1	120	1	3	0.36	NEMA 5-20	24	
USB	RECEPTACLE W/USB PORTS FOR IPAD	11	120	1	1.5	0.18	NEMA 5-20	36	

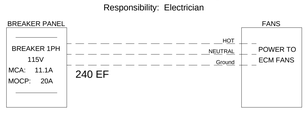
NOTE -
E.C.TO VERIFY EXACT VOLTAGE, NO. OF WIRES, BREAKER AND POWER CONNECTION REQUIREMENT OF THE EQUIPMENT WITH KITCHEN EQUIPMENT VENDOR. ANY DISCREPANCIES SHALL BE COMMUNICATED WITH ENGINEER ON RECORD PRIOR TO BIDDING/ROUGH-IN.

6 EQUIPMENT SCHEDULE
N.T.S.

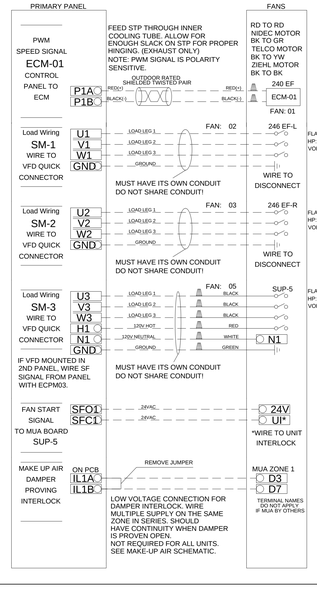
BREAKER PANEL TO PRIMARY CONTROL PANEL
Responsibility: Electrician
BREAKER SIZE SHOWN IS THE MAXIMUM ALLOWED



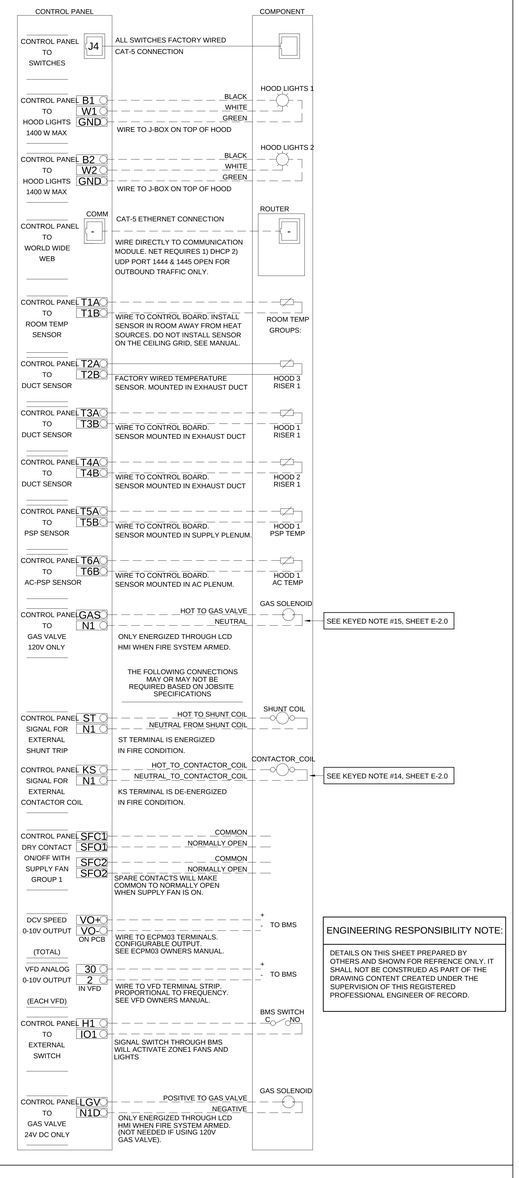
BREAKER PANEL TO FANS
Responsibility: Electrician



CONTROL PANEL TO FANS
Responsibility: Electrician



CONTROL PANEL TO ACCESSORY ITEMS
Responsibility: Electrician



ENGINEERING RESPONSIBILITY NOTE:

DETAILS ON THIS SHEET PREPARED BY OTHERS AND SHOWN FOR REFRENCE ONLY. IT SHALL NOT BE CONSTRUED AS PART OF THE DRAWING CONTENT CREATED UNDER THE SUPERVISION OF THIS REGISTERED PROFESSIONAL ENGINEER OF RECORD.

7 KITCHEN HOOD CONTROL PANEL INTERCONNECTION WIRING DETAIL
N.T.S.

DRAWING TITLE:

ELECTRICAL & HOOD WIRING DETAILS

DRAWING NO.:

E-3.0

Property of WK Engineers

PANEL "A"

PANEL: PANEL"A" | MOUNTING: SURFACE
480Y/277 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: ELECTRICAL ROOM
MAIN CB: NA | MLO: 400A | BUS: EXISTING | MIN, | FED FROM: EX. SERVICE

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
						0.00								
1		SPACE					0.00					SPACE		2
								0.00						
						8.76				8.76	H			
3		SPACE					8.76		EXISTING	8.76	H	RTU-4 (E)	3P-40	4
								8.76		8.76	H			
						0.00								
5		SPACE					0.00					SPACE		6
								0.00						
						17.53				17.53	H			
7		SPACE					17.53		EXISTING	17.53	H	RTU-2 (E)	3P-80	8
								17.53		17.53	H			
						0.00								
9		SPACE					0.00					SPACE		10
								0.00						
						0.00								
11			O	71.37			0.00					SPACE		12
	3P-350	225 KVA TRANSFORMR (EX)	O	71.37	EXISTING			0.00						
						71.37								
13							71.37					SPARE	3P-100	14
			O	71.37				71.37						
		TOTAL CONNECTED LOAD (KVA)				97.66	97.66	97.66						

PANEL "MDP" (2)

PANEL: PANEL"MDP" (2) | MOUNTING: SURFACE
208Y/120 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: ELECTRICAL ROOM
MAIN CB: 800A | MLO: NA | BUS: EXISTING | MIN, | FED FROM: EX. 225 KVA TRANSFORMER

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1						9.64				9.64	O			2
3	3P-50	SPARE					9.64		EXISTING	9.64	O	PANEL KP1	3P-150	4
5								9.64		9.64	O			6
7						19.42				19.42	O			8
9	3P-100	SPARE					19.42		EXISTING	19.42	O	PANEL KP2	3P-200	10
11								19.42		19.42	O			12
13			O	9.93		12.33				2.40	H			14
15	3P-150	PANEL DP1	O	9.93	EXISTING		12.33		EXISTING	2.40	H	MAU-1(E)	3P-30	16
17			O	9.93				12.33		2.40	H			18
19			O	9.92		14.51				4.58	H			20
21	3P-100	PANEL BP1	O	9.92	EXISTING		14.51		EXISTING	4.58	H	RTU-1(E)	3P-60	22
23			O	9.92				14.51		4.58	H			24
25			M	1.58		1.58								26
27	3P-20	KX-1(E) & KX-2(E)	M	1.58	EXISTING		1.58					SPARE	3P-90	28
29			M	1.58				1.58						30
31			M	1.38		7.05				5.67	E			32
33	3P-20	KX-3(E) & KX-4(E)	M	1.38	EXISTING		7.05		3#6, #10G, 3/4"C	5.67	E	K126_2 PLATEN CLAM SHELL GRIDDLE	3P-60**	34
35			M	1.38				7.05		5.67	E			36
37			E	0.74		4.16				3.42	E			38
39	3P-20**	K184_ICE MACHINE	E	0.74	3#12, #12G, 3/4"C		4.16		3#8, #10G, 3/4"C	3.42	E	K121_OVEN, COMBI	3P-35**	40
41			E	0.74				4.16		3.42	E			42
43			H	5.73		6.14			2#12, #12G, 3/4"C	0.41	H	ACH-1(N)	15**	44
45	3P-50	RTU-3(E)	H	5.73	EXISTING		6.14		2#12, #12G, 3/4"C	0.41	H	ACH-2(N)	15**	46
47			H	5.73				6.14	2#12, #12G, 3/4"C	0.41	H	ACH-3(N)	15**	48
		TOTAL CONNECTED LOAD (KVA)				74.81	74.81	74.81						

PANEL "KP1" (2)

PANEL: PANEL"KP1" (2) | MOUNTING: SURFACE
208Y/120 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: DRY STORAGE CORRIDOR
MAIN CB: 150A | MLO: NA | BUS: EXISTING | MIN, | FED FROM: EX. MDP

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	HOOD CONTROL PANEL (EX.)	O	0.50	EXISTING	1.00			EXISTING	0.50	O	HOT WATER CIRCULATOR PUMP (EX)	20	2
3	20**	K151_HEAT LAMP WITH LIGHTS	E	1.36	2#12, #12G, 3/4"C		1.90		2#12, #12G, 3/4"C	0.54	E	K140_FRY/COMBI REFRIGERATOR	20*	4
5	20	HOOD EXHAUST LIGHTS (EX.)	L	0.30	EXISTING			0.84	2#12, #12G, 3/4"C	0.54	E	K140_FRY/COMBI REFRIGERATOR	20*	6
7	20**	K151_HEAT LAMP WITH LIGHTS	E	1.36	2#12, #12G, 3/4"C	2.21			2#12, #12G, 3/4"C	0.85	E	K141_MICROWAVE OVEN	2P-20*	8
9	20	K101_CONVECTION OVEN,GAS (DOUBLE)	E	0.92	2#12, #12G, 3/4"C		1.77			0.85	E			10
11	20**	K151_HEAT LAMP WITH LIGHTS	E	1.36	2#12, #12G, 3/4"C			1.71	2#12, #12G, 3/4"C	0.35	E	K143_REFRIGERATED WORKTOP	20*	12
13	20	K101_CONVECTION OVEN,GAS (DOUBLE)	E	0.92	2#12, #12G, 3/4"C	1.67			2#12, #12G, 3/4"C	0.75	E	K146_BURGER BUILD REFRIGERATOR	20*	14
15	20**	K151_HEAT LAMP WITH LIGHTS	E	1.36	2#12, #12G, 3/4"C		3.09		2#12, #12G, 3/4"C	1.73	E	K172_ICED TEA BREWER	20	16
17	20	K104_RETHERMALIZER, WATER TANK, GA	E	0.12	2#12, #12G, 3/4"C			0.97	2#12, #12G, 3/4"C	0.85	E	K141_MICROWAVE OVEN	2P-20*	18
19	20**	K152_HEAT LAMP WITH LIGHTS	E	1.63	2#12, #12G, 3/4"C	2.48				0.85	E			20
21	20	K105_TIMER, ELECTRONIC	E	0.18	2#12, #12G, 3/4"C		0.38		EXISTING	0.20	O	FREEZR LIGHT AND MISC (EX.)	20	22
23	20*	K160_CHEST FREEZER	E	0.13	2#12, #12G, 3/4"C			0.63	EXISTING	0.50	H	FREEZER EVAP (EX.)	2P-20	24
25	20	K129_HEATED HOLDING/WARMING BIN	E	0.69	2#12, #12G, 3/4"C	1.19				0.50	H			26
27	20**	K162_SPINDLE MIXER	E	0.90	2#12, #12G, 3/4"C		2.70		2#12, #12G, 3/4"C	1.80	E	K176_SODA DISPENSER	20	28
29	20	K132_FRENCH FRY WARMER	E	1.44	2#12, #12G, 3/4"C			3.24	2#12, #12G, 3/4"C	1.80	E	K176_SODA DISPENSER	20	30
31	20*	K165_MEGA TOP SANDWICH/SALAD PREP	E	0.69	2#12, #12G, 3/4"C	1.23			2#12, #12G, 3/4"C	0.54	R	ENGINE WALL RECEPTACLE	20 (1)	32
33	20	K133_FRYER BATTERY, GAS	E	1.20	2#12, #12G, 3/4"C		2.93		2#12, #12G, 3/4"C	1.73	E	K172_ICED TEA BREWER	20	34
35	20*	K166_REFRIGERATOR/FREEZER, DUAL TEMP	E	0.63	2#12, #12G, 3/4"C			2.30	2#12, #12G, 3/4"C	1.67	E	K145_TOASTER, CONTACT GRILL	2P-20*	36
37	20	K134_FRYER BATTERY, GAS	E	1.20	2#12, #12G, 3/4"C	2.87				1.67	E			38
39	20**	WH(E)	O	0.84	2#12, #12G, 3/4"C		3.53		2#8, #10G, 3/4"C	2.69	E	K171_COFFEE BREWER	2P-35*	40
41 (1)	20	K137_REACH-IN FREEZER	E	0.97	2#12, #12G, 3/4"C			3.66		2.69	E			42
		TOTAL CONNECTED LOAD (KVA)				12.65	16.30	13.34						

PANEL "KP2" (2)

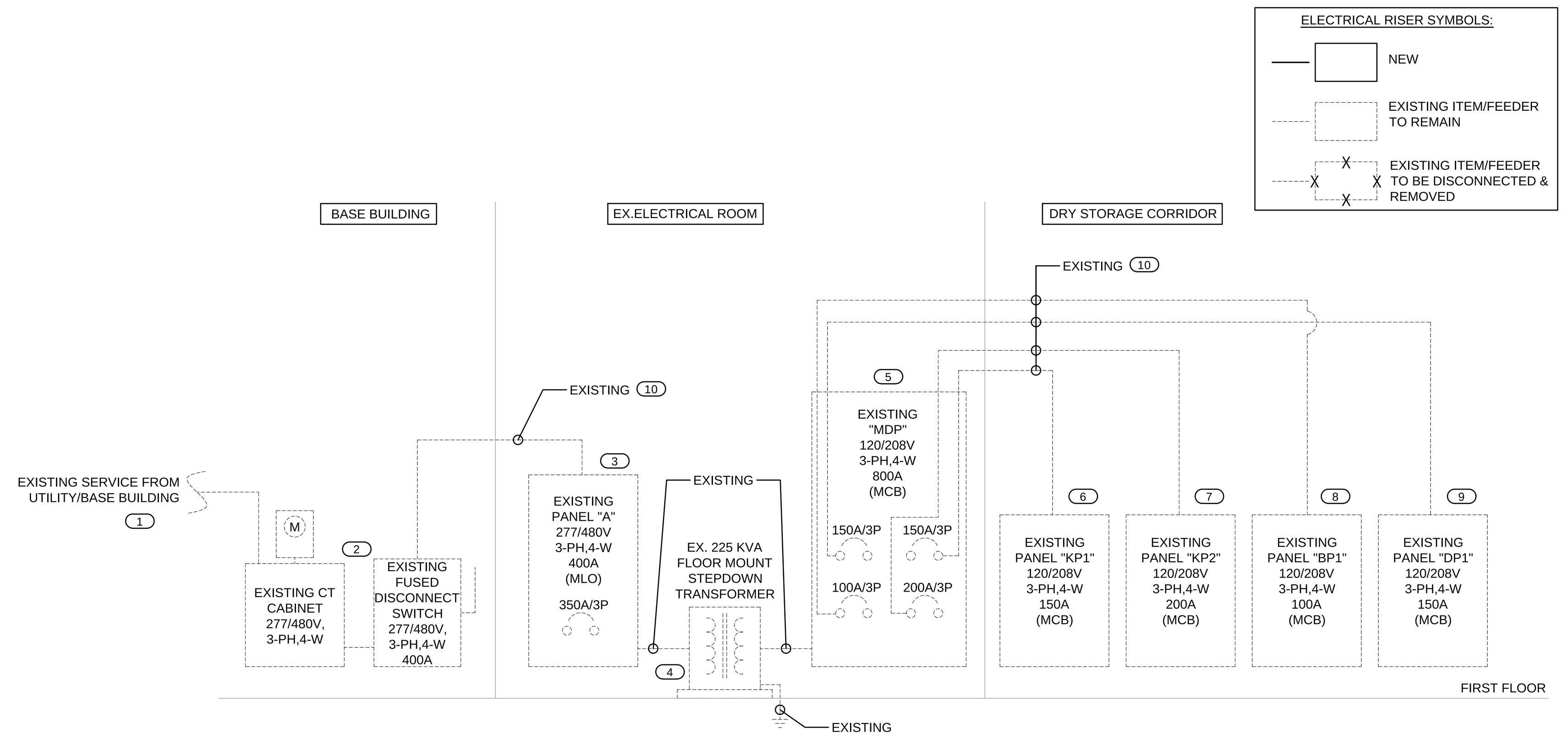
PANEL: PANEL"KP2" (2) | MOUNTING: SURFACE
208Y/120 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: DRY STORAGE CORRIDOR
MAIN CB: 200A | MLO: NA | BUS: EXISTING | MIN, | FED FROM: EX. MDP

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	B154_ENGINE WALL	O	0.50	2#12, #12G, 3/4"C	0.78			2#12, #12G, 3/4"C	0.28	E	K123_WORKTOP REFRIGERATOR	20*	2
3	20	K230_HEATED CABINET	E	2.00	2#12, #12G, 3/4"C		3.43			1.43	E			4
5	20	SHOW WINDOW RECEPTACLES	L	1.20	2#12, #12G, 3/4"C			2.63	3#10, #10G, 3/4"C	1.43	E	K183_ICE MACHINE	3P-30**	6
7	20	SHOW WINDOW RECEPTACLES	L	1.20	2#12, #12G, 3/4"C	2.63				1.43	E			8
9			E	4.17			5.67		2#12, #12G, 3/4"C	1.51	E	B155_GLYCOL SYSTEM	2P-20*	10
11	3P-50*	K127_3 PLATEN CLAM SHELL GRIDDLE	E	4.17	3#8, #10G, 3/4"C			5.67		1.51	E			12
13			E	4.17		4.97			2#12, #12G, 3/4"C	0.80	L	HALLWAY, OFFICE , PREP & DRY STORAGE AREA LIGHTS	20	14
15	20	KX-5(E)	M	1.16	EXISTING		2.16		2#12, #12G, 3/4"C	1.00	O	J BOX FOR HAND DRYERS	20	16
17	20	USB RECEPTACLES	R	0.90	2#12, #12G, 3/4"C			1.40	2#12, #12G, 3/4"C	0.50	O	DINING ROOM-4 FANS	20	18
19	20**	EXTERIOR SIGNAGES	L	1.20	2#12, #12G, 3/4"C	7.05				5.85	E			20
21			E	4.17			10.02		3#6, #10G, 3/4"C	5.85	E	K193_DISHWASHER	3P-60**	22
23	3P-50*	K127_3 PLATEN CLAM SHELL GRIDDLE	E	4.17	3#8, #10G, 3/4"C			10.02		5.85	E			24
25			E	4.17		5.17			2#12, #12G, 3/4"C	1.00	O	J BOX FOR HAND DRYERS	20 (1)	26
27	20*	K194_BOOSTER HEATER (GAS)	E	0.36	2#12, #12G, 3/4"C		0.72		2#12, #12G, 3/4"C	0.36	R	DINING ROOM-3 RECEPTACLES	20	28
29	2P-30*	K130_CHEESEMELTER, ELECTRIC	E	1.83	2#10, #10G, 3/4"C			3.99		2.16	H			30
31			E	1.83		3.99			EXISTING	2.16	H	ROLL IN BLAST FREEZER (EX.)	3P-30	32
33	20**	USB RECEPTACLES	R	0.90	2#12, #12G, 3/4"C		3.06			2.16	H			34
35	20	CAR PATIO DISPLAY LIGHTS	L	0.20	2#12, #12G, 3/4"C			0.38	2#12, #12G, 3/4"C	0.18	E	B124_1-DOOR REFRIGERATOR	20*	36
37	20	K107_2 COMPARTMENT SINK	O	0.18	2#12, #12G, 3/4"C	0.64			2#12, #12G, 3/4"C	0.46	L	DAYLIGHT ZONE AREA LIGHTS	20	38
39	20**	C.O.6_CONVENIENCE OUTLET	R	0.36	2#12, #12G, 3/4"C		1.16		EXISTING	0.80	H	WALK IN COOLER (EX.)	20	40
41	20**	C.O.7_4-PLEX CONVENIENCE OUTLET	R	0.36	2#12, #12G, 3/4"C			1.16	EXISTING	0.80	H	BEER BOX EVAPORATOR (EX.)	20	42
		TOTAL CONNECTED LOAD (KVA)				25.22	26.23	25.26						

1 ELECTRICAL PANEL SCHEDULE

N.T.S.



GENERAL NOTES:

1. ABOVE RISER DIAGRAM IS FOR REFERENCE PURPOSES ONLY. E.C. SHALL VERIFY EXACT POWER DISTRIBUTION IN FIELD AND INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY.
2. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
3. E.C. TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.
4. E.C. TO VERIFY OPERABLE CONDITIONS OF EXISTING DEVICES IN FIELD, REPLACE/RECTIFY IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
5. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION & INCOMING CONNECTION TO ALL PANELS IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND.

KEY NOTES: (#)

1. EXISTING 400A, 277/480V, 3-PHASE, 4-WIRE, ELECTRICAL SERVICE FROM UTILITY FOR THE PROJECT SPACE SHALL REMAIN. E.C SHALL VERIFY EXACT ELECTRICAL DISTRIBUTION/INCOMING LOCATION /RATING /VOLTAGE/ PHASE/WIRE OF EXISTING ELECTRICAL SERVICE IN FIELD WITH ARCHITECT/OWNER. INFORM ENGINEER ON RECORD FOR ANY DISCREPANCY BEFORE COMMENCING ANY WORK. BASE BID ACCORDINGLY.
2. EXISTING 400A, 277/480V, 3-PHASE, 4-WIRE METER, CT CABINET AND FUSED DISCONNECT SWITCH FOR THE PROJECT SPACE SHALL REMAIN. E.C. TO VERIFY THE RATING, SIZE AND OPERABLE CONDITION OF EXISTING METER, CT CABINET AND FUSED DISCONNECT SWITCH IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
3. EXISTING 400A (MLO), 277/480V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A"(NAME TO BE VERIFIED IN THE FIELD) SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "A" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
4. EXISTING 225 KVA, 3-PHASE, FLOOR MOUNTED TRANSFORMER WITH 480V PRIMARY AND 120/208V SECONDARY SHALL REMAIN. E.C. SHALL VERIFY OPERABLE CONDITION OF EXISTING TRANSFORMER & LOCATION IN FIELD. REPLACE IF FOUND INOPERABLE. INFORM ENGINEER IF FOUND ANY DISCREPENCY PRIOR TO BID. BASE BID ACCORDINGLY.
5. EXISTING 800A (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "MDP" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "MDP" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
6. EXISTING 150A (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "KP1" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "KP1" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
7. EXISTING 200A (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "KP2" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "KP2" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
8. EXISTING 100A (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "BP1" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "BP1" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
9. EXISTING 150A (MCB), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "DP1" SHALL REMAIN. E.C. SHALL VERIFY EXACT RATING, LOCATION AND THE OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL "DP1" IN FIELD. INFORM ENGINEER FOR ANY DISCREPANCY FOUND. BASE BID ACCORDINGLY.
10. EXISTING ELECTRICAL FEEDER SHALL REMAIN. E.C. SHALL VERIFY THE RATING, CONDUIT SIZE AND OPERABLE CONDITION OF EXISTING ELECTRICAL FEEDER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

GENERAL NOTES:

1. ALL ARE EXISTING BREAKERS UNLESS OTHERWISE NOTED.
2. ALL CIRCUITING SHOWN IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY CIRCUITING OF THE EXISTING DEVICES IN FIELD AND INFORM ENGINEER FOR ANY DISCREPANCIES.
3. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
4. ELECTRICAL CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBER & BREAKER SIZE OF EXISTING DEVICES IN FIELD.
5. E.C. SHALL PROVIDE NEW CIRCUIT BREAKERS IN PLACE OF EXISTING CIRCUIT BREAKERS WHEREVER NECESSARY TO BE IN LINE WITH THE PANEL SCHEDULE.
6. E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.
7. E.C. SHALL COORDINATE WITH OWNER FOR THE EXISTING TO REMAIN EQUIPMENTS WHOSE ELECTRICAL CONNECTIONS NEED TO BE MAINTAINED.

KEY NOTES: (#)

1. PROVIDE LOCKABLE BREAKER IN OPEN POSITION AS PER NEC 422.31 (B).
2. E.C. SHALL IDENTIFY AND DISCONNECT/REMOVE ALL EXISTING EQUIPMENT NOT USED FOR THE PROJECT FROM THE PANEL AND UPDATE THE PANEL SCHEDULE ACCORDINGLY. BASE BID ACCORDINGLY.
3. E.C. TO VERIFY THE PANEL NAME IN FIELD.

2 ELECTRICAL RISER DIAGRAM

N.T.S.

PANEL "BP1" (2)

PANEL: PANEL"BP1" (2) | MOUNTING: SURFACE
208Y/120 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: DRY STORAGE CORRIDOR
MAIN CB: 100A | MLO: NA | BUS: EXISTING | MIN, | FED FROM: EX. MDP

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	K502_GAS PUMPS	E	1.80	2#12, #12G, 3/4"C	2.00			2#12, #12G, 3/4"C	0.20	L	DINING ROOM-3 AREA LIGHTS & FAN	20	2
3	20	K189_BAG N BOX	R	0.36	2#12, #12G, 3/4"C		1.30		2#12, #12G, 3/4"C	0.94	L	BAR & DINING ROOM - 1,2 AREA LIGHTS	20	4
5	20	K223_NITROGEN GENERATOR/MIXER	O	0.18	2#12, #12G, 3/4"C			1.69	2#12, #12G, 3/4"C	1.51	E	B155_GLYCOL SYSTEM	2P-20*	6
7	20	K210_BUG LIGHT	L	0.54	2#12, #12G, 3/4"C	2.05				1.51	E			8
9	20	K216_POS PRINTER	R	0.72	2#12, #12G, 3/4"C		0.90		2#12, #12G, 3/4"C	0.18	R	K222_BULK CO2 TANK	20	10
11	20	K215_POS	R	0.72	2#12, #12G, 3/4"C			2.52	2#12, #12G, 3/4"C	1.80	E	K502_GAS PUMPS	20	12
13	20	K215_POS	R	0.72	2#12, #12G, 3/4"C	2.52			2#12, #12G, 3/4"C	1.80	E	K502_GAS PUMPS	20	14
15	20	K159_KDS	R	1.28	2#12, #12G, 3/4"C		3.08		2#12, #12G, 3/4"C	1.80	E	K502_GAS PUMPS	20	16
17	20	T.V OUTLET	R	1.26	2#12, #12G, 3/4"C			3.06	2#12, #12G, 3/4"C	1.80	E	K502_GAS PUMPS	20	18
19	20*	B123_BOTTLE COOLER	E	0.23	2#12, #12G, 3/4"C	2.03			2#12, #12G, 3/4"C	1.80	E	K502_GAS PUMPS	20	20
21	20	B105_FROSTERS/CHILLER	E	0.46	2#12, #12G, 3/4"C		0.82		2#12, #12G, 3/4"C	0.36	R	B156_INSIDE CAR	20	22
23	2P-20	SPARE						0.36	2#12, #12G, 3/4"C	0.36	R	B132_POS	20	24
25						0.72			2#12, #12G, 3/4"C	0.72	R	B133A & B133B_PRINTER	20	26
27	2P-15	AC-1(E)	H	0.42	EXISTING		1.52		2#12, #12G, 3/4"C	1.10	L	KITCHEN, PREP & DRY STORAGE AREA LIGHTS	20	28
29			H	0.42				0.88	2#12, #12G, 3/4"C	0.46	E	B105_FROSTERS/CHILLER	20*	30
31	2P-40**	ACCU-1(E)	H	2.08	2#8, #10G, 3/4"C	2.66			2#12, #12G, 3/4"C	0.58	E	B121_ISLAND OASIS DRINK MACHINE	20	32
33			H	2.08			2.25		2#12, #12G, 3/4"C	0.17	E	B148_KEGERATOR (FOR RED WINE)	20*	34
35	2P-15	SPARE						0.18	2#12, #12G, 3/4"C	0.18	R	ROOF TOP GFI	20	36
37						1.20			2#12, #12G, 3/4"C	1.20	L	INTERIOR SIGNAGE	20	38
39	20**	K185_CONDENSER FOR ICE MACHINE	E	0.92	2#12, #12G, 3/4"C		2.12		2#12, #12G, 3/4"C	1.20	L	EXTERIOR SIGNAGES	20	40
41	20**	TIME CLOCK (1)	L	0.20	2#12, #12G, 3/4"C			0.52	2#12, #12G, 3/4"C	0.32	E	B150_BACK BAR CABINET	20*	42
		TOTAL CONNECTED LOAD (KVA)				13.18	11.98	9.20						

PANEL "DP1" (2)

PANEL: PANEL"DP1" (2) | MOUNTING: SURFACE
208Y/120 VOLTS, 3 PHASE, 4 WIRE | PANEL LOCATION: DRY STORAGE CORRIDOR
MAIN CB: 150A | MLO: NA | BUS: EXISTING | MIN, | FED FROM: EX. MDP

NOTE: L : LIGHTING, H : HVAC LOAD, M : MOTOR LOAD, R : RECEPTACLES, O : OTHER/MISC. (TYPICAL), * - GFI BREAKER, ** - NEW BREAKER

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	2P-30	REMOTE CONDENSOR (EX.)	H	1.00	EXISTING	1.20			EXISTING	0.20	O	FIRE ALARM PANEL (EX.)	20	2
3			H	1.00			1.36		2#12, #12G, 3/4"C	0.36	R	RESTROOM RECEPTACLES	20	4
5	2P-20	REMOTE CONDENSOR (EX.)	H	0.50	EXISTING			1.22	EXISTING	0.72	R	IG REC DATA CLOSET (EX.)	20	6
7			H	0.50		1.22			EXISTING	0.72	R	IG REC DATA CLOSET (EX.)	20	8
9	20**	T.V OUTLET	R	1.26	2#12, #12G, 3/4"C		1.62		EXISTING	0.36	R	REC OUTSIDE ENTRANCE (EX.)	20	10
11	20**	T.V OUTLET	R	1.26	2#12, #12G, 3/4"C			2.04	2#12, #12G, 3/4"C	0.78	L	CAR & BAR TAPE LIGHTS	20	12
13	2P-20	SPARE				0.73			2#12, #12G, 3/4"C	0.73	L	DINING TAPE LIGHTS	20	14
15							0.98		2#12, #12G, 3/4"C	0.98	L	DINING TAPE LIGHTS	20**	16
17	20*	B158_BACK BAR CABINET	E	0.32	2#12, #12G, 3/4"C			1.24	2#12, #12G, 3/4"C	0.92	E	K186_CONDENSER FOR ICE MACHINE	20	18
19	20**	B151 & B152_LIQUOR DISPLAYS	R	0.36	2#12, #12G, 3/4"C	0.82			2#12, #12G, 3/4"C	0.46	E	K112_SLICER	20	20
21			H	0.80			2.32		2#12, #12G, 3/4"C	1.52	E	K114_PATTY MAKER	20 (1)	22
23	3P-20	WALK IN COOLER (EX.)	H	0.80	EXISTING			1.74	2#12, #12G, 3/4"C	0.94	L	DINING TAPE LIGHTS	20	24
25			H	0.80		2.13			2#12, #12G, 3/4"C	1.33	L	DINING TAPE LIGHTS	20	26
27	20	C.O.2_CONVENIENCE OUTLET	R	0.18	2#12, #12G, 3/4"C		0.38		2#12, #12G, 3/4"C	0.20	L	TIME CLOCK (2)	20	28
29	20	C.O.3_CONVENIENCE OUTLET	R	0.36	2#12, #12G, 3/4"C			0.90	2#12, #12G, 3/4"C	0.54	R	C.O.1_CONVENIENCE OUTLET	20	30
31	20	C.O.4_CONVENIENCE OUTLET	R	0.18	2#12, #12G, 3/4"C	1.98			2#12, #12G, 3/4"C	1.80	E	K125_HOT FOOD WELL, COUNTERTOP	20	32
33	20	C.O.5_CONVENIENCE OUTLET	R	0.18	2#12, #12G, 3/4"C		0.98		EXISTING	0.80	H	CONDENSOR (EX.)	2P-30	34
35	20	MANAGERS DESK REC (EX.)	R	1.44	EXISTING			2.24		0.80	H			36
37			H	0.80		2.60			2#12, #12G, 3/4"C	1.80	E	K125_HOT FOOD WELL, COUNTERTOP	20	38
39	3P-20	REMOTE STORAGE WALK IN BOX(EX.)	H	0.80	EXISTING		1.70		2#12, #12G, 3/4"C	0.90	R	C.O.1_CONVENIENCE OUTLET	20	40
41			H	0.80				1.38	2#12, #12G, 3/4"C	0.58	L	RESTROOM AREA LIGHTS + TX-1(E) & TX-2(E), EF-(E)	20	42
		TOTAL CONNECTED LOAD (KVA)				10.68	9.34	10.76						

N.T.S.

Property of NY Engineers

PROJECT INFORMATION:
FORD'S GARAGE

DRAWING TITLE:
ELECTRICAL PANEL SCHEDULE & RISER DIAGRAM

DRAWING NO.:
E-4.0

PLUMBING SYMBOL LIST

Symbol	Description
SAN	SANITARY SEWER PIPING (ABOVE FLOOR)
SAN	SANITARY SEWER PIPING (UNDERGROUND)
GSAN	GREASE WASTE PIPING (UNDERGROUND)
	EXISTING GREASE WASTE PIPING
	VENT PIPING
	COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
G	GAS PIPING
	FILTERED WATER PIPING
	P-TRAP
	PIPE UP
	PIPE DROP
	CLEANOUT
	PLUGGED OUTLET/CLEANOUT
	FLOOR SINK
	FLOOR DRAIN
	SHUT-OFF VALVE
	GAS SHUT OFF VALVE
	RECIRCULATION PUMP
	POINT OF CONNECTION
GC	GLYCOL CONDUTE
SC	SODA CONDUTE

PLUMBING ABBREVATIONS

CO	CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
G	GAS
SAN	SANITARY
GSAN	GREASE WASTE SANITARY
V	VENT
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
FD	FLOOR DRAIN
N.I.C.	NOT IN SCOPE
ET	EXPANSION TANK
WH	WATER HEATER
WHA	WATER HAMMER ARRESTOR
CD	CONDENSATE DRAIN
GC	GENERAL CONTRACTOR
RCP	RECIRCULATION PUMP
AAV	AIR ADMITTANCE VALVE
E	EXISTING

PLUMBING DRAWING LIST

P-0.1 PLUMBING SYMBOLS LIST, ABBREVIATION, GENERAL NOTES, SPECIFICATION

P-1.0 PLUMBING WATER & GAS SUPPLY FLOOR PLAN

P-2.0 PLUMBING WASTE & VENT FLOOR PLAN

P-3.0 PLUMBING DETAILS

P-4.0 PLUMBING RISERS

P-5.0 PLUMBING SCHEDULES

APPLICABLE CODES

A. 2021 INTERNATIONAL BUILDING CODE, NJ ED.

B. 2021 INTERNATIONAL MECHANICAL CODE

C. 2021 NATIONAL STANDARD PLUMBING CODE, NJ ED.

D. 2020 NATIONAL ELECTRICAL CODE

E. 2021 INTERNATIONAL FUEL GAS CODE

F. ENERGY CODE - ASHRAE 90.1-2019

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.).

2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 702.2

3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 305.

4. TRENCHING, EXCAVATION AND BACKFILL AS PER 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 306.

5. RODENT PROOFING AS PER 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 304.

6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 2021 NATIONAL STANDARD PLUMBING CODE (NSPC 2021) 303, 605, 702, 902.

7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) CHAPTERS 4, 5, 6, 7, 8 AND 9.

8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 708.

9. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SCETION 308.

10. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) CHAPTER 6 SECTION 601, 602, 603, 604, 606, 607, 608, 610, 611 AND 613.

11. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) CHAPTER 7 SECTION 701, 704, 705, 706, 707, 708, 709 AND 710.

12. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) CHAPTER 9 SECTIONS 901 THROUGH 2021 NATIONAL STANDARD PLUMBING CODE (NSPC 2021) SECTION 919.

13. INSPECTION AND TESTING OF PLUMBING PIPING SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION 2021 NATIONAL STANDARD PLUMBING CODE (NJ ED.) SECTION 107 AND 312.

14. GAS PIPING INSTALLATION SHALL BE AS PER 2021 INTERNATIONAL FUEL GAS CODE CHAPTER 4.

PLUMBING SPECIFICATIONS

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

A. PROVIDE ALL MATERIAL, TOOLS, SUPERVISION AND LABOR INCLUDING ALL MISCELLANEOUS AND INCIDENTAL ITEMS REQUIRED FOR COMPLETE AND OPERABLE PLUMBING INSTALLATIONS AS SHOWN OR DESCRIBED ON THE DRAWINGS AND IN THESE SPECIFICATIONS.

B. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING AND NEW CONDITIONS AND MATERIALS WITHIN THE CONSTRUCTION AREA. ANY DAMAGE CAUSED BY THE CONTRACTOR SHALL BE REPAIRED TO THE OWNER'S SATISFACTION.

C. OBTAIN ALL PERMITS, PAY ALL PERMIT FEES AND SCHEDULE ALL REQUIRED INSPECTIONS. COPIES OF ALL PERMITS AND INSPECTION CERTIFICATES SHALL BE FORWARDED TO THE OWNER FOR RECORD.

D. THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.

E. THE CONTRACTOR SHALL VISIT THE SITE PRIOR TO SUBMITTING BID TO DETERMINE CONDITIONS AND THE EXTENT OF THE WORK. BY COMMENCING WORK, THE CONTRACTOR ACKNOWLEDGES HIS CONFIRMATION OF ALL CONDITIONS AS ACCEPTABLE WITH REFERENCE TO HIS CONTRACT, SCOPE OF WORK AND BID PRICE SUCH THAT NO ADDITIONAL COMPENSATION SHALL BE FORTHCOMING FOR UNFORESEEN EXISTING CONDITIONS.

F. IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.

G. ALL ELECTRICAL REQUIREMENTS SHALL BE COORDINATED WITH THE CONTRACTOR FOR ELECTRICAL WORK. THIS CONTRACTOR IS RESPONSIBLE FOR ALL LOW VOLTAGE WIRING FOR EQUIPMENT INSTALLED UNDER HIS CONTRACT. THE CONTRACTOR FOR ELECTRICAL WORK IS RESPONSIBLE FOR LINE VOLTAGE POWER WIRING ONLY.

H. COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.

I. MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.

J. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.

K. THE CONTRACTOR IS RESPONSIBLE FOR ALL PAINTING ASSOCIATED WITH CUTTING AND PATCHING. ALL PAINTING IN AREAS WITH COMPLETE FINISH RENOVATIONS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR.

1.02 SUBMITTALS

A. SUBMITTAL REQUIREMENTS SHALL BE COORDINATED WITH THE ARCHITECT AND AUTHORITIES HAVING JURISDICTION. UNLESS OTHERWISE DIRECTED, CONTRACTOR SHALL PROVIDE SUBMITTALS AS LISTED BELOW.

1. PIPE AND FITTINGS
2. VALVES
3. HANGERS AND SUPPORTS
4. PLUMBING PIPING LAYOUT
5. TESTS
6. PLUMBING FIXTURES
7. MIXING VALVES
8. ALL SCHEDULED PLUMBING EQUIPMENT

B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.

C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.

D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.

E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.

F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.

G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.

H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.

1.03 SUBSTITUTIONS

A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.

B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

1.04 DEFINITIONS

A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.

B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.

C. PROVIDE: TO FURNISH AND INSTALL.

D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

1.05 DRAWINGS

A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUSTRATE THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GENERAL LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPMENT, RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL PIPING SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHITECT, ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXISTING AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF THE OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHALL BE INSTALLED CONCEALED IN FINISHED SPACES, UNLESS NOTED OTHERWISE.

B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCESSORIES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVEN IF NOT PARTICULARLY SHOWN OR SPECIFIED.

C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAWINGS FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.

D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR ALL FIXTURE ROUGHING SIZE REQUIREMENTS.

E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK AND REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDITIONS WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VISIBLE CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY THE OWNER.

F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE FINAL ARCHITECTURAL DRAWINGS.

1.06 PRODUCTS

A. SANITARY AND VENT PIPING:

1. UNDERGROUND GRAVITY SEWERS & VENT PIPE SHALL BE CAST IRON OR PVC PIPE.

2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.

3. CAST IRON PIPES SHALL BE APPROVED BY CISPI.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.

2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE COPPER OR COPPER ALLOY

3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.

4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.

5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.

6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE RETARDANT, FACTORY APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH ASHRAE 90.1 2019 SECTION 7.4.3 BELOW TABLE.

MINIMUM PIPE INSULATION THICKNESS							
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU.IN./ (H.FT2.°F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	≥8
141-200	0.25-0.29	125	1.5	1.5	2	2	2
105-140	0.21-0.28	100	1.0	1.0	1.5	1.5	1.5
40-60	0.21-0.27	75	0.5	0.5	1.0	1.0	1.0

7. AS PER ASHRAE 90.1 2019 SECTION 7.4.4.2, SYSTEM DESIGNED TO MAINTAIN USAGE TEMPERATURE IN HOT WATER PIPES SUCH AS RE-CIRCULATING HOT WATER SYSTEMS OR HEAT TRACE, SHALL BE EQUIPPED WITH AUTOMATIC TIME SWITCHES OR OTHER CONTROLS THAT CAN BE USED TO SWITCH THE USAGE TEMPERATURE MAINTENANCE SYSTEM DURING EXTENDED PERIOD WHEN HOT WATER IS NOT REQUIRED.

8. AS PER ASHRAE 90.1 2019 SECTION 7.4.4.3, TEMPERATURE CONTROLLING MEANS SHALL BE PROVIDED TO LIMIT THE MAXIMUM TEMPERATURE OF WATER DELIVERED FROM LAVATORY FAUCETS IN PUBLIC FACILITY RESTROOMS TO 110°F.

9. AS PER ASHRAE 90.1 2019 SECTION 7.4.4.4, WHEN USED TO MAINTAIN STORAGE TANK WATER TEMPERATURE, RE-CIRCULATING PUMPS SHALL BE EQUIPPED WITH CONTROLS LIMITING OPERATION TO A PERIOD FROM THE START OF THE HEATING CYCLE TO A MAXIMUM OF FIVE MINUTES AFTER THE END OF THE HEATING CYCLE.

10. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.

11. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.

C. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK-CLOSING VALVES.

D. MAINTAIN ALL REQUIRED AND RECOMMENDED CLEARANCES FOR ALL PLUMBING SYSTEM COMPONENTS AND EQUIPMENT.

E. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.

2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.

3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.

4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2-1/2" AND LARGER (1-1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.

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

F. VALVES:

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

2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.

3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.

4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.

5. ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.

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

G. SLEEVES AND ESCUTCHEONS:

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

H. DRAINAGE ACCESSORIES

1.GENERAL:

a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

I. INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE.

J. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'-0" IN LENGTH.

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

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

M. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

N. IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.

O. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

R. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.

S. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.

T. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.

U. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.

V. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

W. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK-CLOSING VALVES.

1.07 DEMOLITION

A. VISIT THE SITE, EXAMINE THE EXISTING CONDITIONS AND BECOME FAMILIAR WITH THE EXTENT OF THE NECESSARY REMOVAL, RELOCATION, RECONNECTING AND REROUTING OF PLUMBING EQUIPMENT AND PIPING AS NECESSARY FOR THE COMPLETION OF THE PROJECT.

B. REVIEW AND CONFIRM WITH THE ARCHITECT/DESIGNER'S DRAWINGS FOR THE COMPLETE EXTENT OF DEMOLITION AND ALTERATION.

C. ENSURE THAT ALL EXISTING PLUMBING PIPING OR SYSTEMS, IN AREAS OUTSIDE THE AREAS OF THIS WORK, THAT ARE REQUIRED TO REMAIN IN SERVICE, SHALL DO SO.

D. RELOCATE ANY PLUMBING PIPING OR EQUIPMENT THAT IS REQUIRED TO REMAIN IN SERVICE, THAT IS SECURED TO EXISTING WALLS, FLOORS OR CEILINGS TO BE DEMOLISHED.

E. ALL EXISTING PLUMBING EQUIPMENT OR PIPING WHICH IS NO LONGER REQUIRED SHALL BE REMOVED AND DISPOSED OF, OFF SITE.

F. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CONSULTANT.

G. CARRY OUT THE WORK WITH MINIMUM OF NOISE, DUST AND DISTURBANCE

2. INSTALLATION

2.01 GENERAL

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

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

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.

E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.

F. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.

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

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.

J. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

K. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.

L. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

2.02 ABOVE GRADE

A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.

B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES AND ALL LOW POINTS IN PIPING.

C. USE EXISTING CONNECTIONS AT MAINS WHERE AVAILABLE FOR NEW BRANCH PIPING. LOCATE ALL RISERS AND PIPING BEFORE CONSTRUCTION COMMENCES AND TAKE CARE NOT TO DAMAGE SAME. ANY DAMAGE OCCURRING TO THE EXISTING PIPING WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

D. DEVICES:

a. CLEANOUT & CLEANOUT PLUG

- THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG
- PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.
- LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI-SEIZE LUBRICANT BEFORE FINAL INSTALLATION.

b. CLEANOUT WALL PLATE

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

c. CLEANOUT DECK PLATE

- IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.
- GRILLE FREE AREA SHOULD BE AT LEAST EQUAL TO CROSS-SECTION AREA OF PIPE TO WHICH CONNECTION MADE AND MADE OF POLISHED NICKEL BRONZE, WITH REMOVABLE GRATE, EITHER PERFORATED OR BAR TYPE. GRATE ATTACHED TO GRILLE BODY WITH VANDAL RESISTANT FASTENER.
- MAINTAIN MINIMUM 10'-0" CLEARANCE BETWEEN ALL PLUMBING V.T.R.S AND ALL OUTDOOR AIR INTAKES. OFFSET VENT STACKS AND STACK VENTS IF AND AS REQUIRED BELOW ROOF TO MAINTAIN SUCH CLEARANCE WHETHER OR NOT SUCH OFFSET IS INDICATED ON THE DRAWINGS. PROVIDE ALL REQUIRED SEISMIC SUPPORTS.

2.03 LEAK DETECTION

A. VISIT THE SITE, EXAMINE THE EXISTING CONDITIONS AND BECOME FAMILIAR WITH THE EXTENT OF THE NECESSARY REMOVAL, RELOCATION, RECONNECTING AND REROUTING OF PLUMBING EQUIPMENT AND PIPING AS NECESSARY FOR THE COMPLETION OF THE PROJECT.

B. FURNISH AND INSTALL A FLOODMASTER RS-094-1 WATER HEATER LEAK DETECTION AND AUTOMATIC SHUT- OFF KIT, INCLUDING FULL-PORT SHUT-OFF VALVE, ACTUATOR, WATER SENSING PUCK, PLUG FOR A STANDARD 120 V AC OUTLET. RELAYS FOR CONNECTION TO BMS, THE KIT SHALL INCLUDE ALL SYSTEM COMPONENTS FOR A TYPICAL INSTALLATION. CONTACT RELIANCE DETECTION TECHNOLOGIES 888-771-4929.

3. TESTING

A. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.

B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.

C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.

D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.

E. ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.

F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.

G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.

H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

I. ALL EQUIPMENT WILL BE FACTORY TESTED.

J. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.

K. REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.

L. TESTING REQUIREMENTS

a. TEST ALL DOMESTIC WATER PIPING AS PER 2021 NATIONAL STANDARD PLUMBING CODE NJ ED.

b. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.

c. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

M. THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

N. INSPECTION & TESTING SHALL BE AS PER 2021 NATIONAL STANDARD PLUMBING CODE.

PRESS JOINERY SYSTEM:

a. FITTINGS ½" - 4":

1. WHERE APPROVED BY THE LOCAL JURISDICTION, THE NIBCO PRESS SYSTEM MAY BE USED AT THE CONTRACTOR'S OPTION FOR THE FOLLOWING BUILDING SERVICES PIPING -20°F TO +250°F UP TO 200 PSI:
- HOT AND COLD DOMESTIC WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
- POTABLE WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED.
- HOT WATER HEATING SERVICE

ALL LEAD FREE WROT COPPER PRESS FITTINGS SHALL BE MADE FROM COMMERCIALLY PURE COPPER MILL PRODUCTS PER ASTM B 75 ALLOY C12200. THESE FITTINGS SHALL BE THIRD-PARTY CERTIFIED TO NSF/ANSI 61 ANNEX G AND COMPLY WITH NEW JERSEY CITY HEALTH AND SAFETY CODE,NSPC NJ ED. 2021 AND VERMONT ACT 193. NIBCO LEAD FREE CAST DEZINCIFICATION-RESISTANT (DZR) FITTINGS SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. THE PRESS FITTINGS CONNECTIONS SHALL BE COMPATIBLE WITH SEAMLESS K, L OR M COPPER TUBE MADE TO ASTM B 88. FITTINGS SHALL HAVE A MAXIMUM NON-SHOCK WORKING PRESSURE OF 200 PSI BETWEEN THE TEMPERATURES OF -20°F AND +250°F. ELASTOMERIC SEALS WITH LEAK DETECTION DESIGN SHALL BE MADE OF EPDM MATERIAL, AND THE FITTINGS SHALL BE MANUFACTURED WITH AN INBOARD BEAD DESIGN. NIBCO PRESS FITTINGS MEET ALL PERFORMANCE REQUIREMENTS OF ASME B16.22 AND B16.18ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ACCORDING TO LOCAL PLUMBING AND MECHANICAL CODES. THE PRESS-TO-CONNECT JOINT SHALL BE MADE WITH PRESSING TOOLS AND JAW SETS RECOMMENDED AND AUTHORIZED BY NIBCO. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER; NIBCO.

b. VALVES 2" AND SMALLER: BALL VALVES: (ON/OFF, ISOLATION OR THROTTLING)

O.

1. BALL VALVES (STAINLESS STEEL BALL AND STEM) WITH MALE OR FEMALE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI CWP TO +250°F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-110 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODIES AND END PIECES AND SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. NO BRASS CONTAINING MORE THAN 15% ZINC SHALL BE APPROVED. VALVE SHALL HAVE REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, SOLID STAINLESS STEEL BALL AND STEM. NO HOLLOW CHROME PLATED BALLS ACCEPTED. ALL VALVES SHALL BE FULL PORT. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
- WHERE PIPING IS TO BE INSULATED, BALL VALVES SHALL BE EQUIPPED WITH 2" EXTENDED HANDLES OF NON-THERMAL CONDUCTIVE MATERIAL. HANDLE TO HAVE EXTENDED SLEEVE INCORPORATING AN INSULATION PLUG TO PROVIDE A VAPOR BARRIER AND ALLOW VALVE OPERATION WITHOUT DISTURBING THE INSULATION, AND A MEMORY STOP, WHICH CAN BE SET AFTER INSTALLATION.
- ACCEPTABLE VALVES: (NSF-61, NON-INSULATED LINES): NIBCO PC585-66-LF, -HC, -LL.
- ACCEPTABLE VALVES: (NSF-61, INSULATED LINES): NIBCO PC585-66-LF-NS, -HC, -LL

c. CHECK VALVES: (BACKFLOW PREVENTION)

1. VALVES WITH PRESS-TO-CONNECT ENDS SHALL BE RATED TO 200 PSI CWP AT +250°F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-80 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODY & CAP SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. DISC SHALL BE TFE TEFLON. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN. · ACCEPTABLE CHECK VALVES: NIBCO PS413-Y-LF: Y PATTERN, SWING TYPE CHECK VALVE; NIBCO PS480-Y-LF : IN-LINE SPRING LOADED SILENT CHECK VALVE

d. BUTTERFLY VALVES 2-1/2" - 4", (ON/OFF, ISOLATION OR THROTTLING)

1. BUTTERFLY VALVES WITH FEMALE LEAD FREE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI. CWP TO +250°F MAXIMUM. VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-67 AND CONSTRUCTED OF A DUCTILE-IRON BODY, FOR BUBBLE-TIGHT SHUTOFF, EXTENDED-NECK FOR INSULATION, DISC AND LINING SUITABLE FOR POTABLE WATER, VALVES SHALL BE SUITABLE FOR BI-DIRECTIONAL DEAD END SERVICE AT FULL RATED PRESSURE, ONE-PIECE TYPE 416 STAINLESS-STEEL STEM, COPPER BUSHING, FASTENERS AND PINS SHALL NOT BE USED TO ATTACH STEM TO DISC, NO PINS OR FASTENERS IN WATERWAY, ALUMINUM-BRONZE DISC, AND MOLDED-IN EPDM SEAT (LINER). ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
- ACCEPTABLE VALVES: NIBCO PFD2000 SERIES (NSF-61)
- GD4765N-LF (NSF-61)

4. WARRANTY

A. EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROMPTLY CORRECT AND REPAIR ANY AND ALL BREAKS, FAILURES OR WEAR DUE TO FAULTY MATERIALS, WORKMANSHIP OR EQUIPMENT. ALL SETTLEMENTS OF SURFACES THAT MAY OCCUR WITHIN THAT PERIOD SHALL ALSO BE PROMPTLY REPAIRED.

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PROJECT INFORMATION:

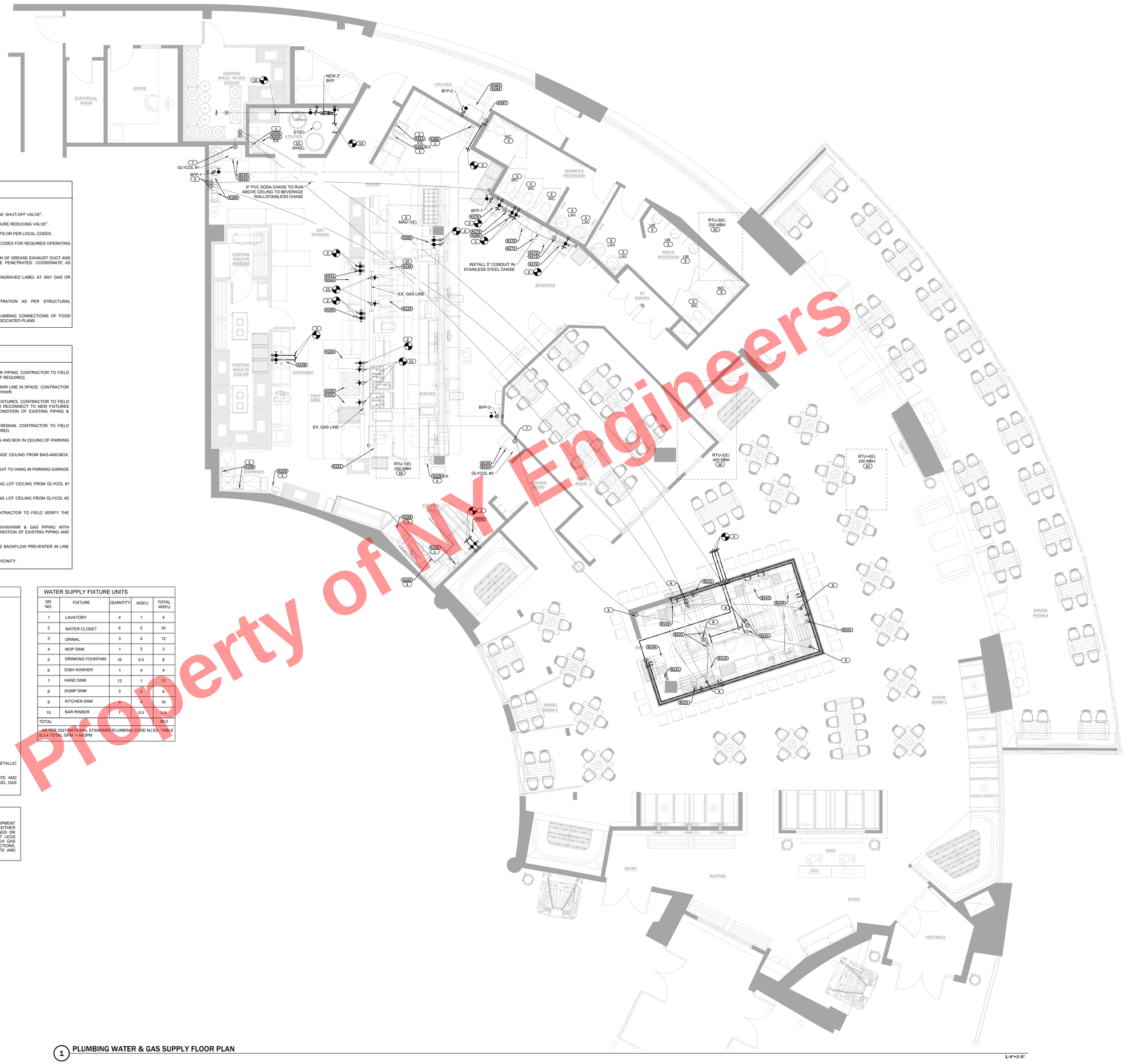
FORD'S GARAGE

DRAWING TITLE:

PLUMBING SYMBOLS LIST, ABBREVIATION, GENERAL NOTES, SPECIFICATION

DRAWING NO.:

P-0.1



WATER PLAN GENERAL NOTES:

1. REFER RISER DIAGRAM FOR ALL PIPE SIZES.
2. PROVIDE ENGRAVED LABEL ADJACENT TO CW SOV ON WALL "MAIN C.W. SHUT-OFF VALVE".
3. PROVIDE ENGRAVED LABEL AT PRESSURE REDUCING VALVE - "PRESSURE REDUCING VALVE".
4. PROVIDE AND INSTALL SOV'S AT ALL HOT AND COLD WATER STUB-OUTS OR PER LOCAL CODES.
5. FLUSH VALVES AND FAUCETS SHALL COMPLY WITH ADA AND LOCAL CODES FOR REQUIRED OPERATING FORCE.
6. REFER TO ARCHITECTURAL AND MECHANICAL SHEETS FOR LOCATION OF GREASE EXHAUST DUCT AND FIRE RATED SHAFTS. GREASE DUCT AND SHAFTS SHALL NOT BE PENETRATED. COORDINATE AS NECESSARY.
7. COORDINATE WITH ARCHITECTURAL CEILING PLAN AND PROVIDE ENGRAVED LABEL AT ANY GAS OR WATER VALVES ABOVE CEILING.
8. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
9. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
10. CONTRACTOR SHALL COORDINATE ALL FINAL LOCATIONS AND PLUMBING CONNECTIONS OF FOOD SERVICE EQUIPMENT WITH THE FOOD SERVICE CONSULTANT AND ASSOCIATED PLANS

KEY NOTES: (#)

1. EXISTING PLUMBING FIXTURE TO REMAIN WITH EXISTING CW,HW,HWR PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING FIXTURE AND PIPING, REPLACE IF REQUIRED.
2. EXTEND AND CONNECT NEW CW/HW/HWR PIPE TO EXISTING CW/HW/HWR LINE IN SPACE. CONTRACTOR TO FIELD VERIFY THE EXACT SIZE AND LOCATION OF EXISTING CW/HW/HWR.
3. EXISTING PLUMBING FIXTURE TO BE REPLACED IN KIND WITH NEW FIXTURES. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION OF EXISTING CW/HW/HWR PIPES AND RECONNECT TO NEW FIXTURES WITH ASSOCIATED ACCESSORIES & FITTINGS AND VERIFY THE CONDITION OF EXISTING PIPING & REPLACE IF REQUIRED.
4. EXISTING HVAC UNIT TO REMAIN AS IS. EXISTING GAS PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING GAS PIPING & REPLACE IF REQUIRED.
5. PROVIDE SLEEVE FOR 6" SODA CONDUIT LINE. LINE TO RUN FROM BAG AND BOX IN CEILING OF PARKING LOT.
6. PROVIDE 4" SLEEVE FOR SODA CONDUIT RUNNING IN PARKING-GARAGE CEILING FROM BAG-AND-BOX. ROUTE CONDUIT THROUGH SLAB AT GIVEN LOCATION.
7. PROVIDE SLEEVE FOR 6" GLYCOL CONDUIT LINE PENETRATION. CONDUIT TO HANG IN PARKING-GARAGE CEILING AND ROUTE TO BAR.
8. PROVIDE 6" SLEEVE FOR GLYCOL CONDUIT LINE RUNNING IN PARKING LOT CEILING FROM GLYCOL #1 TO BAR. TERMINATE LINE 4" AFF.
9. PROVIDE 6" SLEEVE FOR GLYCOL CONDUIT LINE RUNNING IN PARKING LOT CEILING FROM GLYCOL #2 TO BAR. TERMINATE LINE 4" AFF.
10. EXISTING HVAC UNITS TO REMAIN WITH EXISTING GAS PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING GAS PIPING & REPLACE IF REQUIRED.
11. EXISTING GAS WATER HEATER TO REMAIN WITH EXIXTING CW/HW/HWR & GAS PIPING WITH ASSOCIATED ACCESSORIES. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
12. EXISTING MAIN 2" COLD WATER LINE TO REMAIN. PROVIDE NEW RPZ BACKFLOW PREVENTER IN LINE AND RECONNECT TO MAIN 2" COLD WATER AS SHOWN ON PLAN.
13. EXTEND AND CONNECT NEW GAS PIPE TO THE EXISTING GAS LINE IN VICINITY.

GAS LOAD AND SIZING SUMMARY:

1. LOAD SUMMARY

PLUMBING EQUIPMENTS:		
WH-E		300 MBH
	SUB TOTAL	300 MBH
FOOD SERVICE EQUIPMENTS:		
CONVECTION OVEN	K101	100 MBH
HOT PLATE	K102	180 MBH
RETHERMALIZER	K104	55 MBH
FRYER BATTERY	K133	225 MBH
FRYER BATTERY	K134	170 MBH
	SUB TOTAL	730 MBH
HVAC EQUIPMENTS:		
RTU-1(E)		250 MBH
RTU-2(E)		400 MBH
RTU-3(E)		250 MBH
RTU-4(E)		250 MBH
MAU-1(E)		624.9 MBH
	SUB TOTAL	1774.9 MBH
TOTAL		2804.9 MBH

2. PIPE SIZING SUMMARY:

- LESS THAN 2 PSI INLET PRESSURE
- 0.5" W.C. PRESSURE DROP
- 300 FT TOTAL EQUIV. LENGTH
- 2021 INTERNATIONAL FUEL GAS CODE TABLE 402.4(2) SCHEDULE 40 METALLIC PIPE IS USED.

3. CONTRACTOR TO VERIFY PRESSURE AND PIPING LENGTHS ON SITE AND ADJUST PIPE SIZES IN ACCORDANCE WITH 2021 INTERNATIONAL FUEL GAS CODE, CHAPTER 4.

WATER SUPPLY FIXTURE UNITS

SR. NO.	FIXTURE	QUANTITY	WSFU	TOTAL WSFU
1	LAVATORY	4	1	4
2	WATER CLOSET	6	5	30
3	URINAL	3	4	12
4	MOP SINK	1	3	3
5	DRINKING FOUNTAIN	16	0.5	8
6	DISH WASHER	1	4	4
7	HAND SINK	12	1	12
8	DUMP SINK	3	2	6
9	KITCHEN SINK	4	4	16
10	BAR RINSER	7	0.5	3.5
TOTAL				98.5

- AS PER 2021 NATIONAL STANDARD PLUMBING CODE NJ ED. TABLE B.5.4 TOTAL GPM = 44GPM

NATURAL GAS PIPING SYSTEM

PROVIDE A COMPLETE GAS PIPING SYSTEM TO SERVE GAS EQUIPMENT FURNISHED BY OTHERS, AS NOTED ON THE DRAWINGS. PROVIDE EITHER THREADED STEEL OR MALLEABLE IRON PIPE WITH MALLEABLE FITTINGS OR WELDED STEEL. PROVIDE ALL UNIONS, SHUT-OFF VALVES AND DIRT LEGS REQUIRED BY NFPA-54 AND GOVERNING LOCAL CODES AND AT EACH GAS APPLIANCE CONNECTION. PROVIDE ALL TESTS, METERS, INSPECTIONS, HANGERS AND EQUIPMENT CONNECTIONS REQUIRED FOR A COMPLETE AND OPERATING SYSTEM.

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PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

PLUMBING WATER & GAS SUPPLY FLOOR PLAN

DRAWING NO.:

P-1.0

1 **PLUMBING WATER & GAS SUPPLY FLOOR PLAN**

1/4"=1'-0"

SANITARY PLAN GENERAL NOTES:

1. REFER TO ISOMETRIC DIAGRAM ON SHEET P-4.0 FOR PIPE SIZING.
2. VENT SIZES ARE IN ACCORDANCE WITH LOCAL PLUMBING CODES.
3. PLUMBING VENTS SHALL TERMINATE NOT LESS THAN 10' FROM, OR 3' ABOVE, ANY WINDOW, DOOR, AIR INTAKE, OR VENT SHAFT.
4. COORDINATE ROOF PENETRATIONS WITH THE LANDLORD'S ROOFING CONTRACTOR (IF REQUIRED). PROVIDE AND PAY FOR ANY REQUIRED ROOFING BY LANDLORD'S ROOFING CONTRACTOR.
5. VERIFY WITH GENERAL CONTRACTOR AND KITCHEN EQUIPMENT VENDOR FINAL LOCATION OF ALL FLOOR SINKS AND FLOOR DRAINS. LOCATE FLOOR SINKS AND FLOOR DRAINS TO AVOID LEGS OF KITCHEN EQUIPMENT.
6. CONTRACTOR TO FIELD VERIFY ALL EXISTING FLOOR DRAIN, FLOOR SINK & PLUMBING EQUIPMENT ARE IN GOOD CONDITION IF NOT REPLACE WITH NEW.

KEY NOTES: (#)

1. EXISTING FLOOR SINK / DRAIN TO BE DEMOLISHED. CONTRACTOR TO END CAP THE PIPING.
2. EXISTING PLUMBING FIXTURE TO REMAIN WITH EXISTING WASTE AND VENT CONNECTION, ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PLUMBING FIXTURE AND PIPING, REPLACE IF REQUIRED.
3. WATER HEATER: EXISTING WATER HEATER TO REMAIN WITH EXISTING T&P RELIEF DRAIN CONNECTION. CONTRACTOR TO FIELD VERIFY DRAIN IS PROVIDED OR NOT, PROVIDE NEW IF NOT EXISTING.
4. MOP SINK: EXISTING MOP SINK TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING FIXTURE, REPLACE IF REQUIRED.
5. WALK-IN CONDENSATE DRAIN: EXISTING WALK-IN UNITS TO REMAIN WITH EXISTING DRAIN CONNECTION. CONTRACTOR TO FIELD VERIFY THE CONDITION OF DRAIN RECEPTOR AND PIPING, REPLACE IF REQUIRED.
6. EXISTING PLUMBING FIXTURE TO BE REPLACE IN KIND WITH NEW AT SAME LOCATION. RECONNECT EXISTING SANITARY AND VENT CONNECTION, ASSOCIATED ACCESSORIES AND FITTINGS. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
7. EXISTING HVAC UNITS TO REMAIN WITH EXISTING CONDENSATE PIPING. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING CONDENSATE PIPING & REPLACE IF REQUIRED. CONDENSATE PIPING SHALL MAINTAIN A SLOPE OF NOT LESS THAN 1%. CONDENSATE SHALL NOT DISCHARGE INTO A STREET, ALLEY OR OTHER AREAS SO AS TO CAUSE A NUISANCE.
8. ROUTE INDIRECT WASTE FROM EQUIPMENT B111, B115, B121 TO THE FLOOR SINK WITH APPROVED AIR GAP.
9. ROUTE INDIRECT WASTE FROM EQUIPMENT B116, B119, B144, B141, B101, B126 TO THE FLOOR SINK WITH APPROVED AIR GAP.
10. ROUTE INDIRECT WASTE FROM EQUIPMENT B111A, B101, B126, B116, B119, B144 TO THE FLOOR SINK WITH APPROVED AIR GAP.
11. ROUTE INDIRECT WASTE FROM EQUIPMENT B115, B143 TO THE FLOOR SINK WITH APPROVED AIR GAP.
12. ROUTE INDIRECT WASTE FROM EQUIPMENT B116, B141, B126, B101 TO THE FLOOR SINK WITH APPROVED AIR GAP.
13. ROUTE INDIRECT WASTE FROM EQUIPMENT B101 TO THE FLOOR SINK WITH APPROVED AIR GAP.
14. ROUTE INDIRECT WASTE FROM EQUIPMENT K175, K176 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
15. ROUTE INDIRECT WASTE FROM EQUIPMENT K182, K183, K184 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
16. ROUTE INDIRECT WASTE FROM EQUIPMENT K191 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP. CONTRACTOR SHALL FIELD VERIFY THE CONDITION OF THE EXISTING INDIRECT WASTE PIPING SERVING K190 (EX.) AND REPLACE AS REQUIRED.
17. ROUTE INDIRECT WASTE FROM EQUIPMENT K193 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
18. ROUTE INDIRECT WASTE FROM EQUIPMENT K107 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
19. ROUTE INDIRECT WASTE FROM EQUIPMENT K104 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
20. ROUTE INDIRECT WASTE FROM EQUIPMENT K510 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
21. ROUTE INDIRECT WASTE FROM EQUIPMENT K507 TO THE FLOOR SINK (EX.) WITH APPROVED AIR GAP.
22. ROUTE INDIRECT WASTE FROM BACKFLOW PREVENTER TO HUB DRAIN WITH APPROVED AIR GAP.
23. ROUTE INDIRECT DRAIN FROM COMBI UNIT (K121) THROUGH WALL TO EXISTING STAINLESS STEEL FLOOR TROUGH (K188) WITH APPROVED AIR GAP.
24. ROUTE THE INDIRECT DRAIN FROM THE 3-COMPARTMENT SINK AS FOLLOWS: CONNECT THE SANITIZE COMPARTMENT TO THE SANITARY WASTE LINE(FLOOR SINK), AND THE WASH & RINSE COMPARTMENT TO THE GREASE WASTE LINE (FUNNEL DRAIN) THROUGH GREASE INTERCEPTOR, EACH WITH AN APPROVED AIR GAP IN ACCORDANCE WITH CODE.
25. INSTALL NEW FLOOR-MOUNTED GREASE TRAP (SCHIER GB2) BELOW THE 3-COMPARTMENT SINK AND ROUTE ITS DISCHARGE TO THE FLOOR SINK.
26. EXTEND AND CONNECT 2" GREASE WASTE PIPE TO THE EXISTING 4" GREASE WASTE LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION AND INVERT OF EXISTING GREASE WASTE LINE IN FIELD.
27. EXTEND AND CONNECT 1-1/4" VENT PIPE TO THE EXISTING VENT LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION OF EXISTING VENT PIPE IN FIELD.
28. EXTEND AND CONNECT 3" SANITARY PIPE TO THE EXISTING SANITARY LINE IN THE VICINITY. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION AND INVERT OF EXISTING GREASE WASTE LINE IN FIELD.
29. EXTEND AND CONNECT 2" VENT PIPE TO THE EXISTING VENT LINE IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION OF EXISTING VENT PIPE IN FIELD.
30. COLLECT GREASE DRAINAGE FROM ALL HOOD DRAIN CUPS AND ROUTE THE LINE TO THE BULK OIL STORAGE TANK AS SHOWN, PER MANUFACTURER REQUIREMENTS.
31. EXTEND AND CONNECT 4" GREASE WASTE LINE TO THE EXISTING GREASE WASTE LINE IN THE VICINITY. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION AND INVERT OF EXISTING GREASE WASTE LINE IN FIELD.
32. EXISTING HVAC UNIT TO REMAIN AS IS. EXISTING CONDENSATE PIPING TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING CONDENSATE PIPING & REPLACE IF REQUIRED. CONDENSATE PIPING SHALL MAINTAIN A SLOPE OF NOT LESS THAN 1%. CONDENSATE SHALL NOT DISCHARGE INTO A STREET, ALLEY OR OTHER AREAS SO AS TO CAUSE A NUISANCE.

DRAINAGE FIXTURE UNITS

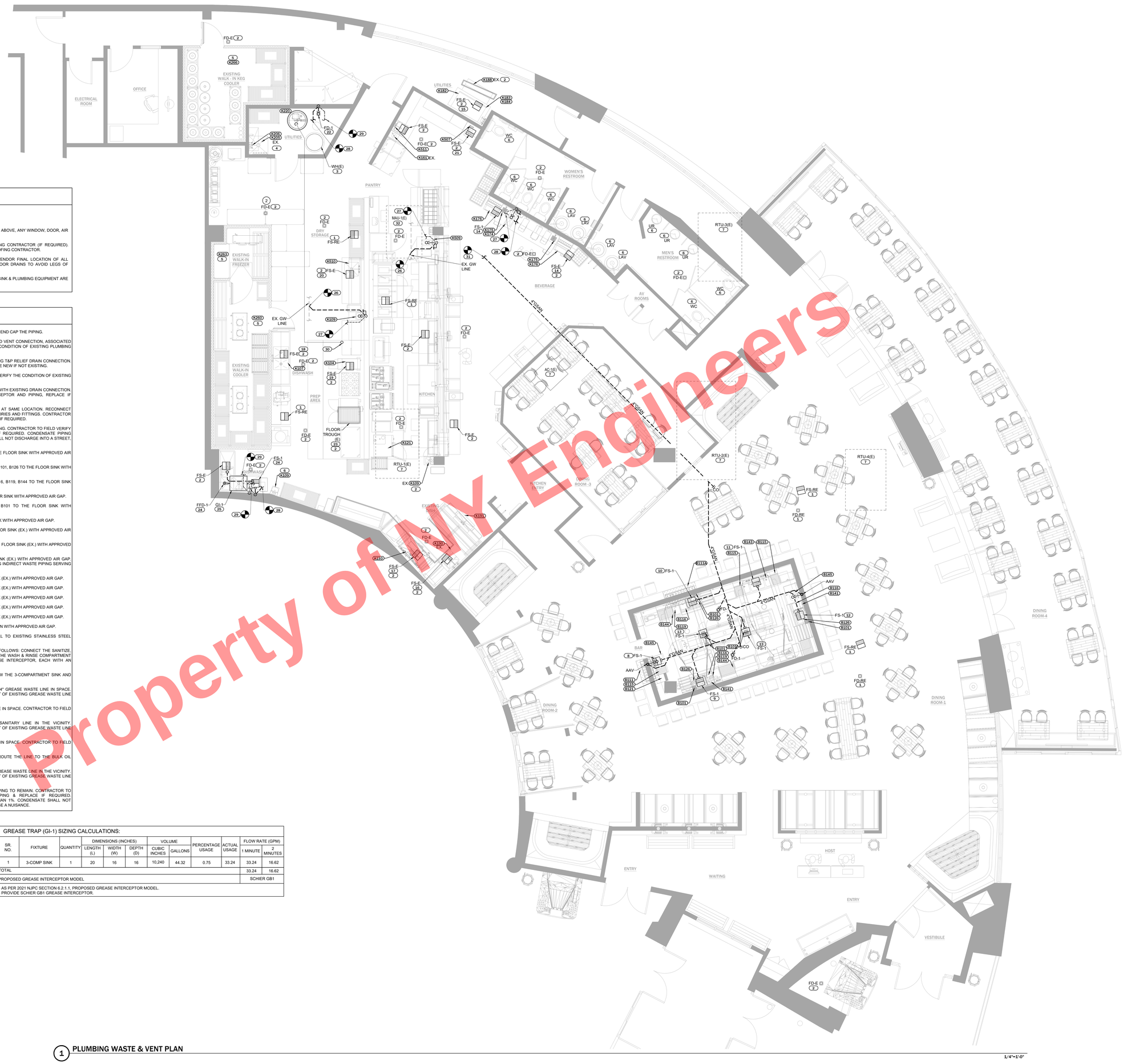
SR. NO.	FIXTURE	QUANTITY	DFU	TOTAL DFU
1	LAVATORY	4	1	4
2	WATER CLOSET	6	4	24
3	URINAL	3	5	15
4	MOP SINK	1	5	5
5	FLOOR DRAIN	18	5	90
6	FLOOR SINK	21	5	105
7	HAND SINK	7	1	7
8	TRENCH DRAIN	1	5	5
TOTAL				255

-DFU VALUES AS PER 2021 NATIONAL STANDARD PLUMBING CODE, NJ ED.

GREASE TRAP (GI-1) SIZING CALCULATIONS:

SR. NO.	FIXTURE	QUANTITY	DIMENSIONS (INCHES) LENGTH (L)	WIDTH (W)	DEPTH (D)	VOLUME CUBIC INCHES	GALLONS	PERCENTAGE USAGE	ACTUAL USAGE	FLOW RATE (GPM) 1 MINUTE	2 MINUTES
1	3-COMP SINK	1	20	16	16	10,240	44.32	0.75	33.24	33.24	16.62
TOTAL										33.24	16.62
PROPOSED GREASE INTERCEPTOR MODEL										SCHIER GB1	

- AS PER 2021 NJPC SECTION 6.2.1.1, PROPOSED GREASE INTERCEPTOR MODEL.
- PROVIDE SCHIER GB1 GREASE INTERCEPTOR.



1 PLUMBING WASTE & VENT PLAN

1/4"=1'-0"

PROJECT INFORMATION:

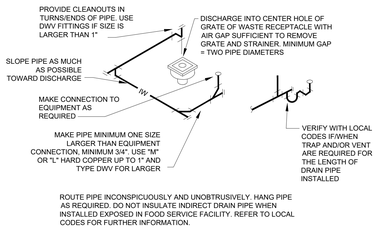
FORD'S GARAGE

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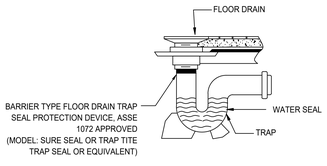
PLUMBING WASTE & VENT FLOOR PLAN

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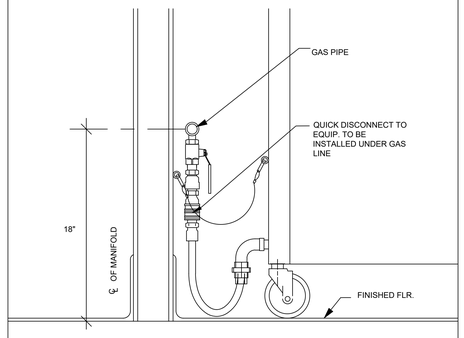
P-2.0



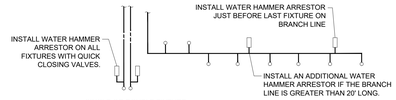
1 INDIRECT DRAIN DETAIL
N.T.S



2 FLOOR DRAIN DETAIL
N.T.S



3 TYPICAL GAS CONNECTION DETAIL
N.T.S



SINGLE OR DOUBLE FIXTURE

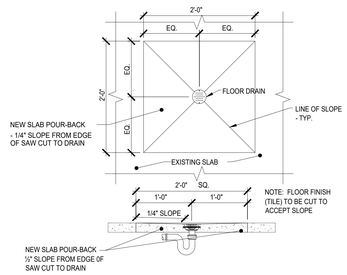
PDI SIZE	PIPE SIZE	FIXTURE UNIT LOAD
A	1/2"	1-11
B	3/4"	12-32
C	1"	33-60
D	1-1/4"	61-113
E	1-1/2"	114-154
F	2"	154-330

MULTIPLE FIXTURES

WATER SUPPLY FIXTURE UNIT (WSFU)		
FIXTURE	COLD	HOT
VALVE WATER CLOSET	5	--
URINAL	4	--
LAVATORY/SINK	1.5	1.5
JANITOR'S SINK	3	3

COMMENTS:
1. WATER HAMMER ARRESTERS SHALL BE HAVE PISTON AND O-RING CONSTRUCTION WITH PDI #WH-201, ASSE # 1010 AND ANSI # A112.26.1M CERTIFICATION. INSTALL IN HORIZONTAL OR VERTICAL POSITION, BUT NEVER UPSIDE DOWN. SIZE THE UNITS AS SHOWN PER THE TABLES SHOWN ABOVE.

4 WATER HAMMER ARRESTOR DETAIL
N.T.S



5 SLOPED FLOOR AT KITCHEN FLOOR DRAIN
N.T.S

6 SODA CHASE UNDERSLAB DETAIL
N.T.S

7 SODA CHASE DETAIL
N.T.S

8 PIPE SLEEVE THRU WALL SECTION
N.T.S

CONCEALED VALVES AND FITTINGS
- WRAP WITH 1-INCH THICK, 1-POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
- SECURE WITH WIRE OR TAPE
- VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

CONCEALED VALVES AND FITTINGS
- PREMOLDED FIBER GLASS OR RADIAL MITERED PIPE INSULATION
- SKIM COAT OF INSULATION CEMENT
- COAT OF MASTIC
- WRAP WITH FIBER GLASS REINFORCING CLOTH
- FINISH COAT OF MASTIC
- OVERLAP 2-INCHES ON PIPE INSULATION.

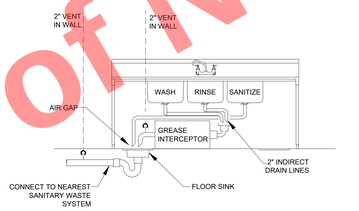
9 INSULATION FOR EXPOSED AND CONCEALED LOCATIONS
N.T.S

COMMENTS:
1. LOCATE AT BUILDING EXIT, AT ENDS OF RUNS, AT TURNS OF PIPE GREATER THAN 45 DEGREES, AT 50' INTERVALS ON STRAIGHT RUNS, AND/OR WHERE SHOWN ON PLANS. PROVIDE BACKFILL PER ARCHITECTURAL SPECIFICATIONS. LOCATE CLEANOUTS WHERE THERE IS 18" CLEAR AROUND. CONSULT LOCAL CODES FOR OTHER FCO REQUIREMENTS.
2. ROUND SECURED GASKETED NICKEL BRONZE ADJUSTABLE TOP WITH "CO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIATED FOR UNFINISHED FLOORS). PROVIDE PLASTIC PLUG BODY. USE TEFLON JOINT COMPOUND ON PLUG THREADS. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.

10 FLOOR CLEANOUT DETAIL
N.T.S

ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"

11 HANGER DETAIL
N.T.S



COMMENTS:
1. COORDINATE INDIVIDUAL BAY DRAINAGE & AIR GAP WITH LOCAL CODE REQUIREMENTS.

12 3-COMPARTMENT SINK DETAILS
N.T.S

SPECIFICATION NOTES
(1) 4" FPT inlet/outlet with 2" and 3" plain end fittings
(2)Unit weight: 39 lbs. For wet weight, add 84 lbs.
(3)Maximum operating temperature: 150° F continuous
(4)Liquid Capacity: 10 gal
Grease Capacity (25 GPM): 57.6 lbs (7.9 gal)
Solids Capacity: 1.3 gal
(5)This unit does not require flow control for 25 GPM applications
(6)For gravity drainage applications only
(7)Do not use for pressure applications
(8)Cover placement allows full access to tank for proper maintenance
(9)Vent not required unless per local code
(10)Engineered inlet and outlet diffusers with inspection ports are removable to inspect / clean piping
(11)Integral air relief / anti-siphon / sampling access
(12)Designed for indoor, on-floor, below-grade or low-profile under sink installations

CERTIFIED PERFORMANCE
Great Basin® hydromechanical grease interceptors are third party certified to conform to the requirements of 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.

ENGINEER SPECIFICATION GUIDE
Schier Great Basin® grease interceptor model GB1 shall be lifetime guaranteed and made in USA of seamless, molded polyethylene with minimum 5/16" uniform wall thickness. Inlet diffuser cap shall be PVC. Interceptor shall be furnished for above or below-grade applications with a unit that is ASME A112.14.3 compliant (Type I) and CSA B481.1 (Type II) and CSA B481.1, with field cut riser system and three outlet options. Interceptor flow rate shall be 25 GPM. Interceptor grease capacity shall be 57.6 lbs (7.9 gal) @ 25 GPM. Cover shall provide water/gas-tight seal and have a minimum of 450 lbs load capacity.

SCHIER
4455 Woodland Dr.
Shawnee, KS 66218
tel: 913-951-3300
fax: 913-951-3399
schierproducts.com
Made in the U.S.A.

SPECIFICATION SHEET

MODEL NUMBER	GB1
PART NUMBER	4060-001-05
DESCRIPTION	GB1 GREASE INTERCEPTOR 25 GPM, 4" FPT INLET/OUTLET, WITH 2" AND 3" PLAIN END FITTING ADAPTERS AND PEDESTRIAN RATED COVER
DRAWN BY	D.KLINE
DATE	10/08/2025
REV#	ECO00150

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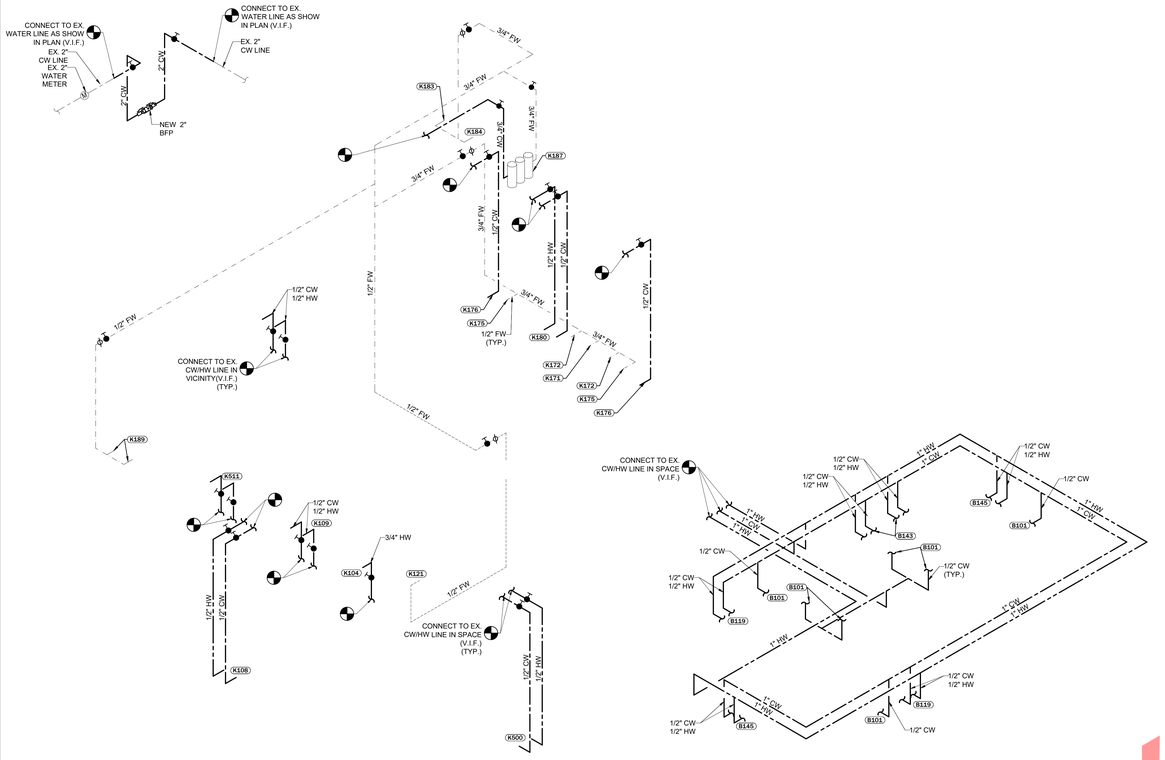
13 GREASE INTERCEPTOR DETAILS
N.T.S

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PROJECT INFORMATION:
FORD'S GARAGE

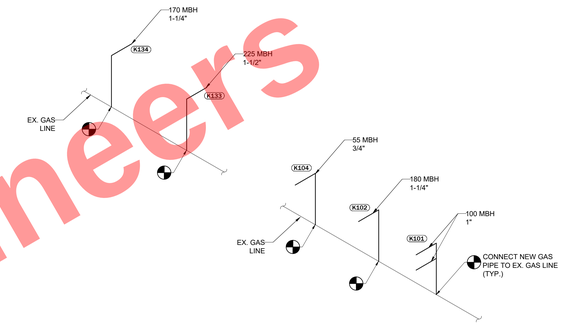
DRAWING TITLE:
PLUMBING DETAILS

DRAWING NO.:
P-3.0



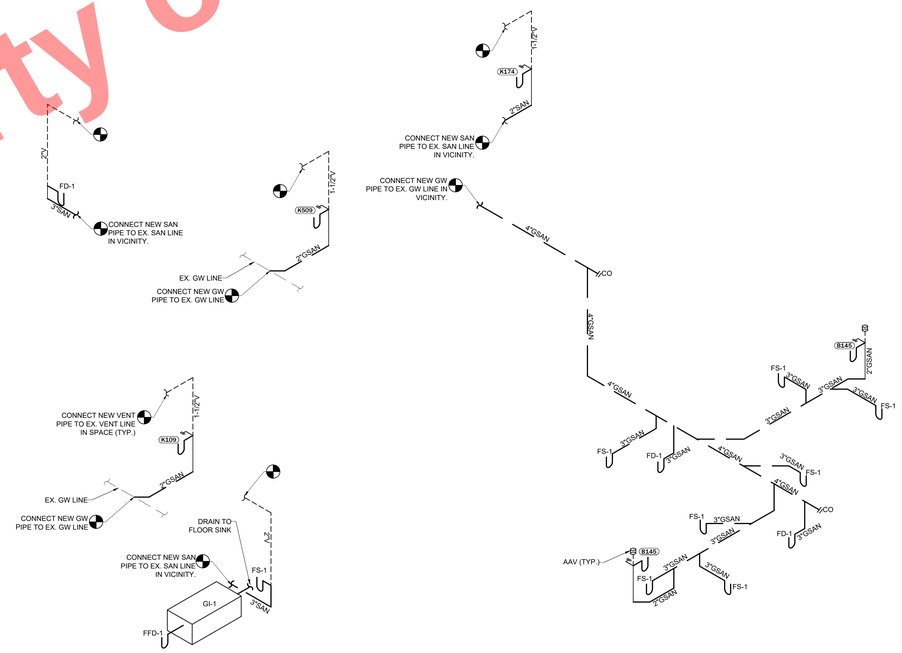
1 **PLUMBING WATER SUPPLY RISER**

N.T.S.



2 **PLUMBING GAS SUPPLY RISER**

N.T.S.



3 **PLUMBING WASTE & VENT RISER**

N.T.S.

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PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

PLUMBING RISERS

DRAWING NO.:

P-4.0

PLUMBING FIXTURE SCHEDULE

SYM.	FIXTURE	MIN. CONNECTION SIZE					DESCRIPTION
		SW.	V.	CW	HW	GW.	
FD-1	FLOOR DRAIN	SEE SHEET P-2.0	SEE SHEET P-2.0	--	--	SEE SHEET P-2.0	ZURN MODEL #415B CAST IRON BODY WITH TYPE "B" STRAINER. SIZE BOTTOM OUTLET AS SHOWN ON THE SANITARY STACK ON SHEET P-2.0.
FS-1	FLOOR SINK	SEE SHEET P-2.0	SEE SHEET P-2.0	--	--	SEE SHEET P-2.0	ZURN MODEL #1902 WHITE A.R.E. INTERIOR CAST IRON BODY, SEEPAGE PAN 1/2 NICKEL BRONZE STRAINER. SIZE BOTTOM OUTLET AS SHOWN ON THE SANITARY STACK ON SHEET P-2.0.
CO	CLEAN OUT	SEE SHEET P-2.0	--	--	--	SEE SHEET P-2.0	-
GI-1	GREASE INTERCEPTOR	SEE SHEET P-2.0	SEE SHEET P-2.0	--	--	SEE SHEET P-2.0	MODEL: SCHIER GB1; 25 GPM, 57.6 LBS GREASE CAPACITY; MOLDED POLYETHYLENE GREASE INTERCEPTOR; WATER/GAS TIGHT ACCESS COVER; BUILT IN FLOW CONTROL AND INLET/ OUTLET FLOW DIFFUSERS; INLET/OUTLET SIZE TO MATCH CONNECTING PIPES (SEE FLOOR PLAN)
LAV	LAVATORY	2"	1-1/2"	1/2"	1/2"	--	--
(K109) (K509) (K174) (B145)	HAND SINK	2"	1-1/2"	1/2"	1/2"	--	K109 - HAND SINK; MANUFACTURER- KROWNE; MODEL-HS-30L K509 - CABINET WITH HAND SINK; MANUFACTURER- CUSTOM; MODEL-CUSTOM K174 - BREVERAGE TABLE W/ HAND SINK; MANUFACTURER- CUSTOM; MODEL-CUSTOM B145 - UNDERBAR HAND SINK; MANUFACTURER- ADVANCE TABCO; MODEL-PRHSST-24-18
(K205)	MOP SINK	E	E	E	E	--	EXISTING TO REMAIN.
UR	URINAL	2"	1-1/2"	3/4"	--	--	--
WC	WATER CLOSET	4"	2"	3/4"	--	--	--
WHA	WATER HAMMER ARRESTOR	--	--	1/2", 3/4"	--	--	SEE SHEET P-3.0; DETAIL 4, FOR DESIGNATION AND PRODUCT SPECIFICATION.

KITCHEN PLUMBING FIXTURE SCHEDULE

SYM.	FIXTURE	MIN. CONNECTION SIZE							MANUFACTURER	MODEL	REMARKS
		SW.	V.	CW	HW	FW	GW.	GAS			
(K101)	CONVECTION OVEN	--	--	--	--	--	--	100 MBH	VULCAN	VC44GD	--
(K102)	HOT PLATE	--	--	--	--	--	--	180 MBH	VULCAN	VHP836	--
(K104)	RETHERMALIZER	--	--	--	3/4"	--	--	55 MBH	PITCO FRIALATOR	SRTG14-GM	INDIRECT DRAIN TO FLOOR SINK
(K133)	FRYER BATTERY	--	--	--	--	--	--	225 MBH	HENNY PENNY	OFG323	--
(K134)	FRYER BATTERY	--	--	--	--	--	--	170 MBH	HENNY PENNY	OFG323	--
(K107) (K108)	ONE COMPARTMENT SINK & FAUCET	SEE SHT P-2.0	SEE SHT P-2.0	1/2"	1/2"	--	SEE SHT P-2.0	--	K-107 - CUSTOM K-108 - T & S BRASS	K-107 - CUSTOM K-107 - B-0201	INDIRECT DRAIN TO FLOOR SINK
(K176)	SODA DISPENSER	SEE SHT P-2.0	--	1/2"	--	--	SEE SHT P-2.0		--	--	INDIRECT DRAIN TO FLOOR SINK
(B119)	DUMP SINK	SEE SHT P-2.0	--	1/2"	1/2"	--	SEE SHT P-2.0	--	ADVANCE TABCO	PRHS-19-12	INDIRECT DRAIN TO FLOOR SINK
(B101)	BAR RINSER	SEE SHT P-2.0	--	1/2"	1/2"	--	SEE SHT P-2.0	--	MICROMATIC	GR-UCM	INDIRECT DRAIN TO FLOOR SINK
(K121)	OVEN, COMBI	SEE SHT P-2.0	--	--	--	1/2"	SEE SHT P-2.0	--	RATIONAL	ICP 6-HALF	INDIRECT DRAIN TO FLOOR SINK
(K171)	COFFEE BREWER	--	--	--	--	1/2"	--	--	--	--	--
(K172)	ICE TEA BREWER	--	--	--	--	1/2"	--	--	--	--	--
(K175)	WATER FILLER FAUCET	SEE SHT P-2.0	--	--	--	1/2"	SEE SHT P-2.0	--	T & S BRASS	B-1210-01	INDIRECT DRAIN TO FLOOR SINK
(K183) (K184)	ICE MACHINE	SEE SHT P-2.0	--	--	--	1/2"	SEE SHT P-2.0	--	HOSHIZAKI	K183-KM-2600SRJ3 K184- KM-1301ARJ3	INDIRECT DRAIN TO FLOOR SINK.
(K189)	BAG N BOX	--	--	--	--	1/2"	--	--	--	--	--

BACKFLOW PREVENTER ASSEMBLY REQUIREMENTS

TAG	TYPE OF EQUIPMENT OR SYSTEM	METHOD OF CROSS CONNECTION CONTROL	MANUFACTURE AND MODEL NUMBER	REMARKS
BFP-1	SODA DISPENSER, BAG-N-BOX	DUAL CHECK VALVE BACKFLOW PREVENTER	WATTS SD-3-QT ASSE 1022	STAINLESS STEEL BODY WITH QUARTER TURN VALVE BRONZE STRAINER.
BFP-2	COFFEE BREWER, ICE TEA BREWER, ICE MACHINE, WATER SOFTNER	DUAL CHECK BACKFLOW PREVENTER	WATTS LF9D ASSE 1012	STAINLESS STEEL BODY WITH QUARTER TURN VALVE BRONZE STRAINER.
BFP-3	OVEN, DISHWASHER	DUAL CHECK VALVE BACKFLOW PREVENTER	WATTS LF7R ASSE 1024	STAINLESS STEEL BODY WITH QUARTER TURN VALVE BRONZE STRAINER.
RPZ	CW INLET	REDUCED PRESSURE VALVE ASSEMBLY	WATTS LF009 ASSE 1013	LEAD FREE CAST COPPER SILICON ALLOY BODY CONSTRUCTION.

1. CONTRACTOR SHALL PROVIDE INDIVIDUAL BACKFLOW PREVENTERS FOR EACH PIECE OF EQUIPMENT.
2. EACH BACKFLOW PREVENTER MUST HAVE TESTING PORTS.
3. BRONZE BODIED BACKFLOW PREVENTERS ARE PERMISSABLE IF ALLOWED BY LOCAL CODES.

EXISTING GAS WATER HEATER SCHEDULE

TAG	QTY.	MANUFACTURER AND MODEL NO.	STORAGE CAPACITY (GALLONS)	RECOVERY(GPH) AT 90°F TEMP. RISE	INPUT MBH	THERM. EFFICIENCY	APPROX. WEIGHT (LBS)	TANK DIMENSIONS (DIA X H)	REMARKS
WH(E)	01	RHEEM GHE100SU-300(A)	100	388	300	96%	775	26-3/8" X 77"	- UNIT IS CAPABLE OF PROVIDING 388 GALLONS PER HOUR AT A 90°F TEMPERATURE RISE.

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PROJECT INFORMATION:

FORD'S GARAGE

DRAWING TITLE:

PLUMBING SCHEDULES

DRAWING NO.:

P-5.0