

DUCT SYMBOLS

DOUBLE LINE SYMBOL	DESCRIPTION	SINGLE LINE SYMBOL
	DUCT- FIRST NUMBER IS VISIBLE DIMENSION.	
	RADIUS ELBOW W/VANE(S) (1.5=R/D STANDARD)	
	DUCT SECTION, POSITIVE PRESSURE	
	DUCT SECTION, NEGATIVE PRESSURE	
	DUCT & AIRFLOW UP(LEFT) POSITIVE PRESSURE	
	DUCT & AIRFLOW DN(RIGHT) POSITIVE PRESSURE	
	DUCT & AIRFLOW UP(LEFT) NEG. /POS. PRESSURE	
	DUCT & AIRFLOW DN(RIGHT) NEG. /POS. PRESSURE	
	CHANGE OF ELEVATION=RISE (R), DROP (D)	
	DUCT W/INTERNAL LINING CLEAR INSIDE DIMENSIONS SHOWN	
	ACCESS DOOR=SIDE (L), BOTTOM (M), TOP (R)	
	FLEXIBLE CONNECTOR	
	FLEXIBLE DUCT	
	FD- FIRE DAMPER, SD- SMOKE DAMPER, FSD- FIRE/SMOKE DAMPER.	
	MANUAL VOLUME DAMPER-SPECIFIC TYPE, NO LABEL-BUTTERFLY, OBD-OPPOSED BLADED DAMPER, PBD-PARALLEL BLADED DAMPER	
	MOTORIZED DAMPER OR ZONE CONTROL DAMPER	
	BRANCH TAP-W/45 DEG. ENTRY	
	BRANCH TAP-CONICAL SPIN-IN	
	BRANCH TAP-STRAIGHT SPIN-IN	
	TRANSITION	
	EXISTING DUCTWORK TO BE DEMOLISHED	
	EXISTING DUCTWORK TO REMAIN	
	HVAC - EQUIP AS NOTED	
	AIR DEVICE, SUPPLY- CEILING, CLEAR	
	AIR DEVICE TAG SPIN-IN DIMENSION AIRFLOW (CFM)	
	AIR DEVICE, RETURN- CEILING.	
	AIR DEVICE, EXHAUST- CEILING.	
	AIR DEVICE, SUPPLY- SIDEWALL.	
	AIR DEVICE, RETURN/EXHAUST- SIDEWALL.	

MECHANICAL DRAWING LIST

M100	MECHANICAL SYMBOLS & NOTES
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CODE COMPLIANCE

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

- INTERNATIONAL BUILDING CODE, 2015.
- INTERNATIONAL MECHANICAL CODE, 2015.
- INTERNATIONAL PLUMBING CODE, 2015.
- INTERNATIONAL FIRE CODE, 2015.
- INTERNATIONAL ENERGY CONSERVATION CODE, 2015.
- NATIONAL ELECTRICAL CODE, 2015.

MECHANICAL ABBREVIATIONS

BD	BACKDRAFT DAMPER
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
CD	CONDENSATE DRAIN PIPE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
FC	FLEXIBLE CONNECTION
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
SEER	SEASONAL ENERGY EFFICIENCY RATIO
VD	VOLUME DAMPER
EF	EXHAUST FAN
RTU	ROOF TOP UNIT
SAE	SAME AS EXISTING
MAU	MAKEUP AIR UNIT
KEF	KITCHEN EXHAUST FAN

GENERAL MECHANICAL NOTES AND SPECIFICATIONS

GENERAL

- COORDINATE WORK AMONG ALL DISCIPLINES. IT IS NOT THE INTENT OF THESE DOCUMENTS TO DICTATE WHO MUST DO THE WORK. ALL WORK SHOWN IS THE RESPONSIBILITY OF THE (PRIME) CONTRACTOR.
- FIELD VERIFY ALL CONDITIONS AND MEASURE DIMENSIONS WITHIN THE BUILDING PRIOR TO ORDERING EQUIPMENT AND/OR PROCEEDING WITH INSTALLATION.
- ALL EQUIPMENT SHALL BE FACTORY TESTED, AND CONTRACTOR SHALL VERIFY THEIR CONDITION PRIOR TO INSTALLATION. CONTRACTOR IS RESPONSIBLE FOR EQUIPMENT DAMAGED DURING MOVING AND INSTALLATION.
- EQUIPMENT FOUND DEFECTIVE PRIOR TO FINAL ACCEPTANCE SHALL BE REPLACED AT NO COST TO OWNER.
- SUBMISSION OF BID PROPOSAL IS CONSIDERED AN ACKNOWLEDGEMENT THAT CONTRACTOR VISITED SITE, AND VERIFIED ALL EXISTING CONDITIONS, AND INCLUDED ANY MODIFICATIONS TO EXISTING AND NEW WORK REQUIRED FOR INSTALLATION OF A COMPLETE AND OPERATIONAL MECHANICAL SYSTEM.
- COORDINATE WITH OWNER AND ENGINEER FOR ANY DISRUPTION IN UTILITY SERVICES, PARTICULARLY THOSE THAT MIGHT AFFECT OTHER BUILDINGS.
- CONTRACTOR SHALL NOT PROCEED WITH ANY WORK INVOLVING A CHANGE IN PROJECT SCOPE OR COST WITHOUT FIRST HAVING OBTAINED ENGINEER'S APPROVAL IN WRITING. UNLESS ENGINEER HAS AGREED TO SUCH CHANGE PRIOR TO IT BEING DONE, AND HAS AGREED THAT AN INCREASE IN COST ASSOCIATED WITH SUCH CHANGE IS WARRANTED; CONTRACTOR WILL NOT BE REIMBURSED FOR SUCH CHANGE.
- TESTING, ADJUSTING AND BALANCING (TAB) CONTRACTOR SHALL BE RETAINED BY THE PRIME CONTRACTOR. TAB SHALL NOT BE A PART OF THE MECHANICAL CONTRACT.

CODES AND ORDINANCES

- PERFORM ALL WORK PER LATEST VERSION OF INTERNATIONAL MECHANICAL CODE, AND APPLICABLE LOCAL CODES AND ORDINANCES, UNLESS DRAWINGS OR SPECIFICATIONS HAVE MORE STRINGENT REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS AND FEES ASSOCIATED WITH PROJECT, INCLUDING FEES FOR INSPECTIONS, APPLICATIONS, AND PROVISION OF NEW SERVICES.
- NOTIFY ENGINEER OF ANY ASPECTS OF DESIGN WHICH ARE THOUGHT TO BE IN NONCOMPLIANCE WITH APPLICABLE CODES.

COORDINATION

- COORDINATE ALL WORK WITH OTHER TRADES; COORDINATE SCHEDULE OF WORK WITH ALL SUB-CONTRACTORS TO ACHIEVE SMOOTH FLOW OF CONSTRUCTION.
- CONTRACTOR SHALL REVIEW COMPLETE DOCUMENTS PRIOR TO SUBMITTAL OF PROPOSAL TO GAIN COMPLETE UNDERSTANDING OF PROJECT SCOPE, WORK BY OTHERS, AND MECHANICAL WORK ASSOCIATED WITH OTHER DISCIPLINES.
- ENGINEER/ ARCHITECT MUST BE GIVEN AT LEAST A TEN (10) WORKING DAY NOTICE TO PERFORM ALL TYPES OF INSPECTIONS. COORDINATE WORK SCHEDULE WITH ARCHITECT AND ENGINEER TO PLAN ACCORDINGLY FOR APPROPRIATE INSPECTIONS.
- COORDINATE LIGHT LOCATIONS WITH ELECTRICAL CONTRACTOR PRIOR TO INSTALLATION OF AIR DEVICES. LIGHT LOCATIONS TAKE PRECEDENCE OVER AIR DEVICES

RETURN AIR SYSTEMS

- MECHANICAL DESIGN ASSUMES A MINIMUM 1" DOOR UNDERCUTS FOR ALL DOORS AND WALL PARTITIONS WITHIN CONDITIONED SPACES.
- CONTRACTOR SHALL IMMEDIATELY NOTIFY THE PROJECT ENGINEER IF ANY DOOR OR PARTITION IS NOT PROVIDED WITH A MINIMUM 1" UNDERCUT OR IF ANY OF THE SPECIFIED SYSTEM RETURN PATHS ARE COMPROMISED DURING CONSTRUCTION IN ANY WAY.
- AT A MINIMUM, THE CONTRACTOR SHALL PROVIDE A FIBERGLASS DUCTED TRANSFER BOOT/GRILL ABOVE CEILING FOR ANY DOOR OR PARTITION THAT IS NOT PROVIDED WITH A MINIMUM 1" UNDERCUT.
- RETURN BOOT SHALL TERMINATE IN NEW RETURN AIR DEVICES. RETURN AIR DEVICES SHALL BE WHITE ALUMINUM PERFORATED LAY-IN TYPE WITH ALL NECESSARY MOUNTING HARDWARE TO MATCH OTHER RETURN DEVICES ON SITE. PROVIDE FRAMED AIR DEVICE IF IN HARD CEILING.

METAL AND FLEXIBLE DUCTS

- DRAWINGS ARE DIAGRAMMATIC IN NATURE. FOR CLARITY SAKE, MOST DUCT OFFSETS/RISES/DROPS ARE NOT SHOWN. RECTANGULAR AND ROUND DUCTWORK SHALL BE GALVANIZED STEEL. SIZES SHOWN ARE INSIDE CLEAR DIMENSION.
- PRIOR TO CONSTRUCTION, CONTRACTOR IS REQUIRED TO COORDINATE HEIGHTS OF DUCTWORK LAYOUT WITH EXISTING STRUCTURE, OTHER TRADES, AND PROPOSED CEILING HEIGHT TO CONFIRM ADEQUATE VERTICAL SPACE FOR STACKING.
- CONSTRUCT AND LEAKAGE TEST ALL DUCTWORK BASED ON SMACNA REQUIREMENTS. COORDINATE PRESSURE CLASSES WITH EQUIPMENT SCHEDULES.
- ALL GALVANIZED SHEET METAL DUCT WORK SHALL COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS--METAL AND FLEXIBLE".
- USE 2" GLASS FIBER-REINFORCED FABRIC JOINT AND SEAM TAPE. USE WATER BASED JOINT AND SEAM SEALER. USE FIRE RESISTANT SEALER FOR FILLING OPENINGS AROUND DUCT PENETRATIONS THROUGH WALLS. ACCEPTABLE PRODUCTS ARE DOW CORNING, FIRE STOP FOAM AND FIRE STOP SEALER OR EQUAL.
- USE SHEET METAL SCREWS OR BLIND RIVETS COMPATIBLE WITH DUCT MATERIALS WHEN SECURING ALL DUCTWORK TO STRUCTURE.
- FLEXIBLE DUCT MAY BE USED TO CONNECT TO SUPPLY DIFFUSERS. MAXIMUM LENGTH OF FLEXIBLE DUCT LIMITED TO 6 FEET. PROVIDE FLEXMASTER TYPE 8M UL 181 CLASS I AIR DUCT OR EQUAL. FLEXIBLE DUCT SHALL HAVE MIN. R-8 INSULATING VALUE.
- FLEXIBLE DUCT CLAMP SHALL BE OF STAINLESS STEEL BANDS WITH CADMIUM PLATED HEX SCREW TO TIGHTEN BAND WITH WORM GEAR ACTION.
- PROVIDE TURNING VANES IN ALL SPLITS, TEES AND SWEEP 90 DEGREE ANGLE DUCT FITTINGS. MANUFACTURED TURNING VANES TO BE 1-1/2" WIDE, DOUBLE VANE, CURVED BLADES OF GALVANIZED SHEET STEEL SET 3/4" O.C. ACCEPTABLE MANUFACTURER'S ARE DUCTMATE INDUSTRIES, METALAIR, WARD INDUSTRIES OR EQUAL.
- WHERE RECTANGULAR TEE FITTINGS ARE SHOWN, PROVIDE FITTING WITH ADJUSTABLE DIVIDER SHEET AND TURNING VANES.

11. WHERE RECTANGULAR MAIN AND BRANCH CONNECTIONS ARE SHOWN, PROVIDE EXTRACTOR VANES.

12. PROVIDE MANUAL VOLUME CONTROL DAMPERS WHERE SHOWN ON DRAWINGS. DAMPERS TO HAVE NEOPRENE BLADE SEALS AND GALVANIZED STEEL FRAMES, TIE BARS, DAMPER AND BRACKETS. ACCEPTABLE MANUFACTURER'S ARE RUSKIN CO., NALOR INDUSTRIES, FLEXMASTER OR EQUAL.

13. ABOVE INACCESSIBLE CEILINGS AND WHERE DUCT CONFIGURATION DOES NOT ALLOW FOR INSTALLATION OF DAMPER IN DUCTWORK OR DIFFUSER, PROVIDE REMOTE MANUAL DAMPER BY YOUNG REGULATOR, (BOWDEN CABLE CONTROL SYSTEM). CONTRACTOR MAY PROVIDE OPPOSED BLADE DAMPER THAT IS INTEGRAL TO GPD WITH ENGINEER'S APPROVAL.

MISSISSIPPI BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE INTERNATIONAL BUILDING CODE 2015, AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.
- VENTILATION FOR ALL AREA SHALL COMPLY WITH INTERNATIONAL MECHANICAL CODE 2015 CHAPTER 4.
- TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE INTERNATIONAL MECHANICAL CODE 2015:
 - VENTILATION SYSTEM BALANCING IMC 2015 - 403.1
 - SMOKE CONTROL SYSTEM IMC 2015 - 606
- THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - STANDARDS OF HEATING - IMC 2015 - 309.1
 - DUCT CONSTRUCTION AND INSTALLATION- IMC 2015 - 603
 - AIR INTAKES, EXHAUSTS AND RELIEF - IMC 2015 - 401.5
 - AIR FILTERS - IMC 2015 - 605
 - GAS FIRED EQUIPMENTS - IFGC 2015
- MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- 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 IMC 2015 - 403.3
- REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- 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.
- 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.
- SMOKE DETECTOR SHALL MEET UL 268A.
- VENTILATION SYSTEMS SHALL BE BALANCED TO MAINTAIN THE MINIMUM VENTILATION AIRFLOW RATE AS SHOWN IN VENTILATION CALCULATION TABLE. THIS SYSTEM SHALL BE BALANCED BY APPROVED METHOD. CONTRACTOR SHALL SUBMIT THE AIR BALANCE REPORT TO THE INSPECTOR.

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:

- AIR SYSTEMS: CONSTANT AND VARIABLE VOLUME SYSTEMS.
- MOTORS.

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

- THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS SECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.
- ALL INSTRUMENTS USED FOR TAB SHALL BE MAINTAINED IN GOOD WORKING CONDITION AND ACCURATELY CALIBRATED.
- TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.
- INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

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GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

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REVISIONS

Drawing Title

MECHANICAL
SYMBOLS & NOTES

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143.200

Drawn
NYE

Sheet No.

M100

SECTION 230713 – DUCT INSULATION

1.1 QUALITY ASSURANCE

SURFACE-BURNING CHARACTERISTICS: ALL INSULATION SHALL HAVE COMPOSITE (INSULATION JACKET OR FACING AND ADHESIVE USED TO ADHERE THE FACING OR JACKET TO THE INSULATION) A FLAME-SPREAD INDEX OF 25, AND SMOKE-DEVELOPED INDEX OF 50 FOR INSULATION INSTALLED INDOOR, 75, AND SMOKE-DEVELOPED INDEX OF 150 FOR INSULATION INSTALLED OUTDOORS; ACCORDING TO ASTM E 84.

1.2 FIELD QUALITY CONTROL

A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE:

A. CONCEALED, RECTANGULAR, ROUND AND FLAT-OVAL, SUPPLY-RETURN, OUTDOOR-AND EXHAUST-AIR DUCT AND AIR PLENUM INSULATION:
 B. FLEXIBLE ELASTOMERIC, MINERAL-FIBER BLANKET, MINERAL-FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:

UNCONDITIONED SPACES:	R-6
WITHIN BUILDING ENVELOPE ASSEMBLY:	R-8
EXTERIOR OF BUILDING:	R-8

1.4 ITEMS NOT INSULATED:

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

1.5 PRODUCTS

A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

1. JOHNS-MANVILLE
2. OWENS-CORNING

1.6 ACOUSTICAL TREATMENT

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

END OF SECTION 230713

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.

B. MANUFACTURERS: TITUS

1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
- a. CARNES.
 - b. HART & COOLEY INC.
 - c. KRUEGER.
 - d. METALAIR, INC.
 - e. NAILOR INDUSTRIES INC.
 - f. RUSKIN

C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.

END OF SECTION 233713

GREASE DUCT SPECIFICATIONS

1. PROVIDE CLEAN OUT AT ALL ELBOWS AND BOTTOM OF RISER AND EVERY 20 FEET HORIZONTAL KITCHEN EXHAUST DUCT AND SHALL COMPLY ALL THE REQUIREMENTS PER 2015 INTERNATIONAL MECHANICAL CODE 506.3.8 & 506.3.9.
2. COMMERCIAL KITCHEN GREASE DUCTS SHALL BE DESIGNED FOR THE TYPE OF COOKING APPLIANCE AND HOOD SERVED. COMMERCIAL KITCHEN GREASE DUCTS SHALL BE OF 16 GAUGE MINIMUM STEEL OR FACTORY FABRICATED GREASE DUCT WITH LISTED AND LABELED IN ACCORDANCE WITH UL 1978.
3. JOINTS, SEAMS AND PENETRATIONS OF GREASE DUCTS SHALL BE MADE WITH A CONTINUOUS LIQUID TIGHT WELD OR BRAZE MADE ON THE EXTERNAL SURFACE IF THE DUCT SYSTEMS.
4. DUCT TO EXHAUST FAN CONNECTIONS SHALL BE FLANGED, GASKETED AND BOLTED TO THE INLET AND OUTLET OF THE FAN FOR INLINE FANS. APPROVED FLEXIBLE CONNECTIONS MAY BE PROVIDED.
5. A VIBRATION ISOLATION CONNECTOR FOR CONNECTING A DUCT TO A FAN SHALL CONSIST OF NON-COMBUSTIBLE PACKING IN A METAL SLEEVE JOINT OF APPROVED DESIGN OR SHALL BE A COATED-FABRIC FLEXIBLE DUCT CONNECTOR LISTED AND LABELED FOR THE APPLICATION. VIBRATION ISOLATION CONNECTORS SHALL BE INSTALLED ONLY AT THE CONNECTION OF A DUCT TO A FAN INLET OR OUTLET.
6. PRIOR TO THE USE OR CONCEALMENT OF ANY PORTION OF A GREASE DUCT SYSTEM, A LEAKAGE TEST SHALL BE PERFORMED AS PER IMC 2015 SECTION 506.3.2.5. DUCT SHALL BE CONSIDERED TO BE CONCEALED WHERE INSTALLED IN SHAFTS OR COVERED BY COATINGS OR WRAPS THAT PREVENT THE DUCTWORK FROM VISUALLY INSPECTED ON ALL SIDE. THE DUCT INSTALLER SHALL BE RESPONSIBLE FOR PROVIDING THE NECESSARY EQUIPMENT AND PERFORMING THE GREASE DUCT LEAKAGE TEST. THE DUCT LEAKAGE TEST SHALL BE PERFORMED FOR ALL THE DUCT SYSTEMS, INCLUDING THE DUCT-TO-DUCT CONNECTION. THE DUCTWORK SHALL BE PERMITTED TO BE TESTED IN SECTIONS, PROVIDED THAT EVERY JOINT IS TESTED (IF TEST IS FAILED, CONTRACTOR TO PROVIDE NEW KITCHEN EXHAUST DUCT).
7. PROVIDE SMOKE TEST TO PROOF TIGHTNESS OF THE GREASE DUCT.
8. GREASE DUCT BRACING AND SUPPORTS SHALL BE OF NON-COMBUSTIBLE MATERIAL SECURELY ATTACHED TO THE STRUCTURE AND DESIGNED TO CARRY GRAVITY AND SEISMIC LADS WITHIN THE STREET LIMITATIONS OF THE 2015 INTERNATIONAL BUILDING CODE. BOLTS, SCREWS, RIVETS AND OTHER MECHANICAL FASTENERS SHALL NOT PENETRATE DUCT WALLS.
9. A RESIDUE TRAP SHALL BE PROVIDED AT THE BASE OF EACH VERTICAL RISER WITH PROVISION FOR CLEANOUT IN ACCORDANCE WITH NFPA 96.
10. CLEANOUT OPENINGS SHALL BE PROVIDED AT EVERY CHANGE IN DIRECTION, WITHIN 3 FEET OF THE EXHAUST FAN.
11. CLEANOUT OPENINGS SHALL BE EQUIPPED WITH TIGHT-FITTING DOORS CONSTRUCTED OF STEEL HAVING A THICKNESS NOT LESS THAN THAT REQUIRED FOR THE DUCT. DOORS SHALL BE EQUIPPED WITH A SUBSTANTIAL METHOD OF LATCHING, SUFFICIENT TO HOLD THE DOOR TIGHTLY CLOSED. DOOR ASSEMBLIES SHALL HAVE A GASKET OR SEALANT THAT IS NONCOMBUSTIBLE AND LIQUID TIGHT AND SHALL NOT HAVE FASTENERS THAT PENETRATED THE DUCT
12. A GREASE DUCT SERVING THE TYPE-1 HOOD THAT PENETRATED A CEILING, WALL OR FLOOR SHALL BE ENCLOSED FROM THE FIRE POINT OF PENETRATION TO THE OUTLET TERMINAL. DUCT ENCLOSURES SHALL HAVE A FIRE-RESISTANCE RATING NOT LESS THAN THAT OF THE FIRE-RESISTANCE RATED ASSEMBLY PENETRATED BUT NEED NOT EXCEED 2 HOURS.
13. PROVIDE MINIMUM 2HR INSULATION COVERING OF 2 INCHES AND SUCH MATERIAL SHALL BE IN ACCORDANCE WITH ASTM E2336. FIELD APPLIED GREASE DUCT ENCLOSURE SHALL COMPLY ALL REQUIREMENTS PER 2015 IMC SECTION 506.3.11.2.

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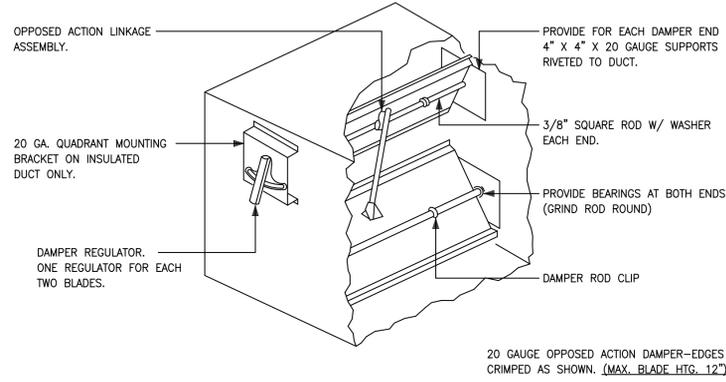
NEARBY ENGINEERS
 382 NE 191st ST, SUITE 49674
 MIAMI, FL 33179
 ANKIT@NY-ENGINEERS.COM
 914-257-3455

05/11/23	PROJECT COORDINATION
05/23/23	ISSUED PER LL COMMENTS
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REVISIONS	

Drawing Title
MECHANICAL NOTES

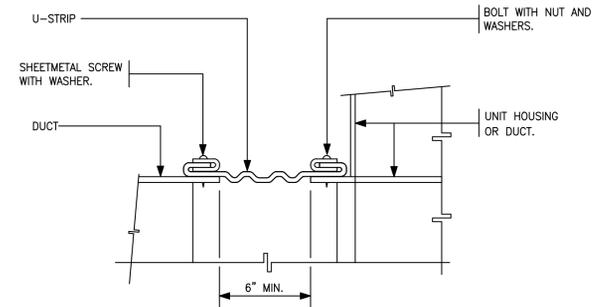
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M101

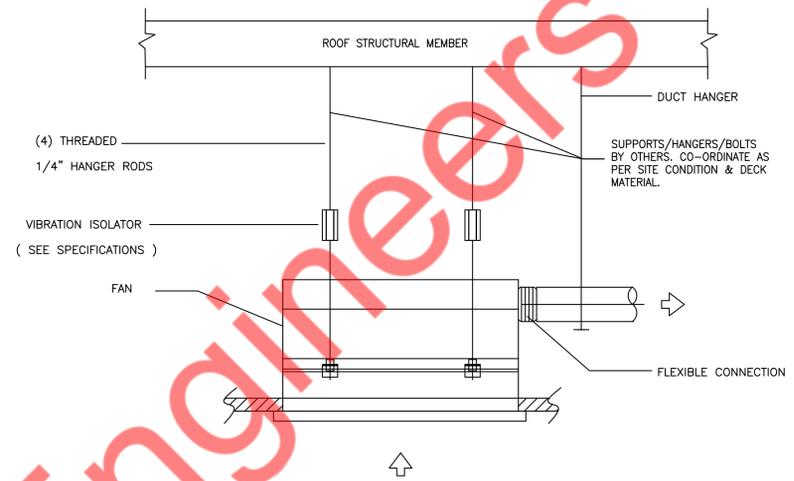


NOTE: 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

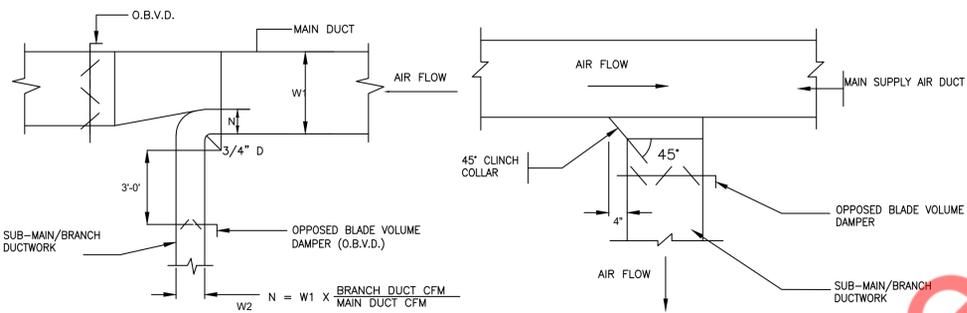
1 LOW PRESSURE BALANCING DAMPER
M102 N.T.S



2 FLEXIBLE CONNECTION (DUCT-EQP.) DETAIL
M102 N.T.S

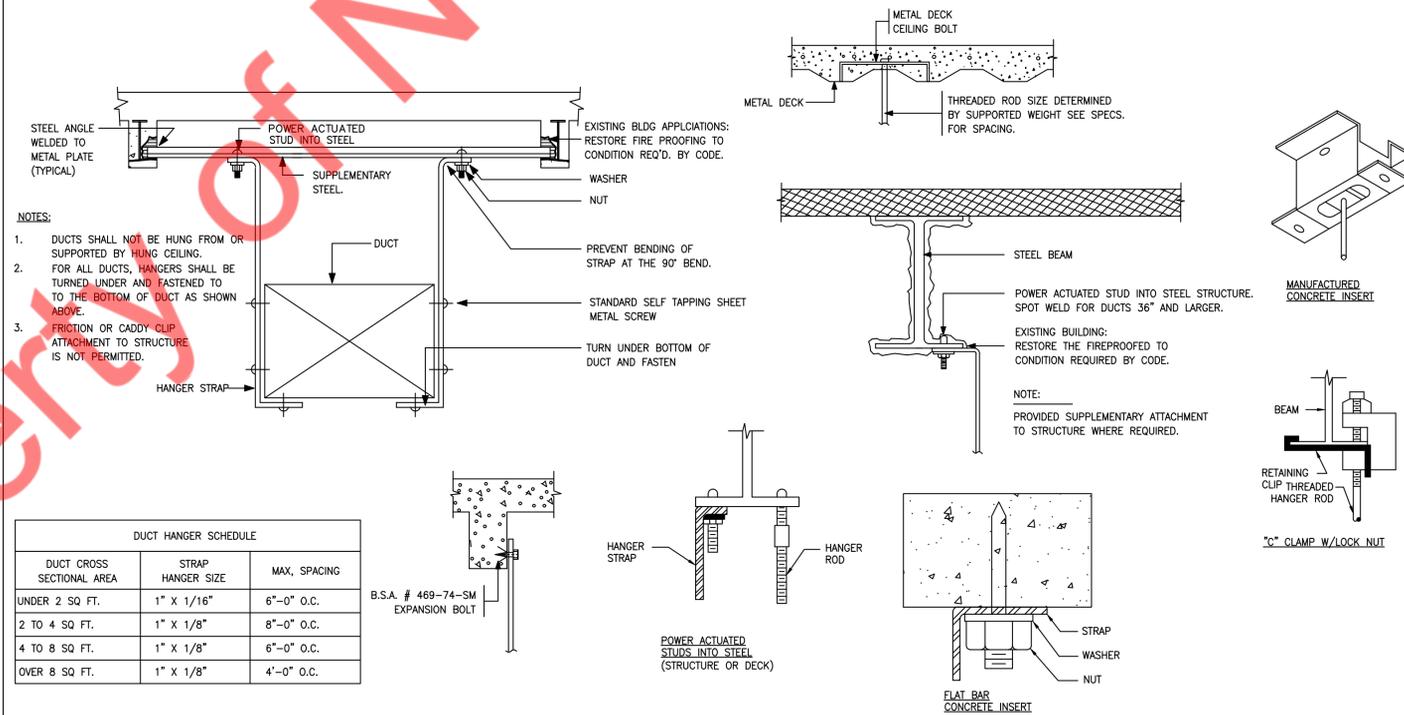


3 CEILING FAN HANGING SUPPORT DETAIL
M102 N.T.S



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

4 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
M102 N.T.S



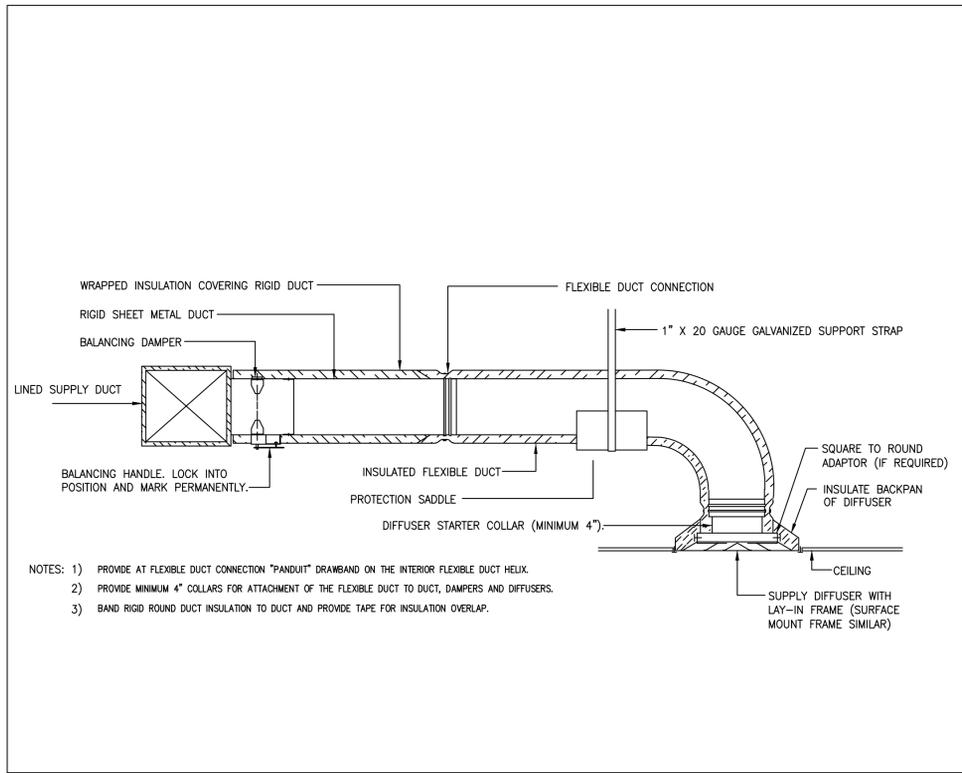
- NOTES:
- DUCTS SHALL NOT BE HUNG FROM OR SUPPORTED BY HUNG CEILING.
 - FOR ALL DUCTS, HANGERS SHALL BE TURNED UNDER AND FASTENED TO TO THE BOTTOM OF DUCT AS SHOWN ABOVE.
 - FRICION OR CADDY CLIP ATTACHMENT TO STRUCTURE IS NOT PERMITTED.

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.

B.S.A. # 469-74-SM EXPANSION BOLT

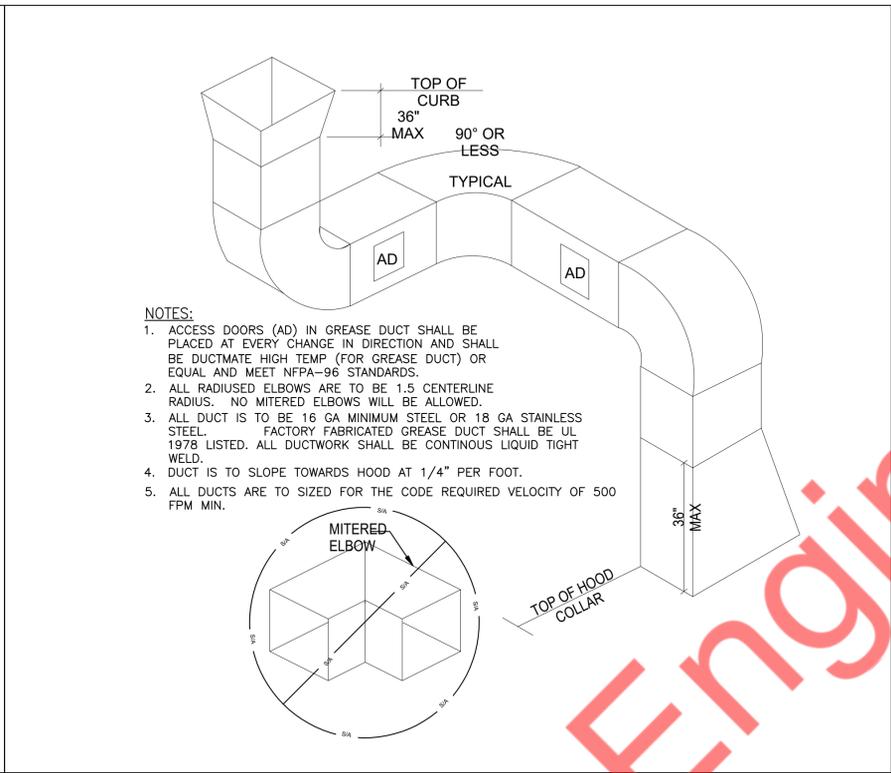
5 DUCT HANGING DETAILS
M102 N.T.S

REVISIONS	
05/11/23	PROJECT COORDINATION
05/23/23	ISSUED PER LL COMMENTS
03/21/23	ISSUED FOR PERMIT



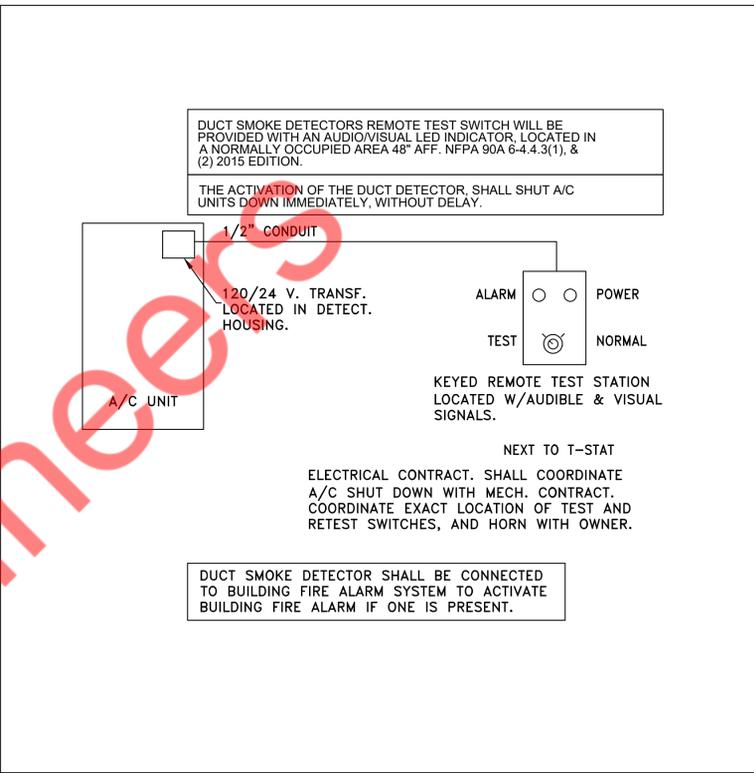
- NOTES:
- 1) PROVIDE AT FLEXIBLE DUCT CONNECTION "PANDUIT" DRAWBAND ON THE INTERIOR FLEXIBLE DUCT HELIX.
 - 2) PROVIDE MINIMUM 4" COLLARS FOR ATTACHMENT OF THE FLEXIBLE DUCT TO DUCT, DAMPERS AND DIFFUSERS.
 - 3) BAND RIGID ROUND DUCT INSULATION TO DUCT AND PROVIDE TAPE FOR INSULATION OVERLAP.

1 DIFFUSER CONNECTION DETAIL-FLEX DUCT
M103 N.T.S



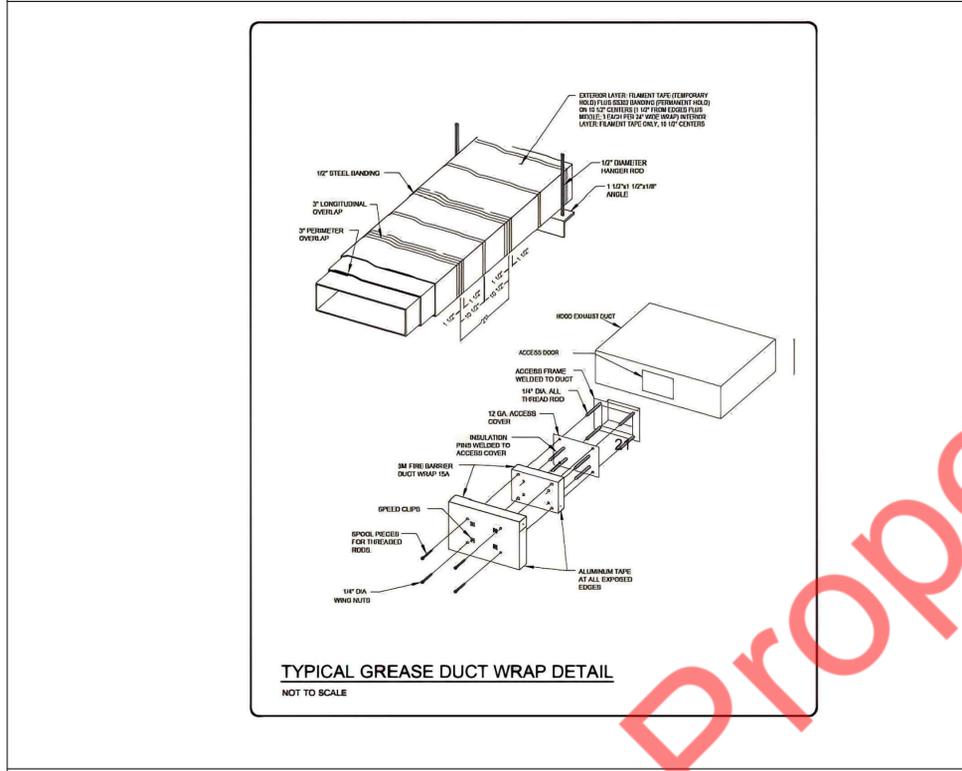
- NOTES:
1. ACCESS DOORS (AD) IN GREASE DUCT SHALL BE PLACED AT EVERY CHANGE IN DIRECTION AND SHALL BE DUCTMATE HIGH TEMP (FOR GREASE DUCT) OR EQUAL AND MEET NFPA-96 STANDARDS.
 2. ALL RADIUS ELBOWS ARE TO BE 1.5 CENTERLINE RADIUS. NO MITERED ELBOWS WILL BE ALLOWED.
 3. ALL DUCT IS TO BE 16 GA MINIMUM STEEL OR 18 GA STAINLESS STEEL. FACTORY FABRICATED GREASE DUCT SHALL BE UL 1978 LISTED. ALL DUCTWORK SHALL BE CONTINUOUS LIQUID TIGHT WELD.
 4. DUCT IS TO SLOPE TOWARDS HOOD AT 1/4" PER FOOT.
 5. ALL DUCTS ARE TO SIZED FOR THE CODE REQUIRED VELOCITY OF 500 FPM MIN.

2 TYPICAL GREASE DUCT DETAIL
M103 N.T.S



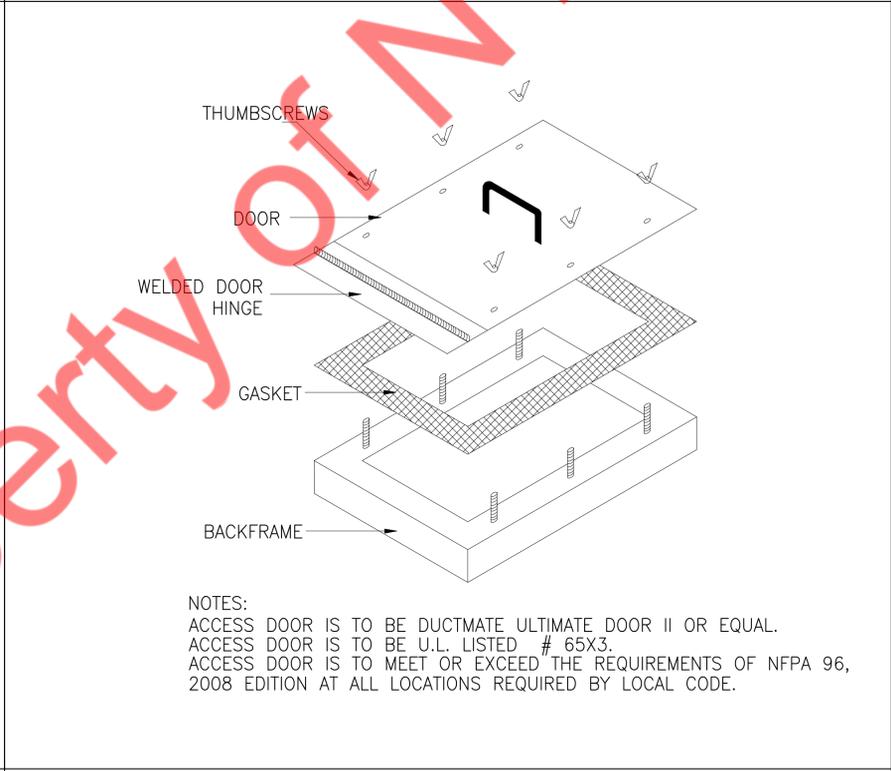
- DUCT SMOKE DETECTOR SHALL BE CONNECTED TO BUILDING FIRE ALARM SYSTEM TO ACTIVATE BUILDING FIRE ALARM IF ONE IS PRESENT.

3 DUCT DETECTOR DETAIL
M103 N.T.S



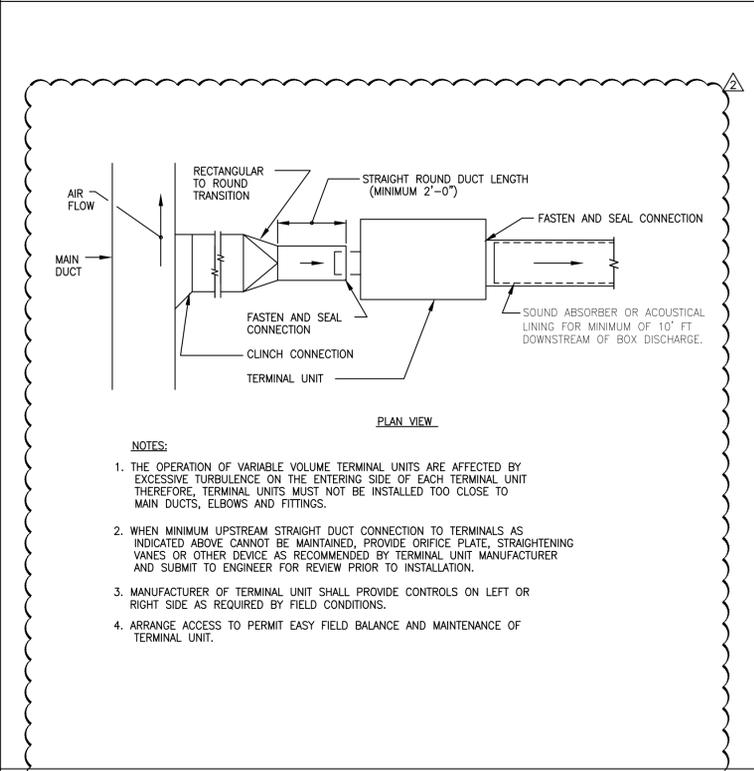
TYPICAL GREASE DUCT WRAP DETAIL
NOT TO SCALE

4 TYPICAL GREASE DUCT WRAP DETAIL
M103 N.T.S



- NOTES:
- ACCESS DOOR IS TO BE DUCTMATE ULTIMATE DOOR II OR EQUAL.
 - ACCESS DOOR IS TO BE U.L. LISTED # 65X3.
 - ACCESS DOOR IS TO MEET OR EXCEED THE REQUIREMENTS OF NFPA 96, 2008 EDITION AT ALL LOCATIONS REQUIRED BY LOCAL CODE.

5 TYPICAL GREASE DUCT ACCESS DOOR DETAIL
M103 N.T.S



- NOTES:
1. THE OPERATION OF VARIABLE VOLUME TERMINAL UNITS ARE AFFECTED BY EXCESSIVE TURBULENCE ON THE ENTERING SIDE OF EACH TERMINAL UNIT THEREFORE, TERMINAL UNITS MUST NOT BE INSTALLED TOO CLOSE TO MAIN DUCTS, ELBOWS AND FITTINGS.
 2. WHEN MINIMUM UPSTREAM STRAIGHT DUCT CONNECTION TO TERMINALS AS INDICATED ABOVE CANNOT BE MAINTAINED, PROVIDE ORIFICE PLATE, STRAIGHTENING VANES OR OTHER DEVICE AS RECOMMENDED BY TERMINAL UNIT MANUFACTURER AND SUBMIT TO ENGINEER FOR REVIEW PRIOR TO INSTALLATION.
 3. MANUFACTURER OF TERMINAL UNIT SHALL PROVIDE CONTROLS ON LEFT OR RIGHT SIDE AS REQUIRED BY FIELD CONDITIONS.
 4. ARRANGE ACCESS TO PERMIT EASY FIELD BALANCE AND MAINTENANCE OF TERMINAL UNIT.

6 VAV BOX INSTALLATION DETAILS
M103 N.T.S

NO.	DATE	REVISIONS
06/11/23		PROJECT COORDINATION
05/23/23		ISSUED PER LL COMMENTS
03/21/23		ISSUED FOR PERMIT

ROOF TOP UNIT SCHEDULE

UNIT TAG	TR	REQ. SA (CFM)	OUTSIDE AIR (CFM)	ESP (IN. OF W.C.)	SUPPLY MOTOR H.P.	MCA/MOP (A)	V/PH	COOLING CAPACITY		HEATING CAPACITY		REQUIRED CAPACITY		GAS NAT PRESS. INCH OF WC	MANUFACTURER & MODEL NO.	STEADY STATE EFFICIENCY	EER	WEIGHT (LBS.)	NOTES
								TOTAL (MBH)	SENSIBLE (MBH)	MBH INPUT	MBH OUTPUT	COOLING (TR)	HEATING (MBH)						
RTU-1(E)	S.A.E.	5000	1040	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	S.A.E.	12.5	100	S.A.E.	TRANE & SXHGD1340	S.A.E.	S.A.E.	S.A.E.	1-8

- NOTES:-
- S.A.E : SAME AS EXISTING.
 - EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
 - EXISTING RTU SHOULD BE ABLE TO WORK AT ITS 100% RATED CAPACITIES. IF CONTRACTOR FINDS ROOF TOP UNIT HAS INSUFFICIENT CAPACITY THEN CONTRACTOR IS TO INFORM WITH DESIGN ENGINEER PRIOR TO CONSTRUCTION.
 - CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.
 - IF REQUIRED, PROVIDE NEW THERMOSTAT AND TEMPERATURE SENSOR COMPATIBLE WITH EXISTING RTU. CO-ORDINATE FINAL LOCATION OF T-SENSOR WITH ARCHITECT/OWNER.
 - CONTRACTOR TO RE-BALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.
 - REPLACE FILTERS, IF REQUIRED.
 - CONTRACTOR TO CONFIRM IF THE EXISTING UNIT IS ABLE TO CATER TO THE REQUIREMENT AS SHOWN IN THE SCHEDULE FOR OUR SPACE. IF NOT REPORT THE DESIGN ENGINEER PRIOR STARTING ANY CONSTRUCTION AND BID.

FAN SCHEDULE

UNIT TAG	SERVICE	CFM	E.S.P. (IN. OF W.G.)	AMP/HP	ELECT. (V/PH)	MANUF. & MODEL NO.	WEIGHT (LBS)	NOTES
EF-1(N)	MOP SINK	70	0.5	0.17A	115/1	GREENHECK S-A90	30	1,2,4
EF-2(N)	TOILET	70	0.5	0.17A	115/1	GREENHECK S-A90	30	1,2,3
EF-3(N)	TOILET	70	0.5	0.17A	115/1	GREENHECK S-A90	30	1,2,3

- NOTES :-
- PROVIDE DISCONNECT SWITCH.
 - PROVIDE BACKDRAFT DAMPER.
 - INTERLOCK WITH ROOM LIGHT OR PROVIDE 24 HR TIMER CONTROL. CONFIRM THE FINAL REQUIREMENT WITH CLIENT/OWNER.
 - PROVIDE MANUAL SWITCH.

VARIABLE AIR VOLUME BOX SCHEDULE

UNIT TAG	QTY.	MANUFACTURER	MODEL	AIR FLOW (CFM)	ELECTRIC HEATING CAPACITY (kW)	ELECTRIC DATA (V/PH/Hz)	MCA/MOCP
VAV-1(N)	2	TUTTLE & BAILEY (OR EQUIVALENT)	SDV341R14 (OR EQUIVALENT)	2500	7.5	460/3/60	10.0/15.0

- REMARKS
- PROVIDE 24X24 SERVICE ACCESS TO VAV BOX.
 - ALL ELECTRICAL AND COMMUNICATION WIRING SHALL BE DONE AS PER MANUFACTURER STANDARDS. COORDINATE WITH EXISTING BUILDING MANAGEMENT SYSTEM FOR CONTROLS AND INTERLOCK OPERATION.
 - PROVIDE ALL NECESSARY CONTROLS COMPATIBLE WITH EXISTING BUILDING MANAGEMENT SYSTEM FOR PROPER FUNCTION OF THE VAV BOX AS PER MANUFACTURER STANDARDS/RECOMMENDATION.

GRILLE AND DIFFUSER SCHEDULE

UNIT TAG	MANUF. & MODEL NO	FRAME/BORDER	LOCATION	MODULE SIZE	NECK SIZE	PATTERN	FINISH	TYPE
A	TITUS OMNI	LAY-IN	AS SHOWN	24"X24"	REFER TABLE -A	4-WAY	BLACK	SUPPLY
B	TITUS TDC-AA	FLANGED	TOILET	12"X12"	REFER TABLE -A	4-WAY	BLACK	SUPPLY
C	TITUS PAR	LAY-IN	AS SHOWN	24"X24"	REFER TABLE -A	PERFORATED	BLACK	SUPPLY
R	TITUS 56FL	LAY-IN	AS SHOWN	AS NOTED	REFER TABLE -A	-	BLACK	RETURN

NECK SIZE TABLE - A

NECK SIZE DIA	CFM RANGE
ø6"	0-100
ø8"	101-200
ø10"	201-400
ø12"	401-600
ø14"	601-900
ø16"	901-1300

- REMARKS
- COORDINATE FINAL FINISH & FRAME/BORDER TYPE WITH ARCHITECT.
 - MAX. NOISE LEVEL 30 OR LESS.
 - PROVIDE VOLUME DAMPER FOR ALL GRILLE AND DIFFUSER.
 - PROVIDE NECK CONNECTIONS TO THE DIFFUSERS AS SHOWN IN THE TABLE-A.

KITCHEN EXHAUST FAN SCHEDULE

UNIT TAG	SERVICE	EXH. AIR FLOW (CFM)	E.S.P. (IN. OF WG)	HP	ELECT. (V/PH)	FLA	MODEL NO.	MANUFACTURER	WEIGHT (LBS)	REMARK
KEF-1(N)	HOOD	4085	2.5	5.0	460/3	7.2A	USB24DD-RM	CAPTIVEAIRE	1100	1-2

- REMARKS
- SEE CAPTIVE AIRE HOOD DRAWING FOR ADDITIONAL INFORMATION.
 - PROVIDED WEIGHT IS INCLUDING ROOF CURB.
 - CONTRACTOR TO HIRE LANDLORD'S APPROVED ROOFING CONTRACTOR FOR PATCH/REPAIR AROUND ALL NEW WORK.

KITCHEN MAKE UP AIR UNIT

UNIT TAG	SERVICE	MUA CFM	E.S.P. (IN. OF WG)	INPLT MBH	EFFICIENCY	PRESS RANGE IN WC	HP	ELECT. (V/PH)	MCA	MOCP	MANUF. & MODEL NO.	MANUFACTURER	WEIGHT (LBS)	REMARK
MUA-1(N)	HOOD	3268	0.75	183.6	92%	7-14	3.0	460/3	5.4A	15A	A2-D.250-20D	CAPTIVEAIRE	1700	1-2

- REMARKS
- SEE CAPTIVE AIRE HOOD DRAWING FOR ADDITIONAL INFORMATION.
 - PROVIDED WEIGHT IS INCLUDING ROOF CURB.
 - CONTRACTOR TO HIRE LANDLORD'S APPROVED ROOFING CONTRACTOR FOR PATCH/REPAIR AROUND ALL NEW WORK.

KITCHEN MAKE UP AIR CONDENSING UNIT

FAN UNIT MODEL #	CONDENSER NO	TONNAGE	VOLTAGE	PHASE	FREQUENCY	MCA	RLA	MAX FUSE SIZE	MIN WIRE SIZE	SEER
A2-D.250-20D-MPU	1	3	460	3 PHASE	60 HZ	7.7 AMPS	6.3 AMPS	15 AMPS	14 AWG	14
	2	5	460	3 PHASE	60 HZ	10.5 AMPS	8.5 AMPS	15 AMPS	14 AWG	14

VENTILATION CALCULATION

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER IMC 2018	NUMBER OF PEOPLE AS PER IMC 2018	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2018		REQ. OA (CFM)	Provided OA (CFM)
					CFM/PEOPLE	CFM/SQ.FT		
DINING	1504	70	106	80	7.5	0.18	871	1040
PREP AREA	340	20	7	4	7.5	0.12	71	
KITCHEN	381	20	8	4	7.5	0.12	76	
RR 1	67	0	0	0	0	0	0	
RR 2	59	0	0	0	0	0	0	
TOTAL	2351	-	-	88	-	-	1017	

AIR BALANCE

UNIT	SUPPLY AIR (CFM)	OUTSIDE AIR		RETURN AIR (CFM)	EXHUAST AIR (CFM)
		SUPPLY (CFM)	%OA		
RTU-1(E)	5000	1040	20.8%	3960	-
EF-1(N)	-	-	-	-	70
EF-1(N)	-	-	-	-	70
EF-1(N)	-	-	-	-	70
MUA-1(N)	3268	3268	-	-	-
KEF-1(N)	-	-	-	-	4085
TOTAL	8268	4308		3960	2770
BUILDING PRESSURE:				13 CFM	POSITIVE

- NOTES:-
- CONTRACTOR TO ADJUST MOTORIZED DAMPER ON FRESH AIR TAP TO PROVIDE OUTSIDE AIR AS MENTIONED IN ABOVE TABLE.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

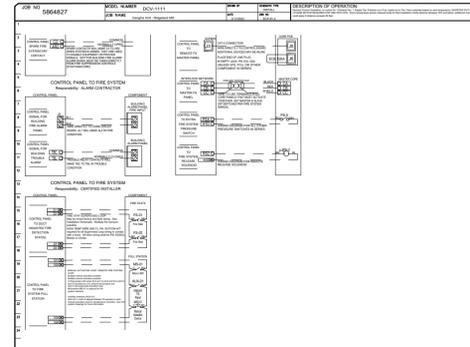
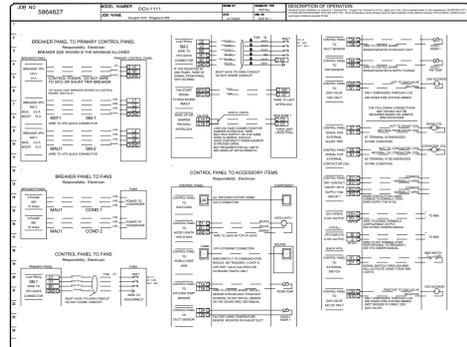
REVISIONS
09/11/23 PROJECT COORDINATION
05/23/23 ISSUED PER LL COMMENTS
03/21/23 ISSUED FOR PERMIT

Drawing Title
MECHANICAL SCHEDULES

Job No. 143.200
Drawn NYE

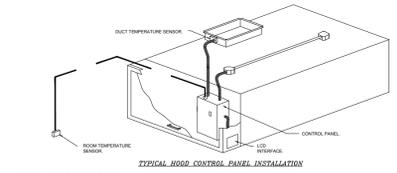
Sheet No.
M104

NO.	PACKAGE #	LOCATION	QUANTITY	OPTION	PANEL CONTROLLED
1	DDY	UTILITY CABINET RIGHT	1	SMART CONTROLS DCV	



DEMAND CONTROL VENTILATION HOOD CONTROL PANEL SPECIFICATIONS:

- CONTROL SHALL BE LISTED BY ETL OR SQA AND SHALL COMPLY WITH DEMAND VENTILATION SYSTEM TURN-DOWN REQUIREMENTS OUTLINED IN IECC 402.2.8 (2015).
- THE CONTROL ENCLOSURE SHALL BE NEMA 1 RATED AND LISTED FOR INSTALLATION INSIDE OF THE EXHAUST HOOD UTILITY CABINET. THE CONTROL ENCLOSURE MAY BE CONSTRUCTED OF STAINLESS STEEL OR PAINTED STEEL.
- TEMPERATURE PROBES LOCATED IN THE EXHAUST DUCT RISERS SHALL BE CONSTRUCTED OF STAINLESS STEEL.
- A DIGITAL CONTROLLER SHALL BE PROVIDED TO ACTIVATE THE HOOD EXHAUST FANS DYNAMICALLY BASED ON A PRESET DIFFERENTIAL BETWEEN THE AMBIENT AND DUCT TEMPERATURE SENSORS. THIS FUNCTION SHALL MEET THE REQUIREMENTS OF IEC 60731-1.
- A DIGITAL CONTROLLER SHALL PROVIDE ADJUSTABLE HYSTERESIS SETTINGS TO PREVENT CYCLING OF THE FANS AFTER THE COOKING APPLIANCE HAS BEEN TURNED OFF AND/OR THE HEAT IN THE EXHAUST SYSTEM IS REDUCED.
- A DIGITAL CONTROLLER SHALL PROVIDE AN ADJUSTABLE MINIMUM FAN RUN-TIME SETTING TO PREVENT FAN CYCLING.
- VARIABLE FREQUENCY DRIVES (VFD'S) SHALL BE PROVIDED FOR FANS AS REQUIRED. THE DIGITAL CONTROLLER SHALL MODULATE THE VFD'S TO MAINTAIN A MINIMUM SETPOINT AND A MAXIMUM SETPOINT ON DEMAND. THE DUCT TEMPERATURE SENSOR INPUT(S) TO THE DIGITAL CONTROLLER SHALL BE USED TO CALCULATE THE SPEED REFERENCE SIGNAL.
- THE VFD SPEED RANGE OF OPERATION SHALL BE FROM 5% TO 100% FOR THE SYSTEM, WITH THE ACTUAL MINIMUM SPEED SET AS REQUIRED TO MEET MINIMUM VENTILATION REQUIREMENTS.
- AN INTERNAL ALGORITHM TO THE DIGITAL CONTROLLER SHALL MODULATE SUPPLY FAN VFD SPEED PROPORTIONAL TO ALL EXHAUST FANS THAT ARE LOCATED IN THE SAME FAN GROUP AS THE SUPPLY FAN.
- THE SYSTEM SHALL OPERATE IN PREP MODE DURING LIGHT COOKING LOAD OR COOL DOWN MODE WHEN SUFFICIENT HEAT REMAINS UNDERNEATH THE HOOD SYSTEM AT COOKING OPERATIONS HAVE COMPLETED OPERATION DURING EITHER OF THESE PERIODS WILL DISABLE THE SUPPLY FANS AND PROVIDE AN EXHAUST FAN SPEED THAT IS EQUAL TO THE MINIMUM VENTILATION REQUIREMENT.
- A DIGITAL CONTROLLER SHALL DISABLE THE SUPPLY FANS; ACTIVATE THE EXHAUST PANEL; ACTIVATE THE APPLIANCE SHUT-TIME; AND DISABLE AN ELECTRIC GAS VALVE AUTOMATICALLY WHEN FIRE CONDITION IS DETECTED ON A COFFERED HOOD.
- A DIGITAL CONTROLLER SHALL ALLOW FOR EXTERNAL, BMS FAN CONTROL, VIA DRY CONTACT EXTERNAL CONTROL, SHALL NOT OVERRIDE FAN OPERATION LOGIC AS REQUIRED BY CODE.
- AN LCD INTERFACE SHALL BE PROVIDED WITH THE FOLLOWING FEATURES:
 - A. ON/OFF FAN BUTTON AND LIGHT TEST INDICATION.
 - B. INTEGRATED GAS VALVE RESET FOR ELECTRIC GAS VALVES AND RESUAL RELAY REQUIRED.
 - C. VFD FAULT DISPLAY WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - D. DUCT TEMPERATURE SENSOR FAILURE DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - E. MIS-WIRED DUCT TEMPERATURE SENSOR DETECTION WITH AUDIBLE & VISUAL ALARM NOTIFICATION.
 - F. A SINGLE LOW VOLTAGE CUT-OFF SWIRING CONNECTION.
 - G. AN ENERGY SAVINGS INDICATOR THAT UTILIZES MEASURED KW/H FROM THE VFD'S.



SEQUENCE OF OPERATIONS:
THE HOOD CONTROL PANEL IS CAPABLE OF OPERATING IN ONE OR MORE OF THE FOLLOWING STATES AT ANY GIVEN TIME.

- AUTOMATIC:** THE SYSTEM OPERATES BASED ON THE DIFFERENTIAL BETWEEN ROOM TEMPERATURE AND THE TEMPERATURE AT THE HOOD DUCT OR EXHAUST DUCT COLLAR. FANS ACTIVATE AT A CONFIGURABLE TEMPERATURE DIFFERENTIAL THRESHOLD. DEPENDS ON THE JOB CONFIGURATION EACH FAN ZONE CAN BE CONFIGURED AS STATIC OR DYNAMIC. THESE TERMS REFER TO WHETHER A VARIABLE MOTOR (SUCH AS VFD) OR ON/OFF MOTOR IS MODULATED WITH TEMPERATURE. IF THE PANEL IS EQUIPPED WITH VARIABLE SPEED FANS AND THE ZONE IS DESIGNATED "DYNAMIC", THESE WILL MODULATE WITHIN A USER-DEFINED RANGE BASED ON THE TEMPERATURE DIFFERENTIAL. PANELS EQUIPPED WITH VARIABLE SPEED FANS AND A FAN ZONE DESIGNATED AS "STATIC" FANS WILL RUN AT A SET SPEED CALCULATED FOR THE DRIVE. DEMAND CONTROL VENTILATION SYSTEMS ARE CAPABLE OF MODULATING EXHAUST AND MAKE UP AIR FAN SPEEDS PER THE REQUIREMENTS OUTLINED IN IECC 402.2.8.
- MANUAL:** THE SYSTEM OPERATES BASED ON HUMAN INPUT FROM AN HMI.
- SCHEDULE:** A WEEKLY SCHEDULE CAN BE SET TO RUN FANS FOR A SPECIFIED PERIOD THROUGHOUT THE DAY. THERE ARE THREE OCCUPIED TIMES PER DAY TO ALLOW FOR THE USER TO SET UP A TIME THAT IS SUITABLE TO THEIR NEEDS. ANY TIME THAT IS WITHIN THE DEFINED OCCUPIED TIME, THE SYSTEM WILL RUN AT MODULATED MODE AND FOLLOW THE FAN PROPORTION ALGORITHM BASED ON TEMPERATURE DURING THIS TIME. DURING UNOCCUPIED TIME, THE SYSTEM WILL HAVE AN EXTRA OFFSET TO PREVENT UNINTENDED ACTIVATION OF THE SYSTEM DURING A TIME WHERE THE SYSTEM IS NOT BEING OCCUPIED.
- OTHER:** THE SYSTEM OPERATES BASED ON THE INPUT FROM AN EXTERNAL SOURCE (DDC, BMS OR HARDWIRED INTERLOCK).
- FIRE:** UPON ACTIVATION OF THE HOOD FIRE SUPPRESSION SYSTEM, THE EXHAUST FAN WILL COME ON OR CONTINUE TO RUN. THE HOOD MAKEUP AIR WILL SHUT-DOWN, AND A SIGNAL WILL BE SENT FOR ACTIVATING THE SHUT-TIME BREAKER PROVIDED BY THE ELECTRICAL. FUEL GAS WILL SHUT OFF VIA MECHANICAL/ELECTRICAL GAS VALVE ACTIVATED BY THE HOOD FIRE SUPPRESSION SYSTEM.

CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted
 Approved with NO Exception Taken
 Review and Re-submit
 SIGNATURE _____ DATE _____

FOR QUESTIONS, CALL THE
 Nashville Office
 Design Information
 PHONE: 615-998-8800
 EMAIL: nge@captivengrill.com

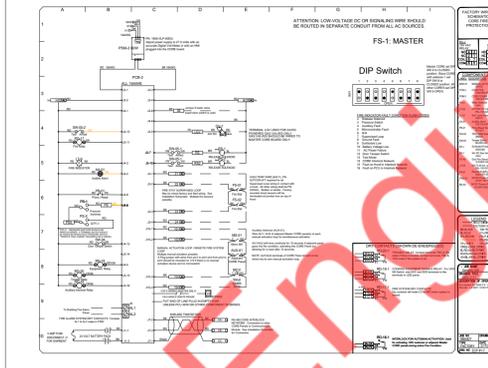
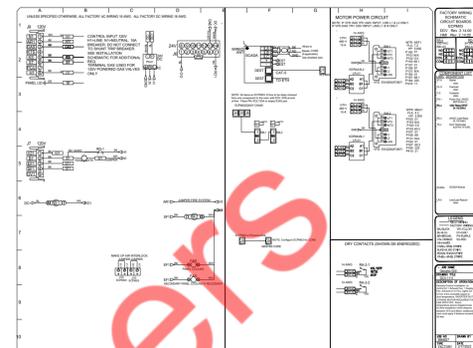
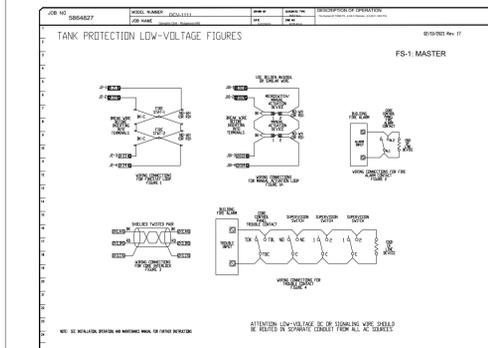
REVISIONS

NO.	DATE	DESCRIPTION
1	2/13/2023	ISSUED FOR PERMIT

DATE: 2/13/2023
DWG. NO.: 5864827
DRAWN BY: DOR-44
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO. 8

CAPTIVE GRILL
 Nashville Office
 100 Blue Hill, Nashville, TN, 37114, PHONE: 615.998.8800 FAX: 615.998.8801 EMAIL: nge@captivengrill.com



CUSTOMER APPROVAL TO MANUFACTURE:

Approved as Noted
 Approved with NO Exception Taken
 Review and Re-submit
 SIGNATURE _____ DATE _____

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 PHONE: 615-998-8800
 EMAIL: nge@captivengrill.com

REVISIONS

NO.	DATE	DESCRIPTION
1	3/17/2023	PROJECT COORDINATION
2	05/23/23	ISSUED PER LL COMMENTS
3	03/21/23	ISSUED FOR PERMIT

DATE: 3/17/2023
DWG. NO.: 5864827
DRAWN BY: DOR-44
SCALE: 3/4" = 1'-0"
MASTER DRAWING

SHEET NO. 9

CAPTIVE GRILL
 Nashville Office
 100 Blue Hill, Nashville, TN, 37114, PHONE: 615.998.8800 FAX: 615.998.8801 EMAIL: nge@captivengrill.com

Property of NY Engineers



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
 382 NE 191st ST, SUITE 49674
 MIAMI, FL 33179
 ANKIT@NY-ENGINEERS.COM
 914-257-3455

DATE	DESCRIPTION
05/11/23	PROJECT COORDINATION
05/23/23	ISSUED PER LL COMMENTS
03/21/23	ISSUED FOR PERMIT

REVISIONS

Drawing Title
HOOD DRAWINGS
 04 OF 04

Job No. 143.200
 Drawn NYE

Sheet No.
M205

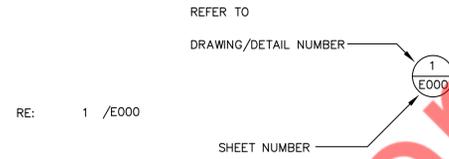
ELECTRICAL SYMBOLS LIST

LIGHTING	
	LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE.
	CIRCUIT NUMBER : INDICATED BY NUMBER
	SWITCHING INDICATED BY LOWER CASE LETTERS.
	DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
	DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONAL ARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN
	STRIP LIGHTING FIXTURE AND OUTLET BOX.
	EMERGENCY LIGHT WITH BATTERY UNIT
WIRING SYSTEMS	
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 Ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	UNDERGROUND
	EXISTING
	NEW
SWITCHES AND CONTROLS	
	20A SPST TOGGLE SWITCH U.O.N. "o" DENOTES LIGHTING FIXTURE CONTROLLED.
	WALL BOX DIMMER SWITCH. DENOTES LIGHTING FIXTURE CONTROLLED.
	WALL MOUNTED VACANCY SENSOR SWITCH.
	DOOR SWITCH
	PHOTOCELL IN NEMA 3R ENCLOSURE.
	CEILING OCCUPANCY SENSOR.
ELECTRICAL DRAWING LIST	
E100	ELECTRICAL SYMBOL LIST & ABBREVIATIONS
E101	ELECTRICAL SPECIFICATIONS - 1
E102	ELECTRICAL SPECIFICATIONS - 2
E200	ELECTRICAL LIGHTING PLAN
E201	ELECTRICAL FLOOR POWER PLAN
E202	ELECTRICAL ROOF POWER PLAN
E300	ELECTRICAL DETAIL SHEET
E400	RISER DIAGRAM & PANEL SCHEDULE

CODE COMPLIANCE	
ALL WORK AND MATERIAL SHALL BE PERFORMED AND INSTALLED IN COMPLIANCE WITH THE FOLLOWING CODES AS ADOPTED AND AMENDED BY THE INSPECTING AUTHORITY. NOTHING IN THESE DRAWINGS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THESE CODES OR OTHERS APPLICABLE TO THESE PROJECT:	
A.	INTERNATIONAL BUILDING CODE, 2015.
B.	INTERNATIONAL MECHANICAL CODE, 2015.
C.	INTERNATIONAL PLUMBING CODE, 2015.
D.	INTERNATIONAL FIRE CODE, 2015.
E.	INTERNATIONAL ENERGY CONSERVATION CODE, 2015.
F.	NATIONAL ELECTRICAL CODE, 2014.

POWER AND TELECOMMUNICATION	
MOTORS AND CONTROLS	
	30A/240V NON FUSED DISCONNECT SWITCH (U.O.N)
	60A/240V NON FUSED DISCONNECT SWITCH (U.O.N)
	100A/240V NON FUSED DISCONNECT SWITCH (U.O.N)
	200A/240V NON FUSED DISCONNECT SWITCH (U.O.N)
	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
RECEPTACLES AND OUTLETS	
	DUPLEX CONVENIENCE RECEPTACLE
	DEDICATED POWER OUTLET "D" DENOTES DEDICATED POWER OUTLET, "GFI" DENOTES GROUND FAULT INTERRUPTER, "WP" DENOTES WEATHERPROOF,
	CEILING MOUNTED DUPLEX OUTLET
	QUAD OUTLET
	JUNCTION BOX
POWER DISTRIBUTION	
	DISTRIBUTION PANELBOARD, SURFACE OR FLUSH MOUNTED.
COMMUNICATIONS	
	TELEPHONE OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING AND PULL STRING ALONG WITH CAT6 CABLE TO ABOVE CEILING
	DATA OUTLET, ELECTRICAL CONTRACTOR TO PROVIDE MUD RING ALONG WITH CAT 6 CABLE AND PULL STRING TO ABOVECEILING
	CCTV
	SPEAKER

DRAWING/DETAIL REFERENCE KEY



RE: 1 /E000

GENERAL NOTES

A. NOT ALL SYMBOLS SHOWN ON THIS SYMBOL LIST ARE USED IN THE CONTRACT DOCUMENTS.

ABBREVIATIONS

A	AMPERES
A/C, AC	AIR CONDITIONING UNIT
AF	AMPERE FRAME/AMP FUSE
AFF	ABOVE FINISHED FLOOR
AS	AMP SWITCH
AIC	AMPS INTERRUPTING CAPACITY
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
C/B,CB	CIRCUIT BREAKER
CKT	CIRCUIT
CLG	CEILING
CU	COPPER
*C	DEGREE CELSIUS
*F	DEGREE FAHRENHEIT
DIA	DIAMETER
DN	DOWN
DP	DISTRIBUTION PANEL
DWG	DRAWING
J.B.	JUNCTION BOX
KCMIL	ONE THOUSAND CIRCULAR MILS
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KW	KILOWATTS
LTG	LIGHTING
MAX	MAXIMUM
MCB	MAIN CIRCUIT BREAKER
MIN	MINIMUM
MLO	MAIN LUGS ONLY
MTD	MOUNTED
N	NEUTRAL
NTS	NOT TO SCALE
EA	EACH
EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
FL	FLOOR
G	GROUND
GFI	GROUND FAULT INTERRUPTER
HP	HORSEPOWER
HZ	HERTZ
IC	INTERRUPTING CAPACITY
PP	POWER PANEL
PVC	POLYVINYL CHLORIDE
R	REMOVE
REC	RECEPTACLE
RGS	RIGID GALVANIZED STEEL
SECT	SECTION
SW	SWITCH
P	POLES
TYP	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
V	VOLT/VOLTAGE
VA	VOLT AMPERE
WP	WEATHER PROOF
E	EXISTING
N.I.C.	NOT IN CONTRACT
RCP	RECIRCULATION PUMP

Property of NY Engineers



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

DATE	REVISIONS
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Drawing Title
**ELECTRICAL
SYMBOLS &
ABBREVIATIONS**

Job No. 143.200	Drawn NYE
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Sheet No.

E100

ELECTRICAL SPECIFICATIONS

1. GENERAL:

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, 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. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
- E. 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.
- F. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.
- G. 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.
- H. 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 AND 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.
- I. 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.
- J. 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.
- K. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- L. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- M. 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. 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, 3 WIRE, 60 HERTZ.
 - b. DISTRIBUTION: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDING 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 IN ORIGINAL 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 SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

- G. 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.

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

- I. 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 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 OF ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO 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 ILLINOIS STATE 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.

- 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 AND 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. 8808F. 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
- B. MOTOR CIRCUITS - ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS 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.

- 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
 - 3) 277/480 VOLTS, 100-AMP FRAME: 22,000 AMPS MINIMUM.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

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REVISIONS

Drawing Title

ELECTRICAL SPECIFICATIONS-1

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E101

ELECTRICAL SPECIFICATIONS (CONT.)

- 8) 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 OR SHALL NOT BE PERMITTED. WHERE REQUIRED BY STRUCTURE, FURNISH THROUGH BOLTS AND FISHPATES.
- 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.
- MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.
- 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.
 - P. 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).

- Q. 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 BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.
 - R. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES' CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES, 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.
 - S. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.
 - T. 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.
9. 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:
 - BLACK FOR A PHASE
 - RED FOR B PHASE
 - BLUE FOR C PHASE
 - 3) NEUTRAL WIRE SHALL UTILIZE WHITE OUTER COVERING THROUGHOUT. EQUIPMENT GROUND WIRE SHALL UTILIZE GREEN OUTER COVERING THROUGHOUT.
 - 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.
 - G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
 - 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.

10. 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, 120/208 VOLT, AC, SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).
 - C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION 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.
 - E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
 - F. COLORS: COORDINATE COLORS WITH ARCHITECT.
 - G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.
 - 11. 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 FOR LED DEVICES, ARRAYS OR SYSTEMS". LED 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. FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF UTILITY COMPANY. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH UTILITY COMPANY AND ARRANGE FOR UTILITY COMPANY TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.
 - H. 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 FOR USE. 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.
 - 12. 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.
 - 13. GROUNDING AND BONDING:
 - A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE 2014, 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.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

NO.	DATE	REVISIONS
09/11/23		PROJECT COORDINATION
05/23/23		ISSUED PER LL COMMENTS
03/21/23		ISSUED FOR PERMIT

Drawing Title

ELECTRICAL SPECIFICATIONS-2

Job No. 143.200 Drawn NYE

Sheet No.

E102

NO.	DATE	DESCRIPTION
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REVISIONS

Drawing Title

ELECTRICAL LIGHTING PLAN

Job No. 143.200
Drawn NYE

Sheet No.

E-200

- ELECTRICAL LIGHTING PLAN GENERAL NOTES:**
- SEE ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT FIXTURE LOCATIONS AND ORIENTATIONS.
 - REFER TO ARCHITECTURAL ELEVATIONS AND SECTIONS FOR ADDITIONAL LIGHTING FIXTURE MOUNTING DETAILS AND INFORMATION.
 - THIS LIGHTING PLAN IS FOR TENANT ONLY.
 - VERIFY ALL MOUNTING HEIGHTS AND LED LENGTHS WITH ARCHITECT AND ENGINEER PRIOR TO ORDERING FIXTURES.
 - PROVIDE EMERGENCY LIGHTS WITH BATTERY BACKUP.
 - FOR CCTV CAMERA REQUIREMENTS, E.C. SHALL COORDINATE WITH SECURITY DRAWINGS/SPECIALIST FOR EXACT REQUIREMENTS AS PER THE EXISTING SITE CONDITIONS. REFER TO SHEET A102.
 - FOR SPEAKER, E.C. SHALL COORDINATE WITH IT DRAWINGS/SPECIALIST FOR EXACT REQUIREMENTS AS PER THE EXISTING SITE CONDITIONS. REFER SHEET A102.

- ELECTRICAL LIGHTING PLAN KEYED WORK NOTES:**
- CONNECT ALL EMERGENCY EGRESS AND NIGHT LIGHTING(24X7 ON) FIXTURES TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES.
 - E.C. SHALL COORDINATE EXACT LOCATION OF SWITCHES WITH ARCHITECT/OWNER. E.C. SHALL CONFIRM CLEAR SPACE FOR SWITCH, NO OBJECT IN FRONT ON SWITCH LOCATION.
 - E.C. TO COORDINATE THE NEON SIGNAGE CONNECTION REQUIREMENTS AND EXACT LOCATION WITH VENDOR/OWNER. BASE BID ACCORDINGLY.
 - E.C. SHALL COORDINATE EXACT LOCATION AND REQUIREMENTS WITH OWNER. REFER POWER PLANS FOR POWER REQUIREMENTS.
 - E.C. TO COORDINATE THE EXTERIOR FACING SIGNAGE CONNECTION REQUIREMENTS WITH SIGN VENDOR. BASE BID ACCORDINGLY.
 - ALL EXTERIOR SIGNAGE SHALL BE CONTROLLED WITH EXTERIOR MOUNTED PHOTOCELL. PHOTOCELL SHALL NOT BE MOUNTED 10' ABOVE GROUND. E.C TO VERIFY LOCATION IN FIELD PRIOR TO ROUGH-IN.
 - WALK-IN BOX COOLER LIGHTING TO BE PROVIDED BY MANUFACTURER.
 - LIGHTING CONTROL IN THE ROOM SHALL NOT BE WITH AUTOMATIC MEANS AS PER NEC 110.26(D).
 - PROVIDE MANUAL SWITCH FOR EF-1(N). E.C TO COORDINATE WITH MECHANICAL DRAWINGS.
 - EF-2(N) & EF-3(N) SHALL BE CIRCUITED AND CONTROLLED ALONG WITH LIGHT FIXTURES IN THE SAME ROOM.

- ELECTRICAL LIGHTING CONTROL GENERAL NOTES:**
- E.C. SHALL INSTALL SENSOR DEVICES AS PER MANUFACTURERS INSTRUCTIONS.
 - E.C. SHALL PROVIDE OWNER TRAINING ON THE OPERATION OF ALL LIGHTING CONTROL DEVICES PRIOR TO TURN OVER.
 - CONTRACTOR SHALL REVISIT SITE 30 DAYS POST TURN OVER TO ADJUST LIGHTING CONTROL DEVICES AS PER OWNER REQUIREMENTS.
 - PROVIDE POWER PACKS AS REQUIRED FOR CONTROLLING PURPOSE.
 - ENABLE WALK THROUGH MODE ON ALL SENSORS PROVIDED.
 - ALL LOW VOLTAGE CONDUITS SHALL BE COORDINATED WITH ARCHITECT/OWNER AND REFER A102 FOR MORE DETAILS.

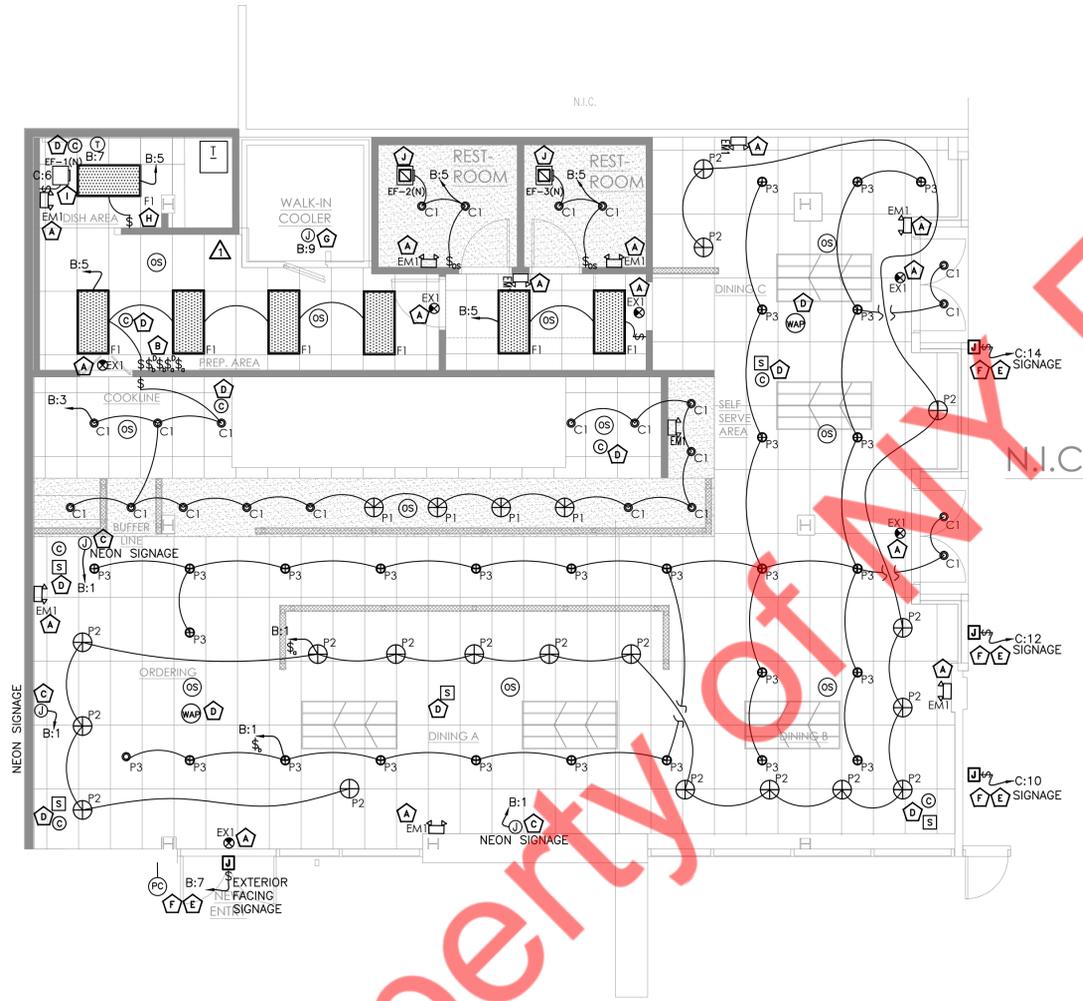
LIGHTING FIXTURE SCHEDULE:

LIGHTING FIXTURE SCHEDULE								
TYPE	DESCRIPTION	MANUFACTURER R/SUPPLIER	MODEL #	MOUNTING	VOLTAGE	NUMBER OF FIXTURES	WATTAGE (W)	REMARK
P1	PENDANT	METAL BOWL	TBD	HANGING	120	4	11	-
P2	PENDANT	METAL BOWL	TBD	HANGING	120	18	11	-
P3	PENDANT	TBD	TBD	HANGING	120	28	11	-
C1	RECESSED LENSED DOWNLIGHT	CONTECH	RL20-CTR2002-CLR-NK	CEILING	120	18	50	-
F1	LED 2X4 RECESSED TROFFER	LITHONIA	2WRTL-G-148-5000LM-I4W-A FL-MVOLT-EXI-35K-80CRI	CEILING	120	7	38.7	-
EX1	EXIT SIGN	LITHONIA	EML2L	WALL/CEILING	120	-	2.4	EMERGENCY FIXTURE
EM1	EMERGENCY LIGHT BATTERY PACK	LITHONIA	EDG-1-R-EL-120V	WALL	120	-	2.8	EMERGENCY FIXTURE

- LIGHTING FIXTURE SCHEDULE NOTES:**
- REFER TO ARCHITECTURAL SCHEDULE FOR EXACT INFORMATION, INCLUDING MANUFACTURER, MODEL NUMBER, COLORS, FINISHES, TRIMS, LAMP COLOR TEMPERATURE AND CEILING TYPES.
 - REFER TO ARCHITECTURAL SHEETS FOR WALL, COLUMN, AND PENDANT MOUNTING HEIGHTS UNLESS NOTED OTHERWISE.
 - PROVIDE DIMMING DRIVERS WHERE REQUIRED. COORDINATE CONTROL TYPE PRIOR TO BID. REFER TO FLOOR PLANS AND LIGHTING CONTROL SCHEDULES FOR MORE INFORMATION. COORDINATE EXACT CONTROL REQUIREMENTS WITH LIGHTING MANUFACTURERS AND COORDINATE WITH CONTROL MANUFACTURERS PRIOR TO BID.
 - E.C. SHALL COORDINATE VOLTAGES REQUIRED FOR FIXTURES PRIOR TO ORDERING.
 - ALL FIXTURES SHALL BE UL LISTED.
 - ALL FIXTURES SHALL BEAR A MAXIMUM WATTAGE LABEL AS INDICATED ABOVE. THE DISTRIBUTOR SHALL AFFIX THE MAX WATTAGE LABEL PRIOR TO SHIPMENT WHERE A REDUCTION IN MAXIMUM WATTAGE IS REQUIRED FOR ENERGY CODE COMPLIANCE.
 - ALL LIGHT COLOR TEMPERATURE TO BE 2700K, UNLESS NOTED OTHERWISE.
 - ALL LIGHTING SHOULD MAINTAIN MINIMUM 85 CRI.
 - NO LAMPS SHOULD HAVE VISIBLE LED CHIPS.
 - ALL FRONT OF THE HOUSE LIGHTS TO BE DIMMABLE.

LIGHTING CONTROL SCHEDULE:

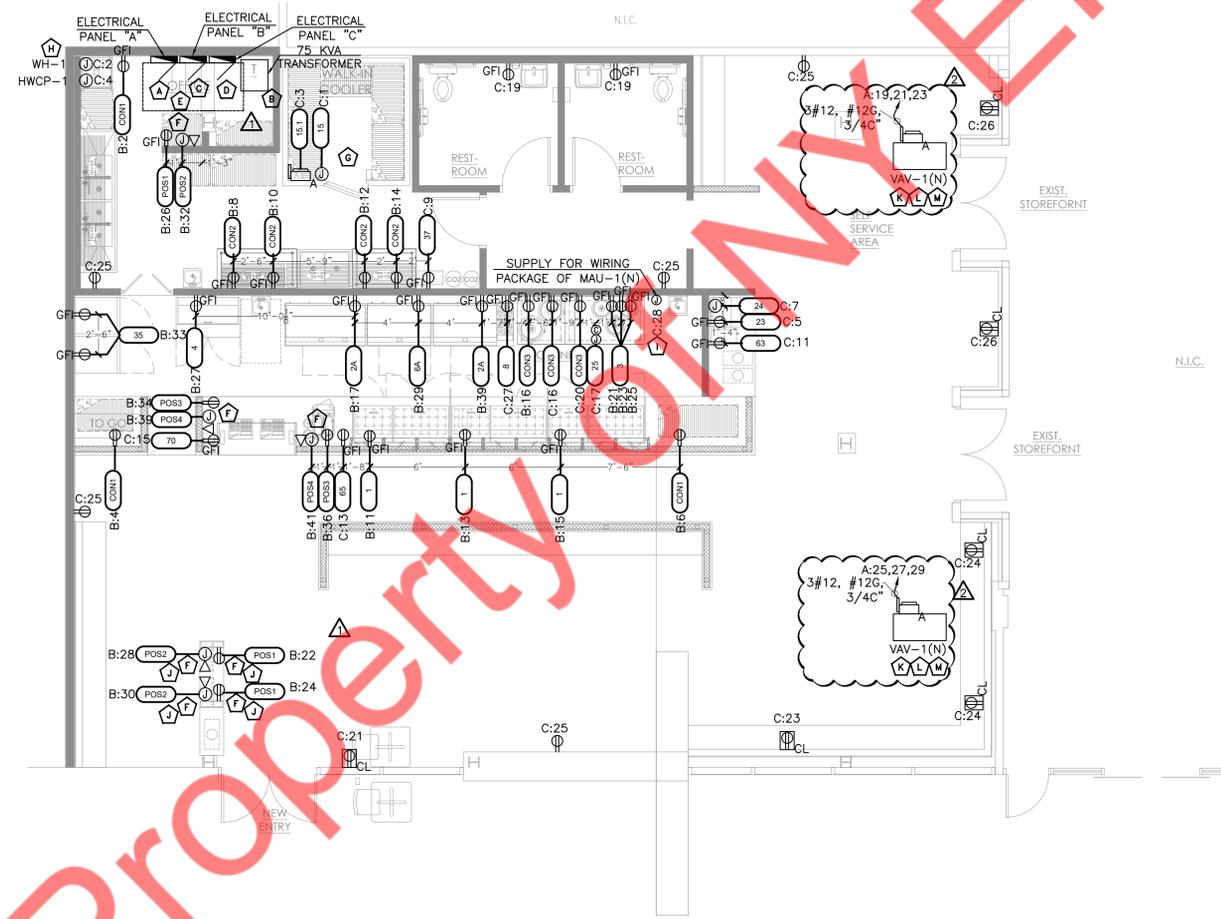
LOW VOLTAGE LIGHTING CONTROL DEVICE SCHEDULE						
TAG	DESCRIPTION	AREA	MAKE/MODEL	MOUNTING	OPERATION	REMARKS
OS	CEILING MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY	FRONT OF HOUSE, BACK OF HOUSE	CM-PDT-10	CEILING	AUTO ON/OFF	MAXIMUM 10 SENSORS PER POWER PACK. PROVIDE LOW VOLTAGE MOMENTARY SWITCH FOR OVERRIDE WHERE INDICATED.



1 LIGHTING PLAN
3/16" = 1'-0"

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Item No	Quantity	Category	Mfr	Model	Voltage	Phase	Amps	Hr	Kw	AFF	LOCATION	Connection Type	NEMA	Remarks
CON1		CONVENIENCE OUTLET			120	1	15.0			18"	WALL	DCO		CONVENIENCE OUTLET - DEDICATED
CON2		CONVENIENCE OUTLET			120	1	15.0			50"	WALL	DCO		CONVENIENCE OUTLET - DEDICATED MOUNT HORIZONTAL
CON3		CONVENIENCE OUTLET			120	1	15.0			50"	WALL	DCO		CONVENIENCE OUTLET - DEDICATED MOUNT HORIZONTAL
FP		FIRE PULL			---	---	---			VERVEY	WALL	SEE DETAIL		FOR REMOTE FIRE PULL - ROUGHED INSIDE WALL - NO SURFACE MOUNT
POS1	1 LOT	POS Terminal and Printer	By Owner		120	1	30.0			50"	WALL	DCO		By Owner, Verify requirements.
POS2	1 LOT	POS Terminal and Printer Data	By Owner		120	1	30.0			50"	WALL	J-BOX		By Owner, Verify requirements.
POS3	1 LOT	POS Terminal and Printer	By Owner		120	1	30.0			18"	WALL	DCO		By Owner, Verify requirements.
POS4	1 LOT	POS Terminal and Printer Data	By Owner		120	1	30.0			18"	WALL	J-BOX		By Owner, Verify requirements.
1	3	Sandwich / Salad Prep Refrigerator	Atosa	MSF830GR	120	1	2.8	1/5		24"	WALL	DCO	5-15P	Card & Plug
2A	2	Equipment Stand, Refrigerated Base	Atosa	MSF945GR-60	120	1	2.3	1/7		24"	WALL	DCO	5-15P	Card & Plug
3	3	Hot / Grain Warmer	Towers	92019	120	1	.8			50"	WALL	DCO		Card & Plug
4	1	Sandwich prep table	Atosa	MSF830GR	120	1	2.3	1/7		24"	WALL	DCO	5-15P	Card & Plug
6A	1	Equipment Stand, Refrigerated Base	Atosa	MSF945GR-48	120	1	2.3	1/7		24"	WALL	DCO	5-15P	Card & Plug
8	1	Two burner	Atosa	JACH-2	120	1	.8			50"	WALL	DCO		Card & Plug
15	1	Walk In Cooler	Norlake	KL0748B-C	120	1	15.0			DFA	CEILING	J-BOX		BT; LIGHTS, DOOR, DOOR HEATER
15.1	1	Walk In Cooler Refrigeration	Norlake	CFR079PC-S-0	120	1	11.4			DFA	CEILING	DCO	5-20P	BT;
23	1	Soda Ice & Beverage Dispenser	Lancer	IS-20406-O-D-31E	120	1	2.25			50"	WALL	DCO		
24	1	Ice Maker, Cube-Style	HoodCorp	MM-3000B1	120	1	8.45			50"	WALL	J-BOX		BT;
25	1	Exhaust Hood	Captive-Aire		---	---	---			DFA	CEILING	J-BOX		BT; SEE CAPTIVE AIR DRAWINGS FOR INFORMATION.
35	1	Reach-In Freezer	Atosa	MSF800GR	120	1	6.3	1/2		18"	WALL	DCO	5-15P	Card & Plug
37	1	Bag-In-Box Soda system - By Purveyor			120	1	15.0			50"	WALL	DCO		By Purveyor - Very Requirements
63	1	Tea Brewer	BUNN	TRBC-0301	120	1	14.4			50"	WALL	DCO	5-15P	Card & Plug
65	1	Frozen Drink Machine	BUNN	58000-003D	120	1	10.0			18"	WALL	DCO		Mount on Millwork Counter
70	1	Refrigerated Self-Service Case	Structural Concepts	EC53248-CH	120	1	16			18"	WALL	DCO	5-15P	Card & Plug



1 ELECTRICAL FLOOR POWER PLAN
3/16" = 1'-0"

ELECTRICAL POWER PLAN GENERAL NOTES:

- COORDINATE EXACT LOCATION OF HVAC EQUIPMENTS WITH MECHANICAL CONTRACTOR.
- E.C. SHALL VERIFY EXACT BREAKERS AND CIRCUITS FEEDING TO EXISTING EQUIPMENT AND WALK-IN BOXES LOCATED IN THE AREA WHICH IS NOT IN SCOPE AND MAINTAIN THOSE CIRCUITS UNDISTURBED.
- ALL SHUTDOWN AND TIES ARE TO BE COORDINATED WITH BUILDING MANAGEMENT. IF SHUTDOWN OF BUILDING UTILITIES IS REQUIRED, WRITTEN REQUESTS SHALL BE SUBMITTED TO BUILDING MANAGEMENT ALLOWING A MINIMUM OF FIVE BUSINESS DAYS FOR BOARD REVIEW AND APPROVAL. WORK SHALL NOT PROCEED UNTIL WRITTEN APPROVAL IS PROVIDED BY THE BUILDING MANAGER. BUILDING MANAGEMENT IS TO BE NOTIFIED IN CASE ANY EMERGENCY SHUTDOWN OR DISCONNECTION OF UTILITY SERVICE IS REQUIRED.
- ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE 2017 NEC, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- LABEL ALL REMOTE MEP EQUIPMENT WITH TENANT NAME AND SPACE NUMBER.
- DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. ALL CONDUIT ROUTING, OFFSETS, DROPS, AND RISES OF RUNS ARE NOT SHOWN ON THE PLANS AND ARE SHOWN DIAGRAMMATICALLY IN THE RISERS. THE CONTRACTOR SHALL ACCOUNT FOR THE PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTION. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED BY THE CONTRACTOR. MAINTAIN HEADROOM AND SPACE CONDITIONS.
- ELECTRICAL CONTRACTOR SHALL VERIFY EXACT POWER REQUIREMENTS WITH THE OWNER/ARCHITECT/MANUFACTURER PRIOR TO ROUGH-IN. PROVIDE THE OUTLET AS PER EQUIPMENT CUTSHEET. BASE BID ACCORDINGLY.

ELECTRICAL POWER PLAN KEYED NOTES:

- A NEW 600A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- B NEW 75KVA, 3-PHASE TRANSFORMER (SUSPENDED FROM CEILING) WITH PRIMARY 480/277V AND SECONDARY 120/208V. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION. ALSO COORDINATE WITH STRUCTURAL ENGINEER.
- C NEW 200A(M.L.O.), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- D NEW 100A(M.L.O.), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- E ELECTRICAL CONTRACTOR SHALL VERIFY THE INSTALLATION OF ELECTRICAL PANELS IN COMPLIANCE WITH N.E.C. ARTICLE 110.26(A) AND (B). E.C. SHALL FIELD VERIFY THAT THE PANELS ARE UNOBSTRUCTED AND THE AREA WHERE THE PANELS ARE PLACED SHALL NOT BE USED AS A STORAGE SPACE.
- F ELECTRICAL CONTRACTOR SHALL COORDINATE WITH OWNER/LOW VOLTAGE VENDOR FOR EXACT LOCATION AND POWER REQUIREMENTS AND MAKE PROVISIONS ACCORDINGLY. BASE BID ACCORDINGLY.
- G ELECTRICAL CONTRACTOR TO COORDINATE WITH WALK IN COOLER/FREEZER FOR EXACT LOCATION OF ELECTRICAL CONNECTION AND POWER SUPPLY REQUIREMENT.
- H ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE WATER HEATER MANUFACTURER FOR THE EXACT POWER REQUIREMENTS PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.
- I ELECTRICAL CONTRACTOR SHALL PROVIDE SEPARATE 120VAC INPUT TO MAU-1(N) SUPPLY FAN. 120V SIGNAL TO BE RUNNED FROM DCV TO MUA SWITCH BY ELECTRICAL CONTRACTOR. COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND POWER REQUIREMENTS PRIOR TO ROUGH-IN. BASE BID ACCORDINGLY.
- J ELECTRICAL CONTRACTOR TO RUN CIRCUITS OF KIOSK UNDER THE SLAB. ELECTRICAL CONTRACTOR TO COORDINATE WITH ARCHITECT FOR SLAB CUT AND FOR OTHER REQUIREMENTS/DETAILS.
- K ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF THE MECHANICAL UNITS IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- L 30A/460V/3P DISCONNECT SWITCH.
- M 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. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

Property of Nearby Engineers



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

NO.	DATE	DESCRIPTION
09/11/23		PROJECT COORDINATION
05/23/23		ISSUED PER LL COMMENTS
03/21/23		ISSUED FOR PERMIT

REVISIONS

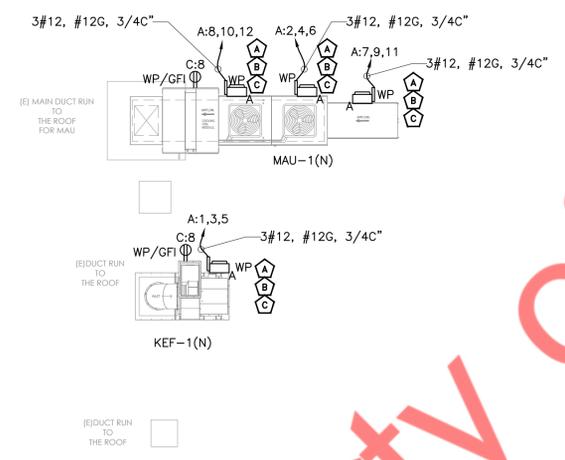
Drawing Title
ELECTRICAL FLOOR POWER PLAN

Job No. 143.200
Drawn NYE

Sheet No.

E201

Property of NY Engineers



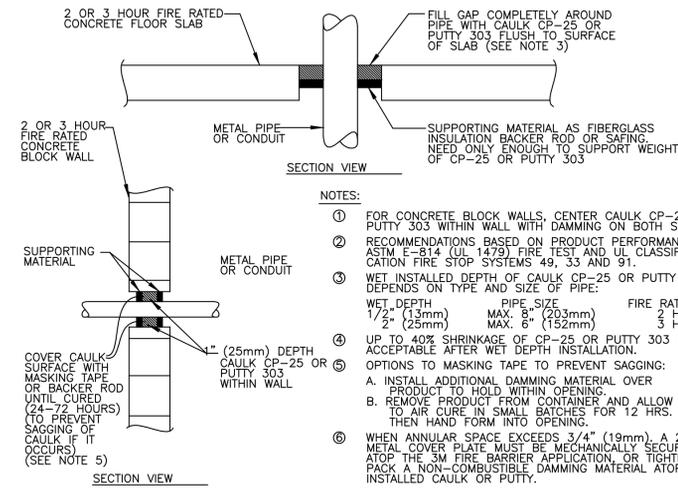
ELECTRICAL KEYED NOTES:

- ⌚ ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR EXACT LOCATION AND POWER REQUIREMENT OF THE MECHANICAL UNITS IN THE FIELD. PROVIDE CIRCUIT AND CONTROL AS REQUIRED.
- ⌚ 30A/480V/3P DISCONNECT SWITCH.
- ⌚ 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. LOCATE AS REQUIRED TO MAINTAIN NEC CLEARANCES.

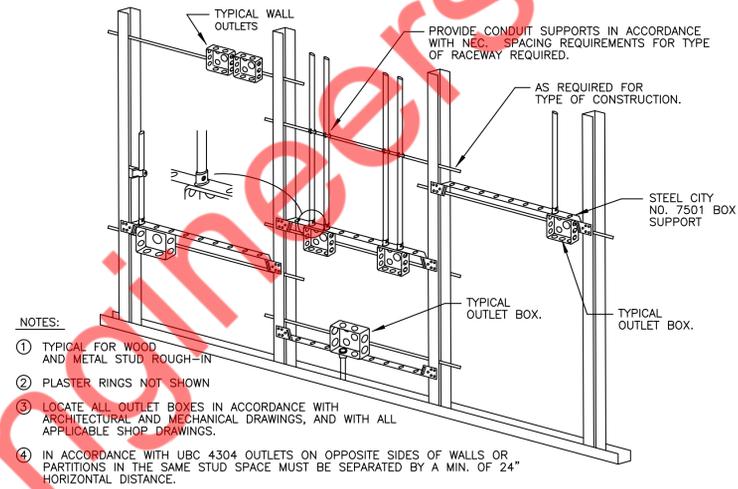
1 ELECTRICAL ROOF POWER PLAN
3/16" = 1'-0"



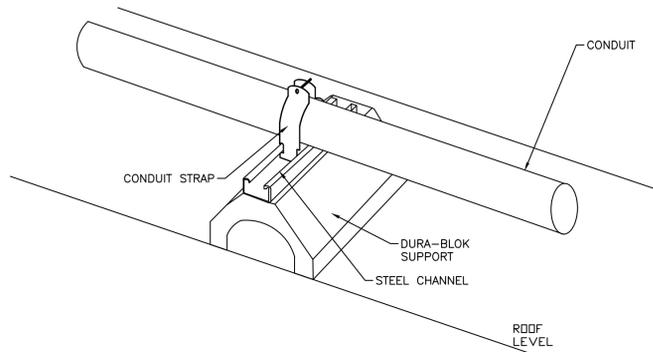
REVISIONS	
05/11/23	PROJECT COORDINATION
05/23/23	ISSUED PER LL COMMENTS
03/21/23	ISSUED FOR PERMIT



4 FIRE STOP DETAILS
E-300 N.T.S

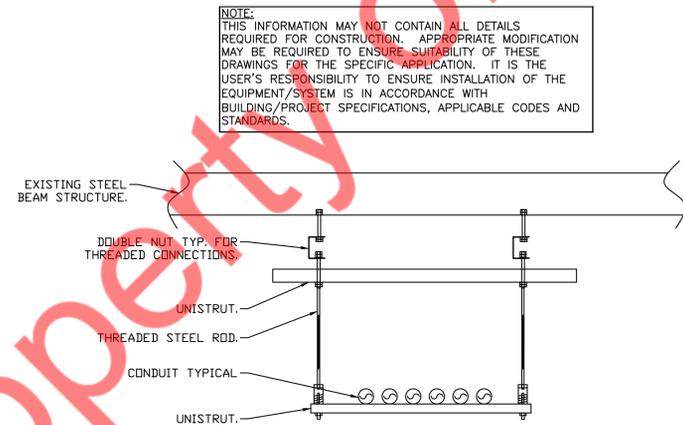


2 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
E-300 N.T.S



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

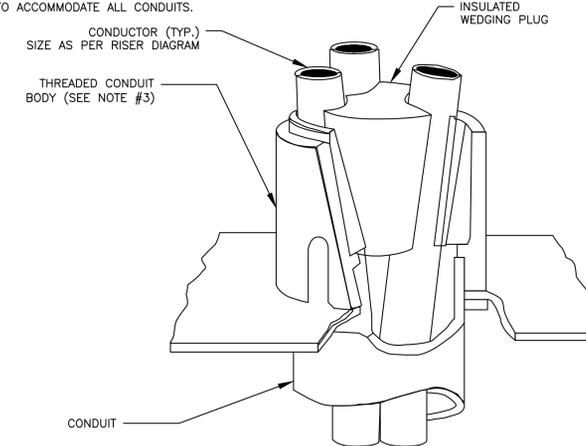
5 CONDUIT SUPPORT DETAILS ON ROOF
E-300 N.T.S



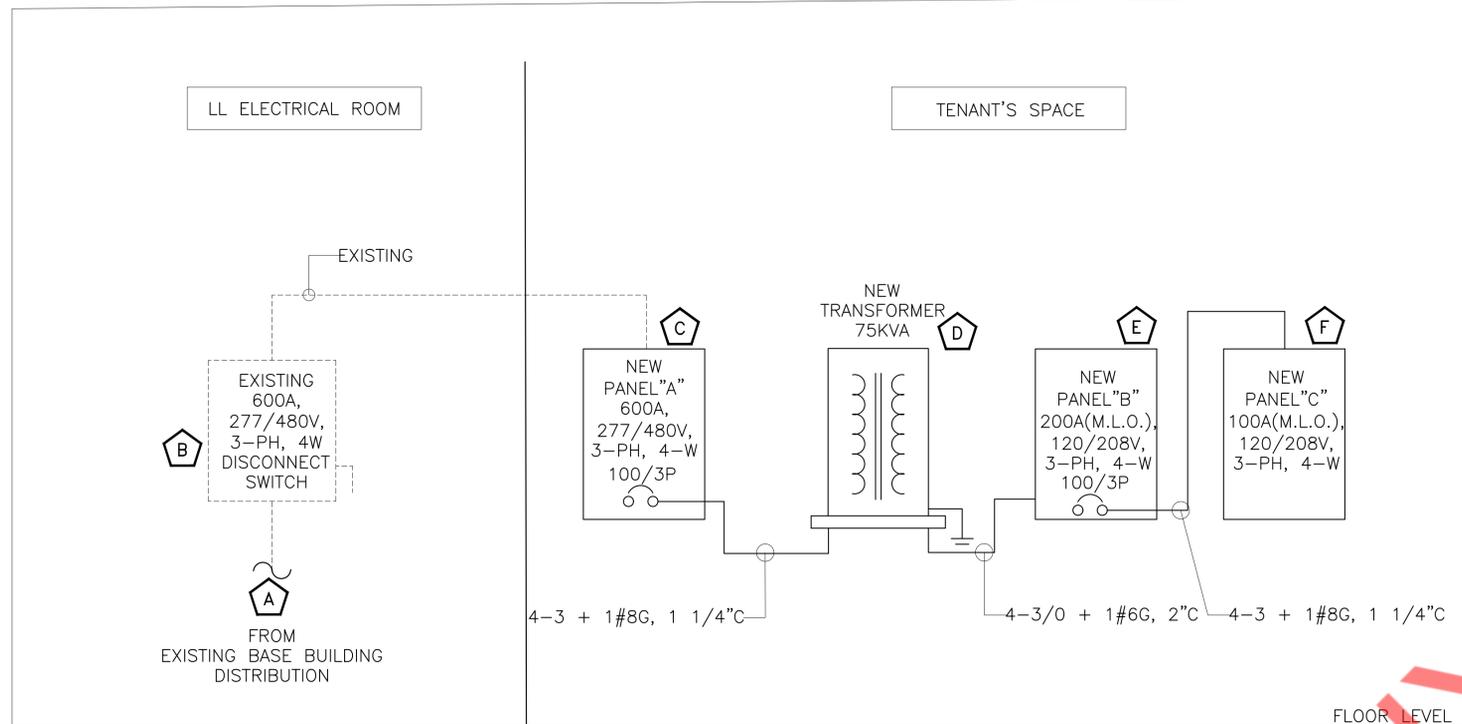
- ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
- SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
- SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
- UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.
- GC TO VERIFY IN FIELD SUPPORT AND STRUCTURE. ALL ATTACHMENTS TO THE PRIMARY STRUCTURE SHALL BE ENGINEERED BY QUALIFIED PROFESSIONAL ENGINEER.

3 CONDUIT SUPPORT DETAIL SUSPENDED FROM STEEL BEAMS
E-300 N.T.S

- NOTES:
- 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.
 - CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH pOZI-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
 - FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
 - PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.



1 VERTICAL CABLE SUPPORT DETAIL
E-300 N.T.S



PANEL SCHEDULE:

PANEL: A(N)		MOUNTING: SURFACE											
480V/277		3 PHASE,		4 WIRE									
MAIN CB: 600A		MLO: NA		BUS: 600A MIN.									
NOTE: L - LIGHTING, R - RECEPTACLE, H - HVAC, E - KITCHEN EQUIPMENTS, O - OTHER/MISCELLANEOUS													
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
					A	B	C						
1			M	2.00	4.13			3#12, #12G, 3/4\"	2.13	M	MUA-1(N) CONDENSING UNIT	15/3P	2
3	20/3P	KEF-1(N)	M	2.00	4.13			3#12, #12G, 3/4\"	2.13	M	MUA-1(N) CONDENSING UNIT		4
5			M	2.00					2.13	M			6
7			M	1.50	4.41				2.91	M			8
9	15/3P	MUA-1(N) MAKE UP AIR UNIT	M	1.50	4.41			3#12, #12G, 3/4\"	2.91	M	MUA-1(N) CONDENSING UNIT	15/3P	10
11			M	1.50					2.91	M			12
13			O	18.02	18.02						SPARE		14
15			O	18.02							SPARE		16
17	100/3P	75 KVA TRANSFORMER(N)	O	18.02	18.02						SPARE		18
19			H	2.50	2.50						SPARE		20
21	15/3P	VAV-1(N)	H	2.50	2.50						SPARE		22
23			H	2.50							SPARE		24
25			H	2.50							SPARE		26
27	15/3P	VAV-1(N)	H	2.50	2.50						SPARE		28
29			H	2.50							SPARE		30
TOTAL LOAD (KVA)					31.56	31.56	31.56						

PANEL: B(N)		MOUNTING: SURFACE												
208V/120		3 PHASE,		4 WIRE										
MAIN CB: NA		MLO: 200A		BUS: 225A MIN.										
NOTE: L - LIGHTING, R - RECEPTACLE, H - HVAC, E - KITCHEN EQUIPMENTS, O - OTHER/MISCELLANEOUS														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.	
					A	B	C							
1	20	LIGHTING: DINING (A,B,C), ORDERING, NEON SIGNAGE	L	1.00	2#12, #12G, 3/4\"	2.80			2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON1)	20	2
3	20	LIGHTING: COOKLINE	L	1.15	2#12, #12G, 3/4\"		2.95		2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON1)	20	4
5	20	LIGHTING: PREP. AREA, CORRIDOR, TOILET	L	0.48	2#12, #12G, 3/4\"			2.28	2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON1)	20	6
7	20	LIGHTING: EXTERIOR FACING SIGNAGE/TIME CLOCK	L	1.20	2#12, #12G, 3/4\"	3.00			2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON2)	20	8
9	20	WALK-IN MISCELLANEOUS	L	0.54	2#12, #12G, 3/4\"		2.34		2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON2)	20	10
11	20	SANDWICH/SALAD PREP. REF. (1)	E	0.34	2#12, #12G, 3/4\"			2.14	2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON2)	20	12
13	20	SANDWICH/SALAD PREP. REF. (2)	E	0.34	2#12, #12G, 3/4\"			2.14	2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON2)	20	14
15	20	SANDWICH/SALAD PREP. REF. (3)	E	0.34	2#12, #12G, 3/4\"			2.14	2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON2)	20	16
17	20	EQUIPMENT STAND, REFG. BASE (2A)	E	0.28	2#12, #12G, 3/4\"			0.28	2#12, #12G, 3/4\"		SHUNT TRIP		18	
19	20	SHUNT TRIP			2#12, #12G, 3/4\"	0.00					SPARE		20	
21	20	RICE, GRAIN WARMER (3)	E	0.10	2#12, #12G, 3/4\"		1.30		2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER (POS1)	20	22
23	20	RICE, GRAIN WARMER (3)	E	0.10	2#12, #12G, 3/4\"			1.30	2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER (POS1)	20	24
25	20	RICE, GRAIN WARMER (3)	E	0.10	2#12, #12G, 3/4\"	1.30			2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER (POS1)	20	26
27	20	SANDWICH PREP. TABLE (4)	E	0.28	2#12, #12G, 3/4\"		1.48		2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER & DATA (POS2)	20	28
29	20	EQUIPMENT STAND, REFG. BASE (6A)	E	0.28	2#12, #12G, 3/4\"		1.48		2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER & DATA (POS2)	20	30
31	20	SHUNT TRIP			2#12, #12G, 3/4\"	1.20			2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER & DATA (POS2)	20	32
33	20	REACH-IN FREEZER (35)	E	0.76	2#12, #12G, 3/4\"		1.96		2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER (POS3)	20	34
35	20	POS TERMINAL & PRINTER & DATA (POS4)	R	1.20	2#12, #12G, 3/4\"		2.40		2#12, #12G, 3/4\"	1.20	R	POS TERMINAL & PRINTER (POS3)	20	36
37	20	POS TERMINAL & PRINTER & DATA (POS4)	R	1.20	2#12, #12G, 3/4\"	7.92				6.72	O		38	
39	20	EQUIPMENT STAND, REFG. BASE (2A)	E	0.28	2#12, #12G, 3/4\"		6.99		4#3, #8G, 1 1/4\"	6.72	O	PANEL C (N)	100/3P	40
41	20	SHUNT TRIP			2#12, #12G, 3/4\"					6.72	O		42	
TOTAL LOAD (KVA)					18.35	19.15	16.58							

PANEL: C(N)		MOUNTING: SURFACE												
208V/120		3 PHASE,		4 WIRE										
MAIN CB: NA		MLO: 100A		BUS: 125A MIN.										
NOTE: L - LIGHTING, R - RECEPTACLE, H - HVAC, E - KITCHEN EQUIPMENTS, O - OTHER/MISCELLANEOUS														
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA)			MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.	
					A	B	C							
1	20	WALK IN COOLER (15)	E	1.80	2#12, #12G, 3/4\"	1.90			2#12, #12G, 3/4\"	0.10	O	WH-1	20	2
3	20	WALK IN COOLER REFG. (15.1)	E	1.37	2#12, #12G, 3/4\"		1.46		2#12, #12G, 3/4\"	0.09	O	HWCP-1	20	4
5	20	SODA ICE & BEVERAGE DISPENSER (23)	E	0.27	2#12, #12G, 3/4\"			0.29	2#12, #12G, 3/4\"	0.02	M	EF-1(N)	20	6
7	20	ICE MAKER (24)	E	1.01	2#12, #12G, 3/4\"	1.37			2#12, #12G, 3/4\"	0.36	R	ROOF RECEPTACLE	20	8
9	20	BAG-IN-BOX-SODA SYSTEM (37)	E	1.80	2#12, #12G, 3/4\"		2.80		2#12, #12G, 3/4\"	1.00	L	SIGNAGE	20	10
11	20	TEA BREWER (63)	E	1.73	2#12, #12G, 3/4\"			2.73	2#12, #12G, 3/4\"	1.00	L	SIGNAGE	20	12
13	20	FROZEN DRINK MACHINE (65)	E	1.20	2#12, #12G, 3/4\"	2.20			2#12, #12G, 3/4\"	1.00	L	SIGNAGE	20	14
15	20	REFRIGERATED SELF-SERVICE CASE (70)	E	1.92	2#12, #12G, 3/4\"		3.72		2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON3)	20	16
17	20	EXHAUST HOOD (25)	E	0.10	2#12, #12G, 3/4\"			0.10	2#12, #12G, 3/4\"		SHUNT TRIP		18	
19	20	TOILET RECEPTACLE	R	0.36	2#12, #12G, 3/4\"	2.16			2#12, #12G, 3/4\"	1.80	R	CONVENIENCE OUTLET (CON3)	20	20
21	20	SHOW WINDOW RECEPTACLE	R	1.80	2#12, #12G, 3/4\"		1.80		2#12, #12G, 3/4\"		SHUNT TRIP		22	
23	20	SHOW WINDOW RECEPTACLE	R	1.80	2#12, #12G, 3/4\"			3.60	2#12, #12G, 3/4\"	1.80	R	SHOW WINDOW RECEPTACLE	20	24
25	20	GENERAL RECEPTACLE	R	0.90	2#12, #12G, 3/4\"	2.70			2#12, #12G, 3/4\"	1.80	R	SHOW WINDOW RECEPTACLE	20	26
27	20	TWO BURNER (8)	E	0.10	2#12, #12G, 3/4\"		0.28		2#12, #12G, 3/4\"	0.18	R	WIRING PACKAGE FOR MAU-1 UNIT	20	28
29	20	SHUNT TRIP			2#12, #12G, 3/4\"	0.00					SPARE		30	
31	20	SPARE				0.00					SPARE		32	
33	20	SPARE				0.00					SPARE		34	
35	20	SPARE				0.00					SPARE		36	
37	20	SPARE				0.00					SPARE		38	
39	20	SPARE				0.00					SPARE		40	
41	20	SPARE				0.00					SPARE		42	
TOTAL LOAD (KVA)					10.33	10.05	6.72							

PANEL SCHEDULE GENERAL NOTES:

- A. ELECTRICAL CONTRACTOR TO VERIFY THE EXACT PANEL SIZES AND INCOMING FEEDER SIZE.
- B. E.C. SHALL VERIFY THE EXISTING EQUIPMENT LOAD & RATINGS IN FIELD AND ACCORDINGLY CONSIDER THE ELECTRICAL LOAD IN PANEL BOARD SCHEDULE.

PANEL SCHEDULE KEYED NOTE:

- A FOR ALL UNDER HOOD EQUIPMENT DEDICATED SHUNT TRIP BREAKER REQUIRED.

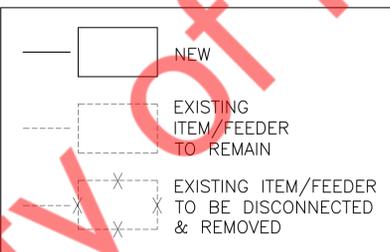
ELECTRICAL RISER KEYED WORK NOTES:

- A EXISTING 600A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL INCOMING SERVICE TO REMAIN. E.C. SHALL COORDINATE WITH THE BASE BUILDING/LANDLORD/OWNER FOR EXACT POWER DISTRIBUTION. REPORT TO ENGINEER ON RECORD FOR ANY DISCREPANCIES.
- B EXISTING 600A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL DISCONNECT SWITCH IN BASE BUILDING ELECTRICAL ROOM. E.C. TO FIELD VERIFY OPERABLE CONDITION OF THE DISCONNECT SWITCH. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- C NEW 600A, 277/480V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "A". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- D NEW 75KVA, 3-PHASE TRANSFORMER WITH PRIMARY 277/480V AND SECONDARY 120/208V. E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- E NEW 200A(M.L.O.), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "B". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.
- F NEW 100A(M.L.O.), 120/208V, 3-PHASE, 4-WIRE ELECTRICAL PANEL "C". E.C. SHALL COORDINATE EXACT LOCATION WITH ARCHITECT/OWNER.

ELECTRICAL GENERAL NOTE:

- E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.
- ELECTRICAL CONTRACTOR TO COORDINATE FAULT CURRENT (Isc) RATING WITH UTILITY COMPANY AND AHJ PRIOR TO COMMENCING ANY WORK.

ELECTRICAL RISER SYMBOLS:



1 ELECTRICAL RISER DIAGRAM

SCALE(S)



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

06/11/23	PROJECT COORDINATION
05/23/23	ISSUED PER LL COMMENTS
03/21/23	ISSUED FOR PERMIT

REVISIONS

Drawing Title
**ELECTRICAL RISER
DIAGRAM &
PANEL SCHEDULE**

Job No. 143.200
Drawn NYE

Sheet No.

E400

PLUMBING LEGEND

SYMBOL	DESCRIPTION
--- SAN ---	GREASE WASTE (UNDERFLOOR)
--- SAN ---	SANITARY SEWER (UNDERFLOOR)
-----	VENT PIPING
--- G ---	GAS PIPING
-----	COLD WATER
-----	HOT WATER
-----	HOT WATER RETURN PIPING
	ISOLATION VALVE
	BALANCING VALVE
	FLOOR DRAIN
	PIPE DOWN
	PIPE UP
	SHUT-OFF VALVE IN RISER
	CAP ON END OF PIPE
	CLEANOUT
	REDUCED PRESSURE ZONE ASSEMBLY
	POINT OF NEW CONNECTION
	FLOOR SINK

PLUMBING DRAWING LIST

P100	PLUMBING SPECIFICATIONS, SYMBOLS & ABBREVIATIONS
P101	PLUMBING SPECIFICATIONS
P102	PLUMBING DETAILS
P200	PLUMBING DRAINAGE & VENT LAYOUT
P201	PLUMBING WATER SUPPLY & GAS LAYOUT
P202	PLUMBING RISER DIAGRAMS & SCHEDULE

PLUMBING ABBREVIATIONS

CO	CLEANOUT
COOP	CLEAN OUT DECK PLATE
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
WH	WATER HEATER
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
BFP	BACK FLOW PREVENTER
WMB	WASHING MACHINE BOX
WB	ICE MAKER OUTLET BOX
WH	WATER HEATER
SV	SHUTOFF VALVE
ET	EXPANSION TANK
TP	TRAP PRIMER
FS	FLOOR SINK
TMV	THERMOSTATIC MIXING VALVE
HWCP	HOT WATER CIRCULATION PUMP
GI-1	GREASE TRAP

CODE COMPLIANCE

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

- 2015 IBC - INTERNATIONAL BUILDING CODE
- 2015 IF - INTERNATIONAL FIRE CODE
- 2015 IMC - INTERNATIONAL MECHANICAL CODE
- 2015 IPC - INTERNATIONAL PLUMBING CODE
- 2015 IFGC - INTERNATIONAL FUEL GAS CODE
- 2015 IECC - INTERNATIONAL ENERGY CONSERVATION CODE
- 2015 NEC - NATIONAL ELECTRICAL CODE

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

- 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.
- 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.
- 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.
- THE GENERAL CONDITIONS OF THE CONTRACT AND ALL DIVISION 1 REQUIREMENTS APPLY TO THE WORK OF THIS SECTION.
- 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.
- IN ALL AREAS SUBJECT TO FREEZING CONDITIONS, THE CONTRACTOR SHALL PROVIDE FREEZE PROTECTION FOR ALL DOMESTIC WATER PIPING INSTALLED UNDER HIS CONTRACT.
- 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.
- COLOR AND FINISH SELECTIONS FOR ALL MATERIALS, INCLUDING PAINTING OF PIPING, SHALL BE AS DIRECTED AND/OR APPROVED BY THE ARCHITECT.
- MINOR DETAILS NOT SHOWN OR SPECIFIED, BUT NECESSARY FOR THE PROPER AND ACCEPTABLE CONSTRUCTION, INSTALLATION OR OPERATION OF ANY PART OF THE WORK AS DETERMINED BY THE ENGINEER SHALL BE INCLUDED AS IF SPECIFIED OR INDICATED ON THE DRAWINGS.
- THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING ALL REQUIREMENTS FOR THE INSTALLATION, CONNECTION, EXTENSION OR MODIFICATION TO ALL UTILITY SERVICES WITH RESPECTIVE PROVIDERS INCLUDING PAYMENT OF ALL ASSOCIATED FEES.
- 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.

- PIPE AND FITTINGS
- VALVES
- HANGERS AND SUPPORTS
- PLUMBING PIPING LAYOUT
- TESTS
- PLUMBING FIXTURES
- WATER HEATERS & ACCESSORIES
- FLOOR DRAINS
- MIXING VALVES
- ALL SCHEDULED PLUMBING EQUIPMENT

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

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

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

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

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

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

1.03 SUBSTITUTIONS

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

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

1.04 DEFINITIONS

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

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

C. PROVIDE: TO FURNISH AND INSTALL.

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

E. REFER TO THE INTERNATIONAL PLUMBING CODE 2015 FOR ADDITIONAL DEFINITIONS.

1.04 DRAWINGS

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

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

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

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

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

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

1.05 PRODUCTS

A. SANITARY AND VENT PIPING:

- ABOVE GRADE/ UNDERGROUND PIPING SHALL BE CAST IRON PIPE WHICH SHOULD COMPLY WITH ASTM A74; ASTM A883; STANDARD/CISPI 301.
- 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.
- ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

- ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE.
- FITTINGS IN DOMESTIC WATER PIPING SHALL BE COPPER OR COPPER ALLOY AS PER TABLE 604.1, 2015 INTERNATIONAL PLUMBING CODE.
- JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
- THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
- COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
- ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY SECTION C403.2.10 REFER WITH 2015 INTERNATIONAL ENERGY CONSERVATION CODE BELOW TABLE.

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	MINIMUM PIPE INSULATION THICKNESS		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	INSULATION CONDUCTIVITY BTU IN./ (H-FI2 °F)	MEAN RATING TEMPERATURE, °F	<1	1 to <1 1/2	1 1/2 to <4	4 to <8	>8
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. WATER DISTRIBUTION SYSTEM AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2015 C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:

- THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
- THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD-WATER PIPING TO 104°F (40°C).

8. AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2015 C404.6.1 HEATED-WATER CIRCULATION SYSTEMS SHALL BE PROVIDED WITH A CIRCULATION PUMP. THE SYSTEM RETURN PIPE SHALL BE A DEDICATED RETURN PIPE OR A COLD WATER SUPPLY PIPE. CONTROLS FOR CIRCULATING HOT WATER SYSTEM PUMPS SHALL START THE PUMP BASED ON THE IDENTIFICATION OF A DEMAND FOR HOT WATER WITHIN THE OCCUPANCY. THE CONTROLS SHALL AUTOMATICALLY TURN OFF THE PUMP WHEN THE WATER IN THE CIRCULATION LOOP IS AT THE DESIRED TEMPERATURE AND WHEN THERE IS NO DEMAND FOR HOT WATER.

9. HEATED WATER SUPPLY PIPING SHALL BE IN ACCORDANCE WITH INTERNATIONAL ENERGY CONSERVATION CODE 2015 SECTION C404.5.1 OR C404.5.2. THE FLOW RATE THROUGH 1/4-INCH PIPING SHALL BE NOT GREATER THAN 0.5 GPM. THE FLOW RATE THROUGH 5/16-INCH PIPING SHALL BE NOT GREATER THAN 1 GPM. THE FLOW RATE THROUGH 3/8-INCH PIPING SHALL BE NOT GREATER THAN 1.5 GPM. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER IECC 2015 C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MAXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAW	OTHER FIXTURES
3/8"	3'	50'
1/2"	2'	43'
3/4"	0.5'	21'
1"	0.5'	13'
1 1/4"	0.5'	8'
1 1/2"	0.5'	6'
2" OR LARGER	0.5'	4'

C. GAS TANKLESS WATER HEATER

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

D. GAS PIPING

- ALL GAS PIPING WORK SHALL COMPLY WITH INTERNATIONAL FUEL GAS CODE 2015, LOCAL UTILITY GAS REQUIREMENTS.
- FURNISH AND INSTALL ALL NECESSARY GAS PIPING TO ALL EQUIPMENT REQUIRING GAS SUPPLY.
- PROVIDE A LUBRICATED GAS VALVE AT ALL CONNECTIONS TO EQUIPMENT.
- ALL GAS PIPING AND INSTALLATION SHALL BE IN ACCORDANCE WITH RULES AND REGULATIONS OF LOCAL UTILITY GAS COMPANY AND OTHER AUTHORITIES HAVING JURISDICTION.
- PROVIDE ADEQUATE SUPPORT FOR ALL PIPING.
- GAS PIPING SHALL BE BLACK STEEL SCHEDULE 40 THREADED PIPE CONFORMING TO ANSI B36-20.
- FITTINGS SHALL BE MALLEABLE IRON.
- HOT WATER RE-CIRCULATING PUMP

1. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.

2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.

3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE-BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.

4. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.

E. MIXING VALVES

1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.

2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 15GPM @ 45 PSIG DIFFERENTIAL.

3. TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP OR EXPANSION BELLOWS; TYPE B- SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C- PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D- BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.

4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.

F. HOT WATER RE-CIRCULATING PUMP

1. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.

2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.

3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE-BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.

4. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

05/23/23	ISSUED PER LL COMMENTS
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REVISIONS

Drawing Title
**PLUMBING SPECIFICATION,
SYMBOLS & ABBREVIATION**

Job No.
143.200

Drawn
NYE

Sheet No.

P100

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

H. 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.

H. 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. USE 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.

I. 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.

2. 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 SCORRIATED 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.

3. INDIRECT WASTE FUNNEL

- c. IT SHOULD BE COMBINATION OF FUNNEL DRAIN AND P TRAP WITH POLISHED CHROME PLATED CAST BRASS CONSTRUCTION WITH 4" TOP DIA., 4" DEEP WITH THREADED OUTLET.

J. 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.

K. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

L. 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.

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

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

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

P. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

R. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

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

V. 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.

W. 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.

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

Y. ALL PIPING INSTALLED ON THE ROOF SHALL BE SUPPORTED BY "PILLOW BLOCK" PIPE STANDS AS MANUFACTURED BY MIRO INDUSTRIES, OR APPROVED EQUAL. WOOD PIPE SUPPORTS SHALL NOT BE ACCEPTABLE. PROVIDE TRAFFIC/WALK PADS BELOW ALL PIPE STANDS.

Z. 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.

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

AB. UNLESS OTHERWISE INDICATED, TRAPS SEALS AT ALL FLOOR DRAINS SHALL BE MAINTAINED BY AN APPROVED TRAP PRIMING DEVICE.

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

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

2. INSTALLATION

2.01 GENERAL

- A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.
- B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.
- C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.
- D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.
- E. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL PLAIN AND FERROUS END PIPE.
- F. REMOVE SCALE AND FOREIGN MATERIAL FROM INSIDE AND OUTSIDE, BEFORE ASSEMBLY.
- G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND 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.

2.03 INSULATION

PIPING FROM A WATER HEATER TO THE TERMINATION OF THE HEATED WATER FIXTURE SUPPLY PIPE SHALL BE INSULATED IN ACCORDANCE WITH TABLE C403.2.10. ON BOTH THE INLET AND OUTLET PIPING OF A STORAGE WATER HEATER OR HEATED WATER STORAGE TANK, THE PIPING TO A HEAT TRAP OR THE FIRST 8 FEET (2438MM) OF PIPING, WHICHEVER IS LESS, SHALL BE INSULATED.

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.

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

M. TESTING REQUIREMENTS

- a. TEST ALL DOMESTIC WATER PIPING HYDROSTATICALLY TO 125 PSIG.
- b. HYDROSTATIC TEST PRESSURES SHALL REMAIN CONSTANT WITH NO VARIATION FOR 120 MINUTES.
- c. TESTS SHALL BE WITNESSED BY THE BUILDING ENGINEER.
- d. THE PLUMBING CONTRACTOR WILL BE HELD RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.

N. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLUN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

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

4. WARRANTY

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



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

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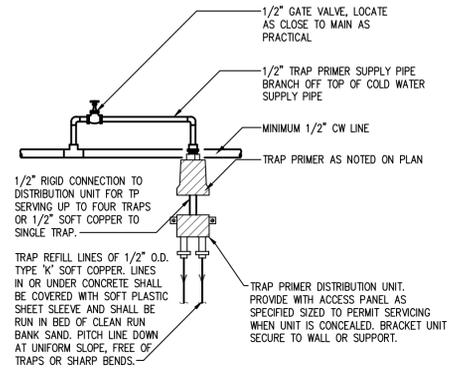
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PLUMBING SPECIFICATIONS

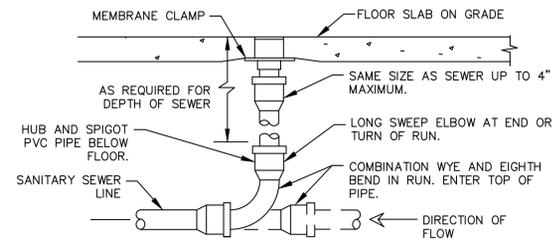
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Sheet No.

PI01



1 TRAP PRIMER DETAIL
NTS

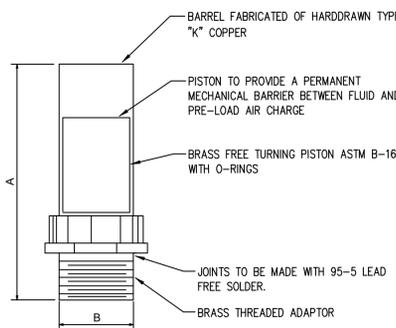


COMMENTS:

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 "OO" CAST IN COVER. PROVIDE CLEANOUT TOP WITH VARIATIONS SUITABLE FOR FLOOR COVERING (CARPET MARKER, RECESSED FOR TILE, SCORIFIED FOR UNFINISHED FLOORS). PROVIDE GASKETED PLASTIC PLUG IN CAST IRON BODY. USE TEFLON JOINT COMPOUND ON PLUG THREADS. CLEAN THE TOP OF EXPOSED FCO AFTER INSTALLATION.

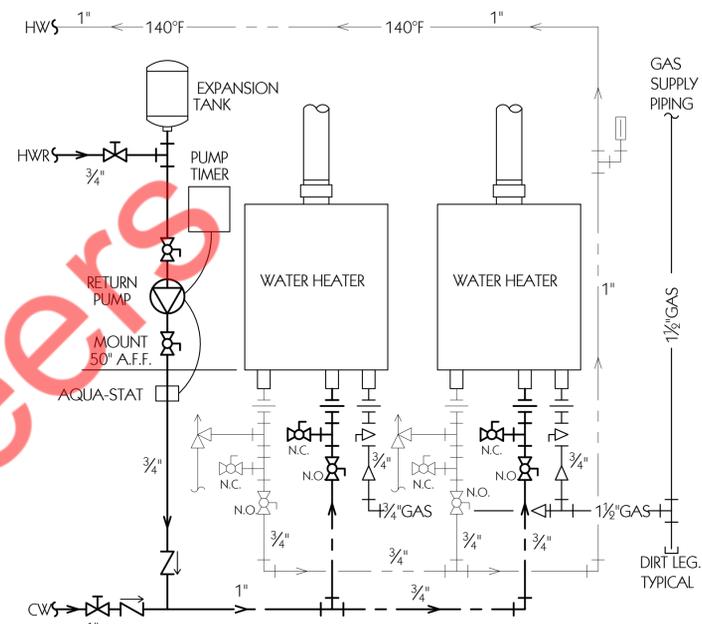
2 FLOOR CLEANOUT DETAIL
NTS



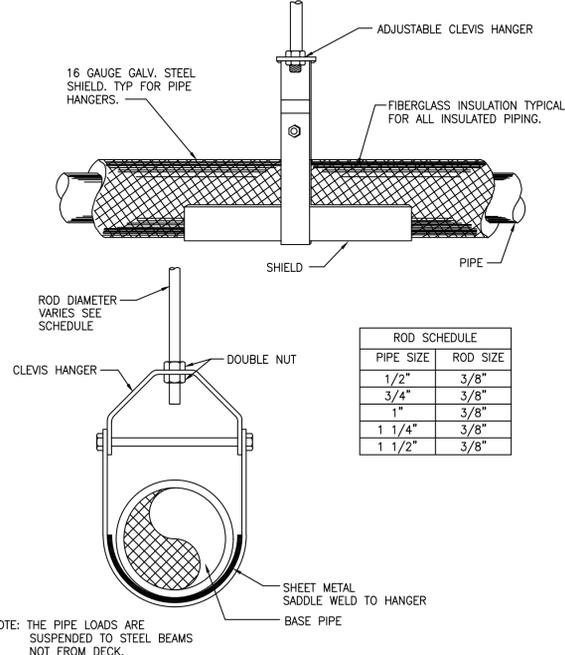
PIPE SIZE	P.D.I. SYMBOL	FIXTURE UNIT RATINGS	A SIZE	B SIZE
1/2"	A	1 - 11	5"	1/2"
3/4"	B	12 - 32	5"	3/4"
1"	C	33 - 60	7"	1"
1-1/4"	D	61 - 113	7"	1-1/4"
1-1/2"	E	114 - 154	9"	1-1/2"
2"	F	155 - 330	9"	2"

NOTE: LOCATE ONE FOR EACH BANK OF FLUSHMETER FIXTURES AT LAST FIXTURE PROVIDE A STAINLESS STEEL ACCESS DOOR FOR EACH SUFFICIENT IN SIZE TO ALLOW REPLACEMENT OF ARRESTOR AT A FUTURE DATE.

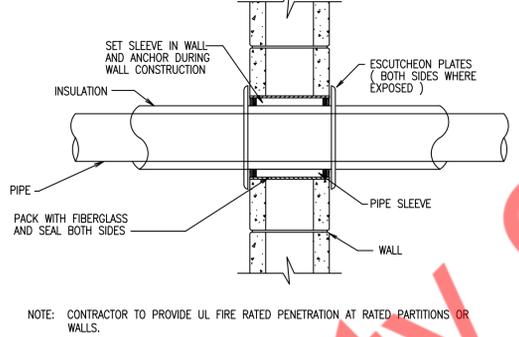
3 WATER HAMMER ARRESTOR DETAILS
NTS



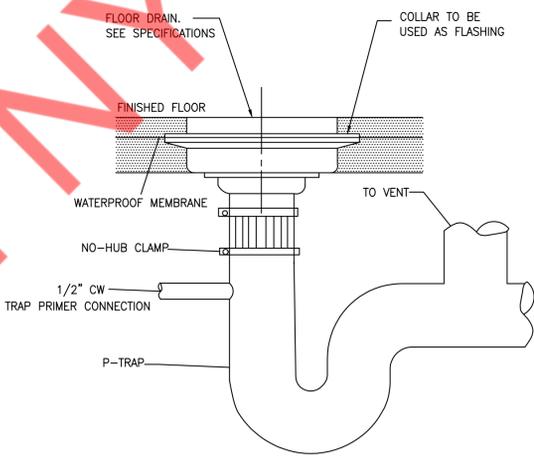
4 WATER HEATER DETAILS
NTS



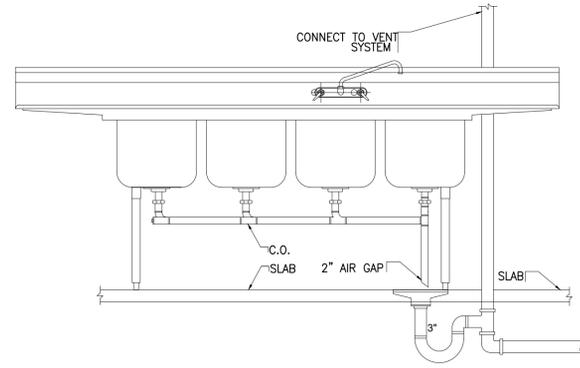
5 HANGER DETAILS
NTS



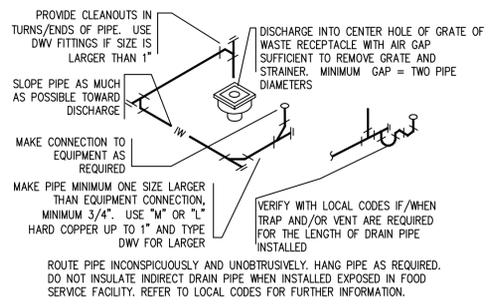
6 PIPE SLEEVE THROUGH INTERIOR WALL DETAIL
NTS



7 FLOOR DRAIN DETAILS
NTS



8 RECESSED FLUSH WITH FLOOR SINK
NTS



9 INDIRECT WASTE DETAIL
NTS

Property of NY Engineers



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

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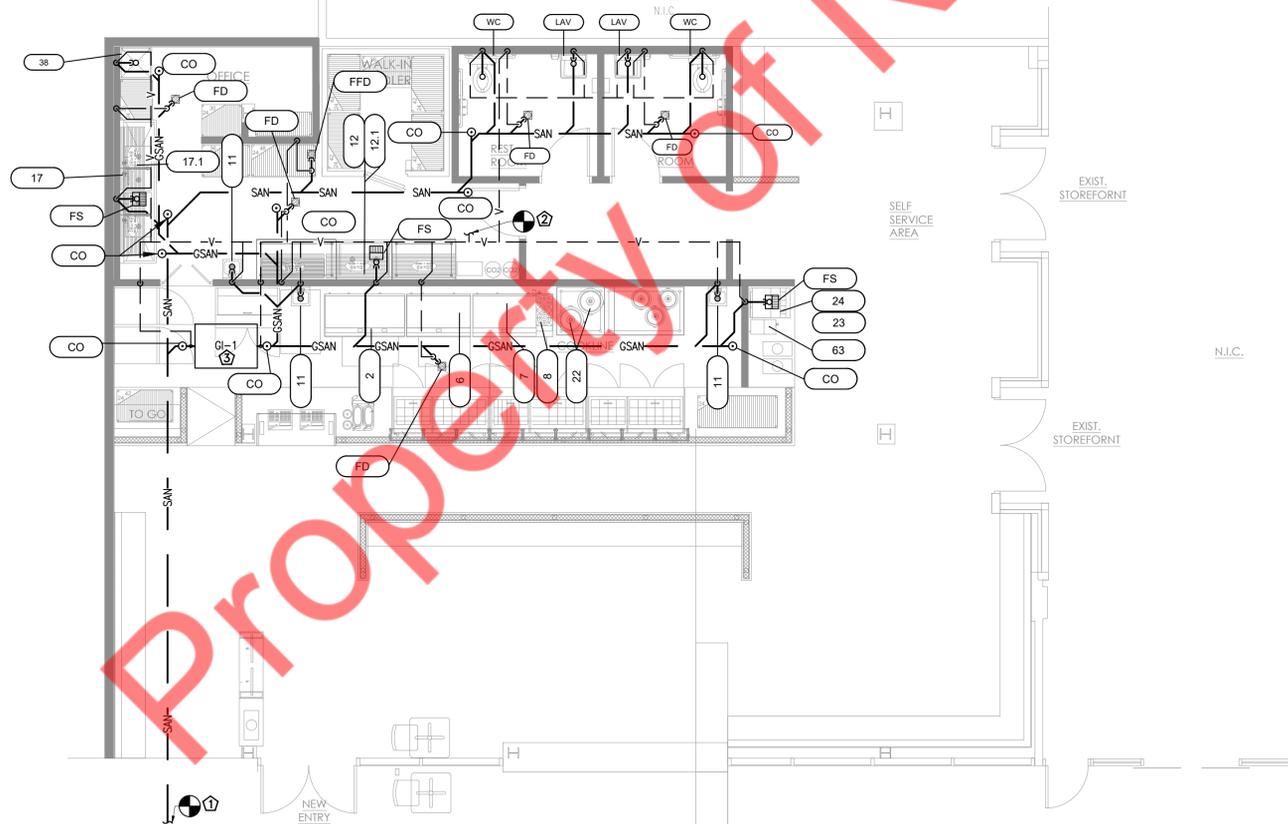
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Drawing Title
PLUMBING DETAILS

Job No. 143.200
Drawn NYE

Sheet No.

P102



PLUMBING DRAINAGE AND VENT LAYOUT

3/16" = 1'-0"

KEY NOTES

- 1. CONNECT NEW 4" SANITARY WASTE PIPING TO EXISTING SANITARY WASTE LINE OF ADEQUATE SIZE IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE, LOCATION, ROUTING AND INVERT OF EXISTING LINE ON SITE.
- 2. CONNECT NEW 3" VENT PIPING TO EXISTING VENT PIPING IN SPACE. CONTRACTOR TO FIELD VERIFY EXACT SIZE AND LOCATION OF EXISTING VENT PIPING.
- 3. GREASE TRAP SCHIER GB-75 OR EQUIVALENT SHALL BE PROVIDED. CONTRACTOR SHALL COORDINATE FINAL LOCATION WITH MANUFACTURER. THE GREASE MANAGEMENT EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND SHALL BE INSTALLED WITH STRICT ADHERENCE TO THE MANUFACTURER'S INSTALLATION INSTRUCTIONS, REQUIREMENTS, AND RECOMMENDATIONS.

GENERAL NOTE:

1. CONTRACTOR SHALL LEAVE NO DEAD ENDS TO CONCEALED, EXPOSED, OR UNDERGROUND PIPING WHEN REMOVING SANITARY PIPING.
2. LOCATION OF EXISTING PLUMBING PIPING ARE TENTATIVE. CONTRACTOR SHALL VERIFY IN FIELD AND DETERMINE THE EXACT LOCATION OF EXISTING PLUMBING PIPES.
3. COORDINATE ALL SERVICE SHUTDOWNS WITH THE LANDLORD, BUILDING STAFF.
4. PROVIDE CUTTING, CORE DRILLING IN WALLS FOR ALL PIPE PENETRATIONS, CONNECTION, AND ALL ASSOCIATED WORK. PROVIDE PATCHING, RESTORATION, AND FINISHING WORK TO MATCH EXISTING CONDITIONS IN ALL ASPECTS.
5. CONTRACTOR TO MAKE ALL FINAL PLUMBING AND GAS CONNECTIONS TO EQUIPMENT AS PER MANUFACTURER'S SPECIFICATIONS.
6. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS.
7. CONTRACTOR TO FIELD VERIFY THE EXISTING SANITARY PIPE SIZE, LOCATION & INVERT ON SITE.
8. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
9. CONTRACTOR TO COORDINATE WITH ARCHITECT FOR THE FLOOR SLOPE IN A THE KITCHEN/FOOD PREP AREAS.
10. ARCHITECT TO COORDINATE EXTENT OF SLAB CUTS AND PATCH/REPAIR WITH DEMO/NEW WASTE AND GREASE WASTE PIPING.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
 382 NE 191st ST, SUITE 49674
 MIAMI, FL 33179
 ANKIT@NY-ENGINEERS.COM
 914-257-3455

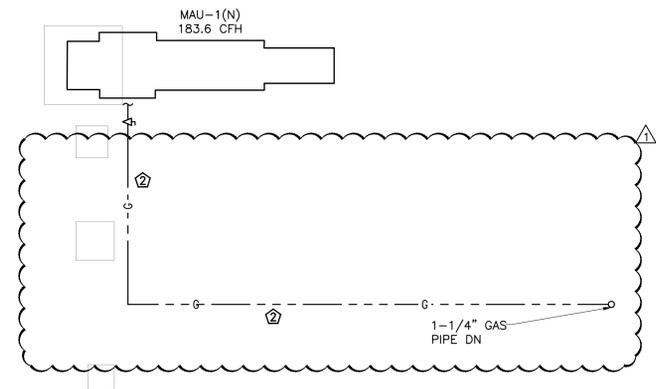
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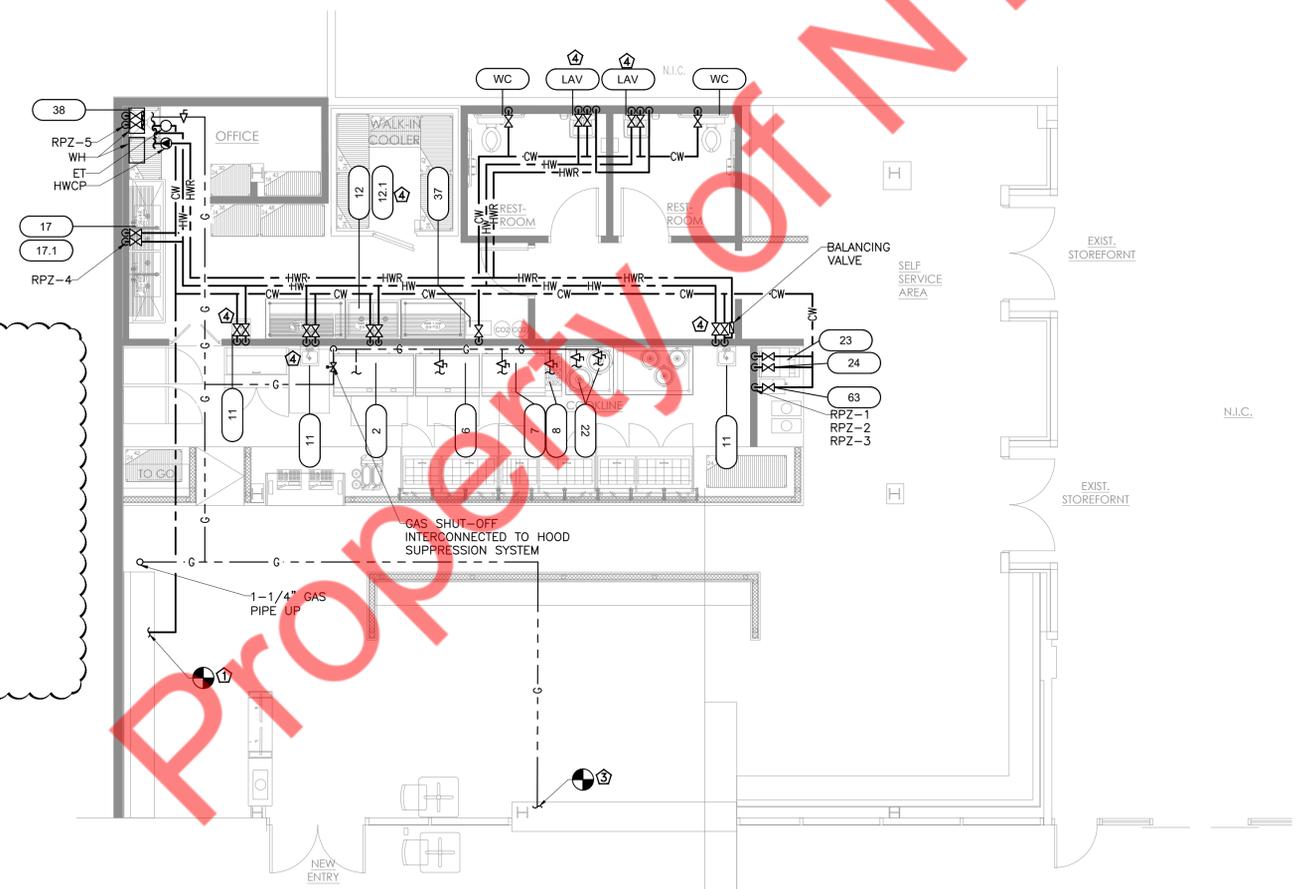
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PLUMBING DRAINAGE & VENT LAYOUT

Job No. 143.200	Drawn NYE
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Sheet No.
P200



PLUMBING GAS PART ROOF LAYOUT 3/16" = 1'-0"



PLUMBING WATER SUPPLY & GAS FLOOR LAYOUT 3/16" = 1'-0"

KEY NOTES

- 1. CONNECT NEW 1/2" CW LINE TO 2" EXISTING WATER MAIN LINE WITH EXISTING WATER METER AND BFP. CONTRACTOR TO FIELD VERIFY SIZE AND LOCATION OF EXISTING WATER LINE, WATER METER AND BACKFLOW PREVENTER REQUIREMENTS AND BASE BID ACCORDINGLY.
- 2. GAS PIPE RUNNING IN ROOF OF ADJACENT TENANT. CONTRACTOR TO COORDINATE WITH LANDLORD/OWNER.
- 3. CONNECT NEW 2" GAS LINE TO EXISTING GAS LINE WITH EXISTING GAS METER. CONTRACTOR TO FIELD VERIFY SIZE, PRESSURE AND LOCATION OF EXISTING GAS METER AND LINE AND UPGRADE IF REQUIRED.
- 4. PROVIDE ASSE 1070 APPROVED MIXING VALVE FOR HAND SINK/LAV.

- GENERAL NOTE:**
1. CONTRACTOR SHALL LEAVE NO DEAD ENDS TO CONCEALED, EXPOSED, OR UNDERGROUND PIPING WHEN REMOVING SANITARY PIPING.
 2. LOCATION OF EXISTING PLUMBING PIPING ARE TENTATIVE. CONTRACTOR SHALL VERIFY IN FIELD AND DETERMINE THE EXACT LOCATION OF EXISTING PLUMBING PIPES.
 3. COORDINATE ALL SERVICE SHUTDOWNS WITH THE LANDLORD, BUILDING STAFF.
 4. PROVIDE CUTTING, CORE DRILLING IN WALLS FOR ALL PIPE PENETRATIONS, CONNECTION, AND ALL ASSOCIATED WORK. PROVIDE PATCHING, RESTORATION, AND FINISHING WORK TO MATCH EXISTING CONDITIONS IN ALL ASPECTS.
 5. CONTRACTOR TO MAKE ALL FINAL PLUMBING AND GAS CONNECTIONS TO EQUIPMENT AS PER MANUFACTURER'S SPECIFICATIONS.
 6. PROVIDE TRAP PRIMER FOR ALL FLOOR DRAINS.
 7. CONTRACTOR TO FIELD VERIFY THE EXISTING SANITARY PIPE SIZE, LOCATION & INVERT ON SITE.
 8. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
 9. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, SHUT-OFF VALVES AS REQUIRED.
 10. REFER RISER DIAGRAM FOR WATER PIPE SIZING.

BACKFLOW PREVENTOR SCHEDULE

LOCATION	TAG	MODEL	ASSE
SODA DISPENSER	RPZ-1	WATTS SERIES 7	1022
ICE MACHINE-OVER SODA FILTERED WATER	RPZ-2	WATTS SD - 3	1022
TEA DISPENSER	RPZ-3	WATTS SD - 3	1022
4 COMP SINK	RPZ-4	WATTS SERIES 765	1020
MOP SINK	RPZ-5	WATTS SERIES 765	1020

NOTE :
VERIFY BACKFLOW VALVE REQUIREMENTS AND APPROVAL FOR ALL EQUIPMENT WITH AUTHORITIES HAVING JURISDICTION PRIOR TO INSTALLATION



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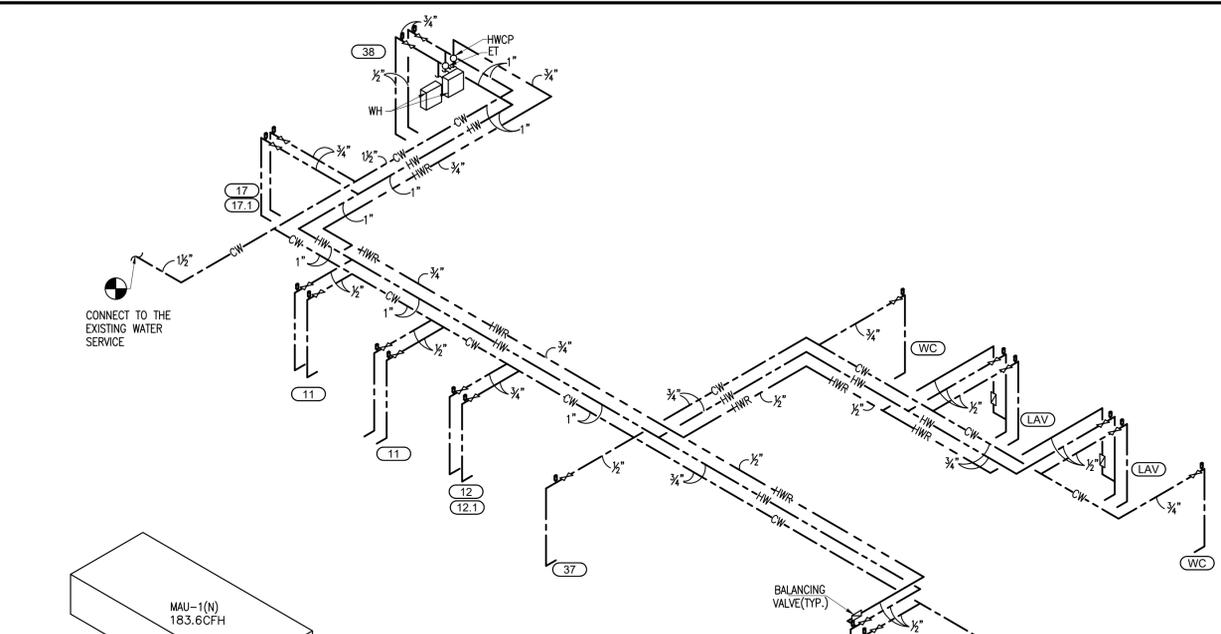
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382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
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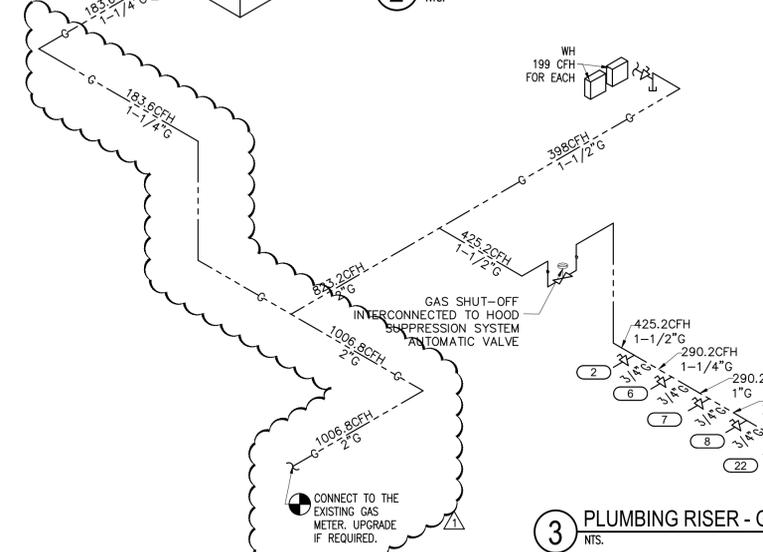
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PLUMBING WATER SUPPLY & GAS LAYOUT

Job No. 143.200
Drawn NYE

Sheet No.
P201



2 PLUMBING RISER - DOMESTIC WATER
NTS.



3 PLUMBING RISER - GAS
NTS.

GAS PIPE SIZING PER INTERNATIONAL FUEL GAS CODE (2015)

LOW PRESSURE SYSTEM
(AS PER INTERNATIONAL FGC TABLE 402.4(2))
INLET PRESSURE - <2 PSI
PRESSURE DROP - 0.5 PSI
LONGEST LENGTH - 145'(APPROX)

GAS DEMAND SCHEDULE

22	RICE COOKER*2	69.2 CFH
2	GAS GRIDDLE	135 CFH
6	GAS GRIDDLE	81 CFH
7	GAS GRIDDLE	108 CFH
8	TWO BURNER	32 CFH
WH	WATER HEATER*2	398 CFH
MAU-1(N)		183.6 CFH
TOTAL DEMAND		= 1006.8 CFH

NOTE: COORDINATE GAS DEMAND REQUIREMENTS. DEVELOPED LENGTH = 143

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.

NOTES:
1. GAS PIPING TO BE SCHEDULE 40 STEEL PIPE W/125 CAST IRON SCREWED FITTINGS
2. GAS SYSTEM TO BE INSTALLED BY QUALIFIED LICENSED CONTRACTOR.
3. VERIFY ALL EQUIPMENT BTU'S PRIOR TO INSTALLATION. ADJUST PIPE SIZE ACCORDING INTERNATIONAL FUEL GAS CODE, 2015, TABLES 402.4(2).

THERMOSTATIC MIXING VALVE

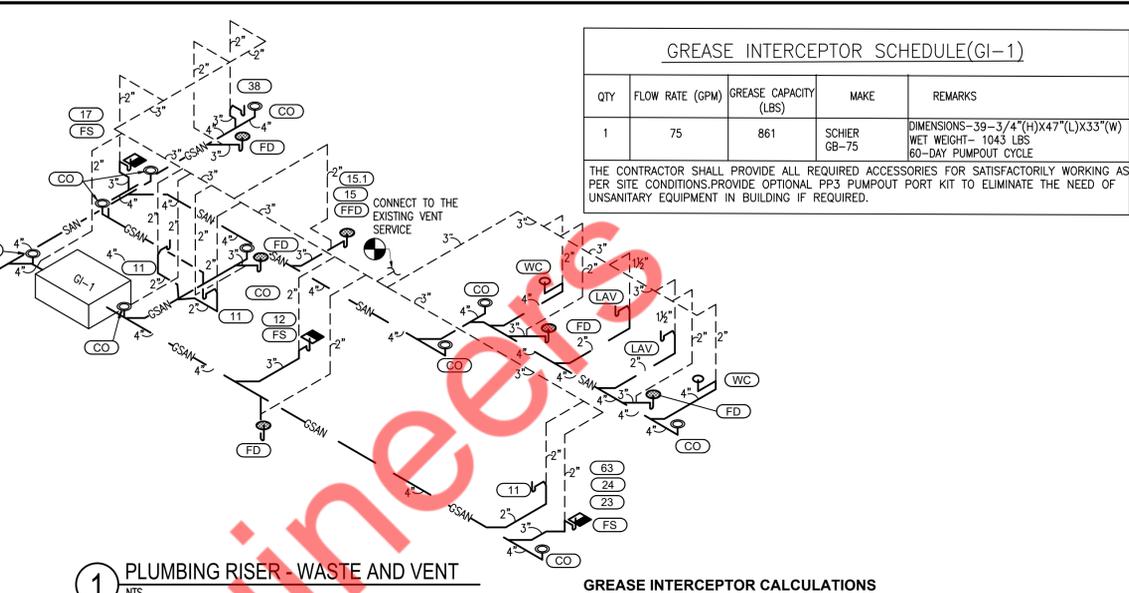
ITEM	CAPACITY (GPM)	PRESSURE DROP (PSI)	MINIMUM FLOW (GPM)	MAKE	CW INLET	HIGH TEMP. INLET	LOW TEMP. OUTLET	REMARKS
TW	5	5	0.5	ACORN MV17-1	1/2"	1/2"	1/2"	-BRONZE BODY AND LEAD FREE CONSTRUCTION -ASSE CERTIFIED

RECIRCULATING PUMP SCHEDULE

MARK	SERVICE	GPM	TOTAL HEAD FT.	MOTOR HP	MANUFACTURER & REMARKS
HWCP	HW RECIRCULATION	2	10	0.115	GRUNDFOS UP 15-18 B5 W/AQUASTAT + TIMER

FOOD SERVICE EQUIPMENT SCHEDULE

TAG	QTY	DESCRIPTION	MANUFACTURER	MODEL	REMARKS	FURN. BY	INST. BY
2	1	GAS GRIDDLE	VULCAN	MSA60	-	OWNER	GC
6	1	GAS GRIDDLE	VULCAN	MSA36	-	OWNER	GC
7	1	GAS GRIDDLE	VULCAN	MSA48	-	OWNER	GC
8	1	TWO BURNER	ATOSA	ACHP-2	-	OWNER	GC
11	3	HAND SINK	JOHN BOOS	TBD	-	OWNER	GC
12	1	2-COMP SINK	JOHN BOOS	2B18244-X	-	OWNER	GC
12.1	1	FAUCET	T&B BRASS	B-0231	-	OWNER	GC
17	1	4-COMP SINK	JOHN BOOS	3B16204-2D18-X	-	OWNER	GC
17.1	1	FAUCET	T&B BRASS	5PR-8W12	-	OWNER	GC
22	2	RICE COOKER	TOWN	RM-SSN-R	-	OWNER	GC
23	1	SODA DISPENSER	LANCER	85-20406-0-031E	-	OWNER	GC
24	1	ICE MACHINE - OVER SODA	HOSHI CORP	KM420MAJ	-	OWNER	GC
38	1	MOP SINK / FAUCET	-	-	-	GC	GC
63	1	TEA BREWER	BUNN	TB6Q-0301	-	OWNER	GC



1 PLUMBING RISER - WASTE AND VENT
NTS.

GREASE INTERCEPTOR SCHEDULE(GI-1)

QTY	FLOW RATE (GPM)	GREASE CAPACITY (LBS)	MAKE	REMARKS
1	75	861	SCHIER GB-75	DIMENSIONS-39-3/4"(H)X47"(L)X33"(W) WET WEIGHT- 1043 LBS 60-DAY PUMPOUT CYCLE

THE CONTRACTOR SHALL PROVIDE ALL REQUIRED ACCESSORIES FOR SATISFACTORILY WORKING AS PER SITE CONDITIONS. PROVIDE OPTIONAL PP-3 PUMPOUT PORT KIT TO ELIMINATE THE NEED OF UNSANITARY EQUIPMENT IN BUILDING IF REQUIRED.

GREASE INTERCEPTOR CALCULATIONS

Project Name: GENGHIS GRILL

Step 1: Flow rate to grease interceptor
Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
11	Hand Sink	10" x 10" x 5"	3	1,500	2.43 GPM
12	2 Compartment Sink	18" x 24" x 14" (2)	1	12,096	19.64 GPM
17	4 Compartment Sink	16" x 20" x 14" (4)	1	17,920	29.09 GPM
38	Mop Basin	22" x 22" x 8"	1	3,872	6.29 GPM
FD	Floor Drain	N/A	3	N/A	0 GPM
FS	Floor Sink	N/A	1	N/A	1.5 GPM
Total					58.95 GPM

Step 2: Grease Production
Number of Seats x 4 turns per seat x Grease Production Value x Days between pump-out = Grease output
Number of seats in facility: 76
Grease production value: 0.035 lbs per serving (Fast Food - Full Prep: High / No flatware)
Days between pump-outs: 60 days
76 x 4 x 0.035 x 60 = 638.4 lbs of FOG

SCHIER MODEL GB-75

Description: Polyethylene Grease Interceptor
Dimensions: Length: 45.5", Width: 33", Height: 40"
Flow Rates/Grease Capacities: 75 GPM / 861.8 lbs
Liquid Capacity: 125 gal

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE - INCHES						REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	
WC	WATER CLOSET	-	4"	2"	3/4"	-	-	FLUSH TANK
LAV	LAVATORY	2"	2"	1 1/2"	1/2"	1/2"	-	PROVIDE P-TRAP
11	HAND SINK	2"	2"	2"	1/2"	1/2"	-	PROVIDE P-TRAP
12	2 COMP SNIK	-	2"	-	3/4"	3/4"	-	INDIRECT WASTE TO FLOOR SINK
17	4 COMP SNIK	-	2"	-	3/4"	3/4"	-	INDIRECT WASTE TO FLOOR SINK
23	SODA DISPENSER	-	1"	-	1/2"	-	-	INDIRECT WASTE TO FLOOR SINK
24	ICE MACHINE - OVER SODA	-	1"	-	1/2"	-	-	INDIRECT WASTE TO FLOOR SINK
63	TEA BREWER	-	1"	-	1/2"	-	-	INDIRECT WASTE TO FLOOR SINK
38	MOP SINK	3"	3"	2"	3/4"	3/4"	-	P-TRAP
FS	FLOOR SINK	3"	3"	2"	-	-	-	P-TRAP
FFD	FUNNEL DRAIN	3"	3"	2"	-	-	-	P-TRAP
FD	FLOOR DRAIN	3"	3"	2"	-	-	-	P-TRAP

NOTE: CONTRACTOR TO COORDINATE WITH ARCHITECTURAL DRAWINGS FOR ALL PLUMBING FIXTURES SPECIFICATIONS AND MOUNTING HEIGHT INSTALLATION.

HOT WATER HEATER

TAG No.	MAX INPUT (MBH)	FLOW (GPM)	FIXTURES SERVING	QUANTITY	TYPE	THERMAL EFFICIENCY %	MANUFACTURER & MODEL NO.	REMARKS
WH	199	5.4@70°F	4-COMPARTMENT SINK, 2-COM SINK SINK, MOP SINK, HAND SINK, LAVATORY, DROP IN HAND SINK	2	GAS TANKLESS TYPE WATER HEATER	94	RINNAI CU1991	-DIMENSIONS 18.5"LX26.4"HX11.4"W

NOTE:
1. VACUUM RELIEF VALVE SHALL CONFIRM WITH ANSI 221.22.
2. PROVIDE EXPANSION TANK (ET) WATTS AMTROL ST-5 OR SIMILAR.



GENGHIS GRILL

NY ENGINEERS

NEARBY ENGINEERS
382 NE 191st ST, SUITE 49674
MIAMI, FL 33179
ANKIT@NY-ENGINEERS.COM
914-257-3455

REVISIONS

NO.	DATE	ISSUED FOR	COMMENTS
05/23/23		ISSUED PER LL	COMMENTS
03/21/23		ISSUED FOR PERMIT	

Drawing Title
PLUMBING RISER
DIAGRAMS & SCHEDULE

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