MECHANICAL SYMBOLS LIST

AC-1 / EF-1	EQUIPMENT SYMBOL
	POINT OF NEW CONNECTION TO EXISTING
AIR DEVICES	
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN/EXHAUST
DUCT ACCESSORIES	
VD VD	VOLUME DAMPER W/ ACCESS DOOR
CONTROLS AND SENSORS	
T	THERMOSTAT
DUCTWORK	
	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	RETURN AIR RECTANGULAR DUCT CROSS SECTION

MECHANICAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
BOD	BOTTOM OF DUCT
BOE	BOTTOM OF EQUIPMENT
CDS	CEILING DIFFUSER SUPPLY
CDR	CEILING DIFFUSER RETURN
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CD	CONDENSATE DRAIN PIPE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
FC	FLEXIBLE CONNECTION
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
VD	VOLUME DAMPER
RTU	ROOF TOP UNIT
V.I.F.	VERIFY IN FEILD
S.A.E.	SAME AS EXISTING
CU	CONDENSER UNIT

MECHANICAL DRAWING LIST

APPLICABLE CODES

A. 2015 INTERNATIONAL BUILDING CODE
B. 2015 INTERNATIONAL MECHANICAL CODE
C. 2021 INTERNATIONAL ENERGY CONSERVATION CODE
D. 248 CMR UNIFORM STATE PLUMBING CODE
E. 248 CMR MASSACHUSETTS FUEL GAS CODE.

MASSACHUSETTS BUILDING NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF NINTH EDITION OF MASSACHUSETTS STATE BUILDING CODE 780; BASE CODE ICC IBC 2015, AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
2. 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.
3. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE INTERNATIONAL MECHANICAL CODE 2015:
   A. VENTILATION SYSTEMS – 2015 IMC 403.1.
4. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
   A. DUCT CONSTRUCTION AND INSTALLATION– 2015 IMC 603
   B. AIR INTAKES, EXHAUSTS AND RELIEFS – 2015 IMC 401.5
   C. AIR FILTERS – 2015 IMC 605.
5. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
6. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2015 IMC 403.1.
7. 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 2015 IMC 403.3.
8. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE–RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
9. 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.
10. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.

GENERAL NOTES

1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF–DAYS WITHOUT PRIOR WRITTEN APPROVAL.
4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
6. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
7. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
8. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
9. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN TIME.
10. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
11. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
12. 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.
13. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
14. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
15. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE.
16. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
19. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
20. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
21. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON–SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
22. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
23. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL.
24. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
25. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY. DEFINITIONS:
   1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
   2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
   3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES. 31.

SCOPE OF WORK

SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.
2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

HVAC NOTES

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

   1. AIR SYSTEMS: CONSTANT

1.2 QUALITY ASSURANCE

A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING, ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.

1.3 EXECUTION

A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.

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

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

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

E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.

F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS S3ECTION WITH THE BUILDING MANAGER. BALANCING WORK SHALL NOT CONFLICT WITH OTHER WORK SO AS TO MAINTAIN COMPLETION WITHIN THE SPECIFIED TIME.

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

H. TOLERANCES: PLUS OR MINUS 5 PERCENT OF DESIGN VALUES.

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

J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 233713 – DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

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

B. MANUFACTURERS: TITUS

   1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
      a. CARNES.
      b. HART & COOLEY INC.
      c. KRUEGER.
      d. METALAIRE, 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

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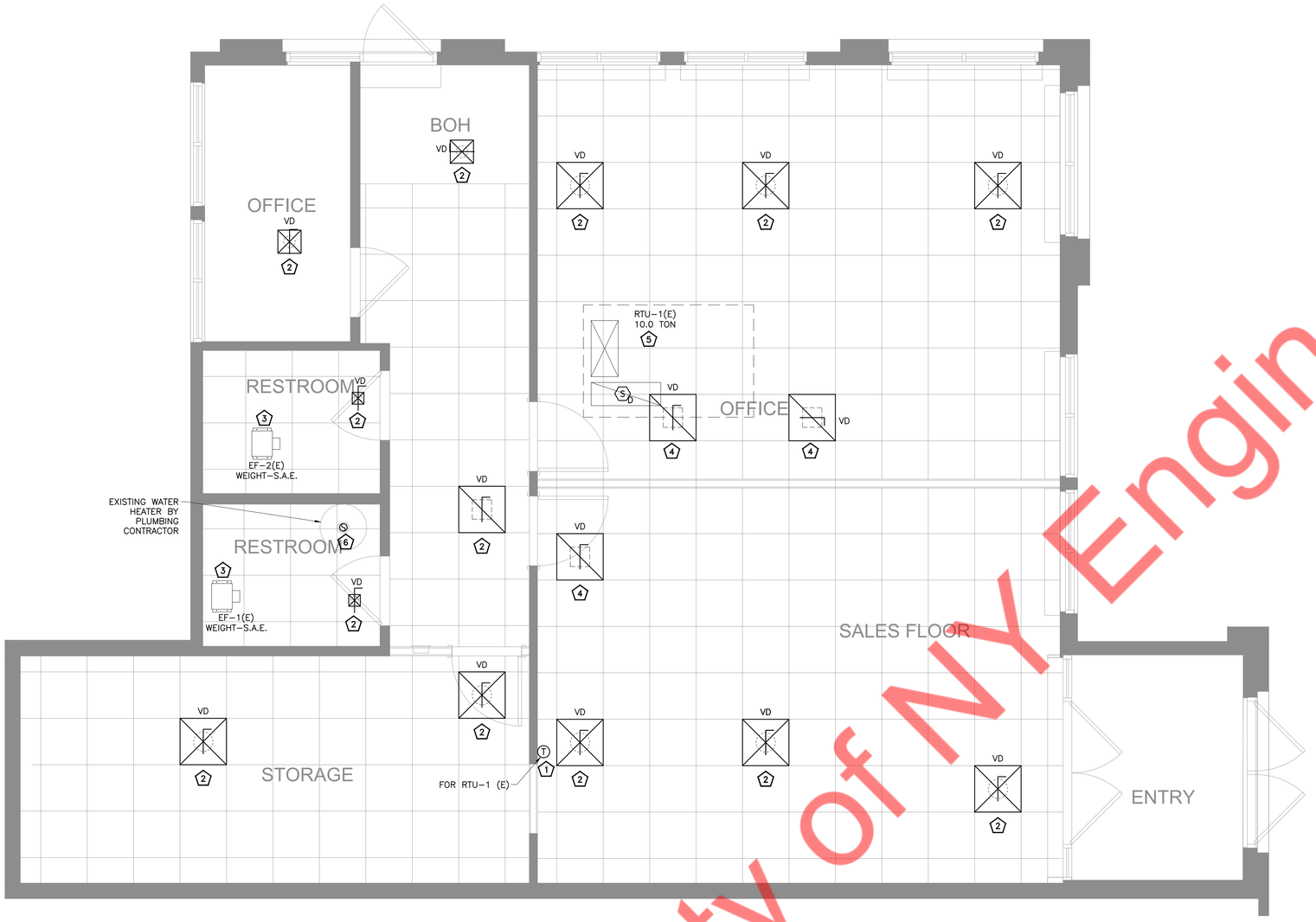
MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS

M0.01



MECHANICAL FLOOR PLAN 1
3/8" = 1'-0"

MECHANICAL GENERAL NOTES:

A. ALL WORK SHALL COMPLY WITH ALL LOCAL CODE & STATE CODE & AUTHORITIES HAVING JURISDICTION.
B. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
C. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
D. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
E. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
F. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
G. PROVIDE MINIMUM R-6 INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT. FROM HVAC UNIT.
H. CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT. ALL EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT TO BE REUSED.
I. ALL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED TO LIKE NEW CONDITION PRIOR TO RE-USE.
J. PROVIDE NECESSARY PROTECTIVE DEVICES WHERE REQUIRED AND IN STRICT ACCORDANCE WITH OSHA AND ICRA REGULATIONS.
K. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.
L. MATERIAL FROM EXISTING SYSTEM WHICH IS RENDERED USELESS SHALL BE REMOVED AND DISPOSED OF OFF SITE.
M. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLISHED BUT BECOME DAMAGED DURING THE PROGRESS OF THE WORK. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS TO THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND AT NO ADDITIONAL COST TO THE OWNER.

MECHANICAL FLOOR PLAN KEY NOTES:

1. EXISTING T-STAT CONTROL TO REMAIN AS IS. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION & WORKING CONDITION. REPLACE AS/IF REQUIRED.
2. EXISTING DIFFUSERS AND GRILLES FROM EXISTING RTU TO REMAIN AS IS. RELOCATE AS/IF REQUIRED AS PER NEW RCP. CONTRACTOR TO FIELD VERIFY. IF DAMAGED, REPLACE WITH SIMILAR KIND.PROVIDE VOLUME DAMPER OR COLLAR DAMPER, VERIFY IN FIELD PRIOR TO BID.
3. EXISTING TOILET EXHAUST SYSTEM TO REMAIN AS IS.
4. EXISTING SUPPLY/RETURN DIFFUSERS TO REMAIN & TO BE RELOCATED AS SHOWN. VERIFY SIZE, LOCATION AND COORDINATE WITH ARCHITECTURAL SHEETS INCLUDING REFLECTED CEILING PLAN FOR RELOCATIONS. CLEAN AND REFURBISH TO "LIKE NEW" CONDITION EXTEND/MODIFY DUCTWORK AS REQUIRED AT RELOCATED DIFFUSERS. PROVIDE VOLUME DAMPER OR COLLAR DAMPER, VERIFY IN FIELD PRIOR TO BID. EXTEND EXISTING FLEX/METAL DUCTWORK AS/IF REQUIRED DUE TO RELOCATION OF THE DIFFUSERS.
5. EXISTING SMOKE DETECTOR TO REMAIN AS IS. IF EXISTING SMOKE DETECTOR IS NOT IN GOOD CONDITION TO REUSE, THEN INSTALL NEW ONE. SMOKE DETECTOR SHALL BE FURNISHED/INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO SHUT DOWN CORRESPONDING RTU UNDER ALARM CONDITIONS.
6. EXISTING VENT FROM HOT WATER HEATER TO REMAIN. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION OF EXISTING WATER HEATER.

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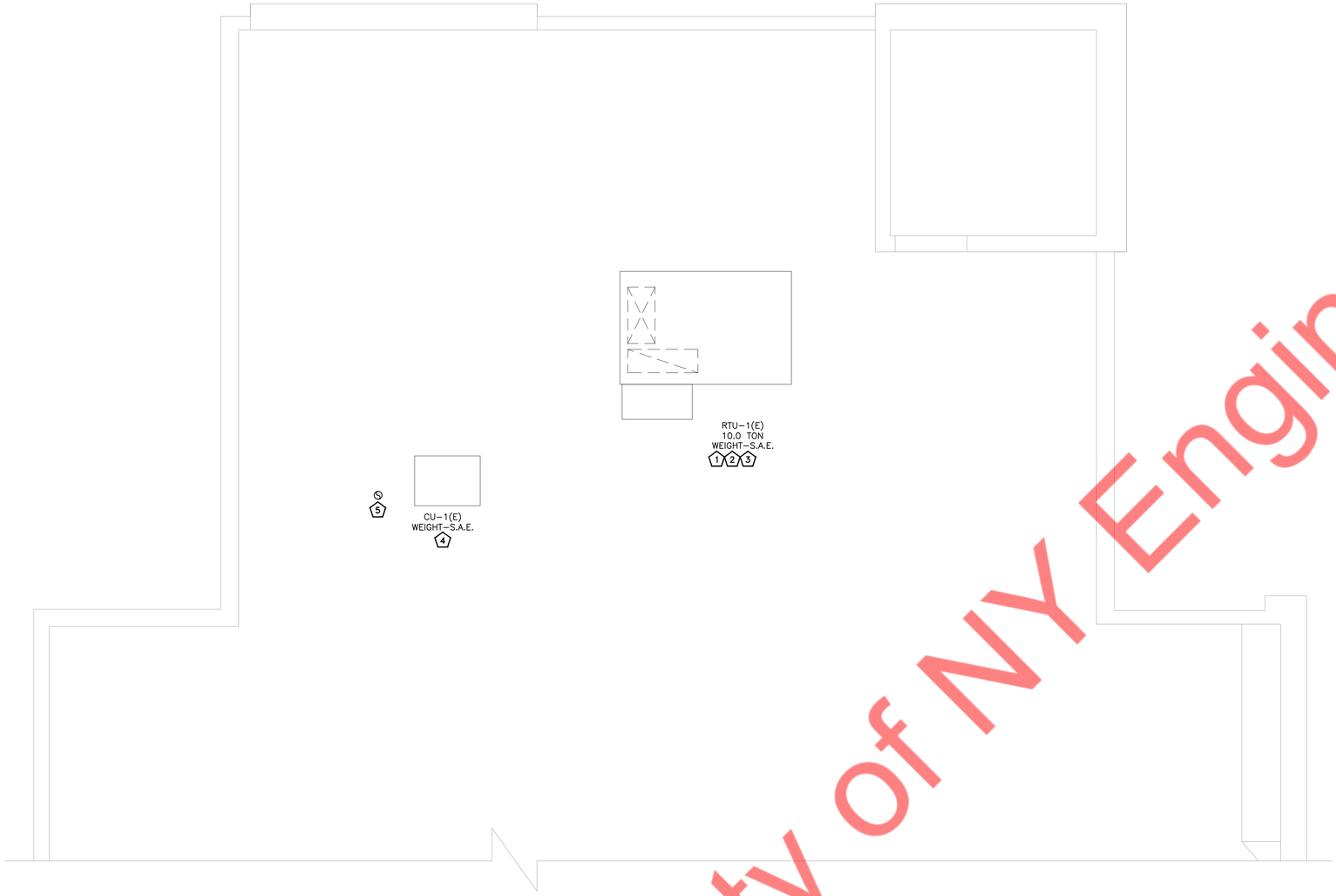
MECHANICAL FLOOR PLAN

M1.01



MECHANICAL ROOF PLAN 1
3/8" = 1'-0"

MECHANICAL GENERAL NOTES:

A. ALL WORK SHALL COMPLY WITH ALL LOCAL CODE & STATE CODE & AUTHORITIES HAVING JURISDICTION.
B. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL ENGINEERS.
C. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK, PIPING ETC.
D. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.
E. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
F. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
G. CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT. ALL EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT TO BE REUSED.
H. M.C. TO COORDINATE INSTALLATION OF WATER HEATER EXHAUST FLUE WITH PLUMBING CONTRACTOR.
I. ALL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED TO LIKE NEW CONDITION PRIOR TO RE-USE.
J. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLISHED BUT BECOME DAMAGED DURING THE PROGRESS OF THE WORK. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS TO THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND AT NO ADDITIONAL COST TO THE OWNER.

MECHANICAL ROOF PLAN KEY NOTES:

1. COORDINATE FINAL LOCATION OF EQUIPMENT IN FIELD.
2. CONTRACTOR TO FIELD VERIFY EXISTING RTU LOCATION & PENETRATION.
3. EXISTING CONDENSATE DRAIN FROM EXISTING RTU TO REMAIN AS IT IS. CONTRACTOR TO FLUSH THE EXISTING DRAIN LINES.
4. EXISTING CONDENSING UNIT OF ICE MAKER MACHINE TO REMAINS.
5. EXISTING VENT FROM HOT WATER HEATER TO REMAIN. CONTRACTOR TO FIELD VEIFY THE EXACT LOCATION OF EXISTING WATER HEATER.

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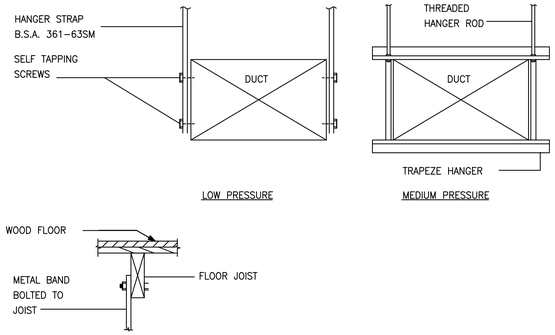
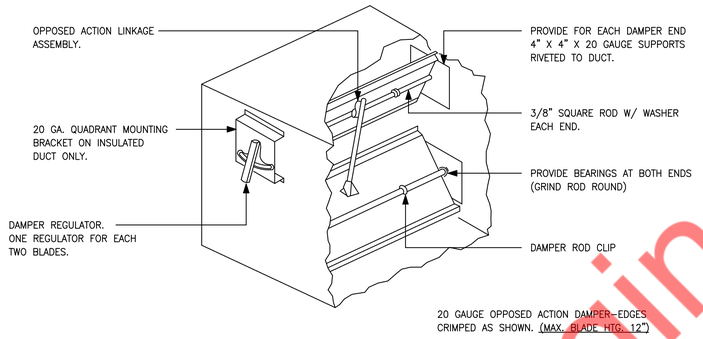
MECHANICAL
ROOF PLAN

M1.02

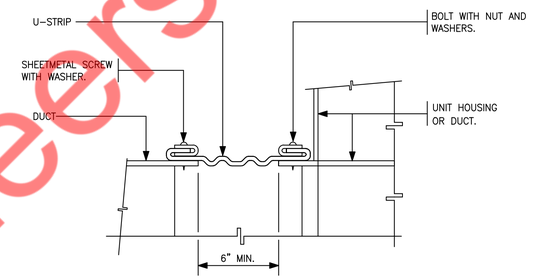


1 / M5.01 METHOD OF HANGING DUCTWORK N.T.S

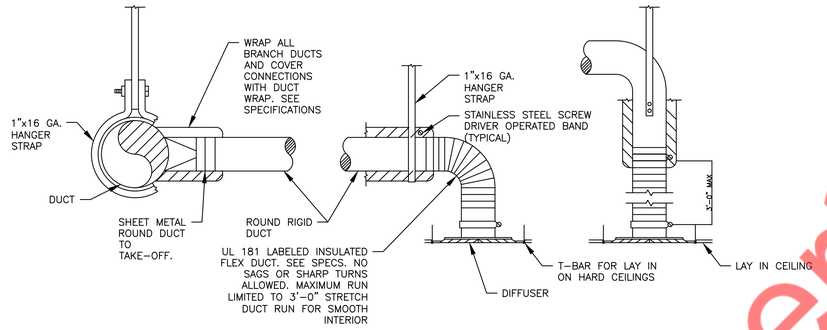


NOTE : 1. FOR DUCTS OVER 29" WIDE AND/OR OVER 12" HIGH.

2 / M5.01 LOW PRESSURE BALANCING DAMPER N.T.S



3 / M5.01 FLEXIBLE CONNECTION (DUCT-EQUIPMENT) N.T.S



4 / M5.01 TYPICAL DIFFUSER CONNECTION DETAIL N.T.S

EXISTING ROOF TOP UNIT SCHEDULE

UNIT ID	MANUFACTURER	MODEL	NOMINAL TONS	SUPPLY FAN DATA			GAS HEAT		COOLING DATA					ELECTRICAL DATA				EER	SEER	THERMAL EFFICIENCY (%)	OPERATING WEIGHT (LBS)	REMARK
				TOTAL SUPPLY CFM	OUTSIDE AIR CFM	EXTERNAL STATIC PRESSURE (IN. W.G.)	INPUT MBH	OUTPUT MBH	TOTAL MBH	SENSIBLE MBH	AMBIENT TEMP. DB (°F)	ENTERING TEMP. DB / WB(°F)	STAGES	VOLTS	PHASE	MCA(A)	MOCP(A)					
RTU-1(E)	CARRIER	48HJE012***571**(V.I.F.)	10	4000 (V.I.F.)	220	S.A.E	224 (V.I.F.)	147 (V.I.F.)	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	208-230	3	53 (V.I.F.)	60 (V.I.F.)	S.A.E	S.A.E	S.A.E	S.A.E	EXISTING

NOTES FOR EXISTING RTU :

1. S.A.E :- SAME AS EXISTING, V.I.F:- VERIFY IN FIELD.
2. EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
3. CONTRACTOR TO CONFIRM IF EXISTING RTU IS WORKING AT 100% RATED CAPACITY.
4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.
5. IF REQUIRED, PROVIDE NEW THERMOSTATS COMPATIBLE WITH EXISTING RTU. COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER.
6. CONTRACTOR TO REBALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.
7. REPLACE ALL THE FILTERS, IF REQUIRED. PROVIDE MINIMUM MERV-8 FILTERS.

VENTILATION CALCULATION

ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS PER IMC 2015	NUMBER OF PEOPLE AS PER IMC 2015	NUMBER OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR AS PER IMC 2015		REQ. OA (CFM)	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR /FIXT.)	TOTAL EXHAUST (CFM)	PROVIDED EXHAUST (CFM)
						CFM/PEOPLE	CFM/SQ.FT					
SALES FLOOR	383	15	6	0	8	7.5	0.12	106	110	0	0	0
BOH	166	0	0	0	0	0	0.12	20	20	0	0	0
OFFICE-1	402	5	3	0	3	5	0.06	39	45	0	0	0
OFFICE-2	75	5	1	0	1	5	0.06	10	10	0	0	0
ENTRY	72	10	1	0	0	5	0.06	4	5	0	0	0
RESTROOM-1	47	0	0	0	0	0	0	0	0	70	70	70
RESTROOM-2	47	0	0	0	0	0	0	0	0	70	70	70
STORAGE	215	0	0	0	0	0	0.12	26	30	0	0	0
TOTAL	**1407**	**-**	**11**	**-**	**12**	**-**	**-**	**205**	**220**	**-**	**140**	**140**

AIR BALANCE TABLE

UNIT	AREA SERVED	SUPPLY AIR (CFM)	OUTSIDE AIR (CFM)	RETURN AIR (CFM)	EXHAUST AIR (CFM)
RTU-1 (E)	SEE PLAN	4000 CFM	220 CFM	3780 CFM	0 CFM
EF-1 (E)	RESTROOM	-	-	-	70 CFM
EF-2 (E)	RESTROOM	-	-	-	70 CFM
	TOTAL:	4000 CFM	220 CFM	3780 CFM	140 CFM
	BUILDING PRESSURE:	.....		80 CFM	**POSITIVE**

NOTES:

1. CONTRACTOR TO BALANCE OUTSIDE AIR & RETURN AIR DAMPER ON RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE.

EXISTING MECHANICAL FAN SCHEDULE

TAG	QUANTITY	FLOW RATE	STATIC PRESSURE	ELECTRIC DATA			MAXIMUM LOUDNESS	WEIGHT	BASIS OF DESIGN	
			EXTERNAL	SPEED	WATTS (W)	V/PH/HZ				
		CFM	IN W.G.	RPM			DBA	LBS	MANUFACTURER	MODEL
EF-1 (E)	1	70 (V.I.F.)	S.A.E.	S.A.E.	V.I.F.	V.I.F.	S.A.E.	S.A.E.	S.A.E.	S.A.E.
EF-2 (E)	1	70 (V.I.F.)	S.A.E.	S.A.E.	V.I.F.	V.I.F.	S.A.E.	S.A.E.	S.A.E.	S.A.E.

NOTES:

1. S.A.E :- SAME AS EXISTING, V.I.F:- VERIFY IN FIELD.

EXISTING AIR COOLED CONDENSING UNIT SCHEDULE

TAG	LOCATION	SERVICE	TONS	COOLING CAPACITY (MBH)	HEATING CAPACITY (MBH)	ELECTRICAL DATA			SEER/EER	HSPF/ COP	DIMENSIONS (LXWXD)	MAKE-MANITOWOC	
						PH/VOLT/HZ	MCA (A)	MOCP (A)				WEIGHT (LBS)	MODEL
CU-1(E)	ROOF	ICE MAKER	S.A.E	(V.I.F.)	(V.I.F)	1/208-230/60 (V.I.F.)	19.6 (V.I.F.)	35.0 (V.I.F.)	S.A.E.	S.A.E.	S.A.E.	S.A.E.	CVD1475(V.I.F.)

NOTES

1. S.A.E : SAME AS EXISTING. VIF : VERIFY IN FIELD
2. EXISTING CU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.
3. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF CU ON SITE.

PLAYERS CAFE

REVISIONS

△	ISSUE	DATE
	PERMIT SET	03/08/24

MECHANICAL DETAILS & EQUIPMENT SCHEDULES

M5.01

ELECTRICAL LEGEND

NOTES:
- ALL MOUNTING HEIGHTS GIVEN ARE TO CENTERLINE OF DEVICE UNLESS OTHERWISE NOTED.
- ALL SYMBOL MAY NOT BE USED.

SYMBOL	DESCRIPTION
	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) - MOUNT AT 15" A.F.F. U.N.O.
A	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) - MOUNT ABOVE COUNTER BACKSPLASH OR 42" A.F.F.
C	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) - MOUNT AT CEILING
GFI	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) - GFI TYPE - MOUNT AT 18" A.F.F. U.N.O.
WP	GROUNDED DUPLEX GFI RECEPTACLE (NEMA5-20R) W/ "WEATHERPROOF WHILE IN USE" COVER
	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) WITH TOP RECEPTACLE CONTROLLER BY SWITCH/SENSOR AND BOTTOM RECEPTACLE SHALL NOT BE CONTROLLED BY SWITCH/SENSOR. CONTROLLED RECEPTACLE SHALL BE PERMANENTLY MARKED AS PER NEC 406.3 (E) AND PROVIDED IN GREEN COLOR.
U	GROUNDED DUPLEX RECEPTACLE WITH INTEGRAL USB-A & USB-C CHARGING PORTS (EQUAL TO HUBBELL, #USB20AC5) - MOUNT AT 15" A.F.F. U.N.O.
	SPECIAL PURPOSE RECEPTACLE - MATCH NEMA CONFIGURATION OF EQUIPMENT SERVED - MOUNT AT 15" A.F.F. U.N.O.
	GROUNDED DOUBLE DUPLEX RECEPTACLE (NEMA5-20R) - MOUNT AT 15" A.F.F. U.N.O.
	GROUNDED DOUBLE DUPLEX RECEPTACLE (NEMA5-20R) WITH TOP RECEPTACLE CONTROLLER BY SWITCH/SENSOR AND BOTTOM RECEPTACLE SHALL NOT BE CONTROLLED BY SWITCH/SENSOR. CONTROLLED RECEPTACLE SHALL BE PERMANENTLY MARKED AS PER NEC 406.3 (E) AND PROVIDED IN GREEN COLOR.
	COMBINATION OF TELEPHONE AND DATA POINT
WAP	WIRELESS ACCESS POINT (WAP) WITH JUNCTION BOX, 1" CONDUIT TILL CEILING SPACE WITH PULL STRING, ONE 90° ELBOW AND PLASTIC BUSHING AT BOTH ENDS WITH TWO (2) CAT6 PLENUM RATED DATA CABLES TO IT RACK.
	FLUSH MOUNTED FLOOR BOX WITH RECEPTACLE AS LISTED ABOVE
	FLUSH MOUNTED FLOOR BOX WITH DATA DEVICES AS LISTED ABOVE
	FLUSH MOUNTED FLOOR BOX WITH RECEPTACLE/DATA DEVICES AS LISTED ABOVE
	JUNCTION BOX
	SINGLE FACE EXIT SIGN WALL/CEILING MOUNTED WITH INTEGRAL BACK-UP BATTERY AND DIRECTIONAL ARROWS AS SHOWN.

ABBREVIATION

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
A	AMPERE	J	JUNCTION BOX
A.F.F.	ABOVE FINISH FLOOR	KEF	KITCHEN EXHAUST FAN
APS	AUXILIARY POWER SUPPLY	LCP	LIGHTING CONTROL PANEL
C	CONDUIT	LTG	LIGHTING
CKT	CIRCUIT	LV	LOW VOLTAGE
CU	CONDENSING UNIT	MCB	MAIN CIRCUIT BREAKER
DE	DEMOLITION	MD	MOTORIZED DAMPER
DF	DESTRATIFICATION FAN	MDP	MAIN DISTRIBUTION PANEL
DWCP	DOMESTIC WATER CIRCULATING PUMP	MH	MOUNTING HEIGHT
E.C.	ELECTRICAL CONTRACTOR	MLO	MAIN LUGS ONLY
EF	EXHAUST FAN	N	NEW
EM	ITEM PROVIDED WITH OR CONNECTED TO EMERGENCY POWER	NL	NIGHT LIGHT
		P	POLE
EMT	ELECTRICAL METALLIC TUBING	PE	PRIMARY ELECTRIC SERVICE
ER	EXISTING TO REMAIN	PP	POWER PANEL
ETP	ELECTRONIC TRAP PRIMER	PVC	POLYVINYL CHLORIDE CONDUIT
ETR	EXISTING TO REMAIN	RE	RELOCATE
EV	EVAPORATOR UNIT	RGS	RIGID GALVANIZED STEEL CONDUIT
EWC	ELECTRIC WATER COOLER	RTU	ROOF TOP UNIT
EWH	ELECTRIC WATER HEATER	SF	SAFETY SWITCH
EX	EXISTING TO REMAIN	SW	SWITCHBOARD
FACP	FIRE ALARM CONTROL PANEL	T.B.D.	TO BE DETERMINED
FATC	FIRE ALARM TERMINAL CABINET	TR	TAMPER RESISTANT
G.C.	GENERAL CONTRACTOR	TV	TELEVISION
GFI	GROUND FAULT INTERRUPTER	TX	TRANSFORMER
HT	HEAT TRACE	U.N.O.	UNLESS NOTED OTHERWISE
HVAC	HEATING VENTILATION AIR CONDITIONING	WH	WATER HEATER
		WP	WEATHER PROOF
IG	ISOLATED GROUND	E	EXISTING

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL BE PERFORMED IN COMPLIANCE WITH CURRENT APPLICABLE CODES, ORDINANCES, THE REGULATORY AGENCIES HAVING JURISDICTION AND THE SPECIFICATIONS. THE SPECIFICATIONS MAY EXCEED THE REQUIREMENTS OF THE CODE, THE MOST STRINGENT CONDITION WILL APPLY.
2. THE INTENT OF THESE DOCUMENTS IS FOR THE MEP TRADES TO FURNISH AND INSTALL PARTIAL MECHANICAL AND ELECTRICAL SYSTEMS. THE SPECIFIED ELECTRICAL SYSTEM SHALL BE COMPLETE IN ALL RESPECTS; OPERATIONAL, TESTED, ADJUSTED, APPROVED BY THE AUTHORITIES HAVING JURISDICTION AND READY FOR BENEFICIAL USE BY THE OWNER.
3. THE TRADES SHALL OBTAIN AND REVIEW ALL CONTRACT DOCUMENTS BEFORE SUBMITTING A BID. INFORMATION IS PROVIDED ON THE VARIOUS DRAWINGS, SCHEDULES, SPECIFICATIONS AND ALL OF THE VARIOUS DOCUMENTS IN THE BIDDING PACKAGE. THE CONTRACT DOCUMENTS ARE COMPLEMENTARY AND FORM A TOTAL PROJECT DESIGN AND INFORMATION SOURCE FOR CONSTRUCTION PURPOSES.
4. THE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF SYSTEMS AND WORK INCLUDED IN THE CONTRACT. COORDINATE LOCATIONS OF EQUIPMENT WITH OTHER TRADES BEFORE AND DURING CONSTRUCTION. ANY MODIFICATION TO THE EQUIPMENT LAYOUT, REQUIRED FOR INSTALLATION, IS TO BE PERFORMED UNDER THE CONTRACT AGREEMENT, AT NO ADDITIONAL COST. REFER TO DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.
5. THE CONTRACTOR SHALL BECOME THOROUGHLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES. THE DRAWINGS ARE DIAGRAMMATIC AND SHOW THE GENERAL ARRANGEMENT OF EQUIPMENT AND CONDUITS. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF EQUIPMENT AND CONDUITS INSTALLATION WITH ALL THE TRADES BEFORE COMMENCING WORK.
6. EQUIPMENT SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS. WHEN EQUIPMENT MUST BE LOCATED ABOVE AN INACCESSIBLE CEILING (GYP BOARD OR EQUIVALENT), OR BEHIND A WALL, AN APPROPRIATE ACCESS DOOR SHALL BE PROVIDED. IF AN ACCESS DOOR IS REQUIRED, IT SHALL BE OF A RATING APPROPRIATE FOR THE WALL/CEILING IN WHICH IT IS TO BE INSTALLED. THE CONTRACTOR SHALL COORDINATE LOCATIONS OF ACCESS PANELS FOR ALL DEVICES, REQUIRING ACCESS, WITH THE ARCHITECT, PRIOR TO INSTALLATION OF SUCH DEVICES OR OTHER APPURTENANCES.
7. WHERE A CONFLICT OCCURS BETWEEN THE DOCUMENTS, IT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT. CARRY AS PART OF THE BID THE LARGER QUANTITY AND/OR MORE EXPENSIVE ITEM(S).
8. THIS CONTRACT SHALL INCLUDE ALL THE NECESSARY CONDUITS, FITTINGS, TRANSITIONS ETC. AS REQUIRED TO INSTALL CONDUITS AND EQUIPMENT, AND TO AVOID ANY CONFLICTS WITH OTHER TRADES AND THE BUILDING STRUCTURE. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY ASSUMPTIONS, OMISSIONS OR ERRORS HE MAKES AS A RESULT OF HIS FAILURE TO COORDINATE WITH OTHER TRADES OR BECOME FULLY FAMILIAR WITH THE PROJECT DOCUMENTS OF ALL TRADES.
9. DO NOT INSTALL ANY ELECTRICAL PANELS, TRANSFORMERS, SPECIAL EQUIPMENT, BELOW PIPING OR THROUGH MECHANICAL ROOMS, THAT ARE NOT ASSOCIATED WITH OR SERVE THE RESPECTIVE ROOMS. COORDINATE THE LOCATION OF MECHANICAL EQUIPMENT IN THE FIELD AND ADJUST AS NECESSARY.
10. CONTRACTOR TO FOLLOW EXISTING BASE BUILDING PHASING COLOR CODE. IF BASE BUILDING PHASING COLOR CODE IS UNKNOWN, FOLLOW CEC OR CODE AS MENTIONED IN SPECIFICATION.
11. FIELD VERIFY WITH MANUFACTURER'S PROVIDED EXACT ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS OF ALL OPERATIONAL EQUIPMENT PRIOR TO MAKING ELECTRICAL POWER CONNECTION. FURNISH AND INSTALL SAFETY DISCONNECT AS REQUIRED BY NEC.
12. ELECTRICAL CONTRACTOR SHALL COORDINATE ALL LOCATIONS OF EQUIPMENT WITH DIV. 21, 22 AND 23 PRIOR TO ROUGHING OR INSTALLING OUTLETS.
13. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE OWNER, ALL LOCATIONS OF EQUIPMENT BEING FURNISHED BY THE OWNER PRIOR TO ROUGHING OR INSTALLING OUTLETS.
14. REFER TO ARCHITECTURAL DRAWINGS FOR ELEVATIONS AND EXACT LOCATION OF DEVICES PRIOR TO ROUGHING OR INSTALLATION OF OUTLETS.
15. REFER TO ARCHITECTS REFLECTED CEILING PLAN FOR EXACT LOCATIONS OF CEILING MOUNTED DEVICES.
16. CONTRACTOR SHALL PROVIDE ALL NECESSARY MISCELLANEOUS STEEL FOR THE SUPPORT OF ALL EQUIPMENT, PIPING, CONDUIT AND DUCTWORK. SUSPENDED FROM SLAB, STEEL, WALL OR TRUSSWORK.
17. ELECTRICAL CONTRACTOR SHALL SEAL ALL CONDUITS PENETRATING EXTERIOR WALLS WITH FIRE STOPPING MATERIAL.
18. ALL PENETRATIONS OF FLOORS AND WALLS (WHETHER OR NOT FIRE RESISTANCE RATED) SHALL BE PROVIDED WITH A THROUGH PENETRATION PROTECTION SYSTEM (FIRESTOPPING). EACH THROUGH - PENETRATION PROTECTION SYSTEM SHALL BE TESTED IN ACCORDANCE WITH ASTM E814 AND BE LISTED FOR THE TYPE OF FLOOR OR WALL ASSEMBLY PENETRATED AND THE TYPE OF PROTECTION SYSTEM.
19. IT IS NOT THE INTENTION TO SHOW EVERY FITTING, HANGER, WIRE OR DEVICE, ALL SUCH ITEMS SHALL BE FURNISHED AND INSTALLED AS NECESSARY FOR A COMPLETE SYSTEM.
20. SEE SPECIFICATION SECTION "ELECTRICAL IDENTIFICATION" FOR PROPERLY LABELING EQUIPMENT WIRING, PANELS, SWITCHBOARD, DISCONNECT SWITCHES, BOXES, CONDUITS,.. ETC.
21. CONTRACTOR SHALL DETERMINE THE QUANTITY OF CONDUCTORS REQUIRED FOR PROPER OPERATION OF ALL SWITCHING SCHEMES.
22. SEISMICALLY SUPPORT THE EQUIPMENT AS REQUIRED BY CODE, THE AUTHORITY HAVING JURISDICTION, AND/OR AS SPECIFIED. SUBMIT ENGINEERED INSTALLATION DETAILS PER THE SPECIFICATIONS. THE CONTRACTOR'S SEISMIC ENGINEER SHALL REVIEW THE INSTALLATION AND PROVIDE A DETAILED REPORT FOR THE RECORD.
23. PROVIDE ALL BONDING AND GROUNDING REQUIRED BY THE NATIONAL ELECTRIC CODE, NFPA 70 AND AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
24. ALL REQUIRED BONDING CONDUCTORS SHALL BE MINIMUM #6 SOLID INSULATED COPPER, PROVIDE ALL NECESSARY FITTINGS, JUNCTION BOXES, END FITTINGS, ETC., FOR A COMPLETE, CONTINUOUS INSTALLATIONS.
25. ALL BONDING/GROUNDING CONNECTIONS SHALL BE MADE BY LISTED CLAMP OR CONNECTORS AS REQUIRED BY ARTICLE 250 OF NFPA 70, THE NATIONAL ELECTRIC CODE (CURRENT ADOPTED EDITION).
26. AN INSULATED (GREEN) EQUIPMENT GROUND WIRES SHALL BE PROVIDED WITH ALL FEEDERS AND BRANCH CIRCUITS.
27. AN EXTRA SEPARATE ISOLATED GROUND CONDUCTOR SHALL BE PROVIDED FOR EACH ISOLATED GROUND RECEPTACLE IN ADDITION TO THE REGULAR GROUND CONDUCTOR. THIS EXTRA SEPARATE ISOLATED GROUND CONDUCTOR SHALL BE TERMINATED AT THE GROUND BAR OF THE MAIN PANEL BOARD AND IS NOT ALLOWED TO GROUND RACEWAYS, BOXES...ETC.
28. ISOLATED GROUND RECEPTACLES SHALL BE IDENTIFIED BY ORANGE TRIANGLE LOCATED ON THE FACE OF THE RECEPTACLE.
29. RECEPTACLE CONTROLLED BY SWITCH SHALL BE PERMANENTLY MARKED AS PER NEC 406.3 (E).
30. RECEPTACLES LOCATED WITHIN 6' OF A WATER SOURCE, OR OUTSIDE, AND WHERE REQUIRED BY CODE SHALL BE PROVIDED WITH GFCI PROTECTION, WHETHER INDICATED OR NOT.
31. EXTERIOR RECEPTACLES SHALL BE PROVIDED WITH "CAST ALUMINUM" LOCKABLE COVERS RATED "WEATHER-PROOF WHILE IN USE", LOCKS SHALL BE KEYED ALIKE.
32. ALL 15- AND 20-AMPERE, 125V- AND 250-VOLT NON-LOCKING RECEPTACLE SHALL BE LISTED TAMPER RESISTANT.
33. WHERE INDICATED, PROVIDE FIXTURES WITH EMERGENCY BATTERY TO OPERATE LAMPS FOR 1 1/2 HOURS UPON LOSS OF NORMAL POWER. WIRE EMERGENCY BATTERY AND EXIT LIGHTS TO LINE SIDE OF AREA LIGHTING CIRCUIT.
34. DIRECTIONAL CHEVRONS FOR EXIT SIGN SHALL CONFORM TO NFPA 5-10.4.1.2 AND SHALL BE IDENTIFIABLE AS A DIRECTIONAL INDICATOR AT A MINIMUM OF 40 FT. UNDER ALL SPACE CONDITIONS. PROVIDE DIRECTIONAL CHEVRONS AS INDICATED ON PLAN.
35. VERIFY ALL LIGHT FIXTURE FINISHES WITH ARCHITECT/OWNER PRIOR TO PURCHASE.
36. VERIFY ALL LIGHT FIXTURE MOUNTING HEIGHTS WITH ARCHITECT/OWNER PRIOR TO INSTALLING LIGHT FIXTURE.
37. VERIFY LOCATION OF ALL OUTLETS WITH OWNER PRIOR TO ANY WORK
38. ALL 1 POLE, 15 AND 20 AMPERE BRANCH CIRCUITS SERVING RECEPTACLE OR LIGHTING SHALL BE 2 WIRE CIRCUITS PROVIDING AN INDIVIDUAL NEUTRAL CONDUCTOR FOR EACH UNGROUNDED (HOT) CIRCUIT CONDUCTOR. DO NOT SHARE NEUTRAL CONDUCTORS.
39. BRANCH CIRCUIT WIRING IS SHOWN ON THE FLOOR PLANS. NUMERALS ADJACENT TO THE HOMERUN SYMBOLS FOR LIGHTING, RECEPTACLES, MOTORS, APPLIANCES, ETC. INDICATE THE CIRCUIT NUMBER TO WHICH THE ITEMS ARE TO BE CONNECTED. PROVIDE BRANCH CIRCUIT WIRING FOR ALL ITEMS SHOWN IN ACCORDANCE WITH THESE GENERAL NOTES AND THE ELECTRICAL SPECIFICATIONS.
40. ALL FEEDERS & BRANCH CIRCUITS SHALL BE COPPER.
41. ALL HOMERUNS SHALL BE 2#12, 1#12G, 3/4"C TO 20A-1P CIRCUIT BREAKER IN PANEL DESIGNATED UNLESS OTHERWISE NOTED.
42. ALL 120 VAC CIRCUITS EXCEEDING 75' IN LENGTH SHALL BE INCREASED TO 2#10, 1#10G, 3/4" CONDUIT.
43. ALL 120 VAC CIRCUITS EXCEEDING 150' IN LENGTH SHALL BE INCREASED TO 2#8, 1#10G, 3/4" CONDUIT.
44. ALL BRANCH CIRCUITS SHALL BE PROVIDED WITH SEPARATE NEUTRALS. USE OF COMMON NEUTRALS WILL NOT BE ALLOWED.
45. ALL WIRING SHALL BE IN CONDUIT, UNLESS OTHERWISE INDICATED. CONDUITS SHALL BE RUN CONCEALED IN NEW AND ABOVE CEILINGS.
46. ALL EXPOSED WIRING IN CEILING OR INTERIOR WALLS MUST BE IN EMT.
47. METAL CLAD CABLE "MC" MAY BE USED ABOVE ACCESSIBLE CEILINGS AND IN DRYWALL. FOR RECEPTACLES AND LIGHTING FIXTURES ONLY. MC CABLE IS LIMITED TO BRANCH CIRCUITS NOT EXCEEDING 30AMP. HOME RUN FROM FIRST RECEPTACLE/LIGHT FIXTURE TO PANEL BOARD SHALL BE IN CONDUIT.
48. ALL HOME RUNS FROM FIRST RECEPTACLE/LIGHT FIXTURE/KITCHEN EQUIPMENT/HVAC EQUIPMENT...ETC TO PANEL BOARD SHALL BE IN CONDUIT.
49. NO "MC" CABLE IS ALLOWED IN DEMISING WALLS.
50. CABLES TYPES NM, NMC, NMS AND ROMEX IS NOT PERMITTED.
51. FLEXIBLE CONDUIT MAY BE USED ONLY FOR FINAL CONNECTIONS FROM OUTLET/JUNCTION BOXES TO LIGHT FIXTURES, MOTORS, APPLIANCES..ETC. LENGTH OF FLEXIBLE CONDUITS SHALL NOT EXCEED 6'.
52. ALL EXPOSED CABLES OF ANY TYPE IN PLENUM CEILING SPACE SHALL BE PLENUM RATED.
53. NO MORE THAN FOUR (4) 90 DEGREE BENDS IN ONE RUN FOR ELECTRICAL POWER SYSTEM.
54. ALL EMPTY CONDUITS SHALL HAVE A PULL STRING WITH A MINIMUM 10' OF SLACK ON BOTH END.
55. CONTRACTOR TO INSTALL EXPOSED CONDUIT IN NEAT AND ORGANIZED WAY IN STRAIGHT LINES AND PARALLEL OR IN RIGHT ANGLES TO THE BUILDING STRUCTURE. DO NOT LOOP EXCESS FLEXIBLE CONDUIT IN CEILING SPACE OR WALL CAVITY.
56. CONTRACTOR TO PROVIDE RIGHT ANGLES TURNS USING FITTINGS OR SYMMETRICAL BENDS.
57. CONTRACTOR TO PAINT ALL EXPOSED CONDUITS.
58. NO CONDUIT TO BE SUPPORTED FROM THE DECK.
59. CONTRACTOR TO RUN CONDUITS ABOVE SUSPENDED CEILING AND UP-HIGH AS POSSIBLE IN AREAS WITH NO SUSPENDED CEILING.
60. CONDUITS INSTALLED ON ROOF SHALL HAVE A MINIMUM DISTANCE OF 7/8" BETWEEN BOTTOM OF CONDUIT AND TOP OF ROOF OTHERWISE CONTRACTOR TO USE "XHHW-2" INSULATED CONDUCTOR "AS PER NFPA 310.15(B)(3)(C)."
61. NO MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS TO BE INSTALLED IN ONE CONDUIT. IF MORE THAN THREE (3) CURRENT CARRYING CONDUCTORS INSTALLED IN ONE CONDUIT, CONTRACTOR TO ADJUST THE SIZE WIRING AS PER TABLE 310.15(B)(3)(a). NEC 2017.
62. ALL EQUIPMENT, DEVICES AND FIXTURES SHALL BE GROUNDED IN COMPLIANCE WITH NEC & UL REQUIREMENT.
63. ALL ELECTRICAL PANELS TO BE UL LABELED WITH BOLT ON TYPE CIRCUIT BREAKER.
64. VERIFY EXACT LOCATION AND ELECTRICAL REQUIREMENT OF ALL HVAC EQUIPMENT WITH MECHANICAL DRAWINGS PRIOR TO ANY WORK AND MODIFY AS NEEDED.
65. VERIFY EXACT LOCATION AND ELECTRICAL REQUIREMENT OF ELECTRIC WATER HEATER WITH PLUMBING DRAWINGS PRIOR TO ANY WORK AND MODIFY AS NEEDED.
66. COORDINATE ALL FLOOR CUT MEANS (TRENCHING/CORING) OF EXISTING FLOOR SLAB WITH LANDLORD PRIOR TO ANY WORK.
67. FLOOR OUTLETS SHALL BE FED FROM THE NEAREST AVAILABLE FULL HEIGHT WALL. CONTRACTOR TO COORDINATE CONDUIT ROUTING AND TRENCHING OF EXISTING FLOOR SLAB WITH LANDLORD AND EXISTING CONDITION IN THE FIELD PRIOR TO ANY WORK. SEAL ALL PENETRATION WITH FIRE STOPPING MATERIALS (TYPICAL NOTE).
68. NOTHING IS PERMITTED TO BE ATTACHED TO, SUSPENDED FROM OR PENETRATE LANDLORD'S STRUCTURE, FLOOR DECK OR ROOF DECK. TENANT'S CONTRACTOR MAY ATTACH, NON-DESTRUCTIVELY, TO OR SUSPEND FROM THE TOP CHORD OF THE JOIST OR THE STRUCTURE STEEL WHICH EXISTS ABOVE TENANT SPACE. WHEN ATTACHING TO LANDLORD'S STRUCTURE, DO NOT DRILL, WELD, SCREW OR SHOOT INTO STRUCTURE. ALTERNATIVE METHODS OF ATTACHMENT ONLY, NOTHING TO DAMAGE LANDLORD'S BASE BUILDING STRUCTURE. TENANT'S CONTRACTOR SHALL PROVIDE SIGNED AND SEALED STRUCTURAL DRAWINGS BY A STRUCTURAL ENGINEER WITH LEGALLY ACTIVE REGISTRATION AS INDICATED BY ALL JURISDICTIONAL REQUIREMENTS. FOR ALL ELECTRICAL INSTALLATION AND ALL STRUCTURE MODIFICATIONS FOR LANDLORD RECORDS.
69. SLAB ON GRADE:
70. TENANT'S GENERAL CONTRACTOR SHALL ADVISE THE OPERATION TEAM PRIOR TO ANY SLAB MODIFICATION OR REMOVAL. TENANT'S GENERAL CONTRACTOR SHALL VERIFY ACTUAL CONDITIONS. SHALL NOT CONFLICT WITH ANY EXISTING STRUCTURE, UTILITY OR OTHER UNDER-SLAB CONDITION. NON-DESTRUCTIVE VERIFICATION MAYBE REQUIRED. ANY DAMAGE OR DOWNTIME CAUSED BY TENANT'S GENERAL CONTRACTOR WORK SHALL BE REPAIRED AND REIMBURSED AT TENANT'S GENERAL CONTRACTOR EXPENSES.
71. ELEVATED SLABS:
72. TENANT'S GENERAL CONTRACTOR SHALL ADVISE THE OPERATION TEAM PRIOR TO ANY SLAB MODIFICATION OR REMOVAL. IF ANY ELEVATED SLAB IS TO BE MODIFIED IN ANYWAY (DRILLED, CORED OR PENETRATED), TENANT'S GENERAL CONTRACTOR SHALL PROVIDE STAMPED AND CERTIFIED DRAWINGS BY A LICENSED STRUCTURAL ENGINEER CERTIFIED IN THE APPLICABLE JURISDICTION. ALL PENETRATIONS SHALL BE CORE BORED ONLY. SAW CUTTING, JACK HAMMERING AND TRENCHING IS STRICTLY PROHIBITED. ALL PENETRATIONS SHALL BE LOCATED, SEALED, TESTED AND STOPPED AND WATERPROOFED. THE PENETRATION SLEEVE SHALL EXTEND A MINIMUM OF 4" ON EITHER SIDE OF THE SLAB AND BE LABELED WITH THE REQUIRED NFPA RATING. TENANT'S GENERAL CONTRACTOR SHALL VERIFY THAT WORK SHALL NOT CONFLICT WITH ANY EXISTING STRUCTURE, UTILITY OR OTHER UNDER-SLAB CONDITION. NON-DESTRUCTIVE VERIFICATION MAYBE REQUIRED. ANY DAMAGE OR DOWNTIME CAUSED BY TENANT'S GENERAL CONTRACTOR WORK SHALL BE REPAIRED AND REIMBURSED AT TENANT'S GENERAL CONTRACTOR EXPENSES.
73. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL REQUIRED SLEEVES AND FIRE STOP FOR CONDUITS AND CABLES PENETRATING FIRE RATED WALLS AND FLOORS.
74. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF DUCT SMOKE DETECTORS WITH DIV. 23. DUCT SMOKE DETECTORS SHALL BE FURNISHED AND WIRED BY ELECTRICAL CONTRACTOR, INSTALLED BY DIV. 23.
75. CONDUITS AND/OR WIRING SHALL NOT PENETRATE STAIR ENCLOSURES UNLESS SPECIFICALLY SERVING EQUIPMENT OR DEVICES LOCATED WITHIN STAIR ENCLOSURE.
76. ANY CONDUITS, WIRING, CIRCUITS, FIRE ALARM LOOPS, DEVICES, EQUIPMENT,...ETC RELATED FOR LANDLORD'S SYSTEM INSIDE TENANT'S SPACE TO REMAIN, VERIFY WITH LANDLORD.
77. ROOF PENETRATION IF NEEDED SHALL BE DONE BY LANDLORD'S ROOF CONTRACTOR AT ELECTRICAL CONTRACTOR EXPENSES TO MAINTAIN ROOF WARRANTY. COORDINATE WITH ROOF CONTRACTOR AS REQUIRED FOR WORK.
78. ELECTRICAL CONTRACTOR TO COORDINATE WITH ELECTRICAL INSPECTOR TO FILED VERIFY THE EXIT AND MEANS OF EGRESS LIGHTING ONCE ALL FIXTURE, FURNITURE...ETC ARE IN PLACE. ELECTRICAL CONTRACTOR TO PROVIDE ADDITIONAL EXIT SIGN/EMERGENCY LIGHT AS REQUIRED.
79. WATER HEATER SHALL BE JUMPERED BETWEEN THE COLD AND HOT WATER PIPES WITH A JUMPER SIZED ACCORDING TO NEC TABLE 250.66, PER NEC 250.104(A)(1).
80. CONTRACTOR TO MAINTAIN THE PROPER CLEARANCES FOR THE ELECTRICAL PANELS/SWITCHBOARD AND NOT USED AS STORAGE. CLEARANCE IN FRONT OF PANEL/SWITCHGEAR SHALL BE AS PER NEC 110.26.
81. CONTRACTOR TO PROVIDE EQUIPMENT GROUNDING CONDUCTOR SUITABLE FOR CONDUCTOR'S SIZE. ANY INCREASE IN CONDUCTOR SIZE IN ORDER TO COMPENSATE FOR VOLTAGE DROP REQUIRES A PROPORTIONAL INCREASE IN THE SIZE OF THE EQUIPMENT GROUNDING CONDUCTOR FOR THAT FEEDER OR CIRCUIT.
82. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE SHORT CIRCUIT STUDY, ARC FLASH LABEL AND COORDINATION STUDY FOR ALL PANEL BOARDS PRIOR OF PURCHASING OR SUBMITTAL.
83. AIC RATING OF PANEL BOARDS IS SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY AIC RATING OF EACH PANEL BOARDS VIA SHORT CIRCUIT STUDY.
84. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO REPLACE ANY DEVICES/EQUIPMENT AS REQUIRED BY SHORT CIRCUIT STUDY AND COORDINATION STUDY REPORTS.
85. ELECTRICAL CONTRACTOR TO PROVIDE LABEL ON EACH POWER PANEL INDICATES THE MAXIMUM AVAILABLE FAULT CURRENT.
86. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO BALANCE ALL PHASES WITHIN 10% USING ACTUAL LOADS.
87. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE PRINTED CIRCUIT DIRECTORY FOR EACH PANEL BOARD (EITHER NEW PANEL OR EXISTING PANEL) IN PROTECTIVE PLASTIC SLEEVE. CIRCUIT DIRECTORY FOR EACH PANEL SHALL ENOUGH DETAIL SO THAT EACH CIRCUIT CAN BE DISTINGUISHED FROM ALL OTHERS.
88. ALL PANELS SHALL BE UL LABELED WITH BOLT ON TYPE CIRCUIT BREAKERS. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE LABEL/TAGS FOR EACH PANEL BOARD & DISCONNECT SWITCH. LABEL/TAG SHALL INDICATES NAME OF PANEL/DISCONNECT SWITCH, SOURCE OF ORIGIN, VOLTAGE, NUMBER OF PHASES AND AMPERAGE. FOR DISCONNECT SWITCH, INDICATES NAME OF LOAD/EQUIPMENT BEING SERVED BY DISCONNECT SWITCH. ALL PANELS SHALL NOT BE RECESSED IN DEMISING AND SHALL BE MOUNTED ON PLYWOOD BACKER PANELS UNLESS RECESSED INTO A FURRED OUT OR INTERIOR WALL.

SCOPE OF WORK

1. THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIAL, STORAGE, UNPACKING AND PLACEMENT; TO INCLUDE BUT NOT BE LIMITED TO, THE

   FOLLOWING ITEMS:
   - A. PARTIAL POWER AND LIGHTING DISTRIBUTION SYSTEM INCLUDING RESPECTIVE PANELS AND FEEDERS AS SHOWN IN DRAWINGS.
   - B. PARTIAL BRANCH CIRCUIT WIRING SYSTEM.
   - C. LIGHTING FIXTURE INSTALLATION.
   - D. PARTIAL TELEPHONE AND COMMUNICATION CONDUIT SYSTEM INCLUDING PULL BOXES, OUTLET BOXES, AND CONDUIT AS SPECIFIED, SHOWN ON THE DRAWINGS AND REQUIRED BY THE LOCAL TELEPHONE COMPANY AND/OR OWNER. FROM EACH OUTLET PROVIDE A 1" EMPTY EMT CONDUIT ROUTED INTO THE CEILING CAVITY OR TO THE CLOSEST TELECOMMUNICATIONS CLOSET. PROVIDE A DRAG LINE IN EACH RUN AND TERMINATE IN A BUSED ELBOW.
   - E. TESTING OF ALL CABLES AND CIRCUIT WIRING AFTER INSTALLATION.
   - F. EXIT & EM LIGHT SYSTEM.
   - G. WIRING DEVICES.
   - H. LIGHTING CONTROLS.
   - I. GROUNDING OF THE ELECTRICAL SYSTEM.
   - J. IDENTIFY RACEWAYS AND CABLES WITH COLOR BANDING AS FOLLOWS:
2. COLORS:
   - A. FIRE ALARM SYSTEM: RED
   - B. SECURITY SYSTEM: BLUE AND YELLOW.
   - C. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.
3. ALL THE LEGENDS, ABBREVATIONS AND NOTES MIGHT NOT BE USED IN THE PLAN. PLEASE REFER AS THE REQUIRED ONES.

GENERAL

1. REQUIREMENTS SPECIFIED ON COVER SHEET, ALONG WITH ELECTRICAL SPECIFICATIONS AND ALL ITS SECTIONS, COMPRISE THE CONTRACT DOCUMENTS FOR THE ELECTRICAL CONTRACT. DRAWINGS AND ALL THEIR REVISIONS UP TO THE BID SUBMITTAL DATE BECOME A BINDING PART OF THE CONTRACT, ALONG WITH THESE SPECIFICATIONS AS THOUGH THEY WERE ONE, AND ANYTHING IMPLIED BY THE SPECIFICATIONS SHALL BE INTERPRETED AS ALSO IMPLIED BY THE DRAWINGS AND VICE VERSA. PROVIDE NECESSARY ITEMS FOR A COMPLETE INSTALLATION OF ALL ELECTRICALLY OPERATED EQUIPMENT LISTED IN THE SPECIFICATIONS OR SHOWN ON THE CONTRACT DRAWINGS.
2. THE ARCHITECTURAL, STRUCTURAL, MECHANICAL, PLUMBING AND EQUIPMENT DRAWINGS AND SPECIFICATIONS ARE INCORPORATED INTO, AND BECOME A PART OF THIS DIVISION. THIS CONTRACTOR SHALL EXAMINE ALL SUCH DRAWINGS AND SPECIFICATIONS AND BECOME THOROUGHLY FAMILIAR WITH THE PROVISIONS CONTAINED THEREIN. THE SUBMISSION OF HIS BID SHALL INDICATE SUCH KNOWLEDGE.
3. ELECTRICAL DRAWINGS ARE DIAGRAMMATIC. THEY ARE INTENDED TO SHOW THE APPROXIMATE LOCATIONS OF EQUIPMENT AND CONDUIT. DIMENSIONS GIVEN ON THE PLANS, IN FIGURES, SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONSAND SHALL BE VERIFIED IN THE FIELD. THE ELECTRICAL CONTRACTOR SHALL LAYOUT ALL EQUIPMENT ROOMS TO MAKE SURE THE EQUIPMENT, AS PURCHASED, FITS IN THE ROOM OR SPACE SHOWN. EXACT LOCATION OF ALL EQUIPMENT SHALL BE VERIFIED IN THE FIELD AND ROUTING OF CONDUITS SHALL SUIT FIELD CONDITIONS.
4. UNTIL THE TIME OF INSTALLATION, THE ARCHITECT RESERVES THE RIGHT TO MAKE MINOR CHANGES IN THE LOCATION OF CONDUIT AND EQUIPMENT WITHOUT ADDITIONAL COST TO THE CONTRACT.
5. THE ELECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE FURNISHED AND INSTALLED EVEN THOUGH

ELECTRICAL MAIN FLOOR LIGHTING PLAN 1
3/8" = 1'-0"

LIGHT FIXTURE SCHEDULE				
TAG	DESCRIPTION	MAKE/MODEL	WATTS	LUMINAIRE NOTES
F1	2'X4' LED PANEL	EXISTING	–	–
F2	6" RECESSED DOWNLIGHT	EXISTING	–	–
F3	TRACK LIGHT	EXISTING	–	–
F4	EMERGENCY LIGHTING	EXISTING	–	–
F5	EXIT SIGN	EXISTING	–	–
F6	1'X4' SURFACE MOUNTED FIXTURE	EXISTING	–	–
F7	2'X2' LED PANEL	EXISTING	–	–
F8	NEW EXIT SIGN	PACE ELECTRONICS PAC0434B1RW	5W	90 MIN BATTERY BACKUP

LIGHTING PLAN GENERAL NOTES:

A. ALL WIRES FOR LIGHTING SHALL BE COPPER. UNLESS NOTED OTHERWISE, WIRE SIZE SHALL BE CU. 2#12,1#12G,3/4"C.

B. E.C SHALL COORDINATE MAKE AND MODEL OF THE NEW EXIT SIGNS WITH THE OWNER/ARCHITECT, PRIOR TO BID.

C. E.C TO VERIFY OPERABLE CONDITION OF THE LIGHTING FIXTURE LOCATED AT EXTERIOR OF THE BUILDING. REPLACE/PROVIDE NEW AS REQUIRED.

D. OPERABLE CONDITION OF THE ALL EXISTING LIGHTING CONTROLS TO BE VERIFIED IN FIELD. MODIFY AS REQUIRED FOR PROPER WORKING AND CODE COMPLIANCE.

E. ALL THE EXISTING LIGHTING FIXTURES MARKED AS (E) SHALL REMAIN CONNECTED TO THE EXISTING CIRCUIT ALONG WITH ITS CONTROL. E.C TO VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF REQUIRED.

LIGHTING PLAN KEYED NOTES: (#)

1. CONNECT EXIT SIGN TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES. EXIT SIGN SHALL NOT EXCEED 5 WATTS PER FACE.
2. THE EXISTING (E) LIGHTING AND THEIR CONTROL SHALL REMAIN. E.C TO VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF REQUIRED.
3. RELOCATE (RL) THE EXISTING TRACK LIGHT FIXTURE. E.C. SHALL VERIFY OPERABLE CONDITION OF THE LIGHTS IN THE FIELD. PROVIDE NEW IF EXISTING IS INOPERABLE, EXTEND THE BRANCH CIRCUIT TO REUSE THE EXISTING POWER.

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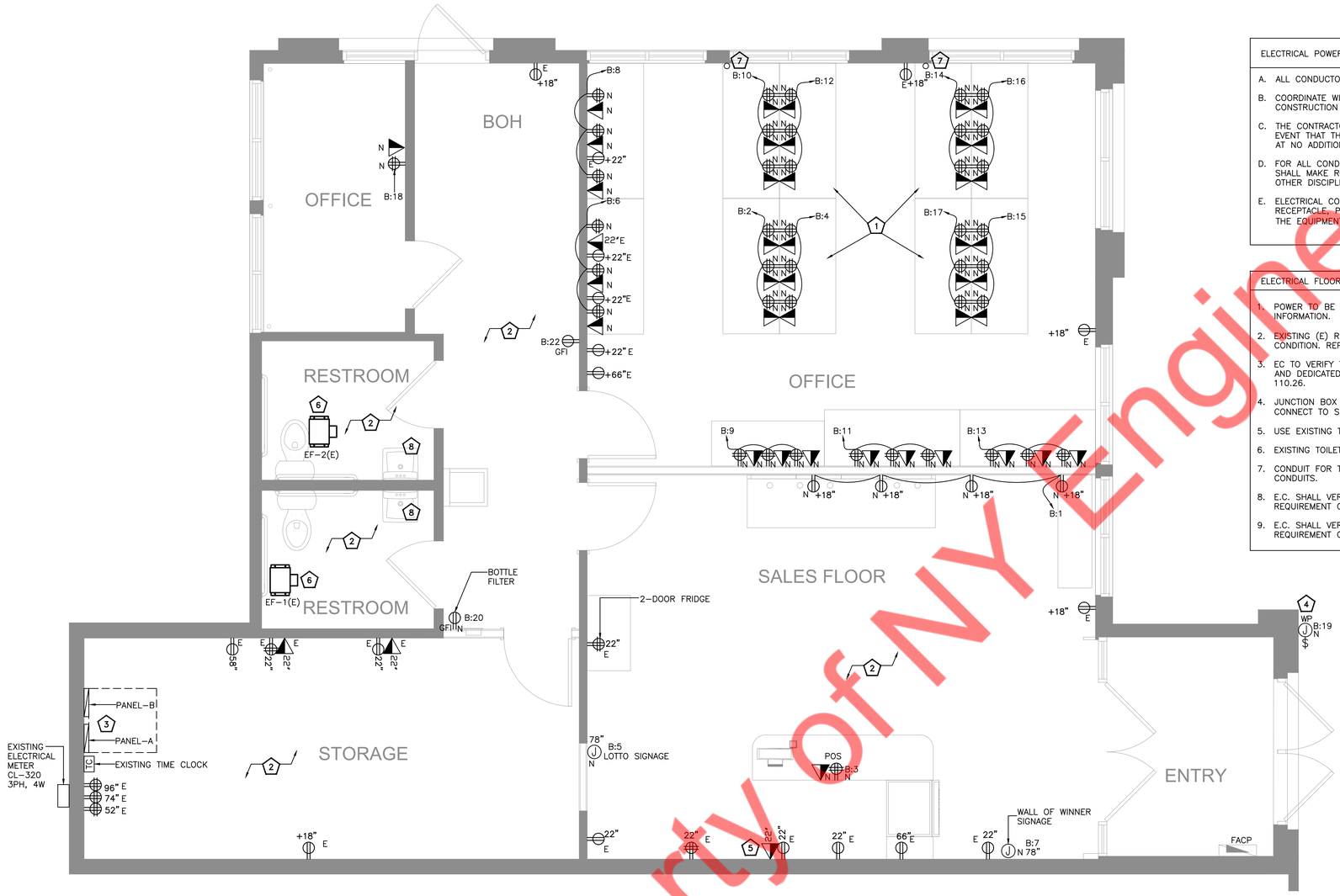
ELECTRICAL LIGHTING PLAN

E1.01



ELECTRICAL MAIN FLOOR POWER PLAN 1

3/8" = 1'-0"

ELECTRICAL POWER PLAN GENERAL NOTES:

A. ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE INDICATED.

B. COORDINATE WITH OTHER DISCIPLINES IN THE FIELD TO ENSURE THAT THE INTEGRITY OF FIRE RATED CONSTRUCTION IS PRESERVED WHERE PENETRATING RATED WALLS AND FLOORS.

C. THE CONTRACTOR SHALL ROUTE ALL EXPOSED CONDUIT NEATLY AND TIGHT TO SUPPORTING SURFACES. IN THE EVENT THAT THE OWNER IS NOT SATISFIED WITH WORKMANSHIP, THE CONTRACTOR SHALL MAKE CORRECTIONS AT NO ADDITIONAL COST TO THE OWNER. MC CABLE IS NOT PERMITTED IN EXPOSED AREAS.

D. FOR ALL CONDUIT RUNS SHOWN ON ELECTRICAL DRAWINGS, THE ROUTING IS APPROXIMATE. THE CONTRACTOR SHALL MAKE ROUTING ADJUSTMENTS AS REQUIRED BASED ON FIELD CONDITIONS AND COORDINATION WITH OTHER DISCIPLINES.

E. ELECTRICAL CONTRACTOR SHALL VERIFY AND PROVIDE THE EXACT ELECTRICAL REQUIREMENT INCLUDING RECEPTACLE, PLUG, CORD, CIRCUIT BREAKER AND CABLES FOR ALL THE EQUIPMENT IN COORDINATION WITH THE EQUIPMENT SUPPLIER/MANUFACTURER IN THE FIELD. BASE BID ACCORDINGLY.

ELECTRICAL FLOOR POWER PLAN KEYED NOTES (#)

1. POWER TO BE RUN THROUGH ADJACENT WALLS. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR MORE INFORMATION.
2. EXISTING (E) RECEPTACLES SHALL REMAIN. CONNECTED TO THE EXISTING CIRCUIT. E.C TO VERIFY OPERABLE CONDITION. REPLACE OUTLET AND WIRING IF REQUIRED.
3. EC TO VERIFY THE EXACT OPERABLE CONDITION OF EXISTING ELECTRICAL PANEL IN THE FIELD. CLEAR WORKING AND DEDICATED SPACE SHALL BE PROVIDED FOR THE ELECTRICAL PANELS IN ACCORDANCE WITH THE NEC 110.26.
4. JUNCTION BOX AND TOGGLE SWITCH FOR BUILDING MOUNTED SIGNAGE. COORDINATE EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURER'S INSTRUCTIONS.
5. USE EXISTING TO ROUTE DATA TO POS.
6. EXISTING TOILET EXHAUST FAN AND THEIR CONTROL SHALL REMAIN.
7. CONDUIT FOR THE POWER DROP. ALL THE WIRING FOR THE TABLE OUTLETS SHALL PASS THROUGH THESE CONDUITS.
8. E.C. SHALL VERIFY WITH THE PLUMBING CONTRACTOR FOR EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL IF REQUIRED.
9. E.C. SHALL VERIFY WITH THE MECHANICAL CONTRACTOR FOR EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROL IF REQUIRED.

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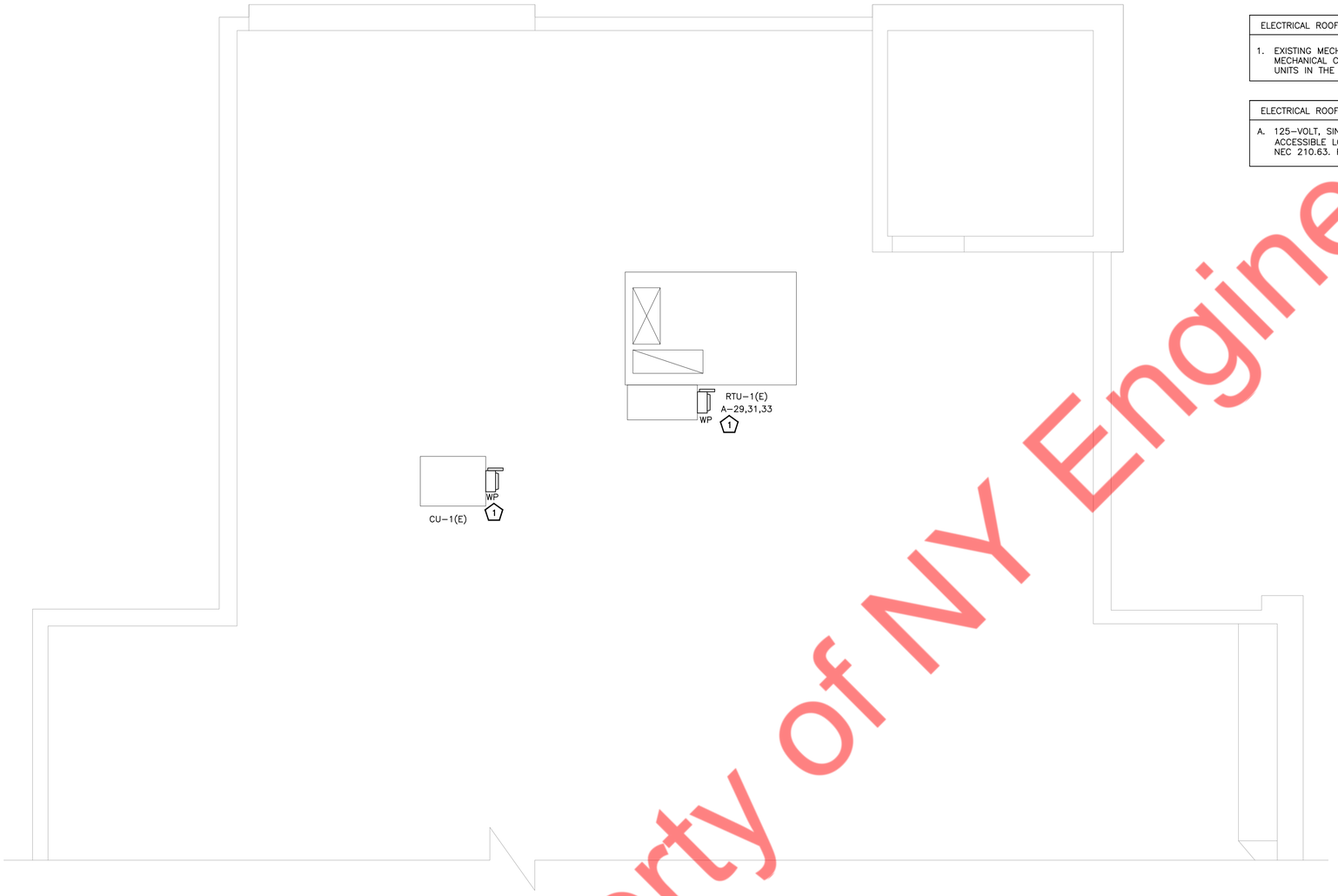
ELECTRICAL POWER PLAN

E2.01



ELECTRICAL ROOF POWER PLAN 1
3/8" = 1'-0"

ELECTRICAL ROOF POWER PLAN KEYED NOTES: #

1. EXISTING MECHANICAL EQUIPMENT AND THEIR CONTROL SHALL REMAIN. E.C. SHALL COORDINATE WITH MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND OPERABLE CONDITION OF THE EXISTING MECHANICAL UNITS IN THE FIELD.

ELECTRICAL ROOF POWER PLAN GENERAL NOTES:

A. 125-VOLT, SINGLE-PHASE, 15- OR 20-AMPERE-RATED RECEPTACLE OUTLET SHALL BE INSTALLED AT AN ACCESSIBLE LOCATION WITHIN 7.5 M (25 FT) OF THE EQUIPMENT AS SPECIFIED IN 210.63(A) AND (B) AS PER NEC 210.63. REUSE EXISTING OR PROVIDE NEW. IF NOT REQUIRED.

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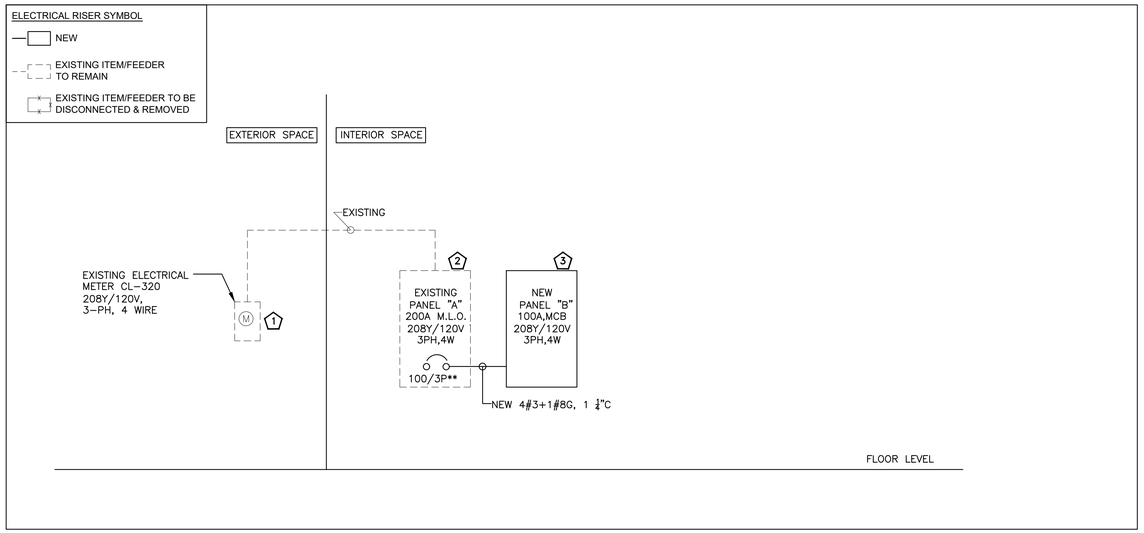
ELECTRICAL ROOF POWER PLAN

E2.02



ELECTRICAL RISER DIAGRAM | 1

NTS

PANEL:	A	(EXISTING)										MOUNTING:	SURFACE
208Y/120	VOLTS	PHASE	3		-	-			DEMAND LOAD	53.64		PANEL LOCATION:	STORAGE
200A	MCB	WIRE	4		-	-			DEMAND CURRENT	149.07		FED FROM:	EXISTING METER
NOTE:													

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	SPARE				0.72			EXISTING	0.72	R	OUTLETS	20	2
3	20	2X2, EXIT	L	0.80	EXISTING		1.80		EXISTING	1.00	R	BATHROOM	20	4
5	20	BACK EBU, DEMISE WALL	R	1.00	EXISTING			1.72	EXISTING	0.72	R	OUTLETS	20	6
7	20	LFT TRAC	L	0.60	EXISTING	1.32			EXISTING	0.72	R	OUTLETS	20	8
9	20	MIDDLE TRAC	L	0.60	EXISTING		1.32		EXISTING	0.72	R	OUTLETS	20	10
11	20	FRONT TRACK	L	0.60	EXISTING			1.68	EXISTING	1.08	R	OUTLETS	20	12
13	20	SPARE				0.00						SPARE	20	14
15	20	SPARE					0.00		EXISTING		L	BACK LTS	20	16
17	20	RECEPTACLES-NEAR PANEL	R	1.08	EXISTING			1.08				SPARE	20	18
19	20	SIGN	L	1.00	EXISTING	1.00						SPARE	20	20
21	20	SIGN	L	1.00	EXISTING		1.00					SPARE	20	22
23	20	SIGN	L	1.00	EXISTING			1.00				SPARE	20	24
25	20	SPARE				0.00						SPARE	20	26
27	20	SPARE					0.00					SPARE	20	28
29			H	6.36				12.87		6.51	O			30
31	80/3P	RTU-(E)	H	6.36	3#4 + 1#8G, 1"C	12.87			4#3 + 1#8G, 1 1/4"C	6.51	O	PANEL B	100/3P**	32
33			H	6.36			12.87			6.51	O			34
35	20	SPARE						0.00				SPARE	20/2P	36
37	20	SPARE				0.00				0.00	0			38
39	20	LED LIGHT	L	0.80	EXISTING		0.80					SPARE	20/2P	40
41	20	SPARE						0.00		0.00	0			42
						15.91	**17.79**	**18.35**						

PANEL:	B	(NEW)										MOUNTING:	SURFACE
208Y/120	VOLTS	PHASE	3		-	-			DEMAND LOAD	19.52		PANEL LOCATION:	STORAGE
100A	MCB	WIRE	4		-	-			DEMAND CURRENT	54.25		FED FROM:	PANEL A
NOTE:													

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER PHASE (KVA) A	B	C	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20	SALES FLOOR RECEPTACLE	R	0.72	2#12 + 1#12G, 3/4"C	1.80			2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	2
3	20	P.O.S	R	0.72	2#12 + 1#12G, 3/4"C		1.80		2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	4
5	20	LOTTO SIGNAGE	L	0.50	2#12 + 1#12G, 3/4"C			1.58	2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	6
7	20	WALL OF WINNER SIGNAGE	L	0.50	2#12 + 1#12G, 3/4"C	1.58			2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	8
9	20	OFFICE RECEPTACLES	R	1.08	2#12 + 1#12G, 3/4"C		2.16		2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	10
11	20	OFFICE RECEPTACLES	R	1.08	2#12 + 1#12G, 3/4"C			2.16	2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	12
13	20	OFFICE RECEPTACLES	R	1.08	2#12 + 1#12G, 3/4"C	2.16			2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	14
15	20	OFFICE RECEPTACLES	R	1.08	2#12 + 1#12G, 3/4"C		2.16		2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	16
17	20	OFFICE RECEPTACLES	R	0.36	2#12 + 1#12G, 3/4"C			1.44	2#12 + 1#12G, 3/4"C	1.08	R	OFFICE RECEPTACLES	20	18
19	20	EXTERIOR SIGNAGE	L	1.00	2#12 + 1#12G, 3/4"C	2.00			2#12 + 1#12G, 3/4"C	1.00	R	BOTTLE FILTER RECEPTACLE	20	20
21	20	SPARE					0.18		2#12 + 1#12G, 3/4"C	0.18	R	BOH GENERAL RECEPTACLE	20	22
23	20	SPARE						0.00				SPARE	20	24
25	20	SPARE				0.00						SPARE	20	26
27	20	SPARE					0.00					SPARE	20	28
29	20	SPARE						0.00				SPARE	20	30
31	20	SPARE				0.00						SPARE	20	32
33	20	SPARE					0.00					SPARE	20	34
35		SPACE						0.00				SPACE		36
37		SPACE				0.00						SPACE		38
39		SPACE					0.00					SPACE		40
41		SPACE						0.00				SPACE		42
						7.54	**6.30**	**5.18**						

ELECTRICAL RISER DIAGRAM GENERAL NOTES:

A. E.C. SHALL VERIFY/COORDINATE THE FOLLOWING INFORMATION IN THE FIELD WITH THE UTILITY/LANDLORD/OWNER AND INFORM THE ENGINEER ON RECORD OF ANY DISCREPANCY.

B. THE EXACT POWER DISTRIBUTION AND SCOPE OF WORK WITH THE LANDLORD/OWNER BEFORE BID.

C. THE ELECTRICAL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE NEC, LOCAL CODES AND AHJ.

D. COORDINATE AVAILABLE FAULT CURRENT (AIC RATING) WITH UTILITY/LANDLORD/OWNER.

E. ENSURE THE COMBINED VOLTAGE DROP OF THE FEEDER AND BRANCH CIRCUIT SHALL NOT EXCEED 5% PER CODE.

F. PROVIDE GEC AND EGC AS PER 250.66 & 250.122 RESPECTIVELY, AS NEEDED. PROVIDE SEPARATE GROUND CONDUCTORS IN ALL CONDUITS.

G. THE PART OF RISER MARKED AS EXISTING IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY THAT THE RISER MATCHES THE SITE CONDITION.

H. SPARE AMPS AVAILABLE IN THE EXISTING ELECTRICAL SERVICE ARE MORE THAN THE NEWLY ADDED DEMAND AMPS.

I. VERIFY THE LOCATION, RATING, AND OPERABLE CONDITION OF ALL THE EXISTING COMPONENTS BEING REUSED. REPLACE IF FOUND INOPERABLE (WITHIN THE SCOPE OF WORK). BASE BID ACCORDINGLY.

J. ADDITION OR ALTERATION TO THE EXISTING SYSTEM SHALL NOT BE DONE WITHOUT THE WRITTEN CONSENT OF THE OWNER.

ELECTRICAL RISER DIAGRAM KEY NOTES: (#)

1. EXISTING ELECTRICAL METER CL-320A, 208Y/120V, 3PH, 4W FOR THE PROJECT SPACE. E.C. TO COORDINATE WITH UTILITY/OWNER/LANDLORD FOR MORE INFORMATION. INFORM ENGINEER ON RECORD OF ANY DISCREPANCY.
2. FOR EVERY ELECTRICAL EQUIPMENT MARKED AS EXISTING, E.C. SHALL VERIFY THE EXACT LOCATION, RATING, AND OPERABLE CONDITION OF EACH AND EVERY EQUIPMENT IN THE FIELD. INFORM THE ENGINEER ON RECORD OF ANY DISCREPANCY, BEFORE BID.
3. COORDINATE THE EXACT LOCATION OF THE NEW ELECTRICAL EQUIPMENT IN THE FIELD.

PANEL SCHEDULE GENERAL NOTES:

A. E.C TO CHECK IF EXISTING PANEL HAVE SPARE CAPACITY TO FEED NEWLY ADDED LOAD. INFORM ENGINEER ON RECORD OF ANY DISCREPANCY.

B. E.C. SHALL MODIFY BREAKERS IN THE EXISTING PANEL (WHERE EVER REQUIRED) TO BE IN LINE WITH THE PANEL SCHEDULE.

C. ALL EXISTING CIRCUITS SHOWN ON THE EXISTING ELECTRICAL PANELS ARE FOR REFERENCE PURPOSE. E.C. TO FIELD VERIFY AND INFORM ENGINEER OF RECORD PRIOR TO BID.

PANEL SCHEDULE ABBREVIATIONS:

L=LIGHTING
R=RECEPTACLE
H=HVAC
M=MOTOR
O=OTHER

(*) GFCI BREAKER
(**) NEW BREAKER IN EXISTING PANEL

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ELECTRICAL RISER DIAGRAM & PANEL SCHEDULE

E3.01

PLUMBING SYMBOLS LIST

—— SAN ——	SANITARY SEWER
– – – – –	VENT PIPING
——–——–	COLD WATER PIPING
——–——–	HOT WATER PIPING
——–——–	HOT WATER RETURN PIPING
——–——–	EXISTING COLD WATER PIPING
——◯	P–TRAP
——○	PIPE UP
——◯	PIPE DROP
—⊙—‖	CLEANOUT
——‖	PLUGGED OUTLET/CLEANOUT
◉	POINT OF CONNECTION

PLUMBING ABBREVIATIONS

CO	CLEANOUT
WCO	WALL CLEANOUT
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
SK	SINK
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
WH	WATER HEATER
RCP	RE–CIRCULATION PUMP
ET	EXPANSION TANK
N.I.C.	NOT IN SCOPE
GC	GENERAL CONTRACTOR

PLUMBING DRAWING LIST

APPLICABLE CODES

A. 2015 INTERNATIONAL BUILDING CODE
B. 2015 INTERNATIONAL MECHANICAL CODE
C. 2021 INTERNATIONAL ENERGY CONSERVATION CODE
D. 248 CMR UNIFORM STATE PLUMBING CODE
E. 248 CMR MASSACHUSETTS FUEL GAS CODE.

BUILDING DEPARTMENT PLUMBING NOTES

ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT WATER DISTRIBUTION PIPING SYSTEMS) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 248 CMR UNIFORM STATE PLUMBING CODE

1. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION 248 CMR 10.05 AND 10.06
2. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER 248 CMR 10.05, SECTION 8.
3. TRENCHING, EXCAVATION AND BACKFILL AS PER 248 CMR 10.05, SECTION 5.
4. RODENT PROOFING AS PER PER 248 CMR 10.05, SECTION 8.
5. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF PER 248 CMR 10.06
6. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF PER 248 CMR 10.07
7. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER PC 1002, AND CLEAN–OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF PER 248 CMR 10.08
8. DRAINAGE PIPE CLEANOUTS AS PER 248 CMR 10.08
9. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS PER 248 CMR 10.11
10. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS PER 248 CMR 10.14
11. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS PER 248 CMR 10.15
12. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS PER 248 CMR 10.16

PLUMBING SPECIFICATIONS :

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS.

1.01 SCOPE

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

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

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

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

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

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

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

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

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

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

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

1.02 SUBMITTALS

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

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

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

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

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

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

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

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

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

1.03 SUBSTITUTIONS

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

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

1.05 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 NATIONAL STANDARD PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.06 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.

1.07 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ALL PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. 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:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD–DRAWN COPPER TUBE.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD–FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER–SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE–RETARDANT, FACTORY–APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY–APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH 2021 MASSACHUSETTS ENERGY CODE SECTION C403.11.2.3 REFER BELOW TABLE.

NOMINAL PIPE SIZE (INCHES)	MIXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	43'
¾"	0.5'	21'
1"	0.5'	13'
1¼"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

10. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.
11. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.

MINIMUM PIPE INSULATION THICKNESS							
FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU in./ (H FT2 °F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	>8
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 2021 MASSACHUSETTS ENERGY CODE C404.6.1, 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:
   a. 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.
   b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD–WATER PIPING TO 104°F (40°C).
8. AS PER 2021 MASSACHUSETTS ENERGY CODE 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. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER 2021 MASSACHUSETTS ENERGY CODE SECTION 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 C404.5.1.

C. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.
2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2–1/2" AND LARGER, (1–1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.
6. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.

D. 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.

E. SLEEVES AND ESCUTCHEONS:

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

F. 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.

G. 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.

H. 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.

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

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

K. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

M. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

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

Q. 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.

R. 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.

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

T. 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.

U. PROVIDE WATER HAMMER ARRESTERS ON SUPPLY PIPING TO ALL FLUSHOMETER VALVES AND QUICK–CLOSING VALVES.

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

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

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1¼" AND 1½" THICK FOR PIPE SIZE 1¼" AND GREATER WITH MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH ½" THICK FOR PIPE SIZE UP TO 1¼" AND 1" THICK FOR PIPE SIZE 1½" AND GREATER WITH 1" MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED WITH MANVILLE ZESTON 2000 PVC INSULAT–ED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE MASSACHUSETTS BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2021 MASSACHUSETTS ENERGY CONSERVATION CODE

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. 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.

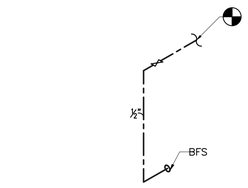
F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT, CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.

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.

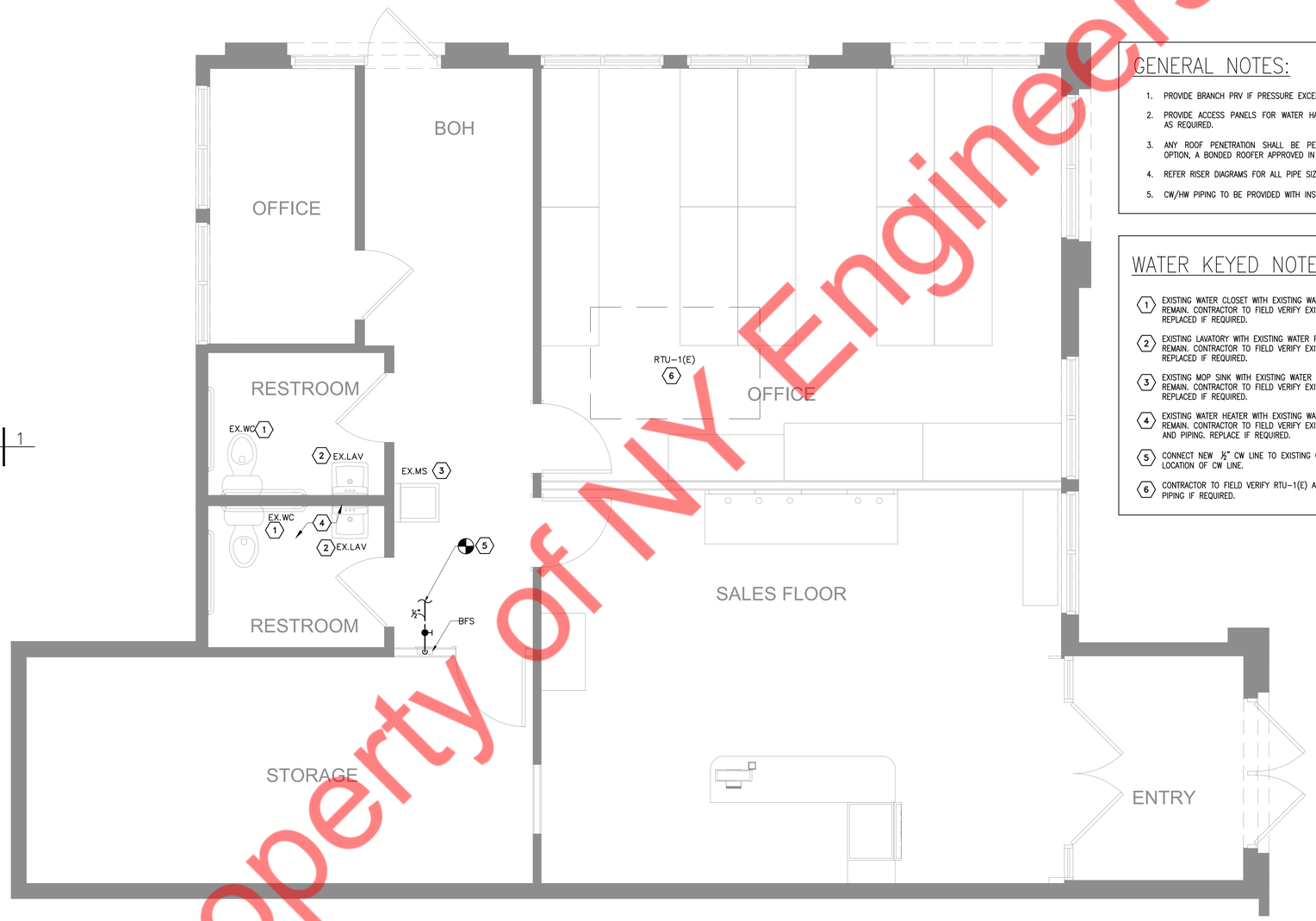
H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

I. ALL EQUIPMENT WILL BE FACTORY TESTED.

J. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTAT



PLUMBING WATER RISER 1
NTS



PLUMBING WATER FLOOR PLAN 1
3/8" = 1'-0"

GENERAL NOTES:

1. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
2. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
3. ANY ROOF PENETRATION SHALL BE PERFORMED BY LANDLORD'S ROOFERS AT LANDLORD OPTION, A BONDED ROOFER APPROVED IN ADVANCE BY LANDLORD.
4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
5. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER IECC 2021(REFER SHEET P0.01)

WATER KEYED NOTES:

1. EXISTING WATER CLOSET WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
2. EXISTING LAVATORY WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
3. EXISTING MOP SINK WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
4. EXISTING WATER HEATER WITH EXISTING WATER PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION, LOCATION AND CAPACITY OF WATER HEATER AND PIPING. REPLACE IF REQUIRED.
5. CONNECT NEW ½" CW LINE TO EXISTING CW LINE IN SPACE. CONTRACTOR TO FIELD VERIFY THE SIZE, LOCATION OF CW LINE.
6. CONTRACTOR TO FIELD VERIFY RTU-1(E) AND ENSURE GAS PIPING IS IN GOOD CONDITION. REPLACE PIPING IF REQUIRED.

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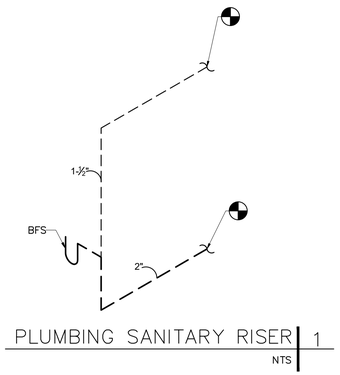
REVISIONS

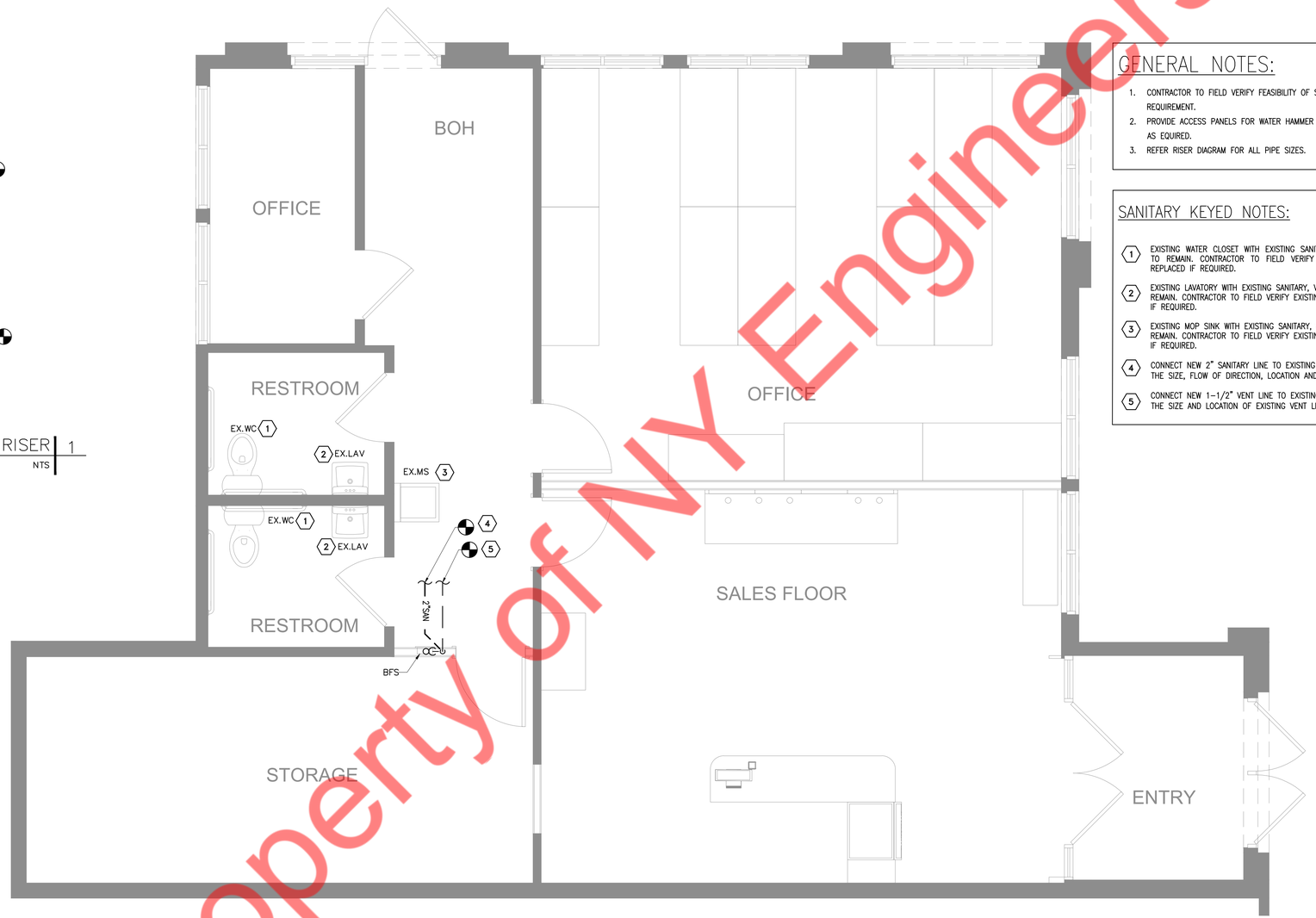
Δ	ISSUE	DATE
	PERMIT SET	03/08/24

PLUMBING WATER FLOOR PLAN AND RISER

P1.01



PLUMBING SANITARY RISER 1
NTS



PLUMBING SANITARY FLOOR PLAN 1
3/8" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRCTURAL REQUIREMENT.
2. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS EQUIRED.
3. REFER RISER DIAGRAM FOR ALL PIPE SIZES.

SANITARY KEYED NOTES:

1. EXISTING WATER CLOSET WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
2. EXISTING LAVATORY WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
3. EXISTING MOP SINK WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE REPLACED IF REQUIRED.
4. CONNECT NEW 2" SANITARY LINE TO EXISTING SANITARY LINE IN SPACE. CONTRACTOR TO FIELD VERIFY THE SIZE, FLOW OF DIRECTION, LOCATION AND INVERT OF EXISTING SANITARY LINE.
5. CONNECT NEW 1-1/2" VENT LINE TO EXISTING VENT LINE IN SPACE. CONTRACTOR TO FIELD VERIFY THE SIZE AND LOCATION OF EXISTING VENT LINE.

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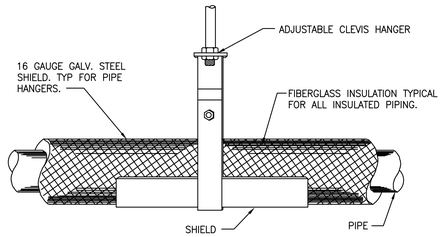
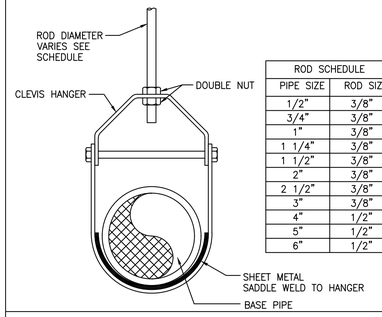
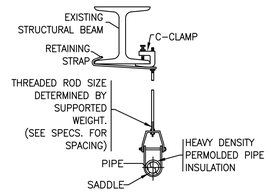
PLUMBING SANITARY FLOOR PLAN AND RISER

P1.02

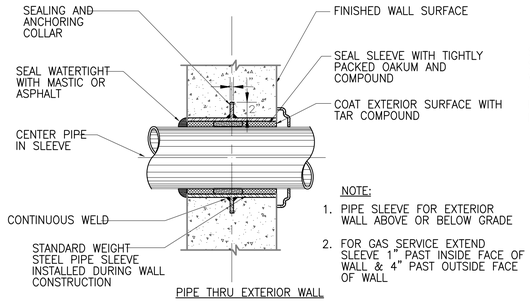


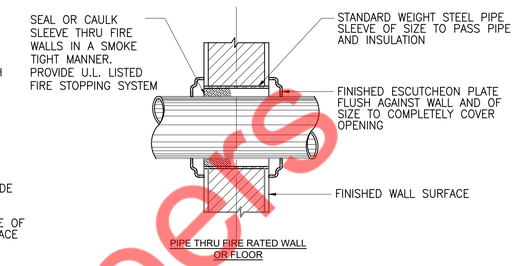


ROD SCHEDULE	
PIPE SIZE	ROD SIZE
1/2"	3/8"
3/4"	3/8"
1"	3/8"
1 1/4"	3/8"
1 1/2"	3/8"
2"	3/8"
2 1/2"	3/8"
3"	3/8"
4"	1/2"
5"	1/2"
6"	1/2"



1 / P2.01 HANGER DETAIL
N.T.S





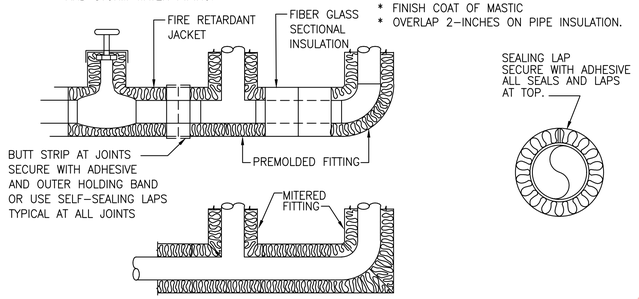
2 / P2.01 PIPE SLEEVE THRU WALL SECTION
N.T.S

CONCEALED VALVES AND FITTINGS

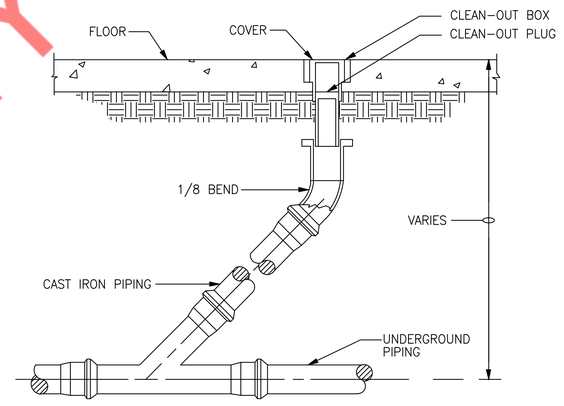
* WRAP WITH 1-INCH THICK, 1-POUND DENSITY TO REQUIRED PIPE INSULATION THICKNESS
* SECURE WITH WIRE OR TAPE.
* VAPOR SEAL COLD WATER, CHILLED WATER AND STORM WATER PIPING.

CONCEALED VALVES AND FITTINGS

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



3 / P2.01 INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS
N.T.S



4 / P2.01 FLOOR CLEANOUT DETAIL
N.T.S

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES						REMARKS
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	
EX.WC	EXISTING WATER CLOSET	–	E	–	E	–	–	EXISTING TO REAMAIN.
EX.LAV	EXISTING LAVATORY	E	E	E	E	E	E	EXISTING TO REAMAIN.
EX.MS	EXISTING MOP SINK	E	E	E	E	E	E	EXISTING TO REAMAIN.
BFS	BOTTLE FILLING STATION	–	2"	1-1/2"	1/2"	–	–	–

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

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PLUMBING DETAILS AND SCHEDULES

P2.01