	MECHANICAL SYME	BOLS	LIST
AC-1) (EF-1)	EQUIPMENT SYMBOL	MECHA	NICAL ABBREVIATIONS
		AFF	ABOVE FINISHED FLOOR
$\bullet$	POINT OF NEW CONNECTION TO EXISTING	AL	ACOUSTIC LINING
		BOD	BOTTOM OF DUCT
	AIR DEVICES	BOE	BOTTOM OF EQUIPMENT
	CEILING DIFFUSER SUPPLY	CDS	CEILING DIFFUSER SUPPLY
		CDR	CEILING DIFFUSER RETURN
	CEILING DIFFUSER RETURN/EXHAUST	CFM	CUBIC FEET OF AIR PER MINUTE
$\Box[]$	CT ACCESSORIES	COP	COEFFICIENT OF PERFORMANCE
		СР	CONDENSATE PUMP
└╷╴╺ <mark>┍</mark> ┝┼╧╛╎╷╷╴╎		CD	CONDENSATE DRAIN PIPE
	VOLUME DAMPER W/ ACCESS DOOR	DN	DOWN
		EER	ENERGY EFFICIENCY RATIO
CONTE	ROLS AND SENSORS	EF	EXHAUST FAN
<b>(</b> T <b>)</b>	THERMOSTAT	FC	FLEXIBLE CONNECTION
~		IEER	INTEGRATED ENERGY
	DUCIWORK		EFFICIENCY RATIO
	AIR DUCT W/ 1.5" ACOUSTICAL LINING	VD	VOLUME DAMPER
-^	FLEXIBLE DUCT	RTU V.I.F.	ROOF TOP UNIT VERIFY IN FEILD
FC FC	FLEXIBLE CONNECTION	S.A.E.	SAME AS EXISTING
 24X12		CU	CONDENSER UNIT
	RECTANGULAR DUCT (WIDTH X DEPTH)		
ø12	ROUND DUCT (DIAMETER)		
$\mathbb{S}$	ROUND DUCT CROSS SECTION		
$\square$	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION		
	RETURN AIR RECTANGULAR DUCT CROSS SECTION		
D1 MECH	MECHANICAL DRAWING LIST anical general notes, symbols list & abbrevi	ATIONS	
	ANICAL FLOOR PLAN		
	ANICAL ROOF PLAN ANICAL DETAILS & EQUIPMENT SCHEDULES		
PPLICAB 015 INTERNATIONAL 015 INTERNATIONAL 021 INTERNATIONAL	LE CODES BUILDING CODE		
	ETTS FUEL GAS CODE.		

TIME.

### SSACHUSETTS BUILDING NOTES

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

NTRACTOR SHALL ENGAGE THE THE SERVICES OF A IONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL IONS AND TESTS.

ENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS NDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND OF TESTS THAT THE SYSTEM COMPLIES WITH THE JCTION DOCUMENTS AND APPLICABLE LAWS.

OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ANCE WITH THE FOLLOWING SECTIONS OF THE IONAL MECHANICAL CODE 2015: NTILATION SYSTEMS – 2015 IMC 403.1.

DLLOWING WORK ITEMS, COMPONENTS, MATERIALS, ES, ETC. SHALL COMPLY WITH THE REFERENCED CODE

CT CONSTRUCTION AND INSTALLATION- 2015 IMC 603 INTAKES, EXHAUSTS AND RELIEFS - 2015 IMC 401.5 FILTERS - 2015 IMC 605.

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

FION FOR ALL AREA SHALL COMPLY WITH 2015 IMC

MENT SHALL BE FILED BY THE OWNER OR TENANT IN SION THAT THE VENTILATION SYSTEM WILL BE KEPT IN IOUS OPERATION AT ALL TIMES DURING THE NORMAL NCY OF THE STRUCTURE AS REQUIRED BY 2015 IMC

TO ARCHITECTURAL DRAWINGS FOR REQUIRED TED WALL AND SMOKE WALL CONSTRUCTION AND

PLANS ARE APPROVED ONLY FOR THE WORK INDICATED APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED HER BEING APPROVED OR IN ACCORDANCE WITH BLE CODES.

EATING AND COOLING LOADS CALCULATED PER ACCA 183.

### GENERAL NOTES

CTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE ING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING CHITECT OF ANY CONDITIONS WHICH WOULD PREVENT TALLATION OF THE WORK AS SHOWN ON DRAWINGS.

PLICABLE CODES. LAWS AND REGULATIONS GOVERNING ATING TO ANY PORTION OF THIS WORK ARE HEREBY RATED INTO AND MADE A PART OF THESE CATIONS, AND THEIR PROVISIONS SHALL BE CARRIED THE CONTRACTOR WHO SHALL INFORM THE OWNER. O SUBMITTING A PROPOSAL, OF ANY WORK OR WHICH VIOLATE ANY OF THE ABOVE LAWS AND IONS. ANY WORK DONE BY THE CONTRACTOR CAUSING IOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

PROCEEDING WITH ANY WORK IN OCCUPIED OR USED THE CONTRACTOR SHALL APPLY TO OWNER FOR SION TO ENTER SUCH AREAS. THE CONTRACTOR TO PERFORM HIS WORK ONLY AT THE TIMES TED BY OWNER. THERE WILL BE NO ADDITIONAL SATION FOR THE WORK PERFORMED AFTER HOURS OR -DAYS WITHOUT PRIOR WRITTEN APPROVAL

RK IN THE BUILDING SHALL BE DONE WHEN AND AS AND IN A MANNER SATISFACTORY TO THE OWNER. RK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST INCONVENIENCE AND DISTURBANCE TO THE PRESENT NTS.

INTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE TED ON THE PERFORMANCE OF THE WORK DURING WORKING HOURS. WHEN SO DIRECTED, HOWEVER, ITRACTOR SHALL INSTALL WORK IN OVERTIME AND THE VAL COST TO BE CHARGED THEREFORE SHALL BE ONLY REMIUM" PORTION OF THE WAGES PAID.

CTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR 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.

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

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

- 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 O 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, TC) 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

- WORKMANLIKE MANNER.
- 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 QUIPMENT SUPPLIED BY THE CONTRACTOR.

BALANCING FOR HVAC 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

- MEASUREMENT LOCATIONS.

- VALUES.
- REPORT.
- SEASONAL TESTS.

END OF SECTION 230593

### 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,

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. THF 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

HVAC NOTES

SECTION 230593 - TESTING, ADJUSTING, AND

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

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 SJECTION 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

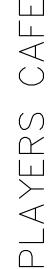
I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING

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

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:

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 SELECTE 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. ALL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED O LIKE NEW CONDITION PRIOR TO RE-USE. PROVIDE NECESSARY PROTECTIVE DEVICES WHERE REQUIRED AND IN STRICT ACCORDANCE WITH OSHA AND ICRA REGULATIONS. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS. MATERIAL FROM EXISTING SYSTEM WHICH IS RENDERED USELESS SHALL BE REMOVED AND DISPOSED OF OFF SITE. 1. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLÍSHED BUT BECOME DAMAGED DÚRING 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

### MECHANICAL FLOOR PLAN KEY NOTES:

 $\begin{array}{c}
\end{array}$  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.

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.

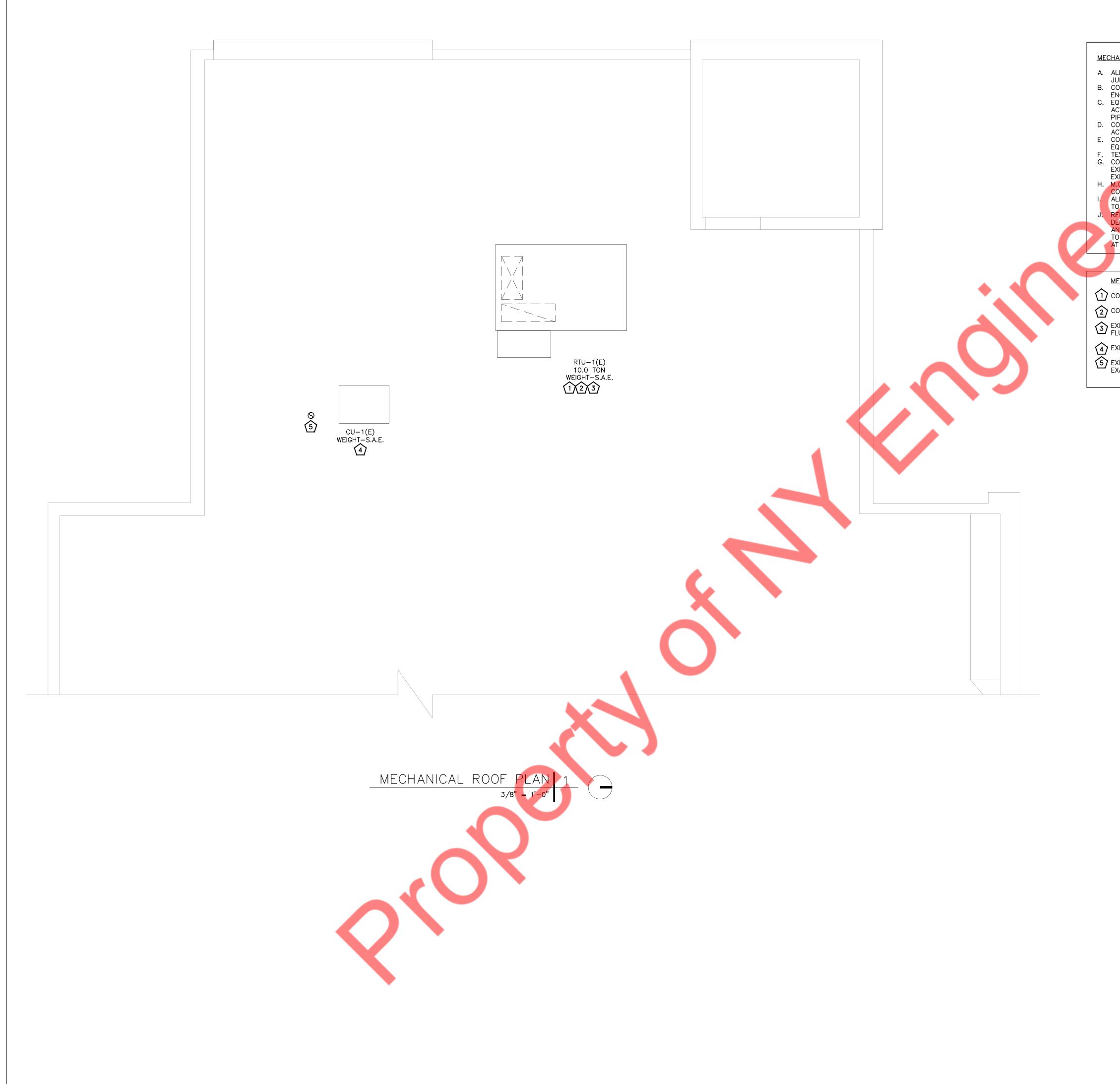
5 EXISTING SMOKE DETECTOR TO REMAIN AS IS. IF EXISTING SMOKE DETECTOR IS NOT IN GOOD CONDITION TO REUSE, THEN INSTALL NEW ONE. SMOKE DETECTOR SHALL BE FURNISHED/INSTALLED BY MECHANICAL CONTRACTOR AND WIRED BY ELECTRICAL CONTRACTOR TO SHUT DOWN CORRESPONDING RTU UNDER ALARM CONDITIONS.

6 EXISTING VENT FROM HOT WATER HEATER TO REMAIN. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION OF EXISTING WATER HEATER.

# CAFE PLAYERS

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### MECHANICAL FLOOR PLAN



ANICAL GENERAL NOTES:
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LL WORK SHALL COMPLY WITH ALL LOCAL CODE & STATE CODE & AUTHORITIES HAVING URISDICTION.
ORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL
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QUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE
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LL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED
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ND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS O THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND
T NO ADDITIONAL COST TO THE OWNER.
The Abbrief Cost to the officer.

### 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.

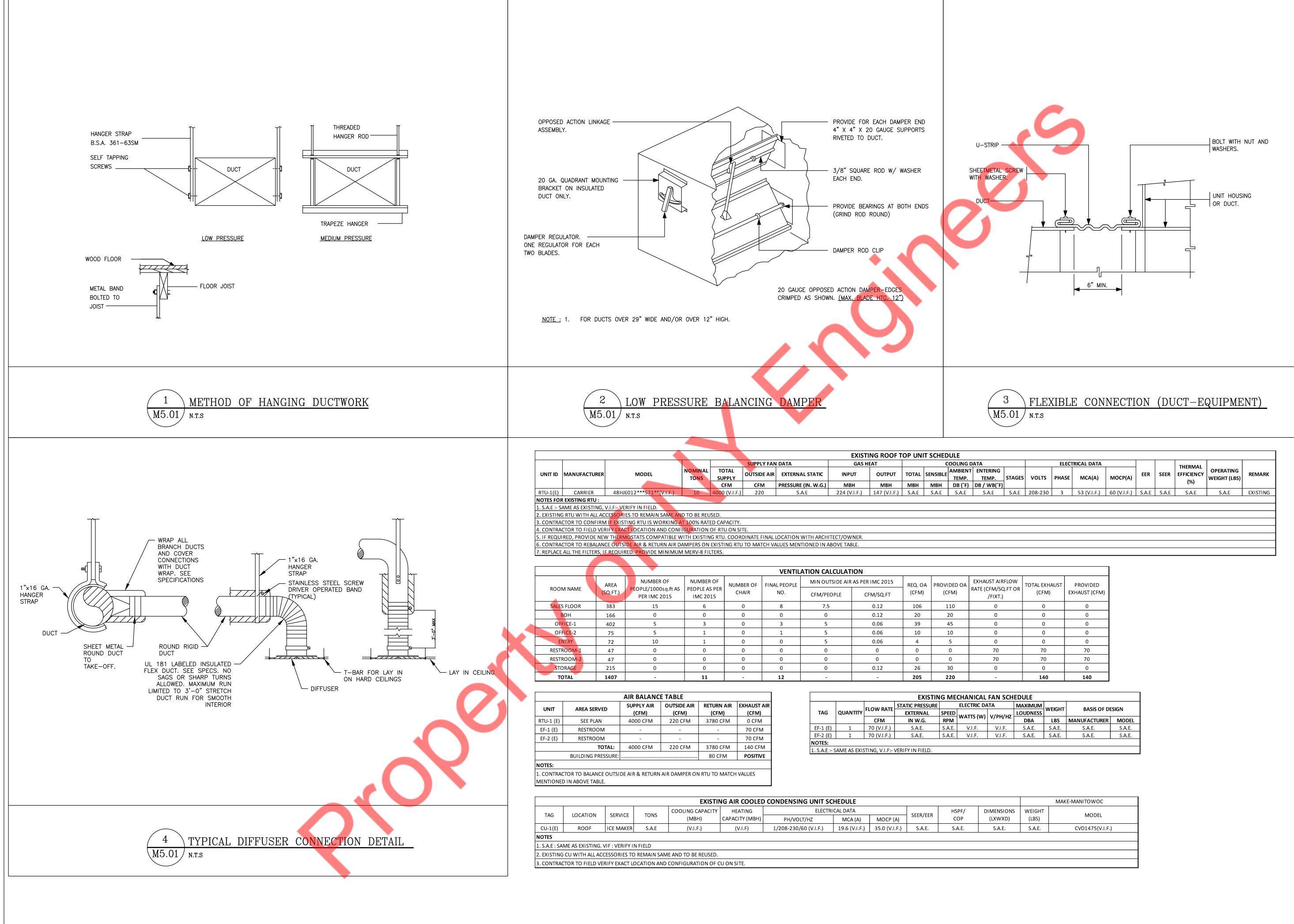
# PLAYERS CAFE

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### MECHANICAL ROOF PLAN

 $\mathbb{N}^{1}$ 



		VENTILATION CALCULATION											
ROOM NAME	AREA (SQ.FT.)	NUMBER OF PEOPLE/1000sq.ft AS	NUMBER OF PEOPLE AS PER	NUMBER OF CHAIR	FINAL PEOPLE NO.	MIN OUTSIDE AIR		REQ. OA (CFM)	PROVIDED OA (CFM)	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR	TOTAL EXHAUST (CFM)	PROVIDED EXHAUST (CFM)	
	(30.11.)	PER IMC 2015	IMC 2015	CHAIR	NO.	CFM/PEOPLE	CFM/SQ.FT			/FIXT.)			
SALES FLOOR	383	15	6	0	8	7.5	0.12	106	110	0	0	0	
вон	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:					-				

	EXISTING MECHANICAL FAN SCHEDULE										
		FLOW RATE	STATIC PRESSURE	ELECTRIC DA		IC PRESSURE ELECTRIC DATA MAX		MAXIMUM	WEIGHT	BASIS OF DE	
TAG	QUANTITY		EXTERNAL	SPEED	WATTS (W)	V/PH/HZ	LOUDNESS	WEIGHT			
		CFM	IN W.G.	RPM	WATIS (W)	V/PN/NZ	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:	IOTES:										

EXISTING AIR COOLED CONDENSING UNIT SCHEDULE												MAKE-MANITOWOC		
TAG	LOCATION	SERVICE	TONS	COOLING CAPACITY	HEATING	ELECTRICAL DATA		SEER/EER	HSPF/	DIMENSIONS	WEIGHT	MODEL		
170	LOCATION	JERVICE	10105	(MBH)	CAPACITY (MBH)	PH/VOLT/HZ	MCA (A)	MOCP (A)	SEENYEEN		СОР	(LXWXD)	(LBS)	WODEL
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 : SAI	ME AS EXISTING.	VIF : VERIFY II	N FIELD											
2. EXISTING	2. EXISTING CU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.													
3. CONTRAC	TOR TO FIELD VE	RIFY EXACT LO	CATION AND	CONFIGURATION OF C	CU ON SITE.									

			ELECT	RICAL DATA				1	THERMAL		
ERING MP. WB(°F)	STAGES	VOLTS	PHASE	MCA(A)	MOCP(A)	EER	SEER	EFFICIENCY (%)	OPERATING WEIGHT (LBS)	REMARK	
.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	

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REVISIONS  $\triangle$  ISSUE

PERMIT SET

MECHANICAL DETAILS & EQUIPMENT SCHEDULES

DATE 03/08/24



	ELECTRICAL LEGEND			
OTHERWISE	NG HEIGHTS GIVEN ARE TO CENTERLINE OF DEVICE UNLESS NOTED. 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 BACKSPLA 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.			
GROUNDED DUPLEX GFI RECEPTACLE (NEMA5-20R) W/ "WEATHERPROOF WHILE IN COVER				
-\$	GROUNDED DUPLEX RECEPTACLE (NEMA5-20R) WITH TOP RECEPTACLE CONTROLLER E SWITCH/SENSOR AND BOTTOM RECEPTACLE SHALL <u>NOT BE CONTROLLED</u> BY SWITCH/SENSOR. CONTROLLED RECEPTACLE SHALL BE PERMANENTLY MARKED AS PEI NEC 406.3 (E) AND PROVIDED IN <u>GREEN COLOR</u> .			
⇔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.			
Ю	SPECIAL PURPOSE RECEPTACLE - MATCH NEMA CONFIGURATION OF EQUIPMENT SERVED - MOUNT AT 15" A.F.F. U.N.O.			
<b>#</b>	GROUNDED DOUBLE DUPLEX RECEPTACLE (NEMA5-20R) - MOUNT AT 15" A.F.F. U.N.O.			
-0	GROUNDED DOUBLE DUPLEX RECEPTACLE (NEMA5-20R) WITH TOP RECEPTACLE CONTROLLER BY SWITCH/SENSOR AND BOTTOM RECEPTACLE SHALL <u>NOT BE</u> <u>CONTROLLED</u> BY SWITCH/SENSOR. CONTROLLED RECEPTACLE SHALL BE PERMANENTLY MARKED AS PER NEC 406.3 (E) AND PROVIDED IN <u>GREEN COLOR</u> .			
$\mathbf{\Lambda}$	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			
V	FLUSH MOUNTED FLOOR BOX WITH DATA DEVICES AS LISTED ABOVE			
	FLUSH MOUNTED FLOOR BOX WITH RECEPTACLE/DATA DEVICES AS LISTED ABOVE			
JJ	JUNCTION BOX			
	SINGLE FACE EXIT SIGN WALL/CEILING MOUNTED WITH INTEGRAL BACK-UP BATTERY AND DIRECTIONAL ARROWS AS SHOWN.			

	ABBREVI	ATION	
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
А	AMPERE	J	JUNCTION BOX
A.F.F.	ABOVE FINISH FLOOR	KEF	KITCHEN EXHAUST FAN
APS	AUXILIARY POWER SUPPLY	LCP	LIGHTING CONTROL PANEL
С	CONDUIT	LTG	LIGHTING
СКТ	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	МН	MOUNTING HEIGHT
E.C.	ELECTRICAL CONTRACTOR	MLO	MAIN LUGS ONLY
EF	EXHAUST FAN	N	NEW
EM	ITEM PROVIDED WITH OR CONNECTED	NL	NIGHT LIGHT
2.00	TO EMERGENCY POWER	Р	POLE
EMT	ELECTRICAL METALLIC TUBING	PE	PRIMARY ELECTRIC SERVICE
ER	EXISTING TO REMAIN	PP	POWER PANEL
ETP	ELECTRONIC TRAP PRIMER	PVC	POLYVINYL CHLORIDE CONDUI
ETR	EXISTING TO REMAIN	RE	RELOCATE
EV	EVAPORATOR UNIT	RGS	RIGID GALVANIZED STEEL CON
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	ТХ	TRANSFORMER
HT	HEAT TRACE	U.N.O.	UNLESS NOTED OTHERWISE
	HEATING VENTILATION AIR	WH	WATER HEATER
HVAC	CONDITIONING	WP	WEATHER PROOF
IG	ISOLATED GROUND	E	EXISTING

### ELECTRICAL GENERAL NOTES

- 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.
- THE INTENT OF THESE DOCUMENTS IS FOR THE MEP TRADES TO FURNISH AND INSTALL PARTIAL MECHANICAL AND ELECTRICA 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.
- 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 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 DITIONAL COST. REFER TO DETAILS, SCHEDULES AND SPECIFICATIONS FOR ADDITIONAL INFORMATION. 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.
- YP 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. 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).
- 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 BI 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.
- 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 COLOR CODE AS MENTIONED IN SPECIFICATION. 11 FIFI D VERIFY WITH MANUFACTURER'S PROVIDED EXACT ELECTRICAL CHARACTERISTICS AND CONNECTION REQUIREMENTS OF ALI 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
- NEERED 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 #8 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 O 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 CEIL INGS

- 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
- 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. EQUIPMENT SHALL BE INSTALLED IN ACCESSIBLE LOCATIONS, WHEN EQUIPMENT MUST BE LOCATED ABOVE AN INACCESSIBLE CEILING 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 O 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 WISE 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
  - 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
  - VORK 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 ROUTIN PENETRATION WITH FIRE STOPPING MATERIALS (TYPICAL NOTE).
  - SCREW OR SHOOT INTO STRUCTURE, ALTERNATIVE METHODS OF ATTACHMENT ONLY, NOTHING TO DAMAGE LANDLORD'S B BUILDING STRUCTURE. TENANT'S CONTRACTOR SHALL PROVIDE SIGNED AND SEALED STRUCTURAL DRAWINGS BY A STRUCT INSTALLATION AND ALL STRUCTURE MODIFICATIONS FOR LANDLORD RECORDS.
  - 69 SLAB ON GRADI 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. 1 ELEVATED SLABS TENANTE 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 LOCAL JURISDICTION. ALL PENETRATIONS SHALL BE CORE BORED ONLY. SAW CUTTING, JACK HAMMERING AND TRENCHING IS STRICTLY PROHIBITED. ALL PENETRATIONS SHALL BE SLEEVED, SEALED, FIRE 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 EXPE 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.
  - LOCATED WITHIN STAIR ENCLOSURE. NANT'S SPACE TO REMAIN, VERIFY WITH LANDLORD.
  - AINTAIN ROOF WARRANTY. CONTRACTOR TO COORDINATE WITH LANDLORD PRIOR TO ANY WORK
  - SIGN/EMERGENCY LIGHT AS REQUIRED. 250.66, PER NEC 250.1
  - 80 CONTRACTOR TO MAINTAIN THE PROPER CLEARANCES FOR THE ELECTRICAL PANELS/SWITCHBOARD AND NOT USED AS STORAGE. ARANCE IN FRONT OF PANEL/SWITCHGEAR SHALL BE AS PER NEC 110.26.
  - 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 ANEL BOARDS PRIOR OF PURCHASING OR SUBMITTAL
  - RATING OF PANEL BOARDS IS SHOWN FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY AIC RATING OF EACH ANEL BOARDS VIA SHORT CIRCUIT STUDY
  - TRICAL CONTRACTOR IS RESPONSIBLE TO REPLACE ANY DEVICES/EQUIPMENT AS REQUIRED BY SHORT CIRCUIT STUDY AND NATION 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.
  - MOUNTED ON PLYWOOD BACKER PANELS UNLESS RECESSED INTO A FURRED OUT OR INTERIOR WALL

- - 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 79.WATER HEATER SHALL BE JUMPERED BETWEEN THE COLD AND HOT WATER PIPES WITH A JUMPER SIZED ACCORDING TO NEC TABLE

## RVICE ONDUIT EL CONDUIT

SCOPE OF WORK . 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.
- 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 FACH 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 TESTING OF ALL CABLES AND CIRCUIT WIRING AFTER INSTALLATION. **EXIT & EM LIGHT SYSTEM** WIRING DEVICES. LIGHTING CONTROLS
- GROUNDING OF THE ELECTRICAL SYSTEM. J. IDENTIFY RACEWAYS AND CABLES WITH COLOR BANDING AS FOLLOWS: COLORS:
- A. FIRE ALARM SYSTEM: RED SECURITY SYSTEM: BLUE AND YELLOW. TELECOMMUNICATION SYSTEM: GREEN AND YELLOW.
- ALL THE LEGENDS. ABBREVATIONS AND NOTES MIGHT NOT BE USED IN THE PLAN. PLEASE REFER AS THE REQUIRED ONES.

- D TRENCHING OF EXISTING FLOOR SLAB WITH LANDLORD AND EXISTING CONDITION IN THE FIELD PRIOR TO ANY WORK. <mark>SEAL</mark> A 68.NOTHING IS PERMITTED TO BE ATTACHED TO, SUSPENDED FROM OR PENETRATE LANDLORD'S STRUCTURE, FLOOR DECK OR ROOI 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 W
- ENGINEER WITH LEGALLY ACTIVE REGISTRATION AS INDICATED BY ALL JURISDICTIONAL REQUIREMENTS, FOR ALL ELECTRICAL 0.TENANT'S GENERAL CONTRACTOR SHALL ADVISE THE OPERATION TEAM PRIOR TO ANY SLAB MODIFICATION OR REMOVAL. TENANT'S
- 75.CONDUITS AND/OR WIRING SHALL NOT PENETRATE STAIR ENCLOSURES UNLESS SPECIFICALLY SERVING EQUIPMENT OR DEVICES
- 76.ANY CONDUITS, WIRING, CIRCUITS, FIRE ALARM LOOPS, DEVICES, EQUIPMENT,...ETC RELATED FOR LANDLORD'S SYSTEM INSIDE 77.ROOF PENETRATION IF NEEDED SHALL BE DONE BY LANDLORD'S ROOF CONTRACTOR AT ELECTRICAL CONTRACTOR EXPENSES TO
- CONTRACTOR TO PROVIDE EQUIPMENT GROUNDING CONDUCTOR SUITABLE FOR CONDUCTOR'S SIZE, ANY INCREASE IN CONDUCTOR
- 88. ALL PANELS SHALL BE UL LABELED WITH BOLT ON TYPE CIRCUIT BREAKERS. ELECTRICAL CONTRACTOR IS RESPONSIBLE TO PROVIDE LABEL/TAGS FOR FACH 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

### 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.
- 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 DIMENSIONSAN SHALL BE VERIFIED IN THE FIELD. THE FLECTRICAL CONTRACTOR SHALL AYOUT 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 FLECTRICAL DRAWINGS AND SPECIFICATIONS ARE INTENDED TO SUPPLEMENT EACH OTHER. MATERIAL AND LABOR NECESSARY TO THE PROJECT SHALL BE URNISHED AND INSTALLED EVEN THOUGH NOT SPECIFICALLY MENTIONED IN BOTH. LABOR AND/OR MATERIALS NEITHER SHOWN NOR SPECIFIED. BUT OBVIOUSLY NECESSARY FOR THE COMPLETION AND PROPER FUNCTIONING OF THE SYSTEM. SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AT NO ADDITIONAL COST
- 6 ARRANGE ALL EQUIPMENT SUBSTANTIALLY AS SHOWN ON THE DRAWINGS. MAKE DEVIATIONS ONLY WHERE NECESSARY TO AVOID INTERFERENCE. CHECK ALL EQUIPMENT SIZES AGAINST AVAILABLE SPACE PRIOR TO SHIPMENT TO AVOID
- 7 EXAMINE THE WORK OF OTHER TRADES INSOFAR AS THEIR WORK COMES IN CONTACT WITH OR IS COVERED BY THIS WORK. IN NO CASE ATTACH TO, OR FINISH AGAINST ANY DEFECTIVE WORK OR INSTALL WORK IN A MANNER WHICH WILL PREVENT PROPER INSTALLATION OF THE WORK OF OTHER TRADES
- 8. ELECTRICAL CONTRACTOR SHALL VERIFY WITH OTHER TRADES ALL ELECTRICAL HARACTERISTICS OF EQUIPMENT REQUIRING ELECTRICAL CONNECTIONS. CONTRACTOR SHALL VERIFY VOLTAGE, PHASE AND HORSEPOWER AND SHAL NOTIFY ENGINEER OF ANY DISCREPANCIES PRIOR TO START OF WORK. ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECTING MEANS AND OVERLOAD PROTECTION FOR ALL EQUIPMENT, UNLESS FURNISHED INTEGRAL WITH EQUIPMENT PACKAGE
- 9. IT IS THE INTENT OF THESE DRAWINGS THAT THIS BE A COMPLETE ELECTRICAL JOB. ANY ERRORS OR OMISSIONS SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO BIDDING THE JOB.

### VISIT TO THE SITE

- 1. THE CONTRACTOR SHALL VISIT THE SITE OF THE WORK AND FAMILIARIZE HIMSELI WITH ALL CONDITIONS AFFECTING HIS WORK. THE SUBMISSION OF HIS PROPOSAL SHALL INDICATE SUCH KNOWLEDGE. NO ADDITIONAL PAYMENT SHALL BE MADE ON CLAIMS THAT ARISE FROM A LACK OF KNOWLEDGE OF THE EXISTING CONDITIONS CODE AND PERMITS
- INSTALLATION SHALL BE IN FULL ACCORDANCE WITH ALL CODES, RULES AND REGULATIONS OF MUNICIPAL, CITY, COUNTY, STATE AND PUBLIC UTILITIES AND AL OTHER AUTHORITIES HAVING JURISDICTION OVER THE PREMISES.
- COMPLY WITH ANY SPECIFICATION REQUIREMENTS THAT ARE IN EXCESS BUT NOT IN CONFLICT WITH CODE REQUIREMENTS. THE CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS, PLAN REVIEWS AND
- CERTIFICATES OF INSPECTION IN CONNECTION WITH HIS WORK, REQUIRED BY THE FOREGOING AUTHORITIES. BEFORE FINAL PAYMENT OF THE CONTRACT IS LLOWED, ALL CERTIFICATES SHALL BE DELIVERED TO THE ARCHITECT IN DUPLICATE
- 4. ELECTRICAL MATERIAL AND EQUIPMENT SHALL BEAR THE UL LABEL EXCEPT WHERE UL DOES NOT LABEL SUCH TYPES OF MATERIAL AND EQUIPMENT. SHOP DRAWINGS SUBMITTALS
- ECTRICAL CONTRACTOR SHALL SUBMIT FIVE (5) SETS OF SHOP DRAWINGS. THE SHOP DRAWINGS OF THE FOLLOWING EQUIPMENT USING THE INDICATED FING SYSTEM AND TITLES SHALL BE SUBMITTED THROUGH THE ARCHITECT. THE ENGINEER AND THEN RESUBMITTED FOR FINAL APPROVAL, IF NECESSARY. SHOP DRAWINGS SHALL BE SUBMITTED FOR THE FOLLOWING ITEMS:
- B. PANELBOARDS AND SAFETY SWITCHES INCLUDING FAULT CURRENT STUDY BASED ON EQUIPMENT BEING SUPPLIED. CONTACTORS, TIME SWITCHES AND PHOTOCELL LIGHTING FIXTURES SUPERVISORY ALARM SYSTEM
- ALL SUBMITTED SHOP DRAWINGS (MANUFACTURERS "EQUIPMENT DESCRIPTIVE HEETS OR VENDORS" PREPARED DRAWINGS) SHALL HAVE THE GENERA CONTRACTOR'S OR SUBCONTRACTOR'S "STAMP OF APPROVAL" INDICATING THAT THE ITEM SUBMITTED IS AS CALLED FOR ON THE PLANS AND SPECIFICATIONS. IS APPROVED BY THE GENERAL CONTRACTOR OR SUBCONTRACTOR, THE DATE OF APPROVAL AND INITIALED BY THE PERSON APPROVING THE SUBMITTAL AND THE NAME OF THE COMPANY SUBMITTING SAID EQUIPMENT FOR APPROVAL.
- SUBMIT BOUND BROCHURES COMPLETE WITH A TABLE OF CONTENTS. LOOSE OR STAPLED TOGETHER SHEETS ARE NOT ACCEPTABLE. ANY SUBMITTALS NOT IN BROCHURE FORM OR NOT AS SPECIFIED SHALL BE RETURNED AT THE CONTRACTOR'S EXPENSE FOR RESUBMITTAL
- 4. ALL DESCRIPTIVE LITERATURE SHALL BE SUBMITTED IN A THREE (3) HOLE BROCHURE WITH A COVER IDENTIFYING THE FOLLOWING: NAME OF THE JOE
- LOCATION OF THE JOB, ADDRESS, CITY AND STATE. NAME AND ADDRESS OF THE COMPANY SUBMITTING THE BROCHURES. DATE OF THE SUBMITTAL. EVERY EFFORT SHALL BE MADE, IN CHECKING THE SHOP DRAWINGS, TO DETECT
- AND CORRECT ALL ERRORS, OMISSIONS AND INACCURACIES. FAILURE TO DO THIS WILL NOT RELIEVE THE ELECTRICAL CONTRACTOR OF THE RESPONSIBILITY FOR THE PROPER AND COMPLETE INSTALLATION IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. RECORD DRAWINGS
- 1. SUBMIT TO THE ARCHITECT ONE SET OF REPRODUCIBLE (MYLARS) ELECTRICAL DRAWINGS SHOWING THE RECORD CONDITIONS. STANDARDS AND SUBSTITUTIONS
- WHEREVER THE WORDS "APPROVED BY", "APPROVED EQUAL", "AS DIRECTED" OF SIMILAR PHRASES ARE USED IN THE FOLLOWING SPECIFICATIONS, THEY SHALL BE UNDERSTOOD TO REFER TO THE OWNER AS THE APPROVING AGENCY. THE NAME OR MAKE OF ANY EQUIPMENT OR MATERIALS NAMED IN THIS SPECIFICATION (WHETHER OR NOT THE WORDS "OR APPROVED EQUAL" ARE USED) SHALL BE KNOWN AS THE "STANDARD".
- 2. THESE SPECIFICATIONS ESTABLISH QUALITY STANDARD OF MATERIALS AND EQUIPMENT TO BE PROVIDED. SPECIFIC ITEMS ARE IDENTIFIED BY MANUFACTURER, TRADE NAME OR CATALOG DESIGNATION THIS CONTRACTOR SHALL SUBMIT HIS BASE BID PRICE BASED UPON STANDARD SPECIFIED EQUIPMENT DESCRIBED HEREIN AND AS DETAILED ON DRAWINGS AND ASSOCIATED CONTRACT DOCUMENTS. THESE SPECIFICATIONS ARE NOT TO BE CONSIDERED PROPRIETARY THE CONTRACTOR MAY SUBMIT INFORMATION ON MATERIALS AND MANUFACTURERS (OTHER THAN THOSE LISTED) FOR REVIEW BY THE ARCHITECT AND ENGINEER NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. IN ADDITION, SAMPLES OF PROPOSED EQUIPMENT MAY BE REQUIRED TO BE SUBMITTED TO THE ENGINEER FOR REVIEW NO LATER THAN TEN (10) DAYS BEFORE BIDS ARE SUBMITTED. MANUFACTURERS OF PRODUCTS ACCEPTED BY THE ARCHITECT AND ENGINEER WILL BE LISTED IN AN ADDENDUM TO THE SPECIFICATIONS AS AN ACCEPTABLE SUBSTITUTION EQUIPMENT ACCEPTED AS DETAILED BELOW AND SHALL BE SHOWN AS A SEPARATE ADD OR DEDUCT PRICE TO BE FACTORED INTO THE BASE BID PRICE BY THE ARCHITECT AND OWNER IF
- 3 SHOULD THE CONTRACTOR PROPOSE TO FURNISH MATERIALS AND EQUIPMENT OTHER THAN THOSE SPECIFIED OR APPROVED BY ADDENDUM. SUBMIT A WRITTEN REQUEST FOR SUBSTITUTIONS TO THE ARCHITECT AT THE BID OPENING. THE REQUEST SHALL BE AN ALTERNATE TO THE ORIGINAL BID; BE ACCOMPANIED WITH COMPLETE DESCRIPTIVE (MANUFACTURER, BRAND NAME, CATALOG NUMBER, ETC.) AND TECHNICAL DATA FOR ALL ITEMS. FAILURE BY THIS CONTRACTOR TO SUBMIT THE REQUISITE DOCUMENTATION DETAILED ABOVE SHALL BE UNDERSTOOD BY THE ARCHITECT AND ENGINEER TO INDICATE THAT SUBSTITUTE EQUIPMENT WILL NOT BE PRESENTED BY THE CONTRACTOR FOR CONSIDERATION. SUCH SUBSTITUTIONS WILL NOT BE CONSIDERED AFTER THE BID OPENING DATE AND DELAY OF PROJECT WILL NOT BE PERMITTED FOR FURTHER INSPECTION AND EVALUATION AFTER THIS

ACCEPTED

- 4. WHERE SUCH SUBSTITUTIONS ALTER THE DESIGN OR SPACE REQUIREMENTS INDICATED ON THE DRAWINGS. INCLUDE ALL ITEMS OF COST FOR THE REVISED DESIGN AND CONSTRUCTION INCLUDING COST OF ALL ALLIED TRADES INVOLVED.
- 5. ACCEPTANCE OR REJECTION OF THE PROPOSED SUBSTITUTIONS SHALL B SUBJECT TO APPROVAL OF THE ARCHITECT AND ENGINEER JE REQUESTED THE CONTRACTOR SHALL SUBMIT (AT HIS COST) INSPECTION SAMPLES OF BOTH THE SPECIFIED AND PROPOSED SUBSTITUTE ITEMS.
- 6. IN ALL CASES WHERE SUBSTITUTIONS ARE PERMITTED, THE CONTRACTOR SHALL BEAR ANY EXTRA COST OF EVALUATING THE QUALITY OF THE MATERIAL AND EQUIPMENT TO BE PROVIDED, INCLUDING ALL ARCH/ENGINEER FEES ASSOCIATED WITH CHANGE

### TESTING AND PLACING IN SERVICE AT THE CONTRACTOR'S EXPENSE

- TESTS SHALL INCLUDE THE FOLLOWING: OF EVERY FEEDER UNDER FULL LOAD CONDITION
- SYSTEM'S GROUNDING ELECTRODE.
- INTERFERENCES
- THEY ARE DISCOVERED. THE ARCHITEC WILL BE RELOCATED, REGARDLESS OF WHICH WAS INSTALLED FIRST. HIS DECISION WILL BE FINAL. QUALITY ASSURANCE

### SHALL ESTABLISH THE STANDARDS OF THE DESIRED QUALITY AND STYLE. IT IS THE

- MATERIALS AND EQUIPMENT INSTALLED. NAMEPLATE OF THE EQUIPMENT OR EQUIPMENT CONTROLLED.
- CREWS AND AN ADHESIVE TYPE FASTENER.
- **NTING ACCESSORIES** THE PLANS
- OLTS, CLAMPS AND NECESSARY ACCESSORIES TO MAKE A COMPLETE WILL BE ACCEPTABLE
- A 4" HIGH CONCRETE HOUSEKEEPING PAD. EXECUTION
- REQUIREMENTS OF THE CURRENT EDITION OF THE NEC CHECK THE HVAC AND PLUMBING SPECIFICATIONS FOR ELECTRICAL
- EQUIPMENT CONNECTIONS, STARTERS, DISCONNECT SWITCHES, CONTROL
- ALL CUTTING, PATCHING, EXCAVATING, BACKFILLING AND CONCRETE WORK PROVIDING THE SLEEVES. CHASES AND OPENINGS NECESSARY FOR THE CEILINGS.
- INSTALLATION.
- MATERIALS AND WORKMANSHI ALL WORK SHALL BE INSTALLED IN A PRACTICAL AND WORKMANLIKE MANNER, BY MECHANICS SKILLED IN THE SEVERAL TRADES NECESSARY. ALL MATERIALS SHALL BE NEW AND FREE FROM DEFECTS AND SHALL BE THE BEST OF THEIR SEVERAL KINDS UNLESS SPECIFIED OR INDICATED ON THE DRAWINGS TO
- 3. DURING EACH PHASE AND AT THE COMPLETION OF THE CONSTRUCTION, THIS WORK. HE SHALL LEAVE THE AREA OF OPERATION BROOM CLEAN.
- LABEL OR ETL LABEL. 5. THIS CONTRACTOR SHALL GUARANTEE HIS WORKMANSHIP AND MATERIAL (LAMPS EXCEPTED) FOR A PERIOD OF ONE YEAR FROM THE DATE OF BUILDING OPENING AND LEAVE HIS WORK IN PERFECT ORDER AT THE COMPLETION. SHOULD DEFECTS VELOP WITHIN THE GUARANTEE PERIOD. THE CONTRACTOR SHALL, UPON NOTICE OF THE SAME. REMEDY THE DEFECTS AND HAVE ALL DAMAGES TO OTHER WORK OR FURNISHINGS CAUSED BY THE REPAIRS CORRECTED AT HIS EXPENSE TO THE CONDITION BEFORE SUCH DAMAGE.
- GROUNDING AND BONDING . GROUND ALL EQUIPMENT PER N.E.C.
- SIZE SHALL BE INCREASED PROPORTIONATELY.
- AFTER INSTALLING GROUNDING SYSTEM BUT BEFORE PERMANENT ELECTRICA CIRCUITRY HAS BEEN ENERGIZED, TEST FOR COMPLIANCE WITH REQUIREMENTS. WIRE AND CABLE
- . COLOR CODE CONDUCTORS (EXCEPT CONTROL AND INSTRUMENTATION CONDUCTORS) AS FOLLOWS:
- 208Y/120V SYSTEM A. PHASE RED NEUTRAL WHITE
- C. GROUND GREEN. #12 AND #10 CONDUCTORS SHALL HAVE CONTINUOUS INSULATION COLOR AS LISTED ABOVE. COLOR CODE CONDUCTORS LARGER THAN ABOVE, WHICH DO NOT HAVE CONTINUOUS INSULATION COLOR BY APPLICATION OF AT LEAST TWO LAPS OF COLORED TAPE ON EACH CONDUCTOR AT ALL POINTS OF ACCESS INCLUDING JUNCTION BOXES. COLOR TAPE SHALL BE THE EQUAL OF 3M
- PRODUCTS SCOTCH #35 CONDUCTORS SHALL BE SOFT ANNEALED COPPER INSULATED FOR 600 VOLTS UNLESS SPECIFICALLY INDICATED OTHERWISE. ALUMINUM AND NM (ROMEX) CONDUCTORS ARE NOT ALLOWED ON THIS PROJECT.
- INSULATION TYPE SHALL BE TYPE THWN FOR WIRE SIZES #8 AWG AND LARGER AND THHN OR THWN FOR #10AWG AND SMALLER. THHN SHALL NOT BE USED IN WET OR DAMP LOCATIONS.
- FLEXIBLE CORD SHALL BE HEAVY DUTY TYPE SO WITH AN EQUIPMENT GROUND CONDUCTOR IN ADDITION TO THE CURRENT CARRYING CONDUCTORS. PROVIDE #12 CONDUCTORS, UNLESS OTHERWISE INDICATED.
- CONTROL CONDUCTORS SHALL BE #14 MINIMUM FOR NEC CLASS I AND #16 FOR NEC CLASS II.
- CONDUCTORS #8 AWG AND LARGER SHALL BE STRANDED. 5. CONDUCTORS #10 AWG AND SMALLER SHALL BE SOLID.

MAY BE RUN IN MC OR AC CABLE.

LARGER CONDUCTORS.

### ANY MATERIAL OR EQUIPMENT FAILING A TEST SHALL BE REPAIRED OR REPLACED

- A. MEASURE THE LOAD ON EACH PHASE OF THE MAIN SERVICE AND EACH PHASE B MEASURE THE NO-LOAD AND FULL-LOAD VOLTAGES (PHASE TO PHASE, PHASE TO NEUTRAL AND PHASE TO GROUND FOR EACH PHASE OF EACH SERVICE, OF EACH SEPARATELY DERIVED SYSTEM. AND AT EACH PANELBOARD OR
- MEASURE THE GROUND RESISTANCE OF THE MAIN SERVICE GROUNDING ELECTRODE AND THE GROUND RESISTANCE OF EACH SEPARATELY DERIVED D. MAKE INSULATION RESISTANCE TESTS ON ALL DRY TYPE TRANSFORMERS AND
- BEFORE THE INSTALLATION OF ANY ITEM BEGINS, THE ELECTRICAL CONTRACTOR SHALL CAREFULLY ASCERTAIN THAT IT DOES NOT INTERFE<mark>RE</mark> WITH CLEARANCI FOR THE ERECTION OF FINISH BEAMS, COLUMNS, PILASTERS, WALLS OR STRUCTURAL OR ARCHITECTURAL MEMBERS AS SHOWN ON THE ARCHITECTU DRAWINGS. IF ANY WORK IS INSTALLED AND THE ARCHITECTURAL DESIGN CANNOT BE FOLLOWED, THIS CONTRACTOR SHALL, AT HIS OWN EXPENSE, MAKE CHANGES IN HIS WORK AS DIRECTED BY THE ARCHITECT TO PERMIT THE COMPLETION OF ARCHITECTURAL WORK IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IT SHALL BE THE DUTY OF THIS CONTRACTOR TO REPORT ANY INTERFERENCES BETWEEN HIS WORK AND THAT OF ANY OF THE OTHER CONTRACTORS AS SOON AS ALL DETERMINE WHICH EQUIPMENT
- ALL PRODUCTS SHALL BE NEW AND OF THE TYPE AND QUALITY SPECIFIED. WHERE MATERIALS, EQUIPMENT, APPARATUS OR OTHER PRODUCTS ARE SPECIFIED BY MANUFACTURER, BRAND NAME, TYPE OF CATALOG NUMBER, SUCH DESIGNATION
- INTENT OF THESE SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY OF ND MOUNT ON EACH PANELBOARD, SWITCHBOARD (INCLUDING BRANCH
- VITCHES), LARGE JUNCTION BOX, SAFETY SWITCH, STARTER, REMOTE CONTROL, PUSH BUTTON STATION AND ALL SIMILAR CONTROLS A NAMEPLATE DESCRIPTIVE
- ROVIDE BLACK AND WHITE NAMEPLATES CONSTRUCTED FROM LAMINATED ENOLIC WITH A WHITE CENTER CORE. LETTERS SHALL BE ENGRAVED IN THE
- NOLIC TO FORM WHITE LETTERS 3/8" HIGH. FASTEN THE NAMEPLATES WITH
- CONTRACTOR SHALL FURNISH AND INSTALL ALL ANGLE IRON, CHANNEL IRON, ODS, SUPPORTS, HANGERS, CONCRETE OR PLYWOOD REQUIRED TO INSTALL, MOUNT AND SUPPORT ANY ELECTRICAL EQUIPMENT OR DEVICE CALLED FOR ON
- UPPORTING MATERIAL SHALL BE COMPLETE WITH HANGERS, CONNECTORS, NSTALLATION SUPPORTING MATERIAL SHALL BE GALVANIZED PAINTED OF THERWISE SUITABLY FINISHED. PRODUCTS BY BRINKLEY, STEEL CITY OR RACO
- ALL SURFACE-MOUNTED EQUIPMENT ON BLOCK WALLS SHALL BE MOUNTED ON 3/4" PLYWOOD BACKBOARD. ALL FLOOR-MOUNTED EQUIPMENT SHALL BE INSTALLED ON
- THE ELECTRICAL WORK FOR CONSTRUCTION PROPOSED SHALL CONFORM TO ALL FEDERAL (OSHA), STATE, ALL SPECIFIC SAFETY REQUIREMENTS AND THE
- REQUIREMENTS AND INCLUDE THE SAME IN THE CONTRACT COST
- TRANSFORMERS AND PUSHBUTTON STATIONS FOR THE EQUIPMENT FURNISHED BY THE OWNER OR UNDER A SEPARATE CONTRACT SHALL BE INSTALLED AND CONNECTED UNDER THIS DIVISION, AS INDICATED ON THE CONTRACT DRAWINGS.
- RELATED TO THIS CONTRACT WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR. THIS CONTRACTOR SHALL ASSUME THE RESPONSIBILITY OF ELECTRICAL INSTALLATION AND FOR THEIR REPAIR IN AN ACCEPTABLE MANNER, AS DETERMINED BY THE ARCHITECT. ALL HOLES SHALL BE CORE-DRILLED. PROVIDE FIRE STOP IN ALL OPENINGS CREATED THROUGH FIRE-RATED WALLS, FLOORS OR
- 5. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL REQUIRED ACCESS PANELS NECESSARY FOR HIS WORK, COORDINATE WITH ARCHITECT PRIOR TO
- CONTRACTOR SHALL REMOVE ALL DEBRIS AND EXCESS MATERIALS CAUSED BY HIS 4. ALL ELECTRICAL EQUIPMENT SHALL BEAR THE UNDERWRITERS LABORATORIES
- ALL CONDUITS SHALL CONTAIN A CODE-SIZED GROUND WIRE SIZED PER N.E.C. IN ADDITION TO THE CONDUCTORS SHOWN ON THE PLANS. WHERE CIRCUI CONDUCTORS ARE INCREASED IN SIZE FOR VOLTAGE DROP, THE GROUND WIRE

- INSTALL WIRING IN CONDUIT. CONCEALED WIRING IN WALLS OR ABOVE CEILINGS OR EXPOSED IN UNFINISHED AREAS (WHERE NOT SUBJECT TO PHYSICAL DAMAGE)
- CONNECT #10 AND SMALLER WIRES WITH CONSTANT PRESSURE EXPANDABLE SPRING TYPE CONNECTORS, "SCOTCHLOK" BY 3M OR B-CAP BY BUCHANAN. 8. CONNECT #8 AND LARGER WIRES WITH COMPRESSION CONNECTORS OR SPLICES
- AS MANUFACTURED BY BURNDY OR T&B. INSULATE SPLICING CONNECTORS TO AT LEAST 200% OF THE WIRE INSULATION. USE PRE-STRETCHED TUBING CONNECTOR INSULATORS, 3M PST FOR #2 AND
- 10. PULL CONDUCTORS USING RECOGNIZED METHODS AND EQUIPMENT LEAVING AT LEAST 6" WIRE AT ALL JUNCTION BOXES FOR CONNECTIONS.
- A. CLEANOUT EACH CONDUIT SYSTEM BEFORE PULLING WIRE.

- 11. FORM AND TIE ALL WIRING IN PANELBOARDS.
- 12. THERE SHALL BE NO WIRENUT JOINTS OR SPLICES MADE INSIDE SWITCHBOARDS/PANELBOARDS.
- 13. BRANCH CIRCUIT WIRE SIZES (AND CONDUITS) SHALL BE INCREASED FROM THOSE INDICATED ON THE PLANS TO PREVENT EXCESSIVE VOLTAGE DROP. BRANCH CIRCUITS SHALL BE INSTALLED WITH WIRES OF SUFFICIENT SIZE SO THAT VOLTAGE DROP BETWEEN THE PANEL AND THE LOADS DOES NOT EXCEED LIMIT OF 3%.
- 14. WIRE SIZES SHALL BE BASED ON THE 75 DEGREES C. AMPACITIES.
- 15. CIRCUITS MAY BE MULTI-PLEXED IN CONDUIT PROVIDED WIRE IS PROPERLY DERATED AND CONDUIT SIZED PER CODE. UNDER NO CIRCUMSTANCE SHALL MORE THAN (8) CURRENT CARRYING CONDUCTORS BE RUN IN A SINGLE CONDUIT.
- ALL WIRE SHALL BE RUN IN ACCORDANCE WITH CODE IN CORROSION RESISTANT RIGID, THREADED, METAL CONDUIT OR ELECTRICAL METALLIC TUBING (E.M.T.) UNI ESS OTHERWISE SPECIFICALLY STATED HEREIN
- A. CONDUIT IN EXTERIOR WALLS, BELOW FLOOR SLAB, OR UNDERGROUND SHALL BE RIGID, THREADED, GALVANIZED, HEAVY WALL TYPE. CARLON PVC TYPE 40 HEAVY WALL CONDUIT WITH GROUND WIRE MAY BE USED. BELOW FLOOR SLAB OR UNDERGROUND IN LIEU OF RIGID, THREADED, GALVANIZED CONDUIT. PVC 40 CONDUIT SHALL NOT BE RUN IN OR ABOVE FLOOR SLAB. PVC CONDUIT SHALL TERMINATE BELOW FLOOR SLAB WITH
- RIGID, THREADED METAL CONDUIT ADAPTER. CONDUIT ABOVE SLAB SHALL BE CONDUIT RUN EXPOSED TO THE WEATHER SHALL BE HEAVY WALL, METAL THREADED TYPE.
- PROVIDE BRANCH CIRCUIT CONDUCTORS THAT ARE TYPE THEN OR THWN AS REQUIRED. MC CABLE CAN BE USED FOR LIGHT FIXTURE TO LIGHT FIXTURE.
- 2. CONDUIT SIZE SHALL BE 3/4" MINIMUM.

RACEWAYS

- CONDUIT SHALL BE SECURELY FASTENED IN PLACE. ALL CONDUIT SHALL BE CONCEALED IN WALLS FLOOR AND CEILINGS WHEREVER POSSIBLE, EXPOSED CONDUIT IN FINISHED AREAS WILL NOT BE PERMITTED. EXPOSED CONDUIT WILL BE PERMITTED IN UNFINISHED AREAS WITH THE SPECIFIC APPROVAL OF THE ARCHITECT
- USE FLEXIBLE CONDUIT FOR THE CONNECTION TO RECESSED OR SEMI-RECESSED IGHTING FIXTURES (6' LENGTH MAXIMUM). USE LIQUID TIGHT METAL CONDUIT FOR ALL CONNECTIONS TO MOTORS AND OTHER EQUIPMENT SUBJECT TO VIBRATION AND IN AREAS SUBJECT TO MOISTURE.
- USE WATERTIGHT JOINTS WITH BURIED AND CONCRETE ENCASED CONDUIT. ALL BURIED CONDUITS OUTSIDE OF BUILDINGS SHALL HAVE A MINIMUM OF 24" OF COVER. METAL CONDUITS BURIED IN EARTH SHALL BE PAINTED (TWO COATS) WITH HEAVY ASPHALTUM PAINT
- SUPPORT RUNS OF CONDUIT AS DETAILED IN THE APPROPRIATE TABLE OF THE NATIONAL ELECTRICAL CODE (NEC
- INSTALL EXPOSED RUNS OF CONDUIT AND CONDUIT ABOVE LAY-IN CEILINGS PARALLEL OR PERPENDICULAR TO THE WALLS, STRUCTURAL MEMBERS OF INTERSECTIONS OF VERTICAL PLANES AND CEILINGS. PROVIDE RIGHT ANGLE TURNS USING FITTINGS OR SYMMETRICAL BENDS. SUPPORT CONDUITS WITHIN 1 OF ALL CHANGES IN DIRECTION.
- 9. IF A CONDUIT IS SUSPENDED, IT SHALL BE SUPPORTED ON TRAPEZE HANGERS WHICH USE "ALL-THREAD" RODS FROM THE STRUCTURAL STEEL. THE USE OF
- CEILING SUPPORT WIRE OR SIMILAR MATERIAL WILL NOT BE ACCEPTED. INSTALL EMPTY CONDUIT FOR FUTURE USE AS INDICATED ON THE DRAWINGS. NDUIT SHALL BE COMPLETE WITH JETLINE OR PULL ROPE, JUNCTION/OUTLET BOXES, TILE RINGS AND APPROPRIATE COVER PLATES.
- 11. PROVIDE PITCHPOCKETS WHERE CONDUITS PENETRATE THE ROOF.
- 12. THREAD LUBRICATION/SEALANT IS REQUIRED ON OUTDOOR AND UNDERGROUND THREADED METAL JOINTS.
- INSTALL FIRE SEAL FITTINGS WHERE CONDUITS PENETRATE CONCRETE FLOOR SLABS OR MASONRY WALLS REQUIRED TO BE FIRE RATED.
- 14. HORIZONTAL PORTION OF CONDUIT EXPOSED ON THE ROOF AND FEEDING EQUIPMENT SHALL NOT BE MORE THAN 5'-0" UNLESS THE WRITTEN APPROVAL FROM ARCHITECT OR ENGINEER IS OBTAINED PULL AND JUNCTION BOXES
- INSTALL PULL AND JUNCTION BOXES WHERE SHOWN ON THE DRAWINGS, AND WHERE REQUIRED FOR CHANGES IN DIRECTION, AT JUNCTION POINTS, AND TO FACILITATE WIRE PULLING. FURNISH BOX SIZES IN ACCORDANCE WITH NEC UNLESS LARGER BOXES ARE INDICATED.
- PROVIDE STEEL BOXES AND REMOVABLE COVERS OF CODE GAUGE, HOT ROLLED SHEET STEEL, HOT DIPPED GALVANIZED INSIDE AND OUTSIDE, FOR ABOVE GROUND WORK. FURNISH WEATHERPROOF BOXES WHEN INSTALLED ABOVE GROUND
- PROVIDE CAST IRON BOXES HOT DIPPED GAI VANIZED INSIDE AND OUTSIDE WHERE SHOWN ON THE DRAWINGS. FURNISH REMOVABLE COVERS WITH GASKETS AND STAINLESS STEEL, BRASS OR BRONZE SCREWS,
- PROVIDE CONCRETE BOXES FOR UNDERGROUND WORK UNLESS OTHERWISE INDICATED ON THE DRAWINGS FURNISH STEEL FRAMES AND COVERS WITH THE OVER ATTACHED TO THE FRAME WITH HEXAGON HEAD, BRASS OR BRONZE CAP SCREWS, 3/8" DIAMETER. PROVIDE A RUBBER GASKET FOR SEALING BETWEEN THE COVER AND THE FRAME. PAINT THE COVER WITH TWO COATS OF HEAVY ASPHALTUM.
- OUTLET BOXES
- USE SHEET STEEL BOXES, ZINC COATED OR CADMIUM PLATED, FOR CONCEALED INTERIOR WORK USE CAST BOXES, ZINC-CADMIUM FINISH MALLEABLE IRON, FOR EXPOSED INTERIOR
- WORK, AND FOR EXPOSED OR CONCEALED WORK IN WET, DAMP OR EXTERIOR LOCATIONS. WALL BOX SIZES (MINIMUM) SHALL BE 4" SQUARE x 2-1/2" DEEP WHERE WALL CONSTRUCTION PERMITS. WHERE WALL CONSTRUCTION DICTATES, THE WIDTH
- MAY BE REDUCED TO 2-1/8" OR 1-1/2" UNDER SPECIAL CONDITIONS. FIXTURE OUTLETS IN CEILINGS (MINIMUM) SHALL BE 4" OCTAGONAL x 1-1/2" DEEP (4-11/16" OCTAGONAL x 2-1/2" DEEP WHERE REQUIRED TO ACCOMMODATE LARGER
- CONDUIT OR LARGER NUMBER OF WIRES). GANG BOXES SHALL BE ONE PIECE (MINIMUM), 2-1/8" DEEP.
- 6 PROVIDE CONCRETE-TIGHT FLOOR BOXES WITH ADJUSTABLE COVERS SET FLUSH AND LEVEL WITH THE FINISHED FLOOR, WITH OUTLETS AS INDICATED ON THE WINGS PROVIDE WIREMOLD #EEB6S SERIES BOXES WITH LEVELING SCREWS FOR ABOVE GRADE APPLICATIONS, AND WIREMOLD #EFB6S-OG FOR ON-GRADE APPLICATIONS. FLUSH TYPE COVERS AND OPENINGS TO SERVE OUTLETS USED. FURNISH FLUSH CAPS FOR CLOSING OFF BOX WHEN NOT IN USE.
- PROVIDE WIREMOLD EVOLUTION SERIES WALL BOX BEHIND ALL WALL MOUNTED FLAT SCREEN MONITORS. COORDINATE HEIGHT WITH ARCHITECT.
- FLUSH MOUNT BOXES IN ALL FINISHED WALLS. INSTALL THE PLASTER RINGS IN DRYWALLED PLASTERED WALLS AND RAISED COVERS AS REQUIRED IN WALLS WITH OTHER FINISHES SO THAT THE COVER PLATES FIT TIGHTLY AGAINST BOXES OR RINGS, 3/16" MAXIMUM GAPS ARE ALLOWED FOR NONCOMBUSTIBLE WALLS.
- ADJUST LOCATION OF OUTLETS IN MASONRY OR TILE CONSTRUCTION TO OCCUR IN THE NEAREST JOINT TO THE HEIGHT SPECIFIED. HEIGHTS SHALL MEET A.D.A. REQUIREMENTS.
- 10. SUPPORT ALL BOXES TO MAINTAIN PROPER ALIGNMENT AND RIGIDITY.
- 11. CLEAN BOXES OF ALL FOREIGN MATTER PRIOR TO THE INSTALLATION OR WIRING OF
- 12. MOUNTING HEIGHTS ON THE DRAWINGS ARE TO THE CENTERLINE OF THE BOX UNLESS OTHERWISE NOTED.
- WIRING DEVICES
- 1. WIRING DEVICE COLOR SHALL BE WHITE, UNLESS OTHERWISE INDICATED. GENERAL SWITCHES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY PASS
- PROVIDE NEMA CONFIGURATION 5-20R DUPLEX 125 VOLT GROUNDING TYPE RECEPTACLES RATED FOR 20 AMPERES UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- RECEPTACLES SHALL BE SPECIFICATION GRADE AS MANUFACTURED BY PASS &
- RECEPTACLES REQUIRING AMPERAGES, VOLTAGES OR CONFIGURATIONS DIFFERENT FROM THE DUPLEX CONVENIENCE RECEPTACLES ABOVE SHALL BE AS INDICATED ON THE DRAWINGS.
- PROVIDE OTHER RECEPTACLES OF A QUALITY, MATERIAL AND WORKMANSHIP EQUAL TO THAT SPECIFIED FOR DUPLEX CONVENIENCE RECEPTACLES. PROVIDE COVER OR DEVICE PLATES FOR OUTLET BOXES AS FOLLOWS UNLESS OTHERWISE NOTED:
- FINISHED AREAS: STAINLESS STEE B UNFINISHED AREAS: ZINC COATED SHEET METAL, ALUMINUM, OR CAST METAL AS APPROPRIATE FOR THE TYPE OF BOX. C EXTERIOR AREAS: COPPER FREE ALUMINUM WITH GRAY. POWDER EPOXY FINISH, GASKET, WEATHERPROOF. TELEPHONE, COMMUNICATION, AND SIGNAL
- OUTLET PLATES, SHALL MATCH THOSE USED FOR RECEPTACLES AND SWITCHES. ALL OUTLET AND/OR JUNCTION BOXES SHALL BE COMPLETE WITH A COVER PLATE BY THIS CONTRACTOR D. WHERE DEVICES ARE GANGED, THEY SHALL BE INSTALLED UNDER A COMMON COVERPLATE.
- LOCATE THE SWITCHES APPROXIMATELY 4'-0" ABOVE THE FINISHED FLOOR ELEVATION OR NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS), UNLESS OTHERWISE INDICATED. THE LONG DIMENSION OF THE SWITCHES SHALL BE
- VERTICAL LOCATE RECEPTACI ES APPROXIMATELY 1"-6" ABOVE THE FINISHED ELOOR ELEVATION OR NEAREST BLOCK COURSE (WITHIN A.D.A. REQUIREMENTS), UNLESS NOTED OTHERWISE. THE LONG DIMENSION OF RECEPTACLES SHALL BE VERTICAL

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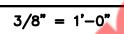
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ELECTRICAL MAIN FLOOR LIGHTING PLAN



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 <u>B</u> ATTERY 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:

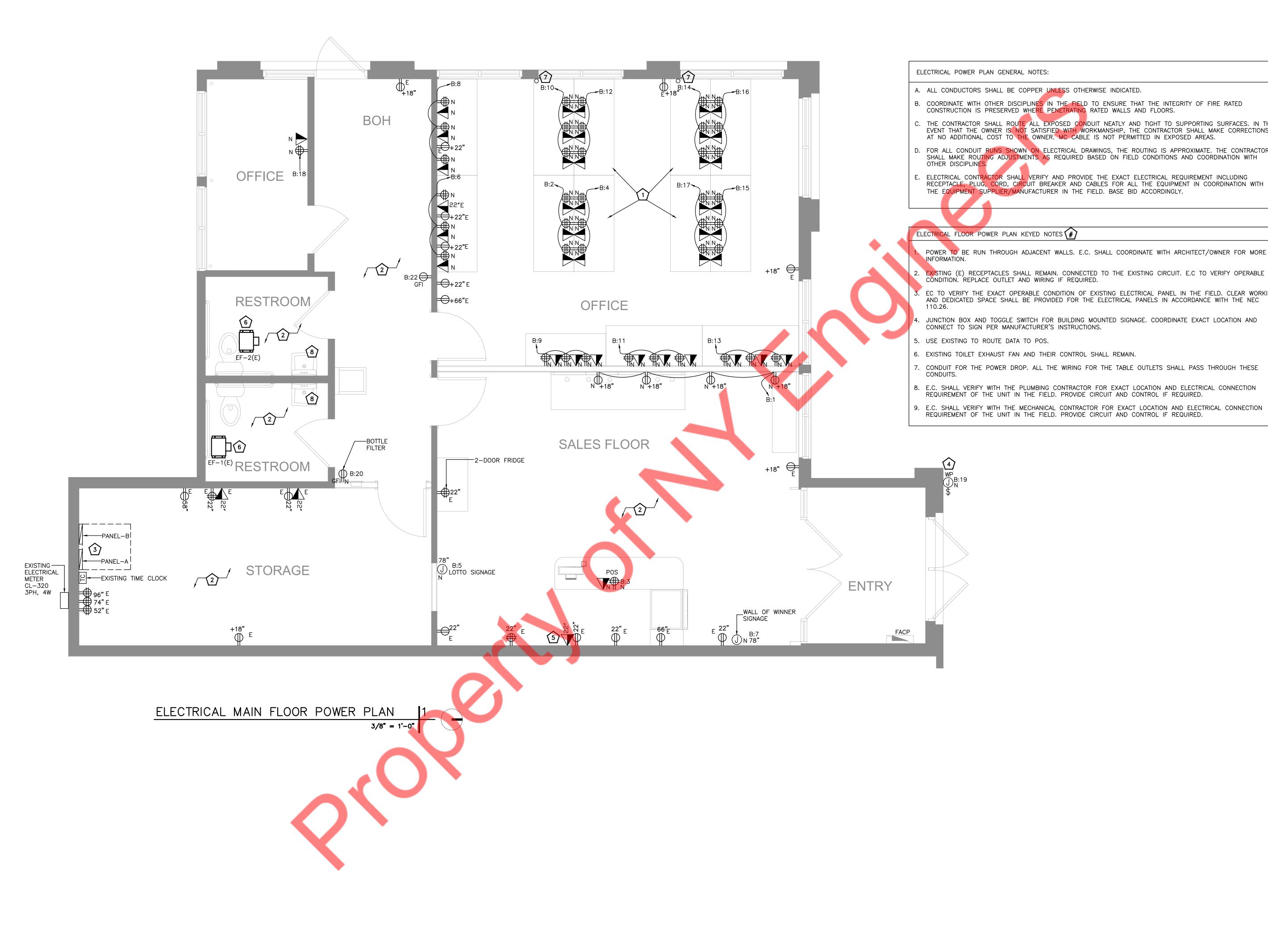
- 1. CONNECT EXIT SIGN TO THE NEAREST LIGHTING BRANCH CIRCUIT AHEAD OF ALL SWITCHING AND CONTROLS PER STATE AND LOCAL CODES. EXIT SIGN SHALL NOT EXCEED 5 WATTS PER FACE.
- 2. THE EXISTING (E) LIGHTING AND THEIR CONTROL SHALL REMAIN. E.C TO VERIFY OPERABLE CONDITION IN FIELD. REPLACE IF REQUIRED.
- 3. 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

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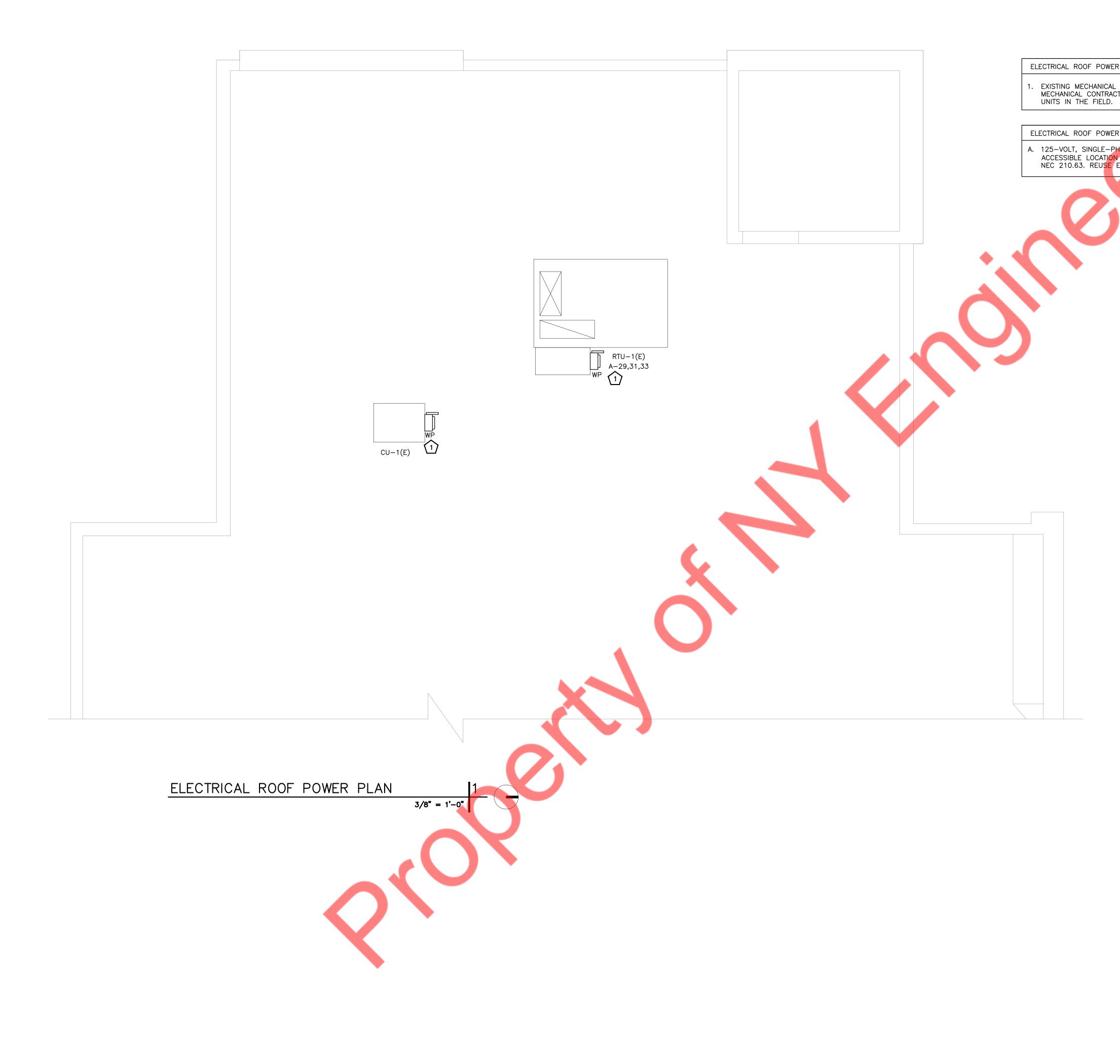
ECTRICAL POWER PLAN GENERAL NOTES:
ALL CONDUCTORS SHALL BE COPPER UNLESS OTHERWISE INDICATED.
COORDINATE WITH OTHER DISCIPLINES IN THE FIELD TO ENSURE THAT THE INTEGRITY OF FIRE RATED CONSTRUCTION IS PRESERVED WHERE PENETRATING RATED WALLS AND FLOORS.
THE CONTRACTOR SHALL ROUTE ALL EXPOSED CONDUIT NEATLY 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.
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.
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.
ECTRICAL FLOOR POWER PLAN KEYED NOTES $\widehat{\#}$
POWER TO BE RUN THROUGH ADJACENT WALLS. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR MORE INFORMATION.
EXISTING (E) RECEPTACLES SHALL REMAIN. CONNECTED TO THE EXISTING CIRCUIT. E.C TO VERIFY OPERABLE CONDITION. REPLACE OUTLET AND WIRING IF REQUIRED.
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.
JUNCTION BOX AND TOGGLE SWITCH FOR BUILDING MOUNTED SIGNAGE. COORDINATE EXACT LOCATION AND CONNECT TO SIGN PER MANUFACTURER'S INSTRUCTIONS.
USE EXISTING TO ROUTE DATA TO POS.
EVICTING TOULET EVILATION AND THEID CONTROL CHALL DEMAIN
EXISTING TOILET EXHAUST FAN AND THEIR CONTROL SHALL REMAIN.
CONDUIT FOR THE POWER DROP. ALL THE WIRING FOR THE TABLE OUTLETS SHALL PASS THROUGH THESE CONDUITS.



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ELECTRICAL POWER PLAN

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R PLAN KEYED NOTES: 🕢
_ EQUIPMENT AND THEIR CONTROL SHALL REMAIN. E.C. SHALL COORDINATE WITH CTOR FOR THE EXACT LOCATION AND OPERABLE CONDITION OF THE EXISTING MECHANICAL
R PLAN GENERAL NOTES:
PHASE, 15– OR 20–AMPERE-RATED RECEPTACLE OUTLET SHALL BE INSTALLED AT AN N WITHIN 7.5 M (25 FT) OF THE EQUIPMENT AS SPECIFIED IN 210.63(A) AND (B) AS PER EXISTING OR PROVIDE NEW. IF NOT REQUIRED.

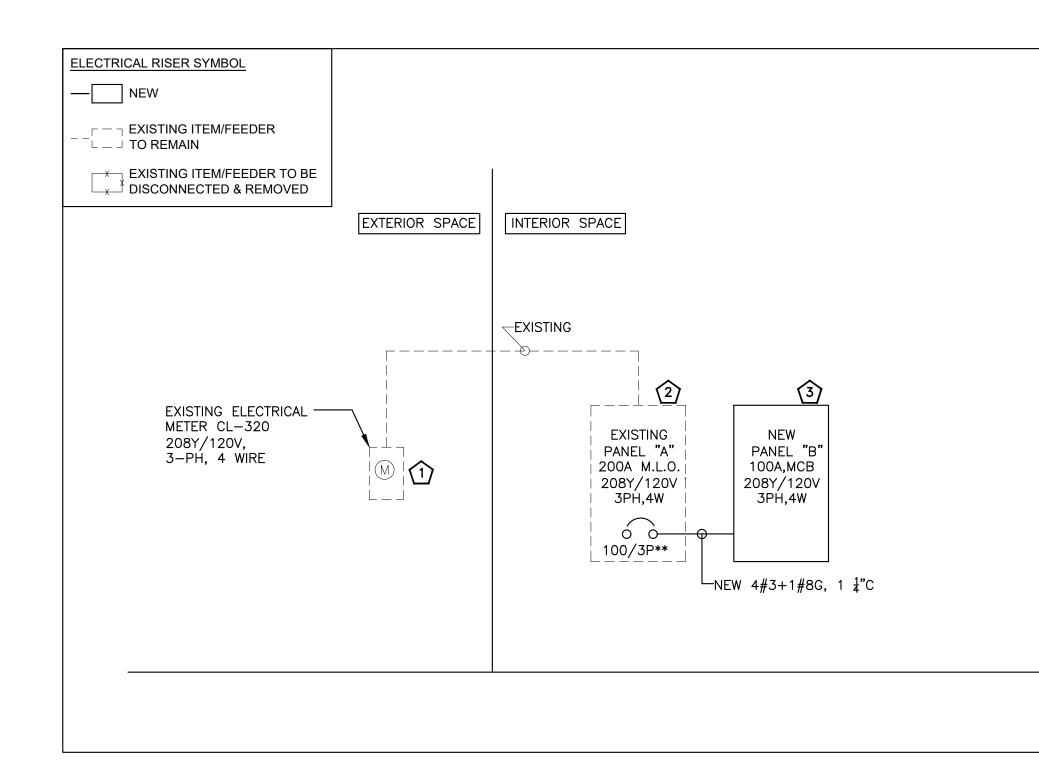


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ELECTRICAL ROOF POWER PLAN

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DATE 03/08/24



PANEL:	A	(EXISTING)										MOUNTING:	SURFACE	
208Y/120	VOLTS	PHASE	3		-	-			DEMAND LOAD	53.64		PANEL LOCATION:	STORAGE	
200A	МСВ	WIRE	4		-	-			DEMAND CURRENT	149.07		FED FROM:	EXISTING N	<b>/</b> ETER
NOTE:									•			·		
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER A	PHASE (H B	(VA) 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		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			Н	6.36				12.87		6.51	0			30
31	80/3P	RTU-(E)	Н	6.36	3#4 + 1#8G, 1"C	12.87			4#3 + 1#8G, 1 1/4"C	6.51	0	PANEL B	100/3P**	32
33			Н	6.36			12.87			6.51	0			34
35	20	SPARE						0.00				SPARE	20/2P	36
37	20	SPARE				0.00				0.00	0		20/21	38
39	20	LED LIGHT	L	0.80	EXISTING		0.80					SPARE	20/2P	40
41	20	SPARE						0.00		0.00	0		20/21	42
						15.91	17.79	18.35						

NTS

ELECTRICAL RISER DIAGRAM

						10.51	17.75	10.00					
PANEL:	В	(NEW)									MOUNTING	: SURFACE	
208Y/120	VOLTS	PHASE	3					DEMAND LOAD	19.52		PANEL LOCATION	STOPACE	
	MCB	WIRE			-	-		DEMAND LOAD			FED FROM		
NOTE:	IVICD	VVINE	4		-	-			J4.2J				
						PER PHASE	(K)/A)						
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	A B		- 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						

FLOOR LEVEL

ELE	CTRICAL 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.
В.	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

### PLUMBING SYMBOLS LIST

SANITARY SEWER VENT PIPING
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

I EQUIDING / E	
СО	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

- P0.01 PLUMBING SYMBOLS & SPECIFICATIONS
- P1.01 PLUMBING WATER FLOOR PLAN AND RISER
- P1.02 PLUMBING SANITARY FLOOR PLAN AND RISER
- P2.01 PLUMBING DETAILS AND SCHEDULES

### 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
- 5. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF PER 248 CMR
- 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
- . HANGERS AND SUPPORTS
- . PLUMBING PIPING LAYOUT TESTS
- PLUMBING FIXTURES MIXING VALVES
- 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
- 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:
- 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,
- 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 C403.12.3 REFER BELOW TABLE.

	MINIMUM P	IPE INSULATION	THIC	KNESS			
FLUID OPERATING		CONDUCTIVITY	NC		PIPE OI (INCHE		βE
TEMPERATURI RANGE AND USAGE (*F)	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

- 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.

NOMINAL PIPE SIZE		PIPING LENGTH (FEET)
(INCHES)	PUBLIC LAV	OTHER FIXTURES
½"	2'	43'
3⁄4"	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.

. HANGERS AND SUPPORTS:

- 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 A 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.
- ). 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.
- 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.
- 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:

- 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
- 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.
- 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.
- IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED SURFACES.
- REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.
- VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED. К.
- IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.

- APPROVED INDIRECT WASTE SOURCE.

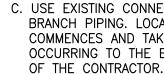
CODE.

- 2. INSTALLATION
- 2.01 GENERAL

- CORROSION, COLOR PER ARCHITECT.
- AND THE CONSTRUCTION SCHEDULE.
- FERROUS END PIPE.
- BEFORE ASSEMBLY.
- UNIONS.
- BUILDING CONDITIONS.
- SPACES.
- PROPERTY MANAGER IS REQUIRED.
- SYSTEMS.
- 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.



2.03 INSULATION

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 11/4" AND 11/2" THICK FOR PIPE SIZE 11/2" AND GREATER WITH MANVILLE MICRO-LOK AP-T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH 1/2" THICK FOR PIPE SIZE UP TO 11/4" AND 1" THICK FOR PIPE SIZE 1%" 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

PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER

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.

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

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 SEATS, ETC., REQUIRED TO ALL STRAINERS, VALVE STEM ACCOMPLISH THE FLUSHING.

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

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

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

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

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

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK

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

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

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND

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

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED

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

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

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

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

### 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.
- 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 E. AQNDOCTEDTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.
- F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.
- G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.
- H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.
- I. ALL EQUIPMENT WILL BE FACTORY TESTED.
- J. CONTRACTOR SHALL IDENTIFY TO THE OWNER'S REPRESENTATIVE ANY LEAKS OR DAMAGE THAT OCCURS AS A RESULT OF SYSTEM TESTING. CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO LIMIT ANY POTENTIAL DAMAGE. CORRECTIVE ACTION REQUIRED AS A RESULT OF TESTING SHALL BE PERFORMED IMMEDIATELY AND AT THE CONTRACTOR'S EXPENSE.
- K. REPORT IN WRITING TO AUTHORITIES HAVING JURISDICTION, THE ARCHITECT AND THE OWNER THE RESULTS OF ALL TESTING.
- L. TESTING REQUIREMENTS
  - a. TEST ALL DOMESTIC WATER PIPING 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.
- M. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

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

### 4. WARRANTY

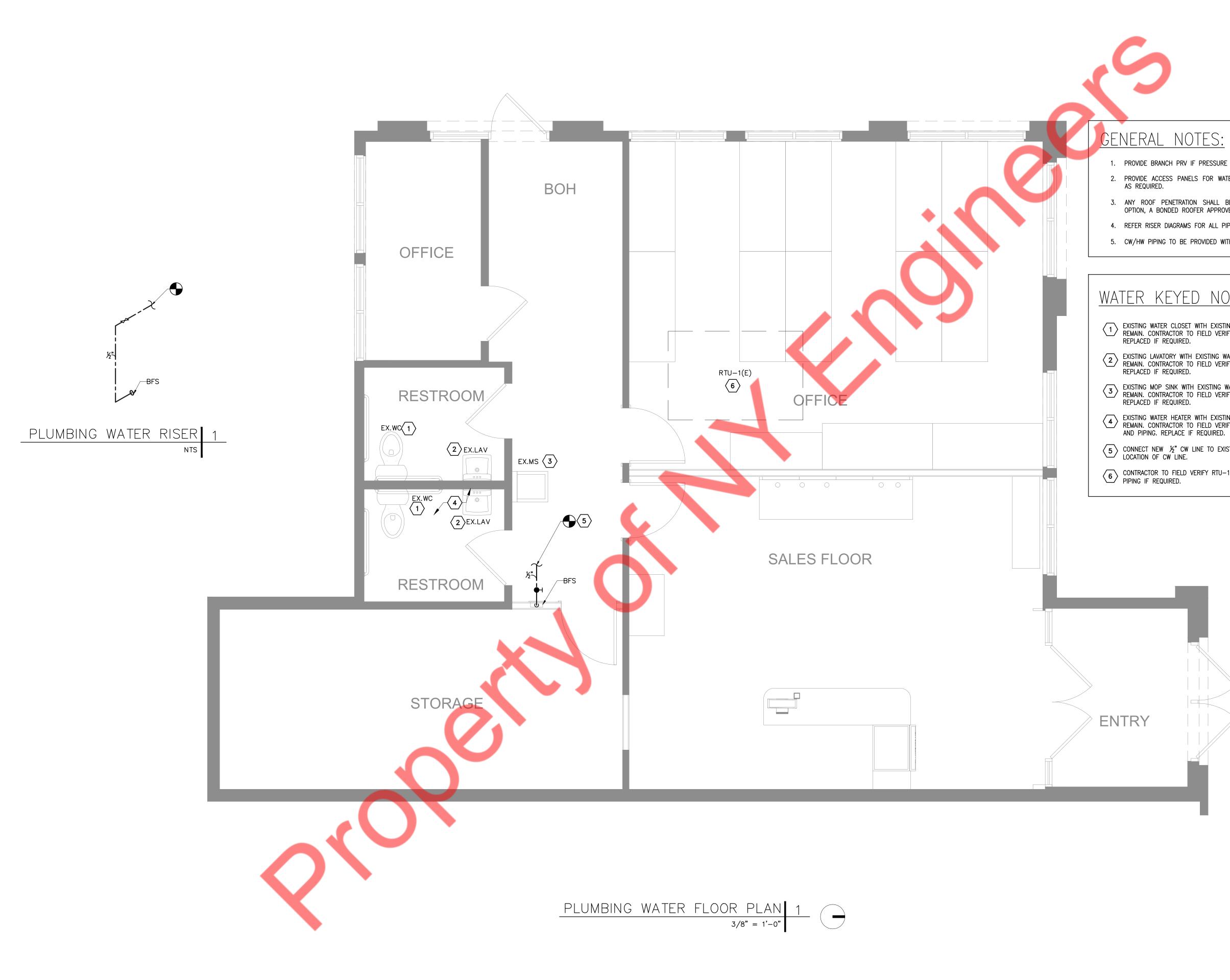
A. EQUIPMENT, MATERIALS AND WORKMANSHIP FURNISHED UNDER THIS CONTRACT SHALL BE GUARANTEED BY THE CONTRACTOR FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. THE CONTRACTOR SHALL KEEP THE WORK IN GOOD REPAIR FOR ONE YEAR AFTER THE DATE OF FINAL APPROVAL. THE CONTRACTOR 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.

PLAYERS

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REVISIONS	
△ ISSUE	DATE
PERMIT SET	03/08/24

### PLUMBING SYMBOLS & SPECIFICATIONS





- 1. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
- 2. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES
- 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
- 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.
- 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.
- A 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  $\frac{1}{2}$ " 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.

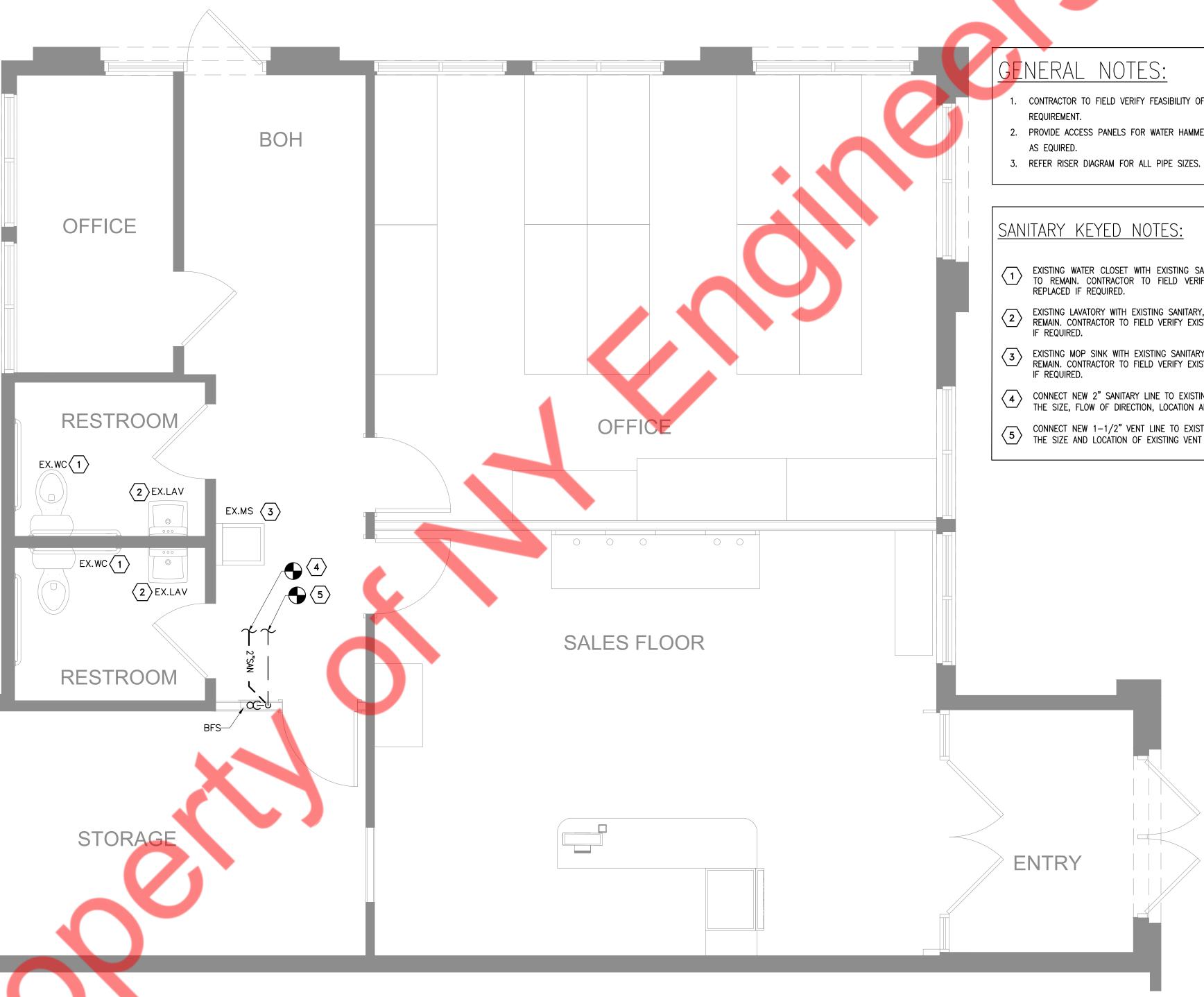
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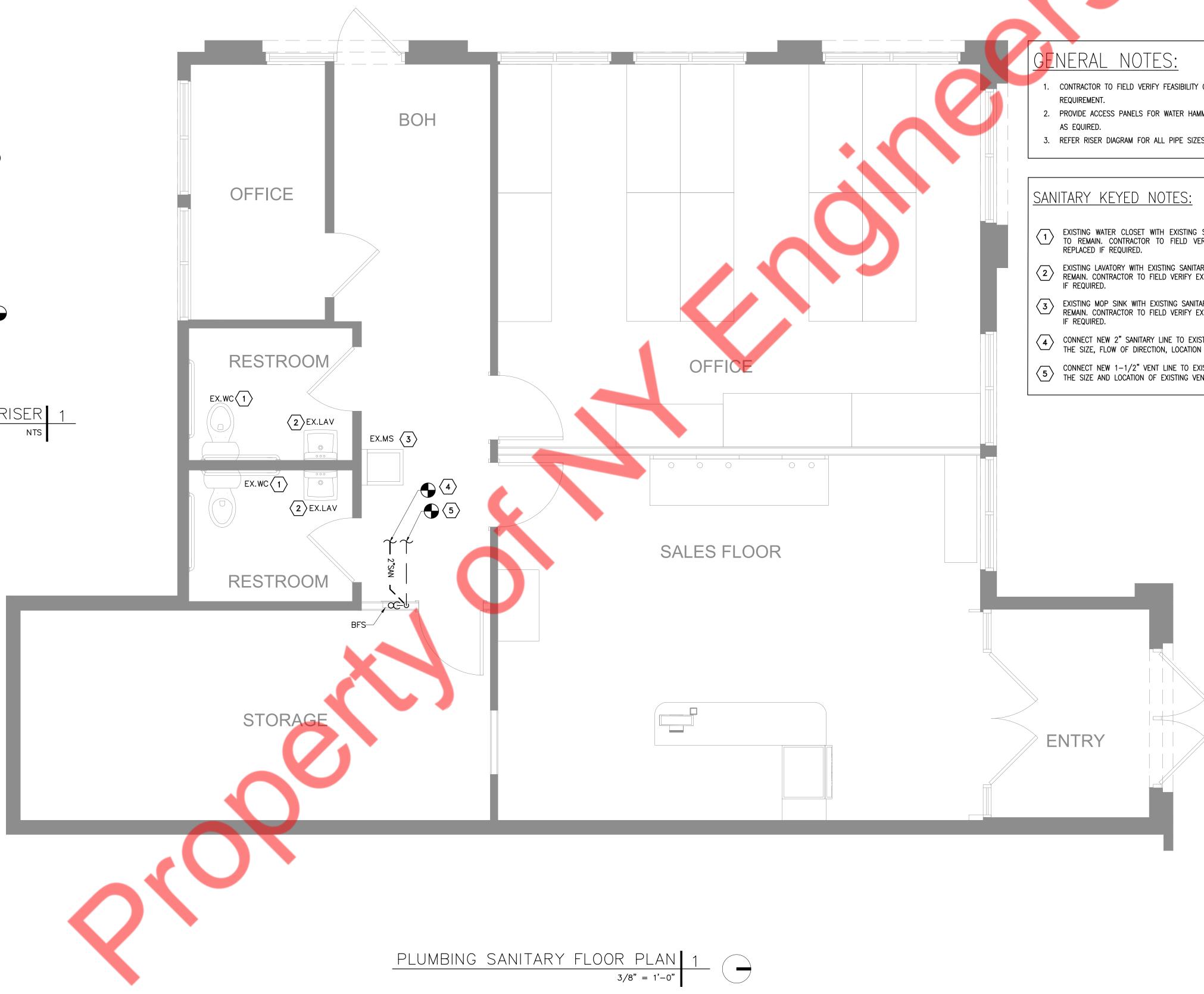
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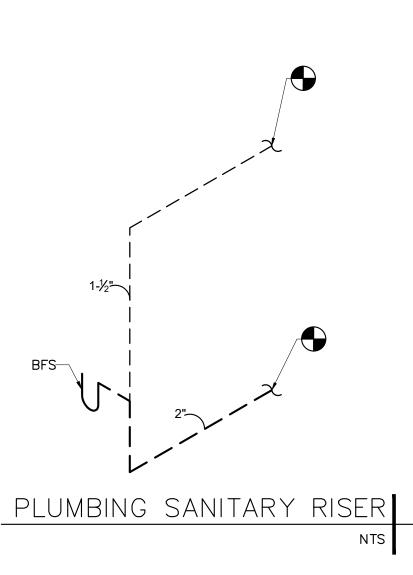
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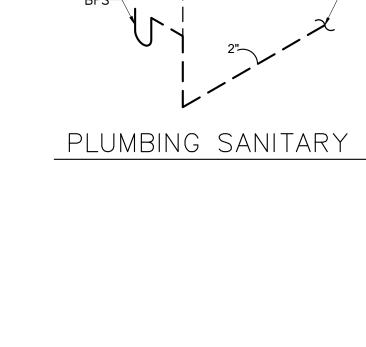
PLUMBING WATER FLOOR PLAN AND RISER

P1





















- CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRCTURAL
- 2. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES

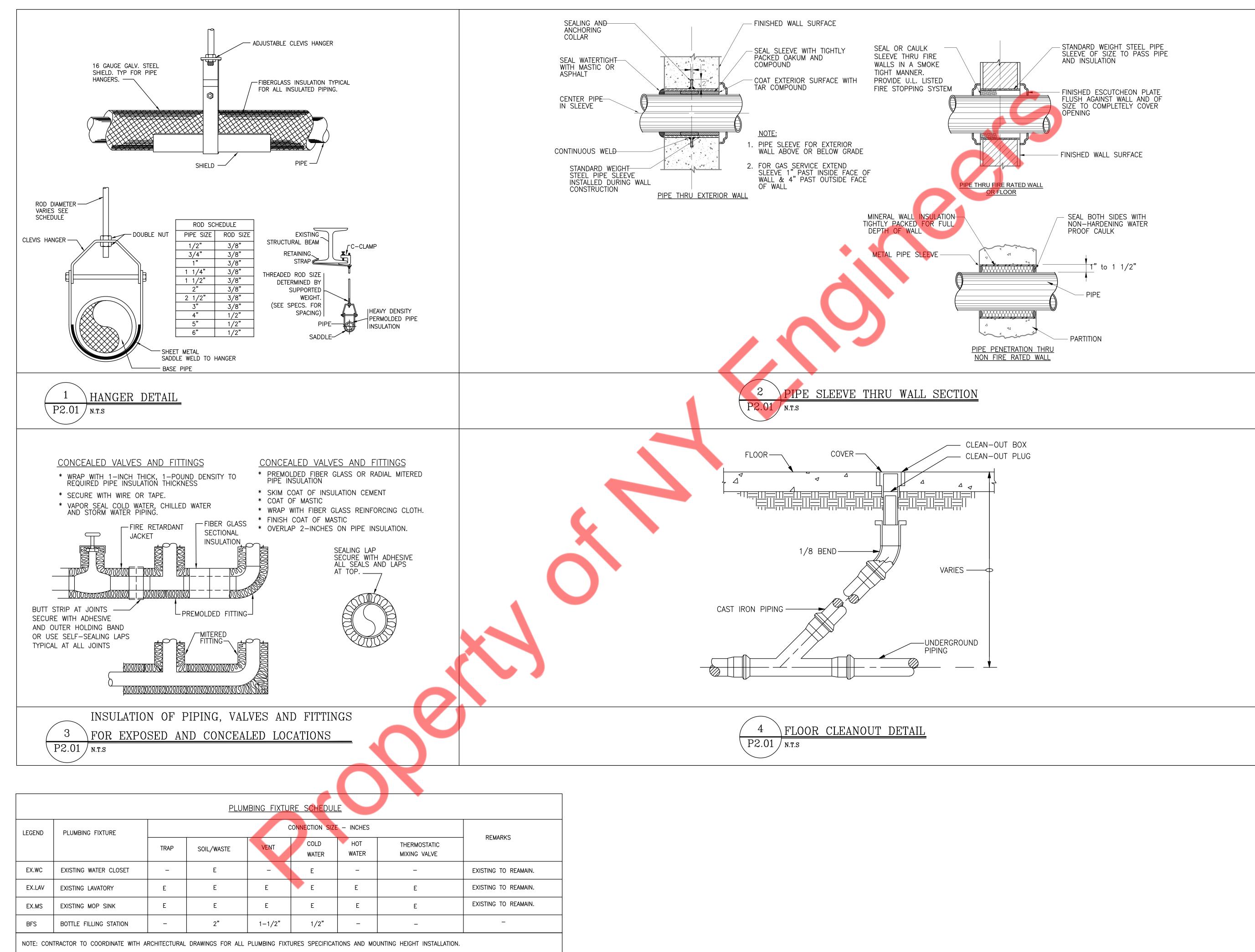
- 1 EXISTING WATER CLOSET WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING CONDITION OF EXISTING PIPING AND FIXTURE
- 2 EXISTING LAVATORY WITH EXISTING SANITARY, VENT WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO 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
- 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.

CAFE PLAYERS

REVISIONS	
∆ ISSUE	DATE
PERMIT SET	03/08/24
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PLUMBING SANITARY FLOOR PLAN AND RISER

P1



PLUMBING FIXTURE SCHEDULE							
LEGEND	PLUMBING FIXTURE	CONNECTION SIZE - INCHES					
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMO: MIXING N
EX.WC	EXISTING WATER CLOSET	_	E	-	E	_	_
EX.LAV	EXISTING LAVATORY	E	E	E	E	E	E
EX.MS	EXISTING MOP SINK	E	E	E	E	E	E
BFS	BOTTLE FILLING STATION	-	2"	1-1/2"	1/2"	_	-
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REVISIONS

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PLUMBING DETAILS AND

DATE 03/08/24

SCHEDULES