MECHANICAL SYMBOLS LIST

			_1 \(\) 1
AC-1 (EF-1)	EQUIPMENT SYMBOL	MECHA	NICAL ABBREVIATIONS
		AFF	ABOVE FINISHED FLOOR
	POINT OF NEW CONNECTION TO EXISTING	AL	ACOUSTIC LINING
	AID DEVICES	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
DII	ICT ACCESSORIES	COP	COEFFICIENT OF PERFORMANCE
	TO THE TOTAL STATE OF THE TOTAL	СР	CONDENSATE PUMP
		CD	CONDENSATE DRAIN PIPE
	VOLUME DAMPER W/ ACCESS DOOR	DN	DOWN
TVT AD **		EER	ENERGY EFFICIENCY RATIO
CONTR	ROLS AND SENSORS	EF	EXHAUST FAN
(T)	THEDWOCTAT	FC	FLEXIBLE CONNECTION
	THERMOSTAT	IEER	INTEGRATED ENERGY
	DUCTWORK	ILLIN	EFFICIENCY RATIO
======	AIR DUCT W/ 1.5" ACOUSTICAL LINING	VD	VOLUME DAMPER
0.00		RTU	ROOF TOP UNIT
<u> </u>	FLEXIBLE DUCT	V.I.F.	VERIFY IN FEILD
FC FC	FLEXIBLE CONNECTION	S.A.E.	SAME AS EXISTING
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)		
<u>ø12</u>	ROUND DUCT (DIAMETER)		
<u>S</u>	ROUND DUCT CROSS SECTION		
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION		
	RETURN AIR RECTANGULAR DUCT CROSS SECTION		

	MECHANICAL DRAWING LIST
MO.1	MECHANICAL GENERAL NOTES, SYMBOLS LIST & ABBREVIATIONS
M1.0	MECHANICAL FLOOR & ROOF PLANS
M5.0	MECHANICAL DETAILS
M6.0	MECHANICAL SCHEDULES

APPLICABLE CODES

A. 2018 INTERNATIONAL BUILDING CODE
B. 2018 INTERNATIONAL MECHANICAL CODE
C. 2018 INTERNATIONAL ENERGY CONSERVATION CODE
D. 2018 INTERNATIONAL PLUMBING CODE
E. 2017 NATIONAL ELECTRICAL CODE, NFPA 70

2018 INTERNATIONAL FIRE CODE

PENNSYLVANIA BUILDING DEPARTMENT NOTES

- ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF 2018—IBC AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.
- THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
- 2. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2018 INTERNATIONAL BUILDING CODE REQUIREMENTS AS OUTLINES IN SECTION [BC 1704].
- 3. THE LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS AND CONDUCTING SUCH TESTS WILL FILE DOCUMENTATION AND REPORTS OF TESTS THAT THE SYSTEM COMPLIES WITH THE CONSTRUCTION DOCUMENTS AND APPLICABLE LAWS.
- 4. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 2018 IMC:
 - A. VENTILATION SYSTEM SERVING COMMERCIAL COOKING APPLIANCES 2018 IMC 506,507.
- 5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - A. STANDARDS OF HEATING 2018 IMC 309.1
- B. DUCT CONSTRUCTION AND INSTALLATION— 2018 IMC 603
 C. AIR INTAKES, EXHAUSTS AND RELIEFS 2018 IMC 401.5
- D. AIR FILTERS 2018 IMC 605
- E. GAS FIRED EQUIPMENT FUEL GAS CODE
- 6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- 7. VENTILATION FOR ALL AREA SHALL COMPLY WITH 2018 IMC 401.
- 8. A STATEMENT SHALL BE FILED BY THE OWNER OR TENANT IN POSSESSION THAT THE VENTILATION SYSTEM WILL BE KEPT IN CONTINUOUS OPERATION AT ALL TIMES DURING THE NORMAL OCCUPANCY OF THE STRUCTURE AS REQUIRED BY 2018 IMC
- 9. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE—RATED WALL AND SMOKE WALL CONSTRUCTION AND
- 10. THESE PLANS ARE APPROVED ONLY FOR THE WORK INDICATED ON THE APPLICATION SPECIFICATION SHEET. ALL OTHER MATTERS SHOWN ARE NOT TO BE RELIED UPON OR TO BE CONSIDERED AS EITHER BEING APPROVED OR IN ACCORDANCE WITH APPLICABLE CODES.
- 11. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183.

GENERAL NOTES

- 1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.
- 2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.
- 3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.
- 4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.
- 5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- 7. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL, EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW SYSTEM.
- 8. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND APPROVED MANNER. RESTORE EXISTING WORK DISTURBED WHILE INSTALLING NEW WORK TO ACCEPTABLE CONDITION AS DETERMINED BY ARCHITECT.
- 9. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING WORK TO INSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH BUILDING OWNER. INSTALL ISOLATION VALVES AT POINT OF CONNECTION TO THE EXISTING PIPING. PROVIDE TEMPORARY DUCT CAPS AND/OR CONNECTIONS TO MINIMIZE SHUTDOWN

10. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS

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.

NOT ACCEPTABLE).

- 12. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- 13. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
- 14. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 15. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE.
- 16. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 17. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.
- 18. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
- 19. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
- 20. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 21. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON—SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.
- 22. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- 23. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVAL
- 24. SPECIFICATIONS ARE OF SIMPLIFIED FORM AND INCLUDE INCOMPLETE SENTENCES. WORDS OR PHRASES SUCH AS "THE CONTRACTOR SHALL," "SHALL BE," "FURNISH," "PROVIDE," "A," "THE," AND "ALL" HAVE BEEN OMITTED FOR BREVITY.
- 25. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY. DEFINITIONS:
- 1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

SCOPE OF WORK

SCOPE OF WORK

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

HVAC NOTES

SECTION 230593 — TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

- A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
- 1. AIR SYSTEMS: CONSTANT

1.2 QUALITY ASSURANCE

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

1.3 EXECUTION

- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS 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 VALUES.
- I. INSPECTIONS: RANDOM CHECKS BY OWNER OR ARCHITECT TO VERIFY FINAL TESTING, ADJUSTING, AND BALANCING REPORT.
- J. ADDITIONAL TESTS: RANDOM TESTS WITHIN 90 DAYS OF COMPLETING TAB TO VERIFY BALANCE CONDITIONS AND SEASONAL TESTS.

END OF SECTION 230593

SECTION 233713 — DIFFUSERS, REGISTERS, AND GRILLES

1.1 PRODUCTS

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

SECTION 230713 - DUCT INSULATION

1.1 QUALITY ASSURANCE

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

1.2 FIELD QUALITY CONTROL

A. FIELD INSPECTIONS: BY OWNER-ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;

- A. CONCEALED, RECTANGULAR, ROUND AND FLAT—OVAL, SUPPLY—RETURN, OUTDOOR—AND EXHAUST—AIR DUCT AND AIR PLENUM INSULATION:
- B. FLEXIBLE ELASTOMERIC, MINERAL—FIBER BLANKET, MINERAL—FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
- UNCONDITIONED SPACES WITHIN BUILDING: R-6
 WITHIN BUILDING ENVELOPE ASSEMBLY: R-8
 OUTSIDE OF BUILDING: R-8
- 1.4 ITEMS NOT INSULATED:
 - 1. FIBROUS-GLASS DUCTS.
 - 2. METAL DUCTS WITH DUCT LINER OR SUFFICIENT THICKNESS TO COMPLY WITH ENERGY CODE ANDASHRAE/IESNA 90.1.
 - 3. FACTORY-INSULATED FLEXIBLE DUCTS.
 - 4. FACTORY-INSULATED PLENUMS AND CASINGS.
 - 5. FLEXIBLE CONNECTORS.
 - 6. VIBRATION-CONTROL DEVICES.
 - 7. FACTORY-INSULATED ACCESS PANELS AND DOORS
 - 8. DUCTS THAT HAVE INTERNAL ACOUSTICAL LINING.

1.5 PRODUCTS

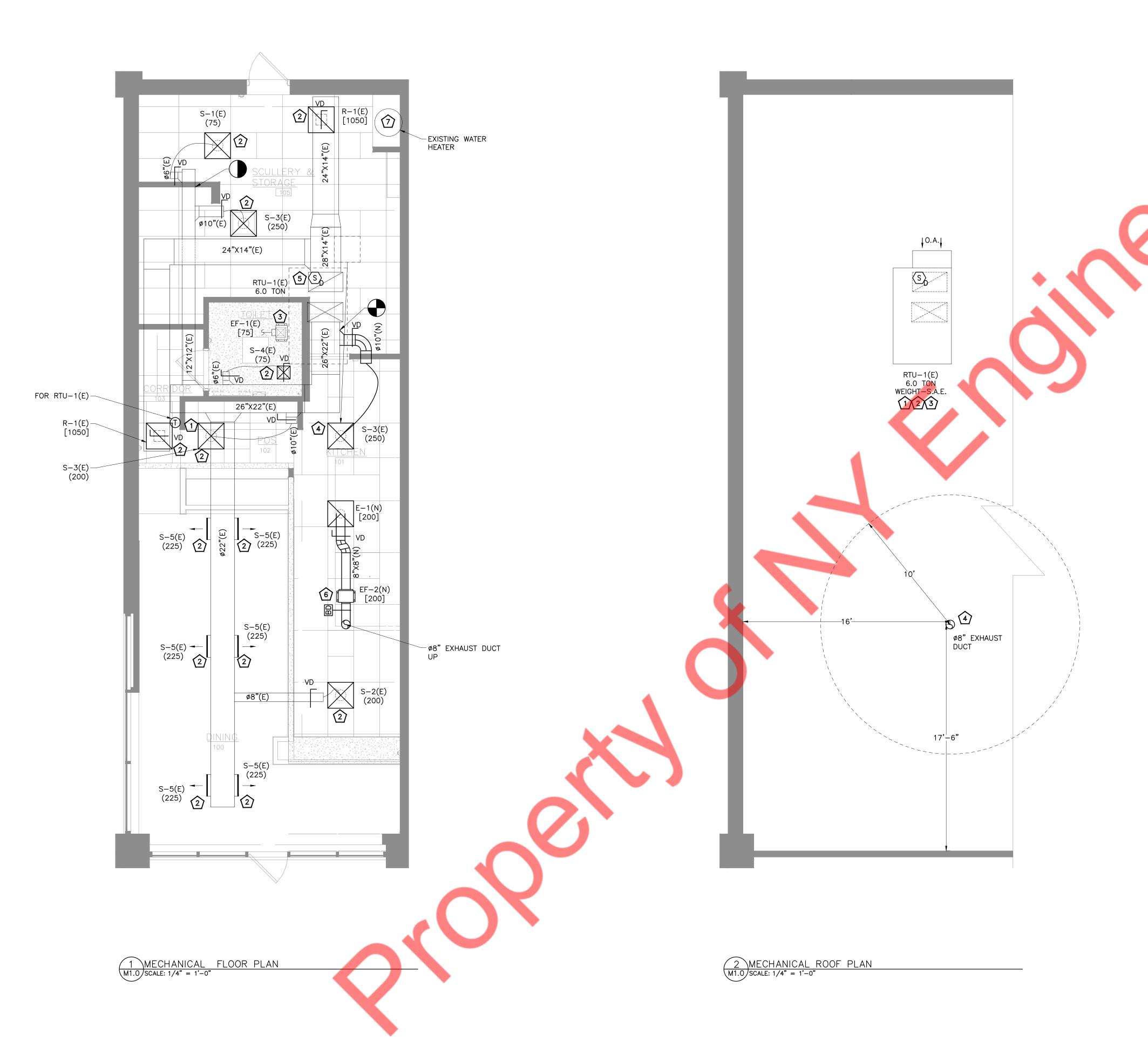
- A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:
 - 1. JOHNS-MANVILLE
- 2. OWENS-CORNING
- 1.6 ACOUSTICAL TREATMENT
 - 1. WHERE SHOWN ON THE DRAWINGS, LOW PRESSURE DUCTWORK SHALL BE LINED WITH 1.5" THICK R-6 AS MANUFACTURED BY DUCTMATE, 1-1/2 POUND MINIMUM DENSITY, NEOPRENE COATED, FLEXIBLE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

END OF SECTION 230713

SECTION 233113 - METAL DUCTS

1.1 CONSTRUCTION

- A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 1 INCH WG PRESSURE, SEAL CLASS "A".
- B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 1" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:
 - 1. CONSTRUCT SO THAT ALL INTERIOR SURFACES ARE SMOOTH. USE SLIP AND DRIVE OR FLANGED AND BOLTED CONSTRUCTION WHEN FABRICATING RECTANGULAR DUCTWORK. USE SPIRAL LOCK SEAM CONSTRUCTION WHEN FABRICATING ROUND SPIRAL DUCTWORK. SHEET METAL SCREWS MAY BE USED ON DUCT HANGERS, TRANSVERSE JOINTS AND OTHER SMACNA APPROVED LOCATIONS IF THE SCREW DOES NOT EXTEND MORE THAN 1/2 INCH INTO THE DUCT.
 - 2. SHEET STEEL SHALL COMPLY WITH ASTMA653 STANDARD SPECIFICATION FOR STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC IRON ALLOY—COATED (GALVANINEALED) BY HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENT FOR SHEET METALLIC—COATED BY HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES ALL 90° ELBOWS.
 - 3. USE ELBOWS AND TEES WITH A CENTER LINE RADIUS TO WIDTH OR DIAMETER RATIO OF 1.5 WHEREVER SPACE PERMITS. WHEN A SHORTER RADIUS MUST BE USED DUE TO LIMITED SPACE, INSTALL SINGLE WALL SHEET METAL SPLITTER VANES IN ACCORDANCE WITH SMACNA PUBLICATIONS, TYPE RE 3. WHERE SPACE WILL NOT ALLOW AND THE C VALUE OF THE RADIUS ELBOW, AS GIVEN IN SMACNA PUBLICATIONS, EXCEEDS 0.31, USE RECTANGULAR ELBOWS WITH TURNING VANES AS SPECIFIED IN SECTION 23 33 00. SQUARE THROAT—RADIUS HEEL ELBOWS WILL NOT BE ACCEPTABLE. STRAIGHT TAPS OR BULLHEAD TEES ARE NOT ACCEPTABLE.



MECHANICAL GENERAL NOTES

- A. ALL WORK SHALL COMPLY WITH ALL LOCAL CODE & STATE CODE & AUTHORITIES HAVING
- B. COORDINATE LOCATIONS AND SIZES OF ROOF OPENINGS WITH OWNER AND STRUCTURAL
- C. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION OF DUCTWORK,
- D. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL FOLIPMENT SELECTED PRIOR TO INSTALLATION
- ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION.

 E. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
- F. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER.
- G. PROVIDE MINIMUM R-6 INSULATION (INTERNAL FOR EXPOSED DUCTS AND EXTERNAL FOR CONCEALED DUCTS) FOR SUPPLY & RETURN AIR DUCTS. PROVIDE ACOUSTIC INSULATION ON MAIN SUPPLY AND RETURN DUCTS UP TO 10 FT. FROM HVAC UNIT.
- H. CONTRACTOR TO FIELD VERIFY EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC EQUIPMENT. ALL EXISTING DUCTWORK, ASSOCIATED ACCESSORIES AND EXISTING HVAC FOLLIPMENT TO BE RELISED.
- EXISTING HVAC EQUIPMENT TO BE REUSED.

 I. ALL ITEMS TO BE RE-USED OR RELOCATED SHALL BE CLEANED, REPAIRED, AND RESTORED
- TO LIKE NEW CONDITION PRIOR TO RE-USE.

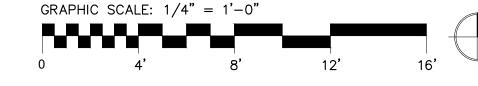
 J. PROVIDE NECESSARY PROTECTIVE DEVICES WHERE REQUIRED AND IN STRICT ACCORDANCE
- WITH OSHA AND ICRA REGULATIONS. K. KEEP ALL ADJOINING AREAS ADJACENT TO THE WORK AREAS CLEAN AND FREE OF DEBRIS.
- L. MATERIAL FROM EXISTING SYSTEM WHICH IS RENDERED USELESS SHALL BE REMOVED AND DISPOSED OF OFF SITE.
- M. REPAIR/ REPLACE EXISTING EQUIPMENT/ MATERIALS NOT SCHEDULED OR NOTED TO BE DEMOLISHED BUT BECOME DAMAGED DURING THE PROGRESS OF THE WORK. MAKE ANY AND ALL SUCH REPAIRS, REPLACEMENTS, MODIFICATIONS TO RESTORE THE DAMAGED ITEMS TO THEIR ORIGINAL CONDITIONS AT THE TIME OF DAMAGE, TO THE SATISFACTION OF AND AT NO ADDITIONAL COST TO THE OWNER.

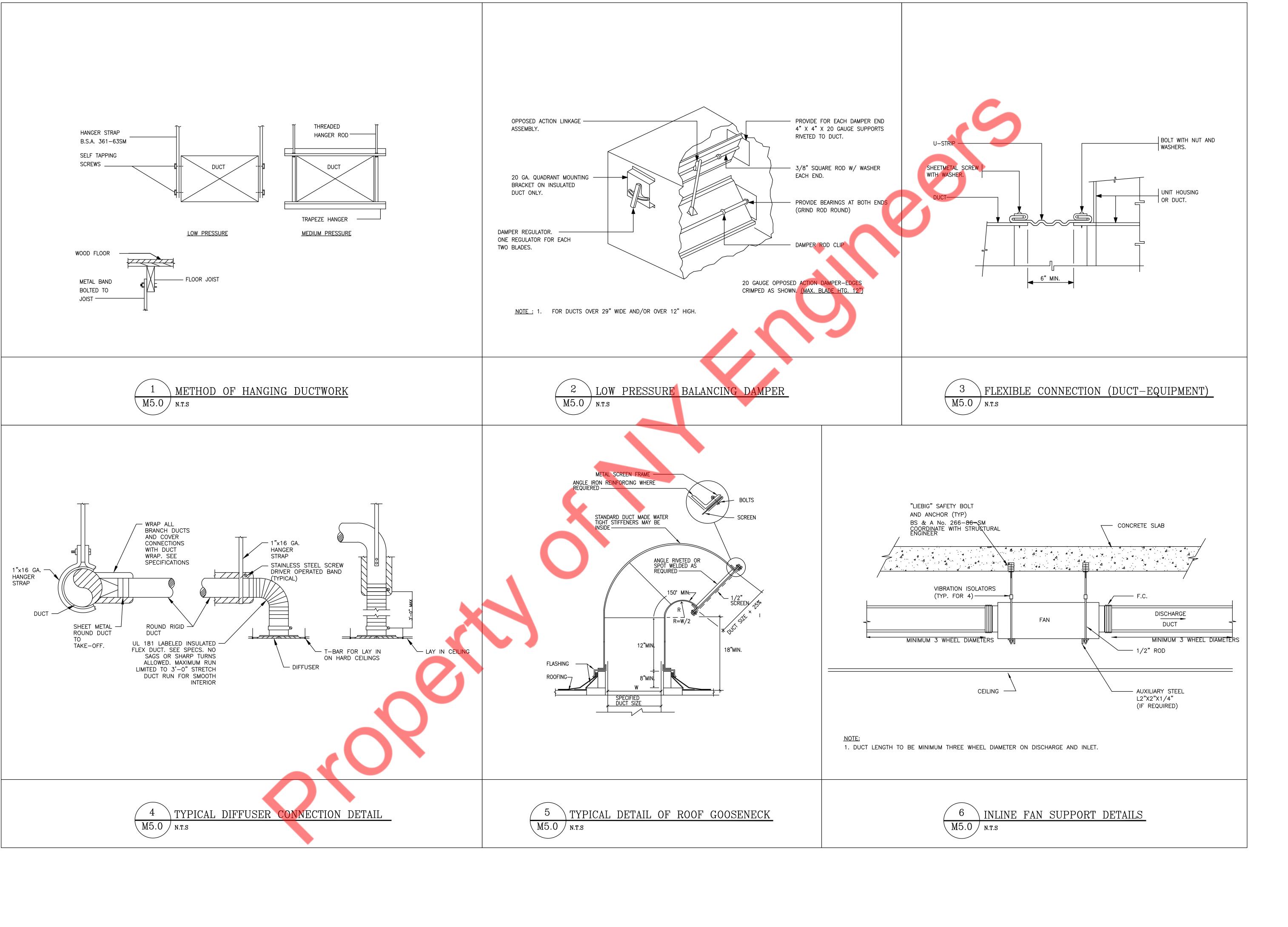
MECHANICAL FLOOR PLAN KEY NOTES:

- EXISTING T-STAT CONTROL TO REMAIN AS IS. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION & WORKING CONDITION. REPLACE AS/IF REQUIRED.
- EXISTING SUPPLY/RETURN DIFFUSERS TO REMAIN AS IS. 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.
- 3 EXISTING TOILET EXHAUST SYSTEM TO REMAIN AS IS.
- RELOCATE EXISTING SUPPLY/RETURN DIFFUSERS 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.
- 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.
- PROVIDE NEW INLINE TYPE EXHAUST FAN. CONTRACTOR TO INSTALL FAN AS PER MANUFACTURER'S RECOMMENDATION.
- EXISTING VENT FROM WATER HEATER TO REMAIN AS IS. CONTRACTOR TO FIELD VERIFY THE EXACT LOCATION & WORKING CONDITION. REPLACE AS/IF REQUIRED.

MECHANICAL ROOF PLAN KEY NOTES:

- (1) COORDINATE FINAL LOCATION OF EQUIPMENT IN FIELD.
- 2 CONTRACTOR TO FIELD VERIFY EXISTING RTU LOCATION & PENETRATION.
- EXISTING CONDENSATE DRAIN FROM EXISTING RTU TO REMAIN AS IS. CONTRACTOR TO FLUSH THE EXISTING DRAIN LINES.
- EXHAUST DUCT UP THROUGH ROOF. TERMINATE WITH GOOSENECK & WIRE-MESH. MAINTAIN A MINIMUM OF 10'-0" FROM ALL OUTSIDE AIR INTAKES.





							E	XISTING RO	OOF TO	P UNIT S	CHEDUL	E										
					SUPPLY FAI	N DATA	GAS H	EAT		C	OOLING [DATA			ELECTRIC	CAL DATA				THERMAL		
UNIT ID	MANUFACTURER	MODEL	NOMINAL	TOTAL	OUTSIDE AIR	EXTERNAL STATIC	INPUT	OUTPUT	TOTAL	SENSIBLE	AMBIENT	ENTERING						EER	SEER	EFFICIENCY	OPERATING	REMARK
UNIT ID	IVIANOFACTORER	MODEL	TONS	SUPPLY	OUTSIDE AIK	EXTERNAL STATIC	INPUI	OUIPUI	IOTAL	SENSIBLE	TEMP.	TEMP.	STAGES	VOLTS	PHASE	MCA(A)	MOCP(A)	EER	SEEK		WEIGHT (LBS)	KEIVIAKK
				CFM	CFM	PRESSURE (IN. W.G.)	MBH	МВН	МВН	MBH	DB (°F)	DB / WB(°F)							(%)		
RTU-1(E)	S.A.E.	S.A.E.	6 (V.I.F.)	2400 (V.I.F.)	300	S.A.E	150 (V.I.F.)	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	S.A.E	208-230 (V.I	.F.) 3 (V.I.F)	S.A.E.	50 (V.I.F.)	S.A.E	S.A.E	S.A.E	S.A.E	EXISTING
NOTES FO	R EXISTING RTU:																					
1. S.A.E :- S	SAME AS EXISTING,	V.I.F:- VERIFY IN FIELD.	·							·					·				•			

2. EXISTING RTU WITH ALL ACCESSORIES TO REMAIN SAME AND TO BE REUSED.

3. CONTRACTOR TO CONFIRM IF EXISTING RTU IS WORKING AT 100% RATED CAPACITY.

4. CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND CONFIGURATION OF RTU ON SITE.

5. IF REQUIRED, PROVIDE NEW THERMOSTATS COMPATIBLE WITH EXISTING RTU. COORDINATE FINAL LOCATION WITH ARCHITECT/OWNER.

6. CONTRACTOR TO REBALANCE OUTSIDE AIR & RETURN AIR DAMPERS ON EXISTING RTU TO MATCH VALUES MENTIONED IN ABOVE TABLE. 7. REPLACE ALL THE FILTERS, IF REQUIRED. PROVIDE MINIMUM MERV-8 FILTERS.

					VENTILA	ATION CALCULAT	ION					
ROOM NAME	AREA	NUMBER OF	NUMBER OF PEOPLE AS PER	NUMBER OF	FINAL PEOPLE	MIN OUTSIDE AIR	AS PER IMC 2018	REQ. OA	PROVIDED OA	EXHAUST AIRFLOW RATE (CFM/SQ.FT OR	TOTAL EXHAUST	PROVIDED
ROOM NAME	(SQ.FT.)	PEOPLE/1000 SQFT AS PER IMC 2018	IMC 2018	CHAIR	NO.	CFM/PEOPLE	CFM/SQ.FT	(CFM)	(CFM)	/FIXT.)	(CFM)	EXHAUST (CFM)
DINING	412	70	29	19	19	7.5	0.12	192		0	0	0
KITCHEN	272	20	6	2	2	7.5	0.12	48		0.7	190.4	200
CORRIDOR	95	0	0	0	1	0	0.06	6	300	0	0	0
TOILET	52	0	0	0	0	0	0	0		70	70	75
SCULLERY & STORAGE	320	0	0	0	0	0	0.12	38		0	0	0
TOTAL	1151		25		22	_		29/	200		260	275

		FLOVA/ DATE	STATIC PRESSURE		ELECTRIC DA	ATA	MAXIMUM	WEIGHT		DACIC OF DECICAL							
TAG	QUANTITY	FLOW RATE	EXTERNAL	SPEED	VALATTE (VAL)	V/DII/UZ	LOUDNESS	WEIGHT		BASIS OF DESIGN							
		CFM	IN W.G.	RPM	WATTS (W)	V/PH/HZ	DBA	LBS	MANUFACTURER	MODEL	NOTES						
EF-1(E)	1	75 (V.I.F.)	S.A.E.	S.A.E.													
EF-2(N)	1	200	0.6	1343	46	115/60/1											
NOTES:																	
1. S.A.E :- S	SAME AS EXIS	STING, V.I.F:- \	VERIFY IN FIELD.														
2. EXISTIN	G FAN WITH	ALL ACCESSO	RIES TO REMAIN SA	ME ANI	O TO BE REUS	ED.											
3. CONTRA	CTOR TO FIE	ELD VERIFY EX	ACT LOCATION AND	CONF	GRATION OF	FAN ON SIT	E.										
4. PROVID	E ALL NECESS	SARY ACCESSO	DIRES AS PER MANU	JFACTU	RER'S RECOM	MENDATIO	NS.										

MECHANICAL FAN SCHEDULE

		A	IR TERMINAL DE	VICES SCHEDU	LE							
TAC	CIZE (INI)	DESCRIPTION	CONSTRUCTION	NECK CIZE (INI)	BASIS OF	DESIGN	NOTES					
TAG	SIZE (IN.)	DESCRIPTION	CONSTRUCTION	NECK SIZE (IN.)	MANUFACTURER	MODEL	NOTES					
S-1(E)	24X24	SUPPLY AIR DIFFUSER	S.A.E.	S.A.E.	TITUS	TDCA (S.A.E.)	S.A.E.					
S-2(E) 24X24 SUPPLY AIR DIFFUSER S.A.E. S.A.E. TITUS TDCA (S.A.E.) S.A.												
S-3(E)	12X8	SUPPLY AIR DIFFUSER	S.A.E.	S.A.E.	TITUS	TDCA (S.A.E.)	S.A.E.					
S-4(E)	12X12	SUPPLY AIR DIFFUSER	S.A.E.	S.A.E.	TITUS	TDCA (S.A.E.)	S.A.E.					
S-5(E)	18X8	SUPPLY AIR GRILLE	S.A.E.	S.A.E.	TITUS	S300FL (S.A.E.)	S.A.E.					
R-1(E)	24X24	RETURN AIR GRILLE	S.A.E.	S.A.E.	TITUS	510 (S.A.E.)	S.A.E.					
E-1(N)	24X24	EXHAUST AIR GRILLE	ALUMINUM	8X8	TITUS	50F	ALL					

1. PROVIDE FRAME FOR MOUNTING AIR DEVICE IN LAY-IN GRID CEILING UNLESS REFLECTED CEILING PLAN INDICATES HARD CEILING. IN AREAS WITH HARD CEILINGS, PROVIDE FRAMES FOR SURFACE MOUNTING.

2. UNLESS OTHERWISE NOTED, BRANCH DUCTS SERVING AIR DEVICES SHALL BE SAME SIZE AS NECK OF AIR DEVICE.

3. COORDINATE FINAL COLOR/FINISH WITH ARCHITECT/OWNER.

4. AIR DEVICE SHALL BE OF GALVANIZED FINISH WHEN INSTALLED ON EXPOSED DUCTWORK.

5. MAXIMUM NOISE CRITERION RATING < 35 DBA.

5. INTERLOCK EF-2(N) WITH RTU-1(E).

		AIR BALANC	E TABLE		
UNIT	AREA SERVED	SUPPLY AIR	OUTSIDE AIR	RETURN AIR	EXHAUST AIR
		(CFM)	(CFM)	(CFM)	(CFM)
RTU-1(E)	SEE PLAN	2400 CFM	300 CFM	2100 CFM	0 CFM
EF-1(E)	RESTROOM	-	-	1	75 CFM
EF-2(N)	KITCHEN	ı	-	1	200 CFM
	TOTAL:	2400 CFM	300 CFM	2100 CFM	275 CFM
·	BUILDING PRESSURE:			25 CFM	POSITIVE

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

ELECTRICAL SYMBOLS LIST

			LECIRICAL SIMDULS LISI		
	SWITCHES AND CONTROLS		POWER AND TELECOMMUNICATION		ELECTRICAL
\$ _a	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.	J	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.		BREVIATIONS
\$ ³	20A 3-WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED	-(1)	JUNCTION BOX WITH BLANK COVER PLATE, WALL MOUNTE, +18" AFF OR AS NOTED.	A	AMPERES
\$ ⁴	20A 4-WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED		JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED	A/C, AC	AIR CONDITIONING UNIT AMPERE FRAME/AMP FUSE
\$D	WALL BOX INCANDESCENT DIMMER SWITCH, LUTHRON MAESTRO SERIES. "a"	Φ	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.	AFF	ABOVE FINISHED FLOOR
Ψα	DENOTES LIGHTING FIXTURE CONTROLLED.	— M — M	DUPLEX DEDICATED RECEPTACLE, +18" AFF OR AS NOTED.	AS	AMP SWITCH
—(OS)	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.	→ ^{CL}	DUPLEX CONVENIENCE RECEPTACLE - 20A-1P, 125V, NEMA 5-20R MOUNTED	AIC	AMPS INTERRUPTING CAPACITY
\$°s	WALL MOUNTED VACANCY SENSOR SWITCH, WATTSTOPPER CS-50PIR SERIES.		FLUSH IN CELING.	AWG	AMERICAN WIRE GAUGE
\$0	WALL MOUNTED SPRING WOUND TIME SWITCH TORK	$ \mathbb{P}_{GFI}$	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED. DUPLEX DEDICATED GFI RECEPTACLE, +18" AFF OR AS NOTED.	С	CONDUIT
		P _{GFI}		C/B,CB	CIRCUIT BREAKER
\$	DIMMER SWITCH	•	ELECTRICAL FLOOR BOX	СКТ	CIRCUIT
\$ _{os}	OCCUPANCY SENSOR SWITCH		SPECIAL RECEPTACLE	СТ	CURRENT TRANSFORMER
\$ _{os}	COMBINATION OF DIMMER AND OCCUPANCY SENSOR SWITCH	•	QUAD RECEPTACLE	CU	COPPER
	ASCO CONTACTOR C-25 TORK TIMER T-25 STACKED.	lacksquare	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND	DISC	DISCONNECT
-D	DOOR SWITCH	v	TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.	DP	DISTRIBUTION PANEL
PC	PHOTOCELL IN NAMA 3R ENCLOSURE.		TELEPHONE OUTLET, WALL-MOUNTED +48" AFF UNO TEL / DATA OUTLET TO BE PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE	JB KVA	JUNCTION BOX KILOVOLT—AMPERES
-PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.		REE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH 1 1/4"DIAMETER GROMMETED OPENING.	KW	KILOWATTS
BP	BELL PUSH		DATA OUTLET — (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE	LTG	LIGHTING
OS) _A	CEILING OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE. 'A' LETTER REFERES TO WIRING DIAGRAM.	◁	PROVIDED WITH 1" CONDUIT U.O.N. TO H.C. AND TERMINATED WITH 90 DEGREE ELBOW AND BUSHING. TEL / DATA OUTLET PLATE SHALL BE PROVIDED WITH	мсв	MAIN CIRCUIT BREAKER
_os	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.		1 1/4" DIAMETER GROMMETED OPENING. MOTORS AND CONTROLS	MLO	MAIN LUGS ONLY
-(vs)	WALL VACANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY		AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION	N	NEUTRAL
	SENSOR SCHEDULE. CEILING VACANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY		WITH JUNCTION BOX AND MOTOR SWITCH.	NIC NTS	NOT IN CONTRACT NOT TO SCALE
(VS)	SENSOR SCHEDULE.	M WP	AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.	PNL	PANEL
(03)	CEILING MOUNTED DAYLIGHT SENSOR.		NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.	W	WATT
	WIRING SYSTEMS		30A NON FUSED DISCONNECT SWITCH	RA	RANGE
<u>3</u> UP-	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF		60A NON FUSED DISCONNECT SWITCH	RH	RANGE HOOD
	1#12 Ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED. POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION,		100A NON FUSED DISCONNECT SWITCH	WA	WASHER
3 5 UP-	NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 Ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.		200A NON FUSED DISCONNECT SWITCH	DR	DRYER
3 5 7	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF		COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH, FURNISHED BY	FA G	FIRE ALARM GROUND
UP-	3#12 ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.	-	HVAC/CONTRACTOR, INSTALLED AND WIRED BY ELECTRICAL CONTRACTOR.	GFI	GROUND FAULT INTERRUPTER
	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.	<u>400</u> 350	FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.	HP	HORSEPOWER
	CONDUIT TUIRNING DOWN, SEE FLOOR PLANS FOR CONDITION.		COMBINATION SOLID—STATE MOTOR STARTER.	PWR	POWER
	CONDUIT AND WIRE TO BUILDING GROUND.	MD	MOTORIZED DAMPER.	REC	RECEPTACLE
± —		FSD	FIRE SMOKE DAMPER	SW	SWITCH
	CABLE TRAY, WIDTH AND MOUNTING AS NOTED.	M/M/	DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.	TELE	TELEPHONE
	UNDERGROUND		THERMAL OVERLOAD SWITCH AT MOTOR, PROVIDE THERMAL ELEMENTS AS	TXF	TOILET EXHAUST FAN
		S ₁	PER MOTOR RATING.	TYP	TYPICAL UNLESS OTHERWISE NOTED
	EXISTING	S _M	MANUAL MOTOR SWITCH		VOLT/VOLTAGE
	NEW	1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING	VA	VOLT AMPERE
	ELECTRICAL DRAWING LIST		ANNOTATION	WP	WEATHER PROOF
E1.0 E1.1	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES	+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.	ø	PHASE
E1.1	ELECTRICAL SPECIFICATIONS SHEET ELECTRICAL LIGHTING PLAN	$ \times$	KEYED NOTE REFERENCE	DW	DISHWASHER
E2.1	ELECTRICAL POWER & ROOF POWER PLAN		DETAIL REFERENCE: DETAIL NUMBER INDICATED ON	REF	REFRIGERATOR
E3.0	ELECTRICAL DETAILS	E1.1	TOP; DRAWING NUMBER INDICATED ON BOTTOM	MW	MICROWAVE ABOVE COUNTER
E4.0	ELECTRICAL RISER DIAGRAM AND PANEL SCHEDULE			AC/GFI	GROUND FAULT INTERRUPTER ABOVE SINK
				AS/GFI	GROUND FAULT INTERRUPTER UNDER COUNTER
				UC/GFI	GROUND FAULT INTERRUPTER

GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)

- 1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NATIONAL ELECTRIC CODE(NEC) WITH AMENDMENTS, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
- 2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.

SHALL BE SLEEVED AND SEALED WATERTIGHT.

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

ELECTRICAL SPECIFICATIONS

. GENERAL:

THE SITE AND INCLUDE

MAINTENANCE OF WIRING CONTINUITY AS

THE WORK PROPOSAL.

- A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
- B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL
 ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN
 DIAGRAMMATICALLY AND DOES NOT SHOW ALL
 OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL
 ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID
 OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES,
 NCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN
 HEADROOM AND SPACE CONDITIONS.
- C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND
 CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO
 FAMILIARIZE THEMSELVES WITH THE EXISTING
 CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE
- EXECUTION OF THIS WORK.

 BE CONSTRUED AS EVIDENCE

 EXECUTION OF THIS WORK.

 BE CONSTRUED AS EVIDENCE

 THAT SUCH AN EXAMINATION HAS

 BEEN MADE, AND LATER CLAIMS

 WILL NOT BE RECOGNIZED FOR

 EXTRA LABOR, EQUIPMENT, OR

 MATERIALS, REQUIRED

 BECAUSE OF DIFFICULTIES ENCOUNTERED

 WHICH COULD HAVE

 BEEN FORESEEN HAD SUCH AN EXAMINATION

 BEEN MADE.
 - D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS FROM DRAWING MAY
 - BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- E. REMOVAL AND RELOCATION OF CERTAIN EXISTING WORK MAY BE
 NECESSARY FOR THE PERFORMANCE OF THE GENERAL
 WORK. ALL EXISTING CONDITIONS CANNOT BE COMPLETELY
 DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY

ALL CHANGES AND CHARGES IN MAKING UP

REQUIRED.

- F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES. AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING ONLY WITH WRITTEN CONSENT OF OWNER. FACILITIES AND ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING
- G. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL,
 EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
- H. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- I. SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, JNLESS OTHERWISE NOTED.
- J. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.
- K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR.
- L. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
- M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE
 ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS,
 PARTITIONS AND OTHER MATERIALS IN THE EXISTING
 BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO
 DRIGINAL CONDITION.
- N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS
 OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING
 STANDARDS.
- O. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF
- . GENERAL PROVISIONS FOR ELECTRICAL WORK:
- A. DEFINITIONS:

INSPECTION AND APPROVAL.

- 1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
- 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
- 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
- 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
- 5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED

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

 7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS
- 8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE,
 DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

DEFINED ABOVE.

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

C. QUALITY ASSURANCE

- 1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.
- 2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3)HEIGHTS OF OUTLETS:

- a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR:
- RECEPTACLES AND TELEPHONES: 1 FT-6 IN
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT–0 IN.
- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN
- b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.
- B. PRODUCT DELIVERY, STORAGE AND HANDLING
- 4) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
- 5) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

- 1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
- 2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

- a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
 - SINGLE ROD: SIMILAR TO GRINNELL FIG. 281
 - MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
 - CLIP FORM NAILS FLUSH WITH INSERTS.
 - MAXIMUM LOADING 75 PERCENT OF RATING.
- b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.
- c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
- d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.
- F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD—APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.
- E. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.
- F. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH
- G. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

S. SCOPE OF WORK:

- A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.
- B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL

- INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR
- D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.
- E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.
- F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

- A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF
- OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND
- B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:
 - 1) PROJECT NAME AND LOCATION
 - 2) NAME OF ARCHITECT AND ENGINEER
 - 3) ITEM IDENTIFICATION
 - 4) APPROVAL STAMP OF PRIME CONTRACTOR
- C. SUBMISSIONS:
 - 1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.
 - 2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.
- D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
 - 1) SAFETY/DISCONNECT SWITCHES
 - 2) FUSES
 - 3) CIRCUIT BREAKERS
- PANEL BOARDS/LOAD CENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).
- 5) RACEWAYS
- 6) WIRE AND CABLE
- 7) WALL SWITCHES
- 8) INSERTION RECEPTACLES
- 9) MOMENTARY CONTACT SWITCHES
- 10) TIME SWITCHES
- 11) LIGHTING FIXTURES.
- E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.
- 5. AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

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

- B. THESE INSTRUCTIONS SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.
- C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.
- D. REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK.
 "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:

LOADS.

HAVING

240

- A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.
- B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.
 - EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.

DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED

VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY

7. FUSES:

- A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V)/LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- B. MOTOR CIRCUITS ALL INDIVIDUAL MOTOR CIRCUITS WITH FULL LOAD AMPERE RATINGS (FLA) OF 480 AMPERES OR LESS SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMANN LOW—PEAK DUAL—ELEMENT TIME—DELAY LPN—RK (AMP)SP (250V) /LPS—RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.
- PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.
- E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL-MAGNETIC, QUICK-MAKE-QUICK-BREAK, BOLT-ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP-FREE HANDLE. MULTI-POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT-TRIPPING, OPEN ND CLOSE MOTOR OPERATOR AND ALARM INDICATION. ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED. FRAMES, IC AND INTERCHANGEABLE TRIPS SHALL BE AS FOLLOWS, UNLESS
- 1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE. 2) 120/208 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM

8. DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:

OTHERWISE NOTED:

- H. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.
- I. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.
- J. PANELBOARD SHALL BE CONSTRUCTED OF CODE—GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH
 - FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.
- K. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE).
- DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.
- M. DISCONNECTS
 - 1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND USTANDARDS, AND SHALL BE HORSEPOWER RATED.
 - 2) SWITCHING MECHANISM SHALL BE QUICK—MAKE, QUICK—BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANCIALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.
- 3) SWITCHES SHALL BE OF THE DOUBLE STATIONARY CONTACT TYPE.
- 4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.
- G. INSTALLATION
 - 1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.
- I. IDENTIFICATION
 - 1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD
- 2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF—TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF 1/4" HIGH WHITE LETTERING.
- DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.
- POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.
- K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.
- L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).
- B. MATERIALS

1) RACEWAYS:

2) FITTINGS AND ACCESSORIES:

INSULATED THROAT.

- a. RIGID STEEL CONDUIT: FULL—WEIGHT PIPE, GALVANIZED, THREADED.
- b. ELECTRO-METALIC TUBING (EMT): THIN WALL PIPE, GALVANIZED, THREAD LESS.
- c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.
- d. WIRE-WAYS: WIRE SHALL BE AS NOTED, MINIMUM NO. 16 GAUGE STEEL WITH GROUND CONTINUITY. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW-ON.
- e. SURFACE METAL RACEWAY: SIZE AS NOTED. BASE 0.04 IN., COVER 0.25 IN. MATERIAL SHALL BE STEEL. FINISH SHALL BE BAKED ENAMEL. COVERS SHALL BE SCREW—ON.

a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE

b. ELECTRO-METALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.

IRON. ZINC DIE CAST NOT PERMITTED.

c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH

- d. BUSHINGS: METALLIC INSULATED TYPE.
- 3) BOXES:
- a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1-1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2-3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1-1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK-TO-BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.
- b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW-ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 AND 265/460 VOLT WIRING AND BETWEEN EMERGENCY AND NORMAL WIRING. FLOOR BOXES SHALL BE SUITABLE FOR CONDUIT DEVICES NOTED. RAISED OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH ABOVE FLOOR FITTING. TELEPHONE BUSHED HOLE. POWER: DUPLEX RECEPTACLE OR OTHER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY. FLUSH OUTLETS SHALL BE HUBBELL #B2414 SERIES WITH FLUSH FLOOR FITTING FOR TELEPHONE AND FLUSH DUAL FLAP COVER WITH DUPLEX RECEPTACLE FOR POWER AS NOTED. INCREASE SIZE TO SUIT AS NECESSARY.
- C. PROVIDE RACEWAYS ONLY AS HEREIN SPECIFIED, EXCEPT AS NOTED. RACEWAYS SHALL BE RUN CONCEALED, EXCEPT AS NOTED.

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

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

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

MAINTAIN GROUNDING CONTINUITY OF INTERRUPTED METALLIC RACEWAYS WITH GROUND CONDUCTOR, AND IN FLEXIBLE CONDUIT FOR FEEDERS AND MOTOR TERMINAL CONNECTIONS.

EMPTY RACEWAYS OVER 10 FT LONG: PROVIDE FISH OR PULL WIRE, GALVANIZED OR NYLON ROPE.

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

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

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

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

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

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

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

- A. ERECT WALL AND SWITCH OUTLETS IN ADVANCE OF FURRING AND FIREPROOFING. OUTLET BOXES SHALL BE SET SQUARE AND TRUE WITH BUILDING FINISH. SECURE TO BUILDING STRUCTURE BY ADJUSTABLE STRAP IRON OR GROUT IN WITH MASONRY. VERIFY OUTLET LOCATIONS IN FINISHED SPACES WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISHES. PROVIDE BARRIERS BETWEEN SWITCHES CONNECTED TO DIFFERENT PHASES FOR VOLTAGES EXCEEDING 150 VOLTS TO GROUND.
- B. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR—TO—CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT

- HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING
 CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON
 SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR
 BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME
 WHERE REQUIRED.
- C. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE—PARTITIONS ROOMS.
- D. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE
- . WIRE AND CABLE:
- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
- . CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.
- C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.
- D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF-2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS-LINKED POLYETHYLENE INSULATION (TYPE XHHW).
- E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS. WHEN USED IN LIEU OF WIRING IN CONDUIT, STATE IN PROPOSAL THAT PRICE IS BASED UPON THE USE OF HOSPITAL GRADE 'BX'.
- F. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM: BLACK FOR A PHASE RED FOR B PHASE BLUE FOR C PHASE

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

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

- PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
- H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION—TYPE OF TWIST—ON SPRING—LOADED CONNECTORS AND CLEAR NYLON—INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON
- I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.
- J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.
- K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST
 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS
 AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

BELOW MANUFACTURER'S STANDARDS.

- PERFORM TESTS PRIOR TO CONNECTING EQUIPMENT AND IN PRESENCE OF AUTHORIZED REPRESENTATIVES. SUBMIT WRITTEN REPORT OF RESULTS. CORRECT OR REPLACE CABLE TESTING
- 10. WIRING DEVICES:
 - A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.
 - B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3-WAY) AND A5624 (4-WAY).
 - C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.
 - 1)SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2—POLE, 3—WIRE GROUNDING, 15A, 125V, NEMA 5—20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).

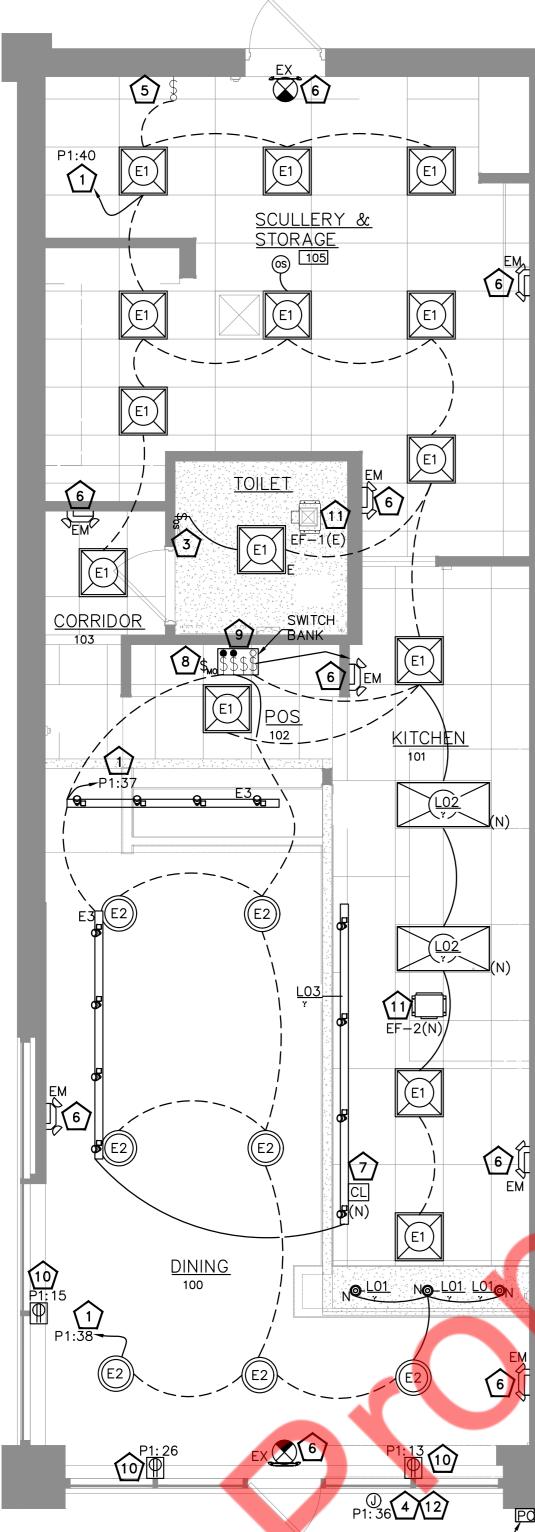
2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE:

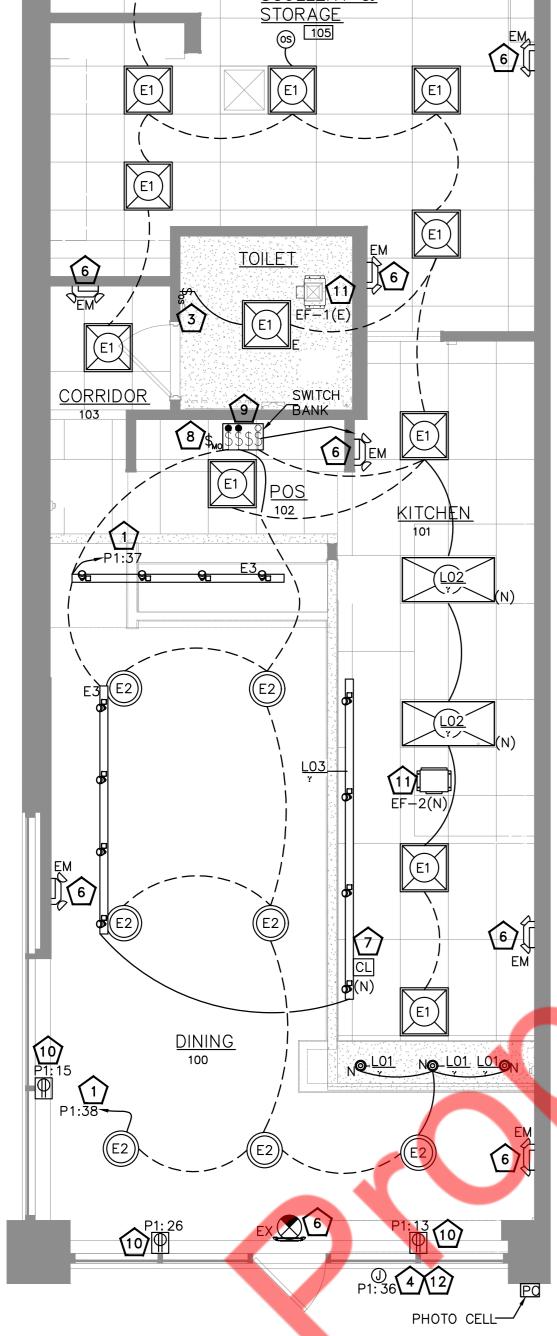
TAMPER RESISTANT,

DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES

WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

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





	DESCRIPTION PRESCOLITE 2'X4' LED PANEL MONOPOINT TRACK HEAD TROFFER LIGHT 2'X2' LIGHTING PENDANTS ZERO LENS EXISTING		FIXTURE SCHEDULE			
TYPE	DESCRIPTION	MAKE	MODEL	WATTAGE S	QTY	REMARK
L01	6" CAN LIGHT	PRESCOLITE	LBRA-6RD-H/LBRA-6 RD-T- 10LCS9-WH (6" CAN)	13.3	3	-
L02	2'X4' LED PANEL		CBT24-A-LSCS-EDD(2X4)	48	2	-
L03	MONOPOINT TRACK HEAD	LUMENTURE	T50-30H-1100-40-S-J	14	4	-
E1	TROFFER LIGHT 2'X2'	EXISTING	EXISTING	-	14	EXISTING TO REMAIN
E2	LIGHTING PENDANTS ZERO LENS	EXISTING	EXISTING	-	7	EXISTING TO REMAIN
E3	MONOPOINT TRACK HEAD	EXISTING	EXISTING	-	8	EXISTING TO REMAIN
EM	EMERGENCY LIGHT	RGENCY LIGHT EXISTING		-	7	EXISTING TO REMAIN
EX	EMERGENCY EXIT SIGN WITH LIGHT	EXISTING	EXISTING	-	2	EXISTING TO REMAIN

LIGHT FIXTURE SCHEDULE GENERAL NOTE:

- A. VERIFY FINAL SELECTION WITH ARCHITECT/OWNER PRIOR TO BID.
- B. ALL THE FIXTURE SHALL BE LED TYPE.
- C. FIXTURES SELECTED SHALL BE OPERABLE AT 120V.

ELECTRICAL SYMBOLS

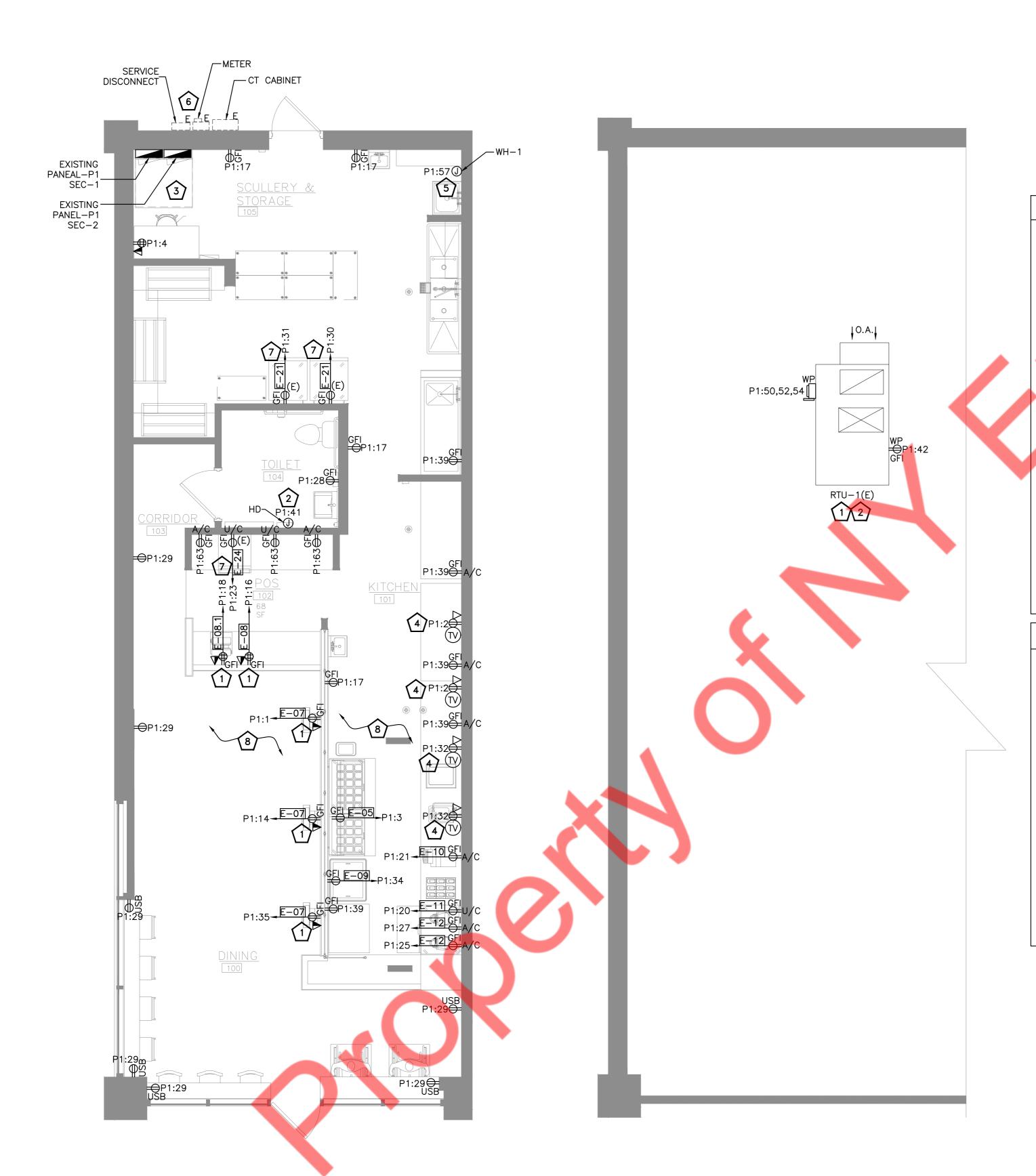
- DUPLEX RECEPTACLE
- QUADPLEX RECEPTACLE □ GCFI DUPLEX RECEPTACLE
- COUNTER DUPLEX RECEPTACLE
- LIGHT SWITCH
- SWITCH W/ DIMMER
- SWITCH W/ MOTION DETECTOR
- 3-WAY SWITCH
- 3-WAY SWITCH W/ DIMMER
- LIGHT FIXTURE TAG
- SWITCHING SYSTEM SWITCH NUMBER
- \$mo MANUAL OVERRIDE SWITCH
- CL CURRENT LIMITER
- \$ SWITCH W/ OCCUPACY SENSOR
- ©S CEILING MOUNTED OCCUPACY SENSOR

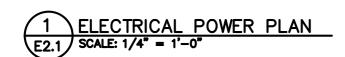
ELECTRICAL LIGHTING PLAN GENERAL NOTES:

- A. COORDINATE FINAL FIXTURE MAKE AND MODEL WITH ARCHITECT.
- B. ALL LIGHT FIXTURES NOT ON THE OCCUPANCY SENSOR / OTHER AUTOMATIC CONTROL SHALL BE CONTROLLED BY TIMER—CONTROLLED LIGHTING
- C. CONTRACTOR TO PROVIDE MANUAL SWITCHING AS PER IECC, C405.2.5 AND LIGHTING CONTROL PER C405.2.2.
- D. TAG (N) SHOWN NEAR LIGHT FIXTURE INDICATE NEW LIGHTING FIXTURES AND OTHER LIGHT FIXTURE ARE EXISTING TO REMIAN. E.C. SHALL VERIFY OPERABLE CONDITION IN THE FIELD. REPLACE IF FOUND INOPERABLE.

ELECTRICAL LIGHTING PLAN KEYED NOTES: (#)

- EXISTING LIGHTING FIXTURES ALONG WITH THEIR CIRCUITS AND CONTROLS SHALL REMAIN. E.C. TO VERIFY OPERABLE CONDITIONS IN THE FIELD. REPLACE IF FOUND INOPERABLE.
- SWITCH WITH OCCUPACY SENSOR. E.C. TO COORDINATE EXACT LOCATION
- REUSE EXISTING OR PROVIDE NEW DISCONNECT SWITCH FOR EXTERIOR SIGNAGE CONTROLLED WITH TIMECLOCK. ALSO COORDINATE EXACT LOCATION WITH SIGNAGE PROVIDER.
- 5. E.C. SHALL VERIFY THE AVAILABILITY OF TIME CLOCK & LIGHTING CONTACTOR & ALSO CHECK OPERABLE CONDITION OF TC & LC. REPLACE IF FOUND INOPERBALE.
- 6. EMERGENCY EGRESS LIGHTING AND EXIT SIGN FIXTURES ALONG WITH THEIR CIRCUITS AND CONTROLS SHALL REMAIN. E.C. TO VERIFY OPERABLE CONDITIONS IN THE FIELD. REPLACE IF FOUND INOPERABLE.
- 7. COORDINATE WITH LIGHTING VENDOR AND PROVIDE CURRENT LIMITER FOR TRACK LIGHTS.
- 8. MANUAL OVERRIDE SWITCH. THE OVERRIDE SWITCH, WHEN INITIATED, SHALL PERMIT THE CONTROLLED LIGHTING TO REMAIN ON FOR NOT MORE THAN
- 9. E.C. SHALL COORDINATE EXACT LOCATION OF THE SWITCH BANK IN THE
- 10. PROVIDE CEILING MOUNTED RECEPTACLE FOR SHOW WINDOW AS REQUIRED BY CODE. VERIFY WITH LOCAL ENERGY AGENCY. VERIFY EXACT LOCATION WITH ARCHITECT.
- 11. EXHAUST FAN SHALL BE INTERLOCKED WITH RTU-1(E)
- 12. E.C. SHALL VERIFY AVAILABILITY OF EXISTING JUNCTION BOX FOR EXTERIOR TO SIGNAGE. E.C. TO VERIFY OPERABLE CONDITIONS IN THE FIELD. REPLACE IF FOUND INOPERABLE. PROVIDE NEW IF EXISTING IS NOT





2 ELECTRICAL ROOF POWER PLAN E2.1 SCALE: 1/4" = 1'-0"

ELECTRICAL EQUIPMENT SCHEDULE

- 1 COORDINATE EXACT MAKE/MODEL NUMBER WITH THE OWNER/ARCHITECT
- 2 COORDINATE EXACT POWER REQUIREMENT WITH THE EQUIPMENT VENDOR.
- 3 COORDINATE EXACT CONNECTION TYPE WITH THE VENDOR PRIOR TO ROUGH IN.
 4 COORDINATE MOUNTING HEIGHT OF THE RECEPTACLE OR DISCONNECTION WITH THE ARCHITECT/OWNER.
- 5 PROVIDE CIRCUIT BREAKER, WIRING, JUNCTION BOX, RECEPTACLES, DISCONNECTS AS REQUIRED.

6 - SELECT EQUIPMENT RATED FOR SERVICE VOLTAGE ELSE PROVIDE THE ADAPTER/TRANSFORMER AS NEEDED.

EQP TAG	EQUIPMENT DESCRIPTION	MAKE	MODEL	VOLTS	PHASE	AMPS	CONNECTION TYPE	REMARK	NOTES
E05	SANDWICH UNIT, REFRIGERATED	CONTINENTAL REFRIGERATOR	SW72N30M-FB	115	1	15	NEMA 5-15P		4
E07	TOUCH DYNAMIC EDGE ULTRA KIOSK 22" W/ FLOOR MOUNT STAND	TOUCH DYNAMIC	EU38A0MH0NN XXNN	-	-	-	-		2,3,4
E08	RAZOR ALL IN ONE 15.6" POS	TOUCH DYNAMIC	LI-R3C8A0- 475EEB-QU06	-	-	-	-		2,3,4
E08.1	RAZOR DISPLAY	TOUCH DYNAMIC	RZ-LCM-01	-	-	-	-		2,3,4
E09	CHEST FREEZER	EXCELLENCE INDUSTRIES	HB-7HCD	115	1	1.3	-		4
E10	CONVEYOR TOASTER	STAR MANUFACTURING	QCS2-500	120	1	14.3	NEMA 5-15P		4
E11	FREEZER, UNDERCOUNTER	BEVERAGE AIR	UCFD36AHC-2	115	1	4	NEMA 5-15P		4
E12	BLENDER, BAR	VITAMIX	036019-ABAB	120	1	15	-		2,4,5
E21	REACH-IN FREEZER	EXISTING	EXISTING					EXISTING TO REMAIN	-
E24	ICE MACHINE	EXISTING	EXISTING					EXISTING TO REMAIN	_

POWER PLAN GENERAL NOTES:

- A. EXACT LOCATION OF MECHANICAL, PLUMBING, KITCHEN, FURNITURE SYSTEMS, OWNER FURNISHED EQUIPMENT ETC. THAT REQUIRE ELECTRICAL CONNECTIONS ARE SHOWN ON THE MECHANICAL, PLUMBING, AND/OR ARCHITECTURAL DRAWINGS. E.C. TO COORDINATE EXACT LOCATIONS WITH RESPECTIVE CONTRACTORS AND/OR VENDORS PRIOR TO ANY ROUGH—INS.
- B. REVIEW AND COORDINATE WITH ALL TRADES CONTRACT DOCUMENTS TO DETERMINE SPECIFIC MOUNTING LOCATIONS FOR EQUIPMENT WITH ELECTRICAL CONNECTIONS. COORDINATE EXACT MOUNTING LOCATIONS WITH THE SPECIFIC TRADE AND ARCHITECT.
- MINIMUM CONDUCTOR SIZE FOR 120V BRANCH CIRCUITS SHALL BE 12-AWG. FOR 120V BRANCH CIRCUITS WITH HOME-RUN OVER 100 LINEAR FEET, A MINIMUM WIRE SIZE OF 10-AWG SHALL BE PROVIDED FROM FIRST JUNCTION/OUTLET BOX TO BRANCH CIRCUIT PANEL BOARD. FOR 120V BRANCH CIRCUITS WITH HOME RUN OVER 150 LINEAR FEET, A MINIMUM OF 8-AWG SHALL BE PROVIDED FROM FIRST JUNCTION/OUTLET BOX TO BRANCH CIRCUIT PANEL BOARD.
- D. ALL WIRING SHALL BE IDENTIFIED BY PANEL BOARD AND CIRCUIT NUMBERS IN ALL CABINETS, JUNCTION BOXES, WIRING TROUGHS, ENCLOSURES, SPLICE OR TERMINATION POINTS ETC.
- E. ALL 120V, 15A AND 20A RECEPTACLES IN KITCHEN AREA SHALL BE "GFCI" IN ACCORDANCE WITH NEC ARTICLE 210.8(B).
- F. GFI SHOWN WITH THE RECEPTACLE INDICATES THAT THE CIRCUIT SHALL BE GFI PROTECTED. E.C. SHALL PROVIDE GFI BREAKER ON THE CIRCUIT SHOWN ON PLAN. IF RECEPTACLE IS NOT AVAILABLE OR IT IS NOT ACCESSIBLE.
- G. ELECTRICAL CONDUCTORS FOR FEEDERS AND BRANCH CIRCUITS COMBINED SHALL BE SIZED FOR A MAXIMUM OF 5 PERCENT VOLTAGE DROP.
- H. EXISTING CIRCUIT CONNECTIONS FOR EXISTING MECHANICAL UNIT SHALL REMAIN. E.C. TO VERIFY OPERABLE CONDITIONS OF CIRCUIT CONNECTION AND BREAKER IN FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.

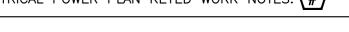
POWER PLAN KEYED NOTES:

- . ELECTRICAL CONTRACTOR TO VERIFY THE MOUNTING HEIGHT, LOCATION & DETAILS FOR POS RECEPTACLES WITH ARCHITECT/ OWNER PRIOR TO ROUGH IN
- 2. PROVIDE JUNCTION BOX AND CIRCUIT FOR HAND DRYER AND LOCKOUT IN THE
- 3. E.C. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH ARCHITECT/ OWNER FOR EXACT LOCATION OF PANELS IN THE FIELD. 3' CLEAR SPACE SHALL BE PROVIDED IN FRONT OF THE PANEL AS PER CODE.
- 4. E.C. SHALL COORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF TV RECEPTACLE & POWER REQUIREMENTS, PROVIDE ACCORDINGLY.
- 5. EXISTING WATER HEATER ALONG WITH ITS CIRCUIT AND CONTROL TO REMAIN. E.C. SHALL IDENTIFY THE EXACT CIRCUIT IN THE PANEL BOARD AND REUSE. VERIFY THE OPERABLE CONDITION IN THE FIELD
- 6. E.C TO COORDINATE EXACT LOCATION IN FIELD.
- 7. EXISTING EQUIPMENT SHALL REMAIN CONNECTED TO THE EXISTING CIRCUIT. E.C. SHALL VERIFY THE OPERABLE CONDITION OF THE ELECTRICAL CIRCUIT AND CONTROL IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- 8. COORDINATE MOUNTING OF ALL THE ELECTRICAL RECEPTACLE IN FIELD.

GENERAL ROOF POWER PLAN NOTES:

- A. E.C. SHALL VERIFY WITH THE OWNER FOR RATING AND OPERABLE CONDITION OF THE EXISTING ELECTRICAL CIRCUITS AND CONTROLS OF THE EXISTING MECHANICAL UNITS IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- B. ALL THE ELECTRICAL ELEMENT VIZ. CONDUITS, WIRING, AND DISCONNECT SWITCHES SHALL BE RATED FOR THE EXTERIOR USE.
- C. THE DISCONNECT SWITCHES FOR THE BRANCH CIRCUIT SHOWN ON THE PLAN SHALL BE RATED EQUAL TO OR HIGHER THAN THE BREAKER RATING. REFER BREAKER RATING IN THE PANEL SCHEDULE AND PROVIDE DISCONNECT AS NEFDED.
- PROTECTED. E.C. SHALL PROVIDE A GFI BREAKER IN THE PANEL FOR THE INDICATED CIRCUIT IF EITHER THE RECEPTACLE IS NOT AVAILABLE OR NOT ACCESSIBLE.

ELECTRICAL POWER PLAN KEYED WORK NOTES: (#)



- EXISTING (E) MECHANICAL UNITS SHALL REMAIN CONNECTED TO THE EXISTING CIRCUIT. E.C. TO VERIFY THE OPERABLE CONDITION OF THE ELECTRICAL CIRCUIT AND CONTROLS IN THE FIELD. REPLACE IF FOUND INOPERABLE. BASE BID ACCORDINGLY.
- E.C. SHALL COORDINATE WITH THE MECHANICAL CONTRACTOR FOR THE EXACT LOCATION AND ELECTRICAL CONNECTION REQUIREMENT OF THE HVAC UNIT IN THE FIELD. PROVIDE CIRCUIT AND CONTROLS AS REQUIRED.



ELECTRICAL PANEL SCHEDULE

PANEL:	P1	(EXISTING)					-					MOUNTING:	SURFACE	
208Y/120	VOLTS	PHA	SE 3		AIC RATING (in kA)	65kA			DEMAND LOAD	43.53		PANEL LOCATION:	SCULLERY & S	STORA
400A	МСВ	WI	RE 4		-	-			DEMAND CURRENT	120.98		FED FROM:	EXISTING PAN	NEL MI
NOTE:														
CKT NO	TRIP AMPS	DESCRIPTION OF LOAD	I O A D TVD	E LOVD (K//V)	MINIMUM BRANCH CIRCUIT	PER	PHASE (I	KVA)	MINIMUM BRANCH CIRCUIT	10VD (K//V)	I O V D TVDE	DESCRIPTION OF LOAD	TRIP AMPS	CKT
CKT NO.	TRIF AIVIF 3	DESCRIPTION OF EGAB	LOAD III	LOAD (KVA)	WIINTIVIOW BRANCIT CIRCOTT	Α	В	С	WIIWIIVIOW BRANCH CIRCOTT	LOAD (KVA)	LOAD TIFL	DESCRIPTION OF EOAD	TIME AIVIES	CK
1	20	EQ7_TOUCH DYNAMIC EDGE ULTRA KIOSK STAND	D E	0.18	2#12, #12G, 3/4"C	0.78			2#12, #12G, 3/4"C	0.60	R	TV MENU DISPLAY RECEPTACLE	20	
3	20	EQ5_SANDWICH UNIT, REFRIGERATED	E	1.80	2#12, #12G, 3/4"C		2.16		2#12, #12G, 3/4"C	0.36	R	SCULLERY & STORAGE AREA QUAD RECEPTACLE	20	
5		SPACE	L	1.40	2#12, #12G, 3/4"C			1.40						
7						0.00						SPARE	30/3P	
9	30/3P	SPARE					0.00							┸
11								0.00				SPACE		┸
13	20*	SHOW WINDOW RECEPTACLE	L	1.40	2#12, #12G, 3/4"C	1.58			2#12, #12G, 3/4"C	0.18	Е	EQ7_TOUCH DYNAMIC EDGE ULTRA KIOSK STAND	20	\perp
15	20*	SHOW WINDOW RECEPTACLE	L	1.80	2#12, #12G, 3/4"C		2.16		2#12, #12G, 3/4"C	0.36	Е	EQ08_RAZOR ALL IN ONE 15.6" POS	20	\perp
17	20	GENERAL RECEPTACLE	R	0.72	EXISTING			1.08	2#12, #12G, 3/4"C	0.36	E	EQ08.1_RAZOR DISPLAY	20	\perp
19		SPACE				0.48			2#12, #12G, 3/4"C	0.48	Е	EQ11_FREEZER, UNDERCOUNTER	20	\perp
21	20	EQ10_CONVEYOR TOASTER	E	1.72	2#12, #12G, 3/4"C		1.72					 SPARE	30/2P	
23	20	EQ24_ICE MACHINE	E	0.80	EXISTING			0.80				or Art	30/ 21	\perp
25	20	EQ12_BLENDER,BAR	E	1.80	2#12, #12G, 3/4"C	3.20			2#12, #12G, 3/4"C	1.40	R	SHOW WINDOW RECEPTACLE	20*	上
27	20	EQ12_BLENDER,BAR	E	1.80	2#12, #12G, 3/4"C		1.98		2#12, #12G, 3/4"C	0.18	R	RESTROOM RECEPTACLE	20	\perp
29	20	GENERAL RECEPTACLE DINING AREA	R	1.08	2#12, #12G, 3/4"C			1.98	EXISTING	0.90	E	EQ21_REACH-IN FREEZER	20	\perp
31	20	EQ21_REACH-IN FREEZER	E	0.90	EXISTING	1.50			2#12, #12G, 3/4"C	0.60	R	TV MENU DISPLAY RECEPTACLE	20	┸
33	20	NETWORK SWITCH	0	0.40	EXISTING		0.56		2#12, #12G, 3/4"C	0.16	E	EQ09_CHEST FREEZER	20	\perp
35	20	EQ7_TOUCH DYNAMIC EDGE ULTRA KIOSK STAND	D E	0.18	2#12, #12G, 3/4"C			2.08	EXISTING	1.90	L	SIGNAGE JB	20	\perp
37	20	LIGHTING	L	1.90	EXISTING	3.50			EXISTING	1.60	L	LIGHTING	20	\perp
39	20	KITCHEN GENERAL RECEPTACLE	R	0.72	2#12, #12G, 3/4"C		2.32		EXISTING	1.60	L	LIGHTING	20	\perp
41	20	HAND DRYER RESTROOM	R	1.00	2#12, #12G, 3/4"C			1.18	EXISTING	0.18	R	ROOFTOP RECEPTACLE	20	
						15.79	15.65	13.27						

PANEL:	P1	(EXISTING)					-					MOUNTING:	SURFACE	
208Y/120	VOLTS	PHASE	3		AIC RATING (in kA)	65kA			DEMAND LOAD	14.24		PANEL LOCATION:	SCULLERY 8	
400A	MLO	WIRE	4		-	-			DEMAND CURRENT	39.57		FED FROM:	PANEL P1S	EC. II
NOTE:				•		•						•	•	
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	MINIMUM BRANCH CIRCUIT	PER A	PHASE (I	(VA)	MINIMUM BRANCH CIRCUIT	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO
43						0.00								44
45	20/3P**	SPARE				0.00	0.00					SPARE	20/3P	46
47	1 -3,51						0.00	0.00						48
49						4.40				4.40	Н			50
51	20/3P	SPARE					4.40		EXISTING	4.40	Н	EXISTING RTU	50/3P	52
53								4.40		4.40	Н	1		54
55		SPACE				0.00						SPACE		56
57	20*	WH-1	0	0.50	2#12, #12G, 3/4"C		0.50					SPACE		58
59	60/2P	SPARE						0.00				SPACE		60
61	00/ 21	SF AILL				0.00						SPACE		62
63	20	KITCHEN GENERAL RECEPTACLE	R	0.54	2#12, #12G, 3/4"C		0.54					SPACE		64
65		SPARE						0.00						66
67		SPARE				0.00						SPARE	60/3P	68
69	1	SPARE					0.00					_	`	70
71	+	SPACE						0.00				SPARE	35/2P**	72
73		SPACE				0.00								74
75		SPACE					0.00					SPARE	20	76
77		SPACE						0.00				SPARE	20	78
79	+	SPACE				0.00						SPARE	20	80
81		SPACE					0.00					SPACE		82
83		SPACE						0.00				SPACE	_ ~	84
						4.40	5.44	4.40						

PANEL	SCHEDULE	GENERAL	NOTES:

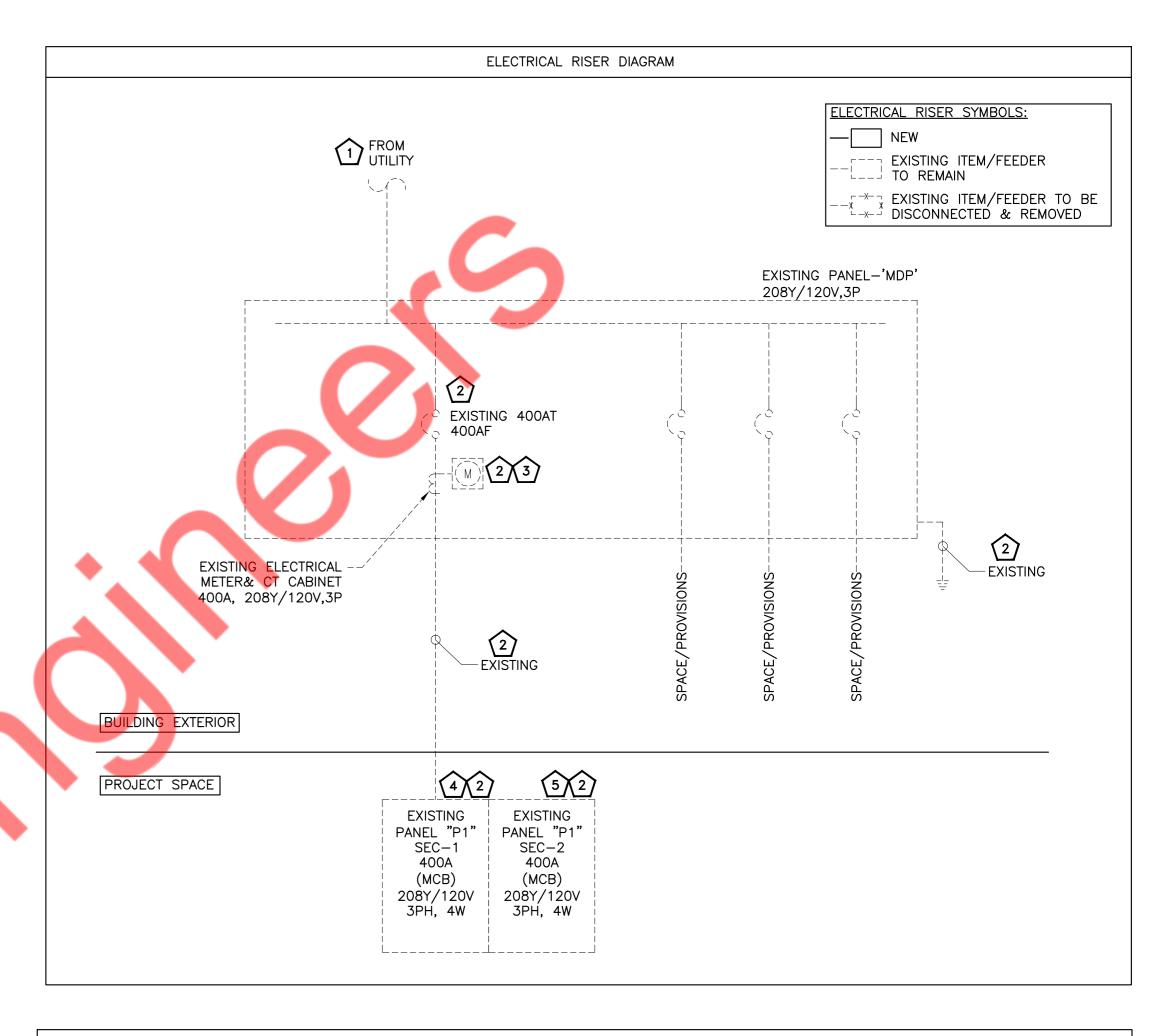
- A. ELECTRICAL CONTRACTOR SHALL VERIFY THE BREAKER AND CABLE RATING WITH EQUIPMENT SUPPLIER/OWNER AND ACCORDINGLY UPDATE THE BREAKER RATING CABLE SIZE IN FIELD.
- B. GFI MARKED ON THE POWER PLAN INDICATES THAT THE CIRCUIT SHALL BE GFCI PROTECTED. E.C. SHALL PROVIDE GFCI BREAKER FOR THE GFI MARKED RECEPTACLES, IF EITHER RECEPTACLE IS NOT ACCESSIBLE OR NOT AVAILABLE.
- C. PROVIDE HACR BREAKER FOR HAVC UNITS. COORDINATE WITH HVAC DRAWINGS.
- D. PROVIDE LOCKING DEVICES ON CIRCUIT BREAKER WHERE EVER REQUIRED.
- E. E.C. TO VERIFY SCOPE OF WORK WITH OWNER/ARCHITECT. PRIOR TO BID.
- F. VERIFY EXACT POWER DISTRIBUTION IN FIELD.

PANEL SCHEDULE ABBREVIATIONS:

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

(*) – MODIFIED BREAKER

(**) - EXISTING TO REMAIN



ELECTRICAL RISER KEYED WORK NOTES: (#)

- 1. EXISTING 400A, 208Y/120V, 3PH, 4W ELECTRICAL SERVICE FEEDER FROM UTILITY FOR THE PROJECT SPACE TO REMAIN. VERIFY LOCATION, RATING, AND OPERABLE CONDITION IN THE FIELD. INFORM THE ENGINEER OF THE RECORD OF ANY DISCREPANCY. BEFORE BID.
- 2. E.C. SHALL VERIFY THE EXACT LOCATION, RATING, AND OPERABLE CONDITION OF EVERY EQUIPMENT MARKED EXISTING IN THE FIELD. INFORM THE ENGINEER OF RECORD OF ANY DISCREPANCY, BEFORE BIDING.
- 3. EXISTING ELECTRICAL METER AND CT CABINET FOR PROJECT SPACE. E.C. SHALL COORDINATE EXACT LOCATION WITH UTILITY/OWNER/
- 4. EXISTING ELECTRICAL PANEL P1 SECTION-1 400A 208Y/120V, 3P,4W
- 5. EXISTING ELECTRICAL PANEL P1 SECTION-2 400A 208Y/120V, 3P,4W

ELECTRICAL RISER GENERAL NOTE:

- A. E.C. SHALL VERIFY THE EXACT POWER DISTRIBUTION AND SCOPE OF WORK WITH THE ARCHITECT/OWNER BEFORE BID.
- B. THE ELECTRICAL WORK SHALL BE PERFORMED IN COMPLIANCE WITH THE NEC, LOCAL CODES AND AHJ.
- C. COORDINATE THE EXACT LOCATION OF ALL THE NEW ELECTRICAL COMPONENTS SHOWN ON THE RISER. AND ENSURE THE CLEAR WORKING AND DEDICATED SPACE HAS BEEN PROVIDED AS PER NEC 110.26.
- 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. THE PART OF RISER MARKED AS EXISTING IS FOR REFERENCE PURPOSE ONLY. E.C. SHALL VERIFY THAT THE RISER MATCHES THE SITE CONDITION.
- G. SPARE AMPS AVAILABLE IN THE EXISTING ELECTRICAL SERVICE ARE MORE THAN THE NEWLY ADDED DEMAND AMPS.
- H. PLEASE REFER POWER PLAN FOR PROPOSED LOCATION OF THE ELECTRICAL METER, SERVICE DISCONNECT, PANELS AND TRANSFORMERS. INFORM ENGINEER ON RECORD OF ANY DISCREPANCY.
- I. ADDITION OR ALTERATION TO THE EXISTING SYSTEM SHALL NOT BE DONE WITHOUT THE WRITTEN CONSENT OF THE OWNER.

PLUMBING SYMBOLS LIST — GSAN — GREASE SANITARY SEWER (UNDERFLOOR) — SAN — SANITARY SEWER (UNDERFLOOR) --- EX.GSAN -EXISTING GREASE SANITARY SEWER (UNDERFLOOR) — EX.SAN — EXISTING SANITARY SEWER (UNDERFLOOR) VENT PIPING ____ COLD WATER PIPING HOT WATER PIPING ____ HOT WATER RETURN PIPING ____ FILTER PIPING EXISTING COLD WATER PIPING ____ $---\infty$ P-TRAP PIPE UP ____ PIPE DROP **─**0**─** CLEANOUT PLUGGED OUTLET/CLEANOUT POINT OF CONNECTION

PLUMBING ABBREVIATIONS

i Lui	ADDITE VIATIONS
СО	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
AFF	ABOVE FINISH FLOOR
FD	FLOOR DRAIN
SQ. FT.	SQUARE FEET
BFP	BACK FLOW PREVENTER
WH-1	WATER HEATER
N.I.C.	NOT IN SCOPE
ET-1	EXPANSION TANK
RCP-1	HOT WATER CIRCULATION PUMP

PLUMBING DRAWING LIST

P6.0 PLUMBING SCHEDULE AND RISERS

2018 INTERNATIONAL PLUMBING CODE.

AS PER SECTION PC 305.

6, 7 AND 9.

PC 917

ACCORDANCE WITH SECTION PC 107.

5. RODENT PROOFING AS PER PC 304

PC 605, PC 702, PC 902,PC 1102.

P5.0 PLUMBING DETAILS

PO.1 PLUMBING SYMBOLS & SPECIFICATIONS P1.0 PLUMBING WATER, GAS AND SANITARY FLOOR PLAN

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND

2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN

3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS

4. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC

6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN

7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE

8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED

ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303,

IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5,

AS PER PC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN

ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708

10. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN

11. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND

12. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND

13. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE

14. INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN

ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308

MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF

CHAPTER 6 SECTION PC 601-603, 604, 606, 607, 608, 610

INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF

CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708,

INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF

CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH

9. DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.

ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 702.2

ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND

MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF

- 6. PLUMBING FIXTURES

 - 8. MIXING VALVES
 - 9. ALL SCHEDULED PLUMBING EQUIPMENT
 - 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.
 - 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 SUBMISSION OF THE SAME ITEM. THE CONTRACTOR SHALL BE RATE SCHEDULE.

 - 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.

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.

AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.

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
- VALVES HANGERS AND SUPPORTS
- 4. PLUMBING PIPING LAYOUT
- TESTS
- WATER HEATERS & ACCESSORIES
- B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO
- C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH
- 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) LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY
- E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE
- 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.

1.03 SUBSTITUTIONS

B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE

- A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.
- B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED
- C. PROVIDE: TO FURNISH AND INSTALL.
- D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: THE CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN AND SHOWN ON THESE DRAWINGS.

1.06 DRAWINGS

1.05 DEFINITIONS

- 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 1.08 GAS PIPING: 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.

- A. SANITARY AND VENT PIPING:
- 1. ABOVE GRADE AND UNDERGROUND PIPING SHALL BE POLYVINYL CHLORIDE (PVC) PIPE AS PER ASTM D2665, ASTM F891, ASTM F1488, CSA B181.2 AS PER IPC 2018, TABLE 702.1 AND TABLE 702.2. OR PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
- 2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
- 3. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

- 1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DRAWN COPPER TUBE. PEX PIPING IS AN ACCEPTABLE SUBSTITUTE AS PER ASTM F876 AWWA C904 AND CSA B137.5
- 2. FITTINGS IN DOMESTIC WATER PIPING SHALL COPPER OR CAST BRASS.
- 3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
- 4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
- 5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
- 6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE-RETARDANT, FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH INTERNATIONAL ENERGY CONSERVATION CODE 2018, SECTION C403.11.3 REFER BELOW TABLE.

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

- WATER DISTRIBUTION SYSTEM AS PER INTERNATIONAL ENERGY CONSERVATION CODE 2018 C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED-WATER SUPPLY PIPE BACK TO THE HEATED-WATER SOURCE THROUGH A COLD-WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
- 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 INTERNATIONAL ENERGY CONSERVATION CODE 2018, 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 INTERNATIONAL ENERGY CONSERVATION CODE 2018 C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE	MIXIMUM PIPING LENGTH (FEET)		
(INCHES)	PUBLIC LAV	OTHER FIXTURES	
1/2"	2'	43'	
3/4"	0.5'	21'	
1"	0.5'	13'	
11/4"	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.

- 1. GAS PIPING SHALL BE SIZED IN ACCORDANCE WITH PIPE SIZING TABLES OR SIZING EQUATIONS IN ACCORDANCE WITH SECTION 402.4.
- 2. METALLIC PIPE SHALL COMPLY WITH SECTIONS 403.4.1 THROUGH 403.4.4.
- 3. PIPING SYSTEM INSTALLATION SHALL COMPLY WITH REQUIREMENTS OF 2018 INTERNATIONAL FUEL GAS CODE, SECTION 404.
- 4. AS PER 2018 INTERNATIONAL FUEL GAS CODE, SECTION 404.6; GAS PIPING SHALL NOT PENETRATE FOUNDATION WALL OF A BUILDING, GAS PIPING SHALL ENTER AND EXIST A BUILDING AT A POINT ABOVE GRADE AND THE ANNULAR SPACE BETWEEN THE PIPE AND THE WALL SHALL BE SEALED.
- 5. PIPING INSTALLED UNDERGROUND BENEATH BUILDINGS IS PROHIBITED EXCEPT WHERE THE PIPING IS ENCASED IN A CONDUIT OF WROUGHT IRON OR STEEL PIPE DESIGNED TO WITHSTAND THE SUPERIMPOSED LOADS. THE CONDUIT SHALL BE PROTECTED FROM CORROSION IN ACCORDANCE WITH SECTION 404.11 AND SHALL BE INSTALLED IN ACCORDANCE WITH SECTION 404.11.1 OR 404.11.2 INTERNATIONAL FUEL GAS CODE.
- 6. AS PER 2018 INTERNATIONAL FUEL GAS CODE, SECTION 404.12; UNDERGROUND PIPING SYSTEMS SHALL BE INSTALLED A MINIMUM DEPTH OF 12 INCHES BELOW GRADE.
- 7. THE GAS PIPING IS ENCASED IN A CONDUIT OF WROUGHT IRON OR STEEL PIPE TO WITH STAND THE SUPERIMPOSED LOADS.
- SHUTOFF VALVES SHALL BE LOCATED IN PLACES SO AS TO PROVIDE ACCESS FOR OPERATION AND SHALL BE INSTALLED SO AS TO BE PROTECTED FROM DAMAGE

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

D. VALVES:

- 1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT-OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT-OFF DUTY.
- 2. ALL FIXTURES WITH THE EXCEPTION FLUSHOMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.
- 3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
- 4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.

HOT WATER CIRCULATING SYSTEM.

TIGHT TO THE STRUCTURE ABOVE.

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

6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE

- F. 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.
- G. IN ALL AREAS WITH FINISHED SURFACES, SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED
- H. REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

- I. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.
- J. IF WATER PRESSURE EXCEEDS 80 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.
- K. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.
- L. PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER APPROVED INDIRECT WASTE SOURCE
- M. 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.
- N. 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.
- WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.
- Q. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.
- R. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED. THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.
- INSTALLATION

FLANGES AND UNIONS.

BUILDING CONDITIONS.

MANAGER IS REQUIRED.

2.01 GENERAL

- T. 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.
- U. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.
- V. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

W. COORDINATE THE PLUMBING WORK WITH ALL OTHER

X. REAM PIPE AND TUBE ENDS. REMOVE BURRS. BEVEL

Y. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND

- AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.
- PLAIN AND FERROUS END PIPE.
- OUTSIDE, BEFORE ASSEMBLY. Z. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH
- AA. 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
- AB. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.
- AC. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY
- AD. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.
- AE. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

- A. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS, CORRECT ALL DEFICIENCIES FOUND.
- B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.
- C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.
- D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.
- E. ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.
- 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.

F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING

OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN. H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL

AUTHORITIES AND THE OWNER'S REPRESENTATIVE.

G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY

CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND

- J. ALL EQUIPMENT WILL BE FACTORY TESTED
- I. 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

- DOMESTIC WATER PIPING a. TEST ALL
- 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

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

ADJACENT TENANT OR ESB SPACES.

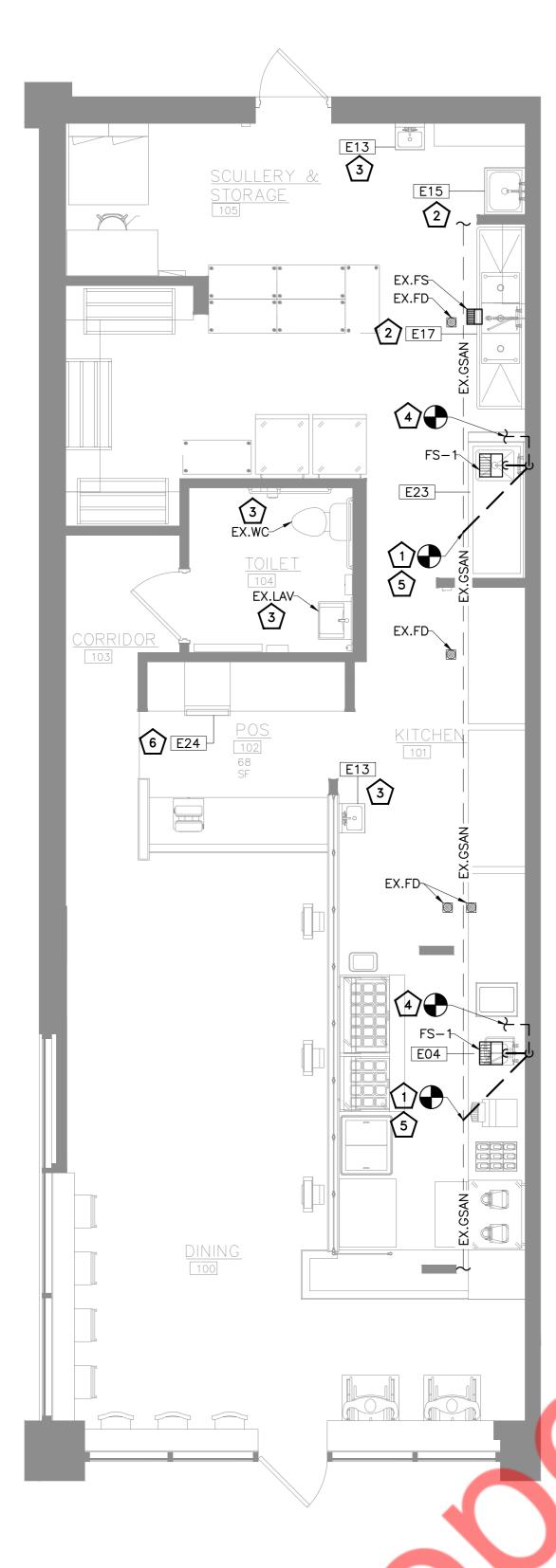
N. THOROUGHLY FLUSH PIPING SYSTEM WITH FRESH WATER IMMEDIATELY PRIOR TO FINAL ACCEPTANCE.

DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION

4. WARRANTY

AS STIPULATED.

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.



PLUMBING SANITARY PLAN
P1.0 SCALE: 1/4" = 1'-0"

SANITARY AND VENT PLAN NOTES:

- EXTEND AND CONNECT NEW 3" GREASE SANITARY LINE PIPING TO EXISTING GREASE SANITARY LINE. CONTRACTOR TO FIELD VERITY EXACT SIZE, LOCATION AND INVERT LEVEL OF EXISTING GREASE SANITARY LINE ON SITE.
- EXISTING PLUMBING EQUIPMENT WITH EXISTING GREASE SANITARY AND VENT PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXISTING PLUMBING FIXTURE WITH EXISTING SANITARY AND VENT PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.
- EXTEND AND CONNECT NEW 2" VENT LINE TO EXISTING VENT LINE. CONTRACTOR TO FIELD VERITY EXACT SIZE AND LOCATION OF VENT LINE ON SITE.
- CONTRACTOR TO FIELD VERIFY EXISTING GREASE INTERCEPTOR SIZE AND LOCATION. PROVIDE NEW IF NOT EXISTING.
- EXISTING ICE MACHINE WITH EXISTING SANITARY AND VENT PIPING WITH ASSOCIATED ACCESSORIES AND FITTINGS TO REMAIN. CONTRACTOR TO FIELD VERIFY THE CONDITION OF EXISTING PIPING AND REPLACE IF REQUIRED.



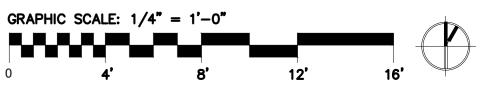


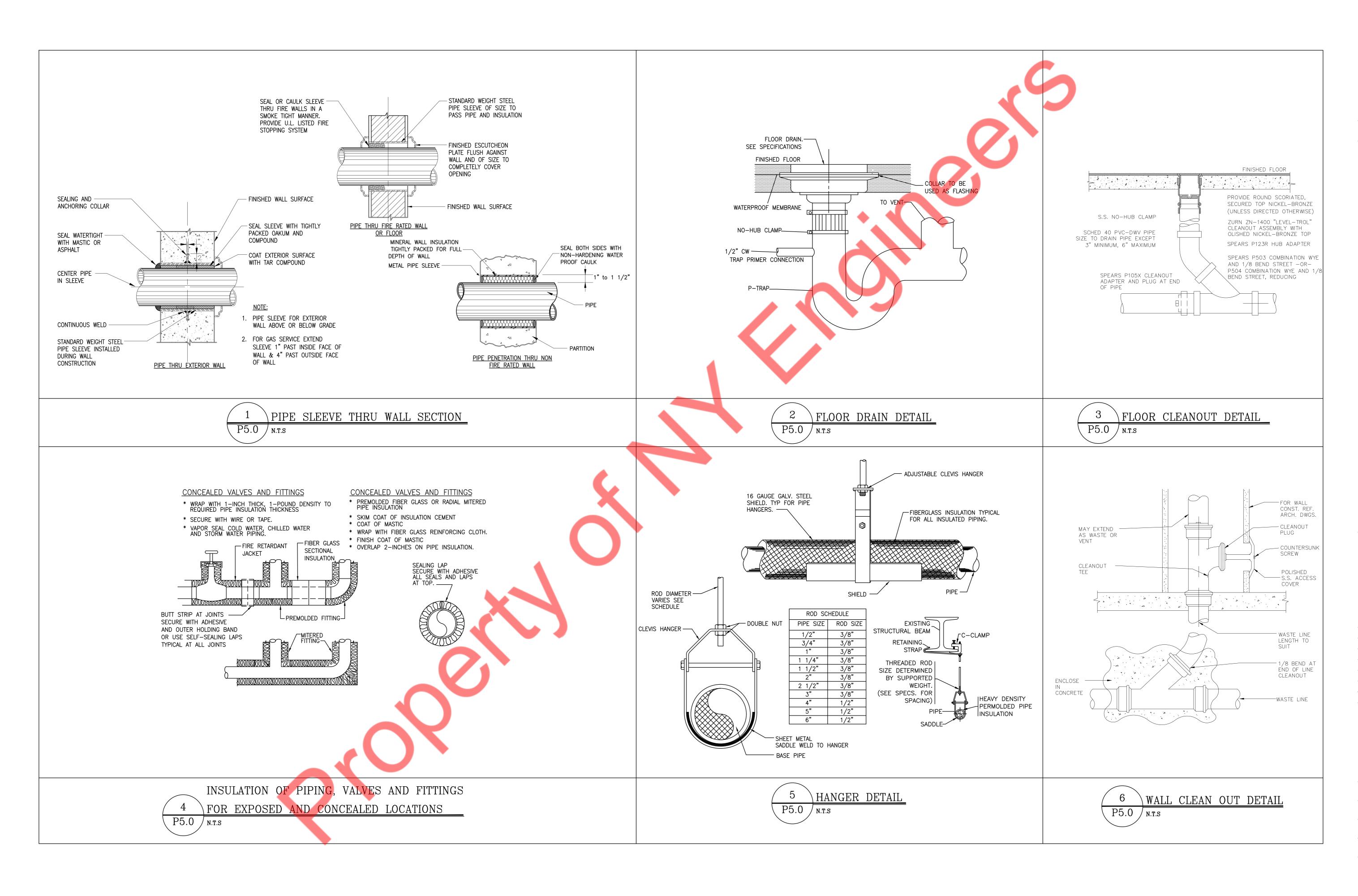


- GENERAL NOTES:
- 1. CW/HW PIPING TO BE PROVIDED WITH INSULATION AS PER 2018 INTERNATIONAL ENERGY CONSERVATION CODE (REFER SHEET PO.1)
- 2. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 80 PSI.
- 3. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION AS PER STRUCTURAL REQUIREMENT.
- 4. PROVIDE ACCESS PANELS FOR WATER HAMMER ARRESTOR, CLEANOUTS & SHUT-OFF VALVES AS REQUIRED.
- 5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
- 6. PROVIDE TRAP PRIMER FOR FLOOR DRAIN AS PER LOCAL JURISDICTION.

DOMESTIC WATER AND GAS PLAN NOTES:

- EXTEND AND CONNECT NEW 34"CW & 34"HW LINE TO EXISTING CW & HW LINE RESPECTIVELY. CONTRACTOR TO FIELD VERIFY EXISTING CW & HW LINE SIZE AND LOCATION, UPGRADE IF REQUIRED.
- EXISTING PLUMBING FIXTURE WITH EXISTING WATER LINE TO BE REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING WATER LINE CONDITION AND REPLACE IF REQUIRED.
- EXISTING WATER HEATER WITH ASSOCIATED PIPING AND EQUIPMENTS TO BE REMAIN. CONTRACTOR TO FIELD VERIFY EXISTING WATER HEATER AND ASSOCIATED EQUIPMENTS CONDITION. REPLACE IF REQUIRED.
- CONTRACTOR TO FIELD VERIFY EXISTING WATER METER, EXISTING RPZ AVAILABILITY, CONDITION, SIZE AND LOCATION. PROVIDE NEW IF NOT EXISTING. UPGRADE CW SERVICE IF REQUIRED. BASE BID ACCORDINGLY.
- EXISTING ICE MACHINE WITH EXISTING WATER LINE TO BE REMAIN.
 CONTRACTOR TO FIELD VERIFY EXISTING WATER LINE CONDITION
 AND REPLACE IF REQUIRED.
- EXISTING RTU TO REMAIN WITH EXISTING GAS PIPING. CONTRACTOR TO FIELD VERIFY THE GA PIPING FOR EXISTING RTU-1(E) ABD ENSURE GAS PIPING IN A GOOD WORKING CONDITION, REPAIR AND REPLACE IF REQUIRED.
- CONTRACTOR TO MAKE SURE THAT SUFFICIENT GAS PRESSURE SHOULD BE PROVIDED TO GAS RTU PROVIDE PRESSURE REGULATOR IF REQUIRED AT AN ACCESSIBLE LOCATION.
- CONTRACTOR TO CHECK AN FILED VERIFY IF EXISTING WATER HEATER HAS MINIMUM 40 GALLON STORAGE AND 65 MBH GAS CAPACITY. IF NOT, REPLACE EXISTING WATER HEATER WITH A NEW ONE. PROVIDE A SUBMITTAL OF NEW WATER HEATER BEFORE BID AND/OR INSTALLATION FOR A/E REVIEW.





	PLUMBING FIXTURE SCHEDULE					
ITEM	DESCRIPTION	WASTE	VENT	CW	HW	FIXTURE DESCRIPTION/ REMARKS
EX.WC	WATER CLOSET	E	E	E	_	EXISTING TO REMAIN.
EX.LAV	LAVATORY	Е	E	E	E	EXISTING TO REMAIN.
EX.FD	FLOOR DRAIN	Е	E	E	E	EXISTING TO REMAIN.
EX.FS	FLOOR SINK	E	E	E	E	EXISTING TO REMAIN.
EX.WH	WATER HEATER	Е	Е	E	E	EXISTING TO REMAIN.
FS-1	FLOOR SINK	3"	2"	_	_	FLOOR SINK, J'R' SMITH 3100 SERIES, CAST IRON FLANGED RECEPTOR, NICKLE BRONZE RIM AND SECURED GRATE, ALUMINUM DOME STRAINER, AND TRAP PRIMER CONNECTION
E04	DUMP SINK	2"	_	3/4"	3/4"	MANUFACTURER — JOHN BOOS, MODEL —1B18244, COORDINATE W/ ARCHITECTURAL. INDIRECT DRAIN TO ADJACENT FLOOR SINK.
E13	HAND SINK	E	E	E	E	EXISTING TO REMAIN.
E15	MOP SINK	E	E	E	E	EXISTING TO REMAIN.
E17	3 COMPARTMENT SINK	E	E	E	E	EXISTING TO REMAIN.
E23	WORKTABLE WITH SINK ON LEFT	2"	_	3/4"	3/4"	EXISTING TO RELOCATED
E24	ICE MACHINE	E	E	Е	E	EXISTING TO RELOCATED

