MECH	ANICAL SYMBOLS LIST
AC-1 (TXF-1)	EQUIPMENT SYMBOL
	AIR DEVICES
	CEILING DIFFUSER SUPPLY
	CEILING DIFFUSER RETURN/EXHAUST
D	UCT ACCESSORIES
	VOLUME DAMPER W/ ACCESS DOOR
	BACKDRAFT DAMPER
	MOTORIZED DAMPER W/ ACCESS DOOR
	FIRE SMOKE DAMPER W/ ACCESS DOOR
	FIRE DAMPER W/ ACCESS DOOR
CONT	TROLS AND SENSORS
T	THERMOSTAT
Ū,	TEMPERATURE SENSOR
	DUCTWORK
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
======	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE CONNECTION
Ø12	ROUND DUCT (DIAMETER)
S	ROUND DUCT CROSS SECTION
	POINT OF NEW CONNECTION
	SUPPLY AIR RECTANGULAR DUCT GOING UP/DOWN
	RETURN AIR RECTANGULAR DUCT GOING UP/DOWN
KEY DIANI	

ME	CHANICAL ABBREVIATIONS
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
BD	GRAVITY DAMPER
CD	CONDENSATE DRAIN
CDR	CEILING DIFFUSER RETURN
CDS	CEILING DIFFUSER SUPPLY
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
СР	CONDENSATE PUMP
DN	DOWN
EDH	ELECTRIC DUCT HEATER
EER	ENERGY EFFICIENCY RATIO
EF	EXHAUST FAN
EN	ENERGY ANALYSIS
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
FD	FIRE DAMPER W/FUSIBLE LINK
FSD	FIRE SMOKE DAMPER
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
MD	MOTORIZED DAMPER
OA	OUTSIDE AIR
OAF	OUTSIDE AIR FAN
RA	RETURN AIR
RAD	RETURN AIR DUCT
REF	REFRIGERANT PIPING
RG	RETURN GRILLE
SA	SUPPLY AIR
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SG	SUPPLY GRILLE
VD	VOLUME CONTROL DAMPER
WSHP	WATER SOURCE HEAT PUMP

<u>ket plan</u>:



110 UNIVERSITY PLACE, NEW YORK, NY 10003 BOROUGH 1 (MANHATTAN) BLOCK 570 7503 I OT ZONING DISTRICT C1-7 MAP MIXED RESIDENTIAL & COMMERCIAL BUILDING BUILDING USE



ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE CITY OF NEW YORK BUILDING CODE. EFFECTIVE NOVEMBER 7, 2022 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

- 1. THE CONTRACTOR SHALL ENGAGE THE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.
- 2. 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 2022 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 MC 108.3 AND THE FOLLOWING SECTIONS OF THE 2022 NEW YORK CITY MECHANICAL CODE:
 - A. VENTILATION SYSTEM BALANCING MC 403.3.1.6 B. NYC NOISE CONTROL CODE: 24-227
 - C. REFRIGERATION SYSTEMS MC 1108
- 5. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:
 - A. STANDARDS OF HEATING MC 309.1
 - B. NYC NOISE CONTROL CODE: 24-227 C. DUCT CONSTRUCTION AND INSTALLATION- MC 603
 - D. AIR INTAKES, EXHAUSTS AND RELIEFS MC 401.5 . AIR FILTERS - MC 605
 - F. SMOKE DETECTORS AND FIRE AND SMOKE DAMPERS MC 606 & 607 RESPECTIVELY
- 6. MINIMUM TEMPERATURE TO BE MAINTAINED IN OCCUPIED SPACES DURING HEATING SEASON: 68 DEG. FAHRENHEIT.
- 7. VENTILATION FOR ALL AREA SHALL COMPLY WITH MC 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 MC 403.3
- 9. ALL FIRE DAMPERS SHALL BE ACCEPTED FOR USE BY THE NEW YORK CITY DEPARTMENT OF BUILDINGS. FIRE DAMPERS SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555, STANDARDS FOR FIRE DAMPERS AND CEILING DAMPERS.
- 10. COMBINATION FIRE/SMOKE DAMPERS AND SMOKE DAMPERS SHALL BE ACCEPTED FOR USE BY NEW YORK CITY DEPARTMENT OF BUILDINGS AND SHALL BE MANUFACTURED AND INSTALLED IN ACCORDANCE WITH UL 555S.
- 11. SMOKE DETECTION SYSTEMS SHALL BE INSTALLED AND SEQUENCED TO FOLLOW CONTROLS OPERATIONS WITH THE REQUIREMENTS OF SECTION MC 606 TO CLOSE DAMPERS AND AUTOMATICALLY STOP THE FAN.
- 12. 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 CODE
- 13. SMOKE DETECTOR SHALL MEET UL268A.
- 14. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 183
- 15. CERTIFICATE OF COMPLIANCE SHALL BE OBTAINED FOR EQUIPMENT PER BC110.
- 16. 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.
- 17. ALL WORK SHALL COMPLY WITH THE 2020 NYC ENERGY CONSERVATION CODE (NYCECC). EXCEPT WHERE EXPLICITLY STATED IN THE CODE, IT IS NOT RETROACTIVE INEXISTING BUILDINGS. ADDITIONS TO EXISTING BUILDING MUST COMPLY WITH THE NYCECCWITH RESPECT TO NEW CONSTRUCTION. ALTERATIONS MUST COMPLY WITH THE ENERGY CODE WHERE ANY BUILDING SYSTEM OR SUBSYSTEM IS BEING EXCEPT WHERE EXCLUDED BY THE CODE.
- 18. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.
- 19. AIR BALANCING REPORT SHALL BE PROVIDED IN ACCORDANCE WITH SECTION C408.2.2

	MECHANICAL DRAWING LIST
M-001.00	MECHANICAL SYMBOL, DRAWING LIST, ABBREVIATION & NOTES
M-002.00	MECHANICAL SPECIFICATIONS (1 OF 2)
M-003.00	MECHANICAL SPECIFICATIONS (2 OF 2)
M-100.00	MECHANICAL FLOOR PLAN – FIRST FLOOR
M-500.00	MECHANICAL DETAILS (1 OF 2)
M-501.00	MECHANICAL DETAILS (2 OF 2)
M-600.00	MECHANICAL SCHEDULE

TR8 PROGRESS INSPECTIONS

YES	NO	INSPECTION LIST	TABLE REFERENCE 1RCNY
			§ 5000-01(H)(1)AND(2)
Х	-	VENTILATION AND AIR DISTRIBUTION SYSTEM	(IB2)
Х	-	SHUTOFF DAMPER	(IIB2)
Х	1	HVAC-R AND SERVICE WATER HEATING EQUIPMENT	(IB3),(IIB3)
Х	1	HVAC-R AND SERVICE WATER HEATING SYSTEM CONTROL	(IB4),(IIB4)
Х		HVAC-R AND SERVICE WATER PIPING DESIGN AND INSULATION	(IB5),(IIB5)
Х	-	DUCT LEAKAGE TESTING, INSULATION AND DESIGN	(IB6),(IIB6)
Х	-	MAINTENANCE INFORMATION	(ID1),(IID1)

TR1 SPECIAL INSPECTIONS

YES	NO	INSPECTION LIST	NYC BC 2022
Х	-	MECHANICAL SYSTEM	BC 1705.21
Х	-	FIRE RESISTANCE PENETRATION AND JOINTS	BC 1705.17
X	_	POST INSTALLED ANCHORS	BC 1705.37

- 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.
- 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.
- 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 HROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.
- 7. DUCTWORK AND PIPING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL MAKE ALLOWANCE IN PRICING FOR ROUTING OF DUCTWORK AND PIPING TO AVOID OBSTRUCTIONS. EXACT LOCATIONS ARE SUBJECT TO APPROVAL OF ARCHITECT. COORDINATION WITH THE OTHER TRADES IS REQUIRED.
- 8. SUPPORT ALL DUCTWORK AND PIPING FROM BUILDING STRUCTURE AND/OR FRAMING IN AN APPROVED MANNER. WHERE OVERHEAD CONSTRUCTION DOES NOT PERMIT FASTENING OR SUPPORTS FOR EQUIPMENT, FURNISH ADDITIONAL FRAMING. INSERTS SHALL BE STEEL, SLOTTED TYPE AND FACTORY PAINTED. SINGLE ROD SHALL BE SIMILAR TO GRINNELL FIG. 281. MULTI-ROD SHALL BE SIMILAR TO FEE & MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS. MAXIMUM LOADING INCLUDING PIPES, DUCTWORK CONTENTS AND COVERING SHALL NOT EXCEED 75% OF RATED INSERT CAPABILITY. WHEN SUPPORTING FROM BUILDING USE BEAM CLAMPS IN APPROVED MANNER.
- 9. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THIS BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF PIPES, DUCTS, LOUVERS, CONDUIT, AND EQUIPMENT. PROVIDE EQUIPMENT CURBS AND DUNNAGE STEEL AS REQUIRED.
- 10. SEAL OPENINGS AROUND DUCTS AND PIPING THROUGH PARTITIONS, WALLS AND FLOORS (NOT IN SHAFTS) WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL (FIBERGLASS INSULATION IS NOT ACCEPTABLE).
- 11. WHERE PENETRATIONS THROUGH FIRE RATED WALLS ARE NOT FIRE PROOFED THIS CONTRACTOR SHALL BE RESPONSIBLE TO SEAL SAME TO MAINTAIN THE RATED INTEGRITY.
- 12. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.
- 13. ACCESS DOORS ARE REQUIRED FOR ALL BUILDING SERVICE VALVES THAT RUN THROUGH THE SPACE, AND ACCESS DOOR SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL. COORDINATE ALL LOCATIONS OF ACCESS DOORS WITH THE ARCHITECT.
- 14. REMOVABLE ACCESS TILE AND/OR ACCESS DOOR ARE REQUIRED IN HUNG CEILINGS, SHAFTS AND WALLS FOR ALL VOLUME AND FIRE DAMPERS, AUTOMATIC DAMPERS AND ALL OTHER MECHANICAL EQUIPMENT AND DEVICES. HVAC CONTRACTOR TO FURNISH ACCESS LOCATION REQUIREMENTS TO GENERAL CONTRACTOR. ACCESS TILE IDENTIFICATION: PROVIDE BUTTONS, TABS, AND MARKERS TO IDENTIFY LOCATION OF CONCEALED VALVES, DAMPERS AND EQUIPMENT.
- 15. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING, EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR.
- 16. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 17. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE
- 18. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
- 19. THE CONTRACTOR SHALL BE RESPONSIBLE FOR HIS WORK WITH ITS COMPLETION AND FINAL ACCEPTANCE AND SHALL REPLACE ANY OF THE SAME WHICH MAY BE DAMAGED, LOST, OR STOLEN WITHOUT ADDITIONAL COST TO THE OWNER.

- 20. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY DUCTWORK SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.
- 21. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.
- 22. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
- 3. 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:

- "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE 1) 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.
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE 2. 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.
- 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.

	GENERAL HVAC NOTES	SPECIFICATIO
1.	PROVIDE ALL MATERIAL AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.	SECTION 0001 – NOTICE TO BIDDER 1.1 bidders representations
2.	CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.	A. THE BIDDER BY MAKING A BID REPRESE THE BIDDER HAS READ AND UNDERSTA TO THE EXTENT THAT SUCH DOCUMENT FOR WHICH THE BID IS SUBMITTED A
3.	THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.	THE PROJECT, IF ANY, BEING BID C UNDER CONSTRUCTION. B. THE BID IS MADE IN COMPLIANCE WITH C. THE SPECIFICATIONS AND DRAWINGS ARE AS A BASIS FOR THE BIDDER TO SUBMI
4.	WHEN MECHANICAL WORK (HVAC, PLUMBING, SHEET METAL, FIRE PROTECTION, ETC.) IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDES A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.	MATERIAL AND LABOR. D. SHOULD CONFLICTS OR DISCREPANCIES DOCUMENTS, THE ITEM OR ITEMS IN E GREATER COST SHALL PREVAIL IN THE F E. THE BID IS BASED UPON THE MATERIA REQUIRED BY THE BIDDING DOCUMENTS 1.2 EXISTING CONDITIONS AND COORDINATION A. THE BIDDER HAS VISITED THE SITE OF
5.	COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.	A. THE BIDDER HAS VISITED THE SITE, E CONDITIONS UNDER WHICH THE WORK IS CORRELATED THE BIDDER'S PERSONA REQUIREMENTS OF THE PROPOSED BIDDI
6.	INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.	B. THE BIDDER SHALL PROPOSE COORDIN CONFLICTS WITH OTHER TRADES AN AVOIDED.
7.	WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.	1.3 RESPONSIBILITIES A. THE BIDDER UNDERSTANDS THAT ANY
8.	COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION	RESPONSIBLE FOR THE TIMELY COMP THEIR WORK AND THAT ANY ITEMS DAMA TIME OF CONSTRUCTION SHALL BE REF ANY ADDITIONAL COST TO THE OWNER. B. THE BIDDER UNDERSTANDS THAT ANY F
9.	ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.	TENANT SPACES SHALL BE PERFORMED OCCUPANCY OR AS SCHEDULED OR MANAGER.
10	. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.	C. THE BIDDER UNDERSTANDS THAT ANY EXISTING SYSTEMS DURING CONSTRUCTI WITH THE BUILDING MANAGER AND THA
11	. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FT. OF, ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS).	BE KEPT TO A MINIMUM. END OF SECTION 0001 SECTION 0101 - QUALITY OF WORK
12	. LOCATE ALL TEMPERATURE, PRESSURE, AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH THE STRAIGHT SECTION OF PIPE OR DUCT UP- AND DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR GOOD ACCURACY.	1.1 WORKMANSHIP A. ALL WORK SHALL BE FREE FROM WORKMANSHIP FOR A PERIOD OF ONE
13	. WHERE BEAMS ARE INDICATED TO BE PENETRATED WITH DUCTWORK OR PIPING, COORDINATE DUCTWORK AND PIPING LAYOUT WITH BEAM OPENING SIZE AND OPENING LOCATIONS. COORDINATION SHALL BE DONE PRIOR TO THE FABRICATION OF DUCTWORK, CUTTING OF PIPING, OR FABRICATION OF BEAMS.	ACCEPTANCE. B. ALL DEFECTS WHICH DEVELOP OR A PERIOD SHALL BE REPAIRED BY SATISFACTION OF THE ARCHITECT OR ADDITIONAL COST TO THE OWNER.
14	. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN THE DETAILS FOR PIPING, DUCTWORK, AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.	C. UPON COMPLETION OF THE WORK THE FROM THE SITE, ALL TOOLS, DEMOL SURPLUS MATERIAL. 1.2 CODE COMPLIANCE
15	. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS, AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION. ACCESS PANELS SHALL HAVE THE EQUAL RATED CAPACITY (1HR, 2HR, ETC.) AS WALL.	A. ALL WORK SHALL MEET ALL STATE JURISDICTION. END OF SECTION 0101 SECTION 0102 - REQUIRED DOCUMEN
16	. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.	A. A SET OF PRINTS FOR ANY MECHANIC
17	. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.	APPROVAL TO THE ENGINEER PRIOR TO OF MATERIALS. 1.2 SUBMITTALS
18	ALL DUCTWORK, PIPING, AND EQUIPMENT SUPPORTED FROM STRUCTURAL STEEL SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. ALL ATTACHMENTS TO STEEL BAR JOISTS, TRUSSES, OR JOIST GIRDERS SHALL BE AT PANEL POINTS. PROVIDE BEAM CLAMPS MEETING MSS STANDARDS. WELDING TO STRUCTURAL MEMBERS SHALL NOT BE PERMITTED. THE USE OF C-CLAMPS SHALL NOT BE PERMITTED.	A. EQUIPMENT SUBMITTALS OF ALL F ANCILLARY EQUIPMENT INCLUDING AI SUBMITTED TO THE ENGINEER FOR REV SIZES, ACCESSORIES AND CHOICES S PRINTED OR OTHERWISE INDICATED ON T
19	ALL ROOF-MOUNTED EQUIPMENT CURBS/STEEL RAILS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR.	 1.3 RECORD DRAWINGS A. UPON COMPLETION OF THE WORK, A SUBMITTED TO THE OWNER DEPICTING ADDITIONS AND OR CORRECTIONS TO
20	D. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.	OR CONTRACT SCOPE MADE DURING SHALL REPRESENT A COMPLETE RECORD
21	ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.	A. ON COMPLETION AND ACCEPTANCE OF W FURNISH WRITTEN INSTRUCTIONS,E DEMONSTRATE TO THE OWNER THE MAINTENANCE OF ALL EQUIPMENT AND
22	HANDLING UNIT SHALL BE PIPED FULL SIZE DRAIN LINES FROM EACH AIR HANDLING UNIT SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET, WITH "P" TRAP, AND PIPED TO THE NEAREST DRAIN. SEE THE DETAILS SHOWN IN THE DRAWINGS OR THE CONTRACT SPECIFICATIONS FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP.	B. THESE INSTRUCTIONS SHALL BE TYPED (AND BOUND IN THREE-RING BINDERS THE CONTRACTOR SHALL GIVE THREE
23	5. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.	C. THE OWNER AND ONE ELECTRONIC C C. THE INSTRUCTION BOOKLET SHALL BE ONE SECTION PER SYSTEM. THE BOOKLET SHALL BEAR THE NAME, ADDF THE PROJECT, ARCHITECT, ENGINEER, SUBCONTRACTORS. END OF SECTION 0102

PECIFICATIONS

ICE TO BIDDERS

NG A BID REPRESENTS THAT:

AD AND UNDERSTANDS THE BIDDING DOCUMENTS, SUCH DOCUMENTATION RELATES TO THE WORK IS SUBMITTED, AND FOR OTHER PORTIONS OF NY, BEING BID CONCURRENTLY OR PRESENTLY

COMPLIANCE WITH THE BIDDING DOCUMENTS. AND DRAWINGS ARE INTENDED TO SERVE JOINTLY BIDDER TO SUBMIT A CONTRACT PRICE FOR THE

OR DISCREPANCIES OCCUR WITHIN THE BIDDING M OR ITEMS IN DISPUTE THAT REPRESENT THE

PREVAIL IN THE FINAL BID. JPON THE MATERIALS, EQUIPMENT AND SYSTEMS DING DOCUMENTS WITHOUT EXCEPTION.

SITED THE SITE, BECOME FAMILIAR WITH LOCAL HICH THE WORK IS TO BE PERFORMED AND HAS BIDDER'S PERSONAL OBSERVATIONS WITH THE PROPOSED BIDDING DOCUMENTS.

PROPOSE COORDINATION OF WORK SUCH THAT HER TRADES AND SPACE ALLOCATIONS ARE

TANDS THAT ANY CONTRACTOR SHALL BE FULLY HE TIMELY COMPLETION AND ACCEPTANCE OF ANY ITEMS DAMAGED. LOST OR STOLEN DURING ON SHALL BE REPAIRED OR REPLACED WITHOUT

TANDS THAT ANY PROPOSED WORK IN OCCUPIED BE PERFORMED DURING TIMES OF NON-TENANT SCHEDULED OR DIRECTED BY THE BUILDING

STANDS THAT ANY PROPOSED SHUT-DOWN OF JRING CONSTRUCTION SHALL BE PRE-ARRANGED MANAGER AND THAT SUCH SHUT-DOWNS ARE TO

BE FREE FROM DEFECTS IN MATERIALS AND PERIOD OF ONE YEAR FROM DATE OF FINAL

DEVELOP OR ARE DISCOVERED WITHIN THIS REPAIRED BY THE CONTRACTOR TO THE E ARCHITECT OR BUILDING MANAGER AT NO

OF THE WORK THE CONTRACTOR SHALL REMOVE L TOOLS, DEMOLISHED APPLIANCES AND ANY

MEET ALL STATE AND LOCAL CODES HAVING

IRED DOCUMENTS

OR ANY MECHANICAL WORK INCLUDING BUT NOT AND PIPING LAYOUT SHALL BE SUBMITTED FOR VIGINEER PRIOR TO CONSTRUCTION OR PURCHASE

ALS OF ALL PROPOSED MECHANICAL AND NT INCLUDING ALL ACCESSORIES SHALL BE NGINEER FOR REVIEW. ALL PERTINENT MODELS, AND CHOICES SHALL BE CLEARLY CHECKED, SE INDICATED ON THE SUBMITTALS.

OF THE WORK, A RECORD DRAWING SHALL BE OWNER DEPICTING ALL SUBSEQUENT CHANGES, CORRECTIONS TO THE CONTRACT DRAWINGS AND MADE DURING CONSTRUCTION. THIS DRAWING COMPLETE RECORD OF THE WORK INSTALLED.

ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL INSTRUCTIONS, EQUIPMENT MANUALS AND THE OWNER THE PROPER OPERATION AND EQUIPMENT AND APPARATUS FURNISHED UNDER END OF SECTION 230517

SHALL BE TYPED ON 8-1/2 IN. X 11 IN. PAPER E-RING BINDERS WITH CLEAR ACETATE COVERS. ALL GIVE THREE COPIES OF THE INSTRUCTIONS ONE ELECTRONIC COPY TO THE ENGINEER.

OKLET SHALL BE ORGANIZED IN SECTIONS, WITH SYSTEM. THE COVER OF THE INSTRUCTION THE NAME, ADDRESS AND PHONE NUMBER OF TECT, ENGINEER, MECHANICAL CONTRACTOR AND

SECTION 078413-PENETRATION FIRE-STOPPING 1.1 QUALITY ASSURANCE A. INSTALLER QUALIFICATIONS: AN FM GLOBAL-APPROVED

FIRE-STOP CONTRACTOR OR A UL-QUALIFIED FIRE-STOP CONTRACTOR.

B. FIRE-TEST-RESPONSE CHARACTERISTICS: UL, INTERTEK ETL SEMKO OR FM GLOBAL

1.2 PENETRATION FIRESTOPPING

- A. PENETRATIONS IN FIRE-RESISTANCE-RATED WALLS: F-RATINGS PER ASTM E 814 OR UL 1479.
- B. PENETRATIONS IN HORIZONTAL ASSEMBLIES: F- AND T-RATINGS PER ASTM E 814 OR UL 1479:
- C. PENETRATIONS IN SMOKE BARRIERS: L-RATINGS PER UL 1479.
- D. W-RATINGS: PER UL 1479.
- 1.3 INSTALLATION A. IDENTIFICATION: PREPRINTED METAL OR PLASTIC LABELS.
- 1.4 FIELD QUALITY CONTROL
- A. INSPECTION OF INSTALLED FIRE-STOPPING: BY OWNER-ENGAGED AGENCY ACCORDING TO ASTM E 2174.
- 1.5 THROUGH-PENETRATION FIRESTOP SYSTEM SCHEDULE WHERE UL-CLASSIFIED SYSTEMS ARE INDICATED, THEY REFER TO SYSTEM NUMBERS IN UL'S "FIRE RESISTANCE DIRECTORY" UNDER PRODUCT CATEGORY XHEZ.

FOR THE FOLLOWING SYSTEMS:

METALLIC AND NON-METALLIC PIPES, CONDUIT, OR TUBING, ELECTRICAL CABLES, CABLE TRAYS WITH ELECTRIC CABLES, MISCELLANEOUS ELECTRICAL PENETRANTS. INSULATED PIPES. GROUPINGS OF PENETRANTS, USE ON OR MORE THE FOLLOWING MATERIALS:

- a. LATEX SEALANT b. SILICONE SEALANT
- c. INTUMESCENT PUTTY
- d. MORTAR
- h. SILICONE FOAM
- i. PILLOWS/BAGS
- j. INTUMESCENT WRAP STRIPS k. INTUMESCENT COMPOSITE SHEET
- 1.6 MANUFACTURERS
- A. HILTI CONSTRUCTION CHEMICAL, INC
- B. TREMCO INC.
- C. 3M FIRE PROTECTION PRODUCTS

END OF SECTION 078413

SECTION 230517 - SLEEVES AND SLEEVE SEALS FOR HVAC PIPING 1.1 SLEEVE-SEAL SYSTEMS

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

SECTION 230518 - ESCUTCHEONS FO

PART 1 – PRODUCTS

- 1.1 ESCUTCHEONS
- A. ONE-PIECE, CAST-BRASS TYPE: WITH POL AND ROUGH-BRASS FINISH AND SETSCREW
- B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-WITH CHROME-PLATED FINISH AND SPRING
- C. ONE-PIECE, STAMPED-STEEL TYPE: WITH AND SPRING-CLIP FASTENERS.
- 1.2 FLOOR PLATES A. ONE-PIECE FLOOR PLATES: CAST-IRON F FASTENERS.

PART 2 – EXECUTION

- 2.1 INSTALLATION
- A. INSTALL ESCUTCHEONS FOR PIPING PENE AND FINISHED FLOORS.
- B. INSTALL ESCUTCHEONS WITH ID TO CLOSE AND INSULATION OF PIPING AND WITH OD OPENING.
 - 1. ESCUTCHEONS FOR NEW PIPING:
 - a. PIPING WITH FITTING OR SLEEVE PR ONE-PIECE, DEEP-PATTERN TYPE.
 - b. INSULATED PIPING: ONE-PIECE, S
 - BARE PIPING AT WALL AND FLOOR SPACES: ONE-PIECE, CAST-BRAS
 - CHROME-PLATED FINISH OR STAMP d. BARE PIPING AT CEILING PENETRATI
 - ONE-PIECE, CAST-BRASS TYPE WIT CHROME-PLATED FINISH OR STAMP
- 2.2 FIELD QUALITY CONTROL
- A. REPLACE BROKEN AND DAMAGED ESCUTCHE USING NEW MATERIALS.
- END OF SECTION 230518

SECTION 230529 - HANGERS AND PIPING AND EQUIPMENT

- 1.1 PERFORMANCE REQUIREMENTS
- A. DELEGATED DESIGN: DESIGN TRAPEZE PIP SUPPORTS, INCLUDING COMPREHENSIVE E QUALIFIED PROFESSIONAL ENGINEER, REQUIREMENTS AND DESIGN CRITERIA INDIC
- B. STRUCTURAL PERFORMANCE: HANGERS PIPING AND EQUIPMENT SHALL WITHSTAN LOADS AND STRESSES WITHIN LIMITS INDICATED ACCORDING TO ASCE/SEI 7.
- 1. DESIGN SUPPORTS FOR MULTIPLE PIPE COMBINED WEIGHT OF SUPPORTED S AND TEST WATER.
- 2. DESIGN EQUIPMENT SUPPORTS CAPABL OPERATING WEIGHT OF SUPPORTED SYSTEMS AND
- 3. DESIGN SEISMIC-RESTRAINT HANGERS AND EQUIPMENT AND OBTAIN APPROVA JURISDICTION.
- 1.2 SUBMITTALS
- A. SHOP DRAWINGS: SIGNED AND SEALED BY 1.3 QUALITY ASSURANCE
- A. AWS D1.1/D1.1M, "STRUCTURAL WELDING
- 1.4 COMPONENTS A. METAL PIPE HANGERS AND SUPPORTS: CAR
- B. FIBERGLASS PIPE HANGERS: -CLEVIS, CEN B-LINE
- D. METAL FRAMING SYSTEMS: MFMA MANUFAC
- E. FIBERGLASS STRUT SYSTEMS: COOPER B-L
- F. THERMAL-HANGER SHIELD INSERTS:

END OF SECTION 230529

CTION 230518 - ESCUTCHEONS FOR HVAC PIPING	SECTION 230548 – VIBRATION CONTROLS FOR PIPING AND HVAC EQUIPMENT
RT 1 – PRODUCTS	PART 1 – GENERAL
ESCUTCHEONS A. ONE-PIECE, CAST-BRASS TYPE: WITH POLISHED, CHROME-PLATED	1.1 PERFORMANCE REQUIREMENTS A. SEISMIC-RESTRAINT LOADING:
 AND ROUGH-BRASS FINISH AND SETSCREW FASTENER. B. ONE-PIECE, DEEP-PATTERN TYPE: DEEP-DRAWN, BOX-SHAPED BRASS WITH CHROME-PLATED FINISH AND SPRING-CLIP FASTENERS. C. ONE-PIECE, STAMPED-STEEL TYPE: WITH CHROME-PLATED FINISH 	 SITE CLASS AS DEFINED IN THE IBC: A, B ASSIGNED SEISMIC USE GROUP OR BUILDING CATEGORY AS DEFINED IN THE IBC:
AND SPRING-CLIP FASTENERS.	 a. COMPONENT IMPORTANCE FACTOR: 1.0 b. COMPONENT RESPONSE MODIFICATION FACTOR: 2.5 c. COMPONENT AMPLIFICATION FACTOR: 2.5. 3. DESIGN SECTEM RESPONSE ACCELERATION AT SHORT REPIONSE
FASTENERS.	 JESIGN SPECTRAL RESPONSE ACCELERATION AT SHORT PERIODS (0.2 SECOND) 18% DESIGN SPECTRAL RESPONSE ACCELERATION AT 1-SECOND DEDICOL: 29%
A. INSTALLATION A. INSTALL ESCUTCHEONS FOR PIPING PENETRATIONS OF WALLS, CEILINGS, AND FINISHED FLOORS.	A. VIBRATION ISOLATORS:
B. INSTALL ESCUTCHEONS WITH ID TO CLOSELY FIT AROUND PIPE, TUBE, AND INSULATION OF PIPING AND WITH OD THAT COMPLETELY COVERS OPENING.	 ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS MOUNTS: DOUBLE-DEFLECTION TYPE.
1. ESCUTCHEONS FOR NEW PIPING: a. PIPING WITH FITTING OR SLEEVE PROTRUDING FROM WALL:	3. RESTRAINED MOUNTS: ALL DIRECTIONAL MOUNTINGS WITH SEISMIC RESTRAINT; CAST-DUCTILE-IRON HOUSING.
ONE-PIECE, DEEP-PATTERN TYPE. b. INSULATED PIPING: ONE-PIECE, STAMPED-STEEL TYPE. DADE DIDNO AT WALL AND ELOOD DENETDATIONS IN ENVIOLED	4. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN-SPRING TYPE.
C. BARE PIPING AT WALL AND FLOOR PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE.	6. HOUSED SPRING MOUNTS: DUCTILE-IRON OR STEEL HOUSING.
 BARE PIPING AT CEILING PENETRATIONS IN FINISHED SPACES: ONE-PIECE, CAST-BRASS TYPE WITH POLISHED, CHROME-PLATED FINISH OR STAMPED-STEEL TYPE. 	WITH INTEGRAL, VERTICALLY ADJUSTABLE SEISMIC SNUBBERS. 7. ELASTOMERIC HANGERS: DOUBLE-DEFLECTION TYPE.
FIELD QUALITY CONTROL	8. SPRING HANGERS: COMBINATION COIL—SPRING AND ELASTOMERIC—INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION
A. REPLACE BROKEN AND DAMAGED ESCUTCHEONS AND FLOOR PLATES USING NEW MATERIALS. O OF SECTION 230518	9. SPRING HANGERS WITH VERTICAL-LIMIT STOP: COMBINATION COIL-SPRING AND ELASTOMERIC-INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL-LIMIT STOP.
CTION 230529 – HANGERS AND SUPPORTS FOR HVAC PING AND EQUIPMENT	10.PIPE RISER RESILIENT SUPPORT: ALL-DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
PERFORMANCE REQUIREMENTS	B. AIR-MOUNTING SYSTEMS:
A. DELEGATED DESIGN: DESIGN TRAPEZE PIPE HANGERS AND EQUIPMENT SUPPORTS, INCLUDING COMPREHENSIVE ENGINEERING ANALYSIS BY A QUALIFIED PROFESSIONAL ENGINEER, USING PERFORMANCE REQUIREMENTS AND DESIGN CRITERIA INDICATED.	 AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED-AIR BELLOWS. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED-AIR BELLOWS.
B. STRUCTURAL PERFORMANCE: HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT SHALL WITHSTAND THE EFFECTS OF GRAVITY LOADS AND STRESSES WITHIN LIMITS AND UNDER CONDITIONS INDICATED ACCORDING TO ASCE/SEI 7.	C. RESTRAINED VIBRATION ISOLATION ROOF-CURB RAILS: FACTORY-ASSEMBLED, FULLY ENCLOSED, INSULATED, AIR- AND WATERTIGHT CURB RAIL; WITH SPRING ISOLATORS MOUNTED ON ELASTOMERIC ISOLATION PADS, AND SNUBBER BUSHINGS.
 DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER. 	D. VIBRATION ISOLATION EQUIPMENT BASES:
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND	 STEEL BASE: FACTORT-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS. INERTIA BASE: FACTORY-FABRICATED, WELDED, STRUCTURAL-STEEL BASES AND RAILS READY FOR FIELD-APPLIED
 DESIGN SEISMIC-RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION. 	CAST-IN-PLACE CONCRETE
SUBMITTALS A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER	A. TESTING: BY EITHER: OWNER-ENGAGED AGENCY, CONTRACTOR-ENGAGED AGENCY, OR CONTRACTOR.
A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE – STEEL."	PART-2 PRODUCTS
COMPONENTS A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL	1.4 VIBRATION ISOLATORS & SEISMIC-RESTRAINT DEVICES A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS MANUFACTURERS OFFERING PRODUCTS THAT MAY BE
 B. FIBERGLASS PIPE HANGERS: -CLEVIS, CENTURY COMPOSITES, COOPER B-LINE 	INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:
D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER E. FIBERGLASS STRUT SYSTEMS: COOPER B-LINE	B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:
F. THERMAL-HANGER SHIELD INSERTS:	1. ACE MOUNTINGS CO., INC.
G. FASTENER SYSTEMS: POWDER-ACTUATED FASTENERS OR MECHANICAL-EXPANSION ANCHORS	2. AMBER/BOOTH COMPANY, INC.
H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB-MOUNTED TYPE	4. COOPER B-LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
I. EQUIPMENT SUPPORTS.	 5. HILTI, INC. 6. ISOLATION TECHNOLOGY, INC.
	7. KINETICS NOISE CONTROL.
	6. LOUS & CO.; CABLEWARE DIVISION. 9. MASON INDUSTRIES.
	10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
	11. UNISTRUT; ITCU INTERNATIONAL, LTD.
	13. VIBRATION ISOLATION

14. VIBRATION MOUNTINGS & CONTROLS, INC.

END OF SECTION 230548

SPECIFICATIONS

SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

- A. TESTING, ADJUSTING, AND BALANCING FOR THE FOLLOWING:
 - 1. MOTORS.
 - 2. CONDENSING UNITS.
 - 3. AIR SYSTEM: CONSTANT VOLUME
- 1.2 QUALITY ASSURANCE
- A. THE CONTRACTOR SHALL PROCURE THE SERVICES OF A TESTING. ADJUSTING AND BALANCING (TAB) SPECIALIST WHO SPECIALIZES IN HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS. THE TAB AGENT SHALL HAVE THE FOLLOWING QUALIFICATIONS: AABC, NEBB OR TABB CERTIFIED.
- 1.3 EXECUTION
- A. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL EXISTING AIR AND HYDRONIC SYSTEMS THAT ARE TO REMAIN OR TO BE INCORPORATED INTO NEW WORK PRIOR TO THE STARTING OF WORK IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS, INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- B. THE TAB SPECIALIST SHALL PERFORM FLOW MEASUREMENTS OF ALL NEW AIR AND HYDRONIC SYSTEMS AS LISTED ABOVE IN THE PROJECT SCOPE. A REPORT OF THESE MEASUREMENTS. INDICATING ANY AND ALL DEFICIENCIES SHALL BE SUBMITTED FOR OWNER REVIEW.
- C. THE REPORT SHALL INDICATE A SCHEMATIC DIAGRAM INDICATING LOCATIONS OF ALL EQUIPMENT TESTED AND MEASUREMENT LOCATIONS.
- D. PRIOR TO FINAL INSPECTION OF THE WORK, THE TAB SPECIALIST SHALL BALANCE ALL SYSTEMS AS INDICATED ABOVE TO THE REQUIREMENTS OF THE DESIGN.
- E. THE CONTRACTOR SHALL HAVE FURNISH AND INSTALL ALL ADDITIONAL BALANCING EQUIPMENT, PRESSURE TAPS, GAUGES AND OTHER EQUIPMENT AS REQUIRED FOR A PROPERLY BALANCED SYSTEM AT NO ADDITIONAL COST TO THE OWNER. SUCH ADDITIONAL EQUIPMENT SHALL ADHERE IN STRICT ACCORDANCE WITH THE RESPECTIVE EQUIPMENT MANUFACTURER'S RECOMMENDATIONS.
- F. THE CONTRACTOR SHALL HAVE THE TESTING AND BALANCING SPECIALIST COORDINATE ALL WORK OF THIS 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

NOISE CONTROL

- A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS. B. PROVIDE SOUND LINING FOR THE FOLLOWING DUCTWORK
- 1) ALL DUCTWORK WITHIN NOT LESS THAN 20 FT ON EACH SIDE OF ALL FANS AND AC UNITS.
- 2) AIR TRANSFER DUCTS.
- 3) DOWNSTREAM OF ALL CONSTANT VOLUME BOXES FOR A MINIMUM OF 15
- 4) ALL MIXED AIR PLENUMS.
- 5) FULL EXTENT OF SUPPLY DUCTS SERVING CONFERENCE ROOMS.
- 6) ALL EXPOSED INTERIOR SUPPLY DUCTWORK. 7) ALSO WHERE NOTED ON A DRAWING.
- C. SOUND LINING IN DUCTWORK: FIBROUS GLASS, MINIMUM 3 LB DENSITY, 1 IN. THICKNESS. MAXIMUM 0.25 K FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACRYLIC COATED FINISH FACTORY APPLIED EDGE COATING AND STENCILED IN ACCORDANCE WITH NFPA 90. FLAMESPREAD SHALL BE A MAXIMUM OF 25. LINING SHALL NOT SUPPORT MICROBIAL GROWTH AND SHALL BE TESTED IN ACCORDANCE WITH ASTM C 1071 AND ASTM G21/G22. SIMILAR TO MANVILLE PERMACOTE LINA COUSTIC.
- D. ALL SOUND LINING, ADHESIVES, FACES AND ACCESSORIES TO BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, EXCEPT AS OTHERWISE NOTED.

VIBRATION ISOLATION

- A. GENERAL
- 1) PROVIDE ISOLATION FOR EQUIPMENT, PIPING AND DUCTWORK 2)INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
- 3) PROVIDE LEVELING DEVICES AND APPROVED RESILIENT RESTRAINING DEVICES AS REQUIRED TO LIMIT EQUIPMENT AND PIPING MOTION IN EXCESS OF 1/4".
- 4) ACCEPTABLE MANUFACTURERS:
- a.MASON INDUSTRIES, INC.
- b. VIBRATION ELIMINATOR CO. c.KORFUND DYNAMICS CORP.
- B. CEILING-HUNG FANS AND EQUIPMENT:
- 1) PROVIDE SPRING HANGER ROD ISOLATORS. STEEL COMPRESSION SPRING AND NEOPRENE SOUND PAD WITHIN A STEEL RETAINER BOX. SIMILAR TO MASON TYPE PCHS.
- 2)1 IN. MINIMUM STATIC DEFLECTION. 1/2 IN. MINIMUM RESERVE DEFLECTION. FACTORY-PRELOADED TO 75% OF RATED LOAD. 3) PROVIDE SUPPLEMENTAL STEEL AS REQUIRED WHERE EQUIPMENT OR
- STRUCTURE CANNOT SUPPORT POINT LOADS.
- C. FLOOR MOUNTED EQUIPMENT HAVING INTERNAL ISOLATION:
- 1) PROVIDE 5/16 IN.-THICK NEOPRENE ACOUSTICAL BASE PADS OF RIB.

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.
- 4. WHERE RECTANGULAR ELBOWS ARE USED, PROVIDE TURNING VANES IN ACCORDANCE WITH SECTION 23 33 00.
- 5. PROVIDE EXPANDED TAKE-OFFS OR 45 DEGREE ENTRY FITTINGS FOR BRANCH DUCT CONNECTIONS WITH BRANCH DUCTWORK AIRFLOW VELOCITIES GREATER THAN 700 FPM. SQUARE EDGE 90-DEGREE TAKE-OFF FITTINGS OR TRAIGHT TAPS WILL NOT BE ACCEPTED.
- 6. BUTTON PUNCH SNAP-LOCK CONSTRUCTION WILL NOT BE ACCEPTED ON ALUMINUM DUCTWORK.
- C. WHERE LATEST EDITION OF SMACNA DOES NOT CLEARLY STATE GAUGES AND/OR STIFFENERS TO BE USED OR, WHERE SMACNA STANDARDS REQUIRE INTERPRETATION. THE FOLLOWING MINIMUM METAL GAUGES AND BRACING SHALL BE USED: SUPPORT SCHEDULE - DUCTWORK

USG	MAX SIDE INCHES	TRANSVER
22	UP TO 12	S SLIP, DRIVE, (
22	13 TO 24	1"X1"X1/8" A
20	25 TO 35	1"X1"X1/8" A

- D. PROVIDE TAPPING IN DUCTS FOR THERMOMETERS WHERE SPECIFIED. IN ADDITION, PROVIDE AN AIRTIGHT PLUGGED TAPPING LOCATED AS FOLLOWS:
- 1. UPSTREAM OF EACH REHEAT COIL AND VAV BOX. 2. DOWNSTREAM OF EACH REHEAT COIL AND VAV BOX.
- E. FLAT OVAL OR ROUND DUCTWORK MAY BE PROVIDED IN LIEU RECTANGULAR DUCTWORK WITH THE REINFORCEMENT FOR FLAT SIDES SAME AS SPECIFIED FOR THE RECTANGULAR DUCTWORK, AND AS PER SMACNA FLAT OVAL DUCT CONSTRUCTION STANDARDS
- F. ALL DUCTWORK SHALL BE SEALED TO CLASS "A" AND LEAK TESTED TO MEAT SMACNA CLASS 6 FOR RECTANGULAR AND CLASS 3 FOR ROUND DUCTS.
- 1.2 MATERIALS
- A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS.
- B. SINGLE-WALL ROUND AND FLAT-OVAL DUCTS AND FITTING
- C. SHEET METAL MATERIALS:
- 1. GALVANIZED SHEET STEEL.
- 1. STAINLESS-STEEL SHEETS
- 2. ALUMINUM SHEETS.
- 3. FACTORY-APPLIED ANTI-MICROBIAL COATING.
- D. DUCT LINER:
- 1. FIBROUS GLASS, TYPE I,
- EROSION-RESISTANT COATING. 2. FLEXIBLE ELASTOMERIC.
- 3. NATURAL FIBER.
- E. SEALANT MATERIALS
- 3. TWO-PART TAPE SEALING SYSTEM.

- WATER-BASED JOINT AND SEAM SEALANT.
- SOLVENT-BASED JOINT AND SEAM SEALANT. FLANGED JOINT SEALANT.
- FLANGE GASKETS.
- 8. ROUND DUCT JOINT O-RING SEALS.

- RSE JOINT AND BRACING ONE INCH POCKET ON 8 FOOT ANGLES ON 4 FOOT CENTERS NGLES ON 2 FOOT CENTERS

- ANTI-MICROBIAL FLEXIBLE

- 1.3 DUCT CLEANING
- A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
- B. CLEAN THE FOLLOWING ITEMS:
 - 1. AIR OUTLETS AND INLETS. 2. SUPPLY, RETURN, AND EXHAUST FANS.
 - AIR-HANDLING UNITS.
- 4. COILS AND RELATED COMPONENTS.
- 5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- 6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
- 7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.

1.4 DUCT SCHEDULE

- A. ALL DUCTS SHALL BE GALVANIZED STEEL EXCEPT AS FOLLOWS:
- 1. MOIST ENVIRONMENT DUCT MATERIAL: ALUMINUM

END OF SECTION 233113

SECTION 230713 - DUCT INSULATION INSULATION - GENERAL REQUIREMENTS

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

DUCTWORK INSULATION

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

ļ	NSULATION S	CHEDULE -	DUCTWORK	
SERVICE	LOCATION	R-VALUE	TYPE	FINISH
SUPPLY/RETURN	CONCEALED	R-6	D-1	VAPORSEAL
SUPPLY/RETURN	EXPOSED	R-8	D-1	VAPORSEAL
INTAKE	ALL 🚽	R-8	D-1	VAPORSEAL
SUPPLY	EXTERIOR	R-8	D-1	VAPORSEAL

- B. REINSULATE ALL DUCTWORK AND PIPING WHICH IS EXISTING TO REMAIN AND WAS DAMAGED DURING CONSTRUCTION OR SHOWN OR REQUIRED TO BE RELOCATED. INSULATE WITH SAME MATERIAL AND THICKNESS.
- C. NON-INSULATED DUCTWORK:

TYPE 814 SPIN-GLAS AP.

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

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, ELEXIBLE 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,

PIPING INSULATION

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

SERVICE	SIZE	THICKNES	SS MATERIAL	FINISH
REFRIGERANT PIPING		1.5'	, P-6	
CONDENSATE DRAIN		1.0'	' P-6	
VALVES AND F	TTINGS	TO BE	INSULATED:	PROTECTIVE
NGS_SHALL_BE_INST	ALLED	ON AREAS	OF INSULATIO	ON THAT ARE
D TO WEATHER C	OR SUE	JECI IO	MECHANICAL	DAMAGE.THE

- B. PIPING, COVERI EXPOSE PROTECTIVE COVERING SHALL BE:
- a.ARMA-CHEK SILVER" MULTI-LAYER LAMINATE OF ALUMINUM, COATED WITH A UV PROTECTIVE FILM AND FLEXIBLE PVC FILM. THE MATERIAL SHOULD BE ADHERED WITH ARMAFLEX 520 ADHESIVE OR EQUIVALENT, AND ALL JOINS AND SEAMS SECURED WITH "ARMA-CHEK SILVER TAPE". INSTALLATION SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS.
- OR b.HIGH DENSITY RUBBER CLADDING OF THE "ARMA-CHECK TYPE BONDED USING AN APPROPRIATE FULL ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A SEALANT SHALL BE APPLIED OVER ALL SEAMS AND JOINTS. ALL MATERIAL SHALL BE OVERLAPPED AND STAGGERED IN SUCH A WAY AS TO ENSURE A WATERSHED IS ALWAYS PROVIDED. INSTALLATION BE IN ALL CASES TO THE MANUFACTURER'S SHALL RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.
- METAL CLADDING, COMPRISED OF COATED SHEET METAL. WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER-PROOF WITH SILICONE SEALANT.
- TYPE P-1: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS, MAXIMUM 0.24 K-FACTOR AT 75 DEG F MEAN TEMPERATURE WITH ACTORY-APPLIED FIRE-RETARDANT FOIL-SKRIM-KRAFT FACING. ALL SERVICE JACKET. SIMILAR TO OWENS-CORNING 650 ASJ. 2) TYPE P-3: MINIMUM 4 LB DENSITY MOLDED FIBERGLASS FITTING,
- MAXIMUM 0.23 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR TO EPOLUX HAMFAB MOLDED FITTINGS. 3) TYPE P-4: MINIMUM 1 LB DENSITY FIBERGLASS FITTING INSERTS, MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE SIMILAR
- TO MANVILLE HI-LO TEMP INSULATION INSERTS. 4) TYPE P-6: MINIMUM 6 LB MOLDED FOAMED PLASTIC. MAXIMUM 0.27 K-FACTOR AT 75 DEG F MEAN TEMPERATURE. MAXIMUM 0.17 PERMEANCE. SIMILAR TO ARMSTRONG ARMAFLEX II.
- D. FINISH:

MATERIA

- 1) TYPE F-1: FITTING COVER, MOLDED WHITE PVC JACKET, UL CLASS 1. MAXIMUM PERMEANCE 0.05 SIMILAR TO MANVILLE ZESTRON. 2) TYPE F-2: WHITE VAPOR BARRIER COATING WITH 10X10 OR 20X20 MESH WHITE GLASS, POLYESTER OR NYLON CLOTH REINFORCING MEMBRANE, MINIMUM 31 MIL DRY FILM THICKNESS, SIMILAR TO
- FOSTER TITE-FIT, UL LABEL. 3) TYPE F-4: ALUMINUM JACKETING WITH MINIMUM 0.016 IN. WALL THICKNESS AND LONGITUDINAL JOINTS WITH LOCK SEAMS.
- 4) TYPE F-6: WHITE FINISHING AND INSULATING CEMENT APPLIED OVER HEXAGONAL WIRE MESH. CEMENT SIMILAR TO KEENE SUPERSLICK.

END OF SECTION 230713

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

- 1.1 PRODUCTS
- A. DIFFUSERS, REGISTERS AND GRILLES SHALL BE FURNISHED AND INSTALLED FOR CAPACITIES AND IN LOCATIONS INDICATED ON DRAWINGS. ALL REGISTERS AND DIFFUSERS SHALL BE PRIME COATED STEEL OR EXTRUDED ALUMINUM FINISHED UNLESS OTHERWISE NOTED IN BAKED WHITE ENAMEL.
- B. MANUFACTURERS: TITUS
 - 1. SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCT BY ONE OF THE FOLLOWING:
- a. HART & COOLEY INC.
- b. KRUEGER.
- c. METALAIRE, INC.
- d. RUSKIN
- C. ALL DIFFUSERS SHALL HAVE CONTROLLING/EQUALIZING GRID AND OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
- D. ALL DUCTED RETURN REGISTERS SHALL HAVE AN OPPOSED BLADE DAMPER UNLESS OTHERWISE NOTED.
- END OF SECTION 233713

BACKED WITH A

CONTACT WEATHER-PROOF MASTIC

C403.4 HEATING AND COOLING SYSTEM CONTROLS EACH HEATING AND COOLING SYSTEM SHALL BE PROVIDED WITH THERMOSTATIC CONTROLS AS SPECIFIED IN SECTION C403.4.1, C403.4.1.2, C403.4.1.3 AND C403.4.2

C403.4.1 THERMOSTATIC CONTROLS

THE SUPPLY OF HEATING AND COOLING ENERGY TO EACH ZONE SHALL BE CONTROLLED BY INDIVIDUAL THERMOSTATIC CONTROLS CAPABLE OF RESPONDING TO TEMPERATURE WITHIN THE ZONE. WHERE HUMIDIFICATION OR DEHUMIDIFICATION OR BOTH IS PROVIDED, AT LEAST ONE HUMIDITY CONTROL DEVICE SHALL BE PROVIDED FOR EACH HUMIDITY CONTROL SYSTEM.

C403.4.1.2 DEADBAND

WHERE USED TO CONTROL BOTH HEATING AND COOLING, ZONE THERMOSTATIC CONTROLS SHALL BE CAPABLE OF PROVIDING A TEMPERATURE RANGE OR DEADBAND OF AT LEAST 5°F (2.8°C) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM.

C403.4.1.3 SET POINT OVERLAP RESTRICTION

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, A LIMIT SWITCH, MECHANICAL STOP OR DIRECT DIGITAL CONTROL SYSTEM WITH SOFTWARE PROGRAMMING SHALL BE PROVIDED WITH THE CAPABILITY TO PREVENT THE HEATING SET POINT FROM EXCEEDING THE COOLING SET POINT AND TO MAINTAIN A DEADBAND IN ACCORDANCE WITH SECTION C403.4.1.2.

C403.4.2 OFF-HOUR CONTROLS

EACH ZONE SHALL BE PROVIDED WITH THERMOSTATIC SETBACK CONTROLS THAT ARE CONTROLLED BY EITHER AN AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROL SYSTEM.

C403.4.2.1 THERMOSTATIC SETBACK CAPABILITIES THERMOSTATIC SETBACK CONTROLS SHALL HAVE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C).

C403.4.2.2 AUTOMATIC SETBACK AND SHUTDOWN CAPABILITIES

AUTOMATIC TIME CLOCK OR PROGRAMMABLE CONTROLS SHALL BE CAPABLE OF STARTING AND STOPPING THE SYSTEM FOR SEVEN DIFFERENT DAILY SCHEDULES PER WEEK AND RETAINING THEIR PROGRAMMING AND TIME SETTING DURING A LOSS OF POWER FOR AT LEAST 10 HOURS. ADDITIONALLY, THE CONTROLS SHALL HAVE A MANUAL OVERRIDE THAT ALLOWS TEMPORARY OPERATION OF THE SYSTEM FOR UP TO 2 HOURS; A MANUALLY OPERATED TIMER CAPABLE OF BEING ADJUSTED TO OPERATE THE SYSTEM FOR UP TO 2 HOURS; OR AN OCCUPANCY SENSOR.

C403.4.2.3 AUTOMATIC AND OPTIMUM START CAPABILITIES

AUTOMATIC START CONTROLS SHALL BE PROVIDED FOR EACH HVAC SYSTEM. THE CONTROLS SHALL BE CONFIGURED TO AUTOMATICALLY ADJUST THE DAILY START TIME OF THE HVAC SYSTEM IN ORDER TO BRING EACH SPACE TO THE DESIRED OCCUPIED TEMPERATURE IMMEDIATELY PRIOR TO SCHEDULED OCCUPANCY.

INDIVIDUAL HEATING AND COOLING SYSTEMS WITH SETBACK CONTROLS AND DIRECT DIGITAL CONTROL SHALL HAVE OPTIMUM START CONTROLS. THE CONTROL ALGORITHM SHALL, AS A MINIMUM, BE A FUNCTION OF THE DIFFERENCE BETWEEN SPACE TEMPERATURE AND OCCUPIED SET POINT, THE OUTDOOR TEMPERATURE, AND THE AMOUNT OF TIME PRIOR TO SCHEDULED OCCUPANCY. MASS RADIANT FLOOR SLAB SYSTEMS SHALL INCORPORATE FLOOR TEMPERATURE INTO THE OPTIMUM START ALGORITHM.



- 1. CONTRACTOR SHALL BALANCE EACH DEVICE WITH THE CFM SHOWN ON PLAN.
- COMPLETE THE INSTALLATION.
- OF DUCTWORK, PIPING ETC.
- 4. DUCT SIZES SHOWN ON PLANS ARE CLEAR INSIDE AIR STREAM DIMENSIONS
- 5. EXTEND FULL SIZE SUPPLY & RETURN DUCTWORK TO SPACE. EXTEND AS SHOWN. ACOUSTICALLY LINE THE FIRST 10'-0" OF BOTH SUPPLY AND RETURN MAIN DUCTS.
- 6. CONTRACTOR SHALL COORDINATE ALL ELECTRICAL REQUIREMENTS FOR ALL HVAC BASED ON ACTUAL EQUIPMENT SELECTED PRIOR TO INSTALLATION. 7. CONTRACTOR SHALL COORDINATE EQUIPMENT WEIGHTS AND SUPPORTS BASED ON ACTUAL EQUIPMENT SELECTED.
- 8. MOUNT DUCTWORK AS HIGH AS POSSIBLE.
- 9. TEST AND BALANCE AIR SYSTEMS. PROVIDE REPORT TO G.C AND OWNER. 10. NEW DUCTWORK IN CONCEALED AREAS MAY BE RECTANGULAR WITH EQUIVALENT CROSS SECTIONAL FLOW AREA.
- 11. PROVIDE R-8 INSULATION FOR OAI DUCT AND R-6 INSULATION FOR SUPPLY AND RETURN DUCT.
- 12. PROVIDE FIRE OR FIRE+SMOKE DAMPER WHEREVER DUCTS ARE CROSSING FIRE/SMOKE RATED WALLS/BARRIERS. COORDINATE WITH ARCHITECTURAL DRAWINGS FOR
- FIRE RATINGS OF THE WALLS COORDINATE WITH ELECTRICAL ENGINEER FOR POWER REQUIREMENT FOR FSD. 13. PROVIDE CHORD OPERATED DAMPERS IN INACCESSIBLE CEILING.
- . OUTDOOR AIR INTAKE, EXHAUST OPENINGS SHALL BE PROVIDED WITH CLASS I MOTORIZED DAMPERS. THE DAMPERS SHALL HAVE AN AIR LEAKAGE RATE NOT GREATER THAN 4 CFM/FT2 OF DAMPER SURFACE AREA AT 1.0 INCH WATER GAUGE (249 PA) AND SHALL BE LABELED BY AN APPROVED AGENCY WHEN TESTED IN ACCORDANCE WITH AMCA 500D.
- 15. ALL EQUIPMENT SHALL MAINTAIN MINIMUM CLEARANCE FROM THE COMBUSTIBLE MATERIAL AS PER MANUFACTURE RECOMMENDATION.
- 16. CONTRACTOR TO COORDINATE POWER REQUIREMENT FOR ALL MD'S AND FSD'S WITH ELECTRICAL CONTRACTOR.
- 17. THE LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED MORE THAN 14 FEET.
- 18. WSHPS SHALL BE LOCKED DURING HEAT PUMP MODE. ONLY FANS INSIDE THE WSHPS SHALL RUN DURING THE HEATING MODE. HEATING SHALL BE PROVIDED BY DUCT HEATERS AS SHOWN ON THE PLANS.

	DS-1 50) W/NECK SIZE 18X18		CDR-1 [900] W/NECK SIZE 18X18	CONDENSER W/ AND O	ATER INLET OUTLET LINE	
Ø10"					CDR-1 [900] W/NECK SIZE 7.5 TO 18X18 7.5 TO	-1 1 2 3 NS 9 12
CDS-1 (260) Ø10"	CDS-1 (240)	Ø10"	CDS-1 (240) Ø10"		CDS-1 (240) 2 Ø10"	DH-1 5 KW 11 8 T 70X18
			Ø10"	18X14	Ø10"	
CDS-1 (260)	X	Ø10"				
	CDS-1 (240)		CDS-1 (240)		CDS-1 (240)	
				Ø10"		

CONDENSER WATER INLET



	FITTING.INSTALL CONDENSATE DRAIN WITH 1% 1 CONDENSATE PUMP AS/IF REQUIRED.
2	CONNECT NEW CONDENSER WATER SUPPLY AND RET WATER SUPPLY AND RETURN PIPING. CONTRACTOR TO PIPING TIE-IN LOCATION AND CONDITION AND REPLACE IF
3	PROVIDE AN AUXILIARY DRAIN PAN WITH WATER LEAK SHUT-OFF THE UNIT IN CASE OF WATER LEAKAGE. THE PA NOT LESS THAN 1.5 INCHES, SHALL BE NOT LESS THAN 3 UNIT, OR THE COIL DIMENSIONS IN WIDTH AND CONSTRUCTED OF CORROSION-RESISTANT MATERIAL. ME THICKNESS OF NOT LESS THAN 0.0236 INCH (NO. 24 GAG METAL PANS, 0.0179 INCH (NO. 26 GAGE) FOR STAINLESS INCH (NO. 20 GAGE) FOR ALUMINUM PANS. NON-METAL THICKNESS OF NOT LESS THAN 0.0625 INCH.
4	EXISTING EXHAUST LOUVER TO REMAIN AS IT IS AND TO FEET AWAY FROM THE OPENING INTO THE BUILDING, 10 F 10 FEET ABOVE GRADE, AND 10 FEET FROM ANY OUTSIDE
5	EXISTING OUTSIDE AIR INTAKE LOUVER TO REMAIN AS CONTRACTOR TO FIELD VERIFY THAT THE LOCATION OF A ADJACENT TENANTS SHOULD BE AT LEAST 10 FEET AW/ INTAKE.
6	LOCATE THERMOSTAT CONTROLS ON WALL IN OFFICE A LOCATION WITH LIGHT SWITCHES AND OTHER WALL MOD 24 VAC POWER AND SIGNAL CONDUCTORS IN TWO CONDUCTOR CABLES, 18 AWG.
7	INSTALL NEW CEILING MOUNTED EXHAUST FAN. INTERCO WSHP-2. FAN SHALL BE SUSPENDED FROM STRUCTU LOCATION OF STRUCTURAL MEMBERS PRIOR TO INSTALLA
8	CONTRACTOR TO COORDINATE FINAL LOCATION ARCHITECT/OWNER.

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

3. EQUIPMENT SIZES, DIMENSIONS AND REQUIRED CONNECTIONS SHALL BE VERIFIED WITH THE ACTUAL EQUIPMENT SELECTED VENDOR DRAWINGS BEFORE FABRICATION

MECHANICAL GENERAL NOTES N.T.S. С





														1					
					WATER SOURC	E HEAT UN				F	IFCTRICAL		FELCIENCY	BASIS OF DESIG	GN: TRANE (OR EQUIVALENT)			
TAG	TYPE OF UNIT	SERVING	TONANGE	SUPPLY	OUTSIDE AIR	ESP (IN	WATER FLOW	WATER PRESSURE	COOLING CAPACITY					DIMENSION	WEIGHT	MODEL			
				AIRCFM	CFM	OF WC)	RATE (GPM)	DROP (FT OF W.C)	(MBH)	V/ PH/ HZ	MCA (A)	MOP (A)	EER	(LXWXH)	(LBS)				
М∕SHP_1		SEE PLAN	75	3000	300	1	22.5	25.7	92.7	208/3/60	35.23	45	14	41"X80"X24"	676	GEHE0903 (OR			
			/.5				22.5	23.7	52.7	2007 57 00						EQUIVALENT) GEHE0903 (OR			
/SHP-2	CEILING SUSPENDED	SEE PLAN	7.5	3000	400	1	22.5	25.7	92.7	208/ 3/ 60	35.23	45	14	41"X80"X24"	676	EQUIVALENT)			
ROVIDE	MERV 8 FILTER AT RETURN	I OF WSHP																	
SUPPLY CF	M BASED ON HIGH CFM.																		
CEILING M	10UNTED UNIT TO BE PRO	VIDED WITH THE	ACCESSORIES.	BM FILTER BOX.															
ALL COND	ENSER WATER PIPING SHA	ALL BE DONE AS P			ENDATION.			05											
) WSHP UNI) WSHP UNI	IT TO BE INSTALLED WITH	VIBRATION ISOLA	ATOR (RESILENTL)	Y SUPPORTED) AS WATER BUG	TO MINIMIZE SOU	IND AND VI FDOWN CC	BRATION TO SPA	CE. QUIPMENT AND TO NO	TIFY THE OPER	RATOR/OWNER	RIN EVENT C	OF WATER L	LEAKAGE.						
	WATER SIDE ECONOMIZER	۲. 																	
ROM THE M	IAIN INCOMING WATER LI	INES, INFORMEN	GINEER IMMEDIA	ATELY (BEFORE I	BID). IF EXISTING \	WATER LIN	ES DO NOT HAVE	ENOUGH STATIC, INFO	RM TO ENGINE	EER.	HE WATER-S	SIDE PRESSU	UKE DRUPS IN A	ALL UNITS. IF THERE	IS NO ENOU	GH GPIVI A VAILABLE			
1)WSHPS SH	HALL BE LOCKED DURING H	HEAT PUMP MODI	E. ONLY FANS IN	SIDE THE WSHP	S SHALL RUN DUR	ING THE HE	ATING MODE. HE	ATING SHALL BE PROV	IDED BY DUCT	HEATERS AS SH	IOWN ON TH	HE PLANS.							
		ELECTRIC	DUCT HEATER					MAKE'- GREENHECK (O	R FOUIVALENT	r)								- V	
	LOCATION DUCT H	IEATER DIMENSIO	ONS (IN) OTY	/	ELECTRICAL	DATA		MODEL											
EDH-1	SEE PLAN 20	H 18	D 6 1	KW 25	V PH 208 3	Hz 60	Amps (A) 69.25	IDHE	SLIP IN	—									
EDH-2	SEE PLAN 20	18	6 1	25	208 3	60	69.25	IDHE	SLIP IN										
UTES:) INSTALL EI	LECTRIC DUCT HEATER AS	PER MANUFACTU	JR'S RECOMMEN	ADATION.						—									
PROVIDE	T-STAT AND WIRE TO DUC	THEATER.																	
PROVIDE [DISCONNECT SWTICH, VA DUCT HEATER WITH SCR O	ON BARRIER, DU	ERMOSTAT.	NU FAN INTERLO	UCK SWITCH.														
					FAN		JLE												
	MANUFACTURER	MODFL	CEM	TYPE DRIV	F FAN RPM E	.S.P.	MO	TOR	SERVICE	NO	TES / W	/FIGHT (LBS	S) SONES						
EF-1	GREENHECK	SP-A90-130-VG	70 CI	EILING -	887	. W.G.) 0.8	HP VOLTS (V) - 115	PHASE FLA (A) 1 0.4	RESTROON	ACCES	SORIES	12	2.5						
DAF-1	GREENHECK	SQ-7-M1-VG	700 1	NLINE DIREC	CT 3133 1	1.15	0.5 208	1 4	WSHP-1,2	2 1,2,	3,4,6	72	12.6						
TES / ACC	SPEED CONTROL																		
PEED CO	NTROL SWITCH																		
AMCA SEA	AL & UL CERTIFIED																		
GRAVITY B	BACKDRAFT DAMPER																		
PROVIDEN	VIERV-8 FILTER.																		
	MECH			S SCHEDULE						AIR BALA	NCE								
TAG	SIZE DESCRIPTIO		TION FINISH	BASIS (MANUFACTU	OF DESIGN IRER MODEL	NOTES	UNIT	AREA SERVED SUP	PLY AIR (CFM)	OUTSIDE AIR	(CFM) RET	TURN AIR (CFM) EXHAU	JST AIR(CFM)					
CDS-1	24X24 PLAQUE FA	ACE ALUMINU	IM WHITE	TITUS	TMS	ALL	WSHP-1 WSHP-2	SEE PLAN SEE PLAN	3000	400		2700		0		•			
CDC 2	PLAQUE FA				TNAS	A11	EF-1	RESTROOM	0	0		0		70					
CD3-2		R		11105		ALL		BUILDING PRESSUR	8000 RE:	630		5300	POSITIVE	70					
CDR-1	24X24 DIFFUSE	R ALUMINU	IM WHITE	TITUS	50FL	ALL	NOTES:												
DTES:								E TABLE.					COULSIDE AIR A						
PROVIDE ST				WISE ON PLAN.			-												
UCTWORK A	ND STRUCTURAL MEMBERS.	FACE OF RETURN AIR	GRILLE FLAT BLACK	(. THIS SHALL INC	LUDE PIPING, CONDU	UH,													
PROVIDE FF	RAME FOR MOUNTING AIR DE	EVICE IN LAY-IN GRID	D CEILING UNLESS R	EFLECTED CEILING	G PLAN INDICATES H	ARD CEILING													
UNLESS OTH	HERWISE NOTED, BRANCH DU	JCTS SERVING AIR DE	EVICES SHALL BE SA	ME SIZE AS NECK	OF AIR DEVICE.														
AIR DEIVCE	SHALL BE OF GALVANIZED FIN NECK DIFFUSERS:	NISH WHEN INSTALLE	ED ON EXPOSED DU	JCTWORK.			-			•									
DIA: 0-100	CFM						-												
DIA: 101-20 DIA: 201-3	00CFM 300 CFM						-												
2" DIA:300-4	460 CFM																		
				VENITI															
	NU	JMBER OF			MIN OUTS	SIDE AIR AS	PER NYSMC 2020		EXHAUST										
ROOMNA	AREA PEOP	PLE/1000sq.ft						REQ. OA		EXHAUS	т								
		2022 N).	PLE	CFIVI/SQ.FT	(CFM) (CFM)	CFIVI/FIXtur	re									
ROOM	1 2592	15	39	0 40) 7.5		0.12	611	0	0									
STORAG	E 112 GE 129	0	0	3 4 0 0	0		0.06	0 700	0	0									
TOILET	Г 60	0	0	0 0	0		0	0	70	70									
							101	nu 000 / /00	1	/U									
				•			•												

			ELECTRICAL SYMBOLS LIST					GENERAL NOTES (APPLY TO ALL "E" DRAWINGS)
	SWITCHES AND CONTROLS		POWER AND TELECOMMUNICATION		ELECTRICAL AB	BREV	/IATIONS	1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE
\$ _a 20	DA LIGHTING SWITCH	IJ	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.	A	AMPERES	EA	EACH	ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
\$ ² _a 3	WAY LIGHTING SWITCH	-()	JUNCTION BOX WITH BLANK COVER PLATE, WALL MOUNTE, +18" AFF OR AS NOTED.	A/C, AC	AIR CONDITIONING UNIT	EC FF	ELECTRICAL CONTRACTOR	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.
\$ ^D DI	MMER SWITCH		JUNCTION BOX WITH BLANK COVER PLATE, CEILING MOUNTED	AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY	3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
\$ _{0V} 0\	VERRIDE SWITCH	P	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.	AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING	4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
	ALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY	<u>Ψ</u>	DUPLEX DEDICATED RECEPTACLE, +18" AFF OR AS NOTED.	AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT	5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS
PC PH	HOTOCELL IN NEMA 3R ENCLOSURE	→ ⊕ [℃]	FLUSH IN CELING.		AMP TRIP	ER	EXISTING TO BE RELOCATED	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
-PC W	ALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.		DUPLEX RECEPTACLE WITH GFCI PROTECTION	AUTO		EWF		OR AT RIGHT ANGLES TO WALLS.
OS C	EILING OCCUPANCY SENSOR	¥		AWG	AMERICAN WIRE GAUGE	EWH	ELECTRIC WATER HEATER	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.
(DS) (CEILING MOUNTED DAYLIGHT SENSOR.		'ONT' AND ITS SISTER BOX AS PER VERIZON STANDARDS.	с	CONDUIT	FA	FIRE ALARM	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
	WIRING SYSTEMS	₩	DOUBLE DUPLEX RECEPTACLE - 20A-1P, 125V, NEMA 5-20R.	C/B,CB	CIRCUIT BREAKER	FBO	& WIRED BY EC	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.
U	NDERGROUND		AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.	CLG	CEILING	FIBO	FURNISHED & INSTALLED BY	8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
———— E	XISTING		DATA OUTLET - (1) PORT UNO, +18" AFF, UNO TEL / DATA OUTLET TO BE	СОММ	COMMUNICATION	FIXT	FIXTURE	9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
N	EW		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	СТ	CURRENT TRANSFORMER	FL	FLOOR	10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE-EXISTING CONDITIONS OR BETTER.
		φ	SIMPLEX RECEPTACLE	CU	COPPER	FLUOR	FLUORESCENT	11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY
F-001.00	ELECTRICAL SYMBOL LIST ARREVIATIONS & CENERAL NOTES]	MOTORS AND CONTROLS	·		G CEI		CONDUITS. 12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN
E-001.00	ELECTRICAL SPECIFICATIONS (1 OF 2)		AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION	DIA		GP	GENERAL PURPOSE	LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
E-003.00	ELECTRICAL SPECIFICATIONS (2 OF 2)		WITH JUNCTION BOX AND MOTOR SWITCH.	DISC	DISCONNECT	НС	HUNG CEILING	TO FULL AND JUNCTION BUXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVDED WHERE
E-101.00	ELECTRICAL LIGHTING PLAN - FIRST FLOOR		AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.	DN	DOWN	HP	HORSEPOWER	REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
E-201.00 E-301.00	ELECTRICAL POWER PLAN - FIRST FLOOR ELECTRICAL PANEL SCHEDULES AND RISER DIAGRAM		NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.	DP	DISTRIBUTION PANEL	нwн	HOW WATER HEATER	14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
E-401.00	ELECTRICAL DETAILS		40A NON FUSED DISCONNECT SWITCH		DOMESTIC WATER HEATER	HZ		15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE
			50A NON FUSED DISCONNECT SWITCH	JB	JUNCTION BOX	PP	POWER PANEL	16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL
			100A NON FUSED DISCONNECT SWITCH	KCMIL	ONE THOUSAND CIRCULAR MILS	PVC	POLYVINYL CHLORIDE	INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
			200A NON FUSED DISCONNECT SWITCH	кv	KILOVOLT	PWR	POWER	17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
			COMBINATION MAGNETIC STARTER AND DISCONNECT SWITCH, FURNISHED BY		KILOVOLT-AMPERES	R	REMOVE	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.
			FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP	KW		RE	RELOCATED EXISTING	REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
		$400 \\ 350$	NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.	LTG		RGS	RIGID GALVANIZED STEEL	19. ALL CONDUITS AND EQUIPMENT TO BE CONCEALED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
			COMBINATION SOLID-STATE MOTOR STARTER.	МАХ	MAXIMUM	RR	REMOVE & RELOCATE	20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
		FSD	FIRE SMOKE DAMPER	мс	MOTOR CONTROLLER	SECT	SECTION	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
			DUPLEX PUMP. NUMBER INDICATES HP RATING OF PUMP.	мсв	MAIN CIRCUIT BREAKER	SPDT	SINGLE POLE DOUBLE THROW	OR PUTTY PADS ARE UTILIZED.
			THERMAL OVERLOAD SWITCH AT MOTOR PROVIDE THERMAL ELEMENTS AS	MER	MECHANICAL EQUIPMENT ROOM	SPST SPEC	SINGLE POLE SINGLE THROW	CONFIRM PENETRATION LOCATIONS WITH THE ENGINEER AND OWNER BEFORE INSTALLATION.
		S _T	PER MOTOR RATING.	MLO	MAIN LUGS ONLY	SW	SWITCH	RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND
		S _M	MANUAL MOTOR SWITCH	MTD	MOUNTED	SWBD	SWITCHBOARD	24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOACTIONS OF ALL LUMINARIES AND SWITCHES, AND
		[1.5 kW]	LECTRICAL HEATER, NUMBER DENOTES HEATER RATING	MTS	MANUAL TRANSFER SWITCH	SYM	SYMMETRICAL	25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR
		+24"		N	NEUTRAL	SYS	SYSTEMS	FINAL CEILING AND WALL HEIGHTS AND LAYOUTS. 26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH
			KEYED NOTE REFERENCE		NOT IN CONTRACT	TEMP	TEMPERATURE	CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
				NL	NIGHT LIGHT	TXF	TOILET EXHAUST FAN	27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH
		$\left \begin{array}{c} 1 \\ E - 201 \end{array} \right $	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM	NTS	NOT TO SCALE	TYP	TYPICAL	- SAIVIL UNCUT NUMBERS AND KUN IU PANELBUAKD.
				ос	ON CENTER	UON	UNLESS OTHERWISE NOTED	KEY PLAN:
			DISTRIBUTION PANELBOARD, 208Y/120V-SURFACE OR FLUSH	- Р 	POLES	V \/A		
			MOUNTED.	PC	PERSONAL COMPUTER	VAV	VARIABLE AIR VOLUME	EAST 13 ST
				ø	PHASE	VFD	VARIABLE FREQUENCY DRIVE	REET (60FT)
				PNL	PANEL	VP	VAPORPROOF	AREA OF WORK
				W	WATT	WP	WEATHER PROOF	
				W WH	WIRE WALL HEATER	ZRT	ZONE REGISTER TERMINALS	
				E	EXISTING	IG	ISOLATED GROUND	
			PROJECT COORDINATION NOTES		RGY CONSERVIATION CODE OF			
	APPLICABLE COD	DES	1. BIDDERS ARE TO VISIT THE SITE AND FAMILIARIZE THEMSELVES WITH		HE BEST OF MY PROFESSIONAL KNOWL	EDGE AND	JUDGEMENT, THESE PLANS	
	a. 2022 NYC BUILDING CODE.		EXISTING CONDITIONS AND SATISFY THEMSELVES AS TO THE NATURE AND SCOPE OF WORK. THE SUBMISSION OF A BID WILL BE EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE. LATER CLAIMS FOR LABOR	AND NEW	SPECIFICATION ARE IN COMPLIANCE WI YORK CITY 2020	IH THE ENE	RGY CONSERVATION CODE OF	
	b. 2022 NYC MECHANICAL CODE. c. 2022 NYC PLUMBING CODE.		EQUIPMENT OR MATERIALS REQUIRED, OR FOR DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD AN EXAMINATION BEEN MADE,	SYSTE	MS COMMISSIONING PURSUAN	<u>IT_T</u> O_SE(<u>CTION C408.</u> 3 NYC ECC 202	O SCALE: N.T.S.
	d. 2011 NYC ELECTRICAL CODE. (NE	EC).	2. COORDINATE WITH OTHER TRADES FOR ITEMS IN THEIR SCOPE OF WORK	SYSTE	EMS REQUIRING COMMISSIONIN	G		<u>110 UNIVERSITY PLACE, NEW YORK, NY 10003</u> BOROUGH : 1 (MANHATTAN)
	e. 2022 NYC FUEL GAS CODE.		WHICH WOULD REQUIRE ELECTRICAL WORK (DISCONNECTION/RECONNECTION, ETC.) AND ARE NOT INDICATED ON THE ELECTRICAL PLANS.	1-0	CCUPANT SENSOR CONTROLS.			BLOCK : 570 LOT : 7503 ZONING DISTRICT : C1-7
	a. 2016 NFPA 13.			<u> </u>				MAP : 12C BUILDING USE : MIXED RESIDENTIAL & COMMERCIAL BUILDING

	APPLICABLE CODES		PF
	ATTEICABLE CODES	1	BIDDERS ARE TO V
а.	2022 NYC BUILDING CODE.		EXISTING CONDITION
b.	2022 NYC MECHANICAL CODE.		SUCH AN EXAMINAT
c.	2022 NYC PLUMBING CODE.		WHICH COULD HAVE
d.	2011 NYC ELECTRICAL CODE. (NEC).	2	COORDINATE WITH (
e.	2022 NYC FUEL GAS CODE.	2.	WHICH WOULD REQU
f.	2020 NYC ENERGY CONSERVATION CODE		LIC., AND ARE NO
a.	2016 NEPA 13		

ELECTRICAL SPECIFICATIONS

- 1. GENERAL
 - A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION." AIA DOCUMENT, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.
 - B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES. INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.
 - C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
 - D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, 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 THE SITE AND INCLUDE ALL CHANGES AND CHARGES IN MAKING UP THE WORK PROPOSAL.
 - F. CONNECTIONS TO EXISTING WORK: INSTALL NEW WORK AND CONNECT TO EXISTING WORK WITH MINIMUM INTERFERENCE TO EXISTING FACILITIES. TEMPORARY SHUTDOWNS OF EXISTING SERVICES SHALL BE PERFORMED AT NO ADDITIONAL CHARGES. AT TIMES NOT TO INTERFERE WITH NORMAL OPERATION OF EXISTING FACILITIES AND ONLY WITH WRITTEN CONSENT OF OWNER. ALARM AND EMERGENCY SYSTEMS SHALL NOT BE INTERRUPTED. MAINTAIN CONTINUOUS OPERATION OF EXISTING FACILITIES AS REQUIRED WITH NECESSARY TEMPORARY CONNECTIONS BETWEEN NEW AND EXISTING WORK. CONNECT NEW WORK TO EXISTING WORK IN NEAT AND ACCEPTABLE MANNER. RESTORE EXISTING DISTURBED WORK TO ORIGINAL CONDITION, INCLUDING MAINTENANCE OF WIRING CONTINUITY AS REQUIRED.
 - G. DISCONNECT, REMOVE AND/OR RELOCATE EXISTING MATERIAL EQUIPMENT AND OTHER WORK AS NOTED OR REQUIRED FOR PROPER INSTALLATION OF NEW WORK.
 - H. THE CONTRACTOR SHALL KEEP ALL EQUIPMENT AND MATERIALS, AND ALL PARTS OF THE BUILDING EXTERIOR SPACES AND ADJACENT STREETS, SIDEWALKS AND PAVEMENTS, FREE FROM MATERIAL AND DEBRIS RESULTING FROM THE EXECUTION OF THIS WORK. EXCESS MATERIALS WILL NOT BE PERMITTED TO ACCUMULATE EITHER ON THE INTERIOR OR THE EXTERIOR
 - SEAL OPENINGS THROUGH PARTITIONS, WALLS AND FLOORS WITH MINERAL WOOL OR OTHER NONCOMBUSTIBLE MATERIAL, UNLESS OTHERWISE NOTED.
 - J. PROVIDE ALL NECESSARY FLASHING AND COUNTER FLASHING TO MAINTAIN THE WATERPROOFING INTEGRITY OF THE BUILDING AS REQUIRED BY THE INSTALLATION OR REMOVAL OF CONDUIT AND EQUIPMENT, PROVIDE EQUIPMENT CURBS AS REQUIRED.
 - K. ALL EXISTING MATERIAL, EQUIPMENT AND CONSTRUCTION DEBRIS TO BE REMOVED UNDER THIS CONTRACT SHALL BECOME THE PROPERTY OF THE CONTRACTOR WITH THE EXCEPTION OF SPECIFIC EQUIPMENT ND APPARATUS REQUESTED BY THE BUILDING REPRESENTATIVE, ARCHITECT OR AS NOTED TO BE RELOCATED ON THE DRAWINGS. REMOVED EQUIPMENT SHALL BE PROPERLY DISPOSED OF BY THIS CONTRACTOR
 - THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.
 - M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.
 - N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.
 - 0. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.
 - P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.
- GENERAL PROVISIONS FOR ELECTRICAL WORK:
- A. DEFINITIONS:
 - 1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.
 - 2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.
 - 3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.
 - 4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.
 - 5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.
 - 6) "CONCEALED": EMBEDDED IN MASONRY OR OTHER CONSTRUCTION, INSTALLED IN FURRED SPACES, WITHIN DOUBLE PARTITIONS OR HUNG CEILINGS, IN TRENCHES, IN CRAWL SPACES, OR IN ENCLOSURES.
 - 7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.
 - 8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.
- B. TEMPORARY LIGHT AND POWER: PROVIDE TEMPORARY LIGHT AND POWER SYSTEMS AT EARLIEST POSSIBLE DATE WITHIN THE CONSTRUCTION AREAS FOR THE REQUIREMENTS OF ALL TRADES AS HEREIN DESCRIBED. EXTEND SYSTEMS TO NEW CONSTRUCTION AS SOON AS PHYSICALLY POSSIBLE. MAINTAIN SYSTEM DURING WORKING OWNER. PROVIDE ALL REQUIRED MAINTENANCE, INCLUDING LAMPS AND SOCKETS.
- C. QUALITY ASSURANCE
 - 1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

- 3) CURRENT CHARACTERISTICS: a. SERVICE: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH
- GROUNDED NEUTRAL.
- b. DISTRIBUTION: 120/208 VOLT, 3 PHASE, 4 WIRE, 60 HERTZ WITH GROUNDED NEUTRAL

4) HEIGHTS OF OUTLETS:

- a. FROM FINISHED FLOOR TO CENTERLINE OF OUTLETS FOR: - RECEPTACLES AND TELEPHONES: 1 FT-6 IN.
- WALL SWITCHES: 4 FT-0 IN.
- WALL FIXTURES: 7 FT-0 IN.

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- MOTOR CONTROLLERS: 5 FT-0 IN.
- CLOCKS: 7 FT 6 IN b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.
- D. PRODUCT DELIVERY, STORAGE AND HANDLING
- 1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.
- 2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED. CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS. MATERIALS
- 1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.
- 2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.
- 3) INSERTS AND SUPPORTS: a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.
 - SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.
 - MULTI-ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.
 - CLIP FORM NAILS FLUSH WITH INSERTS.
- MAXIMUM LOADING 75 PERCENT OF RATING. b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM
- CLAMPS. STEEL FISHPLATES (IN CONCRETE FILL ONLY). CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW
- c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.
- d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.
- F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES. AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD-APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.
- G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.
- H. FINAL LOCATIONS AND MOUNTING ORIENTATIONS OF ALL SWITCHES, RECEPTACLES AND LIGHT FIXTURES SHALL BE VERIFIED WITH ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT
- PRIOR TO INSTALLATION.
- 3. SCOPE OF WORK: A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE NATIONAL ELECTRICAL CODE (NEC), AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION,
- B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.
- C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE WNER. 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
- THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL RRANGE 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.
- 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.

- 2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE

AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

SHOP DRAWINGS

4.

- 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
- FNGINFFR. 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
- SUBMISSIONS:

С.

- 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.
- SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:
- 1) SAFETY/DISCONNECT SWITCHES 2) FUSES
- 3) CIRCUIT BREAKERS
- 4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).
- 5) RACEWAYS
- 6) WIRE AND CABLE
- 7) WALL SWITCHES
- 8) INSERTION RECEPTACLES
- 9) MOMENTARY CONTACT SWITCHES
- 10) TIME SWITCHES
- 11) LIGHTING FIXTURES.

5.

- 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. SUBMI 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.
- AS-BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS 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
- 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.
- THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.
- REPRODUCIBLE "AS-BUILT" DRAWINGS SHALL BE PROVIDED **IDICATING THE AS INSTALLED CONDITIONS OF THE WORK.** "AS-BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION. LOW-VOLTAGE DISTRIBUTION EQUIPMENT:
- PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.
- B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.
- C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 6808F. THREE-POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 7810F. KNIFE-BLADE TYPE SWITCHES SHALL BE LOAD BREAK, QUICK-MAKE- QUICK-BREAK, UL CLASS R UP TO 600 AMP. MAXIMUM RATING EXCEPT AS NOTED SHALL BE 800 AMP. ARC QUENCHERS SHALL BE PROVIDED. SWITCHES SHALL BE SIMILAR TO GENERAL ELECTRIC QMR. ALL SWITCH ENCLOSURES SHALL BE DEAD FRONT, NEMA TYPE 1, EXCEPT AS NOTED.
- 7. FUSES: A. CIRCUITS 0 TO 600 AMPERES SHALL BE PROTECTED BY FUSES SIMILAR TO CURRENT LIMITING BUSSMAN LOW-PEAK DUAL-ELEMENT TIME-DELAY LPN-RK (AMP)SP (250V) /LPS-RK (AMP)SP (600V) OR LPJ (AMP)SP (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- B. MOTOR CIRCUITS ALL INDIVIDUAL MOTOR CIRCUITS WITH 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 LISTED BY UL (600V) (UL CLASS RK1 OR CLASS J), AND BE WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.
- C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.
- D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.
- 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 A 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 OTHERWISE NOTED:
- 1) 120 VOLTS, 100-AMP FRAME: 10,000 AMPS, 1 POLE.
- 2)120/240 VOLTS, 225-AMP FRAME: 22,000 AMPS MINIMUM

- DISTRIBUTION PANELBOARDS, CIRCUIT BREAKER TYPE:
- THREE PHASE, 4 OR 5 WIRE, COPPER BUS BARS, WITH 2, 3, OR 4 WIRE BRANCHES, AS NOTED. CAPACITY OF PANEL AND CIRCUITS, AS NOTED BELOW. PANELBOARD TO HAVE GROUND BUS SAME SIZE AS PHASE BUSES.
- B. CABINETS: CODE GAUGE GALVANIZED SHEET STEEL PRIMED AND PAINTED WITH TRIM AND DOOR, TYPE AS NOTED, LAP AND RIVET CORNERS OR FORM AS APPROVED.
- TRIM: ONE PIECE FULL FINISH PRIMED AND PAINTED SHEET STEEL. TRIM SHALL BE MOUNTED WITH A CONTINUOUS PIANO HINGE CONFIGURED IN SUCH A MANNER THAT IT SHALL BE POSSIBLE TO GAIN FULL ACCESS TO CIRCUIT BREAKERS AND WIRING GUTTERS WITHOUT REMOVING THE TRIM. PROVIDE A MULTI-PIN CYLINDER LOCK (YALE, CORBIN OR EQUAL) TO LATCH THE TRIM. KEYS SHALL BE
- HARDWARE: MULTI-PIN, CYLINDER LOCKS WITH MILLED KEYS. ALL PANELS SHALL BE KEYED ALIKE. DOOR OVER 48" HIGH SHALL B EQUIPPED WITH A CHROME PLATED VAULT HANDLE, BUILT-IN LOCK AND 3-POINT CATCH FASTENING DOOR AT TOP, BOTTOM AND CENTER.
- HINGES: CONCEALED, CONTINUOUS PIANO HINGE AS DESCRIBED
- DIRECTORY HOLDER: MEAL FRAME WITH NONBREAKABLE TRANSPARENT COVER AND DIRECTORY CARD. ENTRIES TO BE TYPEWRITTEN BY ELECTRICAL CONTRACTOR. PROVIDE AN ENGRAVED LAMINATED NAMEPLATE ADJACENT TO EACH BRANCH BREAKER. MOUNT WITH SELF TAPPING MACHINE SCREWS.
- G. FURNISH MULTI-CABLE LUGS WHERE REQUIRED. DOUBLE LUGGING NOT PERMITTED. SECURE LUGS TO BUS BY STUD BOLTS.
- PANELBOARD CONSTRUCTION FOR BOLTED TYPE BREAKERS. MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, RMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. INDIVIDUAL CIRCUIT BREAKERS SHALL HAVE
- MINIMUM GUTTER SPACES: PANELS WITH 225 AMPERE MAINS, 5-34" NIMUM, 400 AMPERES AND OVER, MINIMUM GUTTERS 8". FOR PANELS WITH THROUGH FEEDERS. INCREASE GUTTER WIDTH BY 2" MINIMUM AND PROVIDE A SHEET STEEL BARRIER BETWEEN THE PANEL GUTTER AND THE THROUGH FEEDER PORTION OF THE BACK BOX.
- N SHOWN ON DRAWINGS. STRIBUTION AND SUB-DISTRIBUTION PANELBOARDS SHALL BE A INIMUM OF 30" WIDE AND 10" DEEP.
- DICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID
- NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS). DISTRIBUTION PANELBOARDS, SWITCH AND FUSE:
- A. THREE PHASE, 3 OR 4 WIRE WITH COPPER BUS BARS. ALL THROUGH BUS SHALL BE INSULATED.
- B. NEMA CLASS 1 CONSTRUCTION TO ACCOMMODATE FUSIBLE, INDIVIDUALLY ENCLOSED SWITCHES, FRONT REMOVABLE, SWITCH AND DOOR INTERLOCKS. COVERS TO BE PAD-LOCKABLE.
- C. PANELBOARD SHALL BE CONSTRUCTED OF CODE-GAUGE STEEL, GRAY FINISH OVER RUST INHIBITOR, FOR SURFACE MOUNTING. BOX AND PANEL FRAME SHALL BE FLANGED AND REINFORCED FOR RIGID SUPPORT OF INTERIOR AND ACCURATE ALIGNMENT OF INTERIOR WITH FRONT. TRIMS TO BE FASTENED TO BACK BOX WITH SCREWS.
- D. ALL BRANCH SWITCHES SHALL HAVE INDIVIDUAL ENGRAVED LAMICOID NAMEPLATES (BLACK WITH WHITE CORE)
- DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/2080 APPLICATIONS. APPLICATIONS.
- F. DISCONNECTS
- 1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.
- 2) SWITCHING MECHANISM SHALL BE QUICK-MAKE, QUICK-BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANCIALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.
- 4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS: PROVIDE COMPLETE WITH FUSES AS SCHEDULED.
- G. INSTALLATION
- 1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.
- H. IDENTIFICATION
 - 1) PROVIDE NAMEPLATE AT EACH SWITCH IDENTIFYING THE LOAD SERVED.
 - 2) NAMEPLATES SHALL BE MOUNTED ON THE FRONT COVER SECURED WITH SELF-TAPPING SCREWS OR NUTS AND BOLTS. NAMEPLATES SHALL BE LAMINATED PHENOLIC, BLACK WITH A MINIMUM OF $\frac{1}{4}$ " HIGH WHITE LETTERING.
- I. 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.
- PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).
- M. MATERIALS

1) RACEWAYS:

THREADED.

THREADLESS.

GAI VANIZED.

BE BAKED

SCREW-ON.

MINIMUM 100A FRAME, TRIPS SIZED AS SHOW ON THE PLANS.

ANCH CIRCUIT BREAKERS SHALL BE MECHANICALLY INTERLOCKED

PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS

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

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

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

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP,

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

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

2) FITTINGS AND ACCESSORIES:

- a. RIGID STEEL: NONSPLIT, THREADED, STEEL OR MALLEABLE IRON. ZINC DIE CAST NOT PERMITTED.
- b. ELECTROMETALLIC TUBING: COMPRESSION TYPE. GALVANIZED RIGID STEEL ELBOWS, 2 IN. OR LARGER.
- c. FLEXIBLE METALLIC CONDUIT: ANGLE WEDGE TYPE WITH INSULATED THROAT.
- d. BUSHINGS: METALLIC INSULATED TYPE.

ELECTRICAL SPECIFICATIONS (CONT.

3. BOXES:

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.

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

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

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

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

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

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

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

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

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

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

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

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

O. OVIDE 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).PR

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

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

- R. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE-PARTITIONS ROOMS.
- PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.
- WIRE AND CABLE:
- A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.
- B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.
- 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).
- ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH E. 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

- 1) 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 G. LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.
- H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION-TYPE OF TWIST-ON SPRING-LOADED CONNECTORS AND CLEAR NYLON-INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.
- 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 H

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

10. WIRING DEVICES:

> 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.

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).

- STRAIGHT BLADE RECEPTACLES SHALL BE RESIDENTIAL GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.
- 1)SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2-POLE, 3-WIRE GROUNDING, 15A, 125V, NEMA 5-20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
- 2) USB CHARGER/ DUPLEX TAMPER-RESISTANT RECEPTACLE:

FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR

TAMPER RESISTANT,

- D. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.
- E. COLORS: COORDINATE COLORS WITH ARCHITECT.
- F. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

11. LIGHTING FIXTURES:

- A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS
- B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.
- C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL. ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24-INCH LAMPS AND RAPID START FOR 48-INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.
- D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.
- E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0-10V WHERE NOT INDICATED.
- F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.
- G. EXIT SIGNS SHALL BE PRECISION DIE-CAST ALUMINUM HOUSING WITH LASER-FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED. AC POWERED WITH PREMIUM LONG-LIFE NICKEL CADMIUM BATTERY WITH STANDARD UL LISTED 3-HOUR RUN TIME. PROVIDE WITH INTEGRAL AUTOMATIC CHARGER IN A SELF CONTAINED POWER PACK. LED INDICATOR WITH PUSH TO TEST SWITCH.
- 12. TELEPHONE CONDUIT SYSTEM:
 - A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES OUTLET BOXES, SLEEVES AND FISHWIRES.
 - EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.
 - C. OUTLETS SHALL BE:
 - 1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.
 - D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.
 - CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.
 - F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.
- 13. GROUNDING AND BONDIN
- PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (NATIONAL Α. ELECTRICAL CODE), AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN. EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE
- CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.
- USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE
- ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.
- D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.
- IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS: 1) CIRCUITS SERVING ANY WALL BOX DIMMER.
- 2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE, OR AS OTHER WISE NOTED ON DRAWINGS.
- 3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES
- 4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.
- 14. PANELBOARDS:
 - A. PANELBOARDS SHALL BE OF THE DEAD FRONT TYPE MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE.
 - CIRCUIT BREAKERS SHALL BE OF THE BOLT-ON THERMAL MAGNETIC MOLDED CASE TYPE, AND SHALL HAVE THE TRIP RATINGS AND NUMBER OF POLES SHOWN IN SCHEDULES ON THE CONTRACT DRAWINGS. FOR BLANK (SPACE) COMPARTMENTS, PROVIDE FULL RATED BUS. MINIMUM GUTTER SPACES SHALL BE 5-3/4". SIDES, TOP AND BOTTOM, INCREASE FOR THROUGH FEEDERS. PROVIDE 25% COPPER GROUND BUS AND 100% COPPER NEUTRAL BUS AND INCREASE NEUTRAL BUS INDICATED.
 - C. LOCKING TABS SHALL BE PROVIDED ON ALL CIRCUIT BREAKERS SERVING EMERGENCY LIGHTING, FIRE ALARM SYSTEM, SECURITY SYSTEMS AND OTHER EMERGENCY OR CRITICAL EQUIPMENT AND AS NOTED ON THE CONTRACT DRAWINGS. A TOTAL OF 5 SPARE LOCKING TABS SHALL BE FURNISHED TO THE OWNER.
 - D. BUSES SHALL BE HARD DRAWN COPPER OF 98 PERCENT CONDUCTIVITY AND SHALL HAVE CROSS SECTIONAL AREAS LARGE

ENOUGH TO LIMIT THE TEMPERATURE RISE, WHEN CARRYING FULL LOAD, TO 35 DEGREES C. ABOVE AN AMBIENT INSIDE THE ENCLOSURE OF 55 DEGREES C. AS DEFINED IN IEEE STANDARD RULES. MAIN BUS CAPACITY SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.

- E. ENCLOSURES SHALL BE SURFACE OR FLUSH AS INDICATED. TRIMS SHALL BE SECURED TO PANEL WITH MACHINE SCREWS. COVERS SHALL BE HINGED DOOR-IN-DOOR CONSTRUCTION WITH CYLINDER LOCKS AND CATCHES. LOCKS MUST BE COMPATIBLE WITH BUILDING STANDARD KEY SYSTEM AND WHEN NONE EXISTS, THEY SHALL BE SIMILAR TO A YALE NO. 911 KEY.
- F. DISTRIBUTION AND SUB-DISTRIBUTION PANELBOARD SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.
- G. ALL STANDARD PANELBOARDS SHALL BE A MINIMUM OF 20" WIDE AND 5 3/4" DEEP.
- H. FURNISH ALL PANELBOARDS WITH FEED-THRU LUGS UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
- I. ALL NEW PANELBOARDS SHALL BE PROVIDED WITH AN ENGRAVED WHITE CORE LAMACOID NAMEPLATE, WITH 3/4 IN. WHITE LETTERING ON A BLACK BACKGROUND, WITH DESIGNATION LISTED (PANELBOARD NAME), FASTENED WITH EPOXY CEMENT OR OVAL HEAD CHROME PLATED MACHINE SCREWS.
- THE CIRCUIT DIRECTORY SHALL BE TYPEWRITTEN AND PROVIDED INSIDE EACH PANEL DOOR TO INDICATE EQUIPMENT AND/OR AREA SERVED. DIRECTORY HOLDER SHALL BE METAL FRAME WITH CLEAR PLASTIC, TRANSPARENT COVER. THE TYPEWRITTEN LIST INDICATING CIRCUIT NUMBERS, OUTLETS SUPPLIED AND THEIR LOCATIONS SHALL BE PROVIDED.
- K. TIE-BARS SHALL NOT BE USED TO CREATE MULTI-POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED
- L. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG
- M. SHORT CIRCUIT RATING OF PANELBOARDS SHALL NOT BE LESS THAN AS INDICATED ON THE CONTRACT DRAWINGS OR SPECIFIED HEREIN. WHERE NOT INDICATED OR SPECIFIED THE MINIMUM SHORT CIRCUIT RATING SHALL BE EQUAL TO THE INTERRUPTING CAPACITY OF THE LOWEST RATED CIRCUIT BREAKER IN THE PANELBOARD, BUT IN NO ASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 08Y/120 VOLT SYSTEM AND 14,000 AMPERES R.M.S. SYMMETRICAL FOR 480Y/277 VOLT SYSTEM. SERIES RATED PANELBOARDS
- FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.

SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

NO.	QTY	LOCATION	MFR / CATALOG NUMBER	DESCRIPTION	#	LAMF TYPE	P BAL E TY	last Pe	TYF	MOUNTING E HT.	VOLT	WATT	REMARKS
B2	48	F.O.H.	CREE C-TR-C-FP23-37L-40K-WH 29	2x2 LED TROFFER	-	LED					120	29	-
B4	5	B.O.H.	CREE C-TR-C-FP24-50L-40K-WH- 40	2x4 LED TROFFER	-	LED					120	40	-
B2E	11	B.O.H.	CREE C-TR-C-FP24-50L-40K-WH-EM 40	2x2 LED TROFFER	-	LED	E	м			120	40	-
E1W	1	RESTROOM	ELITE ELM-LED-809-W	EMERGENCY LIGHT FROG EYE - WHITE	-		E	м	WAL	TOP @ 9'-4" L U.O.N.	120	12	
X1W	2	B.O.H.	BEST LIGHTING PRODUCTS 220866-LEDS-WRL-SF-E5280	CLPU LIGHTPIPE LED EXIT & EMERGENCY COMBO	-	LED	E	м	UNIVER	SAL	120	4.5	

- C. EMERGENCY LIGHTING NOT MARKED WITH "NL" SUBSCRIPT SHALL OPERATE UNDER CONTROL OF LIGHTING SWITCH AS INDICATED. PROVIDE UNSWITCHED CONSTANT HOT TO EMERGENCY
- CONTINUOUSLY. PROVIDE UNSWITCHED CONSTANT HOT TO EMERGENCY BALLAST.

D. ALL CONDUITS ENTERING OR LEAVING COOLER/FREEZER SHALL BE PROVIDED WITH SEAL-OFF

G. ALL EXTERIOR NON-EMERGENCY LIGHT FIXTURES, BUILDING SIGNS, AND EXTERIOR SIGNS

H. CONTRACTOR SHALL PROVIDE DIMMING SYSTEM WHEN REQUIRED BY LOCAL ENERGY CODE.

SHALL BE CONTROLLED THROUGH PHOTOCELL AND LIGHTING CONTROL RELAYS.

E. CONTRACTOR TO FIELD VERIFY CEILING TYPE AND PROVIDE PROPER MOUNTING HARDWARE.

A. CONFIRM LIGHTING FIXTURE QUANTITIES WITH SUPPLIER.

BALLAST AND SWITCHED HOT TO NORMAL BALLAST.

FITTING WITH COMPOUND PER NEC 300-(7a).

F. ALL FIXTURES SUPPLIED WITH LAMPS.

BASE BID ACCORDINGLY

NL/EM B2E 3

B2 A:3 b

A:1 a

B2 A:3 b

B2 A:1 a

B2 A:3 t

B2 A:3 b

B2 A:1 a

B2E 3

B2 A:1 a

B2E 3

B2 A:1 a

B2 A:3 b

B2 A:1 a

B2 A:3 b

B2E

A:3 b

B2 A:1 a

A:1 a

- B. EMERGENCY AND NORMAL LIGHTING MARKED WITH "NL" SUBSCRIPT SHALL OPERATE

STATE AND LOCAL CODES.

C405.2.2.1.

B2E 3

A:1 a

B2E

B2 A:3 b

A:3 b

A:3 b

KEY NOTES - ELECTRICAL LIGHTING PLAN

NTS **B**

KEY NOTES - ELECTRICAL POWER PLAN NTS

PANEL:	A (NEV	V)										MOUNTING: SURFACE		
208Y/120	VOLTS,	3 PHASE,			4	WIRE						PANEL LOCATION: BOH		
MAIN CB:	300 A	MLO:		BUS:	400 A	MIN,						FED FROM: DISCONNEC	T SWITCH	
NOTE:														
	TRIP		LOAD	LOAD	MINIMUM BRANCH	Р	ER PHASE (K\	/A)	MINIMUM BRANCH	LOAD	LOAD		TRIP	
CKT NO.	AMPS	DESCRIPTION OF LOAD	TYPE	(KVA)	CIRCUIT	Α	В	С	CIRCUIT	(KVA) TYPE	DESCRIPTION OF LOAD	AMPS	CKT NO.	
1	20	LIGHTING- FOH	L	0.90	2#12, #12G, 3/4"C	1.15			2#12, #12G, 3/4"C	0.25	L	LIGHTING- OFFICE, STORAGE, RESTROOM	20	2
3	20	LIGHTING- FOH	L	0.90	2#12, #12G, 3/4"C		1.90		2#12, #12G, 3/4"C	1.00	L	TIME CLOCK/LIGHTING CONTACTOR	20	4
5	20	SHOW WINDOW RECEPTACLE	R	1.20	2#12, #12G, 3/4"C			5.43		4.23	Н			6
7	20	EXTERIOR SIGNAGE	L	1.00	2#12, #12G, 3/4"C	5.23			3#8, #10G, 3/4"C	4.23	Н	WSHP-1	3P-45	8
9	20	POS	R	0.90	2#12, #12G, 3/4"C		5.13			4.23	Н			10
11	20	OFFICE RECEPTACLE	R	0.36	2#12, #12G, 3/4"C			4.59		4.23	Н			12
13	20	BOH GENERAL RECEPTACLE	R	0.72	2#12, #12G, 3/4"C	4.95			3#8, #10G, 3/4"C 4.23	4.23	Н	WSHP-2	3P-45	14
15	20	RESTROOM RECPTACLE	R	0.18	2#12, #12G, 3/4"C		4.41			4.23	Н			16
17	20	RESTROOM HAND DRYER	М	1.00	2#12, #12G, 3/4"C			9.33		8.33	Н		3P-100	18
19	20	FOH GENERAL RECEPTACLE	R	0.90	2#12, #12G, 3/4"C	9.23			3#3, #8G, 1"C	8.33	Н	EDH-1		20
21	20	FOH GENERAL RECEPTACLE	R	0.90	2#12, #12G, 3/4"C		9.23			8.33	Н			22
23	20	SHELVES LIGHTING RECEPTACLE	R	1.26	2#12, #12G, 3/4"C			9.59		8.33	Н			24
25	20	SPARE				8.33			3#3, #8G, 1"C	8.33	Н	EDH-2	3P-100	26
27	20	SPARE					8.33			8.33	Н			28
29	20	SPARE						2.25	2#10 #100 2/4"0	2.25	0		20.20	30
31		SPACE				2.25			2#10, #10G, 3/4 C	2.25	0		28-30	32
33		SPACE					0.00							34
35		SPACE						0.42		0.42	М		20.20	36
37		SPACE				0.42			2#12, #12G, 3/4 C	0.42	М		29-20	38
39		SPACE					0.05		2#12, #12G, 3/4"C	0.05	М	EF-1	20	40
41		SPACE						0.10	2#12, #12G, 3/4"C	0.10	М	MD/FSD	20	42
43		SPACE				0.00						SPARE	20	44
45		SPACE					0.00					SPARE	20	46
47		SPACE						0.00				SPARE	20	48
	•			TOTAL	CONNECTED LOAD (KVA)	31.55	29.05	31 70						•

PANEL BOARD SCHEDULE GENERAL NOTES

1. PROVIDE A "TYPE" WRITTEN DIRECTORY OF ALL CIRCUITS IN EACH PANEL.

2. P.O.S. SYSTEM, COMPUTER, PRINTERS, MONITORS, CREDIT CARDS AND MODEM TO BE ON ISOLATED GROUND.

ELECTRIC
L = LIGH R = RECE H = HVA(M = MOT E = EQUI O = OTH

CAL PANEL SCHEDULE ABBREVIATIONS

ITING

EPTACLE

TOR IPMENT

ER

ELECTRICAL RISER GENERAL NOTES:

1. E.C. SHALL VERIFY INCOMING SERVICE AMPERAGE, WIRE SIZING AND DISTRIBUTION.

OUTSIDE PROJECT SPACE

1 FROM SUB-METER

E.C. SHALL VERIFY FAULT CURRENT (Isc) AVAILABLE WITH UTILITY COMPANY AND CALCULATE EXACT A.I.C. RATING PRIOR TO BID.

3. PROVIDE SEPARATE GROUND CONDUCTOR IN ALL CONDUITS.

4. E.C SHALL VERIFY EXACT SCOPE OF WORK WITH THE ARCHITECT/OWNER.

5. E.C. SHALL DEMOLISH ALL THE EXISTING ELECTRICAL PANELS WHICH ARE NOT RE-USED FOR THIS PROJECT SPACE AND RETURN TO THE OWNER/AS REQUIRED BY THE OWNER. BASE BID ACCORDINGLY.

FLOOR LEVEL

ELECTRICAL RISER KEY NOTES:

- 1 EXISTING 300A, 120/208V, 3-PHASE, 4-WIRE ELECTRICAL SERVICE FEEDER FROM THE EXISTING SUB METER TO REMAIN EC. SHALL COORDINATE WITH THE EXISTING SUB METER TO REMAIN. E.C. SHALL COORDINATE WITH THE LANDLORD/OWNER FOR EXACT POWER DISTRIBUTION. E.C. SHALL VERIFY EXACT RATING, LOCATION AND OPERABLE CONDITION OF EXISTING METER IN FIELD. REPORT TO ENGINEER ON RECORD FOR ANY DISCREPANCIES.
- 2 NEW 300A(MCB), 208Y/120V, 3PH, 4W, ELECTRICAL PANEL"A". E.C. SHALL CO-ORDINATE WITH ARCHITECT/OWNER FOR EXACT LOCATION OF PANEL.

PLUMBING SYMBOLS LIST

	COLD WATER PIPING
	EXISTING COLD WATER PIPING
	HOT WATER PIPING
	HOT WATER RETURN PIPING
<u> </u>	SANITARY PIPING
	VENT PIPING
	P-TRAP
O	PIPE UP
Э	PIPE DROP
	PLUGGED OUTLET/CLEANOUT
O	FLOOR CLEANOUT
Ø	BALANCING VALVE
Ŧ	ISOLATION VALVE
_	THERMOSTATIC MIXING VALVE
	FLOOR DRAIN
	POINT OF NEW CONNECTION

PLUMBING ABBREVIATIONS

со	CLEANOUT
CW	COLD WATER
нพ	HOT WATER
HWR	HOT WATER RETURN
SAN	SANITARY
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
EXIST.	EXISTING
FD	FLOOR DRAIN
BFP	BACK FLOW PREVENTER
GC	GENERAL CONTRACTOR
VIF	VERIFY IN FIELD
WH	WATER HEATER
RCP	RECIRCULATION PUMP
ET	EXPANSION TANK

PLUMBING DRAWING LIST

P-001.00	PLUMBING NOTES AND SE	PECIFICATIONS
P-002.00	PLUMBING SPECIFICATIONS	5
P-101.00	PLUMBING WASTE AND VE	INT PLAN
P-102.00	PLUMBING WATER PLAN	

- P-501.00 PLUMBING DETAILS 1 OF 2
- P-502.00 PLUMBING DETAILS 2 OF 2
- P-601.00 PLUMBING RISERS AND SCHEDULES

APPLICABLE CODES

- a. 2022 NYC BUILDING CODE.
- b. 2022 NYC MECHANICAL CODE.
- c. 2022 NYC PLUMBING CODE.
- d. 2011 NYC ELECTRICAL CODE. (NEC).
- e. 2022 NYC FUEL GAS CODE.
- f. 2020 NYC ENERGY CONSERVATION CODE

SPECIAL INSPECTION PLUMBING NOTE

- FIRE RESISTANT PENETRATION & JOINTS IN ACCORDANCE WITH NY CITY BUILDING CODE BC-1705.17
- 2. FINAL INSPECTION IN ACCORDANCE WITH NY CITY BUILDING CODE BC 110.5 DIRECTIVE FROM 14 OF 1975, AND 1 RCNY \$ 101-10
- POST INSTALLATION ANCHOR INSPECTION TO BE DONE IN ACCORDANCE WITH NY CITY BUILDING CODE BC-1705.37

BUILDING DEPARTMENT PLUMBING NOTES

- 1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT, WATER) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PLUMBING CODE & 2020 NYC ENERGY CONSERVATION CODE.
- 2. INSTALLATION OF UNDERGROUND PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC SECTION PC 704.
- 3. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER 2022 NYC PC SECTION 305.
- 4. TRENCHING, EXCAVATION AND BACKFILL AS PER 2022 NYC PC SECTION 306.
- 5. RODENT PROOFING AS PER 2022 NYC PC 304.
- 6. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PC SECTION PC 303, PC 605, PC 702, PC 902, PC 1102.
- 7. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC CHAPTERS 4, 5, 6, 7 AND 9.
- 8. DEEP SEAL TRAPS FOR FLOOR DRAINS SHALL BE PROVIDED AS PER 2022 NYC PC 1002, AND CLEAN-OUTS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 708.
- 9. DRAINAGE PIPE CLEANOUTS AS PER 2022 NYC PC 708.
- 10. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PC SECTION 308
- 11. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PC CHAPTER 6 SECTION 601-603, 604, 606, 607, 608, 610.
- 12. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PC CHAPTER 7 SECTION 701, 704, 705, 706, 707, 708, 711
- 13. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF 2022 NYC PC CHAPTER 9 SECTIONS 901 THROUGH SECTION 912 THROUGH SECTION 917.
- 14. INSPECTION AND TESTING OF PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH 2022 NYC PC SECTION 108.

ENERGY CONSERVATION CODE OF NEW YORK CITY COMPLIANCE TO THE BEST OF MY PROFESSIONAL KNOWLEDGE AND JUDGEMENT, THESE PLANS AND SPECIFICATION ARE IN COMPLIANCE WITH THE ENERGY CONSERVATION CODE OF NEW YORK CITY 2020

KEY PLAN:

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 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.
 - . PIPE AND FITTINGS 2. VALVES
 - 3. HANGERS AND SUPPORTS
 - 4. PLUMBING PIPING LAYOUT 5. TESTS
- PLUMBING FIXTURES WATER HEATERS & ACCESSORIES
- 8. FLOOR DRAINS
- 9. MIXING VALVES 10. BACKFLOW PREVENTER
- 11. ALL SCHEDULED PLUMBING EQUIPMENT
- B. SUBMITTALS FROM SUPPLIERS OR MANUFACTURERS WHICH DO NOT BEAR THE STAMP OF THE SUBMITTING CONTRACTOR INDICATING THAT THE CONTRACTOR HAS REVIEWED THE SUBMITTAL FOR CONFORMANCE WITH THE PROJECT REQUIREMENTS WILL BE RETURNED REJECTED.
- C. THE ENGINEER'S REVIEW OF SUBMITTALS IS A COURTESY WHICH DOES NOT RELIEVE THE CONTRACTOR FROM CONFORMING WITH THE CONSTRUCTION DOCUMENTS, REGARDLESS OF THE ACTION INDICATED BY THE SHOP DRAWINGS STAMP.
- D. REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL BE LIMITED TO THE INITIAL REVIEW, AND A SECOND REVIEW OF ANY REQUIRED RESUBMITTED DATA. IF THE ENGINEER IS REQUIRED TO REVIEW SHOP DRAWINGS FOR A THIRD (OR MORE) SUBMISSION OF THE SAME ITEM, THE CONTRACTOR SHALL BE LIABLE FOR COMPENSATING THE ENGINEER FOR THESE SUBSEQUENT REVIEWS AS PER THE ENGINEER'S CURRENT HOURLY RATE SCHEDULE.
- E. SUBMIT PROOF OF APPROVAL AND/OR CONFIRMATION OF SATISFACTORY TEST RESULTS TO THE OWNER AND THE ARCHITECT.
- F. SUBMIT TO THE OWNER'S MAINTENANCE PERSONNEL OPERATION AND MAINTENANCE DATA FOR ALL SYSTEM COMPONENTS, SERVICING REQUIREMENTS, INSPECTION DATA, REPLACEMENT PART NUMBERS AND AVAILABILITY AND CONTACT INFORMATION FOR SERVICE/SUPPLY COMPANY.
- G. FOR ALL BELOW GRADE PIPING WHERE ACTUAL INSTALLATION DEVIATES FROM CONSTRUCTION DRAWINGS, THE CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS INDICATING BELOW GRADE PIPE LOCATIONS DIMENSIONED TO NEAREST COLUMN LINES.
- H. RECORD AS-BUILT DRAWINGS SHALL BE SUPPLIED TO THE OWNER/TENANT AFTER COMPLETION OF THE WORK SHOWING ANY ALTERATIONS, ADDITIONS AND/OR DELETIONS TO THE SYSTEM(S) INSTALLED.
- 1.03 SUBSTITUTIONS

N.T.S.

- A. ALL EQUIPMENT SHALL BE PRODUCTS OF THE SPECIFIED MANUFACTURER OR MANUFACTURERS. ALL BIDS SHALL BE BASED ON THE SPECIFIED MANUFACTURER OR MANUFACTURER'S EQUIPMENT. FOR SUBSTITUTIONS OF OTHER MANUFACTURER'S EQUIPMENT TO BE CONSIDERED, THE SUBSTITUTION MUST BE INDICATED PRIOR TO BIDDING WITH THE REASON FOR THE PROPOSED SUBSTITUTION IDENTIFIED, AND THE PROPOSED CREDIT TO THE OWNER INDICATED. THE ENGINEER SHALL DETERMINE THE ACCEPTABILITY OF ANY PROPOSED SUBSTITUTIONS.
- B. THE CONTRACTOR ASSUMES ALL RESPONSIBILITY FOR COORDINATING THE WORK OF OTHER TRADES WHICH MAY BE AFFECTED BY SUBSTITUTIONS, INCLUDING ALL RELATED COSTS.
- 1.04 DEFINITIONS
- A. FURNISH: TO PURCHASE, PROCURE, ACQUIRE AND DELIVER, COMPLETE WITH RELATED ACCESSORIES.

- B. INSTALL: TO ERECT, MOUNT AND CONNECT, COMPLETE WITH RELATED ACCESSORIES.
- C. PROVIDE: TO FURNISH AND INSTALL
- D. PLUMBING CONTRACTOR, THE CONTRACTOR, THIS CONTRACTOR: CONTRACTOR FOR PLUMBING WORK WHICH IS SPECIFIED HEREIN SHOWN ON THESE DRAWINGS.
- E. REFER TO THE NATIONAL STANDARD PLUMBING CODE FOR ADDITION DEFINITIONS.

1.05 DRAWINGS

- A. THE DRAWINGS ARE DIAGRAMMATIC AND ARE INTENDED TO ILLUST THE GENERAL ARRANGEMENT AND ROUTING OF PIPING AND GEN LOCATIONS OF EQUIPMENT. PRECISE LOCATIONS OF EQUIPM RISERS AND STACKS, AND ROUTING AND ELEVATION OF ALL P SYSTEMS SHALL BE COORDINATED IN THE FIELD WITH THE ARCHI ARCHITECTURAL DRAWINGS, THE WORK OF OTHER TRADES, EXIS AND NEW BUILDING CONDITIONS AND/OR THE PREFERENCES OF OWNER/TENANT AS CONSTRUCTION PROCEEDS. ALL PIPING SHAL INSTALLED CONCEALED IN FINISHED SPACES, UNLESS N OTHERWISE.
- B. PROVIDE ALL NECESSARY INCIDENTAL MATERIALS AND ACCES REQUIRED TO MAKE THE WORK COMPLETE IN ALL RESPECTS, EVE NOT PARTICULARLY SHOWN OR SPECIFIED.
- C. REFER TO PLUMBING EQUIPMENT/FIXTURE SCHEDULE ON THE DRAW FOR ALL FIXTURE AND EQUIPMENT SPECIFICATIONS.
- D. REFER TO FIXTURE CONNECTION SIZE SCHEDULE FOR

ROUGHING SIZE REQUIREMENTS.

- E. VERIFY ALL INDICATED CONDITIONS BEFORE STARTING WORK REPORT ANY DISCREPANCIES. THE DRAWINGS REFLECT CONDIT WHICH CAN BE REASONABLY INTERPRETED FROM THE EXISTING VIS CONDITIONS OR FROM DRAWINGS AND INFORMATION FURNISHED BY OWNER.
- F. LOCATE ALL FIXTURES AND EQUIPMENT AS PER THE ARCHITECTURAL DRAWINGS.

1.06 PRODUCTS A. SANITARY AND VENT PIPING:

- ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM OF BANDS PER COUPLING AS PER CISPI 310-12.
- SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 2-AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
- ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

- 1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD-DF COPPER TUBE.
- 2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COI OR CAST BRASS.
- 3. JOINTS SHALL BE MADE WITH LEAD-FREE SOLDER.
- 4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
- 5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER-SERVICE PI AND SPECIALTIES FOR DOMESTIC WATER.
- 6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE FIRE-RETARDA FACTORY-APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY-APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD SECTION C404.4 REFER WITH NYC ENERGY CONSERVATION CODE 20 BELOW TABLE C403.11.3.

	MINIMUM F	PIPE INSULATION	I TH	ICKNES	SS			
FLUID OPERATING	INSULATION	NOMINAL PIPE TUBE SIZE (INC						
TEMPERATURE RANGE AND USAGE (°F)	CONDUCTIVITY BTU· IN./ (H· FT2· °F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 <		
105-140	0.21-0.28	100	1.0	1.0	1.5	`		
40-60	0.21-0.27	75	0.5	0.5	1.0			

7. HEATED WATER SUPPLY PIPING SHALL BE IN ACCORDANCE WITH NYC CONSERVATION CODE 2020 SECTION C404.5.1 OR C404.5.2. THE FL THROUGH 1/4-INCH PIPING SHALL BE NOT GREATER THAN 0.5 GPN FLOW RATE THROUGH 5/16-INCH PIPING SHALL BE NOT GREATER GPM. THE FLOW RATE THROUGH 3/8-INCH PIPING SHALL BE NOT THAN 1.5 GPM. HW SYSTEM PIPING IS DESIGNED AS PER MA ALLOWED PIPE LENGTH METHOD AS PER NYC ECC C404.5.1 PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PE

NOMINAL PIPE SIZE	MIXIMUM PIPING LENGTH (FEET)						
(INCHES)	PUBLIC LAV	OTHER FIXTURES					
- <u>3∕8</u> "	3'	50'					
1/2"	2'	43'					
3⁄4"	0.5'	21'					
1"	0.5'	13'					
1¼"	0.5'	8'					
1½"	0.5'	6'					
2" OR LARGER	0.5'	4'					

8. SEAL ALL JOINTS BETWEEN SEGMENTS OF INSULATION.

FOLLOWING TABLE.

- 9. PROVIDE SHIELDS BETWEEN HANGERS AND INSULATION.
- 10. AS PER NYC ENERGY CONSERVATION CODE 2020 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.

D	11. WATER DISTRIBUTION SYSTEM AS PER NYC ENERGY CONSERVATION CODE 2020 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
THE AND	FOLLOWING: a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE,
ONAL	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).
TRATE IERAL	C. PRESS JOINERY SYSTEM:
MENT,	a. FITTINGS $\frac{1}{2}$ - 4":
TECT, STING	SYSTEM MAY BE USED AT THE CONTRACTOR'S OPTION FOR THE FOLLOWING BUILDING SERVICES PIPING -20°F TO +250°F UP TO
L BE IOTED	200 PSI: • HOT AND COLD DOMESTIC WATER; FITTINGS AND VALVES SHALL BE
ORIES	 NSF-61 APPROVED. POTABLE WATER; FITTINGS AND VALVES SHALL BE NSF-61 APPROVED. HOT WATER HEATING SERVICE
VINGS	ALL LEAD FREE WROT COPPER PRESS FITTINGS SHALL BE MADE FROM COMMERCIALLY PURE COPPER MILL PRODUCTS PER ASTM B 75 ALLOY C12200. THESE FITTINGS SHALL BE THIRD—PARTY CERTIFIED TO NSF/ANSI 61. ANNEX C AND COMPLY WITH NEW YORK CITY HEALTH AND SAFETY
TURE	CODE,NYC PC 2022 AND VERMONT ACT 193. NIBCO LEAD FREE CAST DEZINCIFICATION—RESISTANT (DZR) FITTINGS SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY
AND TIONS SIBLE	SEAMLESS K, L OR M COPPER TUBE MADE TO ASTM B 88. FITTINGS SHALL HAVE A MAXIMUM NON-SHOCK WORKING PRESSURE OF 200 PSI BETWEEN
THE	THE TEMPERATURES OF -20°F AND +250°F. ELASTOMERIC SEALS WITH LEAK DETECTION DESIGN SHALL BE MADE OF EPDM MATERIAL, AND THE FITTINGS
FINAL	SHALL BE MANUFACTURED WITH AN INBOARD BEAD DESIGN. NIBCO PRESS FITTINGS MEET ALL PERFORMANCE REQUIREMENTS OF ASME B16.22 AND B16.18ALL FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS AND ACCORDING TO LOCAL PLUMBING AND MECHANICAL CODES. THE PRESS—TO—CONNECT JOINT SHALL BE MADE WITH DESSING TOOLS AND LAW SETS RECOMMENDED AND
	AUTHORIZED BY NIBCO. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER; NIBCO.
WITH IM NO.	 b. VALVES 2" AND SMALLER: BALL VALVES: (ON/OFF, ISOLATION OR THROTTLING) 1 BALL VALVES (STAINLESS STEEL BALL AND STEM) WITH MALE OR
FOR -1/2"	FEMALE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI CWP TO +250'F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-110 AND
I THE CISPI)	BODIES AND END PIECES AND SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. NO BRASS CONTAINING MORE THAN 15% ZINC SHALL BE APPROVED. VALVE SHALL HAVE REINFORCED TEFLON SEATS, BLOW-OUT PROOF STEM, SOLID STAINLESS STEEL BALL AND STEM. NO HOLLOW CHROME PLATED BALLS ACCEPTED. ALL VALVES
RAWN	 SHALL BE FULL PORT. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN. WHERE PIPING IS TO BE INSULATED, BALL VALVES SHALL BE EQUIPPED WITH 2" EXTENDED HANDLES OF NON-THERMAL
PPER	CONDUCTIVE MATERIAL. HANDLE TO HAVE EXTENDED SLEEVE INCORPORATING AN INSULATION PLUG TO PROVIDE A VAPOR BARRIER AND ALLOW VALVE OPERATION WITHOUT DISTURBING THE INSULATION, AND A MEMORY STOP, WHICH CAN BE SET AFTER INSTALLATION.
_ BE	 ACCEPTABLE VALVES: (NSF-61, NON-INSULATED LINES): NIBCO PC585-66-LF, -HC, -LL.
	 ACCEPTABLE VALVES: (NSF-61, INSULATED LINES): NIBCO PC585-66-LF-NS, -HC, -LL
IPING	c. CHECK VALVES: (BACKFLOW PREVENTION)
ANT, D COMPLY D20 OR HES)	 VALVES WITH PRESS-TO-CONNECT ENDS SHALL BE RATED TO 200 PSI CWP AT +250°F MAXIMUM. NIBCO LEAD FREE VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-80 AND CONSTRUCTED OF DEZINCIFICATION-RESISTANT (DZR) BRONZE BODY & CAP SHALL BE MADE FROM A HIGH QUALITY LEAD FREE PERFORMANCE BRONZE ALLOY PER ASTM B 584 ALLOY C87850. DISC SHALL BE TFE TEFLON. ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN. ACCEPTABLE CHECK VALVES: NIBCO PS413-Y-LF: Y PATTERN, SWING TYPE CHECK VALVE; NIBCO PS480-Y-LF : IN-LINE SPRING LOADED SILENT CHECK VALVE
to 8 ≥8	d. BUTTERFLY VALVES 2–1/2" – 4", (ON/OFF, ISOLATION OR THROTTLING)
1.5 1.5 1.0 1.0 1.0 1.0 C ENERGY Normalized LOW RATE Normalized M. THE THE THAN 1 GREATER AXIMUM THE HW . THE HW R TO THE	 BUTTERFLY VALVES WITH FEMALE LEAD FREE PRESS-TO-CONNECT ENDS SHALL BE RATED AT 200 PSI. CWP TO +250°F MAXIMUM. VALVES SHALL BE MANUFACTURED IN ACCORDANCE WITH MSS SP-67 AND CONSTRUCTED OF A DUCTILE-IRON BODY, FOR BUBBLE-TIGHT SHUTOFF, EXTENDED-NECK FOR INSULATION, DISC AND LINING SUITABLE FOR POTABLE WATER, VALVES SHALL BE SUITABLE FOR BI-DIRECTIONAL DEAD END SERVICE AT FULL RATED PRESSURE, ONE-PIECE TYPE 416 STAINLESS-STEEL STEM, COPPER BUSHING, FASTENERS AND PINS SHALL NOT BE USED TO ATTACH STEM TO DISC, NO PINS OR FASTENERS IN WATERWAY, ALUMINUM-BRONZE DISC, AND MOLDED-IN EPDM SEAT (LINER). ALL ELASTOMERIC SEALS SHALL HAVE LEAK DETECTION DESIGN.
	 ACCEPTABLE VALVES: NIBCO PFD2000 SERIES (NSF-61) GD4765N-LF (NSF-61)
	1. VALVE BODY SHALL BE MADE OF CAST BRASS. THE
	INTERNAL COMPONENTS SHALL BE MADE OF BRASS OR STAINLESS STEEL.
	2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM, AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105'F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 5GPM @ 45 PSIG DIFFERENTIAL.
TED	3. TYPES OF VALVES: TYPE A- THERMOSTATICALLY OPERATED BY MEANS OF BI-METALLIC STRIP, OR EXPANSION BELLOWS; TYPE B- SINGLE HANDLE MECHANICAL MIXER, OR INDIVIDUAL HOT AND COLD CONTROL VALVES; TYPE C- PRESSURE BALANCING SHOWER VALVE/PISTON OPERATED MIXING VALVE; TYPE D- BALANCED PRESSURE OPERATION, WITH INTEGRAL DIAL THERMOMETER INDICATING DELIVERED WATER TEMPERATURE.

- 4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. M. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.
- E. HANGERS AND SUPPORTS:
- 1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPF.
- 2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.
- 3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.
- 4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
- 5. SUPPORTS SHALL BE PROVIDED IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPING MANUFACTURER.
- F. VALVES:
- 1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT-OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT-OFF DUTY.
- 2. ALL FIXTURES WITH THE EXCEPTION FLUSHOMETER-EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME-PLATED STOPS WITH CHROME-PLATED ESCUTCHEONS ON PIPING PENETRATIONS.
- 3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT-OFF VALVES ON SUPPLY LINES.
- 4. ALL BRANCH LINES TO HAVE SHUT-OFF VALVES.
- 5. ALL VALVES SHALL BE ACCESSIBLE. PROVIDE ACCESS DOORS WHERE REQUIRED FOR VALVE ACCESS.
- 6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.
- G. ELECTRIC WATER HEATER(WH-1)
- TANKS SHALL 20 GALLON CAPACITY AND SHALL HAVE 150 PSI WORKING PRESSURE AND BE EQUIPPED WITH EXTRUDED HIGH DENSITY ANODE.
- 2. ALL INTERNAL SURFACES OF THE HEATER(S) EXPOSED TO WATER SHALL BE GLASS-LINED WITH AN ALKALINE BORO SILICATE COMPOSITION THAT HAS BEEN FUSED-TO-STEEL BY FIRING AT A TEMPERATURE RANGE OF 1400°F TO 1600°F.
- 3. ELECTRIC HEATING ELEMENTS SHALL BE LOW WATT DENSITY GOLDENROD 1" SCREW-IN TYPE.
- 4. EACH ELEMENT SHALL BE CONTROLLED BY AN INDIVIDUALLY MOUNTED THERMOSTAT AND HIGH TEMPERATURE CUT-OFF SWITCH. ALL INTERNAL CIRCUITS SHALL BE FUSED. THE OUTER JACKET SHALL BE OF BAKED ENAMEL FINISH AND SHALL BE PROVIDED WITH FULL SIZE CONTROL COMPARTMENT FOR PERFORMANCE OF SERVICE AND MAINTENANCE THROUGH HINGED FRONT PANEL AND SHALL ENCLOSE THE TANK WITH FOAM INSULATION. ELECTRICAL JUNCTION BOX WITH HEAVY DUTY TERMINAL BLOCK SHALL BE PROVIDED. THE DRAIN VALVE SHALL BE LOCATED IN THE FRONT FOR EASE OF SERVICING.
- H. HOT WATER RE-CIRCULATING PUMP
- 1. IN-LINE PUMP: SINGLE STAGE VOLUTE TYPE PUMP SHALL BE MADE OF CAST IRON OR FORGED LEAD-FREE BRONZE IMPELLER.
- 2. THE PUMP SHALL HAVE A GROUND AND POLISHED STEEL SHAFT WITH A HARDENED INTEGRAL THRUST COLLAR. THE SHAFT SHALL BE SUPPORTED BY TWO HORIZONTAL SLEEVE BEARINGS DESIGNED TO CIRCULATE OIL. THE PUMPS ARE TO BE EQUIPPED WITH A MECHANICAL SEAL WITH CARBON SEAL FACE ROTATING AGAINST CERAMIC SEAT. THE MOTOR SHALL BE NON-OVERLOADING AT ANY POINT ON PUMP CURVE.
- 3. DIRECT CONNECT PUMP TO ELECTRIC MOTOR WITH FLEXIBLE COUPLING. THE MOTOR SHALL BE OF THE DRIP-PROOF, SLEEVE- BEARING, QUIET OPERATING, RUBBER-MOUNTED CONSTRUCTION. EQUIPMENT MOTOR WITH BUILT-IN THERMAL OVERLOAD PROTECTION.
- 4. INSTALL IN-LINE CIRCULATING PUMPS BETWEEN PIPE FLANGES IN PIPING SYSTEMS. INSTALL OVERHEAD PIPE SUPPORTS, BOTH SIDES OF IN-LINE PUMPS, INSTALLED IN HORIZONTAL PIPING RUNS.
- I. INSTALL PIPING TO CONSERVE BUILDING SPACE. DO NOT INTERFERE WITH USE OF BUILDING SPACE AND THE WORK OF OTHER TRADES. ALL PIPING RUN IN CEILING SHALL BE INSTALLED TIGHT TO THE STRUCTURE ABOVE.
- J. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION WITHOUT STRESSING PIPE, JOINTS OR CONNECTED EQUIPMENT. PROVIDE PIPE ANCHORS, GUIDES AND EXPANSION JOINTS OR LOOPS IN ALL HOT WATER AND HOT WATER CIRCULATING MAIN SUPPLY PIPING AND SEGMENTS OF SUCH PIPE THAT EXCEED 30'-0" IN LENGTH.
- K. IN ALL AREAS WITH FINISHED SURFACES. SYSTEM PIPING AND COMPONENTS SHALL BE CONCEALED ABOVE OR WITHIN FINISHED SURFACES.
- L. REDUCTIONS IN PIPE SIZES SHALL BE MADE WITH ONE-PIECE REDUCING FITTINGS. BUSHINGS ARE NOT ACCEPTABLE. USE FLANGED FITTINGS AT THE BASE OF RISERS.

- N. IF WATER PRESSURE EXCEEDS 85 PSI, A WATER PRESSURE REDUCING VALVE SHALL BE INSTALLED IN WATER PIPING AT CONNECTION TO MAIN.
- O. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.
- APPROVED INDIRECT WASTE SOURCE.
- ALL VALVES AND OTHER SYSTEM COMPONENTS ENCLOSED IN WALLS AND CEILINGS. ACCESS DOORS SHALL BE FURNISHED BY THIS CONTRACTOR, INSTALLED BY THE GENERAL CONTRACTOR.
- R. ALL FIXTURES REQUIRING VACUUM BREAKERS SHALL BE EQUIPPED WITH INTEGRAL VACUUM BREAKERS.
- OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.
- FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.
- U. AT ALL INDIRECT WASTE DRAINS, MAINTAIN AIR GAP AS REQUIRED BY CODE.
- V. INSTALL SLEEVES FOR ALL PIPES WHICH PASS THROUGH WALLS, FLOORS, AND CEILINGS. WHERE PIPES ARE TO BE INSULATED, THE SLEEVE SHALL BE LARGE ENOUGH TO ACCOMMODATE INSULATION. SLEEVES SHALL BE FLUSH WITH FINISHED SURFACES AT BOTH ENDS. ON FINISHED SURFACES IN EXPOSED AREAS PROVIDE ESCUTCHEONS COMPATIBLE WITH FINISH.

2. INSTALLATION

2.01 GENERAL

WARRANTIES.

- T. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING
- U. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.
- V. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO
- PREVENT CORROSION, COLOR PER ARCHITECT.
- WORK AND THE CONSTRUCTION SCHEDULE.
- FERROUS END PIPE.
- OUTSIDE, BEFORE ASSEMBLY.
- Z. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.
- REQUIRED. DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.
- 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 MANAGER IS REQUIRED.
- 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 CONSTRAINT 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.

2.02 ABOVE GRADE

- INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.
- B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT-OFF VALVES AND ALL LOW POINTS IN PIPING.

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

P. PIPE BACKFLOW PREVENTER DRAINS TO FLOOR DRAIN OR OTHER

Q. PROVIDE ACCESS DOORS/PANELS FOR SERVICE AND ACCESS TO

S. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS.

T. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY

MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF

W. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED

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

Y. REMOVE SCALE AND FOREIGN MATERIAL, FROM INSIDE AND

AA. COORDINATION WITH THE WORK OF OTHER TRADES IS PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR

A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED

- 3. TESTING
- A. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.
- B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.
- C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.
- D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.
- E. ALL DEFECTIVE PARTS SHALL BE REPLACED OR CORRECTED BY THIS CONTRACTOR AND AN EXTRA TEST OR TESTS SHALL BE MADE UNTIL THE OPERATION IS SATISFACTORY. ALL ARRANGEMENTS AND EXPENSES NECESSARY TO CONDUCT ALL TESTS REQUIRED BY THESE SPECIFICATIONS AND THE VARIOUS AGENCIES HAVING JURISDICTION OVER THE WORK INSTALLED UNDER THIS CONTRACT SHALL BE MADE BY THIS CONTRACTOR. NO EXTRA COMPENSATION WILL BE ALLOWED FOR THESE TESTS, THE COST THEREOF BEING INCLUDED IN THE LUMP SUM BID FOR THIS CONTRACT.
- F. WHERE ANY EVIDENCE OF STOPPAGE IS FOUND IN PIPING OR EQUIPMENT, THIS CONTRACTOR SHALL DISCONNECT CLEAN, REPAIR AND RECONNECT ALL OBSTRUCTED PIPING OR EQUIPMENT AND SHALL ALSO PAY FOR ALL NECESSARY CUTTING AND REPAIRS TO ADJOINING WORK.
- G. ALL PIPING AND EQUIPMENT SHALL BE THOROUGHLY CLEANED INSIDE AND OUT, OF DIRT, CUTTINGS, OILS AND OTHER FOREIGN SUBSTANCES AND SHALL BE LEFT CLEAN.
- H. ALL REQUIRED TESTS SHALL BE WITNESSED BY LOCAL AUTHORITIES AND THE OWNER'S REPRESENTATIVE.
- 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
 - a. THE SYSTEM SHALL BE TESTED AND PROVED TIGHT UNDER A WATER PRESSURE OF 50 PSI (344KPA) ABOVE ITS NORMAL WORKING PRESSURE BUT NOT LESS THAN 150 PSI. b. THIS PRESSURE SHALL BE HELD FOR NOT LESS THAN 15 MINUTES.
 - c. TESTS SHALL BE WITNESSED BY THE BUILDING FNGINFER d. THE PLUMBING CONTRACTOR WILL BE HELD
 - RESPONSIBLE FOR ALL DAMAGE DUE TO TEST FAILURES AND LEAKAGE IN THE TEST AREA AND ADJACENT TENANT OR ESB SPACES.
- M. REFILL ENTIRE POTABLE HOT AND COLD WATER SUPPLY SYSTEM WITH CHLORINE SOLUTION (HTH OLIN CHEMICAL CORP.) AT A STRENGTH TO MEET STANDARDS OF THE DEPARTMENT OF HEALTH, AND FOR A PERIOD OF RETENTION AS STIPULATED.

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

WARRANTY

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

TENANT PROTECTION PLAN NOTES:

28-120.1 TENANT PROTECTION PLAN 2022, A TENANT PROTECTION PLAN SHALL BE PREPARED AND SUBMITTED FOR THE ALTERATION, CONSTRUCTION, OR PARTIAL DEMOLITION OF BUILDINGS IN WHICH ANY DWELLING UNIT WILL BE OCCUPIED DURING CONSTRUCTION, INCLUDING NEWLY CONSTRUCTED BUILDINGS THAT ARE PARTIALLY OCCUPIED WHERE WORK IS ONGOING. THE TENANT PROTECTION PLAN SHALL BE PREPARED BY A REGISTERED DESIGN PROFESSIONAL AND FILED WITH THE DEPARTMENT. THE REGISTERED DESIGN PROFESSIONAL PREPARING THE TENANT PROTECTION PLAN SHALL BE RETAINED BY THE GENERAL CONTRACTOR PERFORMING THE ALTERATION, CONSTRUCTION, OR PARTIAL DEMOLITION WORK. NO PERMIT SHALL BE ISSUED FOR WORK THAT REQUIRES A TENANT PROTECTION PLAN UNLESS SUCH PLAN IS APPROVED BY THE DEPARTMENT. SUCH PLAN SHALL CONTAIN A STATEMENT SIGNED BY THE OWNER AND SIGNED BY THE APPLICANT AFFIRMING THAT THE BUILDING CONTAINS DWELLING UNITS THAT WILL BE OCCUPIED DURING CONSTRUCTION AND SHALL IDENTIFY IN SUFFICIENT DETAIL THE SPECIFIC UNITS THAT ARE OR MAY BE OCCUPIED DURING CONSTRUCTION. THE MEAN AND METHODS TO BE EMPLOYED TO SAFEGUARD THE SAFETY AND HEALTH OF THE OCCUPANTS THROUGHOUT THE CONSTRUCTION, INCLUDING, WHERE APPLICABLE, DETAILS SUCH AS TEMPORARY FIRE-RATED ASSEMBLIES, OPENI PROTECTIVES, OR DUST CONTAINMENT PROCEDURES. SUCH MEANS AND METHODS SHALL BE DESCRI PARTICULARITY AND IN NO CASE SHALL TERMS SUCH AS "CODE COMPLIANT," "APPROVED," "LEGAL," "PROTECTED IN ACCORDANCE WITH LAW" OR SIMILAR TERMS BE USED AS SUBSTITUTE FOR SUCH DESCRIPTION. THE TENANT PROTECTION PLAN MUST BE SITE SPECIFIC. THE ELEMENTS OF THE TENANT PROTECTION PLAN MAY VARY DEPENDING ON THE NATURE AND SCOPE OF THE WORK BUT AT A MINIMUM, MUST COMPLY WITH ALL APPLICABLE LAWS AND REGULATIONS, INCLUDING THE NEW YORK CITY CONSTRUCTION CODES, THE NEW YORK CITY HOUSING MAINTENANCE CODE, THE NEW YORK CITY NOISE CONTROL CODE AND THE NEWYORK CITY HEALTH CODE, AND

EGRESS AT ALL TIMES IN THE COURSE OF CONSTRUCTION PROVISION SHALL BE MADE FOR ADEQUATE EGRESS AS REQUIRED BY THIS CODE AND THE TENANT PROTECTION PLAN SHALL IDENTIFY THE EGRESS THAT WILL BE ROVIDED. REQUIRED EGRESS SHALL NOT BE OBSTRUCTED AT ANY TIME EXCEPT WHERE APPROVED BY THE COMMISSIONER.

SHALL MAKE DETAILED AND SPECIFIC PROVISIONS FOR:

IRE SAFETY.

ALL NECESSARY LAWS AND CONTROLS, INCLUDING THOSE WITH RESPECT TO OCCUPIED DWELLINGS, AS WELL AS ADDITIONAL SAFETY MEASURES NECESSITATED BY CONSTRUCTION SHALL BE STRICTLY OBSERVED.

HEALTH REQUIREMENTS. SPECIFICATION OF MEANS AND METHODS TO BE USED FOR CONTROL OF DUST, DISPOSAL OF CONSTRUCTION DEBRIS, PEST CONTROL AND MAINTENANCE OF SANITARY FACILITIES SHALL BE INCLUDED.

- 3.1.THERE SHALL BE INCLUDED A STATEMENT OF COMPLIANCE WITH APPLICABLE PROVISIONS OF LAW RELATING TO LEAD AND ASBESTOS, AND SUCH STATEMENT SHALL DESCRIBE WITH PARTICULARITY WHAT MEANS AND METHODS ARE BEING UNDERTAKEN TO MEET SUCH COMPLIANCE.
- 4. COMPLIANCE WITH HOUSING STANDARDS. THE REQUIREMENTS OF THE NEW YORK CITY HOUSING MAINTENANCE CODE. AND, WHERE APPLICABLE, THE NEW YORK STATE MULTIPLE DWELLING LAW SHALL BE STRICTLY OBSERVED.
- 5. STRUCTURAL SAFETY. NO STRUCTURAL WORK SHALL BE DONE THAT MAY ENDANGER THE OCCUPANTS.
- NOISE RESTRICTIONS. SPECIFICATION OF MEANS AND METHODS TO BE USED FOR THE LIMITATION OF NOISE TO ACCEPTABLE LEVELS IN ACCORDANCE WITH THE NEW YORK CITY NOISE CONTROL CODE SHALL BE INCLUDED. WHERE HOURS OF THE DAY OR THE DAYS OF THE WEEK IN WHICH CONSTRUCTION WORK MAY BE UNDERTAKEN ARE LIMITED PURSUANT TO THE NEW YORK CITY NOISE CONTROL CODE, SUCH LIMITATIONS SHALL BE STATED.
- 7. MAINTAINING ESSENTIAL SERVICES. WHERE HEAT, HOT WATER, COLD WATER. GAS. ELECTRICITY, OR OTHER UTILITY SERVICES ARE PROVIDED IN SUCH BUILDING OR IN ANY DWELLING UNIT LOCATED THEREIN. THE TENANT PROTECTION PLAN SHALL SPECIFY THE MEANS AND METHODS TO BE USED FOR MAINTAINING SUCH SERVICES DURING SUCH WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEW YORK CITY HOUSING MAINTENANCE CODE. IF A DISRUPTION OF ANY SUCH SERVICE IS ANTICIPATED DURING THE WORK, THEN SUCH PLAN SHALL SPECIFY THE ANTICIPATED DURATION OF SUCH DISRUPTION AND THE MEANS AND METHODS TO BE EMPLOYED TO MINIMIZE SUCH DISRUPTION, INCLUDING
 - THE PROVISION OF SUFFICIENT ALTERNATIVES FOR SUCH SERVICE DURING SUCH DISRUPTION. NOTIFICATION OF THE DISRUPTION MUST BE GIVEN TO ALL AFFECTED OCCUPANTS OF OCCUPIED DWELLING UNITS.
 - EXCEPTION: IN THE FOLLOWING INSTANCES, THE TENANT PROTECTION PLAN MAY BE PREPARED AND FILED BY THE REGISTERED DESIGN PROFESSIONAL OF RECORD FOR THE ALTERATION, CONSTRUCTION, OR PARTIAL DEMOLITION WORK AS PART OF THE UNDERLYING APPLICATION:
 - 1.WORK IN OCCUPIED ONE-AND TWO-FAMILY HOMES.
 - 2.WORK LIMITED TO THE INTERIOR OF A SINGLE DWELLING UNIT OF AN OCCUPIED MULTIPLE DWELLING WITH NO DISRUPTION TO THE ESSENTIAL SERVICES OF OTHER UNITS, WHERE SUCH DWELLING IS OWNER-OCCUPIED. FOR A DWELLING UNIT WITHIN A PROPERTY THAT IS OWNED BY A CONDOMINIUM OR HELD BY A SHAREHOLDER OF A COOPERATIVE CORPORATION UNDER A PROPRIETARY LEASE, THE UNIT MUST BE OCCUPIED BY THE OWNERS OF RECORD FOR SUCH UNIT.
- § 28–120.1.1 PUBLIC AVAILABILITY OF TENANT PROTECTION PLAN. UPON ISSUANCE OF A PERMIT FOR WORK CONTAINING A TENANT PROTECTION PLAN, THE DEPARTMENT SHALL MAKE THE TENANT PROTECTION PLAN PUBLICLY AVAILABLE ON ITS WEBSITE.

28-120.1.2 PROVISION OF COPY OF TENANT PROTECTION PLAN TO OCCUPANTS UPON REQUEST. THE OWNER OF A BUILDING UNDERGOING WORK FOR WHICH A TENANT PROTECTION PLAN IS REQUIRED BY SECTION 28-120.1 SHALL, UPON REQUEST FROM AN OCCUPANT OF A DWELLING UNIT WITHIN SUCH BUILDING, PROVIDE SUCH OCCUPANT WITH A PAPER COPY OF THE TENANT PROTECTION PLAN APPROVED BY THE DEPARTMENT.

28-120.1.2 PROVISION OF COPY OF TENANT PROTECTION PLAN TO OCCUPANTS UPON REQUEST. THE OWNER OF A BUILDING UNDERGOING WORK FOR WHICH A TENANT PROTECTION PLAN IS REQUIRED BY SECTION 28-120.1 SHALL, UPON REQUEST FROM AN OCCUPANT OF A DWELLING UNIT WITHIN SUCH BUILDING, PROVIDE SUCH OCCUPANT WITH A PAPER COPY OF THE TENANT PROTECTION PLAN APPROVED BY THE DEPARTMENT.

28-120.1.3 NOTICE TO OCCUPANTS. UPON ISSUANCE OF A PERMIT FOR WORK CONTAINING A TENANT PROTECTION PLAN, THE OWNER SHALL (I) DISTRIBUTE A NOTICE REGARDING SUCH PLAN TO EACH OCCUPIED DWELLING UNIT AND (II) POST A NOTICE REGARDING SUCH PLAN IN A CONSPICUOUS MANNER IN THE BUILDING LOBBY, AS WELL AS ON EACH FLOOR WITHIN TEN FEET OF THE ELEVATOR, OR IN A BUILDING WHERE THERE IS NO ELEVATOR, WITHIN TEN FEET OF OR IN THE MAIN STAIRWELL ON SUCH FLOOR. THE NOTICE SHALL BE IN A FORM CREATED OR APPROVED BY THE DEPARTMENT AND SHALL INCLUDE:

- (1) A STATEMENT THAT OCCUPANTS OF THE BUILDING MAY OBTAIN A PAPER COPY OF SUCH PLAN FROM THE OWNER AND MAY ACCESS SUCH PLAN ON THE DEPARTMENT WEBSITE;
- (2) THE NAME AND CONTACT INFORMATION FOR THE SITE SAFETY MANAGER, SITE SAFETY COORDINATOR OR SUPERINTENDENT OF CONSTRUCTION REQUIRED BY SECTION 3301.3 OF THE NEW YORK CITY BUILDING CODE, AS APPLICABLE, OR, IF THERE IS NO SITE SAFETY MANAGER, SITE SAFETY COORDINATOR OR SUPERINTENDENT OF CONSTRUCTION, THE NAME AND CONTACT INFORMATION OF THE OWNER OF THE BUILDING OR SUCH OWNER'S DESIGNEE; AND
- (3) STATEMENT THAT OCCUPANTS OF THE BUILDING MAY CALL 311 TO MAKE COMPLAINTS ABOUT THE WORK.

2 PLUMBING SANITARY RISER DIAGRAM NTS

PLUMBING FIXTURE								
LEGEND	PLUMBING FIXTURE		С	CONNECTI				
			SOIL/WASTE	VENT	COL WAT			
WC	WATER CLOSET	_	4"	2"	3/4'			
LAV	LAVATORY	2"	2"	1½"	1/2"			
MS	MOP SINK	3"	3"	2"	3/4"			

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

FIXTURE BRANCH	CONNECTION	SCHEDULE
FIXTURE TYPE	WASTE	VENT
FLOOR DRAIN	3"	2"
FLOOR CLEANOUT		

				-					
			ELECTF	RIC WA	TER	HEATE	R SCHE		
TAG No.	QUANTITY	ELEMENTS	SERVING	STORAGE GALLONS	REC (GP	OVERY CAP. H @ RISE)	Т		
<u>WH-1</u>	1	1	BOOK STORE	20	20 0	PH @ 90'F	ELECTRIC V		
EXPANSION TANK SCHEDULE									
		QUANTITY	SERVICE	GALLONS		MAKE	REMAR		
EXPANSION TANK (ET-1)		HOT WATER	2		AMTROL ST-5	DIMENSIONS SHIPPING V			
			THERM		C M	IXING V	ALVE		

TAG No.	LOCATION	SERVICE	PIPE SIZE (INCHES)	CAPACITY RANGE (GPM)		TEMP. (*			
				MIN.	MAX.	MIN.	MAX.		
TMV	LAVATORY	HOT WATER	1	0.1	45	100	160	ACOF	

— CONNECT TO EXISTING SANITARY SERVICE (VERIFY IN FIELD)

SPRINKLER GENERAL NOTES

- 1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13-2016 AND ALL LOCAL AUTHORITIES.
- 2. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND
- 3. ALL SPRINKLER HEADS SHALL BE INSTALLED AT CENTER OF TILE IF CEILING IS PROVIDED.

REQUIREMENTS.

- 4. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING.
- 5. THE SPRINKLER SYSTEMS ARE TO BE HYDROSTATIC TESTED FOR A (2) HOUR MINIMUM AT 200 PSI. PRESSURE AND ARE TO BE WITNESSED BY AUTHORIZED BUILDING PERSONNEL. COORDINATE ALL TESTING WITH BUILDING MANAGER.
- 6. PIPES SIZES SHOWN ARE BASED ON DESIGN PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.
- 7. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.
- 8. G.C. SHALL BE RESPONSIBLE FOR ALL FINAL TESTS AND INSPECTIONS OF COMPLETED WORK REQUIRED BY THE BUILDING MANAGEMENT PRIOR TO OCCUPANCY OF SPACE.
- 9. ALL SPRINKLER WORK SHALL BE TESTED AND MADE OPERATIONAL PRIOR TO CARPET AND FURNITURE INSTALLATION. G.C. SHALL REPAIR AND/OR REPLACE ALL FINISHES DAMAGED BY DEFECTIVE SPRINKLER WORK AT HIS EXPENSE.
- 10. ALL BURNING, CUTTING, SOLDERING AND WELDING SHALL BE COORDINATED WITH BUILDING FIRE SYSTEMS WITH BUILDING MANAGEMENT, AS REQUIRED.
- 11. G.C. SHALL BE RESPONSIBLE FOR OBTAINING PERMITS AND APPROVALS REQUIRED BY BUILDING INSPECTOR AND FIRE MARSHALL IN CONJUNCTION WITH CHANGES TO EXISTING SPRINKLER SYSTEM.
- 12. REFER TO ENGINEERING DRAWINGS FOR SPRINKLER HEADS. LIGHT SENSORS AND FIRE DETECTION DEVICES.
- 13. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.
- 14. UPON COMPLETION OF ALL SPRINKLER WORK, CONTRACTOR SHALL TEST AND INSPECT ENTIRE SPRINKLER SYSTEM. ENTIRE SYSTEM SHALL BE FULLY OPERATIONAL AND APPROVED IN COMPLIANCE WITH ALL AHJ.
- 15. UPON SUCCESSFUL COMPLETION OF ALL TESTING, CONTRACTOR SHALL PRIME AND PAINT ALL EXPOSED SPRINKLER PIPING. COLOR AND FINISH SHALL BE AS PER ARCHITECT.
- 16. CONTRACTOR SHALL INCLUDE IN HIS BID THE COST TO PROVIDE (5) FIVE ADDITIONAL SPRINKLERS INSTALLED. EXACT LOCATIONS OF THESE SPRINKLER HEADS SHALL BE DETERMINED IN FIELD.
- 17. FOR SPRINKLER WORK DONE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.-13, HYDROSTATIC TESTS IN ACCORDANCE WITH REFERENCE STANDARD NFPA 13-2016, AS MODIFIED FOR NEW YORK CITY, ARE NECESSARY.
- 18. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK TO CLEAR DUCTWORK AND LIGHTING FIXTURES.
- 19. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.
- 20. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.
- 21. PIPES SIZES SHOWN ARE BASED ON SCHEDULE OF PIPE SIZE PIPING LAYOUTS ONLY. ACTUAL PIPE SIZES SHALL BE DETERMINED BY CONTRACTORS HYDRAULIC CALCULATIONS BASED ON HIS INSTALLATION DRAWINGS. CONTRACTOR SHALL ALLOW FOR THIS AND INCLUDE THIS IN HIS CONTRACT PRICE.
- 22. PROVIDE AUXILIARY DRAINS AT TRAPPED SECTIONS OF PIPING AS REQUIRED BY NFPA.
- 23. GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/ EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED WHEN FURNITURE/EQUIPMENT IS LESS THAN 18" TO UNDERSIDE OF CEILING PRIOR TO INSTALLATION.
- 24. COMPOSITE DRAWINGS

CONTRACTOR SHALL BE GIVEN A SEPIA TRANSPARENCIES TO IMPOSE THEIR WORK FOR A COORDINATED ALLOCATION OF SPACE. PROCEDURE SHALL INCLUDE HVAC CONTRACTOR TO INDICATE DUCT WORK, PIPING, STRUCTURAL AND ARCHITECTURAL DETAILS. SEPIAS SHALL BE GIVEN TO PLUMBING, SPRINKLER AND ELECTRICAL TRADES WHO WILL DRAW HIS WORK ON DRAWINGS. HVAC CONTRACTORS SHALL HOLD A COORDINATION MEETING WITH ALL CONTRACTORS TO ELIMINATE INTERFERENCE OR CONFLICTS IN INSTALLING WORK. IF UNABLE TO EACH AGREEMENT ISSUE, ARCHITECT SHALL MAKE BINDING DECISION.

- 25. CONTRACTOR SHALL COORDINATE SPRINKLER MAIN AND BRANCHES WITH NEW CONSTRUCTION TO AVOID CONFLICTS WITH CEILING HEIGHTS. DUCTWORK. LIGHTING FIXTURES, BEAMS. CONTRACTOR TO ADJUST PIPING ACCORDINGLY TO ACCOMMODATE NEW CONSTRUCTION.
- 26. WET SPRINKLER SYSTEM SUBJECTED TO FREEZING SHOULD COMPLY WITH NFPA 13-2016 SEC. 8.16.4.1.
- 27. CONTRACTOR SHALL BE RESPONSIBLE FOR THE FAILURE OF ANY SPRINKLER SYSTEM OR EQUIPMENT TO FUNCTION PROPERLY UPON COMPLETION OF HIS WORK UPON SAID SYSTEM OR EQUIPMENT.

BUILDING DEPARTMENT SPRINKLER NOTES

- 1. THE INSTALLATION, COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPE OF SYSTEMS SHALL CONFORM TO THE 2022 NEW YORK CITY BUILDING CODE APPENDIX Q, SECTION BC Q102, SECTION BC Q103 AND SECTION BC903.
- 2. ONLY APPROVED MATERIALS SHALL BE USED AS PER CHAPTER 6 OF APPENDIX Q, SECTION BCQ102
- 3. DIRECT CONNECTION OF SPRINKLERS TO THE PUBLIC WATER SYSTEM SHALL CONFORM TO SECTION 2022 NYC BUILDING CODE SECTION 903.3.5.
- 4. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER NFPA 13-2016 CHAPTER 8 SECTION 8.6.
- 5. INSPECTION AND TESTS OF SPRINKLERS SHALL BE CONDUCTED AS 2022 NYC BUILDING CODE SEC. 904.4 AND APPENDIX Q, SEC. BCQ102, CH. 27.
- 6. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERED IN ACCORDANCE WITH 2022 NYC BUILDING CODE CHAPTER 3, 4 & 5 AND CHAPTER 5 OF APPENDIX Q SECTION BCQ102.
- WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS PER 2022 NYC BUILDING CODE APPENDIX Q, SECTION BCQ102, 8.17.4.2.1.
- 8. PIPING, FITTINGS, SPECIFICATIONS, PIPE SCHEDULES, SYSTEM TEST PIPES, PROTECTION AGAINST CORROSION, DAMAGE, VALVES, HANGERS, SPRINKLERS GUARDS AND SHIELDS SHALL BE AS PER APPENDIX Q SECTION BCQ102, CHAPTERS 9.
- SPRINKLER ALARM SHALL BE IN ACCORDANCE WITH SECTION OF APPENDIX Q, SECTION BCQ107.
- 10. SPACING, LOCATION AND POSITION OF SPRINKLER WILL BE AS PER SECTION 8 OF APPENDIX Q, SECTION BCQ102.
- 11. ALL BLIND SPACES EXCEEDING 6" IN WIDTH OR DEPTH WHICH CONTAIN COMBUSTIBLE MATERIAL WILL BE SPRINKLERED.
- 12. ALL PIPE PASSING THROUGH WALLS WILL COMPLY WITH SECTION BC712.
- 13. THERE IS NO HIGH PILED STORAGE AS DEFINED IN SECTION 3-3.12 OF APPENDIX Q, SECTION BC Q102
- 14. DISTANCE OF SPRINKLERS FROM HEAT SOURCE SHALL BE IN AS PER TABLES 9.3.2.5 (a) AND 8.3.2.5 (b).
- 15. AS PER SECTION BC903.1.2 PROVIDE DEPARTMENT OF WATER SUPPLY LETTER WITH FLOW TEST DATE IF THERE IS A DIRECT CONNECTION TO THE STREET WATER SUPPLY.
- 16. THIS APPLICATION IS NOT FILED AS A RESULT OF ACTION BY THE FIRE COMMISSIONER AS AUTHORIZED BY BS & A TO MODIFY THE CERTIFICATE OF OCCUPANCY NOR IS SUCH ACTION PENDING.
- 17. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY SECTION 6.7.4. OF APPENDIX Q, SECTION BCQ102.
- 18. DRAINAGE SHALL CONFORM TO SECTION 8.15.2 OF APPENDIX Q, SECTION BCQ102.
- 19. A ONE PIECE REDUCING FITTING OF GOOD DESIGN SHOULD BE USED WHEREVER A CHANGE IS MADE IN THE SIZE OF PIPE, AS PER SECTION 6.4.6 OF APPENDIX Q, SECTION BCQ102.
- 20. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES TO SPRINKLER SHALL BE APPROVED O.S. & Y. OR APPROVED INDICATOR TYPE.
- 21. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER 6.7.3 OF APPENDIX Q, SECTION BCQ102.
- 22. HANGERS SHOULD BE SUPPORTED BY WROUGHT IRON U TYPE OR APPROVED ADJUSTABLE HANGERS. HANGERS SHALL BE OF THE TYPE APPROVED FOR USE WITH THE PIPE OR TUBE INVOLVED, AS PER CHAPTER 9, OF APPENDIX Q, SECTION BCQ102
- 23. PROVISIONS SHOULD BE MADE TO FACILITATE FLUSHING SYSTEM PIPING BY PROVIDING FLUSHING CONNECTIONS CONSISTING OF A CAPPED NIPPLE 4" LONG ON END OF A CROSS MAIN AS PER SECTION 8.14.16 OF APPENDIX Q, SECTION BC0102
- 24. SPRINKLER SHALL BE AN APPROVED TYPE AS PER SECTION 8.3 OF APPENDIX Q, SECTION BCQ102.
- 25. TEMPERATURE RATING SHALL COMPLY WITH SECTION 8.3.2 OF APPENDIX Q, SECTION BCQ102.
- 26. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER SECTION 8.5.6. OF APPENDIX Q. SECTION BCQ102.
- 27. SPACING AND LOCATION OF SPRINKLERS SHALL COMPLY WITH CHAPTER 8 OF APPENDIX Q, SECTION BCQ102.
- 28. SPRINKLER SYSTEM COMPLIES WITH NFPA 13-2016 AS MODIFIED BY APPENDIX Q, SECTION BCQ104.
- 29. SOURCES OF WATER SUPPLY FOR SPRINKLER SYSTEMS AS PER CHAPTER 15 OF APPENDIX Q, SECTION BCQ102.
- 30. PIPE SCHEDULE SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION 14.5 OF
- APPENDIX Q, SECTION BCQ102. 31. HYDRAULICALLY DESIGNED SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER
- 14 OF APPENDIX Q, SECTION BCQ102. 32. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").
- 33. THIS APPLICATION IS MADE ONLY FOR WORK INDICATED ON THE 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.
- 34. PAINTING FOR DEDICATED SPRINKLER PIPING AND VALVES HANDLES SHOULD BE

BUILDING DEPARTMENT SECTION 28-104.8.4 TENANT PROTECTION PLAN

CONSTRUCTION DOCUMENTS FOR ALTERATIONS OF BUILDINGS IN WHICH ANY DWELLING UNIT WILL BE OCCUPIED DURING CONSTRUCTION SHALL INCLUDE A TENANT PROTECTION PLAN. SUCH PLAN SHALL CONTAIN A STATEMENT THAT THE BUILDING CONTAINS DWELLING UNITS THAT WILL BE OCCUPIED DURING CONSTRUCTION AND SHALL INDICATE IN SUFFICIENT DETAIL THE SPECIFIC UNITS THAT ARE OR MAY BE OCCUPIED DURING CONSTRUCTION, THE MEANS AND METHODS TO BE EMPLOYED TO SAFEGUARD THE SAFETY AND HEALTH OF THE OCCUPANTS, INCLUDING, WHERE APPLICABLE, DETAILS SUCH AS TEMPORARY FIRE-RATED ASSEMBLES, OPENING PROTECTIVES, OR DUST CONTAINMENT PROCEDURES. THE ELEMENTS OF THE TENANT PROTECTION PLAN MAY VARY DEPENDING ON THE NATURE AND SCOPE OF THE WORK BUT AT A MINIMUM SHALL MAKE DETAILED AND SPECIFIC PROVISIONS FOR:

- 1. EGRESS. AT ALL TIMES IN THE COURSE OF CONSTRUCTION PROVISION SHALL BE MADE FOR ADEQUATE EGRESS AS REQUIRED BY THIS CODE AND THE TENANT PROTECTION PLAN SHALL IDENTIFY THE EGRESS THAT WILL BE PROVIDED. REQUIRED EGRESS SHALL NOT BE OBSTRUCTED AT ANY TIME EXCEPT WHERE APPROVED BY THE COMMISSIONER.
- 2. FIRE SAFETY. ALL NECESSARY LAWS AND CONTROLS, INCLUDING THOSE WITH RESPECT TO OCCUPIED DWELLINGS, AS WELL AS ADDITIONAL SAFETY MEASURES NECESSITATED BY THE CONSTRUCTION SHALL BE STRICTLY OBSERVED.
- 3. HEALTH REQUIREMENTS. SPECIFICATION OF METHODS TO BE USED FOR CONTROL OF DUST, DISPOSAL OF CONSTRUCTION DEBRIS, PEST CONTROL AND MAINTENANCE OF SANITARY FACILITIES, AND LIMITATION OF NOISE TO ACCEPTABLE LEVELS SHALL BE INCLUDED.
- 3.1 THERE SHALL BE INCLUDED A STATEMENT OF COMPLIANCE WITH APPLICABLE PROVISIONS OF LAW RELATING TO LEAD AND ASBESTOS.
- 4. COMPLIANCE WITH HOUSING STANDARDS. THE REQUIREMENTS OF THE NEW YORK CITY HOUSING MAINTENANCE CODE, AND, WHERE APPLICABLE, THE NEW YORK STATE MULTIPLE DWELLING LAW SHALL BE STRICTLY OBSERVED.
- 5. STRUCTURAL SAFETY. NO STRUCTURAL WORK SHALL BE DONE THAT MAY ENDANGER THE OCCUPANTS.
- NOISE RESTRICTIONS. WHERE HOURS OF THE DAY OR THE DAYS OF THE WEEK IN WHICH CONSTRUCTION WORK MAY BE UNDERTAKEN ARE LIMITED PURSUANT TO THE NEW YORK CITY NOISE CONTROL CODE, SUCH LIMITATIONS SHALL BE STATED.

SPRINKLER DRAWING LIST

- SP-001.00 SPRINKLER GENERAL NOTES, SYMBOLS AND RISER DIAGRAM
- SP-002.00 SPRINKLER SPECIFICATIONS
- SP-101.00 SPRINKLER PLAN
- SP-501.00 SPRINKLER DETAILS

SPRINKLER DEMOLITION NOTES:

- SCOPE OF WORK UNDER THIS CONTRACT SHALL INCLUDE DISCONNECT REMOVE EXISTING WET SPRINKLER SYSTEM IN ITS ENTIRETY. INCLUDING BRANCHES, HEADS, HANGERS, ATTACHMENTS ETC. BACK TO THE SPRINKLER MAIN AND CAP AS SHOWN.
- 2. PROVIDE ALL LABOUR, APPARATUS, ETC, FOR THE REMOVAL OF ALL EXISTING SPRINKLER HEADS, PIPING, HANGERS, ETC. EXCEPT AS INDICATED
- MAINTAIN CONTINEOUS OPERATION OF EXISTING RISERS SO AS NOT TO INCONVENIENCE OTHER BUILDING TENANTS.
- SPRINKLER CONTRACTOR SHALL VISIT THE PREMISES PRIOR TO SUBMITTING ITS PROPOSAL AND EXAMINE THE AREAS EFFECTED BY THIS WORK. HE IS TO BECOME FAMILIAR WITH EXISTING CONDITIONS AND WITH POSSIBLE DIFFICULTIES THAT MAY ATTEND THE EXECUTION OF THIS WORK.
- PERFORM THIS WORK SIMULTANEOUSLY WITH THAT OF OTHER TRADES SO AS NOT TO DELAY OVERALL PROGRESS OF WORK.
- 6. OWNER'S OCCUPANCY REGULATIONS MAY REQUIRE THAT CERTAIN PORTIONS OF WORK BE DONE AFTER REGULAR WORKING HOURS. COORDINATE WITH BUILDING MANAGEMENT, COST OF OVERTIME IS TO BE INCLUDED IN THE CONTRACTOR'S PROPOSAL.
- 7. REMOVE ALL DEMOLITION MATERIALS FROM PROJECT SITE, EXCEPT ITEMS DESIGNATED BY ARCHITECT/OWNER TO REMAIN OWNER'S PROPERTY AND BE STORED
- 8. NO DEAD ENDS SHALL BE LEFT ON PIPING.
- EXISTING EXPOSED PIPING NOT BEING REUSED, AND NOT SPECIFICALLY NOTED OR SHOWN ON DRAWING TO BE ABANDONED SHALL BE COMPLETELY REMOVED.
- 0. THE EXISTING SYSTEM SHALL BE LEFT IN PERFECT WORKING ORDER AT COMPLETION OF NEW WORK.
- 11. NO REMOVED EXISTING PIPING SHALL BE REUSED.
- 12. CONTRACTOR SHALL FIELD VERIFY EXACT ELEVATION, LOCATION AND PIPE SIZES OF EXISTING SPRINKLER HEADS AND PIPING BEFORE INSTALLATION OF NEW WORK.
- 13. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.
- 14. ALL SERVICE SHUTDOWNS SHALL BE BY BASE BUILDING ENGINEERS. MINIMUM OF 48 HOURS NOTICE IS REQUIRED TO THE BUILDING OFFICE PRIOR TO SHUT DOWN.
- 15. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.
- 16. CONTRACTORS SHALL TAKE SPECIAL CARE TO DEMOLISH ONLY THAT WORK WHICH IS REQUIRED TO BE DEMOLISHED AND NOT TO DISTURB ANY WORK WHICH IS TO REMAIN. IF IN THE COURSE OF THE DEMOLITION, THE CONTRACTOR DESTROYS OR DISTURBS ANY WORK WHICH IS TO REMAIN. THEN HE SHALL, AT HIS OWN EXPENSE, REPAIR OR REPLACE SUCH WORK AS NECESSARY.
- 17. EXISTING PIPING SERVING ADJACENT AREAS NOT IN AREA OF WORK SHALL REMAIN ACTIVE AND WITHOUT DISTURBANCE.
- 18. AFTER REMOVAL OF CEILINGS, CONSTRUCTION MANAGER SHALL INSPECT THE SITE WITH BUILDING REPRESENTATIVES TO IDENTIFY BASE BUILDING MEP INFRASTRUCTURE ITEMS WHICH ARE TO REMAIN. ALL SUCH ITEMS ARE TO BE CLEARLY TAGGED "TO REMAIN" AND TO BE PROTECTED DURING DEMOLITION, IN A MANNER SATISFACTORY TO BUILDING MANAGEMENT.

- <u>GENERAL NOTES:</u>
- 1. FOR SPRINKLER WORK ONLY. 2. ALL SPRINKLER HEADS MEET DESIGN
- CRITERIA PER COVERAGE.

<u>SPRINKLER RISER DIAGRAM - FIRST FLOOR</u>

SPRINKLER SCHEDULE											
SYMBOL	NAME	COVERAGE	AREA	METAL	TEMPERATURE (*F)	RESPONSE	K-FACTOR	NPT	MFG	MODEL#	APPROVALS
●(N)	CONCELAED	STANDARD	LH/OH AREAS WITH CEILING	BRASS	155	QUICK	5.6	1⁄2"	TYCO	SERIES RF-II TY3531	UL/FM

NOTE: 1. COORDINATE ALL SPRINKLER COLOR FINISHES WITH ARCHITECT. 2. ALL SPRINKLER SHOULD BE UL/FM APPROVED

ROOF FIRST FLOOR

SPRINKLER SPECIFICATIONS

PART 1 – GENERAL

1.01 REQUIREMENTS

- A. THE SPRINKLER CONTRACTOR SHALL BE A LICENSED, AUTHORIZED INSTALLER OF SPRINKLER SYSTEMS AND SHALL HAVE HAD A MINIMUM OF FIVE YEARS EXPERIENCE IN THE INSTALLATION OF SPRINKLER SYSTEMS IN THE NEW YORK CITY
- B. BEFORE SUBMITTING HIS BID. THE SPRINKLER CONTRACTOR SHALL VISIT THE SITE AND SHALL FULLY FAMILIARIZE HIMSELF WITH, AND BECOME FAMILIAR WITH THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. CONTRACTOR SHALL PERFORM THIS PRIOR TO SUBMITTING HIS PROPOSAL. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.
- C. UPON REVIEW OF THE DRAWINGS AND SPECIFICATIONS, PRIOR TO SUBMITTING HIS PROPOSAL, THE SPRINKLER CONTRACTOR SHALL INFORM ARCHITECT AND/OR ENGINEER OF ANY DISCREPANCIES OR REQUEST CLARIFICATION IN WRITING, IF NECESSARY, CONCERNING THE INTENT OF THE PLANS AND SPECIFICATIONS TO PROVIDE A COMPLETE SPRINKLER SYSTEM INSTALLATION. LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT OF MATERIALS SHOULD SUCH PROCEDURE NOT BE FOLLOWED.
- D. THE SCHEDULING OF THE SPRINKLER WORK SHALL BE COORDINATED WITH BUILDING MANAGEMENT, WITH OTHER CONTRACTORS AND WITH THE ENGINEER.
- E. NECESSARY SHUT-DOWNS OF BASE BUILDING SPRINKLER SYSTEM MUST BE COORDINATED WITH BUILDING MANAGEMENT. SHUT-DOWNS OF BASE BUILDING SYSTEMS SHALL TAKE PLACE AFTER OR BEFORE NORMAL BUSINESS HOURS AND SHALL BE CONSIDERED OVERTIME WORK. THE CONTRACTOR MUST GIVE BUILDING MANAGEMENT AND NEW YORK CITY FIRE DEPARTMENT 48 HOURS NOTICE PRIOR TO SHUT-DOWN OF SPRINKLER, OR OTHER SYSTEMS.

1.02 WORK INCLUDED

- A. WORK SHALL INCLUDE ALL SPRINKLER WORK FURNISHED AND INSTALLED AS INDICATED ON THE PLANS AND AS SPECIFIED HEREIN.
- 1. ALL WORK SHALL COMPLY WITH REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE, N.F.P.A. STANDARD 13, N.Y.S. FIRE DEPARTMENT AND OWNERS INSURANCE RATING ORGANIZATION.
- 2. THESE DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL LOCATION OF WORK. SCALED DIMENSIONS SHALL NOT BE USED. ANY DIMENSIONS NOT SHOWN SHALL BE OBTAINED FROM FIELD MEASUREMENTS.
- 3. PROVIDE COMPUTER GENERATED HYDRAULIC CALCULATIONS IN ACCORDANCE WITH N.Y.S. BUILDING DEPARTMENT AND NFPA STANDARDS.
- 1.03 SHOP DRAWINGS AND SUBMITTALS
- A. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, FULLY COORDINATED SHOP 2.06 LEAK DAMAGE DRAWINGS, CAPACITY, DATA, AND CATALOG CUTS OF THE FOLLOWING:
- 1. PIPE AND FITTINGS
- VALVES HANGERS AND SUPPORTS
- TESTS 5. SPRINKLER HEADS
- A. THE SPRINKLER SYSTEM SHALL BE HYDRAULICALLY DESIGNED. CONTRACTOR SHALL SUBMIT CALCULATIONS WITH SHOP DRAWINGS. CALCULATIONS SHALL BE BUILDING CODE.
- B. ADD APPROPRIATE HOSE ALLOWANCE.

1.04 BUILDING DEPARTMENT FILING, PERMITS AND CERTIFICATES

- A. THE SPRINKLER CONTRACTOR SHALL FILE ALL REQUIRED DRAWINGS AND HYDRAULIC CALCULATIONS WITH THE BUILDING DEPARTMENT AND BE RESPONSIBLE FOR OBTAINING FINAL APPROVAL.
- B. ARRANGE FOR INSPECTION AND TESTS OF ANY AND ALL PARTS OF THE WORK AS REQUIRED BY AUTHORITIES HAVING JURISDICTION AND PAY ALL CHARGES FOR SAMF.

1.05 INSPECTION AND TESTING

- A. THE SPRINKLER SYSTEM SHALL BE INSPECTED AND TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF THE NEW YORK CITY BUILDING CODE FIRE DEPARTMENT INSPECTOR.
- B. THE SPRINKLER SYSTEM SHALL BE SUBJECTED TO A HYDROSTATIC PRESSURE TEST FOR A PERIOD OF TWO HOURS AT A PRESSURE OF AT LEAST 200 PSIG OR 50 PSI IN EXCESS OF THE MAXIMUM PRESSURE TO BE MAINTAINED WHEN THE MAXIMUM PRESSURE IN THE SYSTEM IS IN EXCESS OF 150 PSI AS PER NFPA.
- C. THE BUILDING DEPARTMENT SHALL BE NOTIFIED THAT THE SYSTEM IS READY FOR INSPECTION AND TESTING. THE BUILDING DEPARTMENT INSPECTOR SHALL WITNESS THE TEST. FINAL APPROVAL OF THE SPRINKLER SYSTEM SHALL BE OBTAINED FROM BUILDING DEPARTMENT, AND FIRE DEPARTMENT.
- PART 2 MATERIALS

2.01 GENERAL

- A. THE SPRINKLER SYSTEM SHALL BE COMPLETE WITH ALL PIPES, FITTINGS, VALVES, DRAINAGE SYSTEM, HANGERS AND SUPPORTS, ALL MISCELLANEOUS WORK ITEMS, SUCH AS SIGNS, VALVE TAGS, ETC., AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR COMPLETE AND APPROVED TYPE SYSTEM THAT IS READY FOR FUTURE EXTENSION.
- B. ALL PIPE, FITTINGS, HANGERS, SUPPORTS, SPRINKLER HEADS, ETC., SHALL CONFORM TO THE NEW YORK CITY BUILDING CODE AND NATIONAL FIRE PROTECTION ASSOCIATION'S REQUIREMENTS AS TO TYPES OF MATERIALS, ARRANGEMENT, SIZES AND INSTALLATION. PIPING PENETRATING FIRE RATED PARTITIONS SHALL HAVE OPENING SEALED WITH U.L. APPROVED FIRESTOP SEALANT.

2.02 SPRINKLER PIPING

- A. ALL SPRINKLER PIPING ON BASEMENT, 1ST LEVEL & VERTICAL RISERS SHALL BE SCHEDULE 40, THREADED IN ACCORDANCE WITH NFPA 13-2016. PIPE SHALL BE UL/FM APPROVED.
- B. STEEL PIPE SHALL BE BETHLEHEM STEEL CO., ALLIED TUBE, BERGER INDUSTRIES OR APPROVED EQUIVALENT.
- C. AS PER NFPA 13. FITTINGS USED IN SPRINKLER SYSTEMS SHALL BE OF THE MATERIALS LISTED IN TABLE 6.4.1. FITTING SHALL BE UL/FM APPROVED. CONTRACTOR.
- NONMETALLIC PIPES & FITTINGS USED IN MULTIPURPOSE PIPING SYSTEMS NOT EQUIPPED WITH A FIRE DEPARTMENT CONNECTION SHALL BE DESIGNED TO 2.11 PRESSURE GAUGE WITHSTAND A WORKING PRESSURE OF NOT LESS THAN 130PSI AT 120°F.

2.03 CUTTING AND PATCHING

- 1. DO ALL CUTTING AND CORE DRILLING NECESSARY FOR THE INSTALLATION OF SPRINKLER WORK. ACCURATELY LAYOUT WORK FOR WHICH CUTTING IS REQUIRED. PATCH AND RESTORE ANY DAMAGE WORK TO LIKE NEW CONDITION.
- 2. FOR REPLACEMENT OF THE WORK REMOVED, MATCH EXISTING IN NATURE, CONSTRUCTION AND FINISH.
- MAINTAIN THE PREMISES FREE FROM ACCUMULATION OF WASTE MATERIAL OR RUBBISH COVERED BY THE WORK, REMOVE ALL SURPLUS MATERIALS, TOOLS ETC. AND LEAVE PREMISES CLEAN.

2.04 FIRE STOPPING

INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE MANUFACTURERS PUBLISHED DIRECTIONS AND PER FIRE TESTED DESIGNS THAT HAVE BEEN ACCEPTED BY THE APPROPRIATE CODE AUTHORITY HAVING JURISDICTION.

2.05 PHASING

PHASING SHALL BE COORDINATED BETWEEN THE SPRINKLER CONTRACTOR AND GENERAL CONTRACTOR. SPRINKLER INSTALLATION SHALL BE PHASED IN A MANNER WHICH WILL ALLOW FULL OCCUPANCY OF THE EXISTING FACILITY WHILE THE INSTALLATION IS IN PROGRESS.

2.05 ALTERNATES/SUBSTITUTIONS

CONTRACTOR SHALL STATE IN THEIR PROPOSAL ANY CONTRACTOR PROPOSED SUBSTITUTIONS OF THE MATERIALS OR METHODS OF INSTALLATION FROM THAT SPECIFIED. THESE ALTERATIONS SHALL BE LISTED ON THE PROPOSAL AS CONTRACTOR ALTERNATIVE.

TESTING PERIODS OF THE SPRINKLER SYSTEM FOR ANY LOSS OR DAMAGE TO THE WORK OF OTHERS, TO THE BUILDING, IT'S CONTENTS ETC. CAUSED BY LEAKS IN THE EQUIPMENT. BY UNPLUGGED OR DISCONNECTED PIPES, FITTINGS ETC. OR BY OVERFLOW, AND SHALL PAY FOR THE NECESSARY REPLACEMENTS OR REPAIRS TO THE WORK OF OTHERS, DAMAGED BY SUCH LEAKAGE.

2.07 INSERTS, HANGERS, ETC.

- PERFORMED IN ACCORDANCE WITH REQUIREMENTS OF NFPA #13, AND NYS A. ALL SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED AND SHALL COMPLY WITH THE STANDARDS FOR THE NATIONAL FIRE PROTECTION ASSOCIATION FOR THE INSTALLATION OF SPRINKLER SYSTEMS AND AS REQUIRED BY THE NEW YORK CITY BUILDING CODE 2022.
 - B. HANGERS AND THEIR COMPONENTS SHALL BE FERROUS. HANGERS SHALL BE ADJUSTABLE FLAT IRON TYPE OF CLEVIS TYPE.
 - C. SPRINKLER PIPING OR HANGERS SHALL NOT BE USED TO SUPPORT NON-SYSTEM COMPONENTS.
 - SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING D. STRUCTURE WHICH MUST SUPPORT THE ADDED LOAD OF THE WATER-FILLED PIPE PLUS A MINIMUM OF 250 LBS. APPLIED AT THE POINT OF HANGING. CONTRACTOR SHALL SUBMIT DETAIL OF SUPPORT FOR REVIEW AND APPROVAL.
 - SPRINKLER PIPING SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SHEATHING.
 - WHEN SPRINKLER PIPING IS INSTALLED BELOW DUCTWORK, PIPING SHALL BE F SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE, NOT FROM THE DUCTWORK.
 - MAXIMUM DISTANCE BETWEEN HANGERS SHALL NOT EXCEED 12 FT. FOR 1 AND G. 1-1/4" SIZES NOR 15' FOR SIZES 1-1/2" AND LARGER. H. EXPANSION SHIELDS FOR SUPPORTING PIPES UNDER CONCRETE CONSTRUCTION
 - MAYBE USED IN A HORIZONTAL POSITION IN THE SIDES OF BEAMS. IN CONCRETE HAVING GRAVEL OR CRUSHED STONE AGGREGATE, EXPANSION SHIELDS MAY BE USED IN THE VERTICAL POSITION TO SUPPORT PIPES 4" OR LESS IN DIAMETER.

2.08 ESCUTCHEONS

PARTITIONS, FLOORS AND CEILINGS. ESCUTCHEON SHALL BE HELD IN PLACE BY INTERNAL TENSI<mark>ON</mark> OR SET SCREW. 2.09 AS-BUILT DRAWINGS

PREPARE AND SUBMIT "AS BUILT" DRAWINGS AT THE COMPLETION OF THE PROJECT. 2.10 SPRINKLER HEADS

SPRINKLERS SHALL BE RATED FOR ORDINARY TEMPERATURES (135/165 DEG. F) EXCEPT AS REQUIRED NEAR HEATERS OR LOCATIONS WHERE ELEVATED TEMPERATURES MAY NORMALLY BE EXPECTED OR AS OTHERWISE INDICATED ON THE CONTRACT DRAWINGS.

- THE SPRINKLER CONTRACTOR SHALL BE RESPONSIBLE DURING THE INSTALLATION AND

- PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS,

- B. SPRINKLER HEADS SHALL BE BY TYCO SPRINKLER CO., INC. MANUFACTURE OR APPROVED EQUAL, UL AND FM APPROVED, AS FOLLOWS:
- SPRINKLER HEADS IN FINISHED CEILINGS WITH CONCEALED PIPING SHALL BE AUTOMATIC TYCO MODEL TY3251.
- 2. DRY SPRINKLER HEADS SHOULD BE AUTOMATIC TYCO MODEL TY3255.
- 3. PROVIDE SPARE SPRINKLER EMERGENCY CABINETS CONFORMING TO NFPA 13–2016.
- 4. SPRINKLER EMERGENCY CABINETS SHALL BE OF TYCO SPRINKLER CO., INC. OR APPROVED EQUAL, UL AND FM APPROVED.
- A. ASHCROFT SERIES 1079, OR APPROVED OTHER, 4–1/2" DIAMETER, 0–300 P.S.I. RANGE, 5 PSI INTERVALS.
- PART 3 EXECUTION
- 3.01 GUARANTEE
- A. GUARANTEE FOR A PERIOD OF ONE (1) YEAR FORM THE DATE OF ACCEPTANCE BY THE OWNER, ALL MATERIALS, APPARATUS AND WORKMANSHIP WHETHER FURNISHED BY HIMSELF OR BY HIS SUBCONTRACTORS AND HE SHALL REPLACE OR REPAIR IN A MANNER APPROVED BY THE ARCHITECTS, WITHOUT COST TO THE OWNER, ANY PART OR PARTS OF THE WORK WHICH MAY PROVE DEFECTIVE OR UNSATISFACTORY WITH IN THE PERIOD OF THE GUARANTEE.
- 3.02 INSTALLATION
- A. PIPING
- 1. SPRINKLER PIPING SHALL BE INSTALLED SO THAT THE SYSTEM CAN BE DRAINED.
- 2. PIPE SHALL BE REMOVED BY REAMING.
- 3. BEFORE INSTALLING PIPE, THOROUGHLY CLEAN THE INSIDE FREE OF CUTTING AND FOREIGN MATTER. CUT ALL PIPE SQUARE AND SMOOTH AND MAKE UP ALL JOINTS TO REQUIRED LIMITS.
- B. PIPE JOINTS
- THREADED JOINTS SHALL BE MADE UP OF TIGHT USING PIPE JOINT TEFLON COMPOUND OR TAPE, APPLIED ON THE MALE THREADS ON

- 1. CONTRACTOR TO FIELD VERIFY TO INSTALL ALL SPRINKLER HEADS TO BE MAX. 12" FROM CEILING.
- 2. ALL NEW SPRINKLER HEADS LOCATION TO BE COORDINATED WITH LIGHTING AND DIFFUSERS TO AVOID CONFLICT.
- 3. ALL SPRINKLER HEADS & PIPING TO BE COORDINATED WITH EXISTING & NEW
- SERVICES. 4. ANY WORK SHOWN ON THE DRAWINGS AND NOT PARTICULARLY DESCRIBED IN THE SPECIFICATIONS OR DETAILS, OR ANY WORK WHICH MAY BE DEEMED NECESSARY TO
- COMPLETE THE CONTRACT SHALL BE PROVIDED BY THE CONTRACTOR AS PART OF THIS CONTRACT.
- 5. FOR PURPOSES OF CLEARNESS AND LEGIBILITY, SPRINKLER DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND SIZE AND LOCATION OF EQUIPMENT ARE DRAWN TO SCALE WHEREVER POSSIBLE. THE DRAWINGS INDICATE SIZE, CONNECTION POINTS, AND ROUTED OF PIPES. IT IS NOT INTENDED, HOWEVER, THAT ALL OFFSETS, RISES AND DROPS ARE SHOWN. PROVIDE PIPING AS REQUIRED TO FIT STRUCTURE, AVOID OBSTRUCTIONS, AND RETAIN CLEARANCES, HEADROOM OPENINGS AND PASSAGEWAYS. ALL SPRINKLER PIPING AT CEILING SHALL BE ROUTED TIGHT TO
- EXISTING SLAB AS REQUIRED. 6. CONTRACTOR TO FIELD VERIFY FEASIBILITY OF SLAB PENETRATION IF REQUIRED AS PER STRUCTURAL REQUIREMENT.
- ALL SPRINKLER HEADS & PIPING TO BE COORDINATED WITH EXISTING & NEW SERVICES.
- CONTRACTOR TO FIELD VERIFY EXACT LOCATION AND SIZE OF EXISTING SYSTEM AND RELOCATE HEADS WHEREVER SHOWN.
- ALL PENDANT SPRINKLERS MUST BE SPACED AS FOLLOWS -MAXIMUM 7.5' FROM WALL
- MAXIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 15'.
- MINIMUM DISTANCE BETWEEN 2 SPRINKLER HEADS IS 6'. COVERAGE AREA PER SPRINKLER SHALL BE MAX. 150 SQ.FT.
- 10. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
- 11. AUXILIARY DRAIN SHALL BE PROVIDED AT THE TRAPPED SECTIONS. 12. ALL EXISTING SPRINKLER SYSTEM AT THIS FLOOR TO BE DEMOLISHED UNLESS OTHERWISE NOTED.
- 13. FOR SPRINKLER WORK ONLY.

1 ALL BRANCH TAKE-OFF FOR EACH SPRINKLER TO BE MIN. 1".

SPRINKLER COUNT NEW CONCEALED SPRINKLER HEAD 36 HAZARD CLASSIFICATION AND DESIGN DENSITY:

- AREA : OFFICE, RESTROOM, STORAGE
- OCCUPANCY : LIGHT HAZARD
- MINIMUM DESIGN DENSITY : 0.1 GPM/SQ.FT
- AREA : BOOK STORE
- **OCCUPANCY : ORDINARY HAZARD**
- MINIMUM DESIGN DENSITY : 0.15 GPM/SQ.FT

