PLUMBING SYMBOLS LIST

- SANITARY PIPING
- EXISTING SANITARY PIPING
- EXISTING VENT PIPING
- VENT PIPING
- COLD WATER PIPING
- EXISTING COLD WATER PIPING
- HOT WATER PIPING
- HOT WATER RETURN PIPING
- L — LEADER STORM PIPING
- ST — STORM PIPING
- P–TRAP
- PIPE UP
- PIPE DROP
- PLUGGED OUTLET/CLEANOUT
- SHUT–OFF VALVE
- CHECK VALVE
- SLEEVE
- BALANCING VALVE

PLUMBING ABBREVIATIONS

CO	CLEANOUT
CODP	CLEAN OUT DECK PLATE
CW	COLD WATER
HW	HOT WATER
HWR	HOT WATER RETURN
HWHT	HOT WATER HEATER
SAN	SANITARY
S	SOIL
ST	STORM
V	VENT
W	WASTE
LAV	LAVATORY
WC	WATER CLOSET
TYP.	TYPICAL
DN	DOWN
AFF	ABOVE FINISH FLOOR
PD	PUMP DISCHARGE
SQ. FT.	SQUARE FEET
SH	SHOWER
KS	KITCHEN SINK
DW	DISH WASHER
RD	ROOF DRAIN
OD	OVERFLOW DRAIN
CFRD	CONTROL FLOW ROOF DRAIN
EX	EXISTING
FD	FLOOR DRAIN

BUILDING DEPARTMENT PLUMBING NOTES

1. ALL PLUMBING SYSTEMS (SANITARY, WASTE, VENT WATER DISTRIBUTION SYSTEMS) AND ASSOCIATED EQUIPMENT SHALL BE INSTALLED, OPERATED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF 2014 THE NEW YORK CITY PLUMBING CODE (NYCPC).
2. PROTECTION OF PIPING AND PLUMBING SYSTEM COMPONENTS AS PER SECTION PC 305.
3. TRENCHING, EXCAVATION AND BACKFILL AS PER SECTION PC 306.
4. RODENT PROOFING AS PER PC 304
5. MATERIALS USED IN PLUMBING SYSTEMS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 303, PC 605, PC 702, PC 902,PC 1102.
6. EQUIPMENT CONNECTIONS AND JOINING OF PIPING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTERS 4, 5, 6, 7 AND 9.
7. DRAINAGE PIPE CLEANOUTS AS PER SECTION PC 708.
8. VERTICAL AND HORIZONTAL PIPING SHALL BE SUPPORTED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION PC 308
9. WATER SUPPLY SYSTEMS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 6 SECTION PC 601–603, 604, 606, 607, 608, 610
10. THE SANITARY DRAINAGE SYSTEM SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 7 SECTION PC 701, 704, 705, 706, 707, 708, 711.
11. VENT PIPING FOR THE SANITARY DRAINAGE SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 9 SECTIONS PC 901 THROUGH PC 912 THROUGH PC 917
12. THE STORM DRAINAGE PIPING SHALL BE SIZED AND INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 11 SECTION PC 1101 THROUGH 1113.

PLUMBING DRAWING LIST

PLUMBING SPECIFICATIONS:

1. BASIC PLUMBING REQUIREMENTS, MATERIALS AND METHODS

1.01 SCOPE

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

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

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

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

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

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

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

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

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

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

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

1.02 SUBMITTALS

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

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

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

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

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

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

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

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

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

1.03 SUBSTITUTIONS

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

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

1.04 DEFINITIONS

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

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

C. PROVIDE: TO FURNISH AND INSTALL.

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

E. REFER TO THE NATIONAL STANDARD PLUMBING CODE FOR ADDITIONAL DEFINITIONS.

1.05 DRAWINGS

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

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

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

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

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

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

1.06 PRODUCTS

A. SANITARY AND VENT PIPING:

1. ABOVE GRADE PIPING SHALL BE HUBLESS CAST IRON PIPE WITH STAINLESS STEEL COUPLINGS AND ELASTOMERIC GASKETS WITH A MINIMUM 4 BANDS PER COUPLING.
2. SLOPE OF DRAINAGE SYSTEM SHALL BE 1/8" PER FOOT OF RUN FOR PIPE OVER 3" (I.D.) AND 1/4" PER FOOT OF RUN FOR PIPE 3" AND SMALLER (I.D.). VENT PIPING SHALL BE PITCHED TO DRAIN.
3. PVC OR OTHER COMBUSTIBLE PLASTIC PIPING SHALL NOT BE INSTALLED IN CEILING PLENUM SPACES.
4. ALL CAST IRON SOIL PIPE AND FITTINGS SHALL BE MARKED WITH THE COLLECTIVE TRADEMARK OF THE CAST IRON SOIL PIPE INSTITUTE (CISPI) AND BE LISTED BY NSF INTERNATIONAL.

B. DOMESTIC WATER PIPING:

1. ABOVE GRADE WATER PIPING SHALL BE TYPE 'L' HARD–DRAWN COPPER TUBE.
2. FITTINGS IN DOMESTIC WATER PIPING SHALL BE WROUGHT COPPER OR CAST BRASS.
3. JOINTS SHALL BE MADE WITH LEAD–FREE SOLDER.
4. THE ENTIRE DOMESTIC WATER DISTRIBUTION SYSTEM SHALL BE INSULATED INCLUDING ALL VALVES, FITTINGS, ETC.
5. COMPLY WITH NSF 61 FOR MATERIALS FOR WATER–SERVICE PIPING AND SPECIALTIES FOR DOMESTIC WATER.
6. ALL DOMESTIC WATER PIPING ABOVE GRADE SHALL BE INSULATED WITH FIRE–RETARDANT, FACTORY–APPLIED JACKET. PROVIDE COLD WATER PIPING WITH FACTORY–APPLIED VAPOR BARRIER. INSULATION REQUIREMENT SHOULD COMPLY WITH NYC ENERGY CONSERVATION CODE 2016 SECTION C403.2.10 REFER BELOW TABLE.

MINIMUM PIPE INSULATION THICKNESS

FLUID OPERATING TEMPERATURE RANGE AND USAGE (°F)	INSULATION CONDUCTIVITY		NOMINAL PIPE OR TUBE SIZE (INCHES)				
	CONDUCTIVITY BTU· IN./(H· FT2· °F)	MEAN RATING TEMPERATURE, °F	<1	1 to < 1½	1½ to < 4	4 to < 8	<8
105–140	0.21–0.28	100	1.0	1.0	1.5	1.5	1.5
40–60	0.21–0.27	75	0.5	0.5	1.0	1.0	1.0

7. WATER DISTRIBUTION SYSTEM AS PER NYC ENERGY CONSERVATION CODE 2016 C404.7, HAVING ONE OR MORE RECIRCULATION PUMPS THAT PUMP WATER FROM A HEATED–WATER SUPPLY PIPE BACK TO THE HEATED–WATER SOURCE THROUGH A COLD–WATER SUPPLY PIPE SHALL BE A DEMAND RECIRCULATION WATER SYSTEM. PUMPS SHALL HAVE CONTROLS THAT COMPLY WITH BOTH OF THE FOLLOWING:
   a. THE CONTROL SHALL START THE PUMP UPON RECEIVING A SIGNAL FROM THE ACTION OF A USER OF A FIXTURE OR APPLIANCE, SENSING THE PRESENCE OF A USER OF A FIXTURE OR SENSING THE FLOW OF HOT OR TEMPERED WATER TO A FIXTURE FITTING OR APPLIANCE.
   b. THE CONTROL SHALL LIMIT THE TEMPERATURE OF THE WATER ENTERING THE COLD–WATER PIPING TO 104°F (40°C).

7A. AS PER NYC ENERGY CONSERVATION CODE 2016 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.

8. HW SYSTEM PIPING IS DESIGNED AS PER MAXIMUM ALLOWED PIPE LENGTH METHOD AS PER NYC ECC C404.5.1. THE HW PIPE LENGTH FROM THE NEAREST SOURCE OF HEATED WATER TO THE TERMINATION OF THE FIXTURE SUPPLY PIPE SHALL BE AS PER FOLLOWING TABLE.

NOMINAL PIPE SIZE (INCHES)	MIXIMUM PIPING LENGTH (FEET)	
	PUBLIC LAV	OTHER FIXTURES
½"	2'	20'
¾"	0.5'	20'
1"	0.5'	13'
1¼"	0.5'	8'
1½"	0.5'	6'
2" OR LARGER	0.5'	4'

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

C. PRESS JOINERY SYSTEM:

a. FITTINGS ½" – 4":

1. WHERE APPROVED BY THE LOCAL JURISDICTION, THE NIBCO PRESS SYSTEM MAY BE USED AT THE CONTRACTOR'S OPTION FOR THE FOLLOWING BUILDING SERVICES PIPING –20°F TO +250°F UP TO 200 PSI:
   - HOT AND COLD DOMESTIC WATER; FITTINGS AND VALVES SHALL BE NSF–61 APPROVED.
   - POTABLE WATER; FITTINGS AND VALVES SHALL BE NSF–61 APPROVED.
   - HOT WATER HEATING SERVICE

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 G AND COMPLY WITH SECTION 116875 OF THE CALIFORNIA HEALTH AND SAFETY CODE 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 C87850. THE PRESS FITTINGS CONNECTIONS SHALL BE COMPATIBLE WITH 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 TEMPERATURES OF –20°F AND +250°F. ELASTOMERIC SEALS WITH LEAK DETECTION DESIGN SHALL BE MADE OF EPDM MATERIAL, AND THE FITTINGS 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 PRESSING TOOLS AND JAW SETS RECOMMENDED AND AUTHORIZED BY NIBCO. ALL FITTINGS, VALVES AND TOOLS SHALL BE PROVIDED BY SAME MANUFACTURER; NIBCO.

b. VALVES 2" AND SMALLER: BALL VALVES: (ON/OFF, ISOLATION OR THROTTLING)

1. BALL VALVES (STAINLESS STEEL BALL AND STEM) WITH MALE OR 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 CONSTRUCTED OF DEZINCIFICATION–RESISTANT (DZR) BRONZE 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 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 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.
   - 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

c. CHECK VALVES: (BACKFLOW PREVENTION)

1. 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

d. BUTTERFLY VALVES 2–1/2" – 4", (ON/OFF, ISOLATION OR THROTTLING)

1. 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)

D. DOMESTIC WATER HEATER (ELECTRIC)

1. HEATER SHALL GALLON CAPACITY PER SCHEDULE 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.

E. MIXING VALVES

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

2. TYPES A, C & D VALVES: VALVE SHUTS OFF IN FULL COLD POSITION AND MUST PASS THROUGH COLD RANGE BEFORE DELIVERING WARM, AND/OR HOT WATER. TEMPERATURE LIMIT SET AT 105°F MAXIMUM DELIVERY TEMPERATURE. IF ONE SUPPLY SHOULD FAIL, THE OTHER WILL AUTOMATICALLY AND INSTANTLY SHUT DOWN. DELIVERY CAPACITY IS 5GPM @ 45 PSIG DIFFERENTIAL.

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

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

A. HANGERS AND SUPPORTS:

1. HANGERS SHALL BE STANDARD STEEL, MALLEABLE OR WROUGHT IRON, AS MANUFACTURED BY GRINNELL OR APPROVED EQUAL, SUITABLE FOR THE TYPE OF CONSTRUCTION. PIPING SHALL NOT BE HUNG FROM OTHER PIPE.

2. SECTIONS OF INDIVIDUAL PIPE RUNS SHALL BE SUPPORTED BY CLEVIS HANGERS.

3. ALL EQUIPMENT SHALL BE PROVIDED WITH APPROVED SUPPORTS.

4. PROVIDE SEISMIC RESTRAINTS IN ACCORDANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS AND THE REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.

5. UNLESS OTHERWISE INDICATED OR REQUIRED BY AUTHORITIES HAVING JURISDICTION, THE FOLLOWING SHALL BE PROVIDED WITH SEISMIC RESTRAINTS AS REQUIRED BY THE BOCA NATIONAL BUILDING CODE, SECTION 1610.6.4: ALL EQUIPMENT AND MACHINERY, ALL NEW PIPING 2–1/2" AND LARGER (1–1/4" AND LARGER INBOILER/MECHANICAL ROOMS) WITH HANGERS GREATER THAN 12" IN LENGTH FROM THE TOP OF PIPE TO THE STRUCTURE.

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

B. VALVES:

1. PROVIDE GATE VALVES, BUTTERFLY OR BALL VALVES FOR SHUT–OFF DUTY ON MAIN AND BRANCH SUPPLY LINES. FOR ALL PIPE RUNS 2" AND SMALLER, PROVIDE BALL FOR ALL PIPE RUNS LARGER THAN 2" AND SMALLER THAN 4", PROVIDE GATE VALVES. PIPING 4" AND LARGER, PROVIDE BUTTERFLY VALVES FOR SHUT–OFF DUTY.

2. ALL FIXTURES WITH THE EXCEPTION O FLUSHOMETER–EQUIPPED WATER CLOSETS AND URINALS SHALL HAVE STOP VALVES TO CONTROL SUPPLY TO THE FIXTURE. WHERE SUPPLIES ARE EXPOSED PROVIDE CHROME–PLATED STOPS WITH CHROME–PLATED ESCUTCHEONS ON PIPING PENETRATIONS.

3. ALL PLUMBING FIXTURES AND EQUIPMENT TO HAVE SHUT–OFF.

VALVES ON SUPPLY LINES.

4. ALL BRANCH LINES TO HAVE SHUT–OFF VALVES.

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

6. PROVIDE GLOBE VALVES FOR THROTTLING/BALANCING OF THE HOT WATER CIRCULATING SYSTEM.

C. SLEEVES AND ESCUTCHEONS:

1. SLEEVES THROUGH STRUCTURAL CONCRETE MEMBERS AND SLEEVES FOR WALLS BELOW GRADE AND FLOORS ON GRADE SHALL BE STANDARD WEIGHT GALVANIZED SCHEDULE 40 STEEL PIPE. SLEEVES THROUGH OTHER THAN STRUCTURAL COMPONENTS OF THE BUILDING SHALL BE 20 GAGE GALVANIZED SHEET METAL WITH LOCK SEAM JOINTS. USG THERMAFIBER SAFING INSULATION SHALL BE INSTALLED BETWEEN PIPE AND SLEEVE.

2. PIPE ESCUTCHEON PLATES SHALL BE INSTALLED WHERE EXPOSED PIPING PASSES THROUGH WALLS, CEILINGS, AND FLOORS AND SHALL BE MINIMUM 20 GAGE STEEL. PROVIDE CHROME PLATED ESCUTCHEON PLATES IN FINISHED AREAS.

M. DRAINAGE ACCESSORIES

1. GENERAL:

a. INSTALL THE WORK OF THIS SECTION IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS, UNLESS OTHERWISE SPECIFIED.

b. SECURE EXTERNAL COMPONENTS IN PLACE WITH VANDAL RESISTANT FASTENERS OR DEVICES WHICH CANNOT BE REMOVED WITHOUT SPECIAL TOOLS.

2. DEVICES:

a. CLEANOUT & CLEANOUT PLUG

- THREADED PIPE FITTING OR CAST IRON FERRULE WITH GAS TIGHT CLEANOUT PLUG
- PLUG SHOULD BE CAST BRASS OR BRONZE, WITH THREADED END, AND RAISED OR COUNTERSUNK HEAD.
- LUBRICATE THREADS OF CLEANOUT PLUG WITH ANTI–SEIZE LUBRICANT BEFORE FINAL INSTALLATION.

b. CLEANOUT WALL PLATE

- IT SHOULD BE ROUND, STAINLESS STEEL OR POLISHED CHROME PLATED BRONZE COVER PLATE WITH STAINLESS STEEL VANDAL RESISTANT FASTENER TO SECURE TO CLEANOUT PLUG.

c. CLEANOUT DECK PLATE

- IT SHOULD BE STANDARD DUTY FLOOR CLEANOUT FITTING WITH COATED CAST IRON BODY; ROUND, POLISHED NICKEL BRONZE SCORIATED TOP SECURED TO CLEANOUT PLUG WITH STAINLESS STEEL VANDAL RESISTANT FASTENER; THREADED HEIGHT ADJUSTMENT, CAST IRON HEAD, GAS TIGHT CLEANOUT PLUG, AND CONNECTION TO MATCH PIPING OPTION SELECTED.

d. HOUSE TRAP

- SERVICE WEIGHT CAST IRON SOIL PIPE RUNNING TRAP WITH BELL AND SPIGOT ENDS AND TWO CLEANOUT HUBS.

e. FRESH AIR INTAKE

- PIPE MATERIAL SHOULD BE SAME AS DRAINAGE SYSTEM AT POINT OF CONNECTION
- GRILLE FREE AREA SHOULD BE AT LEAST EQUAL TO CROSS–SECTION AREA OF PIPE TO WHICH CONNECTION MADE AND MADE OF POLISHED NICKEL BRONZE, WITH REMOVABLE GRATE, EITHER PERFORATED OR BAR TYPE. GRATE ATTACHED TO GRILLE BODY WITH VANDAL RESISTANT FASTENER.

3. INDIRECT WASTE FUNNEL

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

N. 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.

O. VERIFY EXACT LOCATIONS OF ALL EXISTING UTILITIES.

P. 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.

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

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

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

T. VENT PENETRATIONS THROUGH THE ROOF SHALL BE FLASHED.

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

V. PROVIDE DIELECTRIC FITTINGS BETWEEN DISSIMILAR METALS.

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

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

Y.

Z. ANY PENETRATIONS THROUGH FIRE RATED PARTITIONS, FLOORS, OR CEILINGS SHALL BE STEEL SLEEVED AND SEALED WITH 3M BRAND UL RATED FIRE BARRIER CAULK OR APPROVED EQUAL.

AA. WHEN THE WATER PIPING SYSTEM IS COMPLETE, THOROUGHLY FLUSH ALL DIRT, SEDIMENT, SOLDER, ETC., OUT OF THE SYSTEM, REMOVING ALL STRAINERS, VALVE STEM SEATS, ETC., REQUIRED TO ACCOMPLISH THE FLUSHING.

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

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

AD. 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.

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

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

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

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

2. INSTALLATION

2.01 GENERAL

A. ALL WORK WHICH REQUIRES DISRUPTION OF THE ROOFING SHALL BE DONE BY A CONTRACTOR CERTIFIED BY THE ROOFING MANUFACTURER AS REQUIRED TO MAINTAIN ANY EXISTING ROOF WARRANTIES.

B. EXTERIOR INSTALLATIONS TO BE WEATHER PROOF IN ALL RESPECTS.

C. EXTERIOR MATERIALS AND EQUIPMENT SHALL BE PAINTED TO PREVENT CORROSION, COLOR PER ARCHITECT.

D. COORDINATE THE PLUMBING WORK WITH ALL OTHER AFFECTED WORK AND THE CONSTRUCTION SCHEDULE.

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

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

G. PREPARE PIPING CONNECTIONS TO EQUIPMENT WITH FLANGES AND UNIONS.

H. COORDINATION WITH THE WORK OF OTHER TRADES IS REQUIRED. PROVIDE OFFSETS IN PIPING SYSTEMS OR MINOR DEVIATIONS TO THE INDICATED PIPE ROUTING IN ORDER TO COORDINATE THE PLUMBING WORK WITH THE WORK OF ALL OTHER TRADES AND THE GENERAL BUILDING CONDITIONS.

I. NO DOMESTIC WATER PIPING SHALL BE INSTALLED IN UNHEATED SPACES.

J. PRIOR TO DISCONNECTING AND CONNECTING NEW WORK TO EXISTING SYSTEMS, THE PLUMBING CONTRACTOR SHALL NOTIFY THE PROPERTY MANAGER AND OFFER A PROPOSED SCHEDULE OF WORK. ESB WILL AUTHORIZE CONNECTIONS AND COORDINATE NECESSARY SHUT DOWNS AND DRAIN DOWNS AS REQUIRED. SHUT DOWNS AND DRAIN DOWNS MAY BE PERFORMED BY THE PLUMBING CONTRACTOR ONLY AFTER RECEIVING ESB AUTHORIZATION, AND SHOULD BE PERFORMED UNDER SUPERVISION OF ESB PERSONNEL. THREE (3) DAYS ADVANCE NOTICE TO THE PROPERTY MANAGER IS REQUIRED.

K. THE PLUMBING CONTRACTOR IS ADVISED THAT DUE TO THE NATURE OF THE OPERATIONS AND TENANT REQUIREMENTS, CONNECTIONS TO EXISTING SYSTEMS MAY HAVE TO BE MADE AFTER REGULAR WORKING HOURS. THE PROPERTY MANAGER WILL ADVISE THE PLUMBING CONTRACTOR OF THE TIME CONSTRAINTS UPON RECEIPT AND APPROVAL OF THE PLUMBING CONTRACTOR'S REQUEST FOR SHUT DOWN AND CONNECTION TO EXISTING SYSTEMS.

L. WHEN CONNECTING TO EXISTING STACKS AND RISERS, PROVISION IS TO BE MADE FOR FUTURE CONNECTIONS BY PROVIDING CAPPED AND VALVED OUTLETS ON DOMESTIC WATER RISERS AND PLUGGED OUTLETS ON THE SANITARY AND VENT STACKS.

2.02 ABOVE GRADE

A. INSTALL PLUMBING PIPING IN ACCORDANCE WITH RECOGNIZED INDUSTRY PRACTICES TO ENSURE THAT PIPING COMPLIES WITH REQUIREMENTS AND SERVES INTENDED PURPOSES.

B. ROUTE PIPING IN AN ORDERLY MANNER, PLUMB AND PARALLEL TO BUILDING STRUCTURE. MAINTAIN GRADIENT. SLOPE PIPING AND ARRANGE SYSTEMS TO DRAIN. IN DOMESTIC WATER SYSTEMS, PROVIDE DRAIN VALVES AT MAIN SHUT–OFF VALVES AND ALL LOW POINTS IN PIPING.

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

2.03 INSULATION

COVER ALL HOT WATER AND HOT WATER RECIRCULATION PIPE WITH 1" THICK FOR PIPE SIZE UP TO 1¼" AND 1½" THICK FOR PIPE SIZE 1½" AND GREATER WITH MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. COVER ALL COLD WATER PIPE WITH ½" THICK FOR PIPE SIZE UP TO 1¼" AND 1" THICK FOR PIPE SIZE 1½" AND GREATER WITH 1" MANVILLE MICRO–LOK AP–T PLUS FIBERGLASS INSULATION. FITTINGS AND VALVES SHALL BE INSULATED WITH MANVILLE ZESTON 2000 PVC INSULAT–ED FITTING COVERS. INSTALL ALL INSULATION AS PER MANUFACTURERS RECOMMENDATIONS. ALL INSULATION MATERIAL SHALL COMPLY WITH THE NEW YORK CITY BUILDING CODE REQUIREMENT OF A FLAME SPREAD RATING NOT TO EXCEED 25 AND A SMOKE DEVELOPED RATING NOT TO EXCEED 50. ALL PIPE INSULATION SHALL COMPLY WITH 2016 NYC ENERGY CONSERVATION CODE.

3. TESTING

A. AT THE COMPLETION OF THE PLUMBING WORK, COMPLETELY TEST THE ENTIRE INSTALLATION OF ALL SYSTEMS FOR PROPER OPERATION AND COMPLIANCE WITH APPLICABLE CODES AND LOCAL REQUIREMENTS. CORRECT ALL DEFICIENCIES FOUND.

B. TESTING OF THE INSTALLED SYSTEMS SHALL BE MADE BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER.

C. THE CONTRACTOR SHALL NOT COVER UP OR PERMANENTLY CONCEAL PIPING, DEVICES OR ANY PORTION OF NEWLY CONSTRUCTED PLUMBING SYSTEM(S) UNTIL SUCH SYSTEM, OR PORTION OF THE SYSTEM, HAS BEEN TESTED IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER AND INSPECTED BY THE LOCAL INSPECTOR AND APPROVED IN WRITING, EXCEPT PIPING PASSING THROUGH FLOORS, WALLS, PARTITIONS, OR BEAMS, FOR DISTANCES EQUAL TO THE THICKNESS OF SUCH FLOOR, WALL, PARTITION OR BEAM.

D. THIS CONTRACTOR SHALL NOTIFY THE VARIOUS DEPARTMENTS, BUREAUS AND INDIVIDUALS AT LEAST TWO WEEKS IN ADVANCE OF THE TIME THAT THE TESTS ARE TO BE CONDUCTED.

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

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

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

4. WARRANTY

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

GENERAL NOTES :

1. ALL GAS RISERS IN APARTMENT 4J, 4I, 4B, 4A, 4E TO BE DEMOLISHED AND CAPPED AT SOURCE.
2. ALL SANITARY, VENT & STORM PIPING ON THIS FLOOR TO RUN IN THE CAVITY SPACE PROVIDED BETWEEN 4TH & 5TH FLOOR.
3. OFFSET ALL EXISTING VENT RISER AND CONNECT TO NEAREST NEW VENT RISERS GOING UP. CONTRACTOR TO FIELD VERIFY EXACT SIZE AND LOCATION.

GENERAL NOTES:

1. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 85 PSI.
2. CONTRACTOR TO COORDINATE WITH THE MECHANICAL CONTRACTOR TO AVOID PIPING IN ACCESS ZONES OF UNIT.
3. ALL WATER PIPING SHOULD BE PROVIDED WITH INSULATION ACCORDING TO NYC ECC 2016. (REFER SHEET P-001.00, SECTION "B" – DOMESTIC WATER PIPING)
4. PROVIDE ACCESS PANEL FOR ALL CONTROL VALVE & CLEAN OUT.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
6. ALL WATER, SANITARY AND VENT PIPING TO RUN INSIDE CABINET ENCLOSURE FOR UNDERCOUNTER FIXTURES.
7. PROVIDE ACCESS FOR ALL CODP.

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES				REMARKS
		SOIL/WASTE	VENT	COLD WATER	HOT WATER	
WC	WALL MOUNTED WATER CLOSET	4" DN	2" UP	1" AFF	–	FLUSH TANK
LAV	LAVATORY	1½" AFF	1½" UP	½" AFF	½" AFF	P–TRAP
KS	KITCHEN SINK	2" DN	1½" UP	¾" AFF	¾" AFF	P–TRAP
DW	DISHWASHER	1" DN	–	–	½" AFF	1" DRAIN TIES TO SINK WITH WYE CONN.
SH	SHOWER	2" DN	1½" UP	¾" AFF	¾" AFF	P–TRAP
WD	WASHER/DRYER	–	–	¾" AFF	¾" AFF	I.W. FROM WM SPILLS INTO 2" STANDPIPE DRAIN

THIS FLOOR IS NOT IN SCOPE

KEYED NOTES:

1. CONTRACTOR TO FIELD VERIFY THE FEASIBILITY OF CONNECTION AND CONNECT NEW STORM AND SANITARY RISERS TO EXISTING HORIZONTAL MAIN PIPES IN CELLAR.

1 4TH FLOOR PLUMBING PLAN
3/16" = 1' - 0"

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES				REMARKS
		SOIL/WASTE	VENT	COLD WATER	HOT WATER	
WC	WALL MOUNTED WATER CLOSET	4" DN	2" UP	1" AFF	–	FLUSH TANK
LAV	LAVATORY	1½" AFF	1½" UP	½" AFF	½" AFF	P–TRAP
KS	KITCHEN SINK	2" DN	1½" UP	¾" AFF	¾" AFF	P–TRAP
DW	DISHWASHER	1" DN	–	–	½" AFF	1" DRAIN TIES TO SINK WITH WYE CONN.
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WD	WASHER/DRYER	2" DN	1½" UP	¾" AFF	¾" AFF	I.W. FROM WM SPILLS INTO 2" STANDPIPE DRAIN

GENERAL NOTES:

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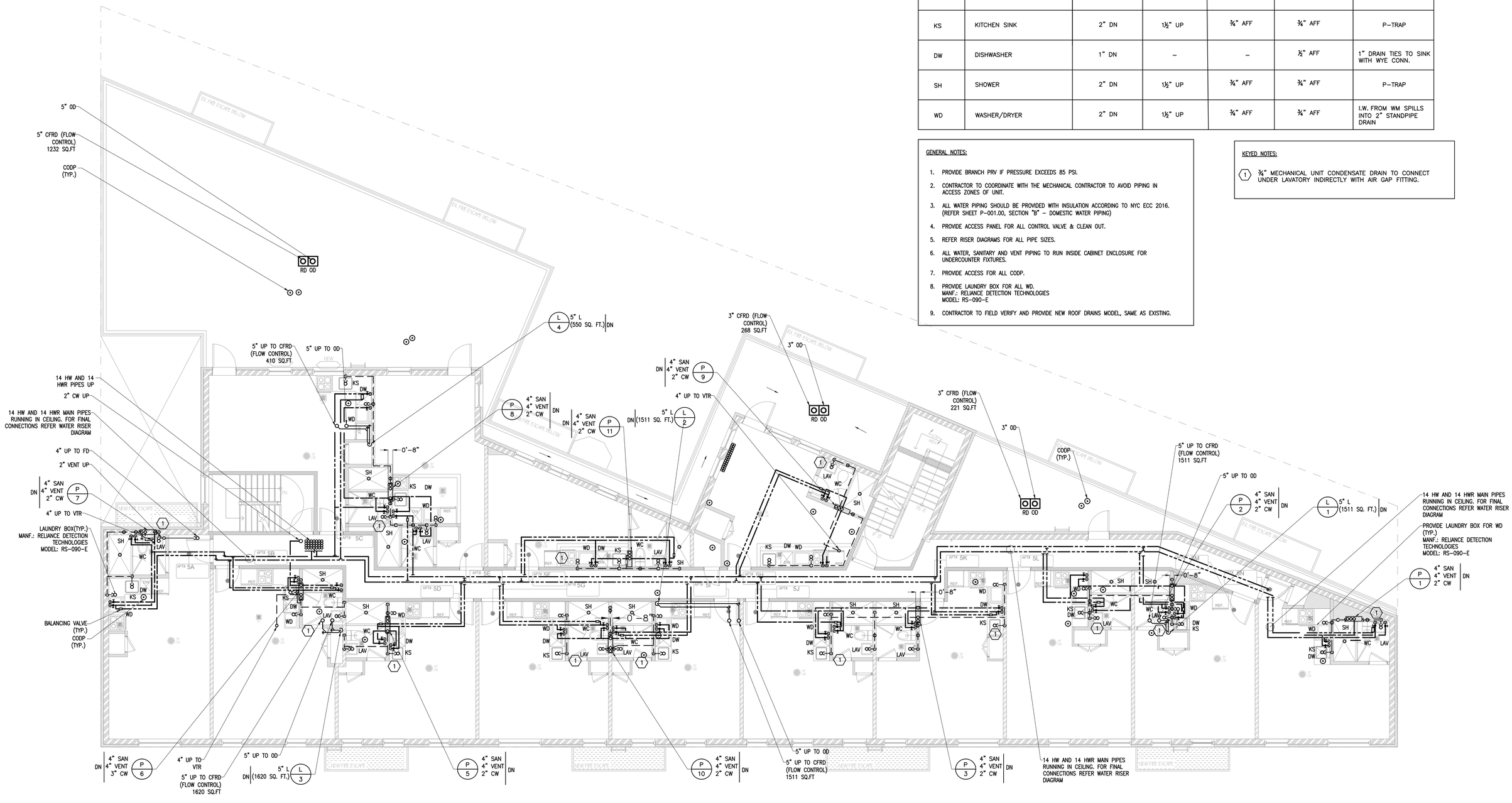
2. CONTRACTOR TO COORDINATE WITH THE MECHANICAL CONTRACTOR TO AVOID PIPING IN ACCESS ZONES OF UNIT.
3. ALL WATER PIPING SHOULD BE PROVIDED WITH INSULATION ACCORDING TO NYC ECC 2016. (REFER SHEET P–001.00, SECTION "B" – DOMESTIC WATER PIPING)
4. PROVIDE ACCESS PANEL FOR ALL CONTROL VALVE & CLEAN OUT.
5. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
6. ALL WATER, SANITARY AND VENT PIPING TO RUN INSIDE CABINET ENCLOSURE FOR UNDERCOUNTER FIXTURES.
7. PROVIDE ACCESS FOR ALL CODP.
8. PROVIDE LAUNDRY BOX FOR ALL WD.
   MANF.: RELIANCE DETECTION TECHNOLOGIES
   MODEL: RS–090–E
9. CONTRACTOR TO FIELD VERIFY AND PROVIDE NEW ROOF DRAINS MODEL, SAME AS EXISTING.

KEYED NOTES:

(1) ¾" MECHANICAL UNIT CONDENSATE DRAIN TO CONNECT UNDER LAVATORY INDIRECTLY WITH AIR GAP FITTING.

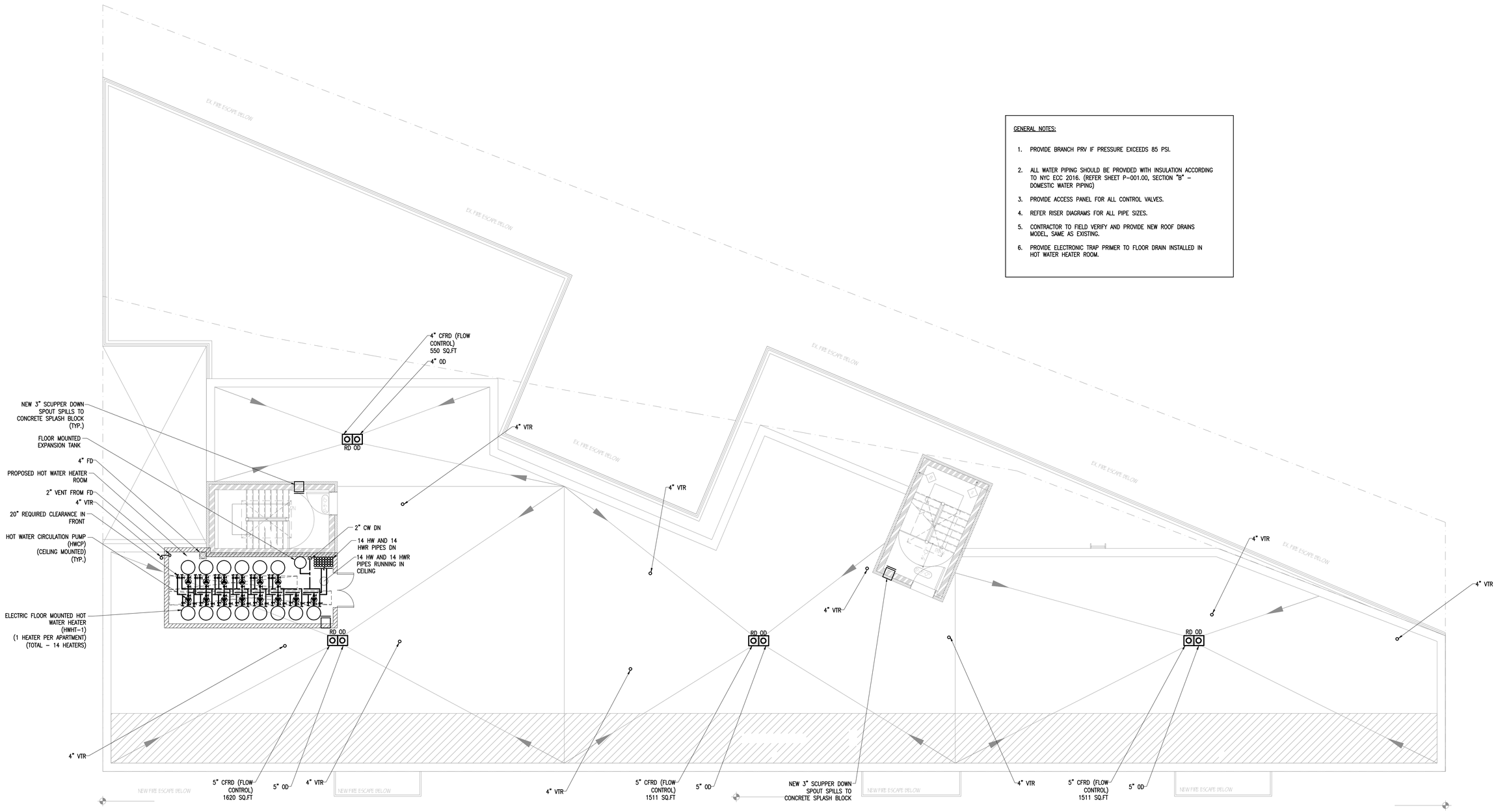


1 5TH FLOOR PLUMBING PLAN

3/16" = 1' - 0"

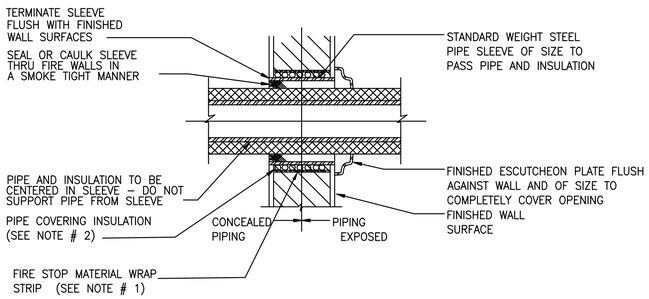
GENERAL NOTES:

1. PROVIDE BRANCH PRV IF PRESSURE EXCEEDS 85 PSI.
2. ALL WATER PIPING SHOULD BE PROVIDED WITH INSULATION ACCORDING TO NYC ECC 2016. (REFER SHEET P-001.00, SECTION "B" – DOMESTIC WATER PIPING)
3. PROVIDE ACCESS PANEL FOR ALL CONTROL VALVES.
4. REFER RISER DIAGRAMS FOR ALL PIPE SIZES.
5. CONTRACTOR TO FIELD VERIFY AND PROVIDE NEW ROOF DRAINS MODEL, SAME AS EXISTING.
6. PROVIDE ELECTRONIC TRAP PRIMER TO FLOOR DRAIN INSTALLED IN HOT WATER HEATER ROOM.

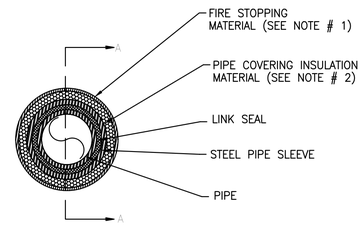


1 ROOF PLUMBING PLAN

3/16" = 1' - 0"

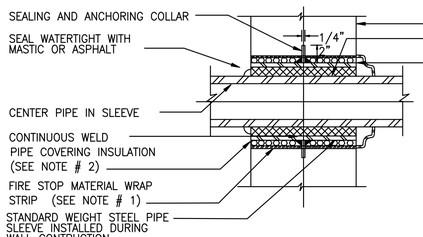


INTERIOR WALLS



PIPE SLEEVE VIEW

NOT TO SCALE



NOTE : PIPE SLEEVE FOR EXTERIOR WALL ABOVE OR BELOW GRADE.

FOR GAS SERVICE EXTEND SLEEVE 1" PAST INSIDE FACE OF WALL & 4" PAST OUTSIDE FACE OF WALL.

EXTERIOR WALLS

PIPE SLEEVE THRU WALL SECTION

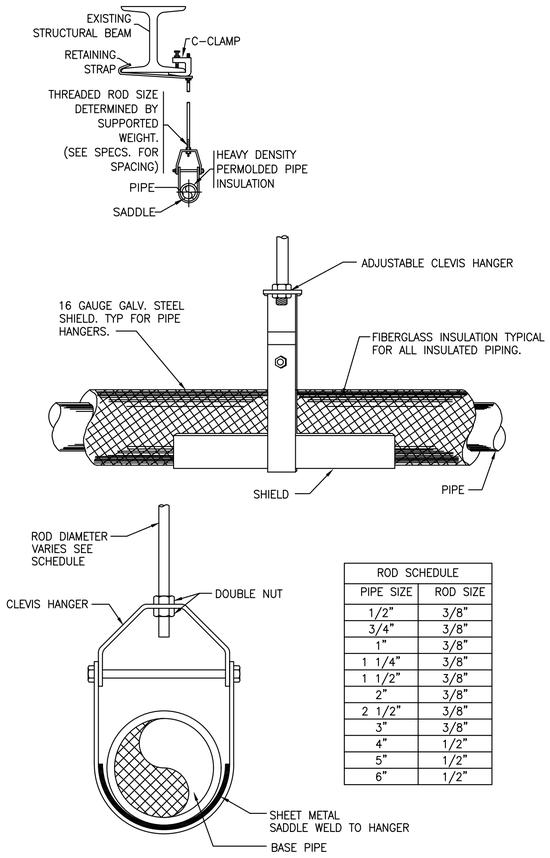
NOT TO SCALE

NOTES:

1. FIRESTOP MATERIAL WRAP STRIP SHALL BE ¼" THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL SUPPLIED IN 2 IN. WIDE STRIPS AND WRAP AROUND THE PIPE AS PER UL MATERIAL LISTED3M COMPANY FS–195+ OR FILL CAVITY WITH CAULK OR SEALANT MIN. ¼" DIA. CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED OF THE WRAP STRIP LAYER APPROX. 3/4" FROM WALL SURFACE. AS PER UL LISTED 3M COMPANY CP25WB+, IC 15WB+, FIRE DAM 150+CAULK.
2. PIPE COVERING INSULATION SHALL BE 2" THICK HOLLOW CYLINDRICAL HEAVY DENSITY GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKETED. AS PER UL CLASSIFICATION AND MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

1 P–501 PIPE SLEEVE THRU WALL SECTION

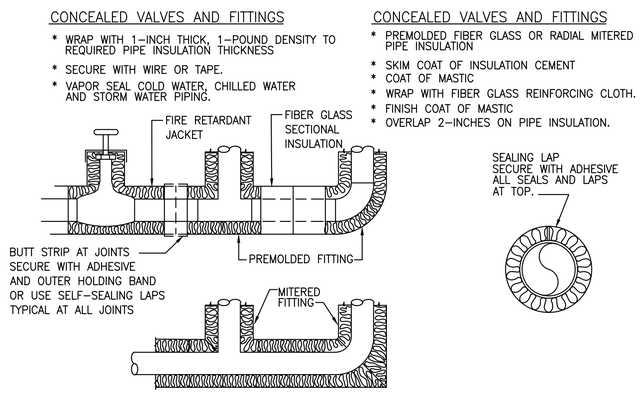
N.T.S



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

2 P–501 HANGER DETAIL

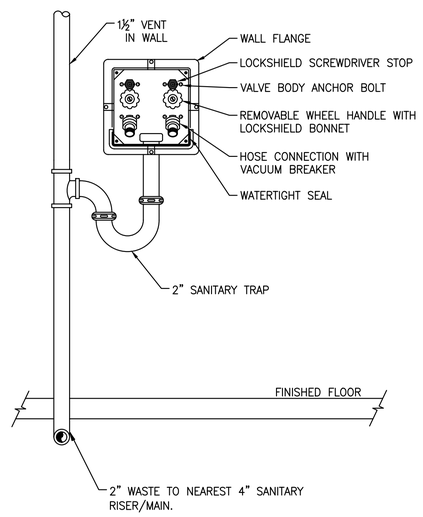
N.T.S



INSULATION OF PIPING, VALVES AND FITTINGS FOR EXPOSED AND CONCEALED LOCATIONS

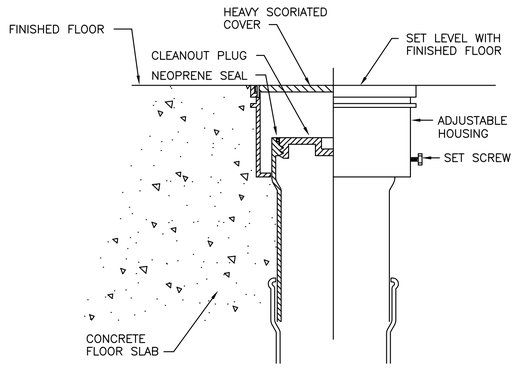
3 P–501

N.T.S

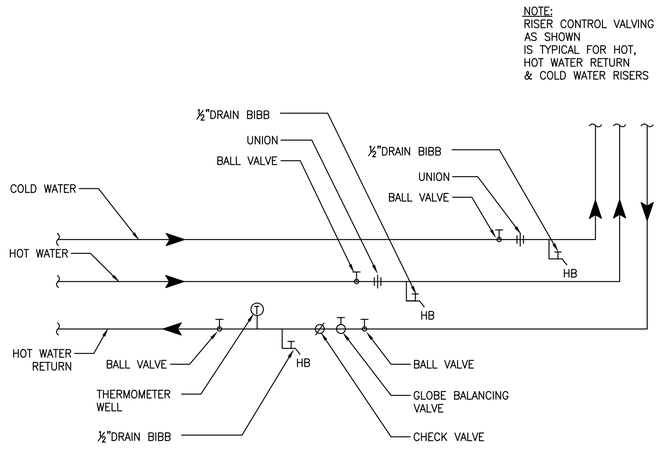


4 P–501 WASHER SUPPLY/ DRAIN BOX DETAIL

N.T.S

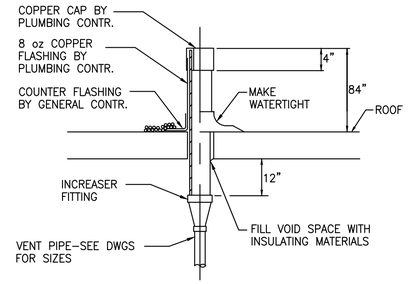


1 P-502 FLOOR CLEANOUT DETAIL
N.T.S

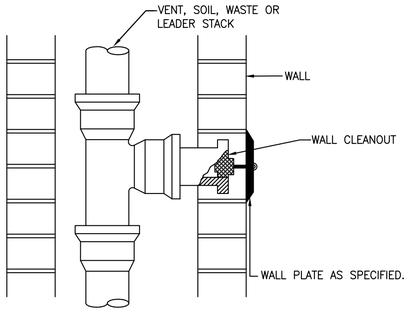


2 P-502 DOMESTIC WATER RISER CONTROL VALVE AND HOT WATER RETURN BALANCING VALVE ASSEMBLY DETAIL
N.T.S

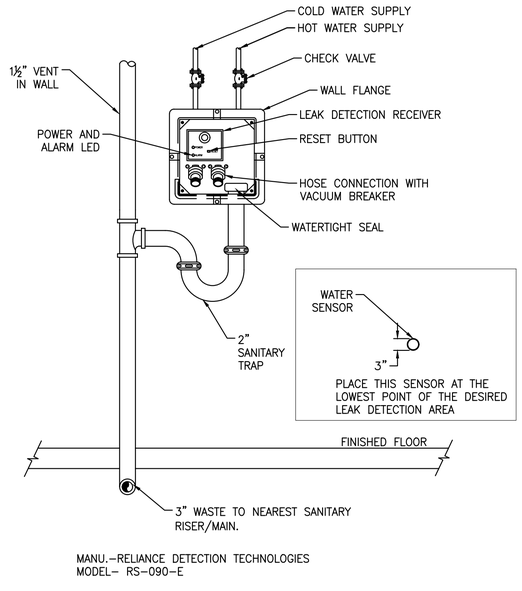
NOTES:
1. MINIMUM SIZE OF VENT EXTENSION THROUGH ROOF TO BE 4".
2. CHANGE OF DIAMETER TO BE MADE AT LEAST 12" BELOW ROOF.
3. VENT PIPE TO EXTEND up to 7'-0" ABOVE ROOF IN ACCESSIBLE WATERTIGHT BY PROPER FLASHING.
4. ALL VENT RISERS SHALL BE OFFSET AS REQUIRED TO CLEAR ROOF STRUCTURE DUCTWORK OR MECH. ROOF TOP UNITS.
5. PLUMBING CONTRACTOR TO COORDINATE WITH OTHER TRADES.
6. ROOFING CONTRACTOR SHALL SUPPLY BOOT FLASHING FOR RUBBER ROOF SYSTEMS.



3 P-502 VENT INCREASER DETAIL
N.T.S

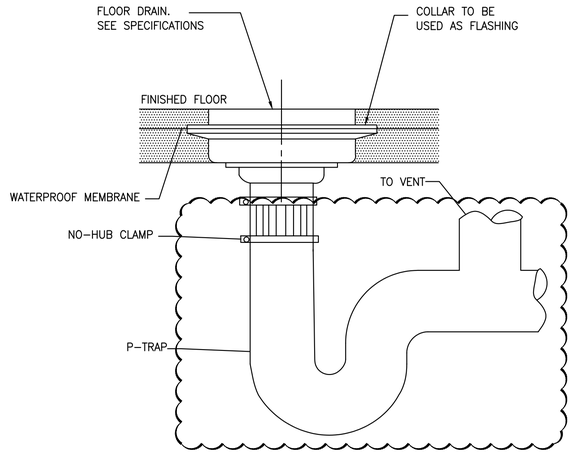


4 P-502 WALL CLEANOUT DETAIL
N.T.S

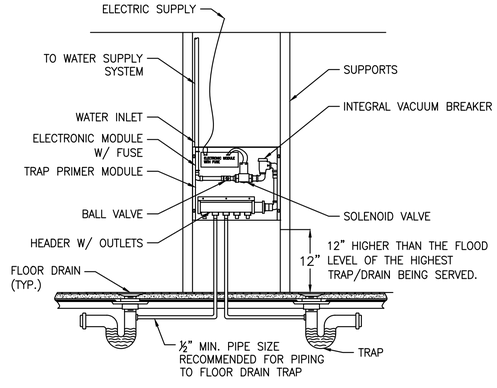


MANU.-RELIANCE DETECTION TECHNOLOGIES
MODEL- RS-090-E

5 P-502 WATER HEATER INSTALLATION
N.T.S



6 P-502 FLOOR DRAIN DETAIL
N.T.S



ELECTRONIC
7 P-502 TRAP PRIMER DETAIL
N.T.S

PLUMBING FIXTURE SCHEDULE

LEGEND	PLUMBING FIXTURE	CONNECTION SIZE – INCHES						
		TRAP	SOIL/WASTE	VENT	COLD WATER	HOT WATER	THERMOSTATIC MIXING VALVE	REMARKS
WC	FLOOR MOUNTED WATER CLOSET	–	4"	2"	1"	–	–	FLUSH TANK
LAV	UNDERCOUNTER LAVATORY	1½"	1½"	1½"	½"	½"	PROVIDE	P–TRAP
KS	KITCHEN SINK	2"	2"	1½"	¾"	¾"	PROVIDE	P–TRAP
DW	DISHWASHING MACHINE	–	1"	–	–	½"	–	1" DRAIN TO SINK P–TRAP WITH WYE CONNECTION
SH	SHOWER	2"	2"	1½"	¾"	¾"	PROVIDE	P–TRAP
DW	DISHWASHER	–	1"	–	–	½"	–	1" DRAIN TIES TO SINK WITH WYE CONN.
BT	BATHTUB	2"	2"	1½"	¾"	¾"	PROVIDE	P–TRAP

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

STORAGE ELECTRIC HOT WATER HEATER SCHEDULE

TAG No.	NO. ELEMENTS	LOCATION	MAX. INPUT (KW)	ELECTRIC EFFICIENCY	STOR. CAP (GAL)	RECOVERY CAP. (GPH) @100° RISE	TYPE	ELECT. CHARACTERISTICS CONTROLS	NO. OF HEATERS	MANUFACTURER & MODEL NO.	REMARKS
HWHT–1	2	ROOF	6	98%	30	24.6	ELECTRIC	208V/1ø/60Hz	14	HUBBELL E30–3.0–3.0–SLRS	– PROVIDE EXPANSION TANK ET–1 – PROVIDE RECIRCULATION PUMP HWCP–1 – PROVIDE DRAIN PAN – ASME, ASHRAE, CSA, UL CERTIFIED – PROVIDE CLEARANCES AS PER MANUFACTURERS RECOMMENDATION. – DIMENSIONS: 20" DIA X 42" HEIGHT

– TEMP. SET TO 110 DEG. F. FOR DISHWASHER AND WASHING MACHINE.
– TEMP. SET TO 100 DEG. F. FOR DWELLING UNITS
– TEMP. SET TO 90 DEG. F. FOR OTHER OCCUPANCIES

EXPANSION TANK SCHEDULE

ITEM	LOCATION	SERVICE	CAPACITY (GALLONS)	MAKE & MODEL	REMARKS
EXPANSION TANK (ET–1)	BOILER ROOM	HOT WATER	20.0	THERM–X–TROL ST–42V	DIMENSIONS– 32"(H)x16"(DIA.)

PUMP SCHEDULE

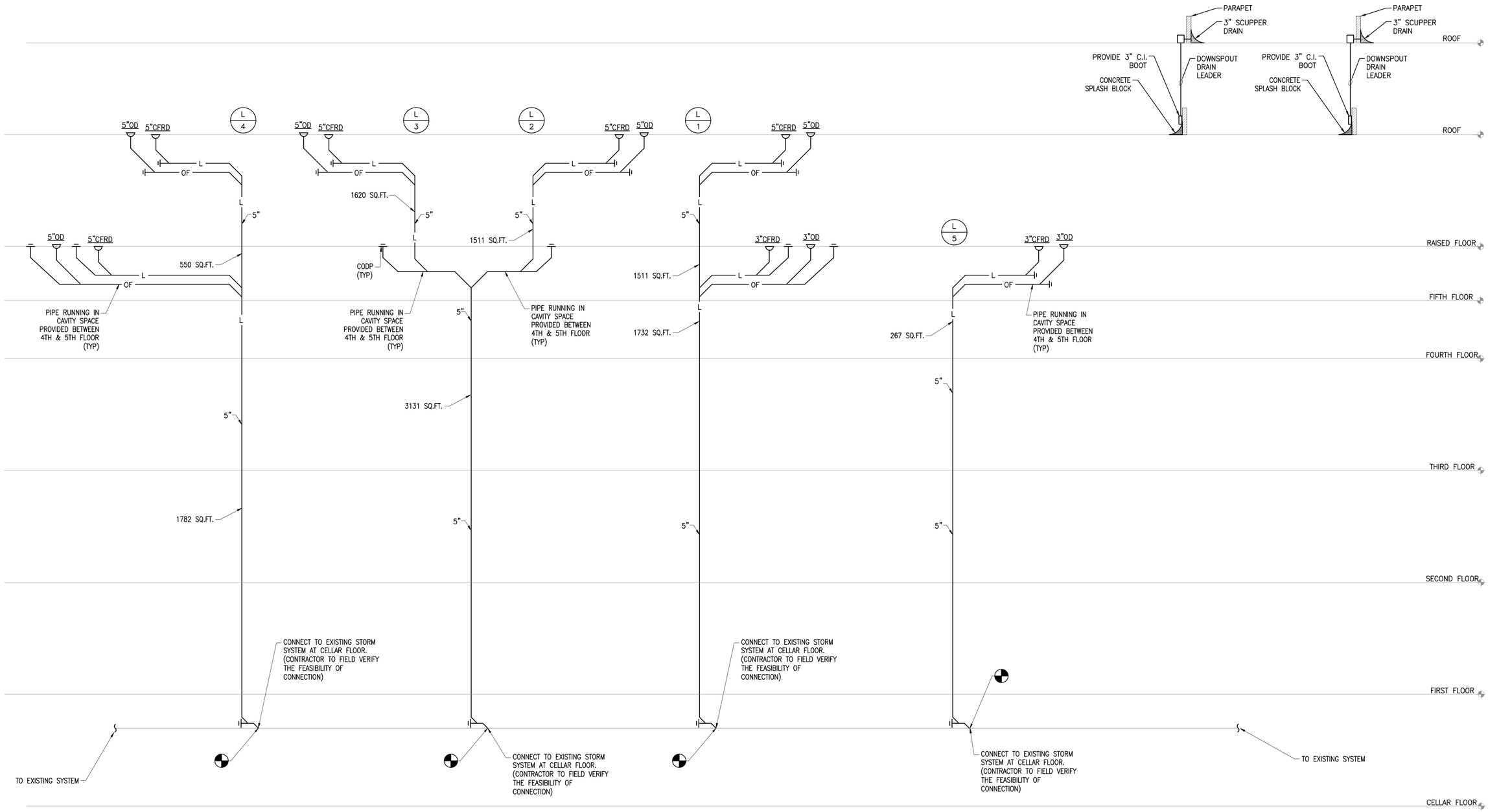
TAG	SERVICE	LOCATION	QTY.	PERFORMANCE DATA			MOTOR DATA				MFGR MODEL	REMARKS
				GPM	TDH (FT)	WATER TEMP. (°F)	MHP	STARTER TYPE	V/PH/HZ	RPM		
HWCP–1	HWHT	ROOF	14	2	10	110	52 WATTS	AQUA STAT	115/1/60	2800	BELL & GOSSETT NBF 10S/LW	INLINE ON HW RETURN LINE AT WATER HEATER NEMA 1 RATED MOTOR

DRAIN ACCESSORIES & SCHEDULE

DESIGNATION	REQUIRED	BODY: SERIES NO. / ZURN / WADE / SMITH / JOSAM	BODY: CAST IRON	BODY: GALVANIZED	BODY: ALL BRONZE	BODY: SECONDARY CLAMP	BODY: CLAMPING DEVICE	BODY: DECK CLAMP	BODY: BACK WATER VALVE	BODY: SUMP RECIEVER	BODY: FLASHING COLLAR	STRAINER: CAST IRON	STRAINER: GALVANIZED	STRAINER: ALL BRONZE	STRAINER: NICKEL BRONZE (ADJUSTABLE)	STRAINER: CHROME PLATED	STRAINER: SEDIMENT BUCKET	STRAINER: SECONDARY STRAINER	STRAINER: POLISHED FINISH	STRAINER: SATIN FINISH	STRAINER: TRACTOR GRATE	STRAINER: ST. STEEL	STRAINER: FUNNEL TOP	STRAINER: FLAT TOP	STRAINER: DOME	STRAINER: RAISED LIP	STRAINER: EXTENSION (WHERE REQUIRED)	STRAINER: LESS GRATE	STRAINER: BRONZE TOP	STRAINER: IRON GRATE	STRAINER: POLYETHYLENE	STRAINER: SOLID HINGED COVER	REMARKS: LOCATION
RD/OD	•	RD,OD: Z–105, ZC–125–89	•			•		•				•													•		•						ROOF
FD/AD	•	Z–503–Z–C–Y	•				•										•													•			ROOF (HEATER ROOM)

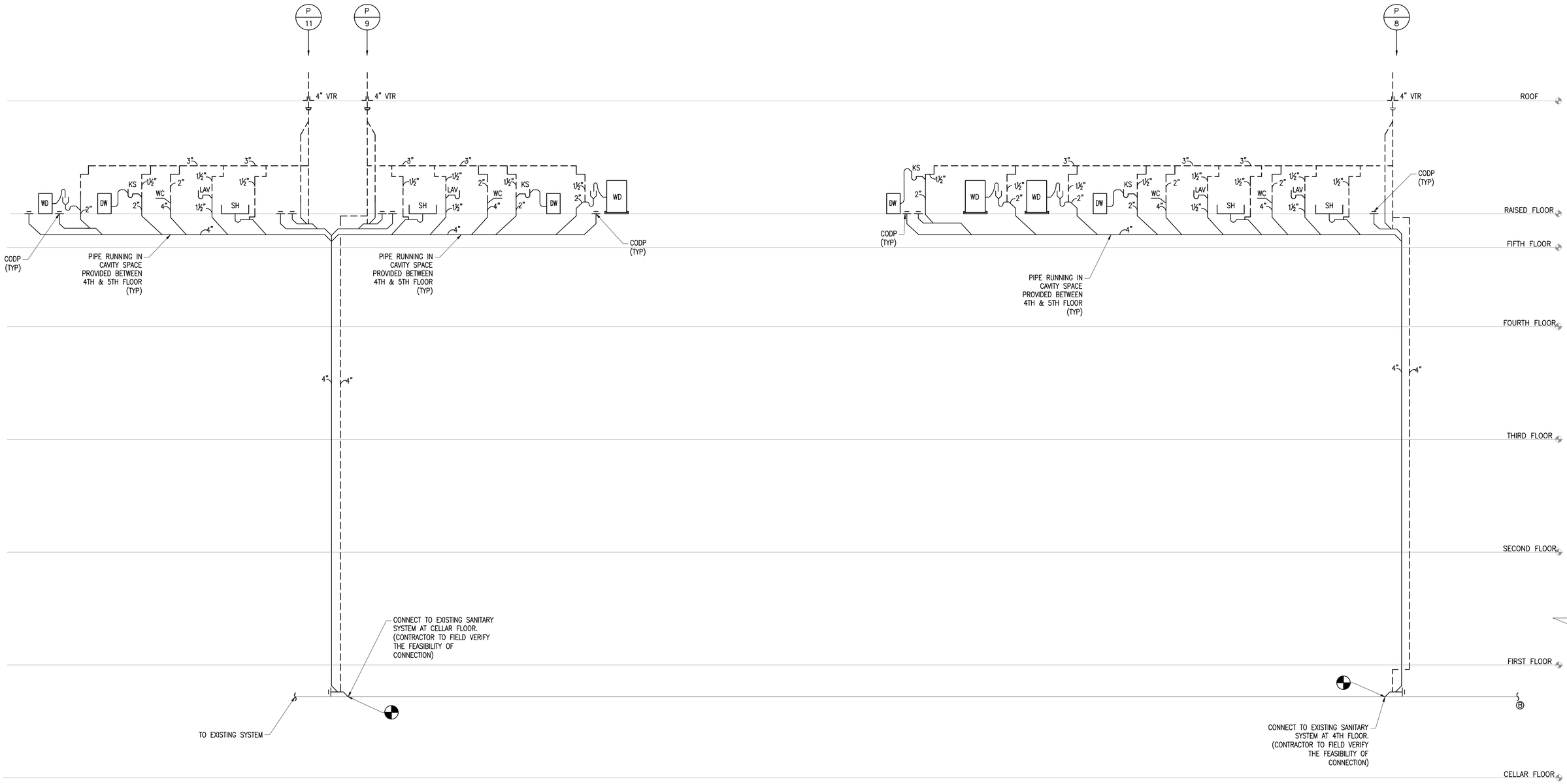
NOTES:

1. THE CONTRACTOR SHALL VERIFY THE COMPATIBILITY OF THE DRAINS WITH THE APPROVED ROOFING AND/OR WATER PROOFING SYSTEMS PRIOR TO SUBMITTING SHOP DRAWINGS.
2. CONTRACTOR TO COORDINATE NEW CFRD WITH EXISTING DRAINS TO MAINTAIN SAME FLOW FOR STORM DETENTION PURPOSE.

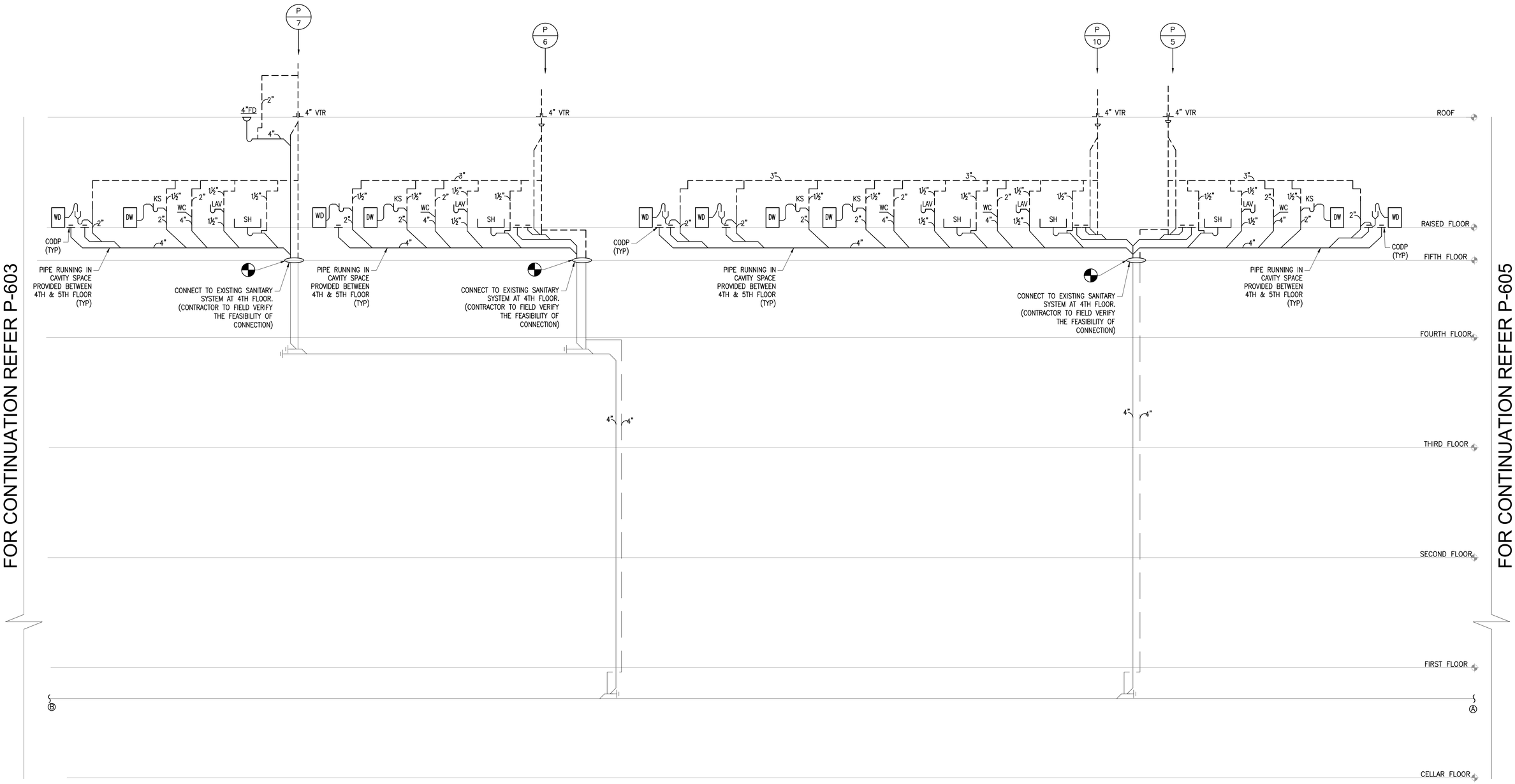


1 STORM RISER DIAGRAM

N.T.S

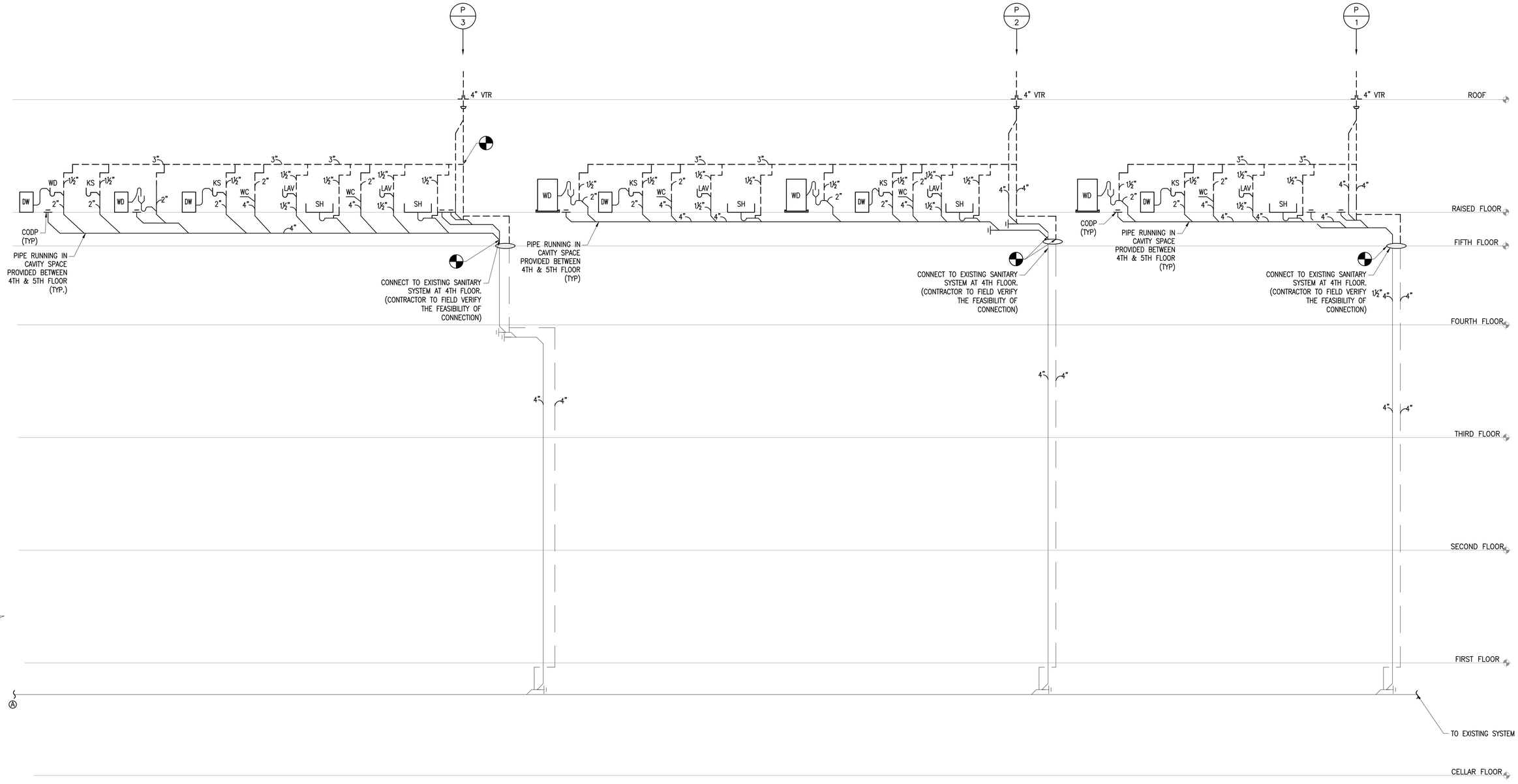


1 SANITARY RISER DIAGRAM (1 OF 3)
N.T.S

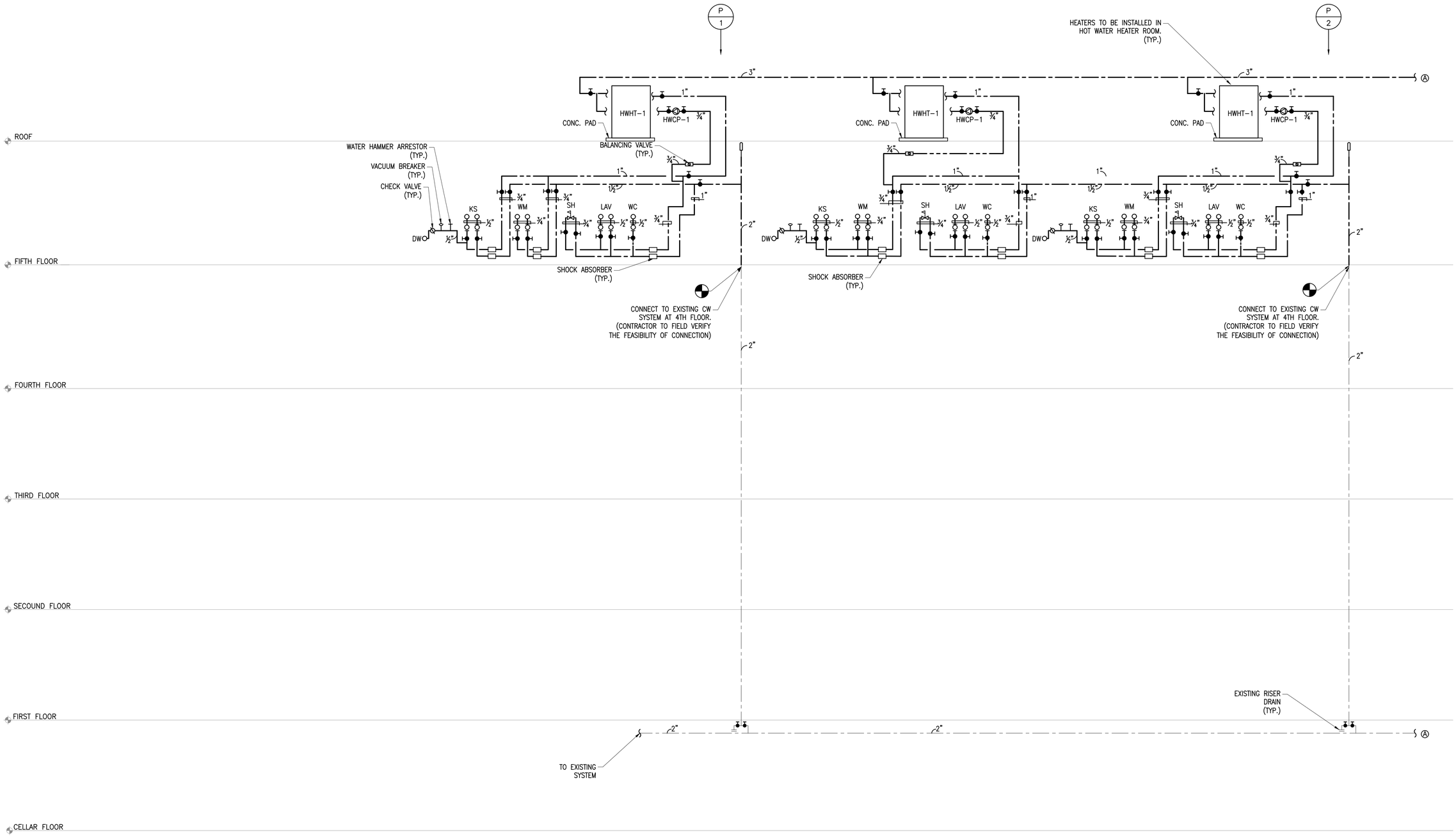


1 SANITARY RISER DIAGRAM (2 OF 3)
N.T.S

FOR CONTINUATION REFER P-604



1 SANITARY RISER DIAGRAM (3 OF 3)
N.T.S

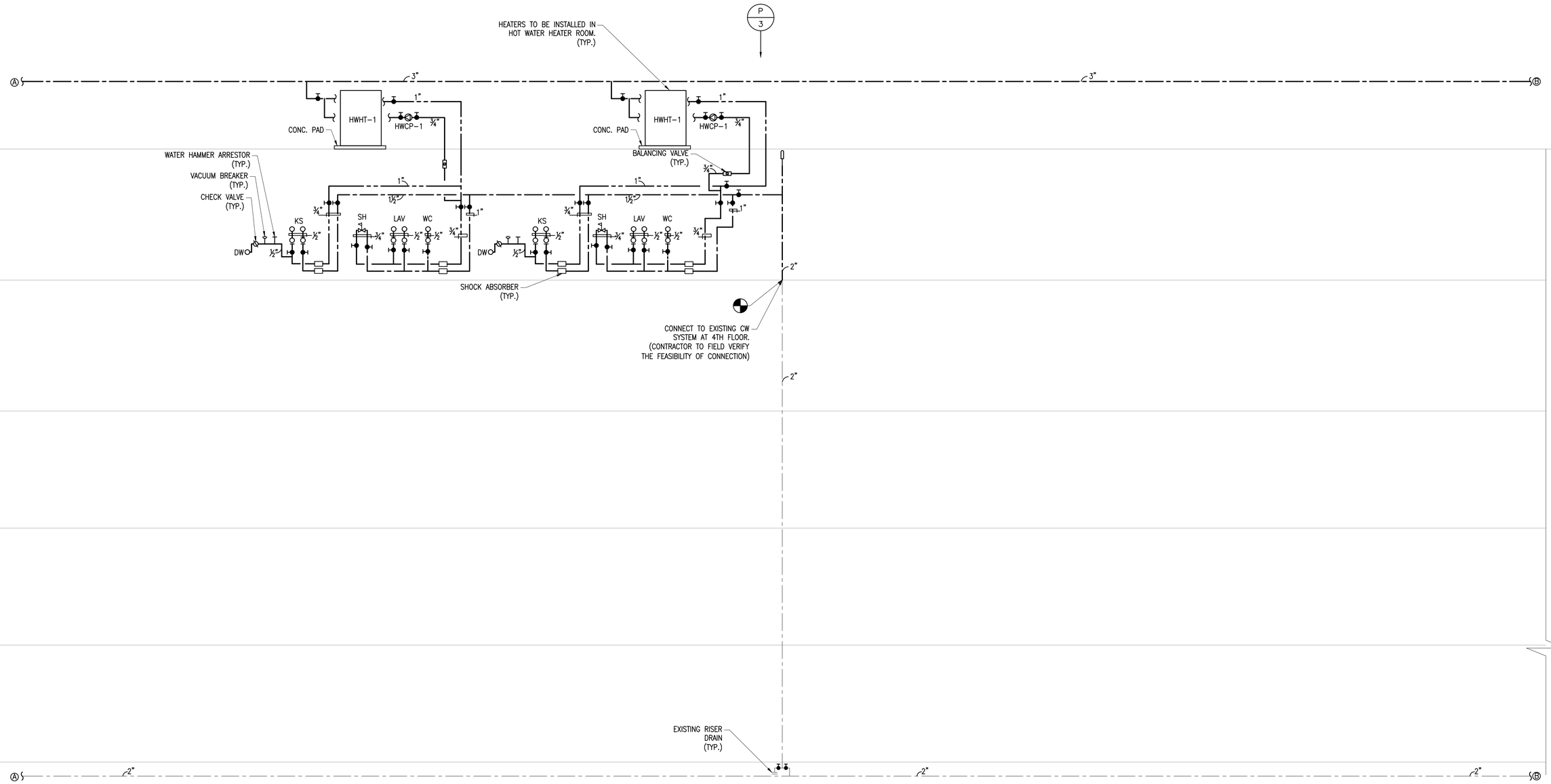


FOR CONTINUATION REFER P-607

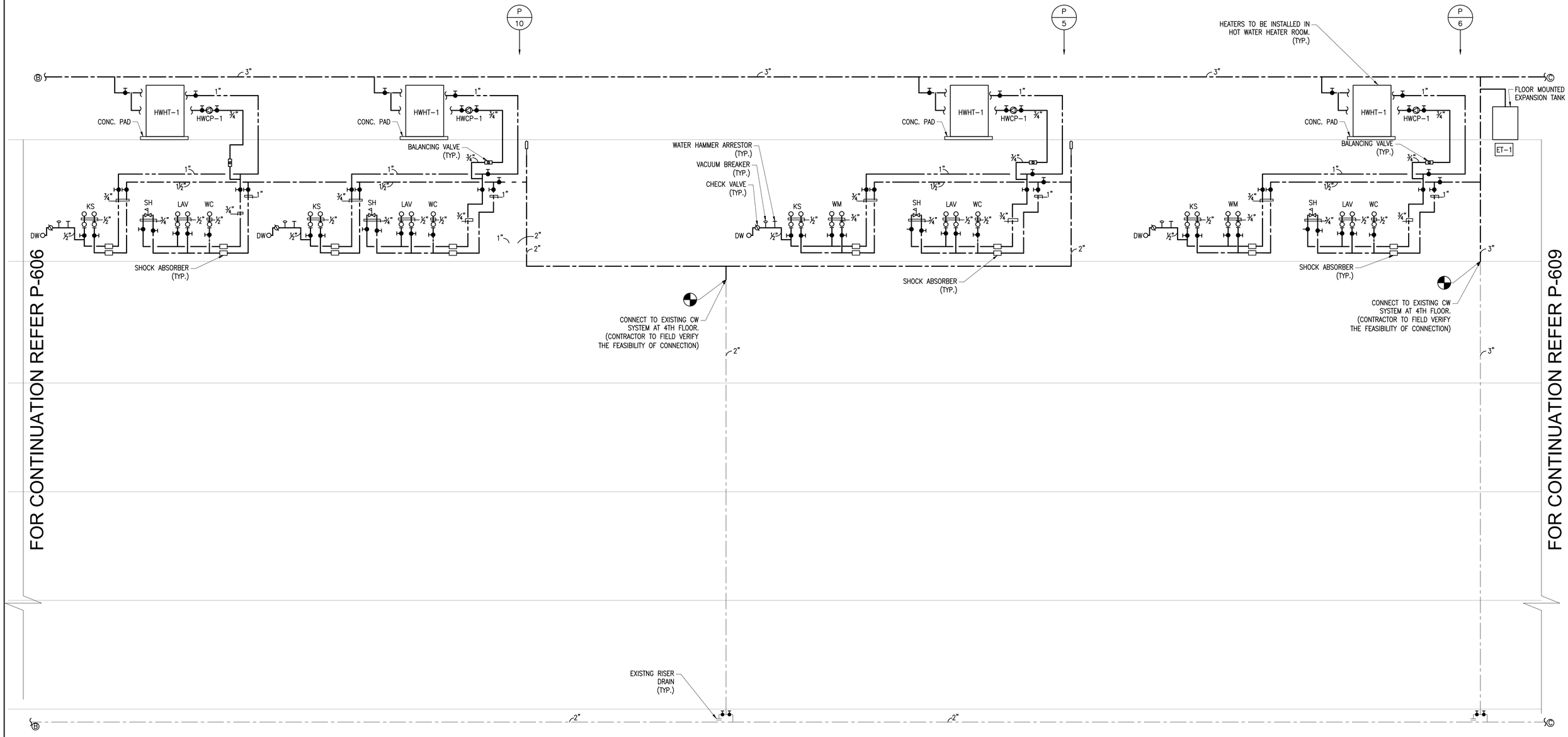
1 WATER RISER DIAGRAM (1 OF 4)
N.T.S

FOR CONTINUATION REFER P-606

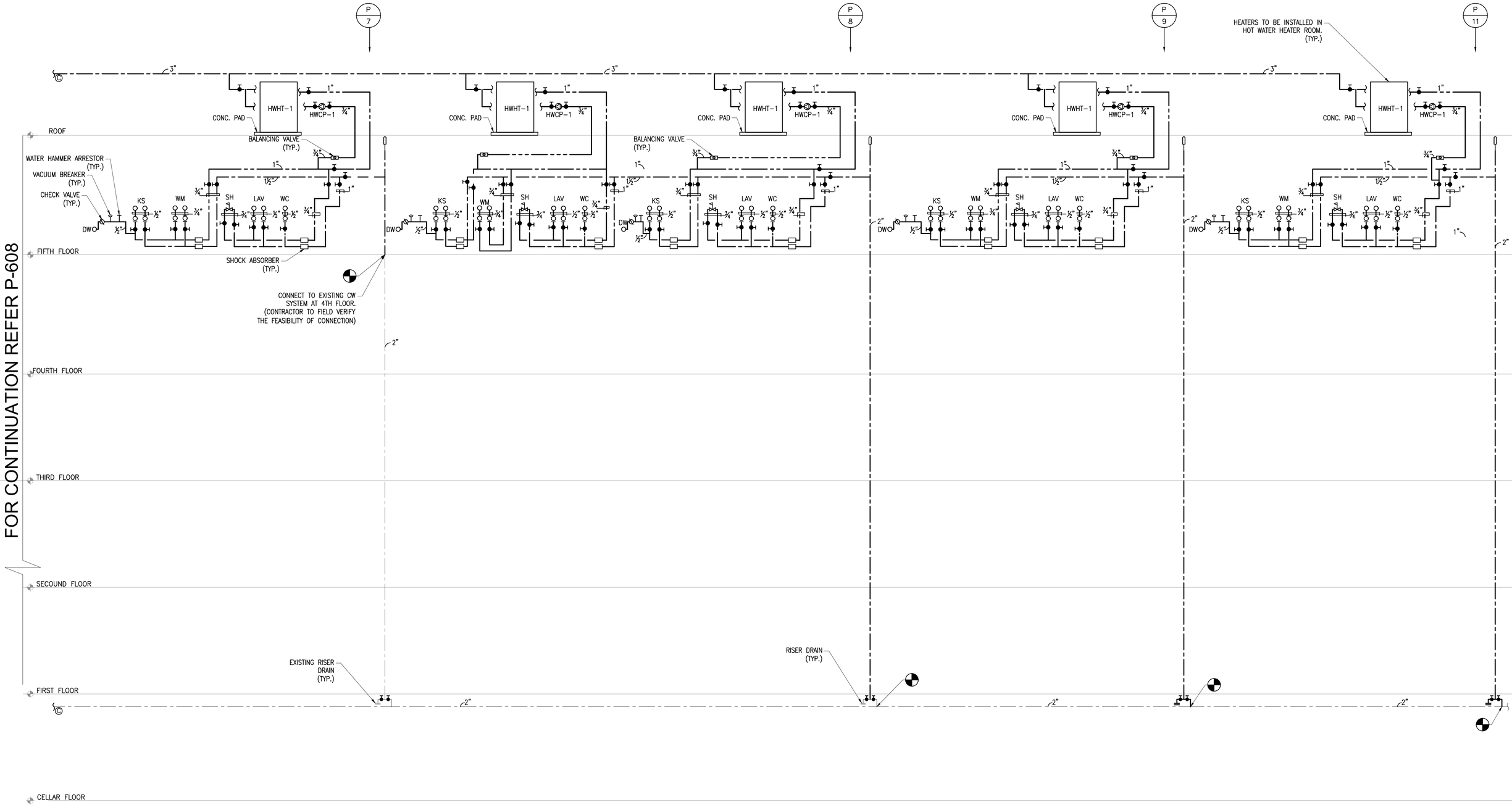
FOR CONTINUATION REFER P-608



2 WATER RISER DIAGRAM (2 OF 4)
N.T.S



3 WATER RISER DIAGRAM (3 OF 4)
N.T.S



4 WATER RISER DIAGRAM (4 OF 4)
N.T.S

GENERAL NOTES:

1. ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.–13R, NYC BC 2014 AND ALL LOCAL AUTHORITIES.
2. CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK TO CLEAR DUCTWORK AND LIGHTING FIXTURES.
3. ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.
4. ALL SPRINKLER HEADS SHALL BE INSTALLED AT CENTER OF TILE.
5. 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.
6. THE SPRINKLER SYSTEMS ARE TO BE HYDROSTATIC TESTED FOR A (1) HOUR MINIMUM AT 200 PSI. PRESSURE AND ARE TO BE WITNESSED BY AUTHORIZED BUILDING PERSONNEL. COORDINATE ALL TESTING WITH BUILDING MANAGER.
7. 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.
8. DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.
9. G.C. SHALL BE RESPONSIBLE FOR ALL FINAL TESTS AND INSPECTIONS OF COMPLETED WORK REQUIRED BY THE BUILDING MANAGEMENT PRIOR TO OCCUPANCY OF SPACE.
10. 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.
11. ALL BURNING, CUTTING, SOLDERING AND WELDING SHALL BE COORDINATED WITH BUILDING FIRE SYSTEMS WITH BUILDING MANAGEMENT, AS REQUIRED.
12. REFER TO ENGINEERING DRAWINGS FOR SPRINKLER HEADS, LIGHT SENSORS AND FIRE DETECTION DEVICES.
13. ALL SERVICE SHUTDOWNS SHALL BE BY BASE BUILDING ENGINEERS. MINIMUM OF 48 HOURS NOTICE IS REQUIRED TO THE BUILDING OFFICE PRIOR TO SHUT DOWN.
14. ALL WORK TO BE DONE DURING THE HOURS DESIGNATED BY OWNER.
15. 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.
16. UPON SUCCESSFUL COMPLETION OF ALL TESTING, CONTRACTOR SHALL PRIME AND PAINT ALL EXPOSED SPRINKLER PIPING. COLOR AND FINISH SHALL BE AS PER ARCHITECT.
17. 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.

SHOP DRAWINGS AND SUBMITTALS

THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, FULLY COORDINATED SHOP DRAWINGS, CAPACITY, DATA, AND CATALOG CUTS OF THE FOLLOWING:

1. PIPE AND FITTINGS.
2. VALVES.
3. HANGERS AND SUPPORTS.
4. SPRINKLER PIPING LAYOUT
5. TESTS
6. SPRINKLER HEADS
7. HYDRAULIC CALCULATIONS

SPRINKLER DRAWING LIST

SPRINKLER LEGEND

- SP — NEW SPRINKLER PIPING
- ⊙ UPRIGHT SPRINKLER HEAD
- ◀ SIDEWALL SPRINKLER HEAD
- EXISTING CHECK VALVE WITH AUTOMATIC BALL DRIP
- EXISTING SPRINKLER SIAMESE CONNECTION
- EXISTING SHUT–OFF VALVE
- EXISTING ALARM CHECK VALVE
- (WFS) EXISTING WATER FLOW SWITCH
- (TS) EXISTING TAMPER SWITCH

BUILDING DEPARTMENT SPRINKLER NOTES

1. THE INSTALLATION, COMPONENTS, SIZING, SPACING, CLEARANCES, POSITION AND TYPE OF SYSTEMS SHALL CONFORM TO THE 2014 NEW YORK CITY BUILDING CODE APPENDIX Q, SECTION BC Q102 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 BCQ102.1 SEE 23.1.1.
4. SPRINKLER SHALL BE PROTECTED AGAINST FREEZING AND INJURY AS PER APPENDIX Q BCQ102, SEC 8.15.3 AND 6.2.8.
5. THE OCCUPANCY OF THE AREAS TO BE SPRINKLERED IN ACCORDANCE WITH SECTION 5.2 AND A.5.2 OF APPENDIX Q SECTION BCQ102.
6. WATER SUPPLY TEST PIPES AND GAUGES SHALL BE PROVIDED AS PER SECTION 8.16.1 AND 8.16.4 OF APPENDIX Q, SECTION BCQ102.
7. 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 6 AND 9.
8. STOCK OF EXTRA SPRINKLERS WILL BE FURNISHED AS PER SECTION 6.2.9 APPENDIX Q, SECTION BCQ102 (REQUIRED FOR EACH TEMPERATURE RATING).
9. SPRINKLER ALARM SHALL BE IN ACCORDANCE WITH SECTION 8.16.1 OF APPENDIX Q, SECTION BCQ102.
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. ALL PIPES PASSING THROUGH FOUNDATION WALLS SHALL BE PROTECTED AS PROVIDED BY SECTION 305.5 OF THE PLUMBING CODE.
17. 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.
18. ALL VALVES SHALL BE IDENTIFIED AS REQUIRED BY SECTION 6.7.4. OF APPENDIX Q, SECTION BCQ102.
19. DRAINAGE SHALL CONFORM TO SECTION 8.15.2 OF APPENDIX Q, SECTION BCQ102.
20. 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.
21. ALL VALVES ON CONNECTIONS TO WATER SUPPLIES TO SPRINKLER SHALL BE APPROVED O.S. & Y. OR APPROVED INDICATOR TYPE.
22. DRAIN VALVES AND TEST VALVES SHALL BE APPROVED TYPE AS PER 6.7.3 OF APPENDIX Q, SECTION BCQ102.
23. 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.
24. 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 BCQ102.
25. SPRINKLER SHALL BE AN APPROVED TYPE AS PER SECTION 8.3 OF APPENDIX Q, SECTION BCQ102.
26. TEMPERATURE RATING SHALL COMPLY WITH SECTION 8.3.2 OF APPENDIX Q, SECTION BCQ102.
27. 18" MINIMUM CLEARANCE TO BELOW SPRINKLER DEFLECTOR AS PER SECTION 8.5.6. OF APPENDIX Q, SECTION BCQ102.
28. SPACING AND LOCATION OF SPRINKLERS SHALL COMPLY WITH CHAPTER 8 OF APPENDIX Q, SECTION BCQ102.
29. SPRINKLER SYSTEM COMPLIES WITH NFPA 13–2007 AS MODIFIED BY APPENDIX Q, SECTION BCQ102.
30. SOURCES OF WATER SUPPLY FOR SPRINKLER SYSTEMS AS PER CHAPTER 15 OF APPENDIX Q, SECTION BCQ102.
31. PIPE SCHEDULE SYSTEMS SHALL BE IN ACCORDANCE WITH SECTION 14.5 OF APPENDIX Q, SECTION BCQ102.
32. AUTOMATIC INTERLOCK CUTOFF SWITCH FOR VENTILATION WILL CONFORM TO CHAPTER 6 OF THE MECHANICAL CODE (APPLICABLE ONLY IF THERE IS AN AIR SYSTEM UTILIZING RECIRCULATED AIR AND REQUIRING A THERMOSTATIC DEVICE).
33. HYDRAULICALLY DESIGNED SYSTEMS SHALL BE IN ACCORDANCE WITH CHAPTER 14 OF APPENDIX Q, SECTION BCQ102.
34. MINIMUM BRANCH PIPE SIZE TO BE ONE INCH (1").
35. 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.
36. SPRINKLER PIPING SHALL BE PAINTED IN ACCORDANCE WITH NYC BC SECTION 903.6

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.
6. 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.

SPECIAL INSPECTION SPRINKLER NOTE:

1. SPECIAL INSPECTION OF SPRINKLER SYSTEM TO BE PERFORMED IN ACCORDANCE WITH NY CITY BUILDING CODE SECTION BC 1704–23
2. FIRE RESISTANT PENETRATION & JOINTS IN ACCORDANCE WITH NY CITY BUILDING CODE BC–1704.27
3. FINAL INSPECTION IN ACCORDANCE WITH NY CITY BUILDING CODE BC 110.5 DIRECTIVE FROM 14 OF 1975, AND 1 RCNY $ 101–10
4. POST INSTALLATION ANCHOR INSPECTION TO BE DONE IN ACCORDANCE WITH NY CITY BUILDING CODE BC–1704.32

GENERAL NOTES:

1. 2016 NYCECC COMPLIANCE; NEW YORK CITY CONSERVATION CODE.

   TO THE BEST OF MY KNOWLEDGE, BELIEF AND PROFESSIONAL JUDGMENT, ALL WORK UNDER THIS APPLICATION IS EXEMPT FROM THE NYCECC IN ACCORDANCE WITH ONE OF THE FOLLOWING: FA, FP, SD, SP, FS, EQ, CC, OT/BPP, OT/FPP

GENERAL NOTES:

1. FOR SPRINKLER WORK ONLY.
2. PROVIDE SP HEAD ABOVE AND BELOW DUCT 48" OR WIDER.

PROTECTION AREA OF SPRINKLER HEADS

LIGHT HAZARD (NON–COMBUSTIBLE/HYDRAULIC):	225 SQ. FT.
ORDINARY HAZARD:	130 SQ. FT.

DESIGN CRITERIA FOR HYDRAULIC FLOW CALCULATIONS

HYDRAULIC CALCULATIONS BASED ON DENSITY–AREA METHOD

OCCUPANCY:	LIGHT HAZARD
MINIMUM DESIGN DENSITY:	0.10 GPM/SQ. FT.
DESIGN AREA OF APPLICATION:	REMOTES 4 SPRINKLER HEADS

NOTE– THE WATER SUPPLY REQUIREMENT FOR SPRINKLERS CALCULATED FROM THE DENSITY/AREA CURVES OF FIGURE 11.2.3.1.1 AS PER NFPA 13–2007ed SECTION 11.2.3.2.1.1

SPRINKLER NOTES:

1. 6.9.2* BATHROOMS.
   SPRINKLERS SHALL NOT BE REQUIRED IN BATHROOMS WHERE THE BATHROOM AREA DOES NOT EXCEED 55 FT² (5.1m²) !
2. 6.9.3 CLOSETS.
   EXCEPT WHERE SPECIFIED IN 6.9.4, SPRINKLERS SHALL NOT BE REQUIRED IN CLOTHES CLOSETS, LINEN CLOSETS, AND PANTRIES WITHIN DWELLING UNITS THAT MEET ALL OF THE FOLLOWING CONDITIONS:
   - THE AREA OF THE SPACE DOES NOT EXCEED 24 FT².
   - THE LEAST DIMENSION DOES NOT EXCEED 3 FT.
   - THE WALLS AND CEILINGS ARE SURFACED WITH NONCOMBUSTIBLE OR LIMITED–COMBUSTIBLE MATERIALS AS DEFINED BY NFPA 220, STANDARD ON TYPES OF BUILDING CONSTRUCTION.

SPACING BETWEEN SPRINKLER HEADS

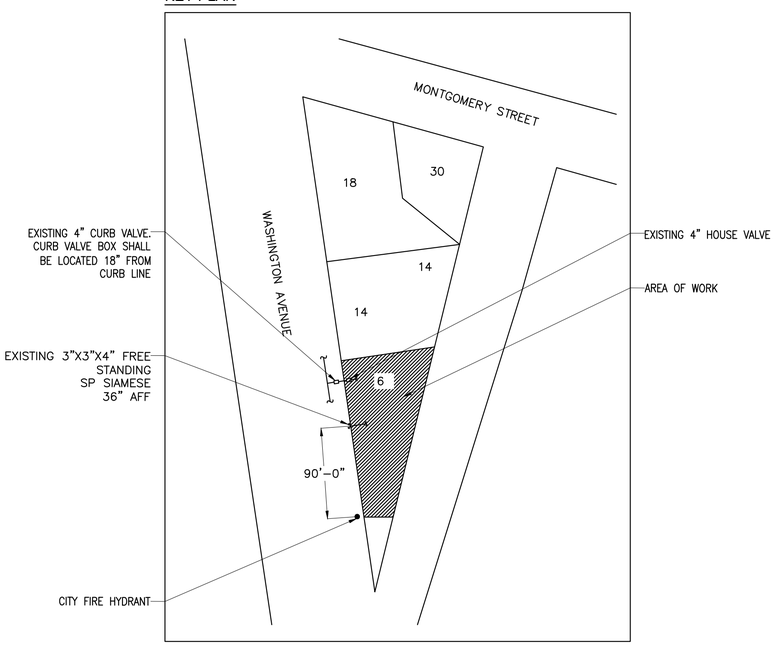
LIGHT HAZARD: 15' MAX.
ORDINARY HAZARD: 15' MAX.

NOTE: MAXIMUM DISTANCE BETWEEN SPRINKLER HEADS & WALLS IS ½ THE DISTANCE BETWEEN HEADS.

SPRINKLER SCHEDULE

SYMBOL	NAME	COVERAGE	AREA	METAL	TEMPERATURE (°F)	RESPONSE	K–FACTOR	NPT	MFG	MODEL#	COAT	APPROVALS
⊙	UPRIGHT	STANDARD	LH/OH OPEN AREAS	BRASS	155	QUICK	5.6	½"	VIKING	VK300	BRASS,CHROME,WHITE,BLACK,ENT,STAINLESS	UL 199, MEA 89–92–E, VOL.16
◀	SIDEWALL	STANDARD	LH/OH OPEN AREAS	BRASS	175	QUICK	5.6	½"	VIKING	VK305	BRASS,CHROME,WHITE,BLACK,ENT	UL 199, MEA 89–92–E, VOL.16
◀(D)	DRY SIDEWALL	STANDARD	LH/OH OPEN AREAS	BRASS	155	QUICK	5.6	1"	VIKING	VK156	BRASS,CHROME,WHITE,BLACK,ENT	MEA 89–92–E, VOL.16
●	CONCEALED	STANDARD	LH/OH AREAS WITH CEILING	BRASS	155	QUICK	5.6	½"	VIKING	VK462	BRASS,CHROME,WHITE,BLACK,ENT	MEA 89–92–E, VOL.32

KEY PLAN



975 WASHINGTON AVENUE
BLOCK: 1192
LOT: 6
ZONE: R8A
MAP: 16D
OCCUPANCY CLASS: R2
BUILDING HEIGHT: 62'–1½"

N

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 CITY OF NEW YORK.

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 NO. 13, N.Y.C. 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.C. BUILDING DEPARTMENT AND NFPA STANDARDS.

1.03 SHOP DRAWINGS AND DATA

A. THE CONTRACTOR SHALL SUBMIT, FOR APPROVAL, FULLY COORDINATED SHOP DRAWINGS, CAPACITY, DATA, AND CATALOG CUTS OF THE FOLLOWING:

1. PIPE AND FITTINGS.
2. VALVES.
3. HANGERS AND SUPPORTS.
4. SPRINKLER PIPING LAYOUT
5. TESTS
6. SPRINKLER HEADS
7. HYDRAULIC CALCULATIONS

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 SAME.

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 REINSPECTION 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 PIPE, FITTINGS, VALVES, DRAINAGE SYSTEM AND VALVES, HANGERS AND SUPPORTS. ALSO, MISCELLANEOUS WORK ITEMS, SUCH AS, SIGNS AS REQUIRED, VALVE TAGS, ETC., AND ALL OTHER RELATED EQUIPMENT, APPARATUS AND MATERIAL ITEMS NECESSARY FOR COMPLETE, APPROVED TYPE SYSTEM, 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 FIREPROOF SEALANT.

2.02 SPRINKLER PIPING

A. ALL SPRINKLER PIPING SHALL BE SCHEDULE 40, THREADED IN ACCORDANCE WITH NFPA 13. PIPE SHALL BE UL/FM APPROVED.

B. STEEL PIPE SHALL BE BETHLEHEM STEEL CO., ALLIED TUBE, BERGER INDUSTRIES OR APPROVED

C. ALL SPRINKLER FITTINGS AND COUPLINGS SHALL BE THREADED CAST IRON SPRINKLER FITTINGS, DESIGNED AND MANUFACTURED FOR A WATER WORKING PRESSURE OF 175 POUNDS. FITTING SHALL BE UL/FM APPROVED. CONTRACTOR MAY USE VICTAULIC GROOVED COUPLINGS AND FITTINGS ON SCHEDULE 40 PIPE.

2.03 CUTTING AND PATCHING

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.

2.04 INSERTS, HANGERS, ETC.

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.

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.

D. SPRINKLER PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING 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.

E. SPRINKLER PIPING SHALL BE SUPPORTED INDEPENDENTLY OF THE CEILING SHEATHING.

F. WHEN SPRINKLER PIPING IS INSTALLED BELOW DUCTWORK, PIPING SHALL BE SUBSTANTIALLY SUPPORTED FROM THE BUILDING STRUCTURE, NOT FROM THE DUCTWORK.

G. MAXIMUM DISTANCE BETWEEN HANGERS SHALL NOT EXCEED 12 FT. FOR 1 AND 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.

2.05 ESCUTCHEONS

PROVIDE ESCUTCHEONS ON ALL EXPOSED PIPING PASSING THROUGH WALLS, PARTITIONS, FLOORS AND CEILINGS. ESCUTCHEON SHALL BE HELD IN PLACE BY INTERNAL TENSION OR SET SCREW.

2.06 AS–BUILT DRAWINGS

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

2.07 SPRINKLER HEADS

A. 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.

B. SPRINKLER HEADS SHALL BE BY VIKING MANUFACTURE OR APPROVED EQUAL, UL AND FM APPROVED, AS FOLLOWS:

1. SPRINKLER HEADS IN AREAS WITHOUT HUNG CEILINGS SHALL BE MODEL VIKING VK300 UPRIGHT. SPRINKLER HEADS IN AREAS WITH HUNG CEILINGS SHALL BE MODEL VIKING VK462 CONCEALED SIDEWALL SPRINKLER HEAD SHALL BE MODEL VIKING VK305. DRY SIDEWALL SPRINKLER HEAD SHALL BE MODEL VIKING VK156.

2. PROVIDE SPARE SPRINKLER EMERGENCY CABINETS CONFORMING TO NFPA 13.

3. SPRINKLER EMERGENCY CABINETS SHALL BE RELIABLE AUTOMATIC SPRINKLER CO., INC. MODEL A1 OR APPROVED EQUAL, UL AND FM APPROVED.

4. CABINET SHALL BE CONSTRUCTED OF 22 GAUGE STEEL WITH PRIME COAT AND MANUFACTURER'S BAKED ENAMEL FINISH IN COLOR SELECTED BY THE ARCHITECT.

5. CABINET SHALL CONTAIN A MINIMUM OF 6 SPRINKLER HEADS OF EACH TYPE EMPLOYED.

2.08 PRESSURE GAUGE

A. ASHCROFT SERIES 1079, OR APPROVED OTHER, 4–1/2" DIA–METER, 0–200 P.S.I. RANGE, 20 P.S.I. 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. INSTALL PIPING AS SHOWN ON THE CONTRACT DRAWINGS AND STRAIGHT AND DIRECT AS POSSIBLE, FORMING RIGHT ANGLES OR PARALLEL LINES WITH BUILDING WALLS, NEATLY SPACED, WITH RISERS PLUMB AND TRUE.

2. SPRINKLER PIPING SHALL BE INSTALLED SO THAT THE SYSTEM CAN BE DRAINED.

PIPE SHALL BE REMOVED BY REAMING. 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

1. THREADED JOINTS SHALL BE MADE UP OF TIGHT USING PIPE JOINT TEFLON COMPOUND OR TAPE, APPLIED ON THE MALE THREADS ONLY.

GENERAL NOTES:

ALL SPRINKLER WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF N.F.P.A.–13 AND ALL LOCAL AUTHORITIES.

CONTRACTOR SHALL COORDINATE WITH OTHER TRADES AND SHALL INSTALL NEW WORK TO CLEAR DUCTWORK AND LIGHTING FIXTURES.

ALL SPRINKLER WORK SHALL COMPLY WITH BUILDING STANDARDS AND REQUIREMENTS.

DRAWING INDICATES SPRINKLER SYSTEM DESIGN ONLY. CONTRACTOR RESPONSIBLE FOR OFFSETS, DROPS AND RISES FOR COORDINATION WITH OTHER TRADES.

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.

PROVIDE AUXILIARY DRAINS AT TRAPPED SECTIONS OF PIPING AS REQUIRED BY NFPA–13.

GENERAL CONTRACTOR SHALL COORDINATE FINAL FURNITURE/ EQUIPMENT HEIGHT ELEVATIONS AND LOCATIONS WITH SPRINKLER INSTALLATION. ENGINEER SHALL BE NOTIFIED OF CEILING PRIOR TO INSTALLATION.

8. 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.

9. 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.

NYC Environmental Protection

Vincent Sapienza, P.E.
Commissioner

Anastasios Georgelis, P.E.
Deputy Commissioner
Bureau of Water & Sewer Operations

59-17 Junction Boulevard
Flushing, NY 11373

4/10/2019

New York Engineers, LLC
135 West 41st Street, 5th Floor
New York, New York 10036
Attn: Jahnavi Sajip

To Whom It May Concern:

The hydrant flow test you requested in the vicinity of ***975 Washington Avenue, Brooklyn*** was performed on ***4/10/2019*** at ***10:16 AM*** with the following results:

The static pressure taken on an 8 inch water main which is fed from one direction on the east side of Washington Avenue 3rd hydrant south of Montgomery Street was **79** pounds per square inch. The residual pressure at this point was **76** pounds per square inch when 500 gallons of water per minute were flowing from the west side of Washington Avenue 2nd hydrant south of Montgomery Street.

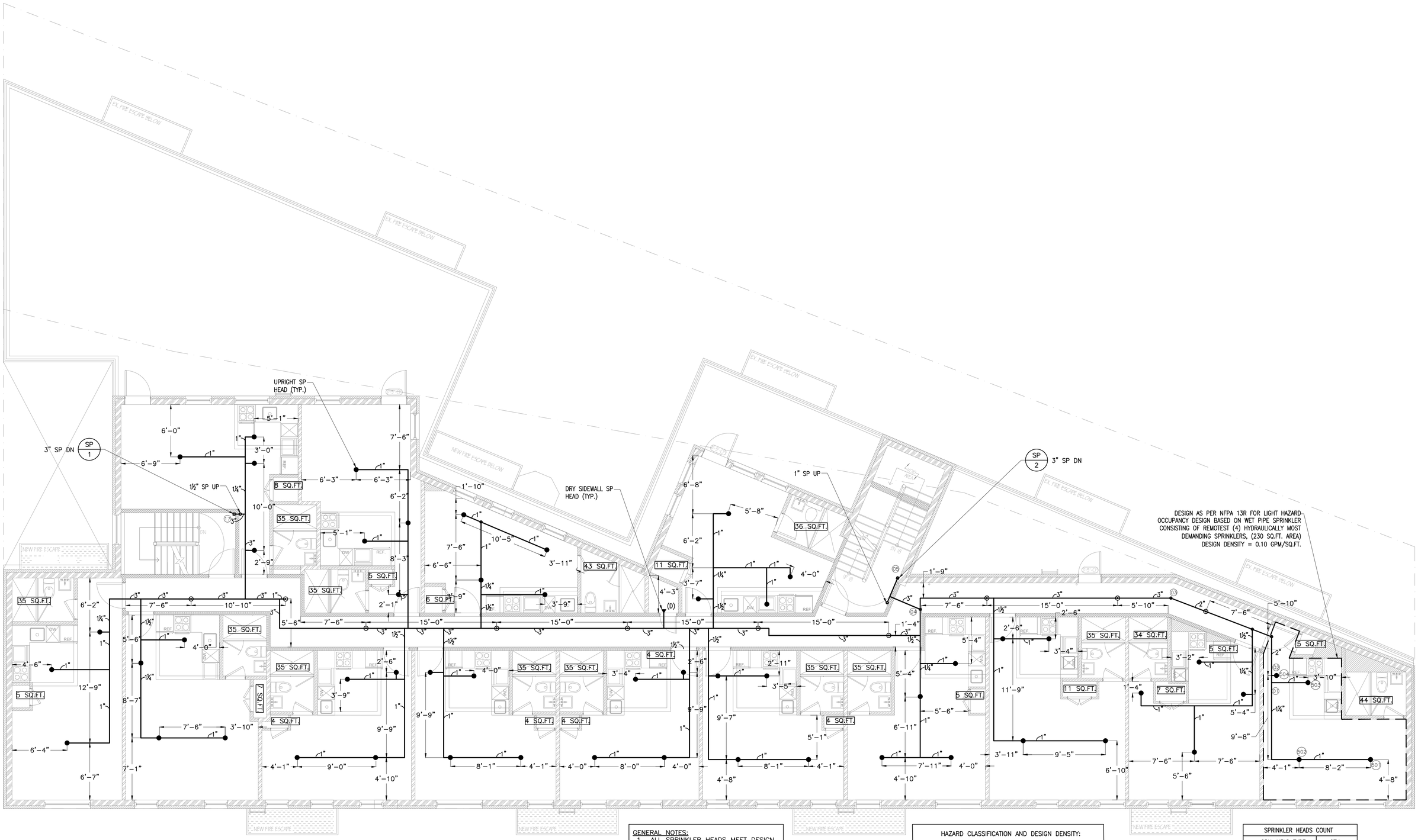
This Department cannot guarantee that this pressure will be maintained in the future because a change may be needed in conformity with good engineering practices.

If you have any questions regarding engineering, and application status, please call (718) 595-7135.

Very truly yours,

Urszula Krajewski, P.E.
Water Distribution Engineer
City Wide Hydraulic Testing Unit

File: FT2019-0625-310484
All hydrant flow test requests are to be addressed to: NYCDEP-BWSO; 59-17 Junction Blvd, 12th Fl., Flushing, NY 11373-5108, Attn: Citywide Hydraulic Flow Test Unit
Enclose payment for $500 payable to NYC Water Board for each test. Indicate the test street, cross streets and borough for each test. All requests are to be made by US or overnight mail, no hand deliveries accepted.

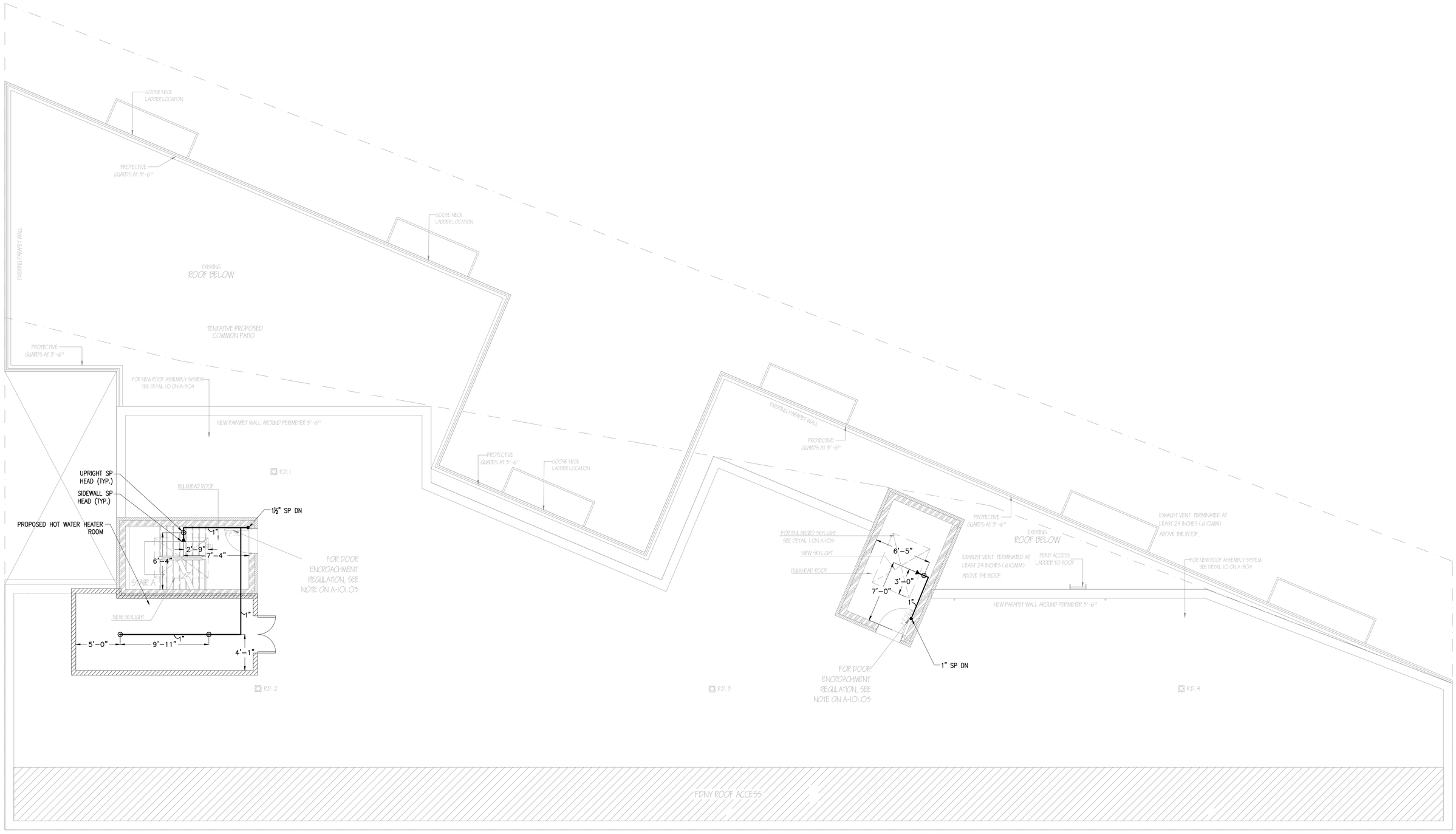


GENERAL NOTES:
1. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
2. FOR SPRINKLER WORK ONLY.

HAZARD CLASSIFICATION AND DESIGN DENSITY:
OCCUPANCY: LIGHT HAZARD MINIMUM DESIGN DENSITY: 0.10 GPM/SQ. FT.

SPRINKLER HEADS COUNT	
SPK. HEAD TYPE	QTY.
UPRIGHT	10
CONCEALED	55
SIDEWALL	01

1 5TH FLOOR SPRINKLER PLAN
3/16" = 1' - 0"



95.59'
SOUTH ELEVATION

95.56'
SOUTH ELEVATION

95.56'
SOUTH ELEVATION

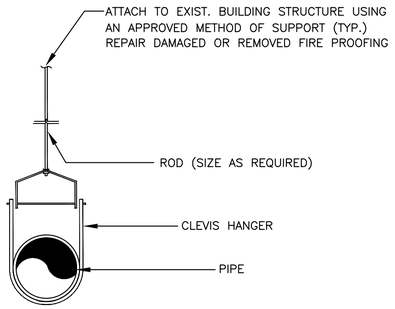
GENERAL NOTES:
1. ALL SPRINKLER HEADS MEET DESIGN CRITERIA PER COVERAGE.
2. FOR SPRINKLER WORK ONLY.

HAZARD CLASSIFICATION AND DESIGN DENSITY:
AREA: MECHANICAL ROOM

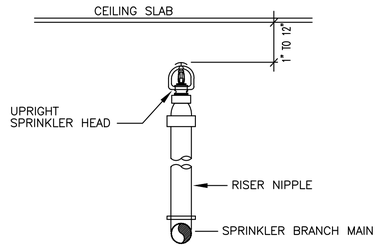
OCCUPANCY: ORDINARY HAZARD (GROUP-2)
MINIMUM DESIGN DENSITY: 0.20 GPM/SQ. FT.

SPRINKLER HEADS COUNT	
SPK. HEAD TYPE	QTY.
UPRIGHT	4
SIDEWALL	2

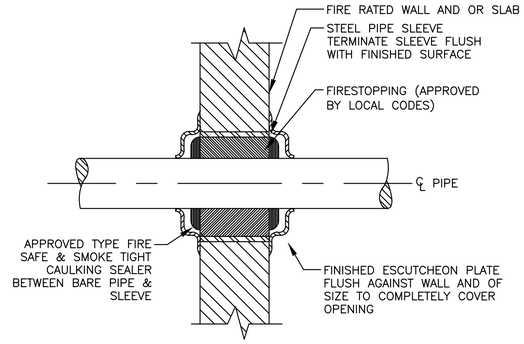
1 ROOF SPRINKLER PLAN
3/16" = 1' - 0"



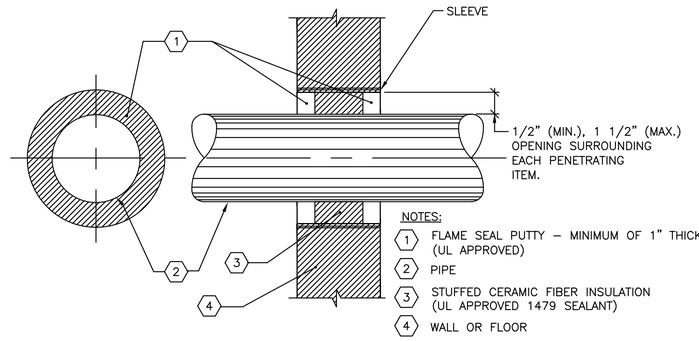
1 SP-501 HANGER DETAILS TYPICAL
N.T.S



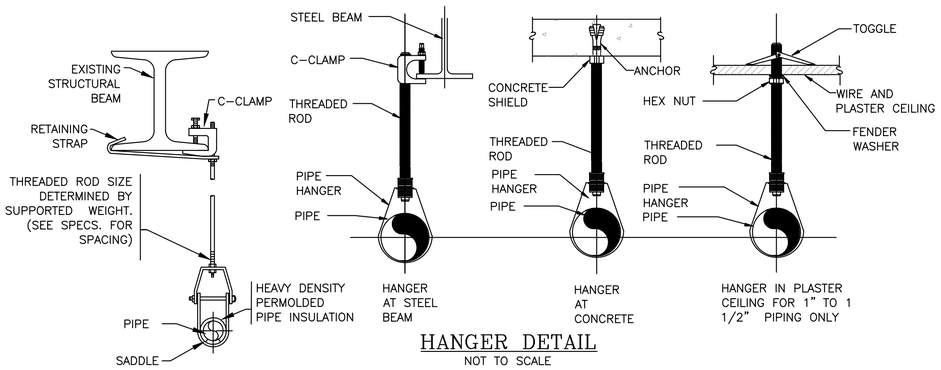
2 SP-501 SPRINKLER HEAD DETAIL UPRIGHT
N.T.S



3 SP-501 PIPE THRU RATED WALL TYPICAL DETAIL
N.T.S



4 SP-501 FIRE STOPPING DETAIL FOR FIRE/SMOKE RATED WALL/FLOOR OPENINGS
N.T.S



HANGER DETAIL
NOT TO SCALE

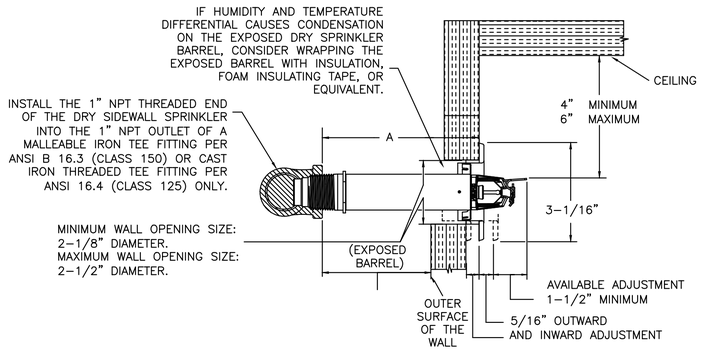
ROD SCHEDULE

PIPE SIZE	ROD SIZE	SPACING	PIPE SIZE	ROD SIZE	SPACING
1"	3/8"	5'–8'	2 1/2"	1/2"	10'–12'
1 1/4"	3/8"	6'–10'	3"	1/2"	10'–12'
1 1/2"	3/8"	8'–10'			
2"	3/8"	10'–12'			

5 SP-501 TYPICAL HANGER DETAIL AND ROD SCHEDULE
N.T.S

SEAL THE CLEARANCE SPACE AROUND THE SPRINKLER BARREL TO AVOID LEAKAGE OF AIR INTO THE PROTECTED AREA AND CONSEQUENT FORMATION OF CONDENSATE AROUND THE SPRINKLER FRAME, WHICH COULD INHIBIT OPERATION OR CAUSE PREMATURE OPERATION.

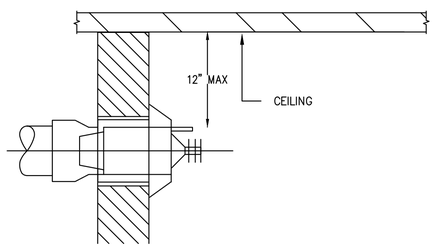
FOR "A" DIMENSION:
1. DETERMINE THE DISTANCE FROM THE FACE OF THE TEE TO THE FACE OF THE FINISHED WALL.
2. ROUND TO THE NEAREST 1/4" BETWEEN 3–1/4" AND 47–1/2".



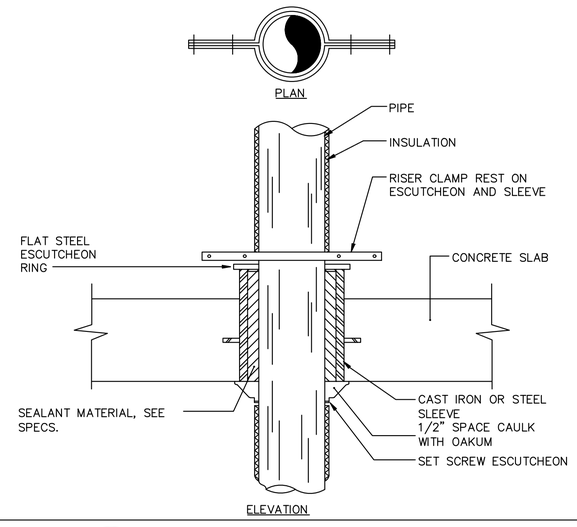
AMBIENT TEMPERATURE OF PROTECTED AREA* AT THE DISCHARGE END OF THE SPRINKLER	EXPOSED BARREL AMBIENT TEMPERATURE 40°F/4°C | 50°F/10°C | 60°F/16°C EXPOSED MINIMUM BARREL LENGTH** FACE OF THE TEE TO THE OUTER SURFACE OF THE WALL		
	INCHES.	INCHES.	INCHES.
40°F (4°C)	0	0	0
30°F (–1°C)	0	0	0
20°F (–7°C)	4	0	0
10°F (–12°C)	8	1	0
0°F (–18°C)	12	3	0
–10°F (–23°C)	14	4	1
–20°F (–29°C)	14	6	3
–30°F (–34°C)	16	8	4
–40°F (–40°C)	18	8	4
–50°F (–46°C)	20	10	6
–60°F (–51°C)	20	10	6

* THE PROTECTED AREA REFERS TO THE AREA BELOW THE CEILING. THE AMBIENT TEMPERATURE IS THE TEMPERATURE AT THE DISCHARGE END OF THE SPRINKLER. FOR PROTECTED AREA TEMPERATURES THAT OCCUR BETWEEN THE VALUES LISTED, USE THE NEXT COOLER TEMPERATURE.
** THE MINIMUM REQUIRED BARREL LENGTH IS NOT THE SAME AS THE "A" DIMENSION. EXPOSED MINIMUM BARREL LENGTHS ARE INCLUSIVE UP TO 30 MPH WIND VELOCITIES.

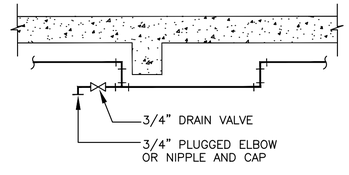
6 SP-501 DRY SIDEWALL SPRINKLER INSTALLATION DETAILS
N.T.S



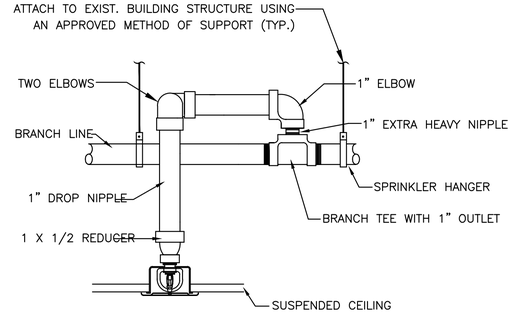
7 SP-501 SIDEWALL SPRINKLER HEAD
N.T.S



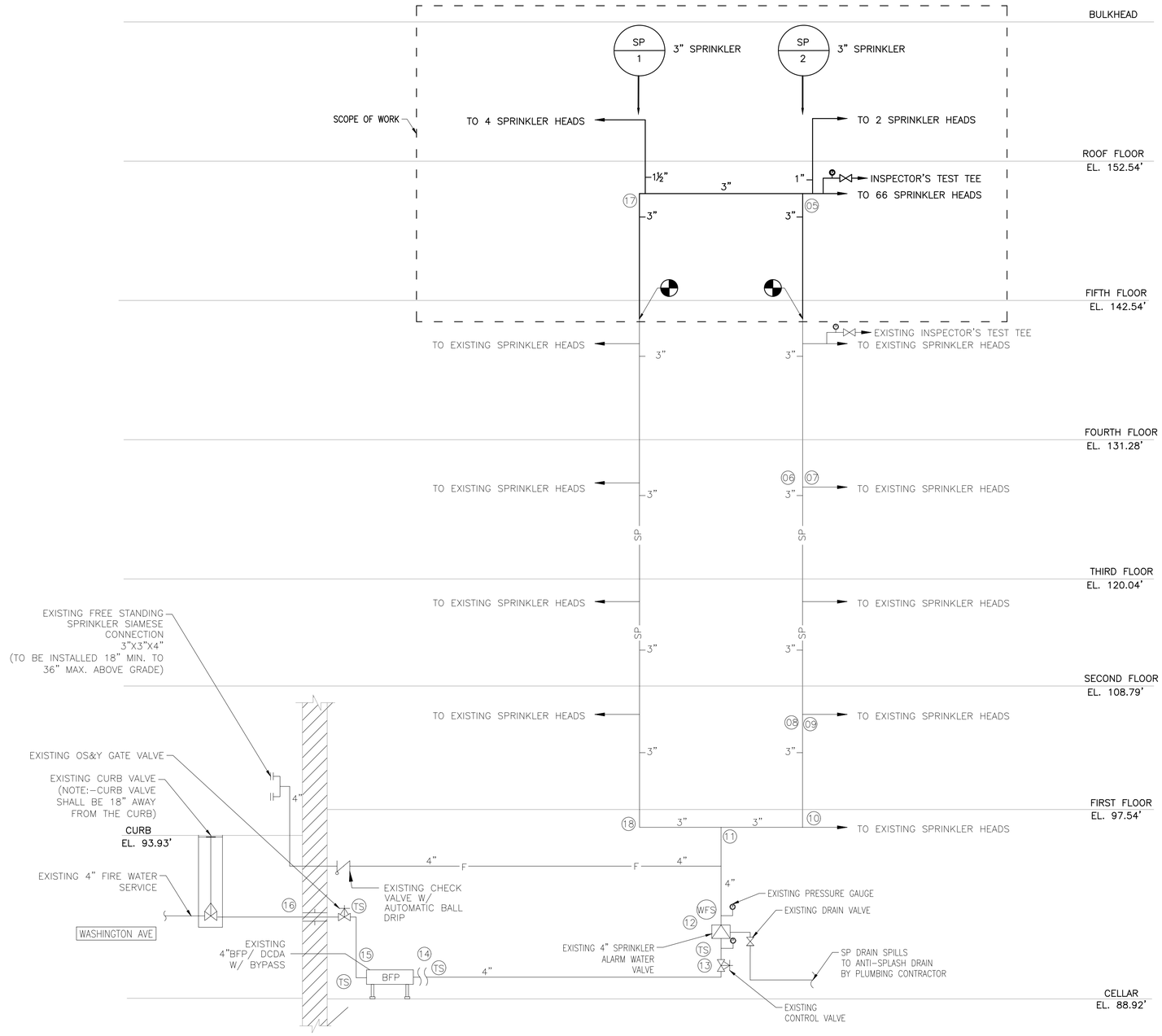
8 SP-501 SPRINKLER RISER CLAMP DETAIL
N.T.S



9 SP-501 TYPICAL DRAIN CONNECTION FOR TRAPPED LINES ON WET PIPE SPRINKLER SYSTEMS
N.T.S



10 SP-501 SPRINKLER HEAD IN SUSPENDED CEILING DETAIL
N.T.S



1 SPRINKLER RISER DIAGRAM

N.T.S.

ELECTRICAL SYMBOLS LIST

LIGHTING

	FLUORESCENT LIGHTING FIXTURE AND OUTLET BOX. HALF SHADED FIXTURE OR "EM" INDICATES FIXTURES WITH INTEGRAL BATTERY PACK FOR EMERGENCY SERVICE, U.O.N.
A 2 a	LUMINAIRE TYPE : INDICATE BY LIPPERCASE LETTER SEE LIGHTING EXTURE SCHEDULE. CIRCUIT NUMBER : INDICATED BY NUMBER SWITCHING INDICATED BY LOWER CASE LETTERS.
EM	DENOTES LUMINAIRE ON EMERGENCY CIRCUIT.
NL	DENOTES FIXTURES DESIGNATED AS NIGHTLIGHT, WIRED TO 24 HOURS UNSWITCHED CIRCUIT.
	CEILING/WALL MOUNTED SELF POWERED EXIT LIGHT FIXTURE WITH DIRECTIONALARROWS AS INDICATED. SHADED AREA DENOTES FACE(S). ISOLITE ELITE SERIES LED EXIT SIGN
	EMERGENCY BATTERY UNIT WITH ATTACHED EMERGENCY FIXTURES AND OUTLET BOX.

SWITCHES AND CONTROLS

$a	20A SPST TOGGLE SWITCH U.O.N. "a" DENOTES LIGHTING FIXTURE CONTROLLED.
$3 a	20A 3–WAY TOGGLE SWITCH U.N.O. "a" DENOTES LIGHTING FIXTURE CONTROLLED
OS	WALL OCCUPANCY SENSOR, NUMBER INDICATES TYPE; SEE OCCUPANCY SENSOR SCHEDULE.
PC	WALL MOUNTED PHOTOCELL MOUNTED IN NEMA 3R ENCLOSURE.

WIRING SYSTEMS

3 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 1#12 ø, 1#12 N. & 1#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3 5 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 2#12 ø, 2#12 N. & 2#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
3 5 7 UP–	POWER OR LIGHTING CIRCUITRY HOMERUN WITH PANELBOARD DESIGNATION, NUMBER WHERE USED INDICATES CIRCUIT NUMBER. IT SHALL CONSISTS OF 3#12 ø, 3#12 N. & 3#12 G. IN 3/4"C, UNLESS OTHERWISE NOTED.
	CONDUIT TURNING UP, SEE FLOOR PLANS FOR CONDITIONS.
	CONDUIT TUIRNING DOWN, SEE FLOOR PLANS FOR CONDITION.
	CONDUIT AND WIRE TO BUILDING GROUND.
	CABLE TRAY, WIDTH AND MOUNTING AS NOTED.
	UNDERGROUND
	EXISTING
	NEW
S/CO	COMBINATION OF SMOKE AND CO DETECTOR.

ELECTRICAL DRAWING LIST

E–001.00	ELECTRICAL SYMBOL LIST, ABBREVIATIONS & GENERAL NOTES
E–002.00	ELECTRICAL SPECIFICATIONS SHEET 1 OF 3
E–003.00	ELECTRICAL SPECIFICATIONS SHEET 2 OF 3
E–004.00	ELECTRICAL SPECIFICATIONS SHEET 3 OF 3
E–101.00	5TH FLOOR LIGHTING PLAN
E–102.00	ROOF LIGHTING PLAN
E–200.00	CELLAR ELECTRICAL POWER PLAN
E–202.00	5TH FLOOR ELECTRICAL POWER PLAN
E–203.00	ROOF ELECTRICAL POWER PLAN
E–400.00	ELECTRICAL DETAILS
E–500.00	ELECTRICAL RISER DIAGRAM
E–600.00	ELECTRICAL PANEL SCHEDULES SHEET 1 OF 4
E–601.00	ELECTRICAL PANEL SCHEDULES SHEET 2 OF 4
E–602.00	ELECTRICAL PANEL SCHEDULES SHEET 3 OF 4
E–603.00	ELECTRICAL PANEL SCHEDULES SHEET 4 OF 4

POWER AND TELECOMMUNICATION

J	JUNCTION BOX WITH BLANK COVER PLATE, FLUSH IN FLOOR.
J	JUNCTION BOX WITH BLANK COVER PLATE, WALL MOUNTE, +18" AFF OR AS NOTED.
A	SIMPLEX RECEPTACLE, +18" AFF OR AS NOTED. SUFFIXE DENOTES FOLLOWING: A– NEMA 5–15R B– NEMA 6–15R C– NEMA 14–30R D– NEMA 14–50R
	DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
	DEDICATED DUPLEX CONVENIENCE RECEPTACLE, +18" AFF OR AS NOTED.
	DUPLEX CONVENIENCE RECEPTACLE, CONTROLLED FROM WALL SWITCH. HALF SWITCHED, HALF CONSTANT HOT.
NID	NETWORK INTERFACE DEVICE. NID IS 'ONT' BOX WHICH INCLUDES BOTH 'ONT' AND ITS SISTER BOX AS PER VERIZON STANDARDS.
	DOUBLE DUPLEX RECEPTACLE – 20A–1P, 125V, NEMA 5–20R.
	TELEPHONE/DATA OUTLET, 4"SQUARE OUTLET BOX WITH SINGLE GANG COLLAR AND BLANK PLATE. PROVIDE 3/4" E.C., U.O.N., UP TO HUNG CEILING AND TERMINATE WITH 90° ELBOW, BUSHING AND DRAG WIRE.
TV	CABLE TV OUTLET, WALL–MOUNTED AT 18" AFF UNO.

MOTORS AND CONTROLS

M	AC INDOOR UNIT MOTOR AS NOTED WITH LIQUID TIGHT FLEXIBLE CONNECTION WITH JUNCTION BOX AND MOTOR SWITCH.
M WP	AC OUTDOOR UNIT MOTOR AS NOTED WITH CONTROLLER AND DISCONNECT SWITCH WITH WEATHER PROOF.
	NON FUSED DISCONNECT SWITCH AMPERAGE, AND NUMBER OF POLES AS NOTED.
A	30A/240V NON FUSED DISCONNECT SWITCH
B	60A/240V NON FUSED DISCONNECT SWITCH
C	100A/240V NON FUSED DISCONNECT SWITCH
D	400A/240V NON FUSED DISCONNECT SWITCH
400 350	FUSED DISCONNECT SWITCH AND FUSE AMPERAGE AS INDICATED. TOP NUMBER DENOTS SWITCH SIZE AND BOTTOM NUMBER DENOTES FUSE.
MD	MOTORIZED DAMPER.
FSD	FIRE SMOKE DAMPER
S_T	THERMAL OVERLOAD SWITCH AT MOTOR. PROVIDE THERMAL ELEMENTS AS PER MOTOR RATING.
S_M	MANUAL MOTOR SWITCH
1.5 kW	ELECTRICAL HEATER, NUMBER DENOTES HEATER RATING

ANNOTATION

+24"	INDICATES MOUNTING HEIGHT, CENTER LINE TO FINISHED FLOOR.
X	KEYED NOTE REFERENCE
1 E/2–1	DETAIL REFERENCE: DETAIL NUMBER INDICATED ON TOP; DRAWING NUMBER INDICATED ON BOTTOM

POWER DISTRIBUTION

	MAJOR ELECTRICAL COMPONENT OR DEVICE. VOLTAGE AND AMPERAGE AS NOTED.
	BRANCH PANELBOARD, 208Y/120V–FLUSH MOUNTED
	DISTRIBUTION PANELBOARD, 208Y/120V–SURFACE MOUNTED.

ELECTRICAL ABBREVIATIONS

A	AMPERES	EA	EACH
A/C, AC	AIR CONDITIONING UNIT	EC	EMPTY CONDUIT/ ELECTRICAL CONTRACTOR
AF	AMPERE FRAME/AMP FUSE	EF	EXHAUST FAN
AFF	ABOVE FINISHED FLOOR	EM	EMERGENCY
AS	AMP SWITCH	EMT	ELECTRICAL METALLIC TUBING
AIC	AMPS INTERRUPTING CAPACITY	EQUIP	EQUIPMENT
AUTO	AUTOMATIC	FA	FIRE ALARM
AWG	AMERICAN WIRE GAUGE	FIXT	FIXTURE
C	CONDUIT	FL	FLOOR
C/B,CB	CIRCUIT BREAKER	G	GROUND
CKT	CIRCUIT	GFI	GROUND FAULT INTERRUPTER
CLG	CEILING	GP	GENERAL PURPOSE
CT	CURRENT TRANSFORMER	HP	HORSEPOWER
CU	COPPER	HZ	HERTZ
°C	DEGREE CELSIUS	IC	INTERRUPTING CAPACITY
°F	DEGREE FAHRENHEIT	PP	POWER PANEL
DIA	DIAMETER	PWR	POWER
DISC	DISCONNECT	REC	RECEPTACLE
DN	DOWN	RGS	RIGID GALVANIZED STEEL
DP	DISTRIBUTION PANEL	SECT	SECTION
HWHT	HOT WATER WATER HEATER	SPEC	SPECIFICATION
DWG	DRAWING	SW	SWITCH
JB	JUNCTION BOX	TELE	TELEPHONE
KCMIL	ONE THOUSAND CIRCULAR MILS	TEMP	TEMPERATURE
LTG	LIGHTING	TX	TOILET EXHAUST FAN
MCB	MAIN CIRCUIT BREAKER	TYP	TYPICAL
MTD	MOUNTED	UON	UNLESS OTHERWISE NOTED
N	NEUTRAL	V	VOLT/VOLTAGE
NIC	NOT IN CONTRACT	VA	VOLT AMPERE
NL	NIGHT LIGHT	WP	WEATHER PROOF
NTS	NOT TO SCALE	IG	ISOLATED GROUND
P	PUMP	W	WIRE
PB	PULLBOX	W	WATT
ø	PHASE	DW	DISHWASHER
RA	RANGE	REF	REFRIGERATOR
RH	RANGE HOOD	DR	DRYER
WA	WASHER		

GENERAL NOTES

(APPLY TO ALL "E" DRAWINGS)

1. ALL WORK SHALL BE PERFORMED IN STRICT ACCORDANCE WITH THE CURRENT VERSION OF THE NYC ELECTRICAL CODE, 2008 NEC WITH NYC AMENDMENTS, LOCAL JURISDICTION REQUIREMENTS, AND ALL GOVERNING LOCAL CODES, LAWS, AND REGULATIONS.
2. CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH ALL EXISTING CONDITIONS THAT MAY AFFECT THE WORK. NO ADDITIONAL COMPENSATION WILL BE CONSIDERED FOR FAILURE TO DO SO.
3. CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, TEST REPORTS, AND CERTIFICATIONS FOR TEMPORARY AND FINAL CERTIFICATE OF OCCUPANCY.
4. FIRE STOP ALL PENETRATIONS OF FIRE RATED CONSTRUCTION IN A CODE APPROVED MANNER IN ORDER TO MAINTAIN FIRE RATING. ALL PENETRATIONS SHALL BE SLEEVED AND SEALED WATERTIGHT.
5. SECURE ALL SUPPORTS TO BUILDING STRUCTURE UTILIZING TOGGLE BOLTS (HOLLOW MASONRY), EXPANSION SHIELDS OR INSERTS (CONCRETE AND BRICK), MACHINE SCREWS (METAL), BEAM CLAMPS (FRAMEWORK), WOOD SCREWS (WOOD) OR PAN THRU STRAPS (METAL DECK). NAILS, RAWL PLUGS AND WOOD PLUGS ARE NOT PERMITTED. WHERE REQUIRED BY STRUCTURE, PROVIDE THRU BOLTS AND FISH PLATES. SUPPORT HORIZONTAL RUNS OF METALLIC RACEWAYS NOT MORE THAN 10 FT APART. SUPPORT RACEWAY RISERS AT EACH FLOOR LEVEL. RUN EXPOSED RACEWAYS PARALLEL WITH OR AT RIGHT ANGLES TO WALLS.
6. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS. RACEWAYS OVER 10 FT LONG IN WHICH WIRING IS NOT INSTALLED: FURNISH FISH WIRE.
7. VERIFY LOCATIONS OF OUTLETS AND SWITCHES IN FINISHED ROOMS WITH ARCHITECTURAL DRAWINGS OF INTERIOR DETAILS AND FINISH. IN CENTERING OUTLETS AND LOCATING BOXES AND OUTLETS, ALLOW FOR OVERHEAD PIPES, DUCTS AND MECHANICAL EQUIPMENT, EQUIPMENT, VARIATIONS IN FIREPROOFING AND PLASTERING, WINDOW AND DOOR TRIM, PANELING, HUNG CEILINGS AND THE LIKE. CORRECT ANY INACCURACY RESULTING FROM FAILURE TO DO SO WITHOUT EXPENSE TO OWNER.
8. CONTRACTOR SHALL PROVIDE A WARRANTY ON ALL MATERIALS, EQUIPMENT, AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM THE DATE OF FINAL ACCEPTANCE.
9. ALL UNUSED MATERIALS AND DEBRIS SHALL BE LEGALLY REMOVED AND DISPOSED OF AWAY FROM THE PREMISES ON A DAILY BASIS.
10. CONTRACTOR SHALL PATCH, PAINT, AND RESTORE EXISTING SURFACES DAMAGED DURING THE COURSE OF THIS CONSTRUCTION TO PRE–EXISTING CONDITIONS OR BETTER.
11. MINIMUM SIZE OF CONDUIT SHALL BE ¾", AND TYPE SHALL BE ELECTRICAL METALLIC TUBING (EMT), UNLESS OTHERWISE NOTED. PROVIDE NYLON DRAG LINE AND CONDUIT CAP FOR ALL EMPTY CONDUITS.
12. CONNECT CONDUIT TO MOTOR CONDUIT TERMINAL BOXES WITH FLEXIBLE CONDUIT (MINIMUM 18 IN. LENGTH AND 50% SLACK). DO NOT TERMINATE IN OR FASTEN RACEWAYS TO MOTOR FOUNDATION.
13. PULL AND JUNCTION BOXES WHERE INDICATED ON THE DRAWINGS, SHALL BE CONSIDERED SHOWN AT THEIR APPROXIMATE LOCATION. THE CONTRACTOR SHALL LOCATE THEM AS FIELD CONDITIONS DICTATE. ADDITIONAL PULL AND JUNCTION BOXES NOT SHOWN ON DRAWINGS SHALL BE PROVIDED WHERE REQUIRED BY APPLICABLE CODE PROVISIONS OR WHERE CALLED FOR BY FIELD CONDITIONS. PULL AND JUNCTION BOXES SHALL BE SURFACE TYPE IN UNFINISHED AREAS AND INSTALLED CANCEALED IN FINISHED AREAS, AND ALL COVERS TO PULL & JUNCTION BOXES SHALL BE READILY ACCESSIBLE.
14. SUPPORT PANEL, JUNCTION AND PULLBOXES INDEPENDENTLY TO BUILDING STRUCTURE WITH NO WEIGHT BEARING ON RACEWAYS.
15. FOR EXACT LOCATION AND MOUNTING HEIGHT OF LIGHTING FIXTURES AND SWITCH/RECEPTACLE OUTLETS, REFER TO ARCHITECTURAL REFLECTED CEILING AND POWER PLANS.
16. ALL ELECTRICAL ACCESSORIES AND EQUIPMENT INSTALLED OUTSIDE OR EXPOSED TO WEATHER SHALL HAVE NEMA 3R ENCLOSURES AND SHALL BE TIGHTLY GASKETED FOR A COMPLETE RAINTIGHT INSTALLATION. ALL BUILDING EXTERIOR MOUNTED RECEPTACLES SHALL BE GFCI RATED AND MOUNTED IN WEATHERPROOF ENCLOSURE.
17. ALL ACCESS PANEL LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.
18. ELECTRICAL CONTRACTOR SHALL COORDINATE THE LOCATION AND INSTALLATION OF NEW WORK WITH THE GENERAL CONTRACTOR AND OTHER ASSOCIATED TRADES IN A TIMELY MANNER. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL DIMENSIONS AND CONDITIONS PRIOR TO CONSTRUCTION. REFER TO ALL GENERAL, MECHANICAL, AND ELECTRICAL, DRAWINGS AND SPECIFICATIONS FOR THIS PROJECT.
19. ALL CONDUITS AND EQUIPMENT TO BE CONCEAL ED IN FINISHED SPACES UNLESS OTHERWISE NOTED. CONDUITS SHALL BE ENCASED IN THE CONCRETE FLOOR SLAB.
20. ALL EQUIPMENT AND MATERIALS INSTALLED IN PLENUM CEILINGS SHALL BE APPROVED FOR THAT APPLICATION.
21. OUTLET BOXES AND JUNCTION BOXES ON OPPOSITE SIDES OF FIRE–RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE OF NOT LESS THAN 24 INCHES, UNLESS FIRE–RATED BOXES OR PUTTY PADS ARE UTILIZED.
22. COORDINATE ALL FLOOR PENETRATIONS WITH THE STRUCTURAL AND ARCHITECTURAL DRAWINGS. CONFIRM PENETRATION LOCATIONS WITRH THE ENGINEER AND OWNER BEFORE INSTALLATION.
23. COORDINATE THE MOUNTING HEIGHT AND LOCATION OF RACEWAYS, COMMUNICATIONS OUTLETS, AND RECEPTACLES WITH THE ARCHITECTURAL CASEWORK DRAWINGS AND DETAILS. COORDINATE LOCATIONS OF LIGHT FIXTURES, SWITCHES, AND RELATED DEVICES WITH THE ARCHITECTURAL DRAWINGS AND DETAILS.
24. REFER TO ARCHITECTURAL PLANS FOR FINAL LOACTIONS OF ALL LUMINARIES AND SWITCHES, AND FOR ALL FINISHED CEILING HEIGHTS.
25. REFER TO ARCHITECTURAL PLANS FOR FINAL LOCATIONS OF ALL ELECTRICAL DEVICES, AND FOR FINAL CEILING AND WALL HEIGHTS AND LAYOUTS.
26. LIGHTING FIXTURES PROVIDED WITH EMERGENCY BATTERY PACKS AND INDICATED WITH SWITCH CONTROL SHALL BE WIRED WITH BATTERY CHARGING/SENSING CIRCUIT WIRED AHEAD OF SWITCH CONTROL.
27. NUMBER(S) SHOWN AT RECEPTACLES, JUNCTION BOXES AND EQUIPMENT INDICATES CIRCUIT NUMBERS IN PANELBOARD. PROVIDE WIRE AND CONDUIT TO INTERCONNECT EQUIPMENT AND DEVICES WITH SAME CIRCUIT NUMBERS AND RUN TO PANELBOARD.

ELECTRICAL SPECIFICATIONS

1. GENERAL:

A. THE "GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION," AIA DOCUMENT A201, LATEST EDITION, AND THESE SPECIFICATIONS AS APPLICABLE ARE PART OF THIS CONTRACT.

B. DRAWING ARE DIAGRAMMATIC AND INDICATE GENERAL ARRANGEMENT OF SYSTEMS AND WORK. CONDUIT ROUTING IS SHOWN DIAGRAMMATICALLY AND DOES NOT SHOW ALL OFFSETS, DROPS AND RISES OF RUNS. THE CONTRACTOR SHALL ALLOW IN HIS PRICE FOR ROUTING OF CONDUIT TO AVOID OBSTRUCTIONS. COORDINATION WITH EXISTING SERVICES, INCLUDING THOSE OF OTHER TRADES, IS REQUIRED, MAINTAIN HEADROOM AND SPACE CONDITIONS.

C. BIDDERS, BEFORE SUBMITTING PROPOSALS, SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL ATTEND THE EXECUTION OF THIS WORK. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE, AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS, REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE.

D. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOROPERATION,MAINTANANCE 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.

I. 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.

L. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK DURING OVERTIME HOURS AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

M. UNLESS OTHERWISE SPECIFICALLY NOTED OR SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

N. ALL MATERIAL AND EQUIPMENT SHALL BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

O. INSURANCE: PROVIDE IN ACCORDANCE WITH OWNER/BUILDING REQUIREMENTS AND SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

P. THE FINAL ACCEPTANCE SHALL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, TESTED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS AND HAS FURNISHED ALL THE REQUIRED CERTIFICATED OF INSPECTION AND APPROVAL.

2. GENERAL PROVISIONS FOR ELECTRICAL WORK:

A. DEFINITIONS:

1) "PROVIDE": TO FURNISH, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE. AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

4) "WORK": LABOR, MATERIALS, EQUIPMENT, APPARATUS, CONTROLS, ACCESSORIES AND OTHER ITEMS REQUIRED FOR PROPER AND COMPLETE INSTALLATION.

5) "WIRING": RACEWAY. FITTINGS, WIRE, BOXES, AND RELATED ITEMS.

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

7) "EXPOSED": NOT INSTALLED UNDERGROUND OR "CONCEALED" AS DEFINED ABOVE.

8) "SIMILAR" OR "EQUAL": EQUAL IN MATERIALS, WEIGHT, SIZE, DESIGN AND EFFICIENCY OF SPECIFIED PRODUCT.

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

C. QUALITY ASSURANCE

1) QUALITY OF MATERIALS: ALL EQUIPMENT SHALL BE NEW SPECIFICATION GRADE, FREE FROM DEFECTS AND LISTED BY APPROVED TESTING AGENCY AND BEARING THEIR LABEL MATERIALS AND EQUIPMENT OF SIMILAR APPLICATION SHALL BE OF SAME MANUFACTURER, EXCEPT AS NOTED.

2) GUARANTEE: ALL MATERIALS AND WORKMANSHIP SHALL BE GUARANTEED AS DEFINED IN PARAGRAPH 2.C.

3) CURRENT CHARACTERISTICS:

a. SERVICE: 120/208 VOLT, 3 PHASE, 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.

– MOTOR CONTROLLERS: 5 FT–0 IN.

– CLOCKS: 7 FT 6 IN

b. EXCEPTIONS: AT JUNCTION OF DIFFERENT WALL FINISH MATERIALS, ON MOLDING OR BREAK IN WALL SURFACE, IN VIOLATION OF CODE, OR AS NOTED OR DIRECTED.

D. PRODUCT DELIVERY, STORAGE AND HANDLING

1) MOVING OF EQUIPMENT: WHERE NECESSARY, SHIP IN CARTED SECTIONS OF SIZE TO PERMIT PASSING THROUGH AVAILABLE SPACES.

2) ACCESSIBILITY: FOR OPERATION, MAINTENANCE AND REPAIR, MINOR DEVIATIONS SHALL BE PERMITTED, CHANGES OF MAGNITUDE OR INVOLVING EXTRA COST ARE NOT PERMISSIBLE WITHOUT REVIEW. GROUP CONCEALED ELECTRICAL EQUIPMENT REQUIRING ACCESS WITH EQUIPMENT FREELY ACCESSIBLE THROUGH ACCESS DOORS.

E. MATERIALS

1) NAMEPLATES: PROVIDE BLACK LAMICOID SHEET WITH 3/4 IN. WHITE LETTERING, FASTENED WITH EPOXY CEMENT FOR EACH DISCONNECT SWITCH, CIRCUIT BREAKER, PANEL, CABINET, TRANSFORMER, ENCLOSURE, MOTOR CONTROLLER AND THE LIKE. NAMEPLATES SHALL DESCRIBE THE NAME AND NUMBER OF EACH COMPONENT.

2) CABLE TAGS: TAG EACH CONDUCTOR PASSING THROUGH SPLICE OR PULLBOX WITH A WHITE LINEN TAG, INDICATING POINT OF ORIGIN AND TERMINATION OF THE CIRCUIT.

3) INSERTS AND SUPPORTS:

a. INSERTS: STEEL, SLOTTED TYPE, FACTORY PAINTED.

– SINGLE ROD: SIMILAR TO GRINNELL FIG. 281.

– MULTI–ROD: SIMILAR TO FEE AND MASON SERIES 9000 WITH END CAPS AND CLOSURE STRIPS.

– CLIP FORM NAILS FLUSH WITH INSERTS.

– MAXIMUM LOADING 75 PERCENT OF RATING.

b. SUPPORTS FROM BUILDING CONSTRUCTION: INSERTS, BEAM CLAMPS, STEEL FISHPLATES (IN CONCRETE FILL ONLY), CANTILEVER BRACKETS OR OTHER MEANS. SUBMIT FOR REVIEW.

c. GROUPED LINES AND SERVICES: TRAPEZE HANGERS OF BOLTED ANGLES OR CHANNELS.

d. WHERE BUILDING CONSTRUCTION IS INADEQUATE: PROVIDE ADDITIONAL FRAMING. SUBMIT FOR REVIEW.

F. PAINT SHALL BE THE BEST GRADE FOR ITS PURPOSE. DELIVER IN ORIGINAL SEALED CONTAINERS AND APPLY IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. COLORS SHALL BE AS SELECTED BY ARCHITECT OR ENGINEER. UTILIZE GALVANIZED IRON PRIMER ON PANEL AND PULL BOXES, AFTER FABRICATION. UTILIZE HOT DIPPED GALVANIZED OR DIPPED IN ZINC BASED PRIMER FOR: OUTLET BOXES, JUNCTION BOXES, CONDUIT HANGERS, RODS, INSERTS AND SUPPORTS. ZINC BASED PRIMER WITH FINISH TO MATCH SURROUNDINGS SHALL BE USED FOR MARRED SURFACES OF STEEL EQUIPMENT AND RACEWAYS. A FIELD–APPLIED ZINC BASED PRIME COAT SHALL BE UTILIZED FOR STEEL OR IRONWORK.

G. BRUSH AND CLEAN WORK PRIOR TO CONCEALING, PAINTING AND ACCEPTANCE. PAINTED EXPOSED WORK SOILED OR DAMAGED; CLEAN AND REPAIR TO MATCH ADJOINING WORK BEFORE FINAL ACCEPTANCE. REMOVE DEBRIS FROM INSIDE AND OUTSIDE OF MATERIAL AND EQUIPMENT.

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

I. ALL ACCESS DOOR LOCATIONS SHALL BE REVIEWED BY ARCHITECT PRIOR TO INSTALLATION.

3. SCOPE OF WORK:

A. SCOPE OF WORK SHALL CONSIST OF PROVIDING LABOR, MATERIALS, EQUIPMENT, SERVICES AND FEES NECESSARY FOR COMPLETE AND SAFE INSTALLATION IN CONFORMING WITH THE 2008 NATIONAL ELECTRICAL CODE (NEC) NYC AMENDMENTS, AND ALL OTHER APPLICABLE INDUSTRY, NATIONAL AND LOCAL CODES AND AUTHORITIES HAVING JURISDICTION, AS INDICATED ON DRAWINGS AND HEREIN SPECIFIED.

B. ALL DRAWINGS, PLANS, DETAILS, SPECIFICATIONS AND SPECIFICATION ADDENDA ARE MADE PART OF THIS CONTRACT AND SHALL APPLY TO ALL WORK UNDER THE CONTRACT UNLESS OTHERWISE AMENDED, MODIFIED, SUPPLIED OR SPECIFIED HEREIN.

C. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES BY OWNER INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER, DATE IS EARLIER, THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDED THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR

D. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH ALL DEPARTMENTS HAVING JURISDICTION, WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

E. CONTRACTOR SHALL PERFORM ALL CONTROLLED INSPECTIONS IN ACCORDANCE WITH THE NYC BUILDING CODE. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.

F. AREAS WITH NO ELECTRICAL WORK SHALL REMAIN AS IS. CONTRACTOR SHALL MAINTAIN CONTINUITY OF ALL ELECTRICAL SYSTEMS TO ALL AREAS NOT COVERED BY THIS RENOVATION AND SHALL PROVIDE 48 HOUR NOTICE TO LANDLORD OF ANY PLANNED POWER INTERRUPTIONS OR SIGNAL SYSTEM OUTAGES.

4. SHOP DRAWINGS

A. PRIOR TO THE INSTALLATION OF ANY WORK AND PROCUREMENT OF EQUIPMENT, CONTRACTOR SHALL PROVIDE COMPLETE SETS OF COORDINATED SHOP DRAWINGS OF ALL NEW AND EXISTING EQUIPMENT, INDICATING CAPACITY, DIMENSIONS AND SEQUENCE OF OPERATION FOR WRITTEN APPROVAL BY THE ARCHITECT AND ENGINEER.

B. INDICATE ON EACH SHOP DRAWINGS SUBMITTED:

1) PROJECT NAME AND LOCATION

2) NAME OF ARCHITECT AND ENGINEER

3) ITEM IDENTIFICATION

4) APPROVAL STAMP OF PRIME CONTRACTOR

C. SUBMISSIONS:

1) SUBMISSIONS 11 IN. X 17 IN. OR SMALLER: IF THE SUBMISSION IS A CATALOG CUT, THEN THE CONTRACTOR SHALL SUBMIT ONE ORIGINAL AND TWO COPIES. OTHERWISE, HE SHALL SUBMIT THREE COPIES. THE ARCHITECT WILL FORWARD THE ORIGINAL AND ONE COPY (TWO COPIES WHEN NO ORIGINAL IS RECEIVED) TO THE ENGINEER. ALL CATALOG CUTS SHALL BE COMPLETE.

2) SUBMISSIONS LARGER THAN 11 IN. X 17 IN.: SUBMIT TWO PRINTS AND ONE PAPER SEPIA TO THE ARCHITECT. THE ARCHITECT WILL FORWARD ONE PRINT AND THE PAPER SEPIA TO THE ENGINEER.

D. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING:

1) SAFETY/DISCONNECT SWITCHES

2) FUSES

3) CIRCUIT BREAKERS

4) PANELBOARDS/LOADCENTER (INCLUDING DIMENSIONS, SCHEDULES, AND CATALOG CUTS).

5) RACEWAYS

6) WIRE AND CABLE

7) WALL SWITCHES

8) INSERTION RECEPTACLES

9) MOMENTARY CONTACT SWITCHES

10) TIME SWITCHES

11) LIGHTING FIXTURES.

E. ASSIST AND PROVIDE ALL NECESSARY INFORMATION, DIAGRAMS, SKETCHES, ETC. TO THE HVAC CONTRACTOR, FOR THE PREPARATION OF COORDINATED SHOP DRAWINGS INDICATING ROUTING OF FEEDERS, CONTROL CONDUITS, RECESSED FIXTURES AND ADJACENT NEARBY PIPING AND DUCTWORK WHERE APPLICABLE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED. SUBMIT FOUR(4) BOOKBOUND OPERATING AND SERVICE MANUALS WHICH SHALL INCLUDE COPIES OF ALL SHOP DRAWING. PROVIDE SHOP DRAWINGS FOR PANELS, FIXTURES, WIRING DEVICES, CONDUIT, CABLE, DISCONNECT SWITCH, RELAYS, CONTRACTORS, AND OTHER SYSTEMS AS DIRECTED BY THE ENGINEER.

5. AS–BUILT DRAWINGS AND EQUIPMENT OPERATIONAL INSTRUCTIONS

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

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8–1/2 IN. X 11 IN. PAPER AND BOUND IN THREE RING BINDERS WITH CLEAR ACETATE COVERS. CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND TELEPHONE NUMBER OF THE PROJECT, ARCHITECT AND ENGINEER.

D. REPRODUCIBLE "AS–BUILT" DRAWINGS SHALL BE PROVIDED INDICATING THE AS INSTALLED CONDITIONS OF THE WORK. "AS–BUILT" DRAWINGS SHALL BE PROVIDED TO THE ARCHITECT AFTER COMPLETION OF THE INSTALLATION.

6. LOW–VOLTAGE DISTRIBUTION EQUIPMENT:

A. PROVIDE COMPLETE EQUIPMENT INCLUDING: SWITCHES, FUSES, CIRCUIT BREAKERS, PANELS AND TRANSFORMERS.

B. ALL EQUIPMENT SHALL CONFORM TO NEMA, ANSI AND IEEE STANDARDS.

C. DISCONNECT SWITCHES SHALL BE FUSED OR NONFUSED AS NOTED. VOLTAGE SHALL BE AS REQUIRED. SWITCHES SHALL BE HEAVY DUTY, EXCEPT AS NOTED, AND HORSEPOWER RATED FOR MOTOR LOADS. TOGGLE TYPE SWITCHES SHALL BE NONFUSED, LOAD BREAK, HAVING MAXIMUM RATINGS OF 20 AMP AT 600 VOLTS AND 30 AMP AT 240 VOLTS. TWO–POLE SWITCHES SHALL BE SIMILAR TO HART AND HEGEMAN NO. 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 (600V) (UL CLASS RK1 OR CLASS J), AND BE LISTED BY UL WITH AN INTERRUPTING RATING OF 300,000 AMPERES RMS SYMMETRICAL.

C. ALL FUSES SHALL BE PROVIDED BY SAME MANUFACTURER.

D. PROVIDE 1 SPACE MATCHING FUSE FOR EACH SET OF 3.

E. CIRCUIT BREAKERS: MOLDED CASE BREAKERS SHALL BE THERMAL–MAGNETIC, QUICK–MAKE–QUICK–BREAK, BOLT–ON TYPE, MANUALLY OPERATED WITH INSULATED TRIP–FREE HANDLE. MULTI–POLE TYPE BREAKERS SHALL CONTAIN INTERNAL TRIP BAR. TERMINALS SHALL BE SUITABLE FOR COPPER OR ALUMINUM CABLE. FURNISH AUXILIARY DEVICES WHERE REQUIRED FOR SHUNT–TRIPPING, OPEN 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

8. 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).

E. DISTRIBUTION PANELBOARD CONSTRUCTION MINIMUM SHORT CIRCUIT RATING 25,000 AMPERES, REMS SYMMETRICAL FOR ALL 120/208V APPLICATIONS. APPLICATIONS.

F. DISCONNECTS

1) DISCONNECT SWITCHES SHALL CONFORM TO NEMA AND UL STANDARDS, AND SHALL BE HORSEPOWER RATED.

ELECTRICAL SPECIFICATIONS (CONT.)

2) SWITCHING MECHANISM SHALL BE QUICK–MAKE, QUICK–BREAK, SINGLE THROW WITH EXTERNAL OPERATING HANDLE MECHANCIALLY INTERLOCKED WITH ENCLOSURE COVER TO PROVIDE ACCESS TO INTERIOR WHEN DISCONNECT IS IN OFF POSITION ONLY. PROVIDE MEANS TO LOCK OPERATING HANDLE IN THE OPEN AND CLOSED POSITION. DESIGNATE ON THE ENCLOSURE THE OPEN AND CLOSED POSITION OF THE OPERATING HANDLE.

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

4) SWITCHES SHALL BE EQUIPPED WITH REJECTION TYPE FUSE HOLDERS, FUSIBLE AS SHOWN ON THE DRAWINGS; PROVIDE COMPLETE WITH FUSES AS SCHEDULED.

G. INSTALLATION

1) DISTRIBUTION PANELBOARD SHALL BE MOUNTED TO STRUCTURAL STEEL CHANNEL (KINDORF) WHICH SHALL BE BOLTED TO THE WALL USING EXPANSION ANCHORS FOR LARGE PANELS.

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 ¼" HIGH WHITE LETTERING.

I. DISTRIBUTION AND SUB–DISTRIBUTION PANELBOARDS SHALL BE A MINIMUM OF 30" WIDE AND 10" DEEP.

J. POWER PANELBOARDS SHALL BE SIMILAR TO GENERAL ELECTRIC TYPE "OMR", AS MANUFACTURED BY ATLAS SWITCH COMPANY, ELECTRIC SWITCHBOARD COMPANY OR APPROVED EQUAL.

K. PANELBOARD SHALL HAVE MAIN CIRCUIT BREAKER OR MAIN LUGS AS INDICATED ON THE DRAWINGS. QUANTITY, POLES AND TRIP RATINGS OF BRANCH CIRCUIT BREAKERS TO BE AS INDICATED ON DRAWINGS.

L. PANELBOARD SHALL HAVE ENGRAVED WHITE CORE, BLACK LAMACOID NAMEPLATE SCREWED ONTO PANE TRIM WITH DESIGNATION LISTED (PANELBOARD NAME, VOLTAGE, RATING OR MAINS IN AMPS).

B. MATERIALS

1) RACEWAYS:

a. RIGID STEEL CONDUIT: FULL–WEIGHT PIPE, GALVANIZED, THREADED.

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

c. FLEXIBLE STEEL CONDUIT: CONTINUOUS SINGLE STRIP, GALVANIZED.

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

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

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.

3) BOXES:

a. OUTLET BOXES: EXCEPT AS OTHERWISE REQUIRED BY CONSTRUCTION, DEVICES OR WIRING, BOXES SHALL BE STAMPED STEEL, 4 IN. SQUARE OR OCTAGON FOR FIXTURES. BOXES ABOVE CEILING SHALL BE 1–1/2 IN. DEEP. BOXES IN CEILING OR SLAB SHALL BE 3 IN. DEEP. BOXES IN WALL FOR FIXTURES SHALL BE 2–3/4 IN. DEEP. BOXES IN WALL FOR RECEPTACLES AND SWITCHES SHALL BE 1–1/2 IN. DEEP. FURNISH WITH RAISED COVERS AND FIXTURE STUDS WHERE REQUIRED. WITHOUT FIXTURE OR DEVICE: FURNISH BLANK COVER. OFFSET BACK–TO–BACK OUTLETS WITH MINIMUM 6 IN. SEPARATION.

b. JUNCTION AND PULL BOXES: GALVANIZED SHEET STEEL WITH SCREW–ON COVERS, EXCEPT AS NOTED. FURNISH WITH INSULATED SUPPORTS FOR CABLES. LOCATIONS SHALL BE AS NOTED OR REQUIRED AND ACCESSIBLE. PROVIDE BARRIERS IN NEW AND RENOVATED BOXES BETWEEN 120/208 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.

. 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.

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

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

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

D. PANEL, JUNCTION AND PULL BOXES SHALL BE LOCATED CLEAR OF OTHER TRADES. CONCEAL JUNCTION AND PULL BOXES IN FINISHED SPACES. WHERE NECESSARY, REROUTE RACEWAYS OR MAKE OTHER ARRANGEMENTS FOR CONCEALMENT. BOXES SHALL BE ACCESSIBLE. SUPPORT BOXES FROM BUILDING STRUCTURE, INDEPENDENT OF CONDUIT. PROVIDE FLOOR–TO–CEILING CHANNELS FOR MOUNTING ON DRYWALL AND LIGHTWEIGHT CONSTRUCTION. OUTLET BOXES FOR FIXTURES RECESSED IN HUNG CEILINGS SHALL BE ACCESSIBLE THROUGH OPENING CREATED BY REMOVAL OF FIXTURE. SECURE TO BLACK IRON SUPPORT. MOTOR TERMINAL BOXES: COORDINATE WITH MOTOR BRANCH CIRCUIT CONDUIT AND WIRING; ADD BOX VOLUME WHERE REQUIRED.

E. FIRE SEALANTS: PROVIDE FOR RACEWAYS AND WIRE PASSING THROUGH FLOOR SLOTS, SLEEVES OR OPENINGS IN FIRE–PARTITIONS ROOMS.

F. PERFORM CONTINUITY TESTS OF RESISTANCE OF FEEDER CONDUITS FROM SERVICE TO POINT OF FINAL DISTRIBUTION USING 1 CONDUCTOR RETURN. MAXIMUM RESISTANCE SHALL BE 25 OHMS.

9. WIRE AND CABLE:

A. PROVIDE WIRE AND CABLE COMPLETE WITH ACCESSORIES. SIZE REFERENCE SHALL BE AWG EXCEPT AS NOTED.

B. CONDUCTORS SHALL BE COPPER, ASTM STANDARD SOLID (NO. 10 AND SMALLER) OR STRANDED (NO. 8 AND LARGER). GENERAL USE CABLING SHALL BE NO. 12 MINIMUM. AT 120 VOLTS AND OVER 100 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM. AT 265 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 10 MINIMUM.

C. CONTROL AND ALARM CABLING, EXCEPT AS NOTED, SHALL BE NO. 14 MINIMUM. AT 120 VOLTS AND OVER 200 FT CIRCUIT LENGTH PROVIDE NO. 12 MINIMUM. OTHER VOLTAGES AND PHASES: ADJUST CABLE SIZING AS REQUIRED TO MAINTAIN VOLTAGE DROP. INCREASE RACEWAY SIZES FOR LARGER WIRE AS REQUIRED.

D. INSULATION SHALL BE RUBBER AND THERMOPLASTIC MEETING ASTM AND IPCEA STANDARDS. TYPE THW OR THWN SHALL BE UTILIZED FOR FEEDERS AND BRANCH CIRCUITS EXCEPT AS NOTED. TYPE SFF–2 SHALL BE UTILIZED FOR BRANCH CIRCUITS LOCATED IN WIRING CHANNELS OF CONTINUOUS FLUORESCENT FIXTURES AND IN AMBIENT TEMPERATURES OVER 90 DEG C. FOR UNGROUNDED ISOLATED BRANCH CIRCUITS PROVIDE CROSS–LINKED POLYETHYLENE INSULATION (TYPE XHHW).

E. ARMORED CABLE (BX) SHALL BE UTILIZED FOR BRANCH CIRCUITS, FEEDER DISTRIBUTION IN DRY HOLLOW LOCATIONS, HUNG CEILINGS, AND BLOCK WALLS.

– BX CABLE SHALL BE STANDARD OF UL 83,UL 1569 ,UL 1685 ,UL ONLINE PRODUCT GUIDE INFO – METAL–CLAD CABLE (PJAZ) (WWW.UL.COM) ,FEDERAL SPECIFICATION A–A59544 (FORMERLY J–C–30B) ,NFPA 70 (NATIONAL ELECTRICAL CODE), ARTICLE 330 ,LISTED FOR USE IN UL 1, 2 AND 3 HOUR THROUGH PENETRATION FIRESTOP SYSTEMS, JACKETED & NON JACKETED WILL BOTH PASS " UL TEST" & "FT4/IEEE 1202" (70,000 BTU/HR) VERTICAL CABLE TRAY FLAME TEST

F. TYPE MC CABLE – ISOLATED GROUND IS CONSTRUCTED WITH SOFT–DRAWN COPPER, TYPE THHN/THWN CONDUCTORS RATED 90°C DRY AND TWO INSULATED GROUNDING CONDUCTORS––ONE SOLID GREEN AND THE SECOND GREEN WITH A YELLOW STRIPE. THE CONDUCTORS ARE CABLED TOGETHER AND A BINDER TAPE BEARING THE PRINT LEGEND IS WRAPPED AROUND THE ASSEMBLY.

G. COLOR CODING SHALL BE AS FOLLOWS:

120/208 VOLT SYSTEM:	277/480 VOLT SYSTEM:
BLACK FOR A PHASE	BROWN FOR A PHASE
RED FOR B PHASE	ORANGE FOR C PHASE
BLUE FOR C PHASE	YELLOW 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.

G. PROVIDE FLAMEPROOF LINEN OR FIBER TAGS IN ACCESSIBLE LOCATIONS. FOR FEEDERS INDICATE FEEDER NUMBER, SIZE, PHASE AND POINTS OF ORIGIN AND TERMINATIONS. FOR CONTROL AND ALARM WIRING INDICATE TYPE (CONTROL OR ALARM), SIZE OF WIRE, AND POINTS OF ORIGIN AND TERMINATIONS.

H. TERMINATIONS, SPLICES AND TAPS UNDER 600 VOLTS: COPPER CONDUCTORS NO. 10 AND SMALLER SHALL UTILIZE COMPRESSION–TYPE OF TWIST–ON SPRING–LOADED CONNECTORS AND CLEAR NYLON–INSULATED COVERING. COPPER CONDUCTORS NO. 8 AND LARGER SHALL UTILIZE MECHANICAL BOLTED PRESSURE OR HYDRAULIC COMPRESSION TYPE USING MANUFACTURER'S RECOMMENDED TOOLING. CABLE LUGS AND CONNECTORS SHALL UTILIZE COMPRESSION TYPE OF SAME METAL AS CONDUCTOR. PROVIDE TO MATCH CABLE, WITH MARKING INDICATING SIZE AND TYPE. COPPER LUG CONNECTIONS TO BUS BARS: USE ANTISEIZE COMPOUND ON TANG.

I. NOT MORE THAN 3 LIGHTING OR CONVENIENCE OUTLET CIRCUITS SHALL BE INSTALLED IN ONE CONDUIT UNLESS OTHERWISE INDICATED. PULL NO THERMOPLASTIC WIRES AT TEMPERATURES LOWER THAN 32 DEG F. PROVIDE SEPARATE RACEWAYS FOR CONDUCTORS OF 120/208 AND 265/460 VOLT SYSTEMS, EXCEPT 460 VOLT MOTOR BRANCH CIRCUIT WIRING AND RELATED 120 VOLT CONTROL WIRING. THERMOPLASTIC WIRES SHALL NOT BE INSTALLED IN COMPUTER AREA RAISED FLOORS.

J. LEAVE WIRES WITH SUFFICIENT SLACK TO PERMIT MAKING FINAL CONNECTIONS.

K. PERFORM CONTINUITY AND INSULATION TESTS. MEGGER TEST 100 PERCENT OF FEEDERS, 10 PERCENT OF BRANCH CIRCUITS AND ALL MOTOR BRANCH CIRCUITS OVER 25 HP.

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

11. WIRING DEVICES:

A. WIRING DEVICES SHALL BE SPECIFICATION GRADE UNLESS OTHERWISE SPECIFIED. ALL DEVICES SHALL BE FLUSH MOUNTED, UNLESS OTHERWISE NOTED. PROVIDE COMPLETE MATERIAL AND ACCESSORIES AS NOTED.

B. LOCAL WALL SWITCHES SHALL BE ROCKER TYPE, QUIET OPERATING, RATED 20 AMP, 120/277 VOLT, AC. SIMILAR TO LEVITON DECORA SERIES A5621 (SINGLE POLE), A5623 (3–WAY) AND A5624 (4–WAY).

C. STRAIGHT BLADE RECEPTACLES SHALL BE COMMERCIAL SPECIFICATION GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT, DECORA SERIES BY LEVITON. GROUNDED, EXCEPT AS NOTED.

1) SINGLE GANG, RECESSED, DUPLEX RECEPTACLE: TAMPER RESISTANT, 2–POLE, 3–WIRE GROUNDING, 15A, 125V, NEMA 5–20R; LEVITON 689 SERIES (COLOR AS SPECIFIED BY ARCHITECT).
2) USB CHARGER/ DUPLEX TAMPER–RESISTANT RECEPTACLE: TAMPER RESISTANT,

D. INSERTION RECEPTACLES SHALL BE HOSPITAL GRADE DUPLEX CONVENIENCE 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT. GROUNDED, EXCEPT AS NOTED.

1) HEALTH CARE FACILITIES:

a) DUPLEX, 20 AMP, 125 VOLTS, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8300 HOSPITAL GRADE.

b) SINGLE, 20 AMP, 125 VOLT, 2 POLE, 3 WIRE, U GROUND SLOT: SIMILAR TO HUBBELL NO. 8310 HOSPITAL GRADE.

2) GROUND FAULT INTERRUPTER RECEPTACLES:

a. 20 AMP DUPLEX FEED–THROUGH TYPE. SIMILAR TO NO. GF8300.

E. DEVICE PLATES: SEE ARCHITECT FOR TYPE. FOR RECEPTACLES WITH OTHER THAN 120 VOLT, INSCRIBED VOLTAGE AVAILABLE.

F. COLORS: COORDINATE COLORS WITH ARCHITECT.

G. MOUNTING ORIENTATION OF RECEPTACLES (HORIZONTAL OR VERTICAL): COORDINATE WITH ARCHITECT.

12. LIGHTING FIXTURES:

A. FIXTURES TO BE AS SPECIFIED BY ARCHITECT AND SHALL BE COMPLETELY FACTORY ASSEMBLED, WIRED AND EQUIPPED WITH ALL NECESSARY SOCKETS, BALLASTS, SUPPORTING HARDWARE AND ACCESSORIES. REFER TO DRAWINGS FOR INDIVIDUAL FIXTURE DESCRIPTIONS.

B. FIXTURE CATALOG NUMBERS USED TO ILLUSTRATE EQUIPMENT TYPE DO NOT NECESSARILY DENOTE REQUIRED MOUNTING EQUIPMENT OR ACCESSORIES. PROVIDE ACCESSORIES TO SUIT.

C. BALLAST: CLASS P, HIGH POWER FACTOR, LOWEST AVAILABLE NEMA RATED NOISE LEVEL, ET1 AND CBM APPROVED. ENERGY SAVING TYPE. TRIGGER START FOR 24–INCH LAMPS AND RAPID START FOR 48–INCH. TWO LAMP BALLASTS; NO THREE LAMP BALLASTS. BALLASTS SHALL BE ADVANCE MAGNETEK, UNIVERSAL OR EQUAL.

D. LED DRIVERS SHALL BE ELECTRONIC TYPE, LABELED AS COMPLIANT WITH RADIO FREQUENCY INTERFERENCE (RFI) REQUIREMENTS OF FCC TITLE 47, PART 15 AND COMPLY WITH NEMA SSL 1 "ELECTRONIC DRIVERS FOR LED DEVICES, ARRAYS OR SYSTEMS". LED DRIVERS SHALL HAVE A SOUND RATING OF "A", HAVE A MINIMUM EFFICIENCY OF 85% AND BE RATED FOR A THD OF LESS THAN 20% AT ALL INPUT VOLTAGES.

E. DIMMABLE LED DRIVERS SHALL BE CAPABLE OF DIMMING WITHOUT LED STROBING OR FLICKER ACROSS THEIR FULL DIMMING RANGE. PROVIDE TYPE OF LED DRIVER AS PER LIGHTING FIXTURE SCHEDULE, DIMMABLE LED DRIVERS SHALL BE 0–10V WHERE NOT INDICATED.

F. CONTINUOUS ROW, TWO LAMP STRIP FIXTURES SHALL BE STAGGERED TYPE.

G. FLUORESCENT LIGHTING FIXTURES, INCLUDING GENERAL CONSTRUCTION, LAMPS AND BALLASTS SHALL CONFORM TO THE ENERGY EFFICIENCY REQUIREMENTS OF CONSOLIDATED EDISON CO. AND QUALITY FOR A UTILITY REBATE TO OWNER UNDER CON EDISON'S ENLIGHTENED ENERGY LIGHTING REBATE PROGRAM. CONTRACTOR SHALL COORDINATE REBATE PROGRAM WITH CON EDISON AND ARRANGE FOR CON EDISON TO PERFORM A SURVEY TO INVENTORY ALL EXISTING FIXTURES PRIOR TO DEMOLITION.

H. EXIT SIGNS SHALL BE PRECISION DIE–CAST ALUMINUM HOUSING WITH LASER–FORMED ACRYLIC LEGEND. EXIT SIGNS SHALL COMPLY WITH UL 924 AND BE MEA APPROVED FOR USE IN NEW YORK CITY. 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.

13. TELEPHONE CONDUIT SYSTEM:

A. PROVIDE COMPLETE SYSTEM OF: RACEWAYS AND ACCESSORIES, OUTLET BOXES, SLEEVES AND FISHWIRES.

B. EQUIPMENT SHALL CONFORM TO REQUIREMENTS OF TELEPHONE COMPANY.

C. OUTLETS SHALL BE:

1) WALL: 4 IN. SQUARE WITH BUSHED COVER PLATE.

D. PROVIDE FISHWIRES, IN RACEWAYS OVER 10 FT LONG.

E. CONDUIT SHALL BE 3/4 IN. MINIMUM. FURNISH EMPTY CONDUIT FROM OUTLET BOX TO BUSHED END THRU WALL 6" BELOW THE PLASTER CEILING.

F. FACE RACEWAYS IN ROOMS SHALL HUBBELL HBL500, HBL750 OR HBL2000 SERIES OR AS ACCEPTABLE.

14. GROUNDING AND BONDING:

A. PROVIDE GROUNDING SYSTEM IN ACCORDANCE WITH (2011 NATIONAL ELECTRICAL CODE WITH NYC AMENDMENTS), AND THESE SPECIFICATIONS. THE WIRING SYSTEM SHALL BE INSTALLED AS REQUIRED TO PROVIDE A CONTINUOUSLY GROUNDED SYSTEM. WHERE FLEXIBLE CONDUIT IS USED FOR PART OF A CONDUIT RUN, EXCEPT LIGHTING BRANCH CIRCUITS, AN INSULATED GROUNDING CONDUCTOR SHALL BE PROVIDED IN THE CONDUIT AND CONNECTED TO GROUNDING BUSHINGS AT EACH END OF THE RUN.

B. USE EXOTHERMIC WELDING PROCESS FOR INACCESSIBLE CONNECTIONS.

C. EXTEND EXISTING SYSTEM GROUND TO INCLUDE ALL THE ELECTRICAL EQUIPMENT IN THE SCOPE OF WORK.

D. WHERE FLEXIBLE METALLIC CONDUIT IS USED AN INTERNAL BONDING CONDUCTOR SHALL BE INSTALLED.

E. IN ADDITION, FURNISH A SEPARATE INSULATED GREEN EQUIPMENT GROUND CONDUCTOR WHERE INDICATED ON DRAWINGS AND FOR THE FOLLOWING BRANCH CIRCUITS:

1) CIRCUITS SERVING ANY WALL BOX DIMMER.

2) CIRCUITS SERVING ANY ISOLATED GROUND RECEPTACLES. TERMINATE GROUND DIRECTLY AT AN EQUIPMENT GROUNDING CONDUCTOR TERMINAL OF THE SOURCE AT THE SOURCE , OR AS OTHER WISE NOTED ON DRAWINGS.

3) CIRCUITS SERVING ANY DUPLEX OR SIMPLEX COMPUTER RECEPTACLES

4) ANY CIRCUIT SERVED VIA AN ISOLATION TRANSFORMER OR COMPUTER POWER DISTRIBUTION UNIT.

15. 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.

B. 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.

ELECTRICAL SPECIFICATIONS (CONT.)

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

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.

J. 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 CASE LESS THAN 10,000 AMPERES R.M.S. SYMMETRICAL FOR 208Y/120 VOLT SYSTEM AND 14,000 AMPERES R.M.S. SYMMETRICAL FOR 480Y/277 VOLT SYSTEM. SERIES RATED PANELBOARDS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

N. FOR ALL EXISTING PANELBOARDS, CONTRACTOR SHALL PROVIDE NEW CIRCUIT BREAKERS TO REPLACE EXISTING AS REQUIRED AS INDICATED ON DRAWINGS.

1. LOADCENTERS

A. LOAD CENTERS SHALL COMPLY WITH UL67 AND MEET FEDERAL SPECIFICATION W-P-115c.

B. CIRCUIT BREAKERS SHALL BE OF THE PLUG-IN, 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. TANDEM OR DUPLEX TYPE CIRCUIT BREAKERS SHALL NOT BE PERMITTED. ONLY ONE WIRE SHALL BE INSTALLED UNDER EACH CIRCUIT BREAKER LUG. TIE-BARS SHALL NOT BE USED TO CREATE MULTI-POLE CIRCUITS. MAXIMUM 42 CIRCUITS ALLOWED.

C. 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.

D. ENCLOSURES MANUFACTURED IN CODE GAUGE AND SIZE BOXES FOR FLUSH MOUNTING AS INDICATED ON PLANS COMPLETE WITH TRIM, DOORS AND LOCKS. ALL LOCKS SHALL BE KEYED ALIKE. 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. ALL LOAD CENTERS SHALL BE 14 ⅜" WIDE AND 3 ¼" DEEP.

E. 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.

F. 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 CASE LESS THAN 22,000/10,000 AMPERES R.M.S. SYMMETRICAL SERIES RATING FOR 208Y/120 VOLT. SERIES RATED LOAD CENTERS SHALL BE USED TO ACHIEVE REQUIRED SHORT CIRCUIT RATINGS.

17. SMOKE ALARMS

A. PROVIDE SOLID STATE, PHOTOELECTRIC TYPE, HARD-WIRED SMOKE ALARM WITH 9V BATTERY BACKUP AND INTEGRAL TEMPORAL PATTER EVACUATION HORN. EDWARDS 517 SERIES OR APPROVED EQUAL.

B. THREE POSITION TEST FEATURE THAT SIMULATES ACTUAL SMOKE CONDITIONS. SHALL CONTAIN MAINTENANCE INDICATOR.

C. PROVIDE WITH INTEGRAL 135 DEGREE F ISOLATED HEAT DETECTION OR INTEGRAL RELAY RATED 0.6A AT 125V AC., AS INDICATED ON THE PLANS AND DRAWINGS.

D. DEVICE SHALL BE RATED TO OPERATE AT A RANGE OF 40°f TO 100°F.

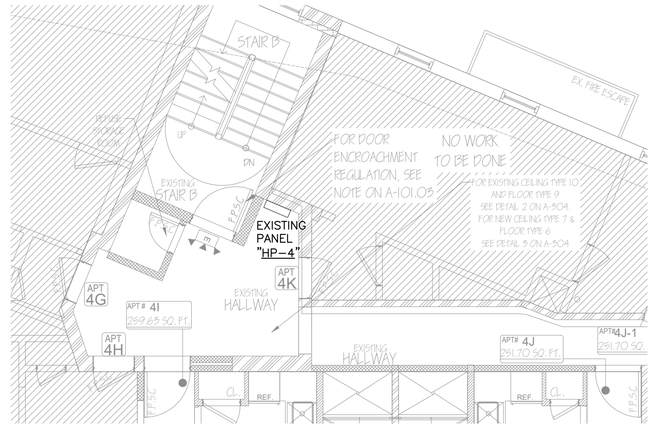
E. UL LISTED TO UL217 AND APPROVED FOR USE IN NEW YORK CITY.

LIGHTING CONTROLS:

AREA	CONTROLS
CORRIDORS	AUTO ON/OFF OF NORMAL FIXTURES UTILIZING OCCUPANCY SENSORS WITH FIXTURES. DESIGNATED 'EM' (EMERGENCY) TO REMAIN ENERGIZED AT EMERGENCY CONDITION.
DWELLING UNITS	LOCAL SWITCHES FOR MANUAL ON/OFF OF LIGHT FIXTURES.
EXTERIOR LIGHTING	AUTO ON/OFF OF NORMAL FIXTURES WITH AMBIENT PHOTOCELL.

LIGHTING CONTROLS NOTES:

1. AUTOMATIC LIGHTING CONTROLS: OCCUPANCY SENSOR SHALL BE CAPABLE OF TURNING OFF LIGHTS WITHIN 20 MINUTES OF ALL OCCUPANT LEAVING THE SPACE.
2. ALL ILLUMINATED EXIT SIGN TO HAVE A MAX WATTAGE OF 5 PER SIDE.
3. EXTERIOR LIGHTING CONTROLS: ALL EXTERIOR LIGHTING SHALL AUTOMATICALLY TURNS OFF LIGHTING WHEN DAYLIGHT IS AVAILABLE.
4. SEPARATE METERING IS PROVIDED FOR DWELLING UNIT.



2 4TH FLOOR ELECTRICAL PART PLAN

3/16" = 1' - 0"

ALL BRANCH CIRCUITS LOCATED IN THIS AREA SHALL BE CIRCUITED TO EXISTING PANEL "HP-4" LOCATED AT 4TH FLOOR, CIRCUIT NUMBERS INDICATED, U.O.N. COORDINATE EXACT LOCATION IN FILED.

EX. FIRE ESCAPE BELOW

NEW FIRE ESCAPE BELOW

NEW FIRE ESCAPE

AP-5A AP-5B AP-5C AP-5D AP-5E AP-5F AP-5G AP-5H AP-5I AP-5J AP-5K AP-5L AP-5M AP-5N

APT# 5A APT# 5B APT# 5C APT# 5D APT# 5E APT# 5F APT# 5G APT# 5H APT# 5I APT# 5J APT# 5K APT# 5L APT# 5M APT# 5N

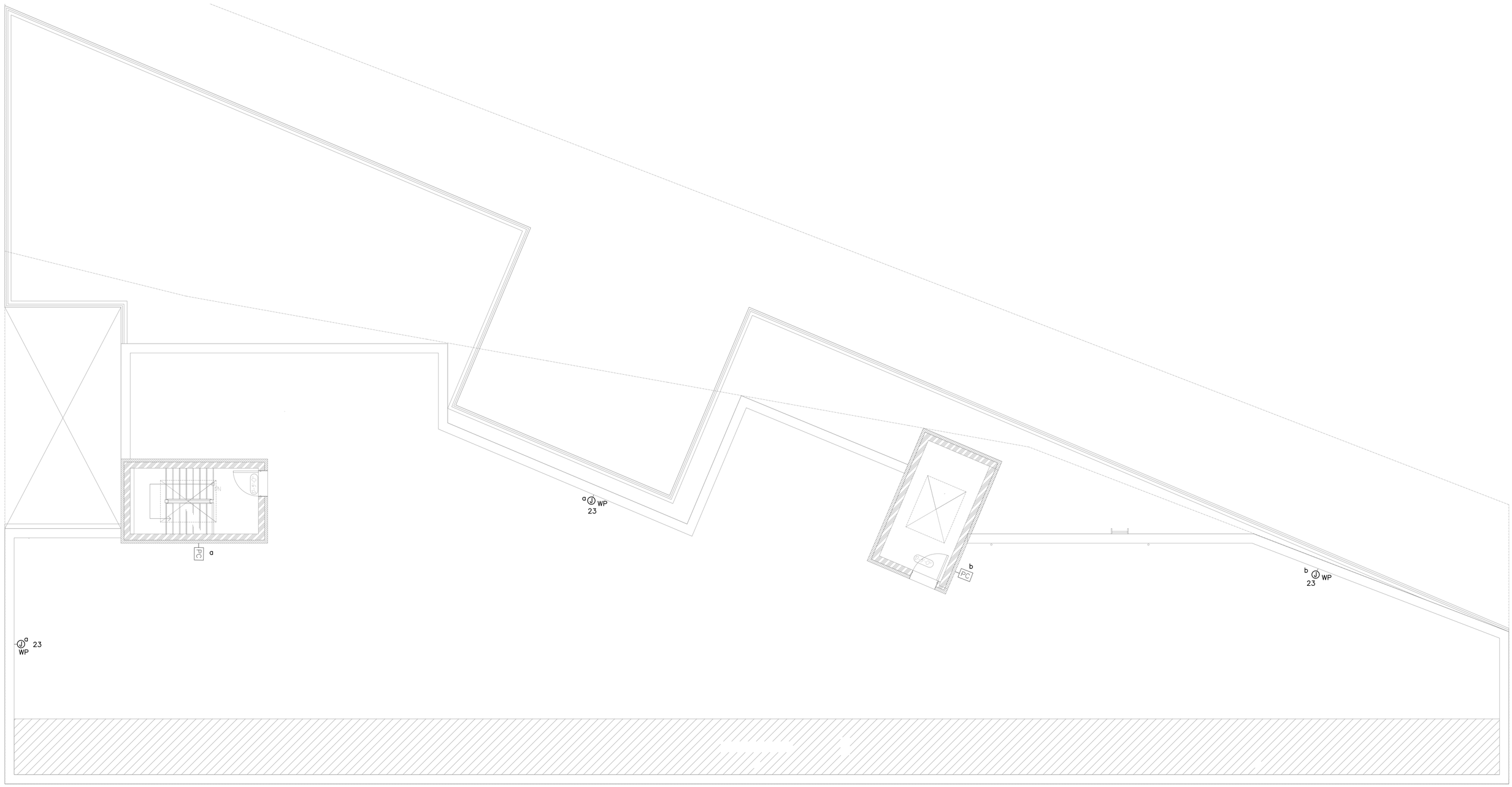
J 21 OS

POWER DRAWING NOTES:

1. ALL BRANCH CIRCUITS HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO PANEL AS MENTIONED ON PLANS, CIRCUIT NUMBER INDICATED, U.O.N.
2. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002.00, E-003.00 & E-004.00 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.

1 5TH FLOOR LIGHTING PLAN

3/16" = 1' - 0"



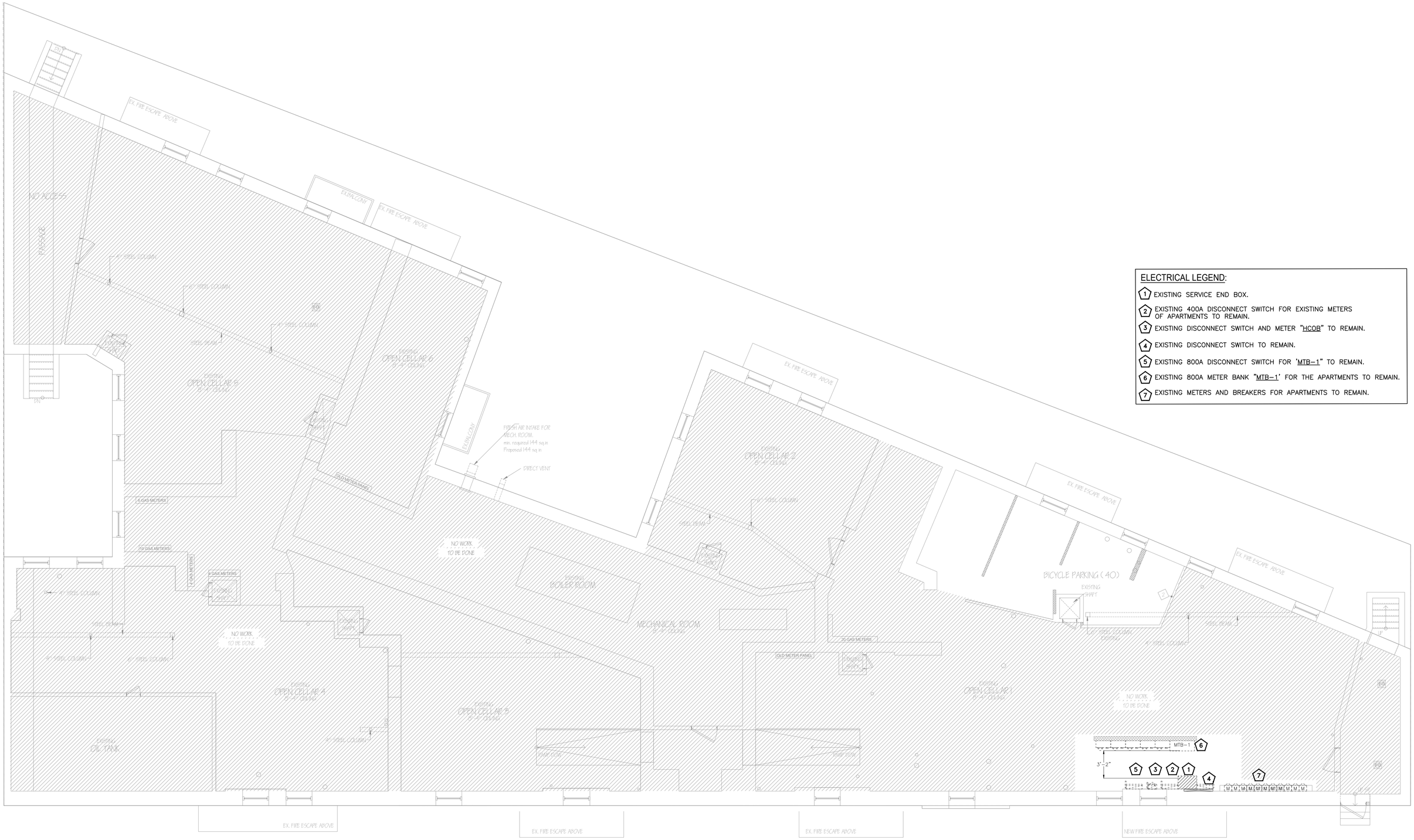
1 ROOF LIGHTING PLAN

3/16" = 1' - 0"

POWER DRAWING NOTES:

1. ALL BRANCH CIRCUITS HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO EXISTING PANEL "HP-5", CIRCUIT NUMBER INDICATED, U.O.N.

2. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002.00, E-003.00 & E-004.00 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.



ELECTRICAL LEGEND:

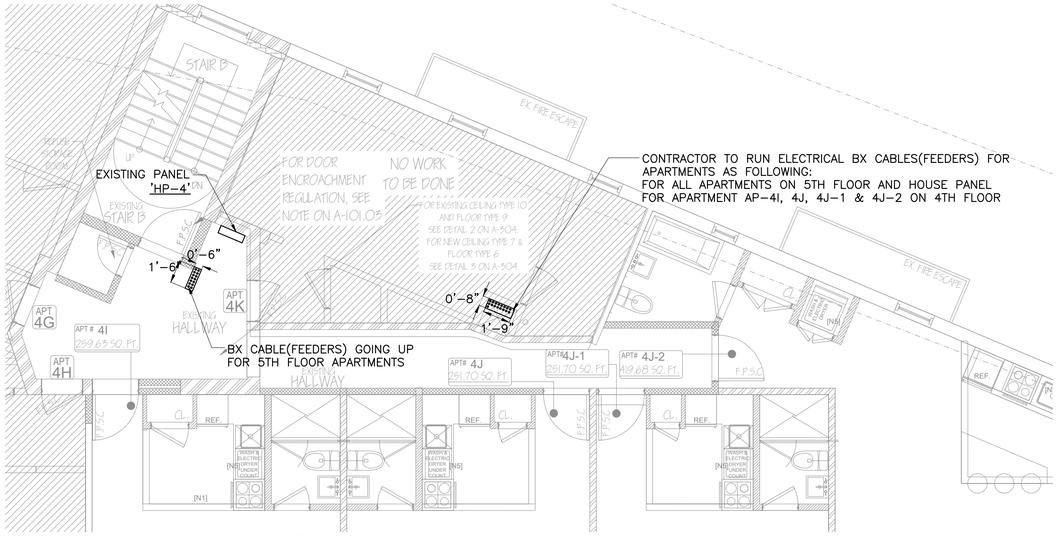
1. EXISTING SERVICE END BOX.
2. EXISTING 400A DISCONNECT SWITCH FOR EXISTING METERS OF APARTMENTS TO REMAIN.
3. EXISTING DISCONNECT SWITCH AND METER "HCOB" TO REMAIN.
4. EXISTING DISCONNECT SWITCH TO REMAIN.
5. EXISTING 800A DISCONNECT SWITCH FOR 'MTB-1" TO REMAIN.
6. EXISTING 800A METER BANK "MTB-1' FOR THE APARTMENTS TO REMAIN.
7. EXISTING METERS AND BREAKERS FOR APARTMENTS TO REMAIN.

GENERAL NOTE:

1. COORDINATE EXACT LOCATION OF EXISTING ELECTRICAL EQUIPMENTS ON FIELD.
2. CONTRACTOR TO FIELD VERIFY EXACT CONDUIT ROUTING AND BASE BID ACCORDINGLY.
3. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002.00, E-003 & E-004 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.

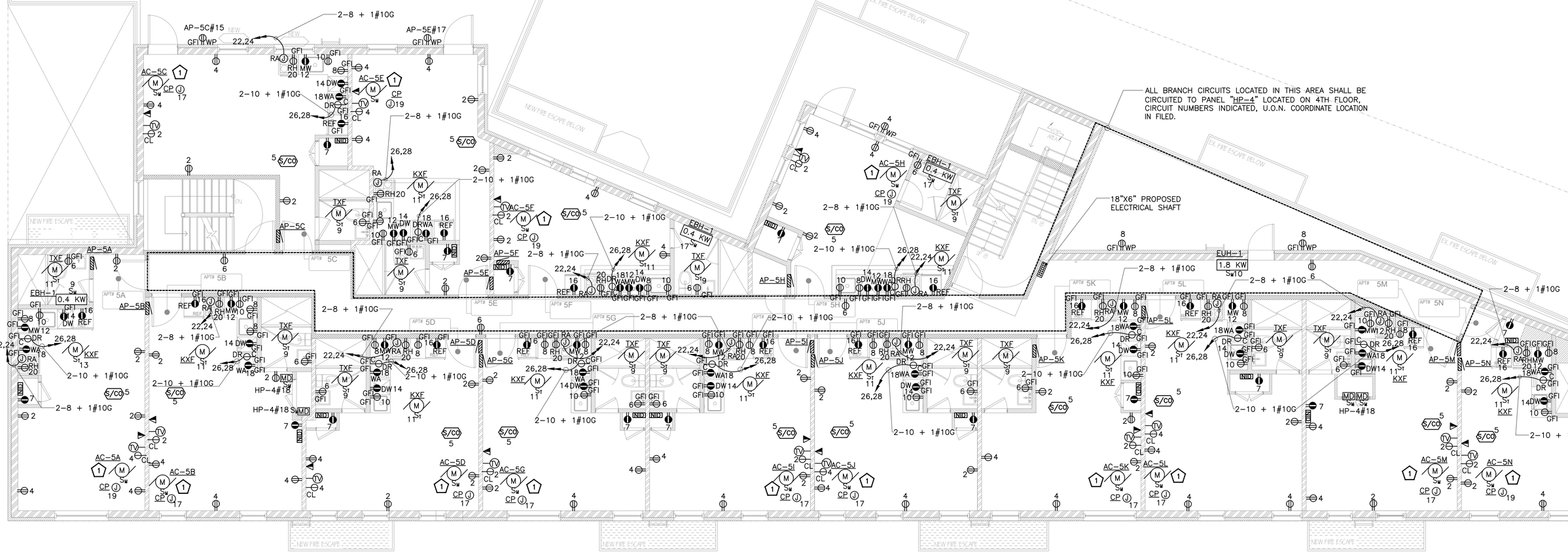
1 CELLAR ELECTRICAL POWER PLAN

3/16" = 1' - 0"



2 4TH FLOOR ELECTRICAL PART PLAN

3/16" = 1' - 0"



1 5TH FLOOR ELECTRICAL POWER PLAN

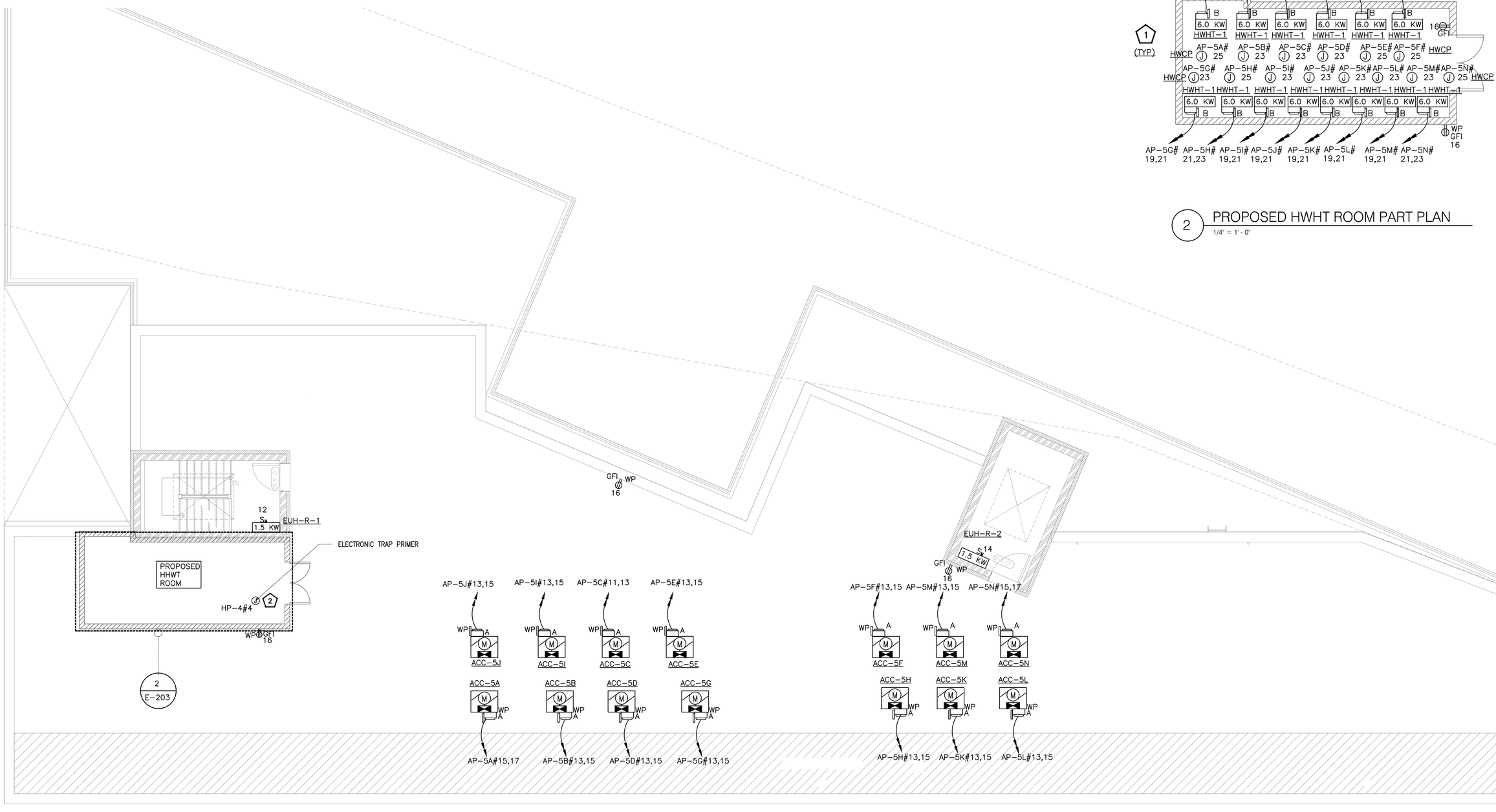
3/16" = 1' - 0"

KEYED WORK NOTES:

1. ALL INDOOR AC UNIT IN APARTMENTS ARE CIRCUITED FROM RESPECTIVE APARTMENT'S OUTDOOR UNIT. COORDINATE WITH MANUFACTURER'S CUTSHEET.

POWER DRAWING NOTES:

1. ALL BRANCH CIRCUITS HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO RESPECTIVE APARTMENTS LOADCENTER AS MENTIONED ON PLANS, CIRCUIT NUMBER INDICATED, U.O.N.
2. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002.00, E-003 & E-004 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.
3. COORDINATE S/CO LOCATION WITH ARCHITECTURAL DRAWING.
4. COORDINATE NID BOX LOCATION WITH ARCHITECT/OWNER.



1 ROOF ELECTRICAL POWER PLAN

3/16" = 1' - 0"

2 PROPOSED HWHT ROOM PART PLAN

1/4" = 1' - 0"

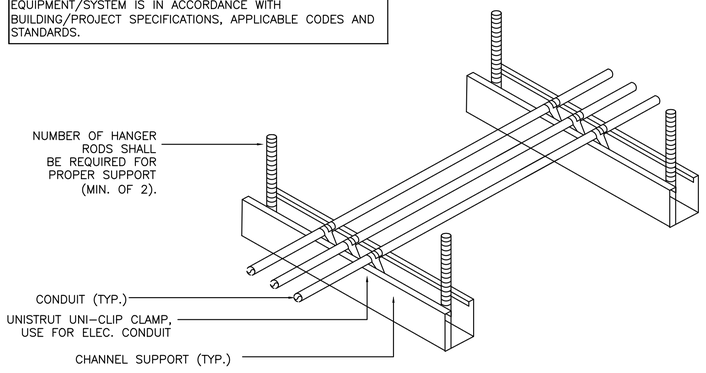
KEYED WORK NOTE:

1. PROVIDE WIRE SIZE OF 2-8 + 1#10G, 3/4"C. FOR ALL HEATERS 'HWHT-1'. REFER PANEL SCHEDULE OF RESPECTIVE APARTMENTS FOR MORE DETAIL.
2. COORDINATE WITH PLUMBING ENGINEER'S DRAWING FOR EXACT LOCATION OF ELECTRONIC TRAP PRIMER.

POWER DRAWING NOTES:

1. ALL BRANCH CIRCUITS HOMERUNS ASSIGN INDICATED ON THIS PLAN SHALL BE CIRCUITED TO EXISTING PANEL "HP-4" LOCATED ON 4TH FLOOR, CIRCUIT NUMBER INDICATED, U.O.N. COORDINATE LOCATION IN FILED.
2. REFER TO DWG. E-001.00 FOR ELECTRICAL GENERAL NOTES, SYMBOL LIST & ABBREVIATIONS. E-002.00, E-003 & E-004 FOR ADDITIONAL ELECTRICAL SPECIFICATIONS.

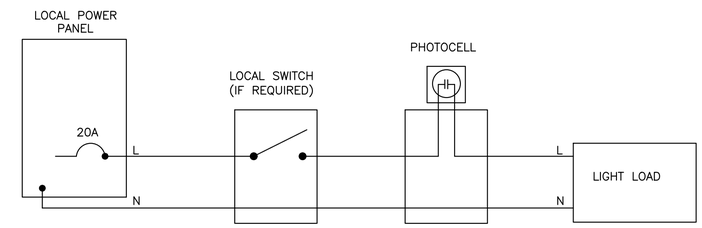
NOTE:
THIS INFORMATION MAY NOT CONTAIN ALL DETAILS REQUIRED FOR CONSTRUCTION. APPROPRIATE MODIFICATION MAY BE REQUIRED TO ENSURE SUITABILITY OF THESE DRAWINGS FOR THE SPECIFIC APPLICATION. IT IS THE USER'S RESPONSIBILITY TO ENSURE INSTALLATION OF THE EQUIPMENT/SYSTEM IS IN ACCORDANCE WITH BUILDING/PROJECT SPECIFICATIONS, APPLICABLE CODES AND STANDARDS.



NOTES:

1. ALL CONDUIT MAY BE COMBINED ON SAME SUPPORT CHANNEL WHERE PRACTICAL.
2. SUPPORT CHANNEL LENGTH SHALL NOT BE DETERMINED UNTIL ALL PIPING, CONDUIT, ETC. TO BE SUPPORTED IS COORDINATED.
3. SUPPORT CHANNEL SPACING SHALL BE NO MORE THAN 10'-0".
4. UNISTRUT AND CONDUIT INSTALLATION MAY BE REVERSED.

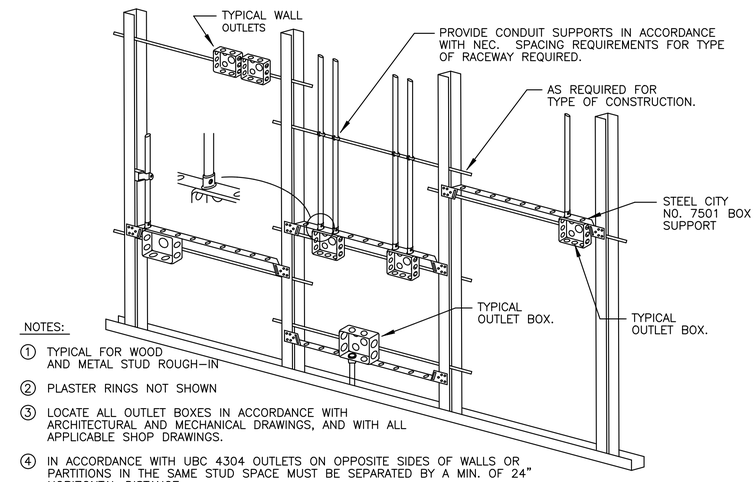
6/E-400 CONDUIT SUPPORT DETAIL
N.T.S



KEYED NOTES:

1. PHOTOCELL SHALL BE MOUNTED ABOVE SNOW LINE (18") ON ROOF OR WALL MOUNTED. EXACT LOCATION SHALL BE FIELD COORDINATED.
2. FOR EXACT CIRCUIT NUMBER, REFER TO LIGHTING PLANS.

4/E-400 PHOTOCELL WIRING DETAILS
N.T.S



NOTES:

① TYPICAL FOR WOOD AND METAL STUD ROUGH-IN

② PLASTER RINGS NOT SHOWN

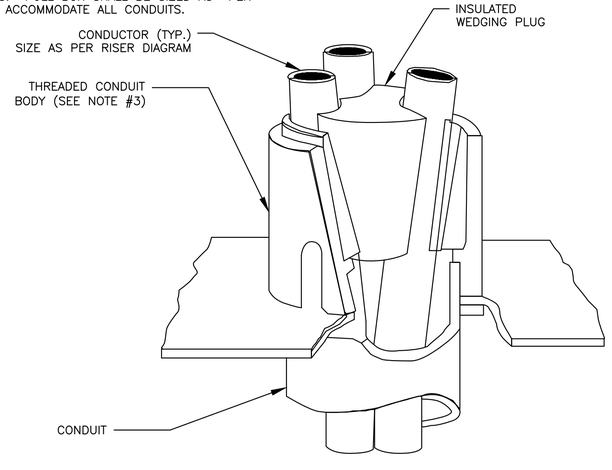
③ LOCATE ALL OUTLET BOXES IN ACCORDANCE WITH ARCHITECTURAL AND MECHANICAL DRAWINGS, AND WITH ALL APPLICABLE SHOP DRAWINGS.

④ IN ACCORDANCE WITH UBC 4304 OUTLETS ON OPPOSITE SIDES OF WALLS OR PARTITIONS IN THE SAME STUD SPACE MUST BE SEPARATED BY A MIN. OF 24" HORIZONTAL DISTANCE.

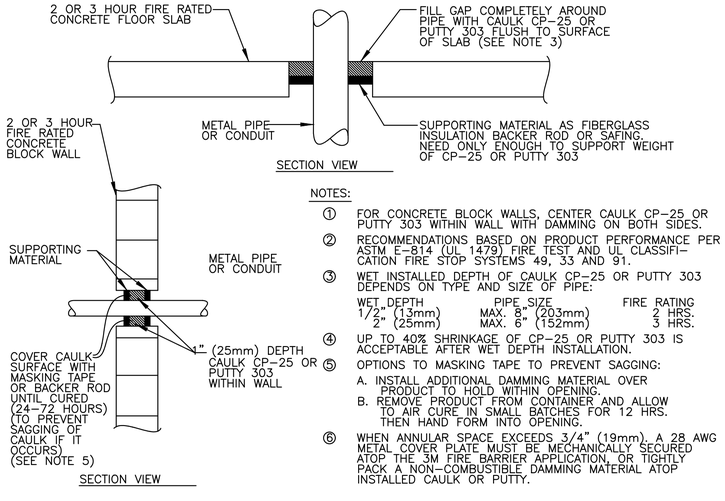
2/E-400 DETAIL TYPICAL ROUGH-IN REQUIREMENTS
N.T.S

NOTES:

1. ALL CONDUCTORS IN VERTICAL RACEWAYS SHALL BE SUPPORTED IN ACCORDANCE WITH ARTICLE 300.19 OF NEC. CABLE SUPPORTS SHALL BE LOCATED AT THE INTERVALS REQUIRED BY THE NEC.
2. CABLE SUPPORT SYSTEM SHALL BE AS MANUFACTURED BY O-Z GEDNEY WITH pOZi-GRIP "S-STYLE" WEDGING PLUG OR APPROVED EQUAL.
3. FOR THREADLESS CONDUIT (RIGID, IMC OR EMT), ATTACH CONDUIT BODY TO MALE THREADS OF A SET SCREW OR COMPRESSION CONNECT, AS PERMITTED BY SPECIFICATIONS.
4. PROVIDE PULL BOX AT EACH LOCATION OF CABLE SUPPORTS. PULL BOX SHALL BE SIZED AS PER CODE TO ACCOMMODATE ALL CONDUITS.



5/E-400 VERTICAL CABLE SUPPORT DETAIL
N.T.S



NOTES:

① FOR CONCRETE BLOCK WALLS, CENTER CAULK CP-25 OR PUTTY 303 WITHIN WALL WITH DAMMING ON BOTH SIDES.

② RECOMMENDATIONS BASED ON PRODUCT PERFORMANCE PER ASTM E-814 (UL 1479) FIRE TEST AND UL CLASSIFI-CATION FIRE STOP SYSTEMS 49, 33 AND 91.

③ WET INSTALLED DEPTH OF CAULK CP-25 OR PUTTY 303 DEPENDS ON TYPE AND SIZE OF PIPE:

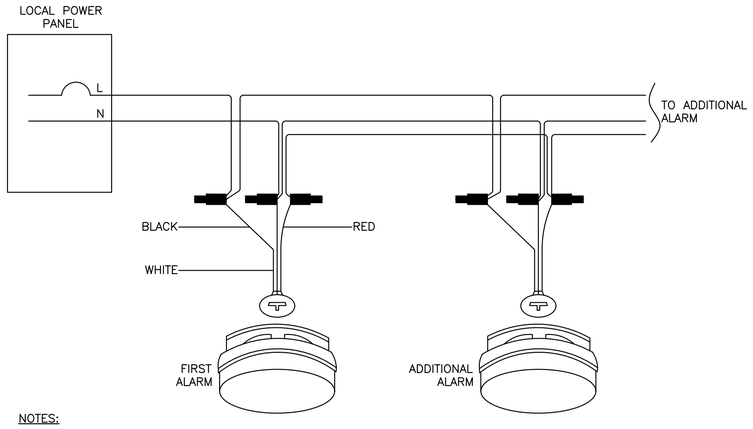
WET DEPTH	PIPE SIZE	FIRE RATING
1/2" (13mm)	MAX. 8" (203mm)	2 HRS.
2" (25mm)	MAX. 6" (152mm)	3 HRS.

④ UP TO 40% SHRINKAGE OF CP-25 OR PUTTY 303 IS ACCEPTABLE AFTER WET DEPTH INSTALLATION.

⑤ OPTIONS TO MASKING TAPE TO PREVENT SAGGING:
A. INSTALL ADDITIONAL DAMMING MATERIAL OVER PRODUCT TO HOLD WITHIN OPENING.
B. REMOVE PRODUCT FROM CONTAINER AND ALLOW TO AIR CURE IN SMALL BATCHES FOR 12 HRS. THEN HAND FORM INTO OPENING.

⑥ WHEN ANNULAR SPACE EXCEEDS 3/4" (19mm), A 28 AWG METAL COVER PLATE MUST BE MECHANICALLY SECURED ATOP THE 3M FIRE BARRIER APPLICATION, OR TIGHTLY PACK A NON-COMBUSTIBLE DAMMING MATERIAL ATOP INSTALLED CAULK OR PUTTY.

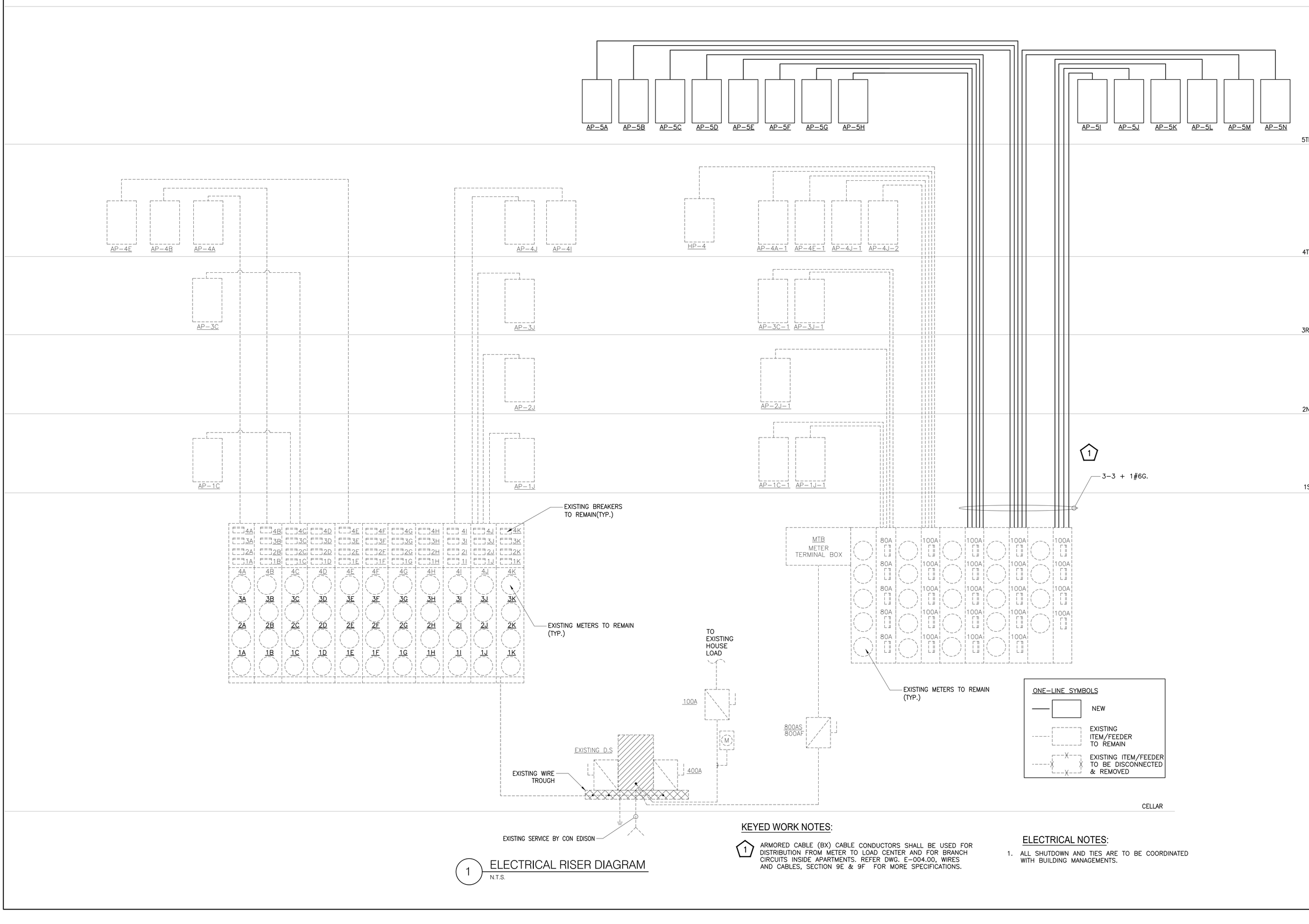
3/E-400 FIRE STOP DETAIL
N.T.S



NOTES:

1. ALL ALARMS ARE WIRED TO A SINGLE, CONTINUOUS (NON SWITCHED) POWER LINE, WHICH IS NOT PROTECTED BY A GROUND FAULT INTERRUPTER.
2. A MAXIMUM OF 1000 ft OF WIRE CAN BE USED IN THE INTERCONNECT SYSTEM AND MAXIMUM 24 NO. OF KIDDE DEVICES CAN BE CONNECTED.
3. USE STANDARD UL LISTED HOUSEHOLD WIRE AS REQUIRED BY THE CODE.
4. ALL ALARMS IN A TANDEM INSTALLATION MUST BE CONTROLLED BY THE SAME FUSE OR CIRCUIT BREAKER. OTHERWISE TANDEM UNITS WILL NOT OPERATE.

1/E-400 SMOKE ALARM TANDEM WIRING DIAGRAM
N.T.S



1 ELECTRICAL RISER DIAGRAM
N.T.S.

KEYED WORK NOTES:

1. ARMORED CABLE (BX) CABLE CONDUCTORS SHALL BE USED FOR DISTRIBUTION FROM METER TO LOAD CENTER AND FOR BRANCH CIRCUITS INSIDE APARTMENTS. REFER DWG. E-004.00, WIRES AND CABLES, SECTION 9E & 9F FOR MORE SPECIFICATIONS.

ELECTRICAL NOTES:

1. ALL SHUTDOWN AND TIES ARE TO BE COORDINATED WITH BUILDING MANAGEMENTS.

PANELBOARD

PANEL:	HP-4					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20	EXISTING				0.1	0.82		0.72	R	EXISTING			20	2
3	20	EXISTING				0.1		0.2	0.1	E	ELECTRONIC TRAP PRIMER			20	4
5	20	EXISTING				0.5	1.22		0.72	R	RECEPTACLES(5TH FL)			20	6
7	20	EXISTING				0.1		0.46	0.36	R	RECEPTACLES(5TH FL)			20	8
9	20	EXISTING				0.1	1.9		1.8	M	EUH-1			20	10
11	20/2P	EXISTING				0.75		2.25	1.5	M	EUH-R-1			20	12
13						0.75	2.25		1.5	M	EUH-R-2			20	14
15	20/2P	EXISTING				0.75		1.47	0.72	R	RECEPTACLES(ROOF)			20	16
17						0.75	0.95		0.2	M	MD(5TH FL)			20	18
19	20	GENERAL LIGHTING(5TH FL)			L	0.1		0.1			SPARE			20	20
21	20	EMERGENCY LIGHTING(5TH FL)			L	0.1	0.1				SPARE			20	22
23	20	LIGHTING			L	0.1		0.1			SPARE			20	24
25	20	SPARE					0				SPARE			20	26
27	20	SPARE						0			SPARE			20	28
29	20	SPARE					0				SPARE			20	30
				TOTAL LOAD (KVA)			7.24	4.58							

LOADCENTERS

PANEL:	AP-5A					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.6	1.32		0.72	R	RECEPTACLES			20*	2
3	20	SPARE						0.54	0.54	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.68		0.18	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			M	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	EBH-1			M	0.4	0.58		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	20	TXF			M	0.1		1.2	1.1	E	MICROWAVE			20	12
13	20	KXF			M	0.1	1.3		1.2	E	DISHWASHER			20	14
15	15/2P	ACC-5A			M	0.92		2.22	1.3	E	REFRIGERATOR			20	16
17					M	0.92	2.42		1.5	R	WASHER			20	18
19	20	CP			M	0.1		0.28	0.18	R	RANGEHOOD			20	20
21	40/2P	HWHT-1			M	3	7		4	E	RANGE			50/2P	22
23					M	3		7	4	E					24
25	20	HWCP			M	0.1	2.6		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			15.9	14.42							

LOADCENTERS

PANEL:	AP-5B					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.6	1.14		0.54	R	RECEPTACLES			20*	2
3	20	SPARE						0.36	0.36	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.68		0.18	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			M	0.5		0.86	0.36	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	TXF			M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	20	KXF			M	0.1		1.2	1.1	E	MICROWAVE			20	12
13	15/2P	ACC-5B			M	0.92	2.12		1.2	E	DISHWASHER			20	14
15					M	0.92		2.22	1.3	E	REFRIGERATOR			20	16
17	20	CP			M	0.1	1.6		1.5	R	WASHER			20	18
19	40/2P	HWHT-1			M	3		3.18	0.18	R	RANGEHOOD			20	20
21					M	3	7		4	E	RANGE			50/2P	22
23	20	HWCP			M	0.1		4.1	4	E					24
25	20	SPARE					2.5		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			15.32	14.42							

LOADCENTERS

PANEL:	AP-5C					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.6	1.14		0.54	R	RECEPTACLES			20*	2
3	20	SPARE						0.36	0.36	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.68		0.18	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	TXF			M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	15/2P	ACC-5C			M	0.92		2.02	1.1	E	MICROWAVE			20	12
13					M	0.92	2.12		1.2	E	DISHWASHER			20	14
15	20	WP/GFI			R	0.18		1.48	1.3	E	REFRIGERATOR			20	16
17	20	CP			M	0.1	1.6		1.5	R	WASHER			20	18
19	40/2P	HWHT-1			M	3		3.18	0.18	R	RANGEHOOD			20	20
21					M	3	7		4	E	RANGE			50/2P	22
23	20	HWCP			M	0.1		4.1	4	E					24
25	20	SPARE					2.5		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			15.32	14.32							

NOTE—
*ASTERISK INDICATES AFCI CIRCUIT BREAKERS

PANEL:	AP-5D					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.5	1.04		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.86	0.36	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5D	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	CP	M	0.1	1.6		1.5	R	WASHER	20	18
19	40/2P	HWHT-1	M	3		3.18	0.18	R	RANGEHOOD	20	20
21			M	3	7		4	E	RANGE	50/2P	22
23	20	HWCP	M	0.1		4.1	4	E			24
25	20	SPARE			2.5		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
		TOTAL LOAD (KVA)			15.22	14.42					

PANEL:	AP-5E					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	1.32		0.72	R	RECEPTACLES	20*	2
3	20	SPARE				0.72	0.72	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5E	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	WP/GFI	R	0.18	1.68		1.5	R	WASHER	20	18
19	20	CP	M	0.1		0.28	0.18	R	RANGEHOOD	20	20
21	40/2P	HWHT-1	M	3	7		4	E	RANGE	50/2P	22
23			M	3		7	4	E			24
25	20	HWCP	M	0.1	2.6		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
		TOTAL LOAD (KVA)			15.68	14.6					

PANEL:	AP-5F					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	1.14		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5F	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	EBH-1	M	0.4	1.9		1.5	R	WASHER	20	18
19	20	CP	M	0.1		0.28	0.18	R	RANGEHOOD	20	20
21	40/2P	HWHT-1	M	3	7		4	E	RANGE	50/2P	22
23			M	3		7	4	E			24
25	20	HWCP	M	0.1	2.6		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
		TOTAL LOAD (KVA)			15.72	14.24					

PANEL:	AP-5G					Sections:									
208Y/120	VOLTS,		1	PHASE,		3	WIRE								
MAIN CB	100A			BUS	125A	MIN,	INTERRUPTING RATING			22 KAIC					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	1.14		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.86	0.36	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5G	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	CP	R	0.1	1.6		1.5	R	WASHER	20	18
19	40/2P	HWHT-1	M	3		3.18	0.18	R	RANGEHOOD	20	20
21			M	3	7		4	E	RANGE	50/2P	22
23	20	HWCP	M	0.1		4.1	4	E			24
25	20	SPARE			2.5		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
		TOTAL LOAD (KVA)			15.32	14.42					

NOTE–
*ASTERISK INDICATES AFCI CIRCUIT BREAKERS

LOADCENTERS

PANEL:	AP-5H					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	1.14		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5H	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	EBH-1	M	0.4	1.9		1.5	R	WASHER	20	18
19	20	CP	M	0.1		0.28	0.18	R	RANGEHOOD	20	20
21	40/2P	HWHT-1	M	3	7		4	E	RANGE	50/2P	22
23			M	3		7	4	E			24
25	20	HWCP	M	0.1	2.6		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
				TOTAL LOAD (KVA)	15.72	14.24					

PANEL:	AP-5I					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.5	1.04		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.86	0.36	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5I	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	CP	M	0.1	1.6		1.5	R	WASHER	20	18
19	40/2P	HWHT-1	M	3		3.18	0.18	R	RANGEHOOD	20	20
21			M	3	7		4	E	RANGE	50/2P	22
23	20	HWCP	M	0.1		4.1	4	E			24
25	20	SPARE			2.5		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
				TOTAL LOAD (KVA)	15.22	14.42					

PANEL:	AP-5J					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	0.96		0.36	R	RECEPTACLES	20*	2
3	20	SPARE				0.54	0.54	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.86	0.36	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5J	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	CP	M	0.1	1.6		1.5	R	WASHER	20	18
19	40/2P	HWHT-1	M	3		3.18	0.18	R	RANGEHOOD	20	20
21			M	3	7		4	E	RANGE	50/2P	22
23	20	HWCP	M	0.1		4.1	4	E			24
25	20	SPARE			2.5		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
				TOTAL LOAD (KVA)	15.14	14.6					

PANEL:	AP-5K					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					

CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD	LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD	TRIP AMPS	CKT NO.
1	20*	LIGHTING	L	0.6	1.14		0.54	R	RECEPTACLES	20*	2
3	20	SPARE				0.36	0.36	R	RECEPTACLES	20*	4
5	15*	S/CO DETECTOR	E	0.5	0.68		0.18	R	BATHROOM GFI	20	6
7	15*	TEL/DATA RECEPTACLE	R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT	20	8
9	20	TXF	M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT	20	10
11	20	KXF	M	0.1		1.2	1.1	E	MICROWAVE	20	12
13	15/2P	ACC-5K	M	0.92	2.12		1.2	E	DISHWASHER	20	14
15			M	0.92		2.22	1.3	E	REFRIGERATOR	20	16
17	20	CP	M	0.1	1.6		1.5	R	WASHER	20	18
19	40/2P	HWHT-1	M	3		3.18	0.18	R	RANGEHOOD	20	20
21			M	3	7		4	E	RANGE	50/2P	22
23	20	HWCP	M	0.1		4.1	4	E			24
25	20	SPARE			2.5		2.5	E	DRYER	30/2P	26
27	20	SPARE				2.5	2.5	E			28
29	20	SPARE			0				SPARE	20	30
31	20	SPARE				0			SPARE	20	32
33	20	SPARE			0				SPARE	20	34
35	20	SPARE				0			SPARE	20	36
37	20	SPARE			0				SPARE	20	38
39	20	SPARE				0			SPARE	20	40
41					0				SPARE	20	42
				TOTAL LOAD (KVA)	15.32	14.24					

NOTE–
*ASTERISK INDICATES AFCI CIRCUIT BREAKERS

LOADCENTERS

PANEL:	AP-5L					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.5	0.86		0.36	R	RECEPTACLES			20*	2
3	20	SPARE						0.72	0.72	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.68		0.18	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	TXF			M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	20	KXF			M	0.1		1.2	1.1	E	MICROWAVE			20	12
13	15/2P	ACC-5L			M	0.92	2.12		1.2	E	DISHWASHER			20	14
15					M	0.92		2.22	1.3	E	REFRIGERATOR			20	16
17	20	CP			M	0.1	1.6		1.5	R	WASHER			20	18
19	40/2P	HWHT-1			M	3		3.18	0.18	R	RANGEHOOD			20	20
21					M	3	7		4	E	RANGE			50/2P	22
23	20	HWCP			M	0.1		4.1	4	E					24
25	20	SPARE					2.5		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			15.04	14.6							

PANEL:	AP-5M					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.6	1.32		0.72	R	RECEPTACLES			20*	2
3	20	SPARE						0.36	0.36	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.68		0.18	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			R	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	TXF			M	0.1	0.28		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	20	KXF			M	0.1		1.2	1.1	E	MICROWAVE			20	12
13	15/2P	ACC-5M			M	0.92	2.12		1.2	E	DISHWASHER			20	14
15					M	0.92		2.22	1.3	E	REFRIGERATOR			20	16
17	20	CP			R	1	2.5		1.5	E	WASHER			20	18
19	40/2P	HWHT-1			M	3		3.18	0.18	R	RANGEHOOD			20	20
21					M	3	7		4	E	RANGE			50/2P	22
23	20	HWCP			M	0.1		4.1	4	E					24
25	20	SPARE					2.5		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			16.4	14.24							

PANEL:	AP-5N					Sections:									
208Y/120	VOLTS,		**1**	PHASE,		**3**	WIRE								
MAIN CB	**100A**			BUS	**125A**	MIN,	INTERRUPTING RATING			**22 KAIC**					
CKT NO.	TRIP AMPS	DESCRIPTION OF LOAD			LOAD TYPE	LOAD (KVA)	PER PHASE (KVA) A	PER PHASE (KVA) B	LOAD (KVA)	LOAD TYPE	DESCRIPTION OF LOAD			TRIP AMPS	CKT NO.
1	20*	LIGHTING			L	0.5	1.04		0.54	R	RECEPTACLES			20*	2
3	20	SPARE						0.54	0.54	R	RECEPTACLES			20*	4
5	15*	S/CO DETECTOR			E	0.5	0.86		0.36	R	BATHROOM GFI			20	6
7	15*	TEL/DATA RECEPTACLE			M	0.5		0.68	0.18	R	SMALL APPLIANCE CIRCUIT			20	8
9	20	EBH-1			M	0.4	0.58		0.18	R	SMALL APPLIANCE CIRCUIT			20	10
11	20	TXF			M	0.1		1.2	1.1	E	MICROWAVE			20	12
13	20	KXF			M	0.1	1.3		1.2	E	DISHWASHER			20	14
15	15/2P	ACC-5N			M	0.92		2.22	1.3	E	REFRIGERATOR			20	16
17					M	0.92	2.42		1.5	R	WASHER			20	18
19	20	CP			M	0.1		0.28	0.18	R	RANGEHOOD			20	20
21	40/2P	HWHT-1			M	3	7		4	E	RANGE			50/2P	22
23					M	3		7	4	E					24
25	20	HWCP			M	0.1	2.6		2.5	E	DRYER			30/2P	26
27	20	SPARE						2.5	2.5	E					28
29	20	SPARE					0				SPARE			20	30
31	20	SPARE						0			SPARE			20	32
33	20	SPARE					0				SPARE			20	34
35	20	SPARE						0			SPARE			20	36
37	20	SPARE					0				SPARE			20	38
39	20	SPARE						0			SPARE			20	40
41							0				SPARE			20	42
				TOTAL LOAD (KVA)			15.8	14.42							

NOTE–
*ASTERISK INDICATES AFCI CIRCUIT BREAKERS

MECHANICAL SYMBOLS LIST

AC-1 / TXF-1	EQUIPMENT SYMBOL
XX / X	RISER SYMBOL
AIR DEVICES	
DUCT ACCESSORIES	
BD	BACKDRAFT DAMPER
	FIRE DAMPER W/ ACCESS DOOR
M	MOTORIZED DAMPER W/ ACCESS DOOR
VD VD	VOLUME DAMPER W/ ACCESS DOOR
HVAC PIPING	
CP	NEW CONDENSATE PIPING
REF	NEW REFRIGERANT PIPING
CONTROLS AND SENSORS	
T	THERMOSTAT
S	MANUAL ON/OFF SWITCH
DUCTWORK	
	AIR DUCT W/ 1.5" ACOUSTICAL LINING
	FLEXIBLE DUCT
FC FC	FLEXIBLE CONNECTION
24X12	RECTANGULAR DUCT (WIDTH X DEPTH)
ø12	ROUND DUCT (DIAMETER)
	ROUND DUCT CROSS SECTION
	SUPPLY AIR RECTANGULAR DUCT CROSS SECTION
	RETURN AIR RECTANGULAR DUCT CROSS SECTION

MECHANICAL ABBREVIATIONS

AC	AIR CONDITIONING UNIT
ACC	AIR COOLED CONDENSER
AFF	ABOVE FINISHED FLOOR
AL	ACOUSTIC LINING
BDD	BACKDRAFT DAMPER
BOD	BOTTOM OF DUCT
CFM	CUBIC FEET OF AIR PER MINUTE
COP	COEFFICIENT OF PERFORMANCE
CP	CONDENSATE PUMP
CD	CONDENSATE DRAIN PIPE
DN	DOWN
EER	ENERGY EFFICIENCY RATIO
EUH	ELECTRIC UNIT HEATER
EBH	ELECTRIC BASEBOARD HEATER.
EN	ENERGY ANALYSIS
FC	FLEXIBLE CONNECTION
FD/AD	FIRE DAMPER W/ACCESS DOOR
HSPF	HEATING SEASONAL PERFORMANCE FACTOR
IEER	INTEGRATED ENERGY EFFICIENCY RATIO
KX	KITCHEN EXHAUST RISER
KXF	KITCHEN EXHAUST FAN
MD	MOTORIZED DAMPER
REF	REFRIGERANT PIPING
SEER	SEASONAL ENERGY EFFICIENCY RATIO
SG	SUPPLY GRILLE
TX	TOILET EXHAUST RISER
TXF	TOILET EXHAUST FAN
VD	VOLUME DAMPER
W.M.S.	WIRE MESH SCREEN

MECHANICAL DRAWING LIST

NATURAL VENTILATION CODE OF NEW YORK CITY COMPLIANCE

ALL OCCUPIED RESIDENTIAL AREAS ARE NATURALLY VENTILATED ACCORDING TO THE 2014 NEW YORK CITY BUILDING CODE SECTION 1203.4. OPENABLE WINDOW AREA IS GREATER THEN 5% OF THE OCCUPIED FLOOR AREA.

ALL HABITABLE RESIDENTIAL AREAS ARE NATURALLY VENTILATED ACCORDING TO THE 2014 NEW YORK CITY BUILDING CODE SECTION 1203.4. OPENABLE WINDOW AREA IS GREATER THEN 4% OF THE OCCUPIED FLOOR AREA.

NYC BUILDING DEPARTMENT NOTES

ALL WORK SHALL COMPLY WITH APPLICABLE SECTIONS OF THE CITY OF NEW YORK BUILDING CODE, EFFECTIVE JULY 1, 2014 AND ALL AMENDMENTS AND RULES AND REGULATIONS OF THE DEPARTMENT OF BUILDINGS TO DATE.

1. THE CONTRACTOR SHALL ENGAGE THE SERVICES OF A PROFESSIONAL ENGINEER TO PROVIDE THE REQUIRED SPECIAL INSPECTIONS AND TESTS.

2. TESTS WILL BE CONDUCTED UNDER DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT OR OTHER PERSON HAVING NOT LESS THAN FIVE (5) YEARS EXPERIENCE SUPERVISING THE INSTALLATION OF SUCH MECHANICAL SYSTEMS. THE TESTS WILL SHOW COMPLIANCE WITH 2014 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. SPECIAL INSPECTIONS: (TR-1)

   THE FOLLOWING SYSTEMS SHALL BE INSPECTED IN ACCORDANCE WITH THE SECTION CITED FROM THE 2014 NYC BUILDING CODE.

   A. MECHANICAL SYSTEMS – BC 1704.16
   B. FIRESTOP, DRAFTSTOP, AND FIREBLOCK SYSTEMS – BC 1704.27
   B. POST INSTALLED ANCHORS– BC 1704.32

5. ENERGY CODE PROGRESS INSPECTIONS: (TR-8)

   THE FOLLOWING PROGRESS INSPECTIONS FOR HVAC SYSTEMS SHALL BE PERFORMED AS REQUIRED BY THE SECTIONS CITED FROM THE 2014 NYC BUILDING CODE.

   A. HVAC INSULATION AND SEALING
   B. SHUTOFF DAMPER
   C. MAINTENANCE INFORMATION

6. TESTS OF MECHANICAL SYSTEMS SHALL BE PERFORMED IN ACCORDANCE WITH SECTION MC 107 AND THE FOLLOWING SECTIONS OF THE 2014 NEW YORK CITY MECHANICAL CODE:

   A. REFRIGERATION SYSTEMS – MC 1108
   B. VENTILATION SYSTEM BALANCING MC 403.8
   C. NYC NOISE CONTROL CODE: 24-227

7. THE FOLLOWING WORK ITEMS, COMPONENTS, MATERIALS, CAPACITIES, ETC. SHALL COMPLY WITH THE REFERENCED CODE OR STANDARD:

   A. STANDARDS OF HEATING – MC 309.1
   B. DUCT CONSTRUCTION AND INSTALLATION– MC 603
   C. AIR FILTERS – MC 605
   D. PIPING & INSULATION – MC 1201-1203 & 1204

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

9. VENTILATION FOR ALL AREA SHALL COMPLY WITH MC 401.

10. 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

11. 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.

12. FIRE DAMPERS LOCATED WITHIN THE AIR DISTRIBUTION AND SMOKE CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE REQUIREMENTS OF SECTION MC 607.

13. REFER TO ARCHITECTURAL DRAWINGS FOR REQUIRED FIRE-RATED WALL AND SMOKE WALL CONSTRUCTION AND LOCATION.

14. 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.

15. MECHANICAL SYSTEMS SHALL BE COMMISSIONED PER 2016 NYCECC C403.2.2, C408.2.1, C408.2.5.4. FINAL COMMISSIONING REPORT SHALL BE DUE WITHIN 90 DAYS OF RECEIPT OF CERTIFICATE OF OCCUPANCY.

16. ALL HEATING AND COOLING LOADS CALCULATED PER ASHRAE/ACCA 18.

GENERAL NOTES

1. CONTRACTOR SHALL SURVEY THE AREA OF THIS WORK BEFORE SUBMITTING A BID AND SHALL BE RESPONSIBLE FOR NOTIFYING THE ARCHITECT OF ANY CONDITIONS WHICH WOULD PREVENT THE INSTALLATION OF THE WORK AS SHOWN ON DRAWINGS.

2. ALL APPLICABLE CODES, LAWS AND REGULATIONS GOVERNING OR RELATING TO ANY PORTION OF THIS WORK ARE HEREBY INCORPORATED INTO AND MADE A PART OF THESE SPECIFICATIONS, AND THEIR PROVISIONS SHALL BE CARRIED OUT BY THE CONTRACTOR WHO SHALL INFORM THE OWNER, PRIOR TO SUBMITTING A PROPOSAL, OF ANY WORK OR MATERIALS WHICH VIOLATE ANY OF THE ABOVE LAWS AND REGULATIONS. ANY WORK DONE BY THE CONTRACTOR CAUSING SUCH VIOLATION SHALL BE CORRECTED BY THE CONTRACTOR.

3. BEFORE PROCEEDING WITH ANY WORK IN OCCUPIED OR USED AREAS, THE CONTRACTOR SHALL APPLY TO OWNER FOR PERMISSION TO ENTER SUCH AREAS. THE CONTRACTOR IS OBLIGED TO PERFORM HIS WORK ONLY AT THE TIMES DESIGNATED BY OWNER. THERE WILL BE NO ADDITIONAL COMPENSATION FOR THE WORK PERFORMED AFTER HOURS OR ON OFF-DAYS WITHOUT PRIOR WRITTEN APPROVAL.

4. THE WORK IN THE BUILDING SHALL BE DONE WHEN AND AS DIRECTED, AND IN A MANNER SATISFACTORY TO THE OWNER. THE WORK SHALL BE PERFORMED SO AS TO CAUSE THE LEAST POSSIBLE INCONVENIENCE AND DISTURBANCE TO THE PRESENT OCCUPANTS.

5. THE CONTRACTOR'S PROPOSAL FOR ALL WORK SHALL BE PREDICATED ON THE PERFORMANCE OF THE WORK DURING REGULAR WORKING HOURS. WHEN SO DIRECTED, HOWEVER, THE CONTRACTOR SHALL INSTALL WORK IN OVERTIME AND THE ADDITIONAL COST TO BE CHARGED THEREFORE SHALL BE ONLY THE "PREMIUM" PORTION OF THE WAGES PAID.

6. CONTRACTOR SHALL ASCERTAIN THE APPROPRIATE METHOD FOR BRINGING THE UNITS INTO AND THROUGH THE BUILDING TO POSITION UNIT IN LOCATION SHOWN ON THE PLANS. WHERE NECESSARY, EQUIPMENT SHALL BE SHIPPED FROM MANUFACTURER IN SECTIONS OF SIZE SUITABLE FOR MOVING THROUGH RESTRICTIVE SPACES. COORDINATE WITH BUILDING OWNER APPROPRIATE TIMES OF DAY SUCH EQUIPMENT MAY BE MOVED THROUGH ALL AREAS.

7. 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 EXISTING SERVICES, INCLUDING THOSE OF 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 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 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. UNLESS OTHERWISE SPECIFICALLY SPECIFIED, INCLUDE ALL CUTTING AND PATCHING OF EXISTING FLOORS, WALLS, PARTITIONS AND OTHER MATERIALS IN THE EXISTING BUILDING. THE CONTRACTOR SHALL RESTORE THESE AREAS TO ORIGINAL CONDITION.

17. MATERIALS AND WORKMANSHIP, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

18. ALL EQUIPMENT SHALL BE PROVIDED WITH ONE YEAR WARRANTY PARTS AND LABOR AND FIVE YEARS ON COMPRESSORS. WARRANTY PERIOD BEGINS UPON PROJECT ACCEPTANCE

19. ALL MATERIAL AND EQUIPMENT TO BE NEW UNLESS OTHERWISE NOTED AND SHALL BE IN ACCORDANCE WITH BUILDING STANDARDS.

20. 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.

21. 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.

22. SUBMIT SHOP DRAWING OF ALL WORK WHICH MUST BE APPROVED BY THE ARCHITECT AND ENGINEER BEFORE WORK COMMENCES.

23. SUBMISSION OF A PROPOSAL SHALL BE CONSTRUED AS EVIDENCE THAT A CAREFUL EXAMINATION OF THE PORTIONS OF THE EXISTING BUILDING, EQUIPMENT, ETC., WHICH AFFECT THIS WORK, AND THE ACCESS TO SUCH SPACES, HAS BEEN MADE AND THAT THE CONTRACTOR IS FAMILIAR WITH EXISTING CONDITIONS AND DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THE WORK. LATER CLAIMS SHALL NOT BE MADE FOR LABOR, EQUIPMENT OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN DURING SUCH AN EXAMINATION. THE ON-SITE INSPECTION SHALL VERIFY EXISTING DUCTWORK, PIPING (SIZES, CLEARANCES, ETC) AND CONDITIONS.

24. INSURANCE: IN ACCORDANCE WITH BUILDING REQUIREMENTS THE CONTRACTOR SHALL INCLUDE A HOLD HARMLESS CLAUSE FOR OWNER AND ENGINEER.

25. 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.

26. 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.

27. WHERE A CONFLICT EXISTS BETWEEN THE DRAWINGS, THE SPECIFICATIONS OR ANY OTHER CONSTRUCTION DOCUMENT, THE ONE WITH THE MOST STRINGENT REQUIREMENT(S) SHALL APPLY.

DEFINITIONS:

1) "PROVIDE": TO SUPPLY, INSTALL AND CONNECT UP COMPLETE AND READY FOR SAFE AND REGULAR OPERATION THE PARTICULAR WORK REFERRED TO UNLESS SPECIFICALLY OTHERWISE NOTED.

2) "INSTALL": TO ERECT, MOUNT AND CONNECT COMPLETE WITH RELATED ACCESSORIES.

3) "FURNISH" OR "SUPPLY": TO PURCHASE, PROCURE, ACQUIRE AND DELIVER COMPLETE WITH RELATED ACCESSORIES.

SCOPE OF WORK

SCOPE OF WORK

1. THE WORK UNDER CONTRACT INCLUDES ALL LABOR, MATERIALS AND APPLIANCES NECESSARY FOR THE FURNISHING, INSTALLING AND TESTING, COMPLETE AND READY FOR SAFE OPERATION OF THE SYSTEMS AS DESCRIBED IN THE SPECIFICATIONS, FLOOR PLAN(S) DESIGN, DETAIL DRAWINGS, NOTES, RFI'S, ETC. FOR THIS PROJECT. WORK SHALL BE INSTALLED IN A NEAT, WORKMANLIKE MANNER.

2. THE CONTRACTOR SHALL GIVE NECESSARY NOTICE, FILE DRAWINGS AND SPECIFICATIONS WITH THE DEPARTMENT HAVING JURISDICTION, OBTAIN PERMITS OR LICENSES NECESSARY TO CARRY OUT THIS WORK AND PAY ALL FEES THEREFORE. THE CONTRACTOR SHALL ARRANGE FOR INSPECTION AND TESTS OF ANY OR ALL PARTS OF THE WORK IF SO REQUIRED BY AUTHORITIES AND PAY ALL CHARGES FOR SAME. THE CONTRACTOR SHALL PAY ALL COSTS FOR, AND FURNISH TO THE OWNER BEFORE FINAL BILLING, ALL CERTIFICATES NECESSARY AS EVIDENCE THAT THE WORK INSTALLED CONFORMS WITH ALL REGULATIONS WHERE THEY APPLY TO THIS WORK.

3. THE CONTRACTOR SHALL FURNISH A WRITTEN GUARANTEE TO REPLACE OR REPAIR PROMPTLY AND ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED FOR ANY WORKMANSHIP AND EQUIPMENT IN WHICH DEFECTS DEVELOP WITHIN ONE YEAR FROM THE DATE OF FINAL CERTIFICATE FOR PAYMENT AND/OR FROM DATE OR ACTUAL USE OF EQUIPMENT OR OCCUPANCY OF SPACES, BY OWNER, INCLUDED UNDER THE VARIOUS PARTS OF THE WORK, WHICHEVER DATE IS EARLIER. THIS WORK SHALL BE DONE AS DIRECTED BY THE OWNER. THIS GUARANTEE SHALL ALSO PROVIDE THAT WHERE DEFECTS OCCUR, THE CONTRACTOR WILL ASSUME RESPONSIBILITY FOR ALL EXPENSES INCURRED IN REPAIRING AND REPLACING WORK OF OTHER TRADES AFFECTED BY DEFECTS, REPAIRS OR REPLACEMENTS IN EQUIPMENT SUPPLIED BY THE CONTRACTOR.

GENERAL HVAC NOTES

GENERAL:

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.

2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK (HVAC, PLUMBING, AND FIRE PROTECTION) ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.

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.

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.

5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.

6. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, CONTRACT DOCUMENTS, AND APPLICABLE CODES AND REGULATIONS.

7. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.

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.

9. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND ELECTRICAL DIVISION OF THE SPECIFICATION.

10. PROVIDE VIBRATION ISOLATION FOR ALL MECHANICAL EQUIPMENT TO PREVENT TRANSMISSION OF VIBRATION TO BUILDING STRUCTURE.

11. 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.

12. 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.

13. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED, TO SERVICE DAMPERS 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.

14. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT BE SUPPORTED FROM A METAL DECK.

15. ALL EQUIPMENT, PIPING, DUCTWORK, ETC., SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION–FREE INSTALLATION.

16. 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.

17. LOCATIONS AND SIZES OF ALL FLOOR, WALL, AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.

18. ALL OPENINGS IN FIRE WALLS DUE TO DUCTWORK, PIPING, CONDUIT, ETC., SHALL BE FIRE STOPPED WITH A PRODUCT SIMILAR TO 3M OR APPROVED EQUAL.

19. ALL AIR CONDITIONING CONDENSATE 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.

20. REFER TO TYPICAL DETAILS FOR DUCTWORK, PIPING, AND EQUIPMENT INSTALLATION.

21. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.

22. ALL ROOF–MOUNTED EQUIPMENT CURBS AND STEEL RAILS FOR EQUIPMENT PROVIDED BY THE MECHANICAL CONTRACTOR SHALL BE FURNISHED BY THE MECHANICAL CONTRACTOR AND INSTALLED BY THE GENERAL CONTRACTOR

23. REINFORCEMENT, DETAILING, AND PLACEMENT OF CONCRETE SHALL CONFORM TO ASTM 315 AND ACI 318. CONCRETE SHALL CONFORM TO ASTM C94. CONCRETE WORK SHALL CONFORM TO ACI 318 PART ENTITLED "CONSTRUCTION REQUIREMENTS".COMPRESSIVE STRENGTH IN 28 DAYS SHALL BE 3,000 PSI. TOTAL AIR CONTENT OR EXTERIOR CONCRETE SHALL BE BETWEEN 5 AND 7 PERCENT BY VOLUME. SLUMP SHALL BE BETWEEN 3 AND 4 IN. CONCRETE SHALL BE CURED FOR 7 DAY AFTER PLACEMENT.

24. CONCRETE HOUSEKEEPING PADS TO SUIT MECHANICAL EQUIPMENT SHALL BE SIZED AND LOCATED BY THE MECHANICAL CONTRACTOR. MINIMUM CONCRETE PAD THICKNESS SHALL BE 6 IN. PAD SHALL EXTEND BEYOND THE EQUIPMENT A MINIMUM OF 6 IN. ON EACH SIDE. CONCRETE HOUSEKEEPING PADS SHALL BE PROVIDED BY THE GENERAL CONTRACTOR. IT SHALL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR TO COORDINATE THE SIZE AND LOCATION OF CONCRETE HOUSEKEEPING PADS WITH THE GENERAL CONTRACTOR.

25. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.

HVAC DUCTWORK – SHEET METAL

1. CERTAIN ITEMS SUCH AS RISES AND DROPS IN DUCTWORK,ACCESS DOORS, VOLUME DAMPERS, ETC., ARE INDICATED ON THE CONTRACT DOCUMENT DRAWINGS FOR CLARITY FOR A SPECIFIC LOCATION REQUIREMENT AND SHALL NOT BE INTERPRETED AS THE EXTENT OF THE REQUIREMENTS FOR THESE ITEMS.

2. ALL NEW DUCTWORK WILL COMPLY WITH THE LATEST SMACNA GUIDELINES AND CONFORM WITH REQUIREMENTS OF THE LATEST HANDBOOKS PUBLISHED BY ASHRAE.

3. PROVIDE VOLUME DAMPER AT EACH TAP TO MAIN DUCT AND WHERE NECESSARY TO PROPERLY BALANCE SYSTEM.

4. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS 4'–0" (CENTER LINE) ABOVE THE FINISHED FLOOR. NOTIFY THE ENGINEER OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.

5. ALL DUCTWORK SHALL CLEAR DOORS AND WINDOWS.

6. ALL DUCTWORK DIMENSIONS, AS SHOWN ON THE DRAWINGS, ARE INTERNAL CLEAR DIMENSIONS AND DUCT SIZE SHALL BE INCREASED TO COMPENSATE FOR DUCT LINING THICKNESS.

7. PROVIDE ALL 90–DEGREE SQUARE ELBOWS WITH DOUBLE RADIUS TURNING VANES UNLESS OTHERWISE INDICATED. ELBOWS IN KITCHEN, AND TOILET EXHAUSTS SHALL BE OF UN–VANED SMOOTH RADIUS CONSTRUCTION WITH A RADIUS EQUAL TO 1–1/2 TIMES THE WIDTH OF THE DUCT. PROVIDE ACCESS DOORS UPSTREAM OF ALL ELBOWS WITH TURNING VANES.

8. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS CONNECTED TO FANS THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE INDICATED.

9. UNLESS OTHERWISE NOTED, ALL DUCTWORK IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION IF NEEDED.

10. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FT.

11. ALL DUCTWORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN DUCTS, INCLUDING DIVIDED DUCTS AND TRANSITIONS AROUND OBSTRUCTIONS, SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

12. PROVIDE ACCESS DOORS IN DUCTWORK TO PROVIDE ACCESS FOR ALL FIRE DAMPERS, VOLUME DAMPERS AND OTHER ITEMS LOCATED IN THE DUCTWORK THAT REQUIRE SERVICE AND/OR INSPECTION.

13. PROVIDE ACCESS DOORS IN DUCTWORK FOR THE OPERATION, ADJUSTMENT, AND MAINTENANCE OF ALL FANS AND MECHANICAL EQUIPMENT.

14. ALL DUCTS SHALL BE GROUNDED ACROSS FLEXIBLE CONNECTIONS WITH FLEXIBLE COPPER GROUNDING STRAPS. GROUNDING STRAPS SHALL BE BOLTED OR SOLDERED TO BOTH THE EQUIPMENT AND THE DUCT.

15. SEE SPECIFICATIONS FOR DUCTWORK GAUGES, BRACING, HANGERS, AND OTHER REQUIREMENTS.

16. NOISE CONTROL

    A. ALL ROOM NC LEVELS SHALL BE 35 OR LESS.

    B. PROVIDE SOUND LINING FOR THE FOLLOWING DUCTWORK:

        1) 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.

PIPING

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE PIPING SYSTEMS AS INDICATED ON THE DRAWINGS AND AS SPECIFIED AND REQUIRED BY CODE.

2. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON THE EQUIPMENT SIDE OF THE VALVE IS REMOVED.

3. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND THE MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).

4. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.

5. ALL PIPING SHALL CLEAR DOORS AND WINDOWS.

6. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

7. ALL PIPING SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

8. SLOPED REFRIGERANT PIPING 1% IN THE DIRECTION OF OIL RETURN. LIQUID LINES MAY BE INSTALLED LEVEL.

9. INSTALL HORIZONTAL REFRIGERANT HOT GAS DISCHARGE PIPING WITH 1/2" PER 10 FT. DOWNWARD SLOPE AWAY FROM THE COMPRESSOR.

10. INSTALL HORIZONTAL REFRIGERANT SUCTION LINES WITH 1/2" PER 10 FT. DOWNWARD SLOPE TO THE COMPRESSOR, WITH NO LONG TRAPS OR DEAD ENDS THAT MAY CAUSE OIL TO SEPARATE FROM THE SUCTION GAS AND RETURN TO THE COMPRESSOR IN DAMAGING SLUGS.

11. PROVIDE LINE SIZE LIQUID INDICATORS IN THE MAIN LIQUID LINE LEAVING THE CONDENSER OR RECEIVER. INSTALL MOISTURE–LIQUID INDICATORS IN LIQUID LINES BETWEEN FILTER DRYERS AND THERMOSTATIC EXPANSION VALVES, AND IN LIQUID LINE TO RECEIVER.

12. PROVIDE A LINE SIZE STRAINER UPSTREAM OF EACH AUTOMATIC VALVE. PROVIDE A SHUT–OFF VALVE ON EACH SIDE OF A STRAINER.

13. PROVIDE PERMANENT FILTER DRYERS IN LOW–TEMPERATURE SYSTEMS AND SYSTEMS USING HERMETIC COMPRESSORS.

14. PROVIDE REPLACEABLE CARTRIDGE FILTER DRYERS WITH A THREE–VALVE BYPASS ASSEMBLY FOR SOLENOID VALVES, ADJACENT TO RECEIVERS.

15. PROVIDE REFRIGERANT CHARGING VALVE CONNECTIONS IN THE LIQUID LINE BETWEEN THE RECEIVER SHUTOFF VALVE AND THE EXPANSION VALVE.

SPECIFICATIONS

SECTION 0001 – NOTICE TO BIDDERS

1.1 BIDDERS REPRESENTATIONS

A. THE BIDDER BY MAKING A BID REPRESENTS THAT:

THE BIDDER HAS READ AND UNDERSTANDS THE BIDDING DOCUMENTS, TO THE EXTENT THAT SUCH DOCUMENTATION RELATES TO THE WORK FOR WHICH THE BID IS SUBMITTED, AND FOR OTHER PORTIONS OF THE PROJECT, IF ANY, BEING BID CONCURRENTLY OR PRESENTLY UNDER CONSTRUCTION.

B. THE BID IS MADE IN COMPLIANCE WITH THE BIDDING DOCUMENTS.

C. THE SPECIFICATIONS AND DRAWINGS ARE INTENDED TO SERVE JOINTLY AS A BASIS FOR THE BIDDER TO SUBMIT A CONTRACT PRICE FOR THE MATERIAL AND LABOR.

D. SHOULD CONFLICTS OR DISCREPANCIES OCCUR WITHIN THE BIDDING DOCUMENTS, THE ITEM OR ITEMS IN DISPUTE THAT REPRESENT THE GREATER COST SHALL PREVAIL IN THE FINAL BID.

E. THE BID IS BASED UPON THE MATERIALS, EQUIPMENT AND SYSTEMS REQUIRED BY THE BIDDING DOCUMENTS WITHOUT EXCEPTION.

1.2 EXISTING CONDITIONS AND COORDINATION

A. THE BIDDER HAS VISITED THE SITE, BECOME FAMILIAR WITH LOCAL CONDITIONS UNDER WHICH THE WORK IS TO BE PERFORMED AND HAS CORRELATED THE BIDDER'S PERSONAL OBSERVATIONS WITH THE REQUIREMENTS OF THE PROPOSED BIDDING DOCUMENTS.

B. THE BIDDER SHALL PROPOSE COORDINATION OF WORK SUCH THAT CONFLICTS WITH OTHER TRADES AND SPACE ALLOCATIONS ARE AVOIDED.

1.3 RESPONSIBILITIES

A. THE BIDDER UNDERSTANDS THAT ANY CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE TIMELY COMPLETION AND ACCEPTANCE OF THEIR WORK AND THAT ANY ITEMS DAMAGED, LOST OR STOLEN DURING TIME OF CONSTRUCTION SHALL BE REPAIRED OR REPLACED WITHOUT ANY ADDITIONAL COST TO THE OWNER.

B. THE BIDDER UNDERSTANDS THAT ANY PROPOSED WORK IN OCCUPIED TENANT SPACES SHALL BE PERFORMED DURING TIMES OF NON–TENANT OCCUPANCY OR AS SCHEDULED OR DIRECTED BY THE BUILDING MANAGER.

C. THE BIDDER UNDERSTANDS THAT ANY PROPOSED SHUT–DOWN OF EXISTING SYSTEMS DURING CONSTRUCTION SHALL BE PRE–ARRANGED WITH THE BUILDING MANAGER AND THAT SUCH SHUT–DOWNS ARE TO BE KEPT TO A MINIMUM.

END OF SECTION 0001

SECTION 0102 –REQUIRED DOCUMENTS

1.1 SHOP DRAWINGS

A. A SET OF PRINTS FOR ANY MECHANICAL WORK INCLUDING BUT NOT LIMITED TO, DUCTWORK AND PIPING LAYOUT SHALL BE SUBMITTED FOR APPROVAL TO THE ENGINEER PRIOR TO CONSTRUCTION OR PURCHASE OF MATERIALS.

1.2 SUBMITTALS

A. WITHIN 90 DAYS, EQUIPMENT SUBMITTALS OF ALL PROPOSED MECHANICAL AND ANCILLARY EQUIPMENT INCLUDING ALL ACCESSORIES SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. ALL PERTINENT MODELS, SIZES, ACCESSORIES AND CHOICES SHALL BE CLEARLY CHECKED, PRINTED OR OTHERWISE INDICATED ON THE SUBMITTALS.

1.3 RECORD DRAWINGS

A. WITHIN 90 DAYS OF COMPLETION OF THE WORK, A RECORD DRAWING SHALL BE SUBMITTED TO THE OWNER DEPICTING ALL SUBSEQUENT CHANGES, ADDITIONS AND OR CORRECTIONS TO THE CONTRACT DRAWINGS AND OR CONTRACT SCOPE MADE DURING CONSTRUCTION. THIS DRAWING SHALL REPRESENT A COMPLETE RECORD OF THE WORK INSTALLED.

1.4 EQUIPMENT OPERATING INSTRUCTIONS

A. WITHIN 90 DAYS OF COMPLETION AND ACCEPTANCE OF WORK, THIS CONTRACTOR SHALL FURNISH WRITTEN INSTRUCTIONS,EQUIPMENT MANUALS AND DEMONSTRATE TO THE OWNER THE PROPER OPERATION AND MAINTENANCE OF ALL EQUIPMENT AND APPARATUS FURNISHED UNDER THIS CONTRACT.

B. THESE INSTRUCTIONS SHALL BE TYPED ON 8–1/2 IN. X 11 IN. PAPER AND BOUND IN THREE–RING BINDERS WITH CLEAR ACETATE COVERS. THE CONTRACTOR SHALL GIVE THREE COPIES OF THE INSTRUCTIONS TO THE OWNER AND ONE ELECTRONIC COPY TO THE ENGINEER.

C. THE INSTRUCTION BOOKLET SHALL BE ORGANIZED IN SECTIONS, WITH ONE SECTION PER SYSTEM. THE COVER OF THE INSTRUCTION BOOKLET SHALL BEAR THE NAME, ADDRESS AND PHONE NUMBER OF THE PROJECT, ARCHITECT, ENGINEER, MECHANICAL CONTRACTOR AND SUBCONTRACTORS.

END OF SECTION 0102

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

1. HILTI CONSTRUCTION CHEMICAL, INC
2. TREMCO INC.
3. 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.
5. PROCO PRODUCTS, 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.

1.3 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.

END OF SECTION 230517

SECTION 230529 – HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

1.1 PERFORMANCE REQUIREMENTS

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.

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.

1. DESIGN SUPPORTS FOR MULTIPLE PIPES CAPABLE OF SUPPORTING COMBINED WEIGHT OF SUPPORTED SYSTEMS, SYSTEM CONTENTS, AND TEST WATER.
2. DESIGN EQUIPMENT SUPPORTS CAPABLE OF SUPPORTING COMBINED OPERATING WEIGHT OF SUPPORTED EQUIPMENT AND CONNECTED SYSTEMS AND COMPONENTS.
3. DESIGN SEISMIC–RESTRAINT HANGERS AND SUPPORTS FOR PIPING AND EQUIPMENT AND OBTAIN APPROVAL FROM AUTHORITIES HAVING JURISDICTION.

1.2 SUBMITTALS

A. SHOP DRAWINGS: SIGNED AND SEALED BY A PROFESSIONAL ENGINEER

1.3 QUALITY ASSURANCE

A. AWS D1.1/D1.1M, "STRUCTURAL WELDING CODE – STEEL."

1.4 COMPONENTS

A. METAL PIPE HANGERS AND SUPPORTS: CARBON OR STAINLESS STEEL

B. TRAPEZE PIPE HANGERS: CARBON OR STAINLESS STEEL

C. FIBERGLASS PIPE HANGERS: –CLEVIS, CENTURY COMPOSITES, COOPER B–LINE

D. METAL FRAMING SYSTEMS: MFMA MANUFACTURER

E. FIBERGLASS STRUT SYSTEMS: COOPER B–LINE

F. THERMAL–HANGER SHIELD INSERTS:

G. FASTENER SYSTEMS: POWDER–ACTUATED FASTENERS OR MECHANICAL–EXPANSION ANCHORS

H. PIPE STANDS: COMPACT, LOW TYPE, SINGLE PIPE, HIGH TYPE, SINGLE PIPE, HIGH TYPE, MULTIPLE PIPES, CURB–MOUNTED TYPE

I. EQUIPMENT SUPPORTS.

END OF SECTION 230529

SECTION 230548 – VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 – GENERAL

1.1 COMPONENTS

A. VIBRATION ISOLATORS:

1. ISOLATOR PADS: NEOPRENE, RUBBER, HERMETICALLY AND/OR SEALED COMPRESSED FIBERGLASS
2. MOUNTS: DOUBLE–DEFLECTION TYPE.
3. SPRING ISOLATORS: FREESTANDING, LATERALLY STABLE, OPEN–SPRING TYPE.
4. RESTRAINED SPRING ISOLATORS: FREESTANDING, STEEL, OPEN–SPRING TYPE WITH SEISMIC RESTRAINT.
5. HOUSED SPRING MOUNTS: DUCTILE–IRON OR STEEL HOUSING, WITH INTEGRAL.
6. ELASTOMERIC HANGERS: DOUBLE–DEFLECTION TYPE.
7. SPRING HANGERS: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION.
8. SPRING HANGERS WITH VERTICAL–LIMIT STOP: COMBINATION COIL–SPRING AND ELASTOMERIC–INSERT HANGERS WITH SPRING AND INSERT IN COMPRESSION AND WITH VERTICAL–LIMIT STOP.
9. PIPE RISER RESILIENT SUPPORT: ALL–DIRECTIONAL, ACOUSTICAL PIPE ANCHOR.
10. RESILIENT PIPE GUIDES.

B. AIR–MOUNTING SYSTEMS:

1. AIR MOUNTS: FREESTANDING, SINGLE OR MULTIPLE, COMPRESSED–AIR BELLOWS.

C. RESTRAINED AIR MOUNTS: HOUSED COMPRESSED–AIR BELLOWS.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.

D. VIBRATION ISOLATION EQUIPMENT BASES:

1. STEEL BASE: FACTORY–FABRICATED, WELDED, STRUCTURAL–STEEL BASES AND RAILS.
2. 2. INERTIA BASE: FACTORY–FABRICATED, WELDED, STRUCTURAL–STEEL BASES AND RAILS READY FOR FIELD–APPLIED, CAST–IN–PLACE CONCRETE

1.2 FIELD QUALITY CONTROL

A. TESTING: BY EITHER: OWNER–ENGAGED AGENCY, CONTRACTOR–ENGAGED AGENCY, OR CONTRACTOR.

PART–2 PRODUCTS

1.1 VIBRATION ISOLATORS DEVICES

A. AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING:

B. MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS BY ONE OF THE FOLLOWING:

1. ACE MOUNTINGS CO., INC.
2. AMBER/BOOTH COMPANY, INC.
3. CALIFORNIA DYNAMICS CORPORATION.
4. COOPER B–LINE, INC.; A DIVISION OF COOPER INDUSTRIES.
5. HILTI, INC.
6. ISOLATION TECHNOLOGY, INC.
7. KINETICS NOISE CONTROL.
8. LOOS & CO.; CABLEWARE DIVISION.
9. MASON INDUSTRIES.
10. TOLCO INCORPORATED; A BRAND OF NIBCO INC.
11. UNISTRUT; TYCO INTERNATIONAL, LTD.
12. VIBRATION ELIMINATOR CO., INC.
13. VIBRATION ISOLATION.
14. VIBRATION MOUNTINGS & CONTROLS, INC.

END OF SECTION 230548

SECTION 230593 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

1.1 SUMMARY

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

1. AIR SYSTEMS: CONSTANT–VOLUME,
2. CONDENSING UNITS.

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

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

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

D. 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.

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

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

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

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

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

END OF SECTION 230593

SECTION 230713 – DUCT INSULATION

1.1 QUALITY ASSURANCE

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

1.2 FIELD QUALITY CONTROL

A. FIELD INSPECTIONS: BY OWNER–ENGAGED AGENCY.

1.3 INDOOR DUCT AND PLENUM INSULATION SCHEDULE;

A. CONCEALED, RECTANGULAR, ROUND AND OUTDOOR–AND EXHAUST–AIR DUCT AND AIR PLENUM INSULATION:

B. FLEXIBLE ELASTOMERIC, MINERAL–FIBER BLANKET, MINERAL–FIBER BOARD OR POLYOLEFIN WITH MINIMUM INSTALLED THERMAL RESISTANCE AS FOLLOWS:
WITHIN BUILDING ENVELOPE ASSEMBLY: R–8
OUTSIDE OF BUILDING: R–8

1.4 ITEMS NOT INSULATED:

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

1.5 PRODUCTS

A. THE FOLLOWING INSULATION MANUFACTURERS WILL BE ACCEPTABLE:

1. JOHNS–MANVILLE
2. OWENS–CORNING

1.6 ACOUSTICAL TREATMENT

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

END OF SECTION 230713

SECTION 233113 – METAL DUCTS

1.1 CONSTRUCTION

A. EACH DUCT SYSTEM SHALL BE CONSTRUCTED FOR THE SPECIFIC SMACNA DUCT PRESSURE CLASSIFICATIONS SHOWN ON THE CONTRACT DRAWINGS. WHERE NO PRESSURE CLASSES ARE SPECIFIED BY THE DESIGNER, THE SMACNA 2–1/2 INCH WG PRESSURE CLASS IS THE BASIS OF COMPLIANCE WITH THESE STANDARDS, REGARDLESS OF THE VELOCITY IN THE DUCT.

B. ALL DUCTWORK SHALL BE CONSTRUCTED TO SMACNA 2" WG DESIGN AND NOT LESS THAN THE FOLLOWING STANDARDS:

1. DUCTWORK SHALL BE TRANSVERSELY JOINTED BY CONNECTING SEAMS OF COMPANION ANGLES, FORMED FROM 1–1/2"X1–1/2"X1/8" GALVANIZED ANGLES, TACK–WELDED OR RIVETED TO THE DUCT. THE ANGLE FRAME SHALL BE CONTINUOUSLY FLANGED UP INTO UPRIGHT OF ANGLE AND EACH CORNER SHALL BE FILLED IN AND GROUND SMOOTH. JOINTS SHALL BE GASKETED WITH 1/8" THICK REINFORCED GASKET, OVERLAPPED AT CORNERS, GASKET SIMILAR TO 3M–1202 OR APPROVED EQUAL.
2. RECTANGULAR FITTINGS AND ALL TRANSITION PIECES FROM RECTANGULAR TO ROUND SHALL BE NO. 16 GAUGE ALL WELDED CONSTRUCTION.
3. HORIZONTAL DUCTS SHALL BE SUPPORTED ON NOT MORE THAN 6' CENTERS. VERTICAL RISERS SHALL BE SUPPORTED AT EACH FLOOR.
4. LONGITUDINAL SEAMS FOR RECTANGULAR DUCTWORK SHALL BE PITTSBURGH LOCK SEAMS WITH SEALING COMPOUND, EQUAL TO BENJAMIN FOSTER NO. 30–03 INSERTED INTO SEAM. ALL SEAMS SHALL BE BRUSHED WITH NO. 30–02 AND COVERED WITH APPROVED SEALING TAPE.
5. RECTANGULAR DUCTWORK 18 GAUGE AND HEAVIER, FILLER RODS SHALL BE IN ACCORDANCE WITH SPECIFICATIONS FOR IRON AND STEEL GAS WELDING RODS, ASTM 215; AWG A5.2.
6. ALL FITTINGS SUCH AS ELBOWS, TEES, ETC., SHALL BE NO. 20 GAUGE ZINC COATED STEEL. ELBOWS SHALL BE OF FIVE (5) PIECE WELDED AIRTIGHT CONSTRUCTION.

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:

USG	MAX. SIDE INCHES	TRANSVERSE JOINTS AND BRACING
22	UP TO 12	S SLIP, DRIVE SLIP, ONE INCH POCKET LOCK ON 8 FOOT CENTERS
22	13 TO 24	1"X1"X1/8" ANGLES ON 4 FOOT CENTERS
20	25 TO 35	1"X1"X1/8" ANGLES ON 2 FOOT CENTERS

D. 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 SHOWN IN FIG. 3–6 AND AS SHOWN IN FIG. 3–1 AND 3–2 FOR ROUND DUCTWORK.

E. 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. DOUBLE–WALL RECTANGULAR DUCTS AND FITTINGS.
1. FIBROUS–GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.
C. SINGLE–WALL ROUND DUCTS AND FITTINGS.
D. DOUBLE–WALL ROUND DUCTS AND FITTINGS.
1. FIBROUS–GLASS OR FLEXIBLE ELASTOMERIC DUCT LINER FOR INTERSTITIAL INSULATION.
2. PERFORATED INNER DUCT.
E. SHEET METAL MATERIALS:
1. GALVANIZED SHEET STEEL.
2. PVC–COATED, GALVANIZED SHEET STEEL.
3. CARBON–STEEL SHEETS.
4. STAINLESS–STEEL SHEETS.
5. ALUMINUM SHEETS.
6. FACTORY–APPLIED ANTI–MICROBIAL COATING.
F. DUCT LINER:
1. FIBROUS GLASS, TYPE I, FLEXIBLE.
a. WITH ANTI–MICROBIAL EROSION–RESISTANT COATING.
2. FLEXIBLE ELASTOMERIC.
3. NATURAL FIBER.
G. SEALANT MATERIALS:
1. TWO–PART TAPE SEALING SYSTEM.
2. WATER–BASED JOINT AND SEAM SEALANT.
3. SOLVENT–BASED JOINT AND SEAM SEALANT.
4. FLANGED JOINT SEALANT.
5. FLANGE GASKETS.
6. ROUND DUCT JOINT O–RING SEALS.

1.3 DUCT CLEANING

A. CLEAN EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
B. CLEAN THE FOLLOWING ITEMS:
1. AIR OUTLETS
2. OUTDOOR AND EXHAUST FANS.
3. COILS AND RELATED COMPONENTS.
4. EXHAUST–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
5. OUTDOOR–AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.

1.4 DUCT SCHEDULE

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

END OF SECTION 233113

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) OUTDOOR: DUCTS EQUIPMENT WHICH IS EXPOSED TO THE WEATHER.

PIPING INSULATION

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

INSULATION SCHEDULE – PIPING

SERVICE	SIZE	THICKNESS	MATERIAL FINISH
REFRIGERANT PIPING		1.5"	P–6
CONDENSATE DRAIN PIPING (IF RUNNING THROUGH EXTERIOR WALL)		1.0"	P–6

B. PIPING, VALVES AND FITTINGS TO BE INSULATED:

1) LOW TEMPERATURE PIPING SYSTEMS – 0 TO 55 DEG F INCLUDING:
a.CONDENSATE DRAIN PIPING.

2)PROTECTIVE COVERINGS SHALL BE INSTALLED ON AREAS OF INSULATION THAT ARE EXPOSED TO WEATHER OR SUBJECT TO MECHANICAL DAMAGE. THE PROTECTIVE COVERING SHALL BE:

a.ARMA–CHEK SILVER?MULTI–LAYER LAMINATE OF ALUMINUM, COATED WITH A UV PROTECTIVE FILM AND BACKED WITH A 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 R TYPE BONDED USING AN APPROPRIATE FULL CONTACT ADHESIVE WITH A MINIMUM 50 MM OVERLAP AT ALL BUTT JOINTS AND LONGITUDINAL SEAMS. A WEATHER–PROOF MASTIC 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 SHALL BE IN ALL CASES TO THE MANUFACTURER'S RECOMMENDATIONS. ALL EXCESS ADHESIVE VISIBLE ON THE SURFACE OF THE COMPLETED ASSEMBLY SHALL BE REMOVED USING AN APPROPRIATE CLEANING MATERIAL.

OR

c.METAL CLADDING, COMPRISED OF COATED SHEET METAL, WITH ALL EXTERNAL JOINTS AND FIXING MADE WEATHER–PROOF WITH SILICONE SEALANT.

C. MATERIAL:

1) 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:

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.

E. INSTALLATION:

3) BEFORE APPLYING INSULATION ALL PRESSURE AND LEAK TESTS SHALL BE COMPLETED AND APPROVED.

4) ALL INSULATION SHALL BE BUTTED FIRMLY TOGETHER. PROVIDE 2 IN. LAMP STRIPS AT ALL SEAMS SECURED WITH ADHESIVE. USE VAPOR BARRIER TAPE AND VAPORSEAL ADHESIVE WHERE REQUIRED. STAPLES NOT PERMITTED. REFRIGERANT PIPING INSULATION SHALL HAVE MITERED FITTINGS.

5) ALL INSULATION AND VAPOR BARRIERS SHALL BE CONTINUOUS PASSING THROUGH SLEEVES, HANGERS, ETC., OR OTHER OPENINGS. PROVIDE SADDLES OR SHIELDS FOR PROTECTION AT ALL HANGINGS.

6) INSULATION FOR STRAINERS OR OTHER FITTINGS OR ACCESSORIES REQUIRING SERVICING OR INSPECTION SHALL HAVE INSULATION REMOVABLE AND REPLACEABLE WITHOUT DAMAGE.

CONDENSATE DRAIN PIPING

1) PIPE: ASTM B88, HARD DRAWN COPPER TUBING TYPE "L".
2) FITTINGS: SOLDERED JOINT FITTINGS, 95/5 SOLDER.
3) PITCH, EXCEPT AS NOTED:

a.1 IN. IN 4 FT PREFERRED.

b.1 IN. IN 8 FT MINIMUM.

4) SWING CHECK VALVES: AT CONDENSATE PUMP DISCHARGE. 300 LB WOG, BRONZE BODY SOLDER ENDS, REGRIND BRONZE DISC TO BE USED WITH COPPER TUBING. JENKINS FIG. 1222.

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.

SEQUENCE OF OPERATION:

1) AC UNITS: UNIT SHALL BE STARTED AND STOPPED BY WALL MOUNTED PROGRAMMABLE THERMOSTAT. DURING "ON" MODE UNIT THERMOSTAT SHALL ENERGIZE COMPRESSOR(S) AND SUPPLY FAN TO MAINTAIN ROOM SET POINT OF 75°F ADJUSTABLE; WHEN ROOM TEMPERATURE DROPS BELOW SET POINT COMPRESSOR(S) SHALL DE–ENERGIZE AND FAN SHALL REMAIN ON.

2)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 ZONE.

A. AUTOMATIC SETBACK CONTROLS 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,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.

B. SETPOINT OVERLAP RESTRICTION:

WHERE A ZONE HAS A SEPARATE HEATING AND A SEPARATE COOLING THERMOSTATIC CONTROL LOCATED WITHIN THE ZONE, ALIMIT 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 DEAD BAND IN ACCORDANCE WITH SECTION C403.2.4.1.2.

C. 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 WITHIN WHICH THE SUPPLY OF HEATING AND COOLING ENERGY TO THE ZONE IS CAPABLE OF BEING SHUT OFF OR REDUCED TO A MINIMUM.

2) FANS: TURNED ON OR OFF THROUGH ON–OFF SWITCH AND SHALL OPERATE CONTINUOUSLY. WHERE THERE ARE DAMPERS (MOTORIZED OR FD) IN THE DUCTWORK SYSTEM SERVED BY THE FAN, THEY SHALL BE INTERLOCKED WITH THE FAN TO OPEN WHEN THE FAN IS OPERATING ONLY. IF FD IS INSTALLED IN THE SYSTEM, THE FAN SHALL SHUT DOWN WHENEVER THE FSD CLOSES ON AN ALARM CONDITION.

a. TRANSFER FANS: FANS SHALL BE CONTROLLED BY A LOCAL WALL MOUNTED SWITCH.

b. OUTSIDE AIR FANS SHALL BE INTERCONNECTED TO THEIR RESPECTIVE OUTSIDE AIR MOTORIZED DAMPER SO THAT THE DAMPER OPENS WHENEVER THE OA FAN IS OPERATING. OA FAN SHALL START RUNNING AFTER DAMPER IS PROOFED OPEN.

AIR OUTLETS

A. GENERAL:

1) MARGIN TYPES, COLORS, FINISH AND METHODS OF ATTACHMENT FOR ALL GRILLES SHALL BE COORDINATED WITH ARCHITECTURAL CEILING AND WALL DETAILS AND SPECIFICATIONS.

2) FRAME TYPE SUITABLE FOR MOUNTING IN CEILING OR WALL CONSTRUCTION AS INDICATED ON ARCHITECTURAL PLANS.

3) EXACT LOCATION OF ALL AIR OUTLETS AS PER ARCHITECTURAL PLANS.

4) SUITABLE FOR OPERATION AT 20% EXCESS AND 20% LESS THAN NOTED CAPACITY FOR CONSTANT VOLUME SYSTEMS AND AT 20% EXCESS. MANUFACTURER RESPONSIBLE FOR EXAMINING APPLICATION OF EACH OUTLET AND GUARANTEE THAT EACH WILL PROVIDE REQUIRED NC LEVELS AND COMFORT SPACE CONDITIONS WITHOUT DRAFTS THROUGHOUT OPERATING RANGE.

FANS

MODEL SP

CEILING EXHAUST FANS ARE DESIGNED FOR CLEAN AIR APPLICATIONS WHERE LOW SOUND LEVELS ARE DESIRED. FAN/LIGHT COMBINATIONS ARE AVAILABLE ON A WIDE RANGE OF SP, SP–A AND SP–B MODELS. SP MODELS ARE THE MOST ENERGY EFFICIENT OPTION FEATURING AN EC MOTOR AND THE LOWEST SOUND VALUES OF <0.3 AT 0.1 IN. WG OF STATIC PRESSURE. THE PERFORMANCE CAPABILITIES ARE 30 CFM TO 110 CFM AND UP TO 0.625 IN. WG OF STATIC PRESSURE. SP–A MODELS ARE PREMIUM ULTRA LOW SOUND EXHAUST FANS WITH PERFORMANCE CAPABILITIES OF 50 CFM TO 1,607 CFM AND UP TO 0.75 IN. WG OF STATIC PRESSURE. SP–B MODELS ARE DELUXE EXHAUST FANS THAT HAVE A GOOD BALANCE BETWEEN PRICE AND SOUND WITH PERFORMANCE CAPABILITIES OF 50 CFM TO 200 CFM AND UP TO 0.75 IN. WG OF STATIC PRESSURE.

SPECIFICATION–OUTDOOR UNIT (MITSUBISHI–PUZ–A12NKA7)

GENERAL

THE OUTDOOR UNIT SHALL BE EQUIPPED WITH AN ELECTRONIC CONTROL BOARD THAT INTERFACES WITH THE INDOOR UNIT TO PERFORM ALL NECESSARY OPERATION FUNCTIONS.

THE OUTDOOR UNIT SHALL BE CAPABLE OF COOLING OPERATION DOWN TO AMBIENT TEMPERATURE OF 0°F FOR HEAT PUMP SYSTEMS AND –20°F (–29°C) FOR COOLING ONLY SYSTEMS WITHOUT ADDITIONAL LOW AMBIENT CONTROLS (OPTIONAL WIND BAFFLE SHALL BE REQUIRED).

THE OUTDOOR UNIT SHALL BE ABLE TO OPERATE WITH A MAXIMUM HEIGHT DIFFERENCE OF 100 FEET (30 METERS) BETWEEN INDOOR AND OUTDOOR UNITS.

MODELS PUZ(Y)–A12/18/24/30NH/KA7 SHALL BE PRE–CHARGED FOR A MAXIMUM OF 70 FEET (21 METERS) OF REFRIGERANT TUBING – PUZ(Y)–A36/42NKA7 FOR 100 FEET (30 METERS).

THE OUTDOOR UNIT SHALL BE COMPLETELY FACTORY ASSEMBLED, PIPED, AND WIRED. EACH UNIT MUST BE TEST RUN AT THE FACTORY.

CABINET

THE CASING SHALL BE CONSTRUCTED FROM GALVANIZED STEEL PLATE, FINISHED WITH AN ELECTROSTATICALLY APPLIED, THERMALLY FUSED ACRYLIC OR POLYESTER POWDER COATING FOR CORROSION PROTECTION AND HAVE A MUNSELL 3Y 7.8/1.1 FINISH.

MOUNTING FEET SHALL BE PROVIDED AND SHALL BE WELDED TO THE BASE OF THE CABINET AND BE OF SUFFICIENT SIZE TO AFFORD RELIABLE EQUIPMENT MOUNT AND STABILITY.

EASY ACCESS SHALL BE AFFORDED TO ALL SERVICEABLE PARTS BY MEANS OF REMOVABLE PANEL SECTIONS.

THE FAN GRILL SHALL BE OF ABS PLASTIC.

CABINET MOUNTING AND CONSTRUCTION SHALL BE SUFFICIENT TO WITHSTAND 155 MPH WIND SPEED CONDITIONS FOR USE IN HURRICANE CONDITION AREAS. MOUNTING, BASE SUPPORT, AND OTHER INSTALLATION TO MEET HURRICANE CODE CONDITIONS SHALL BE BY OTHERS.

FAN

MODELS PUZ(Y)–A12/18/24/30NH/KA7 SHALL BE FURNISHED WITH A SINGLE DC FAN MOTOR.

THE FAN BLADE(S) SHALL BE OF AERODYNAMIC DESIGN FOR QUIET OPERATION, AND THE FAN MOTOR BEARINGS SHALL BE PERMANENTLY LUBRICATED.

THE OUTDOOR UNIT SHALL HAVE HORIZONTAL DISCHARGE AIRFLOW. THE FAN SHALL BE MOUNTED IN FRONT OF THE COIL, PULLING AIR ACROSS IT FROM THE REAR AND DISPELLING IT THROUGH THE FRONT. THE FAN SHALL BE PROVIDED WITH A RAISED GUARD TO PREVENT EXTERNAL CONTACT WITH MOVING PARTS.

COIL

THE L SHAPED CONDENSER COIL SHALL BE OF COPPER TUBING WITH FLAT ALUMINUM FINS TO REDUCE DEBRIS BUILD UP AND ALLOW MAXIMUM AIRFLOW. THE COIL SHALL BE PROTECTED WITH AN INTEGRAL METAL GUARD.

REFRIGERANT FLOW FROM THE CONDENSER SHALL BE CONTROLLED BY MEANS OF AN ELECTRONIC LINEAR EXPANSION VALVE (LEV) METERING DEVICE. THE LEV SHALL BE CONTROL BY A MICROPROCESSOR CONTROLLED STEP MOTOR.

ALL REFRIGERANT LINES BETWEEN OUTDOOR AND INDOOR UNITS SHALL BE OF ANNEALED, REFRIGERATION GRADE COPPER TUBING, ACR TYPE, MEETING ASTM B280 REQUIREMENTS, INDIVIDUALLY INSULATED IN TWIN–TUBE, FLEXIBLE, CLOSED–CELL, CFC–FREE (OZONE DEPLETION POTENTIAL OF ZERO), ELASTOMERIC MATERIAL FOR THE INSULATION OF REFRIGERANT PIPES AND TUBES WITH THERMAL CONDUCTIVITY EQUAL TO OR BETTER THAN 0.27 BTU–INCH/HOUR PER SQ FT / °F, A WATER VAPOR TRANSMISSION EQUAL TO OR BETTER THAN 0.08 PERM–INCH AND SUPERIOR FIRE RATINGS SUCH THAT INSULATION WILL NOT CONTRIBUTE SIGNIFICANTLY TO FIRE AND UP TO 1" THICK INSULATION SHALL HAVE A – FLAME–SPREAD INDEX OF LESS THAN 25 AND A SMOKE–DEVELOPMENT INDEX OF LESS THAN 50 AS TESTED BY ASTM E 84 AND CAN / ULC S–102.

COMPRESSOR

THE COMPRESSOR FOR MODELS PUZ(Y)–A12/18/24/30/36/42NH/KA7 SHALL BE A DC TWIN–ROTOR ROTARY COMPRESSOR WITH VARIABLE SPEED INVERTER DRIVE TECHNOLOGY.

POWER FOR THE INDOOR UNIT SHALL BE SUPPLIED FROM THE OUTDOOR UNIT VIA MITSUBISHI ELECTRIC A–CONTROL USING THREE (3) FOURTEEN (14/16) GAUGE AWG CONDUCTORS PLUS GROUND WIRE CONNECTING THE UNITS.

THE OUTDOOR UNIT SHALL BE CONTROLLED BY THE MICROPROCESSOR LOCATED IN THE INDOOR UNIT.
THE CONTROL SIGNAL BETWEEN THE INDOOR UNIT AND THE OUTDOOR UNIT SHALL BE PULSE SIGNAL 24 VOLTS DC.

THE UNIT SHALL HAVE PULSE AMPLITUDE MODULATION CIRCUIT TO UTILIZE 98% OF INPUT POWER SUPPLY.

UNIT SHALL BE ABLE TO PROVIDE 100% COOLING CAPACITY WHEN OPERATING AT PUZ: 0°F (–18°C)* / PUY: –20°F OUTDOOR AIR TEMPERATURE WHEN A WIND BAFFLE IS USED.

SPECIFICATION–INDOOR UNIT (MITSUBISHI–PKA–A12HA7)

GENERAL:
THE WALL–MOUNTED INDOOR UNIT SHALL BE FACTORY ASSEMBLED, WIRED AND RUN TESTED. CONTAINED WITHIN THE UNIT SHALL BE ALL FACTORY WIRING, PIPING, CONTROL CIRCUIT BOARD AND FAN MOTOR. THE UNIT SHALL HAVE A SELF–DIAGNOSTIC FUNCTION, 3–MINUTE TIME DELAY MECHANISM, AN AUTO RESTART FUNCTION, AND A TEST RUN SWITCH. INDOOR UNIT AND REFRIGERANT PIPES SHALL BE CHARGED WITH DEHYDRATED AIR BEFORE SHIPMENT FROM THE FACTORY.

CABINET:
ALL CASINGS, REGARDLESS OF MODEL SIZE, SHALL HAVE THE SAME WHITE FINISH

MULTI DIRECTIONAL DRAIN AND REFRIGERANT PIPING OFFERING FOUR (4) DIRECTIONS FOR REFRIGERANT PIPING AND TWO (2) DIRECTIONS FOR DRAINING ARE REQUIRED.

THERE SHALL BE A SEPARATE BACK PLATE WHICH SECURES THE UNIT FIRMLY TO THE WALL.

FAN:
THE INDOOR FAN SHALL BE STATICALLY AND DYNAMICALLY BALANCED TO RUN ON A SINGLE MOTOR WITH PERMANENTLY LUBRICATED BEARINGS.

A MANUAL ADJUSTABLE GUIDE VANE SHALL BE PROVIDED WITH THE ABILITY TO CHANGE THE AIRFLOW FROM SIDE TO SIDE (LEFT TO RIGHT).

A MOTORIZED AIR SWEEP LOUVER SHALL PROVIDE AN AUTOMATIC CHANGE IN AIRFLOW BY DIRECTING THE AIR UP AND DOWN TO PROVIDE UNIFORM AIR DISTRIBUTION.

FILTER:
RETURN AIR SHALL BE FILTERED BY MEANS OF AN EASILY REMOVABLE, WASHABLE FILTER.
PROVIDE MERV–8 FILTER.

COIL:
THE INDOOR COIL SHALL BE OF NONFERROUS CONSTRUCTION WITH SMOOTH PLATE FINS ON COPPER TUBING. THE TUBING SHALL HAVE INNER GROOVES FOR HIGH EFFICIENCY HEAT EXCHANGE. ALL TUBE JOINTS SHALL BE BRAZED WITH PHOS–COPPER OR SILVER ALLOY.

THE COILS SHALL BE PRESSURE TESTED AT THE FACTORY.

ELECTRICAL:
THE ELECTRICAL POWER OF THE UNIT SHALL BE 208 VOLTS OR 230 VOLTS, 1 PHASE, 60 HERTZ. THE SYSTEM SHALL BE CAPABLE OF SATISFACTORY OPERATION WITHIN VOLTAGE LIMITS OF 198 VOLTS TO 253 VOLTS. THE POWER TO THE INDOOR UNIT SHALL BE SUPPLIED FROM THE OUTDOOR UNIT, USING THE MITSUBISHI ELECTRIC A–CONTROL SYSTEM. FOR A–CONTROL, A THREE (3) CONDUCTOR AWG–14/16 WIRE WITH GROUND SHALL PROVIDE POWER FEED AND BI–DIRECTIONAL CONTROL TRANSMISSION BETWEEN THE OUTDOOR AND INDOOR UNITS.

SEQUENCE OF OPERATIONS

1) FIRE DAMPER:

WHEN TEMPERATURES IN EXCESS OF 165°F (212°F, 250°F OR 350°F OPTIONAL) ARE DETECTED, THE DAMPER WILL CLOSE AND LOCK. AT NO TIME SHALL THE DAMPER BE DISENGAGED FROM THE ACTUATOR. UPON CESSATION OF THE FIRE CONDITIONS, THE DAMPER CAN BE REOPENED BY PRESSING THE RESET BUTTON LOCATED ON THE DAMPER ASSEMBLY.

2) FANS: TURNED ON OR OFF THROUGH ON–OFF SWITCH AND SHALL OPERATE CONTINUOUSLY. WHERE THERE ARE DAMPERS (MOTORIZED) IN THE DUCTWORK SYSTEM SERVED BY THE FAN, THEY SHALL BE INTERLOCKED WITH THE FAN TO OPEN WHEN THE FAN IS OPERATING ONLY.

a. TRANSFER FANS: FANS SHALL BE CONTROLLED BY A LOCAL WALL MOUNTED SWITCH.

b. OUTSIDE AIR FANS: FANS SHALL BE INTERCONNECTED WITH AC UNITS SERVED. FANS SHALL RUN WHENEVER EITHER BUILDING AIR HANDLER IS OPERATIONAL.

c. OUTSIDE AIR FANS SHALL BE INTERCONNECTED TO THEIR RESPECTIVE OUTSIDE AIR MOTORIZED DAMPER SO THAT THE DAMPER OPENS WHENEVER THE OA FAN IS OPERATING. OA FAN SHALL START RUNNING AFTER DAMPER IS PROOFED OPEN.

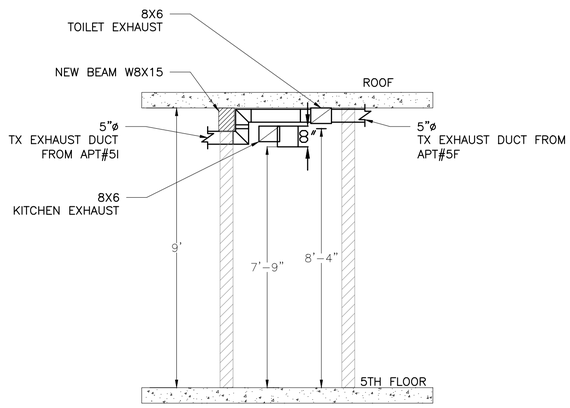
BACKDRAFT DAMPER SPECIFICATION

CONSTRUCTION:

1. FRAME:
   - DAMPER FRAME SHALL BE 14 GA. GALVANIZED STEEL (OPTIONAL: 304 STAINLESS STEEL OR 316 STAINLESS STEEL) FORMED INTO A 8" X 2" CHANNEL WITH 2 INCH FLANGE.
   - DAMPER FRAME SHALL BE 12 GA. GALVANIZED STEEL (OPTIONAL: 304 STAINLESS STEEL OR 316 STAINLESS STEEL) FORMED INTO A 8" X 2" CHANNEL WITH 2 INCH FLANGE.
   - SPARK B OR C (STANDARD CONSTRUCTION): DAMPER FRAME SHALL BE A MINIMUM OF 14 GA. THICK GALVANIZED STEEL (OPTIONAL: 304 STAINLESS STEEL OR 316 STAINLESS STEEL) FORMED INTO A 8" X 2" CHANNEL WITH 2 INCH FLANGE.

δ. • SPARK A (OPTIONAL CONSTRUCTION): DAMPER FRAME SHALL BE A MINIMUM 1/8 INCH THICK ALUMINUM FORMED INTO A 8" X 2" FORMED CHANNEL WITH 2 INCH FLANGE.

2. BLADES:
   - DAMPER BLADES SHALL BE A MINIMUM 0.070 INCH THICK ALUMINUM STRENGTHENED BY LONGITUDINAL VEE GROOVES RUNNING THE ENTIRE LENGTH OF EACH BLADE. BLADE ORIENTATION IS HORIZONTAL.
   - DAMPER BLADES SHALL BE 16 GA. THICK GALVANIZED STEEL STRENGTHENED BY LONGITUDINAL VEE GROOVES RUNNING THE ENTIRE LENGTH OF EACH BLADE (OPTIONAL: 304 OR 316 STAINLESS STEEL). BLADE ORIENTATION IS HORIZONTAL.
   - DAMPER BLADES SHALL BE 18 GA. THICK GALVANIZED STEEL AIRFOIL SHAPED (OPTIONAL: STAINLESS STEEL). BLADE ORIENTATION IS HORIZONTAL.
   - DAMPER BLADES SHALL BE EXTRUDED ALUMINUM AIRFOIL SHAPED. BLADE ORIENTATION IS HORIZONTAL.
   - DAMPER BLADES SHALL BE 16 GA. THICK GALVANIZED STEEL AIRFOIL SHAPED (OPTIONAL: STAINLESS STEEL). BLADE ORIENTATION IS HORIZONTAL.
3. BLADE STOPS:
   - EACH BLADE STOP (AT TOP AND BOTTOM OF DAMPER FRAME) SHALL OCCUPY NO MORE THAN ½" OF THE DAMPER OPENING AREA TO ALLOW FOR MAXIMUM FREE AREA AND TO MINIMIZE PRESSURE LOSS ACROSS THE DAMPER.
4. SEALS:
   a. BLADE EDGE: VINYL IS STANDARD. NONE IS OPTIONAL. TPE IS STANDARD. NONE IS OPTIONAL. SILICONE IS STANDARD. EPDM OR NONE IS OPTIONAL.
   b. JAMB: NONE IS STANDARD.
5. LINKAGE: EXTERNAL, HEAVY DUTY TYPE WITH STEEL CLEVIS ARMS AND PLATED STEEL TIE BARS AND PIVOT PINS WITH NYLON PIVOT BEARINGS. STAINLESS STEEL IS AVAILABLE AS AN OPTION.



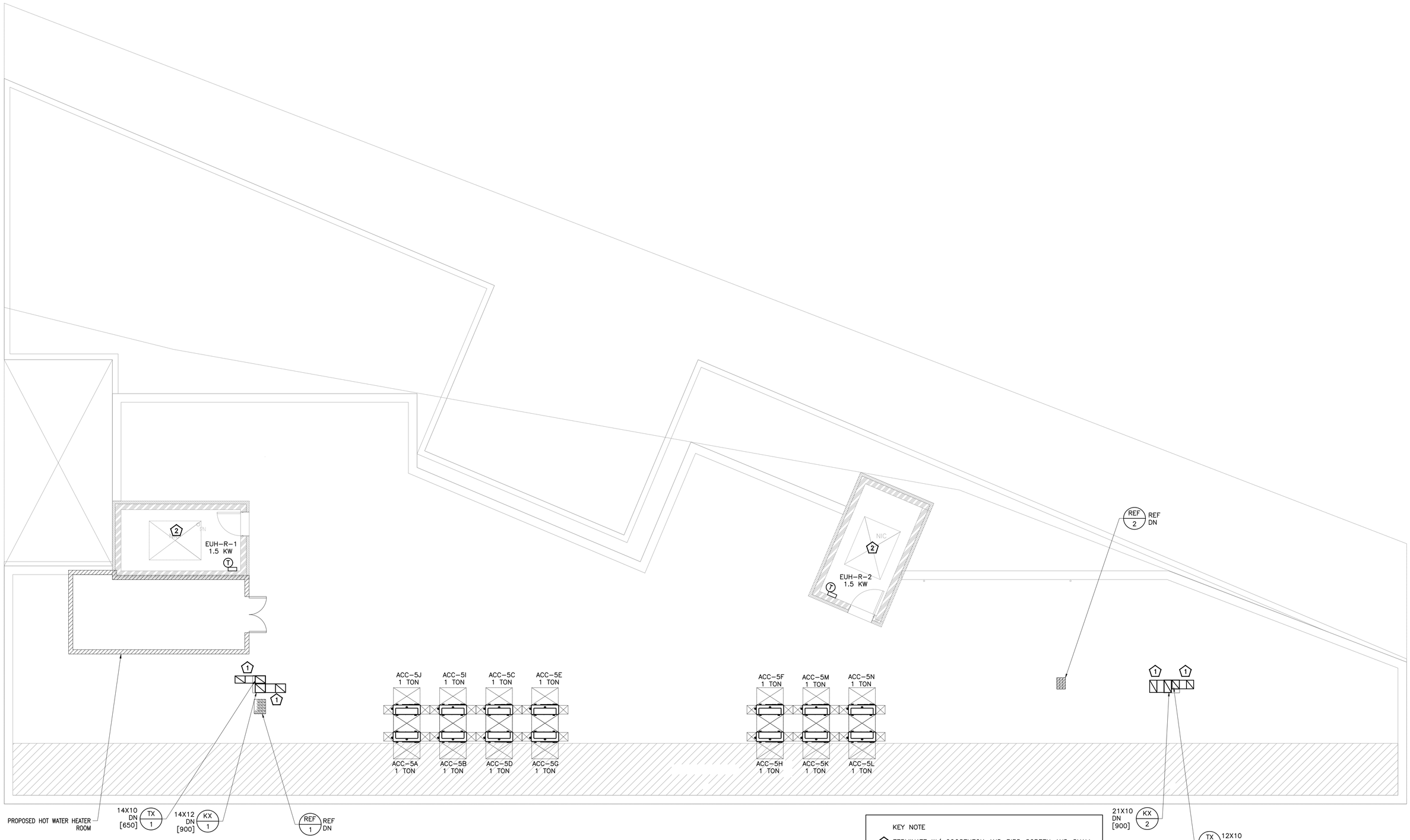
2 CORRIDOR SECTION
SCALE: 3/8" = 1'-0"

GENERAL NOTES

1. KITCHENETTE IS NATURALLY VENTILATED.
2. CORRIDOR IS NATURALLY VENTILATED.
3. ¾" CD TO CONNECT UNDER LAVATORY/SINK W/ AIR GAP FITTING. COORDINATE WITH PLUMBING DRAWING.
4. MD TO INTERLOCK W/ RESPECTIVE TX/KX FANS.

NOTES:
1. BOTTOM OF ALL EQUIPMENTS ARE SHOWN CONSIDERING ALL CLEARANCES.
2. OUTDOOR AIR INTAKE, EXHAUST OPENINGS, STAIRWAY AND SHAFT VENTS 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 AND SHALL BE LABELED BY AN APPROVED AGENCY WHEN TESTED IN ACCORDANCE WITH AMCA 500D.

1 5TH FLOOR MECHANICAL PLAN
SCALE: 3/16" = 1'-0"



KEY NOTE

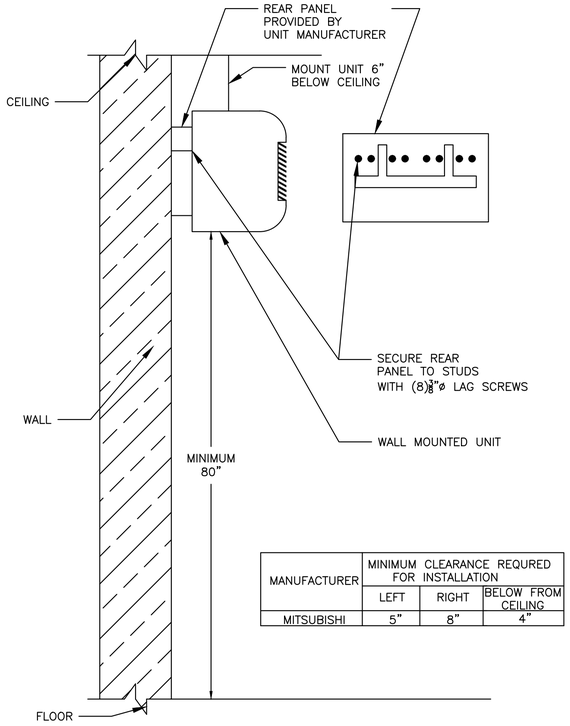
1. TERMINATE W/ GOOSENECK AND BIRD SCREEN AND SHALL TERMINATE 10 FEET AWAY FROM ANY OUTDOOR INTAKE,3 FEET FROM THE LOT LINE & 36" ABOVE ROOF LEVEL.
2. PURSUANT TO BC 708.12.1 , ARCHITECT TO PROVIDE WINDOW OR SKYLIGHT AS A SMOKE VENT WITH MINIMUM NET EFFECTIVE AREA OF 3.5 SQUARE FEET".

NOTES:

1. AIR CONDITIONER UNIT SHALL NOT PRODUCE NOISE LEVELS IN EXCESS OF 42 DECIBELS FOR A SINGLE AIR CIRCULATING DEVICE AND 45 DECIBELS FOR THE CUMULATIVE NOISE LEVEL OF MULTIPLE AIR CIRCULATING DEVICES AS MEASURED 3 FEET FROM THE NOISE SOURCE AT AN OPEN DOOR OR WINDOW OF A NEARBY RESIDENCE.
2. PROVIDE WEATHER PROOF COATING FOR ALL EXTERIOR DUCTWORK AND PIPING INSULATION.

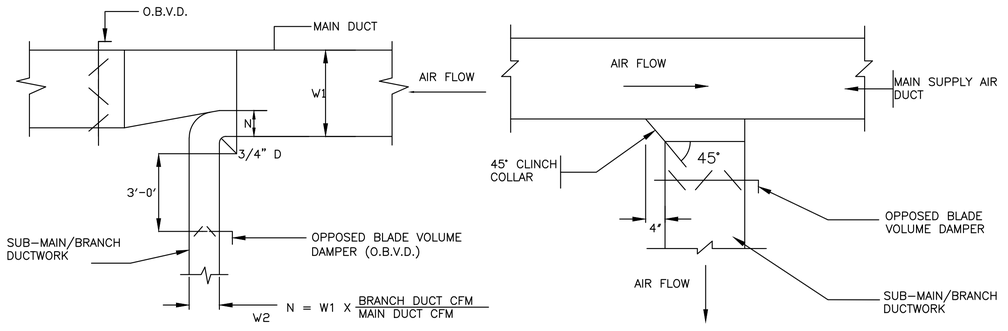
1 ROOF MECHANICAL PLAN

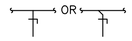
SCALE: 3/16" = 1'-0"



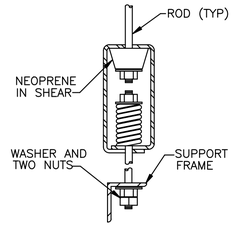
MANUFACTURER	MINIMUM CLEARANCE REQURED FOR INSTALLATION		
	LEFT	RIGHT	BELOW FROM CEILING
MITSUBISHI	5"	8"	4"

1 / M-501 WALL MOUNTED UNIT DETAIL
N.T.S

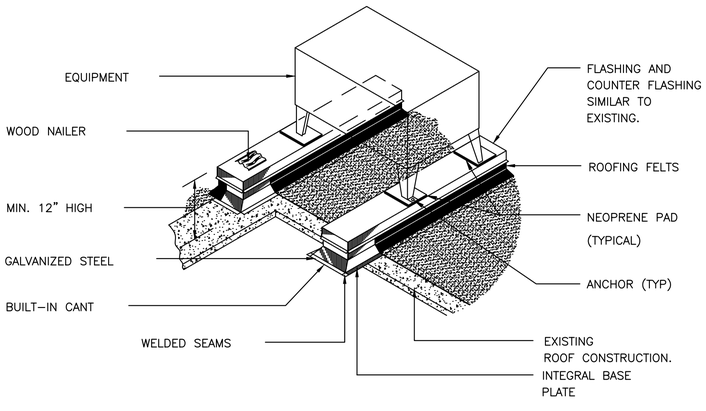


NOTE:
FURNISH THIS TYPE CONNECTION WHEN SINGLE LINE DUCTWORK IS INDICATED AS THIS  OR

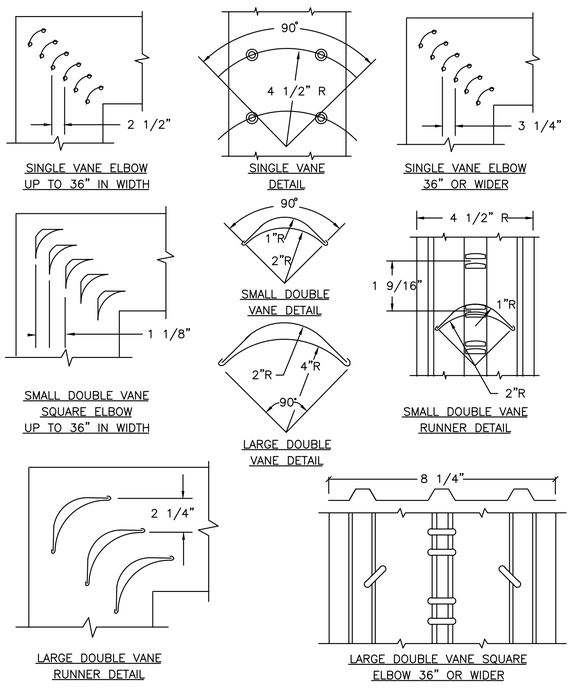
2 / M-501 SUPPLY AIR DUCTWORK SUB-MAIN/BRANCH DUCT CONNECTION
N.T.S



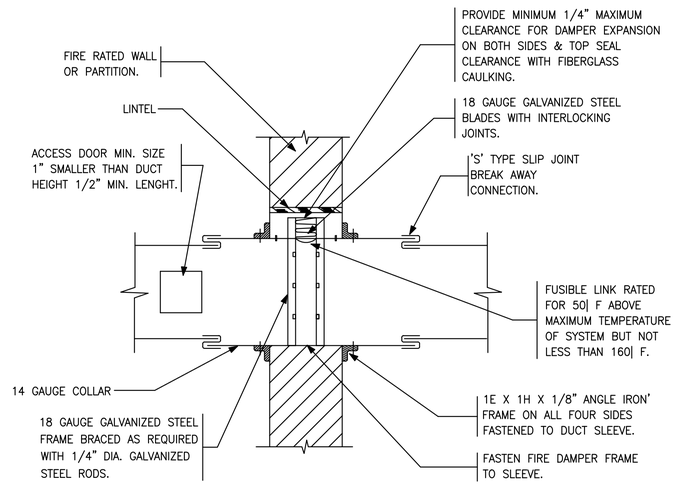
3 / M-501 VIBRATOR ISOLATION DETAIL
N.T.S



4 / M-501 EQUIPMENT RAILS ROOF SUPPORT DETAIL
N.T.S



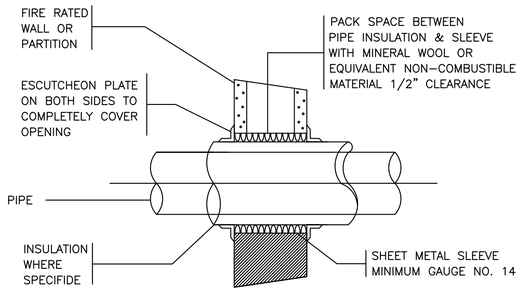
5 / M-501 LOW VELOCITY DUCTWORK ELBOWS
N.T.S



NOTE:
MAXIMUM PRESSURE DROP ACROSS DAMPER SHALL BE 0.1" W.G.

VERTICAL MOUNT

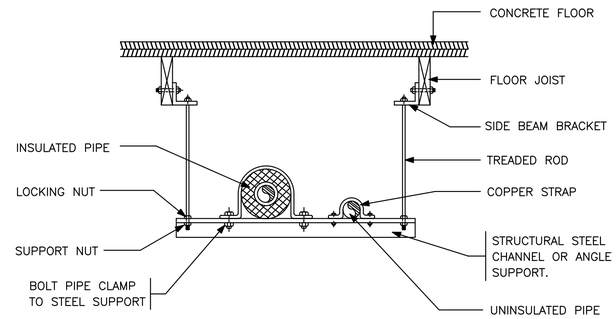
6 / M-501 SHUTTER TYPE FIRE DAMPER
N.T.S



NOTE:

1.) THE INSTALLATION OF FIRE STOPPING MATERIALS SHALL BE SUBJECT TO CONTROLLED INSPECTION IN ACCORDANCE WITH C26-106.3.

1 / M-502 PIPE SLEEVE THRU RATED WALL
N.T.S



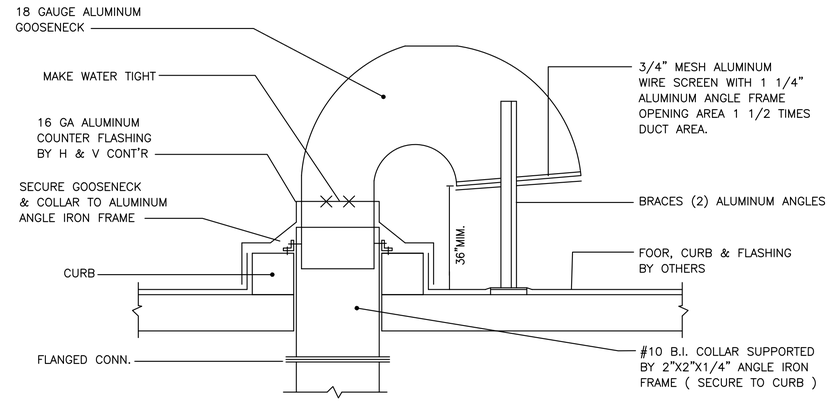
TYPICAL TRAPEZE HANGER SUPPORT

PIPE HANGER ROD AND SPACING SCHEDULE

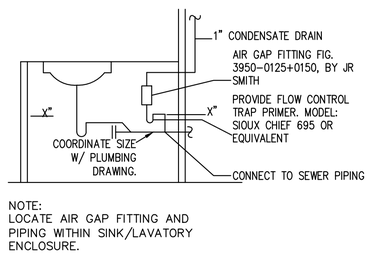
NOMINAL PIPE OR TUBE SIZE – INCHES	5/8	3/4	7/8	1	1 1/2	2	2 1/2	–	–	–	–	–
HANGER ROD SIZES INCHES	3/8	3/8	3/8	3/8	3/8	3/8	3/8	–	–	–	–	–
MAX. SPACING BETWEEN PIPE SUPPORTS – FEET	–	6	–	7	9	10	11	–	–	–	–	–
MAX. SPACING BETWEEN CU. TUBE SUPPORTS–FT.	6	6	6	6	8	9	10	–	–	–	–	–

NOTES : TRAPEZE HANGER SPACING SHALL BE BASED ON SPACING OF SMALLEST PIPE ON TRAPEZE. TRAPEZE SHALL BE DESIGNED WITH A FACTOR OF SAFETY OF 5 FOR CENTER OF SPAN CONCENTRATED LOAD.

2 / M-502 METHOD OF HANGING REFRIGERANT PIPING
N.T.S

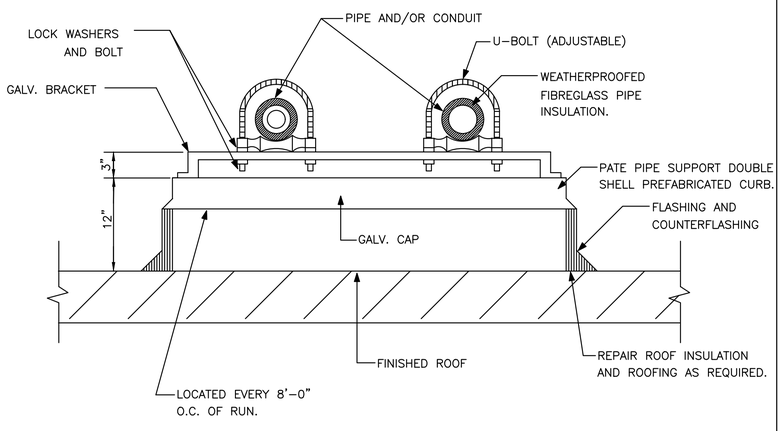


3 / M-502 TYPICAL DETAIL OF ROOF GOOSENECK
N.T.S

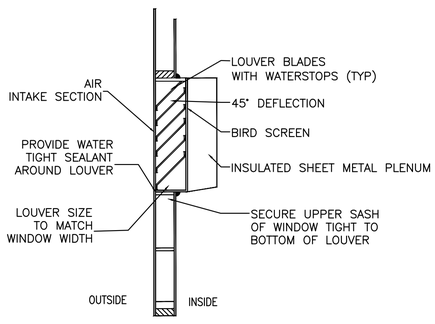


NOTE:
LOCATE AIR GAP FITTING AND PIPING WITHIN SINK/LAVATORY ENCLOSURE.

4 / M-502 AIR GAP FITTING DETAIL
N.T.S

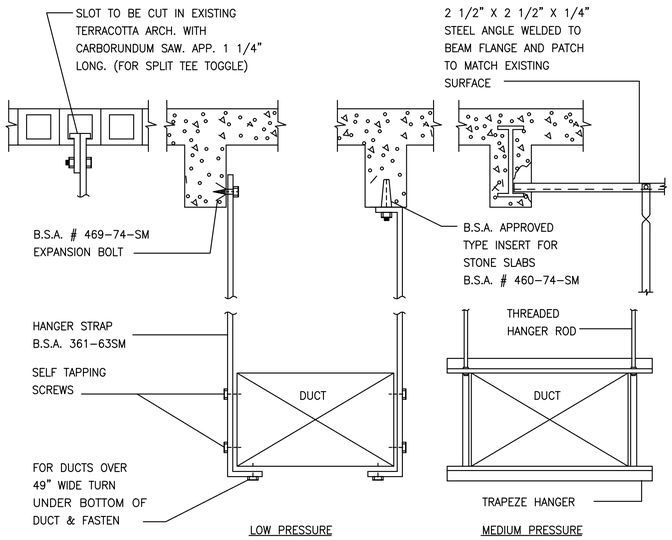


5 / M-502 DETAIL OF PIPE SUPPORT DETAIL ON ROOF
N.T.S



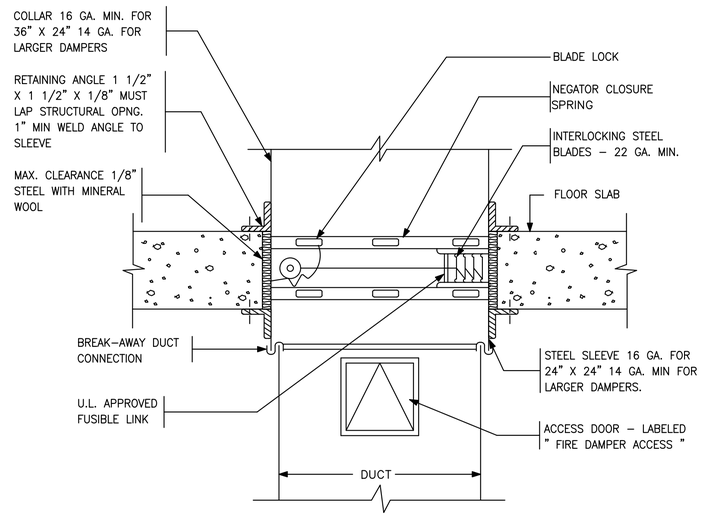
INTAKE LOUVER

6 / M-502 LOUVER DETAIL
N.T.S



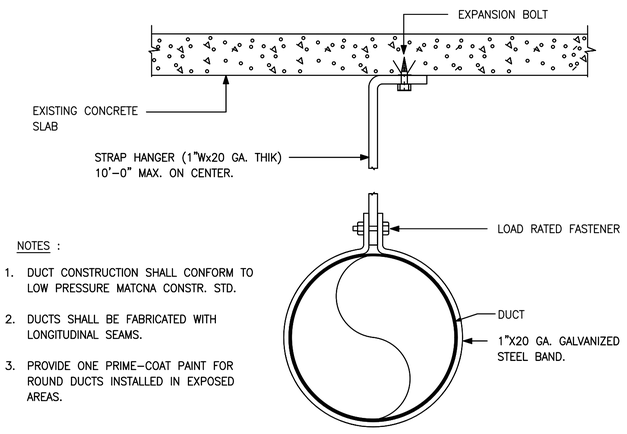
NOTE:
DISTANDE BETWEEN DUCTS HANGERS SHALL BE IN ACCORDANCE WITH RS-13-1 OF NYC BLDG. CODE.

1 / M-503 METHOD OF HANGING DUCTWORK
N.T.S



NOTE:
MAXIMUM PRESSURE DROP ACROSS DAMPER SHALL BE 0.1" W.G.

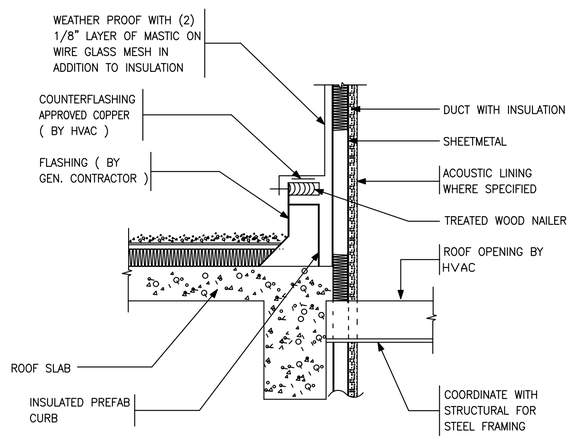
2 / M-503 HORIZONTAL FIRE DAMPER DETAIL
N.T.S



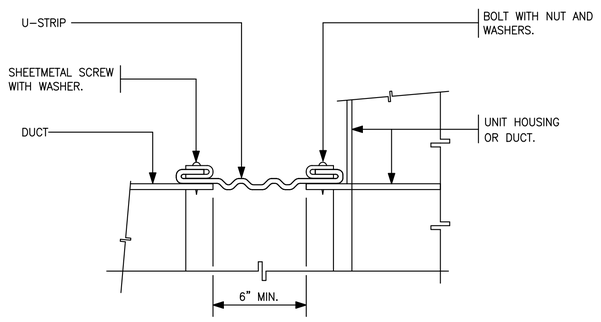
NOTES :

1. DUCT CONSTRUCTION SHALL CONFORM TO LOW PRESSURE MATCNA CONSTR. STD.
2. DUCTS SHALL BE FABRICATED WITH LONGITUDINAL SEAMS.
3. PROVIDE ONE PRIME-COAT PAINT FOR ROUND DUCTS INSTALLED IN EXPOSED AREAS.

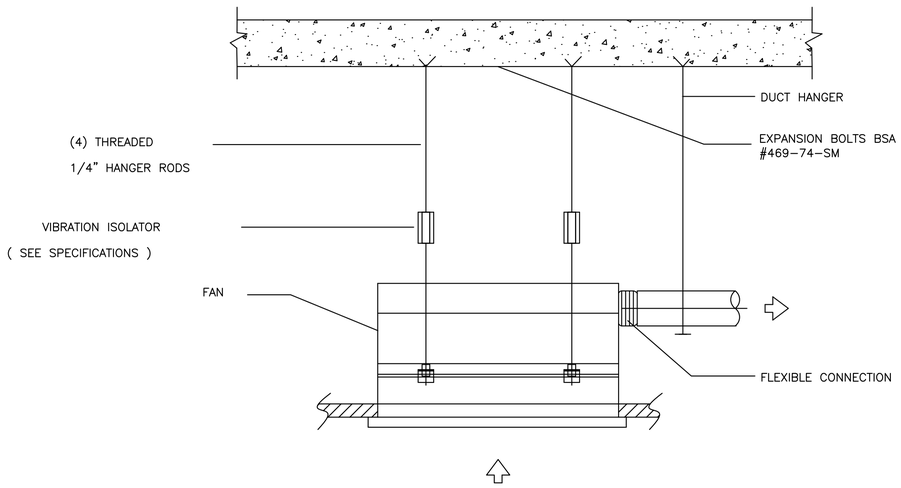
3 / M-503 METHOD OF HANGING DUCTWORK
N.T.S



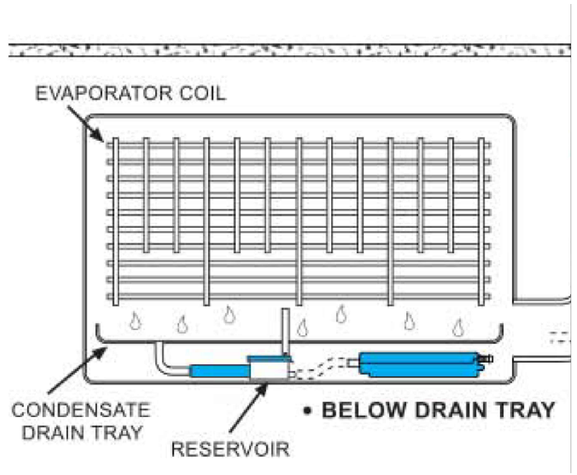
4 / M-503 DUCT PENETRATION THRU CONCRETE ROOF
N.T.S



5 / M-503 FLEXIBLE CONNECTION (DUCT-EQUIPMENT)
N.T.S



1 M-504 CEILING FAN HANGING SUPPORT DETAIL N.T.S



2 M-504 CONDENSATE PUMP INSIDE CASING DETAIL N.T.S

ACC — SPLIT SYSTEM OUTDOOR UNITS SCHEDULE

BASIS OF DESIGN: MITSUBISHI

UNIT NAME	LOCATION	QUANTITY	COMPRESSOR TYPE	V/PH	MAX. BREAKER AMPS	DIMENSIONS (HxWxD)	SOUND RATING	WEIGHT (LBS)	INDOOR MODEL NUMBER	TOTAL COOLING (MBH)	TOTAL HEATING (MBH)	SEER/EER	HSPF	COP	SERVED SYSTEM MODEL NUMBER
ACC-5A TO 5N	ROOF	SEE PLAN	INVERTER DRIVEN TWIN ROTARY	208-230/1	15	24X32X14	46	93	PKA-A12HA7	12	11.1	20.80/12.00	10.20	2.64	PUZ-A12NKA7

NOTES:
1. UNIT SHALL HAVE TEN YEAR EXTENDED WARRANTY FOR COMPRESSORS/PARTS.
2. PROVIDE LOW AMBIENT CONTROL FOR CONDENSING UNIT OPERATION DOWN TO -13'F.
3. PROVIDE COMPRESSOR CYCLE PROTECTOR.
4. PROVIDE STEEL RAILS FOR CONDENSER MOUNTING.
5. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEED THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
6. AIR CONDITIONER UNIT SHALL NOT PRODUCE NOISE LEVELS IN EXCESS OF 42 DECIBELS FOR A SINGLE AIR CIRCULATING DEVICE AND 45 DECIBELS FOR THE CUMULATIVE NOISE LEVEL OF MULTIPLE AIR CIRCULATING DEVICES AS MEASURED 3 FEET FROM THE NOISE SOURCE AT AN OPEN DOOR OR WINDOW OF A NEARBY RESIDENCE.

AC — SPLIT SYSTEM INDOOR UNITS SCHEDULE

BASIS OF DESIGN: MITSUBISHI

UNIT NAME	LOCATION	AREA SERVED	QUANTITY	TYPE	TON(TR)	SUPPLY FAN DATA	SOUND PRESS. LEVEL UNIT (dBA)	DIMENSIONS (HxWxD)	PIPE SIZE			WEIGHT (LBS.)	MODEL NO.
						TOTAL CFM			LIQUID (IN.)	SUCTION (IN.)	DRAIN (IN.)		
AC-5A TO 5N	SEE PLAN	SEE PLAN	SEE PLAN	WALL MOUNTED	1	320	36	12X36X9	1/4	1/2	5/8	113	PKA-A12HA7

NOTES:
1. REFRIGERANT R410A SHALL BE PROVIDED.
2. SUPPLY AIR CFM BASED ON HIGH SPEED.
3. PROVIDE MOUNTING BRACKETS AND ALL ASSOCIATED ACCESSORIES.
4. ALL REFRIGERANT PIPING TO BE SIZED PER MANUFACTURERS RECOMMENDATIONS.
5. SEE FLOOR PLAN FOR QUANTITIES.
6. CONTRACTOR SHALL PROVIDE A LONG LINE SET FOR REFRIGERANT PIPING IN THE EVENT THAT TOTAL REFRIGERANT LENGTH EXCEEDS THE MANUFACTURER'S STANDARD RECOMMENDED LENGTH.
7. PROVIDE CONDENSATE PUMP W/4" WG LIFT MIN.(MODEL:ASP-MA-UNI).

FAN SCHEDULES

BASIS OF DESIGN: GREENHECK

MARK	TYPE	QTY	SERVICE	MODEL	CFM	SP (IN W.G.)	ELEC. V/~/ø	MOTOR SIZE NEMA (W)	FLA (A)	FAN SPEED (RPM)	WEIGHT LBS	INLET dBA (dB)	UNIT DIMENSIONS (EACH MODULE) WXHXD (IN)
TXF	CEILING MOUNTED	SEE PLAN	SEE PLAN	SP-A50-90-VG	50	0.75	115/60/1	12	0.29	808	12	-	15X9X13
KXF	CEILING MOUNTED	SEE PLAN	SEE PLAN	SP-B150	100	0.75	115/60/1	128	1.7	1050	10	-	16X10X13

NOTES:
1) PROVIDE WALL SWITCH AND COORDINATE HEIGHT WITH THE OWNER AND ARCHITECT.
2) ALL DIRECT DRIVE FANS SHALL BE FURNISHED WITH VARI-GREEN MOTOR CONTROL.
3) PROVIDE MOTOR FAN STARTERS.
4) PROVIDE RUBBER IN SHEAR ISOLATION AND ALL-THREAD HANGING RODS FOR INLINE FANS.
5) COORDINATE WITH ARCH./G.C. ACCESS DOORS FPR SERVICING ALL FANS WITHIN CEILINGS.
6) PROVIDE GRILLE TO THE KXF & TXF FANS.
7) SEE FLOOR PLAN FOR QUANTITIES.
8) PROVIDE ALL CONTROLS REQUIRED FOR PROPER OPERATION OF MOTORIZED DAMPER. W/ RESPECT TO KXF/TXF FANS.

EBH ELECTRIC BASEBOARD HEATER SCHEDULE

UNIT TAG	LOCATION	LENGTH (FT.)	WATTS OUTPUT	PH/V	MODEL NO.	MAKE
EBH-1	SEE PLAN	2'	400	1/120	2512W	BERKO

NOTES:
1. PROVIDE DISCONNECT SWITCH.
2. "HEATER ON" PILOT LIGHT.
3. THREE-POSITION SELECTOR SWITCH (HEATER-STANDBY-FAN).
4. BUILT-IN THERMOSTAT 40°F TO 100°F RANGE.
5. ALL UNIT HEATERS SHALL BE INSTALLED IN ACCORDANCE WITH THE LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. SEE FLOOR PLAN FOR QUANTITIES.

EUH — ELECTRIC UNIT HEATER SCHEDULE

BASIS OF DESIGN: BERKO

UNIT TAG	SERVING	QTY.	TYPE	CFM	KW	BTU/HR	ELECTRICAL DATA			WEIGHT (LBS.)	DIMENSIONS (WXHXD) (INCHES)	MODEL NO.
							ø	V	AMPS			
EUH-1	SEE PLAN	1	ARCHITECTURAL	100	1.8	6142	1	120	15.0	25	GRILLE: 16X20X2 BLACK BOX: 15X19X4	SSARWH1802
EUH-R-1&2	SEE PLAN	2	FAN FORCED WALL HEATER	65	1.5	5115	1	120	12.5	11	GRILLE: 12X9X1 BLACK BOX: 9X7X4	CZ1512T

NOTES:
1. PROVIDE DISCONNECT SWITCH.
2. "HEATER ON" PILOT LIGHT.
3. THREE-POSITION SELECTOR SWITCH (HEATER-STANDBY-FAN).
4. BUILT-IN THERMOSTAT 40°F TO 100°F RANGE.
5. ALL UNIT HEATERS SHALL BE INSTALLED IN ACCORDANCE WITH THE LISTING AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
6. SEE FLOOR PLAN FOR QUANTITIES.