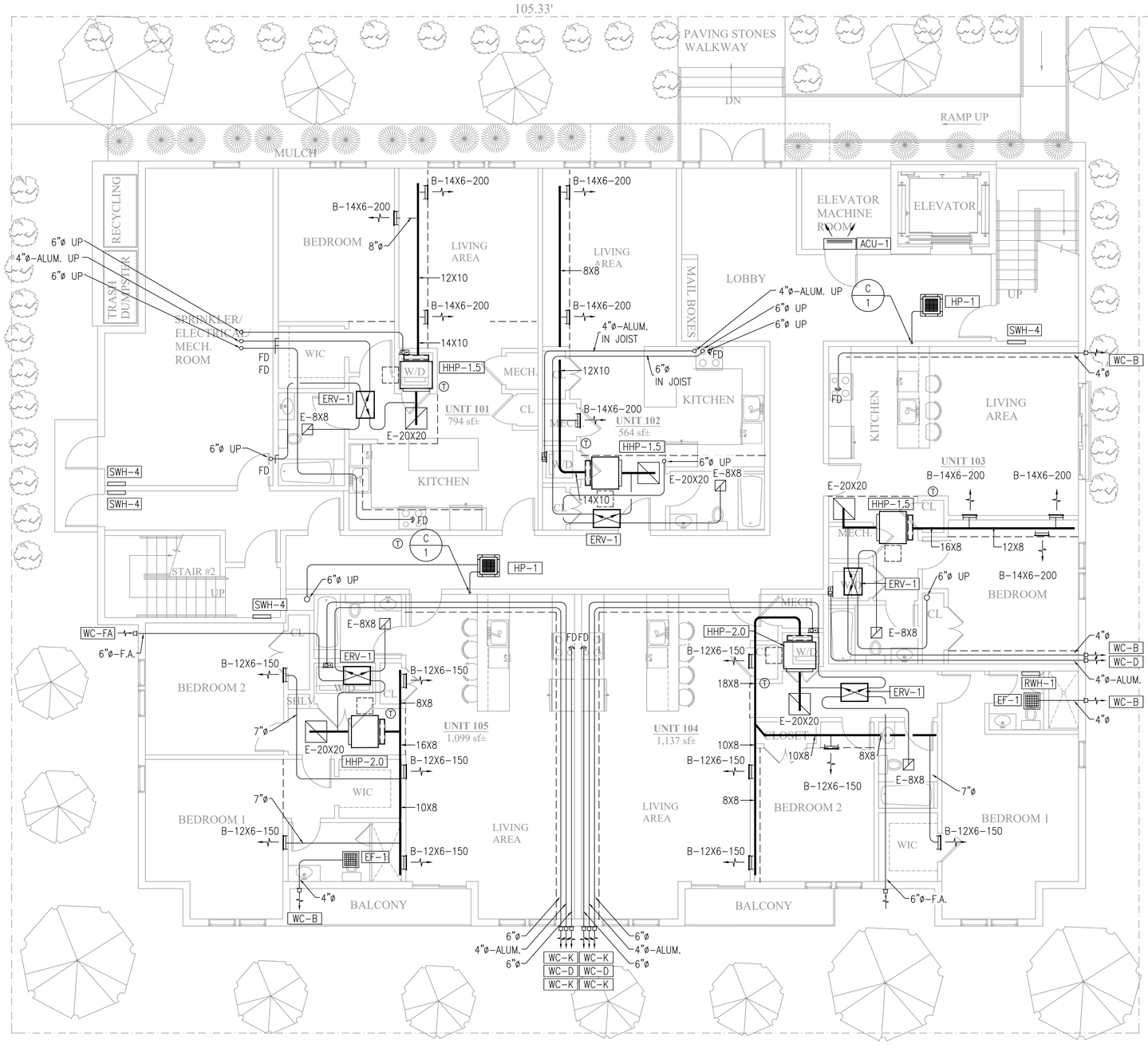

FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"

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COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAD
No. 51899
REGISTERED PROFESSIONAL ENGINEER

Location

PROPOSED RESIDENTIAL BUILDING 17 KENSINGTON AVE SOMERVILLE, MA

No.	Revision Date
	10-10-24

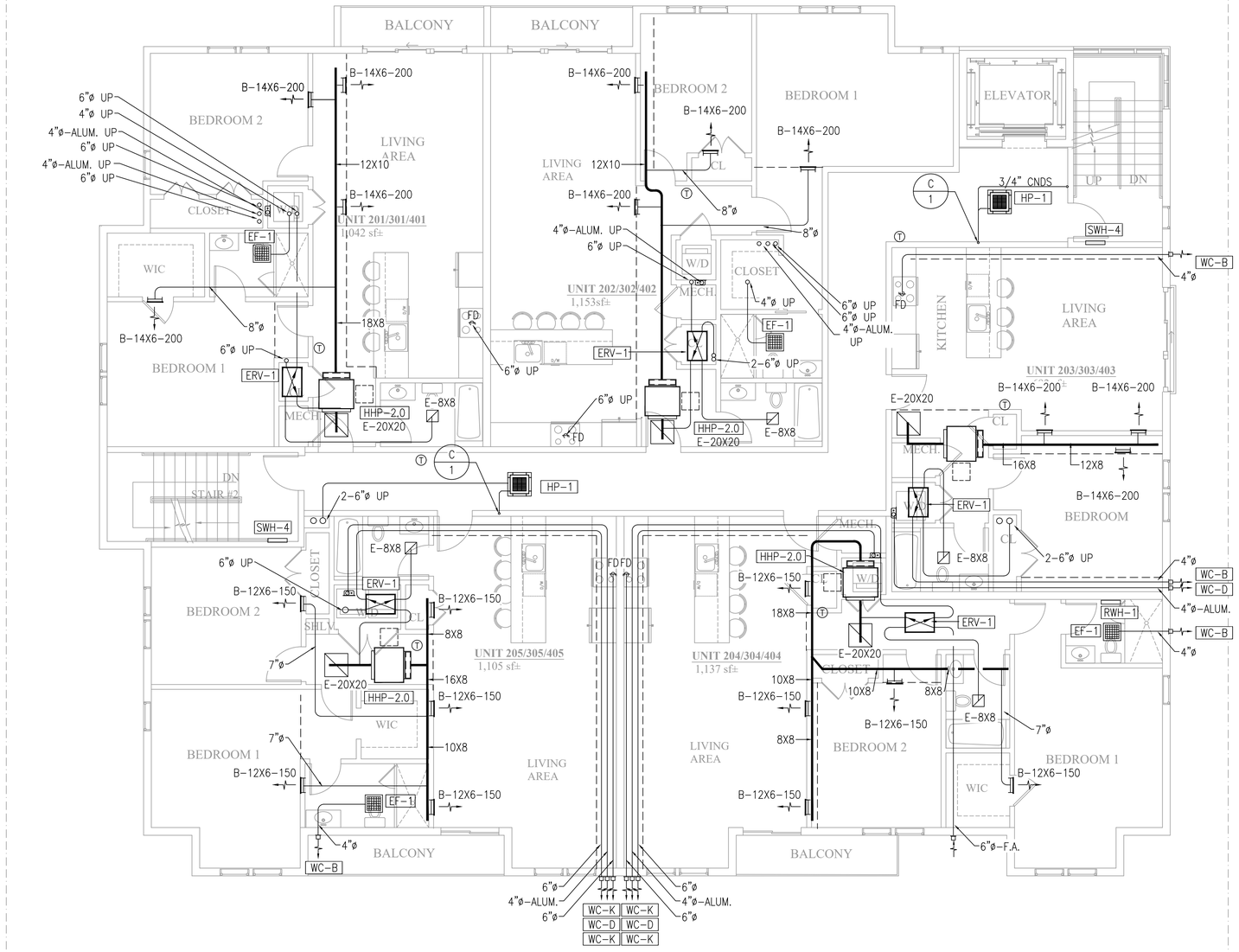
Project No: 2024169
Scale: AS NOTED
Date: 03-04-25
Drawn By: E.A

Drawing Name

FIRST FLOOR HVAC PLAN

Sheet No.

H-1



SECOND TO FOURTH FLOOR PLAN
SCALE: 3/16"=1'-0"

Location

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Drawing Name

SECOND - FOURTH FLOOR HVAC PLAN

Sheet No.

H-2

COMMONWEALTH OF MASSACHUSETTS
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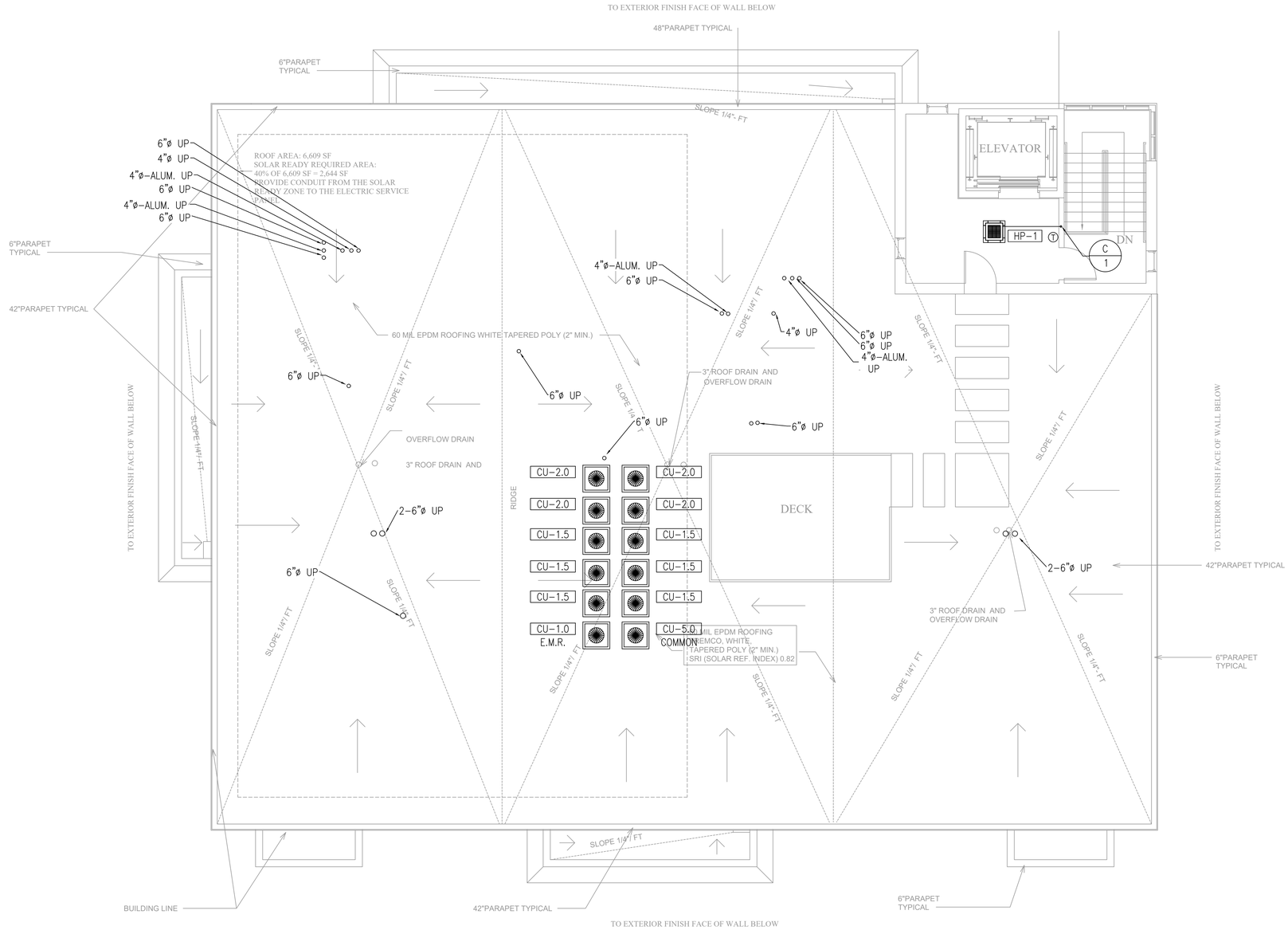

ROOF PLAN
SCALE: 3/16"=1'-0"

Location

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ROOF HVAC PLAN

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAL
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REGISTERED PROFESSIONAL ENGINEER

Sheet No.

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LEGEND

SUPPLY AIR DUCT UP	HOT WATER RETURN PIPE (HWR)
SUPPLY AIR DUCT DOWN	HOT WATER SUPPLY PIPE (HWS)
RETURN AIR DUCT UP	CONDENSATE DRAIN PIPE (D)
RETURN AIR DUCT DOWN	PIPE UP
VOLUME DAMPER	PIPE DOWN
MOTORIZED DAMPER	BALL VALVE
FIRE DAMPER (FD)	GATE VALVE
1" LINED DUCTWORK	CHECK VALVE
SUPPLY AIR REGISTER	STRAINER
RETURN OR EXHAUST AIR REGISTER	UNION
SUPPLY AIR DIFFUSER	3-WAY CONTROL VALVE
	2-WAY CONTROL VALVE
CEILING TRANSFER GRILL	BALANCING VALVE
ACCESS DOOR (AD)	THERMOMETER
SELF BALANCING AIR VALVE (AV)	PRESSURE GAUGE
CEILING FIRE DAMPER (CFD)	FLEXIBLE PIPE CONNECTION

EQUIPMENT TAG NUMBERS

EF-#	EXHAUST FAN
CU-#	CONDENSING UNIT
AC-#	SPLIT SYSTEM AC UNIT
HVAC-#	AIR HANDLER UNIT
UH-#	UNIT HEATER UNIT

E = EXHAUST RISER
# = REFERS TO RISER DIAGRAM

VS = SUPPLY VENTILATION RISER
# = REFERS TO RISER DIAGRAM

VS = RETURN VENTILATION RISER
# = REFERS TO RISER DIAGRAM

R = CONDENSER WATER RISER
# = REFERS TO RISER DIAGRAM

AIR OUTLET + INLET DESIGNATION

EXAMPLE:
TYPE OF GRILLE, DIFFUSER SEE SCHEDULE FOR SPECIFIC INFORMATION ABOUT THIS OUTLET/INLET TYPE — A-6x6-50 — SIZE OF GRILLE, DIFFUSER / AIRFLOW

NOTE:
THIS DESIGNATION FORMAT IS TYPICAL FOR ALL DIFFUSERS, GRILLES, AND REGISTERS, LAY-IN OR SURFACE MOUNTED, FOR SUPPLY, RETURN OR EXH.

EQUIPMENT SYMBOLS

- ROOFTOP UNIT
- ROOFTOP UPBLAST EXHAUST FAN
- EXHAUST CONTROL VALVE
- ROOFTOP UPBLAST EXHAUST FAN
- CONSTANT AIRFLOW REGULATOR DEVICE
- FIRE AND SMOKE DAMPER
- VOLUME DAMPERS (VD)
- CABINET UNIT HEATER IN CEILING
- HORIZONTAL HVAC UNIT
- VERTICAL HVAC UNIT
- ROOF MOUNTED CONDENSING UNIT

CONTROL SYMBOLS

- (T) (TS) WALL MOUNTED THERMOSTAT/SENSOR
- (H) (HS) HUMIDISTAT/SENSOR
- LP LOCAL CONTROL PANEL

GENERAL NOTES

1. PROVIDE ALL LABOR, MATERIALS AND EQUIPMENT NECESSARY TO EXECUTE THE WORK SHOWN AND DESCRIBED. INSTALLATION OF MATERIALS SHALL MEET ALL APPLICABLE STATE, FEDERAL AND MUNICIPAL REQUIREMENTS.
2. OBTAIN PERMITS AND PAY ALL FEES FOR WORK AND REQUIRED INSPECTIONS.
3. MAINTAIN LIABILITY INSURANCE TO PROTECT OWNER AND THE CONTRACTOR FROM ANY AND ALL CLAIMS UNDER THE WORKER'S COMPENSATION ACT.
4. THE DRAWINGS SHALL CONSIDERED DIAGRAMMATIC ONLY. ALL MEASUREMENTS SHALL BE TAKEN FROM BUILDING SITE AND ARCHITECT'S DRAWINGS.
5. PROVIDE TEMPORARY MATERIAL STORAGE AS REQUIRED AND BE RESPONSIBLE FOR ANY LOSS OR DAMAGE THERETO.
6. SUBMIT DIGITAL COPIES OF SHOP DRAWINGS FOR REVIEW COVERING MAJOR MANUFACTURED ITEMS, IE. AIR HANDLING UNITS, REGISTERS & DIFFUSERS, WIRING DIAGRAMS, ETC.
7. KEEP ACCURATE RECORD OF "AS-BUILT" DRAWINGS AND SUBMIT THESE BEFORE FINAL CERTIFICATE OF COMPLETION.
8. ON COMPLETION OF THE WORK, REMOVE FROM THE PREMISES ALL TOOLS, DEBRIS, SURPLUS AND WASTE MATERIALS RESULTING FROM OPERATIONS UNDER THIS SECTION. CLEAN ALL EQUIPMENT AND LEAVE ALL ITEMS IN PERFECT ORDER READY FOR OPERATION.
9. AFTER ACCEPTANCE, INSTRUCT OWNER IN EQUIPMENT OPERATION AND PROVIDE HIM WITH OPERATING AND MAINTENANCE MANUALS STANDARDS AND EXTENDED WARRANTY DOCUMENTS, INSPECTION CERTIFICATES AND COPIES OF SHOP DRAWINGS OF INSTALLED EQUIPMENT.
10. THE CONTRACTOR SHALL, BEFORE FINAL PAYMENT IS MADE, GUARANTEE ALL MATERIALS AND WORKMANSHIP SUPPLIED BY HIM IN THE PERFORMANCE OF THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE AND SHALL, WHEN CALLED UPON, MAKE GOOD WITHOUT FURTHER COST TO THE OWNER SUCH DEFECTS AS MAY APPEAR WITHIN THIS PERIOD.
11. SUPPLY AND INSTALL DUCTWORK AS INDICATED ON DRAWING. DUCTWORK SHALL BE FABRICATED AND INSTALLED IN STRICT ACCORDANCE WITH LATEST ASHRAE & SMACNA STANDARDS AND SHALL BE MANUFACTURED OF GALVANIZED STEEL UNLESS SPECIFICALLY NOTED OTHERWISE.
12. ADJUST ALL FAN SPEEDS TO DELIVER SHOWN AIR QUANTITIES. BALANCE ALL AIR SYSTEMS AND SUPPLY WRITTEN AIR BALANCING REPORTS IN TRIPLICATE. INCLUDE NECESSARY SPARE BELTS AND PULLEYS FOR FIELD ADJUSTMENT.
13. ALL VALVES AND FITTINGS SHALL BE SUITABLE FOR THIS PARTICULAR PIPING APPLICATION AND MINIMUM 150LBS PRESSURE RATING.
14. ALL DUCTWORK SHALL BE: 24 GAUGE UP TO 36 INCHES WIDE, 22 GAUGE 31 INCHES WIDE TO 60 INCHES WIDE, ROUND DUCT SHALL BE 24 GAUGE UO TO 10 INCHES DIAMETER, 22 GAUGE 11 TO 20 INCHES DIAMETER, 20 GAUGE ABOVE 20 INCHJES DIAMETER; ALL GALVINIZED SHEETMETAL. SEAL ALL JOINTS AND SLIPS WITH EC 800 OR OTHER SUITABLE SEALANT. ALL LONGITUDINAL SEAMS SHALL BE PITTSBURG LOCKING TAPE. ALL SLIPS SHALL BE REINFORCED BAR TYPE. FABRICATE AND INSTALL ALL DUCTS IN COMPLIANCE WITH SMACNA STANDARDS FOR LOW PRESURE DUCT CONSTRUCTION.
15. ALL DUCT CONNECTIONS TO FAN DRIVEN UNITS SHALL BE MADE WITH A FIREPROOF FLEXIBLE DUCT CONNECTOR.
16. BEFORE THE H.V.A.C. SYSTEM IS OPERATED, ALL DUCTS SHALL BE BLOWN OUT & THOUGHLY CLEANED. SYSTEM SHALL BE TEST AT FULL PRESSURE & ALL LEAKS & FAULTS CORRECTED.
17. INSTALL ALL PIPING AND VALVES AS HIGH AS POSSIBLE.
18. BALANCE THE AIR SYSTEM AS PER ASSOCIATED AIR BALANCING COUNCILS LATEST STANDARDS. SUBMIT BALANCING REPORT FOR ENGINEERS APPROVAL.
19. THESE DRAWINGS ARE DIAGRAMMATIC, FIELD CONDITIONS SHALL DETERMINE ACTUAL LOCATION OF ALL PIPING AND DUCTWORK.
20. ALL DUCT DIMENSIONS ARE CLEAR INSIDE DIMENSIONS.
21. DUCT CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LOCAL MECHANICAL CODE AND THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION DUCT CONSTRUCTION STANDARDS UNLESS OTHERWISE INDICATED IN THESE DRAWINGS OR IN THE SPECIFICATIONS.
22. ALL DUCT SUPPORTS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH SMACNA STANDARDS UNLESS OTHERWISE NOTED.

GENERAL NOTES

SHOULD ANY CONTRADICTION, AMBIGUITY, ERROR, INCONSISTENCY, OMISSION OR INCOMPLETE SYSTEM APPEAR IN OR BETWEEN ANY OF CONTRACT DOCUMENTS THE CONTRACTOR SHALL, BEFORE SUBMITTING THE FINAL BID AND SIGNING THE CONTRACT FOR CONSTRUCTION, NOTIFY THE ARCHITECT AND REQUEST A WRITTEN RESOLUTION AS TO WHICH METHODS OR MATERIALS WILL BE REQUIRED. IN THE EVENT OF CONFLICTING REQUIREMENTS OF STANDARDS , DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL COMPLY WITH THE MORE STRINGENT REQUIREMENTS. BEFORE SUBMITTING THE FINAL BID AND THE SIGNING THE CONTRACT FOR THE CONSTRUCTION THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION FROM THE ARCHITECT, IN NO CASE SHALL THE CONTRACTOR PROCEED WITH THE AFFECTED WORK UNTIL ADVISED BY THE ARCHITECT.

IF THE CONTRACTOR FAILS TO MAKE A REQUEST FOR INTERPRETATION OR RESOLUTION NO EXCUSE WILL BE ACCEPTED FOR FAILURE TO CARRY OUT THE WORK IN A SATISFACTORY MANNER, AS INTERPRETED BY THE ARCHITECT. THIS GENERALLY MEANS THE USE OF THE HIGHEST QUALITY MATERIAL, MOST EXPENSIVE WAY OF PERFORMING WORK AND PROVIDING COMPLETE FUNCTIONING SYSTEM FOR PROPER OPERATION.

EACH AND EVERY TRADE OR SUBCONTRACTOR WILL BE DEEMED TO HAVE FAMILIARIZED THEMSELVES WITH ALL THE CONTRACT DOCUMENTS OF THIS PROJECT, INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND SITE WORK, AND TO HAVE VISITED THE SITE, SO AS TO AVOID ERROR, OMISSIONS AND MISINTERPRETATIONS. RELATED INFORMATION MAY BE PROVIDED ON CONTRACT DOCUMENTS OTHER THAN THOSE ASSOCIATED WITH THE SUBCONTRACTOR'S TRADE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING RELATED WORK OF ALL THE CONTRACT DOCUMENTS. NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED FOR ALLEGED ERRORS, OMISSIONS AND MISINTERPRETATIONS WHETHER THEY ARE A RESULT OF FAILURE TO OBSERVE THIS REQUIREMENT OR NOT.

ENERGY CODE 2018 REQUIREMENTS

APPLICABILITY (CONTRACTOR SHALL PROVIDE ALL ITEMS LISTED BELOW)

RESIDENTIAL BUILDING. FOR THIS CODE, INCLUDES DETACHED ONE- AND TWO-FAMILY DWELLINGS AND MULTIPLE SINGLE-FAMILY DWELLINGS (TOWNHOUSES) AS WELL AS GROUP R-2, R-3 AND R-4 BUILDINGS THREE STORIES OR LESS IN HEIGHT ABOVE GRADE PLANE.

R401.2 COMPLIANCE.
PROJECTS SHALL COMPLY WITH SECTIONS IDENTIFIED AS "MANDATORY" AND WITH EITHER SECTIONS IDENTIFIED AS "PRESCRIPTIVE" OR THE PERFORMANCE APPROACH IN SECTION R405. (PRESCRIPTIVE METHOD IS CHOSEN)

R403.1.1 PROGRAMMABLE THERMOSTAT.

PROVIDE, AT LEAST ONE THERMOSTAT PER DWELLING UNIT. THERMOSTAT SHALL BE CAPABLE OF CONTROLLING THE HEATING AND COOLING SYSTEM ON A DAILY SCHEDULE TO MAINTAIN DIFFERENT TEMPERATURE SET POINTS AT DIFFERENT TIMES OF THE DAY. THIS THERMOSTAT SHALL INCLUDE THE CAPABILITY TO SET BACK OR TEMPORARILY OPERATE THE SYSTEM TO MAINTAIN ZONE TEMPERATURES DOWN TO 55°F (13°C) OR UP TO 85°F (29°C). THE THERMOSTAT SHALL INITIALLY BE PROGRAMMED WITH A HEATING TEMPERATURE SET POINT NO HIGHER THAN 70°F (21°C) AND A COOLING TEMPERATURE SET POINT NO LOWER THAN 78°F (26°C).

PROVIDE PER R403.2.1 INSULATION (PRESCRIPTIVE).
ANY SUPPLY DUCT IN ATTIC SHALL BE INSULATED TO A MINIMUM OF R-12. ALL OTHER DUCTS SHALL BE INSULATED TO A MINIMUM OF R-6.

PROVIDE PER R403.2.2 SEALING (MANDATORY).
ALL DUCTS, AIR HANDLERS, AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH EITHER THE INTERNATIONAL MECHANICAL CODE OR INTERNATIONAL RESIDENTIAL CODE, AS APPLICABLE.

DO NOT USE BUILDING CAVITIES PER R403.2.3. (MANDATORY).
BUILDING FRAMING CAVITIES SHALL NOT BE USED AS DUCTS OR PLENUMS.

PROVIDE VENTILATION R403.5 AS SHOWN (MANDATORY).
THE BUILDING SHALL BE PROVIDED WITH VENTILATION THAT MEETS THE REQUIREMENTS OF THE INTERNATIONAL RESIDENTIAL CODE OR INTERNATIONAL MECHANICAL CODE, AS APPLICABLE, OR WITH OTHER APPROVED MEANS OF VENTILATION. OUTDOOR AIR INTAKES AND EXHAUSTS SHALL HAVE AUTOMATIC OR GRAVITY DAMPERS THAT CLOSE WHEN THE VENTILATION SYSTEM IS NOT OPERATING.

R403.2 HOT WATER BOILER OUTDOOR TEMPERATURE SETBACK.
HOT WATER BOILERS THAT SUPPLY HEAT TO THE BUILDING THROUGH ONE- OR TWO-PIPE HEATING SYSTEMS SHALL HAVE AN OUTDOOR SETBACK CONTROLL THAT LOWERS THE BOILER WATER TEMPERATURE BASED ON THE OUTDOOR TEMP.

R403.3.2 SEALING (MANDATORY)
DUCTS, AT HANDLERS AND FILTER BOXES SHALL BE SEALED. JOINTS AND SEAMS SHALL COMPLY WITH EITHER THE INTERNATIONAL MECHANICAL CODE OR IRC, AS APPLICABLE

EXCEPTIONS:
1. AIR-IMPERMEABLE SPRAY FOAM PRODUCTS SHALL BE PERMITTED TO BE APPLIED WITHOUT ADDITONAL JOINT SEALS
2. FOR DUCTS HAVING A STATIC PRESSURE CLASSIFICATION OF LESS THAN 2 INCHES OF WATER COLUMN (500 PA) , ADDITIONAL CLOSURE SYSTEMS SHALL NOT BE REQUIRED TO CONTINUOUSLY WELDED JOINTS AND SEAMS, LOCKING TYPE JOINTS AND SEAMS OF OTHER THAN THE SNAP-LOCK AND BUTTON-LOCK TYPES.

403.3.2.1- SEALED AIR HANDLER
AIR HANDLERS SHALL HAVE A MANUFACTURERS DESIGNATION OF AIR LEAKAGE OF NO MORE THAN 2 PERCENT OF THE DESIGN AIR FLOW RATE WHEN TESTED IN ACCORDANCE WITH ASHRAE 193.

R403.3.3 DUCT TESTING
DUCRS SHALL BE PRESSURE TESTED THROUGH ROUGH IN TEST, POST CONSTRUCTION TEST

EXCEPTION- NOT REQUIRED WHERE DUCTS AND AIR HANDLERS ARE LOCATED ENTIRLEY THROUGH THE BUILING THERMAL ENVELOPE

MAIN/BRANCH DUCT SCHEDULE

SIZE	MAX. CFM	SIZE	MAX. CFM
6" DIA	100	12x8	350
7" DIA	150	12x8	400
8" DIA	200	12x8	450
9" DIA	300	14x8	500
10" DIA	400	16x8	600
8x6	200	18x8 OR 16x10	700
8x8	250	20x8 OR 18x10	800
10x8	300	24x8 OR 20x10	1000
		30x8 OR 24x10	1200

NOTE: MAXIMUM FLEXIBLE DUCT LENGTH SHALL BE 4'
USE INSULATED SEMI RIGID BUCK DUCT.

MINIMUM RETURN DUCT PER HERS

CAPACITY	RETURN	FILTER
1.5 TON	ø16"	500 INCH2
2.0 TON	ø18"	600 INCH2
2.5 TON	ø20"	500 INCH2

MAXIMUM RETURN DUCT 30FT

INSULATION NOTES

CONTRACTOR SHALL FOLLOW THE MOST STRINGENT INSULATION REQUIREMENT FOR EACH ITEM

THE FOLLOWING SYSTEMS SHALL BE INSULATED.
DUCT LINER SHALL BE CLOSED CELL TYPE, GERM PROOF

IECC 2015 REQUIREMENTS:

1. HEATING HOT WATER MAINS AND BRANCHES:
   PIPING < 1" REQUIRES 1 1/2" INSULATION
   PIPING > 1½" REQUIRES 2" INSULATION
2. SUPPLY & RETURN DUCTWORK FROM HVAC UNITS:
   1 1/2" INSULATION MIN. R-6

LEED/ASHRAE 2013 REQUIREMENTS:

1. HEATING HOT WATER MAINS AND BRANCHES:
   PIPING < 1 1/2" REQUIRES 1½" INSULATION
   PIPING > 1½" REQUIRES 2" INSULATION
2. SUPPLY & RETURN DUCTWORK FROM HVAC UNITS:
   1" INSULATION MIN. R-6

GENERAL INSULATION REQUIREMENTS:

1: ALL LINED SUPPLY, RETURN AND TRANSFER DUCTWORK SHALL BE 1" DUCT LINER
   -DUCT INSUALTION SHALL CONTINUE OVER DUCT AT LINED POINT
   -FIRST 10' OF SUPPLY AND RETURN FOR ALL ERU'S AND HVAC UNITS
2. CONDENSATE DRAIN: 1"
3. ALL DUCTWORK IN CEILING SPACE SHALL HAVE R-6 INSULATION,
4. REFRIGERANT PIPING ¾" ARAMFLEX

ALL DUCTWORK ON ROOF OR UNCONDITIONED SPACE SHALL BE INSULATED WITH R-12 INSULATION AND COVERED WITH EPDM ROOFING MATERIAL FOR WATER TIGHT INSTALLATION.

APARTMENT EXHAUST NOTES

I) EACH APARTMENT SHALL BE PROVIDED WITH A CONNECTION POINT FOR A CLOTHES WASHER VENT.
II) PROVIDE AND INSTALL THEDRYERBOX ®, SIZED TO THE WALL THICKNESS, SHALL BE PROVIDED AT EACH SCHEDULED DRYER LOCATION
III) DRYER VENT PIPE SHALL BE MINIMUM 28 GAUGE RIGID METAL, WITH NO SCREWS FOR ATTACHMENT, AND CONSTRUCTED AND INSTALLED PER SMACNA STANDARDS.
IV) DRYER VENTING SHALL USE THE DRYER ELL FOR THE FIRST ELBOW, LOCATED AND COORDINATED TO MINIMIZE ANY ADDITIONAL BENDS. DUCTWORK SHALL HAVE THE LAST (5) FEET MINIMUM PITCHED TO THE EXTERIOR EXHAUST POINT.
V) DUCTWORK SHALL EXHAUST TO THE EXTERIOR TO A NON-SCREENED VINYL SIDEWALL HOOD PROVIDED UNDER THIS SCOPE AND COLORED TO MATCH THE ADJACENT EXTERIOR FINISH.
VI)INSULATE WITH R-4 MINIMUM LAST 10' OF EXHAUST SEAL AGAINST EXTERIOR WALL
VII)LAUNDRY VENT DUCT SHALL BE ALUMINUM TYPE TO PREVENT CORROSION AND TAPE SHALL BE IN COMPLIANCE WITH UL FOR DRYER DUCT CONNECTIONS

KITCHEN EXHAUST
I) EACH APARTMENT SHALL BE PROVIDED WITH A CONNECTION POINT FOR EXHAUSTING A RANGE HOOD.
II) COORDINATE SIZE AND CONNECTION POINT WITH THE GENERAL CONTRACTOR, APPLIANCE SUPPLIER AND CABINET SUPPLIER.
III) EXHAUST PIPE SHALL BE MINIMUM 26 GAUGE RIGID METAL, WITH NO SCREWS FOR ATTACHMENT, AND CONSTRUCTED AND INSTALLED PER SMACNA STANDARDS. DUCTWORK SHALL HAVE THE LAST (5) FEET MINIMUM PITCHED TO THE EXTERIOR EXHAUST POINT.
IV) DUCTWORK SHALL EXHAUST TO THE EXTERIOR TO A SCREENED VINYL SIDEWALL HOOD PROVIDED UNDER THIS SCOPE AND COLORED TO MATCH THE ADJACENT EXTERIOR FINISH.
V)INSULATE WITH R-4 MINIMUM LAST 10' OF EXHAUST SEAL AGAINST EXTERIOR WALL

BATHROOM EXHAUST
I) EACH APARTMENT SHALL BE PROVIDED WITH A CONNECTION POINT FOR EXHAUSTING A BATHROOM
II) COORDINATE SIZE AND LOCATION WITH THE GENERAL CONTRACTOR AND ARCHITECT
I) EXHAUST PIPE SHALL BE MINIMUM 26 GAUGE RIGID METAL, CONSTRUCTED AND INSTALLED PER SMACNA STANDARDS. DUCTWORK SHALL HAVE THE LAST (5) FEET MINIMUM PITCHED TO THE EXTERIOR EXHAUST POINT.
IV) DUCTWORK SHALL EXHAUST TO THE EXTERIOR TO A SCREENED VINYL SIDEWALL HOOD PROVIDED UNDER THIS SCOPE AND COLORED TO MATCH THE ADJACENT EXTERIOR FINISH.
V)INSULATE WITH R-4 MINIMUM LAST 10' OF EXHAUST SEAL AGAINST EXTERIOR WALL

COMMONWEALTH OF MASSACHUSETTS — MURAT EKERBICER — MECHANICAL — No. 51899 — REGISTERED PROFESSIONAL ENGINEER

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HVAC NOTES

Sheet No.

H-4

DIFFUSER/REGISTER SCHEDULE

LEGEND: (N)- #x# - ###
- ### — CFM
- # — DIMENSIONS
- x — TYPE

TYPE	DESCRIPTION	MODEL (BASED ON TITUS)
A	LOUVER FACE CEILING DIFFUSER FOR SHEET ROCK CEILING INSTALLATION. PROVIDE ROUND TO SQUARE ADAPTOR. WITH OPPOSIBLE BLADE DAMPER	TITUS TDCA, BORDER 1
A1	LOUVER FACE CEILING DIFFUSER FOR 2'x2' LAY-IN CEILING INSTALLATION. PROVIDE ROUND TO SQUARE ADAPTOR. WITH OPPOSIBLE BLADE DAMPER	TITUS TDCA, BORDER 3
B	DOUBLE DEFLECTION REGISTER FOR SHEET ROCK INSTALLATION. PROVIDE ROUND TO SQUARE ADAPTOR.	TITUS 272RS
E	DOUBLE DEFLECTION GRILLE FOR SHEET ROCK NSTALLATION. WITH OPPOSIBLE BLADE DAMPER	TITUS 25 RS
E1	DOUBLE DEFLECTION GRILLE FOR SHEET ROCK NSTALLATION. WITH OPPOSIBLE BLADE DAMPER ALUMINUM TYPE	TITUS 25 RS
F	PERFORATED SIGHT PROOF EGGCRATE GRILLE FOR SHEET ROCK CEILING INSTALLATION.	TITUS 45F
G	LINEAR DIFFUSER, LINEAR STYLE 1 1/2" SLOT SPACING WIDTH, 4 SLOT FOR SHEET ROCK CEILING INSTALLATION. 100 CFM/FT WITH DAMPER, INSULATED PLENUM	TITUS MLR-40, BORDER TYPE 22

CEILING RADIATION DAMPERS

CEILING RADIATION DAMPERS SHALL BE AS MANUFACTURED BY
GREENHECK
MODEL CRD-1WT FOR SIDE INLET
MODEL CRD-2WT FOR TOP INLET

CONTRACTOR SHALL BE RESPONSIBLE TO PROVIDE UL LISTED DAMPER WITH THE UL LISTING OF THE CEILING

APPROVED CEILING RATINGS ARE
L-528,546,558,562,574,576,581,583,585,592
M-501,503,508
P-533,538,545,547,548,554

FIRE SAFE THROUGH FLOORS

TYPE	SIZE	HILTI	MATERIAL	RATING	BOTTOM	TOP	CHASE WALL
STEEL/CAST COPPER/EMT	MAX 4"	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	REQUIRED
STEEL/CAST 4" EMT/ 2" FLEX	MAX 6" –	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
STEEL/CAST COPPER/EMT	MAX 4"	CP-620	FIRE FOAM	1HRS	FIRE STOP	FIRE STOP	REQUIRED
PEX	MAX 1"	CP 645	INTUMESCENT STRIP W/COLLAR	1HRS	BOTH SIDES	BOTH SIDES	NOT REQUIRED
PVC PIPE	MAX 2"	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
PVC PIPE	MAX 4"	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	REQUIRED
PVC PIPE	MAX 4"	CP 645	INTUMESCENT STRIP W/COLLAR	1HRS	COLLAR	FIRE STOP	NOT REQUIRED
REFRIGERANT	–	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
4" DUCT	MAX 4"	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
INSULATED COPPER/STEEL	MAX 2"	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
CABLES	MAX 2"	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED

LOUVER NOTES

LOUVER DIMENSIONS SHALL BE COORDINATED WITH ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS
LOUVERS SHALL BE AMCA CERTIFIED FOR WIND DRIVEN RAINS
BLADES SHALL BE 4" DEEP MOUNTED BETWEEN 35-45 DEGREES WITH DRAINABLE BLADE AND DRAINABLE HEAD
PROVIDE BIRD SCREENS IN COMPLIANCE WITH IMC 401
PROVIDE CLOR ANODIZED LOUVER PER ARCHITECTS DIRECTION
LOUVERS SHALL BE AS MANUFACTURED BY GREENHECK MODEL EHH 401 SERIES

FIRE RATED CEILING NOTES:

WHEN DUCT PENETRATE RATED CEILING:

-ALL RECESSED DIFFUSERS AND REGISTERS SHALL HAVE RADIATION DAMPERS.
-ALL UNITS DUCTED TO PLENUM SPACE SHALL HAVE CEILING FIRE DAMPERS TO MEET UL 555C -ALL RETURN DUCTS SHALL BE BELOW THE RATED CEILING, DROPPED CEILING AREAS SHALL NOT BE RATED CEILING UNLESS SHOWN OTHERWISE
-ALL RETURN AIR GRILLES IN RATED CEILING SHALL HAVE CEILING FIRE DAMPERS
-ALL UNIT DISCHARGES SHALL BE OFFSET TO GET INTO PROPER JOIST SPACES, CARRY TRANSITION PIECE AS NEEDED
-ALL DUCTS LARGER THAN 4"ø DIAMETER SHALL HAVE FIRE DAMPERS AT CEILING PENETRATIONS

FIRE/SMOKE DAMPER REQUIREMENTS

IMC 607.5.5 REQUIRES FIRE/SMOKE DAMPER AT ALL SHAFT PENETRATIONS

IMC 607.6.1. REQUIRES DAMPER EXCEPT
-DUCT CAN PENETRATE UP TO THREE FLOORS IF, 26 GAUGE, OPEN FROM ONE UNIT TO OUTSIDE, 4" ROUND AND SEALED AROUND AND CEILING GRILLES HAVE RADIATION DAMPERS

IMC 6075.3 REQUIRES FIRE PARTITION PENETRATIONS TO HAVE FIRE DAMPERS EXCEPT
-BUILDING IS SPRINKLED OR
-DUCT IS MINIMUM 26 GAUGE, LESS THAN 100 SQ-INCH AND
-DUCT IS ABOVE CEILING AND,
-DUCT IS NOT TERMINATED AT FIRE RATED WALL AND
-MINIMUM 12" SLEEVE IS PROVIDED

CONSTRUCTION NOTES

-ALL CEILING MOUNTED HVAC UNITS SHALL BE HUNG FROM STRUCTURAL STEEL WITH SPRING ISOLATORS,
-PROVIDE FLEXIBLE DUCT CONNECTIONS AT HVAC UNIT, AND ALL FANS
-PROVIDE ISOLATION VALVES, CONTROL VALVES, DRAIN AND STRAINER FOR ALL WATER BASED HVAC UNITS.
-PROVIDE SECONDARY DRAIN PAN WITH LEAK DETECTOR TO SHUT DOWN HVAC UNIT.
-MAINTAIN ACCESS DOORS AND CODE REQUIRED CLEARANCES FOR ALL FILTER REPLACEMENT, EQUIPMENT REPAIR AND ELECTRICAL CONTROLS,
-PRIOR TO ANY INSTALLATION, COORDINATE CLEARANCES WITH ALL TRADES.
-ALL CONDENSATE DRAINS SHALL RUN TO NEAREST STORM CONNECTION PROVIDED BY P.C. REFER TO PLUMBING DRAWINGS
-ALL CONDENSING UNITS SHALL BE MOUNTED ON CONCRETE PAD ON VIBRATION PADS, OR MOUNTED ON SLEEPERS ANCHORED TO ROOF.
-ALL SPLIT SYSTEM CONDENSER UNITS IF LOCATED AWAY FROM THE BUILDING SHALL BE PIPED UNDERGROUND UP TO BUILDING, PROVIDE MINIMUM 18" COVER.
-PROVIDE MAINTENANCE PADS MINIMUM 4" HIGH FOR ALL FLOOR-MOUNTED EQUIPMENT PUMPS AND BOILERS.
-PROVIDE 13 FILTERS FOR ALL INDOOR UNITS, MERV 8 FOR ESTAR/LEED BUILDINGS
-PROVIDE 11 FILTERS FOR ALL OUTSIDE AIR UNITS, MERV 8 FOR ESTAR/LEED BUILDINGS
-ALL PIPING CONNECTED TO VIBRATION-ISOLATED EQUIPMENT TO BE ISOLATED BY MEANS OF VIBRATION ISOLATORS, RESILIENT LATERAL SUPPORTS AND RESILIENT PENETRATION SLEEVE /SEALS. THIS APPLIES TO FIRST 50 FEET OF TOTAL PIPE LENGTH OR THE ENTIRE PIPE WITHIN MECH. ROOM (WHICHEVER IS LONGER). PIPES THAT ARE 4" DIAMETER OR LARGER TO BE ISOLATED THROUGHT THE BUILDING REFER TO SPEC SECTION 230548 FOR ADDITIONAL INFORMATION
-PROVIDE EXPANSION LOOPS AS REQIRED
-ALL FRESH AIR DUCTS SHALL HAVE MOTORIZED DAMPERS INTERLOCKED WITH UNIT AND HAVE VOLUME DAMPERS

STANDARD SPLIT HEAT PUMP SYSTEM SCHEDULE (INDOOR)

UNIT NO.	MITSUBISHI MODEL	RATED CAPACITY (BTU/H)	SEER	POWER SUPPLY	MCA	FAN MOTOR	AIRFLOW (LOW-MEDIUM HIGH)	SOUND LEVEL (LO-MI-MZ-HI)	W	D	H	WEIGHT (LBS)	INTAKE AIR TEMP MAX	INTAKE AIR TEMP MIN
ACU-1	PKA-A12NA7	12,000	15.3	208/230V 1 PHASE, 60HZ	1.0 A	0.76 F.L.A.	268-328-381 DRY CFM 240-293-342 WET CFM	34-40-45 DB(A)	30-11/16"	8-1/4"	11-3/4"	23	95TDB 71TWB	67TDB 57TWB
HPC-1	PLA-A12NA7	12,000	15.3	208/230V 1 PHASE, 60HZ	1.0 A	0.76 F.L.A.	268-328-381 DRY CFM 240-293-342 WET CFM	34-40-45 DB(A)	30-11/16"	8-1/4"	11-3/4"	23	95TDB 71TWB	67TDB 57TWB

PROVIDE ME HVAC CONTROLLER WALL MOUNTED THERMOSTAT, DISCONNECT SWITCH

STANDARD SPLIT HEAT PUMP SYSTEM SCHEDULE (OUTDOOR)

UNIT NO.	MITSUBISHI MODEL	RATED CAPACITY (BTU/H)	SEER	POWER SUPPLY	R.L.A.	MCA	MOCP	SOUND LEVEL	W	D	H	WEIGHT (LBS)	MAX REFRIDGERANT PIPE LENGTH (FT)	MAX REFRIDGERANT PIPE HEIGHT DIFF (FT)	INTAKE AIR TEMP MAX	INTAKE AIR TEMP MIN
CU-1	PUZ-A12NHA4	12,000	16	208/1PHASE	DC	14	20	50 DB(A)	31-1/2"	11-1/4"	21-5/8"	88	100	100	D.B. 115' F	D.B. -13' F
CU-2	PUZ-A12NHA4	12,000	16	208/1PHASE	DC	14	20	50 DB(A)	31-1/2"	11-1/4"	21-5/8"	88	100	100	D.B. 115' F	D.B. -13' F

WITH EACH UNIT PROVIDE
-3R RATED FUSED DISCONNECT SWITCH BY ELECTRICAL CONTRACTOR
-PROVIDE MOUNTING STAND ABOVE SNOW LINE
-PROVIDE WIND BAFFLE KIT FOR LOW AMBIENT OPERATION

MULTIZONE HEAT PUMP UNIT SCHEDULE (NON-SIMULTANE HEAT AND COOL)

TAG NO.	TON	REFRIG	OUTDOOR UNIT HEAT	OUTDOOR UNIT COOL	OUTDOOR UNIT VOLT/PHS	OUTDOOR UNIT AMP	DUCTED/NON-DUCTED MCA	DUCTED/NON-DUCTED KW	SEER	EER	HSPF	MAX # OF INDOOR	NOISE @3FT PRESSURE	MITSUBISHI MODEL#	DIMENSIONS	MAX REF LENGHT EACH/TOTAL/HEIGHT	ESTAR
CU-4	4.0	R410A	54,000	48,000	208/1	29.5	40	4.3	15.0 19.0	10.8 13.4	10.1 11.0	2.85 2.85	54 DBA	MXZ-8C48NAHZ2	42"WX13"DX53"H-275 LBS	130 BELOW/164 ABOVE 262/492	YES

WITH EACH UNIT PROVIDE
-3R RATED FUSED DISCONNECT SWITCH
-SEACOST PROTECTION OPTION,
-HEATING VALUES ARE AT 5F, USE 95% FACTOR FOR RUNS MORE THAN 50FT
-85% AT -13F
-PROVIDE CLEARANCES OF 6" BEHIND, 15" ON THE RIGHT SIDE AND 20" ON THE FRONT AND ABOVE
-PROVIDE BRANCH BOX FOR MORE THAN 3 UNIT CONNECTIONS
--208/1/.5A POWER TO EACH BC CONTROLLER,
-PROVIDE COLD TEMPERATURE BAFFLE

MULTIZONE HEAT PUMP UNIT SCHEDULE (NON-SIMULTANE HEAT AND COOL)

TAG NO.	TON	CFM	INDOOR UNIT HEAT	INDOOR UNIT COOL	INDOOR UNIT VOLT/PHS	INDOOR UNIT SP	INDOOR UNIT KW		NOISE	MITSUBISHI MODEL#	DIMENSIONS
HPC-.75	.75	400	10,000	9,000	208/1	0.1"	.6		45 DBA	PLA-A09AA7	39"WX27"DX8"H-150LBS
HPC-1	1	400	15,000	12,000	208/1	0.1"	.6		45 DBA	PLA-A12AA7	39"WX27"DX8"H-150LBS

NOTE
UNITS ARE BASED ON HIGH EXTERNAL STATIC PRESSURE OPTION, STANDARD PRESSURE IS 0.1"
HEATING VALUES ARE AT 17.5 WHEN OUTDOORS IS -13 DEGREE F
WITH EACH UNIT PROVIDE ME PROGRAMMABLE CONTROLLER

SPLIT SYSTEM HEAT PUMP UNIT INDOOR SCHEDULE

TAG NO.	TON	CFM	REFRIG	INDOOR UNIT HEAT	INDOOR UNIT COOL	INDOOR UNIT VOLT/PHS	INDOOR UNIT AMP	NOISE	MITSUBISHI MODEL#	DIMENSIONS	NOISE
HV-1.5	1.5	600	R410A	20,000	18,200	208/230/1	15	34/30/49 DBA	PEAD-KP18NA	30" X 27" X 10"	40 DBA
HV-2	2	800	R410A	27,000	24,200	208/230/1	15	34/30/49 DBA	PEAD-KP24NA	38" X 27" X 10"	40 DBA
HV-2.5	2.5	1000	R410A	27,000	24,200	208/230/1	15	34/30/49 DBA	PEAD-KP30NA	38" X 27" X 10"	40 DBA

PROVIDE ENERGY STAR THERMOSTAT WITH CO2 SENSOR/ALARM, SECONDARY DRAIN PAN WITH LEAK SENSOR

SPLIT SYSTEM HEAT PUMP UNIT OUTDOOR SCHEDULE

TAG NO.	TON		REFRIG	OUTDOOR UNIT HEAT	OUTDOOR UNIT COOL	OUTDOOR UNIT VOLT/PHS	OUTDOOR UNIT AMP		MITSUBISHI MODEL#	DIMENSIONS	NOISE
CU-1.5	1.5		R410A	20,000	18,000	208/1	20		SUZ-KA18NAHZ	43"WX10"DX12"H-37LBS	33 DBA
CU-2.0	2		R410A	27,000	24,000	208/1	20		SUZ-KA24NAHZ	43"WX10"DX12"H-37LBS	33 DBA
CU-2.5	2.5		R410A	34,000	30,000	208/1	20		SUZ-KA30NAHZ	43"WX10"DX12"H-37LBS	33 DBA

WITH EACH UNIT PROVIDE
-3R RATED FUSED DISCONNECT SWITCH
-PROVIDE AIR PROTECT GUIDE

WALL CAP SCHEDULE

TAG	BRAND	SIZE	DIMENSIONS	LOCATION	DUCT
WC-B	X-VENT THVB	4" VENT	7.5"X7.5"X1.5"	BATHROOM EXHAUST	ø4"-NO FLEX
WC-K	X-VENT THVB	6" VENT	10"x9"X5"	KITCHEN EXHAUST	ø6" W/FD AT CEILING PENETRATION
WC-D	X-VENT THVB	4" VENT	7.5"X7.5"X1.5"	DRYER EXHAUST-REMOVE SCREEN	ø4" AL WITH HARD ELBOW
WC-FA	X-VENT TEVB	6" VENT	7.5"X7.5"X1.5"	FRESH AIR INTAKE	ø6"-INSULATED

VYNIL COLOR TO MATCH SIDING,
MATCH DUCT SIZE CONNECTED TO UNIT.
ALL EXHAUST DUCTS SHALL HAVE R-6 INSULATION FIRST 10FT FROM EXTERIOR WALL IN
ALL FRESH AIR INTAKE DUCTS SHALL HAVE MOTORIZED DAMPER AT ENVELOPE PENETRATION WITH ACCESS PANEL.
DAMPER SHALL BE INTERLOCKED WITH HVAC UNIT
FOR COMBINED BATHROOMS, USE 6" DUCT AFTER COMBINE AND USE WC-K WALL CAP
COMBINE EXHAUST TO ONE WALL CAP WITH SEPARATE DUCT CONNECTIONS IF LOCATED NEXT TO EACH OTHER COORDINATE WITH ARCHITECT

ELECTRIC HEATER SCHEDULE

TYPE	KW	VOLT/PH	DIMENSIONS	MODEL NUMBER-COLOR BY ARCH
RWH-1	1	120/1		Q'MARK#CRA 1512-T2
RWH-2	2	120/1	19"HX16"WX4"D	Q'MARK# MCSSARWH1802/HTWHS1
RWH-4	4	208/1	19"HX16"WX4"D	Q'MARK# MCSSARWH4808/HTWHS1
SWH-4	4	208/1	19"HX16"WX4"D	Q'MARK# MCSSARWH4808/HTWHSM
EBB-2	0.4	120/1		Q'MARK#QMK-2512W-W/T'STAT
EBB-3	0.75	120/1		Q'MARK#QMK-2513W-W/T'STAT
EBB-4	1	120/1		Q'MARK#QMK-2514W-W/T'STAT
EBB-6	1.5	120/1		Q'MARK#QMK-2516W-W/T'STAT
UH-5	5	208/1		Q'MARK#MUH-35-W/T'STAT
CCH-4	4	208/1		Q'MARK#CDF548-W/T'STAT

SOME HEATERS MAY NOT NOTED/USED ON PLANS

CEILING MOUNTED EXHAUST FAN

TAG	LOCATION	TYPE	DRIVE	CFM	V/ø	LAMP	SP	NOISE SONES	DIMENSIONS	PANASONIC MODEL	ESTAR	CONTROLS
EF-1	BATHROOM	CEILING	DIRECT	110	120/1	(2)PL18	0.1"	0.3	14.5"X17"X11.5"H-16LBS-6" DUCT	FV-05-11VKSL1	YES	HIGH/LOW FAN REQUIRES TWO WALL SWITCHES (HAS LIGHT)

PROVIDE PANASONIC FIRE DAMPER ENCLOSURE FOR ALL CEILING BATHROOM FANS.

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Drawing Name

HVAC SCHEDULES

Sheet No.

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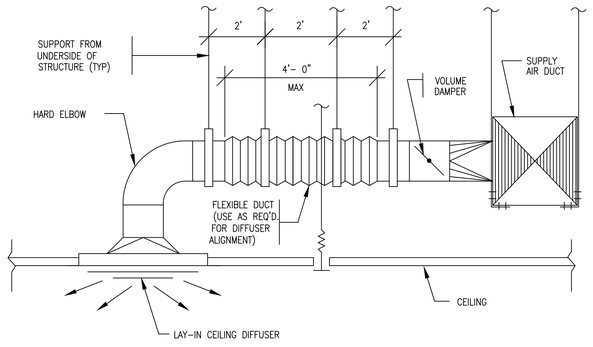
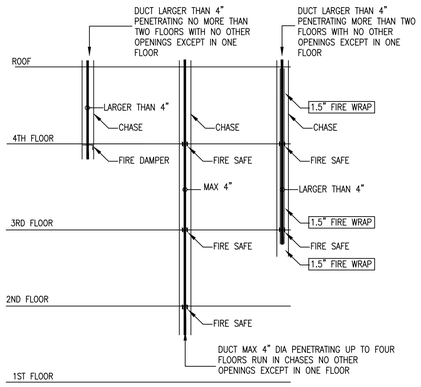


NOTES:

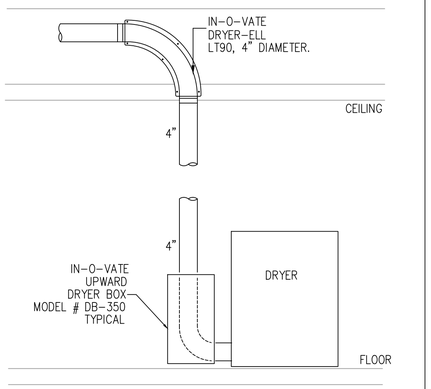
(1) MAXIMUM SAG 1/2" PER FOOT.

CEILING DIFFUSER BRANCH DUCTS | N.T.S.

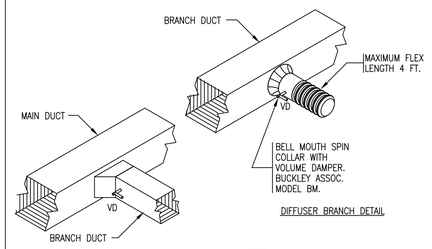


PER IMC 2015 FIGURE 607.6.1(2)

DUCT RISER THROUGH FLOORS | NTS

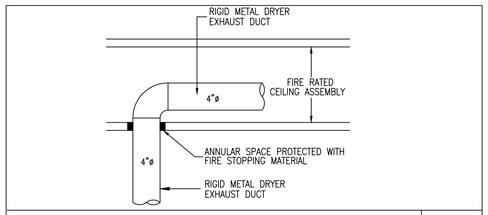


TYPICAL DRYER BOX AND DRYER ELL DETAIL | NTS

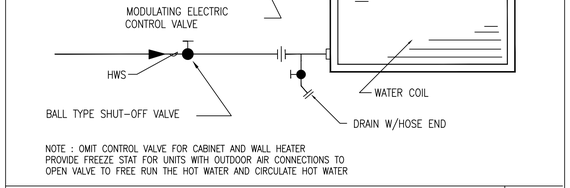


NOTE:
IN AREAS WITH SHEETROCK CEILINGS PROVIDE REMOTELY OPERATED VOLUME DAMPERS.

DUCT DETAILS | NTS

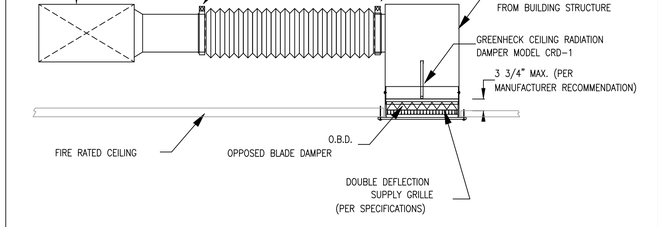


FLOOR/CEILING DUCT PROTECTION DETAIL | NTS

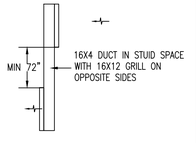


NOTE : OMIT CONTROL VALVE FOR CABINET AND WALL HEATER
PROVIDE FREEZE STAT FOR UNITS WITH OUTDOOR AIR CONNECTIONS TO OPEN VALVE TO FREE RUN THE HOT WATER AND CIRCULATE HOT WATER

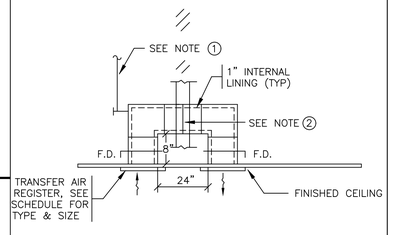
WATER COIL PIPING DETAIL | NTS



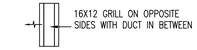
SUPPLY GRILLE/CRD INSTALLATION DETAIL | NTS



BEDROOM WALL TRANSFER GRILL



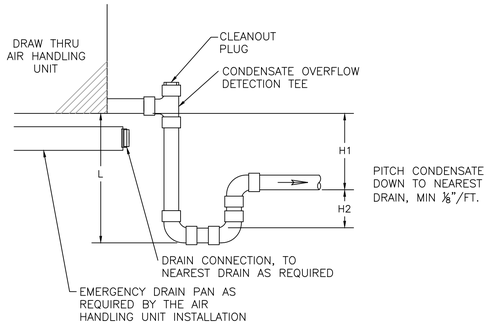
CEILING TRANSFER GRILL



LAUNDRY ROOM WALL TRANSFER GRILL

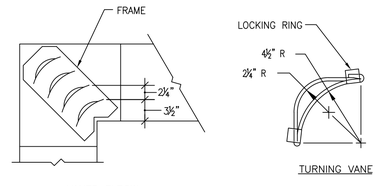
NOTES:
(1) TRANSFER DUCTS TO BE SUPPORTED FROM STRUCTURE ABOVE.
(2) FIRE DAMPER WHERE APPLICABLE, SEE PLANS FOR LOCATION.
(3) OPEN END DUCT WxH.

CEILING AND WALL TRANSFER DUCT DETAIL | N.T.S.



H1 = MAX NEGATIVE STATIC PRESSURE PLUS 1"
H2 = H1/2
L = H1 + H2 + PIPE DIAMETER + INSULATION THICKNESS

CONDENSATE DRAIN DETAIL | NTS



VANED ELBOW

NOTES:
1. LOCKING LUGS INTEGRAL WITH VANE.
2. MAXIMUM UNSUPPORTED VANE LENGTH 48".
3. FRAMES–BOLTED OR RIVETED TO ELBOW.
4. VANES AND FRAMES–SAME GAUGE AS ELBOW.

DOUBLE THICKNESS TURNING VANES FOR SQUARE ELBOW

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HVAC DETAILS

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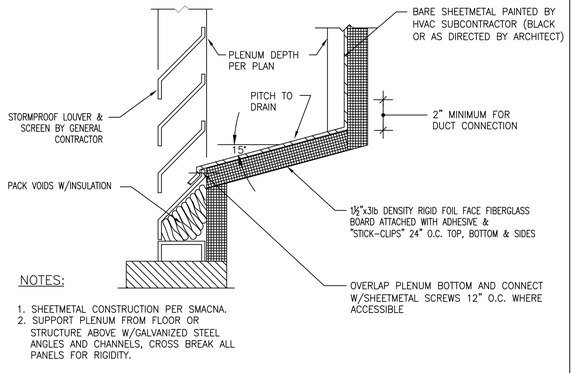
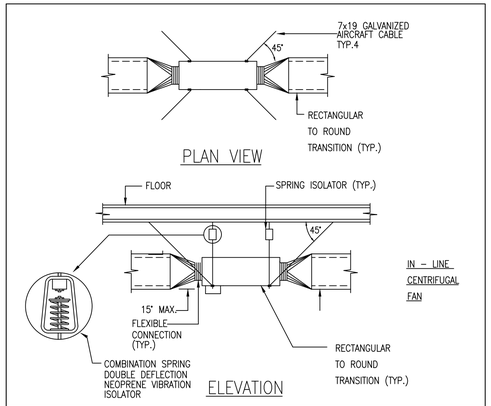
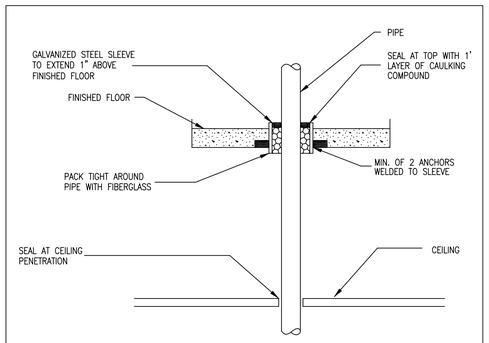


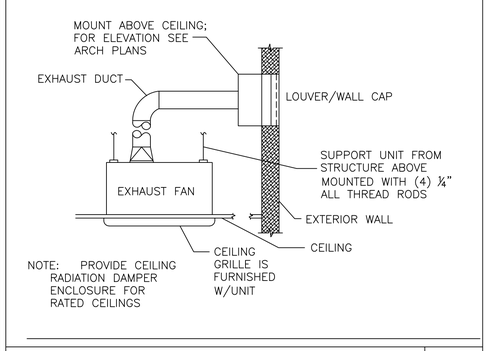
PLENUM AT LOUVER DETAIL | N.T.S.



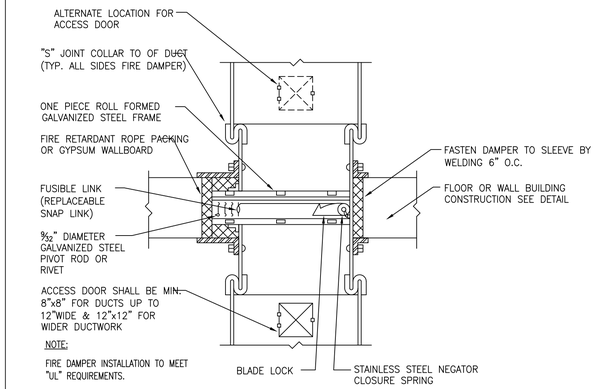
IN LINE FAN HANGER DETAIL | NTS



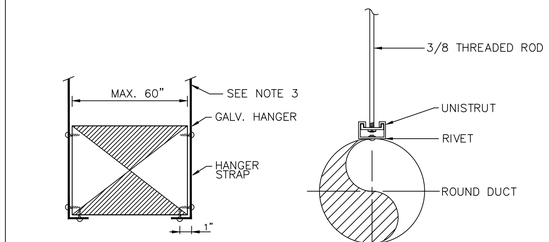
PIPE SLEEVE THRU FLOOR PENTRATION DETAIL | NTS



CEILING EXHAUST FAN DETAIL | NTS



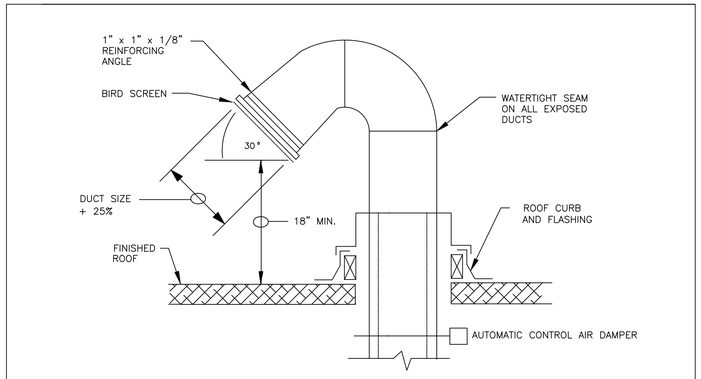
FIRE DAMPER W/BLADES OUTSIDE THE AIR STREAM | N.T.S.



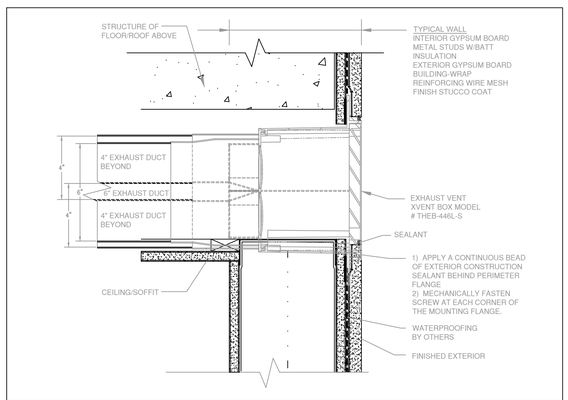
NOTES:
1. ON DUCTS OVER 48" WIDE, BOTTOM SHALL BE BRACED BY ANGLE. FOR CROSS SECTION AREA MORE THAN 8 SQ FT, DUCT SHALL BE BRACED BY ANGLES ON ALL FOUR SIDES.

2. CUTTING AND PATCHING SHALL BE LIMITED TO A MINIMUM AS REQUIRED FOR PROPER INSTALLATION.
3. SUPPORTS SHALL BE SPACED AND SIZED AS PER SMACNA.

DUCT HANGER SUPPORT | NTS



ROOF GOOSENECK DETAIL | NTS



TYPICAL WALL CAP PENETRATION XVENT BOX | NTS

PROPOSED RESIDENTIAL BUILDING
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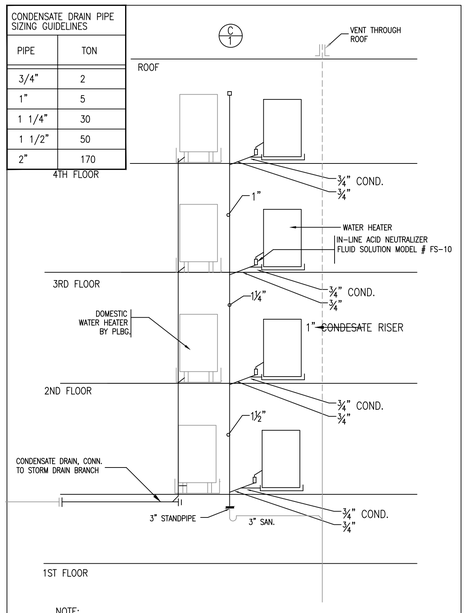
No. 51899
REGISTERED PROFESSIONAL ENGINEER

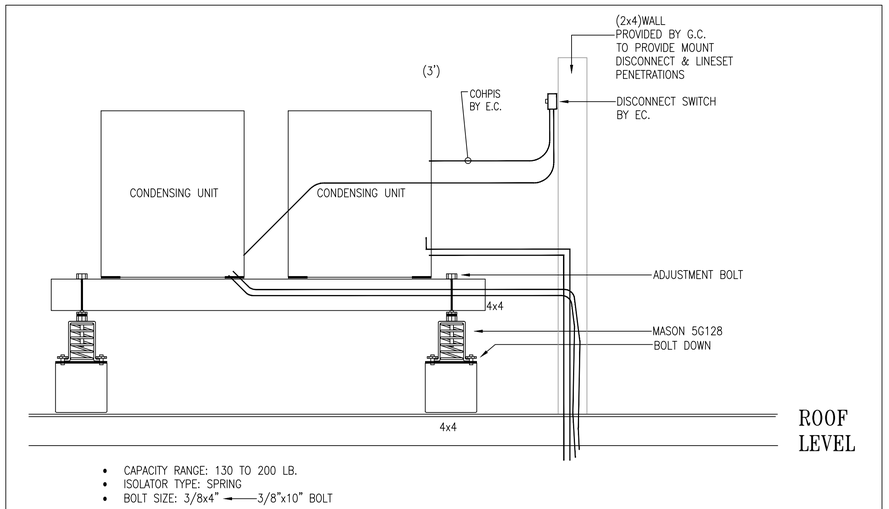
CONDENSATE DRAIN PIPE SIZING GUIDELINES	
PIPE	TON
3/4"	2
1"	5
1 1/4"	30
1 1/2"	50
2"	170



NOTE:
ALL ACID NEUTRALIZERS, DRAIN PIPING FROM FURNACES, AND CONDENSATE DRAIN SHALL BE BY HVAC CONTRACTOR. SANITARY PIPING SHALL BE BY PLUMBING CONTRACTOR.

NOTE:
PROVIDE CONDENSATE RISER IN EACH APARTMENT MECH ROOM AS SHOWN ON THIS DIAGRAM

MECHANICAL ROOM DRAIN RISER DIAGRAM | N.T.S.



- CAPACITY RANGE: 130 TO 200 LB.
- ISOLATOR TYPE: SPRING
- BOLT SIZE: 3/8x4" ←3/8"x10" BOLT

CONDENSING UNIT MOUNTING DETAIL | N.T.S.

Location

PROPOSED RESIDENTIAL BUILDING 17 KENSINGTON AVE SOMERVILLE, MA

Choo & Company, Inc.
One Billings Road Quincy, MA 02171
617-786-7727 fax 617-786-7715

ZADE ENGINEERING LLC
CONSULTING ENGINEERS
1 BILLINGS ROAD STE 306, QUINCY, MA 02171
TEL. (617) 338-4406
FAX. (617) 451-2540
EMAIL zade@zadeengineering.com

No.	Revision Date
	10-10-24

Project No: 2024169
Scale: AS NOTED
Date: 03-04-25
Drawn By: E.A

Drawing Name

HVAC DETAILS

Sheet No.

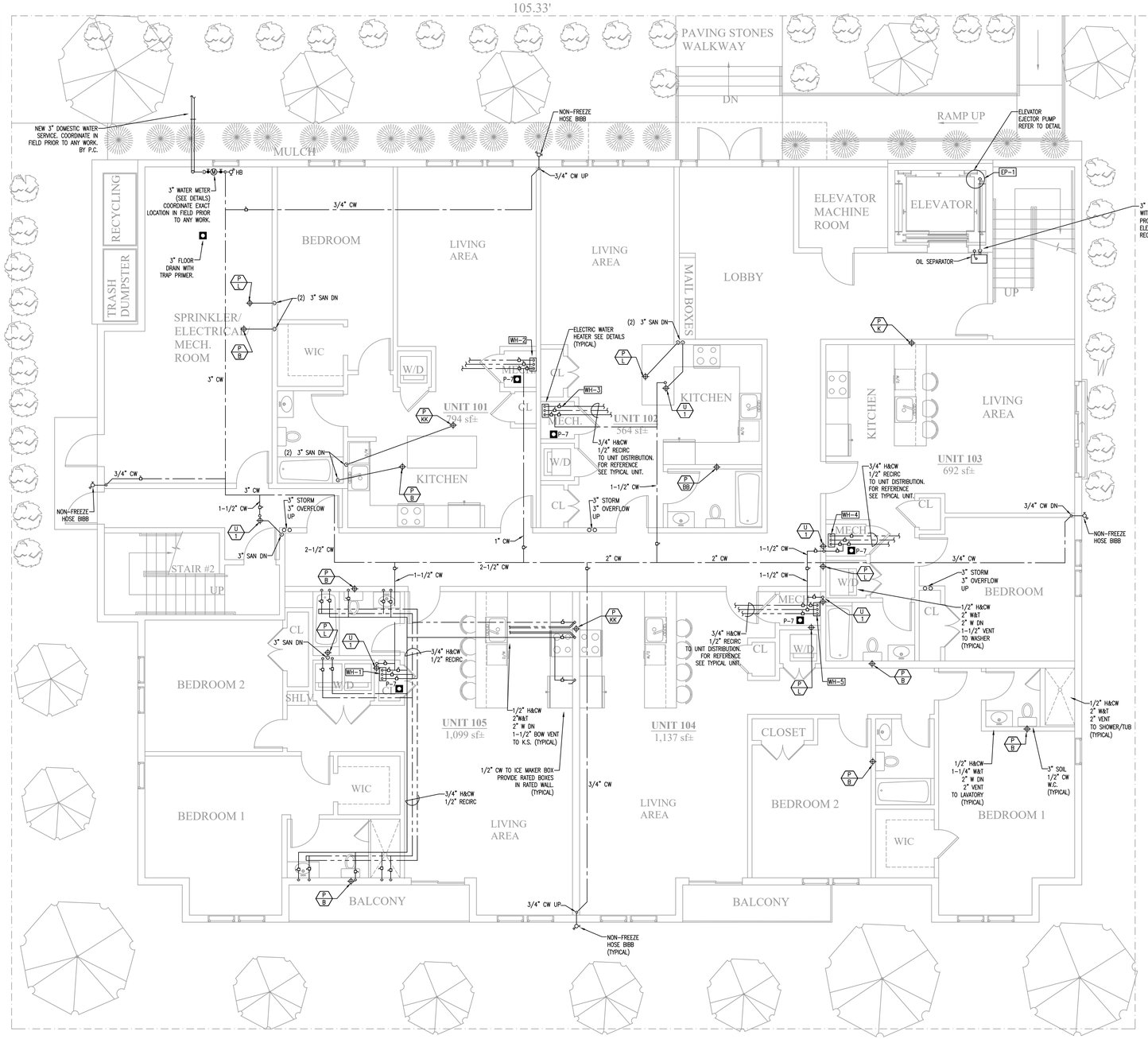
H-8

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAD
No. 51896
REGISTERED
PROFESSIONAL ENGINEER

GENERAL NOTE:
RUN ALL PIPING ON WARM SIDE OF INSULATION TO PREVENT FROM FREEZING. ANY PIPING RUNNING IN COLD AREAS SHALL BE PROVIDED WITH HEAT TRACE AND COORDINATED WITH ELECTRICAL CONTRACTOR.

RUN ¾" CW TO ICE MAKERS FROM KITCHEN WATER RISER

PROVIDE TRAP PRIMER FOR EACH FLOOR DRAIN



FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAD
No. 51899
REGISTERED PROFESSIONAL ENGINEER

Location

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Drawing Name

FIRST FLOOR PLUMBING PLAN

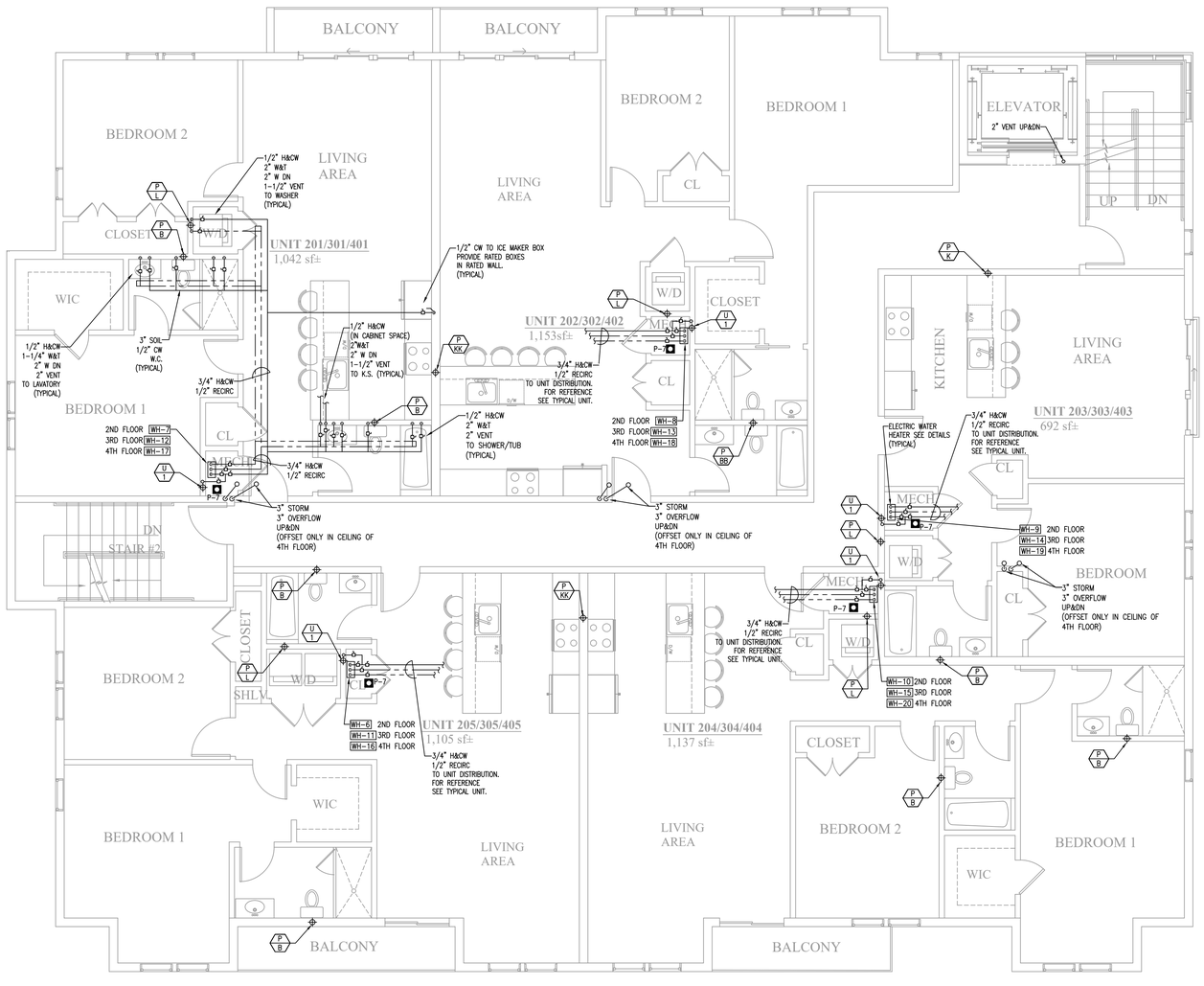
Sheet No.

P-1

GENERAL NOTE:
RUN ALL PIPING ON WARM SIDE OF INSULATION TO PREVENT FROM FREEZING. ANY PIPING RUNNING IN COLD AREAS SHALL BE PROVIDED WITH HEAT TRACE AND COORDINATED WITH ELECTRICAL CONTRACTOR.

RUN 1" CW TO ICE MAKERS FROM KITCHEN WATER RISER

PROVIDE TRAP PRIMER FOR EACH FLOOR DRAIN



SECOND TO FOURTH FLOOR PLAN
SCALE: 3/16"=1'-0"

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAL
No. 51899
REGISTERED PROFESSIONAL ENGINEER

Location

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No.	Revision Date
	10-10-24

Project No: 2024169
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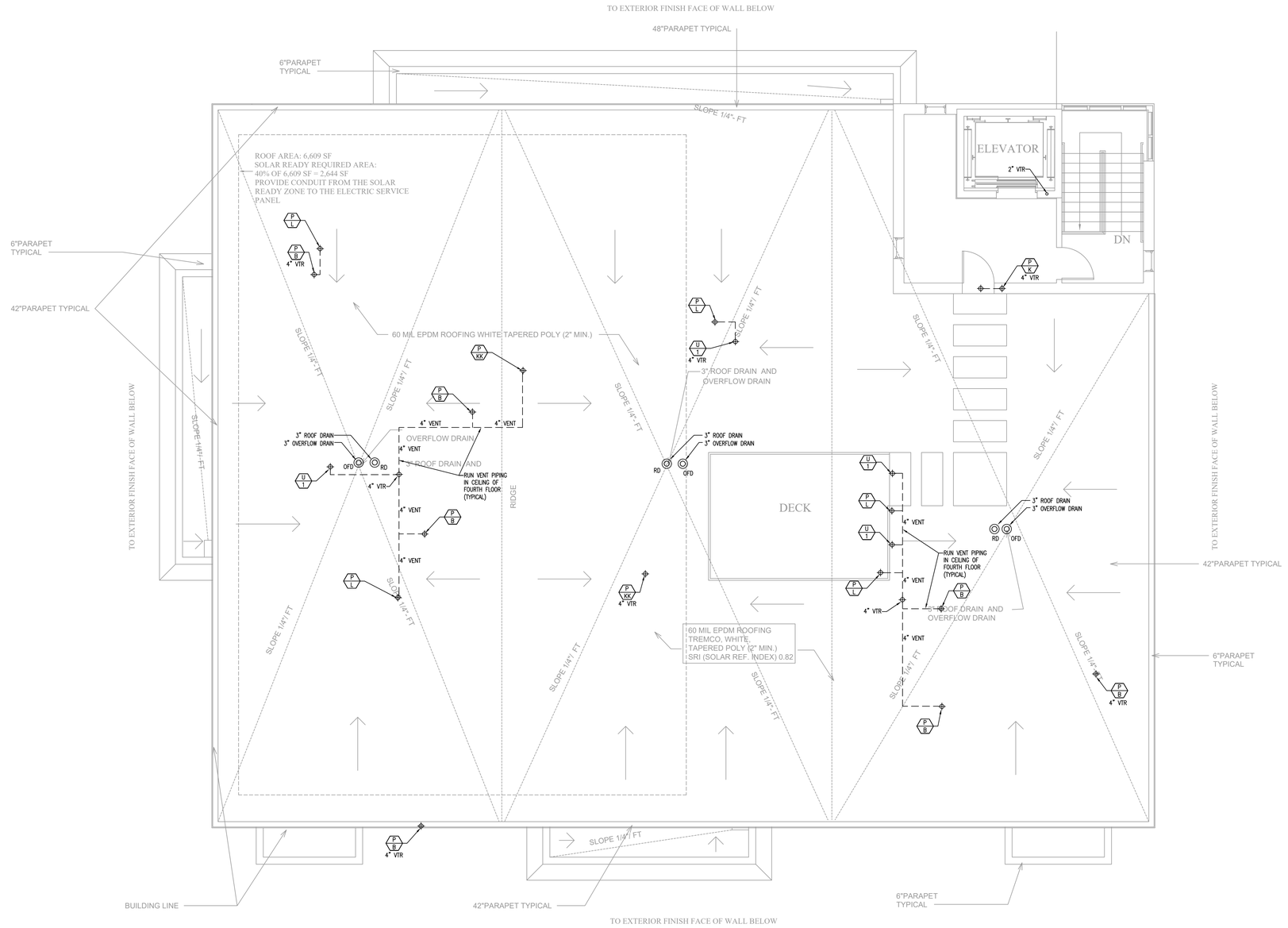
Date: 03-04-25
Drawn By: E.A

Drawing Name

SECOND - FOURTH FLOOR PLUMBING PLAN

Sheet No.

P-2



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

Location

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No.	Revision Date
	10-10-24

Project No: 2024169
Scale: AS NOTED
Date: 03-04-25
Drawn By: E.A

Drawing Name

ROOF PLUMBING PLAN

Sheet No.

P-3

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAL
No. 51899
REGISTERED PROFESSIONAL ENGINEER

BASIC PLUMBING REQUIREMENTS

PART 1. – GENERAL

1.1 RELATED DOCUMENTS

ALL APPLICABLE REQUIREMENTS OF OTHER PORTIONS OF THE CONTRACT DOCUMENTS APPLY TO THE WORK OF THIS SECTION INCLUDING, BUT NOT LIMITED TO, ALL DRAWINGS, ALL SPECIFICATIONS, GENERAL CONDITIONS, AND GENERAL REQUIREMENTS INCLUDING SUBMITTALS.

1.2 APPLICABLE CODES AND STANDARDS

APPLICABLE CODES: ALL LOCAL AND STATE BUILDING CODES, INCLUDING THE INTERNATIONAL PLUMBING CODE
MASSACHUSETTS STATE PLUMBING CODE AND THE MASSACHUSETTS STATE BUILDING CODE.
APPLICABILITY OF STANDARDS: EXCEPT WHERE THE CONTRACT DOCUMENTS INCLUDE MORE STRINGENT REQUIREMENTS, APPLICABLE CONSTRUCTION INDUSTRY STANDARDS HAVE THE SAME FORCE AND EFFECT AS IF BOUND OR COPIED DIRECTLY INTO THE CONTRACT DOCUMENTS. SUCH STANDARDS ARE MADE A PART OF THE CONTRACT DOCUMENTS BY REFERENCE.

CONFLICTING REQUIREMENTS: WHERE COMPLIANCE WITH TWO OR MORE STANDARDS IS SPECIFIED, AND THE STANDARDS ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, REFER REQUIREMENTS THAT ARE DIFFERENT, BUT APPARENTLY EQUAL, AND UNCERTAINTIES TO THE ARCHITECT FOR A DECISION BEFORE PROCEEDING.

PUBLICATION DATES: WHERE THE DATE OF ISSUE OF A REFERENCED STANDARD IS NOT SPECIFIED, COMPLY WITH THE STANDARD IN EFFECT AS OF DATE OF CONTRACT DOCUMENTS.

ABBREVIATIONS AND NAMES: TRADE ASSOCIATION NAMES AND TITLES OF GENERAL STANDARDS ARE FREQUENTLY ABBREVIATED. THE FOLLOWING ACRONYMS OR ABBREVIATIONS AS REFERENCED IN CONTRACT DOCUMENTS ARE DEFINED TO MEAN THE ASSOCIATED NAMES. NAMES AND ADDRESSES ARE SUBJECT TO CHANGE AND ARE BELIEVED TO BE BUT ARE NOT ASSURED TO BE ACCURATE AND UP TO DATE AS OF DATE OF CONTRACT DOCUMENTS.

AGA – AMERICAN GAS ASSOCIATION
ANSI – AMERICAN NATIONAL STANDARDS INSTITUTE
ARI – AIR CONDITIONING AND REFRIGERATION INSTITUTE
ASHRAE – AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEERS
ASME – AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ASSE – AMERICAN SOCIETY OF SANITARY ENGINEERING
ASTM – AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS – AMERICAN WELDING SOCIETY
AWWA – AMERICAN WATER WORKS ASSOCIATION
CISPI – CAST IRON SOIL PIPE INSTITUTE
NEC – NATIONAL ELECTRIC CODE
NFPA – NATIONAL FIRE PROTECTION ASSOCIATION
NSF – NATIONAL SANITATION FOUNDATION
PDI – PLUMBING AND DRAINAGE INSTITUTE
UL – UNDERWRITERS LABORATORIES
DOT – DEPARTMENT OF TRANSPORTATION
EPA – ENVIRONMENTAL PROTECTION AGENCY
OSHA – OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

1.3 SUBMITTALS

PRIOR TO THE PERFORMANCE OF ANY WORK OR INSTALLATION OF ANY MATERIALS, OBTAIN APPROVAL FROM THE ARCHITECT BY SUBMITTING SHOP DRAWINGS AND DATA SHEETS.

SUBMITTAL OF SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES WILL BE ACCEPTED ONLY WHEN SUBMITTED BY THE GENERAL CONTRACTOR. DATA SUBMITTED FROM SUBCONTRACTORS AND MATERIAL SUPPLIERS DIRECTLY TO THE ARCHITECT WILL NOT BE PROCESSED. CERTIFIED DRAWINGS AND CATALOG DATA SHEETS SHALL SHOW:
1. SPECIFICALLY WHAT ITEMS AND FEATURES ARE TO BE PROVIDED.
2. APPLICABLE SPECIFICATION SECTION NUMBER AND EQUIPMENT TAG NUMBER.
3. PRINCIPAL DIMENSIONS AND DETAILS OF CONSTRUCTION.
4. WEIGHTS: INFORMATION REQUIRED FOR THE DESIGN OF SUPPORTS AND FOUNDATIONS.
5. SIZES AND LOCATIONS OF PIPING AND CONNECTIONS.
6. PERFORMANCE DATA CERTIFIED BY THE MANUFACTURER.
7. SUBMIT SCHEDULE OF PROPOSED PIPING, VALVES, SPECIALTIES, ETC.
8. ANY DEVIATIONS FROM THE CONTRACT DOCUMENTS SHALL BE SEPERATELY IDENTIFIED.

PLUMBING SUBMITTALS SHALL BE PROVIDED FOR THE FOLLOWING ITEMS:
1. PIPING AND FITTING MATERIALS.
2. PLUMBING VALVES AND SPECIALTIES.
3. PIPING HANGER AND ATTACHMENT ASSEMBLIES.
4. PIPING INSULATION.
5. ALL SCHEDULED PLUMBING FIXTURES, DRAINS, AND CLEANOUTS.
6. UTILITY CONNECTION DETAILS REQUIRED BY AUTHORITIES HAVING JURISDICTION.

APPROVAL OF SHOP DRAWINGS DOES NOT RELEASE RESPONSIBILITY OF COORDINATING HIS WORK AT JOBSITE AND TAKING FIELD MEASUREMENTS. IN CASES WHERE INTERFERENCES BECOME APPARENT, NOTIFY ARCHITECT SO THAT SUCH INTERFERENCES MAY BE RESOLVED PRIOR TO PROCEEDING WITH SHOP WORK. NO CLAIM WILL BE ALLOWED FOR WORK THAT MIGHT HAVE TO BE MOVED OR REPLACED BASED ON A CLAIM THAT WORK WAS PLACED IN ACCORDANCE WITH DIMENSIONS INDICATED ON AN APPROVED SHOP DRAWING.

1.4 COORDINATION

COORDINATE WITH THE BUILDING TRADES:
1. STRUCTURAL MEMBERS, PADS, AND BUILDING OPENINGS FOR FIXTURES, EQUIPMENT, PIPING, ETC., FOR USE BY THIS INDICATED ON THE ARCHITECTURAL AND STRUCTURAL PLANS ARE THE COORDINATION RESPONSIBILITY OF THIS INSTALLER. PAY FOR ANY CHANGES IN THE ABOVE REQUIREMENTS AFTER LETTING AND ACCEPTING THE CONTRACT.
2. THE DRAWINGS SHOW THE GENERAL ARRANGEMENT, DIRECTIONS AND SIZES OF EQUIPMENT, PIPING, ETC. IT IS NOT INTENDED TO SHOW EVERY OFFSET AND FITTING OF EVERY SITE DIFFICULTY THAT MAY BE ENCOUNTERED. PROVIDE ALL MATERIALS AND PERFORM ALL LABOR NECESSARY TO MAKE COMPLETE WORKING SYSTEMS, READY FOR USE, WITHOUT EXTRA CHARGE. ALL MEASUREMENTS MUST BE VERIFIED ON THE JOBSITE.
3. EXAMINE THE SITE AND ALL DRAWINGS BEFORE PROCEEDING WITH THE LAYOUT AND INSTALLATION OF THIS TO SUIT ACTUAL CONDITIONS. CONFER AND COOPERATE WITH OTHER TRADES ON THE JOB SO THAT ALL WORK WILL BE INSTALLED IN PROPER RELATIONSHIP. COORDINATE PRECISE LOCATION OF PARTS WITH OTHER WORK. ALL SYSTEMS SHALL BE INSTALLED TO PROVIDE MAXIMUM HEADROOM, EXCEPT WHERE DIMENSIONED OTHERWISE ON THE DRAWINGS.

1.5 RECORD DOCUMENTS

RECORD DRAWINGS: MAINTAIN A CLEAN, UNDAMAGED SET OF PRINTS OF CONTRACT DRAWINGS AND SHOP DRAWINGS. MARK THE SET TO SHOW THE ACTUAL INSTALLATION WHERE THE INSTALLATION VARIES SUBSTANTIALLY FROM THE WORK AS ORIGINALLY SHOWN. MARK WHICHEVER DRAWING IS MOST CAPABLE OF SHOWING CONDITIONS FULLY AND ACCURATELY; WHERE SHOP DRAWINGS ARE USED, RECORD A CROSS-REFERENCE AT THE CORRESPONDING LOCATION ON THE CONTRACT DRAWINGS. GIVE PARTICULAR ATTENTION TO CONCEALED ELEMENTS THAT WOULD BE DIFFICULT TO MEASURE AND RECORD LATER.
1. MARK INFORMATION THAT IS IMPORTANT TO THE OWNER, BUT WAS NOT SHOWN ON CONTRACT DRAWINGS OR SHOP DRAWINGS.
2. ORGANIZE RECORD DRAWING SHEETS INTO MANAGEABLE SETS. BIND WITH DURABLE PAPER COVER SHEETS, AND PRINT SUITABLE TITLES, DATES AND OTHER IDENTIFICATION ON THE COVER OF EACH SET.
3. MARK AND BRANCHES OF PIPING SYSTEMS, WITH VALVES AND CONTROL DEVICES LOCATED AND NUMBERED, CONCEALED UNIONS LOCATED, AND WITH ITEMS REQUIRING MAINTENANCE LOCATED (I.E., TRAPS, STRAINERS, EXPANSION COMPENSATORS, TANKS, ETC.).
4. EQUIPMENT LOCATIONS (EXPOSED AND CONCEALED), DIMENSIONED FROM AT LEAST TWO PROMINENT BUILDING LINES.
5. APPROVED SUBSTITUTIONS, CONTRACT MODIFICATIONS, AND ACTUAL EQUIPMENT AND MATERIALS INSTALLED.
6. INCLUDE ALL "CORRECTED FOR RECORD" SHOP DRAWINGS TO REFLECT APPROVALS RECEIVED.

1.6 MAINTENANCE MANUALS

ORGANIZE OPERATING AND MAINTENANCE DATA INTO SUITABLE SETS OF MANAGEABLE SIZE. BIND PROPERLY INDEXED DATA IN INDIVIDUAL HEAVY-DUTY 2-INCH, 3-RING VINYL-COVERED BINDERS, WITH POCKET FOLDERS FOR FOLDED SHEET INFORMATION. MARK APPROPRIATE IDENTIFICATION ON FRONT AND SPINE OF EACH BINDER. INCLUDE THE FOLLOWING TYPES OF INFORMATION.
1. COPIES OF WARRANTIES.
2. WIRING DIAGRAMS.
3. INSPECTION PROCEDURES.
4. APPROVED SHOP DRAWINGS AND PRODUCT DATA.
5. DESCRIPTION OF FUNCTION, NORMAL OPERATING CHARACTERISTICS AND LIMITATIONS, PERFORMANCE CURVES, ENGINEERING DATA AND TESTS, AND COMPLETE NOMENCLATURE AND COMMERCIAL NUMBERS OF REPLACEMENT PARTS.
6. MANUFACTURER'S PRINTED OPERATING PROCEDURES TO INCLUDE START-UP, BREAK-IN, AND ROUTINE AND NORMAL OPERATING INSTRUCTIONS; REGULATION, CONTROL, STOPPING, SHUTDOWN, AND EMERGENCY INSTRUCTIONS; AND SUMMER AND WINTER OPERATING INSTRUCTIONS.
7. MAINTENANCE PROCEDURES FOR ROUTINE PREVENTATIVE MAINTENANCE AND TROUBLESHOOTING; DISASSEMBLY, REPAIR, AND REASSEMBLY; ALIGNING AND ADJUSTING INSTRUCTIONS.
8. SERVICING INSTRUCTIONS AND LUBRICATION CHARTS AND SCHEDULES.

1.7 REGULATIONS AND PERMITS
PROVIDE NOTICES, FILE PLANS, OBTAIN PERMITS AND LICENSES, PAY FEES, AND OBTAIN NECESSARY APPROVALS FROM AUTHORITIES HAVING JURISDICTION.

PAY FOR AND OBTAIN ALL REQUIRED PERMITS & SCHEDULE INSPECTIONS IN A TIMELY MANNER AS TO NOT DELAY THE PROJECT. OBTAIN ALL NECESSARY PERMITS INCLUDING BUT NOT LIMITED TO ENTERING MANHOLES, USE OF WATER FROM LOW PRESSURE HYDRANTS, DEMOLITION AND NEW WORK, ETC. PRIOR TO COMMENCE OF WORK.

PART 2. – PRODUCTS

2.1 GENERAL PRODUCT REQUIREMENTS

ALL EQUIPMENT AND MATERIALS, EXCEPT AS OTHERWISE SPECIFIED, SHALL BE NEW, OF CURRENT PRODUCTION, FIRST QUALITY AND OF THE BEST OF EACH CLASS SPECIFIED. MATERIALS, PRODUCTS, AND EQUIPMENT SHALL BE DELIVERED TO JOBSITE WITH FACTORY PACKAGING BEARING MANUFACTURER'S NAME OR LABEL AND UNION LABEL WHENEVER PRACTICAL.

PART 3. – EXECUTION

3.1 PLUMBING INSTALLATIONS
GENERAL: SEQUENCE, COORDINATE, AND INTEGRATE THE VARIOUS ELEMENTS OF PLUMBING SYSTEMS, MATERIALS, AND EQUIPMENT. COMPLY WITH THE FOLLOWING REQUIREMENTS:
1. COORDINATE SYSTEMS, EQUIPMENT, AND MATERIALS INSTALLATION WITH OTHER BUILDING COMPONENTS.
2. VERIFY ALL DIMENSIONS BY FIELD MEASUREMENTS.
3. ARRANGE FOR CHASES, SLOTS, AND OPENINGS IN OTHER BUILDING COMPONENTS DURING PROGRESS OF CONSTRUCTION, TO ALLOW FOR MECHANICAL INSTALLATIONS.
4. COORDINATE THE INSTALLATION OF REQUIRED SUPPORTING DEVICES AND SLEEVES TO BE SET IN POURED-IN-PLACE CONCRETE AND OTHER STRUCTURAL COMPONENTS, AS THEY ARE CONSTRUCTED.
5. INSTALL SYSTEMS, MATERIALS, AND EQUIPMENT LEVEL AND PLUMB, PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, WHERE INSTALLED EXPOSED IN FINISHED SPACES.
6. INSTALL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.
7. PROVIDE ACCESS PANELS OR DOORS WHERE UNITS ARE CONCEALED BEHIND FINISHED SURFACES.
8. COMPLY WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS AND RECOMMENDATIONS, TO THE EXTENT THAT THOSE INSTRUCTIONS AND RECOMMENDATIONS ARE MORE EXPLICIT OR STRINGENT THAN REQUIREMENTS CONTAINED IN CONTRACT DOCUMENTS.
9. INSPECT MATERIALS OR EQUIPMENT IMMEDIATELY UPON DELIVERY AND AGAIN PRIOR TO INSTALLATION. REJECT DAMAGED AND DEFECTIVE ITEMS.

3.2 FINAL INSPECTION
PRIOR TO FINAL ACCEPTANCE, ALL SYSTEMS SHALL BE OPERATED TO TEST PERFORMANCE TO THE SATISFACTION OF THE ARCHITECT.
1. WATER SHALL CIRCULATE THROUGHOUT SYSTEMS WITHOUT NOISE, WATER HAMMER, LEAKS, TRAPPING, OR AIR-BINDING.
2. MOTORS AND OTHER EQUIPMENT SHALL OPERATE WITHOUT EXCESSIVE NOISE OR VIBRATION.
3. DRAINS SHALL FLOW FREELY, WITHOUT EXCESSIVE NOISE, LEAKS OR STOPPAGES.

CORRECT DEFECTS DEMONSTRATED BY INSPECTIONS AND TESTS TO THE SATISFACTION OF THE ARCHITECT.

3.3 CLEANING OF SYSTEMS AND PREMISES

ALL EQUIPMENT AND FIXTURES SHALL BE THOROUGHLY CLEANED OF DIRT AND DEBRIS AT THE COMPLETION OF THE PROJECT AND PRIOR TO ACCEPTANCE BY THE OWNER.

3.4 PROTECTION

GUARDS, BARRICADES, LIGHTS, SERVICES, ETC., NECESSARY FOR THE PROTECTION OF PERSONS AND PROPERTY SHALL BE FURNISHED AND MAINTAINED.

EXISTING WORK SUCH AS PAVEMENTS, LAWNS, SIDEWALKS, FLOORS, CURBS, AND OTHER STRUCTURES AND UTILITIES WHICH ARE DAMAGED OR DISTURBED DUE TO MAKING CONNECTIONS OR ANY PHASE OF OPERATIONS SHALL BE RESTORED TO THE SATISFACTION OF THE OWNER AND THE GOVERNING AUTHORITIES.

GENERAL NOTES:

1. SHOULD ANY CONTRADICTION, AMBIGUITY, ERROR, INCONSISTENCY, OMISSION OR INCOMPLETE SYSTEM APPEAR IN OR BETWEEN ANY OF CONTRACT DOCUMENTS THE CONTRACTOR SHALL BEFORE SUBMITTING THE FINAL BID AND SIGNING THE CONTRACT FOR CONSTRUCTION, NOTIFY THE ARCHITECT AND REQUEST A WRITTEN RESOLUTION AS TO WHICH METHODS OR MATERIALS WILL BE REQUIRED. IN THE EVENT OF CONFLICTING REQUIREMENTS OF STANDARDS , DRAWINGS AND SPECIFICATIONS, THE CONTRACTOR SHALL COMPLY WITH THE MORE STRINGENT REQUIREMENTS. BEFORE SUBMITTING THE FINAL BID AND THE SIGNING THE CONTRACT FOR THE CONSTRUCTION THE CONTRACTOR SHALL OBTAIN A WRITTEN INTERPRETATION FROM THE ARCHITECT. IN NO CASE SHALL THE CONTRACTOR PROCEED WITH THE AFFECTED WORK UNTIL ADVISED BY THE ARCHITECT.

IF THE CONTRACTOR FAILS TO MAKE A REQUEST FOR INTERPRETATION OR RESOLUTION NO EXCUSE WILL BE ACCEPTED FOR FAILURE TO CARRY OUT THE WORK IN A SATISFACTORY MANNER, AS INTERPRETED BY THE ARCHITECT. THIS GENERALLY MEANS THE USE OF THE HIGHEST QUALITY MATERIAL, MOST EXPENSIVE WAY OF PERFORMING WORK AND PROVIDING COMPLETE FUNCTIONING SYSTEM FOR PROPER OPERATION.

EACH AND EVERY TRADE OR SUBCONTRACTOR WILL BE DEEMED TO HAVE FAMILIARIZED THEMSELVES WITH ALL THE CONTRACT DOCUMENTS OF THIS PROJECT, INCLUDING ARCHITECTURAL, STRUCTURAL, MECHANICAL, ELECTRICAL AND SITE WORK, AND TO HAVE VISITED THE SITE, SO AS TO AVOID ERROR, OMISSIONS AND MISINTERPRETATIONS. RELATED INFORMATION MAY BE PROVIDED ON CONTRACT DOCUMENTS OTHER THAN THOSE ASSOCIATED WITH THE SUBCONTRACTOR'S TRADE. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING RELATED WORK OF ALL THE CONTRACT DOCUMENTS. NO ADDITIONAL COMPENSATION WILL BE AUTHORIZED FOR ALLEGED ERRORS, OMISSIONS AND MISINTERPRETATIONS WHETHER THEY ARE A RESULT OF FAILURE TO OBSERVE THIS REQUIREMENT OR NOT.

2. ALL PENETRATIONS OF ASSEMBLIES EXPOSED TO THE EXTERIOR ENVIRONMENT SHALL BE SEALED WITH FOAM SEALANT OR EQUIVALENT SEALER TO PROVIDE ZERO AIR INFILTRATION. COORDINATE WITH FIRE STOPPING REQUIREMENTS.

3. NO COMPONENT OF ANY SYSTEM SHALL RUN THROUGH THE STAIR ENCLOSURE THAT DOES NOT RELATE TO OR SERVE THE STAIR ENCLOSURE.

PLUMBING NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR TYPE AND LOCATION OF ALL FIRE WALLS. ANY PENETRATION THROUGH FIRE FLOORS SHALL BE FIRE STOPPED . ANY PENETRATION THROUGH FIRE WALL SHALL BE FIRE CAULKED. REFER TO SECTION 7275 FOR PROCEDURE.

2. WITHOUT LIMITATION PAY ATTENTION TO THE FOLLOWING ITEMS:

   A. CHASES BEHIND BATHROOM WALL BETWEEN CORRIDOR AND BATHROOM) AND WALLS BETWEEN UNITS ARE FIRE RATED. FIRE CAULK ALL PENETRATIONS.

   B. TOP AND BOTTOM WALL PLATES AT CEILING AND AT FLOOR IS PART OF FIRE SEPARATION. FIRE STOP ALL PENETRATIONS THROUGH PLATES.

INSULATION NOTES

THE FOLLOWING SYSTEMS SHALL BE INSULATED.
DUCT LINER SHALL BE CLOSED CELL TYPE, GERM PROOF

ESTAR REQUIREMENTS:

1. DOMESTIC HOT WATER & RECIRCULATION MAINS AND BRANCHES:
   PIPING < 1" REQUIRES 1" INSULATION
   PIPING > 1½" REQUIRES 1½" INSULATION

IECC 2018 REQUIREMENTS:

1. DOMESTIC HOT WATER MAINS AND BRANCHES:
   PIPING < 1" REQUIRES 1" INSULATION
   PIPING > 1½" REQUIRES 2" INSULATION

GENERAL INSULATION REQUIREMENTS:

CW PIPING: ½" INSULATION
HORIZONTAL STORM: ½" INSULATION

THIS BUILDING WILL SHALL BE QUALIFIED FOR ESTAR, STRETCH CODE, AND LEED SILVER. PROVIDE THE MOST STRINGENT LEVELS OF INSULATION FOR QUALIFICATION

1. GENERAL PROVISIONS OF CONTRACT, INCLUDING GENERAL AND SUPPLEMENTARY CONDITIONS AND GENERAL REQUIREMENTS, APPLY TO WORK SPECIFIED ON THESE DRAWINGS.
2. COORDINATE WORK WITH THAT OF OTHER TRADES AFFECTING OR AFFECTED BY WORK OF THIS SECTION AND COOPERATE WITH SUCH TRADES TO ASSURE THE STEADY PROGRESS OF THE WORK.
3. ALL WORK AND MATERIALS SHALL COMPLY WITH THE STATE PLUMBING AND GAS CODES AND THE LOCAL CODES.
4. FURNISH AND INSTALL A COMPLETE, SANITARY DRAINAGE AND VENT SYSTEM THROUGHOUT THE BUILDING FOR CONNECTION TO EVERY FIXTURE OR PIECE OF EQUIPMENT REQUIRING DRAINAGE. THE NEW WORK SHALL EXTEND AND CONNECT TO THE EXTERIOR SANITARY SYSTEM AS INDICATED.
5. FURNISH AND INSTALL A COMPLETE HOT WATER AND COLD WATER SYSTEM THROUGHOUT THE BUILDING CONNECTING TO ALL FIXTURES AND EQUIPMENT REQUIRING HOT AND/OR COLD WATER. THE COLD WATER SYSTEM WORK SHALL EXTEND AND CONNECT TO THE EXTERIOR COLD WATER SYSTEM AS INDICATED. THE HOT WATER SYSTEM WORK SHALL BEGIN AT EACH NEW WATER HEATER WHERE INDICATED.
6. FURNISH TO OWNER A WRITTEN GUARANTEE OF THE GENERAL CONTRACTOR AND THIS SUBCONTRACTOR JOINTLY AND SEVERALLY, AGAINST ANY DEFECTS IN MATERIALS AND WORKMANSHIP IN WORK OF THIS SECTION FOR A PERIOD OF ONE YEAR FROM DATE OF SUBSTANTIAL COMPLETION.
7. SUBMIT SHOP DRAWINGS ON PLUMBING FIXTURES AND VALVES SPECIFIED.
8. FURNISH AND INSTALL ALL PIPE OPENINGS, PIPE HANGERS AND HANGER RODS, AND FIXTURE SUPPORTS. PROPERLY SECURE HANGER RODS TO BUILDING STRUCTURE. SEAL ALL PIPE OPENINGS THROUGH FLOORS AND ROOF WATER TIGHT.
9. BURIED STORM, SANITARY AND VENT PIPING SHALL BE CAST IRON PIPE AND DRAINAGE FITTINGS. ABOVE GROUND SANITARY AND VENT PIPING SHALL BE CAST IRON PIPE AND DRAINAGE FITTINGS/PVC SCHED. 40 SOLID. PROVIDE FIRE STOPPING AND SHEET METAL SLEEVES AS REQUIRED BY CODE WHERE ALL PVC PIPING PASSES THROUGH FIRE RATED WALLS AND FLOORS.
10. HOT AND COLD WATER PIPING SHALL BE TYPE L SEAMLESS COPPER TUBING AND FITTINGS WITH 95-5 SOLDER JOINTS. FLOWGUARD PIPING SYSTEM. SEEK APPROVAL FROM ARCHITECT AND BUILDING OWNER REPRESENTATIVE BEFORE SUBMITTING FOR APPROVAL TO ENGINEER. ALL PIPING SHALL BE INSULATED AND MARKED AS HOT WATER (HW) OR COLD WATER (CW)
11. VALVES FOR HOT AND COLD WATER SHALL BE GATE VALVE, BRONZE BODY AND TRIM, NON-RISING STEM, 200 PSIG, SOLDER END, SIMILAR TO JENKINS 1240 OR APPROVED EQUAL. VALVES FOR GAS SHALL BE IRON BODY, PLUG TYPE, WITH SQUARE KEY AND THREADED ENDS.
12. COLD WATER AND HOT WATER PIPING INSULATION SHALL BE 1/2" THICK. WITH FACTORY APPLIED FIBERGLASS CLOTH WITH INTEGRAL VAPOR BARRIER AND SELF-SEALING LAP. FITTINGS AND VALVES SHALL BE COVERED WITH PRE-CUT FIBERGLASS INSERTS AND FITTED WITH MOULDED PVC COVERS, SECURED WITH GLASS FABRIC TAPE WITH MASTIC. INSULATION SHALL BE FIBREGLASS 25 ASJ OR EQUAL, AND SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS TO CONFORM TO THE ALL NON-COMBUSTIBLE RATING.
13. PLUMBING FIXTURES:
    (TO BE APPROVED BY BUILDING OWNER REPRESENTATIVE BEFORE SUBMISSION FOR APPROVAL TO ENGINEER)
14. HB- HOSE BIBB, WALL HYDRANT – WOODFORD MODEL 25 FREEZE RESISTANT, WITH INTREGAL VACUUM BREAKER. (PROVIDE EVERY 150', WHERE DIRECTED BY BUILDING OWNER)
15. WATER HEATERS – FURNISH AND INSTALL WATER HEATERS WHERE INDICATED.
    (TO BE APPROVED BY BUILDING OWNER REPRESENTATIVE BEFORE SUBMISSION FOR APPROVAL TO ENGINEER)
16. TEST ALL NEW PLUMBING WORK IN ACCORDANCE WITH PLUMBING CODE REQUIREMENTS.
17. PROVIDE HEAT TRACE ON ALL PIPING SUBJECT TO FREEZING.

GENERAL NOTES | NTS

GENERAL NOTES

NOTE FOLLOWING LINE ITEMS ARE LISTED FOR QUALITY PURPOSES AND APPLICABLE WHERE COMPONENTS PRESENT IN THE PROJECT.

REGARDLESS HOW THE DETAILS ARE SHOWN, CONTRACTOR SHALL FOLLOW MANUFACTURER'S INSTALLATION RECOMMENDATIONS.

CONTRACTOR SHALL PAY ATTENTION TO GAS FIRED EQUIPMENT DISCHARGE LOCATIONS RELATIVE TO AIR INTAKES BEFORE ANY INSTALLATION AND MAINTAIN CODE REQUIRED OR MANUFACTURER REQUIRED CLEARANCES.

1–ALL HOT WATER PIPING SHALL BE INSULATED, INCLUDING TAKE OFFS.

2–ALL HORIZONTAL COLD WATER MAINS OR BRANCH LINES ABOVE CEILINGS SHALL BE INSULATED.

3–ALL TRAPS SHALL HAVE CLEAN OUTS.

4–ALL COMMON AREA FAUCETS SHALL HAVE POINT OF USE MIXING VALVES, ZURN LEAD FREE SERIES LFUSG-B OR EQUAL

5–ALL FIXTURES SHALL HAVE MULTI TURN LEAD FREE WATER STOPS AS MANUFACTURED BY ZURN LF SERIES.

6–ALL VENT THROUGH THE ROOF LOCATIONS SHALL BE FIELD COORDINATED WITH HVAC EQUIPMENT INTAKES AND IF NECESSARY SHALL BE EXTENDED 3FT ABOVE THE EQUIPMENT WITHIN 10FT OF THE VENT.

7–ALL FLOOR DRAINS SHALL HAVE TRAP PRIMERS.

8–ALL FLOOR PENETRATIONS SHALL BE FIRE RATED WITH FIRE STOP MATERIAL OR INTUMESCENT TYPE COLLARS AS REQUIRED.

9–UNLESS NOTED OTHERWISE PVC MAY BE USED FOR RESIDENTIAL TYPE BUILDINGS UP TO TEN FLOORS FOR DRAINAGE. CPVC MAY BE USED FOR DOMESTIC HOT/COLD WATER IN RESIDENTIAL TYPE BUILDINGS UP TO 60 FT, OR 6 STORY BUILDINGS. PROVIDE SOUND INSULATION ON ALL PVC VERTICAL DRAIN LINES

10–PROVIDE DRAIN PAN FOR ALL STORAGE TYPE WATER HEATERS AND WASHING MACHINES W/DRAINS CONNECTED TO SEWER DRAIN, PROVIDE TRAP PRIMERS.

11–PROVIDE COMPLETE PIPING FOR DISHWASHER AND DISPOSAL CONNECTIONS, OBSERVE CLEARANCE REQUIREMENTS UNDER KITCHEN SINKS.

12–ALL DRAINS LOCATED BELOW THE STREET GRADE SHALL HAVE LOCAL OR CENTRAL TYPE BACK WATER VALVES. DRAINS FROM UPPER FLOORS WILL CONNECT AT EXIT.

13–ALL PLUMBING FIXTURES SHALL BE APPROVED TYPE IN THE STATE OF PROJECT BEING USED, SPECIFICATIONS ARE FOR QUALITY, LOOK AND PERFORMANCE PURPOSES ONLY. IF SPECIFIED EQUIPMENT IS NOT THE APPROVED TYPE. CONTRACTOR SHALL PROVIDE SIMILAR APPROVED FIXTURE.

14–ALL FLOOR DRAINS IN BOILER ROOMS SHALL BE COORDINATED WITH BOILER PLACEMENTS SO THAT CONDENSATE DRAINS WILL BE DRAINED TO FLOOR DRAIN.

15–ALL PENETRATIONS THROUGH FIRE RATED WALLS AND CEILINGS SHALL BE FIRE SAFED.
USE FIRE PUDDY WITH FIRE WOOL FILLING FOR 2" AND SMALL PIPES,
USE INTUMESCENT COLLAR FOR LARGER PIPES.

16– PROVIDE BALL TYPE SHUT OFF VALVES FOR ALL RISERS AND WATER BRANCHES OFF THE MAIN
PIPES. RISERS SHALL HAVE DRAIN VALVES WITH CAP AND CHAIN

GENERAL NOTES

1) FOR EXACT LOCATION OF PLUMBING FIXTURES SEE ARCHITECTURAL DRAWINGS.
2) EXAMINE ALL CONTRACT DRAWINGS, GENERAL CONDITIONS AND SPECIFICATIONS WHICH MAY AFFECT THE WORK.
3) ALL PLUMBING WORK MUST BE COORDINATED WITH ALL OTHER TRADES BEFORE PROCEEDING WITH INSTALLATION.
4) CHECK INVERT ELEVATIONS AND EXACT LOCATIONS OF ALL OUTSIDE UTILITIES BEFORE INSTALLING ANY UNDERGROUND.
5) NO CHANGES ARE TO BE MADE IN PLUMBING LAYOUT WITHOUT WRITTEN PERMISSION OF THE ARCHITECT.
6) NO PIPING SHALL RUN EXPOSED IN FINISHED AREAS.
7) ALL PLUMBING SYSTEM SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE LOCAL AND STATE PLUMBING CODES.
8) ROUGHING DIMENSIONS OF TOILET FIXTURES MUST BE COORDINATED WITH GENERAL CONTRACTOR.
9) INSTALL ALL HOT AND COLD WATER PIPING AS PER SPECIFICATIONS.
10) INSTALL SHUTOFF GATE VALVES ON ALL BRANCH SUPPLY LINES AND AT THE BASE OF HOT AND COLD WATER RISERS.
11) PLUMBING CONTRACT SHALL REQUIRES PANELS TO ACCESS THE CONCEALED PLUMBING CLEANOUTS, DRAINS, DEVICES AND CONTROLS. ACCESS PANELS SHALL BE FIRE RATED TO MATCH THE PENETRATING PARTITION OR CEILING TYPE. GENERAL CONTRACTOR SHALL INSTALL THE ACCESS PANELS.
12) INSTALL ALL FLOOR CLEANOUTS TO CLEAR EQUIPMENT.
13) PLUMBING CONTRACTOR SHALL OBTAIN AND PAY FOR ALL PERMITS, FEES AND CHARGES IN CONNECTION WITH THE WORK.
14) PLUMBING CONTRACTOR SHALL PROVIDE WATERTIGHT SLEEVES FOR ALL PIPES PASSING THRU BASEMENT WALLS.
15) INSTALL CLEANOUTS AT THE BASE OF ALL SANITARY STACKS.
16) INSTALL ALL HORIZONTAL RUNS OF PIPING AS HIGH AS POSSIBLE, PITCH ALL WATER PIPING TO DRAIN, DRAW OFFS AT ALL POINTS.
17) PLUMBING CONTRACTOR SHALL MAKE ALL FINAL CONNECTIONS TO OUTSIDE UTILITIES.
18) FOR PIPE SIZES NOT SHOWN ON PLANS SEE DETAILS & RISER DIAGRAMS.

PIPING MATERIAL NOTES

SANITARY AND VENT: BELOW GROUND: SWCI WITH PUSH ON JOINTS.

ABOVE GROUND:
-SCH.40 PVC WITH SOLVENT JOINTS FOR ALL PLUMBING FIXTURES ONLY SERVING RESIDENTIAL FLOORS, IF SANITARY MAIN CONNECTS TO COMMERCIAL FIXTURES FROM THAT POINT AND BEYOND SHALL BE CAST IRON. IF ANY CONNECTION FROM RESIDENTIAL TO COMMERCIAL FIXTURES HAPPENS ON FIRST LEVEL TRANSITION TO CAST IRON IN RESIDENTIAL LEVEL.
-SWCI WITH HUSKY 4-BAND CLAMPS FOR ALL PLUMBING IN CONNECTIONS IN COMMERCIAL AND GARAGE LEVELS.

WATER PIPING: TYPE "L" COPPER WITH 95-5 SOLDER JOINTS FOR SERVICE, CPVC FOR RESIDENTIAL USE AREA.

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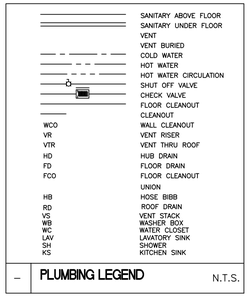

– **PLUMBING LEGEND** N.T.S.

PLUMBING FIXTURE SPECIFICATION SCHEDULE

DESIGNATION	FIXTURE SYMBOL	SYMBOL	MANUFACTURER	FIXTURE			FITTING				CARRIER	LOCATION	REMARKS
				MODEL	TYPE	SIZE	MANUF/MODEL#	TYPE	SUPPLY	TRAP			
REFER TO ARCITECTURAL SPECIFICATION FOR PLUMBING FIXTURES													
TRAP PRIMER	FD	T.P.	PRECISION PLUMBING PRODUCTS	PR-500	–	–	–	–	½" CW SUPPLY	–	–	AS SHOWN	PROVIDE DU-4 FOR MULTIPLE TRAP PRIMERS
PLEASE REFER TO PLUMBING SPECIFICATIONS FOR FIXTURE SELECTION.													

NOTE: ALL WASHER MACHINES TO BE PROVIDED WITH AQUA MANAGERS "FLOODSTOP" (FS 3/4-H) AUTOMATIC FLOOD PROTECTION KIT

DESIGNATION	LOCATION	MANUFACTURER	MODEL NO
FD	AS SHOWN	ZURN	SERIES 415B CAST IRON BODY WITH TYPE "B" STRAINER
FCO	AS SHOWN	ZURN	SERIES ZN-1400-HD
HB	AS SHOWN	ZURN	SERIES Z1321 ECOUTROL CERAMIC DISC WALL HYDRANT, EXPOSED, NON-FREEZE, ANTI-SIPHON, AUTOMATIC DRAINING
WATER HAMMER ARRESTOR	AS SHOWN	SIOUX CHIEF	SERIES 660 SERIERS OR EQUAL BY PRECISION PLUMBING PRODUCTS

SCHEDULE OF WATER HEATER

DESIGNATION	NAME	LOCATION	DESCRIPTION
WH-1 TO WH-20	APARTMENT HOT WATER HEATER	RESIDENTIAL MECH. CLOSET	RHEEM ELECTRIC WATER HEATER, MODEL PROPH50 T2 RH375-50SO GAL. CAPACITY, 4.5 KW, 208V/1Φ, .93 EF, 21 GPH @90°F RISE RECOVERY,

G.C. TO PROVIDE LOUVERED DOOR FOR WATER HEATER CLOSETS OR PROVIDE DUCT KIT

FIRE SAFE THROUGH WOOD FLOORS

TYPE	SIZE	HILTI	MATERIAL	RATING	BOTTOM	TOP	CHASE WALL
STEEL/CAST COPPER/CAST	MAX 4"	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	REQUIRED
STEEL/CAST 4" EMT/ 2" FLEX	MAX 4"	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
STEEL/CAST COPPER/CAST	MAX 4"	CP-620	FIRE FOAM	1HRS	FIRE STOP	FIRE STOP	REQUIRED
PEX	MAX 1"	CP 645	INTUMESCENT STRIP W/COLLAR	1HRS	BOTH SIDES	BOTH SIDES	NOT REQUIRED
PVC PIPE	MAX 2"	FS-ONE	INTUMESCENT SEALANT	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
PVC PIPE	MAX 4"	FS-ONE	INTUMESCENT SEALANT	2HRS	FIRE STOP	FIRE STOP	REQUIRED
PVC PIPE	MAX 4"	CP 645	INTUMESCENT STRIP W/COLLAR	1HRS	COLLAR	FIRE STOP	NOT REQUIRED
REFRIGERANT	–	FS-ONE	INTUMESCENT SEALANT –	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
4" DUCT	MAX 4"	FS-ONE	INTUMESCENT SEALANT –	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
INSULATED COPPER/STEEL	MAX 2"	FS-ONE	INTUMESCENT SEALANT –	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED
CABLES	MAX 2"	FS-ONE	INTUMESCENT SEALANT –	1HRS	FIRE STOP	FIRE STOP	NOT REQUIRED

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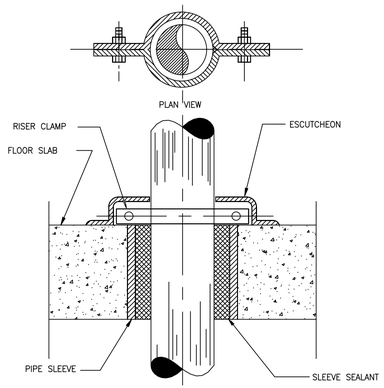
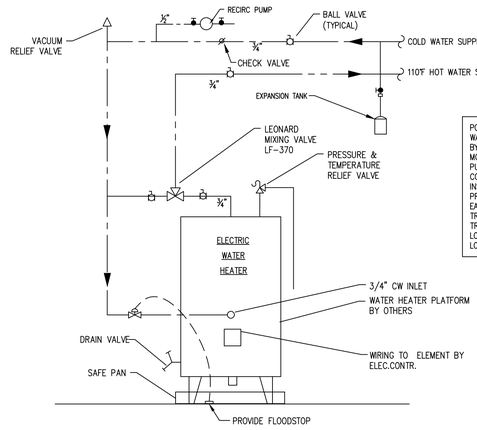
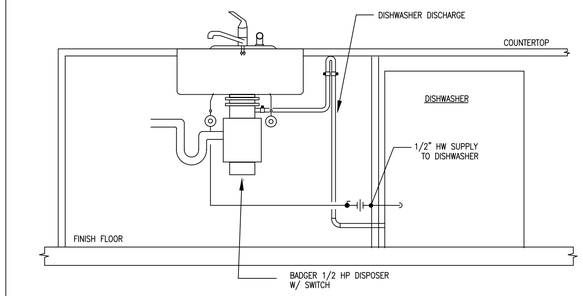


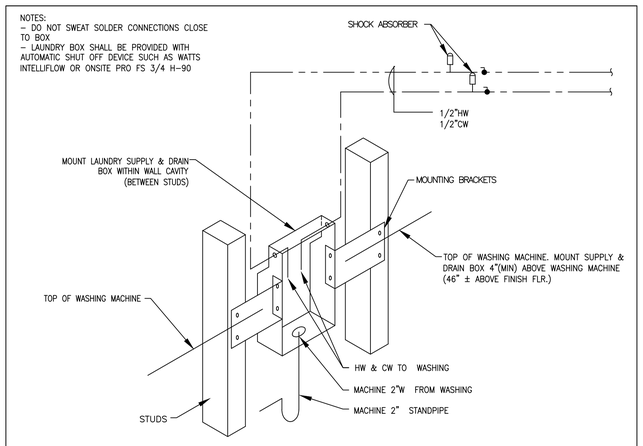
PIPE SLEEVE THROUGH EXPOSED FLOOR SLAB | N.T.S.



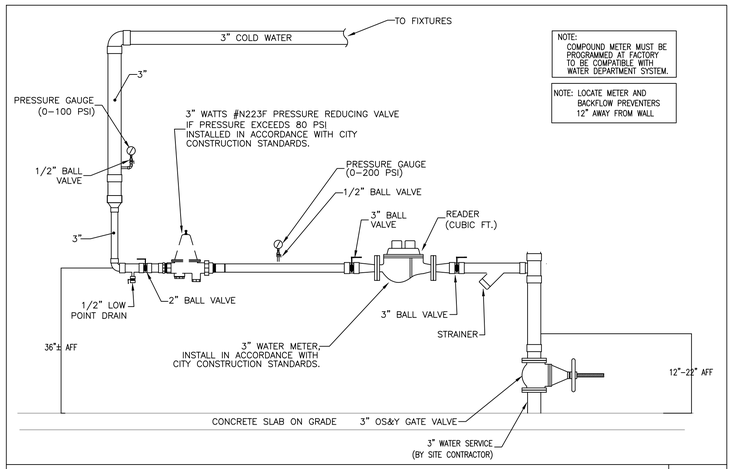
ELECTRIC WATER HEATER PIPING DETAIL | NTS



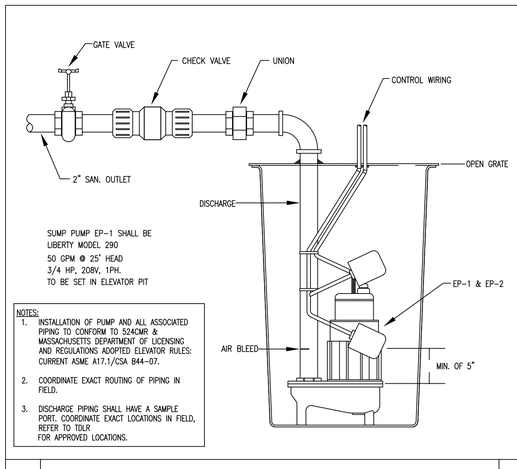
KITCHEN AND DISHWASHER DETAIL | N.T.S.



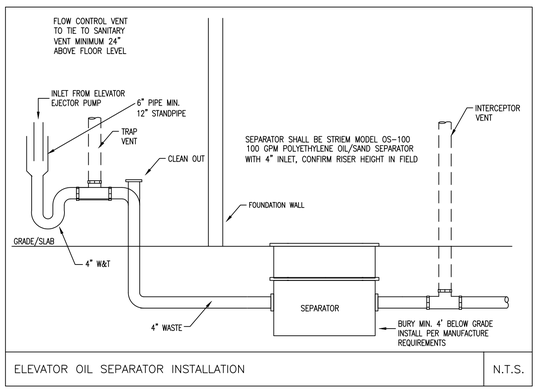
WASHING MACHINE CONNECTION | N.T.S.



WATER METER WITH 2" WATER SERVICE DETAIL | N.T.S.



– ELEVATOR SUMP PUMP DETAIL | N.T.S.



ELEVATOR OIL SEPARATOR INSTALLATION | N.T.S.

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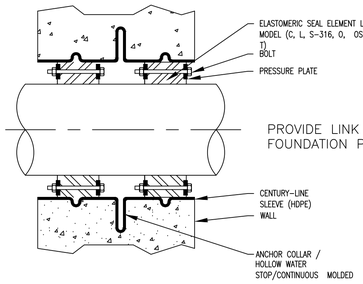
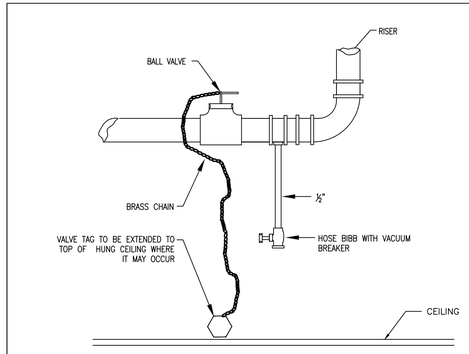


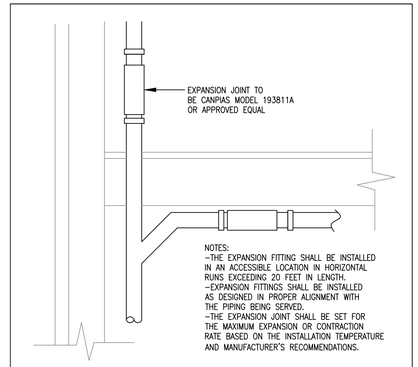
LS Model	Seal Element	Bolts/Nuts	Pressure Plate
C Polymer	EPDM (Black)	Zinc Dichromate/Organic Coated Carbon Steel Bolt	Reinforced Nylon

Sleeve Model	Description	Material
CS	Century-Line Sleeve	HDPE

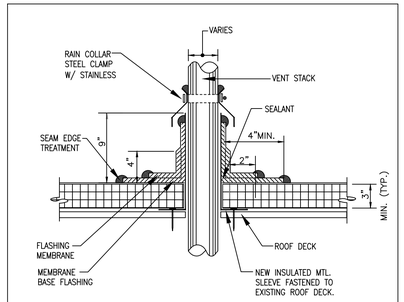
LINK SEAL DETAIL — N.T.S.



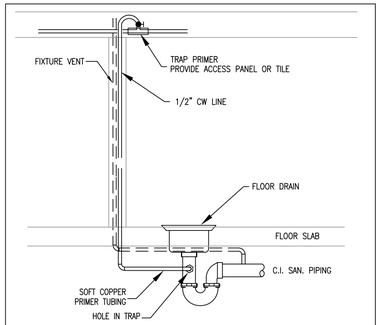
TYPICAL CONNECTION AT BASE OF WATER RISER — N.T.S.



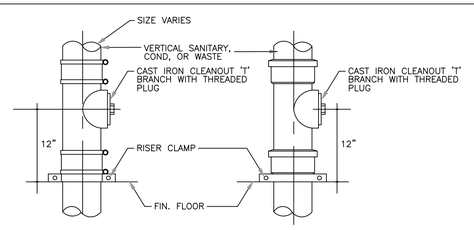
P.V.C. EXPANSION JOINT FITTING — N.T.S.



VENT TERMINAL — N.T.S.

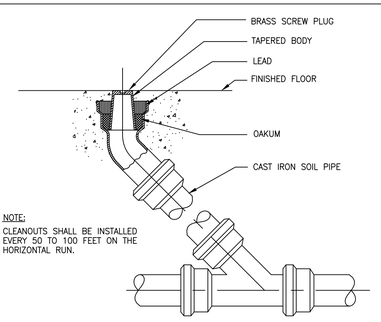


TRAP PRIMER DETAIL — N.T.S.



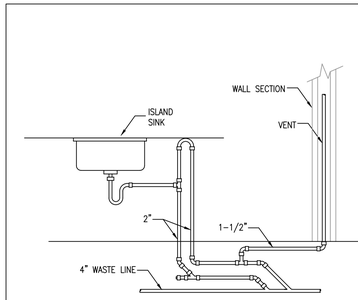
NOTE: LOCATE CLEANOUTS IN UNFINISHED OR NON-PUBLIC SPACES, COORDINATE LOCATIONS WITH ARCHITECT AND OTHER TRADES.

DIAGRAM – DANDY CLEANOUT — N.T.S.

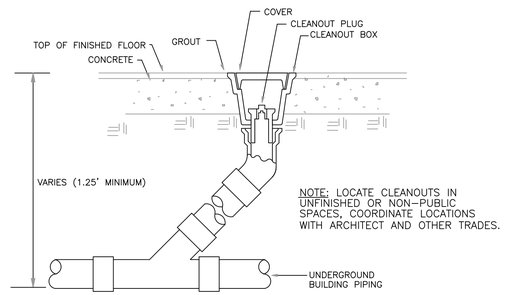


NOTE:
CLEANOUTS SHALL BE INSTALLED EVERY 50 TO 100 FEET ON THE HORIZONTAL RUN.

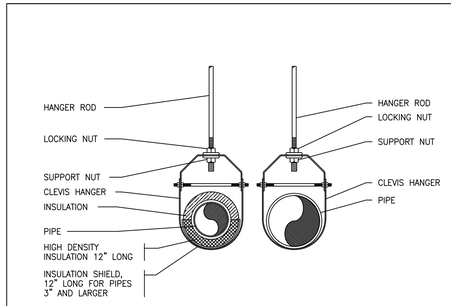
TYPICAL FLOOR CLEANOUT — N.T.S.



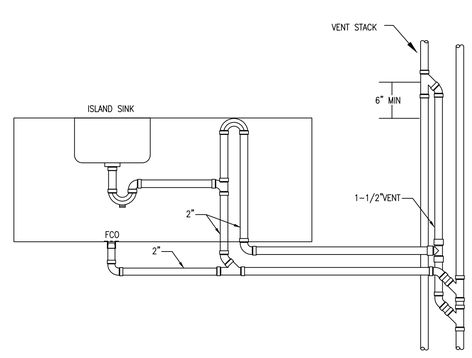
BOW VENT HORIZONTAL CONNECTION DETAIL — N.T.S.



FLOOR LEVEL CLEANOUT DETAIL — N.T.S.



PIPE HANGER INSTALLATION DETAIL — N.T.S.



BOW VENT VERTICAL CONNECTION DETAIL — N.T.S.

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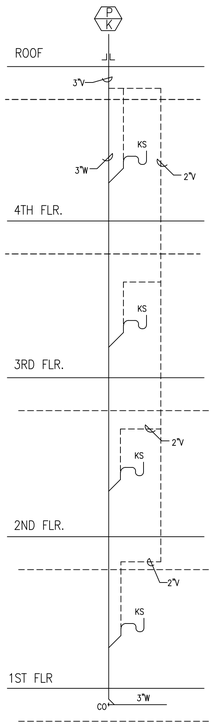
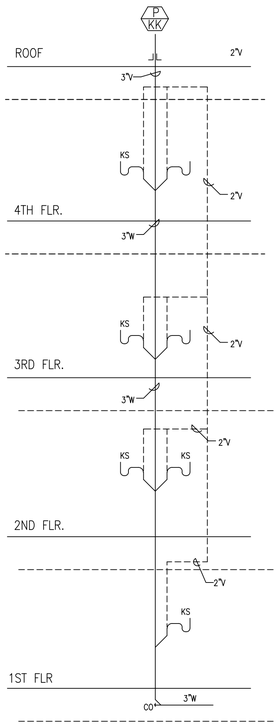
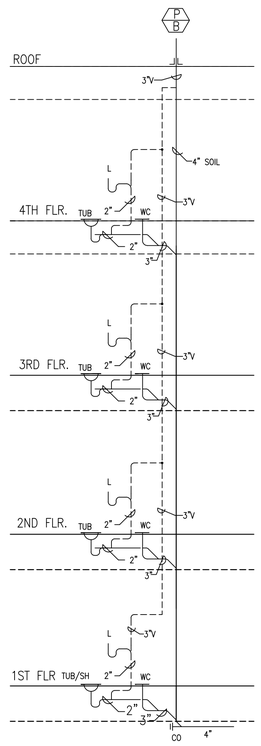


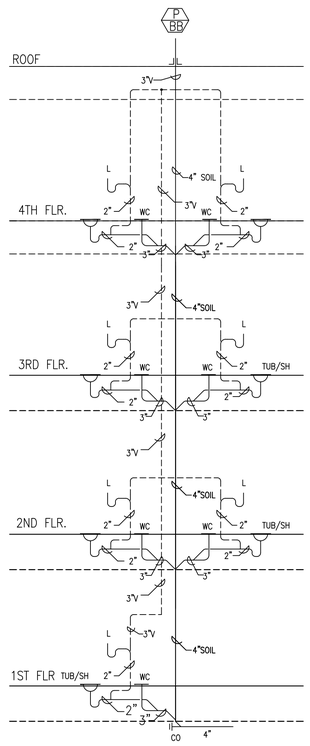
KITCHEN STACK



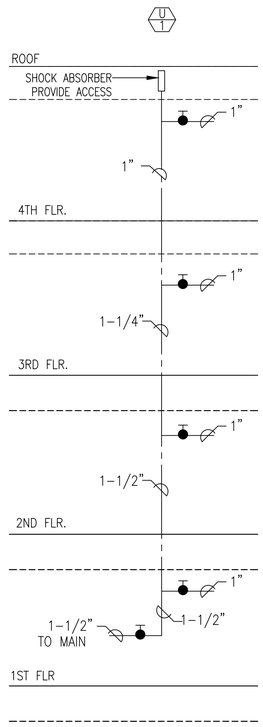
BACK–TO–BACK KITCHEN STACK



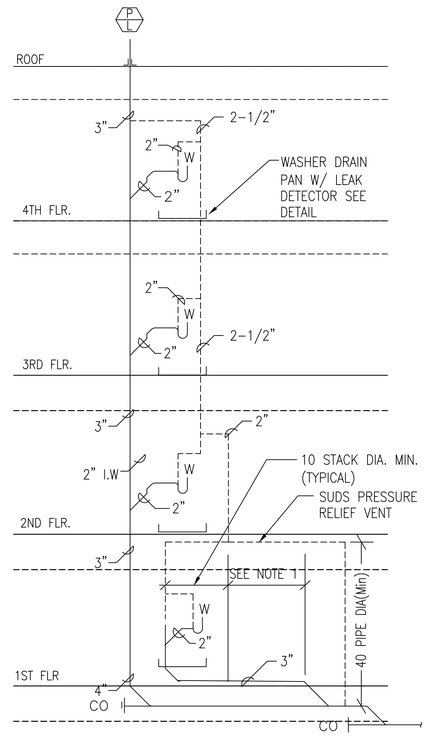
BATH STACK



BACK–TO BACK BATH STACK



CW RISER



NOTE: ALL WASHER MACHINES TO BE PROVIDED WITH AQUA MANAGERS "FLOODSTOP" (FS 3/4–H) AUTOMATIC FLOOD PROTECTION KIT

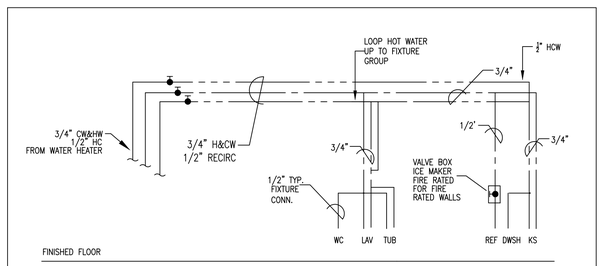
TYPICAL SANITARY RISER DIAGRAMS

N.T.S.

RISER DIAGRAMS DO NOT SHOW OFFSETS.

NOTES:

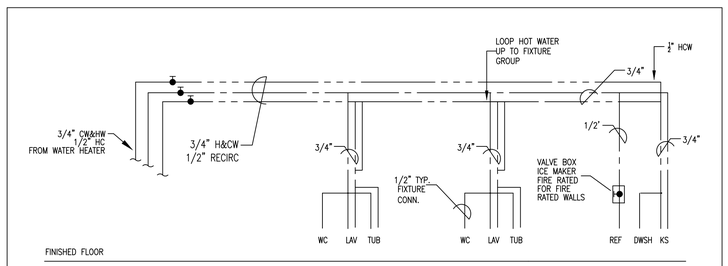
1. 40 PIPE DIAMETER (MIN) IF CHANGE IN DIRECTION IS GREATER THAN 45°.
2. LONG SWEEPS & DANDY CLEANOUTS MAY BE USED IN LIEU OF WYE 1/8 BEND.
3. IF THERE ARE MORE THAN TEN BRANCH INTERVALS ON STACK THEN A RELIEF VENT SHALL BE INSTALLED IN ACCORDANCE WITH 248 CHR 2.16(4)(e).
4. IF IDEAL CONDITIONS DO NOT EXIST, THE LOCAL PLUMBING INSPECTOR MAY APPROVE A VARIATION FROM FIGURE 19 TO ACCOMODATE THE INTENT OF 248 CMR 2.15(9)(d).



TYPICAL WATER PIPING DIAGRAM

N.T.S.
SEE FLOOR PLANS FOR ACTUAL LOCATION OF FIXTURES

CODE REQUIRES HOT WATER RECIRC. LOOP TO EVERY FIXTURE AT A DISTANCE 20' AND MORE. LOOP HOT WATER THROUGH ALL THE FIXTURES AND THE CHASES AND RETURN ¾" HCW TO WATER HEATER FROM THE MOST DISTANT FIXTURE.



TYPICAL WATER PIPING DIAGRAM

N.T.S.
SEE FLOOR PLANS FOR ACTUAL LOCATION OF FIXTURES

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WASHER RISER DIAGRAMS

N.T.S.

RISER DIAGRAMS DO NOT SHOW OFFSETS.

COMMONWEALTH OF MASSACHUSETTS
MURAT EKERBICER
MECHANICAL
No. 51899
REGISTERED
PROFESSIONAL ENGINEER

Location

PROPOSED RESIDENTIAL BUILDING 17 KENSINGTON AVE SOMERVILLE, MA

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PLUMBING DETAILS

Sheet No.

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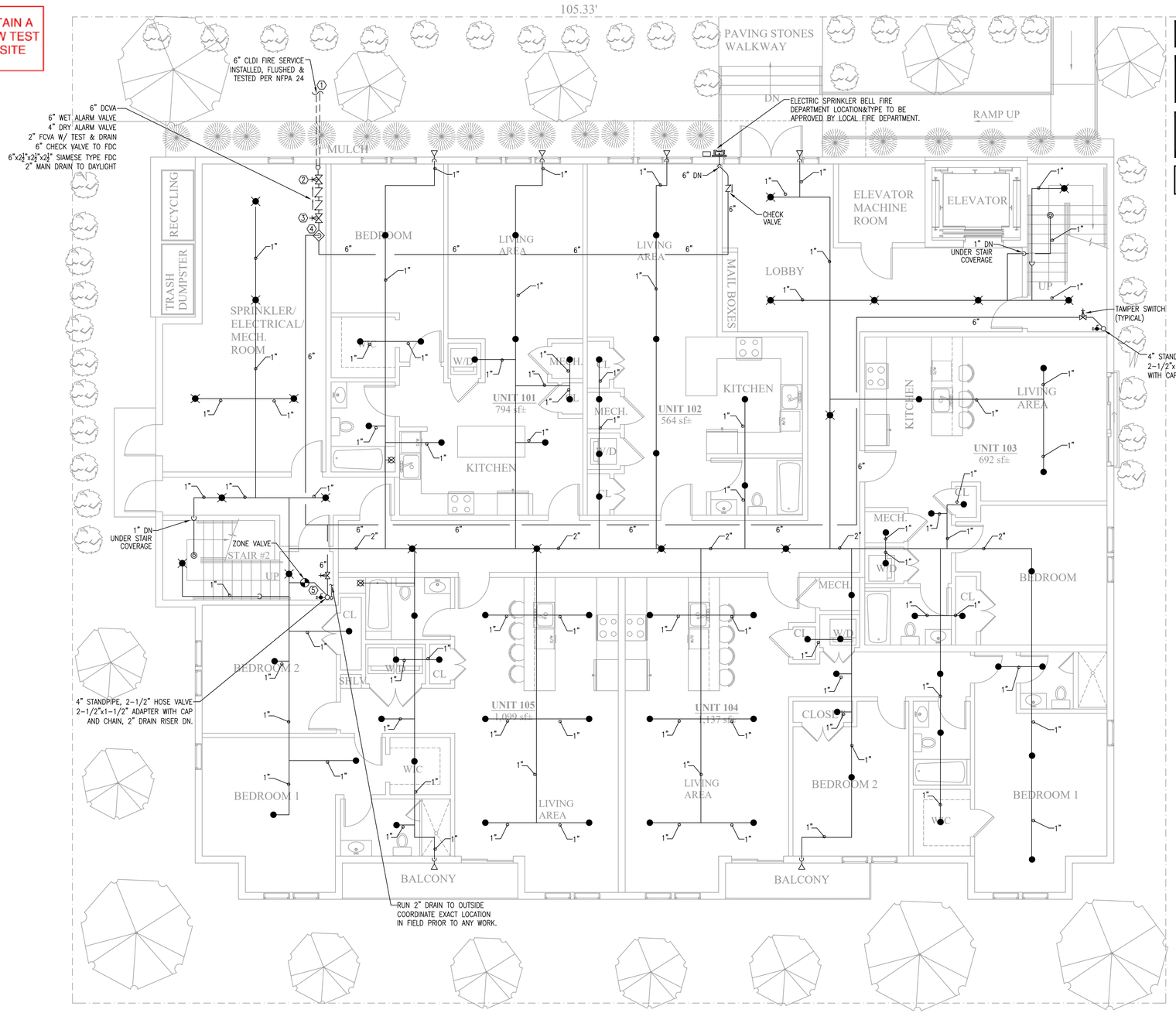
CONTRACTOR SHALL OBTAIN A CURRENT HYDRANT FLOW TEST PRIOR TO ANY WORK ON SITE



DRY SIDEWALL SPRINKLER HEADS ARE REQUIRED AT ALL BUILDING OVERHANGS EXCEEDING 4-FT.

NOTES:
SPRINKLER CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL NEW WORK WITH BUILDING FEATURES AND OTHER TRADES AT NO ADDITIONAL COST TO THE OWNER.

GENERAL NOTES:
PROVIDE COIN TYPE SPRINKLER PROTECTION FOR ALL CONCEALED SPACES CREATED DURING CONSTRUCTION AS REQUIRED BY NFPA-13, INCLUDING OPEN WEB JOIST SPACES NOT COMPLETELY FILL WITH NON-COMBUSTIBLE INSULATION.

SPRINKLER HEAD LAYOUT BASED ON LIGHTING NOT TO EXCEED 12" BELOW THE GWB CEILING.

FIRST FLOOR PLAN
SCALE: 3/16"=1'-0"

Location

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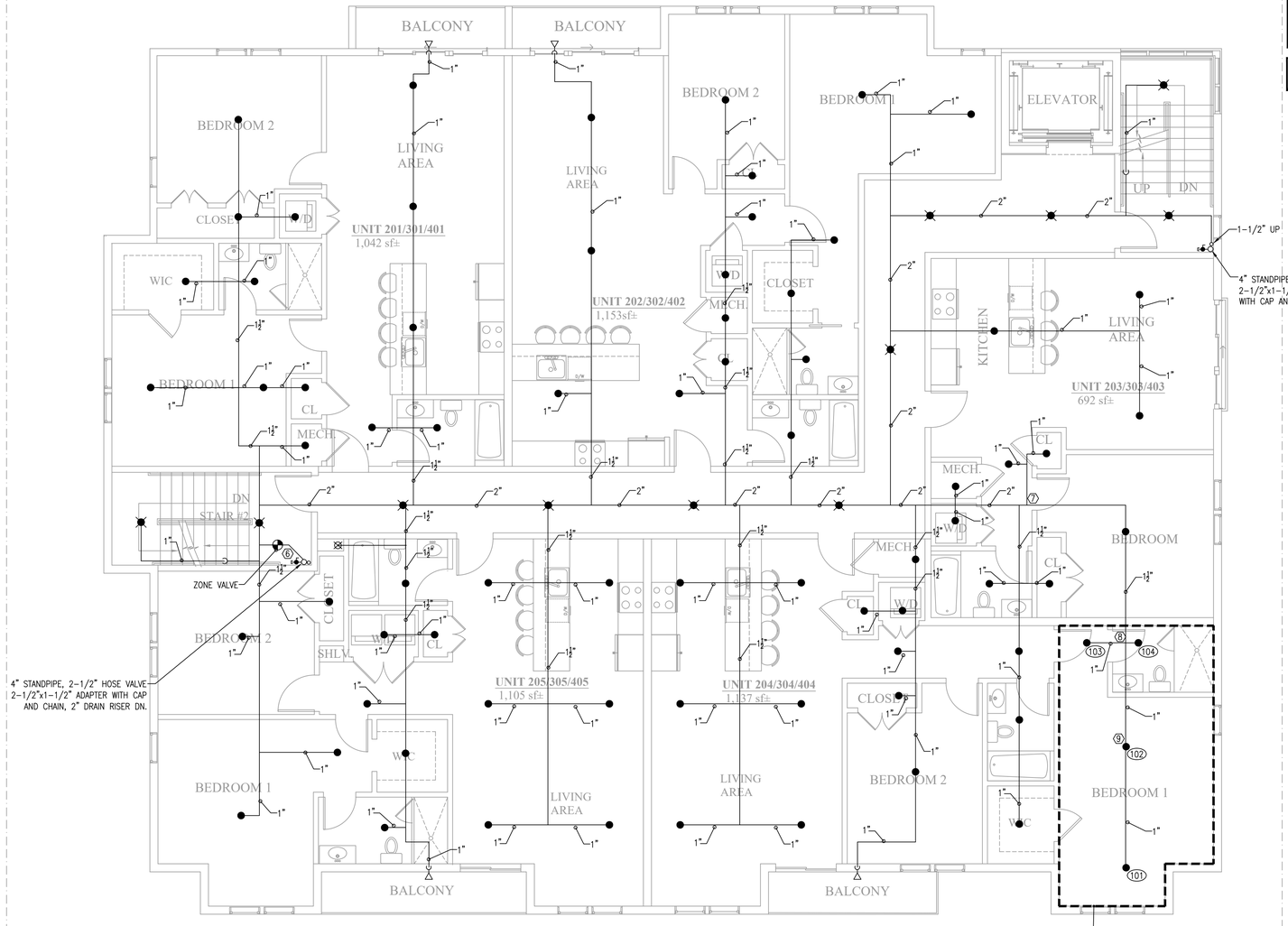
FIRST FLOOR FIRE PROTECTION PLAN

Sheet No.

FP-1



DRY SIDEWALL SPRINKLER HEADS ARE REQUIRED AT ALL BUILDING OVERHANGS EXCEEDING 4-FT.

NOTES:
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SPRINKLER HEAD LAYOUT BASED ON LIGHTING NOT TO EXCEED ½" BELOW THE GWB CEILING.

FOURTH FLOOR RESIDENTIAL	
SYSTEM TYPE: AUTOMATIC-WET	
LIGHT HAZARD RESIDENTIAL	
DENSITY: 0.10 GPM	AREA OF APPLICATION: MOST REMOTE 4 HEADS
PROTECTION AREA 14'x14'	HOSE ALLOWANCE GPM 100

SECOND TO FOURTH FLOOR PLAN
SCALE: 3/16"=1'-0"

Location

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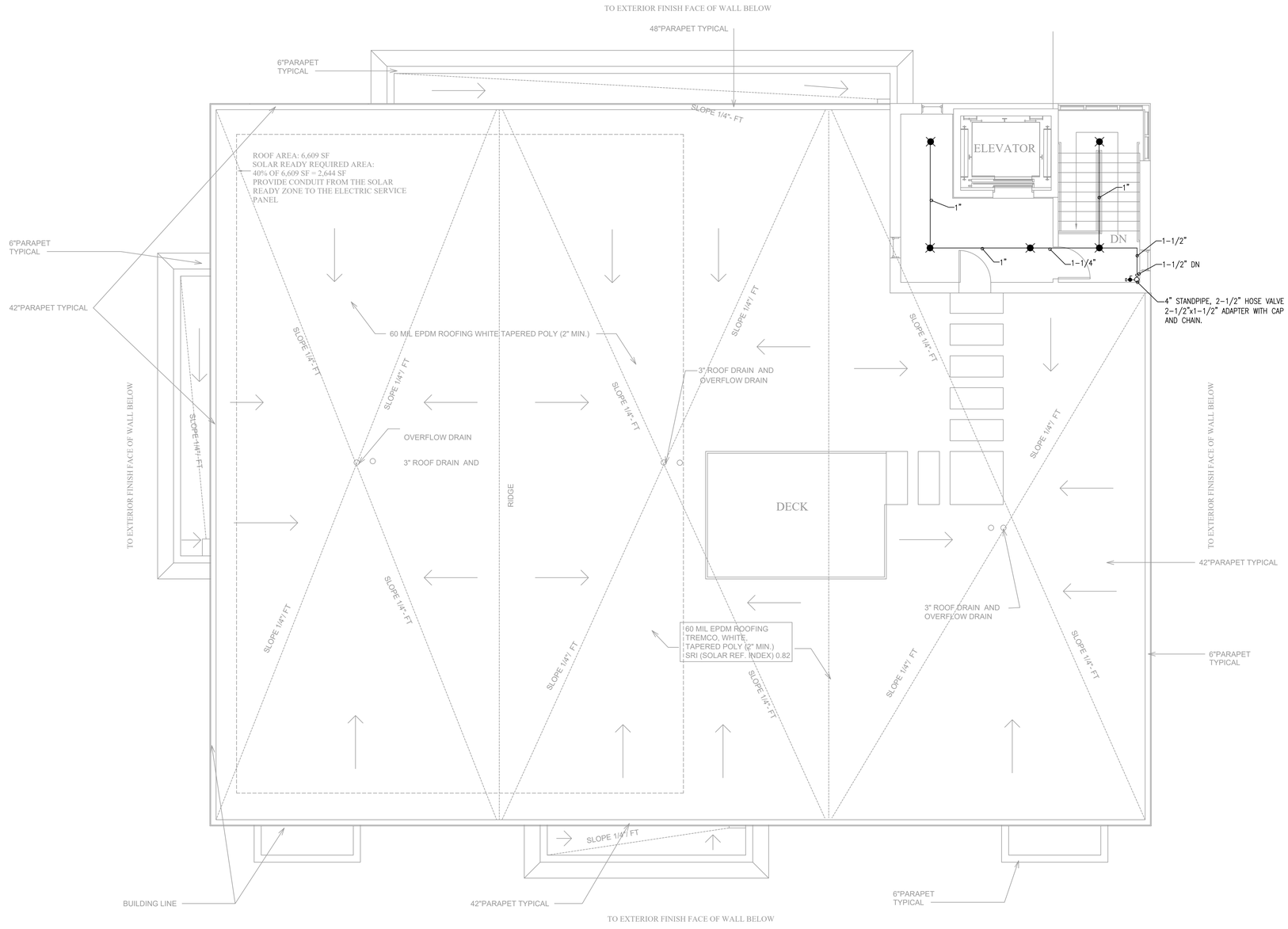
SECOND - FOURTH FLOOR FIRE PROTECTION PLAN

Sheet No.
FP-2



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

Location

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ROOF FIRE PROTECTION PLAN

Sheet No.

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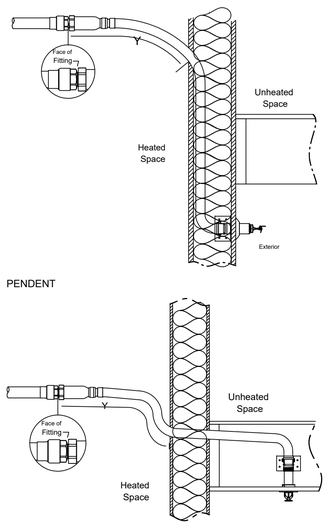
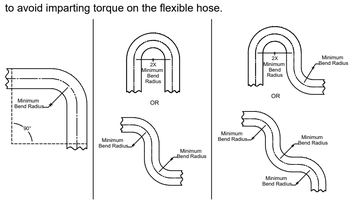


Flexible Hose Bend Characteristics:

NOTE: For out-of-plane (three-dimensional) bends, care shall be taken to avoid imparting torque on the flexible hose.

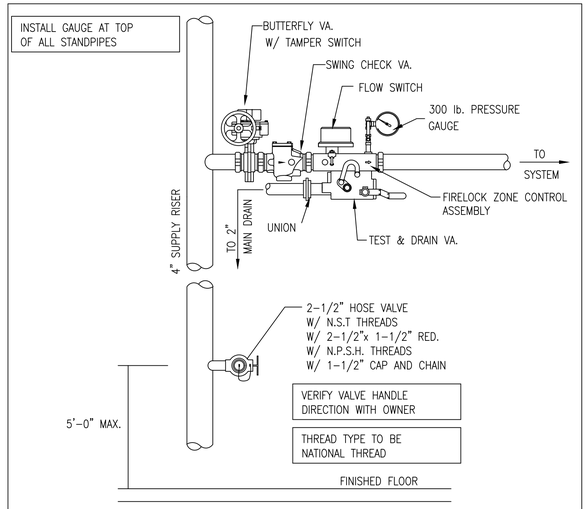


The following table is used when the ambient temperature is maintained **between 40°F/4°C and 60°F/16°C around the wet piping system.**

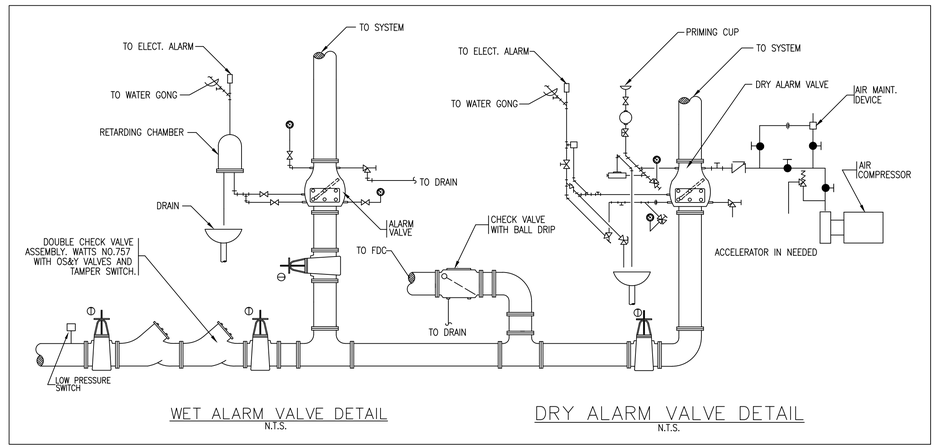
Ambient Temperature Exposed to Discharge End of Sprinkler °F/°C	Exposed Minimum Barrel Length "Y" inches/mm		
	40°F 4°C	50°F 10°C	60°F 16°C
40 4	0 0	0 0	0 0
30 -1	0 0	0 0	0 0
20 -7	4 100	0 0	0 0
10 -12	8 200	 25	0 0
0 -18	12 300	3 75	0 0
-10 -23	14 350	4 100	 25
-20 -29	14 350	6 150	3 75
-30 -34	16 400	8 200	4 100
-40 -40	18 450	8 200	4 100
-50 -46	20 500	10 250	6 150
-60 -51	20 500	10 250	6 150

NOTE: Exposed minimum barrel lengths are inclusive up to 30-mph/48-kph wind velocities

DRY SIDEWALL INSTALLATION DETAIL | NTS

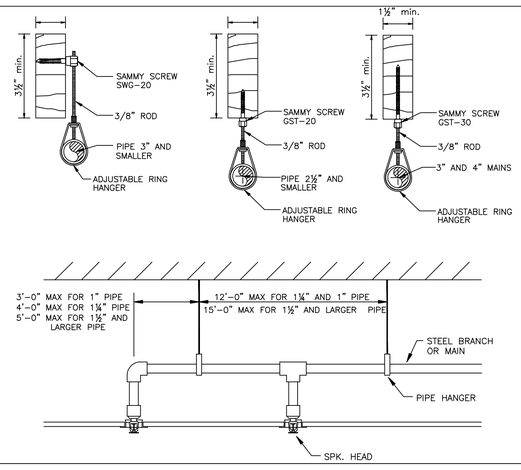


STANDPIPE RISER DETAIL | NTS

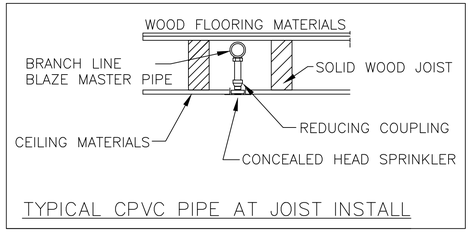


WET ALARM VALVE DETAIL N.T.S.

DRY ALARM VALVE DETAIL N.T.S.



PIPE HANGER SPACING | NTS



TYPICAL CPVC PIPE AT JOIST INSTALL

Location

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FIRE PROTECTION DETAILS

Sheet No.

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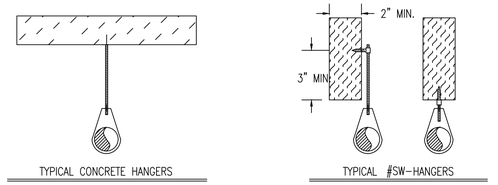
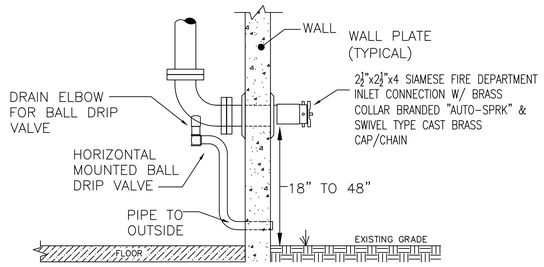
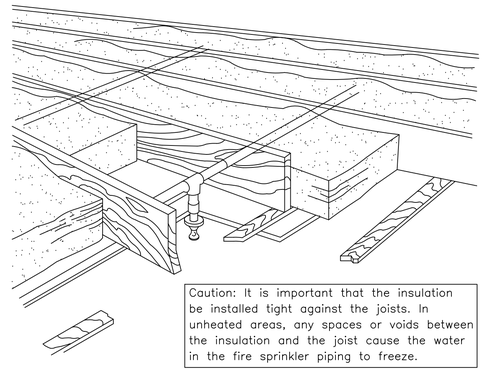


HANGER STRUCTURE ATTACHMENT | NTS



FIRE DEPARTMENT CONNECTION | NTS



Caution: It is important that the insulation be installed tight against the joists. In unheated areas, any spaces or voids between the insulation and the joist cause the water in the fire sprinkler piping to freeze.

PIPE INSULATION | NTS

Location

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FIRE PROTECTION DETAILS

Sheet No.

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DESIGN CRITERIA

THE AUTOMATIC FIRE SUPPRESSION SYSTEM HAS BEEN DESIGNED PER NFPA-13 2013, CMR 780 WITH AMENDMENTS

1. THE DRAWINGS ARE INTENDED TO BE DIAGRAMMATIC IN NATURE AND MAY NOT DEPICT EVERY COMPONENT REQUIRED TO FURNISH A FULLY CODE COMPLIANT SYSTEM. THE FIRE PROTECTION CONTRACTOR IS REQUIRED TO PROVIDE ALL MATERIAL AND LABOR TO FURNISH A FULLY CODE COMPLIANT SYSTEM PER NFPA-13 2013

PIPE, FITTINGS AND JOINTS

1. PIPE AND FITTINGS SHALL CONFORM TO THE LATEST ANSI, ASTM, NFPA AND AWWA STANDARDS INCLUDING LATEST AMENDMENTS AND SHALL BE LISTED FOR USE WITH FIRE SPRINKLER SYSTEMS

2. SEE MATERIAL SCHEDULE ON DETAIL SHEET

HANGERS AND SUPPORTS

1. HANGERS AND SWAY BRACING WHERE REQUIRED , SHALL BE INSTALLED TO MEET NFPA AND LOCAL STATE BUILDING CODE COMPLIANCE AS TO LOCATION, SPACING, AND MAXIMUM LOADS.

2. HANGER MATERIAL SHALL BE COMPATIBLE WITH PIPING MATERIALS WITH WHICH IT COMES INTO CONTACT.

3. HANGERS SHALL BE INSTALLED, IN ADDITION TO THE ABOVE, AT ALL CHANGES OF DIRECTION (HORIZONTAL AND VERTICAL), VALVES AND EQUIPMENT CONNECTIONS. HANGERS SHALL BE LOCATED SO THAT THEIR REMOVAL IS NOT REQUIRED TO SERVICE, ASSEMBLE OR REMOVE EQUIPMENT.

4. HORIZONTAL RUNS MAY USE BAND HANGERS UP TO 4" SIZE. PIPING LARGER THAN 4" SHALL BE PROVIDED WITH CLEVIS TYPE.

5. ALL RODS, CLAMPS, NUTS, WASHERS, SHIELDS AND HANGERS IN ALL AREAS SHALL BE ELECTRO-GALVANIZED COATED STEEL.

VALVES AND SUNDRIES

1. SHUTOFF VALVES ON THE ABOVEGROUND FIRE PROTECTION SYSTEM SHALL BE UL, FM BUTTERFLY OR OS&Y GATE VALVES, AS INDICATED, ON SIZES 2-1/2" AND LARGER, VALVES UP TO 2" SHALL BE UL, FM BALL VALVES. ALL ISOLATION / CONTROL VALVES SHALL BE MONITORED.

2. CHECK VALVES SHALL BE 175-POUND CLASS FOR FIRE PROTECTION.

3. VALVES SHALL BE PROVIDED WITH SEATS SUITABLE FOR THE SERVICE INTENDED.

4. VALVES SHALL BE AS MANUFACTURED BY NIBCO, VICTAULIC, WALLWORTH, MILWAUKEE OR APPROVED EQUAL. MANUFACTURERS MODEL NUMBERS REFERENCED BELOW ARE USED TO INDICATE A TYPE, MATERIAL AND QUALITY TO BE PROVIDED.

5. ALL VALVES SPECIFIED HEREIN SHALL BE UL/FM APPROVED, 175 PSI MINIMUM WORKING PRESSURE. ALL CONTROL VALVES SHALL BE PROVIDED WITH TAMPER SWITCH.

AUTOMATIC SPRINKLERS

1. SPRINKLER HEADS: QUICK RESPONSE, BULB TYPE, AND STYLE AS INDICATED OR REQUIRED BY THE APPLICATION. UNLESS OTHERWISE INDICATED.

2. IN ALL OPEN AREAS, WHERE ELECTRICAL EQUIPMENT IS LOCATED, AN APPROVED TYPE SHIELD, TO KEEP WATER OFF THE ELECTRICAL EQUIPMENT, SHALL BE PROVIDED.

3. PROVIDE ALL SPRINKLER HEADS WITH PROTECTIVE CAGE.

4. PROVIDE IN THE VALVE ROOM, A FINISHED STEEL CABINET SUITABLE FOR WALL MOUNTING, WITH HINGED COVER AND SPACE FOR 6 SPARE SPRINKLER HEADS PLUS SPRINKLER HEAD WRENCH.

SPRINKLER SHOP DRAWINGS

1. PRIOR TO INSTALLATION FIRE PROTECTION CONTRACTOR SHALL FURNISH COMPLETE TIER II SHOP DRAWINGS AND HYDRAULIC CALCULATIONS BASED ON A RECENT HYDRANT FLOW TEST FOR APPROVAL BY THE ENGINEER OF RECORD. FINAL AFFIDAVITS CANNOT BE ISSUED WITHOUT APPROVED SHOP DRAWINGS

FLUSHING AND TESTING

1. ALL LABOR, MATERIALS, INSTRUMENTS, DEVICES AND POWER REQUIRED FOR TESTING SHALL BE PROVIDED BY THIS CONTRACTOR. THE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF THE ENGINEER, GENERAL CONTRACTOR AND THE LOCAL FIRE DEPARTMENT AND SUCH OTHER PARTIES, AS MAY HAVE LEGAL JURISDICTION. NO PIPING IN ANY LOCATION SHALL BE CLOSED UP, FURRED IN, OR COVERED BEFORE TESTING.

2. WHERE PORTIONS OF PIPING SYSTEMS ARE TO BE COVERED OR CONCEALED BEFORE COMPLETION OF THE PROJECT, THOSE PORTIONS SHALL BE TESTED SEPARATELY IN THE MANNER SPECIFIED HEREIN FOR THE RESPECTIVE ENTIRE SYSTEM.

3. ANY PIPING OR EQUIPMENT THAT HAS BEEN LEFT UNPROTECTED AND SUBJECT TO MECHANICAL OR OTHER INJURY IN THE OPINION OF THE GENERAL CONTRACTOR SHALL BE RE TESTED IN PART OR IN WHOLE AS DIRECTED.

4. THE ENGINEER RETAINS THE RIGHT TO REQUEST A RECHECK OR RESETTING OF ANY PUMP OR INSTRUMENT BY THIS CONTRACTOR DURING THE GUARANTEE PERIOD AT NO ADDITIONAL COST TO THE CONTRACTOR.

5. REPAIR, OR IF DIRECTED, REPLACE ANY DEFECTIVE WORK WITH NEW WORK WITHOUT EXTRA CHARGE TO THE CONTRACT. REPEAT TESTS AS DIRECTED, UNTIL THE WORK IS PROVEN TO MEET THE REQUIREMENTS SPECIFIED HEREIN.

6. RESTORE TO ITS FINISHED CONDITION ANY WORK, DAMAGED OR DISTURBED, PROVIDED BY OTHER CONTRACTORS AND ENGAGE THE ORIGINAL CONTRACTOR TO DO THE WORK OF RESTORATION TO THE DAMAGED OR DISTURBED WORK.

7. THIS CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR AND ANY INSPECTORS HAVING JURISDICTION, A MINIMUM OF 48 HOURS IN ADVANCE OF MAKING ANY REQUIRED TESTS SO THAT ARRANGEMENTS MAY BE MADE FOR THEIR PRESENCE TO WITNESS HIS SCHEDULED TESTS.

8. TESTING SHALL BE IN ACCORDANCE WITH NFPA-13 "STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS".

9. EACH SYSTEM SHALL BE TESTED TO A HYDROSTATIC PRESSURE OF 200 PSI FOR TWO HOURS.

10. FLUSHING OF ALL BURIED SUPPLY PIPING SHALL BE PERFORMED AT A MINIMUM RATE OF 880 GPM FOR SYSTEMS WITH A 6" SERVICE.

11. ALL WATER FLOW DETECTING DEVICES AND CIRCUITS SHALL BE FLOW TESTED THROUGH THE INSPECTOR'S TEST CONNECTION AND ACTIVATE WITHIN FIVE MINUTES OF INITIATION.

12. ALL FLOW TESTS ON THE FIRE PROTECTION SYSTEMS SHALL BE PERFORMED IN THE PRESENCE OF THE AUTHORITY HAVING JURISDICTION.

13. SPRINKLER FLOW TEST DISCHARGE AND FLUSHING WATER DISCHARGE SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR AND THE LOCAL FIRE DEPARTMENT OR PUBLIC WORKS AS TO ACCEPTABLE DISCHARGE POINTS PRIOR TO SCHEDULING OF FLUSHING AND TESTS. THIS CONTRACTOR SHALL PROVIDE ALL HOSE AND EQUIPMENT NECESSARY TO PERFORM THE REQUIRED TESTING AND FLUSHING.

AS BUILT DRAWINGS AND CONTRACTOR CERTIFICATES

1. CONTRACTOR SHALL HAVE, ON HAND, AT TIME OF FINAL INSPECTION BY THE AUTHORITY HAVING JURISDICTION, FOR TEMPORARY / FINAL CERTIFICATE OF OCCUPANCY, ALL COMPLETED CERTIFICATES OF MATERIAL AND TESTING FOR ABOVEGROUND AND UNDERGROUND PIPING AS WELL AS THE AS- BUILT DRAWINGS OF THE FIRE PROTECTION INSTALLATION.

2. THE FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE ENGINEER OF RECORD AT SUCH A TIME WHERE THE INSTALLATION HAS PROGRESSED TO 90% AND PRIOR TO WALLS BEING CLOSED FOR INSPECTION.

PATCHING, REPLACEMENT AND MODIFICATION OF EXISTING WORK

1. AFTER INSTALLATION OF PIPELINES, THE CONTRACTOR SHALL NEATLY PATCH, REPAIR, AND/OR REPLACE EXISTING WORK WHERE DAMAGED, REMOVED OR ALTERED FOR PIPE LINE INSTALLATION. THIS WORK SHALL BE SIMILAR AND EQUAL IN QUALITY TO THE WORK REMOVED OR DAMAGED, UNLESS OTHERWISE SHOWN OR SPECIFIED. SUCH WORK SHALL INCLUDE PATCHING AND REPLACEMENT OF EXISTING PIPING AT POINTS OF CONNECTION TO NEW PIPING, PATCHING OF INSULATION, AND WHEREVER ANY SUCH PATCHING WORK IS INDICATED ON THE DRAWINGS OR OTHERWISE REQUIRED.

INSTALLATION

1. GENERAL: INSTALL FIRE PROTECTION SPECIALTY VALVES, FITTINGS, AND SPECIALTIES IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, NFPA 13 AND 14, AND THE AUTHORITY HAVING JURISDICTION.

2. USE PROPER TOOLS TO PREVENT DAMAGE DURING INSTALLATIONS.

3. ALL PENDENT MOUNTED SPRINKLERS SHALL BE INSTALLED ON RETURN BENDS.

4. ALL SPRINKLERS INSTALLED IN ACOUSTICAL CEILING TILES SHALL BE CENTERED IN TILES WHERE APPLICABLE.

5. COORDINATE AND VERIFY DRAFT CURTAINS ARE INSTALLED AS REQUIRED BY SPRINKLER HEAD SPECIFICATIONS

6. CONTRACTOR IS RESPONSIBLE TO PROVIDE 100% SPRINKLED BUILDING INCLUDING ALL COMBUSTIBLE CONCEALED SPACES WHETHER SHOWN ON THIS PLAN OR NOT

7. NO WORK SHALL COMMENCE BEFORE HAVING FULL APPROVAL FROM THIS OFFICE

FIRE PROTECTION SPECIFICATION

1. BEFORE BIDDING THE JOB, CONTRACTOR SHALL VISIT THE JOB SITE AND VERIFY EXISTING CONDITIONS. REPORT ADVERSE CONDITIONS IN WRITING TO ARCHITECT.

2. SPRINKLER PIPING SHALL BE SCH.10/40 BLACK STEEL WITH 125 LB. CAST IRON THREADED/GROOVED JOINTS WHERE EXPOSED. BLAZE-MASTER TYPE CPVC FOR FIRE PROTECTION SHALL BE INSTALLED CONCEALED AND PER MANUFACTURERS INSTRUCTIONS.

3. SPRINKLER HEADS IN COMMON AREAS SHALL BE QUICK RESPONSE CONCEALED TYPE MANUFACTURED BY VIKING OR EQUAL. WITHIN UNITS THEY WILL BE RESIDENTIAL CONCEALED TYPE.

4. APPLY AND OBTAIN PERMIT AND APPROVAL FROM LANDLORD'S INSURANCE COMPANY, FIRE DEPARTMENT AND STATE AND LOCAL AUTHORITIES.

5. COORDINATE WITH ARCHITECT AND ARCHITECTURAL REFLECTED CEILING PLAN FOR THE LOCATION OF SPRINKLER HEADS.

6. COORDINATE SPRINKLER WORK WITH OTHER DISCIPLINES. SINCE PERFORMANCE OF SPRINKLER SYSTEM IS AFFECTED BY OBSTRUCTIONS AND NOT OTHER WAY AROUND, THIS CONTRACTOR SHALL COORDINATE ALL LIGHTING FIXTURE LOCATIONS AND TYPES AND OTHER OBSTRUCTIONS PRIOR TO ANY WORK DONE.

7. THE SYSTEM SHALL BE HYDROSTATICALLY TESTED AT NOT LESS THAN 200 PSI PRESSURE FOR 2 HOURS. THERE WILL BE NO VISIBLE LEAKAGE WHEN THE SYSTEM IS SUBJECTED TO THE HYDROSTATIC PRESSURE TEST.

8. GUARANTEE ALL WORK AND MATERIAL FOR ONE YEAR FROM THE DATE OF ACCEPTANCE.

FLOW TEST DATA

STATIC	-----	74 PSI
RESIDUAL	-----	62 PSI
FLOW	-----	2068

NOTE:
INSTALLING CONTRACTOR SHALL PERFORM NEW HYDRANT FLOW TEST FOR USE IN TIER 2 SHOP DRAWING SUBMITTAL-THIS DATA SHALL NOT BE USED

PREPARATION OF SHOP DRAWINGS:

PER 780CMR 901.2.1

SPRINKLER CONTRACTOR SHALL PREPARE TIER ii SHOP DRAWINGS INCLUDING PIPING & HYDRAULIC CALCULATIONS, AND SHALL SUBMIT TO THE ENGINEER FOR APPROVAL PRIOR TO THE START OF WORK. ENGINEER SHALL CERTIFY SYSTEM INSTALLATION FOR CODE COMPLIANCE AT PROJECT COMPLETION.

FIRE SPRINKLER LEGEND

SYM	POSITION	FINISH	TEMP	K	NPT
	UPRIGHT	BRASS	155°	5.60	1/2"
	UPRIGHT	BRASS	200°	5.60	1/2"
D	DRY UPRIGHT	BRASS	200°	5.60	1/2"
	PENDENT	CONCEALED	155°	5.60	1/2"
	RES PENDENT	CONCEALED	155°	4.90	1/2"
	DRY PENDENT	CONCEALED	155°	5.60	1/2"
	SIDEWALL	RECESSED	155°	5.60	1/2"
	DRY SIDEWALL	CONCEALED	155°	5.60	1/2"

FIRE PROTECTION ABBREVIATIONS

DSW	DRY SIDEWALL
DCVA	DOUBLE CHECK VALVE ASSEMBLY
DIA	DIAMETER
DR	DRAIN
ETR	EXISTING TO REMAIN
FHV	FIRE HOSE VALVE
IT	INTERMEDIATE TEMPERATURE
FP	FIRE PROTECTION
FS	FLOW SWITCH
SP	STANDPIPE
GV	GATE VALVE
GAL	GALLONS
GALV	GALVANIZED
GPM	GALLONS PER MINUTE
MAX	MAXIMUM
MIN	MINIMUM
NTS	NOT TO SCALE
DN	PIPE DROP
PSI	POUNDS PER SQUARE INCH
PRV	PRESSURE REDUCING VALVE
RV	RELIEF VALVE
SPK	SPRINKLER
TS	TAMPER SWITCH
UP	PIPE RISE
VIF	VERIFY IN FIELD

FIRE PROTECTION LEGEND

SYMBOL	DESCRIPTION
	SUPERVISED BUTTERFLY VALVE
	DOUBLE CHECK VALVE ASSEMBLY
	SUPERVISED OS&Y GATE VALVE
FS	FLOW ALARM SWITCH
	SPRINKLER ZONE CONTROL ASSEMBLY (SEE DETAIL)
	PUMP (FIRE OR JOCKEY)
	DRY ALARM VALVE
	WET ALARM VALVE
	CHECK VALVE
	DRAIN VALVE
	FIRE VALVE ASSEMBLY 2-1/2"W X 2-1/2" X 1-1/2"
	PRESSURE GAUGE
XX	HYDRAULIC JUNCTION POINT
XXX	HYDRAULIC DISCHARGE NODE

FIRE PROTECTION MATERIAL SCHEDULE

NOTES:
1. COMPONENT PRESSURE RATING TO MATCH EXISTING
2. ALL MATERIALS SELECTED ON THIS SCHEDULE MUST BE APPROVED BY THE ENGINEER & LOCAL AUTHORITIES
2. ALL MATERIALS SELECTED ON THIS SCHEDULE MUST BE APPROVED BY THE ENGINEER & LOCAL AUTHORITIES

SYSTEM	PIPE										FITTINGS							JOINTS			
	BLAZEMASTER CPVC	DUCTILE IRON	EXTRA HEAVY CAST IRON	STEEL SCHED 10	STEEL SCHED 30	STEEL SCHED 40	STEEL SCHED 80	BLACK	GALVANIZED	CEMENT LINED	MALLEABLE IRON	BLAZEMASTER CPVC	LINED	BLACK	GALVANIZED	VICTAULIC	DUCTILE IRON	THREADED	MECH.JOINT-FLANGED	GROOVED	SLIP
BURIED BUILDING FIRE SERVICE		●						●		●									●		
RESIDENTIAL CROSS MAINS	●											●									●
RESIDENTIAL BRANCH LINES	●											●									●
ARM-OVER & DROPS	●											●									●
SPRINKLER DRAIN PIPE						●			●						●			●		●	
DRY SPRINKLER SYSTEM						●			●						●			●		●	

Location

PROPOSED
RESIDENTIAL BUILDING
17 KENSINGTON AVE
SOMERVILLE, MA

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No.	Revision Date
	10-10-24

Project No: 2024169
Scale: AS NOTED
Date: 03-04-25
Drawn By: E.A

Drawing Name

FIRE PROTECTION DETAILS

Sheet No.

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