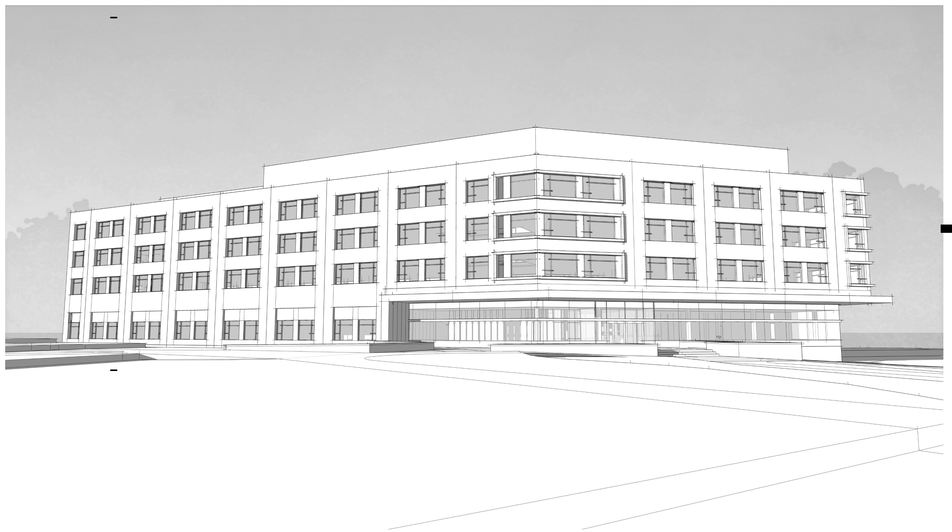
FERRIS STATE UNIVERSITY

NORTH RESIDENCE HALL

1201 South State Street

Big Rapids, Michigan, 49307

BID PACKAGE #02



GREEN CONSTRUCTION

LEED FOR HOMES MID-RISE
GOLD - 65 POINTS

PROJECT SUMMARY

SQUARE FOOTAGE:

BUILDING SQUARE FOOTAGE:

BASEMENT:	2,989
FIRST FLOOR:	26,933
SECOND FLOOR:	28,468
THIRD FLOOR:	28,468
FOURTH FLOOR:	28,468
PENTHOUSE:	8,693
TOTAL:	124,019

UNIT SQUARE FOOTAGE:

4-BED SUITE:	636
R.A. UNIT:	332
R.H.D. APARTMENT:	915

SQUARE FOOTAGE PER BED: 309

APARTMENTS:

4-BED SUITE:	98
R.A. UNITS:	10
R.H.D. APARTMENT:	1
MODEL UNIT:	1

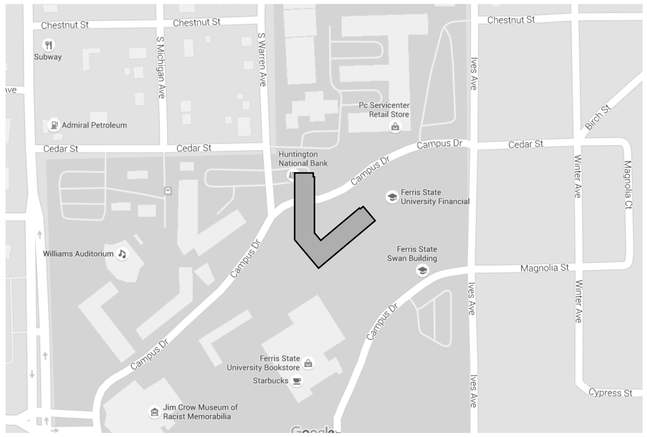
BEDS:

4-BED SUITE:	392
R.A. UNITS:	10
TOTAL:	402

BARRIER FREE UNITS:

ACCESSIBLE UNITS:	7
4-BED SUITE:	6
R.A. UNIT:	1
TYPE "B" UNITS:	101
4-BED SUITE:	92
R.A. UNIT:	9

Location Map



DRAWING INDEX

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ISSUANCES

BID PACKAGE #01
6/27/2016

BID PACKAGE #02
7/22/2016

REVISIONS

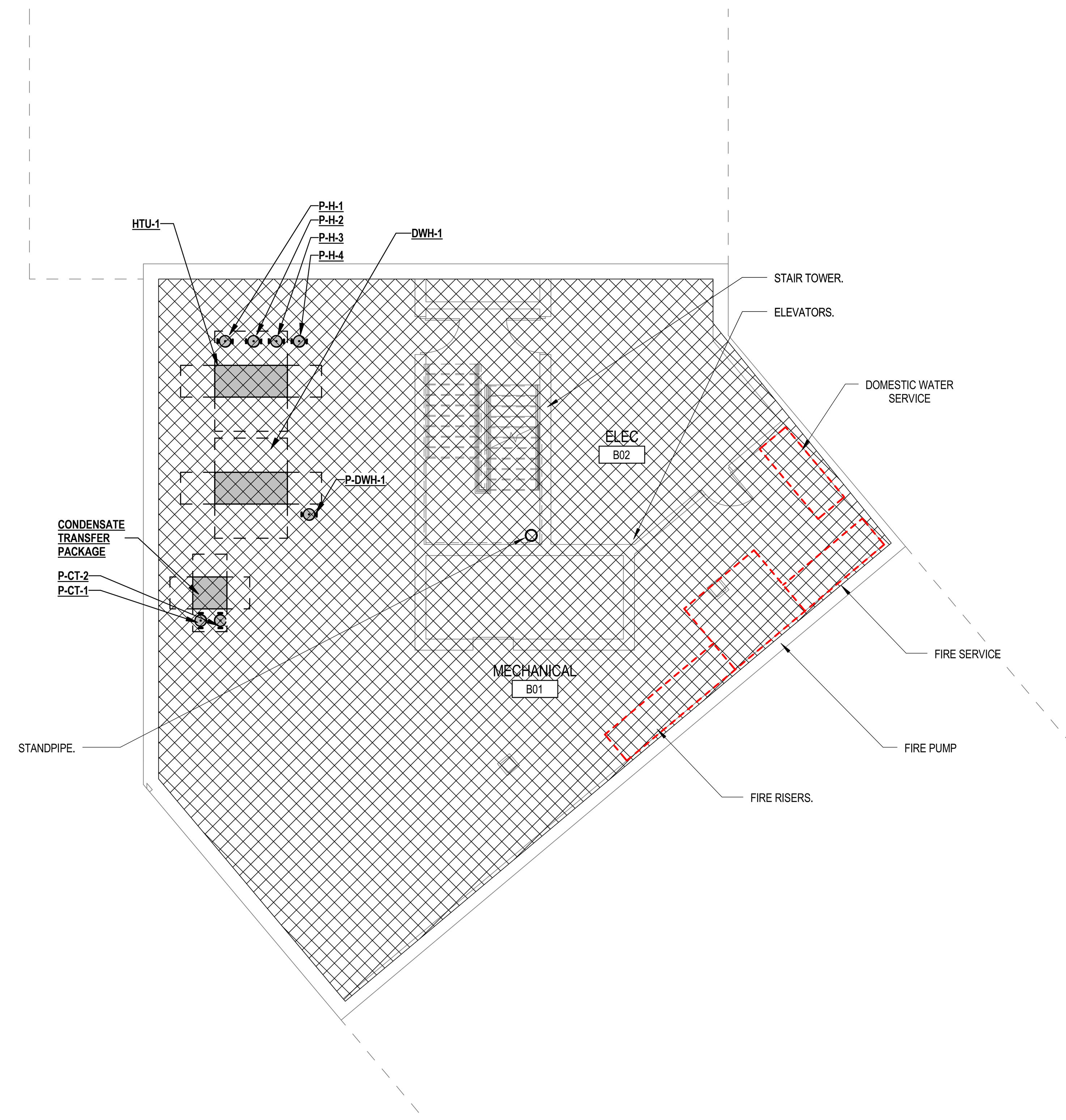
NO.	DATE	DESCRIPTION

BID PACKAGE #02

FILE NO	78070002
DRAWN BY	M.Dixon
JC/ENG BY	D.Gervais
CHECKED BY	P.Weber
PROJECT MGR	D.Shull

TITLE DRAWING
BP 2

T1-02



BASEMENT FIRE PROTECTION PLAN

1/8" = 1'-0"

FIRE SPRINKLER GENERAL NOTES

1. ALL ROOMS/AREAS WITHIN THE BOUNDARY OF THIS PROJECT SHALL BE SPRINKLED. ALL NEW WORK SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 AND STATE CODES. ALL COMPONENTS SHALL BE UL LISTED AND FM APPROVED.
2. ALL NEW SPRINKLERS SHALL BE QUICK RESPONSE TYPE.
3. REFER TO "G" DRAWINGS AND TITLE SHEET "T" FOR CODE COMPLIANCE AND ADDITIONAL INFORMATION.
4. PROVIDE ALL NECESSARY OFFSETS, RAISES OR DROPS IN PIPING AND AUXILIARY DRAINS REQUIRED BY BUILDING CONDITIONS.
5. EXAMINE THE JOB CONDITIONS AND VERIFY ALL MEASUREMENTS, DISTANCES, ELEVATIONS, CLEARANCES ETC.
6. ARCHITECTURAL, HVAC AND ELECTRICAL BACKGROUND INFORMATION IS SHOWN FOR COORDINATION PURPOSES ONLY. REFER TO THE PROPER DRAWINGS FOR EXACT LOCATIONS, SIZES AND QUANTITIES OF OTHER TRADES' WORK.
7. AUTOCAD (DWG) OR MICROSTATION (DGN) COMPATIBLE FILES WILL BE MADE AVAILABLE TO THE SUCCESSFUL FIRE SPRINKLER CONTRACTOR IN ELECTRONIC FORMAT ON REQUEST.
8. SYSTEM MODIFICATIONS SHALL BE DESIGNED AND SIZED HYDRAULICALLY IN ACCORDANCE WITH NFPA 13, OWNERS INSURER, AND ALL STATE AND LOCAL CODES AS INTERPRETED BY THE AUTHORITY HAVING JURISDICTION.
9. ALL NEW SYSTEM PIPING SHALL BE INSTALLED TO ALLOW DRAINAGE BACK TO THE SYSTEM RISERS WHEN POSSIBLE. WHERE IMPRACTICAL, AUXILIARY DRAINS SHALL BE INSTALLED AND DRAINED TO AN ACCEPTABLE LOCATION AS AGREED TO BY THE OWNER AND ENGINEER. EXISTING DRAINS SHALL REMAIN.
10. COORDINATE SPRINKLER HEAD LOCATIONS AND PIPE ROUTING WITH OTHER TRADES TO AVOID INTERFERENCE REFER TO ARCHITECTURAL REFLECTED CEILING PLANS AND THE MECHANICAL AND ELECTRICAL PLANS FOR LOCATIONS OF CEILINGS, DIFFUSERS, LIGHTS AND OTHER CEILING ORNAMENTATION.
11. ALL MAINS RUNNING PARALLEL WITH BUILDING JOISTS/BEAMS SHALL BE HUNG USING HANGERS ATTACHED TO SUPPORTING STEEL SUPPORTED AT PANEL POINTS OF JOISTS AND IN ACCORDANCE WITH NFPA STANDARDS.
12. REFER TO GENERAL AND SUPPLEMENTAL CONDITIONS OF BID INSTRUCTIONS FOR CUTTING AND PATCHING OF WALLS AND ROOFS. THE FIRE PROTECTION CONTRACTOR IS RESPONSIBLE FOR ALL PENETRATIONS REQUIRED TO COMPLETE THE WORK. SEE MECHANICAL SPECIFICATIONS FOR PIPE SEALS, WATERPROOFING AND SLEEVES, AND ESCUTCHEON REQUIREMENTS.
13. REFER TO SPRINKLER SCHEDULE FOR SPRINKLER TYPES. DEFAULT SPRINKLER SHALL BE CONCEALED HEADS. WHERE LOCATED IN A LAYIN CEILING, HEADS SHALL BE CENTERED ON 2'x2' PAD OR 2'x4' PAD.
14. ALL FIRE PROTECTION PIPING SHALL BE PROVIDED IN ACCORDANCE WITH NFPA 13, THREADING OF LIGHT WALL PIPING (LESS THAN SCHEDULE 40) SHALL BE PROHIBITED. OUTLETS AND TEES BEING APPLIED TO EXISTING PIPING MUST BE OF THE, WELDED, THREADED OR GROOVED DESIGN. "TAP-ON" TYPE TEES THAT ARE NOT FULL CIRCUMFERENCE, BOLTED TYPE CONNECTIONS WILL NOT BE ALLOWED.
15. ALL SPRINKLERS SHALL BE UL LISTED AND FM APPROVED FOR THE INTENDED APPLICATION WHEN APPLIED IN ACCORDANCE WITH THE MANUFACTURERS LISTINGS. SPRINKLERS SHALL BE GLASS BULB TYPE AND SHALL COMPLY WITH THE REQUIREMENTS OF NFPA 13.
16. REFER TO ARCHITECTURAL DRAWINGS, SPECIFICALLY WALL SECTIONS AND REFLECTED CEILING PLANS. THE CONTRACTOR SHALL ROUTE NEW FIRE SPRINKLER PIPING AT ELEVATION EQUAL TO EXISTING, COORDINATING WITH NEW AND EXISTING DUCTWORK, PLUMBING AND ELECTRICAL CONDUIT. DESIGN INTENT IS FOR FP PIPING TO ROUTE AROUND EXISTING MECHANICAL CONDITIONS.
17. COMPLY WITH MICHIGAN BUREAU OF FIRE SERVICES REGULATIONS REGARDING SPRINKLER PROTECTION OF WARDROBES AND CLOSETS. SPRINKLERS SHALL BE LOCATED IN OR WITHIN 3 FEET OF THE DOOR OF RESIDENT ROOM WARDROBES AND A SPRINKLER SHALL BE LOCATED INSIDE THE CLOSET.

FIRE SPRINKLER DESIGN CRITERIA

FIRST FLOOR OFFICE AREAS / CORRIDORS / RESTROOMS

CLASSIFICATION:	LIGHT HAZARD
DENSITY:	0.10 GPM/SQFT
TYPICAL OPERATING AREA:	1,500 SQ. FT.
TYPICAL SPRINKLER SPACING:	225 SQ. FT. MAX.
TEMPERATURE RATING:	165°F.

SECOND, THIRD AND FOURTH FLOOR RESIDENTIAL AREAS

CLASSIFICATION:	LIGHT HAZARD
DENSITY:	0.10 GPM/SQFT
TYPICAL OPERATING AREA:	1,500 SQ. FT.
TYPICAL SPRINKLER SPACING:	225 SQ. FT. MAX.
TEMPERATURE RATING:	165°F.

ROOF MECHANICAL PENTHOUSE AREAS

CLASSIFICATION:	ORDINARY HAZARD
DENSITY:	0.20 GPM/SQFT
TYPICAL OPERATING AREA:	1,500 SQ. FT.
TYPICAL SPRINKLER SPACING:	130 SQ. FT. MAX.
TEMPERATURE RATING:	165°F.

JANITORS CLOSETS/ FOOD SERVICE/BASEMENT MECHANICAL SPACES

CLASSIFICATION:	ORDINARY HAZARD
DENSITY:	0.20 GPM/SQFT
TYPICAL OPERATING AREA:	1,500 SQ. FT.
TYPICAL SPRINKLER SPACING:	130 SQ. FT. MAX.
TEMPERATURE RATING:	165°F.

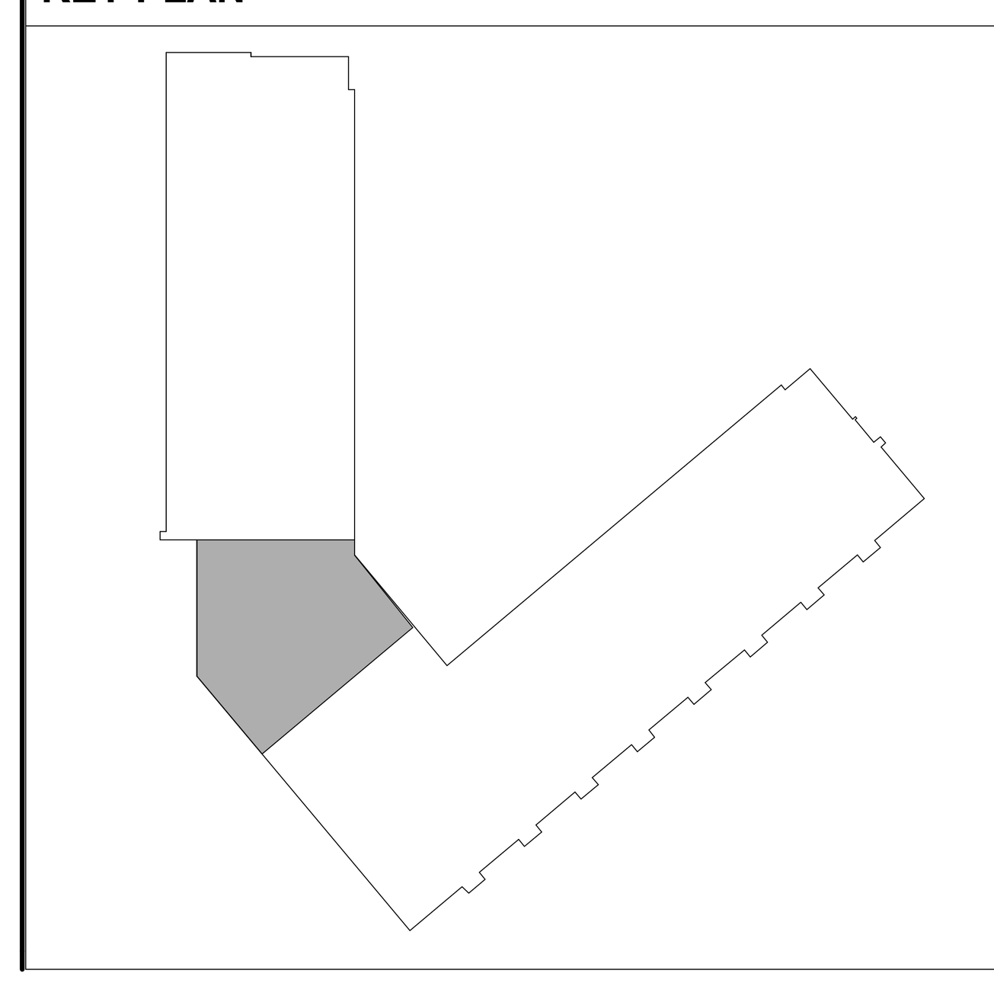
GENERAL INSTALLATION NOTES:

1. THE AWARDED FPC SHALL BE RESPONSIBLE TO ORDER A NEW WATER FLOW TEST IF EXISTING DATA TAKEN WITHIN THE LAST YEAR IS NOT AVAILABLE.
2. DESIGN CALCULATIONS FOR NEW SPRINKLERS SHALL ALLOW FOR 10 PERCENT SAFETY FACTOR.
3. EXISTING FIRE DEPARTMENT CONNECTIONS AND HOSE REELS SHALL REMAIN.
4. CLASSIFICATION PERTAINS TO BOTH NEW ADDITIONS AND REMODEL AREAS.

NEW CONSTRUCTION - LIGHT HAZARD

NEW CONSTRUCTION - ORDINARY HAZARD

KEY PLAN



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ISSUANCES
BID PACKAGE #02
07/22/2016

REVISIONS

NO.	DATE	DESCRIPTION

NOT FOR CONSTRUCTION

FILE NO	78070002
DRAWN BY	TDK
JC/ENG BY	TDK
CHECKED BY	RAF
PROJECT MGR	D.Shull

OVERALL BASEMENT FIRE PROTECTION PLAN

FP100

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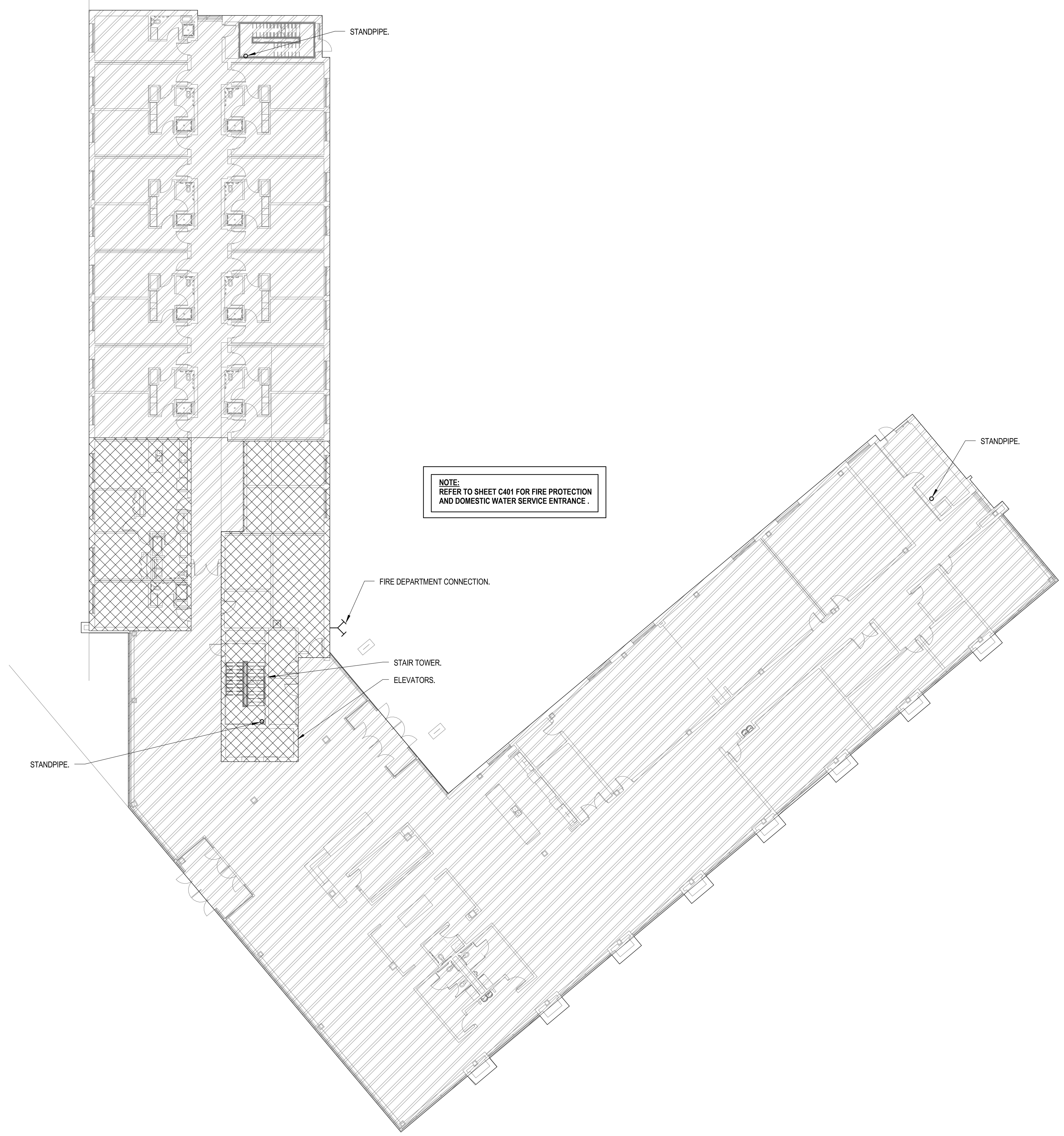
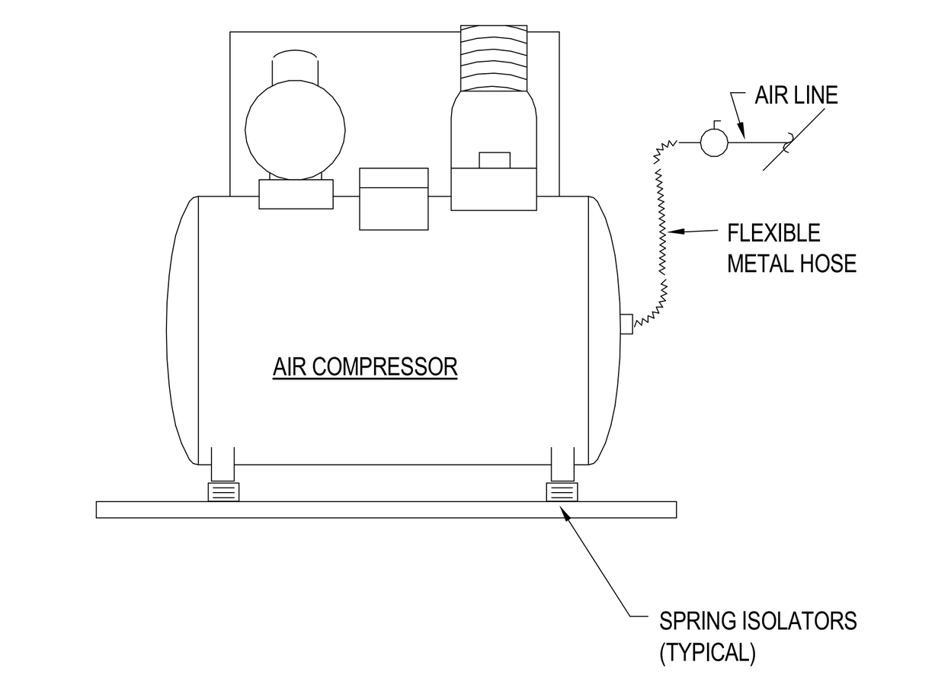


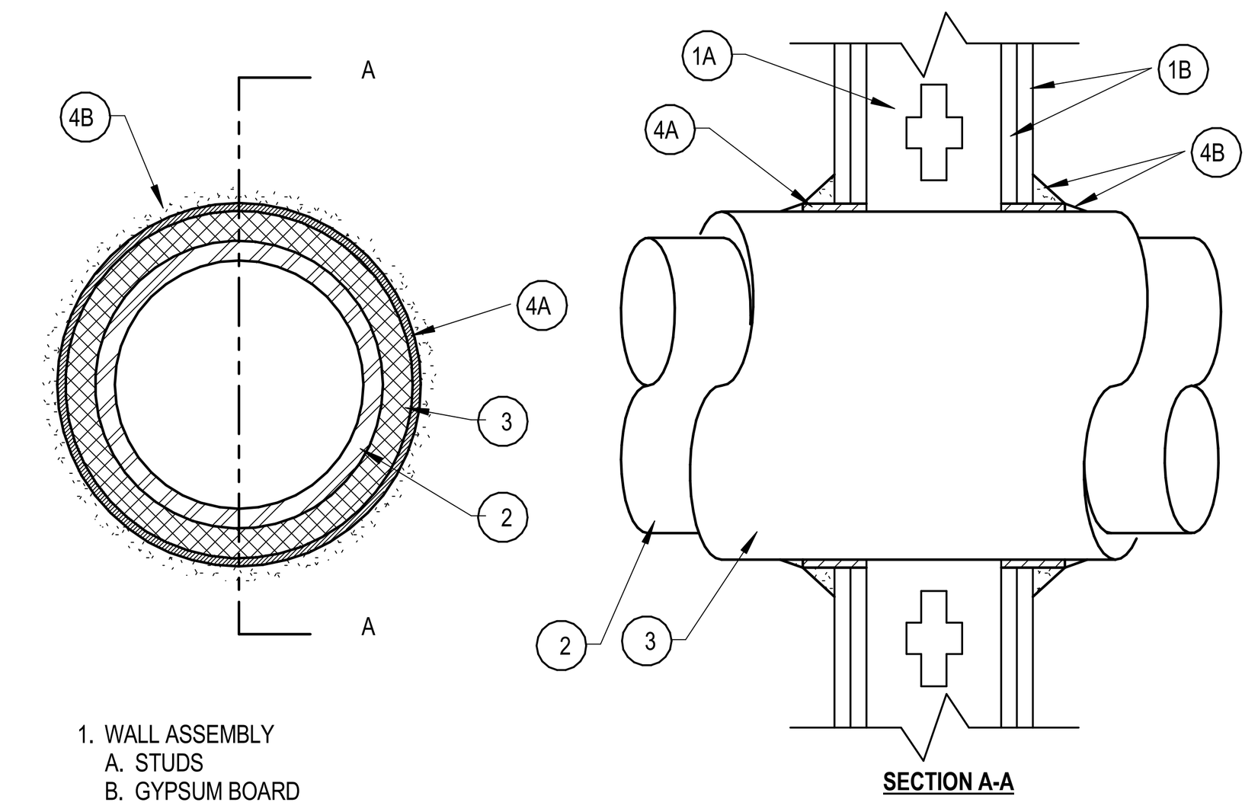
FIRST FLOOR FIRE PROTECTION PLAN

1/16" = 1'-0"



1 FIRE PROTECTION DRY SYSTEM AIR COMPRESSOR DETAIL

NOT TO SCALE



1. WALL ASSEMBLY
   A. STUDS
   B. GYPSUM BOARD

2. THROUGH PENETRATIONS - ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:
   A. STEEL PIPE - NOM. 12 IN. (305 MM) DIAM. (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. COPPER TUBING - NOM. 6 IN. (152 MM) DIAM. (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   C. COPPER PIPE - NOM. 6 IN. (152 MM) DIAM. (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

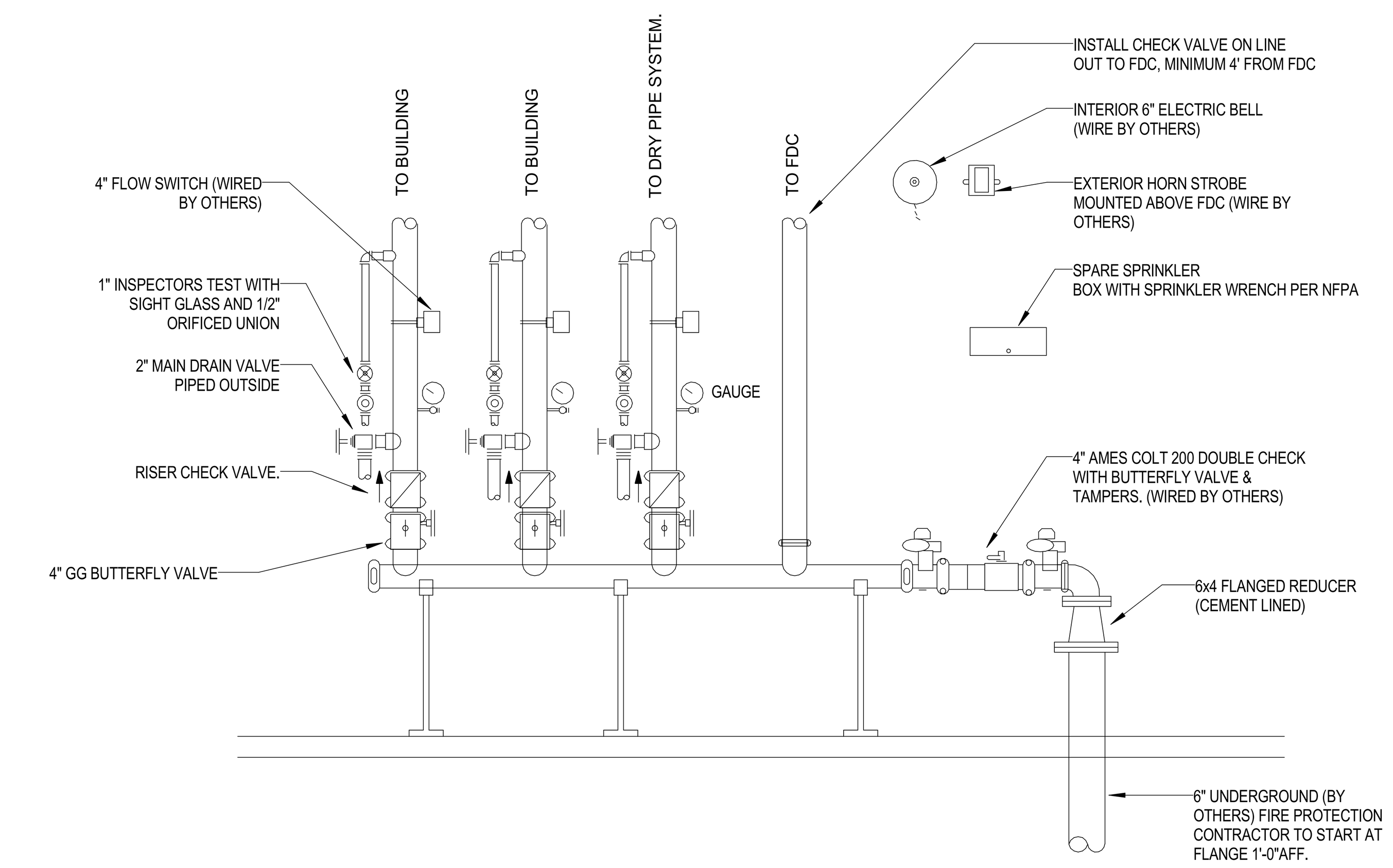
3. PIPE COVERING.

4. FIRESTOP SYSTEM ASSEMBLY. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:
   A. FILL, VOID OR CAVITY MATERIALS - WRAP STRIP.
   B. FILL, VOID OR CAVITY MATERIALS - CAULK OR SEALANT.

5. A UL LISTED ASSEMBLY IS ACCEPTABLE.

2 PIPE THROUGH FIRE RATED WALL DETAIL

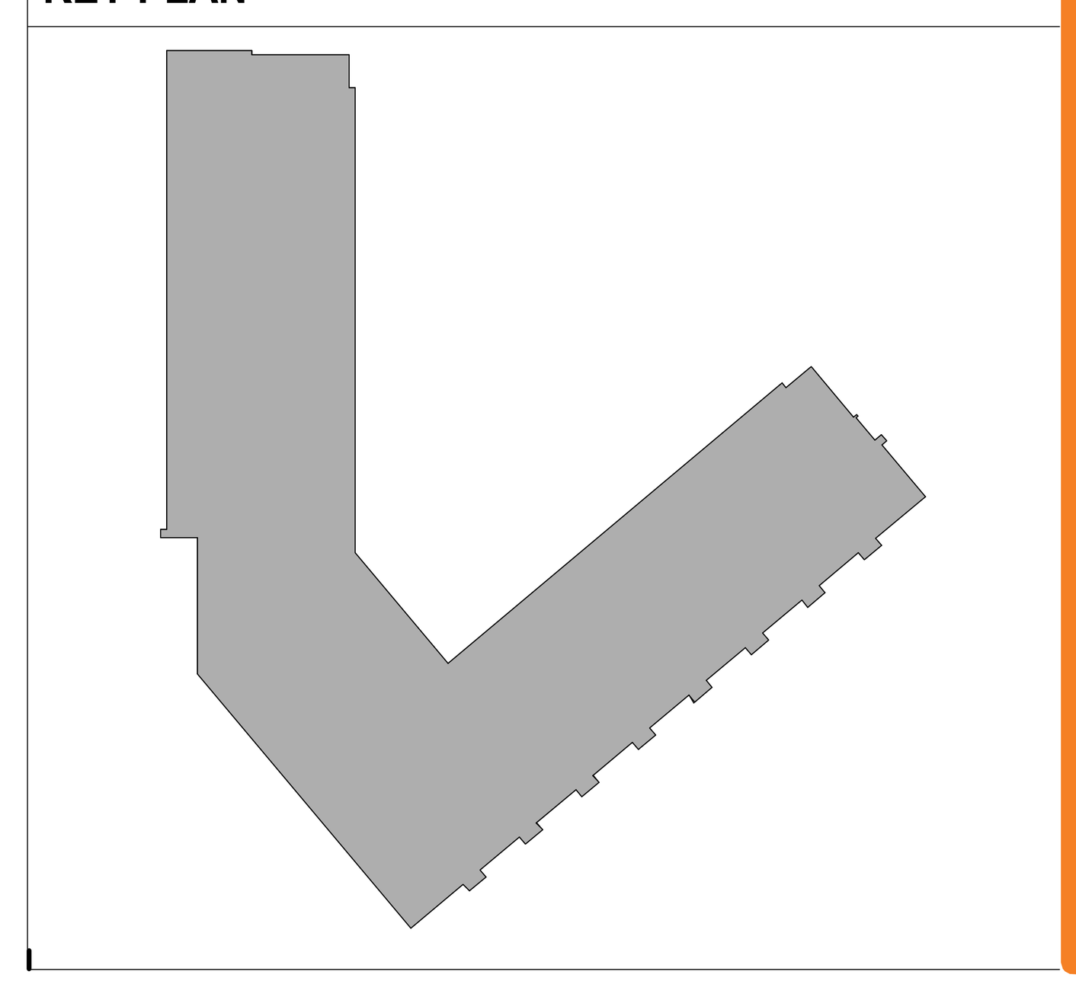
NOT TO SCALE



3 FIRE SPRINKLER RISER DETAIL

NOT TO SCALE

KEY PLAN



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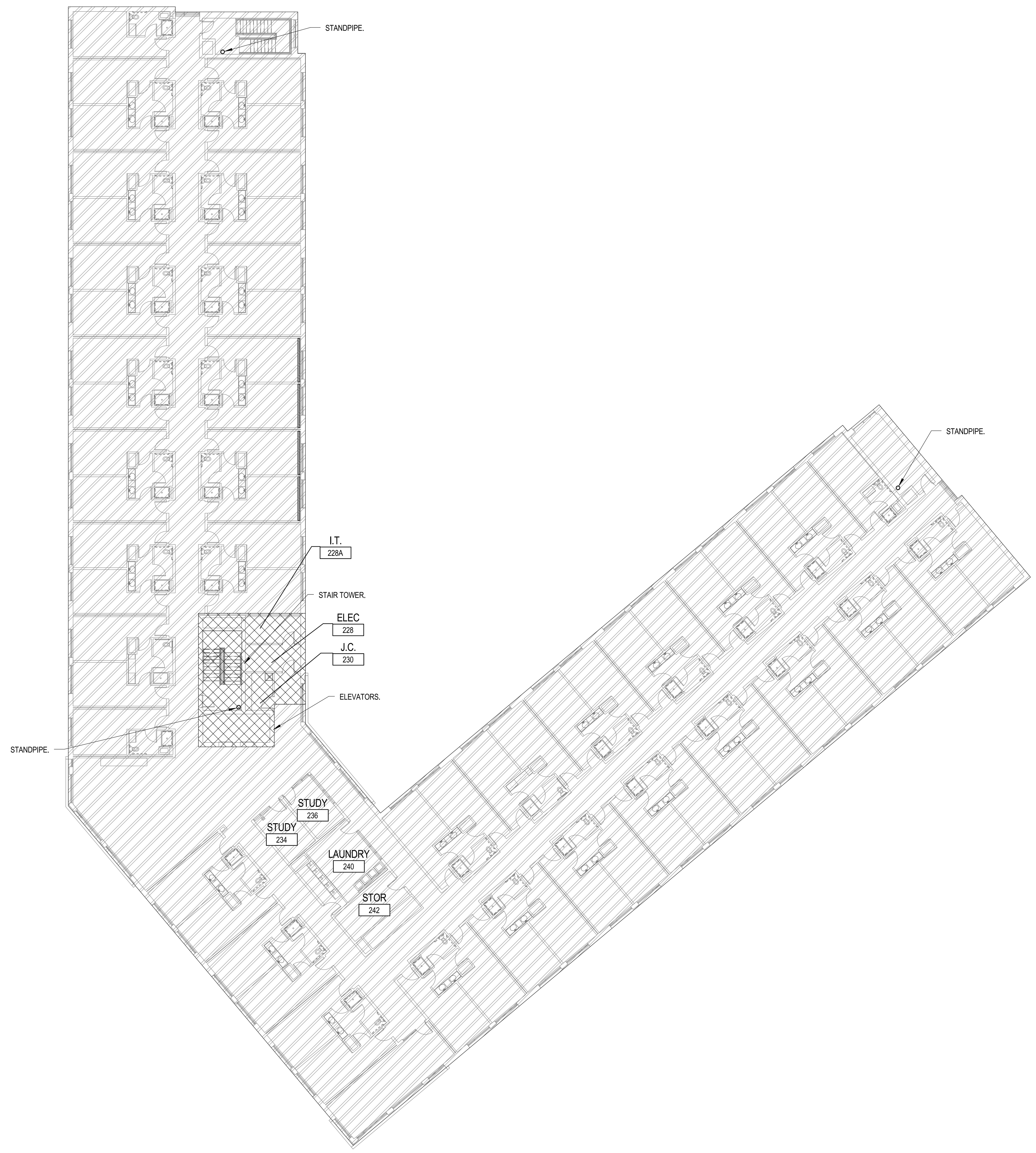
PROJECT MGR	D.Shull

OVERALL FIRST FLOOR FIRE PROTECTION PLAN

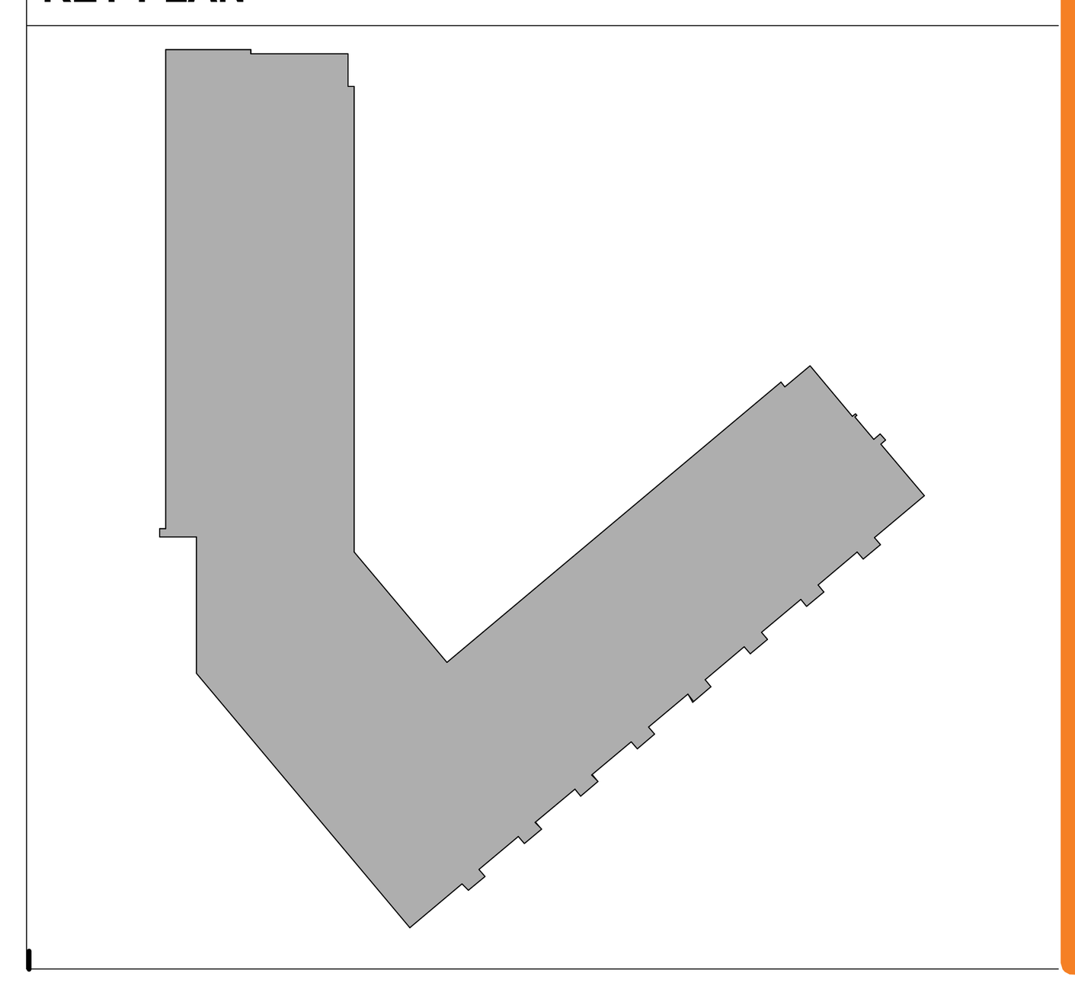
FP101



SECOND- FOURTH FLOOR FIRE PROTECTION PLANS

1/16" = 1'-0"

KEY PLAN



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OVERALL SECOND-FOURTH FLOOR FIRE PROTECTION PLANS

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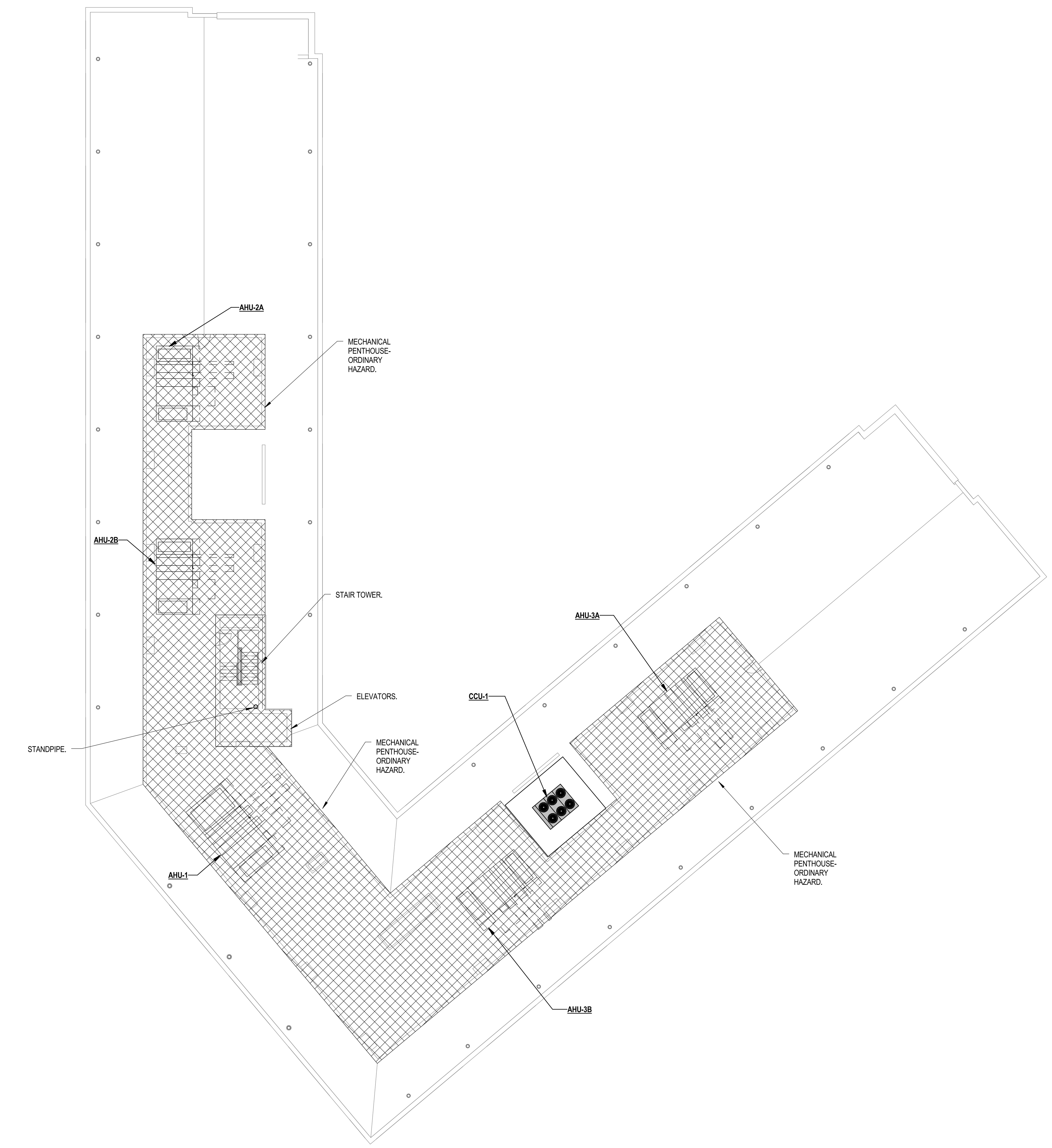
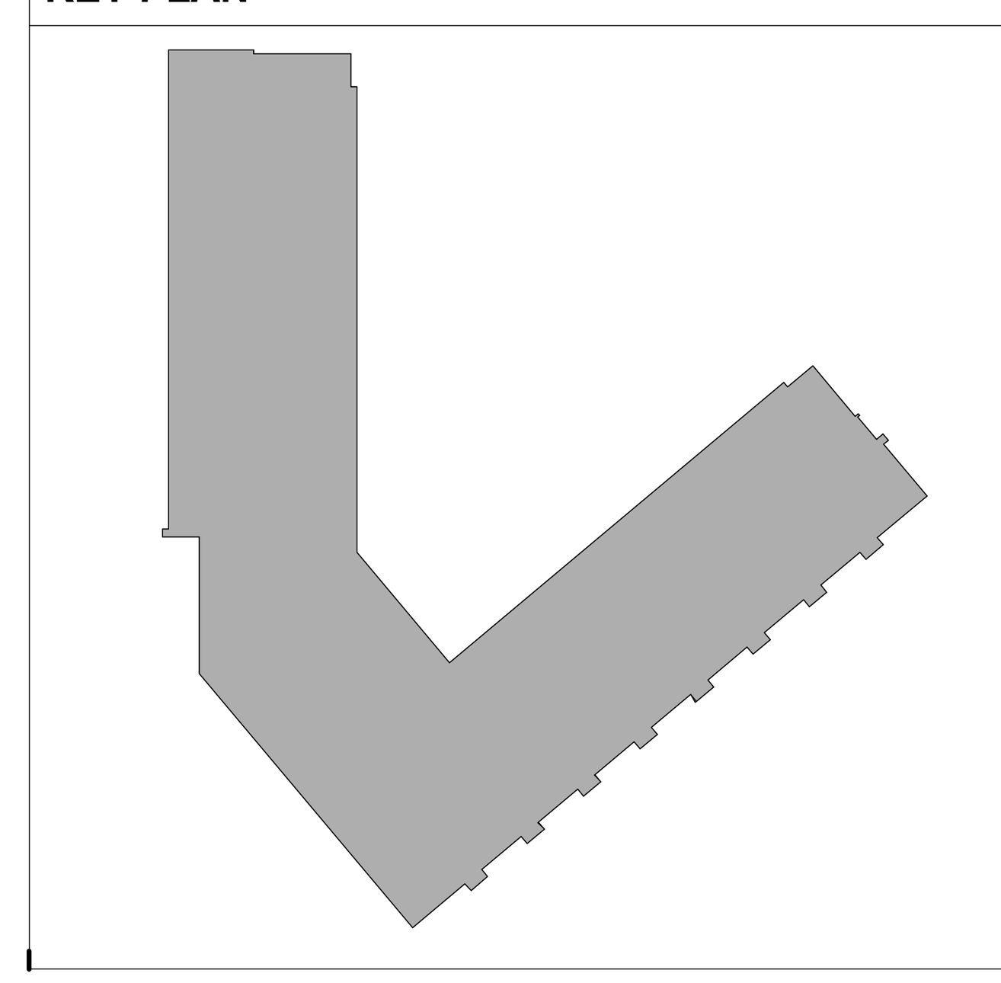


PENTHOUSE FIRE PROTECTION PLAN

1/16" = 1'-0"

KEY PLAN



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OVERALL ROOF FLOOR FIRE PROTECTION PLAN

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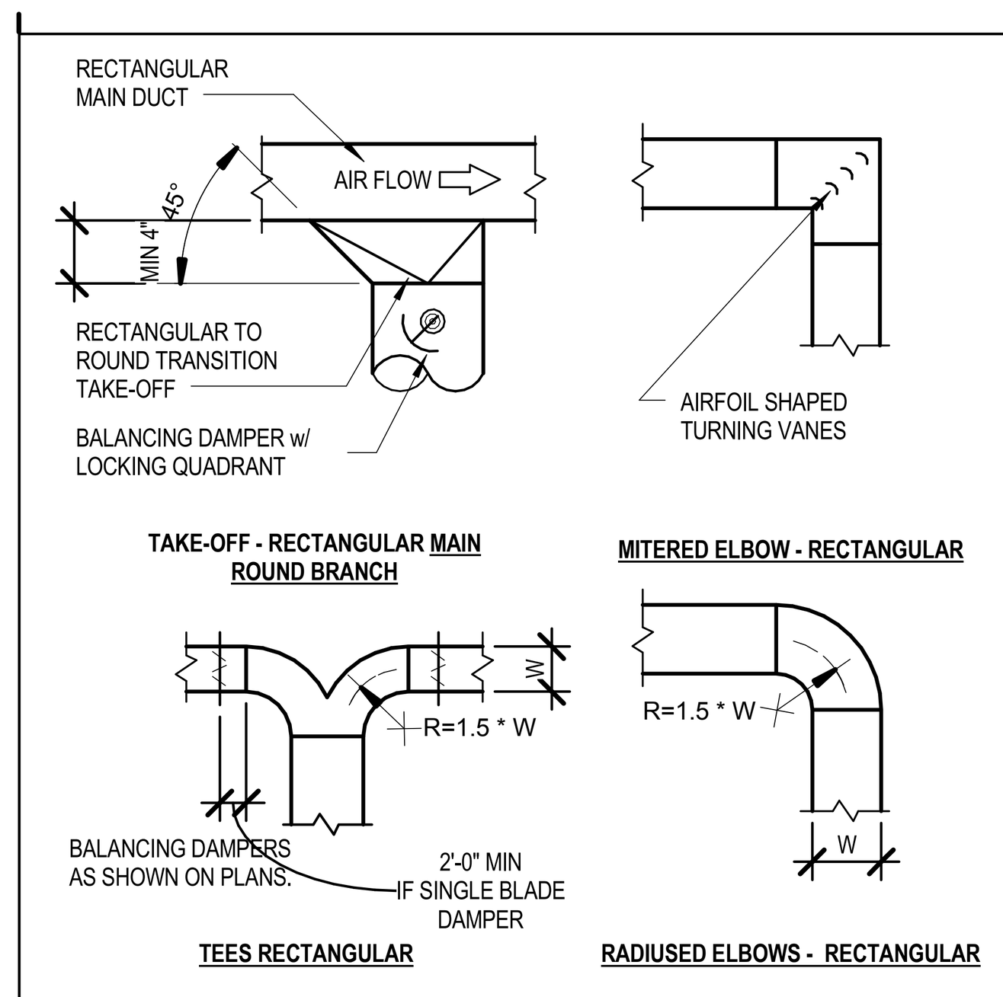
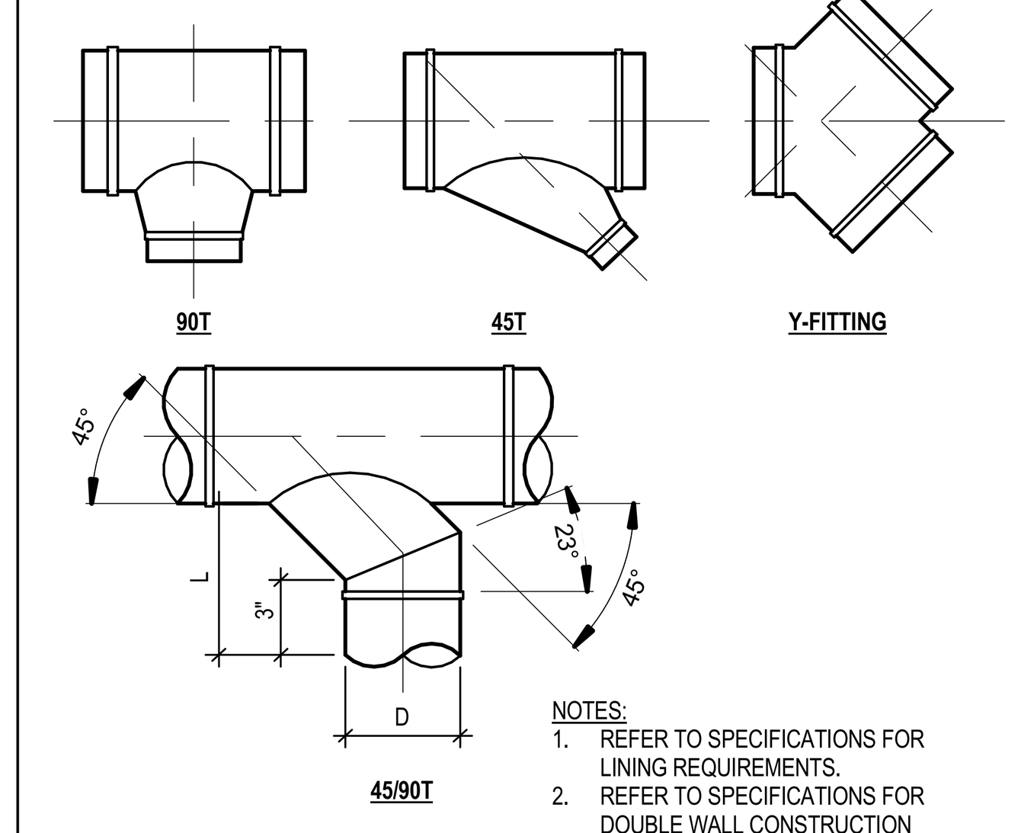


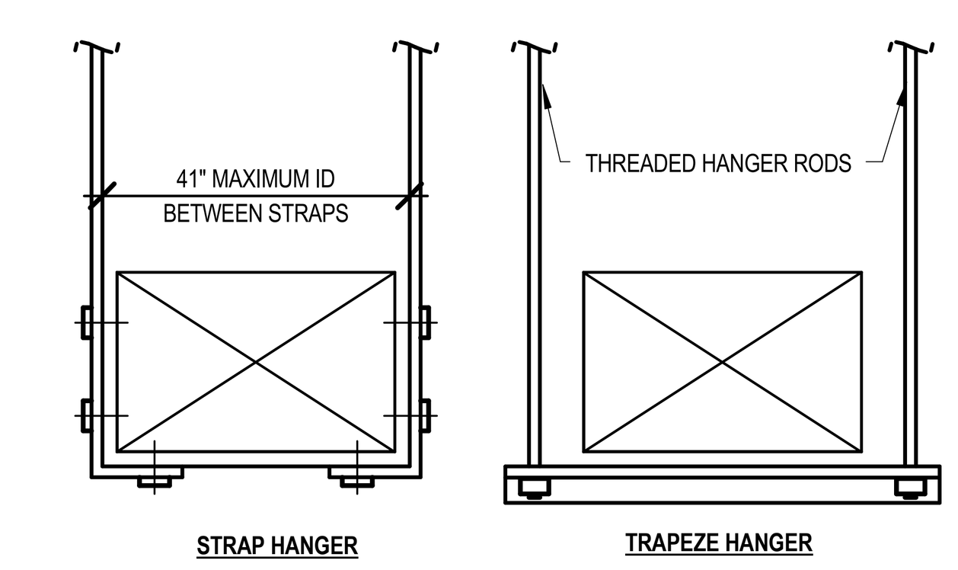
LOW PRESSURE RETANGULAR DUCT FITTINGS

NOT TO SCALE



SPIRAL DUCT FITTINGS

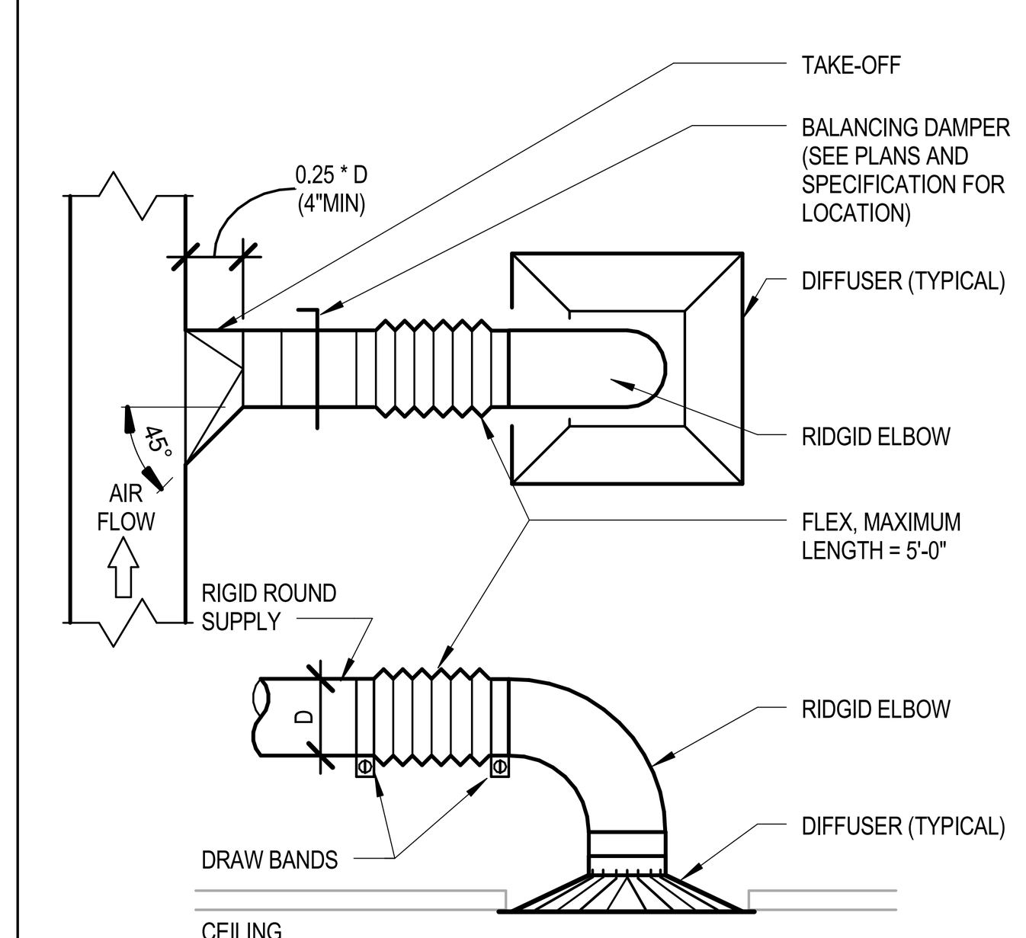
NOT TO SCALE



NOTE:
POP RIVETS ARE **NOT** ALLOWED, USE SELF-TAPPING SHEETMETAL SCREWS ONLY (TYP)

DUCTWORK SUPPORT DETAIL

NOT TO SCALE



TYPICAL DUCT TAKE-OFF DETAIL

NOT TO SCALE

MECHANICAL GENERAL NOTES

1. COMPLY WITH ALL APPLICABLE LOCAL, STATE AND/OR REGULATORY AGENCIES, CODES AND REGULATIONS FOR NEW WORK.
2. DO NOT INSTALL EQUIPMENT, PIPING OR DUCTWORK OVER ANY ELECTRICAL EQUIPMENT OR COMMUNICATION ROOMS.
3. DO NOT RUN ANY PIPING OR DUCTWORK INTO THE ELECTRICAL ROOM UNLESS DEDICATED TO SERVE THAT ROOM.
4. INSTALL MECHANICAL EQUIPMENT TO FACILITATE SERVICING, MAINTENANCE, AND REPAIR OR REPLACEMENT OF EQUIPMENT COMPONENTS. AS MUCH AS PRACTICAL, CONNECT EQUIPMENT FOR EASE OF DISCONNECTING, WITH A MINIMUM OF INTERFERENCE WITH OTHER INSTALLATIONS.
5. LOCATE THERMOSTAT/TEMPERATURE SENSORS 48" ABOVE FINISHED FLOOR OR AS NOTED ON THE PLANS.
6. WORK IDENTIFIED WITH MECHANICAL AND ELECTRICAL NOTES AND KEY NOTES SHALL BE PERFORMED BY QUALIFIED MECHANICAL AND ELECTRICAL CONTRACTORS RESPECTIVELY UNDER DIRECTION OF THE CONSTRUCTION MANAGER. COORDINATE WITH OWNER'S REPRESENTATIVE OR CONSTRUCTION MANAGER.
7. INSTALL SMOKE DETECTOR IN DUCTWORK AS SHOWN ON THE DRAWINGS AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.
8. VERIFY ALL CONDITIONS IN FIELD BEFORE START OF CONSTRUCTION. NOTIFY ARCHITECT/ENGINEER OF DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL FIELD CONDITIONS.
9. COORDINATE WORK WITH OTHER TRADES AND WITH THE CONSTRUCTION MANAGER.
10. COORDINATE ANY REQUIRED SHUTDOWN OF SERVICES OR EQUIPMENT WITH OWNER'S REPRESENTATIVE OR CONSTRUCTION MANAGER, MINIMIZE INTERRUPTION OF EXISTING SERVICES.
11. PROVIDE ALL MISCELLANEOUS STEEL AND ITEMS REQUIRED FOR THE PROPER INSTALLATION OF ALL PIPE, SHEET METAL AND EQUIPMENT.
12. COORDINATE FLOOR, WALL & ROOF PENETRATIONS ETC. WITH ARCHITECTURAL TRADES.
13. FIRESTOP SHALL BE PROVIDED IN HOLES AND PENETRATIONS IN RATED ASSEMBLIES.

SHEETMETAL NOTES

1. THE INSTALLATION OF ALL DUCTWORK SHALL BE CLOSELY COORDINATED WITH NEW PLUMBING, ELECTRICAL, AND STRUCTURAL CONDITIONS. NOT ALL REQUIRED OFFSETS AND FITTINGS ARE INDICATED ON DRAWINGS, BUT SHALL BE PROVIDED. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR CLEARANCES. ALTERNATE DUCT ROUTING SHALL BE APPROVED BY ARCHITECT/ENGINEER BEFORE PROCEEDING IN ORDER TO ENSURE THAT THE AVAILABLE STATIC PRESSURE REMAINS ADEQUATE. DUCTWORK LOCATION SHALL TAKE PRECEDENCE OVER HVAC AND FIRE PROTECTION PIPING AND ELECTRICAL CONDUIT AND CABLE TRAY.
2. REFER TO DUCT TAKEOFF DETAILS. SPIN-IN TYPE WITH SCOOPS SHALL NOT BE ACCEPTED. A MINIMUM OF 2 FEET SHALL BE PROVIDED BETWEEN RUNOUT TAKEOFFS FROM TRUNK DUCTS.
3. THERMOSTAT AND SENSORS LOCATIONS WITHIN DUCTWORK SHALL BE VERIFIED WITH ARCHITECT/ ENGINEER BEFORE ROUGH -IN.
4. RUNOUT BALANCING DAMPERS SHALL BE MOUNTED AS CLOSE TO MAIN DUCT AS POSSIBLE.
5. DUCTWORK LAYOUT SHALL BE DESIGNED TO ABSORB NOISE. ALL FITTINGS SHALL BE PROVIDED AS INDICATED.
6. TERMINAL UNITS SHALL BE MOUNTED TO NOT IMPAIR ACCESS TO FILTERS, COILS AND CONTROLS.
7. WATERTIGHT CONCRETE CURBS SHALL BE PROVIDED AROUND ELEVATED FLOOR SLAB PENETRATIONS.
8. DUCTWORK AND ASSOCIATED COMPONENTS SHALL CLEAR DOORS AND WINDOWS.
9. UNLESS OTHERWISE NOTED, ALL DUCTWORK ABOVE CEILING OR EXPOSED IS OVERHEAD AND AS HIGH AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE, WITH SPACE FOR INSULATION WHERE REQUIRED.
10. LOCATE MECHANICAL EQUIPMENT SUCH THAT THERE IS UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING.
11. PROVIDE FLEXIBLE CONNECTIONS IN ALL DUCTWORK SYSTEMS CONNECTED TO MECHANICAL EQUIPMENT THAT REQUIRE VIBRATION ISOLATION. FLEXIBLE CONNECTIONS SHALL BE PROVIDED AT THE POINT OF CONNECTION TO THE EQUIPMENT UNLESS OTHERWISE NOTED.
12. ALL ELBOWS IN DUCTWORK SHALL BE RADIUS ELBOWS UNLESS OTHERWISE NOTED. RADIUS ELBOWS SHALL HAVE CENTERLINE RADIUS OF CURVATURE 1.5 TIMES THE DUCT DIAMETER OR WIDTH IN THE PLANE OF TURN. WHERE SQUARE ELBOWS ARE SHOWN, INSTALL TURNING VANES.
13. DUCTS CONNECTED TO EQUIPMENT SHALL EQUAL EQUIPMENT CONNECTION SIZE UNLESS NOTED OTHERWISE.
14. MAXIMUM LENGTH ON FLEXIBLE DUCT SHALL BE 5'-0", UNLESS OTHERWISE NOTED ON DETAILS OR SPECIFICATION.

HYDRONIC PIPING NOTES

1. THE INSTALLATION OF ALL PIPING SHALL BE CLOSELY COORDINATED WITH SHEET METAL, ELECTRICAL, AND STRUCTURAL CONDITIONS. NOT ALL REQUIRED OFFSETS AND FITTINGS ARE INDICATED ON DRAWINGS, BUT SHALL BE PROVIDED. REFER TO ARCHITECTURAL AND STRUCTURAL PLANS FOR CLEARANCES.
2. ALL PIPING SHALL BE INSTALLED TO FACILITATE COIL REMOVAL, FILTER REPLACEMENT AND OPENING OF ACCESS PANELS.
3. INSTALL MAINS AS HIGH AS POSSIBLE. MANUAL AIR VENTS SHALL BE PROVIDED AT ALL PIPING HIGH POINTS AND END OF PIPING LOOPS. PROVIDE REMOVABLE INSULATION PLUG.
4. PIPE ANCHORS, EXPANSION LOOPS, AND GUIDES SHALL BE PROVIDED AS REQUIRED. REFER TO SPECIFICATIONS.
5. SLEEVE AND SEAL EXTERIOR WALL AND ROOF PENETRATIONS TO A WEATHER TIGHT CONDITION. SLEEVE AND SEAL INTERIOR FLOOR PENETRATIONS TO A WATER TIGHT CONDITION.
6. PROVIDE MINIMUM OF 3/4" PIPE FOR ALL PIPING UNLESS SHOWN OTHERWISE.
7. ALL VALVES ARE TO BE FULL LINE SIZE EXCEPT CONTROL AND BALANCING VALVES.
8. PROVIDE 1/2" DRAIN VALVES WITH HOSE-END CAPS AT ALL LOW POINTS IN PIPING. PROVIDE MINIMUM PITCH SUFFICIENT TO INSURE ADEQUATE DRAINING. PROVIDE REMOVABLE INSULATION PLUG.
9. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD AND AS HIGH AS POSSIBLE TO THE UNDERSIDE OF THE STRUCTURE OR SLAB, WITH SPACE FOR INSULATION WHERE REQUIRED.
10. PIPING AND ASSOCIATED APPURTENANCES SHALL NOT INTERFERE WITH DOORS AND WINDOWS.
11. INSTALL PIPING WITHOUT FORCING OR SPRINGING.
12. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. PROVIDE OFFSETS IN PIPING AROUND OBSTRUCTIONS ENCOUNTERED IN FIELD.
13. PROVIDE VIBRATION ISOLATORS FOR ALL PIPING SUPPORTS CONNECTED TO, AND WITHIN 50 FEET OF ISOLATED EQUIPMENT (EXCEPT AT BASE ELBOW SUPPORTS AND ANCHOR POINTS) THROUGHOUT MECHANICAL EQUIPMENT ROOMS.
14. FOR BALANCING 3-WAY VALVES, BALANCE BY-PASS WITH VALVE AT 50% POSITION SUCH THAT TOTAL FLOW DOES NOT EXCEED 100%.
15. AIR CONDITIONING CONDENSATE DRAIN LINES FROM EACH UNIT'S DRAIN PAN SHALL BE PIPED FULL SIZE OF THE UNIT DRAIN OUTLET WITH "P" TRAP. CONDENSATE WATER PIPING SHALL BE A MINIMUM OF 3/4". SEE THE DETAILS SHOWN IN THE DRAWINGS OR MANUFACTURER'S LITERATURE FOR THE DEPTH OF THE AIR CONDITIONING CONDENSATE TRAP. PITCH DOWN IN DIRECTION OF FLOW, MINIMUM 1 INCH PER 10 FEET.
16. INSTALL PIPING SO ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
17. PROVIDE PRESSURE/TEMPERATURE (P/T) PLUGS, WITH CAPS UP AND DOWNSTREAM OF ALL EQUIPMENT, AT THE SUPPLY AND RETURN TAPS OF ALL PIPING BRANCHES AND/OR WHERE INDICATED. PROVIDE EXTENDED PLUGS AND LABELS WHERE PIPING IS INSULATED.
18. WHERE SPACE PERMITS PROVIDE AUXILIARY DRAIN PANS UNDER COOLING EQUIPMENT LOCATED ABOVE CEILINGS. WHERE SPACE DOES NOT PERMIT THE USE OF AN AUXILIARY DRAIN PAN PROVIDE WATER LEVEL DETECTION DEVICE (FLOAT SWITCH)CONFORMING TO UL 508 THAT WILL SHUT OFF THE EQUIPMENT SERVED IN THE EVENT THAT THE PRIMARY DRAIN IS BLOCKED.
19. PROVIDE FLUSHING VALVES AND TEES AT BOTH ENDS OF ALL EQUIPMENT. TAPS SHALL MATCH EQUIPMENT PIPING UP TO 1". FOR LARGER EQUIPMENT AND PIPE LOOPS, PROVIDE 1-1/2" TAPS AND VALVES.
20. ALL HYDRONIC PIPING BRANCH TAKEOFFS FROM MAINS SHALL BE MADE WITH SWING JOINTS.
21. USE THE FOLLOWING TABLE FOR PIPING RUNOUT SIZES TO HEATING AND COOLING ELEMENTS. REFER TO SCHEDULE FOR SPECIFIED GPM.

GPM RANGE	PIPE SIZE
0.5 - 2.5	3/4"
2.6 - 6.0	1"
6.1 -10.0	1 1/4"
10.1 - 17.0	1 1/2"
17.1 - 35.0	2"

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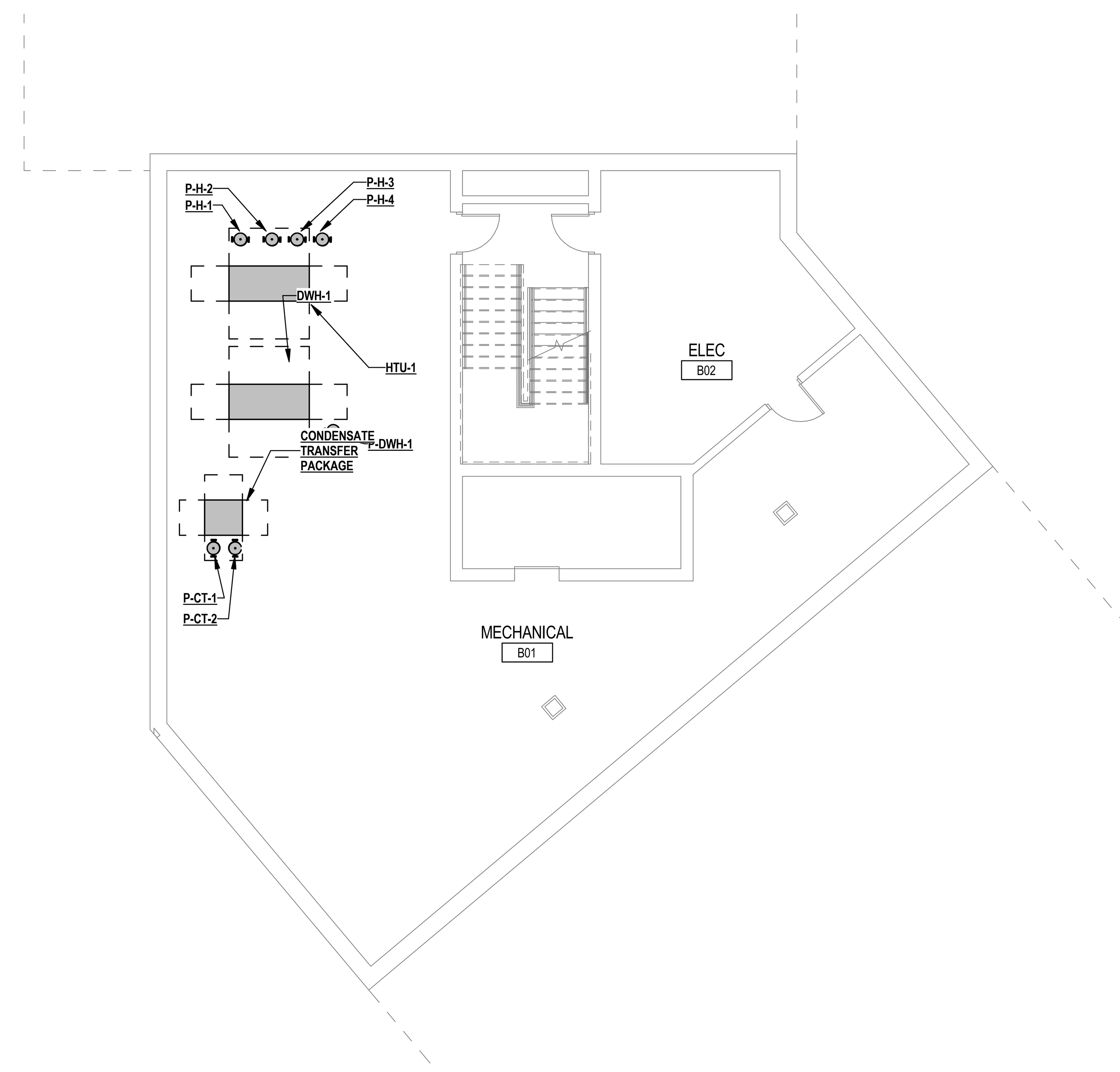
GENERAL MECHANICAL INFORMATION
M001



BASEMENT HVAC PLAN

1/8" = 1'-0"

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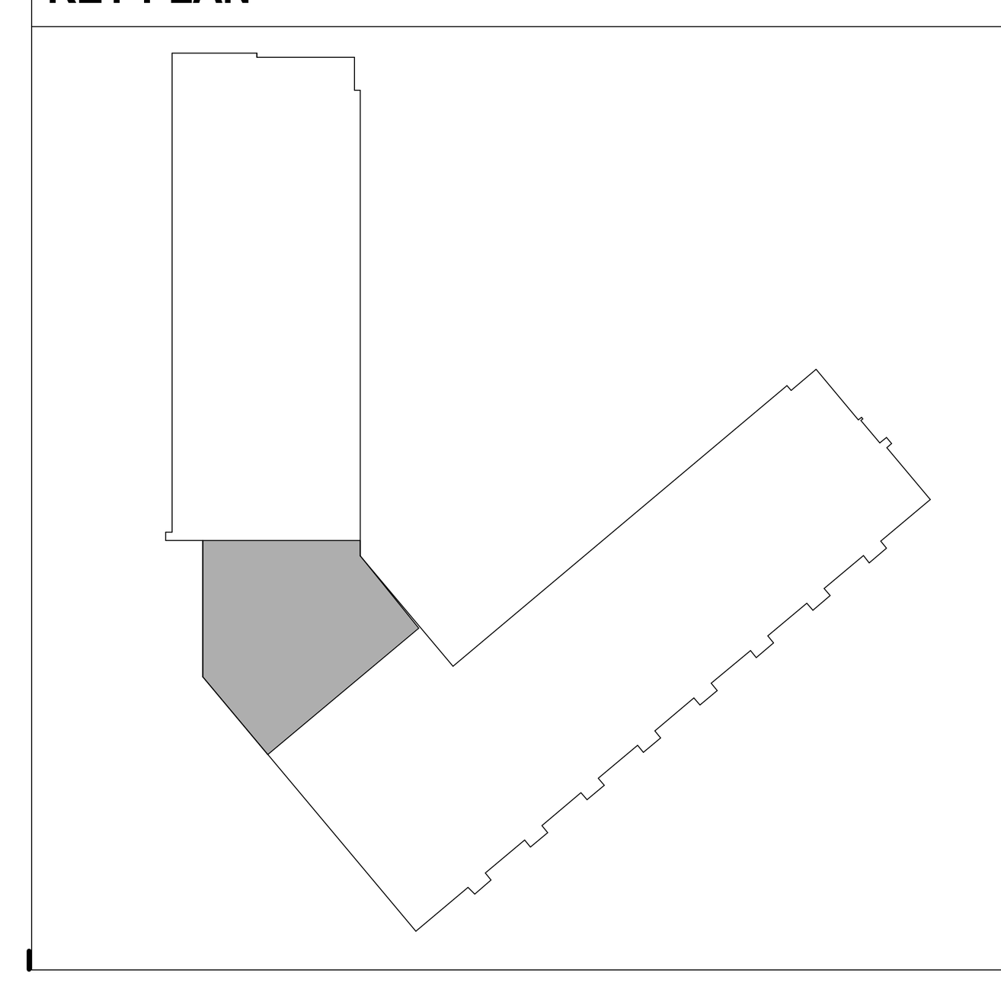

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OVERALL BASEMENT FLOOR HVAC PLAN

M100

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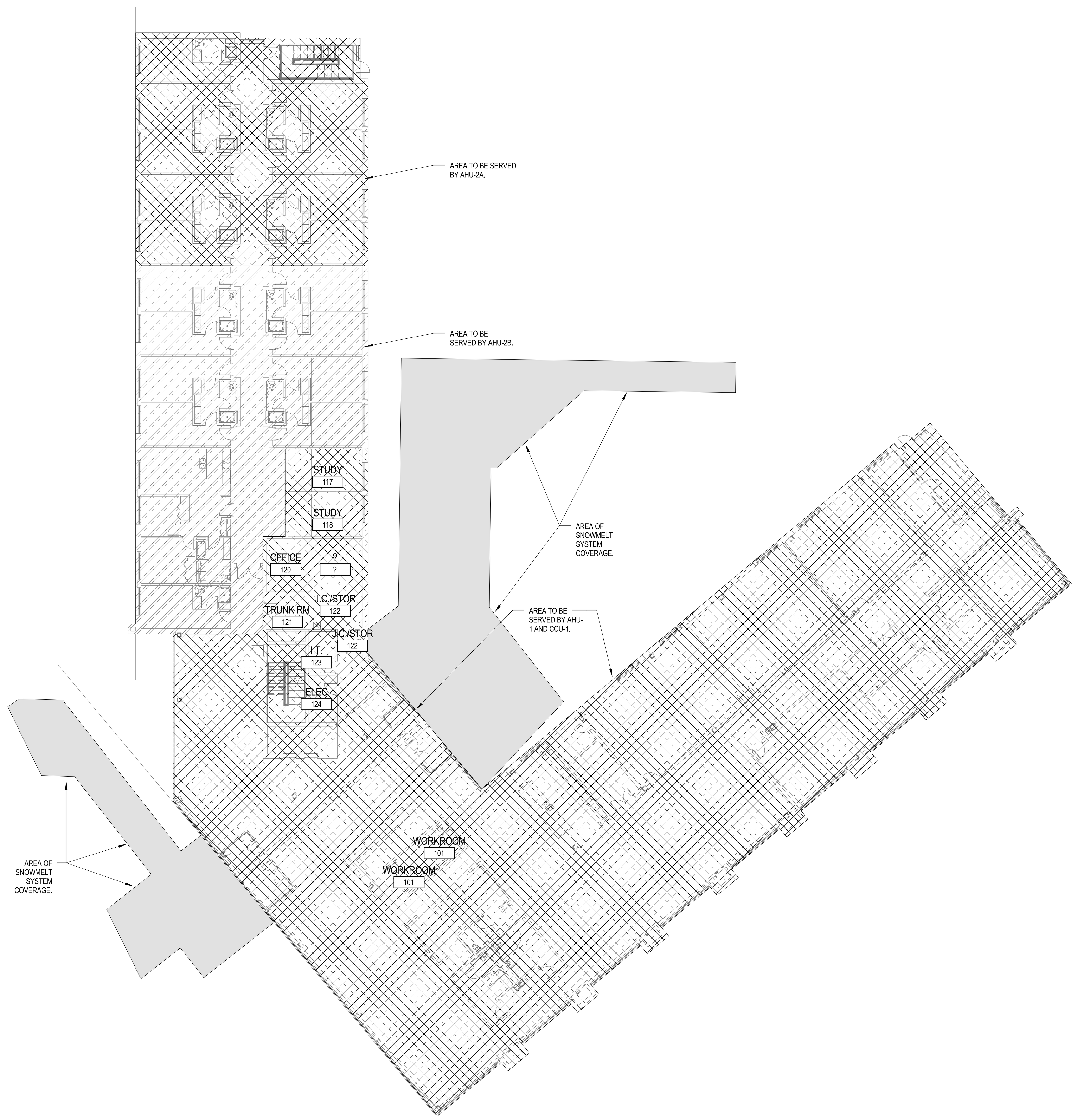
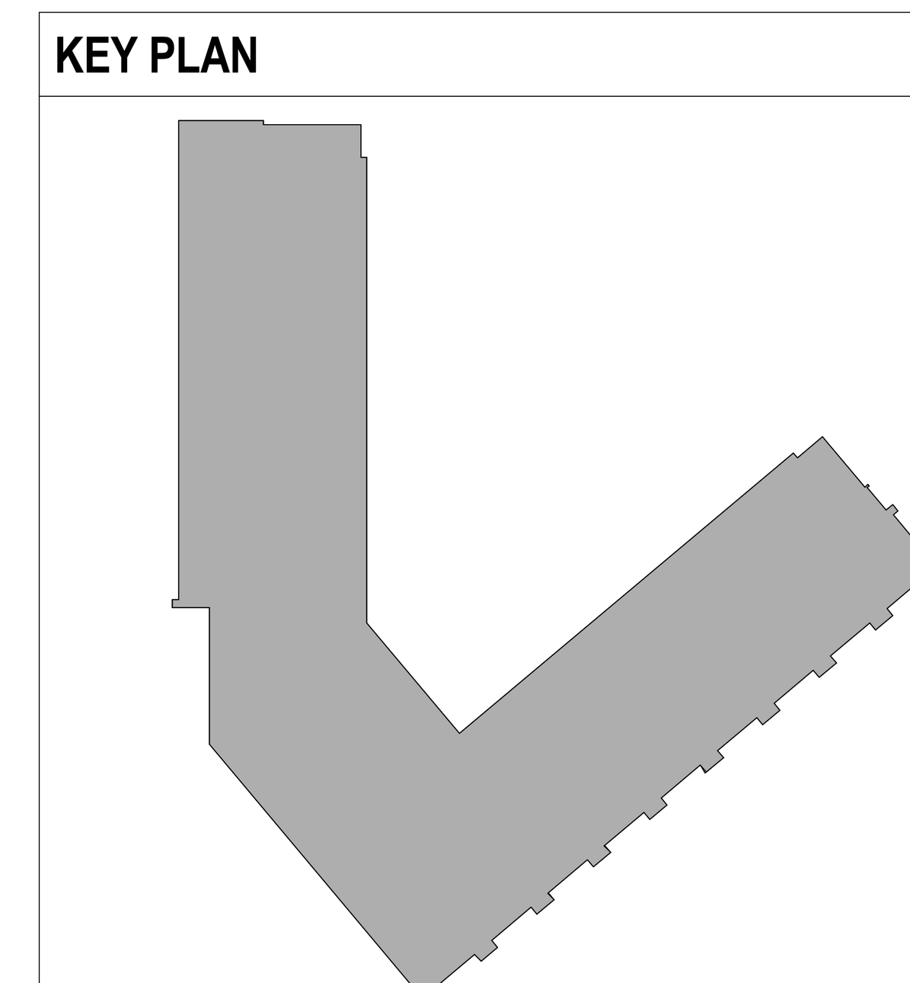


FIRST FLOOR HVAC PLAN

1/16" = 1'-0"

KEY PLAN



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OVERALL FIRST FLOOR HVAC PLAN

M101

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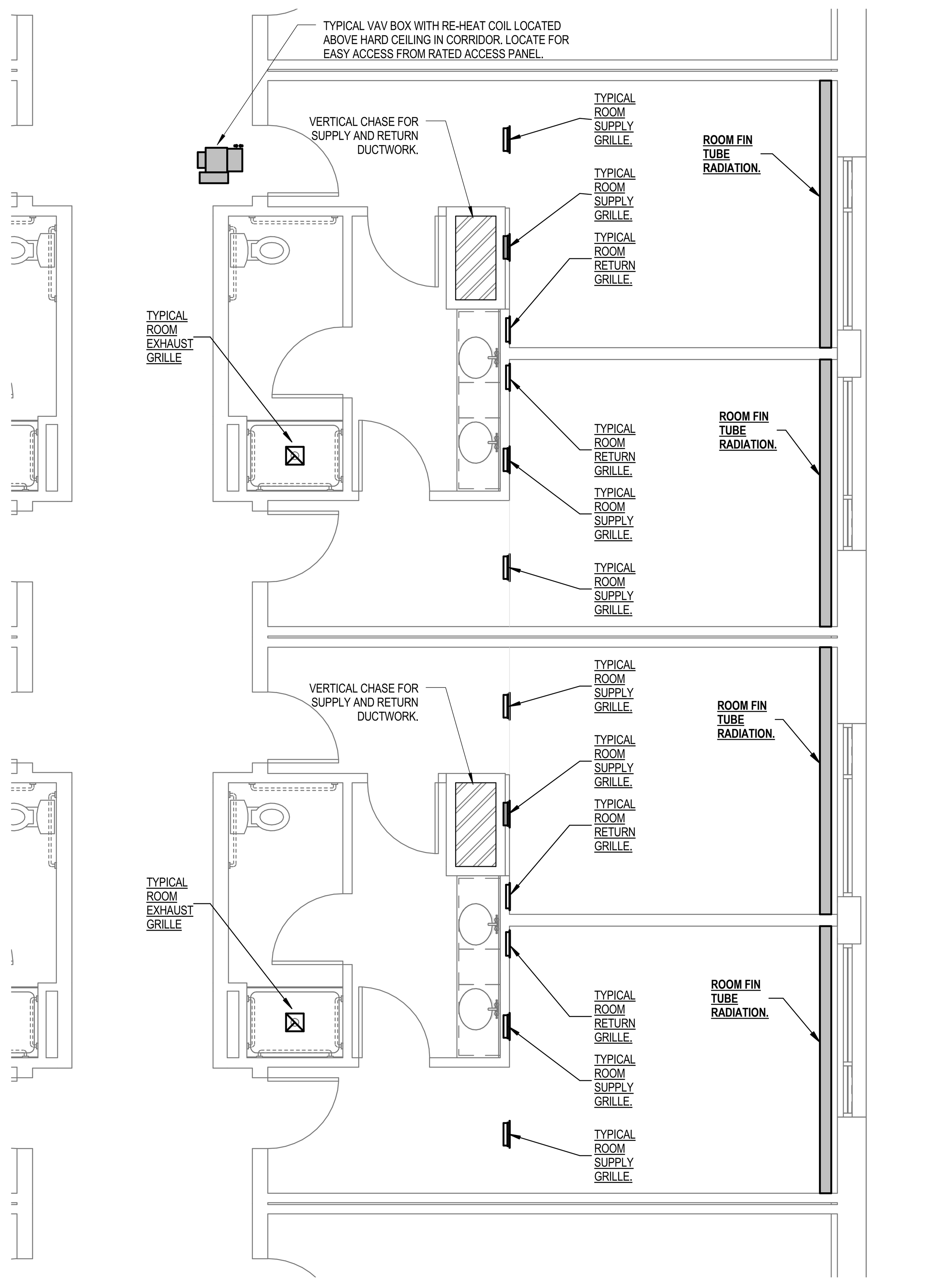
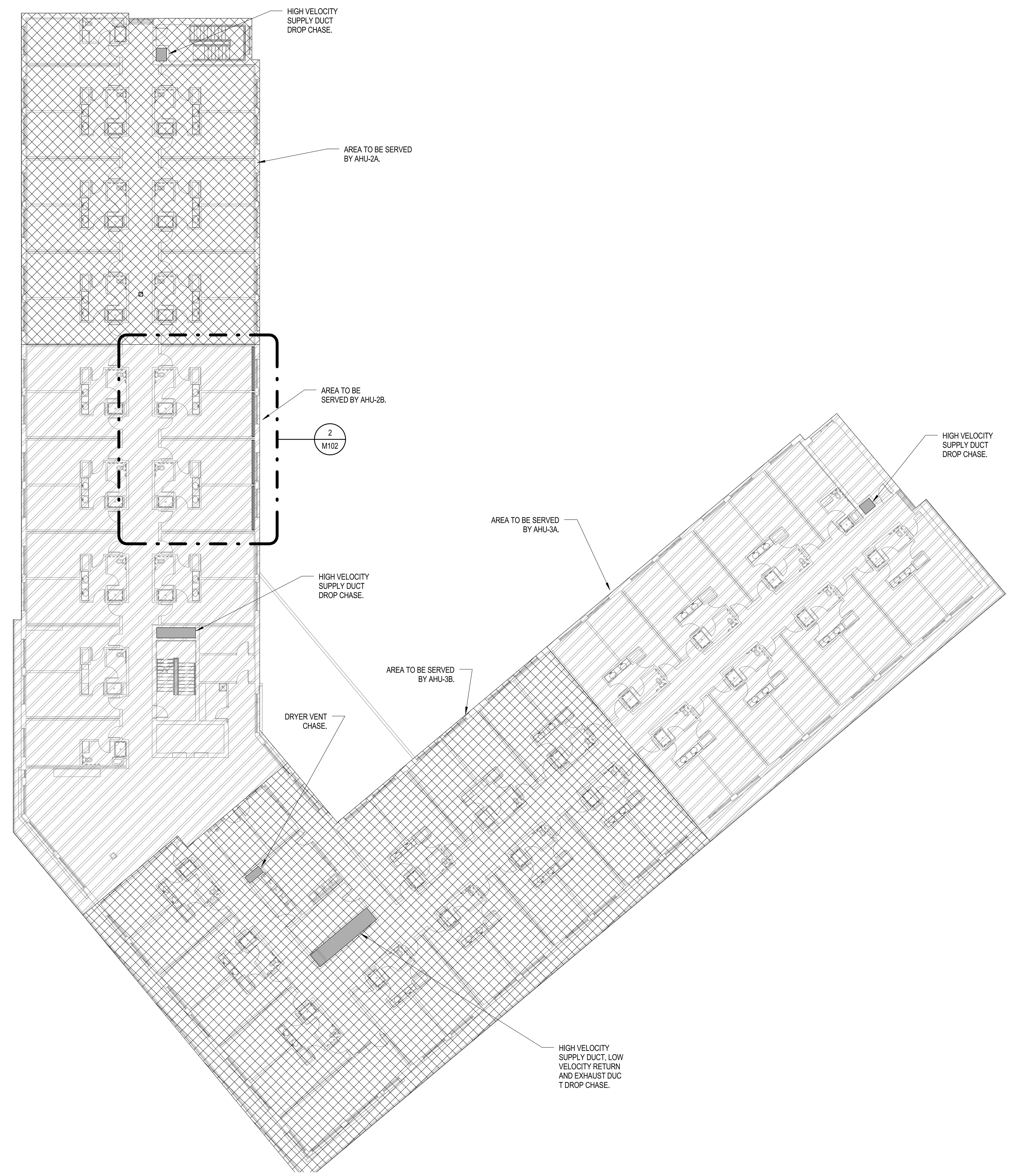


PARTIAL TYPICAL SECOND- FOURTH FLOOR HVAC PLANS

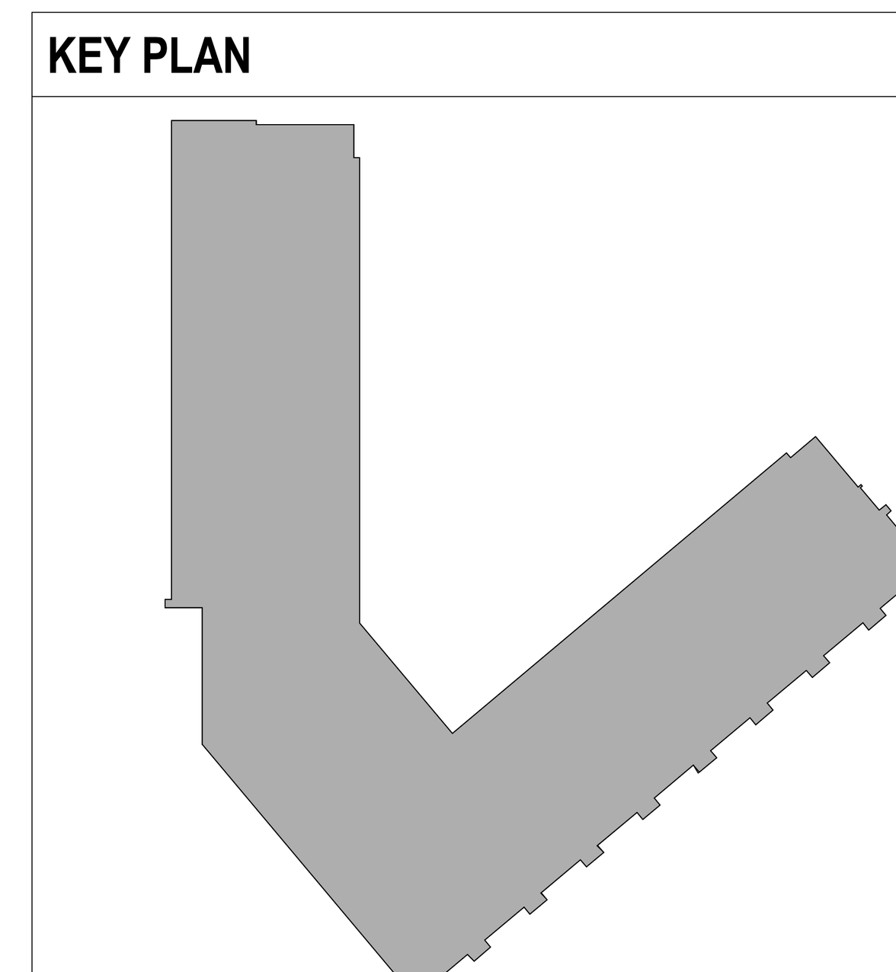
1/4" = 1'-0"



SECOND- FOURTH FLOOR HVAC PLANS

1/16" = 1'-0"

KEY PLAN



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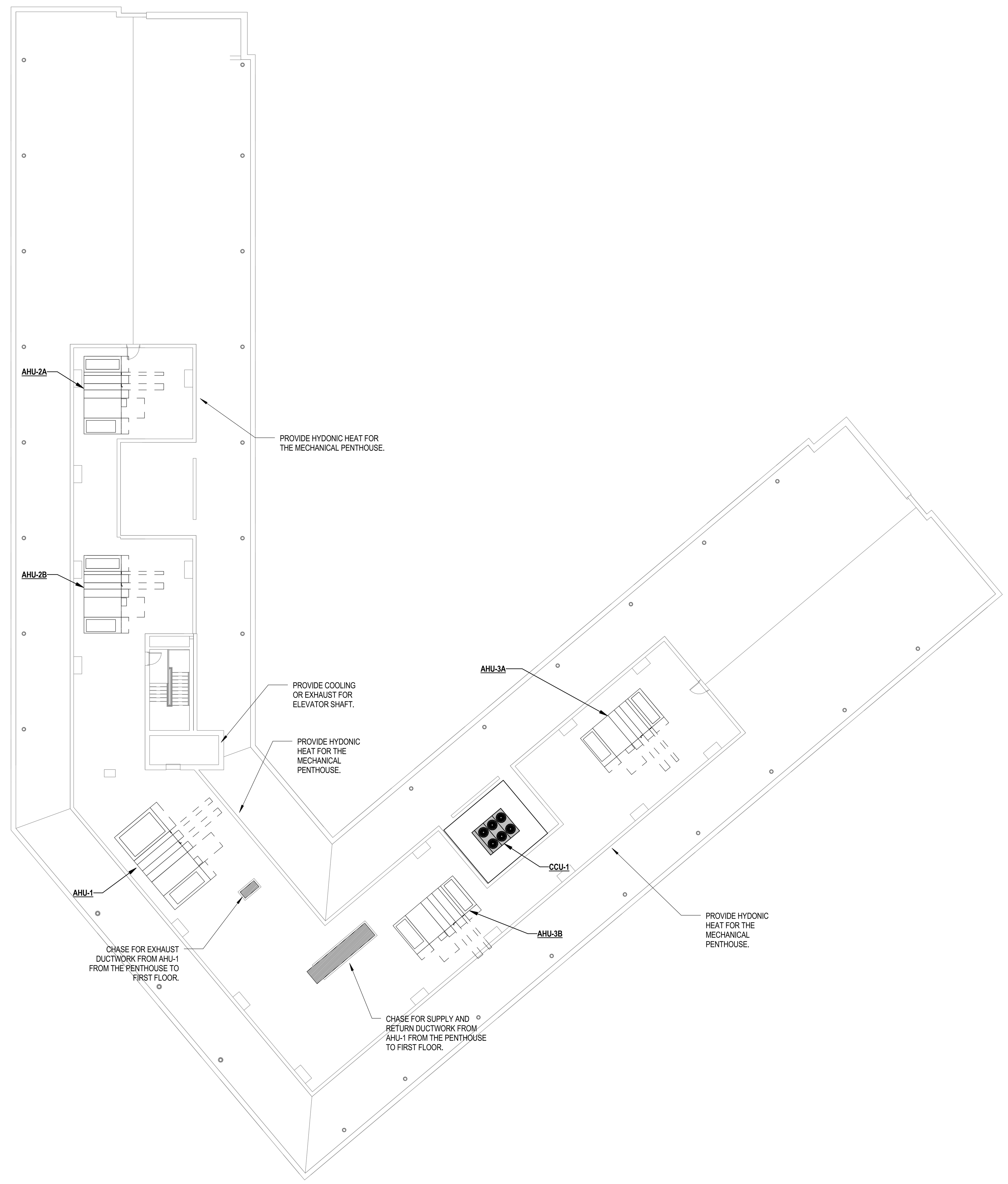
OVERALL SECOND- FOURTH FLOOR HVAC PLANS

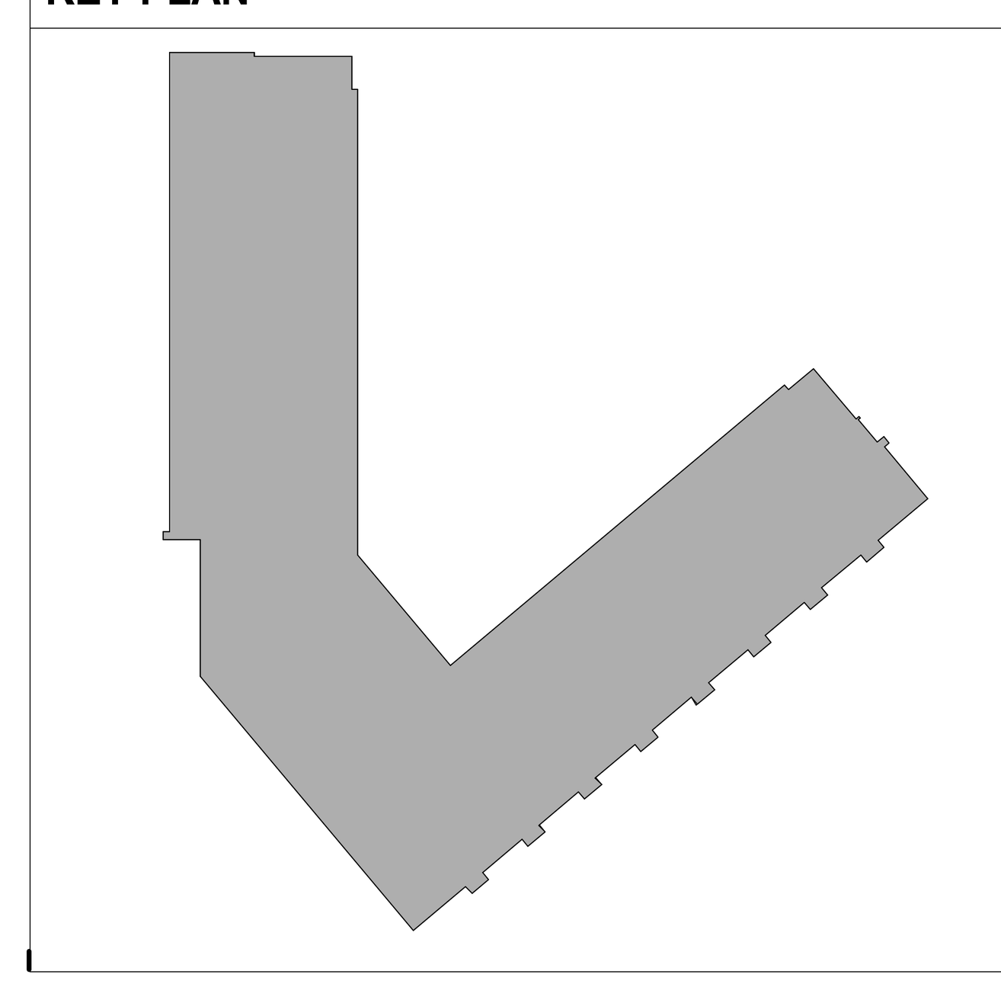
M102



PENTHOUSE HVAC FLOOR PLAN

1/16" = 1'-0"

KEY PLAN



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PENTHOUSE HVAC FLOOR PLAN

M105

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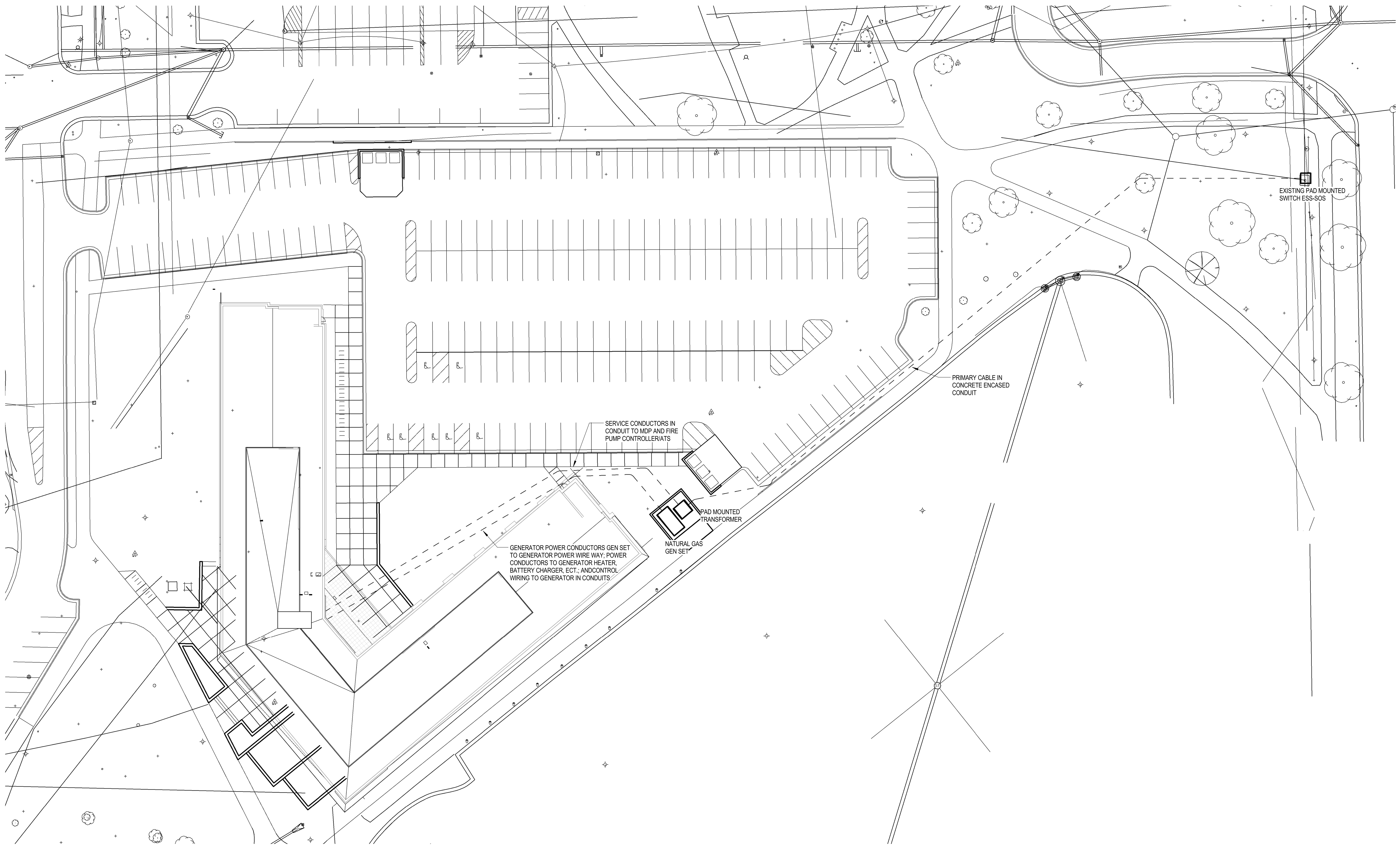

1 SITE ELECTRICAL PLAN
1" = 30'-0"

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ELECTRICAL
SITE PLAN
ES001

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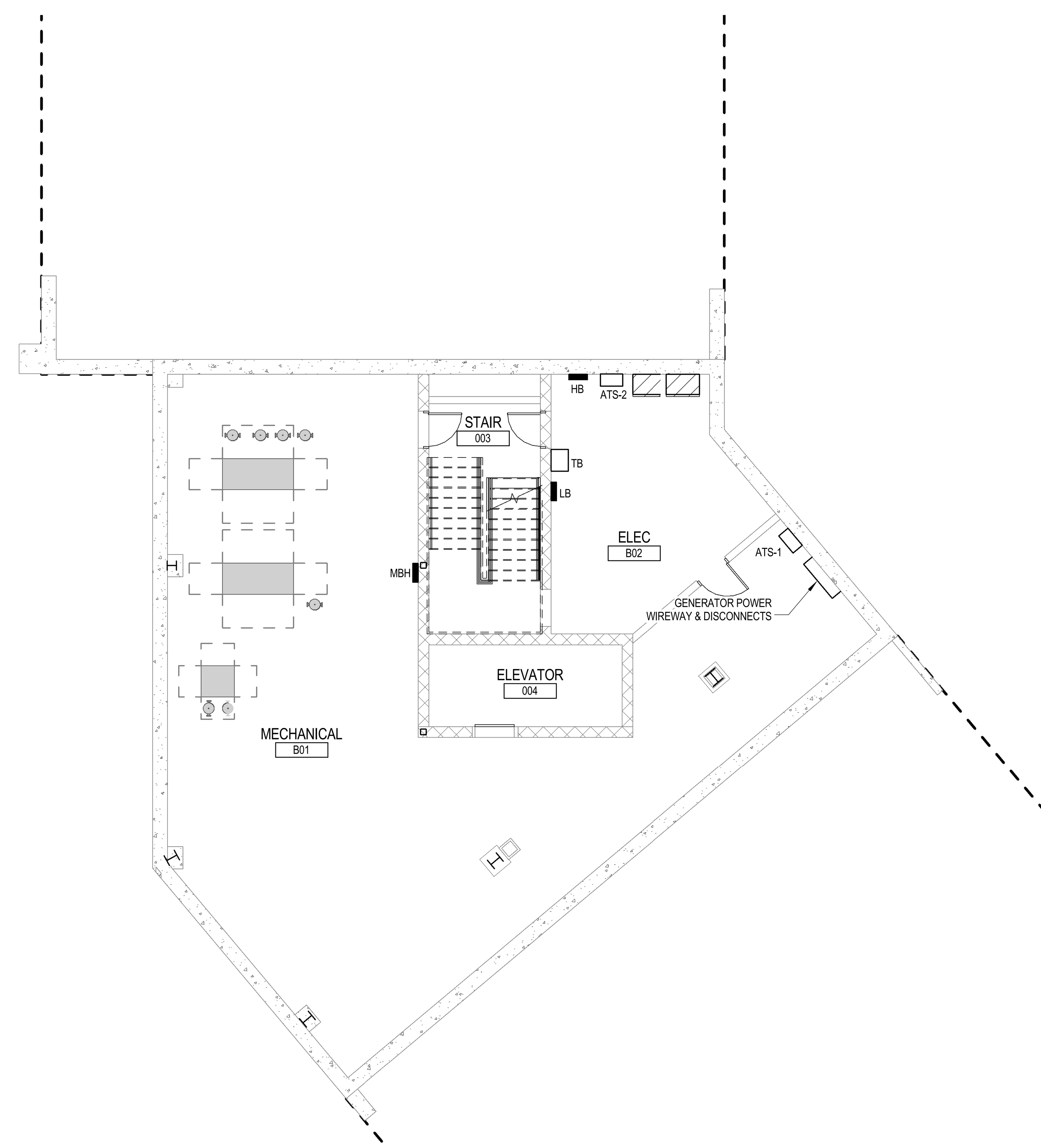

BASEMENT POWER PLAN

1/8" = 1'-0"

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BASEMENT
POWER PLAN

EP101

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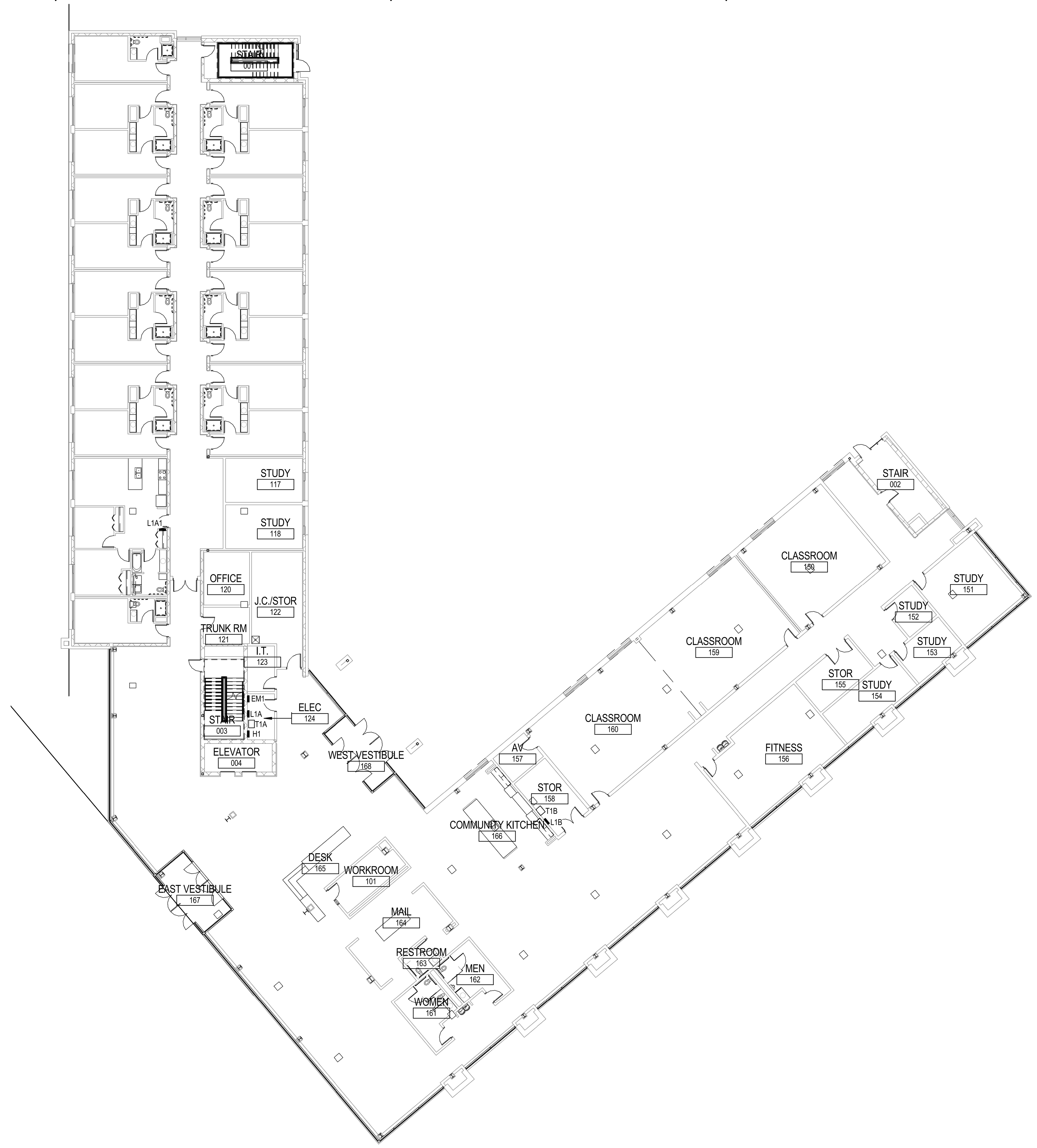

FIRST FLOOR POWER PLAN

1/16" = 1'-0"

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FIRST FLOOR
POWER PLAN
EP102

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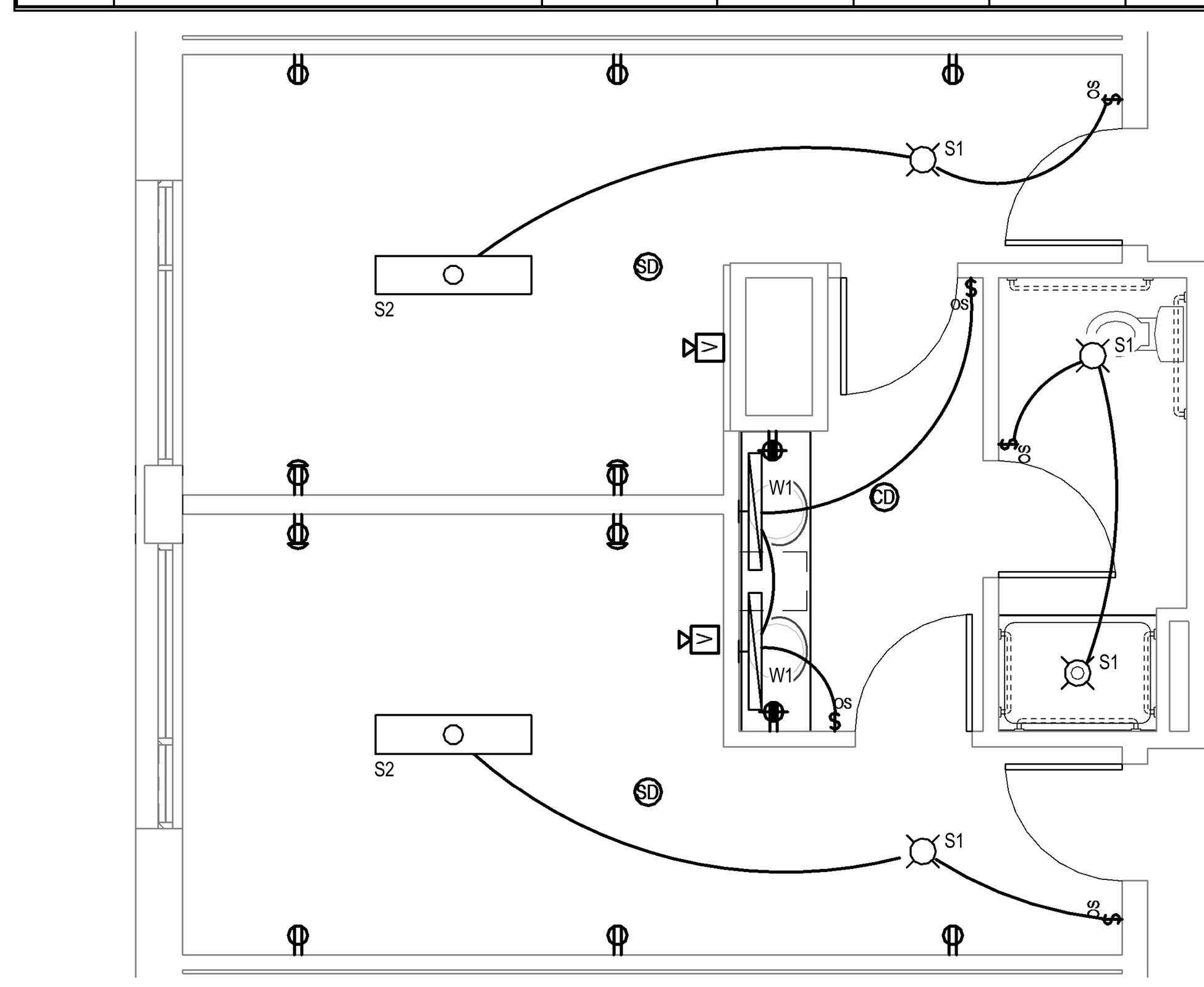
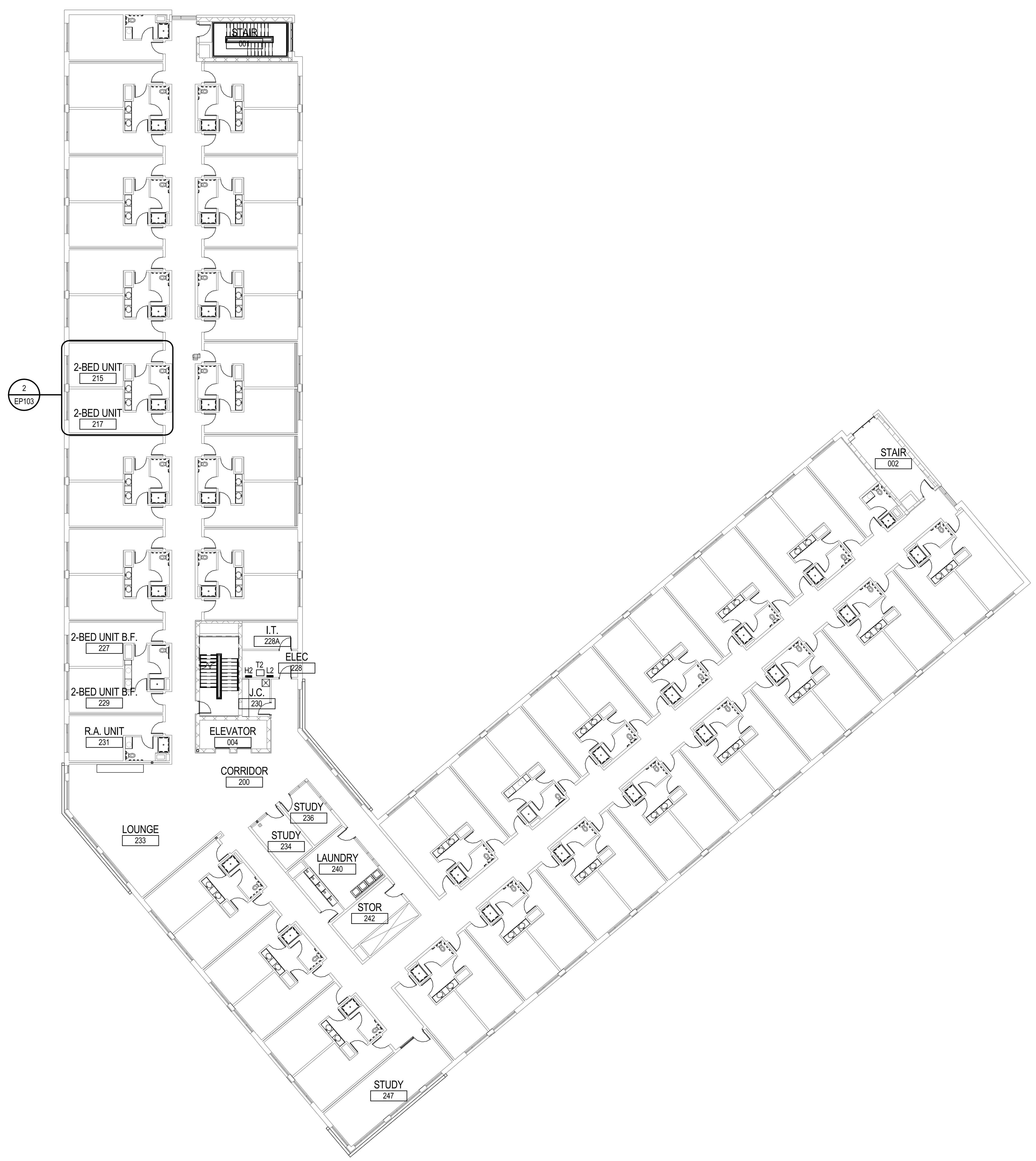
LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LENS-LOUVER	MOUNTING	LAMP	BALLAST	VOLT	WATT
S1	SURFACE MOUNTED LED DOWNLIGHT	ACRYLIC	SURFACE	LED	LED DRIVER	120 V	12 W
S2	SURFACE MOUNTED LED ARCHITECTURAL HIGH-ABUSE LUMINAIRE	ACRYLIC	SURFACE	LED	LED DRIVER	120 V	50 W
W1	WALL MOUNTED VANITY LUMINAIRE	TBD	WALL MT ABOVE MIRROR	LED	LED DRIVER	120 V	20 W



2 TYPICAL 4-BED SUITE ELECTRICAL PLAN
EP103 1/4" = 1'-0"



1 TYPICAL FLOOR POWER PLAN
1/16" = 1'-0"

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TYPICAL FLOOR POWER PLAN
EP103

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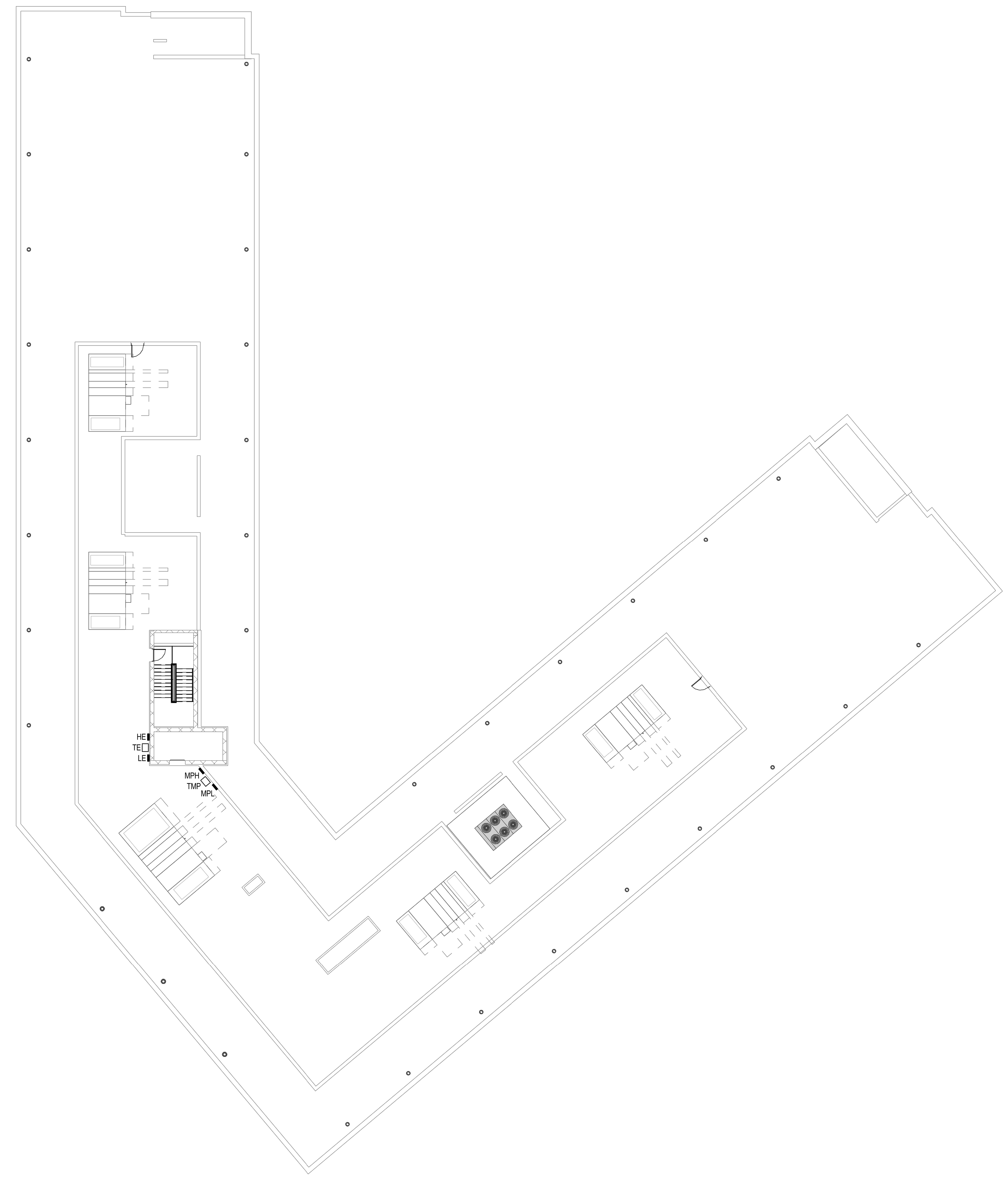

PENTHOUSE POWER PLAN

1/16" = 1'-0"

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PENTHOUSE
POWER PLAN

EP106

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ELECTRICAL ABBREVIATIONS

"	INCHES
#	NUMBER
&	AND
'	FEET
@	AT
A	AMPERES
A/C	AIR CONDITIONING
A/V	AUDIO VISUAL
AAC	ABOVE ACCESSIBLE CEILING
AC	AIR COMPRESSER
AC	ARCHITECTURAL CONTRACTOR
ACLG	ABOVE CEILING
ACU	AIR CONDITIONING UNIT
AD	ACCESS DOOR
ADA	AMERICANS WITH DISABILITIES ACT
ADD	ADDENDUM
ADO	AUTOMATIC DOOR OPENER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISH GRADE
AFI	ARC FAULT CIRCUIT INTERRUPTER
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL	ALUMINUM
ALT	ALTERNATE
AMPL	AMPLIFIER
ANNUN	ANNUNCIATOR
AP	ACCESS PANEL
APPROX	APPROXIMATE
ARCH	ARCHITECT, ARCHITECTURAL
AS	AMP SWITCH
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILARY
AWG	AMERICAN WIRE GAUGE
B	BOILER
BAS	BUILDING AUTOMATION SYSTEM
BATT	BATTERY
BF	BARRIER FREE
BFG	BELOW FINISHED GRADE
BLDG	BUILDING
BMS	BUILDING MANAGEMENT SYSTEM
BOD	BOTTOM OF DEVICE
BSMT	BASEMENT
BULL	BULLETIN
C	CONDUIT
CAB	CABINET
CAP	CAPACITY
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCTV	CLOSED-CIRCUIT TELEVISION
CF	CEILING FAN
CFL	COMPACT FLUORESCENT
CH	CABINET HEATER
CKT	CIRCUIT
CL	CENTERLINE
CLG	CEILING
CLR	CLEAR, CLEARANCE
CMPR	COMPRESSOR
COL	COLUMN
COMB	COMBINATION
CONC	CONCRETE
CONN	CONNECT, CONNECTED, CONNECTION
CONT	CONTINUOUS; CONTINUATION
CONV	CONVECTOR
COORD	COORDINATE
CP	CIRCULATING PUMP
CR	CARD READER
CT	COOLING TOWER
CT	CURRENT TRANSFORMER
CTR	CENTER
CU	COPPER
DCP	DOMESTIC WATER CIRCULATING PUMP
DEG	DEGREES
DEPT	DEPARTMENT
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DISC	DISCONNECT
DIST	DISTANCE
DISTR	DISTRIBUTION
DL	DEAD LOAD
DN	DOWN
DPR	DAMPER
DS	DOOR SWITCH
DT	DOUBLE THROW
DW	DISHWASHER
DWG	DRAWING
DWH	DOMESTIC WATER HEATER
EA	EACH
EC	ELECTRICAL CONTRACTOR
EF	EXHAUST FAN
EHC	ELECTRIC HEATING COIL
EIH	ELECTRIC INFARED HEATER
ELEC	ELECTRIC, ELECTRICAL
ELEV	ELEVATOR
EM	EMERGENCY
EMS	ENERGY MANAGEMENT SYSTEM
EMT	ELECTRICAL METALLIC TUBING
EP	ELECTRIC PNEUMATIC
EQ	EQUAL
EQUIP	EQUIPMENT
ES	ELECTRICAL STRIKE
ETR	EXISTING TO REMAIN
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EX	EXISTING
EXP	EXPLOSION PROOF
EXT	EXTERIOR
F	FAHRENHEIT
FA	FIRE ALARM
FAC	FIRE ALARM CONTRACTOR
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FC	FLEXIBLE CONNECTION
FCU	FAN COIL UNIT
FDR	FEEDER
FDS	FUSED DISCONNECT SWITCH
FIXT	FIXTURE
FL	FLUORESCENT
FLA	FULL LOAD AMPS
FLEX	FLEXIBLE
FLR	FLOOR, FLOORING
FMC	FLEXIBLE METAL CONDUIT
FT	FOOT, FEET
FU	FUSE
FURN	FURNISH, FURNISHED
FV	FIELD VERIFY
GAL	GALLON
GALV	GALVANIZED
GC	GENERAL CONTRACTOR, GENERAL CONTRACT
GEN	GENERATOR
GFI	GROUND FAULT CIRCUIT INTERRUPTOR
GFP	GROUND FAULT CIRCUIT PROTECTOR
GND	GROUND
GRMC	GALVANIZED RIGID METAL CONDUIT
GYP	GYPSUM
HD	HEAVY DUTY
HOA	HAND-OFF AUTOMATIC
HP	HORSEPOWER
HPF	HIGH POWER FACTOR
HSKP	HOUSEKEEPING PAD
HT	HEIGHT
HTG	HEATING
HTP	HEAT PUMP
HTR	HEATER
HUM	HUMIDIFIER
HV	HIGH VOLTAGE
HVAC	HEATING / VENTILATION / AIR CONDITIONING
HWP	HYDRONIC WATER PUMP
I/W	INTERLOCK WITH
IBC	INTERNATIONAL BUILDING CODE
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND

ELECTRICAL ABBREVIATIONS

IMC	INTERMEDIATE METAL CONDUIT
INCAND	INCANDESCENT
IR	INFRARED
JBOX	JUNCTION BOX
KO	KNOCKOUT
KS	KEY SWITCH
KV	KILOVOLT
KVA	KILOVOLT-AMPERES
KVAR	KILOVOLT-AMPERES REACTIVE
KW	KILOWATTS
KWH	KILOWATT-HOURS
LEED	LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN
LP	LIGHT POLE
LT	LITE, LIGHT
LTG	LIGHTING
LTNG	LIGHTNING
LV	LOW VOLTAGE
M/C	MOMENTARY CONTACT
MAX	MAXIMUM
MC	MECHANICAL CONTRACTOR
MCA	MINIMUM CIRCUIT AMPS
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MD	MOTORIZED DAMPER, MOTION DETECTOR
MDC	MAIN DISTRIBUTION CENTER
MDP	MAIN DISTRIBUTION PANEL
MECH	MECHANICAL
MFDS	MAIN FUSED DISCONNECT SWITCH
MFR	MANUFACTURER
MH	MANHOLE
MIC	MICROPHONE
MIN	MINIMUM
MISC	MISCELLANEOUS
ML	MAGNETIC DOOR LOCK
MLO	MAIN LUGS ONLY
MMS	MANUAL MOTOR STARTER
MOA	MULTIOUTLET ASSEMBLY
MOP	MAXIMUM OVERCURRENT PROTECTION
MS	MAGNETIC STARTER
MSBD	MAIN SWITCH BOARD
MSP	MOTOR STARTER PANELBOARD
MT	MOUNT
MTR	MOTOR, MOTORIZED
MTS	MANUAL TRANSFER SWITCH
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
NF	NONFUSED
NFDS	NONFUSED DISCONNECT SWITCH
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT-LIGHT
NO	NORMALLY OPEN
NPF	NORMAL POWER FACTOR
NTS	NOT TO SCALE
OC	ON CENTER
OH	OVERHEAD
OHD	OVERHEAD DOOR
OL	OVERLOAD
P	PUMP
PA	PUBLIC ADDRESS
PB	PUSH BUTTON
PB	PULL BOX
PE	PNEUMATIC ELECTRIC
PED	PEDESTAL
PERF	PERFORATE, PERFORATED
PF	POWER FACTOR
PF	PUMP - FIRE PROTECTION
PH	PHASE
PIV	POST INDICATING VALVE
PNL	PANEL
PP	POWER POLE
PP	PUMP - PLUMBING
PRI	PRIMARY
PROJ	PROJECTOR
PRV	POWER ROOF VENTILATOR
PT	POTENTIAL TRANSFORMER
PVC	POLYVINYL CHLORIDE
PWR	POWER
QTY	QUANTITY
RA	RETURN AIR
RAF	RETURN AIR FAN
RCPT	RECEPTACLE
REQ	REQUIRED, REQUIREMENT
REV	REVISE, REVISION
RIO	ROUGH-IN ONLY
RM	ROOM
RMC	RIGID METAL CONDUIT
RNMC	RIGID NONMETALLIC CONDUIT
RT	RAINTIGHT
RTU	ROOFTOP UNIT
S/S	STOP/START PUSHBUTTONS
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SC	SURFACE CONDUIT
SCHED	SCHEDULE
SEC	SECONDARY
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SM	SURFACE MOUNTED
SN	SOLID NEUTRAL
SP	SPARE
SPD	SURGE PROTECTIVE DEVICE
SPEC	SPECIFICATION
SPKR	SPEAKER
SR	SURFACE RACEWAY
SS	STAINLESS STEEL
SSW	SELECTOR SWITCH
STA	STATION
STD	STANDARD
STOR	STORAGE
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
SYM	SYMMETRY, SYMMETRICAL
SYS	SYSTEM
TBD	TO BE DETERMINED
TEL	TELEPHONE
TEL	TELEPHONE
TERM	TERMINAL
TL	TWIST LOCK
TOD	TOP OF DEVICE
TR	TAMPER RESISTANT
TTC	TELEPHONE TERMINAL CABINET
TU	TERMINAL UNIT
TV	TELEVISION
TVTC	TELEVISION TERMINAL CABINET
TYP	TYPICAL
U/V	UNIT VENTILATOR
UC	UNDER COUNTER
UE	UNDERGROUND ELECTRICAL
UG	UNDERGROUND
UH	UNIT HEATER
UL	UNDERWRITERS LABORATORY
UNO	UNLESS NOTED OTHERWISE
UT	UNDERGROUND TELEPHONE
UV	ULTRA VIOLET
V	VOLTS
VA	VOLT-AMPERES
VDT	VIDEO DISPLAY TERMINAL
VERT	VERTICAL
VFD	VARIABLE FREQUENCY DRIVE
VOL	VOLUME
W	WATTS
W/	WITH
W/O	WITHOUT
WG	WIRE GUARD
WHTR	WATER HEATER
WP	WEATHERPROOF
XFER	TRANSFER
XFMR	TRANSFORMER
Ø	PHASE

POWER SYMBOL LEGEND

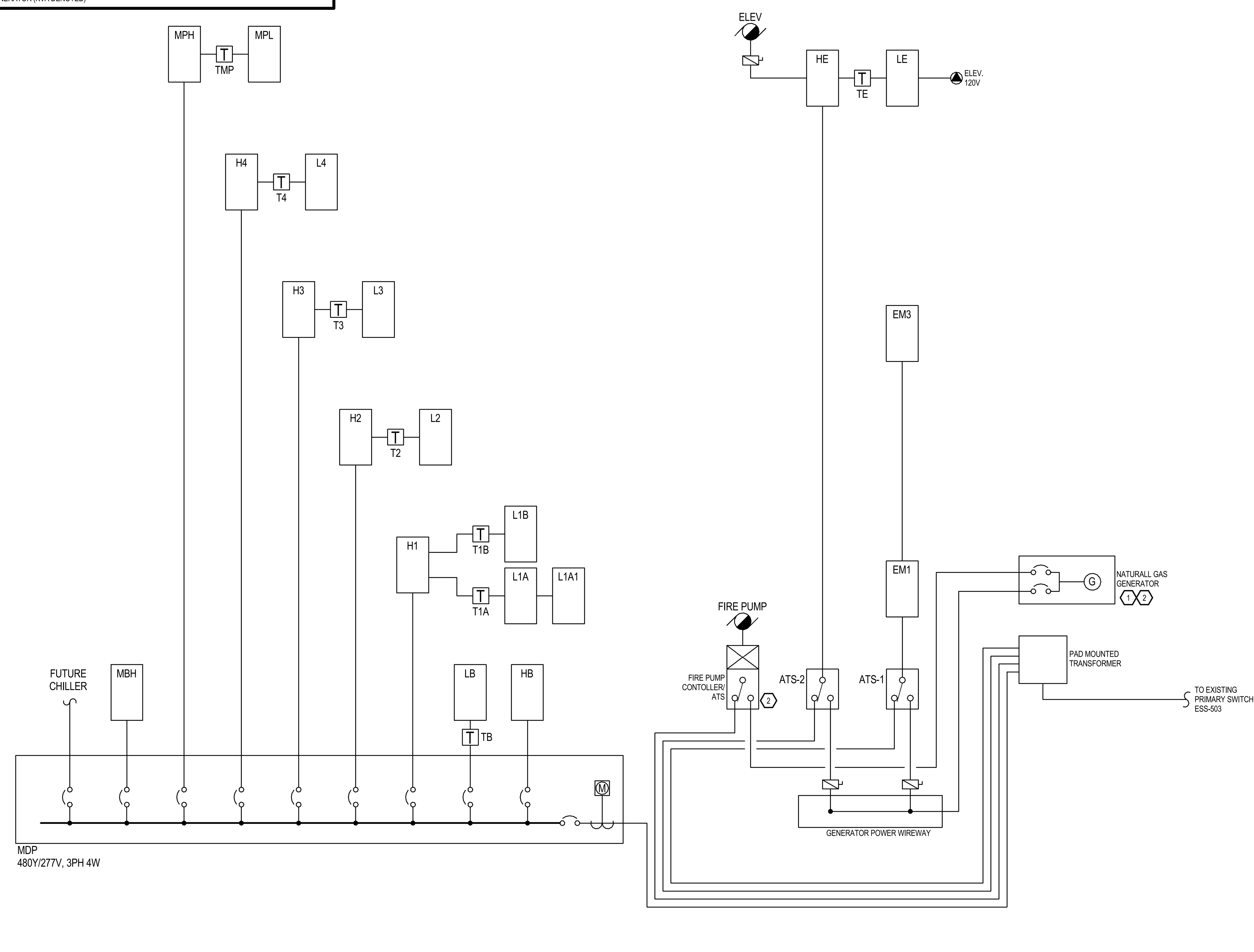
E - ELECTRICAL CONTRACTOR
M - MECHANICAL CONTRACTOR
X - OTHERS

BACKBOX & RACEWAY BY	DEVICE BY	INSTALLED BY	WIRED BY	SYMBOL	DESCRIPTION	HEIGHT TO MIDDLE OF DEVICE (U.N.O.)
E	E	E	E		SINGLE RECEPT ("EM" = EMERGENCY, "HG" = HOSPITAL GRADE, "U" = CONNECTED TO UPS)	18"
E	E	E	E		GFCI RATED SINGLE RECEPT	18"
E	E	E	E		ISOLATED GROUND SINGLE RECEPT	18"
E	E	E	E		SWITCHED SINGLE RECEPT	18"
E	E	E	E		DUPLEX RECEPT ("EM" = EMERGENCY, "HG" = HOSPITAL GRADE, "U" = CONNECTED TO UPS)	18"
E	E	E	E		GFCI RATED DUPLEX RECEPT	18"
E	E	E	E		ISOLATED GROUND DUPLEX RECEPT	18"
E	E	E	E		SWITCHED DUPLEX RECEPT (SPLIT-WIRE)	18"
E	E	E	E		USB/DUPLEX RECEPT	18"
E	E	E	E		ABOVE COUNTERTOP DUPLEX RECEPT, MOUNT 4" ABOVE BACKSPLASH OR 44"	
E	E	E	E		FOURPLEX RECEPT ("EM" = EMERGENCY, "HG" = HOSPITAL GRADE, "U" = CONNECTED TO UPS)	18"
E	E	E	E		GFCI RATED FOURPLEX RECEPT	18"
E	E	E	E		ISOLATED GROUND FOURPLEX RECEPT	18"
E	E	E	E		SWITCHED FOURPLEX RECEPT (SPLIT-WIRE)	18"
E	E	E	E		ABOVE COUNTERTOP FOURPLEX RECEPT, MOUNT 4" ABOVE BACKSPLASH OR 44"	
E	E	E	E		SPECIAL RECEPT OR CONNECTION, PROVIDE DIRECT POWER CONNECTION OR MATCHING RECEPTACLE AS REQUIRED, COORDINATE W/ EQUIPMENT MANUFACTURER	18"
E	E	E	E		MULTIOUTLET WIREMOLD ASSEMBLY, MOUNT 4" ABOVE BACKSPLASH OR PROVIDE POWER RECEPTS AS SHOWN ON DRAWING	44"
E	E	E	E		FLOOR RECEPT (DUPLEX SHOWN)	
E	E	E	E		CEILING RECEPT (DUPLEX SHOWN)	
E	X	X	X	J J J	JUNCTION BOX (FLOOR, WALL, CEILING SHOWN)	AS NOTED
E	E	E	E		PUSH BUTTON STATION	48"
E	E	E	E	$ M	MOTOR HORSEPOWER RATED SWITCH	48"
E	E	E	E	$ F	FUSED SWITCH	48"
E	E	E	E		SAFETY DISCONNECT SWITCH (FUSED)	72"
E	E	E	E		COMBO MOTOR STARTER/DISCONNECT SWITCH (FUSED)	72"
E	E	E	E	VFD	VARIABLE FREQUENCY DRIVE	
E	E	E	E		SINGLE PHASE MOTOR (SEE SCHEDULE)	
E	E	E	E		THREE PHASE MOTOR (SEE SCHEDULE)	
E	E	E	E		CIRCUIT BREAKER PANEL	72"
E	E	E	E		POWER OR DISTRIBUTION PANEL	72"
E	E	E	E		SPECIAL CABINET (TYPE DENOTED)	72"
E	E	E	E	T	TRANSFORMER (TYPE DENOTED)	
E	E	E	E	25 KVA	GENERATOR (KVA DENOTED)	

WIRING SYMBOL LEGEND

E - ELECTRICAL CONTRACTOR
M - MECHANICAL CONTRACTOR
X - OTHERS

BACKBOX & RACEWAY BY	DEVICE BY	INSTALLED BY	WIRED BY	SYMBOL	DESCRIPTION	HEIGHT TO MIDDLE OF DEVICE (U.N.O.)
E	E	E	E		CONDUIT CONCEALED IN WALL OR OVERHEAD	
E	E	E	E		CONDUIT CONCEALED BELOW FLOOR	
E	E	E	E		CONDUIT EXPOSED	
E	E	E	E		CONDUIT TRANSITION UP	
E	E	E	E		CONDUIT TRANSITION DOWN	
E	E	E	E		CONDUIT STUBBED OUT	
E	E	E	E	J	UNDERFLOOR RACEWAY SYSTEM	
E	E	E	E		CABLE TRAY (TYPE DENOTED)	
E	E	E	E		CONDUIT SLEEVE (SIZE DENOTED)	
E	E	E	E		BRANCH CIRCUIT HOME RUN	
E	E	E	E	LV	LOW VOLTAGE POWER WIRING	
E	E	E	E	UE	UNDERGROUND ELECTRICAL	
E	E	E	E	OHE	OVERHEAD ELECTRIC	
E	X	X	E	P	UTILITY SERVICE POWER POLE (SITE)	
E	E	E	E	G	GROUND CONDUCTOR	
E	E	E	E		LIGHTNING PROTECTION AIR TERMINAL	
E	E	E	E		LIGHTNING PROTECTION CONDUCTOR SPLICE	
E	E	E	E		GROUND ROD (PLAN VIEW)	
E	E	E	E		GROUND CONNECTION TO STEEL OR STRUCTURE	
E	E	E	E		GROUND CONNECTION - EXOTHERMIC WELD	



ELECTRICAL ONE-LINE DIAGRAM

NOT TO SCALE

GENERAL ELECTRICAL NOTES

1. UNDERGROUND RACEWAY OUTSIDE THE STRUCTURE SHALL BE PVC.
2. ALL CONDUCTORS OPERATING AT 50 VOLTS OR GREATER SHALL BE IN RACEWAY. ALL RACEWAY WITHIN THE STRUCTURE AND FLOOR SLAB SHALL BE METAL. UNDERGROUND RACEWAY OUTSIDE THE STRUCTURE SHALL BE PVC.
3. ALL LOW VOLTAGE CABLES OR CONDUCTORS OPERATING AT LESS THAN 50 VOLTS SHALL BE IN METAL RACEWAY WHERE INSTALLED WITHIN WALLS OR INACCESSIBLE SPACES. LOW VOLTAGE CABLES TO BE RUN IN CABLE TRAY ABOVE CORRIDORS AND IN EQUIPMENT ROOMS..
4. WHERE POSSIBLE, ALL CONDUIT AND CABLE SHALL BE RUN UNDER THE TOP CHORD OF THE JOISTS. UNDER NO CIRCUMSTANCE SHALL CONDUIT BE RUN WITHIN 1-1/2" OF THE ROOF DECK.
5. COORDINATE LOCATIONS OF DEVICES WITH ARCHITECTURAL ELEVATIONS AND DETAILS.
6. ALL ELEVATION HEIGHTS SHOWN ARE MEASURED TO THE MIDDLE OF THE DEVICE UNLESS NOTED OTHERWISE.
7. ALL RECESSED LIGHTING FIXTURES IN LAY-IN CEILINGS SHALL BE INSTALLLED WITH 6' LONG FLEXIBLE METAL CONDUIT.
8. WHERE CONNECTED TO A 20A BRANCH CIRCUIT SUPPLYING AN INDIVIDUAL RECEPTACLE (SIMPLEX OR DUPLEX), THE RECEPTACLE SHALL BE RATED AT 20A.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR WIRING ALL ELECTRICAL ITEMS SHOWN ON THE DRAWINGS.
10. TV OUTLETS, VOLUME CONTROLS, NURSE CALL DOME LIGHTS, NURSE CALL DEVICES, TELEPHONE OUTLETS, DATA OUTLETS, AND FIRE ALARM DEVICES SHALL CONSIST OF A BACK BOX WITH CONDUIT STUBBED ABOVE THE ACCESSIBLE CEILING. VERIFY SIZE OF BACK BOX REQUIRED WITH DEVICE TO BE INSTALLED. LOCATE BACK BOXES 6" FROM ADJACENT POWER RECEPTACLE INTENDED FOR COMPUTER USE.

ONE-LINE KEYED NOTES

1. GENERATOR SIZED TO PROVIDE STAND-BY POWER TO 12-KW OF EMERGENCY LIGHTING AND FIRE ALARM LOAD + 125-HP FIRE PUMP + 15-HP ELEVATOR.
2. PROVIDE ALTERNATE PRICING TO PROVIDE SEPARATE PARALLEL MV FEED FROM ESS-503 TO SEPARATE PAD-MOUNTED TRANSFORMER TO FIRE PUMP CONTROLLER DIRECTLY IN LIEU OF SIZING GENERATION FOR FIRE PUMP LOAD AND PROVIDING FIRE PUMP TAP DISCONNECT/FUSES.

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ISSUANCES

BID PACKAGE #02
7/22/2016

REVISIONS

NO. DATE DESCRIPTION

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JC/ENG BY	KGG
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ELECTRICAL ONE-LINE DIAGRAM AND SYMBOL LEGENDS

E501