JOHN KNOX VILLAGE MEADOWS

PHASE II

LEE'S SUMMIT, MO

PERMIT SET
VOLUME TWO

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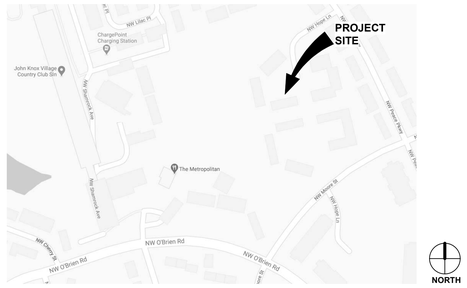
VICINITY MAP

LOCATION MAP



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APARTMENT BUILDING ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

- ■ IECC CHAPTER 4
- ☐ COMCHECK PROVIDED (IECC)
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ ENERGY MODELING DATA PROVIDED
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ■ C406.3 REDUCED LTG DENSITY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.4 ENHANCED LTG CONTROLS
- ☐ C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

4A - JACKSON COUNTY, MISSOURI

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	7° F.
summer dry bulb	93° F.
summer wet bulb	76° F.

INTERIOR (2018 IECC SECTION C302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - SPLIT SYSTEM HEAT PUMPS AND VPTACS

- ■ MINIMUM HVAC EQUIP EFFICIENCY COMPLIANCE - TABLE C403.2.3
- ☐ INCREASED HVAC EQUIP EFFICIENCY COMPLIANCE - 10% OVER TABLE C403.2.3

TABLE C403.2.3(2) - ELECTRICALLY OPERATED UNITARY AND APPLIED HEAT PUMPS

AIR COOLED COOL MODE	< 65,000 (<= 5 TONS)	SPLIT SYSTEM & SINGLE PACKAGE	14.0 SEER	15.4 SEER	SEE SCHEDULE

C403.2.4 THRU C403.2.11

- ■ HVAC SYSTEMS ARE FULLY COMPLIANT WITH THE REQUIREMENTS FOR HVAC SYSTEM CONTROL, VENTILATION, ENERGY RECOVERY, DUCT AND PLENUM INSULATION AND SEALING, PIPING INSULATION, AND SYSTEM COMPLETION.

C403.2.12 - AIR SYSTEM DESIGN AND CONTROL

- ■ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.

C403.3 - ECONOMIZERS (PRESCRIPTIVE)

- ☐ PROJECT INCLUDES AN AIR OR WATER ECONOMIZER COMPLIANT WITH C403.3
- ■ PROJECT MEETS AN ECONOMIZER EXCEPTION LISTED IN C403.3

C403.4 - HYDRONIC AND MULTIPLE-ZONE HVAC SYSTEMS CONTROL AND EQUIPMENT (PRESCRIPTIVE)

- ■ PROJECT CONSISTS OF ONLY SINGLE ZONE DX SYSTEMS, EXEMPT FROM THE PRESCRIPTIVE REQUIREMENTS OF C403.4.
- ☐ PROJECT CONSISTS OF HVAC SYSTEMS FULLY COMPLIANT WITH THE PRESCRIPTIVE REQUIREMENTS OF C403.4.

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

- ■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMNTS PER C405.8, EXCEPT WHERE EXEMPT.
- ☐ NOT APPLICABLE.

C408 - SYSTEM COMMISSIONING

- ■ PROJECT TOTAL COOLING CAPACITY IS GREATER THAN 480,000 BTH/H AND REQUIRES COMMISSIONING PER SECTION C408 (COMMISSIONING NOT REQUIRED IN DWELLING UNITS)

GARAGE ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - MECHANICAL SUMMARY

C401 METHOD OF COMPLIANCE

- ■ IECC CHAPTER 4
- ☐ COMCHECK PROVIDED (IECC)
- ☐ ASHRAE 90.1-2013 PRESCRIPTIVE
- ☐ COMCHECK PROVIDED (90.1-2013)
- ☐ ASHRAE 90.1-2013 PERFORMANCE
- ☐ ENERGY MODELING DATA PROVIDED
- ☐ N/A (EXISTING LIGHTING, HVAC, AND DOM. WATER HEATING SYSTEMS TO REMAIN)

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- ☐ C406.2 EFFICIENT MECH EQUIPMENT
- ☐ C406.5 ON-SITE RENEWABLE ENERGY
- ■ C406.3 REDUCED LTG DENSITY
- ☐ C406.6 DEDICATED OA SYSTEM
- ☐ C406.4 ENHANCED LTG CONTROLS
- ☐ C406.7 SERVICE WATER HEATING

C301 CLIMATE ZONE

4A - JACKSON COUNTY, MISSOURI

DESIGN CONDITIONS

EXTERIOR (ASHRAE 90.1-2013 TABLE D-1)

winter dry bulb	7° F.
summer dry bulb	93° F.
summer wet bulb	76° F.

INTERIOR (2018 IECC SECTION C302.1)

winter dry bulb	72° F.
summer dry bulb	75° F.

C403.2.3 & C406.2 - REQUIRED & INCREASED HVAC EQUIPMENT PERFORMANCE

SYSTEM DESCRIPTION - GARAGE VENTILATION FANS AND ELECTRIC HEATERS

C403.2.12 - AIR SYSTEM DESIGN AND CONTROL

- ☐ ALL FANS INSTALLED ON THE PROJECT ARE 5 HP OR LESS AND ARE EXEMPT FROM THESE REQUIREMENTS.
- ■ FANS ABOVE 5 HP MEET THE CFM LIMITATIONS SHOWN BELOW:

OPTION 1 - FAN SYSTEM MOTOR NAMEPLATE HP - TABLE C403.2.12.1(1)

ALLOWABLE NAMEPLATE MOTOR HP	CONSTANT VOLUME MINIMUM CFM	VARIABLE VOLUME MINIMUM CFM	DESIGN CFM
7.5	6,818 CFM	5,000 CFM	SEE SCHEDULE
10	9,091 CFM	6,667 CFM	SEE SCHEDULE
15	13,636 CFM	10,000 CFM	SEE SCHEDULE
20	18,182 CFM	13,333 CFM	SEE SCHEDULE
25	22,727 CFM	16,667 CFM	SEE SCHEDULE
30	27,272 CFM	20,000 CFM	SEE SCHEDULE
40	36,364 CFM	26,667 CFM	SEE SCHEDULE
50	45,455 CFM	33,333 CFM	SEE SCHEDULE

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS).

- ■ ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMNTS PER C405.8, EXCEPT WHERE EXEMPT.
- ☐ NOT APPLICABLE.

C408 - SYSTEM COMMISSIONING

- ■ PROJECT TOTAL COOLING CAPACITY IS LESS THAN 480,000 BTH/H AND DOES NOT REQUIRE COMMISSIONING PER SECTION C408

CONTROLS AND SEQUENCE OF OPERATION

GARAGE EXHAUST FANS:

FAN G-1 SHALL OPERATE CONTINUOUSLY 24/7/365 AT MINIMUM SPEED

- MINIMUM SPEED SHALL BE 1200 CFM OR LOWEST SPEED VFD CAN UNDERSPEED FAN (GREATER THAN OR EQUAL TO 0.05 CFM/SF PER IMC SECTION 402.2).

CARBON MONOXIDE (CO)/ OXIDES OF NITROGEN (NOx) SENSORS SHALL BE PROVIDED AND INSTALLED IN THE GARAGE AND SHALL SEND SIGNAL TO CENTRALIZED VENTILATION CONTROL SYSTEM (BASIS OF DESIGN SAFE-AIR SYSTEM) WHEN TRIGGERED (SEE PLANS FOR LOCATIONS). UPON RECEIPT OF CONTROL SIGNAL BY THE CENTRALIZED VENTILATION CONTROL PANEL FROM CO/NO2 SENSORS, THE FOLLOWING SEQUENCE OF OPERATION SHALL OCCUR:

- VFD SHALL RAISE FAN SPEED TO DESIGN SETPOINT (22,500 CFM PER FAN)
- SYSTEM SHALL RUN FOR A PRE-DETERMINED (15 MINUTES MINIMUM, ADJ) TIME UNTIL AIR EXCHANGE RATE HAS BEEN SATISFIED AND REMAIN ON UNTIL CO/NO2 SENSORS REACH BELOW THE THRESHOLD LEVELS.
- UPON COMPLETION OF SYSTEM CYCLE/RUN TIME, VFD SHALL LOWER FAN SPEED BACK TO MINIMUM SETPOINT.

GAS MONITORING THRESHOLD LEVELS:
NO2 SENSOR 2.5 ppm (ADJ) - RUN FANS AT HIGH DESIGN SPEED
CO SENSOR 35 ppm (ADJ) - RUN FANS AT HIGH DESIGN SPEED

WHEN CARBON DIOXIDE (CO) CONCENTRATION LEVEL MEASURES ABOVE 100 PPM (ADJ), IMMEDIATELY (ADJ) INITIATE AUDIBLE AND VISUAL ALARMS AND SEND ALARM TO CENTRALIZED VENTILATION CONTROL SYSTEM.

APARTMENT DUCTED SPLIT SYSTEMS:

UNIT SHALL BE CONTROLLED BY ITS ELECTRONIC 7-DAY PROGRAMMABLE THERMOSTAT. UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING PER FACTORY CONTROL. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. UPON A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO SATISFY SPACE TEMPERATURE. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5°, WITHIN WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. THERMOSTATS SHALL BE SET FOR OCCUPIED COOLING 75°, HEATING 70°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING. THERMOSTATS SHALL BE PROGRAMMED BY MECHANICAL CONTRACTOR IN THE PRESENCE OF OWNER'S REPRESENTATIVE PRIOR TO PROJECT COMPLETION.

COMMON AREA DUCTED SPLIT SYSTEMS:

UNIT SHALL BE CONTROLLED BY ITS ELECTRONIC 7-DAY PROGRAMMABLE THERMOSTAT. UNIT SUPPLY FAN SHALL RUN CONTINUOUSLY WHILE IN OCCUPIED MODE. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. UPON A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO SATISFY SPACE TEMPERATURE. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5°, WITHIN WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. THERMOSTATS SHALL BE SET FOR OCCUPIED COOLING 75°, HEATING 70°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING. THERMOSTATS SHALL BE PROGRAMMED BY MECHANICAL CONTRACTOR IN THE PRESENCE OF OWNER'S REPRESENTATIVE PRIOR TO PROJECT COMPLETION.

VERTICAL PTACS:

UNIT SHALL BE CONTROLLED BY ITS ELECTRONIC 7-DAY PROGRAMMABLE THERMOSTAT. UNIT SUPPLY FAN SHALL CYCLE WITH HEATING AND COOLING PER FACTORY CONTROL. UPON A RISE IN SPACE TEMPERATURE, UNIT COMPRESSOR AND CONDENSER FAN SHALL ACTIVATE TO SATISFY SPACE. UPON A DROP IN SPACE TEMPERATURE, UNIT COMPRESSOR SHALL ACTIVATE IN REVERSE CYCLE FOR HEATING. UPON A FURTHER DROP IN SPACE TEMPERATURE, ELECTRIC HEAT SHALL BE ENERGIZED TO SATISFY SPACE TEMPERATURE. THERMOSTATS SHALL PROVIDE A DEADBAND OF 5°, WITHIN WHICH THE SUPPLY OF HEATING OR COOLING ENERGY TO THE ZONE CAN BE REDUCED TO THE MINIMUM. THERMOSTATS SHALL BE SET FOR OCCUPIED COOLING 75°, HEATING 70°. ALL TIME AND TEMPERATURE SETPOINTS SHALL BE VERIFIED BY THE OWNER PRIOR TO PROGRAMMING. THERMOSTATS SHALL BE PROGRAMMED BY MECHANICAL CONTRACTOR IN THE PRESENCE OF OWNER'S REPRESENTATIVE PRIOR TO PROJECT COMPLETION.

DUCTLESS SPLIT SYSTEMS

UNITS SHALL BE PROVIDED WITH A WIRED WALL MOUNTED THERMOSTAT FOR CONTROL; UNIT SHALL CYCLE COOLING AND HEATING AS REQUIRED TO MAINTAIN ROOM TEMPERATURE SETPOINT.

ELECTRIC UNIT HEATERS:

A SPACE TEMPERATURE SENSOR SHALL CONTROL EACH HEATER TO MAINTAIN SPACE TEMPERATURE OF 45° F. (ADJ). WITH SPACE TEMPERATURE ABOVE SETPOINT, HEATER SHALL REMAIN OFF. AS SPACE TEMPERATURE FALLS BELOW SETPOINT, THE HEATER SHALL BE ENERGIZED AS REQUIRED TO MAINTAIN SETPOINT.

MISC. EXHAUST FANS:

PROVIDE SWITCHES, WALL THERMOSTATS, INTERLOCKS, ETC. AS INDICATED ON THE FAN SCHEDULE TO CONTROL FANS AS INDICATED ON PLANS.

COMBINATION FIRE/SMOKE DAMPERS:

FIRE SMOKE DAMPERS SHALL BE ACTUATED BY SPOT CEILING SMOKE DETECTORS. UPON DETECTION OF SMOKE THE SMOKE DETECTOR SHALL SEND A SIGNAL TO CLOSE FIRE/SMOKE DAMPER AND SHUT DOWN ASSOCIATED HVAC UNIT.

MECHANICAL DUCT SYMBOLS

SYMBOL	DESCRIPTION
16x8	SQUARE DUCT SIZE TAG (WIDTH x HEIGHT)
16"Ø	ROUND DUCT SIZE TAG (DIAMETER)
☒	SUPPLY AIR DIFFUSER (4-WAY)
⧅	RETURN AIR GRILLE
⧅	EXHAUST AIR GRILLE
M.C.	MECHANICAL CONTRACTOR
E.C.	ELECTRICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
N.I.C.	NOT IN CONTRACT
AFF	ABOVE FINISHED FLOOR
DN	DOWN
UP	UP

MECHANICAL ACCESSORIES SYMBOL LEGEND

SYMBOL	DESCRIPTION
(T)	THERMOSTAT / TEMP SENSOR (4'-0" AFF TO TOP)
(CO)	CARBON MONOXIDE SENSOR
(S)	SWITCH (4'-0" AFF TO TOP)
FD	RECTANGULAR DUCT FIRE DAMPER W/ ACCESS DOOR (SEE DETAIL)
F/SD	RECTANGULAR DUCT COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)
M	RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS INDICATED. (DAMPER BY M.C.)
(U)	UNDERCUT DOOR (BY G.C.)

MECHANICAL PIPING SYSTEMS LEGEND

SYMBOL	DESCRIPTION
—D—	CONDENSATE DRAINAGE

EQUIVALENT MANUFACTURERS LISTING

LISTING OF MANUFACTURER'S NAME DOES NOT GUARANTEE APPROVAL. ALL EQUIPMENT MUST MEET OR EXCEED QUALITY AND CAPACITIES OF SPECIFIED EQUIPMENT. FINAL APPROVAL WILL BE BASED ON EQUIPMENT SUBMITTALS. ANY MANUFACTURER NOT LISTED BUT WISHING TO BID THIS PROJECT SHALL SUBMIT A WRITTEN REQUEST A MINIMUM OF 7 DAYS PRIOR TO BID DATE OR AS INDICATED IN THE SPECIFICATIONS, PRIOR APPROVAL IS REQUIRED FOR ALL MANUFACTURERS NOT LISTED.

(ALPHABETICAL ORDER)
DUCTED SPLIT SYSTEMS: CARRIER, TRANE, YORK
FANS: COOK, GREENHECK, PENN, TWIN CITY
AIR DISTRIBUTION: CARNES, METAL*AIRE, NAILOR, PRICE, TITUS, TUTTLE & BAILEY, KRUEGER
FIRE DAMPERS: GREENHECK, NAILOR, RUSKIN, POTTORFF, NCA, SAFE-AIRE
LOUVER: GREENHECK, RUSKIN, SAFE-AIR, POTTORFF
DUCTLESS SPLIT SYSTEMS: DAIKIN, MITSUBISHI, TRANE
ELECTRIC WALL/UNIT HEATERS: BERKO, MARKEL, MODINE, RAYWALL, QMARK
DDC CONTROLS: ALERTON, HONEYWELL, SEIMENS, TRANE
VERTICAL PTAC: AMANA, FIRST CO, FRIEDRICH, G.E., MAGIC-PAK

NOTE:
ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF TH MECHANICAL CONTRACTOR.

MECHANICAL GENERAL NOTES

SEE SPECIFICATIONS FOR ADDITIONAL PROJECT REQUIREMENTS. THESE GENERAL NOTES ARE INTENDED TO SUPPLEMENT THE SPECIFICATIONS. IN THE EVENT THAT THE VERBIAGE IS IN CONFLICT OR CONTRADICTS THE REQUIREMENTS LISTED HERE, THE QUESTION SHALL BE ASKED PRIOR TO BIDDING OR THE MORE STRINGENT SHALL APPLY AT THE ENGINEER'S DISCRETION.

1. DO NOT SCALE DRAWINGS. SEE ARCHITECTURAL DRAWINGS AND REFLECTED CEILING PLANS FOR EXACT LOCATION OF DOORS, WINDOWS, CEILING DIFFUSERS, ETC.
2. ALL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT TO COMPLY WITH BASIS OF DESIGN, INCLUDING PROVIDING MAINTENANCE ACCESS, CLEARANCE, PIPING, SHEET METAL, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC., SHALL BE INCLUDED IN THE ORIGINAL BASE BID. NO ADDITIONAL COST ASSOCIATED WITH SUBSTITUTED EQUIPMENT WILL BE APPROVED DURING CONSTRUCTION AND ALL COST WILL BE THE RESPONSIBILITY OF THE MECHANICAL CONTRACTOR. THIS INCLUDES ANY MODIFICATIONS TO ANY ASSOCIATED MECHANICAL, PLUMBING, OR ELECTRICAL SYSTEMS REQUIRED BY THIS SPECIFIC MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. DUCTWORK SHALL BE GALVANIZED SHEET METAL CONSTRUCTED IN ACCORDANCE WITH THE LATEST SMACNA STANDARDS FOR TRUNK DUCT WITH FLEX CONNECTIONS, OR FOR DUCTWORK PASSING THROUGH LOWER MEMBRANE PENETRATION OF RATED ASSEMBLY. ALL SUPPLY, RETURN AND OUTSIDE AIR DUCTWORK SHALL BE WRAPPED WITH 2" THICK DUCT WRAP WITH VAPOR BARRIER. INSULATION (INCLUDING FLEXIBLE DUCT INSULATION) SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 6.0 AND SHALL RUN CONTINUOUSLY THROUGH WALLS AND PARTITIONS. DUCTOWORK LOCATED OUTSIDE OF THE BUILDING THEMRAL ENVELOPE SHALL HAVE A MINIMUM INSTALLED R-VALUE OF 8.0. TRANSFER DUCTS SHALL BE LINED WITH 1" THICK FIBERGLASS DUCT LINER FOR ACOUSTICAL PURPOSES. DUCT DIMENSIONS ON PLANS ARE FREE AREA SIZE.
4. ALL DUCTWORK SHALL BE SEALED PER THE REQUIREMENTS OF THE 2018 INTERNATIONAL MECHANICAL CODE. SEAL LOW PRESSURE SUPPLY, RETURN, OUTSIDE AIR, AND EXHAUST DUCTWORK FOR POSITIVE/NEGATIVE 2" PRESSURE CLASS, SMACNA SEAL CLASS A, SMACNA LEAKAGE CLASS 12.
5. ALL PIPING, DUCTS, VENTS, ETC., EXTENDING THROUGH WALLS AND ROOF SHALL BE FLASHED AND COUNTERFLASHED IN A WATERPROOF MANNER.
6. ALL PIPING AND DUCTWORK LOCATIONS SHALL BE COORDINATED WITH THE WORK UNDER OTHER DIVISIONS OF THE SPECIFICATIONS, TO AVOID INTERFERENCE.
7. THE MECHANICAL CONTRACTOR SHALL BALANCE ALL COMMON AREA MECHANICAL SYSTEMS TO THE PERFORMANCE SPECIFICATIONS INDICATED ON PLANS AND PROVIDE THE ENGINEER WITH THREE COPIES OF A COMPLETE TEST AND BALANCE REPORT. THE REPORT IS TO BE ISSUED A MINIMUM OF TWO WEEKS PRIOR TO PROJECT COMPLETION. THE TEST AND BALANCE REPORT WILL BE SUBJECT TO REVIEW AND APPROVAL BY THE ENGINEER. ANY ADDITIONAL TESTING, ADJUSTING AND BALANCING REQUIRED (AT ENGINEER'S REQUEST) AFTER REVIEW OF THE INITIAL REPORT SHALL BE PROVIDED AT NO ADDITIONAL COST.
8. UPON PROJECT COMPLETION, THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE OWNER INSTALLATION INFORMATION INCLUDING RECORD SUBMITTALS (WITH ANY SUBMITTAL REVIEW COMMENTS ADDRESSED) AND O&M MANUALS FOR EACH PIECE OF EQUIPMENT INCLUDING ALL SELECTED OPTIONS, THE NAME AND ADDRESS OF AT LEAST ONE SERVICE AGENCY, FULL CONTROL SYSTEM O&M AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, FULL SEQUENCE OF OPERATION, AND PROGRAMMED SETPOINTS.
9. PROVIDE A ONE YEAR WARRANTY FOR ALL WORK PERFORMED BEGINNING ON THE DAY THE SYSTEM IS COMPLETELY OPERATIONAL AND ACCEPTABLE BY THE OWNER.
10. PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE AND FILTER REMOVAL.
11. CONDENSATE DRAIN PIPING SHALL BE SCHEDULE 40 PVC PIPE AND FITTINGS. DRAINS FROM AIR HANDLING UNITS SHALL BE TRAPPED. TERMINATE INDOOR UNIT DRAINS ABOVE HUB DRAINS WITH AN AIR GAP - REFER TO PLUMBING PLANS FOR HUB DRAIN LOCATIONS. MINIMUM DRAIN SIZE SHALL BE 3/4". PROVIDE SPALSH BLOCK WHERE ALL CONDENSATE PIPING TERMINATES ON GRADE.
12. ALL REFRIGERANT PIPE SHALL BE NITROGENIZED ACR COPPER TUBE. SIZE, INSULATE, AND INSTALL REFRIGERANT PIPING PER MANUFACTURER'S RECOMMENDATIONS. INSULATION SHALL RUN CONTINUOUSLY THROUGH WALLS AND PARTITIONS. ALL REFRIGERANT PIPING INSTALLED OUTDOORS SHALL HAVE AN OUTER ALUMINUM ENCLOSURE.
13. ANY DEVICE REQUIRING A THERMOSTAT FOR CONTROL SHALL BE FURNISHED WITH A THERMOSTAT WHETHER INDICATED ON THE DRAWINGS OR NOT.
14. INSTALL THE TOP OF ALL THERMOSTATS, SENSORS, AND SWITCHES AT 4'-0" (MAXIMUM) ABOVE FINISH FLOOR. COORDINATE EXACT THERMOSTAT LOCATION WITH OWNER PRIOR TO INSTALLATION. ANY DEVICE ON A PERIMETER WALL SHALL BE MOUNTED ON A FOAM-FILLED ELECTRICAL BOX, WITH ALL GAPS BETWEEN BOX AND WALL SEALED TO PREVENT INFILTRATION.
15. MECHANICAL CONTRACTOR SHALL VERIFY LOCATION OF ROOF PENETRATIONS FOR RELIEF HOODS AND OUTSIDE AIR HOODS WITH ARCHITECT & OWNER PRIOR TO INSTALLATION.
16. ALL ROOF CURBS SHALL EXTEND A MINIMUM OF 8" ABOVE ROOF INSULATION OR AS INDICATED ON THE DRAWINGS, WHICHEVER IS GREATER. IN ADDITION, ALL ROOF CURBS OR EQUIPMENT SUPPORT RAILS THAT SUPPORT EQUIPMENT, PIPING, CONDUIT, ETC. EXPOSED ON THE ROOF SHALL HAVE SUFFICIENT HEIGHT TO MAINTAIN A MINIMUM OF 18" CLEARANCE BELOW SUPPORTED EQUIPMENT FOR ROOF MAINTENANCE.
17. MECHANICAL CONTRACTOR SHALL LOCATE EXHAUST FANS, OUTLETS, AND GAS FLUES A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE AND 3'-0" AWAY FROM ANY OPERABLE BUILDING OPENING.
18. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOORS OF NON- COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814.
19. PROVIDE UNIONS, FLANGES OR COUPLINGS AT CONNECTION TO ALL VALVES AND EQUIPMENT. DO NOT USE DIRECT WELDED OR THREADED CONNECTIONS TO VALVES, EQUIPMENT OR OTHER APPARATUS.
20. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
21. ALL PIPING AND DUCTWORK SHALL BE SUPPORTED IN ACCORDANCE WITH 2018 IMC, AND FURTHER SUPPORTS OR HANGERS SHALL BE PROVIDED AS REQUIRED TO PREVENT THE WEIGHT OF PIPING BEING PLACED ON EQUIPMENT. FIRE DAMPERS AND CEILING RADIATION DAMPERS SHALL BE INSTALLED WHERE SHOWN ON PLANS. DAMPERS SHALL BE INSTALLED PER THE MANUFACTURER'S RECOMMENDATIONS.
22. EQUIPMENT OPERATED DURING CONSTRUCTION SHALL USE FILTERED MEDIA TO PREVENT CONSTRUCTION DEBRIS FROM ENTERING COILS, DUCTWORK SYSTEMS, AIR TERMINALS ETC. AT COMPLETION OF CONSTRUCTION, MECHANICAL CONTRACTOR SHALL CLEAN ALL SYSTEMS WITH ALL CONTROL DEVICES WIDE OPEN AND REMOVE ANY REMAINING DEBRIS PRIOR TO TEST AND BALANCING. MECHANICAL CONTRACTOR SHALL REPLACE ALL FILTRATION WITH NEW FILTERS AT COMPLETION OF CONSTRUCTION. ANY DUCTWORK, AIR TERMINALS, AND/OR OTHER EQUIPMENT UPSTREAM OF FILTRATION SHALL BE CLEANED THOROUGHLY OF CONSTRUCTION DEBRIS BEFORE HANDING OVER TO OWNER.
23. DRYER VENT WALL CAPS SHALL BE PROVIDED WITH A BACKDRAFT DAMPER. DRYER VENT SHALL BE PERMITTED TO EXCEED THE LENGTH LISTED IN IMC SECTION 504.8.4 IF THE CONTRACTORS PROVIDE THE MAKE AND MODEL OF THE DRYER AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS TO THE LOCAL AUTHORITY HAVING JURISDICTION AND THE BUILDING OWNER (OR THE TENANTS ARE REQUIRED BY LEASE AGREEMENT) PROVIDES THE MAKE AND MODEL OF DRYER LISTED ON THE ARCHITECTURAL DRAWINGS. DRYER VENT EXHAUST DUCT SHALL BE ASSEMBLED WITH SMOOTH INTERIOR SURFACE SO THAT THE JOINTS DO NOT PERMIT THE ACCUMULATION OF LINT, DO NOT USE SHEET METAL SCREWS AT JOINTS. ALL 90° TURN SHALL HAVE LONG RADIUS ELBOWS. ALL DUCTWORK SHALL BE INSTALLED PER THE DRYER MANUFACTURER'S RECOMMENDATIONS.
24. DRYER VENT EXHAUST DUCTWORK SHALL BE WRAPPED WITH UL-LISTED THERMAL INSULATION BLANKET AS MANUFACTURED BY FIREMASTER (OR EQUAL) TO MATCH THE CEILING RATING FROM CEILING MEMBRANE PENETRATION TO EXTERIOR TERMINATION. INSULATION SHALL BE INSTALLED PER NFPA-96 AND IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS TO OBTAIN A RATED ASSEMBLY MATCHING FLOOR/CEILING ASSEMBLY (REFER TO ARCHITECTURAL CONTRACT DOCUMENTS FOR ASSEMBLY INFORMATION). ASSEMBLY SHALL BE U.L. APPROVED.
25. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING RESTRAINTS TO RESIST THE EARTHQUAKE EFFECTS ON THE MECHANICAL SYSTEMS. THE REQUIREMENTS FOR THOSE RESTRAINTS ARE FOUND IN THE LOCAL BUILDING CODE AND ASCE 7. THE ANCHORAGE OF THE MECHANICAL SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF THE LOCAL BUILDING CODE AND ASCE 7.
26. MECHANICAL CONTRACTOR SHALL PROVIDE PRE-PRINTED COLOR-CODED PIPE LABELS WITH 1-1/2" HIGH LETTERING INDICATING SERVICE AND FLOW DIRECTION. LABELING ALLOWED TO BE WRITTEN OR STENCILED WITH OWNER APPROVAL.
27. PROVIDE COMBINATION FIRE/SMOKE DAMPERS WITH AN IONIZATION TYPE DUCT MOUNTED SMOKE DETECTOR IN DUCTED APPLICATIONS, OR SPOT DETECTORS IN OPENING APPLICATIONS (WITHIN 5'-0" OF THE DAMPER WITH NO AIR OUTLETS OR INLETS BETWEEN DETECTOR AND DAMPER), INSTALLED IN THE DUCT WIRED, TO CLOSE THE DAMPER UPON ACTIVATION. DUCT MOUNTED SMOKE DETECTORS AND SPOT DETECTORS SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. DETECTORS SHALL BE INSTALLED IN THE DUCT BY THE MECHANICAL CONTRACTOR.
28. EXHAUST SYSTEMS IN DWELLING UNITS ON TOP FLOOR SHALL BE VENTED THROUGH THE ROOF. PROVIDE EACH EXHAUST TERMINATION WITH ROOF EXHAUST CAP. ALL ROOF PENETRATIONS SHALL BE SEALED.

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GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: BLF
DRAWN BY	: BMB
CHECKED BY	: BLF
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

MECHANICAL LEGEND AND NOTES

COMM. NO. 19132.00	DATE January 18, 2021
DRAWING M0.1	SHEET 1 OF 14

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APARTMENT INDOOR UNIT SCHEDULE

ID	SUPPLY AIRFLOW	NOMINAL TONNAGE	O.A. CFM	E.S.P (IN H20)	COOLING CAPACITY		HEATING CAPACITY (BTUH)	ELECTRIC HEAT					FAN MOTOR FLA	ELECRICAL DATA				CARRIER	WEIGHT	REFRIGERANT TPE	MATCHING OUTDOOR UNIT
					TC (BTUH)	SHC (BTUH)		KW	STAGES	AMPS	VOLTAGE	PH		MCA	MOCP	VOLTAGE	PH	MODEL			
IDU-A	1200 CFM	3.0	0	0.5	33000	25370	33000	7.5	2	36.2	208	1	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-A

NOTES:

1. COOLING CAPACITY @ 95°F AMBIENT, 80°/67° ENTERING COIL CONDITIONS.
2. PROVIDE UNITS WITH: ELECTRONIC 7-DAY PROGRAMABLE THERMOSTAT (THERMOSTAT SHALL BE HONEYWELL MODEL FOCUSPRO 5000 - #TH5110D1006 OR APPROVED EQUAL), 1" THICK DISPOSABLE FILTER (MERV 8 MINIMUM), FIELD INSTALLED HEATER, U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, AND 1-INCH INSULATION.

APARTMENT HEAT PUMP SCHEDULE

ID	NOMINAL TONNAGE	COOLING COIL		EFFICIENCY			HEATNG CAPACITY (BTUH)	EFFICIENCY		COMPRESSOR		FAN	ELECTRICAL DATA				REFRIG. TYPE	MANUFACTURER CARRIER MODEL	WEIGHT	MATCHING INDOOR UNIT
		TC (BTUH)	SHC (BTUH)	EER	SEER	IEER		COP	HSPF	LRA	RLA	FLA	MCA	FUSE	VOLTAGE	PH				
HP-A	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-A

NOTES:

1. COOLING CAPACITY @ 95°F AMBIENT.
2. ALL UNITS SHALL BE U.L. LISTED AND ASHRAE 90.1 COMPLIANT.
3. INDOOR UNIT SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTROLS TO PREVENT OPERATION WHEN THE REVERSE CYCLE HEAT CAN MEET HEATING LOAD. SUPPLEMENTAL ELECTRIC HEAT SHALL BE ALLOWED TO OPERATE DURING HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL ELECTRIC HEAT SHALL BE LOCKED OUT WHEN THE OUTDOOR TEMPERATURE IS BETWEEN 35°F AND 40°F AND THE INDOOR TEMPERATURE SETPOINT IS INCREASED.
4. MOUNT UNITS ON ROOF ON EQUIPMENT SUPPORT RAILS AS MFG. BY ROOF PRODUCTS AND SYSTEMS, CORP. (OR EQUAL) AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS.
5. PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS.
6. FOR REFRIGERANT LINE APPLICATIONS WITH A TOTAL EQUIVALENT LENGTH BETWEEN 50'-0" AND 150'-0"
   THE FOLLOWING ACCESSORIES SHALL BE PROVIDED:
   - -COMPRESSOR CRANKCASE HEATER
   - -WIND BAFFLES (FOR UNIT MOUNTED ON ROOFS)
   - -FOR INDOOR UNIT LOCATED BELOW OUTDOOR UNIT (150'-0" MAX); A LIQUID LINE (BI-FLOW) SOLENOID MUST BE INSTALLED WITHIN 2'-0" OF OUTDOOR UNIT.
   - -MECHANICAL CONTRACTOR & UNIT MANUFACTURER ARE TO REVIEW INSTALLATION, AND FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR LONG REFRIGERANT LINE APPLICATIONS (AS DEFINED BY UNIT MFGR.).

COMMON AREA INDOOR UNIT SCHEDULE

ID	SUPPLY AIRFLOW	NOMINAL TONNAGE	O.A. CFM	E.S.P (IN H20)	COOLING CAPACITY		HEATING CAPACITY (BTUH)	ELECTRIC HEAT					FAN MOTOR FLA	ELECRICAL DATA				CARRIER	WEIGHT	REFRIGERANT TPE	MATCHING OUTDOOR UNIT
					TC (BTUH)	SHC (BTUH)		KW	STAGES	AMPS	VOLTAGE	PH		MCA	MOCP	VOLTAGE	PH	MODEL			
IDU-2.1	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-2.1
IDU-2.2	1600 CFM	4.0	300	0.4	46770	36120	45500	11.3	2	31.3	208	3	6.0	47.7	50.0	208 V	3	FB4CNP048	157 lb	R-410A	HP-2.2
IDU-2.3	1000 CFM	2.5	200	0.4	28600	21900	28600	7.5	1	36.2	208	1	2.8	48.8	50.0	208 V	1	FB4CNP030	122 lb	R-410A	HP-2.3
IDU-2.4	800 CFM	2.0	100	0.4	23800	18090	22200	6.0	1	28.9	208	1	2.8	44.7	45.0	208 V	1	FB4CNP025	112 lb	R-410A	HP-2.4
IDU-3.1	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-3.1
IDU-3.2	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-3.2
IDU-3.3	1000 CFM	2.5	200	0.4	28600	21900	28600	7.5	1	36.2	208	1	2.8	48.8	50.0	208 V	1	FB4CNP030	122 lb	R-410A	HP-3.3
IDU-3.4	800 CFM	2.0	100	0.4	23800	18090	22200	6.0	1	28.9	208	1	2.8	44.7	45.0	208 V	1	FB4CNP025	112 lb	R-410A	HP-3.4
IDU-4.1	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-4.1
IDU-4.2	1000 CFM	2.5	150	0.4	28600	21900	28600	7.5	1	36.2	208	1	2.8	48.8	50.0	208 V	1	FB4CNP030	122 lb	R-410A	HP-4.2
IDU-4.3	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-4.3
IDU-4.4	800 CFM	2.0	100	0.4	23800	18090	22200	6.0	1	28.9	208	1	2.8	44.7	45.0	208 V	1	FB4CNP025	112 lb	R-410A	HP-4.4
IDU-5.1	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-5.1
IDU-5.2	1000 CFM	2.5	150	0.4	28600	21900	28600	7.5	1	36.2	208	1	2.8	48.8	50.0	208 V	1	FB4CNP030	122 lb	R-410A	HP-5.2
IDU-5.3	1200 CFM	3.0	200	0.4	33000	25370	33000	7.5	1	36.2	208	3	4.1	50.4	60.0	208 V	1	FB4CNP036	122 lb	R-410A	HP-5.3
IDU-5.4	800 CFM	2.0	100	0.4	23800	18090	22200	6.0	1	28.9	208	1	2.8	44.7	45.0	208 V	1	FB4CNP025	112 lb	R-410A	HP-5.4

NOTES:

1. COOLING CAPACITY @ 95°F AMBIENT, 80°/67° ENTERING COIL CONDITIONS.
2. PROVIDE UNITS WITH: ELECTRONIC 7-DAY PROGRAMABLE THERMOSTAT (THERMOSTAT SHALL BE HONEYWELL MODEL FOCUSPRO 5000 - #TH5110D1006 OR APPROVED EQUAL), LOCKING COVER FOR THERMOSTATS, 1" THICK DISPOSABLE FILTER (MERV 8 MINIMUM), FIELD INSTALLED HEATER, U.L. LABEL, SINGLE POINT ELECTRICAL CONNECTION, AND 1-INCH INSULATION.
3. PROVIDE WITH AN IONIZATION TYPE SMOKE DETECTOR, INSTALLED IN THE RETURN DUCT WIRED TO SHUT DOWN THE UNIT UPON ACTIVATION. SMOKE DETECTOR SHALL BE SUPPLIED, WIRED FOR INTERFACE WITH FIRE ALARM SYSTEM AND UNIT SHUTDOWN BY THE ELECTRICAL CONTRACTOR. SMOKE DETECTOR SHALL BE INSTALLED IN THE RETURN DUCT BY THE MECHANICAL CONTRACTOR.

COMMON AREA HEAT PUMP SCHEDULE

ID	NOMINAL TONNAGE	COOLING COIL		EFFICIENCY			HEATNG CAPACITY (BTUH)	EFFICIENCY		COMPRESSOR		FAN	ELECTRICAL DATA				REFRIG. TYPE	MANUFACTURER CARRIER MODEL	WEIGHT	MATCHING INDOOR UNIT
		TC (BTUH)	SHC (BTUH)	EER	SEER	IEER		COP	HSPF	LRA	RLA	FLA	MCA	FUSE	VOLTAGE	PH				
HP-2.1	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-2.1
HP-2.2	4.0	46770	36120	11.5	14		45500	3.64	8.2	123.0	10.4	1.4	14.5	25.0	208 V	3	R-410A	25HCE448	232 lb	IDU-2.2
HP-2.3	2.5	28600	21900	11.5	14		28600	3.62	8.2	72.5	13.5	0.5	18.3	30.0	208 V	1	R-410A	25HCE430	180 lb	IDU-2.3
HP-2.4	2.0	23800	18090	11.5	14		22200	3.84	8.2	62.9	10.9	0.5	14.2	25.0	208 V	1	R-410A	25HCE424	175 lb	IDU-2.4
HP-3.1	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-3.1
HP-3.2	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-3.2
HP-3.3	2.5	28600	21900	11.5	14		28600	3.62	8.2	72.5	13.5	0.5	18.3	30.0	208 V	1	R-410A	25HCE430	180 lb	IDU-3.3
HP-3.4	2.0	23800	18090	11.5	14		22200	3.84	8.2	62.9	10.9	0.5	14.2	25.0	208 V	1	R-410A	25HCE424	175 lb	IDU-3.4
HP-4.1	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-4.1
HP-4.2	2.5	28600	21900	11.5	14		28600	3.62	8.2	72.5	13.5	0.5	18.3	30.0	208 V	1	R-410A	25HCE430	180 lb	IDU-4.2
HP-4.3	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-4.3
HP-4.4	2.0	23800	18090	11.5	14		22200	3.84	8.2	62.9	10.9	0.5	14.2	25.0	208 V	1	R-410A	25HCE424	175 lb	IDU-4.4
HP-5.1	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-5.1
HP-5.2	2.5	28600	21900	11.5	14		28600	3.62	8.2	72.5	13.5	0.5	18.3	30.0	208 V	1	R-410A	25HCE430	180 lb	IDU-5.2
HP-5.3	3.0	33000	25370	11.5	14		33000	3.62	8.2	70.0	8.5	1.1	11.7	20.0	208 V	3	R-410A	25HCE436	201 lb	IDU-5.3
HP-5.4	2.0	23800	18090	11.5	14		22200	3.84	8.2	62.9	10.9	0.5	14.2	25.0	208 V	1	R-410A	25HCE424	175 lb	IDU-5.4

NOTES:

1. COOLING CAPACITY @ 95°F AMBIENT.
2. ALL UNITS SHALL BE U.L. LISTED AND ASHRAE 90.1 COMPLIANT.
3. INDOOR UNIT SUPPLEMENTARY ELECTRIC RESISTANCE HEAT SHALL BE PROVIDED WITH CONTROLS TO PREVENT OPERATION WHEN THE REVERSE CYCLE HEAT CAN MEET HEATING LOAD. SUPPLEMENTAL ELECTRIC HEAT SHALL BE ALLOWED TO OPERATE DURING HEAT PUMP DEFROST CYCLE. SUPPLEMENTAL ELECTRIC HEAT SHALL BE LOCKED OUT WHEN THE OUTDOOR TEMPERATURE IS BETWEEN 35°F AND 40°F AND THE INDOOR TEMPERATURE SETPOINT IS INCREASED.
4. MOUNT UNITS ON ROOF ON EQUIPMENT SUPPORT RAILS AS MFG. BY ROOF PRODUCTS AND SYSTEMS, CORP. (OR EQUAL) AND PROVIDE MANUFACTURER'S RECOMMENDED CLEARANCES AROUND UNITS.
5. PROVIDE UNITS WITH CONDENSER COIL HAIL GUARDS AND LOW AMBIENT CONTROLS.
6. FOR REFRIGERANT LINE APPLICATIONS WITH A TOTAL EQUIVALENT LENGTH BETWEEN 50'-0" AND 150'-0"
   THE FOLLOWING ACCESSORIES SHALL BE PROVIDED:
   - -COMPRESSOR CRANKCASE HEATER
   - -WIND BAFFLES (FOR UNIT MOUNTED ON ROOFS)
   - -FOR INDOOR UNIT LOCATED BELOW OUTDOOR UNIT (150'-0" MAX); A LIQUID LINE (BI-FLOW) SOLENOID MUST BE INSTALLED WITHIN 2'-0" OF OUTDOOR UNIT.
   - -MECHANICAL CONTRACTOR & UNIT MANUFACTURER ARE TO REVIEW INSTALLATION, AND FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR LONG REFRIGERANT LINE APPLICATIONS (AS DEFINED BY UNIT MFGR.).

OUTDOOR UNIT SCHEDULE

ID	COOLING CAPACITY	HEATING CAPACITY	COMPRESSOR RLA	ELECTRICAL DATA				MANUFACTURER	MODEL NO.	WEIGHT
				MCA	MOCP	PHASE	VOLTAGE			
ODU-0.1	17400 Btu/h	21600 Btu/h	10.8 A	12.8 A	15.0 A	1	208 V	Daikin	RX18RMVJU9	97 lb

DUCTLESS SPLIT SYSTEM SCHEDULE NOTES:

1. ALL UNITS SHALL BE U.L. LISTED AND HAVE A MINIMUM SEER OF 14.3.
2. COOLING CAPACITIES ARE BASED ON 95° AMBIENT, 80° ENTERING AIR DRY BULB, 67° ENTERING AIR WET BULB. AIRFLOWS INDICATED ARE AT 'HIGH' SPEED.
3. MOUNT UNITS ON ROOF ON EQUIPMENT SUPPORT RAILS AS MFG. BY ROOF PRODUCTS AND SERVICE CORP. (OR EQUAL). RAILS SHALL RAISE OUTDOOR UNIT 24" OFF OF ROOF FOR CLEARANCE FROM SNOW ACCUMULATION. MOUNT UNITS ON GRADE ON 4" THICK CONCRETE PAD.
4. PROVIDE MANUFACTURER'S SUGGESTED CLEARANCES AROUND UNIT.
5. PROVIDE UNITS WITH MANUFACTURER'S ADVANCED WIND BAFFLES OR LOW AMBIENT CONTROLS FOR OPERATION DOWN TO -0° F, CONDENSATE PUMP, INVERTER COMPRESSOR, SNOW HOOD, HARD WIRED WALL-MOUNTED CONTROLLER, NON-LOCKING DISCONNECT FOR INDOOR UNIT.
6. PROVIDE OUTDOOR UNITS WITH 5 YEAR EXTENDED COMPRESSOR WARRANTY.
7. SEE MANUFACTURER'S RECOMMENDATIONS FOR REQUIRED ADDITIONAL REFRIGERANT CHARGE AND RECOMMENDED LINE-SET LENGTHS.
8. POWER SUPPLY TO CONDENSING UNIT IS A SINGLE POINT ELECTRICAL CONNECTION FOR THE SYSTEM (A/C UNIT AND CONDENSING UNIT). THE ELECTRICAL CONTRACTOR SHALL PROVIDE POWER TO THE CONDENSING UNIT AND FROM THE CONDENSING UNIT TO THE A/C UNIT INCLUDING CODE REQUIRED DISCONNECT SWITCHES.
9. REFRIGERANT PIPING AND WIRING FOR WALL-MOUNTED INDOOR UNITS SHALL BE ROUTED IN WALL WHERE POSSIBLE. ANY EXPOSED PIPING SHALL BE PAINTED TO MATCH WALL-FINISH.

INDOOR UNIT SCHEDULE

ID	DESIGN AIRFLOW	OUTSIDE AIRFLOW	COOLING CAPCAITY	HEATING CAPACITY	ELECTRICAL DATA			MANUFACTURER	MODEL NO.	UNIT WEIGHT	INTERLOCK ID
					MCA	VOLTAGE	PHASE				
IDU-0.1	448 CFM	70 CFM	17400 Btu/h	21600 Btu/h	0.3 A	208 V	1	Daikin	FFQ18Q2VJU	39 lb	ODU-0.1

FAN SCHEDULE

SYMBOL	SERVES	TYPE	CFM	APPROX. ESP (in-w.g.)	DRIVE TYPE	FAN RPM	ELECTRICAL DATA				MANUFACTURER	MODEL NO.	ACCESSORIES	CONTROLS
							WATTS	H.P.	VOLT	PH				
EF-2.1	RESTROOM	CLG MTD	75	0.250	DIRECT	700	14 W		120 V	1	GREENHECK	SP-B90	A,B,F,G,H,O	2
EF-2.2	HSKP	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-2.3	TRASH	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-3.1	HSKP	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-3.2	TRASH	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-4.1	HSKP	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-5.1	HSKP	CLG MTD	100	0.250	DIRECT	950	18 W		120 V	1	GREENHECK	SP-A110	A,B,F,G,H,O	6
EF-A1	APARTMENT BATHROOM	CLG MTD	75	0.250	DIRECT	1550		0.02	120 V	1	PANASONIC	FV-05-11VKS1	A,B,F,G,H,O,U	4
F-G1	GARAGE	WALL MTD	22500	0.000	BELT	678		7.50	208 V	3	GREENHECK	SBE-2L42	A,B,G,J,N,V	5

EXHAUST FAN SCHEDULE ACCESSORIES:

A. DISCONNECT SWITCH
B. GRAVITY BACKDRAFT DAMPER
C. MOTORIZED BACKDRAFT DAMPER
D. PREFAB, ROOF CURB
E. BIRDSCREEN
F. ACOUSTICAL LINING
G. HANGING BRACKETS WITH VIBRATION ISOLATION
H. WC, WALL CAP DISCHARGE
I. RCC OR GRS ROOF CAP (FLAT ROOF) OR RJ ROOF CAP (PITCHED ROOF)
J. WALL MOUNTING COLLAR
K. INLET GUARD
M. 2" WASHABLE ALUMINUM FILTERS
N. MOTORSIDE FAN GUARD
O. EXHAUST GRILLE
P. U.L. 762
Q. VENTED ROOF CURB EXTENSION
R. COMBINATION KITCHEN HOOD FAN CURB
S. INTERLOCK WITH FUME HOOD
T. PROVIDE DRAIN PLUG ACCESSORY
U. PROVIDE WITH MANUFACTURER'S INTEGRAL CEILING RADIATION DAMPER.
V. VFD

EXHAUST FAN SCHEDULE CONTROLS:

1. WALL MOUNTED THERMOSTAT (REVERSE ACTING, SET FOR 80°)
2. INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IF ANY ROOM IS SERVED BY FAN)
3. WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL
4. WALL SWITCH BY E.C. (WALL SWITCH SHALL MATCH LIGHT SWITCH)
5. CONTROLLED BY VENTILATION CONTROL SYSTEM
6. CONTINUOUS OPERATION
7. CONTROLLED BY THE FACP AND FIREMAN'S MANUAL OVER-RIDE CONTROL PANEL IN FIRE COMMAND ROOM. NO MECHANICAL CONTROL POINTS REQUIRED BY M.C. FOR SMOKE CONTROL FANS

EXHAUST FAN SCHEDULE NOTES:

1. ALL FANS SHALL BE U.L. LISTED AND LABELED AND SHALL BE AMCA CERTIFIED FOR SOUND AND AIR FLOW. ALL FANS INSTALLED INSIDE, ABOVE, OR ADJACENT TO OCCUPIED SPACES SHALL HAVE A MAXIMUM 9.0 INLET SONE LEVEL.
2. ALL FANS SHALL BE SUPPLIED BY ONE MANUFACTURER UNLESS NOTED OTHERWISE.
3. FANS SHALL BE CONTROLLED BY A WALL SWITCH PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ALL WIRING (POWER AND SWITCH LEG) SHALL BE INSTALLED BY THE ELECTRICAL CONTRACTOR
4. PROVIDE ALL DIRECT DRIVE FANS WITH SPEED CONTROLLERS.

VTAC UNIT (VERTICAL PTAC) SCHEDULE

SYMBOL	CFM	ESP (" wg)	O.A. CFM	COOLING CAPACITY		HEATING CAPACITY (BTUH)	ELECTRIC HEAT KW	COMPRESSOR		OUTSIDE FAN		INDOOR BLOWER		POWER SUPPLY				MANUFACTURER	MODEL
				TC (BTUH)	SHC (BTUH)			RLA	LRA	HP	RLA	HP	RLA	MCA	MOCP	VOLTAGE	PH		
VTAC-A	800	0.50	0	22400	17200	18400	7	13.5	58.0	0.1	0.9	0.3	1.6	35.0	40.0	208	1	MAGIC-PAK	7MCE4-10-241P

NOTES:

1. PROVIDE ALL UNITS WITH- WALL SLEEVE, FACTORY INSTALLED VENTILATION AIR KIT, FOUR SPEED BLOWER MOTOR, INTERNAL WASHABLE FILTER, REFRIGERANT R410, COPPER TUBING COIL, FULLY INSULATED (ANTI-MICROBIAL) CABINET, EXTERIOR LOUVER (FINISH-COLOR TO BE SELECTED BY ARCHITECT; SUBMIT COLOR CHART WITH SUBMITTAL FOR APPROVAL). PROVIDE 5 YEAR LIMITED WARRANTY ON ALL PARTS.
2. ALL UNITS SHALL BE U.L. LABELED.
3. PROVIDE WALL MOUNTED THERMOSTAT WITH EACH SYSTEM. THERMOSTAT SHALL BE HONEYWELL MODEL FOCUSPRO 5000 - #TH5110D1006 (0R APPROVED EQUAL).
4. ELECTRIC HEAT KW IS LISTED AT NOMINAL 240V.

GRILLES, REGISTERS AND DIFFUSERS SCHEDULE

SYMBOL	SERVICE	CFM RANGE	FACE SIZE	NECK SIZE	TYPE	OBD	PRICE MODEL
A	SUPPLY	0 - 120	10x6	8x4	DBL. DEFL.	YES	520
B	SUPPLY	125 - 180	10x8	8x6	DBL. DEFL.	YES	520
C	SUPPLY	185 - 240	12x8	10x6	DBL. DEFL.	YES	520
D	SUPPLY	SEE PLANS	SEE PLANS	SEE PLANS	DOUBLE DEFLECTION	NO	520
E	SUPPLY	130 - 285	24 x 24	9 x 9	LOUVERED	NO	SMD
F	SUPPLY	285 - 500	24 x 24	12 x 12	LOUVERED	NO	SMD
G	RETURN	0-175	24 x 24	8"Ø	PERFORATED	NO	PDDR
H	RETURN	505-680	24 x 24	14x14	PERFORATED	NO	PDDR
J	RETURN	0 - 1680	24 x 24	22 x 22	PERFORATED	NO	PDDR
K	RETURN	SEE PLANS	SEE PLANS	SEE PLANS	FIXED BLADE	NO	530

AIR DISTRIBUTION SCHEDULE NOTES:

1. ALL CEILING AND WALL MOUNTED DEVICES SHALL BE FURNISHED WITH AN ENAMEL OFF-WHITE FINISH UNLESS NOTED OTHERWISE.
2. ALL DEVICES SHALL BE FURNISHED WITH FRAMES SUITABLE FOR THE TYPE OF INSTALLATION REQUIRED.
3. DIFFUSERS AT RATED CEILINGS SHALL BE ALL STEEL CONSTRUCTION WITH RADIATION DAMPER. PROVIDE RADIATION INSULATION BLANKET ON TOP SIDE OF DIFFUSER AS REQUIRED TO MAINTAIN RATING OF CEILING.
4. ALL DOUBLE DEFLECTION SUPPLY GRILLES SHALL HAVE DAMPER BLADES ADJUSTED TO PROVIDE AIRFLOW PATTERN INDICATED BY FLOW ARROWS ON PLANS. DAMPERS SHALL BE ADJUSTED TO A 30 DEGREE POSITION UNLESS NOTED OTHERWISE ON PLANS.

ELECTRIC WALL HEATER SCHEDULE

SYMBOL	LOCATION	CFM	BTUH	KW	MOTOR		MANUFACTURER (MARKEL)	ACCESSORIES
					VOLT	PH		
EUH-1	GARAGE (MULTIPLE LOCATIONS)	700	25600	7.5	208 V	3	HF2B5110CA1L	A,C,E,F
EWH-0.1	GARAGE STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.2	GARAGE STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.3	GARAGE STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.4	GARAGE STORAGE	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.5	GARAGE STORAGE	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.6	GARAGE STORAGE	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.7	GARAGE STORAGE	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.8	VESTIBULE	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-0.9	RAMP	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-1.1	SPRINKLER	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-3.1	3RD FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-3.2	3RD FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-3.3	3RD FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-5.1	5TH FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-5.2	5TH FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H
EWH-5.3	5TH FLOOR STAIRS	175	5120	1.5	120 V	1	E3322TD-RP	A,B,G,H

NOTES:

1. HEATING CAPACITY BASED ON 65° F E.A.T.
2. SEE PLANS FOR TYPE OF THERMOSTAT REQUIRED (WALL MOUNTED OR UNIT MOUNTED). UNIT HEATERS SHOWN WITHOUT THERMOSTAT INDICATED SHALL BE PROVIDED WITH A UNIT MOUNTED THERMOSTAT.
3. SET TO MAINTAIN 45°F.

ELECTRIC UNIT HEATER ACCESSORIES:

A. DISCONNECT SWITCH
B. BUILT IN THERMOSTAT
C. WALL MOUNTED THERMOSTAT
D. WALL MOUNTING BRACKETS
E. CEILING MOUNTED BRACKETS
F. ADJUSTABLE DISCHARGE LOUVERS
G. PENCIL PROOF LOUVERS
H. CABINET FOR SURFACE MOUNTING

GENERAL NOTES

PERMIT SET

STATE OF TENNESSEE
BYRON L. FORD JR.
PE-2014023016
REGISTERED ENGINEER
01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: BLF
DRAWN BY	: BMB
CHECKED BY	: BLF
APPROVED BY	: -

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

MECHANICAL SCHEDULES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING M0.2

SHEET 2 OF 14

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VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-2.1

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
2006	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	313	0	0	38	38	47	0
2007	CORRIDOR	CORRIDORS	0	0.06	0	0	1000	0	0	60	60	75	0
2008	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	149	0	0	18	18	22	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				144	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-2.2

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
2001	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	804	8	41	48	89	111	0
2002	ACTIVITY	CONFERENCE ROOMS	5	0.06	50	0	411	21	103	25	128	160	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				271	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				300	150

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-2.3

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
2007	CORRIDOR	CORRIDORS	0	0.06	0	0	250	0	0	15	15	19	0
2011	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	760	8	38	46	84	105	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				123	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-2.4

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
2017	CORRIDOR	CORRIDORS	0	0.06	0	0	1056	0	0	63	63	79	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				79	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				100	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-3.1

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
3006	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	313	0	0	38	38	47	0
3007	CORRIDOR	CORRIDORS	0	0.06	0	0	995	0	0	60	60	75	0
3008	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	149	0	0	18	18	22	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				144	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-3.2

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
3001	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	804	8	41	48	89	111	0
3002	STORAGE	STORAGE ROOMS	0	0.12	0	0	81	0	0	10	10	12	0
3004	HSKP OFFICE	OFFICE	5	0.06	5	0	160	1	4	10	14	17	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				140	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-3.3

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
3007	CORRIDOR	CORRIDORS	0	0.06	0	0	250	0	0	15	15	19	0
3011	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	642	7	33	39	71	89	0
3015	RESIDENT STORAGE	STORAGE ROOMS	0	0.12	0	0	203	0	0	24	24	30	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				138	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-3.4

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
3017	CORRIDOR	CORRIDORS	0	0.06	0	0	1056	0	0	63	63	79	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				79	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				100	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-4.1

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
4006	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	313	0	0	38	38	47	0
4007	CORRIDOR	CORRIDORS	0	0.06	0	0	995	0	0	60	60	75	0
4008	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	149	0	0	18	18	22	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				144	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-4.2

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
4001	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	563	6	29	34	62	78	0
4002	STORAGE	STORAGE ROOMS	0	0.12	0	0	81	0	0	10	10	12	0
4004	FACILITIES OFFICE	OFFICE	5	0.06	5	0	160	1	4	10	14	17	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				107	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				150	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-4.3

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
4007	CORRIDOR	CORRIDORS	0	0.06	0	0	250	0	0	15	15	19	0
4011	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	1167	12	59	70	129	161	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				179	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-4.4

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
4017	CORRIDOR	CORRIDORS	0	0.06	0	0	1056	0	0	63	63	79	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				79	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				100	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-5.1

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
5006	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	313	0	0	38	38	47	0
5007	CORRIDOR	CORRIDORS	0	0.06	0	0	995	0	0	60	60	75	0
5008	RESIDENT CLOSETS	STORAGE ROOMS	0	0.12	0	0	149	0	0	18	18	22	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				144	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-5.2

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
5001	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	563	6	29	34	62	78	0
5002	STORAGE	STORAGE ROOMS	0	0.12	0	0	81	0	0	10	10	12	0
5004	FACILITIES OFFICE	OFFICE	5	0.06	5	0	160	1	4	10	14	17	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				107	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				150	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-5.3

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
5007	CORRIDOR	CORRIDORS	0	0.06	0	0	250	0	0	15	15	19	0
5011	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	1167	12	59	70	129	161	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				179	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				200	75

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-5.4

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
4017	CORRIDOR	CORRIDORS	0	0.06	0	0	1056	0	0	63	63	79	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				79	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				100	0

VENTILATION CALCULATIONS (IMC 2018, SECT 403): GARAGE

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
1008	GARAGE	GARAGE (DESIGN)	0	0	0	0.75	22320	0	0	0	0	0	16740
1008	GARAGE	GARAGE (MINIMUM)	0	0	0	0.05	22320	0	0	0	0	0	1116
								GARAGE TOTAL EXHAUST AIR REQUIRED (CFM)				0	16740
								GARAGE TOTAL EXHAUST AIR PROVIDED (CFM)				0	22500
								GARAGE MINIMUM EXHAUST AIR REQUIRED (CFM)				0	1116
								GARAGE MINIMUM EXHAUST AIR PROVIDED (CFM)				0	1200

VENTILATION CALCULATIONS (IMC 2018, SECT 403): IDU-0.1

ROOM NUMBER	ROOM NAME	OCCUPANCY CLASSIFICATION	Rp (CFM/PERSON)	Ra (CFM/SQ.FT.)	OCCUPANT DENSITY PEOPLE/1000 SQ.FT.	EXHAUST AIRFLOW (CFM/SQ.FT.)	Az AREA (SQ. FT.)	Pz CALCULATED OCCUPANCY (PEOPLE)	RpPz CALCULATED PEOPLE O/A (CFM)	RaAz CALCUATED AREA O/A (CFM)	Vbz PEOPLE + AREA O/A (CFM)	Voz ZONE OUTDOOR AIRFLOW (Ez=0.8)	CALCULATED AREA E/A (CFM)
1002	LOBBY	MAIN ENTRY LOBBY	5	0.06	10	0	250	3	13	15	28	34	0
1002	LOBBY	CORRIDOR	0	0.06	0	0	351	0	0	21	21	26	0
								TOTAL AIR REQUIRED (Ez = 0.8) (CFM)				61	0
								TOTAL AIR PROVIDED (Ez = 0.8) (CFM)				70	0

NOTE:
SEE SHEETS M5.1 AND M5.2 FOR NATURAL VENTILATION CALCS FOR APARTMENTS.

GENERAL NOTES

PERMIT SET

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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
MECHANICAL VENT CALCS

COMM. NO.
19132.00

DATE
January 18, 2021

DRAWING
M0.3

SHEET

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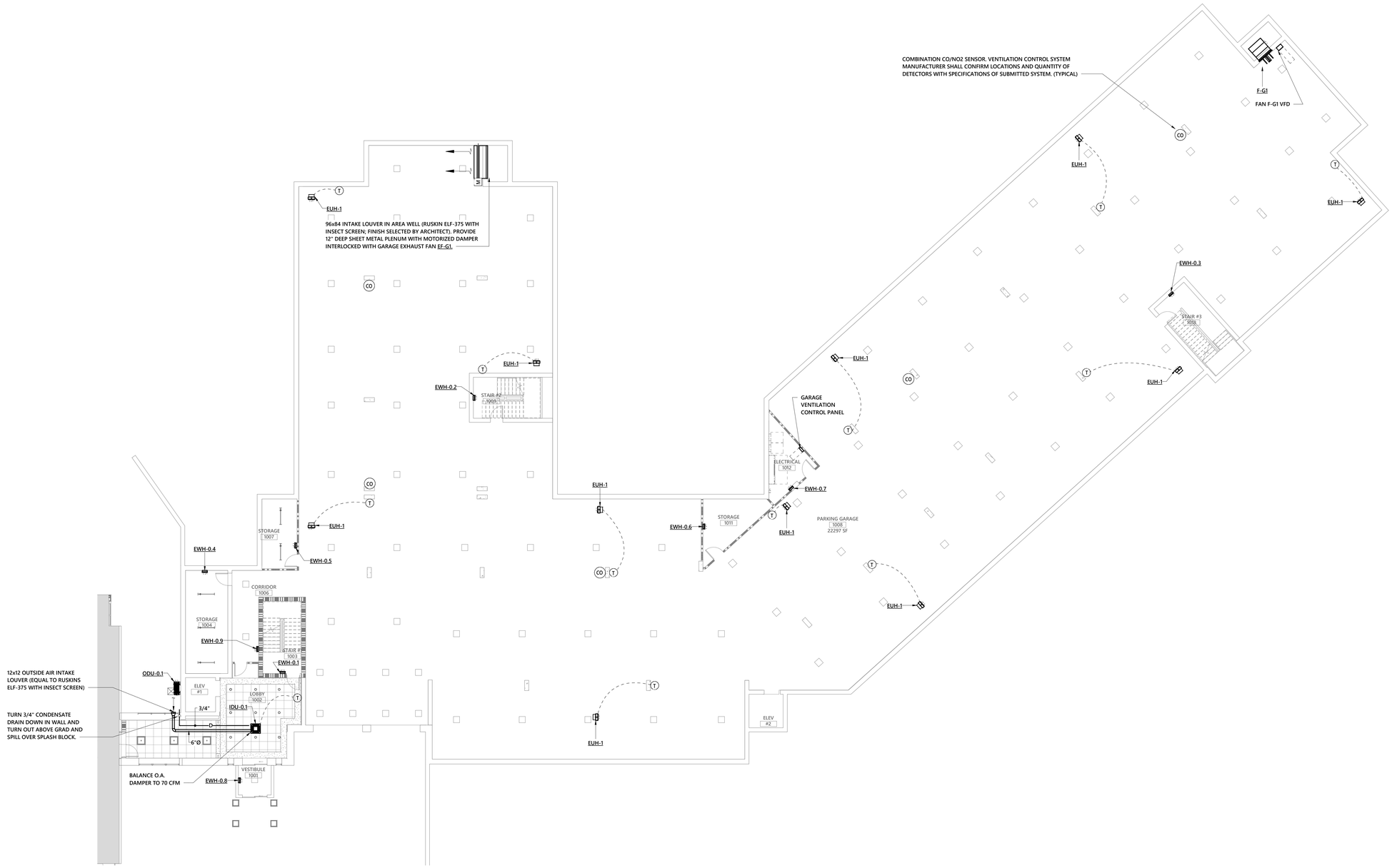

1 GARAVE OVERALL MECHANICAL PLAN

3/32" = 1'-0"

N

PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

GARAGE OVERALL MECHANICAL PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
M1.1	4 OF 14

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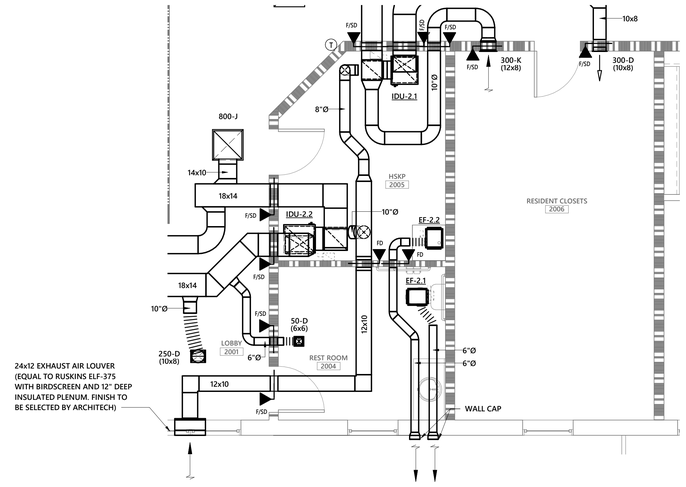
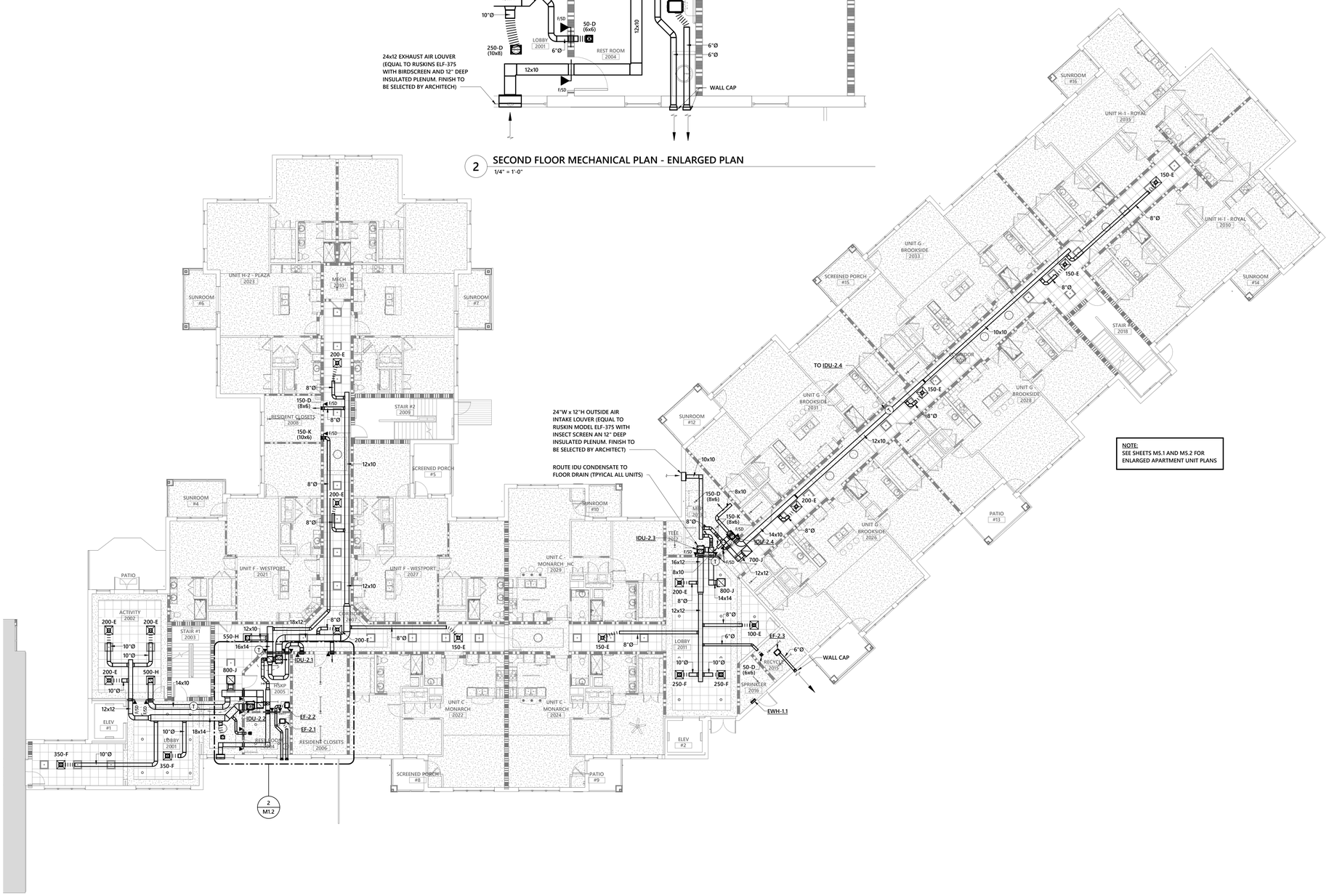


2 SECOND FLOOR MECHANICAL PLAN - ENLARGED PLAN
1/4" = 1'-0"



NOTE:
SEE SHEETS M5.1 AND M5.2 FOR ENLARGED APARTMENT UNIT PLANS

1 OVERALL SECOND FLOOR MECHANICAL PLAN
3/32" = 1'-0"

GENERAL NOTES

PERMIT SET

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NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL SECOND FLOOR MECHANICAL PLAN

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M1.2
SHEET 5 OF 14

N
PLAN NORTH

1/15/2021 BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
10:28:15 AM

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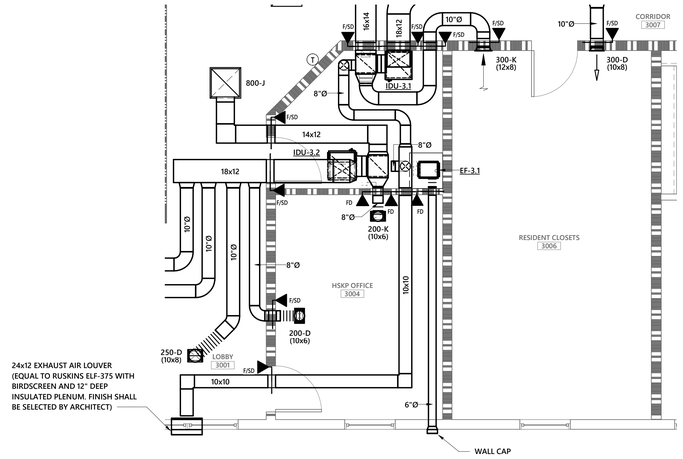
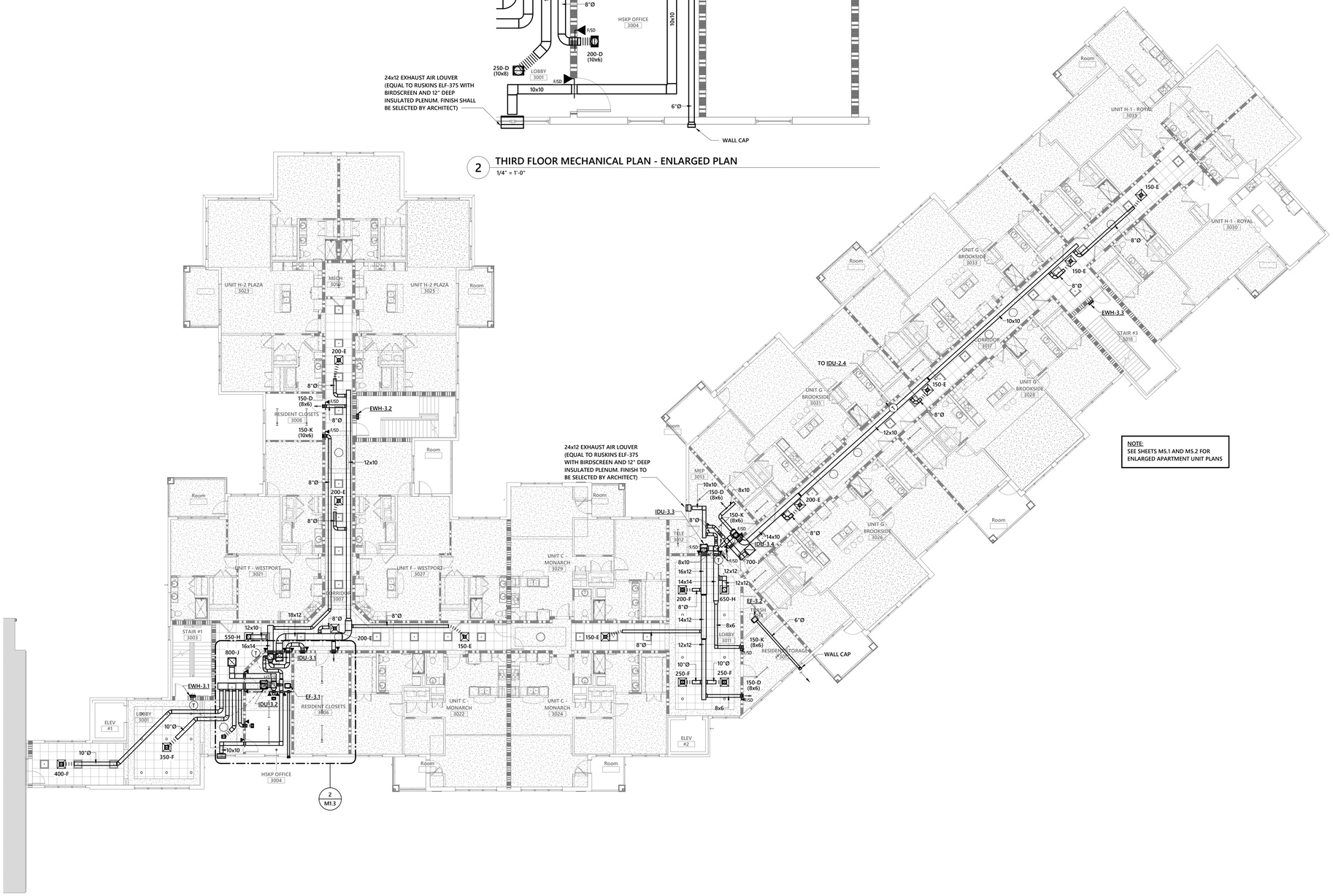


2 THIRD FLOOR MECHANICAL PLAN - ENLARGED PLAN
1/4" = 1'-0"



NOTE:
SEE SHEETS M5.1 AND M5.2 FOR ENLARGED APARTMENT UNIT PLANS

1 OVERALL THIRD FLOOR MECHANICAL PLAN
3/32" = 1'-0"

GENERAL NOTES

PERMIT SET

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NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL THIRD FLOOR MECHANICAL PLAN

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M1.3
SHEET 6 OF 14

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PLAN NORTH

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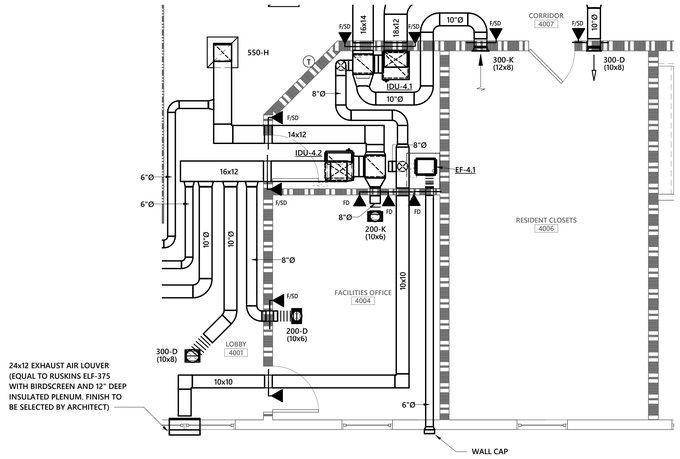
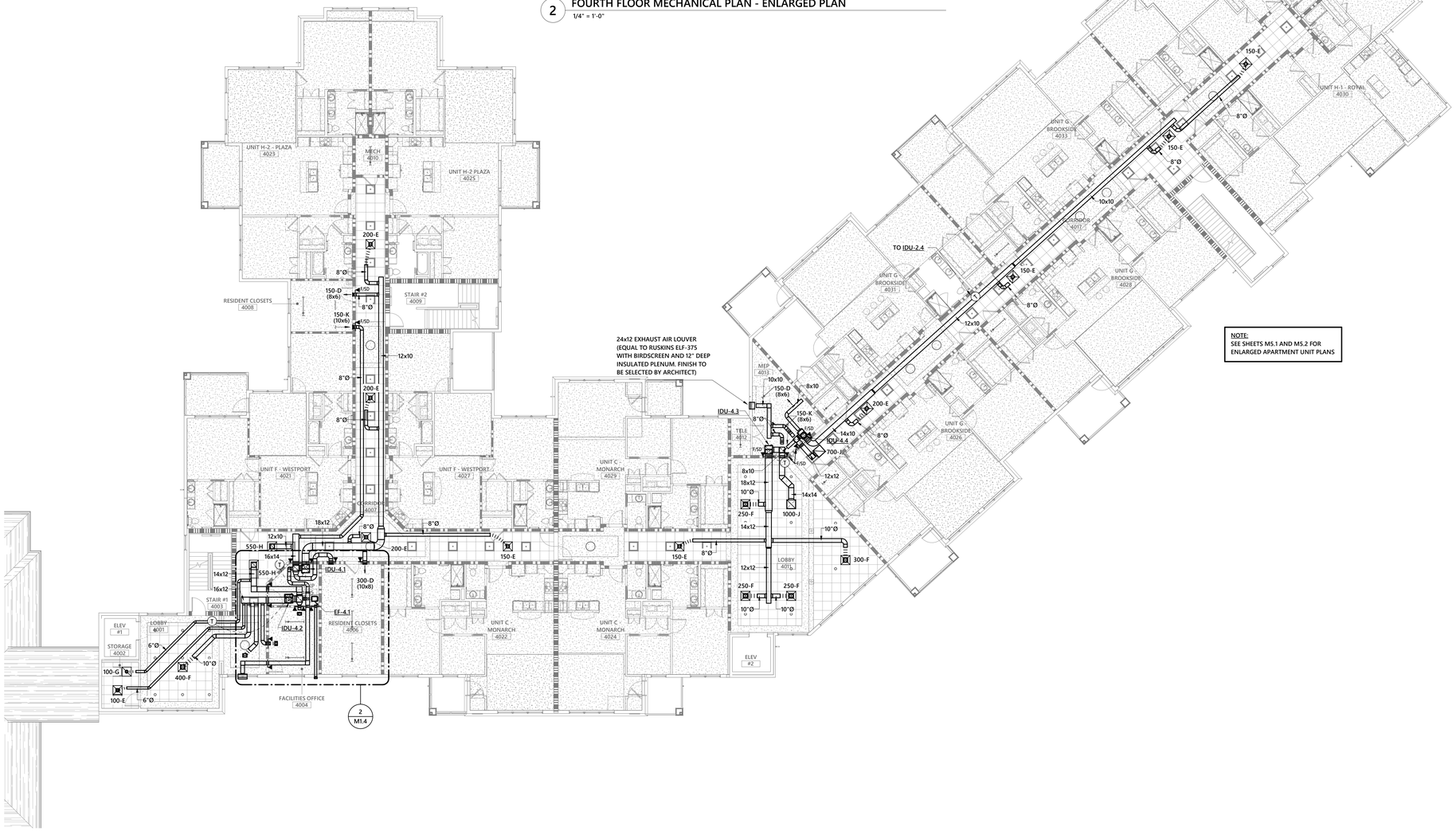


2 FOURTH FLOOR MECHANICAL PLAN - ENLARGED PLAN
1/4" = 1'-0"



1 OVERALL FOURTH FLOOR MECHANICAL PLAN
3/32" = 1'-0"

NOTE:
SEE SHEETS M5.1 AND M5.2 FOR ENLARGED APARTMENT UNIT PLANS

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

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APPROVED BY	:	

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DRAWING TITLE
OVERALL FOURTH FLOOR MECHANICAL PLAN

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M1.4
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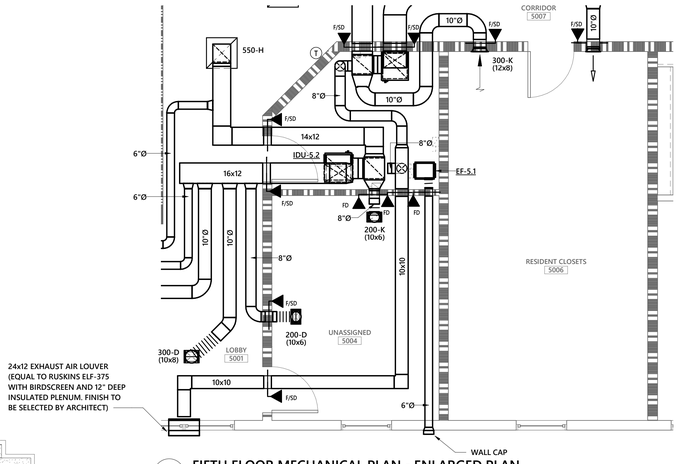
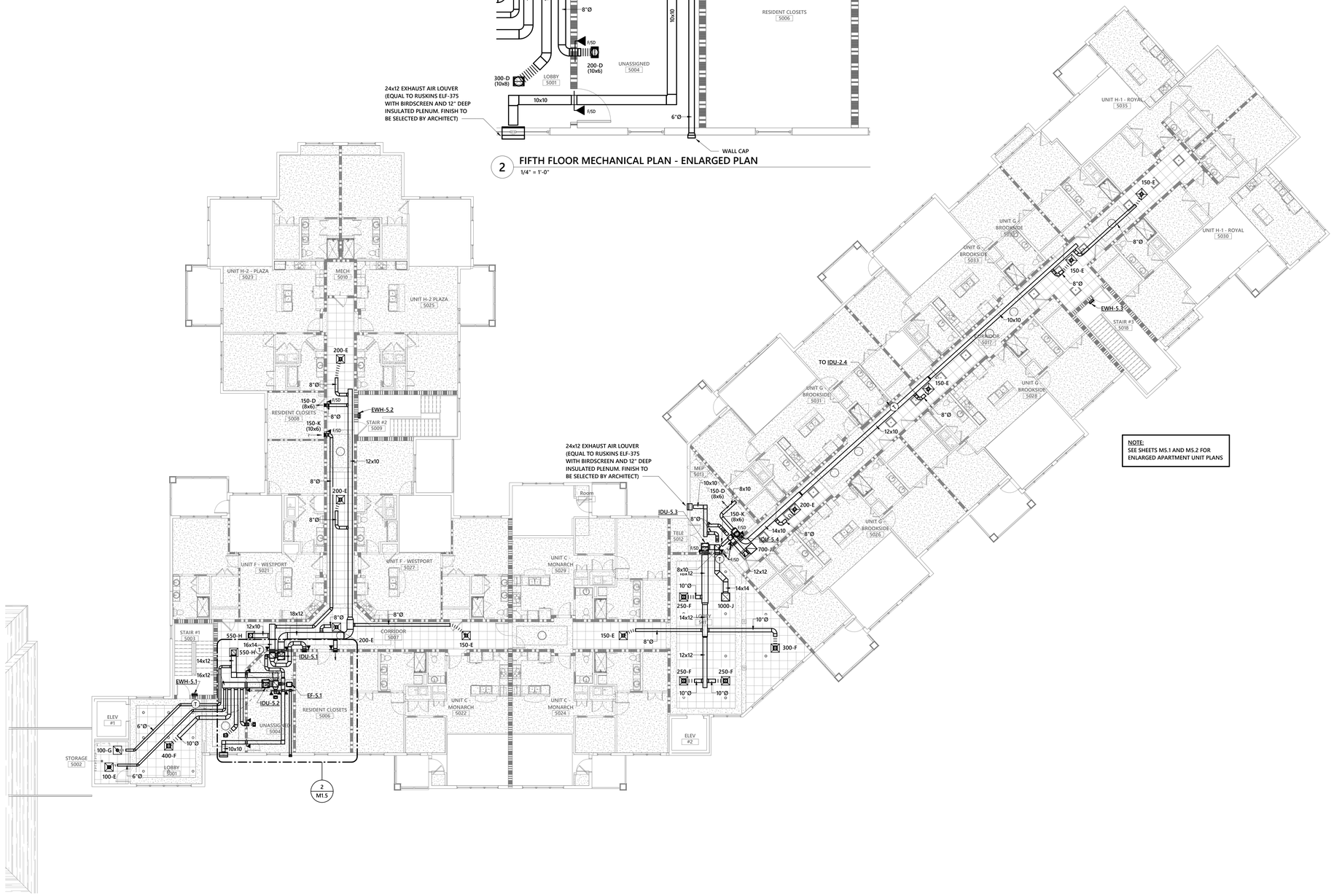


2 FIFTH FLOOR MECHANICAL PLAN - ENLARGED PLAN
1/4" = 1'-0"



NOTE:
SEE SHEETS M5.1 AND M5.2 FOR ENLARGED APARTMENT UNIT PLANS

1 OVERALL FIFTH FLOOR MECHANICAL PLAN
3/32" = 1'-0"

GENERAL NOTES

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NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL FIFTH FLOOR MECHANICAL PLAN

N
PLAN NORTH

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
M1.5	8 OF 14

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1 ROOF MECHANICAL ROOF PLAN
3/32" = 1'-0"

N
PLAN NORTH

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DRAWING TITLE
OVERALL ROOF MECHANICAL PLAN

COMM. NO.	DATE
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DRYER VENT CALCULATIONS

UNIT C/UNIT C HC:
HORIZONTAL RUN = 22.0 FT
(2) 90 DEGREE ELBOW = 10 FT
(0) 45 DEGREE ELBOW = 0 FT
VERTICAL RUN = 8 FT
TOTAL EQUIVALENT RUN = 40 FT

UNIT F:
HORIZONTAL RUN = 18 FT
(2) 90 DEGREE ELBOW = 10 FT
(0) 45 DEGREE ELBOW = 0 FT
VERTICAL RUN = 8 FT
TOTAL EQUIVALENT RUN = 36 FT

UNIT G:
HORIZONTAL RUN = 28 FT
(2) 90 DEGREE ELBOW = 5 FT
(0) 45 DEGREE ELBOW = 0 FT
VERTICAL RUN = 8 FT
TOTAL EQUIVALENT RUN = 41 FT

FOR DRYER ALLOWABLE VENT LENGTH OF 4"Ø RIGID METAL DUCT REFER TO CHART ON DETAIL 7 ON SHEET M6.1. THE EQUIVALENT LENGTH OF THE EXHAUST DUCT AT EACH DRYER SHALL BE IDENTIFIED ON A PERMANENT LABEL. REFER TO DETAIL 6, SHEET M6.1 FOR PERMANENT LABEL REQUIREMENTS.

NATURAL VENTILATION CALCULATION 2018 IMC, SECTION 402

UNIT C/UNIT C HC:
752 SQ. FT. X 4% = 30.08 SQ. FT. REQUIRED
55 SQ. FT. X 8% = 4.40 SQ. FT. REQUIRED
127 SQ. FT. EXHAUSTED PER "2018 IMC, TABLE 403.3"

DOOR (1 DOOR X 21 SQ. FT.) = 21 SQ. FT. PROVIDED
WINDOW (6 WINDOWS X 9 SQ. FT.) = 54 SQ. FT. PROVIDED

34.48 SQ. FT. REQUIRED < 75 SQ. FT. PROVIDED

NATURAL VENTILATION CALCULATION 2018 IMC, SECTION 402

UNIT F:
835 SQ. FT. X 4% = 33.4 SQ. FT. REQUIRED
48 SQ. FT. X 8% = 3.84 SQ. FT. REQUIRED
183 SQ. FT. EXHAUSTED PER "2018 IMC, TABLE 403.3"

DOOR (1 DOOR X 21 SQ. FT.) = 21 SQ. FT. PROVIDED
WINDOW (4 WINDOWS X 9 SQ. FT.) = 36 SQ. FT. PROVIDED

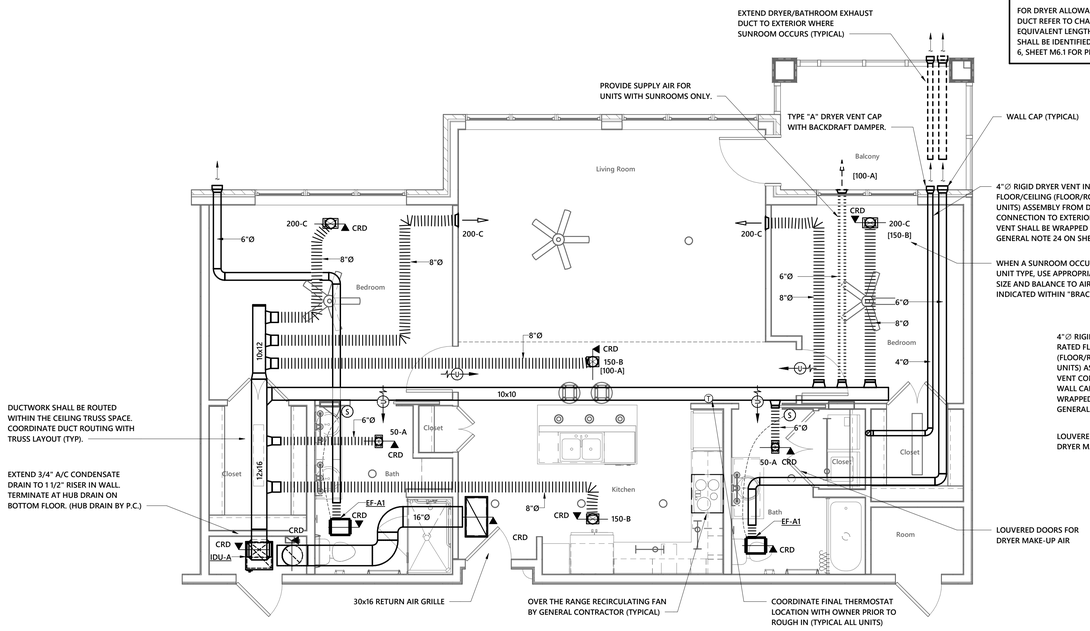
37.24 SQ. FT. REQUIRED < 57 SQ. FT. PROVIDED

NATURAL VENTILATION CALCULATION 2018 IMC, SECTION 402

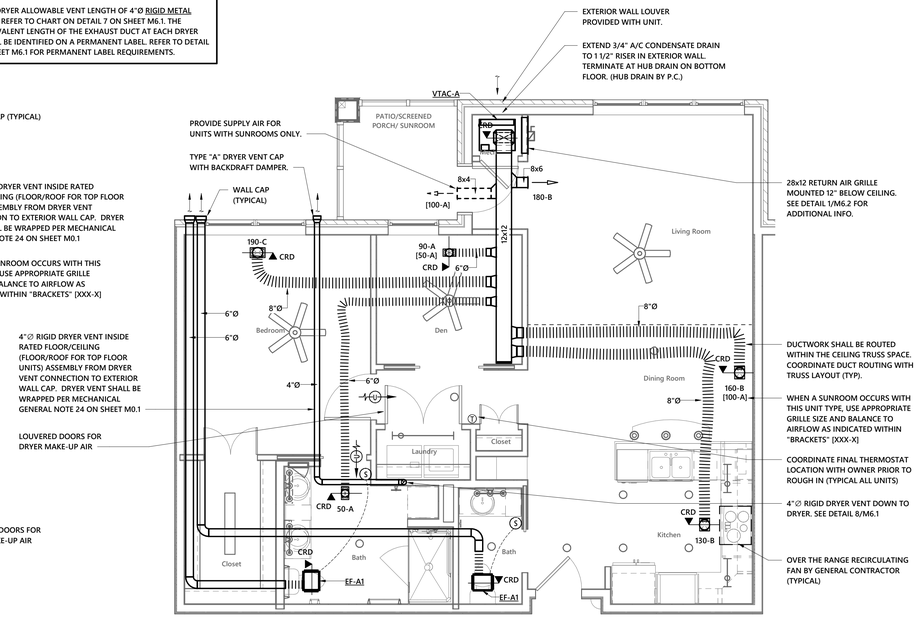
UNIT G:
922 SQ. FT. X 4% = 36.88 SQ. FT. REQUIRED
88 SQ. FT. X 8% = 7.04 SQ. FT. REQUIRED
127 SQ. FT. EXHAUSTED PER "2018 IMC, TABLE 403.3"

DOOR (1 DOOR X 21 SQ. FT.) = 21 SQ. FT. PROVIDED
WINDOW (9 WINDOWS X 9 SQ. FT.) = 81 SQ. FT. PROVIDED

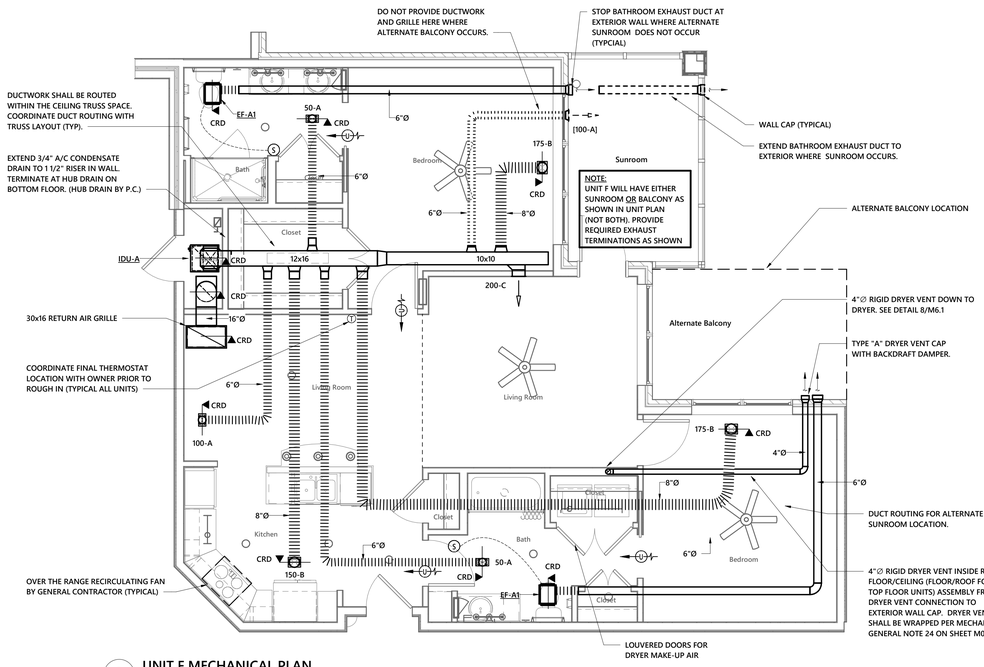
43.92 SQ. FT. REQUIRED < 102 SQ. FT. PROVIDED



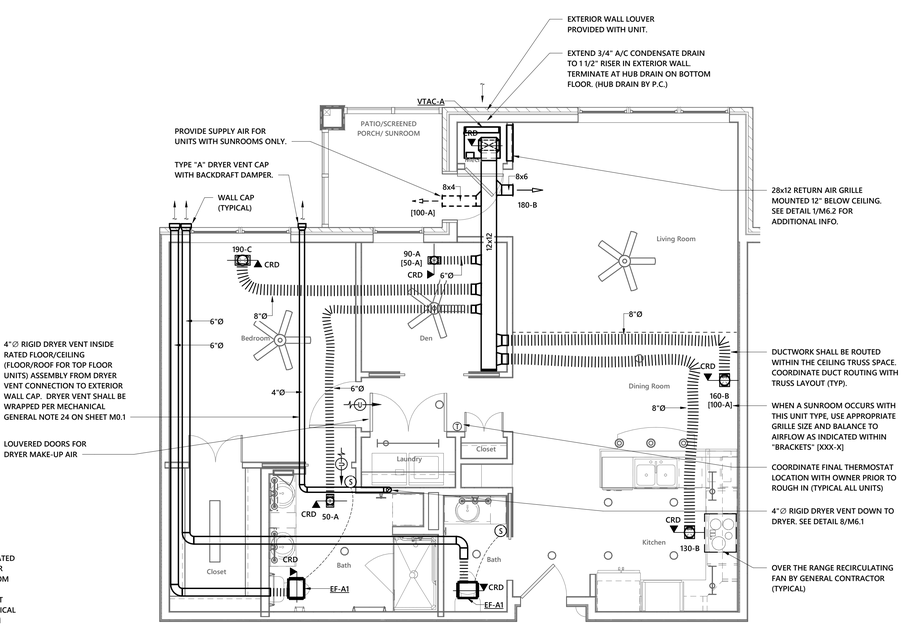
4 UNIT G MECHANICAL PLAN
1/4" = 1'-0"



3 UNIT C MECHANICAL PLAN - HC
1/4" = 1'-0"



2 UNIT F MECHANICAL PLAN
1/4" = 1'-0"



1 UNIT C MECHANICAL PLAN
1/4" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON W. FORD JR. PE-2014023016 NORTH CAROLINA PROFESSIONAL ENGINEER
01/18/2021

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CHECKED BY	:	Checker
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ENLARGED MECHANICAL UNIT PLANS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M5.1
SHEET 10 OF 14

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DRYER VENT CALCULATIONS

UNIT H-1:
HORIZONTAL RUN = 21.0 FT
(2) 90 DEGREE ELBOW = 10 FT
(0) 45 DEGREE ELBOW = 0 FT
VERTICAL RUN = 8 FT
TOTAL EQUIVALENT RUN = 39 FT

UNIT H-2:
HORIZONTAL RUN = 22 FT
(2) 90 DEGREE ELBOW = 10 FT
(0) 45 DEGREE ELBOW = 0 FT
VERTICAL RUN = 8 FT
TOTAL EQUIVALENT RUN = 40 FT

FOR DRYER ALLOWABLE VENT LENGTH OF 4"Ø RIGID METAL DUCT REFER TO CHART ON DETAIL 7 ON SHEET M6.1. THE EQUIVALENT LENGTH OF THE EXHAUST DUCT AT EACH DRYER SHALL BE IDENTIFIED ON A PERMANENT LABEL. REFER TO DETAIL 6, SHEET M6.1 FOR PERMANENT LABEL REQUIREMENTS.

NATURAL VENTILATION CALCULATION 2018 IMC, SECTION 402

UNIT H-1:
965 SQ. FT. X 4% = 38.60 SQ. FT. REQUIRED
167 SQ. FT. X 8% = 13.36 SQ. FT. REQUIRED
139 SQ. FT. EXHAUSTED PER "2018 IMC, TABLE 403.3"

DOOR (0 DOOR X 21 SQ. FT.) = 0 SQ. FT. PROVIDED

WINDOW (12 WINDOWS X 9 SQ. FT.) = 108 SQ. FT. PROVIDED

51.96 SQ. FT. REQUIRED < 108 SQ. FT. PROVIDED

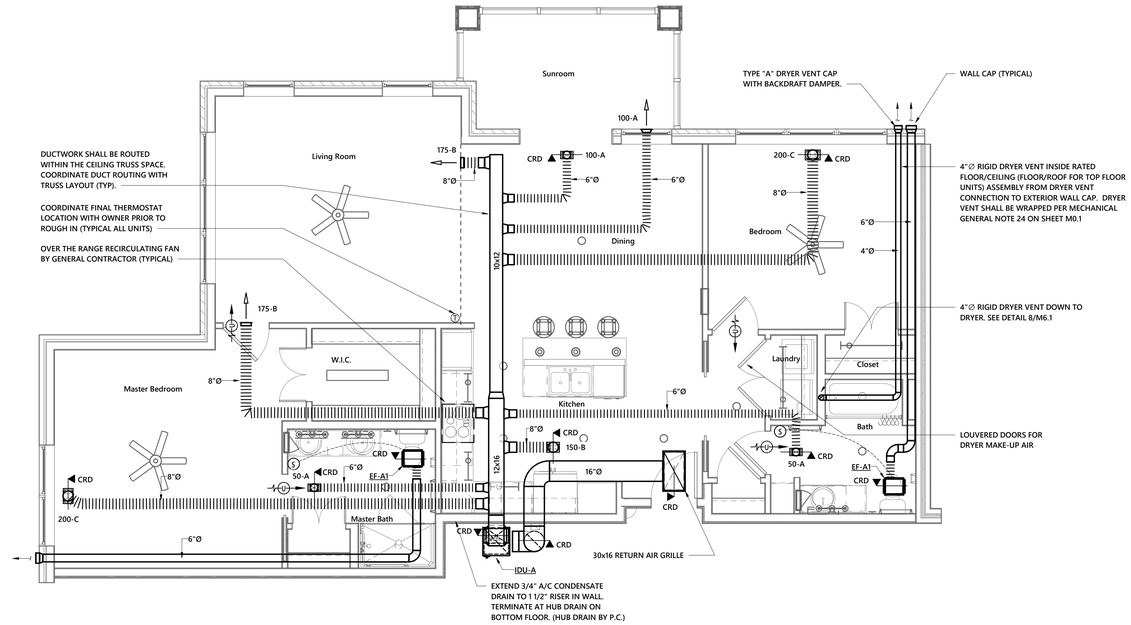
NATURAL VENTILATION CALCULATION 2018 IMC, SECTION 402

UNIT H-2:
1064 SQ. FT. X 4% = 42.56 SQ. FT. REQUIRED
50 SQ. FT. X 8% = 4.00 SQ. FT. REQUIRED
140 SQ. FT. EXHAUSTED PER "2018 IMC, TABLE 403.3"

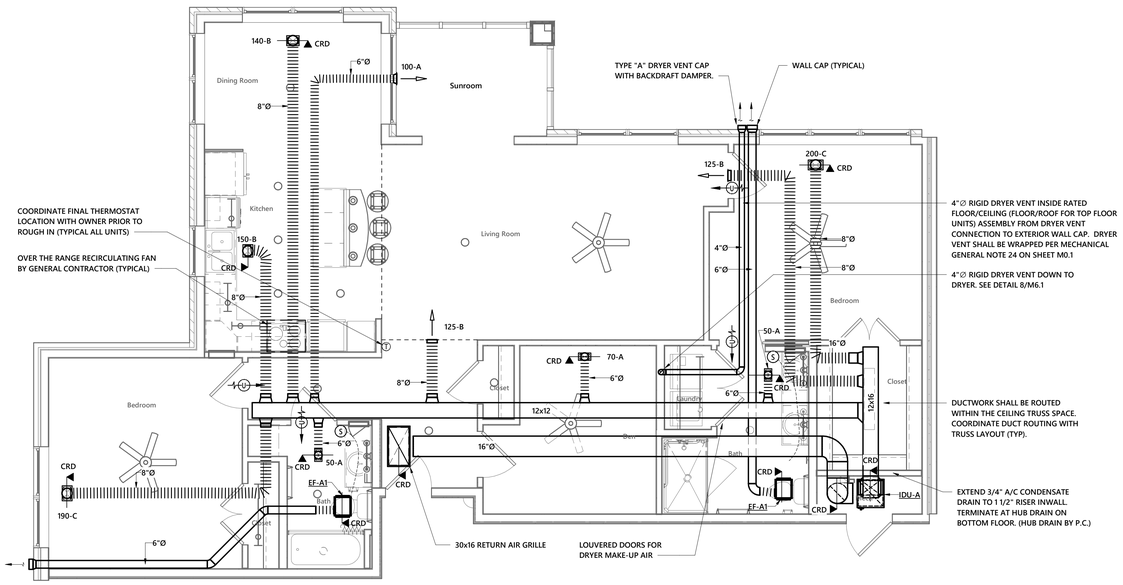
DOOR (0 DOOR X 21 SQ. FT.) = 0 SQ. FT. PROVIDED

WINDOW (10 WINDOWS X 9 SQ. FT.) = 90 SQ. FT. PROVIDED

46.56 SQ. FT. REQUIRED < 90 SQ. FT. PROVIDED



2 UNIT H-2 MECHANICAL PLAN
1/4" = 1'-0"



1 UNIT H-1 MECHANICAL PLAN
1/4" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON L. FORD JR. PE-2014023016 NORTH CAROLINA
01/18/2021

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PROJECT TITLE
John Knox Village

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PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	BLF
DRAWN BY	:	BMB
CHECKED BY	:	BLF
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ENLARGED MECHANICAL UNIT PLANS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M5.2
SHEET 11 OF 14

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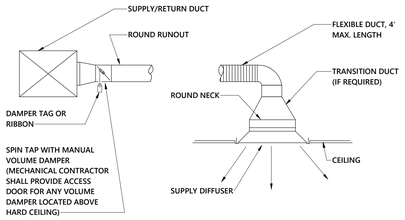
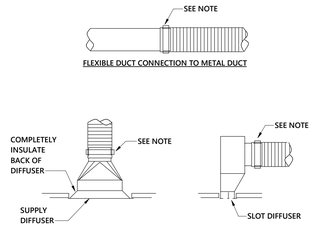


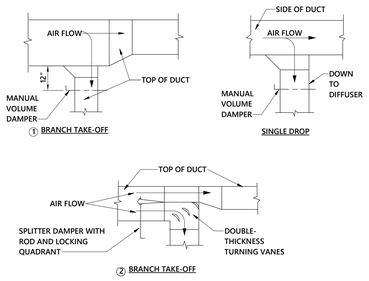
NOTE:
1. ALL MANUAL VOLUME DAMPERS (FOR INSULATED DUCTWORK) SHALL BE PROVIDED WITH AN ELEVATED REGULATOR (STAND-OFF) EQUAL TO DURO DYNE SRST SERIES. STAND SHALL EXTEND A MINIMUM OF 2" BEYOND DUCTWORK WITH EXTENDED TAB/SHAFT.
2. MANUAL VOLUME DAMPERS SHALL BE PROVIDED FOR ALL SUPPLY, RETURN, AND GENERAL EXHAUST RUNOUTS.

1 SPIN TAP TO ROUND NECK DIFFUSER
NOT TO SCALE



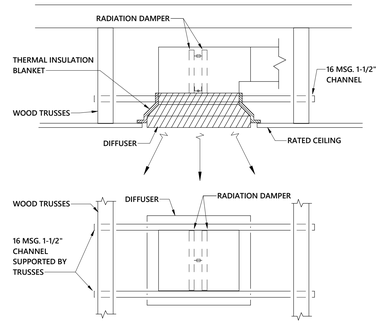
NOTE:
ALL FLEXIBLE DUCT CONNECTIONS TO SHEET METAL SHALL BE SECURED WITH APPROVED STRAP AND SEALANT.

2 FLEX CONNECTION DETAIL
NOT TO SCALE



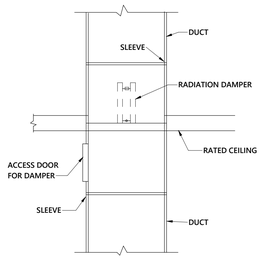
NOTE:
1. USE BRANCH TAKE-OFF 1 WHEN MAIN AND BRANCH DUCTS ARE DIFFERENT DEPTHS.
2. USE BRANCH TAKE-OFF 2 WHEN MAIN AND BRANCH DUCTS ARE SAME DEPTHS.
3. MANUAL VOLUME DAMPERS SHALL BE PROVIDED FOR ALL SUPPLY, RETURN AND GENERAL EXHAUST SINGLE DROP DUCT RUNS.

3 DUCTWORK DETAILS
NOT TO SCALE



NOTES:
1. PROVIDE RADIATION INSULATION BLANKET ON TOP SIDE OF DIFFUSER AS REQUIRED TO MAINTAIN RATING OF CEILING.
2. INSTALL PER MANUFACTURER'S INSTRUCTIONS.

4 RATED CEILING DIFFUSER (SUPPORTED BY STRUCTURE)
NOT TO SCALE



WARNOCK HERSEY LISTING NO. 3225-245:101
(INSTALLATION TYPE 7)

NOTES:
1. PROVIDE RADIATION DAMPER IN SUPPLY AND RETURN DUCT PENETRATIONS OF RATED CEILING.

5 RADIATION DAMPER IN DUCTWORK
NOT TO SCALE

MAXIMUM DRYER VENTING LENGTH:		
TOTAL LENGTH OF STRAIGHT 4" RIGID DRYER VENT:	(XXXX)	FEET
NUMBER OF ELBOWS (DEDUCTION):	QTY:	
4" RADIUS MITERED 45-DEGREE ELBOW (2'-6"):	(XXXX)	
4" RADIUS MITERED 90-DEGREE ELBOW (5'-0"):	(XXXX)	
TOTAL EQUIVALENT LENGTH OF DRYER VENT:	(XXXX)	FEET
MAXIMUM LENGTH OF DRYER VENT (IMC 504.8.4):	35'-0"	FEET
MANUFACTURER'S EXCEPTION TOTAL EQUIVALENT LENGTH OF DRYER VENT MAY EXCEED 35'-0" WHERE DRYER'S MANUFACTURER'S INSTALLATION INSTRUCTIONS ALLOW. INSTALLATION INSTRUCTIONS MUST INCLUDE A MAXIMUM VENTING LENGTH AND DEDUCTIONS FOR FITTINGS.		

PRE-DRILLED HOLES IN PLACARD (TYPICAL OF 4); ATTACH PANEL TO WALL WITHIN 5'-0" OF DRYER BOX WITH 4 SCREWS.

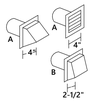
ALL SECTIONS INCLUDING "(XXXX)" MUST BE COMPLETED AND REFLECT THE DRYER VENT INSTALLATION PRIOR TO INSTALLING PLACARD

NOTE:
1. MECHANICAL CONTRACTOR SHALL PROVIDE A 1/16" THICK RED PLASTIC PLACARD WITH WHITE 1/4" HIGH LETTERING INDICATING EACH DRYER VENT INSTALLATION. THE MECHANICAL CONTRACTOR SHALL ORDER PLACARD PRIOR TO CEILING INSTALLATION, BUT NOT BEFORE DRYER VENT INSTALLATION HAS BEEN COMPLETED. DRYERS EXCEEDING 35'-0" OR THAT ALLOWED IN MANUFACTURER'S INSTALLATION INSTRUCTIONS ARE PROHIBITED FROM BEING INSTALLED.
2. PLACARD SHALL INCLUDE (4) PRE-DRILLED HOLES, TO BE ATTACHED ADJACENT TO THE DRYER BOX WITH 4 SCREWS.

6 DRYER VENTING MAXIMUM LENGTH PACARD
NOT TO SCALE

NOTES:
1. DRYER VENT WALL CAPS SHALL BE SECURED TO BUILDING WITH STAINLESS STEEL FASTENERS.
2. DRYER VENT WALL CAPS SHALL BE PROVIDED WITH INTEGRAL BACKDRAFT DAMPERS

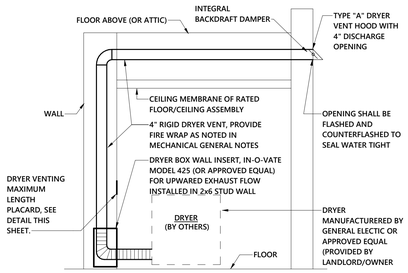
BASIS OF DESIGN: GE MODEL GFD55ESSNWW



		BEST PERFORMANCE	
		MAXIMUM LENGTH OF 4" DIA. RIGID METAL DUCT	
		EXHAUST HOOD TYPE	
	NUMBER OF 90 DEG. TURNS	A 4" OPENING	B 2-1/2" OPENING
PRE-APPROVED 6.0 6.0 CU. FT. CAPACITY DRYER AS NOTED ON PLANS.	0	90 FT.	60 FT.
	1	60 FT.	45 FT.
	2	45 FT.	35 FT.
	3	35 FT.	25 FT.

EXHAUST LENGTH CALCULATION:
1. DETERMINE THE NUMBER OF 90 DEG. TURNS NEEDED FOR YOUR INSTALLATION. IF YOU EXHAUST TO THE SIDE OF BOTTOM OF THE DRYER, ADD ONE TURN.
2. THE MAXIMUM LENGTH OF 4" RIGID (ALUMINUM OR GALVANIZED) DUCT WHICH CAN BE TOLERATED IS SHOWN IN THE TABLE. A TURN OF 45 DEG. OR LESS MAY BE IGNORED. TWO 45 DEG. TURNS WITHIN THE DUCT LENGTH SHOULD BE TREATED AS A 90 DEG. ELBOW. A TURN OVER 45 DEG. SHOULD BE TREATED AS A 90 DEG. ELBOW.

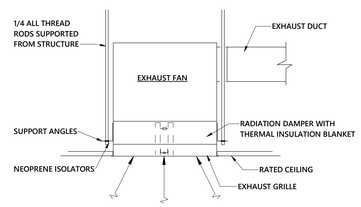
7 DRYER ALLOWABLE VENT LENGTH DETAIL
NOT TO SCALE



NOTES :
1. DRYER VENT PIPING SHALL BE GALVANIZED SHEET METAL AND SHALL HAVE A SMOOTH INTERIOR FINISH WITH JOINTS RUNNING IN THE DIRECTION OF THE AIR FLOW.
2. DRYER VENT SHALL BE PERMITTED TO EXCEED THE LENGTH LISTED IN THE IMC SECTION 504.8.4.1 IF THE CONTRACTORS PROVIDE THE MAKE AND MODEL OR THE DRYER AND THE MANUFACTURER'S INSTALLATION INSTRUCTIONS TO THE LOCAL AUTHORITY HAVING JURISDICTION AND THE BUILDING OWNER PROVIDES THE DRYER VENTING MAXIMUM LENGTH PLACARD.
3. DRYER VENT SHALL BE NONSCREENED WITH A BACKDRAFT DAMPER AND MINIMUM SIZE OF 4".

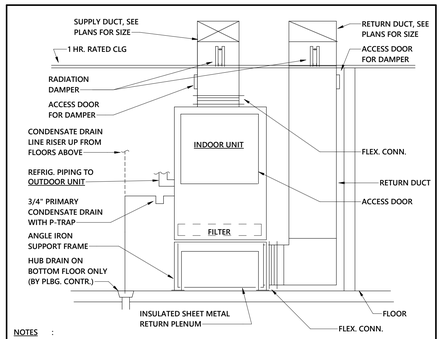
8 DRYER VENT THRU WALL
NOT TO SCALE

NOTE:
MAINTAIN 2" CLEAR ABOVE FAN AND BELOW COMBUSTIBLE CONSTRUCTION OR PROVIDE 5/8" GYPSUM BOARD BETWEEN THE FAN AND THE STRUCTURE ABOVE.



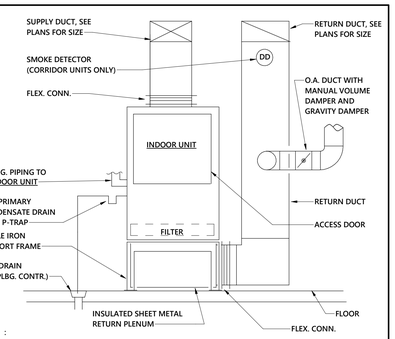
NOTE:
RADIATION DAMPER SHALL BE COMPLETE WITH THERMAL INSULATION BLANKET AND FUSIBLE LINK (160°) AND SHALL BE A U.L. LABELED ASSEMBLY WITH THE FAN.

9 FAN - CEILING EXHAUST WITH RADIATION DAMPER
NOT TO SCALE



NOTES :
1. PROVIDE FULL SIZE CONDENSATE DRAIN WITH TRAP, SEE PLANS FOR ROUTING.
2. PROVIDE INLINE OVERFLOW SAFETY SWITCH EQUAL TO RECTORSEAL SAFE-T-SWITCH MODEL SS1 (UL 508 COMPLIANT) TO SHUT-DOWN THE UNIT UPON ACTIVATION.
3. ROUTE REFRIGERANT PIPING TO HEAT PUMP ON ROOF. ALL PIPING SHALL BE CONCEALED IN WALLS & CEILING SPACE AND SHALL BE SUPPORTED PER THE MFG RECOMMONDATIONS.

10 APARTMENT INDOOR UNIT DETAIL
NOT TO SCALE



NOTES :
1. PROVIDE FULL SIZE CONDENSATE DRAIN WITH TRAP, SEE PLANS FOR ROUTING.
2. SMOKE DETECTOR (WHERE REQ'D) SHALL BE IONIZATION TYPE WIRED TO SHUT-DOWN UNIT WHEN ACTIVATED.
3. PROVIDE INLINE OVERFLOW SAFETY SWITCH EQUAL TO RECTORSEAL SAFE-T-SWITCH MODEL SS1 (UL 508 COMPLIANT) TO SHUT-DOWN THE UNIT UPON ACTIVATION.
4. ROUTE REFRIGERANT PIPING TO HEAT PUMP ON ROOF. ALL PIPING SHALL BE CONCEALED IN WALLS & CEILING SPACE AND SHALL BE SUPPORTED PER THE MFG RECOMMONDATIONS.

11 CORRIDOR INDOOR UNIT DETAIL
NOT TO SCALE

GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT TITLE

John Knox Village

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PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: BLF
DRAWN BY	: BMB
CHECKED BY	: BLF
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
MECHANICAL DETAILS

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
M6.1	12 OF 14

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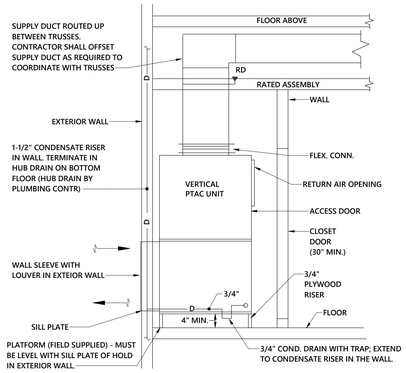
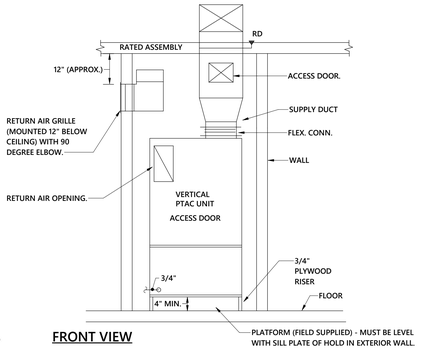
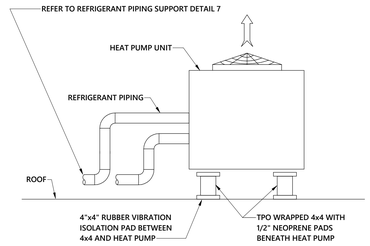


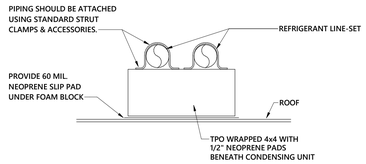


FRONT VIEW

1 VERTICAL PTAC UNIT DETAIL
NOT TO SCALE

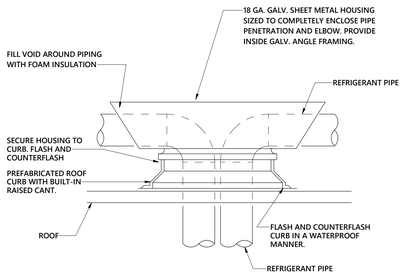


2 ROOF MOUNTED HEAT PUMP
NOT TO SCALE

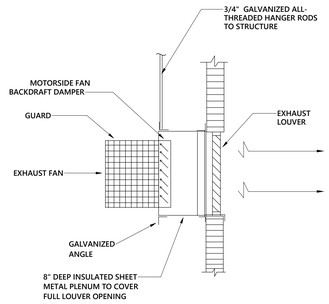


NOTES:
1. PROVIDE PIPE SUPPORTS ON ROOF AT 8'-0" ON CENTER. PROVIDE ADDITIONAL SUPPORTS AT EQUIPMENT TO PREVENT WEIGHT OF PIPE BEING PLACED ON EQUIPMENT.

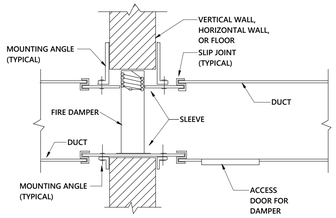
3 REFRIGERANT PIPING SUPPORT (ROOF)
NOT TO SCALE



4 PIPE PORTAL DETAIL
NOT TO SCALE



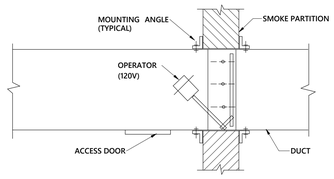
5 SIDEWALL EXHAUST FAN
NO SCALE



NOTE: DAMPERS SHALL BE INSTALLED AS PER MFG. INSTRUCTIONS.

FIRE DAMPER SHALL BE RUSKIN TYPE DIBD2 STYLE B 1 1/2 HOUR UL, INSTALLED IN ACCORDANCE WITH NFPA. ACCESS DOOR SHALL BE RUSKIN MODEL ADC2 LOCATED ON ACCESSIBLE CEILING SIDE OF WALL. IF ACCESSIBLE CEILING NOT AVAILABLE, MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING (OR WALL) TO MATCH FINISH COLOR. DAMPER SHALL BE EQUIPPED FOR HORIZONTAL OR VERTICAL MOUNTING AS REQUIRED. WHERE ROUND DUCTS REQUIRE A DAMPER, AN ENCLOSURE WITH ROUND DUCT CONNECTION WILL BE REQUIRED WITH TYPE B DAMPER INSIDE. ALL MODELS ARE RUSKIN (APPROVED EQUAL ACCEPTABLE).

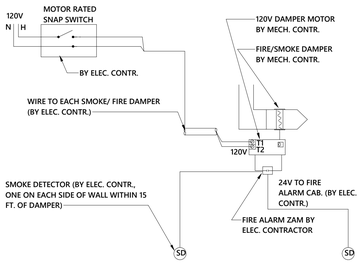
6 DAMPER - LOW PRESSURE FIRE
NOT TO SCALE



NOTE: DAMPERS SHALL BE INSTALLED AS PER MFG. INSTRUCTIONS.

FIRE/SMOKE DAMPER SHALL BE RUSKIN TYPE FSD36 WITH BLADE AND JAM SEALS AT CLASS II LEAKAGE (LOW PRESSURE RECTANGULER) OR TYPE FSDR-25 (ROUND); UL LISTED INSTALLED IN ACCORDANCE WITH NFPA. ACCESS DOOR SHALL BE RUSKIN TYPE ADC2 (LOW PRESSURE). ACCESS DOOR SHALL BE ACCESSIBLE THROUGH CEILING OR MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING. ALL MODELS ARE RUSKIN (APPROVED EQUAL ACCEPTABLE).

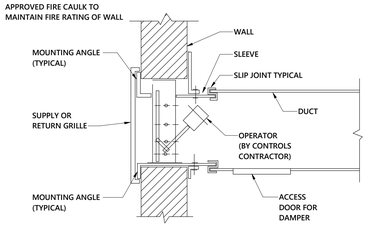
7 DAMPER - COMBINATION FIRE/SMOKE
NOT TO SCALE



NOTE:
1. ALL FIRE/SMOKE DAMPERS SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. ALL FIRE ALARM WIRING INSTALLED BY ELECTRICAL CONTRACTOR. 120V WIRING TO DAMPER PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.
2. DAMPER SHALL BE INSTALLED PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
3. ACTIVATION OF SMOKE DETECTOR SHALL SHUT DOWN ASSOCIATED INDOOR UNIT.

8 SMOKE/FIRE DAMPER WIRING
NOT TO SCALE

NOTE:
SEAL WALL OPENING WITH AN APPROVED FIRE CAULK TO MAINTAIN FIRE RATING OF WALL



NOTE: DAMPERS SHALL BE INSTALLED AS PER MFG. INSTRUCTIONS.

COMBINATION FIRE/SMOKE DAMPER SHALL BE RUSKIN FSD60FA, ½ HOUR FIRE DAMPER, UL555 & UL555S WITH MECHANICAL ATTACHED BLADE AND FLEXIBLE STAINLESS STEEL JAMB SEALS. DAMPER SHALL BE U.L. LISTED INSTALLED IN ACCORDANCE WITH NFPA. ACCESS DOOR SHALL BE RUSKIN MODEL ADC2 LOCATED ON ACCESSIBLE SIDE OF WALL. IF ACCESSIBLE CEILING IS NOT AVAILABLE, MECHANICAL CONTRACTOR SHALL PROVIDE ACCESS DOOR IN CEILING (OR WALL) TO MATCH FINISH COLOR. ALL MODEL NUMBERS ARE RUSKIN, (APPROVED EQUALS ACCEPTABLE).

9 DAMPER - LOW PRESSURE COMBINATION FIRE/SMOKE W/GRILE
NOT TO SCALE

GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	Designer
DRAWN BY	Author
CHECKED BY	Checker
APPROVED BY	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
MECHANICAL DETAILS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M6.2
SHEET 13 OF 14

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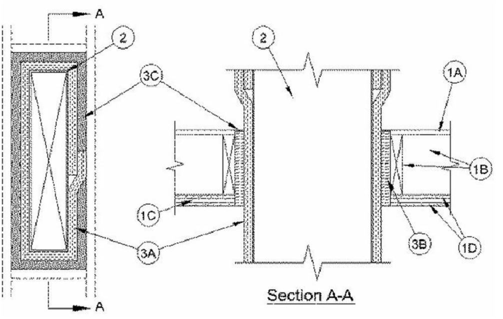
UL SYSTEM NO. F-C-7036
JANUARY 18, 2011
F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATINGS - 1 AND 2 HR (SEE ITEM 1)



1. FLOOR-CEILING ASSEMBLY -- THE 1 HR FIRE RATED SOLID OR TRUSSED LUMBER JOIST FLOOR-CEILING ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL L500 SERIES FLOOR-CEILING DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY. THE 2 HR FIRE RATED WOOD JOIST FLOOR-CEILING ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN DESIGN NO. L505, L511 OR L536 IN THE UL FIRE RESISTANCE DIRECTORY. THE GENERAL CONSTRUCTION DETAILS OF THE FLOOR-CEILING ASSEMBLY ARE SUMMARIZED BELOW:
A. FLOORING SYSTEM -- LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD OR FLOOR TOPPING MIXTURE* AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. MAX AREA OF FLOOR OPENING IS 435 SQ IN. (0.28 M2) WITH A MAX DIMENSION OF 30 IN. (762 MM).
B. WOOD JOISTS -- FOR 1 HR FIRE RATED FLOOR-CEILING ASSEMBLIES NOM 10 IN. (254 MM) DEEP (OR DEEPER) LUMBER, STEEL OR COMBINATION LUMBER AND STEEL JOISTS, TRUSSES OR STRUCTURAL WOOD MEMBERS* WITH BRIDGING AS REQUIRED AND WITH ENDS FIRESTOPPED. FOR 2 HR FIRE RATED FLOOR-CEILING ASSEMBLIES, NOM 2 BY 10 IN. (51 BY 254 MM) LUMBER JOISTS SPACED 16 IN. (406 MM) OC WITH NOM 1 BY 3 IN. (25 BY 76 MM) LUMBER BRIDGING AND WITH ENDS FIRESTOPPED. ADDITIONAL FRAMING MEMBER TO BE INSTALLED TO FORM A RECTANGULAR OPENING AROUND THE THROUGH PENETRANT.
C. FURRING CHANNELS -- IN 2 HR FIRE RATED ASSEMBLIES, RESILIENT GALV STEEL FURRING INSTALLED PERPENDICULAR TO WOOD JOISTS BETWEEN FIRST AND SECOND LAYERS OF GYPSUM BOARD (ITEM 1D). FURRING CHANNELS SPACED MAX 24 IN. (610 MM) OC. WHEN REQUIRED AS SPECIFIED IN THE INDIVIDUAL 1 HR FIRE RATED FLOOR-CEILING DESIGN, RESILIENT GALV STEEL FURRING INSTALLED PERPENDICULAR TO WOOD JOISTS BETWEEN GYPSUM BOARD AND WOOD JOISTS. FURRING CHANNELS SPACED MAX 24 IN. (610 MM) OC. IF FURRING CHANNELS ARE USED WITHIN THE ASSEMBLY, ADDITIONAL FURRING CHANNELS TO BE INSTALLED AROUND THE PERIPHERY OF THE OPENING.
D. GYPSUM BOARD* -- NOM 4 FT (1.2 M) WIDE BY 5/8 IN. (16 MM) THICK AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. FIRST LAYER OF GYPSUM BOARD SECURED TO WOOD JOISTS OR FURRING CHANNELS AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILINGDESIGN. SECOND LAYER OF GYPSUM BOARD (2 HR FIRE RATED ASSEMBLY) SCREW-ATTACHED TO FURRING CHANNELS AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. MAX AREA OF CEILING OPENING IS 435 SQ IN. (0.28 M2) WITH A MAX DIMENSION OF 30 IN. (762 MM).

THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE EQUAL TO THE HOURLY FIRE RATING OF THE FLOOR-CEILING IN WHICH IT IS INSTALLED.

2. STEEL DUCT -- ONE STEEL DUCT TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. STEEL DUCT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR-CEILING ASSEMBLY. THE FOLLOWING TYPES OF STEEL DUCTS MAY BE USED:
A. STEEL AIR DUCT -- MIN 26 GAUGE (0.5 MM) GALV STEEL DUCT HAVING A MAX PERIMETER DIMENSION OF 63 IN. (1.6 M) AND A MAX INDIVIDUAL DIMENSION OF 24 IN. (610 MM).
B. STEEL GREASE DUCT -- MIN 16 GAUGE (1.5 MM) THICK CARBON STEEL DUCT HAVING A MAX PERIMETER DIMENSION OF 63 IN. (1.6 M) AND A MAX INDIVIDUAL DIMENSION OF 24 IN. (610 MM).
3. FIRESTOP SYSTEM -- THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
A. DUCT WRAP MATERIALS* -- NOM 1-1/2 IN. (38 MM) THICK BLANKET TOTALLY ENCAPSULATED WITHIN FOIL-SCRIM FACERS. THE STEEL GREASE DUCT SHALL BE WRAPPED WITH ONE LAYER OF DUCT WRAP INSTALLED IN ACCORDANCE WITH GREASE DUCT ASSEMBLY NO. G-14. SEE GREASE DUCT ASSEMBLIES IN VOL. 2 OF THE FIRE RESISTANCE DIRECTORY. THE STEEL AIR DUCT SHALL BE WRAPPED WITH ONE LAYER OF DUCT WRAP INSTALLED IN ACCORDANCE WITH VENTILATION ASSEMBLY NO. V-19. SEE VENTILATION DUCT ASSEMBLIES IN VOL. 2 OF THE FIRE RESISTANCE DIRECTORY. THE ANNULAR SPACE BETWEEN THE INSULATED STEEL DUCT AND THE PERIPHERY OF THE OPENING SHALL BE NOM 1-1/2 IN. (38 MM). THERMAL CERAMICS INC -- FIREMASTER FAST WRAP+, FIREMASTER FASTWRAP XL, OR PYROSCAT DUCT WRAP XL.
B. PACKING MATERIAL -- MIN 10-3/8 IN. (264 MM) AND 11-5/8 IN. (295 MM) THICKNESS OF UNFACED SCRAP DUCT WRAP MATERIAL COMPRESSED 50 PERCENT INTO OPENING AS A PERMANENT FORM BETWEEN THE INSULATED STEEL DUCT AND THE PERIPHERY OF THE OPENING FOR 1 AND 2 HR FIRE RATED FLOOR-CEILING ASSEMBLIES, RESPECTIVELY. AT POINT CONTACT LOCATION BETWEEN OVERLAP OF DUCT WRAP MATERIAL AND FLOOR-CEILING ASSEMBLY, PACKING MATERIAL SHALL BE FIRMLY PACKED TO MAX EXTENT POSSIBLE ON BOTH SIDES OF THE FLOOR-CEILING ASSEMBLY. PACKING MATERIAL TO BE INSTALLED FLUSH WITH BOTTOM SURFACE OF CEILING AND RECESSED FROM TOP SURFACE OF FLOOR TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
C. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 1/4 IN. (6 MM) THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS ON TOP SURFACE OF FLOOR. A MIN 1/4 IN. (6 MM) DIAM BEAD OF SEALANT SHALL BE APPLIED AT THE PLYWOOD FLOOR/INSULATED STEEL DUCT INTERFACE ON BOTH SURFACES OF FLOOR-CEILING ASSEMBLY.
EGS NELSON FIRESTOP -- ES1399 OR LBS3 SEALANT

HILTI CONSTRUCTION CHEMICALS, DIV OF
HILTI INC -- FS ONE SEALANT
RECTORSEAL -- 835+ SEALANT, FS 900+ SEALANT, FS 1900 SEALANT
SPECIFIED TECHNOLOGIES INC -- SPECSEAL SERIES SSS SEALANT, SPECSEAL LC 150 SEALANT, SPECSEAL LCI SEALANT OR SPECSEAL LE600 SEALANT
THERMAL CERAMICS INC -- FIREMASTER PUTTY
TREMCO INC -- FYRE-SIL, TREMSTOP ACRYLIC OR TREMSTOP INTUMESCENT ACRYLIC SEALANT, FYRECAULK OR TREMSTOP IA+

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*BEARING THE UL CLASSIFICATION MARK

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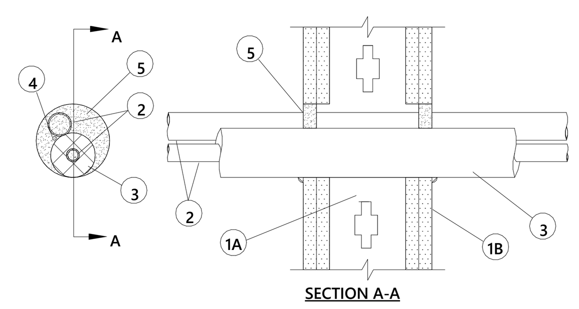
1 U.L. SYSTEM NO F-C-7036 DETAIL
NOT TO SCALE

SYSTEM NO.W-L-8039
RATINGS - 1 & 2 HR (SEE ITEM 1)
T RATINGS - 0 & 1/2 HR (SEE ITEM 1)



1. WALL ASSEMBLY - THE 1 OR 2 HR FIRE RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 IN. BY 4 IN. (51 MM BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 3-1/2 IN. (89 MM) WIDE SPACED MAX 24 IN. (610 MM) OC.
   B. GYPSUM BOARD* - THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 4 IN. (102 MM) THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED. THE HOURLY T RATING IS 0 AND 1/2 HR FOR 1 AND 2 HR RATED ASSEMBLIES, RESPECTIVELY.

2. THROUGH PENETRANTS - A MAX OF TWO PIPES OR TUBES AND ONE CABLE INSTALLED ECCENTRICALLY OR CONCENTRICALLY WITHIN THE OPENING. ANNULAR SPACE BETWEEN PENETRANTS AND PERIPHERY OF OPENING TO BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/2 IN. (0 MM TO MAX 38 MM). SEPARATION BETWEEN PENETRANTS TO BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/2 IN. (0 MM TO MAX 38 MM). PENETRANTS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE WALL. THE FOLLOWING TYPES AND SIZES OF PENETRANTS MAY BE USED:
   A. COPPER TUBING - NOM 1 IN. (25 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   B. COPPER PIPE - NOM 1 IN. (25 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
   C. STEEL PIPE - NOM 1 IN. (25 MM) DIAM (OR SMALLER) SCHEDULE 5 (OR HEAVIER) STEEL PIPE.
   D. CABLES - MAX 7/C NO. 12 AWG MULTICONDUCTOR POWER AND CONTROL CABLES; XLPE OR PVC INSULATION WITH XLPE OR PVC JACKET.

3. TUBE INSULATION-PLASTICS+ - NOM 3/4 IN. (19 MM) THICK (OR LESS) ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. THE TUBE INSULATION MAY BE INSTALLED ON A MAX OF ONE PIPE OR TUBE. ANNULAR SPACE BETWEEN THE TUBE INSULATION AND PERIPHERY OF OPENING TO BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/2 IN. (0 MM TO MAX 38 MM). SPACE BETWEEN INSULATED AND UNINSULATED PENETRANTS TO BE 0 IN. (POINT CONTACT) TO MAX 1-1/2 IN. (0 MM TO MAX 38 MM). SEE PLASTICS (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED COMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MATERIAL MEETING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5A MAY BE USED.

4. CABLES - MAX TWO 7/C (OR LESS) NO. 12 AWG (OR SMALLER) MULTICONDUCTOR POWER AND CONTROL CABLES WITH XLPE OR PVC INSULATION WITH XLPE OR PVC JACKET. CABLES TO BE SPACED MIN 0 IN. (POINT CONTACT) TO MAX 1 IN. (0 MM TO MAX 25 MM) FROM THE INSULATED THROUGH PENETRANTS AND MIN 1/2 IN. TO MAX 1 IN. (13 MM TO MAX 25 MM) FROM NON-INSULATED THROUGH PENETRANTS. THE SPACE BETWEEN THE CABLES AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1 IN. (0 MM TO MAX 25 MM). CABLES TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.

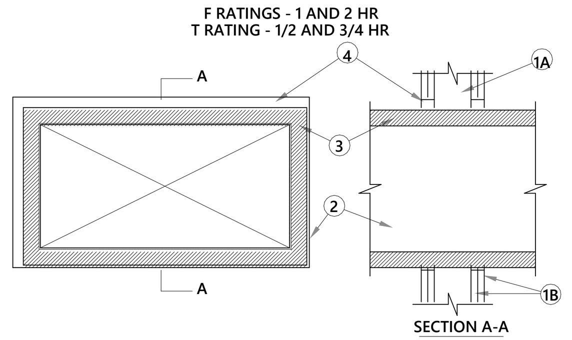
5. FILL,VOID OR CAVITY MATERIAL* - CAULK OR SEALANT - MIN 5/8 IN. (16 MM) THICKNESS OF CAULK APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL.

3M COMPANY- CP 25WB+, IC 15WB+ CAULK OR FB-3000 WT SEALANT

* BEARING THE UL CLASSIFICATION MARKING

2 U.L. SYSTEM NO W-L-8039 DETAIL
NOT TO SCALE

SYSTEM NO. W-L-7059
INSULATED RECTANGULAR DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY
F RATINGS - 1 AND 2 HR
T RATING - 1/2 AND 3/4 HR

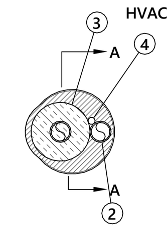


1. WALL ASSEMBLY THE 1 OR 2 FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U400 SERIES OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS WALL FRAMING SHALL CONSIST OF CHANNEL STUDS. STEEL STUDS TO BE MIN 2-1/2 IN . WIDE AND SPACED MAX 24 IN. OC. THE OPENING IN THE WLL TO ACCOMMODATE THE STEEL DUCT (ITEM 2) SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STUDS INSTALLED BETWEEN THE VERTICAL STUDS AND ATTACHED TO THE STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE A NOM 6 IN. WIDE AND 12 IN. OR HIGHER THAN THE WIDTH AND HEIGHT OF THE STEEL DUCT.
   B. WALLBOARD, GYPSUM* 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN TEH INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX AREA OF OPENING IS 395 SQ. IN. WITH MAX DIMENSIONS OF 26-3/4 IN. FOR STEEL STUDS.
2. STEEL DUCT NOM 24 IN. BY 12 IN. (OR SMALLER) 24 GUAGE (OR HEAVIER) STEEL DUCT. TO BE INSTALLED ECCENTRICALLY WITHIN THE OPENING. THE ANNULAR SPACE SHALL BE MIN 1 IN. TO MAX 1-3/4. DUCT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE WALL ASSEMBLY.
3. BATT AND BLANKET* - MAX 1-1/2 THICK GLASS FIBER BATT OR BLANKETT (MIN. 3.4 PCF) JACKETED ON THE OUTSIDE WITH A FOIL-SCRIM-KRAFT FACING. COMPRESSED 50% SUCH THAT THE ANNULAR SPACE WITHIN THE FIRESTOP SYSTEM SHALL BE MIN 1/4 IN. TO MAX 1 IN. SEE BATTS AND BLANKETS (BKNV) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES MANUFACTURERS. ANY BATT OR BLANKET MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX 50 OR LESS MAY BE USED.
4. FILL, VOID OR CAVITY MATERIAL* - SEALANT MIN 5/8 IN. OR 1-1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL FOR 1 OR 2 HR WALLS, RESPECTIVELY. IF VOIDS DEVELOPS AFTER THE FILL MATERIAL CURES, THE VOIDS SHALL BE SEALED WITH ADDITIONAL FILL MATERIAL.

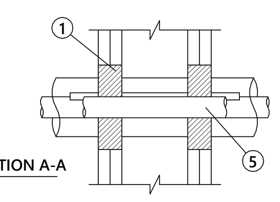
*BEARING THE UL CLASSIFICATION MARK

5 U.L SYSTEM NO W-L-7059 DETAIL
NO SCALE

HVAC LINE SET THROUGH GYPSUM WALL ASSEMBLY



SYSTEM NO. W-L-8047
F RATING -- 2 HR
T RATING -- 1/4 HR



1. WALL ASSEMBLY -- THE 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED MAX 16 IN. OC. STEEL STUDS TO BE MIN 3-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- THE GYPSUM BOARD TYPE, THICKNESS NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 4-1/2 IN.

2. THROUGH PENETRANTS -- ONE OR MORE PIPE OR TUBING TO BE INSTALLED CONCENTRICALLY OR ECCENTRICALLY WITHIN THE OPENING. THE SPACE BETWEEN ANY PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. (POINT CONTACT) TO MAX 1-1/4 IN. PIPES 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. COPPER TUBE -- NOM 1 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
   B. COPPER PIPE -- NOM 1 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. TUBE INSULATION - PLASTICS+ -- NOM 3/4 IN. THICK ACRYLONITRILE BUTADIENE/POLYVINYL CHLORIDE (AB/PVC) FLEXIBLE FOAM FURNISHED IN THE FORM OF TUBING. TUBE INSULATION TO BE INSTALLED ON ONE OR ORE OF THE METALLIC PIPES OR TUBES. SEE PLASTICS+ (QMFZ2) CATEGORY IN THE PLASTICS RECOGNIZED OMPONENT DIRECTORY FOR NAMES OF MANUFACTURERS. ANY RECOGNIZED COMPONENT TUBE INSULATION MTERIAL METING THE ABOVE SPECIFICATIONS AND HAVING A UL 94 FLAMMABILITY CLASSIFICATION OF 94-5VA AY BE USED.

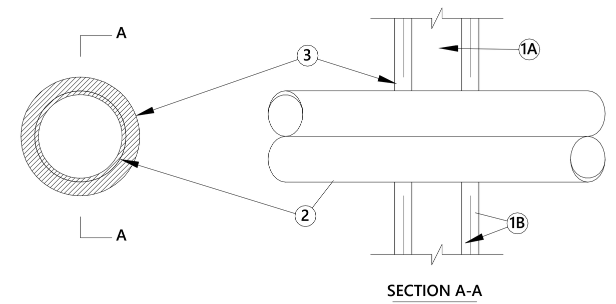
4. CABLES -- MAX OF ONE 4 PAIR NO. 18 AWG (OR SMALLER) CABLE WITH PVC INSULATION AND JACKET MATERIALS.

5. FILL, VOID OR CAVITY MATERIAL - SEALANT* -- MIN 1-1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS BETWEEN PENETRANTS AND GYPSUM BOARD, FLUSH WITH BOTH SURFACES OF WALL. AT POINT CONTACT, A 1/4 IN. BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PENETRANT/GYPSUM BOARD INTERFACE ON BOTH SIDES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

3 U.L SYSTEM NO W-L-8047 DETAIL
NO SCALE

SYSTEM NO. W-L-1054
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY
F RATINGS - 1 AND 2 HR (SEE ITEMS 1 AND 3)
T RATING - 0 HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQ FT



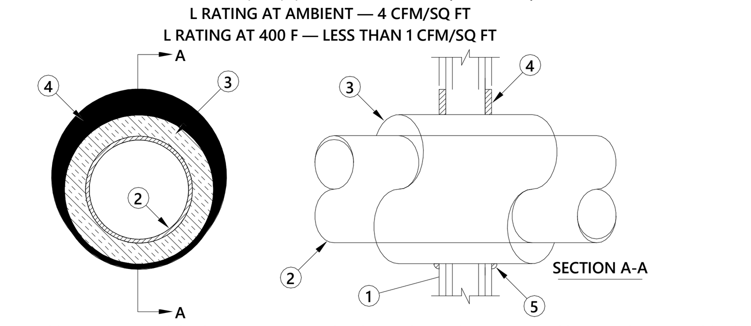
1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNSIN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. WHEN STEEL STUDS ARE USED AND THE DIAM OF OPENING EXCEEDS THE WIDTH OF STUD CAVITY, THE OPENING SHALL BE FRAMED ON ALL SIDES USING LENGTHS OF STEEL STUD INSTALLED BETWEEN THE VERTICAL STUDS AND SCREW-ATTACHED TO THE STEEL STUDS AT EACH END. THE FRAMED OPENING IN THE WALL SHALL BE 4 TO 6 IN. WIDER AND 4 TO 6 IN. HIGHER THAN THE DIAM OF THE PENETRATING ITEM SUCH THAT, WHEN THE PENETRATING ITEM IS INSTALLED IN THE OPENING, A 2 TO 3 IN. CLEARANCE IS PRESENT BETWEEN THE PENETRATING ITEM AND THE FRAMING ON ALL FOUR SIDES.
   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 32-1/4 IN. FOR STEEL STUD WALLS. MAX DIAM OF OPENING IS 14-1/2 IN. FOR WOOD STUD WALLS. THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.

2. THROUGH-PENETRANTS -- ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE SHALL BE MIN 0 IN. TO MAX 2-1/4 IN. PIPE MAY BE INSTALLED WITH CONTINUOUS POINT CONTACT. PIPE, CONDUIT OR TUBING MAY BE INSTALLED AT AN ANGLE NOT GREATER THAN 45 DEGREES FROM PERPENDICULAR. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
   A. STEEL PIPE -- NOM 30 IN DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE -- NOM 30 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   C. CONDUIT -- NOM 4 IN DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR 6 IN. DIAM STEEL CONDUIT.
   D. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   E. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
3. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. AT THE POINT OR CONTINUOUS CONTACT LOCATIONS BETWEEN PIPE AND WALL, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE WALL INTERFACE ON BOTH SURFACES OF WALL .

*BEARING THE UL CLASSIFICATION MARK

6 U.L SYSTEM NO W-L-1054 DETAIL
NO SCALE

SYSTEM NO. W-L-5029
INSULATED METAL PIPE THROUGH GYPSUM WALL ASSEMBLY
F RATINGS — 1 AND 2 HR (SEE ITEM 1)
T RATINGS — 1/2, 3/4, 1, 1-1/2 AND 1-3/4 HR (SEE ITEM 3)
L RATING AT AMBIENT — 4 CFM/SQ FT
L RATING AT 400 F — LESS THAN 1 CFM/SQ FT



1. WALL ASSEMBLY -- THE 1 OR 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE, WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 18-5/8 IN. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
2. THROUGH PENETRANTS -- 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. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
   B. IRON PIPE -- NOM 12 IN. DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
   C. COPPER TUBING -- NOM 6 IN. DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
   D. COPPER PIPE -- NOM 6 IN. DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. PIPE COVERING* -- NOM 1, 1-1/2 OR 2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT.
SEE PIPE AND EQUIPMENT COVERING - MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIAL DIRECTORY FOR THE NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INCEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.
THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT ON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, THE SIZE AND TYPE OF THROUGH PENETRANT AND THE PIPE COVERING THICKNESS,AS SHOWN IN THE TABLE BELOW:

Wall Assembly Rating Hr	Through Penetrant		Pipe Covering Thkns In.	Annular Space		T Rating Hr
	Type +	Max Diam In.		Min In.	Max In.	
1	A	4	1	0	1-1/2	1/2
1	B or C	2	1 or 1-1/2	0	1-1/2	1/2
1	A	4	1-1/2	0	1-1/2	1
1	A	12	2	0	1-7/8	3/4
1	B or C	6	2	0	1-7/8	1
2	A	4	1	0	1-1/2	1
2	B or C	4	1 or 1-1/2	0	1-1/2	1
2	B or C	6	2	0	1-7/8	1
2	A	4	1-1/2	0	1-1/2	1-3/4
2	A	12	2	0	1-7/8	1-1/2
2	B or C	6	2	0	1-7/8	1

+INDICATES PENETRANT TYPE AS ITEMIZED IN ITEM 2.

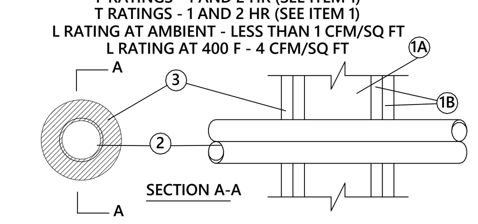
3A. PIPE COVERING* -- (NOT SHOWN) -- AS AN ALTERNATE TO ITEM 3, MAX 2 IN. THICK CYLINDRICAL CALCIUM SILICATE (MIN 14 PCF) UNITS SIZED TO THE OUTSIDE DIAM OF THE PIPE OR TUBE MAY BE USED. PIPE INSULATION SECURED WITH STAINLESS STEEL BANDS OR MIN 8 AWG STAINLESS STEEL WIRE SPACED MAX 12 IN. OC. WHEN THE ALTERNATE PIPE COVERING IS USED, THE T RATING SHALL BE DETERMINED FROM THE TABLE ABOVE.
SEE PIPE AND EQUIPMENT COVERING -- MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FILL, VOID OR CAVITY MATERIAL* -- SEALANT -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL . AT THE POINT CONTACT LOCATION BETWEEN PIPE COVERING AND GYPSUM BOARD, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED AT THE PIPE COVERING/GYPSUM BOARD INTERFACE ON BOTH SURFACES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

4 U.L SYSTEM NO W-L-5029 DETAIL
NO SCALE

SYSTEM NO. W-L-2098
PVC PIPE THROUGH GYPSUM WALL ASSEMBLY
F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATINGS - 1 AND 2 HR (SEE ITEM 1)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQ FT



1. WALL ASSEMBLY -- THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 4-3/8 IN. THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANTS -- ONE NONMETALLIC PIPE INSTALLED WITHIN THE FIRESTOP SYSTEM. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE SPACE BETWEEN PIPE AND PERIPHERY OF OPENING SHALL BE MIN 3/4 IN. TO MAX 1-1/4 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:
   A. POLYVINYL CHLORIDE (PVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEM.
   B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SDR17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.

3. FILL, VOID OR CAVITY MATERIALS* -- SEALANT -- INSTALLED TO COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE PIPES AND GYPSUM WALLBOARD ON BOTH SIDES OF WALL.

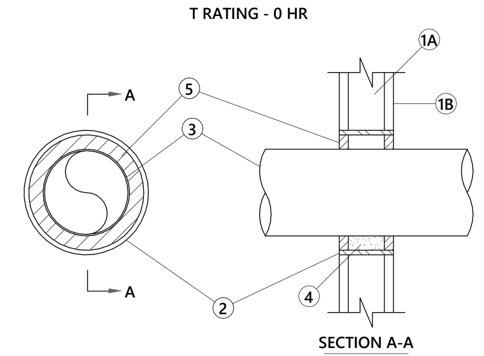
*BEARING THE UL CLASSIFICATION MARK

7 U.L SYSTEM NO W-L-2098 DETAIL
NO SCALE

1. ALL INSULATED METAL PIPING PENETRATING A ONE HOUR OR MORE RATED ASSEMBLY SHALL BE SEALED AROUND INSULATION ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP WRAP/STRIP MATERIAL. NUMBER OF WRAPS AROUND INSULATION WITHIN WALL OPENING SHALL BE AS REQUIRED FOR THICKNESS OF INSULATION AND MFG. RECOMMENDATIONS. COVER EXPOSED SURFACE AND SEAMS WITH AN APPROVED FIRE STOP CAULK ON BOTH SIDES OF WALL.
2. ALL NON-INSULATED METAL PIPING PENETRATING A ONE HOUR WALL OR MORE RATED WALL OR FLOOR SHALL BE SEALED AROUND PIPE ON BOTH SIDES OF WALL WITH AN APPROVED FIRE STOP CAULK. THICKNESS SHALL BE AS RECOMMENDED BY MANUFACTURER FOR WALL RATING REQUIRED TO MAINTAIN U.L. CLASSIFICATION.
3. ALL METAL DUCTWORK (LESS THAN 100 SQUARE INCHES) PENETRATING A ONE HOUR WALL OR SMOKE SHALL BE SEALED AROUND DUCT ON BOTH SIDES OF WALL WITH A SHEET METAL COLLAR (SAME GAUGE AS DUCT) SECURED TO WALL AND DUCT IN A SMOKE-TIGHT MANNER. DUCT PENETRATIONS EXCEEDING 100 SQUARE INCHES SHALL HAVE A FIRE DAMPER INSTALLED IN THE WALL AS DETAILED.
4. ALL DUCTWORK PENETRATING A TWO HOUR OR MORE RATED WALL OR FLOOR SHALL BE PROVIDED WITH A FIRE DAMPER INSTALLED AS DETAILED.
5. NO FLEXIBLE DUCTWORK WILL BE ALLOWED TO PENETRATE ONE HOUR WALLS, TWO HOUR WALLS, SMOKE WALLS, CORRIDOR WALLS OR WALLS CLOSED-OFF TO STRUCTURE. METAL RIGID DUCTWORK SHALL EXTEND A MINIMUM OF 5'-0" FROM WALL BEFORE THE FIRST AIR DISTRIBUTION DEVICE IS INSTALLED OR BEFORE FLEXIBLE DUCT IS STARTED. FLEXIBLE DUCTWORK IN A SINGLE DUCT RUN IS ALLOWED ON ONE SIDE OF A RATED WALL BUT NOT BOTH SIDES.
6. ACCEPTABLE MANUFACTURERS OF FIRE STOP MATERIALS ARE AS FOLLOWS: NELSON FLAMESEAL PUTTY CROUSE-HINDS CABLE BARRIER SYSTEM DOW CORNING FIRE STOP SEALANT/FOAM 3M FIRE BARRIER T&B FLAMESAFE THERMAFIBER BRAND SAFING ALL MATERIALS AND METHODS OF INSTALLATION SHALL BE U.L. APPROVED FOR THAT INSTALLATION. SHOP DRAWING SUBMITTALS OF MATERIALS AND METHOD OF INSTALLATION, INCLUDING DRAWINGS, SHALL BE SUBMITTED TO THE ARCHITECT FOR REVIEW.
7. WHEN A PIPE, WIRE, OR DUCT PENETRATES A NON-RATED SMOKETIGHT PARTITION, THE MECHANICAL CONTRACTOR SHALL SEAL AROUND ALL PIPES WIRES AND DUCTS WITH SEALANT MATERIAL TO MAKE IT SMOKETIGHT. SEE ARCHITECTURAL PLANS FOR LOCATION OF THESE PARTITIONS.
8. SEE ARCHITECTURAL PLANS FOR WALL TYPES.
9. ALL RATED WALL PENETRATIONS SHALL BE IN ACCORDANCE WITH UNDERWRTIERS LABORATORIES PENETRATION FIRESTOP SYSTEM REQUIREMENTS. ALL MATERIALS USED IN PENETRATION FIRESTOP SYSTEMS SHALL BE APPROVED BY UNDERWRITERS LABORATORIES AND SHALL BE U.L. LABELED.
10. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOORS OF NON- COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH NONCOMBUSTIBLE MATERIALS. PENETRATIONS OF NONRATED WALLS, PARTITIONS AND FLOOR OF COMBUSTIBLE CONSTRUCTION SHALL BE FIRESTOPPED WITH MATERIALS EQUIVALENT TO TWO INCHES OF WOOD. FIRESTOPPING SHALL COMPLY WITH ASTM E-814.

PIPE AND DUCTWORK WALL PENETRATION NOTES (MECHANICAL)
NO SCALE

UNINSULATED ROUND DUCT (WITHOUT DAMPER) THROUGH GYPSUM WALL ASSEMBLY
F RATING - 1 HR
T RATING - 0 HR



1. WALL ASSEMBLY -- THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- ONE LAYER OF NOM 5/8 IN. THICK GYPSUM WALLBOARD, AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 8-5/8 IN.
2. METALLIC SLEEVE -- NOM 8 IN. DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL SLEEVE CAST INTO WALL ASSEMBLY WITH JOINT COMPOUND AND INSTALLED FLUSH WITH WALL SURFACES.
3. AIR DUCT -- NOM 6 IN. DIAM (OR SMALLER) PREFABRICATED NO. 28 MSG GALV SHEET METAL DUCT. A MIN 1/2 TO MAX 1-1/2 IN. ANNULAR SPACE IS REQUIRED WITHIN THE FIRESTOP SYSTEM. DUCT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.
4. FORMING MATERIAL* -- FOAMED PLASTIC FORMING MATERIAL FOAMED INTO OPENING AS A PERMANENT FORM. FORMING MATERIAL TO BE RECESSED FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
5. FILL, VOID OR CAVITY MATERIAL* -- MIN 5/8 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

8 U.L SYSTEM NO W-L-7017 DETAIL
NO SCALE

GENERAL NOTES

PERMIT SET
STATE OF MISSOURI
BYRON FORD
NUMBER
PE-2014023016
PROFESSIONAL ENGINEER
01/18/2021

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PROJECT TITLE
John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: Author
CHECKED BY	: Checker
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
MECHANICAL UL DETAILS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING M6.3
SHEET 14 OF 14

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2018 ENERGY CONSERVATION CODE

COMMERCIAL ENERGY EFFICIENCY - ELECTRICAL SUMMARY

C401 METHOD OF COMPLIANCE

- [x] 2018 NCECC CHAPTER 4
- [ ] NC SPECIFIC COMCHECK PROVIDED
- [ ] N/A BASED ON PROJECT SCOPE
- [ ] ASHRAE 90.1-2013

C406 ADDITIONAL EFFICIENCY PACKAGE OPTIONS

- [ ] C406.1.1 EFFICIENT MECH EQUIPMENT
- [ ] C406.1.4 ON-SITE RENEWABLE ENERGY
- [x] C406.1.2 REDUCED LTG DENSITY
- [ ] C406.1.5 DEDICATED OA SYSTEM
- [ ] C406.1.3 ENHANCED DIGITAL LTG CNTLS
- [ ] C406.1.6 HI-EFF SERVICE WTR HTG
- [ ] NOT APPLICABLE BASED ON PROJECT SCOPE

C405.2 - LIGHTING CONTROLS (MANDATORY REQUIREMENTS):

- [x] LIGHTING SYSTEMS ARE PROVIDED WITH CONTROLS AS REQUIRED PER SECTION C405.2, EXCEPT WHERE EXEMPT.
- [ ] NOT APPLICABLE

C405.3 - EXIT SIGNS (MANDATORY REQUIREMENTS):

- [x] INTERNALLY ILLUMINATED EXIT SIGNS DO NOT EXCEED 5 WATTS PER SIDE.
- [ ] NOT APPLICABLE

C405.4 - INTERIOR LIGHTING POWER REQUIREMENTS (PRESCRIPTIVE) (NON-EXEMPT):

- [ ] NOT APPLICABLE PER 2018 NCECC C503.1, EXCEPTION 2.G.

C405.4.1 - TOTAL CONNECTED INTERIOR LIGHTING POWER:

17,126W WATTS SPECIFIED

71,604W 10% REDUCTION OF SPECIFIED VS. ALLOWED (APPLICABLE IF C406.1.2 IS SELECTED)

C405.4.2 - TOTAL ALLOWABLE INTERIOR LIGHTING POWER:

METHOD OF COMPLIANCE:

- [x] BUILDING AREA METHOD
- [ ] SPACE-BY-SPACE METHOD

79,560W WATTS ALLOWED

C405.5.1 - EXTERIOR BUILDING LIGHTING POWER (NON-EXEMPT):

- [ ] NOT APPLICABLE

TOTAL CONNECTED EXTERIOR LIGHTING POWER:

298W WATTS SPECIFIED

TOTAL ALLOWABLE EXTERIOR LIGHTING POWER:

2,238W WATTS ALLOWED

C405.6 - ELECTRICAL ENERGY CONSUMPTION (DWELLING UNITS):

- [ ] SEPARATE ELECTRICAL METERING HAS BEEN PROVIDED FOR EACH DWELLING UNIT IN GROUP R-2 BUILDINGS.
- [x] NOT APPLICABLE

C405.7 - ELECTRICAL TRANSFORMERS (MANDATORY REQUIREMENTS):

- [x] ELECTRICAL TRANSFORMERS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.7, EXCEPT WHERE EXEMPT.

C405.8 - ELECTRICAL MOTORS (MANDATORY REQUIREMENTS):

- [x] ELECTRICAL MOTORS HAVE BEEN SPECIFIED TO MEET MINIMUM EFFICIENCY REQUIREMENTS PER C405.8, EXCEPT WHERE EXEMPT.
- [ ] NOT APPLICABLE

C408 - SYSTEM COMMISSIONING:

SYMBOL SCHEDULE POWER LEGEND

SYMBOL	DESCRIPTION
	JUNCTION BOX WITH CONNECTION TO EQUIPMENT SERVED. 4" SQUARE BOX WITH A SINGLE-GANG OPENING AND PLASTER RING.
	208/120V SINGLE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL MAX. 6'-6" AFF. TOP OF PANEL MAX 4'-0" AFF IN TYPE A AND TYPE B UNITS. MINIMUM 1'-3" TO BOTTOM OF PANEL
	208/120V THREE PHASE PANELBOARD. SEE SCHEDULE FOR MOUNTING. TOP OF PANEL MAX. 6'-6" AFF. TOP OF PANEL MAX 4'-0" AFF IN TYPE A AND TYPE B UNITS. MINIMUM 1'-3" TO BOTTOM OF PANEL
	SPECIAL OUTLET. SEE PLANS.
	FUSED HEAVY DUTY DISCONNECT SWITCH. NUMERALS INDICATE SWITCH RATING. NEMA 1 ENCLOSURE, UNLESS OTHERWISE NOTED. UNSHADED INDICATES NON-FUSED.
0.3 hp XX-1	CONNECTION TO MOTOR. STARTER PROVIDED BY OTHERS UNLESS OTHERWISE NOTED. NUMBER INDICATES HORSEPOWER.
0.0 hp $M	FRACTIONAL HORSEPOWER MANUAL MOTOR STARTER, WITH OVERLOAD PROTECTION
M	RECTANGULAR DUCT MOUNTED MOTOR OPERATED DAMPER, INTERLOCK WITH FAN AS INDICATED. (DAMPER BY M.C.)

ELECTRICAL FIXTURES LEGEND - RESIDENTIAL

SYMBOL	DESCRIPTION
GFI WP	WEATHERPROOF GROUND FAULT SIMPLEX RECEPTACLE. NEMA 5-20R SIMPLEX. COVER SHALL BE INTERMATIC #WP1020 (CLEAR) OR EQUAL, PS WIUCIO-C (CLEAR).
WP	WEATHERPROOF SIMPLEX RECEPTACLE. NEMA 5-20R SIMPLEX. COVER SHALL BE INTERMATIC #WP1020 (CLEAR) OR EQUAL, PS WIUCIO-C (CLEAR).
	DUPLEX RECEPTACLE, 15 AMP, 120 VOLT (USE 20 AMP FOR SINGLE RECEPTACLE ON A CIRCUIT.) TAMPER PROOF.
GFI	GROUND FAULT RECEPTACLE. NEMA 5-15R DUPLEX. ALL RECEPTACLES INSTALLED OUTSIDE, WITHIN 3' OF A SINK OR IN A KITCHEN SHALL BE GFCI. (USE 20AMP FOR SINGLE RECEPTACLE ON A CIRCUIT). TAMPERPROOF.
USB	RECEPTACLE WITH USB OUTLET. OTHERWISE SAME AS ABOVE.
	DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER BACKSPLASH, OR AT HEIGHT NOTED.
GFI	GROUND FAULT DUPLEX RECEPTACLE, NEMA 5-15R DUPLEX RECEPTACLE MOUNTED ABOVE COUNTER BACKSPLASH, OR AT HEIGHT NOTED. (USE 20AMP FOR SINGLE RECEPTACLE ON A CIRCUIT). TAMPERPROOF.
GFI WP	WEATHERPROOF RECEPTACLE. NEMA 5-15R DUPLEX. COVER SHALL BE INTERMATIC #WP1020 (CLEAR) OR EQUAL, PS WIUCIO-C (CLEAR). (USE 20AMP FOR SINGLE RECEPTACLE ON A CIRCUIT).
	QUAD RECEPTACLE. TWO NEMA 5-20R DUPLEX RECEPTACLES. TAMPER RESISTANT.

ABBREVATIONS

+42"	DIMENSION INDICATES HEIGHT ABOVE FINISHED FLOOR AT WHICH CENTER OF DEVICE IS TO MOUNTED. SEE PLANS.
3R	NEMA 3R
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDING UNIT
C	CONDUIT WITH PULL CORD
C.B.	CIRCUIT BREAKER
EC	EMPTY CONDUIT WITH PULL CORD
E.C.	ELECTRICAL CONTRACTOR
EWC	ELECTRICAL WATER COOLER
EWH	ELECTRICAL WATER HEATER
FACP	FIRE ALARM CONTROL PANEL
FPN	FUSE PER NAMEPLATE
LC	LIGHTING CONTACTOR
M.C.	MECHANICAL CONTRACTOR
P.C.	PLUMBING CONTRACTOR
U.G.	UNDERGROUND
WP	WEATHERPROOF
S.E.	SERVICE ENTRANCE
EM	EMERGENCY FIXTURE WITH BATTERY OR GEN. BACK-UP
ER	EXISTING ITEM RELOCATED TO THIS LOCATION.
RL	EXISTING ITEM TO BE RELOCATED.
RM	EXISTING ITEM TO BE REMAIN.
RP	EXISTING ITEM TO BE REPLACED.
RV	EXISTING ITEM TO BE REMOVED.
Isc	RMS SYMMECTRICAL SHORT CIRCUIT CURRENT
AIC	AMPERE INTERRUPTING CAPACITY (EQUIPMENT RATING)
HH	HAND HOLE

SYMBOL SCHEDULE POWER

SYMBOL	DESCRIPTION
	WIRING SYSTEM CONCEALED IN WALL OR CEILING. WHEN SHOWN, CROSS LINES INDICATE NUMBER OF WIRES. (GROUND WIRES ARE NOT SHOWN)
	WIRING SYSTEM CONCEALED IN OR UNDER SLAB OR UNDERGROUND.
	WIRING SYSTEM EXPOSED.
	CONDUIT TURNED UP TO FLOOR ABOVE.
	CONDUIT TURNED DOWN TO FLOOR BELOW.
	BRANCH CIRCUIT HOMERUN TO PANEL.

FIRE ALARM LEGEND

SYMBOL	DESCRIPTION
FACP	FIRE ALARM CONTROL PANEL
RA	FIRE ALARM REMOTE ANNUNCIATOR. PROVIDE BOX AS REQUIRED PER MANUFACTURER RECOMMENDATION. PROVIDE 1"C CONDUIT FOR CABLING.
F	FIRE ALARM MANUAL STATION.
SD	CEILING MOUNTED SMOKE DETECTOR.
MD	CEILING MOUNTED MULTI-CRITERIA SMOKE DETECTOR.
HD	CEILING MOUNTED HEAT DETECTOR.
F/SD	ROUND DUCT COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)
F/SD	RECTANGULAR DUCT COMBINATION FIRE/SMOKE DAMPER W/ ACCESS DOOR (SEE DETAIL)
TS	SPRINKLER SYSTEM TAMPER SWITCH. PROVIDE MONITOR MODULE.
DH	MAGNETIC DOOR HOLDER, PROVIDED BY ELECTRICAL CONTR, INSTALLED BY ELEC. CONTR. PROVIDE A SMOKE DETECTOR WITHIN 5 FT. OF BOTH SIDES OF DOORS TO LOCALLY ACTIVATE DOOR UPON SMOKE SIGNAL.
F 15cd	ADA COMPLIANT WALL MOUNTED FIRE ALARM HORN WITH STROBE LIGHT, 15CD UNLESS OTHERWISE NOTED. WHITE FINISH.**
F 15cd	ADA COMPLIANT CEILING MOUNTED FIRE ALARM HORN WITH STROBE LIGHT. 15CD UNLESS OTHERWISE NOTED. WHITE FINISH.**
S 15cd	ADA COMPLIANT CEILING MOUNTED FIRE ALARM STROBE LIGHT. 15CD UNLESS OTHERWISE NOTED. WHITE FINISH.
R	FIRE ALARM RELAY.
	FIRE BELL NOTIFICATION.

**Note: AUDIBLE DEVICES WITHIN SLEEPING ROOMS SHALL BE SUBJECT TO LOW FREQUENCY REQUIREMENTS. A SQUARE WAVE 520HZ TONE COMPATIBLE WITH NFPA 72 18.4.5.3. COORDINATE WITH LOCAL CODES AND REQUIREMENTS.

EM.LIGHTING FIXTURE SYMBOLS AND DEVICES

SYMBOL	DESCRIPTION
	LED FIXTURE WITH EMERGENCY BATTERY BALLAST OR DRIVER . PROVIDE 1100 LUMEN INVERTER RATED FOR 90 MINUTE OPERATION. SEE FIXTURE SCHEDULE FOR FIXTURE TYPE, EMERGENCY DEVICE SHALL SUPPLEMENT FIXTURE.

LIGHTING FIXTURES SYMBOLS AND DEVICES...

SYMBOL	DESCRIPTION
	LED STRIP LIGHT FIXTURE
	RECESSED LED LIGHTING FIXTURE.
	EXIT LIGHT WITH ARROWS AND NUMBERS OF FACES AS INDICATED ON PLANS. 90 MIN BATTERY BACKUP. SEE LIGHTING FIXTURE SCHEDULE.
	EMERGENCY BATTERY PACK FIXTURE. 90 MINUTE EMERGENCY INTEGRAL BATTERY. SEE LIGHTING FIXTURE SCHEDULE
$	SINGLE POLE SWITCH, 20 AMP, 120/277 VOLT, COOPER AH 1221, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
$2	DOUBLE POLE SWITCH, 20 AMP, 120/277 VOLT, COOPER 1222, OR EQUAL.
$3	THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, THREE WAY SWITCH, 20 AMP, 120/277 VOLT, COOPER 1223, OR EQUAL BY HUBBELL, LEVITON AND PASS & SEYMOUR.
$D	DIMMER SWITCH. LUTRON SERIES, OR EQUAL. VERIFY LOAD ON CIRCUIT AND MATCH DIMMER SIZE TO LOAD AND DEVICE QUANTITY. PROVIDE DOUBLE GANG J-BOX WITH SINGLE GANG TRIM PLATE. PROVIDE DIMMING SWITCH AS RECOMMENDED BY LIGHTING MANUFACTURER. MATCH SWITCH TYPE TO SOURCE (LED, FLUORESCENT, OR INCANDESCENT,) WATTAGE, AND QUANTITY.
$DLV	LOW VOLTAGE 0-10V DIMMING LIGHTING SWITCH WITH ON/OFF CONTROL.
	FAN AND LIGHT SWITCH IN A COMMON BOX AND PLATE.
OS DT	CEILING MOUNTED OCCUPANCY SENSOR, DUAL TECHNOLOGY. SENSOR SWITCH CM PDT 10, WATT STOPPER #DT-300, COOPER OAC-DT OR EQUAL.
$OC	WALL MOUNTED OCCUPANCY SENSOR AND SWITCH. DUAL TECHNOLOGY WITH NEUTRAL, 120/277V RATED. WATT STOPPER #WS-250, OR EQUAL BY SENSOR SWITCH, AND LEVITON.
PP	CEILING MOUNTED OCCUPANCY SENSOR POWER PACK. SENSOR SWITCH PP-20, WATT STOPPER #BZ-100, COOPER SP-20, OR EQUAL.

TELECOM LEGEND-ELECTRICAL

SYMBOL	DESCRIPTION
(1)	DATA OUTLET ABOVE COUNTER. SEE TECHNOLOGY DRAWING FOR CONDUIT SIZE AND MOUNTING HEIGHT/LOCATION.
(1)	DATA OUTLET. SEE TECHNOLOGY DRAWING FOR CONDUIT SIZE AND MOUNTING HEIGHT/LOCATION.
TV	SEE TV DETAIL FOR TYPE AND REQUIREMENTS. COORDINATE WITH TECHNOLOGY DRAWINGS.

ELECTRICAL SHEET INDEX

SHEET NUMBER	SHEET NAME
E0.1	ELECTRICAL LEGEND AND NOTES
E0.10	ELECTRICAL SITE PLAN
E1.0	OVERALL GARAGE LIGHTING PLAN
E1.1	OVERALL SECOND FLOOR LIGHTING PLAN
E1.2	OVERALL THIRD FLOOR LIGHTING PLAN
E1.3	OVERALL FOURTH FLOOR LIGHTING PLAN
E1.4	OVERALL FIFTH FLOOR LIGHTING PLAN
E1.5	OVERALL ATTIC FLOOR LIGHTING PLAN
E2.0	GARAGE OVERALL POWER PLAN
E2.1	OVERALL SECOND FLOOR POWER PLAN
E2.2	OVERALL THIRD FLOOR POWER PLAN
E2.3	OVERALL FOURTH FLOOR POWER PLAN
E2.4	OVERALL FIFTH FLOOR POWER PLAN
E2.5	OVERALL ROOF POWER PLAN
E5.1	ENLARGED ELECTRICAL UNIT PLANS
E5.2	ENLARGED ELECTRICAL UNIT PLANS
E6.1	ELECTRICAL DETAILS
E6.2	ELECTRICAL DETAILS
E6.3	ELECTRICAL DETAILS
E7.1	ELECTRICAL RISER DIAGRAM
E8.1	ELECTRICAL UNIT LOAD CALCULATIONS
E8.2	ELECTRICAL SCHEDULES
E8.3	PANEL SCHEDULES
E8.4	PANEL SCHEDULES
E8.5	PANEL SCHEDULES
ET0.1	TECHNOLOGY LEGEND AND NOTES
ET2.0	GARAGE OVERALL TECHNOLOGY PLAN
ET2.1	OVERALL SECOND FLOOR TECHNOLOGY PLAN
ET2.2	OVERALL THIRD FLOOR TECHNOLOGY PLAN
ET2.3	OVERALL FOURTH FLOOR TECHNOLOGY PLAN
ET2.4	OVERALL FIFTH FLOOR TECHNOLOGY PLAN
ET5.1	ENLARGED TECHNOLOGY UNIT PLANS
ET5.2	ENLARGED TECHNOLOGY UNIT PLANS
ET6.1	TECHNOLOGY DETAILS
ET7.1	TECHNOLOGY RISER DIAGRAM

BIM COORDINATION REQUIREMENTS

MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION AND GENERAL CONTRACTORS SHALL BE RESPONSIBLE FOR CREATING THREE-DIMENSIONAL COORDINATION MODEL OF CONSTRUCTION DRAWINGS. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE TO DETERMINE DESIRED SOFTWARE, NUMBER AND FREQUENCY OF COORDINATION MEETINGS, AND LOCATION OF SUCH MEETINGS. THE GENERAL CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR HOSTING THE MEETINGS, PERFORMING CLASH DETECTION OF MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION, STRUCTURAL, CEILINGS, AND OTHER SYSTEMS, MODEL DELIVERY, AND PRECEDENCE. THE RECOMMENDED ORDER OF PRECEDENCE SHALL BE SLOPED SANITARY AND STORM PIPING, DUCT ROUTING WITHIN TRUSSES AND THROUGH METAL BEAMS, MAIN ELECTRICAL CONDUIT/EQUIPMENT/CLEARANCES/ MECHANICAL EQUIPMENT, LIGHTING, LOW PRESSURE DUCTWORK, FIRE PROTECTION, PLUMBING, OTHER CEILING ELEMENTS. EQUIPMENT MAINTENANCE CLEARANCES AND CEILING ACCESS DOORS SHALL BE INCLUDED AND OBSERVED ON DRAWINGS. ANY RELOCATION OF SYSTEM ROUTINGS WILL BE FOUND IN THE COORDINATION PHASE AND NOTICED BY EACH OF THE CONTRACTORS. THESE DRAWINGS, WHEN COMPLETED, SHALL BE SIGNED OFF BY ALL OF THE ABOVE LISTED PARTIES. DRAWINGS SHALL BE COMPLETED PRIOR TO FABRICATION AND INSTALLATION OF DUCTWORK AND PIPING SYSTEMS, OR PURCHASE OF EQUIPMENT AND STEEL BEAMS. MANY DUCT AND PIPE PENETRATIONS WILL OCCUR THROUGH STEEL BEAMS. PENETRATIONS SHALL BE DETERMINED DURING THIS COORDINATION PROCESS TO INCORPORATE EXACT HOLE SIZE AND LOCATIONS WITHIN STEEL BEAMS PRIOR TO STRUCTURAL SUBMITTALS TO AVOID FIELD CUTTING.

1. ALL SHOP AND COORDINATION DRAWING HARD COPIES WILL BE 1/4" = 1'-0" SCALE.
2. DRAWINGS WILL BE ORIGINAL DRAWINGS AND NOT OVERLAYS OF THE CONTRACT DRAWINGS.
3. ONCE THE COMPLETE COORDINATION DRAWINGS HAVE BEEN COMPLIED, THE GENERAL CONTRACTOR SHALL PROVIDED ON SIGNED SET TO EACH OF THE FOLLOWING CONTRACTORS: MECHANICAL, ELECTRICAL, PLUMBING, AND FIRE PRTOECTION, OWNER ARCHITECT AND ENGINEER.

GENERAL NOTES

A. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE, NFPA, STATE BUILDING CODE AND ANY OTHER LOCAL REQUIREMENTS THAT MAY APPLY.
B. PROVIDE EMERGENCY RESPONDER RADIO COVERAGE. SEE EMERGENCY RESPONDER SYSTEM BOOSTING RISER DETAIL
C. REFER TO DRAWING ET0.1 FOR ADDITIONAL LOW VOLTAGE INFORMATION REGARDING LOW VOLTAGE DEVICES.

PERMIT SET

STATE OF MISSOURI
KEITH PEH
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ELECTRICAL LEGEND AND NOTES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING E0.1

SHEET 1 OF 24

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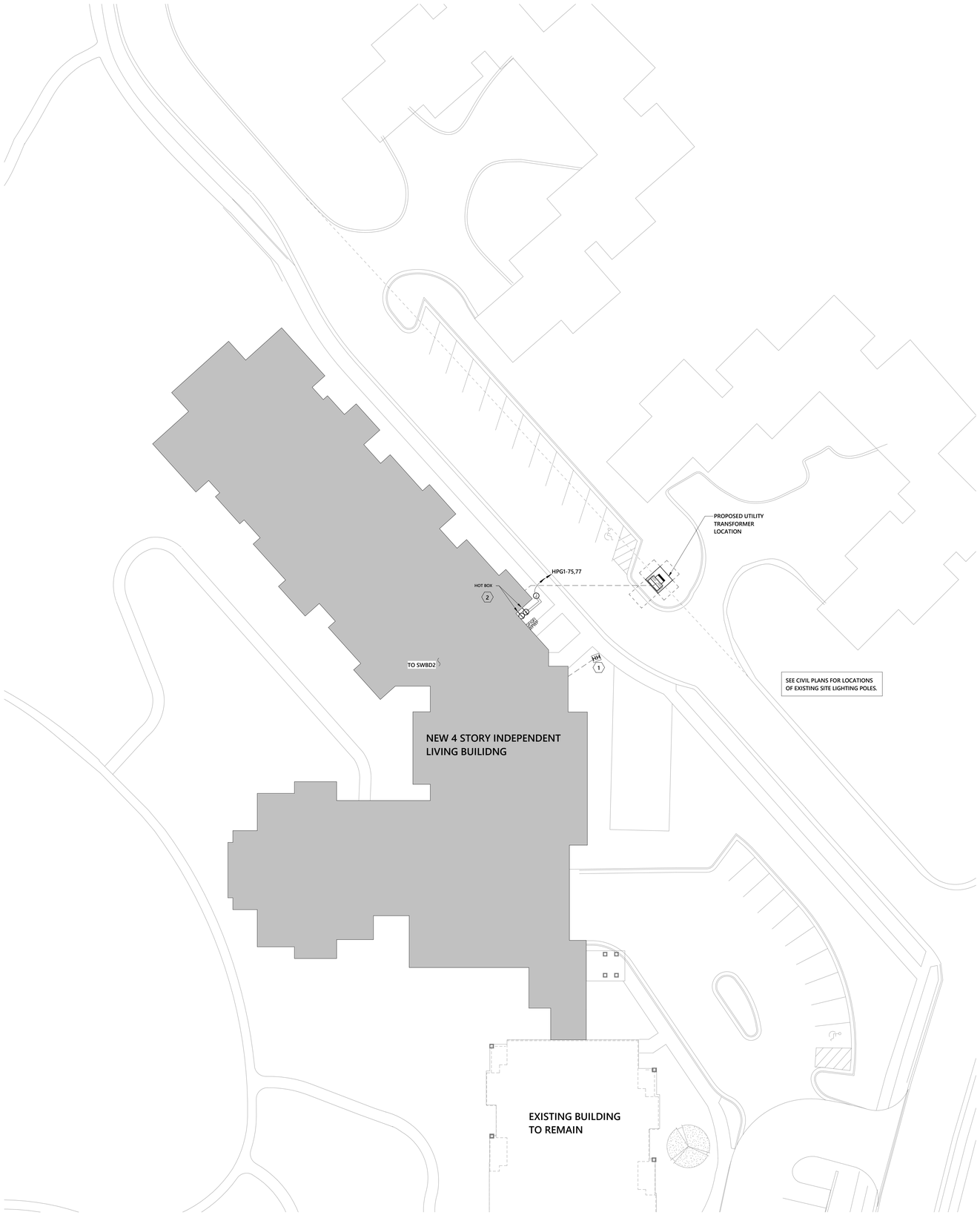
GENERAL NOTES:

A. COORDINATE TRANSFORMER LOCATIONS WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.
B. UTILITY TRANSFORMER SHALL BE LOCATED AT LEAST 10 FT AND 20 FT AWAY FROM DOORS, WINDOWS OR AIR INTAKES.
C. UTILITY TRANSFORMER SHALL HAVE A MINIMUM CLEAR WORKING SPACE OF 10FT AT THE DOOR SIDE AND 3FT CLEARANCE AT NON-DOORSIDE OF THE TRANSFORMER.

KEYED NOTES:

1. PROVIDE (2)-4" CONDUITS FROM TELECOM ROOM 2012 TO 24"x24" HANDHOLE FOR SPARE DATA/TELECOM SERVICE.
2. PROVIDE 1" CONDUIT WITH CABLE TO FIRE ALARM PANEL TO MONITOR TAMPER SWITCHES AND LOW TEMPERATURE SENSOR IN FIRE SPRINKLER BACKFLOW PREVENTER HOT BOX.



1 **SITE-ELECTRICAL PLAN**
1" = 20'-0"

PERMIT SET

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-928-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	ZK
DRAWN BY	:	DG
CHECKED BY	:	ZK
APPROVED BY	:	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ELECTRICAL SITE PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING **E0.10**

SHEET 2 OF 24

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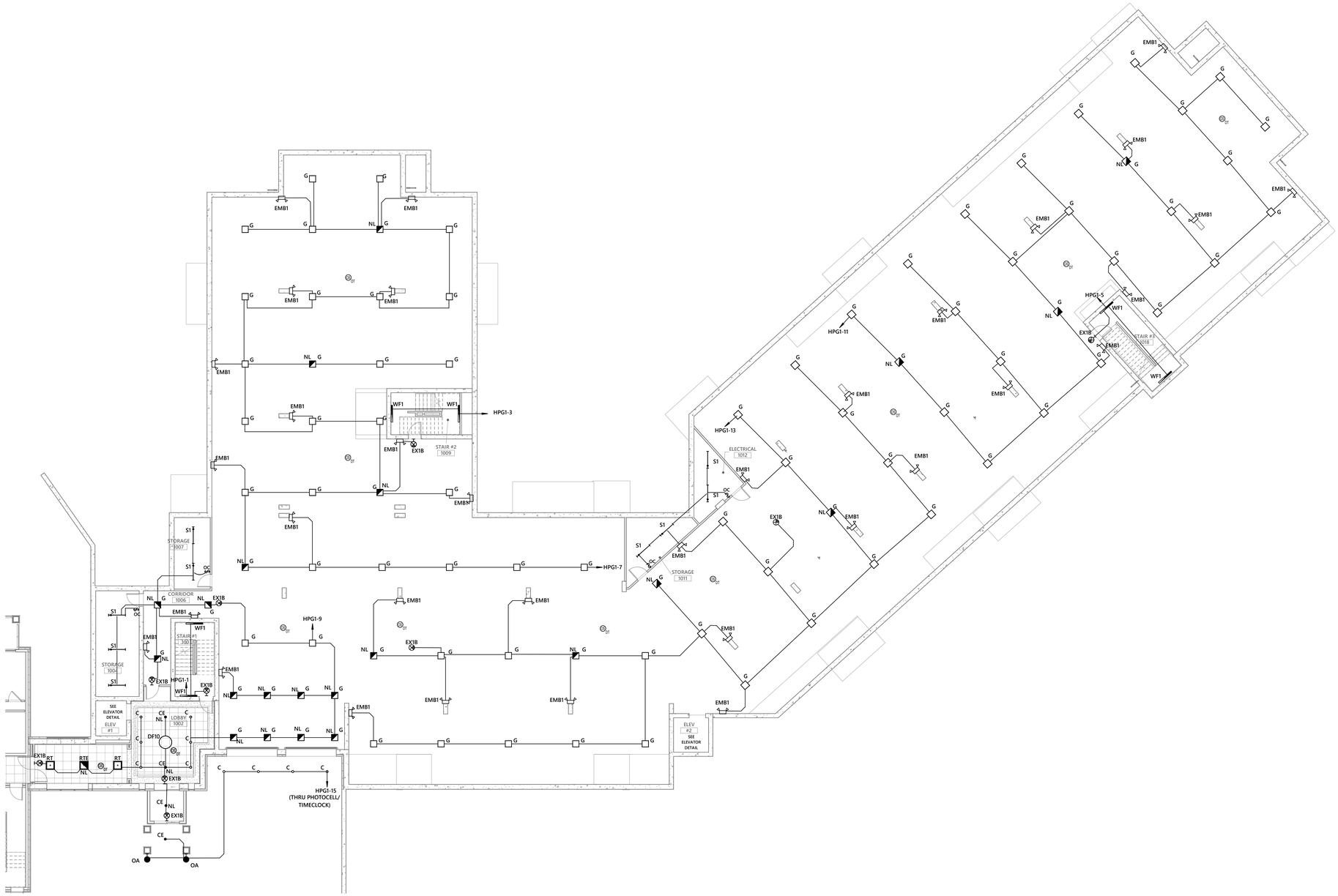
GENERAL NOTES:

A. CONNECT ALL EXIT SIGN AND EMERGENCY EGRESS LUMINARIES AHEAD OF LOCAL AREA SWITCHING.

B. ALL EXTERIOR LIGHT FIXTURES SHALL BE CONTROLLED BY PHOTOCELL ON/TIME CLOCK OFF.



1 OVERALL GARAGE LIGHTING PLAN

3/32" = 1'-0"

N

PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH PETERS
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering

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Phone: 919-926-2200 • www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL GARAGE LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
E1.0	3 OF 24

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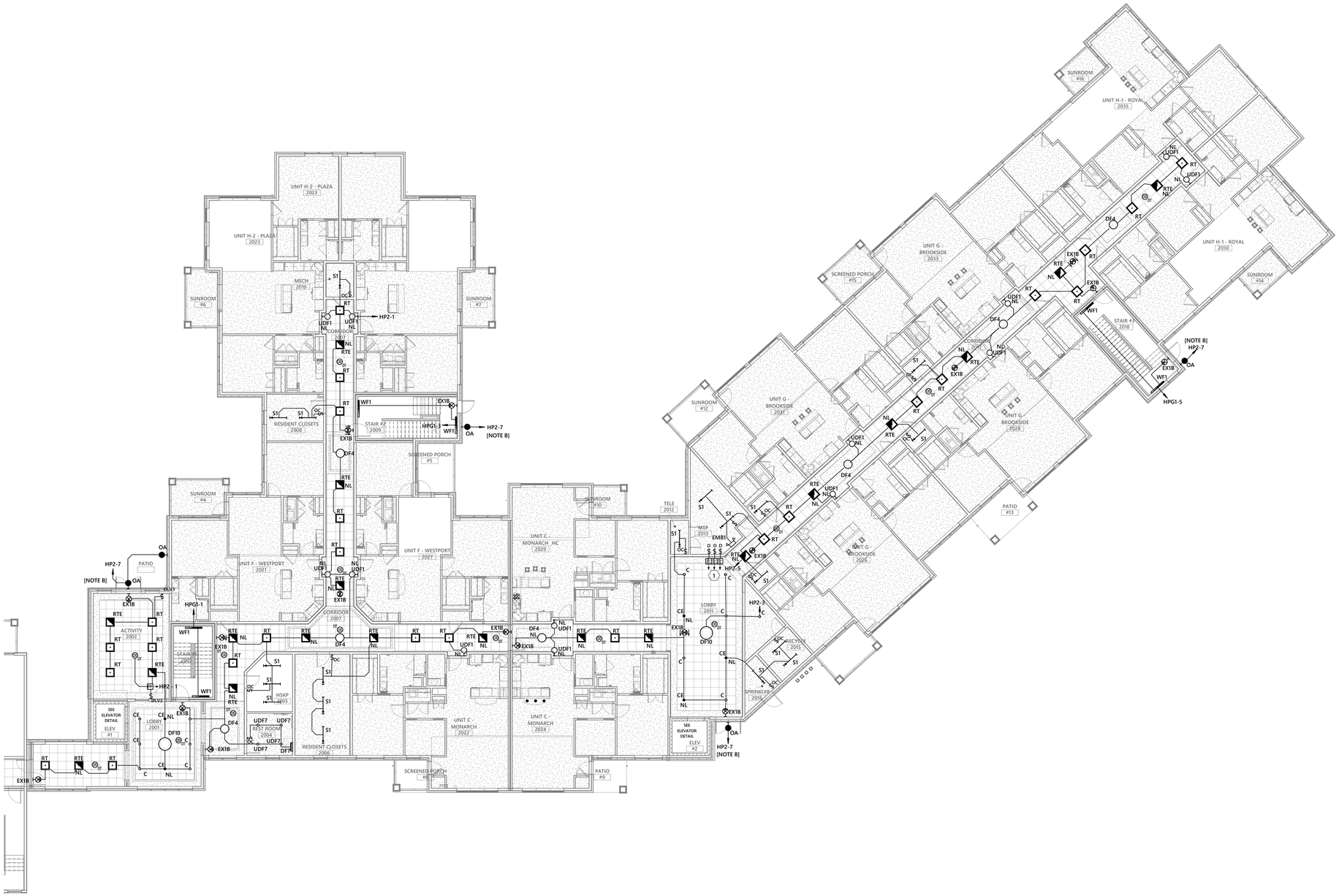
(#) KEYED NOTES:

1. PROVIDE DEDICATED DIMMER SWITCH TO CONTROL CORRIDOR LIGHTS VIA OCCUPANCY SENSORS. CONNECT POWER PACK TO CORRIDOR OCCUPANCY SENSORS THAT ARE IN THE SAME CIRCUIT. ALL EMERGENCY LIGHT FIXTURES AND NIGHT LIGHTS (NL) SHALL BE "ON" ALL THE TIME.



1 **OVERALL SECOND FLOOR LIGHTING PLAN**

3/32" = 1'-0"

N

PLAN NORTH

PERMIT SET

STATE OF MISSISSIPPI
ZACHARY KEITH PARKER
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering

1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL SECOND FLOOR LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING

E1.1

SHEET 4 OF 24

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KEYED NOTES:

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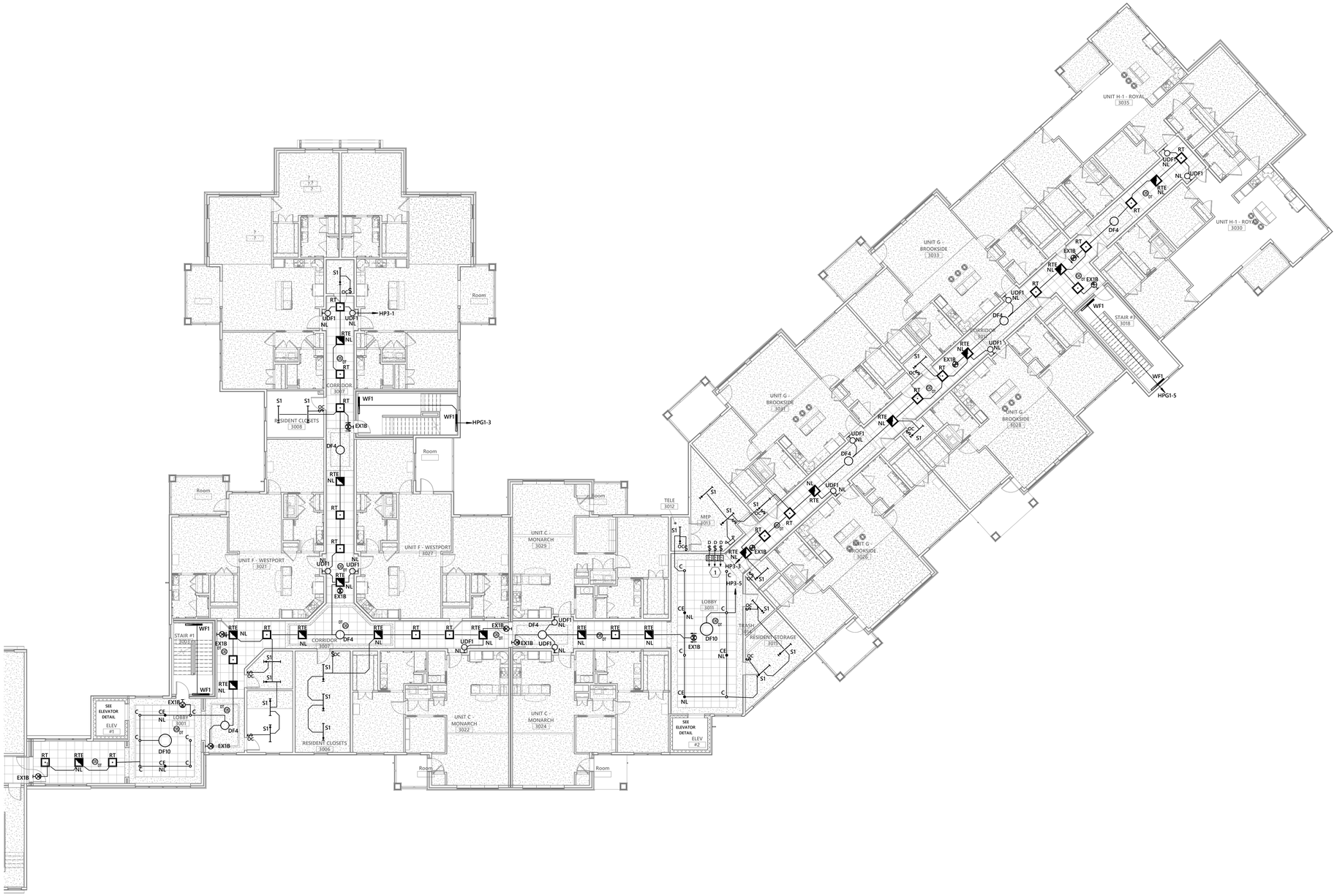

3 OVERALL THIRD FLOOR LIGHTING PLAN

3/32" = 1'-0"

N

PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH A. PEDEN
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering

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Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL THIRD FLOOR LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
E1.2	5 OF 24

1/18/2021 4:48:58 PM BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt

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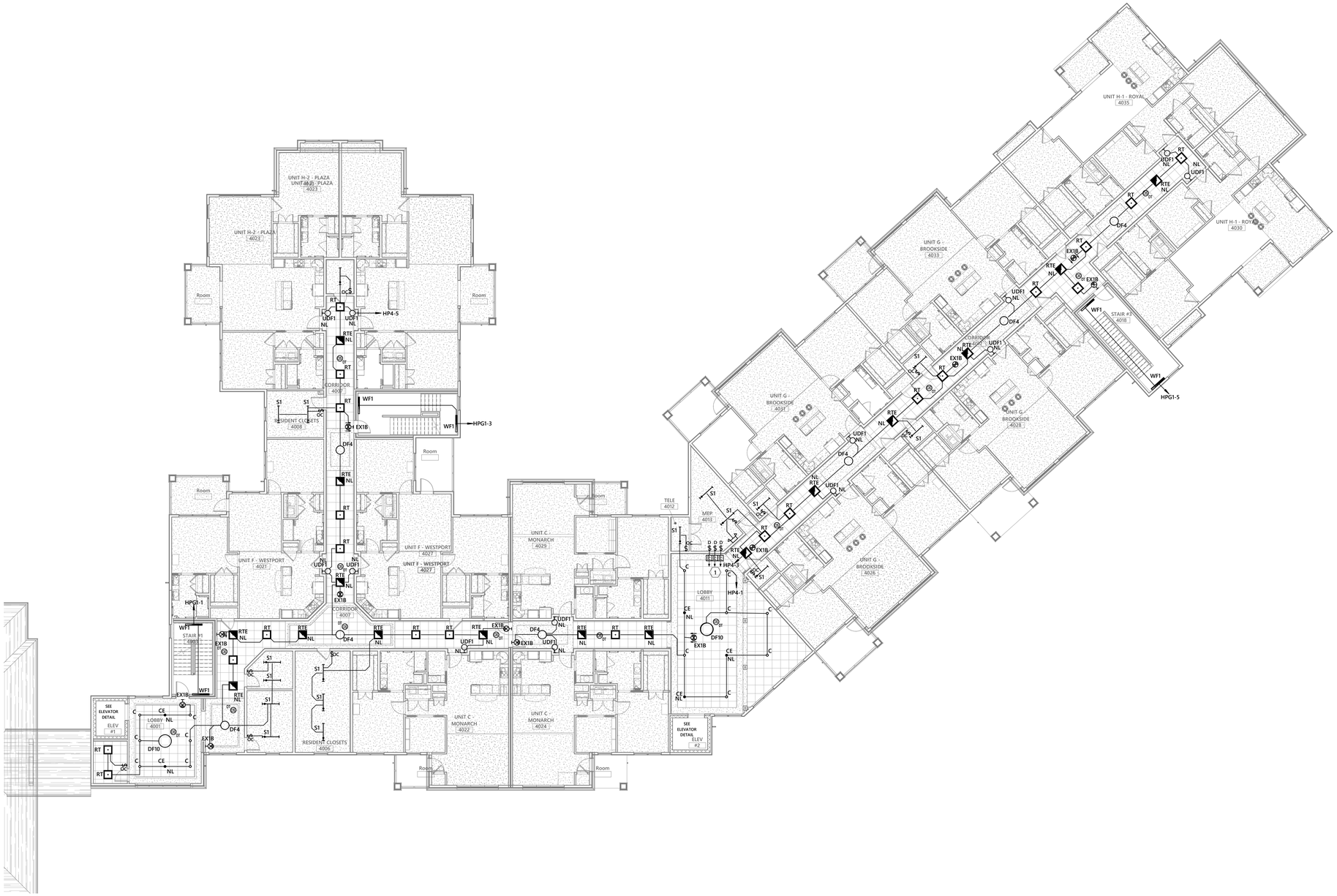

1 OVERALL FOURTH FLOOR LIGHTING PLAN
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH A. PEDERSON
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL FOURTH FLOOR LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
E1.3	6 OF 24

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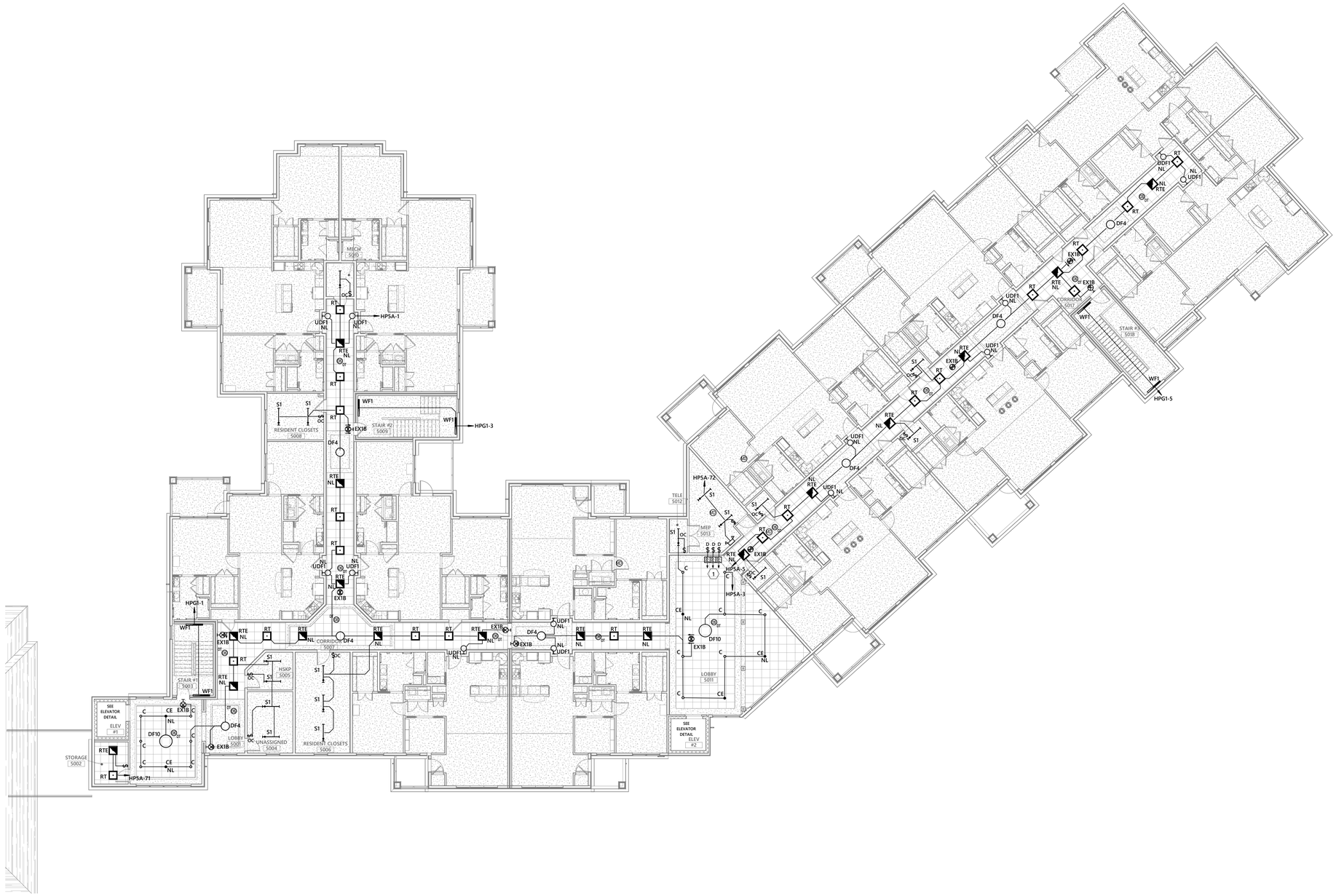

1 OVERALL FIFTH FLOOR LIGHTING PLAN
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL FIFTH FLOOR LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E1.4	7 OF 24

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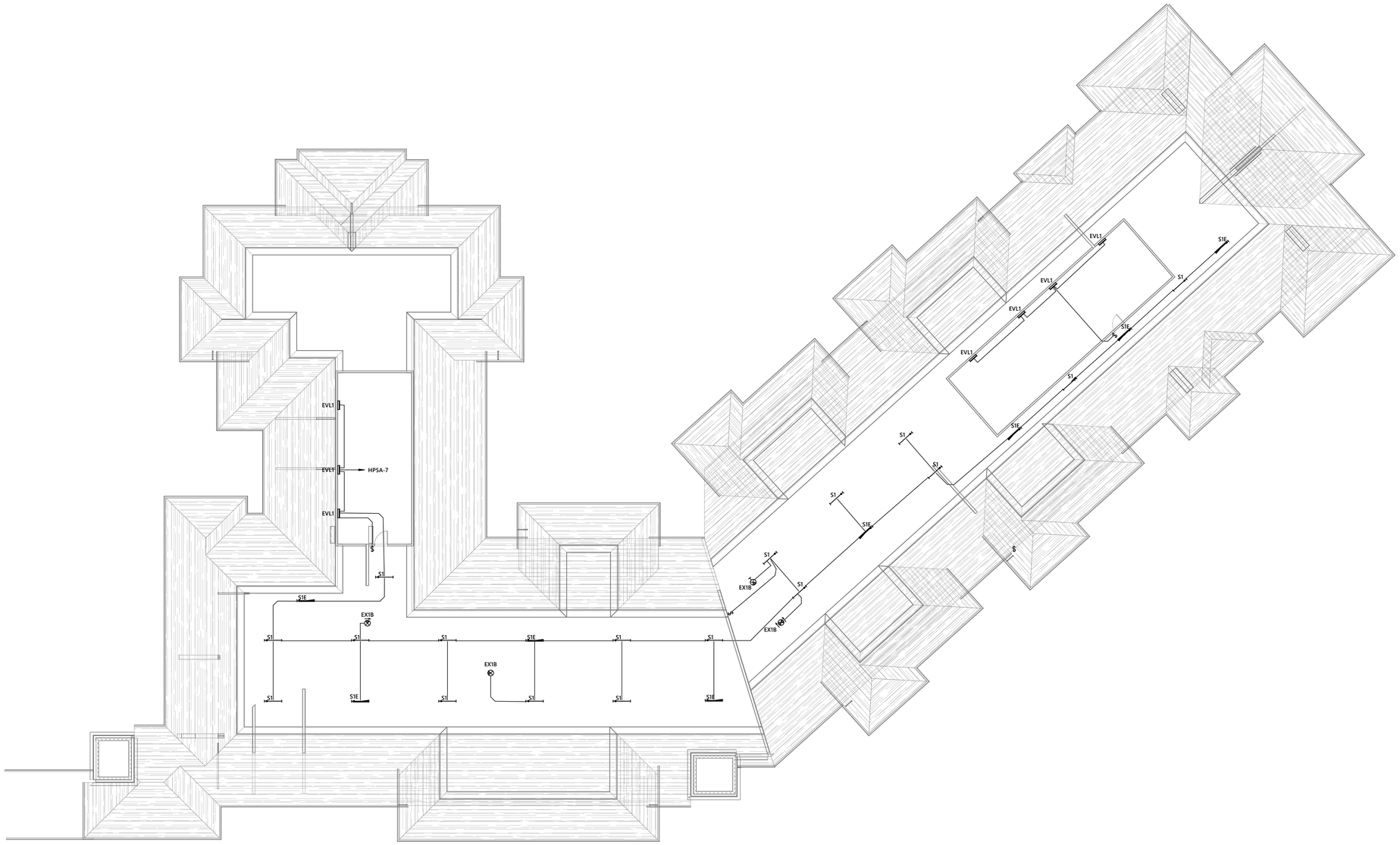
GENERAL NOTES - LIGHTING

1. CONNECT EXIT SIGNS AND EMERGENCY LIGHT FIXTURES AHEAD OF LOCAL AREA SWITCHING.
2. COORDINATE MOUNTING HEIGHT OF ALL INTERIOR AND EXTERIOR LIGHTING FIXTURES WITH THE ARCHITECTURAL PLANS PRIOR TO ROUGH-IN.
3. EXTERIOR LIGHTING TO BE CONTROLLED BY TIME CLOCK AND/OR PHOTOCELL.

KEYNOTES



1 ATTIC LIGHTING PLAN
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
BYRON FORD
PE-2014023016
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St. Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: Author
CHECKED BY	: Checker
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL ATTIC FLOOR LIGHTING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
E1.5	____ OF ____

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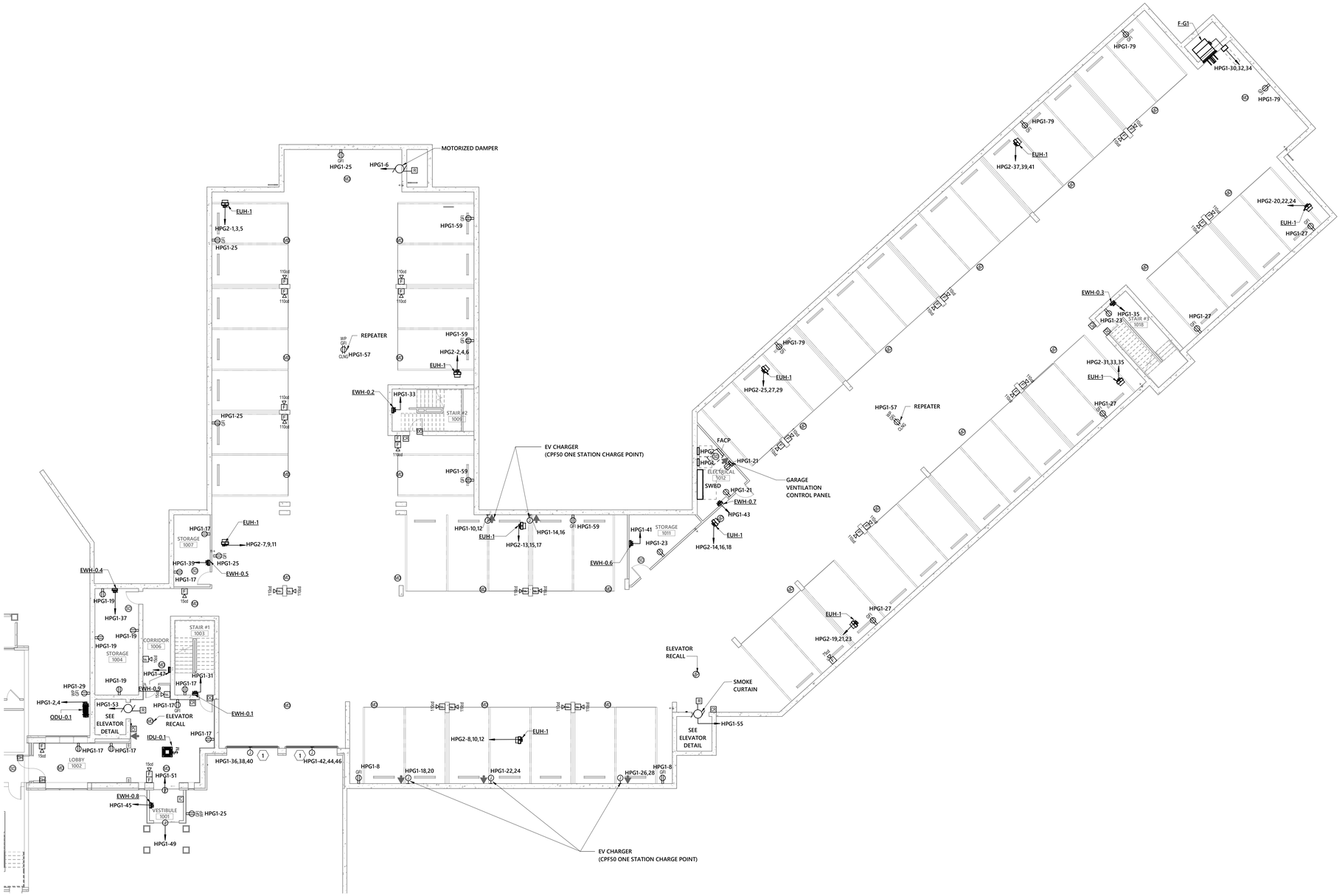
GENERAL NOTES:

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

KEYED NOTES:

1. GARAGE DOOR. COORDINATE EXACT REQUIREMENTS OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER'S SPECIFICATION BEFORE ROUGH-IN AND INSTALLATION.



1 OVERALL GARAGE POWER PLAN
3/32" = 1'-0"

PERMIT SET

STATE OF MISSOURI
KEITH PEDERSON
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St., Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

GARAGE OVERALL POWER PLAN

N
PLAN NORTH

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E2.0	8 OF 24

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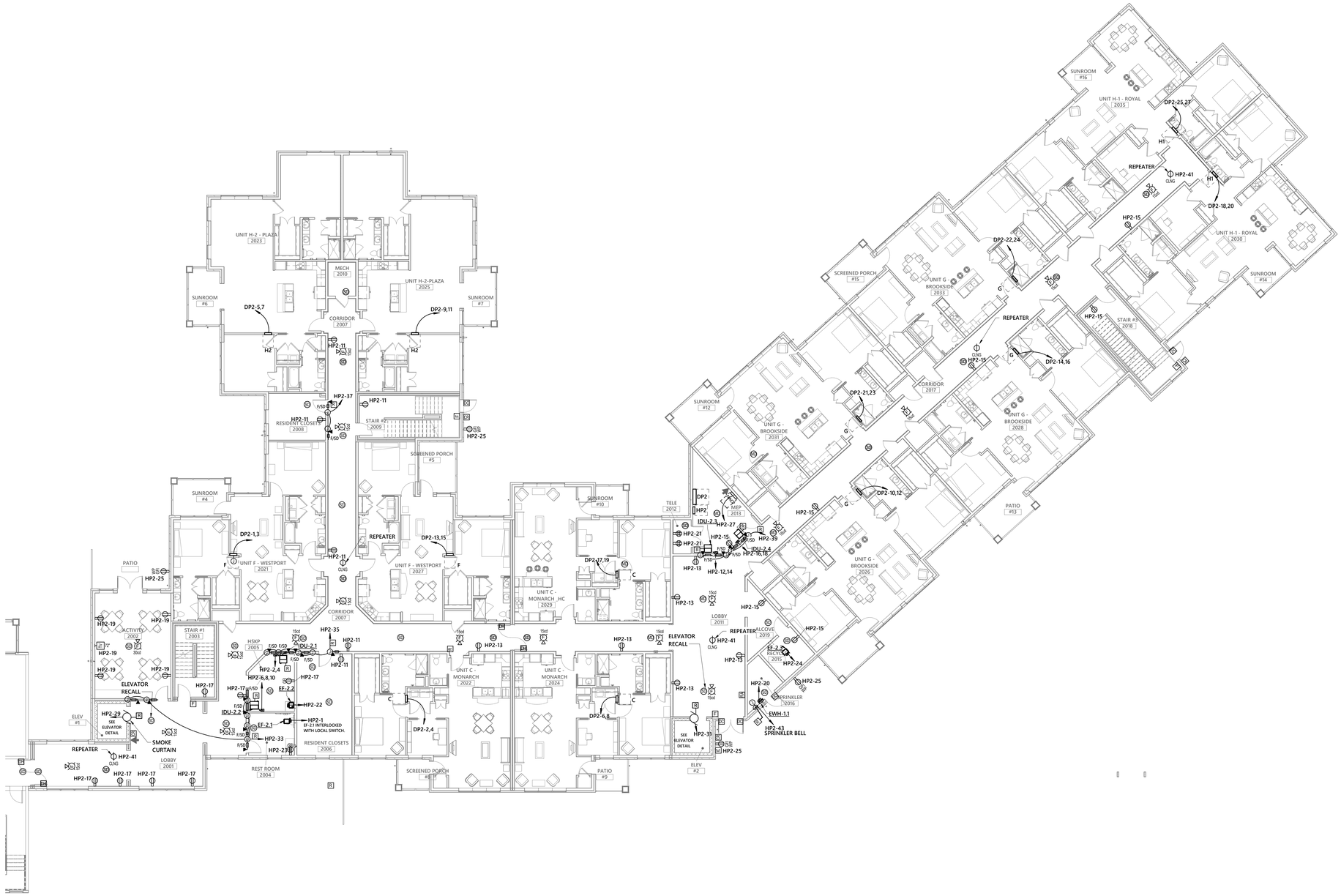
GENERAL NOTES:

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

KEYED NOTES:

1. GARAGE DOOR. COORDINATE EXACT REQUIREMENTS OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER'S SPECIFICATION BEFORE ROUGH-IN AND INSTALLATION.



1 OVERALL SECOND FLOOR POWER PLAN
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH PEPPER
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	ZK
DRAWN BY	:	DG
CHECKED BY	:	ZK
APPROVED BY	:	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL SECOND FLOOR POWER PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E2.1	9 OF 24

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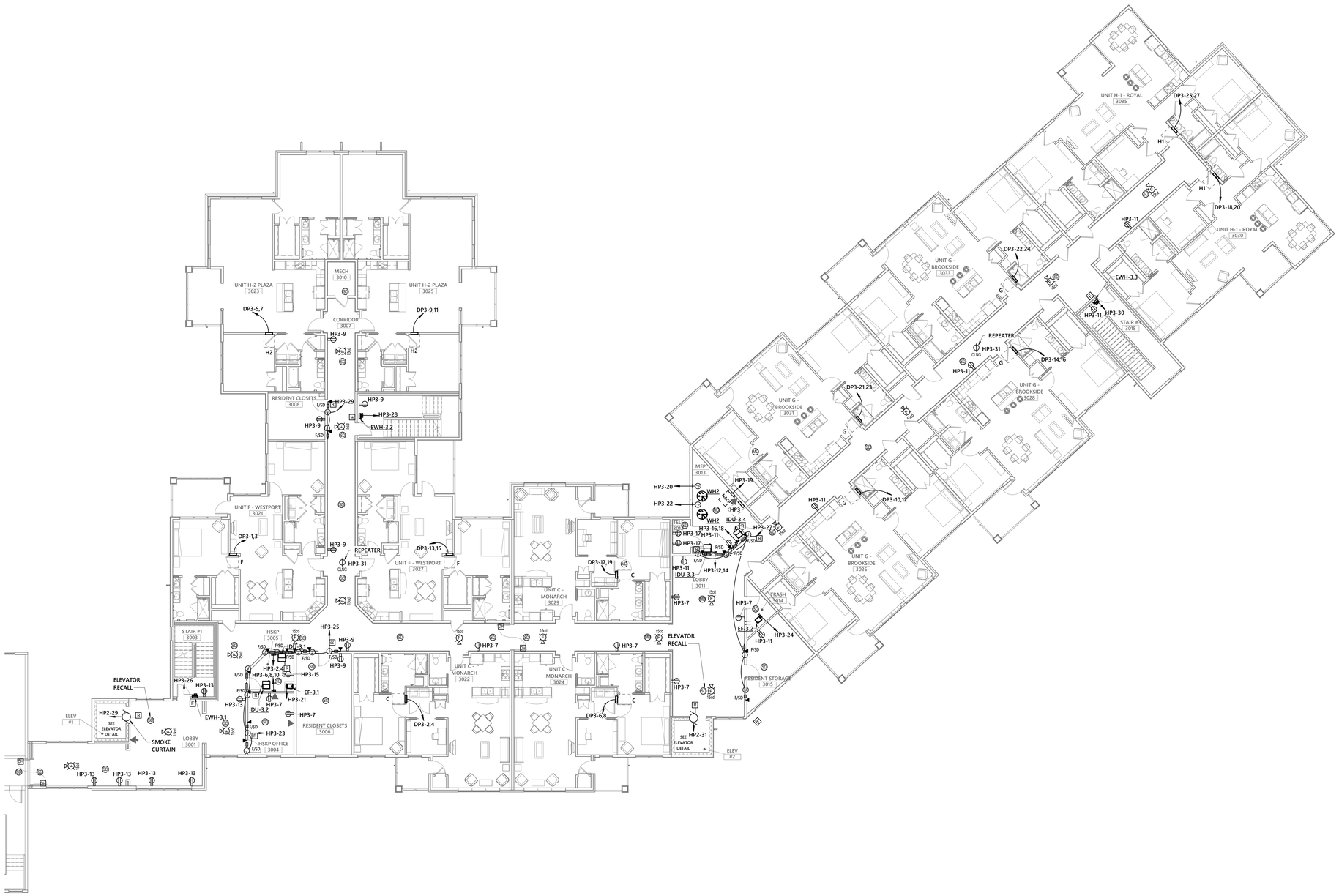
GENERAL NOTES:

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

KEYED NOTES:

1. GARAGE DOOR. COORDINATE EXACT REQUIREMENTS OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER'S SPECIFICATION BEFORE ROUGH-IN AND INSTALLATION.



1 OVERALL THIRD FLOOR POWER PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF MISSOURI
KEITH PETERSEN
E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St., Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL THIRD FLOOR POWER PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E2.2	10 OF 24

1/18/2021 4:49:35 PM BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
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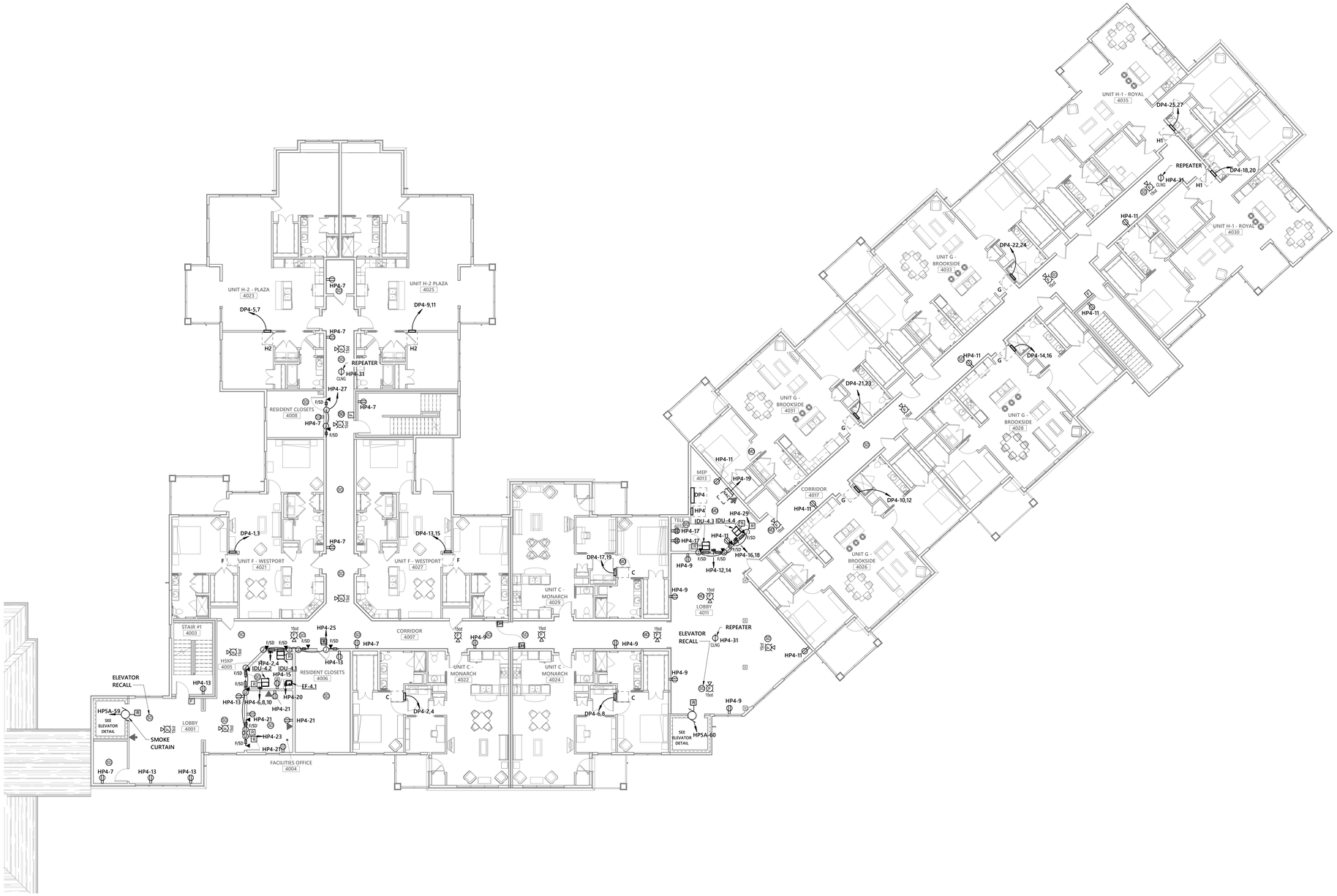
GENERAL NOTES:

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

KEYED NOTES:

1. GARAGE DOOR. COORDINATE EXACT REQUIREMENTS OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER'S SPECIFICATION BEFORE ROUGH-IN AND INSTALLATION.



1 **OVERALL FOURTH FLOOR POWER PLAN**
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEVIN PATRICK CRAFTON
E-25154
PROFESSIONAL ENGINEER
01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-928-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL FOURTH FLOOR POWER PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING
E2.3

SHEET
11 OF 24

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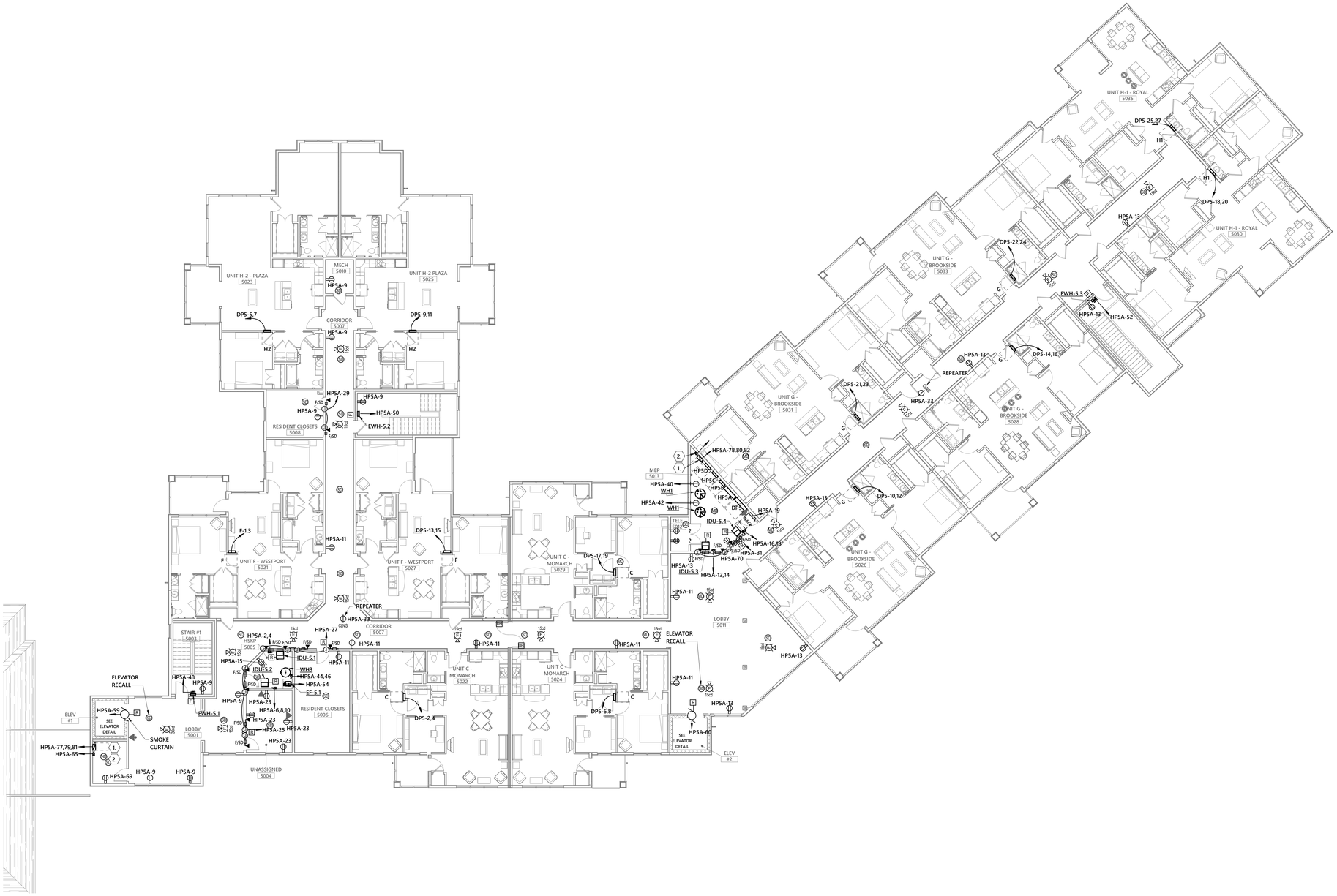
GENERAL NOTES:

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

KEYED NOTES:

1. GARAGE DOOR. COORDINATE EXACT REQUIREMENTS OF GARAGE DOOR WITH GARAGE DOOR MANUFACTURER'S SPECIFICATION BEFORE ROUGH-IN AND INSTALLATION.
1. PROVIDE (60A, 240V, 3PH) ENCLOSED CIRCUIT BREAKER FOR ELEVATOR IN FLUSH ENCLOSURE WITH LOCKABLE COVER. CIRCUIT BREAKER AND ENCLOSURE SHALL MEET ALL REQUIREMENTS OF THE ELEVATOR MANUFACTURER/INSTALLER.
2. PROVIDE (20A, 120V, 1PH) ENCLOSED CIRCUIT BREAKER FOR ELEVATOR CAB LIGHT IN FLUSH ENCLOSURE WITH LOCKABLE COVER. CIRCUIT BREAKER AND ENCLOSURE SHALL MEET ALL REQUIREMENTS OF THE ELEVATOR MANUFACTURER/INSTALLER.



1 OVERALL FIFTH LOOR POWER PLAN
3/32" = 1'-0"

PERMIT SET

01/18/2021

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1927 South Tryon St, Suite 300, Charlotte NC 28203
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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL FIFTH FLOOR POWER PLAN

N
PLAN NORTH

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E2.4	12 OF 24

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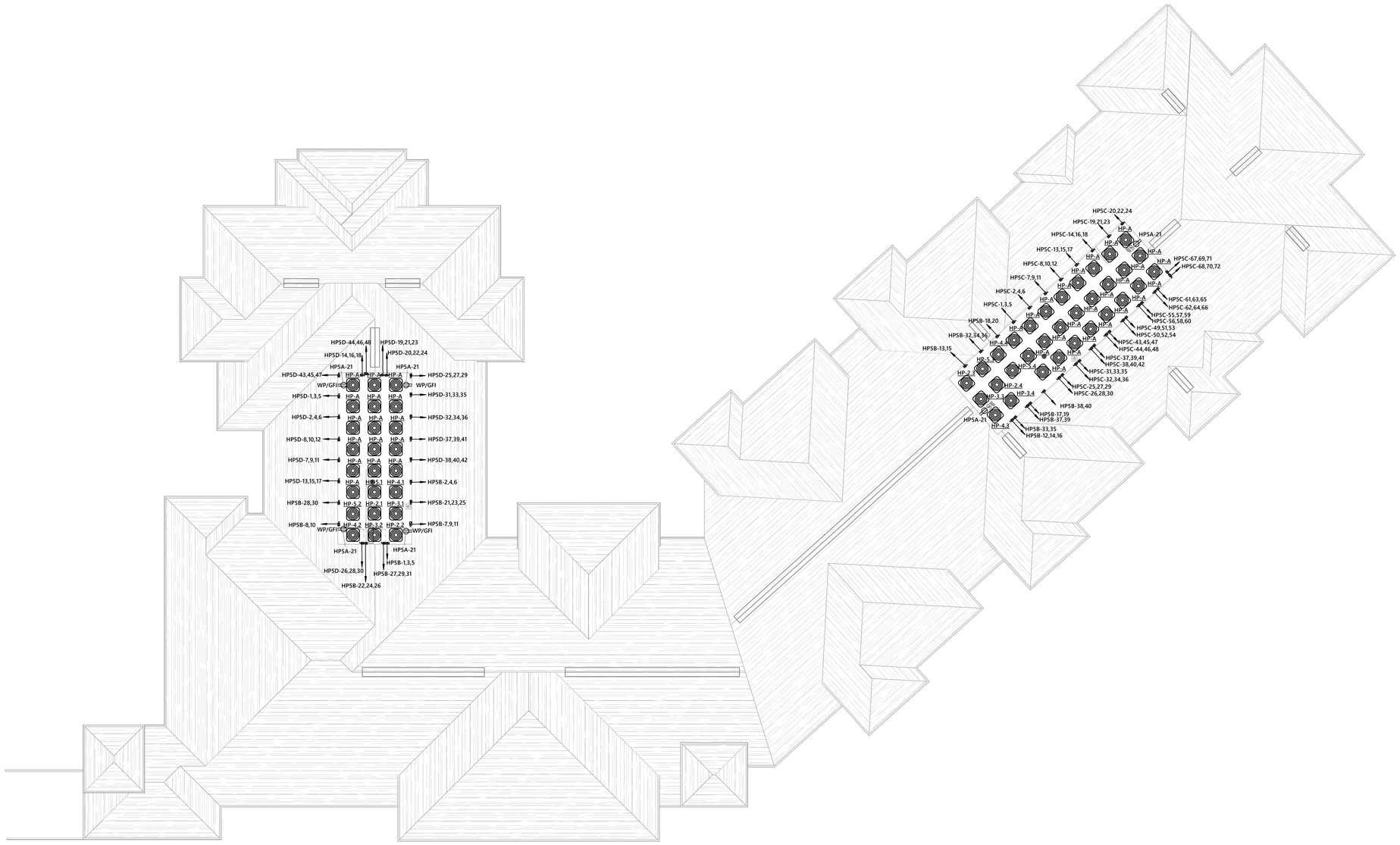
GENERAL NOTES: ROOF

A. COORDINATE LOCATION, MOUNTING HEIGHT AND TERMINATION OF MECHANICAL EQUIPMENT WITH THE MECHANICAL CONTRACTOR PRIOR TO ROUGH-IN.

B. SEAL ALL PENETRATIONS THROUGH THE ROOF PER THE ROOFING MANUFACTURER'S REQUIREMENTS. COORDINATE ROOF PENETRATION WITH GENERAL CONTRACTOR AS REQUIRED TO ENSURE THAT THE ROOF WARRANTY REMAINS IN FULL EFFECT.



1 OVERALL ROOF POWER PLAN
3/32" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSOURI
KEITH PEDERSON
E-25154
PROFESSIONAL ENGINEER

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PROJECT ARCHITECT	: PA
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APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL ROOF POWER PLAN

COMM. NO.	DATE
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E2.5	13 OF 24

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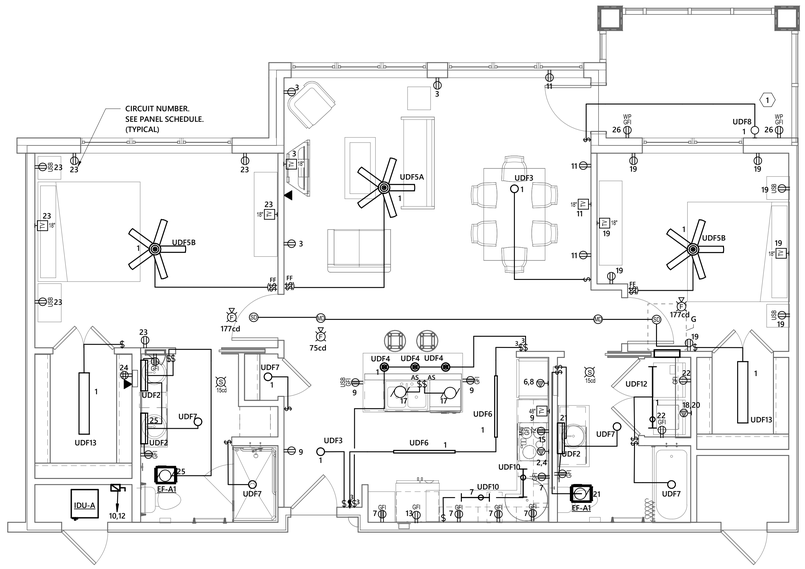
GENERAL NOTES: UNITS

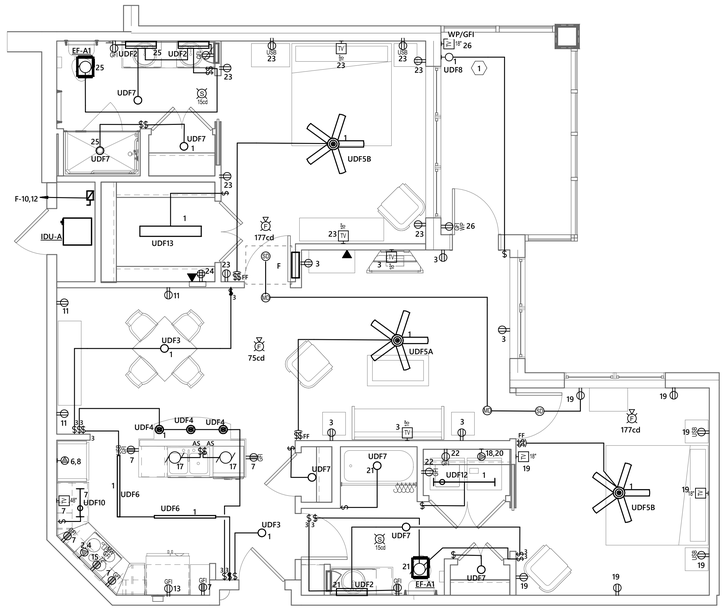
A. ALL AUDIBLE FIRE ALARMS IN EVERY UNIT MUST INCLUDE 520 HZ HORN.
B. ALL SMOKE DETECTORS REQUIRED TO BE PHOTO ELECTRIC.
C. PROVIDE ARC FAULT CIRCUIT INTERRUPTER PROTECTION PER NEC 210.12.
D. COORDINATE TV OUTLET BOX HEIGHT & LOCATION WITH ARCHITECT BEFORE ROUGH-IN.
E. TOP OF UNIT PANEL SHALL NOT EXCEED 4'-0" AFF.
G. MICROWAVE RECEPTACLE SHALL BE LOCATED IN CABINET SPACE ABOVE RANGE/OVEN FOR NONE ADA UNITS.
H. PROVIDE CEILING FAN RATED J-BOX FOR ALL BEDROOMS.
I. PROVIDE GFCI BREAKER FOR BRANCH CIRCUIT SERVING DISH WASHER IN COMPLIANCE WITH NEC 210.8.D.
J. ALL STACKED BALCONY LIGHTS SHALL BE ALIGNED.
K. ALL BATHROOM STROBES IN ADA UNITS TYPE B SHALL BE PRE-WIRED FOR FUTURE ADA ADAPTABLE UNIT UPFIT. FUTURE BATHROOM STROBES SHALL BE PROVIDED WITH BLANK PLATE.
L. ALL ADA UNITS TYPE A SHALL HAVE 177CD HORN/STROBE IN BEDROOM/COMMON AREA AND 15CD STROBE IN BATHROOMS.

KEYED NOTES: UNITS

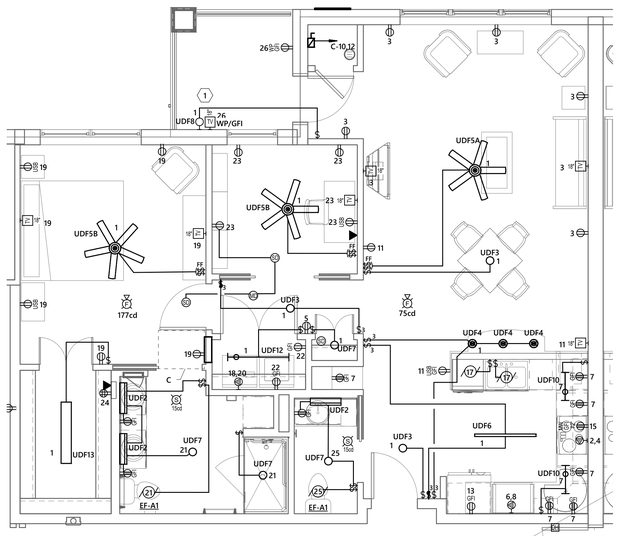
1. PROVIDE UDF3 LIGHT FIXTURE FOR ALL SUNROOMS. PROVIDE UDF8 LIGHT FIXTURE FOR ALL PATIO, BALCONY, AND SCREEN PORCH. PROVIDE NON GFI/WP OUTLETS IN ALL SUNROOMS. PROVIDE TV OUTLETS ONLY IN SUNROOMS.



3 UNIT G - THE BROOKSIDE - ENLARGED ELECTRICAL UNIT PLAN
1/4" = 1'-0"



2 UNIT F - THE WESTPORT - ENLARGED ELECTRICAL UNIT PLAN
1/4" = 1'-0"



1 UNIT C - THE MONARCH - ENLARGED ELECTRICAL UNIT PLAN
1/4" = 1'-0"

N
PLAN NORTH

PERMIT SET

STATE OF MISSISSIPPI
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PROJECT TITLE
John Knox Village

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CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ENLARGED ELECTRICAL UNIT PLANS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING E5.1
SHEET 14 OF 24

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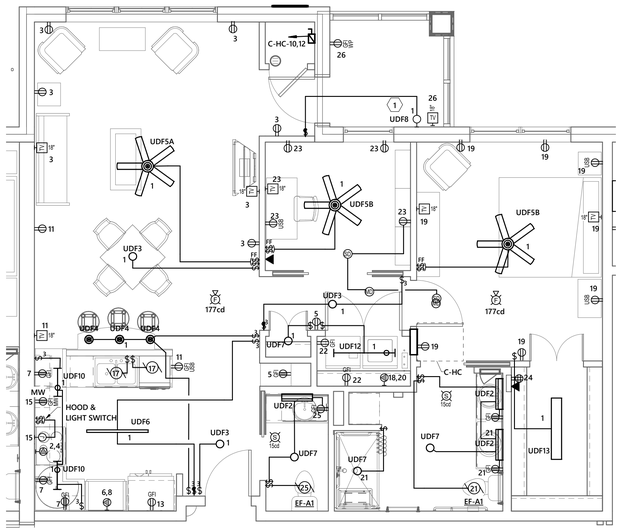
J. ALL STACKED BALCONY LIGHTS SHALL BE ALIGNED.
K. ALL BATHROOM STROBES IN ADA UNITS TYPE B SHALL BE PRE-WIRED FOR FUTURE ADA ADAPTABLE UNIT UPFIT. FUTURE BATHROOM STROBES SHALL BE PROVIDED WITH BLANK PLATE.
L. ALL ADA UNITS TYPE A SHALL HAVE 177CD HORN/STROBE IN BEDROOM/COMMON AREA AND 15CD STROBE IN BATHROOMS.

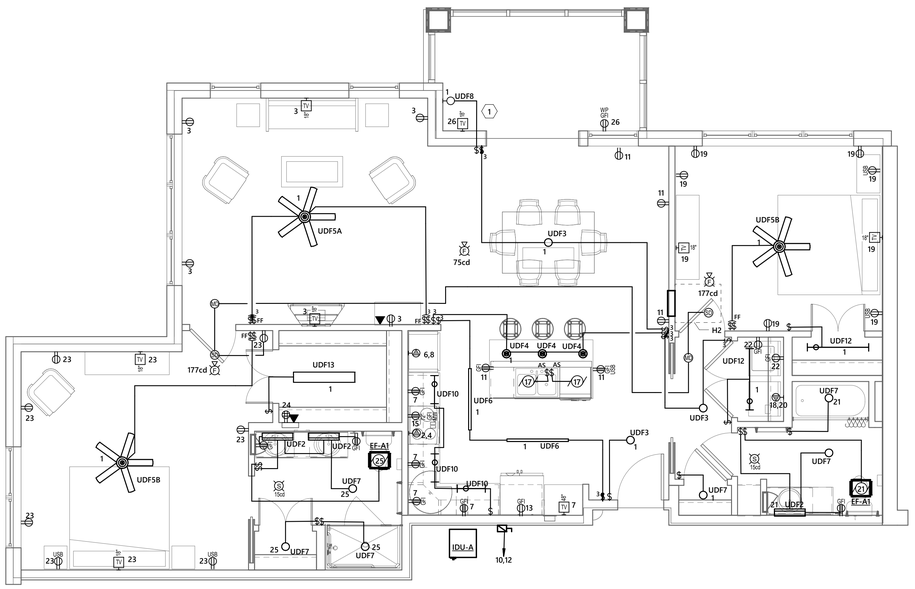
KEYED NOTES: UNITS

1. PROVIDE UDF3 LIGHT FIXTURE FOR ALL SUNROOMS. PROVIDE UDF8 LIGHT FIXTURE FOR ALL PATIO, BALCONY, AND SCREEN PORCH. PROVIDE NON GFI/WP OUTLETS IN ALL SUNROOMS. PROVIDE TV OUTLETS ONLY IN SUNROOMS.

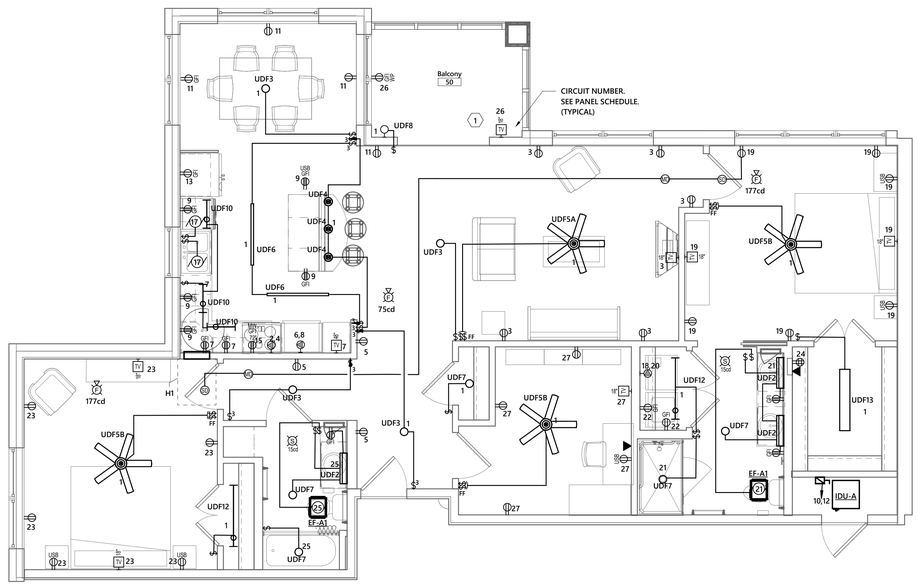
UNIT C-ADA IS SIMILAR TO UNIT C. SEE PANEL SCHEDULE-C FOR CIRCUIT DESIGNATION.



3 UNIT C - THE MONARCH - ENLARGED ELECTRICAL UNIT PLAN - ADA
1/4" = 1'-0"



2 UNIT H-2 - THE PLAZA - ENLARGED ELECTRICAL UNIT PLAN
1/4" = 1'-0"



1 UNIT H-1 - THE ROYAL - ENLARGED ELECTRICAL UNIT PLAN
1/4" = 1'-0"

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PROJECT TITLE

John Knox Village

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DRAWN BY	:	RK
CHECKED BY	:	ZK
APPROVED BY	:	KP

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ENLARGED ELECTRICAL UNIT PLANS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING E5.2

SHEET 15 OF 24

1/18/2021 4:50:08 PM BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
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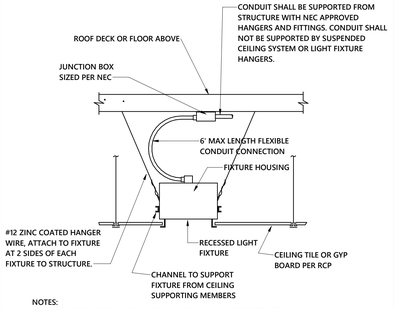
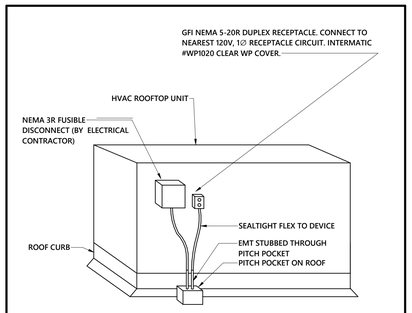


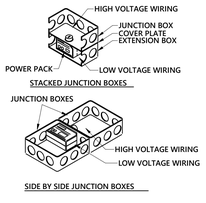
NOTES:
1. WHERE ROOF DECKING IS THE IS THE ALLOWABLE SUPPORT STRUCTURE, AND PATHWAY SYSTEM IS NOT IMC OR RMC, THE MINIMUM DISTANCE FROM ROOF DECKING SHALL BE 1.5" FOR ALL BOXES AND CONDUIT.

1 TYPICAL RECESSED DOWN LIGHT FIXTURE INSTALLATION DIAGRAM
NOT TO SCALE



NOTE: TYPICAL FOR ALL ROOF MOUNTED HVAC EQUIPMENT.

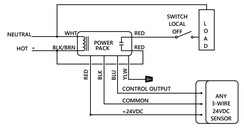
2 ROOFTOP RECEPTACLE DETAIL
NOT TO SCALE



NOTE:
DO NOT MOUNT POWER PACKS CLOSER THAN 6-12 INCHES FROM SENSOR. PROVIDE DOUBLE STACKED JUNCTION BOX FOR MAXIMUM VENTILATION OF POWER PACK. PROVIDE BLANK COVER. WHERE PERMITTED BY CODE AND AHJ, LEAVE (2) OPENINGS IN CONDUIT KNOCKOUT FOR VENTING OF POWER PACK. VERIFY WITH AHJ PRIOR TO KNOCKOUT REMOVAL.

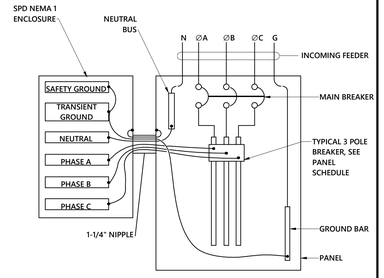
POWER PACK INSTALLED IN J-BOX

3 POWER PACK INSTALLATION
NOT TO SCALE



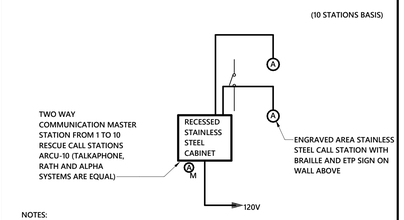
NOTE: CONNECT ONLY THE SUPPLY FOR THE VOLTAGE BEING USED.
CAP UNUSED POWER SUPPLY WIRE.

4 POWER PACK WIRING DIAGRAM
NOT TO SCALE



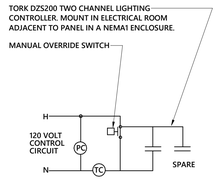
NOTES:
1. ALL WIRING SHALL BE #6 AWG.
2. AVOID SHARP BENDS IN WIRES. ALL WIRE LENGTHS SHALL NOT EXCEED 18" (WHERE POSSIBLE).
3. SEE SPD SPECIFICATION FOR EXACT TYPE (H1,H2,L1,L2) FOR LOCATION AS INDICATED ON THE POWER RISER DIAGRAM.

5 SPD CONNECTION DETAIL
NOT TO SCALE



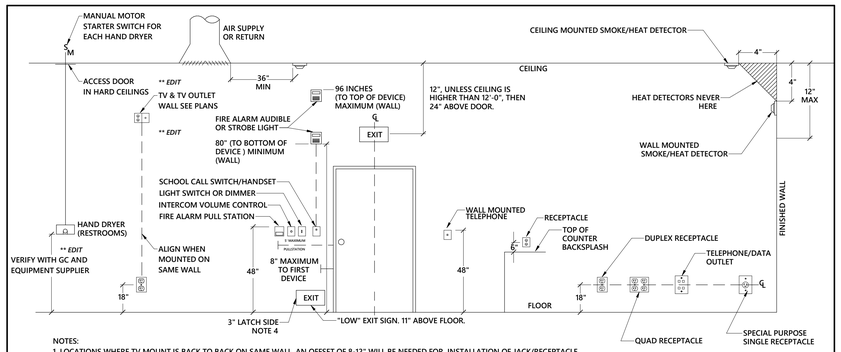
NOTES:
1. ALL EQUIPMENT SHALL BE OF THE SAME MANUFACTURER AND MEET THE REQUIREMENTS OF ADA AND ALL OTHER CODES AND REQUIREMENTS.
2. SYSTEM SHALL BE WIRED IN ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED RECOMMENDATIONS IN MINIMUM OF 1/2" CONDUIT.
3. OPERATION OF SYSTEM SHALL BE HANDS FREE.
4. AREA STATIONS TO HAVE PANIC BUTTONS LABELED "PUSH FOR HELP" MOUNTED AT 44"A.F.F TO CENTER.
5. SEE PLANS FOR EXACT LOCATIONS AND QUANTITY. MASTER STATION LOCATION SHALL BE COORDINATED BEFORE INSTALLATION.
6. PROVIDE (1) RJ11 MODULAR PHONE PORTS FOR MASTER STATION. UNIT SHALL BE PROGRAMMED TO CALL OUT TO 911 IN THE EVENT THE MASTER STATION IS NOT PICKED UP. (TIMED).
7. COMMAND UNIT SHALL HAVE BATTERY BACK UP FOR A MINIMUM OF (3) HOURS. ALL BATTERY BACK UP SHALL BE CONCEALED ABOVE LOCAL UNIT OR WITHIN MASTER STATION (FLUSH).

6 TWO WAY COMMUNICATION SYSTEM DETAIL
NOT TO SCALE



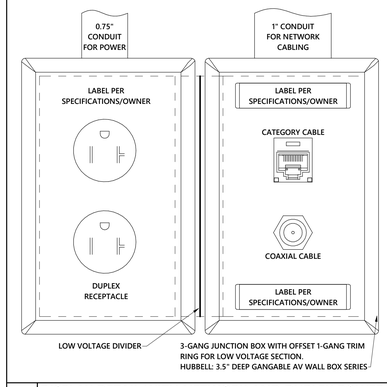
NOTES:
PC PHOTOCELL MOUNTED ON ROOF FACING NORTH. ELECTRICAL CONTRACTOR SHALL ADJUST SENSITIVITY AS REQUIRED BY ARCHITECT.
TC MULTIPOLE 120/240V, 30ACONTACTOR WITH 120V COIL. TC TO CONTROL ALL HOT LEGS OF LIGHTING AS REQUIRED.

7 LIGHTING CONTACTOR DETAIL W-TIMER
NOT TO SCALE

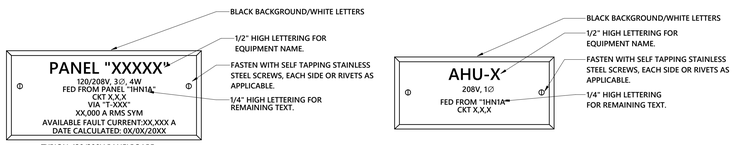


NOTES:
1. LOCATIONS WHERE TV MOUNT IS BACK TO BACK ON SAME WALL, AN OFFSET OF 8-12" WILL BE NEEDED FOR INSTALLATION OF JACK/RECEPTACLE.
2. DEVICES ABOVE COUNTER TOPS SHALL BE A MAXIMUM OF 48" TO TOP OF DEVICE.
3. DEVICES NEXT TO DOOR EXIT SHALL BE WITHIN 8" (MAXIMUM) TYPICAL OF DOOR UNLESS OBSTACLES SUCH AS SIDELITES, ETC.
4. LOW EXIT SIGN AS INDICATED ON PLANS. PER IBC 1011.2.
5. DEVICES REQUIRED TO BE ADA ACCESSIBLE SHALL BE INSTALLED PER ANSI A117.1.

8 MOUNTING HEIGHTS OF DEVICES - ELEVATION
NOT TO SCALE



9 DISPLAY DETAIL WITH NETWORK AND DUPLEX POWER
NOT TO SCALE

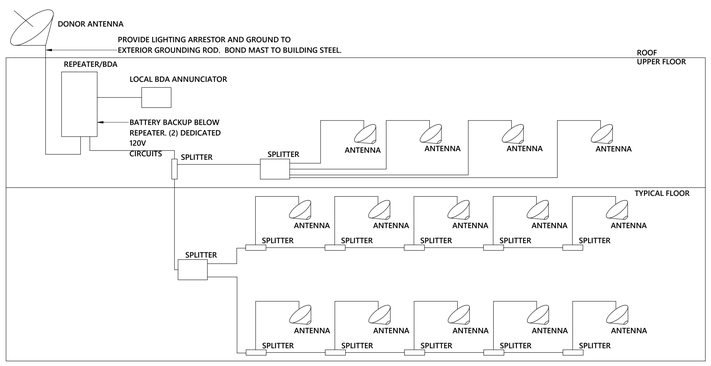


PANELBOARD NAMEPLATES

EQUIPMENT NAMEPLATES

NOTES:
1. SEE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS, COLORS, ETC.
2. PROVIDE SHORT-CIRCUIT CURRENT RATING AND AVAILABLE FAULT CURRENT ON EACH NON-DWELLING SERVICE EQUIPMENT NAMEPLATE.

10 TYPICAL NAMEPLATE DIAGRAM
NOT TO SCALE



11 EMERGENCY RESPONDER SYSTEM BOOSTING RISER
NO SCALE

SYSTEM NOTES

NOTES:
1. SYSTEM IS BASED ON 800Mhz. COORDINATE WITH LOCAL EMERGENCY RESPONDERS FOR NECESSARY FREQUENCY REFQUIRED
2. SEE SPECIFICATIONS FOR ALL EQUIPMENT AND CABLING REQUIREMENTS.
3. ALL CABLING TO BE INSTALLED IN 1 1/2" CONDUIT.
4. SYSTEM BASED ON DESIGN FROM HARRIS COMMUNICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS AND EQUALS.
5. PROVIDE BATTERY BACK UP (5 MINS.) FOR MOMENTARY LOSS OF POWER. MAIN SYSTEM IS GENERATOR BACKED UP. NON GENERATOR BACKED UP SYSTEMS SHALL HAVE A MINIMUM BATTERY BACKUP OF 24 HOURS.
6. SEE SPECIFICATIONS FOR CABLING REQUIREMENTS.
7. SYSTEM SUPPLIER SHALL PROVIDE A SYSTEM SURVEY REPORT PRIOR TO PROVIDING THE SYSTEM. THIS SHALL BE CONSIDERED BASE BID FOR THE PROJECT. SIGNAL SURVEY REPORT SHALL BE TAKEN TO THE LOCAL FIRE CODE OFFICIAL AND THE LOCAL FIRE CODE OFFICIAL SHALL DETERMINE IF THE SYSTEM NEEDS TO BE INSTALLED. SIGNAL STRENGTH MEASUREMENTS SHALL BE MEASURED IN 95% OF ALL AREAS ON EACH FLOOR (100% OF ALL EGRESS AND CRITICAL AREAS). A MINIMUM SIGNAL STRENGTH OF -95dBM IS REQUIRED.
8. PROVIDE A DEDUCTIVE ALTERNATE FOR THE EMERGENCY RESPONDER SYSTEM INCLUDING ALL DEVICES, CABLING, CONDUIT, AND EQUIPMENT. SUBMITTAL AND SURVEY REPORT SHALL BE CONSIDERED BASE BID.
9. SEE PLANS FOR MINIMUM LOCATIONS. BASED ON SURVEY REPORT, DEVICES SHALL BE LOCATED TO MAXIMIZE BOOSTING SIGNAL. LOCATIONS SHALL BE COORDINATED WITH GENERAL CONTRACTOR.
10. LOCAL ANNUNCIATOR SHALL PROVIDE VISUAL AND LABELED IDENTIFICATION OF:
    A. NORMAL AC POWER.
    B. SIGNAL BOOSTER TROUBLE.
    C. LOSS OF NORMAL AC POWER.
    D. FAILURE OF BATTERY CHARGER.
    E. LOW-BATTERY CAPACITY.
    F. ANTENNA FAILURE.
11. PROVIDE FIRE ALARM PANEL CONNECTION (SUPERVISORY SIGNALS). COORDINATE REQUIRED CONNECTIONS WITH FIRE ALARM CONTRACTOR:
    A. DONOR ANTENNA MALFUNCTION.
    B. BDA FAILURE.
    C. LOW BATTERY CAPACITY.
    D. LOSS OF NORMAL AC POWER.
    E. FAILURE OF BATTERY CHARGER.

PERMIT SET

STATE OF MISSOURI — KEITH A. ZIEGLER — PROFESSIONAL ENGINEER

01/18/2021

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Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

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PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ELECTRICAL DETAILS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING E6.1

SHEET 16 OF 24

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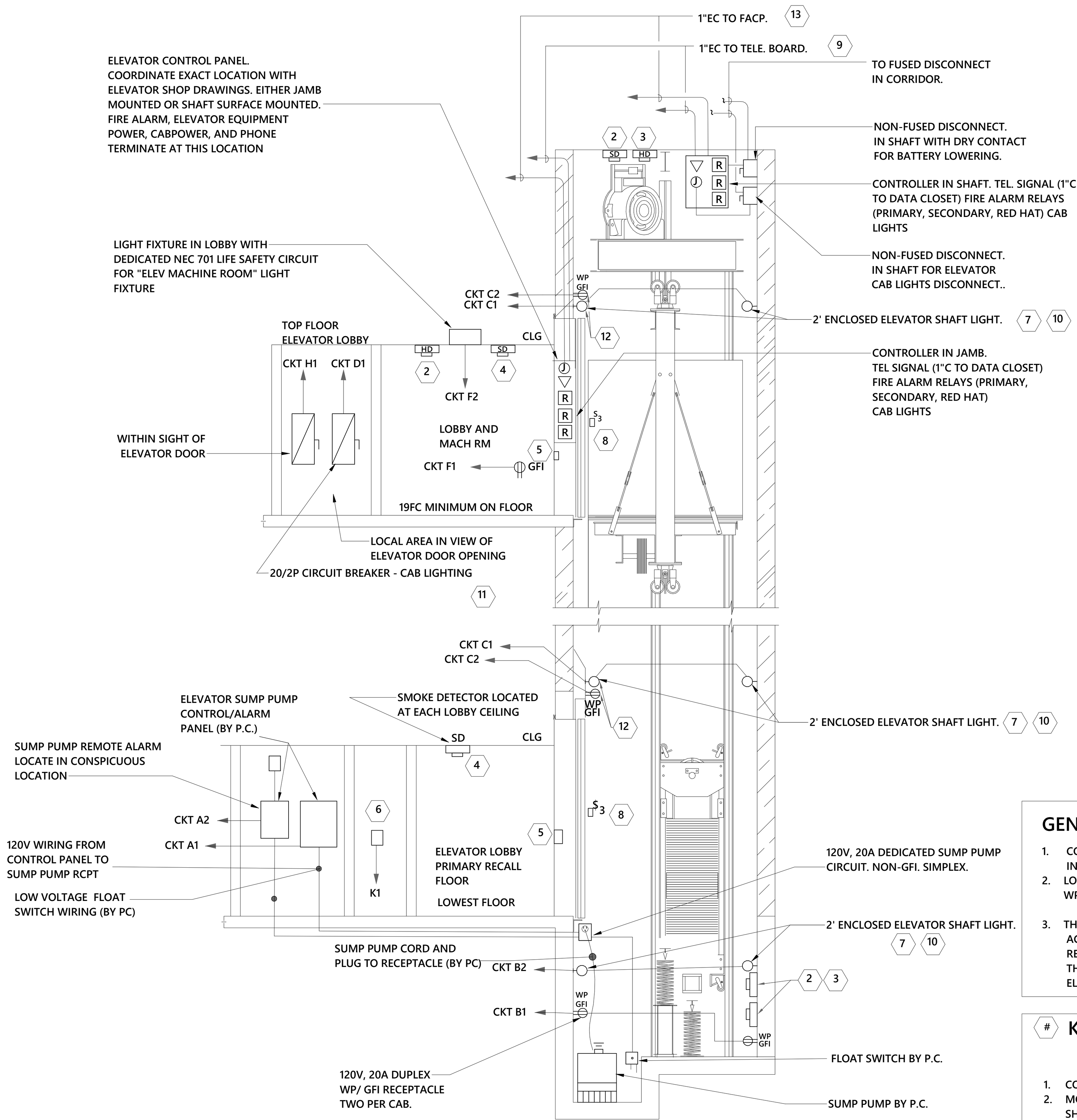
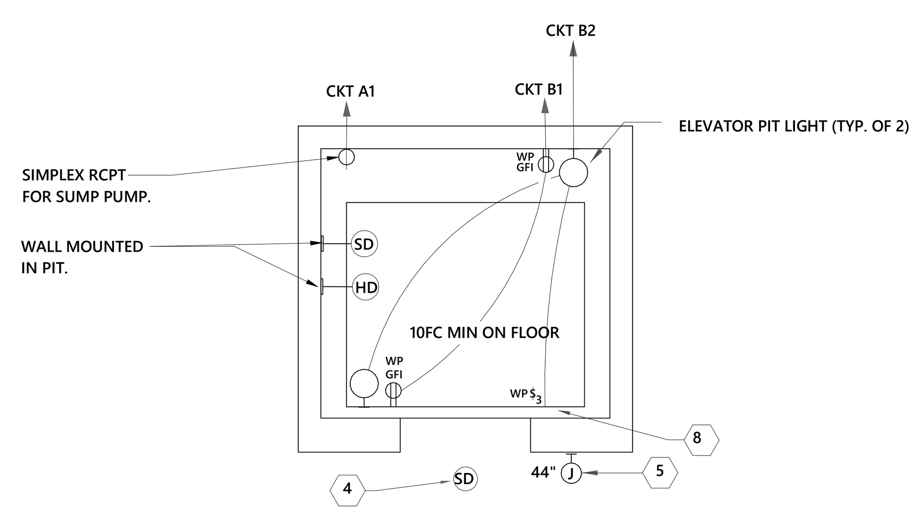
ELEVATOR EQUIPMENT CIRCUIT INFORMATION

CKT	ITEM	CONNECTION	PANEL/CKT ELEV#1	PANEL/CKT ELEV#2	NOTES
A1	SUMP PUMP	WP NON-GFI SIMPLEX	HPG1-61	HPG1-62	
A2	SUMP PUMP CONTROL & ALARM	WP NON-GFI SIMPLEX	HPG1-63	HPG1-64	
B1	ELEVATOR PIT RCPT	WP/GFI DUPLEX	HPG1-65	HPG1-66	
B2	ELEVATOR PIT LIGHT	LIGHT FIXTURE	HPG1-67	HPG1-68	
C1	ELEVATOR SHAFT LIGHT	LIGHT FIXTURE	HP4A-63	HP4A-64	
C2	ELEVATOR SHAFT RCPT	WP/GFI DUPLEX	HP4A-61	HP4A-62	
D1	ELEV CAB LIGHT	30-2P DISC	HP4A-65	HP4A-66	
E1	ELEVATOR CONTROLS	30-2P DISC	HP4A-67	HP4A-68	
F1	ELEV MACHINE ROOM RCPT	GFI DUPLEX RCPT	HP4A-69	HP4A-70	
F2	ELEV MACHINE ROOM LIGHTS	LIGHT FIXTURE	HP4A-71	HP4A-72	
H1	ELEVATOR MOTOR	100/80-3P	HP4A-77,79,81	HP4A-78,80,82	SEE 11 BELOW
K1	ELEV LOBBY COMM SYSTEM	J-BOX	HPG1-69	HPG1-70	



ELEVATOR SHAFT DETAIL



ELEVATOR PIT DETAIL

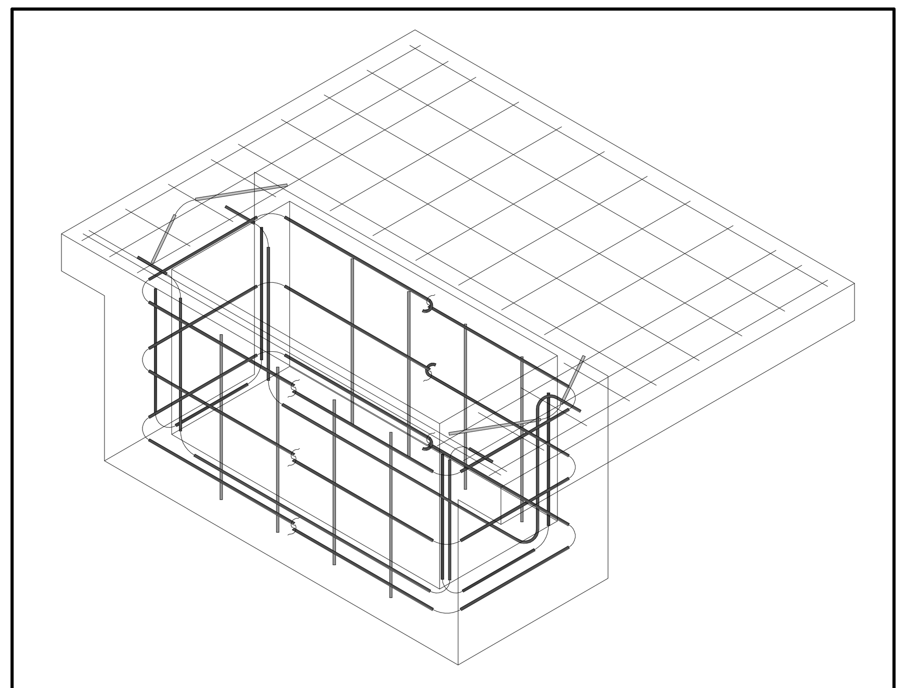
GENERAL NOTES:

1. COORDINATE EXACT LOCATION OF ALL DEVICES WITH ELEVATOR SHOP DRAWINGS PRIOR TO INSTALLATION.
2. LOCATE PIT AND SHAFT LIGHT SWITCH ADJACENT TO ACCESS DOOR ON EACH FLOOR. LOCATE TWO WP/GFI RCPT IN EACH PIT AND ONE EACH PER FLOOR ABOVE PIT.
3. THE SMOKE DETECTOR(S) LOCATED IN THE DESIGNATED ELEVATOR RECALL LOBBY(S) SHALL ACTUATE THE PRIMARY ELEVATOR RECALL CIRCUIT. THE SMOKE DETECTORS IN THE REMAINING ELEVATOR LOBBIES SHALL ACTUATE THE SECONDARY ELEVATOR RECALL CIRCUIT. THE SMOKE DETECTORS IN THE HOISTWAYS AND PIT SHALL ACTUATE THE PRIMARY ELEVATOR RECALL CIRCUIT.

KEY NOTES:

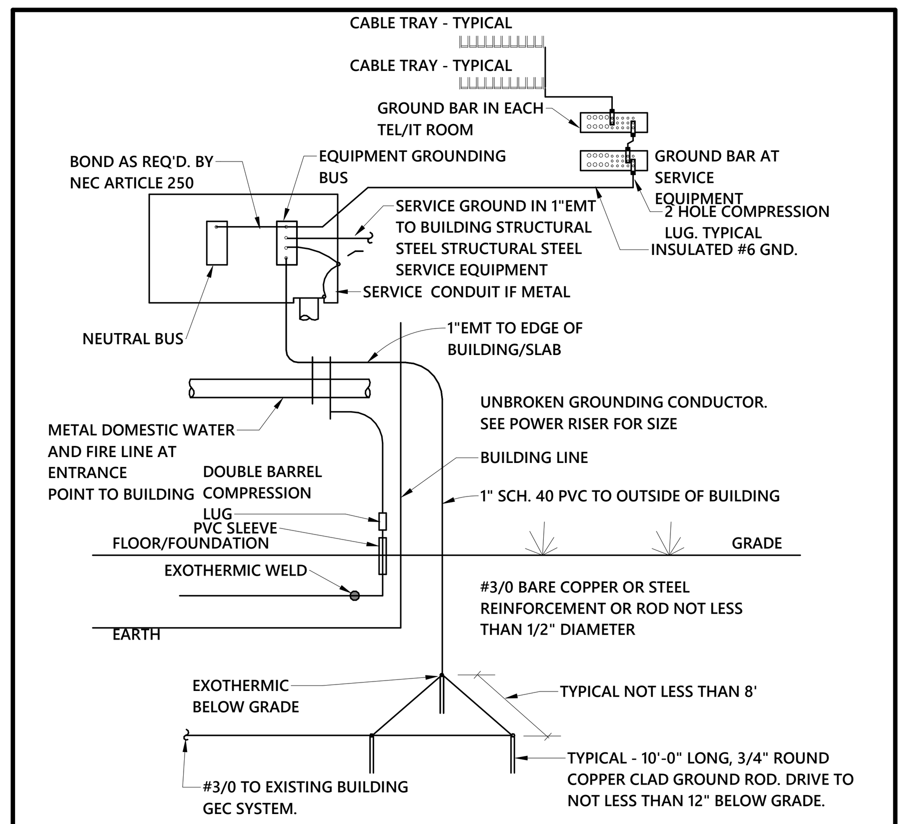
1. CONNECT TO DEDICATED 120V CIRCUIT. SEE CHART ABOVE FOR CIRCUIT DESIGNATION.
2. MOUNT HEAT AND SMOKE DETECTORS WITHIN 24" OF SPRINKLER HEADS. SMOKE DETECTORS SHALL, UPON ALARM, RE-CALL ELEVATOR TO THE APPROPRIATE LEVEL AND LOCK OUT ELEVATOR VIA ELEVATOR EQUIPMENT. HEAT DETECTORS SHALL CONTROL THE OPERATION OF THE SPRINKLER PIPING SOLENOID VALVE(S) AND THE SHUNTING OF THE MAIN ELEVATOR POWER. SEE ELEVATOR ALARM SHUTDOWN MATRIX. HEAT DETECTORS SHALL HAVE A LOWER RESPONSE TIME INDEX (135 DEG) COMPARED TO THE SPRINKLER HEADS IN THE MACHINE ROOM SHAFT OR PIT (155 DEG).
3. WHERE HOISTWAY OR MACHINE ROOM ARE NOT SPRINKLERED, DO NOT PROVIDE HEAT DETECTORS IN THE HOISTWAY OR THE MACHINE ROOM.
4. MOUNT SMOKE DETECTOR IN ELEVATOR LOBBY AT EACH LEVEL WITHIN 10'-0" OF THE DOOR.
5. PROVIDE FLUSH JUNCTION BOX FOR TWO-WAY COMMUNICATIONS BETWEEN EACH ELEVATOR LOBBY LANDING PER NCBC 1009.8. PROVIDE 3/4"EC BETWEEN EACH J-BOX
6. TWO-WAY COMMUNICATION MASTER STATION. COORDINATE LOCATION WITH AHJ.
7. LIGHTS SHALL BE PROVIDED WITH A DEDICATED CIRCUIT. LIGHTS SHALL NOT BE CONNECTED TO THE LOAD SIDE TERMINALS OF THE CONVENIENCE RECEPTACLE.
8. PROVIDE A FOUR WAY SWITCH FOR SHAFT LIGHTS AT EACH INTERMEDIATE LEVEL.
9. PROVIDE TWO (2) CATEGORY 6A CABLES TO EACH ELEVATOR CONTROLLER FROM THE LOCAL TELECOM ROOM FOR NETWORK AND EMERGENCY PHONE INTERFACE. EXTEND INCOMING ANALOG DEMARC TO LOCAL TELECOM ROOM AS REQUIRED. ELEVATOR TRAVELER CABLE SHALL BE PROVIDED NY ELEVATOR INSTALLER. COORDINATE LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR.
10. 2' ENCLOSED ELEVATOR PIT AND SHAFT LIGHT. TYPICAL OF METALUX 2VT2-LD5-5000-DR-UNV-L850-WL-TEH OR EQUAL BY LITHONIA OR WILLIAMS. MAX OF 6" DEEP FIXTURE WITH CONDUIT HUBBED ENDS.
11. DISCONNECT FOR ELEVATOR POWER.
12. MOUNT BOTTOM OF LIGHT AND BOTTOM OF RECEPTACLE 12" ABOVE CAB DOOR OPENING ON EACH FLOOR.
13. 1"C WITH INITIATING CIRCUIT FOR HEAT DETECTOR, SMOKE DETECTOR AND RECALL RELAYS (3). PROVIDE PRIMARY FLOOR RECALL RELAY, SECONDARY FLOOR RECALL RELAY AND FIREMAN'S RED HAT RELAY FOR USE BY ELEVATOR INSTALLER. PROVIDE PROGRAMMING FOR ALL FIRE ALARM DEVICE FUNCTIONS.

1 ELEVATOR MACHINE ROOMLESS DETAIL
NO SCALE

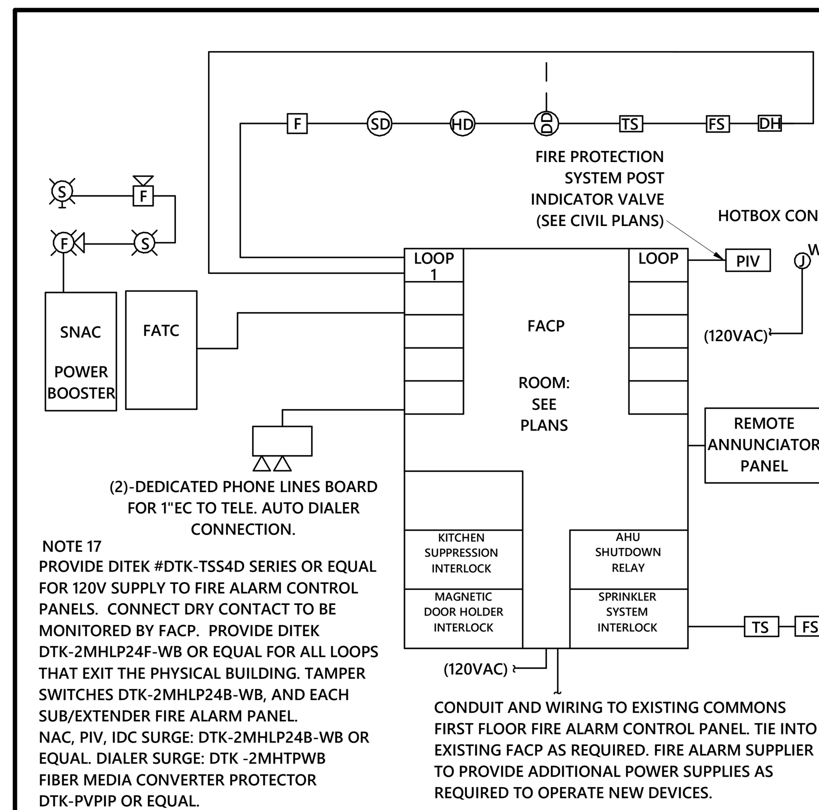


ALL BARS #4 GRADE 60 DEFORMED		
SHAPE DETAIL	SYMBOL	MARK
		4R1
		4R2
		4R3
		4R4
		4R5

2 BUILDING A LARGE PIT PAD
CONCRETE PIT PAD - COMPLETE CONSTRUCTION
NO SCALE



3 SERVICE GROUND DIAGRAM
NOT TO SCALE



FIRE ALARM NOTES

1. FACP SHALL HAVE A MINIMUM 24HR. BATTERY BACKUP.
2. FACP SHALL BE FULLY ANALOG ADDRESSABLE AND SHALL BE AN EXTENSION OF THE EXISTING BUILDING FIRE ALARM SYSTEM.
3. FACP SHALL BE CONNECTED TO A UL APPROVED CENTRAL STATION.
4. ZONE PER NFPA 72, 2013 AND MANUFACTURER'S RECOMMENDATIONS WITH NO ONE ZONE EXCEEDING 15,000 S.F. PER FLOOR.
5. COORDINATE QUANTITY AND LOCATIONS OF DEVICES WITH CONTRACT DRAWINGS.
6. LOCATE SMOKE DETECTOR WITHIN 5' OF THE MAGNETIC HOLD OPEN DOORS. (TYPICAL)
7. LOCATE FIRE ALARM PULL STATION WITHIN 5' OF THE EXIT DOOR.
8. LOCATE SMOKE/HEAT DETECTOR WITHIN 5' OF THE FA EQUIPMENT (FACP, FATC).
9. LOCATION OF CEILING MOUNTED SMOKE/HEAT DETECTOR SHALL BE FIELD COORDINATED PRIOR TO ROUGH IN. THE DETECTOR SHALL BE A MINIMUM OF 2' AWAY FROM LIGHT FIXTURE AND A MINIMUM OF 3' AWAY FROM AIR DISTRIBUTION DEVICES.
10. AUTOMATIC DOOR CLOSING SHALL BE ACCOMPLISHED BY THE ACTIVATION OF THE LOCAL SMOKE DETECTORS AT THAT DOOR. SMOKE DETECTOR ACTIVATION SHALL ALERT THE BUILDING FIRE ALARM SYSTEM. THE FIRE ALARM SYSTEM SHALL CAUSE ALL HOLD OPEN DOORS TO CLOSE UPON ALARM ACTIVATION IN THE BUILDING.
11. ACTIVATION OF AN ALARM ZONE SHALL CAUSE ALL AIR HANDLING EQUIPMENT TO SHUT DOWN (ALL DAMPERS, AIR HANDLERS AND EXHAUST FANS MUST STOP).
12. ACTIVATION OF KITCHEN HOOD SUPPRESSION SYSTEM PROVIDES SIGNAL TO FACP WHICH IN TURN ACTIVATES ALL ANNUNCIATING ZONES & CUTS OFF AHU SUPPLY AIR.
13. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT LOCATIONS OF ALL FLOW, PRESSURE, & TAMPER SWITCHES WITH FIRE PROTECTION CONTRACTOR PRIOR TO INSTALLATION.
14. ALL VISUAL DEVICES WITHIN THE SAME AREA SHALL BE SYNCHRONIZED. IT SHALL BE A THREE BEAT TEMPORAL PATTERN.
15. ALL FIRE ALARM WIRING SHALL BE IN CONDUIT./FIRE ALARM CABLING SHALL BE PLENUM RATED.
16. PROVIDE MULTI-TEMPORAL SOUNDING CAPABILITY AT ALL AUDIO DEVICES FOR EMERGENCY NOTIFICATION FOR NON VOICE SYSTEMS COMPONENTS.
17. THE FIRE ALARM SYSTEM MANUFACTURER SHALL PROVIDE NOTIFICATION APPLIANCE CIRCUIT (NAC) POWER EXTENDERS AS REQUIRED.
18. THE DUCT SMOKE DETECTORS SHALL COMPLY WITH IFC 907.12.
19. SLEEPING AREAS SHALL COMPLY WITH NPFA 72 2013 SECTION 18.4.5.3. WHERE AUDIBLE APPLIANCES ARE PROVIDED TO PRODUCT SIGNALS FOR SLEEPING AREAS, THEY SHALL PRODUCE A LOW FREQUENCY ALARM SIGNAL OF 520HZ SQUAREWAVE ALARM SIGNAL.
20. THE CIRCUIT FEEDING THE FIRE ALARM PANEL IS DEDICATED FOR THE FIRE ALARM ONLY. BREAKER SHALL BE PROVIDED WITH A LABEL "FIRE ALARM CIRCUIT" AND SHALL BE RED.
21. PROVIDE REMOTE LIGHT FOR DUCT SMOKE DETECTOR ON CEILING WHERE UNIT IS ABOVE CEILING.
22. CONTRACTOR SHALL INCLUDE IN BID LABOR AND MATERIAL FOR UP TO (2) DUCT DETECTORS. (5) ANNUNCIATION DEVICES, (2) SMOKE DETECTORS AND (2) PULL STATIONS 100' FROM LOCAL PANEL (IN WALL) AS REQUIRED BY LOCAL AHJ/ENGINEER.
23. CONTRACTOR RESPONSIBLE FOR SHOP DRAWINGS AS REQUIRED BY LOCAL AHJ.
24. DUCT DETECTORS SHALL BE VERIFIED WITH THE MECHANICAL DRAWINGS FOR QUANTITY AND LOCATION. TOTAL QUANTITY MINIMUM SHALL BE BASED ON BOTH MECHANICAL SCHEDULES AND MECHANICAL PLAN LOCATIONS AND ELECTRICAL PLANS. WHEN DEVICE QUANTITIES (ELECTRICAL VS. MECHANICAL) ARE IN CONFLICT, PROVIDE THE GREATER QUANTITY OF DETECTORS.

4 FIRE ALARM RISER DIAGRAM
NOT TO SCALE

FIRE ALARM SYSTEM MATRIX — BUILDING SYSTEM OUTPUTS

FIRE ALARM SYSTEM MATRIX	ACTIVATE COMMON ALARM SIGNAL INDICATOR	ACTIVATE AUDIBLE ALARM SIGNAL	ACTIVATE COMMON SUPERVISORY SIGNAL INDICATOR	ACTIVATE AUDIBLE SUPERVISORY INDICATOR	ACTIVATE COMMON TROUBLE SIGNAL INDICATOR	ACTIVATE AUDIBLE TROUBLE SIGNAL	ACTIVATE GENERAL EVACUATION SIGNAL	DISPLAY CHANGE OF STATUS	ACTIVATE EXTERNAL HORNS/STROBES	TRANSMIT FIRE ALARM SIGNAL TO CENTRAL STATION	TRANSMIT SUPERVISORY SIGNAL TO CENTRAL STATION	TRANSMIT TROUBLE SIGNAL TO CENTRAL STATION	RETURN CAB TO PRIMARY FLOOR	RETURN CAB TO SECONDARY FLOOR	SHUNT TRIP AFTER ELEV. REACHES DESIGNATED FLOOR	SHUT DOWN ALL HVAC UNITS	CLOSE FIRE/SMOKE DAMPER	CLOSE RESPECTIVE FIRE CURTAIN BY FLOOR	SHUT DOWN HVAC IN RESPECTIVE UNIT	ACTIVE SOUNDER BASE IN ALL RESPECTIVE UNIT SMOKE DETECTORS	
MANUAL FIRE ALARM PULL BOXES	X	X					X	X	X	X						X	X				
BUILDING SMOKE DETECTOR	X	X					X	X	X	X						X	X				
DUCT SMOKE DETECTOR			X	X				X			X					X	X				
SPRINKLER WATER FLOW	X	X					X	X	X	X						X	X				
SPRINKLER TAMPER			X	X				X			X										
ELEVATOR PRIMARY SMOKE DETECTOR	X	X					X	X	X	X				X				X			
ELEVATOR SECONDARY SMOKE DETECTOR	X	X					X	X	X	X			X					X			
ELEVATOR PIT, MECHANICAL ROOM HEAT DETECTOR	X	X					X	X	X	X					X						
NOTIFICATION DEVICE SHORT CIRCUIT					X	X		X				X									
OPEN CIRCUIT					X	X		X				X									
GROUND FAULT					X	X		X				X									
FIRE ALARM A.C. POWER FAILURE					X	X		X				X									
FIRE ALARM SYSTEM LOW BATTERY					X			X				X									
NOTIFICATION DEVICE SHORT CIRCUIT					X	X		X													
APT UNIT LOCAL SMOKE DETECTOR																				X	

PERMIT SET

STATE OF MISSOURI
KEITH PEH
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ELECTRICAL DETAILS

COMM. NO. 19132.00
DATE January 18, 2021
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SHEET 17 OF 24

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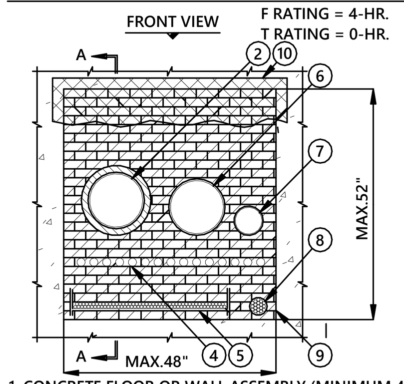
U.L. SYSTEM NO. WJ8007

MULTIPLE PENETRATING ITEMS THROUGH CONCRETE FLOOR OR WALL

F RATING = 4-HR.
T RATING = 0-HR.



1. CONCRETE FLOOR OR WALL ASSEMBLY (MINIMUM 4-1/2" THICK).
2. MAXIMUM 12" DIAMETER STEEL PIPE OR MAXIMUM 6" DIAMETER COPPER PIPE.
3. MAXIMUM 1-1/2" THICK GLASS-FIBER PIPE INSULATION.
4. 1-1/2" DIAMETER STEEL CONDUIT (MAXIMUM QUANTITY = 15).
5. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE : 36" x 6") WITH ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAXIMUM 30% FILL OF CABLE TRAY :
   A. MAXIMUM 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
   B. MAXIMUM 7/C NO. 12 AWG COPPER CONDUCTOR CABLE.
   C. MAXIMUM 300 PAIR NO. 24 AWG TELEPHONE CABLES.
6. MAXIMUM 30" DIAMETER STEEL PIPE (12" DIAMETER PIPE SHOWN).
7. 6" DIAMETER STEEL PIPE.
8. MAXIMUM 4" DIAMETER CABLE BUNDLE TO INCLUDE ANY OF THE FOLLOWING :
   A. FIBER-OPTIC CABLE (MAX. 1/2" DIA). D. 7/C NO. 12 AWG CABLES.
   B. ROMEX (2/C NO. 10 +GROUND). E. RG 62A COAXIAL CABLES.
   C. 25 PAIR NO. 24 AWG TELEPHONE CABLES. F. METAL CLAD CABLE (MAX. 3/4" DIA.).
9. HILTI FS 657 INTUMESCENT FIRESTOP BLOCK (2" TALL x 5" WIDE x 8" DEEP, REF: FRONT VIEW).
10. SEE NOTE NO. 4 BELOW.

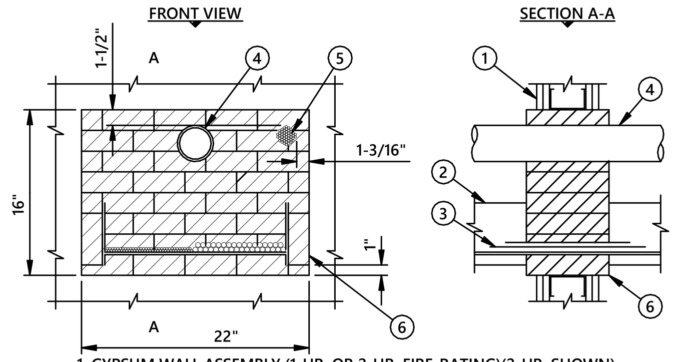
NOTES : 1. ANNULAR SPACING FOR CABLE TRAY = MINIMUM 1-1/2".
2. ANNULAR SPACING FOR PIPE AND CABLE PENETRATIONS = MINIMUM 1".
3. INSTALL HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT IN ANY VOID THAT MAY EXIST (AROUND CABLE TRAY, CABLES, OR PIPE PENETRATIONS).
4. IF THE ANNULAR SPACE IS GREATER THAN 5", PROVIDE A STEEL WIRE MESH (NOMINAL 2" SQUARES, NO. 16 SWG). INSTALL ON EACH SIDE OF WALL ASSEMBLY.
5. MAXIMUM AREA OF OPENING = 2496 SQUARE INCHES.

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

U.L. SYSTEM NO. WL8013

MULTIPLE PENETRATIONS THROUGH 1-HR. OR 2-HR. GYPSUM WALL

F RATING = 1-HR. OR 2-HR. L RATING AT AMBIENT = 5 CFM/SQ. FT.
T RATING = 0-HR. L RATING AT 400°F = 2 CFM/SQ. FT.



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. STEEL OR ALUMINUM CABLE TRAY (MAXIMUM SIZE : 18" x 6").
3. ANY OF THE FOLLOWING TYPES OF CABLE MAY BE USED WITH MAX. 30% FILL ON CABLE TRAY :
   A. 500 KCMIL SINGLE CONDUCTOR POWER CABLE.
   B. 7/C NO. 12 AWG COPPER CONDUCTOR CABLE.
   C. 300 PAIR NO. 24 AWG TELEPHONE CABLE.
4. MAXIMUM 3" DIAMETER PVC PLASTIC PIPE (SCHEDULE 40)(CLOSED OR VENTED PIPING SYSTEM).
5. CABLE BUNDLE (MAX. 2" DIA.) TO CONSIST OF ANY OF THE FOLLOWING:
   A. FIBER-OPTIC CABLE.
   B. RG 59 COAXIAL CABLE.
   C. 25 PAIR NO. 24 AWG TELEPHONE CABLE.
   D. 7/C NO. 12 AWG COPPER CONDUCTOR.
6. HILTI FS 657 FIRESTOP BLOCKS (2" x 5" x 8" DEEP, REF: FRONT VIEW).

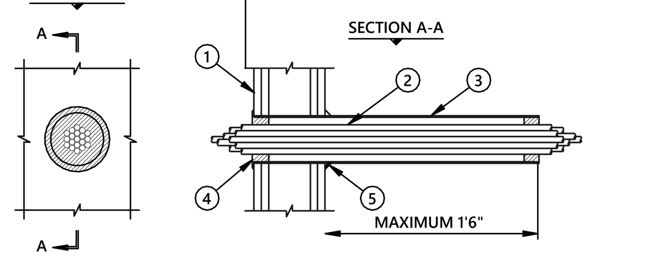
NOTES : 1. NOT SHOWN: PENETRATING ITEMS MAY ALSO INCLUDE A MAX. 4" DIA. STEEL OR COPPER PIPE, EMT, OR STEEL CONDUIT WITH A MAX. 1-1/2" GLASS-FIBER PIPE INSULATION OR NON-INSULATED MAX. 4" STEEL PIPE, EMT, OR CONDUIT.
2. ANNULAR SPACE = MINIMUM 1".
3. INSTALL HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT IN ANY VOID THAT MAY EXIST (AROUND PENETRATING ITEMS, OR BETWEEN BLOCKS).

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

U.L. SYSTEM NO. WL3065

CABLE BUNDLE THROUGH 1-HR. OR 2-HR. FIRE-RATED GYPSUM WALL

F RATING = 1-HR. OR 2-HR. L RATING AT AMBIENT = 5 CFM/SQ. FT.
T RATING = 0-HR. L RATING AT 400°F = 2 CFM/SQ. FT.



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. CABLE BUNDLE TO CONSIST OF ANY OF THE FOLLOWING :
   A. 7/C NO. 12 AWG CAGLES.
   B. 12 PAIR 24 AWG PHONE CABLES.
   C. 25 PAIR 24 AWG PHONE CABLES.
   D. RG 59 COAXIAL CABLES.
   E. 2/C (+GND) NO. 14 AWG METAL-CLAD CABLES.
   F. 2/C NO. 8 AWG METAL-CLAD CABLES.
   G. MAXIMUM 1/2" DIAMETER FIBER-OPTIC CABLES.
3. OPTIONAL : MAX. 4" NOM. DIA. STEEL PIPE SLEEVE (SCH. 40 OR THINNER)(SEE NOTE NO. 4).
4. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
   A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
5. SEE NOTE NO. 4 BELOW.

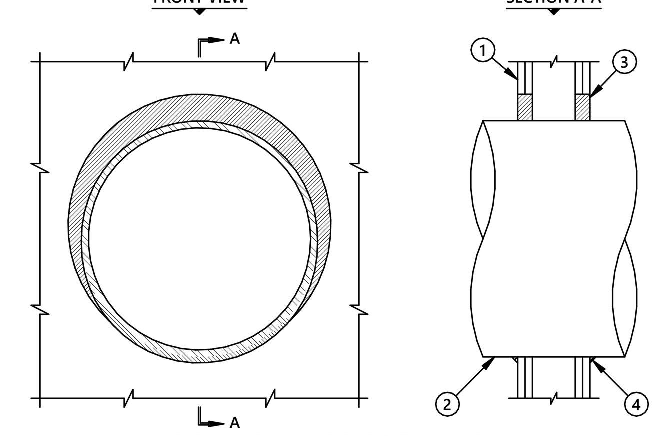
NOTES : 1. MAXIMUM DIAMETER OF OPENING = 4-1/2".
2. CABLES TO FILL MAXIMUM 33% OF AREA OF OPENING.
3. ANNULAR SPACE = MINIMUM 1/4", MAXIMUM 3/4".
4. STEEL SLEEVE MAY BE FLUSH WITH WALL SURFACE OR EXTEND UP TO 18" BEYOND WALL SURFACE IN ANY COMBINATION. WHEN SLEEVE IS FLUSH WITH WALL, APPLY HILTI FS-ONE FIRESTOP SEALANT ONTO WALL SURFACE. WHEN SLEEVE IS EXTENDED BEYOND ONE OR BOTH SIDES OF WALL, APPLY 1/2" CROWN HILTI FS-ONE FIRESTOP SEALANT TO WALL/SLEEVE INTERFACE.

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

U.L. SYSTEM NO. WL1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR. OR 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 4 CFM/SQ. FT.



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 30" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.
3. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT :
   A. MINIMUM 5/8" DEPTH OF SEALANT FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH OF SEALANT FOR A 2-HR. FIRE-RATING.
4. MINIMUM 1/2" BEAD HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT POINT OF CONTACT.

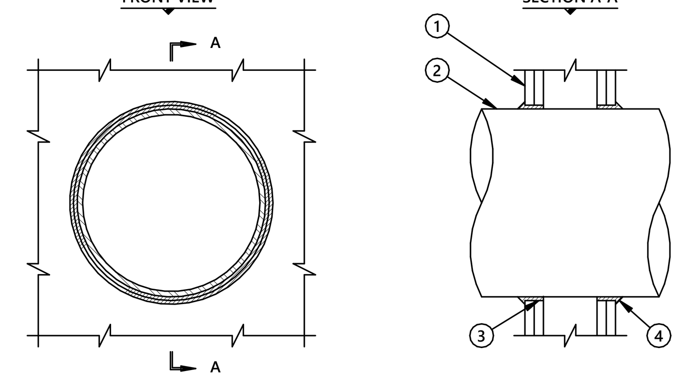
NOTES : 1. MAXIMUM DIAMETER OF OPENING = 32-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

U.L. SYSTEM NO. WL1085

EMT THROUGH 1-HR. OR 2-HR. GYPSUM WALL ASSEMBLY

F RATING = 1-HR. AND 2-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM WALL ASSEMBLY (1-HR. OR 2-HR. FIRE-RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING :
   A. MAXIMUM 12" DIAMETER STEEL PIPE (SCHEDULE 20 OR HEAVIER).
   B. MAXIMUM 12" DIAMETER CAST IRON PIPE.
   C. MAXIMUM 6" DIAMETER COPPER PIPE.
   D. MAXIMUM 6" DIAMETER EMT.
   E. MAXIMUM 6" DIAMETER STEEL CONDUIT.
3. HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT FORCED INTO ANNULAR SPACE TO MAXIMUM EXTENT.
4. MINIMUM 1/2" BEAD HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT AT PIPE/GYPSUM WALLBOARD INTERFACE.

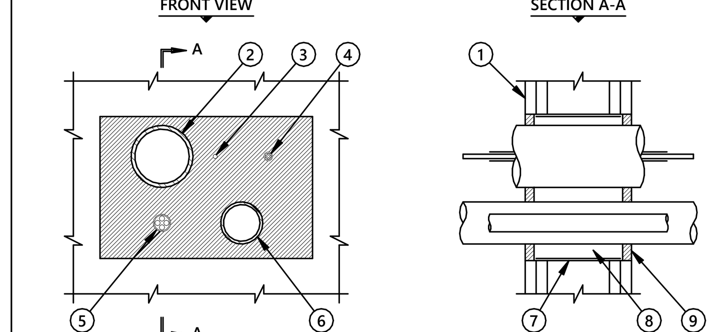
NOTE : ANNULAR SPACE = MINIMUM 0", MAXIMUM 1/4".

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000

U.L. SYSTEM NO. WL8004

MULTIPLE METAL PIPE AND CABLE THROUGH 2-HR. GYPSUM WALL

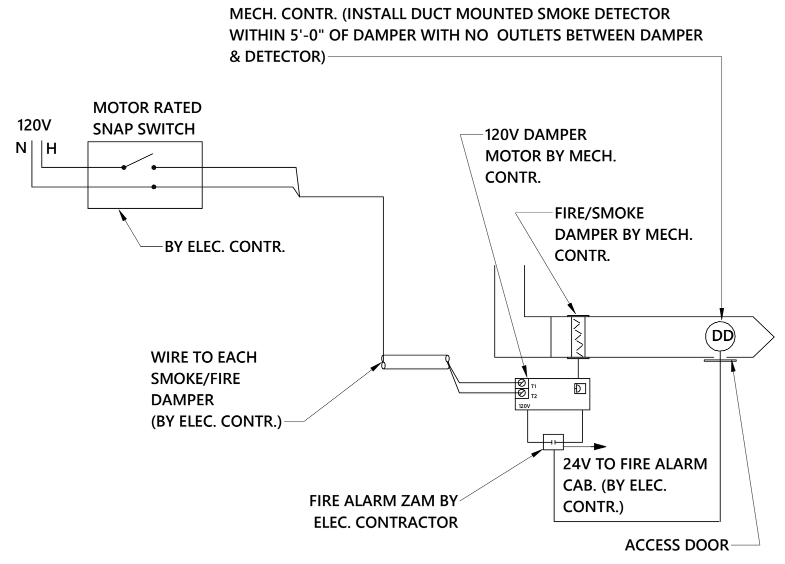
F RATING = 2-HR.
T RATING = 1/4-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM WALL ASSEMBLY (2-HR. FIRE-RATING).
2. MAXIMUM 3" DIAMETER ELECTRICAL METALLIC TUBING (EMT).
3. MAXIMUM 25 PAIR NO. 24 AWG (OR SMALLER) TELEPHONE CABLES.
4. MAXIMUM 3/C NO. 10 AWG NM (WITH GROUND) POWER CABLE WITH PVC INSULATION.
5. MAXIMUM 300 KCMIL (OR SMALLER) POWER CABLE WITH PVC INSULATION & NYLON JACKET.
6. MAXIMUM 2" DIAMETER STEEL PIPE, COPPER PIPE, EMT, OR STEEL CONDUIT.
7. NO. 8 STEEL WIRE MESH, 4-3/4" LONG (OR STANDARD METAL DRYWALL TRACK SCREWED SECURELY IN PLACE) CENTERED IN OPENING.
8. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
9. MIN. 1/2" DEPTH HILTI FS-ONE HIGH PERFORMANCE INTUMESCENT FIRESTOP SEALANT.

NOTES : 1. MAXIMUM AREA OF OPENING = 96 SQUARE INCHES WITH A MAX. DIM. OF 12".
2. DISTANCE BETWEEN ITEMS = MINIMUM 1-3/4", MAXIMUM 7".
3. DISTANCE FROM EDGE OF OPENING = MINIMUM 1/2", MAXIMUM 7". (EXCEPTION: 300 KCMIL POWER CABLE MUST BE MINIMUM 1-1/2" FROM EDGE OF OPENING.

SEE HILTI FIRESTOP INSTALLATION MANUAL FOR ADDITIONAL INSTRUCTIONS
HILTI, INC. TULSA, OK 1-800-879-8000



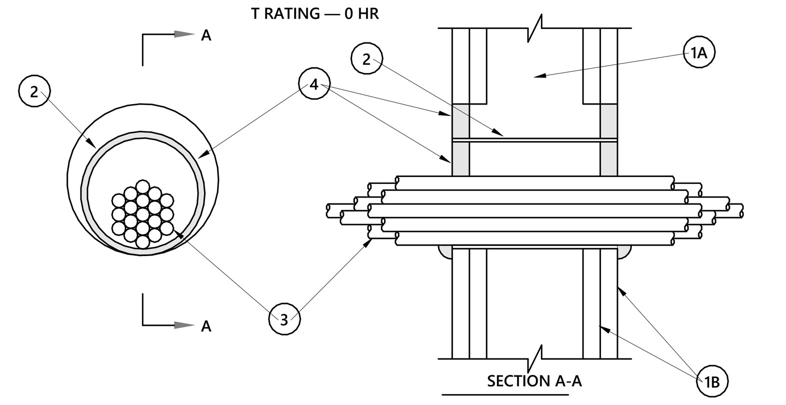
NOTES:
1. ALL FIRE/SMOKE DAMPERS SUPPLIED AND INSTALLED BY MECHANICAL CONTRACTOR. ALL FIRE ALARM WIRING INSTALLED BY ELECTRICAL CONTRACTOR. 120V WIRING TO DAMPER PROVIDED AND INSTALLED BY ELECTRICAL CONTRACTOR.

3 SMOKE/FIRE DAMPER WIRING DETAIL

NO SCALE

SYSTEM NO. W-L-3065

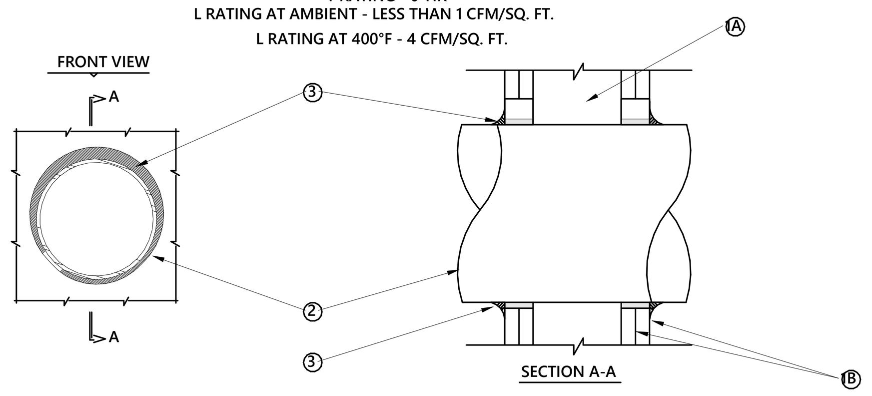
F RATINGS — 1 AND 2 HR (SEE ITEM 1)
T RATING — 0 HR



1. WALL ASSEMBLY — THE 1 OR 2 FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS — WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC. STEEL STUDS TO BE MIN 2-1/2 IN. (64 MM) WIDE AND SPACED MAX 24 IN. (610 MM) OC.
   B. GYPSUM BOARD* — NOM 5/8 IN. (16 MM) THICK GYPSUM BOARD, WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300, U400 OR V400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIA OF OPENING IS 5-1/2 IN. (138 MM) WHEN SLEEVE (ITEM 2) IS EMPLOYED. MAX DIA OF OPENING IS 4 IN. (102 MM) WHEN SLEEVE (ITEM 2) IS NOT EMPLOYED.
   THE F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE FIRE RATING OF THE WALL ASSEMBLY.
2. METALLIC SLEEVE — (OPTIONAL) - NOM 4 IN. (102 MM) DIA (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT) OR SCHEDULE 5 (OR HEAVIER) STEEL PIPE OR MIN 0.016 IN. THICK (0.41 MM, NO. 28 GA) GALV STEEL SLEEVE INSTALLED FLUSH WITH WALL SURFACES. THE ANNULAR SPACE BETWEEN STEEL SLEEVE AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. (0 MM, POINT CONTACT) TO MAX 1 IN. (25MM). WHEN SCHEDULE 5 STEEL PIPE OR EMT IS USED, SLEEVE MAY EXTEND UP TO 18 IN. (457 MM) BEYOND THE WALL SURFACES.
3. CABLES — AGGREGATE CROSS-SECTIONAL AREA OF CABLE IN OPENING TO BE MAX 45 PERCENT OF THE CROSS-SECTIONAL AREA OF THE OPENING. THE ANNULAR SPACE BETWEEN THE CABLE BUNDLE AND THE PERIPHERY OF THE OPENING TO BE MIN 0 IN. (0 MM, POINT CONTACT) TO MAX 1 IN. (25 MM) CABLES TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE WALL ASSEMBLY. ANY COMBINATION OF THE FOLLOWING TYPES AND SIZES OF COPPER CONDUCTOR CABLES MAY BE USED:
   A. MAX 7/C NO. 12 AWG WITH POLYVINYL CHLORIDE (PVC) INSULATION AND JACKET.
   B. MAX 25 PAIR NO. 24 AWG TELEPHONE CABLE WITH PVC INSULATION AND JACKET.
   B1. MAX 4 PR NO. 22 AWG CAT 5 OR CAT 6 COMPUTER CABLES.
   C. TYPE RG/U COAXIAL CABLE WITH POLYETHYLENE (PE) INSULATION AND PVC JACKET HAVING A MAX OUTSIDE DIAMETER OF ½ IN. (13 MM).
   C1. MAX RG 6/U COAXIAL CABLE WITH FLUORINATED ETHYLENE INSULATION AND JACKETING.
   D. MULTIPLE FIBER OPTICAL COMMUNICATION CABLE JACKETED WITH PVC AND HAVING A MAX OD OF 5/8 IN. (16 MM).
   E. THROUGH PENETRATING PRODUCTS*— MAX THREE COPPER CONDUCTOR NO. 8 AWG . METAL-CLAD CABLE+.
   AFC CABLE SYSTEMS INC
   F. MAX 3/C (WITH GROUND)(OR SMALLER) NO. 8 AWG COPPER CONDUCTOR CABLE WITH PVC INSULATION AND JACKETING.
   G. MAX 3/4 IN. (19 MM) DIA COPPER GROUND CABLE WITH OR WITHOUT A PVC JACKET.
   H. FIRE RESISTIVE CABLES* - MAX 1-1/4 IN. (32 MM) DIA SINGLE CONDUCTOR OR MULTI CONDUCTOR TYPE MI CABLE. A MIN 1/8 IN. (3 MM) SEPARATION SHALL BE MAINTAINED BETWEEN MI CABLES AND ANY OTHER TYPES OF CABLE.
   I. MAX 4/C WITH GROUND 300KCMIL (OR SMALLER) ALUMINUM SER CABLE WITH PVC INSULATION AND JACKET.
   J. THROUGH PENETRATING PRODUCT* - ANY CABLES, METAL-CLAD CABLE+ OR ARMORED CABLE+ CURRENTLY CLASSIFIED UNDER THE THROUGH PENETRATING PRODUCTS CATEGORY.
   SEE THROUGH PENETRATING PRODUCT (XHLY) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
4. FILL, VOID OR CAVITY MATERIAL*— SEALANT OR PUTTY — FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH EACH END OF THE STEEL SLEEVE OR WALL SURFACE. FILL MATERIAL INSTALLED SYMMETRICALLY ON BOTH SIDES OF THE WALL. A MIN 5/8 IN. (16 MM) THICKNESS OF SEALANT IS REQUIRED FOR THE 1 OR 2 HR F RATING . AN ADDITIONAL 1/2 IN. (13 MM) DIA BEAD OF FILL MATERIAL SHALL BE APPLIED AROUND THE PERIMETER OF SLEEVE ON BOTH SIDES OF THE WALL WHEN SLEEVE EXTENDS BEYOND SURFACE OF WALL.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CP601S, CP606, FS-ONE SEALANTS OR CP618 PUTTY

*BEARING THE UL CLASSIFICATION MARK
+BEARING THE UL LISTING MARK

F RATING - 1-HR OR 2-HR (SEE ITEM 1B)
T RATING - 0-HR
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F - 4 CFM/SQ. FT.



1. WALL ASSEMBLY - THE 1 OR 2 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.

B. GYPSUM BOARD* - 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIA OF OPENING IS 13-1/4 IN.

DIA OF CIRCULAR OPENING CUT THROUGH GYPSUM WALLBOARD OF EACH SIDE OF WALL ASSEMBLY TO BE MIN 1/4 IN. TO MAX 1/2 IN. LARGER THAN OUTSIDE DIA OF THROUGH PENETRANT (ITEM 2). THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANTS - ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE ANNUIAR SPACE BETWEEN THE THROUGH-PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE MIN 0 IN. TO MAX 1/4 IN. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

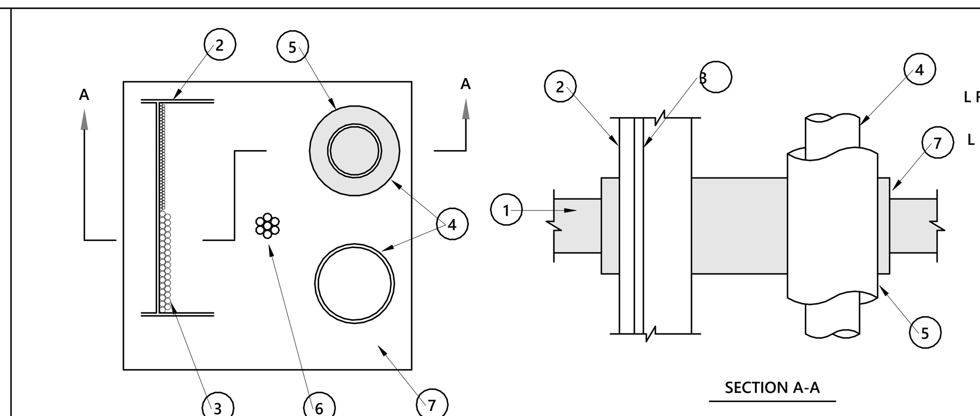
A. STEEL PIPE - NOM 12 IN. DIA (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE - NOM 12 IN. DIA (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. CONDUIT - NOM 6 IN. DIA (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR STEEL CONDUIT.
D. COPPER TUBING - NOM 5 IN. DIA (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER TUBING - NOM 6 IN. DIA (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. FILL, VOID, OR CAVITY MATERIAL* - SEALANT - FILL MATERIAL TO BE FORCED INTO THE ANNULUS TO MAXIMUM EXTENT POSSIBLE. ADDITIONAL FILL MATERIAL TO BE INSTALLED SUCH THAT A MIN 1/2 IN. CROWN IS FORMED AROUND THE PENETRATING ITEM AND LAPPING 1/4 IN. BEYOND THE PERIPHERY OF THE OPENING.

HILTI FIRESTOP SYSTEMS
REPRODUCED BY HILTI, INC.
COURTESY OF UNDERWRITERS LABORATORIES, INC.

System No. C-AJ-8056

F Rating -- 3 Hr
T Rating -- 0 Hr
L Rating At Ambient -- 5 CFM/sq ft
L Rating At 400 F -- 2 CFM/sq ft

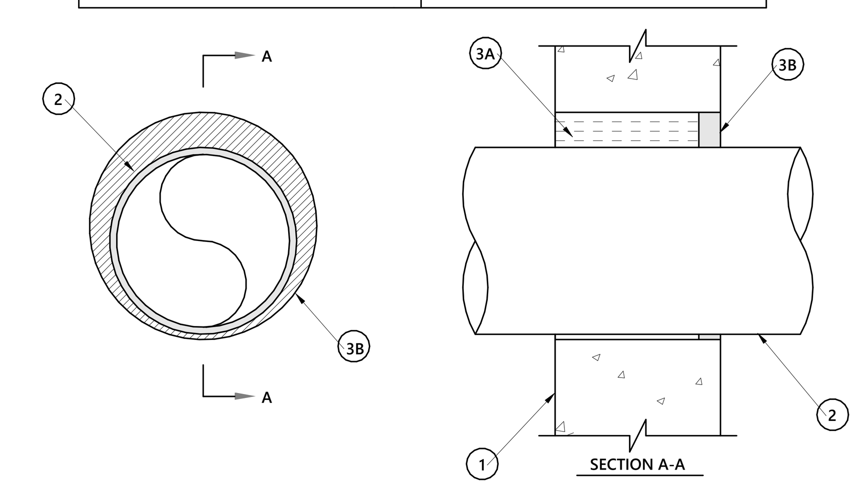


1. FLOOR OR WALL ASSEMBLY -- 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX AREA OF OPENING IS 1296 IN. SQ WITH MAX DIMENSION OF 36 IN.
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. CABLE TRAY* -- MAX 18 IN. WIDE BY MAX 6 IN. DEEP OPEN-LADDER OR SOLID-BACK CABLE TRAY WITH CHANNEL-SHAPED SIDE RAILS FORMED OF 0.060 IN. THICK ALUMINUM OR STEEL AND WITH 1-1/2 IN. WIDE BY 1 IN. CHANNEL SHAPE RUNGS SPACED 9 IN. OC OR A 0.029 IN. THICK STEEL SOLID BACK, RESPECTIVELY. ONE CABLE TRAY TO BE INSTALLED IN THE OPENING. THE MAX ANNULAR SPACE BETWEEN THE CABLE TRAYS IS 9 IN. AND BETWEEN THE PERIPHERY OF THE OPENING SHALL BE MIN 1-1/2 IN. TO MAX 4-1/2 IN. CABLE TRAY TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
3. CABLES -- AGGREGATE CROSS-SECTIONAL AREA OF CABLES IN CABLE TRAY TO BE MAX 30 PERCENT OF THE CROSS-SECTIONAL AREA OF THE CABLE TRAY BASED ON A MAX 3 IN. CABLE LOADING DEPTH WITHIN THE CABLE TRAY. ANY COMBINATION OF THE FOLLOWING TYPES AND SIZES OF COPPER CONDUCTOR OR FIBER OPTIC CABLES MAY BE USED:
A. 7/C NO. 12 AWG WITH POLYVINYL CHLORIDE (PVC) INSULATION AND PVC JACKET.
B. 300 PAIR - NO. 24 AWG CABLE WITH PVC INSULATION AND JACKET.
C. 1/C, 350 KCMIL WITH CROSS-LINKED POLYETHYLENE (XLPE) INSULATION AND JACKET.
D. 1/C, 500 KCMIL WITH THERMO PLASTIC INSULATION AND POLYVINYL CHLORIDE (PVC) JACKET.
E. TWENTY FOUR FIBER OPTIC CABLE WITH PVC SUB UNIT AND JACKET.
4. THROUGH-PENETRANTS -- ONE OR MORE PIPE, CONDUIT OR TUBE TO BE INSTALLED WITHIN THE OPENING. THE TOTAL NUMBER OF THROUGH-PENETRANTS IS DEPENDENT ON THE SIZE OF THE OPENING AND TYPES AND SIZES OF THE PENETRANTS. ANY COMBINATION OF THE PENETRANTS DESCRIBED BELOW MAY BE USED PROVIDED THAT THE FOLLOWING PARAMETERS RELATIVE TO THE ANNULAR SPACES AND THE SPACING BETWEEN THE PIPES ARE MAINTAINED. THE SPACE BETWEEN PIPES, CONDUITS OR TUBING AND BETWEEN THE PERIPHERY OF THE OPENING AND THE PIPES OR CONDUITS SHALL BE MIN 1 IN. TO MAX 4-1/2 IN. PIPE, CONDUIT OR TUBE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. NOM 6 IN. DIA (OR SMALLER) RIGID GALV STEEL CONDUIT.
B. NOM 4 IN. DIA (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
C. NOM 4 IN. DIA (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
D. NOM 4 IN. DIA (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBE.
E. NOM 6 IN. DIA (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
F. NOM 6 IN. DIA (OR SMALLER) CAST OR DUCTILE IRON PIPE.
5. PIPE COVERING -- NOM 1-1/2 IN. THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT TAPE SUPPLIED WITH THE PRODUCT.
SEE PIPE AND EQUIPMENT COVERING AND MATERIALS (BRGU) CATEGORY IN THE BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 MAY BE USED.
6. CABLES -- MAX 2 IN. DIA TIGHT BUNDLE OF CABLES CENTERED IN OPENING AND RIGIDLY SUPPORTED ON BOTH SURFACES OF FLOOR AND WALL. ANY COMBINATION OF THE FOLLOWING TYPES AND SIZES OF CABLES MAY BE USED:
A. 7/C NO. 12 AWG WITH POLYVINYL CHLORIDE (PVC) INSULATION AND PVC JACKET.
B. 25 PAIR - NO. 24 AWG CABLE WITH PVC INSULATION AND JACKET.
C. 2/C NO. 10 AWG WITH PVC INSULATION AND JACKET.
D. 3/C NO. 8 AWG ALUMINUM CLAD CABLE WITH CROSS-LINKED POLYETHYLENE (XLPE) INSULATION AND PVC JACKET.
E. TYPE RC - 62 A/U COAXIAL CABLE WITH AIR CORE AND PVC JACKET.
F. 24 FIBER OPTIC CABLE WITH PVC SUB UNIT AND OUTER JACKET.
7. FIRESTOP SYSTEM -- THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
A. FILL, VOID OR CAVITY MATERIAL* -- FIRE BLOCKS INSTALLED WITH LONG DIMENSION PASSED THROUGH THE OPENING EXTENDING MIN 1-1/2 IN. FROM EACH SURFACE. BLOCKS TO COMPLETELY FILL THE ENTIRE OPENING.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-FIRE BLOCK
B. FILL, VOID OR CAVITY MATERIAL* -- FILL MATERIAL TO BE FORCED INTO INTERSTICES OF CABLES AND BETWEEN CABLES AND CABLE TRAYS TO MAX EXTENT POSSIBLE ON BOTH SURFACES OF THE PENETRATION.
HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC -- FS-ONE SEALANT
C. WIRE MESH (NOT SHOWN) -- WHEN THE ANNULAR SPACE EXCEEDS 4-1/2 IN. TO THE PERIPHERY, A NOM 2 IN. SQ WIRE FENCING SHALL BE USED TO KEEP THE FIRE BLOCKS IN PLACE. THE WIRE FENCING IS FABRICATED FROM MIN NO. 16 SWG (0.060 IN.) GALV STEEL WIRE. THE WIRE IS CUT TO FIT THE CONTOUR OF THE PENETRATING ITEM WITH A MIN 3 IN. LAP BEYOND THE PERIPHERY OF THE OPENING. WIRE FENCING SECURED TO TOP SURFACE OF FLOOR AND BOTH SURFACES OF WALL ASSEMBLY BY MEANS OF 1/4 IN. DIA BY 1 IN. LONG CONCRETE ANCHORS AND 1/4 IN. BY 1-1/2 IN. DIA FENDER WASHERS SPACED MAX 8 IN. OC.
*BEARING THE UL CLASSIFICATION MARK

SYSTEM NO. W-J-1088

ANSI/UL1479 (ASTM E814)	CAN/ULC S115
F RATING - 1 AND 2 HR (SEE ITEM 3)	F RATING - 1 AND 2 HR (SEE ITEM 3)
T RATING - 0 HR	FT RATING - 0 HR
	FH RATING - 1 AND 2 HR (SEE ITEM 3)
	FTH RATING - 0 HR

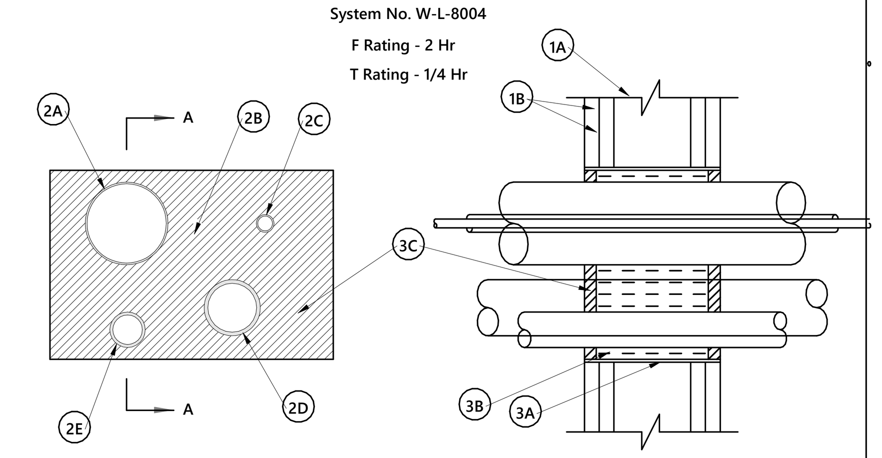


1. WALL ASSEMBLY — MIN 3-3/4 IN. (95 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAMETER OF OPENING 10-1/2 IN. (267 MM).
SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH-PENETRANTS — ONE METALLIC PIPE, CONDUIT OR TUBING TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. AN ANNULAR SPACE OF MIN 1/4 IN. TO MAX 1-5/8 IN. (41 MM) IS REQUIRED WITHIN FIRESTOP SYSTEM. PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:
A. STEEL PIPE — NOM 8 IN. (203 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE — NOM 8 IN. (203 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
C. CONDUIT — NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING (EMT) OR 6 IN. DIAM STEEL CONDUIT.
D. COPPER TUBING — NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER PIPE — NOM 4 IN. (102 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
F. FLEXIBLE STEEL CONDUIT+ — NOM 2 IN. (51 MM) DIAM (OR SMALLER) FLEXIBLE STEEL CONDUIT.
SEE FLEXIBLE METAL CONDUIT (DXUZ) CATEGORY IN THE ELECTRICAL CONSTRUCTION EQUIPMENT DIRECTORY FOR NAMES OF MANUFACTURERS.

HILTI FIRESTOP SYSTEMS
REPRODUCED BY HILTI, INC.
COURTESY OF UNDERWRITERS LABORATORIES, INC.

System No. W-L-8004

F Rating - 2 Hr
T Rating - 1/4 Hr



1. WALL ASSEMBLY THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC. ADDITIONAL FRAMING (NOT SHOWN) MAY BE INSTALLED AROUND THE PERIMETER OF THE OPENING IN LIEU OF THE STEEL WIRE MESH (ITEM NO. 3A).
   B. GYPSUM BOARD* TWO LAYERS OF NOM 5/8 IN. THICK GYPSUM WALLBOARD, AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX AREA OF OPENING IS 96 SQ IN. WITH MAX DIMENSION OF 12 IN. MAX WIDTH OF OPENING IN WOOD STUD WALLS IS LIMITED TO 12 IN.
2. THROUGH PENETRANTS THE FOLLOWING TYPES AND SIZES OF PIPES, CONDUITS, TUBING OR CABLES MAY BE USED:
   A. NOM 3 IN. DIA (OR SMALLER) ELECTRICAL METALLIC TUBING (EMT).
   B. MAX 25 PAIR -- NO. 24 AWG (OR SMALLER) TELEPHONE CABLE WITH POLYVINYL CHLORIDE (PVC) INSULATION AND JACKET.
   C. MAX 3/C WITH GROUND -- NO. 10 AWG (OR SMALLER) TYPE NM CABLE WITH PVC INSULATION AND JACKET.
   D. NOM 2 IN. DIA (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS ONLY.
   E. MAX 300 KCMIL (OR SMALLER) POWER CABLE WITH PVC INSULATION AND NYLON JACKET. THE THROUGH PENETRATING ITEMS TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY AND LOCATED AS SHOWN IN THE TABLE BELOW:

ITEM NO.	MAX DISTANCE BETWEEN ADJACENT PEN. ITEM IN.	MIN DISTANCE BETWEEN ADJACENT PEN. ITEM IN.	MAX DISTANCE FROM THROUGH OPENING IN.	MIN DISTANCE FROM THROUGH OPENING IN.
2A	7-7/16	1-11/16	7-7/16	1/2
2B	7-7/16	1-11/16	7-7/16	1/2
2C	7-7/16	1-11/16	7-7/16	1/2
2D	7-7/16	1-11/16	7-7/16	1/2
2E	7-7/16	1-11/16	7-7/16	1-1/2

3. FIRESTOP SYSTEM THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   A. STEEL WIRE MESH NO. 8 STEEL WIRE MESH HAVING A MIN 1 IN. LAP ALONG THE LONGITUDINAL SEAM. LENGTH OF STEEL WIRE MESH TO BE 4-3/4 IN., CENTERED AND FORMED TO FIT PERIPHERY OF THROUGH OPENING. STEEL WIRE MESH IS NOT REQUIRED WHEN ADDITIONAL FRAMING MEMBERS (ITEM NO. 1A) ARE USED.
   B. PACKING MATERIAL MIN 4.0 IN. THICKNESS OF MIN 3.5 PCF MINERAL WOOL BATT INSULATION FIRMLY PACKED INTO OPENING AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL.
   C. FILL, VOID OR CAVITY MATERIAL* - SEALANT MIN 1/2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH BOTH SURFACES OF WALL.
   HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-ONE SEALANT
*BEARING THE UL CLASSIFICATION MARKING

HILTI FIRESTOP SYSTEMS
REPRODUCED BY HILTI, INC.
COURTESY OF UNDERWRITERS LABORATORIES, INC.

PERMIT SET

STATE OF MISSOURI — KEITH PEH — NUMBER E-25154 — PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ELECTRICAL DETAILS

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING E6.3
SHEET 18 OF 24

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ELECTRICAL FEEDER SCHEDULE

FEEDER AMPS	WIRE SIZE (AL)	WIRE SIZE (CU)
125 A	4#1/0, 1#4G, 2"C	4#1, 1#6G, 1-1/2"C
250 A	4-350 KCMIL, 1#2G, 3"C	4-250 KCMIL, 1#4G, 2-1/2"C
400 A	(2) 4-250 KCMIL, 1#1 G, 3"C	(2)-4#3/0, 1#3G, 2"C
600 A	(2) 4-500 KCMIL, 1#2/0G, 3-1/2"C	(2) 4-350 KCMIL, 1#1G, 3"C
800 A	(3) 4-400 KCMIL, 1#3/0G, 3-1/2"C	(3) 4-300 KCMIL, 1#1/0G, 3"C
3000 A*	(10) 4-500 KCMIL, 4"C	(8) 4-500 KCMIL, 3-1/2"C

ARC-FLASH STUDY NOTE:

A. VENDOR SHALL PROVIDE FULL COORDINATION STUDY, BREAKER SETTING AND LABELS. STUDY SHALL BE FURNISHED AS PART OF GEAR SUBMITTAL PACKAGE.

GENERAL NOTES: UNITS

A. PROVIDE 4" HIGH FORMED CONCRETE HOUSEKEEPING PAD FOR ALL FLOOR MOUNTED ELECTRICAL GEAR.
B. COORDINATE ALL REQUIREMENTS AND LOCATIONS OF TRANSFORMER WITH UTILITY COMPANY.
C. THE USE OF ALUMINUM WIRE IS ACCEPTABLE ABOVE 50A.

2 POWER RISER DIAGRAM
1/8" = 1'-0"

PERMIT SET

STATE OF NORTH CAROLINA
KEITH PATRICK DOWDY
E-25154
PROFESSIONAL ENGINEER
01/18/2021

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PROJECT TITLE
John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	ZK
DRAWN BY	:	DG
CHECKED BY	:	ZK
APPROVED BY	:	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ELECTRICAL RISER DIAGRAM

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING E7.1
SHEET 19 OF 24

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SINGLE DWELLING UNIT FEEDER & SERVICE LOAD CALCULATION
UNIT / SUITE: C **(Standard Calculation)**

Voltage (L-L):	208	Volts
Phase:	1	
Floor Area:	1034	Sq Ft

Project Name: JKV Meadows Phase II
Project #: 20-0220
By: DG
Date: 1/4/2021

LOAD		kVA	QTY	kVA	NOTES
General Lighting Load		3.10	1	3.10	3 VA/SF
(2) Small Appliance Circuits		3.00	1	3.00	(2) Dedicated 20A Ckts (w/ GFCI-P)
Laundry Circuit		1.50	1	1.50	Dedicated 20A Ckt
Range Top		8.00	1	8.00	
Microwave/Oven		5.00	1	5.00	
Clothes Dryer		5.00	1	5.00	
A/C and Cooling	(208V)	0.00	0	0.00	Enter quantity for only the largest coincidental mechanical loads.
HP Compressor	(208V)	0.00	1	0.00	
Strip Heat	(208V)	5.25	1	5.25	
Electric Space Heat	(208V)	0.00	0	0.00	
Elec Thermal / Other	(208V)	0.00	0	0.00	
Water Heater	(208V)	0.00	0	0.00	
Water Heater	(120V)	0.00	0	0.00	
Dishwasher		1.20	1	1.20	(1) 20A Ckt for Dishwasher & Disposal
Disposal		1.00	1	1.00	(1) 20A Ckt for Dishwasher & Disposal
Refrigerator		0.80	1	0.80	Examples of fastened in place appliances are compactors, furnace motors, attic fans, water pumps, etc. Add these appliances individually where applicable.
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
TOTAL CONNECTED LOAD FOR UNIT		**33.85**	**kVA**		

DEMAND LOAD (PHASE)		DEMAND LOAD (NEUTRAL)	
1st 10 kVA @ 100%	10.00kVA	Gen Ltg, Small Appliance, Laundry	7.60
Remaining @ 40%	7.4408kVA	1st 3 kVA @ 100%	3.00kVA
A/C & Cooling @ 100%	0.00kVA	> 3 kVA to 120 kVA @ 35%	1.61kVA
HP Compressor @ 100%	0.00kVA	> 120 kVA @ 25%	0.00kVA
HP Strip Heat @ 65%	3.41kVA	Remaining L-N Loads @ 100%	3.00kVA
Electric Space Heat @ 65%	0.00kVA	Dryer Load @ 70%	3.50kVA
Electric Space Heat @ 40%	0.00kVA	Range Load @ 70%	4.48kVA
Electric Thermal & Other Heating	0.00kVA	Unbalanced load > 200A @ 70%	0.00kVA
TOTAL DEMAND LOAD (PHASE)	**20.85kVA 100.26AMPS**	**TOTAL DEMAND LOAD (NEUTRAL)**	**15.59kVA 74.96AMPS**

Quantity of 15A general lighting circuits (w/ AFCI-P) = **2**
OR
Quantity of 20A general lighting circuits (w/ AFCI-P) = **2**

AMP RATING OF THE GENERAL LIGHTING & RECEPTACLE CIRCUIT(S) SHALL BE AS INDICATED IN THE PANEL SCHEDULES.

NOTES:
1. Provide (1) dedicated 20A bathroom receptacle(s) circuit w/ GFCI-P per NEC 210.11(C)(3).
2. Provide GFCI protection for all locations as defined per NEC 210.8(A).
3. Provide AFCI protection for all locations as defined per NEC 210.12(A).
4. Calculations are based on a 120/240-Volt, 1-Phase, 3-Wire or 120/208-volt, 1-Phase, 3-Wire service.

SINGLE DWELLING UNIT FEEDER & SERVICE LOAD CALCULATION
UNIT / SUITE: F **(Standard Calculation)**

Voltage (L-L):	208	Volts
Phase:	1	
Floor Area:	1222	Sq Ft

Project Name: JKV Meadows Phase II
Project #: 20-0220
By: DG
Date: 1/4/2021

LOAD		kVA	QTY	kVA	NOTES
General Lighting Load		3.67	1	3.67	3 VA/SF
(2) Small Appliance Circuits		3.00	1	3.00	(2) Dedicated 20A Ckts (w/ GFCI-P)
Laundry Circuit		1.50	1	1.50	Dedicated 20A Ckt
Range Top		8.00	1	8.00	
Microwave/Oven		5.00	1	5.00	
Clothes Dryer		5.00	1	5.00	
A/C and Cooling	(208V)	0.00	0	0.00	Enter quantity for only the largest coincidental mechanical loads.
HP Compressor	(208V)	0.00	1	0.00	
Strip Heat	(208V)	5.63	1	5.63	
Electric Space Heat	(208V)	0.00	0	0.00	
Elec Thermal / Other	(208V)	0.00	0	0.00	
Water Heater	(208V)	0.00	0	0.00	
Water Heater	(120V)	0.00	0	0.00	
Dishwasher		1.20	1	1.20	(1) 20A Ckt for Dishwasher & Disposal
Disposal		1.00	1	1.00	(1) 20A Ckt for Dishwasher & Disposal
Refrigerator		0.80	1	0.80	Examples of fastened in place appliances are compactors, furnace motors, attic fans, water pumps, etc. Add these appliances individually where applicable.
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
TOTAL CONNECTED LOAD FOR UNIT		**34.79**	**kVA**		

DEMAND LOAD (PHASE)		DEMAND LOAD (NEUTRAL)	
1st 10 kVA @ 100%	10.00kVA	Gen Ltg, Small Appliance, Laundry	8.17
Remaining @ 40%	7.6664kVA	1st 3 kVA @ 100%	3.00kVA
A/C & Cooling @ 100%	0.00kVA	> 3 kVA to 120 kVA @ 35%	1.81kVA
HP Compressor @ 100%	0.00kVA	> 120 kVA @ 25%	0.00kVA
HP Strip Heat @ 65%	3.66kVA	Remaining L-N Loads @ 100%	3.00kVA
Electric Space Heat @ 65%	0.00kVA	Dryer Load @ 70%	3.50kVA
Electric Space Heat @ 40%	0.00kVA	Range Load @ 70%	4.48kVA
Electric Thermal & Other Heating	0.00kVA	Unbalanced load > 200A @ 70%	0.00kVA
TOTAL DEMAND LOAD (PHASE)	**21.32kVA 102.51AMPS**	**TOTAL DEMAND LOAD (NEUTRAL)**	**15.79kVA 75.90AMPS**

Quantity of 15A general lighting circuits (w/ AFCI-P) = **3**
OR
Quantity of 20A general lighting circuits (w/ AFCI-P) = **2**

AMP RATING OF THE GENERAL LIGHTING & RECEPTACLE CIRCUIT(S) SHALL BE AS INDICATED IN THE PANEL SCHEDULES.

NOTES:
1. Provide (1) dedicated 20A bathroom receptacle(s) circuit w/ GFCI-P per NEC 210.11(C)(3).
2. Provide GFCI protection for all locations as defined per NEC 210.8(A).
3. Provide AFCI protection for all locations as defined per NEC 210.12(A).
4. Calculations are based on a 120/240-Volt, 1-Phase, 3-Wire or 120/208-volt, 1-Phase, 3-Wire service.

SINGLE DWELLING UNIT FEEDER & SERVICE LOAD CALCULATION
UNIT / SUITE: G **(Standard Calculation)**

Voltage (L-L):	208	Volts
Phase:	1	
Floor Area:	1289	Sq Ft

Project Name: JKV Meadows Phase II
Project #: 20-0220
By: DG
Date: 1/4/2021

LOAD		kVA	QTY	kVA	NOTES
General Lighting Load		3.87	1	3.87	3 VA/SF
(2) Small Appliance Circuits		3.00	1	3.00	(2) Dedicated 20A Ckts (w/ GFCI-P)
Laundry Circuit		1.50	1	1.50	Dedicated 20A Ckt
Range Top		8.00	1	8.00	
Microwave/Oven		5.00	1	5.00	
Clothes Dryer		5.00	1	5.00	
A/C and Cooling	(208V)	0.00	0	0.00	Enter quantity for only the largest coincidental mechanical loads.
HP Compressor	(208V)	0.00	1	0.00	
Strip Heat	(208V)	5.63	1	5.63	
Electric Space Heat	(208V)	0.00	0	0.00	
Elec Thermal / Other	(208V)	0.00	0	0.00	
Water Heater	(208V)	0.00	0	0.00	
Water Heater	(120V)	0.00	0	0.00	
Dishwasher		1.20	1	1.20	(1) 20A Ckt for Dishwasher & Disposal
Disposal		1.00	1	1.00	(1) 20A Ckt for Dishwasher & Disposal
Refrigerator		0.80	1	0.80	Examples of fastened in place appliances are compactors, furnace motors, attic fans, water pumps, etc. Add these appliances individually where applicable.
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
TOTAL CONNECTED LOAD FOR UNIT		**34.99**	**kVA**		

DEMAND LOAD (PHASE)		DEMAND LOAD (NEUTRAL)	
1st 10 kVA @ 100%	10.00kVA	Gen Ltg, Small Appliance, Laundry	8.37
Remaining @ 40%	7.7466kVA	1st 3 kVA @ 100%	3.00kVA
A/C & Cooling @ 100%	0.00kVA	> 3 kVA to 120 kVA @ 35%	1.88kVA
HP Compressor @ 100%	0.00kVA	> 120 kVA @ 25%	0.00kVA
HP Strip Heat @ 65%	3.66kVA	Remaining L-N Loads @ 100%	3.00kVA
Electric Space Heat @ 65%	0.00kVA	Dryer Load @ 70%	3.50kVA
Electric Space Heat @ 40%	0.00kVA	Range Load @ 70%	4.48kVA
Electric Thermal & Other Heating	0.00kVA	Unbalanced load > 200A @ 70%	0.00kVA
TOTAL DEMAND LOAD (PHASE)	**21.40kVA 102.90AMPS**	**TOTAL DEMAND LOAD (NEUTRAL)**	**15.86kVA 76.24AMPS**

Quantity of 15A general lighting circuits (w/ AFCI-P) = **3**
OR
Quantity of 20A general lighting circuits (w/ AFCI-P) = **2**

AMP RATING OF THE GENERAL LIGHTING & RECEPTACLE CIRCUIT(S) SHALL BE AS INDICATED IN THE PANEL SCHEDULES.

NOTES:
1. Provide (1) dedicated 20A bathroom receptacle(s) circuit w/ GFCI-P per NEC 210.11(C)(3).
2. Provide GFCI protection for all locations as defined per NEC 210.8(A).
3. Provide AFCI protection for all locations as defined per NEC 210.12(A).
4. Calculations are based on a 120/240-Volt, 1-Phase, 3-Wire or 120/208-volt, 1-Phase, 3-Wire service.

SINGLE DWELLING UNIT FEEDER & SERVICE LOAD CALCULATION
UNIT / SUITE: H-2 (UNIT LOAD CALCULATIONS IS SIMILAR FOR UNIT: H1)

Voltage (L-L):	208	Volts
Phase:	1	
Floor Area:	1420	Sq Ft

Project Name: JKV Meadows Units
Project #: 20-0220
By: DG
Date: 1/4/2021

LOAD		kVA	QTY	kVA	NOTES
General Lighting Load		4.26	1	4.26	3 VA/SF
(2) Small Appliance Circuits		3.00	1	3.00	(2) Dedicated 20A Ckts (w/ GFCI-P)
Laundry Circuit		1.50	1	1.50	Dedicated 20A Ckt
Range Top		8.00	1	8.00	
Microwave/Oven		5.00	1	5.00	
Clothes Dryer		5.00	1	5.00	
A/C and Cooling	(208V)	0.00	0	0.00	Enter quantity for only the largest coincidental mechanical loads.
HP Compressor	(208V)	0.00	1	0.00	
Strip Heat	(208V)	5.63	1	5.63	
Electric Space Heat	(208V)	0.00	0	0.00	
Elec Thermal / Other	(208V)	0.00	0	0.00	
Water Heater	(208V)	0.00	0	0.00	
Water Heater	(120V)	0.00	0	0.00	
Dishwasher		1.20	1	1.20	(1) 20A Ckt for Dishwasher & Disposal
Disposal		1.00	1	1.00	(1) 20A Ckt for Dishwasher & Disposal
Refrigerator		0.80	1	0.80	Examples of fastened in place appliances are compactors, furnace motors, attic fans, water pumps, etc. Add these appliances individually where applicable.
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
(Fastened in Place Appliance)		0.00	0	0.00	
TOTAL CONNECTED LOAD FOR UNIT		**35.39**	**kVA**		

DEMAND LOAD (PHASE)		DEMAND LOAD (NEUTRAL)	
1st 10 kVA @ 100%	10.00kVA	Gen Ltg, Small Appliance, Laundry	8.76
Remaining @ 40%	7.904kVA	1st 3 kVA @ 100%	3.00kVA
A/C & Cooling @ 100%	0.00kVA	> 3 kVA to 120 kVA @ 35%	2.02kVA
HP Compressor @ 100%	0.00kVA	> 120 kVA @ 25%	0.00kVA
HP Strip Heat @ 65%	3.66kVA	Remaining L-N Loads @ 100%	3.00kVA
Electric Space Heat @ 65%	0.00kVA	Dryer Load @ 70%	3.50kVA
Electric Space Heat @ 40%	0.00kVA	Range Load @ 70%	4.48kVA
Electric Thermal & Other Heating	0.00kVA	Unbalanced load > 200A @ 70%	0.00kVA
TOTAL DEMAND LOAD (PHASE)	**21.56kVA 103.66AMPS**	**TOTAL DEMAND LOAD (NEUTRAL)**	**16.00kVA 76.90AMPS**

Quantity of 15A general lighting circuits (w/ AFCI-P) = **3**
OR
Quantity of 20A general lighting circuits (w/ AFCI-P) = **2**

AMP RATING OF THE GENERAL LIGHTING & RECEPTACLE CIRCUIT(S) SHALL BE AS INDICATED IN THE PANEL SCHEDULES.

NOTES:
1. Provide (1) dedicated 20A bathroom receptacle(s) circuit w/ GFCI-P per NEC 210.11(C)(3).
2. Provide GFCI protection for all locations as defined per NEC 210.8(A).
3. Provide AFCI protection for all locations as defined per NEC 210.12(A).
4. Calculations are based on a 120/240-Volt, 1-Phase, 3-Wire or 120/208-volt, 1-Phase, 3-Wire service.

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA PROFESSIONAL ENGINEER SEAL E-25154

01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: **KP**

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ELECTRICAL UNIT LOAD CALCULATIONS

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
E8.1	20 OF 24

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LIGHTING FIXTURE SCHEDULE

TYPE	DESCRIPTION	LAMP	WATTAGE	VOLTAGE	MFR	CATALOG SERIES	NOTE
C	6" RECESSED LED DOWNLIGHT	LED	26 W	120V	PRESCOLITE	CFT632EB - STF602LP32535K B6	6" APERATURE MINIMUM 1250 LUMEN PACKAGE MINIMUM 10% DIMMING CLEAR SPECULAR
CE	6" RECESSED LED DOWNLIGHT (EMERGENCY)	LED	26 W	120V	PRESCOLITE	CFT632EB EM - STF602LP32535K B6	6" APERATURE MINIMUM 1250 LUMEN PACKAGE MINIMUM 10% DIMMING CLEAR SPECULAR BATTERY BACK UP
DF4	24" DRUM PENDANT	LED(GU24)	60 W	120V	JUSTICE DESIGN	CLD-9542	LED BULBS OLDE BRONZE FINISH
DF7	3 LIGHT BATHROOM VANITY	LED (A19)	45 W	120V	KICHLER APPROVED EQUAL	5098NI	ELEEN COLLECTION BRUSHED NICKEL FINISH DAMP LISTED
DF10	36" DRUM PENDANT	LED (E26)	60 W	120V	JUSTICE DESIGN GROUP	CLD	LED BULBS OLDE BRONZE FINISH
EMB1	INTERIOR EMERGENCY BATTERY EGRESS LIGHT AIMABLE	LED	9 W	120V	DUAL LITE APPROVED EQUAL APPROVED EQUAL	LZ SERIES APPROVED EQUAL APPROVED EQUAL	TEST SWITCH PROVIDED SEALED 90 MINUTE BATTERY 20' (ON CENTER) X 6'W DESIGN PATH SELF TEST SDRT WITH RTKIT
EVL1	2' VAPORTITE LED (ELEVATOR PIT LIGHT)	LED	32 W	UNIV	METALUX LITHONIA APPROVED EQUAL	2VT2 SERIES VTAPPROVED EQUAL APROVED EQUAL	5000 LUMENS,W/EMERGENCY BATTERY PACK,WET LOCATION LISTED
EX1B	EXIT SIGN	LED		120V	HUBBEL LIGHTING	DUAL LITE LXURWE	90 MINUTE OPERATION;RED TEST SWITCH PROVIDED UL LISTED FOR DAMP LOCATIONS
G	VANDAL RESISTANT SURFACE MOUNTED GARAGE LED	LED	36 W	120V	WILLIAMS	VG1 L30-740 T5-SM-DBZ DIM-UNV	VANDAL RESISTANT EXTRUDED ALUMINUM HOUSING POLYCARBONATE LENS DIE-CAST END CAPS 4000k, 4300 LUMENS
OA	6" ROUND WALL MOUNTED SCONCE	LED	24 W	120V	FCC LIGHTING APPROVED EQUAL APPROVED EQUAL	FCC610W-120-LED-35K-2000-BZ-WFL-BBU	BRONZE FINISH & WET LISTED. BATTERY BACKUP
RT	2'X2' VOLUMETRIC LED TROFFER	LED	26 W	120V	COLUMBIA LIGHTING APPROVED EQUAL APPROVED EQUAL	CFP22-3340-HE	0-10V DIMMING
RTE	2'X2' VOLUMETRIC LED TROFFER (EMERGENCY)	LED	26 W	120V	COLUMBIA LIGHTING APPROVED EQUAL APPROVED EQUAL	CFP22-3340-HE- ELL14	0-10V DIMMING WITH EMERGENCY BATTERY BACK UP
S1	4 FT. LED STRIP	LED	27 W	120V	LITHONIA	CLX-48-4000LM	PROVIDE CHAIN FOR PENDANT MOUNTING PROVIDE WIRE GUARD 4000 MINIMUM LUMENS LENSED
S1E	4 FT. LED STRIP (EMERGENCY)	LED	27 W	120V	LITHONIA	CLX-48-4000LM	PROVIDE CHAIN FOR PENDANT MOUNTING PROVIDE BATTERY BACKUP PROVIDE WIRE GUARD 4000 MINIMUM LUMENS LENSED
WF1	WALL MOUNTED LED STAIRWELL LIGHT	LED	32 W	120V	LIGHTCONTROL	4L-WID-04-SOS-C1-30K-D05-1C-UNV-NL-EF-NXE-S02	90 MIN EMERGENCY BATTERY BACKUP

LIGHTING FIXTURE SCHEDULE - SUITES

TYPE	DESCRIPTION	LAMP	WATTAGE	VOLTAGE	MFR	CATALOG SERIES	NOTE
UDF1	WALL MOUNTED LED SCONCE - UNIT ENTRY CORRIDOR	LED	21 W	120V	LOCHWOOD	WS83421	BLACK FINISH
UDF2	3 LIGHT BATHROOM VANITY	LED (E26)	45 W	120V	CANARM	PALMER IVL422A03BN	BRUSHED NICKEL FINISH. DAMP LOCATION LISTED.
UDF3	UNIT ENTRY & DINING ROOM LIGHTS	LED (A19)	15 W	120V	PROGRESS LIGHTING	P3852-09	BRUSHED NICKEL FINISH DAMP LISTED
UDF4	DECORATIVE LED PENDANT	LED (A19)	15 W	120V	KICHLER	42432AP	MINI PENDANT ANTIQUE PEWTER FINISH
UDF5A	CEILING FAN WITH LIGHT	LED	80 W	120V	HARBOR BREEZE	SAILOR BAY RLG52BNK5L	52" CEILING FAN LIGHT BRUSHED NICKEL FINISH
UDF5B	CEILING FAN WITH LIGHT	LED	80 W	120V	HARBOR BREEZE	SAILOR BAY RLG52NWZ5L	52" CEILING FAN LIGHT BRONZE FINISH
UDF6	CEILING MOUNTED TRACK LIGHT	LED	21 W	120V	HAMPTON BAY	17208S4-SN	BRUSHED NICKEL LED DIMMABLE FIXED TRACK WITH STRAIGHT BAR FROSTED SQUARE GLASS
UDF7	SHOWER LIGHT	LED	17 W	120V	PRESCOLITE	LBSLEDA10L30K9 WH	WET LOCATION RATED
UDF8	WALL MOUNTED EXTERIOR LED	LED (E26)	15 W	120V	PROGRESS LIGHTING APPROVED EQUAL	P6052-20	ANTIQUE BRONZE FINISH WET LOCATION LISTED
UDF10	22" UNDERCABINET LIGHT	LED	19 W	120V	KICHLER	4U27K22WHT	22" 2700K LED CABINET LIGHT TEXTURED WHITE
UDF12	46" LAUNDRY LIGHT SURFACE MOUNTED	LED	19 W	120V	LUMAX LIGHTING	CLDLED-18L-35K-02-9-FAR	CLDLED SERIES
UDF13	CLOSET LIGHT SURFACE MOUNTED	LED	23 W	120V	COLUMBIA LIGHTING	LAW4-30LW-ED1U	DAMP LOCATION LISTED

FAN SCHEDULE

SYMBOL	SERVES	TYPE	ELECTRICAL DATA		NO. OF POLES	CONTROLS	DISCONNECT
			VOLT	PH			
EF-2.1	RESTROOM	CLG MTD	120 V	1	1	2	W/EQUIPMENT
EF-2.2	HSKP	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-2.3	TRASH	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-3.1	HSKP	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-3.2	TRASH	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-4.1	HSKP	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-5.1	HSKP	CLG MTD	120 V	1	1	6	W/EQUIPMENT
EF-A1	APARTMENT BATHROOM	CLG MTD	120 V	1	1	4	W/EQUIPMENT
F-G1	GARAGE	WALL MTD	208 V	3	3	5	W/EQUIPMENT

EXHAUST FAN SCHEDULE CONTROLS:

1. WALL MOUNTED THERMOSTAT (REVERSE ACTING, SET FOR 80°)
2. INTERLOCK WITH ROOM LIGHT SWITCH (FAN SHALL OPERATE WHEN LIGHT IS ON IF ANY ROOM IS SERVED BY FAN)
3. WALL MOUNTED ON/OFF SWITCH WITH IDENTIFICATION LABEL
4. WALL SWITCH BY E.C. (WALL SWITCH SHALL MATCH LIGHT SWITCH)
5. CONTROLLED BY VENTILATION CONTROL SYSTEM
6. CONTINUOUS OPERATION
7. CONTROLLED BY THE FACP AND FIREMAN'S MANUAL OVER-RIDE CONTROL PANEL IN FIRE COMMAND ROOM. NO MECHANICAL CONTROL POINTS REQUIRED BY M.C. FOR SMOKE CONTROL FANS

COMMON AREA INDOOR UNIT SCHEDULE

ID	ELECRICAL DATA				DISCONNECT
	MCA	MOCP	VOLTAGE	PH	
IDU-2.1	50.4	60.0	208 V	1	60A/F60/3P/NEMA1
IDU-2.2	47.7	50.0	208 V	3	60A/F50/2P/NEMA1
IDU-2.3	48.8	50.0	208 V	1	60A/F50/2P/NEMA1
IDU-2.4	44.7	45.0	208 V	1	60A/F45/2P/NEMA1
IDU-3.1	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-3.2	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-3.3	48.8	50.0	208 V	1	60A/F50/2P/NEMA1
IDU-3.4	44.7	45.0	208 V	1	60A/F45/2P/NEMA1
IDU-4.1	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-4.2	48.8	50.0	208 V	1	60A/F50/2P/NEMA1
IDU-4.3	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-4.4	44.7	45.0	208 V	1	60A/F45/2P/NEMA1
IDU-5.1	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-5.2	48.8	50.0	208 V	1	60A/F50/2P/NEMA1
IDU-5.3	50.4	60.0	208 V	1	60A/F60/2P/NEMA1
IDU-5.4	44.7	45.0	208 V	1	60A/F45/2P/NEMA1
IDU-A	50.4	60.0	208 V	1	60A/F60/2P/NEMA1

HEAT PUMP SCHEDULE

ID	ELECTRICAL DATA				DISCONNECT
	MCA	FUSE	VOLTAGE	PH	
HP-2.1	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-2.2	14.5	25.0	208 V	3	30A/F25/3P/NEMA 3R
HP-2.3	18.3	30.0	208 V	1	30A/F30/2P/NEMA 3R
HP-2.4	14.2	25.0	208 V	1	30A/F25/2P/NEMA 3R
HP-3.1	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-3.2	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-3.3	18.3	30.0	208 V	1	30A/F30/2P/NEMA 3R
HP-3.4	14.2	25.0	208 V	1	30A/F25/2P/NEMA 3R
HP-4.1	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-4.2	18.3	30.0	208 V	1	30A/F30/2P/NEMA 3R
HP-4.3	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-4.4	14.2	25.0	208 V	1	30A/F25/2P/NEMA 3R
HP-5.1	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-5.2	18.3	30.0	208 V	1	30A/F30/2P/NEMA 3R
HP-5.3	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R
HP-5.4	14.2	25.0	208 V	1	30A/F25/2P/NEMA 3R
HP-A	11.7	20.0	208 V	3	30A/F20/3P/NEMA 3R

VTAC UNIT (VERTICAL PTAC) SCHEDULE

SYMBOL	ELECTRIC HEAT KW	POWER SUPPLY				DISCONNECT
		MCA	MOCP	VOLTAGE	PH	
VTAC-A	7	35.0	40.0	208	1	60A/F40/2P/NEMA1

OUTDOOR UNIT SCHEDULE

ID	ELECTRICAL DATA				DICONNECT
	MCA	MOCP	PHASE	VOLTAGE	
ODU-0.1	12.8 A	15.0 A	1	208 V	30A/F15/2P/NEMA 3R

INDOOR UNIT SCHEDULE

ID	ELECTRICAL DATA			INTERLOCK	DISCONNECT
	MCA	VOLTAGE	PHASE	ID	
IDU-0.1	0.3 A	208 V	1	ODU-0.1	MOTORIZED SWITCH

ELECTRIC WATER HEATER SCHEDULE

SYMBOL	KW	WATT		DISCONNECT
		VOLT	PH	
WH3	4.5	208 V	1	30A/F30/2P/NEMA1

ELECTRIC WALL HEATER SCHEDULE

SYMBOL	LOCATION	WATT	ELECTRIC DATA		DISCONNECT
			VOLT	PH	
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EUH-1	GARAGE (MULTIPLE LOCATIONS)	7500.0	208 V	3	W/EQUIPMENT
EWH-0.1	GARAGE STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-0.2	GARAGE STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-0.3	GARAGE STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-0.4	GARAGE STORAGE	1500.0	120 V	1	W/EQUIPMENT
EWH-0.5	GARAGE STORAGE	1500.0	120 V	1	W/EQUIPMENT
EWH-0.6	GARAGE STORAGE	1500.0	120 V	1	W/EQUIPMENT
EWH-0.7	GARAGE STORAGE	1500.0	120 V	1	W/EQUIPMENT
EWH-0.8	VESTIBULE	1500.0	120 V	1	W/EQUIPMENT
EWH-0.9	RAMP	1500.0	120 V	1	W/EQUIPMENT
EWH-1.1	SPRINKLER	1500.0	120 V	1	W/EQUIPMENT
EWH-3.1	3RD FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-3.2	3RD FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-3.3	3RD FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-5.1	5TH FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-5.2	5TH FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT
EWH-5.3	5TH FLOOR STAIRS	1500.0	120 V	1	W/EQUIPMENT

GENERAL NOTES

PERMIT SET

01/18/2021

1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	ZK
DRAWN BY	:	DG
CHECKED BY	:	ZK
APPROVED BY	:	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ELECTRICAL SCHEDULES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING E8.2

SHEET 21 OF 24

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SWITCHBOARD: SWBD2

VOLTAGE: 208Y/120 3Ø **MAIN TYPE:** MCB **MANUFACTUR...** SIEMENS
MOUNTING: FLOOR **PHASE:** 3 **TYPE:** SB
MAIN: 3000 A **WIRE:** 4 **AIC:** 65,000 KAIC

MAIN CB NOTES:

CKT/ID	LOAD SERVED	FRAME	TRIP	POLE	FEEDER	NOTES	Load
1	PANEL - DP2	800 A	800 A	3	SEE RISER DIAGRAM		505.9 kVA
2	PANEL - DP3	800 A	800 A	3	SEE RISER DIAGRAM		501.0 kVA
3	PANEL - DP4	800 A	800 A	3	SEE RISER DIAGRAM		495.8 kVA
4	PANEL - DP5	800 A	800 A	3	SEE RISER DIAGRAM		452.7 kVA
5	PANEL - HPG1	400 A	400 A	3	SEE RISER DIAGRAM		112.6 kVA
6	PANEL - HPG2	400 A	400 A	3	SEE RISER DIAGRAM		82.5 kVA
7	PANEL - HP5A & HP5B	600 A	600 A	3	SEE RISER DIAGRAM		133.9 kVA
8	PANEL - HP5C & HP5D	400 A	400 A	3	SEE RISER DIAGRAM		134.9 kVA
9	SPD	60 A	60 A	3	1" C - 4#6,1#6G		0.0 kVA
10	SPACE ONLY	--	--	--		--	0.0 kVA
11	SPACE ONLY	--	--	--		--	0.0 kVA
12	SPACE ONLY	--	--	--		--	0.0 kVA

Load Classification	Connected...	Demand...	Est. Demand	Ampacity
LIGHTS	15244 VA	125.00%	19055 VA	
LIGHTING - EXTERIOR	5140 VA	125.00%	6425 VA	
HEATING	243371 VA	100.00%	243371 VA	
COOLING	49419 VA	100.00%	49419 VA	
VENTILATION	8840 VA	100.00%	8840 VA	
MOTORS	0 VA	0.00%	0 VA	
KITCHEN	0 VA	0.00%	0 VA	
RECEPTACLES	49620 VA	60.08%	29810 VA	
WATER HEATER	6500 VA	100.00%	6500 VA	
MISC.	64600 VA	100.00%	64600 VA	
ELEVATOR	24000 VA	100.00%	24000 VA	
Spare	0 VA	0.00%	0 VA	
APARTMENT LOADS	1945480 VA	23.00%	447460 VA	1350.1 A
				62 and Over

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. ALL BREAKER SHALL BE AS REQUIRED PER PANEL AIC RATINGS.
2. PANEL SHALL BE FULLY RATED - SERIES RATINGS NOT ALLOWED.
3. ALL BUSSING, INCL GND AND NEUTRAL SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. UL. SERVICE ENTRANCE RATED.
6.PROVIDE LSI TRIP FUNCTIONS ON MAIN.
7.PROVIDE ARC FAULT MITIGATION ON MAIN.

TOTAL KVA (CONNECTED):	2419.2 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	906.5 kVA	7062.7 A	7059.2 A	6253.1 A
TOTAL AMP....	6715.1 A			
TOTAL AMP. (DEMAND):	2516.1 A			
Number Unit Load Centers	52	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	1945480 VA	0.25	486370 VA	1350.1 A

PANEL: DP2

VOLTAGE: 208Y/120 3Ø **FED FROM:** SWBD2
MOUNTING: SURFACE **MAIN TYPE:** MLO **MFR:** SIEMENS
ENCLOSURE: NEMA1 **PHASE:** 3 **TYPE:** P5
MAIN 800 A **WIRE:** 4 **AIC:** 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
AP A...	UNIT F - 2021	1	125 A	1	2	17.40	16.93					2	2	125 A	1	UNIT C - 2022	AP A...
				3				17.40	16.93				4				
AP A...	UNIT H2 - 2023	1	125 A	5	2					17.70	16.93	2	6	125 A	1	UNIT C - 2024	AP A...
				7		17.70	16.93						8				
AP A...	UNIT H2 - 2025	1	125 A	9	2			17.70	17.50			2	10	125 A	1	UNIT G - 2026	AP A...
				11						17.70	17.50		12				
AP A...	UNIT F - 2027	1	125 A	13	2	17.40	17.50					2	14	125 A	1	UNIT G - 2028	AP A...
				15				17.40	17.50				16				
AP A...	UNIT C-ADA - 2029	1	125 A	17	2					16.93	17.70	2	18	125 A	1	UNIT H1 - 2030	AP A...
				19		16.93	17.70						20				
AP A...	UNIT G - 2031	1	125 A	21	2			17.50	17.50			2	22	125 A	1	UNIT G - 2033	AP A...
				23						17.50	17.50		24				
AP A...	UNIT H1 - 2035	1	125 A	25	2	17.70	19.87					3	26	200 A	3/0	PANEL - HP2	Oth er; R...
				27				17.70	16.15				28				
--	SPACE ONLY	--	--	29	--					0.00	17.21		30				

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	2231 VA	125.00%	2789 VA	
LE	LIGHTING - EXTERIOR	1211 VA	125.00%	1514 VA	
H	HEATING	39176 VA	100.00%	39176 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	54 VA	100.00%	54 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	8060 VA	100.00%	8060 VA	
WH	WATER HEATER	0 VA	0.00%	0 VA	
MS	MISC.	800 VA	100.00%	800 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	452650 VA	41.00%	185587 VA	515.1 A
					12 - 13

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.

TOTAL KVA (CONNECTED):	505.88 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	239.68 kVA	1488.1 A	1464.9 A	1305.2 A
TOTAL AMP....	1404 A			
TOTAL AMP. (DEMAND):	665 A			
Number Unit Load Centers	13	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	452650 VA	0.41	185587 VA	515.1 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: DP3

VOLTAGE: 208Y/120 3Ø **FED FROM:** SWBD2
MOUNTING: SURFACE **MAIN TYPE:** MLO **MFR:** SIEMENS
ENCLOSURE: NEMA1 **PHASE:** 3 **TYPE:** P5
MAIN 800 A **WIRE:** 4 **AIC:** 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
AP A...	UNIT F - 3021	1	125 A	1	2	17.40	16.93					2	2	125 A	1	UNIT C - 3022	AP A...
				3				17.40	16.93				4				
AP A...	UNIT H2 - 3023	1	125 A	5	2					17.70	16.93	2	6	125 A	1	UNIT C - 3024	AP A...
				7		17.70	16.93						8				
AP A...	UNIT H2 - 3025	1	125 A	9	2			17.70	17.50			2	10	125 A	1	UNIT G - 3026	AP A...
				11						17.70	17.50		12				
AP A...	UNIT F - 3027	1	125 A	13	2	17.40	17.50					2	14	125 A	1	UNIT G - 3028	AP A...
				15				17.40	17.50				16				
AP A...	UNIT C - 3029	1	125 A	17	2					16.93	17.70	2	18	125 A	1	UNIT H1 - 3030	AP A...
				19		16.93	17.70						20				
AP A...	UNIT G - 3031	1	125 A	21	2			17.50	17.50			2	22	125 A	1	UNIT G - 3033	AP A...
				23						17.50	17.50		24				
AP A...	UNIT H1 - 3035	1	125 A	25	2	17.70	17.55					3	26	200 A	3/0	PANEL-HP3	Oth er; R...
				27				17.70	15.70				28				
--	SPACE ONLY	--	--	29	--					0.00	15.10		30				

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	1922 VA	125.00%	2403 VA	
LE	LIGHTING - EXTERIOR	1107 VA	125.00%	1383 VA	
H	HEATING	36832 VA	100.00%	36832 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	36 VA	100.00%	36 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	5960 VA	100.00%	5960 VA	
WH	WATER HEATER	1000 VA	100.00%	1000 VA	
MS	MISC.	0 VA	0.00%	0 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	452650 VA	41.00%	185587 VA	515.1 A
					12 - 13

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.

TOTAL KVA (CONNECTED):	501.01 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	234.70 kVA	1470.9 A	1463.3 A	1287.7 A
TOTAL AMP....	1391 A			
TOTAL AMP. (DEMAND):	651 A			
Number Unit Load Centers	13	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	452650 VA	0.41	185587 VA	515.1 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HPG1

VOLTAGE: 208Y/120 3Ø **FED FROM:** SWBD2
MOUNTING: SURFACE **MAIN TYPE:** MLO **MFR:** SIEMENS
ENCLOSURE: NEMA1 **PHASE:** 3 **TYPE:** P1
MAIN: 400 A **WIRE:** 4 **AIC:** 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
LI...	LTS - STAIR 1	12	20 A	1	1	0.33	1.10					2	2	20 A	12	ODU-0.1	HE A...
LI...	LTS - STAIR 2	12	20 A	3	1			0.33	1.10				4				
LI...	LTS - STAIR 3	12	20 A	5	1					0.33	0.20	1	6	20 A	12	MOTORIZED DAMPER	M...
LI...	LTS - GARAGE	12	20 A	7	1	1.17	0.36					1	8	20 A	12	REC - GARAGE	R...
LI...	LTS - GARAGE	12	20 A	9	1			1.12	5.20			2	10	80 A	3	EV CHARGER	MIS C.
LI...	LTS - GARAGE	12	20 A	11	1					1.11	5.20		12				
LI...	LTS - GARAGE	12	20 A	13	1	1.22	5.20					2	14	80 A	3	EV CHARGER	MIS C.
LI...	LTS - EXTERIOR	12	20 A	15	1			0.20	5.20				16				
R...	REC - 1002,1003,1007	12	20 A	17	1					1.26	5.20	2	18	80 A	3	EV CHARGER	MIS C.
R...	REC - 1004	12	20 A	19	1	1.26	5.20						20				
R...	REC -ELEC, BAS1	12	20 A	21	1			0.36	5.20			2	22	80 A	3	EV CHARGER	MIS C.
R...	REC -1018	12	20 A	23	1					0.54	5.20		24				
R...	REC - GARAGE	10	20 A	25	1	1.44	5.20					2	26	80 A	3	EV CHARGER	MIS C.
R...	REC - GARAGE	12	20 A	27	1			1.44	5.20				28				
R...	REC - EXTERIOR	12	20 A	29	1					0.18	2.91	3	30	35 A	8	F-G1	VE NTI L...
H...	EWH-0.1	12	20 A	31	1	1.50	2.91						32				
H...	EWH-0.2	12	20 A	33	1			1.50	2.91				34				
H...	EWH-0.3	12	20 A	35	1					1.50	2.00	3	36	30 A	10	GARAGE DOOR	RE CE P...
H...	EWH-0.4	12	20 A	37	1	1.50	2.00						38				
H...	EWH-0.5	12	20 A	39	1			1.50	2.00				40				
H...	EWH-0.6	12	20 A	41	1					1.50	2.00	3	42	30 A	10	GARAGE DOOR	RE CE P...
H...	EWH-0.7	12	20 A	43	1	1.50	2.00						44				
H...	EWH-0.8	12	20 A	45	1			1.50	2.00				46				
H...	EWH-0.9	12	20 A	47	1					1.50	0.00	1	48	20 A	--	SPARE	--
Ot...	MOTORIZED DOOR	12	20 A	49	1	0.50	0.00					1	50	20 A	--	SPARE	--
Ot...	MOTORIZED DOOR	12	20 A	51	1			0.50	0.00			1	52	20 A	--	SPARE	--
M...	ELEV #1 SMOKE CURTAIN	12	20 A	53	1					0.20	0.00	1	54	20 A	--	SPARE	--
M...	ELEV #2 SMOKE CURTAIN	12	20 A	55	1	0.20	0.00					1	56	20 A	--	SPARE	--
R...	REPEATER	12	20 A	57	1			0.60	0.00			1	58	20 A	--	SPARE	--
R...	REC - GARAGE	12	20 A	59	1					0.72	0.00	1	60	20 A	--	SPARE	--
M...	ELEV #1 SUMP PUMP	12	20 A	61	1	1.20	1.20					1	62	20 A	12	ELEV #2 SUMP PUMP	M...
M...	SUMP PUMP CONTROL - ELEV #1	12	20 A	63	1			0.50	0.50			1	64	20 A	12	SUMP PUMP CONTROL - ELEV #2	M...
R...	REC - ELEV #1 PIT	12	20 A	65	1					0.18	0.18	1	66	20 A	12	REC - ELEV #2 PIT	R...
LI...	LTS - ELEV #1 PIT	12	20 A	67	1	0.08	0.08					1	68	20 A	12	LTS - ELEV #2 PIT	LI...
M...	ELEV #1 LOBBY COMM SYSTEM	12	20 A	69	1			0.50	0.50			1	70	20 A	12	ELEV #2 LOBBY COMM SYSTEM	M...
--	SPARE	--	20 A	71	1					0.00	0.00	1	72	20 A	--	SPARE	--
M...	NACP - GARAGE (NOTE 5)	12	20 A	73	1	0.00	0.00					1	74	20 A	--	SPARE	--
M...	HOT BOX - SITE	12	20 A	75	1			1.50	0.00			1	76	20 A	--	SPARE	--
M...	HOT BOX - SITE	12	20 A	77	1					1.50	0.00	1	78	20 A	--	SPARE	--
R...	REC - GARAGE	12	20 A	79	1	0.72	0.00					1	80	20 A	--	SPARE	--
--	SPARE	--	20 A	81	1			0.00	0.00			1	82	20 A	--	SPARE	--
--	SPARE	--	20 A	83	1					0.00	0.00	1	84	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	5465 VA	125.00%	6832 VA
LE	LIGHTING - EXTERIOR	493 VA	125.00%	617 VA
H	HEATING	15700 VA	100.00%	15700 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	8718 VA	100.00%	8718 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	21240 VA	73.54%	15620 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	60000 VA	100.00%	60000 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	112.62...	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	108.49...	321.2 A	350.3 A	278.4 A
TOTAL AMP. (CONNECTED):	313 A			
TOTAL AMP. (DEMAND):	301 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: DP4

VOLTAGE: 208Y/120 3Ø **FED FROM:** SWBD2
MOUNTING: SURFACE **MAIN TYPE:** MLO **MFR:** SIEMENS
ENCLOSURE: NEMA1 **PHASE:** 3 **TYPE:** P5
MAIN 800 A **WIRE:** 4 **AIC:** 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
AP A...	UNIT F - 4021	1	125 A	1	2	17.40	16.93					2	2	125 A	1	UNIT C - 4022	AP A...
				3				17.40	16.93				4				
AP A...	UNIT H2 - 4023	1	125 A	5	2					17.70	16.93	2	6	125 A	1	UNIT C - 4024	AP A...
				7		17.70	16.93						8				
AP A...	UNIT H2 - 4025	1	125 A	9	2			17.70	17.50			2	10	125 A	1	UNIT G - 4026	AP A...
				11						17.70	17.50		12				
AP A...	UNIT F - 4027	1	125 A	13	2	17.40	17.50					2	14	125 A	1	UNIT G - 4028	AP A...
				15				17.40	17.50				16				
AP A...	UNIT C - 4029	1	125 A	17	2					16.93	17.70	2	18	125 A	1	UNIT H1 - 4030	AP A...
				19		16.93	17.70						20				
AP A...	UNIT G - 4031	1	125 A	21	2			17.50	17.50			2	22	125 A	1	UNIT G - 4033	AP A...
				23						17.50	17.50		24				
AP A...	UNIT H1 - 4035	1	125 A	25	2	17.70	14.58					3	26	200 A	3/0	PANEL-HP4	Oth er; R...
				27				17.70	13.73				28				
--	SPACE ONLY	--	--	29	--					0.00	14.83		30				

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	1809 VA	125.00%	2261 VA	
LE	LIGHTING - EXTERIOR	1164 VA	125.00%	1456 VA	
H	HEATING	32332 VA	100.00%	32332 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	18 VA	100.00%	18 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	6420 VA	100.00%	6420 VA	
WH	WATER HEATER	0 VA	0.00%	0 VA	
MS	MISC.	0 VA	0.00%	0 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	452650 VA	41.00%	185587 VA	515.1 A
					12 - 13

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.

TOTAL KVA (CONNECTED):	495.79 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	229.47 kVA	1443.8 A	1444.6 A	1285.4 A
TOTAL AMP....	1376 A			
TOTAL AMP. (DEMAND):	637 A			
Number Unit Load Centers	13	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	452650 VA	0.41	185587 VA	515.1 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: DP5

VOLTAGE: 208Y/120 3Ø **FED FROM:** SWBD2
MOUNTING: SURFACE **MAIN TYPE:** MLO **MFR:** SIEMENS
ENCLOSURE: NEMA1 **PHASE:** 3 **TYPE:** P5
MAIN 800 A **WIRE:** 4 **AIC:** 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
AP A...	UNIT F - 5021	1	125 A	1	2	17.40	16.93					2	2	125 A	1	UNIT C - 5022	AP A...
				3				17.40	16.93				4				
AP A...	UNIT H2 - 5023	1	125 A	5	2					17.70	16.93	2	6	125 A	1	UNIT C - 5024	AP A...
				7		17.70	16.93						8				
AP A...	UNIT H2 - 5025	1	125 A	9	2			17.70	17.50			2	10	125 A	1	UNIT G - 5026	AP A...
				11						17.70	17.50		12				
AP A...	UNIT F - 5027	1	125 A	13	2	17.40	17.50					2	14	125 A	1	UNIT G - 5028	AP A...
				15				17.40	17.50				16				
AP A...	UNIT C - 5029	1	125 A	17	2					16.93	17.70	2	18	125 A	1	UNIT H1 - 5030	AP A...
				19		16.93	17.70						20				
AP A...	UNIT G - 5031	1	125 A	21	2			17.50	17.50			2	22	125 A	1	UNIT G - 5033	AP A...
				23						17.50	17.50		24				
AP A...	UNIT H1 - 5035	1	125 A	25	2	17.70	0.00					1	26	20 A	--	SPARE	--
				27				17.70	0.00			1	28	20 A	--	SPARE	--
--	SPACE ONLY	--	--	29	--					0.00	0.00	1	30	20 A	--	SPARE	--

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	0 VA	0.00%	0 VA	
LE	LIGHTING - EXTERIOR	0 VA	0.00%	0 VA	
H	HEATING	0 VA	0.00%	0 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	0 VA	0.00%	0 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	0 VA	0.00%	0 VA	
WH	WATER HEATER	0 VA	0.00%	0 VA	
MS	MISC.	0 VA	0.00%	0 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	452650 VA	41.00%	185587 VA	515.1 A
					12 - 13

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.

TOTAL KVA (CONNECTED):	452.65 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	185.59 kVA	1322.7 A	1330.5 A	1161.8 A
TOTAL AMP....	1256 A			
TOTAL AMP. (DEMAND):	515 A			
Number Unit Load Centers	13	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	452650 VA	0.41	185587 VA	515.1 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)
F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

GENERAL NOTES

PERMIT SET

STATE OF MISSOURI KEITH PEH NUMBER E-25154 PROFESSIONAL ENGINEER
01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE
John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
PANEL SCHEDULES

COMM. NO. 19132.00
DATE January 18, 2021
DRAWING E8.3
SHEET 22 OF 24

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PANEL: HPG2

VOLTAGE:	208Y/120 3Ø			FED FROM:	SWBD2
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P1
MAIN:	400 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		2.50	2.50						2				
HE ATI NG	EUH-1	10	30 A	3	3			2.50	2.50			3	4	30 A	10	EUH-1	HE ATI NG
				5						2.50	2.50		6				
				7		2.50	2.50						8				
HE ATI NG	EUH-1	10	30 A	9	3			2.50	2.50			3	10	30 A	10	EUH-1	HE ATI NG
				11						2.50	2.50		12				
				13		2.50	2.50						14				
HE ATI NG	EUH-1	10	30 A	15	3			2.50	2.50			3	16	30 A	10	EUH-1	HE ATI NG
				17						2.50	2.50		18				
				19		2.50	2.50						20				
HE ATI NG	EUH-1	10	30 A	21	3			2.50	2.50			3	22	30 A	10	EUH-1	HE ATI NG
				23						2.50	2.50		24				
				25		2.50	0.00					1	26	20 A	--	SPARE	--
HE ATI NG	EUH-1	10	30 A	27	3			2.50	0.00			1	28	20 A	--	SPARE	--
				29						2.50	0.00	1	30	20 A	--	SPARE	--
				31		2.50	0.00					1	32	20 A	--	SPARE	--
HE ATI NG	EUH-1	10	30 A	33	3			2.50	0.00			1	34	20 A	--	SPARE	--
				35						2.50	0.00	1	36	20 A	--	SPARE	--
				37		2.50	0.00					1	38	20 A	--	SPARE	--
HE ATI NG	EUH-1	10	30 A	39	3			2.50	0.00			1	40	20 A	--	SPARE	--
				41						2.50	0.00	1	42	20 A	--	SPARE	--
--	SPARE	--	20 A	43	1	0.00	0.00					1	44	20 A	--	SPARE	--
--	SPARE	--	20 A	45	1			0.00	0.00			1	46	20 A	--	SPARE	--
--	SPARE	--	20 A	47	1					0.00	0.00	1	48	20 A	--	SPARE	--
--	SPARE	--	20 A	49	1	0.00	0.00					1	50	20 A	--	SPARE	--
--	SPARE	--	20 A	51	1			0.00	0.00			1	52	20 A	--	SPARE	--
--	SPARE	--	20 A	53	1					0.00	0.00	1	54	20 A	--	SPARE	--
--	SPARE	--	20 A	55	1	0.00	0.00					1	56	20 A	--	SPARE	--
--	SPARE	--	20 A	57	1			0.00	0.00			1	58	20 A	--	SPARE	--
--	SPARE	--	20 A	59	1					0.00	0.00	1	60	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0 VA	0.00%	0 VA
LE	LIGHTING - EXTERIOR	0 VA	0.00%	0 VA
H	HEATING	82500 VA	100.00%	82500 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	0 VA	0.00%	0 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.

TOTAL KVA (CONNECTED):	82.50 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	82.50 kVA	229.2 A	229.2 A	229.2 A
TOTAL AMP. (CONNECTED):	229 A			
TOTAL AMP. (DEMAND):	229 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP2

VOLTAGE:	208Y/120 3Ø			FED FROM:	DP2
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P1
MAIN:	250 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
O...	LTS - LEVEL 2	10	20 A	1	1	1.73	4.19					2	2	60 A	4	IDU-2.1	HE A...
LI...	LTS - LEVEL 2	10	20 A	3	1			0.66	4.19				4				
LI...	LTS - LEVEL 2	10	20 A	5	1					0.93	4.58		6				
LI...	LTS - EXTERIOR	10	20 A	7	1	0.13	4.58					3	8	50 A	6	IDU-2.2	HE ATI NG
--	SPARE	--	20 A	9	1			0.00	4.58				10				
R...	REC - LEVEL 2	12	20 A	11	1					1.26	4.06	2	12	50 A	6	IDU-2.3	HE A...
R...	REC - LEVEL 2	12	20 A	13	1	1.26	4.06						14				
R...	REC - LEVEL 2	12	20 A	15	1			1.26	3.72			2	16	45 A	6	IDU-2.4	HE A...
R...	REC - LEVEL 2	12	20 A	17	1					1.26	3.72		18				
R...	REC - LEVEL 2	12	20 A	19	1	0.72	1.50					1	20	20 A	12	EWH-1.1	H...
R...	REC - TELE 2012	12	20 A	21	1			0.72	0.02			1	22	20 A	12	EF-2.2	V...
R...	REC - RESTROOM 2004	12	20 A	23	1					0.18	0.02	1	24	20 A	12	EF-2.3	V...
R...	REC - EXTERIOR	10	20 A	25	1	0.90	0.00					1	26	20 A	--	SPARE	--
M...	NACP - LEVEL 2 (NOTE 5)	12	20 A	27	1			0.00	0.00			--	28	--	--	SPACE ONLY	--
M...	ELEV #1 SMOKE CURTAIN	12	20 A	29	1					0.40	0.00	--	30	--	--	SPACE ONLY	--
M...	ELEV #2 SMOKE CURTAIN	12	20 A	31	1	0.40	0.00					--	32	--	--	SPACE ONLY	--
O...	FIRE SMOKE DAMPER	12	20 A	33	1			0.60	0.00			--	34	--	--	SPACE ONLY	--
O...	FIRE SMOKE DAMPER	12	20 A	35	1					0.50	0.00	--	36	--	--	SPACE ONLY	--
O...	FIRE SMOKE DAMPER	12	20 A	37	1	0.20	0.00					--	38	--	--	SPACE ONLY	--
O...	FIRE SMOKE DAMPER	12	20 A	39	1			0.40	0.00			--	40	--	--	SPACE ONLY	--
R...	REPEATER	12	20 A	41	1					0.30	0.00	--	42	--	--	SPACE ONLY	--
R...	SPRINKLER BELL	12	20 A	43	1	0.20	0.00					--	44	--	--	SPACE ONLY	--
--	SPARE	--	20 A	45	1			0.00	0.00			--	46	--	--	SPACE ONLY	--
--	SPARE	--	20 A	47	1					0.00	0.00	--	48	--	--	SPACE ONLY	--
--	SPARE	--	20 A	49	1	0.00	0.00					--	50	--	--	SPACE ONLY	--
--	SPARE	--	20 A	51	1			0.00	0.00			--	52	--	--	SPACE ONLY	--
--	SPARE	--	20 A	53	1					0.00	0.00	--	54	--	--	SPACE ONLY	--
--	SPARE	--	20 A	55	1	0.00	0.00					--	56	--	--	SPACE ONLY	--
--	SPARE	--	20 A	57	1			0.00	0.00			--	58	--	--	SPACE ONLY	--
--	SPARE	--	20 A	59	1					0.00	0.00	--	60	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	2231 VA	125.00%	2789 VA
LE	LIGHTING - EXTERIOR	1211 VA	125.00%	1514 VA
H	HEATING	39176 VA	100.00%	39176 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	54 VA	100.00%	54 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	8060 VA	100.00%	8060 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	800 VA	100.00%	800 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
RF	RECEPTACLE - FUTURE	0 VA	0.00%	0 VA
LF	LIGHTING - FUTURE	0 VA	0.00%	0 VA
HF	HEATING - FUTURE	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	53.23 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	54.09 kVA	167.0 A	134.6 A	144.8 A
TOTAL AMP. (CONNECTED):	148 A			
TOTAL AMP. (DEMAND):	150 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP3

VOLTAGE:	208Y/120 3Ø			FED FROM:	DP3
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P1
MAIN:	250 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Ot...	LTS - LEVEL 3	12	20 A	1	1	1.46	4.19					2	2	60 A	4	IDU-3.1	HE A...
LI...	LTS - LEVEL 3	12	20 A	3	1			0.93	4.19				4				
LI...	LTS - LEVEL 3	12	20 A	5	1					0.63	2.80		6				
R...	REC - LEVEL 3	12	20 A	7	1	1.26	2.80					3	8	60 A	4	IDU-3.2	HE ATI NG
R...	REC - LEVEL 3	12	20 A	9	1			1.26	2.80				10				
R...	REC - LEVEL 3	12	20 A	11	1					1.26	4.06	2	12	50 A	6	IDU-3.3	HE A...
R...	REC - LEVEL 3	12	20 A	13	1	1.08	4.06						14				
R...	REC - HSKP 3005	12	20 A	15	1			0.18	3.72			2	16	45 A	6	IDU-3.4	HE A...
R...	REC - TELE 3012	12	20 A	17	1					0.72	3.72		18				
M...	NACP - LEVEL 3 (NOTE 5)	12	20 A	19	1	0.00	0.50					1	20	20 A	12	WH2 CONTROL - LEVEL3	W...
V...	EF-3.1	12	20 A	21	1			0.02	0.50			1	22	20 A	12	WH2 CONTROL - LEVEL 3	W...
Ot...	FIRE SMOKE DAMPER	12	20 A	23	1					0.40	0.02	1	24	20 A	12	EF-3.2	V...
Ot...	FIRE SMOKE DAMPER	12	20 A	25	1	0.50	1.50					1	26	20 A	12	EWH-3.1	H...
Ot...	FIRE SMOKE DAMPER	12	20 A	27	1			0.60	1.50			1	28	20 A	12	EWH-3.2	H...
Ot...	FIRE SMOKE DAMPER	12	20 A	29	1					0.00	1.50	1	30	20 A	12	EWH-3.3	H...
R...	REPEATER	12	20 A	31	1	0.20	0.00					--	32	--	--	SPACE ONLY	--
--	SPARE	--	20 A	33	1			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPARE	--	20 A	35	1					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPARE	--	20 A	37	1	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPARE	--	20 A	39	1			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPARE	--	20 A	41	1					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	1922 VA	125.00%	2403 VA
LE	LIGHTING - EXTERIOR	1107 VA	125.00%	1383 VA
H	HEATING	36832 VA	100.00%	36832 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	36 VA	100.00%	36 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	5960 VA	100.00%	5960 VA
WH	WATER HEATER	1000 VA	100.00%	1000 VA
MI	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	48.36 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	49.11 kVA	147.0 A	131.6 A	125.9 A
TOTAL AMP. (CONNECTED):	134 A			
TOTAL AMP. (DEMAND):	136 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP4

VOLTAGE:	208Y/120 3Ø			FED FROM:	DP4
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P1
MAIN:	250 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
LI...	LTS - LEVEL 4	12	20 A	1	1	0.61	4.19					2	2	60 A	4	IDU-4.1	HE A...
LI...	LTS - LEVEL 4	12	20 A	3	1			0.93	4.19				4				
Ot...	LTS - LEVEL 4	12	20 A	5	1					1.43	2.71		6				
R...	REC - LEVEL 4	12	20 A	7	1	1.26	2.71					3	8	50 A	6	IDU-4.2	HE ATI NG
R...	REC - LEVEL 4	12	20 A	9	1			1.08	2.71				10				
R...	REC - LEVEL 4	12	20 A	11	1					1.26	4.19	2	12	60 A	4	IDU-4.3	HE A...
R...	REC - LEVEL 4	12	20 A	13	1	0.90	4.19						14				
R...	REC - HSKP 4005	12	20 A	15	1			0.18	3.72			2	16	45 A	6	IDU-4.4	HE A...
R...	REC - TELE 4012	12	20 A	17	1					0.72	3.72		18				
M...	NACP - LEVEL 4 (NOTE 5)	12	20 A	19	1	0.00	0.02					1	20	20 A	12	EF-4.1	V...
R...	REC - 4004	12	20 A	21	1			0.72	0.00			--	22	--	--	SPACE ONLY	--
Ot...	FIRE SMOKE DAMPER	12	20 A	23	1					0.40	0.00	--	24	--	--	SPACE ONLY	--
Ot...	FIRE SMOKE DAMPER	12	20 A	25	1	0.40	0.00					--	26	--	--	SPACE ONLY	--
Ot...	FIRE SMOKE DAMPER	12	20 A	27	1			0.20	0.00			--	28	--	--	SPACE ONLY	--
Ot...	FIRE SMOKE DAMPER	12	20 A	29	1					0.40	0.00	--	30	--	--	SPACE ONLY	--
R...	REPEATER	12	20 A	31	1	0.30	0.00					--	32	--	--	SPACE ONLY	--
--	SPARE	--	20 A	33	1			0.00	0.00			--	34	--	--	SPACE ONLY	--
--	SPARE	--	20 A	35	1					0.00	0.00	--	36	--	--	SPACE ONLY	--
--	SPARE	--	20 A	37	1	0.00	0.00					--	38	--	--	SPACE ONLY	--
--	SPARE	--	20 A	39	1			0.00	0.00			--	40	--	--	SPACE ONLY	--
--	SPARE	--	20 A	41	1					0.00	0.00	--	42	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	1809 VA	125.00%	2261 VA
LE	LIGHTING - EXTERIOR	1164 VA	125.00%	1456 VA
H	HEATING	32332 VA	100.00%	32332 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	18 VA	100.00%	18 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	6420 VA	100.00%	6420 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MI	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	43.14 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	43.89 kVA	122.6 A	114.4 A	124.7 A
TOTAL AMP. (CONNECTED):	120 A			
TOTAL AMP. (DEMAND):	122 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP5B

VOLTAGE:	208Y/120 3Ø			FED FROM:	HP5A
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P1
MAIN:	250 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		1.13	1.12						2				
CO OLI NG	HP-2.1	12	20 A	3	3			1.13	1.12			3	4	20 A	12	HP-4.1	CO OLI NG
				5						1.13	1.12		6				
				7		1.40	1.52					2	8	30 A	10	HP-4.2	CO O...
CO OLI NG	HP-2.2	10	25 A	9	3			1.40	1.52				10				
				11						1.40	1.12		12				
CO O...	HP-2.3	10	30 A	13	2	1.50	1.12					3	14	20 A	12	HP-4.3	CO OLI NG
				15				1.50	1.12				16				
CO O...	HP-2.4	10	25 A	17	2					1.18	1.18	2	18	25 A	10	HP-4.4	CO O...
				19		1.18	1.18						20				
				21				1.12	1.12				22				
CO OLI NG	HP-3.1	12	20 A	23	3					1.12	1.12	3	24	20 A	12	HP-5.1	CO OLI NG
				25		1.12	1.12						26				
				27				1.12	1.52			2	28	30 A	10	HP-5.2	CO O...
CO OLI NG	HP-3.2	12	20 A	29	3					1.12	1.52		30				
				31		1.12	1.12						32				
CO O...	HP-3.3	10	30 A	33	2			1.52	1.12			3	34	20 A	12	HP-5.3	CO OLI NG
				35						1.52	1.12		36				
CO O...	HP-3.4	10	25 A	37	2	1.18	1.18					2	38	25 A	10	HP-5.4	CO O...
				39				1.18	1.18				40				
--	SPARE	--	20 A	41	1					0.00	0.00	1	42	20 A	--	SPARE	--
--	SPARE	--	20 A	43	1	0.00	0.00					1	44	20 A	--	SPARE	--
--	SPARE	--	20 A	45	1			0.00	0.00			1	46	20 A	--	SPARE	--
--	SPARE	--	20 A	47	1					0.00	0.00	1	48	20 A	--	SPARE	--
--	SPARE	--	20 A	49	1	0.00	0.00					1	50	20 A	--	SPARE	--
--	SPARE	--	20 A	51	1			0.00	0.00			1	52	20 A	--	SPARE	--
--	SPARE	--	20 A	53	1					0.00	0.00	1	54	20 A	--	SPARE	--
--	SPARE	--	20 A	55	1	0.00	0.00					1	56	20 A	--	SPARE	--
--	SPARE	--	20 A	57	1			0.00	0.00			1	58	20 A	--	SPARE	--
--	SPARE	--	20 A	59	1					0.00	0.00	1	60	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	0 VA	0.00%	0 VA
LE	LIGHTING - EXTERIOR	0 VA	0.00%	0 VA
H	HEATING	0 VA	0.00%	0 VA
C	COOLING	49419 VA	100.00%	49419 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	0 VA	0.00%	0 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MI	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	49.42 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	49.42 kVA	144.9 A	150.6 A	122.4 A
TOTAL AMP. (CONNECTED):	137 A			
TOTAL AMP. (DEMAND):	137 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP5A

VOLTAGE:	208Y/120 3Ø			FED FROM:	SWBD2
MOUNTING:	SURFACE	MAIN TYPE:	MLO	MFR:	SIEMENS
ENCLOSURE:	NEMA1	PHASE:	3	TYPE:	P5
MAIN:	600 A	WIRE:	4	AIC:	65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A		B		C		Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
O...	LTS - LEVEL 5	12	20 A	1	1	1.38	4.19					2	2	60 A	4	IDU-5.1	HE A...
LI...	LTS - LEVEL 5	12	20 A	3	1			0.61	4.19				4				
LI...	LTS - LEVEL 5	12	20 A	5	1					0.86	2.71		6				
O...	LTS - ROOF & ATTIC	12	20 A	7	1	0.98	2.71					3	8	50 A	6	IDU-5.2	HE ATI NG
R...	REC - LEVEL 5	12	20 A	9	1			1.44	2.71				10				
R...	REC - LEVEL 5	12	20 A	11	1					1.26	4.19	2	12	60 A	4	IDU-5.3	HE A...
R...	REC - LEVEL 5	12	20 A	13	1	1.26	4.19						14				
R...	REC - HSKP 5005	12	20 A	15	1			0.18	3.72			2	16	45 A	6	IDU-5.4	HE A...
--	SPARE	--	20 A	17	1					0.00	3.72		18				
M...	NACP - LEVEL 5 (NOTE 5)	12	20 A	19	1	0.00	17.03						20				
R...	REC - ROOF	12	20 A	21	1			1.08	17.71			3	22	250 A	250	PANEL - HP5B	CO OLI NG
R...	REC - 5004	12	20 A	23	1					0.72	14.69		24				
O...	FIRE SMOKE DAMPER	12	20 A	25	1	0.40	0.00					1	26	20 A	--	SPARE	--
O...	FIRE SMOKE DAMPER	12	20 A	27	1			0.40	0.00			1	28	20 A	--	SPARE	--
O...	FIRE SMOKE DAMPER	12	20 A	29	1					0.20	0.00	1	30	20 A	--	SPARE	--
O...	FIRE SMOKE DAMPER	12	20 A	31	1	0.40	0.00					1	32	20 A	--	SPARE	--
R...	REPEATER	12	20 A	33	1			0.20	0.00			1	34	20 A	--	SPARE	--
--	SPARE	--	20 A	35	1					0.00	0.00	1	36	20 A	--	SPARE	--
--	SPARE	--	20 A	37	1	0.00	0.00					1	38	20 A	--	SPARE	--
--	SPARE	--	20 A	39	1			0.00	0.50			1	40	20 A	12	WH1 - LEVEL 5	W...
--	SPARE	--	20 A	41	1					0.00	0.50	1	42	20 A	12	WH1 - LEVEL 5	W...
--	SPARE	--	20 A	43	1	0.00	2.25					2	44	30 A	10	WH3 - LEVEL 5	WA T...
--	SPARE	--	20 A	45	1			0.00	2.25				46				
--	SPARE	--	20 A	47	1					0.00	1.50	1	48	20 A	12	EWH-5.1	H...
--	SPARE	--	20 A	49	1	0.00	1.50					1	50	20 A	12	EWH-5.2	H...
--	SPARE	--	20 A	51	1			0.00	1.50			1	52	20 A	12	EWH-4.3	H...
--	SPARE	--	20 A	53	1					0.00	0.01	1	54	20 A	12	EF-5.1	V...
--	SPARE	--	20 A	55	1	0.00	0.00					1	56	20 A	--	SPARE	--
--	SPARE	--	20 A	57	1			0.00	0.00			1	58	20 A	--	SPARE	--
M...	ELEV #1 SMOKE CURTAIN	12	20 A	59	1					0.40	0.40	1	60	20 A	12	ELEV #2 SMOKE CURTAIN	M...
R...	REC - ELEV #1 SHAFT	12	20 A	61	1	0.72	0.72					1	62	20 A	12	REC - ELEV #2 SHAFT	R...
LI...	LTS - ELEV #1 SHAFT	12	20 A	63	1			0.32	0.32			1	64	20 A	12	LTS - ELEV #2 SHAFT	LI...
LI...	LTS - ELEV #1 CAB	12	20 A	65	1					0.20	0.20	1	66	20 A	12	LTS - ELEV #2 CAB	LI...
M...	ELEV #1 - CONTROLS	12	20 A	67	1	0.50	0.50					1	68	20 A	12	ELEV #2 - CONTROLS	M...
R...	REC - ELEV #1 MACHINE ROOM	12	20 A	69	1			0.18	0.18			1	70	20 A	12	REC - ELEV #2 MACHINE ROOM	R...
LI...	LTS - ELEV #1 MACHINE ROOM	12	20 A	71	1					0.05	0.07	1	72	20 A	12	LTS - ELEV #2 MACHINE ROOM	LI...
M...	DESTINATION DISPATCH ELEV #1	12	20 A	73	1	0.50	0.50					1	74	20 A	12	DESITNATION DISPATCH ELEV #2	M...
M...	2 WAY VIDEO - ELEV #1	12	20 A	75	1			0.50	0.50			1	76	20 A	12	2 WAY VIDEO - ELEV #2	M...
				77						4.00	4.00		78				
EL EV A...	ELEVATOR #1 LOAD WITH SHUNT TRIP	3	80 A	79	3	4.00	4.00					3	80	80 A	3	ELEVATOR #1 LOAD WITH SHUNT TRIP	EL EV A...
				81				4.00	4.00				82				
R...	SHUNT	12	20 A	83	1					0.00	0.00	1	84	20 A	12	SHUNT	R...

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	3816 VA	125.00%	4770 VA
LE	LIGHTING - EXTERIOR	1164 VA	125.00%	1456 VA
H	HEATING	36832 VA	100.00%	36832 VA
C	COOLING	49419 VA	100.00%	49419 VA
V	VENTILATION	14 VA	100.00%	14 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	0 VA	0.00%	0 VA
R	RECEPTACLES	7940 VA	100.00%	7940 VA
WH	WATER HEATER	5500 VA	100.00%	5500 VA
MS	MISC.	3800 VA	100.00%	3800 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	24000 VA	100.00%	24000 VA
RF	RECEPTACLE - FUTURE	0 VA	0.00%	0 VA
LF	LIGHTING - FUTURE	0 VA	0.00%	0 VA
HF	HEATING - FUTURE	0 VA	0.00%	0 VA
LD	LAUNDRY	0 VA	0.00%	0 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.
6. WITH FEED THRU LUGS TO PANEL HP5B.

TOTAL KVA (CONNECTED):	133.88...	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	135.13...	406.4 A	396.0 A	330.7 A
TOTAL AMP. (CONNECTED):	372 A			
TOTAL AMP. (DEMAND):	375 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PERMIT SET

STATE OF MISSOURI
KEITH PEH
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: ZK
DRAWN BY	: DG
CHECKED BY	: ZK
APPROVED BY	: KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

PANEL SCHEDULES

COMM. NO. 19132.00	DATE January 18, 2021
DRAWING E8.4	SHEET 23 OF 24

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PANEL: HP5C

VOLTAGE: 208Y/120 3Ø | FED FROM: SWBD2

MOUNTING: SURFACE | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE: P5
MAIN 400 A | WIRE: 4 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		1.12	1.12						2				
AP AR T...	HP-A	12	20 A	3	3			1.12	1.12			3	4	20 A	12	HP-A	AP AR T...
				5						1.12	1.12		6				
				7		1.12	1.12						8				
AP AR T...	HP-A	12	20 A	9	3			1.12	1.12			3	10	20 A	12	HP-A	AP AR T...
				11						1.12	1.12		12				
				13		1.12	1.12						14				
AP AR T...	HP-A	12	20 A	15	3			1.12	1.12			3	16	20 A	12	HP-A	AP AR T...
				17						1.12	1.12		18				
				19		1.12	1.12						20				
AP AR T...	HP-A	12	20 A	21	3			1.12	1.12			3	22	20 A	12	HP-A	AP AR T...
				23						1.12	1.12		24				
				25		1.12	1.12						26				
AP AR T...	HP-A	12	20 A	27	3			1.12	1.12			3	28	20 A	12	HP-A	AP AR T...
				29						1.12	1.12		30				
				31		1.12	1.12						32				
AP AR T...	HP-A	12	20 A	33	3			1.12	1.12			3	34	20 A	12	HP-A	AP AR T...
				35						1.12	1.12		36				
				37		1.12	1.12						38				
AP AR T...	HP-A	12	20 A	39	3			1.12	1.12			3	40	20 A	12	HP-A	AP AR T...
				41						1.12	1.12		42				
				43		1.12	1.12						44				
AP AR T...	HP-A	12	20 A	45	3			1.12	1.12			3	46	20 A	12	HP-A	AP AR T...
				47						1.12	1.12		48				
				49		1.12	1.12						50				
AP AR T...	HP-A	12	20 A	51	3			1.12	1.12			3	52	20 A	12	HP-A	AP AR T...
				53						1.12	1.12		54				
				55		1.12	1.12						56				
AP AR T...	HP-A	12	20 A	57	3			1.12	1.12			3	58	20 A	12	HP-A	AP AR T...
				59						1.12	1.12		60				
				61		1.12	1.12						62				
AP AR T...	HP-A	12	20 A	63	3			1.12	1.12			3	64	20 A	12	HP-A	AP AR T...
				65						1.12	1.12		66				
				67		1.12	1.12						68				
AP AR T...	HP-A	12	20 A	69	3			1.12	1.12			3	70	20 A	12	HP-A	AP AR T...
				71						1.12	1.12		72				
--	SPACE ONLY	--	--	73	--	0.00	0.00					--	74	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	75	--			0.00	0.00			--	76	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	77	--					0.00	0.00	--	78	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	79	--	0.00	0.00					--	80	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	81	--			0.00	0.00			--	82	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	83	--					0.00	0.00	--	84	--	--	SPACE ONLY	--

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	0 VA	0.00%	0 VA	
LE	LIGHTING - EXTERIOR	0 VA	0.00%	0 VA	
H	HEATING	0 VA	0.00%	0 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	0 VA	0.00%	0 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	0 VA	0.00%	0 VA	
WH	WATER HEATER	0 VA	0.00%	0 VA	
MS	MISC.	0 VA	0.00%	0 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	134880 VA	28.00%	37766 VA	104.8 A
					39 - 42

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. WITH FEED THRU LUGS TO PANEL HP5D

TOTAL KVA (CONNECTED):	134.88 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	37.77 kVA	374.7 A	374.7 A	374.7 A
TOTAL AMP....	374 A			
TOTAL AMP. (DEMAND):	105 A			
Number Unit Load Centers	41	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	134880 VA	0.28	37766 VA	104.8 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: HP5D

VOLTAGE: 208Y/120 3Ø | FED FROM: HP5C

MOUNTING: SURFACE | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 3 | TYPE: P5
MAIN 400 A | WIRE: 4 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	C	C	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
				1		1.12	1.12						2				
AP AR T...	HP-A	12	20 A	3	3			1.12	1.12			3	4	20 A	12	HP-A	AP AR T...
				5						1.12	1.12		6				
				7		1.12	1.12						8				
AP AR T...	HP-A	12	20 A	9	3			1.12	1.12			3	10	20 A	12	HP-A	AP AR T...
				11						1.12	1.12		12				
				13		1.12	1.12						14				
AP AR T...	HP-A	12	20 A	15	3			1.12	1.12			3	16	20 A	12	HP-A	AP AR T...
				17						1.12	1.12		18				
				19		1.12	1.12						20				
AP AR T...	HP-A	12	20 A	21	3			1.12	1.12			3	22	20 A	12	HP-A	AP AR T...
				23						1.12	1.12		24				
				25		1.12	1.12						26				
AP AR T...	HP-A	12	20 A	27	3			1.12	1.12			3	28	20 A	12	HP-A	AP AR T...
				29						1.12	1.12		30				
				31		1.12	1.12						32				
AP AR T...	HP-A	12	20 A	33	3			1.12	1.12			3	34	20 A	12	HP-A	AP AR T...
				35						1.12	1.12		36				
				37		1.12	1.12						38				
AP AR T...	HP-A	12	20 A	39	3			1.12	1.12			3	40	20 A	12	HP-A	AP AR T...
				41						1.12	1.12		42				
				43		1.12	1.12						44				
AP AR T...	HP-A	12	20 A	45	3			1.12	1.12			3	46	20 A	12	HP-A	AP AR T...
				47						1.12	1.12		48				
--	SPACE ONLY	--	--	49	--	0.00	0.00					--	50	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	51	--			0.00	0.00			--	52	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	53	--					0.00	0.00	--	54	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	55	--	0.00	0.00					--	56	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	57	--			0.00	0.00			--	58	--	--	SPACE ONLY	--
--	SPACE ONLY	--	--	59	--					0.00	0.00	--	60	--	--	SPACE ONLY	--

	LOAD	Connected...	Demand Factor	Est. Demand	Ampacity
L	LIGHTS	0 VA	0.00%	0 VA	
LE	LIGHTING - EXTERIOR	0 VA	0.00%	0 VA	
H	HEATING	0 VA	0.00%	0 VA	
C	COOLING	0 VA	0.00%	0 VA	
V	VENTILATION	0 VA	0.00%	0 VA	
M	MOTORS	0 VA	0.00%	0 VA	
K	KITCHEN	0 VA	0.00%	0 VA	
R	RECEPTACLES	0 VA	0.00%	0 VA	
WH	WATER HEATER	0 VA	0.00%	0 VA	
MS	MISC.	0 VA	0.00%	0 VA	
S	Spare	0 VA	0.00%	0 VA	
E	ELEVATOR	0 VA	0.00%	0 VA	
LD	LAUNDRY	0 VA	0.00%	0 VA	
AP	APARTMENT LOADS	53952 VA	40.00%	21581 VA	58.4 A
					14 - 15

Unit Load Center Quantity to Obtain Demand Factor (Automatic Calc)

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. THIS PANEL SHALL BE U.L. LISTED
3. ALL BUSSING, INCL GND AND NEUTRAL, SHALL BE COPPER.
4. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
5. RED LOCK-ON ATTACHMENT.

TOTAL KVA (CONNECTED):	53.95 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	21.58 kVA	149.9 A	149.9 A	149.9 A
TOTAL AMP....	150 A			
TOTAL AMP. (DEMAND):	60 A			
Number Unit Load Centers	16	DEMAND...	APARTMENT kVA	APARTMENT...
Apartment kVA...	53952 VA	0.39	21041 VA	58.4 A

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: C

VOLTAGE: 120/208 1Ø | FED FROM: SEE ENLARGED POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 125 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Ot...	LIGHTS	12	15 A	1	1	0.20	4.00			2	2	50 A	6	OVEN	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.90	4.00		4				
RE...	REC - HALL	12	15 A	5	1	0.18	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			1.12	2.50		8				
--	SPARE	--	20 A	9	1	0.00	3.50			2	10	40 A	8	VTAC-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.36	3.50		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
KI...	REC - MICROWAVE	12	20 A	15	1			0.18	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			0.90	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.99	0.36			1	22	20 A	12	WASHING MACHINE/LAUNDRY	LA...
RE...	REC - DEN/OFFICE	12	15 A	23	1			0.72	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.74	0.18			1	26	20 A	12	REC - PATIO	RE...
--	SPARE	--	20 A	27	1			0.00	0.00	1	28	20 A	--	SPARE	--
--	SPARE	--	20 A	29	1	0.00	0.00			1	30	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	306 VA	125.00%	382 VA
LE	LIGHTING - EXTERIOR	126 VA	125.00%	157 VA
H	HEATING - UNITS	7000 VA	65.00%	4550 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	14760 VA	65.00%	9594 VA
R	RECEPTACLES	5220 VA	100.00%	5220 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	1000 VA	100.00%	1000 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5360 VA	100.00%	5360 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	33.77 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	26.26 kVA	160.9 A	163.4 A	N/A
TOTAL AMP. (CONNECTED):	162 A			
TOTAL AMP. (DEMAND):	126 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: C-HC

VOLTAGE: 120/208 1Ø | FED FROM: SEE ENLARGED POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 225 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Ot...	LIGHTS	12	20 A	1	1	0.24	4.00			2	2	50 A	6	KITCHEN	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.90	4.00		4				
RE...	REC - HALL	12	15 A	5	1	0.36	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			0.54	2.50		8				
--	SPARE	--	20 A	9	1	0.00	3.50			2	10	40 A	8	VTAC-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.36	3.50		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
RE...	MICROWAVE & HOOD	12	20 A	15	1			0.36	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			1.08	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.99	0.36			1	22	20 A	12	WASHING MACHINE/LAUNDRY	LA...
RE...	REC - DEN/OFFICE	12	15 A	23	1			0.72	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.74	0.36			1	26	20 A	12	REC - PATIO	RE...
--	SPARE	--	20 A	27	1			0.00	0.00	1	28	20 A	--	SPARE	--
--	SPARE	--	20 A	29	1	0.00	0.00			1	30	20 A	--	SPARE	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	306 VA	125.00%	382 VA
LE	LIGHTING - EXTERIOR	126 VA	125.00%	157 VA
H	HEATING	0 VA	0.00%	0 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	14760 VA	65.00%	9594 VA
R	RECEPTACLES	5400 VA	100.00%	5400 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MI	MISC.	1000 VA	100.00%	1000 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5360 VA	100.00%	5360 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	33.95 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	26.44 kVA	164.3 A	161.7 A	0.0 A
TOTAL AMP. (CONNECTED):	163 A			
TOTAL AMP. (DEMAND):	127 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: F

VOLTAGE: 120/208 1Ø | FED FROM: SEE POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 125 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
LI...	LIGHTS	12	15 A	1	1	0.27	4.00			2	2	50 A	6	RANGE TOP	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.90	4.00		4				
--	SPARE	--	20 A	5	1	0.00	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			1.10	2.50		8				
--	SPARE	--	20 A	9	1	0.00	4.20			2	10	60 A	4	IDU-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.54	4.20		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
KI...	REC - MICROWAVE	12	20 A	15	1			0.18	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			1.26	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.28	0.36			1	22	20 A	12	WASHING MACHINE/LAUNDRY	LA...
RE...	REC - BEDROOM	12	15 A	23	1			1.26	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.49	0.36			1	26	20 A	12	REC - PATIO	RE...
--	SPARE	--	20 A	27	1			0.00	0.00	--	28	--	--	SPACE ONLY	--
--	SPARE	--	20 A	29	1	0.00	0.00			--	30	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	307 VA	125.00%	384 VA
LE	LIGHTING - EXTERIOR	212 VA	125.00%	265 VA
H	HEATING - UNITS	8400 VA	65.00%	5460 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	14760 VA	65.00%	9594 VA
R	RECEPTACLES	6300 VA	100.00%	6300 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5360 VA	100.00%	5360 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	35.34 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	27.36 kVA	159.0 A	177.9 A	N/A
TOTAL AMP. (CONNECTED):	170 A			
TOTAL AMP. (DEMAND):	132 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: G

VOLTAGE: 120/208 1Ø | FED FROM: SEE POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 125 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Ot...	LIGHTS	12	15 A	1	1	0.27	4.00			2	2	50 A	6	RANGE TOP	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.54	4.00		4				
--	SPARE	--	20 A	5	1	0.00	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			0.94	2.50		8				
RE...	REC - KITCHEN	12	20 A	9	1	0.72	4.20			2	10	60 A	4	IDU-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.54	4.20		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
KI...	REC - MICROWAVE	12	20 A	15	1			0.18	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			1.08	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.26	0.36			1	22	20 A	12	WASHING MACHINE/LAUNDRY	LA...
RE...	REC - BEDROOM	12	15 A	23	1			0.90	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.49	0.36			1	26	20 A	12	REC - PATIO	RE...
--	SPARE	--	20 A	27	1			0.00	0.00	--	28	--	--	SPACE ONLY	--
--	SPARE	--	20 A	29	1	0.00	0.00			--	30	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	350 VA	125.00%	438 VA
LE	LIGHTING - EXTERIOR	174 VA	125.00%	218 VA
H	HEATING - UNITS	8400 VA	65.00%	5460 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	14760 VA	65.00%	9594 VA
R	RECEPTACLES	5940 VA	100.00%	5940 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5360 VA	100.00%	5360 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	34.98 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	27.01 kVA	165.8 A	169.9 A	N/A
TOTAL AMP. (CONNECTED):	168 A			
TOTAL AMP. (DEMAND):	130 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: H1

VOLTAGE: 120/208 1Ø | FED FROM: SEE POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 125 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
Ot...	LIGHTS	12	15 A	1	1	0.35	4.00			2	2	50 A	6	RANGE TOP	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.90	4.00		4				
RE...	REC - HALL	12	15 A	5	1	0.54	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			0.60	2.50		8				
RE...	REC - KITCHEN	12	20 A	9	1	0.90	4.20			2	10	60 A	4	IDU-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.72	4.20		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
KI...	REC - MICROWAVE	12	20 A	15	1			0.18	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			1.08	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.49	0.36			1	22	20 A	12	WASHING MACHINE/LAUNDRY	KI...
RE...	REC - BEDROOM	12	15 A	23	1			0.90	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.26	0.36			1	26	20 A	12	REC - PATIO	RE...
RE...	REC - DEN/OFFICE	12	15 A	27	1			0.72	0.00	--	28	--	--	SPACE ONLY	--
--	SPARE	--	20 A	29	1	0.00	0.00			--	30	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	366 VA	125.00%	457 VA
LE	LIGHTING - EXTERIOR	254 VA	125.00%	318 VA
H	HEATING - UNITS	8400 VA	65.00%	5460 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	15120 VA	65.00%	9828 VA
R	RECEPTACLES	7560 VA	100.00%	7560 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5000 VA	100.00%	5000 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	36.70 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	28.62 kVA	173.5 A	178.6 A	N/A
TOTAL AMP. (CONNECTED):	176 A			
TOTAL AMP. (DEMAND):	138 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PANEL: H2

VOLTAGE: 120/208 1Ø | FED FROM: SEE POWER FLOOR PLAN

MOUNTING: RECESSED | MAIN TYPE: MLO | MFR: SIEMENS
ENCLOSURE: NEMA1 | PHASE: 1 | TYPE: SN3048L1125
MAIN: 125 A | WIRE: 3 | AIC: 65 KAIC

LC Abbr	Load Served	Wire	Trip	Ckt No	Pole	A	A	B	B	Pole	Ckt No	Trip	Wire	Load Served	LC Abbr
LI...	LIGHTS	12	15 A	1	1	0.33	4.00			2	2	50 A	6	RANGE TOP	KITCHEN
RE...	REC - LIVING ROOM	12	15 A	3	1			0.72	4.00		4				
--	SPARE	--	20 A	5	1	0.00	2.50			2	6	30 A	10	MICROWAVE OVEN	KITCHEN
RE...	REC - KITCHEN	12	20 A	7	1			0.96	2.50		8				
--	SPARE	--	20 A	9	1	0.00	4.20			2	10	60 A	4	IDU-A	HEATI...
RE...	REC - DINING	12	20 A	11	1			0.90	4.20		12				
KI...	REC - REFRIG	12	20 A	13	1	0.18	0.00			1	14	20 A	--	SPARE	--
KI...	REC - MICROWAVE	12	20 A	15	1			0.18	0.00	1	16	20 A	--	SPARE	--
KI...	DISHWASHER & DISPOSAL (NOTE 6)	12	20 A	17	1	1.40	2.50			2	18	30 A	10	DRYER	LAUND...
RE...	REC - BEDROOM	12	15 A	19	1			1.08	2.50		20				
RE...	BATHROOM	12	20 A	21	1	0.26	0.54			1	22	20 A	12	WASHING MACHINE/LAUNDRY	LA...
RE...	REC - BEDROOM	12	15 A	23	1			1.26	0.36	1	24	20 A	12	DATA/TEL	RE...
RE...	BATHROOM	12	20 A	25	1	0.49	0.36			1	26	20 A	12	REC - PATIO	RE...
--	SPARE	--	20 A	27	1			0.00	0.00	--	28	--	--	SPACE ONLY	--
--	SPARE	--	20 A	29	1	0.00	0.00			--	30	--	--	SPACE ONLY	--

	LOAD	Connected Load	Demand Factor	Estimated Demand
L	LIGHTS	366 VA	125.00%	457 VA
LE	LIGHTING - EXTERIOR	233 VA	125.00%	292 VA
H	HEATING - UNITS	8400 VA	65.00%	5460 VA
C	COOLING	0 VA	0.00%	0 VA
V	VENTILATION	0 VA	0.00%	0 VA
M	MOTORS	0 VA	0.00%	0 VA
K	KITCHEN	14760 VA	65.00%	9594 VA
R	RECEPTACLES	6120 VA	100.00%	6120 VA
WH	WATER HEATER	0 VA	0.00%	0 VA
MS	MISC.	0 VA	0.00%	0 VA
S	Spare	0 VA	0.00%	0 VA
E	ELEVATOR	0 VA	0.00%	0 VA
LD	LAUNDRY	5540 VA	100.00%	5540 VA

NOTES:
1. BREAKER FRAME SHALL BE AS REQ'D PER PANEL AIC RATING.
2. ALL INCOMING PANEL & BRKR LUGS SHALL MATCH FEEDERS.
3. ALL 15A & 20A BRANCH CIRCUIT BREAKERS SHALL BE AFCI RATED.
4. THIS IS TO BE A LOAD CENTER WITH A MAXIMUM DEPTH THAT WOULD ALLOW FOR A FLUSH MOUNTING BETWEEN STANDARD WALL STUDS.
5. ALL BREAKERS ARE RATED TO BE AT 10,000AIC AND SERIES RATED TO 65,000AIC WITH BREAKER FEEDING THIS PANEL.
6. PROVIDE GFCI BREAKER.

TOTAL KVA (CONNECTED):	35.42 kVA	TOTAL PER PHASE: (CONNECTED)		
TOTAL KVA (DEMAND):	27.46 kVA	161.2 A	177.0 A	N/A
TOTAL AMP. (CONNECTED):	170 A			
TOTAL AMP. (DEMAND):	132 A			

LOAD CLASSIFICATION ABBREVIATIONS (CONT.)

F - FEEDER FOR DOWN STREAM PANEL. LOADS ARE INCLUDED IN THE PANEL LOAD SUMMARY.

PERMIT SET

STATE OF MISSOURI
KEITH PEH
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	ZK
DRAWN BY	DG
CHECKED BY	ZK
APPROVED BY	KP

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
PANEL SCHEDULES

COMM. NO. 19132.00 | DATE January 18, 2021

DRAWING E8.5 | SHEET 24 OF 24

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SANITARY WASTE, STORM DRAIN & VENT PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON HUB AND SPIGOT PIPE (ASTM A 74) WITH COMPRESSION JOINTS (CISPI HSN) AND NEOPRENE GASKETS (ASTM C 564) OR NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D2665) WITH SOLVENT WELD JOINTS (ASTM D2855). INSTALL PLASTIC PIPE BELOW GRADE PER ASTM D2321. FOAM CORE PVC IS NOT APPROVED.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE SERVICE WEIGHT CAST IRON NO-HUB PIPE AND FITTINGS (CISPI 301) WITH NEOPRENE GASKET AND STAINLESS STEEL CLAMP JOINTS (CISPI 310) WITH NEOPRENE GASKET / STAINLESS STEEL CLAMP JOINTS (ASTM C1540-15) OR PROVIDE SCHEDULE 40 PVC PIPE AND SOCKET FITTINGS (ASTM D2665) WITH SOLVENT WELD JOINTS (ASTM D2855). FOAM CORE PVC IS NOT APPROVED.
3. SLOPE WASTE AND STORM DRAIN PIPING AT 1/4" PER FOOT MINIMUM FOR PIPING 2-1/2" AND SMALLER AND 1/8" PER FOOT MINIMUM FOR PIPING 3" AND LARGER UNLESS NOTED OTHERWISE. SLOPE ALL KITCHEN GREASE WASTE PIPING AT 1/4" PER FOOT MINIMUM.
4. PROVIDE CLEAN-OUTS AT THE BASE OF WASTE STACKS, STORM RISERS, AND AT EVERY TURN IN PIPING IN EXCESS OF 45° AND SPACED WITH-IN 100'-0" APART IN A LOCATION THAT PERMITS ACCESS FOR SERVICE WITHOUT DAMAGE TO THE BUILDING OR FINISHED MATERIALS.
5. PROVIDE FLOOR CLEANOUTS WITH TOPS DESIGNED TO MATCH SPECIFIC FLOOR FINISHES SUCH AS CARPET, TILE, ETC. YARD CLEANOUTS SHALL BE PROVIDED IN AN 18"x18"x6" CONCRETE PAD.
6. WHERE WASTE PIPING IS EXPOSED IN REST ROOM AREAS, PROVIDE CHROME PLATED BRASS PIPING, REMOVABLE P-TRAPS, MATCHING STOPS AND ESCUTCHEONS FOR ALL LAVATORIES.
7. WASTE AND VENT SYSTEMS SHALL BE TESTED AND PROVED WATER TIGHT UNDER A HEAD PRESSURE OF NO LESS THAN 10 FT. THIS PRESSURE SHALL BE HELD FOR A PERIOD OF NO LESS THAN 15 MINUTES.
8. WHERE MECHANICAL ROOM FLOOR DRAINS ARE INSTALLED ABOVE GRADE, PROVIDE 1"THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND JACKET ON THE FLOOR DRAIN BODY, THE ASSOCIATED P-TRAP AND HORIZONTAL DRAIN PIPING ABOVE GRADE.
9. INSULATE ROOF DRAIN BODIES AND HORIZONTAL DRAIN PIPING ABOVE GRADE WITH 1" THICK GLASS FIBER INSULATION WITH VAPOR BARRIER AND JACKET.
10. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.

NATURAL GAS PIPING

1. ABOVE GRADE PIPING AND FITTINGS : PROVIDE SCHEDULE 40 BLACK STEEL PIPING, TYPE S, SEAMLESS, GRADE B (ASTM A 53) AND 150 PSI MALLEABLE BLACK IRON FITTINGS, GRADE 32510, (ASTM B 16.3) OR FORGED STEEL WELDING TYPE FITTINGS (ASTM A234). PROVIDE THREADED JOINTS FOR PIPE 2" AND SMALLER. PROVIDE WELDED JOINTS (ASME B31.9) FOR PIPE 2-1/2" AND LARGER.
2. SPACE GAS PIPING HANGER RODS 7'-0" ON CENTER MAXIMUM AND SPACE TRANSVERSE BRACING 20'-0" ON CENTER MAXIMUM. TRANSVERSE BRACING FOR ONE SECTION MAY ACT AS LONGITUDINAL BRACING FOR THE PIPE SECTION CONNECTED TO IT IF THE BRACING IS INSTALLED WITHIN 24" OF THE ELBOW OR TEE. COORDINATE HANGER LOCATIONS WITH STRUCTURAL DRAWING DETAILS.
3. PROVIDE A.G.A. CERTIFIED SHUT-OFF VALVES MINIMUM, 125 PSI RATED, NON- LUBRICATED PLUG TYPE WITH BRONZE BODY AND BRONZE PLUG, STRAINERS AND REGULATORS (AS RECOMMENDED BY THE EQUIPMENT MANUFACTURER) FOR ALL EQUIPMENT CONNECTED TO THE NATURAL GAS SYSTEM.
4. GAS PRESSURE REGULATORS SHALL COMPLY WITH ANSI Z21.80. REGULATORS SHALL BE CAST IRON OR DIE-CAST ALUMINUM CONSTRUCTION WITH INTERCHANGEABLE ZINC-PLATED STEEL SPRINGS, ZINC-PLATED STEEL DIAPHRAGM PLATE, NITRILE RUBBER SEAT DISC, INTERCHANGEABLE ALUMINUM ORIFICE, AND ULTRAVIOLET-STABILIZED MINERAL FILLED NYLON SEAL PLUG. REGULATOR SHALL BE SINGLE-PORT SELF-CONTAINED WITH ORIFICE NO LARGER THAN REQUIRED AT MAXIMUM PRESSURE INLET AND NO PRESSURE SENSING PIPING EXTERNAL TO THE REGULATOR. PRESSURE REGULATOR SHALL MAINTAIN DISCHARGE PRESSURE SETTING DOWNSTREAM AND NOT EXCEED 150 PERCENT OF DESIGN DISCHARGE PRESSURE AT SHUTOFF. OVERPRESSURE PROTECTION DEVICE SHALL BE FACTORY MOUNTED ON REGULATOR. WHEN USING VENTLESS REGULATORS, MOUNT REGULATOR IN A HORIZONTAL UPRIGHT POSITION. IF VENTED TYPE REGULATORS ARE USED, INSTALL VENT PIPING (FULL SIZE OPENING) FROM GAS PRESSURE REGULATORS TO OUTDOORS AND TERMINATE IN WEATHERPROOF HOOD.
5. PAINT ALL GAS PIPING WITH 2 COATS OF YELLOW ENAMEL PAINT APPLIED WITH A BRUSH (2 MIL THICKNESS MINIMUM). STENCIL "GAS" ON PIPE AT 6'-0" CENTERS.
6. CONTACT LOCAL GAS UTILITY TO PROVIDE GAS SERVICE AND GAS METER. COORDINATE REQUIREMENTS WITH MECHANICAL CONTRACTOR AND LOCAL GAS UTILITY.

SUMP PUMP DISCHARGE PIPING

1. SUMP PUMP DISCHARGE PIPING: PROVIDE SCHEDULE 40 GALVANIZED STEEL PIPE (ASTM A53) AND GALVANIZED 150 POUND MALLEABLE IRON FITTINGS (ASME B16.3) WITH THREADED JOINTS, OR PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8). SLOPE SUMP DISCHARGE LINE AT 1% SLOPE TOWARDS SUMP PUMP.

DOMESTIC WATER PIPING

1. BELOW GRADE PIPING AND JOINTS: PROVIDE TYPE 'K' SOFT ANNEALED SEAMLESS COPPER TUBING (ASTM B 88) WITH NO JOINTS FOR PIPING 2-1/2" AND SMALLER. PROVIDE DUCTILE IRON PIPE AND FITTINGS (AWWA C151, AWWA C110) WITH RUBBER GASKET JOINTS AND RODS (AWWA C111) FOR PIPING 3" AND LARGER.
2. ABOVE GRADE PIPING AND JOINTS: PROVIDE TYPE 'L' HARD DRAWN SEAMLESS COPPER TUBING (ASTM B 88) AND CAST COPPER ALLOY FITTINGS (ASME B16.18). JOINTS 2" AND SMALLER SHALL BE LEAD FREE 95-5 TIN/SILVER SOLDER JOINTS (ASTM B 32), JOINTS 2-1/2" AND LARGER SHALL BE BCUP SILVER / PHOSPHORUS / COPPER BRAZED JOINTS (AWS A5.8). ALTERNATELY PROVIDE COPPER PIPE AND FITTINGS AS SPECIFIED ABOVE EXCEPT WITH GROOVED ENDS (ASTM B 88, ASME B16.18) AND JOINTS UTILIZING GROOVED MECHANICAL COUPLINGS MEETING (ASTM F1476). IN LIEU OF COPPER, THE FOLLOWING MAY BE PROVIDED IN RESIDENTIAL AREAS:
   A. PIPE 2" AND SMALLER: : PROVIDE CROSS-LINKED POLYETHYLENE (PEX) PIPING (ASTM F876) AND COLD EXPANSION FITTINGS (ASTM F1960).
   B. PIPE 2-1/2" AND LARGER: : PROVIDE CPVC PIPE (ASTM D2846/D2846M) PIPE AND FITTINGS WITH SOLVENT CEMENT JOINTS (ASTM F493).
   C. PLASTIC PIPING SHALL NOT BE INSTALLED IN RETURN AIR PLENUMS UNLESS WRAPPED WITH AN APPROVED SYSTEM CONFORMING TO THE REQUIREMENTS OF ASTM E-84.
3. INSULATE PIPING ABOVE GRADE (EXCEPT EXPOSED CONNECTIONS TO PLUMBING FIXTURES) WITH GLASS FIBER INSULATION HAVING A VAPOR BARRIER AND JACKET. PIPE INSULATION SHALL HAVE A CONDUCTIVITY NOT EXCEEDING 0.27 BTUH x SQ. FT., SEE LIST BELOW FOR INSULATION THICKNESS:
   - PROVIDE 1" THICK INSULATION FOR HOT WATER & CIRCULATION PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1-1/2" THICK INSULATION FOR HOT WATER & CIRCULATON PIPING SIZES 1-1/2" THRU 4".
   - PROVIDE 1/2" THICK INSULATION FOR COLD WATER PIPING SIZES 1/2" THRU 1-1/4".
   - PROVIDE 1" THICK INSULATION FOR COLD WATER PIPING SIZES 1-1/2" THRU 4".
4. PIPING INSULATION, JACKETS, COVERINGS, SEALERS, MASTICS AND ADHESIVES SHALL MEET A FLAME-SPREAD RATING OF 25 OR LESS AND A SMOKE-DEVELOPED RATING OF 50 OR LESS AS TESTED BY ASTM E84 (NFPA 255) METHOD AND SHALL BE PLENUM RATED. PROVIDE PVC INSULATION JACKET FOR EXPOSED PIPING IN MECHANICAL ROOMS. INSTALL INSULATION CONTINUOUSLY THRU FIRE RATED WALLS AND PIPE HANGERS. PROVIDE GALVANIZED STEEL SHIELD BETWEEN PIPE HANGER AND INSULATION.
5. PROVIDE A CHROME FINISH ON EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
6. PROTECT COPPER PIPING AGAINST CONTACT WITH DISSIMILAR METALS. ALL HANGERS, SUPPORTS, ANCHORS AND CLIPS SHALL BE COPPER OR COPPER PLATED. WHERE COPPER PIPING IS CARRIED ON TRAPEZE HANGERS WITH OTHER PIPING, PROVIDE A PERMANENT ELECTROLYTIC ISOLATION MATERIAL TO PREVENT CONTACT WITH DISSIMILAR OTHER METALS.
7. PROTECT COPPER PIPING AGAINST CONTACT WITH MASONRY. WHERE COPPER IS SLEEVED THROUGH MASONRY, PROVIDE COPPER OR RED BRASS SLEEVES. WHERE COPPER MUST BE CONCEALED IN OR AGAINST MASONRY PARTITIONS, PROVIDE A HEAVY COATING OF ASPHALTIC ENAMEL ON THE COPPER PIPING AND 15# ASPHALT SATURATED FELT BETWEEN THE PIPING AND THE MASONRY PARTITION.
8. PERFORM A PRESSURE TEST ON ALL WATER PIPING. FILL PIPING WITH POTABLE WATER, CAP AND SUBJECT PIPING TO A STATIC WATER PRESSURE OF 50 PSIG ABOVE OPERATING PRESSURE, WITHOUT EXCEEDING PRESSURE RATING OF PIPING SYSTEM MATERIALS OR PRESSURIZE PIPING WITH AIR TO AT LEAST ONE-HUNDRED (100) PSI. ISOLATE TEST SOURCE AND ALLOW TO STAND FOR FOUR HOURS. LEAKS AND LOSS IN TEST PRESSURE CONSTITUTE DEFECTS THAT MUST BE REPAIRED. REPAIR LEAKS AND DEFECTS WITH NEW MATERIALS AND RETEST PIPING OR PORTION THEREOF UNTIL SATISFACTORY RESULTS ARE OBTAINED
9. STERILIZE THE DOMESTIC WATER SYSTEM PER THE AMERICAN WATER WORKS ASSOCIATION'S INSTRUCTIONS SPECIFICATIONS AND LOCAL HEALTH DEPARTMENT REGULATIONS.
10. SLOPE WATER PIPING FOR DRAINAGE WITH DRAIN VALVES INSTALLED AT LOW POINTS.

GAS LOAD SUMMARY

LOAD	QUANTITY	GAS INPUT
GAS - FIRED WATER HEATER(S) (WH1) - LEVEL 4	2	398 CFH
GAS - FIRED WATER HEATER(S) (WH2) - LEVEL 2	2	398 CFH
TOTAL CONNECTED LOAD AT 2 PSI	4	796 CFH

GAS PIPING SIZED PER 2018 IFGC TABLE 402.4(5) WITH AN INLET PRESSURE OF 2 PSI WITH PRESSURE DROP TO 1 PSI AT 0.60 SPECIFIC GRAVITY. (400 FT. PIPE LENGTH EQUIVALENT)

PLUMBING GENERAL NOTES

1. GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE PLUMBING SCOPE OF WORK. THE PLUMBING DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.
2. PLUMBING WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 UNIFORM PLUMBING CODE AND WITH THE REQUIREMENTS OF THE LOCAL AUTHORITY HAVING JURISDICTION.
3. SCOPE: PROVIDE ALL LABOR, MATERIAL AND EQUIPMENT REQUIRED FOR THE COMPLETION AND OPERATION OF ALL PLUMBING SYSTEMS IN ACCORDANCE WITH ALL APPLICABLE CODES.
4. PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.
5. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE TIME PERIOD SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.
6. COORDINATE ALL PLUMBING PIPING LOCATIONS, ROUGH-IN LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.
7. FIELD VERIFY PROPER OPERATION OF EXISTING SYSTEMS BEFORE STARTING CONSTRUCTION. NOTIFY THE ARCHITECT / ENGINEER OF RECORD OF ANY PROBLEMS OR DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND EXISTING CONDITIONS AND/OR ANY POTENTIAL PROBLEMS OBSERVED BEFORE CONTINUING WORK IN THE EFFECTED AREAS.
8. PLUMBING PLANS SHALL NOT BE SCALED. REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONS OF ALL LOCATIONS OF PLUMBING FIXTURES, FLOOR DRAINS, COLUMNS, WALLS, DOORS, ETC.
9. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.
10. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
11. ALL VALVES, BACKFLOW PREVENTERS, BOOSTER PUMPS, ETC. SERVING THE DOMESTIC WATER SYSTEM SHALL MEET LEAD FREE STANDARDS PER ANSI/NSF 372 AND NSF 61, ANNEX G.
12. PROVIDE COMPLETE PLUMBING FIXTURES AND EQUIPMENT. INCLUDE SUPPLIES, STOPS, VALVES, FAUCETS, DRAINS, TRAPS, TAIL PIECES, ESCUTCHEONS, ETC. AND INSTALL PER THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.
13. CUT WALLS, FLOORS AND CEILINGS AS REQUIRED FOR INSTALLATION OF PLUMBING WORK. ALL CUTTING SHALL BE HELD TO A MINIMUM. PATCH AND FINISH SURFACES TO MATCH ADJOINING SURFACES.
14. PIPING AND SPECIALTIES SHALL BE LOCATED CONCEALED IN WALLS, PARTITIONS OR ABOVE CEILINGS UNLESS NOTED OTHERWISE. PIPING IN EXPOSED AREAS SHALL BE RUN TIGHT TO UNDERSIDE OF STRUCTURE.
15. PROVIDE ACCESS DOORS FOR ALL SPECIALTIES, VALVES, WATER HAMMER ARRESTORS, TRAP PRIMERS, ETC., CONCEALED BEHIND WALLS OR CEILINGS THAT REQUIRE MAINTENANCE ACCESS.
16. DO NOT INSTALL PIPING IN AREAS SUBJECT TO FREEZING TEMPERATURES. INSTALL PIPING SHOWN IN EXTERIOR WALLS ON THE CONDITIONED SIDE OF THE WALL INSULATION.
17. PIPING, VENTS, ETC. EXTENDING THROUGH EXTERIOR WALLS AND/OR THE ROOF SHALL BE FLASHED AND COUNTER FLASHED IN A WATERPROOF MANNER. COORDINATE FLASHING WITH THE GENERAL CONTRACTOR.
18. PROVIDE A CHROME FINISH FOR ALL EXPOSED PIPING IN REST ROOMS AND OTHER FINISHED AREAS.
19. PROVIDE NON-CONDUCTING DIELECTRIC UNIONS WHENEVER CONNECTING DISSIMILAR METALS.
20. ATTACH HANGERS TO STRUCTURE, HANGERS SHALL NOT ATTACH TO THE DECK.
21. PROVIDE MANUFACTURERS RECOMMENDED CLEARANCES AROUND ALL EQUIPMENT FOR MAINTENANCE.
22. VALVES AND OTHER PIPING ACCESSORIES REQUIRING ACCESS SHALL BE INSTALLED IN ACCESSIBLE LOCATION NO MORE THAN 18" ABOVE THE CEILING, PROVIDE OFFSETS IN PIPING AS NEEDED.
23. PLUMBING SYSTEMS INCLUDE, BUT ARE NOT LIMITED TO: PLUMBING FIXTURES AND EQUIPMENT, FIRE STOPPING, SEISMIC BRACING, PIPE IDENTIFICATION, DOMESTIC WATER SYSTEM, SANITARY WASTE AND VENT SYSTEM, STORM DRAIN SYSTEM, NATURAL GAS SYSTEM.

FIRE STOPPING:

1. FIRE STOP ALL PENETRATIONS, BY PIPING OR CONDUITS, OF FIRE RATED WALLS, FLOORS AND PARTITIONS. PROVIDE A DEVICE(S) OR SYSTEM(S) WHICH HAS BEEN TESTED AND LISTED AS COMPLYING WITH ASTM E-814 AND INSTALL IN ACCORDANCE WITH THE CONDITIONS OF THEIR LISTING. PROVIDE A DEVICE(S) OR SYSTEM(S) WITH AN 'F' RATING EQUAL TO THE RATING OF THE ASSEMBLY BEING PENETRATED. REFER TO ARCHITECTURAL PLANS FOR WALL AND FLOOR TYPES.

PIPE IDENTIFICATION:

1. PIPE IDENTIFICATION SHALL MATCH THE FACILITY'S EXISTING STANDARD. IF NO STANDARD EXISTS, THEN THE PIPE IDENTIFICATION SHALL BE IN ACCORDANCE WITH ANSI A13.1.
2. PROVIDE PIPING LABELS FOR ALL PLUMBING PIPING. PIPING LABELS SHALL BE ACRYLIC FACED, WRAP-AROUND TYPE. EACH LABEL SHALL INDICATE THE PIPING CONTENTS, DIRECTION OF FLOW AND SHALL BEAR THE MANUFACTURER'S STANDARD COLOR FOR THE SERVICE INDICATED.

SUBMITTALS:

1. PROVIDE SUBMITTALS BEARING THE CONTRACTORS REVIEW STAMP FOR ALL PLUMBING FIXTURES, PIPING, EQUIPMENT AND ACCESSORIES IN ELECTRONIC FORMAT (PDF).
2. NO PRIVATE LABELED MATERIALS WILL BE ACCEPTED AS EQUALS TO PRODUCTS SPECIFIED HEREIN.
3. THE PLUMBING CONTRACTOR IS RESPONSIBLE FOR ALL COSTS ASSOCIATED WITH SUBSTITUTIONS TO SPECIFIED PLUMBING FIXTURES AND EQUIPMENT INCLUDING BUT NOT LIMITED TO; PROVIDING MAINTENANCE ACCESS CLEARANCE, PIPING, ELECTRICAL, REPLACEMENT OF OTHER SYSTEM COMPONENTS, BUILDING ALTERATIONS, ETC. AND ANY MODIFICATIONS TO ASSOCIATED MECHANICAL, ELECTRICAL OR PLUMBING SYSTEMS REQUIRED BY THE EQUIPMENTS INSTALLATION INSTRUCTIONS. ALL COSTS ASSOCIATED WITH SUBSTITUTIONS SHALL BE INCLUDED IN THE ORIGINAL BASE BID.

PLUMBING LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
CW	CW	COLD WATER PIPING
HW	HW	HOT WATER PIPING
W	W	SANITARY WASTE PIPING
	V	SANITARY VENT PIPING
SD	SD	STORM DRAIN PIPING
ESD	ESD	EMERGENCY STORM DRAIN PIPING
PD	PD	PUMP DISCHARGE (SUMP PUMP)
G	G	NATURAL GAS PIPING
D	D	DRAIN PIPING
	-	PIPING ELBOW DOWN
	-	PIPING ELBOW UP
	-	PIPING CONTINUES
	-	BALL VALVE
	-	CHECK VALVE
	-	GAS VALVE
	PRV	PRESSURE REDUCING VALVE
S	-	SOLENOID VALVE
	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
	-	PIPING REDUCER
	FCO	FLOOR CLEANOUT
	YCO	YARD CLEANOUT
	WCO	WALL CLEANOUT
	CO	PLUG CLEANOUT
	FD	FLOOR DRAIN
	RD	ROOF DRAIN
	HB	HOSE BIBB / WALL HYDRANT
	SA-#	SHOCK ARRESTOR - SUFFIX INDICATES PDI SIZE
S#	S#	SANITARY WASTE RISER
W#	W#	WATER SUPPLY RISER

ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	O/H	OVERHEAD
BAS	BUILDING AUTOMATION SYSTEM	PSI	POUNDS PER SQUARE INCH
BFF	BELOW FINISHED FLOOR	T&P	TEMPERATURE AND PRESSURE
CFH	CUBIC FEET PER HOUR	TW	TEMPERED WATER
CLG	CEILING	TYP	TYPICAL
CONT	CONTINUATION	UG	UNDERGROUND
DN	DOWN	VTR	VENT THRU ROOF
GPF	GALLONS PER FLUSH	VR	VANDAL RESISTANT
GPM	GALLONS PER MINUTE	WC	WATER COLUMN
HP	HORSE POWER		
INV	INVERT ELEVATION	EC	ELECTRICAL CONTRACTOR
KW	KILOWATT	GC	GENERAL CONTRACTOR
MBH	1,000 BRITISH THERMAL UNIT / HOUR	MC	MECHANICAL CONTRACTOR
		PC	PLUMBING CONTRACTOR

FLOW TEST DATA

DATE / TIME	LOCATION	PRESSURE		FLOW (GPM)	FLOW AT 20 PSI (GPM)
		STATIC (PSI)	RESIDUAL (PSI)		
12-17-2020 09:00AM	HYDRANT #029-218FH OFF NW HOPE LANE	98	60	1920	2832

FLOW TEST PERFORMED BY: KANSAS CITY FIRE DEPARTMENT

PLUMBING SHEET INDEX

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P6.1	PLUMBING RISER DIAGRAMS

GENERAL NOTES

PERMIT SET

STATE OF MISSOURI
BYRON FORD
NUMBER PE-2014023016
PROFESSIONAL ENGINEER

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	Designer
DRAWN BY	TAW
CHECKED BY	DAR
APPROVED BY	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

PLUMBING LEGEND, SPECIFICATIONS AND NOTES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING P0.1

SHEET 1 OF 18

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GENERAL NOTES

PLUMBING SPECIALTIES SCHEDULE

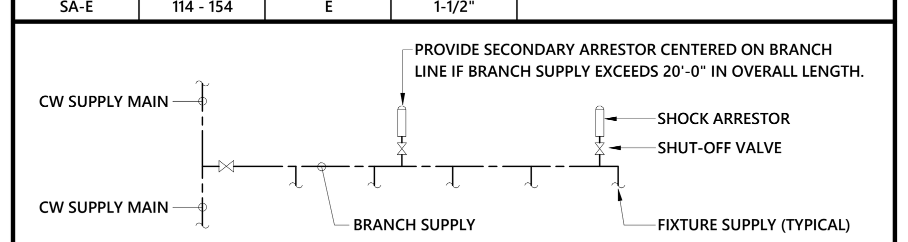
SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
SA-x	SHOCK ARRESTOR, SUFFIX INDICATES PDI SIZE	-	-	x	-	EQUIPMENT: SIOUX CHIEF 650 SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	SEE SHOCK ARRESTOR TABLE THIS SHEET
x-C/S	BALANCING VALVE, THERMOSTATIC, AUTOMATIC, SUFFIX INDICATES PIPE SIZE, SEE FLOOR PLANS	-	-	x	-	EQUIPMENT: CIRCUIT SOLVER CS SERIES, SIZES 1/2" THRU 2", NSF 61 CERTIFIED.	PROVIDE 110°F MODEL
HB1	HOSE BIBB, EXTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, FREEZELESS, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1310-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB2	HOSE BIBB, INTERIOR, EXPOSED, STAINLESS STEEL FACE PLATE, ANTI-SIPHON	-	-	3/4"	-	EQUIPMENT: ZURN Z1333-C-34EL, PROVIDE VACUUM BREAKER AND METAL LOOSE KEY FOR EACH HOSE BIBB	MOUNT 18" AFF
HB3	ROOFTOP HYDRANT, NON-FREEZE, AUTOMATIC DRAINING, ANTI-SIPHON, VACUUM BREAKER	-	-	1"	-	EQUIPMENT: MAPA MPH-24FP:24/9 FINISH: STAINLESS STEEL	
HB4	HOSE BIBB, EXTERIOR, EXPOSED, EXTERIOR CHROME FINISH FREEZELESS, ANTI-SIPHON, DUAL TEMPERATURE	-	-	3/4"	3/4"	EQUIPMENT: ZURN Z1348-BFP WITH AUTOMATIC DRAINING HOSE CONNECTION BACKFLOW PREVENTER.	MOUNT 42" AFF
WB1	WASHING MACHINE CONNECTION BOX, RECESSED IN WALL, MULTI-BOX SYSTEM, SINGLE BOX, WHITE PVC, CENTER DRAIN, WITH WATER HAMMER ARRESTORS AND FACEPLATE	3"	2"	1/2"	1/2"	FIXTURE: WATER-TITE MBS1211HA STOPS: INTEGRAL 1/4 TURN WITH HAMMER ARRESTOR SUPPLIES: (2) 5/8" BRAIDED S.S. FLEXIBLE HOSES	2" DRAIN OUTLET, 2" STANDPIPE WITH 2" P-TRAP. SEE NOTE 1 BELOW
WB2	INDIRECT DRAIN CONNECTION BOX, RECESSED IN WALL, MULTI-BOX SYSTEM, SINGLE AUXILLIARY DRAIN & ADAPTER, WHITE PVC, WITH LOUVERED FACEPLATE	2"	1-1/2"	-	-	FIXTURE: WATER-TITE MBS1200DB3 WITH MB1250AD AUX DRAIN ADAPTER 2" DRAIN OUTLET WITH 2" DEEP SEAL P-TRAP	SEE NOTE 1 BELOW
AAV1	AIR ADMITTANCE VALVE	-	2"	-	-	FIXTURE: STUDOR INC. - "MINI-VENT"	
IMB1	ICE MAKER BOX, RECESSED IN WALL, MULTI-BOX SYSTEM, SINGLE BOX, WHITE PVC, NO DRAIN WITH WATER HAMMER ARRESTOR AND FACEPLATE	-	-	1/2"	-	FIXTURE: WATER-TITE DW1211HA STOP: QUARTER TURN WITH HAMMER ARRESTOR SUPPLY: 1/4" FLEXIBLE HOSE	SEE NOTE 1 BELOW PROVIDE INLINE DOUBLE CHECK VALVE WILIKINS SERIES 700
CO	PLUG CLEANOUT, CAST IRON BODY	**	-	-	-	CLEANOUT: ZURN Z-1440-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
WCO	WALL CLEANOUT, CAST IRON BODY, STAINLESS STEEL WALL PLATE	**	-	-	-	CLEANOUT: ZURN Z-1446-BP, BRONZE PLUG, CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT
FCO	FLOOR CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG CLEANOUT SIZE SHALL MATCH PIPE SIZE	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED FLOOR
YCO	YARD CLEANOUT, CAST IRON BODY, NICKEL BRONZE TOP, ADJUSTABLE, INSTALLED IN 18"x18"x6" CONCRETE PAD	**	-	-	-	CLEANOUT: ZURN ZN-1400-BP, BRONZE PLUG INSTALL IN 18"x 18"x 6" DEEP CONCRETE PAD	GAS / WATER TIGHT, INSTALL TOP FLUSH WITH FINISHED GRADE
FD1	FLOOR DRAIN, CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	**	**	-	-	DRAIN: ZURN ZN-415-B, 6" DIAMETER GRATE P-TRAP: 3" DEEP SEAL	INSTALL TOP FLUSH WITH FINISHED FLOOR. SEE NOTE 2 BELOW.
FD2	FLOOR DRAIN, CAST IRON BODY, ROUND NICKEL BRONZE GRATE, ADJUSTABLE	**	**	-	-	DRAIN: ZURN ZN-415-I, 9" DIAMETER RECESSED GRATE P-TRAP: 3" CAST IRON, DEEP SEAL	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 2 BELOW.
TP1	TRAP PRIMER, PROVIDE DISTRIBUTION UNIT WHEN SERVING MORE THAN ONE FLOOR DRAIN	-	-	1/2"	-	PRIMER: PPP PRODUCTS MODEL P-1 PROVIDE 1/2" COPPER PIPING SLOPED CONTINUOSLY TO FLOOR DRAIN(S)	INSTALL TOP OF DRAIN LIP FLUSH WITH FLOOR. SEE NOTE 2 BELOW.
GD1	GARAGE AREA DRAIN, CAST IRON BODY, SECURED CAST IRON HINGED GRATE WITH SEDIMENT BUCKET	**	**	-	-	DRAIN: ZURN ZN-415-I, 9" DIAMETER RECESSED GRATE P-TRAP: 3" CAST IRON, DEEP SEAL	PROVIDE ACCESS DOOR FOR CONCEALED INSTALLATIONS
TD1	TRENCH DRAIN, 6' - 8' LONG, INTEGRAL FRAMES, DUCTILE IRON SLOTTED GRATE	**	**	-	-	DRAIN: ZURN Z886-HD-DGC, 1 SECTION WITH 2 CLOSED END CAPS AND A 4" BOTTOM P-TRAP: 4" DEEP DEAL	
RD1	PRIMARY ROOF DRAIN, 15" DIA., CAST IRON BODY, SUMP RECEIVER CAST IRON DOME.	**	**	-	-	DRAIN: ZURN ZC100-DP-DR WITH TOP SET DECK PLATE AND ADJUSTABLE DRAIN RISER.	SET TOP OF DRAIN BODY 1.5" BELOW THE ADJACENT FINISHED ROOF ELEVATION.
RD2	SECONDARY ROOF DRAIN, 15" DIA., CAST IRON BODY, SUMP RECEIVER, AND CAST IRON SOLID TOP DOME	**	**	-	-	DRAIN: ZURN ZC100-DP-DR-W4-ST WITH TOP SET DECK PLATE, ADJUSTABLE DRAIN RISER, 4" HIGH INTERNAL WATER DAM AND SOLID TOP DOME	SET WATER DAM ELEVATION 4" ABOVE THE ADJACENT FINISHED ROOF ELEVATION.
NZ1	DOWNSPOUT NOZZLE ALL POLISHED BRONZE BODY DECORATIVE NICKEL BRONZE TOP	**	**	-	-	DRAIN: ZURN ZAB-199-SS ALL POLISHED BRONZE BODY DECORATIVE NICKEL BRONZE TOP WITH REMOVEABLE STAINLESS BIRD SCREEN	

NOTES:
1. PROVIDE FIRE RATED BOX WHERE LOCATED IN A RATED WALL. COORDINATE ALL LOCATIONS PRIOR TO ORDERING.
2. PROVIDE TRAP PRIMER EQUAL TO PPP PRODUCTS MODEL P-1. SEE SCHEDULE THIS SHEET.
** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	SHOCK ARRESTOR	SIOUX CHIEF, PPP INC., ZURN, WATTS
	HOSE BIBBS	ZURN, WOODFORD, ZURN, J.R. SMITH
	DRAINS	ZURN, J.R. SMITH, WADE
	BACKFLOW PREVENTER	WILKINS, WATTS, APOLLO

SHOCK ARRESTOR TABLE

DRAWING SYMBOL	FIXTURE UNITS	P.D.I. WH201 DESIGNATION	ARRESTOR SIZE	REMARKS
SA-A	1 - 11	A	1/2"	INSTALL SHOCK ARRESTORS PER THE PLUMBING DRAINAGE INSTITUTE (P.D.I.) GUIDELINES.
SA-B	12 - 32	B	3/4"	
SA-C	33 - 60	C	1"	ACCEPTED MANUFACTURERS:
SA-D	61 - 113	D	1-1/4"	SIOUX CHIEF, WATTS, PPP INC., ZURN, FNW
SA-E	114 - 154	E	1-1/2"	



PLUMBING EQUIPMENT SCHEDULE

SYM.	DESCRIPTION	CONN. SIZE INLET	OUT	SPECIFICATION	REMARKS
WH1/ WH2	COMMERCIAL WATER HEATER GAS FIRED, TANK TYPE, 100 GALLON CAPACITY, 30" DIAMETER	1-1/2"	1-1/2"	EQUIPMENT: A.O. SMITH BTH-199 GAS INPUT: 199,000 BTUH ELECTRICAL: 120V, 1 PHASE RECOVERY: 587 GPH AT 80° RISE.	SET OUTLET TEMPERATURE TO 120°F SEE NOTES 1 & 3
WH3	WATER HEATER, ELECTRIC, 48 GALLON STORAGE, (2) 4.5kW ELEMENTS, NON-SIMULTANEOUS OPER.	3/4"	3/4"	EQUIPMENT: A.O. SMITH ENLB-50 ELEC: 208V/1P, 4.5 kW RECOVERY: 23 GPH AT 80° RISE	SET OUTLET TEMPERATURE TO 120°F SEE NOTES 1 & 2
ET1/ ET2	THERMAL EXPANSION TANK 6.4 GALLON CAPACITY	3/4"	-	EQUIPMENT: AMTROL ST-12-C	SEE NOTE 6
RCP1	CIRCULATION PUMP ALL BRONZE CONSTRUCTION	1-1/2"	1-1/2"	PUMP: B&G ECOCIRC XL 45-55 ELEC: 1/2 HP, 120V RATED FOR 20 GPM AT 25' HEAD	SEE NOTE 4
RCP2	CIRCULATION PUMP ALL BRONZE CONSTRUCTION	3/4"	3/4"	PUMP: B&G ECOCIRC 20-35 ELEC: 1/12 HP, 120V RATED FOR 10 GPM AT 10' HEAD	SEE NOTE 4
MV1	THERMOSTATIC MIXING VALVE ASSE 1017 CERTIFIED	1"	1"	EQUP: LAWLER 802 SERIES 86006 WITH HIGH-LOW MANIFOLD	SET OUTLET TEMPERATURE TO 115°F
MV2	THERMOSTATIC MIXING VALVE ASSE 1070 CERTIFIED	1/2"	1/2"	EQUIP: ZURN MODEL ZW1017XL, WITH INTEGRAL CHECK VALVES AND SCREENS ON INLETS.	SET OUTLET TEMPERATURE TO 110°F. SEE NOTE 5
SP1	ELEVATOR SUMP PUMP & OIL DETECTION SYSTEM, CONTROL PANEL WITH AUDIBLE, VISUAL AND REMOTE ALARMS.	-	2"	EQUIP: LIBERTY ELV-290 SERIES ELECTRICAL: 1/2 H.P, 120V FLOW: 50 GPM AT 20 FT. HEAD PROVIDE WITH OIL DETECTION MONITOR, CONTROL PANEL AND REMOTE ALARM.	PROVIDE BACKWATER CHECK VALVE AND SHUT-OFF VALVE ON DISCHARGE LINE. SEE SCHEMATIC 4/P0.3

NOTES:
1. WATER HEATER SHALL MEET OR EXCEED THE REQUIREMENTS OF ASHRAE 90.1
2. BASIS-OF-DESIGN WATER HEATER CONTAINS (2) TWO ELEMENTS, WITH NON-SIMULTANEOUS OPERATION.
3. COMMERCIAL GAS FIRED WATER HEATER SHALL HAVE AT LEAST A 5 YEAR WARRANTY, STAINLESS STEEL BURNERS, REDUNDANT GAS VALVES, SEALED COMBUSTION CHAMBER, FAN ASSISTED COMBUSTION, ASME 150 PSI WORKING PRESSURE, INLET AND OUTLET TEMPERATURE GAUGE, TEMP GAUGE, 150 PSI T&P RELIEF VALVE, OPERATING LIMIT AND HIGH LIMIT CONTROLS, U.L. AND FM APPROVED GAS TRAIN, FLOW SWITCH, 100% SAFETY SHUTDOWN AND LOW NOX EMISSIONS. PROVIDE WITH FACTORY CONDENSATE NEUTRALIZATION KIT. WATER HEATER SHALL EXCEED ASHRAE 90.1 REQUIREMENTS.
4. INTERLOCK WITH FULLY ADJUSTABLE AQUASTAT AND 7-DAY, 24 HOUR TIMER.
5. INSTALL UNIT BELOW LAVATORY / SINK AND OUT OF ADA KNEE-SPACE CLEARANCE AREA
6. EXPANSION TANK SHALL BE CHARGED TO MEET FINAL OPERATING PRESSURE FOR DOMESTIC WATER SYSTEM.

** MATCH PIPE SIZE SHOWN ON PLANS, SEE PLANS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	WATER HEATERS	A.O. SMITH, BRADFORD WHITE, LOCHINVAR
	EXPANSION TANKS	AMTROL, A.O. SMITH, WATTS, WESSLES
	SUMP PUMPS	LIBERTY, STANCOR, ALDERON IND.
	MIXING VALVE (MV1)	LAWLER, LEONARD, DELTA
	MIXING VALVE (MV2)	ZURN, SYMMONS, LEONARD

PLUMBING FIXTURE SCHEDULE

SYMBOL	DESCRIPTION	CONNECTION SIZE W	V	CW	HW	SPECIFICATION	REMARKS
P1	TOILET, STANDARD, PRIVATE RESIDENT TANK TYPE, ELONGATED SEAT, WHITE VITREOUS CHINA, FLOOR MOUNTED CLOSED SEAT WITH COVER, 1.6 GPF	3"	2"	1/2"	-	FIXTURE: GERBER "VIPER" 21-518 MATERIAL: WHITE VITREOUS CHINA SEAT: OLSONITE #94 SUPPLY/STOP: ZURN Z-8806-CR	RIM HEIGHT 15" A.F.F. SEE NOTE 1 BELOW
P1A	TOILET, ADA-COMPLIANT, PRIVATE RESIDENT TANK TYPE, ELONGATED SEAT, WHITE VITREOUS CHINA, FLOOR MOUNTED CLOSED SEAT WITH COVER, 1.28 GPF	3"	2"	1/2"	-	FIXTURE: GERBER "VIPER" 21-518 MATERIAL: WHITE VITREOUS CHINA SEAT: OLSONITE #94 SUPPLY/STOP: ZURN Z-8806-CR	RIM HEIGHT 17" A.F.F. SEE NOTES 1 BELOW
P1B	TOILET, ADA-COMPLIANT, PUBLIC TANK TYPE, ELONGATED SEAT, WHITE VITREOUS CHINA, FLOOR MOUNTED CLOSED SEAT WITH COVER, 1.28 GPF	3"	2"	1/2"	-	FIXTURE: GERBER "VIPER" 21-518 MATERIAL: WHITE VITREOUS CHINA SEAT: OLSONITE #94 SUPPLY/STOP: ZURN Z-8806-CR	RIM HEIGHT 17" A.F.F. SEE NOTES 1 BELOW
P3	LAVATORY, PRIVATE RESIDENT INTEGRAL OVAL BOWL IN WHITE CULTURED MARBLE COUNTER TOP MANUAL FAUCET, 1.5 GPM AERATOR	2"	1-1/2"	1/2"	1/2"	FAUCET: PEERLESS P136LF-M WITH POP-UP DRAIN AND STOPPER P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	
P3A	LAVATORY, ADA-COMPLIANT, PRIVATE RESIDENT INTEGRAL OVAL BOWL IN WHITE CULTURED MARBLE COUNTER TOP MANUAL FAUCET, 1.5 GPM AERATOR	2"	1-1/2"	1/2"	1/2"	FAUCET: PEERLESS P136LF-M WITH POP-UP DRAIN AND STOPPER P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	
P3B	LAVATORY, PUBLIC, ADA-COMPLIANT 19"x16" UNDERCOUNTER OVAL BOWL BATTERY-POWERED SENSOR FAUCET, 0.5 GPM AERATOR	2"	1-1/2"	1/2"	1/2"	FIXTURE: AMERICAN STANDARD 0496.221 FAUCET: AMERICAN STANDARD 6055.105, 0.5 GPM GRID DRAIN: ZURN 8743; P-TRAP: ZURN Z-8701 (1-1/4"x1-1/2", 17 GA.) SUPPLIES/STOPS: ZURN 8806-XL-LR-LK	
P4A	WATER COOLER & BOTTLE FILLER, A.D.A. COMPLIANT, STAINLESS STEEL FINISH, BI-LEVEL DOUBLE BOWL, VANDAL RESISTANT, IN-WALL INSTALLATION, INTEGRAL WATER FILTER, SENSOR OPERATED BOTTLE FILLER WITH AUTO SHUT-OFF.	2"	1-1/2"	1/2"	-	FIXTURE: ELKAY LZSTL8WS(VR)*K ELEC: 550 WATT, 120 VOLT, SINGLE PHASE P-TRAP: ZURN Z-870 (1-1/4"x1-1/2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK	SEE NOTE 4 BELOW
P5	SINK, PRIVATE RESIDENT, 31"x 20"x8", DOUBLE BLOW 20 GAUGE STAINLESS STEEL UNDERMOUNT MANUAL FAUCET WITH PULL-OUT SPRAY, 1.8 GPM	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY ELUH3220 FAUCET: PEERLESS P18550LF, 1.8 GPM BASKET STRAINER: ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK DISPOSAL: ISE BADGER 1, 1/3 HP, WITH POWER CORD	PROVIDE WATER AND WASTE CONNECTIONS FOR ADJACENT DISHWASHER.
P5A	SINK, PRIVATE RESIDENT, ADA COMPLIANT, 31"x16"x5-1/2", DOUBLE BOWL UNDERMOUNT, 18 GAUGE STAINLESS STEEL MANUAL FAUCET WITH PULL-OUT SPRAY, 1.8 GPM	2"	1-1/2"	1/2"	1/2"	FIXTURE: ELKAY ELUHAD3216 FAUCET: PEERLESS P18550LF, 1.8 GPM BASKET STRAINER: ZURN Z-8740 P-TRAP: ZURN 8703 (1-1/2"x2", 17 GA.) SUPPLY/STOP: ZURN 8806-XL-LR-LK DISPOSAL: ISE BADGER 1, 1/3 HP, WITH POWER CORD	PROVIDE WATER AND WASTE CONNECTIONS FOR ADJACENT DISHWASHER.
P5C	MOP SINK, 24"x 24"x 10", MOLDED STONE, 12" STAINLESS STEEL WALL GUARDS, SERVICE FAUCET, HOSE, MOP HANGER BRACKET.	3"	2"	1/2"	1/2"	FIXTURE: FIAT MSBID2424-100, 832AA, (2) MSG3624, 889CC, E88AA FAUCET: FIAT 830-AA DRAIN: FIAT 1453-BB P-TRAP: 3" DEEP SEAL, CAST IRON	PROVIDE CHECK VALVES ON HW AND CW SUPPLIES.
P6	BATH AND SHOWER, PRIVATE RESIDENT, ADA - ADAPTABLE ONE-PIECE DESIGN, WHITE FRP, PRESSURE BALANCED SHOWER VALVE	2"	1-1/2"	1/2"	1/2"	FIXTURE: STERLING S711211100 60 x 21 FAUCET: KOHLER KTS10581-4-BN VALVE: KOHLER K304-KS-NA DIVERTER VALVE: DELTA R1000 HANDHELD: GROHE 26077 ELBOW: GROHE 28627 WASTE OVERFLOW: OATEY 46121 DRAIN: MCQUIRE 155-WC, 2" P-TRAP	PROVIDE RIGHT OR LEFT HAND CONTROLS PER ARCHITECTURAL PLANS AND ELEVATIONS
P6A	SHOWER, PRIVATE RESIDENT, ADA, ROLL-IN, ONE-PIECE DESIGN WHITE FRP, PRESSURE BALANCED SHOWER VALVE	2"	1-1/2"	1/2"	1/2"	FIXTURE: AQUARIUS MPB6036-BF FAUCET: KOHLER K-72415-BN VALVE: DELTA R10000-UNWS DIVERTER VALVE: DELTA T11800 HANDHELD: KOHLER K-45906-BN, K-45982-BN ELBOW: GROHE 28627 GRID DRAIN: KOHLER K-9132-BN SEAT: BOBRICK B-517	
P6B	JOB-BUILT SHOWER PRESSURE BALANCED SHOWER VALVE, 1.5 GPM WALL SHOWERHEAD	2"	1-1/2"	1/2"	1/2"	FIXTURE: AQUARIUS AB3460WH FAUCET: KOHLER K-72419-BN VALVE: DELTA R10000-UNWS DIVERTER VALVE: KOHLER K304-KS-NA HANDHELD: KOHLER K-45906-BN, K-45982-BN ELBOW: GROHE 28627 GRID DRAIN: KOHLER K-9132-BN	

NOTES:
1. PROVIDE HEAVY DUTY CAST IRON CLOSET FLANGE WITH COMPRESSION SEAL AND TEST CAP EQUAL TO ZURN CF2980-CI4. OFFSET FLANGES ARE NOT ACCEPTABLE.
2. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1222-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.
3. PROVIDE PRE-MANUFACTURED A.D.A. COMPLIANT INSULATION KIT FOR EXPOSED P'TRAP AND SUPPLY TRIM UNDER SINK.
4. SEE ARCHITECTURAL PLANS FOR MOUNTING HEIGHT. PROVIDE A FLOOR MOUNTED PLATE STYLE CARRIER EQUAL TO ZURN Z1225-EZ (-SL) SERIES. WHEN CARRIER IS LOCATED BEHIND A BLOCK WALL, PROVIDE EXTENDED STUD LENGTHS TO COMPENSATE FOR THE BLOCK WALL THICKNESS.

APPROVED EQUALS:	PRODUCT TYPE:	ACCEPTED MANUFACTURERS:
THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING THE MODEL WHICH MOST CLOSELY MATCHES THE SPECIFIED PRODUCT. PROVIDE PRODUCTS MADE BY THE MANUFACTURER'S LISTED.	VITREOUS CHINA	GERBER, KOHLER, AMERICAN STANDARD,
	FAUCETS	PEERLESS, DELTA, AMERICAN STANDARD,
	WATER COOLERS	ELKAY, HALSEY TAYLOR, HAWS
	SUPPLIES, STOPS	ZURN, MCGUIRE, BRASSCRAFT
	HOSE BIBBS	ZURN, J.R. SMITH, WOODFORD
	UTILITY SINKS	FIAT, FLORESTONE, STERN WILLIAMS

PERMIT SET

STATE OF MISSOURI BYRON FORD NUMBER PE-2014023016 PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	Designer
DRAWN BY	TAW
CHECKED BY	DAR
APPROVED BY	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

PLUMBING SCHEDULES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING P0.2

SHEET 2 OF 18

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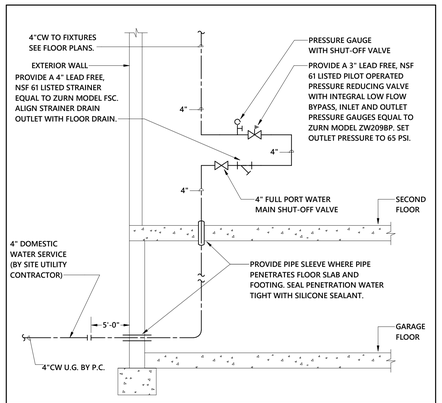
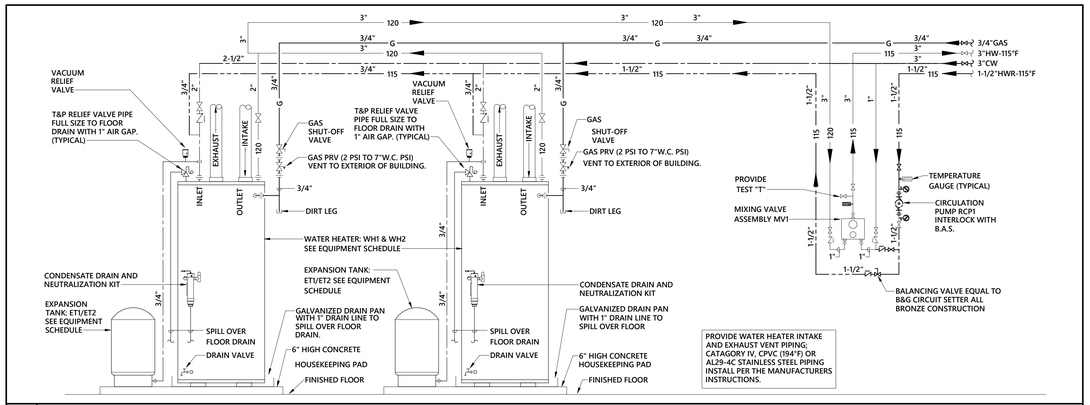
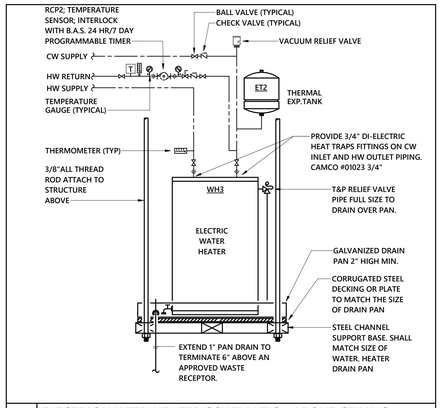


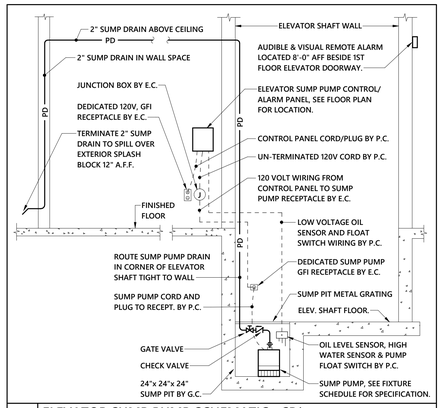
1 WATER SERVICE ENTRANCE SCHEMATIC W/BACKFLOW
NOT TO SCALE



2 WATER HEATER SCHEMATIC - BUILDING HOT WATER
NO SCALE



3 ELECTRIC WATER HEATER SCHEMATIC - ABOVE CEILING
NOT TO SCALE



4 ELEVATOR SUMP PUMP SCHEMATIC - SP1
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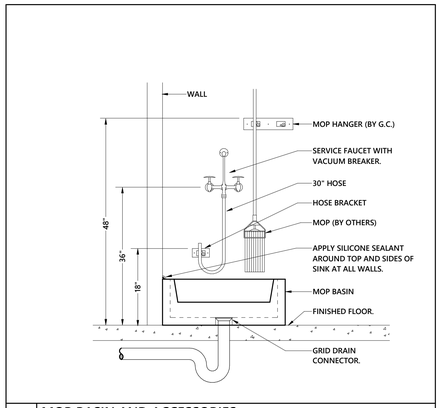
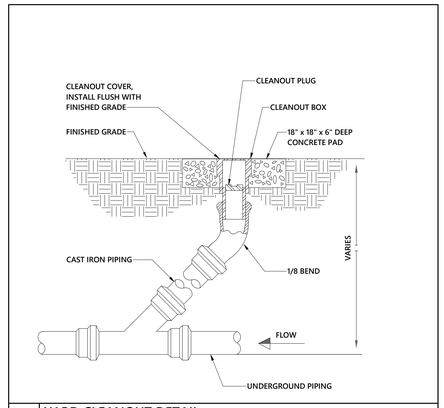
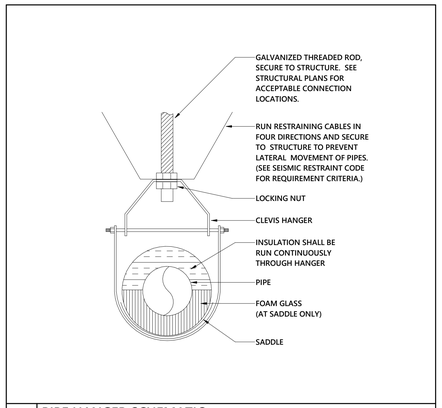


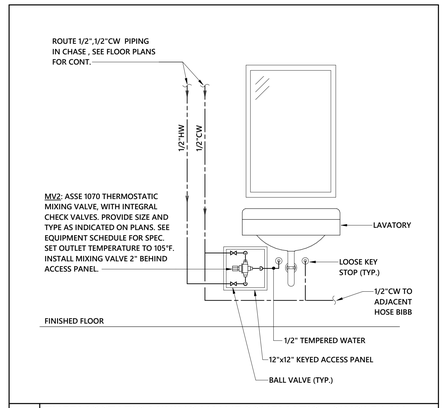
5 MOP BASIN AND ACCESSORIES
NOT TO SCALE



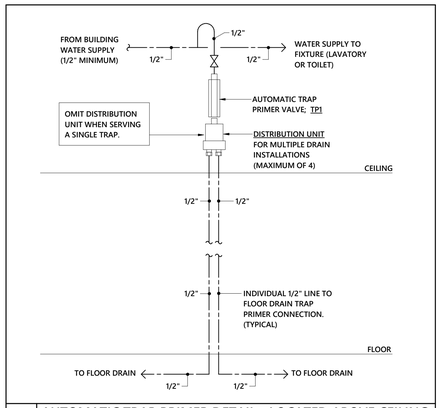
6 YARD CLEANOUT DETAIL
NOT TO SCALE



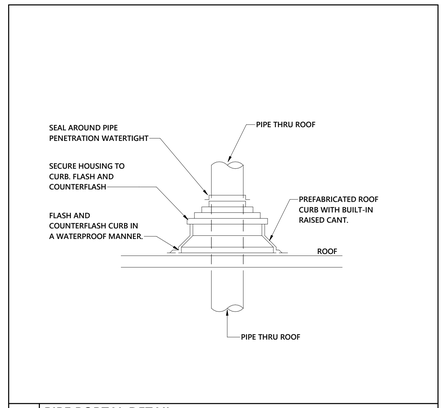
7 PIPE HANGER SCHEMATIC
NOT TO SCALE



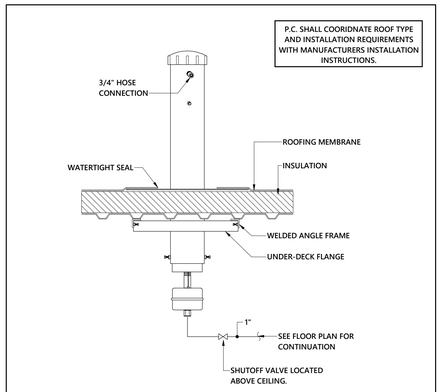
8 THERMOSTATIC MIXING VALVE SCHEMATIC - SINGLE LAV
NOT TO SCALE



9 AUTOMATIC TRAP PRIMER DETAIL - LOCATED ABOVE CEILING
NOT TO SCALE



10 PIPE PORTAL DETAIL
NOT TO SCALE



11 ROOF MOUNTED HOSE BIB
NOT TO SCALE

GENERAL NOTES

PERMIT SET

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APPROVED BY	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
PLUMBING SCHEMATICS AND DETAILS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING P0.3

SHEET 3 OF 18

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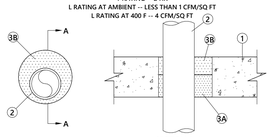
SYSTEM NO. C-AJ-2141

PVC PIPE THROUGH CONCRETE WALL ASSEMBLY

F RATING -- 3 HR
T RATING -- 2 HR
L RATING AT AMBIENT -- LESS THAN 1 CFM/SQ.FT
L RATING AT 400 F -- 4 CFM/SQ.FT



SECTION A-A

1. FLOOR OR WALL ASSEMBLY — MIN 4-1/2 IN. THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 6 IN. SEE CONCRETE BLOCKS* (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.
2. THROUGH PENETRANTS — ONE NONMETALLIC PIPE OR CONDUIT TO BE INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN THE PIPE OR CONDUIT AND THE PERIPHERY OF THE OPENING SHALL BE A MIN 1/2 IN. TO A MAX 2 IN. THE PIPE OR CONDUIT TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL. THE FOLLOWING TYPES AND SIZES OF PIPES OR CONDUITS MAY BE USED:
   A. POLYVINYL CHLORIDE (PVC) PIPE — NOM 3 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
   B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE — NOM 3 IN. DIAM (OR SMALLER) SDR 17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
3. FIRESTOP SYSTEM — THE FIRESTOP SYSTEM SHALL CONSIST OF THE FOLLOWING:
   A. FORMING MATERIAL* — MIN 2-1/2 IN. THICKNESS OF FORMING MATERIAL FOAMED INTO OPENING AS A PERMANENT FORM. FORMING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF FILL MATERIAL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — CF810, CFB12 OR CFS11 FOAM SEALANT
   B. FILL, VOID OR CAVITY MATERIAL* — SEALANT — MIN 2 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS FLUSH WITH TOP SURFACE OF FLOOR OR WITHIN BOTH SURFACES OF WALL. HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC — FS-ONE SEALANT

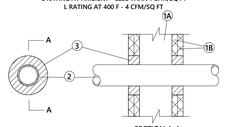
*BEARING THE UL CLASSIFICATION MARK

1 PVC PIPE THROUGH CONCRETE WALL ASSEMBLY
NOT TO SCALE

SYSTEM NO. W-L-2098

PVC PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATINGS - 1 AND 2 HR (SEE ITEM 1)
T RATINGS - 1 AND 2 HR (SEE ITEM 1)
L RATING AT AMBIENT - LESS THAN 1 CFM/SQ FT
L RATING AT 400 F - 4 CFM/SQ FT

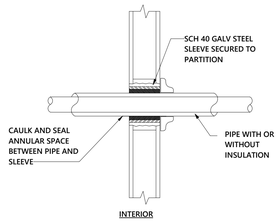


SECTION A-A

1. WALL ASSEMBLY -- THE FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES WALL AND PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
   A. STUDS -- WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE AND SPACED MAX 24 IN. OC.
   B. GYPSUM BOARD* -- 5/8 IN. THICK, 4 FT WIDE WITH SQUARE OR TAPPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL WALL AND PARTITION DESIGN. MAX DIAM OF OPENING IS 4-3/8 IN. THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
2. THROUGH PENETRANTS -- ONE NONMETALLIC PIPE INSTALLED WITHIN THE FIRESTOP SYSTEM. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY. THE SPACE BETWEEN PIPE AND PERIPHERY OF OPENING SHALL BE MIN 3/4 IN. TO MAX 1-1/4 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:
   A. POLYVINYL CHLORIDE (PVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SCHEDULE 40 PVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEM.
   B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE -- NOM 2 IN. DIAM (OR SMALLER) SDR17 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
3. FILL, VOID OR CAVITY MATERIALS* -- SEALANT -- INSTALLED TO COMPLETELY FILL THE ANNULAR SPACE BETWEEN THE PIPES AND GYPSUM WALLBOARD ON BOTH SIDES OF WALL.

*BEARING THE UL CLASSIFICATION MARK

2 PVC PIPE THROUGH GYPSUM WALL ASSEMBLY
NOT TO SCALE



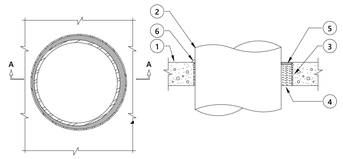
NOTES:
1. TYPICAL FOR NON-INSULATED PIPE AND CONDUIT.
2. ALL CAULKING AND SEALANT SHALL BE FIRE RATED (SEE SPECIFICATIONS).
3. WHERE PIPING IS EXPOSED AT FINISHED WALL, FLUSH MOUNT SLEEVE AND PROVIDE AN ESCUTCHEON PLATE.

3 SUPPORT PIPE PENETRATION THRU INTERIOR WALLS
NOT TO SCALE

U.L. SYSTEM NO. CAJ1155

METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



TOP VIEW SECTION A-A

1. FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE.
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.

3. OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).

4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.

5. MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

6. A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 22".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ1155

STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

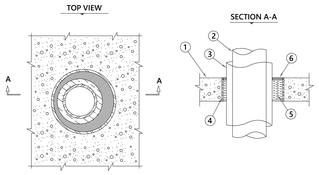
STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

4 U.L. SYSTEM NO CAJ-1155 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. CAJ5090

INSULATED METALLIC PIPE THROUGH CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = 4 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



1. CONCRETE FLOOR ASSEMBLY (MINIMUM 4-1/2" THICK)
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 4" DIAMETER STEEL PIPE.
   B. MAXIMUM 4" DIAMETER COPPER PIPE.
   C. MAXIMUM 4" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.
3. MAXIMUM 3/4" THICK AB/PVC PIPE INSULATION.
4. OPTIONAL: MAXIMUM 8" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).
5. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) TIGHTLY PACKED.
6. MINIMUM 1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 8-5/8".
2. ANNULAR SPACE = MINIMUM 1/2", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ5090

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - BACKING MATERIAL: Pack mineral wool tightly around the penetrating item to the depth shown in the drawings, and recess it below the top surface of the floor (or both surfaces of a wall) to allow proper space for the firestop material.

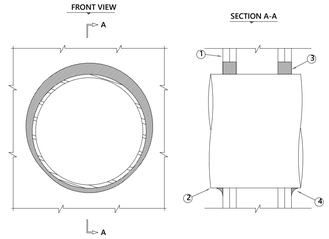
STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to the depth shown. Wall penetrations require Firestop Sealant on both sides. Leave completed seal undisturbed for 48 hours.

5 U.L. SYSTEM NO CAJ5090 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. WL1054

METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR OR 2-HR
T RATING = 0-HR
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. AND 2-HR. FIRE RATING)(2-HR. SHOWN).

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.

1. MINIMUM DEPTH
   A. MINIMUM 5/8" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 1-HR. FIRE-RATING. B. MINIMUM 1-1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 2-HR. FIRE-RATING.

2. MINIMUM 1/2" BEAD HILTI FS-ONE FIRESTOP SEALANT FOR POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22-1/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

INSTALLATION INSTRUCTIONS FOR UL NO.WL1054

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space around the penetrating item. Tool excess sealant beyond perimeter of the opening 1/2" onto wall surface. Leave completed seal undisturbed for for 48 hours.

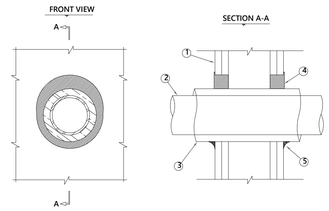
6 U.L. SYSTEM NO WL1054 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. WL5028

INSULATED METAL PIPE THROUGH 1-HR. OR 2-HR.
GYPSUM WALL ASSEMBLY

F RATING = 1-HR AND 2-HR
T RATING = 1/2-HR

L RATING AT AMBIENT = 4 CFM/SQ. FT.
L RATING AT 400°F = LESS THAN 1 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. OR 2-HR. FIRE RATING)(2-HR. SHOWN).
2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 4" DIAMETER STEEL PIPE.
   B. MAXIMUM 2" DIAMETER COPPER PIPE.
   C. MAXIMUM 4" DIAMETER EMT.
   D. MAXIMUM 4" DIAMETER STEEL CONDUIT.
3. MAXIMUM 3/4" THICK (AB/PVC) FLEXIBLE FOAM TYPE PIPE INSULATION.
4. HILTI FS-ONE FIRESTOP SEALANT:
   A. MINIMUM 5/8" DEPTH, FOR A 1-HR. FIRE-RATING.
   B. MINIMUM 1-1/4" DEPTH, FOR A 2-HR. FIRE-RATING.
5. MINIMUM 1/2" CROWN HILTI FS-ONE FIRESTOP SEALANT AT PIPE INSULATION/WALL ASSEMBLY INTERFACE.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 7-1/2".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.WL5028

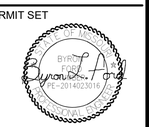
STEP 1 - PREPARATION: ALL SURFACES MUST BE CLEAN, SOUND, DRY AND FROST FREE PRIOR TO APPLICATION OF FIRESTOPPING MATERIALS.

STEP 2 - FIRESTOP SEALANT: APPLY A MINIMUM 5/8" OR 1-1/4" DEPTH OF FS-ONE IN THE ANNULAR SPACE BETWEEN THE PIPE AND WALL ON BOTH SIDES AND TOOL IT WITH A PUTTY KNIFE UNTIL FLUSH WITH SURFACE. TOOL EXCESS BEYOND THE PERIMETER OF THE OPENING 1/2" ONTO EACH WALL SURFACE. LEAVE COMPLETED SEAL UNDISTURBED FOR 48 HOURS.

7 U.L. SYSTEM NO WL5028 DETAIL
NOT TO SCALE

GENERAL NOTES

PERMIT SET



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DRAWING	SHEET
P0.4	4 OF 18

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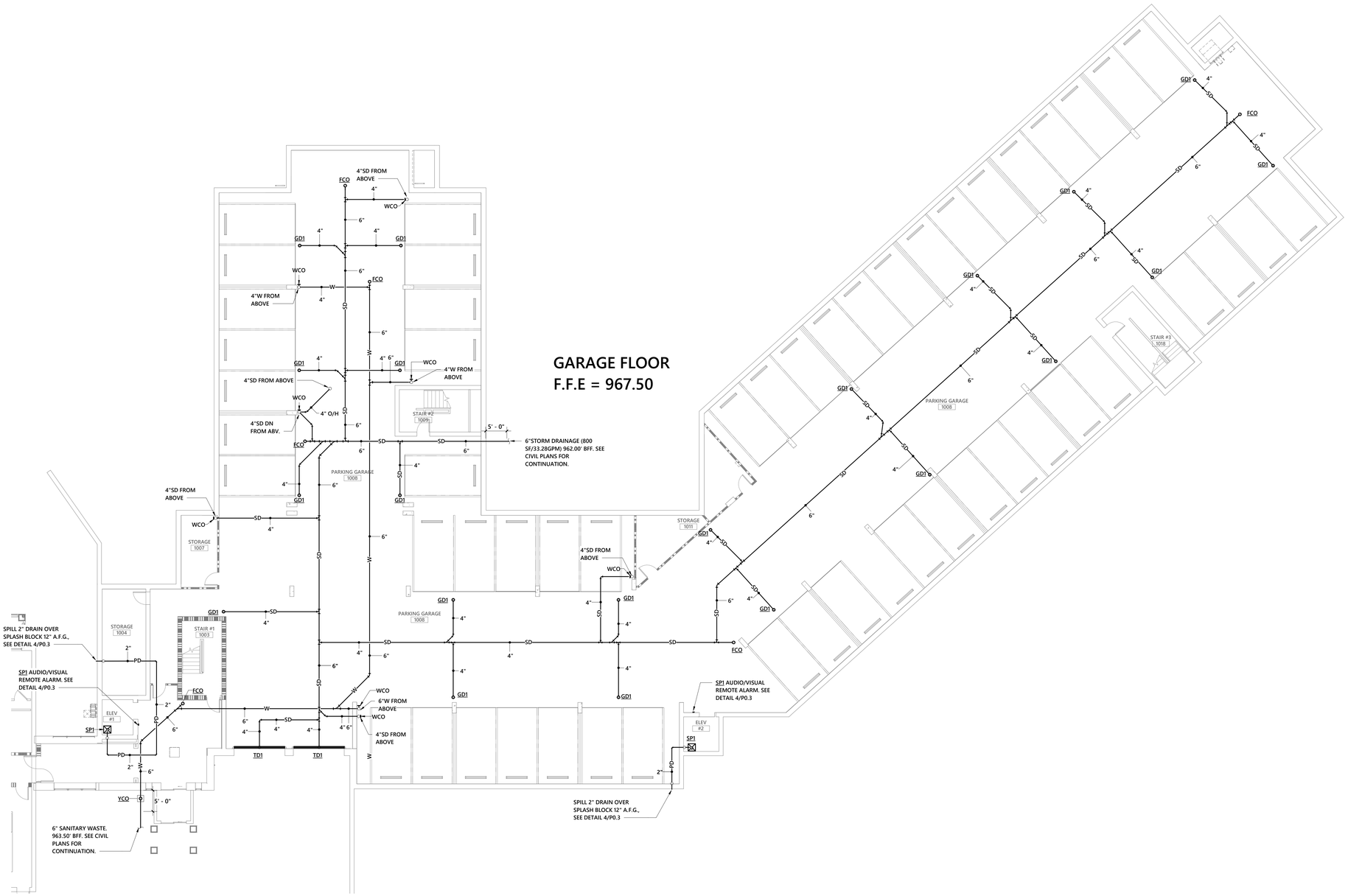

1 GARAGE OVERALL DRAINAGE PIPING PLAN
3/32" = 1'-0"

GENERAL NOTES

PERMIT SET

01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	DAR
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

GARAGE OVERALL DRAINAGE PIPING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
P1.1	5 OF 18

N
PLAN NORTH

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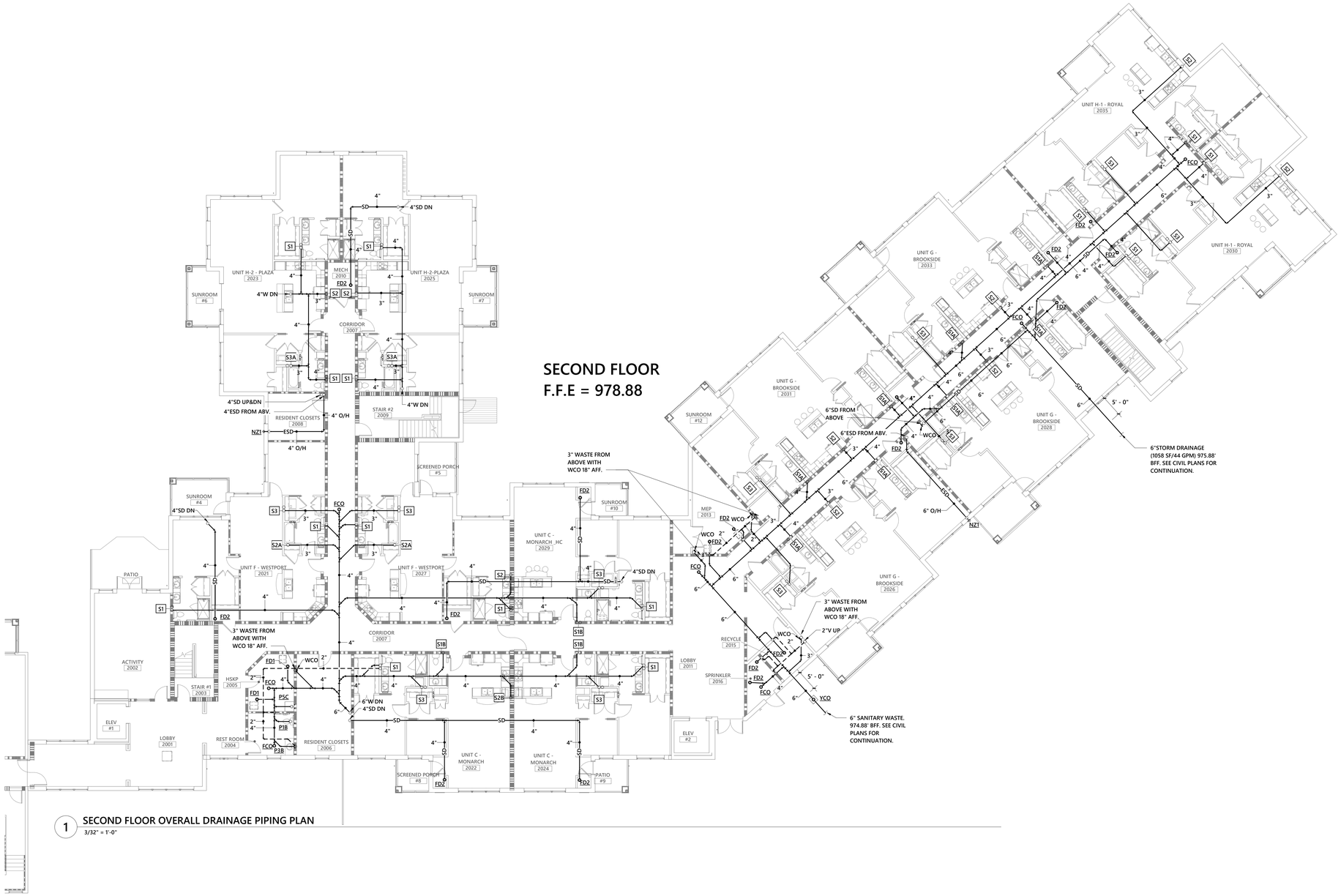
2. REFER TO P6 SERIES SHEETS FOR SANITARY WASTE AND VENT RISER DIAGRAMS.



1 SECOND FLOOR OVERALL DRAINAGE PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	DESIGNER
PROJECT ARCHITECT	PA
PROJECT ENGINEER	Designer
DRAWN BY	TAW
CHECKED BY	DAR
APPROVED BY	-

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

SECOND FLOOR OVERALL DRAINAGE PIPING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
P1.2	6 OF 18

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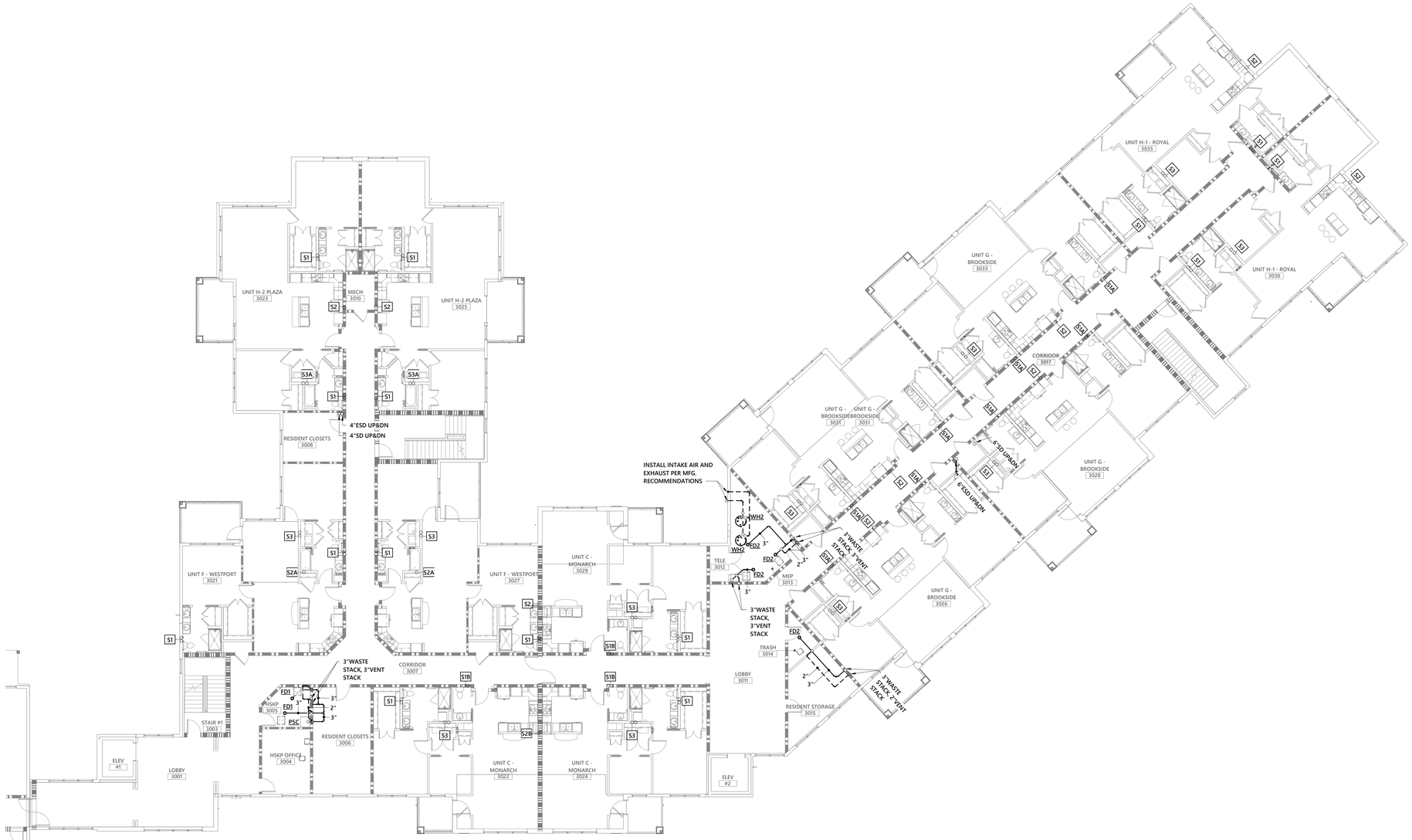
2. REFER TO P6 SERIES SHEETS FOR SANITARY WASTE AND VENT RISER DIAGRAMS.



1 THIRD FLOOR OVERALL DRAINAGE PIPING PLAN

3/32" = 1'-0"

N

PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON W. PAYNE JR. PE-014023016 PROFESSIONAL ENGINEER

01/18/2021

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Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	DAR
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

THIRD FLOOR OVERALL DRAINAGE PIPING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
P1.3	7 OF 18

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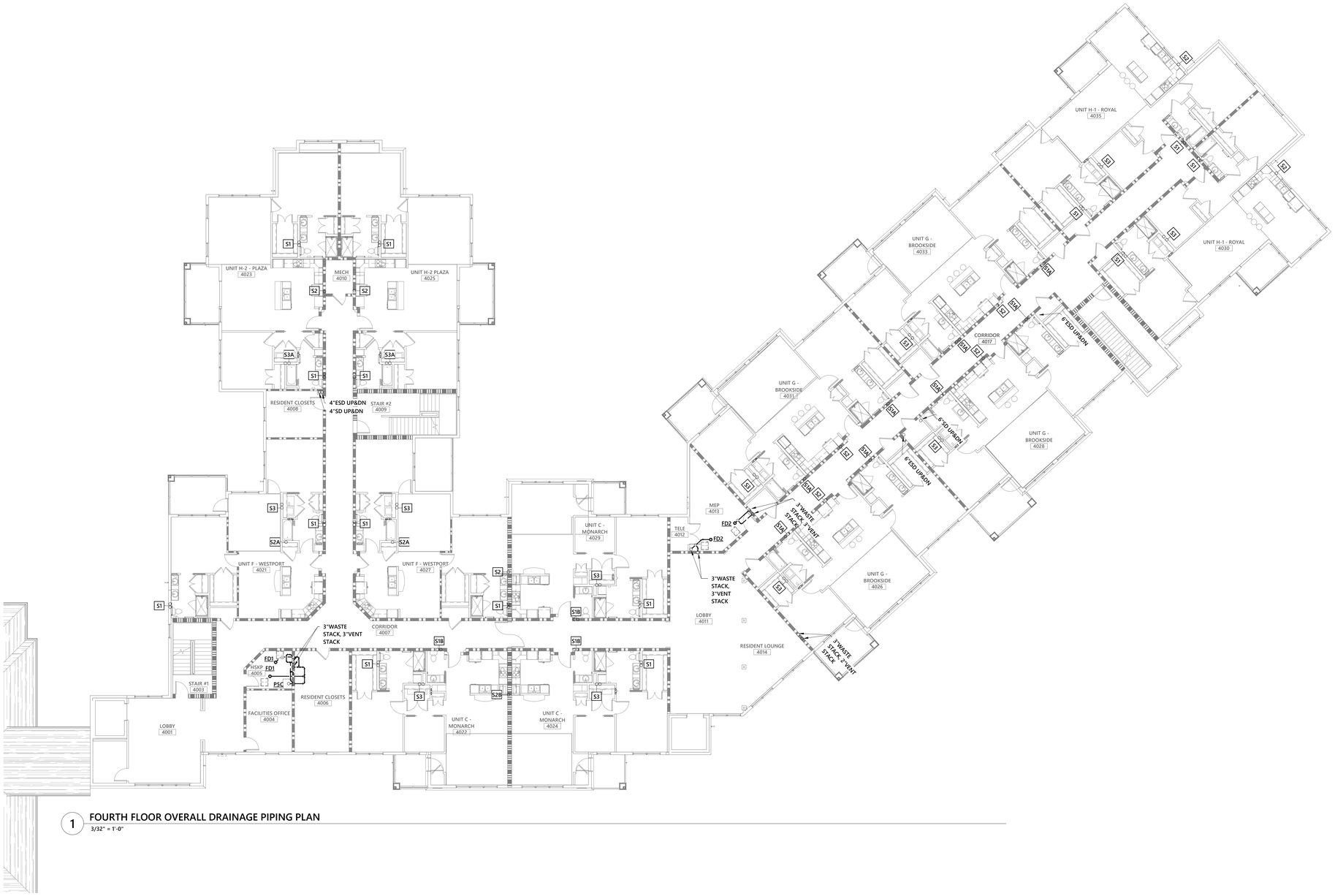

1 FOURTH FLOOR OVERALL DRAINAGE PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON L. FORD JR. PE-2014023016 NORTH CAROLINA PROFESSIONAL ENGINEER

01/18/2021

optima engineering
1907 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	GCF
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

FOURTH FLOOR OVERALL DRAINAGE PIPING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
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P1.4	8 OF 18

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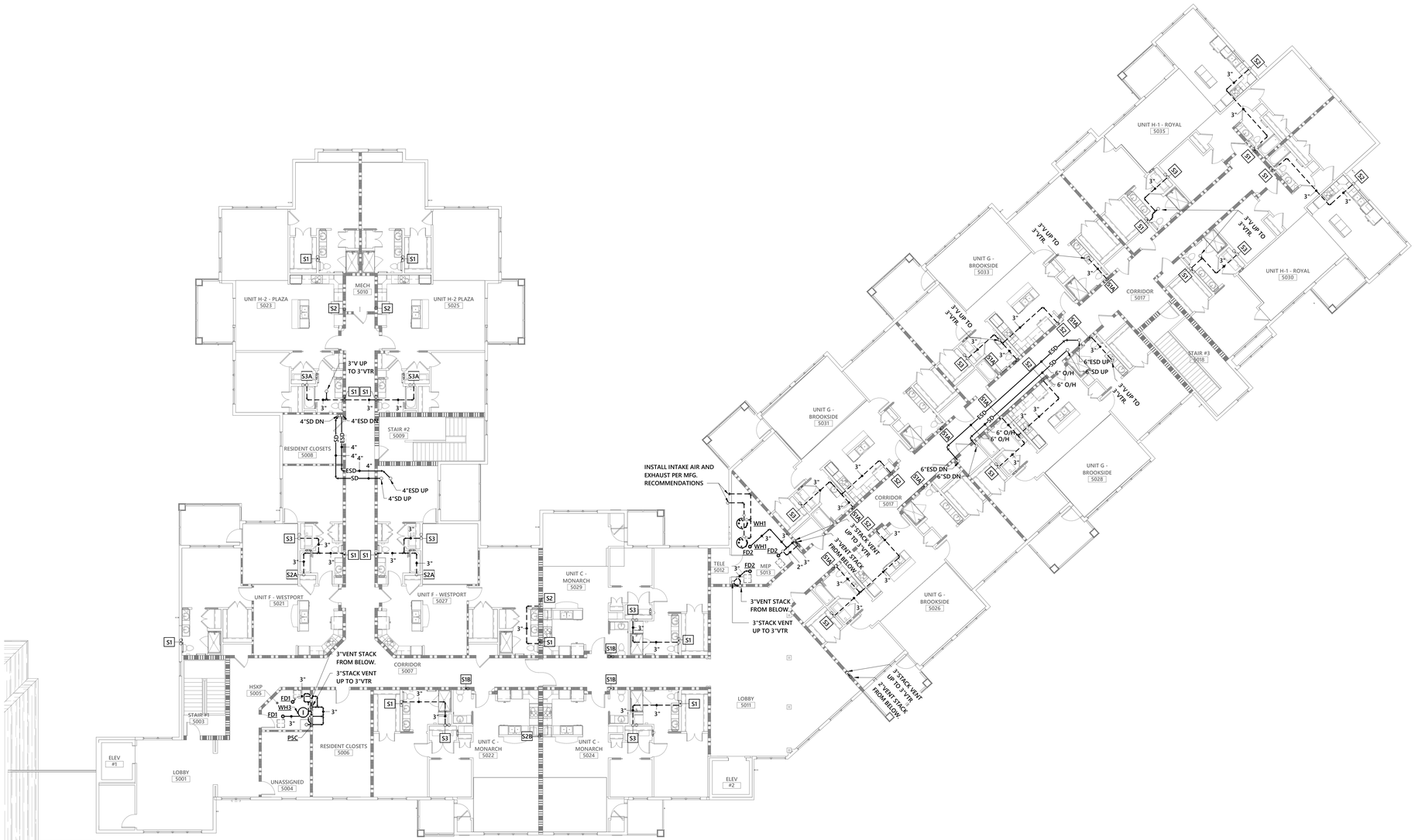

1 FIFTH FLOOR OVERALL DRAINAGE PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

FIFTH FLOOR OVERALL DRAINAGE PIPING PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
P1.5	9 OF 18

1/15/2021 BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
9:36:01 AM
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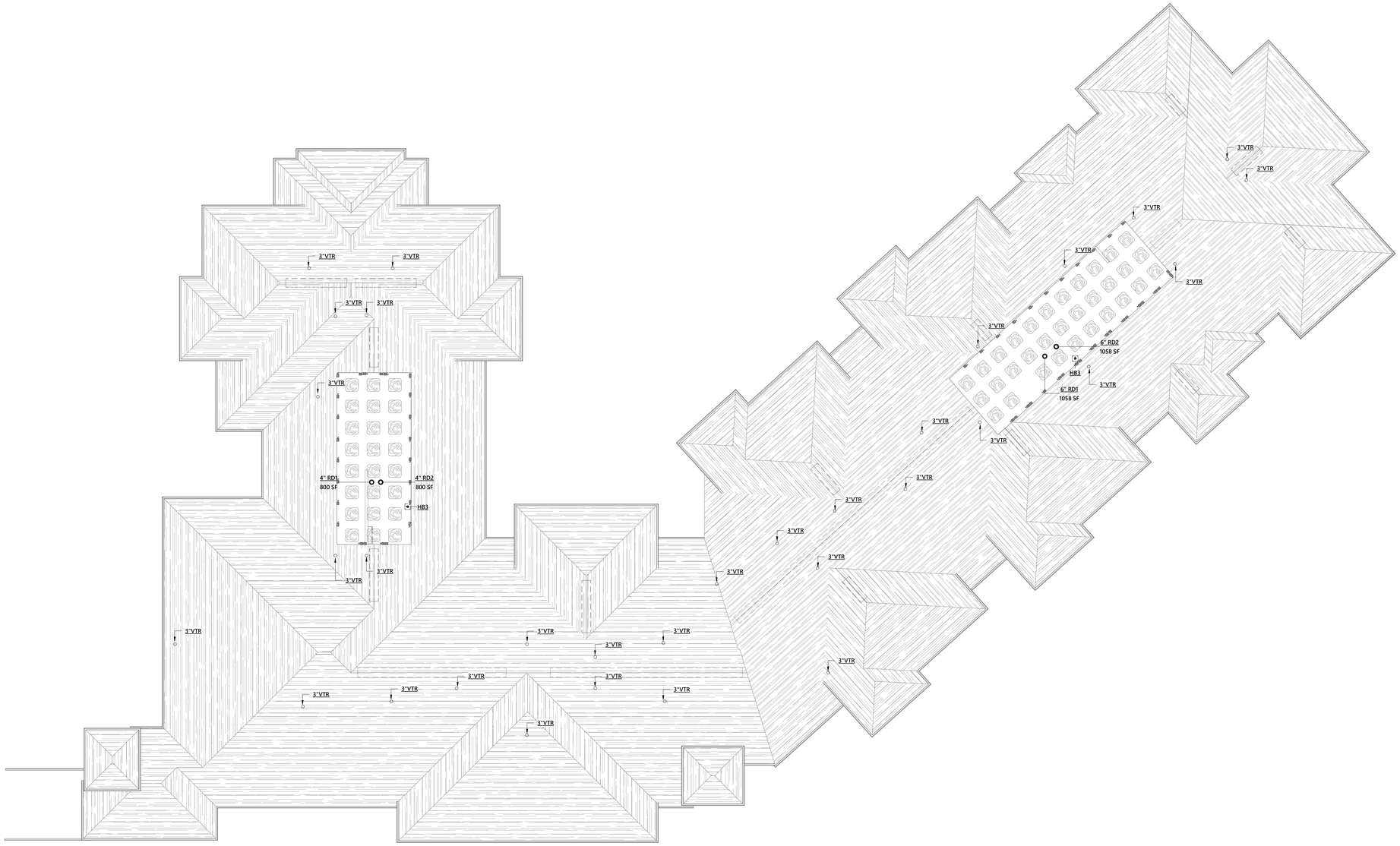

1 OVERALL ROOF PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL ROOF PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
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P1.6	10 OF 18

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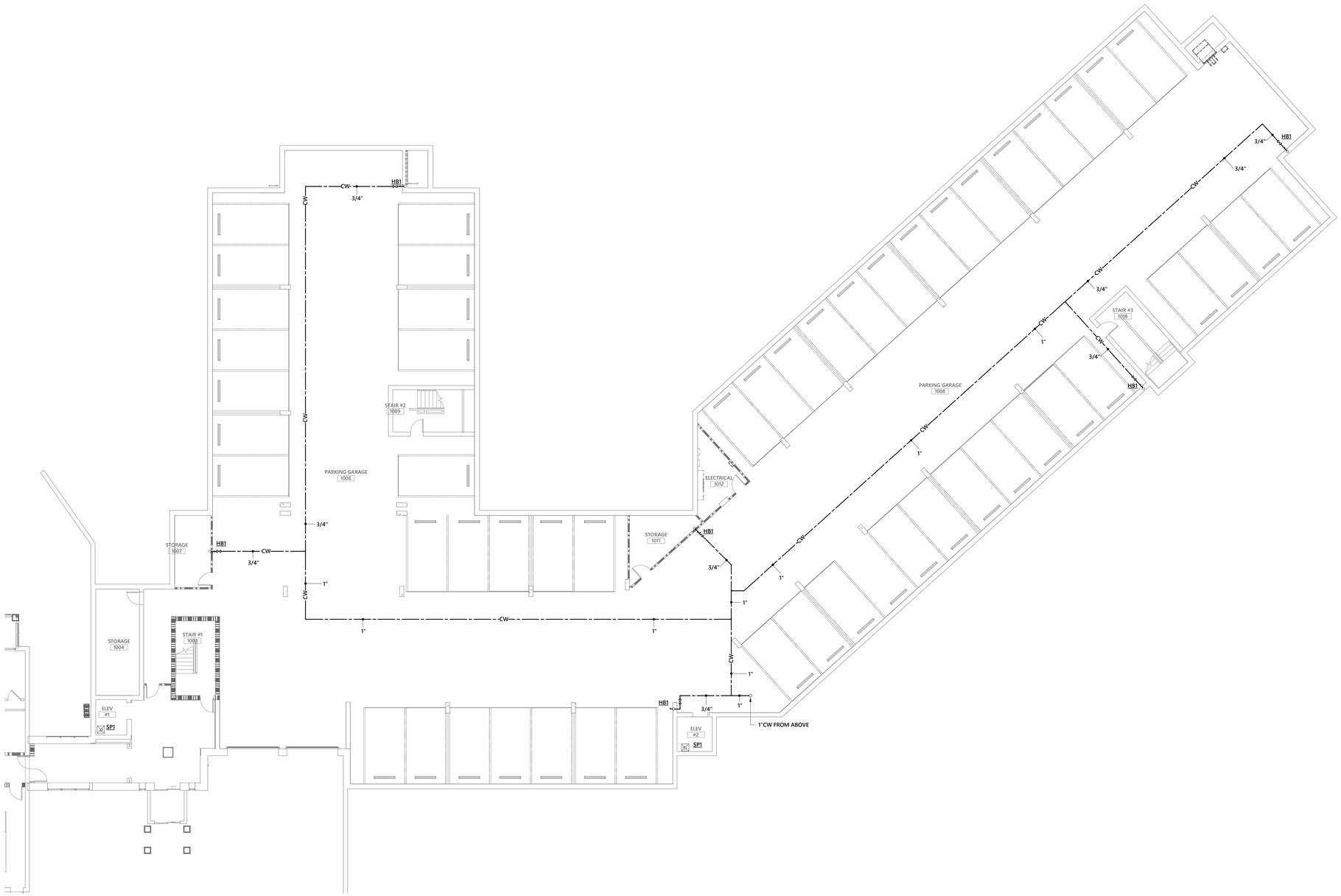

1 GARAGE OVERALL SUPPLY PIPING PLAN

3/32" = 1'-0"

N

PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

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GARAGE OVERALL SUPPLY PIPING PLAN

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DRAWING	SHEET
P2.1	11 OF 18

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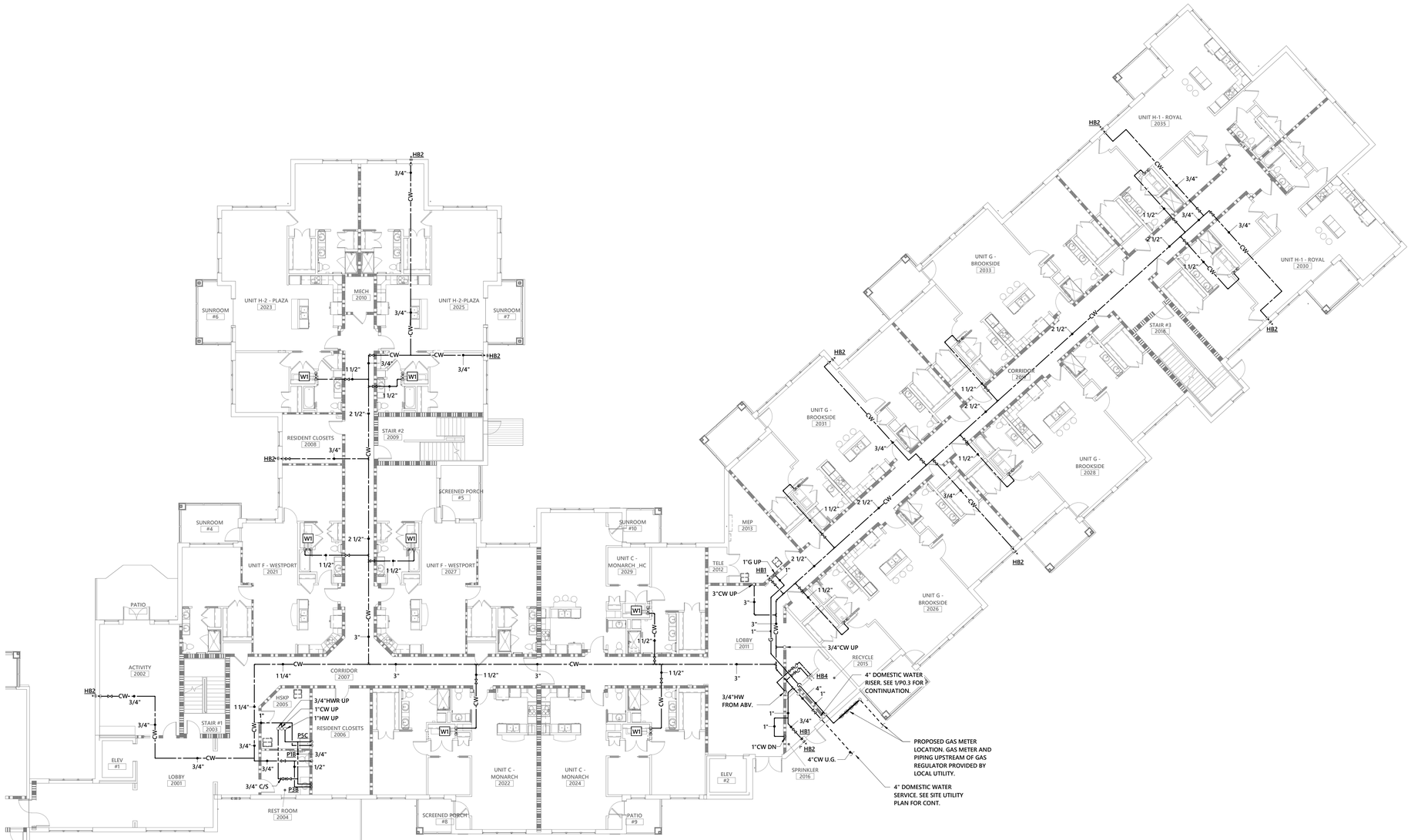

1 SECOND FLOOR OVERALL SUPPLY PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

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PROJECT TITLE

John Knox Village

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PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	DAR
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

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SECOND FLOOR OVERALL SUPPLY PIPING PLAN

COMM. NO.	DATE
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P2.2	12 OF 18

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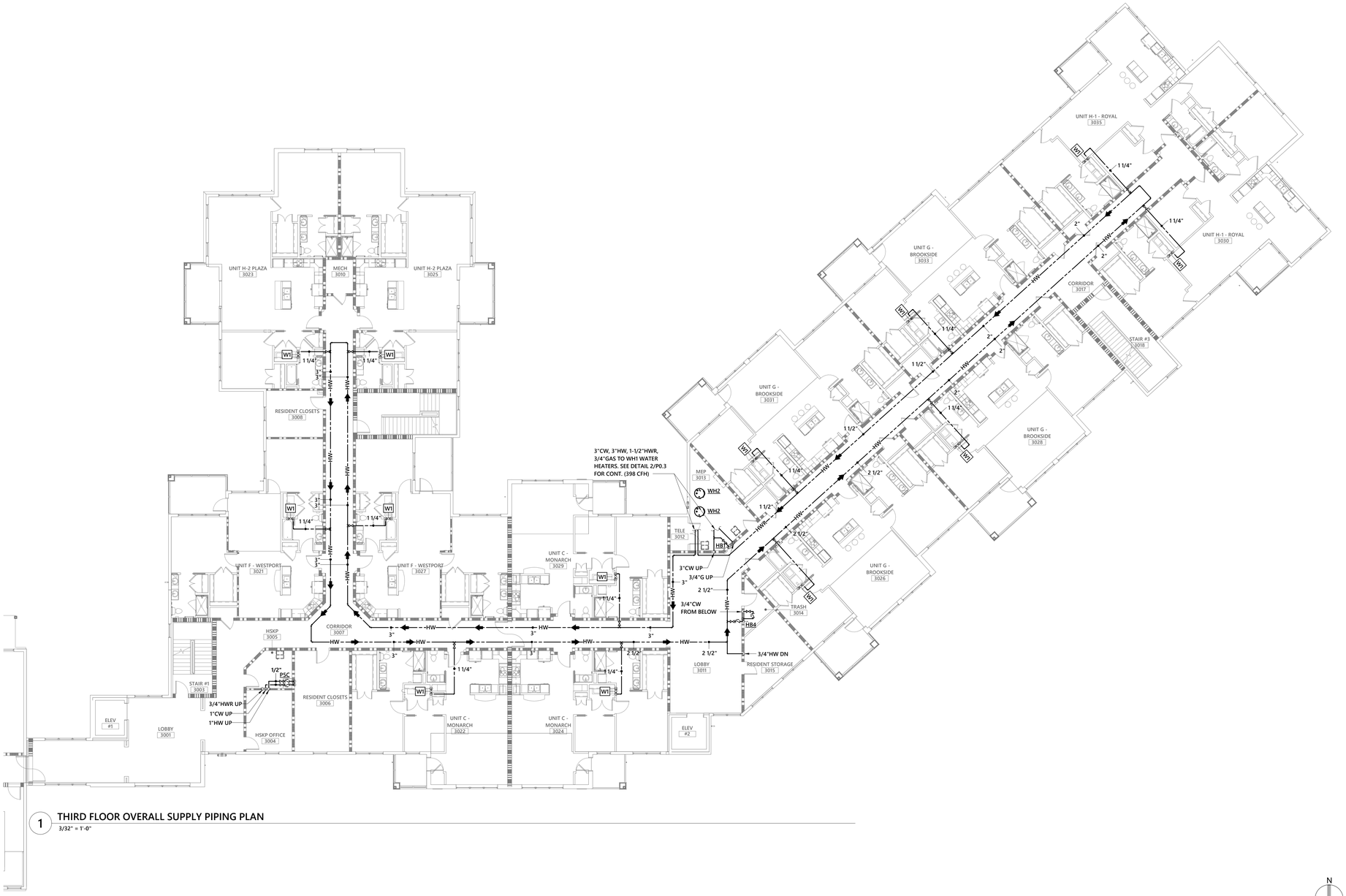
2. REFER TO P6 SERIES SHEETS FOR WATER SUPPLY RISER DIAGRAMS.



1 THIRD FLOOR OVERALL SUPPLY PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

THIRD FLOOR OVERALL SUPPLY PIPING PLAN

COMM. NO.	DATE
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P2.3	13 OF 18

1/15/2021 9:36:06 AM BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt

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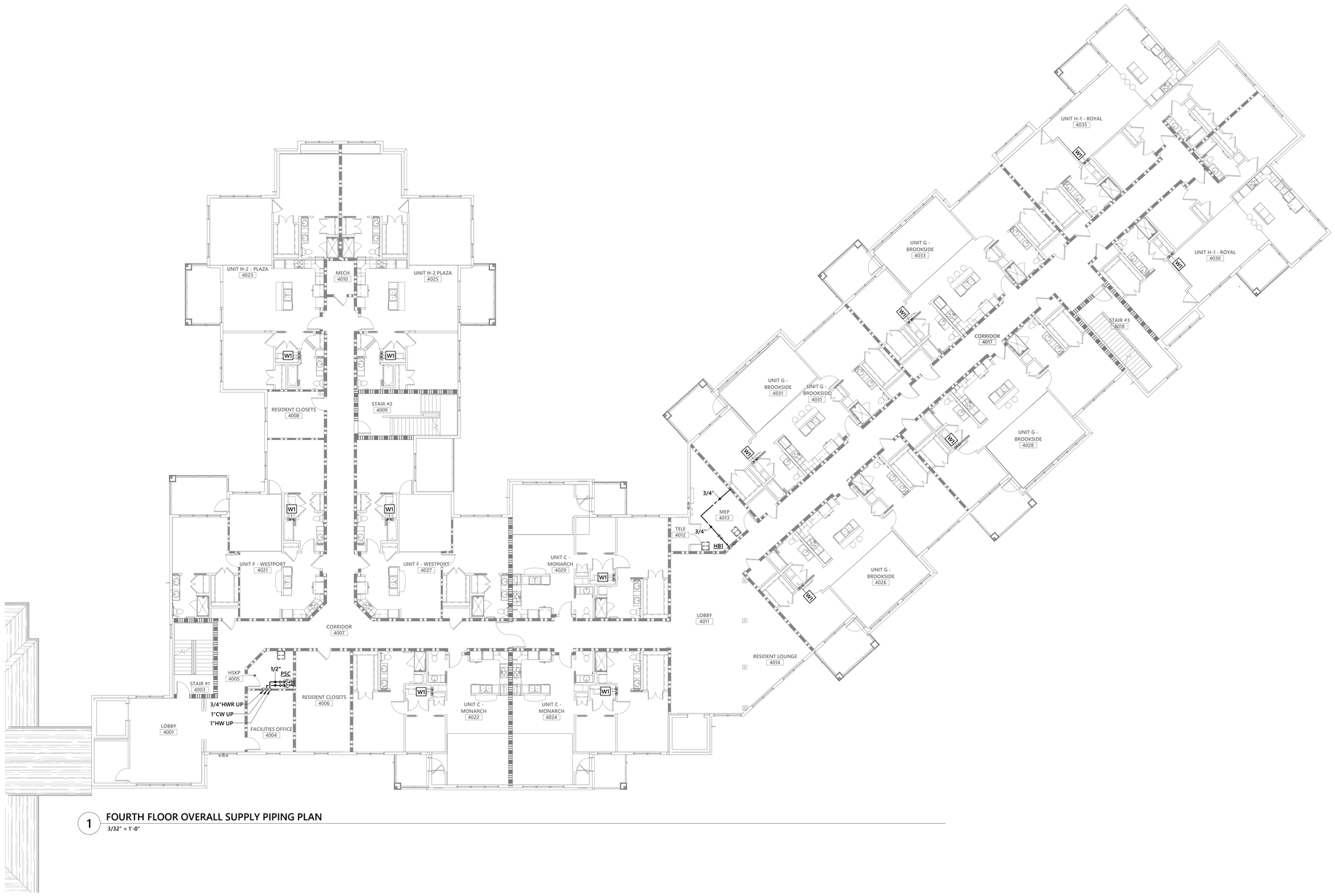

1 FOURTH FLOOR OVERALL SUPPLY PIPING PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

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01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
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APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

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FOURTH FLOOR OVERALL SUPPLY PIPING PLAN

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P2.4	14 OF 18

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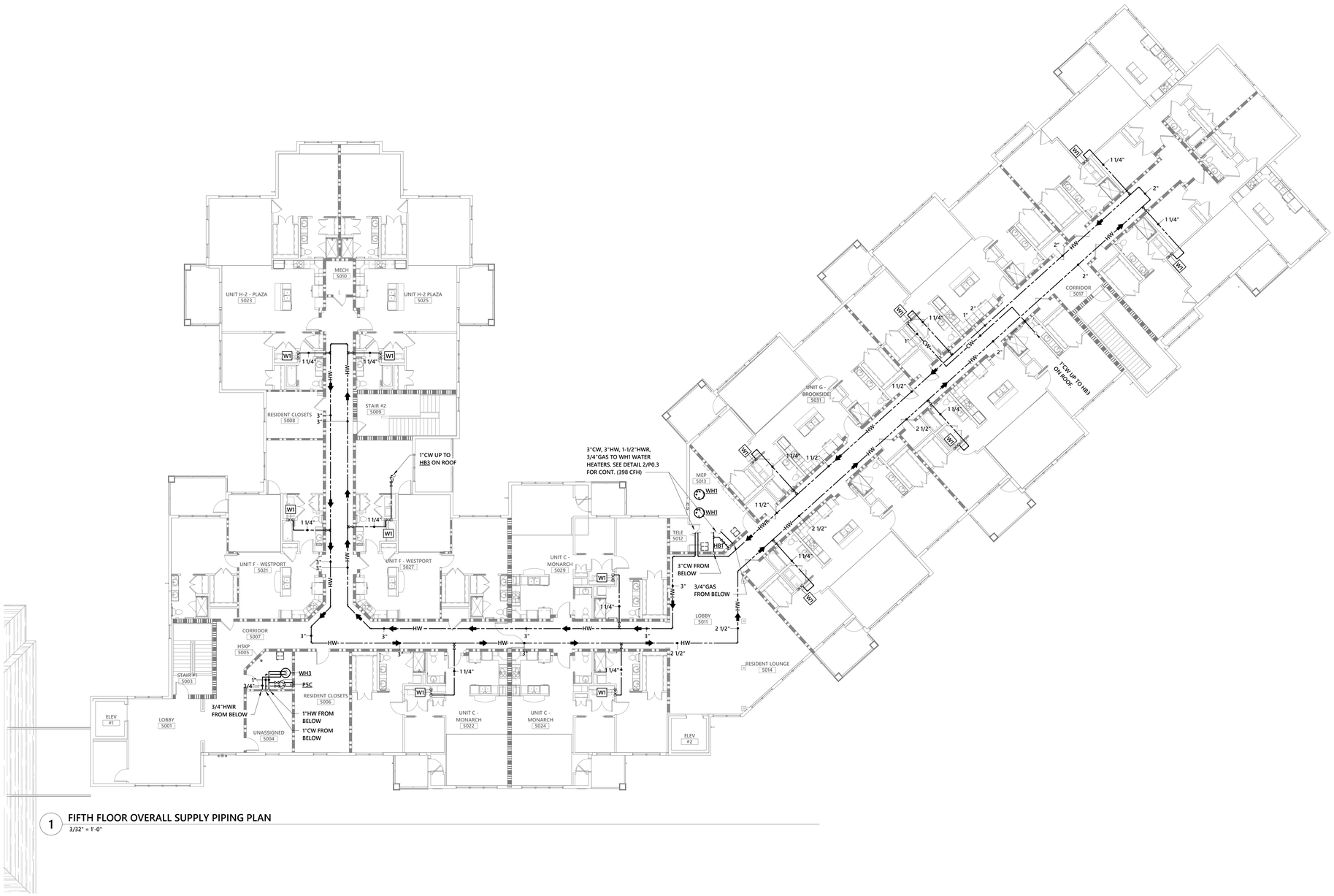

1 FIFTH FLOOR OVERALL SUPPLY PIPING PLAN

3/32" = 1'-0"

N

PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
BYRON A. FOX
PROFESSIONAL ENGINEER
SEAL
PE - 201402301

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

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FIFTH FLOOR OVERALL SUPPLY PIPING PLAN

COMM. NO.	DATE
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P2.5	15 OF 18

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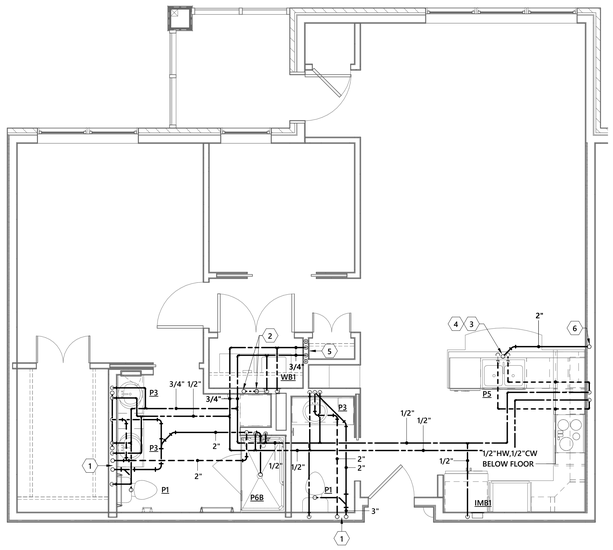
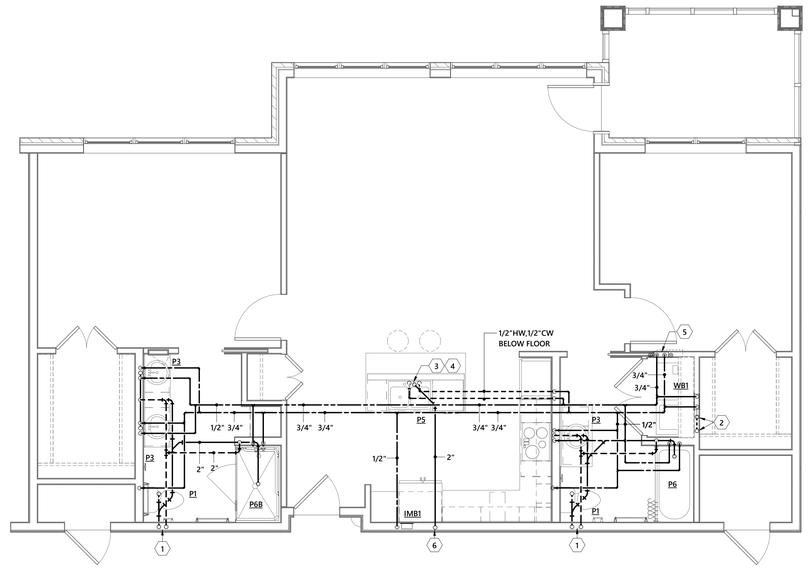
UNIT PLAN KEYNOTES: (#)

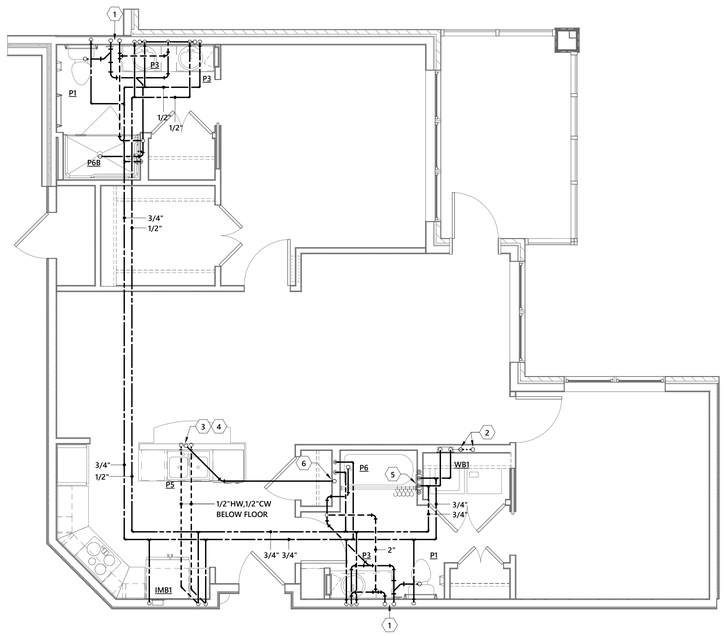
1. 4 WASTE STACK AND 3" VENT STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.
2. 3" WASTE STACK AND 3" VENT STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.
3. PROVIDE WASTE AND WATER CONNECTIONS TO DISHWASHER PER MFG. INSTRUCTIONS. PROVIDE WASTE CONNECTION TO GARBAGE DISPOSER PER MFG. INSTRUCTIONS.
4. PROVIDE AN AIR ADMITTANCE VALVE AND INSTALL PER KANSAS CITY AMENDMENTS SECTION EXCEPTION 906.1.
5. 1-1/4" COLD WATER AND 1-1/4" HOT WATER RISER AND MAIN SHUT-OFF VALVE IN ACCESS PANEL.
6. 3"WASTE STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.



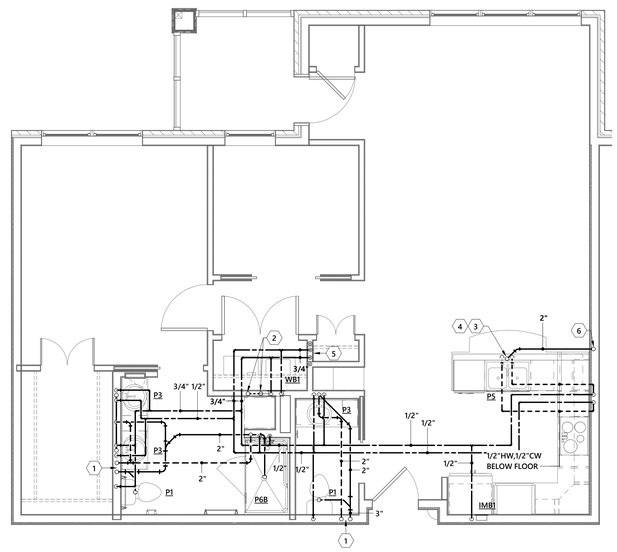
4 UNIT C - THE MONARCH - ENLARGED UNIT PLAN
1/4" = 1'-0"



3 UNIT G - THE BROOKSIDE - ENLARGED UNIT PLAN
1/4" = 1'-0"



2 UNIT F - THE WESTPORT - ENLARGED UNIT PLAN
1/4" = 1'-0"



1 UNIT C - THE MONARCH - ENLARGED UNIT PLAN - ADA
1/4" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON D. FORD
PE-2014023016
01/18/2021

optima engineering
1927 South Tryon St.,Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	DAR
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
ENLARGED PLUMBING UNIT PLANS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING
P5.1

SHEET
16 OF 18

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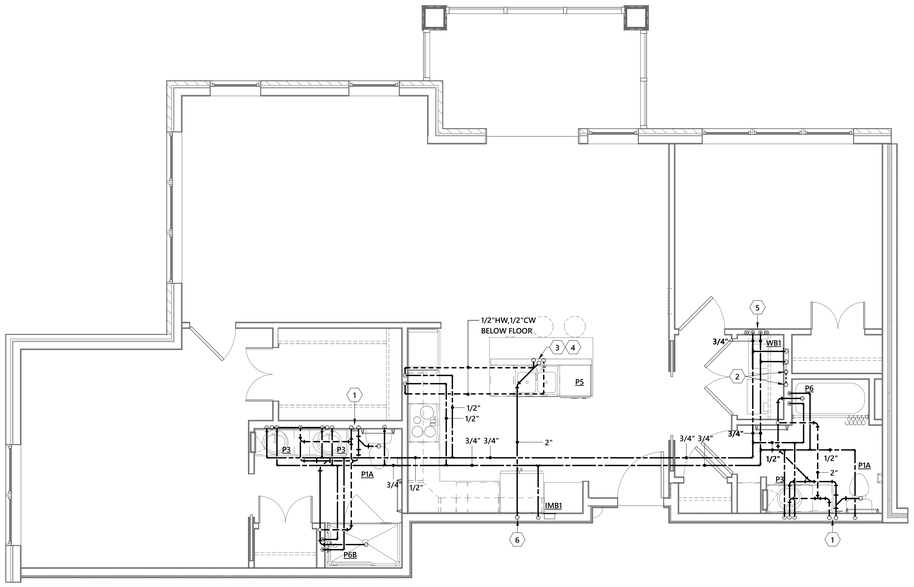
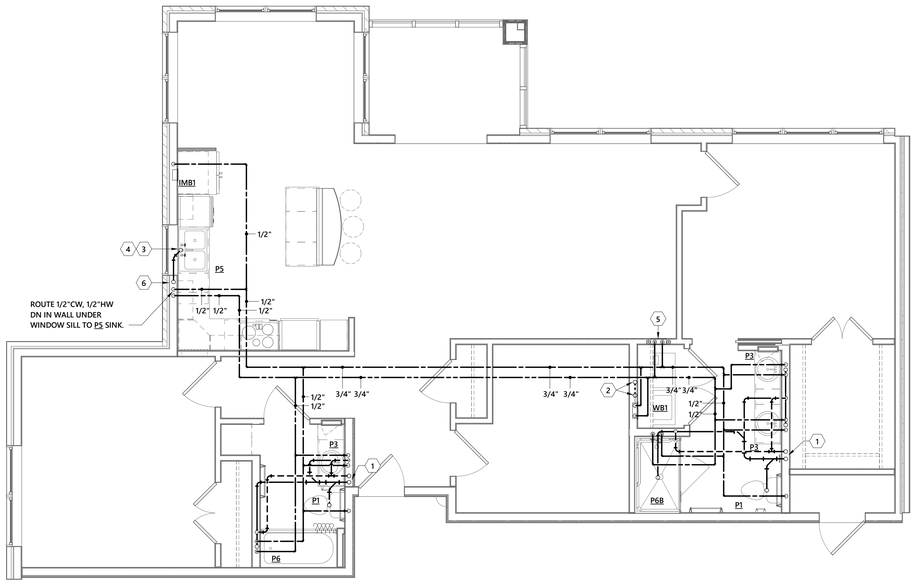
UNIT PLAN KEYNOTES: (#)

1. 4 WASTE STACK AND 3" VENT STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.
2. 3" WASTE STACK AND 3" VENT STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.
3. PROVIDE WASTE AND WATER CONNECTIONS TO DISHWASHER PER MFG. INSTRUCTIONS. PROVIDE WASTE CONNECTION TO GARBAGE DISPOSER PER MFG. INSTRUCTIONS.
4. PROVIDE AN AIR ADMITTANCE VALVE AND INSTALL PER KANSAS CITY AMENDMENTS SECTION EXCEPTION 906.1.
5. 1-1/4" COLD WATER AND 1-1/4" HOT WATER RISER AND MAIN SHUT-OFF VALVE IN ACCESS PANEL.
6. 3"WASTE STACK. SEE FLOOR PLANS AND RISER DIAGRAMS FOR CONTINUATION.



2 UNIT H-2 - THE PLAZA - ENLARGED UNIT PLAN

1/4" = 1'-0"



1 UNIT H-1 THE ROYAL - ENLARGED UNIT PLAN

1/4" = 1'-0"

N

PLAN NORTH

GENERAL NOTES

PERMIT SET

BYRON D. FORD
PE-2014023016
NORTH CAROLINA
PROFESSIONAL ENGINEER

01/18/2021

optima engineering

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Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	:	DESIGNER
PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	Designer
DRAWN BY	:	TAW
CHECKED BY	:	DAR
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ENLARGED PLUMBING UNIT PLANS

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING P5.2

SHEET 17 OF 18

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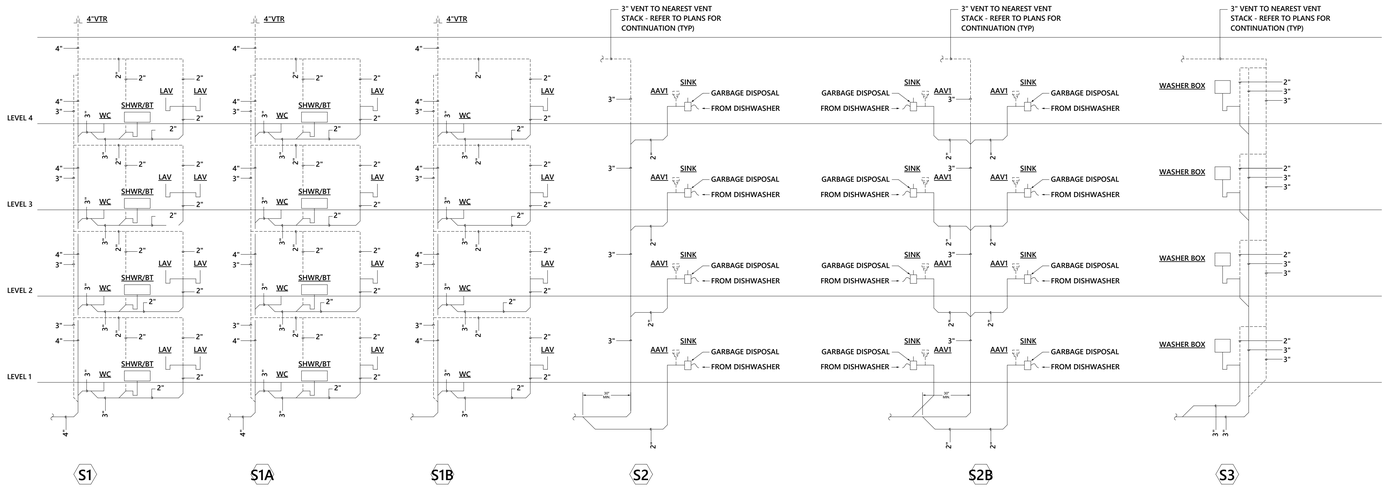
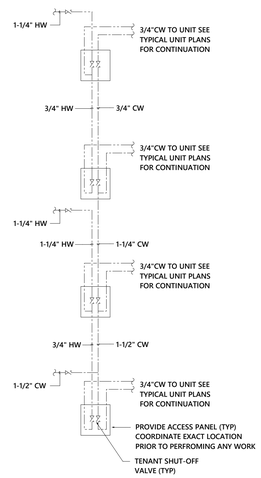


1 SANITARY RISER DIAGRAMS

NO SCALE

NOTE:
PROVIDE AN ACCESSIBLE CLEANOUT AT THE BASE OF ALL SANITARY WASTE STACKS. PROVIDE A FIRE-RATED ACCESS PANEL WHERE WASTE STACK IS LOCATED IN A RATED WALL. ALL FIRE-RATED ACCESS PANELS SHALL HAVE A MINIMUM RATING AS THE FIRE-RATING OF THE WALL IN WHICH IT IS INSTALLED. COORDINATE ALL LOCATIONS PRIOR TO ORDERING OR PERFORMING ANY WORK.



W1 WATER SUPPLY RISER - W1

NOT TO SCALE

GENERAL NOTES

PERMIT SET

01/18/2021

optima engineering
1927 South Tryon St, Suite 300, Charlotte NC 28203
Phone: 919-926-2200 - www.optimaengineering.com

PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

PLUMBING RISER DIAGRAMS

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
P6.1	18 OF 18

1/15/2021 BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
9:36:12 AM

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GENERAL NOTES

FIRE PROTECTION DESIGN CRITERIA

SYMBOL	OCCUPANCY	TYPE	DESIGN DENSITY (GPM/SF)	HYDRAULIC REMOTE AREA (SF)	MAX. COVERAGE PER SPRINKLER HEAD (SF)	HOSE STREAM INSIDE GPM	HOSE STREAM OUTSIDE GPM	AREAS OF COVERAGE
LH	LIGHT HAZARD	WET	0.10	1500	225	100	-	ENTIRE FACILITY, EXCEPT AS NOTED OTHERWISE
OH-1	ORDINARY HAZARD GROUP I	WET	0.15	1500	130	100	150	MECHANICAL ROOMS, STORAGE ROOMS, ELECTRICAL ROOMS, JANITORS CLOSETS, ETC.

APPLICABLE PUBLICATIONS: THE FOLLOWING PUBLICATIONS SHALL BE USED AS A REFERENCE FOR THE DESIGN OF THE FIRE PROTECTION SYSTEM ON THIS PROJECT:

1. NFPA 13R - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS IN LOW RISE RESIDENTIAL OCCUPANCIES - 2013 EDITION
2. NFPA 13 - STANDARD FOR THE INSTALLATION OF SPRINKLER SYSTEMS - 2013 EDITION
3. NFPA 14 - STANDARD FOR THE INSTALLATION OF STANDPIPE AND HOSE SYSTEMS - 2013 EDITION

NOTES:
1. DURING DESIGN CALCULATIONS, AN ALLOWANCE SHALL BE MADE FOR A 250 GPM HOSE STREAM.
2. STANDPIPE SYSTEM: PROVIDE CLASS I, MANUAL WET PER NFPA 14 - 5.4.1.1 AND 7.7.3

RESIDENTIAL AREAS:

1. SPRINKLER AREA OF COVERAGE SHALL NOT EXCEED 144 SQ. FT. PER HEAD
2. DESIGN DENSITY: PROVIDE AT LEAST THE FLOW REQUIRED FOR THE MULTIPLE AND SINGLE SPRINKLER OPERATING CRITERIA SPECIFIED BY THE SPRINKLER'S LISTING OR PER NFPA 13 OR NFPA 13R AS APPLICABLE.
3. NUMBER OF DESIGN SPRINKLERS: UNDER SMOOTH FLAT CEILINGS, THE DESIGN SHALL INCLUDE ALL SPRINKLERS WITHIN A COMPARTMENT, UP TO A MAXIMUM OF FOUR SPRINKLERS, THAT REQUIRE THE GREATEST HYDRAULIC DEMAND.
4. SPACING AND POSITIONING OF SPRINKLERS SHALL MEET ALL THE PERTINENT REQUIREMENTS OF NFPA 13 OR NFPA 13R AS APPLICABLE.

SPRINKLER SCHEDULE

1. PROVIDE ADJUSTABLE CONCEALED PENDENT SPRINKLERS ALL LAY-IN ACOUSTICAL TILE AND GYPBOARD CEILINGS. COORDINATE COLOR OF CONCEALED SPRINKLER HEAD COVER-PLATE WITH ARCHITECT.
2. LOCATE SPRINKLERS TO AVOID OBSTRUCTIONS BY CEILING MOUNTED DEVICES. WHERE CEILING DEVICES OBSTRUCT SPRINKLER DISCHARGE, ADD ADDITIONAL SPRINKLERS SPACED AROUND THE OBSTRUCTION.
3. PROVIDE BRASS UPRIGHT SPRINKLERS IN EXPOSED AREAS WITH NO FINISH CEILING.
4. PROVIDE BRASS PENDENT SPRINKLERS WITH SHIELDS IN MECHANICAL ROOMS, ELECTRIC ROOMS, GYMNASIUMS, STORAGE ROOMS AND OTHER AREAS WHERE EXPOSED SPRINKLERS ARE SUBJECT TO DAMAGE.
5. PROVIDE RECESSED DRY STEM PENDENT SPRINKLER WITH WHITE PLATE IN AREAS SUBJECT TO FREEZING.
6. PROVIDE RECESSED SIDEWALL SPRINKLERS AS REQUIRED OR AS INDICATED.
7. PROVIDE INTERMEDIATE TEMPERATURE SPRINKLERS (175° F - 225°F ACTIVATION TEMPERATURE) IN ELEC. ROOMS, BOILER ROOMS, DATA CLOSETS AND WHEN SPRINKLER IS LOCATED WITHIN 18" OF HVAC DIFFUSER.
8. PROVIDE HIGH TEMPERATURE SPRINKLERS (250° F - 300°F ACTIVATION TEMPERATURE) IN KILN ROOMS OR OTHER AREAS SUBJECT TO HIGH TEMPERATURES.

* INSTALL SPRINKLERS IN ACCORDANCE WITH NFPA 13 AND THE MANUFACTURERS APPROVAL LISTING.
* PROVIDE QUICK RESPONSE SPRINKLERS.

FLOW TEST DATA

DATE / TIME	LOCATION	PRESSURE STATIC (PSI)	PRESSURE RESIDUAL (PSI)	FLOW (GPM)	FLOW AT 20 PSI (GPM)
12-17-2020 09:00 AM	HYDRANT #029-218FH OFF NW HOPE LANE	98	60	1920	2832

FLOW TEST PERFORMED BY: KANSAS CITY FIRE DEPARTMENT

FLOW TEST NOTES:

1. THE CONTRACTOR SHALL OBTAIN A NEW FIRE FLOW TEST ON WHICH TO BASE THEIR CALCULATIONS.
2. THE FLOW TEST USED FOR THE WORKING PLAN DESIGN SHOULD BE PERFORMED AS INDICATED IN NFPA 291 WHICH USES TWO HYDRANTS; A PRESSURE HYDRANT AND A FLOW HYDRANT. THE TWO HYDRANTS SHALL BE AS CLOSE TO THE POINT OF CONNECTION AS POSSIBLE. PROVIDE A COPY OF THE FLOW TEST AND TEST HYDRANT LOCATIONS WITH THE SUBMITTED SPRINKLER SHOP DRAWING PACKAGE.

FIRE PROTECTION GENERAL NOTES

1. THE INTENT OF THESE PLANS IS TO PROVIDE INFORMATION TO THE REVIEWING AUTHORITIES THAT THE BUILDING WILL BE PROTECTED BY A SPRINKLER SYSTEM.
2. GENERAL AND SPECIAL CONDITIONS OF THE CONTRACT APPLY TO THE FIRE PROTECTION SCOPE OF WORK. THE FIRE PROTECTION DRAWINGS AND SPECIFICATIONS SHALL NOT BE INTERPRETED AS WAIVING OR OVERRULING ANY REQUIREMENTS EXPRESSED IN GENERAL CONDITIONS.
3. SCOPE: PROVIDE DESIGN, FABRICATION AND INSTALLATION OF A HYDRAULICALLY CALCULATED AUTOMATIC SPRINKLER SYSTEM INCLUDING ALL SERVICES, MATERIALS, LABOR AND EQUIPMENT REQUIRED FOR A COMPLETE WORKING SPRINKLER SYSTEM IN FULL COMPLIANCE WITH THE REQUIREMENTS OF THE 2013 EDITION OF NFPA 13, THE OWNER'S INSURANCE UNDERWRITER, THE 2018 NORTH CAROLINA STATE FIRE CODE AND THE LOCAL AUTHORITY HAVING JURISDICTION.
4. PERMITS: APPLY AND PAY FOR ALL NECESSARY PERMITS, FEES AND INSPECTIONS REQUIRED BY ANY PUBLIC AUTHORITY HAVING JURISDICTION. ACREAGE CHARGES, FACILITIES CHARGES AND BOND PROPERTY ASSESSMENTS ARE NOT TO BE CONSTRUED TO BE A PART OF THIS CONTRACT.
5. WARRANTY: PROVIDE A ONE YEAR WARRANTY, FROM THE DATE OF ACCEPTANCE OF WORK BY THE OWNER, FOR ALL SPRINKLER SYSTEM MATERIALS AND EQUIPMENT.
6. COORDINATE ALL SPRINKLER PIPING LOCATIONS, SPRINKLER LOCATIONS AND EQUIPMENT LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS AND INTERFERENCES. FINAL PIPING AND EQUIPMENT LOCATIONS SHALL BE A CODE COMPLIANT INSTALLATION FOR ALL TRADES.
7. DO NOT SCALE THE DRAWINGS, REFERENCE THE ARCHITECTURAL PLANS FOR DIMENSIONAL INFORMATION.
8. WHERE DISCREPANCIES ARE FOUND IN THE DRAWINGS AND SPECIFICATIONS THE MORE STRINGENT SHALL APPLY. CONTACT ENGINEER FOR CLARIFICATION.
9. OBTAIN A NEW FLOW TEST, LESS THAN 1 MONTH OLD, PRIOR TO STARTING THE DESIGN OF THE SPRINKLER SYSTEM. THE FLOW TEST CRITERIA SHALL INCLUDE THE STATIC PRESSURE, RESIDUAL PRESSURE, FLOW IN GPM, HORIZONTAL AND VERTICAL DISTANCE OF TEST FROM BASE OF FIRE RISER, THE NAME OF THE PERSON AND COMPANY WHOM PERFORMED THE FLOW TEST, THE TESTING COMPANY'S PHONE NUMBER, AND THE DATE AND TIME THE TEST WAS PERFORMED.
10. DESIGN AND HYDRAULICALLY CALCULATE THE SPRINKLER SYSTEM UTILIZING THE CURRENT FLOW TEST DATA. MEET ALL NFPA 13 REQUIREMENTS WHETHER OR NOT SPECIFICALLY INDICATED WITHIN THESE DOCUMENTS. TERMINATE THE HYDRAULIC CALCULATIONS AT THE CITY CONNECTION MINIMUM. INDICATE ON DRAWINGS ALL UNDERGROUND PIPE AND FITTINGS BOTH NEW AND EXISTING.
11. THE CONTRACTOR SHALL HAVE A DESIGNER ON STAFF WITH A CURRENT N.I.C.E.T. LEVEL III CERTIFICATION OR HIGHER TO PREPARE THE WORKING PLANS AND HYDRAULIC CALCULATIONS IN ACCORDANCE WITH NFPA 13 CHAPTER 23 "PLANS AND CALCULATIONS". THE N.I.C.E.T. DESIGNERS NAME, SIGNATURE AND CERTIFICATE NUMBER SHALL APPEAR ON THE WORKING DRAWINGS AND HYDRAULIC CALCULATIONS.
12. FOR PROJECTS LOCATED OUTSIDE NORTH CAROLINA AND SOUTH CAROLINA, FIRE SPRINKLER SHOP DRAWINGS SHALL BE REVIEWED AND SEALED (SIGNED) BY A REGISTERED FIRE PROTECTION ENGINEER IN THE STATE WHERE THE BUILDING PERMIT IS TO BE OBTAINED PRIOR TO SUBMITTING SHOP DRAWINGS TO THIS OFFICE FOR REVIEW.
13. PROVIDE DESIGN AND INSTALLATION OF SEISMIC RESTRAINT ELEMENTS FOR THE FIRE PROTECTION SYSTEM(S) IN COMPLIANCE WITH THE 2013 EDITION OF NFPA 13. REFER TO THE APPENDIX B ON THE ARCHITECTURAL DRAWINGS FOR THE SITE'S SEISMIC DESIGN CATEGORY.
14. SUBMIT WORKING PLANS, HYDRAULIC CALCULATIONS AND MATERIALS DATA AND ACCESSORIES IN ELECTRONIC FORMAT (PDF) TO THE ARCHITECT / ENGINEER FOR REVIEW AND OBTAIN APPROVAL BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.
15. THE CONTRACTOR SHALL SUBMIT WORKING PLANS AND HYDRAULIC CALCULATIONS EXPEDIENTLY TO THE AUTHORITIES HAVING JURISDICTION. APPROVAL FROM ALL AUTHORITIES HAVING JURISDICTION SHALL BE OBTAINED BEFORE STARTING THE INSTALLATION OF THE SPRINKLER SYSTEM.
16. AT THE COMPLETION OF THE PROJECT, PROVIDE TWO SETS OF RECORD DRAWINGS TO THE OWNER, CLEARLY SHOWING ANY CHANGES AND/OR MODIFICATIONS, ADDITIONS OR DELETIONS TO AND FROM THE CONSTRUCTION DOCUMENTS. THESE SETS SHALL BE REVIEWED BY THE ARCHITECT / ENGINEER BEFORE BEING TURNING OVER TO THE OWNER.

INSTALLATION REQUIREMENTS:

1. PROVIDE ALL NECESSARY OFFSETS, RISES OR DROPS IN THE PIPING AND AUXILIARY DRAINS AS REQUIRED BY ALL APPLICABLE CODES WHETHER OR NOT SHOWN ON THE PLANS.
2. CONNECT ALL SPRINKLER ALARM, TAMPER AND DETECTION SYSTEMS TO THE BUILDINGS CENTRAL FIRE ALARM SYSTEM, COORDINATE LOCATIONS AND REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR.
3. PIPE PENETRATIONS THRU WALLS, PARTITIONS AND FLOORS SHALL BE SLEEVED. CORE DRILLING THRU WALLS AND PARTITIONS IS PERMITTED IF PERFORMED IN A NEAT CRAFTSMAN LIKE MANNER. PIPES PENETRATING THRU EXTERIOR WALLS SHALL BE SEALED WATER TIGHT. INSTALL ESCUTCHEONS IN ALL EXPOSED AREAS.
4. CONCEAL PIPING ABOVE CEILINGS OR TIGHT TO UNDERSIDE OF STRUCTURE IN EXPOSED AREAS.
5. PAINT ALL EXPOSED FIRE PROTECTION SYSTEM PIPING (IN CLOSETS, STAIRWELLS, MECHANICAL ROOMS, ETC.). COLOR TO BE SELECTED BY THE ARCHITECT.
6. SPRINKLER LOCATIONS ARE TO BE IN THE CENTER OF THE CEILING TILE USING THE REFLECTED CEILING PLANS AND AS COORDINATED WITH THE CEILING CONTRACTOR.
7. WARRANT THE SYSTEM LABOR, MATERIALS AND EQUIPMENT FOR THE AMOUNT OF TIME SPECIFIED IN THE PROJECT MANUAL. IF NO WARRANTY SECTION IS PROVIDED, THEN WARRANT THE SYSTEM LABOR, MATERIAL AND EQUIPMENT FOR A MINIMUM OF ONE YEAR AFTER COMPLETION AND ACCEPTANCE. PRIOR TO TURNING THE COMPLETED SYSTEM OVER TO THE OWNER, REVIEW THE INSTALLATION WITH THE ARCHITECT / ENGINEER AND REPLACE OR REPAIR ANY DEFECTIVE WORKMANSHIP, EQUIPMENT AND MATERIALS AT NO ADDITIONAL COST TO THE OWNER.

TESTING AND FLUSHING:

1. OVERHEAD SPRINKLER PIPING: TESTED FOR A PERIOD OF TWO HOURS AT A HYDROSTATIC PRESSURE OF 200 LBS. AND ALL PIPING, VALVES, HEADS,ETC. SHALL BE WATERTIGHT.

FIRE PROTECTION LEGEND

SYMBOL	ABBREVIATION	DESCRIPTION
FP	FP	SPRINKLER PIPING WET
FPD	FPD	SPRINKLER PIPING DRY
SP	SP	STANDPIPE PIPING
PA	PA	PRE-ACTION PIPING
D	D	DRAIN PIPING
	-	PIPING ELBOW DOWN
	-	PIPING ELBOW UP
	-	PIPING CONTINUES
	OSY	OS&Y VALVE
	-	SHUT-OFF VALVE
	BF	BUTTERFLY VALVE
	CV	CHECK VALVE
	PRV	PRESSURE REDUCING VALVE
	RPZ	REDUCED PRESSURE BACKFLOW PREVENTER ASSEMBLY
	FDC	FIRE DEPARTMENT CONNECTION
	FHV	FIRE HOSE VALVE
	-	UPRIGHT SPRINKLER HEAD
	-	PENDANT SPRINKLER HEAD
	-	RECESSED SPRINKLER HEAD
	-	CONCEALED SPRINKLER HEAD
D	-	"D" REPRESENTS DRY SPRINKLER HEAD
	-	SIDEWALL SPRINKLER HEAD
	-	EXTENDED COVERAGE SIDEWALL SPRINKLER HEAD

ADDITIONAL ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MFG	MANUFACTURER
AFG	ABOVE FINISHED GRADE	PSI	POUNDS PER SQUARE INCH
BAS	BUILDING AUTOMATION SYSTEM	TS	TAMPER SWITCH
BFF	BELOW FINISHED FLOOR	TYP	TYPICAL
CLG	CEILING	WMG	WATER MOTOR GONG
CONT	CONTINUATION	WC	WATER COLUMN
DN	DOWN		
FS	FLOW SWITCH	EC	ELECTRICAL CONTRACTOR
FHV	FIRE HOSE VALVE	FSC	FOOD SERVICE CONTRACTOR
GPM	GALLONS PER MINUTE	GC	GENERAL CONTRACTOR
HP	HORSE POWER	MC	MECHANICAL CONTRACTOR
INV	INVERT ELEVATION	PC	PLUMBING CONTRACTOR
KW	KILOWATT		

FIRE PROTECTION MATERIALS

1. ALL PIPING SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
2. ABOVE GRADE PIPING: BLACK STEEL PIPING (ASTM A53, ASTM A135, OR ASTM A795) SHALL BE LISTED FOR FIRE SPRINKLER PIPING USE AND INCLUDE FM APPROVED MIC INHIBITING COATING. PIPING 2" AND SMALLER SHALL BE SCHEDULE 40 BLACK STEEL PIPE THREADED, WELDED OR ROLL GROOVED FOR MECHANICAL FITTINGS. PIPING 2-1/2" AND LARGER SHALL BE SCHEDULE 10 BLACK STEEL PIPE WELDED, OR ROLL GROOVED FOR MECHANICAL FITTINGS.
3. THREADED FITTINGS: UL-LISTED, STANDARD WEIGHT SUITABLE FOR PRESSURE UP TO 175 PSIG, CAST IRON MEETING ASTM A126 OR MALLEABLE IRON MEETING ASTM A197. THREADED CAST IRON FITTINGS SHALL MEET ANSI B16.4; FLANGED CAST IRON FITTINGS SHALL MEET ANSI B16.1. THREADED MALLEABLE IRON FITTINGS SHALL MEET ANSI B16.3.
4. GROOVED FITTINGS AND COUPLINGS: UL-LISTED, DUCTILE IRON MEETING ASTM A536, UTILIZING AN EDPM GASKET. PLAIN-END FITTINGS AND COUPLINGS, OR WELDED-SEGMENTED FITTINGS SHALL NOT BE USED. CHANGES IN PIPE DIAMETER SHALL BE MADE USING TAPERED REDUCING FITTINGS. BUSHINGS OR GROOVED-END REDUCING COUPLINGS SHALL NOT BE USED UNLESS STANDARD REDUCING FITTINGS ARE NOT REGULARLY AVAILABLE.
5. USE HOT-DIPPED GALVANIZED PIPING AND FITTINGS FOR COMPRESSED AIR PIPING, WATER MOTOR ALARM PIPING, BALL DRIP DISCHARGES AND TEST / DRAIN PIPING SUBJECT TO ALTERNATE WETTING AND DRYING.
6. PIPE HANGERS: UL-LISTED SWIVEL LOOP TYPE WITH PRE-GALVANIZED CARBON STEEL BAND, HANGER RODS SIZED PER NFPA 13, UL-LISTED STEEL OR MALLEABLE IRON BEAM CLAMPS, UL-LISTED ANCHORS. POWER DRIVEN ANCHORS SHALL NOT BE USED.
7. VALVES: OS&Y TYPE, IRON BODY BRONZE MOUNTED, DOUBLE DISC WITH PARALLEL SEATS, OR; BUTTERFLY, LUG TYPE, DUCTILE IRON BODY, STAINLESS STEEL STEM, ALUMINUM BRONZE DISC, PHENOLIC RING AND BUNA N SEAT. VALVES SHALL BE FM/UL LISTED AND APPROVED FOR FIRE PROTECTION SERVICE.
8. ESCUTCHEON PLATES: PROVIDE CHROME PLATED ESCUTCHEON PLATES WHERE PIPES PASS THROUGH FINISHED WALLS, FLOORS, OR CEILING. PROVIDE PRIME COAT PAINTED ESCUTCHEON PLATES WHERE PIPES PASS THROUGH WALLS, CEILINGS, ETC. IN UNFINISHED EXPOSED AREAS.

FIRE PROTECTION SHEET INDEX

SHEET NUMBER	SHEET NAME
FP0.1	FIRE PROTECTION LEGEND AND NOTES
FP0.2	FIRE PROTECTION DETAILS AND SCHEMATICS
FP0.3	FIRE PROTECTION STANDPIPE RISER DIAGRAM
FP1.0	GARAGE FLOOR OVERALL FIRE PROTECTION PLAN
FP1.1	SECOND FLOOR OVERALL FIRE PROTECTION PLAN
FP1.2	THIRD FLOOR OVERALL FIRE PROTECTION PLAN
FP1.3	FOURTH FLOOR OVERALL FIRE PROTECTION PLAN
FP1.4	FIFTH FLOOR OVERALL FIRE PROTECTION PLAN
FP1.5	OVERALL ROOF FIRE PROTECTION PLAN

PERMIT SET

STATE OF MISSOURI
BYRON FORD
NUMBER
PE-2014023016
PROFESSIONAL ENGINEER

01/18/2021

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PROJECT TITLE

John Knox Village

PROJECT DESIGNER	: DESIGNER
PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
FIRE PROTECTION
LEGEND AND NOTES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING FP0.1

SHEET 1 OF 9

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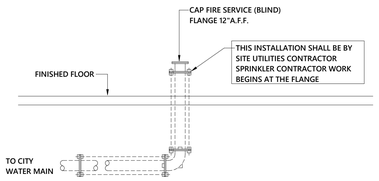
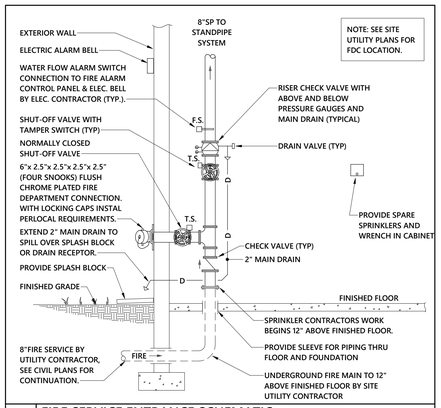
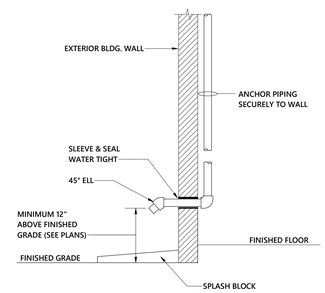


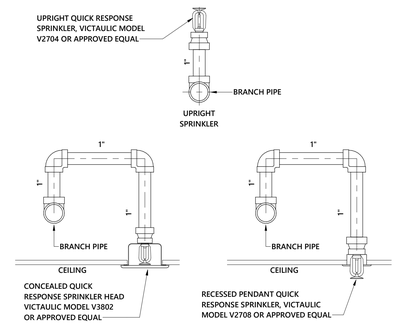
1 FIRE SERVICE ENTRY DETAIL
NOT TO SCALE



2 FIRE SERVICE ENTRANCE SCHEMATIC
NOT TO SCALE

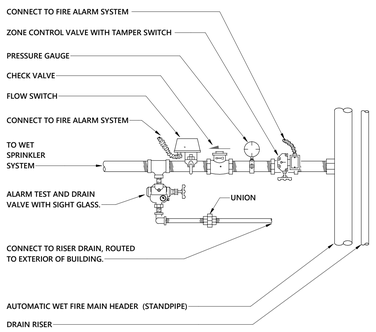


3 TYPICAL DRAIN THRU WALL
NOT TO SCALE

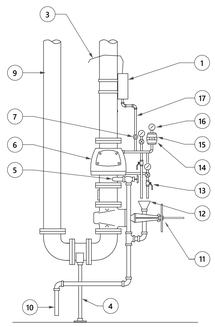


REFER TO ARCHITECTURAL PLANS FOR CEILING TYPE, REFER TO SPRINKLER LEGEND FOR TYPE.

4 TYPICAL RETURN BEND SCHEMATIC
NOT TO SCALE



5 WET SPRINKLER RISER ASSEMBLY - ABOVE CEILING
NOT TO SCALE



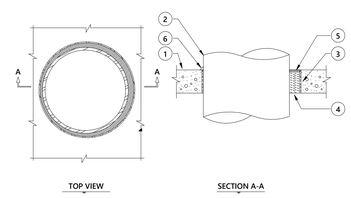
ITEM	DESCRIPTION
1	STRAP-ON AIR COMPRESSOR
2	NOT USED
3	CONNECT TO ELEC.
4	PIPE STAND
5	MAIN DRAIN VALVE
6	DRY PIPE ALARM VALVE
7	AIR PRESSURE MAINTENANCE DEVICE
8	NOT USED
9	SUPPLY FROM MAIN
10	ROUTE TO FLOOR DRAIN
11	O.S.&Y. VALVE WITH TAMPER SWITCH
12	DRAIN CUP
13	ALARM TEST VALVE
14	ALARM LINE STRAINER (HIDDEN)
15	PRESSURE SWITCH (HIDDEN)
16	ACCELERATOR
17	AIR SUPPLY FROM COMPRESSOR

AIR COMP. AT 230V, 1Ø, 1 HP

6 DRY PIPE VALVE RISER DETAIL
NOT TO SCALE

U.L. SYSTEM NO. CAJ1155
METAL PIPE THROUGH A SLEEVE IN CONCRETE WALL OR FLOOR

F RATING = 3-HR.
T RATING = 0-HR.
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. FLOOR OR WALL ASSEMBLY: B. U.L. CLASSIFIED CONCRETE BLOCK WALL (MINIMUM 8" BLOCK). A. MINIMUM 4-1/2" THICK LIGHTWEIGHT OR NORMAL WEIGHT CONCRETE FLOOR.

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE.
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER EMT.

3. OPTIONAL: MAXIMUM 22" DIAMETER STEEL PIPE SLEEVE (SCHEDULE 10 OR HEAVIER).

4. MINIMUM 4" THICKNESS MINERAL WOOL (MIN. 4 PCF DENSITY) RECESSED 1/2" FROM TOP OF SLEEVE.

5. MINIMUM 1/2" DEPTH HILTI FS-ONE FIRESTOP SEALANT.

6. A GENEROUS BEAD OF HILTI FS-ONE FIRESTOP SEALANT AROUND OUTER PERIMETER OF STEEL SLEEVE.

NOTES:
1. MAXIMUM DIAMETER OF OPENING = 22".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 1-1/2".

INSTALLATION INSTRUCTIONS FOR UL NO.CAJ1155

STEP 1 - PREPARATION: to application of firestopping materials. All surfaces must be clean, sound, dry and frost free prior

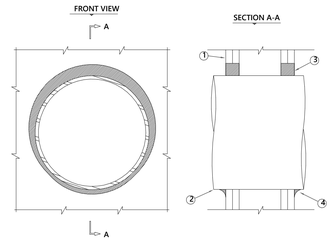
STEP 2 - BACKING MATERIAL: Firmly pack mineral wool around the penetrating item recessing it 1/2" below surface of the sleeve (or both ends of sleeve in wall)

STEP 3 - FIRESTOP SEALANT: Apply the Firestop Sealant over the backing material to a min. depth of 1/2" flush with the end(s) of the sleeve. Wall penetrations require Firestop Sealant installed on both sides. Leave completed seal undisturbed for 48 hours.

7 U.L. SYSTEM NO CAJ-1155 DETAIL
NOT TO SCALE

U.L. SYSTEM NO. WL1054
METAL PIPE THROUGH GYPSUM WALL ASSEMBLY

F RATING = 1-HR OR 2-HR
T RATING = 0-HR
L RATING AT AMBIENT = LESS THAN 1 CFM/SQ. FT.
L RATING AT 400°F = 4 CFM/SQ. FT.



1. GYPSUM-WALL ASSEMBLY (1-HR. AND 2-HR. FIRE RATING)(2-HR. SHOWN).

2. PENETRATING ITEM TO BE ONE OF THE FOLLOWING:
   A. MAXIMUM 20" DIAMETER STEEL PIPE (SCHEDULE 10 OR HEAVIER).
   B. MAXIMUM 6" DIAMETER COPPER PIPE.
   C. MAXIMUM 6" DIAMETER STEEL CONDUIT.
   D. MAXIMUM 4" DIAMETER STEEL EMT.

1. MINIMUM DEPTH
   A. MINIMUM 5/8" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 1-HR. FIRE-RATING. B. MINIMUM 1-1/4" DEPTH HILTI FS-ONE FIRESTOP SEALANT = 2-HR. FIRE-RATING.

2. MINIMUM 1/2" BEAD HILTI FS-ONE FIRESTOP SEALANT FOR POINT OF CONTACT.

NOTES: 1. MAXIMUM DIAMETER OF OPENING = 22-3/4".
2. ANNULAR SPACE = MINIMUM 0", MAXIMUM 2-1/4".

INSTALLATION INSTRUCTIONS FOR UL NO.WL1054

STEP 1 - PREPARATION: All surfaces must be clean, sound, dry and frost free prior to application of firestopping materials.

STEP 2 - FIRESTOP SEALANT: Apply a minimum 5/8" or 1-1/4" depth of FS-ONE in the annular space around the penetrating item. Tool excess sealant beyond perimeter of the opening 1/2" onto wall surface. Leave completed seal undisturbed for for 48 hours.

8 U.L. SYSTEM NO WL1054 DETAIL
NOT TO SCALE

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
BYRON A. FORD
PE - 2014023016
PROFESSIONAL ENGINEER

01/18/2021

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PROJECT TITLE

John Knox Village

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PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
FIRE PROTECTION DETAILS AND SCHEMATICS

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
FP0.2	2 OF 9

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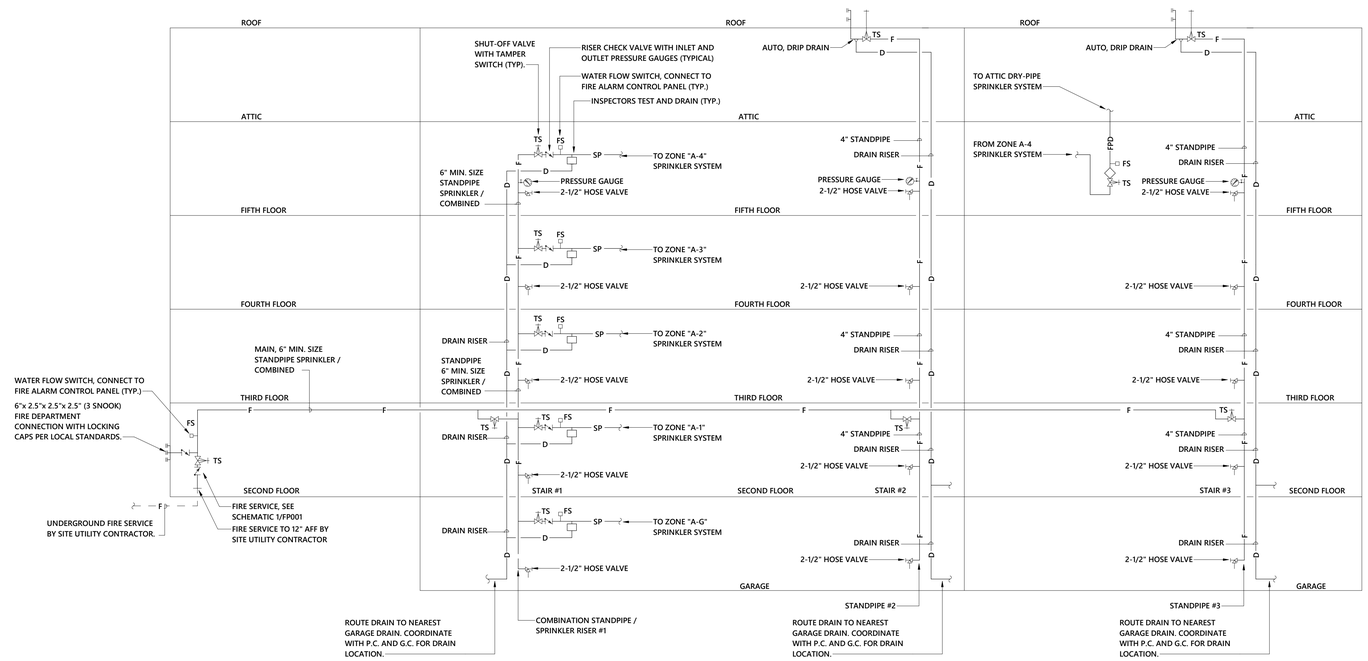

1 **FIRE PROTECTION STANDPIPE RISER DIAGRAM**
NO SCALE

GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT ENGINEER	: Designer
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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

FIRE PROTECTION STANDPIPE RISER DIAGRAM

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
FP0.3	3 OF 9

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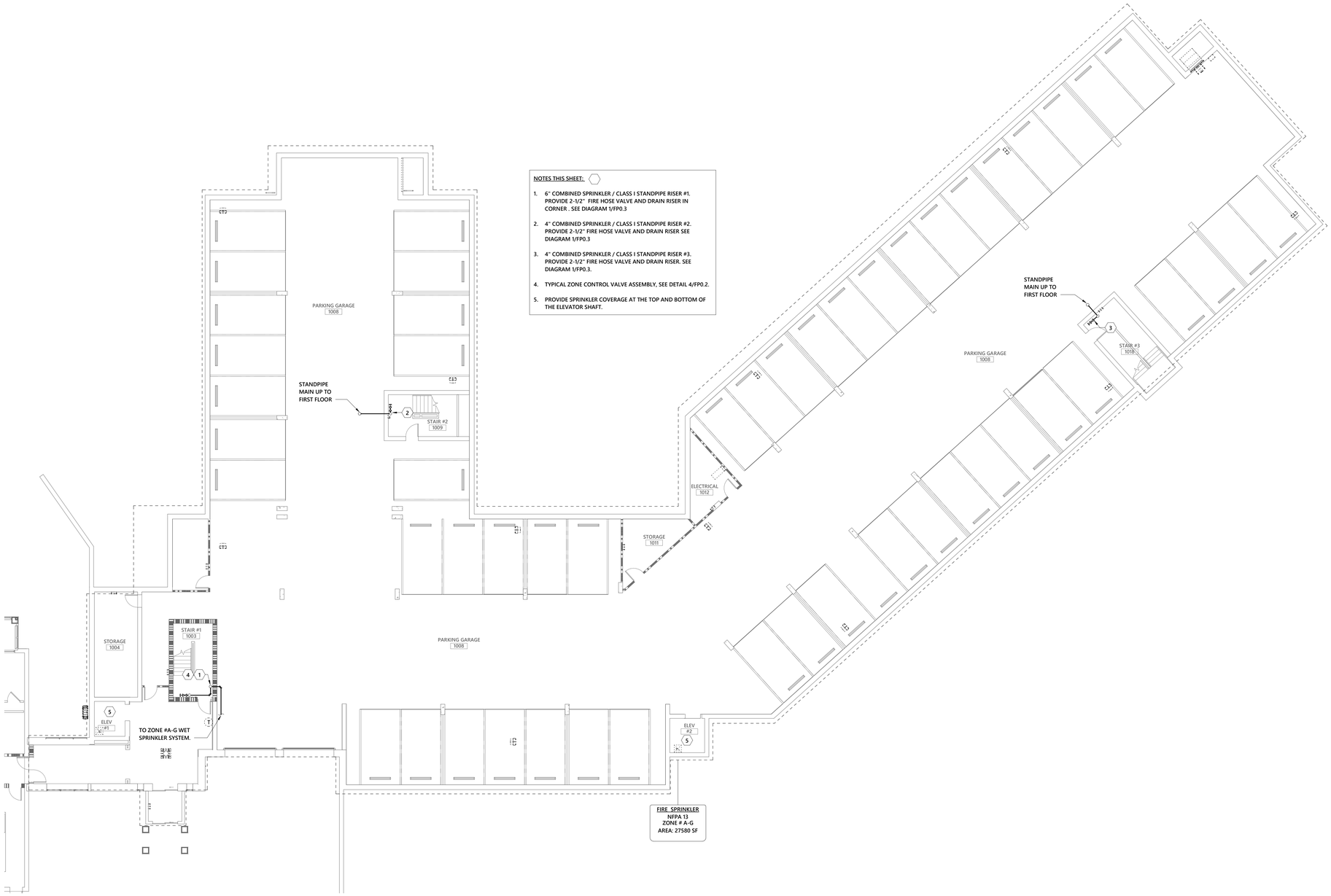

NOTES THIS SHEET:

1. 6" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #1. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER IN CORNER . SEE DIAGRAM 1/FP0.3
2. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #2. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER SEE DIAGRAM 1/FP0.3
3. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #3. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER. SEE DIAGRAM 1/FP0.3.
4. TYPICAL ZONE CONTROL VALVE ASSEMBLY, SEE DETAIL 4/FP0.2.
5. PROVIDE SPRINKLER COVERAGE AT THE TOP AND BOTTOM OF THE ELEVATOR SHAFT.

1 GARAGE FLOOR OVERALL FIRE PROTECTION PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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PROJECT TITLE

John Knox Village

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PROJECT ARCHITECT	: PA
PROJECT ENGINEER	: Designer
DRAWN BY	: TAW
CHECKED BY	: DAR
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
GARAGE FLOOR OVERALL FIRE PROTECTION PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
FP1.0	4 OF 9

1/15/2021 8:45:07 AM BIM 360://19132.00 John Knox Village – Meadows Phase II/20-0220 JKV_Meadows Phase II_MEP Central-R20.rvt
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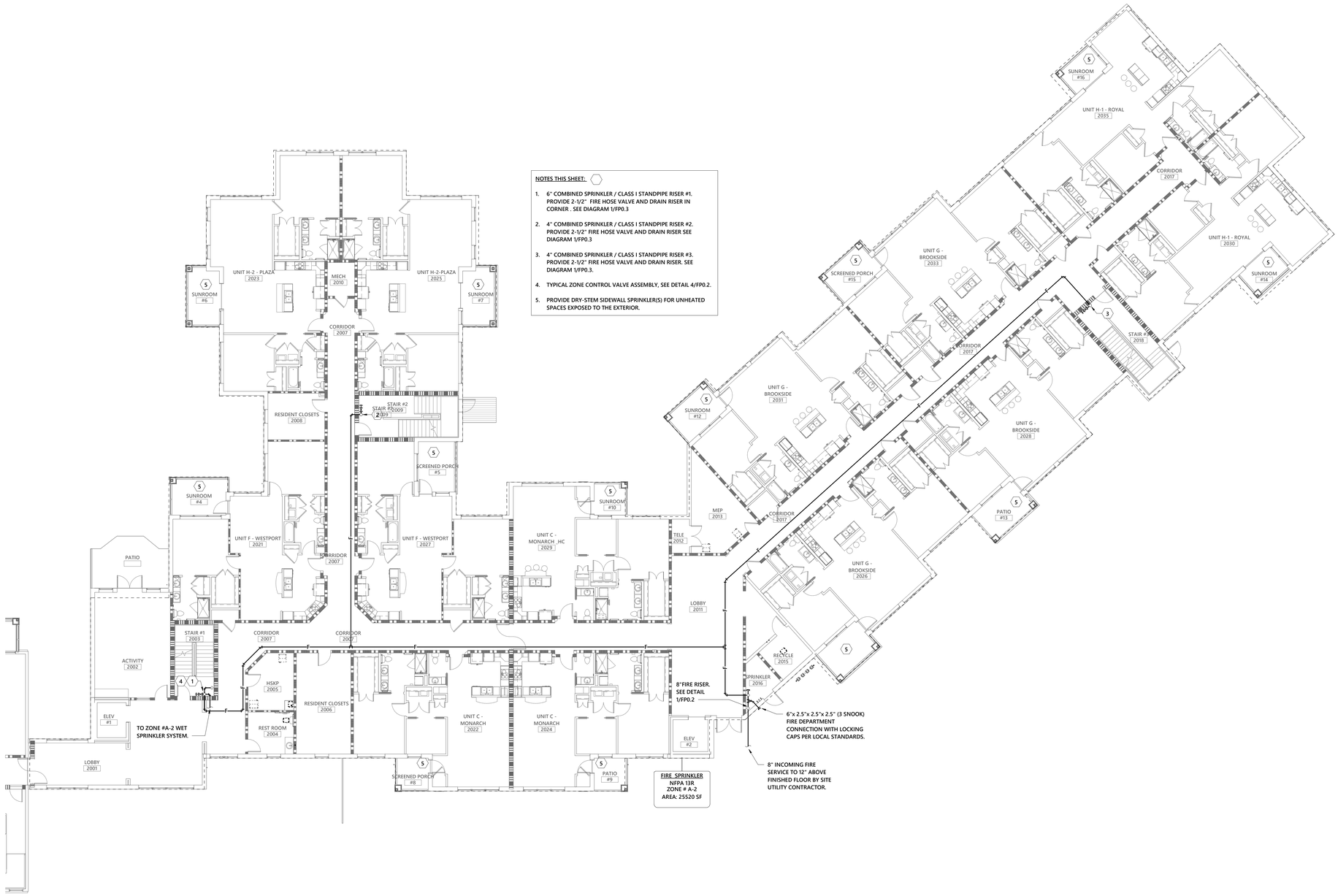

NOTES THIS SHEET:

1. 6" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #1. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER IN CORNER . SEE DIAGRAM 1/FP0.3
2. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #2. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER SEE DIAGRAM 1/FP0.3
3. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #3. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER. SEE DIAGRAM 1/FP0.3.
4. TYPICAL ZONE CONTROL VALVE ASSEMBLY, SEE DETAIL 4/FP0.2.
5. PROVIDE DRY-STEM SIDEWALL SPRINKLER(S) FOR UNHEATED SPACES EXPOSED TO THE EXTERIOR.

1 SECOND FLOOR OVERALL FIRE PROTECTION PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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John Knox Village

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PROJECT ARCHITECT	: PA
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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
SECOND FLOOR OVERALL FIRE PROTECTION PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
FP1.1	5 OF 9

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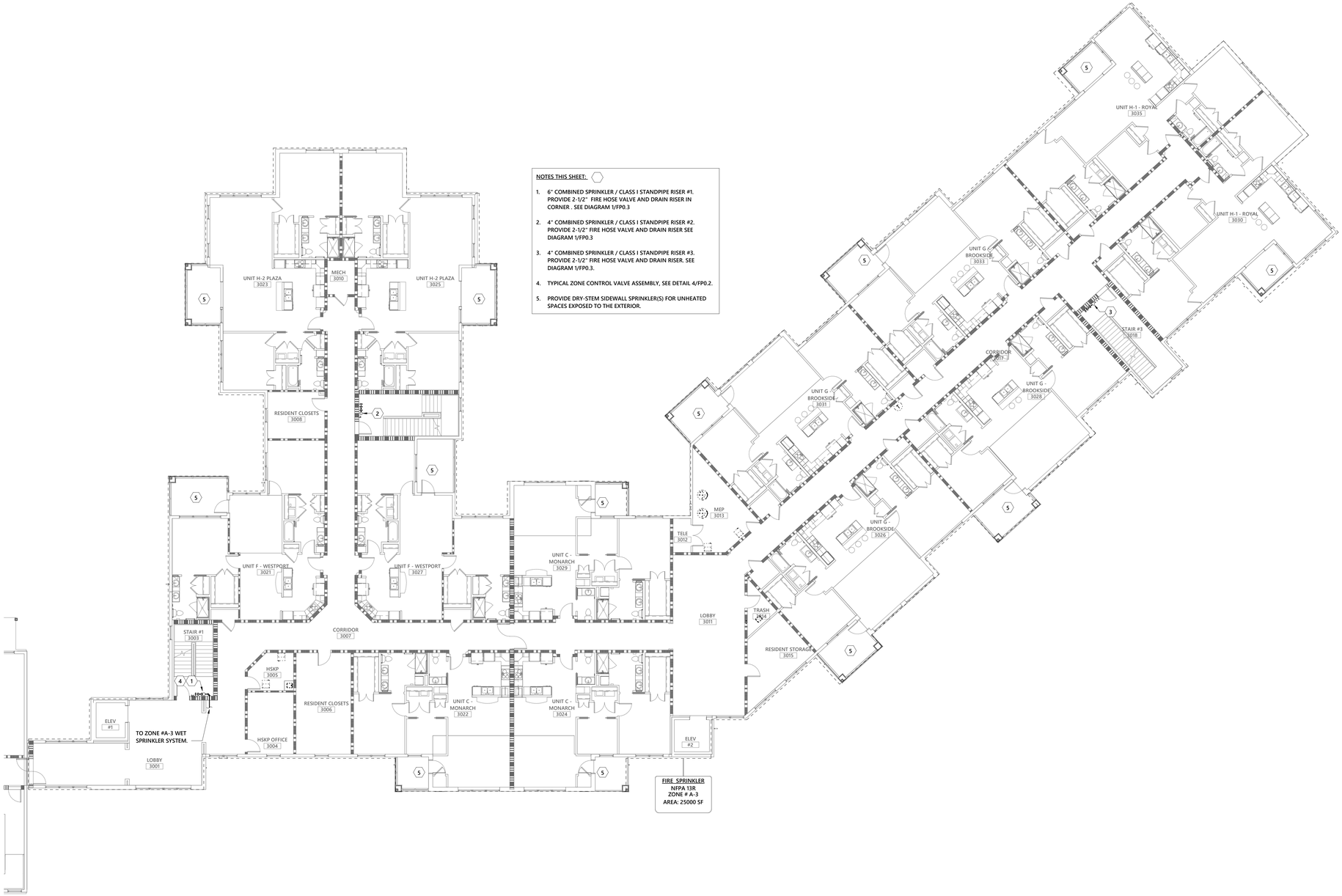

NOTES THIS SHEET:

1. 6" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #1. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER IN CORNER . SEE DIAGRAM 1/FP0.3
2. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #2. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER SEE DIAGRAM 1/FP0.3
3. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #3. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER. SEE DIAGRAM 1/FP0.3.
4. TYPICAL ZONE CONTROL VALVE ASSEMBLY, SEE DETAIL 4/FP0.2.
5. PROVIDE DRY-STEM SIDEWALL SPRINKLER(S) FOR UNHEATED SPACES EXPOSED TO THE EXTERIOR.

1 THIRD FLOOR OVERALL FIRE PROTECTION PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

01/18/2021

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APPROVED BY	:

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DRAWING TITLE
THIRD FLOOR OVERALL FIRE PROTECTION PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
FP1.2	6 OF 9

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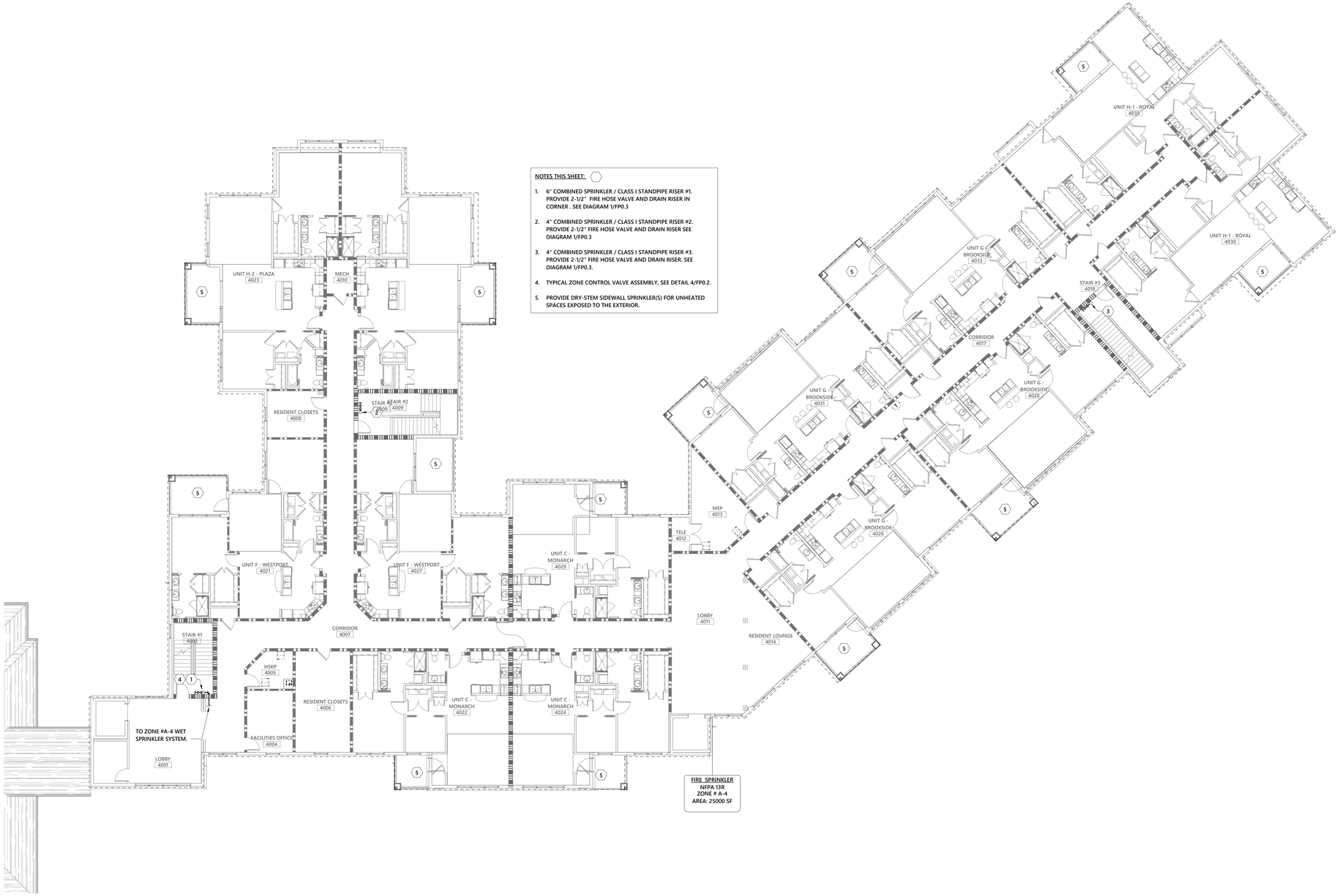

NOTES THIS SHEET:

1. 6" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #1. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER IN CORNER . SEE DIAGRAM 1/FP0.3
2. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #2. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER SEE DIAGRAM 1/FP0.3
3. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #3. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER. SEE DIAGRAM 1/FP0.3.
4. TYPICAL ZONE CONTROL VALVE ASSEMBLY, SEE DETAIL 4/FP0.2.
5. PROVIDE DRY-STEM SIDEWALL SPRINKLER(S) FOR UNHEATED SPACES EXPOSED TO THE EXTERIOR.

1 FOURTH FLOOR OVERALL FIRE PROTECTION PLAN

3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
BYRON D. FORD
PE-2014023016
PROFESSIONAL ENGINEER

01/18/2021

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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

FOURTH FLOOR OVERALL FIRE PROTECTION PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
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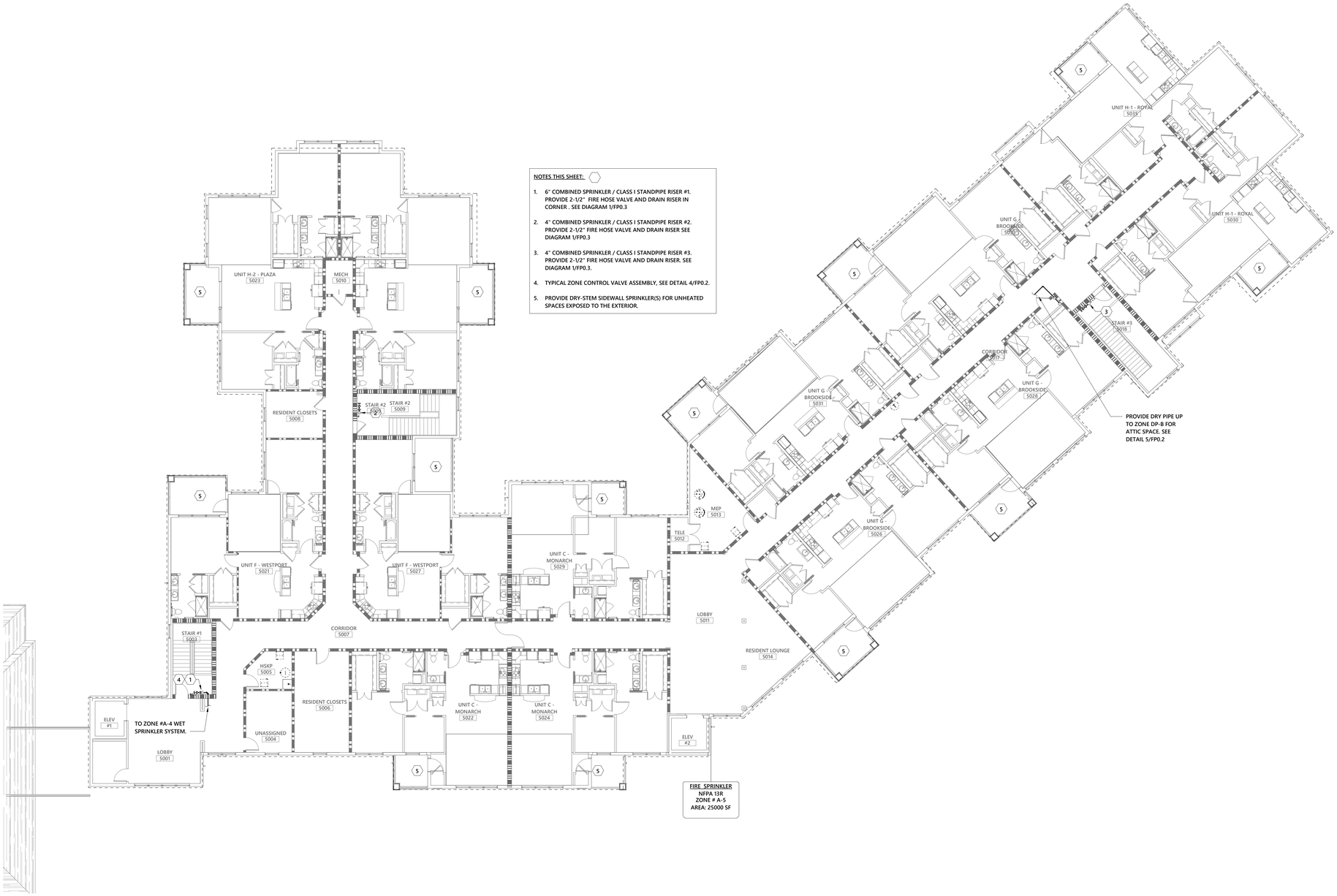

NOTES THIS SHEET:

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2. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #2. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER SEE DIAGRAM 1/FP0.3
3. 4" COMBINED SPRINKLER / CLASS I STANDPIPE RISER #3. PROVIDE 2-1/2" FIRE HOSE VALVE AND DRAIN RISER. SEE DIAGRAM 1/FP0.3.
4. TYPICAL ZONE CONTROL VALVE ASSEMBLY, SEE DETAIL 4/FP0.2.
5. PROVIDE DRY-STEM SIDEWALL SPRINKLER(S) FOR UNHEATED SPACES EXPOSED TO THE EXTERIOR.

1 FIFTH FLOOR OVERALL FIRE PROTECTION PLAN

3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
BYRON A. FORD
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01/18/2021

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APPROVED BY	:

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DRAWING TITLE

FIFTH FLOOR OVERALL FIRE PROTECTION PLAN

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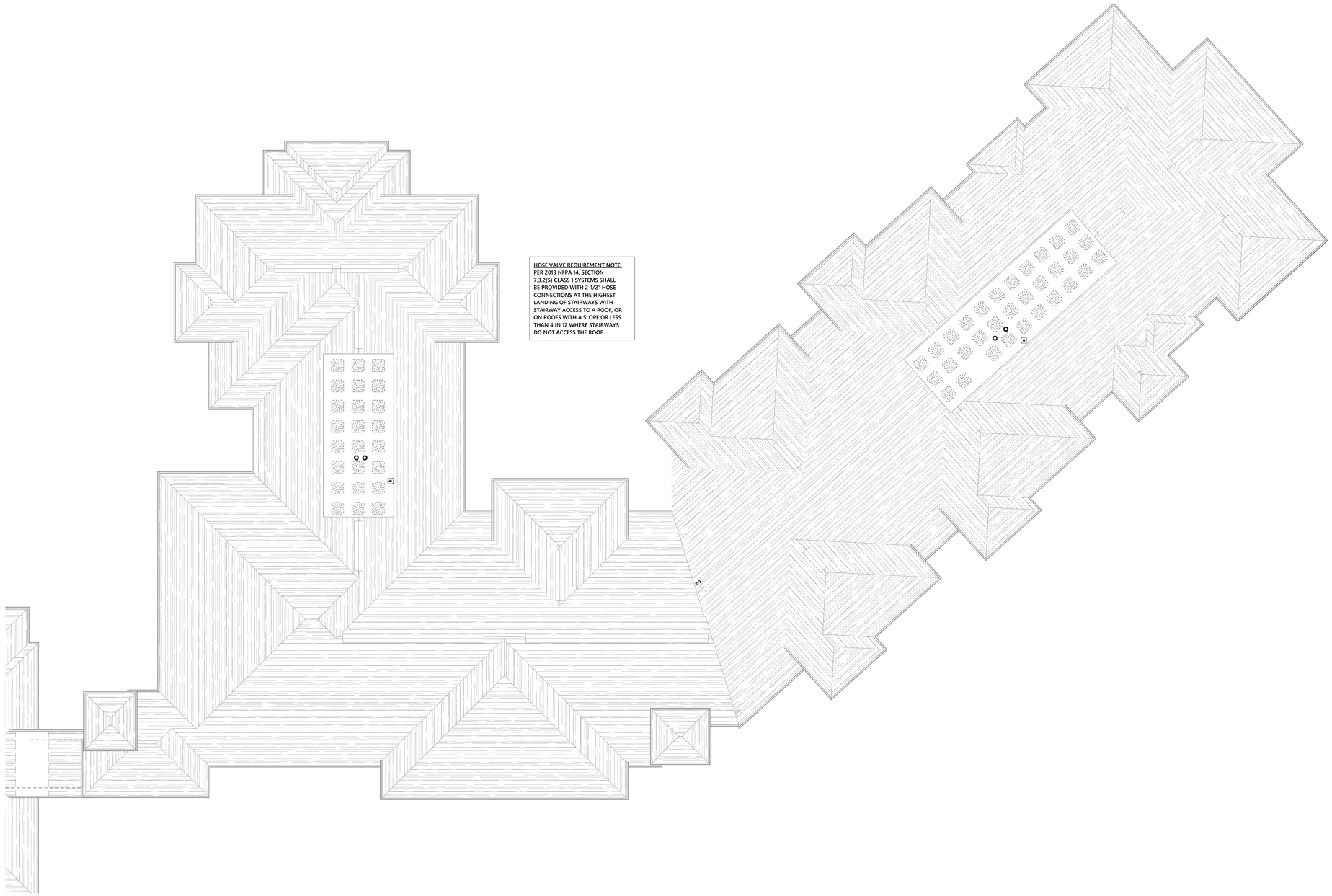

HOSE VALVE REQUIREMENT NOTE:
PER 2013 NFPA 14, SECTION 7.3.2(5) CLASS 1 SYSTEMS SHALL BE PROVIDED WITH 2-1/2" HOSE CONNECTIONS AT THE HIGHEST LANDING OF STAIRWAYS WITH STAIRWAY ACCESS TO A ROOF, OR ON ROOFS WITH A SLOPE OR LESS THAN 4 IN 12 WHERE STAIRWAYS DO NOT ACCESS THE ROOF.

1 **ROOF FIRE PROTECTION PLAN**
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

PERMIT SET

STATE OF NORTH CAROLINA
BYRON D. FORD
PE-2014023016
PROFESSIONAL ENGINEER

01/18/2021

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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
OVERALL ROOF FIRE PROTECTION PLAN

COMM. NO.	DATE
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DRAWING	SHEET
FP1.5	9 OF 9

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SYMBOLS:

SYMBOL	DESCRIPTION
#D/#V	NETWORK OUTLET. STANDARD HEIGHT (+18" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
#D/#V	NETWORK OUTLET. ELEVATED HEIGHT (+42" AFF, UNLESS OTHERWISE NOTED). ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE QUANTITY OF CATEGORY 6A CABLES AS INDICATED BY SUBSCRIPT.
W 1V	NETWORK WALL PHONE OUTLET. ELEVATED HEIGHT (+42" AFF). ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 1" CONDUIT WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE AND PHONE WALL MOUNT FACEPLATE.
WAP	WIRELESS ACCESS POINT CONNECTION (CEILING). WHEN INSTALLED IN HARD/OPEN CEILING, ELECTRICAL CONTRACTOR SHALL PROVIDE 2-GANG JUNCTION BOX WITH 1-GANG TRIM RING AND 1.25" CONDUIT WITH PULL STRING TO NEAREST ACCESSIBLE CEILING SPACE. REFER TO WIRELESS ACCESS POINT DETAIL (HARD/OPEN CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (2) CATEGORY 6A CABLES FOR EACH WIRELESS ACCESS POINT CONNECTION, CABLE TO NEAREST DATA/ELEC ROOM. WHEN INSTALLED IN ACCESSIBLE CEILING, STRUCTURED CABLING CONTRACTOR SHALL PROVIDE ABOVE CEILING BRACKET AND SURFACE BOX. REFER TO WIRELESS ACCESS POINT DETAIL (ACCESSIBLE CEILING). STRUCTURED CABLING CONTRACTOR SHALL PROVIDE 3'-0" EQUIPMENT CORD. WIRELESS ACCESS POINT EQUIPMENT SHALL BE OWNER FURNISHED, CONTRACTOR INSTALLED. COORDINATE WITH OWNER EXACT LOCATION AND MOUNTING METHOD OF WIRELESS ACCESS POINT EQUIPMENT.
TV	DISPLAY CONNECTION WITH NETWORK AND DUPLEX POWER. ELECTRICAL CONTRACTOR SHALL PROVIDE 3-GANG JUNCTION BOX WITH OFFSET 1-GANG TRIM RING FOR LOW VOLTAGE SECTION, LOW VOLTAGE DIVIDER, 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE FOR NETWORK CABLING, 0.75" CONDUIT FOR POWER AND DUPLEX RECEPTACLE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE AND (1) RG-6 COAXIAL CABLE. REFER TO SHEET ET6.1/DETAIL #1.
	CONDUIT/SLEEVE. 4" UNLESS OTHERWISE NOTED.
	RUNWAY LADDER CABLE TRAY IN TELECOMMUNICATIONS ROOMS.
	BASKET TYPE CABLE TRAY ABOVE ACCESIBLE CEILING.
FRONT	WALL MOUNTED CABINET IN TELECOMMUNICATIONS ROOM.
	3/4" FIRE-RATED AC PLYWOOD WITH TWO COATS OF FIRE RETARDANT LIGHT-COLORED PAINT ON ALL SIDES. STAMP SHALL BE VISIBLE. MOUNT 8" AFF WITH GRADE A SURFACE EXPOSED.
	MEDIA ENCLOSURE. ELECTRICAL CONTRACTOR SHALL PROVIDE PRIMEX 4200 ENCLOSURE OR APPROVED EQUAL WITH TWO DUPLEX RECEPTACLES. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLES FROM NETWORK DEVICES WITHIN UNIT TO MEDIA ENCLOSURE AND TERMINATE ON DATA MODULE WITHIN ENCLOSURE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE AN ADDITIONAL DATA MODULE AND ROUTE CABLING TO LOCAL IT ROOM. PROVIDE PATCH CORD FOR EACH TERMINATED PORT. APPLIES TO BOTH CATEGORY AND COAXIAL CONNECTIONS. REFER TO SHEET ET6.1/DETAIL #14.
TGB	TELECOMMUNICATIONS GROUND BAR. MOUNT AT 80" AFF.
TMGB	TELECOMMUNICATIONS MAIN GROUND BAR. MOUNT AT 80" AFF.
X	DRAWING NOTE
CR	CARD READER. ELECTRICAL CONTRACTOR SHALL PROVIDE 1-GANG JUNCTION BOX AND 3/4" CONDUIT WITH PULL STRING TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
DC	DOOR CONTACT. ELECTRICAL CONTRACTOR SHALL PROVIDE 3/4" CONDUIT WITH PULL STRING TO ACCESS CONTROL JUNCTION BOX ON SECURE SIDE OF DOOR. SECURITY CONTRACTOR SHALL PROVIDE DEVICE AND CABLING.
IC	INTERCOM.
EXT	NETWORK CAMERA (EXTERIOR WALL). ELECTRICAL CONTRACTOR SHALL PROVIDE 8"x8"x6" DEEP JUNCTION BOX, 1" SLEEVE TO EXTERIOR AND 1.25" CONDUIT TO NEAREST ACCESSIBLE CEILING SPACE. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE (1) CATEGORY 6A CABLE FOR EACH CAMERA CONNECTION. STRUCTURED CABLING CONTRACTOR SHALL PROVIDE SURGE PROTECTION AND 1'-0" EQUIPMENT CORD. REFER TO EXTERIOR NETWORK DEVICE DETAIL.

CONTRACTOR/INTEGRATOR RESPONSIBILITY MATRIX

SYSTEM		EQUIPMENT FURNISHED	EQUIPMENT INSTALLED	RACEWAY FURNISHED & INSTALLED	POWER WIRING FURNISHED & INSTALLED	CONTROLS WIRING FURNISHED & INSTALLED	PROGRAMMING & INTEGRATION	DESIGNED BY
GROUNDING AND BONDING	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	N/A	N/A	N/A	OPTIMA
TELECOM ROOM CABLE TRAYS	--	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
STRUCTURED CABLING J-HOOKS	--	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
SECURITY CABLING J-HOOKS	--	SECURITY	SECURITY	N/A	N/A	N/A	N/A	OPTIMA
PLYWOOD BACKBOARD	--	GENERAL	GENERAL	N/A	N/A	N/A	N/A	OPTIMA
EQUIPMENT RACKS & CABINETS	--	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
INCOMING COMMUNICATIONS SERVICE	--	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
STRUCTURED CABLING	--	TELECOM	TELECOM	ELECTRICAL	ELECTRICAL	N/A	N/A	OPTIMA
STRUCTURED CABLING SURGE SUPPRESSION	--	TELECOM	TELECOM	N/A	N/A	N/A	N/A	OPTIMA
WIRELESS ACCESS POINTS	--	OWNER	TELECOM	ELECTRICAL	ELECTRICAL	N/A	OWNER	OTHERS
VOIP TELEPHONE EQUIPMENT	--	OWNER	OWNER	ELECTRICAL	ELECTRICAL	OWNER	OWNER	OTHERS
ACTIVE NETWORK ELECTRONICS	--	OWNER	OWNER	ELECTRICAL	ELECTRICAL	OWNER	OWNER	OWNER
SECURITY/SURVEILLANCE	--	SECURITY	SECURITY	ELECTRICAL	ELECTRICAL	SECURITY	SECURITY	OPTIMA
HARDWIRED DOOR ACCESS CONTROL	--	SECURITY	SECURITY	ELECTRICAL	ELECTRICAL	SECURITY	SECURITY	OPTIMA
WIRELESS DOOR ACCESS CONTROL	--	HARDWARE	HARDWARE	ELECTRICAL	ELECTRICAL	HARDWARE	HARDWARE	ARCHITECT
ELECTRIFIED DOOR HARDWARE	--	HARDWARE	HARDWARE	ELECTRICAL	ELECTRICAL	HARDWARE	HARDWARE	ARCHITECT
BUILDING LIGHTING	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	OPTIMA
SITE LIGHTING	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	OPTIMA
ELEVATORS	--	ELEVATOR	ELEVATOR	ELECTRICAL	ELECTRICAL	ELEVATOR	ELEVATOR	ARCHITECT
ELECTRICAL METERING	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	OPTIMA
FIRE ALARM	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	OPTIMA
FIRST RESPONDER DISTRIBUTED ANTENNA	--	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	ELECTRICAL	OPTIMA

MATRIX NOT INCLUSIVE OF ALL SYSTEMS TO BE PROVIDED. REFER TO PROJECT MANUAL AND DRAWINGS FOR ADDITIONAL INFORMATION.

GENERAL NOTES:

A. COORDINATE WITH ARCHITECTURAL PLANS FOR EXACT NETWORK OUTLET LOCATIONS.

B. COORDINATE LOCATIONS OF CEILING MOUNTED DEVICES (WIRELESS ACCESS POINTS, SPEAKERS, CABLE TRAY, ETC) WITH ALL OTHER TRADES (ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING, TECHNOLOGY, ETC).

C. ANY DIRECTION GIVEN IN THE FIELD THAT DEVIATES FROM THE CONSTRUCTION DOCUMENTS MUST BE DOCUMENTED AND VERIFIED WITH THE ENGINEER.

D. PROVIDE ALL REQUIRED HARDWARE FOR A COMPLETE INSTALLATION.

E. ALL CONDUITS SHALL BE CONCEALED UNLESS OTHERWISE NOTED. WHERE CONDUITS ARE TO BE INSTALLED IN EXPOSED CEILINGS, CONDUITS SHALL BE INSTALLED TIGHT TO STRUCTURE AND PAINTED TO MATCH ADJACENT SURFACE.

F. NO SECTION OF LOW VOLTAGE CONDUIT SHALL CONTAIN MORE THAN (2) 90° BENDS, OR EQUIVALENT BETWEEN PULL POINTS. PROVIDE JUNCTION BOX SIZED PER NEC OR AS INDICATED.

G. NO SECTION OF LOW VOLTAGE CONDUIT SHALL BE LONGER THAN 100'-0" BETWEEN PULL POINTS. PROVIDE JUNCTION BOX SIZED PER NEC OR AS INDICATED.

H. ELECTRICAL CONTRACTOR SHALL COORDINATE EXACT CONDUIT ROUTING FOR TELECOMMUNICATIONS HORIZONTAL CABLING WITH STRUCTURED CABLING CONTRACTOR PRIOR TO INSTALLATION.

I. ALL 2" AND LARGER CONDUITS SHALL BE LABELED ON BOTH ENDS INDICATING DESTINATION LOCATION.

J. ELECTRICAL CONTRACTOR SHALL PROVIDE PULLSTRINGS (INTERIOR) OR MULE TAPE (EXTERIOR) FOR ALL CONDUITS (NEW AND EXISTING TO REMAIN) TO BE UTILIZED FOR LOW VOLTAGE SYSTEMS.

K. ELECTRICAL CONTRACTOR SHALL MAINTAIN FIRE RATINGS OF WALLS, PARTITIONS, FLOORS OR CEILINGS PER NEC & IBC WHEN INSTALLING RECESSED BOXES. BOXES IN RATED WALLS SHALL BE SEPARATED BY A HORIZONTAL DISTANCE NOT LESS THAN 24". THE HORIZONTAL DISTANCE MAY BE REDUCED, BUT SHALL NOT BE LESS THAN THE DEPTH OF THE WALL CAVITY, WHERE FILLED WITH CELLULOSE LOOSE FILL, ROCKWOOL OR SLAG MINERAL WOOL INSULATION OR WHERE PROTECTED BY LISTED PUTTY PADS OR OTHER LISTED MATERIALS/METHODS. ELECTRICAL CONTRACTOR SHALL PROVIDE LISTED PUTTY PADS AS REQUIRED. IN NO CASE SHALL THE AGGREGATE AREA OF OPENINGS EXCEED 100 SQUARE INCHES IN ANY 100 SQUARE FEET OF WALL SPACE. ELECTRICAL CONTRACTOR SHALL COORDINATE WITH LOW VOLTAGE CONTRACTOR TO VERIFY FINAL INSTALLATION WILL SATISFY CODE REQUIREMENTS.

L. INSTALLATION OF AC VOLTAGE CABLING IN LOW VOLTAGE PATHWAYS IS NOT ACCEPTABLE.

M. CABLING SHALL PASS STRAIGHT THROUGH ANY PULL BOX. CHANGE OF DIRECTION IN A PULL BOX IS NOT ACCEPTABLE.

N. CONDUITS SHALL HAVE A MINIMUM OF 40% FILL PRIOR TO UTILIZING AN ADJACENT SPARE CONDUIT.

O. FACEPLATES SHALL MATCH ADJACENT ELECTRICAL DEVICES. FINAL COLOR AND FINISH TO BE APPROVED BY ARCHITECT AND OWNER.

P. ALL FACEPLATES AND PATCH PANELS SHALL UTILIZE MODULAR JACKS.

Q. COPPER JACK COLOR SHALL MATCH CABLE COLOR.

R. ALL CABLING SHALL BE PLENUM RATED UNLESS OTHERWISE NOTED.

S. ALL CABLING, TERMINATIONS AND HOUSINGS ARE TO BE RATED FOR THE ENVIRONMENTS IN WHICH THEY ARE INSTALLED.

T. CABLING SHALL NOT BE PAINTED. MANUFACTURERS WARRANTY MAY BE VOIDED.

U. TERMINATE ALL CABLING ON DEDICATED SYSTEM PATCH PANEL. (WIRELESS, DATA, SECURITY, ETC.)

V. PROVIDE OUTSIDE PLANT CATEGORY CABLING FOR IN/UNDERSLAB OR OUTDOOR APPLICATIONS. CONDUIT CONTAINING OUTSIDE PLANT CABLING SHALL BE EXTENDED TO LOCAL TELECOMMUNICATIONS ROOM. INDOOR/OUTDOOR CATEGORY CABLING IS AN ACCEPTABLE ALTERNATIVE. GENERAL CABLE: GENSPEED 10 UTP INDOOR/OUTDOOR 7141007 OR APPROVED EQUAL.

W. ALL CABLING SHALL BE TERMINATED, TESTED AND LABELED PER SPECIFICATIONS. ALL LABELING SHALL BE MACHINE PRINTED. HAND WRITTEN LABELS ARE NOT ACCEPTABLE.

X. PROVIDE PATCH CORD FOR EACH TERMINATED PORT IN TELECOMMUNICATIONS ROOM. COORDINATE EXACT LENGTH WITH OWNER.

Y. PROVIDE EQUIPMENT CORD FOR EACH WIRELESS ACCESS POINT AND NETWORK CAMERA. COORDINATE EXACT LENGTH WITH OWNER.

Z. PROVIDE SURGE SUPPRESSION MODULE AT DEVICES UTILIZING IN/UNDERSLAB CONDUIT AND EXTERIOR WIRELESS ACCESS POINT, CAMERA, AND NETWORK SPEAKER LOCATIONS. DITEK: DTK-MRJPOES OR APPROVED EQUAL. REFER TO EXTERIOR NETWORK DEVICE DETAIL. PROVIDE 24 CHANNEL, RACK MOUNTED SURGE SUPPRESSION AT RACK LOCATION FOR NETWORK PROTECTION. DITEK: DTK-RM24NETS OR APPORVED EQUAL. PROVIDE PATCH CORDS AS REQUIRED.

AA. ALL PENETRATIONS THROUGH RATED WALLS MUST BE FIRESTOPPED. UTILIZE MECHANICAL FIRE RATED PATHWAYS. STI EZ-PATH OR APPROVED EQUAL.

BB. PROVIDE METALLIC J-HOOKS FOR CABLING IN ACCESSIBLE CEILING SPACES WITHOUT CABLE TRAY, BETWEEN CONDUITS, AND BETWEEN CONDUITS AND CABLE TRAY AT 3'-5' IRREGULAR INTERVALS. PANDUIT, COOPER B-LINE, NVENT CADDY, OR APPROVED EQUAL.

CC. THE USE OF J-HOOKS IN EXPOSED CEILING AREAS IS NOT ACCEPTABLE. PROVIDE CONDUIT OR SOLID BOTTOM CABLE TRAY. CONDUITS AND/OR SOLID BOTTOM CABLE TRAY SHALL BE PAINTED TO MATCH ADJACENT SURFACE.

DD. THE USE OF J-HOOKS ABOVE INACCESSIBLE CEILING AREAS IS NOT ACCEPTABLE. PROVIDE CONDUIT.

EE. NYLON CABLE TIE WRAPS ARE NOT ACCEPTABLE FOR BINDING OR SECURING CABLE BUNDLES. UTILIZE HOOK AND LOOP STRAPS TO SECURE CABLING IN TELECOMMUNICATIONS ROOM. STRAPS SHALL BE EVENLY SPACED THROUGHOUT THE DRESSED LENGTH AND PLENUM RATED WHERE APPLICABLE.

FF. PROVIDE (1) CATEGORY 6A CABLE TO EACH ELEVATOR CONTROLLER FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK AND EMERGENCY PHONE INTERFACE. EXTEND INCOMING ANALOG DEMARK TO LOCAL TELECOMMUNICATIONS ROOM AS REQUIRED. ELEVATOR TRAVELER CABLE SHALL BE PROVIDED WITH ELEVATOR. COORDINATE LOCATION AND REQUIREMENTS WITH ELEVATOR CONTRACTOR.

GG. PROVIDE (1) CATEGORY 6A CABLE TO EACH FIRE ALARM CONTROL PANEL FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. EXTEND INCOMING ANALOG DEMARK TO LOCAL TELECOMMUNICATIONS ROOM AS REQUIRED. COORDINATE LOCATION AND REQUIREMENTS WITH FIRE ALARM CONTRACTOR.

HH. PROVIDE (1) CATEGORY 6A CABLE TO EACH SECURITY ALARM PANEL FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. EXTEND INCOMING ANALOG DEMARK TO LOCAL TELECOMMUNICATIONS ROOM AS REQUIRED. COORDINATE LOCATION AND REQUIREMENTS WITH SECURITY CONTRACTOR.

II. PROVIDE (1) CATEGORY 6A CABLE TO EACH HVAC CONTROLLER (JACE) FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. COORDINATE LOCATION AND REQUIREMENTS WITH HVAC CONTRACTOR

JJ. PROVIDE (1) CATEGORY 6A CABLE TO EACH LIGHTING CONTROL PANEL FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. COORDINATE LOCATION AND REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

KK. PROVIDE (1) CATEGORY 6A CABLE TO MAIN SWITCHBOARD FROM LOCAL TELECOMMUNICATIONS ROOM FOR NETWORK INTERFACE. COORDINATE LOCATION AND REQUIREMENTS WITH ELECTRICAL CONTRACTOR.

TELECOMMUNICATIONS STANDARDS:

INSTALLATION SHALL CONFORM TO THE FOLLOWING STANDARDS:

A. TIA-568.0-D-1 (GENERIC TELECOMMUNICATIONS CABLING FOR CUSTOMER PREMISES)

B. TIA-568.1-D-1 (COMMERCIAL BUILDING TELECOMMUNICATIONS CABLING)

C. TIA-568.3-D (OPTICAL FIBER CABLING COMPONENTS)

D. TIA-568-C.2-1 (BALANCED TWISTED-PAIR TELECOMMUNICATIONS CABLING AND COMPONENTS)

E. TIA-569-D-1 (TELECOMMUNICATIONS PATHWAYS AND SPACES)

F. TIA-606-C (ADMINISTRATION STANDARD FOR TELECOMMUNCATIONS INFRASTRUCTURE)

G. TIA-607-C-1 (TELECOMMUNICATIONS BONDING AND GROUNDING FOR CUSTOMER PREMISES)

PULL BOX SIZING SCHEDULE

CONDUIT	PULL BOX WIDTH	PULL BOX LENGTH	PULL BOX DEPTH	PULL BOX WITH MULTIPLE CONDUITS (NOTE A)
1.00"	4.00"	16.00"	3.00"	2.00"
1.25"	6.00"	20.00"	3.00"	3.00"
1.50"	8.00"	27.00"	4.00"	4.00"
2.00"	8.00"	36.00"	4.00"	5.00"
2.50"	10.00"	42.00"	5.00"	6.00"
3.00"	12.00"	48.00"	5.00"	6.00"
4.00"	15.00"	60.00"	8.00"	8.00"

NOTES:
A. FOR EACH ADDITIONAL CONDUIT, ADD INDICATED DIMENSION TO PULL BOX WIDTH.
B. SIZING INDICATED IS FOR MINIMUM PULL BOX SIZE. INCREASE AS REQUIRED.

CONDUIT CAPACITY SCHEDULE

CONDUIT		1.25"	1.50"	2.00"	2.50"	3.00"	4.00"
CABLES		7	10	18	25	40	70

NOTES:
A. UPSIZE CONDUIT TO NEXT SIZE SHOWN IN THIS SCHEDULE WHEN CABLE CAPACITY HAS BEEN EXCEEDED.
B. CONDUIT CAPACITY CALCULATED WITH 0.295" O.D. CATEGORY CABLE AT 40% FILL RATIO.

CONDUIT/SLEEVE SCHEDULE

RESIDENTIAL UNITS	(2) 1.25" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR. REFER TO MEDIA ENCLOSURE SYMBOL AND DESCRIPTION FOR ADDITIONAL INFORMATION AND REQUIRMENTS.
WORKSPACES	(1) 4" CONDUITS TO CABLE TRAY/J-HOOKS IN ACCESSIBLE CEILING SPACE IN CORRIDOR.

ADDITIONAL REQUIREMENTS:

A. PROVIDE A MINIMUM OF (2) 4" CONDUITS BETWEEN ALL ACCESSIBLE CEILING SPACES SEPARATED BY A HARD CEILING GREATER THAN 3'-0" UNLESS OTHERWISE NOTED. REFER TO TELECOMMUNICATIONS CONDUIT CAPACITY SCHEDULE.

CABLE SERVICE LOOP SCHEDULE

	SOURCE	DESTINATION	NOTES
BACKBONE - FIBER	20'-0"	20'-0"	
BACKBONE - COAXIAL	20'-0"	20'-0"	
BACKBONE - COPPER	20'-0"	20'-0"	
HORIZONTAL - COAXIAL	20'-0"	20'-0"	
HORIZONTAL - COPPER	10'-0"	1'-6"	

NOTES:
A. UTILIZE FIGURE EIGHT CONFIGURATION FOR LARGE SERVICE LOOPS.
B. COIL CABLING FOR FIELD DEVICE LOCATIONS AT CABLE TRAY/J-HOOKS ABOVE ACCESSIBLE CEILING.

ABBREVIATIONS

ACT	ACOUSTICAL CEILING TILE	IoT	INTERNET OF THINGS
ADA	AMERICANS WITH DISABILITIES ACT	IP	INTERNET PROTOCOL
AFF	ABOVE FINISHED FLOOR (ELEVATION TAKEN FROM FINISHED FLOOR)	J-BOX	JUNCTION BOX
		MH	MANHOLE
AFG	ABOVE FINISHED GRADE (ELEVATION TAKEN FROM FINISHED GRADE)	MIN	MINIMUM
		NEC	NATIONAL ELECTRICAL CODE
AV	AUDIO/VISUAL	NVR	NETWORK VIDEO RECORDER
AVC	AUDIO/VISUAL CONTRACTOR	OSP	OUTSIDE PLANT
AWG	AMERICAN WIRE GAUGE	PDU	POWER DISTRIBUTION UNIT
BOCT	BOTTOM OF CABLE TRAY	PoE	POWER OVER ETHERNET
C	CONDUIT	PVC	POLYVINYL CHLORIDE
CAM	CAMERA	QTY	QUANTITY
CATV	CABLE TELEVISION	SC	SECURITY CONTRACTOR
CLG	CEILING	SPECS	SPECIFICATIONS
CMU	CONCRETE MASONRY UNIT	TC	TELECOMMUNICATIONS CONTRACTOR
EC	ELECTRICAL CONTRACTOR	TELECOM	TELECOMMUNICATIONS
ETR	EXISTING TO REMAIN	TYP	TYPICAL
EXT	EXTERIOR	UON	UNLESS OTHERWISE NOTED
FACP	FIRE ALARM CONTROL PANEL	UPS	UNINTERRUPTIBLE POWER SUPPLY
GYP	GYPSUM BOARD	VoIP	VOICE OVER INTERNET PROTOCOL
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE	WAP	WIRELESS ACCESS POINT
HDTV	HIGH DEFINITION TELEVISION	WP	WEATHERPROOF
HH	HANDHOLE		

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NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE
TECHNOLOGY LEGEND AND NOTES

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING ET0.1

SHEET 25 OF 34

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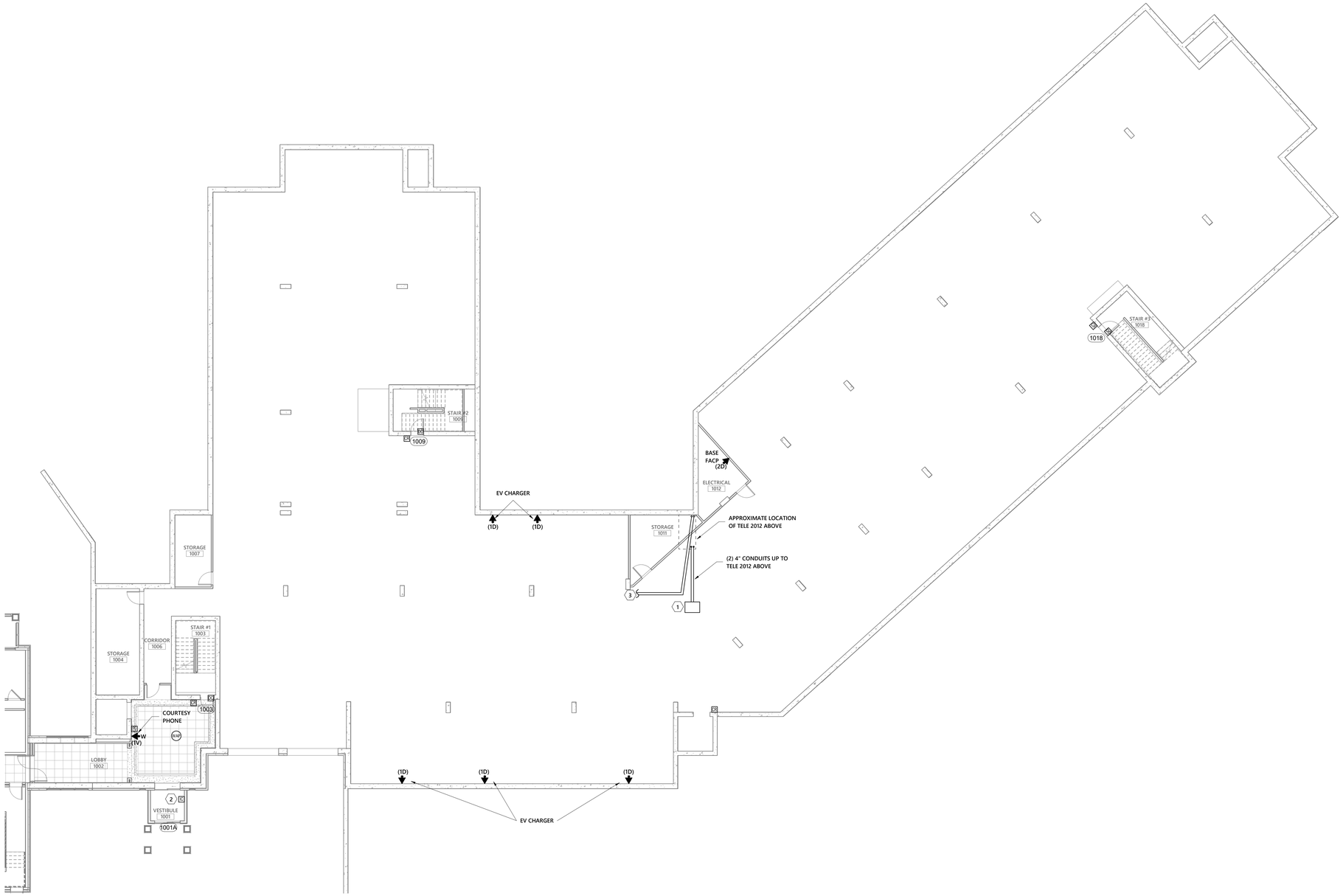

1 OVERALL GARAGE TECHNOLOGY PLAN
3/32" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

A. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLING FROM NETWORK DEVICES IN GARAGE TO TELE 2012 ON SECOND FLOOR.

KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL ROUTE ALL STRUCTURED CABLING AND SECURITY CONDUITS TO CONSOLIDATION PULL BOX LOCATED IN CEILING. PULL BOX SHALL BE SIZED PER NEC.
2. SECURITY CONTRACTOR SHALL PROVIDE INTERCOM MODULE. DEVICE SHALL MATCH EXISTING IN PHASE I AND TIE INTO EXISTING HEADEND.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 4" CONDUITS FROM TELE 2012 ABOVE ACCESSIBLE CEILING SPACE IN PHASE I BUILDING.

PERMIT SET

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APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

GARAGE OVERALL TECHNOLOGY PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

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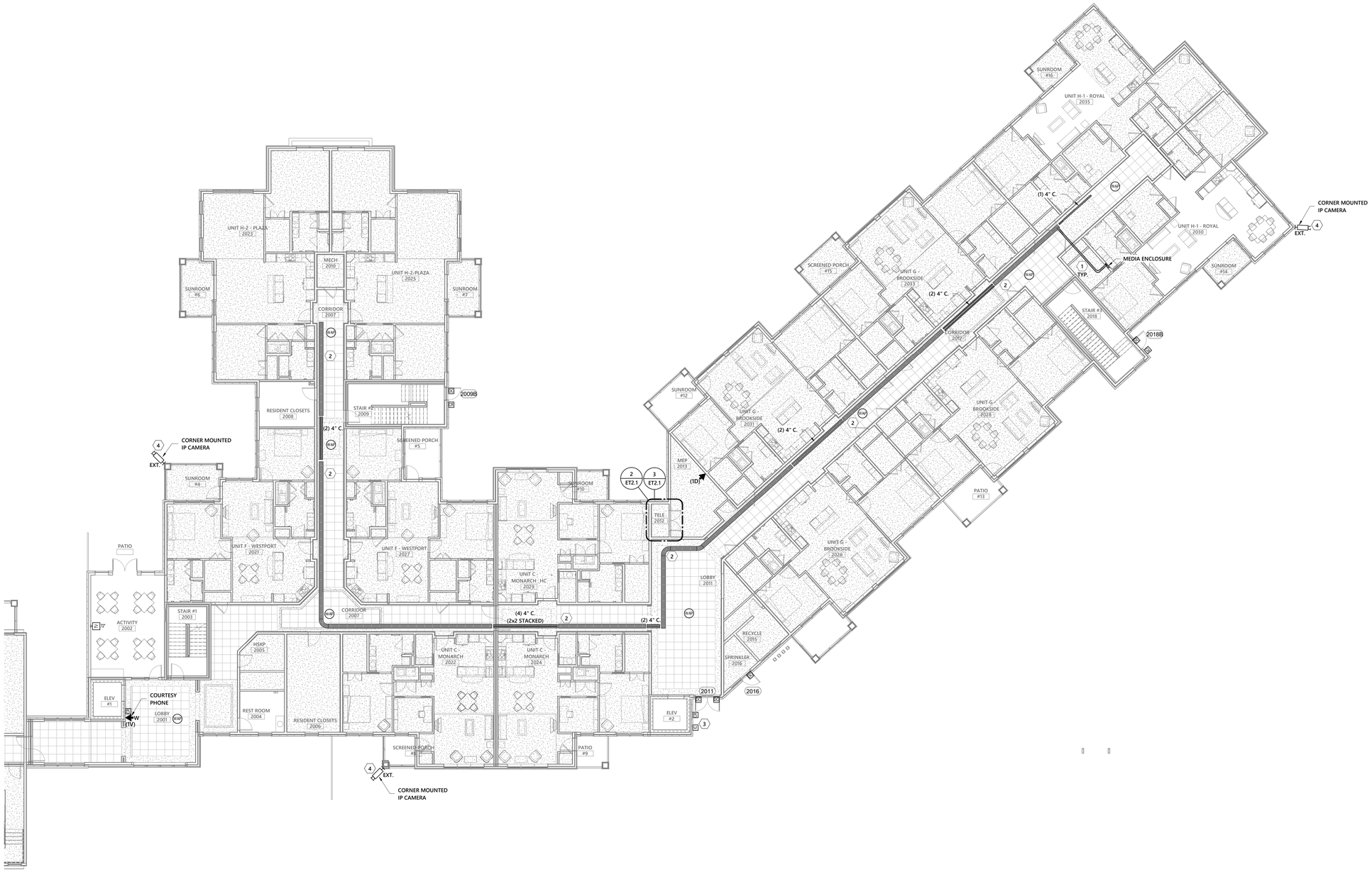
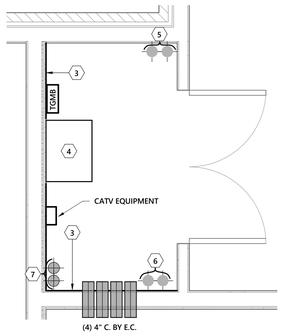


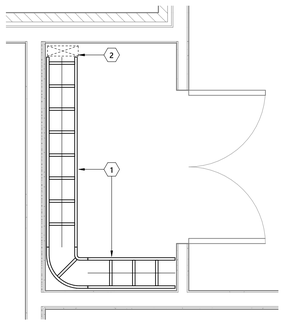
1 OVERALL SECOND FLOOR TECHNOLOGY PLAN

3/32" = 1'-0"



2 ENLARGED PLAN - TELE 2012 - LOWER

1/2" = 1'-0"



3 ENLARGED PLAN - TELE 2012 - UPPER

1/2" = 1'-0"

GENERAL NOTES (ENLARGED PLANS):

A. FEED ALL CABLES INTO RACKS FROM ABOVE.
B. LEAVE ONE RACK UNIT SPACE FREE ABOVE AND BELOW EACH PATCH PANEL, WIRE MANAGER, AND OWNER PROVIDED NETWORK ELECTRONICS. FILL THESE SPACES WITH BLANK PANELS.

DRAWING NOTES (ENLARGED PLANS):

1. PROVIDE 12" LADDER RACK WALL MOUNTED AT 7'-6" AFF. MOUNT FLUSH TO TOP OF DATA RACKS UTILIZING 6" RUNWAY ELEVATION KITS.
2. PROVIDE 12" WIDE LADDER RACK MOUNTED VERTICALLY TO BE USED FOR LACING AND SUPPORT OF CABLES.
3. PLYWOOD BACKBOARD.
4. PROVIDE 16 RU WALL MOUNTED CABINET FOR DATA CONNECTIVITY.
5. (2) 4" CONDUITS BY E.C. UNDERGROUND FROM TELECOM HANDHOLE TO TELE 2012. CONDUITS SHALL STUB UP TO BOTTOM OF VERTICAL LADDER RACK.
6. (2) 4" CONDUITS STUBBED UP FROM GARAGE BELOW.
7. CONDUIT SLEEVES BETWEEN TELECOMMUNICATION ROOMS. REFER TO ET7.1/#1 CONDUIT RISER DIAGRAM FOR ADDITIONAL INFORMATION.

N
PLAN NORTH

GENERAL NOTES

A. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLING FROM NETWORK DEVICES IN CORRIDOR TO TELE 2012.
B.

KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 1-1/4" EMT. CONDUIT FROM MEDIA ENCLOSURE WITHIN UNITS TO ACCESSIBLE CEILING SPACE IN CORRIDOR (TYPICAL OF EACH UNIT). INSTALL PULLSTRING FOR EACH CONDUIT.
2. 18" WIDE x 4" DEEP WIRE BASKET TYPE CABLE TRAY ROUTED ABOVE ACCESSIBLE CEILING.
3. SECURITY CONTRACTOR SHALL PROVIDE INTERCOM MODULE. DEVICE SHALL MATCH EXISTING IN PHASE I AND TIE INTO EXISTING HEADEND.
4. ELECTRICAL CONTRACTOR SHALL FIELD COORDINATE EXACT MOUTING HEIGHT AND LOCATION OF SECURITY CAMERA WITH OWNER/ARCHITECT PRIOR TO ROUGH IN.

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NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL SECOND FLOOR TECHNOLOGY PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

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SHEET 27 OF 34

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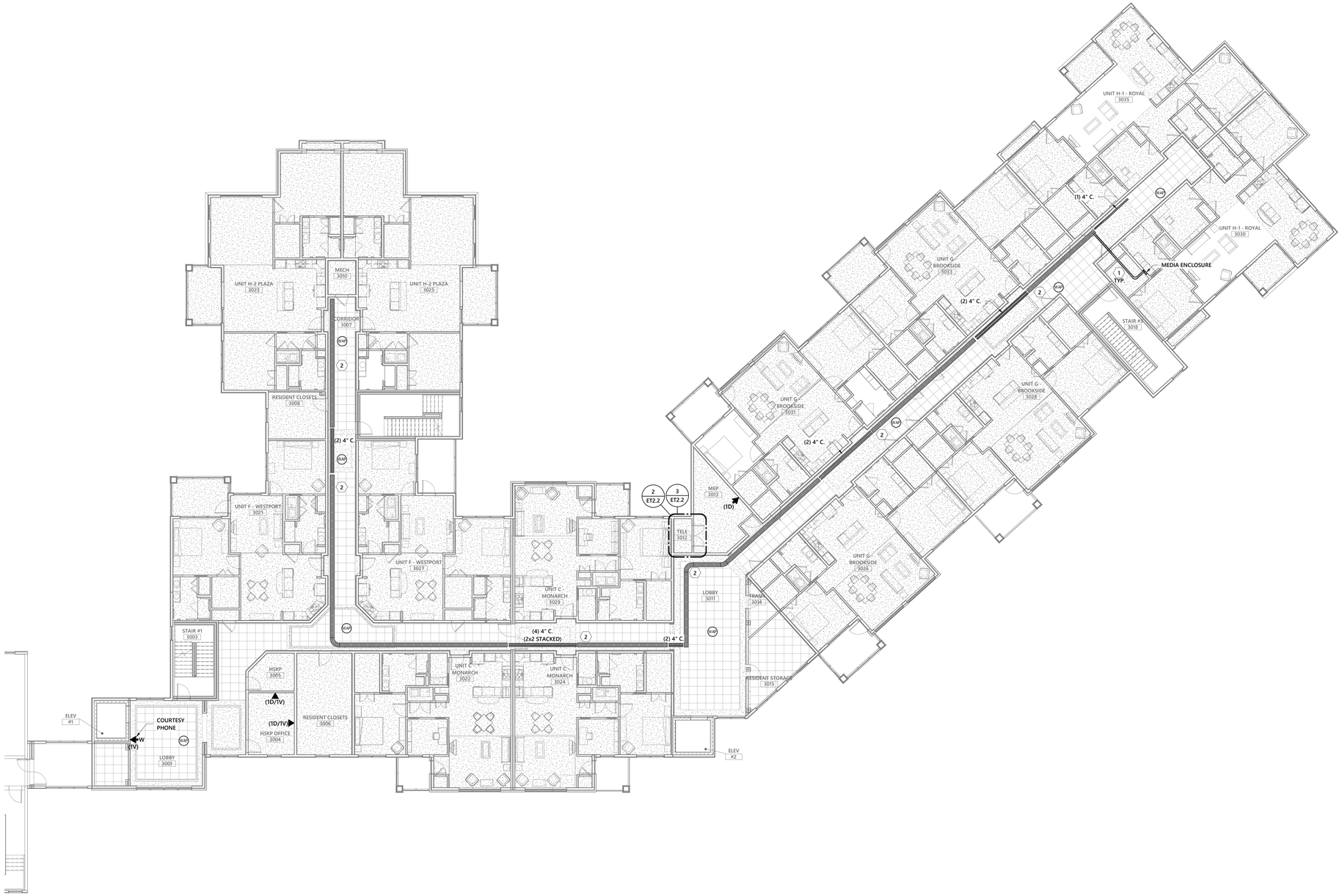
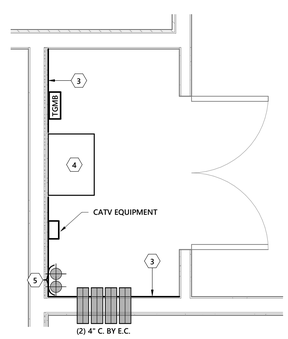
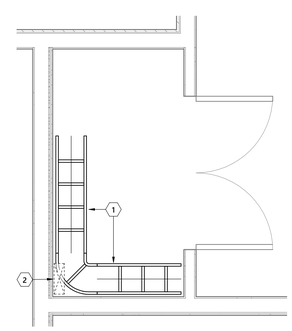


1 OVERALL THIRD FLOOR TECHNOLOGY PLAN
3/32" = 1'-0"



2 ENLARGED PLAN - TELE 3012 - LOWER
1/2" = 1'-0"



3 ENLARGED PLAN - TELE 3012 - UPPER
1/2" = 1'-0"

GENERAL NOTES (ENLARGED PLANS):

A. FEED ALL CABLES INTO RACKS FROM ABOVE.
B. LEAVE ONE RACK UNIT SPACE FREE ABOVE AND BELOW EACH PATCH PANEL, WIRE MANAGER, AND OWNER PROVIDED NETWORK ELECTRONICS. FILL THESE SPACES WITH BLANK PANELS.

DRAWING NOTES (ENLARGED PLANS):

1. PROVIDE 12" LADDER RACK WALL MOUNTED AT 7'-6" AFF. MOUNT FLUSH TO TOP OF DATA RACKS UTILIZING 6" RUNWAY ELEVATION KITS.
2. PROVIDE 12" WIDE LADDER RACK MOUNTED VERTICALLY TO BE USED FOR LACING AND SUPPORT OF CABLES.
3. PLYWOOD BACKBOARD.
4. PROVIDE 16 RU WALL MOUNTED CABINET FOR DATA CONNECTIVITY.
5. CONDUIT SLEEVES BETWEEN TELECOMMUNICATION ROOMS. REFER TO ET7.1/#1 CONDUIT RISER DIAGRAM FOR ADDITIONAL INFORMATION.

N
PLAN NORTH

GENERAL NOTES

A. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLING FROM NETWORK DEVICES IN CORRIDOR TO TELE 3012.

KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 1-1/4" EMT. CONDUIT FROM MEDIA ENCLOSURE WITHIN UNITS TO ACCESSIBLE CEILING SPACE IN CORRIDOR (TYPICAL OF EACH UNIT). INSTALL PULLSTRING FOR EACH CONDUIT.
2. 18" WIDE x 4" DEEP WIRE BASKET TYPE CABLE TRAY ROUTED ABOVE ACCESSIBLE CEILING.

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DRAWING ET2.2

SHEET 28 OF 34

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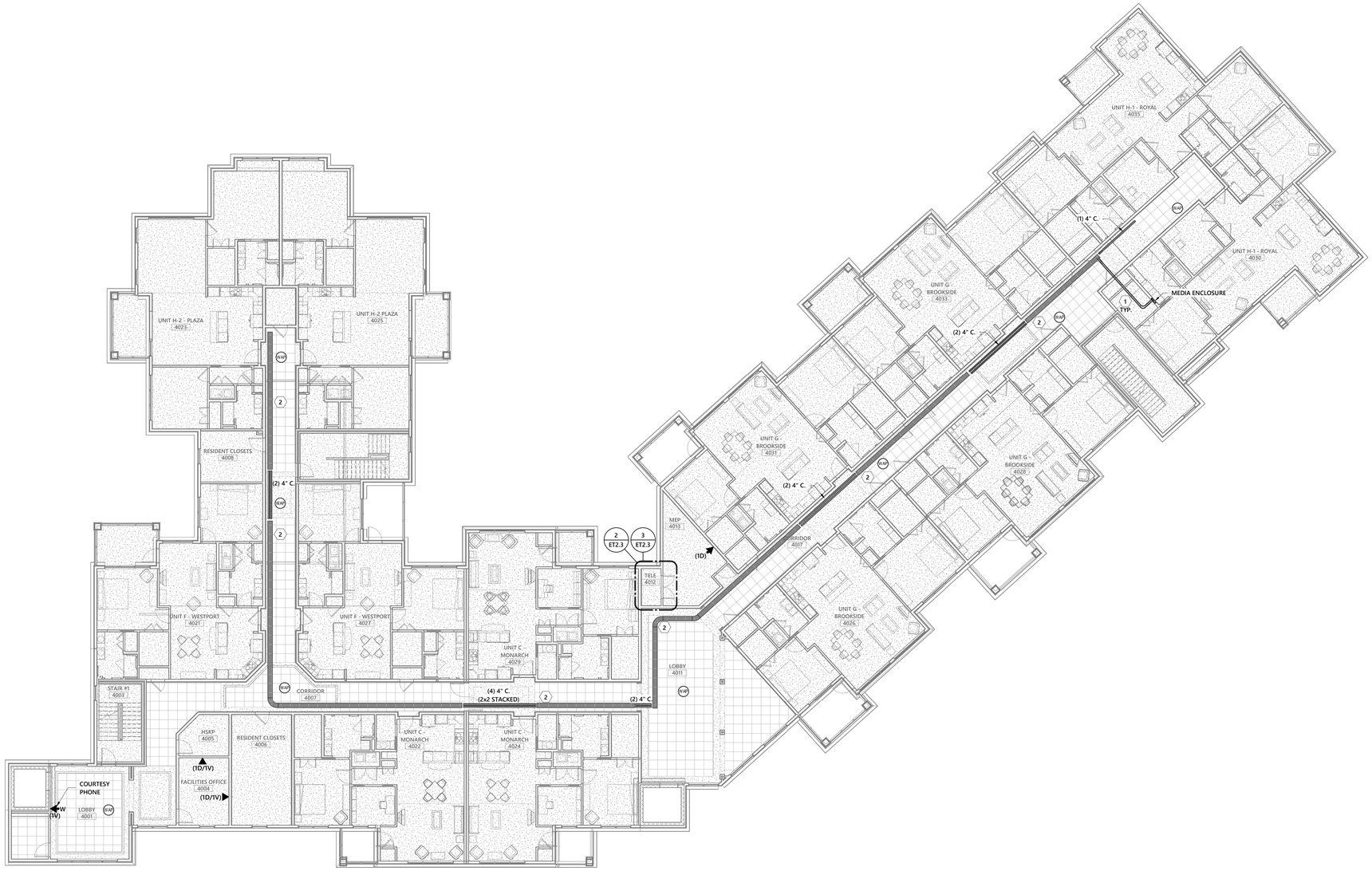
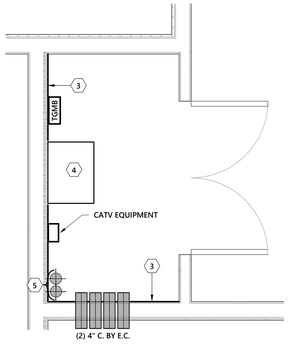
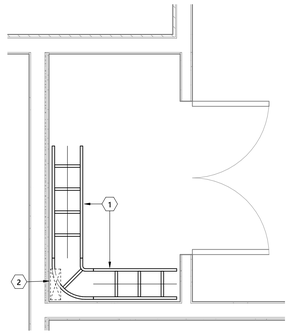


1 OVERALL FOURTH FLOOR TECHNOLOGY PLAN
3/32" = 1'-0"



2 ENLARGED PLAN - TELE 4012 - LOWER
1/2" = 1'-0"



3 ENLARGED PLAN - TELE 4012 - UPPER
1/2" = 1'-0"

GENERAL NOTES (ENLARGED PLANS):

A. FEED ALL CABLES INTO RACKS FROM ABOVE.
B. LEAVE ONE RACK UNIT SPACE FREE ABOVE AND BELOW EACH PATCH PANEL, WIRE MANAGER, AND OWNER PROVIDED NETWORK ELECTRONICS. FILL THESE SPACES WITH BLANK PANELS.

DRAWING NOTES (ENLARGED PLANS):

1. PROVIDE 12" LADDER RACK WALL MOUNTED AT 7'-6" AFF. MOUNT FLUSH TO TOP OF DATA RACKS UTILIZING 6" RUNWAY ELEVATION KITS.
2. PROVIDE 12" WIDE LADDER RACK MOUNTED VERTICALLY TO BE USED FOR LACING AND SUPPORT OF CABLES.
3. PLYWOOD BACKBOARD.
4. PROVIDE 16 RU WALL MOUNTED CABINET FOR DATA CONNECTIVITY.
5. CONDUIT SLEEVES BETWEEN TELECOMMUNICATION ROOMS. REFER TO ET7.1/#1 CONDUIT RISER DIAGRAM FOR ADDITIONAL INFORMATION.

N
PLAN NORTH

GENERAL NOTES

A. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLING FROM NETWORK DEVICES IN CORRIDOR TO TELE 4012.

KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 1-1/4" EMT. CONDUIT FROM MEDIA ENCLOSURE WITHIN UNITS TO ACCESSIBLE CEILING SPACE IN CORRIDOR (TYPICAL OF EACH UNIT). INSTALL PULLSTRING FOR EACH CONDUIT.
2. 18" WIDE x 4" DEEP WIRE BASKET TYPE CABLE TRAY ROUTED ABOVE ACCESSIBLE CEILING.

PERMIT SET

STATE OF MISSOURI
KEITH PETERS
NUMBER E-25154
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01/18/2021

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John Knox Village

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DRAWN BY	: TJH
CHECKED BY	: TMC
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL FOURTH FLOOR TECHNOLOGY PLAN

COMM. NO.	DATE
19132.00	January 18, 2021
DRAWING	SHEET
ET2.3	29 OF 34

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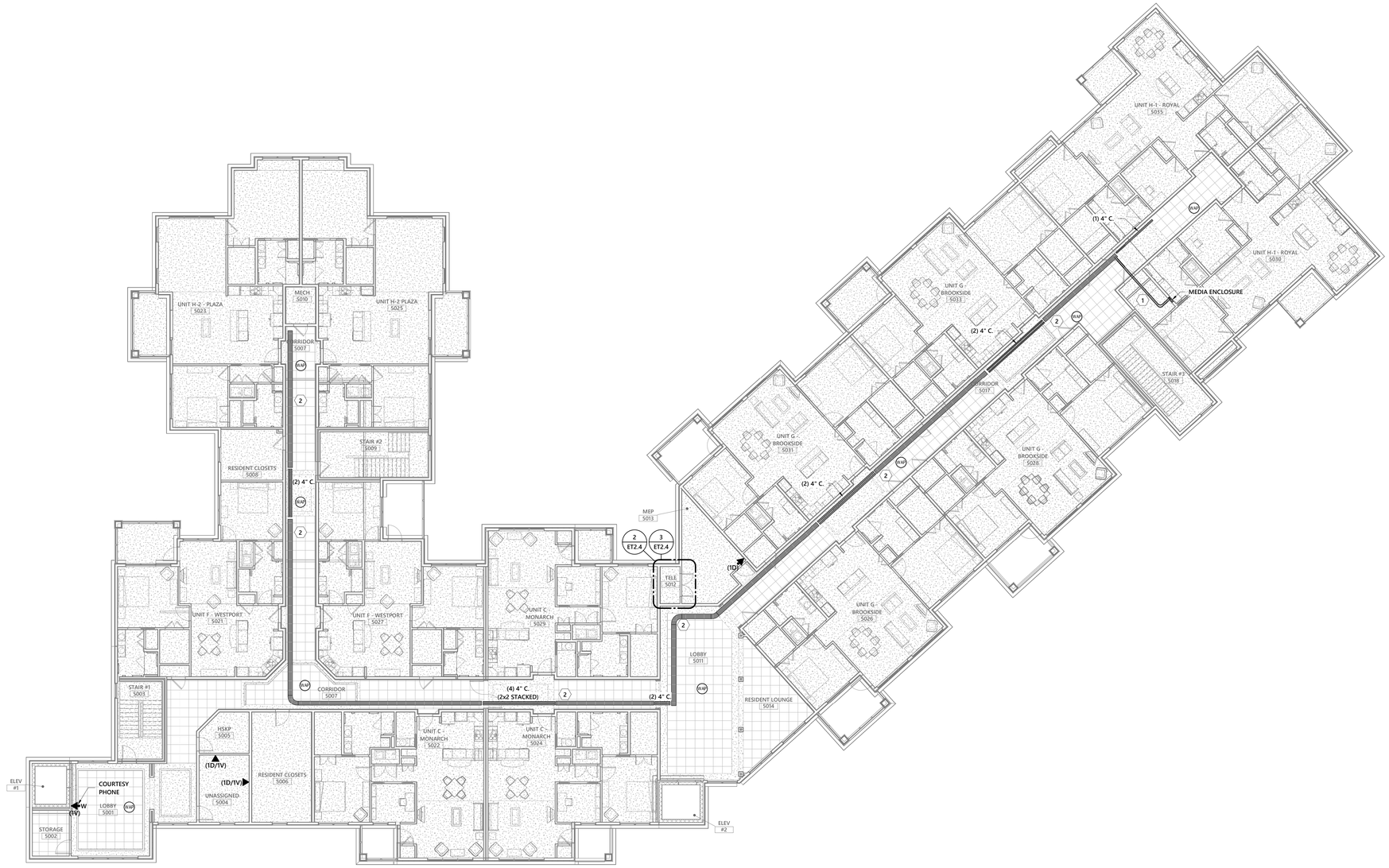
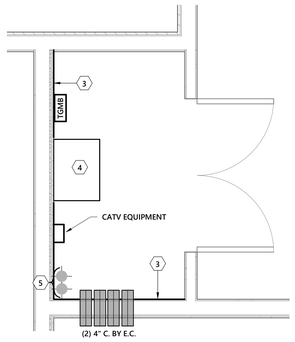
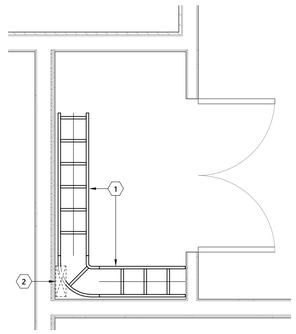


1 OVERALL FIFTH FLOOR TECHNOLOGY PLAN
3/32" = 1'-0"



2 ENLARGED PLAN - TELE 5012 - LOWER
1/2" = 1'-0"



3 ENLARGED PLAN - TELE 5012 - UPPER
1/2" = 1'-0"

GENERAL NOTES (ENLARGED PLANS):

A. FEED ALL CABLES INTO RACKS FROM ABOVE.
B. LEAVE ONE RACK UNIT SPACE FREE ABOVE AND BELOW EACH PATCH PANEL, WIRE MANAGER, AND OWNER PROVIDED NETWORK ELECTRONICS. FILL THESE SPACES WITH BLANK PANELS.

DRAWING NOTES (ENLARGED PLANS):

1. PROVIDE 12" LADDER RACK WALL MOUNTED AT 7'-6" AFF. MOUNT FLUSH TO TOP OF DATA RACKS UTILIZING 6" RUNWAY ELEVATION KITS.
2. PROVIDE 12" WIDE LADDER RACK MOUNTED VERTICALLY TO BE USED FOR LACING AND SUPPORT OF CABLES.
3. PLYWOOD BACKBOARD.
4. PROVIDE 16 RU WALL MOUNTED CABINET FOR DATA CONNECTIVITY.
5. CONDUIT SLEEVES BETWEEN TELECOMMUNICATION ROOMS. REFER TO ET7.1/#1 CONDUIT RISER DIAGRAM FOR ADDITIONAL INFORMATION.

N
PLAN NORTH

GENERAL NOTES

A. STRUCTURED CABLING CONTRACTOR SHALL ROUTE CABLING FROM NETWORK DEVICES IN CORRIDOR TO TELE 5012.

KEY NOTES

1. ELECTRICAL CONTRACTOR SHALL PROVIDE (2) 1-1/4" EMT. CONDUIT FROM MEDIA ENCLOSURE WITHIN UNITS TO ACCESSIBLE CEILING SPACE IN CORRIDOR (TYPICAL OF EACH UNIT). INSTALL PULLSTRING FOR EACH CONDUIT.
2. 18" WIDE x 4" DEEP WIRE BASKET TYPE CABLE TRAY ROUTED ABOVE ACCESSIBLE CEILING.

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CHECKED BY	: TMC
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

OVERALL FIFTH FLOOR TECHNOLOGY PLAN

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING ET2.4

SHEET 30 OF 34

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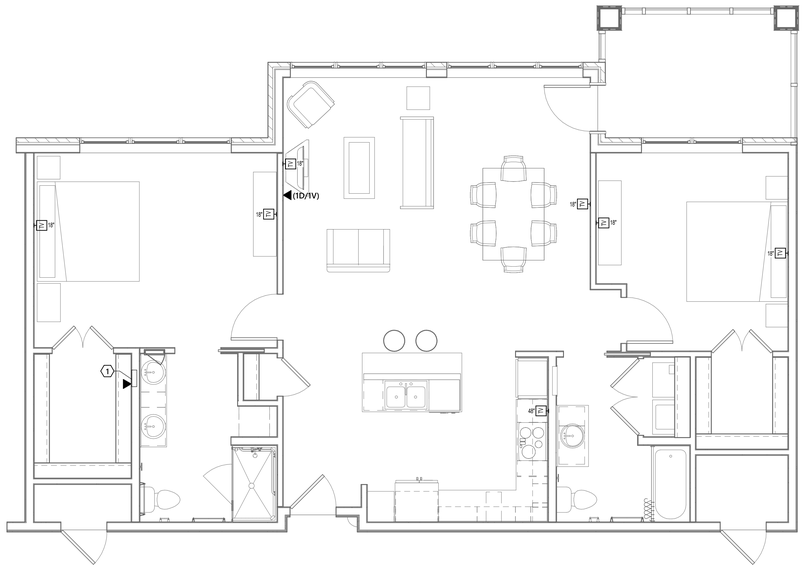
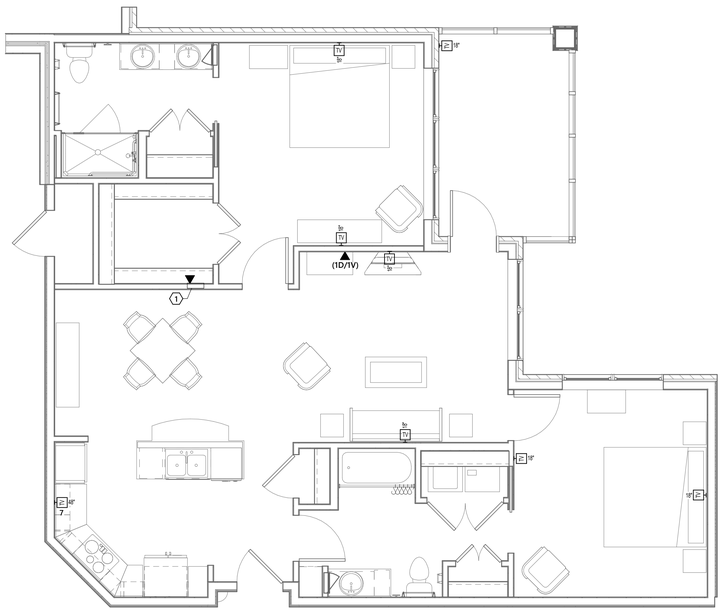
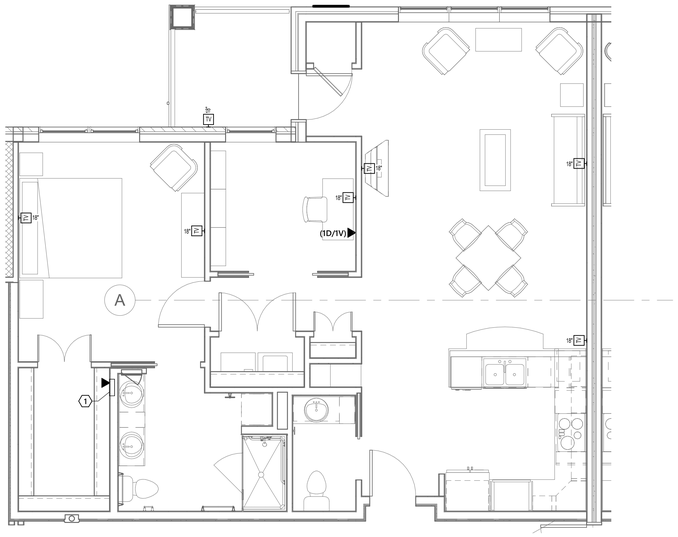


3 UNIT G - TECHNOLOGY
1/4" = 1'-0"



2 UNIT F - TECHNOLOGY
1/4" = 1'-0"



1 UNIT C - TECHNOLOGY
1/4" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

A. PROVIDE 1" CONDUIT AND CABLING FROM EACH TV LOCATION IN UNIT TO MEDIA ENCLOSURE. TERMINATE IN DATA MODULE WITHIN MEDIA ENCLOSURE UNLESS OTHERWISE NOTED.

KEY NOTES

1. MEDIA ENCLOSURE. SEE SHEET ET6.1/DETAIL #14 FOR ADDITIONAL REQUIREMENTS AND INFORMATION.

PERMIT SET

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PROJECT ENGINEER	: TMC
DRAWN BY	: TJH
CHECKED BY	: TMC
APPROVED BY	:

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ENLARGED TECHNOLOGY UNIT PLANS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING	SHEET
ET5.1	31 OF 34

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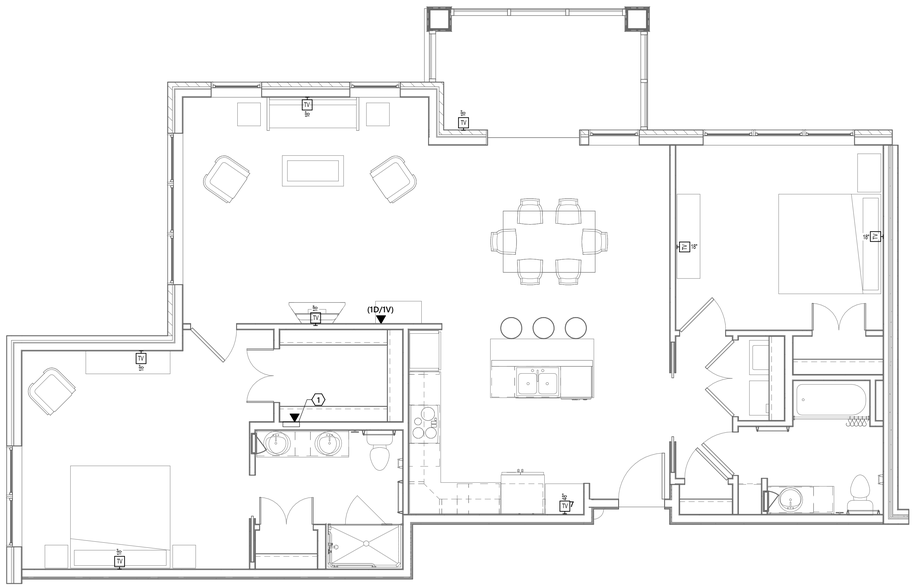
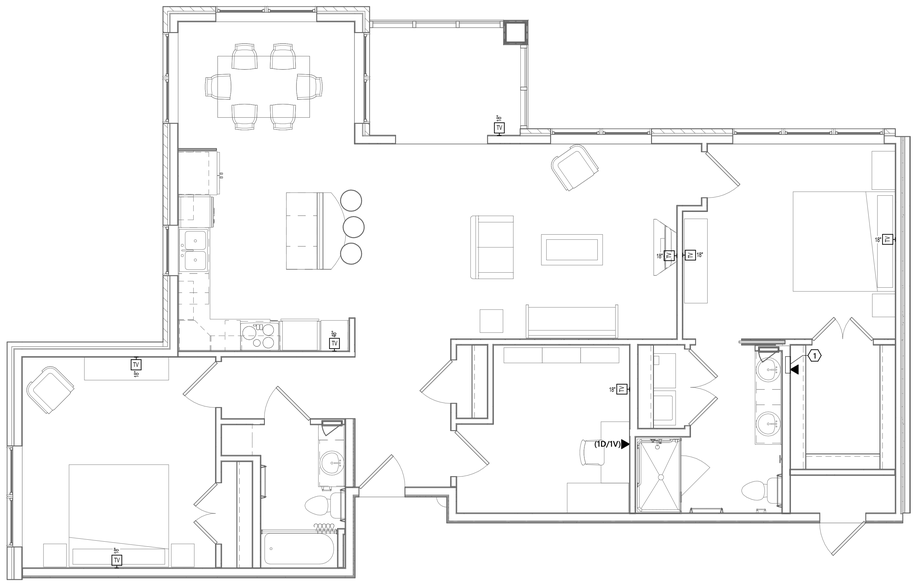


2 UNIT H-2 - TECHNOLOGY
1/4" = 1'-0"



1 UNIT H-1 - TECHNOLOGY
1/4" = 1'-0"

N
PLAN NORTH

GENERAL NOTES

A. PROVIDE 1" CONDUIT AND CABLING FROM EACH TV LOCATION IN UNIT TO MEDIA ENCLOSURE. TERMINATE IN DATA MODULE WITHIN MEDIA ENCLOSURE UNLESS OTHERWISE NOTED.

KEY NOTES

1. MEDIA ENCLOSURE. SEE SHEET ET6.1/DETAIL #14 FOR ADDITIONAL REQUIREMENTS AND INFORMATION.

PERMIT SET

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PROJECT ENGINEER	:	TMC
DRAWN BY	:	TJH
CHECKED BY	:	TMC
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

ENLARGED TECHNOLOGY UNIT PLANS

COMM. NO.	DATE
19132.00	January 18, 2021

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ET5.2	32 OF 34

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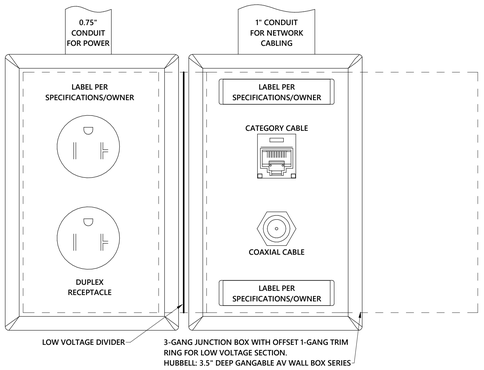
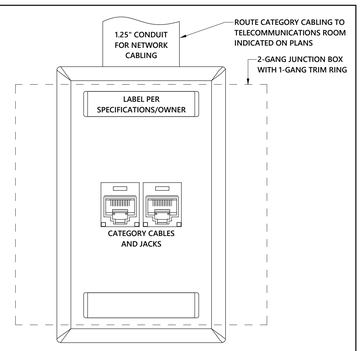


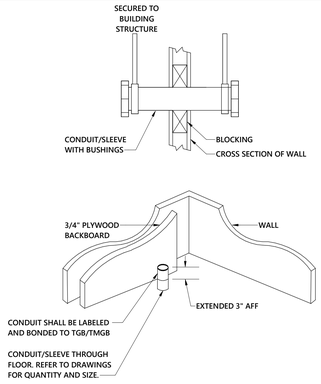
GENERAL NOTES:

A. INSTALL WITH BETWEEN-STUB MOUNTING BOX WITH INTEGRAL MUD RING. ERICO CADDY AIBAIG, OR APPROVED EQUAL.
B. TV POWER/DATA SHALL BE MOUNTED AT 18" AFF, UNLESS OTHERWISE NOTED ON PLANS.
C. DEVICES SHALL BE CENTERED ON WALL. VERIFY EXACT LOCATION WITH OWNER/ARCHITECT PRIOR TO ROUGH-IN.
D. CONTRACTOR SHALL COORDINATE WITH ELECTRICAL PLANS.

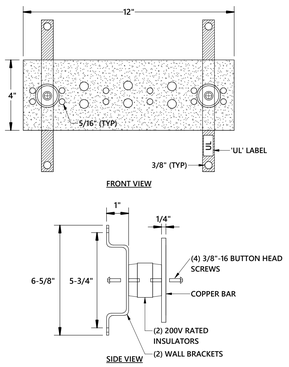
1 DISPLAY DETAIL WITH NETWORK AND DUPLEX POWER
NOT TO SCALE



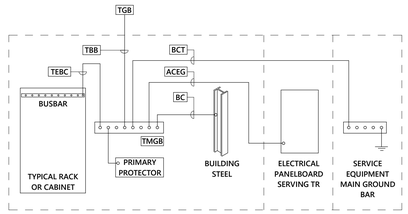
2 NETWORK OUTLET DETAIL - 2 PORT
NOT TO SCALE



3 TELECOMMUNICATIONS CONDUIT/SLEEVE DETAIL
NOT TO SCALE



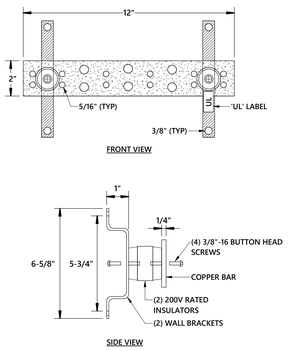
4 TELECOMMUNICATIONS MAIN GROUNDING BUSBAR 'TMGB'
NOT TO SCALE



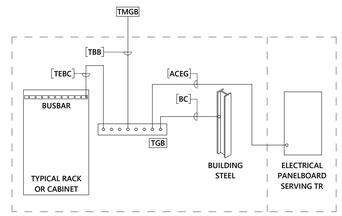
TELECOMMUNICATIONS GROUNDING LEGEND

TMGB	TELECOMMUNICATIONS MAIN GROUND BAR
TGB	TELECOMMUNICATIONS GROUND BAR
TBB	TELECOMMUNICATIONS BONDING BACKBONE. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" C.
TEBC	TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
BC	BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
ACEG	ALTERNATING CURRENT EQUIPMENT GROUND. PROVIDE A MINIMUM #6 AWG GROUND.
BCT	BONDING CONDUCTOR FOR TELECOMMUNICATIONS. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" C.

5 TYPICAL TMGB CONNECTIONS
NOT TO SCALE



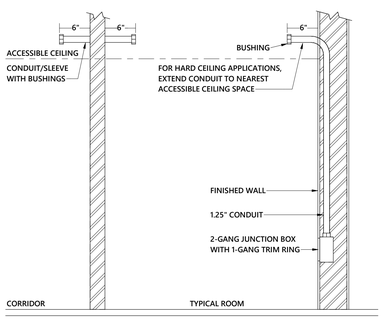
6 TELECOMMUNICATIONS GROUNDING BUSBAR 'TGB'
NOT TO SCALE



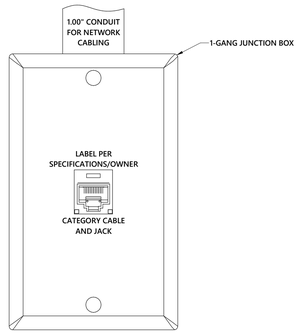
TELECOMMUNICATIONS GROUNDING LEGEND

TMGB	TELECOMMUNICATIONS MAIN GROUND BAR
TGB	TELECOMMUNICATIONS GROUND BAR
TBB	TELECOMMUNICATIONS BONDING BACKBONE. PROVIDE A MINIMUM #3/0 AWG GROUND IN 3/4" CONDUIT.
TEBC	TELECOMMUNICATIONS EQUIPMENT BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
BC	BONDING CONDUCTOR. PROVIDE A MINIMUM #6 AWG GROUND.
ACEG	ALTERNATING CURRENT EQUIPMENT GROUND. PROVIDE A MINIMUM #6 AWG GROUND.

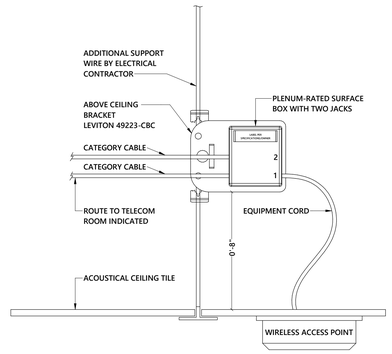
7 TYPICAL TGB CONNECTIONS
NOT TO SCALE



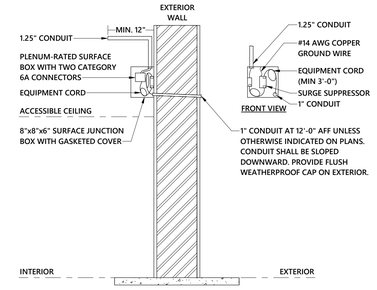
8 NETWORK OUTLET STUB UP DETAIL
NOT TO SCALE



9 NETWORK WALL PHONE OUTLET DETAIL
NOT TO SCALE



10 WIRELESS ACCESS POINT DETAIL (ACCESSIBLE CEILING)
NOT TO SCALE



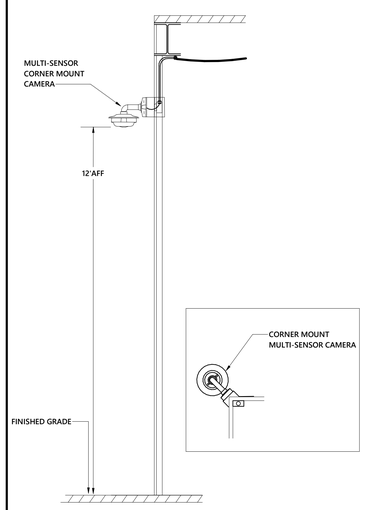
GENERAL NOTES:

A. SURFACE JUNCTION BOX SHALL BE LOCATED ABOVE ACCESSIBLE CEILING SPACE.
B. ALL DEVICES SHALL BE SECURED INSIDE JUNCTION BOX.

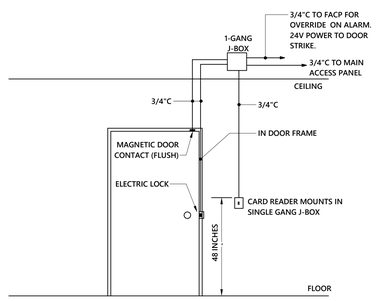
11 EXTERIOR NETWORK DEVICE DETAIL (ACCESSIBLE CEILING)
NOT TO SCALE

GENERAL NOTES:

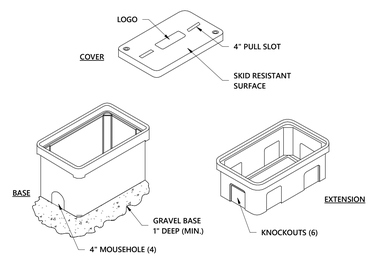
A. COORDINATE EXACT MOUNTING HEIGHT AND LOCATION WITH OWNER/ARCHITECT PRIOR TO ROUGH IN.



15 CORNER MOUNT MULTI-SENSOR CAMERA
NOT TO SCALE



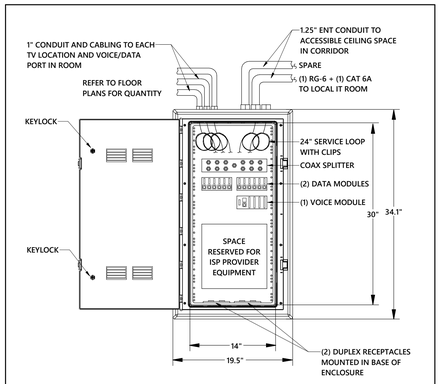
12 TYPICAL CARD READER-DOOR LOCK
NOT TO SCALE



GENERAL NOTES:

A. PROVIDE STANDARD HANDHOLE. COORDINATE COVER COLOR WITH OWNER AND ARCHITECT PRIOR TO PROCUREMENT.
B. PROVIDE 1" x 3/8" BELL PULL SLOT FOR EACH HANDHOLE.
C. COVER RING AND BOX SHALL BE MADE OF SAME MATERIAL.
D. PROVIDE IMPRINTED LOGO TO MATCH.
E. SEAL ALL ENTERING AND EXITING CONDUITS.
F. PROVIDE DRAIN LINE TO SURFACE FOR EACH HANDHOLE.
G. SIZE ALL HANDHOLES APPROPRIATELY.

13 HANDHOLE DETAIL (TYPICAL)
NO SCALE



14 MEDIA ENCLOSURE
NOT TO SCALE

PERMIT SET

STATE OF MISSOURI
KEITH E. PEARSON
NUMBER E-25154
PROFESSIONAL ENGINEER

01/18/2021

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PROJECT ARCHITECT	PA
PROJECT ENGINEER	TMC
DRAWN BY	TJH
CHECKED BY	TMC
APPROVED BY	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

TECHNOLOGY DETAILS

COMM. NO.	DATE
19132.00	January 18, 2021

DRAWING

ET6.1

SHEET 33 OF 34

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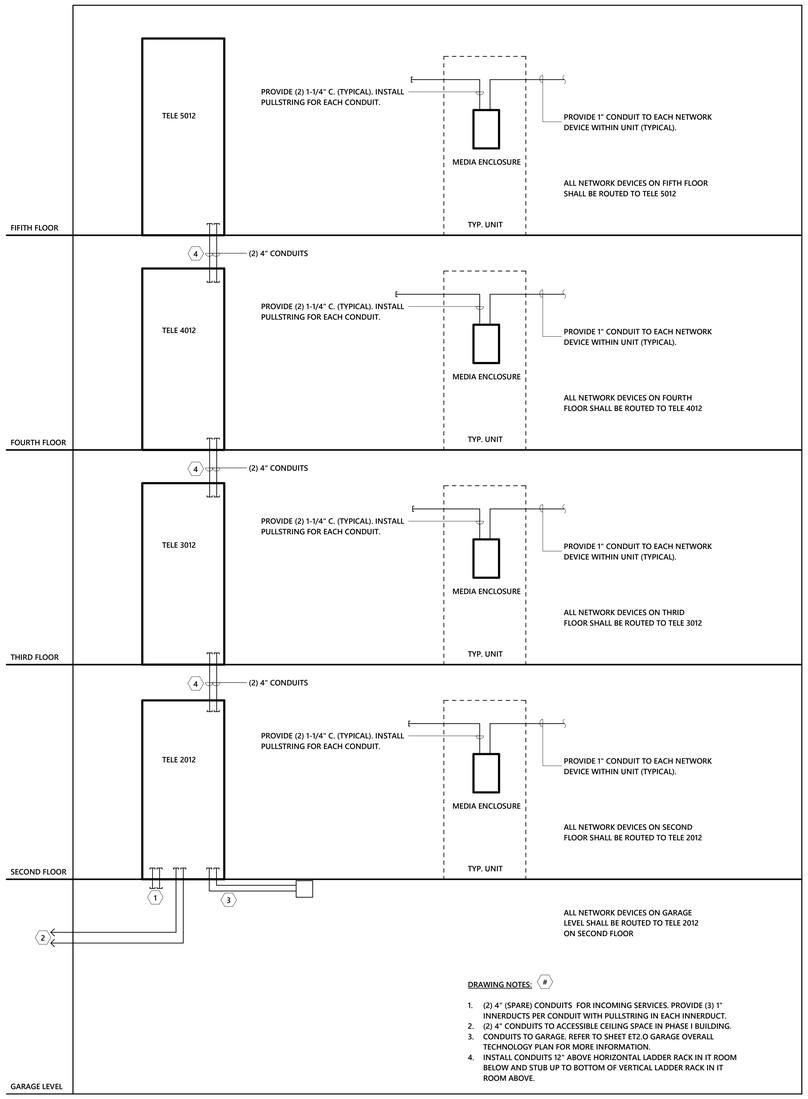
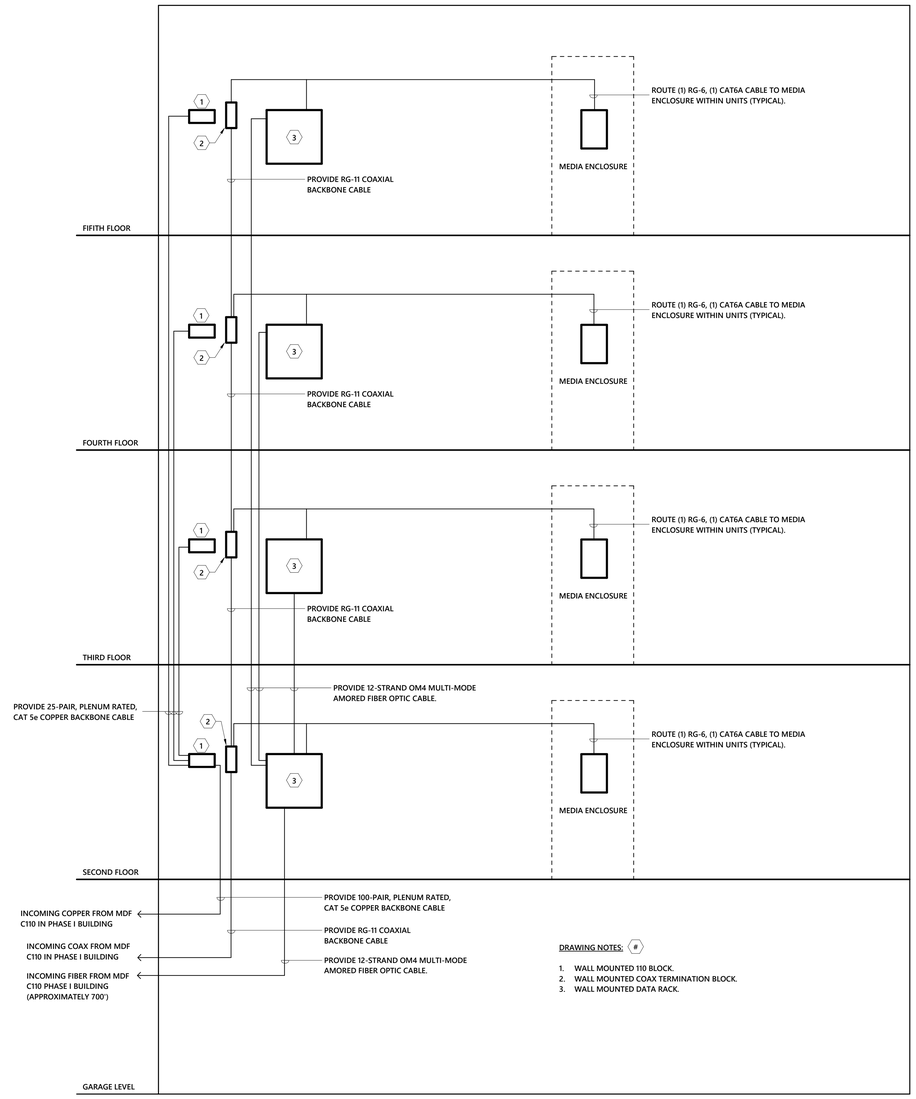


1 TECHNOLOGY CONDUIT RISER DIAGRAM

1/2" = 1'-0"



2 TECHNOLOGY BACKBONE CABLE RISER DIAGRAM

1/2" = 1'-0"

GENERAL NOTES

KEY NOTES

PERMIT SET

STATE OF MISSOURI KEITH E. FEIL NUMBER E-25154 PROFESSIONAL ENGINEER

01/18/2021

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PROJECT TITLE

John Knox Village

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PROJECT ARCHITECT	:	PA
PROJECT ENGINEER	:	TMC
DRAWN BY	:	TJH
CHECKED BY	:	TMC
APPROVED BY	:	

NO.	REVISION DESCRIPTION	DATE

DRAWING TITLE

TECHNOLOGY RISER DIAGRAM

COMM. NO. 19132.00

DATE January 18, 2021

DRAWING ET7.1

SHEET 34 OF 34

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