

## MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM. DEFINITIONS: FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED. COORDINATION: COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOF WARRANTY. DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS. SHEET METAL DUCTWORK: PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS, SEAL CLASS "A". SHEET METAL SHALL BE GALVANIZED SHEET STEEL OF LOCK FORMING QUALITY, WITH G90 ZINC COATING. SHEET STEEL SHALL COMPLY WITH ASTM A653 STANDARD SPECIFICATION FOR SHEET STEEL METAL, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY-COATED (GALVALNEAE) BY THE HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC-COATED BY THE HOT DIP PROCESS. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT. PROVIDE TURNING VANES AT ALL 90° ELBOWS. TRAPEZE DUCT HANGERS: PROVIDE MINIMUM 1" X 2" X 1" X 18 GAUGE CHANNELS WITH MINIMUM 1" X 18 GAUGE STRAP. STRUCTURAL SUPPORT, ROUND RODS, AND WELDED RODS, MODIFIED SPIRAL SEAM SIZES, OR SNAP LOCK (DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL-1. FIBER GLASS DUCT BOARD IS AN ACCEPTABLE ALTERNATIVE IF APPROVED BY OWNER AND THE LOCAL BUILDING CODE OFFICIAL. PRODUCT AND INSTALLATION MUST MEET NAIMA STANDARDS AND OTHER APPLICABLE CODES AND REGULATIONS. EXPOSED DUCTWORK: EXPOSED DUCTWORK SHALL BE CLEANED OF DEBRIS AND OIL, THEN WIPED DOWN WITH VINEGAR OR OTHER SURFACE PREPARING CHEMICAL TO PREPARE DUCT FOR PAINT. DUCT SEALANT: PROVIDE POLYMERIC RUBBER TYPE SEALANT FOR USE ON BOTH INTERIOR LOCATED DUCTWORK AND DUCTWORK EXPOSED TO OUTDOOR CONDITIONS. SEALER SHALL HAVE HIGH BONDING STRENGTH FOR SURE, FIRST TIME SEALING OF JOINTS IN LOW, MEDIUM, AND HIGH PRESSURE DUCT SYSTEMS. SEALER SHALL BE HIGH IN SOLID CONTENT. PROVIDE A TWO PART TAPE SEALING SYSTEM, CONSISTING OF WOVEN FIBER TAPE IMPREGNATED WITH A GYPSUM MINERAL COMPOUND, AND A MODIFIED ACRYLIC/SILICONE ACTIVATOR THAT REACTS EXOTHERMICALLY WITH THE TAPE. TWO PART TAPE SEALING SYSTEM MUST BE RATED FOR BOTH INDOOR AND OUTDOOR APPLICATION. TAPE SHALL NOT CONTAIN ASBESTOS. DUCT INSULATION: MATERIAL FOR SUPPLY AND RETURN AIR DUCT ABOVE CEILING INSIDE THE BUILDING SHALL BE THE EQUIVALENT THERMAL RESISTANCE OF MINIMUM R-6. THE REQUIRED R VALUES ARE FOR INSTALLED INSULATION WITH 25% COMPRESSION AT THE CORNERS. PROVIDE PINS AND WASHERS IN ACCORDANCE WITH SMACNA REQUIREMENTS AND AS REQUIRED TO PREVENT INSULATION FROM SAGGING. PROVIDE ADEQUATE INSULATION AT THE SUPPLY AIR DIFFUSERS TO PREVENT CONDENSATION. FLEXIBLE DUCT : UL #181 LISTED, CLASS 1, AND CONTAIN A 0.1 PERM RATED POLYETHYLENE INNER LINER, WITH R-8 FIBERGLASS INSULATION. FLEXIBLE DUCTS SHALL BE SECURED TO RIGID SHEET METAL COLLARS AND AIR DIFFUSERS WITH NYLON TIES OR STAINLESS STEEL WORM GEAR STRAPS. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT. SUPPORT FLEXIBLE DUCTS FROM THE BUILDINGS STRUCTURE WITH MINIMUM 1" WIDE, 18 GAUGE, GALVANIZED STEEL STRAP AT MAXIMUM 4'-0" CENTERS. PROVIDE 4" WIDE SHEET METAL SADDLES AT EACH SUPPORT EACH STRAP. SAG OF FLEXIBLE DUCT BETWEEN HANGERS SHALL NOT EXCEED 1/2" PER FOOT OF SUPPORT SPACING. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION. ROUND VOLUME DAMPERS: PROVIDE MINIMUM 20 GAUGE GALVANIZED STEEL FRAME AND BLADES, MINIMUM 3/8" SQUARE STEEL AXLE. MOLDED SYNTHETIC BEARINGS, WITH LOCKING POSITION REGULATOR. REGULATOR SHALL BE POSITIONED WITH SHEET METAL BACKET BEHIND DUCT. DUCT SHALL BE POSITIONED SUCH THAT ROTATION IS NOT ACCESSIBLE. PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 18 GAUGE GALVANIZED STEEL CHANNEL FRAME, 18 GAUGE GALVANIZED STEEL BLADES, MINIMUM 1/2" HEXAGONAL AXLE, BOLDED SYNTHETIC BEARINGS, WITH 3/8" SQUARE PLATED STEEL CONTROL SHAFT. LINKAGES SHALL BE CONCEALED IN THE FRAME. OPERATING SHAFT SHALL EXTEND BEYOND FRAME AND DUCT TO A LOCKING QUADRANT WITH ADJUSTABLE LEVER. MAXIMUM BLADE WIDTH SHALL NOT EXCEED 6".

DUCT TURNING VANES: PROVIDE FABRICATED TURNING VANES AND VANE RUNNERS, CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS". PROVIDE TURNING VANES CONSTRUCTED OF CURVED BLADES, SUPPORTED WITH BARS PERPENDICULAR TO BLADES, AND SET INTO SIDE STRIPS SUITABLE FOR MOUNTING IN DUCTWORK. FOLLOW SMACNA GUIDELINES FOR SPACING SUPPORT, AND CONSTRUCTION. ALL BLADES SHALL BE DOUBLE THICKNESS AIRFOIL TYPE. FLEXIBLE DUCT CONNECTORS: PROVIDE U.L. LABELED 30 OUNCE NEOPRENE COATED FIBERGLASS FABRIC DUCT CONNECTORS. DUCT ACCESS DOORS: PROVIDE HINGED ACCESS DOORS IN DUCTWORK WHERE REQUIRED FOR ACCESS TO EQUIPMENT. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED. PROVIDE FLUSH FRAMES FOR UN-INSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE-TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO-SIDED LATCHES FOR LARGER ACCESS DOORS. HVAC CONTROL SYSTEMS: PROVIDE ALL THE NECESSARY CONTROLS AND CONTROL WIRING IN CONDUIT, COMPATIBLE TO SYSTEMS SHOWN ON EQUIPMENT SCHEDULE M2.0. PROGRAMMABLE THERMOSTAT FOR EACH SYSTEM SHALL ENABLE THE SUPPLY FAN AND CYCLE THE COOLING AND HEATING STAGES TO MAINTAIN SPACE SET-POINT. SUPPLY FAN RUNS CONTINUOUSLY DURING THE OCCUPIED MODE. EACH THERMOSTAT SHALL HAVE A DEAD BAND OF AT LEAST 5 DEGREES (ΔJ) WITHIN WHICH THE SUPPLY OF HEATING AND COOLING IS SHUT OFF. EACH THERMOSTAT SHALL HAVE SETBACK AND SET-UP CAPABILITY DURING THE UNOCCUPIED MODE. FOR SETBACK, THE HEATING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE DOWN TO 55 DEGREES. FOR SET-UP, THE COOLING SHALL RESTART AND TEMPORARILY OPERATE ACCORDING TO A SET-POINT ADJUSTABLE UP TO 85 DEGREES OR TO PREVENT HIGH SPACE HUMIDITY LEVELS. EACH SYSTEM SHALL BE PROVIDED WITH A MOTORIZED OUTSIDE AIR DAMPER THAT WILL AUTOMATICALLY SHUT WHEN THE SYSTEM OR SPACES SERVED ARE NOT IN USE. VENTILATION OUTSIDE AIR DAMPERS SHALL BE CAPABLE OF AUTOMATICALLY CLOSING DURING PREOCCUPANCY BUILDING WARM-UP, COOL DOWN, AND SETBACK, EXCEPT WHEN VENTILATION REDUCES ENERGY COSTS (e.g., NIGHT PURGE) OR WHEN VENTILATION MUST BE SUPPLIED TO MEET CODE REQUIREMENTS. COMMISSIONING/VERIFICATION: HVAC CONTROL SYSTEM SHALL BE TESTED TO ENSURE THAT CONTROL ALGORITHMS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION. THE CONTRACTOR SHALL MEET ALL THE DESIGN REQUIREMENTS. TEST AND BALANCE: CONTRACTOR DIRECTLY A THIRD PARTY TO PROVIDE TEST AND BALANCE OF THE HVAC SYSTEM. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR SCHEDULING, TEST AND ADJUST ALL MECHANICAL SYSTEM AND EQUIPMENT TO ASSURE PROPER BALANCE AND OPERATION. PERFORM TESTS IN ACCORDANCE WITH NEBB PROCEDURAL STANDARDS-1999 OR AABC 2002, AND ASHRAE STANDARD 111. ELIMINATE NOISE AND VIBRATION, AND ASSURE PROPER FUNCTION OF CONTROLS. SUBMIT COMPLETED TEST AND BALANCE REPORT TO OWNER'S REPRESENTATIVE. BALANCING CONTRACTOR SHALL BE INDEPENDENT AND CERTIFIED WITH NEBB OR AABC. BALANCE ALL SYSTEMS WITHIN 5% OF AIR FLOW INDICATED ON DRAWINGS, AND REPORT ALL DISCREPANCIES TO THE HVAC CONTRACTOR FOR CORRECTION. MARK FINAL BALANCE POSITIONS ON DAMPERS WITH PERMANENT MARKER. COMPLETION REQUIREMENTS: THE CONTRACTOR SHALL PROVIDE, WITHIN 90 DAYS AFTER THE DATE OF SYSTEM ACCEPTANCE, RECORD DRAWINGS AND AN OPERATING AND MAINTENANCE MANUAL TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE OWNER. THE RECORD DRAWING SHALL BE OF THE ACTUAL INSTALLATION AND INCLUDE AS A MINIMUM THE LOCATION AND PERFORMANCE DATA ON EACH PIECE OF EQUIPMENT, GENERAL CONFIGURATION OF DUCT AND PIPE DISTRIBUTION SYSTEM INCLUDING SIZES, AND THE TERMINAL AIR OR WATER DESIGN FLOW RATES. THE OPERATING AND MAINTENANCE MANUALS SHALL BE IN ACCORDANCE WITH THE FOLLOWING: (A) ACCEPTED MANUFACTURER'S MANUALS, AT A MINIMUM, THE FOLLOWING: (A) SUBMITTAL DATA SHEET, (B) EQUIPMENT SIZE AND SELECTION OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, (C) OPERATION MANUALS AND MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE, EXCEPT EQUIPMENT NOT FURNISHED AS PART OF THE PROJECT. REQUIRED ROUTINE MAINTENANCE ACTIONS SHALL BE CLEARLY IDENTIFIED; (C) NAMES AND ADDRESSES OF AT LEAST ONE SERVICE AGENCY; (D) HVAC CONTROLS SYSTEMS MAINTENANCE AND CALIBRATION INFORMATION, INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SYSTEM SEQUENCE DESCRIPTIONS. DESIRED OR FIELD-DETERMINED SET-POINTS SHALL BE PERMANENTLY RECORDED ON CONTROL DRAWINGS AT CONTROL DEVICES OR, FOR DIGITAL CONTROL SYSTEMS, IN PROGRAMMING COMMENTS; (E) A COMPLETE NARRATIVE OF HOW EACH SYSTEM EACH SYSTEM IS INTENDED TO OPERATE, INCLUDING SET-POINTS,

## HVAC GENERAL NOTES

- THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE HEATING, VENTILATION, AND AIR CONDITIONING SYSTEM AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. DRAWINGS FOR HVAC WORK ARE DIAGRAMMATIC SHOWING THE GENERAL LOCATION, TYPE, LAYOUT, AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENT. REFER TO ARCHITECTURAL DRAWINGS FOR DIMENSIONS PROVIDE ALL DUCTWORK, MATERIALS, CONNECTIONS, ACCESSORIES, FITTINGS, OFFSETS, TRANSITIONS, DAMPERS AS REQUIRED FOR A COMPLETE WORKABLE SYSTEM.
4. ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS AND APPROVED LISTING. ALL EQUIPMENT, PIPING AND SUPPORTS SHALL BE RESTRAINED IN ACCORDANCE WITH THE LATEST EDITION OF THE GUIDELINES FOR SEISMIC RESTRAINT OF MECHANICAL SYSTEMS AND PLUMBING PIPING SYSTEMS" BY THE SHEET METAL AND AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA). ALL EQUIPMENT SHALL BE ANCHORED TO RESIST THE LATERAL FORCE REQUIREMENTS OF CHAPTER 16 OF THE 2021 INTERNATIONAL BUILDING CODE.
5. COORDINATE THE INSTALLATION OF THE HVAC SYSTEM WITH ALL OTHER TRADES PRIOR TO FABRICATION OR INSTALLATION. COORDINATE THE LOCATIONS OF PENETRATIONS AND FINAL LOCATION OF ALL EQUIPMENT WITH THE GENERAL CONTRACTOR. PROVIDE EQUIPMENT WEIGHTS, EQUIPMENT DIMENSIONS, PLATFORM SIZES & LOCATIONS, CURB SIZES & LOCATIONS, CONCRETE PAD SIZES AND LOCATIONS AS REQUIRED. COORDINATE LOCATIONS OF GAS & CONDENSATE LINES WITH PLUMBING CONTRACTOR. COORDINATE LOCATIONS OF POWER, DISCONNECTS, AND CONTROL CONDUIT WITH THE ELECTRICAL CONTRACTOR. COORDINATE LOCATIONS OF ALL DIFFUSERS, REGISTERS, AND GRILLES WITH ARCHITECTURAL PLANS, ELECTRICAL LIGHTING PLANS AND ARCHITECTURAL ELEVATIONS.
6. DETAILS FOR EQUIPMENT PADS, PLATFORMS, AND FLASHINGS SHALL BE AS INDICATED BY THE ARCHITECTURAL/STRUCTURAL/CIVIL DRAWINGS, UNLESS NOTED OTHERWISE.
7. ALL EQUIPMENT, DUCTS, PIPING, SUPPORTS, AND OTHER DEVICES OUTSIDE OF THE BUILDING OR EXPOSED TO WEATHER, SHALL BE COMPLETELY WEATHER-PROOFED.
8. OUTSIDE AIR INTAKES SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. BELOW ANY VENT OR EXHAUST DISCHARGE.
9. ALL DUCT SIZES ARE CLEAR INSIDE DIMENSIONS. DUCTWORK SHALL BE CONSTRUCTED, ERECTED, INSULATED AND TESTED IN ACCORDANCE CHAPTER 6 OF THE 2021 INTERNATIONAL MECHANICAL CODE.
10. ALL EXHAUST FANS SHALL BE EQUIPPED WITH A BACK DRAFT DAMPER.
11. DUCT AND AIR TRANSFER PENETRATIONS THRU BUILDING ASSEMBLIES REQUIRING PROTECTION SHALL BE PROTECTED WITH FIRE DAMPERS, SMOKE DAMPERS, COMBINATION SMOKE/FIRE DAMPERS AND CEILING RADIATION DAMPERS IN ACCORDANCE WITH SECTION 607 OF THE INTERNATIONAL MECHANICAL CODE. DUCTS NOT REQUIRING DAMPERS SHALL COMPLY WITH SECTION 714 & 717 OF THE 2021 TEXAS BUILDING CODE.
12. INSTALL SMOKE DETECTORS AND PROVIDE FOR SMOKE DETECTION AND AUTOMATIC SHUT-OFF OF ALL AIR HANDLING EQUIPMENT IN ACCORDANCE WITH SECTION 806 OF THE 2021 TEXAS MECHANICAL CODE.
13. UNLESS NOTED OTHERWISE, ALL LINE VOLTAGE WIRING, CONDUIT, FINAL CONNECTIONS, DISCONNECTS, STARTERS, AND OVER CURRENT PROTECTION DEVICES SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR AS INDICATED ON THESE MECHANICAL DRAWINGS AND/OR ELECTRICAL DRAWINGS AND/OR ELECTRICAL SECTION OF THE SPECIFICATIONS.
14. INSTALL ALL LOW VOLTAGE HVAC CONTROL WIRE AND DEVICES PER PLAN. ALL WIRE SHALL BE IN CONDUIT PROVIDED AND INSTALLED BY THE ELECTRICAL CONTRACTOR UNLESS NOTED OTHERWISE.
15. PROVIDE OWNER WITH THREE COPIES OF A CERTIFIED AIR BALANCE REPORT PREPARED IN BY A THIRD PARTY CERTIFIED BY THE AABC OR NEBB. TEST, ADJUST AND BALANCE THE HVAC SYSTEM IN ACCORDANCE WITH AABC OR NEBB PROCEDURES. PROVIDE START-UP/TEST REPORTS FOR ALL AIR HANDLING EQUIPMENT, FANS, AND REFRIGERATION EQUIPMENT. TEST AND VERIFY PROPER OPERATION OF ALL MAKE-UP AIR/EXHAUST AIR INTERLOCK SYSTEMS AND THEIR SEQUENCES OF OPERATION. BALANCE ALL AIR FLOWS WITHIN 5% OF DESIGN VALUES. PERMANENTLY MARK BALANCE POSITION OF ALL REGULATING DEVICES.
16. PROVIDE OWNER WITH THREE SETS OF AS-BUILT PLANS AND OPERATIONS AND MAINTENANCE MANUALS. CLEARLY IDENTIFY ALL EQUIPMENT WITH PERMANENT PLASTIC OR METAL LABELS/TAGS (PEN MARKING NOT ACCEPTABLE).
17. PROVIDE ONE YEAR WARRANTY ON ALL LABOR, PARTS AND MATERIALS.
18. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE WRITTEN APPROVAL OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK. 19.0
- a) DUCTS FOR DEMAND CONTROLLED VENTILATION SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE FAN MANUFACTURER'S INSTALLATION INSTRUCTIONS, THE PROVISIONS ASHRAE 62.2, TABLE 5.3, OR THE AIRFLOW SHALL BE MEASURED AS REQUIRED BY AND IN COMPLIANCE WITH ASHRAE 62.2, 5.4.
- 1) DUCTS FOR KITCHEN COOKTOPS OR RANGES SHALL BE SHOWN OF METAL WITH A SMOOTH INTERIOR.
- a) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE INSTALLED IN ACCORDANCE WITH CMC 504.0.
- b) DUCTS FOR DOMESTIC CLOTHES DRYERS SHALL BE RIGID METALLIC DUCTS WITH A MINIMUM MILL THICKNESS OF 16 (0.016-INCH), SHALL HAVE A MINIMUM 4-INCH DIAMETER AND A SMOOTH INTERIOR. THE COMBINED HORIZONTAL AND VERTICAL LENGTH OF THE DUCTS OF THE DUCTS SHALL BE 14-FEET, WHICH SHALL BE REDUCED BY 2-FEET FOR EVERY 90-DEGREE ELBOW IN EXCESS OF TWO ELBOWS.
- c) LISTED CLOTHES DRYER TRANSITION DUCTS NOT MORE THAN 6-FEET IN LENGTH SHALL BE PERMITTED TO CONNECT THE DRYER TO THE EXHAUST DUCTS AS LONG AS THEY ARE NOT CONCEALED WITHIN CONSTRUCTION, AND THEY ARE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

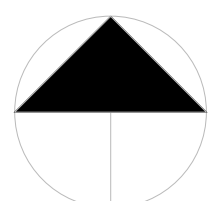
## LEGEND

		DUCT WORK (WIDTHxDEPTH)
		LINED DUCT WORK (WIDTHxDEPTH DIMENSIONS ARE FOR I.D.)
		SUPPLY DUCT, SECTION
		RETURN DUCT, SECTION
		EXHAUST DUCT, SECTION
		RISE OR DROP IN DIRECTION OF AIR FLOW
	FLEX. CONN.	FLEXIBLE CONNECTION
		DUCT TRANSITION, ROUND AND RECTANGULAR
		SPLITTER DAMPER
		EXTRACTOR AT BRANCH DUCT
		TURNING VANES
		FLEXIBLE DUCT
		SINGLE LINE DUCT WORK
	AVD	AUTOMATIC VOLUME DAMPER
	MVD	MANUAL VOLUME DAMPER
	BDD	BACKDRAFT DAMPER
	MD	MODULATING DAMPER
	AFD	AUTOMATIC FIRE DAMPER
	AD	ACCESS DOOR
	SD	SUPPLY DIFFUSER
	RR	RETURN REGISTER
	ER	EXHAUST REGISTER
	SWR	SIDE WALL SUPPLY REGISTER
	SWE	SIDE WALL RETURN OR EXHAUST
	LD	LINEAR DIFFUSER
	DL	DOOR LOUVER
	UC	UNDER CUT DOOR
	VAV	VARIABLE AIR VOLUME
		THERMOSTAT
		DUCT SMOKE DETECTOR
	T/B	TO BELOW
	F/B	FROM BELOW
	T/A	TO ABOVE
	F/A	FROM ABOVE

## SPECIAL NOTICE TO CONTRACTORS

1. ALL CONTRACTORS (GENERAL CONTRACTOR AND SUB-CONTRACTORS) BIDDING THIS PROJECT ARE REQUIRED TO VISIT THE JOB SITE AND VERIFY THE EXISTING CONDITIONS PRIOR TO SUBMITTING THEIR BID. CONTRACTORS ARE TO CAREFULLY REVIEW ALL CONSTRUCTION DOCUMENTS AND NOTE ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED AT THE JOB SITE PRIOR TO SUBMISSION OF ANY BID. THE BUILDING OWNER REPRESENTATIVE LISTED BELOW MAY BE CONTACTED FOR ACCESS TO THE JOB SITE.
2. CONTRACTORS ARE RESPONSIBLE FOR VERIFYING THE LOCATION AND CONDITION OF ALL POINTS OF CONNECTION, LOCATION AND CONDITION OF ALL BUILDING (ROOF/FLOOR/CEILING) PENETRATIONS, LOCATION AND CONDITION OF ALL UTILITIES AND BUILDING SYSTEMS INCLUDING, BUT NOT LIMITED TO, GAS, WATER, SEWER, VENT, ELECTRICAL, BUILDING MECHANICAL SYSTEMS, DUCT CONNECTIONS, EXHAUST/OUTSIDE AIR CONNECTIONS, SECURITY, FIRE ALARM, DATA, AND PHONE PRIOR TO SUBMISSION OF THEIR BID.
3. ANY DISCREPANCIES BETWEEN THE CONSTRUCTION DOCUMENTS AND THE CONDITIONS OBSERVED SHALL BE BROUGHT TO THE ATTENTION, IN WRITING, TO THE ARCHITECT AND/OR ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION.
4. NO WORK SHALL BE DONE ON ANY PART OF THE BUILDING BEYOND THE POINT INDICATED IN EACH SUCCESSIVE INSPECTION WITHOUT FIRST OBTAINING THE WRITTEN APPROVAL OF THE CODE OFFICIAL. NO CONSTRUCTION SHALL BE CONCEALED WITHOUT BEING INSPECTED AND APPROVED.

List of Drawing	Drawing Name	Scale
M0.00	MECHANICAL GENERAL NOTES AND SPECIFICATIONS	NTS
M1.01	MECHANICAL LAYOUT MAIN FLOOR	1/8"=1'-0"
M1.02	MECHANICAL LAYOUT ROOF FLOOR	1/8"=1'-0"
M2.01	MECHANICAL EQUIPMENT SCHEDULE AND VENTILATION	NTS
M3.01	HEAT LOAD CALCULATIONS	NTS
M4.01	EQUIPMENT DATASHEET	NTS
M5.01	MECHANICAL GENERAL DETAILS	NTS

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**TRUE NORTH**

## DESIGN DEVELOPMENT

Sheet Name

## MECHANICAL GENERAL NOTES & SPECIFICATIONS

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

M 0.00

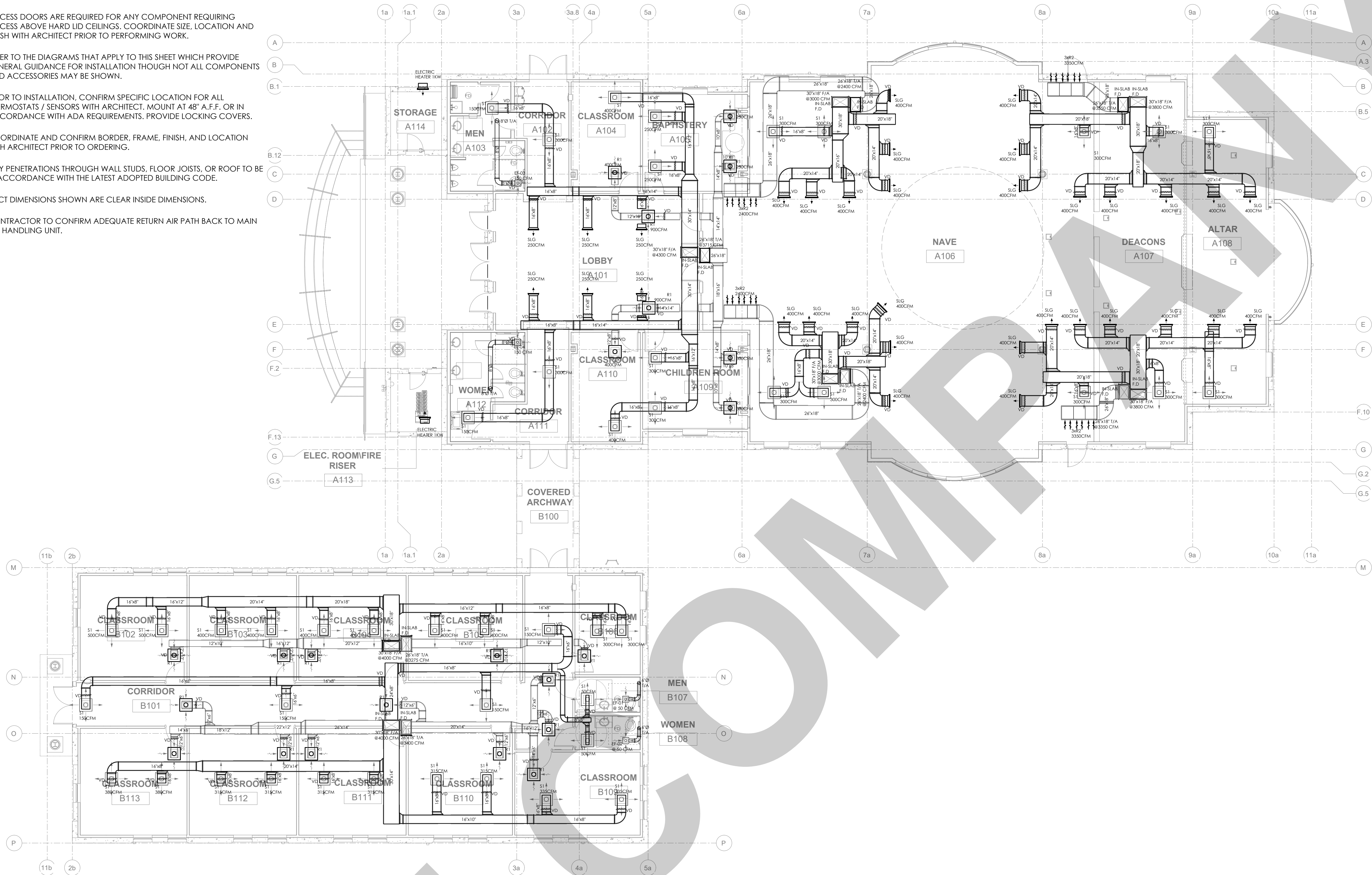
Project

Drawing Date



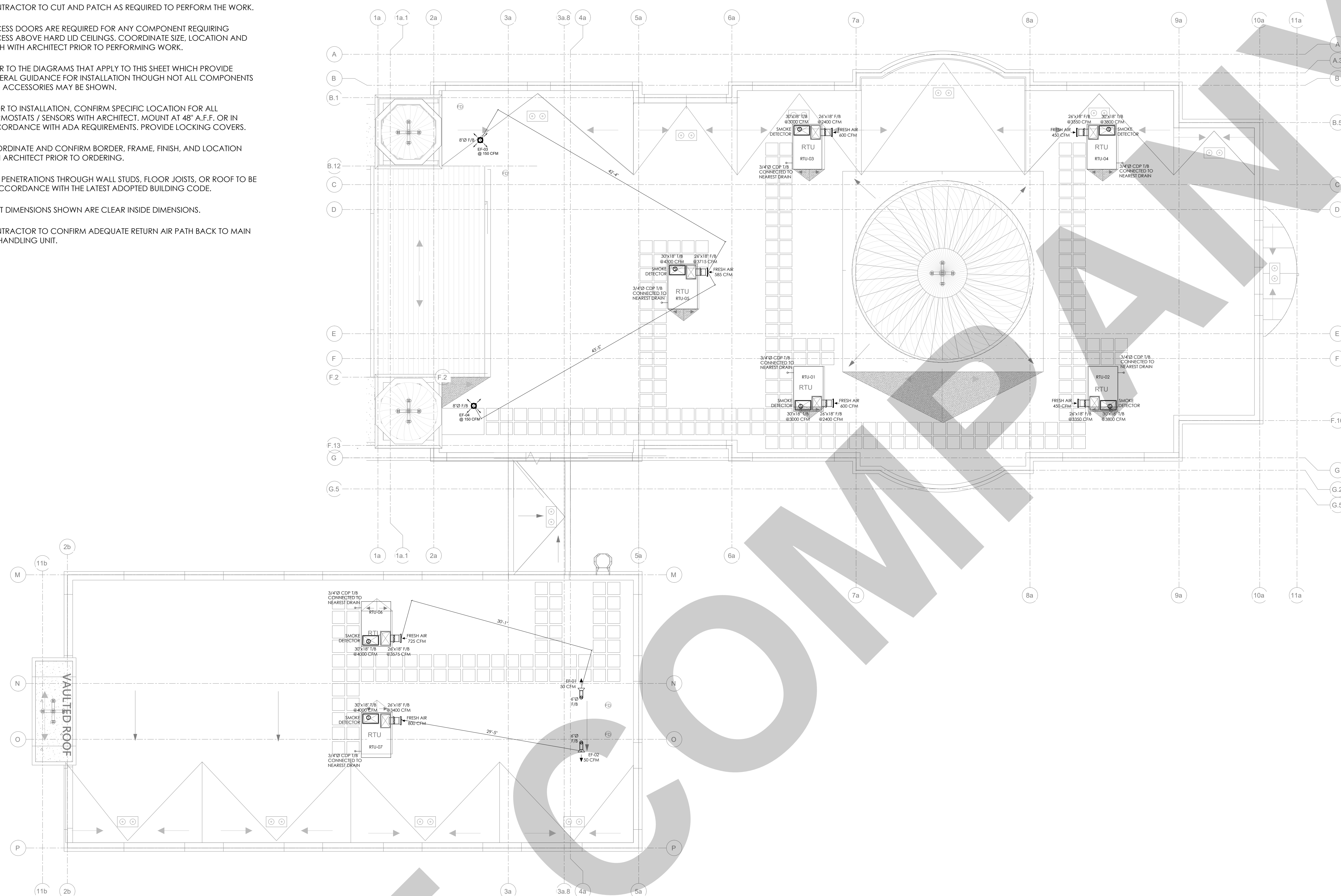
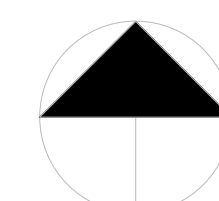
GENERAL NOTES

- MECHANICAL CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF MECHANICAL COMPONENTS AND EQUIPMENT WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS PRIOR TO PERFORMING WORK.
- CONTRACTOR TO CUT AND PATCH AS REQUIRED TO PERFORM THE WORK.
- ACCESS DOORS ARE REQUIRED FOR ANY COMPONENT REQUIRING ACCESS ABOVE HARD LID CEILINGS. COORDINATE SIZE, LOCATION AND FINISH WITH ARCHITECT PRIOR TO PERFORMING WORK.
- REFER TO THE DIAGRAMS THAT APPLY TO THIS SHEET WHICH PROVIDE GENERAL GUIDANCE FOR INSTALLATION THOUGH NOT ALL COMPONENTS AND ACCESSORIES MAY BE SHOWN.
- PRIOR TO INSTALLATION, CONFIRM SPECIFIC LOCATION FOR ALL THERMOSTATS / SENSORS WITH ARCHITECT. MOUNT AT 48" A.F.F. OR IN ACCORDANCE WITH ADA REQUIREMENTS. PROVIDE LOCKING COVERS.
- COORDINATE AND CONFIRM BORDER, FRAME, FINISH, AND LOCATION WITH ARCHITECT PRIOR TO ORDERING.
- ANY PENETRATIONS THROUGH WALL STUDS, FLOOR JOISTS, OR ROOF TO BE IN ACCORDANCE WITH THE LATEST ADOPTED BUILDING CODE.
- DUCT DIMENSIONS SHOWN ARE CLEAR INSIDE DIMENSIONS.
- CONTRACTOR TO CONFIRM ADEQUATE RETURN AIR PATH BACK TO MAIN AIR HANDLING UNIT.





1. MECHANICAL CONTRACTOR TO COORDINATE ROUTING AND LOCATION OF MECHANICAL COMPONENTS AND EQUIPMENT WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS PRIOR TO PERFORMING WORK.
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## DESIGN DEVELOPMENT

Sheet Name
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## MECHANICAL LAYOUT ROOF FLOOR

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

**M 1.02**

Project #

Drawing Date	05/05/2023
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## Zone Sizing Summary for RTU-CHURCH-A

Project Name: 2.246-Fire, 15 Means Church  
 Worksheet: 10-1

09/10/2016  
 03:00AM

### Air System Information

Air System Name	RTU-CHURCH-A	Number of Zones	5
Equipment Code	REC-ROOF	Location	50.0 x 1
Air Flow Type	SD-AV	Ductless	Yes

### Sizing Calculation Information

Calculation Method	Use In Doc	Zone CFM Rating	Sum of space airflow rates
Sizing Date	Calculated	Space CFM Rating	Individual peak space loads

### Zone Terminal Sizing Data

Design Supply Airflow (CFM)	Minimum Supply Airflow (CFM)	Zone CFM Rating	Reheat Coil Capacity (BTU/hr)	Zone Cooling Area (SF)	Zone Heating Area (SF)	Zone Heating Load (BTU/hr)	Zone Heating Load (Tons)	Misc. Heating Load (Tons)
1935	1050	2.00	0.0	0.0	0.0	0.0	0.0	0.0

### Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible Load (BTU/hr)	Time of Peak Sensible Load (MM/DD)	Zone Heating Load Area (SF)	Zone Heating Load (BTU/hr)
Zone 1	35.1	At 17:00	0.0	506.0

### Space Loads and Airflows

Zone Name	Zone Name	Time of Peak Sensible Load (MM/DD)	Air Flow (CFM)	Heating Load (BTU/hr)	Floor Area (SF)	Zone CFM Rating
A110-CHURCH-A	1	3.31	Jul 17/00	1956	0.0	936.0 (2.00)

[illegible][illegible]

Air System Sizing Summary for RTU-CHURCH-C				03/10/2012 10:58AM
Project Name: 2,244 Fds. St. Marys Church				
<b>Air System Information</b>				
24 System Name:	RTU-CHURCH-C	Number of zones:	1	1
24 System Type:	PRO-DOOP	Peak Demand:	150.0 T	
Air Return Type:	SE-RAW	Dates, Times:		
<b>Sizing Calculation Information</b>				
Calculation Method:	Jan to Dec	Zone CFM Sizing:	Sum of mass airflow rates	
Sizing Date:	Calculated	Space CFM Sizing:	Individual peak airflow rates	
<b>Control Cooling Coil Sizing Data</b>				
4.6.1 Total load:	8.6 Btu/s	Load removed at:	Jul 1988	
4.6.2 Total coil load:	71.8 Btu/s	CUA (DB) at 100°F:	80.4 Btu/s	
4.6.3 Total coil load:	71.8 Btu/s	CUA (WB) at 100°F:	85.0 Btu/s	
4.6.4 Max CUA at 100°F:	71.8 Btu/s	CUA (DB) at 95°F:	76.2 Btu/s	
4.6.5 Max CUA at 95°F:	71.8 Btu/s	CUA (WB) at 95°F:	80.8 Btu/s	
4.6.6 Heating coil load:	0.0 Btu/s	Reheating (DB) at:	95 °F	
4.6.7 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.8 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.9 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.10 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.11 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.12 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.13 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.14 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.15 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.16 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.17 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.18 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.19 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.20 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.21 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.22 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.23 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.24 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.25 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.26 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.27 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.28 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.29 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.30 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.31 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.32 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.33 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.34 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.35 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.36 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.37 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.38 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.39 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.40 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.41 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.42 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.43 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.44 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.45 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.46 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.47 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.48 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.49 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.50 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.51 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.52 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.53 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.54 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.55 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.56 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.57 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.58 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.59 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.60 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.61 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.62 Heating coil load:	0.0 Btu/s	Reheating (WB) at:	95 °F	
4.6.63 Heating coil load:</				

Zone Sizing Summary for RTU-CHURCH-C										08/10/2016																					
Project Name: 2.2348 Fate St. Menora Church																															
Worksheet ID: 2.2348-01																															
<b>Air System Information</b> Air System Name: RTU-CHURCH-C Equipment Code: PUMP ROOM Equipment Type: MECH																															
Number of Zones:				14/6/0 17																											
Location:				Della, Texas																											
<b>Sizing Calculation Information</b> Calculation Month: Jan to Dec Sizing Day:																															
Zone CFM Sizing:				Burst of space air flows Individual peak space needs																											
<b>Zone Terminal Sizing Data</b> Design Supply Airflow (CFM) 1000 Minimum Supply Airflow (CFM) 1000 Maximum Supply Airflow (CFM) 1000 Heat Loss (BTU/hr) 1000 Heat Gain (BTU/hr) 1000 Zone Peak Heat Load (BTU/hr) 1000 Zone Peak Cold Load (BTU/hr) 1000 Zone Peak Hot Water Load (BTU/hr) 1000 Zone Peak Cold Water Load (BTU/hr) 1000 Zone Peak Fan Power (CFM) 1000																															
<b>Zone Peak Sensible Loads</b> <table border="1"> <thead> <tr> <th>Zone Name / Zone #</th> <th>Zone Cooling Sensible (BTU/hr)</th> <th>Zone Time of Peak Sensible Cooling Load (hr)</th> <th>Zone Heating Load (BTU/hr)</th> <th>Zone Floor Area (sq ft)</th> <th>Zone Peak Heat Load (BTU/hr)</th> <th>Zone Peak Cold Load (BTU/hr)</th> <th>Zone Peak Hot Water Load (BTU/hr)</th> <th>Zone Peak Cold Water Load (BTU/hr)</th> <th>Zone Peak Fan Power (CFM)</th> </tr> </thead> <tbody> <tr> <td>Zone 1</td> <td>32.0</td> <td>24.0000</td> <td>14.5</td> <td>1400.0</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>												Zone Name / Zone #	Zone Cooling Sensible (BTU/hr)	Zone Time of Peak Sensible Cooling Load (hr)	Zone Heating Load (BTU/hr)	Zone Floor Area (sq ft)	Zone Peak Heat Load (BTU/hr)	Zone Peak Cold Load (BTU/hr)	Zone Peak Hot Water Load (BTU/hr)	Zone Peak Cold Water Load (BTU/hr)	Zone Peak Fan Power (CFM)	Zone 1	32.0	24.0000	14.5	1400.0					
Zone Name / Zone #	Zone Cooling Sensible (BTU/hr)	Zone Time of Peak Sensible Cooling Load (hr)	Zone Heating Load (BTU/hr)	Zone Floor Area (sq ft)	Zone Peak Heat Load (BTU/hr)	Zone Peak Cold Load (BTU/hr)	Zone Peak Hot Water Load (BTU/hr)	Zone Peak Cold Water Load (BTU/hr)	Zone Peak Fan Power (CFM)																						
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Zone Name / Zone #	Cooling Sensible (BTU/hr)	Time of Peak Sensible Cooling Load (hr)	Air Flow (CFM)	Heating Load (BTU/hr)	Floor Area (sq ft)	Space CFM/HR																									
A110-CHURCH-C	1	32.0 24.0000	1025	14.5	1400.0	1.36																									

Air System Sizing Summary for RTU-CHURCH-D				08/10/2010		
Project Name: 22.246 Plains Airs Church-D				Drawn By: C. ZIMMER		
<b>Air System Information</b>						
Air System Name:	RTU-CHURCH-D	Number of zones:	1			
Exhaust System:	None/ROOF	Exhaust CFM:	1460.0	1"		
Supply System:	ROOF	Supply CFM:	1460.0	1"		
	Supply					
<b>Sizing Calculation Information</b>						
Calculation Method:	As in DE	Zone CFM Rating:	Sum of space airflow rates			
Design Date:	Calculated	Space CFM Rating:	Individual space values			
<b>Cooling Cooling Coil Sizing Data</b>						
Total coil load:	6.22 Tons	Load on coils at:	Aug 1400			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Max coil CFM:	2346 CFM	Coil CFM:	1460.0 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
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Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
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Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			
Coil entering air temp:	24.61 WHt	Coil entering air temp:	50.50 F			
Coil leaving air temp:	24.61 WHt	Coil leaving air temp:	50.50 F			

## Zone Sizing Summary for RTU-CHURCH-D

Project Name: 22-246 Fals St. Moore Church  
 03/09/2024 09:00 AM

### As/ System Information

As System Name	RTU-CHURCH-D	Number of zones	1
Cooperating Code	PTW-BPOOP	Number of floors	1
Cooperating Code	SECUF	Number of units	1

### Building Calculation Information

Calculation Method	As Is	Zone CFM Rating	Sum of surface area
Calculation Method	Customized	Sum CFM Rating	Individual peak values

### Zone Terminal Sizing Data

Zone Name	Zone Supply Air Flow (CFM)	Minimum Supply Air Flow (CFM)	Minimum Supply Air Flow (CFM)	Return Cold Air Flow (CFM)	Return Warm Air Flow (CFM)	Zone Supply Air Flow (CFM)	Zone Return Air Flow (CFM)	Zone Net Air Flow (CFM)
Zone 1	204.5	204.5	14.5	14.5	180.0	204.5	180.0	24.5

### Zone Peak Sensible Loads

Zone Name	Zone Cooling Sensible Load (BTU/hr)	Time of Peak Sensible Load	Zone Heating Sensible Load (BTU/hr)	Zone Peak Air Flow (CFM)
Zone 1	14,500	See 14000	14,500	1400.0

### Space Loads and Airflows

Zone Name / Space Name	Mar.	Cooling Sensible Load (BTU/hr)	Peak Heating Load (BTU/hr)	Air Flow (CFM)	Heating Load (BTU/hr)	Floor Area (SF)	Space CFM/Ft <sup>2</sup>
A10-CHURCH-D	Y	34.5	See 14000	204.5	14,500.0	1400.0	1.45

Air System Sizing Summary for RTU-LOBBY A101				08/10/2016
Project Name: 2.246 First St. Miami Church				
Contractor: Joe Edwards				
<b>Air System Information</b>				
Room Name	RTU-LOBBY A101	Number of Zones	1	
System Name	Room HVAC	Supply Air Flow	125.05	CFM
System Type	COOL	Return Air Flow	Ductless, None	
<b>Sizing Calculation Information</b>				
Calculations Made	Jan 16 2016	Zone CO2 Sizing	Sum of space airflow	
Sizing Date		Space CO2 Sizing	Individual space airflow	
<b>Ceiling Cooling Coil Sizing Data</b>				
Total coil load	7.7	Unit location at	Aug 1900	
Max coil load	10.2	Room Name	RTU-LOBBY A101	
Summer coil load	8.2	Room Type	Emergency CO2 HES	
Min coil load @ 55°F	2.0	Room Volume	50.0	
Max Zone CFM	24.0	Coil Type	Cooling	
Min Zone CFM	1.0	Room Surface	10.0	
Min Zone CFM @ 55°F	1.0	Room Temp	75.0	
TRAC Temp	54.0	Design supply temp	18.0	
TRAC Temp @ 55°F	54.0	Zone Temp	75.0	
Water Flow @ 55°F	0.7	Zone Temp @ 55°F	54.0	
Water Flow @ 55°F	0.7	Max coil temperature	100.0	
<b>Ceiling Heating Coil Sizing Data</b>				
Max coil load	37.2	Unit location at	Dct Htg	
Min coil load	1.0	Room Name	RTU-LOBBY A101	
Max Zone CFM	24.0	Room Type	Emc CO2 Log Dg	
Min Zone CFM	1.0	Room Volume	50.0	
Water Flow @ 55°F	0.7	Coil Type	Cooling	
<b>Supply Fan Sizing Data</b>				
Max coil load	37.2	Fan motor VFD	1.00	
Min coil load	1.0	Fan motor VFD	1.00	
Max Zone CFM	24.0	Fan motor VFD	1.00	
Min Zone CFM	1.0	Fan motor VFD	1.00	
<b>Outdoor Ventilation Air Data</b>				
Max Zone CFM	0.50	CFM/Person	0.00	
Min Zone CFM	0.50	CFM/Person	0.00	

### Zone Sizing Summary for RTU-LOBBY A161

Project Name: 2.24-PA St. James Church

Submitted for: 7/20/2016

08/10/2016  
10:00 AM

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#### Air System Information

Air System Name: RTU-LOBBY A161

System Type: Variable Airflow

Design Airflow: 10000 CFM

Design Temp: 55.0°F

Number of zones: 1

Zone Area: 1255.8 1'

Design Temp: 55.0°F

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#### Coil Calculation Information

Calculations Made: Jan 16, 2016

Sizing Date: Calculated

Zone CFM Rating: 10000

Space CFM Rating: Individual space ratios

Base of space airflow rates: 10000 CFM

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#### Zone Terminal Sizing Data

Zone Name	Zone Cooling Sensible Load (CFM)	Minimum Sensible Ratio (CFM)	Zone CFM Rating	Reheat Water Coil (CFM)	Reheat Water Coil (55.0°F)	Zone Cooling Sensible Load (CFM)	Minimum Sensible Ratio (CFM)	Zone CFM Rating	Reheat Water Coil (CFM)	Reheat Water Coil (55.0°F)
Zone Name	1	1	1	1	1	1	1	1	1	1

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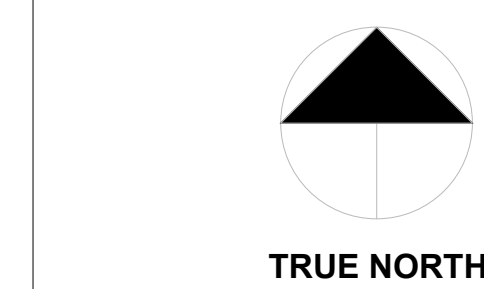
#### Zone Peak Possible Loads

Zone Name	Zone Cooling Sensible Load (Peak)	Zone Time of Peak Sensible Cooling Load (hr)	Zone Peak Cooling Load (Tons)	Zone Peak Heating Load (Tons)	Zone Peak Cooling Load (Tons)	Zone Peak Heating Load (Tons)
Zone Name	1	1	1	1	1	1

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#### Excess Loads and Airflows

Zone Name / Space Name	Max.	Cooling Sensible Load	Peak Cooling Load	Air Flow (CFM)	Heating Load	Flow Rate (GPM)	Space CFM/RAT
A160-LOBBY	1	20.1	10000	1140	580.0	1.50	
A160-LOBBY STORGE	1	4.0	10000	1140	182.0	0.84	
A160-BOFFICE	1	16.8	10000	577	41.0	270.0	2.10
A160-BOFFICE	1	16.8	10000	577	41.0	268.0	2.09
A160-BOFFICE	1	12	10000	70	0.6	114.0	0.87

[illegible][illegible][illegible][illegible]



## Product Data

# Single-Package Rooftop Units High-Efficiency Electric Cooling/ Gas Heating

3 to 12½ Nominal Tons

48100A-007

48100B-014

Carrier has designed the Weathermaster units based on customer needs and requests to be the most efficient and reliable rooftop unit ever made.

## Features/Benefits

- Most efficient rooftop line for cooling using scroll compressor technology
- Most efficient rooftop line for heating using damped heat exchangers on all units
- High reliability — non-corrosive condensate pans, pre-painted cabinets and primer interior panels, and 316 stainless steel components produced by Carrier
- Quietest operation — all compressors mounted on independent vibration isolators. Standard, ball-bearing evaporator fan motors on all units
- Ease of maintenance achieved by easy disengagement on the Gas Controller (GCR), optional direct digital controls, standard size filters, tool-less filter access, internally lubricated fan motors, optional disconnect switch, optional v.v. convergence outlet, and optional integral panel
- Exclusive ModularMill® sub-identification package — a result of recent advances by Carrier in controlling component tolerances. This factory-installed option significantly improves the dimensional accuracy of the rooftop unit and helps control humidity levels in the building.

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Form 48H-119SD

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Panasonic

**WhisperGreen® Select™ Connected Ventilation Fans**

**WhisperGreen® Select™**

Fan Only Models: PV-B01YWSL,

PV-B01YWSL/PV-V11SWG.

Fan/Light Models: PV-E01YWSL2,

PV-L01YWSL2/PV-V11SWG2.

**HEALTHY AIR, HEALTHY HOME**

Fresh, clean energy in your home  
provides peace of mind as you work to  
ensure every space is healthy, happy.

**KEY FEATURES**


- Precise, whole-home ventilation solution ideal for use in the bathroom, laundry room, sun room, basement or garage.
- Helps achieve good indoor air quality for a healthy home and healthy living.
- Operates as a standalone unit or as part of the Control+ Healthy Home System through Wi-Fi using smart communication.
- Customizable, connected fan and fan/light LED light combinations.
- Plug & Fan airflow sensor (DS-B01-Y1) or DS-T001 LED light module combined with the WhisperGreen® technology simplifies the selection process and ensures optimum performance to meet code and reduce clutter.
- Sleight-of-air design complements the aesthetics of any room.
- Single-hinged "Tee" fan bracket provides flexible, fast and easy installation.
- Can be used to comply with ASHRAE 62.1 LEED, CALGreen, APC California Title 24, WB Ventilation Code and ENERGY STAR Version 13.0.

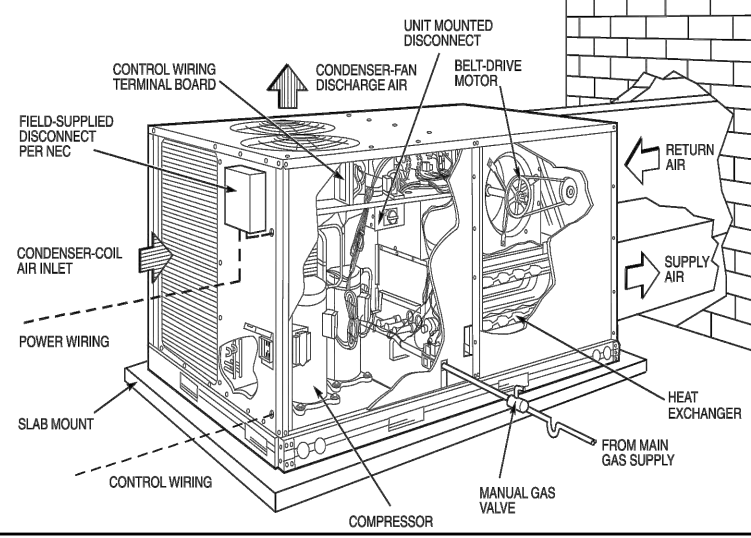
**ADDITIONAL BENEFITS**

- Ideal electrical load for green buildings
- Environmentally friendly 24 gpm housing using Zinc-Aluminum-Magnesium (ZAM) casting
- Integrated 1" or 1.5" dual static pressure resistant insulation panels for 2 x 4 or construction
- Built-in metal flange protects leading for penetrations through drywall as an air barrier, and seals with the AirTightie in leakage to help prevent air from entering living spaces due to drywall
- Suitable for installation in ceilings installed up to 6'0"
- Dual access points for simplified wiring and pipe access
- US Listed for tub/shower enclosure use when EPP-certified
- UL Listed for use with the Panasonic Smart Energy Manager (PSE) and/or Control+ app
- Power warranty on EMR units. 5 years on LED, 3 years on parts

Tub/shower enclosure ratings per ANSI A117.1 and International Association of Plumbing and Mechanical Officials (IAPMO)

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## Carrier means Top Quality and Reliability

Each component offered by Carrier is designed and tested for a minimum of 15 years of trouble-free operation. Every part is the best of its kind.

Every unit is thoroughly air tested at the factory in each operating mode and ensured prior to final shipping. Every coil is leak tested with helium gas pressure. Automated air testing allows accurate, unparaleled tests and measurements which are second to none in the industry.

Each unit contains a factory printout indicating tested pressures, amperages, draws, and inspection, providing certification of the unit's status at the time of manufacture.

Units are equipped with valuable safety controls designed to monitor and protect the life of the unit. The standard safety controls include:

- low-pressure/low-flow-of-gas switch
- high-pressure switch
- freeze-protection thermostat
- internal compressor overload

- exclusive Carrier LDC-OP circuit board that provides anti-compressor cycling
- non-ferrous filter drier

The cabinet is constructed of galvalume, finished, and coated with a pre-painted baked enamel finish.

The patent finish is a noncorrosive type in capable of exceeding Federal Test Method Standard 3-111 (Method 6661) 500 Hour Salt Spray Test. In addition, all cabinet panel rivets are sealed, allowing the entire unit to handle longer life and a more attractive appearance.

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# Performance data (cont)

## FAN PERFORMANCE – HORIZONTAL DISCHARGE UNITS (cont)

**Horizontal Discharge Units (cont) (continued)**

Model	1.5				2.0				External Static Pressure (in. wg)				2.5				3.0			
	Flow	Static	Temp	Watt	Flow	Static	Temp	Watt	Flow	Static	Temp	Watt	Flow	Static	Temp	Watt	Flow	Static	Temp	Watt
220V	200	0.25	138	1.0	200	0.25	138	1.0	200	0.25	138	1.0	200	0.25	138	1.0	200	0.25	138	1.0
220V	210	0.25	138	1.0	210	0.25	138	1.0	210	0.25	138	1.0	210	0.25	138	1.0	210	0.25	138	1.0
220V	220	0.25	138	1.0	220	0.25	138	1.0	220	0.25	138	1.0	220	0.25	138	1.0	220	0.25	138	1.0
220V	230	0.25	138	1.0	230	0.25	138	1.0	230	0.25	138	1.0	230	0.25	138	1.0	230	0.25	138	1.0
220V	240	0.25	138	1.0	240	0.25	138	1.0	240	0.25	138	1.0	240	0.25	138	1.0	240	0.25	138	1.0
220V	250	0.25	138	1.0	250	0.25	138	1.0	250	0.25	138	1.0	250	0.25	138	1.0	250	0.25	138	1.0
220V	260	0.25	138	1.0	260	0.25	138	1.0	260	0.25	138	1.0	260	0.25	138	1.0	260	0.25	138	1.0
220V	270	0.25	138	1.0	270	0.25	138	1.0	270	0.25	138	1.0	270	0.25	138	1.0	270	0.25	138	1.0
220V	280	0.25	138	1.0	280	0.25	138	1.0	280	0.25	138	1.0	280	0.25	138	1.0	280	0.25	138	1.0
220V	290	0.25	138	1.0	290	0.25	138	1.0	290	0.25	138	1.0	290	0.25	138	1.0	290	0.25	138	1.0
220V	300	0.25	138	1.0	300	0.25	138	1.0	300	0.25	138	1.0	300	0.25	138	1.0	300	0.25	138	1.0
220V	310	0.25	138	1.0	310	0.25	138	1.0	310	0.25	138	1.0	310	0.25	138	1.0	310	0.25	138	1.0
220V	320	0.25	138	1.0	320	0.25	138	1.0	320	0.25	138	1.0	320	0.25	138	1.0	320	0.25	138	1.0
220V	330	0.25	138	1.0	330	0.25	138	1.0	330	0.25	138	1.0	330	0.25	138	1.0	330	0.25	138	1.0
220V	340	0.25	138	1.0	340	0.25	138	1.0	340	0.25	138	1.0	340	0.25	138	1.0	340	0.25	138	1.0
220V	350	0.25	138	1.0	350	0.25	138	1.0	350	0.25	138	1.0	350	0.25	138	1.0	350	0.25	138	1.0
220V	360	0.25	138	1.0	360	0.25	138	1.0	360	0.25	138	1.0	360	0.25	138	1.0	360	0.25	138	1.0
220V	370	0.25	138	1.0	370	0.25	138	1.0	370	0.25	138	1.0	370	0.25	138	1.0	370	0.25	138	1.0
220V	380	0.25	138	1.0	380	0.25	138	1.0	380	0.25	138	1.0	380	0.25	138	1.0	380	0.25	138	1.0
220V	390	0.25	138	1.0	390	0.25	138	1.0	390	0.25										

# AR<sup>®</sup> capacitors

Carrier

UNIT	NOMINAL TONS	STANDARD CTR	Cooling Load (kW)	TOTAL kW	SEER <sup>1</sup>	EER	SCORING RATING (SEER)	PLV
400000	10	1000	29,812.00	34,000.00	11.20	12.20	11.20	0.91
400000	4	400	11,900.00	13,933.33	10.70	7.8	10.70	0.88
400000	2	200	5,950.00	6,966.67	10.20	6.9	10.20	0.85
400000	1	100	2,975.00	3,483.33	9.70	6.4	9.70	0.82
400000	0.5	50	1,487.50	1,741.67	9.20	6.0	9.20	0.79
400000	0.25	25	743.75	870.83	8.70	5.6	8.70	0.76
400000	0.125	12.5	371.88	435.42	8.20	5.2	8.20	0.73
400000	0.0625	6.25	185.94	217.71	7.70	4.8	7.70	0.70
400000	0.03125	3.125	92.97	108.86	7.20	4.4	7.20	0.67
400000	0.015625	1.5625	46.48	54.43	6.70	4.0	6.70	0.64
400000	0.0078125	0.78125	23.24	27.22	6.20	3.6	6.20	0.61
400000	0.00390625	0.390625	11.62	13.61	5.70	3.2	5.70	0.58
400000	0.001953125	0.1953125	5.81	6.81	5.20	2.8	5.20	0.55
400000	0.0009765625	0.09765625	2.90	3.40	4.70	2.4	4.70	0.52
400000	0.00048828125	0.048828125	1.45	1.70	4.20	2.0	4.20	0.49
400000	0.000244140625	0.0244140625	0.72	0.85	3.70	1.6	3.70	0.46
400000	0.0001220703125	0.01220703125	0.36	0.42	3.20	1.2	3.20	0.43
400000	0.00006103515625	0.006103515625	0.18	0.21	2.70	0.8	2.70	0.40
400000	0.000030517578125	0.0030517578125	0.09	0.10	2.20	0.4	2.20	0.37
400000	0.0000152587890625	0.00152587890625	0.04	0.05	1.70	0.2	1.70	0.34
400000	0.00000762939453125	0.000762939453125	0.02	0.02	1.20	0.1	1.20	0.31
400000	0.000003814697265625	0.0003814697265625	0.01	0.01	0.70	0.0	0.70	0.28
400000	0.0000019073486328125	0.00019073486328125	0.00	0.00	0.30	0.0	0.30	0.25
400000	0.00000095367431640625	9.5367431640625E-05	0.00	0.00	0.15	0.0	0.15	0.22
400000	0.000000476837158203125	4.76837158203125E-05	0.00	0.00	0.07	0.0	0.07	0.19
400000	0.0000002384185791015625	2.384185791015625E-05	0.00	0.00	0.04	0.0	0.04	0.16
400000	0.00000011920928955078125	1.1920928955078125E-05	0.00	0.00	0.02	0.0	0.02	0.13
400000	0.000000059604644775390625	5.9604644775390625E-06	0.00	0.00	0.01	0.0	0.01	0.10
400000	0.0000000298023223876953125	2.98023223876953125E-06	0.00	0.00	0.00	0.0	0.00	0.07
400000	0.00000001490116119384765625	1.490116119384765625E-06	0.00	0.00	0.00	0.0	0.00	0.04
400000	0.000000007450580596923828125	7.450580596923828125E-07	0.00	0.00	0.00	0.0	0.00	0.02
400000	0.0000000037252902984619140625	3.7252902984619140625E-07	0.00	0.00	0.00	0.0	0.00	0.01
400000	0.00000000186264514923095703125	1.86264514923095703125E-07	0.00	0.00	0.00	0.0	0.00	0.00
400000	0.000000000931322574615478515625	9.31322574615478515625E-08	0.00	0.00	0.00	0.0	0.00	0.00
400000	0.00000000046566128730773928125	4.6566128730773928125E-08	0.00	0.00	0.00	0.0	0	

# FAN PERFORMANCE – HORIZONTAL DISCHARGE UNITS (cont)

(Standard Air Conditions)

Airflow (CFM)	0.2			0.5			External Static Pressure (in. wg)			1.0			1.6		
	0.2	0.2	0.2	0.5	0.5	0.5	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
1500	10.0	10.0	10.0	10.0	10.0	10.0	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
1600	10.1	10.1	10.1	10.1	10.1	10.1	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
1700	10.2	10.2	10.2	10.2	10.2	10.2	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
1800	10.3	10.3	10.3	10.3	10.3	10.3	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
1900	10.4	10.4	10.4	10.4	10.4	10.4	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2000	10.5	10.5	10.5	10.5	10.5	10.5	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2100	10.6	10.6	10.6	10.6	10.6	10.6	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2200	10.7	10.7	10.7	10.7	10.7	10.7	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2300	10.8	10.8	10.8	10.8	10.8	10.8	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2400	10.9	10.9	10.9	10.9	10.9	10.9	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2500	11.0	11.0	11.0	11.0	11.0	11.0	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2600	11.1	11.1	11.1	11.1	11.1	11.1	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2700	11.2	11.2	11.2	11.2	11.2	11.2	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2800	11.3	11.3	11.3	11.3	11.3	11.3	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
2900	11.4	11.4	11.4	11.4	11.4	11.4	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3000	11.5	11.5	11.5	11.5	11.5	11.5	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3100	11.6	11.6	11.6	11.6	11.6	11.6	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3200	11.7	11.7	11.7	11.7	11.7	11.7	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3300	11.8	11.8	11.8	11.8	11.8	11.8	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3400	11.9	11.9	11.9	11.9	11.9	11.9	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3500	12.0	12.0	12.0	12.0	12.0	12.0	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3600	12.1	12.1	12.1	12.1	12.1	12.1	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3700	12.2	12.2	12.2	12.2	12.2	12.2	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3800	12.3	12.3	12.3	12.3	12.3	12.3	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
3900	12.4	12.4	12.4	12.4	12.4	12.4	0.2	0.5	1.0	1.6	0.2	0.5	1.0	1.6	2.0
4000	12.5	12.5	12.5	12.5	12.5	12.5	0.2	0.5</							

[illegible]

## FAN RPM AT MOTOR PULLEY SETTING

### STANDARD MOTOR

INCH		MOTOR PULLEY TURNS OPEN									
HP	SIZE	1	2	3	4	5	6	7	8	9	10
004	1/2	1050	1050	1025	890	890	860	860	825	825	790
004	1/2	1180	1180	1150	1025	1025	980	980	940	940	900
006	3/4	1400	1400	1350	1200	1200	1125	1125	1050	1050	1000
006 (3 phase)	3/4	1580	1560	1440	1440	1400	1300	1300	1250	1180	1120
008 (3 phase)	1	1600	1600	1550	1425	1425	1350	1350	1275	1200	1150
010	1 1/8	1800	1800	1750	1600	1600	1500	1500	1425	1350	1300
012	1 1/2	1800	1800	1750	1600	1600	1500	1500	1425	1350	1300
015	1 3/4	2200	2200	2150	1950	1950	1825	1825	1750	1675	1600

\*Approximate fan rpm shown (fan speed increased).

## FAN RPM AT MOTOR PULLEY SETTING

### HIGH-SPEED MOTOR

INCH		MOTOR PULLEY TURNS OPEN									
HP	SIZE	1	2	3	4	5	6	7	8	9	10
004	1/2	1050	1050	1025	890	890	860	860	825	825	790
004	1/2	1400	1425	1380	1230	1230	1150	1150	1075	1075	1025
006	3/4	1400	1425	1380	1230	1230	1150	1150	1075	1075	1025
006	3/4	1580	1560	1440	1440	1400	1300	1300	1250	1180	1120
008	1	1600	1600	1550	1425	1425	1350	1350	1275	1200	1150
010	1 1/8	1800	1800	1750	1600	1600	1500	1500	1425	1350	1300
012	1 1/2	1800	1800	1750	1600	1600	1500	1500	1425	1350	1300
015	1 3/4	2200	2200	2150	1950	1950	1825	1825	1750	1675	1600
018	2	2200	2200	2150	1950	1950	1825	1825	1750	1675	1600
022	2 1/2	2600	2600	2550	2325	2325	2175	2175	2075	1975	1875

## EVAPORATOR FAN MOTOR DATA — STANDARD MOTOR

LINE	CHU	PHASE	CONF. TURNS/SHIP	OPERATING RPM	UNIT VOLTAGE	MAXIMUM AIRFLOW
					208/230	5.4
004	Single	1/2	120	1000	100	2.4
	Single	1/2	120	1000	575	2.4
	Single	1/2	120	1000	208/230	5.4
006	Single	3/4	120	1000	100	2.4
	Single	3/4	120	1000	575	2.4
	Single	3/4	120	1000	208/230	5.4
006	Single	2 1/2	400	2120	208/230	6.6
	Single	2 1/2	400	2120	575	2.4
	Single	2 1/2	400	2120	208/230	6.6
008	Single	2 1/2	400	2120	208/230	6.6
	Single	2 1/2	400	2120	575	2.4
	Single	2 1/2	400	2120	208/230	6.6
010	Single	3 1/2	500	2675	400	2.4
	Single	3 1/2	500	2675	575	2.4
	Single	3 1/2	500	2675	208/230	6.6
012	Single	3 1/2	500	2675	400	2.4
	Single	3 1/2	500	2675	575	2.4

# Base unit unit dimensions — 48HJ008-01A

Carrier

REV	DESCRIPTION	DATE	BY	CHKD	APP'D	REV	DESCRIPTION	DATE	BY	CHKD	APP'D	REV	DESCRIPTION	DATE	BY	CHKD	APP'D
1	INITIAL RELEASE	11/11/01	WJ	WJ	WJ	1	INITIAL RELEASE	11/11/01	WJ	WJ	WJ	1	INITIAL RELEASE	11/11/01	WJ	WJ	WJ
2	REVISION	11/11/01	WJ	WJ	WJ	2	REVISION	11/11/01	WJ	WJ	WJ	2	REVISION	11/11/01	WJ	WJ	WJ
3	REVISION	11/11/01	WJ	WJ	WJ	3	REVISION	11/11/01	WJ	WJ	WJ	3	REVISION	11/11/01	WJ	WJ	WJ
4	REVISION	11/11/01	WJ	WJ	WJ	4	REVISION	11/11/01	WJ	WJ	WJ	4	REVISION	11/11/01	WJ	WJ	WJ
5	REVISION	11/11/01	WJ	WJ	WJ	5	REVISION	11/11/01	WJ	WJ	WJ	5	REVISION	11/11/01	WJ	WJ	WJ
6	REVISION	11/11/01	WJ	WJ	WJ	6	REVISION	11/11/01	WJ	WJ	WJ	6	REVISION	11/11/01	WJ	WJ	WJ
7	REVISION	11/11/01	WJ	WJ	WJ	7	REVISION	11/11/01	WJ	WJ	WJ	7	REVISION	11/11/01	WJ	WJ	WJ
8	REVISION	11/11/01	WJ	WJ	WJ	8	REVISION	11/11/01	WJ	WJ	WJ	8	REVISION	11/11/01	WJ	WJ	WJ
9	REVISION	11/11/01	WJ	WJ	WJ	9	REVISION	11/11/01	WJ	WJ	WJ	9	REVISION	11/11/01	WJ	WJ	WJ
10	REVISION	11/11/01	WJ	WJ	WJ	10	REVISION	11/11/01	WJ	WJ	WJ	10	REVISION	11/11/01	WJ	WJ	WJ
11	REVISION	11/11/01	WJ	WJ	WJ	11	REVISION	11/11/01	WJ	WJ	WJ	11	REVISION	11/11/01	WJ	WJ	WJ
12	REVISION	11/11/01	WJ	WJ	WJ	12	REVISION	11/11/01	WJ	WJ	WJ	12	REVISION	11/11/01	WJ	WJ	WJ
13	REVISION	11/11/01	WJ	WJ	WJ	13	REVISION	11/11/01	WJ	WJ	WJ	13	REVISION	11/11/01	WJ	WJ	WJ
14	REVISION	11/11/01	WJ	WJ	WJ	14	REVISION	11/11/01	WJ	WJ	WJ	14	REVISION	11/11/01	WJ	WJ	WJ
15	REVISION	11/11/01	WJ	WJ	WJ	15	REVISION	11/11/01	WJ	WJ	WJ	15	REVISION	11/11/01	WJ	WJ	WJ
16	REVISION	11/11/01	WJ	WJ	WJ	16	REVISION	11/11/01	WJ	WJ	WJ	16	REVISION	11/11/01	WJ	WJ	WJ
17	REVISION	11/11/01	WJ	WJ	WJ	17	REVISION	11/11/01	WJ	WJ	WJ	17	REVISION	11/11/01	WJ	WJ	WJ
18	REVISION	11/11/01	WJ	WJ	WJ	18	REVISION	11/11/01	WJ	WJ	WJ	18	REVISION	11/11/01	WJ	WJ	WJ
19	REVISION	11/11/01	WJ	WJ	WJ	19	REVISION	11/11/01	WJ	WJ	WJ	19	REVISION	11/11/01	WJ	WJ	WJ
20	REVISION	11/11/01	WJ	WJ	WJ	20	REVISION	11/11/01	WJ	WJ	WJ	20	REVISION	11/11/01	WJ	WJ	WJ
21	REVISION	11/11/01	WJ	WJ	WJ	21	REVISION	11/11/01	WJ	WJ	WJ	21	REVISION	11/11/01	WJ	WJ	WJ
22	REVISION	11/11/01	WJ	WJ	WJ	22	REVISION	11/11/01	WJ	WJ	WJ	22	REVISION	11/11/01	WJ	WJ	WJ
23	REVISION	11/11/01	WJ	WJ	WJ	23	REVISION	11/11/01	WJ	WJ	WJ	23	REVISION	11/11/01	WJ	WJ	WJ</

# Electrical data

## STANDARD MOTOR DATA WITHOUT ELECTRIC HEATER OUTLET

UNIT	NOMINAL VOLTAGE (V/PHASE)	VOLTAGE RANGE			COMPRESSION RATIO			O/R (MM)			FIR			CONVENTION TAP			POWER PSW			BROOKFIELD INCHES			
		Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max
480V/3PH/3W (3 Taps)	208/230-240	192	248	100	100	7.7	7.7	1.9	1.9	17	17	15.75	15.75	1000	1000	13.00	13.00	10.00	10.00	10.00	10.00	10.00	10.00
	230/240-340	248	348	103	103	7.7	7.7	0.7	0.7	48	48	18.015	18.015	5500	5515	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
	460/480	456	504	201	201	8.0	8.0	2.0	2.0	30	30	20.0	20.0	1000	1000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
	575/600	568	620	242	242	8.0	8.0	2.2	2.2	30	30	23.00	23.00	1000	1000	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
480V/3PH/3W (4 Taps)	208/230-240	192	248	100	100	7.7	7.7	1.9	1.9	17	17	15.75	15.75	1000	1000	13.00	13.00	10.00	10.00	10.00	10.00	10.00	10.00
	230/240-340	248	348	103	103	8.0	8.0	0.7	0.7	48	48	18.015	18.015	5500	5515	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
	460/480	456	504	201	201	8.0	8.0	2.0	2.0	30	30	20.0	20.0	1000	1000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
	575/600	568	620	242	242	8.0	8.0	2.2	2.2	30	30	23.00	23.00	1000	1000	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
480V/3PH/3W (5 Taps)	208/230-240	192	248	100	100	7.7	7.7	1.9	1.9	17	17	15.75	15.75	1000	1000	13.00	13.00	10.00	10.00	10.00	10.00	10.00	10.00
	230/240-340	248	348	103	103	8.0	8.0	0.7	0.7	48	48	18.015	18.015	5500	5515	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
	460/480	456	504	201	201	8.0	8.0	2.0	2.0	30	30	20.0	20.0	1000	1000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
	575/600	568	620	242	242	8.0	8.0	2.2	2.2	30	30	23.00	23.00	1000	1000	23.00	23.00	23.00	23.00	23.00	23.00	23.00	23.00
480V/3PH/3W (6 Taps)	208/230-240	192	248	100	100	7.7	7.7	1.9	1.9	17	17	15.75	15.75	1000	1000	13.00	13.00	10.00	10.00	10.00	10.00	10.00	10.00
	230/240-340	248	348	103	103	8.0	8.0	0.7	0.7	48	48	18.015	18.015	5500	5515	18.00	18.00	18.00	18.00	18.00	18.00	18.00	18.00
	460/480	456	504	201	201	8.0	8.0	2.0	2.0	30	30	20.0	20.0	1000	1000	20.00	20.00	20.00	20.00	20.00	20.00	20.00	20.00
	575/600	568	620	242	242	8.0																	

## One Connected Fan. Endless Possibilities.

The customizable IAO solution for virtually any space.

For over 25 years, Performance has developed innovative solutions that promote better indoor air quality and healthy home environments. Our IAO solutions are designed to provide a healthy indoor environment for your business, your home, or your organization that delivers healthy indoor air quality for healthy living in any space. Now more versatile, it operates as a standalone fan or as part of the Connected Healthy Home System using any wireless communication technology.

### WHISPERER® SELECT™ IS AS EASY AS 1-2-3!

#### Step 1: Select a Base Fan Model

Select a base fan model to start building the perfect IAO solution that activates your ventilation design requirements.

Base Fan	Unit Length
FV-01TWL2: 50 to 110 CFM angle mount	FW-011TWL2: 50 to 110 CFM angle mount • LED Light
FV-01TWL2: 30 to 110 CFM pre-installed multi-mount	FW-011TWL2: 30 to 110 CFM pre-installed multi-mount • LED Light
FV-01DWL2: 50 to 110 CFM angle mount	FW-011DWL2: 50 to 110 CFM angle mount • LED Light

#### Step 2: Add a Four-Function Remote

Pick a 4-way Arrow Select™ remote, any you possess the BNC. Provides the unique ability to select your required airflow (50-80-100 CFM) and 100% fresh air mode with the simple flip of a switch.

#### Step 3: Select Value Added Features

Whisperer Select™ offers a wealth of 3rd party patented modules that allow you to further customize your fan.

**Multi-Speed with Time Delay (MS-DTW)** – Allows you to select the proper CFM settings to adjust ASHRAE 62.2 continuous ventilation requirements. The fan begins continuous at a pre-set level, then elevates to a maximum level when the system is well ventilated, or when the Smart Air Quality (SAQ) sensor detects a poor air quality. When the system is activated, ASHRAE 62.2 continuous ventilation remains on the pre-set CFM level after a period of time set by the user.

**Smart™ with Motion Sensor (MS-S)** – Automatically adjusts fan speed when someone enters the room. Once the sensors have been applied, the fan becomes truly automatic, making it ideal for people with disabilities and assisted living environments such as nursing homes and retirement communities. This model is also activates an automatic 30-minute delay of timer for the fan.

**Condo Sensor (FV-CW1)** – Helps control bathroom condensation by preventing mold and mildew. Adjusted sensor detects bathroom humidity and automatically adjusts fan speed to control humidity. When humidity is detected, the fan automatically adjusts fan speed to control humidity. When humidity is detected, the fan automatically adjusts fan speed to control humidity. When humidity is detected, the fan automatically adjusts fan speed to control humidity.

**Smart™ with Motion Sensor (MS-S)** – Automatically adjusts fan speed when someone enters the room. Once the sensors have been applied, the fan becomes truly automatic, making it ideal for people with disabilities and assisted living environments such as nursing homes and retirement communities. This model is also activates an automatic 30-minute delay of timer for the fan.


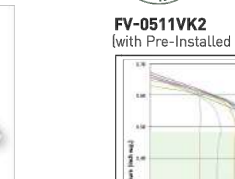
**Smart™ with Motion Sensor (MS-S)** – Automatically adjusts fan speed when someone enters the room. Once the sensors have been applied, the fan becomes truly automatic, making it ideal for people with disabilities and assisted living environments such as nursing homes and retirement communities. This model is also activates an automatic 30-minute delay of timer for the fan.

#### Step 3: Install Your Ideal Fan with the New Flex-2-Fast™ Installation System

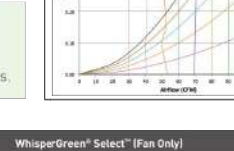
**Superior Installation Performance up to 8.375" and Certified Code for Installation at 0.25" Static Pressure**


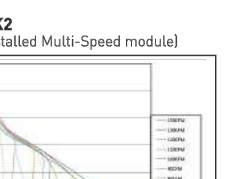
Although ASHRAE ENERGY STAR™ LED for Homes and WE have set the industry standard for performance measurement at 1" and 0.25", Whisperer Select™ fans provide greater CFM output at 0.25" static than most representative of typical installation. These fans also have certified for 1.375" static for a more realistic, installed capacity, so they are quiet under pressure and after installation.

**WhisperGreen® Select™** Connected Ventilation Fans

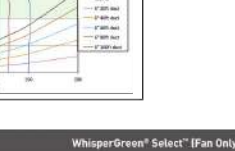




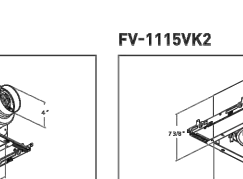
**FV-0511WK2**  
100 CFM Rated Multi-Speed model



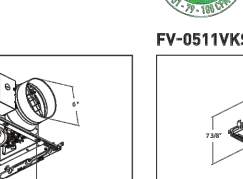



**FV-115VW2**  
160 CFM Rated Multi-Speed model

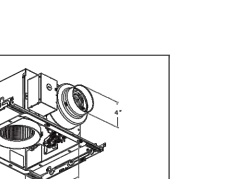


**FV-0511WK2**



**FV-115VW2**



**FV-0511WK2**

**HEALTHY AIR, HEALTHY HOME**  
 The FAN ENERGY STAR® and ENERGY STAR® labels prove a product's energy efficiency and resource usage create a healthy home.

Model Number	WhisperGreen® Select™ (100 CFM)										WhisperGreen® Select™ (160 CFM)										WhisperGreen® Select™ (200 CFM)									
	Standard										Standard										Standard									
	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10	1	2	3	4	5	6	7	8	9	10
Rated Airflow (CFM)	100	100	100	100	100	100	100	100	100	100	160	160	160	160	160	160	160	160	160	160	200	200	200	200	200	200	200	200	200	200
Rated Power (W)	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Rated Efficiency (W/CFM)	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
Sound Power Level (dBA)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound Pressure Level (dBA)	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Sound Power Level (dB(A))	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound Pressure Level (dB(A))	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Sound Power Level (dB(A))	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound Pressure Level (dB(A))	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Sound Power Level (dB(A))	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Sound Pressure Level (dB(A))	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Sound Power Level (dB(A))	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3														

[illegible]



1. MECHANICAL CONTRACTOR SHALL EXAMINE ALL OTHER SPECIFICATIONS, DRAWINGS AND ALL FEATURES OF BUILDING CONSTRUCTION WHICH MAY AFFECT HIS WORK AND SHALL BE GOVERNED BY THESE AND OTHER SPECIFICATIONS, INCLUDING THE GENERAL CONDITIONS AND PARTICULAR INSTRUCTIONS T ALL BIDDER AND SUPPLIERS
2. ALL WORK SHALL BE EXECUTED AND INSPECTED IN STRICT ACCORDANCE WITH ALL LOCAL CODES AND/OR STATE CODES, LAWS, ORDINANCES, RULES AND REGULATIONS APPLICABLE TO THIS PARTICULAR CLASS OF WORK, AND EACH CONTRACTOR SHALL INCLUDE IN HIS PRICE ALL APPLICABLE SERVICE CHARGES, FEES, PERMITS, TAXES, AND OTHER SIMILAR COSTS IN CONNECTION THEREWITH.
3. PRIOR TO FABRICATION OF DUCTWORK, THE MECHANICAL CONTRACTOR SHALL EXAMINE AND VERIFY ALL CONDITIONS ABOVE AND BELOW THE CEILING WHICH MAY INTERFERE WITH THE DUCT SYSTEM AND NOTIFY THE ARCHITECT OF ANY CONFLICT ENCOUNTERED. CONTRACTOR SHALL PROVIDE ALL OFFSETS, ETC. WHICH MAY BE REQUIRED, WITHOUT ADDITIONAL COST TO THE OWNER
4. ALL SHEET METAL DUCT CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH "SMACNA" LOW PRESSURE DUCT CONSTRUCTION STANDARD
5. TURNING VANES SHALL BE INSTALLED IN ALL BENDS IN RECTANGULAR DUCT EXCEEDING 30"
6. ALL DUCTS SHALL BE SUPPORTED WITH 1" WIDE, 16 GAUGE, GALVANIZED STEEL BANDS
7. ALL RECTANGULAR DUCT SHALL BE INSULATED WITH A MIN. OF 1" INTERNAL LINER, 2 LBS. DENSITY R-60. ALL ROUND DUCTS AND DIFFUSER TOPS SHALL HAVE A MIN. 2" THICK OF FOIL BACKED BLANKET TYPE INSULATION R=4-4.2, WITH ALL JOINTS BUTTED AND TAPED
8. ALL DUCT DIMENSIONS SHOWN ON PLANS ARE INTERNAL
9. THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF SUPPLY AND RETURN AIR REGISTERS, DUCTS, GRILLES AND DIFFUSERS WITH LIGHTING AND CEILING PATTERNS
10. PROVIDE LATERAL BRACING OF ALL DUCTS AND PIPES AS REQUIRED BY CODE
11. INSULATE AND SEAL ALL DUCTWORK PER CHAPTER 10 OF THE STATE MECHANICAL CODE
12. MOUNT ALL THERMOSTATS AT 48" ABOVE FINISHED FLOOR
13. ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES
14. WHERE BRACING DETAILS ARE NOT SHOWN ON THE DRAWINGS OR IN THE GUIDELINES, THE FIELD INSTALLATION SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT AND THE MECHANICAL ENGINEER
15. DUCT SMOKE DETECTOR SHALL BE INSTALLED BELOW THE ROOF
16. MATERIALS EXPOSED WITHIN DUCTS OR PLENUMS SHALL BE NON COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX NOT TO EXCEED 25 AND A SMOKE DEVELOPED INDEX NOT TO EXCEED 50 WHERE TESTED AS A COMPOSITE PRODUCT IN ACCORDANCE WITH ASTM E84 OR UL 723

**TRANSITIONS**

30/12  
18/12  
12/12  
DIFFUSER  
TRANSITION

30/12  
18/12  
12/12  
DIFFUSER  
TRANSITION  
% GAS SAFETY

**MAIN BRANCH TAKE-OFFS**

30/12  
16/12  
20/12  
SPLITTER DAMPER

30/12  
16/12  
20/12

**RISERS**

36/24  
24/36 DN  
RISE

36/24  
24/36 DN  
R = RISE  
D = DROP

**SIDEWALL REGISTERS**

36/12  
24/12  
AIR EXTRACTOR  
SIDEWALL GRILLE

36/12  
24/12  
SIDEWALL GRILLE

**DUCT CROSSOVERS**

THIS DUCT RUNS UNDERNEATH  
ELBOW WITH TURNING VANES

THIS DUCT RUN UNDERNEATH

**SUB-BRANCH TAP AND TEE**

30/12  
18/12  
12/8  
SUB-BRANCH TAP  
(1000 CFM MAX.)

30/12  
18/12  
12/8  
SUB-BRANCH TAP  
(1000 CFM MAX.)

**Diagram Labels:**

- MEDIUM PRESSURE, ACOUSTICAL FLEX DUCT (EQUAL TO FLEX MASTER 8M) WITH EXTERNAL INSULATION MAXIMUM 5' LENGTH
- TIE OFF TO ROOF STRUCTURE METAL BAND SUPPORT
- BUTTERFLY DAMPER IN BRANCH DUCT
- SUPPLY DUCT
- 2" EXTERNAL WRAP INSULATION
- T-BAR TYPE SUSPENDED CEILING
- LAY-IN SUPPLY AIR DIFFUSER W/ROUND NECK & O.B.D.
- HIGH EFFICIENCY SPIN-IN TAP
- INSULATION
- FLEX DUCT WITH MIN R-5 EXTERNAL INSULATION MAX. LENGTH 5'-0"

**SUPPLY AIR DIFFUSER CONNECTION**

**Diagram Labels:**

- EXTERIOR WALL CONSTRUCTION METAL OR WOOD STUDS WITH INSULATION
- REFRIGERANT LINES
- PLASTIC SLEEVE WITH CHROME ESCUTCHEON
- AIR FLOW
- MAINTAIN SERVICE CLEARANCE AROUND UNIT
- AIR COOLED CONDENSING UNIT
- SIGHT GLASS
- SLAB
- GRADE
- NEOPRENE PAD
- 4" THICK CONCRETE HOUSEKEEPING PAD
- FILTER DRYER
- REFRIGERANT VALVE [TYPICAL]

**OUTSIDE AIR CONDITIONER**

Diagram illustrating a vibration isolation system for a ceiling exhaust grille. The system includes a rectangular or round ductwork connected to a ceiling exhaust grille via a flexible connection. The ductwork is supported by neoprene vibration isolators and a backdraft damper. The entire assembly is mounted on a structure above with threaded rods and neoprene vibration isolators. Arrows indicate the direction of airflow and the location of the flexible connection.

Diagram illustrating the installation of a fan on a structure, showing the connection to ductwork and the use of vibration isolators.

Labels and components shown in the diagram:

- DUCTWORK
- BACKDRAFT DAMPER
- GASKETED ACCESS PANEL
- FLEXIBLE CONNECTION
- MOUNT FAN FROM STRUCTURE ABOVE WITH THREADED RODS. PROVIDE NEOPRENE VIBRATION ISOLATORS.

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Sheet Name  
**MECHANICAL GENERAL  
DETAILS**

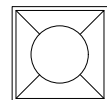






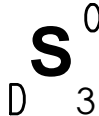







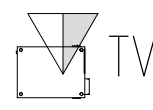


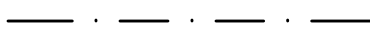
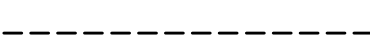
Original Issue	09/25/2022 / PROGRESS
Sheet Number	

## M 5.01

Project #	Drawing Date 05/05/2023
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## LIST OF SYMBOLS AND SERVICES

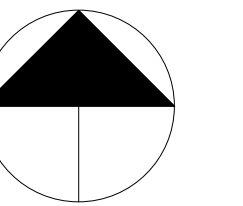
	60X60CM LED LIGHTING FIXTURE
	RECESSED LED LIGHT LIGHTING FIXTURE FOR CHURCH HALL
	RECESSED LED LIGHT LIGHTING FIXTURE FOR LOW LEVEL CEILING
	CEILING_BASED_PROJECTOR_4126-3714111
	EAE_GLORY_V2_DIFFUZER_CH_8W_010 - STANDART-V26
	EMERGENCY ILLUMINATION FIXTURE, WITH EMERGENCY LIGHT SHALL BE ON ALL TIME WITH 90 BACK UP MINUTES BATTERY BUILT IN SIMILAR TO "Lithonia lighting" ELM4L
	CEILING MOUNTED EXIT SIGN WITH EMERGENCY LIGHT SHALL BE ON ALL TIME WITH 90 BACK UP MINUTES BATTERY BUILT IN SIMILAR TO "Lithonia lighting"
	ONE WAY ONE GANG LIGHT SWITCH - WALL MOUNTED @ +48" A.F.F.L D: DENOTES SWITCH WITH DIMMER
	TWO WAY ONE GANG LIGHT SWITCH - WALL MOUNTED @ +48" A.F.F.L D: DENOTES SWITCH WITH DIMMER O: DENOTES OCCUPANCY SENSOR
	ONE WAY ONE GANG SWITCH FOR TOILET EXHAUST FAN - WALL MOUNTED @ +48" A.F.F.L
	120/240V, 1PH, 3W LOAD CENTER
	ceiling EXHAUST FAN EXHAUST FAN
	DUPLEX RECEPTACLE - WALL MOUNTED @ +18" AFF UNLESS NOTED
	JUNCTION BOX - WALL MOUNTED - HEIGHT AS INDICATED
	JUNCTION BOX
	NON-FUSED DISCONNECT SWITCH - SIZE AS INDICATED
	DATA OUTLET FOR TV
	TELEPHONE OUTLET
	RG6 OUTLET FOR TV
	CONDUITS IN CEILING
	CONDUITS UNDER TILES
<p>INSTALLATION HEIGHTS:</p> <p>h1: 23.622 inches.</p> <p>h2: 43.3071 inches.</p> <p>h3: 47.2441 inches.</p> <p>h4: 70.86 inches.</p> <p>h5: 94.48 inches.</p> <p>h6: 60 inches.</p> <p>(R) = RELOCATED</p> <p>(N) = NEW LED LAY-IN LIGHT FIXTURE.</p>	

## ELECTRICAL ABBREVIATIONS

AFB	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
A/C	AMP INTERRUPTING CURRENT
AL	ALUMINUM
ATS	AUTOMATIC TRANSFER SWITCH
BFG	BELOW FINISHED GRADE
BKBD	BACKBOARD
C	CONDUIT
CU	COPPER
DB	DISTRIBUTION BOARD
(E)	EXISTING TO REMAIN
EA	EACH
EM	EMERGENCY
EMCS	ENERGY MANAGEMENT CONTROL SYSTEM
EWC	ELECTRIC WATER COOLER
F	FUSE (DUAL ELEMENT, TIME DELAY)
FBO	FINISHED BY OTHERS
FPN	FUSE PER NAMEPLATE
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND	GROUND
W.P	WEATHER PROOF
HOA	HAND-OFF-AUTOMATIC
HP	HORSEPOWER
IG	ISOLATED GROUND
JBOX	JUNCTION BOX
KVA	KILOVOLT-AMPS
KW	KILOWATT
MCC	MOTOR CONTROL CENTER
MPC	MINI POWER CENTER
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NF	NON-FUSED
NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NOT TO SCALE
PB	PULLBOX
PNL	PANEL BOARD
(R)	EXISTING TO BE RELOCATED
RGS	RIGID GALVANIZED STEEL
SWBD	SWITCH BOARD
SQFT	SQUARE FEET
TL	TWISTLOCK
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSION
TVP	TYPICAL
UG	UNDERGROUND
UMC	UNIFORM MECHANICAL CODE
UON	UNLESS OTHERWISE NOTED
UPS	UNINTERRUPTABLE POWER
V	VOLTS
VA	VOLT-AMPS
V/PH/A	VOLTS/PHASE/AMPS
V/PH/Hz	VOLTS/PHASE/HERTZ
VFD	VARIABLE FREQUENCY DRIVE - PROVIDED BY OTHERS
MECHANICAL	
WP	WEATHER PROOF (NEMA 3R)
(X)	EXISTING TO BE REMOVED
XFMR	TRANSFORMER
XP	EXPLOSION PROOF

GENERAL NOTES:

1. ALL WORK AND EQUIPMENT UNDER THIS DIVISION SHALL BE IN STRICT COMPLIANCE WITH THE CODES, STANDARDS AND PRACTICES LISTED HEREIN, AND THEIR RESPECTIVE DATES ARE FURNISHED AS THE MINIMUM LATEST REQUIREMENTS.
  - A. LIFE SAFETY CODE
  - B. NATIONAL FIRE PROTECTION ASSOCIATION
  - C. NATIONAL ELECTRICAL CODE
  - D. AMERICAN NATIONAL STANDARDS INSTITUTE
  - E. INSTITUTE IF ELECTRICAL AND ELECTRONIC ASSOCIATION
  - F. NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION (NEMA)
  - G. REQUIREMENTS OF LOCAL POWER COMPANY
  - H. BUILDING CODE
2. THE ELECTRICAL INSTALLATION SHALL MEET THE APPROVAL OF THE LOCAL GOVERNING AUTHORITIES AND THE OWNER'S REPRESENTATIVE PRIOR TO ACCEPTANCE.
3. REFER TO THE ARCHITECTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION, CIVIL, INTERIOR DESIGN, FOR RELATED INFORMATION AND ADDITIONAL INSTALLATION REQUIREMENTS TO BE CONSIDERED AS PART OF THE ELECTRICAL CONTRACT DOCUMENTS.
4. IT IS NOT THE INTENT OF THESE PLANS TO SHOW EVERY MINOR DETAIL OF CONSTRUCTION THE CONTRACTOR IS EXPECTED TO FURNISH ALL ITEMS FOR A COMPLETE ELECTRICAL SYSTEM. PROVIDE EVERYTHING NECESSARY FOR EQUIPMENT TO BE PLACED IN PROPER WORKING ORDER. THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MINOR ITEMS WHICH ARE OBVIOUSLY NECESSARY TO COMPLETE THE INSTALLATION.
5. LIGHT SWITCHES SHALL BE MOUNTED 48 INCHES ABOVE FINISHED FLOOR TO CENTER LINE OF THE DEVICE, UNLESS NOTED OTHERWISE. GANG SWITCHES AND DIMMER WITH A COMMON PLATE WHERE TWO (2) OR MORE ARE INDICATED ADJACENT TO EACH OTHER.
6. RECEPTACLES SHALL BE LOCATED 18" ABOVE FINISHED FLOOR TO CENTER LINE OF DEVICE. UNLESS NOTED OTHERWISE. ABOVE-COUNTER RECEPTACLES SHALL BE MOUNTED 6" ABOVE BACK SPLASH TO CENTERLINE OF DEVICE UNLESS NOTED OTHERWISE.
7. USE GALVANIZED RIGID STEEL CONDUIT WHERE EPOSED TO EXTERIOR CONDITIONS OR WHERE EXPOSED IN ANY LOCATIONS WHERE SUBJECT TO MECHANICAL DAMAGE. EMT SHALL BE PROVIDED WITH SET SCREW STEEL FITTINGS FOR INSTALLATION IN ALL CONCEALED WALLS AND CEILINGS IN DRY AREAS. ALL CONDUIT FOR LIGHTING PROTECTION SHALL BE PVC, SCHEDULE 40, UNLESS OTHERWISE NOTED, PVC MAY BE USED WHERE BURIED UNDER GRADE AND ENCASED IN CONCRETE SLAB OR WALLS. ALUMINUM CONDUIT IS NOT ALLOWED. EMT CAN BE USED IN DRY AREAS WHEN INSTALLED 10 FEET ABOVE FINISHED FLOOR LEVEL.
8. ALL CONDUITS IN PUBLIC SHALL BE CONCEALED UNLESS NOTED OTHERWISE.

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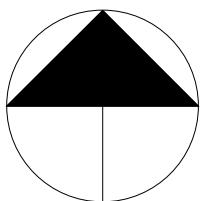
Sheet Name	
<b>ELECTRICAL LIST OF SYMBOLS AND GENERAL NOTES</b>	
Original Issue	09/25/2022 / PROGRESS
Sheet Number	

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Project #	Drawing Date 26/03/2023
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ELECTRICAL SPECIFICATIONS													
<div><div><div>1. DO NOT SCALE DRAWINGS. VERIFY DIMENSIONS IN FIELD PRIOR TO COMMENCEMENT OF WORK.</div><div>2. WHEREVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN TO "PROVIDE AND INSTALL".</div><div>3. FINAL CONNECTIONS TO EQUIPMENT SHALL BE PER MANUFACTURER'S APPROVED WIRING DIAGRAMS, DETAILS AND INSTRUCTIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE MATERIALS AND EQUIPMENT COMPATIBLE WITH EQUIPMENT ACTUALLY SUPPLIED.</div><div>4. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS TO ESTABLISH A STANDARD OF QUALITY. THE ENGINEER RESERVES THE RIGHT TO APPROVE METHODS AND MATERIALS NOT REFLECTED HEREIN.</div><div>5. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL, MECHANICAL, AND OTHER RELATED DRAWINGS PRIOR TO BID.</div><div>6. CONTRACTOR SHALL VISIT SITE PRIOR TO BID AND VERIFY THAT CONDITIONS ARE AS INDICATED IN THE CONTRACT DOCUMENTS. CONTRACTOR SHALL INCLUDE IN HIS BID, ANY COSTS REQUIRED TO MAKE HIS WORK MEET THE CONTRACT SCOPE UTILIZING EXISTING CONDITIONS.</div><div>7. WORK SHALL BE PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT.</div><div>8. WORK, MATERIALS AND EQUIPMENT SHALL CONFORM TO THE LATEST EDITIONS OF LOCAL, STATE AND NATIONAL CODES AND ORDINANCES.</div><div>9. PROVIDE PERMITS AND INSPECTIONS REQUIRED.</div><div>10. GUARANTEE THE INSTALLATION AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP WHICH MAY OCCUR UNDER NORMAL USAGE FOR A PERIOD OF ONE YEAR AFTER OWNER'S ACCEPTANCE. DEFECTS SHALL BE PROMPTLY REMEDIED WITHOUT COST TO THE OWNER.</div><div>11. PROVIDE RECORD DRAWINGS TO ENGINEER. DRAWINGS SHALL INCLUDE ALL ADDENDUM ITEMS, CHANGE ORDERS, ALTERATIONS, REROUTINGS, ETC.</div><div>12. VERIFY SPECIFIC LOCATION OF EQUIPMENT TO BE FURNISHED BY OTHERS PRIOR TO ROUGH-IN.</div><div>13. ELECTRICAL SYSTEMS SHALL BE TESTED FOR PROPER OPERATION. IF TESTS SHOW THAT WORK IS DEFECTIVE, CONTRACTOR SHALL MAKE CORRECTIONS NECESSARY AT NO COST TO OWNER.</div><div>14. RECESSED LIGHT FIXTURES INSTALLED IN GYP. BOARD OR PLASTER CEILINGS SHALL HAVE PLASTER FRAMES INSTALLED PRIOR TO CEILING MATERIAL.</div><div>15. RECESSED FIXTURES INSTALLED INDOORS SHALL BE THERMALLY PROTECTED.</div><div>16. SEE DIVISION 15 DRAWINGS FOR LOCATION OF MECHANICAL EQUIPMENT. PROVIDE SERVICE TO AND CONNECT EQUIPMENT AS REQUIRED.</div><div>17. PROVIDE EQUIPMENT GROUNDING CONDUCTOR IN ALL CONDUITS.</div><div>18. ALL ELECTRICAL SYSTEMS COMPONENTS SHALL BE LISTED OR LABELED BY U.L. OR OTHER RECOGNIZED TESTING FACILITY.</div><div>19. WIRE TERMINATION PROVISIONS FOR PANELBOARDS, CIRCUIT BREAKERS, SAFETY SWITCHES, AND ALL OTHER ELECTRICAL APPARATUS SHALL BE LISTED AS SUITABLE FOR 75 DEGREE C.</div><div>20. THE FOLLOWING CONDUCTOR SIZES SHALL BE UTILIZED FOR 20 AMP CIRCUITS PERTAINING TO DISTANCES (IN FEET) INDICATED:</div><div><table><tr><th>120VOLT, 1PH</th><th>CONDUCTOR</th><th>240 VOLT, 1PH</th></tr><tr><td>0-64</td><td>#12AWG</td><td>0-129</td></tr><tr><td>65-106</td><td>#10AWG</td><td>130-212</td></tr><tr><td>107-160</td><td>#8AWG</td><td>213-321</td></tr></table></div><div>NOTE: BASED ON 75°C COPPER CONDUCTORS INSTALLED IN EMT WITH 16AMP LOAD @ 85% P.F.</div><div>21. CONTRACTOR SHALL REVIEW ARCHITECTURAL, STRUCTURAL AND MECHANICAL DRAWINGS AND SHALL PROVIDE LIGHTS, SWITCHES, RECEPTACLES, EQUIPMENT CONNECTIONS, ETC., AND ASSOCIATED CIRCUITING IN NEW AND REMODELED AREAS, EVEN IF SUCH AREAS ARE NOT SHOWN ON ELECTRICAL DRAWINGS. LAYOUTS, FIXTURE TYPES, QUANTITIES AND SPACINGS SHALL BE IN ACCORDANCE WITH SIMILAR AREAS ON THIS PROJECT. CONTRACTOR SHALL INCLUDE COSTS FOR THE ABOVE IN HIS BID. IN ADDITION, CONTRACTOR SHALL PROVIDE LAYOUT DRAWINGS FOR WORK IN SUCH AREAS AND SUBMIT FOR APPROVAL PRIOR TO ROUGH-IN.</div><div>22. WIRE SHALL BE COPPER, 75 DEGREES C RATED FOR GENERAL USE. FOR WIRING WITHIN 3 INCHES OF FLUORESCENT BALLASTS WIRE SHALL BE COPPER, MINIMUM 90 DEGREES C RATED. SIZES INDICATED ARE FOR INSTALLATION IN A MAXIMUM 30 DEGREES C AMBIENT. CONDUCTOR AMPACITY SHALL BE DERATED FOR HIGHER AMBIENT INSTALLATIONS. 600 VOLT COMPACT ALUMINUM WIRE AND CABLE IN SIZES 1/0 AND LARGER MAY BE SUBSTITUTED FOR COPPER ON SERVICES AND FEEDERS IF AMPACITY IS EQUIVALENT TO OR GREATER</div><div>23. CONTRACTOR SHALL BE RESPONSIBLE FOR REPLACING EQUIPMENT WHICH IS DAMAGED DUE TO INCORRECT FIELD WIRING PROVIDED UNDER THIS SECTION OR FACTORY WIRING IN EQUIPMENT PROVIDED UNDER THIS SECTION.</div><div>24. CONTRACTOR'S FAILURE TO ORDER OR RELEASE ORDER FOR MATERIALS AND/OR EQUIPMENT WILL NOT BE ACCEPTED AS A REASON TO SUBSTITUTE ALTERNATE MATERIALS, EQUIPMENT OR INSTALLATION METHODS.</div><div>25. ELECTRICAL SYSTEMS SHALL BE COMPLETE, OPERABLE AND READY FOR CONTINUOUS OPERATION AT COMPLETION OF PROJECT.</div><div>26. RECEPTACES WHICH ARE SHOWN WALL MOUNTED ON THE ELECTRICAL DRAWINGS ON WALLS WHICH, ON THE ARCHITECTURAL DRAWINGS AND ELEVATIONS ARE SHOWN AS GLASS OR PARTITIONS, SHALL BE FLUSH FLOOR DUPLEX RECEPTACLES MOUNTED ADJACENT TO BAS OR WALLS.</div><div>27. RECEPTACLES AT COUNTER SHALL BE MOUNTED WITH THEIR LONG AXIS HORIZONTAL AT +46" UNLESS NOTED.</div><div>28. FLUSH FLOOR RECEPTACLE OUTLETS SHALL BE WIREMOLD 862 SERIES. PROVIDE CARPET OR TILE FLANGE TO MATCH FLOOR FINISH.</div><div>29. THE COLOR OF THE DEVICES AND COVER PLATES SHALL BE AS DIRECTED BY ARCHITECT. IN DAMP OR WET LOCATIONS COVER PLATES SHALL BE STAINLESS STEEL. IN DRY LOCATIONS COVER PLATES SHALL BE SMOOTH HIGH ABUSE NYLON OR EQUIVALENT. PROVIDE COVER PLATES FOR SWITCHES, RECEPTACLES, TELEPHONE, TELEVISION, COMPUTER AND J-BOX OUTLETS AS REQUIRED.</div><div>30. ROMEX CABLE WITH A GROUNDING CONDUCTOR MAY BE USED WHERE PERMITTED BY BOTH THE N.E.C. AND LOCAL ORDINANCES.</div><div>31. DISCONNECT SWITCHES SHALL BE GENERAL DUTY TYPE, FUSIBLE SWITCHES SHALL ACCEPT CLASS 'R' FUSES ONLY AND REJECT ALL OTHERS.</div><div>32. FINAL CONNECTIONS TO VIBRATING EQUIPMENT SHALL BE WITH FLEX (LIQUIDTIGHT FOR EXTERIOR APPLICATIONS) AND APPROVED FITTINGS. DO NOT SECURE CONDUITS, DISCONNECTS OR DEVICES TO DUCTWORK OR MECHANICAL EQUIPMENT.</div><div>33. THE ENGINEER OF RECORD HAS PERFORMED SHORT CIRCUIT CALCULATIONS AND THE AIC RATINGS INDICATED FOR EACH DEVICE IS ADEQUATE TO PROTECT THE EQUIPMENT AND THE ELECTRICAL SYSTEM.</div><div>34. THE ENGINEER OF RECORD HAS PERFORMED VOLTAGE DROP CALCULATIONS AND ALL BRANCH CIRCUITS AND FEEDERS COMPLY WITH NEC 210-19(A) FPN NO.4.</div><div>35. THE CONTRACTOR SHALL PROVIDE 120V CONNECTION TO NEAREST MAINTENANCE RECEPTACLE WHERE REQUIRED FOR CONDENSATE PUMPS ASSOCIATED WITH FAN COIL UNITS. COORDINATE WITH MECHANICAL CONTRACTOR.</div><div>36. THE CONTRACTOR SHALL COORDINATE THE SPECIFIC LOCATION, MOUNTING HEIGHT, ROTATION, TYPE, COLOR, ETC. OF ALL DEVICES PRIOR TO INSTALLATION.</div><div>37. CONNECTIONS TO HYDROMASSAGE BATHIUBS, JACUZZI TUBS OR SIMILAR EQUIPMENT SHALL BE MADE IN ACCORDANCE WITH ARTICLE 680.70 OF THE NEC. PROVIDE BONDING AS REQUIRED BY ARTICLE 680.74 OF THE NEC.</div><div>38. ALL INDOOR FLUORESCENT FIXTURES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE OR BALLASTED LUMINARIES THAT ARE SUPPLIED FROM MULTIWIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE SHALL COMPLY WITH 410.73 (G) OF THE NEC.</div><div>39. CEILING MOUNTED SMOKE AND CARBON MONOXIDE DETECTORS PER NFPA 72, SECTION R314 MUST COMPLY WITH U.L. 2075 AND SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS.</div><div>40. ALL SMOKE DETECTORS AND COMBINATION SMOKE/CARBON MONOXIDE DETECTORS SHALL BE HARDWIRED ON SAME CIRCUIT AND HAVE A BATTERY BACKUP SYSTEM.</div><div>41. WHEN MORE THAN EITHER ONE (1) SMOKE ALARM OR MORE THAN ONE (1) CARBON MONOXIDE ALARM IS REQUIRED TO BE INSTALLED WITHIN AN INDIVIDUAL DWELLING UNIT, ALL ALARM DEVICES SHALL BE INTERCONNECTED IN SUCH A MANNER THAT THE ACTUATION OF ONE ALARM WILL ACTIVATE ALL OF THE ALARMS IN THE INDIVIDUAL UNIT. SMOKE AND CARBON MONOXIDE ALARMS SHALL BE INSTALLED IN THE FOLLOWING LOCATIONS. (IRC SECTION R314.5 AS AMENDED)<div><div>A. SMOKE ALARMS IN EACH SLEEPING ROOM.</div><div>B. SMOKE ALARMS OUTSIDE OF EACH SEPARATE SLEEPING AREA IN THE IMMEDIATE VICINITY OF THE BEDROOMS.</div><div>C. SMOKE ALARMS ON EACH ADDITIONAL STORY OF THE DWELLING INCLUDING BASEMENTS BUT NOT INCLUDING CRAWL SPACE AND UNINHABITABLE ATTICS. IN DWELLINGS OR DWELLING UNITS WITH SPLIT LEVELS AND WITHOUT AN INTERVENING DOOR BETWEEN THE ADJACENT LEVELS, A SMOKE ALARM INSTALLED ON THE UPPER LEVEL SHALL SUFFICE FOR THE ADJACENT LOWER LEVEL PROVIDED THAT THE LOWER LEVEL IS LESS THAN ONE FULL STORY BELOW THE UPPER LEVEL...</div><div>D. CARBON MONOXIDE ALARMS OUTSIDE OF SLEEPING AREAS IN THE IMMEDIATE VICINITY OF THE BEDROOMS IN DWELLING UNITS WITHIN WHICH FUEL-FIRED APPLIANCES ARE INSTALLED AND IN DWELLING UNITS THAT HAVE ATTACHED GARAGES.</div><div>E. CARBON MONOXIDE ALARMS WITHIN EACH BEDROOM WHICH CONTAINS A FUEL-FIRED APPLIANCE.</div></div></div><div>43. ALL BRANCH CIRCUITS THAT SUPPLY 125-VOLT, SINGLE PHASE, 15 AND 20 AMP BRANCH CIRCUITS SUPPLYING OUTLETS INSTALLED IN DWELLING UNIT FAMILY ROOMS, DINING ROOMS, LIVING ROOMS, PARLORS, LIBRARIES, DENIS, BEDROOMS, SUNROOMS, RECREATION ROOMS, CLOSETS, HALLWAYS, OR SIMILAR ROOMS OR AREAS SHALL BE PROTECTED BY A LISTED ARC-FAULT CIRCUIT INTERRUPTER, COMBINATION-TYPE, INSTALLED TO PROVIDE PROTECTION OF THE BRANCH CIRCUIT. NEC ARTICLE 210.12 (A).</div><div>44. ALL ATTIC ACCESSES SHALL BE PROVIDED WITH A SWITCHED LIGHT AND 120 VOLT GFI OUTLET AT OR NEAR THE FORCED AIR UNIT. LOCATE LIGHT SWITCH AT THE ATTIC ACCESS OPENING.</div></div></div>	120VOLT, 1PH	CONDUCTOR	240 VOLT, 1PH	0-64	#12AWG	0-129	65-106	#10AWG	130-212	107-160	#8AWG	213-321	<div><div>NOTES:</div><div>1. FIXTURES SHALL HAVE APPROPRIATE U.L. LABEL (i.e., DAMP OR WET) AS REQUIRED BY CODES AND ORDINANCES.</div><div>2. FIXTURES SHALL INCLUDE ALL ACCESSORIES NECESSARY FOR INSTALLATION ACCORDING TO MANUFACTURER'S SHOP DRAWINGS AND AS REQUIRED BY CODES AND LOCAL ORDINANCES.</div><div>3. PRIOR TO ORDERING ANY LIGHTING EQUIPMENT, THE CONTRACTOR SHALL COORDINATE ALL FIXTURE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS AND CEILING CAVITY DEPTHS.</div><div>4. ALL LAMPS SHALL BE PROVIDED AND INSTALLED ACCORDING TO THE ATTACHED FIXTURE SCHEDULE AND SPECIFICATIONS ENSURE COMPATIBILITY BETWEEN FIXTURE, LAMP(S) AND BALLAST(S). (OSRAM SYLVANIA SERIES)</div><div>5. CONTRACTOR SHALL VERIFY FIXTURE VOLTAGES AND CEILING TRIM COMPATIBILITY PRIOR TO ORDERING FIXTURE.</div><div>6. PROVIDE APPROVED FIRE-RATED ENCLOSURES FOR ALL LIGHTING FIXTURES LOCATED IN FIRE-RATED CEILINGS.</div><div>7. LIGHTING FIXTURE CATALOG NUMBERS ARE SERIES TYPE ONLY. PROVIDE ALL NECESSARY HARDWARE AS REQUIRED BY THE SPECIFICATIONS, DRAWINGS, AND PROJECT CONDITIONS FOR A COMPLETE INSTALLATION.</div><div>8. ALL FIXTURES SHALL BE ORDERED WITH APPROPRIATE BALLAST(S) THAT HAVE U.L. AND CB, LABELS. ALL BALLASTS MUST CONFORM TO TITLE 24 AND/OR IECC REQUIREMENTS FOR PERFORMANCE. PROVIDE MULTIPLE BALLASTS FOR DUAL LEVEL SWITCHING AND WIRING (i.e. TANDEM) AS INDICATED ON THE PLANS.</div><div>9. UPON INITIAL ENERGIZING OF ALL NEW FLUORESCENT LAMPS, A CONTINUOUS PERIOD OF 30 HOURS SHALL OCCUR PRIOR TO DE-ENERGIZING OF LAMPS FOR MANUFACTURER REQUIRED</div><div>10. ALL FLUORESCENT BALLASTS SHALL BE ELECTRONIC TYPE, PROVIDE END OF LIFE (EOL) SHUT-DOWN PROTECTION FOR COMPACT FLUORESCENT LAMPS.</div><div>11. ENSURE COMPATIBILITY OF ALL LIGHTING SYSTEM COMPONENTS, ESPECIALLY DIMMED SYSTEMS, FIXTURES, LAMPS, BALLAST(S), AND DIMMING SYSTEMS/INDIVIDUAL CONTROLS MUST BE FACTORY CERTIFIED</div><div>12. COMPATIBLE FOR FULL RANGE OF DIMMING COMPATIBILITY.</div><div>13. PROVIDE CLEARANCES FROM COMBUSTIBLES, A MINIMUM OF 3/4" [OTHER THAN AT POINTS OF SUPPORT] AND 3" FROM INSULATION FOR RECESSED LIGHTING FIXTURES WHICH ARE NON-IC, RATED.</div><div>14. PROVIDE A MINIMUM OF TWO (2) #12 SUPPORT WIRES ATTACHED TO BUILDING FRAME IN ADDITION TO T-BAR CLIPS FOR FLUORESCENT FIXTURES RECESSED IN SUSPENDED T-BAR CEILING.</div><div>15. FIXTURES WITH EMERGENCY BATTERY BACKUP SHALL BE WIRED AHEAD OF ANY LOCAL SWITCHING IN COMPLIANCE WITH NEC ARTICLE 700.</div><div>16. EMERGENCY LIGHTING UNITS SHALL BE EQUIPPED WITH FACTORY-INSTALLED INTEGRAL TEST SWITCHES.</div><div>17. PROVIDE DOOR-TO-FRAME AND LENS-TO-DOOR GASKETING, INVERTED LENS, AND FOOD SERVICE RATING FOR ALL FIXTURES LOCATED IN FOOD SERVICE AREAS.</div><div>18. FLUORESCENT LUMINARIES THAT UTILIZE DOUBLE-ENDED LAMPS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE, OR BALLASTED LUMINARIES THAT ARE SUPPLIED FROM MULTIWIRE BRANCH CIRCUITS AND CONTAIN BALLAST(S) THAT CAN BE SERVICED IN PLACE, SHALL HAVE DISCONNECTING MEANS EITHER INTERNAL OR EXTERNAL TO EACH LUMINAIRE SO TO DISCONNECT SIMULTANEOUSLY FROM THE SOURCE OF SUPPLY ALL CONDUCTORS OF THE BALLAST (INCLUDING THE GROUNDED CONDUCTOR IF ANY). IN ACCORDANCE WITH NEC ARTICLE 410, THE LINE-SIDE TERMINALS OF THE DISCONNECTING MEANS SHALL BE LOCATED SO AS TO BE ACCESSIBLE TO QUALIFIED PERSONS BEFORE SERVICING OR MAINTAINING THE BALLAST.</div><div>19. ALL FLUORESCENT LAMPS SHALL BE OF A LOW MERCURY DESIGN, HAVE A MINIMUM CRI RATING OF 85 AND 3500K COLOR TEMPERATURE UNLESS NOTED OTHERWISE.</div></div>
120VOLT, 1PH	CONDUCTOR	240 VOLT, 1PH											
0-64	#12AWG	0-129											
65-106	#10AWG	130-212											
107-160	#8AWG	213-321											

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## DESIGN DEVELOPMENT

Sheet Name

## ELEC.SPECIFICATIONS

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

**E 0.01**

Project #

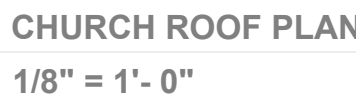
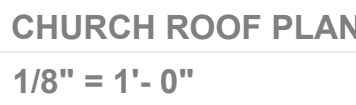
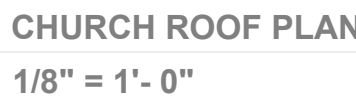
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## DESIGN DEVELOPMENT

Sheet Name  
**POWER LAYOUT ROOF  
FLOOR**

Original Issue	09/25/2022 / PROGRESS
Sheet Number	

## E 1.02

<b>Project #</b>	<b>Drawing Date</b> 26/03/2023
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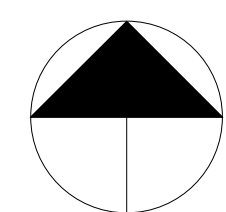


	DESCRIPTION	*	WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	*
1	Lighting 110-111-112	L	2X 12 AWG - #12G		15A-1P	1.80	2.40			0.60	15A-1P	2X 12 AWG - #12G		Lighting Lobby 101	L 2
3	Lighting 102-104-105-113	L	2X 12 AWG - #12G		15A-1P	0.90		1.80		0.90	15A-1P	2X 12 AWG - #12G		Lighting 107-108-109-112 & Covered Connection	L 4
5	Receptacles Electric Room	R	2X 10 AWG - #10G		20A-1P	0.72			1.80	1.08	20A-1P	2X 10 AWG - #10G		Receptacles Corridor	R 6
7	Receptacles 109-112	R	2X 10 AWG - #10G		20A-1P	1.26	1.98			0.72	20A-1P	2X 10 AWG - #10G		Receptacles 107	R 8
9	Receptacles 106	R	2X 10 AWG - #10G		20A-1P	0.90		1.80		0.90	20A-1P	2X 10 AWG - #10G		Receptacles 101 & Corridor	R 10
11	Receptacles 103-113	R	2X 10 AWG - #10G		20A-1P	1.26			2.16	0.90	20A-1P	2X 10 AWG - #10G		Receptacles 102	R 12
13	Receptacles 104	R	2X 10 AWG - #10G		20A-1P	0.72	1.44			0.72	20A-1P	2X 10 AWG - #10G		Receptacles 105	R 14
15	Receptacles 110	R	2X 10 AWG - #10G		20A-1P	1.08		2.16		1.08	20A-1P	2X 10 AWG - #10G		Receptacles 111-112	R 16
17	Receptacles 111-112	R	2X 10 AWG - #10G		20A-1P	1.08			2.16	1.08	20A-1P	2X 10 AWG - #10G		Receptacles 110	R 18
19	Receptacles 101	R	2X 10 AWG - #10G		20A-1P	0.90	5.46			4.56					
21		A				4.56		9.12		4.56					
23		A				4.56			9.12	4.56					
25		A				4.56	9.12			4.56					
27		A				4.56		6.06		1.50	20A-1P	2X 10 AWG - #10G			
29		A				4.56			6.06	1.50	20A-1P	2X 10 AWG - #10G			
31		A				4.56	4.91			0.35	20A-1P	2X 10 AWG - #10G			
33		N				10.94		11.74		0.80	15A-1P	2X 12 AWG - #12G			
35		N				10.94			11.19	0.25	15A-1P	2X 12 AWG - #12G			
37		N				10.94				0.35	15A-1P	2X 12 AWG - #12G			
39											20A-1P	2X 10 AWG - #10G			
41											20A-1P	2X 10 AWG - #10G			
43											20A-1P	2X 10 AWG - #10G			
	(KVA)														
	Total Connected Load					25.31	32.68	32.49							

CB	WIRE	GRD	DESCRIPTION	*
15A-1P	2X 12 AWG - #12G		Lighting Lobby 101	L 2
15A-1P	2X 12 AWG - #12G		Lighting 107-108-109-112 & Covered Connection	L 4
20A-1P	2X 10 AWG - #10G		Receptacles Corridor	R 6
20A-1P	2X 10 AWG - #10G		Receptacles 107	R 8
20A-1P	2X 10 AWG - #10G		Receptacles 101 & Corridor	R 10
20A-1P	2X 10 AWG - #10G		Receptacles 102	R 12
20A-1P	2X 10 AWG - #10G		Receptacles 105	R 14
20A-1P	2X 10 AWG - #10G		Receptacles 111-112	R 16
20A-1P	2X 10 AWG - #10G		Receptacles 110	R 18
50A-2P	2X 6 AWG - #6G		RTU-2	A 20 A 22
50A-2P	2X 6 AWG - #6G		RTU-4	A 24 A 26
20A-1P	2X 10 AWG - #10G		Electric Water Heater	H 28
20A-1P	2X 10 AWG - #10G		Electric Water Heater	H 30
20A-1P	2X 10 AWG - #10G		Gas Water Heater	H 32
15A-1P	2X 12 AWG - #12G		Lighting Projector	L 34
15A-1P	2X 12 AWG - #12G		Emergency Light **	L 36
15A-1P	2X 12 AWG - #12G		Exit Light **	L 38
20A-1P	2X 10 AWG - #10G		Spare	40
20A-1P	2X 10 AWG - #10G		Spare	42
20A-1P	2X 10 AWG - #10G		Spare	44

	DESCRIPTION	* WIRE	GRD	CB	KVA	A	B	C	KVA	CB	WIRE	GRD	DESCRIPTION	* L
1	Lighting 102-103	L 2X 12 AWG - #12G		15A-1P	0.60	1.20			0.60	15A-1P	2X 12 AWG - #12G		Lighting 104-105	2
3	Lighting 112-113	L 2X 12 AWG - #12G		15A-1P	0.60		1.20		0.60	15A-1P	2X 12 AWG - #12G		Lighting 110-111	4
5	Lighting 106-107-108-109	L 2X 12 AWG - #12G		15A-1P	0.50			0.88	0.38	15A-1P	2X 12 AWG - #12G		Lighting 101	6
7	Receptacles 102	R 2X 10 AWG - #10G		20A-1P	1.08	2.16			1.08	20A-1P	2X 10 AWG - #10G		Receptacles 103	8
9	Receptacles 104	R 2X 10 AWG - #10G		20A-1P	1.08		2.16		1.08	20A-1P	2X 10 AWG - #10G		Receptacles 105	10
11	Receptacles 113	R 2X 10 AWG - #10G		20A-1P	1.08			2.16	1.08	20A-1P	2X 10 AWG - #10G		Receptacles 112	12
13	Receptacles 111	R 2X 10 AWG - #10G		20A-1P	1.08	2.16			1.08	20A-1P	2X 10 AWG - #10G		Receptacles 110	14
15	Receptacles 101	R 2X 10 AWG - #10G		20A-1P	1.26		2.34		1.08	20A-1P	2X 10 AWG - #10G		Receptacles 109	16
17	Receptacles 107-108 & Corridor	R 2X 10 AWG - #10G		20A-1P	1.08			2.16	1.08	20A-1P	2X 10 AWG - #10G		Receptacles 106	18
19	RTU-6	A 2X 6 AWG - #6G		50A-2P	4.56	9.86			5.30	60A-2P	2X 4 AWG - #4G		RTU-7	A 20
21		A			4.56		9.86		5.30					A 22
23	Electric Water Heater	H 2X 10 AWG - #10G		20A-1P	1.50			3.00	1.50	20A-1P	2X 10 AWG - #10G		Electric Water Heater	H 24
25	Spare	2X 10 AWG - #10G		20A-1P		0.25			0.25	15A-1P	2X 12 AWG - #12G		Emergency Light **	L 26
27	Spare	2X 10 AWG - #10G		20A-1P			0.35		0.35	15A-1P	2X 12 AWG - #12G		Exit Light **	L 28
29	Spare	2X 10 AWG - #10G		20A-1P						20A-1P	2X 10 AWG - #10G		Spare	30
53	Spare	2X 10 AWG - #10G		20A-1P						15A-1P	2X 12 AWG - #12G		Spare	54
	(KVA)													
	Total Connected Load					15.63	15.91	8.20						

	CB	WIRE	GRD	DESCRIPTION	*
	15A-1P	2X 12 A WG - #12G		Lighting 104-105	L 2
	15A-1P	2X 12 A WG - #12G		Lighting 110-111	L 4
	15A-1P	2X 12 A WG - #12G		Lighting 101	L 6
	20A-1P	2X 10 A WG - #10G		Receptacles 103	R 8
	20A-1P	2X 10 A WG - #10G		Receptacles 105	R 10
	20A-1P	2X 10 A WG - #10G		Receptacles 112	R 12
	20A-1P	2X 10 A WG - #10G		Receptacles 110	R 14
	20A-1P	2X 10 A WG - #10G		Receptacles 109	R 16
	20A-1P	2X 10 A WG - #10G		Receptacles 106	R 18
	60A-2P	4 A WG - #4G		RTU-7	A 20 A 22
	20A-1P	2X 10 A WG - #10G		Electric Water Heater	H 24
	15A-1P	2X 12 A WG - #12G		Emergency Light **	L 26
	15A-1P	2X 12 A WG - #12G		Exit Light **	L 28
	20A-1P	2X 10 A WG - #10G		Spare	30
	15A-1P	2X 12 A WG - #12G		Spare	54



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Date of issue: 09/25/2022**

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Project #	Drawing Date 26/03/2023
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THE WORK INCLUDES MODIFICATION TO THE EXISTING PLUMBING SYSTEM AND PROVIDING NEW MATERIALS, FITTINGS AND ACCESSORIES NECESSARY FOR A COMPLETE FUNCTIONING PLUMBING SYSTEM. THE WORK ALSO INCLUDES ROUGH-IN AND FINAL CONNECTIONS TO FOOD SERVICE EQUIPMENT AND BEVERAGE DISPENSING EQUIPMENT PROVIDED BY OTHERS. ALL WORK SHALL BE IN ACCORDANCE WITH LOCAL CODES AND/OR ORDINANCES AND IS SUBJECT TO INSPECTION. HOOK-UP CHARGES, PERMITS AND ALL OTHER EXPENSES RELATED TO A COMPLETE AND FUNCTIONING PLUMBING SYSTEM ARE INCLUDED AS A PART OF THIS SECTION. WARRANTY: PROVIDE LABOR AND MATERIALS TO REPAIR OR REPLACE DEFECTIVE PARTS AND MATERIALS AS REQUIRED FOR ONE YEAR AFTER SUBSTANTIAL COMPLETION OR OWNER ACCEPTANCE OF THE COMPLETED PROJECT. PROVIDE A SEPARATE LINE ITEM DEDUCT AMOUNT ON THE PROPOSAL FORM TO DELETE WARRANTY SERVICE, AT THE OWNER'S OPTION. THE INTENT OF THE DRAWINGS IS TO INDICATE THE GENERAL EXTENT OF WORK REQUIRED FOR THE PROJECT. THE DRAWINGS FOR PLUMBING WORK ARE DIAGRAMMATIC, SHOWING THE GENERAL LOCATION, TYPE, FIXTURES AND EQUIPMENT REQUIRED. THE DRAWINGS SHALL NOT BE SCALED FOR EXACT MEASUREMENTS. REFER TO MANUFACTURER'S STANDARD ROUGH-IN DRAWINGS FOR PLUMBING FIXTURE INSTALLATION REQUIREMENTS. COMPLY WITH ALL APPLICABLE ADA INSTALLATION REQUIREMENTS. COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE. PIPING SYSTEMS - GENERAL: ALL PIPING SHALL BE RUN PARALLEL TO BUILDING LINES AND SUPPORTED AND ANCHORED AS REQUIRED TO FACILITATE EXPANSION AND CONTRACTION. ALL PIPING SHALL BE CONCEALED EXCEPT IN UNFINISHED SPACES. INSTALL AS REQUIRED TO MEET ALL CONSTRUCTION CONDITIONS AND TO ALLOW FOR INSTALLATION OF OTHER WORK SUCH AS DUCTS AND ELECTRICAL CONDUIT. AT ALL CONNECTIONS BETWEEN FERROUS PIPING AND NONFERROUS PIPING, PROVIDE AN ISOLATING DIELECTRIC UNION. ALL HANGERS SHALL BE COMPATIBLE WITH THE PIPING MATERIAL TO PREVENT CORROSION. PROVIDE ALL FITTINGS, ACCESSORIES, OFFSHOTS AND MATERIALS NECESSARY TO FACILITATE THE PLUMBING SYSTEMS FUNCTIONING AS INDICATED BY THE DESIGN AND THE EQUIPMENT INDICATED. FIXTURES/EQUIPMENT FURNISHED BY OTHERS: PLUMBING CONTRACTOR SHALL PROVIDE UTILITY CONNECTIONS REQUIRED SUCH AS WATER, GAS, AIR, SUPPLIES, WASTE OUTLET, TRAPS, ETC. AT ALL PLUMBING TYPE FIXTURES OR EQUIPMENT FURNISHED BY OWNER, GENERAL CONTRACTOR, FOOD SERVICE CONTRACTOR, EQUIPMENT SUPPLIER, ETC. INCLUDED ARE STOP VALVES, ESCUTCHEONS, AND CHROME PLATED BRASS TUBING WITH COMPRESSION FITTINGS. SEWER AND WASTE PIPING: PROVIDE ALL DRAINS AND SEWERS WITHIN THE SPACE WITH CONNECTION TO THE EXISTING DRAINAGE SYSTEMS ON-SITE. SANITARY DRAINAGE PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. SANITARY DRAINAGE PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS MAY BE USED (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES). ALL DRAINAGE PIPING SHALL BE UNIFORMLY PITCHED, 1/4" PER FOOT UNLESS OTHERWISE REQUIRED BY EXISTING CONDITIONS, OR INDICATED ON THE DRAWINGS. VENTS: PROVIDE A COMPLETE SYSTEM OF STANDARD WEIGHT CAST IRON NO-HUB VENT RISERS WHERE THE CEILING SPACE IS USED AS A RETURN AIR PLENUM OR USE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE (WHERE PERMITTED BY CODE/LOCAL AUTHORITIES) WHERE THERE IS A DUCTED RETURN AIR SYSTEM. DO NOT USE PVC PIPE IN RETURN AIR PLENUM SPACES. THE VENT SYSTEM SHALL BE CARRIED THROUGH THE ROOF WITH APPROPRIATE FLASHING. CONDENSATE AND INDIRECT DRAIN PIPING: PIPING ABOVE FLOOR SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE, FITTINGS AND CONNECTIONS. PIPING BELOW GRADE SHALL BE CO-EXTRUDED PVC DWV (SCHEDULE 40) PIPE WITH SOLVENT WELD FITTINGS. CLEANOUTS: PROVIDE CLEANOUTS AT THE END OF EACH HORIZONTAL RUN, AND AT THE BASE OF ALL VERTICAL WASTE AND DRAIN PIPES. CLEANOUTS SHALL BE OF THE SAME SIZE AS THE PIPES THEY SERVE, CONFORMING TO CODE REQUIREMENTS. PROVIDE SUITABLE WALL OR FLOOR CLEANOUTS WITH ACCESSORIES TO OBSCURE FROM VIEW. WATER DISTRIBUTION PIPING: LAYOUT WATER PIPING SO THAT THE ENTIRE SYSTEM CAN BE DRAINED. HOT AND COLD WATER PIPING SHALL BE 1/2" MIN. CPVC PIPE WITH SOLVENT FITTING. PROVIDE WATER HAMMER ARRESTERS AT EACH FIXTURE OR GROUP OF FIXTURES AS REQUIRED. INSTALL CHROME PLATED BRASS ESCUTCHEON PLATES AT ALL PENETRATIONS THROUGH FINISHED SURFACES (INCLUDING CABINET INTERIORS). PIPE INSULATION: INSULATE (AS ALLOWED BY CODE) ALL LISTED SERVICE PIPING AS FOLLOWS. DOMESTIC COLD/HOT WATER, HOT WATER RETURN, STORM WATER PIPING: PROVIDE 1" PREFORMED FIBERGLASS, AS/JS-11, FLAME SPREAD 25, SMOKE DEVELOPED 50, ASTM C-547. FOR CONDENSATE PIPING PROVIDE 1/2" THICK INSULATION OF SAME CHARACTERISTICS AS LISTED FOR 1" ABOVE. WHERE PERMITTED BY LOCAL CODES, PROVIDE 1/2" SELF-ADHESIVE UNICELLULAR FOAM PIPE INSULATION WITH PRE-FORMED PVC FITTING COVERS - EQUAL TO SELF-ADHESIVE ARMSTRONG 2000 WITH K FACTOR OF 0.27 AT 75 DEGREES MEAN TEMPERATURE. INSULATE ANY EXPOSED CONDENSATE PIPING WITH WASTE TEMPERATURE BELOW 60 DEGREES F. SHUTOFF VALVES, WITH UTILITY SHALL BE PROVIDED FOR SERVICE TO EACH PLUMBING FIXTURE, FOOD SERVICE EQUIPMENT OR OTHER EQUIPMENT ITEM, TO FACILITATE LAYOUT FOR REPAIR OR REPLACEMENT. REPAIR OR REPLACE TO MEET LISTED TO #902-T BALL VALVE, CHROME-FINISHED BRONZE, TEFLON SEATS AND PACKING, 40 LB. W.O.G. SOLDER END. ACCESS PANELS SHALL BE PROVIDED WHERE CONCEALED CONTROL DEVICES, VALVES, ETC. ARE CONCEALED WITHIN WALLS. WHERE ACCESS FOR ADJUSTMENT AND MAINTENANCE IS POSSIBLE THROUGH LAY-IN SUSPENDED CEILINGS, ACCESS PANELS ARE NOT REQUIRED. PIPING SYSTEM- PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPE WITH SOLVENT FITTINGS SHALL BE USED WHERE PERMITTED BY CODE/LOCAL AUTHORITIES. INSTALLATION: THOROUGHLY CLEAN ITEMS BEFORE INSTALLATION. CAP PIPE OPENINGS TO EXCLUDE DIRT UNTIL FIXTURES ARE INSTALLED AND FINAL CONNECTIONS HAVE BEEN MADE. PROCEED AS RAPIDLY AS CONSTRUCTION WILL PERMIT. SET FIXTURES LEVEL AND IN PROPER ALIGNMENT. INSTALL SUPPLIES IN PROPER ALIGNMENT WITH FIXTURES. INSTALL SILICONE SEALANT BETWEEN FIXTURES AND ADJACENT MATERIAL, FOR SANITARY JOINT, AND OMIT ESCUTCHEONS. REPAIR EXISTING PLUMBING SYSTEM COMPONENTS DAMAGED BY CONSTRUCTION OPERATIONS AND RESTORE TO ORIGINAL CONDITIONS. TEST WATER SYSTEM UNDER 150 PSIG HYDROSTATIC PRESSURE, FOR FOUR (4) HOURS MINIMUM. WHEN TESTING INDICATES MATERIALS OR WORKMANSHIP IS DEFICIENT, REPLACE OR REPAIR AS REQUIRED, AND REPEAT TEST UNTIL STANDARDS ARE ACHIEVED. ROOF PENETRATIONS SHALL COMPLY WITH "SMACNA" AND "NRCRA" STANDARDS, AND WITH THE REQUIREMENTS OF THE EXISTING ROOFING WARRANTY, IF APPLICABLE. DO NOT PERFORM ROOFING PENETRATIONS IN A MANNER WHICH WOULD VOID OR OTHERWISE LIMIT THE EXISTING ROOFING WARRANTY.

1. THE INTENT OF THESE PLANS AND SPECIFICATIONS IS TO INCLUDE ALL LABOR, EQUIPMENT, MATERIALS, AND SERVICES NECESSARY TO FURNISH, INSTALL, TEST, AND ADJUST A COMPLETE WORKABLE PLUMBING INSTALLATION AS SHOWN, PRESCRIBED, OR REASONABLY IMPLIED BUT NOT LIMITED TO THAT EXPLICITLY INDICATED IN THE CONTRACT DOCUMENTS, BUT NECESSARY FOR THE PROPER EXECUTION AND COMPLETION OF THE INTENT THEREOF.
2. THE ENTIRE INSTALLATION SHALL CONFORM TO THE REQUIREMENTS OF THE 2021 INTERNATIONAL PLUMBING CODE, 2021 INTERNATIONAL BUILDING CODE, 2021 INTERNATIONAL ENERGY CONSERVATION CODE AND ALL OTHER APPLICABLE CODES AND REGULATIONS REQUIRED BY AUTHORITIES HAVING JURISDICTION. IN THE EVENT OF CONFLICT BETWEEN SPECIFICATIONS, CODES, AND REGULATIONS, THE MORE RESTRICTIVE SHALL APPLY.
3. COORDINATE ENTIRE INSTALLATION OF THE PLUMBING SYSTEM WITH THE WORK OF OTHER TRADES PRIOR TO ANY FABRICATION OR INSTALLATION. FIELD VERIFY ALL DIMENSIONS AND CONDITIONS. REPORT ANY DISCREPANCIES, IN WRITING, TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
4. CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS WITH ALL CHANGES NOTED THEREON AT THE COMPLETION OF THE PROJECT IN ACCORDANCE WITH THE SPECIFICATIONS. PROVIDE ONE YEAR WARRANTY ON ALL PARTS AND LABOR.
5. THE DRAWINGS ARE DIAGRAMMATIC AND INTENDED TO SHOW SCOPE. CONTRACTOR SHALL COORDINATE HIS WORK WITH OTHER TRADES TO PROVIDE THE BEST ARRANGEMENT OF ALL DUCT, PIPE, CONDUIT, ETC. ALL CUTTING AND PATCHING OF THE EXISTING STRUCTURE SHALL BE PROVIDED UNDER OTHER SECTIONS OF THE WORK. PROVIDE NECESSARY REQUIREMENTS TO THE PROJECT SUPERINTENDENT.
6. ALL HOT WATER PIPING AND RECIRCULATION PIPING (EXCEPT RUNOUTS 12" OR SHORTER TO INDIVIDUAL FIXTURES) SHALL BE INSULATED TO MEET THE REQUIREMENTS OF THE 2021 INTERNATIONAL ENERGY CONSERVATION CODE.
7. CONDENSATE DRAINS SHALL BE PROVIDED FOR EACH AIR CONDITIONING UNIT. HORIZONTAL CONDENSATE DRAINS ABOVE ANY CEILING SHALL BE INSULATED WITH MIN. 3/8" THICK CLOSED CELL INSULATION.
8. PIPING:
9. A. WASTE, VENT, AND STORM DRAIN PIPING SHALL BE CO-EXTRUDED PVC (SCHEDULE 40) PIPE
10. B. WATER PIPE SHALL BE CPVC PIPE
11. C. CONDENSATE PIPING SHALL BE CO-EXTRUDED PVC (SCHEDULE 40) PIPE
12. D. INSIDE GAS PIPING SHALL BE BLACK IRON SCHEDULE 40 WITH MALLEABLE IRON FITTINGS. OUTSIDE SHALL BE GALVANIZED IRON SCHEDULE 40 WITH GALVANIZED FITTINGS. GAS LINE TO BE PAINTED GRAY IN COLOR. A 24 HOUR METERED GAS TEST SHALL BE REQUIRED
13. E. ALL PIPING NOT ENCLOSED IN CONDITION SPACE OR AT EXTERIOR WALLS SHALL BE INSULATED.
14. F. PIPING: PVC SCHEDULE 40, SCHEDULE 80 AND CPVC PIPING WITH SOLVENT WELD FITTINGS SHALL BE USED WHERE PERMITTED BY CODE/LOCAL AUTHORITIES
15. 11. ALL VENTS OR EXHAUSTS SHALL BE AT LEAST 10 FT. AWAY OR 3 FT. ABOVE ANY WINDOW, DOOR, OPENING, OR AIR INTAKE.
16. 12. CLEANOUTS SHALL BE INSTALLED PER THE INTERNATIONAL PLUMBING CODE.
17. 13. PROVIDE WATER TIGHT FLASHINGS WHEREVER PIPES PASS THROUGH EXTERIOR WALLS, ROOFS, OR FLOORS.
18. 14. PROVIDE ISOLATION FOR ALL PIPES THAT COME IN CONTACT WITH THE STRUCTURE.
19. 15. LOCATION OF EXISTING UTILITIES AND POINTS OF CONNECTION ARE APPROXIMATE. CONTRACTOR SHALL VERIFY EXACT LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICES PRIOR TO STARTING WORK OF THIS SECTION. IF INDICATED POINTS OF CONNECTION CANNOT BE MADE TO EXISTING UTILITIES AS FOUND, THE CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO INSTALLING ANY WORK WHICH MAY BE AFFECTED.
20. 16. VALVES SHALL BE NIBCO, JENKINS, HAMMOND, RED & WHITE OR APPROVED EQUAL. SERVICE PRESSURE SHALL BE SUITABLE FOR SERVICE INTENDED. THE MAIN WATER SHUT OFF VALVE SHALL BE A FULL PORT BALL TYPE AND APPROVED FOR SERVICE INTENDED.
21. 17. CONTRACTOR SHALL PROVIDE ALL SHUT OFF VALVES AS NECESSARY TO ISOLATE ANY EQUIPMENT, PLUMBING ITEMS, OR FIXTURES, THAT MAY NEED SERVICING OR ARE SUBJECT TO FAILURE WHETHER OR NOT SUCH VALVES ARE SHOWN ON THE DRAWINGS.
22. 18. PROVIDE HANGERS AND SUPPORTS AS REQUIRED. PLUMBERS TAPE AND WIRE ARE NOT ACCEPTABLE.
23. 19. CONTRACTOR IS RESPONSIBLE FOR HIS OWN TRENCHING, BACKFILL, AND COMPACTION OF TRENCHES NECESSARY TO COMPLETE HIS SCOPE OF WORK. BACKFILLED TRENCHES SHALL BE RETURNED TO THE ORIGINAL GRADE, UNLESS NOTED OTHERWISE.
24. 20. CONTRACTOR SHALL AFFIX A MAINTENANCE LABEL TO ALL EQUIPMENT REQUIRING ROUTINE MAINTENANCE AND SHALL PROVIDE MAINTENANCE AND OPERATIONAL MANUALS IN ACCORDANCE WITH THE SPECIFICATIONS.
25. 21. ALL EQUIPMENT THAT REQUIRES KEYS OR SPECIAL TOOLS TO OPERATE SHALL SUPPLY THE OWNER WITH TWO OF ANY SUCH KEYS OR TOOLS FOR EACH PIECE OF EQUIPMENT THAT REQUIRE THE SAME.
26. 25. ANY CHANGE OR DEVIATION FROM THESE PLANS OR SPECIFICATIONS SHALL REQUIRE THE APPROVAL, IN WRITING, OF THE ENGINEER PRIOR TO COMMENCEMENT OF SUCH WORK.
27. 26. ALL PLUMBING, ELECTRICAL, AND GAS LINES SHALL BE CONCEALED WITHIN THE BUILDING STRUCTURE TO AS GREAT EXTENT AS POSSIBLE. ALL LINES NOT CONCEALED SHALL BE SECURED 6" OFF THE FLOOR AND 3/4" FROM THE WALLS USING STANDOFF BRACKETS
28. 27. AN APPROVED BACKFLOW PREVENTOR SHALL BE PROPERLY INSTALLED UPSTREAM OF ANY POTENTIAL HAZARD BETWEEN THE POTABLE WATER SUPPLY AND SOURCE OF CONTAMINATION.
29. 28. WATER SUPPLY CARBONATORS SHALL BE PROTECTED BY AN APPROVED REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR. THE RELIEF VALVE SHALL DRAIN INDIRECTLY TO A FLOOR SINK WITH A 1" MIN. AIR GAP.

**PLUMBING / GENERAL NOTES**  
BATHTUBS AND WHIRLPOOL BATHTUBS. THE MAX. HOT WATER TEMPERATURE DISCHARGING SHALL BE LIMITED TO 120 DEGREES.

BATHTUBS WASTE OPENING IN FLOOR OVER CRAWL SPACES SHALL BE PROTECTED BY A METAL SCREEN NOT EXCEEDING 12" OR SOLID COVER.

SHOWERS AND TUB-SHOWERS COMBINATIONS IN ALL BUILDINGS SHALL BE PROVIDED WITH INDIVIDUAL CONTROL VALVES OF THE PRESSURE BALANCE, THERMOSTATIC, OR COMBINATION OF BOTH THAT PROVIDE SCALD AND THERMAL SHOCK PROTECTION. VALVES SHALL BE ADJUSTED TO DELIVER A MAXIMUM MIXED WATER SETTING OF 120 DEGREES FAHRENHEIT. THE WATER HEATER THERMOSTAT SHALL NOT BE CONSIDERED A SUITABLE CONTROL FOR MEETING THIS PROVISION.

VERIFY AND WHERE WATER PRESSURE EXCEEDS 80 PSI AN APPROVED PRESSURE REGULATOR PRECEDED BY AN ADEQUATE STRAINER SHALL BE INSTALLED

1-INSTALL TEMPERATURE AND PRESSURE RELIEF VALVE WITH MINIMUM 3/4" DRAIN PIPE AND TERMINATE TO THE EXTERIOR OF THE BUILDING OVER WINDOW, DOOR OR VISIBLE LOCATION. DISCHARGE FROM A RELIEF VALVE INTO A WATER HEATER PAN SHALL BE PROHIBITED

2-PROVIDE (ON THE PLANS) A GAS PIPING DIAGRAM OF THE GAS PIPING SYSTEM THAT INCLUDES ALL PIPE SIZES, PIPE LENGTHS AND BTU RATINGS.

3-SUBMIT GAS LOAD CALCULATIONS IN ACCORDANCE WITH IPC TABLE 12-8 TO VERIFY THE PIPE SIZES ARE ADEQUATE FOR THE MAXIMUM DELIVERY CAPACITY OF CUBIC FEET OF GAS PER HOUR.

4- A WHOLE HOUSE TEST IS REQUIRED UPON COMPLETION OF THE INSTALLATION, ALTERATION, OR REPAIR OF ANY GAS PIPING. THE CITY SHALL BE NOTIFIED WHEN GAS PIPING IS READY FOR INSPECTION.

5- 2 GPM SHOWER FIXTURE, MAX. 1.5 GPM BATHROOM FAUCET, MAX. 2 GPM KITCHEN FAUCET, AND MAX 1.28 WATER CLOSET TO CONFORM TO CITY GREEN REQUIREMENTS.

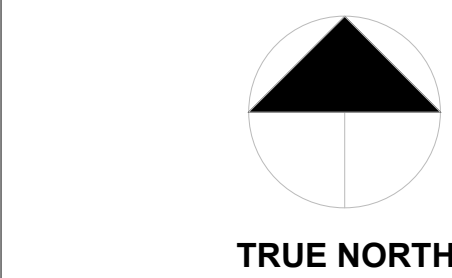
BATHROOMS: PROVIDE AN EXHAUST FAN (AT LEAST 50 CFM) DUCTED TO THE OUTSIDE (MINIMUM 4" DIAMETER FLEX DUCT WITH A MAXIMUM LENGTH OF 70') WITH A MINIMUM VENTILATION RATE OF 100 CFM. IDENTIFY THE REQUIREMENT FOR A BACKDRAFT DAMPER ON THE DUCT, AN ENERGY STAR COMPLIANT EXHAUST FAN THAT IS CONTROLLED BY A HUMIDITY SENSOR THAT IS CAPABLE OF BEING ADJUSTED BETWEEN  $\leq$  50-PERCENT TO 80-PERCENT HUMIDITY; AND A SEPARATE SWITCH FROM THE LIGHT UNLESS THE FAN IS ALLOWED TO OPERATE WITH THE LIGHT SWITCHED OFF.

6-NOTE THAT ALL PLUMBING VENTS SHALL TERMINATE NOT LESS THAN 6" ABOVE ROOF NOR LESS THAN 1' FROM ANY VERTICAL SURFACE. VENTS SHALL TERMINATE NOT LESS THAN 10' FROM OR 3' ABOVE ANY WINDOW, DOOR OPENING AIR INTAKE, OR VENT SHAFT NOR 3' FROM LOT LINE.

IF WATER PRESSURE EXCEEDS 80 PSI, AND EXPANSION TANK AND AN APPROVED PRESSURE REGULATOR SHALL BE INSTALLED.

NON-REMOVABLE BACK FLOW PRE-VENTER OR BIBB-TYPE VACUUM BREAKER WILL BE INSTALLED ON ALL EXTERIOR HOSE BIBBS. HOT WATER RE-CIRCULATING SYSTEM IS INSTALLED, THE ENTIRE LENGTH OF HOT WATER PIPES SHALL BE INSULATED.

List of Drawing	Drawing Name	Scale
P0.00	PLUMBING GENERAL NOTES AND SPECIFICATIONS	NTS
P1.01	WATER SUPPLY LAYOUT MAIN FLOOR	1/8"=1'-0"
P1.02	WATER SUPPLY LAYOUT ROOF FLOOR	1/8"=1'-0"
P2.01	SEWER LAYOUT MAIN FLOOR	1/8"=1'-0"
P2.02	SEWER LAYOUT ROOF FLOOR	1/8"=1'-0"
P3.01	GAS LAYOUT MAIN FLOOR	1/8"=1'-0"
P3.02	GAS LAYOUT ROOF FLOOR	1/8"=1'-0"
P4.01	GAS ISOMETRIC RISER DIAGRAM & SIZING TABLE	NTS
P5.01	HOT WATER CALCULATION AND DATASHEET	NTS
P6.01	PLUMBING GENERAL DETAILS	NTS



Sheet Name

# PLUMBING GENERAL NOTES AND SPECIFICATIONS

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

Sheet Number

**P 0.00**

Project #

Project #	Drawing Date 05/05/2023
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GENERAL NOTES:

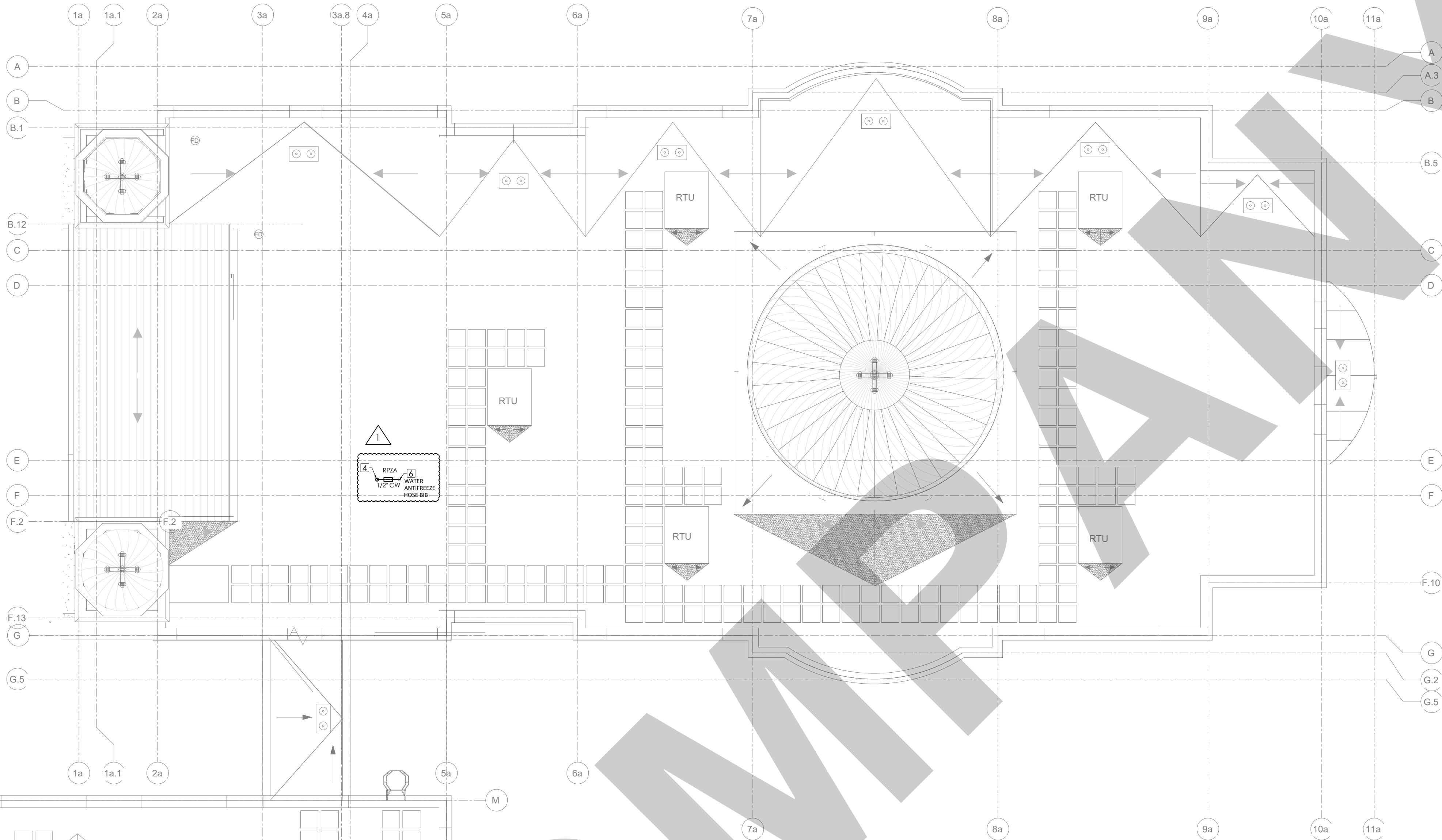
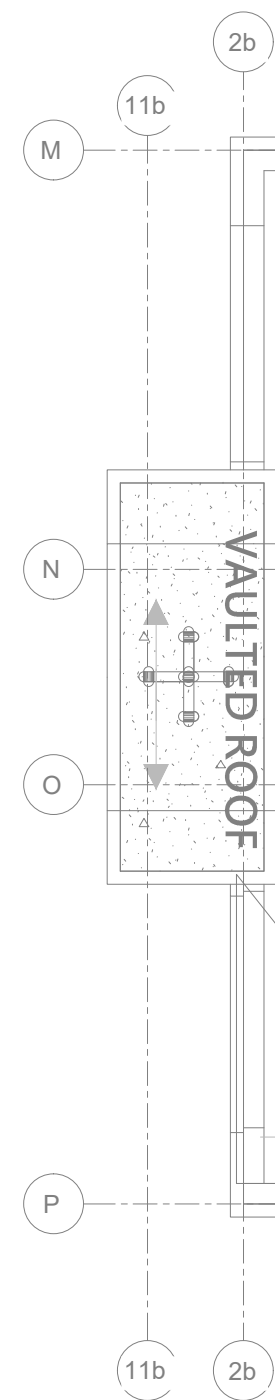
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WATER SUPPLY SHEET NOTES:

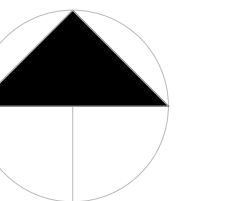
- 1]—DCW, DHW RISE TO HIGH LEVEL.
- 2]—DCW & DHW DROP IN WALL.
- 3]—DCW FROM BELOW GRADE UP IN WALL.
- 4]—DHW DOWN TO BELOW GRADE.
- 5]—DCW/DHW/RHW TO FIXTURE CONNECTION.
- 6]—HOSE BIB.

TOTAL BUILDING WATER LOAD

DESCRIPTION	LOAD WSFU	PIPE SIZE PEX
DCW	23	1-1/4"
DHW	5	3/4"
TOT. COMBINED	28.5	1-1/4"



Issue	Issue Name	Date
01	SEWER CONNECTION REVISION	2023.06.20



TRUE NORTH

DESIGN  
DEVELOPMENT

Sheet Name

WATER SUPPLY LAYOUT  
ROOF FLOOR

Original Issue 09/25/2022 / PROGRESS

Sheet Number

P 1.02

Project #

Drawing Date

05/05/2023



GENERAL NOTES:

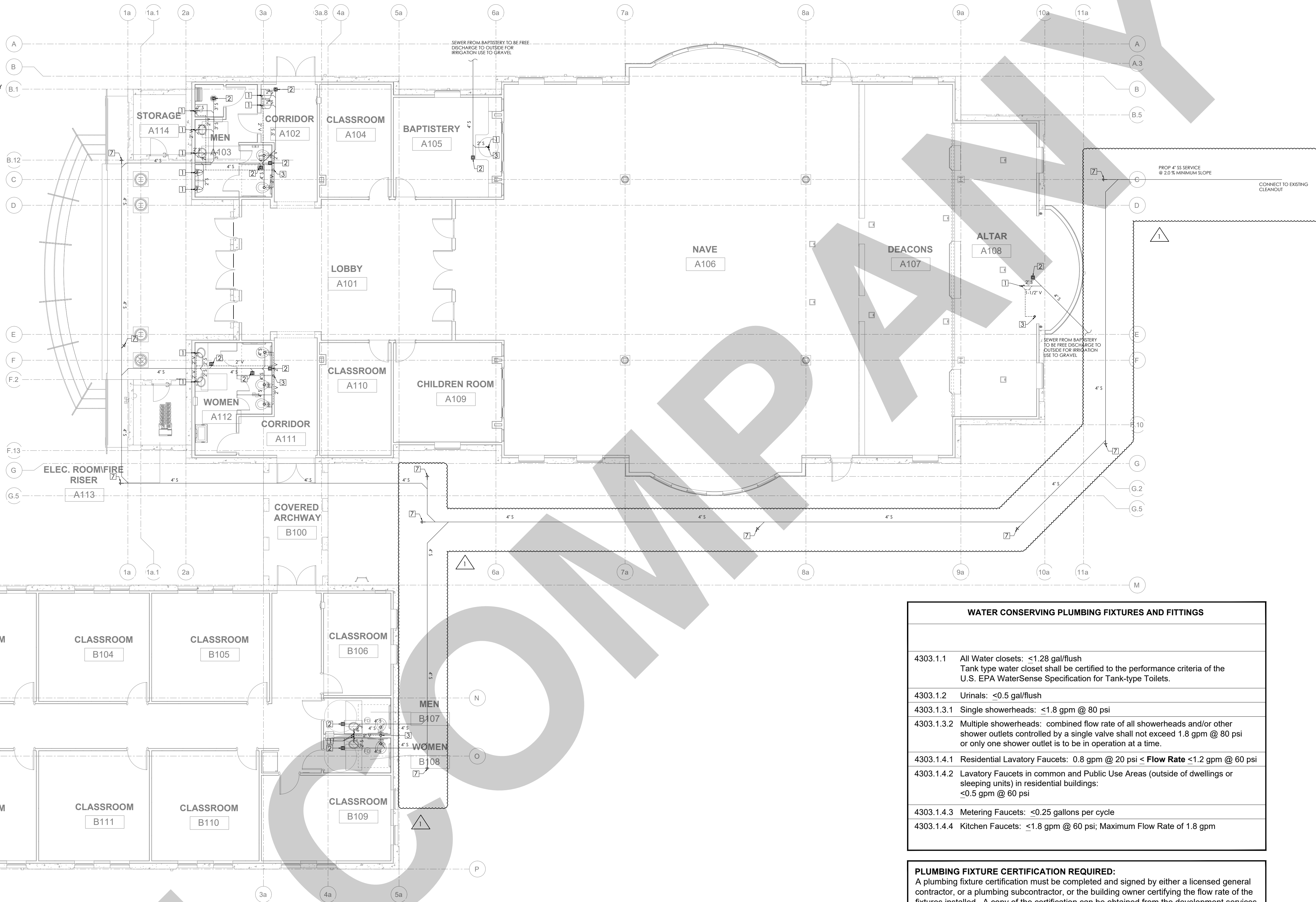
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SANITARY SHEET NOTES:

- 1 — WASTE DROP AND 2" VENT RISE.
- 2 — 4" FLOOR CLEAN-OUT.
- 3 — 3" VENT STACK TO ABOVE.
- 4 — 3" FLOOR DRAIN.
- 5 — 4" SOIL DROP FROM ABOVE.
- 6 — WASTE DROP.
- 7 — GRADE CLEAN-OUT.
- 8 — 3" SOIL DROP FROM ABOVE.
- 9 — 3" SOIL DROP TO BELOW.
- 10 — 4" SOIL DROP TO BELOW.

TOTAL BUILDING DFU LOAD

FIXTURE	DFU	QUANTITY	TOTAL DFU
WC	4.0	7	28.0
LAVATORY	1.0	4	4.0
URINAL	2.0	2	4.0
DRINKING FOUNTAIN	0.5	2	1.0
TOTAL DFU =			37.0



WATER CONSERVING PLUMBING FIXTURES AND FITTINGS

- 4303.1.1 All Water closets: <1.28 gal/flush  
Tank type water closet shall be certified to the performance criteria of the U.S. EPA WaterSense Specification for Tank-type Toilets.
- 4303.1.2 Urinals: <0.5 gal/flush
- 4303.1.3.1 Single showerheads: <1.8 gpm @ 80 psi
- 4303.1.3.2 Multiple showerheads: combined flow rate of all showerheads and/or other shower outlets controlled by a single valve shall not exceed 1.8 gpm @ 80 psi or only one shower outlet is to be in operation at a time.
- 4303.1.4.1 Residential Lavatory Faucets: 0.8 gpm @ 20 psi < Flow Rate <1.2 gpm @ 60 psi
- 4303.1.4.2 Lavatory Faucets in common and Public Use Areas (outside of dwellings or sleeping units) in residential buildings: <0.5 gpm @ 60 psi
- 4303.1.4.3 Metering Faucets: <0.25 gallons per cycle
- 4303.1.4.4 Kitchen Faucets: <1.8 gpm @ 60 psi; Maximum Flow Rate of 1.8 gpm

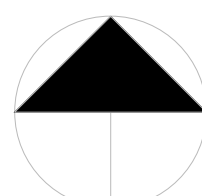
PLUMBING FIXTURE CERTIFICATION REQUIRED:

A plumbing fixture certification must be completed and signed by either a licensed general contractor, or a plumbing subcontractor, or the building owner certifying the flow rate of the fixtures installed. A copy of the certification can be obtained from the development services department.

PLUMBING PIPING MATERIAL SCHEDULE

PIPING SYSTEM	LOCATION	ACCEPTABLE PIPING MATERIAL
DOMESTIC WATER	BELOW GRADE	ASTM B 88 TYPE K SOLDERED COPPER
	ABOVE GRADE	PEX A COMPRESSION JOINT

Issue	Issue Name	Date
01	SEWER CONNECTION REVISION	2023.06.20



TRUE NORTH

DESIGN DEVELOPMENT

Sheet Name  
**SEWER LAYOUT MAIN FLOOR**

Original Issue | 09/25/2022 / PROGRESS  
Sheet Number

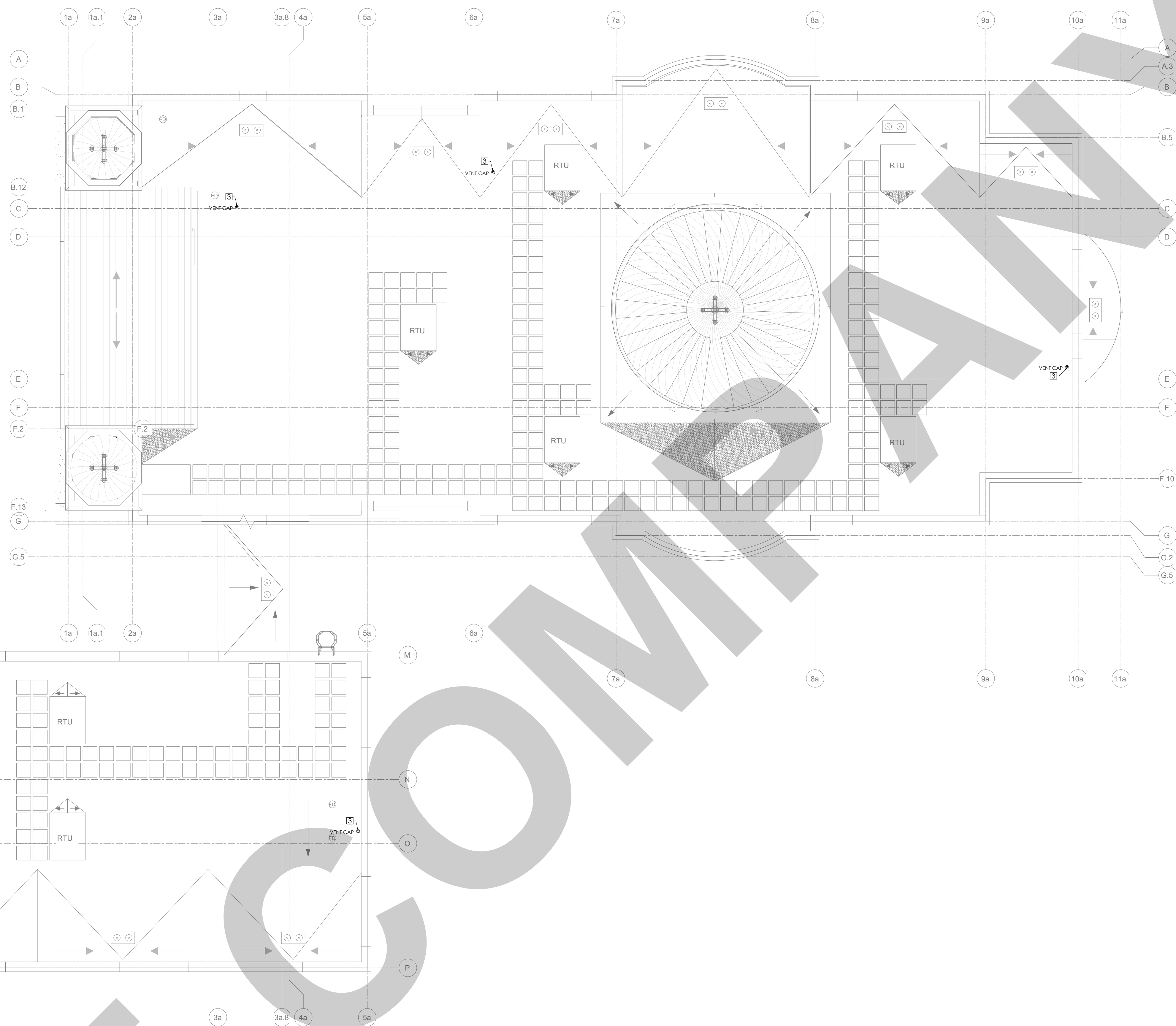
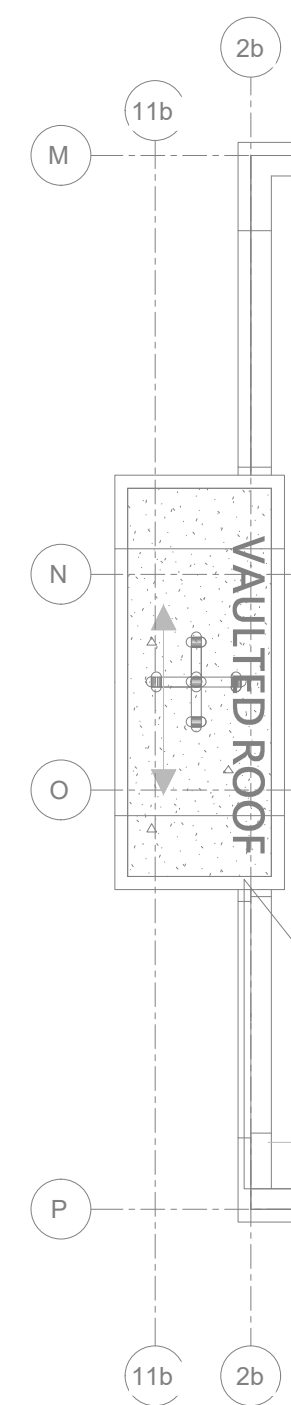
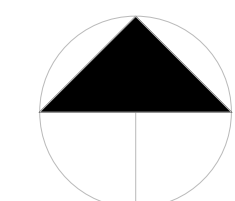
**P 2.01**

Project # Drawing Date  
05/05/2023



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TRUE NORTH

## DESIGN DEVELOPMENT

## SEWER LAYOUT ROOF FLOOR

Sheet Number

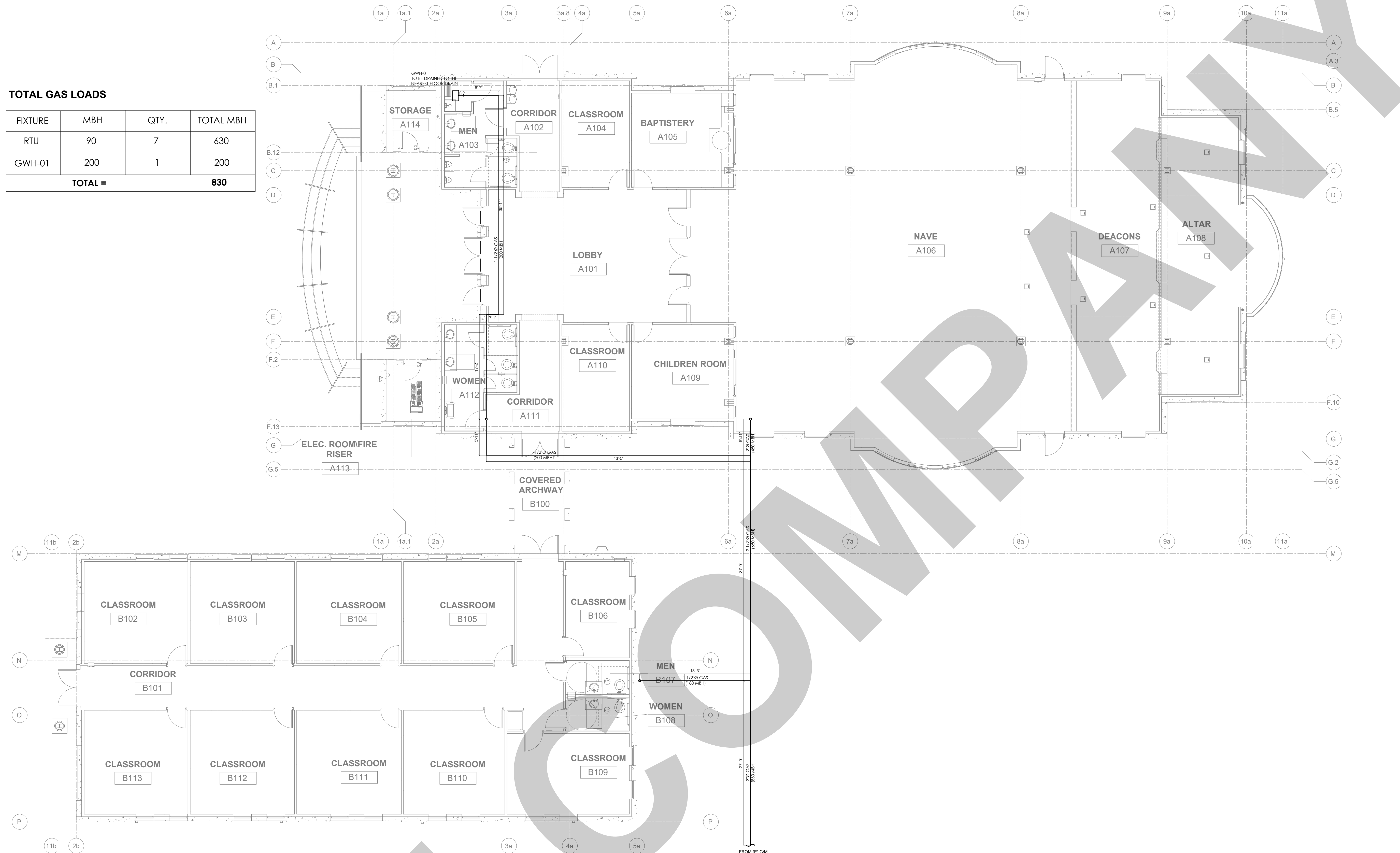
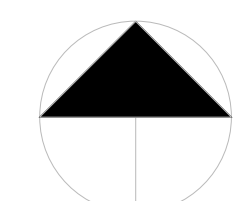
**P 2.02**

Drawing Date	05/05/2023
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**THE TOTAL GAS PIPE LENGTH FROM PROPANE TANK TO THE FARTHEST EQUIPMENT IS APPRX. 350 FEET.**

FIXTURE	MBH	QTY.	TOTAL MBH
RTU	90	7	630
GWH-01	200	1	200
<b>TOTAL =</b>			<b>830</b>

[illegible]

TRUE NORTH

## DESIGN DEVELOPMENT

Sheet Name

**GAS LAYOUT MAIN FLOOR**

Original Issue	09/25/2022 / PROGRESS
Sheet Number	

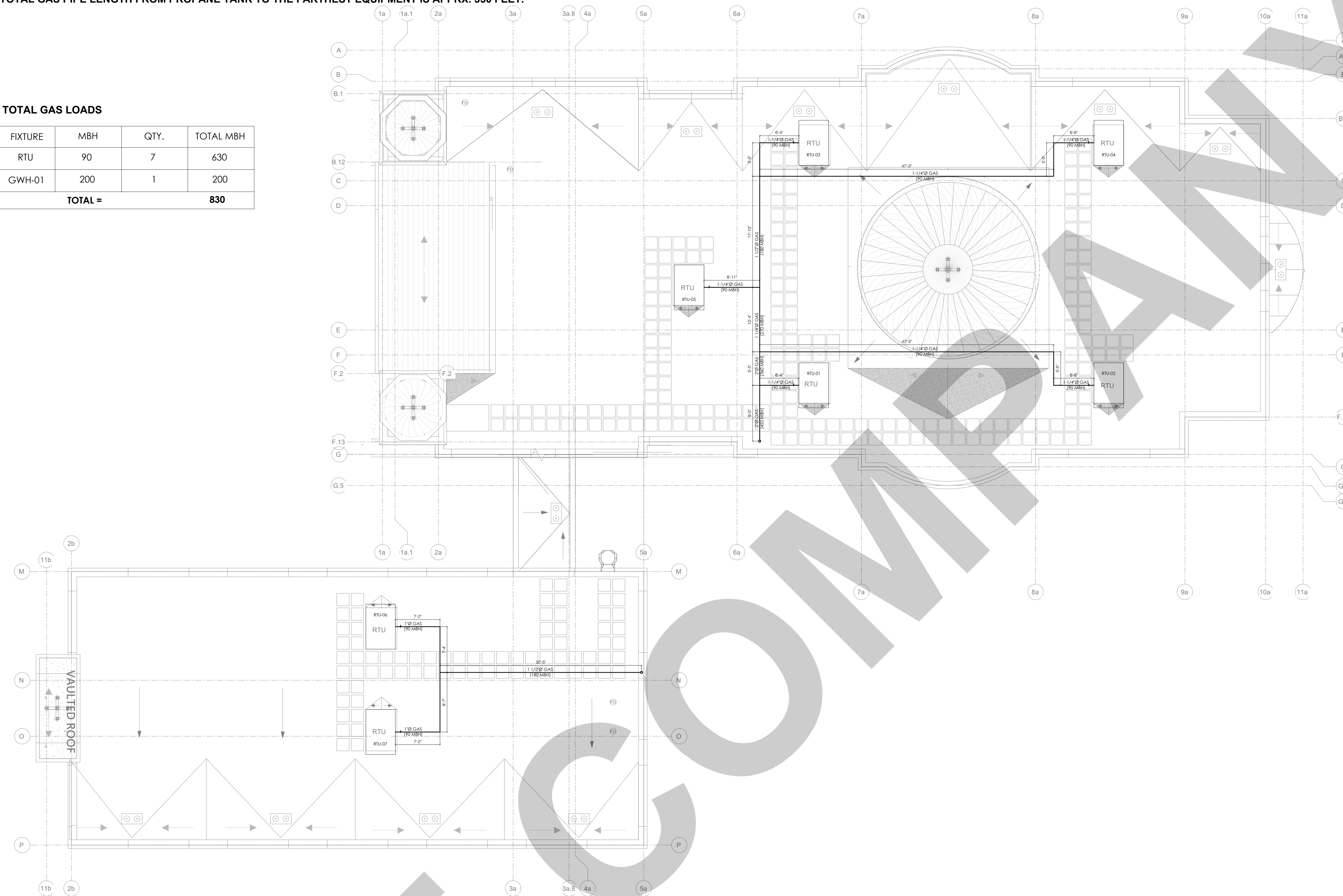
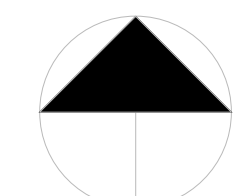
**P 3.01**

Project #	Drawing Date 05/05/2023
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[illegible]

TRUE NORTH

## DESIGN DEVELOPMENT

Sheet Name

**GAS LAYOUT ROOF  
FLOOR**

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

**P 3.02**

Project #	Drawing Date 05/05/2023
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RTU	90	7	630
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<b>TOTAL =</b>			<b>830</b>

## GAS PIPING INSTALLATIONS

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 pound per square inch = 6.895 kPa, 1-inch water column = 0.2488 kPa, 1 British thermal unit per hour = 0.2931 W, 1 cubic foot per hour = 0.0283 m<sup>3</sup>/h, 1 degree = 0.01745 rad.

**Notes:**

1. NA means a flow of less than 10 cfh.
2. All table entries have been rounded to three significant digits.




**Drawing Date**  
05/05/2023



Project no:	Date: 16/9/2022	Sheet no.: 1 of 1	Computed by: Innodez
Subject: St. Meena Church Hot Water Calculation			Checked by: Innodez
			Approved by: Innodez

<u>Application Type</u>	<u>Hotel</u>					
<u>Water Temperature</u>	Tin	=	50	°F	=	10 °C
	Tout	=	140	°F	=	60 °C
	ΔT	=	90	°F	=	50 °C




Fixture	GPH	QTY.
Basin, Public lavatory	8 x	4 = 32 gph

Other	GPH	QTY.

[illegible]

Project no:	Date: 16/9/2022	Sheet no.: 1 of 1	Computed by: Innodez
Subject: St. Meena Church Hot Water Calculation			Checked by: Innodez
			Approved by: Innodez

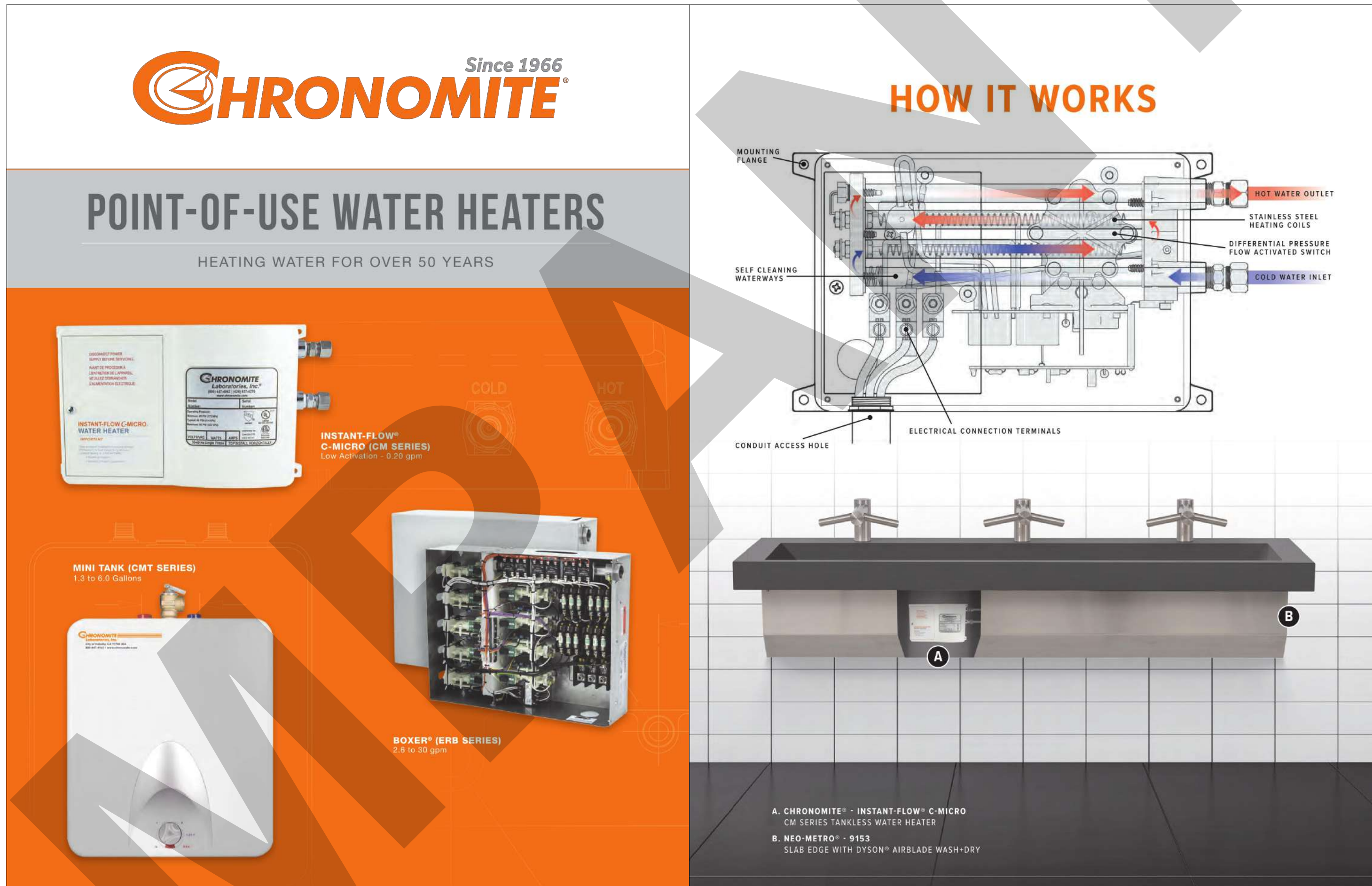
<u>Application Type</u>	Private Residence			
<u>Water Temperature</u>	T <sub>in</sub>	=	50	°F = 10 °C
	T <sub>out</sub>	=	140	°F = 60 °C
	ΔT	=	90	°F = 50 °C



Fixture	GPH	QTY.
Basin, Private lavatory	2	x 1 = 2 gph

Other	GPH	QTY.

						Maximum Possible Demand	=	2	gph
						Demand Factor ( <b>Custom</b> )	=	0.3	gph
						Maximum Probable Demand	=	0.6	gpm
						Maximum Probable Demand	=	0.01	L/s
						Heater Recovery Capacity	=	0.01	gpm
						Storage Factor ( <b>Custom</b> )	=	0.8	
						Storage Tank Capacity	=	0.48	gal
								1.9	liters
						Actual Selection		2	Liters
Heater or Coil	=	500	x	gpm	x	°T / Efficiency			
Capacity	=	500	x	0.01	x	0.9 /	=	500	btu/hr
						0.2 =		kW	
						Actual Selection		1	kW



**CHRONOMITE**  
Laboratories, Inc.  
5000 E. 10th Avenue, Suite 100  
Denver, CO 80231  
Tel: 303.751.1100 Fax: 303.751.1101  
www.chronomite.com

Model: SR Series  
Capacity: 1.5 GPM  
Flow Rate: 1.5 GPM  
Pressure: 150 PSI  
Temperature: 120°F  
Voltage: 120VAC  
Power: 1500W

**INSTANT-FLOW**  
WATER HEATER

**Important:**  
This product is not intended for use with gas, oil, or kerosene.  
For more information, please contact your local distributor or Chronomite Laboratories, Inc.

**MODEL SR SERIES**

INSTANT FLOW™ - SR SERIES									
LOW FLOW				T TEMPERATURE RISE #					
ACTIVATION Q <sub>1</sub>	Q <sub>2</sub>	VOLTS	TR	AMPS	% C.WIRE	0.35 Q <sub>2</sub> PM	0.31 PM	1.5 PM	2.0 Q <sub>2</sub> PM
SR-151/120	0.35	120	1.60	15	14.4%	35	25	12	8
SR-251/120	0.35	120	2.40	20	12.4%	47	31	16	11
SR-301/120	0.35	120	3.60	30	10.4%	70	49	25	16
SR-401/120	0.35	120	4.80	40	8.4%	100	72	38	24
SR-501/120	0.35	240	1.80	15	12.4%	90	66	33	22
SR-151/277	0.35	277	4.15	15	14.4%	81	57	28	19
SR-251/277	0.35	277	5.54	20	12.4%	90	76	38	25

INSTANT FLOW™ - SR SERIES									
STANDARD FLOW				T TEMPERATURE RISE #					
ACTIVATION Q <sub>1</sub>	Q <sub>2</sub>	VOLTS	TR	AMPS	% C.WIRE	0.55 Q <sub>2</sub> PM	1.0 Q <sub>2</sub> PM	1.5 PM	2.0 Q <sub>2</sub> PM
SR-30/208	0.65	208	8.24	30	10.4%	66	41	23	21
SR-40/208	0.65	208	8.32	40	8.4%	87	57	33	28
SR-50/240	0.65	240	7.20	50	10.4%	76	46	33	25
SR-60/240	0.65	240	9.60	60	8.4%	95	66	43	34
SR-70/277	0.65	277	8.31	70	10.4%	87	57	33	28

CHRONOMITE LABORATORIES, INC. • 800-447-4962 • WWW.CHRONOMITE.COM

Manual handwashing faucets, kitchen sinks, bar sinks, utility sinks, and hand set showers.

Chromonite Instant-Flow® SR Low-Flow Electric Tankless Water Heaters are designed to provide reliable instant hot water when installed at the point of use. This instant electric tankless water heater is perfect for lavatories and sinks. It is ideal for two-handle and single-handle faucets and is the perfect under-the-sink water heater. The SR series is designed to provide a predetermined temperature rise to the incoming cold water and to increase the water outlet temperature by manually increasing/decreasing water flow.

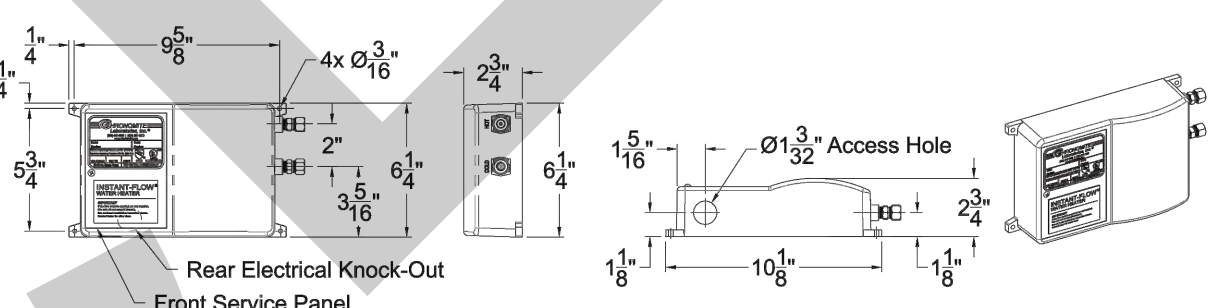
Chronomite Electric Tankless Water Heaters are the space-saving solution for point-of-use, under-the-counter sink and basin applications where instant hot water is needed. Chronomite Electric Tankless Water Heaters are designed to be lightweight, compact and are constructed with a durable metal housing for optimal vandal resistance. No pressure and temperature relief valves are needed (unless required by code), saving time and money on installation.

Instant-Flow® SR Electric Water Heaters meet the ADA barrier-free requirements and are 99% energy efficient.

- 99% Energy Efficient
- Compact Size
- Easy to Install
- Low Installation Cost
- Unlimited Hot Water
- Meets ADA Requirements
- Optional Stainless Steel Housing

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- Easy to Install
- Low Installation Cost
- Unlimited Hot Water
- Meets ADA Requirements
- Optional Stainless Steel Housing

SUFFIX OPTION	DESCRIPTION
Standard housing	Aluminum
P	ABS Housing
SS	Satin Finish Stainless housing
SSP	Polished Stainless Housing
NPT08	1/2" Male NPT Connection
NPT12	3/4" Male NPT Connection - ABS only
2095-1	Disconnect Switch



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[illegible]

A WORLD LEADER IN TANKLESS WATER HEATERS, COMBI-BOILERS AND BOILERS

TAG	EWHP-01,02,03,04
LOCATION	AS SHOWN
MANUFACTURER	CHRONOMITE
MODEL	SR-15L/120
TYPE	ELECTRIC
VOLTS	120
POWER KW	1.80
AMPS	15
WIDTH x DEPTH (in)	9-5/8" x 2-3/4"
HEIGHT (in)	5-3/4"

TAG	GW-H-01
LOCATION	JANITOR
MANUFACTURER	NAVIEN
MODEL	NPE-240A2
TYPE	GAS
FLOW RATE AT TEMP. RISE 67F (GPM)	5.6
MAX. NATURAL GAS (BTU/hr)	200,000
UEF	0.95
APPROX. WEIGHT (lbs)	77
WIDTH (in)	17.3"
HEIGHT (in)	27.4"
DEPTH (in)	13.2"
POWER SUPPLY	120V,60HZ,350W(MAX.4A)
CW/HW CONNECTION SIZE	3/4"
GAS INLET CONNECTION	3/4"

Sheet Name

**HOT WATER  
CALCULATION AND  
DATASHEET**

Original Issue	09/25/2022 / PROGRESS
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Sheet Number

**P 5.01**

Project #	Drawing Date
	05/05/2023



COMcheck Software Version COMcheckWeb

Envelope Compliance Certificate

**Additional Efficiency Package(s)**  
Credits: 10.0 Required 16.0 Proposed  
10% cooling efficiency improvement, 8.5 credit  
10% cooling efficiency improvement, 7.5 credit

Building Area	Floor Area
1-Nave, Nartex, Altar (Religious Building) - Nonresidential 2-Classrooms (School/University) - Nonresidential	7686 4565

Envelope Assemblies	Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
SOUTH	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	110	—	—	0.400	0.450
	Ext. Wall 2: Solid Concrete, 8in. Thickness, Light Density, Furring: Metal, (Bldg. Use 1 - Nave, Nartex, Altar)	4050	13.0	0.0	0.126	0.151
	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 1 - Nave, Nartex, Altar) (b)	410	—	—	0.400	0.450
	Ext. Wall 6: Solid Concrete, 3in. Thickness, Light Density, Furring: Metal, (Bldg. Use 2 - Classrooms)	1065	13.0	0.0	0.141	0.151
WEST	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	150	—	—	0.400	0.450
	Ext. Wall 4: Solid Concrete, 8in. Thickness, Light Density, Furring: Metal, (Bldg. Use 1 - Nave, Nartex, Altar)	1675	13.0	0.0	0.126	0.151
	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 1 - Nave, Nartex, Altar) (b)	300	—	—	0.400	0.450
	Ext. Wall 8: Solid Concrete, 3in. Thickness, Light Density, Furring: Metal, (Bldg. Use 2 - Classrooms)	945	13.0	0.0	0.141	0.151
EAST	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	110	—	—	0.400	0.450
	Ext. Wall 3: Solid Concrete, 8in. Thickness, Light Density, Furring: Metal, (Bldg. Use 1 - Nave, Nartex, Altar)	1675	13.0	0.0	0.126	0.151
	Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 1 - Nave, Nartex, Altar) (b)	282	—	—	0.400	0.450
	Ext. Wall 7: Solid Concrete, 3in. Thickness, Light Density, Furring: Metal, (Bldg. Use 2 - Classrooms)	945	13.0	0.0	0.141	0.151

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Assembly	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	110	---	---	0.400	0.450
SOUTH					
Ext. Wall 2: Solid Concrete, 8in. Thickness, Light Density, Furring: Metal, (Bldg. Use 1 - Nave, Nartex, Altar)	4050	13.0	0.0	0.126	0.151
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 1 - Nave, Nartex, Altar) (b)	410	---	---	0.400	0.450
Ext. Wall 6: Solid Concrete, 3in. Thickness, Light Density, Furring: Metal, (Bldg. Use 2 - Classrooms)	1065	13.0	0.0	0.141	0.151
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	150	---	---	0.400	0.450
WEST					
Ext. Wall 4: Solid Concrete, 8in. Thickness, Light Density, Furring: Metal, (Bldg. Use 1 - Nave, Nartex, Altar)	1675	13.0	0.0	0.126	0.151
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 1 - Nave, Nartex, Altar) (b)	300	---	---	0.400	0.450
Ext. Wall 8: Solid Concrete, 3in. Thickness, Light Density, Furring: Metal, (Bldg. Use 2 - Classrooms)	945	13.0	0.0	0.141	0.151
Window: Metal Frame with Thermal Break: Fixed, Perf. Specs.: Product ID Pending ID, SHGC 0.25, (Bldg. Use 2 - Classrooms) (b)	110	---	---	0.400	0.450

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.  
(b) Fenestration product performance must be certified in accordance with NFRC and requires supporting documentation.  
(c) Slab-On-Grade proposed and budget U-factors shown in table are R-factors.

Envelope PASS/ES: Design 10% better than code

#### Envelope Compliance Statement

Compliance Statement: The proposed envelope design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed envelope systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

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COMcheck Software Version COMcheckWeb

Interior Lighting Compliance Certificate

**Project Information**  
Energy Code: 2021 IECC  
Project Title: St. Meena Coptic Orthodox Church  
Project Type: New Construction  
Construction Site: 11545 Alta Vista Road Fort Worth, Texas 76244  
Owner/Agent: Designer/Contractor:

Additional Efficiency Package(s)	Credits: 10.0 Required 16.0 Proposed
10% cooling efficiency improvement, 8.5 credit 10% cooling efficiency improvement, 7.5 credit	

#### Allowed Exterior Lighting Power

A Area Category	B Floor Area (R2)	C Allowed Watts / R2	D Allowed Watts
1-Nave, Nartex, Altar (Religious Buildings/Audience/Seating Area)	7686	0.72	5534
Total Allowed Watts =		5534	

#### Proposed Interior Lighting Power

## Interior Lighting Compliance Statement

**Compliance Statement:** The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

#### Interior Lighting PASS/ES: Design 3% better than code

#### Interior Lighting Compliance Statement

Compliance Statement: The proposed interior lighting design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed interior lighting systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

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COMcheck Software Version COMcheckWeb

Exterior Lighting Compliance Certificate

**Project Information**  
Energy Code: 2021 IECC  
Project Title: St. Meena Coptic Orthodox Church  
Project Type: New Construction  
Construction Site: 11545 Alta Vista Road Fort Worth, Texas 76244  
Owner/Agent: Designer/Contractor:

Allowed Exterior Lighting Power	A Area/Surface Category	B Quantity	C Allowed Watts /	D Tradable Wattage	E Allowed Watts (B X C)
Total Tradable Watts (a) =		0		0	
Total Allowed Supplemental Watts (b) =		350		350	

(a) Wattage tradeoffs are only allowed between tradable areas/surfaces.  
(b) Supplemental allowance equal to 350 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

#### Proposed Exterior Lighting Power

Exterior Lighting TBD: Exterior lighting zone not specified (see project screen)

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COMcheck Software Version COMcheckWeb

Mechanical Compliance Certificate

**Project Information**  
Energy Code: 2021 IECC  
Project Title: St. Meena Coptic Orthodox Church  
Location: Fort Worth, Texas  
Climate Zone: 2a  
Project Type: New Construction  
Construction Site: 11545 Alta Vista Road Fort Worth, Texas 76244  
Owner/Agent: Designer/Contractor:

**Additional Efficiency Package(s)**  
Credits: 10.0 Required 16.0 Proposed  
10% cooling efficiency improvement, 8.5 credit  
10% cooling efficiency improvement, 7.5 credit

Mechanical Systems List	System Type & Description
7 HVAC System (Single Zone w/ Perimeter/System): Heating: 2 each: Central Furnace, Gas, Capacity = 120000 kBtu/h Proposed Efficiency = 82.0% EER, Required Efficiency = 81.0% EER Cooling: 1 each: Packaged Terminal Unit, Capacity = 120000 kBtu/h, Air-Cooled Condenser, Air Economizer Proposed Efficiency = 11.0 EER, Required Efficiency = 9.5 EER Proposed Part Load Efficiency = 0.00, Required Part Load Efficiency = 0.00 Fan System: FAN SYSTEM 1 - Compliance (Motor nameplate HP and fan efficiency method) - Passes	
1 Water Heater: Gas Instantaneous Water Heater, Capacity: 1 gallons, Input Rating: 200 kBtu/h No minimum efficiency requirement applies	
4 Water Heater: Electric Instantaneous Water Heater, Capacity: 1 gallons No minimum efficiency requirement applies	

#### Mechanical Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications, and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the 2021 IECC requirements in COMcheck Version COMcheckWeb and to comply with any applicable mandatory requirements listed in the Inspection Checklist.

Name: Title Signature Date

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COMcheck Software Version COMcheckWeb

Inspection Checklist

**Energy Code: 2021 IECC**  
Requirements: 98.0% were addressed directly in the COMcheck software

Text in the "Comments/Assumptions" column is provided by the user in the COMcheck Requirements screen. For each requirement, the user certifies that a code requirement will be met and how that is documented, or that an exception is being claimed. Where compliance is itemized in a separate table, a reference to that table is provided.

Section # & Req. ID	Plan Review	Complies?	Comments/Assumptions
C103.2 (PR1)	Plans and/or specifications provide all information with which compliance can be determined for the building envelope and document where exceptions to the standard are claimed.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C103.2 (PR2)	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the mechanical and service water heating systems and document where exceptions to the standard are claimed. Load calculations per acceptable engineering standards and handbooks. Hot water system sized per manufacturer's sizing guide.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C103.2 (PR4)	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the interior lighting and electrical systems and equipment and document where exceptions to the standard are claimed. Information provided should include interior lighting power calculations, wattage of bulbs and ballasts, transformers and control devices.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C402.4.1 (PR10)	The vertical fenestration area <= 30 percent of the gross above-grade wall area.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C402.4.1 (PR11)	The skylight area <= 3 percent of the gross roof area.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req. ID	Plan Review	Complies?	Comments/Assumptions
C402.4.2 (PR14)	In enclosed spaces > 2,500 ft <sup>2</sup> directly under a roof with ceiling heights > 8 ft, and used as an office, lobby, atrium, concourse, corridor, storage, gymnasium/exercise center, convention center, automobile service, manufacturing, non-warehouse storage, retail store, distribution/processing area, floor operation, or workshop, the following requirements apply: (a) the daylight zone under skylight <= 1/2 the floor area; (b) the skylight area <= daylight zone <= 3 percent with a skylight VT >= 0.40; or a minimum daylight effective aperture >= 1 percent.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C406 (PR9)	Plans, specifications, and/or calculations provide all information with which compliance can be determined for the additional energy efficiency package options.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

#### Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req. ID	Footing / Foundation Inspection	Complies?	Comments/Assumptions
C303.2 (FO4)	Slab edge insulation installed per manufacturer's instructions.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C303.2 (FO6)	Exterior insulation protected against damage, sunlight, moisture, wind, landscaping and equipment maintenance activities.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C105 (FO3)	Installed slab-on-grade insulation type and R-value consistent with insulation specifications reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.4 (FO7)	Slab edge insulation depth/length: Slab insulation extending away from building is covered by pavement or >= 10 inches of soil.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met. See the Envelope Assemblies table for values.
C403.12.3 (FO9)	Snow/ice melting system and freeze protection systems have sensors and controls configured to limit service for pavement temperature above 50F and outdoor temperature above 40F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.

#### Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req. ID	Framing / Rough-In Inspection	Complies?	Comments/Assumptions
C303.1.3 (PR12)	Fenestration products rated in accordance with NFRC certified and as to performance label or certificate provided.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.4.3 (PR10)	Vertical fenestration SHGC value.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.4.3 (PR8)	Installed vertical fenestration U-factor and SHGC, consistent with label specifications and as reported in plans and COMcheck reports.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	See the Envelope Assemblies table for values.
C402.5.1 (PR16)	The building envelope contains a continuous air barrier that is sealed in an approved manner and either constructed or tested in an approved manner. Air barrier penetrations are sealed in an approved manner.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C402.5.4 (PR19)	Factory-built fenestration and doors are labeled as meeting air leakage requirements.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

#### Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req. ID	Plumbing Rough-In Inspection	Complies?	Comments/Assumptions
C404.5.1 (ME57)	Heated water supply piping conforms to pipe length and volume requirements. Refer to section details (PR6).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

#### Additional Comments/Assumptions:

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Section # & Req. ID	Mechanical Rough-In Inspection	Complies?	Comments/Assumptions
C403.7.4 (ME57)	Exhaust air energy recovery on systems meeting Table C403.7.4(1) and C403.7.4(2).	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C403.7.5 (ME18)	Kitchen exhaust systems comply with replacement air and conditioned supply air limitations, and satisfy hood exhaust requirements and maximum exhaust rate criteria.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Exception: Requirement does not apply.
C403.11.1 (ME60)	HVAC ducts and plenums insulated in accordance with C403.11.1 and constructed in accordance with C403.11.2, verification may need to occur during Foundation Inspection.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.5 (ME21)	Air economizers provided where required, meet the requirements for design capacity, control signal, and operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.5.3 (ME124)	Air economizers automatically reduce outdoor air intake to the design minimum outdoor air quantity when outdoor air intake will not reduce cooling energy usage. See Table C403.5.3 for applicable device types and climate zones.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.5.4 (ME125)	System capable of relieving excess outdoor air during air economizer operation to prevent over pressurizing the building. The relief air outlet located to avoid recirculation into the building.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.5.5 (ME126)	Return, exhaust/relief and outdoor air dampers used in economizers have motorized dampers that automatically shut when not in use and meet maximum leakage rates. Reference section C403.7.7 for details.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.4.1 (ME33)	Heating for vestibules and air curtains with integral heating include automatic controls that shut off the heating system when outdoor air temperatures < 45F. Vestibule heating and cooling systems controlled by a thermostat in the vestibule with heating setpoint <= 60F and cooling setpoint >= 80F.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C403.3.3 (ME35)	Hot gas bypass limited to <=240 kBtu/h - 50% >=240 kBtu/h - 25%	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.
C408.2.2 (ME33)	Air outlets and zone terminal devices have means for air balancing.	<input type="checkbox"/> Complies <input type="checkbox"/> Does Not <input type="checkbox"/> Not Observable <input type="checkbox"/> Not Applicable	Requirement will be met.

1 High Impact (Tier 1) 2 Medium Impact (Tier 2) 3 Low Impact (Tier 3)

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Issue Issue Name Date



