

**GDI ENGINEERING**



# **Daycare Unity Church**

Education

**Springs- Texas**



## MECHANICAL SPECIFICATIONS

PROVIDE EQUIPMENT INDICATED ON THE DRAWINGS, AND AS REQUIRED FOR A COMPLETE FUNCTIONING SYSTEM.

DEFINITIONS:

1. FURNISH MEANS TO SUPPLY AND DELIVER TO PROJECT SITE, READY FOR INSTALLATION.
2. INSTALL MEANS TO PLACE IN POSITION AND MAKE CONNECTIONS FOR SERVICE OR USE.
3. PROVIDE MEANS TO FURNISH AND INSTALL, COMPLETE AND READY FOR INTENDED USE.
4. 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.
5. PROVIDE OPERATION MANUALS, MAINTENANCE MANUALS AND SCHEMATICS FOR ALL MECHANICAL EQUIPMENT INSTALLED.
6. COORDINATION: COORDINATE WITH THE WORK OF OTHER SECTIONS, EQUIPMENT FURNISHED BY OTHERS, REQUIREMENTS OF THE OWNER, AND WITH THE CONSTRAINTS OF THE EXISTING CONDITIONS OF THE PROJECT SITE.
7. 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.
8. DUCT DIMENSIONS: UNLESS OTHERWISE NOTED, DUCT DIMENSIONS ON THE DRAWINGS ARE INSIDE CLEAR DIMENSIONS.
9. SHEET METAL DUCTWORK:
  - 9.1. PROVIDE SHEET METAL DUCTWORK FABRICATED AND INSTALLED IN ACCORDANCE WITH ASHRAE AND SMACNA STANDARDS, FOR 1" W.G. PRESSURE CLASS. SEAL CLASS "A".
  - 9.2. 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 STEEL SHEET METAL, ZINC COATED (GALVANIZED) OR ZINC-IRON ALLOY COATED (GALVANNEALED) BY THE HOT DIP PROCESS, AND A924 STANDARD SPECIFICATION FOR GENERAL REQUIREMENTS FOR SHEET, METALLIC-COATED BY THE HOT DIP PROCESS.
  - 9.3. ALL ANGLE IRON USED FOR SUPPORT SHALL BE GALVANIZED.
  - 9.4. CONNECTIONS TO WALLS OR FLOOR SHALL BE AIR TIGHT WITH ANGLE IRON AND CAULKING.
  - 9.5. SEAL ALL DUCT SEAMS, TRANSVERSE AND LONGITUDINAL, AIR TIGHT.
  - 9.6. PROVIDE TURNING VANES AT ALL 90° ELBOWS.
  - 9.10. TRAPEZE DUCT HANGERS: PROVIDE MINIMUM 1" X 2" X 1" X 18 GAUGE CHANNELS WITH MINIMUM 1" X 18 GAUGE STRAPS TO STRUCTURAL SUPPORT.
  - 9.11. ROUND SHEET METAL DUCT: PROVIDE SPIRAL SEAM (ALL SIZES) OR SNAP LOCK (DUCT SIZES UP TO 10") GALVANIZED STEEL COMPLYING WITH SMACNA STANDARDS.
  - 9.12. SPIRAL SEAM DUCTWORK SHALL HAVE SMACNA SEAM TYPE RL-1.
  - 9.13. 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.
  - 9.14. 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.
  - 9.15. 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.
  - 9.16. 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.
  - 9.20. DUCT INSULATION: MATERIAL FOR SUPPLY AND RETURN AIR DUCT ABOVE CEILING INSIDE THE BUILDING SHALL HAVE THE EQUIVALENT THERMAL RESISTANCE OF MINIMUM R-6. THE REQUIRED R VALUES ARE FOR INSTALLED INSULATION WITH 25% COMPRESSION AT THE CORNERS.
  - 9.21. PROVIDE PINS AND WASHERS IN ACCORDANCE WITH SMACNA REQUIREMENTS AND AS REQUIRED TO PREVENT INSULATION FROM SAGGING.
  - 9.22. PROVIDE ADEQUATE INSULATION AT THE SUPPLY AIR DIFFUSERS TO PREVENT CONDENSATION.
  - 9.23. 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.
  - 9.24. SEAL ALL CONNECTIONS AND JOINTS AIRTIGHT.
  - 9.25. 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. 9.26. RADIUS FOR TURNS OF FLEXIBLE DUCTS SHALL BE A MINIMUM OF ONE DUCT DIAMETER.
  - 9.27. FLEXIBLE DUCT RUNS SHALL NOT EXCEED 10'-0" IN LENGTH AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK CONNECTION.
  - 9.28. 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 BRACKET BEYOND DUCT COVERING, WHERE POSITIONING REGULATOR IS NOT ACCESSIBLE, PROVIDE COUPLING AND EXTENSION ROD WITH REGULATOR FOR CEILING OR WALL INSTALLATION, AS REQUIRED.

- 9.29. RECTANGULAR VOLUME DAMPERS: PROVIDE MINIMUM 16 GAUGE GALVANIZED STEEL CHANNEL FRAME, 16 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".
- 9.30. 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.
- 9.31. 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.
- 9.32. PROVIDE INSULATED ACCESS DOORS FOR INSULATED DUCTWORK. CONSTRUCT OF SAME OR THICKER GAUGE SHEET METAL AS DUCT IN WHICH IT IS INSTALLED.
- 9.33. PROVIDE FLUSH FRAMES FOR UN-INSULATED DUCTS, AND EXTENDED FRAMES FOR EXTERNALLY INSULATED DUCTS.
- 9.34. PROVIDE CONTINUOUS HINGE ON ONE SIDE, WITH ONE HANDLE-TYPE LATCH FOR ACCESS DOORS 12" HIGH AND SMALLER, AND TWO HANDLE-TYPE LATCHES FOR LARGER ACCESS DOORS.
10. HVAC CONTROL SYSTEM: PROVIDE ALL THE NECESSARY CONTROLS AND CONTROL WIRING IN CONDUIT COMPATIBLE TO SYSTEMS SHOWN ON EQUIPMENT SCHEDULE.
11. PROGRAMMABLE THERMOSTAT FOR EACH SYSTEM SHALL ENABLE THE SUPPLY FAN AND CYCLE THE COOLING AND HEATING STAGES TO MAINTAIN SPACE SET-POINT.
12. 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.
13. WHERE DEMAND CONTROLLED VENTILATION IS SPECIFIED ON PLANS, 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.
14. COMMISSIONING / VERIFICATION: HVAC CONTROL SYSTEM SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND IN PROPER WORKING CONDITION, AND THAT THE SYSTEM MEETS THE DESIGN REQUIREMENTS.
15. TEST AND BALANCE: CONTRACT 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.
16. 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 INDUSTRY-ACCEPTED STANDARDS AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
  - (A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE;
  - (B) 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 IS INTENDED TO OPERATE, INCLUDING SET-POINTS.

## HVAC GENERAL NOTES

1. SEE ARCHITECTURAL PLANS FOR TYPE OF CEILING AND LOCATIONS OF WALL MOUNTED DEVICES.
2. DO NOT OPERATE AIR HANDLERS OR EXHAUST FANS UNTIL ALL INTERIOR CLEANING AND PAINTING IS COMPLETE. THE CLEANING OF FOULED COILS OR FAN ASSEMBLIES DUE TO PAINT OR CONSTRUCTION DEBRIS WILL THE RESPONSIBILITY OF THE HVAC CONTRACTOR.
3. RECTANGULAR DUCT SIZES INDICATED ARE ACTUAL SHEET METAL DIMENSIONS IN INCHES. ALL ROUND DUCT SIZES INDICATE NET FREE INSIDE DIAMETER AND DO NOT ACCOUNT FOR ANY INSULATION. ROUND DUCTS ARE EXTERNALLY INSULATED.
4. MAJOR EQUIPMENT SHOWN ON THE PLANS AND ELEVATIONS ILLUSTRATE THE GENERAL ARRANGEMENT AND SPACE ALLOCATION. VERIFY THE SPACE REQUIREMENTS FOR EACH SYSTEM COMPONENT USING MANUFACTURER CERTIFIED SHOP DRAWINGS AND MAKE THE NECESSARY ADJUSTMENTS IN EQUIPMENT PLACEMENT AND CONNECTIONS IN ORDER TO ACCOMMODATE THE EXACT EQUIPMENT TO BE INSTALLED IN COORDINATION WITH ARCHITECTURAL SPACES.
5. REFER TO DETAILS FOR SUPPORTS, ANCHOR BOLTS AND HANGERS FOR ALL EQUIPMENT, OTHER MISCELLANEOUS STEEL BRACING, SUPPORTS, AND REINFORCEMENT STEEL REQUIRED TO SUPPORT EQUIPMENT SHALL BE FURNISHED AS PART OF THE SCOPE OF DIVISION 23.
6. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE CODES, STANDARDS, AND AUTHORITIES HAVING JURISDICTION.
7. DUCTWORK AND PLENUMS SHALL BE SEALED IN ACCORDANCE WITH THE MECHANICAL CODE AND SMACNA METHOD AND COMMERCIAL ENERGY CONSERVATION CODE. SEAL ALL LONGITUDINAL AND TRANSVERSE JOINTS. SEAL ALL PENETRATIONS OF FLOORS, SMOKE WALLS, FIRE WALLS, AND EXTERIOR WALLS.
8. DO NOT RUN DUCT ON PIPE OVER ELECTRICAL PANELS. COORDINATE LOCATION OF DUCTS AND EQUIPMENT IN MECHANICAL ROOMS WITH THE ELECTRICAL AND PLUMBING CONTRACTOR BEFORE ANY INSTALLATION.
9. ALL DUCT RUN-OUTS TO SUPPLY AND EXHAUST AND DIFFUSERS AND RECEPTORS SHALL HAVE NORMAL BALANCING DAMPERS. PROVIDE YOUNG REGULATORS WITH REMOTE ADJUSTMENT WHERE CEILING IS INACCESSIBLE.
10. ALL DUCTWORK SHALL BE INSTALLED AND MANUFACTURED IN ACCORDANCE WITH LATEST SMACNA STANDARDS.
11. SECURE ALL PERMITS AND PROVIDE ANY REQUIRED TEMPORARY UTILITIES.
12. ALL FLEXIBLE DUCT SHALL BE UL 181, CLASS 1 AIR DUCT BLACK LINER. MAXIMUM LENGTH OF FLEXIBLE DUCT SHALL NOT EXCEED 6'-0". PROVIDE RIGID ROUND INSULATED AIR DUCT RUN-OUT AS REQUIRED. FLEXIBLE DUCT SHALL HAVE THE EQUIVALENT OF ONLY TWO 90 DEGREE ELBOWS. MAXIMUM FLEX DUCTS ARE SAME SIZE AS DIFFUSER NECK.
13. THE AIR QUANTITIES SHOWN ON THE DRAWINGS FOR INDIVIDUAL OUTLETS MAY BE CHANGED TO OBTAIN UNIFORM TEMPERATURE WITH EACH ZONE, BUT THE TOTAL AIR QUANTITY SHOWN FOR EACH ZONE MUST BE OBTAINED.
14. INSTALL SMOKE DETECTOR FOR ALL UNITS WITH THE CAPACITY OF 2200 CFM AND HIGHER AS REQUIRED BY CODE. FIRE ALARM CONTRACTOR TO FURNISH AND TERMINATE.
15. ALL SUPPLY AND RETURN AIR DUCTS LOCATED IN UNCONDITIONED ATTICS OUTSIDE THE ENVELOPE OR OUTSIDE THE BUILDING SHALL BE INSULATED USING R-8 INSULATION. EXTERNALLY INSULATED DUCT SHALL BE R-8 (INSTALLED) OR MINIMUM REQUIRED BY CURRENT HOUSTON COMMERCIAL ENERGY CONSERVATION CODE.
16. ALL SUPPLY AND RETURN DUCTS LOCATED IN A CONDITIONED SPACE OR INSIDE THE ENVELOPE SHALL BE INSULATED USING MINIMUM R-5.6 INSULATION (INSTALLED R-VALUE). EXTERNALLY INSULATED DUCT SHALL BE R-5.6 OR MINIMUM REQUIRED BY CURRENT ENERGY CONSERVATION CODE.
17. PROVIDE RECORD DRAWINGS OF THE ACTUAL INSTALLATION TO THE BUILDING OWNER OR THE DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER. RECORD DRAWINGS SHALL 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.
18. PROVIDE OPERATING AND MAINTENANCE MANUALS TO THE BUILDING OWNER OR DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER. THESE MANUALS SHALL BE IN ACCORDANCE WITH INDUSTRY ACCEPTED STANDARDS AND SHALL INCLUDE, AT A MINIMUM, THE FOLLOWING:
  - A) SUBMITTAL DATA STATING EQUIPMENT SIZE AND SELECTED OPTIONS FOR EACH PIECE OF EQUIPMENT REQUIRING MAINTENANCE.
  - B) 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 SYSTEM MAINTENANCE AND CALIBRATION INFORMATION INCLUDING WIRING DIAGRAMS, SCHEMATICS, AND CONTROL SEQUENCE DESCRIPTIONS, AND 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 IS INTENDED TO OPERATE, INCLUDING SUGGESTED SET POINTS.
19. DUCTWORK THAT IS DESIGNED TO OPERATE AT STATIC PRESSURES IN EXCESS OF 3 IN W.G. SHALL BE LEAK TESTED ACCORDING TO INDUSTRY-ACCEPTED TEST PROCEDURES. REPRESENTATIVE SECTIONS TOTALING NO LESS THAN 25% OF THE TOTAL INSTALLED DUCT AREA FOR THE DESIGNATED PRESSURE CLASS SHALL BE TESTED. DUCT SYSTEMS WITH PRESSURE RATINGS IN EXCESS OF 3 IN W.G. SHALL BE IDENTIFIED ON THE DRAWINGS. THE MAXIMUM PERMITTED DUCT LEAKAGE SHALL BE NO MORE THAN 1% OF THE TOTAL AIRFLOW IN THE SECTION TESTED OR AS REQUIRED BY CURRENT COMMERCIAL ENERGY CONSERVATION CODE.
20. ALL HVAC SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING STANDARDS. A WRITTEN BALANCE REPORT SHALL BE PROVIDED TO THE OWNER OF DESIGNATED REPRESENTATIVE OF THE BUILDING OWNER.
21. HVAC CONTROL SYSTEMS SHALL BE TESTED TO ENSURE THAT CONTROL ELEMENTS ARE CALIBRATED, ADJUSTED, AND PROPER WORKING CONDITION AS REQUIRED BY COMMERCIAL ENERGY CONSERVATION CODE.
22. PROVIDE AND INSTALL 7-DAY PROGRAMMABLE THERMOSTAT.

## 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
	U.C.	UNDER CUT DOOR
	VAV	VARIABLE AIR VOLUME
	T	THERMOSTAT
	S	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.

UNITY CHILDREN'S HOME

2111 RIVER VALLEY DR.,  
SPRING, TX 77373

Drawn By:

Scale: NTS

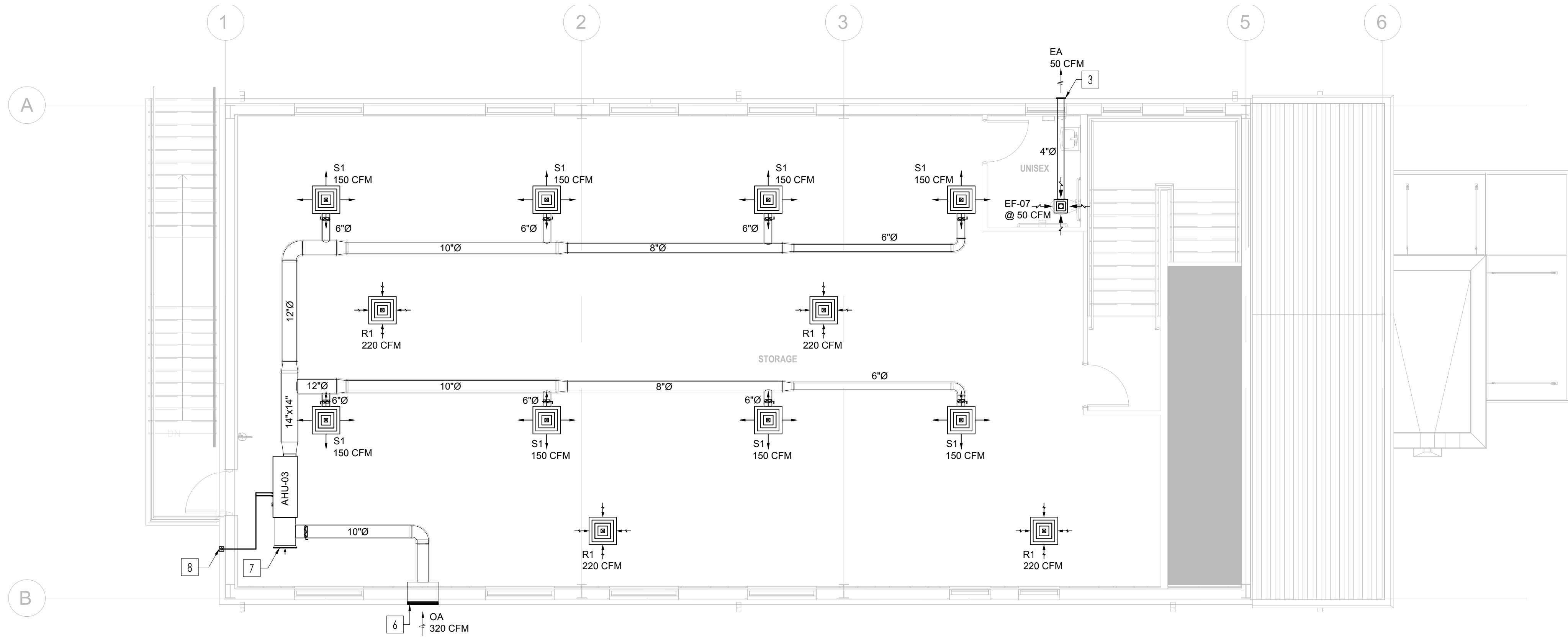
Date: 05.03.2023

PROJ.NO.:

M 1.00

SHEET NO.





**SECOND FLOOR PLAN**

**GENERAL NOTES:**

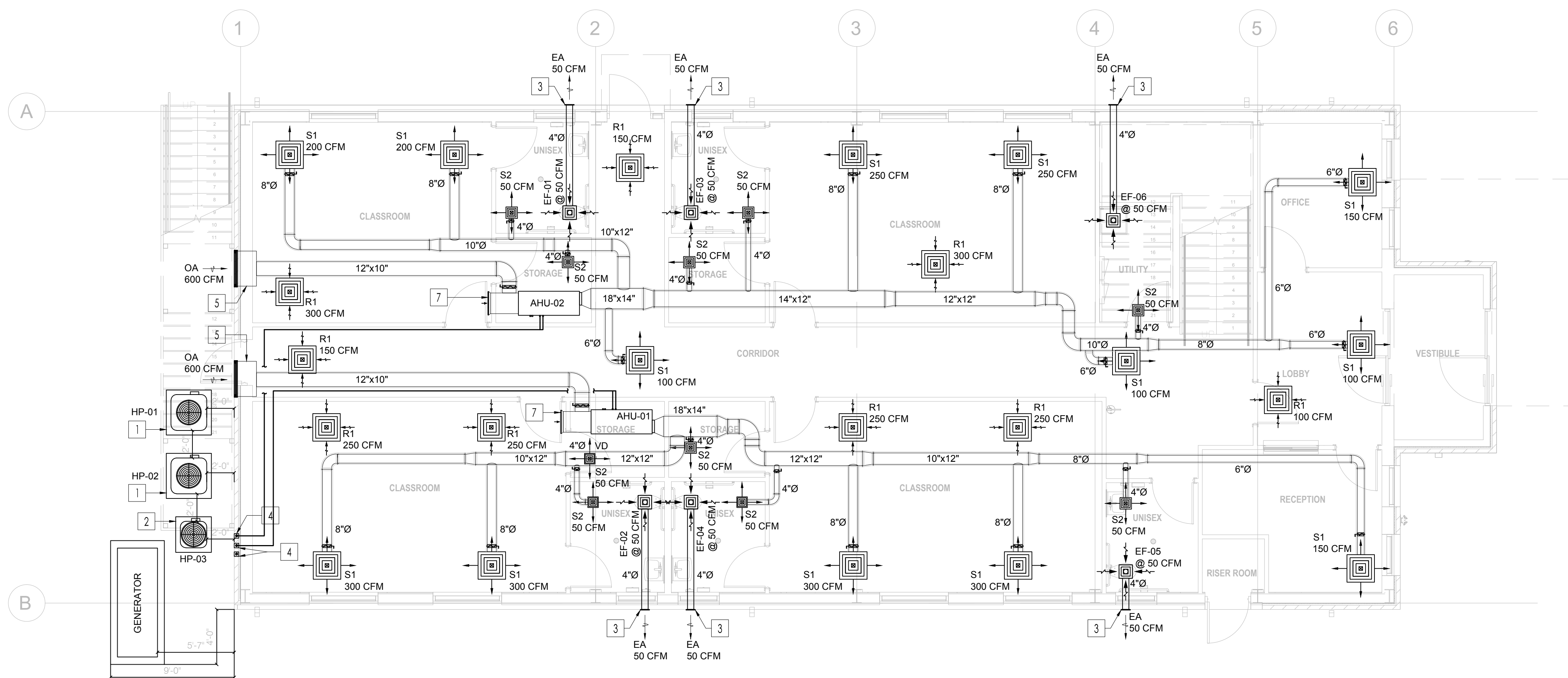
1. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
3. REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
4. CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
5. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
6. ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
7. ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
8. ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
9. CONTRACTOR SHALL PROVIDE VALVES LOCATED ABOVE LAY-IN CEILING OR 24"x24" CEILING ACCESS PANEL COORDINATE FINAL LOCATION AND SIZE WITH ARCHITECT. PROVIDE BALANCING VALVES FOR HOT WATER RETURN SYSTEM AS REQUIRED. 1" PER FOOT. PIPING 4" AND 10. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT 1/8" PER FOOT. LARGER SHALL BE SLOPED AT 1/4" PER FOOT AND PROVIDE ACCESSIBLE 11. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8" CLEANOUTS AT ALL CHANGES OF DIRECTION.
12. VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
13. REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

**MECHANICAL KEYED NOTES:**

- 1 → OUTDOOR HEAT PUMP 44"x44" CONCRETE SLAB - INSTALL UNIT ON VIBRATION ISOLATORS.
- 2 → OUTDOOR HEAT PUMP 32"x32" CONCRETE SLAB - INSTALL UNIT ON VIBRATION ISOLATORS.
- 3 → EXHAUST DUCT TERMINATION TO OUTDOORS TO BE SPACED FROM ANY OPERABLE WINDOW BY >3'. THE LOCATIONS PROVIDED ARE WITHIN THE 3' LIMIT FROM THE PROPERTY LINE.
- 4 → EXTERIOR WALL SEAL PENETRATION OUTLET WITH ELASTOMETRIC LINE-SET COMPRESSION SLEEVE TYPE "TITAN GS30" BY AIREX MANUFACTURING INC. & REFRIGERANT PIPE LINES TO ABOVE IN WALL.
- 5 → EXTERIOR OUTDOOR AIR LOUVER - GREENHECK FAD-402-24x24 4" ADJUSTABLE, DRAINABLE BLADE, FABRICATED STEEL LOUVER - 600 CFM.
- 6 → EXTERIOR OUTDOOR AIR LOUVER - GREENHECK FAD-402-20x20 4" ADJUSTABLE, DRAINABLE BLADE, FABRICATED STEEL LOUVER - 320 CFM.
- 7 → RETURN AIR PLENUM & MIXING BOX WITH RETURN AIR BELLMOUTH FOR FREE RETURN FROM CEILING PLENUM, AND OUTDOOR AIR LATERAL CONNECTION WITH MANUAL VOLUME DAMPER.
- 8 → REFRIGERANT GAS LINES FROM OUTDOOR UNIT HEAT PUMP BELOW UP IN WALL TO THE AHU COIL.

**CODES ANALYSIS**

**THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES (AS AMENDED BY THE STATE OF TEXAS):**  
**2018 International Building Code (IBC)**  
**2020 National Electrical Code (NEC)**  
**2018 International Mechanical Code (IMC)**  
**2018 International Plumbing Code (IPC)**  
**2018 International Fire Code (IFC)**  
**2018 International Energy Conservation Code (IECC)**



**FLOOR PLAN**

UNITY CHILDREN'S HOME

2111 RIVER VALLEY DR.,  
SPRING, TX 77373

Drawn By: Scale: 3/16"= 1'-0"

Date: 05.03.2023 PROJ.NO.:

**M 2.00**

SHEET NO.



**NOTES FOR BIDDERS:**

- 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 FROM ALL BIDDER AND SUPPLIERS
- 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
- 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
- ALL SHEET METAL DUCT CONSTRUCTION SHALL BE IN STRICT ACCORDANCE WITH "SMACNA" LOW PRESSURE DUCT CONSTRUCTION STANDARD
- TURNING VANES SHALL BE INSTALLED IN ALL BENDS IN RECTANGULAR DUCT EXCEEDING 30"
- ALL DUCTS SHALL BE SUPPORTED WITH 1" WIDE, 16 GAUGE, GALVANIZED STEEL BANDS
- 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
- ALL DUCT DIMENSIONS SHOWN ON PLANS ARE INTERNAL
- THE MECHANICAL CONTRACTOR SHALL COORDINATE THE LOCATION OF SUPPLY AND RETURN AIR REGISTERS, DUCTS, GRILLES AND DIFFUSERS WITH LIGHTING AND CEILING PATTERNS
- PROVIDE LATERAL BRACING OF ALL DUCTS AND PIPES AS REQUIRED BY CODE
- INSULATE AND SEAL ALL DUCTWORK PER THE STATE MECHANICAL CODE
- MOUNT ALL THERMOSTATS AT 48" ABOVE FINISHED FLOOR
- ALL BRACING OF DUCTS AND PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SMACNA GUIDELINES
- 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
- DUCT SMOKE DETECTOR SHALL BE INSTALLED BELOW THE ROOF
- ALL MECHANICAL EQUIPMENT AND SYSTEMS INSTALLED AS PART OF PROJECT SHALL COMPLY WITH ALL REQUIREMENTS OF THE STATE MECHANICAL CODE AND THE STATE BUILDING CODE AND THE STATE BUILDING ENERGY EFFICIENCY STANDARDS. SEE APPLICABLE CODES IN ANALYSIS SECTION ON THIS SHEET.
- OUTSIDE AIR FOR A HEATING OR COOLING SYSTEM SHALL NOT BE TAKEN FROM CLOSER THAN 10 FEET FROM AN APPLIANCE VENT OUTLET, VENT OPENING OF A PLUMBING SYSTEM, OR THE DISCHARGE OUTLET OF EXHAUST FAN, UNLESS THE OUTLET IS 3 FT ABOVE THE OUTSIDE AIR INLET.
- PROVIDE 120 VOLT ELECTRICAL OUTLETS WITHIN 25 FT OF ALL MECH. EQUIPT.
- HEATING, VENTILATING, AND AIR CONDITIONING SYSTEMS SHALL BE BALANCED IN ACCORDANCE WITH ONE OF THE FOLLOWING METHODS IN ACCORDANCE WITH:
  - AABC NATIONAL STANDARDS FOR TOTAL SYSTEM BALANCE
  - ACCA MANUAL B
  - ASHRAE 111
  - NEBB PROCEDURAL STANDARDS FOR TESTING, ADJUSTING, ADJUSTING, BALANCING OF ENVIRONMENTAL SYSTEMS
  - SMACNA HVAC TESTING, ADJUSTING, AND BALANCING
- 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

**SCHEDULE No. 1**

**AIR HANDLING UNIT - INDOOR UNIT**

TAG	AHU-1	AHU-2	AHU-3
SERVING	FIRST FLOOR NORTH SIDE	FIRST FLOOR SOUTH SIDE	SECOND FLOOR STORAGE
MANUFACTURER	CARRIER	CARRIER	CARRIER
INDOOR MODEL	FE4ANF005000	FE4ANF005000	FE4ANF005000
POWER SUPPLY	208-230/1/60	208-230/1/60	208-230/1/60
MCA (A)	5.4	5.4	5.4
MOCP (A)	15.0	15.0	15.0
MOTOR (HP)	1/2	1/2	1/2
AIR FLOW (CFM)	1600	1600	1200
OUTDOOR AIR (CFM)	600	600	315
EXTERNAL STATIC PRESSURE (INCHES OF WATER)	0.35	0.35	0.30
NOMINAL COOLING CAPACITY (BTU/H)	30,000 TO 48,000	30,000 TO 48,000	30,000 TO 48,000
INDOOR DIMENSIONS - UPRIGHT (W x D x H) (inch)	21 1/8 x 22 1/16 x 53 3/16	21 1/8 x 22 1/16 x 53 3/16	21 1/8 x 22 1/16 x 53 3/16
APPROX. WEIGHT (lb)	172	172	172

**NOTES:**

- PROVIDE CONDENSATE PUMP, IF REQUIRED.
- PROVIDE DISCONNECT SWITCH.
- PROVIDE 2" MERV 8 THROWAWAY FILTER.
- PROVIDE VIBRATION ISOLATION.
- PROVIDE USER INTERFACE.
- PROVIDE 7-DAY PROGRAMMABLE THERMOSTATS.

**SCHEDULE No. 2**

**OUTDOOR UNIT - HEAT PUMP**

TAG	HP-1	HP-2	HP-3
MANUFACTURER	CARRIER	CARRIER	CARRIER
OUTDOOR MODEL	25VNA848A0030	25VNA848A0030	25VNA836A0030
SERVING	FIRST FLOOR NORTH SIDE	FIRST FLOOR SOUTH SIDE	SECOND FLOOR STORAGE
CONNECTED INDOOR UNITS	AHU-1	AHU-2	AHU-3
COOLING CAPACITY (BTU/H)	46,000	46,000	34,200
COOLING EFFICIENCY EER / SEER	11.0 / 18.0	11.0 / 18.0	10.0 / 17.5
HEATING CAPACITY @47°F (BTU/H)	50,500	50,500	34,200
HEATING EFFICIENCY COP @47°F / HPSF	3.44 / 11.0	3.44 / 11.0	3.56 / 10.0
HEATING CAPACITY @17°F (BTU/H)	35,200	35,200	23,000
HEATING EFFICIENCY COP @17°F	2.66	2.66	2.58
REFRIGERANT CHARGE (lb)	8.3	8.3	6.38
POWER SUPPLY	208-230 / 1 / 60	208-230 / 1 / 60	208-230 / 1 / 60
COMPRESSOR RLA (A) / FAN FLA (A)	23.9 / 1.2	23.9 / 1.2	18.3 / 1.2
MCA (A)	31.4	31.4	24.4
MOCP (A)	50	50	40
SOUND RATING dB(A)	73	73	72
DIMENSIONS (W x D x H) (inch)	31 3/16 x 31 3/16 x 39 3/8	31 3/16 x 31 3/16 x 39 3/8	23 1/8 x 23 1/8 x 38 15/16
APPROX. WEIGHT (lb)	218	218	164

**NOTES:**

- PROVIDE VIBRATION ISOLATION.
- PROVIDE FREEZE THERMOSTAT.
- PROVIDE CONCRETE SLAB.
- PROVIDE DISCONNECT SWITCH.

**SCHEDULE No. 3**

**FAN SCHEDULE**

TAG	EF-01 TO EF-07
LOCATION	TOILETS & UTILITY
SELECTED FLOW (CFM)	50
SELECTED PRESSURE DROP (IN. H2O)	0.25"
ELECTRICAL (V / PH / HZ)	120 / 1 / 60
POWER	25 W
MOTOR SPEED (RPS)	MULTI SPEED
FAN TYPE	CEILING FANS
MANUFACTURER	PANASONIC
MODEL	WHISPER FV-0511VK52

**NOTES:**

- PROVIDE UL LISTING.
- PROVIDE ENERGY STAR COMPLIANCE.
- INTERLOCK WITH WALL SWITCH.
- PROVIDE MOTOR WITH THERMAL OVERLOADS.

**SCHEDULE No. 4**

**AIR OUTLETS**

TAG	DESCRIPTION	MANUFACTURER	MODEL	MOUNTING
S1	SUPPLY DIFFUSER - FLOOR LEVEL	TITUS	24in. x 24in.	Duct Mounted
S2	SUPPLY DIFFUSER - CEILING LEVEL	TITUS	14in. x 14in.	Duct Mounted
R1	RETURN DIFFUSER	TITUS	24in. x 24in.	Duct Mounted
SC1/D1	SUCTION - OUTDOOR AIR LOUVER	TITUS	18in. x 6in.	Duct Mounted

**NOTES:**

- COORDINATE FINISH, COLOR, BORDER AND EXACT LOCATION WITH OWNER PRIOR TO ORDERING.
- PROVIDE OPPOSED BLADE DAMPER ACCESSIBLE THROUGH DIFFUSER FACE FOR GYP BD. CEILING INSTALLATIONS.
- PROVIDE DUCT TRANSITIONS AS REQUIRED.

VENTILATION LOAD CALCULATION												
IMC 2018 TABLE 403.3.1.1												
ROOM N°	ROOM NAME	IMC OCCUPANCY CLASS	AREA (ft²) Az	Ra CFM/ft²	Az x Ra CFM	Pz Pers. / 1000ft²	Pers.	Rp CFM/Pers.	Rp x Pz CFM	Vbz CALC. CFM	CORRECTED CFM AFTER E2=0.8	SOURCE OF OA
1	CLASSROOM NW	DAYCARE (THROUGH AGE 4)	253	0.18	46	25	13*	10	130	176	220	AHU-2
2	STORAGE NW	STORAGE ROOMS	43	0.12	5	-	-	-	-	5	6	AHU-2
3	CLASSROOM SW	DAYCARE (THROUGH AGE 4)	318	0.18	57	25	16*	10	160	217	271	AHU-1
4	STORAGE SW	STORAGE ROOMS	38	0.12	5	-	-	-	-	5	6	AHU-1
5	CLASSROOM NE	DAYCARE (THROUGH AGE 4)	346	0.18	62	25	17*	10	170	232	290	AHU-2
6	STORAGE NE	STORAGE ROOMS	43	0.12	5	-	-	-	-	5	6	AHU-2
7	CLASSROOM SE	DAYCARE (THROUGH AGE 4)	335	0.18	60	25	17*	10	170	230	288	AHU-1
8	STORAGE SE	STORAGE ROOMS	38	0.12	5	-	-	-	-	5	6	AHU-1
9	CORRIDOR	CORRIDORS	583	0.06	35	-	-	-	-	35	44	AHU-2
10	RECEPTION	RECEPTION AREAS	115	0.06	7	30	3	5	15	22	28	AHU-1
11	LOBBY	MAIN ENTRY LOBBIES	115	0.06	7	10	1	5	5	12	15	AHU-2
12	OFFICE	OFFICE SPACES	93	0.06	6	5	1	5	5	11	14	AHU-2
13	STORAGE SECOND FLOOR	STORAGE ROOMS	2100	0.12	252	-	-	-	-	252	315	AHU-3
<b>TOTAL BUILDING VENTILATION REQUIRED (CFM)</b>										1,207	1,509	

**NOTES:**

- WHERE \* IS MENTIONED, THE OCCUPANTS LOAD IN THE ARCHITECTURAL SET IS CONSIDERED AS IT IS HIGHER THAN THE Pz RATE.
- SYSTEM VENTILATION EFFICIENCY EV IS 0.8 DUE TO THE SUPPLY AND RETURN AIR OUTLETS BEING LOCATED AT THE CEILING LEVEL. RESULTS AFTER EV ARE INDICATED SHOWN UNDER CORRECTED CFM.
- TOILETS REQUIRE EXHAUST AIR AT A RATE OF 50CFM PER URINAL / WC.

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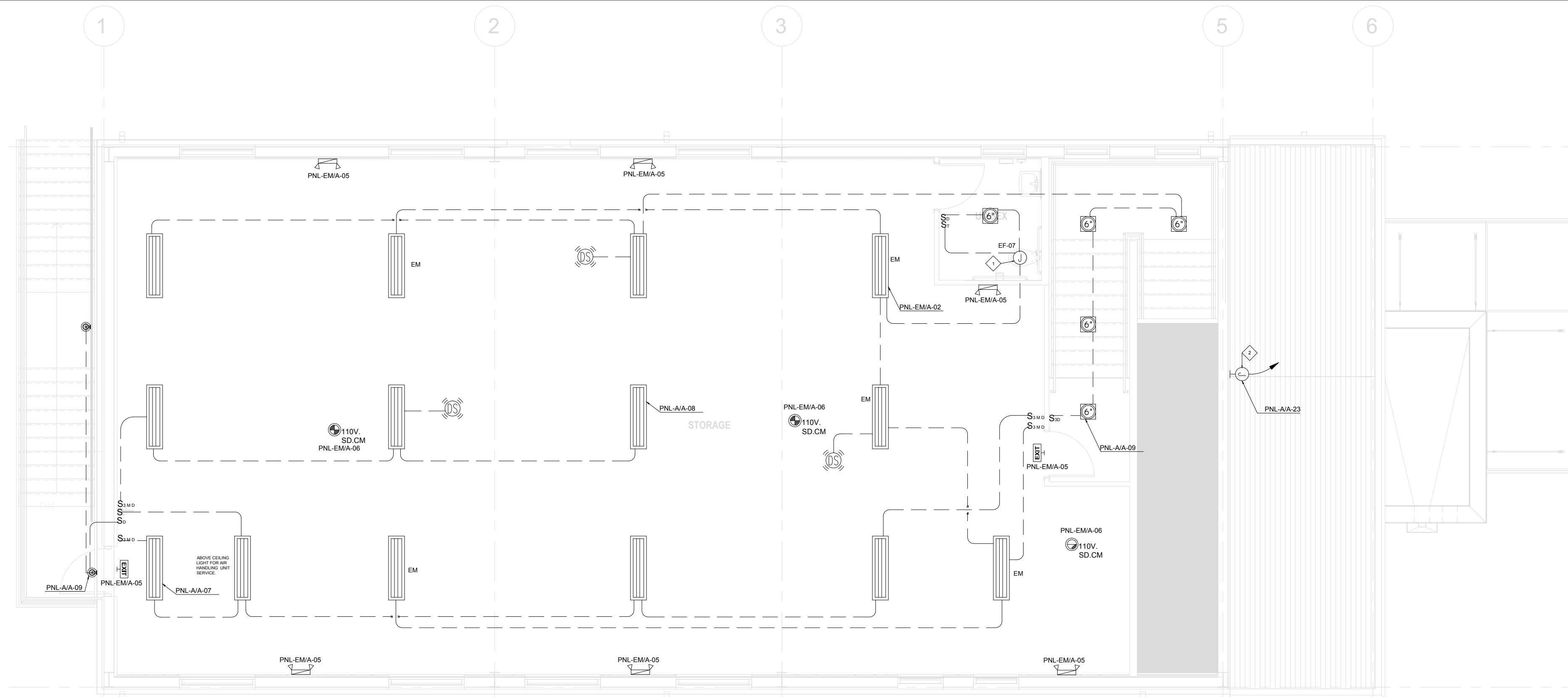
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Date: 05.03.2023 PROJ. NO.:

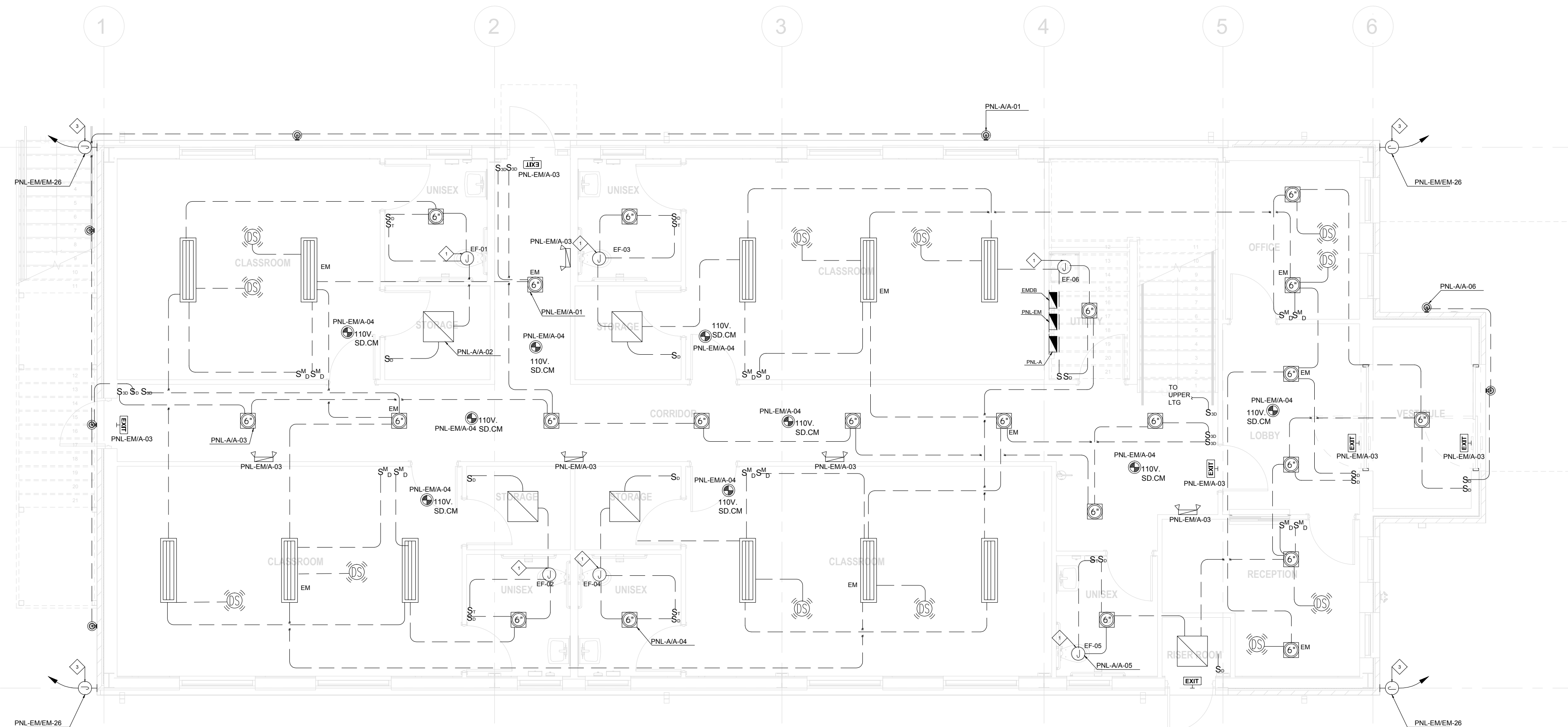
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SHEET NO.





SECOND FLOOR PLAN



FLOOR PLAN

**GENERAL NOTES:**

1. ALL WORK SHALL BE DONE IN COMPLIANCE WITH THE NATIONAL ELECTRICAL CODE (NEC) AND ALL APPLICABLE LOCAL CODES.
2. FOR ALL CONDUITS: UNDERGROUND CONDUIT TO BE GALVANIZED RIGID CONDUIT AT A MINIMUM DEPTH OF 12" BELOW GRADE; ABOVE GROUND CONDUIT SHALL BE RIGID ALUMINUM WITH ALL CONNECTIONS, FITTINGS AND BOXES TO BE THREADED AND SURFACE MOUNTED.
3. WIRE TO BE COPPER TYPE THWN - GEOTROL, MINIMUM NO. 12 AWG. EXCEPT AS NOTED. WIRING IN LIGHT FIXTURES SHALL BE TEMPERATURE RATED PER NEC REQUIREMENTS.
4. VERIFY EXACT REQUIREMENTS FOR ELECTRICAL EQUIPMENT WITH OWNER FOR THIS PROJECT. IN THE CASE OF A DISCREPANCY BETWEEN THE ACTUAL SELECTION OF EQUIPMENT AND THESE DRAWINGS, ADVISE THE OWNER BEFORE WORK BEGINS.
5. FIELD VERIFY ROUGH-IN LOCATIONS FOR ALL LIGHTS AND EQUIPMENT BEFORE INSTALLATION.
6. CONTRACTOR SHALL FURNISH A FILE SYSTEM FOR ALL EQUIPMENT AND MAINTENANCE OF EACH PIECE OF EQUIPMENT.
7. ALL ELECTRICAL CIRCUITS HAVE TO BE MARKED AS TO WHAT EACH CONTROLS. CONTRACTOR HAVE TO FURNISH PHONE CONTACTS FOR WARRANTY SHOULD CONTRACTOR NOT BE LIABLE.
8. SEALING: WHERE PORTIONS OF INTERIOR RACEWAY ARE EXPOSED TO WIDELY DIFFERENT TEMPERATURES, CIRCULATION OF AIR FROM WARMER TO A COLDER SECTION SHALL BE PREVENTED. CONTRACTOR MUST COMPLY WITH ARTICLE 300-7 (a) N.E.C.
9. WHERE MORE THAN "ONE" SERVICE IS PERMITTED AS SET OUT IN ARTICLE 230-2 N.E.C. A PERMANENT "PLAQUE" OR DIRECTORY SHALL BE INSTALLED AT EACH SERVICE EQUIPMENT LOCATION DENOTING ALL OTHER SERVICES ON OR IN THE BUILDING AND THE AREA SERVED BY EACH. CONTRACTOR MUST COMPLY WITH ART. 230-2(e) N.E.C.

**NOTES ON ENERGY CODE:**

1. CONTRACTOR TO INSURE INSTALLATION OF "INDEPENDENT CONTROLS" SWITCH/ OCCUPANCY SENSORS) TO SWITCHES, DIMMER, OR OCCUPANCY SENSOR IN EACH SPACE PROVIDING A UNIFORM ILLUMINATION PATTERN.
2. CONTRACTOR TO INSURE INSTALLATION OF "PHOTOCELL ASTRONOMICAL SWITCH ON EXTERIOR LIGHTING".
3. TANDEM WIRED ONE-LAMP AND THREE-LAMP BALLASTED LUMINARIES.
4. CONTRACTOR TO INSURE ALL "EXIT" SIGNS TO HAVE BATTERY BACK-UP IN CASE OF POWER FAILURE AS REQUIRED BY N.E.C. STANDARDS, ARTICLE 700.
5. CONTRACTOR TO INSURE ALL JOINTS AND PENETRATION ARE CAULKED CASKETER, WEATHER-STRIPPED OR OTHERWISE SEALED.
6. ALL WINDOWS, DOORS AND SKYLIGHTS ARE TO BE CERTIFIED AS "MEETING LEAKAGE REQUIREMENTS".
7. COMPONENT R-VALUE AND U-FACTOR TO BE LABELED AS "CERTIFIED".
8. FIXTURE CONTROL TYPE AS FOLLOWS:
  - 8.1 OCCUPANCY SENSORS.
  - 8.2 LIGHTING PHOTOCELL CONTROLLED.
  - 8.3 ON/OFF SWITCH.

**LIGHTING KEYED NOTES:**

- ◇ PROVIDE HEAVY DUTY JUNCTION BOX, FLUSH IN CEILING (OR WALL) FOR EXHAUST FANS.
- ◇ PROVIDE HEAVY DUTY WEATHERPROOF WALL MOUNTED JUNCTION BOX FOR SIGN.
- ◇ PROVIDE HEAVY DUTY WEATHERPROOF WALL MOUNTED JUNCTION BOX FOR CAMERAS.

LIGHTING SCHEDULE							
ID	SYMBOL	DESCRIPTION	MANUF.	MODEL N°	VOLT. LUMINAIRE TYPE	POWER INPUT	REMARKS
L1	[Symbol]	SURFACE MOUNTED 2'x2' LIGHT PANEL	LITHONIA LTO	CPANEL 2x2 ALUMINUM 142	120 LED	30W	
L2	[Symbol]	EXTERIOR WALL MOUNTED LIGHT	LITHONIA LTO	CLLW LED P1 40K W/0L1	120 LED	9.1W	WITH PHOTOCELL CONTROL.
L3	[Symbol]	4" RECESSED DOWNLIGHT	SYLVANIA LTO	WFL LED 2700K/80K 10CR- WHITE FINISH	120 LED	14W	
L4	[Symbol]	EMERGENCY ILLUMINATION FIXTURE	LITHONIA LTO	ECBRM	120 LED	2.3W	SHALL BE ON WITH 90 BACK UP MINUTES BATTERY BUILT IN.
L5	[Symbol]	WALL MOUNTED EMERGENCY LIGHTS	LITHONIA LTO	ELMRL	120 LED	2.5W	SHALL BE ON WITH 90 BACK UP MINUTES BATTERY BUILT IN.
L6	[Symbol]	SURFACE MOUNTED 2'x2' LIGHT PANEL	LITHONIA LTO	CPANEL 2x2 ALUMINUM 142	120 LED	25W	

NOTES:  
 1. THIS PLAN SHALL BE USED IN CONJUNCTION WITH THE ELECTRICAL, MECHANICAL AND PLUMBING PLANS.  
 2. NOTIFY ARCHITECT IN CASE OF DISCREPANCIES FOUND.  
 3. MANUFACTURERS AND MODELS ARE SHOWN FOR CODE COMPLIANCE AND BIDDING PURPOSES ONLY. PRIOR ORDERING/INSTALLING ANY LIGHT FIXTURES CONTRACTOR SHALL PROVIDE SAMPLES AND CUT SHEETS TO OWNER FOR APPROVAL AND CONFIRM MANUFACTURER, MODEL, COLOR AND BUDGET/ COSTS.  
 4. PROVIDE COMPLETE LIGHTING FIXTURES WITH ACCESSORIES AS REQUESTED TO PROVIDE FULLY OPERABLE AND PROPERLY INSTALLED.

**CODES ANALYSIS**

**THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES (AS AMENDED BY THE STATE OF TEXAS):**  
 2018 International Building Code (IBC)  
 2020 National Electrical Code (NEC)  
 2018 International Mechanical Code (IMC)  
 2018 International Plumbing Code (IPC)  
 2018 International Fire Code (NFC)  
 2018 International Energy Conservation Code (IECC)

UNITY CHILDREN'S HOME

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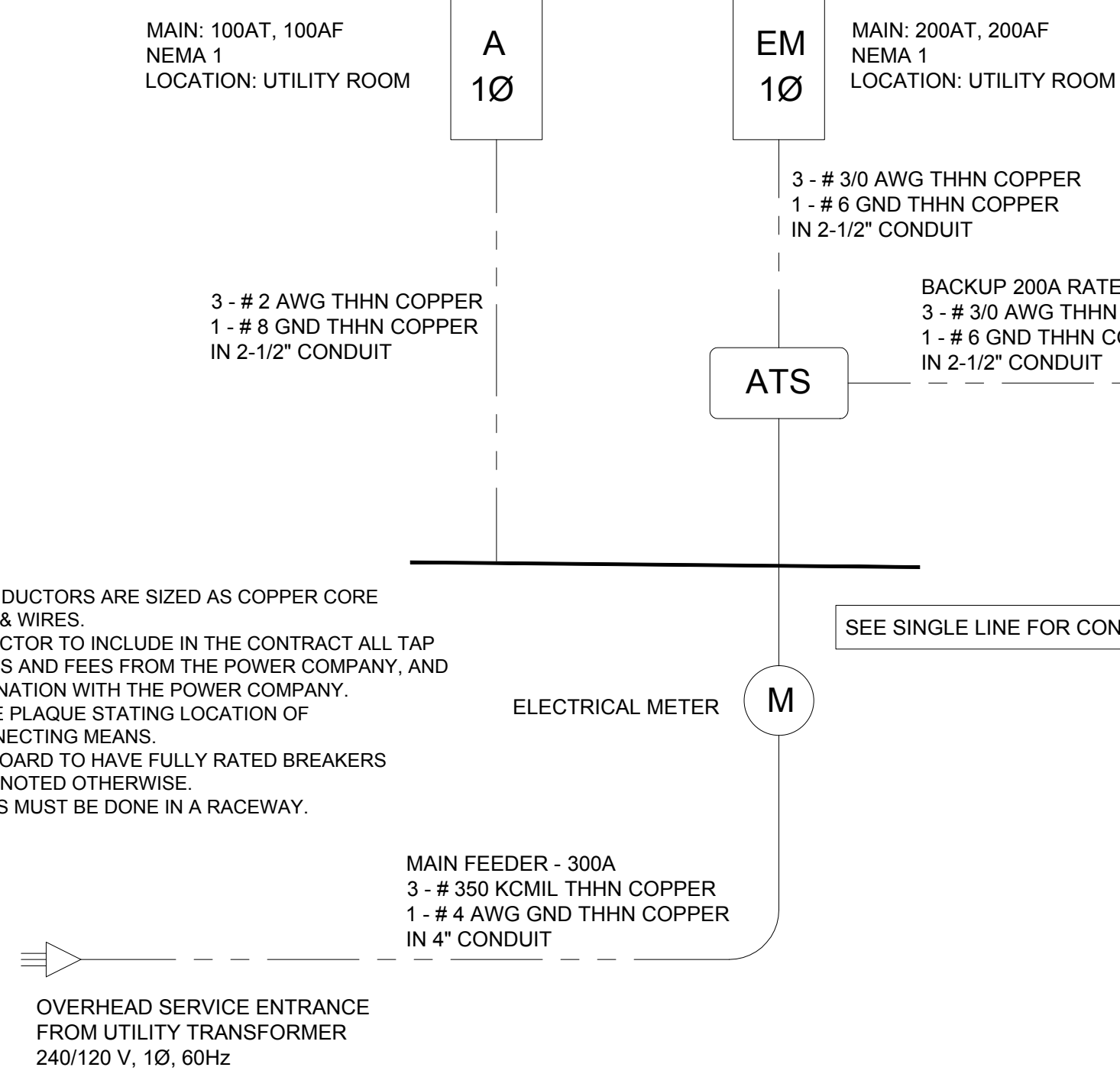
**LIGHTING FIRST & SECOND FLOOR LAYOUTS**

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 Date: 03.25.2023      PROJ.NO.:

**E 3.0**

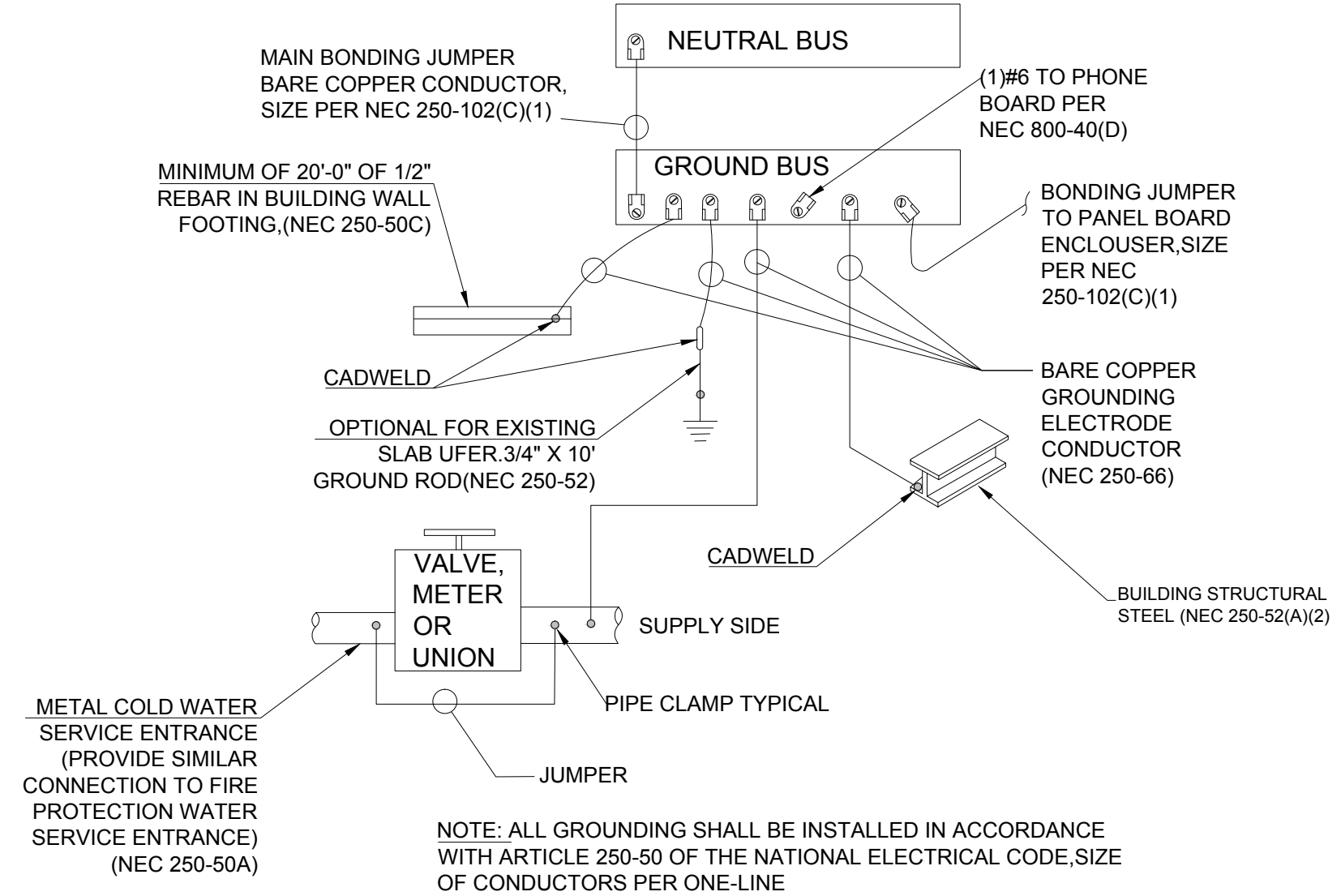
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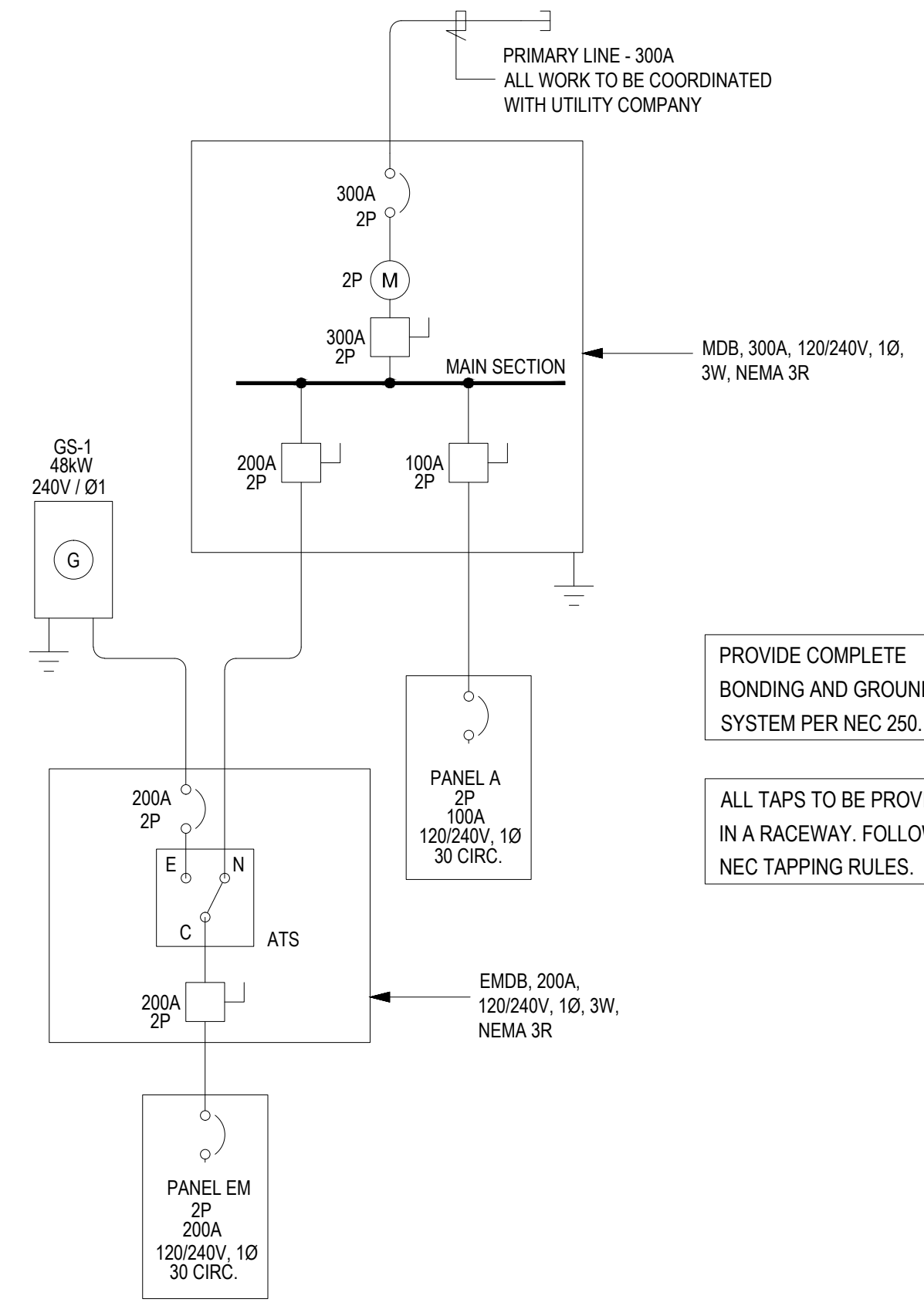


- NOTES:**
- ALL CONDUCTORS ARE SIZED AS COPPER CORE CABLES & WIRES.
  - CONTRACTOR TO INCLUDE IN THE CONTRACT ALL TAP CHARGES AND FEES FROM THE POWER COMPANY, AND COORDINATION WITH THE POWER COMPANY.
  - PROVIDE PLAQUE STATING LOCATION OF DISCONNECTING MEANS.
  - PANEL BOARD TO HAVE FULLY RATED BREAKERS UNLESS NOTED OTHERWISE.
  - ALL TAPS MUST BE DONE IN A RACEWAY.

1 POWER RISER DIAGRAM  
E-1 SCALE NTS



3 GROUNDING DETAIL  
E-1 SCALE NTS



2 SINGLE LINE DIAGRAM  
E-1 SCALE NTS

CONNECTED LOAD										DEMAND TOTAL									
CL	WF	A	B	CL	WF	A	B	CL	WF	A	B								
L Lighting	2.75	1.25	0.51	2.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
M Commercial Recept	12.80	0.80	0.80	0.20	7.68	0.00	0.00	0.00	0.00	0.00	0.00								
N Heating (Electric)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
O Cooling	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
P HVAC	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Q Other Continuous	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
R Motor	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
S Noncontinuous	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
<b>Total</b>	<b>15.55</b>	<b>7.11</b>	<b>0.46</b>	<b>11.16</b>															

CONNECTED LOAD										DEMAND TOTAL									
CL	WF	A	B	CL	WF	A	B	CL	WF	A	B								
L Lighting	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
M Commercial Recept	0.40	0.80	2.40	4.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00								
N Heating (Electric)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
O Cooling	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
P HVAC	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Q Other Continuous	0.40	1.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
R Motor	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
S Noncontinuous	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
<b>Total</b>	<b>0.80</b>	<b>5.85</b>	<b>2.60</b>	<b>36.18</b>															

CONNECTED LOAD										DEMAND TOTAL									
CL	WF	A	B	CL	WF	A	B	CL	WF	A	B								
L Lighting	0.00	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
M Commercial Recept	0.40	0.80	2.40	4.00	3.84	0.00	0.00	0.00	0.00	0.00	0.00								
N Heating (Electric)	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
O Cooling	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
P HVAC	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
Q Other Continuous	0.40	1.00	0.20	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
R Motor	0.00	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
S Noncontinuous	0.00	0.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
<b>Total</b>	<b>0.80</b>	<b>5.85</b>	<b>2.60</b>	<b>36.18</b>															

Table 250.122 Minimum Size Equipment Grounding Conductors for Grounding Raceway and Equipment

Rating or Setting of Automatic Overcurrent Device in Circuit Ahead of Equipment, Conduit, etc., Not Exceeding (Amperes)	Size (AWG or kcmil)	
	Copper	Aluminum or Copper-Clad Aluminum*
15	14	12
20	12	10
60	10	8
100	8	6
200	6	4
300	4	2
400	3	1
500	2	1/0
600	1	2/0
800	1/0	3/0
1000	2/0	4/0
1200	3/0	250
1600	4/0	350
2000	250	400
2500	350	600
3000	400	600
4000	500	750
5000	700	1200
6000	800	1200

Note: Where necessary to comply with 250.4(A)(5) or (B)(4), the equipment grounding conductor shall be sized larger than given in this table.  
\*See installation restrictions in 250.120.

4 NEC GROUNDING CONDUCTOR SIZE  
E-1 SCALE NTS

UNITY CHILDREN'S HOME

2111 RIVER VALLEY DR.,  
SPRING, TX 77373

PANEL BOARDS  
SCHEDULES,  
SINGLE LINE AND  
RISER DIAGRAMS.

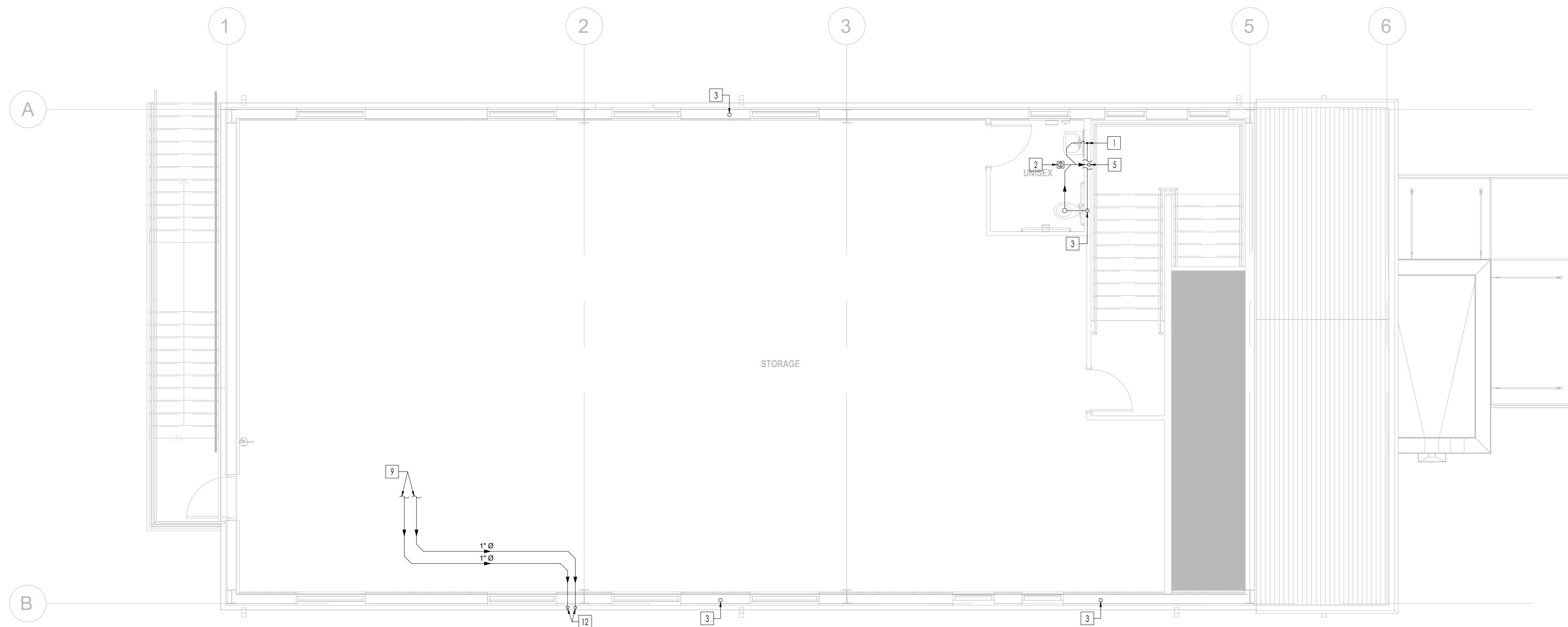
Drawn By: M.T Scale: NTS

Date: 03.25.2023 PROJ.NO.:

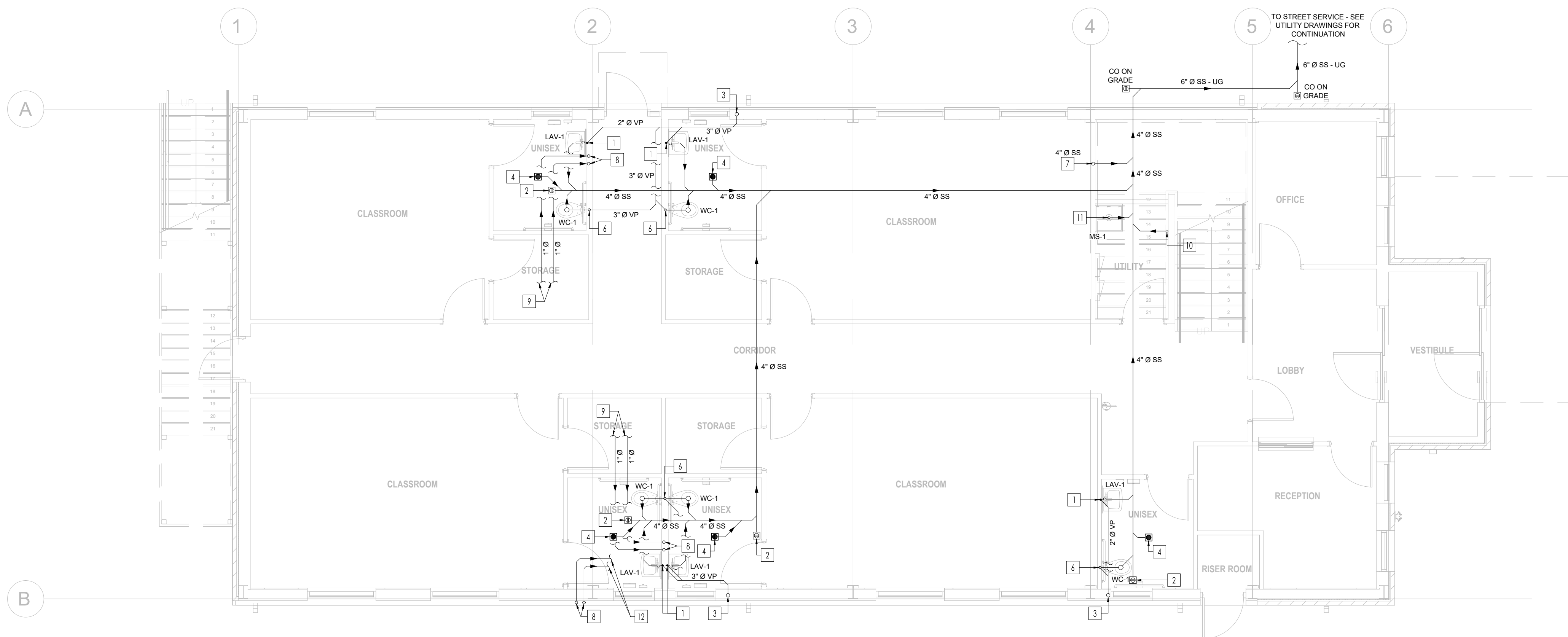
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SHEET NO.





**SECOND FLOOR PLAN**



**FLOOR PLAN**

PLUMBING PIPING MATERIAL SCHEDULE		
PIPING SYSTEM	LOCATION	ACCEPTABLE PIPING MATERIAL
VENT	IN RETURN AIR PLENUM SPACES	<math>\leq 1\frac{1}{2}</math>" DMV COPPER OR SCHEDULE 40 GALVANIZED PIPE AND FITTINGS
	IN NON-PLENUM AREAS	ASTM D-1785 PVC SCHEDULE 40, SOLVENT CEMENT TYPE JOINTS
SANITARY WASTE	BELOW AND ABOVE GRADE	ASTM D-1785 PVC SCHEDULE 40, SOLVENT CEMENT TYPE JOINTS
	ABOVE SLAB IN RETURN AIR PLENUM SPACES	ASTM A-74 CAST IRON PIPE, HUBLESS SERVICE WEIGHT
DOMESTIC WATER		TYPE L COPPER TUBING WITH WROUGHT COPPER FITTINGS AND PS/S SOLDER JOINTS

**FROM 2018 IPC - TABLE 709.1:  
DRAINAGE FIXTURE UNIT VALUES (DFU)**

FIXTURE	D.F.U	QTY.	TOTAL D.F.U
WATER CLOSET	3.0	6	18.0
LAVATORY	1.0	6	6.0
FLOOR DRAIN	2.0	5	10.0
MOP SINK	2.0	1	2.0
<b>TOTAL DFU =</b>			<b>36.0</b>

**AS PER 2018 IPC - TABLE 710.1(1):**  
- MAIN SEWER PIPE: 4"Ø

**FROM 2018 IPC - TABLE 709.1:  
PIPE SIZE PER FIXTURE**

FIXTURE	DR (INCH)	VENT (INCH)
WATER CLOSET	4	3
LAVATORY	2	2
MOP SINK	2	2

**GENERAL NOTES:**

- PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
- PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
- REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
- CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
- CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
- ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
- ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
- ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
- ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT  $\frac{1}{8}$ " PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT  $\frac{1}{4}$ " PER FOOT.
- ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT  $\frac{1}{8}$ " PER FOOT AND PROVIDE ACCESSIBLE CLEANOUTS AT ALL CHANGES OF DIRECTION.
- VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
- REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

**DRAINAGE KEYED NOTES:**

- WASTE DROP AND 2" VENT RISE.
- 4" FLOOR CLEAN-OUT.
- 3" VENT STACK TO ABOVE.
- FD-1 - 3" FLOOR DRAIN WITH TRAP PRIMER.
- 4" SEWER DROP TO BELOW STORY.
- VENT PIPE RISE TO CEILING LEVEL.
- 4" SEWER DROP FROM ABOVE TO BELOW.
- PRIMARY & SECONDARY CONDENSATE DRAIN CONNECTIONS TO LAVATORY TRAP.
- PRIMARY & SECONDARY CONDENSATE DRAIN CONNECTIONS TO AIR HANDLING UNIT.
- T&P DISCHARGE DRAIN CONNECTION - INDIRECT WASTE.
- MOP SINK DRAIN POINT.
- PRIMARY & SECONDARY CONDENSATE DRAIN CONNECTIONS TO BELOW / FROM ABOVE STORY.

**CODES ANALYSIS**  
THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES (AS AMENDED BY THE STATE OF TEXAS):  
**2018 International Building Code (IBC)**  
**2020 National Electrical Code (NEC)**  
**2018 International Mechanical Code (IMC)**  
**2018 International Plumbing Code (IPC)**  
**2018 International Fire Code (IFC)**  
**2018 International Energy Conservation Code (IECC)**

Cleanouts are required at the upper most terminals of all horizontal waste lines. Please provide cleanouts location within the floor plan.

ABS/PVC vent terminations up through the roof exposed to sunlight are required to be protected by water based synthetic latex paints." 906.1

ALL PIPE BELOW 4"Ø PIPE SIZE TO BE SLOPED 2%.  
ALL PIPES GREATER THAN 4"Ø PIPE SIZE SHALL BE SLOPED 1%.

UNITY CHILDREN'S HOME

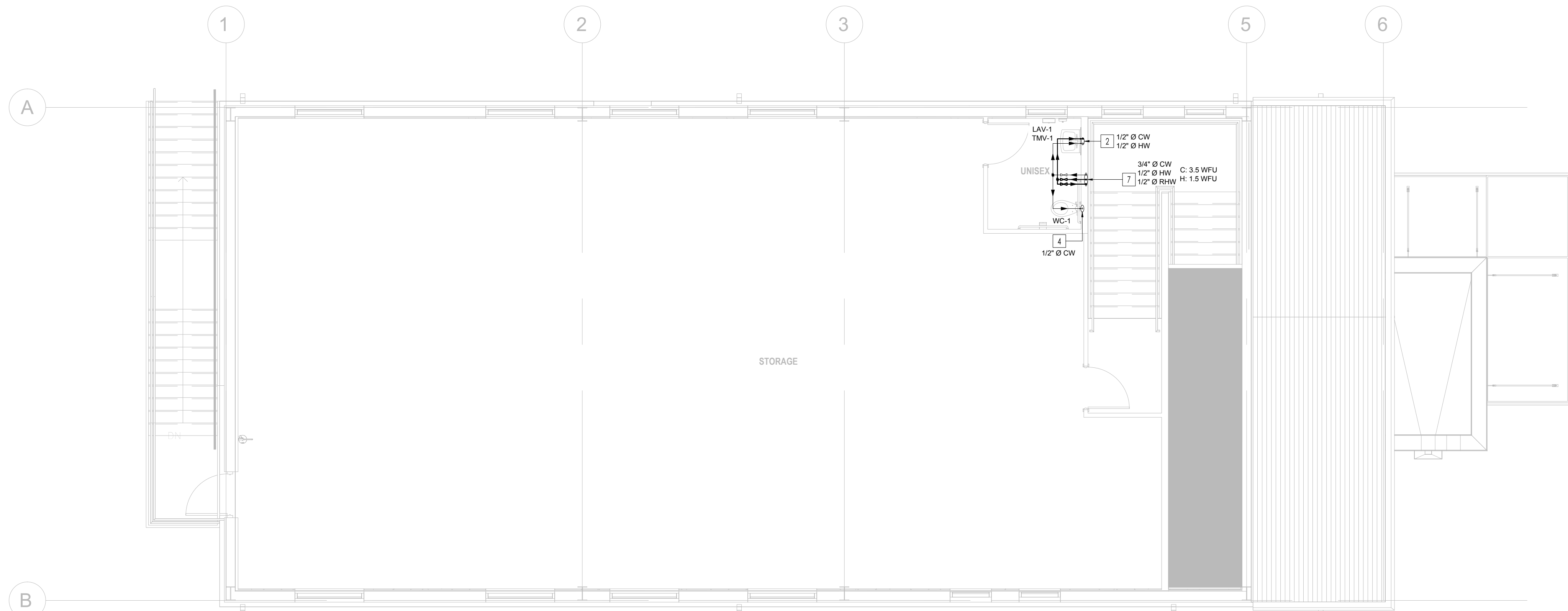
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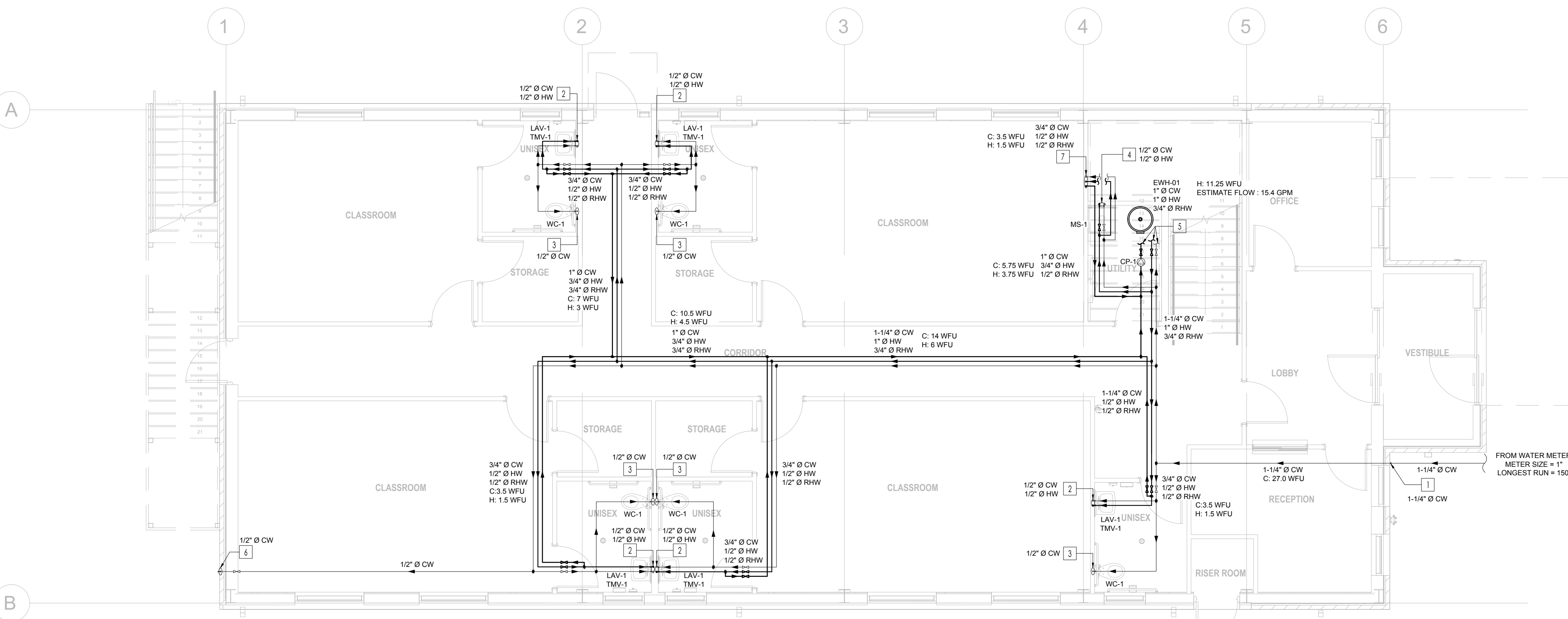
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## SECOND FLOOR PLAN



## FLOOR PLAN

### WATER SUPPLY KEYED NOTES:

- 1 DCW FROM BELOW GRADE UP IN WALL - MAIN WATER ENTRY.
- 2 DCW & DHW DROP IN WALL TO LAVATORY WITH THERMOSTATIC MIXING VALVE.
- 3 DCW DROP IN WALL TO FIXTURE TERMINAL.
- 4 DCW & DHW DROP IN WALL TO MOP SINK FAUCET.
- 5 DCW, DHW & DHWR CONNECTION TO ELECTRIC WATER HEATER EWH-1. SEE SCHEDULE & INSTALLATION DETAIL FOR COMPLETION.
- 6 DCW DROP TO HOSE BIB - AQUOR HOUSE HYDRANT V2+ WITH BUILT-IN VACCUUM BREAKER.
- 7 DCW, DHW & DHWR RISE TO ABOVE / FROM BELOW LEVEL - RISER.

### CODES ANALYSIS

**THIS PROJECT SHALL COMPLY WITH THE FOLLOWING CODES (AS AMENDED BY THE STATE OF TEXAS):**  
**2018 International Building Code (IBC)**  
**2020 National Electrical Code (NEC)**  
**2018 International Mechanical Code (IMC)**  
**2018 International Plumbing Code (IPC)**  
**2018 International Fire Code (NFC)**  
**2018 International Energy Conservation Code (IECC)**

EACH VALVE NEEDS A HOSE BIBB OR OTHER FITTING ALLOWING FOR FLUSHING THE WATER HEATER WHEN THE VALVES ARE CLOSED.

### PLUMBING PIPING MATERIAL SCHEDULE

PIPING SYSTEM	LOCATION	ACCEPTABLE PIPING MATERIAL
VENT	IN RETURN AIR FLENUM SPACES	<math>\le 1-1/2''</math> DWV COPPER OR SCHEDULE 40 GALVANIZED PIPE AND FITTINGS
	IN NON-FLENUM AREAS	>=2" ASTM A-74 CAST IRON SOIL PIPE AND FITTINGS
SANITARY WASTE	BELOW AND ABOVE GRADE	ASTM D-1785 PVC SCHEDULE 40. SOLVENT CEMENT TYPE JOINTS
	ABOVE SLAB IN RETURN AIR FLENUM SPACES	ASTM A-74 CAST IRON PIPE, HUBLESS SERVICE WEIGHT
DOMESTIC WATER		TYPE L COPPER TUBING WITH WROUGHT COPPER FITTINGS AND 95/5 SOLDER JOINTS

FIXTURE TYPE	MAXIMUM FLOW RATE
Water closets	1.28 gallons/flush
Lavatory faucets-nonresidential	0.5 gpm @60 psi

### FROM 2018 IPC - TABLE E 103.3 (2): WATER SUPPLY FIXTURE UNITS LOADS:

FIXTURE	OCCUPANCY	W.S.F.U	QTY.	TOTAL W.S.F.U
LAVATORY	PUBLIC	2.0	6	12.0
WC - FLUSH TANK 1.6 GPF	PUBLIC	2.0	6	12.0
MOP SINK	OFFICES, ETC...	3.0	1	3.0
TOTAL =				27.0 W.F.U
EQUIVALENT FLOW =				22.5 GPM
Ø1 1/4" MAIN PIPE WILL OPERATE AT APPROX.				5.5 FT/s

### DISINFECTATION OF POTABLE WATER SYSTEM

**GENERAL:**  
 POTABLE WATER SYSTEM EQUIPMENT AND PIPING SHALL BE PURGED OF DELETERIOUS MATTER AND DISINFECTED PRIOR TO UTILIZATION. THE METHOD TO BE FOLLOWED SHALL BE THAT PRESCRIBED BY THE HEALTH AUTHORITY OR AUTHORITY HAVING JURISDICTION OR IN THE ABSENCE OF A PRESCRIBED METHOD, THE PROCEDURE DESCRIBED IN EITHER AWWA C651 OR AWWA C652 OR AS DESCRIBED AS BELOW. THIS REQUIREMENT SHALL APPLY TO "ONSITE" OR "IN PLANT" FABRICATION OF A SYSTEM OR TO A MODULAR PORTION OF A SYSTEM.

1. THE PIPE SYSTEM SHALL BE FLUSHED WITH CLEAN, POTABLE WATER UNTIL DIRTY WATER DOES NOT APPEAR AT THE POINTS OF OUTLET.
2. THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER/CHLORINE SOLUTION CONTAINING NOT LESS THAN 50 PARTS PER MILLION (50mg/L) OF CHLORINE, AND THE SYSTEM OR PART THEREOF SHALL BE VALVES OFF AND ALLOW TO STAND FOR 24-HOURS, OR THE SYSTEM OR PART THEREOF SHALL BE FILLED WITH A WATER CHLORINE SOLUTION CONTAINING NOT LESS THAN 200 PARTS PER MILLION (200mg/L) OF CHLORINE AND ALLOWED TO STAND FOR 3-HOURS.
3. FOLLOWING THE REQUIRED STANDING TIME, THE SYSTEM SHALL BE FLUSHED WITH CLEAN WATER UNTIL THE CHLORINE IS PURGED FROM THE SYSTEM.
4. THE PROCEDURE SHALL BE REPEATED WHERE SHOWN BY A BACTERIOLOGICAL EXAMINATION THAT CONTAMINATION REMAINS PRESENT IN THE SYSTEM.

### GENERAL NOTES:

1. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE EXACT PIPE SIZES, INVERT ELEVATIONS, PRESSURES FOR LOCATIONS OF ANY SEWER, WATER PIPING AND WATER METER WITH CIVIL UTILITIES DRAWINGS, AND ANY OTHER ENGINEER AS APPLICABLE.
2. PRIOR TO PERFORMING WORK, CONTRACTOR TO COORDINATE PIPE ROUTING WITH ALL OTHER TRADES AND EXISTING FIELD CONDITIONS.
3. REFER TO MECHANICAL PLANS FOR PLUMBING SPECIFICATION OF MATERIAL, INSULATION AND INSTALLATION REQUIREMENTS.
4. CONTRACTOR IS RESPONSIBLE FOR ROUGH-IN COORDINATION AND LOCATIONS. REFER TO ARCHITECTURAL PLANS FOR LOCATIONS AND FIXTURES.
5. CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED CUTTING AND PATCHING.
6. ALL NOTCHING, BORING, AND CUTTING OF HOLES IN WALL STUDS AND FLOOR JOISTS SHALL BE PERFORMED BASED ON THE LATEST ADOPTED AND APPROVED EDITION OF THE BUILDING CODE.
7. ALL PLUMBING FIXTURES SHALL BE OF WATER CONSERVATION TYPE AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
8. ALL WATER PIPING SHALL BE INSTALLED ON INTERIOR SIDE OF THE BUILDING WALL INSULATION.
9. ALL SANITARY DRAINAGE PIPING 3" AND SMALLER SHALL BE SLOPED AT 1/8" PER FOOT. PIPING 4" AND LARGER SHALL BE SLOPED AT 1/4" PER FOOT.
10. ALL CONDENSATE DRAIN PIPING SHALL BE SLOPED AT 1/8" PER FOOT AND PROVIDE ACCESSIBLE CLEANOUTS AT ALL CHANGES OF DIRECTION.
11. VENTS THAT TERMINATE AT THE ROOF SHALL BE A MINIMUM OF 10' FROM ANY FRESH AIR INTAKE.
12. REFER TO THE PLUMBING DIAGRAMS FOR GUIDANCE OF INSTALLATION INTENT. CONTRACTOR IS TO PROVIDE ALL COMPONENTS NECESSARY TO MEET THE DESIGN INTENT, WHETHER SHOWN IN DIAGRAM OR NOT.

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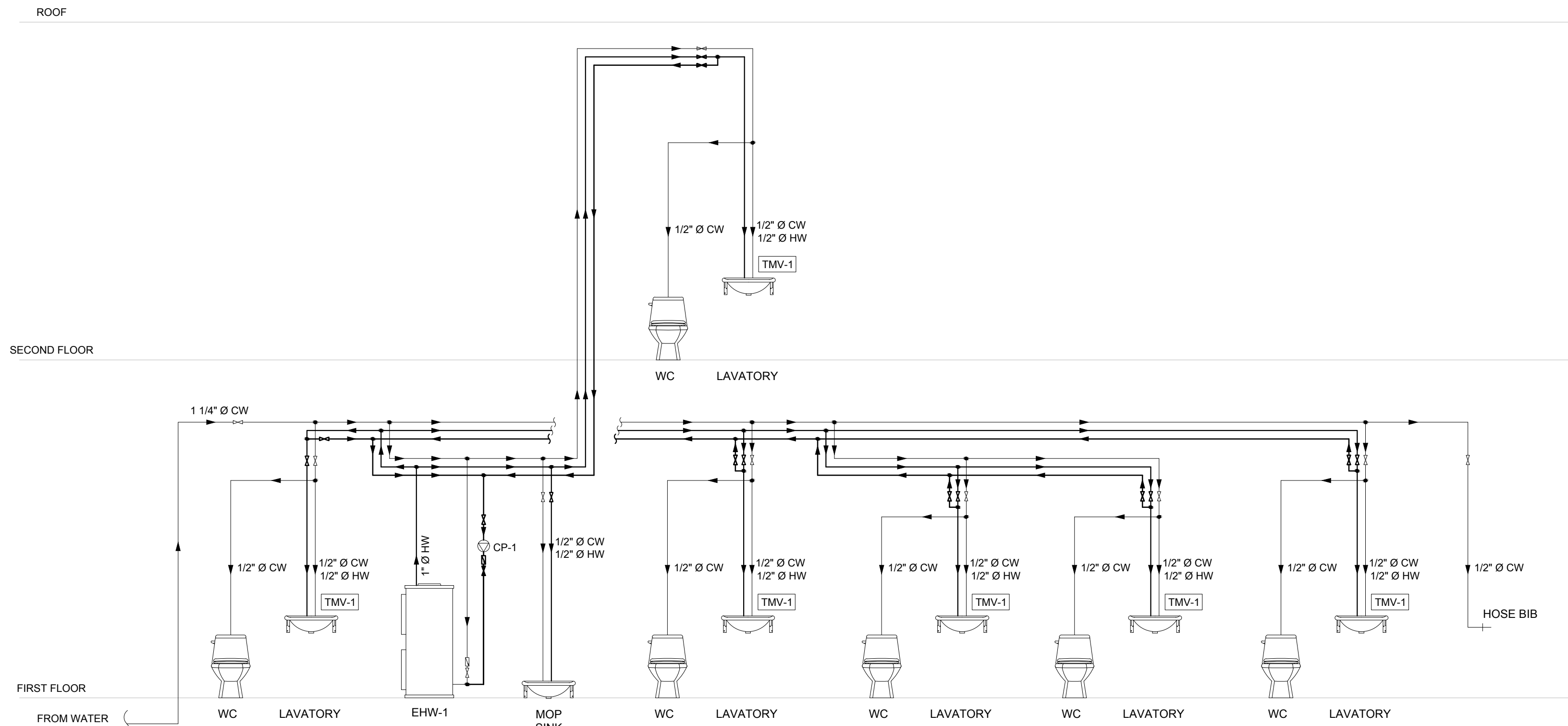
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Date: 05.03.2023 PROJ.NO.:

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**WATER SUPPLY RISER DIAGRAM**  
Scale: NTS

FIXT ID	DESCRIPTION	ROUGH-IN					REMARKS
		TRAP	SS	SV	CW	HW	
WC-1	WATER CLOSET (FLOOR MOUNTED) (A.D.A APPROVED)	-	4"	2"	1/2"	-	2487100 AMERICAN STANDARD "CADET", VITREOUS CHINA, HIGH EFFICIENCY, ULTRA LOW CONSUMPTION 1.1 GPF, ELONGATED BOWL, PRESSURE-ASSISTED SIPHON, JET FLUSH ACTION. 9500CT CHURCH, EXTRA HEAVY WEIGHT AND INJECTION MOULDED OF SOLID PLASTIC. OPEN FRONT LESS COVER FOR ELONGATED BOWL AND FEATURE LARGE HOLED-IN BUMPERS. CONCEALED CHECK HINGES TO FEATURE 300 SERIES STAINLESS STEEL POSTS THAT STOP SEAT 11 DEGREES BEYOND VERTICAL. USES 300 SERIES STAINLESS STEEL HARDWARE. 8V02 MCGUIRE, 1/2" IPS X 3/8" O.D. QUARTER-TURN BRASS BALL VALVE ANGLE STOP. CHROME PLATED, CONVERTIBLE LOOSE KEY HANDLE. SUPPLY STOP VALVE SHALL BE CERTIFIED BY CSA OR OTHER RECOGNIZED TESTING AUTHORITY AND SHALL BEAR MANUFACTURER AND TESTING MARK. STOP TO BE CERTIFIED TO 200 PSI LINE PRESSURE. WATER CLOSET SHALL BE 14" ABOVE FINISHED FLOOR LEVEL.
LAV-1	LAVATORY (UNDER COUNTER) (TEMPERED CWHW @ 105 F)	1-1/4"	2"	2"	1/2"	1/2"	0495221 AMERICAN STANDARD "OVALYN", UNDER COUNTER LAVATORY, 3 HOLES - 4" CENTERS MOUNTING. SYMONS 5-61 SLOW CLOSING METERING LAVATORY FAUCET TO METER A SINGLE TEMPERED WATER. TEMPERED WATER SHALL BE 105F. CAST BRASS 4" CENTERSET WITH TIME LIMIT STOP TO ADJUST FLOW TIME. SPRAY OUTLET WITH 0.5 GPM FLOW RATE, VANDAL RESISTANT. 155A MCGUIRE 1-1/4" X 6", 17 GAUGE TAILPIECE GRID STRAINER. 2165LK MCGUIRE 1/2" X 3/8" ANGLE STOP AND SUPPLY LOOSE KEY. CB872 MCGUIRE 1-1/4" CHROME PLATED "P" TRAP WITH CLEAN-OUT.
MS-1	SERVICE SINK (FLOOR MOUNTED)	1-1/4"	2"	2"	1/2"	-	HL-1800 STERN WILLIAMS HILOR, 24" X 24" X 12" DRAIN. SHALL CAST BRASS WITH STAINLESS STEEL STRAINER. CAST INTEGRAL AND SHALL PROVIDE FOR CAULKED LEAD CONNECTION NOT LESS THAN 1" DEEP TO A 3" PIPE RECEPTOR. COMPOSED OF PEARL GRAY MARBLE CHIPS AND WHITE PORTLAND CEMENT GROUND SMOOTH. GROUTED AND SEALED TO RESIST STAINS. STAINLESS STEEL CAP OF ONE PIECE 20 GA 302 STAINLESS STEEL. CAST INTEGRAL ON THRESHOLD. T-10-V8 MOP-SERVICE SINK FITTING WITH VACUUM BREAKER, ADJUSTABLE TOP BRACE, 3/4" HOSE THREAD ON SPOUT WITH BUCKET. HOOK INLETS 8" ON CENTER. CHROME FINISH. T-35 HOSE AND WALL HOOK. HOSE 36" LONG WITH 3/4" CHROME COUPLINGS. WALL BRACKET OF STAINLESS STEEL. T-40 STAINLESS STEEL MOP HANGAR OF STAINLESS STEEL WITH #4 FINISH, 24" LONG WITH 3 RUBBER SPRING LOADED GRIPS. BP SPLASH CATCHER PANELS OF 20 GA TYPE 304 STAINLESS STEEL.
TMV-1	THERMOSTATIC MIXING VALVE	-	-	-	1"	1"	370 LEONARD 3/4" INLETS, 3/4" OUTLETS, IPS CONNECTIONS. MATERIALS: BRONZE BODY, LOCKED TEMPERATURE AND ADJUSTMENT CAP (VANDAL RESISTANT). COPPER ENCAPSULATED THERMOSTAT ASSEMBLY WITH POLYMER HERMOPLASTIC SHUTTLE, STAINLESS STEEL SPRINGS, INTEGRAL CHECK VALVES ON HOT AND COLD INLETS. PRESSURE-TEMPERATURE MAXIMUM HOT WATER TEMPERATURE 200F. APPROACH TEMPERATURE 5F ABOVE SET POINT. PROVIDE WITH TEMPERATURE GAUGE ON THE OUTLET SIDE. HOT WATER INLET SHALL BE 140F AND HOT WATER OUTLET SHALL BE 110F.
FD-1	FLOOR DRAIN	3"	3"	2"	-	-	2010C-A JR SMITH DUCCO CAST IRON BODY WITH FLASHING COLLAR AND ADJUSTABLE STAINER HEAD 6" DIAMETER TYPE "A" NICKEL BRONZE STRAINER. INSTALL COMPLETE WITH PROSET TRAP GUARD, EXCEPT FOR SHOWER DRAIN.

**SCHEDULE No. 1**  
**ELECTRIC WATER HEATER SCHEDULE**

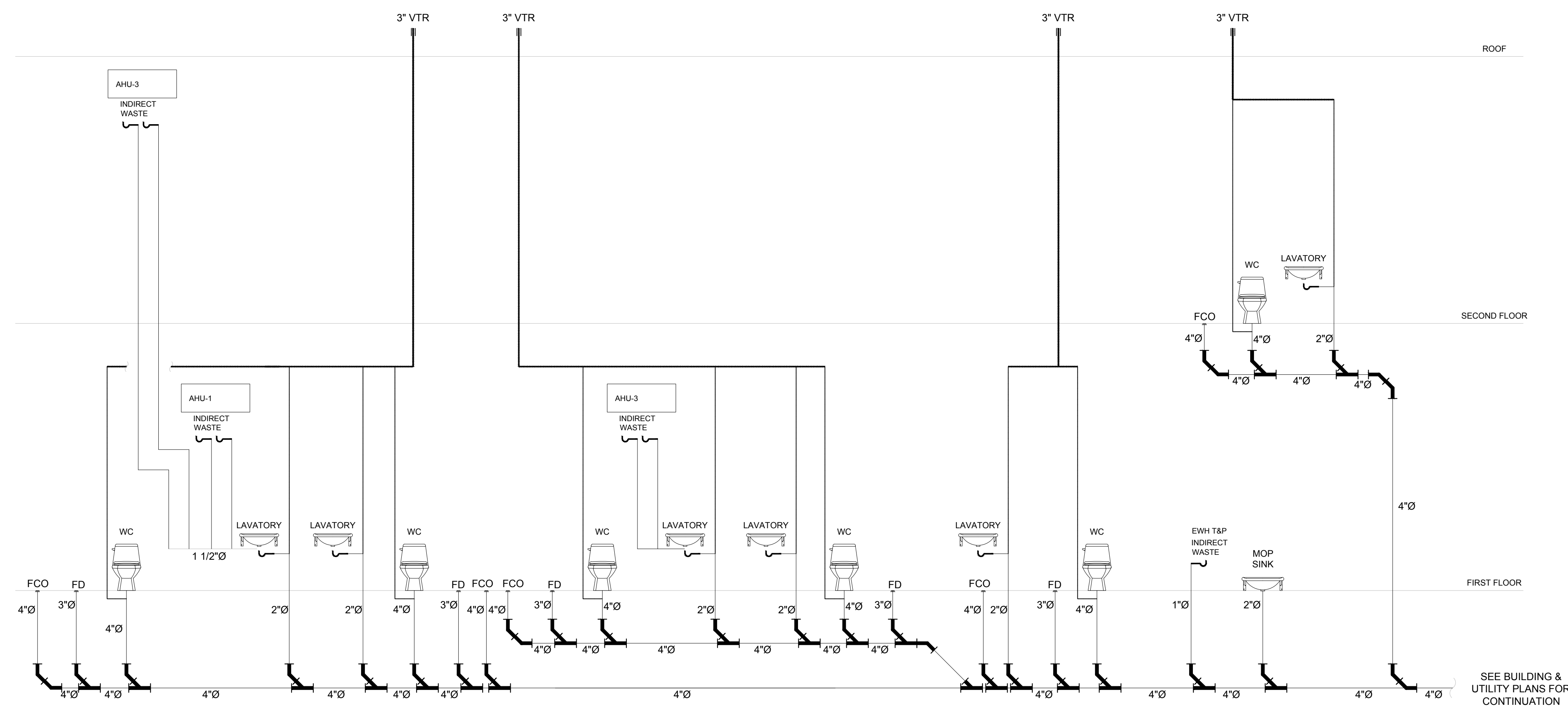
TAG	EWH-01
LOCATION	FIRST FLOOR UTILITY
SERVES	WHOLE DAYCARE
MANUFACTURER	A.O SMITH
MODEL	DRE-52-12
TYPE	ELECTRIC - TANK
HEATER INPUT (KW) / N° OF HEATERS	12.3 / 3
FIRST HOUR DELIVERY (GPH)	90
RECOVERY AT 100°F RISE (GPH)	49
VOLTAGE (V / PH / HZ)	208 - 230 / 1 / 60
LISTED TANK CAPACITY (GAL)	50
USABLE TANK CAPACITY (GAL)	40
UNIFORM ENERGY FACTOR U.E.F	-
APPROXIMATE SHIPPING WEIGHT (LBS)	260
DIAMETER x HEIGHT (in.)	21 3/4 x 55 3/4

Water piping and cooling system line insulation thickness and conductivity Piping shall be insulated to the thickness as follows:  
a) All domestic hot water system piping conditions listed below, whether buried or unburied, must be insulated and the insulation thickness shall be selected based on the conductivity range in TABLE 120.3-A and the insulation level shall be selected from the fluid temperature range based on the thickness requirements in TABLE 120.3A  
b) The first 5 feet of hot and cold-water pipes from the storage tank  
c) All piping with a nominal diameter of 3/4 inch (19 millimeter) or larger.  
d) All piping associated with a domestic hot water recirculation system regardless of the pipe diameter.  
e) All hot water piping from the heat source to the kitchen fixtures

"Galvanized malleable iron, galvanized wrought iron, or galvanized steel are prohibited materials for water supply and building water piping both underground and in buildings."

- NOTES:  
1. HEATER SHALL BE EQUIPPED WITH TERMINAL BLOCK TO ALLOW SIMULTANEOUS ELEMENTS WIRING, AND TO HAVE SINGLE PHASE SUPPLY.  
2. HEATER SHALL HAVE CSA CERTIFIED AND ASME RATED T&P RELIEF VALVE.  
3. HEATER SHALL MEET OR EXCEED THE THERMAL EFFICIENCY AND/OR STANDBY LOSS REQUIREMENTS OF THE US DOE AND CURRENT EDITION OF ASHRAE/IESNA 90.1.  
4. HEATER SHALL HAVE SURFACE MOUNTED THERMOSTATS.  
5. HEATER SHALL HAVE INCOLOY ELEMENTS.  
6. HEATER SHALL HAVE INDIVIDUAL ELEMENT FUSING.  
7. HEATER SHALL HAVE FULL FLOW BRASS DRAIN VALVE.

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.
4303.1.4.2	Lavatory Faucets in common and Public Use Areas: <0.5 gpm @ 60 psi
<b>PLUMBING FIXTURE CERTIFICATION REQUIRED:</b> 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.	



**DRAINAGE RISER DIAGRAM**  
Scale: NTS

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