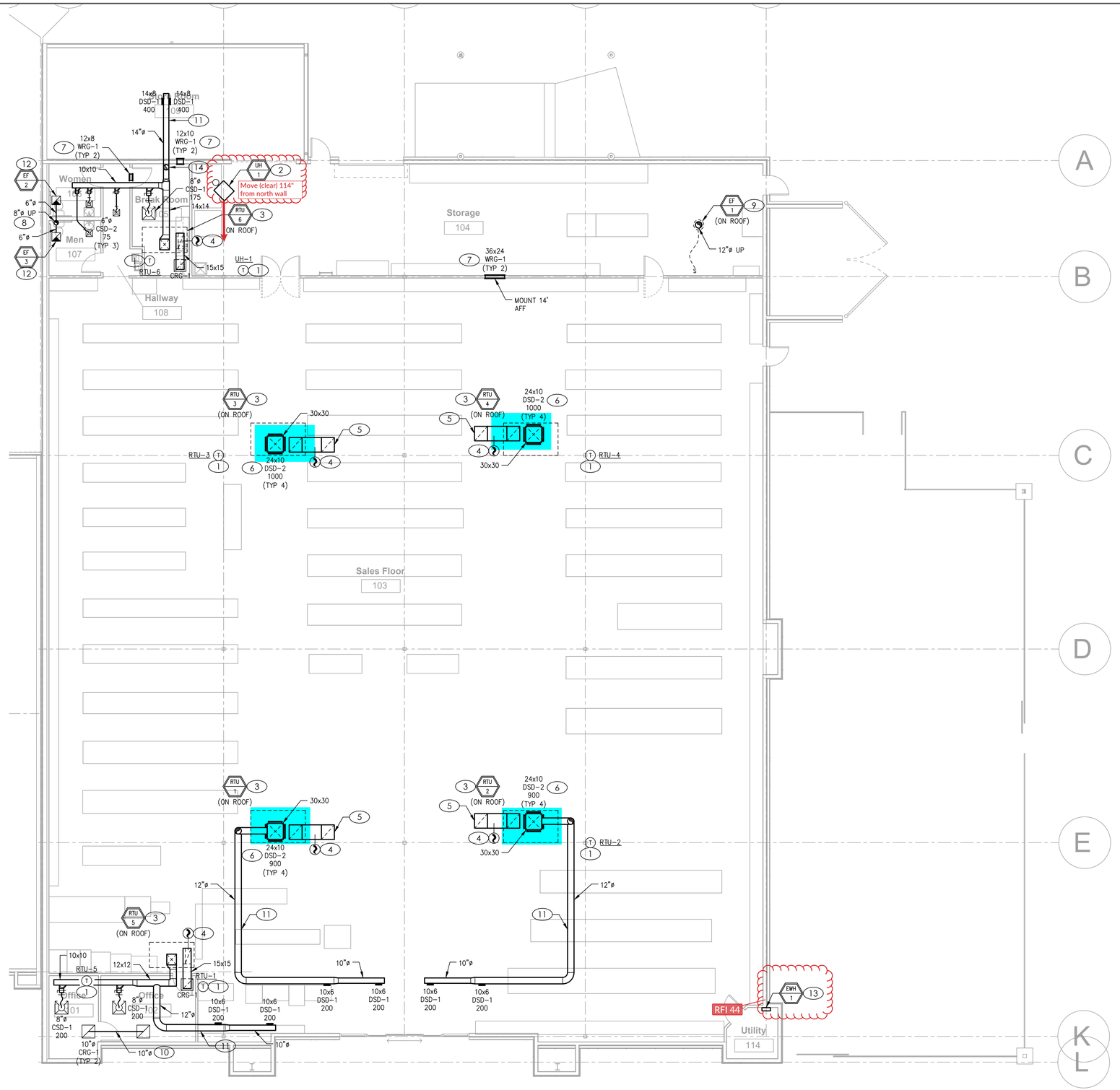

MECHANICAL PLAN

SCALE : 1/8" = 1'-0"

1

NORTH

GENERAL WORK NOTES

A. DRAWINGS ARE DIAGRAMMATIC ONLY AND REPRESENT THE GENERAL SCOPE OF WORK. REVIEW THE GENERAL NOTES, SPECIFICATIONS AND PLANS FOR ADDITIONAL REQUIREMENTS THAT MAY NOT BE SPECIFICALLY CALLED OUT IN THIS PORTION OF THE CONSTRUCTION DOCUMENTS. NOTIFY ARCHITECT, ENGINEER AND/OR OWNER OF CONFLICTS OR DISCREPANCIES PRIOR TO SUBMISSION OF BID.

B. COORDINATE INSTALLATION OF MECHANICAL AND PLUMBING SYSTEMS WITH OTHER TRADES TO ENSURE A NEAT AND ORDERLY INSTALLATION AND AVOID CONFLICTS. INSTALL DUCTWORK AND PIPING AS TIGHT TO STRUCTURE AS POSSIBLE. COORDINATE INSTALLATION OF DUCTWORK AND PIPING TO AVOID CONFLICTS WITH ELECTRICAL PANELS, LIGHTING FIXTURES, ETC. VERIFY DUCT SPACE AVAILABLE ABOVE ALL CEILINGS PRIOR TO ANY FABRICATION OF INSTALLATION.

C. NEW MECHANICAL EQUIPMENT, DUCTWORK AND PIPING ARE SHOWN AT APPROXIMATE LOCATIONS. FIELD MEASURE FINAL DUCTWORK AND PIPING LOCATIONS PRIOR TO FABRICATION AND MAKE ADJUSTMENTS AS REQUIRED TO FIT THE DUCTWORK AND PIPING WITHIN THE AVAILABLE SPACE. VERIFY THAT FINAL EQUIPMENT LOCATIONS MEET MANUFACTURER'S RECOMMENDATIONS REGARDING SERVICE CLEARANCE AROUND EQUIPMENT.

D. BRANCH DUCTWORK SHALL BE THE SAME SIZE AS NECK SIZE SHOWN UNLESS OTHERWISE NOTED.

E. ALL ROOF AND WALL PENETRATIONS SHALL BE COORDINATED WITH THE GENERAL CONTRACTOR. PROVIDE ALL REQUIRED SLEEVES, FLASHINGS, CURBS, REINFORCED ANGLES, SUPPORTING FRAMES, ETC. UNLESS THEY ARE SPECIFICALLY CALLED OUT TO BE FURNISHED BY OTHERS.

F. THE ELECTRICAL SYSTEM DESIGN IS BASED IN PART ON THE SPECIFIED HVAC EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE ELECTRICAL REQUIREMENTS OF THE HVAC EQUIPMENT BEING FURNISHED. ANY CHANGES TO THE ELECTRICAL SYSTEM DUE TO HVAC EQUIPMENT OTHER THAN THE SPECIFIED EQUIPMENT BEING FURNISHED SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

(#) KEYED PLAN NOTES

1. LOCATE THERMOSTAT AT 54"AFF. COORDINATE EXACT LOCATION WITH TENANT PRIOR TO INSTALLATION. PROVIDE LOCKING COVER FOR THERMOSTAT.
2. GAS UNIT HEATER. SUPPORT FROM STRUCTURE AS REQUIRED. INSTALL PER MANUFACTURER'S INSTRUCTIONS MAINTAINING MANUFACTURER'S REQUIRED CLEARANCES TO COMBUSTIBLES. PROVIDE 4" TYPE 'B' VENT UP THROUGH ROOF PER MANUFACTURER'S WRITTEN INSTRUCTIONS. LOCATE VENT A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE.
3. INSTALL NEW RTU ON 14" HIGH ROOF CURB. INSTALL PER MANUFACTURER'S WRITTEN INSTRUCTIONS MAINTAINING SERVICE CLEARANCES. COORDINATE WITH SPRINKLER LINES, ELECTRICAL CONDUIT AND STRUCTURAL MEMBERS. DISCHARGE CONDENSATE DRAIN TOWARDS NEAREST ROOF DRAIN. PROVIDE FULL SIZE SUPPLY AND RETURN DUCT DROPS DOWN THROUGH ROOF THEN DISTRIBUTE DUCTWORK AS SHOWN.
4. PROVIDE SMOKE DETECTOR IN RETURN AIR DUCT IN COMPLIANCE WITH NFPA 72. DUCT SMOKE DETECTORS SHALL BE INTERLOCKED TO SHUT DOWN ALL UNITS UPON ANY DETECTION OF SMOKE. PROVIDE REMOTE ENUNCIATOR AUDIO/VISUAL. VERIFY LOCATION WITH FIRE MARSHALL PRIOR TO INSTALLATION.
5. FULL SIZE RETURN DUCT DOWN FROM RTU THEN OFFSET 36" AND TURN UP. PROVIDE 1" ACOUSTIC LINER. COVER INLET WITH 1/4" X 1/4" WIRE MESH SCREEN.
6. SUPPLY DIFFUSERS MOUNTED TO SUPPLY DUCT DROP BELOW TRUSS STRUCTURE. INSTALL BOTTOM OF DUCT AT 14'-0" AND BOTTOM OF DIFFUSERS AT 14'-3".
7. PROVIDE RETURN GRILLE ON BOTH SIDES OF WALL FOR RETURN AIR TRANSFER INTO PLENUM SPACE.
8. COMBINE DUCTS IN VERTICAL DIRECTION WITH Y-FITTING. DO NOT USE TEE. ROUTE UP TO WEATHER HEAD ROOF CAP. LOCATE A MINIMUM OF 10'-0" FROM ANY OUTSIDE AIR INTAKE. SEAL ROOF PENETRATION WEATHER TIGHT.
9. ROUTE OPEN 12"ø EXHAUST DUCT DOWN TO 18" BELOW STRUCTURE. PROVIDE INSECT SCREEN. TRANSITION TO CURB MOUNTED EXHAUST FAN AS REQUIRED. LOCATE SPEED CONTROLLER ON WALL BELOW FAN.
10. PROVIDE FLEX DUCT BETWEEN LAY-IN RETURN AIR TRANSFER CEILING GRILLES.
11. INSTALL EXPOSED ROUND SPIRAL SUPPLY DUCTWORK AS SHOWN ON PLAN. PROVIDE DUCT LINER IN EXPOSED ROUND SUPPLY AIR DUCTWORK. DUCT SIZES SHOWN ARE ACTUAL SHEET METAL SIZES AND INCLUDE ALLOWANCE FOR DUCT LINER. COORDINATE INSTALLATION OF DUCTWORK WITH FIRE SPRINKLER PIPING.
12. PROVIDE CEILING MOUNTED EXHAUST FAN WITH INTEGRAL BACKDRAFT DAMPER. SUPPORT UNIT FROM STRUCTURE AS REQUIRED BY MANUFACTURER.
13. INSTALL WALL HEATER AT 14"AFF.
14. ROUTE DUCT DOWN TO STORE ROOM CEILING ELEVATION.

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NEW BUILDING FOR:

HIGHLAND PLAZA EAST, 5th PLAT

9731 N. ASH AVE, KANSAS CITY, MO

STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003568
PROFESSIONAL ENGINEER

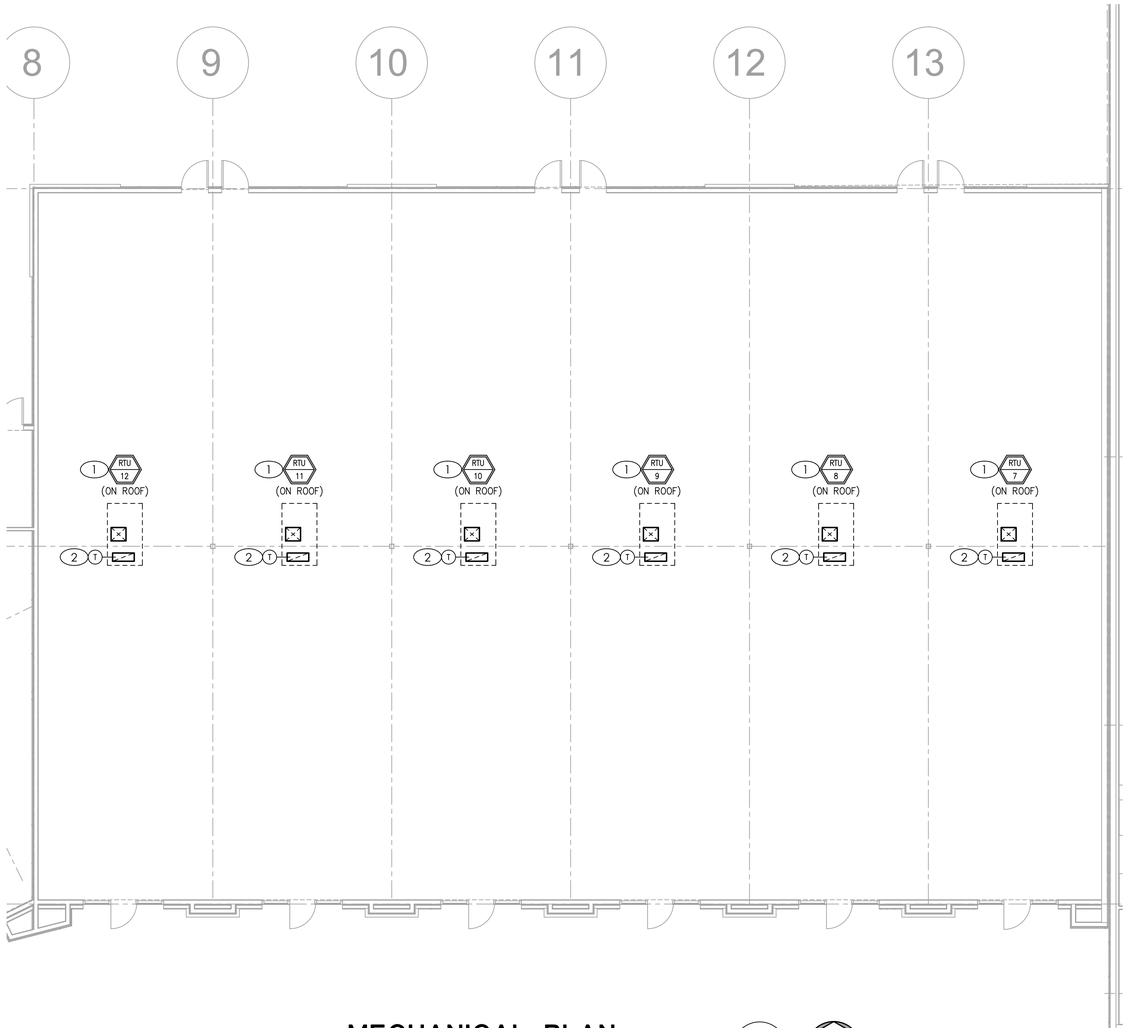
02-14-2022

No.	Description	Date

MECHANICAL PLAN - WESTLAKE

Project number	21-154
Date	02.14.2022

M101



MECHANICAL PLAN

SCALE : 1/8" = 1'-0"

1

NORTH

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2. SUSPEND THERMOSTAT BENEATH RETURN DUCT OPENING WITH 50' OF COILED WIRE FOR INSTALLATION BY TENANT.

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STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003568
PROFESSIONAL ENGINEER

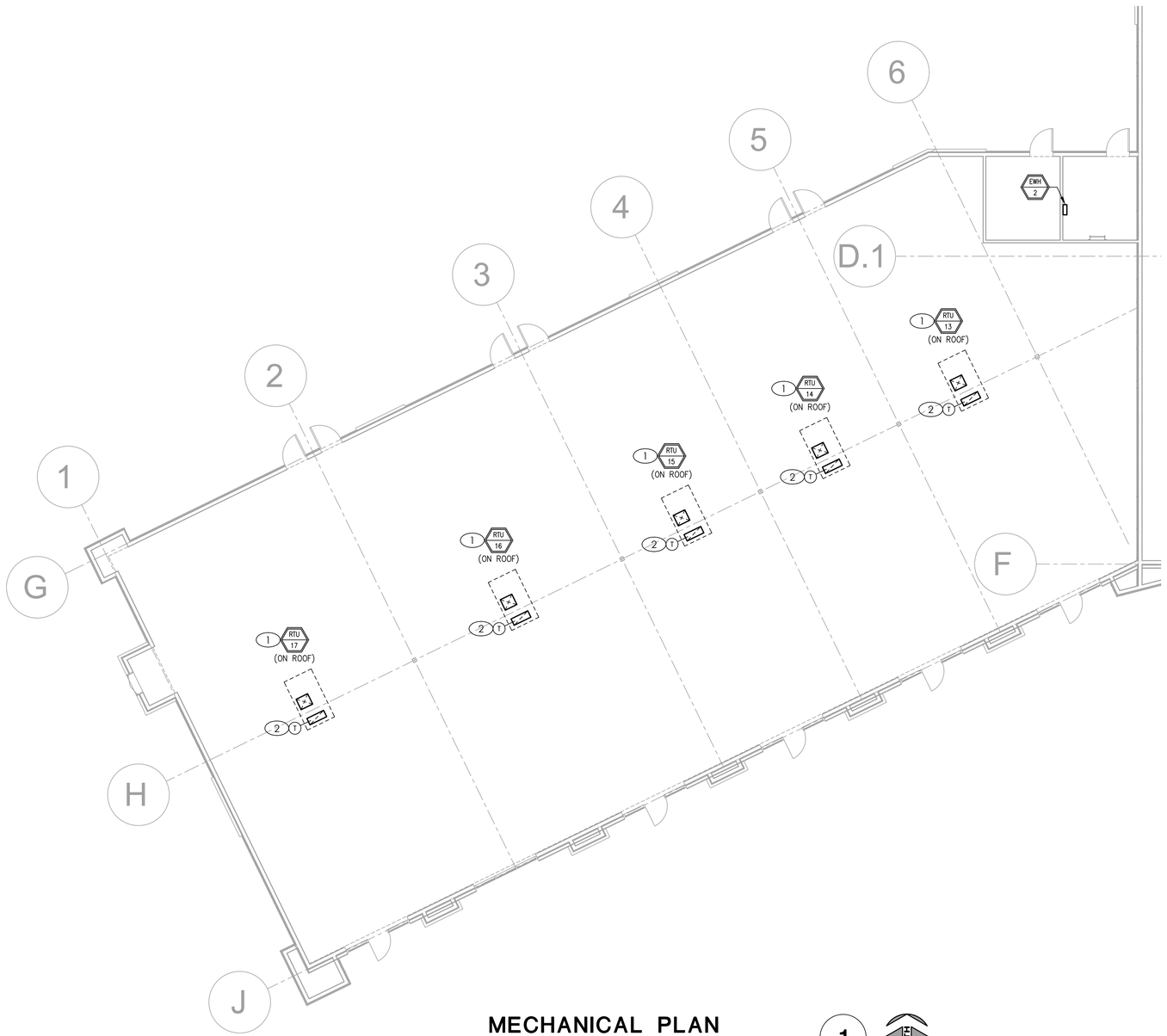
02-14-2022

No.	Description	Date

MECHANICAL PLAN - CENTER

Project number	21-154
Date	02.14.2022

M102



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02-14-2022

No.	Description	Date

MECHANICAL PLAN - WEST

Project number	21-154
Date	02.14.2022

M103

GREASE INTERCEPTOR CALCULATIONS

Reference No. 34995 — Project Name: HIGHLAND PLAZA NORTH

Step 1: Flow rate to grease interceptor

Fixture flow rate: (cu in / 231) = gal x 0.75 / 2 min = 2 min flow rate

NAME	TYPE	DIMENSIONS	QTY	CU IN	FLOW RATE
3-COMP SINK	3 Compartment Sink	21" x 21" x 14" (3)	6	111,132	180 GPM
FLOOR DRAIN	Floor Drain	N/A	10	N/A	N/A
HAND SINK	Hand Sink	10" x 14" x 5"	10	7,000	11.3 GPM
LOW TEMP DISHWASHER	Conveyor (Dishwasher)	2 gal.	3	1,386	3 GPM
MOP SINK	Mop Basin	24" x 24" x 10"	3	17,280	28.05 GPM
Total					**222.35 GPM**

Flow rate used to size interceptor (less of fixture or pipe size)
Pipe size (6 in):
Pipe Size flow rate per Manning's Formula **200 GPM**

Step 2: Grease Production

Servings per day x Grease production value x Days between pump-outs = Grease output

Number of meals served per day: 1500
Grease production value: 0.0455 lbs per serving (Don't Know Yet: High / Flatware)
Days between pump-outs: 90 days

1500 x 0.0455 x 90 = 6142.5 lbs of FOG

SCHIER MODEL	
GB-1000 (2)	**Description:** Polyethylene Grease Interceptor **Dimensions:** Length: 92", Width: 73.75", Height: 71.25" **Flow Rates/Grease Capacities:** 200 GPM / 9918.0 lbs **Liquid Capacity:** 2000 gal

2,000 GALLON PRECAST ALSO ALLOWED

MECHANICAL & PLUMBING SPECIFICATIONS

1. GENERAL PROVISIONS:
   A. PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY FOR THE COMPLETE INSTALLATION OF THE PLUMBING AND MECHANICAL SYSTEMS OUTLINED.
   B. OBTAIN ALL PERMITS, FEES, LICENSES, INSPECTIONS, AND CERTIFICATIONS OF COMPLIANCE OR APPROVAL AS REQUIRED BY AUTHORITIES.
   C. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE LAWS, CODES AND REGULATIONS OF THE GOVERNMENTAL BODIES HAVING JURISDICTION OVER THE SITE.
   D. ALL TESTING REQUIRED BY AUTHORITIES SHALL BE CONSIDERED PART OF THIS WORK.
   E. DURING CONSTRUCTION, ALL FIXTURES, EQUIPMENT, PIPE, DUCT, ETC. SHALL BE COVERED, PLUGGED, OR CAPPED AS REQUIRED TO KEEP CLEAN AND UNDAMAGED. ALL DAMAGED ITEMS SHALL BE RESTORED TO ORIGINAL CONDITION OR REPLACED. ALL PROTECTIVE COVERING SHALL BE REMOVED BEFORE FINAL ACCEPTANCE.
   F. PROVIDE ALL NECESSARY CUTTING AND PATCHING OF WALLS, FLOORS, CEILINGS, AND ROOFS AS NECESSARY. PATCH AROUND ALL OPENINGS SHALL MATCH ADJACENT AREA. COORDINATE ALL ROOFING WORK WITH OWNER OR RESPONSIBLE PARTY, SO THAT THE EXISTING ROOFING WARRANTY WILL BE MAINTAINED.
   G. CONTRACTOR SHALL GUARANTEE ALL WORK AND MATERIALS AGAINST DEFECT FOR A PERIOD OF ONE YEAR FROM FINAL ACCEPTANCE.
   H. INSPECTION OF THE SITE: THIS CONTRACTOR SHALL THOROUGHLY ACQUAINT HIMSELF WITH THE MEP DRAWINGS, SPECIFICATIONS, DETAIL, AND THE SITE. THIS CONTRACTOR SHALL NOTIFY THE ARCHITECT OF ANY SPECIAL OR UNUSUAL PROBLEMS, CONFLICTS, OR OBSTRUCTIONS THAT AFFECT HIS BID.
   I. FOR THE PURPOSE OF CLEARNESS AND LEGIBILITY, THE MECHANICAL AND PLUMBING DRAWINGS ARE ESSENTIALLY DIAGRAMMATIC AND DO NOT SHOW ALL OFFSETS AND FITTINGS REQUIRED FOR INSTALLATION. DO NOT SCALE DRAWINGS. THE SIZE AND LOCATION OF EQUIPMENT IS SHOWN TO SCALE WHEREVER POSSIBLE. THE CONTRACTOR SHALL VERIFY ALL CONDITIONS AND DATA AS INDICATED ON THE DRAWINGS AND IN THE SPECIFICATION SECTIONS WHERE MECHANICAL WORK INTERFACES WITH OTHER TRADES.
   J. IN THE EVENT OF A CONFLICT OR INCONSISTENCY BETWEEN ITEMS INDICATED ON THE PLANS OR WITH CODE REQUIREMENTS, THE NOTE OR CODE WHICH PRESCRIBES AND ESTABLISHES THE MORE COMPLETE JOB OR HIGHER STANDARD SHALL PREVAIL.
   K. INSTALL MATERIALS AND SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS. INSTALL MATERIALS IN PROPER RELATION WITH ADJACENT CONSTRUCTION AND WITH UNIFORM APPEARANCE FOR EXPOSED WORK. COORDINATE WITH WORK OF OTHER SECTIONS. COMPLY WITH APPLICABLE REGULATIONS AND CODE REQUIREMENTS. PROVIDE PROPER CLEARANCES FOR SERVICING.
   L. INCLUDE ALL BASIC MATERIALS AND CONSTRUCTION METHODS INCLUDING PIPES, PIPE FITTINGS, AND SPECIALTIES AND SUPPORTING DEVICES, VALVES, PIPE AND VALVE IDENTIFICATION, PUMPS, VIBRATION ISOLATION, ETC.
   M. FURNISH ADEQUATE ACCESS PANELS AND DOORS TO ALLOW FOR FUTURE PIPING ALTERATIONS, REPLACEMENT, AND MAINTENANCE OF PIPING. PROPERLY IDENTIFY ALL ACCESS PANELS AND DOORS.

2. OPERATION AND MAINTENANCE MANUALS:
   A. DURING THE COURSE OF CONSTRUCTION, COLLECT AND COMPILE OPERATING INSTRUCTIONS, WIRING DIAGRAMS, CATALOG CUTS, LUBRICATION AND PREVENTIVE MAINTENANCE INSTRUCTIONS, PARTS LISTS, ETC. FOR ALL EQUIPMENT FURNISHED UNDER THIS CONTRACT.
   B. ALL LITERATURE AND INSTRUCTIONS SHIPPED WITH THE EQUIPMENT SHALL BE SAVED FOR INCLUSION IN THE OPERATING AND MAINTENANCE MANUALS.
   C. ALL LITERATURE LISTED ABOVE AND ALL PAPERS LISTING WARRANTIES, ETC. SHALL BE BOUND IN A 3-RING BINDER AND LABELED WITH THE PROJECT NAME, ADDRESS, ARCHITECT, ENGINEER AND CONTRACTORS.

3. MANUFACTURERS:
   A. MANUFACTURERS, MODEL NUMBERS, ETC. INDICATED OR SCHEDULED ON THE DRAWINGS SHALL BE INTERPRETED AS HAVING ESTABLISHED A STANDARD OF QUALITY AND SHALL NOT BE CONSTRUED AS LIMITING COMPETITION. ARTICLES, FIXTURES, ETC. OF EQUAL QUALITY BY MANUFACTURERS SHALL BE ACCEPTABLE, SUBJECT TO STRUCTURAL AND ELECTRICAL CONSTRAINTS OF THE PROJECT DESIGN.
   B. THE ELECTRICAL SYSTEM DESIGN IS BASED IN PART ON THE SPECIFIED EQUIPMENT. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE ELECTRICAL REQUIREMENTS OF THE EQUIPMENT BEING FURNISHED. ANY CHANGES TO THE ELECTRICAL SYSTEM DUE TO HVAC EQUIPMENT OTHER THAN THE SPECIFIED EQUIPMENT BEING FURNISHED SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

4. MOTORS:
   A. PROVIDE THERMAL OVERLOAD PROTECTION FOR EACH MOTOR PROVIDED BY THIS WORK.

5. PLUMBING:
   A. PROVIDE AN APPROVED WATER HAMMER ARRESTOR FOR EACH PLUMBING FIXTURE SUPPLY AS REQUIRED BY FIXTURE MANUFACTURER.
   B. ALL EXPOSED PIPE IN FINISHED AREAS SHALL BE CHROME PLATED BRASS PIPE, NO FERROUS PIPE.
   C. PROVIDE CLEANOUTS AT EACH CHANGE IN DIRECTION AND AT 100 FOOT INTERVALS IN STRAIGHT RUNS.
   D. PROVIDE ACCESS PANELS FOR ALL CONCEALED VALVES AND TRAPS.
   E. CLEANOUTS:
      1. VINYL TILE FLOOR (FCO):JR SMITH #4140, OR EQUAL.
      2. QUARRY TILE FLOOR (FCO):JR SMITH #4200, OR EQUAL.
      3. CARPETED FLOOR (FCO):JR SMITH #4020-Y, OR EQUAL.
      4. UNFINISHED FLOOR (FCO):JR SMITH #4020, OR EQUAL.
      5. WALL (WCO):JR SMITH #4472, OR EQUAL, 24" ABOVE THE FLOOR.
      6. GRADE (GCO):JR SMITH #4256, OR EQUAL, WITH HEAVY DUTY CAST IRON BODY AND COVER.
   F. ALL SEWER PIPING LOCATED INSIDE THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
      1. INSTALL 2-1/2" AND SMALLER PIPE AT 1/4" PER FOOT FALL.
      2. INSTALL 3" AND LARGER PIPE AT 1/8" PER FOOT FALL.
      3. CONDENSATE DRAIN SHALL BE INSTALLED AT 1/8" PER FOOT FALL.
   G. PROVIDE DIELECTRIC UNIONS WITH APPROPRIATE END CONNECTION TO MATCH THE PIPE SYSTEM IN WHICH INSTALLED (SCREWED, SOLDERED, OR FLANGED). PROVIDE DIELECTRIC UNIONS ON ALL PIPING CONNECTIONS TO HOT WATER HEATERS AND EXPANSION JOINTS.
   H. ALL SEWER PIPING LOCATED EXTERIOR TO THE BUILDING SHALL BE INSTALLED WITH THE FOLLOWING SLOPES.
      1. INSTALL 4" AND SMALLER PIPE AT A MINIMUM OF 2% SLOPE.
      2. INSTALL 6" AND LARGER PIPE AT A MINIMUM OF 1% SLOPE.
   I. WHERE WATER SERVICE LINES MUST CROSS OVER SEWERS, STORM DRAINS, OR SANITARY SEWERS, THE SERVICE LINE MUST BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE SERVICE LINE IS AT LEAST 18" ABOVE THE TOP OF THE SEWER. THIS VERTICAL SEPARATION MUST BE MAINTAINED FOR THAT PORTION OF THE SERVICE LINE LOCATED WITHIN 10 FEET HORIZONTALLY OF ANY SEWER OR SEWER LINE THAT IT CROSSES, SAID 10 FEET TO BE MEASURED AS THE NORMAL DISTANCE FROM THE SERVICE LINE TO THE SEWER.

6. PIPING
   A. DOMESTIC COLD, HOT, AND HOT WATER RECIRCULATING (ABOVEGROUND).
      2 1. TYPE L HARD DRAWN COPPER TUBING, ASTM B-88 WITH WROUGHT BRONZE SOLDERED FITTINGS.
      2. BALL VALVE: CRANE #932 OR EQUAL.
   B. DOMESTIC WATER, 1"-2" (UNDERGROUND).
      1. TYPE K FLEXIBLE COPPER TUBING, FEDERAL-WW-T-799, ASTM B-88, UP TO THE WATER METER TO MINIMUM 5' PAST METER.
      2. FIVE FEET AFTER THE METER CONTRACTOR MAY USE HDPE, PIGMENT BLUE, CTS SIZES, AWWA C901 4710 SDR9 PC250.
      3. SEE CIVIL PLANS FOR MATERIAL SPECIFICATION PAST 5'-0" FROM BUILDING.
   C. FIRE WATER, LARGER THAN 2" (UNDERGROUND).
      1. DUCTILE IRON PIPE AND FITTINGS, AWWA C151, CLASS 50, CEMENT LINING, SEALCOATED, AWWA C104.
      2. MATERIAL AND INSTALLATION MUST CONFORM TO WATER DEPARTMENT STANDARDS.
      3 3. THRUST BLOCKS IN ACCORDANCE WITH NFPA 24.
   D. SANITARY SEWER AND VENTS (UNDERGROUND, INTERIOR TO BUILDING).
      1. ASTM D2665 POLYVINYL CHLORIDE (PVC) DWV PIPE, SCHEDULE 40, SOLVENT JOINT.
      2. SEWER LINES SHALL BE LOCATED IN GENERAL AS SHOWN ON THE DRAWINGS. THE EXACT LOCATIONS SHALL BE DETERMINED BY THE CONTRACTOR IN SUCH A MANNER AS TO MAINTAIN PROPER CLEARANCES AND SUFFICIENT SLOPE TO ENSURE DRAINAGE.
      3. VENT STACKS SHALL BE EXTENDED FULL SIZE THROUGH THE ROOF AND FLASHED WITH 4 POUND LEAD SHEETS TURNED DOWN INTO THE STACK AT LEAST 2" AND EXTENDED 12" IN ALL DIRECTIONS FROM THE PIPE AT THE ROOF LINE. VENTS THROUGH ROOF SHALL NOT BE LESS THAN 3". PVC PIPING SHALL NOT BE USED FOR VENT PIPING THROUGH THE ROOF. WHERE APPLICABLE FOR ROOFING SYSTEM USED, PROVIDE FLASHING VIA PLEATED EPDM CONE IN LIEU OF LEAD. ALL VENT STACKS IN OR AT OUTSIDE WALLS SHALL BE OFFSET 1'-6" MINIMUM FROM OUTSIDE WALLS BEFORE GOING THROUGH THE ROOF, TO FACILITATE FLASHING.
   E. CONDENSATE DRAIN AND INDIRECT WASTE (ABOVEGROUND)
      1. PVC DWV PIPE, SCHEDULE 40, SOLVENT JOINT.
   F. NATURAL GAS PIPING:
      1. SCHEDULE 40 BLACK STEEL PIPING: 3" AND SMALLER WITH SCREWED JOINTS AND 150 LB. MALLEABLE IRON SCREWED FITTINGS. PIPE 4" AND LARGER SHALL USE STANDARD WEIGHT BLACK STEEL WELDING FITTINGS WITH WELDED JOINTS.
      2. PIPE 3" AND SMALLER MAY USE VIEGA MEGAPRESS FOR WATER AND GAS. CSA LC4, TSSA/ASME B31 FOR USE WITH ASTM A53 S-40 BLACK IRON PIPE.
      3. GAS VALVES SHALL BE ROCKWELL 142/143, PLUG VALVE.
      4. SUPPORT PIPING AT INTERVALS NOT TO EXCEED THOSE LISTED IN TABLE 415.1 OF THE I.F.G.C.
      5. PROVIDE A.G.A. APPROVED SHUT OFF VALVES AND DIRT LEGS AT CONNECTIONS TO ALL EQUIPMENT.
      6. ALL ELEVATED PRESSURE GAS PIPING (GREATER THAN 14" W.C.) SHALL BE LABELED EVERY 40' WITH SIGNS INDICATING "ELEVATED PRESSURE."
      7. EPOXY PAINT ALL EXTERIOR GAS PIPING TO PREVENT CORROSION.
   G. ALL PIPE HANGERS AND SUPPORTS SHALL BE STANDARD PRODUCTS OF GRINNELL, FEE AND MASON, OR ANVIL. HANGER SPACING SHALL BE IN ACCORDANCE WITH MSS-SP-69.
   H. SLEEVES
      1. PROVIDE, SET, AND PROPERLY LOCATE PIPE SLEEVES AS REQUIRED FOR THIS WORK. ALL SLEEVES SHALL BE OF SUFFICIENT SIZE TO PERMIT PIPE MOVEMENT DUE TO EXPANSION AND CONTRACTION AND TO ACCOMMODATE PIPE INSULATION.
      2. INTERIOR PARTITIONS: 16 GAUGE GALVANIZED STEEL, PACK BETWEEN PIPE AND SLEEVE WITH FIRE SAFING AND CAULK AT EACH END WITH FIRE RESISTANT SEALANT.
      3. ROOF: PROSET OR EQUAL, MANUFACTURED PVC SCHEDULE 40 PIPE SLEEVE WITH WATERPROOF SEAL. COORDINATE WITH ROOFING CONTRACTOR AND FLASH AS REQUIRED TO MAINTAIN ROOF WARRANTY.
      4. PLUMBING VENTS: FLASH ROOF VENT INTO ROOFING SYSTEM AS REQUIRED BY THE ROOFING CONTRACTOR TO MAINTAIN THE EXISTING ROOF WARRANTY. ALL PLUMBING VENT TERMINALS SHALL TERMINATE A MINIMUM OF 12" ABOVE ROOF OR EQUAL TO HEIGHT OF PARAPET, WHICHEVER IS GREATER.
   I. PROVIDE CHROME PLATED ESCUTCHEONS ON ALL PIPE ENTERING FINISHED AREAS.

7. INSULATION:
   A. ALL INSULATIONS AND ACCESSORIES SHALL HAVE A FIRE HAZARD CLASSIFICATION WITH A FLAME SPREAD RATING OF NOT OVER 25, A FUEL CONTRIBUTION RATING OF NOT OVER 50, AND A SMOKE DEVELOPMENT RATING OF NOT OVER 50, IN ACCORDANCE WITH NFPA.
   B. PIPE INSULATION (ABOVE GRADE):
      1. THE PIPE INSULATION USED SHALL HAVE A THERMAL CONDUCTIVITY OF 0.27 BTU PER IN/HR*SQ-FT*°F OR LESS.
      2. FIBERGLASS INSULATION WITH FACTORY APPLIED VAPOR BARRIER, ASJ JACKET, FACTORY APPLIED PRESSURE SEALING LONGITUDE LAP JOINT, NO STAPLES, ZESTON PREMOLDED PVC FITTING COVERS. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
      3. FOR NON CIRCULATING SYSTEMS THE FIRST 8 FEET OF INLET AND OUTLET PIPING BETWEEN THE TANK AND HEAT TRAP (INCLUDING THE HEAT TRAP) MUST BE INSULATED.
      4. INSULATION SCHEDULE:
         a. DOMESTIC COLD WATER: 1/2"
         b. DOMESTIC HOT WATER: 1"
   C. DUCTWORK INSULATION:
      1. DUCT COVERING: 3/4 LB/CF, FIBERGLASS BLANKET WITH FACTORY APPLIED VAPOR BARRIER AND FACING. THICKNESS AS SCHEDULED, INSTALLATION IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS. DUCT COVERING SHALL BE MINIMUM R-6.
         a. SUPPLY AIR DUCT: 2"
         b. RETURN AIR DUCT: 2"
   D. EXPOSED SPIRAL DUCT:
      1. SPIRAL DUCT LINING - ARMACELL AP/SPIRAFLEX FIBER FREE ELASTOMERIC DUCT LINER. MEETS ASTM E 84 25/50 FLAME AND SMOKE, 1" THICKNESS, AIR STREAM SIDE COATED, INSTALL PER SMACNA STANDARDS.

8. TESTING, BALANCING AND CLEANING:
   A. ALL PIPING SHALL BE TESTED FOR LEAKS BEFORE BEING CONCEALED IN WALL CONSTRUCTION OR COVERED WITH INSULATION.
   B. SEWER AND VENT PIPING SHALL BE HYDROSTATICALLY TESTED WITH NO LESS THAN 10 FEET OF HEAD FOR A PERIOD OF NOT LESS THAN 15 MINUTES, PER THE LOCAL PLUMBING CODE, WITH NO LEAKS.
   C. DOMESTIC WATER PIPING SHALL BE HYDROSTATICALLY TESTED AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE, BUT NOT LESS THAN 60 PSI, FOR A PERIOD OF NOT LESS THAN 2 HOURS, WITH NO LEAKS.
   D. NATURAL GAS SYSTEMS SHALL BE TESTED WITH COMPRESSED AIR AT A PRESSURE OF NOT LESS THAN 1-1/2 TIMES THE OPERATING PRESSURE , BUT NOT LESS THAN 50 PSIG FOR A PERIOD OF 2 HOURS WITH NO LEAKS.
   E. THE INSPECTION AUTHORITY HAVING JURISDICTION SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO PERFORMANCE OF ALL TESTS SO THAT THEY TESTS MAY BE WITNESSED IF DEEMED NECESSARY.
   F. DUCTWORK AND PIPING SHALL BE BALANCED BY QUALIFIED BALANCING PERSONNEL WHO HAVE PREVIOUS EXPERIENCE WITH BALANCING PROCEDURES AND ARE FAMILIAR WITH TESTING AND BALANCING PROCEDURES OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB).
      1. BALANCING SHALL INCLUDE THE BALANCING OF THE EQUIPMENT AND AIR DISTRIBUTION SYSTEMS TO PROVIDE DESIGN QUANTITIES INDICATED AND VERIFICATION PERFORMANCE OF ALL EQUIPMENT AND AUTOMATIC CONTROLS.
      2. WITH IN 30 DAYS OF THE COMPLETION OF THE TESTING AND BALANCING WORK, SUBMIT THE TEST AND BALANCING REPORT BEARING THE SIGNATURE OF THE TEST AND BALANCE ENGINEER. THE REPORTS SHALL BE CERTIFIED PROOF THAT THE SYSTEMS HAVE BEEN TESTED, ADJUSTED, AND BALANCED IN ACCORDANCE WITH THE REFERENCED STANDARDS; ARE AN ACCURATE REPRESENTATION OF HOW THE SYSTEMS HAVE BEEN INSTALLED AND ARE OPERATING. REPORTS SHALL BE BOUND IN A VINYL BINDER AND THE BINDER LABELLED OR MAY BE AN ELECTRONIC PDF SUBMITTAL.

9. DUCTWORK:
   A. ALL DUCTWORK UNLESS OTHERWISE INDICATED SHALL BE FABRICATED FROM GALVANIZED SHEET STEEL COMPLYING WITH ASTM A 527, LOCKFORMING QUALITY, WITH G60 ZINC COATING IN ACCORDANCE WITH ASTM A 525, AND MILL PHOSPHATIZED FOR EXPOSED LOCATIONS.
   B. DUCTWORK METAL GAUGES, REINFORCING, ETC SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION FOR A 2" WATER GAUGE STATIC PRESSURE.
   C. ALL FITTINGS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SMACNA "HVAC DUCT CONSTRUCTION STANDARDS," LATEST EDITION.
   D. RECTANGULAR DUCT:
      1. ELBOWS, UNLESS INDICATED OTHERWISE, SHALL BE CONSTRUCTED WITH CENTERLINE RADIUS OF NOT LESS THAN 1.5 DUCT WIDTH OR SQUARE ELBOWS WITH DOUBLE WALL STREAMLINE ELBOWS.
      2. TAKE-OFF FITTINGS: BRANCH DUCT TAKE-OFF FITTINGS FOR SUPPLY AND EXHAUST DIFFUSER/REGISTERS SHALL INCLUDE AN INTEGRAL MANUAL VOLUME DAMPER WITH LOCKING QUADRANT, DAMPER NOT REQUIRED ON RETURN AIR. FOR RECTANGULAR TO ROUND TAKE-OFFS, UTILIZE A "BUCKLEY" MODEL 3300 & 3300D OR EQUAL.
      3. RETURN AIR ACOUSTIC ELBOWS AND SOUND BOOTS SHALL BE A SQUARE ELBOW WITH NO TURNING VANES.
      4. SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE A MINIMUM 1 TO 3.
   E. ROUND AND OVAL SPIRAL SEAM DUCT:
      1. PROVIDE RADIUS TYPE FITTINGS FABRICATED OF MULTIPLE SECTIONS WITH MAXIMUM 15 DEGREE CHANGE OF DIRECTION PER SECTION. UNLESS SPECIFICALLY DETAILED OTHERWISE, USE 45 DEGREE LATERALS FOR BRANCH TAKEOFF CONNECTIONS. WHERE 90 DEGREE BRANCHES ARE INDICATED PROVIDE CONICAL TYPE TEES.
      2. SLOPES FOR TRANSITIONS OR OTHER CHANGES IN DIMENSIONS SHALL BE MINIMUM 1 TO 3.
      3. ROUND LONGITUDINAL SEAM DUCT: USE FOR RIGID METAL DUCT ON LEAVING SIDE OF DUCT IN CONCEALED LOCATIONS FOR EXTENSION TO FLEX FOR DIFFUSERS.
   F. SEAL ALL CONCEALED DUCTWORK JOINTS WITH NON-HARDENING, NON-MIGRATING MASTIC SEALANT, AS RECOMMENDED FOR SEALING SEAMS AND JOINTS IN DUCTWORK. OIL BASED CAULKING AND GLAZING COMPOUNDS SHALL NOT BE ACCEPTABLE. DUCTS SHALL BE SEALED TO THE CLASS LEVEL LISTED BELOW:

(1) UNCONDITIONED SPACES:	CLASS B	CLASS C	CLASS B
(2) CONDITIONED SPACES (PLENUM):	CLASS C	CLASS B	CLASS C
	SUPPLY 2"WC OR LESS	EXHAUST	RETURN

   G. DUCT SIZES SHOWN ON THE DRAWINGS ARE SHEET METAL SIZES. INCREASE SHEET METAL SIZES ACCORDINGLY TO ACCOUNT FOR THICKNESS OF DUCT LINER.
   H. WHETHER SHOWN ON PLANS OR NOT, PROVIDE MANUAL VOLUME DAMPERS IN EACH RUNOUT TO EACH SUPPLY DIFFUSER OR REGISTER. PROVIDE ACCESS PANELS TO DAMPERS LOCATED ABOVE HARD CEILINGS.
   I. PROVIDE AUXILIARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT DUCTWORK.
   J. WHERE DUCTS PASS THROUGH FIRE-RATED FLOORS, WALLS, OR PARTITIONS, PROVIDE FIRESTOPPING BETWEEN DUCT AND WALL.
   K. WHERE DUCTS PASS THROUGH INTERIOR PARTITIONS OR EXTERIOR WALLS, AND ARE EXPOSED TO VIEW, CONCEAL SPACE BETWEEN OPENING AND DUCT OR DUCT INSULATION WITH SHEET METAL FLANGES OF SAME GAUGE AS DUCT. OVERLAP OPENING ON 4 SIDES BY AT LEAST 1-1/2". FASTEN TO DUCT AND WALL.

10. FLEXIBLE DUCT:
   A. ATCO #086 (R-6), OR EQUAL.
   B. FACTORY APPLIED INSULATION AND VAPOR BARRIER, 1-1/2" THICK.
   C. MAXIMUM LENGTH OF 6'-0".

11. FLUES AND ACCESSORIES:
   A. PROVIDE MANUFACTURER'S STANDARD ACCESSORY ITEMS INCLUDING BIRD PROOF TOP, STORM COLLAR, ROOF THIMBLE, ETC. AS REQUIRED FOR A COMPLETE INSTALLATION. ROOF THIMBLES THROUGH THE BUILDING ROOF SHALL BE SUITABLE FOR USE WITH THE ROOF PROVIDED.
   B. FLUES FOR HEATERS SHALL BE DOUBLE WALL TYPE B EQUAL TO METALBESTOS. PROVIDE MANUFACTURER'S STANDARD FITTING AND ACCESSORIES (ROOF THIMBLE, STORM COLLAR, COUNTER FLASHING, ETC.) AS REQUIRED FOR A COMPLETE INSTALLATION.

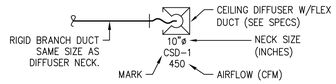
12. SMOKE DETECTORS:
   A. UNITS MOUNTED IN THE DUCTWORK SHALL BE A DUCT MOUNTED UL LISTED PHOTO-ELECTRIC SELF-CONTAINED SMOKE DETECTOR WITH HOUSING. UNITS SHALL BE EQUAL TO SIMPLEX #4098-4687. THE SAMPLING TUBE SHALL BE #2098-9804. LENGTH AS REQUIRED FOR DUCT.
   B. DUCT DETECTOR REMOTE TEST STATION SHALL BE SIMPLEX #4098-9842 WITH REMOTE ALARM INDICATOR. POWER-ON INDICATOR, TONE-ALERT, TONE-ALERT SILENCE SWITCH, AND TEST/RESET SWITCH. DEVICES SHALL BE MOUNTED IN APPROVED LOCATION BY LOCAL AHJ. WHERE DUCT SMOKE DETECTORS ARE NOT RESETTABLE FROM THE PROTECTED PREMISES FIRE ALARM SYSTEM, A LISTED ALARM/SUPERVISORY INDICATOR WITH AN INTEGRAL RESET SWITCH SHALL BE PROVIDED.
   C. SMOKE DETECTORS SHALL BE INTERLOCKED. IN ALARM CONDITION OF A SINGLE DETECTOR ALL UNITS SHALL SHUT DOWN.

M&P SYMBOLS

THIS IS A MASTER LEGEND AND NOT ALL SYMBOLS, ETC, ARE NECESSARILY USED ON THE DRAWINGS.

HVAC EQUIPMENT & DUCTWORK

- SPIN-IN FITTING WITH MANUAL VOLUME DAMPER
- BRANCH DUCT WITH 45° RECTANGLE-ROUND BRANCH FITTING AND MANUAL VOLUME DAMPER
- ELBOW WITH TURNING VANES
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT UP
- RETURN, EXHAUST, OR OUTSIDE AIR DUCT DOWN
- SUPPLY AIR DUCT UP
- SUPPLY AIR DUCT DOWN
- EQUIPMENT WITH FLEXIBLE DUCT CONNECTION
- MANUAL VOLUME DAMPER
- SQUARE TO ROUND TRANSITION
- DUCT TRANSITION
- T THERMOSTAT
- DUCT MOUNTED SMOKE DETECTOR



HVAC EQUIPMENT & DUCTWORK

SYMBOL	DESCRIPTION
SS	SANITARY SEWER (ABOVE GRADE)
SS	SANITARY SEWER (BELOW GRADE)
CD	CONDENSATE DRAIN
V	VENT PIPING
G	G = GAS PIPING LESS THAN 2 PSI
MPG	MPG = GAS PIPING 2 PSI
CW	COLD WATER PIPING
HW	HOT WATER PIPING
	GAS PIPE ON ROOF, G OR MPG
CA	COMPRESSED AIR
	PIPE ELBOW DOWN
	PIPE ELBOW UP
	GATE VALVE
	BACKFLOW PREVENTER
	BALL VALVE
	PLUG VALVE
	FLOOR CLEANOUT (FCO)
	WALL CLEANOUT (WCO)
	FLOOR DRAIN
	FLOOR SINK
	HOSE BIB

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	MC	MECHANICAL CONTRACTOR
BAS	BUIDLING AUTOMATION SYSTEM	MIN	MINIMUM
BD	BACKDRAFT	NC	NOISE CRITERIA
CFM	CUBIC FEET PER MINUTE	OA	OUTSIDE AIR
DDC	DIRECT DIGITAL CONTROL	RA	RETURN AIR
DX	DIRECT EXPANSION	SA	SUPPLY AIR
EA	EXHAUST AIR	SD	SMOKE DUCT DETECTOR
FFA	FROM FLOOR ABOVE	TFA	TO FLOOR ABOVE
FFB	FROM FLOOR BELOW	TFB	TO FLOOR BELOW
GPM	GALLONS PER MINUTE	TYP	TYPICAL
IN WC	INCHES OF WATER COLUMN	UNO	UNLESS NOTED OTHERWISE
MAX	MAXIMUM	W/	WITH
MBH	1000 BTU PER HOUR	W/O	WITHOUT

ANNOTATION

- (#) PLAN WORK NOTE
- (RTU 1) MECHANICAL EQUIPMENT DESIGNATION (CONTRACTOR FURNISHED AND INSTALLED UNLESS NOTED OTHERWISE)
- (-) PLUMBING FIXTURE DESIGNATION
- (A / M1) DETAIL REFERENCE UPPER NUMBER INDICATED DETAIL NUMBER LOWER NUMBER INDICATES SHEET NUMBER

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NEW BUILDING FOR:
HIGHLAND PLAZA EAST, 5th PLAT
9731 N. ASH AVE, KANSAS CITY, MO

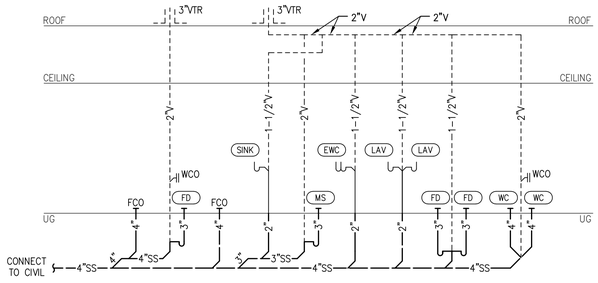
STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003568
PROFESSIONAL ENGINEER
06-02-22

No.	Description	Date
1	City Comments	02.16.22
2	City Comments	03.30.22
3	City Comments	06.02.22

MECHANICAL & PLUMBING SPECS & SYMBOLS

Project number	21-154
Date	06.02.2022

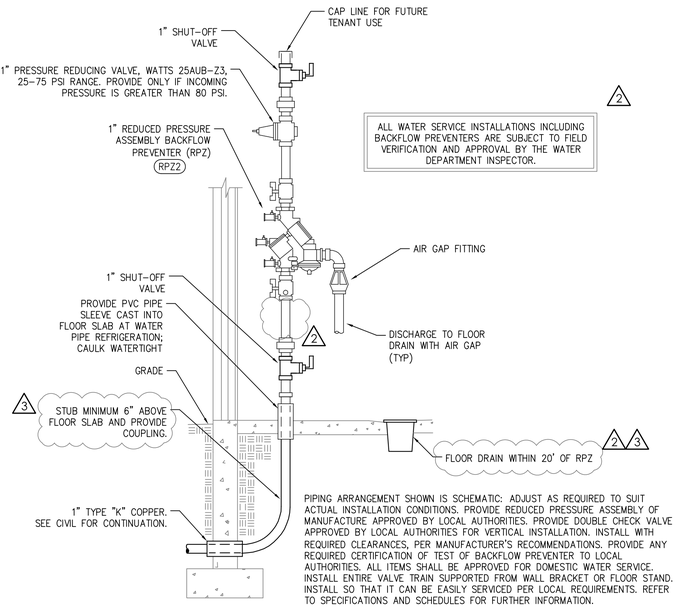
MP001



WASTE & VENT RISER - WESTLAKE

6

SCALE : NO SCALE

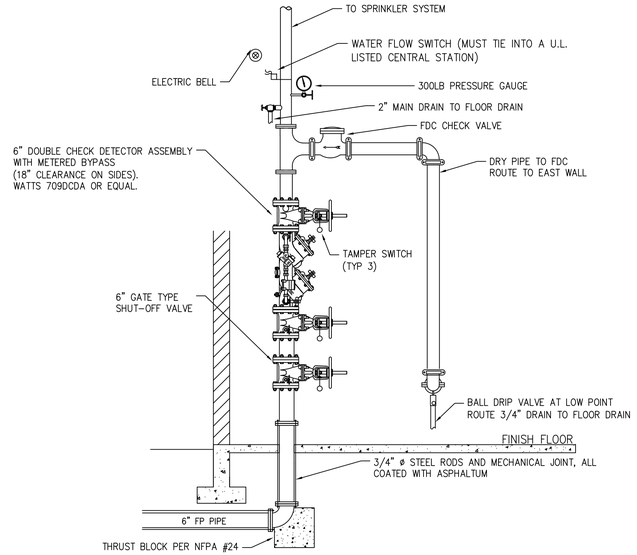


PIPING ARRANGEMENT SHOWN IS SCHEMATIC. ADJUST AS REQUIRED TO SUIT ACTUAL INSTALLATION CONDITIONS. PROVIDE REDUCED PRESSURE ASSEMBLY OF MANUFACTURE APPROVED BY LOCAL AUTHORITIES. PROVIDE DOUBLE CHECK VALVE APPROVED BY LOCAL AUTHORITIES FOR VERTICAL INSTALLATION. INSTALL WITH REQUIRED CLEARANCES, PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ANY REQUIRED CERTIFICATION OF TEST OF BACKFLOW PREVENTER TO LOCAL AUTHORITIES. ALL ITEMS SHALL BE APPROVED FOR DOMESTIC WATER SERVICE. INSTALL ENTIRE VALVE TRAIN SUPPORTED FROM WALL BRACKET OR FLOOR STAND. INSTALL SO THAT IT CAN BE EASILY SERVICED PER LOCAL REQUIREMENTS. REFER TO SPECIFICATIONS AND SCHEDULES FOR FURTHER INFORMATION.

1" DOMESTIC WATER SERVICE ENTRY

4

SCALE : NO SCALE

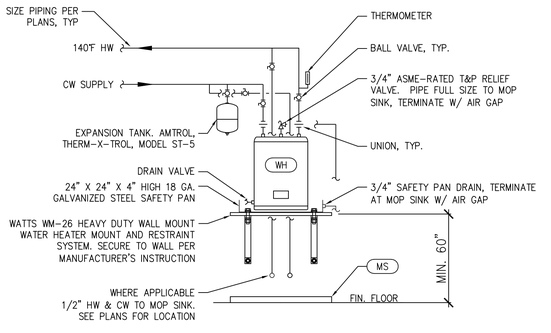


NOTES:
1) SEE NFPA 13 FOR CONNECTIONS PASSING THROUGH OR UNDER FOUNDATION WALLS.
2) ADEQUATE CLEARANCE SHALL BE PROVIDED AROUND FIRE RISER. DIMENSIONS FROM FACE-OF-PIPE SHALL MEASURE A MINIMUM OF 12" OFF THE BACK WALL, 18" ON EACH SIDE, AND 36" CLEAR IN FRONT. ALL VALVES NO MORE THAN 7'-0" AFF.
3) TAMPER SWITCH OR CHAIN & LOCK REQUIRED FOR CONTROL VALVES.
4) MONITORING SYSTEM: PROVIDE A SYSTEM FOR DETECTION OF FLOW AND SUPERVISION OF VALVES, CAPABLE WITH COMMUNICATING WITH OWNER'S MONITORING COMPANY. PROVIDE ALL WIRING. ROUTE COMMUNICATION CABLE TO TELEPHONE EQUIPMENT FOR CONNECTIONS BY OWNER.
5) DRAWING IS SCHEMATIC. ORIENT VALVE SO THAT 36" CLEAR IS IN FRONT OF HANDWHEEL.
6) CONFIRM ALL SIZING WITH DESIGN-BUILD FIRE SPRINKLER CONTRACTOR.

FIRE SPINKLER RISER - WET PIPE

2

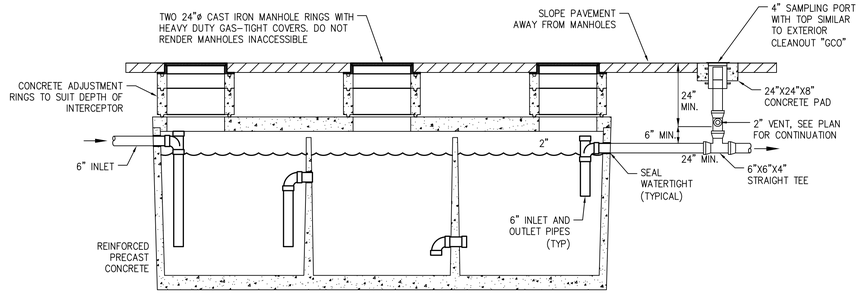
SCALE : NO SCALE



ELECTRIC WATER HEATER

5

SCALE : NO SCALE

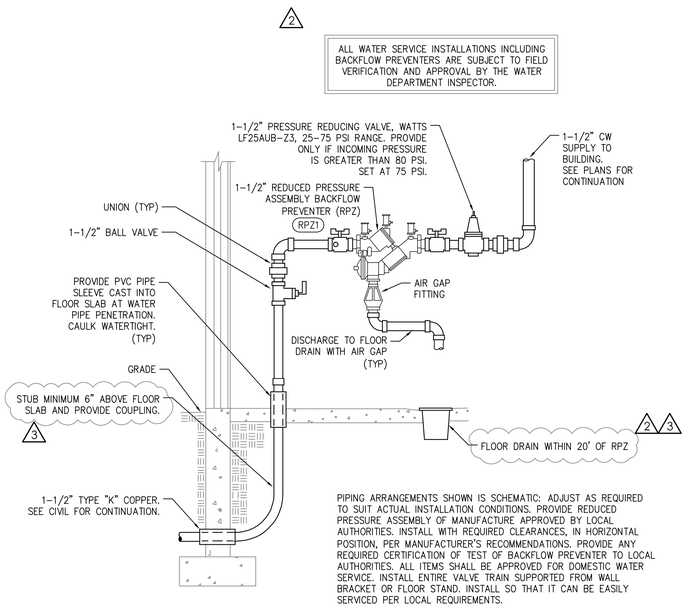


PIPING ARRANGEMENT SHOWN IN SCHEMATIC. ADJUST TO SUIT FIELD CONDITIONS. SUBMIT PROPOSED GREASE INTERCEPTOR INSTALLATION PLANS AND SPECIFICATIONS TO LOCAL AUTHORITIES FOR THEIR APPROVAL BEFORE ACQUISITION OF INTERCEPTOR. 1500 GALLON INTERCEPTOR DESIGN IS SIMILAR, BUT WITH SINGLE BAFFLE.

2000 GALLON GREASE INTERCEPTOR

3

SCALE : NO SCALE



PIPING ARRANGEMENTS SHOWN IS SCHEMATIC: ADJUST AS REQUIRED TO SUIT ACTUAL INSTALLATION CONDITIONS. PROVIDE REDUCED PRESSURE ASSEMBLY OF MANUFACTURE APPROVED BY LOCAL AUTHORITIES. INSTALL WITH REQUIRED CLEARANCES, IN HORIZONTAL POSITION, PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE ANY REQUIRED CERTIFICATION OF TEST OF BACKFLOW PREVENTER TO LOCAL AUTHORITIES. ALL ITEMS SHALL BE APPROVED FOR DOMESTIC WATER SERVICE. INSTALL ENTIRE VALVE TRAIN SUPPORTED FROM WALL BRACKET OR FLOOR STAND. INSTALL SO THAT IT CAN BE EASILY SERVICED PER LOCAL REQUIREMENTS.

1-1/2" DOMESTIC WATER ENTRY

1

SCALE : NO SCALE

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MECHANICAL & PLUMBING DETAILS

Project number	21-154
Date	06.02.2022

MP002

PLUMBING FIXTURE SCHEDULE

BASIS OF DESIGN: CONFIRM ALL SELECTIONS WITH OWNER AND ARCHITECT PRIOR TO PURCHASE.

FD	FLOOR DRAIN: SIOUX CHIEF 832-2PNR, FLOOR DRAIN, PVC BODY AND CLAMPING COLLAR, ADJUSTABLE 5-1/2" ROUND NICKEL BRONZE STRAINER. PROVIDE WITH PROSET SYSTEMS "TRAP GUARD" INSERT FOR ACTUAL FLOOR DRAIN MODEL AND SIZE PROVIDED.
LAV	WALL MOUNTED LAVATORY: TOTO LT307, SINGLE FAUCET HOLE, 20.875"X18" RECTANGULAR BOWL, VITREOUS CHINA, WITH SINGLE HANDLE FAUCET (DELTA 501). PROVIDE FLEXIBLE SS RISERS WITH CHROME PLATED STOP VALVES, P-TRAP WITH CLEANOUT AND ESCUTCHEONS. INSULATE WITH "HANDI-LAV-GUARD" MODEL 102, OR EQUAL.
MS	MOP SINK: FIAT TSB3010. 24"x24", 12" DEEP WITH 6" DROP FRONT, PRECAST TERRAZZO, INTEGRAL DRAIN ASSEMBLY AND STRAINER PLATE . WALL MOUNT SERVICE FAUCET, FIAT 830AA, WITH TWO HANDLES, VACUUM BREAKER AND 3/4" HOSE THREAD.
SINK	DROP-IN KITCHEN SINK: ELKAY LRAD2222, 22"X22", SINGLE COMPARTMENT, SELF-RIMMING, STAINLESS STEEL, WITH SINGLE LEVER FAUCET (ELKAY LK1000CR). PROVIDE GARBAGE DISPOSAL (INSINKERATOR BADGER 5, 120V, 1/2HP), FLEXIBLE SS RISERS WITH CHROME PLATED STOP VALVES, P-TRAP WITH CLEANOUT AND ESCUTCHEONS.
IMB	ICE MAKER OUTLET BOX: WATER TITE AB9702 OUTLET BOX WITH QUARTER TURN VALVES, 1/2" CW CONNECTION AND WATER HAMMER ARRESTOR.
GI	GREASE INTERCEPTOR: OLDCASTLE INFRASTRUCTURE GT-2000, REINFORCED PRECAST CONCRETE, 2000 GALLON CAPACITY, 11'-0"L x 6'-0"W x 7'-4"D, (3) 24" DIA. MANHOLE COVERS, 20 TON LOADING CAPACITY.
EWC	ELECTRIC WATER COOLER: ELKAY EZSTL8C, BARRIER FREE TWO-STATION BI-LEVEL WATER COOLER, 8.0 GPH REFRIGERATED, 120V, ADA, FRONT AND SIDE PUSH BARS, CHROME PLATED CAST BRASS P-TRAP WITH CLEANOUT, CHROME PLATED LOOSE KEY ANGLE STOP, FLOOR MOUNTED CARRIER AND CANE APRON.
NFWH	NON-FREEZE WALL HYDRANT: JR SMITH 5609, 3/4" HOSE CONNECTION, BRONZE-NICKEL PLATED, INTEGRAL VACUUM BREAKER WITH VANDAL RESISTANT CAP, KEY OPERATED.
RD	COMBINATION ROOF DRAIN AND OVERFLOW: ZURN Z164. CAST IRON BODY, EACH WITH LOW SILHOUETTE CAST IRON DOMES (4.25" HEIGHT), 4" CONNECTION.
NFYH	NON-FREEZE YARD HYDRANT: JR SMITH 5904, 3/4" HOSE CONNECTION, HEAVY DUTY CAST IRON HEAD WITH PAIL HOOK, FLOW LOCK WHEEL.
HB	HOSE BIBB: JR SMITH 560, 3/4" HOSE CONNECTION, ROUGH BRASS FINISH, HANDWHEEL OPERATED, INTEGRAL VACUUM BREAKER.
RPZ1	REDUCED PRESSURE ZONE BACKFLOW PREVENTER: WATTS LF009, 1-1/2", MEETING ASSE 1013, LEAD FREE CAST BRONZE BODY, QUARTER TURN TESTING COCKS, QUARTER TURN BALL VALVES, AND AIR GAP FITTING.
RPZ2	REDUCED PRESSURE ZONE BACKFLOW PREVENTER: WATTS LF009, 1", MEETING ASSE 1013, LEAD FREE CAST BRONZE BODY, QUARTER TURN TESTING COCKS, QUARTER TURN BALL VALVES, AND AIR GAP FITTING.
WC	FLOOR-MOUNTED ADA WATER CLOSET: KOHLER K-3519-TR-0, HANDICAP ACCESSIBLE, VIREOUS CHINA, 1.0 GPF, ELONGATED BOWL, FLOOR MOUNTED W/ 17.125" BOWL HEIGHT, WHITE, VITREOUS CHINA TANK AND COVER CONTAINING FLUSH VALVE, WHITE OPEN-FRONT SEAT, CHROME STOPS, C.P. FLEXIBLE RISER TUBE, BOLT CAPS, AND ESCUTCHEON.
WH	ELECTRIC WATER HEATER: AO SMITH DEL-10, 10 GALLON, 3/4" CONNECTIONS, 120V, 1500W ELEMENT, 7.0 GPH @ 90° RISE.

RTU SCHEDULE (NATURAL GAS)

MARK	LOCATION	MANUFACTURER	MODEL	NOMINAL CAPACITY (TONS)	SUPPLY FAN				COOLING COIL				HEAT EXCHANGER				QTY. O/A (CFM)	ELECTRICAL				WEIGHT (LBS)	NOTES
					CFM	SPEEDS	ESP (IN)	HP	RFR. TYPE	GROSS CAPACITY (BTUH)	COMPRESSOR TYPE (NUMBER)	EER	MIN. OUTPUT (BTUH)	NOM. INPUT (BTUH)	MIN. EFF (%)	MIN NO. STAGES		VOLTS	PHASE	MCA	MOCP		
RTU-1	ROOF	LENNOX	LGH120H4M3Y	10	4000	MSAV	0.4	3	R-410A	122,000	SCROLL (2)	12	144,000	180,000	80	2	950	208	3	52	60	1250	A-G
RTU-2	ROOF	LENNOX	LGH120H4M3Y	10	4000	MSAV	0.4	3	R-410A	122,000	SCROLL (2)	12	144,000	180,000	80	2	950	208	3	52	60	1250	A-G
RTU-3	ROOF	LENNOX	LGH120H4M3Y	10	4000	MSAV	0.2	3	R-410A	122,000	SCROLL (2)	12	144,000	180,000	80	2	950	208	3	52	60	1250	A-G
RTU-4	ROOF	LENNOX	LGH120H4M3Y	10	4000	MSAV	0.2	3	R-410A	122,000	SCROLL (2)	12	144,000	180,000	80	2	950	208	3	52	60	1250	A-G
RTU-5	ROOF	LENNOX	KGB024H4ES3Y	2	800	ECM	0.5	1/3	R-410A	24,600	SCROLL (1)	12.5	52,000	65,000	80	1	100	208	1	19	25	650	A-G
RTU-6	ROOF	LENNOX	KGB036H4ES3Y	3	1200	ECM	0.4	2-Jan	R-410A	37,300	SCROLL (1)	12.3	52,000	65,000	80	1	100	208	1	26	40	650	A-G
RTU-7	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-8	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-9	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-10	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-11	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-12	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-13	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-14	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-15	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-16	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G
RTU-17	ROOF	LENNOX	LGH060H4EU3Y	5	2000	ECM	0.5	1	R-410A	61,600	2-STAGE (1)	12.7	86,000	108,000	80	2	300	208	3	29	40	900	A-G

NOTES:

A. PROVIDE WITH MANUFACTURER'S 14" HIGH ADJUSTABLE PITCH ROOF CURB.
B. DISCONNECT SWITCH FURNISHED AND INSTALLED BY ELECTRICAL CONTRACTOR.
C. STARTERS FOR ALL MOTORS SHALL BE FURNISHED INTEGRAL WITH UNIT.
D. PROVIDE MERV 8 FILTERS.
E. PROVIDE ECONOMIZER AND BAROMETRIC RELIEF DAMPER.
F. PROVIDE WITH 115V GFCI SERVICE OUTLET, NON-POWERED, FIELD WIRED. FURNISH WITH WEATHERPROOF COVER.
G. PROVIDE 7-DAY PROGRAMMABLE THERMOSTAT.

FIXTURE BRANCH CONNECTION SCHEDULE

FIXTURE	COLD WATER	HOT WATER	WASTE	VENT
FLOOR DRAIN	-	-	3"	1-1/2"
LAVATORY/SINK	1/2"	1/2"	1-1/2"	1-1/2"
ELECTRIC WATER COOLER	1/2"	-	1-1/2"	1-1/2"
HOSE BIBB/HYDRANT	3/4"	-	-	-
ICE MAKER BOX	1/2"	-	-	-
MOP SINK	1/2"	1/2"	3"	2"
WATER CLOSET (FLUSH TANK)	1/2"	-	4"	2"
WATER HEATER	3/4"	3/4"	-	-
NOTE:	PIPE SIZES SHOWN ARE MINIMUM. MINIMUM SANITARY SIZE UNDERGROUND IS 2".			

EXHAUST FAN SCHEDULE

MARK	AREA SERVED	MANUFACTURER	MODEL	MOUNTING / TYPE	CFM	ESP (IN)	DRIVE	POWER	ELECTRICAL		WEIGHT	NOTES
									VOLTS	PHASE		
EF-1	STORE ROOM	COOK	100C15DH	ROOF MOUNTED	600	0.3	DIRECT	1/8 HP	120	1	31	A-D
EF-2	RESTROOM	PANASONIC	FV-0511VKS2	CEILING / CABIENT	110	0.2	DIRECT	9.9 W	120	1	12	E,F
EF-3	RESTROOM	PANASONIC	FV-0511VKS2	CEILING / CABIENT	110	0.2	DIRECT	9.9 W	120	1	12	E,F

NOTES:

A. INSTALL EXHAUST FAN PER MANUFACTUER'S WRITTEN INSTRUCTIONS.
B. PROVIDE 3 SPEED SWITCH.
C. MECHANICAL CONTRACTOR SHALL COORDINATE ALL DIMENSIONS WITH GENERAL CONTRACTOR AND ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTOR.
D. PROVIDE FAN SPEED CONTROLLER, 12" ROOF CURB AND BACKDRAFT DAMPER.
E. PROVIDE INTERNAL CABINET BACKDRAFT DAMPER, CEILING GRILLE, ALL THREAD RODS AND VIBRATION ISOLATORS.
F. INTERLOCK FAN OPERATION WITH LIGHT SWITCH

OUTDOOR AIR CALCULATIONS

UNIT	AREA (SQ-FT)	OCCUPANCY CLASSIFICATION	OCCUPANT DENSITY, PEOPLE/1000 SQ-FT	SPECIFIED OCCUPANCY	OUTDOOR AIRFLOW RATE PER PERSON (Rp), CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE (Ra), CFM/SQ-FT	ZONE DISTRIBUTION EFFECTIVENESS (Ez)	REQUIRED AIR FLOW, CFM
RTU-1	3220	SALES	15	-	7.5	0.12	0.8	935.8
							TOTAL	935.8
RTU-2	3220	SALES	15	-	7.5	0.12	0.8	935.8
							TOTAL	935.8
RTU-3	3220	SALES	15	-	7.5	0.12	0.8	935.8
							TOTAL	935.8
RTU-4	3220	SALES	15	-	7.5	0.12	0.8	935.8
							TOTAL	935.8
RTU-5	170	SALES	15	-	7.5	0.12	0.8	49.4
	250	OFFICE	5	-	5	0.06	0.8	26.6
							TOTAL	76.0
RTU-6	153	OFFICE	5	-	5	0.06	0.8	16.3
	72	COORIDOR	-	-	-	0.06	0.8	5.4
							TOTAL	21.7

GRILLE, REGISTER AND DIFFUSER SCHEDULE

MARK	MANUFACTURER	MODEL	FACE TYPE	MOUNTING LOCATION	FACE SIZE (IN.)	MAX NC	NOTES
SUPPLY							
DSD-1	TITUS	S300FL	DOUBLE DEFLECTION	SPIRAL DUCT MOUNT	DUCT + 1.5	25	A-D
DSD-2	TITUS	121RS	SINGLE DEFLECTION	DUCT MOUNTED	DUCT + 1.75	25	A-D
CSD-1	TITUS	TMS	3-CONE	LAY-IN	24 x 24	25	A-D
CSD-2	TITUS	TMS	3-CONE	LAY-IN	12 x 12	25	A-D
RETURN							
WRG-1	TITUS	350RL	LOUVERED	SURFACE MOUNT	DUCT + 1.75	25	A-D
CRG-1	TITUS	PAR	PERFORATED	LAY-IN	24 x 24	25	A-D

NOTES:

A. NECK SIZE SHOWN ON DRAWINGS.
B. FRAME TYPE TO MATCH CEILING/WALL CONSTRUCTION, COORDINATE WITH ARCHITECTURAL REFLECTED CEILING PLAN.
C. BRANCH DUCT SIZE SHALL BE SAME AS NECK SIZE UNLESS OTHERWISE SHOWN ON DRAWINGS.
D. BAKED ENAMEL FINISH, WHITE TO MATCH CEILING/WALL COLOR.

UNIT HEATER SCHEDULE (NATURAL GAS)

MARK	LOCATION	MFGR.	MODEL	HEATING (GAS)				CFM	MOTOR (HP)	ELECTRICAL		NOTES
				INPUT (BTUH)	OUTPUT (BTUH)	MIN EFF (%)	NO. STAGES			VOLTS	PH	
UH-1	STORE ROOM	REZNOR	UDAP-75	75,000	62,250	83	1	961	0.6	120	1	A-C

NOTES:

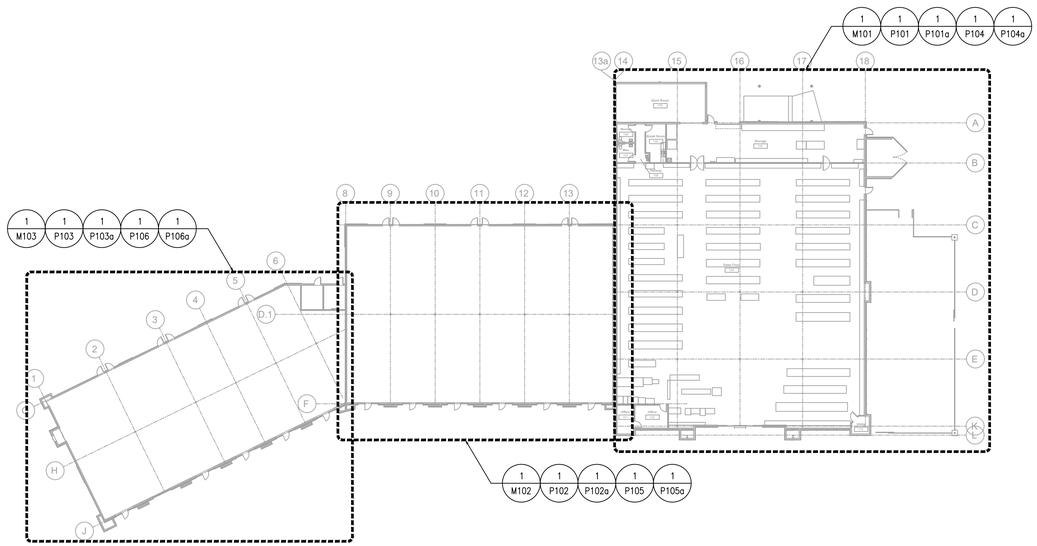
A. MOUNT 12'-0" ABOVE FINISHED FLOOR WITHOUT OBSTRUCTING AIRFLOW.
B. PROVIDE WALL MOUNTED THERMOSTAT.
C. PROVIDE NECESSARY MOUTING BRACKET AND ACCESSORIES FOR VERTICAL MOUNTING.

UNIT HEATER SCHEDULE (ELECTRIC)

MARK	LOCATION	MANUFACTURER	MODEL	WEIGHT	WATTAGE (kW)	CFM	ELECTRICAL			NOTES
							VOLTS	PH	AMPS	
EWH-1	FIRE RISER - WESTLAKE	QMARK	AWH3150F	25	1.5	100	120	1	12.5	A
EWH-2	FIRE RISER - SHELL	QMARK	AWH4404F	25	3.0	100	208	1	14.4	A

NOTES:

A. PROVIDE WALL MOUNT BRACKET COMPATIBLE WITH WALL TYPE.



OVERALL REFERENCE PLAN

SCALE : 1/32" = 1'-0"

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NEW BUILDING FOR:
HIGHLAND PLAZA EAST, 5th PLAT
9731 N. ASH AVE, KANSAS CITY, MO

STATE OF MISSOURI
JUSTIN R. SMOTHERS
NUMBER PE-2012003568
PROFESSIONAL ENGINEER
02-14-2022

No.	Description	Date

MECHANICAL & PLUMBING SCHEDULES

Project number 21-154
Date 02.14.2022

MP003