1. MECHANICAL GENERAL PROVISIONS

1.1. GENERAL PROVISIONS

1.1.1. THE CONTRACTOR SHALL PROVIDE ALL LABOUR, MATERIAL, EQUIPMENT, ETC. AS REQUIRED TO COMPLETE ALL WORK SPECIFIED HEREIN AND AS SHOWN ON THE MECHANICAL DRAWINGS. THE CONTRACTOR SHALL PROVIDE ANY REQUIRED CONNECTIONS AND/OR SMALL MATERIALS TO INSURE THE INSTALLATION OF ALL SYSTEMS WORK AS INTENDED.

1.1.2. THE CONTRACTOR SHALL VISIT THE SITE AND BE FAMILIAR WITH ALL WORKING CONDITIONS AND SCOPE OF WORK PRIOR TO SUBMITTING BIDS. NO EXTRAS TO THE CONTRACT WILL BE GRANTED DUE TO CONTRACTOR'S FAILURE TO COMPLETE A THOROUGH SITE INVESTIGATION.

1.1.3. MECHANICAL DRAWINGS SHOW MECHANICAL WORK ONLY AND ARE NOT INTENDED TO SHOW STRUCTURAL, ARCHITECTURAL OR ELECTRICAL DETAILS. CONTRACTOR SHALL TAKE BUILDING DIMENSIONS AND DETAILS FROM ARCHITECTURAL/STRUCTURAL DRAWINGS OR FROM JOB MEASUREMENTS ONLY.

1.1.4. THE CONTRACTOR SHALL SUBMIT MANUFACTURERS' SHOP DRAWINGS TO THE CONSULTANT FOR REVIEW PRIOR TO PURCHASE AND INSTALLATION FOR ALL NEW SPECIFIED EQUIPMENT.

1.1.5. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL MECHANICAL WORK WITH OTHER TRADES PRIOR TO ROUGH-IN. IF A CONFLICT OCCURS AFTER THE INSTALLATION OF SERVICES, THE CONTRACTOR IS TO PAY ALL COSTS ASSOCIATED WITH REWORK.

1.1.6. THE CONTRACTOR SHALL SUBMIT RED-LINE AS-BUILT DRAWINGS AT THE COMPLETION OF THE PROJECT TO THE CONSULTANT FOR REVIEW AND ACCEPTANCE PRIOR TO SUBMITTING FOR FINAL PAYMENT.

1.1.7. LEAVE SYSTEMS OPERATING WITH WORK AREAS CLEAN TO ACCEPTANCE OF CONSULTANT.

1.2. REGULATIONS AND PERMITS

1.2.1. CARRY OUT THE WORK IN ACCORDANCE WITH THE LATEST EDITIONS OF ALL RELEVANT CODES, LOCAL BYLAWS, AND REQUIREMENTS FROM THE LOCAL AUTHORITY'S HAVING JURISDICTION. APPLY FOR,PAY AND OBTAIN ANY WORK PERMITS REQUIRED.

1.3. MATERIAL AND EQUIPMENT

1.3.1. CONTRACTOR TO ENSURE THAT ALL INSTALLED PRODUCTS ARE NEW AND WITHOUT DEFECT. ANY PRODUCTS PROPOSED AS AN EQUAL SHALL MEET ALL REQUIREMENTS SPECIFIED AND SHOWN ON THE DRAWINGS. APPROVAL FOR EQUALS MUST BE GIVEN BY THE CONSULTANT OR OWNER.

1.4. WARRANTY

1.4.1. THE CONTRACTOR SHALL PROVIDE A ONE YEAR WARRANTY FOR ALL WORKMANSHIP, MATERIAL AND EQUIPMENT SUPPLIED EXCEPT WHERE SPECIFIED OTHERWISE. MAKE GOOD ANY DAMAGE CAUSED BY DEFECTS AND/OR WORKMANSHIP AND REPLACE DAMAGED OR NONWORKING EQUIPMENT/DEVICES AS REQUIRED AT NO EXTRA COST TO THE OWNER.

1.5. COOPERATION WITH OTHER TRADES/OWNER'S STAFF

1.5.1. SHUTDOWNS OF ANY KIND MUST BE SCHEDULED WITH THE OWNER AND GENERAL CONTRACTOR. ANY OVERTIME WAGES DUE TO SHUTDOWNS REQUIRED AS PART OF THE SCOPE OF WORK ARE TO BE INCLUDED IN THE BID PRICE AS EXTRAS WILL NOT BE GRANTED.

2. PRODUCTS

2.1. MATERIALS

2.1.1. USE NEW CSA APPROVED MATERIALS ONLY AS SPECIFIED HEREIN OR SHOWN ON THE MECHANICAL DRAWINGS.

2.2. FIRESTOPPING

2.2.1. USE ONLY SERVICE PENETRATION FIRESTOP COMPONENTS AND ASSEMBLIES TESTED IN ACCORDANCE WITH CAN.ULC S115 “FIRE TESTS OF FIRESTOP SYSTEMS” AND LISTED IN MOST RECENT ULC “LIST OF EQUIPMENT AND MATERIALS” OR BY ANOTHER RECOGNIZED INDEPENDENT TESTING AND CERTIFICATION AGENCY ACCEPTABLE TO THE CONSULTANT.

2.2.2. PIPE SLEEVES THROUGH FIRE SEPARATIONS REQUIRING A RATING ARE TO BE INSTALLED AS PER FIRESTOPPING MANUFACTURER'S RECOMMENDATIONS, AS SOME FIRESTOPPING MANUFACTURERS DO NOT ALLOW PIPE SLEEVES WITHIN THEIR APPROVED SYSTEM. CONFIRM PIPE SLEEVE COMPATIBILITY PRIOR TO STARTING WORK ON SITE.

3. EXECUTION

3.1. GENERAL

3.1.1. INSTRUCT AND SUPERVISE OTHER TRADES DOING RELATED WORK.

3.1.2. SUPPLY MEASUREMENTS OF EQUIPMENT TO OTHER TRADES TO ALLOW FOR NECESSARY OPENINGS TO BE LEFT IN THE WORK OF OTHER TRADES.

3.1.3. INSTALL PIPING AND DUCT WORK, WHICH IS TO BE CONCEALED, NEATLY AND CLOSE TO THE BUILDING STRUCTURE SO THAT THE NECESSARY FURRING CAN BE KEPT AS SMALL AS POSSIBLE.

3.1.4. MECHANICAL DRAWINGS SHOW APPROXIMATE LOCATIONS FOR WALL MOUNTED DEVICES. CLARIFY EXACT LOCATION WITH THE CONSULTANT PRIOR TO ROUGHING-IN.

3.1.5. ALL SERVICEABLE EQUIPMENT INSTALLED ON THE ROOF SHALL BE INSTALLED MINIMUM 10'-0" FROM ROOF EDGE UNLESS OTHERWISE NOTED.

3.2. STORAGE OF MATERIAL

3.2.1. PROVIDE PROPER WEATHERPROOF STORAGE FOR THE PROTECTION OF MATERIALS AND EQUIPMENT ON SITE. BLANK OFF OPENINGS IN ALL EQUIPMENT UNTIL REQUIRED FOR USE. CONSULTANT MAY REQUIRE MATERIALS WHICH ARE NOT PROPERLY STORED TO BE DISCARDED AND REMOVED FROM THE SITE.

3.3. SUPPORTS AND BASES

3.3.1. SET ALL FLOOR-MOUNTED EQUIPMENT ON CONCRETE BASES AT LEAST 100 MM (4″) HIGH.

3.3.2. PROVIDE ALL BRACKETS AND SUPPORTS REQUIRED IN STEEL STUD WALLS. ALL PIPING, DUCTING AND EQUIPMENT MUST BE SUPPORTED ON BRACKETS OR SUPPORTS ATTACHED TO STEEL STUDS. DO NOT SUPPORT MATERIALS OR EQUIPMENT FROM WALL SHEATHING.

3.3.3. PROVIDE INDEPENDENT SUPPORT; BRACKETS AND UNISTRUT STRUCTURES WHERE REQUIRED TO INSTALL MECHANCIAL EQUIPMENT; HVAC UNITS, AIR HANDLERS, HEATERS, FANS, DAMPERS, ETC: IN AREAS WHERE THE EQUIPMENT IS LOCATED ON WALLS/COLUMNS THAT ARE NOT SUITABLE FOR DIRECT INSTALLATION OR WHEN INSTALLATION AWAY FROM STRUCTURAL BUILDING ELEMENTS IS CALLED FOR OR WHEN CLEARANCES ARE REQUIRED DUE TO CODE.

3.4. CUTTING AND PATCHING

3.4.1. ENSURE THAT ALL NEW ROOF, EXTERIOR WALL AND FLOOR PENETRATIONS ARE SEALED WEATHER TIGHT.

3.4.2. REPAIR ALL ROOF AND WALL AND FLOOR OPENINGS AFFECTED BY THE WORK OF THIS CONTRACT TO MATCH EXISTING CONSTRUCTION AND FINISHING. ALL CUTTING AND PATCHING TO BE PERFORMED BY THE TRADE SPECIALIZING IN THE MATERIALS TO BE USED TO COMPLETE THIS WORK.

3.5. TESTING

3.5.1. ALL SYSTEMS MUST BE THOROUGHLY TESTED BY THE TECHNICAL REPRESENTATIVE OF THE SYSTEM MANUFACTURERS BEFORE ARRANGEMENTS ARE MADE FOR THE FINAL DEMONSTRATION IN THE PRESENCE OF THE OWNERS STAFF.

3.6. TEMPORARY FACILITIES

3.6.1. CONTRACTOR SHALL PROVIDE TEMPORARY MECHANICAL SYSTEMS AS REQUIRED TO COMPLETE THE WORK.

3.6.2. DO NOT USE ANY OF THE PERMANENT MECHANICAL SYSTEMS DURING CONSTRUCTION, UNLESS SPECIFIC WRITTEN ACCEPTANCE IS OBTAINED FROM THE OWNER.

4. HEATING AND COOLING

4.1. PRODUCTS AND MATERIALS

4.1.1. PROVIDE EQUIPMENT SPECIFIED HEREIN OR APPROVED EQUAL. REFER TO EQUIPMENT SCHEDULES ON DRAWINGS. ALL EQUIPMENT SHALL MEET THE PERFORMANCE REQUIREMENTS AS INDICATED ON THE SCHEDULES.

4.2. EQUIPMENT AND TERMINALS

4.2.1. COMPLY WITH MANUFACTURER'S REQUIREMENTS FOR THE INSTALLATION OF ALL SPECIFIED EQUIPMENT.

4.2.2. INSTALL AND CONNECT REMOTE COMPONENTS SUCH AS THERMOSTATS, HUMIDISTATS, CONTROL PANELS, LEVEL CONTROLLERS, ETC., THAT ARE SUPPLIED WITH THE EQUIPMENT. INSTALL IN LOCATIONS AS SHOWN ON THE DRAWINGS.

4.3. EQUIPMENT START-UP

4.3.1. FOLLOW MANUFACTURER'S INSTRUCTIONS AND HAVE MANUFACTURER'S REPRESENTATIVE PRESENT TO CERTIFY THE INSTALLATION.

5. AIR DISTRIBUTION

5.1. PRODUCTS AND MATERIALS

5.1.1. PROVIDE GRILLES, REGISTERS AND DIFFUSERS SPECIFIED HEREIN OR APPROVED EQUAL. REFER TO EQUIPMENT SCHEDULES ON DRAWINGS. ALL EQUIPMENT SHALL MEET THE PERFORMANCE REQUIREMENTS AS INDICATED ON THE SCHEDULES.

5.1.2. FIRE DAMPERS: PROVIDE ULC LABELLED AND LISTED FIRE DAMPERS, DYNAMIC CURTAIN, OUT OF AIRSTREAM, TYPE 'B' OR 'C' GRAVITY OR SPRING TYPE. SIZE OF FIRE DAMPER TO SUIT OPENINGS SHOWN ON THE DRAWINGS. WHERE INSTALLED IN METAL STUD WALLS, COMPLY WITH ULC REQUIREMENTS AND ADVISE OTHER AFFECTED TRADES.

5.1.3. PROVIDE DUCT ACCESS DOORS WHERE REQUIRED, CONSTRUCTED OF NO. 22 GA MATERIALS WITH FLAT OR ANGLE IRON STIFFENING FRAME SO THE DOOR CAN BE OPERATED WITHOUT DISTORTION.

5.2. DUCTWORK

5.2.1. PROVIDE RECTANGULAR AND ROUND DUCTWORK CONSTRUCTED OF ASTM A525 HOT DIP GALVANIZED STEEL SHEETS IN ARRANGEMENTS AS SHOWN ON THE DRAWINGS COMPLETE WITH REINFORCEMENT, HANGING METHODS, JOINTS, SEAMS AND FITTINGS AS SPECIFIED IN SECTIONS I THROUGH 6 AS WELL AS APPENDICES A-1 THROUGH A-32 IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE 1995.

5.2.2. FOR EXHAUST, RETURN AND AIR SUPPLY SYSTEMS WHERE SYSTEM STATIC PRESSURE DOES NOT EXCEED 0.124 KPA (½" WG), POSITIVE OR NEGATIVE, PROVIDE REINFORCED DUCTWORK IN METAL GAGES AND REINFORCEMENT REQUIREMENTS AS SPECIFIED IN SMACNA TABLE 1-3.

5.2.3. FOR EXHAUST, RETURN AND AIR SUPPLY SYSTEMS WHERE SYSTEM STATIC PRESSURE DOES NOT EXCEED 0.248 KPA (1" WG), POSITIVE OR NEGATIVE, PROVIDE REINFORCED DUCTWORK IN METAL GAGES AND REINFORCEMENT REQUIREMENTS AS SPECIFIED IN SMACNA TABLE 1-4.

5.2.4. CROSS BREAK ALL DUCTWORK GREATER THAN 300MM (12") IN WIDTH.

5.2.5. FACTORY FABRICATED DUCTWORK AND FITTINGS: AS AN ALTERNATIVE TO SHOP FABRICATED RECTANGULAR AND ROUND SHEETMETAL DUCTWORK, FACTORY FABRICATED "SPIROSAFE" DUCTWORK (OR EQUAL) AND GASKETED SELF SEALING FITTINGS PERFORMING TO SPECIFIED SYSTEM STATIC PRESSURE REQUIREMENTS IS ALSO ACCEPTABLE.

5.2.6. PROVIDE BALANCING DAMPERS ON ALL BRANCHES TO CEILING DIFFUSERS. LOCATE DAMPERS IN AN EASILY ACCESSIBLE LOCATION, CLOSE TO THE MAIN DUCT, OR CEILING DIFFUSER. MAINTAIN CONSISTENCY IN DAMPER LOCATION WHERE POSSIBLE.

5.2.7. CLEAN-OUT OPENINGS: COMPLY WITH REQUIREMENTS OF NFPA 96.

5.3. DUCT INSTA**LLATION**

5.3.1. INSTALL ALL DUCTWORK AND FITTINGS USING CROSSBREAKING, JOINING, ATTACHMENT AND HANGING METHODS AS SPECIFIED IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE 1995.

5.3.2. PROVIDE HANGERS FOR RECTANGULAR AND ROUND DUCTWORK AS SPECIFIED IN TABLES 4-1 AND 4-2 AS SPECIFIED IN THE SMACNA HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE 1985.

5.3.3. DUCTWORK SUBJECT TO STATIC PRESSURE IN EXCESS OF 0.75 KPA (3 IN.) W.C. SHALL BE LEAK TESTED AND BE IN CONFORMANCE WITH SECTIONS OF THE HVAC DUCT LEAKAGE TEST MANUAL. PROVIDE ALL NECESSARY ASSISTANCE TO THE AIR BALANCING CONTRACTOR TO PERFORM SUCH LEAKAGE TEST.

5.3.4. GROUND ACROSS FLEXIBLE CONNECTORS WITH NO. 2/0 BRAIDED COPPER STRAP.

5.3.5. FLEXIBLE DUCTWORK: BEARING ULC CLASS 1 LABEL, INSULATED OR ACOUSTIC. MAXIMUM INSTALLED LENGTH: ONE CONTINUOUS LENGTH AT 1600 MM (5'-0"). DO NOT BEND FLEXIBLE DUCTWORK ANY GREATER THAN 1.5 X DIAMETER.

5.3.6. SEALING OF DUCTWORK AND PLENUMS:

APPLY SEALANT ON ALL SEAMS AND JOINTS ON ALL AIR SUPPLY, RETURN AND EXHAUST DUCTS AND ALL PLENUMS IN ACCORDANCE WITH ASHRAE 90.1-2016.

REFER TO ARTICLE 6.4.4.2 OF ASHRAE 90.1-2016. DUCTWORK AND ALL PLENUMS WITH PRESSURE CLASS RATINGS, AS DEFINED BY SMACNA ARE TO BE CONSTRUCTED TO SEAL CLASS A. OPENINGS FOR ROTATING SHAFTS TO BE SEALED WITH BUSHINGS OR OTHER DEVICES THAT SEAL OFF AIR LEAKAGE. PRESSURE SENSITIVE TAPE IS TO BE USED AS THE PRIMARY SEALANT UNLESS IT HAS BEEN CERTIFIED TO COMPLY WITH UL-181A OR UL-181B. ALL CONNECTIONS SUCH AS SPIN-INS, TAPS, BRANCH CONNECTIONS, ACCESS DOORS, ACCESS PANELS AND DUCT CONNECTION TO EQUIPMENT ARE TO BE SEALED.

5.3.7. DURING INSTALLATION OF DUCTWORK, PROTECT OPEN ENDS OF DUCTS TO PREVENT ENTRY OF DEBRIS AND DUST.

5.3.8. PLACE DUCTWORK AS CLOSE AS POSSIBLE TO PARTITIONS WHERE SHOWN ON THE DRAWINGS IN SUCH LOCATIONS.

5.3.9. WASHROOM AND KITCHEN EXHAUST DUCT AND RESIDENTIAL OUTDOOR AIR INTAKE DUCT SHALL BE SLOPED AT 1% GRADE TOWARDS OUTSIDE.

5.4. GAS VENTS AND STACKS

5.4.1. FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR PREFABRICATED COMPONENTS. COMPLY WITH REQUIREMENTS OF AUTHORITIES FOR INSTALLATION OF GAS VENTS FOR BOTH INTERIOR AND OUTDOOR LOCATIONS. PROVIDE A MINIMUM OF THREE 6MM (3") STAINLESS STEEL GUY CABLES WITH TURNBUCKLES ON ANY VENT (OR STACK) HIGHER THAN 1500MM (5'-0") ABOVE ROOF.

5.4.2. VENT CONNECTORS SERVING APPLIANCES VENTED BY NATURAL DRAFT SHALL NOT BE CONNECTED INTO ANY PORTION OF MECHANICAL DRAFT SYSTEMS OPERATING UNDER POSITIVE PRESSURE.

5.5. AIR BALANCING

5.5.1. PERFORM AIR BALANCING IN ACCORDANCE WITH CURRENT NBCTA, NEBB OR AACB PROCEDURAL STANDARDS.

6. PLUMBING

6.1. FIXTURE INSTALLATION

6.1.1. INSTALL ALL FIXTURES, DRAINS, CLEANOUTS, BRASS AND SPECIALTIES TO MANUFACTURER'S REQUIREMENTS.

6.1.2. CONNECT FIXTURES, COMPLETE WITH SUPPLIES AND DRAINS, SEPARATELY TRAPPED, SUPPORTED LEVEL AND SQUARE. PROVIDE CHROME PLATED PIPING FOR ALL EXPOSED WATER SUPPLY, WASTE AND VENT CONNECTIONS COMPLETE WITH CP ESCUTCHEONS.

6.1.3. PROVIDE ACCESSIBLE SHUT OFF VALVES TO ALL FIXTURES.

6.1.4. PROVIDE SUPPORTS TO SET FIXTURES SQUARE AND LEVEL.

6.1.5. OBTAIN ACCEPTANCE OF MOUNTING HEIGHTS OF ALL WALL MOUNTED FIXTURES.

6.1.6. FIXTURES MOUNTED ON GLAZED TILE SURFACES: PROVIDE GROUND FACES TO FINISHED SURFACES.

6.1.7. INSTALL WATER HAMMER ARRESTORS FOR EACH FIXTURE OR GROUP OF FIXTURES.

6.2 PRODUCTS AND MATERIALS

6.2.1. BURIED SANITARY DRAINAGE AND VENT PIPING SHALL BE:
- PVC OR ABS PIPE AND FITTINGS TO CSA CAN 3-B181.1-M85 (ABS) CAN 3-B181.2-M85 (PVC) B182.1, B182.2, (LARGE DIAMETER PSM PVC). B182.3, (LARGE DIAMETER IPS PVC)
- CAST IRON PIPE AND FITTINGS TO CSA B70.

6.2.2. NON-COMBUSTIBLE CONSTRUCTION SANITARY DRAINAGE AND VENT PIPING SHALL BE
- IPEX SYSTEM 15 DRAIN, WASTE AND VENT PIPE AND FITTINGS, CERTIFIED TO CSA B181.2. WHEN COMBUSTIBLE PIPE AND FITTINGS ARE USED IN BUILDINGS REQUIRED TO BE OF NONCOMBUSTIBLE CONSTRUCTION, THEY SHALL BE LISTED BY ULC TO THE STANDARD CAN/ULC S102.2 AND CLEARLY MARKED WITH THE CERTIFICATION LOGO INDICATING A FLAME SPREAD RATING NOT EXCEEDING 25.
- CAST IRON PIPE AND FITTINGS TO CSA B70.
- DWV COPPER TO ASTM B306 WITH 50-50 SOLDERED CAST BRASS DRAINAGE FITTINGS TO CSA B158.1 OR WROUGHT COPPER FITTINGS TO ANSI B16-29.

6.2.3. COMBUSTIBLE CONSTRUCTION DOMESTIC WATER SHALL BE:
- CVPC HOT AND COLD WATER PIPING THIRD-PARTY LISTED TO CSA B137.6, AND NSF 61. MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF ASTM D1784 AND HAVE A CELL CLASSIFICATION OF 24448. FITTINGS SHALL BE THIRD-PARTY LISTED TO CSA B137.6 OR ASTM F1970. FITTING AND VALVE MATERIAL SHALL COMPLY WITH THE REQUIREMENTS OF ASTM D1784 AND HAVE A CELL CLASSIFICATION OF 23447.
- TYPE L COPPER MARKED CERTIFIED FOR COMPLIANCE WITH ASTM B88 STANDARD WITH WROUGHT COPPER OR CAST BRONZE PRESSURE SOLDER FITTINGS TO ANSI B22.18 AND ANSI B16.18 RESPECTIVELY. BURIED PIPING: SOFT TEMPER TYPE K WITH SOLDERED FITTINGS TO THE PREVIOUSLY MENTIONED STANDARDS.

6.2.4. NON-COMBUSTIBLE CONSTRUCTION DOMESTIC WATER PIPING SHALL BE:
- TYPE L COPPER MARKED CERTIFIED FOR COMPLIANCE WITH ASTM B88 STANDARD WITH WROUGHT COPPER OR CAST BRONZE PRESSURE SOLDER FITTINGS TO ANSI B22.18 AND ANSI B16.18 RESPECTIVELY. BURIED PIPING: SOFT TEMPER TYPE K WITH SOLDERED FITTINGS TO THE PREVIOUSLY MENTIONED STANDARDS.
- PEX/AL/PEX COMPOSITE PIPE AND FITTINGS USED FOR POTABLE WATER SYSTEMS CERTIFIED TO CSA-B137.10. KNOWN AS CROSSLINKED POYETHYLENE / ALUMINUM / CROSSLINKED POYETHYLENE PRESSURE-PIPE SYSTEMS.

6.3. PIPE INSTALLATION

6.3.1. GENERAL: INSTALL STRAIGHT, PARALLEL AND CLOSE TO WALLS AND CEILINGS, WITH SPECIFIED PITCH. USE STANDARD FITTINGS FOR DIRECTION CHANGES.

6.3.2. INSTALL GROUPS OF PIPING PARALLEL TO EACH OTHER ON TRAPEZE HANGERS; SPACE PIPING TO PERMIT APPLICATION OF INSULATION, IDENTIFICATION AND SERVICE ACCESS.

6.3.3. INSTALL ECCENTRIC REDUCERS IN HORIZONTAL PIPING TO PERMIT DRAINAGE AND ELIMINATE AIR POCKETS.

6.3.4. WHERE PIPE SIZES DIFFER FROM CONNECTION SIZES OF EQUIPMENT, INSTALL REDUCING FITTINGS CLOSE TO EQUIPMENT. REDUCING BUSHINGS ARE NOT PERMITTED.

6.3.5. PROVIDE VENTS TO ATMOSPHERE FOR ALL GAS REGULATORS AS REQUIRED BY CODE.

6.3.6. LAY COPPER TUBING SO THAT IT IS NOT IN CONTACT WITH DISSIMILAR METAL AND WILL NOT BE KINKED OR COLLAPSED.

6.3.7. PROVIDE NON TOXIC LUBRICANT OR TEFLON TAPE APPLIED TO MALE THREAD ON ALL THREADED CONNECTIONS.

6.3.8. SANITARY AND STORM DRAINAGE: RUN PIPING TO MAIN SEWERS WITH UNIFORM GRADE.

6.3.9. JOINTING OF PIPE SHALL BE COMPATIBLE WITH TYPE OF PIPE USED.

6.3.10. WATER PIPING: RUN WATER PIPING FROM SERVICE CONNECTION AND CONNECT TO FIXTURES AND EQUIPMENT. AT LAVATORIES INSTALL SUPPLIES AS HIGH AS POSSIBLE.

6.3.11. PROVIDE WASHROOM GROUPS AND BRANCH TAKE-OFFS FROM MAINS WITH ISOLATING VALVES. INSTALL STOP VALVE IN EACH FIXTURE SUPPLY.

6.3.12. WHERE TWO OR MORE BRANCH RECIRCULATING HOT WATER LINES ARE CONNECTED TO MAIN RECIRCULATING LINE, PROVIDE LOCKSHIELD GLOBE VALVE AND CHECK VALVE IN EACH BRANCH LINE FOR BALANCING WATER FLOW AND FOR PREVENTION OF BACK FLOW IN ONE BRANCH. ADJUST BALANCING VALVES TO PROVIDE RECIRCULATION THROUGH EACH CIRCUIT. TURN OVER LOCKSHIELD VALVE KEY TO OWNER.

6.3.13. PROVIDE HOSE END BALL VALVES FOR COMPLETE SYSTEM DRAINAGE.

6.3.14. PROVIDE ALL PARTS OF THE PLUMBING SYSTEM INCLUDING ALL REQUIRED VENTING IN ACCORDANCE WITH PART 7 OF THE ONTARIO BUILDING CODE TO CURRENT AMENDMENTS.

6.4. SPECIALITIES INSTALLATION

6.4.1. CLEANOUTS: INSTALL ACCESSIBLE CLEANOUTS AT TRAPS AND WHERE REQUIRED BY CODE OR REGULATION.

6.4.2. FLOOR DRAINS: PROVIDE WITH TRAP PRIMERS CONNECTED TO NEAREST COLD WATER FLUSH VALVE, OR TO AUTOMATIC PRIMER OR FLUSH TANK. PRIME ALL FLOOR DRAIN TRAPS.

6.4.3. NON-FREEZE WALL HYDRANT: INSTALL 360MM (14") ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED AND WITH INSIDE SHUT-OFF VALVE.

6.5. EQUIPMENT INSTALLATION

6.5.1. INSTALL ACCORDING TO MANUFACTURER'S INSTRUCTIONS. ENSURE ALL COMPONENTS ARE ACCESSIBLE.

6.5.2. PROVIDE CONDENSATE DRAINS WITH TRAPS FROM ALL AIR HANDLING EQUIPMENT. TRAPS TO PROVIDE WATER SEAL DEPTH OF 25 MM (1 IN.) IN EXCESS OF AIR HANDLING SYSTEM OPERATING STATIC PRESSURE AT POINT OF DRAIN CONNECTION.

6.6. TESTING

6.6.1. TEST PIPING IN ACCORDANCE WITH PROCEDURES OUTLINED IN SECTION 7 OF THE ONTARIO BUILDING CODE TO CURRENT AMENDMENTS.

6.6.2. ENSURE THAT INSULATED PIPING AND EQUIPMENT INSTALLED IN CONCEALED PLACES IS TESTED AND INSPECTED PRIOR TO PERMANENT CONCEALMENT.

6.7. COMMISSIONING

6.7.1. THOROUGHLY FLUSH AND DISINFECT (CHLORINATE) WATER SUPPLY SYSTEMS IN ACCORDANCE WITH MUNICIPAL REQUIREMENTS.

6.7.2. MAKE TESTS TO DEMONSTRATE CAPABILITIES AND GENERAL OPERATING CHARACTERISTICS OR FIXTURES AND EQUIPMENT IN THE PRESENCE OF THE CONSULTANT.

6.8. NATURAL GAS SERVICE

6.8.1. CO-ORDINATE WITH LOCAL UTILITY AND BEAR ALL COSTS IN PROVIDING THE NATURAL GAS SERVICE COMPLETE WITH METER TO THE BUILDING AS SHOWN ON THE DRAWINGS.

6.9. DOMESTIC WATER SERVICE

6.9.1. CO-ORDINATE WITH THE MUNICIPALITY OR LOCAL UTILITY AND BEAR ALL COSTS IN PROVIDING A BUILDING WATER METER AS DETAILED ON THE DRAWINGS AND MAKE INSTALLATION IN ACCORDANCE WITH MUNICIPAL REQUIREMENTS.

6.9.2. CONTRACTOR IS RESPONSIBLE FOR PROVIDING BACKFLOW PREVENTER, PRESSURE REGULATING DEVICE AND ALL SUPPORTS FOR WATER SERVICE EQUIPMENT AS REQUIRED BY THE MUNICIPALITY AND THE BUILDING CODES.

7. INSULATION

7.1. GENERAL

7.1.1. INSULATION SHALL BE INSTALLED IN ACCORDANCE WITH INDUSTRY ACCEPTED STANDARDS.

7.1.2. INSULATION EXPOSED TO WEATHER SHALL BE SUITABLE FOR OUTDOOR SERVICE. ie. PROTECTED BY ALUMINUM, SHEET METAL, PAINTED CANVAS, OR PLASTIC COVER.

7.1.3. INCLUDE VAPOUR RETARDANT FOR INSULATION COVERING CHILLED WATER PIPING, REFRIGERANT SUCTION PIPING OR COOLING DUCTS LOCATED OUTSIDE.

7.2. PRODUCTS AND MATERIALS

7.2.1. RECTANGULAR EXPOSED DUCT: IMPALE RIGID BOARD ON WELD PINS AND SPEED WASHERS, 12" O/C WITH A MINIMUM OF 2 ROWS PER SIDE ON ANY SIDE GREATER THAN 12".

7.2.2. ROUND EXPOSED DUCT:SCORE AND MITRE RIGID BOARD TO FIT CONTOURS OF DUCT AND SECURE WITH 12" X 0.015" GALVANIZED STEEL BANDS 12" O/C. POINT UP ALL JOINTS WITH INSULATING CEMENT AND SEAL WITH FOIL FACED SELF ADHESIVE TAPE. FINISH WITH CANVAS.

7.2.3. CONCEALED DUCT: BLANKET TYPE INSULATION. APPLY FLEXIBLE BLANKET INSULATION WITH AN APPROVED ADHESIVE BRUSHED ON. FOR RECTANGULAR DUCTS OVER 450MM (18”), BLANKET TYPE INSULATION SHOULD BE SECURED TO THE BOTTOM SIDE OF THE DUCT WITH MECHANICAL FASTENERS.

7.2.4. DUCTWORK EXPOSED TO OUTDOORS: IMPALE RIGID BOARD ON WELD PINS AND SPEED WASHERS 12" O/C WITH A MINIMUM OF TWO ROWS PER SIDE ON ANY SIDE GREATER THAN 12". FINISH WITH TWO APPLICATIONS OF WEATHER PROTECTIVE COATING TROWELLED SMOOTH.

7.3. INSULATION THICKNESS

7.3.1. DUCT INSULATION THICKESSES SHALL BE PROVIDED AS PER ASHRAE 90.1 LATEST EDITION, TABLE 6.8.2.

7.3.2. PIPING SHALL BE THERMALLY INSULATED IN ACCORDANCE WITH ASHRAE 90.1 LATEST EDITION, TABLES 6.8.3-1 AND 6.8.3-2.

MECHANICAL DRAWING LIST

M100	MECHANICAL SPECIFICATIONS & DRAWING LIST
M101	MECHANICAL LEGENDS & SCHEDULES
M201	HVAC LAYOUT AND DETAILS
M301	PLUMBING DRAINAGE PLANS
M302	PLUMBING SUPPLY PLANS
M401	MECHANICAL INSTALLATION DETAILS

PRELIMINARY
NOT FOR CONSTRUCTION

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PROFESSIONAL SEAL:

DATE	REV.	ISSUED FOR	DSN	ENG
JULY 7/23	0.1	FINAL REVIEW	HV	MMc

PROJECT:
UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE,
SARNIA, ONTARIO

DATE: JUN. 26 2023	DRAWN BY: HV
	APPROVED BY: MMc
SCALE: AS NOTED	PROJECT No: MV23-044

DRAWING TITLE:
MECHANICAL SPECIFICATIONS & DRAWING LIST

DRAWING NUMBER: M100
REVISION: 0.1

HVAC LEGEND

	SUPPLY AIR DUCT	T RA	REVERSE ACTING THERMOSTAT		SUPPLY AIR DIFFUSER
	RETURN AIR DUCT	XX	SENSOR (SMOKE, GAS, CO)		RETURN AIR GRILLE
	EXHAUST DUCT	BD	BALANCING DAMPER		EXHAUST AIR GRILLE
TAG CFM WxH	AIR DISTRIBUTION SERVICE	FD	FIRE DAMPER		SIDEWALL DIFFUSER/GRILLE
TAG #	EQUIPMENT TAG		PRESSURE REGULATOR		LOUVRE / TRANSFER GRILLE / DOOR GRILLE
T	THERMOSTAT	M	MOTORIZED DAMPER		

PLUMBING LEGEND

CW	COLD WATER SUPPLY		VENT PIPING	VTR	VENT THRU ROOF
HWS	HOT WATER SUPPLY	FD	FLOOR DRAIN	BWV	BACK WATER VALVE
	SANITARY ABOVE GROUND	FFD	FUNNEL FLOOR DRAIN		BACKFLOW PREVENTER
SAN	SANITARY BELOW GROUND	(W)CO	(WALL) CLEANOUT		
	EXISTING SANITARY	FCO	FLOOR CELANOUT		

ABBREVIATIONS

AFF	ABOVE FINISHED FLOOR	HWS	HT WATER SUPPLY	STM	STORM
AFG	ABOVE FINISHED GRADE	HWR	HOT WATER RETURN	S/A	SUPPLY AIR
CWS	COLD WATER SUPPLY	F/A	FRESH AIR	T/A	TRANSFER AIR
DN	DOWN	O/E	OPEN ENDED	VTR	VENT THRU ROOF
EXST	EXHAUST	R/A	RETURN AIR		
HB	HOSE BIB	SAN	SANITARY		

DUCT INSULATION

	EXTERIOR	UNCONDITIONED SPACE	INDIRECTLY CONDITIONED SPACE
SUPPLY & RETURN	R12	R6	R1.9
EXHAUST AIR	-	R6	R1.9
CONTRACTOR SHALL FOLLOW SB-10 REQUIREMENTS FOR DUCT INSULATION			

DUCT SEALING

SYSTEM	EXTERIOR	UNCONDITIONED SPACE	CONDITIONED SPACE
SUPPLY AIR	A	B	B
RETURN AIR	A	B	B
EXHAUST AIR	B	B	B

PIPE MATERIALS AND INSULATION

SYSTEM	NOMINAL PIPE SIZE				
	<1	1 TO < 1½	1½ TO <4	4 TO <8	>8
	INSULATION THICKNESS				
DOM. HOT WATER (UP TO 140°F	1	1	1½	1½	1½
INCLUDES HOT WATER RECIRCULATION					

PLUMBING FIXTURE SCHEDULE

SYMBOL	TYPE	QTY (TOTAL)	DRAIN	HW	CW	DESCRIPTION	COMMENTS
EW-1	EYE WASH STATION	1	1¼"	½"	½"	BRADLEY S19224EW WALL MOUNT HALO EYE WASH WITH PLASTIC BOWL, C/W S19-2000 EMERGENCY FIXTURE THERMOSTATIC MIXING VALVE	OR APPROVED EQUAL
LAV-1	BARRIER FREE WASHROOM SINK	1	1½"	½"	½"	DELTA 591LF ELECTRONIC FAUCET, OBC BARRIER FREE COMPLIANT, 4" CENTERSET, C/W DELTA R3070-MIXLF THERMOSTATIC MIXING VALVE, REUSE EXISTING LAV BASIN	OR APPROVED EQUAL
LAV-2	WASHROOM SINK	4	1½"	½"	½"	DELTA 591LF ELECTRONIC FAUCET, OBC BARRIER FREE COMPLIANT, 4" CENTERSET, C/W DELTA R3070-MIXLF THERMOSTATIC MIXING VALVE, REUSE EXISTING LAV BASIN	COORDINATE MILLWORK WITH G.C., OR APPROVED EQUAL
MS-1	MOP SINK	1	3"	½"	½"	FIAT MOLDED STONE SERVICE BASIN, MODEL MSB2424, WITH DELTA MODEL WALL MOUNTED SERVICE FAUCET, 28T9, 30" FLEXIBLE HOSE, AND HOSE BRACKET.	OR APPROVED EQUAL. SEE SHOP DRAWING
S-1	SINK	1	1½"	½"	½"	KINDRED BROOKEMORE DROP-IN SINK, BDL2131-9-1 21"X31"X9", STAINLESS STEEL, WITH DELTA 9159-DST KITCHEN FAUCET. 'P' TRAP AND SUPPLY PROVIDED SEPARATELY.	COORDINATE MILLWORK WITH G.C., OR APPROVED EQUAL. SEE SHOP DRAWING
UR-1	URINAL	1	1½"	---	¾"	AMERICAN STANDARD MAYBROOK URNIAL, 0.5 GPF MANUAL OPERATED FLUSH VALVE	OR APPROVED EQUAL
WC-1	BARRIER FREE WASHROOM WATER CLOSET	1	3"	---	½"	REUSE EXISTING WATER CLOSET, REPLACE SEAT WITH NEW CENTOCO 820STS EXTRA HEAVY DUTY, OPEN FRONT WITH COVER FOR ELONGATED BOWL	OR APPROVED EQUAL
WC-2	WASHROOM WATER CLOSET	2	3"	---	½"	REUSE EXISTING WATER CLOSET, REPLACE SEAT WITH NEW CENTOCO 820STS EXTRA HEAVY DUTY, OPEN FRONT WITH COVER FOR ELONGATED BOWL	OR APPROVED EQUAL
WF-1	WASH FOUNTAIN	1	2"	1"	1"	BRADLEY WF2703, 36" SEMI CIRCULAR WASH FOUNTAIN, STANDARD HEIGHT, FOOT ACTIVATION, WITH THERMOSTATIC MIXING VALVE	OR APPROVED EQUAL
WH-1	WATER HEATER	1	---	¾"	¾"	RHEEM PROFFESSIONAL CLASSIC PLUS POWER VENT GAS WATER HEATER, 48 USGAL, 120/1/60, 47.5 TO 65.7 USGPH RECOVERY @ 90°F	REUSE EXISTING IF ACCEPTABLE TO OWNER, OR APPROVED EQUAL

HVAC EQUIPMENT LIST

TAG No.	QTY	SERVICE	HEATING	COOLING	FLOW	ESP	FRESH AIR	ELECTRICAL	MODEL	NOTES
			TOTAL BTUH INPUT	TOTAL BTUH INPUT	CFM	IN.WG	CFM			
AHU-1	1	AIR HANDLING UNIT	70 MBH	4 TON	1600	0.5	250	120/1/60 MCA:12	RUUD U96V	OR APPROVED EQUAL
CU-1	1	CONDENSING UNIT	-	4 TON	-	-	-	208/230/1/60 MCA:32	RUUD UA17	OR APPROVED EQUAL
HRV-1	1	HEAT RECOVERY UNIT	-	-	250	0.5	250	120/1/60 MCA:2.1	LIFEBREATH 267 MAX	OR APPROVED EQUAL

EXHAUST FANS

TAG No.	QTY	MANUFACTURER	MODEL	DESCRIPTION	CAPACITY (CFM)	SP (IN. WG.)	ELECRICAL	NOTES
EF-1	1	GREENHECK	G-080	DOWNBLAST EXHAUST	300	0.3	120/1/60	PROVIDE 24 HR TIMER, C/W WALL MOUNT BRACKET
EF-2	1	PANASONIC	FV-0810VSS1	CEILING/WALL CASSETTE	100	0.3	120/1/60	PROVIDE 24 HR TIMER
EF-3	1	PANASONIC	FV-0810VSS1	CEILING/WALL CASSETTE	100	0.3	120/1/60	CONTINUOUS OPERATION
EF-4	1	GREENHECK	S2-20	SIDEWALL EXHAUST FAN	6200	0.15	120/1/60 1HP	INTERLOCK WITH CO/NO2 DETECTOR. C/W 45° WEATHER HOOD, BACKDRAFT DAMPER, DAMPER GUARD.
EF-5	1	GREENHECK	S2-20	SIDEWALL EXHAUST FAN	4500	0.15	120/1/60 1/2HP	INTERLOCK WITH CO/NO2 DETECTOR. C/W 45° WEATHER HOOD, BACKDRAFT DAMPER, DAMPER GUARD.
EF-6	1	GREENHECK	S1-14	SIDEWALL EXHAUST FAN	1350	0.15	120/1/60 1/6HP	INTERLOCK WITH CO/NO2 DETECTOR. C/W 45° WEATHER HOOD, BACKDRAFT DAMPER, DAMPER GUARD.

SUPPLY DIFFUSERS

TAG No.	MANUFACTURER	MODEL	DESCRIPTION	SIZE	NOTES
SD-1	PRICE	SCD	LAY IN SQUARE CONE DIFFUSER	6"Ø	24X24 CEILING MODULE, C/W OPPOSED BLADE DAMPER. OR APPROVED EQUAL
SD-2	PRICE	SCD	LAY IN SQUARE CONE DIFFUSER	8"Ø	24X24 CEILING MODULE, C/W OPPOSED BLADE DAMPER. OR APPROVED EQUAL
SD-3	PRICE	520	LOUVERED DOUBLE DEFLECTION GRILLE	10X4	TYPE F FRAME, MOUNTING TO SUIT CEILING INSTALLATION C/W OPPOSED BLADE DAMPER

RETURN GRILLES

TAG No.	MANUFACTURER	MODEL	DESCRIPTION	SIZE	NOTES
RG-1	PRICE	80	EGG CRATE RETURN GRILLE	24x6	CORE ONLY, OR APPROVED EQUAL
RG-2	PRICE	80	EGG CRATE RETURN GRILLE	24x12	TYPE F FRAME, OR APPROVED EQUAL

EXHAUST GRILLES

TAG No.	MANUFACTURER	MODEL	DESCRIPTION	SIZE	NOTES
EG-1	PRICE	80	EGGCRATE, ALUMINUM	8X8	TYPE F FRAME, C/W OPPOSED BLADE DAMPER

LOUVERS

TAG No.	MANUFACTURER	MODEL	DESCRIPTION	SIZE	NOTES
L-1	PRICE	DE635	6" DEEP, 35° EXTRUDED DRAINABLE LOUVRE	48x48	INTAKE LOUVER, PROVIDE BUG SCREEN, COLOUR SELECTION BY OWNER,C/W MOTORIZED DAMPER & 120VAC BELIMO ACTUATOR, MIN FREE AREA: 9.21 FT^2
L-2	PRICE	DE635	6" DEEP, 35° EXTRUDED DRAINABLE LOUVRE	48x36	INTAKE LOUVER, PROVIDE BUG SCREEN, COLOUR SELECTION BY OWNER,C/W MOTORIZED DAMPER & 120VAC BELIMO ACTUATOR, MIN FREE AREA: 6.72 FT^2
L-3	PRICE	DE635	6" DEEP, 35° EXTRUDED DRAINABLE LOUVRE	24X24	INTAKE LOUVER, PROVIDE BUG SCREEN, COLOUR SELECTION BY OWNER. C/W MOTORIZED DAMPER & 120VAC BELIMO ACTUATOR. MIN FREE AREA: 1.86 FT^2

ZONE HEATING UNITS

TAG No.	QTY	MANUFACTURER	MODEL	TYPE	HEATING SOURCE	CAPACITY	ELECRICAL	NOTES
BB-1	3	OUELLET	OMF1002	BASEBOARD HEATER	ELECTRIC	1000 W	120/1/60	ONBOARD THERMOSTAT OR APPROVED EQUAL
RH-1	3	EZ RADIANT WORKS	EZ(SH)100-30	RADIANT TUBE HEATER	NATURAL GAS	100 MBH	120/1/60	NATURAL GAS, 30 FEET LONG, INDOOR, VERTICAL VENTING, LINE VOLTAGE THERMOSTAT OR APPROVED EQUAL
RH-1	1	EZ RADIANT WORKS	EZ(SH)165-60	RADIANT TUBE HEATER	NATURAL GAS	165 MBH	120/1/60	NATURAL GAS, 60 FEET LONG, INDOOR, VERTICAL VENTING, LINE VOLTAGE THERMOSTAT OR APPROVED EQUAL
RH-1	1	EZ RADIANT WORKS	EZ(SH)100-30-CW	RADIANT TUBE HEATER	NATURAL GAS	100 MBH	120/1/60	CAR WASH MODEL, NATURAL GAS, 30 FEET LONG, INDOOR, VERTICAL VENTING, LINE VOLTAGE THERMOSTAT OR APPROVED EQUAL
WFH-1	1	OUELLET	OAC01502-T	WALL FAN HEATER	ELECTRIC	1500 W	120/1/60	ONBOARD THERMOSTAT OR APPROVED EQUAL

GENERAL NOTES:

1. REFER TO DRAWING M100 FOR APPLICABLE SPECIFICATIONS.

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PROFESSIONAL SEAL:

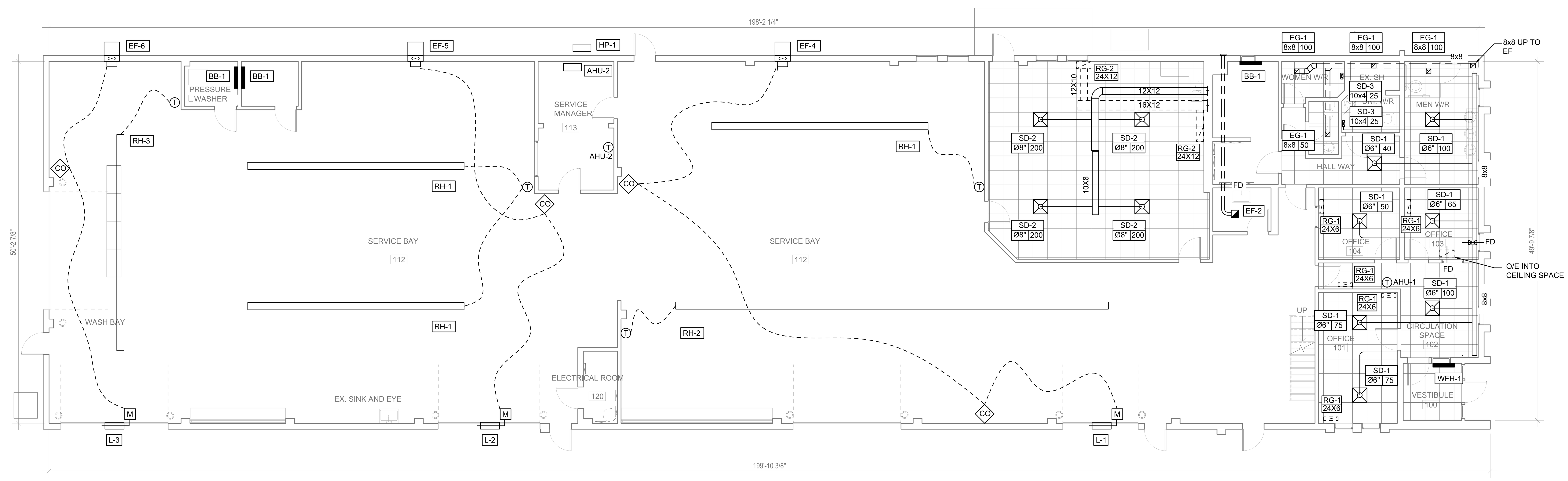
DATE	REV.	ISSUED FOR	DSN	ENG
JULY 7/23	0.1	FINAL REVIEW	HV	MMc

PROJECT:
UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE,
SARNIA, ONTARIO

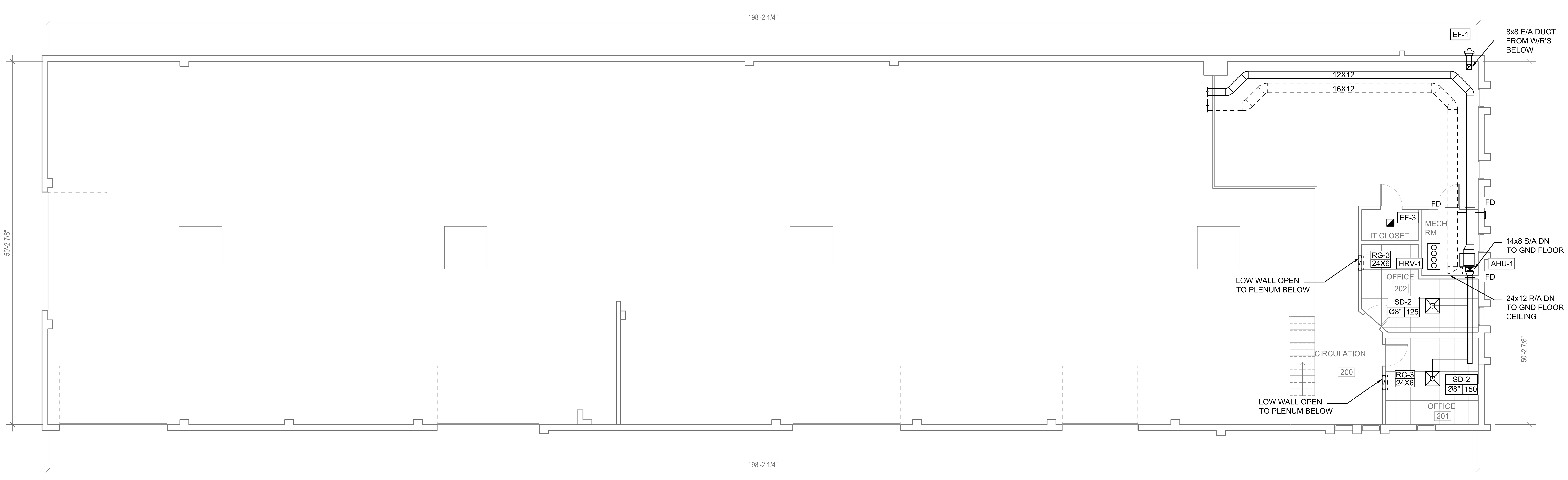
DATE: JUN. 26 2023
DRAWN BY: HV
APPROVED BY: MMc
SCALE: AS NOTED
PROJECT No: MV23-044

DRAWING TITLE:
MECHANICAL LEGENDS AND SCHEDULES

DRAWING NUMBER: M101
REVISION: 0.1



1 HVAC LAYOUT - FIRST FLOOR
SCALE: 1/8" = 1'-0"



2 HVAC LAYOUT - SECOND FLOOR
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND RELEVANT LAYOUTS.
2. REFER TO DRAWING M100 FOR APPLICABLE SPECIFICATIONS, REFER TO M101 FOR APPLICABLE LEGENDS & SCHEDULES.
3. CONTRACTOR SHALL INFORM ENGINEER OF ALL COMPLETED WORK FOR THE FOLLOWING INSPECTIONS:
   - UNDERGROUND INSTALLATION, PRIOR TO BACKFILLING
   - ROUGH-IN INSTALLATION, PRIOR TO CLOSING IN WALLS & CEILINGS.
   - FINAL INSTALLATION.
4. PROVIDE GAS DETECTION SYSTEM, WITH CO AND NO_2 MONITORING. SENSOR LOCATIONS AS SHOWN ON THE DRAWING. INTERLOCK EXHAUST FAN.
5. PROVIDE NEW MECHANICAL VENTILATION AS PER 6.2.2.3. OF THE ONTARIO BUILDING CODE; EXHAUST VENT TO BE CONNECTED TO A MONITORING DEVICE FOR NO_2 AND CO; PROVIDE A INLET LOUVERED VENT FOR MAKE-UP AIR.
6. PROVIDE AVERAGING SENSORS FOR AHU-1 SPREAD EVENLY THROUGHOUT OFFICES AND LUNCH ROOM.
7. HRV DUCT SHALL BE INSTALLED VIA SIMPLIFIED INSTALLATION INTO RETURN DUCT OF AHU-1. INTERLOCK WITH AHU-1.

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PROFESSIONAL SEAL:

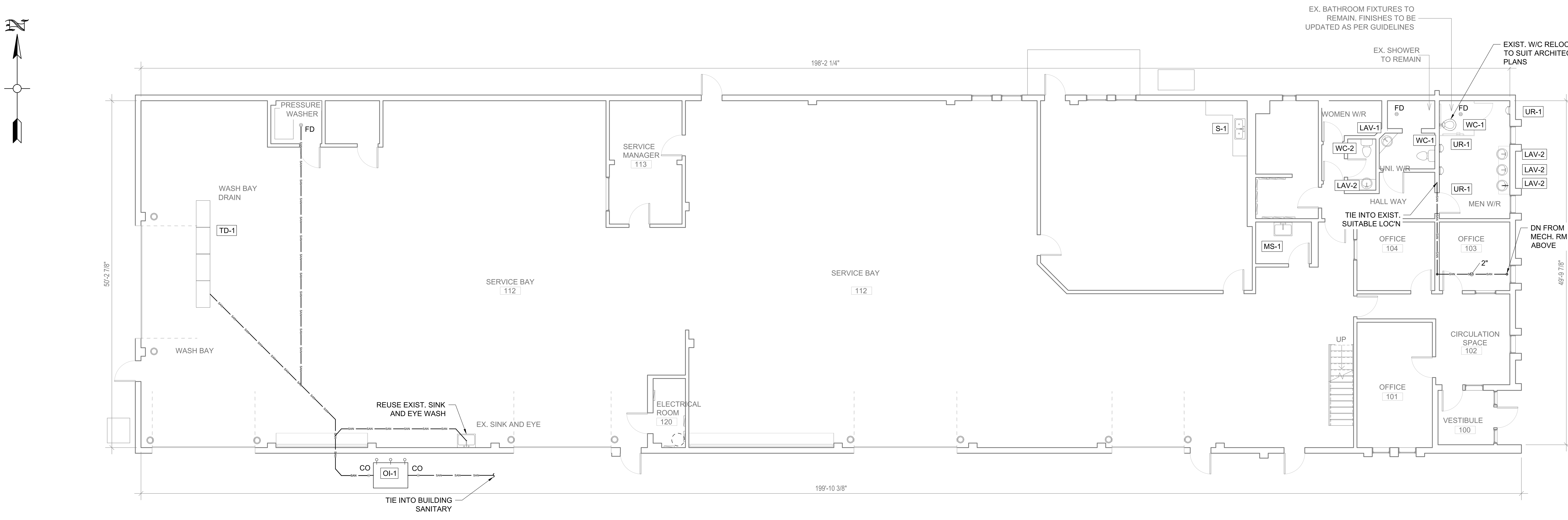
JULY 7/23	0.1	FINAL REVIEW	HV	MMc
DATE	REV.	ISSUED FOR	DSN	ENG

PROJECT:
UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE, SARNIA, ONTARIO

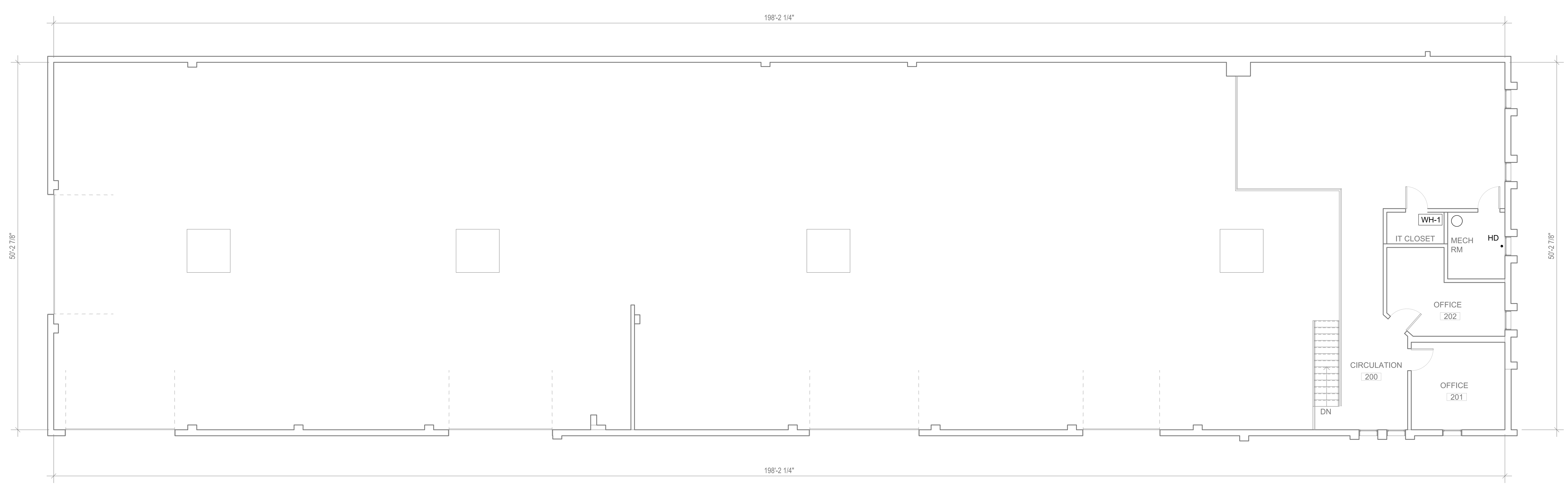
DATE: JUN. 26 2023	DRAWN BY: HV
	APPROVED BY: MMc
SCALE: AS NOTED	PROJECT No: MV23-044

DRAWING TITLE:
MECHANICAL HVAC LAYOUT & DETAILS

DRAWING NUMBER: M201
REVISION: 0.1



1 DRAINAGE LAYOUT - FIRST FLOOR
SCALE: 1/8" = 1'-0"



2 DRAINAGE LAYOUT - SECOND FLOOR
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND RELEVANT LAYOUTS.
2. REFER TO DRAWING M101 FOR APPLICABLE SPECIFICATIONS.
3. CONTRACTOR SHALL INFORM ENGINEER OF ALL COMPLETED WORK FOR THE FOLLOWING INSPECTIONS:
   - UNDERGROUND INSTALLATION, PRIOR TO BACKFILLING
   - ROUGH-IN INSTALLATION, PRIOR TO CLOSING IN WALLS & CEILINGS.
   - FINAL INSTALLATION.
4. PROVIDE 1½" VENTS FOR EACH CHAMBER OF OIL INTERCEPTOR. VENTS SHALL TERMINATE INDEPENDENTLY AND MAY NOT CONNECT TO OTHER VENTING SYSTEMS.
5. DIRECT BURY OIL INTERCEPTOR AS PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. INSTALL EXTENSION COLLAR ON COVER TO ALIGN LID WITH TOP OF CONCRETE.
6. DRAINAGE PIPING ABOVE GRADE, ROUTED THRU CEILING PLENUM SPACE SHALL BE IPEX SYSTEM 15 OR APPROVED EQUAL.

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PROFESSIONAL SEAL:

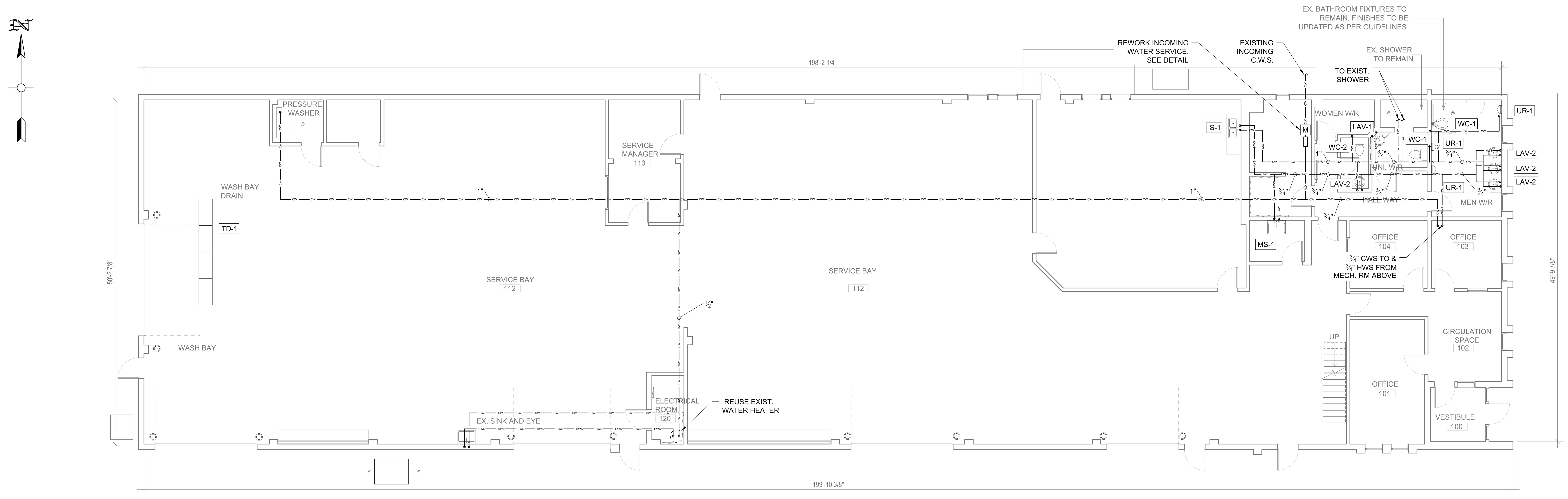
JULY 7/23	0.1	FINAL REVIEW	HV	MMc
DATE	REV.	ISSUED FOR	DSN	ENG

PROJECT:
UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE, SARNIA, ONTARIO

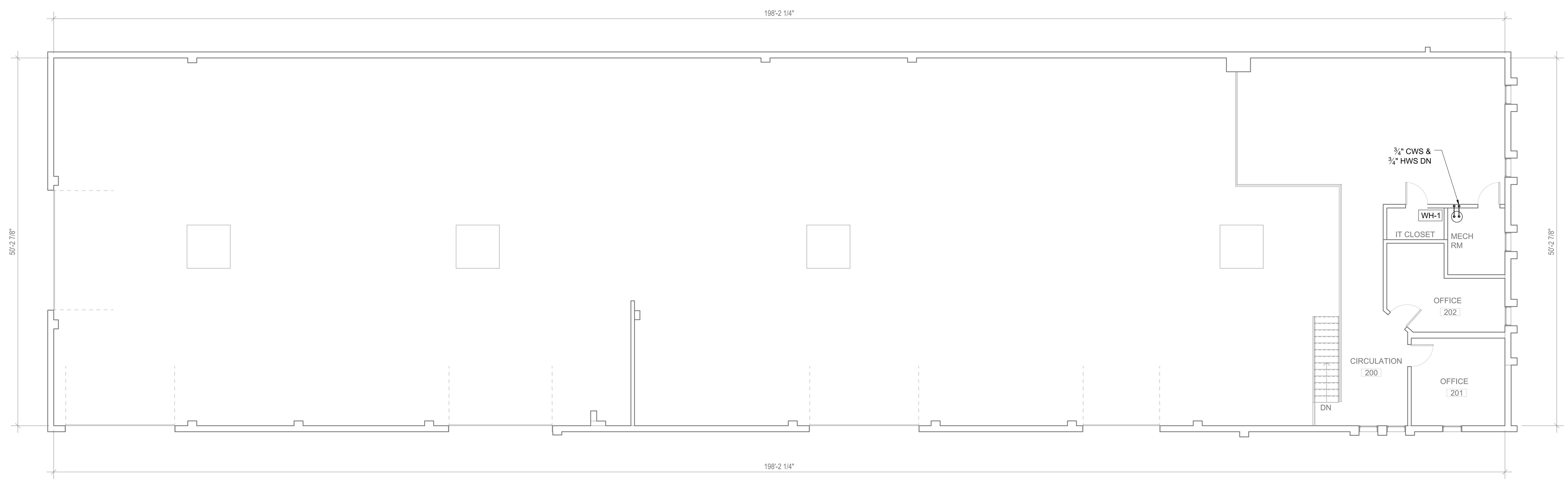
DATE: JUN. 26 2023	DRAWN BY: HV
	APPROVED BY: MMc
SCALE: AS NOTED	PROJECT No: MV23-044

DRAWING TITLE:
PLUMBING DRAINAGE PLAN & DETAILS

DRAWING NUMBER: M301
REVISION: 0.1



3 SUPPLY LAYOUT - FIRST FLOOR
SCALE: 1/8" = 1'-0"



2 SUPPLY LAYOUT - SECOND FLOOR
SCALE: 1/8" = 1'-0"

GENERAL NOTES:

1. REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS AND RELEVANT LAYOUTS.
2. REFER TO DRAWING M101 FOR APPLICABLE SPECIFICATIONS.
3. CONTRACTOR SHALL INFORM ENGINEER OF ALL COMPLETED WORK FOR THE FOLLOWING INSPECTIONS:
   - UNDERGROUND INSTALLATION, PRIOR TO BACKFILLING
   - ROUGH-IN INSTALLATION, PRIOR TO CLOSING IN WALLS & CEILINGS.
   - FINAL INSTALLATION.
4. INSTALL OUTDOOR HOSE BIBS WITH ADDITIONAL SHUT OFF VALVE INSIDE IN AN ACCESSIBLE LOCATION.
5. CONTRACTOR SHALL PROVIDE NATURAL GAS PIPING TO ALL GAS FIRED EQUIPMENT AS INDICATED ON MECHANICAL DRAWINGS AND SCHEDULES. SIZE AND INSTALL IN ACCORDANCE WITH LOCAL REGULATIONS AND CSA B149.1.
6. REUSE EXISTING SUPPLY PIPING WHERE PRACTICAL AND IN GOOD CONDITION. CONFIRM WITH OWNER.

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PROFESSIONAL SEAL:

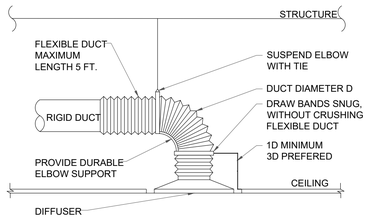
DATE	REV.	ISSUED FOR	DSN	ENG
JULY 7/23	0.1	FINAL REVIEW	HV	MMc

PROJECT:
UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE,
SARNIA, ONTARIO

DATE: JUN. 26 2023
DRAWN BY: HV
APPROVED BY: MMc
SCALE: AS NOTED
PROJECT No: MV23-044

DRAWING TITLE:
PLUMBING SUPPLY PLAN & DETAILS

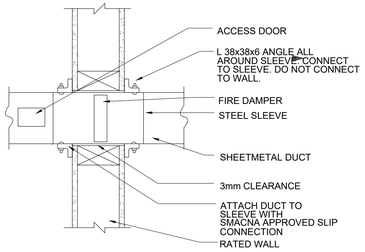
DRAWING NUMBER: M302
REVISION: 0.1



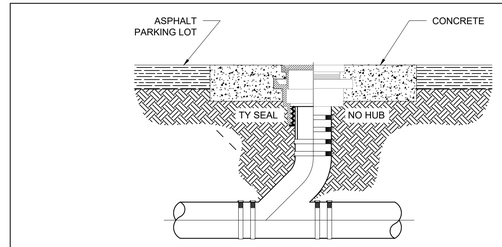
TYPICAL DIFFUSER INSTALLATION DETAIL
N.T.S.

NOTES:

1. ADAPTED FROM ASHRAE HANDBOOK FUNDAMENTALS.
2. WHEN LENGTH OF STRAIGHT DUCT UPSTREAM OF DIFFUSER IS LESS THAN 3D, PROVIDE AN EQUALIZING GRID.
3. BALANCING DAMPERS TO BE LOCATED MINIMUM 3D, PREFERABLY 5-10D AWAY FROM DIFFUSER.



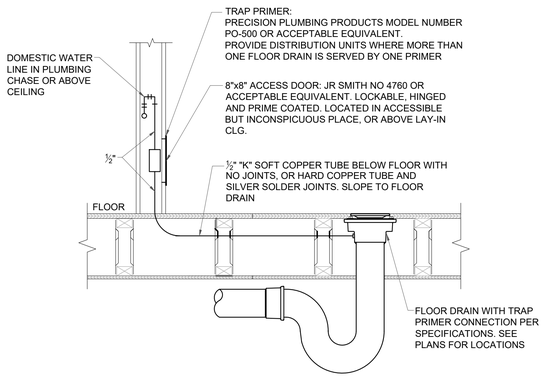
FIRE DAMPER IN WALL DETAIL
N.T.S.



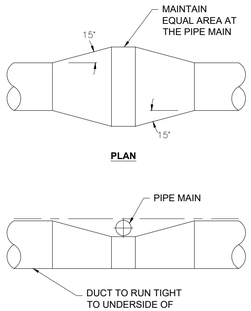
CLEANOUT HOUSING INSTALLATION DETAIL
N.T.S.

CLEANOUT INSTALLATION NOTES:

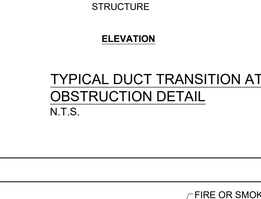
1. CLEANOUT SHALL BE HEAVY DUTY DUCTILE IRON CLEANOUT SUCH AS WADE MODEL 8401-12 OR EQUAL.
2. EMBED CLEANOUT IN CONCRETE, 6" THICK, REINFORCED. EXTEND PAD, MINIMUM 12" FROM THE CENTER OF THE CLEANOUT.



TYPICAL PRIMER DETAIL
N.T.S.

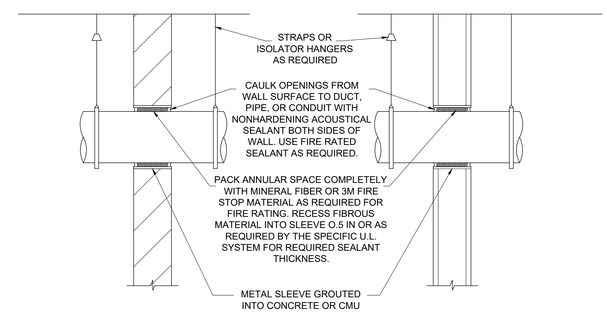


PLAN



ELEVATION

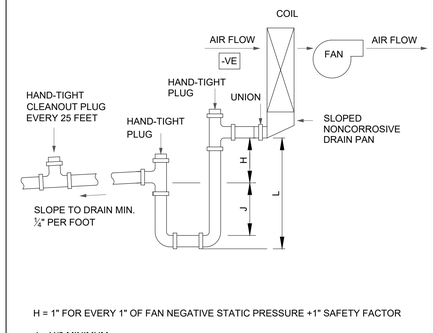
TYPICAL DUCT TRANSITION AT OBSTRUCTION DETAIL
N.T.S.



TYPICAL DUCT PENETRATION DETAIL
N.T.S.

NOTES:

1. ADAPTED FROM ASHRAE HANDBOOK-HVAC APPLICATIONS.



H = 1" FOR EVERY 1" OF FAN NEGATIVE STATIC PRESSURE +1" SAFETY FACTOR

J = H/2 MINIMUM

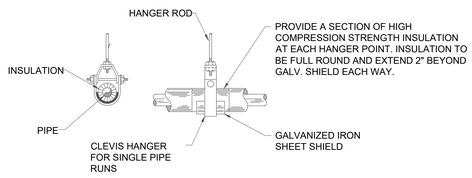
L = H+J+ PIPE DIAMETER + INSULATION (IF APPLICABLE)

DRAIN PIPE DIA. = FULL SIZE OF DRAIN PAN CONNECTION

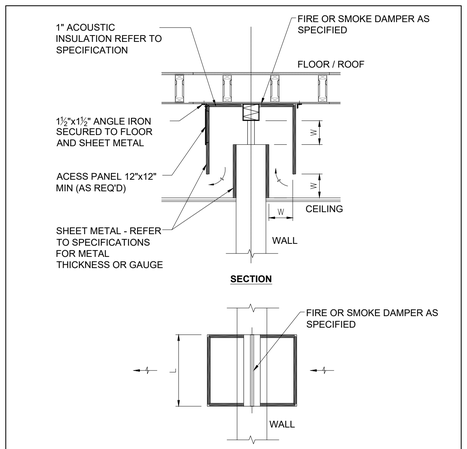
TYPICAL COIL DRAIN TRAP DETAIL DRAW-THRU COIL CONFIGURATION (NEGATIVE PRESSURE)
N.T.S.

NOTES:

1. DO NOT COMBINE DRAIN TRAPS OF MULTIPLE COILS.
2. ENSURE ADEQUATE AIR HANDLING UNIT MOUNTING HEIGHT TO ACCOMMODATE TRAP HEIGHT 'L'.
3. ENSURE TRAPS ARE PRIMED.
4. ROUTE DRAIN TO NEAREST HUB DRAIN.



TYPICAL CEILING-MOUNTED PIPE SUPPORT DETAIL
N.T.S.

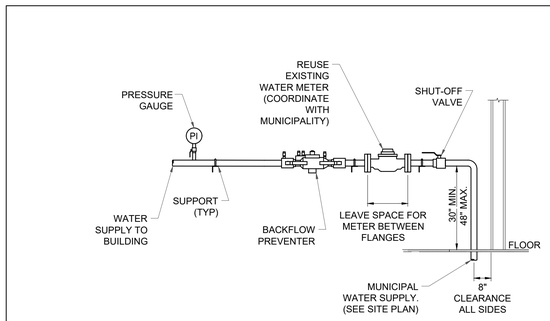


SECTION

PLAN

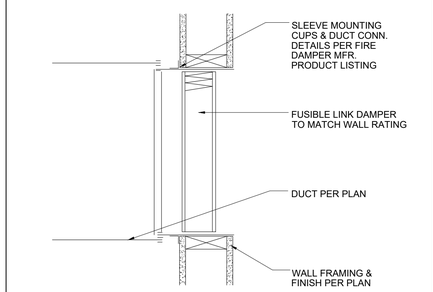
FIRE DAMPER DETAIL
N.T.S.

NOTE:
1. DIMENSIONS AS SHOWN ON THE DRAWINGS W+L=NET OPENING OF DAMPER



MUNICIPAL WATER SUPPLY DETAIL
N.T.S.

1. PROVIDE ½" CONDUIT THROUGH EXTERIOR WALL FOR PURPOSE OF INSTALLING AN OUTSIDE REMOTE.
2. METER AND OUTSIDE REMOTE ARE TO BE PROVIDED BY MUNICIPALITY.
3. ALL COMPONENTS ILLUSTRATED SHALL BE INSTALLED PRIOR TO THE INSTALLATION OF THE WATER METER.
4. PRESSURE GAUGE SHALL BE INSTALLED DOWNSTREAM OF THE WATER METER.



TYPICAL WALL RETURN FROM PLENUM
N.T.S.

GENERAL NOTES:

PRELIMINARY NOT FOR CONSTRUCTION

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PROFESSIONAL SEAL:

DATE	REV.	ISSUED FOR	DSN	ENG
JULY 7, 23	0.1	FINAL REVIEW	HV	MMc

PROJECT:

UNITED RENTALS RENOVATION
1315 LOUGAR AVENUE,
SARNIA, ONTARIO

DATE: JUN. 26 2023	DRAWN BY: HV
	APPROVED BY: MMc
SCALE: AS NOTED	PROJECT No: MV23-044

DRAWING TITLE:

MECHANICAL INSTALLATION DETAILS

DRAWING NUMBER:	REVISION:
M401	0.1