

13. PLUMBING FIXTURE AND TRIM:

1. FIXTURE PIPING:
 1. HOT AND COLD WATER SUPPLIES TO EACH FIXTURE:
 1. SUPPLY STOPS SHALL BE ALL BRASS WITH FULL TURN BRASS SEAMS AND REPLACEABLE WASHER ATTACHMENT SHALL BE IPS INLET X COMPRESSION OD OUTLET TO FIXTURE. ALL FIXTURE STOP VALVES SHALL BE SCREW DRIVER TYPE.
 2. CHROME PLATED IN ALL EXPOSED PLACES.
2. WASTE:
 1. CAST BRASS ADJUSTABLE STYLE P-TRAP WITH CLEANOUT ON EACH FIXTURE NOT HAVING INTEGRAL TRAP.
 2. CHROME PLATED IN ALL EXPOSED PLACES.
 3. SINK AND LAVATORY HEAVY GAUGE P-TRAPS SHALL BE CAST BRASS ADJUSTABLE STYLE WITH 17 GA SEAMLESS BRASS WILL BEND. ATTACHMENT NUTS SHALL BE BRASS, NO ZINC ALLOWED. P-TRAPS TO BE REMOVABLE/UNION TYPE OR TO INCLUDE CLEANOUT.
 4. LAVATORY STRAINERS SHALL BE CHROME PLATED CAST BRASS WITH 17 GA SEAMLESS BRASS TAILPIECE.
 5. ALL BARRIER-FREE LAVATORIES AND SINKS SHALL HAVE CHROME PLATED OFFSET TAIL PIECE IN ADDITION TO P-TRAP WITH CLEANOUT. INSULATE P-TRAP AND HOT & COLD WATER PIPES WITH PRE-FORMED & FINISHED SURFACE INSULATION. ARMAFLEX INSULATION AND TAPE NOT ACCEPTABLE.
 6. URINAL WASTE PIPE & FITTINGS SHALL BE DOW PVC EQUIVALENT TO IPEX SYSTEM 15. EXTEND PLASTIC PIPING UP TO COMBINED WASTE FROM ADJACENT LAVATORY OR OTHER PLUMBING FIXTURES ALLOWING DILUTION OF WASTE.

16. THERMAL INSULATION FOR DUCTING:

1. FLAME AND SMOKE:
 1. IN ACCORDANCE WITH CAN/ULC S102:
 1. MAXIMUM FLAME SPREAD RATING: 25.
 2. MAXIMUM SMOKE DEVELOPED RATING: 50.
2. INSULATION:
 1. MINERAL FIBRE AS SPECIFIED HEREIN INCLUDES GLASS FIBRE, ROCK WOOL, SLAG WOOL, FIBRE NOT TO EXCEED SPECIFIED VALUES AT 24°C MEAN TEMPERATURE WHEN TESTED IN ACCORDANCE WITH ASTM C339/C335M.
 2. RIGID MINERAL FIBRE BOARD TO CAN/CGSB-51.10, WITH FACTORY APPLIED VAPOUR RETARDER JACKET TO CGSB 51-0P-52MA.
 3. MINERAL FIBRE BLANKET TO CAN/CGSB-51.11 FACED WITH FACTORY APPLIED VAPOUR RETARDER JACKET TO CGSB 51-0P-52MA.
 1. MINERAL FIBRE: TO CAN/CGSB-51.11.
 2. JACKET: TO CGSB 51-0P-52MA.
 3. MAXIMUM "K" FACTOR: TO CAN/CGSB-51.11.
 4. DENSITY: 24 KG/M3.

4. RECTANGULAR AND FITTINGS: GALVANIZED SHEET STEEL NOT LESS THAN THE FOLLOWING THICKNESS: 24 GA. - 75MM (30") WIDE SMOKESTOPPER SHALL ALLOW FOR ALL MAINTENANCE ON ONE SIDE OF THE UNIT. SERVICE PANELS SHALL HAVE HINGED PANELS WHILE PROVIDING A WATER AND AIR TIGHT SEAL. ALL EXPOSED VERTICAL PANELS AND TOP COVERS IN THE INDOOR AIR SECTION SHALL BE INSULATED WITH A CLEANABLE, FOIL-FACED, FIRE-RETARDANT, PERMANENT, ODORLESS, GLASS FIBRE MATERIAL. THE BASE OF THE UNIT SHALL BE INSULATED WITH 1/2" INSULATION. INSULATION SHALL BE EITHER CAPTURED OR SEALED. THE UNIT'S BASE PAN SHALL HAVE NO PENETRATIONS WITHIN THE PERIMETER OF THE CURB OTHER THAN THE RAISED DOWNFLOW SUPPLY/RETURN OPENINGS TO PROVIDE AN ADDED WATER INTEGRITY PRECAUTION, IF THE CONDENSATE DRAIN BACKS UP.
3. UNIT TOP:
 1. THE TOP COVER SHALL BE ONE PIECE CONSTRUCTION OR, WHERE SEAMS EXIST, IT SHALL BE DOUBLE-HEMMED AND GASKET-SEALED. THE ROBBED TOP ADDS EXTRA STRENGTH AND FINANCES WATER REMOVAL FROM UNIT TOP.
4. COMPRESSORS:
 1. ALL UNITS SHALL HAVE DIRECT-DRIVE, HERMETIC, SCROLL TYPE COMPRESSORS WITH CENTRIFUGAL TYPE OIL PUMPS. MOTOR SHALL BE SUCTION GAS-COOLED AND SHALL HAVE A VOLTAGE UTILIZATION RANGE OF PLUS OR MINUS 10 PERCENT OF UNIT NAMEPLATE VOLTAGE. INTERNAL OVERLOADS SHALL BE PROVIDED WITH THE SCROLL COMPRESSORS.
 2. THIS 3-POLE, MOLDED CASE, DISCONNECT SWITCH WITH PROVISIONS FOR THROUGH THE BASE ELECTRICAL CONNECTIONS. THE DISCONNECT SWITCH SHALL BE INSTALLED IN THE UNIT IN A WATER TIGHT ENCLOSURE WITH ACCESS THROUGH A SWINGING DOOR. WIRING SHALL BE PROVIDED FROM THE SWITCH TO THE UNIT HIGH VOLTAGE TERMINAL BLOCK. THE SWITCH SHALL BE UL/CSA AGENCY RECOGNIZED.
 3. NOMER, TO MAINTAIN BARRIER BUILDING PRESSURIZATION.
 4. CURBS INSULATED. 60MM HIGH. SERVICIALLY RESTRAINED CURB.
 5. ACCEPTABLE MATERIAL: TRANE VYH SERIES.

20. GRILLES, REGISTERS AND DIFFUSER:

1. GENERAL:
 1. TO MEET CAPACITY, PRESSURE DROP, TERMINAL VELOCITY, NOISE LEVEL, NECK VELOCITY AS INDICATED.
 2. FRAMES:
 1. FULL PERIMETER GASKETS.
 2. PLASTER FRAMES WHERE SET INTO PLASTER OR GYPSUM BOARD AND AS SPECIFIED.
 3. CONCEALED FASTENERS.
 4. CONCEALED OPERATORS.
 5. ACCEPTABLE MANUFACTURER: E.H. PRICE, NALOR, TITUS, KRUEGER, METALABE, MAD KLIMA.
 3. GRILLES:
 1. TYPE SGI: STEEL CONSTRUCTION, DOUBLE DEFLECTION, HORIZONTAL FACE BASE, OFF-WHITE BAKED ENAMEL FINISH. COMPLETE WITH BALANCING DAMPER SET: 200 X 150.
 2. ACCEPTABLE MATERIAL: E.H. PRICE MODEL 5200 OR EQUAL.

21. ELECTRIC AND ELECTRONIC STANDALONE CONTROLS:

1. ALL LOW VOLTAGE 240V OR HIGH VOLTAGE 120VAC CONTROLS BY MECHANICAL CONTROL.
2. PROVIDE EMT CONDUIT C/W STEEL COUPLINGS AND FITTINGS FOR CONTROL WIRING IN EXPOSED OR EXTERIOR LOCATIONS. REFER TO ELECTRICAL SPECIFICATIONS FOR INSTALLATION DETAILS.
3. PROVIDE FT-6 FIRE RATED CABLE FOR CONTROL WIRING IN CONCEALED AREAS.
4. THERMOSTAT (LINE VOLTAGE)
 1. WALL MOUNTED, FOR HEATING/COOLING WITH AUTOMATIC CHANGEOVER.
 2. FULL LOAD RATING: 16A AT 120V.
 3. TEMPERATURE SETTING RANGE: 5°C TO 30°C.
 4. THERMOMETER RANGE: 5°C TO 30°C.
 5. MARKINGS IN 5°C INCREMENTS.
 6. DIFFERENTIAL TEMPERATURE FIXED AT 1.1°C.
 5. THERMOSTAT GUARDS: LOCKABLE, CLEAR, PLASTIC. SLOTS FOR AIR CIRCULATION TO THERMOSTAT.

22. TESTING, ADJUSTING AND BALANCING (TAB):

1. GENERAL:
 1. TAB MEANS TO TEST, ADJUST AND BALANCE TO PERFORM IN ACCORDANCE WITH REQUIREMENTS OF CONTRACT DOCUMENTS AND TO DO ALL OTHER WORK AS SPECIFIED IN THIS SECTION.

25. WALL MOUNTED DUCTLESS SPLIT:

1. GENERAL:
 1. INTEGRATED PACKAGE: TO CAN/CSA C656.
 2. SYSTEM TYPE:
 1. AIR FLOW ARRANGEMENT: WALL MOUNTED CASSETTE.
 2. COOLING: DIRECT EXPANSION WITH MATCHING AIR COOLED CONDENSING UNIT.
 3. UNIT CAPACITY: REFER TO EQUIPMENT SCHEDULE.
 4. UNIT CAPACITY: TO BE SIZED USING INDOOR AIR AT 22°C AND 50% RH & OUTDOOR AIR AT 35°C.
 5. CAPABLE OF OPERATING WITH A REFRIGERANT PIPING LENGTH OF 20 METRES (65 FT.).
 6. UNIT TO BE EQUIPPED WITH UNIT MOUNTED CONDENSATE PUMP.
2. CABINET:
 1. GALVANIZE STEEL FRAME, EPOXY COATED FINISH. READY FOR CEILING MOUNTING COMPLETE WITH WHITE PLASTIC COVER.
 2. CABINET TO HOUSE: COOLING COIL, FANS, FILTERS AND ELECTRICAL CONTROLS.
 3. PROVIDE ADEQUATE ACCESS TO COMPONENTS FOR SERVICING.
3. FILTER HOUSING:
 1. THE FILTER CHAMBER SHALL BE AN INTEGRAL PART OF THE CABINET AND LOCATED AT THE ENTRANCE OF THE RETURN AIR PATH AND SHOULD BE SERVICABLE FROM BELOW.
 2. FILTER SHALL BE A REMOVABLE AND WASHABLE.
4. FAN:
 1. DIRECT DRIVE, DOUBLE WIDTH FAN WHEELS WITH FORWARD CURVED BLADES, STATIONALLY AND DYNAMICALLY BALANCED.
5. COMPRESSORS:
 1. HERMETIC TYPE, WITH VIBRATION ISOLATORS, ADJUSTABLE HIGH AND LOW PRESSURE SWITCHES, ANTI-SLUG DEVICE, MOTOR OVERLOAD AND OVERTEMPERATURE PROTECTION PUMP DOWN CONTROLS, REFRIGERANT SERVICE VALVES AND CAPACITY CONTROLS.
6. COOLING COIL:
 1. ALUMINUM FINNS, MECHANICALLY BONDED TO COPPER TUBES, TESTED TO 1.7 MPA, MAXIMUM FACE VELOCITY 2.8 M/S, WITH STAINLESS STEEL INSULATED CONDENSATE TRAY AND DRAIN CONNECTIONS.
 2. DIRECT EXPANSION, WITH SEPARATE REFRIGERANT CIRCUIT FOR EACH COMPRESSOR AND SHALL BE SPLIT.
 3. COOLING COIL CONDENSATE DRAIN PANS: DESIGNED TO AVOID ANY STANDING WATER, TO BE EASILY CLEANED OR REMOVABLE FOR CLEANING.
7. AIR COOLED CONDENSER:
 1. AIR COOLED: FREE STANDING, WELDED STEEL UNIT CONSTRUCTION, CORROSION PROTECTED.
 2. ALUMINUM FINNS, MECHANICALLY BONDED TO COPPER TUBES, TESTED TO 3.1 MPA.
 3. PROPPELLER TYPE FANS, DIRECT DRIVE.
 4. ELECTRICAL AND CONTROL COMPONENTS HOUSED IN WEATHER-TIGHT ACCESS PANELS WITH ELECTRICAL DISCONNECT SWITCH AND CONTROL CABLE FOR CONTROL INTERCONNECTION.
 5. VIBRATION ISOLATION: PROVIDING AT LEAST 95% ISOLATION EFFICIENCY.
8. REFRIGERANT PIPING, VALVES, FITTINGS AND ACCESSORIES WITHIN UNIT:
 1. INCLUDE FOR EACH REFRIGERANT CIRCUIT:
 1. GAS & LIQUID LINE INSULATION: FLEXIBLE ELASTOMERIC INSULATION TO CAN/CGSB 51.40, 12 MM MINIMUM THICKNESS.
9. ENVIRONMENTAL CONTROLS:
 1. THE SYSTEM SHALL INCORPORATE A PROGRAMMABLE TEMPERATURE CONTROLLER. THE CONTROLLER SHALL BE SHIPPED LOOSE FOR FIELD MOUNTING WITH FACTORY WIRED AIR TEMPERATURE SENSOR. THE CONTROLLER SHALL INDICATE TEMPERATURE AND INCLUDE THE FOLLOWING: FAN SELECTOR, BUILT-IN SHORT CYCLE PROTECTION, NIGHT SET BACK AND MANUAL OVERRIDE.
10. REFRIGERANT CHARGE:
 1. CHARGE REFRIGERANT SYSTEM AT FACTORY, SEAL AND TEST.
11. TUBING:
 1. PROCESSED FOR REFRIGERATION INSTALLATIONS, DEOXIDIZED, DEHYDRATED AND SEALED.
 2. HARD COPPER: TO ASTM B280, TYPE ACR.

3. SOFT COPPER: ANNEALED, TO ASTM B280, WITH MINIMUM WALL THICKNESS AS PER CSA B52 SMART AND ASME B31.5, BARE OR PRE-INSULATED.
2. FITTINGS:
 1. SERVICE: DESIGN PRESSURE 300 PSI AND TEMPERATURE 121°C.
 2. BRAZED:
 1. FITTINGS: WROUGHT COPPER TO ASME B16.22.
 2. JOINTS: SILVER SOLDER, 45% 40-15% CU AND NON-CORROSIVE FLUX.
 3. FLANGED:
 1. BRONZE OR BRASS, TO ASME B16.24, CLASS 150 AND SORE RA & OUTDOOR AIR AT 35°C.
 2. GASKETS: SUITABLE FOR SERVICE.
 3. BOLTS, NUTS AND WASHERS: TO ASTM A307, HEAVY SERIES.
 4. FLARED:
 1. BRONZE OR BRASS, FOR REFRIGERATION, TO ANS/ASME16.26.
3. PIPE SLEEVES:
 1. HARD COPPER OR STEEL, STEEL TO PROVIDE 7 MM (3/4") CLEARANCE ALL AROUND BETWEEN SLEEVE AND UNINSULATED PIPE OR BETWEEN SLEEVE AND INSULATION.
4. VALVES:
 1. 20 MM (3/4") AND UNDER: CLASS 500, 3,450 KPA (500 PSIG), GLOBE OR ANGLE NON-DIRECTIONAL TYPE, DIAPHRAGM, PACKLESS TYPE, WITH FORGED BRASS BODY AND BONNET, MOISTUREPROOF SEAL FOR BELOW FREEZING APPLICATIONS, BRAZED CONNECTIONS.
 2. OVER 20 MM (3/4") - CLASS 375, 2,585 KPA (375 PSIG), GLOBE OR ANGLE TYPE, DIAPHRAGM, PACKLESS TYPE, BACK-SEATING, CAP SEAL, WITH CAST BRONZE BODY AND BONNET, MOISTUREPROOF SEAL FOR BELOW FREEZING APPLICATIONS, BRAZED CONNECTIONS.
5. INSULATION:
 1. TIAC CODE A-6: FLEXIBLE UNICELLULAR TUBULAR ELASTOMER.
 1. TO ASTM C634 WITH ANTI-MICROBIAL PROTECTION.
 2. "K" VALUE: 0.04 W/m°C AT 24°C MEAN TEMPERATURE.
 3. TEMPERATURE RANGE: -4°C TO 100°C.
 4. 25/50 RATED TO ASTM E84.
 5. THICKNESS: 13 MM UNLESS OTHERWISE INDICATED.
 6. ACCEPTABLE MATERIAL: ARMACELL AP, ARMAFLEX BLACK LAP SEAL, AEROCEL SPPT, OR APPROVED EQUAL.
 6. INSULATION SECUREMENT: TAPE: SELF-ADHESIVE, REINFORCED, 50 MM WIDE MINIMUM TO INSULATION MANUFACTURER'S RECOMMENDATION.
7. JACKETS:
 1. ALUMINUM ON ALL OUTDOOR PIPING:
 1. TO ASTM B209.
 2. THICKNESS: 0.50 MM SHEET.
 2. FINISH: EMBOSSED.
 3. FINISH: LONGITUDINAL AND CIRCUMFERENTIAL SLIP JOINTS WITH 50 MM LAPS.
 4. FITTINGS: 0.5 MM THICK DEE-SHAPED FITTING COVERS WITH FACTORY-ATTACHED PROTECTIVE LINER.
 5. METAL JACKET BANDING AND MECHANICAL SEALS: STAINLESS STEEL, 19 MM WIDE, 0.5 MM THICK AT 300 MM SPACING.
8. INSTALLATION:
 1. HARD DRAWN COPPER TUBING: DO NOT BEND. MINIMIZE USE OF FITTINGS.
 2. SUPPORT PIPING USING UNISTRUT WITH CUSHION CLAMPS.
 3. HOT GAS LINES:
 1. PREVENT AT LEAST 1240 DOWN IN DIRECTION OF FLOW TO PITCH AIR RETURN TO COMPRESSOR DURING OPERATION.
 2. PROVIDE TRAP AT BASE OF RISERS GREATER THAN 2,400 MM (8 FEET) HIGH.
 3. PROVIDE INVERTED DEEP TRAP AT TOP OF EACH RISER.
 4. PROVIDE DOUBLE RISERS FOR COMPRESSORS HAVING CAPACITY MODULATION.
 1. LARGE RISER: INSTALL TRAPS AS SPECIFIED ABOVE.
 2. SMALL RISER: SIZE FOR 5.1M/S AT MINIMUM LOAD. CONNECT UPSTREAM OF TRAPS ON LARGE RISER.
 4. PRESSURE AND LEAK TEST TO MANUFACTURER'S RECOMMENDATIONS.

2. FIXTURES:
 1. MANUFACTURE IN ACCORDANCE WITH CSA B45.
 2. ALL PRODUCTS, WHERE APPLICABLE, SHALL BE MARKED WITH MANUFACTURER'S NAME OR PRODUCT #.
 3. TRIM, FITTINGS: MANUFACTURE IN ACCORDANCE WITH CSA B125.
 4. NUMBER, LOCATIONS: ARCHITECTURAL DRAWINGS TO GOVERN.
 5. FIXTURES IN ANY ONE LOCATION TO BE PRODUCT OF ONE MANUFACTURER AND OF SAME TYPE.
 6. TRIM IN ANY ONE LOCATION TO BE PRODUCT OF ONE MANUFACTURER AND OF SAME TYPE UNLESS OTHERWISE INDICATED.
 7. CARRIERS: PROVIDE FOR ALL WALL MOUNTED PLUMBING FIXTURES.
 8. ROUGHING-IN OF FIXTURES: ROUGH-IN FOR EQUIPMENT SUPPLIED BY OTHER TO BE COMPLETE WITH VALVED SUPPLIES, WASTES AND VENTS, CAPPED AND ASSOCIATED FITTING PIPING & REDUCERS.
 9. CONTRACTOR IS RESPONSIBLE TO ENSURE INSTALLATION OF FIXTURES MEETS CSA-B651 WHERE BARRIER FREE IS REQUIRED.
 10. CONTRACTOR IS RESPONSIBLE TO ENSURE PROPER OPERATION OF FIXTURES UP TO 80 PSI (950 KPA).
 11. PLUMBING FIXTURES: REFERENCE FIXTURE SCHEDULE ON DRAWINGS.

14. NATURAL GAS PIPING:

1. STEEL PIPE: TO ANS/ASME A102.1 OR ASTM A53/AS3M, SCHEDULE 40, SEAMLESS AS FOLLOWS:
 1. NPS 2" AND OVER, WELDED.
 2. NPS 1 1/2" AND UNDER, WELDED.
2. JOINTING:
 1. SCREWED FITTINGS: POLYMERIZED LEAD PASTE.
 2. WELDED FITTINGS: TO CSA W47.1.
 3. FLANGE GASKETS: TO ANS/ASME B16.21 OR ANS/ASME B16.20.
3. FITTINGS:
 1. STEEL PIPE FITTINGS, SCREWED, FLANGED OR WELDED:
 1. MALLEABLE IRON: SCREWED, BANGED, CLASS 150.
 2. STEEL BUTT-WELDING FITTINGS:
 1. UNIONS: MALLEABLE IRON, BRASS TO IRON, GROUND SEAT, TO ASTM A47/A47M.
 2. BOLTS AND NUTS: TO ANS/ASME B18.2.1.
 3. NIPPLES: SCHEDULE 40, TO ASTM A53/ A53M.
4. VALVES:
 1. PROVINCIAL CODE APPROVED, LUBRICATED PLUG OR BALL TYPE.
 5. IDENTIFICATION: TO CSA B149.1
 6. INSTALLATION: TO CSA B149.1

15. DUCTWORK:

1. GENERAL:
 1. DETAILS, CONSTRUCTION AND MATERIALS HEREIN SHALL BE AS PER SMACNA STANDARDS.
 2. ALL MATERIALS SHALL CONFORM TO SMOKE AND FLAME SPREAD RATING LIMITATIONS STIPULATED IN THE PROVINCIAL BUILDING CODE OR AS SPECIFIED HEREIN.
 3. ALL GALVANIZED DUCTWORK INDICATED TO BE FABRICATE FROM 0.2% ZINC COATED GALVANIZED SHEET STEEL WITH 1-1/4 CLASS CFC CONTENTS.
2. RECTANGULAR AND FITTINGS: GALVANIZED SHEET STEEL NOT LESS THAN THE FOLLOWING THICKNESS: 24 GA. - 75MM (30") WIDE SMOKESTOPPER SHALL ALLOW FOR ALL MAINTENANCE ON ONE SIDE OF THE UNIT. SERVICE PANELS SHALL HAVE HINGED PANELS WHILE PROVIDING A WATER AND AIR TIGHT SEAL. ALL EXPOSED VERTICAL PANELS AND TOP COVERS IN THE INDOOR AIR SECTION SHALL BE INSULATED WITH A CLEANABLE, FOIL-FACED, FIRE-RETARDANT, PERMANENT, ODORLESS, GLASS FIBRE MATERIAL. THE BASE OF THE UNIT SHALL BE INSULATED WITH 1/2" INSULATION. INSULATION SHALL BE EITHER CAPTURED OR SEALED. THE UNIT'S BASE PAN SHALL HAVE NO PENETRATIONS WITHIN THE PERIMETER OF THE CURB OTHER THAN THE RAISED DOWNFLOW SUPPLY/RETURN OPENINGS TO PROVIDE AN ADDED WATER INTEGRITY PRECAUTION, IF THE CONDENSATE DRAIN BACKS UP.
3. UNIT TOP:
 1. THE TOP COVER SHALL BE ONE PIECE CONSTRUCTION OR, WHERE SEAMS EXIST, IT SHALL BE DOUBLE-HEMMED AND GASKET-SEALED. THE ROBBED TOP ADDS EXTRA STRENGTH AND FINANCES WATER REMOVAL FROM UNIT TOP.
4. COMPRESSORS:
 1. ALL UNITS SHALL HAVE DIRECT-DRIVE, HERMETIC, SCROLL TYPE COMPRESSORS WITH CENTRIFUGAL TYPE OIL PUMPS. MOTOR SHALL BE SUCTION GAS-COOLED AND SHALL HAVE A VOLTAGE UTILIZATION RANGE OF PLUS OR MINUS 10 PERCENT OF UNIT NAMEPLATE VOLTAGE. INTERNAL OVERLOADS SHALL BE PROVIDED WITH THE SCROLL COMPRESSORS.
 2. THIS 3-POLE, MOLDED CASE, DISCONNECT SWITCH WITH PROVISIONS FOR THROUGH THE BASE ELECTRICAL CONNECTIONS. THE DISCONNECT SWITCH SHALL BE INSTALLED IN THE UNIT IN A WATER TIGHT ENCLOSURE WITH ACCESS THROUGH A SWINGING DOOR. WIRING SHALL BE PROVIDED FROM THE SWITCH TO THE UNIT HIGH VOLTAGE TERMINAL BLOCK. THE SWITCH SHALL BE UL/CSA AGENCY RECOGNIZED.
 3. NOMER, TO MAINTAIN BARRIER BUILDING PRESSURIZATION.
 4. CURBS INSULATED. 60MM HIGH. SERVICIALLY RESTRAINED CURB.
 5. ACCEPTABLE MATERIAL: TRANE VYH SERIES.

19. ROOFTOP UNIT:

1. GENERAL:
 1. ALL UNITS SHALL BE FACTORY ASSEMBLED, INTERNALLY WIRED, FULLY CHARGED WITH R-410A, AND 100 PERCENT RUN TESTED TO CHECK COOLING OPERATION, FAN AND BLOWER ROTATION, AND CONTROL SEQUENCE BEFORE LEAVING THE FACTORY. WIRING INTERNAL TO THE UNIT SHALL BE COLOURED AND NUMBERED FOR SIMPLIFIED IDENTIFICATION. UNITS SHALL BE ULC LISTED AND LABELED, CLASSIFIED FOR CENTRAL COOLING AIR CONDITIONERS.
 2. ROOFTOP UNIT SHALL MEET OR EXCEED ASHRAE 90.1 COMPLIANCE REQUIREMENTS.
 3. UNIT CASING SHALL BE CONSTRUCTED OF ZINC COATED, HEAVY GAUGE, GALVANIZED STEEL. EXTERIOR SURFACES SHALL BE CLEANED, PHOSPHATIZED, AND FINISHED WITH A OR ON
2. CASING:
 1. UNIT CASING SHALL BE CONSTRUCTED OF ZINC COATED, HEAVY GAUGE, GALVANIZED STEEL. EXTERIOR SURFACES SHALL BE CLEANED, PHOSPHATIZED, AND FINISHED WITH A OR ON

ROOFTOP UNIT SCHEDULE WITH HEAT RECOVERY

TAG	2500	AREA SERVED	SUPPLY FAN DATA (VSD)				GAS HEATING SECTION				DX COOLING COIL DATA				ELECTRICAL DATA		REMARKS						
			FAN TYPE	AIR FLOW (L/s)	EXTERNAL STATIC PRESSURE (Pa)	TOTAL STATIC PRESSURE (Pa)	MOTOR SIZE (HP)	INPUT (kW)	OUTPUT (kW)	E.A.T. (°C)	L.A.T. (°C)	MODULATION	TOTAL CAPACITY (kW)	SENSIBLE CAPACITY (kW)	E.A.T. (DB/WB) (°C)	L.A.T. (DB/WB) (°C)		STAGES	MCA/MOP	V/PH/Hz			
RTU-1	GROUND FLOOR (BESIDE THE BLD.)	FELLOWSHIP HALL (#111)	FC CENTRIFUGAL	2360	250	260	3	102	82	21	50	2.5 : 1	49.3	37	26.6/19.4	13.8/13.3	2	68/90	208/3/60	DISCHARGE LW(dB)/RETURN LW(dB)	86/92 80/79 71/72 70/67 66/61 67/62	TRANE VOYAGER	YH1803R/B

NOTES: 1. FOR DETAILS REFER TO SPECIFICATIONS.
2. MANUFACTURER NAME & MODEL NUMBER REPRESENTS ACCEPTABLE QUALITY STANDARD ONLY. ALTERNATIVE MATERIALS MAY BE APPROVED AFTER REVIEW OF TECHNICAL INFORMATION BY ENGINEER.

FIXTURE CONNECTION SCHEDULE

TAG	DOMESTIC COLD WATER (Ømm)	DOMESTIC HOT WATER (Ømm)	SANITARY (Ømm)	COMMENTS	BASIS OF DESIGN	ELECTRICAL DATA		REMARKS
						INPUT (kW)	OUTPUT (kW)	
WC1	13	-	75	381 MM HIGH TOILET, VITREOUS CHINA, FLOOR MOUNTED, 4.8 L PER FLUSH, TWO PIECE, ELONGATED BOWL, HEAVY DUTY TOILET SEAT, SOLID PLASTIC, OPEN FRONT LESS COVER.	AMERICAN STANDARD #215CA.104.020, CADET PRO ELONGATED, CENTOCCO #5005TSC.001			
WC2	13	-	75	419 MM HIGH TOILET, VITREOUS CHINA, FLOOR MOUNTED, 4.8 L PER FLUSH, TWO PIECE, ELONGATED BOWL, HEAVY DUTY TOILET SEAT, SOLID PLASTIC, OPEN FRONT WITH COVER. PROVIDE BOLTED TANK COVER TO MEET LOCAL CODES.	AMERICAN STANDARD #215AA.164.020, CADET PRO RIGHT HEIGHT ELONGATED, CENTOCCO #8205T.S.001			
U1	20	-	50	URINAL, WHITE FINISH VITREOUS CHINA, OPERATES IN THE RANGE OF 0.5 L TO 3.8 L PER FLUSH, WALL HUNG, CHROME PLATED, NON-METALLIC STRAINER, EXPOSED MANUAL FLUSHMETER FOR TOP SPUD URINAL, 1.9 L FACTORY SET FLOW, MOUNTED ON CONCRETE FLOOR, FIXTURE CARRIER.	AMERICAN STANDARD #6590.001.020, WASHBROOK FLOWISE SLOAN #RECAL 166-0.5-XL, REGAL WATTS #CA-321			
LAV1	13	13	40	Basin, WHITE FINISH, SELF-RIMMING / DROP-IN, SINGLE HANDLE FAUCET, BELOW DECK MECHANICAL WATER MIXING VALVE, INTEGRAL CHECKS, OPEN GRID DRAIN, POLISHED BRASS FAUCET SUPPLIES	AMERICAN STANDARD #9494.001.020 "CADET UNIVERSAL ACCESS CHICAGO FAUCETS #420-ABCP LAWLER #1MM-1070			
LAV2	13	13	40	WALL HUNG BASIN - TWO HANDLES MANUAL FAUCET BELOW DECK MECHANICAL WATER MIXING VALVE, OPEN GRID DRAIN, BASIN CARRIER	AMERICAN STANDARD #095A.004EC.020/0059.020EC.020 "MURRO WITH EVERCLEAN CHICAGO FAUCETS #895-317FCBPC LAWLER #1MM-1070 WATTS #WCA-411-CA-481,			
KS	13	13	40	COUNTER MOUNTED COUNTERTOP MOUNT SINK- SINGLE HANDLE FAUCET/BELW DECK MECHANICAL WATER MIXING VALVE	FRANKE COMMERCIAL #LBS6808-1/3 AMERICAN STANDARD #4175300.002, LAWLER #1MM-1070			
MS	20	20	75	FLOOR MOUNTED SERVICE / MOP SINK - TWO HANDLES FAUCET, BUMPER GUARD 610 MM (24") EXTRUDED VINYL, MOP HANGER 22 GA. (0.8 MM) TYPE 304 STAINLESS STEEL	FIAT #MSB2424100, "MODESTO FIAT #830-4A,			
BFS1	20	-	50	DRINKING FOUNTAIN & BOTTLE FILLING STATION WITH SINGLE FILTERED WATER COOLER, SENSOR TOUCHLESS ACTIVATION BOTTLE FILLER	ELKAY #LZ5MSWLP WATTS #CA-311			
FD	-	-	75	REVERSIBLE FLASHING CLAMP WITH PRIMARY AND SECONDARY WEEPHOLES, NO HUB OUTLET, TRAP PRIMER CONNECTION WITH PLUG, 75 MM DIAMETER ROUND STRAINER, 127 MM DIAMETER, NICKEL BRONZE	WATTS FD-103-C-AS-1-7-61			

NOTES: 1. COORDINATE EXACT PIPING LOCATIONS ON SITE.
2. VENT TO MEET OBC REQUIREMENTS, VENTING THROUGH SLOPED ROOFS NOT PERMITTED.
3. MANUFACTURER NAME & MODEL NUMBER REPRESENT ACCEPTABLE QUALITY STANDARD ONLY.
4. INSTALLATION OF BARRIER FREE FIXTURES SHALL COMPLY WITH BARRIER FREE REQUIREMENTS OF OBC.
5. FOR BARRIER FREE SINKS & LAVATORIES, INSULATE DOMESTIC HOT WATER AND DRAIN PIPING UNDER COUNTER. SEE ARCH. DWG FOR DETAILS. ACCEPTABLE MATERIAL: SKAGGLIARD WHITE OR MINERAL FIBRE WITH WHITE PVC JACKET.

FINNED TUBE RADIATION SCHEDULE

TAG	CABINET (SLOPED TOP / TOP OUTLET / FRONT OUTLET)	ARRANGEMENT (WALL MOUNTED / FREE STANDING)	PIPE SIZE (NPS-mm)	FN SIZE (mmW x mmH)	FINS/METRE	EWT (°C)	LWT (°C)	EAT (°C)	DIMENSIONS WxH(mm)	BASIS OF DESIGN	REMARKS
WF	FLAT TOP	FLOOR MOUNTED	20	100X100	170	82.2	71.1	18	133X250	ROSMEX-RVP-ARG-A-RAF4C1	-

NOTES: 1. FOR DETAILS REFER TO SPECIFICATIONS.
2. DISCONNECT SWITCH BY DIV. 316.

ELECTRIC DOMESTIC WATER HEATER SCHEDULE

TAG	LOCATION	INPUT (kW)	STORAGE CAPACITY (L)	RECOVERY RATE (L/H) @ 56°C	ELECTRICAL DATA		BASIS OF DESIGN	REMARKS
					AMPS	V/PH/Hz		
DHWT-1	JANITOR ROOM	2 x 3kW	303	46	14.4	208/3/60	RHEEM EDL80	-

NOTES: 1. FOR DETAILS REFER TO SPECIFICATIONS.
2. MANUFACTURER NAME & MODEL NUMBER REPRESENT ACCEPTABLE QUALITY STANDARD ONLY.
3. ALTERNATIVE MATERIALS MAY BE APPROVED AFTER REVIEW OF TECHNICAL INFORMATION BY ENGINEER.

GRILLE AND DIFFUSER SCHEDULE

UNIT NO.	TYPE	MODULE (mm)	INLET (mm)	MOUNT	FINISH	BASIS OF DESIGN	REMARKS
SSD-1	INTEGRATED DUCT SUPPLY DIFFUSER	AS INDICATED	AS INDICATED	DUCT	CUSTOM	NAD KLIMA 2000mm LONG 3 SLOTS	
SG1	SUPPLY AIR GRILLE	AS INDICATED	AS INDICATED	DUCT	B12	EH PRICE 520 ADJUSTABLE DOUBLE DEFLECTION	
RG1	RETURN AIR GRILLE	AS INDICATED	AS INDICATED	WALL	WHITE	EH PRICE 510 SERIES	

NOTES: 1. FOR DETAILS REFER TO SPECIFICATIONS.

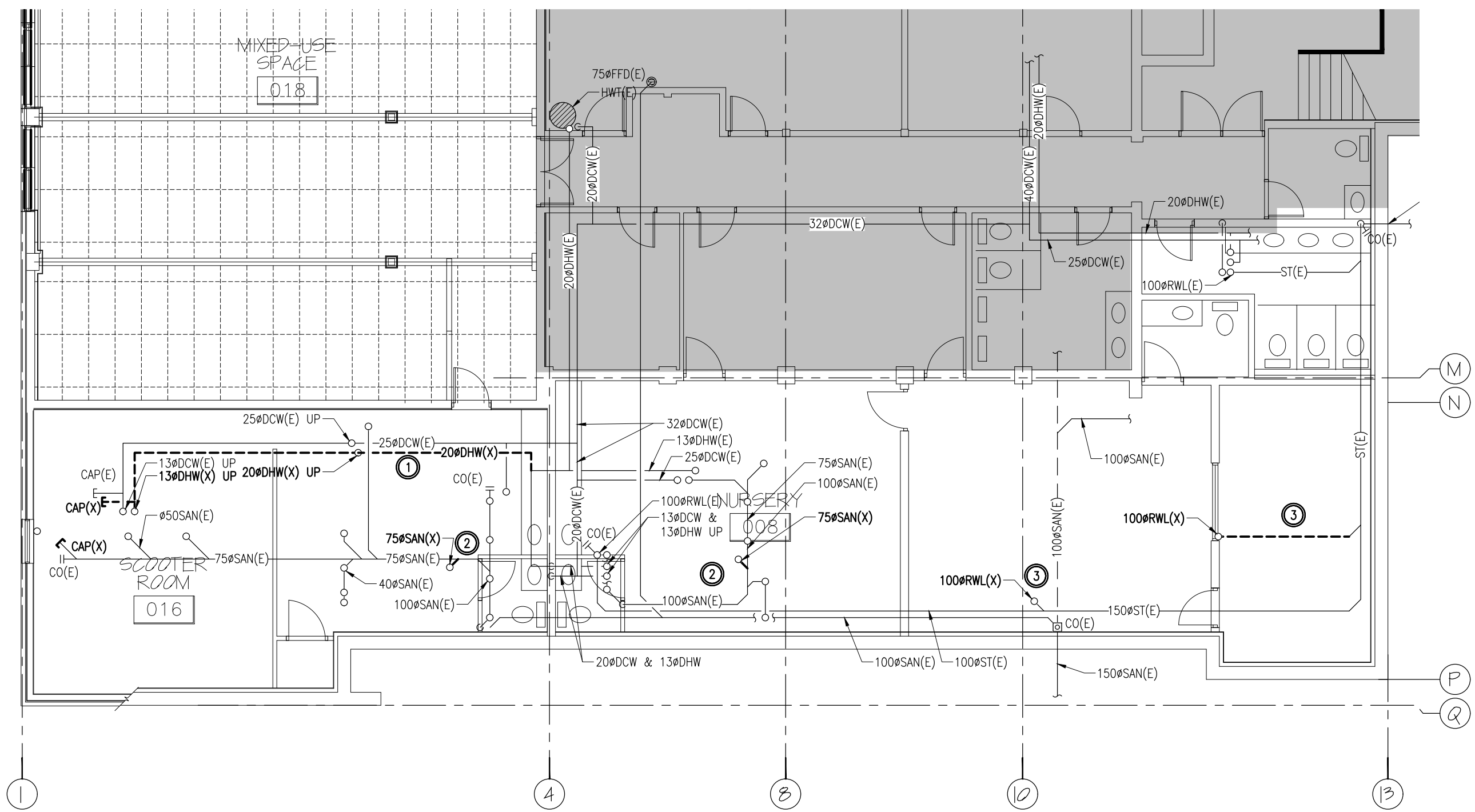
DUCTLESS SPLIT UNIT SCHEDULE

TAG	LOCATION	AIR FLOW (L/s)	COOLING		ELECTRICAL DATA		REFRIGERANT TYPE	BASIS OF DESIGN	REMARKS
			TOTAL CAPACITY (kW)	MOTOR SIZE (W)	V/PH/Hz	W			
AC-1	KITCHEN	245	5.27	30	208/1/60	R410A	MITSUBISHI-MSY-G118NA-U1	-	

NOTES: 1. FOR DETAILS REFER TO SPECIFICATIONS.

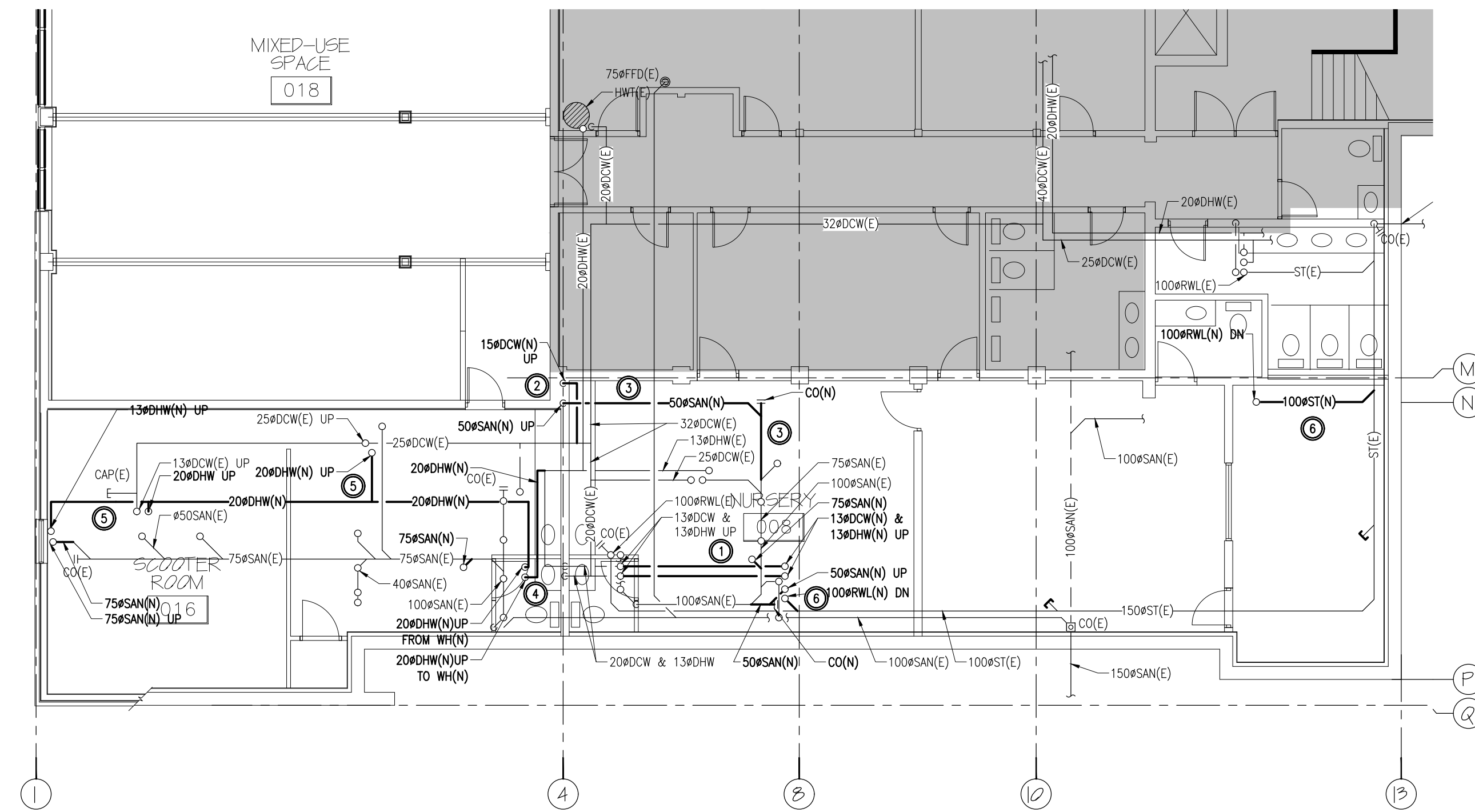
CONDENSER UNIT SCHEDULE

TAG	LOCATION	FUNCTION	CAPACITY (kW)	ELECTRICAL DATA		BASIS OF DESIGN	REMARKS
				FLA/MCA	V/PH/Hz		
C-1	OUTSIDE ON THE GROUND	AC-1	5.27				



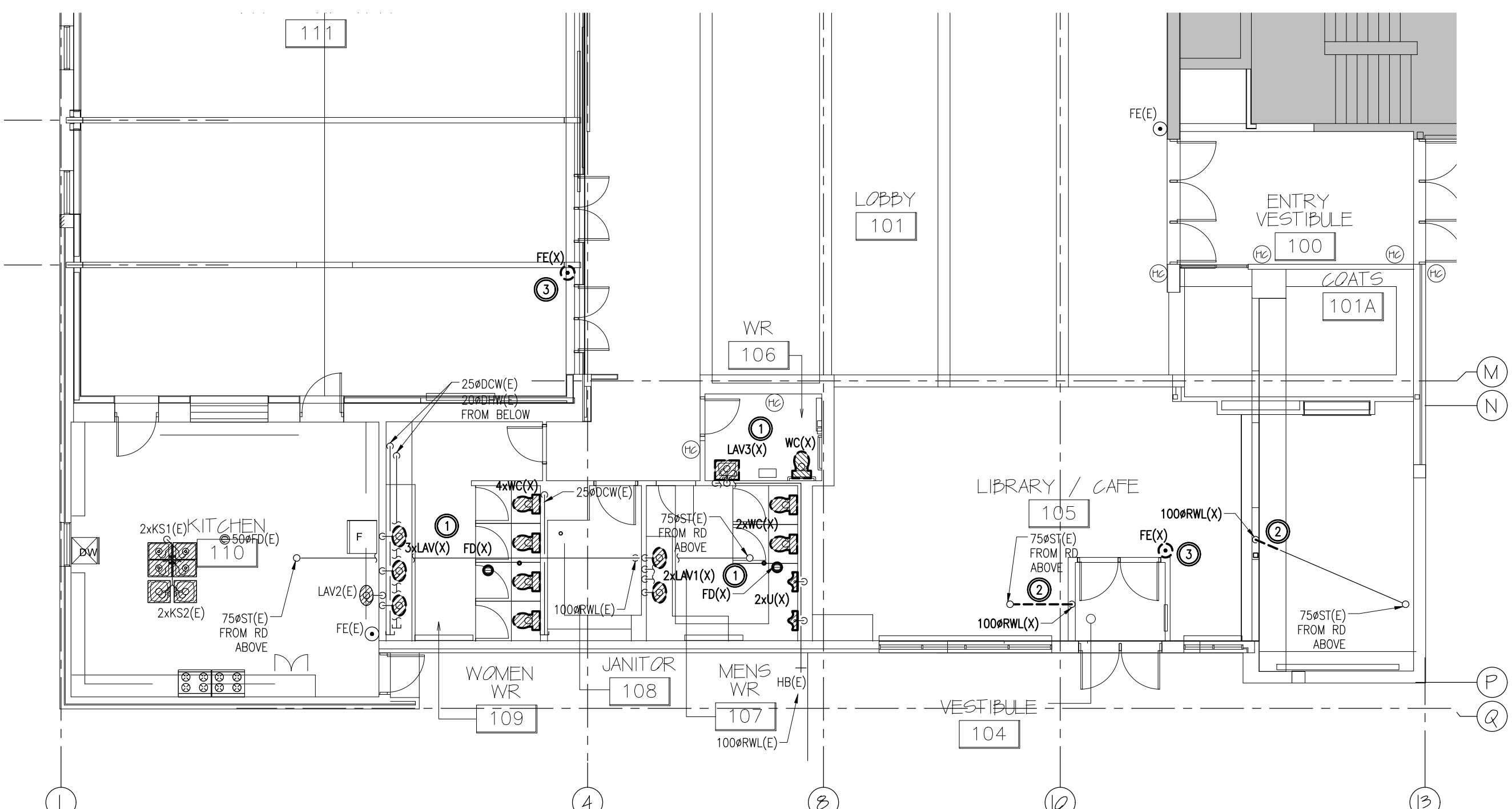
1
M3
1:100
**BASEMENT LEVEL
MECHANICAL - PLUMBING - REMOVALS**

- DRAWING NOTES – REMOVALS (BASEMENT)**
1. REMOVE DHW PIPING C/W SUPPORTS AND ACCESSORIES.
 2. REMOVE SANITARY FLOOR DRAIN PIPING FROM GROUND FLOOR WASHROOM TO ALLOW FOR DRAIN REPLACEMENT.
 3. REMOVE THE STORM PIPING AND CAP THE PIPE.



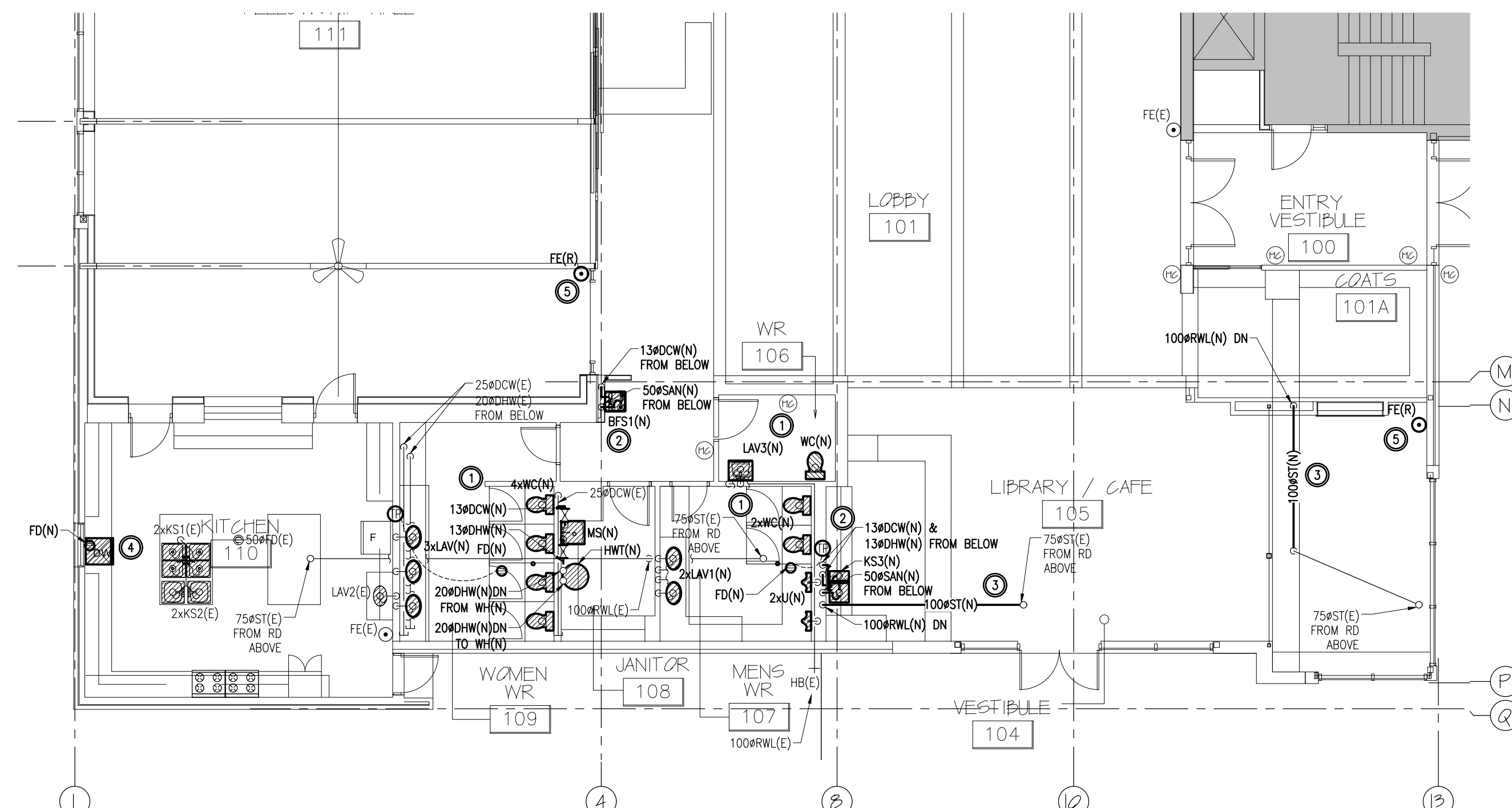
2
M3
1:100
**BASEMENT LEVEL
MECHANICAL - PLUMBING - NEW WORK**

- DRAWING NOTES – NEW WORK (BASEMENT)**
1. CONTRACTOR TO EXTEND 13mmø DCW & DHW PIPING FROM BASEMENT WASHROOM TO NEW SINK IN CAFE AREA.
 2. CONTRACTOR TO EXTEND 13mmø DCW PIPING FROM BASEMENT WASHROOM TO NEW DRINKING FOUNTAIN.
 3. CONTRACTOR TO PROVIDE SANITARY PIPING IN CEILING OF BASEMENT FROM NEW CAFE SINK AND NEW DRINKING FOUNTAIN.
 4. PROVIDE DOMESTIC WATER PIPING TO NEW GROUND FLOOR HOT WATER TANK C/W SUPPORTS AND ACCESSORIES.
 5. PROVIDE NEW DOMESTIC HOT WATER PIPING TO ALL KITCHEN SINKS OF GROUND FLOOR KITCHEN.
 6. PROVIDE STORM DRAINAGE PIPING C/W ACCESSORIES.



3
M3
1:100
**GROUND FLOOR LEVEL
MECHANICAL - PLUMBING - REMOVALS**

- DRAWING NOTES – REMOVALS (GROUND FLOOR)**
1. CONTRACTOR TO REMOVE PLUMBING FIXTURES C/W ACCESSORIES. DCW, DHW, SANITARY AND VENT. ROUGH-IN ARE TO BE MAINTAINED WITHIN WALLS AND TO BE USED IN NEW WORK.
 2. REMOVE STORM PIPING IN THE CEILING AND IN THE VERTICAL WALLS.
 3. REMOVE FIRE EXTINGUISHER AND RETAIN FOR NEW WORK.



4
M3
1:100
**GROUND FLOOR LEVEL
MECHANICAL - PLUMBING - NEW WORK**

- DRAWING NOTES – NEW WORK (GROUND FLOOR)**
1. CONTRACTOR TO PROVIDE NEW FIXTURES AS INDICATED C/W REQUIRED PIPING AND ACCESSORIES.
 2. CONTRACTOR TO PROVIDE VENT PIPING FROM NEW CAFE SINK & NEW DRINKING FOUNTAIN/BOTTLE FILLING STATION. CONNECT INTO GROUND FLOOR VENTING PIPING.
 3. CONTRACTOR TO PROVIDE STORM PIPING WITHIN CEILING AND IN VERTICAL WALLS.
 4. PROVIDE DHW AND SANITARY CONNECTION TO OWNER SUPPLIED DISHWASHER. CONTRACTOR TO CARRY ALLOWANCE TO MAKE DECISIONS TO FIND CONNECTIONS TO APPLIANCES.
 5. RELOCATE FIRE EXTINGUISHER.

Client

DATE	REVISION	REF
2021-01-14	ISSUED FOR CONSTRUCTION	-
2020-07-24	ISSUED FOR TENDER	-
2020-05-27	ISSUED FOR PERMIT	-
2020-05-08	ISSUED FOR REVIEW	-

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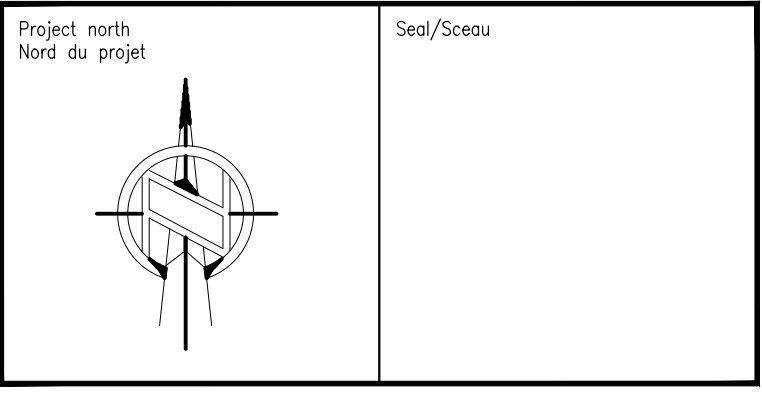
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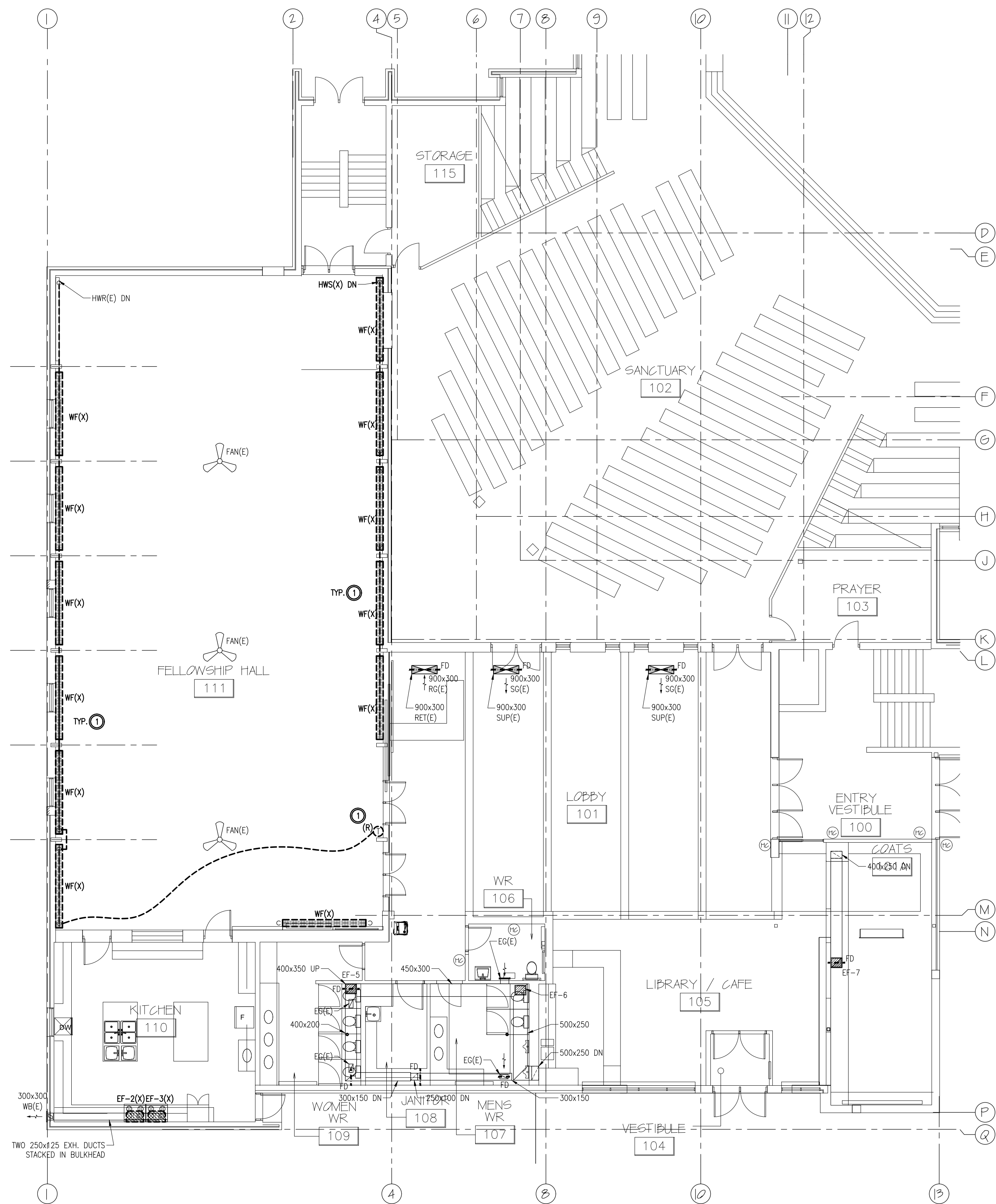
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**MECHANICAL & GROUND FLOOR
PLUMBING
REMOVALS & NEW WORK**

Scale Échelle	AS NOTED	Project no./No. du projet 2019-333-1
Design by Conçu par	P. LABELLE	Drawing/Desin
Drawn by Dessiné par	H. FALLAH	M3 OF 6
Reviewed by Examiné par	F. BANN	
Date Date	JANUARY 2021	Revision no. Acad file/Fichier:

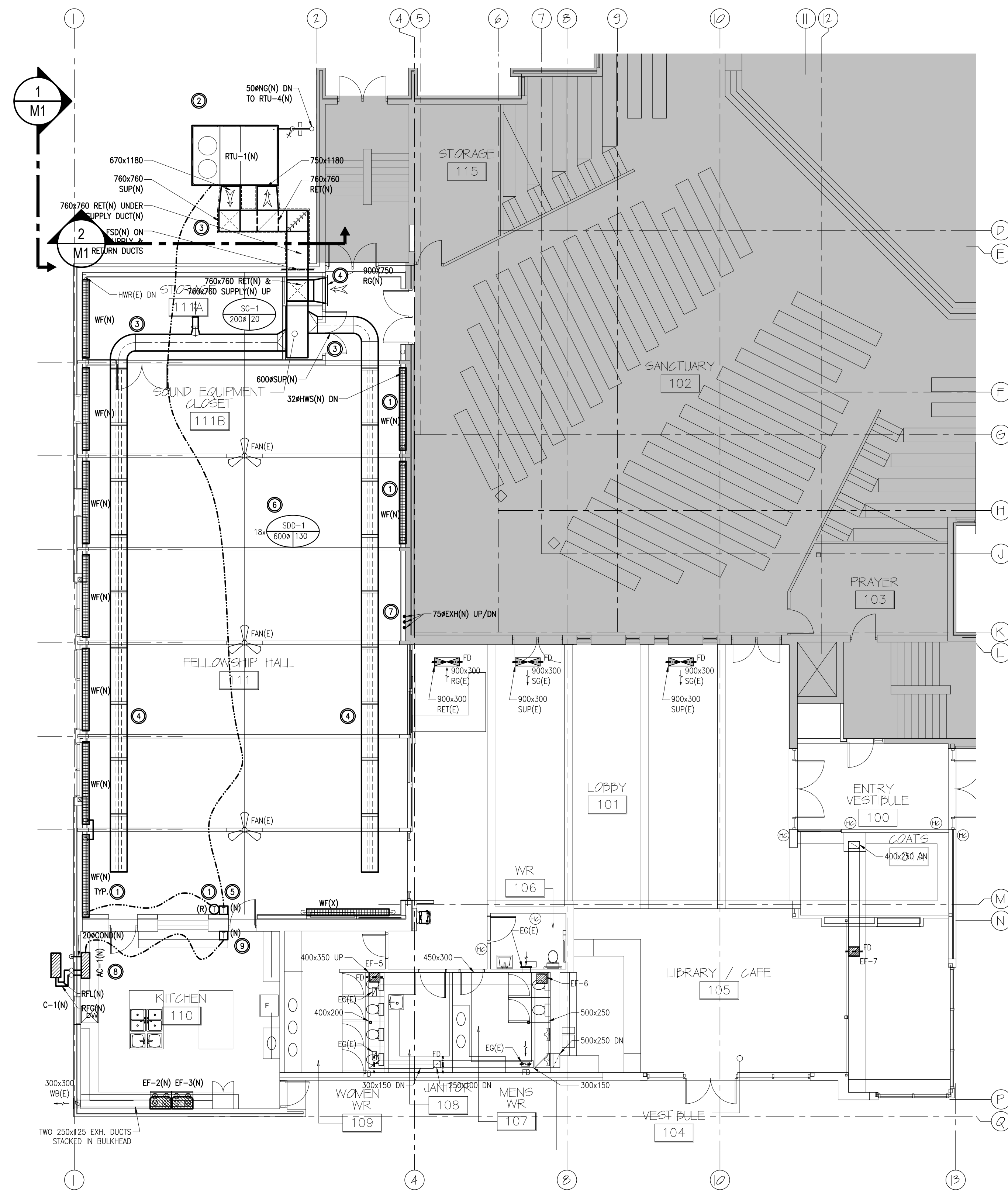


**GROUND FLOOR LEVEL
MECHANICAL - HVAC & UTL - REMOVALS**

1
M5
1:100

DRAWING NOTES - REMOVALS (GROUND FLOOR)

- CONTRACTOR TO REMOVE SECTIONS OF WALL FIN AS INDICATED C/W PIPING AND ACCESSORIES. REMOVE THE THERMOSTAT AND RETAIN FOR NEW WORK.



**GROUND FLOOR LEVEL
MECHANICAL - HVAC & UTL - NEW WORK**

2
M5
1:100

DRAWING NOTES - NEW WORK (GROUND FLOOR)

- PROVIDE NEW WALL MOUNTED DUCTLESS SPLIT UNIT & NEW CONDENSER UNIT C/W ASSOCIATED ACCESSORIES.
- PROVIDE NEW THERMOSTAT C/W ASSOCIATED ACCESSORIES AND WIRING. REFER TO DETAILS 3/M1 FOR COMPLETE SCOPE OF WORK.

DRAWING NOTES - NEW WORK (GROUND FLOOR)

- CONTRACTOR TO PROVIDE NEW WALL FIN C/W PIPING, VALVES AND ACCESSORIES. RELOCATE THERMOSTAT AND PROVIDE REQUIRED ACCESSORIES.
- CONTRACTOR TO PROVIDE NEW RTU UNIT ON CONCRETE BASE LOCATED AT GRADE.
- CONTRACTOR TO PROVIDE SUPPLY AND RETURN AIR DUCTWORK C/W INSULATION, SUPPORTS AND ACCESSORIES.
- CONTRACTOR TO PROVIDE SUPPLY AIR DUCT DIFFUSER AND RETURN GRILL C/W ACCESSORIES.
- CONTRACTOR TO PROVIDE THERMOSTAT C/W CONTROL WIRING FOR NEW RTU.
- CONTRACTOR TO BALANCE AND ADJUST RTU AND SUPPLY DIFFUSERS TO CAPACITIES INDICATED. SUBMIT REPORT TO ENGINEER FOR REVIEW.
- CONTRACTOR TO EXTEND THE FURNACE BREACHING FROM BASEMENT THROUGH GROUND FLOOR AND UP TO ROOF LINE WITHIN RATED SHAFT. PROVIDE FIRE CALLER AT CEILING AT UNDER SIDE OF THE ATTIC. CONTRACTOR TO PROVIDE FIRE WRAP ON BREACHING LOCATED IN ATTIC UP TO ROOF LINE.

Client

DATE	REVISION	REF
2021-01-14	ISSUED FOR CONSTRUCTION	-
2021-01-06	ISSUED FOR POST TENDER ADDENDUM	-
2020-07-24	ISSUED FOR TENDER	-
2020-05-27	ISSUED FOR PERMIT	-
2020-05-08	ISSUED FOR REVIEW	-

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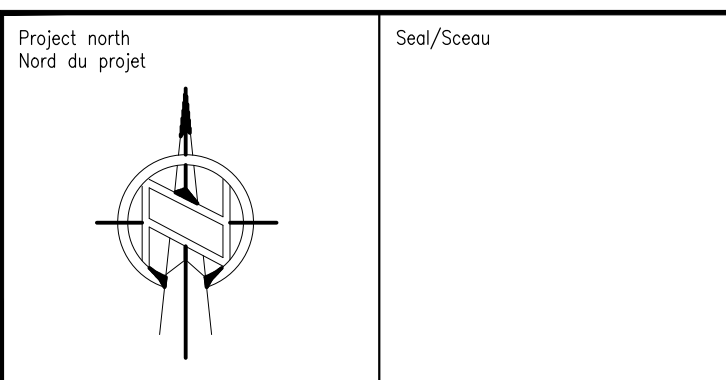
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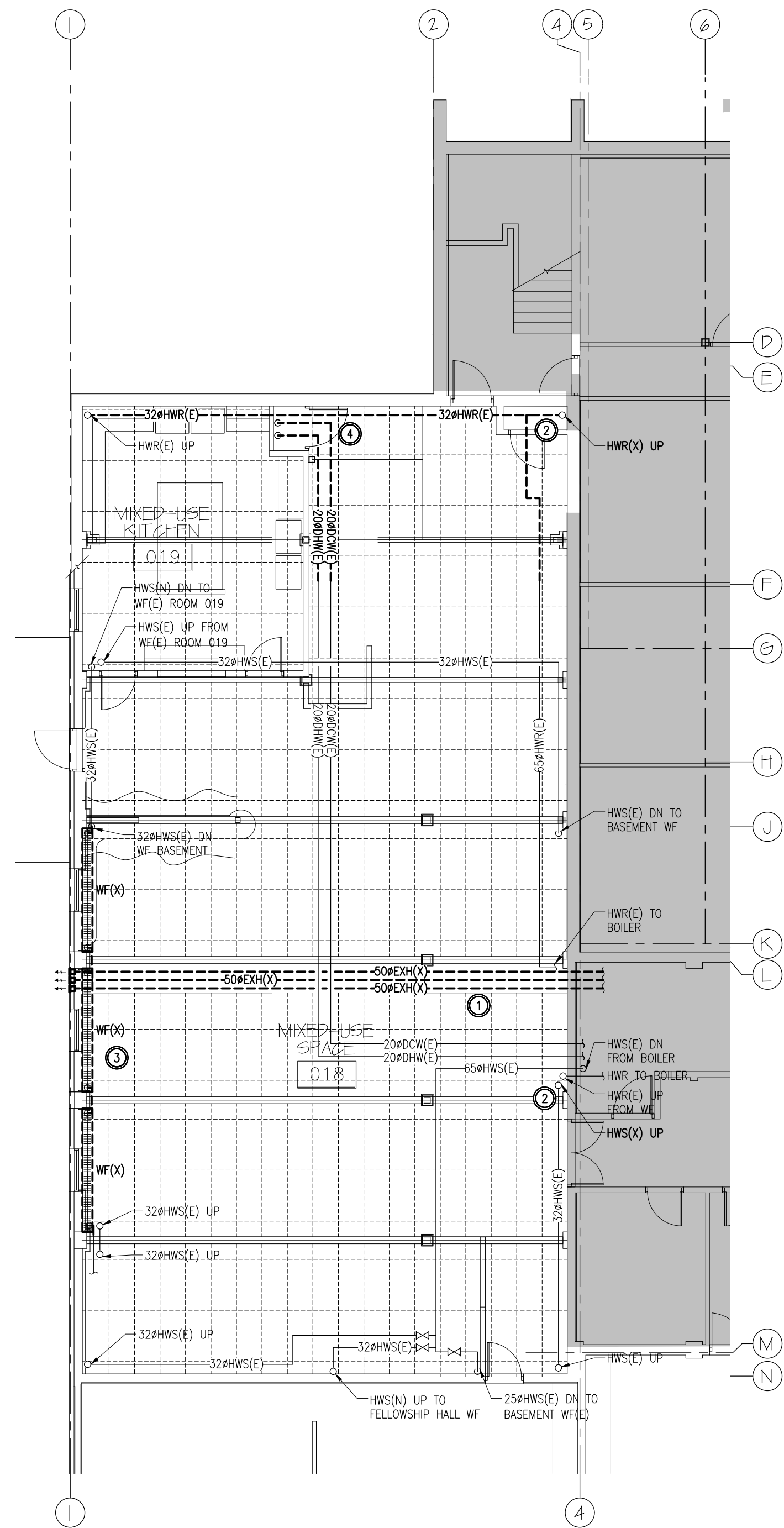
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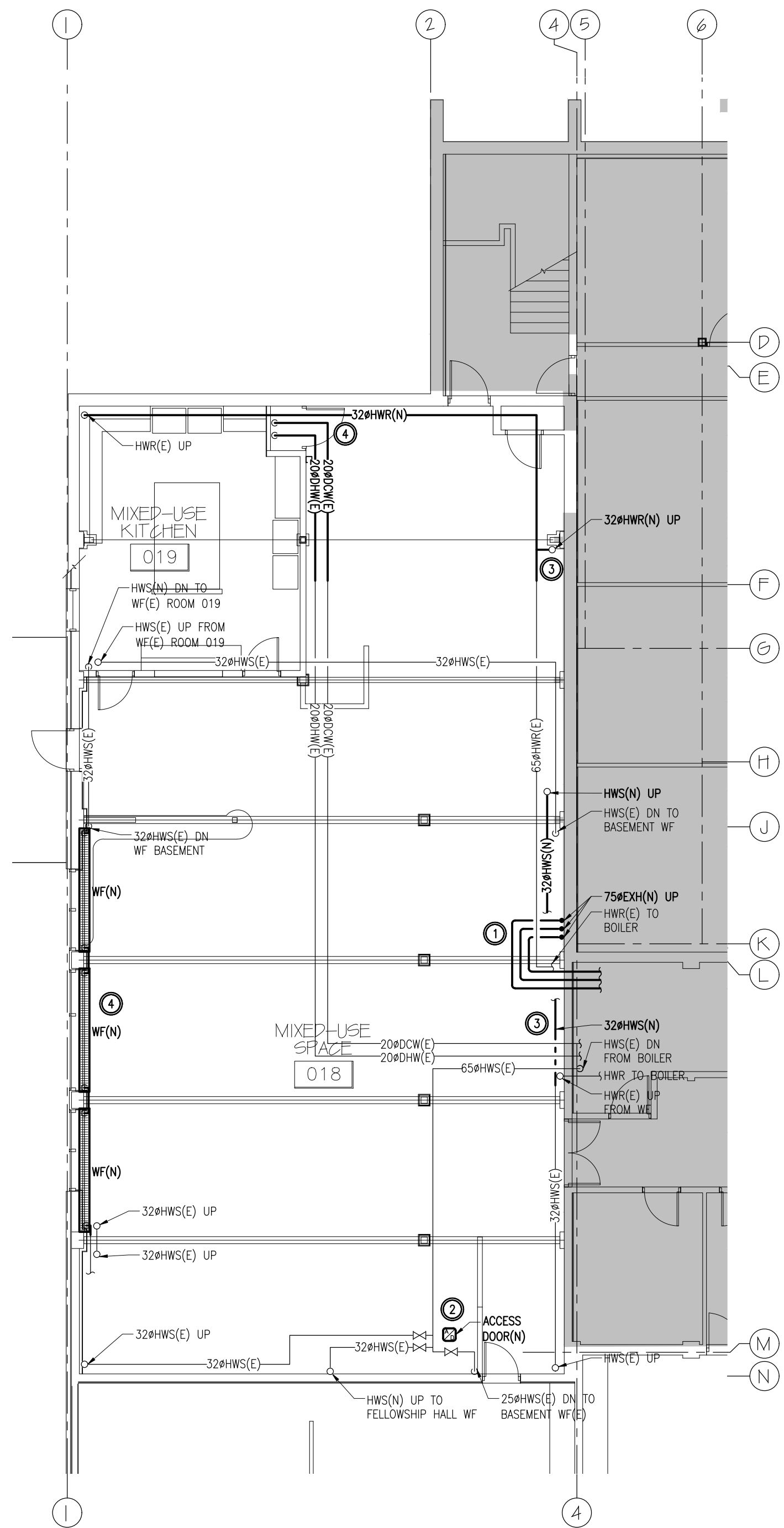
**MECHANICAL
GROUND FLOOR
HVAC AND UTILITIES
REMOVALS & NEW WORK**

Scale Échelle	AS NOTED	Project no./No. du projet 2019-333-1
Design by Conçu par	P. LABELLE	Drawing/Dessin
Drawn by Dessiné par	H. FALLAH	M5
Reviewed by Examiné par	F. BANN	
Date Date	JANUARY 2021	Revision no. Acad file/Fichier: - -



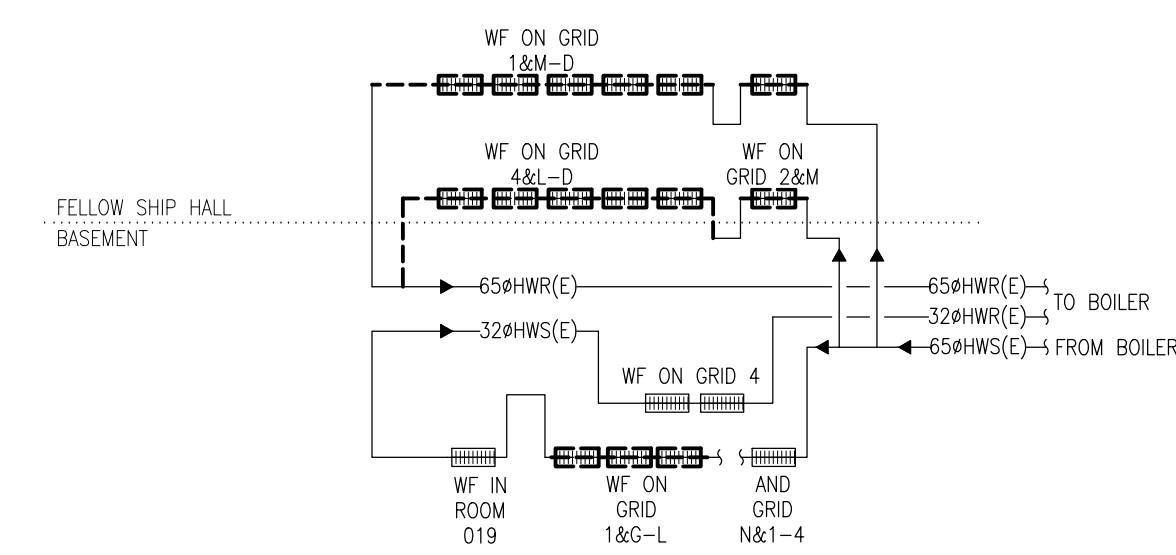
1
M4
1:100
BASEMENT FLOOR LEVEL
MECHANICAL - PLUMBING & UTL - REMOVALS

- DRAWING NOTES – REMOVALS (BASEMENT)**
1. CONTRACTOR TO REMOVE FURNACE BREACHING AS INDICATED.
 2. CONTRACTOR TO REMOVE HWS & HWR PIPE SEGMENT AS INDICATED C/W SUPPORTS & ACCESSORIES AND CAP THE PIPE.
 3. CONTRACTOR TO REMOVE SECTIONS OF WALL FIN AS INDICATED C/W PIPING AND ACCESSORIES.
 4. CONTRACTOR TO REMOVE HWS, DOW & DHW AS INDICATED C/W SUPPORTS AND ACCESSORIES AND CAP THE PIPE.

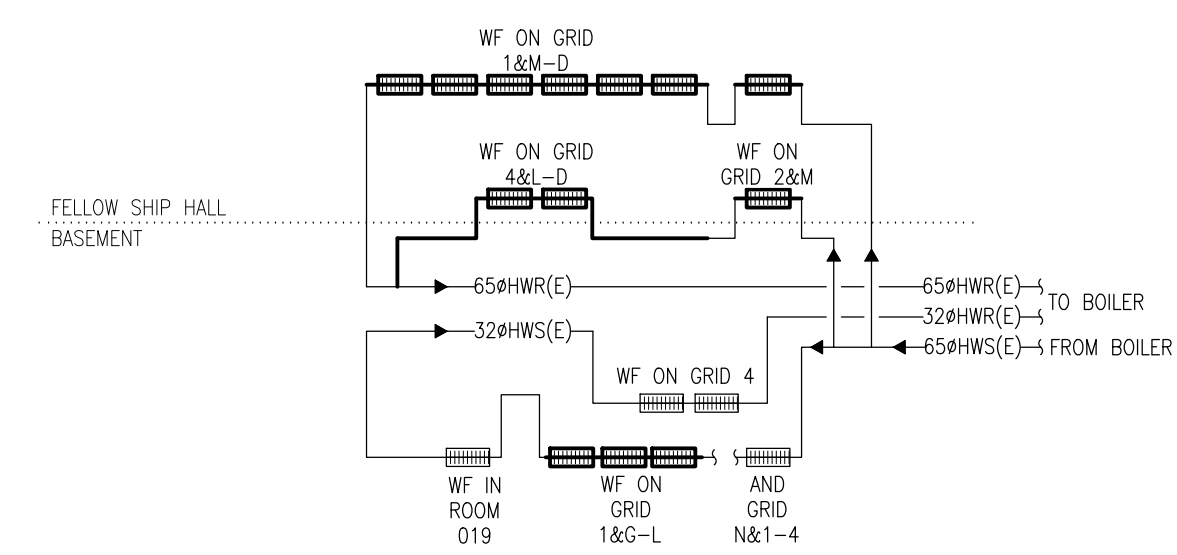


2
M4
1:100
BASEMENT FLOOR LEVEL
MECHANICAL - PLUMBING & UTL - NEW WORK

- DRAWING NOTES – NEW WORK (BASEMENT)**
1. CONTRACTOR TO PROVIDE NEW FURNACE BREACHING AS INDICATED.
 2. CONTRACTOR TO PROVIDE RATED ACCESS DOOR IN NEW DRYWALL ENCLOSURE TO ALLOW USE OF ISOLATION VALVES.
 3. CONTRACTOR TO PROVIDE NEW HWS & HWR PIPING AS INDICATED C/W SUPPORTS AND ACCESSORIES.
 4. CONTRACTOR TO PROVIDE NEW WALL FIN C/W PIPING, VALVES AND ACCESSORIES.
 5. CONTRACTOR TO PROVIDE NEW HWS, DOW & DHW PIPING AS INDICATED C/W SUPPORTS AND ACCESSORIES.



3
M4
N.T.S.
HEATING WATER REMOVALS SCHEMATIC



4
M4
N.T.S.
HEATING WATER NEW WORKS SCHEMATIC

Client

DATE	REVISION	REF
2021-01-14	ISSUED FOR CONSTRUCTION	--
2021-01-14	ISSUED FOR MIB-002	--
2021-01-11	ISSUED FOR MIB-001	--
2020-07-24	ISSUED FOR TENDER	--
2020-05-27	ISSUED FOR PERMIT	--
2020-05-08	ISSUED FOR REVIEW	--

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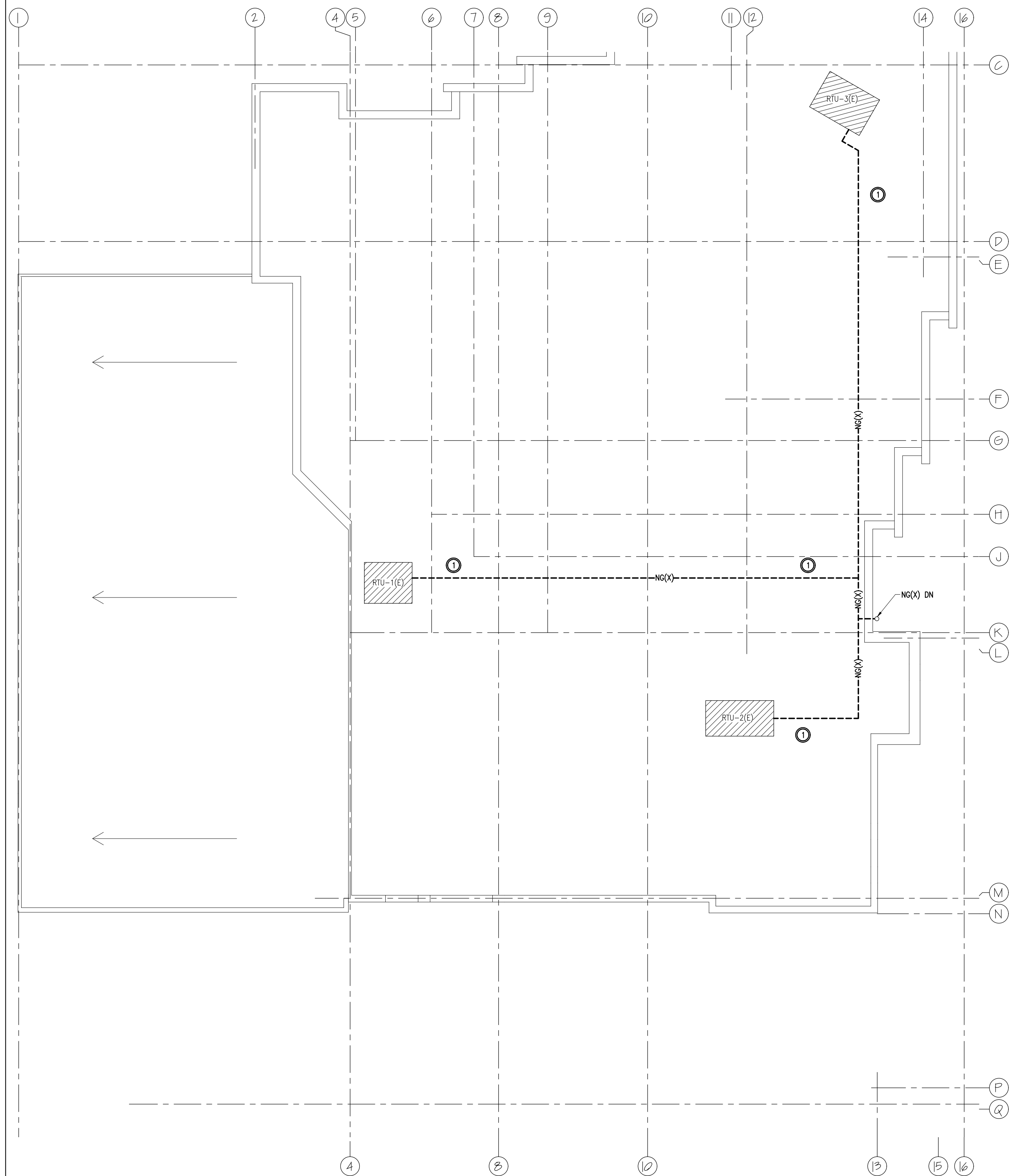
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Drawing/Title du dessin
**MECHANICAL
BASEMENT LEVEL
PLUMBING AND UTILITIES
REMOVALS & NEW WORK**

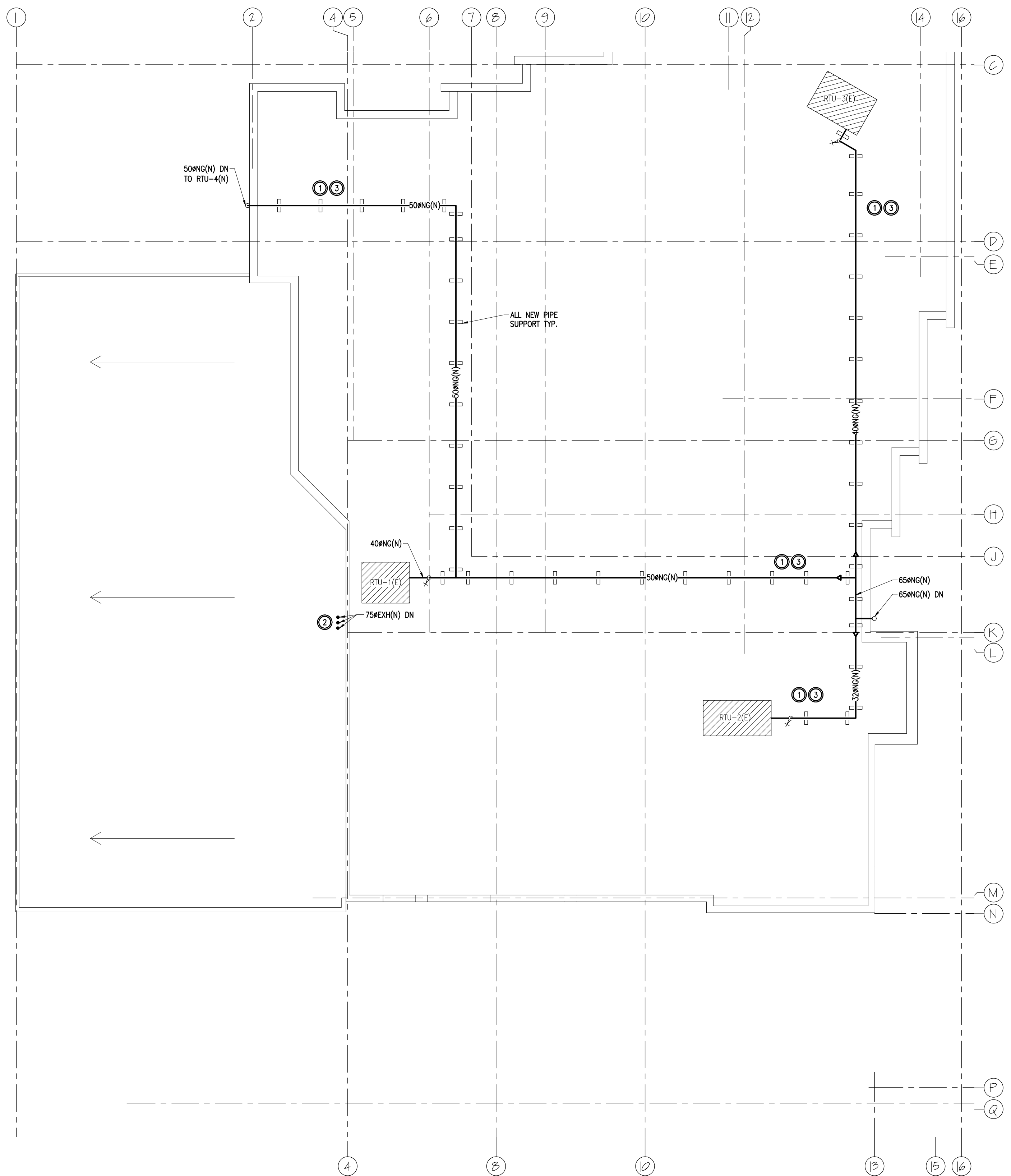
Scale Échelle	AS NOTED	Project no./No. du projet 2019-333-1
Design by Conçu par	P. LABELLE	M4
Drawn by Dessiné par	H. FALLAH	
Reviewed by Examiné par	F. BANN	OF 6
Date Date	JANUARY 2021	Revision no. Acad file/Fichier: --



1
M6
1:100
ROOF LEVEL
MECHANICAL - HVAC & UTL - REMOVALS

DRAWING NOTES – REMOVALS

1. REMOVE ALL GAS PIPE C/W SUPPORTS AND ACCESSORIES.



2
M6
1:100
ROOF LEVEL
MECHANICAL - HVAC & UTL - NEW WORK

DRAWING NOTES – NEW WORK

1. PROVIDE NEW GAS PIPE C/W NEW SUPPORTS AND ACCESSORIES.
2. CONTRACTOR TO EXTEND FURNACE BREACHING TROUGH ROOFLINE AND EXTEND 1METER ABOVE RTU ADJACENT
3. CONTRACTOR TO APPLY PAINT TO ALL EXISTING & NEW GAS PIPING.

Client

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2021-01-14	ISSUED FOR CONSTRUCTION	-
2020-07-24	ISSUED FOR TENDER	-
2020-05-27	ISSUED FOR PERMIT	-
2020-05-08	ISSUED FOR REVIEW	-

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Drawing title/Titre du dessin
**MECHANICAL
ROOF PLAN
GAS PIPING LAYOUT
REMOVAL & NEW WORK**

Scale Échelle	AS NOTED	Project no./No. du projet 2019-333-1
Design by Conçu par	P. LABELLE	M6 OF 6
Drawn by Dessiné par	H. FALLAH	
Reviewed by Examiné par	F. BANN	
Date Date	JANUARY 2021	