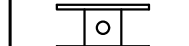
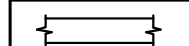
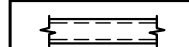
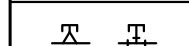
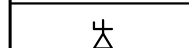
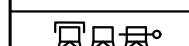
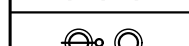
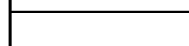
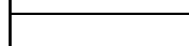
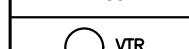
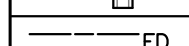
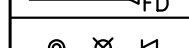
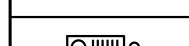
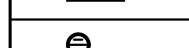
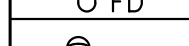
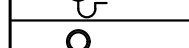
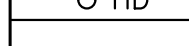
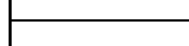
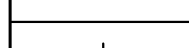
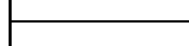
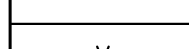
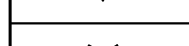
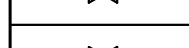
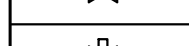
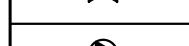
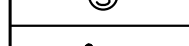
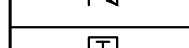
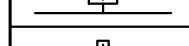
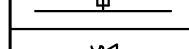
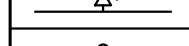
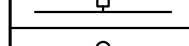
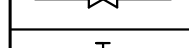


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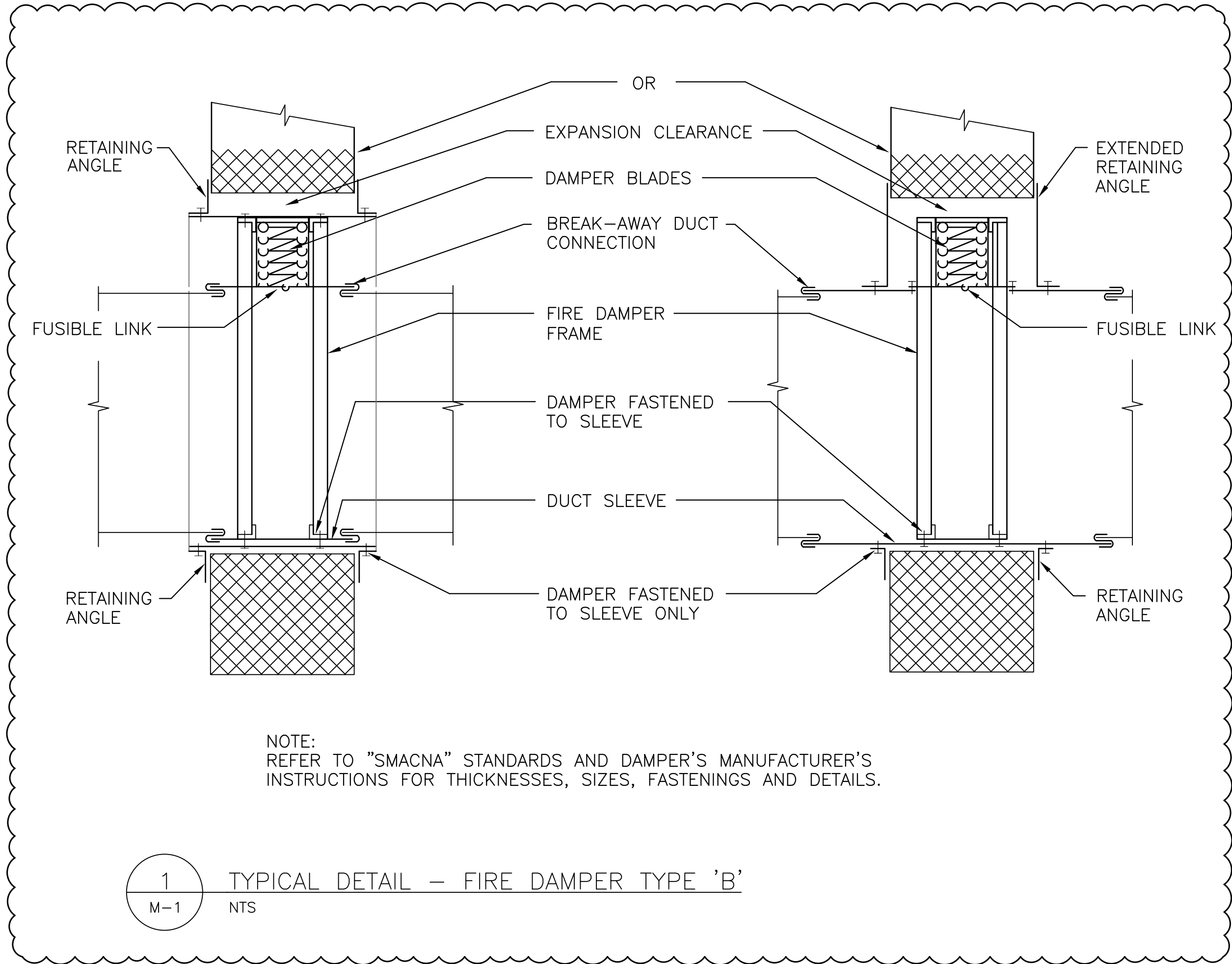
Authorized modifications must be signed and sealed by an engineer and this engineer will be completely responsible for these modifications. J.R.P. Engineering is not and will not be responsible for the consequences of these modifications or for modifications carried out without it's consent.

MECHANICAL LEGEND	
SYMBOL	DESCRIPTION
	LINEAR DIFFUSER
	LIGHT TROFFER
	SQUARE DIFFUSER
	RETURN AIR GRILLE
	THERMOSTAT
	SUPPLY DUCT
	ACOUSTIC INSULATION
	FLEXIBLE DUCT
	CAP DUCT OR PIPE AS INDICATED
	CONICAL TAKE-OFF C/W BALANCING DAMPER (BD)
	CONICAL TAKE-OFF (CAPPED, NO BD, W/ BD)
	ROUND DUCT TO ROUND DUCT TAKE-OFF
	VERTICAL ROUND DUCT TAKE-OFF (W/BD, W/O BD)
	VARIABLE AIR VOLUME (VAV) TERMINAL DEVICE (W/O ATTENUATOR, W/ ATTENUATOR)
	FAN-POWERED VAV TERMINAL DEVICE (W/O ATTENUATOR, W/ ATTENUATOR)
	CLEAN OUT
	PLUMBING VENT THROUGH ROOF
	TRANSFER DUCT
	FIRE DAMPER
	SPRINKLER HEAD (UPRIGHT, PENDANT, WALL MOUNTED)
	FIRE HOSE CABINET
	FLOOR DRAIN
	FUNNEL DRAIN
	HUB DRAIN
	D.C.W. PIPING
	D.H.W. PIPING
	SANITARY UNDERGROUND
	SANITARY UNDER FLOOR
	SANITARY VENT PIPING
	GATE VALVE
	BALL VALVE
	SOLENOID VALVE
	PUMP
	SUCTION DIFFUSER
	CHECK VALVE
	TEMPERATURE SENSOR
	TEMPERATURE GAUGE
	PRESSURE RELIEF VALVE
	AIR VENT
	GAS VALVE
	GAS SHUT OFF VALVE
	ELECTRIC CONVECTOR
	DRAWING NOTE
NOT ALL SYMBOLS SHOWN IN LEGEND ARE NECESSARILY USED IN THE DRAWING SET.	

GENERAL NOTES:

- ALL MECHANICAL EQUIPMENT SHOWN IN THIN SOLID LINES IS EXISTING TO REMAIN.
- ALL MECHANICAL EQUIPMENT SHOWN IN THICK SOLID LINES IS NEW TO BE PROVIDED UNDER THIS CONTRACT.
- ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'R' IS EXISTING TO BE RELOCATED AS SHOWN.
- ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'X' IS EXISTING TO BE REMOVED BACK TO SOURCE.
- THIS DRAWING WAS BASED ON PARTIAL SITE REVIEW. ALL EQUIPMENT, DUCTS, PIPING AND ALL ACCESSORIES' SIZES, LOCATIONS AND DETAILS OF INSTALLATIONS TO BE CONFIRMED BY MECHANICAL CONTRACTOR ON SITE.
- MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ROOF, WALL AND BUILDING ENVELOPE CUTTING, PATCHING AND REPAIRS, AS REQUIRED FOR EXECUTION OF WORK INCLUDED IN THIS CONTRACT.
- PROVIDE ALL NEW EQUIPMENT, CONTROLS, DUCTWORK, PIPING, VALVES AND ACCESSORIES AS SHOWN AND NOTED ON DETAILS AND AS REQUIRED FOR COMPLETE FUNCTIONING SYSTEMS.
- PROVIDE ADDITIONAL DUCTWORK, PIPING, FITTINGS AND OFFSETS WHERE REQUIRED TO SUIT EXISTING CONDITIONS AND TO AVOID COLLISIONS WITH EXISTING SYSTEMS AND BUILDING STRUCTURE.
- NOT ALL MECHANICAL ELEMENTS SHOWN, AFFECTED AREAS ONLY.
- SEISMIC RESTRAINT SYSTEM (SRS) – PROVIDE DESIGN, SUPPLY AND INSTALLATION OF COMPLETE SRS FOR ALL SYSTEMS, EQUIPMENT SPECIFIED FOR INSTALLATION ON THIS PROJECT AS PER ONTARIO BUILDING CODE LATEST EDITION.
- HATCHED AREA INDICATED ON FLOOR PLANS NOT IN CONTRACT.

DRAWING LIST	
DRAWING NUMBER	DESCRIPTION
M-1	MECHANICAL LEGEND, GENERAL NOTES, AND DRAWING LIST
M-2	MECHANICAL – PLUMBING AND FIRE EXTINGUIHSERS
M-3	MECHANICAL – HVAC SYSTEMS
M-4	MECHANICAL SPECIFICATIONS



4	ISSUED FOR ADDENDUM M1	JULY 13, 2026
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2	ISSUED FOR REVIEW	APR. 24, 2026
1	ISSUED FOR PERMIT AND PRICING	FEB, 21, 2025
0	ISSUED FOR REVIEW	APR. 24, 2024
No	DESCRIPTION	DATE

REVISIONS

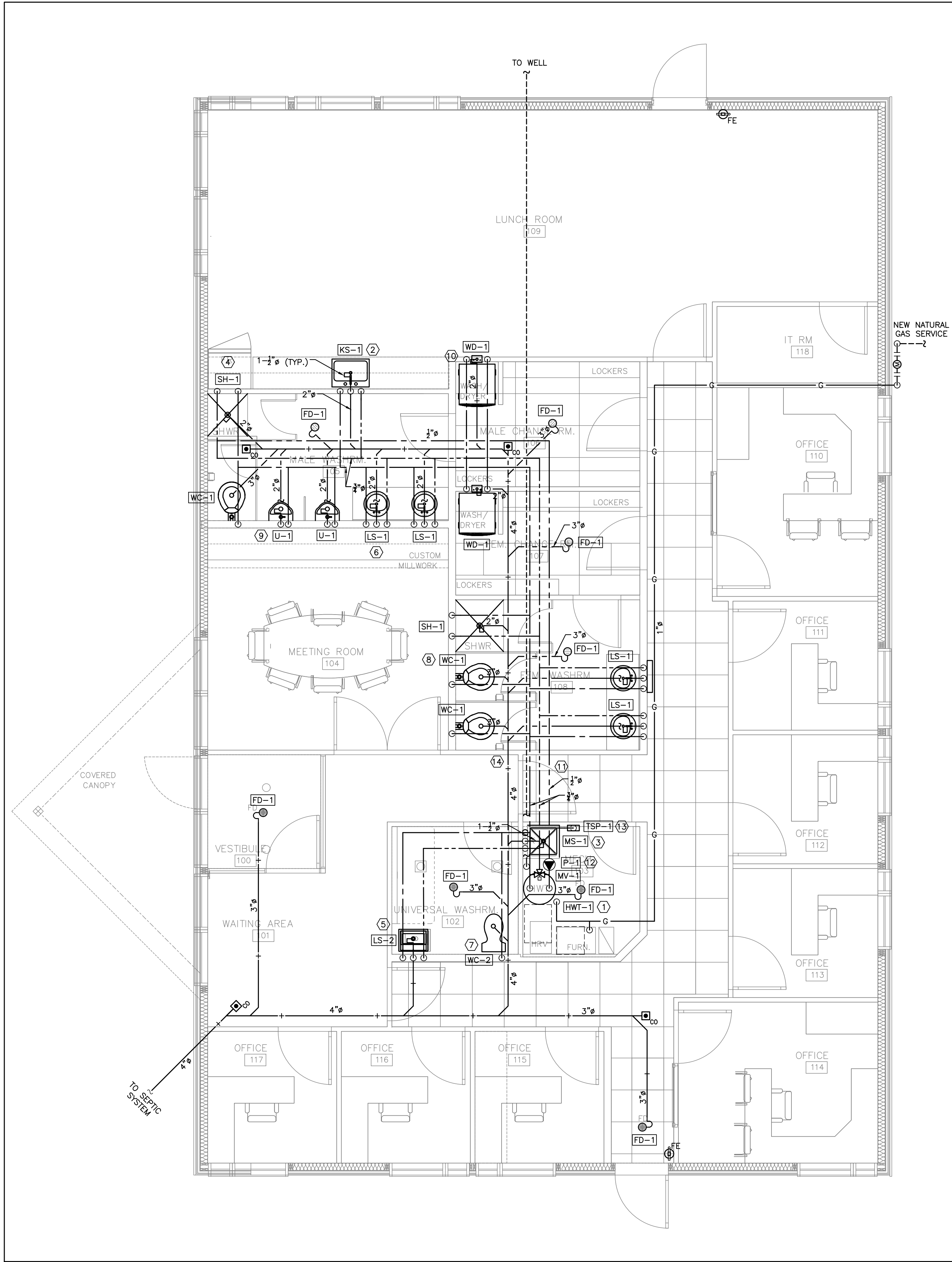
client:
BELL+ASSOCIATES
ARCHITECTURE
186 PEMBROKE STREET EAST
PEMBROKE, ON K8A 3J7

project:
MILLHAVEN GARAGE
ADMINISTRATION
BUILDING
240 COUNTY ROAD 4,
BATH, ONTARIO K0H 1G0

drawing title:
MECHANICAL LEGEND,
GENERAL NOTES, &
DRAWING LIST

scale:	AS NOTED	drawn by:	K.P.
designed by:	K.P.	reviewed by:	P.P.
approved by:	P.P.	date:	JULY 2026

project no.:	drawing no.:
420-2301-03	M-1 of 4



1 GROUND FLOOR PLAN – PLUMBING & FIRE EXTINGUISHERS
M-2 1/4" : 1'0"

DRAWING NOTES:

- PROVIDE AND INSTALL NEW GAS-FIRED HOT WATER TANK (HWT-1). PROVIDE COMPLETE WITH THERMOSTATIC MIXING VALVE AND ACCESSORIES REQUIRED FOR A COMPLETE INSTALLATION. INSTALL AS PER MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS. COORDINATE INSTALLATION WITH ELECTRICAL DIVISION.
- PROVIDE AND INSTALL NEW KITCHENETTE SINK (KS-1) WITH FAUCET AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, DHW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE AND INSTALL NEW MOP SINK (MS-1) WITH FAUCET AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, DHW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- TYPICAL: PROVIDE AND INSTALL NEW SHOWER KIT (SH-1) WITH FAUCET AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, DHW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE AND INSTALL NEW BARRIER FREE LAVATORY SINK (LS-2) WITH FAUCET AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, DHW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- TYPICAL: PROVIDE AND INSTALL NEW LAVATORY SINK (LS-1) WITH FAUCET AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, DHW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE AND INSTALL NEW BARRIER FREE WATER CLOSET (WC-2) AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- TYPICAL: PROVIDE AND INSTALL NEW WATER CLOSET (WC-1) AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE AND INSTALL NEW URINAL (U-1) AS SHOWN. REFER TO ASSOCIATED ARCHITECTURAL DRAWING SET FOR EXACT INSTALLATION LOCATION. PROVIDE AND INSTALL DCW, AND SANITARY DRAIN CONNECTIONS. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- PROVIDE AND INSTALL DCW, DHW AND SANITARY DRAIN CONNECTIONS TO CLIENT PROVIDED WASHING MACHINE. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- TYPICAL: PROVIDE NEW DOMESTIC HOT AND COLD WATER DISTRIBUTION, AND HOT WATER RETURN PIPEWORK AS SHOWN, SIZE INDICATED, IN CEILING SPACE. PROVIDE COMPLETE WITH ALL VALVES, FITTINGS, SUPPORTS, THERMAL INSULATION/JACKETING, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION. ALL PIPING TO BE 1/2" UNLESS OTHERWISE SPECIFIED.
- PROVIDE AND INSTALL NEW DOMESTIC HOT WATER RECIRCULATION PUMP (P-1). PROVIDE COMPLETE WITH ALL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION. COORDINATE INSTALLATION WITH ELECTRICAL DIVISION.
- TYPICAL: PROVIDE AND INSTALL NEW ELECTRONIC TRAP SEAL PRIMER (TSP-1). COORDINATE INSTALLATION WITH ELECTRICAL DIVISION.
- PROVIDE AND INSTALL UNDERSLAB SANITARY PIPING CONNECTIONS, SIZE INDICATED.
- PROVIDE NEW UNDERSLAB DOMESTIC COLD WATER CONNECTION FROM EXISTING WELL. TO BE COORDINATED WITH SITE SERVICES. EXACT LOCATION AND ROUTING TO BE CONFIRMED ON SITE.
- GENERAL (NOT SHOWN): PROVIDE ALL VENTING (NOT SHOWN) AS REQUIRE BY OBC. CONNECT TO EXISTING VENT PIPING IN CEILING SPACE. PROVIDE ALL FITTINGS, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- TYPICAL: PROVIDE AND INSTALL PORTABLE FIRE EXTINGUISHER ON WALL-MOUNTED BRACKET. EXTINGUISHER TO BE SUITABLE FOR CLASS A ORDINARY HAZARD WITH MINIMUM 3A RATING. INSTALL AS PER ONTARIO FIRE CODE (O.REG. 213/07) BY CERTIFIED FIRE PROTECTION CONTRACTOR.
- PROVIDE AND INSTALL NEW GAS PIPING, SIZE INDICATED. PROVIDE ALL PIPING, FITTINGS, VALVES, SUPPORTS, AND ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION. ALL WORK AND MATERIALS BY LICENSED CONTRACTOR TO LATEST EDITION OF CSA B149.1.

PLUMBING EQUIPMENT SCHEDULE:

HWT-1

TYPE: GAS-FIRED TANK STYLE HOT WATER HEATER
MAKE: RHEEM
MODEL: GPV75-76PV-2
DESCRIPTION:
- 75 GALLON CAPACITY
- 77 US GPH AT 95F RISE
- 75100 BTU INPUT
ELECTRICAL:
- 120V/1PH
- 1440 W

WC-1

TYPE: TOP SPUD, BOTTOM DISCHARGE WATER CLOSET
MAKE: AMERICAN STANDARD
MODEL: MADERA FLOWISE 16-1/2" HEIGHT ELONGATED FLUSHOMETER TOILET (3461.001)
DESCRIPTION:
- VITREOUS CHINA
- LOW CONSUMPTION, 1.6 GPF
- WHITE
ACCESSORIES:
- PROVIDE COMPLETE WITH HEAVY DUTY OPEN FRONT LESS COVER (#5901.100SS)
- PROVIDE COMPLETE WITH FLUSHOMETER FLUSH VALVE

WC-2

TYPE: BARRIER FREE WATER CLOSET
MAKE: AMERICAN STANDARD
MODEL: CADET CHAIR HEIGHT, ELONGATED TOILET (2467.016)
DESCRIPTION:
- VITREOUS CHINA
- LOW CONSUMPTION, 1.6 GPF
- WHITE
ACCESSORIES:
- PROVIDE COMPLETE WITH ELONGATED SEAT WITH SLOW-CLOSE SNAP-OFF HINGES (5321.110)

LS-1

TYPE: DROP-IN COUNTERTOP LAVATORY SINK
MAKE: AMERICAN STANDARD
MODEL: COLONY COUNTERTOP SINK
DESCRIPTION:
- VITREOUS CHINA
- WHITE
- FRONT OVERFLOW
ACCESSORIES:
- FAUCET: AMERICAN STANDARD COLONY PRO SINGLE CONTROL LAVATORY FAUCET (7075)

LS-2

TYPE: WALL-HUNG, BARRIER FREE LAVATORY SINK
MAKE: AMERICAN STANDARD
MODEL: MURRO UNIVERSAL DESIGN WALL-HUNG LAVATORY WITH EVERCLEAN
DESCRIPTION:
- VITREOUS CHINA
- WHITE
- OVERFLOW
- SELF-DRAINING DECK
ACCESSORIES:
- FAUCET: AMERICAN STANDARD COLONY PRO SINGLE CONTROL LAVATORY FAUCET (7075)
- PROVIDE COMPLETE WITH PROTECTIVE SHROUD (0059.020EC)

KS-1

TYPE: KITCHENETTE SINK
MAKE: AMERICAN STANDARD
MODEL: COLONY 25 x 22 SINGLE BOWL STAINLESS STEEL KITCHEN SINK
DESCRIPTION:
- STAINLESS STEEL
- SINGLE BOWL
- TOP MOUNT INSTALLATION
ACCESSORIES:
- FAUCET: AMERICAN STANDARD COLONY PRO SINGLE HANDLE KITCHEN FAUCET (7074)

MS-1

TYPE: MOP SERVICE BASIN
MAKE: ZURN
MODEL: Z1996-24
DESCRIPTION:
- STAINLESS STEEL STRAINER
- PVC DRAIN BODY

WF-1

TYPE: WATER BOTTLE FILLING STATION
MAKE: ELKAY
MODEL: LZWSM
DESCRIPTION:
- SURFACE (WALL) MOUNT
ELECTRICAL:
- 115V/60HZ, 1 A, 15 W

U-1

TYPE: TOP SPUD URINAL
MAKE: AMERICAN STANDARD
MODEL: MAYBROOK UNIVERSAL URINAL
DESCRIPTION:
- VITREOUS CHINE
- LOW CONSUMPTION
- WHITE
ACCESSORIES:
- PROVIDE COMPLETE WITH FLUSH VALVE

SH-1

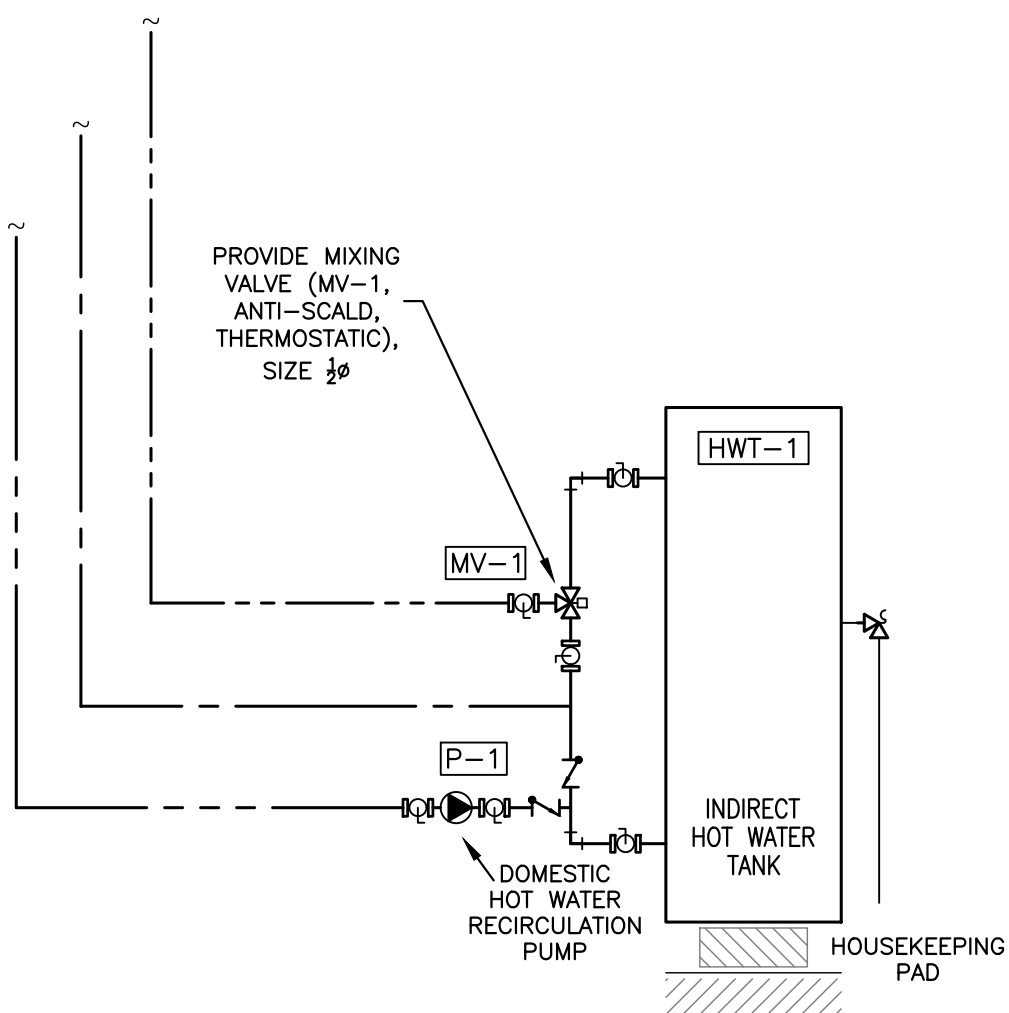
TYPE: SHOWER
MAKE: AMERICAN STANDARD
MODEL: COMMERCIAL SHOWER SYSTEM KIT (TU662SG.211)

FD-1

TYPE: FLOOR DRAIN
MAKE: ZURN
MODEL: ZXN211
DESCRIPTION:
- PROVIDE COMPLETE WITH TRAP SEAL PRIMER FROM CENTRAL TRAP SEAL PRIMER

P-1

TYPE: DOMESTIC HOT WATER RECIRCULATION PUMP
MAKE: TACO
MODEL: 0026e
ELECTRICAL: 120V/60PH, 120W, 0.16 HP



2 INDIRECT HOT WATER TANK & RECIRC. PUMP
M-2 NTS

JRP ENGINEERING
Professional Engineers

110 Didsbury Rd – Unit M090, Kanata, ON, K2T 0C2
Tel: 613-627-2462 Email: Admin@jrpeng.com

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0	ISSUED FOR REVIEW	APR. 24, 2024
No	DESCRIPTION	DATE

REVISIONS

BELL+ASSOCIATES
ARCHITECTURE

186 PEMBROKE STREET EAST
PEMBROKE, ON K8A 3J7

MILLHAVEN GARAGE
ADMINISTRATION
BUILDING

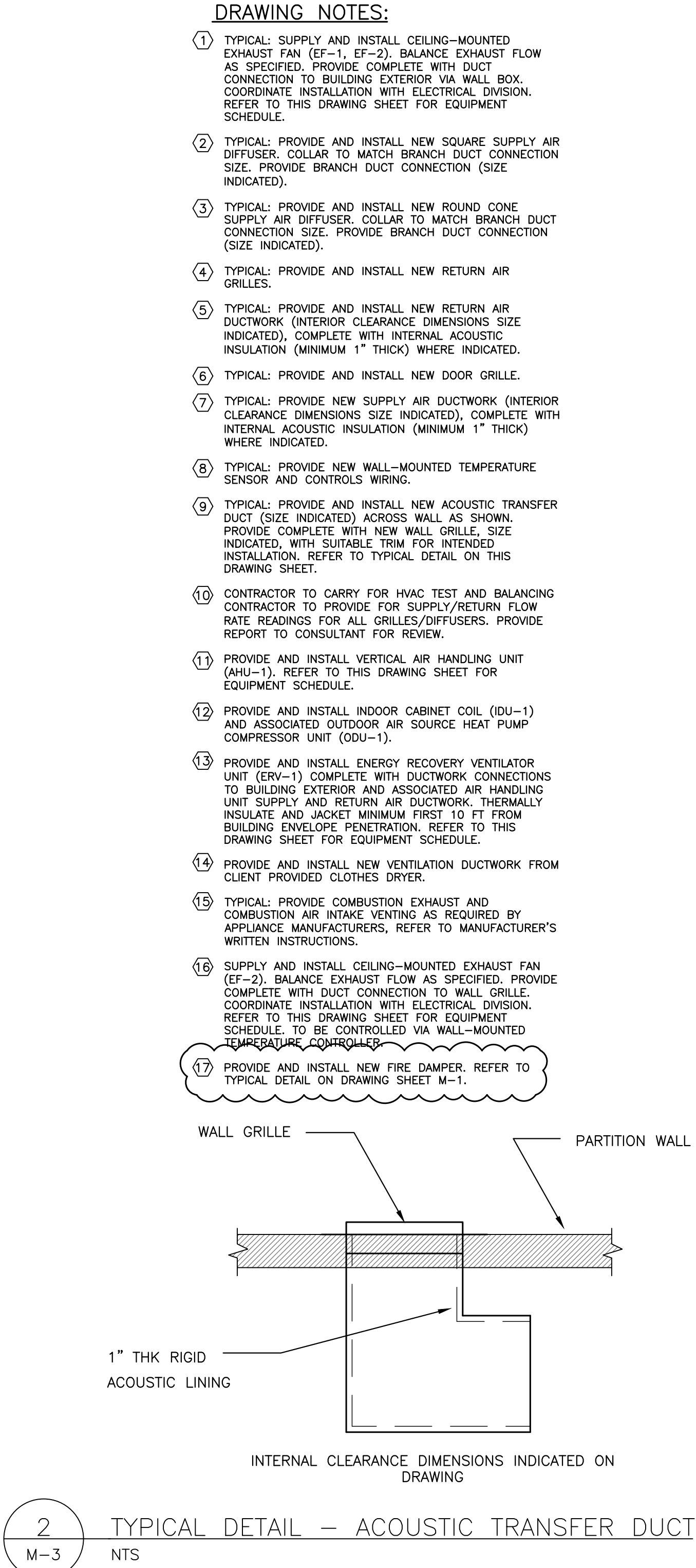
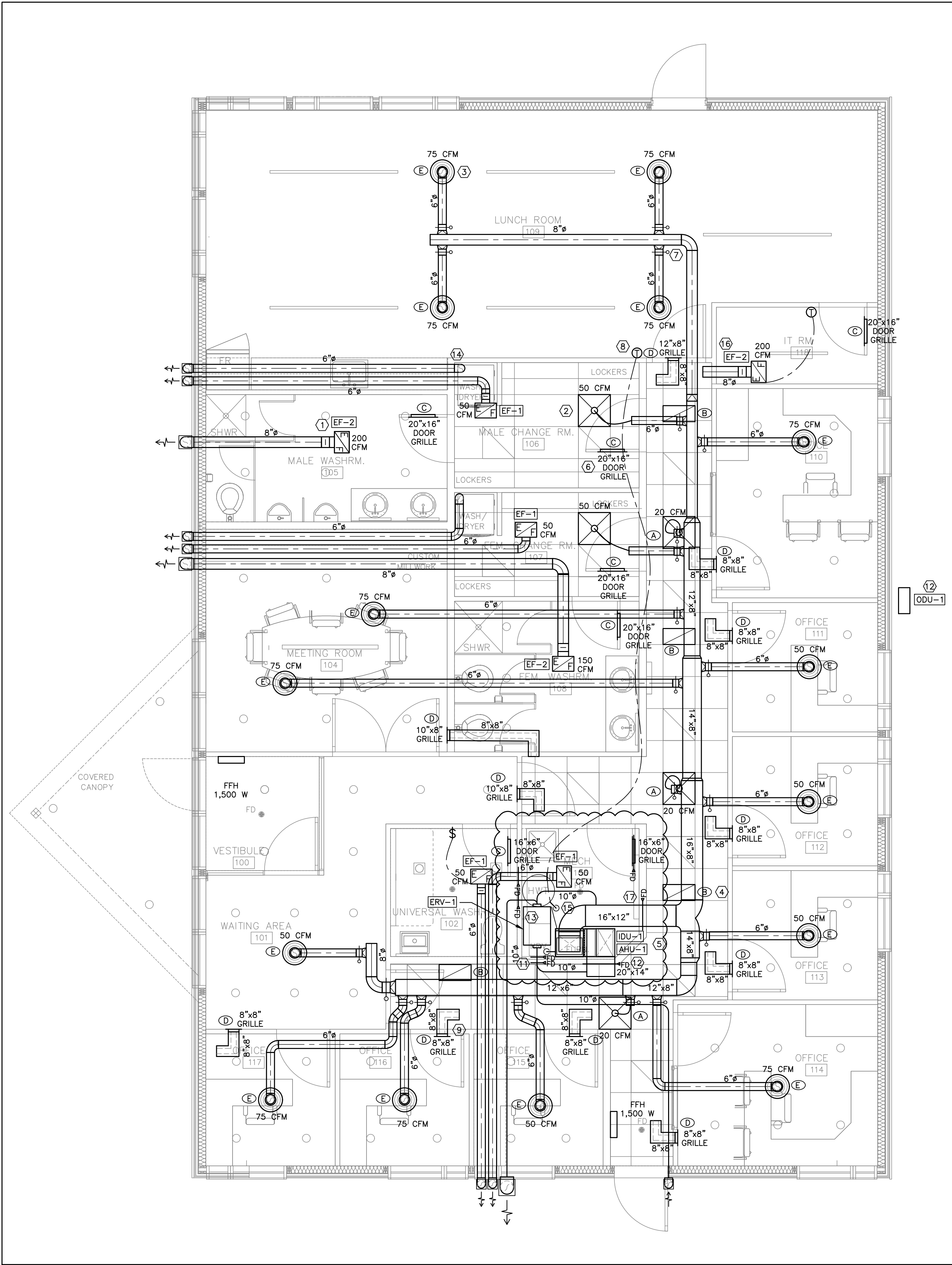
240 COUNTY ROAD 4,
BATH, ONTARIO K0H 1G0

MECHANICAL
PLUMBING

scale:	AS NOTED	drawn by:	K.P.
designed by:	K.P.	reviewed by:	P.P.
approved by:	P.P.	date:	JULY 2026

project no.:
420-2301-03

drawing no.:
M-2
of 4



HVAC EQUIPMENT SCHEDULE:	
EF-1	
TYPE: CEILING EXHAUST FAN	
MAKE: GREENHECK	
MODEL: SP-A70	
DESCRIPTION:	
- BALANCED TO 50 CFM EXHAUST FLOW RATE	
ELECTRICAL:	
- 115V/60HZ/1PH, 0.14A	
- FAN TO BE CONTINUOUSLY OPERATING, UNLESS OTHERWISE INDICATED	
EF-2	
TYPE: CEILING EXHAUST FAN	
MAKE: GREENHECK	
MODEL: SP-A200	
DESCRIPTION:	
- BALANCED AS SPECIFIED	
ELECTRICAL:	
- 115V/60HZ/1PH, 0.56A	
- FAN TO BE CONTINUOUSLY OPERATING, UNLESS OTHERWISE INDICATED	
ERV-1	
TYPE: INDOOR ERV UNIT	
MAKE: RENEWAIRE	
MODEL: HE05IN	
DESCRIPTION:	
- BALANCE TO 250 CFM	
ELECTRICAL:	
- 115V/60HZ/1PH, 220 W, 2.7 FLA, MCA: 6.1, MOCP: 15	
AHU-1	
TYPE: TWO STAGE VARIABLE SPEED ECM RESIDENTIAL GAS FURNACE	
MAKE: YORK	
MODEL: LX, TM9V080B12MP12C	
DESCRIPTION:	
- 80 MBH HEATING CAPACITY	
- 1,200 CFM SUPPLY AIR	
- NATURAL GAS INPUT	
ELECTRICAL:	
- 208-230V/60HZ/1PH, MCA: 9.6A, MOCP: 15A	
IDU-1, ODU-1	
DESCRIPTION: COLD CLIMATE AIR SOURCE HEAT PUMP, CASED COIL CABINET	
MAKE: MOOVAIR	
MODEL: CUB36HAC20CWT7A (INDOOR COIL), DMA36HOS20230E7 (OUTDOOR COMPRESSOR UNIT)	
DESCRIPTION:	
- 40 MBH MAXIMUM COOLING CAPACITY	
- 45 MBH MAXIMUM HEATING CAPACITY	
- 1,200 CFM SUPPLY AIR	
- COMPLETE WITH SPLIT-SYSTEM COIL	
- REFRIGERANT: R410A	
- PROVIDE AND INSTALL NEUTRALIZER ON COMBUSTION CONDENSATE DRAIN	
ELECTRICAL:	
- 208-230V/60HZ/1PH, MCA: 30A, MOCP: 50A	

GRILLE & DIFFUSER SCHEDULE:	
TYPE 'A'	
MAKE: EH PRICE	
MODEL: SPD	
DESCRIPTION:	
- SQUARE PLAQUE DIFFUSER	
- SIZE INDICATED, COLLAR TO MATCH	
TYPE 'B'	
MAKE: EH PRICE	
MODEL: 80	
DESCRIPTION:	
- EXHAUST AIR GRILLE	
- 12x12x12 EGG CRATE GRILLE	
- SIZE: 24"x12"	
- INSTALLATION: FOR DROP CEILING TYPE, PROVIDE FRAME AS REQUIRED	
TYPE 'C'	
MAKE: EH PRICE	
MODEL: STG	
DESCRIPTION:	
- STEEL TRANSFER GRILLE	
- SIZE INDICATED	
TYPE 'D'	
MAKE: EH PRICE	
MODEL: 530	
DESCRIPTION:	
- STEEL LOUVERED RETURN GRILLE WITH 45° DEFLECTION AND 3/4" BLADE SPACING	
- SIZE INDICATED	
TYPE 'E'	
MAKE: EH PRICE	
MODEL: RCD	
DESCRIPTION:	
- ROUND CONE DIFFUSER	
- SIZE INDICATED, COLLAR TO MATCH	
TYPE 'F'	
MAKE: EH PRICE	
MODEL: 510	
DESCRIPTION:	
- STEEL LOUVERED SUPPLY GRILLE	
- SIZE INDICATED	

1 GROUND FLOOR PLAN — HVAC SYSTEMS
M-3 1/4" : 1'0"

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No	DESCRIPTION	DATE
4	ISSUED FOR ADDENDUM M1	JULY 13, 2026
3	ISSUED FOR PERMIT & TENDER	MAY 29, 2026
2	ISSUED FOR REVIEW	APR. 24, 2026
1	ISSUED FOR PERMIT AND PRICING	FEB. 21, 2025
0	ISSUED FOR REVIEW	APR. 24, 2024
REVISIONS		

client:
BELL+ASSOCIATES
ARCHITECTURE
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project:
MILLHAVEN GARAGE
ADMINISTRATION
BUILDING
240 COUNTY ROAD 4,
BATH, ONTARIO K0H 1G0

drawing title:
MECHANICAL
HVAC SYSTEMS

scale:	AS NOTED	drawn by:	K.P.
designed by:	K.P.	reviewed by:	P.P.
approved by:	P.P.	date:	JULY 2026

drawing no.:
420-2301-03
drawing no.:
M-3
of 4

GENERAL INSTRUCTIONS

1.0 CONDITIONS OF CONTRACT

THE INSTRUCTIONS TO BIDDERS AND THE GENERAL CONDITIONS ARE AN INTEGRAL PART OF THIS DIVISION AND SHALL BE READ IN CONJUNCTION HEREWITH, THESE INSTRUCTIONS TO BIDDERS AND GENERAL CONDITIONS SHALL BE FULLY BINDING ON THE GENERAL CONTRACTOR AND THEIR SUB-CONTRACTORS TO THE FULL SATISFACTION OF THE ENGINEER AND OWNER.

THE RESPONSIBILITY AND SCOPE OF EACH SUB-TRADE RESTS SOLELY WITH THE MECHANICAL CONTRACTOR. EXTRAS WILL NOT BE CONSIDERED BASED ON THE GROUNDS OF DIFFERENCE IN INTERPRETATION OF SPECIFICATIONS AND DRAWINGS AS TO WHICH TRADE INVOLVED SHALL PROVIDE CERTAIN SPECIALITIES OR MATERIALS.

2.0 EXAMINATION OF WORK

EXAMINE THE SITE AND LOCAL CONDITIONS LIKELY TO AFFECT WORK INDICATED AND SPECIFIED PRIOR TO SUBMITTING FINAL PRICE.

THIS PROJECT INVOLVES CHANGES TO THE BUILDING, WHICH IS PRESENTLY OCCUPIED. THEREFORE, EXAMINE THE SITE AND LOCAL CONDITIONS TO DETERMINE THE DIFFICULTIES IN CARRYING OUT THE WORK INDICATED AND SPECIFIED PRIOR TO SUBMITTING A FINAL PRICE.

3.0 LIABILITY

THIS CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR LAYING OUT THEIR WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER AND OTHER CONTRACTORS BY IMPROPER LOCATION OR CARRYING OUT OF THIS WORK. CARRY ALL NECESSARY INSURANCE COVERAGE.

THIS CONTRACTOR SHALL PROTECT ALL FINISHED AND UNFINISHED WORK OF THEIR OWN AND OTHER CONTRACTORS INCLUDING EXISTING FROM DAMAGE DUE TO HE CARRYING OUT OF THEIR WORK.

4.0 INTENT

IT IS THE INTENT OF THIS SPECIFICATION AND DRAWINGS TO PROVIDE FOR A COMPLETE AND FULLY-OPERATING SYSTEM IN COMPLETE ACCORD WITH ALL APPLICABLE CODES. THESE SPECIFICATIONS MAY NOT COVER EACH AND VERY ITEM REQUIRED FOR THE COMPLETE MECHANICAL INSTALLATION; THEREFORE, THE CONTRACTOR SHALL MAKE PROVISIONS FOR ALL LABOUR, MATERIAL, AND EQUIPMENT DEEMED NECESSARY TO COMPLETE THE SYSTEM(S) AFFECTED BY THE WORK DESCRIBED IN THE SPECIFICATIONS AND DRAWINGS.

5.0 CERTIFICATES, FEES, ETC.

THIS CONTRACTOR TO PAY ALL FEES AND OBTAIN ALL PERMITS. PROVIDE AUTHORITIES WITH PLANS AND INFORMATION FOR ACCEPTANCE CERTIFICATES. FURNISH INSPECTION CERTIFICATES AS EVIDENCE THAT WORK CONFORMS WITH REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION (AHJs).

6.0 CUTTING AND PATCHING

THE MECHANICAL CONTRACTOR WILL CONFER WITH THE GENERAL CONTRACTOR IN REGARDS TO THIS WORK AND SHALL GIVE LOCATIONS FOR ALL HOLES/PENETRATIONS FOR PIPES, DUCTS THROUGH FLOORS AND ROOF, ETC., AND PROVIDE SLEEVES REQUIRED TO EXECUTE THE MECHANICAL INSTALLATION.

7.0 PIPE HANGERS, SUPPORTS, AND SLEEVES

HANGERS AND SUPPORTS SHALL SECURE PIPES N PLACE, PREVENT VIBRATION, MAINTAIN GRADE BY ADJUSTMENT, PROVIDE FOR EXPANSION AND CONTRACTION, ND SHALL BE DIRECTLY SUPPORTED FROM THE STRUCTURE. PERFORATED STRAP HANGERS ARE NOT ACCEPTABLE.

8.0 TESTING

TEST ALL EQUIPMENT AND MATERIAL WHERE REQUIRED BY SPECIFICATIONS OR AUTHORITIES HAVING JURISDICTION (AHJs) TO DEMONSTRATE ITS PROPER OPERATION TO THE OWNER'S REPRESENTATIVE. TEST PROCEDURES SHALL BE IN ACCORDANCE WITH THE APPLICABLE PORTIONS OF THE ASME, ASHRAE, AND OTHER RECOGNIZED TEST CODES AS FAR AS FIELD CONDITIONS PERMIT.

- PERFORM TESTING UPON COMPLETION OF THE MECHANICAL INSTALLATION, TURN OVER TO THE OWNER A CERTIFICATION OF THE TEST COMPLETE WITH DETAILED DATA AS REQUIRED BY EACH.
- TESTS SHALL BE ITEMIZED AS TO THE TIME PERFORMED AND PERSONNEL RESPONSIBLE FOR THE TEST. HYDRAULIC TESTS SHALL BE CARRIED OUT FOR A PERIOD OF 8 HOURS AND PRESSURE MAINTAINED WITH NO APPRECIABLE PRESSURE DROP. WHERE LEAKAGE OCCURS, REPAIRS SHALL BE MADE AND THE ENTIRE SYSTEM RETESTED TO THE SATISFACTION OF BUILDING OWNER AND ENGINEER.
- ALL TESTS TO BE MADE BEFORE BACK-FILLING AND FURRING.
- ALL LOW AND HIGH VELOCITY DUCT SYSTEMS, INCLUDING SUPPLY SHALL BE CHECKED FOR TIGHTNESS. ALL LEAKS SHALL BE REPAIRED BEFORE DUCTS ARE FURRED IN TO ENSURE TOTAL OUTLET CAPACITY IS WITHIN 5% OF THE TOTAL QUANTITY BEING SUPPLIED BY THE AIR SYSTEM

9.0 RECORD 'AS-BUILT' DRAWINGS

KEEP IN THE JOB OFFICE AN EXTRA SET OF WHITE PRINTS AND SPECIFICATIONS ON WHICH ALL CHANGES AND DEVIATIONS SHALL BE RECORDED DAILY. AT COMPLETION OF THIS PROJECT, TURN OVER TO ENGINEER TWO (2) SETS OF NEAT AND LEGIBLE 'AS-BUILT' RECORD DRAWINGS AND SPECIFICATIONS. USE RED INK TO MARK ALL CHANGES AND DEVIATIONS AND SEAL WITH CONTRACTOR'S IDENTIFYING SEAL. THESE EXTRA SETS OF WHITE PRINTS AND SPECIFICATIONS WILL BE PROVIDED BY THE ENGINEER UPON REQUEST.

10.0 SHOP DRAWINGS

BEFORE FABRICATION OF MAJOR EQUIPMENT AND MATERIALS, SUBMIT THROUGH THE GENERAL CONTRACTOR SHOP DRAWINGS AND DATA SHEETS COVERING ALL ITEMS OF EQUIPMENT AND MATERIALS FURNISHED AND INSTALLED UNDER THIS CONTRACT FOR REVIEW BY THE ENGINEER.

11.0 TEMPORARY AND TRIAL USAGE

ANY PERMANENT EQUIPMENT USED TEMPORARILY FOR HEAT OR OTHERWISE WILL BE REPAIRED AND REPLACED TO THE FULL SATISFACTION OF THE OWNER.

12.0 CLEANING

DUCTS, PIPEWORK, AND EQUIPMENT SHALL BE THOROUGHLY CLEANED OF DIRT, CUTTINGS, AND OTHER FOREIGN SUBSTANCES. DISCONNECT, CLEAN, AND RE-CONNECT WHENEVER NECESSARY FOR THE PURPOSE OF LOCATING AND REMOVING OBSTRUCTIONS. REPAIR WORK THAT HAS BEEN DAMAGED IN THE COURSE OF REMOVING OBSTRUCTIONS. DUCTS SHALL BE POWER-VACUUM CLEANED BEFORE BEING TURNED OVER TO THE OWNER.

13.0 GUARANTEE

THE MECHANICAL CONTRACTOR, AS A CONDITION PRECEDENT TO FINAL PAYMENT AFTER COMPLETION OF THIS WORK, SHALL GIVE THE OWNER A WRITTEN GUARANTEE WARRANTING ALL APPARATUS FURNISHED UNDER THE CONTRACT TO REMAIN IN PERFECT SERVICEABLE CONDITION FOR A PERIOD OF ONE (1) CALENDAR YEAR FROM THE DATE OF FINAL ACCEPTANCE OF THEIR WORK BY THE OWNER AND THE ENGINEER.

14.0 INSTALLATION

INSTALL EQUIPMENT IN ACCORDANCE TO MANUFACTURER'S INSTRUCTIONS.

15.0 OPERATING AND MAINTENANCE DATA

FURNISH OPERATING AND MAINTENANCE DATA FOR ALL EQUIPMENT AND SYSTEMS AS PROVIDED AND/OR INSTALLED UNDER THE CONTRACT. DATA SHALL BE ASSEMBLED IN BOOKLET FORM WITH SORT COVER AND INDEX. IDENTITY FRONT COVER WITH NAME AND LOCATION OF THE PROJECT, CONSULTING ENGINEER, AND CONTRACTOR. SUBMIT REVIEW COPY TO OWNER AND ENGINEER FOR ACCEPTANCE. IF AGREEABLE TO THE OWNER, AND AGREED UPON IN WRITING, THE OPERATING AND MAINTENANCE DATA MAY BE SUBMITTED IN ELECTRONIC FORM (.PDF FILE FORMAT ONLY).

16.0 MATERIALS

REPLACE MATERIAL AND WORKMANSHIP BELOW SPECIFIED QUALITY AND RELOCATE WORK WRONGLY PLACED TO THE SATISFACTION OF OWNER AND ENGINEER.

MATERIALS AND EQUIPMENT INSTALLED SHALL BE NEW, FULL WEIGHT, ND OF THE BEST QUALITY SPECIFIED. USE SAME BRAND OF MANUFACTURER FOR EACH SPECIFIC INSTALLATION.

STATICALLY AND DYNAMICALLY BALANCE ROTATING EQUIPMENT FOR MINIMUM VIBRATION AND LOW OPERATING NOISE LEVEL.

17.0 APPROVALS

THE PRICE SUBMITTED FOR THIS CONTRACT SHALL BE BASED ON THE USE OF MATERIALS AND EQUIPMENT AS SPECIFIED. IF THIS CONTRACTOR WISHES TO QUOTE ON EQUIVALENT MATERIALS AND EQUIPMENT, THEY MUST QUOTE ON PRODUCTS REVIEWED AND APPROVED BY THE ENGINEER (WRITTEN APPROVAL), AS EQUIVALENT TO THE PRODUCT SPECIFIED. MANUFACTURER'S LISTED IN SPECIFICATIONS DO NOT HAVE TO REQUEST APPROVAL BUT MUST MEET ALL PERFORMANCE REQUIREMENTS.

CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY ADDITIONAL WORK OR MATERIALS REQUIRED BY THE MECHANICAL TRADE OR OTHER CONTRACTORS TO ACCOMMODATE APPROVED EQUIVALENT MATERIALS OR EQUIPMENT. EXTRA COSTS ASSOCIATED WILL NOT BE APPROVED.

VENTILATION AND AIR-CONDITIONING

1.0 DUCTWORK

DUCTWORK SHALL BE OF GALVANIZED STEEL AND SHALL BE LOCK-FORMING QUALITY. ALL DUCTWORK SHALL BE CONSTRUCTED, BRACED, CONNECTED, AND JOINED AS RECOMMENDED IN THE LATEST ISSUE OF ASHRAE GUIDE AND DUCT CONSTRUCTION STANDARDS ISSUED BY THE SHEET METAL NATIONAL ASSOCIATION INC. (SMACNA). ALL DUCTWORK SHALL BE INSTALLED TO CONFORM TO THE NATIONAL BUILDING CODE, THE CFIA PAMPHLETS 90A AND 91, AND BE IN ACCORDANCE WITH APPLICABLE CODES. THE MINIMUM SHEET METAL THICKNESS SHALL BE AS FOLLOWS:

RECTANGULAR DUCTS	
MAXIMUM WIDTH	GAUGE
UP TO 300MM	18 USGA
325MM TO 750MM	24 USGA
775MM TO 1,350MM	22 USGA

ROUND DUCTWORK SHALL BE SUSPENDED WITH BAND IRON HANGERS.

RECTANGULAR DUCTWORK SHALL BE SUPPORTED AT MAXIMUM 2.4M (8FT) SPACING.

SHEET METAL SCREWS TO BE ACCEPTABLE FOR DUCT FABRICATION.

FLEXIBLE DUCT TO BE TRIPLE-LOCK ALUMINUM, MAXIMUM LENGTH 3.0M (10FT).

SEAL CLASSIFICATION AS FOLLOWS:

MAXIMUM PRESSURE (PA)	SMACNA SEAL CLASS
1000 AND OVER	A
750	B
500	C

CLASS A SEAL: LONGITUDINAL SEAMS, TRANSVERSE JOINTS, DUCT WALL PENETRATIONS, AND CONNECTIONS MADE AIR-TIGHT WITH SEALANT AND TAPE.

CLASS B SEAL: LONGITUDINAL SEAMS, TRANSVERSE JOINTS, AND CONNECTIONS MADE AIR-TIGHT WITH SEALANT, TAPE, OR COMBINATION THEREOF.

CLASS C SEAL: TRANSVERSE JOINTS AND CONNECTIONS MADE AIR-TIGHT WITH GASKETS, SEALANT, TAPE, OR COMBINATION THEREOF. LONGITUDINAL SEAMS UNSEALED.

2.0 VOLUME DAMPERS

INSTALL AT EACH TAKE-OFF FROM MAIN AS NOTED ON DRAWING - SINGLE-BLADE WITH LOCKING QUADRANT, EQUAL TO DURO-DYNE K-9.

3.0 AIR OUTLETS AND INLETS

ALL NEW SUPPLY DIFFUSERS AND RETURN GRILLES TO BE PROVIDED AS PER SCHEDULE AND/OR AS LISTED IN DRAWING NOTES.

4.0 AIR SYSTEM BALANCING AND TESTING

BALANCING SYSTEMS FOR RATED AIR FLOWS, ROOM TEMPERATURE CONTROL, AND ELECTRICAL CURRENT DRAW AFTER INSTALLATION IS COMPLETE AND EQUIPMENT IS IN FULL WORKING ORDER. ADJUST CONTROLS FOR CONTINUOUS AIR CIRCULATION AND MINIMUM ENERGY CONSUMPTION. ADJUST FAN SPEEDS AS REQUIRED TO OBTAIN SPECIFIC PERFORMANCE. BALANCING WORK TO BE PERFORMED BY INDEPENDENT BALANCING CONTRACTOR. PROVIDE COPIES OF TESTING AND BALANCING (TAB) REPORT TO ENGINEER FOR REVIEW.

5.0 DUCT INSULATION: THERMAL AND ACOUSTIC

ALL HIGH-PRESSURE DUCTWORK UP TO VARIABLE AIR VOLUME (VAV) TERMINAL DEVICE INLETS SHALL BE THERMALLY-INSULATED WITH 25MM THICK RIGID FIBREGLASS INSULATION AND VAPOUR BARRIER, SEALED WITH ALUMINUM DUCT TAPE.

PROVIDE ACOUSTIC DUCT LINING IN ALL RECTANGULAR DUCTS DOWNSTREAM FROM VARIABLE AIR VOLUME (VAV) TERMINAL DEVICE, IN ALL TRANSFER DUCTS, OR AS INDICATED ON DRAWINGS. THE LINING SHALL BE RIGID FIBREGLASS BOARD OF 25MM THICKNESS WITH A MINIMUM DENSITY OF 36 KG/M². DUCT DIMENSIONS AS INDICATED ON DRAWINGS REPRESENT CLEARANCE DIMENSIONS INSIDE OF DUCT LINING. ALL COVERING SHALL BE APPLIED IN A WORKMAN-LIKE MANNER TO PRESENT A NEAT AND CLEAN APPEARANCE AT COMPLETION OF THE WORK TO THE FULL SATISFACTION OF THE ENGINEER AND OWNER. INSULATION ASSEMBLIES SHALL COMPLY WITH ONTARIO BUILDING REGULATIONS WITH RESPECT TO FLAME SPREAD AND SMOKE-DEVELOPED RATINGS NOT EXCEEDING 25 AND 50, RESPECTIVELY.

REPAIR EXISTING INSULATION AND/OR JACKETING THAT IS DAMAGED BY CUTTING INTO MAINS OR OTHER ALTERATIONS PERFORMED UNDER THIS CONTRACT.

6.0 EQUIPMENT

REFER TO NOTES AND SCHEDULES ON DRAWINGS FOR DETAILS ON EQUIPMENT, TYPES, MODEL NUMBERS, AND PERFORMANCE REQUIREMENTS.

DOMESTIC WATER PIPING

1.0 GENERAL

ALL WORK AND MATERIALS TO THE FOLLOWING SPECIFICATIONS/REQUIREMENTS:

- ONTARIO BUILDING CODE (OBC)
- NATIONAL PLUMBING CODE OF CANADA (NPC)
- AUTHORITIES HAVING JURISDICTION (AHJ), AS APPLICABLE
- ASTM B88M STANDARD SPECIFICATION FOR SEAMLESS COPPER WATER TUBE (METRIC)
- ANSI/ASME B16.15 CAST BRONZE THREADED FITTINGS, CLASSES 125 AND 250
- ANSI/ASME B16.18 CAST COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS
- ANSI/ASME B16.22 WROUGHT COPPER AND COPPER ALLOY SOLDER JOINT PRESSURE FITTINGS
- ANSI/ASME B16.24 CAST COPPER ALLOY PIPE FLANGES AND FLANGED FITTINGS - CLASS 150 THROUGH 2500
- CAN/CGSB-24.3 IDENTIFICATION OF PIPING SYSTEMS

2.0 PIPING

DOMESTIC HOT, COLD, AND RECIRCULATION SYSTEMS WITHIN BUILDING AS FOLLOWS:

- ABOVE GROUND: COPPER TUBE, HARD DRAWN, TYPE K/L/M
- BURIED / EMBEDDED: COPPER TUBE, SOFT ANNEALED, TYPE K/L

3.0 INSTALLATION

- ASSEMBLE PIPING USING FITTINGS MANUFACTURED TO ANSI STANDARDS.
- INSTALL COLD WATER PIPING BELOW AND AWAY OF HOT WATER SUPPLY AND CIRCULATION PIPING SO AS TO MAINTAIN TEMPERATURE OF COLD WATER AS LOW AS POSSIBLE.
- CONNECT TO FIXTURES AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS UNLESS OTHERWISE SPECIFIED.
- WHEREVER DISSIMILAR METALS ARE JOINED OR SUPPORTED, THE PIPING SHALL HAVE NON-CONDUCTING TYPE CONNECTIONS OR HANGERS TO PREVENT GALVANIC CORROSION.
- BURIED TUBING:
- LAY IN WELL-COMPACTED WASHER SAND IN ACCORDANCE AWWA CLASS B BEDDING.
- BEND TUBING WITHOUT CRIMPING OR CONSTRUCTION
- MINIMIZE USE OF FITTINGS
- MUST BE INSTALLED IN LONG LENGTHS, NO BURIED JOINTS

4.0 VALVES

ISOLATE EQUIPMENT, FIXTURES, AND BRANCHES WITH BALL VALVES. BALANCE RECIRCULATION SYSTEMS USING LOCK-SHIELD GLOBE VALVES - MARK SETTINGS AND RECORD ON AS-BUILT DRAWINGS ON COMPLETION OF WORK. PROVIDE ALL VALVES AS SHOWN ON THE DRAWINGS OR REQUIRED BY AUTHORITIES HAVING JURISDICTION. PROVIDE VACUUM BREAKERS BACKFLOW PREVENTER DEVICES ON LINES SERVING EQUIPMENT OR FIXTURES WHERE CONTAMINATION OF DOMESTIC WATER CAN OCCUR.

5.0 PRESSURE TESTING

TEST PRESSURE TO BE ONE (1) TIMES THE MAXIMUM SYSTEM OPERATING PRESSURE, OR 125 PSI (860KPA), WHICHEVER IS GREATER.

6.0 FLUSHING/CLEANING AND DISINFECTION

FLUSH /CLEAN AND DISINFECT SYSTEM TO EXTENT REQUIRED BASED ON SCOPE OF DOMESTIC WATER PLUMBING PIPING SCOPE OF WORK , APPLICABLE REGULATIONS, AND REQUIREMENTS OF BUILDING OWNER/PROPERTY MANAGER/LANDLORD.

DRAINAGE, WASTE, AND VENT (DWV) PIPING

1.0 GENERAL

ALL WORK AND MATERIALS TO THE FOLLOWING SPECIFICATIONS/REQUIREMENTS:

- ONTARIO BUILDING CODE (OBC)
- NATIONAL PLUMBING CODE OF CANADA (NPC)
- AUTHORITIES HAVING JURISDICTION (AHJ), AS APPLICABLE

- ASTM B32 STANDARD SPECIFICATIONS FOR SOLDER METAL
- ASTM B306 STANDARD SPECIFICATION OF COPPER DRAINAGE TUBE (DWV)
- ASTM C564 STANDARD SPECIFICATION FOR RUBBER GASKETS FOR CAST IRON SOIL PIPE AND FITTINGS
- CSA B67 LEAD SERVICE PIPE, WASTE PIPE, TRAPS, BENDS, AND ACCESSORIES
- CAN/CSA B70 CAST IRON SOIL PIPE, FITTINGS, AND MEANS OF JOINING
- CAN/CSA B125.3 PLUMBING FITTINGS
- ASTM D2564 STANDARD SPECIFICATION FOR SOLVENT CEMENTS FOR POLY VINYL-CHLORIDE (PVC) PLASTIC PIPING SYSTEMS
- CAN/CSA-SERIES B1800 THERMOPLASTIC NON-PRESSURE PIPE COMPENDIUM - B1800 SERIES
- CAN/CSA B181.2 PVC DRAIN, WASTE, AND VENT PIPE AND PIPE FITTINGS
- CAN/CGSB-24.3 IDENTIFICATION OF PIPING SYSTEMS

2.0 COPPER TUBE AND FITTINGS:

- CAST BRASS AND WROUGHT COPPER FITTINGS TO CAN/CSA-B125.3
- JOINING: LEAD-FREE SOLDER (95:5 TIN ANTIMONY) RATED FOR USE IN POTABLE WATER SYSTEMS

3.0 CAST IRON PIPING AND FITTINGS:

- BURIED SANITARY/STORM/VENT PIPING TO BE MINIMUM NPS 3, WITH POLYETHYLENE FILM WRAP, TO CAN/CSA-B70 WITH FOLLOWING JOINING METHODS:
- MECHANICAL: NEOPRENE OR BUTYL RUBBER COMPRESSION GASKETS, TO CAN/CSA-B70
- HUB AND SPIGOT: CAULKING LEAD TO CSA B67, COLD CAULKING COMPOUNDS

ABOVE-GROUND SANITARY/STORM/VENT PIPING TO CAN/CSA-B70 WITH FOLLOWING JOINING METHODS:

- MECHANICAL: NEOPRENE OR BUTYL RUBBER COMPRESSION GASKETS, TO CAN/CSA-B70, WITH STAINLESS STEEL CLAMPS
- HUB AND SPIGOT: CAULKING LEAD TO CSA B67

STORM WATER DRAINAGE:

- VERIFY THAT DOWNS ARE SECURE
- ENSURE WEIRS ARE CORRECTLY SIZED AND INSTALLED PROPERLY
- VERIFY PROVISIONS FOR MOVEMENT OF ROOF SYSTEM

4.0 PVC PIPING AND FITTINGS:

- MUST BE AIR PLENIUM AND HIGH-BUILDING RATED (FLAME SPREAD <= 25, AND SMOKE DEVELOPED CLASSIFICATION <= 50), TESTED AND VERIFIED TO CAN/ULC S102.2. BASIS OF DESIGN PERFORMANCE: IPEX XFR OR APPROVED EQUIVALENT.
- PIPING AND FITTINGS CERTIFIED TO CSA B181.2.

5.0 CLEANOUTS:

- PROVIDE AND SET CLEANOUTS AT ALL POINTS REQUIRED BY CODE AND WHERE INDICATED ON DRAWINGS.
- ENSURE ACCESSIBLE AND THAT ACCESS DOORS ARE CORRECTLY LOCATED, EXTENDING BRANCH CONNECTIONS TO FINISHED SURFACES AND FITTING THEM WITH A SUITABLE ACCESS DOOR / COVER.
- OPEN, COVER IN LINED OIL, AND RE-SEAL
- VERIFY THAT CLEAN-OUT RODS CAN PROBE AS FAR AS THE NEXT CLEANOUT (AT MINIMUM)

6.0 TESTING / VERIFICATION:

- PRESSURE TEST BURIED SYSTEMS BEFORE BACKFILLING
- HYDRAULICALLY TEST TO VERIFY GRADES AND FREEDOM FROM OBSTRUCTIONS
- TEST TO ENSURE THAT TRAPS ARE FULLY AND PERMANENTLY PRIMED
- ENSURE THAT FIXTURES ARE PROPERLY ANCHORED, CONNECTED TO DRAINAGE SYSTEM, AND EFFECTIVELY VENTED AS REQUIRED
- AFFIX APPLICABLE LABEL (STORM / SANITARY / VENT / PUMP DISCHARGE / ETC.) COMPLETE WITH DIRECTIONAL ARROWS MINIMUM EVERY 15 FT (4.5 M), AND AT LEAST ONCE PER FLOOR.

THERMAL INSULATION OF PIPING

1.0 GENERAL:

ALL WORK AND MATERIALS TO THE FOLLOWING SPECIFICATIONS/REQUIREMENTS:

- ONTARIO BUILDING CODE (OBC)
- NATIONAL PLUMBING CODE OF CANADA (NPC)
- AUTHORITIES HAVING JURISDICTION (AHJ), AS APPLICABLE
- ASHRAE STANDARD 90.1 ENERGY STANDARD FOR BUILDINGS EXCEPT LOW-RISE RESIDENTIAL BUILDINGS
- CGSB 51-GP-52MA VAPOUR BARRIER, JACKET, AND FACING MATERIAL FOR PIPE, DUCT, AND EQUIPMENT THERMAL INSULATION
- CAN/CGSB-51.53 POLY VINYL-CHLORIDE JACKETING SHEET, FOR INSULATED PIPES, VESSELS, AND ROUND DUCTS
- TIAC: NATIONAL INSULATION STANDARDS
- CAN/ULC-701 THERMAL INSULATION, POLYSTYRENE, BOARDS AND PIPE COVERING
- CAN/ULC-702 THERMAL INSULATION, MINERAL FIBRE, FOR BUILDINGS
- CAN/ULC-702.2 THERMAL INSULATION, MINERAL FIBRE, FOR BUILDINGS, PART 2: APPLICATION GUIDELINES

2.0 FIRE AND SMOKE RATING:

TO CAN/ULC-S102 STANDARD METHOD OF TEST FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS AND ASSEMBLIES, WITH MAXIMUM FLAME SPREAD RATING OF 25 AND MAXIMUM SMOKE DEVELOPED RATING OF 50

3.0 INSULATION:

- THERMAL CONDUCTIVITY (K FACTOR) TO NOT EXCEED SPECIFIED VALUES AT 75 FAHRENHEIT (24 CELSIUS) MEAN TEMPERATURE WHEN TESTED IN ACCORDANCE WITH ASTM C335
- MAXIMUM K FACTOR TO CAN/ULC-S702 AND/OR ASTM C547
- JACKETING TO CGSB 51-GP-52MA, TYPE TO MEET CONDITIONS AT LOCATION OF INSTALLATION AND PIPING TYPE.

4.0 INSTALLATION:

- INSTALL IN ACCORDANCE WITH TIAC NATIONAL STANDARDS
- APPLY MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS
- USE TWO (2) LAYERS WITH STAGGERED JOINTS WHEN REQUIRED NOMINAL WALL THICKNESS EXCEEDS 3IN (75MM)
- MAINTAIN UNINTERRUPTED CONTINUITY AND INTEGRITY OF VAPOUR RETARDER JACKET AND FINISHES. INSTALL HANGERS AND SUPPORTS OUTSIDE VAPOUR RETARDED JACKET
- SUPPORTS AND HANGERS - APPLY HIGH-COMPRESSIVE STRENGTH INSULATION, SUITABLE FOR SERVICE, AT OVERSIZED SADDLES AND SHOES WHERE INSULATION SADDLES HAVE NOT BEEN PROVIDED

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4	ISSUED FOR ADDENDUM M1	JULY 13, 2026
3	ISSUED FOR PERMIT & TENDER	MAY 29, 2026
2	ISSUED FOR REVIEW	APR. 24, 2026
1	ISSUED FOR PERMIT AND PRICING	FEB. 21, 2025
0	ISSUED FOR REVIEW	APR. 24, 2024
No	DESCRIPTION	DATE

REVISIONS

client:

BELL+ASSOCIATES ARCHITECTURE

186 PEMBROKE STREET EAST
PEMBROKE, ON K8A 3J7

project:

MILLHAVEN GARAGE ADMINISTRATION BUILDING

240 COUNTY ROAD 4,
BATH, ONTARIO K0H 1G0

drawing title:

MECHANICAL SPECIFICATIONS

scale:	AS NOTED	drawn by:	K.P.
designed by:	K.P.	reviewed by:	P.P.
approved by:	P.P.	date:	JULY 2026

project no.:

420-2301-03

drawing no.:

M-4
of 4