

	PLUMBING PI	PING L	EGEND		AIR SYST	EM LEG				
N	DOMESTIC COLD WATER	IW	INDUSTRIAL WASTE ABOVE FLOOR OR		RECTANGULAR SUPPLY/ OUTSIDE AIR DUCT UP	CFM	SPACE PRESSURIZATION ARROW	1.	ALL DRAV	MINGS ARE D 1ATIONS ONL
<u> </u>	COMPRESSED AIR	IW	- INDUSTRIAL WASTE BELOW FLOOR	123	RECTANGULAR SUPPLY/ OUTSIDE AIR DUCT DOWN	DL/ UC— r -	DOOR LOUVER / UNDERCUT DOOR		PROJECT.	THESE DRAM
N N	CLEAR WATER WASTE ABOVE FLOOR		OR GROUND	2	RECTANGULAR RETURN/ RELIEF	+	SUPPLY AIRFLOW ARROW		OUTLETS,	FURNITURE
	OR GROUND	—км—	- KITCHEN WASTE ABOVE FLOOR/GROUND	4	RECTANGULAR RETURN/ RELIEF		RETURN OR EXHAUST AIRFLOW ARROW	2.	IN EVERY	INSTANCE W ERIALS BE R
N —	CLEAR WATER WASTE BELOW FLOOR	—км—	- KITCHEN WASTE BELOW FLOOR/GROUND		RECTANGULAR EXHAUST AIR DUCT	1	AIR VOLUME TRAVERSE STATION		PART IN WHERE N	NEW LOCATIO
v—	OR GROUND	G	- LIQUID PETROLEUM GAS		UP RECTANGULAR EXHAUST AIR DUCT		CEILING DIFFUSER			. TEST ALL I
<u> </u>	DEIONIZED WATER SUPPLY	— HG —	- NATURAL GAS - HIGH PRESSURE		DOWN		(SUPPLY)	7		
<u>ا ا ا</u>	DEIONIZED WATER RETURN	— MG —	- NATURAL GAS - MEDIUM PRESSURE	7 8	ROUND SUPPLY/ OUTSIDE AIR DUCT UP		RETURN AIR GRILLE OR REGISTER	5.	STRUCTU	RAL CONSULT
<u> </u>	GRAY WATER ABOVE FLOOR OR GROUND	PD	- PUMP DISHARGE	2	ROUND SUPPLY/ OUTSIDE AIR DUCT DOWN	\square	EXHAUST AIR GRILLE OR REGISTER		ON THE	BUILDING. TH
/ <u></u>	GRAY WATER BELOW FLOOR OR GROUND	— RW —	- RECLAIMED WATER	20	ROUND RETURN/ RELIEF AIR DUCT UP	пп			COORDIN/ WORK SH	ATE ALL COR ALL BE PERF
<u>w</u> 40	HOT WATER (140°F)		- REVERSE OSMOSIS WATER RETURN	477	ROUND RETURN/ RELIEF AIR DUCT		LIGHT TROFFER DIFFUSER	4.	ALL WOR	K SHALL BE
40—	HOT WATER RETURN (140°F)	— SAN—	- SANITARY SEWER ABOVE FLOOR/GROUND				DIFFUSER WITH FLOW		ADHERE	TO THE REQU
60 —	HOT WATER (160°F)	— SAN —	- SANITARY SEWER BELOW FLOOR/GROUND			Â.	DIRECTION. NO FLOW ARROWS	5.		TOR SHALL E
60—	HOT WATER RETURN (160°F)		- SANITARY SEWER VENT	4 3	ROUND EXHAUST AIR DUCT DOWN	•	PATTERN.		MANNER	TO ENSURE
/ <u>R</u> N	SOFT COLD WATER		- STORM DRAIN ABOVE FLOOR/GROUND	2==3	INSULATION		CIRCULAR CEILING DIFFUSER (SUPPLY)	6.	ALL OPEN	INGS IN BUI
N	SOFT HOT WATER	——SSD—	- SECONDARY STORM DRAIN ABOVE		STAINLESS STEEL DUCT		SIDE WALL GRILLE		APPROVE	D FIRE STOP
/R	SOFT HOT WATER RETURN		FLOOR OR GROUND		PVC COATED DUCT	Ήĭ	HUMIDITY SENSOR / HUMIDISTAT &	7.	ALL PIPE	PENETRATIO
<u>۲</u>	FUEL OIL RETURN	SSD	- SECONDARY STORM DRAIN BELOW		DOUBLE WALL DUCT	_ ا	SENSOR AND NUMBER		MATERIAL THE BUIL	. FIRE STOP DING. REFER
v —	FUEL OIL SUPPLY		- SUBSURFACE STORM DRAIN		AUTOMATIC CONTROL DAMPER FOR			8.	SEAL AIR	-TIGHT AROL
v —	INDUSTRIAL NONPOTABLE HOT WATER	TP	- TRAP PRIMER		ROUND AND RECTANGULAR DUCT		TENDEDATIDE SENSOR /		BAFFLES	ABOVE CEILI
R—	INDUSTRIAL NONPOTABLE HOT	— тw —	- TEMPERED WATER		RECTANGULAR DUCT	Ωĭ	THERMOSTAT & ZONE NUMBER	9.	COORDIN	TE WITH TEN
	WATER RETURN	TWR	TEMPERED WATER RETURN		FIRE DAMPER FOR ROUND AND RECTANGULAR DUCT	Ξ×	W/ VANDAL GUARD & ZONE NUMBER	10.	PROVIDE	TEMPORARY
w—	INDUSTRIAL NONPOTABLE SOFT				SMOKE DAMPER FOR ROUND AND RECTANGULAR DUCT	YM	REMOTE DAMPER OPERATOR		FILTERS	SHALL HAVE
w—	INDUSTRIAL NONPOTABLE SOFT		- WASTE OIL	SFD	COMBINATION SMOKE/FIRE DAMPER	(DP)	DIFFERENTIAL PRESSURE SENSOR		REMOVED	
	HOT WATER		- WASTE OIL VENT		SLIDE GATE DAMPER FOR ROUND)		11.	ALL FILTE	NS IN BASE UPON COM
VR—	INDUSTRIAL NONPOTABLE SOFT	+++++	- DEMOLITION PIPING		AND RECTANGULAR DUCT MANUAL VOLUME DAMPER FOR ROUND			12.	CONTRAC	TOR SHALL E
	HOT WATER RETURN		DEMOLITION EQUIPMENT		AND RECTANGULAR DUCT	 €	STATIC PRESSURE SENSOR		FINISHES	AFFECTED B
	INDUSTRIAL VENT				FLEXIBLE CONNECTION	(0)	CARBON MONOXIDE SENSOR	13.	ALL INST BUILDING	ALLATIONS W MANAGEMEN
			TIONS			602	CARBON DIOXIDE SENSOR		INTERFER	ENCES TO S
	GENERAL AB		4110INS		(SHOWN ON ROOF)	AA-##	DIFFUSER TYPE – DIFFUSER SIZE	14.	THE CON	TRACTOR IS
D	EGREES FAHRENHEIT	MFR	MANUFACTURER			##	DIFFUSER CFM		LEASED F	REMISES SH
	EGREES CELSIUS	MIN MTD	MINIMUM	OR OR	(IND) ROOF EXHAUST FAN (SHOWN ON FLOOR PLAN)	CTE	CONNECT TO EXISTING	15.		NS ON DRAW
A	CCESS DOOR	N/A	NOT APPLICABLE					10		
A	DJUSTABLE	NC	NORMALLY CLOSED OR NOISE CRITERIA					16.	CONTRAC	TOR, CONVER
A	BOVE FINISHED FLOOR	NIC	NOT IN CONTRACT		PLUMBING S	IMBOL L	EGEND		CONTRAC	TOR FOR ALL 602-8622.
	BOVE FINISHED GRADE	NO NOM	NORMALLY OPEN OR NUMBER	G	PIPING TURN DOWN OR DROP	#-	WALL HYDRANT	17.	ALL SPRI	NKLER AND I
B	RAKE HORSEPOWER	NTS	NOMINAL NOT TO SCALE		PIPING TURN UP OR RISE PIPING TEF DOWN OR DROP		UNION FLOW SWITCH		APPROVE	D TO DO WO
B	OTTOM OF DUCT	OB	OCTAVE BAND		PIPING TEE UP OR RISE		PRESSURE SWITCH	18.	ALL TEST	ING, ADJUST
В	UILDING MANAGEMENT CONTROL SYSTEM	OC	ON CENTER	ം	P-TRAP		EXPANSION JOINT		DESIGN A	ND CONSTRU
B	OTTOM OF PIPE	OD	OUTSIDE DIAMETER		GATE VALVE		AUTOMATIC AIR VENT	19.	ANY SHU	TDOWN, DRAI
B	RITISH THERMAL UNIT RITISH THERMAL LINIT DER HOUR				BALL VALVE	¥ ••_;	VALVE ON PIPING RISE OR DROP		DONE BY	
	EILING	PH	PHASE		MIXING VALVE		TRAP PRIMER		INSTRUCT	IONS, & SHA
c	OLUMN	POC	POINT OF CONNECTION		BUTTERFLY VALVE		THERMOMETER	20.	ALL NOIS	Y WORK (CO
С	UBIC FEET	POD	POINT OF DEMARCATION		GLOBE VALVE PRESSURE REDUCING VALVE		WATER HAMMER ARRESTOR		TAKING F	LACE.
D	RY BULB TEMPERATURE	POS	POSITION OR POSITIVE		BACKFLOW PREVENTER		SLOPE & DIRECTION OF FALL	21.	ALL CORI	DRILLING S
	IFFERENTIAL PRESSURE	QTY	QUANTITY		BALANCING VALVE		REDUCER OR INCREASER		HOURS IN WITH, AN	I ADVANCE (D APPROVED
D	RAWING	RC	ROOM CRITERIA (NOISE)		AUTOMATIC FLOW CONTROL VALVE	\square	POINT OF CONNECTION	22		S OF CORES
E	ACH	RET	RETURN	<u>下外</u> 下沿	IEMF. & FRESSURE RELIEF VALVE	ø			WORK W	TH CLIENT AN
E	FFICIENCY	REQD	REQUIRED		MOTORIZED SHUT-OFF VALVE	₽́	SQUARE FEET	23.	SUBMIT 1	O TENANT &
		RH	RELATIVE HUMIDITY		SOLENOID VALVE	8	DRAIN RECEPTOR		DATA SH	EETS, BROCH
E	QUIPMENT	RPM	REVOLUTIONS PER MINUTE							IUN INSTRUC
E	XHAUST	SCH	SCHEDULE		WALL CLEAN OUT		FLOOR SINK	24.	"REVIEWE	O IENANI & D"BY THE II
E	XPANSION	SHT	SHEET	d	EXTERIOR CLEAN OUT		ROOF DRAIN	25.	SUBMIT 1	0 TENANT &
E	XISTING	SPEC	SPECIFICATION	[CAPPED PIPE / CLEAN OUT		SECONDARY ROOF DRAIN		DRAWING	S SHALL BE
E	XISTING TO BE REMOVED	SQ SQFT	SQUARE FEET		FLEXIBLE CONNECTION (PIPE)	(E) 西	EXISTING BY-PASS TERMINAL LINIT		MARKED-	UP DRAWING
F	IRE ALARM	STD	STANDARD			<u> </u>				
F	LOOR DRAIN	SUP	SUPPLY		TACS &		.с			
F	LOOR	TEMP	TEMPERATURE				5			
- F	EET PER MINUTE			EQUIP	EQUIPMENT REQUIRING ELECTRICAL	<u> </u>	REVISION CALLOUT	M-1)	MECHANIC
F	eet per second	TOD	TOP OF DOCT	#	PERFORMANCE REQUIREMENTS.	\bigcirc	KEYNOTE CALLOUT	M	- 5	MECHANIC
G	AUGE	TOP	TOP OF PIPE		EQUIPMENT NOT REQUIRING	,	POINT OF CONNECTION	M-4	ļ	MECHANIC
G	ALLONS	TYP	TYPICAL	#	SCHEDULES FOR PERFORMANCE		POINT OF DEMARCATION	M-5	<u>,</u>	MECHANIC
G	ALLONS PER HOUR		UNLESS NOTED OTHERWISE		REQUIREMENTS. SECTION CALLOUT		FURNISHED & INSTALLED BY	м-(м-	,	
G G	ALLUNS PER MINUTE	עוא ע ווא	UP IHKUUGH KUUF		SECTION DESIGNATION			M-8	}	MECHANIC
Н	OUR	· VAV	VARIABLE AIR VOLUME	P3.1		$\langle M \rangle$	MECHANICAL			·
Н	ERTZ	VEL	VELOCITY		DETAIL CALLOUT — DETAIL DESIGNATION	$\langle P \rangle$	FURNISHED AND INSTALLED BY PLUMBING			
IN	ISIDE DIAMETER	VFD	VARIABLE FREQUENCY DRIVE	P3.1	- SHEET NUMBER	S E	HEAT TRACE CIRCUIT START AND END			
	ICHES	VOL			·	<u> </u>				
<u> К</u>	OUND	wirk W	WDTH		FIRE PRATEA	TION I F	GEND			
-+ <u>'</u> u	NEAR FEET	W/	WITH			HUN LL				
L	EAVING	W/0	WITHOUT		PORTABLE FIRE EXTINGUISHER					
M	AXIMUM	WB	WET BULB TEMPERATURE	L						
<u>Т</u>	HOUSAND BRITISH THERMAL UNITS PER OUR	WF WG								
— м	EZZANINE	WT	WEIGHT							

	CLIENT	
GENERAL NOTES		
NGS ARE DIAGRAMMATIC ONLY. THE ARRANGEMENTS OF EQUIPMENT SHOWN ARE TIONS ONLY AND MAY BE ALTERED BY THE ENGINEERS TO MEET THE REQUIREMENTS OF THE THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH THE ARCHITECT'S, INTERIOR AND MECHANICAL DRAWINGS FOR LOCATION OF ALL LUMINARIES, SWITCHES, DEVICES, "URNITURE FEEDING POINTS, DIMENSIONS, MOUNTING HEIGHTS, AND CONSTRUCTION DETAILS."	MUN	110
NSTANCE WHERE IT IS REQUIRED IN THE SPECIFICATION OR ON DRAWING THAT EQUIPMENT RIALS BE REMOVED FROM EXISTING LOCATIONS AND RE-INSTALLED, EITHER IN WHOLE OR IN EW LOCATIONS, ALL SUCH EQUIPMENT AND MATERIALS SHALL BE THOROUGHLY CLEANED AND DESSARY PUT INTO GOOD OPERATING CONDITION BEFORE BEING RE-INSTALLED IN THE NEW TEST ALL PARTS OF THE RE-USED OR RELOCATED ELECTRICAL EQUIPMENT AND CORRECT S AND GROUNDS.		
OPENINGS SHALL BE X-RAYED AND REVIEWED WITH LANDLORD AND BASE BUILDING AL CONSULTANT. CONTRACTOR SHALL X-RAY THE FLOOR AND SUBMIT TO BASE BUILDING AL ENGINEER FOR WRITTEN APPROVAL AT LEAST 72 HOURS PRIOR TO ANY CORE DRILLING JILDING. THE CONTRACTOR SHALL INCLUDE THE COST OF STRUCTURAL ENGINEER. E ALL CORE DRILLING WITH LANDLORD'S SITE REPRESENTATIVE AND TENANT. ALL NOISY L BE PERFORMED AFTER HOURS.	PROJECT NO	DRTH
SHALL BE PERFORMED IN ACCORDANCE WITH THE LANDLORD'S GUIDELINES AND SHALL THE REQUIREMENTS STATED IN THE BASE BUILDING CONSTRUCTION MANUAL.		
DR SHALL BE RESPONSIBLE FOR COORDINATION OF ALL WORK WITH ALL OTHER TRADES, ITS, TENANT & LANDLORD. ALL WORK SHALL BE SCHEDULED AND CARRIED OUT IN SUCH A D ENSURE CONTINUED AND NON—INTERRUPTED OPERATION OF EXISTING FACILITY.		
NGS IN BUILDING RISER, IF APPLICABLE, SHALL BE SEALED WITH APPROVED FIRE STOP ANY FIRE STOPPING MATERIAL REMOVED WILL BE REPLACED WITH A SUITABLE AND FIRE STOPPING MATERIAL AND SHALL BE INSTALLED AS PER BUILDING AND FIRE CODE		
PENETRATIONS THROUGH FIRE RATED WALLS & FLOORS SHALL BE SEALED WITH FIRE STOP FIRE STOP MATERIAL SHALL BE THAT WHICH IS APPROVED BY THE LANDLORD FOR USE IN NG. REFER TO BASE BUILDING CONSTRUCTION MANUAL FOR FIRE STOPPING REQUIREMENTS.		
TIGHT AROUND ALL DUCT, PIPE, CONDUIT & WIRE PENETRATIONS THROUGH PARTITIONS, BOVE CEILINGS & THROUGH FLOORS THAT ARE NOT FIRE RATED.		
E WITH TENANT & LANDLORD TO CONFIRM EQUIPMENT, SYSTEMS & DEVICES TO REMAIN.		
G TO THE ADJACENT TENANT SPACE THAT REMAIN OPERATIONAL DURING CONSTRUCTION. IALL HAVE A MERV RATING OF 13. FILTERS SHALL BE REPLACED WEEKLY & SHALL BE IPON COMPLETION OF CONSTRUCTION.		
S IN BASE BUILDING AIR HANDLING EQUIPMENT SERVING THE CONSTRUCTION AREA SHALL BE UPON COMPLETION OF CONSTRUCTION.		
OR SHALL BE RESPONSIBLE FOR ALL REFINISHING OF DAMAGED BUILDING AREAS AND FFECTED BY THE WORK AS OUTLINED UNDER SCOPE OF WORK OF THIS PROJECT.		
LATIONS WITHIN EXISTING AREAS SHALL BE COORDINATED WITH LANDLORD AND BASE IANAGEMENT. INSTALLATION MUST BE PERFORMED IN A MANNER TO ELIMINATE ANY ICES TO STAFF AND NORMAL OPERATION OF THE FACILITY.		
ACTOR IS RESPONSIBLE FOR THE INSTALLATION AND DISTRIBUTION OF TEMPORARY POWER PREMISES DURING THE CONSTRUCTION PERIOD. EXPOSED ELECTRICAL CORDS OUTSIDE THE EMISES SHALL NOT BE PERMITTED.	2	
S ON DRAWINGS ARE EXPRESSED IN METRIC UNITS AND FLOWS ON DRAWINGS ARE IN IMPERIAL UNITS.	1 ISSUE	
CONTROLS WORK SHALL BE PREFORMED BY THE BASE BUILDING HVAC CONTROLS DR, CONVERGINT TECHNOLOGIES. CONTRACTOR SHALL CARRY BASE BUILDING HVAC CONTROLS DR FOR ALL HVAC CONTROLS WORK. CONTACT OMAR YAKOBI: OMAR.YAKOBI@CONVERGINT.COM 502-8622.	IT IS THE	RESI
KLER AND FIRE PROTECTION WORK SHALL BE PERFORMED BY THE A SPRINKLER CONTRACTOR TO DO WORK IN THE BUILDING. REFER TO TENANT DESIGN AND CONSTRUCTION MANUAL.	REPORT BEFORE	anl All WO
IG, ADJUSTING, AND BALANCING (TAB) WORK SHALL BE PERFORMED BY AN INDEPENDENT AIR R BALANCING CONTRACTOR APPROVED TO DO WORK IN THE BUILDING. REFER TO TENANT D CONSTRUCTION MANUAL.	ALL WO APPLICA	rk I: \ble
DOWN, DRAINAGE, AND/OR FILLING OF BASE BUILDING SYSTEMS AND/OR SERVICES SHALL BE THE LANDLORD'S BUILDING MANAGEMENT STAFF. SCHEDULE & COORDINATE ANY SHUTDOWNS LANDLORD AT LEAST 72 HOURS IN ADVANCE. CONTRACTOR SHALL FOLLOW ALL LANDLORD'S INS, & SHALL CARRY ALL COSTS ASSOCIATED WITH THIS WORK IN THE TENDER PRICE.	DO NOT	SC,
WORK (CORE DRILLING, ETC.) SHALL BE PERFORMED AFTER HOURS AND SHALL BE ED WITH THE LANDLORD & THE FACILITY AT LEAST 72 HOURS IN ADVANCE OF THE WORK ACE.		
DRILLING SHALL BE COORDINATED WITH THE CLIENT AND THE LANDLORD AT LEAST 72 ADVANCE OF ANY WORK TAKING PLACE. LOCATIONS OF ALL CORE SHALL BE COORDINATED APPROVED BY THE LANDLORD'S STRUCTURAL ENGINEER.		
OF CORES SHALL BE X-RAYED PRIOR TO START OF CORING WORK. COORDINATE X-RAY CLIENT AND LANDLORD AT LEAST 72 HOURS IN ADVANCE.		
TENANT & LANDLORD OPERATIONS & MAINTENANCE MANUALS FOR EACH PIECE OF PROVIDED UNDER THIS CONTRACT. OPERATION & MAINTENANCE MANUALS SHALL INCLUDE TS, BROCHURES, MAINTENANCE INFORMATION, RECOMMENDED SPARE PARTS LISTS, IN INSTRUCTIONS, & START-UP CERTIFICATES.		
TENANT & LANDLORD A REVIEWED SET OF ALL SHOP DRAWINGS CLEARLY MARKED WITH BY THE INSTALLING CONTRACTOR & THE TENANT ENGINEER.	PROFESSIO	NAL -
TENANT & LANDLORD A COMPLETE SET OF AS-BUILT RECORD DRAWINGS. AS-BUILT SHALL BE PREPARED USING CAD SOFTWARE (I.E. AUTOCAD) & SUBMITTED IN DIGITAL PDF & ATS, AND AS A HARD COPY TO EACH THE TENANT & THE LANDLORD. SCANNED REDLINE P DRAWINGS ARE NOT ACCEPTABLE.		
DRAWING LIST		
MECHANICAL NOTES AND LEGENDS MECHANICAL SPECIFICATIONS	EXP Se	rvi
MECHANICAL SPECIFICATIONS MECHANICAL SPECIFICATIONS	T: 613.688 100 – 2650	.189 Qu
MECHANICAL SCHEDULES AND DETAILS MECHANICAL – SECOND FLOOR – PLUMBING & FIRE PROTECTION PLAN	Ottawa, O Canada	NK
MECHANICAL – SECOND FLOOR – HVAC PLAN MECHANICAL – ROOF PLAN	www.exp.	com
	• BUI • INDU	LDI STF
	PROJECT	
		1
		1
	DRAWING	
		N 1

ICIPALITY OF CASSELMAN

ISSUED FOR 99% COORDINATION 2025-02-24 ISSUED FOR 66% COORDINATION 2023-05-12 DATE DESCRIPTION

SPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO ND VERIFY ALL DIMENSIONS ON SITE AND PROMPTLY LL ERRORS AND/OR OMISSIONS TO THE CONSULTANT ORK COMMENCES.

k is to follow the OBC 2012 and any other BLE CODES AND REGULATIONS.

CALE DRAWINGS.

_ STAMP

rvices Inc. 1899 Queensview Drive I K2B 8H6



DINGS • EARTH & ENVIRONMENT • ENERGY • RIAL • INFRASTRUCTURE • SUSTAINABILITY •

INDUSTRIEL STREET OFFICE FIT-UP

MECHANICAL NOTES AND LEGENDS

PROJECT No: REVISION: MRK-23002008-A0 DRAWN: DATE: M. OMAR JUNE 2023 APPROVED: SCALE: B. BROWN AS SHOWN DRAWING No:

M-1

<u>GENERAL</u>

1. GENERAL REQUIREMENTS

AUTHORITIES HAVING JURISDICTION.

- THE WORK SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE BUILDING CODE, THE MINISTRY OF LABOUR, THE CITY AND ALL CODES HAVING JURISDICTION, WHICH ARE TO BE CONSIDERED AN INTEGRAL PART OF THESE SPECIFICATIONS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION & PROVIDE REPAIR OF ADJACENT EXISTING SURFACES, EQUIPMENT, AREAS & PROPERTY THAT 1.2. MAY BE DAMAGED AS A RESULT OF ANY DEMOLITION AND / OR NEW WORK.
- 1.3. PAY FOR AND OBTAIN ALL REQUIRED PERMITS, FEES. LICENSES, CERTIFICATES OF INSPECTION, ETC. PROVIDE AND SUBMIT REQUIRED DRAWINGS TO THE
- THE CONTRACTOR SHALL FURNISH ALL MATERIALS, LABOR, EQUIPMENT, TRANSPORTATION & SERVICES NECESSARY FOR COMPLETION OF THE WORK. ALL 1.4. MATERIALS & WORK SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES & GOVERNING REGULATIONS & SHALL MEET WITH THE APPROVAL OF THE CITY & PROVINCIAL FIRE MARSHAL
- ALL DRAWINGS ARE CONSIDERED TO BE PART OF THE CONTRACT DOCUMENTS . THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE REVIEW & 1.5. COORDINATION OF ALL DRAWINGS PRIOR TO ANY CONSTRUCTION, INCLUDING ARCHITECTURAL, STRUCTURAL, AIR CONDITIONING, PLUMBING & ELECTRICAL. ANY DISCREPANCIES THAT OCCUR SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER PRIOR TO THE START OF CONSTRUCTION SO THAT A CLARIFICATION MAY BE ISSUED. ANY WORK PERFORMED IN CONFLICT WITH THE CONTRACT DOCUMENTS OR ANY CODE REQUIREMENT SHALL BE CORRECTED BY THE CONTRACTOR AT HIS OWN EXPENSE, & AT NO EXPENSE TO THE OWNER .
- 1.6. DO NOT SCALE DRAWINGS - ALL DIMENSIONS & JOB SITE CONDITIONS SHALL BE VERIFIED BY THE CONTRACTOR AT THE JOB SITE PRIOR TO BID SUBMITTAL, START OF CONSTRUCTION AND / OR FABRICATION OF MATERIALS. IF DISCREPANCIES ARE ENCOUNTERED, THE ENGINEER SHALL BE NOTIFIED FOR CLARIFICATION
- CONTRACTOR TO PROVIDE ANY TEMPORARY HEATING AND OR COOLING MEASURES FOR SPACES THAT REQUIRE THE SHUTDOWN OF AN EQUIPMENT 1.7. SERVING MULTIPLE AREAS.
- CONTRACTOR TO KEEP A RECORD SET OF DRAWINGS ON SITE AT ALL TIMES. ANY CHANGES SHALL BE RECORDED ON THIS SET FOR AS-BUILT 1.8. DRAWINGS
- PROVIDE SEISMIC BRACING FOR MECHANICAL EQUIPMENT BASED ON APPROPRIATE SEISMIC ZONE REQUIREMENTS PER LOCAL AND NATIONAL CODES. 1.9. CONTRACTOR'S RESPONSIBILITY INCLUDES STRUCTURAL ENGINEER'S CERTIFICATION ON DETAILS SUBMITTED FOR PERMITTING.
- 2. INTERRUPTION OF SERVICES
- 2.2. ALL INTERRUPTIONS OF EXISTING MECHANICAL SYSTEMS MUST BE APPROVED BY AND CO-ORDINATED WITH THE OWNER.
- DISRUPTION OF NORMAL OPERATIONS WILL NOT BE ALLOWED. ALL INTERRUPTIONS SHALL OCCUR AFTER THE CLOSE OF NORMAL HOURS. PREMIUM TIME 2.3. TO BE INCLUDED IN THE TENDER PRICE.
- 2.1. CONTRACTOR TO ARRANGE WITH THE OWNER FOR NECESSARY SHUTDOWNS FOR ALL SYSTEMS THAT REQUIRE TIE-INS AND WORK WITHIN OTHER TENANT SPACES. SCHEDULING OF THIS WORK TO BE COORDINATED WITH THE OWNER AND OTHER TENANTS.
- 3. SHOP DRAWINGS
- 3.1. SUBMIT SHOP DRAWINGS FOR THE FOLLOWING MAJOR EQUIPMENT:
- 3.1.1. HVAC UNIT 3.1.2. DOMESTIC HOT WATER HEATER
- 3.1.3. SUPPLY AIR DIFFUSERS, GRILLES & REGISTERS EXHAUST FANS 3.1.4.
- 3.1.5. FLOOR DRAINS 3.1.6. HUB DRAINS
- 3.1.7. PLUMBING FIXTURES
- ALTERNATE EQUIPMENT MAY BE SPECIFIED, PROVIDED THAT THE SPACE REQUIREMENTS, QUALITY AND PERFORMANCE CHARACTERISTICS, AIR AND FLUID 3.2. FLOW REQUIREMENTS, WEIGHTS AND POWER REQUIREMENTS ARE EQUAL TO THE SPECIFIED EQUIPMENT. ACCEPTANCE OF ANY ALTERNATE EQUIPMENT SHALL BE BY THE CONSULTANT.
- 4. COORDINATION
- COORDINATE AND VERIFY EXACT LOCATIONS, SIZES, POINTS OF CONNECTION AND INVERT ELEVATIONS OF NEW AND EXISTING BUILDING PLUMBING SERVICE LATERALS ON SITE PRIOR TO PERFORMING WORK. NOTIFY ARCHITECT IMMEDIATELY OF ANY DISCREPANCIES. MAKE FINAL CONNECTIONS TO LATERALS.
- 4.2. COORDINATE ELECTRICAL REQUIREMENTS WITH THE ELECTRICAL CONTRACTOR INCLUDING POWER LOADS OF NEW EQUIPMENT, FIXTURES AND APPLIANCES.
- 4.3. COORDINATE ACCESS PANEL REQUIREMENTS WITH THE ARCHITECT. PROVIDE PANEL SIZES, FINISH, ELEVATIONS AND LOCATIONS.
- COORDINATE LOCATIONS, SIZES AND ELEVATIONS OF SLEEVES AND PENETRATIONS THRU WALLS, FLOORS, BEAMS (INCLUDING GRADE BEAMS/FOOTINGS) 4.4. AND SLABS WITH THE ARCHITECT AND STRUCTURAL ENGINEER.
- COORDINATE AND PROVIDE PIPING ROUGH-INS AND CONNECTIONS TO EQUIPMENT, FIXTURES AND APPLIANCES THRU PRE MANUFACTURED CABINET 4.5. FRAMING SYSTEMS (CHASES).
- THE LOCATION, QUANTITIES AND SIZES OF EXISTING PIPING, FIXTURES, EQUIPMENT, SHUT-OFF VALVES, ETC. INDICATED ON THE PLANS HAS BEEN DERIVED FROM AVAILABLE RECORD DRAWINGS AND FIELD INVESTIGATIONS AND ARE SHOWN DIAGRAMMATICALLY. THE CONTRACTOR SHALL VERIFY ALL SUCH ITEMS PRIOR TO INSTALLATION OF NEW WORK.
- WHERE EXISTING/UNDOCUMENTED PIPING SYSTEMS ARE INSTALLED IN WALLS THAT ARE TO BE REMOVED OR REMODELED, THE CONTRACTOR SHALL 4.7. IMMEDIATELY IDENTIFY SUCH SYSTEMS TO THE ARCHITECT FOR REVIEW PRIOR TO DEMOLITION OR REROUTE. IF REROUTE IS DEEMED NECESSARY TO MAINTAIN OTHER BUILDING SYSTEM OPERATIONS, THE CONTRACTOR SHALL PROVIDE A SOLUTION TO THE REROUTE FOR REVIEW BY THE ARCHITECT.
- 4.8. CONTRACTOR SHALL COORDINATE ALL DUCT, PIPE AND EQUIPMENT LOCATIONS WITH ELECTRICAL, STRUCTURAL, PLUMBING AND ALL OTHER TRADES. 4.9. ALL OUTLETS FOR FUTURE CONNECTIONS SHALL BE INSTALLED SO AS TO PERMIT EASY CONNECTION. COORDINATE DUCTWORK, STRUCTURAL CONDITIONS AND ARCHITECTURAL LAYOUT.
- 5. SLEEVES, CUTTING AND PATCHING
- INSTALL SLEEVES AND FRAMES FOR PIPING AND SIMILAR EQUIPMENT TO BE BUILT INTO THE BUILDING AS THE CONSTRUCTION PROGRESSES. IF THESE 5.1. ARE NOT INSTALLED AT THE TIME OF CONSTRUCTION, THE COST OF CUTTING AND PATCHING AT A LATER DATE, WILL BE AT THE EXPENSE OF THIS CONTRACTOR.
- 5.2. THE PRIME MECHANICAL CONTRACTOR IS RESPONSIBLE FOR THE CUTTING AND PATCHING OF ALL HOLES AND OPENINGS UP TO AND INCLUDING 200 mm (8") DIAMETER.
- 5.3. THE PRIME MECHANICAL CONTRACTOR IS TO LOCATE THE EXACT POSITIONS AND DIMENSIONS OF LARGER OPENINGS FOR CUTTING BY THE GENERAL DIVISION.
- SEAL AROUND SERVICES PASSING THROUGH CUT OPENINGS WITH MATERIALS EQUIVALENT TO THE FIRE RATING OF THE WALL FLOOR OR ROOF. ENSURE 5.4. SEALING IS WEATHERPROOF FOR OPENINGS THROUGH EXTERIOR WALLS AND ROOFS. PROVIDE ANY PAINTING ON REPAIRED SURFACES IF REQUIRED BEFORE SEALING
- 5.5. PROVIDE SLEEVES FOR ALL NEW PIPING PASSING THROUGH FLOOR AND ROOF SLABS, BEAMS, CONCRETE WALLS AND SLAB TO SLAB PARTITIONS, ETC. SEAL TO BE AIR-TIGHT AROUND ALL DUCTWORK AND PIPING PENETRATIONS THROUGH PARTITIONS, BAFFLES ABOVE CEILINGS, AND THROUGH FLOORS 5.6.
- THAT ARE NOT FIRE RATED. PROVIDE ALL SLEEVES REQUIRED FOR DUCTWORK, PIPING AND ACCESS OPENINGS. 5.7.
- FOR INTERIOR WALLS, EXTERIOR WALLS ABOVE GRADE, NON WATERPROOF FLOORS, PROVIDE SCHEDULE 40 STEEL PIPE, MEDIUM CAST IRON OR 18 GAUGE GALVANIZED STEEL
- 6. COMMISSIONING AND CLOSEOUT
- 6.1. CONTRACTOR SHALL PROVIDE COMMISSIONING AND REPORT FOR ALL THE NEW EQUIPMENT AND ANY ON-SITE TRAINING REQUIRED FOR OPERATION.
- 6.2. CLEAN ALL EQUIPMENT AND THE OVERALL INSTALLATION. FOLLOW INITIAL MAINTENANCE INSTRUCTIONS FROM THE MANUFACTURER.
- 6.3. GUARANTEE IN WRITING FOR THE MATERIAL AND WORKMANSHIP INCLUDING THE MANUFACTURER'S GUARANTEE FOR THE PERIOD OF ONE (1) YEAR FROM THE DATE OF ACCEPTANCE.
- PROVIDE ALL DOCUMENTATION REQUIRED CLOSEOUT DOCUMENTATION (AIR/WATER BALANCE REPORT, NFPA 13 COMPLIANCE LETTER, TEST CERTIFICATES, 6.4. ETC.) PRIOR TO PROJECT CLOSEOUT & CLOSE OF BUILDING PERMIT. 6.5. CERTIFY IN WRITING FOR ALL WORK HAS BEEN COMPLETED IN ACCORDANCE WITH THE SPECIFICATIONS AND DRAWINGS.
- SUBMIT TO TENANT & LANDLORD OPERATIONS & MAINTENANCE MANUALS FOR EACH PIECE OF EQUIPMENT PROVIDED UNDER THIS CONTRACT. OPERATION 6.6. & MAINTENANCE MANUALS SHALL INCLUDE DATA SHEETS, BROCHURES, MAINTENANCE INFORMATION, RECOMMENDED SPARE PARTS LISTS, LUBRICATION INSTRUCTIONS, & START-UP CERTIFICATES.
- 6.7. SUBMIT TO TENANT & LANDLORD A REVIEWED SET OF ALL SHOP DRAWINGS CLEARLY MARKED WITH "REVIEWED" BY THE INSTALLING CONTRACTOR & THE TENANT ENGINEER.
- SUBMIT TO TENANT & LANDLORD A COMPLETE SET OF AS-BUILT RECORD DRAWINGS. AS-BUILT DRAWINGS SHALL BE PREPARED USING CAD SOFTWARE 6.8. (I.E. AUTOCAD) & SUBMITTED IN DIGITAL PDF & DWG FORMATS, AND AS A HARD COPY TO EACH THE TENANT & THE LANDLORD. SCANNED REDLINE MARKED-UP DRAWINGS ARE NOT ACCEPTABLE

FIRE EXTINGUISHERS

7. CODES AND STANDARDS: FIRE EXTINGUISHERS ARE TO BE IN ACCORDANCE WITH THE FOLLOWING CODES AND STANDARDS:

- NATIONAL FIRE CODE OF CANADA: NFPA 10, STANDARD FOR PORTABLE FIRE EXTINGUISHERS;
- CAN/ULC-S508-02 (INCLUDING AMENDMENTS 1 AND 2), STANDARD FOR THE RATING AND FIRE TESTING OF FIRE EXTINGUISHERS. 7.3. 8. GENERAL
- 8.1. ALL FIRE EXTINGUISHERS ARE TO BE PRESSURIZED (STORED PRESSURE) RECHARGEABLE TYPE, IN ACCORDANCE WITH NFPA 10, AND UL AND/OR ULC LISTED AND LABELLED FOR THE CLASS OF FIRES AND HAZARD LOCATIONS FOR WHICH THEY ARE SPECIFIED. 8.2. EACH EXTINGUISHER IS TO BE COMPLETE WITH:
- 8.2.1. A MANUFACTURER'S IDENTIFICATION LABEL INDICATING THE EXTINGUISHER MODEL NUMBER, RATING, AND OPERATING INSTRUCTIONS; AN ANODIZED ALUMINUM OR CHROME PLATED FORGED BRASS VALVE WITH POSITIVE SQUEEZE GRIP ON-OFF OPERATION AND A PULL-PIN 8.2.2.
- SAFETY LOCK; 8.2.3. DISCHARGE HOSE WITH NOZZLE OR HORN AND HOSE SECURING CLIP;

EI	LEC	<u>TRI</u>
_		

	19.1
	19.1 19.1 19.1 19.1 19.1
19.2.	/ 19.2 19.2 19.2

8.2.4. FOR WALL MOUNTED EXTINGUISHERS, A WALL MOUNTING BRACKET.	19.2.6. RBI WATER HEATERS.
9. INSTALLATION OF FIRE EXTINGUISHERS	19.3. INSTALLATION OF POINT-OF-USE ELECTRIC HOT WATER STORAGE TANK AND HEATER
9.1. PROVIDE FIRE EXTINGUISHERS OF TYPE(S) IN ACCORDANCE WITH REQUIREMENTS OF NFPA 10. 9.2. UNLESS OTHERWISE SHOWN OR SPECIFIED, WALL MOUNT EXTINGUISHERS USING WALL BRACKETS SUPPLIED WITH EXTINGUISHERS.	19.3.1. PROVIDE A POINT-OF-USE DOMESTIC HOT WATER HEATER. 19.3.2. PROVIDE A WALL BRACKET (SUPPLIED BY THE HEATER MANUFACTURER) FOR HEATER MOUNTING AND RIGIDL
9.3. DO NOT INSTALL EXTINGUISHERS UNTIL AFTER WALL FINISHING WORK IS COMPLETE. 9.4. BE RESPONSIBLE FOR MAINTAINING FIRE EXTINGUISHERS UNTIL SUBSTANTIAL COMPLETION OF THE WORK.	19.3.3. MOUNT HEATER IN A CATCH PAN AND:
9.5. IF EXTINGUISHERS ARE INDICATED ADJACENT TO A DOOR, LOCATE EXTINGUISHERS AT THE STRIKE SIDE OF THE DOOR.	19.3.5. PIPE AUXILIARY CATCH PAN TO DRAIN;
DOMESTIC WATER PIPING AND VALVES	19.3.7. CHECK AND TEST HEATER OPERATION AND, UNLESS OTHERWISE SPECIFIED OR INSTRUCTED, SET THERMOSTA WATER
10. DUMESTIC WATER PIPING AND VALVES ARE TO COMPLY WITH FOLLOWING CODES, REGULATIONS AND STANDARDS (AS APPLICABLE):	DRAINAGE WASTE PIPING SPECIALTIES
10.1. APPLICABLE LOCAL CODES AND REGULATIONS; 10.2. CAN/CSA B125.1, PLUMBING SUPPLY FITTINGS;	
10.3. CAN/CSA B125.3, PLUMBING FITTINGS; 10.4. CAN/CSA B137 SERIES. THERMOPLASTIC PRESSURE PIPING COMPENDIUM:	20.1. SHOP DRAWINGS/PRODUCT DATA: SUBMIT SHOP DRAWINGS/PRODUCT DATA SHEETS FOR ALL PRODUCTS SPECIFIED I
10.5. NSF/ANSI 14, PLASTICS PIPING SYSTEM COMPONENTS AND RELATED MATERIALS;	21. CLEANOUTS
10.0. NSF/ANSI 61, DRINKING WATER STSTEM COMPONENTS – HEALTH EFFECTS, 10.7. NSF/ANSI 372, DRINKING WATER SYSTEM COMPONENTS – LEAD CONTENT.	21.1. HORIZONTAL PIPING: TY PIPE FITTING WITH AN EXTRA HEAVY BRASS PLUG SCREWED INTO THE FITTING. 21.2. VERTICAL PIPING: BRONZE OR COPPER CLEANOUT TEES IN COPPER PIPING, EACH COMPLETE WITH A BRONZE FERRU
11. PIPE, FITTINGS AND JOINTS	"BARRETT" TYPE CAST IRON CLEANOUT TEES, EACH GAS AND WATER-TIGHT AND COMPLETE WITH A BOLTED COVER
11.1. SOFT COPPER: TYPE "K" SOFT COPPER TO ASTM B88, SUPPLIED IN A CONTINUOUS COIL WITH NO JOINTS IF POSSIBLE, AND COMPLETE WITH, IF JOINTS ARE REQUIRED, COMPRESSION TYPE FLARED JOINT COUPLINGS,	22. FLOOR CLEANOUT TERMINATIONS 22.1. FACTORY FINISHED CAST IRON TERMINATIONS, EACH ADJUSTABLE AND COMPLETE WITH A CAST IRON BODY WITH NE
11.2. COPPER PRESSURE COUPLED JOINT: TYPE "L" HARD DRAWN SEAMLESS COPPER TO ASTM B88 WITH "PROPRESS WITH SMART CONNECT FEATURE" COPPER FITTINGS WITH EDPM SEALS, AND PRESSURE TYPE CRIMPED JOINTS MADE BY USE OF A RIGID TOOL CO. MODEL RP 330 OR MODEL RP 210	POLISHED NICKEL-BRONZE SCORIATED TOP ACCESS COVER TO SUIT THE FLOOR FINISH, A SEAL PLUG, AND CAPTIVE SECURING HARDWARE. ACCEPTABLE PRODUCTS ARE:
ELECTRO-HYDRAULIC CRIMPING TOOL. 11.3. SEMI-RIGID POLYETHYLENE TUBING: VERSA FITTINGS AND MFG. INC. ½" DIA., HIGH DENSITY, SEMI-RIGID POLYETHYLENE TUBING, 200 PSI RATED.	22.1.1. WATTS INDUSTRIES (CANADA) LTD.; 22.1.2. JAY R. SMITH MANUFACTURING CO.:
11.4. CROSS-LINKED POLYETHYLENE (PEX) TUBING: NON-BARRIER TYPE PEX PIPING IN ACCORDANCE WITH CAN/CSA B137.5, ASTM F876 AND TESTED FOR COMPLIANCE BY AN INDEPENDENT THIRD-PARTY AGENCY 25/50 FLAME SPREAD/SMOKE DEVELOPED RATED WHEN TESTED TO CAN/ULC S102.2 AND	22.1.3. ZURN INDUSTRIES LTD.; 22.1.4 MIFAB INC
COMPLETE WITH BRASS INSERTS AND CRIMP-RING OR COLD-EXPANSION JOINT FITTINGS AND COUPLINGS.	22.2. ALL CLEANOUT TERMINATIONS IN AREAS WITH A TILE OR SHEET VINYL FLOOR FINISH ARE TO BE AS ABOVE BUT WI ROUND TOP.
12. SHUT-OFF VALVES: 12.1 BALL VALVES: CLASS 600, 600 PSL WOC PATED FULL PORT BALL TYPE VALVES FACH COMPLETE WITH A FORCED REASS BODY WITH SOLDER ENDS	
FORGED BRASS CAP, AND BLOWOUT-PROOF STEM, SOLID FORGED BRASS CHROME PLATED BALL, "TEFLON" OR "PTFE" SEAT, AND A REMOVABLE LEVER HANDLE VALVES IN INSULATED DIPING APE TO BE CONDUCT FORGED BRASS CHROME PLATED BALL, "TEFLON" OR "PTFE" SEAT, AND A REMOVABLE LEVER	23.1. UNLESS OTHERWISE SPECIFIED OR SCHEDULED, FLOOR DRAINS AND FUNNEL FLOOR DRAINS ARE TO BE VANDAL-PRO
12.1.1. TOYO VALVE CO. FIG. 5049A;	FACTORY FINISHED WITH LATEX BASED PAINT COATING.
12.1.2. MILWAUKEE VALVE CO. #BA-155; 12.1.3. KITZ CORPORATION CODE 59;	GRATE.
12.1.4. APOLLO VALVES # 77–200; 12.1.5. WATTS INDUSTRIES (CANADA) INC. #FBVS–3.	23.3.1. WATTS INDUSTRIES (CANADA) LTD.;
13. CHECK VALVES	23.3.2. JAY R. SMITH MANUFACTURING CO.; 23.3.3. ZURN INDUSTRIES LTD.;
13.1. HORIZONTAL: CLASS 125, BRONZE 200 PSI WOG RATED HORIZONTAL SWING TYPE CHECK VALVES WITH SOLDER ENDS. ACCEPTABLE PRODUCTS ARE:	23.3.4. MIFAB INC.
13.1.2. MILWAUKEE VALVE CO. #1510; 13.1.3. KITZ COPPORATION CODE 23:	24. INSTALLATION OF CLEANOUTS
13.1.4. APOLLO VALVES # 61-600. 13.1.4. APOLLO VALVES # 61-600. 13.0. VEDTICAL VELOVICE VALVE WITH SOLDEDING ENDS.	24.1. PROVIDE CLEANOUTS IN DRAINAGE PIPING IN LOCATIONS AS FOLLOWS: 24.1.1. IN THE BUILDING DRAIN OR DRAINS AS CLOSE AS POSSIBLE TO THE INNER FACE OF THE OUTSIDE WALL, AN
13.2. VERTICAL EQUAL TO KITZ CORP. CODE 26, BRUNZE, 250 PSI WOG RATED VERTICAL LIFT CHECK VALVE WITH SULDERING ENDS.	INSTALLED, LOCATE THE CLEANOUT ON THE DOWNSTREAM SIDE OF THE BUILDING TRAP; 24.1.2. AT OR AS CLOSE AS PRACTICABLE TO THE FOOT OF EACH DRAINAGE STACK;
14. DRAIN VALVES 14.1. MINIMUM 300 PSI WATER RATED, 3/4" DIA., STRAIGHT PATTERN FULL PORT BRONZE BALL VALVES, EACH COMPLETE WITH A THREADED OUTLET	24.1.3. AT MAXIMUM 50' INTERVALS IN HORIZONTAL PIPE 4" DIA. AND SMALLER;
SUITABLE FOR COUPLING CONNECTION OF 3/4" DIA. GARDEN HOSE, AND A CAP AND CHAIN. ACCEPTABLE PRODUCTS ARE: 14.1.1. TOYO VALVE CO. FIG. 5046;	24.1.5. WHEREVER ELSE SHOWN ON DRAWINGS.
14.1.2. DAHL BROTHERS CANADA LTD. FIG. NO. 50. 430; 14.1.3. KITZ CORPORATION CODE 58CC:	24.2. CLEANOUIS ARE TO BE SAME DIAMETER AS PIPE IN PIPING TO 100 MM (4) DIA., AND NOT LESS THAN 100 MM (4 MM (4") DIA.
14.1.4. APOLLO VALVES # 78-104-01; 14.1.5. WATTS INDUSTRIES (CANADA) INC. (RECORD CC	24.3. WHERE CLEANOUTS IN VERTICAL PIPING ARE CONCEALED BEHIND WALLS OR PARTITIONS, INSTALL CLEANOUTS NEAR MM (1") OF THE FINISHED FACE OF THE WALL OR PARTITION.
	25. INSTALLATION OF FLOOR CLEANOUT TERMINATIONS
13. PIPING INSTALLATION REQUIREMENTS	25.1. WHERE CLEANOUTS OCCUR IN HORIZONTAL INACCESSIBLE UNDERGROUND PIPING, EXTEND THE CLEANOUT TY FITTING CLEANOUT TERMINATION SET FLUSH WITH THE FINISHED FLOOR.
15.1. PROVIDE ALL REQUIRED DOMESTIC WATER PIPING. 15.2. PIPING, UNLESS OTHERWISE SPECIFIED, IS TO BE AS FOLLOWS:	25.2. IN WATERPROOF FLOORS, ENSURE THAT EACH CLEANOUT TERMINATION IS EQUIPPED WITH A FLASHING CLAMP DEVICI SUIT THE FLOOR FINISH.
15.2.1. FOR UNDERGROUND PIPING LESS THAN 100 MM (4") DIA. INSIDE BUILDING – TYPE "K" SOFT COPPER; 15.2.2. FOR 12 MM (½") DIA. TRAP SEAL PRIMER TUBING LOCATED UNDERGROUND OR IN CONCRETE OR MASONRY CONSTRUCTION –SEMI—RIGID	25.3. WHERE CLEANOUT TERMINATIONS OCCUR IN FINISHED AREAS, CONFIRM LOCATIONS PRIOR TO ROUGH–IN AND ARRAN 25.4. ENSURE THAT CLEANOUT TERMINATION COVERS IN TILED FLOOR ARE SQUARE IN LIEU OF ROUND.
POLYETHYLENE; 15.2.3. FOR PIPE INSIDE BUILDING AND ABOVEGROUND IN SIZES TO 100 MM (4") DIA., EXCEPT IN VERTICAL SHAFTS AND THROUGH FIRE BARRIERS –	26. INSTALLATION OF FLOOR DRAINS, FUNNEL FLOOR DRAINS AND HUB DRAINS
RIGID CPVC; 15.2.4. FOR BRANCH HOT AND COLD PIPING ABOVEGROUND FROM MAINS AND RISERS TO FIXTURES, FITTINGS, AND EQUIPMENT WHERE FIRE RATED	26.1. PROVIDE FLOOR DRAINS, FUNNEL FLOOR DRAINS AND HUB DRAINS. 26.2. COORDINATE LOCATION OF FLOOR DRAINS FUNNEL FLOOR DRAINS AND HUB DRAINS WITH FOUIPMENT PROVIDED BY
CONSTRUCTION IS NOT PENETRATED - AT YOUR OPTION, PEX TUBING INSTALLED AND JOINED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS;	SUPPLIED EQUIPMENT. INSTALL IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
15.2.5. FOR UNDERGROUND PIPING OUTSIDE BUILDING TO FIXTURES/OUTLETS AT GRADE LEVEL –FLEXIBLE POLYETHYLENE, SNAKED IN THE TRENCH AND IN A CONTINUOUS LENGTH WHEREVER POSSIBLE;	26.4. IN EQUIPMENT ROOMS AND SIMILAR AREAS, EXACTLY LOCATE FLOOR DRAINS TO SUIT THE LOCATION OF MECHANICA
15.2.6. FOR PIPE INSIDE BUILDING AND ABOVEGROUND IN SIZES TO 100 MM (4") DIA TYPE "L" HARD COPPER WITH SOLDER JOINTS OR TYPE "L" HARD COPPER WITH PRESSURE COUPLED MECHANICAL JOINTS	26.5. CONFIRM THE EXACT LOCATION OF DRAINS PRIOR TO ROUGHING IN. WHERE FLOOR DRAINS OCCUR IN WASHROOMS C
	26.6. TEMPORARILY PLUG AND COVER FLOOR DRAINS DURING CONSTRUCTION PROCEDURES. REMOVE PLUGS AND COVERS
16.1. PROVIDE A DOMESTIC HOT WATER THERMOSTATIC MIXING VALVE ASSEMBLY AND WALL MOUNT.	DRAIN WHERE THE CAST IRON FINISH HAS BEEN DAMAGED OR REMOVED, INCLUDING RUSTED AREAS.
16.2. ADJUST EACH VALVE TO DESIGN REQUIREMENTS AND CHECK AND LEST OPERATION. SET MAXIMUM TEMPERATURE LIMIT STOPS. 16.3. IDENTIFY EACH VALVE AND ITS WATER TEMPERATURE DELIVERY SETTING WITH AN ENGRAVED NAMEPLATE.	
17. FLUSHING AND DISINFECTING PIPING	PLUMBING FIXTURES AND FITTINGS
17.1. FLUSH AND DISINFECT ALL NEW AND/OR REWORKED DOMESTIC WATER PIPING AFTER LEAKAGE TESTING IS COMPLETE.	27. GENERAL RE: PLUMBING FIXTURES AND FITTINGS
DRAINAGE WASTE & VENT DIDING & VALVES	27.1. FIXTURES AND FITTINGS, WHERE APPLICABLE, ARE TO BE IN ACCORDANCE WITH REQUIREMENTS OF CAN/CSA B45 SI PLUMBING FIXTURES, INCLUDING SUPPLEMENTS, ASME A112.1.18.1/CSA B125.1, PLUMBING SUPPLY FITTINGS, AND CS/
DIVALINAGE, WASTE & VENT I'LLING & VALVES	27.2. BARRIER-EREE FIXTURES AND FITTINGS ARE TO BE IN ACCORDANCE WITH GOVERNING CODE REQUIREMENTS.
18. DRAIN AND VENT PIPING INSTALLATION REQUIREMENTS	27.3 UNLESS OTHERWISE SPECIFIED VITREOUS CHINA PORCELAIN ENAMELLED AND ACRYLIC EINISHED FIXTURES ARE TO L
18.1. PROVIDE ALL REQUIRED DRAINAGE AND VENT PIPING. PIPE, UNLESS OTHERWISE SPECIFIED, IS TO BE AS FOLLOWS:	27.5. UNLESS OTHERWISE SECURED, VITREOUS CHINNA, FORCELLIN ENAMELLED, AND ACTED THISTED THTORES AND DOUGLED
18.1.1. FOR UNDERGROUND PIPE INSIDE BUILDING AND TO POINTS 1.5 M (5') OUTSIDE BUILDING LINES -RIGID PVC SEWER PIPE, MINIMUM 75 MM (3")	27.4. UNLESS OTHERWISE SPECIFIED, FITTINGS AND PIPING EXPOSED TO VIEW ARE TO BE CHROME PLATED AND POLISHED.
DIA.; 18.1.2. FOR PIPE INSIDE BUILDING AND ABOVEGROUND IN SIZES LESS THAN OR EQUAL TO 65 MM (2-1/3") DIA TYPE DWV COPPER:	27.5. FITTINGS LOCATED IN AREAS OTHER THAN PRIVATE WASHROOMS ARE TO BE VANDAL-PROOF.
18.1.3. FOR PIPE INSIDE BUILDING AND ABOVEGROUND IN SIZES GREATER THAN OR EQUAL TO 75 MM (3") DIACLASS 4000 CAST IRON;	27.6. FIXTURE CARRIERS ARE TO BE SUITABLE IN ALL RESPECTS FOR THE FIXTURE THEY SUPPORT AND CONSTRUCTION IN
18.1.4. FOR FIFE INSIDE BUILDING AND ABDERGROUND IN LIEU OF THE DWY COFFER AND CAST IRON, AT TOOR OFTION AND WHERE FERMITTED BT GOVERNING CODES AND REGULATIONS -RIGID PVC DWY;	27.7. FLOOR FLANGES FOR FLOOR MOUNTED WATER CLOSETS ARE TO BE CAST IRON OR BRASS, SECURED TO FLOOR TO WITH A WAX SEAL AND BRASS OR STAINLESS STEEL BOLTS, NUTS, AND WASHERS. PLASTIC FLOOR FLANGES WILL N
10.1.3. FOR DRAINAGE FOME DISCHARGE FIFE CONNECTIONS FROM FOMP TO AND INCLUDING SHOT-OFF AND CHECK VALVE CONNECTIONS - TYPE DWV" COPPER WITH VICTAULIC FITTINGS AND COUPLINGS, OR SCHEDULE 40 GALVANIZED STEEL WITH VICTAULIC FITTINGS AND COUPLINGS, OR SCHEDULE 40 GALVANIZED STEEL WITH VICTAULIC FITTINGS AND COUPLINGS.	27.8. PROPER SEAL TO MATE WITH FIXTURE CARRIER FLANGE AND PRODUCE A WATER-TIGHT INSTALLATION.
	27.9. EXPOSED TRAPS FOR FIXTURES NOT EQUIPPED WITH INTEGRAL TRAPS. SUCH AS LAVATORIES. ARE TO BE ADJUSTAB
18.2. UNLESS OTHERWISE SPECIFIED, SLOPE HORIZONTAL DRAINAGE PIPING ABOVEGROUND IN SIZES TO AND INCLUDING 75 MM (3") DIA. 25 MM (1") IN 1.2 M (4'), AND PIPE 100 MM (4") DIA. AND LARGER 25 MM (1") IN 2.4 M (8').	"P" TRAPS WITH CLEANOUTS, MINIMUM #17 GAUGE CHROME PLATED TUBULAR EXTENSIONS, AND CHROME PLATED ES TYPE AND DRAIN CONNECTION.
18.3. INSTALL AND SLOPE UNDERGROUND DRAINAGE PIPING TO INVERTS OR SLOPES INDICATED ON DRAWINGS TO FACILITATE STRAIGHT AND TRUE GRADIENTS	27.10. CONCEALED TRAPS FOR FIXTURES NOT FOUIPPED WITH INTEGRAL TRAPS SUCH AS COUNTER SINKS ARE TO BE AD.
BETWEEN POINTS SHOWN. VERIFY AVAILABLE SLOPES BEFORE INSTALLING PIPES.	CLEANOUT PLUGS, ALL TO SUIT FIXTURE TYPE AND DRAIN CONNECTION.
18.4. UNLESS OTHERWISE SPECIFIED, SLOPE HORIZONTAL BRANCHES OF VENT PIPING DOWN TO FIXTURE OR PIPE TO WHICH THEY CONNECT WITH A MINIMUM PITCH OF 25 MM (1") IN 1.2 M (4').	27.11. EXPOSED SUPPLIES FOR FIXTURES WHICH DO NOT HAVE SUPPLY TRIM/FITTINGS WITH INTEGRAL STOPS, I.E. LAVATOR PLATED BRASS ANGLE VALES WITH SCREWDRIVER STOPS FOR PLURIC AREAS WHEEL HANDLE STOPS FOR PRIVATE A
18.5. EXTEND VENT STACKS UP THROUGH ROOF GENERALLY WHERE SHOWN BUT WITH EXACT LOCATIONS TO SUIT SITE CONDITIONS AND IN ANY CASE A	RISERS, AND STAINLESS STEEL OR CHROME PLATED STEEL ESCUTCHEONS, ALL ARRANGED AND SIZED TO SUIT FIXTU
MINIMUM OF 3 M (10') FROM FRESH AIR INTAKES. TERMINATE VENT STACKS A MINIMUM OF 330 MM (13") ABOVE ROOF (INCLUDING ROOF PARAPETS) IN VENT STACK COVERS. WHERE NOT SHOWN ON DRAWINGS, ROUTE VENT PIPING FROM SOURCE TO BUILDING EXTERIOR AS REQUIRED IN ORDER TO SATISFY	27.12. WATER PIPING AS SPECIFIED, COMPLETE WITH BALL TYPE SHUT-OFF VALVES AS SPECIFIED WITH WATER PIPING, OR
LOCAL GOVERNING CODES AND AUTHORITY. COORDINATE VENT ROUTING WITH OTHER BUILDING SERVICES AND ENSURE THERE IS NO ARCHITECTURAL IMPACT.	MIINI DALL VALVES.
18.6. PROVIDE CAST BRASS DIELECTRIC UNIONS AT CONNECTIONS BETWEEN COPPER PIPE AND FERROUS PIPE OR EQUIPMENT.	BASEBOARD HEATERS

C DOMESTIC WATER HEATERS

19. POINT-OF-USE ELECTRIC HOT WATER STORAGE TANK AND HEATER

19.1. ULC LISTED AND CSA CERTIFIED ELECTRIC HOT WATER HEATER WITH MODEL NUMBER AND PERFORMANCE AS SPECIFIED ON DRAWINGS, AND COMPLETE WITH 1035 KPA (150 PSI) RATED (WORKING PRESSURE) STEEL TANK, GLASS LINED, POLYURETHANE FOAM INSULATED, COVERED WITH AN ENAMELLED

- STEEL JACKET WITH ACCESS PANEL, AND EQUIPPED WITH A BOTTOM HOSE END DRAIN COCK; IMMERSION HEATING ELEMENT IMBEDDED IN MAGNESIUM OXIDE AND SEALED IN A SEAMLESS COPPER TUBE; SACRIFICIAL ANODE ROD;
- SURFACE MOUNTED ADJUSTABLE THERMOSTAT AND A HIGH TEMPERATURE SAFETY CUT-OUT; ASME RATED TEMPERATURE AND PRESSURE RELIEF VALVE; I.6. ROUND GALVANIZED STEEL AUXILIARY CATCH PAN WITH DRAIN HOLE AND CONNECTION SPIGOT.

ACCEPTABLE MANUFACTURERS ARE:

- 2.1. RHEEM CANADA LTD.; JOHN WOOD (GSW WATER HEATING CO.); SMITH WATER PRODUCTS CO.;
- 19.2.4. BRADFORD WHITE CANADA INC.;
- 19.2.5. PVI;

- 30. QUALITY ASSURANCE
- AMENDED BY LOCAL GAS CODES.

28.5. FULL LENGTH AUTOMATIC OVERHEAT PROTECTION;

NATURAL GAS PIPING SYSTEM

FOLLOWING FEATURES:

29. SUBMITTALS

ELECTRIC HOT WATER STORAGE TANK AND HEATER DOMESTIC HOT WATER HEATER.

(SUPPLIED BY THE HEATER MANUFACTURER) FOR HEATER MOUNTING AND RIGIDLY SECURE IN PLACE. SURE RELIEF VALVE OUTLET TO DRAIN;

OPERATION AND, UNLESS OTHERWISE SPECIFIED OR INSTRUCTED, SET THERMOSTAT TO PRODUCE 48.8°C (120°F) HOT

SPECIALTIES

SUBMIT SHOP DRAWINGS/PRODUCT DATA SHEETS FOR ALL PRODUCTS SPECIFIED IN THIS SECTION.

ING WITH AN EXTRA HEAVY BRASS PLUG SCREWED INTO THE FITTING. PPER CLEANOUT TEES IN COPPER PIPING, EACH COMPLETE WITH A BRONZE FERRULE, AND, FOR CAST IRON PIPING, NOUT TEES, EACH GAS AND WATER-TIGHT AND COMPLETE WITH A BOLTED COVER.

RMINATIONS, EACH ADJUSTABLE AND COMPLETE WITH A CAST IRON BODY WITH NEOPRENE SLEEVE, SOLID, GASKETED, ATED TOP ACCESS COVER TO SUIT THE FLOOR FINISH, A SEAL PLUG, AND CAPTIVE, VANDAL—PROOF, STAINLESS STEEL

AREAS WITH A TILE OR SHEET VINYL FLOOR FINISH ARE TO BE AS ABOVE BUT WITH A SQUARE TOP IN LIEU OF A

SCHEDULED, FLOOR DRAINS AND FUNNEL FLOOR DRAINS ARE TO BE VANDAL-PROOF DRAINS IN ACCORDANCE WITH OMPLETE WITH A CAST IRON BODY AND A TRAP SEAL PRIMER CONNECTION. ALL CAST IRON COMPONENTS ARE TO BE H A TILE OR SHEET VINYL FLOOR FINISH ARE TO BE AS ABOVE BUT WITH A SQUARE GRATE IN LIEU OF A ROUND

PIPING IN LOCATIONS AS FOLLOWS:

R DRAINS AS CLOSE AS POSSIBLE TO THE INNER FACE OF THE OUTSIDE WALL, AND, IF A BUILDING TRAP IS LEANOUT ON THE DOWNSTREAM SIDE OF THE BUILDING TRAP; CTICABLE TO THE FOOT OF EACH DRAINAGE STACK;

ALS IN HORIZONTAL PIPE 4" DIA. AND SMALLER;

AMETER AS PIPE IN PIPING TO 100 MM (4") DIA., AND NOT LESS THAN 100 MM (4") DIA. IN PIPING LARGER THAN 100 PIPING ARE CONCEALED BEHIND WALLS OR PARTITIONS, INSTALL CLEANOUTS NEAR FLOOR AND SO COVER IS WITHIN 25 OF THE WALL OR PARTITION.

RIZONTAL INACCESSIBLE UNDERGROUND PIPING, EXTEND THE CLEANOUT TY FITTING UP TO THE FLOOR, AND PROVIDE A SH WITH THE FINISHED FLOOR. THAT EACH CLEANOUT TERMINATION IS EQUIPPED WITH A FLASHING CLAMP DEVICE. CLEANOUT TERMINATIONS ARE TO OCCUR IN FINISHED AREAS, CONFIRM LOCATIONS PRIOR TO ROUGH-IN AND ARRANGE PIPING TO SUIT. TION COVERS IN TILED FLOOR ARE SQUARE IN LIEU OF ROUND.

FLOOR DRAINS AND HUB DRAINS

FLOOR DRAINS AND HUB DRAINS. DRAINS, FUNNEL FLOOR DRAINS AND HUB DRAINS WITH EQUIPMENT PROVIDED BY MECHANICAL DIVISION AND OWNER'S ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

R AREAS, EXACTLY LOCATE FLOOR DRAINS TO SUIT THE LOCATION OF MECHANICAL EQUIPMENT AND EQUIPMENT SHROOMS, EXACTLY LOCATE FLOOR DRAINS TO AVOID INTERFERENCE WITH TOILET PARTITIONS. DRAINS PRIOR TO ROUGHING IN. WHERE FLOOR DRAINS OCCUR IN WASHROOMS COORDINATE LOCATIONS WITH TOILET LOOR DRAINS DURING CONSTRUCTION PROCEDURES. REMOVE PLUGS AND COVERS DURING FINAL CLEANUP WORK AND

FREE AND CLEAR OPERATION OF EACH DRAIN. REPLACE ANY DAMAGED GRATES, AND REFINISH ANY AREAS OF THE IISH HAS BEEN DAMAGED OR REMOVED, INCLUDING RUSTED AREAS.

NPPLICABLE, ARE TO BE IN ACCORDANCE WITH REQUIREMENTS OF CAN/CSA B45 SERIES, GENERAL REQUIREMENTS FOR UPPLEMENTS, ASME A112.1.18.1/CSA B125.1, PLUMBING SUPPLY FITTINGS, AND CSA B125.3, PLUMBING FITTINGS.

TREOUS CHINA, PORCELAIN ENAMELLED, AND ACRYLIC FINISHED FIXTURES ARE TO BE WHITE.

JITABLE IN ALL RESPECTS FOR THE FIXTURE THEY SUPPORT AND CONSTRUCTION IN WHICH THEY ARE LOCATED.

NTED WATER CLOSETS ARE TO BE CAST IRON OR BRASS, SECURED TO FLOOR TO PREVENT MOVEMENT AND COMPLETE STAINLESS STEEL BOLTS, NUTS, AND WASHERS. PLASTIC FLOOR FLANGES WILL NOT BE ACCEPTABLE.

OT EQUIPPED WITH INTEGRAL TRAPS, SUCH AS LAVATORIES, ARE TO BE ADJUSTABLE CHROME PLATED CAST BRASS IMUM #17 GAUGE CHROME PLATED TUBULAR EXTENSIONS, AND CHROME PLATED ESCUTCHEONS, ALL TO SUIT FIXTURE

NOT EQUIPPED WITH INTEGRAL TRAPS, SUCH AS COUNTER SINKS, ARE TO BE ADJUSTABLE CAST BRASS WITH IXTURE TYPE AND DRAIN CONNECTION.

WHICH DO NOT HAVE SUPPLY TRIM/FITTINGS WITH INTEGRAL STOPS, I.E. LAVATORIES, ARE TO BE SOLID CHROME SCREWDRIVER STOPS FOR PUBLIC AREAS, WHEEL HANDLE STOPS FOR PRIVATE AREAS, FLEXIBLE STAINLESS STEEL CHROME PLATED STEEL ESCUTCHEONS, ALL ARRANGED AND SIZED TO SUIT FIXTURE.

PLETE WITH BALL TYPE SHUT-OFF VALVES AS SPECIFIED WITH WATER PIPING, OR DAHL BROS. CANADA LTD. 1/4 TURN

28. DIMPLEX, "BN-ELITE PRO" SERIES, CSA APPROVED, STANDARD WATT DENSITY ELECTRIC BASEBOARD HEATERS AS SIZED ON DRAWINGS, EACH COMPLETE WITH 28.1. CONSTRUCTION - CONTOURED FRONT AND TOP CONSTRUCTED OF EXTRUDED ALUMINIUM WITH FRONT AIR INTAKE AND EXHAUST VENTS; LARGE REAR ENTRY JUNCTION BOXES ON BOTH SIDES; KNOCKOUTS FOR POWER CONNECTION; 28.2. ELEMENTS - STAINLESS STEEL SHEATH ENCLOSING A NICKEL CHROMIUM FINNED TUBULAR ELEMENT; ALUMINUM FINS; 28.3. FINISH - HYBRID POLYESTER EPOXY POWDER COAT, TO CONSULTANT'S DIRECTION; 28.4. THERMOSTAT - ADJUSTABLE, INTEGRAL, TAMPERPROOF, 7°C - 30°C (45°F - 85°F) RANGE;

29.1. SUBMIT SHOP DRAWINGS/PRODUCT DATA FOR ALL PRODUCTS SPECIFIED IN PART 2 OF THIS SECTION EXCEPT FOR PIPE, FITTINGS, AND UNIONS. INDICATE PERFORMANCE CRITERIA, CONFORMANCE TO APPROPRIATE REFERENCE STANDARDS, AND LIMITATIONS.

30.1. ALL GAS SYSTEM WORK IS TO BE IN ACCORDANCE WITH REQUIREMENTS OF CAN/CSA-B149.1, NATURAL GAS AND PROPANE INSTALLATION CODE, AS 30.2. ALL GAS SYSTEM WORK IS TO BE PERFORMED ONLY BY LICENSED GAS PIPE FITTERS (HOLDING GAS TECHNICIAN 1 CERTIFICATE) AUTHORIZED UNDER THE

MUNICIPALITY OF CASSELMAN

PROJECT NORTH

CLIENT

ISSUED FOR 99% COORDINATION 2025-02-24 **ISSUED FOR 66% COORDINATION** 2023-05-12

ISSU

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND PROMPTLY REPORT ALL ERRORS AND/OR OMISSIONS TO THE CONSULTANT BEFORE WORK COMMENCES.

ALL WORK IS TO FOLLOW THE OBC 2012 AND ANY OTHER APPLICABLE CODES AND REGULATIONS.

DESCRIPTION

DO NOT SCALE DRAWINGS.

PROFESSIONAL STAMP

EXP Services Inc. T: 613.688.1899 100 – 2650 Queensview Drive Ottawa, ON K2B 8H6 Canada



DATE

www.exp.com

 BUILDINGS
 EARTH & ENVIRONMENT
 ENERGY • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

PROJECT

1 INDUSTRIEL STREET OFFICE FIT-UP

DRAWING

MECHANICAL SPECIFICATIONS

PROJECT No:	MRK-23002008-A0	REVISION:	
DRAWN:	M. OMAR	DATE:	JUNE 2023
APPROVED:	B. BROWN	SCALE:	AS SHOWN
DRAWING No			



7	TSS/ 30.3. APPI ANY OBT/ SYS ⁻	A ACT. LY FOR, ON TSSA FORMS, APPROVAL OF THE GAS SYSTEM DESIGN BY THE TSSA PRIOR TO WORK BEGINNING AT THE SITE AND PRIOR TO ORDERING EQUIPMENT. SUBMIT THE COMPLETED TSSA FORM AND COPIES OF SHOP DRAWINGS/PRODUCT DATA SHEETS AS REQUIRED TO THE TSSA AND AIN AN APPROVAL CERTIFICATE. PAY ALL COSTS FOR THE TSSA REVIEW AND APPROVAL PROCESS. IF THE TSSA REQUIRES REVISIONS TO THE TEM AND THE REVISIONS RESULT IN AN EXTRA COST, A NOTICE OF CHANGE WILL BE ISSUED BY THE CONSULTANT FOR THE REVISION.	HVAC 44. GAL ^V 44.1.
31.	PIPE, FITTING	and joints	44.2.
3	31.1. FOR 31.1.1.	UNDERGROUND PIPING: COATED BLACK STEEL – WELDED JOINTS: "YELLOW JACKET" SCHEDULE 40 MILD BLACK CARBON STEEL, ASTM A53, GRADE B, FACTORY COATED WITH YELLOW PLASTIC, MILL OR SITE BEVELLED, AND COMPLETE WITH FORGED STEEL BUTT WELDING FITTINGS AND WELDED JOINTS. ALL BARE METAL SURFACES ARE TO BE CLEANED AND CORROSION PROTECTED WITH A SUITABLE DENSO PRIMER AND TAPE CORROSION PROTECTION	44.3. 44.4.
	31.1.2. 31.1.3.	SYSTEM. POLYETHYLENE: SAFETY YELLOW COLOURED POLYETHYLENE PIPE, FITTINGS, AND JOINTS TO CSA—B137.4. COATED COPPER: TYPE "K" SOFT TEMPER COPPER WITH A FACTORY APPLIED EXTERNAL YELLOW PLASTIC COATING AND FLARE FITTINGS WITH FORGED BRASS NUTS TO CAN/CSA—B149.1. NUTS ARE TO BE STAMPED WITH THE DESIGNATION C37700 TO INDICATE THAT THEY ARE FORGED BRASS.	45. MAN 45.1.
3	31.2. FOR 31.2.1. 31.2.2	PIPING ABOVE GROUND: UNCOATED BLACK STEEL – SCREWED JOINTS: SCHEDULE 40 MILD BLACK CARBON STEEL, ASTM A53, GRADE B, COMPLETE WITH MALLEABLE CAST IRON SCREWED FITTINGS TO ANSI B2.1, AND SCREWED JOINTS. UNCOATED BLACK STEEL – WELDED JOINTS: SCHEDULE 40 MILD BLACK CARBON STEEL ASTM A53, GRADE B, MILL OR SITE BEVELLED	
	31.2.3.	COMPLETE WITH FACTORY MADE FORGED STEEL BUTT WELDING FITTINGS AND WELDED JOINTS. COPPER-UNCOATED: TYPE "G" SEAMLESS COPPER TUBING TO ASTM B837, HARD TEMPER WITH WROUGHT COPPER CAPILLARY BRAZED JOINT TYPE FITTINGS TO ASTM B.61, AND BRAZED JOINTS MADE WITH "SIL-FOS" OR "SIL-FOS 5" BRAZING ALLOY, OR, SOFT TEMPER WITH FLARED BRASS FITTINGS OF A SINGLE 45" FLARE TYPE, FORGED OR WITH A MACHINED LONG NUT AND COPPER TO COPPER THREADED CONNECTORS, AND. WHERE REQUIRED. FLARED BRASS COPPER TO NPS ADAPTERS.	45.2.
32.	PIPING UNIO	NS	45.3.
	32.1. SCRI WITH 32.2. FLAN SLIP 32.3. COPI	EWED PIPING: MALLEABLE IRON, GROUND JOINT, BRONZE OR BRASS TO IRON OR BRONZE TO BRONZE SEAT SCREWED UNIONS AND UNION ELBOWS A MINIMUM PRESSURE RATING OF 1725 KPA (250 PSI) STEAM AT 260°C (500°F). IGED PIPING: FORGED CARBON STEEL SLIP—ON TYPE RAISED FACED WELDING FLANGE UNIONS TO ASTM A105, 150 LB. CLASS FOR STEEL PIPE, AND —ON TYPE 150 LB. CLASS BRONZE FLANGES FOR COPPER PIPE. PER TO STEEL: EQUAL TO KAMCO PRODUCTS "COPPER STOPPER".	45.4. 45.5.
33. 3	EARTHQUAKE 33.1. EQU SUIT	E ACTIVATED AUTOMATIC SHUT-OFF VALVE AL TO KAS INTERNATIONAL OR NIHON KOSO MODEL 315 HPF EARTHQUAKE ACTIVATED, FLANGED, HIGH PRESSURE AUTOMATIC SHUT-OFF VALVE ABLE FOR BOTH NATURAL GAS AND PROPANE, ULC LISTED AND IN ACCORDANCE WITH ANSI Z21.70, EARTHQUAKE ACTUATED AUTOMATIC GAS	
	SHU	TOFF VALVES.	
34. 3	SHUT-OFF V 34.1. BALL WITH 34.1.1. 34.1.2.	(ALVES TYPE: CGA CERTIFIED, MINIMUM 3100 KPA (450 PSI) WOG RATED, 1/4 TURN, FULL PORT NON-LUBRICATED BRASS BALL VALVES, EACH COMPLETE A TEFLON PTFE SEAT, CHROME PLATED SOLID BALL, REMOVABLE LEVER HANDLE, AND SCREWED ENDS. ACCEPTABLE PRODUCTS ARE: NEO VALVES INC. #425; KITZ CORP. CODE 58;	46. FABf 46.1.
	34.1.3. 34.1.4.	TOYO VALVE CO. FIG. 5044A; FLOWTEK S85.	46.2.
35	NATURAL	S CONVENIENCE OUTLET	46.3.
30.	35.1. NEO CON EXCI 35.1.1.	VALVES MODEL 3/375 QUICK-CONNECT TYPE CSA CERTIFIED OUTLET WITH INTERLOCKING SAFETY CAM TO PREVENT RELEASE OF THE APPLIANCE NECTOR UNTIL THE VALVE IS OFF, INTEGRAL THERMAL PROTECTION TO PREVENT GAS FLOW IF THE OUTLET IS EXPOSED TO TEMPERATURES EEDING 90°C (195°F), AND A WALL ENCLOSURE BOX. ACCEPTABLE MANUFACTURERS ARE: NEO VALVES INC.;	46.4.
	35.1.2.	FAIRVIEW FITTINGS & MFG. LID.	46.5.
36. 3	PRESSURE R 36.1. CSA	EGULATORS CERTIFIED PRESSURE REGULATORS AS FOLLOWS:	46.6.
	36.1.1. 36.1.1.1. 36.1.1.2. 36.1.1.3.	VENTED TYPE: SPRING-LOADED SELF-OPERATED DESIGN, TIGHT CLOSING, SELECTED FOR THE FACILITY GAS PRESSURE AND PIPING PRESSURE LOSS, AND CONNECTED EQUIPMENT LOAD AT FULL FIRING RATE PLUS 20% SPARE, AND COMPLETE WITH: 1035 KPA (150 PSI) RATED CAST IRON BODY FINISHED WITH CORROSIVE RESISTANT EPOXY ENAMEL; ALUMINUM DIAPHRAGM AND SPRING CASE WITH NITRILE DIAPHRAGM, DISC, AND BODY O-RING; THROTTLING TYPE, HIGH FLOW RATE, TIGHT SHUT-OFF RELIEF VALVE SELECTED TO PROTECT EQUIPMENT DOWNSTREAM OF THE REGULATOR IN	46.7.
	36.1.2. 36.1.2.1. 36.1.2.2. 36.1.2.3.	COORDINATION WITH REGULATOR CAPACITY. ACCEPTABLE MANUFACTURERS ARE: MAXITROL CO.; FISHER CONTROLS; LESLIE CONTROLS INC.;	46.8.
	36.1.2.4.	LAKESIDE PROCESS CONTROLS.	
37. 3	EXPANSION 37.1. PRO	LOOPS VIDE FLEXIBLE HOSE EXPANSION LOOP(S) AS INDICATED ON THE CONTRACT DRAWINGS OR AS REQUIRED TO ACCOMMODATE ANY THERMAL	46.9.
	EXP/ 37.2. FLEX BRAI 37.3. FLEX 37.4. FLEX	ANSION, CONTRACTION, BUILDING SETTLEMENT, OR SEISMIC MOVEMENT OF THE PIPING SYSTEM. (IBLE HOSE EXPANSION LOOPS SHALL BE MANUFACTURED COMPLETE WITH TWO PARALLEL SECTIONS OF CORRUGATED METAL HOUSE, COMPATIBLE ID, 180 DEG RETURN BEND, WITH INLET AND OUTLET CONNECTIONS. FIELD FABRICATED LOOPS SHALL NOT BE ACCEPTABLE. (IBLE LOOPS SHALL BE CAPABLE OF MOVEMENT IN THE ±X, ±Y, AND ±Z PLANES. (IBLE HOSE EXPANSION LOOPS SHALL IMPART NO THRUST LOADS TO SYSTEM SUPPORT, ANCHORS OR BUILDING STRUCTURE.	46.10.
	37.5. ALL SPE(GENI QUA QUA	FLEXIBLE HOSE EXPANSION LOOPS SHALL BE MANUFACTURED IN ACCORDANCE WITH THE DOCUMENTED MANUFACTURERS WELD PROCEDURE CIFICATIONS. THE PROCEDURE QUALIFICATION RECORD SHALL BE USED TO DOCUMENT THE EXECUTION OF THIS PROCEDURE AND SHALL FOLLOW THE ERAL "GUIDELINES" OF ASME SECTION IX. EACH INDIVIDUAL WELDER SHALL CONFORM TO THE IN—HOUSE PROCEDURE QUALIFICATION RECORD AND BE LIFIED PRIOR TO EACH PRODUCTION LOT. THE TESTING OF EACH INDIVIDUAL WELDER SHALL BE DOCUMENTED IN A WELDING PROCEDURE LIFICATION RECORD.	46.11.
3	37.6. MAT 37.6.1. 37.6.2. 37.6.3.	ERIALS; FITTINGS SHALL BE STANDARD WEIGHT, CARBON STEEL CONFORMING TO ASTM A234 / ASME B16.9 CORRUGATED HOSE; STAINLESS STEEL, TYPE 321 BRAID; 304 STAINLESS STEEL.	40.11.
3	37.6.4. 37.7. FLEX	END FITTINGS SHALL CARBON STELL PLATE FLANGES WITH 150 LB. DRILLING. (IBLE HOSE EXPANSION LOOPS FOR FLAMMABLE LIQUID OR GAS SERVICE UP TO 4"SHALL BE CSA / AGA LISTED AND BE IN CONFORMANCE WITH 536	
3	37.8. FLEX	IBLE HOSE EXPANSION LOOPS TO BE "GAS METRALOOP" AS MANUFACTURED BY THE METRAFLEX COMPANY, OR EQUAL.	46.11.
38. 3	NATURAL GA 38.1. MAK	IS SERVICE E ALL REQUIRED ARRANGEMENT WITH THE NATURAL GAS SUPPLY UTILITY ON BEHALF OF THE OWNER FOR INSTALLATION OF NATURAL GAS SERVICE	40.11. 46.11.
3	PIPIN 38.2. PRO	NG WITH GAS PRESSURE REGULATOR VIDE AN EARTHQUAKE ACTIVATED AUTOMATIC SHUT-OFF VALVE IN GAS SERVICE PIPING OUTSIDE THE BUILDING IN ACCORDANCE WITH THE VALVE VIEACTURER'S INSTALLATION INSTRUCTIONS, PROVIDE AN ANGLE IRON FRAMED WIRE MESH ENCLOSURE AROUND THE VALVE AND POLITED TO THE	46.11.
3	WAN WALI 38.3. PRO LOC/ 600	L. VIDE 2 M (7') HIGH MINIMUM 200 MM (8") DIAMETER SCHEDULE 80 GALVANIZED STEEL CONCRETE FILLED BOLLARDS AT THE METER-REGULATOR ATION IN A PATTERN TO PROTECT THE METER-REGULATOR. INSTALL THE PIPE STRAIGHT AND PLUMB A 1.2 M (4') BELOW GRADE IN A CONTINUOUS MM (2') DIAMETER REINFORCED CONCRETE FOOTING. SMOOTHLY CROWN THE TOP OF THE CONCRETE ABOVE THE TOP OF THE PIPE.	46.12.
39. 3	NATURAL GA 39.1. PRO PIPIN CAN	IS PIPING INSTALLATION REQUIREMENTS VIDE ALL REQUIRED NATURAL GAS DISTRIBUTION PIPING AND CONNECT GAS FIRED OR OPERATED EQUIPMENT, AND PROVIDE ALL REQUIRED VENT NG TO ATMOSPHERE, INCLUDING VENT PIPING FROM PRESSURE REGULATORS. DO ALL PIPING WORK IN ACCORDANCE WITH REQUIREMENTS OF /CSA-B149.1, NATURAL GAS AND PROPANE INSTALLATION CODE, AS AMENDED BY LOCAL GAS CODES.	46.13.
3	39.2. PIPIN 39.2.1. 39.2.2.	NG IS TO BE AS FOLLOWS: FOR UNDERGROUND PIPING, COATED SCHEDULE 40 BLACK STEEL, COATED SOFT COPPER, OR POLYETHYLENE; FOR ABOVE GROUND PIPING, UNCOATED SCHEDULE 40 BLACK STEEL, HARD TEMPER OR SOFT COPPER, OR, IF PERMITTED, FLEXIBLE STAINLESS STEEL.	46.15. 47. INST
40. 2	INSTALLATIO 40.1. PRO 40.2. ENSI	N OF SHUT-OFF VALVES VIDE CSA APPROVED BALL TYPE OR LUBRICATED PLUG TYPE SHUT-OFF VALVES TO ISOLATE EQUIPMENT, AND WHEREVER ELSE SHOWN. JRE THAT VALVES ARE LOCATED FOR EASY ACCESSIBILITY AND MAINTENANCE.	47.1.
41. 2	INSTALLATIO 41.1. PRO 41.2. PRO SECU	N OF NATURAL GAS CONVENIENCE OUTLETS VIDE NATURAL GAS CONVENIENCE OUTLETS AND WALL MOUNT. VIDE A SHUT-OFF VALVE IN CONNECTING PIPING, CONFIRM EXACT LOCATION PRIOR TO ROUGHING-IN, AND ENSURE THAT THE OUTLET IS RIGIDLY JRED IN PLACE.	47.2.
42.	INSTALLATIO	N OF PRESSURE REGULATORS VIDE PRESSURE REGULATORS IN GAS DISTRIBUTION PIPING WHERE INDICATED AND /OR REQUIRED	,
1	42.2. USE 42.3. INST	VENTED TYPE PRESSURE REGULATORS FOR ALL OTHER APPLICATIONS. ALL REGULATING STATIONS IN ACCORDANCE WITH REQUIREMENTS OF CAN/CSA-B149.1.	47.4. 47. AR
2	42.4. PRO 42.5. LOCA	VIDE 6 MM (¼") DIAMETER TEST PORTS UPSTREAM AND DOWNSTREAM OF EACH REGULATOR ASSEMBLY. ATE OUTDOOR REGULATING STATIONS A MINIMUM OF 300 MM (12") AWAY FROM WALKWAYS AND 3 M (10') AWAY FROM FOLLIDMENT AIR INTAKES	40. DUC 48.1
2	AND SECU	BUILDING OPENINGS. PROVIDE ALL REQUIRED VENT PIPING AND TERMINATE VENTS IN A TURN-DOWN ELBOW FITTING WITH BRONZE BUG SCREEN JRED IN PLACE.	48.2.
2	42.6. Loc/ Incr Opei	ATE INDOOR REGULATING STATIONS IN LOCATIONS ACCESSIBLE WITHOUT THE USE OF LADDERS OR LIFTS. COMBINE VENTS WHERE PERMITTED AND EASE VENT PIPE SIZE ACCORDINGLY. EXTEND VENT PIPING UP THROUGH THE ROOF 3 M (10') AWAY FROM EQUIPMENT AIR INTAKES AND BUILDING NINGS AND TERMINATED IN A TURN-DOWN ELBOW FITTING WITH BRONZE BUG SCREEN SECURED IN PLACE.	48.3.
2	42.7. INDI	CATE OPERATING SET-POINTS, RELIEF SETTINGS AND VENT ARRANGEMENTS FOR EACH REGULATING STATION ON AS-BUILT RECORD DRAWINGS.	48.4
43. 2	INSTALLATIO 43.1. INST QUA 43.2. FIFY	N OF EXPANSION LOOPS ALL AND GUIDE PER MANUFACTURERS' INSTALLATION INSTRUCTIONS AND MECHANICAL CONTRACTORS ASSOCIATION OF AMERICA "GUIDELINES FOR LITY PIPING INSTALLATIONS". (IBLE HOSE EXPANSION LOOP RETURN FITTING SHALL BE SUPPORTED TO ALLOW MOVEMENT.	48.5.
2	τυ.z. FLEX	ADEL HOSE LAFANSION LOUF INLIGINA FITTING SHALL DE SUFFORTED TO ALLOW MOVEMENT.	

49. INSTALLATION OF GRILLES AND DIFFUSERS: 49.1.

VAC	AIR	DISTRIBUTION
GAL 44.1.	VANIZED S GALVA TO BE	TEEL DUCTWORK NIZED STEEL SHEET IS TO BE HOT DIPPED IN ACCORDANCE WITH REQUIREMENTS OF ASTM A653. G60 GALVANIZING FOR BARE UNCOVERED DUCT FINISH PAINTED. G90 FOR ALL OTHER GALVANIZING.
44.2.	44.2.1.	LOCK FORMING GRADE HOT DIP GALVANIZED STEEL, ASTM A653, SHOP FABRICATED, MINIMUM #26 GAUGE.
44.3.	44.3.1.	FACTORY MACHINE FABRICATED, SPIRAL, MECHANICALLY LOCKED FLAT SEAM, SINGLE WALL DUCT, FITTINGS AND COUPLINGS.
44.4.	FLAT 44.4.1.	UVAL FACTORY MACHINE FABRICATED, SINGLE WALL, 4-PLY SPIRAL LOCK SEAM DUCT, FITTINGS AND COUPLINGS.
MAN	IUAL BALA	NCING (VOLUME) DAMPERS
45.1.	FLANG MATEF EACH	ED AND DRILLED, SINGLE OR PARALLEL BLADE (DEPENDING ON DAMPER SIZE) MANUAL BALANCING DAMPERS, EACH CONSTRUCTED OF SAME NAL AS CONNECTING DUCTWORK UNLESS OTHERWISE SPECIFIED, EACH DESIGNED TO MAINTAIN INTERNAL FREE AREA OF CONNECTING DUCT, AND COMPLETE WITH: HEXACONAL OR SOLLARE SHAFT EXTENSION THROUGH FRAME:
	45.1.2. 45.1.3. 45.1.4.	NON-STICK, NON-CORROSIVE SYNTHETIC BEARINGS FOR RECTANGULAR DAMPERS, FLANGE STAINLESS STEEL BEARINGS FOR ROUND DAMPERS; BLADE STOPS FOR SINGLE BLADE DAMPERS, DESIGNED TO PREVENT BLADE FROM MOVING MORE THAN 90°; LINKAGE FOR MULTIPLE BLADE DAMPERS;
	45.1.5.	LOCKING HAND QUADRANT DAMPER OPERATOR WITH, FOR INSULATED DUCTS 50 MM (2") STANDOFF MOUNTING.
45.2.	RECTA	NGULAR DAMPERS: NAILOR INDUSTRIES INC. 1800 SERIES, MAXIMUM SIZE 1.2 M X 1.2 M (4' X 4') FOR A SINGLE DAMPER.
45.3.	rouni Blade	D DAMPERS: NAILOR INDUSTRIES INC. MODEL 1890, MAXIMUM 600 MM (24") DIAMETER, EQUIPPED WITH A MINIMUM 200 MM (8") DEEP FRAME, AND STIFFENERS WHERE REQUIRED.
45.4.	MULTI MATEF	PLE RECTANGULAR DAMPER SECTION ASSEMBLY: RECTANGULAR ASSEMBLY SUPPLIED WITH THE DAMPERS OR SITE CONSTRUCTED, OF SAME NAL AS DAMPER AND DESIGNED FOR TIGHT AND SECURE MOUNTING OF INDIVIDUAL DAMPERS.
45.5.	ACCEF 45.5.1. 45.5.2. 45.5.3. 45.5.4. 45.5.5.	PTABLE MANUFACTURERS ARE: NAILOR INDUSTRIES INC.; MORRISON & CO. INC. "TAMCO"; NCA MANUFACTURING LTD.; GREENHECK FAN CORP.; RUSKIN CO.
FAB	RICATION	AND INSTALLATION OF GALVANIZED STEEL DUCTWORK
46.1.	PROVI DUCTV	DE REQUIRED DUCTWORK, RECTANGULAR, ROUND AND/OR FLAT OVAL. WHERE RECTANGULAR DUCTWORK IS SHOWN, ROUND OR FLAT OVAL WORK OF EQUIVALENT CROSS-SECTIONAL AREA IS ACCEPTABLE.
46.2.	IT IS	TO BE UNDERSTOOD THAT ALL DUCT DIMENSIONS SHOWN ON DRAWINGS ARE CLEAR INTERNAL DIMENSIONS.
46.3.	Confi Routi Dimen	RM ROUTING OF ALL DUCTWORK AT SITE AND SITE MEASURE DUCTWORK PRIOR TO FABRICATION. DUCT DIMENSIONS MAY BE REVISED TO SUIT SITE NG AND BUILDING ELEMENT REQUIREMENTS, IF DIMENSION REVISIONS ARE REVIEWED WITH AND APPROVED BY CONSULTANT. DUCT ROUTING AND/OR SION REVISIONS TO SUIT CONDITIONS AT SITE ARE NOT GROUNDS FOR A CLAIM FOR AN EXTRA COST.
46.4.	REFER DRAW CROSS	TO STRUCTURAL DRAWINGS. WHERE DUCTWORK IS TO BE RUN WITHIN OR THROUGH OPEN WEB STEEL JOISTS, DUCTWORK SHOWN ON MECHANICAL NGS IS SCHEMATIC ONLY AND IS TO BE ALTERED AS REQUIRED TO SUIT STEEL JOIST CONFIGURATION, SPACING, PANEL POINTS, AND S-BRIDGING AT NO ADDITIONAL COST.
46.5.	WHERE AFTER	EVER DUCTWORK IS REQUIRED AT LOCATIONS WHERE SPRAYED FIREPROOFING IS APPLIED TO BUILDING CONSTRUCTION, INSTALL DUCTWORK ONLY FIREPROOFING WORK IS COMPLETE AND DO NOT COMPROMISE FIRE RATING OF SPRAYED FIREPROOFING.
46.6.	INSTA	L (BUT DO NOT CONNECT) DUCT SYSTEM MOUNTED AUTOMATIC CONTROL COMPONENTS SUPPLIED AS PART OF THE AUTOMATIC CONTROL WORK.
46.7.	SUPP(FLEXIE EXPOS DUCT, CORE	ORT HORIZONTAL RECTANGULAR DUCTS INSIDE BUILDING IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND BLE, BUT USE TRAPEZE HANGERS WITH, UNLESS OTHERWISE SPECIFIED, GALVANIZED STEEL CHANNELS, AND GALVANIZED STEEL HANGER RODS FOR BED DUCTS AND CONCEALED DUCTS WIDER THAN 500 MM (20"). SUPPORT HARDWARE CONSTRUCTED OF SAME MATERIAL AS DUCT FOR METAL AND, UNLESS OTHERWISE SPECIFIED, TYPE 316 STAINLESS STEEL FOR NON-METAL DUCT. SUPPORTS FOR "HEAVY" DUCT SUCH AS CEMENTITIOUS DUCT IS TO BE SUITABLE IN ALL RESPECTS FOR THE APPLICATION AND APPROVED BY CONSULTANT.
46.8.	SUPP(Flexie At to Insul Non-	ORT ROUND AND FLAT OVAL DUCTS INSIDE BUILDING IN ACCORDANCE WITH ANSI/SMACNA HVAC DUCT CONSTRUCTION STANDARDS METAL AND PLE, BUT, UNLESS OTHERWISE SPECIFIED, FOR BOTH UNINSULATED AND INSULATED DUCTS EXPOSED IN FINISHED AREAS, USE BANDS AND SECURE P OF DUCT TO A HANGER ROD, ALL SIMILAR TO DUCTMATE CANADA LTD. TYPE "BA". IF DUCT IS INSULATED, SIZE STRAP TO SUIT DIAMETER OF ATED DUCT. UNLESS OTHERWISE SPECIFIED, DUCT SUPPORT HARDWARE FOR METAL DUCT IS CONSTRUCTED OF SAME MATERIAL AS DUCT, AND FOR METAL DUCT, TYPE 316 STAINLESS STEEL.
46.9.	WHERE USE F	E FLANGED DUCT JOINTS ARE USED, DO NOT LOCATE JOINTS IN WALL OR SLAB OPENINGS, OR IMMEDIATELY AT WALL OR SLAB OPENINGS. DO NOT LANGED JOINTS FOR EXPOSED UNINSULATED DUCTS IN FINISHED AREAS.
46.10	. Where Botto Drain	E WATERTIGHT HORIZONTAL DUCTWORK IS REQUIRED, CONSTRUCT DUCTS WITHOUT BOTTOM LONGITUDINAL SEAMS. SOLDER OR WELD JOINTS OF M AND SIDE SHEETS. SEAL ALL OTHER JOINTS WITH DUCT SEALER. SLOPE HORIZONTAL DUCT TO HOODS, RISERS, OR DRAIN POINTS. PROVIDE POINTS. PROVIDE WATERTIGHT DUCTWORK FOR:
	46.10.1.	DUCTWORK OUTSIDE BUILDING OR OTHERWISE EXPOSED TO THE ELEMENTS;
46.11 46.11	. LEAKA 46.11.1. .1.1.	GE TESTING: DUCTWORK LEAKAGE IS NOT TO EXCEED FOLLOWING: DUCTWORK TO 2" W.C. CLASS, 1% OF TOTAL AIR QUANTITY HANDLED BY RESPECTIVE FANS;
	46.11.2.	LEAKAGE TESTING IS TO BE PERFORMED BY THE TESTING, ADJUSTING AND BALANCING (TAB) AGENCY IN ACCORDANCE WITH SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL AND IS TO BE WITNESSED BY CONSULTANT.
	16 11 7	

40.11.3. BE RESPONSIBLE FOR FULLOWING:

- PREPARING DUCT SYSTEMS FOR LEAKAGE TESTING PRIOR TO INSTALLATION OF EXTERNAL INSULATION INCLUDING CAPPING DUCT RUNOUTS AND PROVISION OF FINAL TAP-IN FOR TEST EQUIPMENT;
- SCHEDULE TESTING WITH TAB AGENCY IN ADVANCE, BE PRESENT FOR ALL TESTING AND ENSURE NOTICE IS GIVEN TO CONSULTANT SO THEY MAY WITNESS TESTING;
- RESEALING AND/OR REPLACEMENT OF DEFECTIVE DUCTWORK; BEARING ALL COSTS ASSOCIATED WITH RETESTING DUCTWORK WHICH HAS FAILED TO PASS LEAKAGE TESTING. .3.4.

SEAL ALL DUCTWORK IN ACCORDANCE WITH SMACNA SEAL CLASS "A", EXCEPT FOR ROUND DUCT WITH SELF-SEALING GASKETED FITTINGS AND COUPLINGS WHICH DOES NOT REQUIRE SITE APPLIED SEALANT. APPLY SEALANTS BY BRUSH OR GUN TO CLEANED METAL SURFACES. WHERE BARE DUCTWORK IS EXPOSED APPLY NEAT UNIFORM LINES OF SEALANT. RANDOMLY BRUSHED, SLOPPY LOOKING SEALANT APPLICATIONS WILL BE REJECTED AND MUST BE REPAIRED OR REPLACED WITH A NEAT APPLICATION OF SEALANT.

APPLY SEALANTS BY BRUSH OR GUN TO CLEANED METAL SURFACES. WHERE BARE DUCTWORK IS EXPOSED APPLY NEAT UNIFORM LINES OF SEALANT. RANDOMLY BRUSHED, SLOPPY LOOKING SEALANT APPLICATIONS WILL BE REJECTED AND MUST BE REPAIRED OR REPLACED WITH A NEAT APPLICATION OF

CLEAN EXTERIOR EXPOSED (UNINSULATED) DUCTS AND COAT WITH A HEAVY FULL COVERAGE OF BAKOR #410-02 BLACK METAL PAINT.

SEALANT

PROVIDE MAXIMUM 3 M (10') LONG LENGTHS OF FLEXIBLE DUCTWORK FOR CONNECTIONS BETWEEN GALVANIZED STEEL DUCT MAINS AND BRANCHES, AND NECKS OF CEILING GRILLES AND DIFFUSERS. DO NOT INSTALL FLEXIBLE DUCTWORK THROUGH WALLS, EVEN IF SHOWN ON DRAWINGS.

PRIOR TO OPERATING FANS.

OF PERMANENT FILTERS.

WALK-THROUGH.

MANUFACTURER.

INSTALL FLEXIBLE DUCTS AS STRAIGHT AS POSSIBLE AND SUPPORT IN ACCORDANCE WITH REQUIREMENTS OF ANSI/SMACNA HVAC DUCT CONSTRUCTION

REMOVE ALL DIRT AND FOREIGN MATTER FROM ENTIRE DUCT SYSTEMS AND CLEAN DUCT SYSTEM TERMINALS AND INTERIOR OF AIR HANDLING UNITS

PROVIDE CHEESECLOTH OVER DUCT SYSTEM INLETS AND OUTLETS AND RUN SYSTEM FOR 24 HOURS, AFTER WHICH REMOVE CHEESECLOTH AND

PRIOR TO STARTING ANY SUPPLY AIR HANDLING SYSTEM PROVIDE 50 MM (2") THICK GLASS FIBRE CONSTRUCTION FILTERS AT FAN EQUIPMENT IN PLACE

INCLUDE ALL LABOUR FOR A COMPLETE SITE WALK-THROUGH WITH TESTING AND BALANCING PERSONNEL FOLLOWING ROUTE OF ALL DUCT SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED FOR THE PURPOSE OF CONFIRMING PROPER POSITION AND ATTITUDE OF DAMPERS, LOCATION OF PITOT TUBE

OPENINGS, AND ANY OTHER WORK AFFECTING TESTING AND BALANCING PROCEDURES. PERFORM CORRECTIVE WORK REQUIRED AS A RESULT OF THIS

PROVIDE GRILLES AND DIFFUSERS WHERE SHOWN ON THE DRAWINGS. WHEREVER POSSIBLE, GRILLES AND DIFFUSERS ARE TO BE THE PRODUCT OF ONE

STANDARDS METAL AND FLEXIBLE, AND SECURE AT EACH END WITH NYLON OR STAINLESS STEEL GEAR TYPE CLAMPS, AND SEAL JOINTS. PROVIDE LONG

TEMPORARILY COVER ALL OPEN ENDS OF DUCTS DURING CONSTRUCTION.

CONSTRUCTION FILTERS, AND INSTALL NEW PERMANENT FILTERS.

DO NOT PENETRATE FIRE BARRIERS WITH FLEXIBLE DUCT.

RADIUS DUCT BENDS WHERE THEY ARE REQUIRED.

SYSTEM PROTECTION, CLEANING AND START-UP

COLLARS. SEAL JOINTS WITH DUCT SEALER.

AT RECTANGULAR GALVANIZED STEEL DUCT, ACCURATELY CUT HOLES AND PROVIDE FLANGED OR "SPIN-IN" ROUND FLEXIBLE DUCT CONNECTION

TALLATION OF FLEXIBLE DUCTWORK

WHERE DISSIMILAR METAL DUCTS ARE TO BE CONNECTED, ISOLATE DUCTS BY MEANS OF FLEXIBLE DUCT CONNECTION MATERIAL.

49.2.	UNLESS OTHERWISE	SPECIFIED	CONNECT	GRILLES	and I	DIFFUSERS IN	ACCORDANCE	WITH	REQUIREMENTS O	F SMACNA	HVAC DUCT	CONSTRUCTION	

49.3. EXACTLY LOCATE GRILLES AND DIFFUSERS TO CONFORM TO THE FINAL ARCHITECTURAL REFLECTED CEILING PLANS AND DETAILED WALL ELEVATIONS, AND TO CONFORM TO THE FINAL LIGHTING ARRANGEMENT, CEILING LAYOUT, ORNAMENTAL AND OTHER WALL TREATMENT.

49.4. EQUIP SUPPLY DIFFUSERS HAVING A BASIC FOUR-WAY OR ALL ROUND AIR PATTERN FOR OPERATION IN ONE, TWO, OR THREE WAY PATTERN WHERE

49.5. GRILLES AND DIFFUSERS ARE TO BE TESTED AND PERFORMANCE CERTIFIED TO THE AIR-CONDITIONING AND REFRIGERATION INSTITUTE STANDARD ARI

49.6.3. KRUEGER DIVISION OF AIR SYSTEM COMPONENTS INC.;

STANDARDS METAL AND FLEXIBLE.

INDICATED ON THE DRAWINGS.

49.6. ACCEPTABLE MANUFACTURERS ARE:

49.6.2. METALAIRE;

49.6.4. TITUS;

50. PIPE INSULATION MATERIALS

INSULATION

49.6.1. PRICE INDUSTRIES INC.;

49.6.5. NAILOR INDUSTRIES INC.; 49.6.6. TUTTLE & BAILEY.

JACKET. ACCEPTABLE PRODUCTS ARE:

27. PIPE INSULATION REQUIREMENTS - MINERAL FIBRE

28. DUCTWORK SYSTEM INSULATION MATERIALS

28.1.4. OWENS CORNING 703.

50.1.3. MANSON INSULATION INC. "ALLEY K APT"; 50.1.4. OWENS CORNING FIBERGLAS PIPE INSULATION.

28.1.3. JOHNS MANVILLE INC. TYPE 814 "SPIN-GLAS";

28.2.2. GLASS-CELL FABRICATORS LTD. "R-FLEX";

28.4.1. ARMACELL "AP/ARMAFLEX SA";

29. DUCTWORK INSULATION REQUIREMENTS - MINERAL FIBRE

MM (1%") THICK AS REQUIRED:

BLANKET AS REQUIRED:

REQUIREMENTS ARE AS FOLLOWS:

THE DUCT AND THE HANGER.

PITOT TUBE ACCESS COVERS;

DAMAGE BY MEANS OF TAPE SEALANT.

LAYERS WITH STAGGERED TIGHTLY BUTTED JOINTS.

SPECIFIED.

INDICATED:

FOLLOWS:

29.6.4.

AIR HANDLING UNIT

CONTRACT DOCUMENTS. INCLUDE:

31.1.1. CERTIFIED FAN PERFORMANCE CURVES;

31.1.5. PRODUCT DATA FOR FAN MOTORS AND DRIVES; 31.1.6. ALL ITEMS SHIPPED LOOSE FOR SITE INSTALLATION.

30.2.

31. SUBMITTALS

28.3.4. CERTAINTEED CORPORATION SOFTTOUCH FSK DUCT WRAP TYPE 150.

650, STANDARD FOR AIR OUTLETS AND INLETS.

50.1. PREMOULDED MINERAL FIBRE: RIGID, SECTIONAL, SLEEVE TYPE INSULATION TO ASTM STANDARD C 547-00, WITH A FACTORY APPLIED VAPOUR BARRIER 50.1.1. JOHNS MANVILLE INC. "MICRO-LOK AP-T PLUS";

50.1.2. KNAUF FIBER GLASS "PIPE INSULATION" WITH "ASJ-SSL" JACKET;

27.1. INSULATE THE FOLLOWING PIPE INSIDE THE BUILDING AND ABOVE GROUND WITH MINERAL FIBRE INSULATION OF THE THICKNESS INDICATED: 27.1.1. DOMESTIC COLD WATER PIPING TO AND INCLUDING 100 MM (4") DIA. -25 MM (1") THICK; 27.1.2. DOMESTIC HOT WATER PIPING, TO AND INCLUDING 40 MM (1½") DIA. -25 MM (1") THICK;

28.1. RIGID MINERAL FIBRE BOARD: PREFORMED BOARD TYPE INSULATION TO ASTM C612-00A, 48 KG/M3 (3.0 LB./FT.³) DENSITY, WITH A FACTORY APPLIED REINFORCED ALUMINUM FOIL AND KRAFT PAPER FACING. ACCEPTABLE PRODUCTS ARE: 28.1.1. KNAUF FIBER GLASS INSULATION BOARD WITH FSK FACING; 28.1.2. MANSON INSULATION INC. "AK BOARD FSK";

28.2. SEMI-RIGID MINERAL FIBRE BOARD: ROLL FORM INSULATION TO ASTM STANDARD C1393 00A, CONSISTING OF CUT STRIPS OF RIGID MINERAL BOARD INSULATION GLUED TO AN ALUMINIUM FOIL AND KRAFT PAPER FACING. ACCEPTABLE PRODUCTS ARE: 28.2.1. MULTI-GLASS INSULATION LTD. "MULTI-FLEX MKF";

28.2.3. OWENS CORNING PIPE AND TANK INSULATION; 28.2.4. JOHNS MANVILLE INC. PIPE AND TANK INSULATION. 28.3. BLANKET MINERAL FIBRE: BLANKET TYPE ROLL FORM INSULATION TO ASTM STANDARD C553-00, 24 KG/M3 (1½ LB./FT.³) DENSITY, 40 MM (1½") THICK,

WITH A FACTORY APPLIED VAPOUR BARRIER FACING. ACCEPTABLE PRODUCTS ARE: 28.3.1. JOHNS MANVILLE INC. MICROLITE FSK DUCT WRAP TYPE 150; 28.3.2. KNAUF FIBER GLASS BLANKET INSULATION FSK DUCT WRAP TYPE III; 28.3.3. MANSON INSULATION INC. ALLEY WRAP FSK DUCT WRAP TYPE III;

28.4. FLEXIBLE FOAM ELASTOMERIC SHEET: SHEET FORM, CFC FREE, CLOSED CELL, SELF-ADHERING ELASTOMERIC NITRILE RUBBER INSULATION WITH A WATER VAPOUR PERMEABILITY RATING OF 0.08 IN ACCORDANCE WITH ASTM E96 PROCEDURE A. ACCEPTABLE PRODUCTS ARE:

28.4.2. IK INSULATION GROUP "K-FLEX DUCT WRAP", S2S.

29.1. INSULATE THE FOLLOWING DUCTWORK SYSTEMS INSIDE THE BUILDING AND ABOVE GROUND WITH MINERAL FIBRE INSULATION OF THE THICKNESS

29.1.1. ALL OUTSIDE AIR INTAKE DUCTWORK, CASINGS AND PLENUMS FROM FRESH AIR INTAKES TO AND INCLUDING MIXING PLENUMS OR SECTIONS, OR, IF MIXING PLENUMS OR SECTIONS ARE NOT PROVIDED, TO THE FIRST HEATING COIL, OR IF BOTH MIXING PLENUMS OR SECTIONS AND HEATING COIL SECTIONS ARE NOT PROVIDED, AND THE FRESH AIR IS NOT TEMPERED, THEN THE FRESH AIR DUCTWORK SYSTEM COMPLETE - MINIMUM 40

29.1.2. MIXED SUPPLY AIR OR PREHEATED SUPPLY AIR CASINGS, PLENUMS AND SECTIONS TO AND INCLUDING THE FAN SECTION WHERE NOT FACTORY INSULATED - MINIMUM 25 MM (1") THICK RIGID BOARD OR MINIMUM 40 MM (1½") THICK FLEXIBLE BLANKET AS REQUIRED; SUPPLY AIR DUCTWORK OUTWARD FROM FANS, EXCEPT FOR SUPPLY DUCTWORK EXPOSED IN THE AREA IT SERVES - MINIMUM 25 MM (1") THICK RIGID BOARD OR MINIMUM 40 MM (11/2") THICK FLEXIBLE BLANKET AS REQUIRED; 29.1.4. EXHAUST DISCHARGE DUCTWORK FOR A DISTANCE OF 3 M (10') DOWNSTREAM (BACK) FROM EXHAUST OPENINGS TO ATMOSPHERE, INCLUDING ANY EXHAUST PLENUMS WITHIN THE 3 M (10') DISTANCE - MINIMUM 25 MM (1") THICK RIGID BOARD OR MINIMUM 40 MM (11/2") THICK FLEXIBLE

29.1.5. ANY OTHER DUCTWORK, CASINGS, PLENUMS OR SECTIONS SPECIFIED OR DETAILED ON THE DRAWINGS TO BE INSULATED - THICKNESS AS

29.2. INSULATION FOR CASINGS, PLENUMS, AND EXPOSED RECTANGULAR DUCTWORK IS TO BE RIGID BOARD TYPE. INSULATION FOR ROUND DUCTWORK AND CONCEALED RECTANGULAR DUCTWORK IS TO BE BLANKET TYPE.

29.3. EXPOSED RECTANGULAR DUCTS AND/OR CASINGS: LIBERALLY APPLY ADHESIVE TO ALL SURFACES OF THE DUCT AND/OR CASING. ACCURATELY AND NEATLY PRESS THE INSULATION INTO THE ADHESIVE WITH TIGHTLY FITTED BUTT JOINTS. PROVIDE PIN AND WASHER INSULATION FASTENERS AT 300 MM (12") CENTRES ON BOTTOM AND SIDE SURFACES. SECURE AND SEAL ALL JOINTS WITH 75 MM (3") WIDE TAPE SEALANT. ADDITIONAL INSTALLATION

29.3.1. AT TRAPEZE HANGER LOCATIONS INSTALL INSULATION BETWEEN THE DUCT AND THE HANGER; 29.3.2. PROVIDE DRYWALL TYPE METAL CORNER BEADS ON EDGES OF DUCTWORK, CASINGS AND PLENUMS IN EQUIPMENT ROOMS, SERVICE CORRIDORS,

AND ANY OTHER AREA WHERE THE INSULATION IS SUBJECT TO ACCIDENTAL DAMAGE, AND SECURE IN PLACE WITH TAPE SEALANT.

29.4. CONCEALED RECTANGULAR OR OVAL DUCTWORK: LIBERALLY APPLY ADHESIVE TO ALL SURFACES OF THE DUCT AND WRAP THE INSULATION AROUND THE

DUCT WITH A TOP BUTT JOINT AND TIGHT SECTION TO SECTION BUTT JOINTS. PROVIDE PIN AND WASHER INSULATION FASTENERS AT 300 MM (12")

CENTRES ON BOTTOM SURFACES. SECURE AND SEAL ALL JOINTS WITH 75 MM (3") TAPE SEALANT. ADDITIONAL INSTALLATION REQUIREMENTS ARE AS

29.4.1. AT EACH TRAPEZE TYPE DUCT HANGER PROVIDE A 100 MM (4") WIDE FULL LENGTH PIECE OF RIGID MINERAL FIBRE BOARD INSULATION BETWEEN

29.5. EXPOSED & CONCEALED ROUND OR OVAL DUCTWORK: ACCURATELY CUT SECTIONS OF INSULATION TO FIT TIGHTLY AND COMPLETELY AROUND THE DUCT. LIBERALLY APPLY ADHESIVE TO ALL SURFACES OF THE DUCT AND WRAP THE INSULATION AROUND THE DUCT WITH A TOP BUTT JOINT AND TIGHT

SECTION TO SECTION BUTT JOINTS. SEAL ALL JOINTS WITH TAPE SEALANT. AT DUCT HANGER LOCATIONS INSTALL THE INSULATION BETWEEN THE DUCT AND HANGER. AT EACH HANGER LOCATION FOR CONCEALED DUCTWORTH WHERE FLEXIBLE BLANKET INSULATION IS USED, PROVIDE A 100 MM (4") WIDE FULL CIRCUMFERENCE STRIP OF SEMI-RIGID BOARD TYPE DUCT INSULATION BETWEEN THE DUCT AND THE HANGER.

29.6. COMMON DUCT INSULATION REQUIREMENTS: INSULATION APPLICATION REQUIREMENTS COMMON TO ALL TYPES OF RIGID DUCTWORK ARE AS FOLLOWS: 29.6.1. AT DUCT CONNECTION FLANGES INSULATE THE FLANGES WITH NEATLY CUT STRIPS OF THE RIGID INSULATION MATERIAL SECURED WITH ADHESIVE TO SIDE SURFACES OF THE FLANGE WITH A TOP STRIP TO COVER THE EXPOSED EDGES OF THE SIDE STRIPS, THEN BUTT THE FLAT SURFACE

DUCT INSULATION UP TIGHT TO THE FLANGE INSULATION, OR, ALTERNATIVELY, INCREASE THE INSULATION THICKNESS TO THE DEPTH OF THE FLANGE AND COVER THE TOP OF THE FLANGES WITH TAPE SEALANT; 29.6.2. THE INSTALLATION OF FASTENER PINS AND WASHERS IS TO BE CONCURRENT WITH THE DUCT INSULATION APPLICATION;

29.6.3. CUT INSULATION FASTENER PINS ALMOST FLUSH TO THE WASHER AND COVER WITH NEATLY CUT PIECES OF TAPE SEALANT;

31.1. SHOP DRAWINGS/PRODUCT DATA: SUBMIT SHOP DRAWINGS/PRODUCT DATA FOR ALL UNITS TO CONFIRM COMPLIANCE WITH REQUIREMENTS OF THE

31.2. FACTORY INSPECTION AND TEST REPORT: SUBMIT WITH DELIVERY OF EACH UNIT A COPY OF THE FACTORY INSPECTION AND FIRE TEST REPORT, AND

31.1.2. ESTIMATED SOUND POWER LEVELS TO BE EXPECTED ACROSS INDIVIDUAL OCTAVE BANDS IN DB;

INCLUDE A COPY OF EACH REPORT WITH O & M MANUAL PROJECT CLOSE-OUT DATA.

31.1.3. CERTIFIED POWER AND CONTROL WIRING DIAGRAMS WHICH DIFFERENTIATE BETWEEN FACTORY AND SITE WIRING;

31.1.4. DIMENSIONED LAYOUTS, INCLUDING DIMENSIONED CURB LAYOUTS AND DUCT PENETRATIONS, AS APPLICABLE;

ACCURATELY AND NEATLY CUT AND FIT INSULATION AT DUCT ACCESSORIES SUCH AS DAMPER OPERATORS (WITH STANDOFF MOUNTING) AND 29.6.5. PRIOR TO CONCEALMENT OF INSULATION BY EITHER CONSTRUCTION FINISHES OR CANVAS JACKET MATERIAL, PATCH ALL VAPOUR BARRIER

30. DUCTWORK INSULATION REQUIREMENTS - FLEXIBLE ELASTOMERIC

30.1. INSULATE ALL EXPOSED EXTERIOR DUCTWORK (EXCEPT FRESH AIR INTAKE DUCTWORK) AND ASSOCIATED PLENUMS AND/OR CASINGS OUTSIDE THE BUILDING WITH MINIMUM 40 MM (11/2") THICK FLEXIBLE ELASTOMERIC SHEET INSULATION AS REQUIRED, APPLIED IN TWO MINIMUM 20 MM (14") THICK

ENSURE THAT SHEET METAL WORK JOINTS ARE SEALED WATERTIGHT PRIOR TO APPLYING INSULATION.

INSTALL WITH ADHESIVE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PUBLISHED INSTRUCTIONS TO PRODUCE A WEATHER-PROOF INSTALLATION.

T: 613.688.1899 Canada www.exp.com

> BUILDINGS
> EARTH & ENVIRONMENT
> ENERGY • INDUSTRIAL • INFRASTRUCTURE • SUSTAINABILITY •

PROJECT

1 INDUSTRIEL STREET OFFICE FIT-UP

DRAWING

MECHANICAL **SPECIFICATIONS**

ROJECT No: REVISION MRK-23002008-A0 M. OMAR JUNE 2023 **APPROVED** SCALE: AS SHOWN B. BROWN DRAWING No:

M-3

MUNICIPALITY OF CASSELMAN

ISSUED FOR 99% COORDINATION 2025-02-24

IT IS THE RESPONSIBILITY OF THE APPROPRIATE CONTRACTOR TO CHECK AND VERIFY ALL DIMENSIONS ON SITE AND PROMPTLY REPORT ALL ERRORS AND/OR OMISSIONS TO THE CONSULTANT BEFORE WORK COMMENCES.

ISSUED FOR 66% COORDINATION

DESCRIPTION

ALL WORK IS TO FOLLOW THE OBC 2012 AND ANY OTHER APPLICABLE CODES AND REGULATIONS.

DO NOT SCALE DRAWINGS.

PROFESSIONAL STAMP

EXP Services Inc. Ottawa, ON K2B 8H6

100 – 2650 Queensview Drive

2023-05-12

DATE

PROJECT NORTH

CLIENT

31.3. SITE INSPECTION AND START-UP REPORT: SUBMIT A SITE INSPECTION AND START-UP REPORT FROM THE MANUFACTURER'S REDRESENTATIVE AS	33.7.3. SERVICE RELAY OUTPUT
SPECIFIED IN PART 3 OF THIS SECTION.	33.7.4. DIRTY FILTER SWITCH INPUT; 33.7.5. DEFILIMIDISTAT INPUT:
31.4. SPARE AIR FILTERS: SUBMIT SPARE AIR FILTERS AS SPECIFIED IN PART 2 OF THIS SECTION.	33.7.6. ECONOMIZER CONTROL; 33.7.7. CAS VALVE DELAY RETWEEN STACES:
31.5. WALL OPENING COORDINATION: SUPPLY REVIEWED COPIES OF CURB ASSEMBLY SHOP DRAWINGS OR PRODUCT DATA SHEETS TO THE TRADE WHO WILL CUT THE WALL OPENINGS FOR DUCTWORK, AND ENSURE THAT THE OPENINGS ARE PROPERLY SIZED AND LOCATED.	33.7.8. UNIT DIAGNOSTICS;
31.6 EXTENDED WARRANTIES' SUBMIT SIGNED COPIES OF THE MANUEACTURER'S EXTENDED WARRANTIES AS FOLLOWS'	33.7.10. INDOOR AIR QUALITY INPUT;
31.6.1 STAINIESS STEEL CAS FIDED UNIT HEAT EVCHANCED. TEN VEADS.	33.7.12. LOW AMBIENT CONTROLS; 33.7.12. MINIMUM RUN TIME;
31.6.2. REFRIGERANT COMPRESSOR(S): FIVE YEARS;	33.7.13. NIGHT SETBACK MODE; 33.7.14. SMOKE ALARM MODE;
31.6.3. INTEGRATED MODULAR CONTROL: THREE YEARS.	33.7.15. LOW PRESSURE CONTROL; 33.7.16. THERMOSTAT BOUNCE RELAY;
32. QUALITY ASSURANCE	33.7.17. 3-DIGIT DISPLAY AND DEGREES F OR C DISPLAY; 33.7.18. HEAT/COOL THERMOSTAT COMPATIBLE WITH WARM-UP MODE.
32.1. HEATING AND AIR CONDITIONING EQUIPMENT IS TO BE RATED (CAPACITY, PERFORMANCE, EFFICIENCY AND SOUND) AND CERTIFIED IN ACCORDANCE WITH REQUIREMENTS OF THE FOLLOWING AIR-CONDITIONING AND REFRIGERATION INSTITUTE STANDARDS:	
32.1.1. ARI 210/240, PERFORMANCE RATING OF UNITARY AIR-CONDITIONING AND AIR-SOURCE HEAT PUMP EQUIPMENT; 32.1.2. ARI 270, SOUND RATING OF OUTDOOR UNITARY EQUIPMENT;	33.8. ROOM THERMOSTAT: SURFACE WALL MOUNTING (ON A RECESSED BOX) ADJUSTABLE 24 VOLT THERMOSTAT SUPPLIED LOOSE WITH THE UNIT AND EQUIPPED WITH A FAN AUTO-ON SWITCH, OFF-HEAT-COOL-AUTO SWITCH, NIGHT SET-BACK CONTROLS, AND DIGITAL THERMOMETER AND SET-POINT DISPLAY.
32.1.3. ARI 340/360, COMMERCIAL AND INDUSTRIAL UNITARY AIR-CONDITIONING AND HEAT PUMP EQUIPMENT. 32.2. HEATING AND AIR CONDITIONING EQUIPMENT IS ALSO TO BE IN ACCORDANCE WITH REQUIREMENT OF THE FOLLOWING CODES, STANDARDS, AND REGULATIONS:	33.9. ROOF MOUNTING CURB: MINIMUM 450 MM (18') HIGH PREFABRICATED AND INSULATED CURB CONFORMING TO REQUIREMENTS OF THE NATIONAL ROOFING CONTRACTORS ASSOCIATION.
	33.10. SEISMIC RESTRAINT HARDWARE: FACTORY SECURED SEISMIC RESTRAINT CONNECTION HARDWARE.
32.2.1. CAN/CSA-C22.2 NO. 236/UL 1995, HEATING AND COOLING UNITS;	
32.2.4. CSA OR ETL CERTIFICATION AND LABELLING FOR ALL ELECTRICAL COMPONENTS;	
32.2.6. GOVERNING LOCAL CODES AND REGULATIONS.	33.11.2. PROVIDE ALL REQUIRED RIGGING AND HOLSTING/MOVING EQUIPMENT REQUIRED TO MOVE EACH UNIT TO THE REQUIRED LOCATIONS. DO ALL
32.3. GAS FIRED HEATING AND AIR CONDITIONING UNITS ARE TO BE INSTALLED BY LICENSED JOURNEYMAN GAS FITTERS.	RIGGING/HOISTING/MOVING IN ACCORDANCE WITH THE UNIT MANUFACTURER'S DIRECTIONS AND DETAILS. 33.11.3. SECURE BASE MOUNTING UNITS IN PLACE, LEVEL, AND PLUMB, ON A FABRICATED STEEL BASE OR CONCRETE PAD AS INDICATED.
32.4. ACCEPTABLE MANUFACTURERS ARE:	33.11.4. BRACE AND SECURE EACH UNIT IN ACCORDANCE WITH REQUIREMENTS SPECIFIED IN THE MECHANICAL WORK SECTION ENTITLED SEISMIC CONTROL AND RESTRAINT.
32.4.1. LENNOX INDUSTRIES INC.; 32.4.2. CARRIER ENTERPRISE CANADA:	33.11.5. INSTALL ALL COMPONENTS SHIPPED LOOSE WITH THE UNITS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. CALIBRATE ALL CONTROL COMPONENTS REQUIRING FIELD CALIBRATION.
32.4.3. TRANE CANADA INC.; 32.4.4. JOHNSON CONTROLS YORK:	33.11.6. EXTEND CONDENSATE TRAPPED DRAINS USING SCHEDULE 40 GALVANIZED STEEL PIPING TO THE ROOF. 33.11.7. PROVIDE THERMOSTATS AND WALL MOUNT ON A RECESSED BOX WHERE SHOWN. CONFIRM EXACT LOCATIONS PRIOR TO ROUGHING-IN. CONNECT
32.4.4. JOHNSON CONTROLS TORK; 32.4.5. DAIKIN INDUSTRIES LTD.;	COMPLETE WITH 24 VOLT CONTROL WIRING IN CONDUIT TO THE STANDARDS OF THE ELECTRICAL WORK AND THE MANUFACTURER'S CERTIFIED WIRING DIAGRAM. SET-UP AND PROGRAM THERMOSTATS IN ACCORDANCE WITH THE OWNER'S REQUIREMENTS.
32.4.6. AAON; 32.4.7. GREENHECK FAN CORP.;	33.11.8. CAREFULLY COORDINATE THE INSTALLATION OF EACH UNIT WITH ALL OTHER TRADES MAKING CONNECTIONS TO THE UNIT, IN PARTICULAR, POWER, INTERLOCK CONNECTIONS, AND CONTROL CONNECTIONS.
32.4.8. PRICE INDUSTRIES LTD.	33.11.9. EQUIPMENT AND SYSTEM MANUFACTURER'S CERTIFICATION: REFER TO THE ARTICLE ENTITLED EQUIPMENT AND SYSTEM MANUFACTURER'S CERTIFICATION IN THE MECHANICAL WORK SECTION ENTITLED MECHANICAL WORK GENERAL INSTRUCTIONS.
3. AIR HANDLING UNITS – PACKAGED OUTDOOR	33.11.10. START-UP: REFER TO THE ARTICLE ENTITLED EQUIPMENT AND SYSTEM START-UP IN THE MECHANICAL WORK SECTION ENTITLED MECHANICAL WORK GENERAL INSTRUCTIONS.
33.1. PACKAGE TYPE, FACTORY TESTED, OUTDOOR. WEATHERPROOF HEATING AND AIR CONDITIONING UNITS AS PER THE DRAWING SCHEDULE.	33.11.11. DEMONSTRATION AND TRAINING: REFER TO THE ARTICLE ENTITLED EQUIPMENT AND SYSTEM O&M DEMONSTRATION & TRAINING IN THE MECHANICAL WORK SECTION ENTITLED MECHANICAL WORK GENERAL INSTRUCTIONS INCLUDE FOR A ONE HALE DAY ON-SITE OPERATION
33.2. CABINET: CONSTRUCTED OF MINIMUM #18 GAUGE GAI VANIZED STEEL PANELS ERECTED ON FULL PERIMETER MINIMUM #14 CALLOE CAI VANIZED STEEL	DEMONSTRATION AND TRAINING SESSION. THE TRAINING IS TO BE A FULL REVIEW OF ALL COMPONENTS INCLUDING BUT NOT LIMITED TO A FULL OPERATION AND MAINTENANCE DEMONSTRATION. WITH ABNORMAL EVENTS.
BASE RAILS WITH LIFTING LUGS, FINISHED WITH TWO COATS OF BAKED EXTERIOR ENAMEL PAINT ON PRIMER, ARRANGED AND CONSTRUCTED FOR AIRFLOW CONFIGURATIONS AS SHOWN. AND COMPLETE WITH COLLARS FOR FLECTRICAL POWER AND DUCT CONNECTION OPENINGS AND THE FOLLOWING	
77.0.1 A FULLY INCLUATED DASE AND INCLUATION FOR ALL DANELS AD ACENT TO CONDITIONED AD WITH 50 ANA (07) THOS AND PREPARE FACED 70	TESTING, ADJUSTING, AND BALANCING
 33.2.1. A FULLT INSULATED BASE, AND INSULATION FOR ALL PANELS ADJACENT TO CONDITIONED AIR, WITH 50 MM (2) THICK NEOPHENE FACED, 52 KG/M³ (2 LB/FT³) DENSITY INSULATION MEETING FLAME SPREAD AND SMOKE DEVELOPED RATING REQUIREMENTS OF CAN/ULC S102 AND SECURED IN PLACE SUCH THAT INSULATION WILL NOT SAG AND FIBRES WILL NOT ERODE OR ENTER THE AIRSTREAM; 33.2.2. HINGED ACCESS PANELS, EACH AIR AND WATER SEALED AND EQUIPPED WITH ¼ TURN LATCHING HANDLES, AND PROVIDED FOR 	34. APPLICATION 34.1 THIS SECTION SPECIFIES MECHANICAL SYSTEM TESTING ADJUSTING AND BALANCING REQUIREMENTS THAT ARE COMMON TO MECHANICAL WORK SECTIONS
COMPRESSOR/CONTROLS/HEATING AREAS, BLOWER ACCESS, AND AIR FILTER AND ECONOMIZER ACCESS.	OF THE SPECIFICATION AND IT IS A SUPPLEMENT TO EACH SECTION AND IS TO BE READ ACCORDINGLY.
33.3. COMPRESSOR/CONDENSER & REFRIGERATION: VIBRATION ISOLATED SCROLL TYPE HERMETICALLY SEALED COMPRESSOR(S) WITH DIRECT DRIVE VERTICAL DISCHARCE PROPERTIES TYPE CONDENSER FAN(S) AND CORPER THRE (ALLMINIUM FIN FACTORY LEAK AND PRESSURE TESTED CONDENSER CON (S) AND	35. SUBMITTALS 35.1 NAME AND QUALIFICATIONS OF TESTING AND BALANCING ACENCY, WITHIN THIRTY DAYS OF WORK COMMENCING AT THE SITE SUBMIT THE NAME AND
EQUIPPED WITH THE FOLLOWING:	35.1. NAME AND QUALIFICATIONS OF TESTING AND BALANCING AGENCY: WITHIN THIRTY DATS OF WORK COMMENCING AT THE SHE, SUBMIT THE NAME AND QUALIFICATIONS OF THE PROPOSED TESTING AND BALANCING AGENCY IN ACCORDANCE WITH REQUIREMENTS OF THE ARTICLE ENTITLED QUALITY ASSIDANCE RELOW
33.3.1. PVC COATED CONDENSER FAN GUARD AND CONDENSER COIL GUARD;	35.2. SAMPLE TEST FORMS: SUBMIT SAMPLE TEST FORMS, IF OTHER THAN THOSE STANDARD FORMS PREPARED BY THE ASSOCIATED AIR BALANCE COUNCIL
33.3.2. PERMANENTLY LUBRICATED TOTALLY ENCLOSED, RESILIENTLY MOUNTED, OVERLOAD PROTECTED CONDENSER FAN MOTOR(S) CONFORMING TO	(AABC) OR NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB) ARE PROPOSED FOR USE. 35.3. DRAWING EVALUATION REPORT: SUBMIT A REPORT BY THE AGENCY TO INDICATE THE AGENCY'S EVALUATION OF THE MECHANICAL DRAWINGS WITH
REQUIREMENTS OF THE MECHANICAL WORK SECTION ENTITLED BASIC MECHANICAL MATERIALS AND METHODS, TOTALLY ENCLOSED FROM THE WEATHER;	RESPECT TO SERVICE ROUTING AND LOCATION OR LACK OF BALANCING DEVICES. INCLUDE THE SET OF DRAWINGS USED AND MARKED-UP BY THE AGENCY TO PREPARE THE REPORT.
33.3.3. A REFRIGERATION SYSTEM CAPABLE OF OPERATING DOWN TO -17°C(0°F) WITHOUT INSTALLATION OF ADDITIONAL CONTROLS, COMPLETE WITH	35.4. SITE VISIT REPORTS: SUBMIT A REPORT BY THE AGENCY AFTER EACH SITE VISIT MADE BY THE AGENCY DURING THE CONSTRUCTION PHASE OF THIS PROJECT.
SELF-SEALING DISCHARGE, SUCTION AND LIQUID LINE SERVICE GAUGE PORTS, FREEZE-STATS, EXPANSION VALVES, COPPER REFRIGERANT TUBING AND INSULATION WHERE REQUIRED LIQUID LINE FILTER DRIFE A FULL CHARGE OF R410A REFRIGERANT AUTOMATIC RESET HIGH AND LOW	35.5. DRAFT REPORT: SUBMIT A DRAFT REPORT, AS SPECIFIED IN PART 3 OF THIS SECTION. 35.6. FINAL REPORT: SUBMIT A FINAL REPORT, AS SPECIFIED IN PART 3 OF THIS SECTION.
PRESSURE COMPRESSOR CIRCUIT CONTROLS, AND FAN CONTROL FOR -34°C (-30°F) LOW AMBIENT OPERATION;	35.7. WARRANTY: SUBMIT A TESTING AND BALANCING WARRANTY AS SPECIFIED IN PART 3 OF THIS SECTION. 35.8. POST CONSTRUCTION SITE VISIT REPORTS: SUBMIT REPORTS LISTING OBSERVATIONS AND RESULTS OF POST CONSTRUCTION SITE VISITS AS SPECIFIED IN
33.3.4. COPPER TUBE/ALUMINIUM FIN FACTORY TESTED EVAPORATOR COIL WITH THERMAL EXPANSION VALVE WITH ADJUSTABLE SUPERHEAT AND EXTERNAL FOLIAUZER, AND NON-CORROSIVE CONDENSATE DRAIN PAIN REMOVABLE FOR CLEANING, DESIGNED TO PREVENT STANDING WATER AND	PART 3 OF THIS SECTION.
EQUIPPED WITH A DRAIN CONNECTION WITH DEEP SEAL TRAP.	36. DEFINITIONS 36.1. THE FOLLOWING ARE DEFINITIONS OF WORDS USED IN THIS SECTION:
33.4. COOLING CONTROLS: COOLING CONTROLS ARE TO INCLUDE THE FOLLOWING:	36.1.1. "TAB" – MEANS TESTING, ADJUSTING AND BALANCING TO DETERMINE AND CONFIRM QUANTITATIVE PERFORMANCE OF EQUIPMENT AND SYSTEMS AND TO REGULATE THE SPECIFIED FLUID FLOW RATE AND AIR PATTERNS AT THE TERMINAL EQUIPMENT, E.G., REDUCE FAN SPEED, THROTTLING,
33.4.1. SMOKE DETECTORS IN BOTH SUPPLY AND RETURN AIR STREAMS;	ETC.; 36.1.2 "HYDRONIC SYSTEMS" - INCLUDES HEATING WATER CHILLED WATER GLYCOL-WATER SOLUTION CONDENSER WATER AND ANY SMILLAR SYSTEM:
33.4.2. MOTORIZED NORMALLY CLOSED FRESH AIR AND EXHAUST AIR DAMPERS AND NORMALLY OPEN RETURN AIR DAMPER (EQUAL TO T. A. MORRISON	36.1.3. "AIR SYSTEMS" – INCLUDES ALL OUTSIDE AIR, SUPPLY AIR, RETURN AIR, EXHAUST AIR, AND RELIEF AIR SYSTEMS;
TAMCO SERIES 1000 FOR RETURN AIR AND SERIES 9000 FOR FRESH AIR AND EXHAUST AIR), WITH 24 VOLT SPRING RETURN BELIMO OR EQUAL OPERATORS AND A CONTROL PACKAGE TO AUTOMATICALLY VARY THE OUTSIDE AIR QUANTITY;	36.1.4. "FLOW RATE TOLERANCE" – MEANS THE ALLOWABLE PERCENTAGE VARIATION, MINUS TO PLUS, OF ACTUAL FLOW RATE VALUES IN THE CONTRACT DOCUMENTS;
33.4.3. ADJUSTABLE MIXED AIR CONTROLS TO MAINTAIN 13°C (55°F OR AS INDICATED) MIXED AIR TEMPERATURE;	36.1.5. "REPORT FORMS" – MEANS TEST DATA SHEETS ARRANGED FOR COLLECTING TEST DATA IN LOGICAL ORDER FOR SUBMISSION AND REVIEW, AND THESE FORMS, WHEN REVIEWED AND ACCEPTED, SHOULD ALSO FORM THE PERMANENT RECORD TO BE USED AS THE BASIS FOR REQUIRED
33.4.4. UP TO FOUR STAGES OF COOLING CONTROL:	FUTURE TESTING, ADJUSTING AND BALANCING; 36.1.6. "TERMINAL" — MEANS THE POINT WHERE THE CONTROLLED FLUID ENTERS OR LEAVES THE DISTRIBUTION SYSTEM, AND THESE ARE SUPPLY
	INLETS ON WATER TERMINALS, SUPPLY OUTLETS ON AIR TERMINALS, RETURN OUTLETS ON WATER TERMINALS, AND EXHAUST OR RETURN INLETS ON AIR TERMINALS SUCH AS REGISTERS, GRILLES, DIFFUSERS, LOUVERS, AND HOODS;
ZERO, AND CONTROLS TO ALLOW BLOWER OFF DELAY OF UP TO TWO HUNDRED AND FORTY SECONDS AFTER COOLING DEMAND HAS ENDED, WITH A DEFAULT VALUE OF ZERO.	36.1.7. "MAIN" – MEANS THE DUCT OR PIPE CONTAINING THE SYSTEM'S MAJOR OR ENTIRE FLUID FLOW; 36.1.8. "SUBMAIN" – MEANS THE DUCT OR PIPE CONTAINING PART OF THE SYSTEMS' CAPACITY AND SERVING TWO OR MORE REANCH MAINS.
TO DETAILS THESE OF LENS,	36.1.9. "BRANCH MAIN" - MEANS DUCT OR PIPE SERVICING TWO OR MORE TERMINALS;
JULTE. MILINING COMPRESSION ON AND OF TIME OF TIME OF TIME DECONDENDE DECONDE, DUTE ADJUSTABLE BETWEEN SIXTY AND FIVE HUNDRED AND TEN SECONDS; 77.4.7 DEFAULT MANIMUM HIGH DEFENDE ONNTOLETOD COOLDEENDE DUDING COOLDE CONTRACTOR STATE OF THE STATE OF THE SECONDE	JO.I.TU. BRANCH - MEANS DUCT OR PIPE SERVING A SINGLE TERMINAL.
33.4.7. DEFAULT MAXIMUM HIGH PRESSURE SWITCH TRIP OCCURRENCE DURING COULING OR DEHUMIDIFICATION CYCLE OF THREE (ADJUSTABLE BETWEEN ONE AND EIGHT OCCURRENCES), WITH COMPRESSOR LOCK-OUT IF MAXIMUM OCCURRENCE LIMIT IS REACHED, AND DIGITAL OUTPUT FOR SERVICE	37. QUALITY ASSURANCE
ACTIVATED; 33.4.8. LOW PRESSURE TRIP READ DELAY OF FIVE MINUTES (ADJUSTABLE BETWEEN ZERO AND THIRTY-FOUR MINUTES) IF COMPRESSOR OFF TIME HAS	37.1. TESTING AND BALANCING AGENCY: EMPLOY THE SERVICES OF AN INDEPENDENT TESTING, ADJUSTING, AND BALANCING AGENCY MEETING THE QUALIFICATIONS SPECIFIED BELOW, TO BE THE SINGLE SOURCE OF RESPONSIBILITY TO TEST, ADJUST, AND BALANCE THE BUILDING MECHANICAL SYSTEMS
BEEN LESS THAN FOUR HOURS (ADJUSTABLE BETWEEN ONE AND SIX HOURS) AND THE OUTDOOR TEMPERATURE IS LESS THAN 21°C (70°F), ADJUSTABLE BETWEEN –12°C AND 38°C;	TO PRODUCE THE DESIGN OBJECTIVES. THE TESTING, ADJUSTING AND BALANCING AGENCY IS TO HAVE SUCCESSFULLY COMPLETED TESTING, ADJUSTING AND BALANCING OF MECHANICAL SYSTEMS FOR A MINIMUM OF FIVE PROJECTS SIMILAR TO THIS PROJECT WITHIN THE PAST THREE YEARS, AND IS TO
33.4.9. LOW PRESSURE TRIP READ DELAY OF FIFTEEN MINUTES (ADJUSTABLE BETWEEN ZERO AND THIRTY-FOUR MINUTES) IF COMPRESSOR OFF TIME HAS BEEN LESS THAN FOUR HOURS (ADJUSTABLE BETWEEN ONE AND SIX HOURS) AND THE OUTDOOR TEMPERATURE IS LESS THAN 210 (70%)	BE CERTIFIED AS AN INDEPENDENT AGENCY IN ALL REQUIRED CATEGORIES BY ONE OF THE FOLLOWING: 37.1.1. AABC – ASSOCIATED AIR BALANCE COUNCIL;
ADJUSTABLE BETWEEN -12°C AND 38°C; 33.4.10. I OW PRESSURE TRIP READ DELAY OF TWO MINITES (ADJUSTARIE RETWEEN ZERO AND THIRTY-FOUR MINITES) IE THE COMPRESSOR OF THE	37.1.2. NEBB - NATIONAL ENVIRONMENTAL BALANCING BUREAU;
HAS BEEN LESS THAN FOUR HOURS AND THE OUTDOOR AIR TEMPERATURE IS 21°C (70°F) OR GREATER;	37.2. STANDARDS: TESTING, ADJUSTING AND BALANCING OF THE COMPLETE MECHANICAL SYSTEMS IS TO BE PERFORMED OVER THE ENTIRE OPERATING RANGE OF EACH SYSTEM IN ACCORDANCE WITH ONE OF THE FOLLOWING PUBLICATIONS:
33.4.11. LOW PRESSURE THE READ DELAT OF EIGHT MINUTES (ADJUSTABLE BETWEEN ZERO AND THIRTY-FOUR MINUTES) IF THE COMPRESSOR OFF TIME HAS BEEN FOUR HOURS AND THE OUTDOOR AIR TEMPERATURE IS 21°C (70°F) OR GREATER;	37.2.1. NATIONAL STANDARDS FOR A TOTAL SYSTEM BALANCE PUBLISHED BY THE ASSOCIATED AIR BALANCE COUNCIL;
33.4.12. EACH PRESSURE SWITCH TRIP OCCURRENCE (EITHER HIGH OR LOW) TO RECORD AN ERROR IN NON-VOLATILE MEMORY AND IDENTIFY THE COMPRESSOR CIRCUIT;	57.2.2. I NOOLDONAL STANDANDSTON ILSTING, ADDUSTING AND DALANGING OF ENVIRONMENTAL STSTEMS PUBLISTED BY THE NATIONAL ENVIRONMENTAL BALANCING BUREAU; 37.2.3. CHADTER 37 TESTING AD HISTING AND DALANGING OF ASHDAE HANDDOOK HVAG ADDUGATIONS
33.4.13. LOW OUTDOOR AIR TEMPERATURE COMPRESSOR LOCKOUT SET-POINT OF -18°C (0°F) FOR EACH COMPRESSOR CIRCUIT, INDIVIDUALLY ADJUSTABLE	38 ACCEDIADIE LICT OF TAD FIDUS.
FROM 27°C (80°F) TO -34°C (-30°F);	38.1. AIR & WATER PRECISION BALANCING;
33.4.14. MAXIMUM ALLOWABLE EVAPORATOR FREEZE-STAT TRIP OCCURRENCE OF THREE (ADJUSTABLE BETWEEN ONE AND FOUR OCCURRENCES) DURING COOLING DEMAND, WITH CIRCUITRY TO SHUT-OFF THE COMPRESSOR EACH TIME A FREEZE-STAT TRIP OCCURS AND RECORD AN ERROR IN NON-VOLATILE MEMORY, AND IF THE MAXIMUM LIMIT IS REACHED, THE COMPRESSOR IS TO BE LOCKED-OUT AND A DIGITAL OUTPUT FOR	38.2. DESIGNTEST & BALANCING CO LID.; 38.3. FLOWSET BALANCING LTD.; 38.4. DYMANIC FLOW BALANCING.
SERVICE IS TO BE DISPLATED;	39. SCOPE OF WORK 30.1. DEREORM TOTAL MECHANICAL SYSTEMS TESTING AD ILISTING, AND DALANGING, DEGUIDEMENTS INCLUDE MEASUREMENT, AND ESTADLISHMENT OF THE
33.4.15. CONDENSER FAN CONTROL INCLUDING:	JULIA FERFORM I UTAL MECHANICAL STSTEMS TESTING, ADJUSTING, AND BALANCING. REQUIREMENTS INCLUDE MEASUREMENT AND ESTABLISHMENT OF THE FLUID QUANTITIES OF THE MECHANICAL SYSTEMS AS REQUIRED TO MEET DESIGN SPECIFICATIONS AND COMFORT CONDITIONS, AND RECORDING AND REPORTING THE RESULTS.
33.4.15.1. SIX SECOND (ADJUSTABLE BETWEEN ZERO AND SIXTEEN SECONDS) BETWEEN CONDENSER FAN SHUT-OFF AND RESTART TO PREVENT REVERSE ROTATION OF THE FANS(S);	39.2. MECHANICAL SYSTEMS TO BE TESTED, ADJUSTED AND BALANCED INCLUDE:
33.4.15.2. COOLING STAGE LOW OUTDOOR TEMPERATURE SET-POINT CONTROL (4 TO 13°C (40 TO 55°F) DEPENDING ON NUMBER OF FANS AND ADJUSTABLE BETWEEN 16°C AND -12°C (60°F AND 10°F) TO REDUCE AIRFLOW THROUGH THE CONDENSER BY TURNING OFF SOME OR ALL FANS, DEPENDING ON THE NUMBER OF CONDENSER FANS.	 39.2.1. DOMESTIC WATER SYSTEMS: TAB OF DOMESTIC WATER SYSTEMS (ALL PIPING EXTENDED FROM THE MUNICIPAL MAIN) IS TO INCLUDE: 39.2.1.1. DOMESTIC HOT WATER RECIRCULATION PIPING; 39.2.1.2. TEMPERED WATER PIPING FLOWS.
33.5. FILTERS: ROLL TYPE GLASS FIBRE MESH CONSTRUCTION FILTER MEDIA FACTORY INSTALLED WHEN THE UNIT IS SHIPPED. AND DISPOSABLE, 50 MM (2')	39.2.2. HEATING STSTEMS: TAB OF HEATING STSTEMS IS TO INCLUDE ALL PIPING AND EQUIPMENT FLUID TEMPERATURES, PRESSURE, FLOWS AND CONTROL, AND IF TAB IS NOT DONE DURING THE HEATING SEASON, A FOLLOW-UP SITE VISIT DURING THE HEATING SEASON WILL BE REQUIRED TO CONFIDE PROVED AND TEMPERATURES. AND ANY DECURED SYSTEM "FINE THINKS"
THICK, PLEATED, UL CLASS 1 MERV 7 RATED, METAL FRAMED FILTERS WITH AN INITIAL LOADING OF FILTERS, AND A SPARE SET OF FILTERS FOR EACH UNIT, SUPPLIED LOOSE IN SEALED CONTAINERS.	10 CUNFIRM PROPER FLOWS AND TEMPERATURES, AND ANY REQUIRED SYSTEM "FINE TUNING". 39.2.3. COOLING SYSTEMS: TAB OF COOLING SYSTEMS IS ALSO TO INCLUDE ALL PIPING AND EQUIPMENT FLUID TEMPERATURES, FLOWS AND CONTROL,
	AND IF TAB IS NOT DONE DURING THE COOLING SEASON, A FOLLOW-UP SITE VISIT DURING THE COOLING SEASON WILL BE REQUIRED TO CONFIRM PROPER FLOWS AND TEMPERATURES, AND ANY REQUIRED SYSTEM "FINE TUNING".
33.6. SUPPLY AIR BLOWER: CENTRIFUGAL, STATICALLY AND DYNAMICALLY BALANCED, REMOVABLE (SLIDE-OUT) BLOWER ASSEMBLY COMPLETE WITH:	39.2.4. AIR HANDLING SYSTEMS: TAB OF AIR HANDLING SYSTEMS IS TO INCLUDE ALL EQUIPMENT AND DUCTWORK AIR TEMPERATURES, CAPACITIES AND FLOWS.
33.6.1. MOTOR, DRIVE ASSEMBLY AND GUARD CONFORMING TO REQUIREMENTS SPECIFIED IN THE MECHANICAL WORK SECTION ENTITLED BASIC MECHANICAL MATERIALS AND METHODS:	39.2.5. EXISTING SYSTEMS: ALL OF THE EXISTING SYSTEMS REVISED AS PART OF THE MECHANICAL WORK, ARE TO BE TESTED, ADJUSTED AND BALANCED AS FOR NEW SYSTEMS.
	40. TESTING, ADJUSTING AND BALANCING
SYSTEM, AND WITH BUILT-IN FUNCTIONS AS FOLLOWS:	40.1. GENERAL REQUIREMENTS: CONFORM TO THE FOLLOWING REQUIREMENTS: 40.1.1 AS SOON AS POSSIBLE AFTER AWARD OF CONTRACT. THE AGENCY IS TO CAREFULLY EXAMINE A WHITE PRINT SET OF MECHANICAL DRAWINGS

33.7.1. BLOWER ON/OFF DELAY; 33.7.2. CONTROL PARAMETER DEFAULTS;

WITH RESPECT TO ROUTING OF SERVICES AND LOCATION OF BALANCING DEVICES, AND IS TO ISSUE A REPORT LISTING THE RESULTS OF THE EVALUATION; 40.1.2. THE SET OF DRAWINGS EXAMINED BY THE AGENCY IS TO BE RETURNED WITH THE EVALUATION REPORT, WITH RED LINE MARK-UPS TO INDICATE

	10.1.0.	DURING CONSTRUCTION OF THE MECHANICAL SYSTEM
	40.1.4.	AFTER ACH SITE VISIT, THE AGENCY IS TO REPORT
	40.1.5.	TESTING, ADJUSTING AND BALANCING IS NOT TO BE
40.1.5	5.1.	BUILDING CONSTRUCTION WORK IS SUBSTANTIALLY CO
40.1.3).Z.	PERFORMANCE TESTED.
	40.1.6.	ALL MECHANICAL SYSTEMS TO BE TESTED, ADJUSTE
	40.1.7.	OBTAIN COPIES OF REVIEWED SHOP DRAWINGS OF A
	40.1.8.	THE AGENCY IS TO WALK EACH SYSTEM FROM THE
	40.1.9.	THE AGENCY IS TO CHECK ALL VALVES AND DAMPE
	40.1.10.	WHEREVER POSSIBLE, THE AGENCY IS TO LOCK ALL
	40.1.11.	ON ALL DEVICES; FOR BELT-DRIVEN EQUIPMENT, THE AGENCY IS TO R
		CONSULTANT OF ANY SITUATION WHERE SHEAVES HA
	40.1.12.	THE AGENCY IS TO LEAK TEST ALL DUCTWORK AS S DUCT LEAK TEST MANUAL", COORDINATE WORK WITH
		CONTRACTOR AND CONSULTANT IDENTIFYING DUCTWO 05 AND 23 31 06, AND RETEST CORRECTED DUCTWO
	40.1.13.	NOISE: THE AGENCY IS TO BALANCE ALL SYSTEMS V FAN SPEEDS AND PERFORMING TERMINAL WORK SUC
		DESIGN CONDITIONS, THE AGENCY IS TO IMMEDIATEL' ACCURATE ASSESSMENT OF THE NOISE PROBLEM TO
	40.1.14.	STRATIFICATION: THE AGENCY IS TO CHECK ALL SUF VARIATION OF MIXED AIR TEMPERATURE ACROSS COL
	40 1 15	THE AGENCY IS TO REPORT THE PROBLEM AND ISSU
	40.1.10.	AND RECORD MEASUREMENTS USING INSTRUMENTS W
	40.1.16.	FILTERS BY PROVIDING A FALSE PRESSURE DROP;
	40.1.17.	DURING WINTER SEASON, INCLUDING AT LEAST A PE
		MAXIMUM SUMMER DESIGN CONDITION, AND WITHIN 5 FINAL TEMPERATURE READINGS DURING SEASONAL C
40.2	PRFP	PARATION OF REPORTS: PREPARE REPORTS AS INDICATE
10.2.	40.2.1.	DRAFT REPORTS: UPON COMPLETION OF TESTING, AI
		REPORTS IN THE SAME MANNER SPECIFIED FOR THE
	40.2.2.	FINAL REPORT: UPON VERIFICATION AND APPROVAL
		FORMATTED AS SPECIFIED BELOW. SUBMIT 2 COMPLE THE PROJECT DOCUMENTS.
	40.2.3.	REPORT FORMAT: REPORT FORMS ARE TO BE THOSE AND SYSTEM TO BE TESTED, ADJUSTED, AND BALAN
		DATA IN REINFORCED, VINYL, THREE-RING BINDERS. OF THE CONTENTS, DIVIDE THE CONTENTS OF THE B
40.2.3	3.1.	GENERAL INFORMATION AND SUMMARY;
40.2.3	3.2. 3.3.	AIR SYSTEMS; TEMPERATURE CONTROL SYSTEMS:
10.2.0	40.2.4.	REPORT CONTENTS: THE AGENCY IS TO PROVIDE TH
40.2.4	4.1.	INSIDE COVER SHEET TO IDENTIFY THE AGENCY, THE ON NUMBERS AND A LISTING OF THE INSTRUMENTATION U
40.2.4	4.2.	THE REMAINDER OF THE REPORT IS TO CONTAIN THE
40.2.4	4.3.	THE AGENCY IS TO INCLUDE FOR EACH SYSTEM TO B
		PLANT EQUIPMENT LOCATION, AND AREA SERVED) SCH ACCESSORIES;
40.2.4	1.4.	THE AGENCY IS TO INCLUDE REPORT SHEETS INDICATI
40.3.	VERIF CONT	TICATION OF REPORTS: AFTER THE FINAL TESTING AND
	AND	INSTRUMENTS TO COMPLETE SPOT CHECKS. NOTE THAT
	AND	AGAIN PERFORM SPOT CHECKS WITH THE CONTRACTOR
40.4.	CERT	IFICATION AND WARRANTY: WHEN THE FINAL REPORT H
	THE	CONTRACTOR IS TO SUBMIT A WRITTEN EXTENDED WARF
	VISIT	S, WILL, AT NO COST, BE INVESTIGATED BY THE AGENCE IT OF INDEODED FESTING AD USTIGATED BY THE AGENCE
	KESU	LI UI IMERUTEN IEJIINU, AUJUJIINU ANU BALANUNG,
40.5.	POST ACCC	BALANCING SITE VISITS: AFTER ACCEPTANCE OF THE DRDANCE WITH THE FOLLOWING REQUIREMENTS:
	40.5.1.	POST TESTING AND BALANCING SITE VISITS ARE TO
40.5.1 40.5 1	.1. .2.	ONCE DURING THE FIRST MONTH OF BUILDING OPERAT
40.5.1	.3.	ONCE BETWEEN THE FOURTH AND TENTH MONTHS IN
	40.5.2.	DURING EACH RETURN VISIT AND ACCOMPANIED BY
	40.5.3.	THE AGENCY IS TO SCHEDULE EACH VISIT WITH THE
	40.5.4.	AFTER EACH FOLLOW-UP SITE VISIT, THE AGENCY IS

ADDITIONAL DEVICES;

IS OF TESTING AND BALANCING DEVICES,	MUN		OF CASS	FI MAN
TE AND TIME OF THE VISIT, AND DETAILED ANCING;				
L, NORMAL OPERATION DURING EACH DAY				
ND TERMINALS, AND TEMPERATURE		ЛРТН		
NITS TO DETERMINE VARIATIONS OF	FROJECTING			
MPERATURE CONTROL SYSTEMS FOR				
SETTING, AND PERMANENTLY MARK SETTINGS				
JRN IS TO INFORM THE CONTRACTOR AND ANCING, AND REPLACEMENTS ARE TO BE				
WITH REQUIREMENTS OF SMACNA 'HVAC AIR AILED SKETCH(ES) TO SHEET METAL (AGE VALUES SPECIFIED IN SECTION 23 31				
CH IS TO BE A FACTOR WHEN ADJUSTING DBJECTIONABLE NOISE OCCUR AT THE LUDING SOUND READINGS, TO PERMIT AN				
₹ STRATIFICATION, AND WHERE THE US 5 PERCENT OF DESIGN REQUIREMENTS, JIRED TO ELIMINATE THE STRATIFICATION; ₹ MINUS 5% OF DESIGN VALUES, AND MAKE § OR MINUS 2% OF REQUIRED VALUES; TEMS WITH SIMULATED 50% LOADED (DIRTY)				
MMER SEASON AND HEATING SYSTEMS				
WINTER DESIGN CONDITION, AND TAKE				
E DRAFT REPORTS ON AABC OR NEBB				
F DRAFT REPORTS. ONLY ONE COMPLETE				
'YPE WRITTEN, AND ORGANIZED AND SUREMENT (SI OR IMPERIAL) AS USED ON				
ED STANDARD FOR EACH RESPECTIVE ITEM				
CT IDENTIFICATION AND A TITLE DESCRIPTIVE ATED BY DIVIDER TABS:	2	ISSUED FOR 99% CC	ORDINATION	2025-02-24
	1	ISSUED FOR 66% CC	ORDINATION	2023-05-12
DATA:	ISSUE	DESCRIPTIC	DN	DATE
OF OF CALIBRATION; , THE INFORMATION INDICATED ON THE	IT IS THE F	RESPONSIBILITY OF THE AF	PROPRIATE CONTR	
DRAWN, IDENTIFIED (SYSTEM DESIGNATION, ENTIFYING ALL EQUIPMENT, TERMINALS, AND	REPORT A	AND VERIFY ALL DIMENSION ALL ERRORS AND/OR ON WORK COMMENCES.	ans on she and p Aissions to the CC	DNSULTANT
ROOMS.	ALL WOF APPLICA	RK IS TO FOLLOW THE OB ABLE CODES AND REGULA	C 2012 AND ANY O Ations.	THER
AGENCY IS TO VISIT THE SITE WITH THE CY IS TO SUPPLY ALL LABOUR, LADDERS, DNSISTENT BASIS, AGREE WITH THE FINAL INVOLVED, RESUBMIT THE FINAL REPORT,	DO NOT	SCALE DRAWINGS.		
3MIT TO THE OWNER, IN THE NAME OF THE RANCE PROGRAM BOND, AND IN ADDITION, FATING SEASON AND ONE FULL COOLING				
ISION WORK DONE DURING SCHEDULED SITE IS DETERMINED THAT THE PROBLEMS ARE A				
OUT ADDITIONAL COST TO THE OWNER.				
I LESTING AND BALANCING STIE VISITS IN				
IONTH VISIT.	PROFESSION			
O SPOT REBALANCE TERMINAL UNITS AS				
E CONSULTANT; NT A REPORT INDICATING ANY CORRECTIVE				
ND RECOMMENDED CORRECTIVE ACTION.				
	EXP Se	rvices Inc.		
	T: 613.688. 100 – 2650	.1899 Queensview Drive		N
	Canada	N K2B 8H6		
	www.exp.c	com		
	• BUIL • INDUS	_DINGS • EARTH & STRIAL • INFRASTF	ENVIRONMENT RUCTURE • SU	• ENERGY • STAINABILITY •
	PROJECT			
		1 INDUSTR	IEL STRE	EET
		OFFICE	E FIT-UP	
	DRAWING			
		MECH	ANICAL	
		SPECIFI	CATIONS	5
	PROJECT No:	MRK-23002008-A0	REVISION:	
	DRAWN:	M. OMAR	DATE: JUN	E 2023
	APPROVED:	B. BROWN	SCALE: AS S	SHOWN

DRAWING No:

M-4

CLIENT

LOCATIONS FOR DUCT SYSTEM TEST PLUGS, AND REQUIRED REVISION WORK SUCH AS RELOCATION OF BALANCING DEVICES AND LOCATIONS FOR 40.1.3. AFTER REVIEW OF THE MECHANICAL WORK DRAWINGS AND SPECIFICATION, THE AGENCY IS TO VISIT TH MS, TO OBSERVE ROUTING OF SERVICES, LOCATIONS FECT TESTING, ADJUSTING AND BALANCING; T RESULTS OF THE SITE VISIT INDICATING THE DATI

EQUIRED TO ENSURE PROPER ADJUSTING AND BALAI BEGIN UNTIL: COMPLETE AND DOORS HAVE BEEN INSTALLED; ECTS, AND HAVE BEEN CHECKED, STARTED, ADJUSTE

TED AND BALANCED ARE TO BE MAINTAINED IN FULL

ALL APPLICABLE MECHANICAL PLANT EQUIPMENT AN e system "head end" equipment to terminal uni

STALLATION TRADES WILL ACCOMPANY THE AGENCY; PERS FOR CORRECT AND LOCKED POSITION, AND TEM g equipment; L BALANCING DEVICES IN PLACE AT THE PROPER S

D REPORT TO THE COMMISSIONING AGENT WHO IN TURE HAVE TO BE REPLACED TO SUIT TESTING AND BALAN

SPECIFIED IN SECTION 23 31 05 IN ACCORDANCE TH THE WORK OF SECTION 23 31 05, PROVIDE DETA WORK NOT IN ACCORDANCE WITH ACCEPTABLE LEAK

S WITH DUE REGARD TO OBJECTIONABLE NOISE WHICH SUCH AS ADJUSTING AIR QUANTITIES, AND SHOULD OB ELY REPORT THE PROBLEM AND SUBMIT DATA, INCLUI O BE MADE;

SUPPLY AIR HANDLING SYSTEM MIXING PLENUMS FOR COILS IS FOUND TO BE IN EXCESS OF PLUS OR MINUS SUE A DETAIL SKETCH OF PLENUM BAFFLE(S) REQUI G, ADJUSTING AND BALANCING TO WITHIN PLUS OR I WITH MINIMUM ACCURACY WHICH ARE WITHIN PLUS ED WITH AIR FILTERS, TEST AND BALANCE THE SYSTE

LANCE AIR CONDITIONING SYSTEMS DURING THE SUMM PERIOD OF OPERATION AT OUTSIDE CONDITIONS WITHIN 5.5°C (10°C) DRY BULB TEMPERATURE OF MINIMUM

TED BELOW. ADJUSTING, AND BALANCING PROCEDURES, PREPARE BUT MUST BE COMPLETE, FACTUAL, ACCURATE, AND HE FINAL REPORTS. SUBMIT TWO COMPLETE SETS OF

L OF DRAFT REPORTS, PREPARE FINAL REPORTS, T LETE SETS OF FINAL REPORTS. USE UNITS OF MEAS

SE STANDARD FORMS PREPARED BY THE REFERENCE ANCED. BIND REPORT FORMS COMPLETE WITH SCHEM. IS. PROVIDE BINDING EDGE LABELS WITH THE PROJECT BINDER INTO THE DIVISIONS LISTED BELOW, SEPARA

THE FOLLOWING MINIMUM INFORMATION, FORMS AND D E CONTRACTOR, AND PROJECT, INCLUDING ADDRESSES USED FOR THE PROCEDURES ALONG WITH THE PRO E APPROPRIATE FORMS CONTAINING AS A MINIMUM, ED FOR EACH RESPECTIVE ITEM AND SYSTEM;

BE TESTED, ADJUSTED AND BALANCED, A NEATLY CHEMATIC "AS-BUILT" DIAGRAM INDICATING AND ID

TING BUILDING COMFORT TEST READINGS FOR ALL I

D BALANCING REPORT HAS BEEN SUBMITTED, THE A INDICATED ON THE BALANCING REPORT. THE AGENC T IF RESULTS OF SPOT CHECKS DO NOT, ON A CO HE AGENCY IS TO THEN REBALANCE THE SYSTEMS I R AND CONSULTANT.

HAS BEEN ACCEPTED, THE CONTRACTOR IS TO SUBMI UARANTY CERTIFICATION OR A NEBB QUALITY ASSURA RRANTY FROM THE AGENCY COVERING ONE FULL HI WHICH OCCUR, WITH THE EXCEPTION OF MINOR REVIS CY AND REPORTED ON TO THE OWNER, AND IF IT , THEY ARE TO BE IMMEDIATELY CORRECTED WITHOUT

E FINAL REPORT, THE AGENCY IS TO PERFORM POST

O BE MADE: ATION;

ATION; N A SEASON OPPOSITE TO THE FIRST AND THIRD MO

Y THE OWNER'S REPRESENTATIVE, THE AGENCY IS T /INATE COMPLAINTS;

HE CONTRACTOR AND THE OWNER, AND INFORM THE C ' IS TO ISSUE TO THE CONTRACTOR AND CONSULTANT WORK PERFORMED DURING THE VISIT, ALL ABNORMAL CONDITIONS AND COMPLAINTS ENCOUNTERED, AN

									ROOF	TOP UNIT	SCHEDUL	E					
TAG LOCATION		COOLING		HEATING		SUPPLY AIR FAN		ELECTRICAL									
	LOCATION	WEIGHT (LBS)	TOTAL CAPACITY (MBH)	SENSIBLE CAPACITY (MBH)	POWER INPUT W/O BLOWER (kW)	FUEL SOURCE	INPUT CAPACITY (MBH)	OUTPUT CAPACITY (MBH)	SUPPLY AIR (CFM)	ESP (IN WG)	POWER INPUT (kW)	MOTOR HP	POWER SUPPLY (V/PH/HZ)	МСА	MOCP	BASIS OF DESIGN	REMARK
RTU-1	ROOFTOP AT NORTH SIDE OF BUILDING	1245	95.4	65.4	5.58	NATURAL GAS	180	146	3,300	0.75	2.01	3	575/3/60	18.8	20	YORK SINGLE PACKAGE R-454B AIR CONDITIONER MODEL # KJ090N18R5BBAAE2A1	C/W 2-STAGE NATURAL GAS HEAT RELIEF AND HOODS, DUAL ENTH/
RTU-2	ROOFTOP AT SOUTH SIDE OF BUILDING	1245	101.1	68.5	6.28	NATURAL GAS	180	146	3,300	0.75	1.83	3	575/3/60	17.3	25	YORK SINGLE PACKAGE R-454B AIR CONDITIONER MODEL # KJ102S18R5BBAAE2A1	C/W 2-STAGE NATURAL GAS HEAT RELIEF AND HOODS, DUAL ENTH/

ELECTRIC DOMESTIC HOT WATER HEATER SCHEDULE

TAG	LOCATION	STORAGE CAPACITY (GAL.)	RECOVERY RATE @ 100°F (GAL/H)	SHIPPING WEIGHT (LBS.)	INPUT (kW)	ELECTRICAL (V/Ph/Hz)	BASIS OF DESIGN	
DHWT-1	JANITOR ROOM	20	21	_	5	208/3/60	A.O. SMITH DEL-20S-5	

ELECTRIC BASEBOARD HEATER SCHEDULE									
TAG	kW / BTU	VOLTS/PH/HZ	LENGTH (IN)	BASIS OF DESIGN	REMARKS				
B-1	0.5 / 1706	120/1/60	22	STELPRO – CODE#SPR0501W	C/W INTEGRAL THERMOSTAT				
B-2	0.75 / 2560	208/1/60	36	STELPRO – CODE#SPR1002W	C/W INTEGRAL THERMOSTAT				
B-3	1 / 2560	208/1/60	36	STELPRO – CODE#SPR1002W	C/W INTEGRAL THERMOSTAT				
B-4	1.5 / 2560	208/1/60	50	STELPRO – CODE#SPR1508W	C/W INTEGRAL THERMOSTAT				

GRILLE AND DIFFUSER SCHEDULE										
TAG	TYPE	REMARKS								
D-1	SUPPLY DIFFUSER	24" X 24"	SHOWN IN PLANS	EH PRICE SCD						
D-2	SUPPLY DIFFUSER	12" X 12"	6"	EH PRICE SCD						
D-3	SUPPLY DIFFUSER	-	SHOWN IN PLANS	EH PRICE RCD						
G-1	EGG CRATE RETURN GRILLE	24" X 4"	-	EH PRICE 80						
G-2	EGG CRATE RETURN GRILLE	24" X 24"	_	EH PRICE 80						
ALL GRILLES AND REGI	ALL GRILLES AND REGISTERS TO BE COLOUR B12 (WHITE)									

FAN SCHEDULE									
TAG	LOCATION	TYPE	AIR FLOW (CFM)	SP (IN WG)	BASIS OF DESIGN	REMARKS			
EF-1	BF WASHROOM 216	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH WASHROOM LIGHT. COORDINATE WITH ELECTRICAL			
EF-2	JANITOR 217	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH LIGHT. COORDINATE WITH ELECTRICAL			
EF-3	WASHROOM 218	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH WASHROOM LIGHT. COORDINATE WITH ELECTRICAL			
EF-4	WASHROOM 219	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH WASHROOM LIGHT. COORDINATE WITH ELECTRICAL			
EF-5	WASHROOM 220	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH WASHROOM LIGHT. COORDINATE WITH ELECTRICAL			
EF-6	WASHROOM 221	INLINE EXHAUST FAN	70	0.25	GREENHECK SP-A70	INTERLOCK WITH WASHROOM LIGHT. COORDINATE WITH ELECTRICAL			
TF-1	IT ROOM 213	INLINE CABINET FAN	200	0.5	GREENHECK CSP-A250-QD	INTERLOCK WITH THERMOSTAT			
TF-2	ELECTRICAL ROOM 201	INLINE CABINET FAN	200	0.5	GREENHECK CSP-A250-QD	INTERLOCK WITH THERMOSTAT			
	•	·	•		•	•			

REMARKS

TAG	TYPE	DESCRIPTION	CONNECTION SIZE (IN)			
			C.W.	H.W.	DRAIN	
WC-1	WASHROOM TOILET	AMERICAN STANDARD CADET RIGHT HEIGHT ELONGATED PRESSURE-ASSISTED TOILET 1.6 GPF	1/2	-	3	
L-1	WASHROOM SINK	MONOLITH B SERIES SINK (38"X 24") C/W AN ANGLED PIPE SKIRT AND ZURN AQUASPEC Z82200-XL SINGLE CONTROL FAUCET	1/2	1/2	1 1/2	
L-2	WASHROOM SINK	MONOLITH A SERIES SINK (30"X 24") C/W AN ANGLED PIPE SHIRT AND ZURN AQUASPEC Z82200-XL SINGLE CONTROL FAUCET	1/2	1/2	1 1/2	
S-1	KITCHEN SINK	COUNTER MOUNTED, DOUBLE COMPARTMENT SINK, CONSTRUCTED FROM 18 GAUGE TYPE 304 STAINLESS STEEL, WITH OVERALL DIMENSION 794 MM (31–1/4") LONG, 460 MM (18–1/8") WIDE, 203 MM (8") HIGH. C/W CHICAGO FAUCETS 434–ABCP FAUCET, MCGUIRE LFBV2165 SUPPLY, MCGUIRE 8912CB P–TRAP	1/2	1/2	1 1/2	
JS–1	JANITOR SINK	MOLDED HIGH DENSITY COMPOSITE BASIN, PVC DRAIN BODY, STAINLESS STEEL STRAINER AND 2" GASKETED OUTLET CONNECTION, C/W AMERICAN STANDARD SINK FAUCET MODEL #GUS29RT22	1/2	1/2	2	









MECHANICAL PLAN — ROOF scale: 1/4"=1'-0"

	CLIENT			
	MU	NICIPALITY	OF CASS	ELMAN
EXHAUST DUCT IEN HOOD	PROJECT	NORTH		
			1	
	2 1	ISSUED FOR 99% CC		2025-02-24 2023-05-12
	ISSUE	DESCRIPTIC	DN .	DATE
	PROFESS	SIONAL STAMP		
	EXP S T: 613.6 100 – 20 Ottawa, Canada www.ex	Services Inc. 588.1899 550 Queensview Drive ON K2B 8H6 cp.com	······································	xp.
	• BI • IND	UILDINGS • EARTH & USTRIAL • INFRASTF	ENVIRONMENT (RUCTURE • SUS	• ENERGY • TAINABILITY •
	PROJECT	1 INDUSTR OFFICE	IEL STRE E FIT-UP	ET
	DRAWING	MECI ROC	HANICAL OF PLAN	
	PROJECT DRAWN:	No: MRK-23002008-A0	REVISION: DATE: JUNE	2023
	APPROVE	D: B. BROWN	SCALE: AS SH	IOWN
	DKAWING	NO.	1-8	