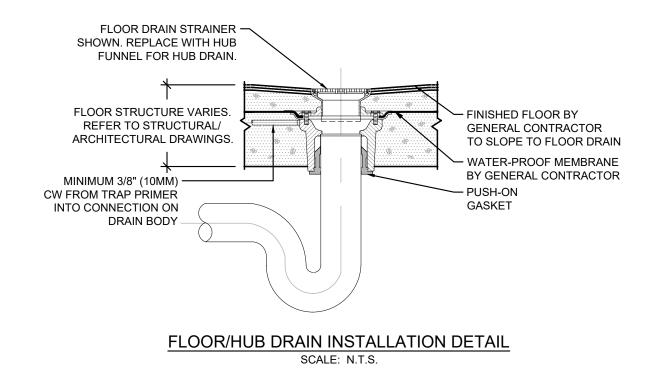


TRAP SEAL PRIMER VALVE DETAIL SCALE: N.T.S.



1. PROVIDE EXTENSION KITS AS REQUIRED FOR ELEVATED PIPING 2. PROVIDE SUPPORT AT EVERY FITTING 3. PROVIDE ACCOMMODATION FOR PIPE MOVEMENT DUE TO

EXPANSION/CONTRACTION AS REQUIRED 4. ROOF PIPE HORIZONTAL SUPPORT SPACING, PER CSA B149 IS: LESS THAN 1" (25mm): 4 FT (1.2m) - 18 GAUGE GALVANIZED STEEL U 8 FT (2.5 m) 1" (25mm): CLAMP. SIZE TO SUIT PIPE 1-1/4" - 2-1/2" (32mm - 63mm): 10 FT (3.0m) 3"-4" (75mm - 100mm): 15 FT (4.5m) - PROTECTIVE SHIELD 5"-8" (125mm - 200mm): 20 FT (6.0m) - S/S FASTENERS 10" (250mm) & LARGER: 25 FT (8.0m) - INTERLOCKING UV STABILIZED POLYPROPYLENE SLEEPER C/W CLOSED CELL RIGID FOAM INSULATION BASE ROOF STRUCTURE

NATURAL GAS PIPE SUPPORT ON ROOF DETAIL SCALE: N.T.S.

CONTROL NOTES:

EXHAUST FAN: EF-101

OPERATING SEQUENCE:

CYCLE FAN ON/OFF WITH LOCAL LIGHT.

| PLUMBING FIXTURE SCHEDULE | | | | | | | |
|---------------------------|--|-----|------|-------|--|--|--|
| DWG REF | DESCRIPTION | НОТ | COLD | DRAIN | | | |
| FD | FLOOR DRAIN- EPOXY COATED CAST IRON FLOOR DRAIN WITH ANCHOR FLANGE, REVERSIBLE CLAMPING COLLAR WITH PRIMARY AND SECONDARY WEEPHOLES, ADJUSTABLE CAST IRON (STANDARD) HUB FUNNEL, AND NO HUB (STANDARD) OUTLET. WATTS DRAINAGE - MODEL: FD-100-DD | | | 3" | | | |
| FPWH | WATTS HY-42 – NON-FREEZE WALL HYDRANT WITH BACKFLOW PREVENTER. SHALL BE EXPOSED TYPE, AUTOMATIC DRAINING, WITH VACUUM BREAKER BACKFLOW PREVENTOR, 3/4" HOSE THREAD, LOOSE TEE KEY. | | 3/4" | | | | |

| ACCESSORIES: 1) HANGER RODS 2) HANGING VIBRATION ISOLATORS 3) BASE ISOLATOR KIT 4) FLEXIBLE CONNECTIONS - INLET AND/OR OUTLET 5) MOTORIZED BACKDRAFT DAMPER COORDINATE OPERATING VOLTAGE W/ DIV.16 6) ROOF CURB TO BE PROVIDED BY GENERAL CONTRACTOR AS DETAILED ON ARCHITECTURAL DWGS. | | | | 7) 18" ROOF CURB BY FAN MANUFACTURER 8) DISCONNECT SWITCH 9) BELTS, DRIVES, AND PULLEYS 10) BIRDSCREEN 11) TRANSFORMER AND RELAY FOR 24V CONTROL 12) WEATHER HOOD 13) SPEED CONTROLLER | | | 14) WALL MOUNT CONTROLLER 15) BELT DRIVE MOTOR COVERS 16) INSULATED HOUSING 17) DRAIN CONNECTION 18) LOUVERED WALL BOX C/W B.D.D. 19) REVERSE ACTING THERMOSTAT 20) ECM MOTOR C/W SPEED ADJUSTMENT | | | CONTROL LGT: ENERGIZE WITH ROOM LIGHTING TMR: TIME CLOCK MSW: MANUAL SWITCH BAS: BUILDING AUTOMATION SYSTEM RAT: REVERSE ACTING THERMOSTAT, 120V GDC: BY GAS DETECTION CONTROLLER INT-EQMT TAG: INTERLOCKED WITH REFERENCED EQMT OTH: OTHER. SEE REMARKS | | |
|---|--|-----------|---------|--|---------------------------|---------------|--|------------------|-----------------------------|--|-------------|-------------------------------|
| DWG REF. | MANUF. | SERVING | MODEL | AIRFLOW [CFM] (L/s) | ESP [in. w.c.] (Pa) | MOTOR [HP] | RPM | SOUND [SONES] | ELECTRICAL [V / Ph / Hz] | CONTROL | ACCESSORIES | REMARKS |
| EF-101 | GREENHECK | MECH ROOM | G-070-G | 150 (71) | 0.25 (62.2) | FHP | 1300 | 1.5 | 120 / 1 / 60 | LGT | 1,2,4 | CONTROL WITH LOCAL THERMOSTAT |
| APPROVED MANUFA | APPROVED MANUFACTURERS: GREENHECK, COOK, DELHI, PENN BARRY | | | | | | | | | | | |

EXHAUST FAN SCHEDULE

| ELECTRIC UNIT HEATER SCHEDULE | | | | | | | | | | | | |
|-------------------------------|--|--------|---------------------------|----------------|-------|-----|--|------|---|----------------|--|-----------|
| DWC DEE | MANUF. | MODEL | CAPACITY [MBH] (kW) | AIRFLOW | MOTOR | DDM | ELECTRICAL | | CONTROL | 4005000DI50 | DEMARKO. | |
| DWG REF | | | | | | | [CFM] (L/s) | [HP] | RPM | VOLT / PH / HZ | MCA | MOCP |
| UH-101 | MODINE | АМР090 | 31 (9.1) | 550 (259.4) | - | - | 208/1/60 | | - | T-24 | | TWO STAGE |
| ALTERNATE MAN | LTERNATE MANUFACTURERS: | | | | | | CONTROL: | | | ACCESSORIES: | | |
| MODINE, RE-VER | MODINE, RE-VERBER (BRANT RADIANT), REZNOR, TRANE | | | | | | T-24: THERMOSTAT - 24V T-120: THERMOSTAT - 120V | | 1) ROOF VENT 2) SIDEWALL VENT 3) SIDEWALL COMB. AIR INLET | | 4) CONCENTRIC SIDEWALL VENT / COMB. AIR 5) ROOF COMB. AIR INLET | |

GENERAL NOTES: (APPLICABLE TO ALL DRAWINGS)

- THESE DRAWINGS ARE AN INTEGRAL PART OF THE SPECIFICATIONS WHICH ACCOMPANY THEM.
- ALL MATERIALS AND WORKMANSHIP SHALL BE NEW UNLESS NOTED OTHERWISE, FREE OF DEFECTS, AND COMPLY WITH ALL APPLICABLE STANDARDS.
- ALL DIMENSIONS ARE IN INCHES UNLESS NOTED OTHERWISE
- INSTALL PIPING TIGHT TO UNDERSIDE OF STRUCTURE UNLESS NOTED OTHERWISE.
- DO NOT SCALE DRAWINGS. OBTAIN ALL DIMENSIONS FROM EXISTING ARCHITECTURAL PLANS, SITE INSPECTIONS, AND MANUFACTURER'S SHOP
- REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION OF FIRE RATED
- OPENINGS IN EXTERIOR WALLS AND ROOF ARE TO BE PROPERLY FLASHED AND MADE WEATHERPROOF.
- ALL ROOF FLASHING FOR CURBS & PENETRATIONS TO COMPLY WITH ROOF
- WARRANTOR'S REQUIREMENTS. ALL NECESSARY CUTTING / PATCHING FOR MECHANICAL WORK SHALL BE PROVIDED BY APPROPRIATE TRADE(S) AT CONTRACTOR'S EXPENSE UNLESS
- MAKE GOOD ALL BUILDING COMPONENTS DAMAGED BY WORK OF THIS TRADE TO THE CONSULTANT SATISFACTION.
- PROVIDE ALL SLEEVES, INSERTS AND HANGERS REQUIRED FOR THE WORK. TREAT ALL SLEEVES OR HOLES PIERCING ACOUSTICAL SEPARATIONS FOR INSTALLATIONS OF THIS DIVISION TO MAINTAIN ACOUSTICAL RATING. ALL GAPS SHALL BE PACKED WITH ACOUSTICAL INSULATION AND SEALED AT BOTH ENDS WITH ACOUSTICAL CAULKING. PATCH ALL OPENINGS AROUND INSTALLATIONS OF THIS DIVISION PIERCING FIRE OR SMOKE SEPARATIONS WITH AN APPROVED WATERTIGHT SMOKE AND FIRE STOP SEALANT.
- INSTALL ALL EQUIPMENT AND ASSOCIATED APPURTENANCES TO PROVIDE MAINTENANCE ACCESS. ALLOW FOR ALL ACCESS DOORS REQUIRED FOR EQUIPMENT INSTALLATIONS & SERVICE. ENSURE PROPER ACCESS DOOR SIZE, TYPE AND FIRE RATING.
- COORDINATE ALL WORK WITH OTHER TRADES AND SUPPLIERS/MANUFACTURERS TO AVOID INTERFERENCES AND CONFLICTS BETWEEN SERVICES. PLAN WORK WELL IN ADVANCE TO ELIMINATE INSTALLATION AND COORDINATE DIFFICULTIES. COOPERATE WITH OTHER TRADES ON SITE TO RESOLVE INTERFERENCES TO SATISFACTORILY COMPLETE THE PROJECT.
- DEBRIS WILL BE KEPT TO A MINIMUM. ON COMPLETION OF CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER, SITE SHALL BE CLEANED AND ALL SCRAP MATERIALS RESULTING FROM THE WORK SHALL BE
- PRIOR TO THE FINAL INSPECTION, ALL EQUIPMENT SHALL BE CLEANED. ALL CONSTRUCTION DUST AND DIRT SHALL BE REMOVED FROM INSTALLED EQUIPMENT AT THE END OF THE JOB.
- ALLOW FOR SCOPING OF EXISTING CONCEALED DRAINAGE PIPING TO VERIFY LOCATION & ROUTING.

| DUCTWORK LEGEND | | | | | |
|---|---|--|--|--|--|
| SYMBOL | DESCRIPTION | | | | |
| } | DUCTWORK SHOWN DOUBLE LINE | | | | |
| OED | OPEN ENDED DUCT | | | | |
| T | THERMOSTAT/TEMPERATURE SENSOR | | | | |
| EA | EXHAUST AIR | | | | |
| SA | SUPPLY AIR | | | | |
| □тс | TIMECLOCK | | | | |
| | DUCT DOWN - POSITIVE / NEGATIVE PRESSURE | | | | |
| | DUCT UP - POSITIVE / NEGATIVE PRESSURE | | | | |
| \boxtimes | SUPPLY AIR GRILLE | | | | |
| | RETURN AIR GRILLE | | | | |
| ? | DRAWING NOTE TAG | | | | |
| | EQUIPMENT TAG | | | | |
| ??? | - EQUIPMENT TYPE - EQUIPMENT NUMBER (REFER TO SCHEDULES FOR INFO) | | | | |
| THIS IS A STANDARD LEGEND. ALL SYMBOLS MAY NOT NECESSARILY BE USED ON DRAWINGS. | | | | | |

| | PIPING LEGEND |
|---------------------|---|
| ITEM | DESCRIPTION |
| | NEW ITEM |
| | EXISTING ITEM TO REMAIN |
| | EXISTING ITEM TO BE REMOVED |
| | BELOW FLOOR PIPING |
| | POTABLE (DOMESTIC) COLD WATER (DCW) |
| —SAN— | SANITARY DRAIN |
| G | NATURAL GAS |
| —₩— | GATE VALVE |
| — Ф— | BALL VALVE |
| — ∞ — | GLOBE VALVE |
| — № TBV | THERMOSTATIC BALANCING VALVE |
| ₹ | GAS VALVE |
| o | ELBOW TURNED UP |
| c | ELBOW TURNED DOWN |
| E | PIPE CAP |
| | PIPE SINGLE LINE CUTOFF |
| — □CO | FLOOR CLEAN OUT |
| —II ^{co} | WALL CLEAN OUT |
| → MHB | HOSE BIB |
| → FPWH | FROST PROOF WALL HYDRANT |
| FD ØC | FLOOR DRAIN; FFD: FUNNEL FLOOR DRAIN; HD: HUB DRAIN |
| € FEX | FIRE EXTINGUISHER |
| \(\Phi \) | NEW CONNECTION TO EXISTING |
| | TANDARD LEGEND. ALL SYMBOLS MAY NOT ILY BE USED ON DRAWINGS. |

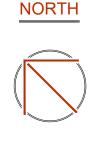


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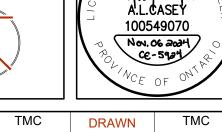
KEYPLAN

W www.callidus.ca E info@callidus.ca

REVISIONS ISSUED FOR DATE 90% COORDINATION 24.06.26 100% COORDINATION 24.10.15 PERMIT



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PROJECT

ALC REVIEWED

STARBUCKS

COBOURG

ADDRESS

1030 DIVISION STREET, COBOURG, ON

PROJECT NO.

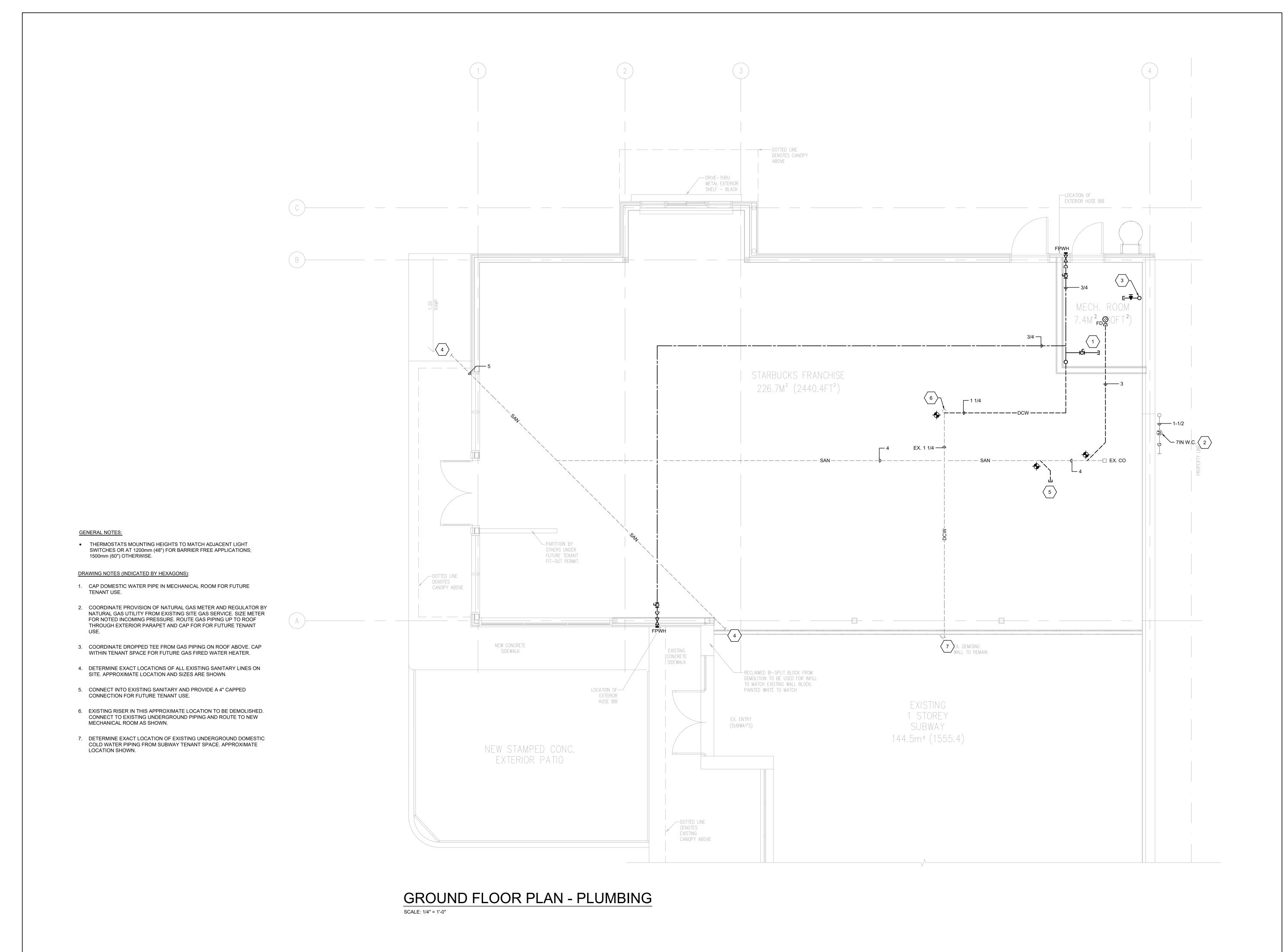
CE-5924

DRAWING TITLE

MECHANICAL NOTES, SCHEDULES, DETAILS

DRAWING NUMBER

M1 of 5





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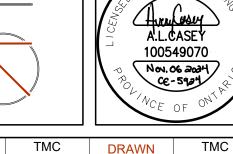
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STARBUCKS COBOURG

ADDRESS

1030 DIVISION STREET, COBOURG, ON

PROJECT NO.

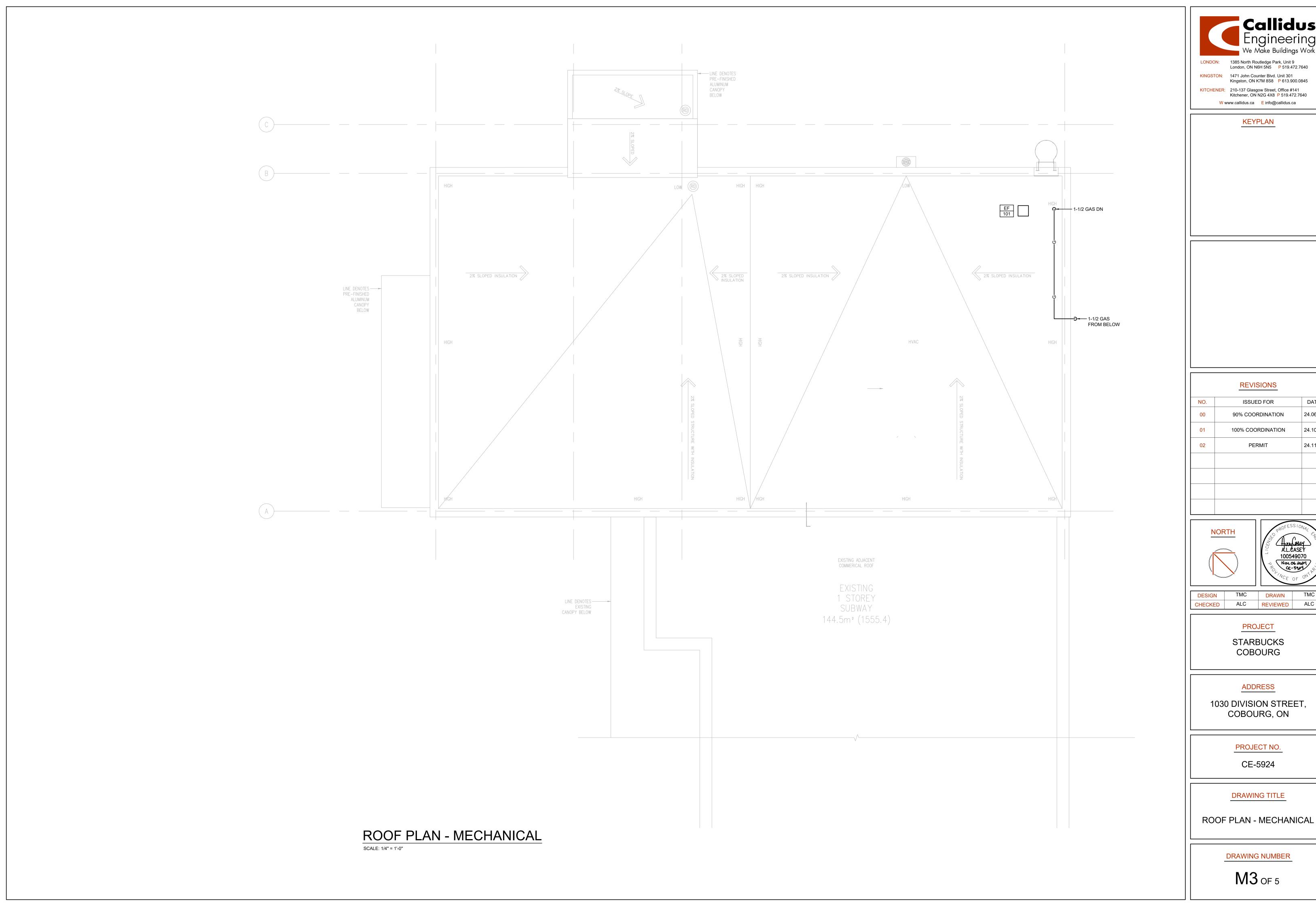
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DRAWING TITLE

GROUND FLOOR PLAN -PLUMBING

DRAWING NUMBER

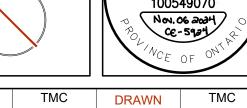
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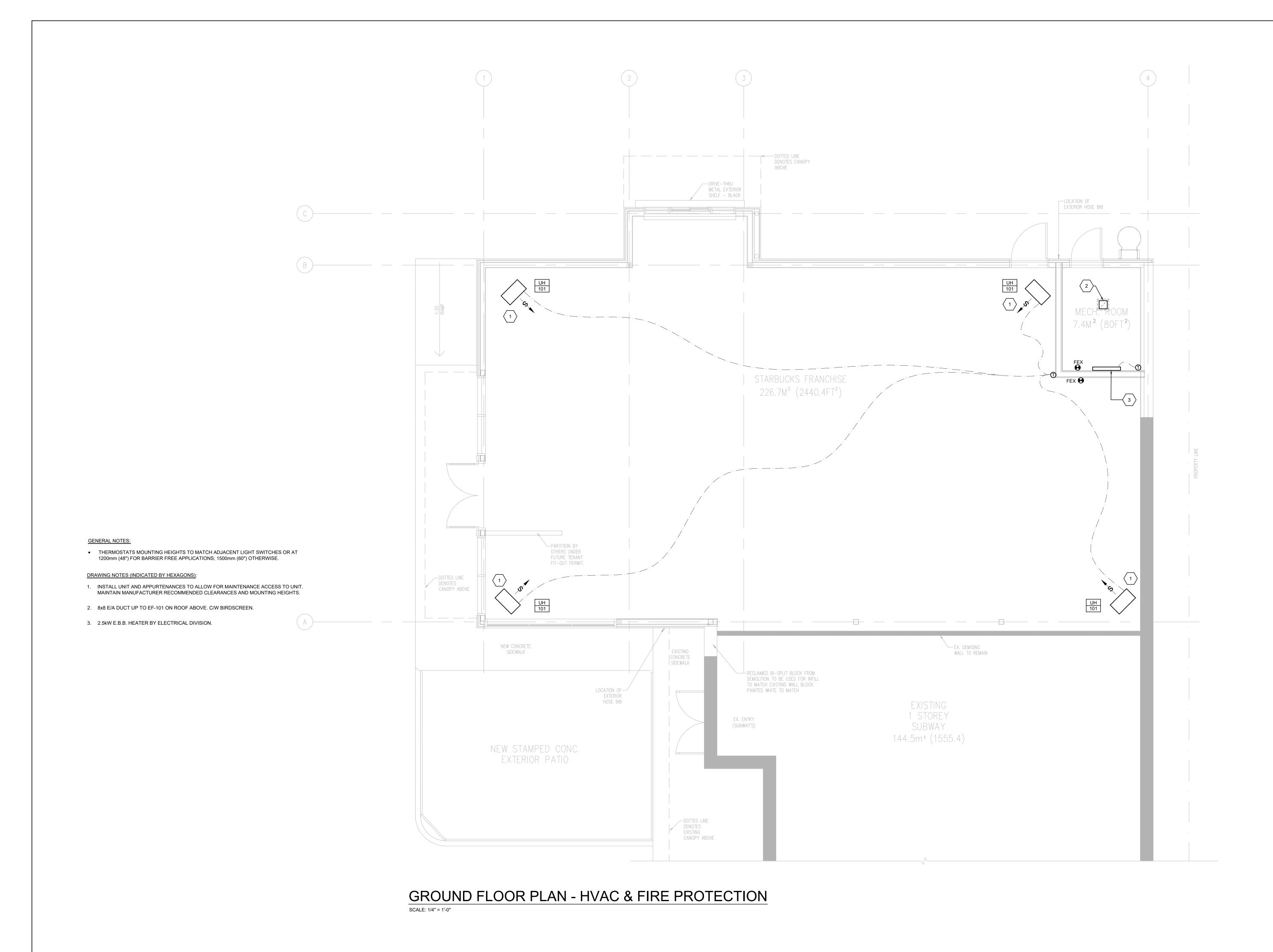




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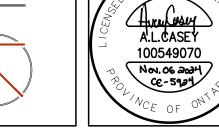
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 24.11.07





| | DESIGN | TMC | DRAWN | TMC |
|--|---------|-----|----------|-----|
| | CHECKED | ALC | REVIEWED | ALC |
| | | | | |

PROJECT

STARBUCKS COBOURG

ADDRESS

1030 DIVISION STREET, COBOURG, ON

PROJECT NO.

CE-5924

DRAWING TITLE

GROUND FLOOR PLAN - HVAC & FIRE PROTECTION

DRAWING NUMBER

M4 OF 5

MECHANICAL GENERAL REQUIREMENTS:

- 1.1. <u>GENERAL:</u>
- 1.1.1. MAKE SITE VISIT(S) AS NECESSARY BEFORE BID CLOSING TO ESTABLISH AND VERIFY ALL EXISTING CONDITIONS. MAKE ALLOWANCE FOR ANY NEW OR EXISTING SERVICE AND EQUIPMENT RELOCATIONS NECESSARY TO COMPLETE THE WORK AND INCLUDE IN THE BID PRICE. EXTRAS WILL NOT BE ALLOWED FOR FAILURE TO PROPERLY EVALUATE EXISTING CONDITIONS.
- 1.1.2. THE DRAWINGS SHOW THE GENERAL INTENT OF THE WORK, NOT THE DETAILS OF INSTALLATION. CO-ORDINATE THE ROUTING AND INSTALLATION OF ALL MECHANICAL SERVICES WITH ALL EXISTING CONDITIONS, STRUCTURE AND THE WORK OF ALL OTHER TRADES. PROVIDE INSTALLATION DRAWINGS AS REQUIRED.
- 1.1.3. DO NOT SCALE MECHANICAL DRAWINGS. TAKE FIELD DIMENSIONS PRIOR TO ANY INSTALLATION.
- DESCRIPTION: PROVIDE WORK IN ACCORDANCE WITH FULL INTENT AND MEANING OF DRAWINGS ND SPECIFICATIONS. THE WORD "PROVIDE" WHERE USED IN THE CONTRACT DOCUMENTS, IS TO BE INTERPRETED AS "SUPPLY AND INSTALL" ALONG WITH ALL ASSOCIATED HARDWARE AND
- 1.3. <u>WORKMANSHIP:</u> PROVIDE ALL NEW MATERIALS AND EQUIPMENT WITH THE APPROPRIATE LISTING (I.E. CSA. ULC. CETL. ETC.) ALL WORKMANSHIP BY THIS TRADE SHALL BE FIRST CLASS CONFORMING TO INDUSTRY STANDARD PRACTICES FOR SAFETY, ACCESSIBILITY, DURABILITY AND NEATNESS FOR ACCEPTANCE BY THE OWNER'S REPRESENTATIVES.
- 1.4. <u>SLEEVES, HANGERS, INSERTS:</u> PROVIDE ALL SLEEVES, INSERTS AND HANGERS REQUIRED FOR THE MECHANICAL WORK/ TREAT ALL SLEEVES OR HOLES PIERCING ACOUSTICAL SEPARATIONS FOR INSTALLATIONS OF THE DIVISION TO MAINTAIN ACOUSTICAL RATING. ALL GAPS SHALL BE PACKED WITH ACOUSTICAL INSULATION AND SEALED AT BOTH ENDS WITH ACOUSTICAL CAULKING. PATCH ALL OPENINGS AROUND INSTALLATIONS OF THIS DIVISION PIERCING FIRE OR SMOKE SEPARATIONS WITH AN APPROVED WATERTIGHT SMOKE AND FIRE STOP SEALANT.
- INTERPRETATION: DIVISION OF THE WORK AMONG SUPPLIERS OR VENDORS AND SUBCONTRACTORS IS SOLELY THE CONTRACTOR'S RESPONSIBILITY. NEITHER THE OWNER NOR CONSULTANT ASSUMES ANY RESPONSIBILITY TO ACT AS AN ARBITER TO ESTABLISH SUBCONTRACT TERMS BETWEEN SECTORS OR DISCIPLINES OF WORK.
- COORDINATION BETWEEN TRADES: CO-ORDINATE THE WORK OF THIS TRADE WITH ALL OTHER TRADES ON THE JOB SO THAT THE WORK MAY PROGRESS WITHOUT ANY DELAY. SCHEDULE AND PHASE DEMOLITION AND NEW WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH
- DISCREPANCY: IF A DISCREPANCY IS FOUND IN THE SPECIFICATION OR ON THE DRAWINGS, REQUEST CLARIFICATION PRIOR TO THE END OF THE QUESTION PERIOD SO THAT CLARIFICATION CAN BE PROVIDED IN WRITING.
- 1.8. REGULATORY REQUIREMENTS: CONFORM TO GOVERNING MUNICIPAL AND PROVINCIAL CODES, RULES AND REGULATIONS AND/OR AUTHORITIES HAVING JURISDICTION.
- 1.9. CODES AND STANDARDS
- 1.9.1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE, THE ONTARIO FIRE CODE AND ANY OTHER LOCAL REGULATIONS HAVING JURISDICTION OVER THE WORK OF THIS TRADE.
- 1.9.2. WHERE A CODE OR STANDARD IS REFERENCED, THE LATEST VERSION OF THE CODE OR STANDARD REFERENCED IN THE APPLICABLE BUILDING CODE IS TO BE APPLIED.
- 1.10. SAFETY: COMPLY WITH ALL PROVINCIAL/FEDERAL AND/OR LOCAL SAFETY REGULATIONS, CLUDING THE OCCUPATIONAL HEALTH AND SAFETY ACT. IN ADDITION, COMPLY WITH ALL OF THE OWNER'S HEALTH AND SAFETY REQUIREMENTS.
- 1.11. PERMITS AND FEES: OBTAIN ALL PERMITS REQUIRED FOR INSTALLATION OF MECHANICAL TRADES WORK, ARRANGE FOR INSPECTIONS TESTS THEREWITH AND PAY ALL COSTS FOR PERMITS, INSPECTIONS, AND ASSOCIATED FEES. THIS INCLUDES ANY TSSA INSPECTION AND/OR CERTIFICATION. OBTAIN PERMITS IMMEDIATELY AFTER NOTIFICATION OF AWARD OF CONTRACT.
- 1.12. TAXES: ENSURE THAT PROVINCIAL AND/OR FEDERAL TAXES ARE INCLUDED WHERE REQUIRED
- 1.13. <u>WARRANTY:</u> PROVIDE A WRITTEN WARRANTY FOR ALL MATERIALS, EQUIPMENT AND LABOUR FOR A ONE-YEAR PERIOD TO BEGIN AT THE TIME OF SUBSTANTIAL COMPLETION. COMPLETE ALL WARRANTY REGISTRATION DOCUMENTATION ON BEHALF OF THE BUILDING OWNER. INCLUDE COPIES OF COMPLETED DOCUMENTATION IN OPERATIONS AND MAINTENANCE MANUALS.
- 1.14. <u>CERTIFICATION:</u> PROVIDE MANUFACTURER'S WRITTEN CERTIFICATION OF THE INSTALLATION AND OPERATION OF ALL SYSTEMS AND MAJOR EQUIPMENT.
- 1.15. EXISTING SERVICE:
- 1.15.1. DO NOT SHUT DOWN OR MAKE CONNECTIONS TO ANY EXISTING SERVICE WITHOUT WRITTEN PERMISSION OF THE OWNER.
- 1.15.2. BE RESPONSIBLE FOR DEMOLITION AND REMOVAL OF MECHANICAL EQUIPMENT AND SERVICES DESIGNATED FOR REMOVAL ON DRAWINGS.
- 1.16. <u>SITE PROTECTION AND CLEANLINESS:</u> PROTECT ALL WORK AND MATERIALS, BEFORE AND AFTER ERECTION, FROM WEATHER AND OTHER HAZARDS, AND KEEP IN A CLEAN AND ORDERLY MANNER AVOID ACCUMULATION OF DEBRIS AS THE WORK PROGRESSES ON COMPLETION OF THE CONSTRUCTION AND PRIOR TO THE FINAL INSPECTION AND ACCEPTANCE BY THE OWNER CLEAN UP AND REMOVE FROM THE SITE ALL SCRAP MATERIALS RESULTING FROM THE WORK OF
- 1.17. ADJUSTMENT AND OPERATION OF SYSTEMS: WHEN WORK IS COMPLETE, ADJUST ALL EQUIPMENT ITEMS, OF VARIOUS SYSTEMS, FOR PROPER OPERATION WITHIN FRAMEWORK OF DESIGN INTENT, AND OPERATING CHARACTERISTICS AS PUBLISHED BY EQUIPMENT MANUFACTURER.
- 1.18. MISCELLANEOUS STEEL: SUPPLY AND INSTALL MISCELLANEOUS STRUCTURAL SUPPORTS, PLATFORMS, AND BRACES, AS REQUIRED TO HANG OR SUPPORT ALL EQUIPMENT, PIPING, DUCTWORK AND SIMILAR ITEMS.
- 1.19. EQUIPMENT INSTALLATION: INSTALL AND START UP ALL ITEMS OF EQUIPMENT, DEVICES AND SYSTEMS IN ACCORDANCE WITH MOST RECENT MANUFACTURER'S PUBLISHED GUIDELINES AND RECOMMENDATIONS, CONTRACTOR IS RESPONSIBLE FOR ASCERTAINING MANUFACTURERS INSTALLATION GUIDELINES AND RECOMMENDATIONS. TOLICH-LIP ALL SHOP PAINTED FOLIPMENT DAMAGED IN TRANSIT OR DURING INSTALLATION TO MATCH ORIGINAL SHOP FINISH.
- 1.20. <u>CUTTING AND PATCHING:</u> PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS TRADE. ALL CUTTING AND PATCHING SHALL BE PERFORMED BY TRADE SPECIALIZING IN THE MATERIAL TO BE PATCHED. INCLUDE ALL COSTS FOR CUTTING AND PATCHING RELATED TO THE WORK OF THIS TRADE IN THE BID PRICE. WHERE PIPES AND DUCTS ARE SHOWN PASSING THROUGH EXISTING WALLS, FLOORS, AND ROOF, CUT AND PATCH THE NECESSARY OPENINGS SHOULD CUTTING. REPAIRING. AND PATCHING OF PREVIOUSLY FINISHED WORK. OF OTHER TRADES, BE REQUIRED TO ALLOW INSTALLATION OF MECHANICAL WORK, PAY ALL COSTS FOR TRADE SECTION CONCERNED TO PERFORM WORK.
- 1.21. CHANGES IN THE WORK: CHANGES TO THE CONTRACT REQUIRING ADDITIONS TO OR DELETIONS FROM THE WORK OF THIS DIVISION SHALL BE CARRIED OUT UPON WRITTEN REQUEST OF THE CONSULTANT. EXTRAS TO THE CONTRACT OR CREDITS SHALL BE SUBMITTED WITH A COMPLETE COST BREAKDOWN AS FOLLOWS:
- MATERIALS, QUANTITIES AND UNIT PRICES FOR ALL EQUIPMENT REQUIRED OR DELETED
- UNIT HOURS
- TOTAL MATERIAL COST
- HOURLY RATE (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL CONTRACT)
- TOTAL OVERHEAD AND PROFIT (REFER TO SUPPLEMENTARY CONDITIONS AND GENERAL
- 1.22. COMPLETION: PRIOR TO THE FINAL INSPECTION, CLEAN ALL MECHANICAL EQUIPMENT. CLEAN LL CONSTRUCTION DUST AND DIRT FROM INSTALLED EQUIPMENT AT THE END OF THE JOB. REPAIR ANY DAMAGE BY THE MECHANICAL TRADE TO EXISTING BUILDINGS OR EQUIPMENT, ETC TO THE CONSULTANTS SATISFACTION.
- 1.23. SUBMITTALS:
- 1.23.1. SHOP DRAWINGS:
 - 1.23.1.1. SUBMIT SHOP DRAWINGS FOR ALL EQUIPMENT SUPPLIED BY MECHANICAL DIVISION. SUBMIT ELECTRONIC COPIES TO CONSULTANT FOR REVIEW.

(INCLUDING SPECIFICATION CLAUSE REFERENCE).

- 1.23.1.2. SUBMIT UNITS OF MEASURE IN EITHER METRIC OR IMPERIAL THAT MATCH THOSE OF THE DRAWINGS.
- 1.23.1.3. PROVIDE TITLE SHEET INCLUDING PROJECT NAME, SHOP DRAWING NAME
- 1.23.1.4. EACH SHOP DRAWING MUST BEAR STAMP AND SIGNATURE OF RESPONSIBLE OFFICIAL IN CONTRACTOR'S AND SUBCONTRACTOR'S ORGANIZATION, FOR FACH SUBMISSION, AS EVIDENCE THAT DRAWING HAS BEEN CHECKED AGAINST REQUIREMENTS AS CALLED FOR IN SPECIFICATIONS AND DRAWINGS.
- 1.23.2. OPERATION AND MAINTENANCE INSTRUCTION MANUALS:
 - 1.23.2.1. PROVIDE PDF COPIES OF COMPLETE OPERATION AND MAINTENANCE INSTRUCTIONS FOR EQUIPMENT FURNISHED UNDER THIS CONTRACT. MANUAL TO BE ORGANIZED WITH BOOKMARKS IN A FORMAT TO MATCH THE SPECIFICATION SECTIONS. ONCE MANUAL IS REVIEWED AND ACCEPTED, PROVIDE PDF VERSION ON FLECTRONIC MEDIA

- 1.23.2.2. MANUALS SHALL INCLUDE THE FOLLOWING INFORMATION:
 - CONTACT INFORMATION OF CONSULTANTS AND CONTRACTORS
 - COMPLETE SET OF FINAL PROJECT SHOP DRAWINGS OPERATING INSTRUCTIONS, INCLUDING START-UP AND SHUT-DOWN
- MAINTENANCE INSTRUCTIONS, INCLUDING PREVENTIVE MAINTENANCE INSTRUCTIONS FOR COMPONENTS OF EQUIPMENT
 - MANUFACTURERS' WARRANTIES AND GUARANTEES
- 1.23.3. AS-BUILT DRAWINGS:

PROCEDURE

- 1.23.3.1. MAINTAIN AN ACCURATE RECORD OF DEVIATIONS AND CHANGES FROM CONTRACT DRAWINGS WITH RED LINE MARKINGS. TRANSFER AS-BUILT MARK-UPS TO DIGITAL DRAWING FORMAT. THIS PROCESS SHOULD BE COMPLETED BEFORE TESTING, BALANCING AND/OR COMMISSIONING, SUBMI
- TO THE CONSULTANT WITH THE O&M MANUALS AT COMPLETION OF PROJECT. 1.23.3.2. FORMAT FILES TO MATCH EXACTLY THE LAYERING SYSTEM AND SYMBOLOGY OF THE CONSULTANT. BIND ALL EXTERNAL REFERENCES.
- 1.23.3.3. THE AS-BUILT DRAWINGS SHALL HAVE A VALUE OF \$5,000 UNLESS THE MECHANICAL CONTRACT VALUE IS LESS THAN \$100,000 WHICH SHALL HAVE A \$3,000 VALUE. ONCE AS-BUILT DRAWINGS HAVE BEEN COMPLETED, SUBMITTED AND REVIEWED, PAYMENT WILL BE RELEASED. THIS VALUE IS NOT INCLUDED IN THE AMOUNT REQUIRED BY THE CONSTRUCTION LIEN ACT.
- 1.23.3.4. THIS PROJECT UTILIZED THE FOLLOWING DIGITAL FORMAT(S): AUTOCAD
- 1.24. FIRESTOPPING AND SMOKE SEAL
- 1.24.1. PROVIDE ULC LISTED FIRESTOP SYSTEM TO SEAL AROUND ALL MECHANICAL SERVICES WHICH PENETRATE PART OF A BUILDING ASSEMBLY REQUIRED TO HAVE A FIRE
- 1.24.2. SUBMIT DETAILED SHOP DRAWINGS TO THE CONSULTANT FOR REVIEW. INCLUDING:
 - MANUFACTURER'S TECHNICAL PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH SPECIFIC TYPE AND LOCATION OF PENETRATION
 - -CERTIFICATION THAT PROPOSED FIRESTOPPING MATERIALS AND ASSEMBLIES COMPLY WITH CAN4-S115-M
- -ULC LISTINGS WITH COPIES OF ULC DATA SHEETS FOR EACH SPECIFIC TYPE AND LOCATION OF PENETRATION
- 1.25. MECHANICAL PROJECT COMPLIANCE:
- 1.25.1. THE FOLLOWING DOCUMENTS AND/OR CONFIRMATION IS REQUIRED TO ALLOW THE CONSULTANT TO ISSUE OUR LETTER OF GENERAL REVIEWS:
- FIRE EXTINGUISHERS INSTALLED

MECHANICAL INSULATION:

- 2.1. WHERE INSULATION THICKNESS IS NOT IDENTIFIED, COMPLY WITH ASHRAE 90.1 REQUIREMENTS.
- 2.2. ALL PRODUCTS TO HAVE FLAME SPREAD RATING LESS THAN 25 AND SMOKE DEVELOPED
- CLASSIFICATION LESS THAN 50 IN COMPLIANCE WITH CAN/ULC-S102
- 2.3. PROVIDE A CONTINUOUS VAPOUR BARRIER ON ALL COLD SYSTEMS. 2.4. <u>DEFINITIONS:</u>
 - ONCEALED: INSULATED MECHANICAL SERVICES AND EQUIPMENT IN SUSPENDED CEILINGS AND NON ACCESSIBLE CHASES AND FURRED IN SPACES.
- EXPOSED: NOT CONCEALED
- 2.5. <u>INSULATION TYPES:</u> PGF - PREFORMED GLASS FIBRE: FIBROUS GLASS SPLIT SECTIONAL PIPE INSULATION CONFORMING TO CAN/ULC C-S702, WITH FACTORY APPLIED VAPOUR BARRIER JACKET
- 2.6. <u>PIPING:</u>
- 2.6.1. DO NOT INSULATE FLANGES OR UNIONS AT CONNECTION TO EQUIPMENT.
- 2.6.2. VALVE OPERATORS AND BALANCING VALVE TEST PORTS TO BE ACCESSIBLE WITHOUT REMOVAL OF INSULATION.
- 2.6.3. PIPE INSULATION INSERTS AND SHIELDS: PROVIDE RIGID INSERTS AND SHIELDS AT ALL HANGER SUPPORTS WHERE PIPING IS INSULATED. INSERT THICKNESS TO MATCH INSULATION THICKNESS. INSERT TO BE HYDROUS CALCIUM SILICATE RIGID PIPE INSULATION. INSERT AND SHIELD TO PROTECT BOTTOM HALF OF PIPE. SHIELD TO BE FABRICATED FROM GALVANIZED STEEL. SHIELD COLOUR TO MATCH COLOUR OF INSULATION FINISH. SHIELD AND INSERT LENGTH TO BE AS FOLLOWS:

| NOMINAL PIPE SIZE | INSERT LENGTH |
|-----------------------|---------------|
| MM (IN) | MM (IN) |
| 40-65 (1-1/2 - 2-1/2) | 250 (10) |
| 80-150 (3-6) | 300 (12) |
| 200-250 (8-10) | 400 (14) |

TO ASTM C921 AND SELF-SEAL LAP JOINT.

- >=300 (>=12) 550 (22) 2.6.4. PIPE INSULATION TYPE AND THICKNESS:
- - 2.6.4.1.1. POTABLE (DOMESTIC) COLD WATER AND CITY WATER (PGF): 25 MM
 - 2.6.4.1.2. <u>SANITARY DRAIN (PGF):</u> 25 MM (1")
- 2.6.5. <u>APPLICATION:</u>
 - 2.6.5.1. COMPLETELY INSULATE THE FOLLOWING SYSTEMS
 - -POTABLE (DOMESTIC) COLD WATER
- PIPING SYSTEMS: 3.1. GENERAL:
 - 3.1.1. <u>EXPANSION AND CONTRACTION:</u> INSTALL ALL PIPING SO AS TO BE FREE FROM STRAIN D DISTORTION DUE TO EXPANSION AND CONTRACTION AS GOVERNED BY REQUIREMENTS OF ANSI B31.1, EXCEPT AS HEREINAFTER MODIFIED. ALLOW FOR EXPANSION AND CONTRACTION BY OFFSETS, EXPANSION U-BENDS OR LOOPS. DO NOT USE EXPANSION JOINTS OF ANY TYPE UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
 - 3.1.2. <u>LINES, GRADES AND SLOPES:</u>
 - 3.1.2.1. INSTALL LIQUID AND AIR PIPING FREE OF POCKETS AND PITCH TO DRAIN, AT LOW POINTS IN PIPING, WITH VALVES OR TRAPS INSTALLED AS REQUIRED FOR DRAINAGE OF THE PIPING.
 - 3.1.2.2. INSTALL PIPING TO FOLLOWING SLOPES: DRAINAGE PIPING: 1:50 ON DRAINS OF NPS 3 SIZE AND LESS AND 1:100 ON
 - DRAINS OF NPS 4 AND LARGER. POTABLE (DOMESTIC) WATER PIPING: PITCH TO LOW POINTS SO THAT ALL
 - 3.1.3. <u>UNIONS OR FLANGES PROVIDE IN THE FOLLOWING LOCATIONS:</u>

PIPING MAY BE COMPLETELY DRAINED

- 3.1.3.1. FOR BY-PASSES AROUND EQUIPMENT, CONTROL VALVES, DEVICES IN PIPING SYSTEMS, AND ELSEWHERE INDICATED ON DRAWINGS.
- 3.1.3.2. AT CONNECTIONS TO EQUIPMENT (LOCATE BETWEEN SHUT-OFF VALVE AND
- 3.1.3.3. IN SCREWED, OR SOLDER JOINT, DRAINAGE TUBING AT INLET SIDE OF TRAP.
- 3.1.4. PIPING CONNECTIONS TO MAINS:

3.1.4.1. MAKE BRANCH CONNECTIONS OF GAS AND PIPING, TO RESPECTIVE

3.1.4.2. MAKE DOWN FEED PIPING CONNECTIONS, TO HORIZONTAL SUPPLY AND RETURN WATER MAINS, ON BOTTOM QUADRANT OF MAINS.

HORIZONTAL PIPING OF LARGER DIAMETER, TO UPPER QUADRANT OF LARGER

- 3.1.5.1. INSTALL SLEEVES WHERE PIPING PASSES THROUGH FOUNDATIONS, ABOVE GRADE FLOORS, AND WALLS. FABRICATE SLEEVES OF SCHEDULE 40 BLACK STEEL PIPE OR TYPE "K" COPPER TUBING.

- 3.1.5.2. SLEEVES FOR PIPING PASSING THROUGH ROOFS WILL BE SUPPLIED AND INSTALLED UNDER THIS DIVISION.
- 3.1.5.3. MAKE SLEEVES LARGE ENOUGH TO PASS FULL THICKNESS OF PIPE COVERING WHERE SAME IS USED, AND WITH SUFFICIENT CLEARANCE BETWEEN PIPE AND SLEEVE TO ALLOW FOR ANY LATERAL MOVEMENT OF PIPING DUE TO EXPANSION AND CONTRACTION.
- 3.1.5.4. FILL SLEEVES FOR FUTURE USE WITH LIME MORTAR.
- 3.1.6. <u>VALVES:</u> PROVIDE DRAIN VALVES WITH HOSE THREAD OUTLET CONNECTION, OR VALVE ITH LONG NIPPLE ON OUTLET, AT ALL LOW POINTS OF EACH WATER SYSTEM, AND ABOVE ALL RISER OR BRANCH STOP VALVES, FOR PROPER DRAINAGE OF PIPING.
- 3.1.7. PIPE IDENTIFICATION:
 - 3.1.7.1. LABEL PIPING INSTALLED UNDER THIS DIVISION TO INDICATE CONTENT AND DIRECTION OF FLOW. INCLUDE OPERATING PRESSURE OR VACUUM, AS
 - 3.1.7.2. ALL LABELS SHALL BE OF SUFFICIENT WIDTH TO OVERLAP ITSELF.
 - 3.1.7.3. PROVIDE LABELS OF PLASTIC COATED TAPE, WITH SELF-ADHESIVE BACKING SURFACE. FOR INSTALLATION ON INSULATED PIPE, PROVIDE ADHESIVE SUITABLE FOR THIS APPLICATION. CONFORM WITH CAN/CGSB-24.3 AND/OR OWNER STANDARDS FOR PRIMARY LABEL COLOUR. AND WITH LEGEND AND DIRECTION ARROWS IN BLACK. PRINT LEGEND IN FULL WHEREVER FEASIBLE. OR A RECOGNIZED ABBREVIATION OF SERVICE INVOLVED.
- 3.1.7.4. LOCATE LABELS AS FOLLOWS: AT EVERY END OF EVERY PIPE RUN, ADJACENT TO VALVE OR ITEM OF EQUIPMENT SERVICES. ON EACH EXPOSED PIPE PASSING THROUGH WALL, PARTITION OR FLOOR AT INTERVALS OF 15 M (50'-0") ALONG EVERY EXPOSED PIPE RUN EXCEEDING 15 M (50'-0") IN LENGTH. AT EVERY ACCESS POINT ON CONCEALED PIPING.

3.2. HANGERS AND SUPPORTS:

- 3.2.1.1. PIPE HANGERS & SUPPORTS TO CSA B214 & MSS SP-58.
- 3.2.1.2. SUPPORT OR SUSPEND ALL PIPING WITH NECESSARY HANGERS, STRUCTURAL SUPPORTS AND/OR BRACKETS AS REQUIRED, TO PREVENT SAGGING, WARPING
- 3.2.1.3. DO NOT ALLOW LOADS, OF ANY NATURE, TO BE TRANSMITTED THROUGH PIPING CONNECTIONS TO EQUIPMENT
- 3.2.1.4. PROVIDE SUITABLY DAMPENED SPRING HANGERS FOR FIRST THREE SUPPORTS FROM EQUIPMENT CONNECTION ON PIPING SUBJECT TO EXCESSIVE
- 3.2.1.5. DO NOT HANG ANY PIPE, FROM ANOTHER PIPE OR FROM ROOF DECK, UNLESS
- SPECIFICALLY INDICATED ON DRAWINGS. 3.2.1.6. PROVIDE DIELECTRIC SEPARATION AS REQUIRED.

3.2.2. <u>HANGERS:</u>

- 3.2.2.1. FOR ALL INSULATED PIPING UP TO NPS 4, CARRYING LIQUIDS AT TEMPERATURES 10.5°C (51°F) AND HIGHER, USE STANDARD WEIGHT CLEVIS
- 3.2.2.2. FOR INSULATED PIPING CARRYING LIQUIDS AT A TEMPERATURE OF 10°C (50°F) OR LESS, USE ELONGATED CLEVIS TYPE HANGERS.
- 3.2.2.3. PROVIDE INSULATION PROTECTION BEARING PLATES AT ALL HANGERS AND
- SUPPORTS FOR ALL INSULATED PIPING.

3.2.2.4. FOR NON-INSULATED PIPING USE CLEVIS TYPE OF WROUGHT STEEL

- CONSTRUCTION.
- 3.2.2.5. FOR COPPER TUBING PROVIDE COPPER COATED HANGERS. 3.2.2.6. ATTACH HANGER RODS, TO BUILDING STRUCTURE, BY MEANS OF MALLEABLE
- IRON BEAM CLAMPS OR CONCRETE INSERTS 3.2.3. HANGER SPACING:
 - 3.2.3.1. FOR HORIZONTAL RUNS OF PLUMBING AND DRAINAGE PIPING COMPLY WITH
- HANGER SPACING REQUIREMENTS OF BUILDING CODE. 3.2.3.2. FOR HORIZONTAL RUNS OF BLACK OR GALVANIZED STEEL PIPE, OTHER THAN FOR PLUMBING SERVICE, COMPLY WITH MSS SP-58 TABLES 3 & 4.
- 3.2.4. FOR HORIZONTAL RUNS OF COPPER TUBING FOR SERVICES OTHER THAN PLUMBING, DO NOT EXCEED 1.8 M (6'.) BETWEEN HANGERS UNLESS SPECIFICALLY NOTED.
- 3.2.5. FOR HORIZONTAL RUNS OF PIPING FABRICATED OF PVC FOR SERVICES OTHER THAN PLUMBING, DO NOT EXCEED 1.22 M (48")
- 3.2.6. IN A HORIZONTAL RUN, PEX TUBING SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING 800 MM (32"), UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER.

3.3. MATERIALS OF CONSTRUCTION:

- 3.3.1. SANITARY AND INDIRECT DRAIN (INCLUDING VENTING):
 - 3.3.1.1. REFERENCE STANDARDS:
 - 3.3.1.1.1. <u>CAST IRON:</u> TO CSA B70. MECHANICAL FITTINGS TO CSA B602. COPPER, DWV: HARD DRAWN COPPER DRAINAGE TUBE ONFORMING TO ASTM B 306 WITH WROUGHT COPPER OR CAST BRASS SOLDER JOINT DRAINAGE FITTINGS TO ASME B16.29 OR ASME
 - 3.3.1.1.3. PVC, DWV: TO CAN/CSA-B182.1 OR B182.2. RUBBER RING GASKETS NTEGRAL WITH BELL OR SOLVENT WELD TO ASTM D2564.
 - 3.3.1.2. <u>APPLICATION:</u>
 - 3.3.1.2.1. BURIED SECTIONS WITHIN BUILDING AREA AND TO 1.5M (5'-0")
 - **OUTSIDE BUILDING** PIPING 200 MM (8") AND SMALLER:
 - CAST IRON SOIL PIPE AND FITTINGS OR
 - PVC DWV

3.3.2. POTABLE (DOMESTIC) COLD WATER:

3.3.2.1. REFERENCE STANDARDS:

- 3.3.2.1.1. ALL MATERIALS TO BE NSF/ANSI 61 & 372 CERTIFIED.
- 3.3.2.1.2. <u>COPPER:</u>
 - 3.3.2.1.2.1. PIPING SEAMLESS WATER TUBE TO ASTM B88
 - 3.3.2.1.2.2. <u>FITTINGS:</u> SOLDER JOINT FITTINGS TO ASME B16.18 (CAST) OR B16.22 (WROUGHT) OR
 - COLD PRESS FITTINGS WITH EPDM SEALING ELEMENT TO ASME B16.18 OR ASME B16.22. INSTALLED USING PROPER TOOL, ACTUATOR, JAWS, AND RINGS AS
- 3.3.2.1.3. <u>PEX-A:</u>
 - 3.3.2.1.3.1. CROSSLINKED POLYETHYLENE PIPING TO CAN/CSA-B137.5. PRESSURE AND TEMPERATURE RATINGS: 93°C (200°F) AT 80 PSI (551 KPA), 82°C (180°F) AT 100 PSI (689 KPA).
 - 50 MM (2") AND SMALLER CAN/ULC-S102.2 LISTED TO A MAXIMUM OF 25 FLAME SPREAD / 50 SMOKE DEVELOPED WITH NO LIMITATIONS ON SPACING.

INSTRUCTED BY THE PRESS FITTING MANUFACTURER.

- 65 MM (2-1/2") AND LARGER CAN/ULC-S102.2 LISTED TO A MAXIMUM OF 25 FLAME SPREAD / 50 SMOKE DEVELOPED WITH RATED FIBERGLASS INSULATION. 3.3.2.1.3.2. SEAL PENETRATIONS AT FIRE SEPARATIONS PER
- 3.3.2.1.3.3. PIPING WITHIN A FIRE SEPARATION PER CAN/ULC-S101.
- 3.3.2.1.3.5. 25 YEAR CSA SYSTEM WARRANTY (INCLUDING CONSEQUENTIAL) FROM INSTALLATION DATE. 3.3.2.1.4. PVC: TO CSA B137.3 OR CSA B137.2. MINIMUM PRESSURE RATING

100 KPA (160 PSI).

3.3.2.1.3.4. ALL FITTINGS BY TUBING MANUFACTURER.

- 3.3.2.2. <u>APPLICATION:</u>
 - 3.3.2.2.1. BURIED PIPING 75 MM (3") AND SMALLER:
 - 3.3.2.2.1.1. TYPE "K" SOFT ANNEALED COPPER TUBING WITH NO JOINTS PERMITTED BELOW GRADE. BEND TUBING USING
 - APPROVED TUBE BENDER. 3.3.2.2.1.2. USE TYPE "K" SOFT ANNEALED COPPER TUBING FOR
 - TRAP SEAL PRIMER PIPING TO TRAPS INSTALLED IN CONCRETE FLOORS.
 - 3.3.2.2.1.3. PVC WITH NO JOINTS BELOW GRADE. COLD WATER

SOLDER TO THREADED ADAPTERS AT SCREWED

CONNECTION. STUB-OUT TO BE MANUFACTURED FROM

SEAMLESS COPPER TUBING WITH A MACHINED ASTM

F-1807 PEX BARB CONNECTION AND SPIN SEALED OUTLET. FOLLOW MANUFACTURERS INSTRUCTIONS FOR

- 3.3.2.2.2. ABOVE GROUND PIPING 75 MM (3") AND SMALLER: 3.3.2.2.2.1. TYPE "L" HARD DRAWN COPPER TUBING. PROVIDE
 - VALVES OR EQUIPMENT. 3.3.2.2.2.2. PEX-A FOR 38 MM (1-1/2") AND SMALLER (ON COMPLETION OF INSTALLATION THE SYSTEM SHALL BE CHARGED WITH POTABLE WATER TO A PRESSURE WHICH MEETS LOCAL PLUMBING CODES. THE SYSTEM SHALL REMAIN AT THIS PRESSURE FOR A MINIMUM OF 24 HOURS TO ENSURE SYSTEM INTEGRITY.) PROVIDE COPPER STUB-OUT ELBOWS AT EACH FIXTURE

3.4. NATURAL GAS:

3.4.1. ABOVE GRADE PIPING (EXPOSED) PIPING 50 MM (2") AND SMALLER: SCHEDULE 40 ERW OR CW BLACK CARBON STEEL PIPE CONFORMING TO ASTM A 53/A53M-99B GRADE B, WITH THREADED ENDS. FITTINGS:CLASS 150 BLACK MALLEABLE IRON SCREWED

CONFORMING TO ASTM A 234/A234M-99 WPB GRADE B AND ASME B16.9-1993.

INSTALLATION.

- FITTINGS CONFORMING TO ASTM A 197/A197M-98 AND ASME B16.3-1998. 3.4.2. ABOVE GRADE PIPING (CONCEALED) PIPING 50 MM (2") AND SMALLER: SCHEDULE 40 ERW OR CW BLACK CARBON STEEL PIPE CONFORMING TO ASTM A 53/A53M-99B GRADE B. WITH BEVELED ENDS. FITTINGS: SCHEDULE 40 CARBON STEEL BUTTWELDING FITTINGS
- 3.4.3. ABOVE GRADE CONTINUOUS PIPING (CONCEALED) PIPING 50 MM (2") AND SMALLER: CORRUGATED STAINLESS STEEL TUBING COMPLYING WITH ANSI LC 1 AND LISTED WITH CSA, ASTM A240 TYPE 300 CORRUGATED STAINLESS STEEL TUBING WITH MINIMUM WALL THICKNESS OF 0.010". JACKETING OF UV RESISTANT POLYETHYLENE MEETING THE REQUIREMENTS OF ASTM E84 FOR FLAME SPREAD AND SMOKE DEVELOPMENT. ALL FITTINGS ARE SAE CA360 BRASS INCORPORATING DOUBLE WALL FLARE SEALING AND "JACKET LOCK" JACKET CAPTURING FOR STEEL TUBING PROTECTION. SIZING LISTED ON DRAWINGS IS BASED ON STEEL PIPING, UNLESS SPECIFICALLY STATED OTHERWISE;

ADJUST SIZING ACCORDINGLY WHEN USING CORRUGATED PIPING.

- 4. FIRE PROTECTION SYSTEM:
 - 4.1.1. FIRE EXTINGUISHERS: 4.1.1.1. LOCATE FIRE EXTINGUISHERS WHERE INDICATED ON DRAWINGS. WHERE RECESSED CABINETS ARE SHOWN, CONTRACTOR TO VERIFY DIMENSIONS OF
 - RECESSED CABINET WILL FIT WITHIN WALL. 4.1.1.2. SURFACE MOUNT: MULTI-PURPOSE DRY CHEMICAL EXTINGUISHERS WITH A

5. PLUMBING SYSTEM:

5.1. <u>REFERENCES STANDARDS:</u>

5.1.1. CONFORM TO ALL APPLICABLE CODES INCLUDING, BUT NOT LIMITED TO, THE

RATING OF 2A10BC. COMPLETE WITH WALL BRACKET.

- FOLLOWING:
- 5.1.1.1. <u>CSA-B64.10:</u> SELECTION AND INSTALLATION OF BACKFLOW PREVENTERS
- 5.1.1.2. <u>CSA-B149.1:</u> NATURAL GAS INSTALLATION CODE 5.2. VENTING: PLUMBING VENTING MAY NOT BE SHOWN ON DRAWINGS. PROVIDE A COMPLETE MBING VENTING SYSTEM FOR ALL PLUMBING FIXTURES SHOWN, IN ACCORDANCE WITH OBC

5.3. STERILIZATION OF POTABLE (DOMESTIC) WATER SYSTEMS:

BY CONSULTANT.

FUISH EACH SYSTEM AFTER COMPLETION BY ALLOWING FULL FLOW OF WATER THROUGH SYSTEM FOR A PERIOD OF FIFTEEN MINUTES, OR LONGER WHEN DIRECTED

ELAPSED, FLUSH SYSTEM TO REDUCE CHLORINE CONTENT TO AN ACCEPTABLE LEVEL.

REDUCING STATION, AND CONNECTION THERETO AT LOCATION INDICATED. PAY FOR

LUSHING OF THE SYSTEM IS COMPLETED, PROVIDE A 24 HOUR CONTACT STERILIZATION TREATMENT BY TREATING THE WATER WITH 50 PPM OF CHLORINE AS RECOMMENDED IN AWWA SPECIFICATION C-651. AFTER STERILIZATION PERIOD HAS

5.4.1. <u>NATURAL GAS SERVICE:</u> MAKE ARRANGEMENTS WITH LOCAL GAS UTILITY FOR INSTALLATION OF UNDERGROUND GAS SERVICE, GAS METER, MAIN PRESSURE

5.5. <u>VALVES:</u>

5.4. <u>CONNECTIONS SERVICES:</u>

- COSTS LEVIED BY GAS UTILITY FOR PROVISION, INSTALLATION AND CONNECTION OF THIS SERVICE.
- 5.5.1. SUBMIT SHOP DRAWINGS FOR ALL VALVES.

5.5.2. POTABLE (DOMESTIC) WATER:

- 5.5.2.1. REFERENCE STANDARDS:
 - 5.5.2.1.2. BRONZE TO ASTM C89530
- 5.5.2.1.3. BRASS TO ASTM C46750
- 5.5.2.1.4. CAST IRON TO ASTM A126

5.5.2.1.5. STAINLESS STEEL TO ASTM A351

5.5.2.1.1. LEAD FREE, 0.25% CONTENT PER NSF-61/372

5.5.2.1.6. CPVC RATED TO 1,600 KPA (232 PSI) AT 23°C (73°F) 5.5.2.1.7. ALL PRESSURE RATINGS, SIZES TO MSS SP-25 5.5.2.2. ISOLATION / SHUT-OFF: 2 PIECE BRASS OR BRONZE BODY, 1,034 KPA (150 PSI) 60

WITH INSULATION STEM EXTENSION. SOLDERED, THREADED OR PEX CONNECTIONS. MANUFACTURED TO MSS SP-110.

5.5.3. NATURAL GAS ISOLATION: 5.5.3.1. <u>UP TO 50 MM (2"):</u> 1,034 KPA (150PSIG) / 600WOG RATING . BRASS OR BRONZE BODY, FULL PORT, BALL VALVE. PFTE SEATS, DOUBLE O-RING DESIGN OR PTFE PACKING. CHROME PLATED SOLID BRONZE BALL. LEVER HANDLE. CSA/CGA 125

OG RATING, FULL PORT, STAINLESS STEEL BALL, LOCKING LEVER HANDLE

5.6. PLUMBING SPECIALTIES: 5.6.1. FLOOR DRAINS: PROVIDE FLOOR DRAIN SIZES AS INDICATED ON DRAWINGS, WITH TAPPED PRIMER CONNECTION IN DRAIN BODY AND TO CONFORM WITH CODE

- 5.6.2. CLEANOUTS (CO): 5.6.2.1. PROVIDE CLEANOUTS IN DRAINAGE PIPING AT LOCATIONS INDICATED ON DRAWINGS, AT BASE OF EACH VERTICAL STACK OR RAINWATER LEADER AND AS CLOSE AS POSSIBLE TO WHERE THE DRAINAGE PIPING LEAVES THE
- BUILDING. AS REQUIRED TO COMPLY WITH BUILDING CODE. 5.6.2.2. WHERE CLEANOUTS ARE CONCEALED IN WALLS, PROVIDE AN ACCESS COVER

REQUIREMENTS. PROVIDE EACH FLOOR DRAIN WITH DEEP SEAL "P" TRAP UNLESS

ON WALL. TYPE OF COVER TO SUIT WALL SURFACE AND CONSTRUCTION. 5.6.3. FROST PROOF WALL HYDRANTS (FPWH):

BAR (150 PSI) WORKING PRESSURE.

OTHERWISE INDICATED.

- 5.6.3.1. NON-FREEZE TYPE WITH NPS HOSE CONNECTION: SELF-DRAINING HOSE END VACUUM BREAKER, GALVANIZED WALL SLEEVE, GROUND JOINT UNION ELBOW ADAPTER AND OPERATING KEY.
- TRAP SEAL PRIMER: PROVIDE LEAD FREE TRAP SEAL PRIMER. PRIMER TO BE CAPABLE OF BEING INSTALLED ON PIPING UP TO 40 MM (1-1/2"), PROVIDE SHUTOFF VALVE UPSTREAM AND UNION DOWNSTREAM OF PRIMER. TRAP GUARD MAY BE USED IN LIEU OF TRAP SEAL PRIMER.

5.6.4. <u>WATER HAMMER ARRESTORS:</u> PROVIDE IN ACCORDANCE WITH THE PLUMBING AND

DRAINAGE INSTITUTE STANDARD PDI-WH-201. ARRESTORS SHALL BE COPPER

CONSTRUCTION WITH BELLOWS SIZED TO PDI WH-201 AND PRE-CHARGED FOR

OPERATION IN TEMPERATURE RANGE -0.5C TO 82C (33F TO 180F) AND A MAXIMUM 10.6

- MECHANICAL EQUIPMENT:
- 6.1. EXHAUST FANS:
- 6.1.1. DOWNBLAST: CENTRIFUGAL DIRECT DRIVE EXHAUST FAN WITH SPUN ALUMINUM OUSING. MOUNT MOTOR AND DRIVE HOUSING ON VIBRATION ISOLATORS AND SEAL FROM EXHAUST AIR STREAM. CAPACITIES AND ACCESSORIES AS INDICATED IN SCHEDULE ON DRAWINGS. FAN SOUND SHALL NOT EXCEED SONES NOTED IN
- 6.2. <u>UNIT HEATER (SEPARATED COMBUSTION):</u> UNIT HEATER. MINIMUM 20 GA. COATED GALVANIZED STEEL CASING. HEAT EXCHANGER TO BE STAINLESS STEEL. BLOWER TO BE DWDI FORWARD CURVED DYNAMICALLY AND STATICALLY BALANCED CENTRIFUGAL FAN WHEEL WITH BELT DRIVE OPEN DRIP PROOF MOTOR.

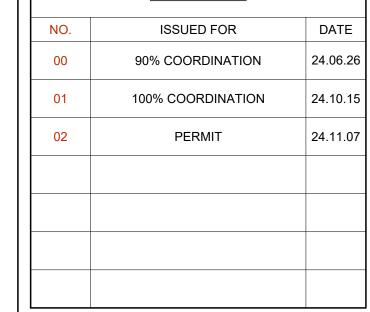


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KEYPLAN

REVISIONS





TMC

CHECKED

PROJECT **STARBUCKS**

DRAWN

ALC

ALC REVIEWED

ADDRESS

1030 DIVISION STREET

COBOURG, ON

CE-5924

MECHANICAL

SPECIFICATIONS

COBOURG

PROJECT NO.

DRAWING TITLE

DRAWING NUMBER