

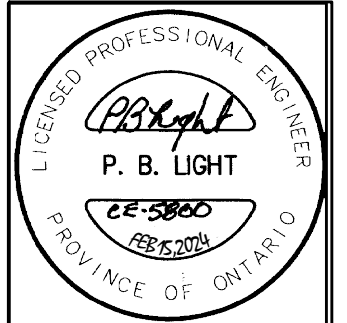
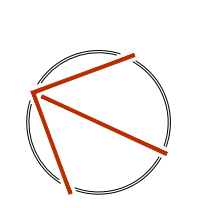
KEYPLAN

**PRELIMINARY
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CONSTRUCTION**

REVISIONS

NO.	ISSUED FOR	DATE
00	CLIENT REVIEW	24.01.26
01	TENDER	24.02.15

NORTH



DESIGN	BCD	DRAWN	BCD
CHECKED	PBL	REVIEWED	PBL

PROJECT

**MONSIGNOR
DOYLE CSS**

ADDRESS

**185 MYERS ROAD,
CAMBRIDGE, ON**

PROJECT NO.

CE-5800

DRAWING TITLE

**SCHEDULES, LEGENDS &
DETAILS - MECHANICAL**

DRAWING NUMBER

M1 OF 7

GREASE TRAP CALCULATION USING ASPE FORMAT

EQUIPMENT:

- ONE THREE COMPARTMENT POT SINK: 3 @ 20" x 24" x 12".
= 74.8 GALLONS
- HANDSINK: 22" x 18" x 10"
= 17.14 GALLONS
- UNDERCOUNTER DISHWASHER:
= 0.58 GPM

CALCULATION:

- DRAINAGE LOAD = 91.5 GALLON @ 75% FULL (THIS INCLUDES UTENSIL DISPLACEMENT)
= 68.63 GAL
- FLOW RATE = 68.6 / 2 MIN. DISCHARGE + 0.33 GPM
= 34.6 GPM

NOTE: CALCULATION IS BASED ON DIMENSIONS OF SPECIFIED SINK(S). CONFIRM EXACT SIZE OF SINK(S) WITH OWNER/CONTRACTOR BEFORE ORDERING GREASE INTERCEPTOR AND ADJUST CALCULATION AS NECESSARY.

EXHAUST FAN SCHEDULE

DWG REF.	MANUF.	SERVING	MODEL	AIRFLOW [CFM] (L/s)	ESP [in. w.c.] (Pa)	FAN POWER [BHP]	MOTOR [HP]	RPM	SOUND [SONES]	ELECTRICAL [V / Ph / Hz]	CONTROL	ACCESSORIES	REMARKS
EF-1,EF-2	GREENHECK	MENS W/R 144 & G WOMENS W/R 145 & G	G-090-G	400 (189)	0.25 (62.2)	FHP	FHP	850	5.5	120 / 1 / 60	OTH	5, 7, 8, 9, 13	CONNECT TO EXISTING CONTROL SYSTEM

APPROVED MANUFACTURERS: GREENHECK, COOK, DELHI, PENN BARRY

PIPING LEGEND

ITEM	DESCRIPTION
---	NEW ITEM
---	EXISTING ITEM TO REMAIN
-x-x-	EXISTING ITEM TO BE REMOVED
----	BELOW FLOOR PIPING
----	POTABLE (DOMESTIC) COLD WATER (DCW)
----	POTABLE (DOMESTIC) HOT WATER (DHW)
---SAN---	SANITARY DRAIN
---HW---	HOT WATER SUPPLY
---HW---	HOT WATER RETURN
--- ---	CHECK VALVE
--- ---	3 WAY CONTROL VALVE
--- ---	PUMP
--- ---	ELBOW TURNED UP
--- ---	ELBOW TURNED DOWN
--- ---	PIPE CAP
--- ---	PIPE SINGLE LINE CUTOFF
--- ---	NEW CONNECTION TO EXISTING

THIS IS A STANDARD LEGEND. ALL SYMBOLS MAY NOT NECESSARILY BE USED ON DRAWINGS.

DUCTWORK LEGEND

SYMBOL	DESCRIPTION
---	NEW ITEM
---	EXISTING ITEM TO REMAIN
-x-x-	EXISTING ITEM TO BE REMOVED
EX	EXISTING ITEM TO REMAIN
---	DUCTWORK SHOWN DOUBLE LINE
FD	DYNAMIC FIRE DAMPER
J	BALANCING DAMPER
⊕	THERMOSTAT/TEMPERATURE SENSOR
⊕	NEW CONNECTION TO EXISTING
⊗	DUCT DOWN - POSITIVE / NEGATIVE PRESSURE
⊗	DUCT UP - POSITIVE / NEGATIVE PRESSURE
⊗	SUPPLY AIR GRILLE
⊗	RETURN AIR GRILLE
?	DIFFUSER TAG DIFFUSER/GRILLE SIZE (AND NECK SIZE WHERE APPLICABLE) AIR VOLUME (CFM OR L/s AS INDICATED)
?	DIFFUSER/GRILLE DESIGNATION (REFER TO SCHEDULE FOR TYPE)
?	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.

MECHANICAL PROJECT SCOPE:

- REPLACEMENT OF EXISTING GREASE INTERCEPTOR AND DISHWASHER IN FOOD SERVICES ROOM AS DESCRIBED ON DRAWINGS AND IN THE SPECIFICATIONS.
- MODIFICATIONS TO EXISTING LABORATORY VENT ON ROOF AS DESCRIBED ON THE DRAWINGS AND IN THE SPECIFICATIONS.
- REPLACEMENT OF EXISTING MIXING STATIONS AS DESCRIBED ON DRAWINGS AND IN THE SPECIFICATIONS.
- REPLACEMENT OF EXISTING WASHROOM EXHAUST FANS AS DESCRIBED ON DRAWINGS AND IN THE SPECIFICATIONS.
- RENOVATIONS TO EXISTING WASHROOMS AS DESCRIBED ON DRAWINGS & IN THE SPECIFICATIONS.
- REPLACEMENT OF EXISTING 3-WAY VALVE AS DESCRIBED ON DRAWINGS & IN THE SPECIFICATIONS.
- REPLACEMENT OF EXISTING DECOMMISSIONED DRINKING FOUNTAIN AS DESCRIBED ON DRAWINGS & IN THE SPECIFICATIONS.
- REPLACEMENT OF EXISTING LEAKING PUMPS IN MECHANICAL ROOM AS DESCRIBED ON DRAWINGS & IN THE SPECIFICATIONS.
- CLEANING OF ALL EXISTING DUCTWORK AS DESCRIBED IN DRAWINGS & SPECIFICATIONS.
- PAINTING OF EXISTING GAS PIPING ON ROOF AS DESCRIBED ON DRAWINGS & IN THE SPECIFICATIONS.

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 MILLIMETERS UNLESS NOTED OTHERWISE
- DO NOT SCALE DRAWINGS. OBTAIN ALL DIMENSIONS FROM EXISTING ARCHITECTURAL PLANS, SITE INSPECTIONS, AND MANUFACTURER'S SHOP DRAWINGS.
- ALL MATERIALS WITHIN RETURN AIR PLENUMS SHALL HAVE A FLAME—SPREAD RATING NOT MORE THAN 25 AND A SMOKE DEVELOPED CLASSIFICATION NOT MORE THAN 50.
- 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 NOTED OTHERWISE.
- MAKE GOOD ALL BUILDING COMPONENTS DAMAGED BY WORK OF THIS TRADE TO THE CONSULTANT SATISFACTION.
- INSTALL ALL EQUIPMENT & ASSOCIATED DUCTWORK, PIPING, 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 REMOVED.
- 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.
- EXISTING INSTALLATIONS SHOWN FOR GENERAL REFERENCE ONLY. ATTEND SITE TO ASSESS WORK PRIOR TO BID SUBMISSION. INCLUDE ALL COSTS TO MODIFY AND / OR EXTEND NEW WORK AS REQUIRED TO MEET DESIGN INTENT. VERIFY ALL EXISTING DUCT / PIPE SIZES & CLEARANCES ON SITE.
- ALL EXISTING MECHANICAL EQUIPMENT TO REMAIN UNLESS NOTED OTHERWISE
- SCHEDULE AND PHASE WORK TO REDUCE INTERFERENCE AND DOWNTIME OF EXISTING SYSTEMS. NOTIFY OWNER'S REPRESENTATIVE OF ALL DOWNTIME PRIOR TO PROCEEDING WITH WORK.
- REMOVE EXISTING CEILING TILES AS REQUIRED TO PERFORM WORK. SAFELY STORE TILES FOR REINSTALLATION AFTER WORK & INSPECTIONS ARE COMPLETE. EXISTING DAMAGED TILES MUST BE IDENTIFIED & REPORTED TO OWNER'S REPRESENTATIVE BEFORE REMOVAL. REPLACE ANY DAMAGED TILES TO MATCH EXISTING.
- WHERE REPLACEMENT EQUIPMENT EXPOSES PREVIOUSLY UNFINISHED SURFACES, FINISH TO MATCH ADJACENT ASSEMBLIES.
- ALLOW FOR SCOPING OF EXISTING CONCEALED DRAINAGE PIPING TO VERIFY LOCATION & ROUTING.

GENERAL DEMOLITION NOTES: (APPLICABLE TO ALL DRAWINGS)

- ALL EXISTING EQUIPMENT TO REMAIN UNLESS IDENTIFIED OTHERWISE ON THE DRAWINGS, GENERAL NOTES OR SPECIFICATIONS.
- EXTENTS OF DEMOLITION SHOWN ARE APPROXIMATE AND THIS TRADE IS RESPONSIBLE FOR ALL DEMOLITION REQUIRED TO MEET DESIGN INTENT.
- REMOVE ALL UNUSED, ABANDONED OR REDUNDANT PIPING, HANGERS, & ACCESSORIES BACK TO SOURCE & CAP.
- COORDINATE WITH FACILITY MAINTENANCE DEPARTMENT FOR DISPOSAL OF REMOVED DEVICES. DISPOSE OF ALL UNWANTED DEVICES AS REQUIRED AS PER FACILITY STANDARDS.

GREASE INTERCEPTOR SCHEDULE

DWG REF	MANUF.	MODEL	CAPACITY [lbs] (kg)	FLOW RATE [GPM] (L/s)	INLET Ø [in.] (mm)	OUTLET Ø [in.] (mm)	REMARKS
GI-101	WATTS	WD-135	70.0 (31.8)	35.0 (2.2)	4 (100)	4 (100)	-PROVIDE CW INTERNAL FLOW CONTROL

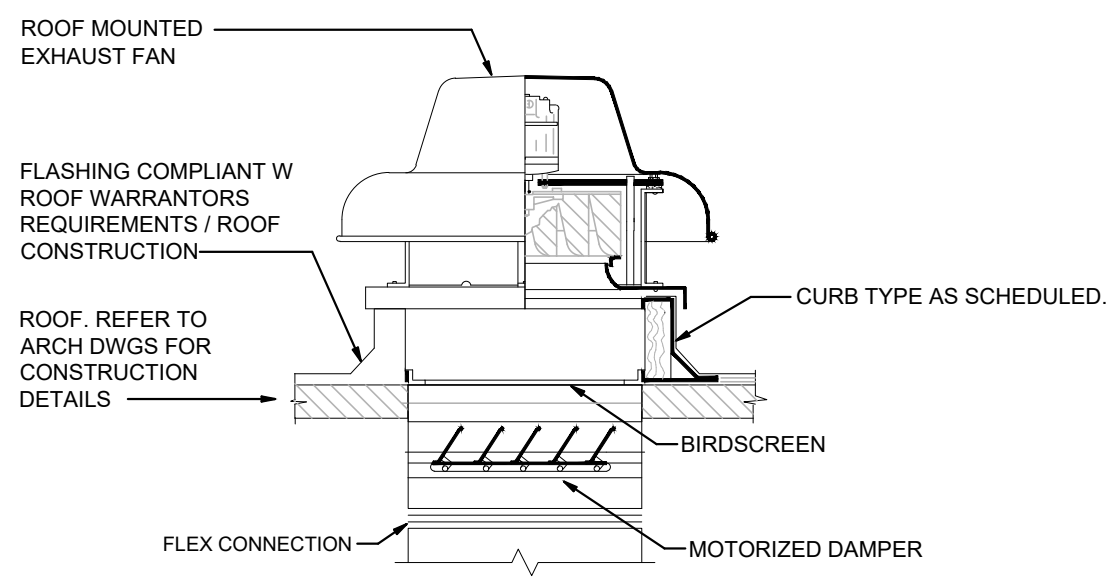
PUMP SCHEDULE

DWG REF	MANUF.	MODEL	FLOW [GPM] (L/s)	HEAD [ft. w.c.] (kPa)	FLUID	EFF. [%]	PUMP POWER [BHP] (kPa)	MOTOR [HP]	RPM	VOLTAGE [V / Ph / Hz]	REMARKS
P-5, P-6	BELL AND GOSSETT	E-90 2AAB	48.0 (0.3)	25.00 (1.5)	WATER	64.5	0.47	3/4	1800	208 / 3 / 60	-

APPROVED MANUFACTURERS: BELL AND GOSSETT

PLUMBING FIXTURE SCHEDULE

DWG REF	DESCRIPTION	HOT	COLD	DRAIN
WC	BOWL: AMERICAN STANDARD 8L FLUSH 2402.016 'CADET ELONGATED PA'. VITREOUS CHINA WATER CLOSET WITH 3481.016 PRESSURE ASSISTED ELONGATED SIPHON JET FLUSH ACTION BOWL AND 4142.016 TANK. SUPPLY: MCGUIRE LPH1728V FLEXIBLE CLOSET SUPPLY WITH ANGLE LOCKSHIELD STOP. SEAT: BENEKE 523 SOLID WHITE PLASTIC, OPEN FRONT WITH REMOVABLE BUMPERS, CONCEALED CHECK HINGE AND TYPE 316 STAINLESS STEEL HINGE POSTS AND TRIM.	1/2" (13)	1/2" (13)	3" (75)
BWC	BOWL: AMERICAN STANDARD 8L FLUSH 3461.001 MADERA FLOOR MOUNTED, VITREOUS CHINA WATER CLOSET WITH ELONGATED SIPHON JET BOWL AND 40 MM (1 1/2") TOP SPUD INLET, BARRIER FREE COMPLIANT. VALVE: DELTA TECK 8120V-1 EXPOSED CHROME PLATED FLUSH VALVE, VACUUM BREAKER, 40MM (1 1/2") CONNECTION, WALL AND SPUD FLANGES, ADJUST FOR 8L FLUSH, 29MM (1") COPPER SWEAT ANGLE CHECK STOP WITH PROTECTING CAP, AND CENTER COVER BUMPER, BARRIER FREE COMPLIANT. SEAT: BENEKE 521 SOLID WHITE PLASTIC, OPEN FRONT WITH REMOVABLE BUMPERS, CONCEALED CHECK HINGE AND COVER.	1/2" (13)	1/2" (13)	3" (75)
BLV	LAVATORY: AMERICAN STANDARD 0954.004EC 'MURRO' VITREOUS CHINA WALL-HUNG BASIN WITH FRONT OVERFLOW, AND WALL HANGER, 100 MM (4") CENTRES. FAUCET: CHICAGO FAUCETS 802 HEAVY DUTY CHROME PLATED CAST BRASS FAUCET WITH VANDAL-RESISTANT NON-AERATING SPRAY SPOUT, 0.5 USGPM, AND 70 MM (3") WRISTBLADE HANDLES, 4" CENTRES, BARRIER FREE COMPLIANT. NSF/ANSI 372 LOW LEAD CONTENT SUPPLIES: MCGUIRE LPH1708V FLEXIBLE LAVATORY SUPPLIES WITH ANGLE LOCKSHIELD STOPS AND WALL FLANGES. DRAIN: MCGUIRE 115A, 32 MM (1 1/2") CHROME PLATED CAST BRASS DRAIN WITH INLINE WASTE STRAINER MCGUIRE 8872C, 32 MM (1 1/2") TUBULAR 'P' TRAP, CLEANOUT, CHROME FINISH, CAST BRASS BODY AND WALL FLANGE. CARRIER: WATTS CA SERIES HEAVY DUTY CARRIERS FOR WALL-HUNG LAVATORIES WITH CONCEALED ARM SUPPORT AND PIPE UPRIGHTS WELDED TO STEEL BASE PLATES.	1/2" (13)	1/2" (13)	1 1/4" (31)
LV1	LAVATORY: AMERICAN STANDARD 0355.012 'LUCERNE' VITREOUS CHINA WALL-HUNG BASIN WITH FRONT OVERFLOW, AND WALL HANGER, 100 MM (4") CENTRES. FAUCET: DELTA TECK 21153 HEAVY DUTY CHROME PLATED CAST BRASS FAUCET WITH VANDAL-RESISTANT NON-AERATING SPRAY SPOUT, 0.5 USGPM, AND 70 MM (3") LEVER HANDLES, 4" CENTRES. SUPPLIES: DELTA 47312 FLEXIBLE LAVATORY SUPPLIES WITH ANGLE LOCKSHIELD STOPS AND WALL FLANGES. DRAIN: DELTA 337260, 32 MM (1 1/2") CHROME PLATED CAST BRASS DRAIN WITH INLINE WASTE STRAINER AND DELTA 337311, 32 MM (1 1/2") TUBULAR 'P' TRAP, CLEANOUT, CHROME FINISH, CAST BRASS BODY AND WALL FLANGE. CARRIER: WATTS CA SERIES HEAVY DUTY CARRIERS FOR WALL-HUNG LAVATORIES WITH CONCEALED ARM SUPPORT AND PIPE UPRIGHTS WELDED TO STEEL BASE PLATES.	1/2" (13)	1/2" (13)	1 1/4" (31)
LV2	LAVATORY: AMERICAN STANDARD 0954.004EC 'MURRO' VITREOUS CHINA WALL-HUNG BASIN WITH FRONT OVERFLOW, AND WALL HANGER, 100 MM (4") CENTRES. FAUCET: CHICAGO FAUCETS 426 SINGLE 4-1/4 INCH (108mm) LEVER FAUCET, 0.5 GPM (1.9 LPM) VANDAL RESISTANT NON-AERATING OUTLET, DECK MOUNT, 4 INCH (200mm) CENTRES, CERAMIC CARTRIDGE WITH VOLUME CONTROL & HOT WATER STOP, ANSI A112.18.1/CSA B125.1 AND ADA / ANSI 117.1 CODE COMPLIANT, BARRIER FREE COMPLIANT, NSF/ANSI 372 LOW LEAD CONTENT SUPPLIES: MCGUIRE LPH1708V FLEXIBLE LAVATORY SUPPLIES WITH ANGLE LOCKSHIELD STOPS AND WALL FLANGES, BARRIER FREE COMPLIANT. WASTE: MCGUIRE 155A, 32 MM (1 1/2") CHROME PLATED CAST BRASS DRAIN WITH OFFSET INLINE WASTE STRAINER AND MCGUIRE 8872C, 32 MM (1 1/2") TUBULAR 'P' TRAP, CLEANOUT, CHROME FINISH, CAST BRASS BODY AND WALL FLANGE, BARRIER FREE COMPLIANT.	1/2" (13)	1/2" (13)	1 1/4" (31)
KS	SINK: FRANKE MODEL LBD6408 DOUBLE SINK, 20 GAUGE TYPE 302 STAINLESS STEEL, WITH BACKLEDGE AND UNDERCOATING, FACTORY APPLIED RIM SEAL, TWO CRUMB CUP STRAINERS IN BACK OF BOWLS, AND TAILPIECES, OVERALL DIMENSIONS 530MM X 790MM X 200MM (21" X 31" X 8"), BACKLEDGE CENTRES DRILLED FOR 200 MM (8") DECK-MOUNTED FAUCET. FAUCET: DELTA TECK 26T3143 DECKMOUNT FAUCET, C.P. CAST BRASS WITH 200 MM (8") SWING SPOUT, VANDAL-RESISTANT CONTROL FLOW AERATOR, 75 MM (3") LEVER HANDLES, BRASS CONNECTIONS AND TAILPIECE LOCKNUTS. WASTE: MCGUIRE 8912CB, 40 MM (1 1/2") CP CAST BRASS 'P' TRAP WITH CLEANOUT AND WALL FLANGE.	1/2" (13)	1/2" (13)	1 1/2" (38)
DW	HIGH TEMPERATURE UNDER COUNTER DISHWASHER PROVIDED BY CLIENT.	1/2" (13)	--	3/4" (19)
DF	MURDOCK MFG MODEL A171100F-BF1 BARRIER FREE WALL MOUNTED DRINKING FOUNTAIN WITH PUSH BUTTON OPERATED BOTTLE FILLER, ELECTRIC REFRIGERATED, 1.1 L/S (0.8 GPM) FLOW, FRONT PUSH BUTTON USING LESS THAN 5 LBS FORCE, STAINLESS STEEL FINISH & BASIN, PROVIDE 10MM (3/8") SUPPLY WITH FIXTURE STOP VALVE AND 32MM (1 1/2") 'P' TRAP.	1/2" (13)	--	3/4" (19)



ROOF MOUNTED EXHAUST FAN DETAIL
SCALE: N.T.S.

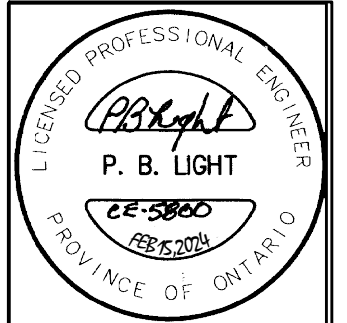
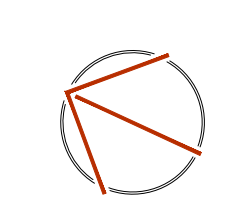
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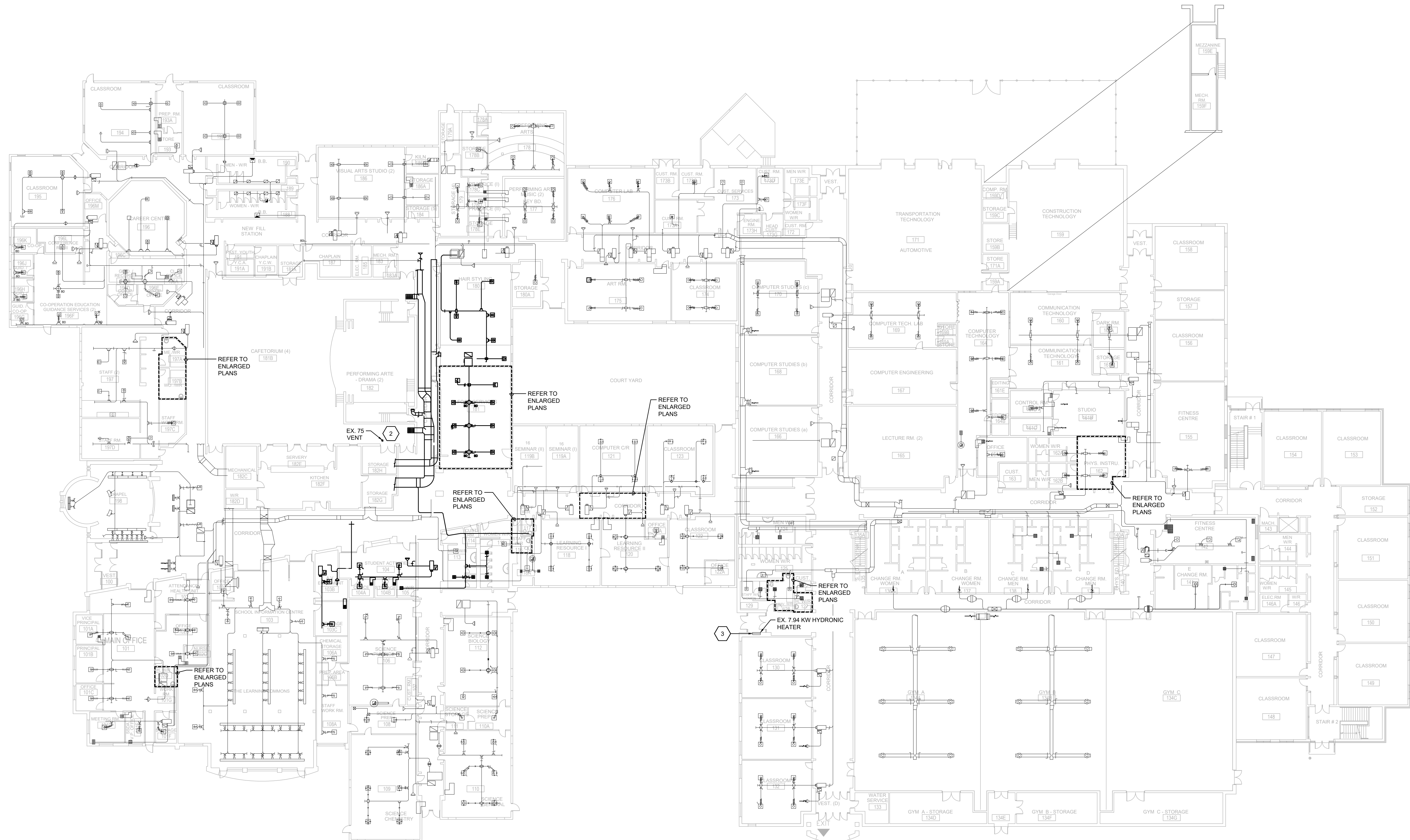
CE-5800

DRAWING TITLE

**GROUND FLOOR -
REMOVALS & REVISIONS**

DRAWING NUMBER

M2 OF 7

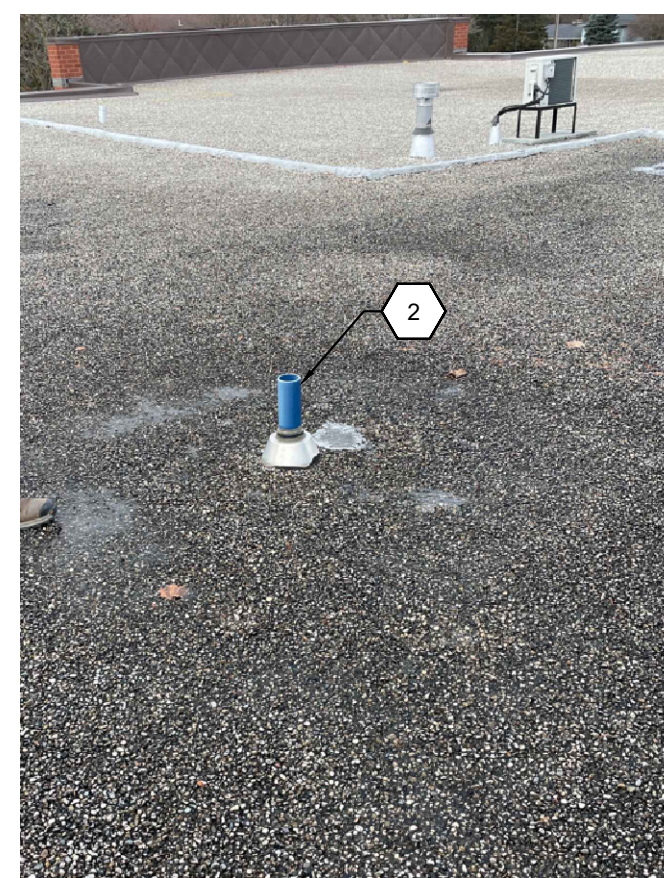


GROUND FLOOR PLAN - MECHANICAL

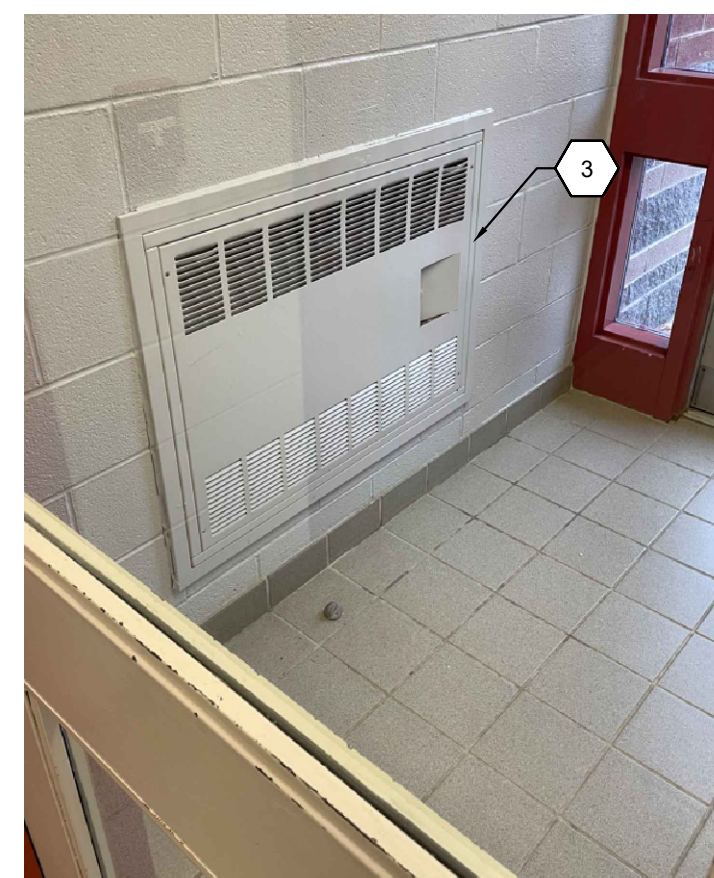
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DRAWING NOTES (INDICATED WITH HEXAGONS):

- EXISTING DUCTWORK & ASSOCIATED GRILLES / REGISTERS, ETC SHALL BE CLEANED AS SPECIFIED. EXISTING DUCTWORK PLANS SHOWN ARE PER DOCUMENTATION FURNISHED BY OWNER. WHERE NO DUCT WORK IS SHOWN NO DOCUMENTATION HAS BEEN PROVIDED. FIELD VERIFICATION REQUIRED.
- EXTEND EXISTING 75mm LAB EXHAUST VENT SUCH THAT IT TERMINATES A MINIMUM OF 385mm (12'-0") ABOVE THE ROOF SURFACE. PROVIDE WITH GUY WIRE SUPPORTS. COORDINATE WITH STRUCTURAL ENGINEER AND ROOFING CONTRACTOR.
- CONTRACTOR TO VERIFY OPERATION AND PROVIDE DEFICIENCY REPORT.

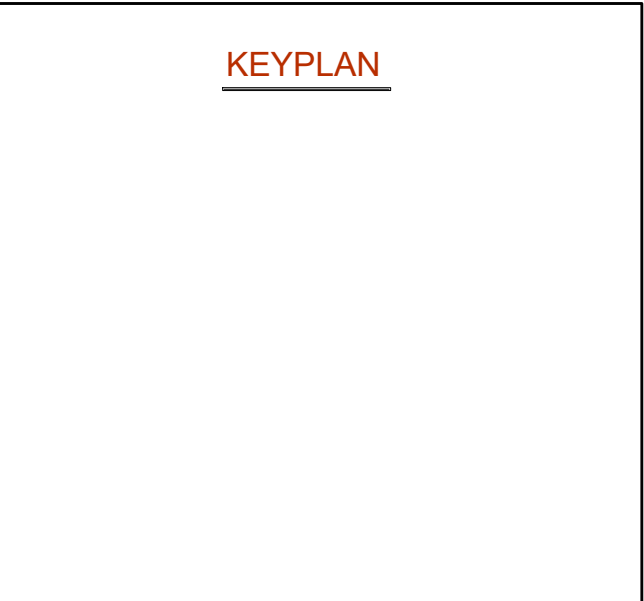


ROOF - EX.LAB VENT



FLOOR PLAN - EX. HEATER

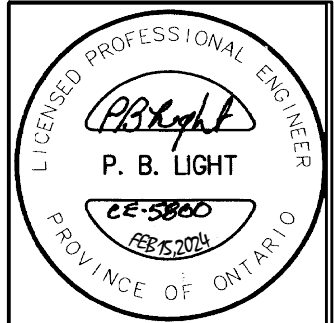
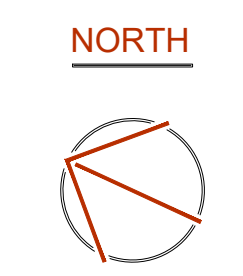
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DRAWING TITLE

MECH. ROOM - REMOVALS & REVISIONS

DRAWING NUMBER

M3 OF 7



ROOF - GAS PIPING 5

SCALE: 1:250



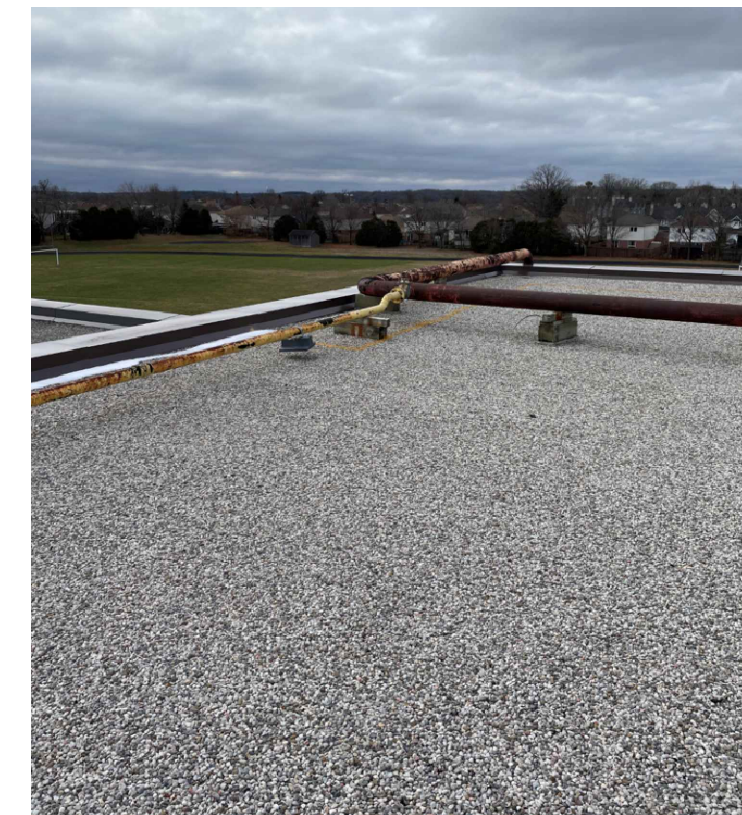
MACH. RM - PUMP 6 4

SCALE: 1:250



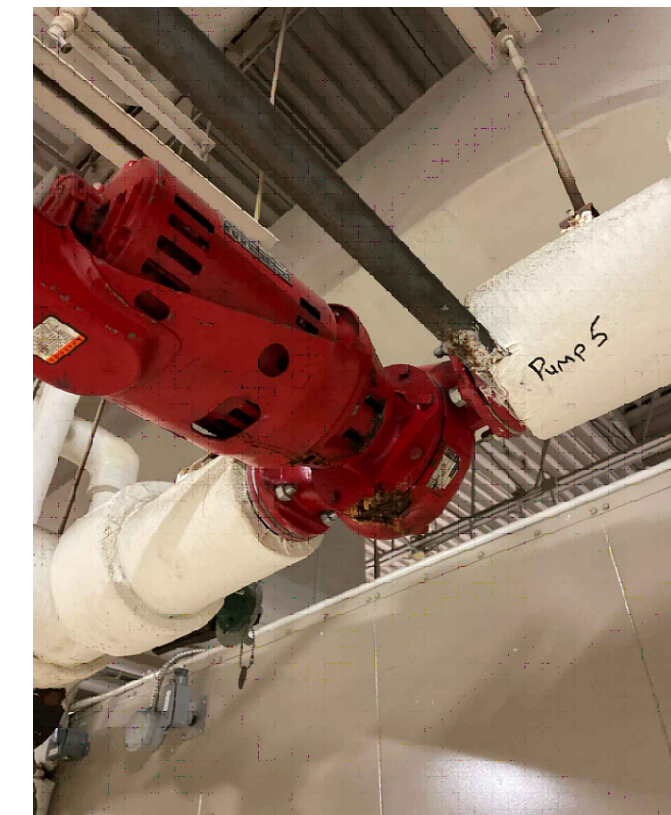
MACH. RM - WATER SOFTENER PIPING 2

SCALE: 1:250



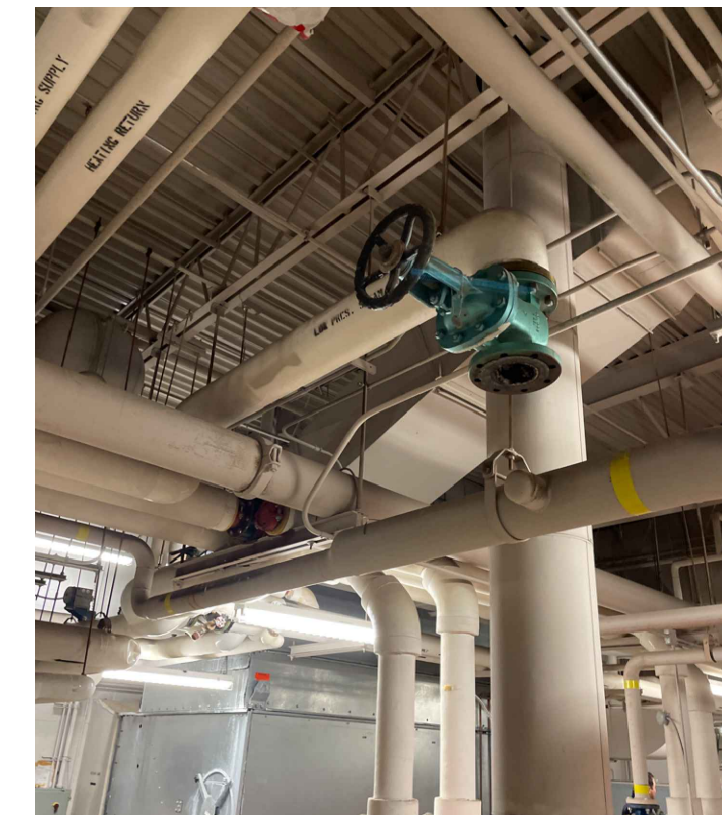
ROOF - GAS PIPING 5

SCALE: 1:250



MACH. RM - PUMP 5 4

SCALE: 1:250



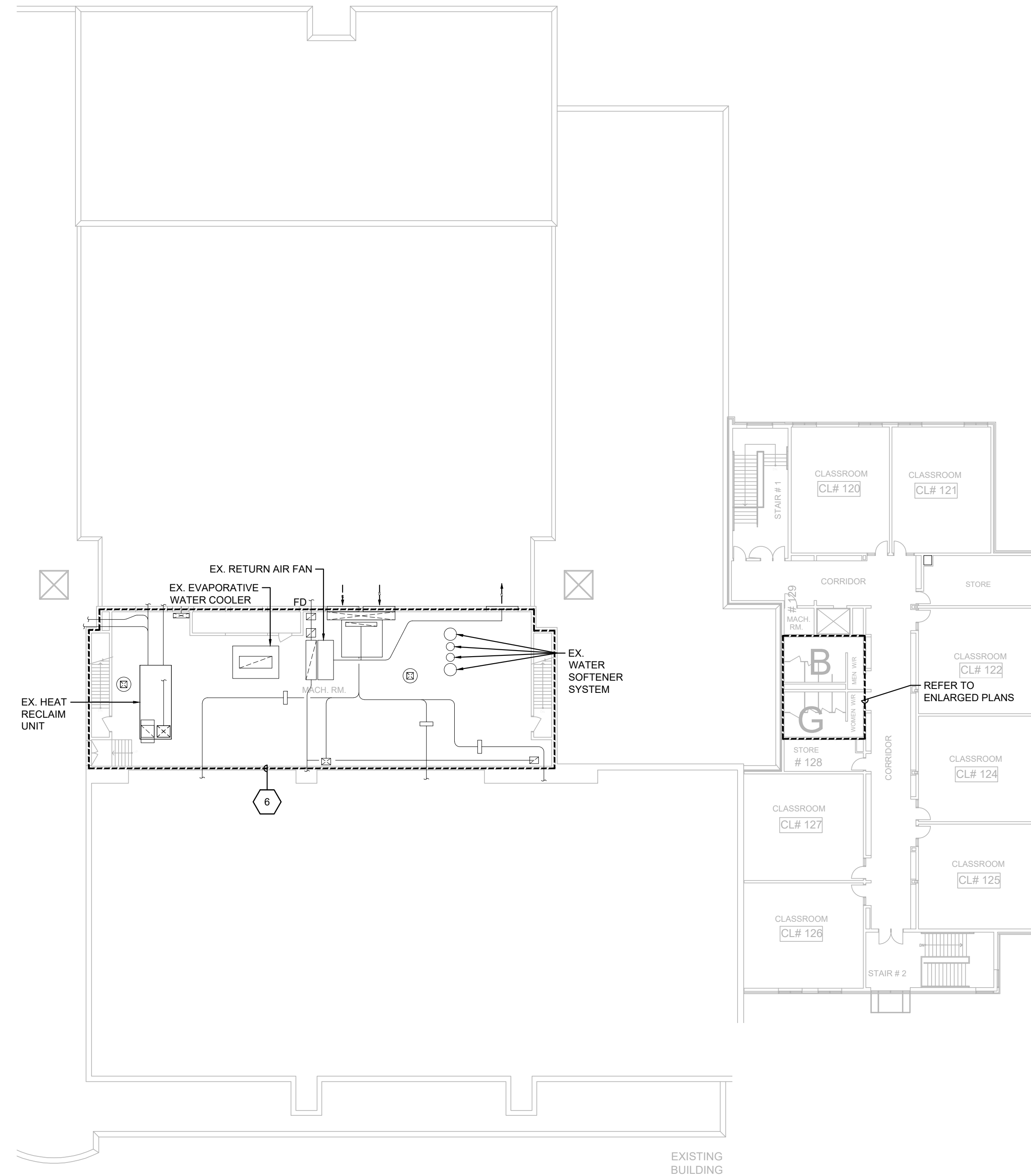
MACH. RM - STEAM PIPE 3

SCALE: 1:250



MACH. RM - 3 WAY VALVE 1

SCALE: 1:250



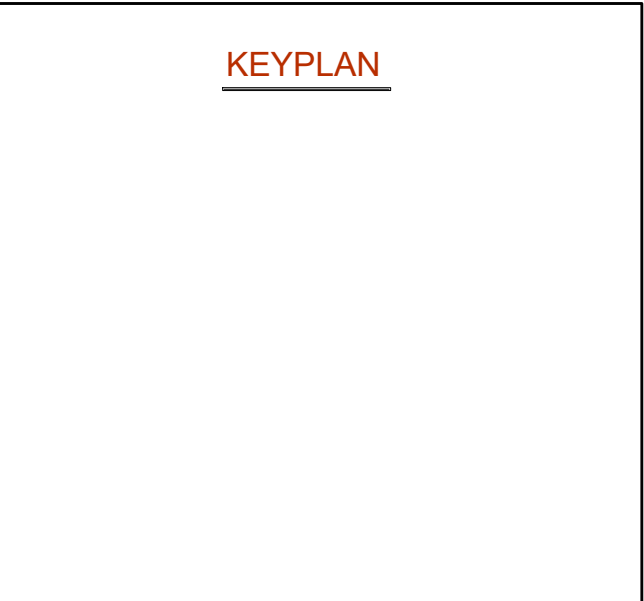
2ND FLOOR PLAN - MECHANICAL

SCALE: 1:250

DRAWING NOTES (INDICATED WITH HEXAGONS):

- EXISTING 100mm (4") THREE WAY VALVE AND ACTUATOR SHALL BE REPLACED. CONNECT ACTUATOR TO EXISTING POWER AND CONTROL WIRING. FIELD VERIFY PIPE SIZES BEFORE SUBMITTING SHOP DRAWINGS.
- INSULATE EXPOSED PIPING SERVING WATER SOFTENERS AS PER SPECIFICATIONS.
- CAP EXISTING OPEN ENDED STEAM PIPE WITH BLIND FLANGE.
- EXISTING HEATING SUPPLY PUMP SHALL BE REPLACED AS PER PUMP SCHEDULE ON DRAWING M1. CONNECT REPLACEMENT PUMP TO EXISTING POWER AND CONTROL WIRING.
- EXISTING GAS PIPING ON ROOF TO BE REPAINTED AS PER SPECIFICATIONS. APPROXIMATELY 300 METERS OF PIPING TO BE PAINTED. FIELD VERIFY PIPE SIZES AND LENGTHS BEFORE PAINTING.
- EXISTING DUCTWORK & ASSOCIATED GRILLES / REGISTERS, ETC SHALL BE CLEANED AS SPECIFIED. EXISTING DUCTWORK PLANS SHOWN ARE PER DOCUMENTATION FURNISHED BY OWNER. WHERE NO DUCT WORK IS SHOWN NO DOCUMENTATION HAS BEEN PROVIDED. FIELD VERIFICATION REQUIRED.

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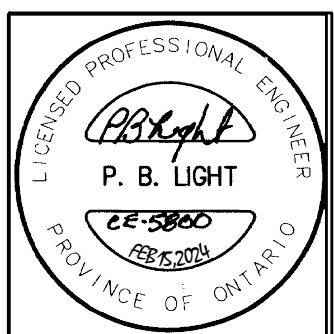
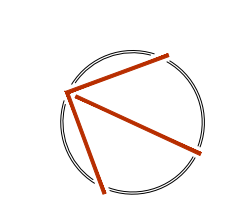


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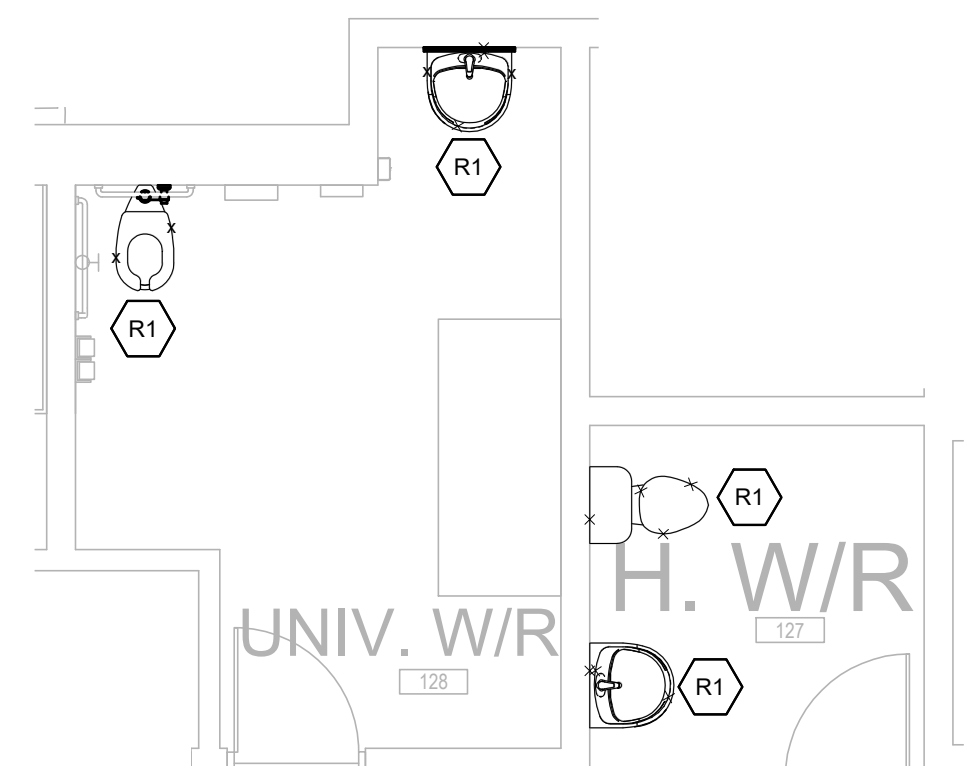
CE-5800

DRAWING TITLE

ENLARGED PLANS -
MECHANICAL

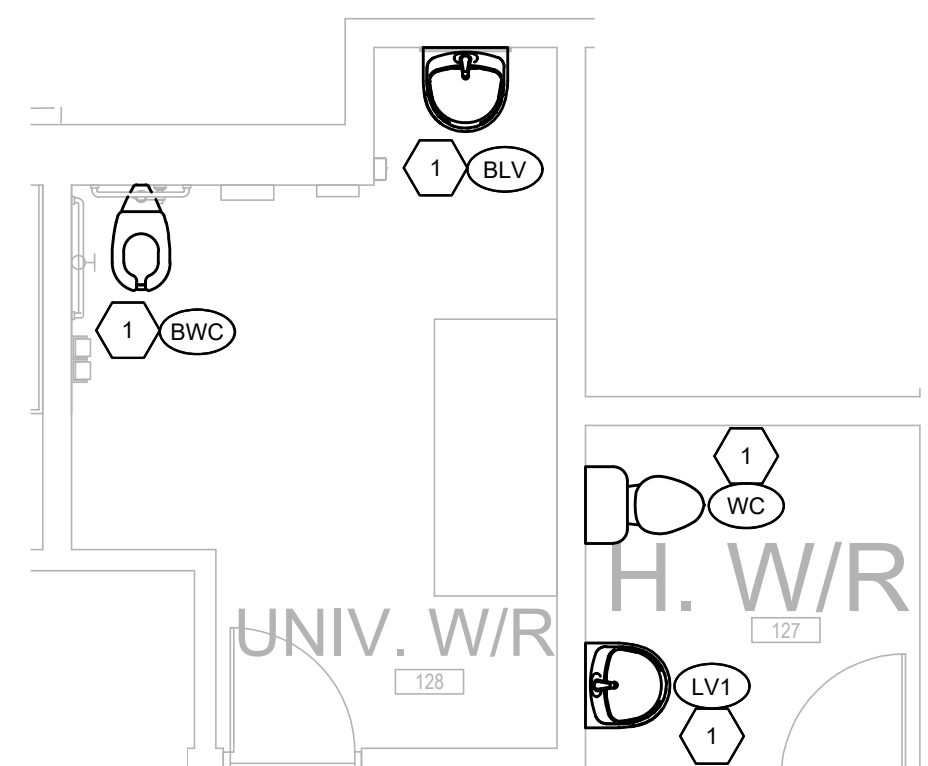
DRAWING NUMBER

M4 OF 7



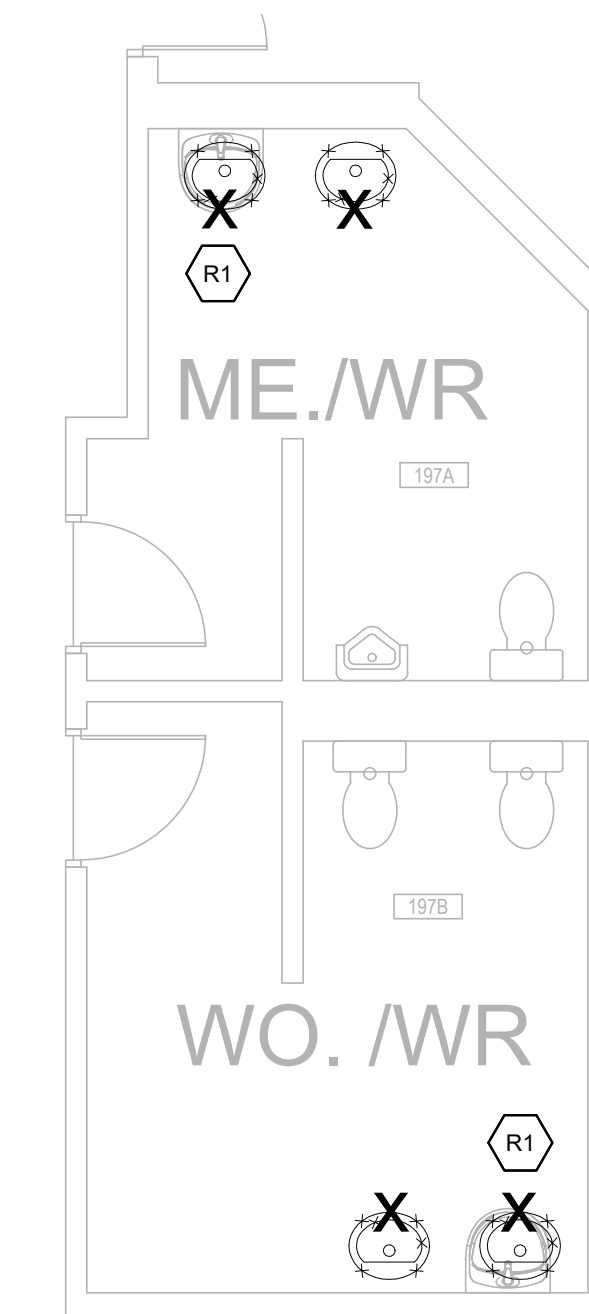
**ENLARGED PLAN - UNIV. W/R
& H. W/R REMOVALS**

SCALE: 1:50



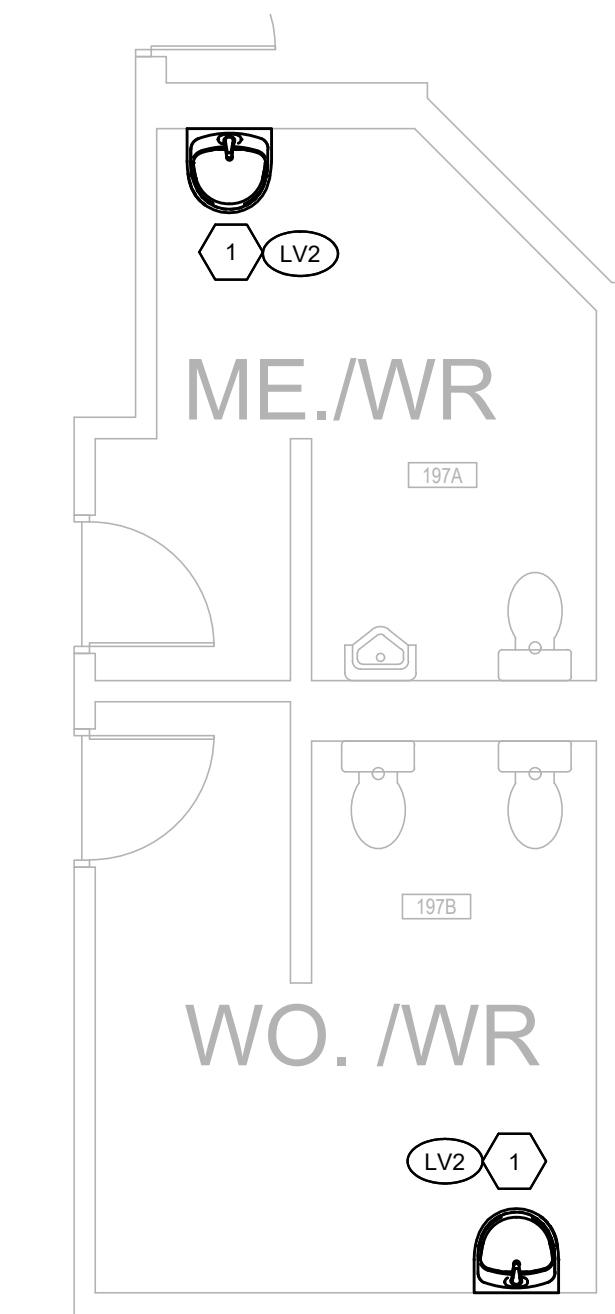
**ENLARGED PLAN - UNIV.
W/R & H. W/R REVISED**

SCALE: 1:50



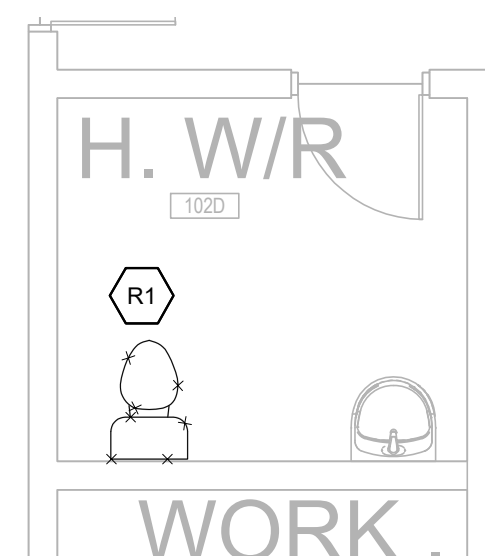
**ENLARGED PLAN -
ME. & WO. W/R 197A
& 197B REMOVALS**

SCALE: 1:50



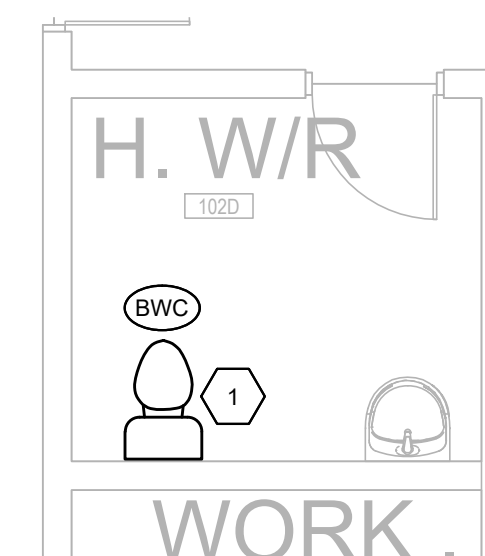
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ME. & WO. W/R 197A
& 197B REVISED**

SCALE: 1:50



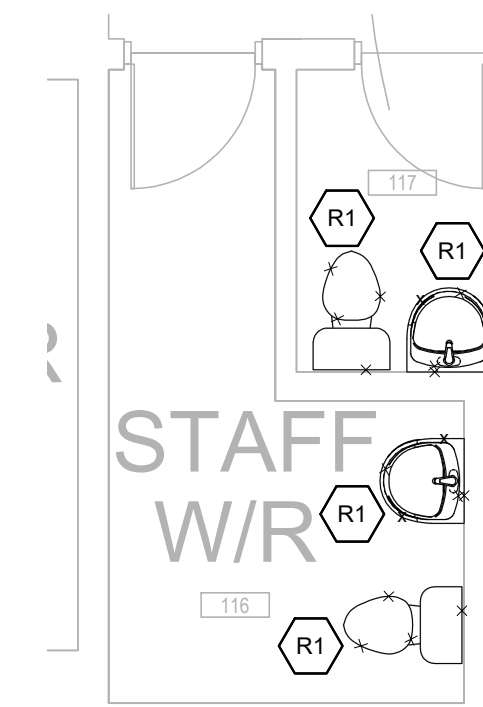
**ENLARGED PLAN -
H.W/R 102D REMOVALS**

SCALE: 1:50



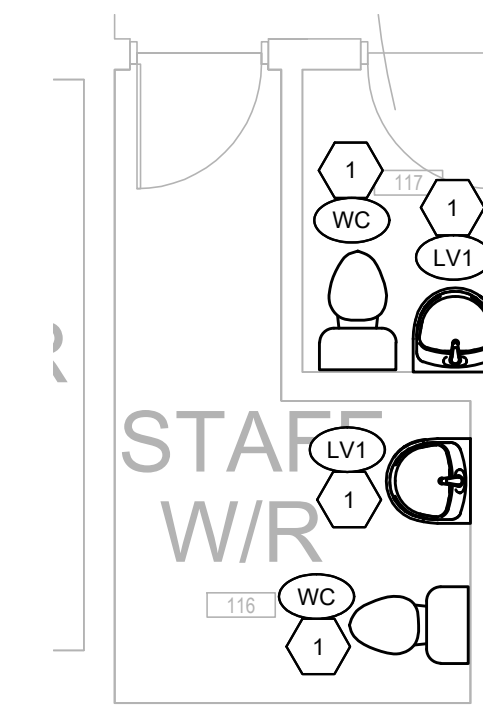
**ENLARGED PLAN -
H.W/R 102D REVISED**

SCALE: 1:50



**ENLARGED PLAN -
STAFF W/R'S 116 &
117 REMOVALS**

SCALE: 1:50



**ENLARGED PLAN -
STAFF W/R'S 116 &
117 REVISED**

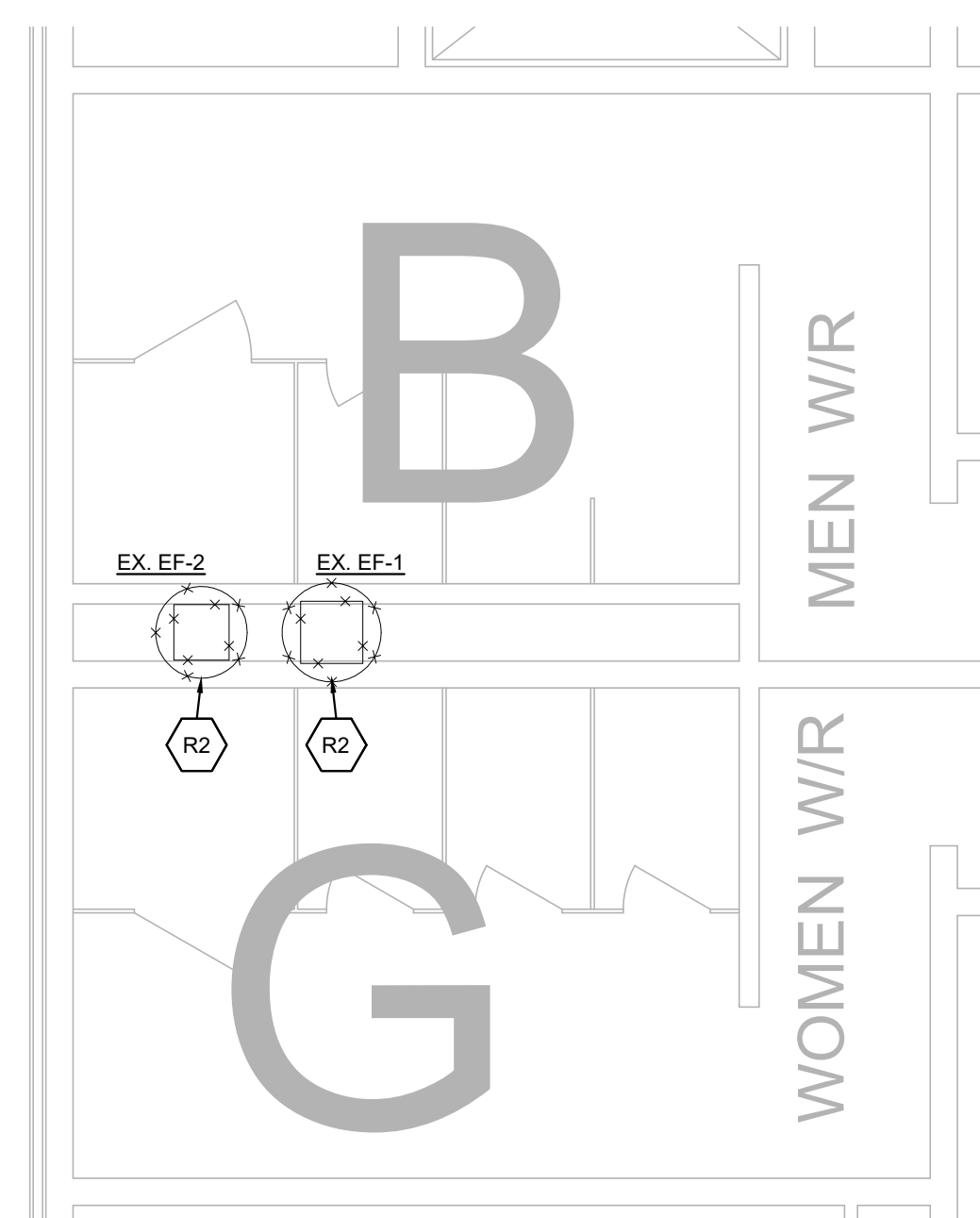
SCALE: 1:50

DRAWING REMOVAL NOTES (INDICATED WITH HEXAGONS):

- R1. REMOVE EXISTING PLUMBING FIXTURE. ASSOCIATED PIPING CONNECTIONS TO REMAIN FOR RECONNECTION TO REPLACEMENT FIXTURE.
- R2. REMOVE EXISTING WASHROOM FANS ON THE ROOF. ASSOCIATED DUCTWORK CONNECTION TO REMAIN FOR RECONNECTION TO REPLACEMENT FANS. PRIOR TO REMOVAL EXISTING AIRFLOW TO BE MEASURED AND REPORTED TO ENGINEER.

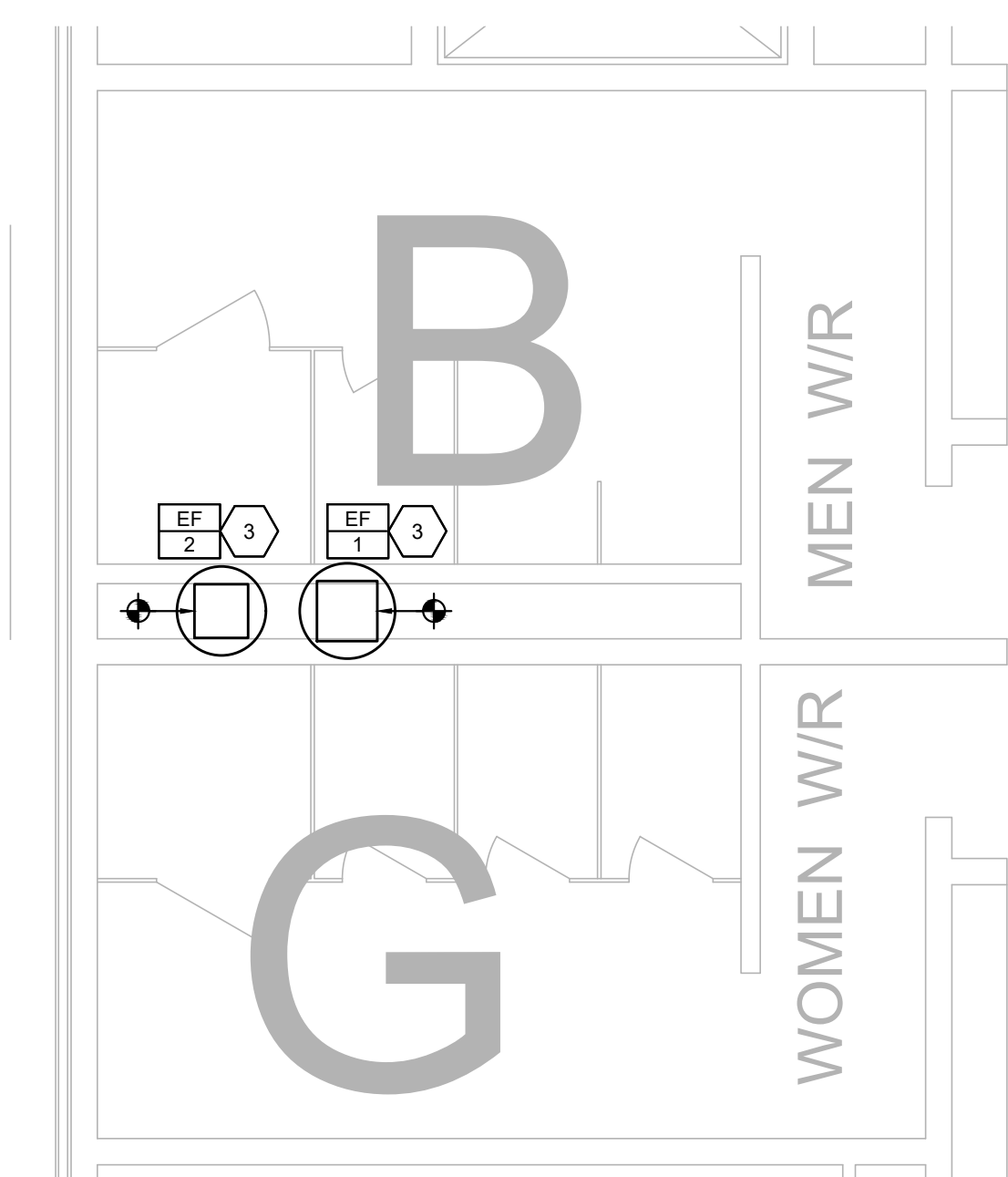
DRAWING NOTES (INDICATED WITH HEXAGONS):

- 1. MODIFY EXISTING PIPING AS REQUIRED TO CONNECT REPLACEMENT FIXTURE TO EXISTING PIPING.
- 2. MODIFY EXISTING DUCT WORK AS REQUIRED TO CONNECT REPLACEMENT EXHAUST FAN. BALANCE AIRFLOW TO 50 CFM PER EXHAUST GRILLE.



**ENLARGED PLAN -
WOMEN/MEN W/R REMOVALS**

SCALE: 1:50



**ENLARGED PLAN -
WOMEN/MEN W/R REVISED**

SCALE: 1:50

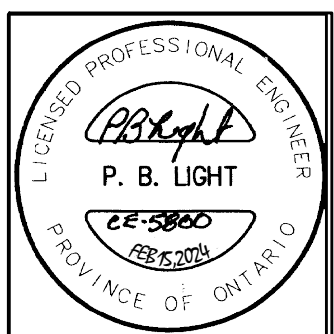
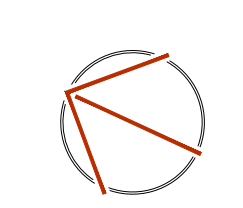
KEYPLAN

PRELIMINARY
NOT FOR
CONSTRUCTION

REVISIONS

NO.	ISSUED FOR	DATE
00	CLIENT REVIEW	24.01.26
01	TENDER	24.02.15

NORTH



DESIGN	BCD	DRAWN	BCD
CHECKED	PBL	REVIEWED	PBL

PROJECT

MONSIGNOR
DOYLE CSS

ADDRESS

185 MYERS ROAD,
CAMBRIDGE, ON

PROJECT NO.

CE-5800

DRAWING TITLE

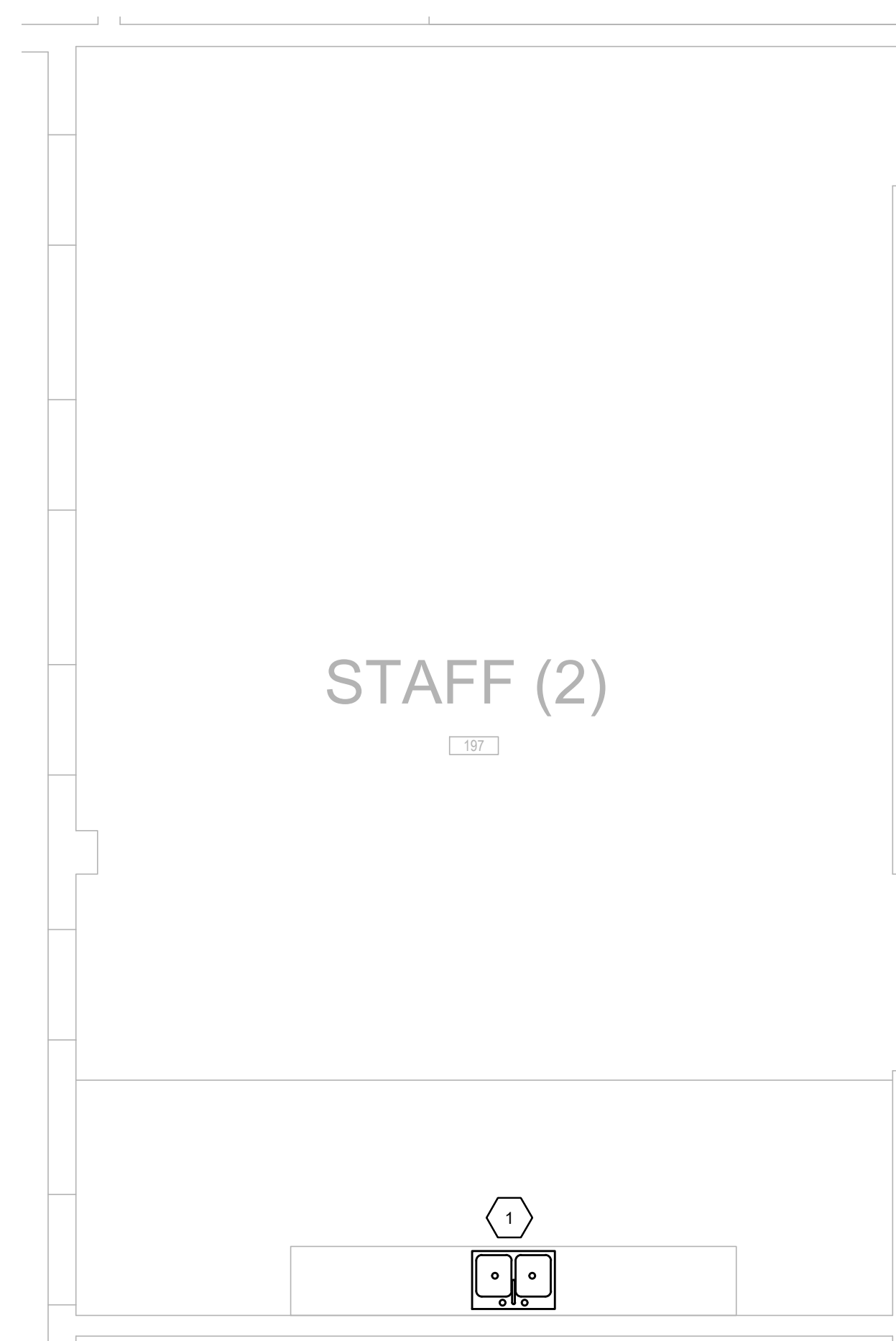
ENLARGED PLANS -
MECHANICAL

DRAWING NUMBER

M5 OF 7



**ENLARGED PLAN - STAFF (2) 197
REMOVALS**
SCALE: 1:50



**ENLARGED PLAN - STAFF (2) 197
REVISED**
SCALE: 1:50

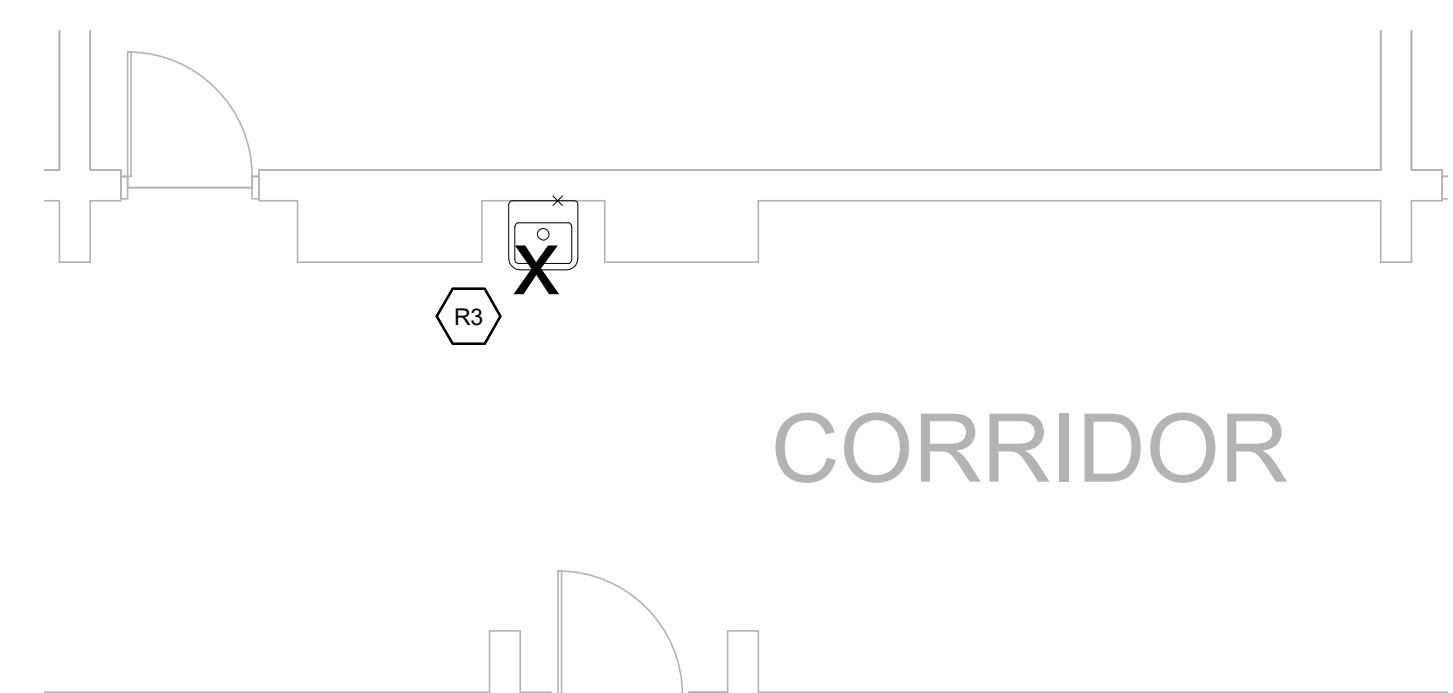


**ENLARGED PLAN - FOOD SERVICES 181
REMOVALS**
SCALE: 1:50

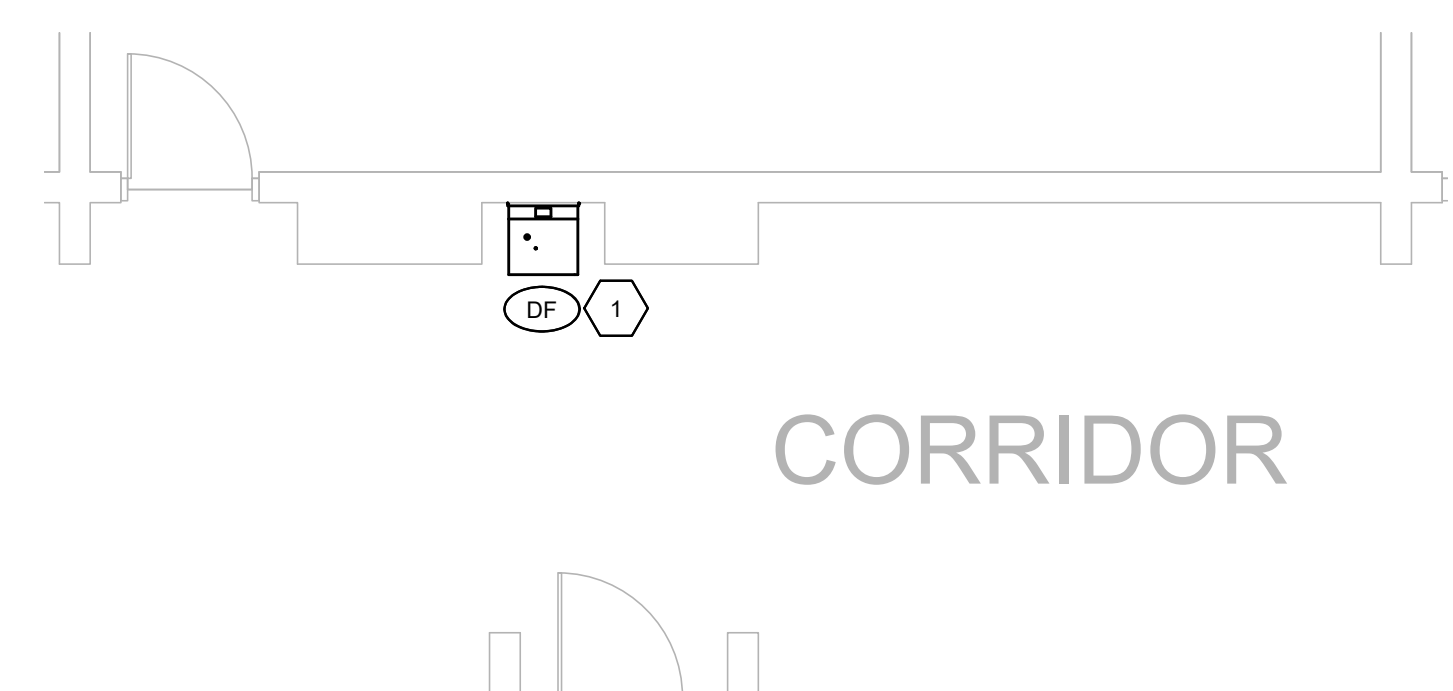
- DRAWING REMOVAL NOTES (INDICATED WITH HEXAGONS):
- R1. REMOVE EXISTING PLUMBING FIXTURE. ASSOCIATED PIPING CONNECTIONS TO REMAIN FOR RECONNECTION TO REPLACEMENT FIXTURE.
 - R2. REMOVE EXISTING MIXING VALVE STATIONS. ASSOCIATED PIPING CONNECTIONS TO REMAIN FOR RECONNECTION TO REPLACEMENT MIXING VALVE.
 - R3. REMOVE EXISTING GREASE INTERCEPTOR. PRIOR TO DISPOSAL CONFIRM EXISTING INTERCEPTOR SIZE. CONTRACTOR TO CONFIRM EXISTING PIPE CONNECTION SIZES TO EXISTING INTERCEPTOR.
- DRAWING NOTES (INDICATED WITH HEXAGONS):
- 1. MODIFY EXISTING PIPING AS REQUIRED TO CONNECT REPLACEMENT FIXTURE TO EXISTING PIPING.
 - 2. MODIFY EXISTING PIPING AS REQUIRED TO CONNECT TO REPLACEMENT MIXING VALVE.
 - 3. MODIFY EXISTING PIPING AS REQUIRED TO CONNECT TO REPLACEMENT GREASE INTERCEPTOR. MINIMUM 100mm SANITARY PIPE REQUIRED DOWNSTREAM OF INTERCEPTOR.



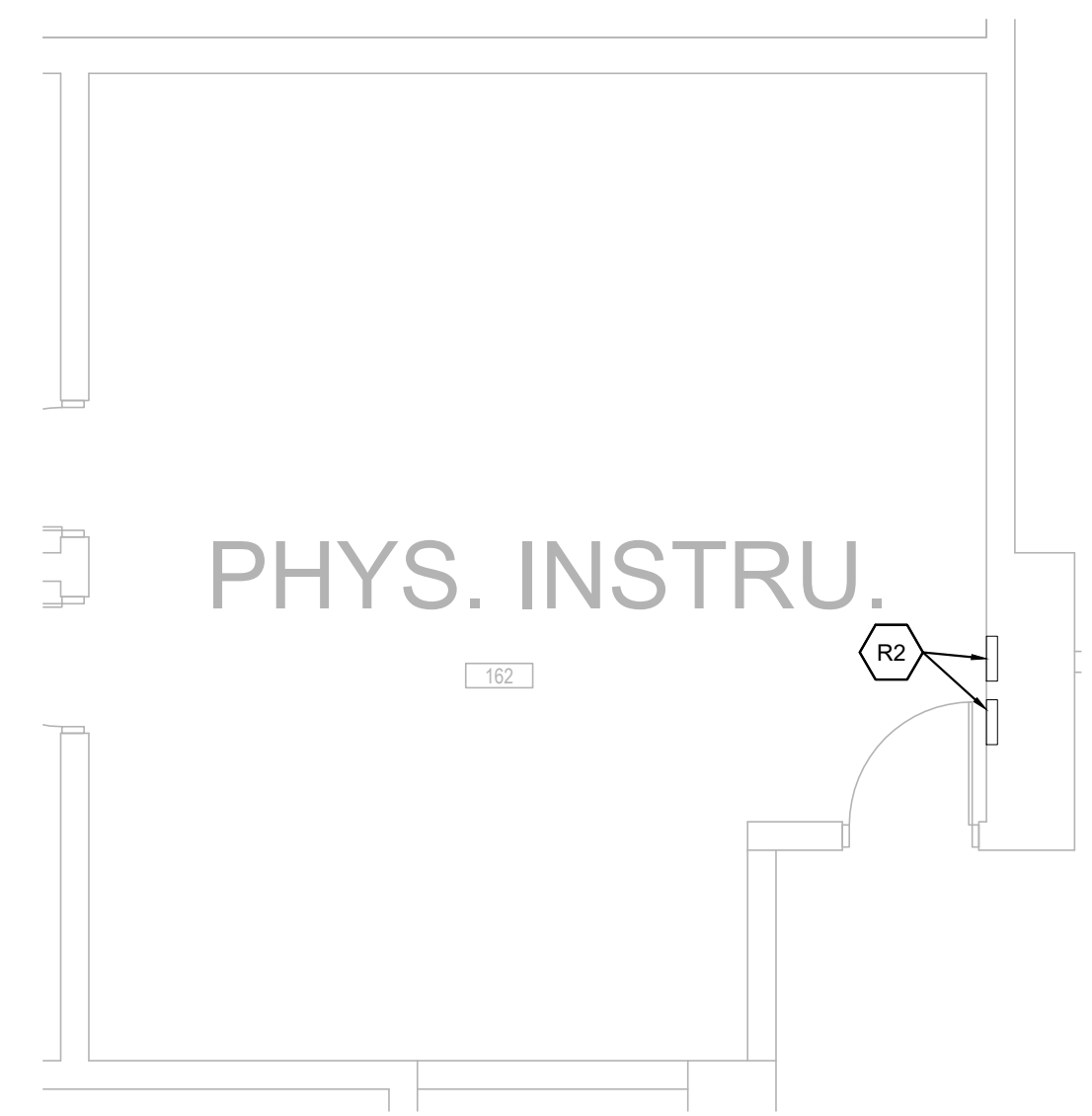
**ENLARGED PLAN - FOOD SERVICES 181
REVISED**
SCALE: 1:50



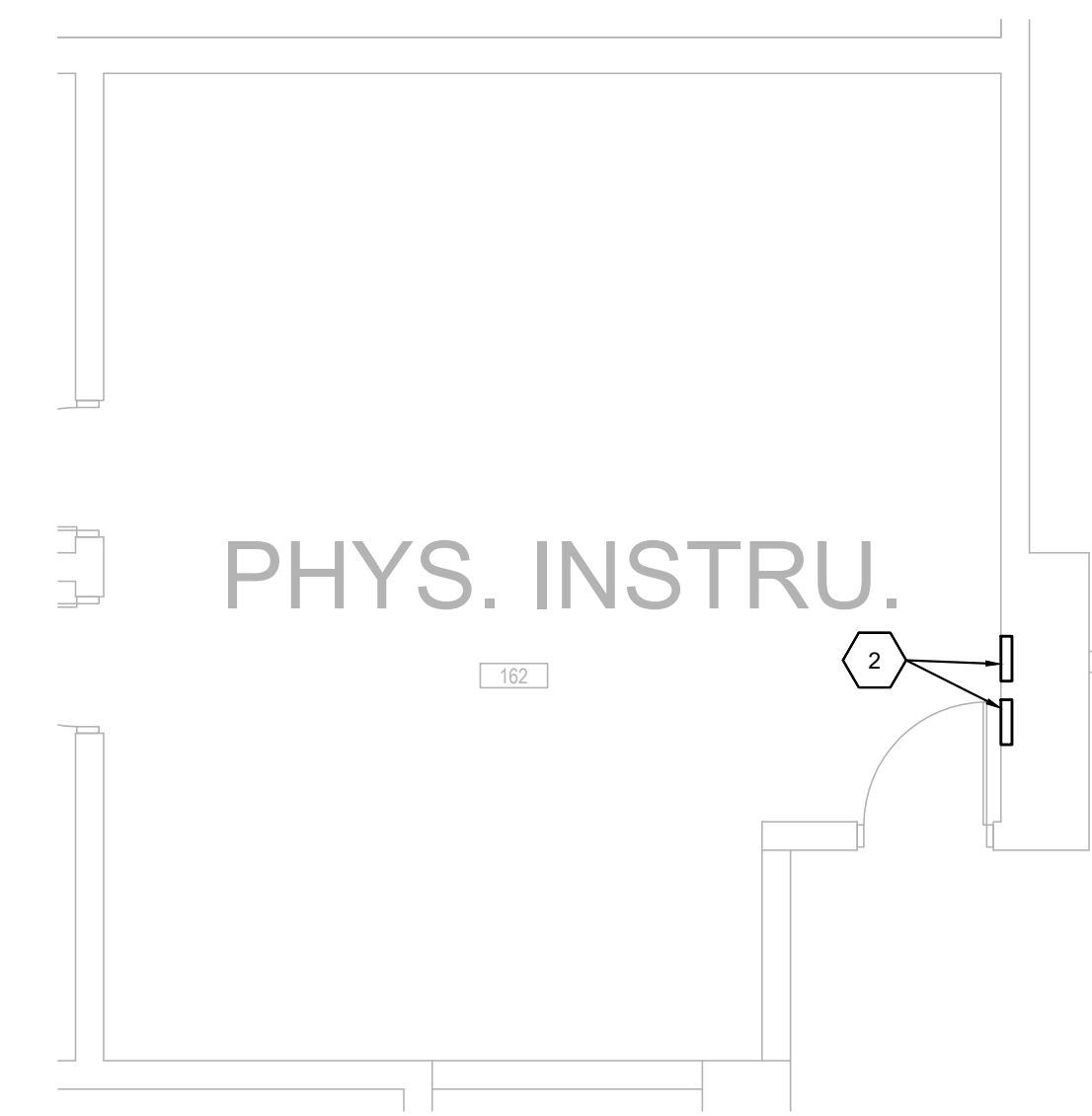
**ENLARGED PLAN - CORRIDOR
REMOVALS**
SCALE: 1:50



**ENLARGED PLAN - CORRIDOR
REVISED**
SCALE: 1:50



**ENLARGED PLAN - PHYS.
INSTRU. 162 REMOVALS**
SCALE: 1:50



**ENLARGED PLAN - PHYS.
INSTRU. 162 REVISED**
SCALE: 1:50

MECHANICAL GENERAL REQUIREMENTS: 1.1. GENERAL: 1.1.1. MAKE SITE VISITS(S) AS NECESSARY BEFORE BID CLOSING TO ESTABLISH AND VERIFY ALL EXISTING CONDITIONS... 1.1.2. THE DRAWINGS SHOW THE GENERAL INTENT OF THE WORK... 1.1.3. DO NOT SCALE MECHANICAL DRAWINGS... 1.2. DESCRIPTION: PROVIDE WORK IN ACCORDANCE WITH FULL INTENT AND MEANING OF DRAWINGS... 1.3. WORKMANSHIP: PROVIDE ALL NEW MATERIALS AND EQUIPMENT... 1.4. SLEEVES, HANGERS, INSERTS: PROVIDE ALL SLEEVES, INSERTS AND HANGERS... 1.5. INTERPRETATION: DIVISION OF THE WORK AMONG SUPPLIERS OR VENDORS... 1.6. COORDINATION BETWEEN TRADES: CO-ORDINATE THE WORK OF THIS TRADE WITH ALL OTHER TRADES... 1.7. DISCREPANCY: IF A DISCREPANCY IS FOUND IN THE SPECIFICATION OR ON THE DRAWINGS... 1.8. REGULATORY REQUIREMENTS: CONFORM TO GOVERNING MUNICIPAL AND PROVINCIAL CODES... 1.9. CODES AND STANDARDS: 1.9.1. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE ONTARIO BUILDING CODE... 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... 1.11. PERMITS AND FEES: OBTAIN ALL PERMITS REQUIRED FOR INSTALLATION OF MECHANICAL TRADES WORK... 1.12. TAXES: ENSURE THAT PROVINCIAL AND/OR FEDERAL TAXES ARE INCLUDED WHERE REQUIRED... 1.13. WARRANTY: PROVIDE A WRITTEN WARRANTY FOR ALL MATERIALS, EQUIPMENT AND LABOUR FOR A ONE-YEAR PERIOD... 1.14. CERTIFICATION: PROVIDE MANUFACTURERS' 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. SITE PROTECTION AND CLEANLINESS: PROTECT ALL WORK AND MATERIALS, BEFORE AND AFTER ERECTION FROM WEATHER AND OTHER HAZARDS... 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... 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 MANUFACTURERS' PUBLISHED INSTRUCTIONS AND RECOMMENDATIONS... 1.20. CUTTING AND PATCHING: PROVIDE ALL CUTTING AND PATCHING REQUIRED FOR THE WORK OF THIS TRADE... 1.21. SPARE PARTS: PROVIDE SPARE SET OF FILTERS FOR EACH FILTER BANK... 1.22. 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... 2. TESTING AND BALANCING: 2.1. PRESSURE TESTS: 2.1.1. PROVIDE PRESSURE TESTS ON ALL PIPING INCLUDED IN THIS CONTRACT... 2.1.2. CONDUCT HYDROSTATIC TESTS FOR A MINIMUM PERIOD OF 2 HOURS... 2.1.3. FOR PNEUMATIC TESTS, FIRST PRESSURIZE SYSTEM WITH AIR TO APPROXIMATELY ONE-HALF SPECIFIED PRESSURE... 2.2. AIR BALANCING: 2.2.1. ASSUME RESPONSIBILITY FOR TESTING, BALANCING, AND PLACING ALL AIR HANDLING SYSTEMS IN OPERATION... 2.2.2. RETAIN INDEPENDENT BALANCING FIRM TO BALANCE AIR HANDLING SYSTEMS... 2.2.3. PROVIDE SHEAVES AND PULLEYS AND BELTS AS REQUIRED TO ACHIEVE AIR FLOWS INDICATED... 2.2.4. ON COMPLETION OF TESTING AND BALANCING OF ALL SYSTEMS, SUBMIT TO CONSULTANT A PDF REPORT OF FINDINGS... 2.2.5. SUBMIT WITH EACH COPY OF REPORT, COMPLETE SETS OF DUCT LAYOUT PRINTS... 2.2.6. INSTALLATION TOLERANCES: 2.2.6.1. AIR HANDLING SYSTEMS: ±5% OF DESIGN... 2.2.6.2. AIR OUTLETS / INLETS: ±10% OF DESIGN... 2.2.6.3. HYDRONIC SYSTEMS: ±5% OF DESIGN... 3. MECHANICAL INSULATION: 3.1. WHERE INSULATION THICKNESS IS NOT IDENTIFIED, COMPLY WITH ASHRAE 90.1 REQUIREMENTS... 3.2. ALL PRODUCTS TO HAVE FLAME SPREAD RATINGS LESS THAN 25 AND SMOKE DEVELOPED CLASSIFICATION LESS THAN 50... 3.3. PROVIDE A CONTINUOUS VAPOUR BARRIER ON ALL COLD SYSTEMS... 3.4. DEFINITIONS: 3.5. CONCEALED: INSULATED MECHANICAL SERVICES AND EQUIPMENT IN SUSPENDED CEILING AND NON ACCESSIBLE CHASES AND FURRED IN SPACES... 3.6. EXPOSED: NOT CONCEALED... 3.7. INSULATION TYPES: 3.7.1. PFC - PREFORMED GLASS FIBRE: FIBROUS GLASS SPLIT SECTIONAL PIPE INSULATION CONFORMING TO CANULC C-5702... 3.7.2. FGF - FLEXIBLE GLASS FIBRE: ASTM C553 FLEXIBLE NON-COMBUSTIBLE BLANKET... 3.7.3. RGF - RIGID GLASS FIBRE: ASTM C612 RIGID NON-COMBUSTIBLE BLANKET... 3.7.4. CF - CELLULAR FOAM: ASTM C534/C534M FLEXIBLE CELLULAR ELASTOMERIC... 3.8. PIPING: 3.8.1. DO NOT INSULATE FLANGES OR UNIONS AT CONNECTION TO EQUIPMENT... 3.8.2. VALVE OPERATORS AND BALANCING VALVE TEST PORTS TO BE ACCESSIBLE WITHOUT REMOVAL OF INSULATION... 3.8.3. PIPE INSULATION INSERTS AND SHIELDS: PROVIDE RIGID INSERTS AND SHIELDS AT ALL HANGER SUPPORTS... 3.8.4. NOMINAL PIPE SIZE: 3.8.5. MM (IN): 3.8.6. 40-65 (1-1/2 - 2-1/2) 250 (10) 3.8.7. 80-150 (3-6) 300 (12) 3.8.8. 200-250 (8-10) 400 (14) 3.8.9. >=300 (>=12) 550 (22) 3.8.10. PIPE INSULATION TYPE AND THICKNESS: 3.8.10.1. PLUMBING: 3.8.10.2. POTABLE (DOMESTIC) COLD WATER AND CITY WATER (PGF): 25 MM (1") 3.8.10.3. POTABLE (DOMESTIC) HOT WATER (PGF): <=32 MM (1-1/4") - 25 MM (1") >=40 MM (1-1/2") - 40 MM (1-1/2") 3.8.10.4. STORM AND SANITARY DRAIN (PGF): 25 MM (1") 3.8.10.5. HOT WATER HEATING (PGF): <=32 MM (1-1/4") - 40 MM (1-1/2") >=40 MM (1-1/2") - 50 MM (2") 3.8.10.6. COMPLETELY INSULATE THE FOLLOWING SYSTEMS: -POTABLE (DOMESTIC) COLD WATER -POTABLE (DOMESTIC) HOT WATER -POTABLE (DOMESTIC) HOT WATER RE-CIRCULATION -CONDENSATE DRAINS -HOT WATER HEATING 3.9. EQUIPMENT: INSULATE ALL EQUIPMENT LISTED BELOW THAT IS CONNECTED TO PIPING SYSTEMS... 3.10. PUMP BODIES 3.11. SURFACE FINISHES: 3.11.1. PIPING: 3.11.1.1. EXPOSED INTERIOR PIPING: FINISH EXPOSED INSULATED PIPING, VALVES AND FITTINGS WITH PVC JACKETS... 3.11.1.2. SANITARY PIPING: FINISH INSULATED SANITARY PIPING BELOW BARRIER FREE LAVATORY TRAPS... 4. PIPING SYSTEMS: 4.1. GENERAL: 4.1.1. EXPANSION AND CONTRACTION: INSTALL ALL PIPING SO AS TO BE FREE FROM STRAIN AND DISTORTION... 4.1.2. LINES, GRADES AND SLOPES: 4.1.2.1. INSTALL LIQUID AND AIR PIPING FREE OF POCKETS AND PITCH TO DRAIN... 4.1.2.2. 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... 4.1.3. UNIONS OR FLANGES - PROVIDE IN THE FOLLOWING LOCATIONS: 4.1.3.1. FOR BY-PASSES AROUND EQUIPMENT... 4.1.4. PIPING CONNECTIONS TO MAINS: 4.1.4.1. MAKE DOWN FEED PIPING CONNECTIONS... 4.1.5. SLEEVES: 4.1.5.1. INSTALL SLEEVES WHERE PIPING PASSES THROUGH FOUNDATIONS... 4.1.5.2. MAKE SLEEVES LARGE ENOUGH TO PASS FULL THICKNESS OF PIPE COVERING WHERE SAME IS USED... 4.1.5.3. FILL SLEEVES FOR FUTURE USE WITH LIME MORTAR... 4.1.6. ESCUTCHEON PLATES: PROVIDE ESCUTCHEON PLATE ON BARE PIPING PASSING THROUGH FINISHED WALLS OR FLOORS... 4.1.7. VALVE TAGS AND INDEXES: UPON COMPLETION OF WORK, FURNISH AND INSTALL 25 MM (1") DIA. BRASS TAG AT EACH VALVE... 4.1.8. PIPE IDENTIFICATION: 4.1.8.1. LABEL PIPING INSTALLED UNDER THIS DIVISION TO INDICATE CONTENT AND DIRECTION OF FLOW... 4.1.8.2. ALL LABELS SHALL BE OF SUFFICIENT WIDTH TO OVERLAP ITSELF... 4.1.8.3. PROVIDE LABELS OF PLASTIC COATED TAPE... 4.1.8.4. LOCATE LABELS AS FOLLOWS: AT EVERY END OF EVERY PIPE RUN... 4.2. HANGERS AND SUPPORTS: 4.2.1. GENERAL: 4.2.1.1. PIPE HANGERS & SUPPORTS TO CSA B214 & MSS SP-58... 4.2.1.2. SUPPORT OR SUSPEND ALL PIPING WITH NECESSARY HANGERS... 4.2.1.3. DO NOT ALLOW LOADS, OF ANY NATURE, TO BE TRANSMITTED THROUGH PIPING CONNECTIONS TO EQUIPMENT... 4.2.1.4. PROVIDE SUITABLY DAMPENED SPRING HANGERS FOR FIRST THREE SUPPORTS... 4.2.1.5. DO NOT HANG ANY PIPE, FROM ANOTHER PIPE OR FROM ROOF DECK... 4.2.1.6. PROVIDE DIELECTRIC SEPARATION AS REQUIRED... 4.2.2. HANGERS: 4.2.2.1. FOR ALL INSULATED PIPING UP TO NPS 4, CARRYING LIQUIDS AT TEMPERATURES 10.5°C (51°F) AND HIGHER... 4.2.2.2. FOR INSULATED PIPING OF NPS 4 DIA. AND LARGER... 4.2.2.3. FOR INSULATED PIPING CARRYING LIQUIDS AT A TEMPERATURE OF 10°C (50°F) OR LESS... 4.2.2.4. PROVIDE INSULATION PROTECTION BEARING PLATES AT ALL HANGERS AND SUPPORTS... 4.2.2.5. FOR NON-INSULATED PIPING USE CLEVIS TYPE OF WROUGHT STEEL CONSTRUCTION... 4.2.2.6. FOR COPPER TUBING PROVIDE COPPER COATED HANGERS... 4.2.2.7. ATTACH HANGER RODS, TO BUILDING STRUCTURE... 4.2.3. HANGER SPACING: 4.2.3.1. FOR HORIZONTAL RUNS OF PLUMBING AND DRAINAGE PIPING... 4.2.4. FOR HORIZONTAL RUNS OF COPPER TUBING FOR SERVICES OTHER THAN PLUMBING... 4.2.5. FOR HORIZONTAL RUNS OF PIPING FABRICATED OF PVC FOR SERVICES OTHER THAN PLUMBING... 4.2.6. IN A HORIZONTAL RUN, PEX TUBING SHALL BE SUPPORTED AT INTERVALS NOT EXCEEDING 800 MM (32"), UNLESS OTHERWISE SPECIFIED... 4.3. MATERIALS OF CONSTRUCTION: 4.3.1. SANITARY AND INDIRECT DRAIN (INCLUDING VENTING): 4.3.1.1. REFERENCE STANDARDS: 4.3.1.1.1. CAST IRON: TO CSA B70, MECHANICAL FITTINGS TO CSA B602... 4.3.1.1.2. COPPER: DWV, HARD DRAINAGE COPPER DRAINAGE TUBE... 4.3.1.1.3. PVC: DWV: TO CAN/CSA-B182.1 OR B182.2... 4.3.1.1.4. PVC SYSTEM 15: TO CSA B182.2... 4.3.1.1.5. PVC XFR: TO CSA B182.2... 4.3.1.2. APPLICATION: 4.3.1.2.1. BURRED SECTIONS WITHIN BUILDING AREA AND TO 1.5M (5'-0") OUTSIDE BUILDING... 4.3.1.2.2. ABOVE GRADE: 4.3.1.2.2.1. PIPING 75 MM (3") AND SMALLER: DWV COPPER... 4.3.1.2.2.2. PIPING 100 MM (4") AND LARGER: CAST IRON... 4.3.1.2.2.3. PIPING 150 MM (6") AND SMALLER: PVC DWV... 4.3.2. REFERENCE STANDARDS: 4.3.2.1.1. ALL MATERIALS TO BE NSF/ANSI 61 & 372 CERTIFIED... 4.3.2.1.2. COPPER: 4.3.2.1.2.1. PIPING - SEAMLESS WATER TUBE TO ASTM B88... 4.3.2.1.2.2. FITTINGS: 4.3.2.1.2.2.1. SOLDER JOINT FITTINGS TO ASME B16.18 (CAST) OR B16.22 (WROUGHT) OR... 4.3.2.1.2.2.2. COLD PRESS FITTINGS WITH EPDM SEALING ELEMENT TO ASME B16.18 OR ASME B16.22... 4.3.2.1.3. PEX-A: 4.3.2.1.3.1. CROSSLINKED POLYETHYLENE PIPING TO CAN/CSA-B137.5... 4.3.2.2.1. ABOVE GROUND PIPING 75 MM (3") AND SMALLER: 4.3.2.2.1.1. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.1.2. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.1.3. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.1.4. ALL FITTINGS BY TUBING MANUFACTURER... 4.3.2.2.1.5. 25 YEAR SYSTEM WARRANTY... 4.3.2.2.2. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.1. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.2. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.3. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.4. ALL FITTINGS BY TUBING MANUFACTURER... 4.3.2.2.2.5. 25 YEAR SYSTEM WARRANTY... 4.3.2.2.2.6. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.7. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.8. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.9. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.10. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.11. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.12. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.13. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.14. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.15. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.16. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.17. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.18. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.19. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.20. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.21. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.22. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.23. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.24. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.25. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.26. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.27. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.28. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.29. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.30. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.31. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.32. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.33. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.34. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.35. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.36. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.37. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.38. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.39. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.40. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.41. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.42. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.43. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.44. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.45. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.46. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.47. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.48. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.49. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.50. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.51. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.52. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.53. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.54. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.55. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.56. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.57. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.58. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.59. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.60. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.61. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.62. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.63. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.64. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.65. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.66. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.67. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.68. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.69. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.70. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.71. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.72. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.73. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.74. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.75. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.76. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.77. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.78. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.79. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.80. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.81. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.82. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.83. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.84. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.85. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.86. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.87. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.88. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.89. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.90. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.91. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.92. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.93. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.94. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.95. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.96. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.97. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.98. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.99. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.100. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.101. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.102. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.103. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.104. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.105. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.106. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.107. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.108. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.109. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.110. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.111. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.112. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.113. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.114. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.115. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.116. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.117. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.118. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.119. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.120. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.121. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.122. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.123. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.124. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.125. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.126. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.127. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.128. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.129. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.130. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.131. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.132. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.133. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.134. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.135. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.136. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.137. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.138. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.139. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.140. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.141. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.142. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.143. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.144. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.145. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.146. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.147. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.148. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.149. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.150. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.151. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.152. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.153. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.154. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.155. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.156. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.157. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.158. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.159. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.160. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.161. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.162. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.163. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.164. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.165. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.166. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.167. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.168. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.169. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.170. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.171. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.172. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.173. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.174. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.175. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.176. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.177. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.178. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.179. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.180. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.181. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.182. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.183. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.184. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.185. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.186. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.187. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.188. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.189. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.190. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.191. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.192. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.193. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.194. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.195. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.196. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.197. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.198. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.199. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.200. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.201. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.202. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.203. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.204. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.205. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.206. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.207. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.208. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.209. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.210. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.211. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.212. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.213. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.214. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.215. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.216. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.217. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.218. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.219. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.220. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.221. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.222. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.223. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.224. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.225. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.226. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.227. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.228. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.229. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.230. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.231. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.232. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.233. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.234. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.235. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.236. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.237. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.238. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.239. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.240. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.241. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.242. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.243. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.244. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.245. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.246. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.247. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.248. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.249. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.250. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.251. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.252. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.253. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.254. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.255. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.256. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.257. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.258. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.259. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.260. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.261. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.262. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.263. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.264. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.265. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.266. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.267. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.268. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4.3.2.2.2.269. TYPE "L" HARD DRAWN COPPER TUBING... 4.3.2.2.2.270. PEX-A FOR 38 MM (1-1/2") AND SMALLER... 4

- 4.4.1.2. ABOVE FLOOR PIPING 50 MM (2") AND SMALLER:
 - 4.4.1.2.1. COPPER - TYPE "L" HARD DRAWN COPPER TUBING. TYPE "L" SOFT ANNEALED COPPER TUBING MAY BE USED WITHIN CONVECTOR ENCLOSURES. FITTINGS: WROUGHT COPPER SOLDER JOINT PRESSURE TYPE. WITH IPS TO COPPER ADAPTERS AT SCREWED CONNECTIONS.
 - 4.4.1.2.2. STEEL - SCHEDULE 40 WITH ASME B16.3 CLASS 150 THREADED OR COLD PRESS FITTINGS.
 - 4.4.1.2.3. PEX-A - WITH F1960 COLD-EXPANSION FITTINGS
 - 4.4.1.2.4. PVC (CONDENSER WATER ONLY) - SCHEDULE 40
- 4.4.1.3. ABOVE FLOOR PIPING, 63 MM (2-1/2") AND LARGER:
 - 4.4.1.3.1. STEEL - SCHEDULE 40 WITH RAISED FACE FLANGE OR GROOVED FITTINGS.
 - 4.4.1.3.2. PEX-A - WITH COMPRESSION FITTINGS UP TO 100 MM (4").
 - 4.4.1.3.3. PVC (CONDENSER WATER ONLY) - SCHEDULE 40
- 4.4.2. CLEANING:
 - 4.4.2.1. CLEAN ALL NEW HYDRONIC PIPING.
 - 4.4.2.2. FLUSH SYSTEMS TO REMOVE LOOSE DIRT.
 - 4.4.2.3. PROVIDE CLEANER TO ADEQUATELY CLEAN NEW SYSTEM PIPING. MIX CONCENTRATION IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND CIRCULATE FOR 24 TO 72 HOURS AT A TEMPERATURE BETWEEN 21-60°C (70-140°F).
 - 4.4.2.4. DRAIN SYSTEMS, REFILL WITH FRESH WATER AND CIRCULATE FOR MINIMUM OF 4 HOURS TO FLUSH OUT REMAINING CHEMICAL SOLUTION.
 - 4.4.2.5. REFILL SYSTEMS WITH CLEAN WATER AND INHIBITOR AS REQUIRED.
 - 4.4.2.6. INCLUDE SUPPLIER OF WATER TREATMENT SYSTEMS SUPERVISION AND ASSISTANCE DURING INSTALLATION FOR CLEAN OUT AND STARTUP PROCEDURES. PROVIDE ELECTRONIC VERSION OF WRITTEN REPORT TO CONSULTANT.
 - 4.4.2.6.1.
 - 4.4.2.6.2.
- 4.5. TESTING:
 - 4.5.1. WATER: HYDROSTATICALLY TEST WATER PIPING AT 862 KPA (125 PSIG) PRESSURE TO DETECT EXCESSIVE WATER LOSSES.
- 5. PLUMBING SYSTEM:
 - 5.1. REFERENCES STANDARDS:
 - 5.1.1. CONFORM TO ALL APPLICABLE CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING:
 - 5.1.1.1. CSA-B149.1: NATURAL GAS AND PROPANE INSTALLATION CODE
 - 5.2. VENTING: PLUMBING VENTING MAY NOT BE SHOWN ON DRAWINGS. PROVIDE A COMPLETE PLUMBING VENTING SYSTEM FOR ALL PLUMBING FIXTURES SHOWN, IN ACCORDANCE WITH OBC SECTION 7.5.
 - 5.3. STERILIZATION OF POTABLE (DOMESTIC) WATER SYSTEMS:
 - 5.3.1. FLUSH EACH SYSTEM, AFTER COMPLETION, BY ALLOWING FULL FLOW OF WATER THROUGH SYSTEM FOR A PERIOD OF FIFTEEN MINUTES, OR LONGER WHEN DIRECTED BY CONSULTANT.
 - 5.3.2. AFTER FLUSHING 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-451. AFTER STERILIZATION PERIOD HAS ELAPSED, FLUSH SYSTEM TO REDUCE CHLORINE CONTENT TO AN ACCEPTABLE LEVEL.
 - 5.4. PLUMBING FIXTURES:
 - 5.4.1. PROVIDE CSA COMPLIANT PLUMBING FIXTURES.
 - 5.4.2. PROVIDE PLUMBING FIXTURES AS INDICATED IN SCHEDULE ON DRAWINGS.
 - 5.4.3. CAULK ALL AROUND BASES OF MOP SERVICE SINKS, BUILT-IN BATHTUBS, AND OTHER BUILT-IN FIXTURES.
 - 5.5. VALVES:
 - 5.5.1. SUBMIT SHOP DRAWINGS FOR ALL VALVES.
 - 5.5.2. POTABLE (DOMESTIC) WATER:
 - 5.5.2.1. REFERENCE STANDARDS:
 - 5.5.2.1.1. LEAD FREE, 0.25% CONTENT PER NSF-61/372
 - 5.5.2.1.2. BRONZE TO ASTM C895/30
 - 5.5.2.1.3. BRASS TO ASTM C467/50
 - 5.5.2.1.4. CAST IRON TO ASTM A126
 - 5.5.2.1.5. STAINLESS STEEL TO ASTM A351
 - 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
 - 5.6. PLUMBING SPECIALTIES:
 - 5.6.1. GREASE INTERCEPTOR: EPOXY COATED STEEL WITH GASKETED STEEL SKID PROOF COVER SECURED WITH STAINLESS STEEL HARDWARE. REMOVABLE Baffle ASSEMBLY, DEEP SEAL TRAP WITH CLEANOUT. EXTERNAL CAST IRON FLOW CONTROL FITTING, AND NO HUB CONNECTIONS. PROVIDE SEDIMENT BUCKET.
- 6. HYDRONICS (HEATING, COOLING, CONDENSER WATER) SYSTEM:
 - 6.1. THE SYSTEMS SHALL CONFORM TO ALL APPLICABLE CODES INCLUDING, BUT NOT LIMITED TO, CSA-B214.
 - 6.2. VALVES:
 - 6.2.1. REFERENCE STANDARDS:
 - 6.2.1.1. BRONZE: TO ASTM B62.
 - 6.2.1.2. BRASS: TO ASTM B283.
 - 6.2.1.3. CAST IRON: TO ASTM A126
 - 6.2.1.4. STAINLESS STEEL: TO ASTM A351.
 - 6.2.2. GENERAL: PROVIDE SAME MANUFACTURER THROUGHOUT WITH PRESSURE RATING MARKED PER MSS-SP-25. ALL VALVES TO HAVE VALID CRN REGISTRATION NO. ISSUED BY RESPECTIVE PROVINCE. SUBMIT SHOP DRAWINGS FOR ALL VALVES.
 - 6.2.3. VALVES, 63MM (2-1/2") AND LARGER:
 - 6.2.3.1. ISOLATION: LUG STYLE CAST OR DUCTILE IRON BODY, 1,380 KPA (150 PSI) 200 WOG RATING, ALUMINUM BRONZE DISC, EPDM, STAINLESS STEEL STEM, LOCKING LEVER HANDLE WITH INSULATION STEM EXTENSION UP TO 150 MM (6") MANUAL GEAR OPERATOR WITH INSULATION STEM EXTENSION 200MM (8") AND LARGER. DEAD END SERVICE - BUBBLE TIGHT SHUT-OFF TO 200 PSI.
 - 6.2.3.2. CHECK WAFFER: CAST IRON BODY, STAINLESS STEEL TRIM & SEAT, VITON A SEAT RING, CLASS 125, 200 WOG RATING.
 - 6.2.3.3. CHECK AT PUMP DISCHARGE: SILENT, CAST IRON BODY, STAINLESS STEEL TRIM & SEAT, SPRING LOAD CENTRE GUIDED DISC, CLASS 125, 200 WOG RATING.
 - 6.3. PUMPS:
 - 6.3.1. SEE SCHEDULE ON DRAWINGS FOR SERIES, CAPACITIES, AND DETAILS.
 - 6.3.2. STARTERS AND ELECTRICAL WIRING BY ELECTRICAL TRADE.
 - 6.3.3. INLINE:
 - 6.3.3.1. CLOSE-COUPLED, SINGLE STAGE, CENTRIFUGAL PUMPS DESIGNED FOR INSTALLATION IN A VERTICAL OR HORIZONTAL POSITION, OPERATING TO 1,207 KPA (175 PSIG) MAXIMUM WORKING PRESSURE AND 225°F (107°C) MAXIMUM OPERATING TEMPERATURE.
 - 6.3.3.2. PUMP VOLUTE SHALL BE CAST IRON AND IMPELLER SHALL BE BRONZE/BRASS.
- 7. MECHANICAL EQUIPMENT:
 - 7.1. EXHAUST FANS:
 - 7.1.1. DOWNBLAST: CENTRIFUGAL DIRECT DRIVE EXHAUST FAN WITH SPUN ALUMINUM HOUSING, 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 SCHEDULES.
- 8. AIR DISTRIBUTION SYSTEM:
 - 8.1. DUCTWORK:
 - 8.1.1. GENERAL:
 - 8.1.1.1. PROVIDE DUCTWORK CONSTRUCTED TO SMACNA 250 PA (1" W.G.) PRESSURE CLASSIFICATION & SEAL CLASS A. FOLLOW ALL OF THE LATEST SMACNA REQUIREMENTS.
 - 8.1.1.2. SEAL ALL DUCT JOINTS AND CONNECTIONS TO DIFFUSERS AND EQUIPMENT WITH HIGH VELOCITY WATER BASED DUCT SEALER.
 - 8.1.1.3. CONTINUOUSLY SOLDER OR SEAL JOINTS IN EXTERIOR AIR INTAKE DUCTS AND PLENUMS TO PREVENT DRIPPING OF MOISTURE.
 - 8.1.2. DUCT CLEANING:
 - 8.1.2.1. ALL EXISTING EXHAUST DUCTS SHALL BE THOROUGHLY CLEANED AND SANITIZED. CLEAN DUCT SYSTEMS WITH HIGH POWER VACUUM MACHINES. PROTECT EQUIPMENT WHICH MAY BE HARMED BY EXCESSIVE DIRT WITH FILTERS, OR BYPASS DURING CLEANING.
 - 8.1.2.2. PROVIDE ACCESS OPENINGS AS NECESSARY. RESEAL WITH METAL PLATES NO LESS THAN 20 GA., SECURED WITH SHEET METAL SCREWS AND DUCT TAPE.
 - 8.1.2.3. ALL PORTIONS OF THE DUCT SYSTEM AND ALL EQUIPMENT WITHIN THE DUCT SYSTEMS AND UNITS SHALL FIRST BE BRUSH CLEANED, THEN VACUUM CLEANED.
 - 8.1.2.4. 10.1.1.4. CONTRACTOR SHALL COVER WITH DROP CLOTHS, ALL FURNITURE AND MACHINERY LOCATED UNDER OR ADJACENT TO WORK AREA. AT THE COMPLETION OF WORK IN THIS AREA, THIS CONTRACTOR SHALL CLEAN UP ALL DEBRIS AND DUST RESULTING FROM HIS WORK.
- 9. CONTROL SYSTEM:
 - 9.1. INSTALL CONTROLS SUPPLIED WITH EQUIPMENT UNLESS NOTED OTHERWISE.
 - 9.2. ELECTRICAL:
 - 9.2.1. PROVIDE POWER BOTH HIGH >120V AND LOW <120 VOLTAGE REQUIRED FOR THIS SECTION.
 - 9.2.2. ELECTRICAL INTERLOCK WIRING OF EQUIPMENT SPECIFIED UNDER OTHER SECTIONS OF THIS DIVISION IS THE RESPONSIBILITY OF TRADE SECTION INSTALLING THAT EQUIPMENT, UNLESS INDICATED OTHERWISE.
 - 9.2.3. SUPPLY AND INSTALL ELECTRICAL WIRING INCLUDING RACEWAYS FOR COMPONENTS FURNISHED UNDER THIS SECTION. INSTALL WIRING IN ACCORDANCE WITH GOVERNING ELECTRICAL CODE.
 - 9.3. QUALIFICATIONS:
 - 9.3.1. MINIMUM OF 5 YEARS EXPERIENCE INSTALLING SIMILAR SYSTEMS INVOLVING COMPUTER BASED CONTROL SYSTEMS AND BE LICENSED REPRESENTATIVE, AFFILIATE, OR OPERATING DIVISION OF CONTROLS MANUFACTURER, WHOLESALERS OR FRANCHISED DEALER/REPRESENTATIVES ARE NOT ACCEPTABLE. USE INSTALLATION PERSONNEL THAT ARE TRAINED AND CERTIFIED AS QUALIFIED BY CONTROLS MANUFACTURER.
 - 9.3.2. UPON COMPLETION OF INSTALLATION, VERIFY BY TEST AND WRITTEN REPORT, THAT SYSTEM IS FULLY FUNCTIONAL, INSTALLED IN ACCORDANCE WITH PLANS AND SPECIFICATIONS AND CALIBRATED WITHIN OPERATIONAL LIMITS SPECIFIED.
 - 9.4. WARRANTY: PROVIDE LABOUR, MATERIAL AND EQUIPMENT NECESSARY TO MAINTAIN BENEFICIAL PERFORMANCE OF ENTIRE BUILDING AUTOMATION SYSTEM FOR PERIOD OF 2 YEARS AFTER ACCEPTANCE OF SYSTEM, OR PARTS THEREOF.
 - 9.5. SEQUENCE OF OPERATIONS: PROVIDE NECESSARY CONTROL DEVICES AND APPLICATION SOFTWARE TO CARRY OUT DESCRIBED SEQUENCES OF OPERATION. SEE DRAWINGS FOR SPECIFIED SEQUENCE OF OPERATIONS.
 - 9.6. SHOP DRAWINGS:
 - 9.6.1. PREPARE AND SUBMIT SHOP DRAWINGS FOR EQUIPMENT AND SYSTEMS COVERED BY THIS SECTION. AS MINIMUM INCLUDE FOLLOWING:
 - 9.6.1.1. COMPLETE CATALOGUE DATA AND INSTALLATION INSTRUCTIONS FOR EACH CONTROL COMPONENT.
 - 9.6.1.2. VALVE SCHEDULE WITH PIPE SIZES, FLOW RATES, DESIGN AND ACTUAL PRESSURE DROPS.
 - 9.6.1.3. SEQUENCE OF OPERATION DIAGRAMS AND DESCRIPTIVE PROSE.
 - 9.6.1.4. PROJECT TEST PLAN, INDICATING HOW SYSTEM WILL BE TESTED AND FOUND TO BE OPERATING IN ACCORDANCE WITH PLANS AND SPECIFICATION.
 - 9.6.2. PROVIDE COMPLETE AND APPROVED AS-BUILT SHOP DRAWINGS DETAILING EQUIPMENT AND INSTALLATION.
 - 9.7. EQUIPMENT:
 - 9.7.1. IDENTIFICATION OF EQUIPMENT:
 - 9.7.1.1. IDENTIFY EACH PIECE OF EQUIPMENT WITH NAMEPLATE IDENTIFYING EQUIPMENT AND FUNCTIONS WITH LETTER AND NUMBER DESIGNATION.
 - 9.7.1.2. USE LAMINATED PLASTIC NAMEPLATES OF AT LEAST 75 MM X 25 MM X 3 MM (3" X 1" X 1/8") WITH BLACK FACE AND WHITE CENTRE AND 6 MM (1/4") HIGH ENGRAVED LETTERING. SECURELY ATTACH TO EQUIPMENT.
 - 9.7.2. AUTOMATIC CONTROL VALVES:
 - 9.7.2.1. CHARACTERISTICS OF CONTROL VALVES SHALL BE SUITED TO REQUIRED APPLICATION. SIZE AND SELECT VALVES.
 - 9.7.2.2. MAXIMUM ALLOWABLE PRESSURE DROPS:
 - 9.7.2.3. -HOT WATER COIL VALVES - 21 KPA (3 PSIG)
 - 9.7.2.4. VALVE TYPE:
 - 9.7.2.5. -VALVES 2-1/2" AND LARGER - FLANGED BODIES



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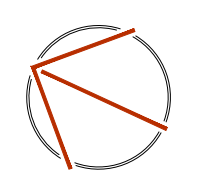
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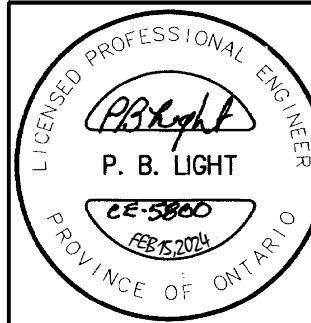
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00	CLIENT REVIEW	24.01.26
01	TENDER	24.02.15

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REGISTERED PROFESSIONAL ENGINEER
PROVINCE OF ONTARIO

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DRAWING TITLE

MECHANICAL -
SPECIFICATIONS CONT'D

DRAWING NUMBER

M7 OF 7