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DRAWINGS RE- ISSUED FOR TENDER & TENDER
PROJECT NUMBER : 1024011
AUGUST 2025

LIST OF DRAWINGS :

MECHANICAL DRAWING LIST

SR NO.	DWG NO.	DESCRIPTION
1	M-100	MECHANICAL SERVICES - LEGEND AND SPECIFICATIONS
2	M-300	MECHANICAL SERVICES - HVAC DEMOLITION & NEW WORK - LAUNDRY ROOM
3	M-301	MECHANICAL SERVICES - VENTILATION SYSTEM LAYOUT - FLOOR PLAN
4	M-700	MECHANICAL SERVICES - STANDARD DETAILS

ELECTRICAL DRAWING LIST

SR NO.	DWG NO.	DESCRIPTION
1	E-001	ELECTRICAL SERVICES - LEGEND AND SPECIFICATIONS
2	E-002	ELECTRICAL SERVICES - MECHANICAL EQUIPMENT WIRING SCHEDULE
3	E-003	ELECTRICAL SERVICES - KEY PLAN
4	E-004	ELECTRICAL SERVICES - ELECTRICAL POWER - DEMOLITION/NEW WORK
5	E-005	ELECTRICAL SERVICES - ELECTRICAL POWER - DEMOLITION/NEW WORK

STRUCTURAL DRAWING LIST

SR NO.	DWG NO.	DESCRIPTION
1	S-01	STRUCTURAL SERVICES - GENERAL NOTES AND SPECIFICATIONS
2	S-02	STRUCTURAL SERVICES - GENERAL NOTES AND SPECIFICATIONS - KEY PLAN AND DETAILS

GENERAL NOTES

1. SPECIFICATIONS AND STANDARD DRAWINGS OF LOCAL AUTHORITIES HAVING JURISDICTION SHALL BE READ IN CONJUNCTION WITH AND FORM PART OF THIS CONTRACT. MAXIMUM CONDITIONS WILL GOVERN.
2. SPECIFICATIONS ARE INTEGRAL PART OF ACCOMPANYING DRAWINGS. ANY ITEM OMITTED FROM ONE OR OTHER, BUT WHICH IS MENTIONED OR REASONABLY IMPLIED SHALL BE CONSIDERED AS PROPERLY AND SUFFICIENTLY SPECIFIED.
3. PROVIDE ALL WORK AS INDICATED AND SPECIFIED HEREIN. INCLUDE SYSTEM COMPONENTS AND ACCESSORIES NOT INDICATED ON DRAWINGS OR STIPULATED HEREIN BUT REQUIRED TO ENSURE FULLY OPERATIONAL SYSTEMS.
4. ALL WORK AND EQUIPMENT SHALL BE IN CONFORMANCE WITH ASHRAE 90.1.
5. CONFER AND CO-OPERATE WITH ALL TRADES INSTALLING EQUIPMENT WHICH MAY AFFECT THE MECHANICAL WORK AND ARRANGE THE WORK IN PROPER RELATION WITH EQUIPMENT INSTALLED UNDER ALL DIVISIONS OF THE CONTRACT FOR THE SATISFACTORY COMPLETION OF THE JOB. IDENTIFY AND RESOLVE SITE INTERFERENCES PRIOR TO FABRICATION AND INSTALLATION OF EQUIPMENT. CO-ORDINATE INSTALLATION WITH OWNER'S INTERIOR DESIGN PLANS AND REFLECTED CEILING PLANS.
6. "WORK" MEANS ALL PERMITS, EQUIPMENT, MATERIALS, LABOUR, START-UP AND TESTING TO PROVIDE A COMPLETE MECHANICAL INSTALLATION AS REQUIRED.
7. "PROVIDE" MEANS SUPPLY AND INSTALL. WHERE USED IN REFERENCE TO SERVICES SUCH AS TESTING, START-UP AND COMMISSIONING, IT MEANS PROCURE, SUPERVISE, TAKE RESPONSIBILITY AND PAY FOR THESE SERVICES.
8. "SUPPLY" MEANS FURNISH TO SITE IN LOCATION REQUIRED OR DIRECTED COMPLETE WITH ACCESSORY PARTS.
9. "INSTALL" MEANS MOUNT, SECURE IN PLACE AND CONNECT FOR OPERATION AS REQUIRED OR DIRECTED.
10. "CONCEALED" MEANS NOT VISIBLE ON COMPLETION.
11. "EXPOSED" MEANS VISIBLE ON COMPLETION.
12. "AUTHORITIES HAVING JURISDICTION" MEANS ANY AND ALL CURRENT LAWS AND/OR BY-LAWS OF ANY AUTHORIZED AGENCY HAVING OR CLAIMING JURISDICTION OVER SUM TOTAL OR PARTS OF WORK.
13. APPLY FOR, OBTAIN AND PAY FOR ALL PERMITS AND INSPECTIONS REQUIRED. INCLUDE ALL H.S.T.
14. COMPLY WITH ALL GOVERNMENT, MUNICIPAL, PROVINCIAL, FEDERAL AND UNDERWRITER'S REGULATIONS AND LOCAL BY-LAWS. CARRY OUT ALL CHANGES REQUIRED BY INSPECTORS OR AUTHORITIES HAVING JURISDICTION WITHOUT EXTRA EXPENSE TO THE OWNER. PREPARE AND FURNISH ANY ADDITIONAL DRAWINGS, DETAILS OR INFORMATION AS MAY BE REQUIRED. NOTIFY CONSULTANT OF CHANGES REQUIRED PRIOR TO MAKING CHANGES.
15. FURNISH NECESSARY CERTIFICATES AS EVIDENCE THAT WORK INSTALLED CONFORMS WITH LAWS AND REGULATIONS OF AUTHORITIES HAVING JURISDICTION.
16. ALL ELECTRICAL ITEMS SHALL BE CSA APPROVED OR BEAR A STAMP TO INDICATE SPECIAL ELECTRICAL SAFETY AUTHORITY APPROVAL.
17. PRIOR TO TENDER SUBMISSION VISIT AND EXAMINE THE SITE AND PLANS, BECOME FAMILIAR WITH ALL FEATURES WHICH AFFECT THE WORK, VERIFY ALL CONDITIONS AND DIMENSIONS, AND ALLOW FOR ANY RE-ROUTING OF INSTALLED SERVICES AND EQUIPMENT IN TENDER PRICE. FAILURE TO DO SO SHALL NOT RELIEVE THE CONTRACTOR FROM RESPONSIBILITY. NO EXTRAS WILL BE ALLOWED FOR ANY DIFFICULTIES ENCOUNTERED DUE TO ANY FEATURES OF THE BUILDING OR THE SITE OR THE ADJACENT PROPERTIES WHICH EXISTED UP TO THE TIME OF TENDER.
18. REPORT TO THE ENGINEER ALL AMBIGUITIES, DISCREPANCIES, OMISSIONS, ERRORS AND DEPARTURES FROM BUILDING BYLAWS AND/OR FROM GOOD PRACTICE PRIOR TO TENDER CLOSING.
19. IN CASE OF APPARENT CONTRADICTION OR AMBIGUITY IN TENDER DOCUMENTS, OR WHERE THERE ARE APPARENT DISCREPANCIES IN OR OMISSIONS FROM DOCUMENTS, OR IF THERE IS ANY DOUBT AS TO INTENT OF DOCUMENTS, REQUEST AND OBTAIN WRITTEN CLARIFICATION FROM CONSULTANT PRIOR TO SUBMITTING YOUR TENDER. CONSIDERATIONS WILL NOT BE GRANTED FOR MISUNDERSTANDING OF INTENT OF DOCUMENTS OR EXTENT OF WORK TO BE PERFORMED.
20. PROVIDE A COMPLETE BREAKDOWN OF MATERIALS, EQUIPMENT AND LABOUR COSTS WITH EACH SUBMISSION FOR EXTRA OR DELETED WORK. FAILURE TO DO SO WILL RESULT IN BACKCHARGES FOR ADDITIONAL CONSULTING SERVICES TO PROCESS SUCH CLAIMS.
21. PROVIDE PROPER SHOP DRAWINGS OF ALL SPECIFIED PRODUCTS AND SUBMIT FOR REVIEW TO THE ARCHITECT AND ENGINEER. SUBMIT SHOP DRAWINGS IN ELECTRONIC 'PDF' FILE FORMAT. SHOP DRAWINGS ARE TO INDICATE PROJECT SPECIFIC TECHNICAL DATA. CLEARLY MARK ITEMS BEING SUPPLIED, NORMAL AND OPTIONAL ACCESSORIES. DO NO SUBMIT SALES LITERATURE.
22. REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMITTAL AND CLEARLY CERTIFY AS 'CORRECT FOR REVIEW BY CONSULTANT'. SHOW COMPANY NAME, DATE AND SIGN ALL SHOP DRAWINGS.
23. REVIEW OF SHOP DRAWINGS BY THE ENGINEER IS FOR THE SOLE PURPOSE OF ASCERTAINING CONFORMANCE WITH GENERAL DESIGN CONCEPT. REVIEW DOES NOT MEAN THAT CONSULTANT APPROVES DETAIL DESIGN INHERENT IN SHOP DRAWINGS, RESPONSIBILITY FOR WHICH REMAINS WITH THE CONTRACTOR SUBMITTING SAME, AND SUCH REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR ERRORS OR OMISSIONS CONTAINED IN SHOP DRAWINGS OR OF THE RESPONSIBILITY FOR MEETING ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL DIMENSIONS AT JOB SITE, FOR INFORMATION PERTAINING SOLELY TO FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION AND INSTALLATION, AND FOR CO-ORDINATION WITH RELATED TRADES.
24. THE MECHANICAL CONTRACTOR IS TO CIRCULATE REVIEWED AND STAMPED SHOP DRAWINGS TO THE ELECTRICAL AND STRUCTURAL ENGINEERS AND CONTRACTORS FOR REVIEW PRIOR TO ORDERING ANY EQUIPMENT. REPORT ANY DISCREPANCIES TO THE ENGINEER.
25. MATERIALS AND EQUIPMENT ARE SPECIFICALLY DESCRIBED FOR PURPOSE OF INDICATING STANDARDS OF QUALITY AND WORKMANSHIP. BASE TENDER PRICE ON MATERIALS AND EQUIPMENT SPECIFIED OR NAMED AS ACCEPTABLE ALTERNATE. IF ACCEPTABLE ALTERNATE PRODUCT IS PROPOSED, INDICATE REASON FOR CHANGE, SHOW SAVINGS AND CLEARLY INDICATE ALL AREAS WHERE ALTERNATE PRODUCT DOES NOT MEET SPECIFIED PRODUCT. IF ACCEPTABLE ALTERNATE MANUFACTURERS ARE NOT LISTED, BASE THE TENDER PRICE ON THE PRODUCT SPECIFIED.
26. DESIGN IS BASED ON DIMENSIONS AND PHYSICAL CONFIGURATION OF MANUFACTURER'S EQUIPMENT SPECIFIED. ASSUME FULL RESPONSIBILITY FOR ENSURING THAT PRODUCTS SUPPLIED BY AN ALTERNATE MANUFACTURER ARE EQUIVALENT IN PERFORMANCE AND OPERATING CHARACTERISTICS TO THE SPECIFIED PRODUCT. ASSUME FULL RESPONSIBILITY FOR ENSURING THAT THE SAME ACCESS AND MAINTENANCE SPACE IS ACHIEVED WHERE ALTERNATE PRODUCT IS PROVIDED.
27. ALTERNATE PRODUCTS/EQUIPMENT MAY BE PROPOSED PRIOR TO PROGRESS OF WORK PROVIDING THE QUALITY AND PERFORMANCE CHARACTERISTICS ARE EQUAL TO THE SPECIFIED PRODUCTS, AND SUBJECT TO THE APPROVAL OF THE PROPERLY SUBMITTED SHOP DRAWINGS TO THE ARCHITECT AND ENGINEER.
28. DURING PROGRESS OF WORK, SUBSTITUTE PRODUCTS/EQUIPMENT WILL ONLY BE CONSIDERED WHEN TENDERED PRODUCTS BECOME UNOBTAINABLE AND WRITTEN PROOF IS SUBMITTED.
29. ASSUME RESPONSIBILITY AND PAY FOR ANY ADDITIONAL INSTALLATION COSTS INCURRED BY ALL DIVISIONS RESULTING FROM THE ALTERNATES AND/OR SUBSTITUTIONS. MAKE REVISIONS TO RECORD DRAWINGS INCORPORATING ALL ALTERNATES AND/OR SUBSTITUTIONS AND ALL RELATED CHANGES.
30. CONTRACTOR WILL PAY TO THE ARCHITECT AND ENGINEERS FOR THEIR TIME SPENT FOR REVIEW OF ALTERNATE EQUIPMENT EVEN IF SUCH EQUIPMENT IS NOT ACCEPTABLE.
31. WHERE MATERIALS AND EQUIPMENT ARE SUPPLIED BY OTHERS FOR INSTALLATION BY THIS CONTRACTOR, RECEIVE, UNLOAD, HANDLE, STORE, AND PROTECT MATERIALS AND EQUIPMENT UNTIL READY FOR ACTUAL INSTALLATION. UPON RECEIPT OF MATERIALS CHECK THE ENTIRE SHIPMENT AND PROMPTLY ADVISE THE CONSULTANT IN WRITING OF ANY DAMAGE AND/OR MISSING COMPONENTS. ANY MATERIAL WHICH IS SUBSEQUENTLY LOST OR DAMAGED DUE TO THIS CONTRACTOR'S NEGLIGENCE IS TO BE PROMPTLY REPLACED OR REPAIRED TO THE CONSULTANT'S SATISFACTION AT NO ADDITIONAL COST. INCLUDE FOR ONE YEAR WARRANTY ON RELATED LABOUR.
32. DRAWINGS INDICATE DESIGN INTENT ONLY AND ARE TO BE CONSIDERED DIAGRAMMATIC INTENDED TO CONVEY SCOPE OF WORK AND INDICATE GENERAL ARRANGEMENT AND APPROXIMATE LOCATIONS OF EQUIPMENT AND ROUTES OF PIPES AND DUCTS. DRAWINGS DO NOT SHOW ARCHITECTURAL AND STRUCTURAL DETAILS.
33. DO NOT SCALE DRAWINGS. OBTAIN INFORMATION INVOLVING ACCURATE MEASUREMENTS OF BUILDING FROM ARCHITECTURAL AND STRUCTURAL DRAWINGS OR AT THE SITE. MAKE NECESSARY CHANGES TO ACCOMMODATE STRUCTURAL CONDITIONS WITHOUT ADDITIONAL CHARGE.
34. CONTRACTOR IS TO PREPARE A SCHEDULE OF VALUES AND SUBMIT TO CONSULTANT TEAM FOR REVIEW AND ADJUSTMENT PRIOR TO FIRST APPLICATION FOR PAYMENT. SCHEDULE OF VALUES MUST INCLUDE, AMONG OTHER ITEMS, VALUE ASSIGNED TO CLOSE-OUT DOCUMENTS (AS-BUILT DRAWINGS, WARRANTIES, MAINTENANCE MANUALS, ETC...). THE AGREED UPON SCHEDULE OF VALUES WILL FORM THE BASIS FOR FACTORING PERCENTAGE OF WORK COMPLETED INTO CERTIFICATES FOR PAYMENT.

GENERAL NOTES

35. PROVIDE THE OWNER WITH A WRITTEN WARRANTY, FOR ALL LABOUR, MATERIALS AND EQUIPMENT IN THIS CONTRACT, FOR A PERIOD OF ONE YEAR COMMENCING AT SUCH TIME THAT THE OWNER, OR HIS REPRESENTATIVE, DEEMS THE WORK ACCEPTABLE.
36. PROVIDE ALL ITEMS, ARTICLES, MATERIALS, OPERATIONS OR METHODS LISTED, MENTIONED OR SCHEDULED ON THE DRAWINGS AND/OR HEREIN SPECIFIED, INCLUDING ALL LABOUR, MATERIALS, EQUIPMENT, AND INCIDENTALS NECESSARY AND REQUIRED FOR THEIR COMPLETION (CURBS, MOUNTINGS, SUPPORTS, ETC.).
37. UNLESS NOTED OTHERWISE, PROVIDE NEW MATERIALS AND EQUIPMENT MANUFACTURED TO REFERENCE STANDARDS AND AS SCHEDULED.
38. EXISTING SERVICES SHALL BE FIELD CHECKED BEFORE WORK COMMENCEMENT INCLUDING LOCATION, SIZE AND ELEVATION OF RELEVANT PIPING, VALVES, MANHOLES, ETC. ALSO PROPOSED ELEVATIONS SHALL BE VERIFIED FOR FLOOR DRAINS, CATCH BASINS, GRADE AND MANHOLES TOP ELEVATIONS.
39. CONSERVE HEADROOM AND MAINTAIN SERVICE SPACE AROUND SERVICEABLE EQUIPMENT AS PER MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
40. BEAR THE COST OF CLEAN-UP, (FLOORS, WALLS, CEILINGS ETC.), CUTTING, PATCHING AND FLASHING OF BUILDING STRUCTURE AND ROOF. EMPLOY THE OWNER'S GENERAL CONTRACTOR TO DO THE WORK. INFORM THE ENGINEER PRIOR TO PROCEEDING.
41. ENSURE THAT THE LABOUR UNION AFFILIATION IS COMPATIBLE WITH THAT OF THE OWNER'S GENERAL CONTRACTOR.
42. ALL ELECTRICAL DISCONNECT SWITCHES AND ALL MANUAL OR AUTOMATIC STARTERS FOR MECHANICAL EQUIPMENT SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR.
43. ALL LINE SIDE POWER WIRING SHALL BE BY THE ELECTRICAL CONTRACTOR AND SHALL BE TERMINATED AT A JUNCTION BOX ADJACENT TO THE EQUIPMENT OR AT THE STARTER OR AT THE DISCONNECT SWITCH OR AT THE PACKAGED EQUIPMENT CONTROL PANEL, AS INDICATED ON MECHANICAL AND/OR ELECTRICAL DRAWINGS. WHEN A JUNCTION BOX IS PROVIDED BY DIV-16 (REFER TO ELECTRICAL DRAWINGS), DIV-15 SHALL PROVIDE CONNECTION BETWEEN EQUIPMENT AND JUNCTION BOX. ALL LOAD SIDE AND CONTROLS WIRING SHALL BE BY THE MECHANICAL CONTRACTOR.
44. PROVIDE WHERE SHOWN AND/OR REQUIRED BY SITE CONDITIONS, ALL ACCESS DOORS COMPATIBLE WITH CEILING/WALL TYPES AND FINISHES. MARK IN AN APPROVED MANNER, T-BAR CEILING TILES WHICH ARE USED FOR ACCESS. PROVIDE MILCOR, LEHAGE OR APPROVED EQUAL, ACCESS DOORS. PROVIDE MINIMUM SIZE OF CEILING ACCESS OF A 4 SQUARE FEET.
45. THIS CONTRACTOR SHALL COMPLY WITH LANDLORD'S GENERAL REQUIREMENTS FOR WORK TO BASE BUILDING SYSTEMS.
46. INCLUDE FOR PREMIUM TIME FOR WORK REQUIRED OUTSIDE OF NORMAL BUSINESS HOURS.
47. PROVIDE FIRE STOP FOR ALL PENETRATIONS THROUGH RATED PARTIONS AND SLABS. FIRE STOP MATERIAL SHALL BE ULC APPROVED AND CONFORM TO BASE BUILDING STANDARDS.
48. THIS CONTRACTOR SHALL PROVIDE THE LANDLORD WRITTEN NOTICE 48 HOURS PRIOR TO REQUIRED ACCESS TO RESTRICTED AREAS OR OTHER TENANT SPACES.
49. CHANGE NOTICE QUOTATIONS SHALL BE SUBMITTED COMPLETE WITH COST BREAKDOWN OF LABOR AND MATERIALS. FAILURE TO PROVIDE WILL RESULT IN REJECTION. ALL MECHANICAL CHANGE NOTICES SHALL BE PRICED IN ACCORDANCE WITH "MECHANICAL CONTRACTORS ASSOCIATION" (MCA). LABOR UNITS STRICTLY FOR LABOR AND FOR MATERIAL COST USE "ALL PRICER" LESS DISCOUNT, TYPICALLY 20% - 30%.
50. PROTECT ALL MECHANICAL WORK FROM DAMAGE INCLUDING THAT CAUSED BY WEATHER. KEEP ALL EQUIPMENT DRY AND CLEAN AT ALL TIMES. COVER OPENINGS IN EQUIPMENT, PIPES AND DUCTS WITH CAPS OR HEAVY GAUGE PLASTIC SHEETING UNTIL FINAL CONNECTIONS ARE MADE. REPAIR ANY DAMAGE CAUSED BY IMPROPER STORAGE, HANDLING OR INSTALLATION OF EQUIPMENT AND MATERIALS.
51. TEMPORARY FILTERS 25MM (1 IN.) SHALL BE PROVIDED AT ALL BASE BUILDING RETURN AIR OPENINGS WHICH REMAIN OPERATIONAL DURING CONSTRUCTION. FILTERS TO BE REPLACED WEEKLY. REMOVE UPON CONSTRUCTION COMPLETION.
52. BASE BUILDING HVAC COMPONENTS REMOVED I.E. LIGHT TROFFERS, DIFFUSERS VAV BOXES ETC. SHALL BE TURNED OVER TO THE LANDLORD/OWNER AT THEIR DIRECTIONS.
53. COMPLY WITH THE GENERAL CONTRACTORS CONSTRUCTION SCHEDULE.
54. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR PROVIDING, COORDINATING AND MAINTAINING ALL TEMPORARY SERVICES INCLUDING GAS, WATER, SPACE HEATING AND ELECTRICITY AS REQUIRED TO COMPLETE THE MECHANICAL CONSTRUCTION/INSTALLATION. DO NOT USE PERMANENT PLUMBING, HEATING, AIR CONDITIONING OR VENTILATION SYSTEMS FOR TEMPORARY SERVICES DURING CONSTRUCTION UNLESS WRITTEN PERMISSION IS PROVIDED BY THE ENGINEER.
55. STRUCTURAL REINFORCING: MECHANICAL CONTRACTOR SHALL PROVIDE ALL STRUCTURAL REINFORCING TO BUILDING STRUCTURE AS PER LOCAL BUILDING CODE. IT IS THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO HIRE A LICENSED PROFESSIONAL ENGINEER TO DESIGN ALL STRUCTURAL REINFORCING REQUIRED FOR NEW MECHANICAL EQUIPMENT ON ROOF OR SUSPENDED FROM BUILDING STRUCTURE. A BUILDING PERMIT MUST BE OBTAINED. SUBMIT FOR APPROVAL TO PROJECT COORDINATOR, LANDLORD AND MECHANICAL ENGINEER PRIOR TO CONSTRUCTION. STRUCTURAL REINFORCING DESIGN SHALL BEAR THE SEAL OF A PROFESSIONAL ENGINEER. UPON COMPLETION THE ENGINEER SHALL ISSUE A CERTIFICATION LETTER INDICATING THAT SUCH INSTALLATION IS CONSTRUCTED IN COMPLIANCE WITH LOCAL BUILDING CODE, AND ALL APPLICABLE REGULATIONS.
56. FOLLOWING COMPLETION OF ALL INSTALLATION WORK, BALANCING, TESTING AND COMMISSIONING THE MECHANICAL CONTRACTOR IS TO FULLY INSTRUCT THE OCCUPANT OR OWNER IN ALL ASPECTS OF THE OPERATION OF THE MECHANICAL SYSTEMS AND EQUIPMENT. THIS INCLUDES BUT NOT LIMITED TO THERMOSTAT PROGRAMMING, SUMP PUMP CONTROLS, TIME-CLOCKS ETC...
57. OFFSHORE MANUFACTURED PRODUCTS ARE NOT ACCEPTABLE UNLESS WRITTEN PERMISSION IS PROVIDED BY ENGINEER. THIS INCLUDES ALL PIPING, FITTINGS, VALVES, SHEET METAL, HANGERS, AND FASTENERS.

RECORD DRAWINGS

RECORD DRAWINGS

1. SUITABLY STORE AND PROTECT DRAWINGS ON SITE. IN A NEAT MANNER, MARK WITH RED PEN ALL REVISIONS TO DESIGN DRAWINGS AND MAKE AVAILABLE AT ALL TIMES FOR INSPECTION. TRANSFER ALL MODIFICATIONS FROM ORIGINAL DESIGN TO DIGITAL COPY USING AutoCAD SOFTWARE. UPON COMPLETION OF WORK SUBMIT A COMPLETE SET OF RECORD DRAWING PRINTS AND DIGITAL COPY OF RECORD DRAWINGS IN PDF AND DWG FORMAT TO ENGINEER AND BUILDING OWNER.
2. SHOW LOCATIONS OF ACCESS DOORS AND PANELS AND IDENTIFY THE EQUIPMENT AND COMPONENTS THAT THEY SERVE.

OPERATING AND MAINTENANCE MANUALS

1. SUBMIT ONE COPY FOR REVIEW AT LEAST TWO WEEKS BEFORE INSTRUCTIONS TO OWNER ARE COMMENCED.
2. SUBMIT 2(TWO) COPIES OF FINAL MANUALS TO THE ENGINEER.
3. ENSURE THAT THE TERMINOLOGY USED IN VARIOUS SECTIONS OF THE MANUAL IS CONSISTENT.
4. EACH MANUAL SHALL CONTAIN THE FOLLOWING INFORMATION:
5. DESCRIPTION OF EACH SYSTEM WITH DESCRIPTION OF EACH MAJOR COMPONENT OF SYSTEM
6. - COMPLETE SETS OF PAGE SIZE EQUIPMENT SHOP DRAWINGS
7. - EQUIPMENT MANUFACTURER'S INSTALLATION, STARTUP AND OPERATION MANUALS
8. - EQUIPMENT MANUFACTURER'S RECOMMENDED SPARE PARTS LISTS
9. - EQUIPMENT IDENTIFICATION LIST WITH SERIAL NUMBERS
10 - FINAL BALANCING REPORTS
11 - WARRANTY DOCUMENTATION
12 OPERATING AND MAINTENANCE MANUALS SHALL BE SUBMITTED AS A COMPLETE SINGLE PACKAGE IN A THREE RING BINDER AND PREPARED IN A PROFESSIONAL MANNER INCLUDING THE FOLLOWING:
13 - TABLE OF CONTENTS.
14 - NUMBERED SECTION TABS.
15 - PAGE NUMBERS.
16 - FRONT COVER WITH PROJECT DETAILS SUCH AS CLIENT NAME, PROJECT LOCATION AND CONTRACTOR CONTACT INFORMATION.
17 - INTRODUCTION SHEET.
18 - COPY OF EACH REVIEWED SHOP DRAWING.
19 - EQUIPMENT OPERATING AND MAINTENANCE MANUALS AS DESCRIBED ABOVE.
20 - START-UP AND VERIFICATION TEST REPORTS.
21 - AS-BUILT DRAWINGS AS DESCRIBED ABOVE.
22 - AIR AND WATER BALANCING REPORTS.
23 - WARRANTY DOCUMENTATION.

HVAC SYSTEM

1. FABRICATE DUCTWORK FROM GALVANIZED SHEET METAL UNLESS OTHER MATERIALS ARE SPECIFICALLY NAMED. CONFORM TO FABRICATION AND INSTALLATION STANDARDS DESCRIBED IN THE LATEST EDITION OF ASHRAE AND SMACNA RECOMMENDATIONS.
2. A. DUCTWORK SHALL BE SMOOTH ON THE INSIDE AND FREE FROM OBSTRUCTIONS, VIBRATIONS AND RATTLE.
   B. DAMPERS SHALL BE FREE TO MOVE IN EITHER DIRECTION WITHOUT BINDING AND SHALL NOT RATTLE. DAMPERS SHALL BE CONSTRUCTED FROM 18GA GALVANIZED SHEET METAL. USE MANUAL QUADRANTS ON SMALL DUCTS. ON DAMPERS LONGER THAN 15" USE PUSH RODS WITH DURODYNE MODEL SRP BALL JOINTS. USE TWO PUSH RODS ON DUCTS WIDER THAN 24".
   C. DUCT TRANSFORMATIONS SHALL BE MADE WITH EXPANSION FITTINGS HAVING SLOPES NOT EXCEEDING 1 TO 7 AND CONTRACTION FITTINGS HAVING SLOPES NOT EXCEEDING 1 TO 4.
   D. SEAL ALL JOINTS IN SUPPLY AIR AND EXHAUST AIR DUCTWORK WITH 3M EC-800, OR DURODYNE S-3 DUCT SEALER.
   E. PACK AROUND ALL DUCT OPENINGS IN ROOF AND WALLS WITH FIBERGLASS INSULATION.
   F. PROVIDE FULL RADIUS TEES, BENDS, AND ELBOWS FOR CHANGES IN DIRECTION EXCEPT WHERE SQUARE ELBOWS ARE REQUIRED DUE TO SPACE RESTRICTIONS. PROVIDE DURODYNE DOUBLE THICKNESS 24 GAUGE TURNING VANES ASSEMBLED IN TOP AND BOTTOM RAILS IN SQUARE ELBOWS.
3. PROVIDE FLEXIBLE CONNECTIONS BETWEEN ALL FANS AND ADJACENT DUCTWORK CONSISTING OF A PREASSEMBLED UNIT WITH 75MM (3") LONG GALVANIZED DUCT CONNECTOR AND 150 MM (6") WIDE HEAVY GLASS FIBRE FABRIC WITH ELASTOMER COATING EQUAL TO DURO DYNE 'DUROLON'.
4. NOTE THAT DUCT DIMENSIONS ON DRAWINGS ARE CLEAR INSIDE DIMENSIONS. WHERE ACOUSTIC INSULATION IS INSTALLED, INCREASE DIMENSIONS ACCORDINGLY.
5. DUCTWORK INSULATION (PER ASHRAE 90.1)
   A. PROVIDE 25 MM (1") THICK ACOUSTIC DUCT LINER WHERE SHOWN ON DRAWINGS. ACOUSTIC LINER SHALL BE JOHNS MANVILLE PERMACOTE LINACOUSTIC RECTANGULAR DUCT LINER MEETING ASTMC 1071 WITH AIR SURFACE COATED WITH ACRLIC COATING TREATED WITH EPA REGISTERED ANTI-MICROBIAL AGENT PROVEN TO RESIST MICROBIAL GROWTH AS DETERMINED BY ASTM G21 AND G22.
   B. INSULATE SUPPLY AND RIGID DUCTWORK WITHIN UNCONDITIONED SPACE WITH THERMAL FIBERGLASS REINFORCED FOIL-FACED RIGID VAPOR SEAL DUCT INSULATION HAVING AN R-VALUE OF 3.3 HR FTý øF/BTU.
6. FLEXIBLE DUCT SHALL BE EQUAL TO FLEXMASTER TRIPLE LOCK ALUMINUM AIR DUCT AND SHALL BE THE SAME SIZE AS THE DIFFUSER NECK TO WHICH IT CONNECTS TO UNLESS OTHERWISE SHOWN. SUPPORT FLEXIBLE DUCT AT MAXIMUM 5'-0" SPACING.
7. USE GEAR CLAMPS FOR SECURING FLEXIBLE DUCTS TO RIGID DUCT CONNECTIONS SUCH AS SPIN-ON FITTINGS, ETC. AND NECKS OF DIFFUSERS AND SEAL AIR TIGHT WITH DUCT TAPE. ROUND FLEXIBLE DUCTS SHALL BE MAXIMUM 3.0M (10') LONG AND REMAINDER SHALL BE ROUND RIGID DUCT OF THE SAME DIAMETER.
8. PROVIDE BALANCING DAMPERS IN ALL BRANCHES OFF THE MAIN DUCTWORK WITH SUITABLE MEANS OF CEILING ACCESS FOR BALANCING, AND VOLUME DAMPERS FOR ALL SUPPLY AIR DIFFUSERS AND REGISTERS.
9. PROVIDE GRILLES, DIFFUSERS, REGISTERS AND DOOR GRILLES OF SIZE AND TYPE CALLED FOR ON THE DRAWINGS. HAND OVER DOOR GRILLES TO THE GENERAL CONTRACTOR FOR INSTALLATION IN THE DOORS.
10. PROVIDE ALL CONTROLS, WIRING AND APPURTENANCES NECESSARY FOR COMPLETE AND OPERATING SYSTEMS. CONNECT ALL ROOM THERMOSTATS, DAMPERS, BASEBOARD HEATERS AND OTHER CONTROL DEVICES AS NECESSARY.
11. INSTALL AIR TERMINALS IN STRICT ACCORDANCE WITH FINAL REFLECTED ARCHITECTURAL CEILING PLANS.
12. PROVIDE ROOF CURBS FOR ROOF MOUNTED EQUIPMENT, DUCT AND PIPE PENETRATIONS. PRE-MANUFACTURED CURBS ARE TO BE PROVIDED FOR MECHANICAL EQUIPMENT MOUNTED ON ROOF AND TO BE SUPPLIED BY EQUIPMENT MANUFACTURER. ROOF CURB IS TO BE AT LEAST 14" ABOVE FINISHED ROOF. MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING INSTALLATION OF ROOF CURB WITH ROOFING CONTRACTORS.
13. BALANCING

    TEST, BALANCE AND ADJUST ALL AIR, HYDRONIC AND PLUMBING SYSTEMS ENTIRELY TO OBTAIN THE DESIGN FLOW QUANTITIES. MARK THE FINAL BALANCE POSITION ON ALL BALANCING DAMPERS AND ADJUSTABLE AIR TURNING DEVICES AND BALANCE FITTINGS. SUBMIT AIR AND WATER SYSTEMS TEST AND BALANCE REPORT TO THE ENGINEER AND PROJECT CO-ORDINATOR. INDICATE ALL TEST RESULTS CLOSEST AND FURTHEST OUTLET SUPPLY AIR TEMPERATURES AND ROOM TEMPERATURES FOR ALL AIR SYSTEMS. INCLUDE FOR REPLACEMENT OF DRIVE KITS. INCLUDE ADDITIONAL BALANCING AS PART OF SCOPE AT LEAST ONE (1) MONTH FOLLOWING OCCUPANCY. THIS WORK SHALL BE PERFORMED BY AN AGENCY CURRENTLY A MEMBER OF AND IN GOOD STANDING WITH EITHER THE ASSOCIATED AIR BALANCE COUNCIL OR NATIONAL ENVIRONMENTAL BALANCING BUREAU. TESTING AND BALANCING CONTRACTOR SHALL BE APPROVED BY THE LANDLORD AND HIRED AT THE EXPENSE OF DIVISION 15.
14. CONTROLS
    A. THE MECHANICAL CONTRACTOR IS TO PROVIDE ALL CONTROL WIRING REGARDLESS OF VOLTAGE. THIS INCLUDES ALL INTERLOCKS BETWEEN MAKE-UP AIR UNITS AND EXHAUST FANS; MOTORIZED DAMPERS AND FANS AND ALL OTHER INTERLOCKS BETWEEN MECHANICAL EQUIPMENT.
    B. CONTROL WIRING BELOW 50 VOLTS RELATED TO CONTROL SYSTEMS SHALL BE PROVIDED IN ACCORDANCE WITH LATEST EDITION OF CSA C22.1, NATIONAL ELECTRICAL SAFETY CODE AND REQUIREMENTS OF ELECTRICAL SAFETY AUTHORITY.
    G. MOUNTING HEIGHT OF OCCUPANT ADJUSTABLE THERMOSTATS SHALL BE 1200MM [3 FT. 11 IN.] FROM FINISHED FLOOR. MOUNTING HEIGHT OF NON-ADJUSTABLE THERMOSTATS SHALL BE 1500 MM [5 FT. 0 IN.] FROM FINISHED FLOOR. COORDINATE LOCATION WITH ARCHITECT/DESIGNER. DO NOT INSTALL IN VICINITY OF ELECTRICAL LIGHTING DIMMERS.
    H. CLEAN AND RECALIBRATE EXISTING THERMOSTATS UPON COMPLETION OF CONSTRUCTION. SUBMIT REPORT THAT THIS WORK WAS COMPLETED.
    I. INSTALL ALL EXPOSED WIRING WITHIN EMT CONDUIT, C/W ALL NECESSARY FITTINGS AND SUPPORTS FOR A COMPLETE AND OPERATING CONTROL SYSTEM. HARD WIRE ALL ELECTRICAL CONTROL DEVICES INTO THE ASSOCIATED SYSTEM MAGNETIC STARTER. PROVIDE POWER TO CONTROL PANEL FROM THE NEAREST NORMAL POWER ELECTRICAL DISTRIBUTION PANEL.

PIPE IDENTIFICATION

PIPES IDENTIFICATION:-

1. PROVIDE SMS WRAP-MARK ON ALL PIPE COVERING, USING WRAP-MARK PIPE MARKERS WITH FLOW ARROW AND ALTERNATING WORDING. FOR OUTSIDE DIAMETERS UP TO {150MM} [6"], ALLOW MARKER TO COMPLETELY WRAP PIPE. FOR LARGER OUTSIDE DIAMETERS, SECURE MARKERS WITH STAINLESS STEEL SPRINGS. SECURE MARKERS ON VERTICAL PIPING AND ELSEWHERE MARKERS COULD BE INADVERTENTLY MOVED. PIPING MARKERS AS PER ANSI STANDARDS.
2. LOCATE IDENTIFICATION AND FLOW ARROWS SO THEY CAN BE SEEN CLEARLY FROM FLOOR AND SERVICE PLATFORMS
   .1 AT EACH BRANCH CLOSE TO CONNECTION POINT TO MAIN PIPING
   .2 AT NOT GREATER THAN INTERVALS OF {15 METER} [50FT] ON STRAIGHT RUNS OF EXPOSED PIPING
   .3 BOTH SIDES WHERE PIPING PASSES THROUGH WALLS
   .4 ON VERTICAL PIPES APPROXIMATELY {1800MM}[6FT] ABOVE FLOOR

PIPE MARKING SHALL BE AS FOLLOWS:-

1. (DCW) [DOMESTIC COLD WATER] - GREEN WITH WHITE LETTERING.
7. (V) [PLUMBING VENT] - GREEN WITH WHITE LETTERING.
10. (G) [GAS PIPING] - YELLOW WITH BLACK LETTERING.

T-BAR CEILING TILES

LAY-IN PANELS: 2'-0" x 4'-0" x ⅝" THICKNESS FACTORY APPLIED WHITE WASHABLE FINISH, FINE FISSURED MEDIUM TEXTURE, RADAR' ClimaPlus' BY CGC INC..., OR OTHER APPROVED MANUFACTURER. PROVIDE SQUARE EDGES. PANELS SHALL MEET THE FOLLOWING CLASSIFICATION WHEN TESTED IN ACCORDANCE WITH STANDARD LISTED.

.1 FLAME SPREAD RATING: ASTM E84 CLASS A
.2 NOISE REDUCTION:
COEFFICIENT: ASTM C423 .55 TO .60 MIN
.3 CAC: 35
.4 LIGHT REFLECTANCE: ASTM E1477.84

PLUMBING SYSTEMS

1. PROVIDE PLUMBING SYSTEMS AS PER SPECIFICATIONS, DRAWINGS, THE ONTARIO PLUMBING CODE, THE O.B.C. AND LOCAL BY-LAWS. PROVIDE ALL NECESSARY ACCESSORIES AND FITTING REQUIRED FOR COMPLETE AND OPERATIONAL SYSTEMS.
2. MAKE ALL WATER, WASTE AND VENT PIPING CONNECTIONS AS REQUIRED. PROVIDE VENTING, TRAPPING AND PRIMING AS PER THE APPLICABLE REGULATIONS.
3. PROVIDE ALL CURBS, MOUNTINGS AND SUPPORTS FOR EQUIPMENT, FIXTURES AND PIPING AS REQUIRED AND SPECIFIED.
4. ALL EXPOSED FITTINGS CONNECTED TO FIXTURES SHALL BE CHROME-PLATED BRASS. ALL EXPOSED FITTINGS AND TRIM SHALL BE CHROME PLATED. PROVIDE ESCUTCHEONS PLATES ON ALL PIPING THROUGH PARTITIONS.
5. INDOOR UNDERGROUND STORM AND SANITARY PIPES SHALL BE CSA CLASS 4000 CAST IRON SOIL PIPE AND FITTINGS WITH MECHANICAL JOINTS. MATERIALS, FITTINGS, CONSTRUCTION AND INSTALLATION METHODS SHALL CONFORM TO THE CURRENT STANDARDS OR LOCAL AUTHORITIES HAVING JURISDICTION.
6. ALL MECHANICAL JOINTS (MJ) INSTALLED BELOW GRADE, AT THE BASE OF ALL SANITARY STACKS, ON SANITARY DRAINS 4"(100mm) AND LARGER, ON ALL STORM DRAINAGE PIPING, AND AS NOTED WITHIN THE PLUMBING FIXTURE SCHEDULE, SHALL BE EQUIVALENT TO MISSION HEAVY WEIGHT COUPLINGS C/W MULTIPLE BANDS ATTACHED TO HEAVY DUTY CORRUGATED 304 STAINLESS STEEL SHIELD OVER A MOLDED ONE-PIECE ELASTOMER SEALING SLEEVE, SEALING RINGS ON FLANGED NEOPRENE RUBBER GASKET SHALL MEET OR EXCEED THE REQUIREMENTS OF ASTM C 564, AXIALLY SLOTTED HEAVY DUTY WORM DRIVE CLAMPS CAPABLE OF TIGHTENING TO 80 IN/LBS OF TORQUE AND FM 1680 COMPLIANT.
7. ALL WALL AND FLOOR OPENINGS SHALL BE PACKED WITH AN APPROVED FIRE BARRIER MINERAL WOOL TO 25MM (1") FROM END SIDE OF OPENING ON BOTH SIDES OF FLOOR OR WALL. REMAINING PORTION SHALL BE SEALED WITH AN APPROVED AND LISTED FIRE BARRIER SILICONE.
8. FINAL LOCATION OF ALL PLUMBING FIXTURES SHALL BE CO-ORDINATED ON SITE WITH ALL TRADES. REFER TO ARCHITECTURAL & SPECIALTY EQUIPMENT CONSULTANT LAYOUT DRAWINGS AND DETAILS FOR EXACT LOCATION OF FIXTURES.
9. PROVIDE NEW PLUMBING FIXTURES WHERE INDICATED ON PLANS, OF MAKE AND MODEL AS SPECIFIED ON MECHANICAL DRAWINGS. ALL FIXTURES SHALL BE OF FIRST QUALITY, CLEANED AND IN PERFECT CONDITION FOR THE TENANT OWNER TAKEOVER. FIXTURES SHALL BE PIPED COMPLETE IN A FIRST CLASS MANNER WITH ALL NECESSARY APPURTENANCES FOR A COMPLETE FIXTURE IN EVERY RESPECT. INSTALL ALL COMPONENTS IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
10. PROVIDE ISOLATING VALVES ON MAIN AND/OR BRANCH LINES AND FOR ALL EQUIPMENT SERVED WITH HOT AND COLD WATER LINES. ALL VALVES SHALL BE SUITABLE FOR THE OPERATING PRESSURE OF THE SYSTEM IN WHICH THEY ARE INSTALLED.
11. PROVIDE ACCESS DOORS TO ALL PLUMBING EQUIPMENT WHERE INDICATED AND/OR REQUIRED OF SIZE TO SUIT CONVENIENT MAINTENANCE REQUIREMENTS.
12. PIPING INSULATION
    A. PIPE INSULATION TO BE A MIN. OF R-4 PER INCH.
    B. REFER TO PIPING INSULATION SCHEDULE
13. PROVIDE TRAP SEAL PRIMER TO ALL HUB DRAINS, FLOOR DRAINS, FUNNEL FLOOR DRAINS IN ACCORDANCE WITH CODES. IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE ADEQUATE COLD WATER SUPPLY. PROVIDE ALL NECESSARY PIPING TO SUPPLY TRAP SEAL PRIMER. NO EXTRAS SHALL BE ACCEPTED FOR PROVIDING TRAP SEAL PRIMER.
14. CLEANING, FLUSHING AND DISINFECTING OF WATER PIPING
    A. BE RESPONSIBLE FOR CARE AND CLEANING OF THE PIPING SYSTEM DURING AND AFTER CONSTRUCTION. PLUG ALL OPEN ENDS DURING CONSTRUCTION TO PREVENT THE ENTRANCE OF FOREIGN MATERIALS.
    B. FLUSH ALL SYSTEMS WITH CLEAN, POTABLE WATER TO REMOVE SCALE AND SEDIMENT IMMEDIATELY UPON FILLING.
    C. STERILIZE ALL NEW POTABLE WATER LINES TO MEET LOCAL MUNICIPAL REQUIREMENTS. UPON REQUEST BY ENGINEER OR OWNER CONTRACTOR SHALL PROVIDE CERTIFICATION THAT STERILIZATION HAS BEEN COMPLETED.
15. HORIZONTAL PIPING SHALL BE SUPPORTED AT INTERVALS AS PER LATEST EDITION OF SECTION 7.3.4 "SUPPORT OF PIPING" OF THE O.B.C.2012.
16. VERTICAL PIPING SHALL BE SUPPORTED AT THE FLOOR AND/OR WITH INTERMEDIATE WALL SUPPORTS AT 10FT. INTERVALS FOR PIPING 2" AND OVER AND 6FT INTERVALS FOR SMALLER PIPING. MORE FREQUENT SUPPORTS SHALL BE PROVIDED WHERE NECESSARY TO PREVENT MOVEMENT. PIPING SHALL BE SUPPORTED AS PER LATEST EDITION OF SECTION 7.3.4 "SUPPORT OF PIPING" OF THE O.B.C.2012.
17. POTABLE WATER VALVES
    A. NEW GATE VALVES 2-1/2"Ø AND LARGER SHALL BE MANUFACTURED BY WATTS (OR EQUAL). VALVES SHALL BE SUITABLE FOR USE IN POTABLE WATER SYSTEMS. VALVES SHALL BE PRESSURE RATED TO 200psi CWP AND HAVE FLANGED ENDS. VALVES SHALL HAVE NON-RISING STEM AND FULL PORT FLOW AND EPOXY COATED.
    B. NEW GATE VALVES 2"Ø AND SMALLER SHALL BE MANUFACTURED BY WATTS (OR EQUAL). VALVES SHALL BE SUITABLE FOR USE IN POTABLE WATER SYSTEMS. VALVES SHALL BE MANUFACTURED OUT OF BRONZE AND BE PRESSURE TESTED TO 125psi WSP, 200psI WOG NON-SHOCK. VALVES SHALL HAVE NON-RISING STEM AND FULL PORT FLOW.
    C. FOR 2" AND SMALLER, BALL VALVES MAY BE PROVIDED AS SUBSTITUTE FOR GATE VALVES. PROVIDE BALL VALVES WITH BRASS OR BRONZE BOBY, CHROME PLATED SOLID BALL, PTFE SEAT AND SEALS AND FULL PORT.
    D. STANDARD CHECK VALVES
    2"Ø AND SMALLER - SOLDERED 300 psi WOG
    2-1/2" AND LARGER - FLANGED 200 psi WOG.
18. ABOVE GROUND SANITARY DRAIN PIPING MATERIAL AND FITTINGS SHALL BE:
    A. PIPE SIZE 2-1/2" AND LESS: TYPE P-1 OR P-2.
    B. PIPE SIZE 3" AND GREATER: TYPE P-2 OR P-4.
19. UNDERGROUND SANITARY DRAIN PIPING MATERIAL AND FITTINGS SHALL BE:
    A. PIPE SIZE 2-1/2" AND LESS: TYPE P-3 OR P-4.
    B. PIPE SIZE 3" AND GREATER: TYPE P-4. P-5, OR P-7.
20. ABOVE GROUND VENT PIPING MATERIAL AND FITTINGS SHALL BE:
    A. PIPE SIZE 2-1/2" AND LESS: TYPE P-1 OR P-2.
    B. PIPE SIZE 3" AND GREATER: TYPE P-2 OR P-4.
21. UNDERGROUND VENT PIPING MATERIAL AND FITTINGS SHALL BE:
    A. PIPE SIZE 2-1/2" AND LESS: TYPE P-4, P-5 OR P-6.
    B. PIPE SIZE 3" AND GREATER: TYPE P-4. P-5, OR P-7.
22. ABOVE GROUND DOMESTIC HOT, COLD AND RECIRCULATION PIPING MATERIAL AND FITTINGS SHALL BE:
0. A. PIPE SIZE 2-1/2" AND LESS: TYPE P-6.
0. B. PIPE SIZE 3" AND GREATER: TYPE P-6.
23. PIPING MATERIAL AND FITTINGS
0. P-1: DWV COPPER PIPE WITH DRAINAGE FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS
   P-2: IPEX SYSTEM XFR 15-50 DWV PIPE AND FITTINGS WHICH SHALL BE CERTIFIED TO CSA B181.2 AND SHALL BE TESTED IN ACCORDANCE WITH CAN/ULC S102.2 AND SHALL BE CLEARLY MARKED WITH THE CERTIFICATION LOGO INDICATING A FLAME-SPREAD RATING OF NOT MORE THAN 25 AND A SMOKE-DEVELOPED CLASSIFICATION NOT EXCEEDING 50.
0. P-3: TYPE L COPPER WITH 95/5 TIN/ANTIMONY SOLDER JOINTS.
0. P-4: CSA CLASS 4000 CAST IRON SOIL PIPE AND FITTINGS, WITH MECHANICAL JOINTS.
0. P-5: IPEX RING-TITE PVC SDR 35 SEWER PIPE AND SHALL BE IN COMPLIANCE WITH ASTM D3040 OR ASTM F1760 AND THIRD PARTY CERTIFIED TO CSA B182.2 OR CSA B182.7. SEWER LATERALS WILL BE PVC SRD 28 SEWER PIPE AND SHALL BE THIRD PARTY CERTIFIED BY CSA AS ABOVE. SEALING GASKETS AT JOINTS MUST MEET THE REQUIREMENTS OF ASTM D3034 OR ASTM 1760, CSA B182.2 OR CSA B182.7 AND MUST BE ABLE TO WITHSTAND A MINIMUM HYDROSTATIC PRESSURE OF 345 kPa (50 psi) WITHOUT LEAKAGE. PIPE STIFFNESS AND FITTINGS SHALL ALSO MEET THE APPROPRIATE ASTM AND CSA STANDARDS.
0. P-6: TYPE L HARD COPPER PIPE WITH WROUGHT COPPER FITTINGS AND 95/5 TIN/ANTIMONY SOLDER JOINTS.
0. P-7: ROYAL PIPE SYSTEMS ABS-DWV PIPE SCHEDULE 40. CERTIFIED TO CSA B181.1. ABS COMPOUND MEETING CELL CLASSIFICATION REQUIREMENTS OF 42221 AS DEFINED BY ASTM D 3965. ABS PIPING, TUBING AND ASSOCIATED ADHESIVES ARE PERMITTED TO BE USED IN A BUILDING REQUIRED TO BE OF NONCOMBUSTIBLE CONSTRUCTION PROVIDED THEY ARE CONCEALED IN A WALL OR CONCRETE FLOOR SLAB. ABS PIPING SHALL NOT BE USED IN A RETURN PLENUM APPLICATION.

GAS PIPING SYSTEM

1. PROVIDE AND INSTALL NATURAL GAS PIPING IN COMPLIANCE WITH ALL REQUIREMENTS OF APPLICABLE SECTIONS OF CSA CODE B149 SPECIFICATION, THE LATEST AMENDMENTS, THE C.G.A. UTILIZATION CODE, AND OBTAIN APPROVAL FROM THE LOCAL GAS UTILITY'S AUTHORITY PRIOR TO THE INSTALLATION OF GAS PIPING.
2. CONTRACTOR TO SUPPLY AND INSTALL ISOLATION LUBRICATED GAS COCKS AT EACH PIECE OF EQUIPMENT AND AT EACH CAPPED CONNECTION.
3. GAS PIPING ON ROOF SHALL BE MOUNTED ON ROOF TOP BLOX MODEL RTB-01. THE SUPPORT BLOCKS MUST BE DESIGNED TO ELIMINATE ROOF PENETRATIONS, FLASHINGS OR DAMAGE TO ROOFING MEMBRANE. BODY SHALL BE RECYCLED UV-RESISTANT POLYPROPYLENE COPOLYMER. BASE PLATFORM SHALL BE 1" THICK, TYPE 4 CLOSED CELL STRUCTURAL FOAM. THE TOP SURFACE SHALL HAVE MOLDED IN PIPE ORGANIZING SADDLES AND STRUT MOUNTING CRADLE. THE TOP SURFACE SHALL ALSO HAVE SCREW GUIDE INDENTS AND ENGINEERED INTERNAL SCREW THREAD GRIPPING FEATURE. BLOCK MUST ACCEPT 3/8" AND 1/2" THREADED ROD USING SIDE ENTRY NUT SLOTS TO ALLOW FAST TOP SIDE ASSEMBLY AND PIPING HEIGHT ADJUSTMENTS. INSTALL PIPING AT NO LESS THAN 6'-0" CLEARANCE FROM THE ROOF EDGE IN ORDER TO COMPLY WITH B.149.1 CODE. REMOVE ALL LOOSE AGGREGATE FROM UNDER SUPPORT BASE ON GRAVEL COVERED ROOF TOPS.
4. PROVIDE AND INSTALL FOR NATURAL GAS PIPING STANDARD WEIGHT BLACK STEEL PIPE (SCHEDULE - 40) WITH EITHER STANDARD WEIGHT MALLEABLE IRON SCREWED FITTINGS OR WELDED FITTINGS ACCORDING TO PIPE SIZE AND LOCATION. WELD ALL CONCEALED PIPES AND VENT LINES. VENT AND PROTECT IN ACCORDANCE WITH THE REQUIREMENTS OF THE LOCAL GAS UTILITY. PROVIDE APPROVED TYPE LUBRICATED PLUG COCKS WITH QUARTER STOPS.
5. INDOOR GAS PIPING IS TO BE INSTALLED AT HIGH LEVEL IN JOIST SPACE. IF OBSTRUCTED, OFFSET GAS PIPING AND IMMEDIATELY RETURN TO HIGH LEVEL. GAS PIPING PENETRATION THROUGH ROOF TO BE WITH PURPOSE MADE SLEEVES AND CONES.
6. CONNECT TO EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
7. SLOPE PIPING DOWN IN DIRECTION OF FLOW TO LOW POINTS.
8. PROVIDE CLEARANCES FOR MAINTENANCE OF EQUIPMENTS, VALVES AND FITTINGS.
9. PURGE AFTER PRESSURE TEST IN ACCORDANCE WITH CANI-B149 (1-M86).
10. TEST SYSTEM IN ACCORDANCE WITH CANI-B149 (1-M86).

SPACING OF SUPPORTS FOR PIPING

NPS	MAXIMUM SPACING OF SUPPORT FT (M)
1/2" OR LESS HORIZONTAL	6 (2)
3/4" - 1" HORIZONTAL	8 (2.5)
1-1/4" - 2-1/2" HORIZONTAL	10 (3)
ALL SIZES VERTICAL	EVERY FLOOR BUT NOT MORE THAN 125% OF HORIZONTAL SPACING
TUBING ALL SIZES - VERTICAL AND HORIZONTAL	6 (2)

11. GAS PIPING OR TUBING SHALL BE IDENTIFIED BY ONE OF THE FOLLOWING:
    A) THE ENTIRE PIPING OR TUBING SYSTEM SHALL BE PAINTED YELLOW;

MECHANICAL LEGEND

SYMBOL	DESCRIPTION
	EXISTING DUCTWORK TO REMAIN
	EXISTING DUCTWORK / EQUIPMENT / PIPING TO BE REMOVED
	NEW DUCTWORK
	EXISTING FLEXIBLE DUCTWORK TO REMAIN
	EXISTING FLEXIBLE DUCTWORK / CONTROL WIRING TO BE REMOVED
	NEW FLEXIBLE DUCTWORK
	EXISTING CONTROL WIRING TO REMAIN
	NEW CONTROL WIRING
	EXISTING S/A DUCTWORK DOWN (OR INTO PAGE) TO REMAIN
	EXISTING R/A DUCTWORK DOWN (OR INTO PAGE) TO REMAIN
	NEW S/A DUCTWORK DOWN (OR INTO PAGE)
	NEW R/A DUCTWORK DOWN (OR INTO PAGE)
	EXISTING S/A DUCTWORK UP (OR OUT OF PAGE) TO REMAIN
	EXISTING R/A DUCTWORK UP (OR OUT OF PAGE) TO REMAIN
	EXISTING RETURN AIR GRILLE TO REMAIN
	EXISTING RETURN AIR GRILLE TO BE REMOVED
	NEW RETURN AIR GRILLE
	EXISTING SUPPLY AIR DIFFUSER TO REMAIN
	EXISTING SUPPLY AIR DIFFUSER TO REMOVED
	NEW SUPPLY AIR VAV DIFFUSER
XXX-1	EQUIPMENT TAG
T	THERMOSTAT
	SPIN-ON BALANCING DAMPER
G	EXISTING GAS PIPING TO REMAIN
	BALANCING VALVE
	ISOLATION VALVE
	PIPE/DUCTWORK DOWN
SAN	EXISTING UNDERGROUND SANITARY DRAIN PIPING TO REMAIN
SAN	NEW UNDERGROUND SANITARY DRAIN PIPING
STMS	NEW STEAM SUPPLY PIPING
STMC	NEW STEAM CONDENSATE RETURN PIPING
	EXISTING DOMESTIC HOT WATER PIPING TO REMAIN
	NEW DOMESTIC HOT WATER PIPING
	EXISTING DOMESTIC COLD WATER PIPING TO REMAIN
	NEW DOMESTIC COLD WATER PIPING
CO	CLEAN OUT
FD, FFD	NEW FLOOR DRAIN OR FUNNEL FLOOR DRAIN
B/D	BALANCING DAMPER
S/A	SUPPLY AIR
R/A	RETURN AIR
O/A	OUTDOOR AIR
E/A	EXHAUST AIR
RTU	ROOFTOP UNIT
SAN	SANITARY
TSP	TRAP SEAL PRIMING DEVICE
BFP	BACKFLOW PREVENTION DEVICE
A / B / C	DIFFUSER, GRILLE, OR TERMINAL UNIT 'A' - INDICATES TYPE 'B' - INDICATES SIZE (INCH) 'C' - INDICATES CAPACITY (CFM)

SUMMERY OF THE SCOPE OF WORK

1.	INSTALL TWO NEW CEILING EXHAUST FANS
2.	INSTALL A NEW EXTRACTOR OF GIRBAU MODEL RMG623 H AND A NEW DRYING CABINET OF CIRCUL AIR MODEL E612 IN THE NEW WASHING ROOM
3.	INSTALLATION OF NEW VENT FOR THE NEW DRYING CABINET
4.	REPLACEMENTS OF THE BUNKER GEAR ROOM CEILING TILES
5.	RE-BALANCING OF THE EXISTING AC-5 ROOF TOP UNIT AND ACCOSTED DIFFUSERS AND GRILLS.

REV.	DATE	DESCRIPTION
4	2025-AUG-22	RE-ISSUED FOR PERMIT & TENDER
3	2025-JUL-21	RE-ISSUED FOR REVIEW
2	2025-APR-23	RE-ISSUED FOR REVIEW
1	2024-APR-12	ISSUED FOR PERMIT & TENDER
0	2024-MAR-15	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering
250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917

Client

Oshawa®

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

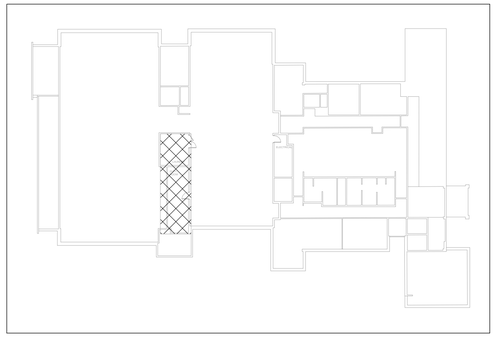
MECHANICAL SERVICES
LEGEND AND SPECIFICATIONS

DATE:	2024-MAR-07
DESIGNED BY:	R.A
DRAWN BY:	R.A
APPROVED BY:	M.A
PROJECT NO.:	1024011

Engineer / Architect Stamp

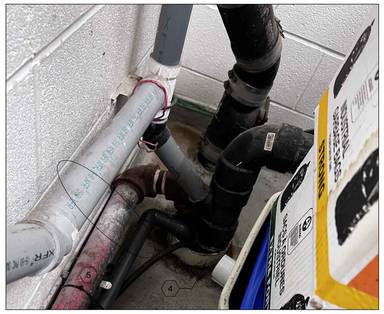
LICENSED PROFESSIONAL ENGINEER
M.AKHAVANBAZAZ
100088319
2025-AUG-22
PROVINCE OF ONTARIO

Drawing No.
M-100



1 SCOPE OF WORK

Scale: N.T.S



3 EXISTING FLOOR DRAIN - DETAIL 1

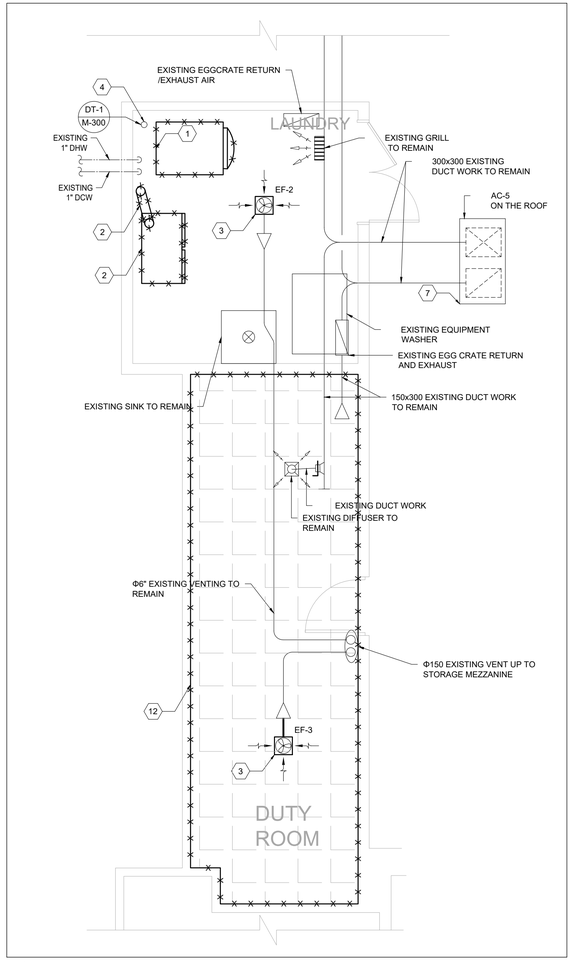
Scale: 1'-0"= 4"

IMPORTANT NOTES:

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO BRING THE NEW EQUIPMENTS (DRYING CABINET, WASHER EXTRACTOR, AND ALL OF IT'S ANCILLARIES) INTO THE PROPOSED LOCATION. INCLUDE ALL COSTS ASSOCIATED WITH TRANSFERRING THE EQUIPMENTS TO THE PROPOSED LOCATION.
- SEAL ALL REDUNDANT & NEW OPENINGS WITH FIRE RATED MATERIAL. PATCH / FIX / PAINT WALLS OR DOORS TO MATCH EXISTING.
- CONTRACTOR TO REVIEW CONDITION OF THE EXISTING SPACE AND INCLUDE FOR RELOCATION /REMOVAL AND RE-INSTALLATION OF EXISTING PIPES, EQUIPMENTS, CONDUITS, WIRING, LIGHTING, CEILING, ETC IF REQUIRED TO ALLOW INSTALLATION OF NEW PIPES AND CHIMNEYS.
- ACCORDING TO THE MECHANICAL DRAWING, ALL NEW EQUIPMENT IS TO BE MOUNTED ON NEW HOUSEKEEPING PADS REEFER TO STRUCTURAL DRAWINGS.
- THE CONTRACTOR IS ALLOWED TO MAKE ANY CHANGES TO THE PIPING SYSTEM BASED ON THE FINAL SHOP DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR UPDATING THE DRAWINGS.
- THE CONTRACTOR SHOULD REVIEW THE EQUIPMENT'S ELECTRICAL PANEL AND ENSURE IT MATCHES THE BUILDING'S EXISTING ELECTRICAL POWER VOLTAGE. BASED ON ELECTRICAL DRAWINGS, THE CONTRACTOR CAN PROVIDE ANY MODIFICATION TO CONNECT TO THE EXISTING POWER. HAVE THE WORK INSPECTED AND CERTIFIED BY THE TSSA. AT THE END OF THE WORK, THE NEW PLANT SHALL BE FULLY TSSA-CERTIFIED.
- PROVIDE AND INSTALL NEW EQUIPMENTS AT LOCATION SHOWN AS PER EQUIPMENT SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. CONTRACTOR TO COORDINATE EXACT LOCATION ON SITE DEPENDING ON SITE CONDITIONS. COMMISSION THE NEW EQUIPMENTS AND SUBMIT THE REPORT FOR ENGINEERS REVIEW.

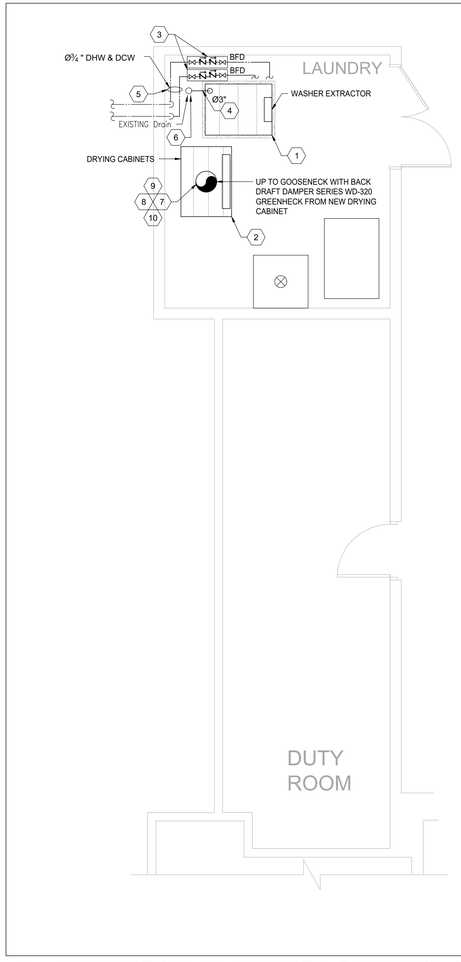
GENERAL NOTES:

- ALL EXISTING SERVICES SHOWN HAS BEEN EXTRACTED FROM AVAILABLE BASE BUILDING DRAWINGS AND RANDOM SITE SURVEYS. NOT ALL EXISTING SERVICES/SITE INFORMATION HAS BEEN SHOWN NOR CAN THE INFORMATION SHOWN BE GUARANTEED FOR PRECISE ACCURACY. CONTRACTOR SHALL THEREFORE VISIT THE SITE PRIOR TO SUBMITTING A BID TO SATISFY THEMSELVES THAT ALL WORK SHOWN AND/OR SPECIFIED CAN BE CARRIED OUT IN ACCORDANCE WITH THE CONTRACT DOCUMENT.
- ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- ALL CUTTING/PATCHING/CORING OF WALLS AND FLOORS REQUIRED TO ACCOMMODATE NEW MECHANICAL WORK IS TO BE ARRANGED AND PAID FOR BY MECHANICAL CONTRACTOR. X-RAY FLOORS/CONCRETE WALLS PRIOR TO CORING/CUTTING.
- THE MECHANICAL DRAWINGS DO NOT SHOW ALL THE ARCHITECTURAL AND STRUCTURAL DETAILS. ANY SPECIFIC INFORMATION INVOLVING ACCURATE MEASURING OF THE BUILDING SHALL BE TAKEN FROM THE BUILDING DRAWINGS OR AT THE BUILDING. MAKE WITHOUT ADDITIONAL CHARGE, ANY NECESSARY CHANGES OR ADDITIONS TO THE RUNS OF DUCTS AND PIPES TO ACCOMMODATE THE ABOVE CONDITIONS.
- COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- ALL ABANDONED PIPING WHICH ARE NO LONGER BEING USED SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL ENSURE PRIOR TO REMOVAL OF ANY PIPING THAT THE SYSTEM IS COMPLETELY ISOLATED AND IS NOT ALIVE.
- WORK SHALL INCLUDE STARTUP OF ALL SYSTEMS, FURNISHING OF OPERATING AND MAINTENANCE INSTRUCTIONS, AND ONE (1) YEAR GUARANTEE, COMMENCING ON THE DATE OF ACCEPTANCE BY THE TENANT.
- CONNECTIONS BETWEEN EQUIPMENTS (SINK AND WASHER EXTRACTOR) AND PIPES SHALL BE MADE WHIT FLEXIBLE CONNECTOR.
- SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING STRUCTURE.
- ACCORDING TO THE MECHANICAL DRAWING, WASHER EXTRACTOR IS TO BE MOUNTED ON NEW HOUSEKEEPING PADS REEFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- CONTRACTOR TO INCLUDE REMOVAL OF WALL/ T-BAR OR DRY WALL CEILINGS AND REINSTALLING & PAINTING TO MATCH EXISTING WHERE REQUIRED FOR REMOVAL OF EXISTING PIPING AND INSTALLATION OF NEW PIPING.
- THE CONTRACTOR IS ALLOWED TO MAKE ANY CHANGES TO THE PIPING AND DUCTWORK SYSTEM BASED ON THE FINAL SHOP DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR UPDATING THE DRAWINGS.
- ALL DIMENSIONS SHALL BE CHECKED BEFORE CONSTRUCTION BY CONTRACTOR.
- CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE EXTENT OF THE ALL EXISTING CONDITIONS PRIOR TO SUBMITTING ANY QUOTATION.
- ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS AND/OR EXISTING CONDITIONS ARE TO BE REFERRED TO CONSULTANT FOR INSTRUCTIONS BEFORE ANY WORK IS BEGUN.
- COORDINATE ALL CORE DRILLING AS REQUIRED. PROVIDE SLAB XRAY AND /OR SCANNING AS REQUIRED TO CONFIRM THE FLOOR OR WALL OPENING.
- COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- THE CONTRACTOR IS TO PROVIDE YEARLY SCHEDULE TAG ON ALL OF THE VALVES.
- WHILE EVERY EFFORT HAS BEEN MADE TO SHOW THE FULL EXTENT OF THE MODIFICATIONS, PIPING OFFSETS AND INTERFERENCES WITH OTHER SERVICES HAVE NOT BEEN SHOWN. THE CONTRACTOR IS REQUIRED TO INSPECT THE SITE TO CONFIRM THE MODIFICATIONS CAN BE CARRIED OUT AND TO MEET THE DESIGN INTENT AND ALLOW FOR RE-ROUTING OR RELOCATION / REMOVAL & REINSTALLATION OF EXISTING SERVICES.
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW PIPING AND DUCTWORK WILL BE INSTALLED.



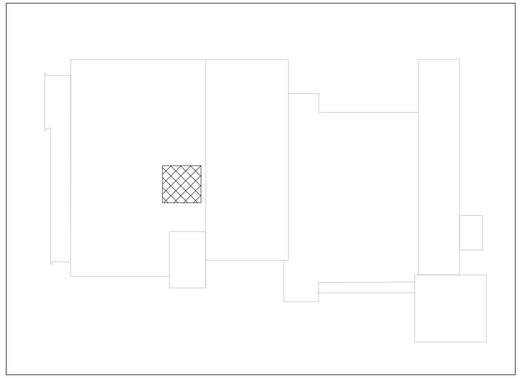
2 DEMOLITION PLAN - LAUNDRY - GROUND FL

Scale: 1'-0"= 4"



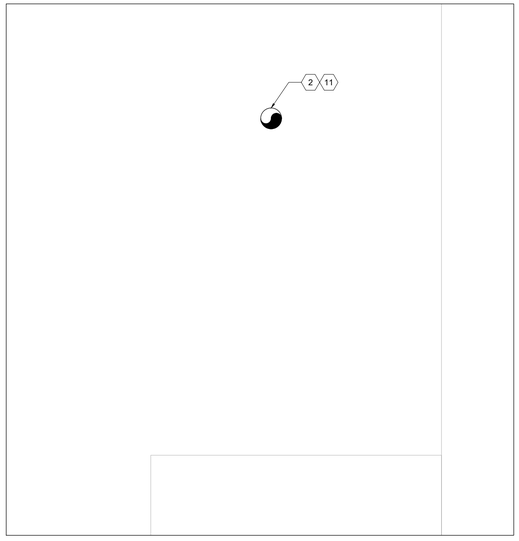
4 NEW WORK PLAN - LAUNDRY PLUMBING - GROUND FL

Scale: 1'-0"= 4"



5 SCOPE OF WORK - ROOF

Scale: 1'-0"= 4"



DEMOLITION NOTES:

1. DEMOLISH THE EXISTING WASHER INSIDE THE LAUNDRY ROOM C/W ALL ELECTRICAL AND WIRING, MECHANICAL CONNECTIONS, SUPPORT AND OTHERS.
2. DEMOLISH THE EXISTING DRYING CABINET C/W ALL ELECTRICAL AND WIRING, MECHANICAL EQUIPMENT INCLUDING THE VENTING AND OTHERS.
3. DEMOLISH THE EXISTING EXHAUST FAN AS SHOWN PER DRAWING. REFER TO NEW DRAWING FOR MORE INFORMATION.
4. EXISTING FLOOR DRAIN TO REMAIN. PROTECT THE DRAIN DURING CONSTRUCTION FROM ANY DEBRIS.
5. CONTRACTOR TO ALLOW FOR MODIFICATION OF THE EXISTING PLUMBING LINE TO THE FLOOR DRAIN. ALLOW FOR INSTALLATION OF NEW FLOOR DRAIN. REFER TO NEW DRAWING FOR MORE INFORMATION.
6. CONTRACTOR TO DEMOLISH THE EXISTING DRYING CABINET VENT C/W ALL ASSOCIATED EQUIPMENT, SUPPORT AND CONNECTION FROM THE LAUNDRY ROOM TO THE TERMINATION POINT ON THE ROOF.
7. CONTRACTOR TO PRE-AUDIT THE EXISTING AC-5 UNIT AND PROVIDE A REPORT FOR CONSULTANT REVIEW PRIOR TO START OF DEMOLITION.
8. REMOVE AND REPLACE THE EXISTING CEILING TILES. CONTRACTOR TO ALLOW FOR TEMPORARY REMOVAL AND REINSTALLATION OF THE EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT AS SHOWN ON THE DRAWING. FOR MORE INFORMATION OF THE ELECTRICAL EQUIPMENT REFER TO ELECTRICAL DRAWINGS

DESIGN NOTE:

- CONTRACTOR TO VERIFY EXACT LOCATION OF PIPING AND EXACT LOCATION OF CONNECTIONS ON SITE TO ACCOMMODATE WITH CONSULTANT REQUIREMENTS.
- CONTRACTOR TO INCLUDE FOR CUTTING / PATCHING / PAINTING WALLS IF REQUIRED FOR INSTALLATION OF NEW SERVICES. CONTRACTOR TO SEAL ALL REDUNDANT & NEW OPENINGS WITH FIRE RATED MATERIAL. THE EXACT LOCATION FOR PENETRATING THE WALL SHALL BE VERIFIED ON SITE.

1. PROVIDE AND INSTALL WASHER EXTRACTOR MACHINE C/W ASSOCIATED EQUIPMENTS ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS AND AS PER EQUIPMENT SCHEDULE. CONTRACTOR TO TIE Ø ¾" COLD AND HOT WATER TO EXISTING DOMESTIC COLD WATER ADJACENT WASHER EXTRACTOR. EXACT LOCATION AND ROUTING SHALL BE DETERMINED BY CONTRACTOR ON SITE BASED ON SITE CONDITIONS. THE PIPE INSULATION SHALL BE MATCHED WITH THE PLUMBING SPECIFICATIONS.
2. INSTALL DRYING CABINET C/W ALL ASSOCIATED EQUIPMENTS ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTION. THE CONTRACTOR SHOULD REVIEW THE EQUIPMENT'S ELECTRICAL PANEL AND ENSURE IT MATCHES THE BUILDING'S EXISTING ELECTRICAL POWER VOLTAGE. BASED ON ELECTRICAL DRAWINGS, THE CONTRACTOR CAN PROVIDE ANY MODIFICATION TO CONNECT TO THE EXISTING POWER. HAVE THE WORK INSPECTED AND CERTIFIED BY THE TSSA. AT THE END OF THE WORK, THE NEW PLANT SHALL BE FULLY TSSA-CERTIFIED.
3. PROVIDE AND INSTALL BACK FLOW PREVENTER VALVE SERIES 4000B OR EQUAL FOR EXISTING DCW AND DHW PLUMBING C/W ASSOCIATED EQUIPMENT IN PIPES CONNECTED TO EXISTING WASHER. THE CONTRACTOR WILL VERIFY THE EXACT LOCATION AND SIZE ON SITE. REFER TO THE PLUMBING SPECIFICATION FOR REQUIREMENTS.
4. PROVIDE AND CONNECT Ø3" SANITARY FOR WASHER EXTRACTOR INLET TO BOX DRAIN. EXACT LOCATION OF THE DRAIN OPENING SHALL BE COORDINATED BASED ON SITE CONDITIONS AND FIXTURE SHOP DRAWING. REFER TO PLUMBING SPECIFICATION FOR FIXTURE AND FAUCET INSTALLATION REQUIREMENT.
5. CONTRACTOR TO PROVIDE AND INSTALL INSULATED Ø¾" DHW AND DCW SUPPLY COPPER PIPE C/W, TIE IT TO EXISTING LINE AS SHOWN AND PER SITE EXISTING CONDITION. EXACT LOCATION AND ROUTING SHALL BE DETERMINED BY CONTRACTOR ON SITE BASED ON SITE CONDITIONS. THE PIPE INSULATION SHALL BE MATCHED WITH THE PLUMBING SPECIFICATIONS.
6. EXISTING FLOOR DRAIN TO REMAIN. CONTRACTOR SHALL ALLOW FOR MODIFICATION OF THE EXISTING DRAIN PLUMBING AS REQUIRED TO ACCOMMODATE THE INSTALLATION OF NEW EQUIPMENT AND ENSURE PROPER CONNECTION TO THE EXISTING FLOOR DRAIN, MAINTAINING CONDITIONS SIMILAR TO THE EXISTING SETUP.
7. PROVIDE AND INSTALL 14" EXPOSED DUCT AND CONNECT TO DRYING CABINET. PROVIDE ALL NECESSARY DUCTWORK OFFSET TO SUIT THE CONNECTION BETWEEN THE GOOSENECK WITH HEAVY-DUTY STYLE FLAT GUARD (STANDARD GALVANIZED MESH BIRD SCREEN) ON THE ROOF AND DRYING CABINET AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. DUCTWORK APPROXIMATELY AT LOCATION SHOWN.
8. PROVIDE AND INSTALL BACKDRAFT DAMPER INSIDE THE GOOSENECK AS PER DETAIL. ALL ROOF PENETRATION OR MODIFICATION ON THE ROOF MUST BE SEALED.
9. CONTRACTOR TO ALLOW FOR CHANGE AND REPAIR WORKS AT ROOF/WALL/CEILING FOR INSTALLING MECHANICAL SERVICES. FIREPROOFING, PAINTING AND REPAIRING THE FACADE/WALL/ROOF TO MATCH THE EXISTING.
10. CONTRACTOR TO PROVIDE AND INSTALL SUITABLE AND ADEQUATE SUPPORTING FOR THE EQUIPMENT AND DUCTING SYSTEM AND PROVIDE SHOP DRAWINGS BEFORE ANY EXECUTIVE OPERATION.
11. CONTRACTOR TO REMOVE AND DEMOLISH THE EXISTING THE EXISTING GOOSENECK FOR THE EXISTING DRYING CABINET AND REPLACE WITH NEW Ø14" GOOSENECK TO SUIT THE NEW UNIT.

REV.	DATE	DESCRIPTION
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1	2024-APR-12	ISSUED FOR PERMIT & TENDER
0	2024-MAR-15	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering
250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
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Client

Oshawa®

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

MECHANICAL SERVICES
HVAC DEMOLITION & NEW WORK
LAUNDRY ROOM

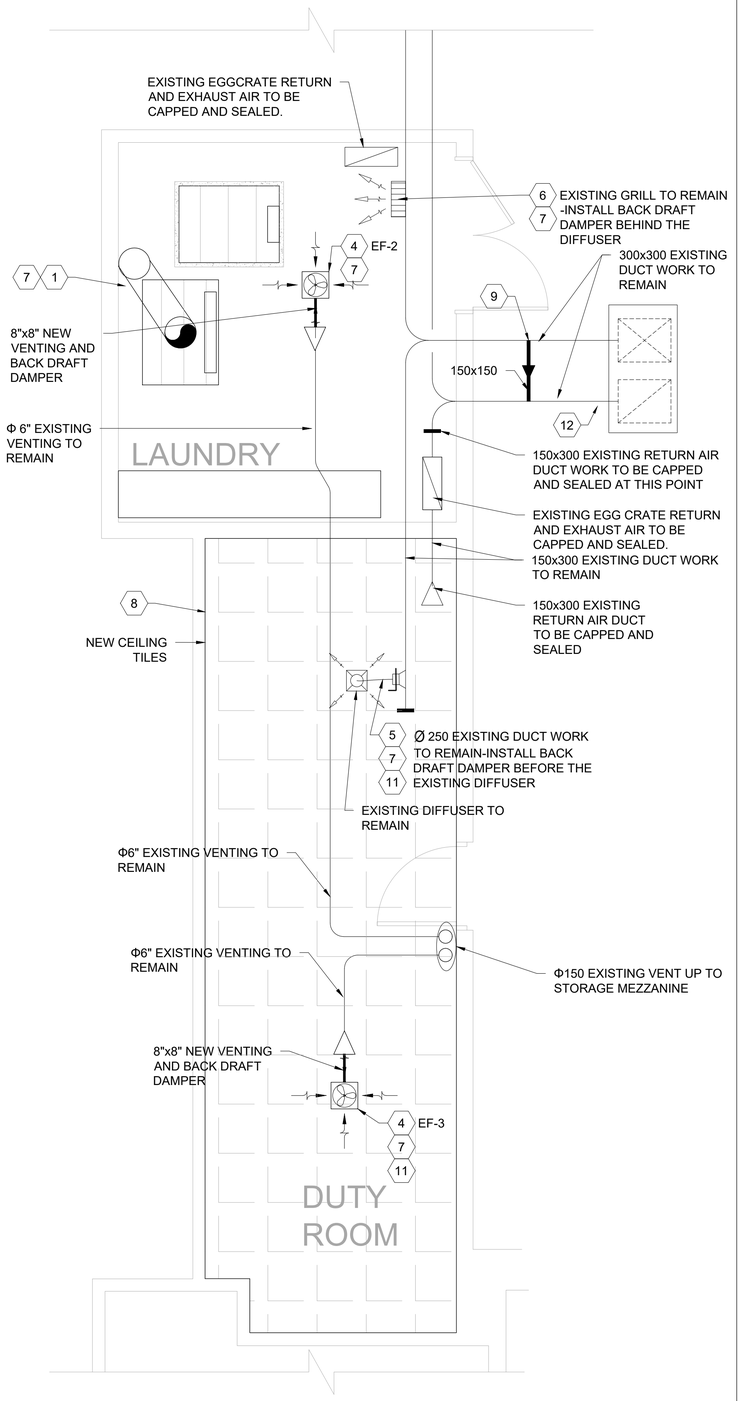
DATE:	2024-MAR-07
DESIGNED BY:	R.A
DRAWN BY:	R.A
APPROVED BY:	M.A
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
M.AKHAVANBAZAZ
100088319
2025-AUG-22
PROVINCE OF ONTARIO

Drawing No.

M-300



1 VENTILATION SYSTEM-FIRST FLOOR

Scale: 1'-0"= 3/8"

DUCTWORK NOTES:

1. PROVIDE AND INSTALL Ø14" EXPOSED SPIRAL ROUND DUCTWORK WITH 22 GAUGE THICKNESS, REMOVE AND DISPOSE EXISTING FLEXIBLE VENTING. PROVIDE ALL NECESSARY DUCTWORK OFFSET TO SUIT THE CONNECTION BETWEEN THE EQUIPMENT AND THE DRYING CABINET. DUCTWORK IS APPROXIMATELY AT THE LOCATION SHOWN.
2. DELETED
3. DELETED
4. CONTRACTOR TO REMOVE EXISTING EXHAUST FAN AND PROVIDE AND INSTALL NEW CEILING EXHAUST FAN WITH BACK DRAFT DAMPER AS PER EQUIPMENT SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. EXHAUST FAN TO OPERATE AS PER EXISTING CONDITIONS SEQUENCE.
5. PROVIDE AND INSTALL 250mm ROUND BACKDRAFT DAMPER SERIES SSWDR-53 GREENHECK OR AN APPROVED EQUAL (VERTICAL MOUNTING) AT THIS APPROXIMATE LOCATION AS SHOWN. (THE BACKDRAFT DAMPER WILL BE INSTALLED INSIDE THE FLEXIBLE DUCT WORK).
6. PROVIDE AND INSTALL 8"x6" RECTANGULAR BACKDRAFT DAMPER SERIES WD-320 GREENHECK OR AN APPROVED EQUAL (VERTICAL MOUNTING) AT THIS APPROXIMATE LOCATION AS SHOWN. (THE BACKDRAFT DAMPER WILL BE INSTALLED BEHIND THE EXISTING DIFFUSER).
7. CONTRACTOR TO PROVIDE AND INSTALL SUITABLE AND ADEQUATE SUPPORT FOR THE EQUIPMENT AND DUCTING SYSTEM AND PROVIDE SHOP DRAWINGS BEFORE ANY EXECUTIVE OPERATION.
8. PROVIDE AND INSTALL NEW FIRE RATED CEILING TILES. RE-INSTALL THE EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT REMOVED AS A RESULT. NEW CEILING TILES TO MATCH THE EXISTING COLOUR. REFER TO M-100 FOR TYPE AND SPECIFICATION.
9. PROVIDE AND INSTALL NEW INSULATED BYPASS DUCTWORK AS INDICATED ON THE DRAWINGS, COMPLETE WITH ALL REQUIRED SUPPORTS AND BALANCING DAMPERS AND TO BE BALANCED AT 130 CFM.
10. CONTRACTOR TO ALLOW FOR RE-BALANCING OF EXISTING SUPPLY AND RETURN DIFFUSERS AT LOCATIONS SHOWN ON DRAWINGS (CLOTHES DUTY ROOM, LAUNDRY ROOM, LAVATORY, AND OFFICE). CONTRACTOR TO PROVIDE AND INSTALL BALANCING DAMPERS AT EACH DIFFUSER OR GRILLE. CONTRACTOR TO PERFORM AIR BALANCING AFTER INSTALLATION AND SUBMIT REPORT TO CONSULTANT FOR REVIEW.
11. CONTRACTOR TO ALLOW FOR REBALANCING OF EXISTING AC-5 UNIT TO PROVIDE 320 CFM OUTSIDE AIR (40%) AND 480 CFM RETURN AIR (60%).

IMPORTANT NOTES:

- IT IS THE CONTRACTOR'S RESPONSIBILITY TO BRING THE NEW EQUIPMENT TO THE PROPOSED LOCATION. INCLUDE ALL COSTS ASSOCIATED WITH TRANSFERRING THE EQUIPMENT TO THE PROPOSED LOCATION.
- SEAL ALL REDUNDANT & NEW OPENINGS WITH FIRE RATED MATERIAL. PATCH / FIX / PAINT WALLS OR DOORS TO MATCH EXISTING.
- CONTRACTOR TO REVIEW CONDITION OF THE EXISTING SPACE AND INCLUDE FOR RELOCATION /REMOVAL AND RE-INSTALLATION OF EXISTING PIPES, EQUIPMENTS, CONDUITS, WIRING, LIGHTING, CEILING, ETC IF REQUIRED TO ALLOW INSTALLATION OF NEW PIPES AND CHIMNEYS.
- THE CONTRACTOR IS ALLOWED TO MAKE ANY CHANGES TO THE PIPING SYSTEM BASED ON THE FINAL SHOP DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR UPDATING THE DRAWINGS.
- THE CONTRACTOR SHOULD REVIEW THE EQUIPMENT'S ELECTRICAL PANEL AND ENSURE IT MATCHES THE BUILDING'S EXISTING ELECTRICAL POWER VOLTAGE. BASED ON ELECTRICAL DRAWINGS, THE CONTRACTOR CAN PROVIDE ANY MODIFICATION TO CONNECT TO THE EXISTING POWER. HAVE THE WORK INSPECTED AND CERTIFIED BY THE TSSA. AT THE END OF THE WORK, THE NEW PLANT SHALL BE FULLY TSSA-CERTIFIED.
- PROVIDE AND INSTALL NEW EQUIPMENTS AT LOCATION SHOWN AS PER EQUIPMENT SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTION. CONTRACTOR TO COORDINATE EXACT LOCATION ON SITE DEPENDING ON SITE CONDITIONS. COMMISSION THE NEW EQUIPMENTS AND SUBMIT THE REPORT FOR ENGINEERS REVIEW.
- CONTRACTOR TO ALLOW FOR ALL COSTS ASSOCIATED WITH HIRING FIRE WATCH PERSONNEL TO SUPERVISE THE FIRE HAZARD WHERE WELDING IS REQUIRED FOR CONSTRUCTION / INSTALLATION OF SUPPORTS, DUCTWORK, ETC.
- REFER TO STRUCTURAL DRAWINGS FOR LINTEL DETAIL. PATCH AND WATER SEAL ALL WALL PENETRATIONS.
- HAVE THE WORK INSPECTED AND CERTIFIED BY THE TSSA. AT THE END OF THE WORK, THE NEW PLANT SHALL BE FULLY TSSA-CERTIFIED.
- CONTROL CONTRACTOR TO MODIFY EXISTING PANELS AS REQUIRED.
- THE CONTRACTOR IS RESPONSIBLE FOR UPDATING THE DRAWINGS.
- ALL PIPING MUST BE SUPPORTED FROM ROOF/CEILING STRUCTURE, THE INSTALLATION DETAILS MUST BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
- ALL DIMENSIONS SHALL BE CHECKED BEFORE CONSTRUCTION BY CONTRACTOR.
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW PIPING AND CHIMNEYS WILL BE INSTALLED.
- INCLUDE FOR CUTTING / PATCHING / PAINTING WALLS, ROOF, FENCE AND DOOR IF REQUIRED FOR INSTALLATION OF NEW SERVICES.
- MECHANICAL CONTRACTOR SHALL CONNECT ALL NEW PIPING AND EQUIPMENT TO THE BUILDING GROUNDING SYSTEM.
- MECHANICAL CONTRACTOR SHALL ALL PIPING ON THE FLOOR REPRESENTS A TRIPPING HAZARD, PROVIDE CHECKERED ALUMINUM RAMP COVERS.

FAN SCHEDULE

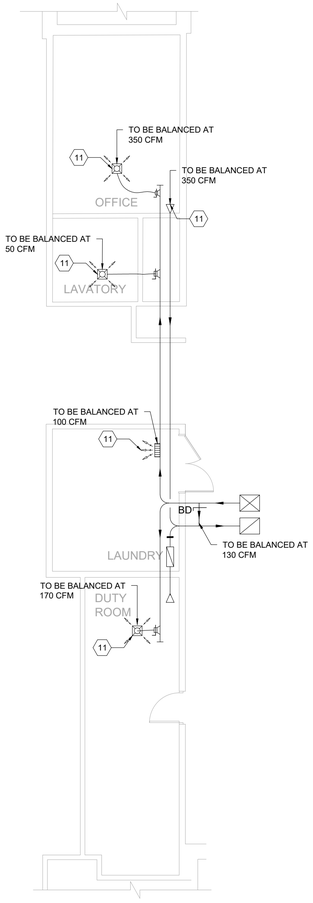
TAG	SERIES MODEL	QUANTITY	MANUFACTURER	AIR FLOW (CFM)	POWER (WATTS / AMP)	VOLT-PH-HZ	RPM	STATIC PRESSURE (IN)
EF-2	SP-A390 CENTRIFUGAL CEILING EXHAUST AND INLINE CABINET- WITH BACK DRAFT DAMPER (8"x8")	1	GREENHECK / OR EQUAL	260	135 / 1.34	115-1-60	1350	0.61
EF-3	SP-A390-VG CENTRIFUGAL CEILING EXHAUST AND INLINE CABINET- WITH BACK DRAFT DAMPER (8"x8")	1	GREENHECK / OR EQUAL	350	100 / 1.46	115-1-60	1340	0.50
	NOTES: 1-THE EXHAUST FAN # 2,3 WILL BE CONTROLLED BY A FLUSH MOUNT KEYED SWITCH.							

EXTRACTOR SCHEDULE

TAG	EQUIPMENT DESCRIPTION	MANUFACTURER	SERIES MODEL	QUANTITY	UNIT CAPACITY LBC/PIECES	DIMENSIONS (INCH)	VOLT-PH-HZ
WS-1	WASHER EXTRACTOR	CIRCUL-AIR CORP	CACHMHD-55	1	55 / 11	34.3 X 44.8 X 56.1	208-1-60

EXTRACTOR SCHEDULE

TAG	EQUIPMENT DESCRIPTION	MANUFACTURER	SERIES MODEL	QUANTITY	AIR FLOW (CFM)	VENT REQUIREMENT	VOLT-PH-HZ
DC-1	DRYING CABINET	CIRCUL-AIR CORP	E-613	1	900	Ø14"	208-1-60



2 BALANING

Scale: N.T.S

GENERAL NOTES:

- ALL EXISTING SERVICES SHOWN HAS BEEN EXTRACTED FROM AVAILABLE BASE BUILDING DRAWINGS AND RANDOM SITE SURVEYS. NOT ALL EXISTING SERVICES/SITE INFORMATION HAS BEEN SHOWN NOR CAN THE INFORMATION SHOWN BE GUARANTEED FOR PRECISE ACCURACY. CONTRACTOR SHALL THEREFORE VISIT THE SITE PRIOR TO SUBMITTING A BID TO SATISFY THEMSELVES THAT ALL WORK SHOWN AND/OR SPECIFIED CAN BE CARRIED OUT IN ACCORDANCE WITH THE CONTRACT DOCUMENT.
- ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- ALL CUTTING/PATCHING/CORING OF WALLS AND FLOORS REQUIRED TO ACCOMMODATE NEW MECHANICAL WORK IS TO BE ARRANGED AND PAID FOR BY MECHANICAL CONTRACTOR. X-RAY FLOORS/CONCRETE WALLS PRIOR TO CORING/CUTTING.
- THE MECHANICAL DRAWINGS DO NOT SHOW ALL THE ARCHITECTURAL AND STRUCTURAL DETAILS. ANY SPECIFIC INFORMATION INVOLVING ACCURATE MEASURING OF THE BUILDING SHALL BE TAKEN FROM THE BUILDING DRAWINGS OR AT THE BUILDING. MAKE WITHOUT ADDITIONAL CHARGE, ANY NECESSARY CHANGES OR ADDITIONS TO THE RUNS OF DUCTS AND PIPES TO ACCOMMODATE THE ABOVE CONDITIONS.
- COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- ALL ABANDONED PIPING WHICH ARE NO LONGER BEING USED SHALL BE REMOVED FROM THE SITE. CONTRACTOR SHALL ENSURE PRIOR TO REMOVAL OF ANY PIPING THAT THE SYSTEM IS COMPLETELY ISOLATED AND IS NOT ALIVE.
- WORK SHALL INCLUDE STARTUP OF ALL SYSTEMS, FURNISHING OF OPERATING AND MAINTENANCE INSTRUCTIONS, AND ONE (1) YEAR GUARANTEE, COMMENCING ON THE DATE OF ACCEPTANCE BY THE TENANT.
- CONNECTIONS BETWEEN EQUIPMENTS (SINK AND WASHER EXTRACTOR) AND PIPES SHALL BE MADE WHIT FLEXIBLE CONNECTOR.
- SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING STRUCTURE.
- ACCORDING TO THE MECHANICAL DRAWING, WASHER EXTRACTOR IS TO BE MOUNTED ON NEW HOUSEKEEPING PADS REEFER TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- CONTRACTOR TO INCLUDE REMOVAL OF WALL/ T-BAR OR DRY WALL CEILINGS AND REINSTALLING & PAINTING TO MATCH EXISTING WHERE REQUIRED FOR REMOVAL OF EXISTING PIPING AND INSTALLATION OF NEW PIPING.
- THE CONTRACTOR IS ALLOWED TO MAKE ANY CHANGES TO THE PIPING AND DUCTWORK SYSTEM BASED ON THE FINAL SHOP DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR UPDATING THE DRAWINGS.
- ALL DIMENSIONS SHALL BE CHECKED BEFORE CONSTRUCTION BY CONTRACTOR.
- CONTRACTOR SHALL VISIT THE SITE TO DETERMINE THE EXTENT OF THE ALL EXISTING CONDITIONS PRIOR TO SUBMITTING ANY QUOTATION.
- ANY DISCREPANCIES BETWEEN DRAWINGS AND SPECIFICATIONS AND/OR EXISTING CONDITIONS ARE TO BE REFERRED TO CONSULTANT FOR INSTRUCTIONS BEFORE ANY WORK IS BEGUN.
- COORDINATE ALL CORE DRILLING AS REQUIRED. PROVIDE SLAB XRAY AND /OR SCANNING AS REQUIRED TO CONFIRM THE FLOOR OR WALL OPENING.
- COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- THE CONTRACTOR IS TO PROVIDE YEARLY SCHEDULE TAG ON ALL OF THE VALVES.
- WHILE EVERY EFFORT HAS BEEN MADE TO SHOW THE FULL EXTENT OF THE MODIFICATIONS, PIPING OFFSETS AND INTERFERENCES WITH OTHER SERVICES HAVE NOT BEEN SHOWN. THE CONTRACTOR IS REQUIRED TO INSPECT THE SITE TO CONFIRM THE MODIFICATIONS CAN BE CARRIED OUT AND TO MEET THE DESIGN INTENT AND ALLOW FOR RE-ROUTING OR RELOCATION / REMOVAL & REINSTALLATION OF EXISTING SERVICES.
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW PIPING AND DUCTWORK WILL BE INSTALLED.

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0	2024-MAR-15	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering
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TEL: (647) 478-5156
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Client

Oshawa

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

MECHANICAL SERVICES
VENTILATION SYSTEM LAYOUT
FLOOR PLAN

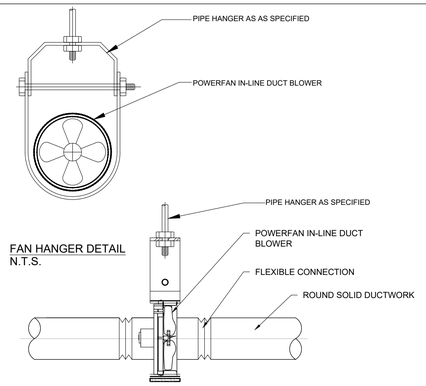
DATE:	2024-MAR-07
DESIGNED BY:	R.A
DRAWN BY:	R.A
APPROVED BY:	M.A
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
M.AKHAVANBAZAT
100088319
2025-AUG-22
PROVINCE OF ONTARIO

Drawing No.

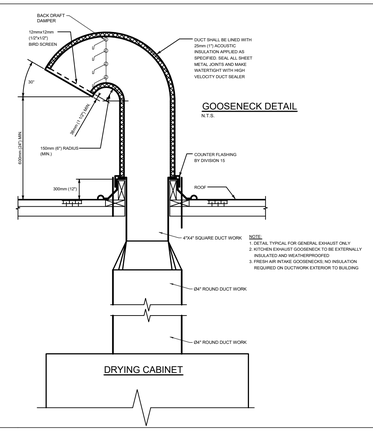
M-301



- REFER TO STRUCTURAL DRAWING S-01 FOR FAN HANGER DETAIL

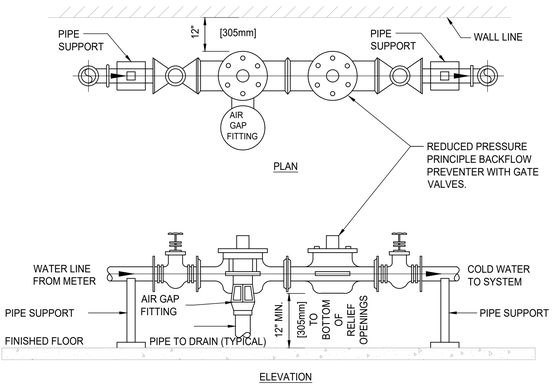
1 ROOF EXHAUST FAN DETAIL

Scale: N.T.S



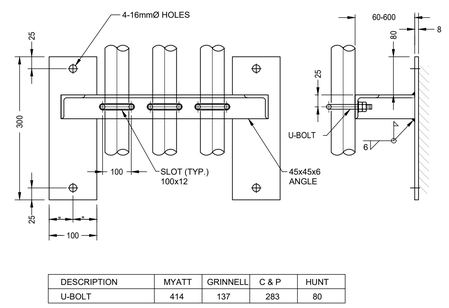
2 GOOSENECK DETAIL

Scale: N.T.S



3 REDUCED PRESSURE BACKFLOW PREVENTER WITH GATE VALVES

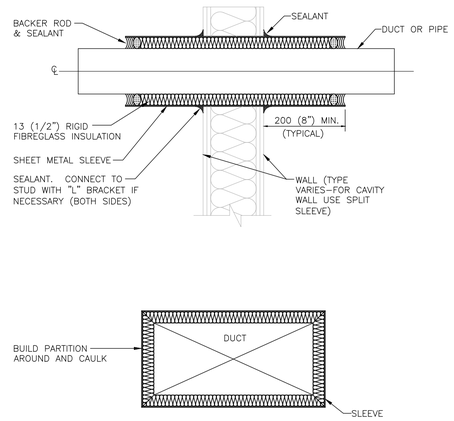
Scale: N.T.S



DESCRIPTION	MYATT	GRINNELL	C & P	HUNT
U-BOLT	414	137	283	80

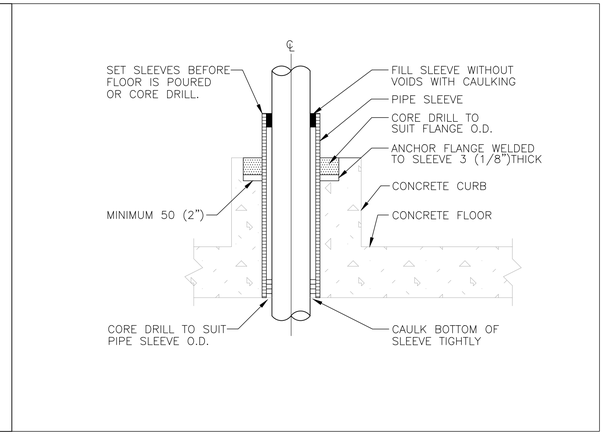
4 PS3-09 WALL MOUNTED MULTIPLE PIPE SUPPORT

Scale: N.T.S



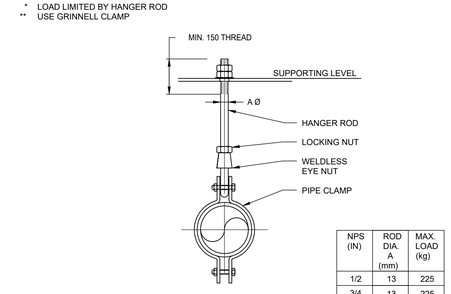
5 CONCEPT FOR SEALING DUCT PENETRATION THROUGH WALLS

Scale: N.T.S



6 WATERPROOF PIPE SLEEVE THROUGH CONCRETE FLOOR

Scale: N.T.S

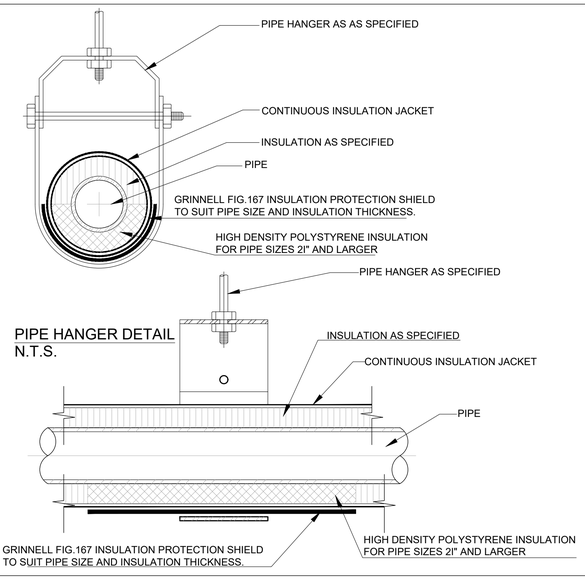


NPS (IN)	ROD DIA. A (mm)	MAX. LOAD (kg)	
1/2	13	225	
3/4	13	225	
1	13	225	
1 1/2	13	225	
2	13	455	
3	13	455	
4	13	455	
6	13	514	*
8	16	725	
10	19	1090	
12	22	1714	*
14	25	2250	*
16	28	2826	*
18	31	3629	*
20	31	3629	*
24	38	5275	**

DESCRIPTION	MYATT	GRINNELL	C & P	HUNT
PIPE CLAMP - 1/2 TO 10	133	212	175	60
PIPE CLAMP - 12 TO 16	134	216	298	60H
PIPE CLAMP - 18 TO 24	-	216	-	-
MACHINE ROD OR	-	-	133	-
ALL-THREAD ROD	432	146	94	99
WELDLESS EYE NUT	480	290	279	88

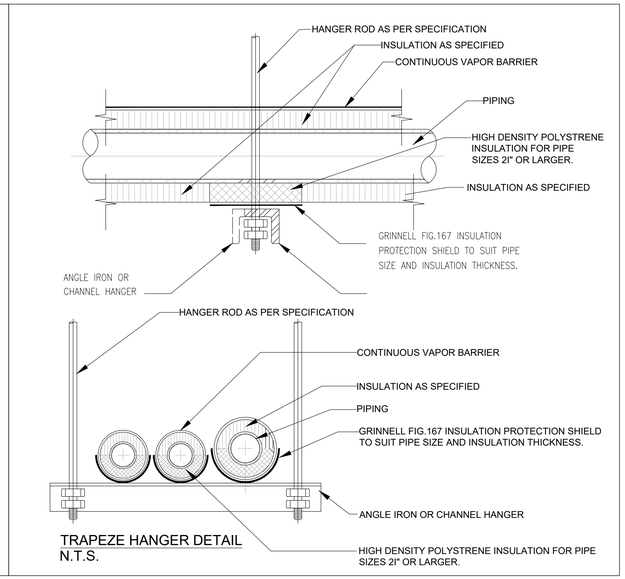
7 PS5-01 HANGER ROD AND CLAMP ASSEMBLY

Scale: N.T.S



8 PIPE HANGER DETAIL

Scale: N.T.S



9 TRAPEZE HANGER DETAIL

Scale: N.T.S

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Key Plan

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250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
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Client

Oshawa

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

MECHANICAL SERVICES
STANDARD DETAILS

DATE:	2024-MAR-07
DESIGNED BY:	R.A
DRAWN BY:	R.A
APPROVED BY:	M.A
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
M.AKHAVANBAZAZ
100088319
2025-AUG-22
PROVINCE OF ONTARIO

Drawing No.

M-700

GENERAL NOTES

1. THESE GENERAL NOTES APPLY TO ALL DRAWINGS.

2. WHERE USED, INDIVIDUAL WORDINGS SUCH AS 'SUPPLY', 'INSTALL', OR 'PROVIDE' SHALL MEAN TO INCLUDE ALL LABOR, MATERIAL AND SERVICES NECESSARY TO SUPPLY, INSTALL AND CONNECT THE PRODUCTS AND SERVICES SPECIFIED, UNLESS NOTED OTHERWISE.

3. IT IS MANDATORY FOR THE ELECTRICAL CONTRACTOR TO VISIT THE SITE PRIOR TO BIDDING AND REVIEW EXISTING CONDITIONS AND DEMOLITION SCOPE OF WORK TO SUIT EXISTING ARCHITECTURAL, STRUCTURAL AND MECHANICAL SITE CONDITIONS, DRAWINGS. SPECIFICATIONS AND ALL CONTRACT DOCUMENTS. NO EXTRA WILL SUBSEQUENTLY BE ALLOWED TO COVER ANY SUCH ERROR, OMISSION AND/OR OVERSIGHT FOR NOT HAVING MADE A THOROUGH INSPECTION OF THE GROUNDS. EXISTING CONDITIONS, DRAWINGS. SPECIFICATION AND DESIGN INTENT. THE ELECTRICAL CONTRACTOR SHALL NOTE THAT THE EXISTING BUILDING WILL REMAIN IN OPERATION THROUGHOUT DEMOLITION/CONSTRUCTION. ALLOW FOR ANY WORK REQUIRED TO BE DONE WHICH MAY AFFECT POWER SUPPLY AND OPERATION OF THE BUILDING TO BE CARRIED OUT AFTER HOURS OR AT A TIME CONVENIENT TO THE BUILDING MANAGEMENT. PROVIDE TEMPORARY SERVICES AS REQUIRED TO ENSURE CONTINUED OPERATION AT ALL TIMES.

4. CAREFULLY EXAMINE OTHER EXISTING UTILITY LINES SUCH AS GAS, WATER ETC. PRIOR TO START THE ELECTRICAL CONSTRUCTION WORKS AND COORDINATE WITH OTHER TRADES AND REPORT OF ANY DISCREPANCY PRIOR TO PROCEEDING.

5. ALL EXISTING SERVICES THAT ARE NOT SHOWN ON THE DRAWINGS AND ARE EXPOSED DURING DEMOLITION/CONSTRUCTION SHALL BE VERIFIED BY THE CONTRACTOR AS TO THE SOURCE AND ROUTING AND SHALL BE REPORTED TO THE CONSULTANT WITH PROPOSED RESOLUTIONS.

6. THESE DRAWINGS SHALL BE READ & PRICED IN CONJUNCTION WITH ARCHITECTURAL, MECHANICAL. AND STRUCTURAL DRAWINGS AND SPECIFICATIONS AS WELL AS ALL OTHER DOCUMENTS FORMING THIS BID. INCLUDE FOR THE SUPPLY AND INSTALLATION OF POWER, SYSTEMS, AND LIGHTING AS PER THE COMPLETE CONSTRUCTION DOCUMENTS. NO EXTRA COST WILL BE ACCEPTED IN FAILURE TO OBTAINING AND/OR REVIEW OF SUCH DOCUMENTS. REFER TO ARCHITECTURAL. ELECTRICAL. STRUCTURAL AND MECHANICAL LAYOUTS IN CONJUNCTION FOR EXACT LOCATION OF ALL EQUIPMENT. REPORT ANY DISCREPANCIES TO THE ELECTRICAL ENGINEER PRIOR TO COMMENCING WORK. NO EXTRA WILL BE PROVIDED AS A RESULT OF A FAILURE TO DO SO.

7. IT IS MANDATORY THAT ELECTRICAL WORK CONFORM TO ALL APPLICABLE CODES (INCLUDING THE ONTARIO BUILDING, FIRE, AND ONTARIO ELECTRICAL SAFETY CODE), BASE BUILDING (BOARD) STANDARDS, AND THE STANDARDS SET BY ANY AND ALL LOCAL AUTHORITIES HAVING JURISDICTION.

8. LOCATIONS OF ALL NEW DISCONNECT SWITCHES AND STARTERS SHALL BE CONFIRMED WITH DIVISION 15 PRIOR TO INSTALLATION. STARTERS FOR EXHAUST FANS SHALL BE SUPPLIED AND INSTALLED BY DIV. 16.

9. ALL ELECTRICAL WORK SHALL BE INSPECTED BY THE ELECTRICAL SAFETY AUTHORITY (ESA). ARRANGE AND PAY FOR ALL INSPECTIONS REQUIRED FOR THE DURATION OF THE PROJECT.

10. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR HIRING A FIRE WATCH AS REQUIRED BY CODE. LOCAL AUTHORITIES HAVING JURISDICTION. AND DURING ANY ALTERATION OR DOWNTIME OF THE ARE ALARM SYSTEM. FIRE WATCH SHALL BE PRESENT THROUGHOUT THE DOWNTIME DURATION.

11. DURING CONSTRUCTION, IT IS CRITICAL THAT THE ELECTRICAL CONTRACTOR COORDINATES ITS WORK WITH ALL OTHER TRADES. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR REVIEWING THE SCOPE OF WORK OF OTHER TRADES (INCLUDING, BUT NOT LIMITED TO. ARCHITECTURAL. MECHANICAL, STRUCTURAL. MILLWORK. ETC.) IN CONJUNCTION WITH THE PROPOSED ELECTRICAL SCOPE OF WORK. THE ELECTRICAL CONTRACTOR SHALL ESPECIALLY REVIEW MECHANICAL CONVECTOR AND NEW MILLWORK LOCATIONS AND IDENTIFY ANY POSSIBLE INTERFERENCES WITH THE PROPOSED ELECTRICAL WORK PRIOR TO ROUGH-IN (I.E. RECEPTACLE LOCATIONS SHALL BE SHIFTED FROM THE PROPOSED LOCATION TO ANOTHER LOCATION SHOULD THE CONTRACTOR FIND OUT DURING COORDINATION THAT MECHANICAL CONVECTORS ARE BEING INSTALLED IN A CERTAIN LOCATION. SIMILARLY. RECEPTACLE HEIGHTS SHALL BE ADJUSTED IN THE EVENT THAT NEW. PROPOSED MILLWORK MIGHT BLOCK PROPOSED RECEPTACLES. NO EXTRA WILL BE PERMITTED OF AN ERROR RELATED TO A LACK OF COORDINATION ON SITE.

12. THE ELECTRICAL CONTRACTOR SHALL LABEL ALL NEW AND EXISTING LIGHT SWITCHES. RECEPTACLES AND JUNCTION BOXES COVERPLATES WITH THE PANEL NAME AND BREAKER IT IS FED FROM. ALL LABELING OF ELECTRICAL DEVICES SHALL BE DONE SO WITH A LABELMAKER ONLY. NO HAND WRITTEN LABELS WILL BE PERMITTED.

13. WHERE NEW PARTITIONS ARE BEING CONSTRUCTED. ALL WIRING AND RACEWAYS SHALL BE EMBEDDED IN THE CONSTRUCTION OF THE NEW WALLS AND ALL BACK BOXES SHALL BE RECESSED. WHERE NEW DEVICES/SYSTEMS ARE PROPOSED ON EXISTING BLOCK WALLS, UTILIZE WIREMOLD 500/700 SERIES AS RACEWAY FOR ALL NEW PROVIDE WIREMOLD BACKBOXES FOR SURFACE MOUNTED, INTERIOR APPLICATIONS. THE USE OF SHEET METAL BOXES WILL NOT BE PERMITTED. WHENEVER POSSIBLE, ALL CONDUIT INSTALLATION AT FRONT OF HOUSE (FOH: OFFICES, CORRIDORS, STAIRCASE, GYMNASIUM, CLASSROOMS, ETC.) TO BE CONCEALED IN FALSE CEILINGS AND WALLS. ALL EXPOSED CONDUITS AT FOH TO BE PAINTED SAME COLOUR AS ARCHITECTURAL FINISH TO BLEND IN. BACK OF HOUSE (BOH: ELECTRICAL / MECHANICAL / FAN ROOMS, ETC.) CONDUIT INSTALLATION TO RUN EXPOSED WITHOUT PAINT.

14. IN THE EVENT OF ANY DISCREPANCY BETWEEN THE ELECTRICAL DRAWINGS AND SPECIFICATIONS, ALLOW FOR THE HIGHEST-PRICED OPTION IN THE TENDER PRICE.

15. ALL WIRING USED ON THIS PROJECT SHALL BE RUN IN RACEWAYS. NO USE OF ARMOURED (BX) CABLE WILL BE PERMITTED WITH THE EXCEPTION OF RUNS NOT TO EXCEED 5' BETWEEN A LIGHT FIXTURE AND THE RESPECTIVE JUNCTION BOX.

16. COORDINATE DISRUPTION OF ELECTRICAL SERVICES (FIRE ALARM, POWER, ETC.) WITH THE PROJECT SUPERVISOR WITH AT MINIMUM 5 DAYS ADVANCED NOTICE. SEEK APPROVAL PRIOR TO EXECUTION.

17. SEAL AND FIRESTOP ALL WALL, FLOOR, AND ROOF PENETRATIONS THROUGH FIRE RATED ASSEMBLIES.

18. MAKE GOOD ALL SURFACES, INCLUDING CORE HOLES FROM DEMOLISHED OR RELOCATED EQUIPMENT/DEVICES, AFTER COMPLETION OF WORK.

19. ALL MODIFICATIONS TO THE FIRE ALARM SYSTEM SHALL BE COMPLETED BY THE BASE BUILDING FIRE ALARM CONTRACTOR/VENDOR/MANUFACTURER. NEW FIRE ALARM DEVICES SHALL MATCH EXISTING. CONNECT NEW FIRE ALARM DEVICES TO EXISTING CIRCUITS WITH SPARE CAPACITY. PROVIDE NEW FIRE ALARM CIRCUITS AS REQUIRED. ALLOW FOR ALL ASSOCIATED COSTS AND ADDITIONAL COMPONENTS INCLUDING, BUT NOT LIMITED TO; ASSOCIATED EQUIPMENT, DEVICES, PROGRAMMING, TESTING, AND VERIFICATION TO MAKE SYSTEM OPERATIONAL AND CODE COMPLIANT. FIRE ALARM SYSTEM SHALL BE INSTALLED AS PER LATEST EDITION OF CAN/ULC-S524. FIRE ALARM VERIFICATION SHALL BE COMPLETED AS PER LATEST EDITION OF CAN/ULC-S537.

20. REWORK AND EXTEND EXISTING FEEDERS, CONDUITS AND JUNCTION BOXES AS REQUIRED TO ACCOMMODATE NEW INSTALLATIONS.

21. ALLOW FOR SCANNING, X-RAY, AND CORING AS REQUIRED.

22. THE CONTRACTOR SHALL REPLACE OR REPAIR ANY ITEMS WHICH ARE DAMAGED DUE TO THIS WORK AT NO EXTRA COST TO THE BUILDING OWNER.

23. CONFIRM EXACT POWER REQUIREMENTS AND RECEPTACLE TYPES FOR SPECIAL EQUIPMENT WITH MANUFACTURER PRIOR TO INSTALL. PROVIDE HARDWIRE CONNECTION IN LIEU OF RECEPTACLES OR VICE VERSA, AS REQUIRED.

24. ALL CONDUIT INSTALLATION AT ROOF LEVEL TO BE RIGID METTALIC CONDUIT. ALL INDOOR CONDUITS TO BE EMT. CONDUIT INSTALLATION AT ROOFTOP TO BE SUPPORTED WITH UNISTRUTS MOUNTED ON POLYCARBONATE BASE ROOFTOP SUPPORT SYSTEM THAT DOES NOT REQUIRE ROOFTOP MEMBRANE PENETRATION.

25. ALL FINAL CONNECTIONS TO MECHANICAL EQUIPMENT SHALL BE IN LIQUID TIGHT FLEXIBLE.

26. PROVIDE UPDATED, TYPE-WRITTEN PANEL DIRECTORIES AFTER COMPLETION OF WORK OF AFFECTED PANELS.

27. PROVIDE LAMACOID NAME PLATES WITH ENGRAVED LETTERS 0.4" (10 MM) HIGH, FOR ELECTRICAL EQUIPMENT BUT NOT LIMITED TO PANELS, SWITCHBOARDS, TRANSFORMERS, DISCONNECT SWITCHES, BREAKERS, CONTACTORS, RELAY PANELS, STARTERS, TVSS AND MISCELLANEOUS PANELS.
    27.1. NAME OF THE EQUIPMENT / NAME OF THE SUPPLY SOURCE
    27.2. RATED LOAD AMP (A) OR HORSEPOWER (HP) – VOLTAGE (V) – NUMBER OF PHASE (Ø) – NUMBER OF WIRE (W) – FREQUENCY (HZ).

28. UPON COMPLETION OF CONTRACT WORK, PRIOR TO SUBSTANTIAL PERFORMANCE INSPECTION, CONTRACTOR SHALL SUBMIT AS-BUILT DRAWINGS TO THE CONSULTANT/ENGINEER FOR REVIEW AND APPROVAL. CONTRACTOR SHALL SUBMIT HARD COPY AND CAD FORMAT 2004 VERSION UPDATED AS-BUILT DRAWINGS AS PART OF CLOSEOUT DOCUMENT.

29. PROVIDE CLOSEOUT DOCUMENTS WHICH INCLUDE 3 CDS OF ELECTRONIC COPY AND 1 3-RING BINDER HARD COPY OF CLOSEOUT DOCUMENTS WHICH SHALL INCLUDE BUT NOT LIMITED TO FOLLOWING:- ESA FINAL INSPECTION CERTIFICATE, STAMPED APPROVED SHOP DRAWINGS, WARRANTY LETTER, TEST REPORT/CERTIFICATE FROM THE MANUFACTURER, FIRE ALARM VERIFICATION REPORT, O & M MANUAL OF EQUIPMENT (IF ANY) AND AS-BUILT DRAWINGS (AUTOCAD 2004 AND PDF FORMAT)

30. WHERE EMT CONDUIT IS REQUIRED, PROVIDE COMPRESSION TYPE COUPLINGS (CAST FITTING AND SET-SCREW NOT ACCEPTABLE) AND WATERTIGHT GLAND CONNECTOR WITH FACTORY INSULATED THROATS AND TO BE FORGED STEEL.

31. THE CONTRACTOR SHALL REVIEW CONDITION OF EXISTING CEILING TILE(S) AND DRYWALL CEILING OF AFFECTED AREAS AND THEN REPORT FINDINGS E.G DAMAGED/QUESTIONED CEILING TILE(S) AND DRYWALL ETC. TO THE PROJECT SUPERVISOR/ENGINEER IN 2 WEEK ONCE TENDER AWARDED, OTHERWISE REPLACEMENT OF DAMAGED/QUESTIONED DRYWALL CEILING AND/OR CEILING TILE(S) SHALL BE DONE BY THE CONTRACTOR AFTER COMPLETION OF SYSTEM INSTALLATION. NO EXTRAS TO THE SCHOOL IS PERMITTED.

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	GENERAL
E, EX	Existing to Remain
ER	Existing to be demolished/removed
RR	Existing to be removed and reconnected
N	New material/equipment/services
REL	Material/equipment/services to be relocated.
REP	Existing in Relocated Position
WG	Wire Guard
U/F	Under Raised Floor
WP	Weather Proof/Water proof
NIC	Not In Contract
GFCI, GFI	Ground Fault Circuit Interrupter
VFD	Variable Frequency Drive
	LIGHTING FIXTURES Refer to Lighting Fixture Schedule for exact fixture specifications.
	Denotes new fluorescent luminaire.
	As above, connected to night light circuit.
	Luminaires ceiling or wall mounted respectively.
	As above, connected to night light circuit.
	Square aperture pot light.
	Fluorescent strip light
	Fluorescent strip light
	As above, connected to night light circuit.
NL	Connected to light light circuit.
	EMERGENCY LIGHTING
	Ceiling or wall mounted illuminated exit sign. Shaded area indicates illuminated face. Provide directional arrows as indicated on plans.
	Ceiling or wall mounted illuminated exit sign combo unit c/w emergency heads. Shaded area indicates illuminated face. Provide directional arrows as indicated on plans.
	Combination emergency lighting & battery unit. BU-X indicates battery unit # for remote heads to be connected to.
BU-X	Emergency lighting battery unit. BU-X indicates battery unit # for remote heads to be connected to.
	One and two head wall mounted emergency lighting remote units.
	One and two head ceiling mounted emergency lighting remote units.
EM	Denotes 'EMERGENCY'
	POWER EQUIPMENT
	1-phase direct connection point/outlet as noted.
	3-phase direct connection point/outlet as noted.
	Single phase motor, HP (kW) as noted.
	Three phase motor, HP (kW) as noted.
	DISTRIBUTION EQUIPMENT
	Surface mounted distribution panelboard.
	Surface mounted distribution panelboard.
	Flush mounted distribution panelboard.
	Transformer
	Unfused disconnect switch, size as noted.
	Fused disconnect switch, size and fusing as noted.
	Manual motor starter.
	Contactor or starter.
	Magnetic motor starter.
	Combination motor starter.
	FIRE ALARM / FIRE DETECTION
	Manually operated fire alarm pull station.
B	Fire alarm bell, ceiling mounted
	Fire alarm bell, wall mounted.
	Surface mounted fire alarm speaker in garage
H	Fire alarm horn
	Fire alarm horn
H	Fire alarm mini-horn
	Fire alarm strobe.
	Combination horn/strobe
S	Fire alarm ceiling mounted speaker
S	Fire alarm ceiling mounted speaker
HS	Fire alarm wall mounted speaker
	Heat detector.
	Heat detector, 94 degree C fixed temp.
	Heat detector, 58 degree C fixed temp & rate or rise.
	Photoelectric smoke detector.
	Ionization smoke detector.
m	Duct smoke detector.
	Relay Module

This legend is generic. All symbols listed may not be applicable for this project. Refer to floor plans to determine used devices and equipment.

	LIGHTING CONTROLS
	Single pole, single throw toggle switch c/w coverplate.
	Single pole, single throw toggle switch with two gang coverplate
	Single pole, single throw toggle switch with three gang coverplate
	Three-way switch.
	Four-way switch.
	Dimmer switch. 1500W rated. Provide dimming ballast for fluorescent fixtures.
	LV Master Switch
P U	Wall mounted occupancy sensor. P denotes Passive Infrared, U denotes Ultrasonic, PU denotes dual technology.
	Ceiling mounted occupancy sensor. P denotes Passive Infrared, U denotes Ultrasonic, D denotes Dual Passive Infrared/Ultrasonic.
	OTHER CONTROLS
	Fan switch
	Key Switch
	Switch c/w Pilot Light
	POWER RECEPTACLES AND BOXES
	120V U-ground duplex receptacle.
	120V U-ground quad receptacle.
	120V U-ground duplex Separate Circuit receptacle
	120V U-ground Isolated Ground (IG) Circuit duplex receptacle.
	120V Duplex receptacle w/ GFI
	120V U-ground duplex dedicated receptacle c/w separate neutral run from each panel to each receptacle.
	20A-1P, NEMA 5-20A duplex receptacle
	Special Receptacle. Verify outlet requirements prior to rough-in.
	120V U-ground duplex receptacle split receptacle mounted above counter top as instructed by Designer on site.
	3-Pole Receptacle as indicated.
	Clock receptacle
	120V U-ground duplex receptacle mounted above counter top or as instructed on site.
	120V U-ground duplex receptacle on floor.
	120V U-ground duplex receptacle mounted on rear of rack in hot aisle mounted at typical wall mounted receptacle height.
	Floor monument.
JB PB	Junction box. Pull box.
	COMMUNICATION DEVICES AND ROUGH-INS
	Wall mounted data or telephone outlet.
	Wall mounted telephone outlet.
	Wall mounted data outlet.
	Any of the above devices mounted above counter top or as instructed on site.
	Wall mounted television outlet.
	SECURITY LEGENDS
CR	CARD READER
DA	SECURITY ALARM DOOR CONTACTS
ML	MAGNETIC LOCK
ES	ELECTRIC STRIKE
BF	BARRIER FREE DOOR OPERATOR ACTUATOR BUTTON

DRAWING SCHEDULE

REV.	DATE	DESCRIPTION
3	2025-JULY-21	RE-ISSUED FOR PERMIT &TENDER
2	2025-APR-23	RE-ISSUED FOR PERMIT &TENDER
1	2024-APR-12	ISSUED FOR TENDER
0	2024-MAR-15	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering
250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL: (647) 478-5156
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Client

Oshawa®

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

ELECTRICAL SERVICES
LEGEND AND SPECIFICATIONS

DATE:	2024 - MAR - 07
DESIGNED BY:	F.A.
DRAWN BY:	F.A.
APPROVED BY:	J.E.
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
O. ELOWE
100143577
2025-07-21
PROVINCE OF ONTARIO

Drawing No.

E-1

MECHANICAL EQUIPMENT WIRING SCHEDULE

EQUIPMENT ID	EQUIPMENT DESCRIPTION	LOCATION	STARTER TYPE	MCA/HP/KW	VOLTS/PH./FREQ	BREAKER SIZE OR FUSE SIZE	FEEDER SIZE	PANEL AND CCT. NOS.	REMARKS	FIRE ALARM FAN SHUTDOWN [AHU/EF ONLY]	PROVIDE DUCT SMOKE DETECTOR
EF-02	CEILING EXHAUST AND INLINE CABINET	DUTY ROOM	MAGNETIC STARTER	100W	115V/1Ø/60	15A-1P	2 #12AWG + G IN 21mmC	F.F. PANEL D CCT#9	ELECTRICAL DIVISION SHALL PROVIDE POWER CONNECTION TO THE UNIT. PROVIDE LOCAL DISCONNECT SWITCH.	-	-
EF-03	CEILING EXHAUST AND INLINE CABINET	LAUNDRY ROOM	MAGNETIC STARTER	100W	115V/1Ø/60	15A-1P	2 #12AWG + G IN 21mmC	F.F. PANEL D CCT#9	ELECTRICAL DIVISION SHALL PROVIDE POWER CONNECTION TO THE UNIT. PROVIDE LOCAL DISCONNECT SWITCH.	-	-
WS-1	WASHER EXTRACTOR	LAUNDRY ROOM	DIRECT CONNECT	1.05KW	208V/1Ø	15A-2P	2 #12AWG + G IN 21mmC	F.F. PANEL-D, CCT#44,46	ELECTRICAL DIVISION SHALL PROVIDE POWER CONNECTION TO THE UNIT. PROVIDE LOCAL DISCONNECT SWITCH.	-	-
DC-1	DRYING CABINET	LAUNDRY ROOM	DIRECT CONNECT	6KW	208V/1Ø	35A-2P	3 #8 AWG + G IN 21mmC	F.F. PANEL-D, CCT#52,54	ELECTRICAL DIVISION SHALL PROVIDE POWER CONNECTION TO THE UNIT. PROVIDE LOCAL DISCONNECT SWITCH.	-	-

1. PROVIDE POWER CONNECTION TO ALL MECHANICAL EQUIPMENT LISTED IN THE SCHEDULE FOR A FULLY OPERATIONAL SYSTEM. REFER TO MECHANICAL LAYOUTS AND SCHEDULES FOR EXACT LOCATION OF EQUIPMENT. PROVIDE SEPARATE BREAKER FOR INDIVIDUAL MECHANICAL EQUIPMENT. SIZE AS INDICATED IN THE SCHEDULE.

2. PROVIDE A LOCAL DISCONNECT SWITCH FOR ALL MECHANICAL EQUIPMENT IN THIS SCHEDULE, UNLESS IT IS NOTED THAT THE DISCONNECT SWITCH IS TO BE PROVIDED BY THE EQUIPMENT MANUFACTURER. DISCONNECT SWITCH SHALL BE SEPARATE FROM THE STARTER SERVING THE RESPECTIVE EQUIPMENT. NOTE THAT DISCONNECT SWITCHES ARE NOT ILLUSTRATED ON THE FLOOR PLAN (FOR CLARITY), HOWEVER MUST BE SUPPLIED AND INSTALLED BY DIVISION 26 FOR ALL MECHANICAL EQUIPMENT LISTED IN THE ABOVE SCHEDULE.

3. THE ELECTRICAL CONTRACTOR WILL BE RESPONSIBLE FOR REVIEWING ALL MECHANICAL SHOP DRAWINGS WITH RESPECT TO RELEVANT ELECTRICAL INFORMATION PRIOR TO THE SHOP DRAWINGS BEING SUBMITTED TO THE MECHANICAL AND ELECTRICAL ENGINEER FOR REVIEW. NO EQUIPMENT SHALL BE ORDERED PRIOR TO SUBMITTING SHOP DRAWINGS AND RECEIVING SHOP DRAWINGS BACK APPROVED BY BOTH THE MECHANICAL AND ELECTRICAL ENGINEER. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR WORKING WITH EACH MANUFACTURER OR MECHANICAL EQUIPMENT AND GATHERING THE 'MCA' AND 'MOP' OF ALL EQUIPMENT AND LISTING IT ON THE SHOP DRAWING FOR EACH MECHANICAL EQUIPMENT PRIOR TO SUBMITTING SHOP DRAWINGS FOR REVIEW.

4. THE STARTER LOCATION AND TYPE LISTED ABOVE IS FOR INFORMATION PURPOSES ONLY. THE CONTRACTOR SHALL REFER TO MECHANICAL DRAWINGS FOR EXACT EQUIPMENT LOCATIONS AND MANUFACTURER CUT SHEETS AND EQUIPMENT DATA SHEET FOR STARTER INFORMATION. NO EXTRA WILL BE PERMITTED AS A RESULT OF A FAILURE TO DO SO.

SCHEDULE OF LUMINAIRES

TYPE	SPECIFIED MANUFACTURER AND CATALOGUE NUMBER	PRODUCT DESCRIPTION	LAMP						MOUNTING				ACCEPTABLE MANUFACTURER	COMMENTS
			VOLTAGE	WATTAGE	TYPE	LUMEN OUTPUT	COLOR TEMPERATURE	CRI	RECESSED	SURFACE	SUSPENDED	WALL		
L1	LITHONIA LIGHTING (CPX 2X4 ALO8 (Mid) 80CRI SWW7 (50K) A12 MVOLT)	LED PANEL 2FTX4FT, SWITCHABLE LUMENS-4300LM, 80CRI, SWITCHABLE WHITE 50K, PRISMATIC A12 PATTERN, 120-277V	UNV	34.49	LED	4730	5000K	80	-	-	X	-	LITHONIA LIGHTING	FIXTURE WILL BE SUSPENDED AND NEED ORDERING ACCESSORIES
L2	LITHONIA LIGHTING (CPXIP 1X4 5000LM 80CRI 50K PC12M MVOLT)	CPX LED PANEL IP65 RATED 1X4, 5000LM, 80CRI, 5000K, IK10 POLYCARBONATE LENS PRISMATIC A12 PATTERN MATTE, 120-277V	UNV	42.25	LED	4709	5000K	80	X	-	-	-	LITHONIA LIGHTING	-

NOTE:
1. REFER TO SPECIFICATIONS FOR FURTHER DETAILS AND REQUIREMENTS.
2. REFER TO DRAWING NOTES FOR WIRE GUARD REQUIREMENTS.

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Key Plan

True North

Engineer Logo

Spectra Engineering
250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL: (647) 478-5156
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Client

Oshawa

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

ELECTRICAL SERVICES
MECHANICAL EQUIPMENT WIRING SCHEDULE

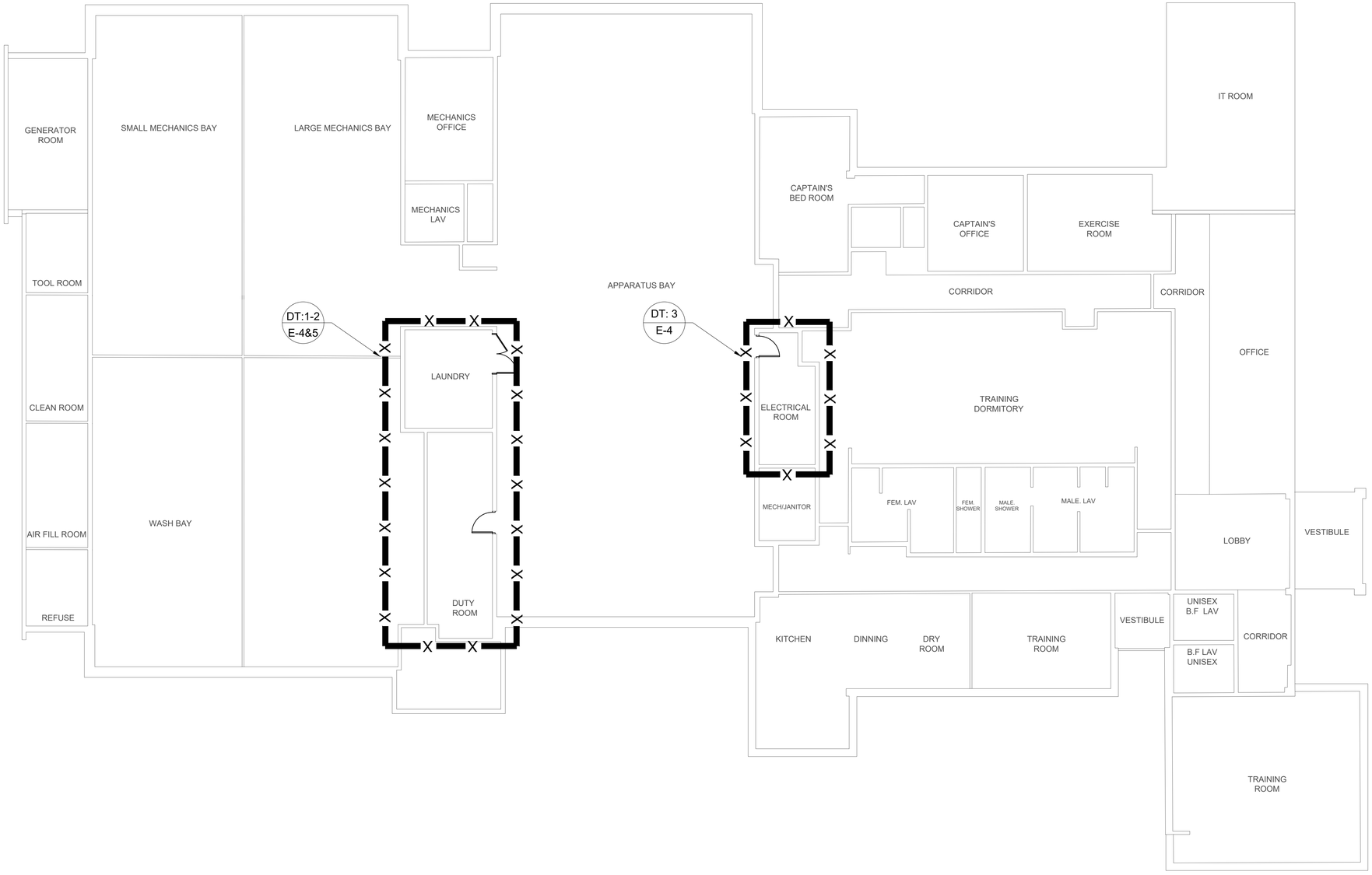
DATE:	2024 - MAR - 07
DESIGNED BY:	F.A.
DRAWN BY:	F.A.
APPROVED BY:	J.E.
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
O. ELOWE
100143577
2025-07-21
PROVINCE OF ONTARIO

Drawing No.

E-2



- MAIN FLOOR-KEY PLAN

Scale: NTS

REV.	DATE	DESCRIPTION
3	2025-JULY-21	RE -ISSUED FOR PERMIT & TENDER
2	2025-APR-23	RE -ISSUED FOR PERMIT & TENDER
1	2024-APR-12	ISSUED FOR TENDER
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Key Plan

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Drawing Overall Scale

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Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

ELECTRICAL SERVICES
MAIN FLOOR - KEY PLAN

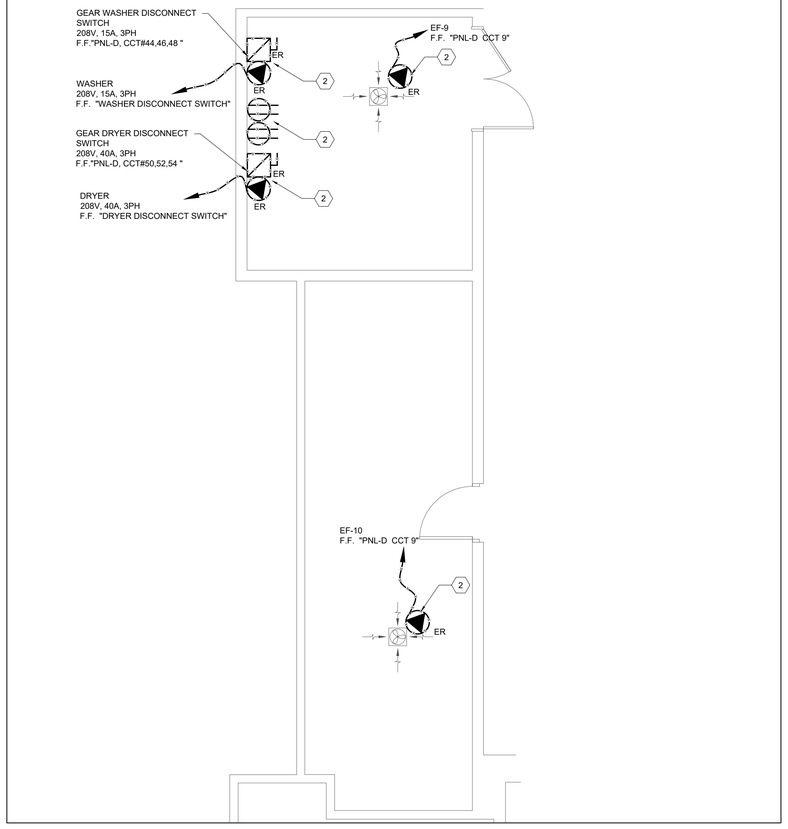
DATE:	2024 - MAR - 07
DESIGNED BY:	F.A.
DRAWN BY:	F.A.
APPROVED BY:	J.E.
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
O. ELOWE
100143577
2025-07-21
PROVINCE OF ONTARIO

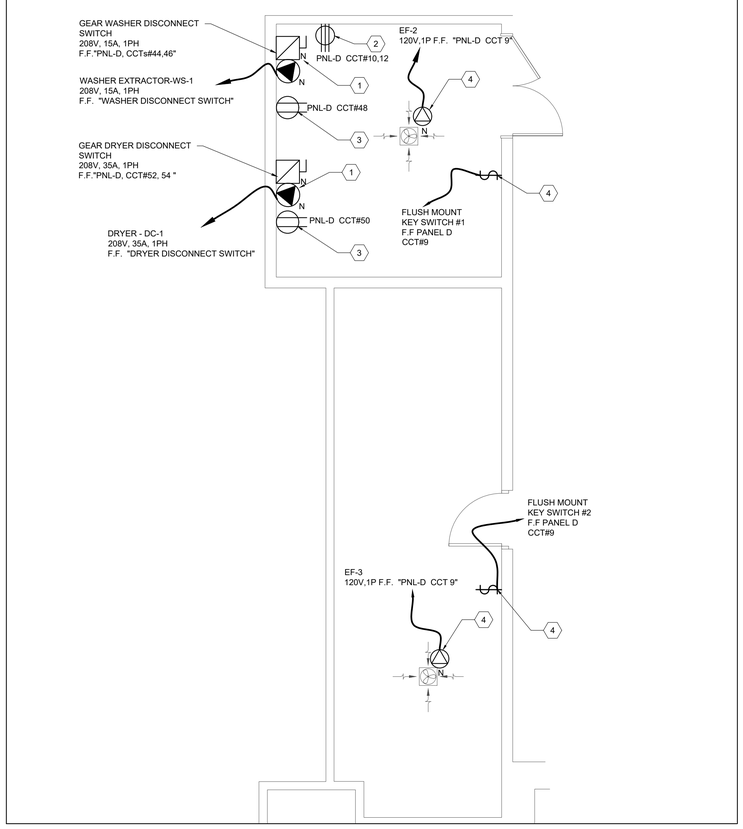
Drawing No.

E-3



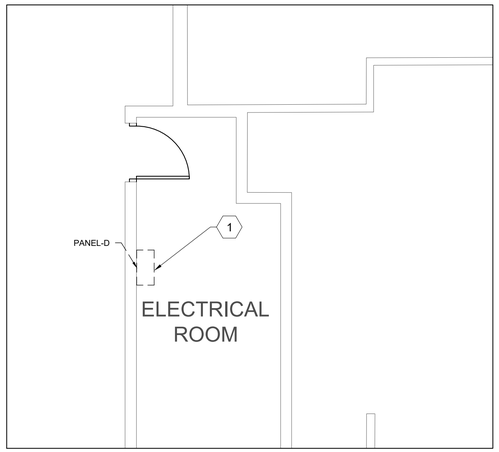
1 ELECTRICAL POWER - DEMOLITION

Scale: Scale: 1/4"=1'-0"



2 ELECTRICAL POWER - NEW WORK

Scale: Scale: 1/4"=1'-0"



3 EXISTING ELECTRICAL PANEL

Scale: Scale: 1/4"=1'-0"

DESIGN NOTES (DEMO/EXIST WORK):

1. NOTED EQUIPMENT TO REMAIN.
2. REMOVE EXISTING EQUIPMENT. EXISTING WIRING AND CONDUIT TO REMAIN. UPDATE EXISTING SCHEDULE WITH NEW TYPEWRITTEN SCHEDULE.

DESIGN NOTES (NEW WORK) :

1. PROVIDE NEW POWER CONNECTION, DISCONNECT SWITCH TO MECHANICAL EQUIPMENT PER IDENTIFIED EQUIPMENT TAG. REFER TO MECHANICAL EQUIPMENT WIRING SCHEDULE FOR FEEDER SIZE AND SOURCE.
2. PROVIDE AND INSTALL NEW L14-30R DUPLEX RECEPTACLE FOR NEW WASHER EXTRACTOR .
3. PROVIDE AND INSTALL NEW L5-20R DUPLEX RECEPTACLE FOR SANITARY AND NEW DRYER .
4. PROVIDE NEW EXHAUST FANs#1, 2 REFER TO MECHANICAL EQUIPMENT WIRING SCHEDULE FOR FEEDER SIZE AND SOURCE. EXHAUST FANS# 1& 2 WILL BE ON 24/7,THESE FANS SHOULD ONLY BE ACCESSIBLE FOR MAINTENANCE WITH FLUSH MOUNT KEYED SWITCH LOCATED NEARBY FANS.

REV.	DATE	DESCRIPTION
3	2025-JULY-21	RE-ISSUED FOR PERMIT & TENDER
2	2025-APR-23	RE-ISSUED FOR PERMIT & TENDER
1	2024-APR-12	ISSUED FOR TENDER
0	2024-MAR-15	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering
250 SHEPPARD AVE EAST, SUITE#306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917

Client

Oshawa®

Drawing Overall Scale

AS SHOWN

Project Name & Address

City of Oshawa-Fire STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY ROAD, OSHAWA, ONTARIO

Drawing Title

ELECTRICAL SERVICES
ELECTRICAL POWER - DEMOLITION/NEW WORK

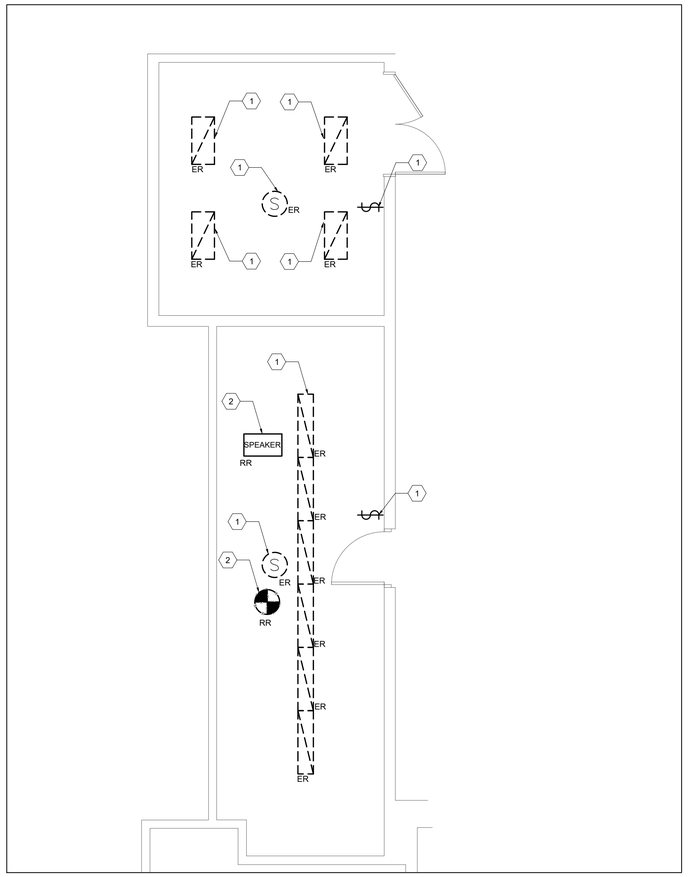
DATE:	2024 - MAR - 07
DESIGNED BY:	F.A.
DRAWN BY:	F.A.
APPROVED BY:	J.E.
PROJECT NO.:	1024011

Engineer / Architect Stamp

LICENSED PROFESSIONAL ENGINEER
O. ELOWE
100143577
2025-07-21
PROVINCE OF ONTARIO

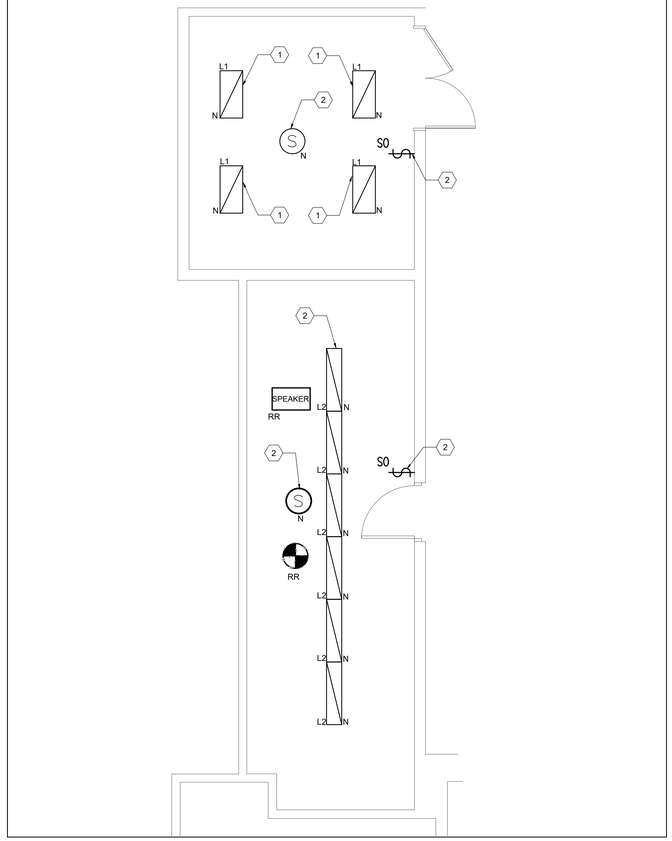
Drawing No.

E-4



1 ELECTRICAL LIGHTING - DEMOLITION

Scale: Scale: 1/4"=1'-0"



2 ELECTRICAL LIGHTING - NEW WORK

Scale: Scale: 1/4"=1'-0"

DESIGN NOTES (LIGHTING DEMOLITION):

1. REMOVE EXISTING LIGHTINGS, OCCUPANCY SENSORS AND KEY SWITCH. EXISTING WIRING AND CONDUIT TO REMAIN.
2. REMOVE ALL EXISTING ELECTRICAL EQUIPMENTS CONSIST OF FIRE ALARM DETECTOR, SPEAKER. CONTRACTOR TO ALLOW FOR CHANGE AND REPAIR WORKS AT CEILING FOR INSTALLING ELECTRICAL SERVICES. REINSTALLING THE T-BAR CEILING BASED ON THE STRUCTURAL DRAWINGS.

DESIGN NOTES (LIGHTING NEW WORK) :

1. PROVIDE AND INSTALL NEW LIGHTING FIXTURES. REFER TO LIGHTING LUMINARIES SCHEDULE FOR MAKE, MODEL. CONFIRM EXISTING LOCAL LIGHTING CIRCUIT VOLTAGE PRIOR TO ORDERING LIGHTING FIXTURES. ALLOW TO EXTEND WIRING AND CONDUIT AS REQUIRED.
2. ELECTRICAL CONTRACTOR SHALL PROVIDE OCCUPANCY SENSORS TO CONTROL LOCAL ROOM LIGHTING AS SHOWN. SENSOR TO BE WATTSTOPPER DSW-301-W OR APPROVED EQUIVALENT. PROVIDE OVERRIDE SWITCH. CONFIRM EXISTING LOCAL LIGHTING CIRCUIT VOLTAGE PRIOR TO SHOP DRAWING APPROVAL.

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Drawing Title

ELECTRICAL SERVICES
ELECTRICAL LIGHTING - DEMOLITION/NEW WORK

DATE:	2024 - MAR - 07
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LICENSED PROFESSIONAL ENGINEER
O. ELOWE
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PROVINCE OF ONTARIO

Drawing No.

E-5

A. GENERAL NOTES

1. DESIGN CONFORMS TO THE 2024 ONTARIO BUILDING CODE (OBC).
2. THE GENERAL NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE PROJECT AND SHALL BE READ IN CONJUNCTION WITH THE DRAWINGS AND SPECIFICATIONS.
3. USE ONLY THE LATEST ISSUES OF ANY GOVERNMENT CODES, STANDARDS OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES, UNLESS NOTED OTHERWISE.
4. VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
5. FOR DETAILS AND DIMENSIONS NOT GIVEN ON STRUCTURAL DRAWINGS REFER TO ARCHITECTURAL, MECHANICAL AND ELECTRICAL DRAWINGS. VERIFY LOCATIONS AND DIMENSIONS OF ALL OPENINGS, PIPE SLEEVES, ETC. AS REQUIRED WITH THE MECHANICAL AND ELECTRICAL CONTRACTORS.
6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DIMENSIONS AND FOR COORDINATION OF SUB-TRADES.
7. DO NOT SCALE THE DRAWINGS, USE FIGURE DIMENSIONS ONLY.
8. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES AFFECTED BY THIS CONSTRUCTION. ON ANY NEW STRUCTURE, DO NOT EXCEED THE DESIGN LOADINGS INDICATED ON THESE DRAWINGS.
9. ALL STRUCTURAL MEMBERS SHOWN ARE NEW UNLESS NOTED OTHERWISE.
10. DRAWINGS AND DETAILS ARE INTENDED TO SHOW THE END RESULT OF DESIGN. MODIFICATIONS TO THE DESIGN NECESSARY TO SUIT SITE DIMENSIONS OR CONDITIONS SHALL BE SUBMITTED TO CONSULTANT FOR APPROVAL BEFORE PROCEEDING.
11. THE SCHEDULING OF ALL WORK, INCLUDING ACCESSIBILITY AND LOGISTICS SHALL BE COORDINATED AND AGREED WITH THE OWNER PRIOR TO COMMENCEMENT.
12. CO-ORDINATE WORK WITH MECHANICAL AND ELECTRICAL TRADES REGARDING ANY EXISTING MECHANICAL AND ELECTRICAL SERVICES ADJACENT TO THE WORK.
13. DO NOT CUT THROUGH, CORE-DRILL OR OTHERWISE ALTER ANY EXISTING OR NEW PART OF THE STRUCTURE UNLESS SHOWN ON THE DRAWINGS, OR UNLESS APPROVED BY THE CONSULTANT. PROVIDE ADDITIONAL REINFORCING OR FRAMING AT OPENINGS AS SHOWN OR DIRECTED, PRIOR TO MAKING ANY OPENINGS.
14. THE DRAWINGS AND SPECIFICATIONS ARE THE PROPERTY OF THE CONSULTANT AND MAY NOT BE REPRODUCED IN ANY FORM WITHOUT WRITTEN AUTHORIZATION.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MONITORING EXISTING STRUCTURES ADJACENT TO NEW CONSTRUCTION AND AS OTHERWISE DIRECTED DURING ALL PHASES OF WORK.

B. STRUCTURAL STEEL

1. DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO CAN/CSA-S16 INCL. S16S1 SUPPLEMENT AND CISC CODE OF STANDARD PRACTICE FOR STRUCTURAL STEEL.
2. ALL STRUCTURAL STEEL TO CONFORM TO CAN/CSA-G40.20/G2040.21 WITH THE FOLLOWING MIN. GRADES:
   - 350W (50 KSI) CLASS C, FOR HSS SECTIONS
   - 350W (50 KSI), FOR WELDED OR ROLLED W-SECTIONS
   - 300W (44 KSI), FOR CHANNELS, ANGLES AND PLATES
   - 350W (50 KSI), FOR ALL OTHER SECTIONS, UNLESS NOTED OTHERWISE
3. ALL BOLTS TO BE HIGH STRENGTH TYPE TO ASTM A325 REQUIREMENTS. USE BEARING-TYPE CONNECTIONS, MINIMUM TWO M20 (3/4") BOLTS PER CONNECTION UNLESS OTHERWISE NOTED. THREADS MUST BE EXCLUDED FROM THE BOLT SHEAR PLANES.
4. ANCHOR BOLTS: ASTM F1554 GRADE 55 UNLESS OTHERWISE NOTED.
5. WELDING:
   a. WELDING WORK TO BE IN ACCORDANCE WITH CSA-W59.
   b. WELDING TO BE UNDERTAKEN ONLY BY WELDERS CERTIFIED TO CSA-W55.
   c. WELDING ONLY TO BE UNDERTAKEN BY A FABRICATOR CERTIFIED TO CSA-W47.1 FOR DIVISION 1 OR 2.
   d. EXPOSED WELDS SHALL BE CONTINUOUS AND GROUND SMOOTH.
   e. REPAIR DAMAGED OR FIELD CUT AREAS OF GALVANIZED SURFACES WITH TWO COATS OF ZINC RICH PAINT. REFER TO FINISHING PROCESS.
   f. ALL NECESSARY PRECAUTIONS SHALL BE UNDERTAKEN TO PREVENT FIRES CAUSED BY WELDING, INCLUDING BUT NOT LIMITED TO THE PRESENCE OF FIRE WATCHERS, USE OF FIRE SHIELDS, AND REMOVAL OF COMBUSTIBLE MATERIALS. SUITABLE FIRE EXTINGUISHING EQUIPMENT SHALL BE PRESENT AND WITHIN REACH OF THE WELDING CREW.
   g. NEARBY SURFACES SCORCHED OR OTHERWISE AFFECTED BY WELDING SHALL BE RESTORED TO ITS ORIGINAL CONDITION PER THE SATISFACTION OF THE CLIENT, UNLESS OTHERWISE AGREED UPON.
6. PROVIDE ALL REQUIRED GUSSETS, SPACERS, FILLERS AND SHIM PLATES.
7. PROVIDE BUTTER COAT OF NON-SHRINK GROUT BETWEEN SURFACES WHERE CONNECTING STEEL PLATE TO STRUCTURAL CONCRETE OR MASONRY, UNLESS NOTED OTHERWISE.
8. CENTRE BEARING PLATES UNDER BEAMS EXCEPT WHERE NOTED OTHERWISE.
9. CONNECT ALL BEAMS TO END BEARING PLATES WITH A MIN. OF 50 mm (1/2") LENGTH OF 6 mm (1/4") FILLET WELD EACH SIDE OF FLANGE.
10. PROVIDE 4.8 mm (3/16") THICK CAP PLATES WITH ALL-AROUND SEAL WELD ON OPEN ENDS OF HSS MEMBERS UNLESS NOTED OTHERWISE.
11. DO NOT MAKE HOLES IN ANY STRUCTURAL STEEL MEMBER OTHER THAN THOSE SHOWN ON REVIEWED SHOP DRAWINGS WITHOUT THE PRIOR APPROVAL OF THE CONSULTANT.
12. STRUCTURAL STEEL EXPOSED TO THE WEATHER (INCLUDING ALL MASONRY LINTELS) SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH CSA-G164, WITH A MINIMUM ZINC COATING OF 600 GRAMS PER SQUARE METRE. ALL INTERIOR STEEL TO BE PRIME PAINTED OR GALVANIZED, UNLESS NOTED OTHERWISE.

C. WOOD

1. ALL FRAMING LUMBER TO BE KILN-DRIED D-FIR OR SPF NO.2 OR BETTER.
2. ALL METAL CONNECTORS ARE SIMPSON STRONG-TIE OR APPROVED EQUIVALENT.
3. ALL FRAMING NAILS SHALL BE COMMON NAILS. NO BOX NAILS ALLOWED.

D. FOUNDATIONS

1. CONTRACTOR SHALL CARRY OUT EXCAVATION, DEWATERING, BACKFILLING, CAISSONS, AND FOUNDATION CONSTRUCTION (AS REQUIRED) IN ACCORDANCE WITH THESE DRAWINGS AND THE RECOMMENDATIONS OF A GEOTECHNICAL ENGINEER.
2. PREPARATION OF SUBGRADE FOR SLAB-ON-GRADE SHALL BE INSPECTED AND APPROVED BY GEOTECHNICAL ENGINEER BEFORE CONCRETE (OR PAVEMENT) IS PLACED. LEVEL EXISTING NATIVE SOIL, COMPACT LOOSE AREAS TO 98% STANDARD PROCTOR DRY DENSITY (SPDD) AND PROOF ROLL TOTAL AREA. FILL TO UNDERSIDE OF SUBBASE WITH GRANULAR B1 COMPACTED TO 98% SPDD. FILL REMAINING 150mm TO UNDERSIDE OF SLAB WITH GRANULAR A1 COMPACTED TO 98% SPDD. NOTIFY STRUCTURAL ENGINEER 24 HOURS PRIOR TO ANY COMPACTION TO ALLOW FOR TESTING.
3. IF THE STRUCTURAL CONSULTANT APPROVES THE PROCEDURE, ANY SOFT SPOT ENCOUNTERED IN THE BEARING AREA OF THE FOUNDATION EXCAVATION SHALL BE REMOVED AND FILLED TO THE UNDERSIDE OF FOUNDATION USING CONCRETE OF MINIMUM 10 MPa COMPRESSIVE STRENGTH
4. ALL FOUNDATIONS SHALL BE PLACED ON UNFROZEN GROUND ONLY.
5. SLAB ON GRADE TO BE PLACED ON 200mm THICK LAYER OF 20 mm CLEAR CRUSHED STONE OVER COMPACTED SUBGRADE OR ENGINEERED FILL, UNLESS OTHERWISE SHOWN.
6. FILL FOOTING EXCAVATIONS WITH CONCRETE AS SOON AS POSSIBLE AFTER EXCAVATION. ENSURE EXCAVATION BOTTOM IS CLEAN, SOUND AND UNFROZEN PRIOR TO CONCRETE PLACEMENT.
7. BACKFILL MATERIAL AROUND STRUCTURES TO BE GRANULAR "B1" (TO OPSS 1010), COMPACTED TO 98% STANDARD PROCTOR DRY DENSITY (SPDD). NOTIFY TESTING COMPANY 24 HOURS BEFORE PLACING BACKFILL TO ALLOW FOR SOILS INSPECTION AND COMPACTION TESTING.
8. UNLESS OTHERWISE INSTRUCTED, USE "HYDRO-EXCAVATION" TO LOCATE UTILITIES AND EXCAVATE AREA FOR FOUNDATION INSTALLATIONS (AS APPLICABLE).
9. REFER TO THE GEOTECHNICAL REPORT FOR THIS SITE FOR FOUNDATION INFORMATION NOT OTHERWISE SHOWN ON THESE DRAWINGS OR SPECIFICATIONS.

E. BACKFILL AND COMPACTION

1. BACKFILL UNDER SLAB ON GRADE WITH APPROVED MATERIALS. UNLESS SPECIFICALLY NOTED OTHERWISE, BACKFILL SHALL BE CARRIED OUT IN MAXIMUM OF 200MM THICK OF LOOSE FILL, EACH COMPACTED TO A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
2. UNLESS OTHERWISE NOTED, PROVIDE IMMEDIATELY UNDER SLAB ON GRADE A MINIMUM OF 200MM OF COMPACTED GRANULAR "B" MATERIAL. COMPACTION TO ACHIEVE A MINIMUM OF 95% STANDARD PROCTOR MAXIMUM DRY DENSITY.
3. COMPACTION WILL BE IN ACCORDANCE WITH ONTARIO PROVINCIAL STANDARD SPECIFICATION 501 - CONSTRUCTION SPECIFICATION FOR COMPACTING AND 514 - TRENCHING, BACKFILLING AND COMPACTING.
4. APPLY UNCONTAMINATED WATER AS NECESSARY DURING COMPACTION TO OBTAIN SPECIFIED DENSITY.
5. DO NOT DIRECT JETS OF WATER AT FILL WITH SUCH FORCE THAT FINER MATERIALS WILL BE WASHED OUT.
6. ENSURE COMPACTED MATERIAL IS FREE FROM STONES GREATER THAN 100 MM, ORGANIC AND DELETERIOUS MATERIALS.
7. COMPACT FINAL LIFT USING SMOOTH DRUM ROLLER TO PROVIDE SMOOTH LEVEL SURFACE.
8. WHENEVER PREPARATION OF THE BASE MATERIAL RESUMES AFTER SUSPENSION, DISC OR SCARIFY THE MATERIAL SURFACE IN PLACE TO A DEPTH BETWEEN 100 AND 150 MM AND RECOMPACT AT THE SPECIFIED MOISTURE CONTENT.
9. OBTAIN APPROVAL FROM ENGINEER OF PREPARED SURFACES PRIOR TO RESUMPTION OF MATERIAL PLACEMENT AND PRIOR TO COVERING SURFACES WITH PERMANENT MATERIAL.
10. MAINTAIN MOISTURE CONTENT THROUGHOUT EACH LAYER OF COMPACTED MATERIAL AS UNIFORMLY AS PRACTICABLE AND CONTROL THE MOISTURE CONTENT TO ACCEPTABLE LEVELS.

F. CONCRETE

1. ALL CONCRETE TO CONFORM TO THE REQUIREMENTS OF CSA STANDARD A23.1.
2. ALL CONCRETE FORMWORK AND FALSEWORK TO CONFORM TO CSA-S269.1.
3. ALL CONCRETE IS TO HAVE THE MINIMUM SPECIFIED 28 DAY COMPRESSIVE STRENGTH, WATER/CEMENTING MATERIALS RATIO, AND AIR CONTENT IN ACCORDANCE WITH THE REQUIREMENTS OF CSA STANDARD A23.1.
4. ALL CONCRETE WHICH WILL BE SUBJECTED TO FREEZING AND THAWING OR SUBJECTED TO APPLICATIONS OF DE-ICING CHEMICALS IS TO HAVE THE 28 DAY COMPRESSIVE STRENGTH, WATER/CEMENTING MATERIALS RATIO, AND AIR CONTENT IN ACCORDANCE WITH THE REQUIREMENTS OF CSA STANDARD A23.1.
5. ALL CONCRETE SHALL BE NORMAL DENSITY CONCRETE AND CONFORMING TO THE FOLLOWING UNLESS NOTED OTHERWISE:

LOCATION	EXPOSURE CLASS	28-DAY f´c (MPa)	MAX. AGGR. SIZE (mm)
EXTERIOR CONCRETE, UNLESS NOTED	C-1	35	20
INTERIOR CONCRETE, UNLESS NOTED	N	25	20
DRILLED CONCRETE PIERS	N	25	20
INTERIOR GRADE BEAMS	N	25	20
EXTERIOR GRADE BEAMS	F-2	32	20
SKIM SLAB	N	10	20
EXTERIOR EQUIPMENT PAD	C-1	35	20
FENCE FOUNDATIONS, DUCT BANKS, BOLLARDS, SIGNAGE	F-1	32	20

6. ADMIXTURES THAT CONTAIN CHLORIDES SHALL NOT BE USED.
7. UNLESS NOTED OTHERWISE, PROVIDE THE FOLLOWING CLEAR CONCRETE COVER FOR REINFORCING STEEL:

LOCATION	SPECIFIED COVER (mm)
CONCRETE CAST AGAINST EARTH	75
CONCRETE ON SKIM SLAB	50
INTERIOR SLAB ON GRADE*	50
FORMED SLABS AND WALLS NOT EXPOSED TO EARTH OR WEATHER	25
FORMED SLABS EXPOSED TO WEATHER	40
FORMED PIERS, BEAMS AND COLUMNS NOT EXPOSED TO EARTH OR WEATHER	40
FORMED WALLS EXPOSED TO WEATHER	50
TOP OF SLAB ON GRADE TO WELDED WIRE MESH	50
TOP OF SLAB ON STEEL DECK / EXPOSED TO WEATHER	25 / 40
* COVER ON BOTTOM BARS MAY BE REDUCED TO 25mm IF SLAB IS PLACED ON 50mm SKIM SLAB OR RIGID INSULATION	

8. PROVIDE 1"X1" CHAMFER AT ALL EXPOSED CORNERS UNLESS OTHERWISE NOTED.
9. ALL OPENINGS SHALL BE FORMED OR SLEEVED PRIOR TO PLACING CONCRETE.

G. REINFORCING STEEL

1. CONFORM TO THE REQUIREMENTS OF CSA STANDARDS A23.1 AND A23.3.
2. REINFORCING STEEL SHALL BE DEFORMED BAR CONFORMING TO CSA STANDARD G30.18, GRADE 400R, UNO.
   REINFORCING STEEL SPECIFIED TO BE WELDED SHALL CONFORM TO CSA STANDARD G30.18, GRADE 400W, UNO.
3. BAR MARKS WITH PREFIX 'S' DENOTES STAINLESS STEEL BARS.
4. BAR MARKS WITH PREFIX 'C' DENOTED EPOXY-COATED STEEL BARS.
5. WELDED WIRE FABRIC SHALL HAVE A MINIMUM YIELD STRENGTH OF 450 MPa AND SHALL CONFORM TO ASTM A185. SUPPLY IN FLAT SHEETS ONLY.
6. REINFORCING STEEL IS TO BE DETAILED AND BENT AS OUTLINED IN THE REINFORCING STEEL MANUAL OF STANDARD PRACTICE PUBLISHED BY THE REINFORCING STEEL INSTITUTE OF CANADA.
7. SUBMIT SHOP DRAWINGS SHOWING PLACEMENT AND DETAILS OF ALL REINFORCING STEEL.
   DRAW ALL WALLS IN FULL ELEVATION, AND SLABS WITH TOP AND BOTTOM BARS ON SEPARATE PLANS.
8. DO NOT FIELD-CUT OR FIELD-BEND BARS WITHOUT CONSULTANT'S APPROVAL.
9. PROVIDE CHAIRS, SPACER BARS, SUPPORT BARS AND OTHER ACCESSORIES TO SUPPORT REINFORCING IN ACCORDANCE WITH A23.1 AND A23.3. ALL THE WIRE, CHAIRS AND BAR SUPPORTS FOR FOUNDATIONS AND FOR EXPOSED CONCRETE SHALL BE NON-METALLIC OR COATED.
10. PROVIDE CLASS 'B' TENSION LAP SPLICES UNLESS NOTED OTHERWISE. ALL SPLICE LOCATIONS SHALL BE TO THE APPROVAL OF THE CONSULTANT.
11. LAP SPLICES IN WELDED WIRE MESH SHALL NOT BE LESS THAN 200 mm, AS MEASURED BETWEEN THE OUTERMOST CROSS-WIRES OF EACH FABRIC SHEET.
12. BAR LAPS IN REINFORCED MASONRY TO BE NOT LESS THAN 40 BAR DIAMETERS, AND SHALL BE LOCATED AT FLOOR LEVELS ONLY.
13. DOWELS TO EXISTING CONCRETE SHALL USE THE HILTI "RE500" DOWELING SYSTEM. COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS.
14. PROVIDE ONE 15M NOSING BAR FOR ALL SILLS, LEDGES, AND STEPS, UNLESS NOTED OTHERWISE.
15. PROVIDE ONE CONTINUOUS 15M TOP AND BOTTOM REINFORCING BARS AT ALL EDGES OF SLABS. THIS REINFORCING MAY BE PROVIDED BY MODIFYING THE BARS SHOWN ON PLAN OR SCHEDULE, OR BY PROVIDING ADDITIONAL REINFORCING.
16. PROVIDE MINIMUM 2-20M VERTICAL AT EACH END, TEE AND CORNER OF ALL REINFORCED CONCRETE WALLS UNO.
17. REINFORCING STEEL IN MASONRY BOND BEAMS AND LINTELS SHALL BE MIN. 15M BARS CONTINUOUS (WITHOUT SPLICES). PROVIDE STANDARD HOOKS AT BOTH ENDS TO BARS IN MASONRY LINTELS. PROVIDE 90-DEGREE "L-BARS" AT CORNERS IN MASONRY BOND BEAMS, WITH LAPS OF 40 BAR DIAMETERS.

H. MASONRY

1. ALL MASONRY WORK TO BE IN ACCORDANCE WITH THE LATEST VERSIONS OF CSA-A371 AND CSA-A179.
2. STRUCTURAL DRAWINGS SHOW LOAD-BEARING MASONRY WALLS ONLY U.N.O. REFER TO ARCHITECTURAL DRAWINGS FOR ALL NON-LOADBEARING MASONRY WALLS.
3. PROVIDE TYPE H/15/A/M UNITS CONFORMING TO CSA A165 SERIES FOR ALL CONCRETE BLOCK MASONRY.
4. USE TYPE 'S' MORTAR AND 12.5 MPa 28-DAY STRENGTH GROUT FOR ALL MASONRY WALLS, CONFORMING TO CSA-A179.
5. CONSTRUCT WALLS IN RUNNING BOND ONLY. USE FULL MORTAR BEDDING.
6. PROVIDE 100% SOLID OR GROUTED MASONRY AT TOP AND BOTTOM COURSES OF WALLS, TWO COURSES DEEP AND TWO BLOCKS WIDE UNDER ALL BEAMS OR LINTEL BEARINGS, GROUTED CELLS CONTAINING VERTICAL STEEL, BOND BEAMS, KEYWAYS AT EACH SIDE OF CONTROL JOINTS, AND CELLS CONTAINING DOWELS, ANCHOR BOLTS OR OTHER EMBEDDED HARDWARE.
7. PROVIDE CONTINUOUS 8-GA LADDER-TYPE GALVANIZED HORIZONTAL JOINT REINFORCEMENT AT EVERY SECOND COURSE AND AT THE FIRST COURSE AT THE TOP AND BOTTOM OF THE WALL.
8. PROVIDE PREFABRICATED CORNERS AND TEES FOR HORIZONTAL JOINT REINFORCING.
9. PROVIDE VERTICAL WALL REINFORCING IN ALL NEW CONCRETE BLOCK WALLS IN ACCORDANCE WITH TYPICAL WALL REINFORCING DETAILS UNLESS NOTED OTHERWISE. VERTICAL WALL REINFORCING TO BE CONTINUOUS BETWEEN FLOORS AND ROOF. PROVIDE FULL CLASS B TENSION LAP SPLICE. INDICATE LOCATION OF ALL PROPOSED LAP SPLICES ON SHOP DRAWINGS FOR APPROVAL.
10. PROVIDE BULLNOSE BLOCKS AT EXPOSED CORNERS.
11. NEW MASONRY WALLS TO BE TOOTHED INTO EXISTING MASONRY WALLS WHERE SHOWN.
12. BOND BEAMS ARE TO BE CONTINUOUS WHERE INDICATED ON PLANS AND OR SPECIFICATIONS.
13. REFER TO ARCHITECTURAL DRAWINGS FOR CONTROL JOINT (HORIZONTAL MOVEMENT) LOCATIONS.
14. PROVIDE 100% SOLID OR FULLY GROUTED MASONRY AT:
    a. TOP AND BOTTOM COURSE OF WALLS,
    b. TWO COURSES DEEP AND TWO BLOCKS WIDE UNDER ALL BEAMS OR LINTEL BEARINGS,
    c. GROUTED CELLS CONTAINING VERTICAL REINFORCING,
    d. BOND BEAMS,
    e. ALL PIERS BETWEEN ADJACENT OPENINGS LESS THAN 800 mm WIDE, FOR FULL HEIGHT OF PIER,
    f. ALL BELOW GRADE MASONRY,
    g. KEYWAYS AT EACH SIDE OF CONTROL JOINTS, AND
    h. CELLS CONTAINING DOWELS, ANCHOR BOLTS OR OTHER EMBEDDED HARDWARE.
17. SOLID MASONRY MEANS GROUT FILL IN HOLLOW MASONRY, OR 100% SOLID UNITS.
18. CONTRACTOR TO BE RESPONSIBLE FOR THE DESIGN AND PROVISION OF ADEQUATE TEMPORARY BRACING WHEN INSTALLING MASONRY.

I. STEEL ROOF DECK

1. UNLESS NOTED OTHERWISE, ROOF DECK TO BE 900mm WIDE, 38mm DEEP PREFORMED ZINC-COATED STEEL WITH FLUTES SPACED AT 150mm MAXIMUM ON CENTRE. MINIMUM THICKNESS BEFORE GALVANIZING TO BE 0.76 mm. ATTACH TO SUPPORTS USING 20mm DIAMETER PUDDLE WELDS AS PER THE DETAILS ON THE DRAWINGS BUT AT NOT LESS THAN 300 mm ON CENTER TRANSVERSE TO THE DECK SPAN AND AT 600 mm ON CENTER AT THE PERIMETER.
2. METAL DECK IS TO BE DESIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE PROVINCE OF ONTARIO USING THE LOADS GIVEN ON THIS DRAWING AND IN ACCORDANCE WITH THE OBC. DECK DEFLECTION TO BE NOT MORE THAN L/240.
3. NOMINAL THICKNESS TO BE INCREASED BY DECK ENGINEER AS REQUIRED TO SUPPORT RAIN LOADS AND/OR SNOW ACCUMULATION LOADS AS INDICATED ON THE DRAWINGS (WHERE APPLICABLE).

J. SHOP DRAWINGS AND SUBMITTALS

1. SUBMIT SHOP DRAWINGS TO CONSULTANT FOR REVIEW BEFORE COMMENCING FABRICATION. ALLOW 7 DAYS FOR RETURN OF SHOP DRAWINGS.
2. SHOP DRAWINGS FOR CONCRETE REINFORCEMENT AND PLACEMENT SHALL BE SUFFICIENTLY DETAILED AND DIMENSIONED TO PERMIT CORRECT PLACEMENT OF REINFORCEMENT AND ACCESSORIES WITHOUT REFERENCE TO ARCHITECTURAL AND STRUCTURAL DRAWINGS.
3. NOTIFY CONSULTANT IN WRITING AT TIME OF SUBMISSION OF ANY DEVIATIONS IN SHOP DRAWINGS FROM REQUIREMENTS OF CONTRACT DOCUMENTS.
4. CONFIRM CONTRACTOR'S REVIEW OF EACH SHOP DRAWING BY STAMP, DATE AND SIGNATURE OF A RESPONSIBLE PERSON.

K. DEMOLITION AND REWORK

1. ENSURE THAT EXISTING AND NEW STRUCTURE IS AT ALL TIMES MAINTAINED IN A SAFE CONDITION AND THAT THE PUBLIC IS PROTECTED FROM DEMOLITION ACTIVITIES
2. DESIGN AND PROVIDE ALL REQUIRED SHORING OR TEMPORARY FALSEWORK REQUIRED FOR SUPPORT OF EXISTING STRUCTURE DURING DEMOLITION REWORK OR INSTALLATION ACTIVITIES. BEFORE UNDERTAKING WORK, SUBMIT TO CONSULTANT FOR REVIEW DRAWING(S) BEARING THE SEAL OF THE LICENSED PROFESSIONAL ENGINEER RESPONSIBLE FOR DESIGN. CONTRACTOR'S ENGINEER IS THE ENGINEER OF RECORD FOR TEMPORARY SHORING AND FALSEWORK. CONSULTANT'S REVIEW OF DRAWING(S) IS ONLY ON THE OWNER'S BEHALF TO ENSURE COMPLIANCE WITH CONTRACT REQUIREMENTS. REFER TO SPECIFICATIONS.

L. TESTING AND INSPECTION

1. WHERE APPLICABLE AS PER AGREEMENT, THE CONTRACTOR SHALL ARRANGE AND PAY FOR THE FOLLOWING ITEMS TO BE INSPECTED OR TESTED BY AN INDEPENDENT THIRD-PARTY INSPECTION/TESTING AGENCY ACCEPTABLE TO THE OWNER AND THE CONSULTANT. COPIES OF ALL TEST REPORTS SHALL BE FORWARDED TO THE OWNER AND CONSULTANT ON THE SAME DAY TESTS ARE MADE. THE ITEMS TO BE TESTED SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING:
   a. GEOTECHNICAL: PERFORM ALL TESTING AND INSPECTION (COMPACTION, BEARING CAPACITY, SOIL PREPARATION ETC.) AS PER THE REQUIREMENTS OF THE DRAWINGS AND THE GEOTECHNICAL ENGINEERING REPORT.
   b. CONCRETE: CONCRETE TO BE TESTED IN ACCORDANCE WITH THE REQUIREMENTS OF CSA A23.1 AND A23.2, INCLUDING THE REQUIREMENTS FOR AIR, SLUMP AND AGE PRIOR TO BEING USED. CONTRACTOR TO MAINTAIN RECORDS OF POUR DATES, TESTING PERFORMED, CLASS OF CONCRETE USED AND TEST RESULTS FOR ALL ITEMS PLACED. RESULTS OF CYLINDER STRENGTH TESTING TO BE SENT TO OWNER AND CONSULTANT. ALL MIX DESIGNS TO BE REVIEWED AND APPROVED BY TESTING AGENCY.
   c. MASONRY: MORTAR, GROUT AND CONCRETE MASONRY UNITS: SAMPLE AND TEST JOB-MIXED MORTARS IN ACCORDANCE WITH CSA A179 AND CSA S304.1. TEST FREQUENCY TO BE IN ACCORDANCE WITH S304.1, BUT NOT LESS THAN ONE TEST FOR EACH DAY OF WORK. CONTRACTOR TO SUBMIT LABORATORY TEST REPORTS OF MANUFACTURER FOR CONCRETE MASONRY UNITS.
   d. STRUCTURAL STEEL AND JOISTS: PERFORM VISUAL INSPECTION OF ALL WELDS, TORQUE TESTING OF BOLTED CONNECTIONS AND CHECK ON BEARING, PLUMBNESS, ALIGNMENT AND PAINTING. BASIS OF INSPECTION SHALL BE FINAL REVIEWED SHOP DRAWINGS. PERFORM NON-DESTRUCTIVE TESTING OF WELDS WHERE RESULTS OF VISUAL INSPECTION ARE NOT ACCEPTABLE OR INCONCLUSIVE.
   e. REINFORCING STEEL: CONTRACTOR SHALL ADVISE CONSULTANT OF PLACEMENT OF ALL REINFORCING STEEL FOR REINFORCED MASONRY AND REINFORCED CONCRETE, AT LEAST 24 HOURS PRIOR TO PLANNED TIME OF MASONRY GROUT OR CONCRETE PLACEMENT. DO NOT PLACE GROUT OR CONCRETE UNTIL BAR PLACEMENT HAS BEEN APPROVED BY CONSULTANT.

1 GENERAL NOTES AND SPECIFICATIONS

REV.	DATE	DESCRIPTION
2	2025-APR-23	RE-ISSUED FOR TENDER
1	2024-APR-12	ISSUED FOR TENDER
0	2024-MAR-25	ISSUED FOR REVIEW

Key Plan

True North

Engineer Logo

Spectra Engineering Ltd.
200 CACHET WOODS COURT, UNIT 120, MARKHAM, ON L6C 0Z8
TEL: (647) 478-5156
FAX (647) 478-5917

Client

Oshawa®

Drawing Overall Scale

AS SHOWN

Project Name & Address

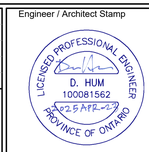
CITY OF OSHAWA - FIRE STATION NO.5
BUNK GEAR RETROFIT
1550 HARMONY RD N, OSHAWA, ON L1H 7K5

Drawing Title

STRUCTURAL SERVICES
GENERAL NOTES AND SPECIFICATIONS

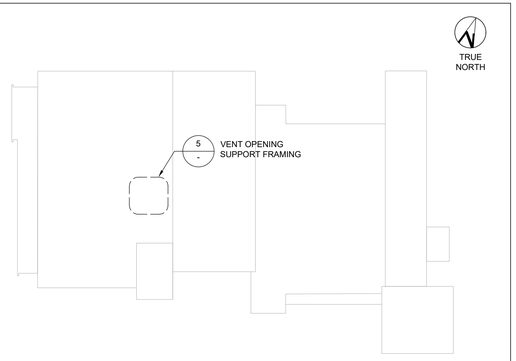
DATE:	2024-FEB-26
DESIGNED BY:	E.FLORES
DRAWN BY:	E.FLORES
APPROVED BY:	D.HUM
PROJECT NO.:	1024011

Engineer / Architect Stamp



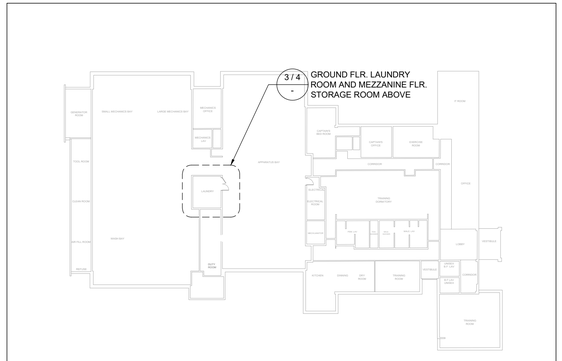
Drawing No.

S-01



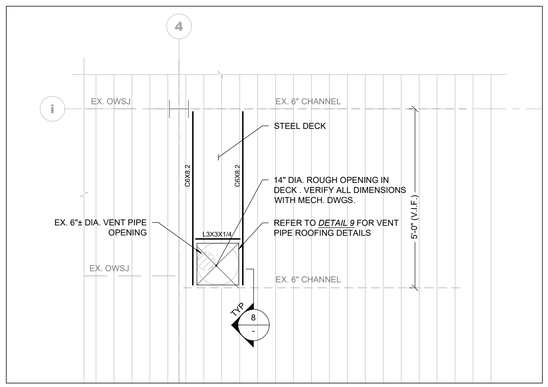
1 ROOF KEY PLAN

SCALE: 1/32" = 1'-0"



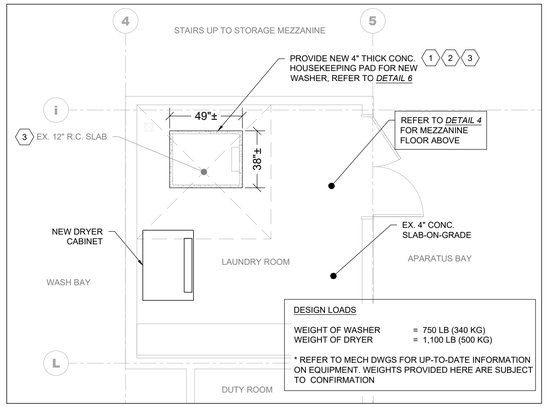
2 FIRST FLOOR KEY PLAN

SCALE: 1/32" = 1'-0"



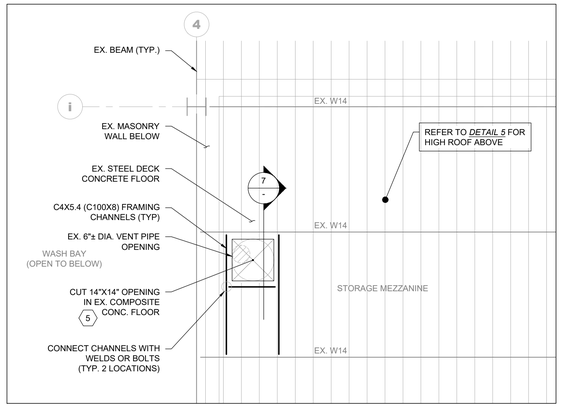
5 PARTIAL HIGH ROOF FRAMING PLAN

SCALE: 1/2" = 1'-0"



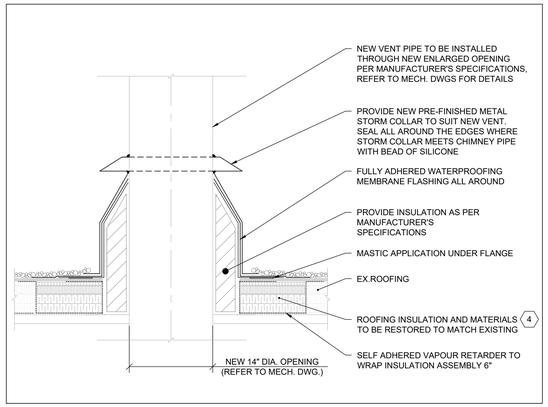
3 PARTIAL GROUND FLOOR PLAN - LAUNDRY ROOM

SCALE: 1/4" = 1'-0"



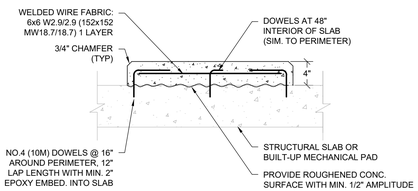
4 PARTIAL MEZZANINE FLOOR FRAMING

SCALE: 1/2" = 1'-0"



9 VENT PIPE COLLAR DETAIL

SCALE: 1" = 1'-0"

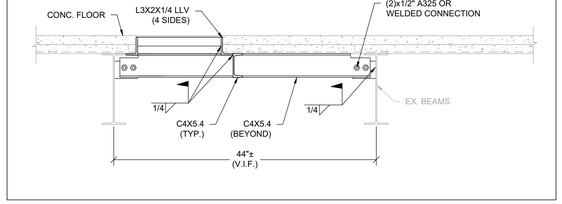


NOTES:

1. REFER TO ARCHITECTURAL, MECHANICAL, ELECTRICAL, DRAWINGS FOR LOCATION AND SIZE OF HOUSEKEEPING PADS.
2. PRIOR TO SUBSTANTIAL COMPLETION OF THE PROJECT, GROUT ALL CRACKS IN THE HOUSEKEEPING PADS AND FILL WITH MORTAR CONTAINING CEMENT, SAND AND LATEX BONDING AGENT OR AS NOTED IN SPECIFICATIONS.
3. CONCRETE STRENGTH MIN. 25 MPa.

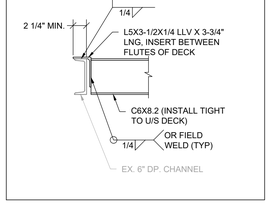
6 HOUSEKEEPING PAD DETAIL

SCALE: 1" = 1'-0"



7 FLOOR OPENING SUPPORT

SCALE: 1" = 1'-0"



8 CONNECTION DETAIL

SCALE: 1" = 1'-0"

GENERAL NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING POSSIBLE INTERFERENCES. SHOULD ANY DISCREPANCIES APPEAR BETWEEN THE DRAWINGS AND SPECIFICATIONS WHICH LEAVE THE CONTRACTOR IN DOUBT AS TO THE TRUE INTENT AND MEANING OF THE PLANS AND SPECIFICATIONS, THE CONTRACTOR SHALL OBTAIN A RULING FROM THE CONSULTANT IN WRITING BEFORE SUBMITTING A TENDER. IF THIS IS NOT DONE IT WILL BE ASSUMED THAT THE MOST EXPENSIVE ALTERNATIVE HAS BEEN INCLUDED IN THE TENDER PRICE. FOR ANY RULING TO BECOME BINDING, THE CONSULTANT MUST ISSUE THE NEW DIRECTION IN A PUBLISHED FORM.
2. ANY ROOF RELATED WORK (E.G. SLEEPERS, MOUNT PENETRATIONS, OPENINGS, ETC.) HAS TO BE EXECUTED AS PER MANUFACTURER'S REQUIREMENTS. ONLY CITY OF OSHAWA APPROVED VENDORS CAN PERFORM ROOFING WORK. ALL PROPOSED ROOFING WORK SHALL BE CLOSELY COORDINATED BETWEEN THE CONTRACTOR, CITY OF OSHAWA, AND MANUFACTURER.

DESIGN NOTES:

1. DIMENSIONS OF CONCRETE PADS ARE SUBJECT TO CONFIRMATION WITH MECHANICAL DRAWINGS AND FINAL DIMENSIONS OF MECHANICAL EQUIPMENT. CONFIRM ALL DIMENSIONS.
2. ANCHOR WASHER TO NEW CONCRETE PAD IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
3. NEW WASHER MAY BE ANCHORED DIRECTLY TO CONCRETE FLOOR SLAB (NEW CONCRETE PAD OMITTED) IF CONTRACTOR CONFIRMS PRESENCE OF MIN. 12" THICK CONCRETE SLAB BELOW PROPOSED WASHER LOCATION. ANY TEST CUTS BY THE CONTRACTOR MUST SCAN FOR BURIED SERVICES AND ANY SLAB DAMAGE REPAIRED TO ORIGINAL CONDITION AND FINISH.
4. CONTRACTOR TO CONTACT CITY OF OSHAWA FOR ROOFING DETAILS AROUND EXISTING VENT PIPE
5. CONTRACTOR TO ENLARGE EXISTING OPENINGS AS NEEDED TO AVOID OBSTRUCTIONS AND EXISTING MEZZANINE AND HIGH ROOF FRAMING. LOCATION OF ENLARGED VENT OPENING TO BE VERIFIED ON SITE AND VENTING RE-ROUTED AS NEEDED.

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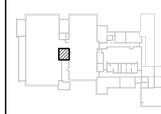
Key Plan



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BUNK GEAR RETROFIT
1550 HARMONY RD N, OSHAWA, ON L1H 7K5

Drawing Title

STRUCTURAL SERVICES
GENERAL NOTES AND SPECIFICATIONS
KEY PLAN AND DETAILS

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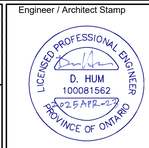

Drawing No.

S-02