



BOWMANVILLE HIGH SCHOOL - HVAC UPGRADE 49 LIBERTY STREET, BOWMANVILLE, ON L1C 2L8 DRAWINGS ISSUED FOR PERMIT AND TENDER PROJECT NUMBER: 1021027 MAY 2021

LIST OF DRAWINGS

MECHANICAL

M-101 MECHANICAL SERVICES - MECHANICAL SPECIFICATIONS
M-102 MECHANICAL SERVICES - MECHANICAL SPECIFICATIONS
M-103 MECHANICAL SERVICES - MECHHANICAL LEGENDS
M-300 MECHANICAL SERVICES - HVAC DEMOLITION WORK, SECOND FLOOR - AREA 'A'
M-301 MECHANICAL SERVICES - HVAC DEMOLITION WORK, SECOND FLOOR - AREA 'B'
M-302 MECHANICAL SERVICES - HVAC DEMOLITION WORK, SECOND FLOOR - AREA 'C'
M-303 MECHANICAL SERVICES - HVAC NEW WORK PLAN, SECOND FLOOR - AREA 'A'
M-304 MECHANICAL SERVICES - HVAC NEW WORK PLAN, SECOND FLOOR - AREA 'B'
M-305 MECHANICAL SERVICES - HVAC NEW WORK PLAN, SECOND FLOOR - AREA 'C'
M-306 MECHANICAL SERVICES - DEMOLITION WORK, FIRST FLOOR - BOILER ROOM
M-307 MECHANICAL SERVICES - NEW WORK, FIRST FLOOR - BOILER ROOM
M-500 MECHANICAL SERVICES - GRILL AND REGISTER AND PUMP SCHEDULE
M-701 MECHANICAL SERVICES - STANDARD DETAIL
M-702 MECHANICAL SERVICES - STANDARD DETAIL
M-703 MECHANICAL SERVICES - STANDARD DETAIL
M-704 MECHANICAL SERVICES - STANDARD DETAIL
M-705 MECHANICAL SERVICES - STANDARD DETAIL
M-706 MECHANICAL SERVICES - STANDARD DETAIL
M-707 MECHANICAL SERVICES - STANDARD DETAIL

STRUCTURAL

S-01 STRUCTURAL SERVICES - GENERAL NOTES AND SPECIFICATIONS
S-02 STRUCTURAL SERVICES - KEY PLAN - SECOND FLOOR DEMOLITION WORKS

ELECTRICAL

E-001 ELECTRICAL SERVICES - SPECIFICATIONS

-002	ELECTRICAL SERVICES - GENERAL NOTES & LEGENDS
-100	ELECTRICAL SERVICES - SINGLE LINE DIAGRAM
-201	ELECTRICAL SERVICES - BOILER ROOM - FIRST FLOOR DEMOLITION PLAN
-212	ELECTRICAL SERVICES - SECOND FLOOR CEILING DEMOLITION PLAN AREA "A"
-213	ELECTRICAL SERVICES - SECOND FLOOR CEILING DEMOLITION PLAN AREA "B'
-214	ELECTRICAL SERVICES - SECOND FLOOR CEILING DEMOLITION PLAN AREA "C"
-301	ELECTRICAL SERVICES - BOILER ROOM - FIRST FLOOR NEW WORK PLAN

1. SCOPE OF WORK REPLACE/ADD/ RELOCATE. MODIFICATION TO EQUIPMENT/SERVICES BUT NOT LIMITED TO:

- A HVAC B. INSULATION
- . AIR AND WATER BALANCING
- D. CONTROLS
- FIRE SUPPRESSION SPRINKI FRS
- FURNISH ALL LABOR, MATERIALS, EQUIPMENT, TOOLS AND SUPPORTS AS WELL AS SUPERVISION TO PROVIDE A COMPLETE INSTALLATION, TESTED AND IN WORKING ORDER, AS SHOWN ON THE DRAWINGS. REMOVAL AND DISPOSAL OF THE EQUIPMENT.
- MAKE GOOD ALL DAMAGES TO CEILINGS, WALLS, EXISTING EQUIPMENT AND/OR SYSTEM. COORDINATE WORK AND WORKING HOURS WITH THE OWNER AND OTHER TRADES TO MINIMIZE DISRUPTION. WHERE WORK DISRUPTS OR INTERFERES WITH BUILDING OCCUPANTS, MAKE ALL NECESSARY ARRANGEMENTS WITH THE LANDLORD OR FACILITY MANAGER FOR A SUITABLE TIME PERIOD FOR THE WORK OR SYSTEM SHUT-DOWN TO OCCUR. LIFE SAFETY SYSTEMS ARE NOT TO BE LEFT INOPERABLE DURING UNSUPERVISED TIMES OF THE DAY, AND SHALL BE FULLY OPERATIONAL AT THE END

2. CODES AND STANDARDS

- ALL WORK SHALL CONFORM TO THE CURRENT ISSUES OF: THE ONTARIO BUILDING CODE.
- ONTARIO ELECTRICAL SAFETY CODE.
- BYLAWS AND REGULATIONS ISSUED BY THE BUILDING AUTHORITY HAVING JURISDICTION.
- SMACNA GUIDE
- TSSA REQUIREMENTS NFPA STANDARDS

3 SPECIFICATIONS

COMPLY WITH THE GENERAL SECTIONS AND APPLICABLE SECTIONS OF THE GENERAL CONTRACT SPECIFICATIONS.

4. PERMITS, FEES & INSPECTIONS

OBTAIN AND PAY FOR ALL REQUIRED PERMITS, INSPECTIONS, ETC. AS REQUIRED BY THE AUTHORITIES

OBTAIN ALL PERMITS BEFORE PROCEEDING WITH WORK. CONTRACTOR SHALL BE RESPONSIBLE SHOULD FAILURE OCCUR

THE CONTRACTOR SHALL CONTACT THE BUILDING DEPARTMENT AND THE MECHANICAL CONSULTANT FOR A REVIEW OF THE MECHANICAL SYSTEMS COMPLETED FOR ROUGH IN PRIOR TO CLOSING UP CEILINGS AND WALLS. PROVIDE A MINIMUM ONE (1) WEEK NOTICE. ALL ROUGH-IN DEFICIENCIES ARE TO BE RECTIFIED WITH A CALL FOR A RE-INSPECTION PRIOR TO CLOSING UP THE CEILINGS AND WALLS. FAILURE TO HAVE THE INSPECTIONS PROVIDED WILL RESULT IN OPENING THE WALLS AND CEILINGS FOR THE REQUIRED REVIEWS, WITH ALL REMEDIAL WORK AND MAKING GOOD OF ALL CONSTRUCTION / REMEDIAL WORK AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR SHALL COORDINATE WITH TSSA REGARDING REFRIGERANT PIPING FOR INSPECTION AND

5. SITE CONDITIONS

EXAMINE SITE CONDITIONS TO ENSURE THAT WORK CAN BE SATISFACTORILY CARRIED OUT AS SHOWN. IF SITE EXAMINATION REVEALS ANY HIDDEN DIFFICULTIES, THESE MUST BE INDICATED IN THE TENDER PRICE, AND BROUGHT TO THE ATTENTION OF THE ENGINEER.

- DRAWINGS SHOW GENERAL INTENT OF THE WORK AND PROPOSED ROUTING ONLY. FIELD MEASURE TO CONFIRM ALL EXISTING DIMENSIONS, DUCT AND PIPING SIZES BEFORE PROCEEDING
- WITH FABRICATION. DO NOT SCALE DRAWINGS. CONTRACTOR SHALL BE RESPONSIBLE FOR IDENTIFYING POSSIBLE INTERFERENCES..

WARRANT ALL LABOR AND MATERIALS INCLUDED IN THIS CONTRACT FOR A PERIOD OF ONE YEAR FROM DATE OF FINAL ACCEPTANCE. ASSUME FULL RESPONSIBILITY FOR LAYOUT OF ALL WORK AND FOR ANY DAMAGE CAUSED TO OWNER OR OTHERS BY IMPROPER CARRYING OUT OF THE WORK.

LEAVE PREMISES IN CLEAN AND NEAT CONDITION AT TERMINATION OF WORK EACH DAY. DO NOT ACCUMULATE DEBRIS AND WASTE MATERIALS ON SITE. REMOVE FROM SITE DAILY.

USE ONLY NEW AND CSA CERTIFIED EQUIPMENT AND MATERIALS UNLESS OTHERWISE INDICATED. ONLY FIRST CLASS WORKMANSHIP WILL BE ACCEPTED WITH RESPECT TO STANDARD PRACTICES, SAFETY, ACCESSIBILITY, DURABILITY AND NEATNESS OF INSTALLATION WORK.

ONLY FIRST CLASS WORKMANSHIP WILL BE ACCEPTED, NOT ONLY IN REGARDS TO SAFETY, EFFICIENCY, DURABILITY, ETC., BUT ALSO IN REGARDS TO THE NEATNESS OF DETAIL. UNLESS SHOWN OTHERWISE, ALL PIPE WORK MUST BE LINED UP PARALLEL TO, OR AT RIGHT ANGLES TO THE BUILDING WALLS. EQUIPMENT MUST BE ACCURATELY SET, PLUMBED, AND LEVELED, AND HANGER RODS MUST BE SIMILARLY IN TRUE VERTICAL ALIGNMENT. IN GENERAL, THE ENTIRE WORK THROUGHOUT SHALL FIRST CLASS AND WORKMANLIKE AND PRESENT A NEAT AND CLEAN APPEARANCE ON COMPLETION.

SUBMIT 3 COPIES OF SHOP DRAWINGS AND PRODUCT DATA FOR ENGINEER'S REVIEW COVERING ALL RELEVANT DETAILS AND DIMENSIONS.

12 AS BUILT DRAWINGS

- KEEP ACCURATE RECORD OF "AS-BUILT" DRAWINGS AND SUBMIT THESE BEFORE FINAL CERTIFICATE OF COMPLETION. BURIED SERVICES MUST BE DIMENSIONED.
- AFTER COMPLETION OF THE WORK PROVIDE THE OWNER AND ENGINEER WITH AS-BUILT RECORD DRAWINGS IN AUTOCAD 2007 FORMAT AND A SET OF HARD COPY.

13. OPERATION & MAINTENANCE (O&M) MANUAL

SUBMIT 4 COPIES OF O&M MANUALS TO CONSULTANT FOR REVIEW. MANUALS SHALL INCLUDE SHOP DRAWINGS OF ALL NEW EQUIPMENT, TEST AND BALANCE REPORTS, COMMISSIONING REPORTS, WARRANTIES, AND OPERATION AND MAINTENANCE PROCEDURES.

14.EXISTING EQUIPMENT AND SYSTEMS

DISCONNECT, RECONNECT OR RELOCATE EXISTING EQUIPMENT OR SERVICES WHERE SHOWN OR REQUIRED TO PERMIT NEW WORK TO BE INSTALLED WITHOUT INTERFERENCES. ENSURE THAT REQUIRED SERVICES ARE MAINTAINED. COORDINATE WITH THE OWNER AND OWNERS REPRESENTATIVE BEFORE ANY SERVICES ARE INTERRUPTED. COORDINATE ALL ROUTING OF NEW SERVICES AS THEY MAY BE ADJUSTED TO ACCOMMODATE EXISTING SERVICES PROVIDING THAT THE INTENT OF THE DRAWINGS IS MET AND THE SAME STANDARDS ARE MAINTAINED. PROVIDE DRAWINGS OF PROPOSED REVISIONS FOR APPROVAL BEFORE BEGINNING ANY WORK AND INCORPORATE IN AS BUILT DRAWINGS. COORDINATE ALL ROUTING CHANGES WITH OTHER TRADES WHO MAY BE AFFECTED. CONSULTANT TO BE ADVISED PRIOR TO CHANGES WHERE CHANGES COULD BE SIGNIFICANT.

THE CONTRACTOR IS TO TAKE EXTRA CARE DURING THIS INSTALLATION NOT TO DISTURB ANY OPERATIONS. IT IS CRITICAL THAT THERE WILL BE NO UNSCHEDULED SHUTDOWNS OR INTERRUPTIONS OF ANY OPERATIONS. ALL ASSOCIATED COSTS OF SUCH WILL BE PASSED ON TO THE CONTRACTOR.

15. OPEN FLAMES AND WELDING

NO OPEN FLAMES OR WELDING IS PERMITTED WITHIN THE BUILDING WITHOUT WRITTEN PERMISSION BY THE OWNER AND THE CONSULTANT.

16. CUTTING, PATCHING AND PAINTING REQUIREMENTS

PROVIDE CUTTING PATCHING AND PAINTING FOR ALL OPENINGS. USE QUALIFIED TRADES FOR THIS WORK. RESTORE FINISHES TO MATCH EXISTING. SUPPLY AND INSTALL APPROVED FIRE STOP AS REQUIRED TO MAINTAIN FIRE RATING

PIPING AND VENTS THROUGH WALLS AND ROOF SHALL BE BY MECHANICAL CONTRACTOR, INCLUDING ALL PATCHING. ALL RATED WALL OPENINGS SHALL BE PACKED WITH AN APPROVED FIRE RESISTANT INSULATION AND SHALL BE SEALED WITH AN APPROVED FIRE STOP EQUAL TO 'DOW CORNING' SILICONE

17.PENETRATIONS THROUGH FLOORS AND WALLS

UNLESS OTHERWISE SPECIFIED ON ARCHITECTURAL DRAWINGS, GLASS FIBER FIRE RETARDANT INSULATION OR FIRESTOP CAULKING SHALL BE PACKED AROUND DUCT AND PIPE OPENINGS IN FLOORS

AND WALLS AT TIME OF DUCT AND PIPE INSTALLATION. FIRESTOP CAULKING SHALL BE JOHNS MANVILLE FIRETEMP CAULK OR EQUIVALENT.

PRIOR TO WORK COMMENCING ON SITE COORDINATE OPENINGS WITH SERVICES BELOW OPENINGS IN SLABS AND CONCRETE WALLS ARE TO BE X-RAYED WITH X-RAYS SUBMITTED TO THE BASE

BUILDING STRUCTURAL ENGINEER FOR APPROVAL.

18.PIPE / DUCT SLEEVES PROVIDE STEEL PIPE SLEEVES, AND SHEET METAL DUCT SLEEVES WHERE PENETRATING CONCRETE OR CONCRETE BLOCK WALLS AND FLOOR SLABS. SLEEVES SHALL EXTEND ABOVE THE FLOOR SLAB 1", TO PROVIDE WATER PROOFING PROTECTION TO THE FLOOR BELOW.

PROVIDE CONTINUOUS INSULATION AROUND PIPING PENETRATING THE SLEEVES SEAL THE ANNULAR SPACE BETWEEN THE SLEEVE AND THE SERVICE WITH FIRE RATED INSULATION AND SEALANT EQUAL TO "DOW CORNING" #3-6548 SILICON RTV FOAM PENETRATION SEALANT.

19 EQUIPMENT IDENTIFICATION

PROVIDE LAMACOID NAMEPLATE FOR ALL PIECES OF EQUIPMENT BOTH NEW AND EXISTING. NAME PLATES TO BE ENGRAVED WHITE LETTERS ON BLACK, AND SCREWED TO THE EQUIPMENT. IF SCREW FASTENING IS NOT POSSIBLE, PROVIDE BRASS CHAINS. PLATES ARE TO PROVIDE THE UNIT NUMBER

DESIGNATION AND SERVICE NEW EQUIPMENT IDENTIFICATION NUMBER SHALL BE CONSECUTIVE WITH THE EXISTING EQUIPMENT ON THE FLOOR. NUMBERING SYSTEM TO BE VERIFIED ON SITE.

20.DIELECTRIC ISOLATION

PROVIDE ISOLATION WHEN USING DISSIMILAR MATERIALS TO PREVENT GALVANIC ACTION.

21 PRESSURE TESTING

ALL PIPING SYSTEMS SHALL BE PRESSURE TESTED TO 860KPA OR 1.5 TIMES SYSTEM OPERATING

GENERAL MECHANICAL CONDITION (CONT'D)

PRESSURE FOR A DURATION OF 4 HRS UNLESS OTHERWISE INDICATED.

POWER WIRING FOR MECHANICAL EQUIPMENT SHALL BE INSTALLED BY THE ELECTRICAL DIVISION. ALL STARTERS, CONTROL TRANSFORMERS FOR THEM, SAFETY DISCONNECT FOR FAN COIL, ETC. WHERE REQUIRED. SHALL BE PROVIDED BY THE MECHANICAL DIVISION. ALL LOW VOLTAGE CONTROL WIRING SHALL ALSO BE PROVIDED AND INSTALLED BY THE MECHANICAL DIVISION. PROVIDE AND INSTALL NEW SYSTEM COMPONENTS C/W REQUIRED POWER, CONTROLS AND INTERLOCKING. ALL ELECTRICAL SHOWN TO BE COMPLETED BY ELECTRICAL CONTRACTOR.

23 FINAL INSPECTION

REQUEST IN WRITING FOR A FINAL INSPECTION OF THE MECHANICAL SYSTEMS.

DISCONNECT ELECTRICAL POWER TO EQUIPMENT AND RECONNECT AS REQUIRED.

WHEN THE REQUEST IS MADE, ALL DEFICIENCIES MUST BE COMPLETE, BALANCING REPORTS SUBMITTED SYSTEMS READY FOR OPERATION, DATA BOOK SUBMITTED, ALL TAGS, CHARTS AND NAMEPLATES COMPLETED, ALL FIXTURES AND EQUIPMENT CLEANED, SPARE PARTS PROVIDED, RECORD DRAWINGS COMPLETED, CONTROL SYSTEMS OPERATIONAL AND THE OWNER'S STAFF INSTRUCTED IN ALL PHASES OF

24.TESTING AND BALANCING

TEST, BALANCE AND ADJUST ALL AIR SYSTEM TO OBTAIN THE DESIGN QUANTITIES. SUBMIT AIR SYSTEMS TEST AND AIR BALANCE REPORT TO THE LANDLORD, CONSULTANT, AND OWNER'S COORDINATOR, INDICATE ALL TEST RESULTS INCLUDING ENTERING AND LEAVING AIR TEMPERATURES. THIS WORK SHALL BE PERFORMED BY A QUALIFIED TESTING AND BALANCING CONTRACTOR.

25.CLOSE OUT DOCUMENTATION AND TRAINING

CONTRACTOR TO PROVIDE A THREE-DAY TRAINING SESSION FOR THE OWNER'S MAINTENANCE STAFF ON NON-CONSECUTIVE DAYS, ALLOWING THE OPERATIONS STAFF AN OPPORTUNITY TO FAMILIARIZE THEMSELVES AFTER THE FIRST TRAINING SESSION. TRAINING FOR THE BAS SHALL BE A MINIMUM OF 12

PROVIDE CLOSE-OUT DOCUMENTATION, WITH ALL ITEMS INSERTED INTO A THREE RING HARD COVER BINDER. THE CONTENTS SHALL INCLUDE BUT NOT BE LIMITED TO THE FOLLOWING: NAMES, ADDRESSES, PHONE NUMBERS, AND CONTACTS OF ALL SUB-CONTRACTORS AND MAJOR

MAINTENANCE DATA. PROVIDE A ROUTINE MAINTENANCE SCHEDULE COORDINATED WITH EQUIPMENT MANUFACTURER, AND GOOD MAINTENANCE PROCEDURES. THIS WILL INCLUDE FILTER CHANGES, LUBRICATION, HUMIDIFIER MAINTENANCE, CLEANING OF BLOWER COMPARTMENTS, AND GENERAL OBSERVANCE TO THE OPERATION OF ALL FOUIPMENT AND ATTENDING TO ANY DETAILS ARISING . WARRANTY CERTIFICATES FOR ALL EQUIPMENT.

EQUIPMENT MANUFACTURER'S INFORMATION INCLUDING PERFORMANCE CAPACITIES, INSTALLATION, AND

2. WARRANTY LETTER FROM THE TRADES,

3. CONTROL DIAGRAMS AND HARDWARE LISTS. 4. CONTROL TRADE LETTER VERIFYING VISUAL CONFIRMATION AND COMMISSIONING OF THE ENTIRE CONTROL SYSTEM.

5. AS-BUILT DRAWINGS: CONTRACTOR TO CARRY COSTS ASSOCIATED WITH THE PREPARATION OF AS-BUILT RECORD DRAWINGS IN AUTOCAD 2007 FORMAT COMPLIANT WITH LATEST REVISION OF 'ROGERS NATIONAL CADD STANDARDS', TO BE SUBMITTED TO THE ENGINEER AND CLIENT FOR REVIEW AND APPROVAL. RED-LINE, HAND MARK-UP AS-BUILT DRAWINGS ARE NOT PERMISSIBLE.

6. AIR BALANCING REPORT 7. TSSA APPROVAL CERTIFICATE TO BE INCLUDED IN CLOSE OUT DOCUMENTATION.

- DEMOLISH EXISTING HEATING AND COOLING S/A , R/A AND E/A DUCTWORK AND PROVIDE NEW DUCTWORK ASSOCIATED WITH ALL DIFFUSERS AND ACCESSORIES AND FIRE DAMPERS IN SECOND FLOORS.
- PRE-AUDIT AND RE-BALANCE THE ENTIRE DUCTWORK FOR THE AIR FLOW AS SHOWN IN THE DRAWING

PROVIDE SEPARATE PRICE FOR BELOW SCOPE OF WORK

• DEMOLISH EXISTING HWSP#1,2 AND HWRP#1,2,3.4 PUMPS AND PROVIDE NEW HWSP#1,2 AND HWRP#1,2,3.4 PUMPS FOR HEATING SYSTEM, ASSOCIATED WITH ALL VALVES, PIPING, ACCESSORIES AND ALL RELATED CONTROL UPGRADES IN BOILER ROOM

- DUCTWORK SHALL BE CONSTRUCTED TO ASHRAE/SMACNA STANDARDS DUCT SIZES ARE LISTED ON DRAWINGS. ALL DUCT SIZES SHOWN ARE CLEAR INSIDE DIMENSIONS

DUCTWORK HANGERS AND SUPPORTS SHALL BE ALL DUCTWORK TO BE SUPPORTED WITH DUCT STRAPS AT 5'-0" OC. AND AS REQUIRED TO SUPPORT THE DUCT JOINTS. ALL ROUND DUCTWORK TO BE SECURED WITH A MINIMUM OF THREE (3) SHEET METAL SCREWS AT ALL DUCT JOINTS, PRIOR TO SEALING THE DUCT JOINT WITH METAL DUCT TAPE. TAPE IS TO BE PRESSED TIGHT AGAINST A CLEAN DUCT SURFACE. TO ENSURE NO AIR GAPS AND BLISTERS. WHICH MAY ALLOW

THE GLUE TO DRY UP AND CAUSE AN AIR LEAK ALL ROUND DUCTWORK TO BE SECURED WITH A MINIMUM OF THREE (3) SHEET METAL SCREWS AT ALL DUCT JOINTS, PRIOR TO SEALING THE DUCT JOINT WITH METAL DUCT TAPE. TAPE IS TO BE PRESSED TIGHT AGAINST A CLEAN DUCT SURFACE. TO ENSURE NO AIR GAPS AND BLISTERS. WHICH MAY ALLOW

THE GLUE TO DRY UP AND CAUSE AN AIR LEAK. PROVIDE STANDARD FITTINGS AS REQUIRED BY THE ASHRAE AND SMACNA AND GOOD COMMERCIAL /

RESIDENTIAL SHEET METAL INSTALLATION PRACTICE AND AS FOLLOWS: • DUCT REDUCER FITTINGS SHALL HAVE TAPER ANGLES OF 45 DEG. OR LESS

• SUPPLY AND RETURN PLENUM COLLAR AREA SHALL BE A MIN. OF 1.5 TIMES THE DUCT AREA. • ALL BRANCH DUCTS SHALL BE CONNECTED TO THE MAIN WITH A TAPERED BOOT AND BALANCING DAMPER. PROVIDE RETURN AIR CONNECTION TO THE AIR HANDLING EQUIPMENT WITH A ROUNDED HEEL, AND A

MINIMUM 150MM (6") RADIUS WITH TURNING VANES. • ALL ELBOWS ARE TO HAVE INSIDE RADIUS AT LEAST 1/3 THE DUCT WIDTH. IF THIS IS NOT POSSIBLE, PROVIDE A MINIMUM 6" RADIUS WITH TURNING VANES.

ALL DUCT TRANSITIONS ARE TO BE AT AN ANGLE OF 15 DEG

• PROVIDE FLEXIBLE CONNECTIONS AT ALL FAN AND AIR HANDLING EQUIPMENT CONNECTIONS. WHERE DUCTS ARE WIDER THAN 24", USE STANDING SEAM DUCT JOINTS/CONNECTIONS.

ELBOWS SHALL HAVE RADIUS OF NOT LESS THAN DUCT WIDTH. BARBER-COLEMAN "AIRTURNS" OR HART & COOLEY "DUCTURNS" TURNING VANES SHALL BE PROVIDED IN ELBOWS OF LESSER RADIUS IN ALL

4. FLEXIBLE CONNECTIONS

FIRE RESISTANT NEOPRENE COATED GLASS FABRIC.

PROVIDE FLEXIBLE CONNECTION AT ALL DUCTED HVAC UNITS AND FANS AND/OR AS INDICATED ON

5. DUCTWORK THERMAL INSULATION INSULATE SUPPLY DUCTWORK AS SHOWN ON DRAWINGS.

BLANKET OR RIGID THERMAL INSULATION ON INDOOR DUCTS SHALL BE PROVIDED WHERE INDICATED ON THERMAL INSULATION SHALL BE 38MM THICK BLANKET MINERAL FIBER OR 25MM THICK RIGID MINERAL

FIBERBOARD FOR CONDITIONED AIR DUCTWORK AND 50MM RIGID FOR OUTDOOR AIR DUCTWORK. INSULATION SHALL BE FOIL FACED HAVING FLAME SPREAD RATING OF 25 OR LESS AND A SMOKE DEVELOPMENT CLASSIFICATION OF 50 OR LESS. ACCEPTABLE BLANKET MINERAL FIBER SHALL BE JOHNS MANVILLE MICROLITE DUCT WRAP TYPE OR

FOUIVALENT

ACCEPTABLE RIGID MINERAL FIBERBOARD SHALL BE JOHNS MANVILLE 800 SERIES SPIN-GLASS TYPE OR EQUIVALENT. SEAL ALL JOINTS WITH ULC LISTED SELF-ADHESIVE INSULATION TAPE FOR INDOOR DUCTS AND INSULATION. UNLESS OTHERWISE SPECIFIED

PROVIDE CANVAS JACKET WITH LAGGING ADHESIVE ON ALL EXPOSED DUCTWORK. PROVIDE SHEET METAL JACKET ON INSULATION & DUCTWORK ABOVE THE ROOF.

6. ACOUSTIC INSULATION

OR EQUIVALENT.

ACOUSTIC INSULATION SHALL BE PROVIDED AND INSTALLED ON SUPPLY AIR CONDITIONING DUCTWORK FOR FIRST 5M OF DUCTWORK OR AS INDICATED ON DRAWINGS.

ACOUSTIC INSULATION SHALL BE 25MM THICK INTERNAL LINING, C/W FACTORY APPLIED BLACK ACRYLIC POLYMER COATING, HAVING FLAME SPREAD RATING OF 25 OR LESS AND SMOKE DEVELOPMENT CLASSIFICATION OF 50 OR LESS. DUCT SIZES SHOWN ON DRAWINGS INDICATE CLEAR INSIDE DIMENSIONS. APPLY BLACK ACRYLIC POLYMER COATING TO ALL FIELD CUT EDGES AS PER SMACNA STANDARDS. ACCEPTABLE COATING SHALL BE JOHNS MANVILLE SUPERSEAL OR EQUIVALENT.

WHERE HUMIDIFICATION (DUCT TYPE) IS REQUIRED, INSULATION MATERIAL TO BE MICROBIAL GROWTH LINING SHALL BE PINNED AT 12" O.C., AND ADHERED WITH FULL AREA COVERAGE WITH AN ADHESIVE CONFORMING TO ASTM C916. PINS ARE TO BE CUT BACKTIGHT TO WASHER. ALL RAW EDGES TO BE

SEALED WITH THE SAME ADHESIVE. ALL LEADING EDGES TO BE PROVIDED WITH A SHEET METAL STRIP

ALONG THE EDGE TO SECURE THE LINING TO THE DUCT AND AVOID EROSION OF THE FIBREGLASS. ALL EXPOSED PORTIONS OF THE FIBREGLASS LINING, NOT COVERED WITH THE THERMOSETTING RESIN JACKET SHALL BE BUTTERED DOWN TO AVOID ANY POSSIBILITY OF INSULATION EROSION. ACCEPTABLE ACOUSTIC DUCT LINER SHALL BE JOHNS MANVILLE PERMACOTE LINACOUSTIC STANDARD/HP

7. BALANCING DAMPERS

BALANCING DAMPERS SHALL BE MANUALLY OPERATED OPPOSED BLADE FOR DUCTS LARGER THAN 20" (508MM) AND SPLITTER TYPE FOR SMALLER DUCTS. SPLITTER DAMPERS SHALL BE COMPLETE WITH

HVAC

CONTROL ROD, PIVOT BRACKET AND BALL JOINT FITTING WITH LOCKING SET SCREW. PROVIDE BALANCING DAMPERS IN THE TRUNK DUCTS AND ALL SUPPLY AND RETURN BRANCH DUCTS AS SHOWN, REQUIRED AND AS REQUESTED BY THE AIR BALANCE TECHNICIAN. DAMPERS ARE TO BE **EQUIVALENT TO "DURO-DYNE"**

DAMPERS ON THE ROUND BRANCH DUCTS SHALL BE DURO-DYNE MODEL #KS-7 WITH TWO POINT DAMPER SUPPORTS. RECTANGULAR DUCT BRANCHES SHALL HAVE HEAVY DUTY DURO-DYNE MODEL #KS-385 QUADRANT DAMPER AND END BEARINGS WITH SPOT WELDED DAMPER BLADE TO THE SHAFT. PROVIDE SPLITTER DAMPERS AT ALL MAIN BRANCHES WHERE THE BRANCH CONNECTS TO THE TRUNK

DUCT. PROVIDE "DURO DYNE" RODS, LOCK UP DEVICE WITH SWIVEL HEAD, AND SWIVEL HEAD HINGE ON A MINIMUM 22 GAUGE SPLITTER BLADE.

8. MOTORIZED DAMPERS

PROVIDE OPPOSED BLADE DAMPERS FOR MODULATING OPERATION CONDITION.

PROVIDE PARALLEL BLADE DAMPERS FOR OPEN AND CLOSED TYPE OPERATION. DAMPERS SHALL BE COMPLETE WITH [120][24]V ELECTRONIC ACTUATOR [C/W 120V/24V TRANSFORMER]. ELECTRONIC ACTUATOR SHALL BE FACTORY INSTALLED BY DAMPER MANUFACTURER. ACTUATORS TO COME WITH SINGLE POLE DOUBLE THROW (SPDT) END SWITCH. NUMBER OF SETS REQUIRED AS PER CONTROL SEQUENCE OF OPERATION.

FOR COOLING ONLY APPLICATIONS PROVIDE THERMOSTAT. WHERE APPLICATION IS FOR COOLING AND HEATING PROVIDE A THERMOSTAT CAPABLE OF COOLING/HEATING/AUTO CHANGEOVER WITH DUCT MOUNTED TEMPERATURE SENSOR INSTALLED TO SENSE TEMPERATURE UPSTREAM OF MOTORIZED

PRODUCT SHALL BE EQUAL TO SIEMENS.

HANGERS AND SUPPORTS

PIPING, DUCTWORK AND EQUIPMENT SHALL BE SECURELY SUPPORTED FROM BUILDING STRUCTURE. PERFORATED STRAP OR WIRE HANGERS ARE NOT PERMITTED.

SUPPORT COMPONENTS SHALL CONFORM TO MANUFACTURERS STANDARDIZATION SOCIETY SPECIFICATION HANGERS SHALL ADEQUATELY SUPPORT DUCT OR PIPING SYSTEM. LOCATE HANGERS NEAR OR AT CHANGES IN DIRECTION AND CONCENTRATED LOADS. PROVIDE VERTICAL ADJUSTMENT TO MAINTAIN PITCH REQUIRED FOR PROPER DRAINAGE IN PIPING SYSTEMS. ALLOW FOR PIPING EXPANSION AND CONTRACTION.

WEIGHT AND STRESSES SHALL BE SUPPORTED INDEPENDENTLY OF ANY EQUIPMENT.

AIR SYSTEMS:

ALL MECHANICAL AND ELECTRICAL EQUIPMENT SHALL BE ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF NOISE AND VIBRATION ISOLATORS.

PIPING OVER 25 MM (1") OUTSIDE DIAMETER LOCATED IN MECHANICAL EQUIPMENT ROOMS, AND FOR A MINIMUM OF FIFTY (50) FFFT OR 100 PIPE DIAMETERS, WHICHEVER IS GREATER, FROM ANY CONNECTION TO VIBRATION ISOLATED MECHANICAL OR ELECTRICAL EQUIPMENT, SHALL BE ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF NOISE AND VIBRATION ISOLATION HANGERS. ALL PIPING IN THE BUILDING, WHICH IS CONNECTED TO VIBRATION ISOLATED EQUIPMENT. SHALL BE ISOLATED AT CONNECTIONS TO THE BUILDING STRUCTURE

DUCTWORK LOCATED IN MECHANICAL EQUIPMENT ROOM, AND FOR A MINIMUM OF FIFTY (50) FEET FROM ANY CONNECTION TO VIBRATION ISOLATED AIR MOVING EQUIPMENT, AND DUCTWORK VERTICAL RISERS SHALL BE ISOLATED FROM THE BUILDING STRUCTURE BY MEANS OF NOISE AND VIBRATION ISOLATION HANGERS. ENSURE ISOLATION SYSTEMS HAVE A NATURAL FREQUENCY NO HIGHER THAN 1/3 OF THE LOWEST FORCING FREQUENCY UNLESS OTHERWISE SPECIFIED.

PROVIDE WEATHERPROOF COATING (RUSTOLEUM OR NEOPRENE PAINT) ON SPRINGS AND FRAMES ON ALL ISOLATION EQUIPMENT EXPOSED TO OUTDOORS.

11. TESTING, BALANCING, ADJUSTING AND COMMISSIONING

AND ADJUST THE AIR AND WATER SYSTEMS.

PROVIDE TESTING, BALANCING AND COMMISSIONING OF ALL SYSTEMS. COMMISSIONING SHALL INCLUDE PUTTING INTO SERVICE, ADJUSTING, CALIBRATING AND VERIFYING ALL SYSTEMS. BOTH NEW AND EXISTING. PROVIDE AN INDEPENDENT BALANCING COMPANY ACCEPTABLE TO THE CONSULTANT TO TEST, BALANCE

-- PROVIDE AIR BALANCE IN ACCORDANCE WITH THE REQUIREMENTS OF THE DRAWINGS AND AABC STANDARDS. AIR BALANCING SHALL BE PERFORMED WITH CLEAN FILTERS INSTALLED. MECHANICAL CONTRACTOR SHALL CLEAN ALL AIR SYSTEM FILTERS (NEW AND EXISTING) PRIOR TO AIR BALANCING. SUBMIT THREE (3) COPIES OF THE AIR BALANCE REPORT TO THE CONSULTANT FOR REVIEW.

- PROVIDE DATA IN THE BALANCING REPORT WHICH INDICATES AIR VOLUMES AT EACH OUTLET, STATIC PRESSURES, FAN DATA, MOTOR DATA AND COIL DATA.

- PROVIDE BALANCING AND ADJUSTING OF ALL AIR SYSTEMS TO ACHIEVE SPECIFIED DESIGN VALUES

PROVIDE DUCT TRAVERSE READINGS FOR EACH AIR HANDLING UNIT AND FAN (WITH DUCTED CONNECTIONS AND EXCEEDING 1000 CFM).

-- ADJUST THE AIR PATTERN FOR ALL DIFFUSERS AS INDICATED ON THE DRAWINGS OR AS DIRECTED BY THE CONSULTANT.

-- VERIFY THE OPERATION OF ALL CONTROL DEVICES, INCLUDING VARIABLE VOLUME BOXES.

-- IDENTIFY PRESSURE DROP ACROSS FILTERS FOR ALL AIR HANDLING UNITS.

HEATING PUMPS - INLINE

PART 1 - GENERAL

1.1 DEFINITIONS

A. CSC: CARBON VS. SILICON CARBIDE B. STC: SOLID TUNGSTEN CARBIDE

MANUFACTURER.

1.2 SUBMITTALS

A. PRODUCT DATA: INCLUDE CERTIFIED PERFORMANCE CURVES AND RATED CAPACITIES, OPERATING CHARACTERISTICS, FURNISHED SPECIALTIES, FINAL IMPELLER DIMENSIONS, AND ACCESSORIES FOR EACH TYPE OF PRODUCT INDICATED. INDICATE PUMP'S OPERATING POINT ON CURVES. PUMP SHALL

BE NON-OVERLOADING THRU OUT THE OPERATING CURVE. B. SHOP DRAWINGS: SHOW PUMP LAYOUT AND CONNECTIONS, INCLUDE SETTING DRAWINGS WITH TEMPLATES FOR INSTALLING FOUNDATION AND ANCHOR BOLTS AND OTHER ANCHORAGES.

WIRING DIAGRAMS: POWER, SIGNAL, AND CONTROL WIRING. C. OPERATION AND MAINTENANCE DATA: FOR PUMPS TO INCLUDE IN EMERGENCY, OPERATION, AND

MAINTENANCE MANUALS. 1.3 QUALITY ASSURANCE A. SOURCE LIMITATIONS: OBTAIN HYDRONIC PUMPS THROUGH ONE SOURCE FROM A SINGLE

B. PRODUCT OPTIONS: DRAWINGS INDICATE SIZE, PROFILES, AND DIMENSIONAL REQUIREMENTS OF HYDRONIC PUMPS AND ARE BASED ON THE SPECIFIC SYSTEM INDICATED. C. ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA70,

ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

D- PUMP MANUFACTURE SHALL BE ISO CERTIFIED AND SIX SIGMA RATED. 1.6 DELIVERY, STORAGE, AND HANDLING A. MANUFACTURER'S PREPARATION FOR SHIPPING: CLEAN FLANGES AND EXPOSED MACHINED METAL SURFACES AND TREAT WITH ANTICORROSION SOLUTION AFTER ASSEMBLY AND TESTING. PROTECT

FLANGES, PIPE OPENINGS, AND NOZZLES WITH PLASTIC COVER OVER ENTIRE PUMP. B. STORE PUMPS IN DRY LOCATION. ROTATE MOTOR & IMPELLER ROUTINELY FOR LONG STORAGE

C. RETAIN PROTECTIVE COVERS FOR FLANGES AND PROTECTIVE WOOD CRATE AND PLASTIC WRAP DURING STORAGE. D. PROTECT BEARINGS AND COUPLINGS AGAINST DAMAGE FROM SAND, GRIT, AND OTHER FOREIGN

1.7 EXTRA MATERIALS A. FURNISH EXTRA MATERIALS DESCRIBED BELOW THAT MATCH PRODUCTS INSTALLED AND THAT ARE

PACKAGED WITH PROTECTIVE COVERING FOR STORAGE AND IDENTIFIED WITH LABELS DESCRIBING 1. MECHANICAL SEALS: ONE MECHANICAL SEAL AND VOLUTE GASKET FOR EACH PUMP.

E. COMPLY WITH PUMP MANUFACTURER'S WRITTEN RIGGING INSTRUCTIONS.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. IN OTHER PART 2 ARTICLES WHERE TITLES BELOW INTRODUCE LISTS, THE FOLLOWING REQUIREMENTS APPLY TO PRODUCT SELECTION: AVAILABLE MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, MANUFACTURERS OFFERING

PRODUCTS THAT MAY BE INCORPORATED INTO THE WORK INCLUDE, BUT ARE NOT LIMITED TO, MANUFACTURERS SPECIFIED $2. \ \ MANUFACTURERS: SUBJECT\ TO\ COMPLIANCE\ WITH\ REQUIREMENTS,\ PROVIDE\ PRODUCTS\ BY\ ONE\ OF\ THE$

B. DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, CENTRIFUGAL, OVERHUNG-IMPELLER, CLOSE

MANUFACTURERS SPECIFIED.

2.2 CLOSED COUPLED, VERTICAL, IN-LINE CENTRIFUGAL PUMPS

A. MANUFACTURERS: 1. PATTERSON PUMP COMPANY

2. BELL &GOSSETT; DIV. OF ITT INDUSTRIES. 3. ARMSTRONG PUMPS INC. 4. AURORA PUMPS.

HVAC

IN-LINE PUMP AS DEFINED IN HI 1.1-1.2 AND HI 1.3; DESIGNED FOR INSTALLATION WITH PUMP AND MOTOR SHAFTS MOUNTED VERTICALLY. RATE PUMP FOR 170-PSIG MAXIMUM WORKING PRESSURE

AND A CONTINUOUS WATER TEMPERATURE OF 225 DEG F.

1. CASING: BACK PULL-OUT DESIGN, CAST IRON, WITH THREADED GAGE TAPPINGS AT INLET AND OUTLET, AND FLANGE CONNECTIONS. ASTM A48-CL30. PROVIDE CASE WEAR RINGS PER ASTM B505-932. BOTTOM OF CASING TO BE DRILLED AND TAPPED TO ACCOMMODATE A PIPE FLANGE FOR FLOOR SUPPORTS. PROVIDE STAMPED

PUMP SERIAL NUMBER IN CASING. SO AS TO IDENTIFY PUMP IF TAG IS REMOVED. 2. IMPELLER: ASTM B584-875, PRECISION CAST BRONZE; STATICALLY AND DYNAMICALLY BALANCED, AND KEYED TO SHAFT WITH STAINLESS STEEL KEY. TRIM IMPELLER TO MATCH SPECIFIED PERFORMANCE. IMPELLER TO BE BALANCED AND TRIMMED BY THE PUMP MANUFACTURE. IMPELLER ATTACHED TO PUMP MOTOR SHAFT WITH A STAINLESS STEEL BOLT AND WASHER.

3. MECHANICAL SEAL: CARBON ROTATING RING AGAINST A SILICON CARBIDE SEAT HELD BY A 416 STAINLESS-STEEL SPRING, AND BUNA-N BELLOWS AND GASKET. COPPER FLUSH SEAL LINE SHALL BE INSTALLED FROM DISCHARGE OF PUMP TO SEAL GLAND.

4. PUMP BEARINGS: PERMANENTLY LUBRICATED BALL BEARINGS. D. MOTOR: JM FRAME, SINGLE SPEED, WITH PERMANENTLY LUBRICATED BALL BEARINGS, UNLESS

OTHERWISE INDICATED; AND RIGIDLY MOUNTED TO PUMP CASING. MOTOR SHALL BE A JM FRAME

COUPLED, END-SUCTION PUMP AS DEFINED IN HI 1.1-1.2 AND HI 1.3; DESIGNED FOR BASE MOUNTING,

WITH PUMP AND MOTOR SHAFTS HORIZONTAL. RATE PUMP FOR 170-PSIG MAXIMUM WORKING

E. CAPACITIES AND CHARACTERISTICS;

 REFER TO SCHEDULE ON DRAWINGS. 2.3 RIGIDLY COUPLED, VERTICAL IN-LINE CENTRIFUGAL PUMPS

1. PATTERSON PUMP COMPANY 2. BELL &GOSSETT; DIV. OF ITT INDUSTRIES.

A. MANUFACTURERS:

3. ARMSTRONG PUMPS INC. 4. AURORA PUMPS. B. DESCRIPTION: FACTORY-ASSEMBLED AND -TESTED, CENTRIFUGAL, OVERHUNG-IMPELLER, SEPARATELY

PRESSURE AND A CONTINUOUS WATER TEMPERATURE OF 225 DEG F. C. PUMP CONSTRUCTION:

PLUG AT BOTTOM, FLANGED CONNECTIONS. ASTM A48-CL30. BOTTOM OF CASING O BE DRILLED AND TAPPED TO ACCOMMODATE A PIPE FLANGE FOR FLOOR SUPPORTS. PROVIDE TAMPED PUMP SERIAL NUMBER IN CASING, SO AS TO IDENTIFY PUMP IF TAG IS REMOVED 2. IMPELLER: ASTM B584-875, PRECISION CAST BRONZE; STATICALLY AND DYNAMICALLY BALANCED, KEYED TO SHAFT, SECURED WITH A LOCKING STAINLESS STEEL CAP SCREW. TRIM IMPELLER TO MATCH SPECIFIED

1. CASING: BACK PULL-OUT DESIGN. CAST IRON. WITH THREADED GAGE TAPINGS AT INLET AND OUTLET, DRAIN

PERFORMANCE. IMPELLER TO BE BALANCED AND TRIMMED BY THE PUMP MANUFACTURE. 3. PUMP SHAFT: 416 STAINLESS STEEL, WITH GRAPH ALLOY GM 205.3 THROTTLE BUSHING.

FIRE DAMPER

PART 1 - GENERAL

1.3 RELATED WORK

1.1 GENERAL

.1 COMPLY WITH THE CONTRACT DOCUMENTS WHICH INCLUDE, BUT ARE NOT NECESSARILY LIMITED TO, THE GENERAL CONDITIONS, THE SUPPLEMENTARY GENERAL CONDITIONS, THE GENERAL REQUIREMENTS, SPECIFICATIONS, DRAWINGS, ALL ADDENDA AND ANY CHANGE ORDERS

1.2 DESCRIPTION OF WORK

.11 NOTE: WHERE APPLICABLE IN THE SPECIFICATIONS, REFER BACK TO: DELETE THIS LINE AFTERWARDS!!!

.1 PROVIDE FIRE DAMPERS AS SHOWN.

.2 GENERAL REQUIREMENTS SECTION 01 00 00

.3 SHOP DRAWINGS SECTION 01 03 40 .4 SUBMITTALS SECTION 01 03 41 .5 QUALITY CONTROL SECTION 01 04 00

.6 TEMPORARY FACILITIES SECTION 01 05 00 .7 ENVIRONMENTAL PROTECTION SECTION 01 05 60

.8 SAFETY REQUIREMENTS SECTION 01 06 00

.9 MATERIAL AND EQUIPMENT SECTION 01 07 00

.10 CLEANING SECTION 01 07 10 .11 PROJECT CLOSEOUT SECTION 01 08 00

1.4 SHOP DRAWINGS AND PRODUCT DATA

.1 SUBMIT MANUFACTURERS PRODUCT SHEETS WITH INSTALLATION DATA FOR: .1 FIRE DAMPERS. 1.5 APPLICABLE CODES AND STANDARDS

.1 GENERAL: AMCA 500 LABORATORY METHODS OF TESTING DAMPERS FOR RATINGS.

.2 AMCA 503 FIRE CEILING (RADIATION), SMOKE, AND FIRE/SMOKE DAMPERS APPLICATION MANUAL.

.2 FIRE DAMPERS AND FIRE STOP FLAPS:

.1 TESTED IN ACCORDANCE WITH APPROPRIATE PROVISIONS OF; .1 CAN/ULC - S112 STANDARD METHOD OF FIRE TEST OF FIRE DAMPER ASSEMBLIES

.2 ULC CAN4 - S112.2 STANDARD METHOD OF FIRE TEST OF CEILING FIRESTOP FLAP ASSEMBLIES

RESPECTIVELY .3 UL-555 FIRE DAMPERS OR UL-555C CEILING DAMPERS, INCLUDING TESTS TO DEMONSTRATE CLOSURE UNDER DYNAMIC CONDITIONS.

.2 LISTINGS:

.1 LISTED BY AND BEARING LABEL OF ULC .2 CLASSIFIED BY AND BEARING LABEL OF UL, LABELLED BY WARNOCK HERSEY OR OTHER

10 M/S (2000 FPM)

APPROVED TESTING AGENCY.

.3 IN COMPLIANCE WITH REQUIREMENTS OF THE ONTARIO BUILDING CODE.

PART 2 - PRODUCTS

2.1 FIRE DAMPERS - GENERAL

.2 "DYNAMIC": RATED TO CLOSE WITH AIR FLOW THROUGH DAMPER.

.1 "STATIC": RATED ONLY TO CLOSE WITH ESSENTIALLY NO AIRFLOW THROUGH DAMPER.

.2 STYLE: .1 TYPE A: BLADES AND FRAMES IN AIRSTREAM, .2 TYPE B: BLADES OUT OF AIRSTREAM,

.3 TYPE C: BLADES AND FRAME OUT OF AIRSTREAM, RECTANGULAR, ROUND AND FLAT OVAL DUCTWORK.

.2 DIFFERENTIAL PRESSURE, MAXIMUM: 1000 PA (4 IN WC.)

.3 RATINGS, EACH DYNAMIC DAMPER; .1 AIR VELOCITY, MAXIMUM:

.4 MANUFACTURERS:

.1 STANDARD OF ACCEPTANCE .1 NAILOR .2 EH PRICE (NATIONAL CONTROLLED AIR)

.3 RUSKIN 2.2 FIRE DAMPERS - CURTAIN TYPE

> .2 BLADES: CURTAIN TYPE, INTERLOCKING BLADES, G60 GALVANIZED STEEL .3 SLEEVE: SAME MATERIAL AS DAMPER FRAME, LENGTH TO SUIT APPLICATION WITH STEEL ENCLOSURE AND TRANSITION COLLARS, AND RETAINING ANGLES, .4 ENCLOSURE: TYPE A AND B

.1 FRAME: G60 ROLL FORMED GALVANIZED STEEL FRAME,

.5 FUSIBLE LINK: 74°C (165°F) UNLESS OTHERWISE SHOWN.

.6 NOTWITHSTANDING THE ABOVE, FRAME, SLEEVE, AND BLADES TO BE STAINLESS STEEL WHERE DAMPER IS INSTALLED IN A DUCT SYSTEM WHICH IS STAINLESS STEEL. .2 DYNAMIC DAMPERS:

.1 AS ABOVE, AND

.1 AS ABOVE, AND

.1 CONSTRUCTION:

.2 FITTED WITH STAINLESS STEEL CLOSURE SPRING, .3 STATIC DAMPERS:

.2 MOUNTING IN VERTICAL PLANE: FITTED WITH STAINLESS STEEL CLOSURE SPRING.

.3 MOUNTING IN HORIZONTAL PLANE: FITTED WITH STAINLESS STEEL CLOSURE SPRING. 2.3 FIRE DAMPERS - AIRFOIL MULTIBLADE TYPE

.1 CONSTRUCTION: .1 TYPE: DYNAMIC .2 FRAME: G60 GALVANIZED STEEL HAT CHANNEL

15/05/2021 ISSUED FOR PERMIT AND TENDER 10/02/2021 ISSUED FOR REVIEW ∖REV. DATE DESCRIPTION Key Plan True North



Drawing Overall Scale

Project Name & Address

AS SHOWN

BOWMANVILLE HIGH SCHOOL

MECHANICAL SERVICES

MECHANICAL SPECIFICATIONS

Kawartha Pine Ridge

District School Board

HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Engineer / Architect Stamp DATE: 2021-MARCH-19 DESIGNED BY: B.E DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027

M. Akhanan M.AKHAVANBAZAZ 100088319 \ 14 MAY 2021

M-101

.6 SLEEVE: SAME MATERIAL AS DAMPER FRAME, LENGTH TO SUIT APPLICATION WITH STEEL ENCLOSURE AND TRANSITION COLLARS, AND RETAINING ANGLES,

.7 ENCLOSURE: TYPE A AND B

.8 FUSIBLE LINK: HIGH TORQUE SPRING/FUSIBLE LINK, 74°C (165°F) UNLESS OTHERWISE SHOWN.

.5 JACKSHAFT: WITH INTERNAL LOCKING QUADRANT, FOR USE AS A BALANCING DAMPER,

.9 NOTWITHSTANDING THE ABOVE, FRAME, SLEEVE, AND BLADES TO BE STAINLESS STEEL WHERE DAMPER IS INSTALLED IN A DUCT SYSTEM WHICH IS STAINLESS STEEL

.2 OPERATOR, ELECTRIC:

.1 WHERE REQUIRED BY LISTING, FOR MULTIPLE DAMPER INSTALLATIONS:

.2 FACTORY INSTALLED ELECTRIC TWO POSITION, FAIL CLOSE, OPERATOR, 120 VAC MOTOR,

.1 ELECTRIC RESETTABLE LINK: 121°C (250°F), WITH MANUAL RESET BUTTON

.2 CONTROLLED RATE SPRING CLOSURE.

2.4 SMOKE DAMPERS

.1 CONSTRUCTION:

.1 TYPE: DYNAMIC, .2 FRAME: G60 GALVANIZED STEEL HAT CHANNEL, WITH STAINLESS STEEL JAMB SEALS,

.3 BLADES: AIRFOIL MULTIBLADE TYPE, PARRALLEL ACTION, INTERLOCKING BLADES, 6063-T5 EXTRUDED ALUMINUM, WITH SILICONE BLADE SEALS,

.4 LINKAGE: EXTERIOR SIDE OF FRAME (OUT OF AIRSTREAM),

.5 SLEEVE: SAME MATERIAL AS DAMPER FRAME, LENGTH TO SUIT APPLICATION WITH STEEL ENCLOSURE AND TRANSITION COLLARS, CAULKED JOINTS, AND RETAINING ANGLES,

.6 ENCLOSURE: TYPE A AND B

.7 FUSIBLE LINK: HIGH TORQUE SPRING/FUSIBLE LINK, 74°C (165°F) UNLESS OTHERWISE SHOWN.

.8 NOTWITHSTANDING THE ABOVE, FRAME, SLEEVE, AND BLADES TO BE STAINLESS STEEL WHERE DAMPER IS INSTALLED IN A DUCT SYSTEM WHICH IS STAINLESS STEEL

.2 OPERATOR, ELECTRIC:

.1 FACTORY INSTALLED ELECTRIC TWO POSITION, FAIL CLOSE, OPERATOR, 120 VAC MOTOR,

.1 ELECTRIC RESETTABLE LINK: 121°C (250°F), WITH MANUAL RESET BUTTON

.2 CONTROLLED RATE SPRING CLOSURE.

.3 DAMPER POSITION SWITCH:

.1 FACTORY INSTALLED, DAMPER POSITION CONTACT SWITCHES,

.1 PROVE DAMPER OPEN,

.2 PROVE DAMPER CLOSED

2.5 FIRE STOP FLAPS (CEILING RADIATION DAMPERS)

.1 CONSTRUCTION:

.1 GALVANIZED STEEL FRAME AND BLADES FOR ROUND OR SQUARE NECK DIFFUSERS,

.2 FITTED WITH CORROSION RESISTANT STEEL SPRINGS AND REPLACEABLE 75°C (165°F) FUSIBLE LINK,

.3 SUPPLIED WITH THERMAL BLANKET CUT TO SUIT DIFFUSER FACE PLATE DIMENSIONS AND DIFFUSER

.4 LABELED OR LISTED AND RATED FOR BOTH STEEL DUCT AND FLEXIBLE DUCT INSTALLATIONS,

.5 FITTED WITH ADJUSTABLE VOLUME CONTROLLERS WHERE SHOWN.

.1 STANDARD OF ACCEPTANCE

.1 EH PRICE (NCA)

.2 NAILOR

.3 RUSKIN

PART 3 -EXECUTION

3.1 FIRE DAMPERS AND FIRE STOP FLAPS

.1 INSTALL FIRE DAMPERS AND FIRE STOP FLAPS THROUGHOUT SUPPLY, RETURN AND EXHAUST AIR

.2 INSTALL FIRE DAMPERS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS, WITH SLEEVE, DUCT CONNECTIONS AND ANGLE SUPPORTS TO COMPLY WITH TERMS AND CONDITIONS OF LISTING OR CLASSIFICATION AND MAINTAIN INTEGRITY OF FIRE WALL AND/OR FIRE SEPARATION.

3.2 FIRE DAMPER SELECTION

.1 SELECT DAMPER TYPES AS FOLLOWS:

.1 "DYNAMIC" - ALL LOCATIONS,

.2 "STATIC" - RESTRICTED TO UNDUCTED, TRANSFER AIR OPENINGS ONLY.

.3 "STATIC" - IN AIR HANDLING SYSTEMS DESIGNED TO SHUT-DOWN ON FIRE ALARM AND NOT USED FOR SMOKE VENTING OR CONTROL SYSTEMS

.2 SELECT DAMPER STYLES AS FOLLOWS:

.1 DYNAMIC DAMPER:

.1 REQUIREMENT IN EACH COLUMN MUST BE MET.

.2 WIDTH IS DUCT DIMENSION PARALLEL TO BLADES, HEIGHT IS DUCT DIMENSION PERPENDICULAR TO BLADES.

A B
В
С
С
С

DUCT VELOCITY	DUCT HEIGHT	DUCT WIDTH	STYLE
≤ 1500 FPM	> 12 IN	> 12 IN	Α
≤ 1500 FPM	> 8 IN	> 8 IN	В
≤ 1500 FPM	> 8 IN	> 8 IN	С
ANY	> 8 IN	ANY	С
≤ 1500 FPM	ANY	ANY	С

HEATING

C.2 STATIC DAMPERS:

.1 REQUIREMENT IN EACH COLUMN MUST BE MET.

.2 WIDTH IS DUCT DIMENSION PARALLEL TO BLADES, HEIGHT IS DUCT DIMENSION PERPENDICULAR

DUCT VELOCITY	DUCT HEIGHT	DUCT WIDTH	STYLE
≤ 7.5 M/S	> 300 MM	> 300 MM	Α
ANY	ANY	ANY	В
DUCT VELOCITY	DUCT HEIGHT	DUCT WIDTH	STYLE
≤ 1500 FPM	> 12 IN	> 12 IN	Α
ANY	ANY	ANY	В

B.3 INSTALL INDIVIDUAL DAMPERS AND/OR ASSEMBLIES OF INDIVIDUAL DAMPERS WITHIN LIMITATIONS OF LISTING OR CLASSIFICATION;

.1 USE CURTAIN DAMPERS IN SINGLE DAMPER INSTALLATIONS;

.1 FOR GREATER CLARITY, DO NOT USE CURTAIN DAMPERS IN MULTIPLE DAMPER ASSEMBLIES, WITH OR WITHOUT MULLIONS.

.2 WHERE DUCT SIZE EXCEEDS ABOVE REQUIREMENTS FOR CURTAIN DAMPERS, USE MULTIBLADE FIRE

.3 WHERE LISTING REQUIRES MULTIPLE DAMPER ASSEMBLIES, USE MULTIBLADE FIRE DAMPERS,

.4 WHERE DUCT SIZE EXCEEDS ALLOWABLE DIMENSIONS FOR LISTED OR CLASSIFIED MULTIBLADE FIRE

.4 INSTALL STAINLESS STEEL DAMPERS IN STAINLESS STEEL DUCT SYSTEMS AND/OR WHEREVER DUCTWORK IS SPECIFIED TO BE WATERTIGHT CONSTRUCTION.

DAMPER ASSEMBLIES, USE COMBINATION FIRE AND SMOKE DAMPERS.

.5 POSITION DUCT ACCESS DOOR AT EACH FIRE DAMPER, TO PERMIT VISUAL INSPECTION AND

.6 INSTALL FIRE STOP FLAPS IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS TO COMPLY WITH TERMS AND CONDITIONS OF LISTING OR CLASSIFICATION. POSITION SUPPLIED THERMAL BLANKETS TO COVER CEILING DIFFUSERS.

3.3 POWER FOR MULTIBLADE FIRE DAMPER ACTUATORS

.1 WHERE MULTIBLADE FIRE DAMPER LISTING REQUIRES AN ELECTRIC ACTUATOR, PROVIDE POWER AND CONDUIT FROM NEAREST NORMAL EMERGENCY 120 VAC POWER DISTRIBUTION PANEL.

.1 PROVIDE 15 A BREAKER, WITH TAMPER LOCK, FOR EACH CIRCUIT,

.2 MAXIMUM NUMBER OF ACTUATORS ON EACH ELECTRICAL CIRCUIT: 5 A,

.3 EACH CIRCUIT ONLY TO SERVE FLOOR THAT POWER DISTRIBUTION PANEL IS LOCATED ON.

3.4 SMOKE DAMPERS AND COMBINATION SMOKE/FIRE DAMPERS

.1 INSTALL SMOKE DAMPERS, WITH LEAKAGE CLASS AS INDICATED, THROUGHOUT SUPPLY, RETURN AND EXHAUST AIR SYSTEMS AS SHOWN. PROVIDE LOW PRESSURE LOSS DAMPERS WHERE INDICATED.

.2 INSTALL INDIVIDUAL DAMPERS AND/OR ASSEMBLIES OF INDIVIDUAL DAMPERS WITHIN LIMITATIONS OF LISTING OR CLASSIFICATION.

.3 INSTALL AND CONNECT DAMPER OPERATORS TO ACHIEVE SMOKE CONTROL AND SMOKE VENTING SEQUENCES AS SHOWN

3.5 POWER FOR SMOKE DAMPERS AND COMBINATION SMOKE/FIRE DAMPERS

.1 POWER WIRE AND CONDUIT PROVIDED BY DIVISION 26 UP TO JUNCTION BOX ADJACENT TO DAMPER.

.2 PROVIDE WIRE AND CONDUIT BETWEEN JUNCTION BOX AND DAMPER ACTUATOR.

3.6 DAMPER ACCESS

INSPECTION.

.1 POSITION DUCT ACCESS DOOR AT EACH FIRE DAMPER, TO PERMIT VISUAL INSPECTION AND REPLACEMENT OF FUSIBLE LINK.

.2 POSITION DUCT ACCESS DOOR AT EACH COMBINATION FIRE AND SMOKE DAMPER, TO PERMIT VISUAL

INSPECTION AND SERVICE OF DETECTION/ACTUATION MECHANISM. .3 PROVIDE SIMILAR ACCESS DOOR UPSTREAM OR DOWNSTREAM OF EACH SMOKE DAMPER FOR VISUAL

HEATING

4. MECHANICAL SEAL: CARBON ROTATING RING AGAINST A SILICON CARBIDE SEAT HELD BY A 416 STAINLESS-STEEL SPRING, AND BUNA-N BELLOWS AND GASKET. COPPER FLUSH SEAL LINE SHALL BE INSTALLED FROM DISCHARGE OF PUMP TO SEAL GLAND.

D. RIGID SHAFT COUPLING: HIGH TENSILE ALUMINUM, TWO PIECE DESIGN. COUPLING KEY TO BE

STEEL-ASTM A 108-1018. E. (OPTIONAL) MOUNTING FRAME: FACTORY FABRICATED C-CHANNEL STEEL TO MOUNT PUMP CASING TO

MOTOR: VP FRAME SINGLE SPEED, WITH PERMANENTLY LUBRICATED BALL BEARINGS, UNLESS OTHERWISE INDICATED; SECURED TO MOTOR MOUNTING FRAME, WITH ADJUSTABLE ALIGNMENT: CAST IRON ASTM A48-CL30, ALLOWING THE REMOVAL OF MOTOR WITHOUT DISTURBING WET END OF

G. CAPACITIES AND CHARACTERISTICS:

PERFORMANCE OF WORK

 REFER TO SCHEDULE ON DRAWINGS. 2.4 PUMP SPECIALTY FITTINGS

A. SUCTION DIFFUSER: ANGLE PATTERN, 175-PSIG PRESSURE RATING, CAST-IRON BODY AND END CAP. PUMP-INLET FITTING; WITH BRONZE STARTUP AND BRONZE OR STAINLESS-STEEL PERMANENT STRAINERS: STRAIGHTENING VANES: DRAIN PLUG: AND FACTORY-FABRICATED SUPPORT BOSS DIFFUSER SHALL ACCOMMODATE A FULLY OPENED BUTTERFLY VALVE ON THE VERTICAL INLET SIDE.

MANUFACTURED BY PUMP MANUFACTURE TRIPLE-DUTY VALVE: ANGLE OR STRAIGHT PATTERN, 175-PSIG PRESSURE RATING, CAST-IRON BODY. PUMP DISCHARGE FITTING; WITH DRAIN PLUG AND BRONZE-FITTED SHUTOFF, BALANCING, AND CHECK VALVE FEATURES. BRASS GAGE PORTS WITH INTEGRAL CHECK VALVE, AND ORIFICE FOR FLOW MEASUREMENT. MANUFACTURED BY PUMP MANUFACTURE.

PART 3 - EXECUTION

3.1 EXAMINATION

A. EXAMINE EQUIPMENT FOUNDATIONS AND ANCHOR-BOLT LOCATIONS FOR COMPLIANCE WITH REQUIREMENTS FOR INSTALLATION TOLERANCES AND OTHER CONDITIONS AFFECTING

B. EXAMINE ROUGHING-IN FOR PIPING SYSTEMS TO VERIFY ACTUAL LOCATIONS OF PIPING CONNECTIONS

PUMP INSTALLATION.

C. EXAMINE FOUNDATIONS AND INERTIA BASES FOR SUITABLE CONDITIONS WHERE PUMPS ARE TO BE

D. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED. 3.2 (OPTIONAL) SUPPORT BASES

VERTICAL IN-LINE PUMP SHALL BE SUPPLIED FROM FACTORY WITH OPTIONAL C-CHANNEL STEEL ONE

PUMP SHALL COME ATTACHED TO BASE FROM PUMP MANUFACTURE

B. INSTALL CONCRETE BASES OF DIMENSIONS INDICATED FOR PUMPS AND CONTROLLERS. 1. INSTALL ANCHOR RODS TO CONNECT CONCRETE BASE TO CONCRETE FLOOR. UNLESS OTHERWISE INDICATED, INSTALL ANCHOR RODS ON I-1INCH CENTERS AROUND FULL PERIMETER OF BASE.

2. FOR SUPPORTED EQUIPMENT, INSTALL EPOXY-COATED ANCHOR BOLTS THAT EXTEND THROUGH CONCRETE BASE AND ANCHOR INTO STRUCTURAL CONCRETE FLOOR. 3. PLACE AND SECURE ANCHORAGE DEVICES. USE SETTING DRAWINGS, TEMPLATES, DIAGRAMS, INSTRUCTIONS,

AND DIRECTIONS FURNISHED WITH ITEMS TO BE EMBEDDED. 4. INSTALL ANCHOR BOLTS TO ELEVATIONS REQUIRED FOR PROPER ATTACHMENT TO SUPPORTED EQUIPMENT.

3.3 PUMP INSTALLATION

A. COMPLY WITH HI 14 B. INSTALL PUMPS WITH ACCESS FOR PERIODIC MAINTENANCE INCLUDING REMOVAL OF MOTORS,

IMPELLERS, COUPLINGS, AND ACCESSORIES.

INDEPENDENTLY SUPPORT PUMPS AND PIPING SO WEIGHT OF PIPING IS NOT SUPPORTED BY PUMPS WEIGHT OF PUMPS IS NOT SUPPORTED BY PIPING.

D. INSTALL CONTINUOUS-THREAD HANGER RODS AND ELASTOMERIC HANGERS OF SUFFICIENT SIZE TO SUPPORT PUMP WEIGHT. FABRICATE BRACKETS OR SUPPORTS AS REQUIRED. REFER TO HANGER AND SUPPORT SPECIFICATIONS FOR MORE DETAILS.

E. SET BASE-MOUNTED PUMPS ON CONCRETE FOUNDATION. DISCONNECT COUPLING BEFORE SETTING. DO NOT RECONNECT COUPLINGS UNTIL ALIGNMENT PROCEDURE IS COMPLETE.

1. SUPPORT PUMP BASE PLATE ON RECTANGULAR METAL BLOCKS AND SHIMS, OR ON METAL WEDGES WITH SMALL TAPER, AT POINTS NEAR FOUNDATION BOLTS TO PROVIDE A GAP OF 3/4 TO 1-1/2 INCHES BETWEEN PUMP BASE AND FOUNDATION FOR GROUTING

2. ADJUST METAL SUPPORTS OR WEDGES UNTIL PUMP AND DRIVER SHAFTS ARE LEVEL. CHECK COUPLING FACES AND SUCTION AND DISCHARGE FLANGES OF PUMP TO VERIFY THAT THEY ARE LEVEL AND PLUMB.

A. ALIGN PUMP AND MOTOR SHAFTS AND PIPING CONNECTIONS AFTER SETTING ON FOUNDATION, GROUT HAS BEEN SET AND FOUNDATION BOLTS HAVE BEEN TIGHTENED, AND PIPING CONNECTIONS HAVE

B. COMPLY WITH PUMP AND COUPLING MANUFACTURERS' WRITTEN INSTRUCTIONS.

ADJUST PUMP AND MOTOR SHAFTS FOR ANGULAR AND OFFSET ALIGNMENT BY METHODS SPECIFIED IN HI 1.1-1.5, "CENTRIFUGAL PUMPS FOR NOMENCLATURE, DEFINITIONS, APPLICATION AND OPERATION."

D. AFTER ALIGNMENT IS CORRECT, TIGHTEN FOUNDATION BOLTS EVENLY BUT NOT TOO FIRMLY. COMPLETELY FILL BASE PLATE WITH NON SHRINK, NONMETALLIC GROUT WHILE METAL BLOCKS AND SHIMS OR WEDGES ARE IN PLACE. AFTER GROUT HAS CURED, FULLY TIGHTEN FOUNDATION BC

3.5 CONNECTIONS A. DRAWINGS INDICATE GENERAL ARRANGEMENT OF PIPING, FITTINGS, AND SPECIALTIES.

B. INSTALL PIPING ADJACENT TO MACHINE TO ALLOW SERVICE AND MAINTENANCE C. CONNECT PIPING TO PUMPS. INSTALL VALVES THAT ARE SAME SIZE AS PIPING CONNECTED TO PUMPS.

D. INSTALL SUCTION AND DISCHARGE PIPE SIZES EQUAL TO OR GREATER THAN DIAMETER OF PUMP

E. INSTALL TRIPLE-DUTY VALVE ON DISCHARGE SIDE OF PUMPS.

F. INSTALL Y-STRAINER OR SUCTION DIFFUSER AND SHUTOFF VALVE ON SUCTION SIDE OF PUMPS. G. INSTALL FLEXIBLE CONNECTORS ON SUCTION AND DISCHARGE SIDES OF BASE-MOUNTED PUMPS

BETWEEN PUMP CASING AND VALVES WITH CONTROL RODS. H. INSTALL PRESSURE GAGES ON PUMP SUCTION AND DISCHARGE, AT INTEGRAL PRESSURE-GAGE

INSTALL SINGLE GAGE WITH MULTIPLE INPUT SELECTOR VALVE. I. INSTALL CHECK VALVE AND GATE OR BALL VALVE ON EACH CONDENSATE PUMP UNIT DISCHARGE.

J. INSTALL ELECTRICAL CONNECTIONS FOR POWER, CONTROLS, AND DEVICES. 3.6 STARTUP SERVICE

A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO PERFORM STARTUP SERVICE. 1. COMPLETE INSTALLATION AND STARTUP CHECKS ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS.

2. CHECK PIPING CONNECTIONS FOR TIGHTNESS. 3. CLEAN STRAINERS ON SUCTION PIPING.

4. PERFORM THE FOLLOWING STARTUP CHECKS FOR EACH PUMP BEFORE STARTING:

a. VERIFY BEARING LUBRICATION. b. VERIFY THAT PUMP IS FREE TO ROTATE BY HAND AND THAT PUMP FOR HANDLING HOT LIQUID IS FREE TO ROTATE WITH PUMP HOT AND COLD. IF PUMP IS BOUND OR DRAGS. DO NOT OPERATE UNTIL CAUSE OF TROUBLE IS DETERMINED AND CORRECTED

c. VERIFY THAT PUMP IS ROTATING IN THE CORRECT DIRECTION. 5. PRIME PUMP BY OPENING SUCTION VALVES AND CLOSING DRAINS, AND PREPARE PUMP FOR OPERATION.

START MOTOR. 7. OPEN DISCHARGE VALVE SLOWLY.

3.7 DEMONSTRATION A. ENGAGE A FACTORY-AUTHORIZED SERVICE REPRESENTATIVE TO TRAIN OWNER'S MAINTENANCE PERSONNEL TO ADJUST, OPERATE, AND MAINTAIN HYDRONIC PUMPS.

PLUMBING

3. THE WORK UNDER THIS SECTION SHALL INCLUDE ALL LABOR, MATERIALS, PLANT, TOOLS, TRANSPORTATION, AND TESTING OF PLUMBING AND DRAINAGE SYSTEMS, THE WORK SHALL BE LEFT COMPLETE AND IN SATISFACTORY OPERATION. THE WORK GENERALLY CONSISTS OF, BUT IS NOT LIMITED

ALL PLUMBING AND DRAINAGE SYSTEMS.

ALL COLD/HOT DOMESTIC WATER PIPING, VALVES, AND INSULATIONS.

ALL MISCELLANEOUS PLUMBING WORK AS HERINAFTER SPECIFIED AND AS SHOWN ON DRAWINGS. 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING PIPING. APPROXIMATE LOCATIONS ARE INDICATED ON DRAWINGS.

5. DOMESTIC WATER PIPING SHALL BE TYPE 'M' COPPER WITH CAST BRONZE OR WROUGHT COPPER SOLDER

TYPE FITTINGS OR EQUAL TO BUILDING STANDARDS 6. SOLDER JOINTS IN COPPER PIPE WITH A BLOWTORCH. LEAD SOLDER IS NOT PERMITTED.

7. JOINTS FOR GALVANIZED PIPE TO COPPER PIPING SHALL BE MADE USING APPROVED TYPE FITTINGS TO RETARD THE GALVANIC CORROSION OF TWO DISSIMILAR METALS. 8. INSTALL ALL DRAIN PIPING WITH REQUIRED FITTINGS OF DIMENSIONS AND IN LOCATIONS SHOWN ON DRAWINGS. HORIZONTAL PIPING SHALL BE PITCHED ON AN EVEN GRADE OF NOT LESS THAN 1/8" PER FOOT RUN. TURNS SHALL BE MADE WITH LONG RADIUS BENDS OR 1/8 BENDS AND FITTINGS, AND 45 DEGREE

9. NO BULLHEADED TEES SHALL BE USED ON WATER PIPING.

PLUMBING

10. ALL VALVES SHALL BE CRANE, JENKINS, NEWSMAN HATTERSLEY OR EMCO. NO OTHER VALVES MAY BE USED WITHOUT THE WRITTEN PERMISSION OF THE ENGINEER. VALVES SPECIFIED HEREINAFTER SHALL BE

READ IN CONJUNCTION WITH THE PLANS. 11. SUPPLY AND INSTALL FULL 'PIPE SIZE' VALVES WHERE SHOWN ON PLANS.

12.SHUT-OFF VALVES SHALL BE BALL TYPE EXCEPT WHERE THROTTLING EFFECT IS REQUIRED AS IN BYPASSES OR FOR END OF LINE SERVICE WHERE GLOBES SHALL BE PROVIDED.

13.ALL VALVES SHALL BE SUITABLE FOR 200 P.S.I. WORKING PRESSURE AND UP TO AND INCLUDING 2-1/2" SIZE

SHALL BE ALL BRONZE. LARGER SIZES SHALL HAVE IRON BODIES AND BRONZE TRIM. 14. ALL BRONZE GATE VALVES UP TO AND INCLUDING 2-1/2" SIZE SHALL BE JENKINS FIG. #470 OR CRANE #430.

GLOBE VALVES SHALL BE JENKINS #106 OR CRANE #7. 15. ALL VALVES ON COPPER PIPE SHALL BE BRONZE SOLDER JOINT GLOBE VALVES, NON-RISING STEM, FOR 150 P.S.I. WATER AND SHALL BE CRANE #1310 OR JENKINS #142.

16. SUPPLY AND INSTALL CLEAN OUTS AT THE ENDS OF ALL STRAIGHT RUNS OF DRAINS IN ALL HORIZONTAL BRANCHES, ON STRAIGHT HORIZONTAL RUNS FIFTY FEET APART, ON EXPOSED OR ACCESSIBLE TRAPS, AND AT ALL POINTS OF THE SYSTEM WHERE SO INDICATED OR NECESSARY TO REMOVE OBSTRUCTIONS. IF CLEAN OUT HAS TO BE ABOVE DRY WALL CEILING, PROVIDE ACCESS HATCH.

17.INSULATION SHALL BE MANUFACTURED BY FIBREGLAS OF CANADA. INSULATION MANUFACTURED BY CANADIAN JOHNS MANVILLE HAVING THE THICKNESS, PROPERTIES AND METHOD OF APPLICATION EQUAL TO THE INSULATION SPECIFIED SHALL BE EQUALLY ACCEPTABLE.

18. ALL COVERING SHALL BE APPLIED IN A NEAT AND WORKMANLIKE MANNER SO THAT THE FINISHED JOB IS UNIFORM IN DIAMETER, SMOOTH IN FINISH, AND ALL LONGITUDINAL SEAMS SHALL BE PLACED SO AS TO BE INVISIBLE. ALL CANVAS SHALL BE 6 OZ. PER SQUARE YARD.

19. ALL COVERINGS, JACKETS, CEMENTS, FINISHES, ETC., SHALL BE APPROVED BY AND MEET THE REQUIREMENTS OF ALL AUTHORITIES HAVING JURISDICTION REGARDING FIRE SPREAD PROPERTIES ETC. INCI LIDE FOR ALL NECESSARY MODIFICATIONS AND TREATMENTS OF THE ABOVE MATERIALS AS REQUIRED TO MEET SUCH REQUIREMENTS IN FORCE AT TIME OF BIDDING.

20.ALL COLD WATER PIPING SHALL BE COVERED WITH 1/2" THICK FIBERGLASS LOW PRESSURE PIPE COVERING AND FIRE RESISTANT VAPOUR BARRIER.

21.COVER ALL FITTINGS AND ELBOWS TO MATCH ADJOINING INSULATION IN THICKNESS WITH INSULATING CEMENT OF FIBERGLASS AND FINISH WITH ALUMINUM FOIL IN STRICT ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

22.ALL PIPING INSTALLED IN THE PROJECT SHALL BE HYDRAULICALLY TESTED AS SPECIFIED HEREIN OR AS REQUIRED BY THE APPLICABLE PLUMBING CODE TO THE SATISFACTION OF THE PLUMBING INSPECTOR AND

23.DO ALL TEST PRIOR TO PIPE COVERING OR INSULATION.

24.CORRECT ALL DEFICIENCIES WITH NO EXTRA COSTS TO THE OWNER.

25.ALL PIPING INSTALLED IN THE PROJECT SHALL BE HYDRAULICALLY TESTED AS SPECIFIED HEREIN OR AS REQUIRED BY THE APPLICABLE PLUMBING CODE TO THE SATISFACTION OF THE PLUMBING INSPECTOR AND THE ENGINEER.

26.DRAINAGE WASTE AND VENT PIPING:

MATERIAL AS INDICATED ON DRAWINGS. IF MATERIALS HAVE NOT BEEN INDICATED ON DRAWINGS, THEN INSTALLATION SHALL ADHERE TO THIS SECTION.

ABOVE GROUND SANITARY LESS THAN 75MM AND VENT SHALL BE TYPE DWV TO ASTM B306 WITH CAST BRASS OR WROUGHT COPPER FITTINGS TO CAN/CSA B125 OR PVC TO CAN/CSA-B181.2 OR ABS TO CAN/CSA-181.1.

JOINTS FOR COPPER TUBE/ PIPE SHALL BE TIN-LEAD (50%TN-50%±B) SOLDER JOINTS FOR PVC PIPE SHALL BE SOLVENT WELD TO ATSM D2564 ABOVE GROUND SANITARY, STORM AND VENT GREATER THAN 75MM SHALL BE CAST IRON TO

CAN/CSA-B70 OR PVC TO CAN/CSA-B181.2 OR ABS TO CAN/CSA-181.1. JOINTS FOR CAST IRON SHALL BE HUB AND SPIGOT FOR STORM DRAIN ONLY, AND MECHANICAL JOINT FOR

JOINTS FOR PVC PIPE SHALL BE SOLVENT WELD TO ATSM D2564 BURIED SANITARY, STORM AND VENT SHALL BE MINIMUM 75MM CAST IRON TO CAN/CSA-B70 OR PVC TO

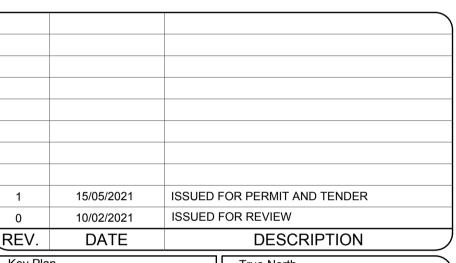
CAN/CSA-B181.2 OR ABS TO CAN/CSA-181.1. JOINTS FOR CAST IRON SHALL BE HUB AND SPIGOT

JOINTS FOR PVC PIPE SHALL BE SOLVENT WELD TO ATSM D2564 25.PROVIDE TRAP PRIMERS AS REQUIRED BY CODES AND STANDARDS. 26.PROVIDE VENTING OF DRAINAGE SYSTEMS IN ACCORDANCE WITH OBC.

27.CORRECT ALL DEFICIENCIES WITH NO EXTRA COSTS TO THE OWNER. 28.ALL PIPING INSTALLED IN THE PROJECT SHALL BE HYDRAULICALLY TESTED AS SPECIFIED HEREIN OR AS REQUIRED BY THE APPLICABLE PLUMBING CODE TO THE SATISFACTION OF THE PLUMBING INSPECTOR AND

DO ALL TESTS PRIOR TO PIPE COVERING OR INSULATION.

SANITARY ONLY





AS SHOWN

District School Board

Project Name & Address **BOWMANVILLE HIGH SCHOOL**

HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SPECIFICATIONS

DATE: 2021-MARCH-19 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027



∖REV. Key Plan True North

Kawartha Pine Ridge

Drawing Overall Scale

MECHANICAL SERVICES

Engineer / Architect Stamp

M-102

MECHANICAL LEGEND

GENERAL NOTES

- A. ALL SHUTDOWNS OF ANY PORTION OF EXISTING BASE BUILDING SYSTEMS SHALL BE PERFORMED BY THE LANDLORD'S BUILDING OPERATIONS STAFF AND/OR COORDINATED WITH THE LANDLORD FOR TIME AND DURATION OF INTERRUPTIONS AND ADHERENCE TO THE LANDLORD'S INSTRUCTIONS IN THIS REGARD.
- B. ALL THE WORK MUST COMPLY WITH KPRDSB'S GUIDELINES WHERE APPLICABLE. COMPLY WITH ALL APPLICABLE
- C. BE SURE TO READ THE SPECIFICATIONS AND ALL DRAWINGS BEFORE ORDERING MATERIALS OR COMMENCING CONSTRUCTION WORK. IF ANY OF THE ABOVE INSTRUCTIONS ARE NOT CARRIED OUT AND IT RESULTS IN ADDITIONAL COSTS DURING OR AFTER CONSTRUCTION, NO ADDITIONAL CHARGES WILL BE PAID BY THE
- KPRDSB OR ITS AGENTS. D. WORK SHALL INCLUDE TESTING AND BALANCING OF ALL AIR AND HYDRONIC SYSTEMS AS APPLICABLE. MAKE ALL ADJUSTMENTS TO PROVIDE DESIGN REQUIREMENTS.
- E. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH KPRDSB STANDARD DETAILS IF APPLICABLE. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- F. SECURE AND PAY FOR ALL REQUIRED PERMITS.
- G. INCLUDE COST OF PREMIUM TIME IN TENDER PRICE FOR WORK DURING NIGHTS, WEEKENDS, OR OTHER TIMES OUTSIDE NORMAL WORKING HOURS NECESSARY TO MAINTAIN ALL MECHANICAL SERVICES IN OPERATION.
- H. WORK IN OCCUPIED AREAS, DRILLING OF FLOORS AND WALLS, AND OTHER WORK OPERATIONS THAT MAY CREATE NOISE SHALL BE PERFORMED IN COORDINATION WITH BUILDING MANAGEMENT. I. TIE-INS TO EXISTING SERVICES MUST BE ARRANGED AS ITEM ABOVE.
- J. ALLOW FOR REVISIONS / CHANGES TO EXISTING INSTALLATIONS IN ORDER TO INSTALL NEW SERVICES AND AT NO EXTRA COST TO THE OWNER.
- K. ALL EXISTING STRUCTURES AND SERVICES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED TO ORIGINAL STANDARD AND AT NO ADDITIONAL COST TO OWNER.
- L. 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.
- M. 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 MILCORE OR APPROVED EQUAL ACCESS DOORS. IN ADDITION, PROVIDE ACCESS DOORS TO ALL EXISTING BUILDING SYSTEMS CLEANOUTS ON VERTICAL STACKS, BACKWATER VALVES AND CEILING SUSPENDED EQUIPMENT. PROVIDE MINIMUM SIZE OF CEILING ACCESS OF 4 SQUARE
- N. THE CONTRACTOR SHALL ARRANGE THE SCHEDULE AND PROCEED WITH THE WORK DESCRIBED WITH THE MINIMUM DISTURBANCE AND INTERRUPTION OF EXISTING FACILITIES AND SERVICES.
- O. ASSUME FULL RESPONSIBILITY FOR LAYOUT OF THE WORK AND FOR ANY DAMAGE CAUSED TO THE OWNER OR OTHERS BY IMPROPER LOCATION OR CARRYING OUT OF THIS WORK.
- P. X-RAY FLOOR/WALL OR ANY CONCRETE SURFACES PRIOR TO CUTTING OR CORING OPENINGS FOR MECHANICAL PROVISIONING.
- Q. CONTRACTOR SHALL VISIT THE SITE DURING THE TENDER AND REVIEW DRAWINGS WITH THE EXISTING CONDITION AND IDENTIFY ANY DISCREPANCIES OR INTERFERENCES BETWEEN DRAWINGS AND SITE CONDITIONS AND ALLOW IN THEIR PRICING TO MODIFY/ RELOCATE EXISTING SERVICES (CONDUITS, PIPING, DUCTWORK, ETC) FOR INSTALLATION OF NEW SERVICES. ADDITIONAL FEES FOR THE ABOVE WILL NOT BE APPROVED AFTER CLOSING THE TENDER.
- R. CONTRACTOR SHALL REMOVE CEILING FOR ACCESS TO PIPING ABOVE CEILING WHEN EXISTING PIPING TO BE REMOVED/ NEW PIPING TO BE INSTALLED ABOVE CEILING AND RE-INSTALL CEILING FOLLOWING COMPLETION OF WORK AND PAINT WHOLE CEILING TO MAKE GOOD.
- S. CONTRACTOR TO PRE-AUDIT FOR ALL AIR SYSTEMS IN THIS CONTRACT.
- T. CONTRACTOR SHALL PERFORM A COMPLETE TEST AND BALANCING AFTER COMPLETION OF THE WORK AND SUBMIT REPORT TO CONSULTANT AND KPRDSB.
- U. THE MECHANICAL CONTRACTOR IS RESPONSIBLE FOR COMMISSIONING OF REPLACED AND NEW HEATING/COOLING EQUIPMENT AND C/W ALL ASSOCIATED DAMPERS, VALVES, DAMPERS.
- V. CONTRACTOR SHALL PROVIDE ANY EQUIPMENT NECESSARY FOR PERFORMING AIR BALANCING AND HOT WATER SYSTEM BALANCING.
- W. 10 FT OF SUPPLY DUCTS AND WHOLE LENGTH OF RETURN AIR AND O/A DUCTS TO BE CLEANED AND VACUUMED AND FILTERS TO BE REPLACED AT THE END OF CONSTRUCTION.

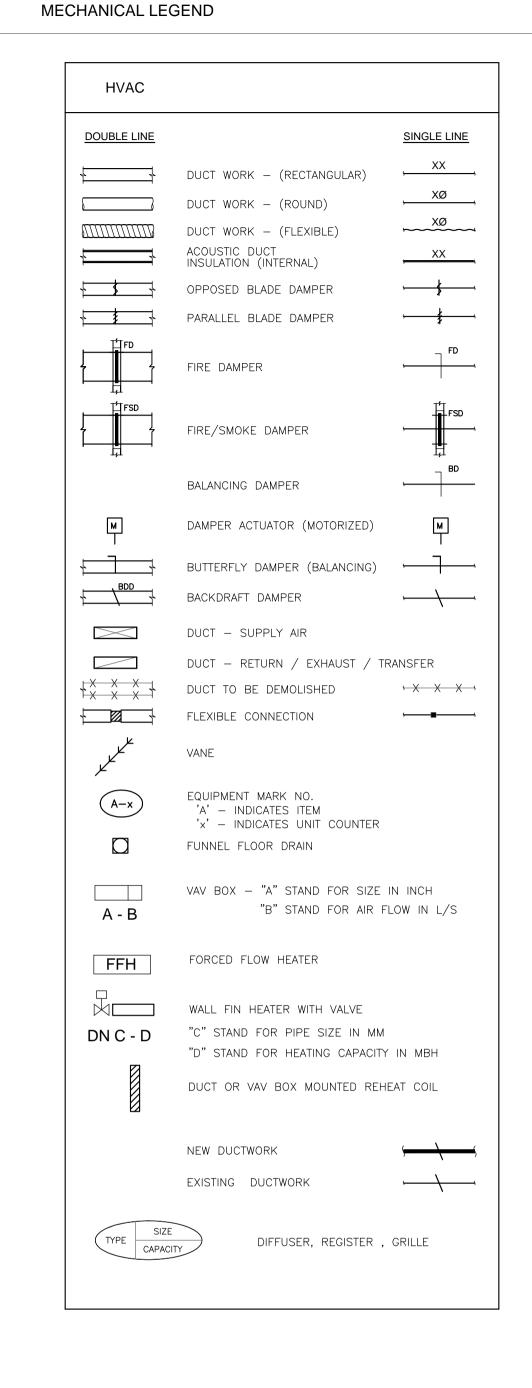
PIPING	
HWR	GLYCOL-HOT WATER RETURN
LPS	LOW-PRESSURE STEAM PIPE
LPC	LOW-PRESSURE STEAM CONDENSATE PIPE
SAN	SANITARY PIPE NEW PIPING
	EXISTING PIPING TO REMAIN
- x x x	EXISTING PIPING TO BE REMOVED
───	GATE VALVE
───	GLOBE VALVE
	PLUG VALVE
——————————————————————————————————————	BUTTERFLY VALVE
——⊳&1——	BALL VALVE
───	DRAIN VALVE WITH HOSE CONNECTION
<u> </u>	CHECK VALVE
>	PRESSURE REDUCING VALVE
—— V ——	BALANCING VALVE
\$	TWO-WAY CONTROL VALVE
\	THREE-WAY CONTROL VALVE
₽ AA∨	AUTOMATIC AIR VENT
H	MANUAL AIR VENT
<u></u>	PRESSURE RELIEF VALVE
	'Y' TYPE STRAINER
<u> </u>	UNION
	PIPE END CAP
<u></u>	PIPE ANCHOR
	PIPE LINE GUIDE
∏ ⊤ X	THERMOMETER
© X	PRESSURE GAUGE AND COCK

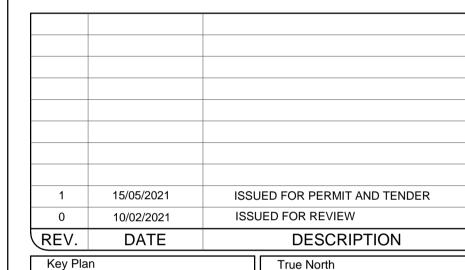
CONTROLS	:
(T)	EXISTING TEMPERATURE SENSOR
P	PRESSURE SENSOR / TRANSMITTER / SWITCH
T	NEW TEMPERATURE SENSOR
Т	EXISTING PNEUMATIC THERMOSTAT
E	NEW DDC THERMOSTAT
SD	NEW SMOKE DETECTOR

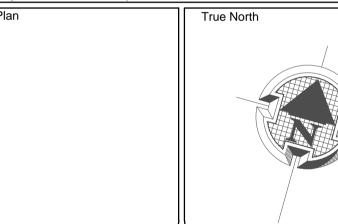
ABBREVIATIONS

AFF - ABOVE FINISHED FLOOR AHU - AIR HANDLING UNIT BCP - BAS CONTROL PANEL BOD EL BOTTOM OF DUCT ELEVATION BOP EL BOTTOM OF PIPE ELEVATION C EL CENTRELINE ELEVATION C EL CENTRELINE ELEVATION C CEL CENTRELINE OF PIPE ELEVATION C CEL CENTRELINE ELEVATION CO - CLEANOUT EA - EXHAUST AIR EF - EXHAUST FAN EFF - ELECTRIC FORCE FLOW HEATER EFF - EXPANSION TANK FA - FROM ABOVE FB - FROM BELOW FFD - FUNNEL FLOOR DRAIN GHR - POLYPROPYLENE GLYCOL-HOT WATER RETURN GHS - POLYPROPYLENE GLYCOL-HOT WATER SUPPLY HX - HEAT EXCHANGER HWR - HOT WATER RETURN HWS - HOT WATER RETURN HWS - HOT WATER SUPPLY NC - NORMALLY CLOSED NIC - NOT IN CONTRACT NO - NORMALLY OPEN NPS - NOMINAL PIPE SIZE O/A - OUTSIDE AIR R/A - RETURN AIR S/A - SUPPLY AIR SF - SUPPLY FAN TOD - TOP OF DUCT ELEVATION TOP - TOP OF PIPE ELEVATION TOP - TOP OF PIPE ELEVATION TYP - TYPICAL MAU - MAKEUP AIR UNIT (X) - REFERENCE NOTE 'X' FFFH - FORCED FLOW HEATER UV - UNIT VENTILATOR

СО	NTROL ABBREVIATIONS	
AI AO DI DO	ANALOGUE INPUT ANALOGUE OUTPUT BINARY/DIGITAL INPUT BINARY/DIGITAL OUTPUT	
CO2 P PD T	CARBON DIOXIDE SENSOR PRESSURE SENSOR PRESSURE DIFFERENTIAL TEMPERATURE SENSOR	
CV-x VFD	CONTROL VALVE NUMBER VARIABLE FREQUENCY DRIVE	









Spectra **Engineering** 50 SHEPPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9 TEL. (647) 478-5156



Kawartha Pine Ridge **District School Board**

Drawing Overall Scale

AS SHOWN

Project Name & Address

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SERVICES MECHANICAL LEGENDS

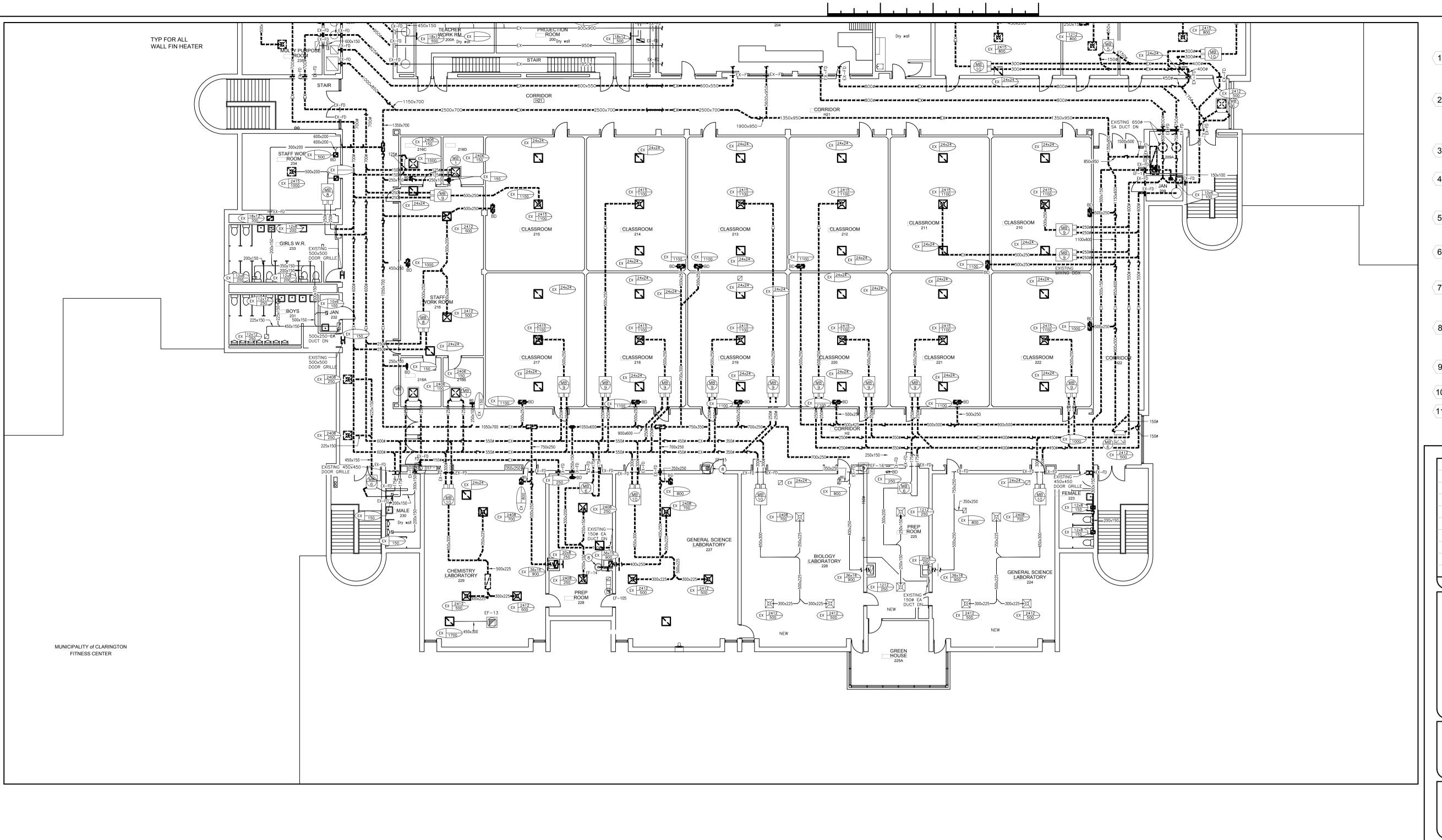
DATE: 2021-MARCH-19 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027



Drawing No. Phase Revision



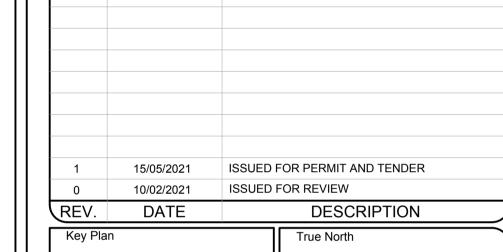




SECOND FLOOR DUCT- AREA "A" - DEMOLITION WORK

DEMOLITION NOTES:

- 1 CONTRACTOR TO DEMOLISH ALL EXISTING SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED DIFFUSERS, FIRE DAMPERS, SUPPORTS, BALANCING DAMPERS AND INSULATIONS AS PER DRAWINGS, MAKE LOCATION READY FOR NEW INSTALLATION.
- \langle 2 \rangle Contractor to pre-audit air and submit the report to ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- \langle 3 \rangle Contractor to demolish t. Bar ceiling in order to demolition DUCTWORK AS REQUIRED, REFER TO STRUCTURAL DRAWINGS FOR MORE DETAILS.
- 4 EXISTING DUCTWORK IN DRYWALL CEILING AREA TO REMAIN. CONTRACTOR TO DEMOLISH ALL DIFFUSERS AND GRILLS AS SHOWN IN THE DRAWINGS.
- 5 CONTRACTOR TO VACUUM AND CLEAN TO REMAIN DUCTWORK IN DRYWALL AREA. CONTRACTOR SHALL PERFORM THE DUCTWORK CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
- CONTRACTOR TO INCLUDE CUTTING / PATCHING / PAINTING WALLS. 6 IN ORDER TO DEMOLISH EXISTING AND INSTALL THE NEW DUCTWORK AND GRILLS. FOR DETAIL REFER TO STRUCTURAL DRAWING.
- 7 EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF DUCTWORK AND SERVICES.
- 8 CONTRACTOR TO INCLUDE ALL REMOVING SERVICES INCLUDING BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND DOMESTIC COLD WATER PIPES, FIRE FIGHTING PIPES, ELECTRICAL CABLE TRAY, CONTROL WIRES IN ORDER TO DEMOLITION WORK.
- 9 EXISTING MIXING BOX TO REMAIN. CONTRACTOR TO VACUUM CLEAN ALL MIXING BOXES
- (10) EXISTING TEMPERATURE SENSOR/ THERMOSTAT TO REMAIN.
- $\langle 11 \rangle$ EXISTING INDICATED EXHAUST FAN TO REMAIN.





Englineering Ltd. 50 SHEPPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9 TEL. (647) 478-5156 FAX (647) 478-5917



Kawartha Pine Ridge **District School Board**

Drawing Overall Scale

AS SHOWN

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

MECHANICAL SERVICES DEMOLITION WORK SECOND FLOOR AREA "A"

DATE: 2021-JAN-14 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027

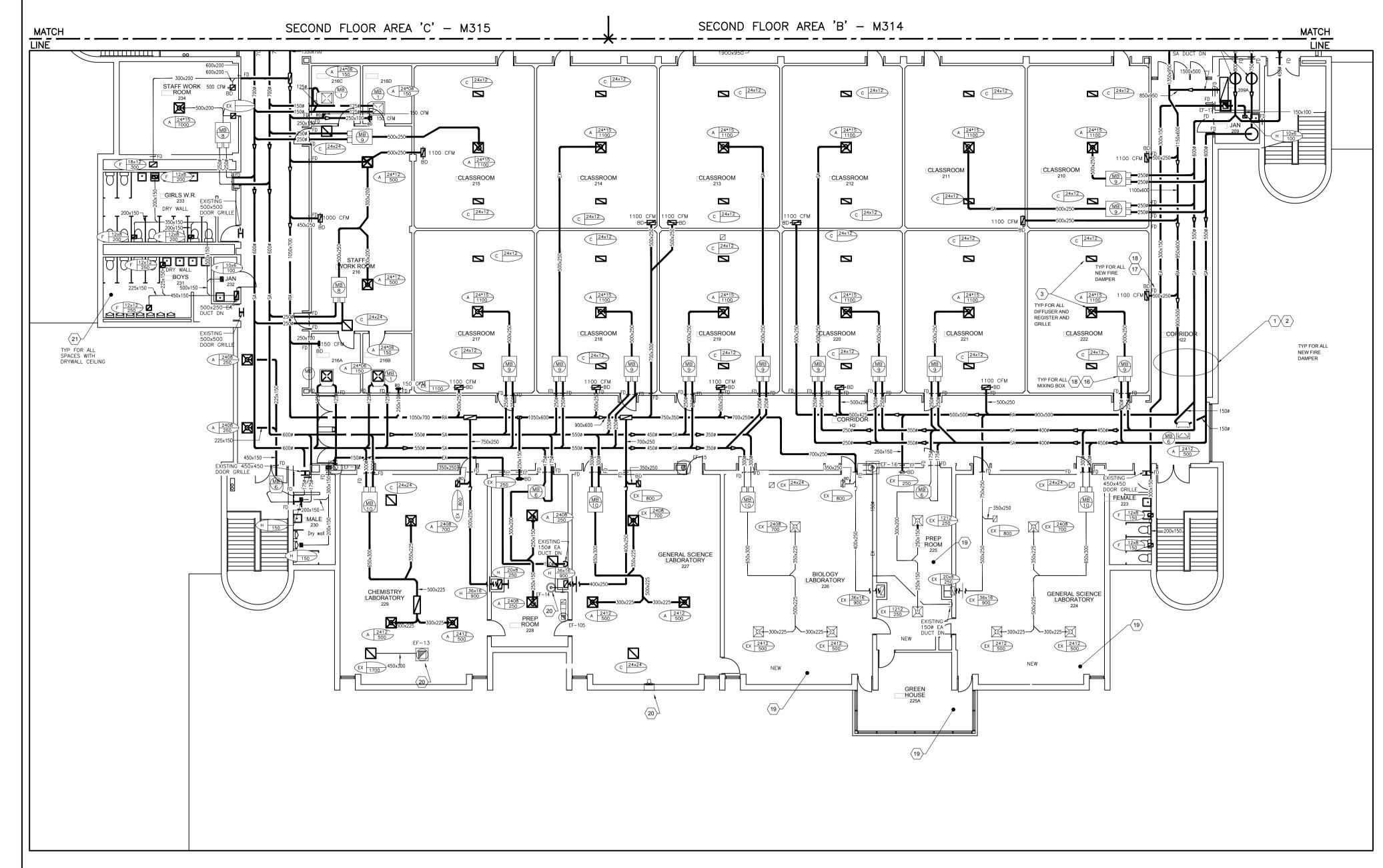


M-300 T 1

DEMOLITION NOTES: CONTRACTOR TO DEMOLISH ALL EXISTING SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED DIFFUSERS, FIRE DAMPERS, SUPPORTS, BALANCING DAMPERS AND INSULATIONS AS PER DRAWINGS, MAKE LOCATION READY FOR NEW INSTALLATION. \langle 2 \rangle Contractor to pre-audit air and submit the report to ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. \langle \langle \rangle contractor to demolish t. Bar ceiling in order to demolition DUCTWORK AS REQUIRED, REFER TO STRUCTURAL DRAWINGS FOR MORE DETAILS. 4 EXISTING DUCTWORK IN DRYWALL CEILING AREA TO REMAIN. CONTRACTOR TO DEMOLISH ALL DIFFUSERS AND GRILLS AS SHOWN IN THE DRAWINGS. 5 CONTRACTOR TO VACUUM AND CLEAN TO REMAIN DUCTWORK IN DRYWALL AREA. CONTRACTOR SHALL PERFORM THE DUCTWORK CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL. 6 CONTRACTOR TO INCLUDE CUTTING / PATCHING / PAINTING WALLS. IN ORDER TO DEMOLISH EXISTING AND INSTALL THE NEW DUCTWORK AND GRILLS. FOR DETAIL REFER TO STRUCTURAL 7 EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF DUCTWORK AND SERVICES. 8 CONTRACTOR TO INCLUDE ALL REMOVING SERVICES INCLUDING BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND 500×1757 DOMESTIC COLD WATER PIPES, FIRE FIGHTING PIPES, ELECTRICAL CABLE TRAY, CONTROL WIRES IN ORDER TO DEMOLITION WORK. 9 EXISTING MIXING BOX TO REMAIN. CONTRACTOR TO VACUUM CLEAN ALL MIXING BOXES **─**500×175**─** 10 EXISTING TEMPERATURE SENSOR/ THERMOSTAT TO REMAIN. 11 EXISTING INDICATED EXHAUST FAN TO REMAIN. 500×1757 **UPPER GYM** —500×300—X 500×1757 EX 24"NK 2000 ISSUED FOR PERMIT AND TENDER 15/05/2021 ISSUED FOR REVIEW 10/02/2021 REV. DESCRIPTION DATE -500×175 1 X 201. EXISTING 900×500 — EXISTING EXHAUST UP&DN SILENCER EXISTING 900×400 — EXISTING SILENCER SILENCER SA DUCT DN EX 20x2 680 EXISTING SILENCER EF-18 *+xx -500×175 EXISTING — 1800x950 SILENCER Spectra RETURN UP&DN **%** PPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917 **X** EXISTING DOOR— (-FD SILENCER PREP ROOM 207 OFFICE BOW. EX 400 SENIOR PHYSICS PHYSICS Kawartha Pine Ridge LABORATORY LABORATORY **-----**650×250**----District School Board** 208 FAN ROOM **-** 450x200 **Drawing Overall Scale** Dry wall **AS SHOWN BOWMANVILLE HIGH SCHOOL HVAC UPGRADE** 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8 MECHANICAL SERVICES 1900×950 ^{_/} DEMOLITION WORK SECOND FLOOR AREA "B" EX 24x24 EX 24x24 EX 24×24 EX 24x24 Engineer / Architect Stamp DATE: 2021-JAN-14 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. M. Akhanan PROJECT NO.: 1021027 M.AKHAVANBAZAZ SECOND FLOOR DUCT-AREA "B" - DEMOLITION WORK 100088319 Scale: 1:100 Drawing No. Phase Revision M-301

DEMOLITION NOTES: CONTRACTOR TO DEMOLISH ALL EXISTING SUPPLY AIR, RETURN AIR ROOF AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED DIFFUSERS, FIRE DAMPERS, SUPPORTS, BALANCING DAMPERS AND INSULATIONS AS PER 900x800 RA — -1200×900 DUCT TO REMAIN DRAWINGS, MAKE LOCATION READY FOR NEW INSTALLATION. CONTRACTOR TO PRE-AUDIT AIR AND SUBMIT THE REPORT TO 900x800 ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL. **STU**1800×900 \langle 3 \rangle contractor to demolish t. Bar ceiling in order to demolition DUCTWORK AS REQUIRED, REFER TO STRUCTURAL DRAWINGS FOR ____150ø—___ MORE DETAILS. 300×200 BRICK VENT TO REMAIN EXISTING DUCTWORK IN DRYWALL CEILING AREA TO REMAIN. CONTRACTOR TO DEMOLISH ALL DIFFUSERS AND GRILLS AS SHOWN IN 1050×850 RA -2250x800 SA DUCT TO THE DRAWINGS. DUCT TO REMAIN EXISTING EXISTING 350×250 —— EA DUCT DN SUPPLY CONTRACTOR TO VACUUM AND CLEAN TO REMAIN DUCTWORK IN SILENCER DRYWALL AREA. CONTRACTOR SHALL PERFORM THE DUCTWORK CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL. CONTRACTOR TO INCLUDE CUTTING / PATCHING / PAINTING WALLS. 6 IN ORDER TO DEMOLISH EXISTING AND INSTALL THE NEW DUCTWORK AND GRILLS. FOR DETAIL REFER TO STRUCTURAL 7 EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW **UPPER STAGE** FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF BD └-400×175 400×175 [→] REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF 400×175 → **→** 900x450 DUCTWORK AND SERVICES. 325x350 → 8 CONTRACTOR TO INCLUDE ALL REMOVING SERVICES INCLUDING 650×1350 └─600x750 BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND DOMESTIC COLD WATER PIPES. FIRE FIGHTING PIPES. ELECTRICAL 750×450 CABLE TRAY, CONTROL WIRES IN ORDER TO DEMOLITION WORK. 400×175 RA DUCT 400×175 [→] 400×175→ 9 EXISTING MIXING BOX TO REMAIN. CONTRACTOR TO VACUUM CLEAN EX. COMPUTER ROOM ALL MIXING BOXES ┌500×175 500×175 500×175¬ (10) EXISTING TEMPERATURE SENSOR/ THERMOSTAT TO REMAIN. 400×175 [→] EX 20x20 680 211 EXISTING INDICATED EXHAUST FAN TO REMAIN. UPPER AUDITORIUM 400×175 – -300x250 EXISTING 650×350 NFPA → MIXING BOX RESOURCES 400×175 [→] 400×175 → EXHAUST DUCT UP ┌500×175 500×175¬ 500×1757 CENTRE THRU ROOF C/W 2 HOUR FIRE WRAP -500×300-X --500×300---_500×175 500×175-500×1757 500×175 <u></u>350x250 ISSUED FOR PERMIT AND TENDER 15/05/2021 400×175→ 400×175 – 400×175 – CLASSROOM ISSUED FOR REVIEW 10/02/2021 EX 20×20 680 REV. DATE DESCRIPTION 400×175 – 400×175 ¬ 400×175 ¬ OFFICE 237A BD LIBRARY
OFFICE
237
LIBRARY
OFFICE
257
250x1. *Spectra* PARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917 500×1757 ┌500×175 500×175 EX EX 20x2 680 400×175 – ←400×175 EX 2412 420 550×400 — -500x175 EXISTING 950×450
RA DUCT DN
1500×600 Kawartha Pine Ridge **District School Board** EX-[C-10] EX 30×60 4300 CORRIBORO **Drawing Overall Scale AS SHOWN** TEACHER

8×12
500
200A
Dry wall PROJECTION
ROOM
200
Dry wall TYP FOR ALL Project Name & Address WALL FIN HEATER **BOWMANVILLE HIGH SCHOOL HVAC UPGRADE** STAIR 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8 STAIR MECHANICAL SERVICES DEMOLITION WORK SECOND FLOOR AREA "C" Engineer / Architect Stamp DATE: 2021-JAN-14 **-**−1350x700 DESIGNED BY: B.E. 600x200 — DRAWN BY: B.E. EX 24x24 APPROVED BY: M.A. M. Akhanan PROJECT NO.: 1021027 M.AKHAVANBAZAZ SECOND FLOOR DUCT-AREA "C" - DEMOLITION WORK 100088319 Scale: 1:100 Drawing No. Phase Revision M-302



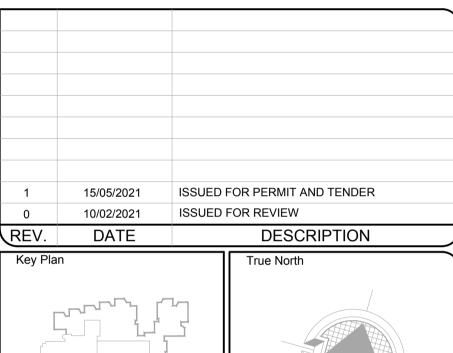
SECOND FLOOR DUCT- AREA "A" - NEW WORK

NEW WORK NOTES:

- CONTRACTOR TO PROVIDE AND INSTALL NEW SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED NEW FLEXIBLE DUCT, DIFFUSERS, FIRE DAMPERS, BALANCING DAMPERS, GRILLS SUPPORTS AND INSULATIONS AS PER DRAWINGS. EXACT DUCT LAYOUT AND TIE-IN POINTS TO EXISTING DUCTWORK SHALL BE VERIFIED ON SITE. PROVIDE ACCESS DOOR ON DUCT FOR ALL NEW FIRE DAMPERS AS REQUIRED.
- CONTRACTOR TO PROVIDE AND INSTALL THERMAL INSULATION FOR S/A DUCTWORK AS PER STANDARDS.
- CONTRACTOR TO PROVIDE AND INSTALL NEW DIFFUSERS AND GRILLS FOR ALL NEW AND EXISTING NOT REPLACED S/A, R/A, E/A DUCTWORK.
- CONTRACTOR TO PRE-AUDIT AIR AND SUBMIT THE REPORT TO ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL
- CONTRACTOR TO INSTALL NEW T.BAR CEILING C/W ALL ELECTRICAL AND MECHANICAL FIXTURES. REFER TO STRUCTURAL DRAWINGS S-02, S-03 FOR MORE DETAILS.
- EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF DUCTWORK AND SERVICES.
- CONTRACTOR TO VACUUM AND CLEAN WHOLE EXISTING, NOT REPLACED DUCTWORK AND DAMPERS. CONTRACTOR SHALL PERFORM THE DUCTWORK. CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
- CONTRACTOR ALLOW FOR REMOVAL AND RE-INSTALLATION OTHER SERVICES INCLUDING BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND DOMESTIC COLD WATER PIPES, FIRE FIGHTING PIPES, ELECTRICAL CABLE TRAY, CONTROL WIRES.
- 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. PATCH / FIX / PAINT WALLS TO MATCH EXISTING.
- THE EXACT LOCATION FOR PENETRATING THE WALL SHALL BE VERIFIED ON $\langle 11 \rangle$
- CONTRACTOR TO REVIEW CONDITION OF THE EXISTING SPACE AND INCLUDE FOR RELOCATION OF EXISTING PIPES, CONDUITS, ETC IF REQUIRED TO ALLOW INSTALLATION OF NEW EQUIPMENT AND DUCTS.
- **13** REFER TO DWG M-500, M-700 AND M-701 FOR CONTROLS AND STANDARD DETAILS.
- ALL DUCTWORK MUST BE SUPPORTED FROM ROOF/CEILING STRUCTURE, THE INSTALLATION DETAILS MUST BE SUBMITTED TO THE CONSULTANT FOR **(14)**
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW DUCTWORK WILL BE INSTALLED.
- EXISTING MIXING BOX TO REMAIN. CONTRACTOR TO RECONNECT NEW S/A DUCT TO THE MIXING BOX ALLOW FOR FLEXIBLE CONNECTION AND ALL REQUIRED. CONTRACTOR TO INCLUDE FOR DISCONNECTING AND RECONNECTING ALL ELECTRICAL AND CONTROL CONNECTION AS REQUIRED.
- CONTRACTOR TO PROVIDE NEW FIRE DAMPER AS SHOWN IN THE DRAWING. PROVIDE ACCESS DOOR ON THE DUCT. ACCESS DOOR TO BE ON THE CORRIDOR. CONTRACTOR TO PROVIDE PROPER LABEL ON THE T-BAR CEILING TO INDICATE THE LOCATION OF THE FIRE DAMPER.
- CONTRACTOR TO PROVIDE LABEL ON THE T-BAR CEILING FOR LOCATION OF MIXING BOX AND FIRE DAMPER
- EXISTING DUCT TO REMAIN IN ROOMS 224, 225, 225A, 226. CONTRACTOR TO VACUUM CLEAN ALL DUCT WORK AND SEND THE REPORT FOR THE
- EXHAUST FAN IN THE CLASSROOM TO REMAIN INCLUDING THE DUCTWORK
- EXISTING DUCTWORK ABOVE DRY WALL CEILING TO REMAIN. CONTRACTOR TO VACUUM CLEAN THE DUCT WORK AND SUBMIT THE REPORT TO THE CONSULTANT.

GENERAL NOTES:

- 1. 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.
- 2. ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- 3. 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.
- 4. 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.
- 5. COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON
- 6. 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.
- 7. 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
- 8. CONNECTIONS BETWEEN DUCTS AND FANS/AHUS SHALL BE MADE WITH 6" LONG FLEXIBLE NEOPRENE.
- 9. SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING/ROOF
- STRUCTURE. 10. ALL NEW AIR HANDLING UNITS SHALL BE INSTALLED ON NEW VIBRATION
- ISOLATOR PROPERLY SIZED FOR THE WIDTH OF THE UNIT.
- 11. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH STANDARD DETAILS AND ONLY BY KPRDSB APPROVED ROOFING TRADES. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- 12. NEW CONTROL SYSTEM TO BE DDC.



Spectra **Engineering** 50 SHEPPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156



Kawartha Pine Ridge **District School Board**

Drawing Overall Scale

Project Name & Address

AS SHOWN

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

MECHANICAL SERVICES NEW WORK SECOND FLOOR AREA "A"

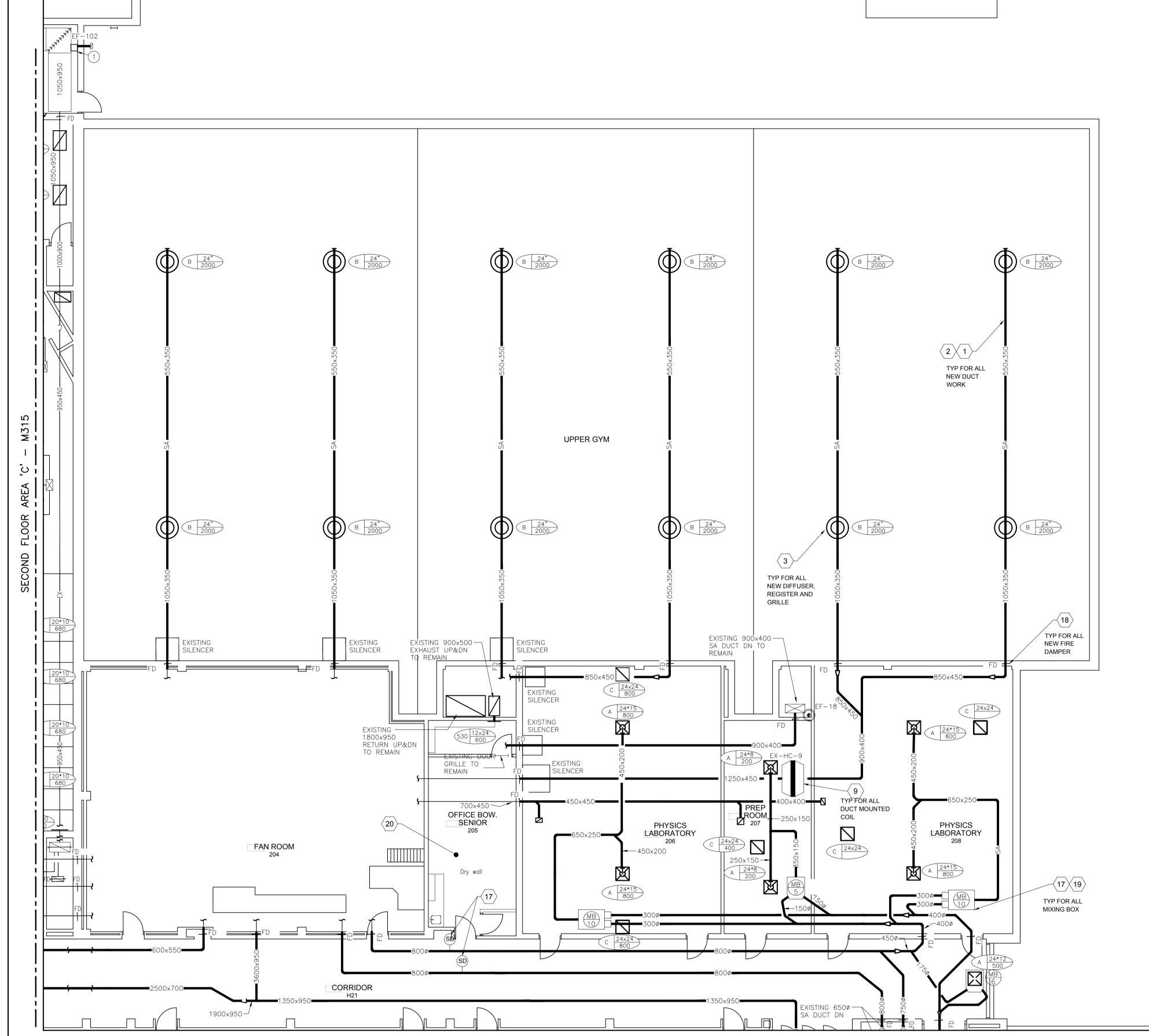
DATE: 2021-JAN-14 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027

M. Akhanan M.AKHAVANBAZAZ 100088319 30 APRIL 2021

Engineer / Architect Stamp

Drawing No. Phase Revision

M-303 T 1



SECOND FLOOR AREA 'A' -M313

SECOND FLOOR DUCT-AREA "B" - DEMOLISH WORK

NEW WORK NOTES:

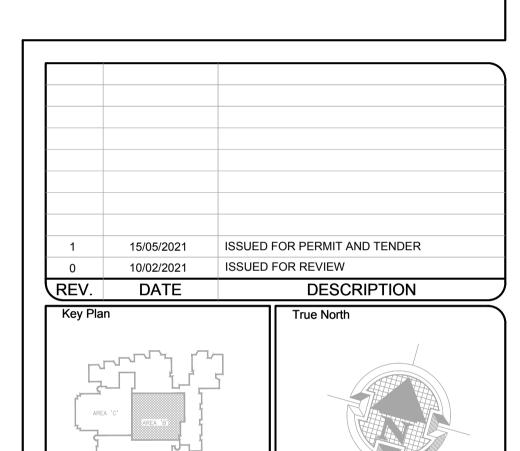
- CONTRACTOR TO PROVIDE AND INSTALL NEW SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED NEW FLEXIBLE DUCT, DIFFUSERS, FIRE DAMPERS, BALANCING DAMPERS, GRILLS SUPPORTS AND INSULATIONS AS PER DRAWINGS. EXACT DUCT LAYOUT AND TIE-IN POINTS TO EXISTING DUCTWORK SHALL BE VERIFIED ON SITE. PROVIDE ACCESS DOOR ON DUCT FOR ALL NEW FIRE DAMPERS AS REQUIRED.
- $\fbox{2}$ Contractor to provide and install thermal insulation for s/a ductwork as per standards.
- CONTRACTOR TO PROVIDE AND INSTALL NEW DIFFUSERS AND GRILLS FOR ALL NEW AND EXISTING NOT REPLACED S/A, R/A, E/A DUCTWORK.
- CONTRACTOR TO PRE-AUDIT AIR AND SUBMIT THE REPORT TO ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- CONTRACTOR TO INSTALL NEW T.BAR CEILING C/W ALL ELECTRICAL AND MECHANICAL FIXTURES. REFER TO STRUCTURAL DRAWINGS S-02, S-03 FOR MORE DETAILS.
- 6 EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF DUCTWORK AND SERVICES.
- 7 CONTRACTOR TO VACUUM AND CLEAN WHOLE EXISTING NOT REPLACED DUCTWORK AND DAMPERS. CONTRACTOR SHALL PERFORM THE DUCTWORK. CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
- 8 CONTRACTOR ALLOW FOR REMOVING AND RE-INSTALLATION OTHER SERVICES INCLUDING BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND DOMESTIC COLD WATER PIPES, FIRE FIGHTING PIPES, ELECTRICAL CABLE TRAY, CONTROL WIRES.
- 9 EXISTING DUCT MOUNTED COIL TO REMAIN. CONTRACTOR TO CLEAN THE COIL AND REPORT TO CONSULTANT IF THE COIL, PIPING, ACCESSORIES AND CONTROL VALVE ARE DEFECTIVE OR CORRODED.
- 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. PATCH / FIX / PAINT WALLS TO MATCH EXISTING.
- THE EXACT LOCATION FOR PENETRATING THE WALL SHALL BE VERIFIED ON SITE.
- CONTRACTOR TO REVIEW CONDITION OF THE EXISTING SPACE AND INCLUDE FOR RELOCATION OF EXISTING PIPES, CONDUITS, ETC IF REQUIRED TO ALLOW INSTALLATION OF NEW EQUIPMENT AND DUCTS.
- $\left\langle 14 \right\rangle$ REFER TO DWG M-500, M-700 AND M-701 FOR CONTROLS AND STANDARD DETAILS.
- ALL DUCTWORK MUST BE SUPPORTED FROM ROOF/CEILING STRUCTURE, THE INSTALLATION DETAILS MUST BE SUBMITTED TO THE CONSULTANT FOR REVIEW.
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW DUCTWORK WILL BE INSTALLED.
- EXISTING MIXING BOX TO REMAIN. CONTRACTOR TO RECONNECT NEW S/A DUCT TO THE MIXING BOX ALLOW FOR FLEXIBLE CONNECTION AND ALL REQUIRED. CONTRACTOR TO INCLUDE FOR DISCONNECTING AND RECONNECTING ALL ELECTRICAL AND CONTROL CONNECTION AS REQUIRED.
- CONTRACTOR TO PROVIDE NEW FIRE DAMPER AS SHOWN IN THE DRAWING. PROVIDE ACCESS DOOR ON THE DUCT. ACCESS DOOR TO BE ON THE CORRIDOR. CONTRACTOR TO PROVIDE PROPER LABEL ON THE T-BAR CEILING TO INDICATE THE LOCATION OF THE FIRE DAMPER.
- CONTRACTOR TO PROVIDE LABEL ON THE T-BAR CEILING FOR LOCATION OF MIXING BOX.
- EXISTING DUCTWORK ABOVE DRY WALL CEILING TO REMAIN. CONTRACTOR TO VACUUM CLEAN THE DUCT WORK AND SUBMIT THE REPORT TO THE
- PROVIDE NEW SMOKE DETECTOR CONNECT TO RELATED UNIT AND FIRE ALARM PANEL AND BAS. INCLUDE FOR ALL WIRING AND CONTROL WORK

GENERAL NOTES:

- 1. 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
- ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.

CAN BE CARRIED OUT IN ACCORDANCE WITH THE CONTRACT DOCUMENT.

- 3. 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.
- 4. 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.
- 5. COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- 6. 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.
- 7. 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
- 8. CONNECTIONS BETWEEN DUCTS AND FANS/AHUS SHALL BE MADE WITH 6" LONG FLEXIBLE NEOPRENE.
- 9. SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING/ROOF STRUCTURE.
- 10. ALL NEW AIR HANDLING UNITS SHALL BE INSTALLED ON NEW VIBRATION ISOLATOR PROPERLY SIZED FOR THE WIDTH OF THE UNIT.
- 11. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH STANDARD DETAILS AND ONLY BY KPRDSB APPROVED ROOFING TRADES. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- 12. NEW CONTROL SYSTEM TO BE DDC.



neer Logo

Spectra

Engineering
Ltd.

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

Client



Drawing Overall Scale

AS SHOWN

ect Name & Address

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SERVICES

NEW WORK SECOND FLOOR

AREA "B"

DATE: 2021-JAN-14

DESIGNED BY: B.E.

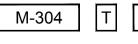
DRAWN BY: B.E.

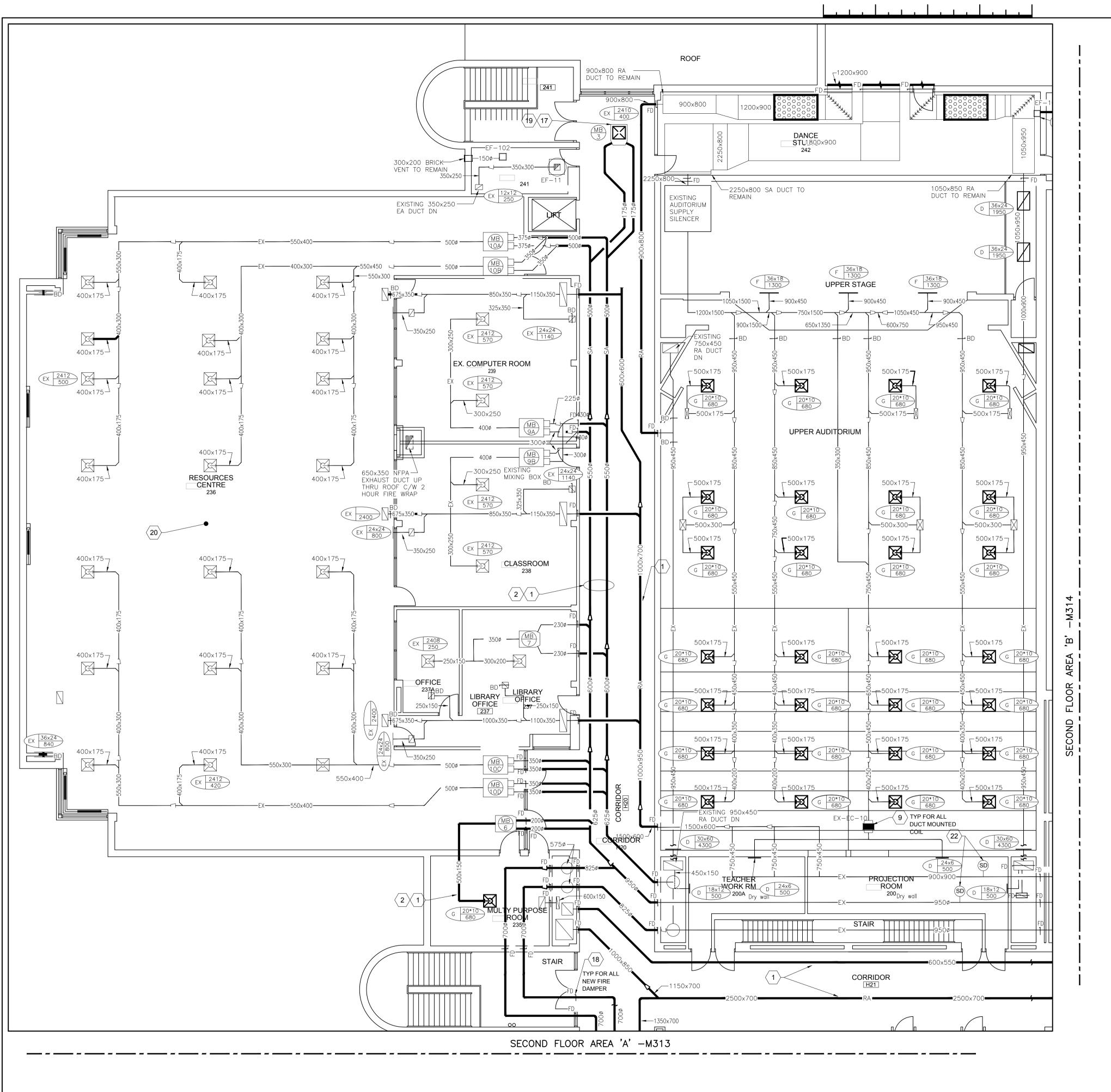
APPROVED BY: M.A.

PROJECT NO.: 1021027



Drawing No. Phase Revision



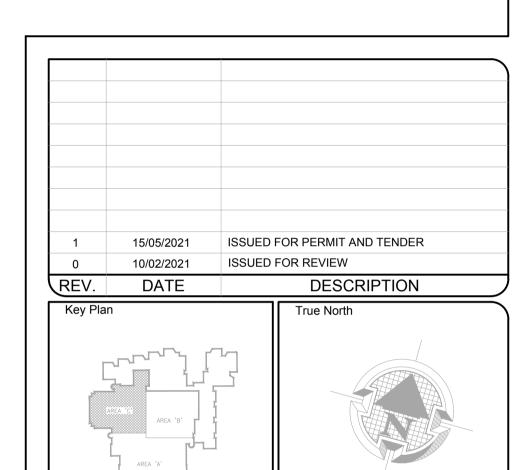


NEW WORK NOTES:

- CONTRACTOR TO PROVIDE AND INSTALL NEW SUPPLY AIR, RETURN AIR AND EXHAUST AIR DUCTWORK C/W ALL ASSOCIATED NEW FLEXIBLE DUCT, DIFFUSERS, FIRE DAMPERS, BALANCING DAMPERS, GRILLS SUPPORTS AND INSULATIONS AS PER DRAWINGS. EXACT DUCT LAYOUT AND TIE-IN POINTS TO EXISTING DUCTWORK SHALL BE VERIFIED ON SITE. PROVIDE ACCESS DOOR ON DUCT FOR ALL NEW FIRE DAMPERS AS REQUIRED.
- CONTRACTOR TO PROVIDE AND INSTALL THERMAL INSULATION FOR S/A DUCTWORK AS PER STANDARDS.
- CONTRACTOR TO PROVIDE AND INSTALL NEW DIFFUSERS AND GRILLS FOR \langle 3 \rangle ALL NEW AND EXISTING NOT REPLACED S/A, R/A, E/A DUCTWORK.
- CONTRACTOR TO PRE-AUDIT AIR AND SUBMIT THE REPORT TO ENGINEER FOR REVIEW. AFTER INSTALLATION OF THE NEW SERVICES, CONTRACTOR SHALL PERFORM AIR BALANCING TO BALANCE THE SYSTEM. AIR BALANCING REPORT TO BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL.
- CONTRACTOR TO RE-INSTALL T.BAR CEILING C/W ALL ELECTRICAL AND MECHANICAL FIXTURES. REFER TO STRUCTURAL DRAWINGS S-02, S-03 FOR MORE DETAILS.
- EXISTING DRY WALL CEILING TO REMAIN. CONTRACTOR TO ALLOW FOR CUTTING / PATCHING / PAINTING DRY WALL CEILING IF REQUIRED FOR AUDIT, VACUUM, CLEANING AND DEMOLITION OF DUCTWORK AND SERVICES.
- CONTRACTOR TO VACUUM AND CLEAN WHOLE EXISTING NOT REPLACED DUCTWORK AND DAMPERS IN THE AUDITORIUM AND MECHANICAL SHAFT AND RESOURCE CENTER AND INCLUDING ADJACENT ROOM. CONTRACTOR SHALL PERFORM THE DUCTWORK. CLEANING REPORT TO ENGINEER FOR REVIEW AND APPROVAL.
- ⟨ 8 ⟩ CONTRACTOR ALLOW FOR REMOVING AND RE-INSTALLATION OTHER SERVICES INCLUDING BUT NOT LIMITED TO ELECTRICAL CONDUIT, HOT WATER AND DOMESTIC COLD WATER PIPES, FIRE FIGHTING PIPES, ELECTRICAL CABLE TRAY, CONTROL WIRES.
- EXISTING DUCT MOUNTED COIL TO REMAIN. CONTRACTOR TO CLEAN THE COIL AND REPORT TO CONSULTANT IF THE COIL, PIPING, ACCESSORIES AND CONTROL VALVE ARE DEFECTIVE OR CORRODED.
- 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 11 MATERIAL. PATCH / FIX / PAINT WALLS TO MATCH EXISTING.
- THE EXACT LOCATION FOR PENETRATING THE WALL SHALL BE VERIFIED ON SITE.
- CONTRACTOR TO REVIEW CONDITION OF THE EXISTING SPACE AND INCLUDE for relocation of existing pipes, conduits, etc if required to allow INSTALLATION OF NEW EQUIPMENT AND DUCTS.
- REFER TO DWG M-500, M-700 AND M-701 FOR CONTROLS AND STANDARD (14) DETAILS.
- ALL DUCTWORK MUST BE SUPPORTED FROM ROOF/CEILING STRUCTURE, THE $\langle 15 \rangle$ installation details must be submitted to the consultant for REVIEW.
- CONTRACTOR SHALL ALLOW FOR RELOCATION/REMOVAL AND (16) RE-INSTALLATION OF WIRING, CONDUITS, LIGHTING WHERE THE NEW DUCTWORK WILL BE INSTALLED.
- $\langle 17 \rangle$ Existing mixing box to remain. Contractor to reconnect New S/A DUCT TO THE MIXING BOX ALLOW FOR FLEXIBLE CONNECTION AND ALL REQUIRED. CONTRACTOR TO INCLUDE FOR DISCONNECTING AND RECONNECTING ALL ELECTRICAL AND CONTROL CONNECTION AS REQUIRED.
- CONTRACTOR TO PROVIDE NEW FIRE DAMPER AS SHOWN IN THE DRAWING. PROVIDE ACCESS DOOR ON THE DUCT. ACCESS DOOR TO BE ON THE CORRIDOR. CONTRACTOR TO PROVIDE PROPER LABEL ON THE T-BAR CEILING TO INDICATE THE LOCATION OF THE FIRE DAMPER.
- CONTRACTOR TO PROVIDE LABEL ON THE T-BAR CEILING FOR LOCATION OF MIXING BOX.
- SUPPLY AND RETURN DIFFUSER IN THE RESOURCE CENTER AND ADJACENT SUPPLY AND RETURN ROOM TO REMAIN.
- EXISTING DUCTWORK ABOVE DRYWALL CEILING TO REMAIN. CONTRACTOR TO VACUUM CLEAN THE DUCT WORK.
- PROVIDE NEW SMOKE DETECTOR CONNECT TO RELATED UNIT AND FIRE ALARM PANEL AND BAS. INCLUDE FOR ALL WIRING AND CONTROL WORK

GENERAL NOTES:

- 1. 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.
- 2. ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- 3. 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.
- 4. 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.
- 5. COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON
- 6. 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.
- 7. 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
- 8. CONNECTIONS BETWEEN DUCTS AND FANS/AHUS SHALL BE MADE WITH 6" LONG FLEXIBLE NEOPRENE.
- 9. SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING/ROOF STRUCTURE.
- 10. ALL NEW AIR HANDLING UNITS SHALL BE INSTALLED ON NEW VIBRATION ISOLATOR PROPERLY SIZED FOR THE WIDTH OF THE UNIT.
- 11. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH STANDARD DETAILS AND ONLY BY KPRDSB APPROVED ROOFING TRADES. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- 12. NEW CONTROL SYSTEM TO BE DDC.







Kawartha Pine Ridge **District School Board**

Drawing Overall Scale

AS SHOWN

Project Name & Address

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SERVICES NEW WORK SECOND FLOOR AREA "C"

DATE: 2021-JAN-14 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027



Drawing No. Phase Revision

M-305

BOILER ROOM

DEMOLITION NOTES:

- EXISTING HEATING WATER PUMPS HWSP#1&2 WITH ALL ASSOCIATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER AND PRESSURE GAGES TO BE DEMOLISHED. DISCONNECT THE POWER AND CONTROL POINT. MAKE LOCATION READY FOR NEW INSTALLATION.
- EXISTING HEATING WATER PUMPS HWRP#1&2 WITH ALL 4 ASSOCIATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER AND PRESSURE GAGES TO BE DEMOLISHED. DISCONNECT THE POWER AND CONTROL POINT. MAKE LOCATION READY FOR NEW INSTALLATION.
- 3 EXISTING HEATING WATER PUMPS HWRP#3&4 WITH ALL ASSOCIATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER AND PRESSURE GAGES TO BE DEMOLISHED. DISCONNECT THE POWER AND CONTROL POINT. MAKE LOCATION READY FOR NEW INSTALLATION.

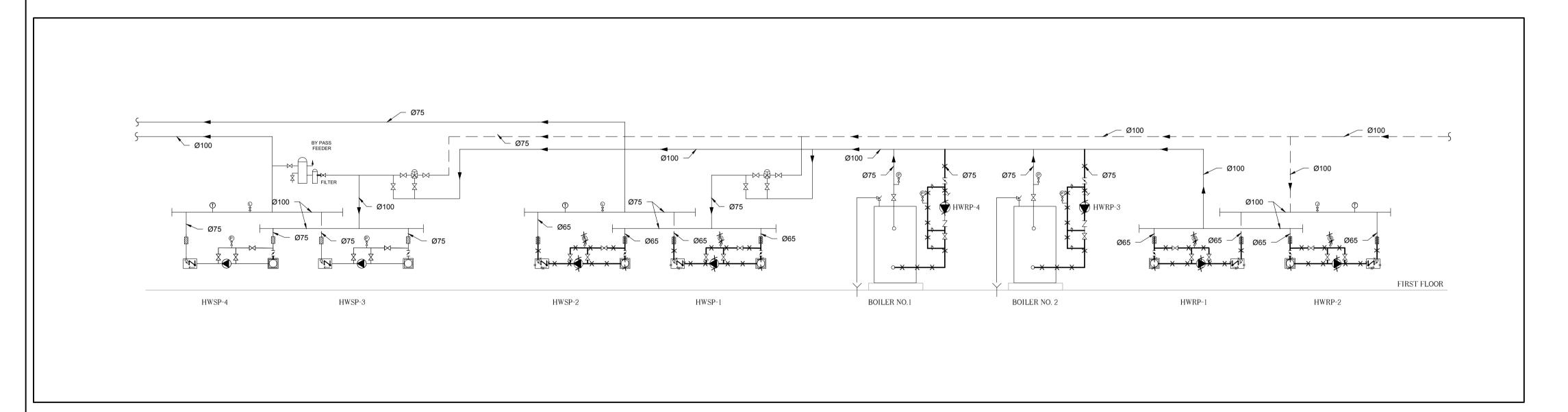
IMPORTANT NOTE:

CONTRACTOR TO PROVIDE LUMP SUMP PRICE FOR ENTIRE PROJECT INCLUDING(SECOND FLOOR WORK S/A, R/A, E/A DUCT, DIFFUSERS, GRILLES, FIRE DAMPERS REPLACEMENT C/W STRUCTURAL AND ELECTRICAL PART ACCORDING TO THE DRAWING) EXCEPT THE AREA MENTIONED IN THE SEPARATE

A LUMP SUMP PRICE FOR REPLACEMENT OF HEATING PUMP, ALL REQUIRED VALVES AND TEMPERATURE AND PRESSURE GAUGES ACCORDING TO THE DRAWING. PRICE SHALL INCLUDE ALL THE MECHANICAL, ELECTRICAL, CONTROL, STRUCTURAL AND ARCHITECTURAL SCOPE OF WORK. REFER TO ELECTRICAL AND STRUCTURAL DRAWING FOR

NOTE:ALL PIPING AND EQUIPMENT LAYOUTS AND VALVE LOCATIONS ARE APPROXIMATE. MECHANICAL CONTRACTOR SHALL VERIFY AT THE SITE .

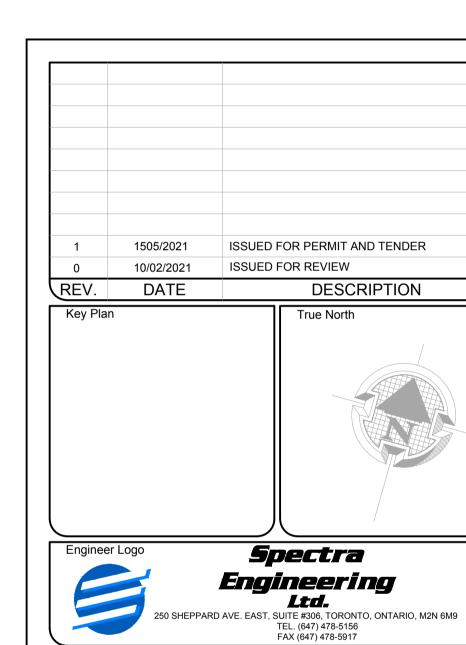
BOILER ROOM - HEATING SYSTEM - DEMOLITION WORK



HEATING FLOW DIAGRAM - BOILER ROOM - DEMOLITION WORK

GENERAL NOTES:

- 1. 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.
- 2. ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- 3. 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.
- 4. 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.
- 5. COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON
- 6. 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.
- 7. 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
- 8. CONNECTIONS BETWEEN DUCTS AND FANS/AHUS SHALL BE MADE WITH 6" LONG FLEXIBLE NEOPRENE.
- 9. SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING/ROOF STRUCTURE.
- 10. ALL NEW AIR HANDLING UNITS SHALL BE INSTALLED ON NEW VIBRATION ISOLATOR PROPERLY SIZED FOR THE WIDTH OF THE UNIT.
- 11. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH STANDARD DETAILS AND ONLY BY KPRDSB APPROVED ROOFING TRADES. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- 12. NEW CONTROL SYSTEM TO BE DDC.



Kawartha Pine Ridge **District School Board**



AS SHOWN

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Project Name & Address

MECHANICAL SERVICES DEMOLITION WORK FIRST FLOOR - BOILER ROOM

2021-MARCH-19 DESIGNED BY: B.E. DRAWN BY: B.E. APPROVED BY: M.A. PROJECT NO.: 1021027



M-306

MEANWA PURINE ALL REQUIRED

REALING ADMICHAGE ACCORDING TO THE

RECETTIONAL REPORTING.

PE NORS REPAYOCOMATE

THE STIE.

BOILER ROOM - HEATING SYSTEM - NEW WORK

DESIGN NOTES:

- PROVIDE AND INSTALL NEW HOT WATER PUMPS HWSP#1&2 WITH ALL ASSOCIATED INSULATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER, FLEXIBLE, DRAIN, AIR VENT PIPES, PRESSURE GAGES, DRAIN AND BALANCING VALVES, RE-CONNECT POWER AND CONTROL POINTS. PROVIDE MAGNETIC STARTER, INSTALL BY ELECTRICAL CONTRACTOR, AS PER SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE AND INSTALL NEW HOT WATER PUMPS HWRP#1&2 WITH ALL ASSOCIATED INSULATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER, FLEXIBLE, DRAIN, AIR VENT PIPES, PRESSURE GAGES, DRAIN AND BALANCING VALVES, RE-CONNECT POWER AND CONTROL POINTS. PROVIDE MAGNETIC STARTER, INSTALL BY ELECTRICAL CONTRACTOR, AS PER SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- PROVIDE AND INSTALL NEW HOT WATER PUMPS HWRP#3&4 WITH ALL ASSOCIATED INSULATED SUCTION AND DISCHARGE PIPES, HEADER AND VALVES, CHECK VALVES, STRAINER, FLEXIBLE, DRAIN, AIR VENT PIPES, PRESSURE GAGES, DRAIN AND BALANCING VALVES, RE-CONNECT POWER AND CONTROL POINTS. PROVIDE MAGNETIC STARTER, INSTALL BY ELECTRICAL CONTRACTOR, AS PER SCHEDULE AND IN ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS.
- 4 PROVIDE NEW INSULATION WITH P.V.C COVER, COMPLETE WITH LABEL ARROW DIRECTION FOR ALL NEW HOT WATER PIPES VALVES AND PUMPS.
- 5 PROVIDE AND INSTALL NEW CHEMICAL POT FEEDER AND FILTER C/W ALL ASSOCIATED VALVES AND SUPPORTS.

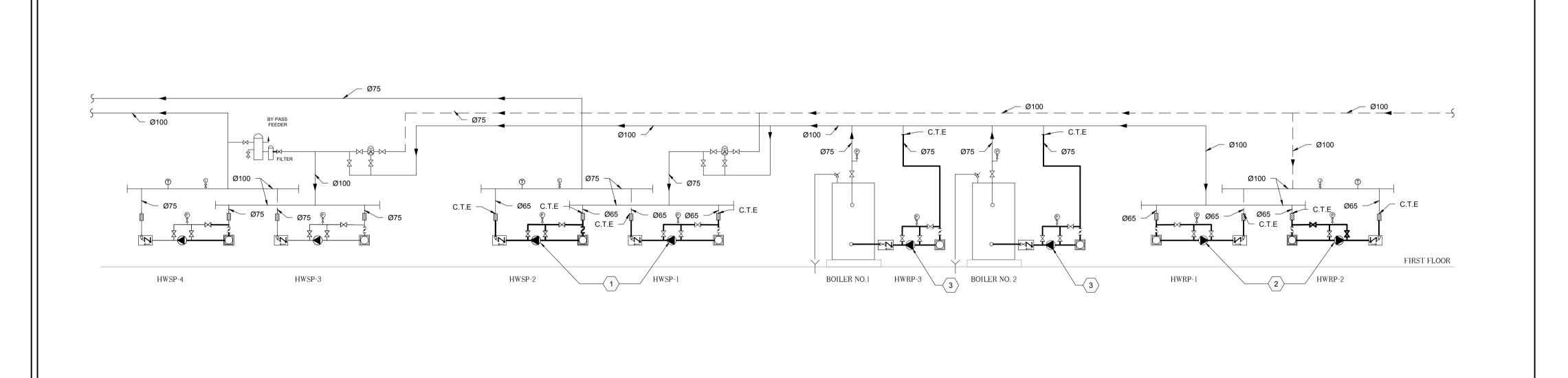
IMPORTANT NOTE:

CONTRACTOR TO PROVIDE LUMP SUMP PRICE FOR ENTIRE PROJECT INCLUDING(SECOND FLOOR WORK S/A, R/A, E/A DUCT, DIFFUSERS, GRILLES, FIRE DAMPERS REPLACEMENT C/W STRUCTURAL AND ELECTRICAL PART ACCORDING TO THE DRAWING) EXCEPT THE AREA MENTIONED IN THE SEPARATE PRICE.

A LUMP SUMP PRICE FOR REPLACEMENT OF HEATING PUMP, ALL REQUIRED VALVES AND TEMPERATURE AND PRESSURE GAUGES ACCORDING TO THE DRAWING.

PRICE SHALL INCLUDE ALL THE MECHANICAL, ELECTRICAL, CONTROL, STRUCTURAL AND ARCHITECTURAL SCOPE OF WORK. REFER TO ELECTRICAL AND STRUCTURAL DRAWING FOR DETAIL.

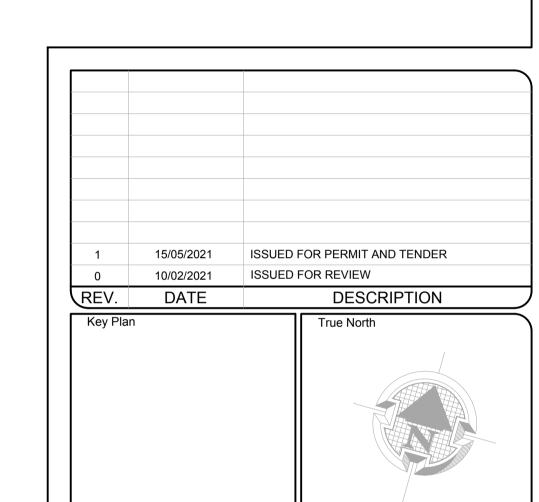
NOTE:ALL PIPING LAYOUTS AND VALVE LOCATIONS ARE APPROXIMATE.
MECHANICAL CONTRACTOR SHALL VERIFY AT THE SITE .



2 HEATING FLOW DIAGRAM - MECH ROOM - NEW WORK
Scale: N.T.S

GENERAL NOTES:

- 1. 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.
- 2. ALL EXISTING EQUIPMENT TAG NOS. USED ON THIS DRAWING ARE BASED ON EXISTING BASE BUILDING STANDARDS.
- 3. 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.
- 4. 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.
- 5. COORDINATE WITH ALL OTHER TRADES AND SITE SUPERINTENDENT ON ALL WORK.
- 6. 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.
- 7. 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
- 8. CONNECTIONS BETWEEN DUCTS AND FANS/AHUs SHALL BE MADE WITH 6" LONG FLEXIBLE NEOPRENE.
- 9. SUPPORT ALL NEW DUCTS AND PIPES FROM THE CEILING/ROOF STRUCTURE.
- 10. ALL NEW AIR HANDLING UNITS SHALL BE INSTALLED ON NEW VIBRATION ISOLATOR PROPERLY SIZED FOR THE WIDTH OF THE UNIT.
- 11. ALL ROOFING AND PENETRATIONS SHALL BE DONE IN STRICT ACCORDANCE WITH STANDARD DETAILS AND ONLY BY KPRDSB APPROVED ROOFING TRADES. IF THE ROOF IS UNDER WARRANTY, ONLY THE WARRANTY HOLDER SHALL BE RETAINED TO PERFORM THE WORK.
- 12. NEW CONTROL SYSTEM TO BE DDC.





Spectra Engineering

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

Client



Kawartha Pine Ridge
District School Board

Drawing Overall Scale

AS SHOWN

Project Name & Address

BOWMANVILLE HIGH SCHOOL HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SERVICES

NEW WORK

FIRST FLOOR - BOILER ROOM

DATE: 2021-MARCH-19

DESIGNED BY: B.E.

DRAWN BY: B.E.

APPROVED BY: M.A.

PROJECT NO.: 1021027

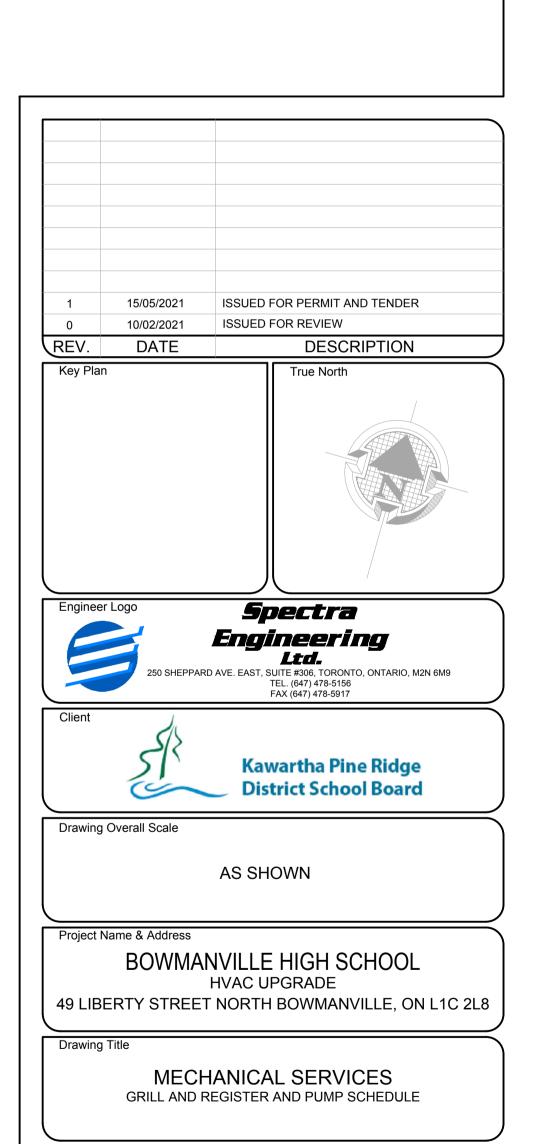


Drawing No. Phase Rev

BOWMANVILE HS PROJECT

				PUM	PS SCHED	ULE					
NO	SERIVICES	LOCATION	FLUID	CAP (GPM)	HEAD (FT)	MAKE/MODEL	SIZE	MTR (HP)	SPD RPM	V/PH/HZ	
HWSP- 1,2	HEATING SUPPLY PUMPS	BOLIER ROOM	WATER	66.16	26	ARMSTRONG S-S69	3X3X6	1	1750	115/1/60	COMPLETE WITH MAGNETIC STAR
HWRP-1,2	HEATING RETURN PUMPS	BOLIER ROOM	WATER	280	26	ARMSTRONG 4380 4P	4X4X6	3	1765	575/3/60	COMPLETE WITH MAGNETIC STAR
HWRP-3,4	HEATING RETURN PUMPS	BOLIER ROOM	WATER	166	10	ARMSTRONG 1060-3D	3X3X6	1	1750	575/3/60	COMPLETE WITH MAGNETIC STAR
NOTE : CONT	FRACTOR TO PROVIDE LUMP SUI	MP PRICE FOR PUMP	REPLACEMENT ACCORD	DING TO DRA	WING M306 &	M307					

		GRILLE,	REGISTER & D	IFFUSER SC	CHEDULE			
TYPE	MANUFACTURER	MODEL	BORDER	FRAME	FASTING	FINISH	OPTION	REMARK
Α	E.H. PRICE	SCD		31-T BAR	-	B12		
В	E.H. PRICE	RCD				B12	SC	
С	E.H. PRICE	80	F	T-BAR		B12		
D	E.H. PRICE	530D			А	B12		SURFACE MOUNTE
Е	E.H. PRICE	90L		F	А	B12		
F	E.H. PRICE	535			А	B12		SURFACE MOUNTE
G	E.H. PRICE	SCD				B12		SURFACE MOUNTE
Н	E.H. PRICE	530			Α	B12		SURFACE MOUNTE
J	E.H. PRICE	520			А	B12		SURFACE MOUNTE
1	E.H. PRICE	DE635						SURFACE MOUNTE



Engineer / Architect Stamp

M.AKHAVANBAZAZ 100088319

Drawing No. Phase Revision

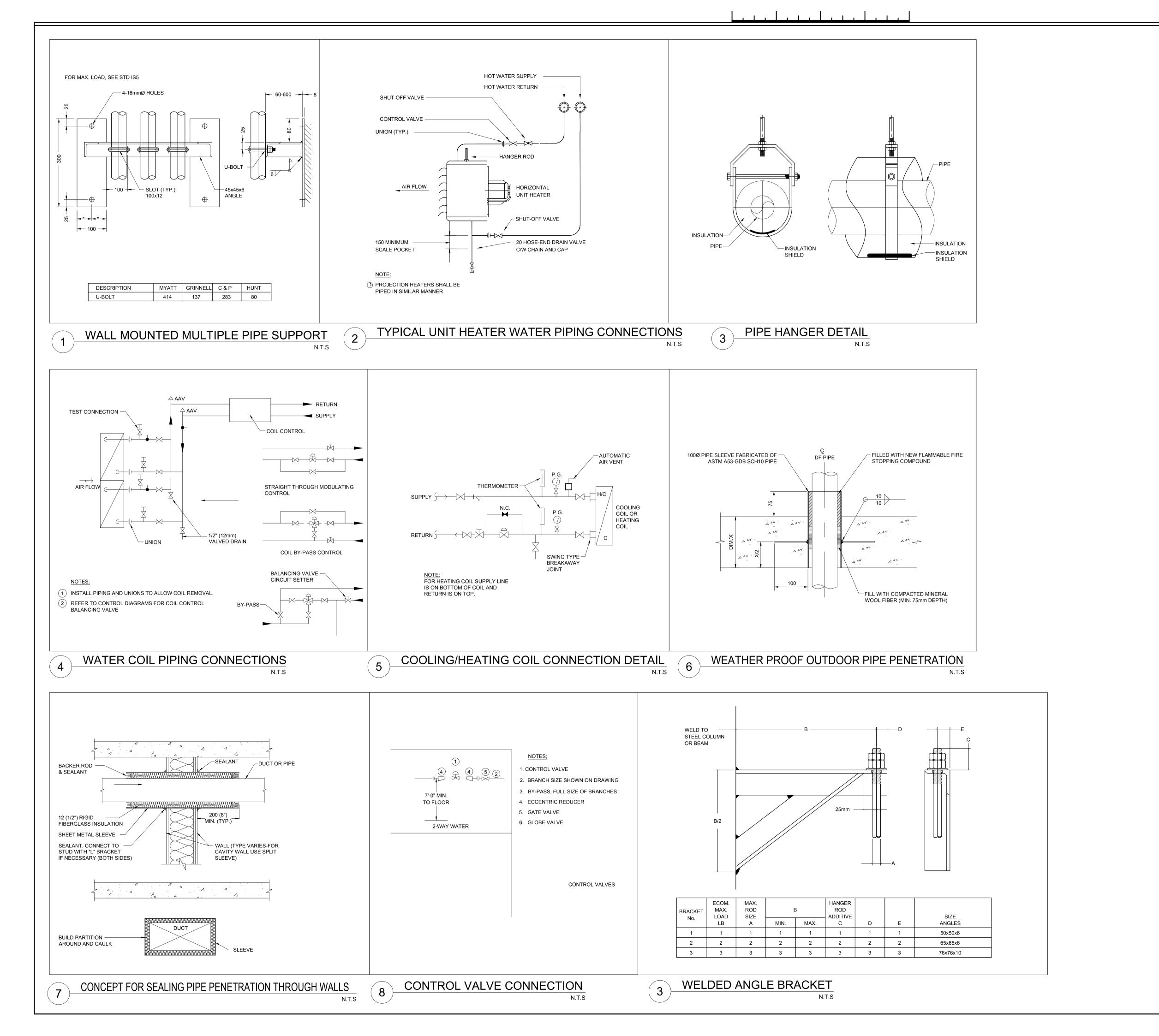
M-500 T 1

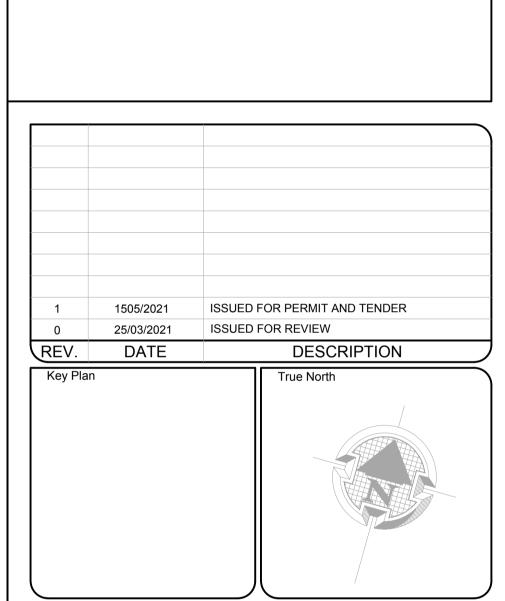
DESIGNED BY: B.E.

DRAWN BY: B.E.

APPROVED BY: M.A.

PROJECT NO.: 1021027







AS SHOWN

BOWMANVILLE HIGH SCHOOL

Spectra
Engineering
Ltd.

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

HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

Project Name & Address

MECHANICAL SERVICES
STANDARD DETAILS

DATE: 25/03/2021

DESIGNED BY: B.E

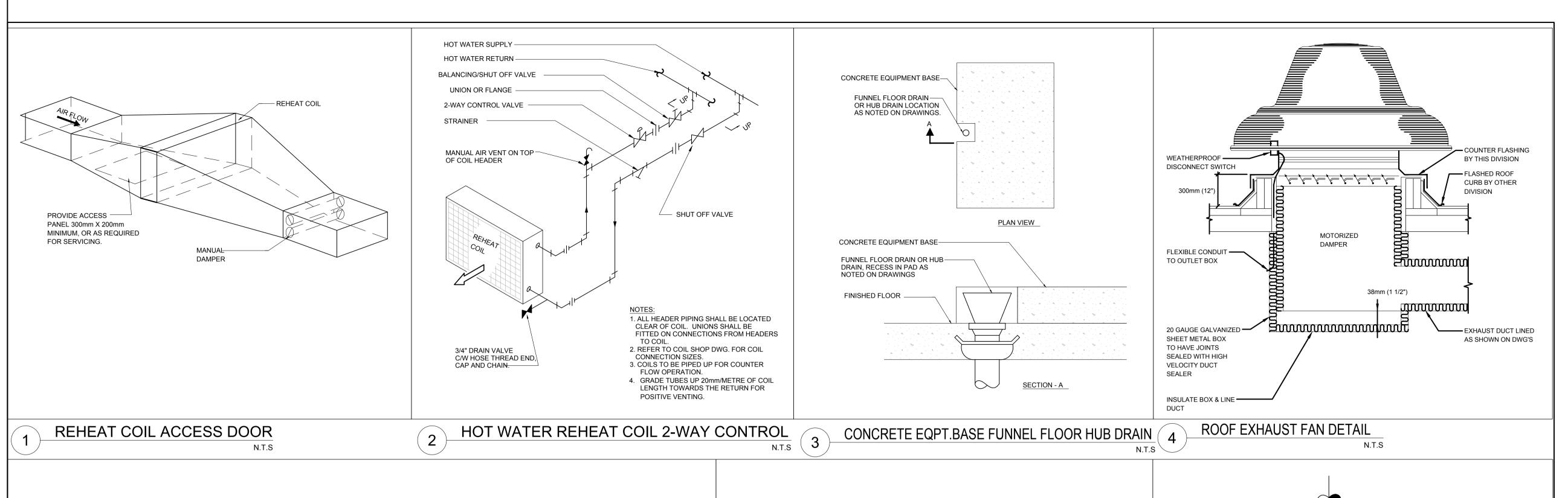
DRAWN BY: B.E

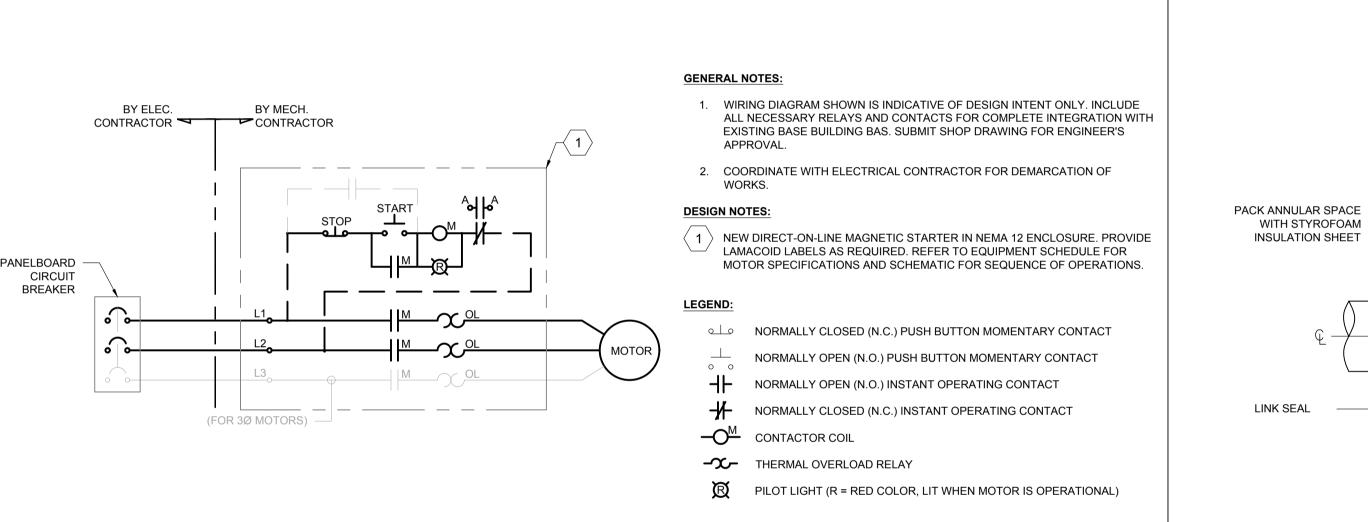
APPROVED BY: M. A

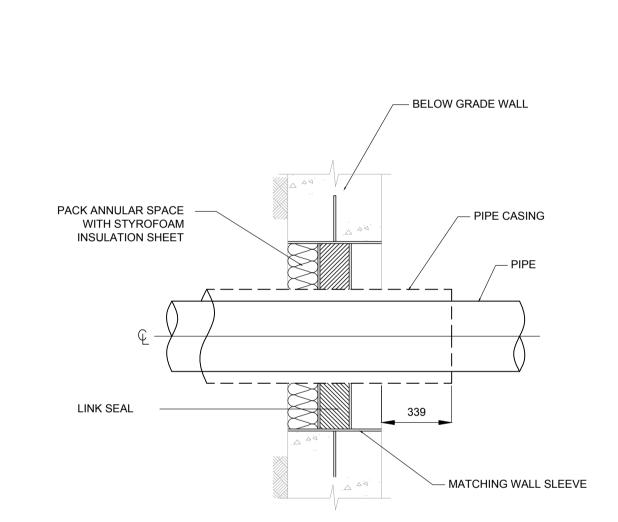
PROJECT NO.: 1021027



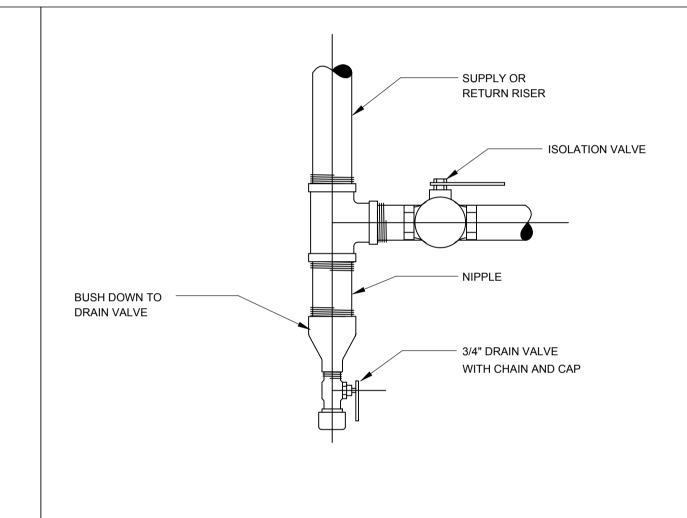
Drawing No. Phase I

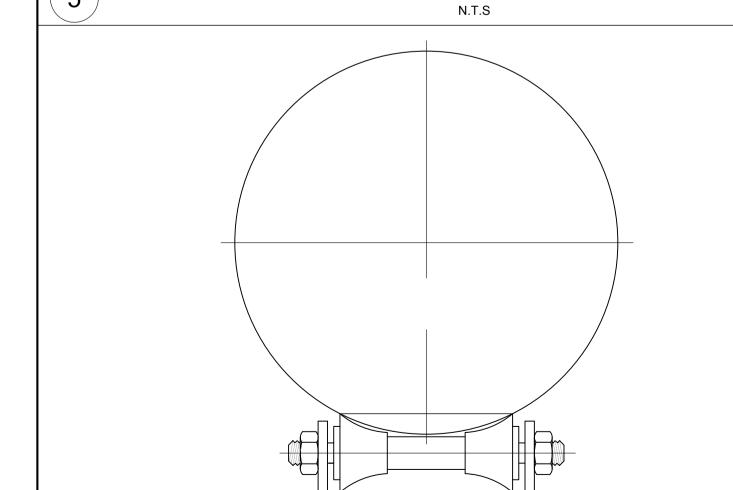






BELOW-GRADE WALL PENETRATION

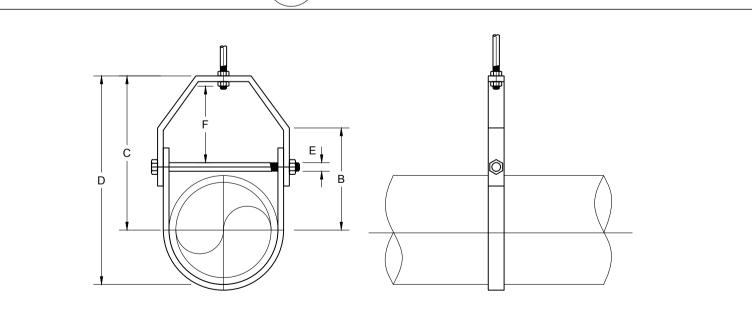




GRINNEL PIPE ROLLER CHAIR

MAGNETIC STARTER DETAILS

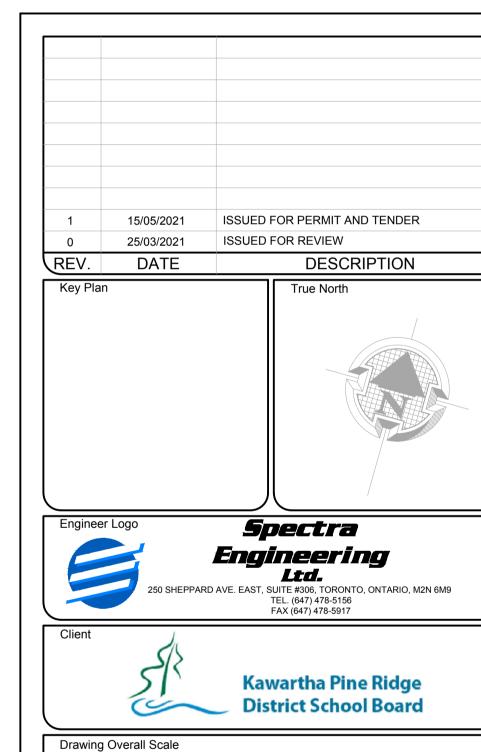
	EN	GINEERING I	DATA		D	IMENSION	N DATA						
HANGER SIZE	RECOM. MAX.	M. FROM PIPE CENTRELINE											APPR. WEIGH
OIZL	LOAD LBS	TO STEAM PLATE A	TO ROLL CENTRE B	С	D	F	G	н	J	К	Т	MATERIAL	PER 100
1 1/2"		3 1/4"	1 1/2"										
2"		3 1/2"	1 3/4"										
2 1/2"	390	3 7/8"	2 1/8"	1 3/4"	3 7/16"	2 3/4"	1 7/8"	1/2"	1 3/8"	9/16"	-	1/4"x2"	215
3"		4 1/8"	2 3/8"										
3 1/2"		4 3/8"	2 5/8"										
4"		4 13/16"	2 3/4"										
5"	950	5 7/16"	3 3/8"	2 1/16"	4 11/16"	3 3/4"	2 1/8"	1/2"	2"	11/16"	-	3/8"x2 1/2"	410
6"		6 1/16"	4"										



WATER RISER DRAIN

	ENGINEE	RING DATA		DI	MENSION DAT	A	MATERIAL		
PIPE SIZE	REC HGR SPACING	HNAGER ROD DIA(A)	ROD TAKE-OUT(B)	С	D	E	F	UPPER	LOWER
1/2"	5'-0"	3/8"	1 1/4"	1 3/4"	2 1/4"	1/4"	1/4"	16GAx7/8	16gax7/8
3/4"	6'-0"	3/8"	1 7/8"	2 3/4"	3 5/16"	5/16"	7/8"	1/8 x 1	1/8 x 1
1"	7'-0"	3/8"	1 1/8"	1 13/16"	2 5/16"	5/16"	7/8"	1/8 x 1 1/8	1/8 x 1 1/8
1 1/4"	8'-0"	3/8"	1 1/8"	1 13/16"	2 5/16"	3/8"	3/4"	3/16 x 1	3/16 x 1
1 1/2"	9'-0"	3/8"	1 1/8"	1 13/16"	2 5/16"	3/8"	3/4"	3/16 x 1	3/16 x 1
2"	10'-0"	3/8"	1 1/8"	1 13/16"	2 5/16"	3/8"	1 1/4"	3/16 x 1	3/16 x 1
2 1/2"	11'-0"	1/2"	1 1/8"	1 13/16"	2 5/16"	3/8"	1 1/4"	3/16 x 1 /1/4	3/16 x 1 1/4
3"	12'-0"	1/2"	1 1/8"	1 13/16"	2 5/16"	7/16"	1 5/8"	3/16 x 1 /1/4	3/16 x 1 1/2
4"	14'-0"	5/8"	1 1/8"	1 13/16"	2 5/16"	1/2"	1 1/2"	3/16 x 1 1 /2	3/16 x 1 1/2
6"	17'-0"	3/4"	1 1/8"	1 13/16"	2 5/16"	1/2"	2"	5/16 x 1 /1/2	3/16 x 1 1/2
8"	19'-0"	3/4"	1 1/8"	1 13/16"	2 5/16"	5/8"	2 7/8"	3/8 x 1 1/2	1/4 x1 1/2
10"	22'-0"	7/8"	1 1/8"	1 13/16"	2 5/16"	3/4"	2 3/4"	3/8 x 2	1/4 x 2
12"	23'-0"	7/8"	1 1/8"	1 13/16"	2 5/16"	3/4"	2 7/8"	1/2 x 2	2/3 x 2





AS SHOWN

BOWMANVILLE HIGH SCHOOL

HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

MECHANICAL SERVICES
STANDARD DETAILS

Engineer / Architect Stamp

M.AKHAVANBAZAZ 100088319

M-701 T 1

Project Name & Address

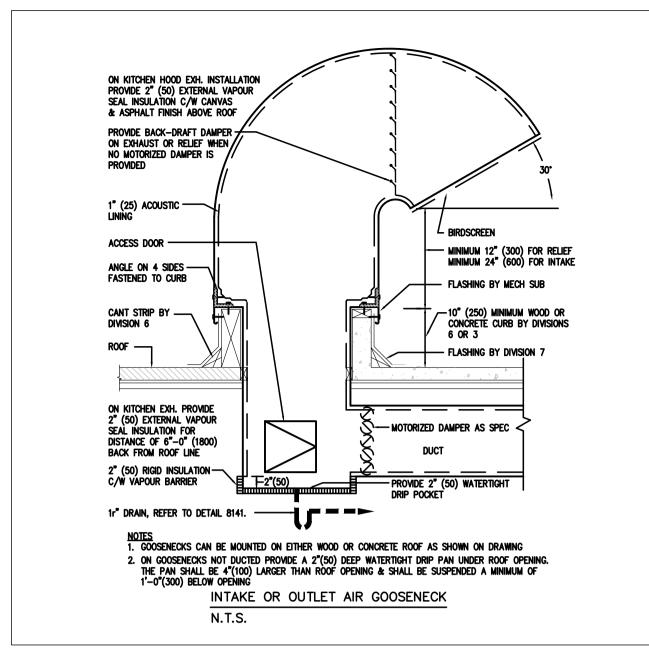
DATE:

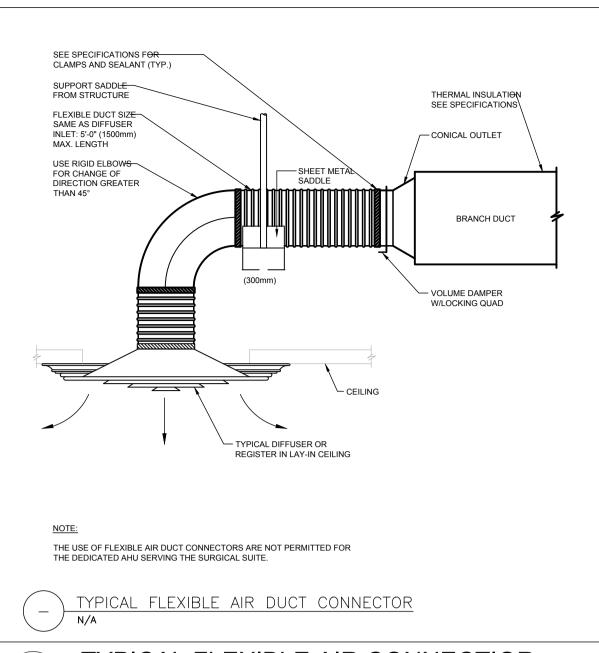
DESIGNED BY: B.E

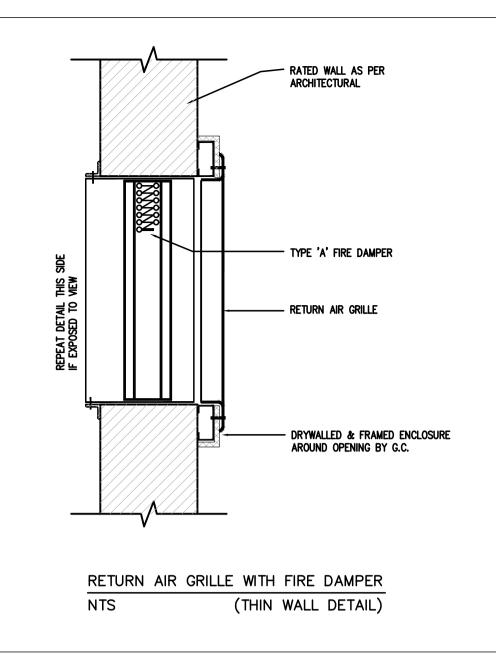
DRAWN BY: B.E

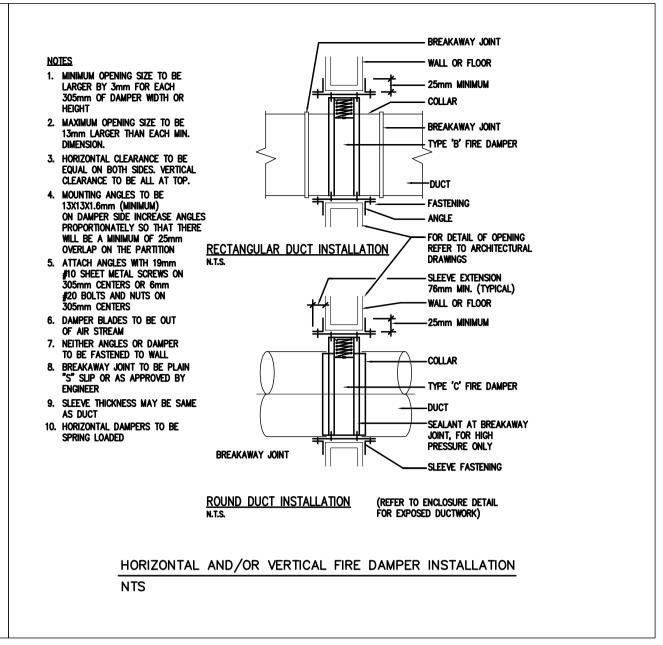
APPROVED BY: M. A

PROJECT NO.: 1021027







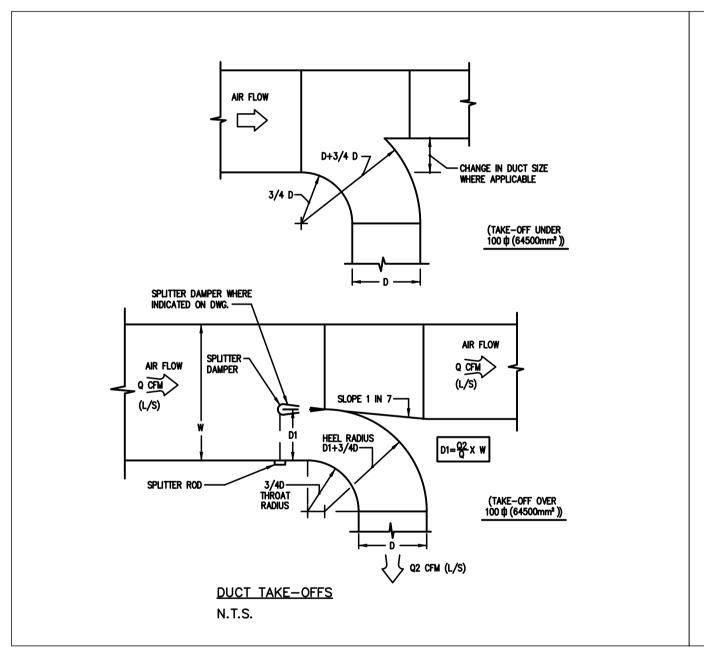


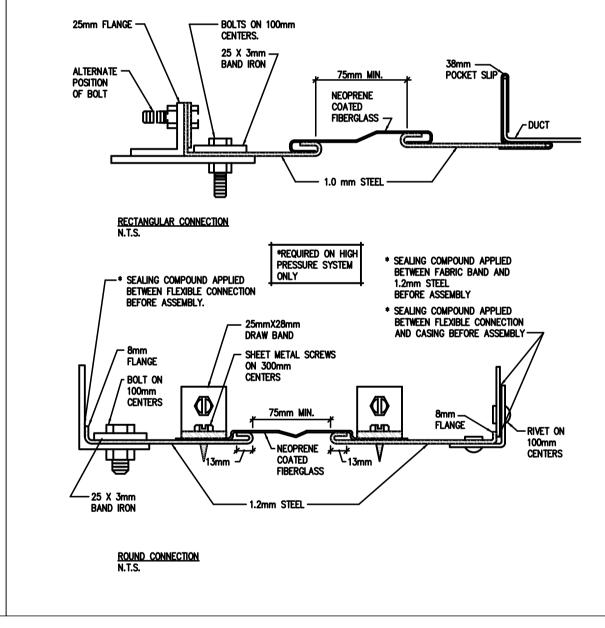
1 INTAKE ORT OUTLET AIR GOOSENECK

TYPICAL FLEXIBLE AIR CONNECTIOR

3 RETURN AIR GRILLE WITH FIRE DAMPER

HORIZONTAL AND/OR VERTICAL FIRE DAMPER INSTALLATION

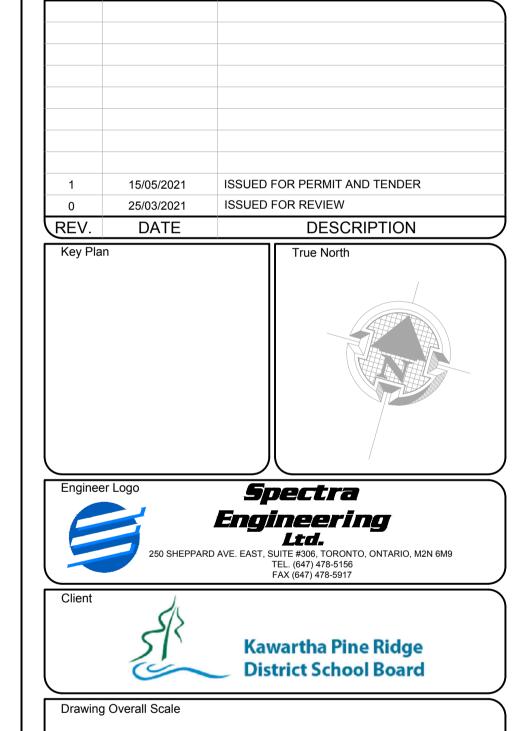




5 DUCT TAKE-OFFS
NT.S

6 FLEXIBLE CONNECTION

N.T.S



AS SHOWN

7.0 0110 WIV

Project Name & Address

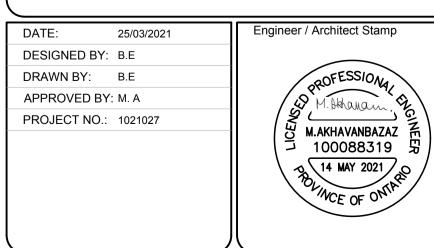
BOWMANVILLE HIGH SCHOOL

HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

Drawing Title

MECHANICAL SERVICES
STANDARD DETAILS



Drawing No. Phase Revision

M-702

T

1

SPECIFICATIONS

PART A - GENERAL ELECTRICAL SPECIFICATIONS

1. CODES & REGULATIONS

1.1. ALL WORK SHALL COMPLY WITH THE LATEST EDITIONS OF THE BUILDING CODE, ELECTRICAL CODE, C.S.A. STANDARDS, UNDERWRITERS' LABORATORIES, ALL APPLICABLE LOCAL CODES, AND ALL OTHER AUTHORITIES HAVING JURISDICTION. THESE CODES AND REGULATIONS CONSTITUTE AN INTEGRAL PART OF THE SPECIFICATIONS.

2. BUILDING STANDARDS.

2.1. COMPLETE ALL ELECTRICAL WORK IN ACCORDANCE WITH THE RELEVANT SECTIONS OF THE BASE BUILDING SPECIFICATIONS. DRAWINGS, AND STANDARDS TO THE SATISFACTION OF THE CONSULTANT AND/OR THE BUILDING OWNER. THE BASE BUILDING DOCUMENTS WILL BE MADE AVAILABLE FOR REVIEW BY THE BUILDING OWNER IF SO REQUIRED.

SITE VISIT

3.1. THE CONTRACTOR SHALL VISIT THE SITE AND EXAMINE ALL DRAWINGS 5. CAREFULLY TO DETERMINE THE EXTENT OF WORK AFFECTING THE EXISTING BUILDING. DETERMINE AND INCLUDE IN THE TOTAL PRICE. THE TOTAL COST OF LABOUR AND MATERIAL TO DISCONNECT, REMOVE, RELOCATE, BLANK OFF, REROUTE OR MAKE SAFE ALL EXISTING SERVICES, CONDUITS, WIRE, BOXES, LUMINAIRES AND EQUIPMENT AS REQUIRED.

4. PERMITS & INSPECTIONS

- 4.1. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND INSPECTIONS AS REQUIRED OR REQUESTED.
- 4.2. ONCE THE ELECTRICAL WORK HAS BEEN COMPLETED AND ACCEPTED BY THE OWNER, THE ELECTRICAL CONTRACTOR SHALL PROVIDE THE OWNER WITH CERTIFICATES VERIFYING THAT THE WORK HAS BEEN COMPLETED IN ACCORDANCE WITH ALL CODES, BUILDING STANDARDS AND ALL AUTHORITIES HAVING JURISDICTION.

5. INSURANCE

5.1. PROVIDE INSURANCE FOR THE DURATION OF THE PROJECT TO PROTECT THE BUILDING OWNER, TENANT, AND TRADES FROM ALL CLAIMS. SUBMIT, AT THE TIME OF THE BID, PROOF OF AN AMOUNT ACCEPTABLE TO BUILDING OWNER AND TENANT.

6. CONTRACT DOCUMENTS

- 6.1. THE DRAWINGS FOR THE WORK OF THIS DIVISION ARE IN PART DIAGRAMMATIC INTENDED TO CONVEY THE SCOPE OF WORK, GENERAL ARRANGEMENT, APPROXIMATE SIZES AND LOCATIONS OF THE EQUIPMENT AND OUTLETS.
- 6.2. REPORT ANY DISCREPANCIES BETWEEN THE ARCHITECTURAL, INTERIOR DESIGNER, MECHANICAL, STRUCTURAL, SECURITY, AUDIO VISUAL, KITCHEN LADNSCAPE DRAWINGS, ETC, AND THE ENGINEER'S DRAWING TO THE ENGINEER PRIOR TO INSTALLATION.
- 6.3. WHENEVER DIFFERENCES OCCUR BETWEEN PLANS AND DIAGRAMS, SCHEMATICS, AND BETWEEN SPECIFICATIONS AND DRAWINGS, THE MAXIMUM CONDITION SHALL GOVERN AND THE TENDER SHALL BE BASED ON WHICHEVER IS THE GREATER AMOUNT.

7. SHOP DRAWINGS

7.1. SUBMIT SHOP DRAWINGS OF LUMINAIRES, PANELBOARDS, AND OTHER MAJOR ELECTRICAL EQUIPMENT, AS REQUESTED BY THE ENGINEER, UNLESS OTHERWISE NOTED. EACH SHOP DRAWING SHALL BE CHECKED AND STAMPED AS BEING CORRECT BY THE GENERAL CONTRACTOR AND THE APPROPRIATE TRADE BEFORE SUBMISSION TO THE ENGINEER FOR APPROVAL.

8. RECORD DRAWINGS

8.1. KEEP A RECORD SET OF DRAWINGS ON THE SITE ON WHICH SHALL BE CLEARLY INDICATED, THE EXACT LOCATION OF ALL OUTLETS, FIXTURES, FEEDER RUNS, PANELS, CONDUITS, JUNCTION BOXES, PULL | 12. GROUNDING BOXES, ETC. INFORMATION ON THESE DRAWINGS SHALL BE INCORPORATED IN THE AS-BUILT DRAWINGS UPON COMPLETION OF THE PROJECT.

EXTRA WORK

- 9.1. IN CASES WHERE EXTRA WORK OF ANY KIND IS REQUIRED, OBTAIN WRITTEN INSTRUCTIONS FROM THE ARCHITECT/DESIGN CONSULTANT | 13. DIRECTORY BEFORE PROCEEDING. PAYMENTS WILL BE MADE FOR AUTHORIZED
- 9.2. QUOTATION WITH BREAKDOWN OF MATERIAL, LABOUR, OVERHEAD. PROFIT, ETC. SHALL BE SUBMITTED FOR EACH CHANGE. LABOUR UNITS SHALL BE BASED ON LATEST NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION (NECA) LABOUR UNITS COLUMN ONE FOR THE COMPLETE 14. DISRUPTION OF EXISTING SERVICES DURATION OF THE PROJECT. MATERIAL PRICES SHALL BE BASED ON THE CURRENT NATIONAL PRICE SYSTEM WITH TRADE DISCOUNTS. HOURLY LABOUR RATE SHALL INCLUDE RELATED CHARGES FOR SUPERVISION, HYDRO INSPECTION, HAND TOOLS, PARKING, CLEAN-UP, AS-BUILT DRAWINGS AND ADDITIONAL BONDING.

WARRANTY

10.1. THE CONTRACTOR SHALL PROVIDE THE TENANT WITH A WRITTEN ONE-YEAR WARRANTY, COMMENCING ON THE DATE OF ACCEPTANCE. THE WARRANTY SHALL COVER THE COMPLETE ELECTRICAL INSTALLATION. THE ELECTRICAL CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY DEFECTS IN MATERIALS OR WORKMANSHIP THAT OCCUR DURING THE WARRANTY PERIOD AT A TIME CONVENIENT TO THE TENANT/BUILDING OWNER, AND AT NO EXTRA COST.

11. AS-BUILTS

- 11.1. PROVIDE AS-BUILT DRAWINGS OF THE ACTUAL INSTALLATION AS ELECTRONICS FILES IN AUTOCAD 2004 FORMAT
- 11.2. AS-BUILT DRAWINGS SHALL INCORPORATE ALL CHANGES AND DEVIATIONS FROM TENDER DRAWINGS, INCLUDING ALL MAIN CONDUIT RUNS, CABLE TRAYS, JUNCTION BOXES, AND INFORMATION RECORDED ON RECORD DRAWINGS DURING CONSTRUCTION.
- 11.3. ENGINEER'S STAMP AND COMPANY LOGO SHALL BE REMOVED FROM DRAWINGS. DRAWINGS SHALL BE MARKET "AS-BUILT" ALONG WITH ELECTRICAL CONTRACTOR'S NAME.

12. CLOSE-OUT DOCUMENTS

- 12.1. AFTER COMPLETION OF THE PROJECT, PROVIDE THE FOLLOWING DOCUMENTS TO THE BUILDING OWNER, THE TENANT, AND THE ENGINEER.
- 12.1.1. THREE SETS OF FULL SIZE AS-BUILT DRAWINGS ALONG WITH DISK(S)
- 12.1.2. HYDRO ELECTRICAL INSPECTION REPORT.
- 12.1.3. FIRE ALARM VERIFICATION REPORT AND CERTIFICATE. 12.1.4. WRITTEN WARRANTY.

WORKMANSHIP

PART B - EXECUTION

- 1.1. ALL WORK SHALL BE CARRIED OUT AND PERFORMED IN A WORKMANLIKE MANNER TO THE SATISFACTION OF THE ARCHITECT/DESIGN CONSULTANT, ANY UNSATISFACTORY WORK BY THIS DIVISION SHALL BE REPLACED WITHOUT EXTRA COST TO THE
- 1.2. THE CONSTRUCTION SITE SHALL BE KEPT CLEAN AND ANY DEBRIS AND CONSTRUCTION MATERIAL SHALL BE REMOVED FROM THE SITE

THROUGHOUT THE CONSTRUCTION PERIOD AND ON COMPLETION OF THE WORK.

2. SCHEDULING

2.1. ALL WORK SHALL BE SCHEDULED AND COORDINATED TO AVOID ANY CONFLICTS WITH OTHER TRADES, BUILDING OWNER AND TENANT(S) DURING OR AFTER CONSTRUCTION, ALLOW FOR ALL NECESSARY PREMIUM TIME, ALL ALLOWANCE FOR THIS SHALL BE INCLUDED IN THE TENDER PRICE

DELIVERY OF EQUIPMENT

- 3.1. DELIVERY SCHEDULE OF ALL MAJOR ITEMS OF EQUIPMENT SUPPLIED UNDER THIS CONTRACT SHALL BE SUBMITTED IN WRITING TO THE GENERAL CONTRACTOR AT THE START OF THE PROJECT. FAILURE TO IDENTIFY DELIVERY PROBLEMS MAY RESULT IN DELAY CLAIMS. TEMPORARY POWER
- 4.1. PROVIDE TEMPORARY ELECTRICAL POWER FOR THE WORK OF THIS TRADE AND OTHER TRADES AS REQUIRED BY THE GENERAL

CONTRACTOR OR THE TENANT. LOCATION OF OUTLETS

5.1. THE ARCHITECT/DESIGN CONSULTANT SHALL HAVE THE RIGHT, AT ANY TIME, TO CHANGE THE LOCATION OF ANY OUTLET UP TO TEN FEET WITHOUT EXTRA COST TO THE TENANT. PROVIDED THAT NOTIFICATION OF SUCH CHANGES ARE ISSUED PRIOR TO THE INSTALLATION OF THE OUTLET.

6. ROUTING OF EQUIPMENT

- 6.1. NEW CONDUITS AND OTHER NEW SERVICES SHALL BE CAREFULLY ROUTED SO THAT THEY DO NOT INTERFERE WITH ANY EXISTING INSTALLATIONS. ROUTING OF EQUIPMENT IN BUILDING COMMON AREAS AND RISER ROOMS SHALL BE REVIEWED AND APPROVED BY BUILDING OWNER PRIOR TO INSTALLATION, ANY EXISTING CONDUITS, CABLE TRAYS, BUS DUCTS OR OTHER SERVICES NAT INTERFERE WITH THE
- NEW INSTALLATION SHALL BE RELOCATED UNDER THIS CONTRACT. FLOOR PENETRATION
- 7.1. X-RAY AND OBTAIN WRITTEN APPROVAL FROM BUILDING OWNER PRIOR TO PENETRATING ANY STRUCTURAL SURFACES OR FLOOR SLABS AND CARRY OUT THE WORK IN ACCORDANCE WITH THE BUILDING STANDARDS. THE CONTRACTOR SHALL REPLACE OR REPAIR ANY ITEMS WHICH ARE DAMAGED DUE TO THIS WORK AT NO EXTRA COST TO THE BUILDING OWNER.
- 7.2. ALL NEW SERVICES NAT PENETRATE THE FLOOR SLAB OR ARE RATED WALLS OR CEILINGS SHALL BE IN CONDUIT AND SHALL BE SEALED WITH AN APPROVED, NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT.
- 8. CUTTING AND PATCHING
- 8.1. ALL CUTTING AND PATCHING REQUIRED TO THE BUILDING STRUCTURE FOR THE WORK SHALL BE INCLUDED AS PART OF THIS CONTRACT. UNLESS OTHERWISE ADVISED BY THE GENERAL CONTRACTOR.

9. ACCESS PANEL

9.1. ACCESS PANELS SHALL BE PROVIDED IN CEILINGS WHERE JUNCTION BOXES AND OTHER ELECTRICAL EQUIPMENT CAN NOT BE LOCATED IN ACCESSIBLE LOCATIONS PROVIDED THAT APPROVAL HAS BEEN OBTAINED FROM THE ARCHITECT/DESIGN CONSULTANT.

10. NOISE & VIBRATION

- 10.1. ALL ELECTRICAL EQUIPMENT SHALL OPERATE WITHOUT OBJECTIONABLE NOISE OR VIBRATION TO THE OWNER'S SATISFACTION. 11. MECHANICAL WIRING
- 11.1. CONTROL WIRING FOR ALL MECHANICAL EQUIPMENT TO BE SUPPLIED AND INSTALLED BY DIV.25. ALL STARTERS, INCLUDING FAN SWITCHES TO BE SUPPLIED BY DIV.25 AND INSTALLED BY DIV.26 UNLESS OTHERWISE NOTED. DIV.26 TO PROVIDE ALL POWER HIRING AND

REQUIRED DISCONNECT SWITCHES.

- 12.1. ALL GROUNDING SHALL CONFORM TO THE ELECTRICAL SAFETY CODE AND LOCAL AUTHORITY REQUIREMENTS.
- 12.2. PROVIDE SEPARATE GREEN INSULATED GROUND CONDUCTOR IN EVERY POWER CONDUIT TO ALL DEVICES, LUMINAIRES, EQUIPMENT, AND WIN ALL FEEDERS.
- 13.1. PROVIDE TYPEWRITTEN DIRECTORIES FOR NEW AND EXISTING PANELBOARDS WITHIN THE AREA OF WORK, TO REFLECT THE LATEST REVISIONS. LABELING TO BE BASED ON ROOM NUMBERS AND/OR

LOCATION AND LOAD TYPES.

- 14.1. THE CONTRACTOR SHALL ASSUME FULL RESPONSIBILITY FOR ANY DISRUPTION TO THE EXISTING SERVICES. THE EXISTING BUILDING MUST BE KEPT IN OPERATION AT ALL TIMES. ARRANGE WORK IN SUCH A MANNER THAT INTERRUPTIONS IN SERVICES OCCUR ONLY AT SCHEDULED TIMES. INTERRUPTIONS SHALL BE SCHEDULED WITH THE ARCHITECT/DESIGN CONSULTANT AT LEAST 48 HOURS IN ADVANCE. OVERTIME WORK NAT MAY BE REQUIRED TO TIE-IN SERVICES AT NIGHT OR ON WEEKENDS SHALL BE INCLUDED IN THE TENDER AMOUNT.
- 15. DEFECT OR INTERFERENCE
 - 15.1. EXAMINE THE WORK OF THE OTHER TRADES, AS THEY AFFECT THIS DIVISION, REPORT AT ONCE TO THE ARCHITECT/DESIGN CONSULTANT ANY DEFECT OR INTERFERENCE NAT MAY AFFECT THE WORK OF THIS DIVISION OR THE GUARANTEE OF THIS WORK.

16. REMOVAL OF EXISTING EQUIPMENT

- 16.1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DISCONNECTING AND REMOVING ALL ELECTRICAL EQUIPMENT FROM AREAS BEING ALTERED OR DEMOUSHED. WIRING, CONDUIT AND EQUIPMENT WHICH IS REQUIRED TO MAINTAIN SERVICE IN OTHER PARTS OF THE BUILDING SHALL BE TEMPORARILY SUPPORTED, REROUTED, SERVICED OR RELOCATED AS REQUIRED.
- 16.2. EQUIPMENT TO BE RELOCATED SHALL BE VERIFIED FOR WORKING CONDITION. PROVIDE NEW IF NECESSARY AND FEASIBLE. EXTEND WIRING/CONDUIT AND RECONNECT TO SUIT.
- 16.3. OBSOLETE CONDUITS AND CABLES SHALL BE DISCONNECTED FROM THEIR SOURCE OF SUPPLY, CUT BACK AS FAR AS POSSIBLE, AND SHALL BE REMOVED. ALL EXISTING WIRING NOT REMOVED SHALL BE DISCONNECTED, BLANKED-OFF AND MADE SAFE.
- 16.4. UNLESS OTHERWISE ADVISED, ALL BASE BUILDING LUMINAIRES, TRANSFORMERS, PANELBOARDS AND DISCONNECT SWITCHES WHICH | PART C - MATERIAL ARE REMOVED SHALL BE HANDED OVER TO THE BUILDING OWNER. 16.5. ALL REMOVED EQUIPMENT AND MATERIALS WHICH ARE NO LONGER REQUIRED, UNLESS OTHERWISE NOTED, SHALL BECOME THE
- PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE UPON COMPLETION OF THE WORK. 16.6. PROVIDE BLANK COVER PLATE WHERE OUTLETS ARE REMOVED FROM
- 16.7. BE RESPONSIBLE AND PAY FOR ANY DAMAGE TO THE BASE BUILDING INCURRED BY WORK OF THIS DIVISION, OR REPAIR TO THE SATISFACTION OF THE CONSULTANT.
- 16.8. CARRY OUT THE WORK WITH MINIMUM OF NOISE, DUST AND DISTURBANCE.

EXISTING WALLS TO REMAIN.

17. OPERATION AND MAINTENANCE MANUALS

17.1. PROVIDE 4 (FOUR) SETS OF OPERATION AND MAINTENANCE MANUALS | 3. CONDUIT SUBMITTED IN HARD COVER 3-RING BINDERS. ALSO INCLUDE 1 COPY IN PDF FORMAT CONTRACTOR RED LINES AND O&M MANUAL. INCLUDE

- THE FOLLOWING INFORMATION IN THE OPERATIONS AND MAINTENANCE MANUALS:
 - NAMES AND ADDRESS OF LOCAL SUPPLIERS FOR THE ITEMS INCLUDES.
 - TECHNICAL DATA, PRODUCT DATA, SUPPLEMENTED BY BULLETINS, COMPONENT ILLUSTRATIONS, EXPLODED VIEWS, TECHNICAL DESCRIPTIONS OF ITEMS, AND PARTS LISTS. ADVERTISING OR SALES LITERATURE IS NOT ACCEPTABLE.
- THE CONSULTANT'S REVIEWED SHOP DRAWINGS.
- CERTIFICATE(S) OF ACCEPTANCE FOR ANY NEW FIRE ALARM COMPONENTS OR TIE-INS AND ANY BASE BUILDING TIE-INS FOR MISCELLANEOUS SYSTEMS (IE. SECURITY, LIGHTING CONTROL, DIGITAL METERING).
- LOAD BALANCE REPORT. WRITTEN GUARANTEE.
- 17.2.REVIEW INFORMATION PROVIDED IN THE MAINTENANCE INSTRUCTIONS AND MANUAL WITH THE TENANT'S OPERATING PERSONNEL AND LANDLORD'S OPERATING PERSONNEL WHERE BASE BUILDING SYSTEMS ARE REVISED, TO ENSURE A COMPLETE UNDERSTANDING OF THE ELECTRICAL EQUIPMENT AND SYSTEMS AND THEIR OPERATION.

18. COMMUNICATION

- 18.1. COMPLETE THE INSTALLATION OF THE WORK IN ACCORDANCE WITH LATEST EDITIONS OF THE ONTARIO BUILDING CODE, PROVINCIAL ELECTRICAL SAFETY CODE, CSA, ANSI/TIA/EIA, ULC, NFPA, O.S.H.A. AND OTHER CODES AS REQUIRED. ALSO , ALL COMMUNICATION WORK SHALL COMPLY WITH LANDLORD'S REQUIREMENTS AND BASE BUILDING STANDARDS.
- 18.2. PROVIDE CABLE SUPPORTS, HARNESSES AND SLEEVES AS REQUIRED. ALL FREE RUNNING CABLES SHALL BE SECURELY FASTENED TO APPROPRIATE CABLE SUPPORTS AND HARNESS WITH A MAXIMAL INTERSUPPORT CABLE SAG OF 6". ALL CABLES SHALL BE COMPLETELY SUPPORTED BY THE HARNESSES SO THAT NO WEIGHT IS TRANSFERRED TO ANY OTHER EXISTING NON-STRUCTURAL FIXTURE OR CEILING CABLE STRUCTURE.
- 18.3. IT IS THE INTENT OF THESE DRAWINGS AND SPECIFICATIONS THAT THE CONTRACTOR PROVIDE COMPLETE AND OPERATIONAL SYSTEMS AS REQUIRED.
- 18.4. PROVIDE AND INSTALL ALL HORIZONTAL DATA COMMUNICATIONS CABLING AS INDICATED. HORIZONTAL DATA COMMUNICATIONS CABLES SHALL BE 4-PAIR UNSHIELDED TWISTED PAIR, CSA FT6/CMP FIRE RATED, CERTIFIED TO EIA/TIA CATEGORY 6 SPECIFICATIONS. COMMUNICATIONS CABLES SHALL BE BELDEN, SIEMON OR APPROVED **FQUIVALENT.**
- 18.5. ANY HORIZONTAL CABLES THAT ARE NOT RUN IN A PLENUM SPACE FOR ANY DISTANCE MAY BE CSA FT4 RATED OR CMR RATED CABLES.
- 18.6. PROVIDE AND INSTALL FLEX FOR PROTECTION OF HORIZONTAL CABLES FROM WALL/FLOOR FEED POINT TO SYSTEMS FURNITURE/WIREMOLD. FLEX TO BE BLACK SPIRAL WRAP TUBING SIZED TO FIT FURNITURE CABLE BUNDLE.
- 18.7. PROVIDE AND INSTALL ALL MODULAR JACKS AS INDICATED. THE MODULAR JACKS FOR DATA AND VOICE SHALL BE 8-POSITION IN EIA/TIA-A 568A CONFIGURATION.
- 18.8. PROVIDE NEW TERMINATION PATCH PANELS AND BIX 1A4 IDC STRIPS. 18.9. DATA PATCH PANELS ARE TO BE CATEGORY 6 48-PORT MODULAR JACK
- PANELS AND FULLY LOADED WITH IDENTIFIED MODULES. 18.10. PROVIDE AND INSTALL PLYWOOD BACKBOARD AS REQUIRED. PLYWOOD BACKBOARD SHALL BE 19mm (3/4") THICK, OF HIGHEST
- QUALITY FIRE RETARDANT. 18.11. ALL DATA/VOICE CABLES SHALL BE TESTED AFTER COMPLETE INSTALLATION FROM TERMINATION END TO TERMINATION END. DEFECTS AND DEFICIENCIES WHICH ORIGINATE OR BECOME EVIDENT DURING THE WARRANTY PERIOD MUST BE REPAIRED OR REPLACED, AT
- 18.12. THE COMMUNICATIONS CABLING CONTRACTOR/INSTALLER MUST BE SYSTEM. CERTIFICATION BY THIRD PARTY OR ANY OTHER MEANS IS NOT ACCEPTABLE.

19. FIRE ALARM SYSTEM

NO COST.

- 19.1. ALL FIRE ALARM SYSTEM INSTALLATION SHALL BE ACCORDING TO THE LATEST EDITION OF 'CAN-ULC S524-06 - INSTALLATION OF FIRE ALARM SYSTEMS' AND THE REQUIREMENTS OF THE LOCAL AUTHORITIES HAVING JURISDICTION.
- 19.2. ALL WIRING SHALL BE INSTALLED IN CONDUIT AND TO CONFORM TO THE REQUIREMENT OF THE 'ONTARIO ELECTRICAL SAFETY CODE, 26TH EDITION' OR LOCAL CODE HAVING JURISDICTION. PROVIDE A GROUND WIRE IN ALL CONDUITS.
- 19.3. FINAL LOCATION OF SYSTEM COMPONENTS AND DEVICES TO BE COORDINATED WITH THE ARCHITECTURAL CONSULTANT PRIOR TO
- 19.4. ONLY A CERTIFIED FIRE ALARM TECHNICIAN IS ALLOWED TO WORK ON ANY FIRE ALARM SYSTEM INSTALLATION.
- 19.5. UPON COMPLETION OF WORKS AS PER CONTRACT DRAWINGS, OBTAIN | 12. LUMINAIRES THE SERVICES OF BASE BUILDING FIRE ALARM MANUFACTURER TO MAKE A COMPLETE INSPECTION AND VERIFICATIONS OF ALL INSTALLED FIRE ALARM EQUIPMENT AND DEVICES.
- 19.6. PERFORM ANY CHANGES NECESSARY AS A RESULT OF THE ABOVE VERIFICATION AND INSPECTION IN ACCORDANCE WITH THE MANUFACTURER'S DIRECTIONS.
- 19.7. ON COMPLETION OF THE VERIFICATION, INSPECTION AND TESTING OBTAIN THE VERIFICATION CERTIFICATE AND INSPECTION REPORTS FROM THE MANUFACTURER AND FORWARD TO THE OWNER. 19.8. FIRE ALARM SIGNALING DEVICES TO BE INSTALLED AND TESTED IN
- COMPLIANCE WITH 2012 ONTARIO BUILDING CODE SECTION 3.2.4.20 AUDIBILITY. INCLUDE FOR ALL COSTS IN TENDER.
- 19.9. ENSURE THAT ALL COSTS FOR THE ABOVE TESTING, VERIFICATION, INSPECTION ARE INCLUDED IN THE TENDER PRICE. 19.10. WHERE THE INTEGRITY OF THE EXISTING LIFE SAFETY INPUT AND
- OUTPUT DEVICES ARE AFFECTED DUE TO RELOCATIONS, CEILING DEMOLITIONS AND/OR RE-INSTALLATIONS ONTO NEW SUSPENDED CEILING, ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO MAINTAIN THE SYSTEM OPERATION AT ALL TIMES. ALL SUSPENSION ACCESSORIES REQUIRED FOR THE INSTALLATION (E.G., MOUNTING CHANNELS AND FRAMES, ETC.) AND VERIFICATION OF THE SYSTEM SHALL BE INCLUDED IN THE TENDER PRICES.

1.1. ALL ELECTRICAL EQUIPMENT SHALL BE C.S.A. APPROVED AND BEAR THE C.S.A. STAMP. ALL EQUIPMENT SHALL BE NEW UNLESS OTHERWISE

NOTED. WIRE AND CABLE

- 2.1. ALL WIRE AND CABLE SHALL BE COPPER WITH TYPE R-90, X-LINK INSULATION, AND MINIMUM NO.12 AWG WIRE SIZE, NO.10 AND 12 TO BE SOLID, AND NO.8 AND LARGER TO BE STRANDED.
- 2.2. SIZE ALL WIRE FOR MAXIMUM 3% VOLTAGE DROP AT 80% LOAD AND 90% POWER FACTOR.

- 3.1. ALL WIRING IN CEILINGS AND PARTITIONS SHALL BE IN EMT CONDUIT (MIN 3/4'Ø') WITH STEEL SETSCREW COUPLING AND CONNECTORS.
- 3.2. ALL WIRING IN SLABS SHALL BE IN RIGID PVC CONDUIT.
- 3.3. AC-90 CABLE MAY BE PERMITTED FOR DOWN-DROPS FROM JUNCTION BOXES TO LUMINAIRES AND IN PARTITIONS UNLESS PROHIBITED BY CODE OR BUILDING STANDARDS. AC-90 CABLE SHALL NOT BE USED IN ANY EXPOSED AREAS UNLESS OTHERWISE NOTED. AC-90 CABLE RUNS IN CEILING SPACE SHALL NOT EXCEED 3048MM (10') IN LENGTH. DO NOT TERMINATE AC-90 CABLE DIRECTLY TO PANEL BOARDS.
- 3.4. PROVIDE FLEXIBLE METAL CONDUIT FOR CONNECTION TO TRANSFORMERS AND MOTORS, MINIMUM 1M (3') LENGTH.
- 3.5. ALL CONDUITS FOR COMMUNICATION WIRING SHALL BE INSTALLED WITH BUSHINGS AT EACH END. CONDUITS SHALL BE TERMINATED ON EQUIPMENT RACK, BACKBOARD OR CABLE TRAY WITHIN THE ROOM.
- 3.6. ALL EMPTY CONDUITS SHALL BE COMPLETE WIN NYLON PULL STRING. DO NOT CADDIE CLIP CONDUITS TO CEILING HANGERS.
- 3.7. ALL EXPOSED CONDUIT RUNS TO BE PAINTED TO MATCH EXISTING WALL AND CEILING FINISH.

PULL BOXES

4.1. A MINIMUM OF ONE PULL BOX SHALL BE INSTALLED FOR EVERY 303.1 (100') OF CONDUIT (EACH 90 DEGREE BEND SHALL EQUATE TO A 9M (30') LENGTH OF CONDUIT). NO MORE THAN TWO 90 DEGREE BENDS SHALL BE INSTALLED BETWEEN TWO PULL BOXES.

SWITCHES

- 5.1. LOCAL SWITCHES SHALL BE 20 AMP, SPECIFICATION GRADE, AND VOLTAGE, AS INDICATED. VERIFY EXACT LOCATION. MOUNTING HEIGHT AND COLOUR WITH ARCHITECT/DESIGN CONSULTANT PRIOR TO
- 5.2. MANUFACTURER 120V- P&S 2621 SERIES (UNLESS OTHERWISE NOTED) - 347V- P&S 2621 SERIES (UNLESS OTHERWISE NOTED)

RECEPTACLES

6.1. DUPLEX RECEPTACLES SHALL BE 120 VOLT, 15 AMP AND SPECIFICATION GRADE UNLESS OTHERWISE NOTED. VERIFY EXACT LOCATION, MOUNTING HEIGHT AND COLOUR WIN ARCHITECT/DESIGN CONSULTANT PRIOR TO INSTALLATION. 6.2 MANUFACTURER: - P&S 26252 SERIES (UNLESS OTHERWISE NOTED)

COVERPLATES

DIMMERS

- 7.1. EXPOSED COVERPLATES SHALL BE MADE OF UNBREAKABLE NYLON AND INSTALLED AFTER FINAL PAINTING, FLUSH WITH THE WALL.
- COLOUR TO MATCH DEVICES UNLESS OTHERWISE NOTED. 7.2. MANUFACTURER: - P&S 7 26 SERIES (UNLESS OTHERWISE NOTED)
- 8.1. ALL DIMMERS SHALL BE SIZED TO SUIT LOADS IN WATTAGE AND TYPES (FLUORESCENT, LOW VOLTAGE MAGNETIC, LOW VOLTAGE
- ELECTRONIC, ETC.) 8.2. PROVIDE LAMP DE-BUZZING COILS FOR ALL INCANDESCENT AND LOW VOLTAGE DIMMING CIRCUITS.
- 8.3. ALL DIMMING CIRCUITS ARE TO HAVE SEPARATE NEUTRAL CONDUCTOR.

8.4. MANUFACTURER: - LUTRON NOVA-T SERIES (UNLESS OTHERWISE

NOTED)

SERVICE EQUIPMENT

10. FUSES

- 9.1. ALL NEW PANELBOARDS, DISCONNECT SWITCHES, SPLITTERS, ETC. TO BE OF THE SAME MANUFACTURER. RATING AND TYPE TO COMPLY WITH BASE BUILDING EQUIPMENT WHERE POSSIBLE. MOULDED CIRCUIT BREAKERS SHALL BE BOLT-ON TYPE. ALL PANELBOARDS SHALL HAVE LOADS BALANCED ON THE FEEDERS (OPERATING AT NORMAL BUSINESS HOURS), ADJUST BRANCH CIRCUITS AS REQUIRED. DISCONNECT SWITCHES SHALL BE OF QUICK-MAKE/QUICK-BREAK TYPE.
- 9.2. MANUFACTURER: FEDERAL PIONEER, SIEMENS, SQUARE D. CUTLER-HAMMER, WESTINGHOUSE

TYPE, SIZED AS NOTED.

10.1. FUSES SHALL BE BUSSMAN 'FUSETRON' DUAL ELEMENT SLOW BLOW

- 11.1. ALL DRY TYPE TRANSFORMERS SHALL BE MINIMUM K13 RATED AND WITH ELECTRO STATICALLY SHIELDED WINDINGS. TRANSFORMER TO HAVE DOUBLE LUGS TO ACCOMMODATE DOUBLE NEUTRALS.
- HAMMOND, POLYGON, REX. 11.2. WHERE INDICATED ON THE DRAWINGS USE HARMONIC MITIGATION TRANSFORMERS. MANUFACTURER: (TO MATCH BASE BUILDING WHERE

MANUFACTURER: (TO MATCH BASE BUILDING WHERE POSSIBLE) -

POSSIBLE) - HARMONY SERIES FROM MIRUS POWERSMITHS. 11.3. ALL TRANSFORMERS UP TO AND INCLUDING 75 KVA ARE TO BE CEIUNG

MOUNTED WITH SUSPENSION RODS UNLESS OTHERWISE NOTED.

- 12.1. ALL NEW LUMINAIRES SHALL BE AS SPECIFIED ON DRAWINGS. ALTERNATES ARE NOT ACCEPTABLE WITHOUT APPROVAL BY
- ENGINEER AND CLIENT. 12.2. ALL LUMINAIRES INSTALLED IN OR ON BASE BUILDING CEILINGS SHALL BE INDEPENDENTLY SUPPORTED FROM BUILDING STRUCTURE WITH CHAIN UNLESS OTHERWISE NOTED.
- 12.3. NEW AND RELOCATED EXISTING BASE BUILDING LUMINAIRES SHALL BE INSTALLED WITH CHAIN SUPPORTS UNLESS BASE BUILDING CEILING SYSTEM IS DESIGNED AND CONSTRUCTED TO SUPPORT THE ADDITIONAL WEIGHT OF THE BASE BUILDING LUMINAIRES. PROVIDE

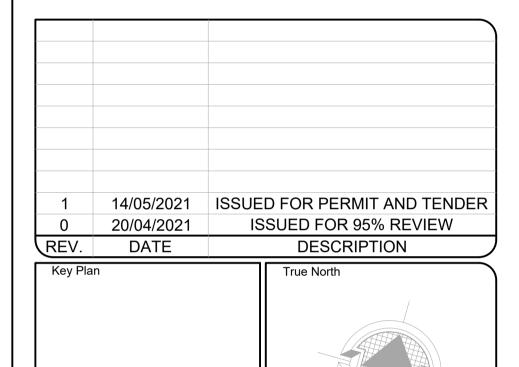
WRITTEN CONFIRMATION FROM CEILING MANUFACTURER. 13. LAMPS

- 13.1. ALL LUMINAIRES SHALL BE COMPLETE WITH SUITABLE LAMPS AS RECOMMENDED BY MANUFACTURER. COLOUR TEMPERATURE, BEAM ANGLE, CRI, FROSTED/CLEAR, ETC. SHALL BE CONFIRMED WITH ENGINEER AND ARCHITECT/DESIGN CONSULTANT PRIOR TO ORDERING
- 13.2. COMPACT FLUORESCENT, FLUORESCENT, AND H.I.D. LAMPS SHALL BE GUARANTEED FOR A PERIOD OF TWELVE MONTHS FROM THE DATE OF
- 13.3. LOW VOLTAGE, HALOGEN, AND INCANDESCENT LAMPS SHALL BE GUARANTEED FOR A PERIOD OF SIX MONTHS FROM THE DATE OF
- 13.4. MANUFACTURER PHILIPS, G.E.CANADA, OSRAM/SYLVANIA 14. PLYWOOD BACKBOARDS

14.1. PLYWOOD BACKBOARDS SHALL BE FIRE RETARDANT VENEER CORE FIR, 19MM(3/4") NICK AND SIZED AS INDICATED ON DRAWINGS. BACKBOARDS COLOUR AS SPECIFIED BY ARCHITECT/DESIGN CONSULTANT. SHALL BE PRIMED AND PAINTED WITH APPROVED FIRE RETARDANT PAINT.

15. NAMEPLATE

15.1. PROVIDE ENGRAVED LAMICOID NAMEPLATE ON ALL MAJOR ELECTRICAL EQUIPMENT IDENTIFYING NAME. VOLTAGE. PHASE. CURRENT RATING, "FED FROM" AND USE. LETTERING SHALL BE MINIMUM, 4" HIGH, WHITE ON BLACK BACKGROUND.







Kawartha Pine Ridge

District School Board

Drawing Overall Scale

AS SHOWN

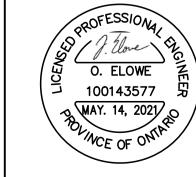
Project Name & Address **BOWMANVILLE HIGH SCHOOL**

HVAC UPGRADE

49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

ELECTRICAL SERVICE **SPECIFICATIONS**

DATE: 05/04/2021 DESIGNED BY: E.S. DRAWN BY: E.S. APPROVED BY: J.E. PROJECT NO.: 1021027

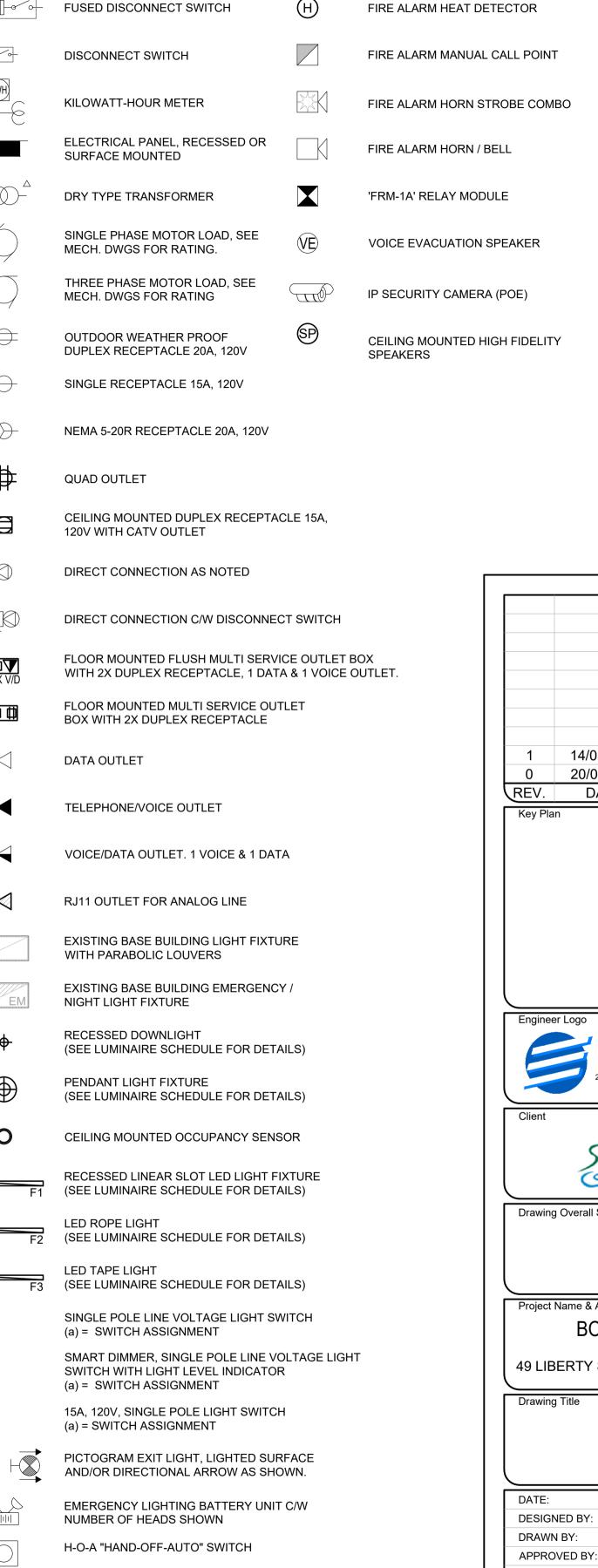


Engineer / Architect Stamp

Phase Revisi

E-001

GENERAL NOTES: — ○ CIRCUIT BREAKER 1. UNLESS OTHERWISE INDICATED, ALL EXISTING EQUIPMENT TO REMAIN. 2. MOUNTING AND ROUTING OF ELECTRICAL EQUIPMENT AND DISTRIBUTION SHALL BE COORDINATED WITH ALL OTHER 3. COORDINATE ELECTRICAL CONNECTIONS FOR MECHANICAL EQUIPMENT WITH MECHANICAL TRADE PRIOR TO INSTALLATION. 4. PENETRATION THROUGH FIRE RATED WALL AND ROOF TO BE SEALED WITH NON-SHRINK, WATERPROOF AND FIREPROOF SEALANT AND APPROVED BY THE DESIGNER OWNER PRIOR TO INSTALLATION. 5. ALL WORKS THAT WILL REQUIRE THE SHUT DOWN OF ELECTRICAL POWER TO BE COORDINATED WITH OWNER PRIOR TO COMMENCEMENT OF WORK. ANY LOSS OF REVENUE FROM FAILURE TO DO SO WILL BE SOLE RESPONSIBILITY OF CONTRACTOR. 6. CONTRACTOR TO CARRY COSTS (AS A SEPARATE PRICE) ASSOCIATED WITH POSSIBLE RELOCATION OR TEMPORARY REMOVAL & RE-INSTALLATION OF EXISTING LIGHT FIXTURES TO ALLOW FOR INSTALLATION OF NEW MECHANICAL SERVICES. 7. CONTRACTOR TO PERFORM SITE VISIT TO VERIFY EXISTING CONDITIONS & HIGHLIGHT DISCREPANCY TO THE ENGINEER FOR CLARIFICATION PRIOR TO PRICING. 8. SOME DEVICES MAY NOT BE SHOWN ON THIS LAYOUT FOR CLARITY PURPOSES, BUT MAY EXIST. ALL SUCH DEVICES (UNLESS OTHERWISE INDICATED ON THE LAYOUT) ARE TO REMAIN AS IS. PROTECT THROUGHOUT CONSTRUCTION. 9. NOT ALL EQUIPMENT SHOWN. 10. NOT ALL DEVICES IDENTIFIED FOR DEMOLITION ARE SHOWN. CONTRACTOR TO SURVEY SITE TO DETERMINE EXTENT OF DEMOLITION WORKS PRIOR TO SUBMISSION OF BID. 11. 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. 12. 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. 13. ELECTRICAL METALLIC TUBING (EMT) COUPLINGS SHALL BE COMPRESSION TYPE (CAST FITTINGS/SET - SCREW NOT ACCEPTABLE) AND FORGED STEEL. 14. ALL NEW EQUIPMENTS SHALL BE TAGGED WITH LAMACOID LABELS FOR IDENTIFICATION.



FIRE ALARM SMOKE DETECTOR

ABBREVIATIONS

ER

RL

AFF

GFI

O/C

HD

FCU

HWC

MD

TBC

TYP

VAV

WP

EXISTING TO REMAIN

EXISTING TO BE REMOVED

ABOVE FINISHED FLOOR

HOT WATER CYLINDER

VARIABLE AIR VOLUME

MOTORIZED DAMPER

TO BE CONFIRMED

WEATHERPROOF

OVER COUNTER

EXHUAST FAN

HAND DRYER

FAN COIL UNIT

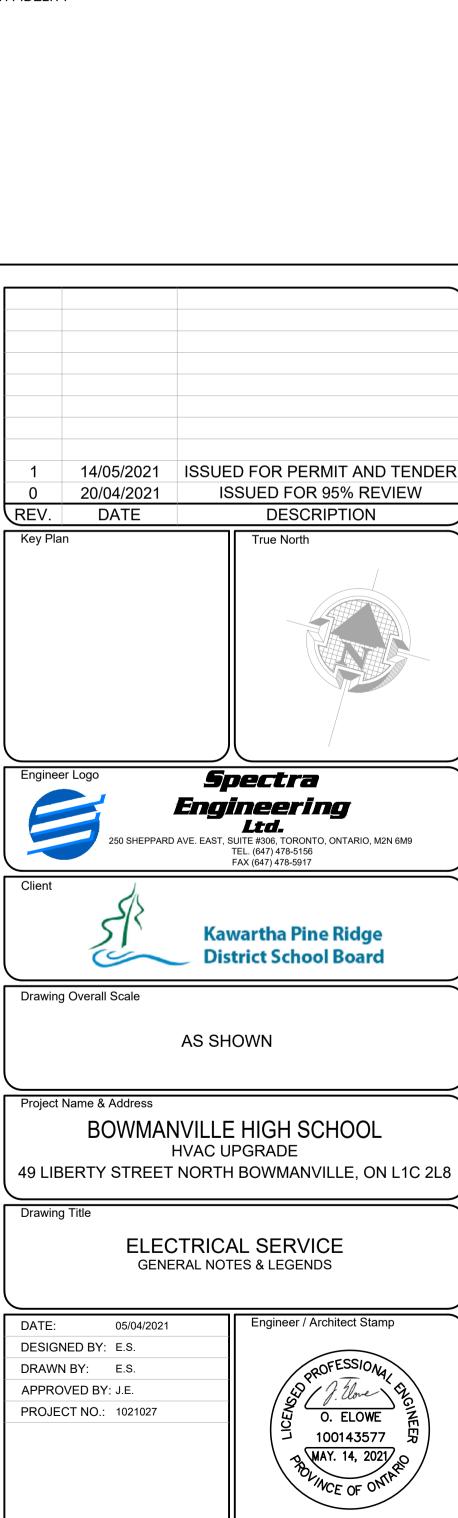
TYPICAL

NOTE: NOT ALL SYMBOLS USED

EXISTING TO BE RELOCATED REMOVE AND RE-INSTALL

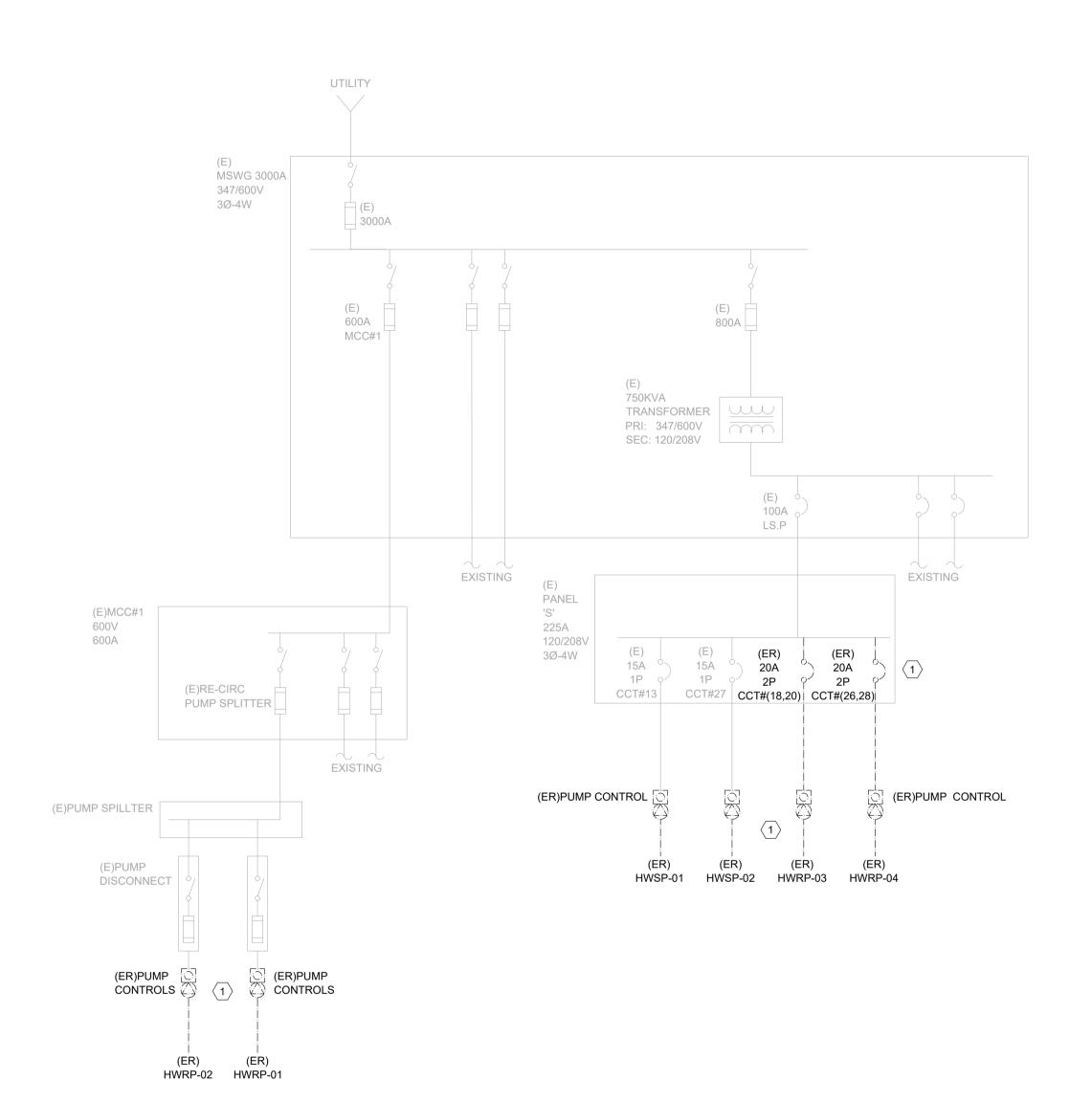
EXISTING IN RELOCATED POSITION

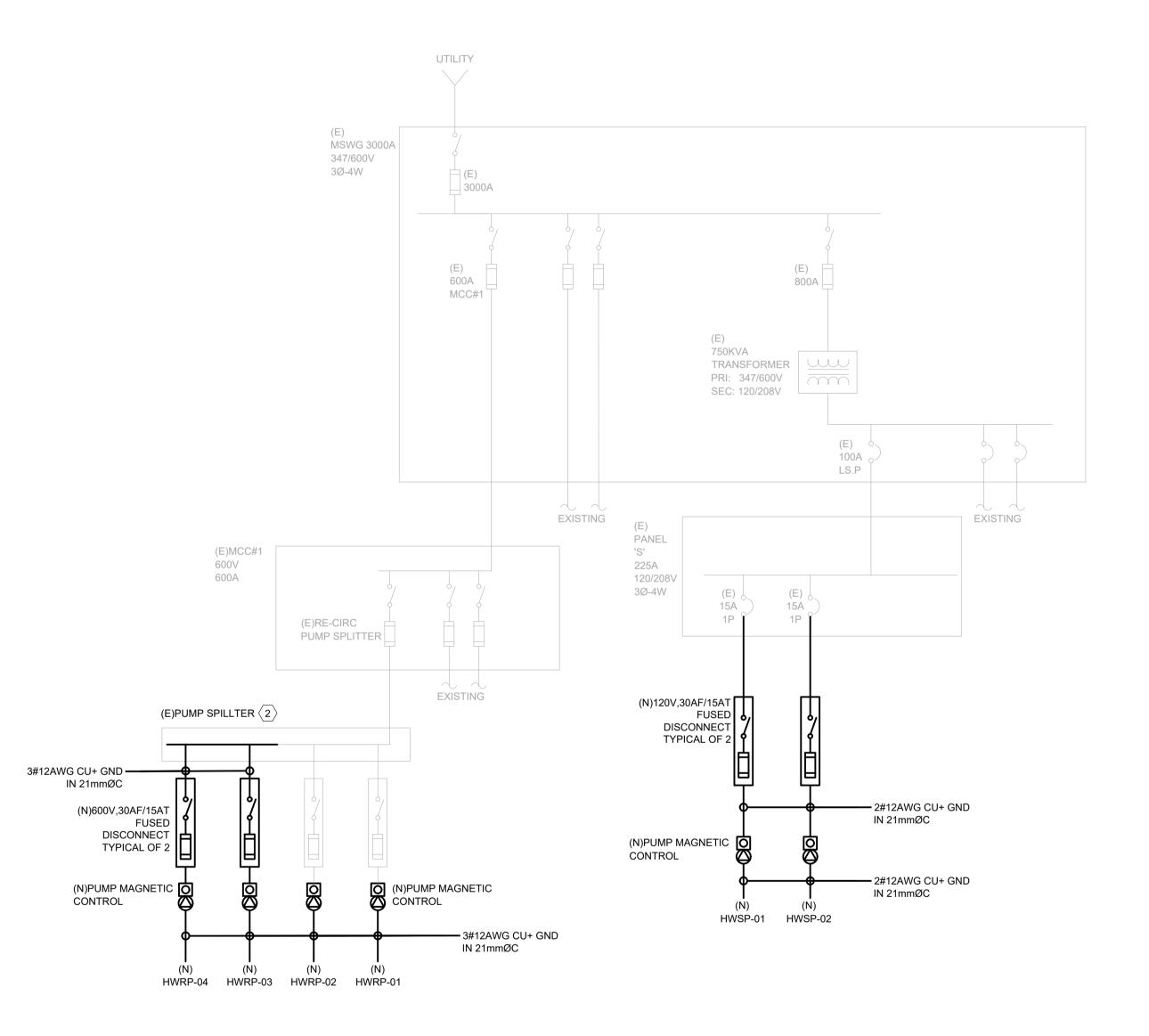
GROUND FAULT INTERRUPTER



Drawing No. Phase Revision

E-002



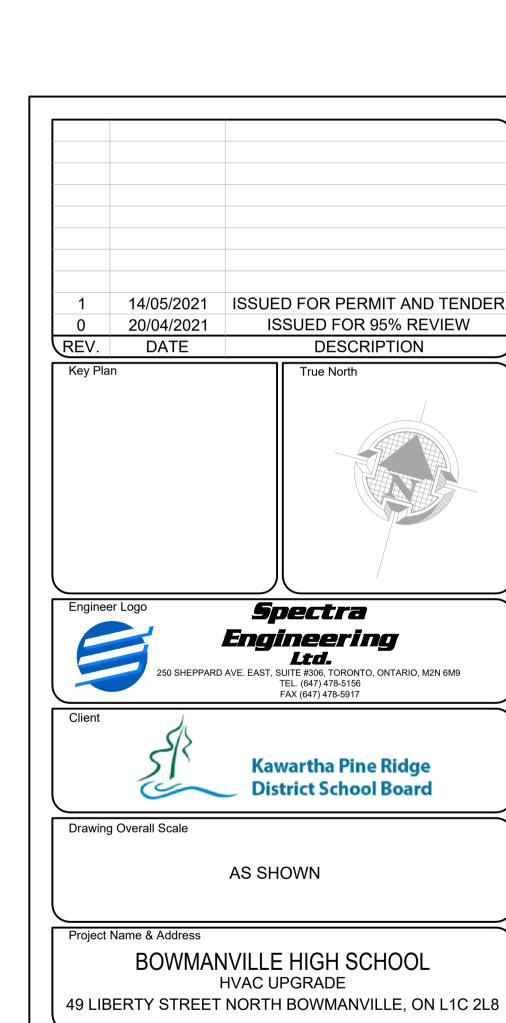


1 SINGLINE LINE DIAGRAM - DEMOLITION PLAN
Scale: NTS

2 SINGLINE LINE DIAGRAM - NEW WORK PLAN
Scale: NTS

DEMOLITION & DESIGN NOTES:

- 1 REMOVE EXISTING PUMPS AND ASSOCIATED WIRING, CONDUITS, CONTROLS AND DISCONNECT MEANS AS INDICATED, PULL WIRE BACK TO SOURCE/ SAFETY. CONTRACTOR SHALL USE EXISTING WIRING AND CONDUITS IN GOOD CONDITION FOR NEW WORK WHERE POSSIBLE. EXTEND, REPLACE AND MATCH IN KIND IF NEEDED.
- 2 CONTRACTOR SHALL MODIFY EXISTING PUMP SPLITTER IN BOILER ROOM TO ACCOMMODATE NEW HWRP-03 & HWRP-04 WIRING, DISCONNECT AND CONTROLS.



ELECTRICAL SERVICE SINGLINE LINE DIAGRAM

DATE:

DESIGNED BY: E.S.

DRAWN BY: E.S.

APPROVED BY: J.E.

PROJECT NO.: 1021027

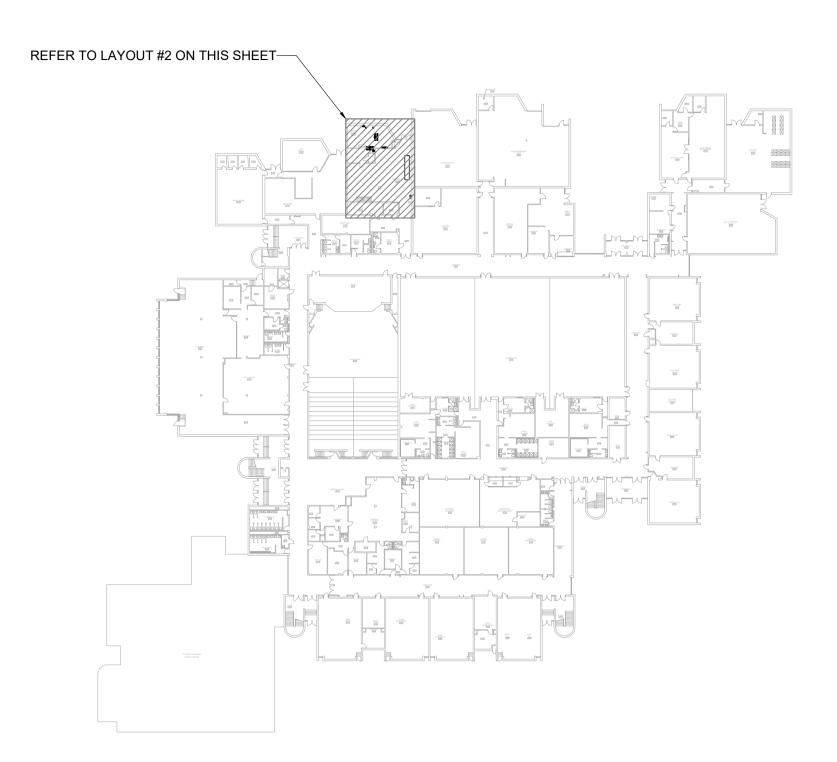
04/05/2021

Engineer / Architect Stamp

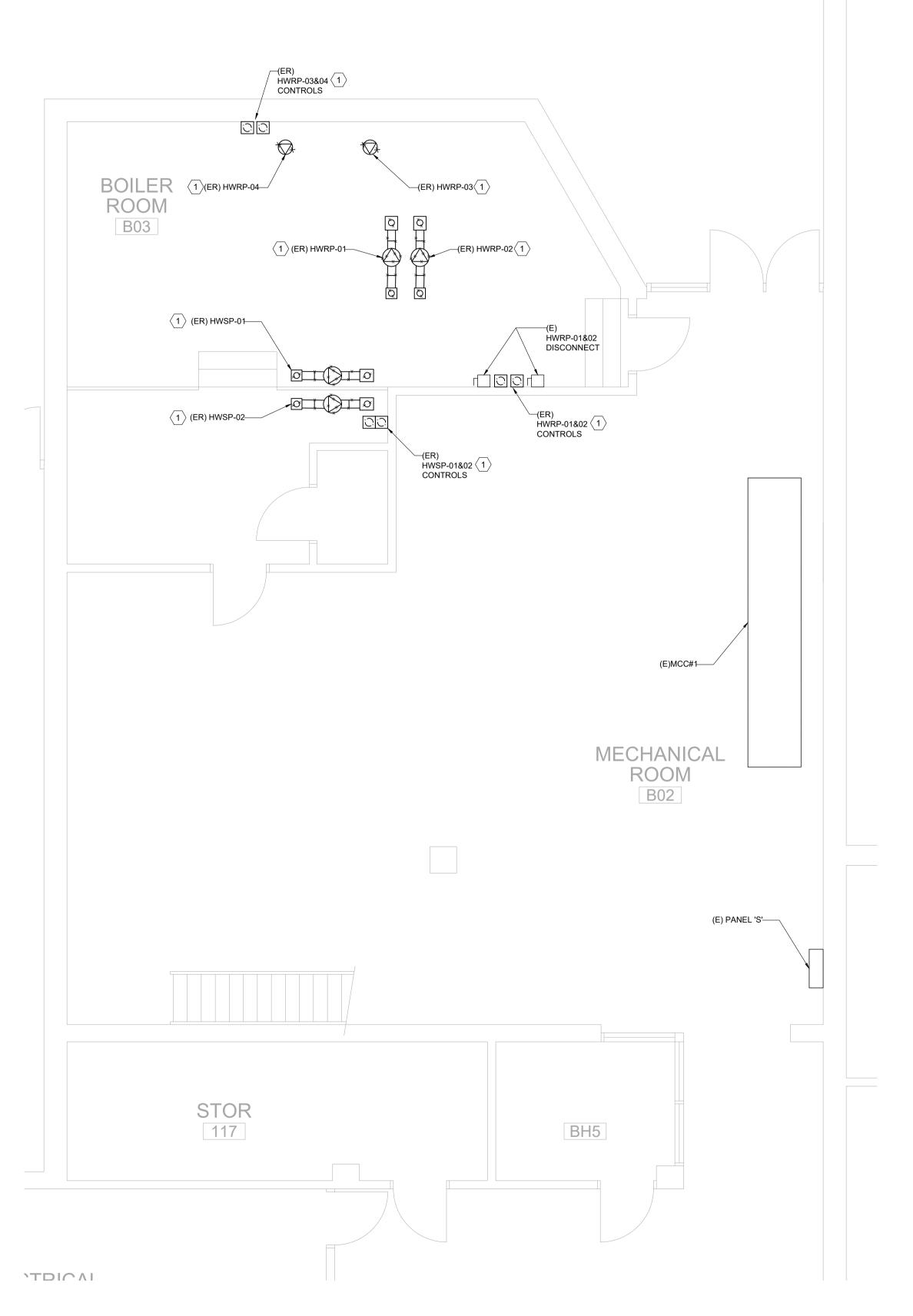
100143577 🕏

Drawing No. Phase Revision

E-100 T 1



FIRST FLOOR - GENERAL LAYOUT



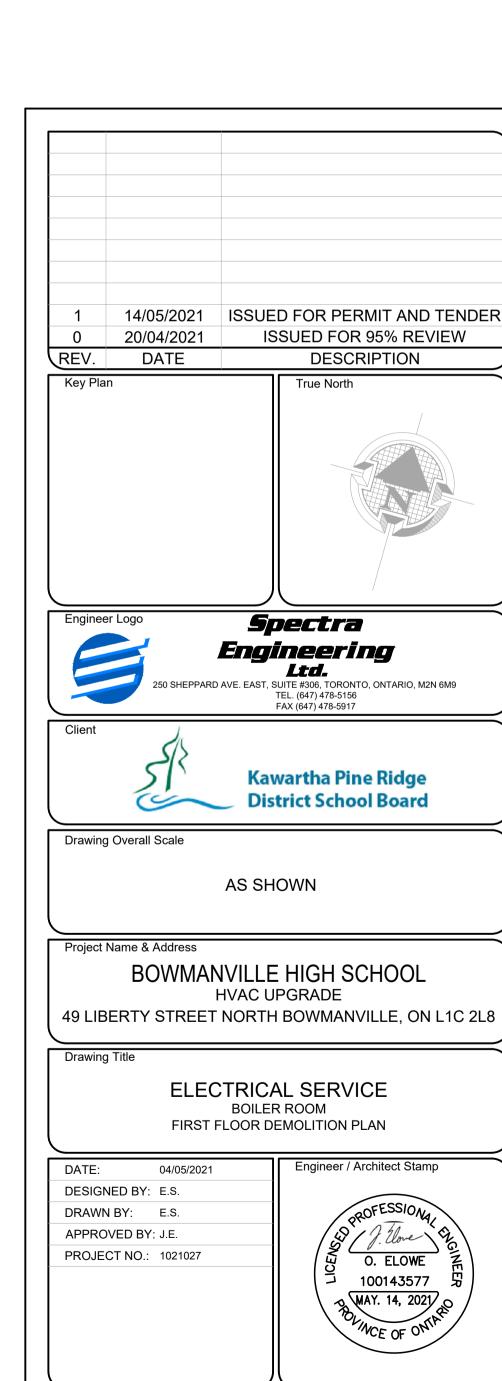
BOILER ROOM - ELECTRICAL DEMOLITION PLAN

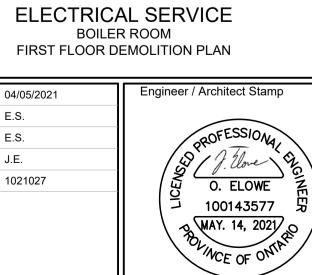
DEMOLITION NOTES:

DISCONNECT AND REMOVE EXISTING PUMPS AND ASSOCIATED WIRING, CONDUITS, CONTROLS AND DISCONNECT. PULL WIRES BACK TO SOURCE/SAFETY. COORDINATE WITH MECHANICAL. REFER TO SINGLE LINE DIAGRAM FOR DETAILS.

IMPORTANT NOTE:

CONTRACTOR TO PROVIDE A SEPARATE LUMP SUMP PRICE FOR REPLACEMENT OF HEATING PUMP, ALL REQUIRED WIRING, CONDUITS, CIRCUIT BREAKERS AND DISCONNECTS ACCORDING TO THE DRAWING PRICE SHALL INCLUDE ALL THE MECHANICAL,
ELECTRICAL, CONTROL, STRUCTURAL AND
ARCHITECTURAL SCOPE OF WORK. REFER TO
MECHANICAL AND STRUCTURAL DRAWING FOR





ISSUED FOR 95% REVIEW

DESCRIPTION

Spectra

Kawartha Pine Ridge District School Board

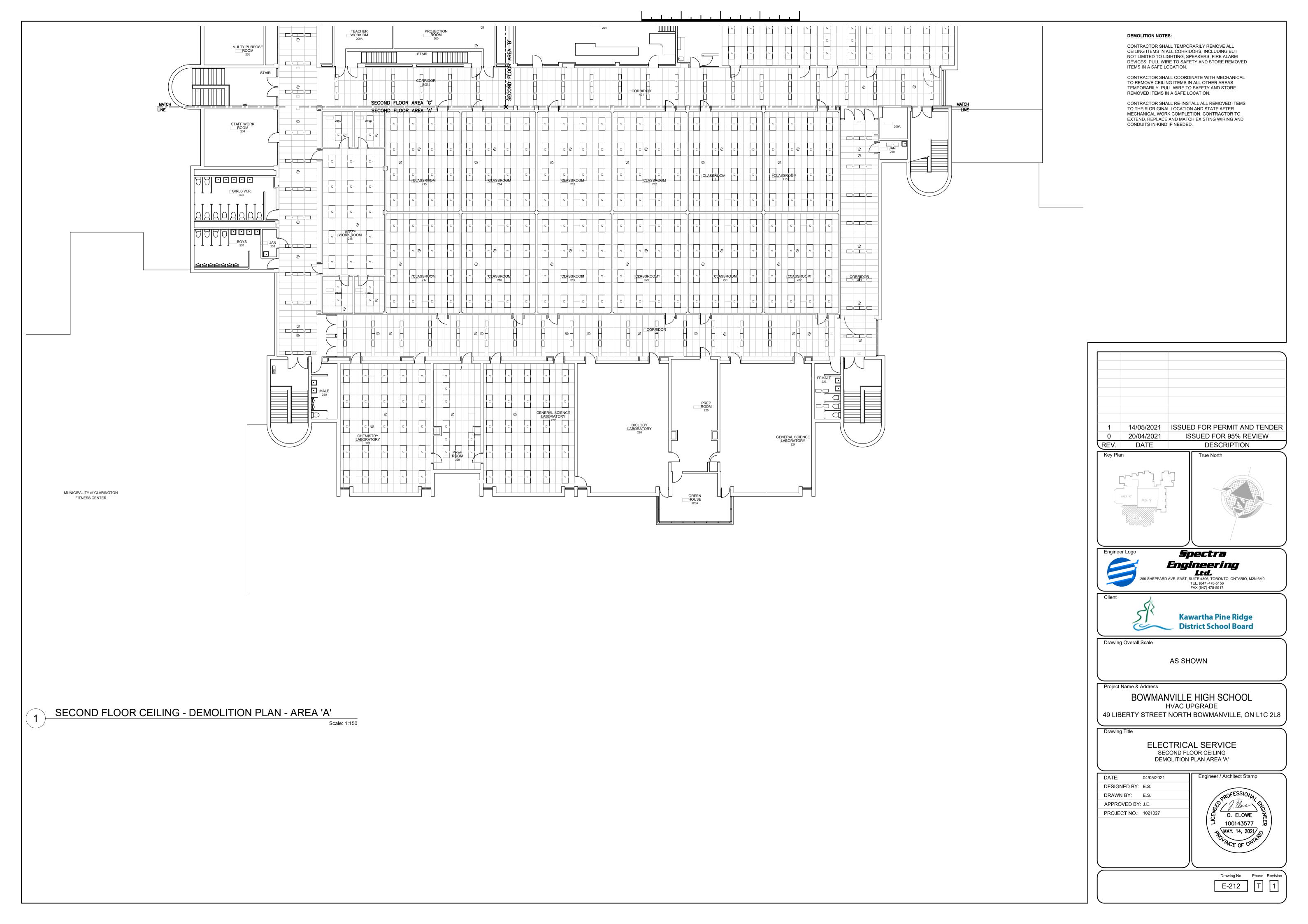
AS SHOWN

Drawing No. Phase Revision

E-201

T

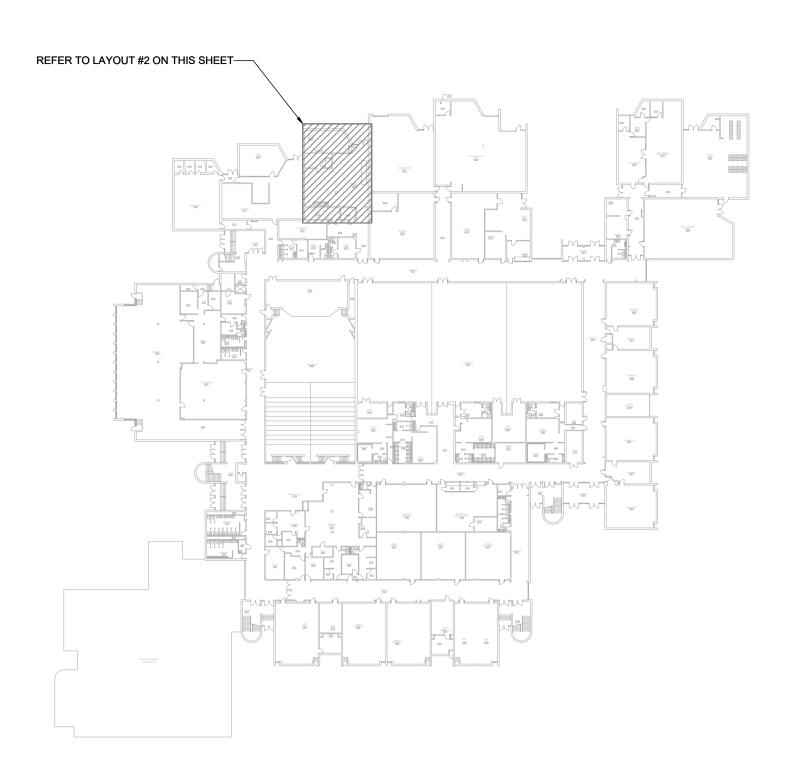
1



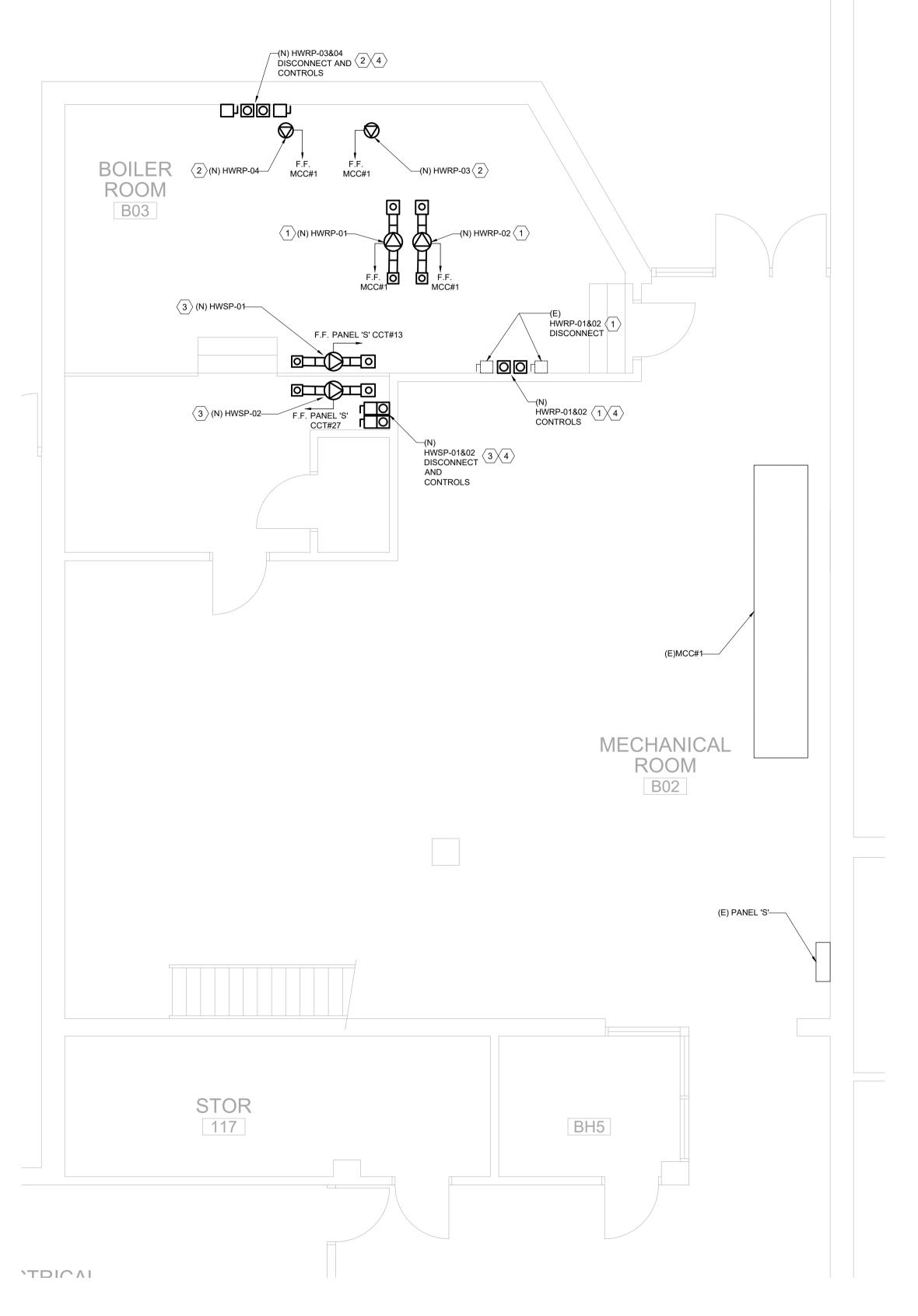
DEMOLITION NOTES: CONTRACTOR SHALL TEMPORARILY REMOVE ALL CEILING ITEMS IN ALL CORRIDORS, INCLUDING BUT NOT LIMITED TO LIGHTING, SPEAKERS, FIRE ALARM DEVICES. PULL WIRE TO SAFETY AND STORE REMOVED ITEMS IN A SAFE LOCATION. CONTRACTOR SHALL COORDINATE WITH MECHANICAL TO REMOVE CEILING ITEMS IN ALL OTHER AREAS TEMPORARILY. PULL WIRE TO SAFETY AND STORE REMOVED ITEMS IN A SAFE LOCATION. CONTRACTOR SHALL RE-INSTALL ALL REMOVED ITEMS TO THEIR ORIGINAL LOCATION AND STATE AFTER MECHANICAL WORK COMPLETION. CONTRACTOR TO EXTEND, REPLACE AND MATCH EXISTING WIRING AND CONDUITS IN-KIND IF NEEDED. **UPPER GYM** 14/05/2021 ISSUED FOR PERMIT AND TENDER **ISSUED FOR 95% REVIEW** 20/04/2021 DATE DESCRIPTION *Spectra* Engineering
Ltd.

PPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917 PREP ROOM OFFICE BOW.
SENIOR
205 PHYSICS LABORATORY PHYSICS LABORATORY Kawartha Pine Ridge District School Board FAN ROOM 204 Drawing Overall Scale AS SHOWN BOWMANVILLE HIGH SCHOOL HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8 CORRIDOR ELECTRICAL SERVICE SECOND FLOOR CEILING DEMOLITION PLAN AREA 'B' MATCH LINE Engineer / Architect Stamp DATE: DESIGNED BY: E.S. DRAWN BY: E.S. APPROVED BY: J.E. PROJECT NO.: 1021027 SECOND FLOOR CEILING - DEMOLITION PLAN - AREA 'B' 100143577 MAY. 14, 2021 Drawing No. Phase Revision E-213 T 1

DEMOLITION NOTES: CONTRACTOR SHALL TEMPORARILY REMOVE ALL ROOF CEILING ITEMS IN ALL CORRIDORS, INCLUDING BUT NOT LIMITED TO LIGHTING, SPEAKERS, FIRE ALARM DEVICES. PULL WIRE TO SAFETY AND STORE REMOVED ITEMS IN A SAFE LOCATION. CONTRACTOR SHALL COORDINATE WITH MECHANICAL TO REMOVE CEILING ITEMS IN ALL OTHER AREAS TEMPORARILY. PULL WIRE TO SAFETY AND STORE REMOVED ITEMS IN A SAFE LOCATION. CONTRACTOR SHALL RE-INSTALL ALL REMOVED ITEMS TO THEIR ORIGINAL LOCATION AND STATE AFTER DANCE STUDIO 242 MECHANICAL WORK COMPLETION. CONTRACTOR TO EXTEND, REPLACE AND MATCH EXISTING WIRING AND CONDUITS IN-KIND IF NEEDED. <u>`S`</u> **UPPER STAGE** ŠP. L2 L2 EX. COMPUTER ROOM ×S. UPPER AUDITORIUM ×SP. RESOURCES CENTRE 236 L2 L2 L2 L2 14/05/2021 ISSUED FOR PERMIT AND TENDER CLASSROOM **ISSUED FOR 95% REVIEW** 20/04/2021 DATE DESCRIPTION L2 L2 ×SP. <u>`S</u> L2 L2 OFFICE 237A LIBRARY OFFICE 237 L2 L2 *Spectra* Engineering
Ltd.
50 SHEPPARD AVE. EAST, SUITE #306, TORONTO, ONTARIO, M2N 6M9
TEL. (647) 478-5156
FAX (647) 478-5917 L2 L2 Kawartha Pine Ridge **District School Board** L2 L2 CORRIDOR Drawing Overall Scale AS SHOWN **€**€2 TEACHER WORK RM 200A PROJECTION ROOM 200 L2 L2 Project Name & Address MULTY PURPOSE ROOM 235 BOWMANVILLE HIGH SCHOOL **HVAC UPGRADE** STAIR 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8 L2 L2 STAIR ELECTRICAL SERVICE SECOND FLOOR CEILING DEMOLITION PLAN AREA 'C' Engineer / Architect Stamp SECOND FLOOR AREA 'C' DATE: DESIGNED BY: E.S. SECOND FLOOR AREA 'A' DRAWN BY: E.S. APPROVED BY: J.E. PROJECT NO.: 1021027 SECOND FLOOR CEILING - DEMOLITION PLAN - AREA 'C' 100143577 Drawing No. Phase Revision E-214 T 1



FIRST FLOOR - GENERAL LAYOUT



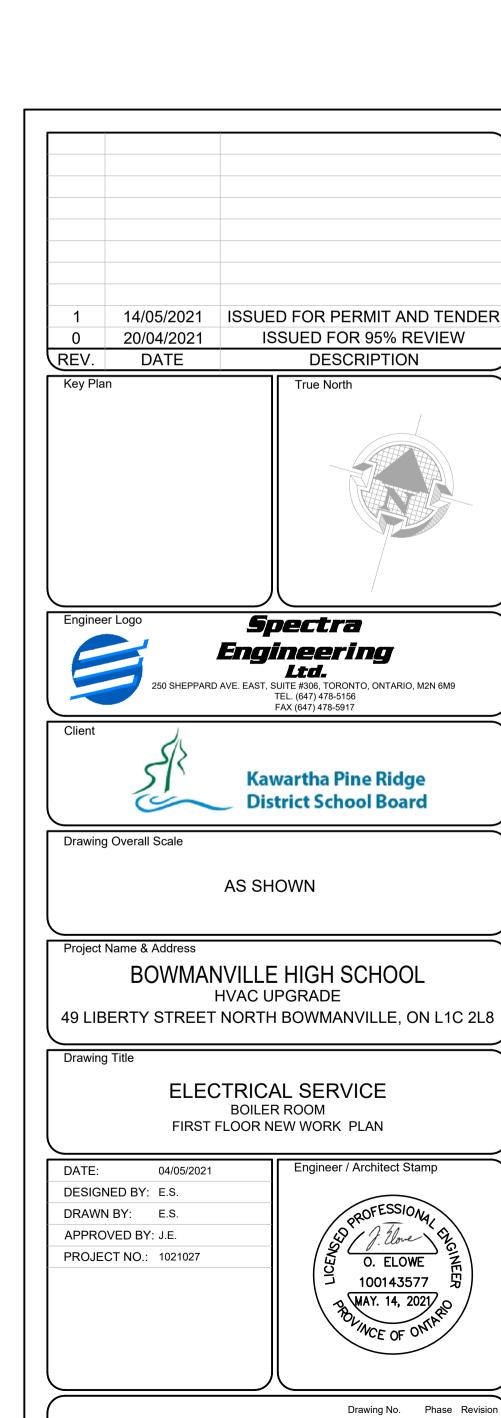
BOILER ROOM - ELECTRICAL NEW WORK PLAN

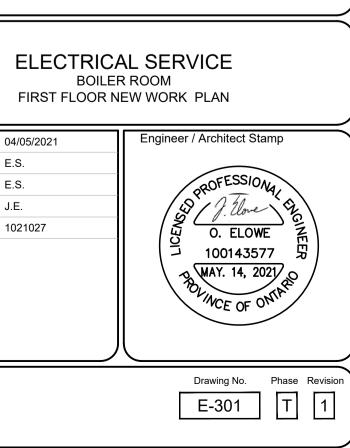
NEW WORK NOTES:

- PROVIDE NEW DIRECT CONNECTION FOR HWRP-01 & 02 C/W WIRING, CONDUIT TO BE FED FROM EXISTING MCC#1 LOCATED AT MECHANICAL ROOM.
 CONTRACTOR SHALL UTILIZE EXISTING PUMP DISCONNECT. REFER TO SINGLE LINE DIAGRAM FOR
- PROVIDE NEW DIRECT CONNECTION FOR HWRP-03 & 04 C/W WIRING, CONDUIT AND 30AF/15AT-3P FUSED DISCONNECT SWITCH TO BE FED FROM ESTERS. MCC#1 LOCATED AT MECHANICAL ROOM. REFER TO SINGLE LINE DIAGRAM FOR WIRING DETAIL.
- PROVIDE NEW DIRECT CONNECTION FOR HWSP-01 & 02 C/W WIRING, CONDUIT TO BE FED FROM EXISTING PANEL 'S' LOCATED AT MECHANICAL ROOM. REFER TO SINGLE LINE DIAGRAM FOR WIRING DETAIL.
- 4 CONTRACTOR TO COORDINATE WITH MECHANICAL TO PROVIDE STARTERS, CONTROLS ETC. C/W WIRING AND CONDUIT FOR ALL NEW PUMPS.

IMPORTANT NOTE:

CONTRACTOR TO PROVIDE A SEPARATE LUMP SUMP PRICE FOR REPLACEMENT OF HEATING PUMP, ALL REQUIRED WIRING, CONDUITS, CIRCUIT BREAKERS AND DISCONNECTS ACCORDING TO THE DRAWING PRICE SHALL INCLUDE ALL THE MECHANICAL,
ELECTRICAL, CONTROL, STRUCTURAL AND
ARCHITECTURAL SCOPE OF WORK. REFER TO
MECHANICAL AND STRUCTURAL DRAWING FOR





ISSUED FOR 95% REVIEW

DESCRIPTION

Spectra

Kawartha Pine Ridge District School Board

AS SHOWN

A. GENERAL NOTES

- 1. DESIGN IS IN ACCORDANCE WITH THE ONTARIO BUILDING CODE 2012, ONTARIO REGULATION 88/19 AND AMENDMENTS.
- 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,
- 4. VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO THE CONSULTANT BEFORE PROCEEDING WITH THE WORK.
- 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
- 6. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR DIMENSIONS AND FOR COORDINATION OF SUB-TRADES.
- DO NOT SCALE THE DRAWINGS, USE FIGURE DIMENSIONS ONLY.
- 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.
- ALL STRUCTURAL MEMBERS SHOWN ARE NEW UNLESS NOTED OTHERWISE.
- 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.
- THE SCHEDULING OF ALL WORK, INCLUDING ACCESSIBILITY AND LOGISTICS SHALL BE COORDINATED AND AGREED WITH THE OWNER PRIOR
- 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.
- 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

- DESIGN, FABRICATION AND ERECTION SHALL CONFORM TO CAN/CSA-S16 INCL. S16S1 SUPPLEMENT AND CISC CODE OF STANDARD PRACTICE FOR STRUCTURAL STEEL
- 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
- 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.
- 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.
- 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.
- DO NOT MAKE HOLES IN ANY STRUCTURAL STEEL MEMBER OTHER THAN THOSE SHOWN ON REVIEWED SHOP DRAWINGS WITHOUT THE
- 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. 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

D. 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.
- WELDED WIRE FABRIC SHALL HAVE A MINIMUM YIELD STRENGTH OF 450 MPa AND SHALL CONFORM TO ASTM A185. SUPPLY IN FLAT SHEETS ONLY.
- 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.
- 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.
- DO NOT FIELD-CUT OR FIELD-BEND BARS WITHOUT CONSULTANT'S APPROVAL.
- 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
- 10. PROVIDE CLASS 'B' TENSION LAP SPLICES UNLESS NOTED OTHERWISE. ALL SPLICE LOCATIONS SHALL BE TO THE APPROVAL OF THE
- 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.
- 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.
- PROVIDE MINIMUM 2-20M VERTICAL AT EACH END, TEE AND CORNER OF ALL REINFORCED CONCRETE WALLS UNO.
- 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.

E. MASONRY

- 1. ALL MASONRY WORK TO BE IN ACCORDANCE WITH THE LATEST VERSIONS OF CSA-A371 AND CSA-A179.
- STRUCTURAL DRAWINGS SHOW LOAD-BEARING MASONRY WALLS ONLY U.N.O. REFER TO ARCHITECTURAL DRAWINGS FOR ALL NON-LOADBEARING MASONRY WALLS.
- 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.
- CONSTRUCT WALLS IN RUNNING BOND ONLY. USE FULL MORTAR BEDDING.
- 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
- 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
- PROVIDE PREFABRICATED CORNERS AND TEES FOR HORIZONTAL JOINT REINFORCING.
- 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,
- ALL BELOW GRADE MASONRY. a. 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.

F. SHOP DRAWINGS AND SUBMITTALS

- SUBMIT SHOP DRAWINGS TO CONSULTANT FOR REVIEW BEFORE COMMENCING FABRICATION. ALLOW 7 DAYS FOR RETURN OF SHOP
- 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.
- 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.

G. DEMOLITION AND REWORK

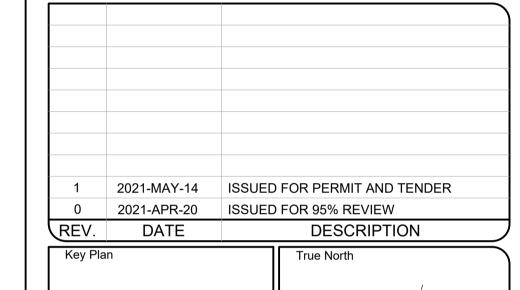
- ENSURE THAT EXISTING AND NEW STRUCTURE IS AT ALL TIMES MAINTAINED IN A SAFE CONDITION AND THAT THE PUBLIC IS PROTECTED FROM DEMOLITION ACTIVITIES
- IF REQUIRED, DESIGN AND PROVIDE ALL REQUIRED SHORING OR TEMPORARY FALSEWORK REQUIRED FOR SUPPORT OF EXISTING STRUCTURE DURING DEMOLITION REWORK OR INSTALLATION 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.

H. TESTING AND INSPECTION

- 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 FESTED 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.
- 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.

d. STRUCTURAL STEEL AND JOISTS: PERFORM VISUAL INSPECTION OF ALL WELDS, TORQUE TESTING OF BOLTED CONNECTIONS AND CHECK







Kawartha Pine Ridge **District School Board**

Drawing Overall Scale

AS SHOWN

Project Name & Address **BOWMANVILLE HIGH SCHOOL**

STRUCTURAL SERVICES **GENERAL NOTES AND SPECIFICATIONS**

HVAC UPGRADE 49 LIBERTY STREET NORTH BOWMANVILLE, ON L1C 2L8

DATE: 2021-APR-01 DESIGNED BY: M.CHAN DRAWN BY: M.CHAN APPROVED BY: D.HUM PROJECT NO.: 1021027

Engineer / Architect Stamp

D. HUM 100081562

S-01

