

**Mechanical Specifications:**

1. Comply with local Codes and Bylaws, Building Code Act (BCA) and Ontario Building Code (OBC) including:

- BCA: 1.1-(3) Role of Builders. It is the role of a builder,
- to ensure that construction does not proceed unless any permit required under this Act has been issued by the chief building official;
  - to construct the building in accordance with the permit;
  - to use appropriate building techniques to achieve compliance with this Act and the Building Code; and
  - when site conditions affect compliance with the building code, to notify the designer and an inspector or registered code agency, as appropriate.

BCA 8 (13) Prohibition.  
No person shall construct or demolish a building or cause a building to be constructed or demolished except in accordance with the plans, specifications, documents and any other information on the basis of which a permit was issued or any changes to them authorized by the chief building official.

2. General:

- In addition, the requirements of the Ontario Building Code (OBC) shall be considered the bare minimum for construction and where the Act or the OBC is exceeded by the requirements of this document (drawings and/or specifications), this document shall govern, unless revised in writing by the Engineer. Merely "Meeting the Code" will not be accepted as an argument to avoid provision of the mechanical systems as documented and the Contractor shall bear all and any costs associated with making the necessary revisions to the satisfaction of the Engineer.
- Bekolay & Associates retain the copyright to all drawings and specifications created for this project and solid works (both hard copy and CADD files) are not to be copied or distributed without consent. Costs for assimilation and/or distribution will be established upon written application to Bekolay & Associates for further copies.
- Obtain all permits, make arrangements for inspections and effect repairs required by inspectors at no cost to the owner. Provide the consultant a Certificate of Approval from the inspecting authorities at completion of the work.
- Examine the site and be aware of site conditions associated with this contract since extras related to site conditions will not be accepted.
- Provide all hoisting, rigging and scaffolding associated with the installation of the equipment and material associated with this contract.
- Make arrangements with the building owner to install all roof mounted equipment so the warranty can be maintained.
- Provide miscellaneous steel, cutting and patching or make arrangements with the General Contractor for such work as may be required to complete the contract. Include for marking of duct openings through block walls for the General Contractor to cut and reinforce based on details provided by the Structural Engineer. Cut and patch core pipe sleeve openings as detailed on the drawings. Co-ordinate the work of this trade with the General Contractor for timely completion of each phase of construction. Do not cut structural elements without written authorization from the consultant.
- Repair or replace, at no cost to the owner, any defect in workmanship or materials which appear within a period of one year from the date of substantial completion of the work. Pay for all damage resulting from the deficiency which occurs within the warranty period. Contractor shall not be held liable for anything attributable to acts of the owner or his agents. Co-ordinate the work of this trade with the General Contractor for timely completion of each phase of construction.

3. Motor and Equipment Efficiencies:

- All electrical motors supplied with mechanical equipment shall comply with OBC SB-10, sentence 10.4.1 and tables 10.4.1 (a) or 10.4.1 (b).
- All equipment to comply with energy efficiency regulations, current ASHRAE 90.1 Standard, and OBC SB-10: Section 6 Heating, Ventilating and Air Conditioning (Tables 6.8.1.A-G), and SB-10: Section 7 Service Water Heating (Table 7.6).

4. Equivalents and Alternates:

- Manufacturer's names listed in these specifications set the standard for the material and energy efficiency requirements to comply with SB-10 but are not intended to exclude other manufacturers from bidding with equivalent products.
- Products not meeting all design requirements are considered alternates and they will be rejected until the specified item or equivalents meeting the energy efficiency requirements acceptable to the Engineer are provided. However, alternate products meeting the general intent accompanied by a savings allowance (including breakdown of material and labour) may be submitted for consideration provided they do not violate the SB-10 requirements.

5. Include Seismic Restraints for all mechanical equipment including piping, ductwork and equipment as required by OBC Part B, article 4.1.8.17 "Elements of Structures, Non-Structural Components and Equipment". Provide suitable pre-engineered systems and include the services of a professional structural engineer (registered in Ontario) to design, sign and seal drawings for all seismic restraints including permit approval from the Authority having jurisdiction.

6. Shop Drawings

- Provide "2/3" copies of shop drawings for review by the Engineer.
- Submit product data for all specified equipment or trim including but not limited to grilles, diffusers, VAV terminal units, rooftop units, plumbing fixtures & trim, valves, thermostats & controls
- Shop drawings and product data shall be accompanied by:
  - Detailed drawings of bases, supports, and anchor bolts.
  - Acoustical sound power data, where applicable.
  - Points of operation on performance curves.
  - Manufacturer to certify as to current model production.
  - Certification of compliance to applicable codes.

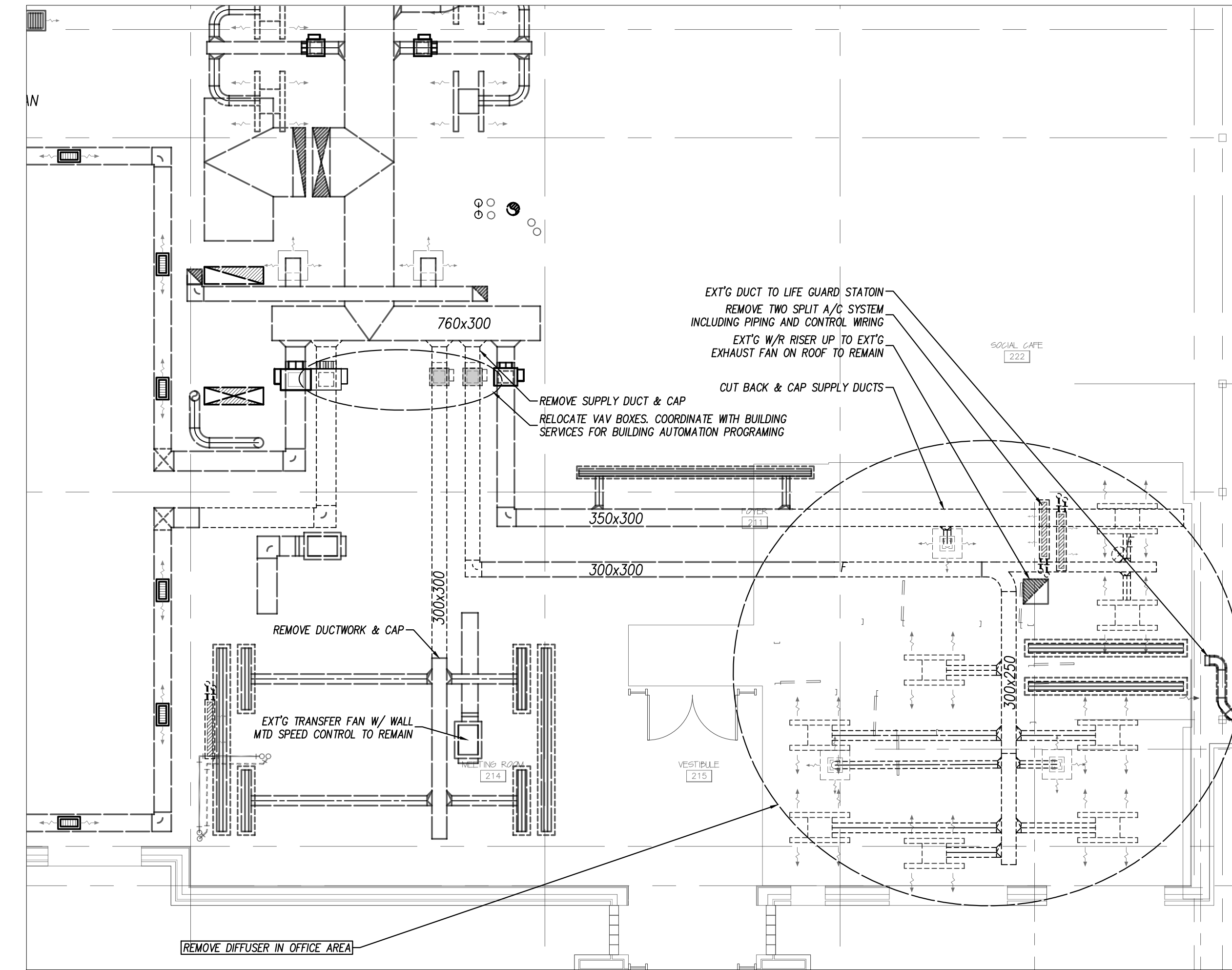
7. Record Drawings

- Record all changes as work progresses and as changes occur on a set of clean prints. This shall include changes to existing mechanical systems, control systems and low voltage control wiring.
- Use different colour waterproof ink for each service.
- Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "RECORD DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (date).
- Make available for reference purposes and inspection at all times.

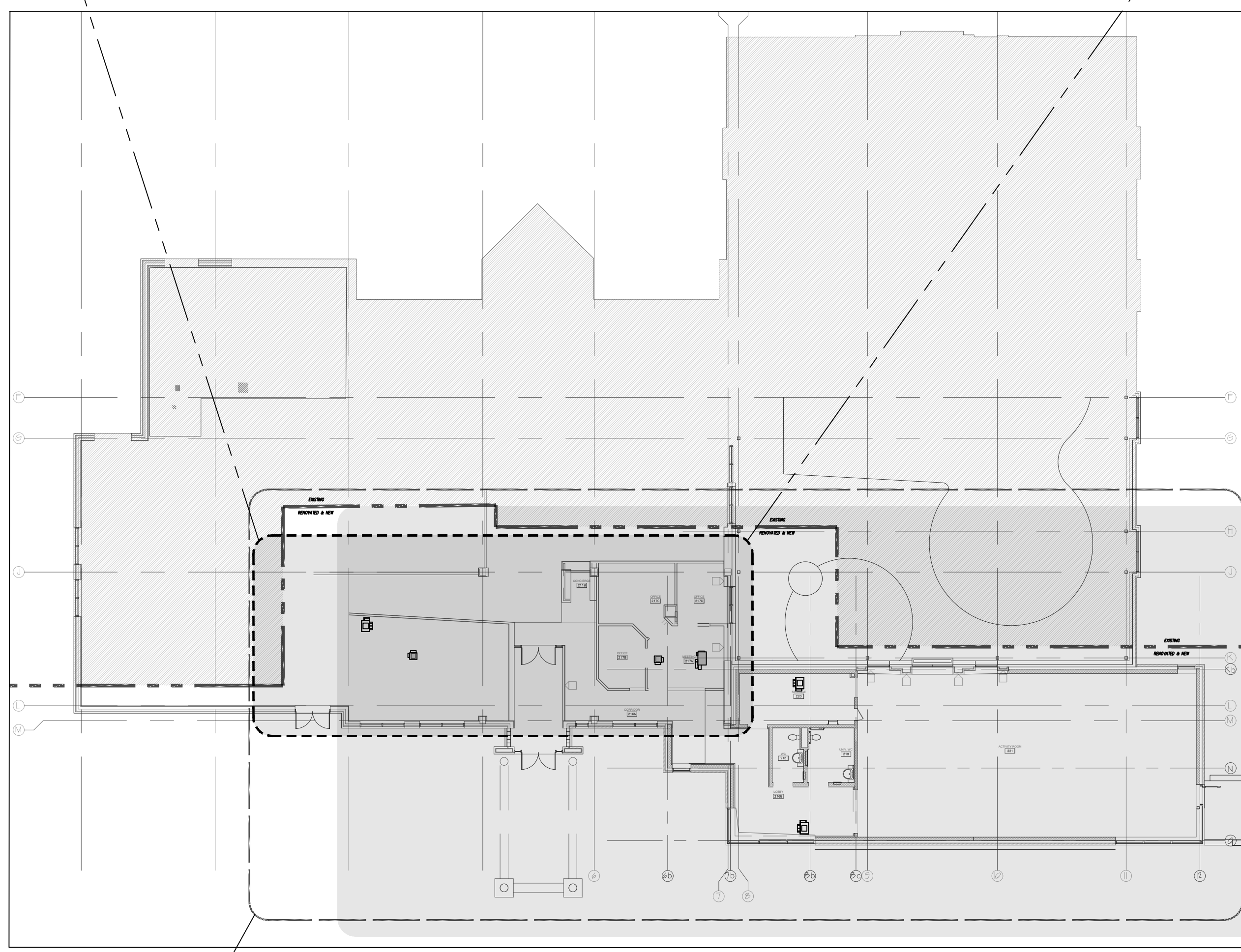
8. Fire stopping

- Provide fire stopping of all fire separations including fire dampers, retaining angles, steeves and caulking
- Caulking and Sealing Stc: HHI

Con't...



2 Demo Plan  
M-1 1:50



M-4 M-3 M-2

1 Key Plan  
M-1 NTS

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1.	ISSUED FOR BUILDING PERMIT	2017-07-28

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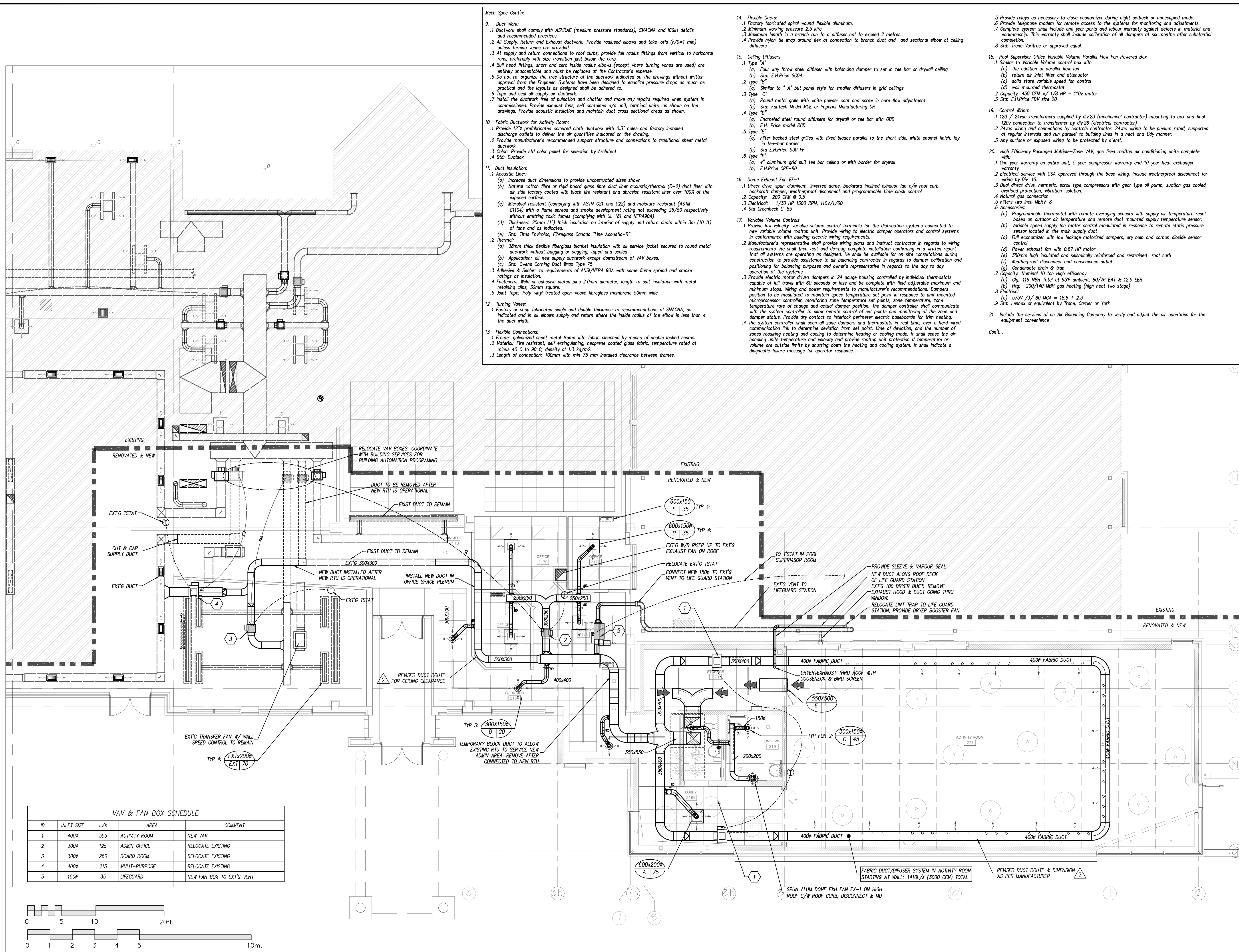
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11-Oct-17

PROJECT: Dovercourt 2017 Phase 2  
DRAWING: Key Plan, Specs & Demo

DATE	11-Oct-17	SCALE	1:50
DRAWN BY	MAG	DESIGNED BY	JRB
JOB NO.	2017-009	CHECKED BY	JRB
DRAWING NO.			





**VAV & FAN BOX SCHEDULE**

ID	INLET SIZE	L/s	AREA	COMMENT
1	400#	355	ACTIVITY ROOM	NEW VAV
2	300#	125	ADMIN OFFICE	RELOCATE EXISTING
3	300#	280	BOARD ROOM	RELOCATE EXISTING
4	400#	215	MULTI-PURPOSE	RELOCATE EXISTING
5	150#	35	LIFEGUARD	NEW FAN BOX TO EXT'G VENT

- Mech. Spec. Cont'n.**
- Duct Work:**
    - Ductwork shall comply with ASHRAE (medium pressure standards), SMACNA and ICCH details and recommended practices.
    - All Supply, Return and Exhaust ductwork: Provide radiused elbows and take-offs (R/D=1 min) unless turning vanes are provided.
    - At supply and return connections to roof curbs, provide full radius fittings from vertical to horizontal runs, preferably with size transition just below the curb.
    - Full radius fittings, start and zero inside radius elbows (except where turning vanes are used) are entirely unacceptable and must be replaced at the Contractor's expense.
    - Do not re-organize the tree structure of the ductwork indicated on the drawings without written approval from the Engineer. Systems have been designed to equalize pressure drops as much as practical and the layouts as designed shall be adhered to.
    - Tape and seal all supply air ductwork.
    - Install the ductwork free of pulsation and chatter and make any repairs required when system is commissioned. Provide exhaust fans, self contained g/c unit, terminal units, as shown on the drawings. Fabric acoustic insulation and maintain duct cross sectional area as shown.
  - Fabric Ductwork for Activity Room:**
    - Provide 12" prefabricated coloured cloth ductwork with 0.3" holes and factory installed discharge outlets to deliver the air quantities indicated on the drawing.
    - Provide manufacturer's recommended support structure and connections to traditional sheet metal ductwork.
    - Color: Provide std color pallet for selection by Architect
    - Std: Ductsox
  - Duct Insulation:**
    - Acoustic Liner:
      - Increase duct dimensions to provide unobstructed sizes shown
      - Natural cotton fibre or rigid board glass fibre duct liner acoustic/thermal (R-2) duct liner with air side factory coated with black fire resistant and abrasion resistant liner over 100% of the exposed surface.
      - Microbial resistant (complying with ASTM G21 and G22) and moisture resistant (ASTM C1104) with a flame spread and smoke development rating not exceeding 25/50 respectively without emitting toxic fumes (complying with UL 181 and NFPA204).
      - Thickness: 25mm (1") thick insulation on interior of supply and return ducts within 3m (10 ft) of fans and as indicated.
      - Std: Titus Enviroclad, Fibreglass Canada "Line Acoustic-R"
    - Thermal:
      - 38mm thick flexible fiberglass blanket insulation with all service jacket secured to round metal ductwork without bagging or sagging, taped and sealed
      - Application: all new supply ductwork except downstream of VAV boxes.
      - Std: Owens Corning Duct Wrap Type 75
    - Adhesive & Sealer: to requirements of ANSI/NFPA 90A with same flame spread and smoke ratings as insulation.
    - Fasteners: Weld or adhesive plated pins 2.0mm diameter, length to suit insulation with metal retaining clips, 32mm square.
    - Joint Tape: Poly-vinyl treated open weave fiberglass membrane 50mm wide.
  - Turning Vanes:**
    - Factory or shop fabricated single and double thickness to recommendations of SMACNA, as indicated and in all elbows supply and return where the inside radius of the elbow is less than the duct width.
  - Flexible Connections:**
    - Frame: galvanized sheet metal frame with fabric clamped by means of double locked seams.
    - Material: Fire resistant, self extinguishing, neoprene coated glass fabric, temperature rated at minus 40 C to 90 C, density of 1.3 kg/m<sup>2</sup>.
    - Length of connection: 100mm with min 75 mm installed clearance between frames.
  - Flexible Ducts:**
    - Factory fabricated spiral wound flexible aluminum.
    - Minimum working pressure 2.5 kPa.
    - Maximum length in a branch run to a diffuser not to exceed 2 metres.
    - Provide nylon tie wrap ground fix at connection to branch duct and sectional elbow at ceiling diffusers.
  - Ceiling Diffusers**
    - Type "A"
      - Four way throw steel diffuser with balancing damper to set in tee bar or drywall ceiling
      - Std: E.H.Price SCD4
    - Type "B"
      - Similar to "A" but panel style for smaller diffusers in grid ceilings
    - Type "C"
      - Round metal grille with white powder coat and screw in core flow adjustment.
      - Std: Fantech Model MGE or Imperial Manufacturing DR
    - Type "D"
      - Enamelled steel round diffusers for drywall or tee bar with OBD
      - E.H. Price model RCD
    - Type "E"
      - Filter backed steel grilles with fixed blades parallel to the short side, white enamel finish, lay-in tee-bar border
      - Std: E.H.Price 530 FF
    - Type "F"
      - aluminum grid suit tee bar ceiling or with border for drywall
      - E.H.Price CRE-80
  - Dome Exhaust Fan EF-1**
    - Direct drive, spun aluminum, inverted dome, backward inclined exhaust fan c/w roof curb, backdraft damper, weatherproof disconnect and programmable time clock control
    - Capacity: 200 CFM @ 0.5
    - Electrical: 1/30 HP 1300 RPM, 110V/1/60
    - Std: Greenheck G-85
  - Variable Volume Controls**
    - Provide low velocity, variable volume control terminals for the distribution systems connected to new variable volume rooftop unit. Provide wiring to electric damper operators and control systems in conformance with building electric wiring requirements.
    - Manufacturer's representative shall provide wiring plans and instruct contractor in regards to wiring requirements. He shall then test and de-bug complete installation confirming in a written report that all systems are operating as designed. He shall be available for on site consultations during construction to provide assistance to air balancing contractor in regards to damper calibration and positioning for balancing purposes and owner's representative in regards to the day to day operation of the systems.
    - Provide electric motor driven dampers in 24 gauge housing controlled by individual thermostats capable of full travel with 60 seconds or less and be complete with field adjustable maximum and minimum stops. Wiring and power requirements to manufacturer's recommendations. Dampers position to be modulated to maintain space temperature set point in response to unit mounted microprocessor controller, monitoring zone temperature set points, zone temperature, zone temperature rate of change and actual damper position. The damper controller shall communicate with the system controller to allow remote control of set points and monitoring of the zone and damper status. Provide dry contact to interlock perimeter electric baseboards for trim heating.
    - The system controller shall scan all zone dampers and thermostats in real time, over a hard wired communication link to determine deviation from set point, time of deviation, and the number of zones requiring heating and cooling to determine heating or cooling mode. It shall sense the air handling units temperature and velocity and provide rooftop unit protection if temperature or volume are outside limits by shutting down the heating and cooling system. It shall indicate a diagnostic failure message for operator response.
  - Control Wiring:**
    - 120 / 24vac transformers supplied by div.23 (mechanical contractor) mounting to box and final 120vac connection to transformer by div.26 (electrical contractor)
    - 24vac wiring and connections by controls contractor. 24vac wiring to be plenum rated, supported at regular intervals and run parallel to building lines in a neat and tidy manner.
    - Any surface or exposed wiring to be protected by c'ent.
  - High Efficiency Packaged Multiple-Zone VAV, gas fired rooftop air conditioning units complete with:**
    - One year warranty on entire unit, 5 year compressor warranty and 10 year heat exchanger warranty
    - Electrical service with CSA approved through the base wiring. Include weatherproof disconnect for wiring by Div. 16.
    - Dual direct drive, hermetic, scroll type compressors with gear type oil pump, suction gas cooled, overload protection, vibration isolation.
    - Natural gas connection
    - Filters two inch MERV-8
    - Accessories:
      - Programmable thermostat with remote averaging sensors with supply air temperature reset based on outdoor air temperature and remote duct mounted supply temperature sensor.
      - Variable speed supply fan motor control modulated in response to remote static pressure sensor located in the main supply duct
      - Full economizer with low leakage motorized dampers, dry bulb and carbon dioxide sensor control
      - Power exhaust fan with 0.87 HP motor
      - 350mm high insulated and seismically reinforced and restrained roof curb
      - Weatherproof disconnect and convenience outlet
      - Condensate drain & trap
    - Capacity: Nominal 10 ton High efficiency
      - Qg: 119 MBH Total at 95°F ambient, 80/76 EAT & 12.5 EER
      - Htg: 200/140 MBH gas heating (high heat two stage)
    - Electrical:
      - 575V 3/60 MCA = 18.8 + 2.3
      - Std: Lennox or equivalent by Trane, Carrier or York
  - Include the services of an Air Balancing Company to verify and adjust the air quantities for the equipment convenience**

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PROJECT: **Dovercourt 2017 Phase 2**  
 DRAWING: **HVAC**

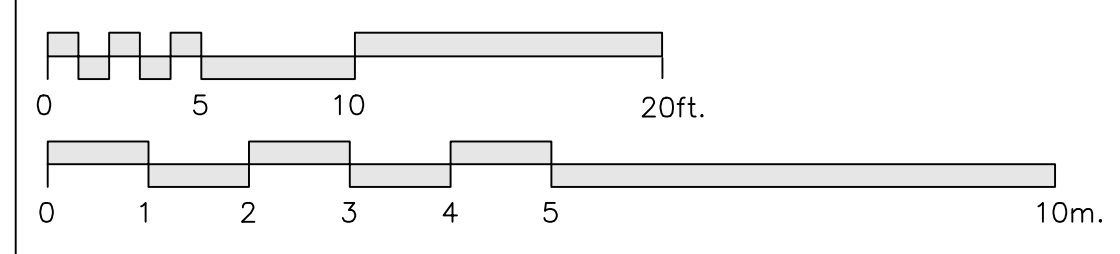
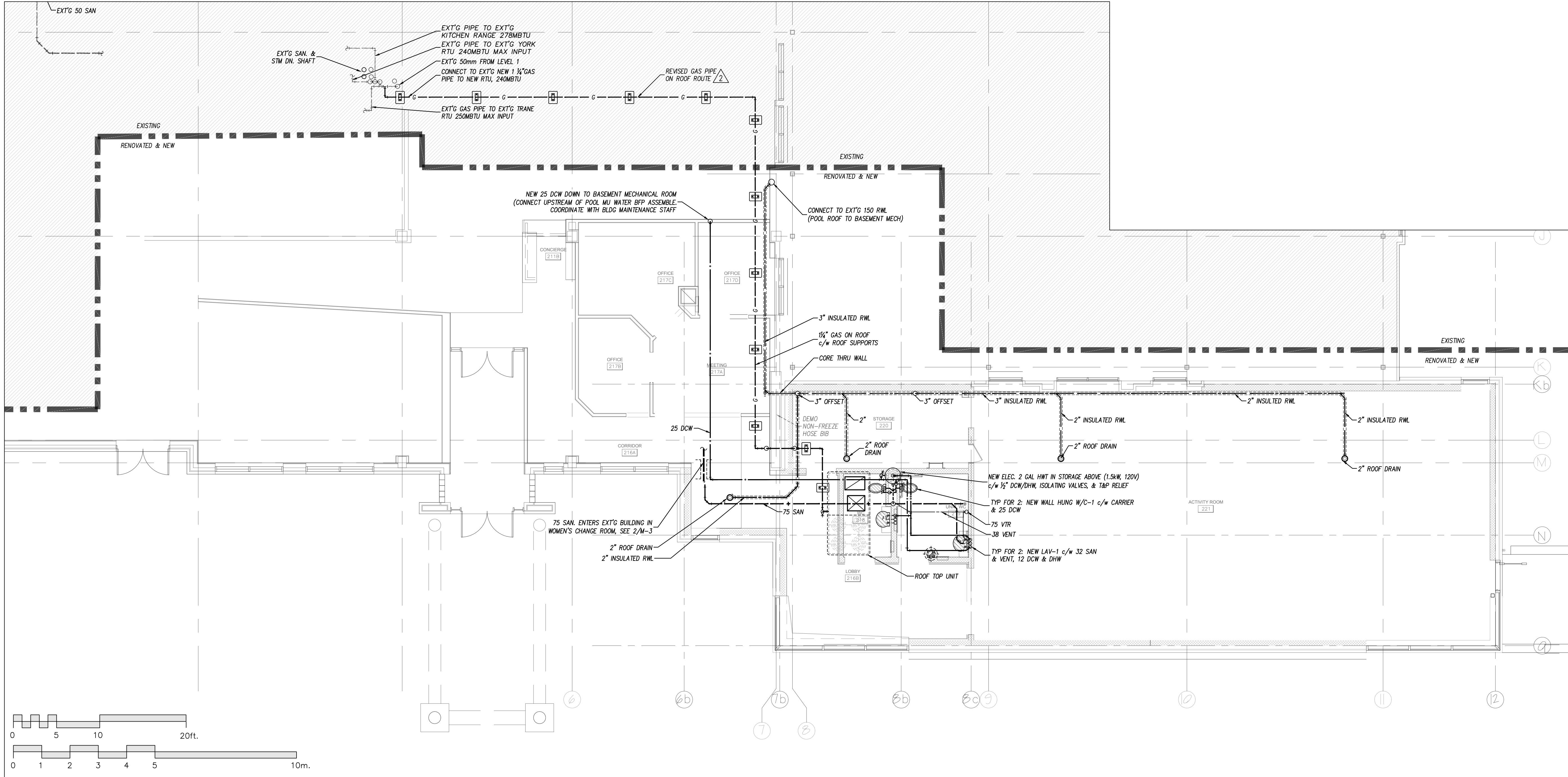
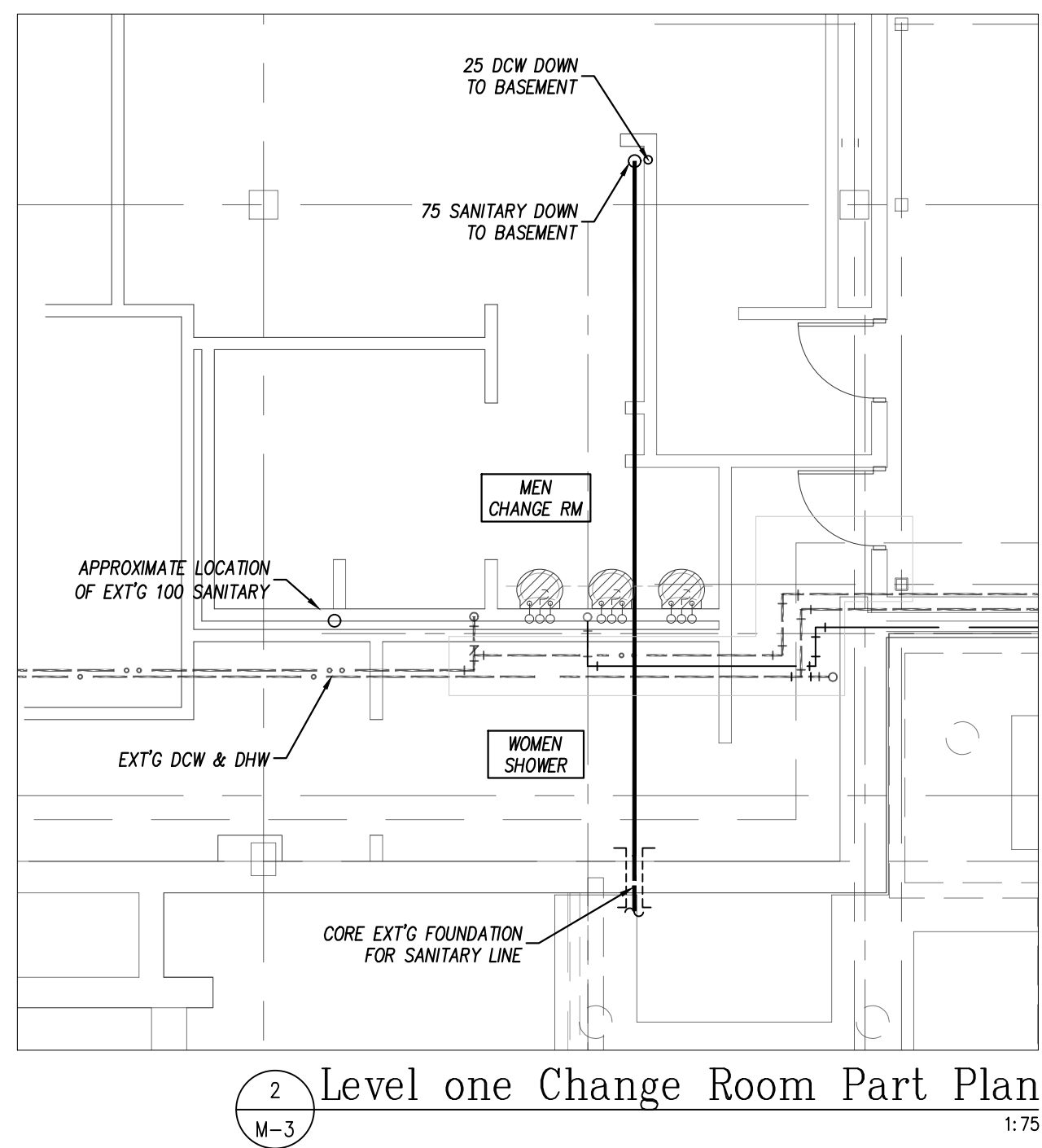
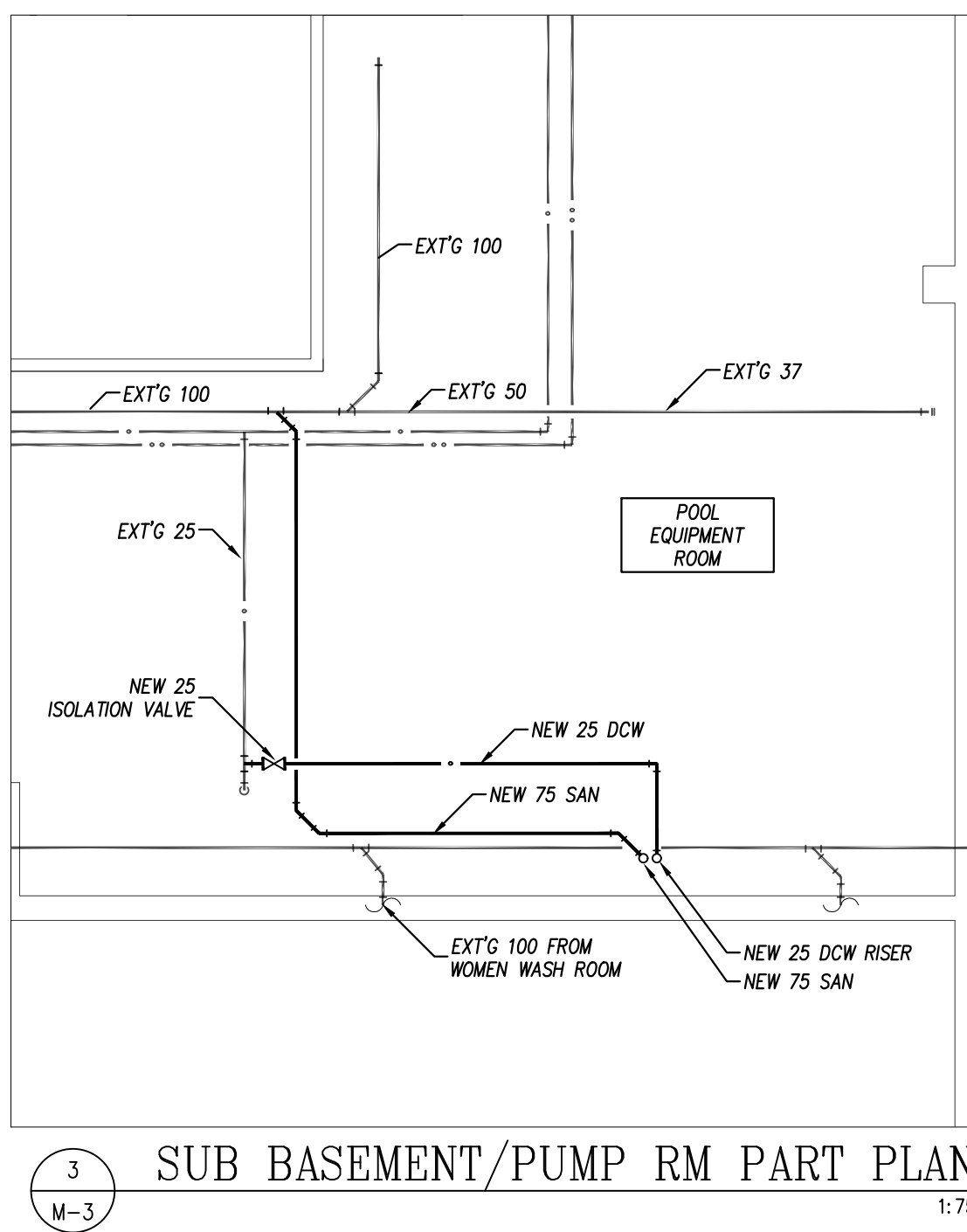
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- Mesh Spec. Cont'n:
22. Insulation:
- Piping:
    - Insulate all hot and cold potable water piping as follows:
      - Pre-formed fiberglass in 900mm sections with all service jacket sealed with aluminum tape.
      - Thickness: (to ASHRAE 90.1 table 9-1)
 

Pipe Size	DHW	DCW
NPS 1/2"	5/8"	5/8"
NPS 3/4" to 2"	1-1/2"	1"
      - Provide white, preformed PVC jacket for all exposed insulated pipe.
      - Hangers shall be outside of jacket.
- Identification:
  - 2" outside (or insulated) diameter: Provide all weather vinyl pipe markers and tags with arrows and tape bands to identify all piping (except sprinkler branch piping) including direction and supply or return where applicable.
  - 1" & smaller: pre-formed, curled vinyl sleeves with coloured letters & background
  - Comply with ANSI standards for colours and identification requirements. Meet WHMIS tag requirements where applicable.
  - Marker separation shall be such that any pipe can be readily identified and not exceed 25 feet between markings.
  - Std: Brady, Tap Tape & Label Ltd
24. Hangers & Roof Supports
- Uninsulated Copper Pipe (Any system):
    - Eave piping: factory PVC coated or copper hangers. Duct tape or similar applications are not acceptable.
    - Split Ring metal support ring with integral rod connection and EPDM corrugated pipe ring.
    - Clevis hangers and tape are not acceptable.
    - Std: Shall be Caddy Superfix Series 454
    - 32mm and smaller
      - Swivel loop hanger with electro-zinc plated band with hanger rod nut
      - Std: Caddy Series 100
    - 38mm and larger
      - epoxy coated or electro-zinc plated split black iron clevis
      - Std: Caddy Series 401, 427 or 420
  - Insulated piping (38mm and larger)
    - Oversize hangers to fit over the insulation and/or outside of the jacket
    - Electro-zinc plated split clevis with spot welded shield
    - Std: Caddy Series 403
3. Duct and/or Piping
- Pre-manufactured support system with galvanized u-channel structure on rubber or nylon base as applicable for required use
  - Std: Rectoseal Bigfoot, Better Idea Inc-E-Z Steeper/Quick Block, or C-Port

25. Water Piping:
- Potable water piping shall be type 'M' copper with 95-5 lead free solder joints and fittings.
  - Isolating valves: equal to Crane 1324, 438 (gate) or 8322 (ball).
  - Rigidly fasten water supplies to the internal wall structure and secure with wing back elbow. Extend with chrome plated nipple protruding through wall finish and terminate with chrome plated straight or angle ball valve complete with chrome escutcheon. Extend to faucet or fixture with braided stainless steel supplies regardless of supplies shipped. Copper pipe roughing at this location is not acceptable.
  - Conceal all TSP's in ceilings or walls c/w access doors as required.
26. Plumbing Piping
- Plumbing and vent piping above grade:
    - NPS 1-1/2" and smaller DWV copper with solder joints
    - NPS 2" and larger shall be cast iron with MJ neoprene couplings or
    - System XPR 15-50 PVC DWV solvent weld pipe and fittings with suitable fire stopping. Note regular PVC is not acceptable and shall not be installed.
    - Extend vent piping from all plumbing fixtures to vent stacks through roof complete with weatherproof flashing to comply with OBC.
    - Provide plumbing and vent connections to all fixtures with chrome plate traps with cleanouts. Brass or plastic not acceptable. Provide trap insulation for barrier free sinks.
    - Floor drain trap seal primer: all brass with integral vacuum breaker, NPS 12mm continuous soft copper line drip line connection with tapping on drain body
  - Plumbing and vent piping below grade:
    - PVC or ABS with solvent weld joints
    - SSD with rattle joints
    - Provide 150mm of compacted sand bedding in the bottom of all trenches. After inspection by the Engineer cover and compact at least 150mm of sand over piping. Granular fill in contact with the piping is not acceptable.
27. Plumbing Fixtures:
- Lavatories L-1:
    - Semi-counter vitreous china, universal design, wall-hung sink meeting the requirements for barrier free design c/w insulated trap or knee guard.
      - Std: American Std. Mezzo
    - Trims: 1.9 L/min chrome plated, battery operated electronic faucet, single faucet, adjustable sensor set point, 90 second max run time and aerator. Provide chrome plated waste strainer, trap with cleanout.
      - Std: Delta Model HDI commercial DEMO 111F Series or Watco Moen equivalents
  - Water closets:
    - Seat: white, open front, molded plastic (with slow close cover for handicapped) and stainless steel check hinge and insert post. Centoco 500 (or 820) or equivalent.
    - 1/2" Chrome plated angle ball valve with chrome nipple & wall escutcheon, braided stainless steel flexible supply.
      - WC-1:
        - ADA compliant wall hung vitreous china elongated bowl with 4.2 Lpf. with floor carrier

- Std: American Std: Aflow "FlowWise"
  - Flush Valve:
    - 4.2 Lpf hard wired A/C powered dual flush with hands free sensor & electronics and manual flush c/w 120 V transformer, wall flange, angle stop w/ BFP, vandal resistant covers, chrome finish
    - Std: American Std: Selectronic FlowWise Exposed
  - Floor drains:
    - General duty, round cast iron body, adjustable head and nickel bronze strainer.
    - Std: Ancon FD-100 or equal
  - Roof Drains:
    - Controlled flow aluminum or cast iron body, under deck clamp and sump receiver to suit roof construction, flashing clamp ring with integral gravel stop, bearing pan, flow control two weir assembly, aluminum, self locking cast iron or polyethylene dome.
    - A single slot weir in each roof drain
    - Std: Equal to Ancon RD 100 ABE, Empoco E2600 BDZ Zum ZCF 121 RC, Uflow "Classic-P", Joy R.Smith 1011
28. Domestic Hot Water Tank:
- Glass lined electric hot water tank.
    - 2 Gal. 120V / 1hp / 60hz, 1500W element
    - Std: Giant 103ET
29. Natural Gas Piping
- Modify natural gas piping to new rooftop unit
  - Piping shall be schedule 40 black iron complete with lubricated isolating valves and malleable iron fittings for exposed installation and welded fittings for ceiling or concealed installation. Conform to Ontario gas Utilization Code including installation and testing.
  - Painting: Clean and epoxy prime paint bare piping followed by two coats of enamel.
  - Roof pipe supports:
    - Replace all existing wood blocking with manufactured roof supports per sentence 11.
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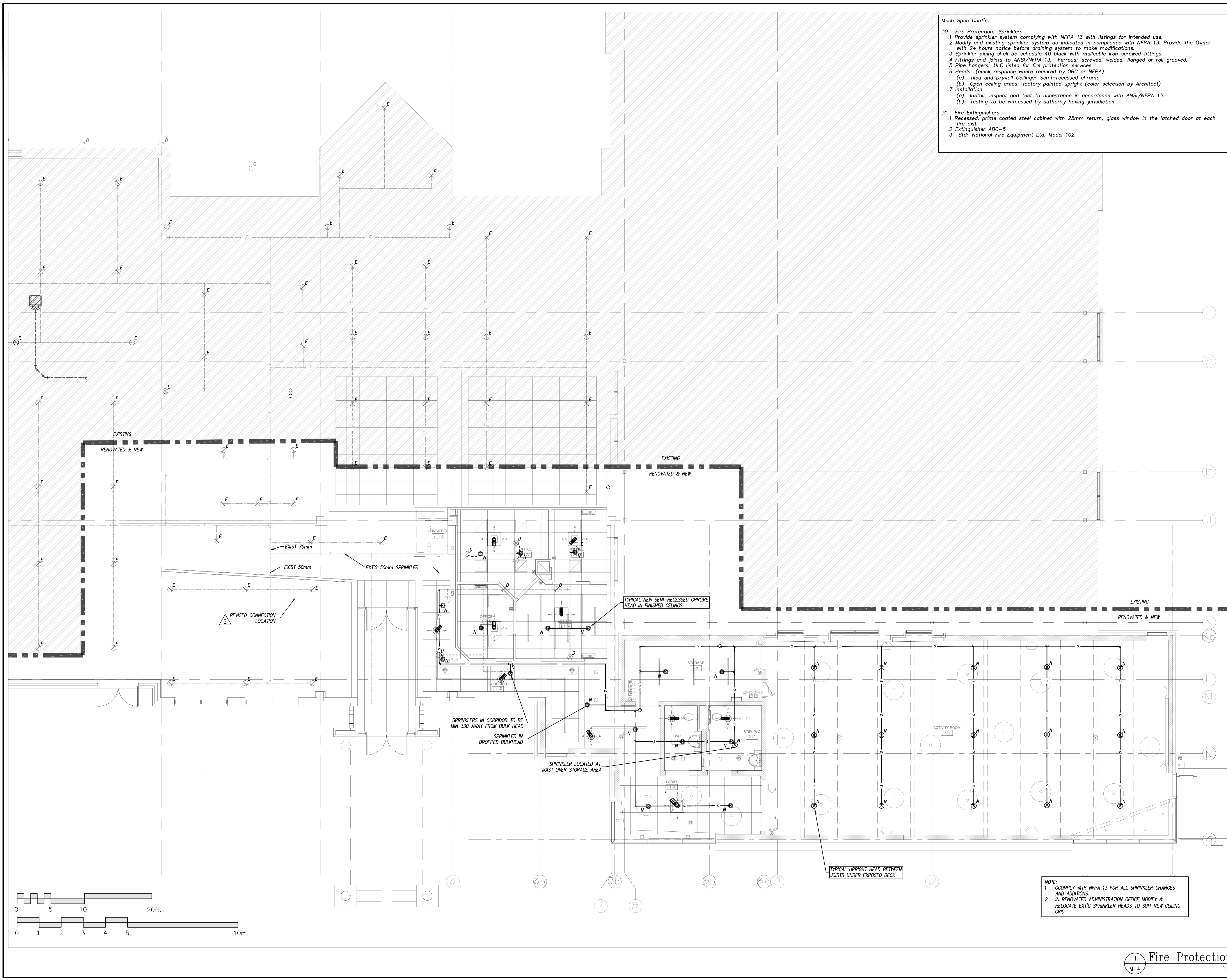
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PROJECT: **Dovercourt 2017 Phase 2**  
 DRAWING: **Plumbing**

DATE:	11-01-17	SCALE:	AS NOTED
DRAWN BY:	MAG	DESIGNED BY:	JRB
JOB NO.:	2017-009	CHECKED BY:	JRB
DRAWING NO.:	11-01-17		



Mech Spec Cont'n:

30. Fire Protection: Sprinklers

- 1 Provide sprinkler system complying with NFPA 13 with listings for intended use.
- 2 Modify and existing sprinkler system as indicated in compliance with NFPA 13. Provide the Owner with 24 hours notice before draining system to make modifications.
- 3 Sprinkler piping shall be schedule 40 black with malleable iron screwed fittings.
- 4 Fittings and joints to ANSI/NFPA 13, Ferrules: screwed, welded, flanged or roll grooved.
- 5 Pipe hangers: ULC listed for fire protection services.
- 6 Heads: (quick response where required by OBC or NFPA)
  - (a) Tied and Drywall Ceilings: Semi-recessed chrome
  - (b) Open ceiling areas: factory painted upright (color selection by Architect)
- 7 Installation
  - (a) Install, inspect and test to acceptance in accordance with ANSI/NFPA 13.
  - (b) Testing to be witnessed by authority having jurisdiction.

31. Fire Extinguishers

- 1 Recessed, prime coated steel cabinet with 25mm return, glass window in the latched door at each fire exit.
- 2 Extinguisher ABC-5
- 3 Std: National Fire Equipment Ltd. Model 102

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**HOBIN**  
 ARCHITECTURE

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1.	ISSUED FOR BUILDING PERMIT	2017-07-28
NO.	REVISIONS	DATE

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11-Oct-17

PROJECT: Dovercourt 2017  
 Phase 2

DRAWING: Fire Protection

DATE: 11-Oct-17 SCALE: AS NOTED

DRAWN BY: MAG DESIGNED BY: JRB

JOB NO.: 2017-009 CHECKED BY: JRB

DRAWING NO.: 11-Oct-17

PROFESSIONAL ENGINEER  
 J. R. BEKOLAY  
 PROVINCE OF ONTARIO

1 Fire Protection  
 M-4 1:75

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