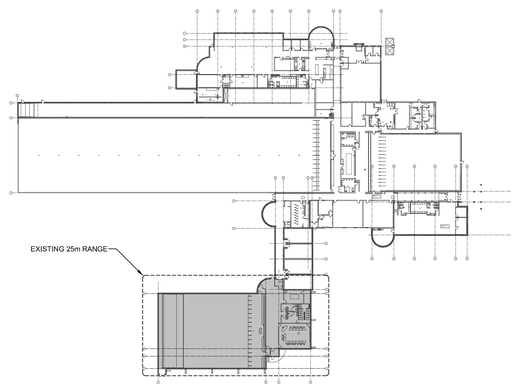


1 KEY PLAN
N.T.S.

NORTH

MECHANICAL SPECIFICATIONS

SCOPE OF WORK: The Mechanical Contractor shall include, but not be limited to, the following items as part of this project: supply and installation of ventillation systems as shown on plans, specification and equipment schedule.

INTENT: Provide a complete and fully operational mechanical system with facilities and services to meet requirements described herein and in complete accord with applicable codes and ordinances. Contract documents of this Division are diagrammatic and approximately to scale unless detailed otherwise. They establish scope, material and installation quality and are not detailed installation instructions. Should any discrepancies occur on drawings or in specifications which leaves doubt as to the intent and meaning of the drawings and specifications, obtain a ruling from the designer before submitting tender. If this is not done, it will be assumed that the most expensive alternate has been allowed for. Follow manufacturers recommended installation details and procedures for equipment supplemented by details given herein and on plans subject to approval of the Consultant. Install equipment generally in locations and routes shown, close to building structure with minimum interference with other services or free space. Remove and replace improperly installed equipment to satisfaction of the Consultant at no extra cost. All installed equipment must be serviceable in place, provide access doors as required. Provide labour and materials required to install, test and place into operations a complete mechanical system. Provide additional material for modifications required to correct minor job conflictions. Connect to equipment furnished in other Sections and by Owner, including uncrating equipment, moving in place and installing complete, start-up and test.

MATERIALS: Replace materials or workmanship below specified quality and relocate work wrongly placed to satisfaction of the Consultant. Materials and equipment installed shall be new, full weight and of the best quality specified. Use same brand or manufacturer for each specific application. Statically and dynamically balance rotating equipment for minimum vibration and low operating noise level. Each major component of equipment shall have manufacturers name, address, catalog and serial number in a conspicuous place. Install materials and equipment in a neat and workmanlike manner by competent specialists.

CODES, FEES: All necessary fees, permits, et cetera, shall be provided under this section as necessary for the work hereinafter specified to conform to the laws and regulations of the Province of Saskatchewan. All work shall be in accordance with the requirements of the Canadian Standards Association, Canadian Fire Underwriter's Association, TSASK, NFPA, and the Department of Labour. Changes or alterations required by any authorized inspector shall be done without charge or expense to the Owners.

PIPING, HANGERS & SUPPORTS: Mechanical systems shall be supported directly from structure, it is not permitted to support from others systems (pipe, ductwork, conduit etc.)

ADJUSTMENTS: Balancing of air system shall be carried out by an independent Balance Contractor who specializes in this kind of work. All equipment, apparatus, et cetera, shall be adjusted to specifications. Provide four (4) copies of Balance Report to Engineer for approval. Balancing shall be done when system is fully installed and operational. Balance Contractor to commission relief damper and establish reasonable damper resistance to ensure protection of envelope. Balance Contractor to test and establish operating setpoint for motorized damper. Balancing Contractor to establish methodology with Consultant.

CUTTING & PATCHING: Locate and provide holes and sleeves, cutting and fitting required for mechanical work. Relocate improperly located holes and sleeves at no extra cost. Drill for expansion bolts, hanger rods, brackets, and supports. All patching of finished construction of building shall be performed by qualified trades to match existing, (Note that the Mechanical contractor shall be responsible for patching and repairing if there is no General Contractor), All patching and repair shall be painted to match existing unless noted otherwise.

SHEET METAL: Sheet metal shall be first quality cold rolled of best grade galvanized iron and stamped with U.S. standard gauges. Construction of ductwork and supports as per ASHRAE and SMACNA Standards. Seal all metal duct joints with low VOC water resistant, fire resistive, high velocity duct sealant compatible with mating materials as per SMACNA manuals.

CONTROL WIRING: The supply of all control devices for mechanical equipment including thermostats, gauges, controllers, motorized actuators, etc., shall be by the Mechanical Contractor and/or his subtrade. The wiring and connections of all mechanical devices shall be the responsibility of the Mechanical Contractor. Control wiring routing through exposed areas or subject to physical damage shall be run in conduit. Control wiring routing through concealed spaces shall be plenum rated or run in conduit.

INSULATION: Insulation shall be installed to TIAC standards. Ductwork shall be insulated externally (unless noted otherwise). Ductwork within the building shall be complete with exterior duct wrap to be 50 mm Manson Alley-Wrap FSK Fibreglass duct wrap or approved equal complete vapor barrier.

MECHANICAL SPECIFICATIONS (CONTINUED)

IDENTIFICATION: Identify ductwork and equipment throughout with labels and direction of flow arrows. Apply labels at 15 meter (50 foot) intervals, before and after pipes pass through walls, at access door openings or at intervals closer than 15 meters (50 foot) in equipment rooms as required. Labels shall be black, 19 mm (3/4") minimum letters on yellow backgrounds. Tag automatic controls, instruments and relays and key to control schematic on which instruments are numbered in sequence. Identify electric starting switches and remote push-button stations with 6 mm (1/4") laminated plastic plates.

ACCESS DOORS: Supply access doors for furred ceilings, ducts or spaces for servicing equipment and accessories or for inspection of safety, operating and fire devices for installation under section erecting the walls or ceilings. Access doors shall be flush mounted, 600 mm x 600 mm (24" x 24") for body entry and 300 mm x 300 mm (12" x 12") for hand entry unless otherwise noted. Doors shall open 180 degrees, have rounded safety corners, concealed hinges, screwdriver latches and anchor straps. Steel shall be prime coated. Doors shall be of approved manufacturer with published literature.

SITE PREPARATION: Contractor to visit site prior to commencing work to confirm the exact site conditions.

SITE CLEAN-UP: Ongoing during construction and upon completion of installation, Contractor shall clean up all dirt, debris, and dust to the satisfaction of the Engineer and Owner. At completion of the project, the site shall be put back into the condition at the start of the project.

GUARANTEE: The warranty period shall begin when substantial completion has been achieved as determined by the Engineer. During the one year warranty or guarantee period all defective material, improper material or workmanship shall be made good without expense to the Owner.

MAINTENANCE MANUALS: Provide four (4) copies of manufacturer's operation and maintenance instructions in hard bound binders. The manuals shall include start-up sheets for all equipment, balancing report, and controls As-Built drawings.

SHOP DRAWINGS: Contractor shall provide eight (8) copies of shop drawings for approval by Engineer prior to ordering of equipment. Shop drawings shall be provided for all equipment, including controls.

AS-BUILT DRAWINGS: Contractor shall provide one set of marked-up prints to the Engineer indicating all revisions made during the course of construction and recording the as-built conditions. A set of as-built wiring diagrams / drawings for the controls shall also be included for insertion into the maintenance manuals.

DEMOLITION: Mechanical Contractor shall include in his Base Price the cost to provide the removal of all existing mechanical equipment and material that is not to be reused under this contract. Equipment shall be Owner's salvage unless noted otherwise.

INSTRUCTION OF OPERATING STAFF: Provide trained personnel to instruct operating staff on maintenance, adjustment and operation of mechanical equipment. Instruction shall be provided during regular work hours after substantial completion and prior to acceptance and turnover to operating staff for regular operation. Use operation and maintenance data manual for instruction purposes. It is assumed a minimum of 2 hours of instruction is required.

MECHANICAL EQUIPMENT SCHEDULE

MOTORIZED DAMPERS: Tamco, or approved equal, Series 9000 ECT, thermally insulated damper with broken frame and extreme cold temperature silicone upgrade. Damper frame shall be extruded aluminum no less than 100mm deep and insulated with polystyrene on all four sides. Entire frame shall be thermally broken. Blades shall be extruded aluminum less than 200mm width, internally insulated with expanded polyurethane foam, thermally broken, and mounted in parallel blade action. Blade and frames seals to be extruded extremely flexible silicone secured in an integral slot. Dampers to be rated to operate in temperatures between -73 deg.C. (-100 deg.F.) and 100 deg.C. (212 deg.F.). Pressure drop of dampers, when fully open, to not exceed 7 Pa (0.03") at 5.08 m/s (1000 fpm). Dampers to be flanged to duct and installed in strict accordance with manufacturer's installation guidelines. Intermediate or tubular steel structural support is required for all dampers that consist of two or more sections in either height or width or both.

MECHANICAL EQUIPMENT SCHEDULE (CONTINUED)

DAMPER ACTUATOR: Belimo, or approved equal, Model AF120-S US, on-off, spring return damper actuator, direct coupled type which require no crankarm and linkage, be capable of direct mounting to a jackshaft up to 1.05" diameter, reversible with clockwise or counter clockwise fail-safe operation, visual position indicator with 3mm hex crank manual override positioning mechanism accessible on its cover, brushless DC motor and be protected from overload at all angles of rotation, run time shall be constant and independent of torque, and 2 built in SPDT auxiliary switches.

PRESSURE RELIEF DAMPER: Greenheck, or approved equal, Model HPR-120, heavy duty pressure relief damper with galvanized steel double flanged channel frame and galvanized steel single thickness blades. External heavy duty linkage with galvanized steel clevis arms and plated steel tie bars and pivot pins with nylon pivot bearings, ball bearings, blade counterbalance, and adjustable pressure setting weights are standard.

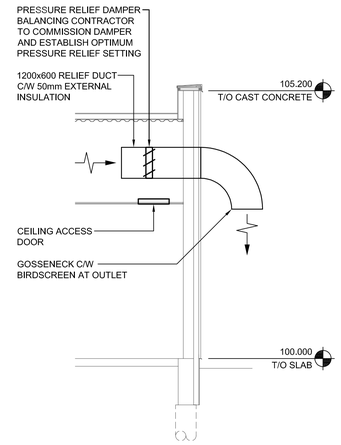
CEILING ACCESS DOORS: Acudor, or approved equal, Model UF-5000 24x24 SCPC, universal flush: ceiling access door with 14 gauge flush to frame door with rounded edges, one-piece outer frame welded to 16 gauge mounting frame, continuous concealed hinge, stainless steel screwdriver operated cam latch, and prime coated

SEQUENCE OF OPERATIONS

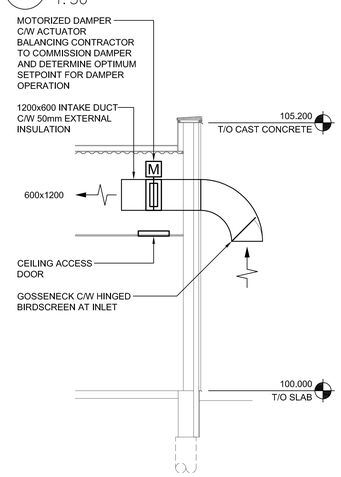
1. OVER PRESSURIZATION SAFETY
   - Provide end switch on gravity damper and monitor when damper is closed, dampers closed to be normal operation
   - Alarm at Front End when damper breaks contact for a set length of time (Initially 5 minutes). Time delay to be adjustable to reduce nuisance alarms that may result from fluctuating wind pressure.

2. DE PRESSURIZATION SAFETY
   - Provide local differential pressure sensor to monitor between outdoor and indoor pressure.
   - Local differential pressure sensor to control motorized damper. When differential pressure exceeds setpoint (is more negative than), damper shall open.
   - If damper opens, alarm at front end.
   - Negative pressure setpoint to be determined on site and shall be below the normal operating negative pressure to ensure damper remains closed under normal operation.

LINTEL DETAIL

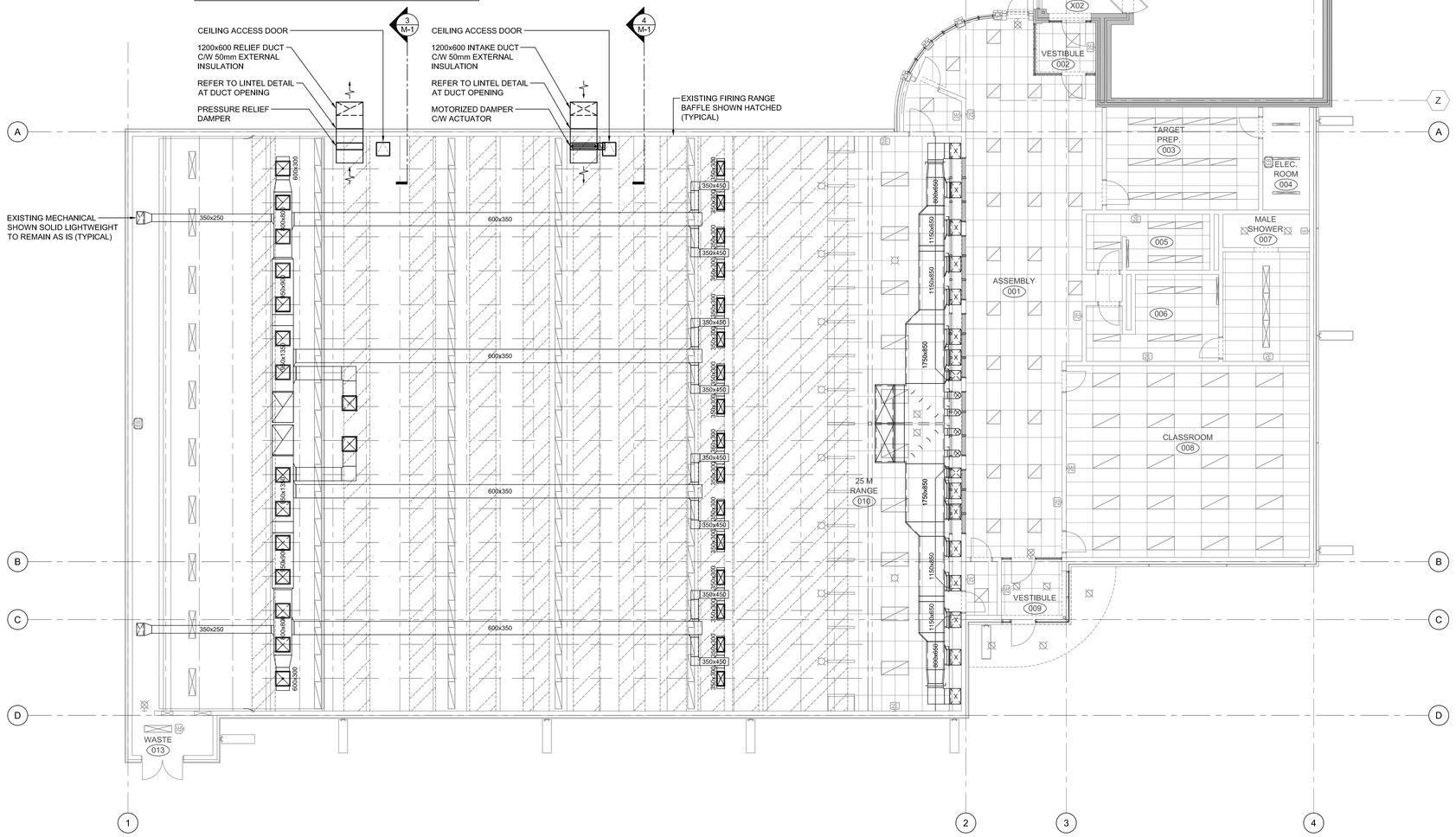


3 WALL SECTION
1:50



4 WALL SECTION
1:50

NOTE:
LOCATE PENETRATIONS AND CEILING ACCESS DOORS ON SITE IN CONJUNCTION WITH FIRING RANGE BAFFLES TO ENSURE ACCESS TO DAMPER AND ACTUATORS THROUGH CEILING ACCESS DOOR. CONFIRM LOCATION ON SITE WITH OPERATOR PRIOR TO COMMENCING WORK.



NORTH

2 MAIN FLOOR PLAN
1:100

HDA ENGINEERING LTD.
Mechanical Engineering Consultants
1580 Angus Street Regina, Saskatchewan S4T 1Z1
P:306-525-9815 F: 306-525-6369 E: hda@hdaeng.com

PROFESSIONAL ENGINEER
E. V. COOKE
MEMBER 11372
13 11 05
YR. MN. DAY
SASKATCHEWAN

Association of Professional Engineers & Geoscientists of Saskatchewan
CERTIFICATE OF AUTHORIZATION
HDA ENGINEERING LTD.
Number C981
Permission to Consult Held by:

Discipline	Sk. Reg. No.	Signature
Mech.	6093	

REVISIONS	DATE

PROJECT TITLE
RCMP TRAINING ACADEMY
PUBLIC WORKS AND
GOVERNMENT SERVICES CANADA
EXISTING 25m RANGE

SHEET TITLE
MAIN FLOOR PLAN
VENTILATION

DRAWN BY:	CHK
CHECKED BY:	TKC
SCALE:	AS SHOWN
DATE:	2013-11-05
PROJECT NO:	12028

SHEET NO
M-1