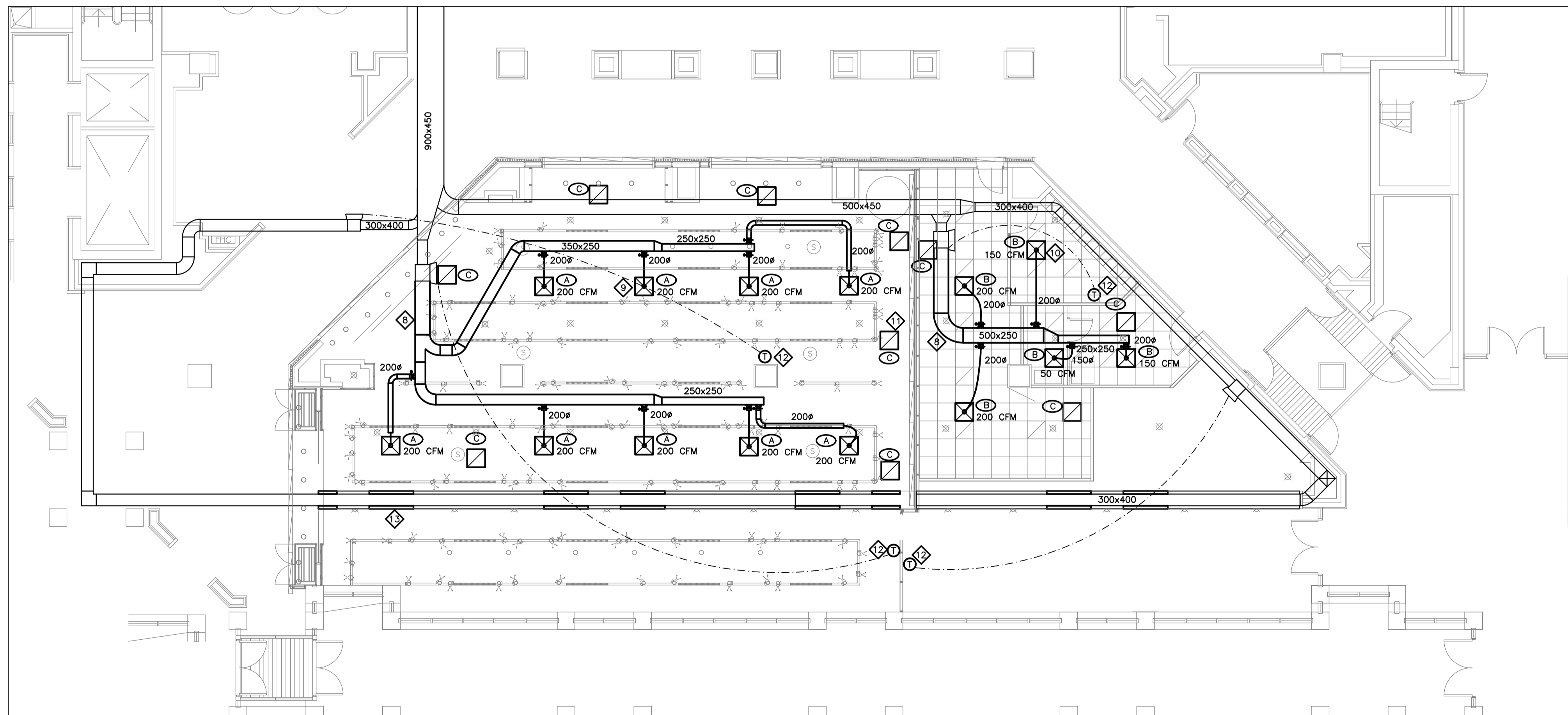


PARTIAL GROUND FLOOR PLAN – H.V.A.C. – EXISTING AND DEMOLITION

NTS: 1:100



PARTIAL GROUND FLOOR PLAN – H.V.A.C. – EXISTING AND NEW

NTS: 1:100

DRAWING NOTES:

- 1 TYPICAL: EXISTING SUPPLY AIR DUCTWORK TO REMAIN.
- 2 TYPICAL: EXISTING SUPPLY AIR DUCTWORK TO BE REMOVED C/W ALL HANGER AND ACCESSORIES. EXACT LOCATIONS TO BE CONFIRMED ON-SITE.
- 3 TYPICAL: EXISTING VAV BOX TO REMAIN.
- 4 TYPICAL: EXISTING PERIMETER LINEAR SUPPLY AIR GRILLES TO REMAIN.
- 5 TYPICAL: EXISTING LIGHT FIXTURE SUPPLY AIR DIFFUSER TO BE REMOVED C/W BRANCH DUCT CONNECTION AND SUPPLY AIR DUCTWORK. EXACT LOCATIONS TO BE CONFIRMED ON-SITE.
- 6 TYPICAL: EXISTING RETURN AIR GRILLE TO BE REMOVED.
- 7 EXISTING TEMPERATURE SENSOR TO BE REMOVED C/W ALL CONTROL WIRING.
- 8 TYPICAL: PROVIDE NEW SUPPLY AIR DUCTWORK C/W 25MM ACOUSTIC LINING, 25MM THERMAL INSULATION, HANGERS AND ALL ACCESSORIES AS REQUIRED FOR A COMPLETE INSTALLATION.
- 9 TYPICAL: PROVIDE NEW SUPPLY AIR DIFFUSER, TYPE A, PRICE SPD, 600X600, 200# NECK FOR DRYWALL CEILING. PROVIDE NEW BRANCH DUCT CONNECTION WITH BALANCING DAMPER, BALANCE AS INDICATED.
- 10 TYPICAL: PROVIDE NEW SUPPLY AIR DIFFUSER, TYPE B, PRICE SPD, 600X600, 200# NECK FOR T-BAR CEILING. PROVIDE NEW BRANCH DUCT CONNECTION WITH BALANCING DAMPER, BALANCE AS INDICATED.
- 11 TYPICAL: PROVIDE NEW RETURN AIR GRILLE, TYPE C, PRICE CORE 80, 600X600. PROVIDE BRACKET FOR DRYWALL CEILING.
- 12 TYPICAL: PROVIDE NEW TEMPERATURE SENSOR FOR VAV BOX BY BASE BUILDING CONTROLS CONTRACTOR, VAV BOXES TO BE RE-BALANCED AS INDICATED, MINIMUM FLOW TO BE 35% OF MAXIMUM.
- 13 TYPICAL: PROVIDE NEW LINEAR GRILLE BLANKING PLATE, COLOR TO MATCHING EXISTING LINEAR GRILLE BELOW BEAM.

GENERAL NOTES:

- 1 ALL MECHANICAL EQUIPMENT SHOWN IN THIN SOLID LINES IS EXISTING TO REMAIN.
- 2 ALL MECHANICAL EQUIPMENT SHOWN IN THICK SOLID LINES IS NEW TO BE PROVIDED UNDER THIS CONTRACT.
- 3 ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'R' IS EXISTING TO BE RELOCATED AS SHOWN.
- 4 ALL MECHANICAL EQUIPMENT SHOWN IN DASHED LINES WITH LETTER 'X' IS EXISTING TO BE REMOVED BACK TO SOURCE.
- 5 THIS DRAWING WAS BASED ON PARTIAL SITE REVIEW. ALL EQUIPMENT, DUCTS, PIPING AND ALL ACCESSORIES' SIZES, LOCATIONS AND DETAILS OF INSTALLATIONS TO BE CONFIRMED BY MECHANICAL CONTRACTOR ON SITE.
- 6 MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ROOF, WALL AND BUILDING ENVELOPE CUTTING, PATCHING AND REPAIRS, AS REQUIRED FOR EXECUTION OF WORK INCLUDED IN THIS CONTRACT.
- 7 PROVIDE ALL NEW EQUIPMENT, CONTROLS, DUCTWORK, PIPING, VALVES AND ACCESSORIES AS SHOWN AND NOTED ON DETAILS AND AS REQUIRED FOR COMPLETE FUNCTIONING SYSTEMS.
- 8 PROVIDE ADDITIONAL DUCTWORK, PIPING, FITTINGS AND OFFSETS WHERE REQUIRED TO SUIT EXISTING CONDITIONS AND TO AVOID COLLISIONS WITH EXISTING SYSTEMS AND BUILDING STRUCTURE.
- 9 SEISMIC RESTRAINT SYSTEM (SRS) – PROVIDE DESIGN, SUPPLY AND INSTALLATION OF COMPLETE SRS FOR ALL SYSTEMS. EQUIPMENT SPECIFIED FOR INSTALLATION ON THIS PROJECT AS PER ONTARIO BUILDING CODE LATEST EDITION. LETTER TO BE PROVIDED BY SEISMIC ENGINEER REGISTERED WITH PROFESSIONAL ENGINEER'S ONTARIO (PEO).

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Authorized modifications must be signed and sealed by an engineer and this engineer will be completely responsible for these modifications. J.R.P. Engineering is not and will not be responsible for the consequences of these modifications or for modifications carried out without its consent.

No	DESCRIPTION	DATE
0	ISSUED FOR TENDER	SEP. 04 2015

REVISIONS	

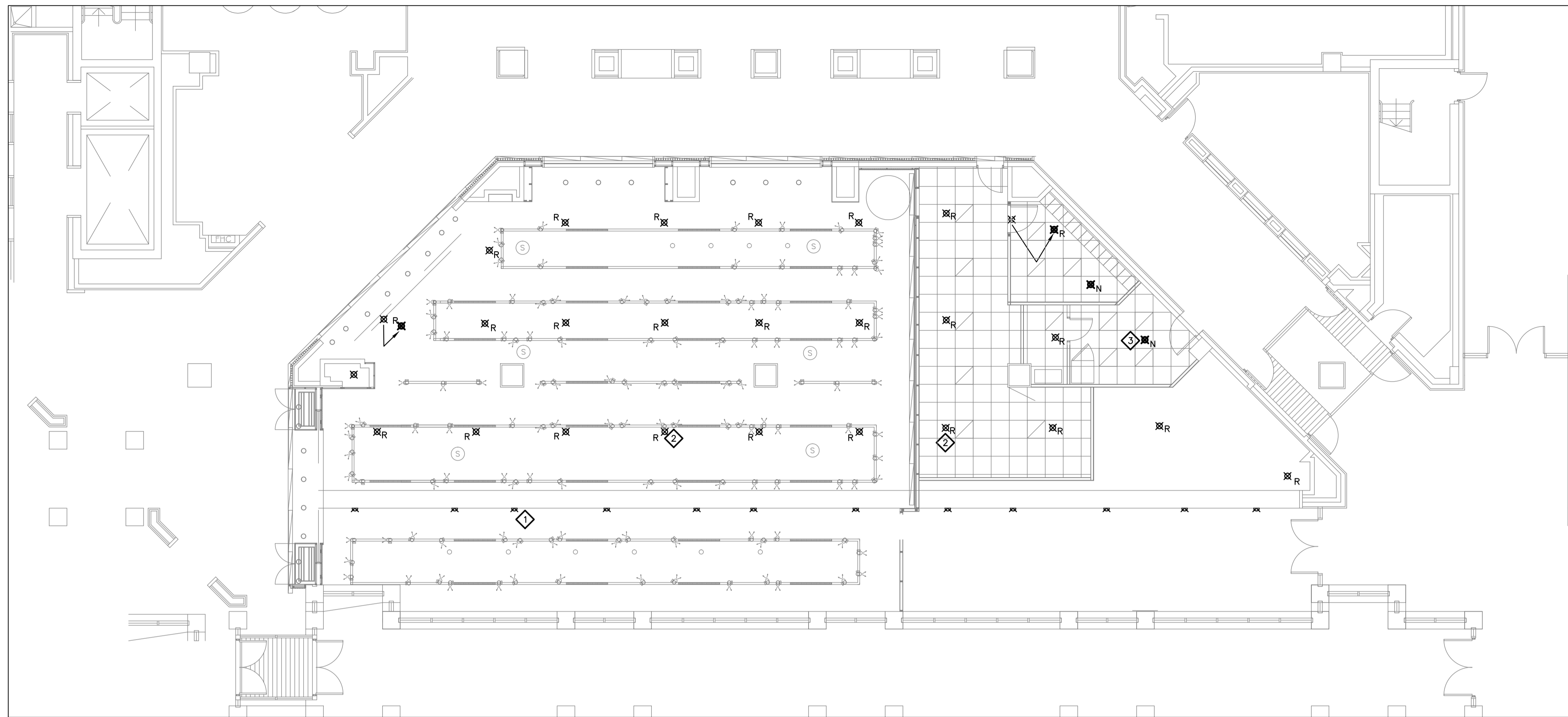
client:  
**NATIONAL GALLERY OF CANADA**

project:  
**NEW RETAIL STORE**  
**380 SUSSEX DR. OTTAWA, ONTARIO**

drawing title:  
**H.V.A.C. EXISTING, DEMO, AND NEW**

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	AUG. 2015

project no.:	100-161	drawing no.:	M-1
revision:	<0>		of 3



**PARTIAL GROUND FLOOR PLAN – SPRINKLERS – EXISTING, DEMOLITION AND NEW**

NTS: 1:100

**DRAWING NOTES:**

- 1 EXISTING SIDEWALL SPRINKLER HEAD TO REMAIN.
- 2 EXISTING PENDANT SPRINKLER HEAD TO TEMPORARILY REMOVED AND RELOCATED TO FIT IN NEW CEILING. PROVIDE ALL ADDITIONAL BRANCH PIPING AS REQUIRED TO SUIT NEW INSTALLATION.
- 3 PROVIDE PENDANT SPRINKLER HEAD IN NEW CEILING C/W ALL BRANCH PIPING AS REQUIRED TO SUIT INSTALLATION.

LEGEND	
SYMBOL	DESCRIPTION
	THERMOSTAT
	NEW DUCTWORK
	DUCT OR MATERIAL TO BE REMOVED
	ACOUSTICALLY INSULATED DUCT
	THERMALLY INSULATED DUCT
	FLEXIBLE DUCT; MAX LENGTH 10 FEET
110 cfm	S/A BALANCING INFORMATION
	SQUARE S/A DIFFUSER
	LIGHT FIXTURE S/A DIFFUSER
	RETURN AIR GRILLE
	NEW CONICAL SIDE TAKE-OFF C/W BALANCING DAMPER
	NOTE ID TAG
	GRILLE OR DIFFUSER TYPE - REFER
	PENDANT SPRINKLER HEAD
	SIDE WALL SPRINKLER HEAD

NOT ALL SYMBOLS SHOWN IN LEGEND ARE NECESSARILY USED IN THE DRAWING SET.

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No	DESCRIPTION	DATE
0	ISSUED FOR TENDER	SEP. 04 2015

**REVISIONS**

client:  
**NATIONAL GALLERY OF CANADA**

project:  
**NEW RETAIL STORE**  
**380 SUSSEX DR. OTTAWA, ONTARIO**

drawing title:  
**SPRINKLERS EXISTING, DEMO, AND NEW**

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	AUG. 2015

project no.:	100-161	drawing no.:	M-2
revision:	<0>		of 3

**GENERAL**

**Conditions of Contract**

The Instructions to Bidders and the General Conditions are an integral part of this Division and shall be read in conjunction herewith. These instructions to Bidders and General Conditions shall be fully binding on the General Contractor and his sub-contractors to the full satisfaction of the Engineer and Owner.

The responsibility and scope of each sub-trade rest solely with the Mechanical Contractor. Extras will not be considered based on the grounds of difference in interpretation of specifications and drawings as to which trade involved shall provide certain specialties or materials.

**Examination of Work**

Examine the site and local conditions likely to affect work indicated and specified prior to submitting final price.

This project involves changes to the building, which is presently occupied. Therefore examine the site and local conditions to determine the difficulties in carrying out the work indicated and specified prior to submitting final price.

**Liability**

This contractor shall assume full responsibility for laying out his work and for any damage caused to the Owner and other contractor by improper location or carrying out of this work. Carry all necessary insurance coverage.

This contractor shall protect all finished and unfinished work of his own and other contractors including existing from damage due to the carrying out of his work.

**Intent**

It is the intent of this specification and drawings to provide for a complete and fully operating system in complete accord with all applicable codes. These specifications may not cover each and every item required for the complete mechanical installation; therefore, the Contractor shall make provisions for all labour, material and equipment deemed necessary to complete the mechanical system.

**Certificates, Fees, etc.**

Pay all fees and obtain all permits. Provide authorities with plans and information for acceptance certificates. Furnish inspection certificates as evidence that work conforms with requirements of authority having jurisdiction.

**Cutting and Patching**

The Mechanical Contractor will confer with the General Contractor in regards to this work and shall give locations for all holes for pipes, ducts through floors and roof, etc., and provide sleeves required to execute the mechanical installation.

**Pipe Hangers, Supports and Sleeves**

Hangers and supports shall secure pipes in place, prevent vibration, maintain grade by adjustment, provide for expansion and contraction and shall be directly supported from the structure.

Perforated strap hangers are not acceptable.

**Testing**

Test all equipment and material where required by specifications or authorities having jurisdiction to demonstrate its proper operation to the Owner's representative. Test procedures shall be in accordance with the applicable portions of the ASME, ASHRAE, and other recognized test codes as for as field conditions permit.

Perform the following test and upon completion of the mechanical installation, turn over to the Owner a certification of the test with the detailed data as required by each. Test shall be itemized as to the time performed and personnel responsible for the test. Hydraulic tests shall be carried out for a period of 8 hours and pressure maintained with no appreciable pressure drop. Where leakage occurs, repairs shall be made and the entire system retested. All tests to be made before backfilling and furring.

- .1 All low and high velocity duct systems, including supply shall be checked for tightness. All leaks shall be repaired before ducts are furred in to ensure total outlet capacity is within 5% of the quantity being supplied by the air system.
- .2 Hydraulically test on hydronic piping systems at 1-1/2 times system operating pressure or minimum 860 kPa, whichever is greater.

**Record "As-Built" Drawings**

Keep in the job office an extra set of white prints and specifications on which all changes and deviations shall be recorded daily. At completion of the project, turn over to the Engineer two sets of neat "as-built" record drawings and specifications. These extra sets of white prints and specifications will be provided by the Engineer.

**Shop Drawings**

Before fabrication of major equipment and materials, submit through the General Contractor a minimum of 6 complete sets of shop drawings and data sheets covering all items of equipment furnished and installed under this Contract for approval by the Engineer.

**Temporary and Trial Usage**

Any permanent equipment used temporarily for temporary heat or otherwise will be completely repaired or replaced to the full satisfaction of the Owner.

**Equipment Clean-up**

Ducts and equipment shall be thoroughly cleaned of dirt, cuttings and other foreign substances. Disconnect, clean and reconnect whenever necessary for the purpose of locating and removing obstructions. Repair work damaged in the course of removing obstructions. Ducts shall be power vacuum cleaned before being turned over to the Owner.

**Guarantee**

The Mechanical Contractor, as a condition precedent to final payment after completion of this work, shall give the Owner a written guarantee warranting all apparatus furnished under the contract to remain in perfect serviceable condition for a period of one year from the date of final acceptance of his work by the Owner and Engineer.

**Installation**

Install equipment in accordance to manufacturer's instructions.

**Operating and Maintenance Data**

Furnish three sets of operating and maintenance data for all equipment and systems. Data shall be assembled in booklet form with soft cover and index. Identify front cover with name and location of the project, Consulting Engineer and Contractor. Submit one copy to the Engineer for approval.

**Materials**

Replace material and workmanship below specified quality and relocate work wrongly placed to the satisfaction of the Engineer.

Materials and equipment installed shall be new, full weight and of best quality specified. Use some brand of manufacturer for each specific application. Statically and dynamically balance rotating equipment for minimum vibration and low operating noise level.

**Approvals**

The price submitted for this Contract shall be based on the use of materials and equipment as specified. If this contractor wishes to quote on equivalent materials and equipment, he must quote on products approved by the Engineer, "in writing", as an equivalent to the product specified. Manufacturers listed in specifications do not have to request approval but must meet all performance requirements.

This Contractor shall be fully responsible for any additional work or materials required by the mechanical trade or other Contractors to accommodate approved equivalent materials or equipment. Extras will not be approved to cover such work.

**VENTILATION AND AIR CONDITIONING**

**Ductwork**

Ductwork shall be of galvanized steel and shall be lock forming quality. All ductwork shall be constructed, braced, connected and jointed as recommended in the latest issue of ASHRAE Guide and the Duct Construction Standards issued by the Sheet Metal National Association Inc. (SMACNA). All ductwork shall be installed to conform to the National Building Code, the CFUA Pamphlets 90A and 91 and in accordance with applicable codes. The minimum sheet metal thickness for ducts shall be as follows:

Rectangular Ducts Maximum Width	Gauge
Up to 300mm	26 USga
325mm to 750mm	24 USga
775mm to 1350mm	22 USga

Round ductwork shall be suspended by band iron hangers.

Rectangular ductwork shall be supported at maximum 2.4m (8 ft.) spacing.

Sheet Metal screws will be acceptable for ducting.

Flexible duct to be triple lock aluminum, maximum length 3.0m (10 feet).

**Seal Classification as follows:**

Maximum Pressure (Pa)	SMACNA Seal Class
1000 and over	A
750	B
500	C

**Seal Classification**

Class A: longitudinal seams, transverse joints, duct wall penetrations and connections made airtight with sealant and tape.

Class B: longitudinal seams, transverse joints and connections made airtight with sealant, tape or combination thereof.

Class C: transverse joints and connections made air tight with gaskets, sealant, tape or combination thereof. Longitudinal seams unsealed.

**Volume Dampers**

Install at each take-off from main as noted on drawing; single blade with locking quadrant. equal to Duro-Dyne K-9.

**Air Outlets and Inlets**

All new supply diffusers and return grilles as indicated on drawing.

**Air System Testing and Balancing**

Contractor to measure airflow of existing system prior to construction and report results.  
Balance systems for rated air flow, room temperature control and current draw after installation is complete and in full working order. Adjust controls for continuous air circulation and minimum energy consumption. Adjust fan speeds as required to obtain specific performance. Balancing work to be performed by independent balancing contractor. Electronic copy of report to be issued to engineers for review.

**Duct Insulation: Thermal and Acoustic**

All high pressure ductwork up to VAV box inlets, shall be thermally insulated with 25 mm thick rigid fibreglass insulation and vapour barrier and aluminum duct tape.  
Provide acoustic duct lining for a distance of 2.0m following the VAV box, in all ducts connected at both sides of conference room exhaust fans, in transfer ducts, in return and supply duct at heat pump, and in other ducts as shown on drawings. The lining shall be rigid fibreglass board 25mm thick with a density of 36 kg/cu.m. Duct dimensions, as indicated, are clear inside duct lining.

All covering shall be applied in a workmanlike manner to present a neat and clean appearance at completion of the work to the approval of the Engineer and Owner. Insulation assemblies shall comply with Ontario Building Regulations with flame spread and smoke developed ratings not exceeding 25 and 50 respectively.

Repair existing insulation and jacket where damaged by cutting into mains or other alterations performed under this project.

**Equipment List**

See notes and schedules on drawings for details on equipment, types, models and performance required.

**Controls**

Install new temperature sensor as indicated on drawings. Provide all control wiring as required to operate VAV box and to interface to existing Building Automation System. All work associated with BAS to be by base building controls contractor.

Base building controls contractor (VCI) to update Building Automation System Graphics with new and existing temperature zone locations (cost carried by Mechanical Contractor).

**FIRE PROTECTION**

Verify on site locations of existing sprinkler heads. Provide new heads and relocate existing as indicated on drawings and as required by NFPA-13. All new sprinkler heads shall conform to NFPA-13. Model and type to match existing sprinklers. All work to be performed by base building sprinkler contractor.

**SEISMIC RESTRAINT SYSTEM (SRS)**

Provide design, supply and installation of complete SRS for all systems, equipment specified for installation on this project as per Ontario Building Code latest edition and NFPA13.

Design to be by professional engineer specializing in design of SRS and registered in the province of ontario. Mechanical contractor to include costs associated with this work as it relates to mechanical contractor installations. submit design sketches/drawings prior to start of installations, c/w installation requirements.

Provide letter from seismic engineer stating all mechanical installations have been installed in conformance with seismic restraint requirements as per Ontario Building Code.

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REVISIONS		

client:

**NATIONAL GALLERY OF CANADA**

project:

**NEW RETAIL STORE**

**380 SUSSEX DR. OTTAWA, ONTARIO**

drawing title:

**SPECIFICATIONS**

scale:	AS SHOWN	drawn by:	M.M.K.
designed by:	M.M.K.	reviewed by:	J.R.P.
approved by:	J.R.P.	date:	AUG. 2015

project no.:	100-161	drawing no.:	M-3
revision:	<0>		of 3