

**NRC ADVANCED MANUFACTURING PROGRAM (AMP)  
WINNIPEG, MB****ISSUED BY**

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**ALL BIDDERS SHALL READ THE ENTIRE ADDENDUM AND TAKE INTO ACCOUNT AS PART OF THE TENDER DOCUMENTS.**

**WHERE A REVISION IS CALLED FOR IN A DRAWING OR IN A SECTION OF A SPECIFICATION, IT SHALL BE CONSIDERED REVISED FOR ALL RELATED DRAWINGS AND SECTIONS OF THE SPECIFICATION.**

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## 1.0 MECHANICAL SPECIFICATIONS

- 1.1 Delete Specification Section 22 42 01 Plumbing Specialties and Accessories in its entirety, and replace with new Specification Section 22 42 01.R1 Plumbing Specialties and Accessories attached to this addendum.
- 1.2 Refer to Specification Section 22 42 03 Commercial Washroom Fixtures.
  - .1 Article 2.1 Manufactured Units; add paragraph 2.2.16 with the following
    - “1 DF-1
      - .1 Wall hung water cooler, sensor, touchless activation with auto 20-second shut off (bottle filler), bi-level, 8 GPH of 50 °F drinking water at 90 °F ambient and 80 °F inlet water.
      - .2 light gray granite vinyl clad steel cooler cabinet, galvanized structural steel cooler chassis frame provides structural integrity, laminar flow provides minimal back splash, lead-free design, easy-touch front and side pushbar controls (cooler),
      - .3 Flexi-Guard safety bubbler utilizes an infused anti-microbial pliable polyester elastomer to prevent mouth injuries, real drain system eliminates standing water, stainless steel bottle filler wrapper with ABS plastic alcove, quick fill rate of 1.1 gpm, Innovative Green Ticker counts bottles saved from waste, 1-1/2" (38 mm) p-trap.
      - .4 Compressor: hermetically-sealed, reciprocating type, single phase. Sealed-in lifetime lubrication, condenser: fan cooled, copper tube with aluminum fins, fan motor is permanently lubricated, cooling unit: combination tube-tank type, self cleansing, continuous copper tubing with stainless steel tank, fully insulated with eps foam which meets UL requirements for self-extinguishing material, Chilling Capacity of 8GPH, Voltage Requirement: 115V at 60 Hz, current of 5.0 Amps, power consumption: 370W.
      - .5 Refrigerant control: refrigerant R134a is controlled by accurately calibrated capillary tube, temperature control: easily accessible enclosed adjustable thermostat is factory pre-set, WaterSentry Plus 3000-gallon capacity filtration system, NSF/ANSI 42 & 53 certified, LED Visual Filter Monitor shall automatically detect new filter and reset visual filter monitor while diagnosing system issues and relay related messages, Green Spec Listed.
      - .6 Integrated silver ion anti-microbial protection in key areas. Provide electrical duplex box with GFI. Supply Drinking fountain supplies, Chrome plated finish All metal construction, straight stops, low lead.
      - .7 Double carrier, mounted on concrete floor, universal steel hangar support plates with integral mounting brackets, heavy gauge steel uprights with integral welded feet. For one unit: 114 mm (4-1/2") finished metal stud wall to back of pipe space.”
- 1.3 Refer to new 22 06 30.13 Pump Schedule attached to this addendum.
- 1.4 Refer to new 23 06 30.13 Fan Schedule attached to this Addendum.
- 1.5 Refer to new 23 06 50.13 VAV Schedule attached to this Addendum.
- 1.6 Refer to new 23 06 50.23 Expansion Tank Schedule attached to this Addendum.

1.7 Refer to new 23 06 70.43 Heat Exchanger Schedule attached to this Addendum.

## **2.0 MECHANICAL DRAWINGS**

2.1 Delete Drawing M403 – H.V.A.C. PLAN – LEVEL 1 – WEST in its entirety and replace with new Drawing M403R1 – H.V.A.C. PLAN – LEVEL 1 – WEST attached to this Addendum.

2.2 Delete Drawing M404 – H.V.A.C. PLAN – LEVEL 1 – EAST in its entirety and replace with new Drawing M404R1 – H.V.A.C. PLAN – LEVEL 1 – EAST attached to this Addendum.

2.3 Refer to M400 – H.V.A.C. PLAN – LEVEL 0 – EAST:

.1 Revise make up air unit tag by grid lines R and 12 as shown on MSK-01 attached to this Addendum.

2.4 Refer to M405 – H.V.A.C. PLAN – LEVEL 2 – WEST:

.1 Add Venturi Valve airflow tags as shown on MSK-02 attached to this Addendum.

2.5 Refer to M405 – H.V.A.C. PLAN – LEVEL 2 – WEST:

.1 Add size 8 VAV Box as shown and associated 300x300 supply air duct. Refer to MSK-03 attached to this addendum.

2.6 Refer to M203 – MECHANICAL SCHEMATICS - DETAIL 1:

.1 Revise pipe size to 65Ø.

.2 Revise note “Piped service to service panel at each lab module (6 SCFM 100 PSI)” with the following:

.1 “Piped service to service panel at each lab module (200 SCFM 100 PSI).

2.7 Refer to M602 – PART PLANS AND DETAILS – DETAIL 2

.1 Add tag “DF-1” to drinking fountain shown near gridline 8.

**END OF ADDENDUM**

- Part 1            General**
- 1.1            RELATED REQUIREMENTS**
- .1            Section 21 05 01
- 1.2            REFERENCE STANDARDS**
- .1            ASTM International
- .1            ASTM A126-04(2014), Standard Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.
- .2            American Water Works Association (AWWA)
- .1            AWWA C702-15, Standard for Cold Water Meters-Compound Type.
- .3            CSA International
- .1            CAN/CSA-B64 Series-11(R2016), Backflow Preventers and Vacuum Breakers.
- .2            CSA B79-08(R2013), Commercial and Residential Drains and Cleanouts.
- .3            CAN/CSA-B356-10(R2015), Water Pressure Reducing Valves for Domestic Water Supply Systems.
- .4            Efficiency Valuation Organization (EVO)
- .1            International Performance Measurement and Verification Protocol (IPMVP).
- .1            IPMVP 2007 Version.
- .5            National Research Council Canada (NRC)
- .1            National Plumbing Code of Canada 2015 (NPC).
- .6            Plumbing and Drainage Institute (PDI)
- .1            PDI-G101-R2010, Testing and Rating Procedure for Grease Interceptors with Appendix of Installation and Maintenance.
- .2            PDI-WH201-R2010, Water Hammer Arresters Standard.
- 1.3            ADMINISTRATIVE REQUIREMENTS**
- .1            Pre-installation Meetings:
- .1            Convene pre-installation meeting 1 week prior to beginning on-site installation in accordance with Section 01 31 19 Project Meetings to:
- .1            Verify project requirements.
- .2            Review installation and substrate conditions.
- .3            Co-ordination with other building construction subtrades.
- .4            Review manufacturer's written installation instructions and warranty requirements.
- 1.4            ACTION AND INFORMATIONAL SUBMITTALS**
- .1            Submit in accordance with Section 01 33 00.
- .2            Product Data:
- .1            Submit manufacturer's instructions, printed product literature and data sheets for plumbing products and include product characteristics, performance criteria, physical size, finish and limitations.

- .3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .4 Instructions: submit manufacturer's installation instructions.
- .5 Manufacturers' Field Reports: manufacturers' field reports specified.

## **1.5 CLOSEOUT SUBMITTALS**

- .1 Submit in accordance with Section 01 78 00.
- .2 Operation and Maintenance Data: submit operation and maintenance data for plumbing specialties and accessories for incorporation into manual.
  - .1 Description of plumbing specialties and accessories, giving manufacturers name, type, model, year and capacity.
  - .2 Details of operation, servicing and maintenance.
  - .3 Recommended spare parts list.

## **1.6 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver, store and handle materials in accordance with manufacturer's written instructions and Section 01 61 00.
- .2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.
- .3 Storage and Handling Requirements:
  - .1 Store materials indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
  - .2 Store and protect plumbing materials from nicks, scratches, and blemishes.
  - .3 Replace defective or damaged materials with new.

## **Part 2 Products**

### **2.1 FLOOR DRAINS**

- .1 Floor Drains and Trench Drains: to CSA B79.
- .2 Type 1: finished areas; cast iron body, round, adjustable head, 127mm diameter, 6.35mm thick nickel bronze strainer, integral seepage pan, and clamping collar, trap primer connection.
- .3 Type 2: non-finished areas; cast iron body, drainage flange, adjustable nominal 200 mm dia. heavy-duty strainer.
- .4 Type 3: combination funnel floor drain; cast iron body with integral seepage pan, clamping collar, minimum nominal 127 mm dia. 6.35mm thick Nickel bronze strainer, full opening for funnel and nominal 75 mm x 225 mm oval funnel. .
- .5 Type 4: planters; cast-iron body with integral seepage pan, clamping collar, nickel-bronze adjustable head strainer, vandal-proof dome and standpipe, stainless steel screen.
- .6 Type 5: finished areas, tile; cast iron body, square, adjustable head, 127mm x 127mm, 6.35mm thick nickel bronze strainer, integral seepage pan, and clamping collar, trap primer connection.

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**2.2 TRENCH DRAINS (Addendum #3)**

- .1 TD-1: Trench drain systems shall be precast polymer concrete, nominal 125 mm (5 in.) wide sloped modular system with interlocking components and extra heavy duty class "E" ductile iron grates and integral channel rail frame, catch basin, foul air trap as required. Provide minimum 100 mm (4 in.) bedding of concrete around trench.

**2.3 ROOF DRAINS**

- .1 Type 1: controlled flow; coated cast iron body, large sump, wide non-crimping flange, vandal proof aluminum or ductile iron mushroom dome strainer, extension frame to suit thickness of insulation, sump receiver, under-deck clamps and flashing clamp with integral gravel stop. flow control weir assembly, cast iron dome.
- .2 Type 2: parapet or scupper drain; cast iron body with bronze strainer/grate and flashing clamp.

**2.4 DOWNSPOUT NOZZLE (Addendum #3)**

- .1 Type 1 (Main Entrance): Downspout nozzle with hinged perforated cover. Stainless Steel body with decorative face of wall flange.
- .2 Type 2: Downspout Nozzle, stainless steel body, threaded inlet and decorative face of wall flange and outlet nozzle complete with removable stainless steel screen.

**2.5 CLEANOUTS**

- .1 Cleanout Plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.
- .2 Access Covers:
  - .1 Wall Access: face or wall type, round polished nickel bronze square cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.
  - .2 Floor Access: round cast iron body and frame with adjustable secured nickel bronze top and:
    - .1 Plugs: bolted bronze with neoprene gasket.
    - .2 Cover for Unfinished Concrete Floors: nickel bronze frame round cast iron, gasket, vandal-proof screws.
    - .3 Cover for Terrazzo Finish: polished nickel bronze with recessed cover for filling with terrazzo, vandal-proof locking screws.
    - .4 Cover for Tile and Linoleum Floors: polished nickel bronze with recessed cover for linoleum or tile infill, complete with vandal-proof locking screws.
    - .5 Cover for Carpeted Floors: polished nickel bronze with deep flange cover for carpet infill, complete with carpet retainer vandal-proof locking screws.

**2.6 NON-FREEZE WALL HYDRANTS**

- .1 Recessed type with integral vacuum breaker, NPS 3/4 hose outlet, removable operating key. Chrome plated finish.

**2.7 WATER HAMMER ARRESTORS**

- .1 Stainless steel, bellows type: to PDI-WH201.

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**2.8 BACK FLOW PREVENTERS**

- .1 Preventers: to CAN/CSA-B64 Series 11, application double check valve assembly reduced pressure principle type.

**2.9 VACUUM BREAKERS**

- .1 Breakers: to CAN/CSA-B64 Series 11, vacuum breaker atmospheric, laboratory faucet intermediate.

**2.10 PRESSURE REGULATORS**

- .1 Capacity: as indicated.
  - .1 Inlet pressure: as indicated.
  - .2 Outlet pressure: as indicated.
- .2 Up to NPS 1-1/2 bronze bodies, screwed: to ASTM B62.
- .3 NPS 2 and over, semi-steel bodies, Class 125, flanged: to ASTM A126, Class B.
- .4 Semi-steel spring chambers with bronze trim.

**2.11 BACKWATER VALVES**

- .1 Coated extra heavy cast iron body with bronze seat, revolving bronze flapper and threaded cover.
- .2 Access:
  - .1 Surface access.
  - .2 Access pipe with cover: maximum 300mm depth.
  - .3 Steel housing with gasketed steel cover.
  - .4 Concrete access pit with cover, as indicated.

**2.12 HOSE BIBBS AND SEDIMENT FAUCETS**

- .1 Bronze construction complete with integral back flow preventer, hose thread spout, replaceable composition disc, and chrome plated in finished areas.

**2.13 WATER MAKE-UP ASSEMBLY**

- .1 Complete with backflow preventer pressure gauge on inlet and outlet, pressure reducing valve to CAN/CSA-B356, pressure relief valve on low pressure side and gate valves on inlet and outlet.

**2.14 WATER METERS**

- .1 Compound type to AWWA C702.
- .2 Capacity: as indicated.
- .3 Accessories: remote readout device.

**2.15 TRAP SEAL PRIMERS**

- .1 Brass, with integral vacuum breaker, NPS 1/2 solder ends, NPS drip line connection.
- .2 Electronic, automatic with integral ball valve. Pre-piped with copper manifold and distribution system suitable for number of drains
- .3 Electrical components to require a single point power connection at 120V. Unit shall include a manual override switch and 24 hour timer with relay and adjustable delay. All

components shall be factory assembled and installed into a coated steel box with access door for recessed installation.

## **2.16 STRAINERS**

- .1 860kPa, Y type with 20 mesh, monel, bronze or stainless steel removable screen.
- .2 NPS 2 and under, bronze body, screwed ends, with brass cap.
- .3 NPS 2 1/2 and over, cast iron body, flanged ends, with bolted cap.

## **2.17 OIL INTERCEPTOR (Addendum #3)**

- .1 Oil interceptors shall be injection molded HDPE with flow rating of 3.2 l/s (50 GPM) with oil storage holding capacity of 303 Litres (80 Gallons). Unit shall include sediment bucket with perforated baffle near inlet, deep seal trap covered by lid, sewer gas stopper, securing latches, stainless steel calibrated orifice plate, internal air relief by-pass, adjustable automatic draw-off assembly, double vent connection on each side, and HDPE injection molded, non skid, rectangular gasketed lids.

## **2.18 GRIT INTERCEPTOR (Addendum #3)**

- .1 Grit interceptors shall be injection molded HDPE with flow rating of 3.2 l/s (50 GPM) with liquid holding capacity of 189 Litres (50 Gallons). Unit shall include two internal sand separation baffles with 75mm (3 in) diameter holes, internal deep seal trap and HDPE injection molded, non skid, rectangular gasketed lid with securing latches.

## **2.19 Flammable Liquid Emergency Overflow Tank (Addendum #3)**

- .1 Tank shall have a minimum capacity of 5300 Litres (1400 Gallons) be fiberglass or rotationally molded HDPE with minimum thickness of 10mm (3/8 in). Tank is designed for below grade installation with up to 3000mm of cover and include and adjustable lid system, sample port access, deep seal trap covered by lid. Steel encased composite lids provide water / gas tight seal and have a minimum of 9070 kg (20,000 lbs) load capacity – in accordance with the loading requirements of AASHTO H20. ASME A112.14.3, CSA B481, ANSI Z100 compliant and listed with IAPMO.
- .2 All drainage and vent piping serving storage tank shall be cast iron.

## **Part 3 Execution**

### **3.1 MANUFACTURER'S INSTRUCTIONS**

- .1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

### **3.2 INSTALLATION**

- .1 Install in accordance with National Plumbing Code of Canada (NPC), local authority having jurisdiction, Manitoba Building code.
- .2 Install in accordance with manufacturer's instructions and as specified.

### **3.3 CLEANOUTS**

- .1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.
- .2 Bring cleanouts to wall or finished floor unless serviceable from below floor.
- .3 Building drain cleanout and stack base cleanouts: line size to maximum NPS 4.

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**3.4 NON-FREEZE WALL HYDRANTS**

- .1 Install 600mm above finished grade in locations indicated.

**3.5 WATER HAMMER ARRESTORS**

- .1 Install on branch supplies to fixtures or group of fixtures.

**3.6 BACK FLOW PREVENTERS**

- .1 Install in accordance with CAN/CSA-B64 Series-11, where indicated and elsewhere as required by code. Back-flow preventers shall be installed for any connection to potable water systems in which backflow may occur, including
  - .1 Connections to wall hydrants
  - .2 connections to hose bibs
  - .3 Water Make-up Assemblies.

- .2 Pipe discharge to terminate over nearest drain or service sink.

**3.7 BACKWATER VALVES**

- .1 Install where indicated
- .2 Install in access pit as indicated.

**3.8 HOSE BIBBS AND SEDIMENT FAUCETS**

- .1 Install at bottom of risers, at low points to drain systems, and as indicated.

**3.9 TRAP SEAL PRIMERS**

- .1 Provide electronic automatic trap seal primer systems with 12 mm connection complete with integral ball valve, backflow preventer and vacuum breaker. Pre-pipe unit with a copper manifold and distribution system suitable for the number of drains served. Electrical components to require a single point power connection at 120V. Unit shall include a manual override switch and 24 hour timer with relay and adjustable delay. All components shall be factory assembled and installed into a coated steel box with access door for recessed, or surface mounted installation as shown.
- .2 Install for floor drains and elsewhere, as indicated.
- .3 Install soft copper tubing to floor drain.
- .4 Provide a running trap and cleanout for each pit drain.

**3.10 STRAINERS**

- .1 Install with sufficient room to remove basket for maintenance.

**3.11 WATER METERS**

- .1 Install water metre provided by local water authority.
- .2 Install water metre as indicated.

**3.12 WATER MAKE-UP ASSEMBLY**

- .1 Install on valved bypass.
- .2 Pipe discharge from relief valve to nearest floor drain.

**3.13 START-UP**

- .1 Timing: start-up only after:
  - .1 Pressure tests have been completed.
  - .2 Disinfection procedures have been completed.
  - .3 Certificate of static completion has been issued.
  - .4 Water treatment systems operational.
- .2 Provide continuous supervision during start-up.

**3.14 TESTING AND ADJUSTING**

- .1 General:
  - .1 Test and adjust plumbing specialties and accessories in accordance with Section 01 91 13: General Requirements, supplemented as specified.
- .2 Timing:
  - .1 After start-up deficiencies rectified.
  - .2 After certificate of completion has been issued by authority having jurisdiction.
- .3 Application tolerances:
  - .1 Pressure at fixtures: +/- 70 kPa.
  - .2 Flow rate at fixtures: +/- 20%.
- .4 Adjustments:
  - .1 Verify that flow rate and pressure meet design criteria.
  - .2 Make adjustments while flow rate or withdrawal is (1) maximum and (2) 25% of maximum and while pressure is (1) maximum and (2) minimum.
- .5 Floor drains:
  - .1 Verify operation of trap seal primer.
  - .2 Prime, using trap primer. Adjust flow rate to suit site conditions.
  - .3 Check operations of flushing features.
  - .4 Check security, accessibility, removability of strainer.
  - .5 Clean out baskets.
- .6 Vacuum breakers, backflow preventers, backwater valves:
  - .1 Test tightness, accessibility for O&M of cover and of valve.
  - .2 Simulate reverse flow and back-pressure conditions to test operation of vacuum breakers, backflow preventers.
  - .3 Verify visibility of discharge from open ports.
- .7 Roof drains:
  - .1 Check location at low points in roof.
  - .2 Check security, removability of dome.
  - .3 Adjust weirs to suit actual roof slopes, meet requirements of design.
  - .4 Clean out sumps.
  - .5 Verify provisions for movement of roof systems.
- .8 Access doors:

- .1 Verify size and location relative to items to be accessed.
- .9 Cleanouts:
  - .1 Verify covers are gas-tight, secure, yet readily removable.
- .10 Water hammer arrestors:
  - .1 Verify proper installation of correct type of water hammer arrester.
- .11 Wall, ground hydrants:
  - .1 Verify complete drainage, freeze protection.
  - .2 Verify operation of vacuum breakers.
- .12 Pressure regulators, PRV assemblies:
  - .1 Adjust settings to suit locations, flow rates, pressure conditions.
- .13 Strainers:
  - .1 Clean out repeatedly until clear.
  - .2 Verify accessibility of cleanout plug and basket.
  - .3 Verify that cleanout plug does not leak.
- .14 Hose bibbs, sediment faucets:
  - .1 Verify that flow and pressure meet design criteria.
  - .2 Check for leaks, replace compression washer if required.
- .15 Hydronic system water Make-up Assembly:
  - .1 Verify flow, pressure, and connection.
- .16 Water meters:
  - .1 Verify location and accessibility.
  - .2 Test metre reading accuracy.
- .17 Soap Dispensing Systems:
  - .1 Verify location and reach.
  - .2 Check for leaks.
- 3.15 CLOSEOUT ACTIVITIES**
  - .1 Training: provide training in accordance with Section 01 79 00: Training of O&M Personnel, supplemented as specified.
- 3.16 CLEANING**
  - .1 Progress Cleaning: clean in accordance with Section 01 74 11.
    - .1 Leave Work area clean at end of each day.
  - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11.
  - .3 Waste Management: in accordance with Section 01 74 20
- 3.17 PROTECTION**
  - .1 Protect installed products and components from damage during construction.

- .2 Repair damage to adjacent materials caused by plumbing specialties and accessories installation.

EQUIPMENT NO.			WPG03CTP01A/B	WPG03HRP01A/B	WPG03CWP01A/B/C	WPG03HRP02A/B/C	WPG03HWP01A/B/C	WPG03GLP01A/B/C	WPG03GLP02A/B	WPG03SUP01/02	
System			CONDENSER	CONDENSER	CHILLED	HEATING HOT	HEATING HOT	HEATING	HEAT RECOVERY	WEeping TILE	
Location			L1 MECH ROOM	L1 MECH ROOM	L1 MECH ROOM	L1 MECH ROOM	L1 MECH ROOM	L1 MECH ROOM	L2 MECH ROOM	LEVEL 0	
Service			DUTY/STANDBY	DUTY/STANDBY	50/50/50	50/50/50	50/50/50	50/50/50	50/50	50/50	
Fluid			35% P.G.	25% P.G.	25% P.G.	25% P.G.	25 % P.G.	50% P.G.	50% P.G.	WATER	
Fluid Flow			USgpm L/min	1,329 5,031	1,246 4,717	525 1,987	189 715	674 2,551	711 2,691	600 2,271	526 1,991
Head			ft H2O kPa	95.00 283.48	58.00 173.07	85.00 253.64	40.00 119.36	87.00 259.61	65.00 193.96	41.00 122.34	35.00 104.44
Brake			hp kW	21.50 16.03	11.60 8.65	16.60 12.38	2.57 1.92	19.50 14.54	15.20 11.33	8.84 6.59	7.20 5.37
Motor			hp kW	30.00 22.37	15.00 11.19	20.00 14.91	3.00 2.24	25.00 18.64	20.00 14.91	10.00 7.46	7.50 5.59
RPM				1800	1800	1800	1800	1800	1800	1800	1750
Voltage				575/3/60	575/3/60	575/3/60	575/3/60	575/3/60	575/3/60	575/3/60	575/3/60
Variable Frequency Drives			Yes / No	YES	NO						
Pump Efficiency			%			69.7	75.5	69.1	80	72.8	68.6
Remarks				floor mounted centrifugal inline	duplex sump c/w control panel						
EQUIPMENT NO.			WPG03SUP03/04	WPG03SUP05/06	WPG03SUP07/08	WPG03DCP01					
System			WEeping TILE	ELEVATOR	WEeping TILE	DHWR					
Location			SUMP LEVEL 0	SUMP LEVEL 0	SUMP LEVEL 0	L1 MECH ROOM					
Service			50/50	DUTY/STANDBY	50/50	DUTY					
Fluid			WATER	WATER	WATER	DHW					
Fluid Flow			USgpm L/min	256.00 969.06	50.00 189.27	979 3,706	15 57	--	--	--	--
Head			ft H2O kPa	38.00 113.39	18.00 53.71	45.00 134.28	35.00 104.44	--	--	--	--
Brake			hp kW	4.69 3.50	--	18.60 13.87	0.35 0.26	--	--	--	--
Motor			hp kW	6.00 4.47	0.75 0.56	20.00 14.91	0.40 0.30	--	--	--	--
RPM				1750	3500	1750	3250				
Voltage				575/3/60	120/1/60	575/3/60	208/1/30				
Variable Frequency Drives			Yes / No	NO	NO	NO	NO				
Pump Efficiency			%	55		70.4					
Remarks				duplex sump c/w control panel	duplex sump c/w control panel	duplex sump c/w control panel	ceiling hung centrifugal inline				

EQUIPMENT NO.			SF-WPG03AHU01		SF-WPG03AHU02		SF-WPG03AHU03		SF-WPG03AHU04		EF-WPG03AHU04		EF-WPG03AHU-05		EF-WPG03AHU-06		WPG03EXF01	
System			WPG03AHU01		WPG03AHU02		WPG03AHU03		WPG03AHU04		WPG03AHU04		WPG03AHU05		WPG03AHU06		Crawlspace	
Location			L1 MECH ROOM		L1 MECH ROOM		Crawlspace		L2 MECH ROOM		L2 MECH ROOM		Roof		Roof		Crawlspace	
Service			Lab Make Up Air		Lab Make Up Air		Ventilation		Office		Office		Lab Exhaust		Lab Exhaust		Exhaust	
Airflow Rate	cfm	L/s	7,500	3,540	7,500	3,540	3,000	1,416	3,500	1,652	3,615	1,706	6,300	2,974	6,300	2,974	1,575	743
External Static Pressure	In H2O	Pa	3.0	746	3.0	746	1.0	249	1.5	373	1.5	373	--	--	--	--	1.0	249
Total Static Pressure	In H2O	Pa	6.0	1,492	6.0	1,492	2.0	--	5.0	--	3.5	--	4.9	--	4.9	1,219	--	--
Brake	hp	kW	12.60	9.40	12.60	9.40	2.11	1.57	--	--	--	--	10.20	7.61	10.20	7.61	--	--
Motor	hp	kW	15.00	11.19	15.00	11.19	3.00	2.24	5.00	3.73	5.00	3.73	15.00	11.19	15.00	11.19	2.00	1.49
SOUND DATA																		
2nd Band	Inlet	Outlet	82	88	82	88	78	88	82	83	81	81	91	90	91	90		
3rd Band	Inlet	Outlet	97	96	97	96	68	83	94	94	92	92	90	93	90	93		
4th Band	Inlet	Outlet	90	93	90	93	68	82	91	93	87	89	90	92	90	92		
5th Band	Inlet	Outlet	80	88	80	88	63	84	81	87	78	85	89	90	89	90		
Basis of Design																		
Type			EPFN SW		EPFN SW		CENTRIFUGAL		EPFN SW		EPFN SW		TVIFE		TVIFE		CENTRIFUGAL	
Size			22		22		10		18		18		High Plume Exhaust 182HV		High Plume Exhaust 182HV		IN-LINE	
RPM			2188		2188		1507		2485		2139		2807		2807			
Variable Inlet Vanes	Yes/No																	
Variable Frequency Drive	Yes/No		YES		YES		NO		YES		YES		YES		YES		NO	
Remarks			575/3/60		575/3/60		575/3/60		575/3/60		575/3/60		575/3/60		575/3/60		575/3/60	
			Qty of 4 in AHU		Qty of 4 in AHU								Qty of 6 in AHU		Qty of 6 in AHU			

EQUIPMENT NO.			WPG03EXF02		WPG03EXF03		WPG03EXF04		WPG03EXF04		WPG03EXF06					
System			Crawlspace		Flammable Gas		Hazardous Material		Flammable Liquid		Hazardous Material					
Location			Crawlspace		Storage L1		Storage (LRG) L1		Storage L1		Storage (SML) L1					
Service			Exhaust		Exhaust		Exhaust		Exhaust		Exhaust					
Airflow Rate	cfm	L/s	1,575	743	254	120	254	120	254	120	254	120	--	--	--	--
External Static Pressure	In H2O	Pa	1.0	249	0.8	199	0.8	199	0.8	199	0.8	199	--	--	--	--
Total Static Pressure	In H2O	Pa		--		--		--		--		--	--	--	--	--
Brake	hp	kW		--	0.16	0.12	0.16	0.12	0.16	0.12	0.16	0.12	--	--	--	--
Motor	hp	kW	2.00	1.49	0.25	0.19	0.25	0.19	0.25	0.19	0.25	0.19	--	--	--	--
SOUND DATA																
2nd Band	Inlet	Outlet			80		80		80		80					
3rd Band	Inlet	Outlet			76		76		76		76					
4th Band	Inlet	Outlet			75		75		75		75					
5th Band	Inlet	Outlet			72		72		72		72					
Basis of Design																
Type			CENTRIFUGAL IN-LINE		CENTRIFUGAL IN-LINE		CENTRIFUGAL IN-LINE		CENTRIFUGAL IN-LINE		CENTRIFUGAL IN-LINE					
Size																
RPM					2069		2069		2069		2069					
Variable Inlet Vanes	Yes/No															
Variable Frequency Drive	Yes/No		NO		NO		NO		NO		NO					
Remarks			575/3/60		115/1/60		115/1/60		115/1/60		115/1/60					
					AMCA Class A Construction											

EQUIPMENT NO.			4		5		6		7		8		9		10		12	
Basis of Design			E.H.Price		E.H.Price		E.H.Price		E.H.Price		E.H.Price		E.H.Price		E.H.Price		E.H.Price	
Model			SDV		SDV		SDV		SDV		SDV		SDV		SDV		SDV	
Inlet Size	In	mm	4	102	5	127	6	152	7	178	8	203	9	229	10	254	12	305
Maximum Airflow	cfm	L/s	200	94	300	142	400	189	550	260	700	330	950	448	1,150	543	1,700	802
Minimum Airflow	cfm	L/s	26	12	42	20	62	29	85	40	110	52	140	66	180	85	270	127
Fan Airflow	cfm	L/s	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fan Motor	hp	kW	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Air Pressure Drop	In H2O	Pa	0.01	2	0.01	2	0.16	40	0.07	17	0.01	2	0.01	2	0.01	2	0.01	2
SOUND DATA																		
Inlet Static Pressure	In H2O	Pa	1.50	373	1.50	373	1.50	373	1.50	373	1.50	373	1.50	373	1.50	373	1.50	373
2nd Band	Discharge	Radiated	61	54	63	57	64	58	64	62	65	61	68	60	67	61	71	62
3rd Band	Discharge	Radiated	61	50	61	50	64	51	66	53	66	53	68	53	66	55	68	56
4th Band	Discharge	Radiated	56	45	56	46	58	47	61	47	60	47	61	48	60	49	66	51
Outlet Width	In	mm	12.0	305	12.0	305	12.0	305	12.0	305	12.0	305	14.0	356	14.0	356	16.0	406
Outlet Height	In	mm	8.0	203	8.0	203	8.0	203	10.0	254	10.0	254	12.5	318	12.5	318	15.0	381
Return Width	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Return Height	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Remarks																		
EQUIPMENT NO.																		
Basis of Design																		
Model																		
Inlet Size (Diameter)	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Airflow	cfm	L/s	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Minimum Airflow	cfm	L/s	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fan Airflow	cfm	L/s	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fan Motor	hp	kW	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Air Pressure Drop	In H2O	Pa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
SOUND DATA																		
Inlet Static Pressure	In H2O	Pa	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
2nd Band	Discharge	Radiated																
3rd Band	Discharge	Radiated																
4th Band	Discharge	Radiated																
Outlet Width	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Outlet Height	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Return Width	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Return Height	In	mm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Remarks																		

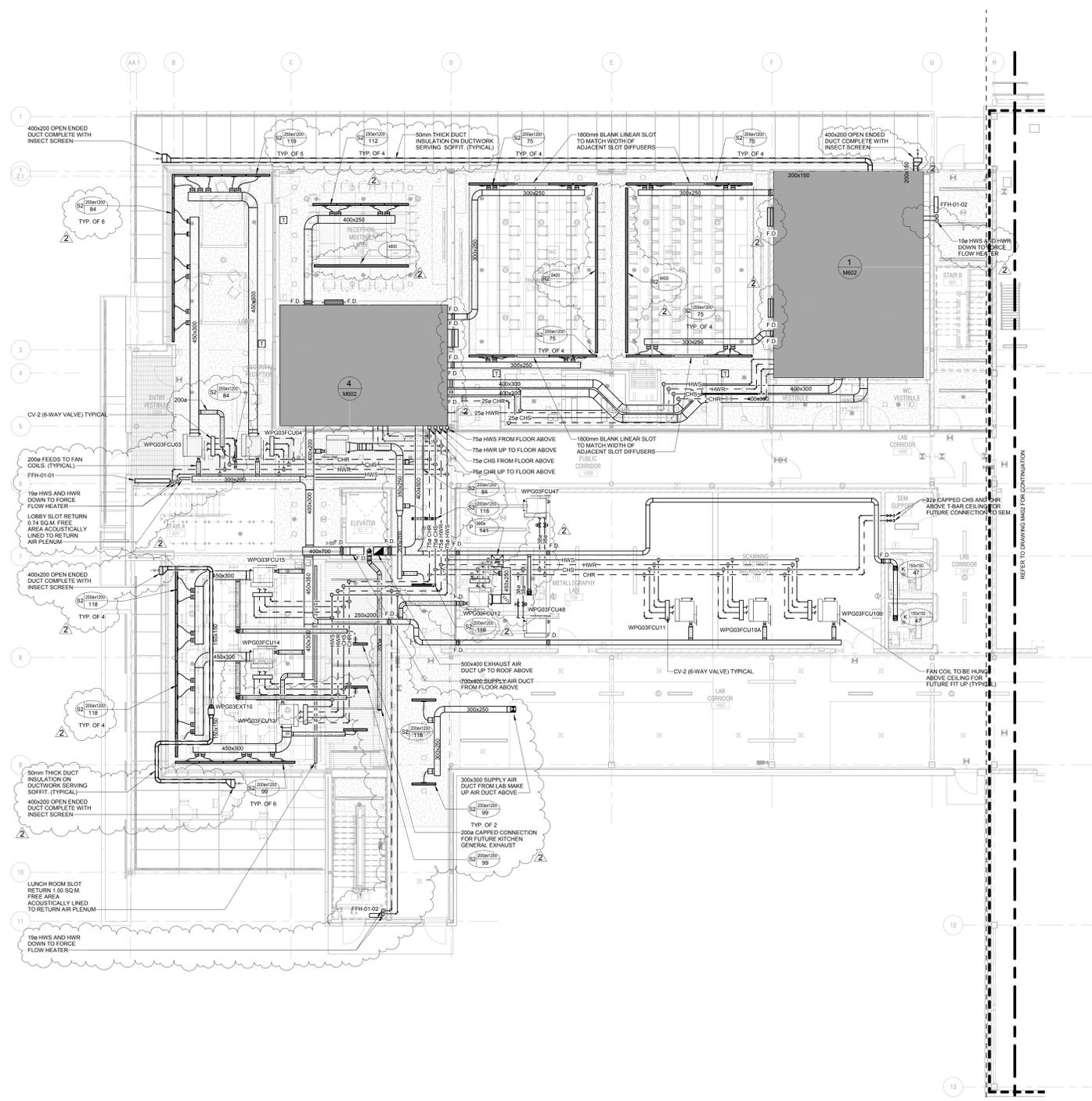
EQUIPMENT NO.			SMA		SMB		SMC		SMD		SME		SMF		SMG		SMH			
Basis of Design			Supply Valve		Supply Valve		Supply Valve		Supply Valve		Supply Valve		Supply Valve		Supply Valve		Supply Valve			
Model			Antec		Antec		Antec		Antec		Antec		Antec		Antec		Antec			
Inlet Size			214		214		414		414		414		414		210		210			
Inlet Size			In	mm	--		10	254	12	305	14	356	2 x 14	2x356	8	203	10	254	12	305
Maximum Airflow			cfm	L/s	4,410	2,082	2,779	1,312	8,817	4,162	5,420	2,558	8,668	4,091	7,263	3,428	663	313	1,342	633
Minimum Airflow			cfm	L/s	400	189	400	189	800	378	800	378	800	378	800	378	100	47	100	47
Fan Airflow			cfm	L/s	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0
Fan Motor			hp	kW	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00
Air Pressure Drop			In H2O	Pa	1	249	1	249	1	249	1	249	1	249	1	249	1	249	1	249
SOUND DATA																				
Inlet Static Pressure			In H2O	Pa	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249
2nd Band			Discharge	Radiated	69	46	68	50	67	60	74	42	82	70	65	46	66	50	65	60
3rd Band			Discharge	Radiated	66	51	64	54	63	52	71	47	78	68	62	51	60	54	60	52
4th Band			Discharge	Radiated	60	46	58	52	61	54	61	41	67	67	64	46	52	52	56	54
Outlet Width			In	mm	30.25	768	30.25	768	60.50	1,537	60.50	1,537	60.50	1,537	60.50	1,537	22.25	565	22.25	565
Outlet Height			In	mm	15.25	387	15.25	387	15.25	387	15.25	387	15.25	387	15.25	387	11.25	286	11.25	286
Return Width			In	mm		--		--		--		--		--		--		--		--
Return Height			In	mm		--		--		--		--		--		--		--		--
Remarks					med pressure valve		med pressure valve		med pressure valve		med pressure valve		med pressure valve		med pressure valve		med pressure valve		med pressure valve	
											c/w Silencer		c/w Silencer							
EQUIPMENT NO.			FEA		FEB		FEC		FED		FEE		FEF		FEG		FEH			
Basis of Design			Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve		Fume Hood Ex. Valve			
Model			Antec		Antec		Antec		Antec		Antec		Antec		Antec		Antec			
Inlet Size (Diameter)			214		214		414		414		414		414		210		210			
Inlet Size (Diameter)			In	mm	2 x 10	2 x 254	2 x 12	2 x 305	2 x 14	2 x 356			8	203	10	254	12	305	2 x 12	0
Maximum Airflow			cfm	L/s	4,631	2,186	2,918	1,377	9,258	4,370	5,691	2,686	9,101	4,296	7,626	3,600	696	329	1,409	665
Minimum Airflow			cfm	L/s	420	198	420	198	840	396	840	396	840	396	840	396	105	50	105	50
Fan Airflow			cfm	L/s	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0	n/a	0
Fan Motor			hp	kW	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00	n/a	0.00
Air Pressure Drop			In H2O	Pa	1	249	1	249	1	249	1	249	1	249	1	249	1	249	1	249
SOUND DATA																				
Inlet Static Pressure			In H2O	Pa	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249	1.00	249
2nd Band			Discharge	Radiated	67	63	69	66	75	79	67	63	69	64	70	64	68	66	68	73
3rd Band			Discharge	Radiated	65	56	65	59	71	80	65	56	67	62	62	58	61	63	61	67
4th Band			Discharge	Radiated	60	54	67	60	65	73	60	54	67	61	66	65	67	66	56	70
Outlet Width			In	mm	30.25	768	30.25	768	60.50	1,537	60.50	1,537	60.50	1,537	60.50	1,537	22.25	565	22.25	565
Outlet Height			In	mm	15.25	387	15.25	387	15.25	387	15.25	387	15.25	387	15.25	387	11.25	286	11.25	286
Return Width			In	mm		--		--		--		--		--		--		--		--
Return Height			In	mm		--		--		--		--		--		--		--		--
Remarks					bubble tight shut-off		bubble tight shut-off		bubble tight shut-off		bubble tight shut-off		bubble tight shut-off		bubble tight shut-off		bubble tight shut-off		bubble tight shut-off	

EQUIPMENT NO.			WPG03EXT01		WPG03EXT02		WPG03EXT03		WPG03EXT04		WPG03EXT05		WPG03EXT06	
Location			L1 MECH ROOM		L1 MECH ROOM		L1 MECH ROOM		Mechanical Penthouse		Mechanical Penthouse		Mechanical Penthouse	
System			Condenser Water		Condenser Water		Chilled Water		Heating Hot Water		Heating Glycol		Heat Recovery Glycol	
Approximate System Volume	gal	litres		--		--		--		--		--		--
Fluid			35% P.G.		25% P.G.		25% P.G.		25% P.G.		50% P.G.		Water	
Minimum Temperature	deg f	deg C	40	4.4	40	4.4	40	4.4	40	4.4	40	4.4	40	4.4
Maximum Temperature	deg f	deg C	100	37.8	100	37.8	80	26.7	180	82.2	180	82.2	100	37.8
Precharge Pressure	psi	kPa	20	137.90	20	137.90	20	137.90	20	137.90	20	137.90	20	137.90
System Fill Pressure	psi	kPa	25	172.38	25	172.38	25	172.38	25	172.38	25	172.38	25	172.38
Maximum System Pressure	psi	kPa	40	276	40	276	40	276	40	276	40	276	40	276
Fluid Expansion	gallon	litres	17.4	66	6.1	23	0.3	1	0.3	1	2.9	11	3.1	12
Acceptance Factor			0.274		0.274		0.274		0.274		0.274		0.274	
Minimum Tank Volume	gallons	litres	400	1514	400	1514	500	1893	500	1893	300	1136	200	757
Tank Dimensions														
Height	inches	mm	66.14	1680	66.14	1680	80.14	2036	80.14	2036	52.27	1328	38.4	975
Diameter	inches	mm	24	610	24	610	24	610	24	610	24	610	24	610
Remarks														

EQUIPMENT NO.		WPG03HEX01A	WPG03HEX02A/B	WPG03HEX03										
Location		L1 MECH ROOM	L1 MECH ROOM	L2 MECH ROOM										
Basis of Design		B&G	B&G											
Model		AP62	AP110											
Type		Gasketed Plate	Gasketed Plate	Gasketed Plate										
PRIMARY SERVICE		Condenser Water		Heating Glycol	Heat Reclaim Loop	Water	Water	Water	Water	Water				
Fluid (Steam/Water/%Glycol)		35% P.G.		50% P.G.	50% P.G.									
Fluid Flow Rate		USgpm	L/min	1,274	4,823	711	2,691	600	2,271	--	--	--	--	--
Fluid Pressure Drop		ft H2O	kPa	9.7	29	--	--	--	--	--	--	--	--	--
Entering Fluid Temperature		°F	°C	82.0	27.8	95.0	35.0	--	--	--	--	--	--	--
Leaving Fluid Temperature		°F	°C	92.0	33.3	125.0	51.7	--	--	--	--	--	--	--
Operating Pressure		psig	kPa	150	1,034	150	1,034	150	1,034	--	--	--	--	--
Steam Flow Rate		Lb/hr	Kg/hr	--	--	--	--	--	--	--	--	--	--	--
SECONDARY SERVICE		Condenser Water		Heating Hot Water	HWR	Water								
Fluid (Steam/Water/%Glycol)		25% P.G.		25% P.G.	25% P.G.									
Fluid Flow Rate		USgpm	L/min	1,246	4,717	674	2,551	625	2,366	--	--	--	--	--
Fluid Pressure Drop		ft H2O	kPa	8.8	26	--	--	--	--	--	--	--	--	--
Entering Fluid Temperature		°F	°C	95.0	35.0	130.0	54.4	100.0	37.8	--	--	--	--	--
Leaving Fluid Temperature		°F	°C	85.0	29.4	100.0	37.8	130.0	54.4	--	--	--	--	--
Operating Pressure		psig	kPa	150	1,034	150	1,034	150	1,034	--	--	--	--	--
Minimum Surface Area		sq.ft.	s.m.	2,847	264.5	2,699	250.7	--	--	--	--	--	--	--
Remarks														
EQUIPMENT NO.														
Location														
Make														
Model														
Type														
PRIMARY SERVICE														
Fluid (Steam/Water/%Glycol)				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Fluid Flow Rate		USgpm	L/min	--	--	--	--	--	--	--	--	--	--	--
Fluid Pressure Drop		ft H2O	kPa	--	--	--	--	--	--	--	--	--	--	--
Entering Fluid Temperature		°F	°C	--	--	--	--	--	--	--	--	--	--	--
Leaving Fluid Temperature		°F	°C	--	--	--	--	--	--	--	--	--	--	--
Operating Pressure		psig	kPa	--	--	--	--	--	--	--	--	--	--	--
Steam Flow Rate		Lb/hr	Kg/hr	--	--	--	--	--	--	--	--	--	--	--
SECONDARY SERVICE														
Fluid (Steam/Water/%Glycol)				Water	Water	Water	Water	Water	Water	Water	Water	Water	Water	Water
Fluid Flow Rate		USgpm	L/min	--	--	--	--	--	--	--	--	--	--	--
Fluid Pressure Drop		ft H2O	kPa	--	--	--	--	--	--	--	--	--	--	--
Entering Fluid Temperature		°F	°C	--	--	--	--	--	--	--	--	--	--	--
Leaving Fluid Temperature		°F	°C	--	--	--	--	--	--	--	--	--	--	--
Operating Pressure		psig	kPa	--	--	--	--	--	--	--	--	--	--	--
Minimum Surface Area		sq.ft.	s.m.	--	--	--	--	--	--	--	--	--	--	--
Remarks														

CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON THE JOB.  
DO NOT SCALE DRAWINGS.  
ALL DIMENSIONS SPECIFICATIONS AND RELATED DOCUMENTS ARE THE COPYRIGHT PROPERTY OF THE ARCHITECT AND MUST BE RETURNED UPON REQUEST. REPRODUCTION OF DRAWINGS, SPECIFICATIONS AND RELATED DOCUMENTS IN PART OR IN WHOLE IS FORBIDDEN WITHOUT THE WRITTEN PERMISSION OF THE ARCHITECT.  
THIS DRAWING IS NOT TO BE USED FOR CONSTRUCTION UNLESS SO INDICATED BY THE ARCHITECT.

- GENERAL NOTES**
- DO NOT SCALE DRAWINGS. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR SPECIFIED THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE SITE CONDITIONS. REVIEW ALL REVISIONS WITH THE CONSULTANT.
  - FLOOR PLANS SHALL BE READ IN CONJUNCTION WITH SCHEMATICS. INFORMATION SHOWN ON FLOOR PLANS SHALL BE ASSUMED TO BE APPLICABLE TO THE RELATED SYSTEM SCHEMATIC AND VICE-VERSA TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
  - VERIFY STRUCTURAL INTEGRITY OF ALL TEMPORARY AND PERMANENT OPENINGS. ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY SHALL BE INCLUDED UNDER THIS CONTRACT.
- H.V.A.C. NOTES**
- ALL HWS AND HWR BRANCH PIPES SHALL BE MINIMUM 19MM (3/4 IN) UNLESS INDICATED OTHERWISE.
  - ALL CONTROL VALVES FOR PERIMETER TERMINAL UNITS AND RADIATION ARE TYPE-1 UNLESS INDICATED OTHERWISE.
  - ALL TRANSFER AIR DUCTS SHALL BE 600X400X1200 (WORK) ACoustically LINED ELBOW OR STRAIGHT DUCTS AS SHOWN OR UNLESS INDICATED OTHERWISE. TRANSFER AIR DUCTS SHALL NOT BE USED IN LIEU OF SILENCERS.
  - ALL POWER FOR ON-FLOOR CONTROL DEVICES SHALL BE OBTAINED FROM THE DEDICATED EMERGENCY POWER CIRCUIT IN ROOMS 700X.
  - ALL DUCTWORK DOWNSTREAM OF VAV BOXES AND FAN POWERED BOXES SHALL BE EQUAL TO THE BOX OUTLET SIZE (MINIMUM) OR LARGER AS INDICATED. WHERE OUTLET SIZES ARE COOL SIZES, THE DUCT SIZE SHALL BE ROUNDED UP TO THE NEAREST EVEN SIZE (I.E. 319MM (12.5 IN) OR 330MM (13 IN) SHALL BE 356MM (14 IN)). PROVIDE TRANSITION DUCTS AS REQUIRED.
  - ALL FLEXIBLE DUCTWORK LENGTHS SHALL BE NO LONGER THAN 1.5M (5 FT.) WHEN FULLY STRETCHED.
  - REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF GRILLES AND DIFFUSERS.
  - TEMPERATURE SENSORS ARE LOCATED TO AID IN PRICING ONLY AND ALL REQUIRED SENSORS MAY NOT BE SHOWN (REFER TO SPECIFICATIONS). COORDINATE FINAL LOCATION WITH THE ARCHITECT WITHIN 100MM (4 IN) OF LOCATION SHOWN. ALL RELOCATIONS OUTSIDE OF THIS RANGE SHALL BE REVIEWED WITH THE CONSULTANT.
  - TEMPERATURE SENSORS SHALL BE NOMINALLY 1200MM (48 IN) ABOVE THE FINISHED FLOOR UNLESS INDICATED OTHERWISE.
  - DIFFUSER DUCT RUN CUTS SHALL BE THE SAME SIZE AS THE DIFFUSER INLETS UNLESS INDICATED OTHERWISE.
  - AIR FLOW RATES SHALL BE BALANCED EQUALLY BETWEEN ALL INTERIOR DIFFUSERS BASED ON THE MAXIMUM AIR FLOW RATE SHOWN FOR THE ASSOCIATED VAV BOX.
  - MAINTAIN A MINIMUM OF 600MM (24 IN) CLEARANCE TO THE UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC. THROUGHOUT ACCESS ROUTES TO MECHANICAL ROOMS.
  - ALL PIPING SHALL BE OVERHEAD, TIGHT TO UNDERSIDE OF THE STRUCTURE WITH SUFFICIENT ROOM FOR INSULATION UNLESS INDICATED OTHERWISE.
  - CONTRACTOR TO VERIFY STRUCTURAL INTEGRITY OF TEMPORARY AND PERMANENT OPENINGS. ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY SHALL BE INCLUDED UNDER THIS CONTRACT.
  - EXPLOSION PROOF ENCLOSURES ARE REQUIRED ON ALL ACTUATORS WITHIN CLASS 1 ZONE 2 SPACES.



No.	Description	Date
2	ISSUED FOR ADDENDUM #3	20190513
1	ISSUED FOR TENDER	20190328



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**APCA**  
Certificate of Authorization  
SMITH + ANDERSEN  
No. 5990

**NRC ADVANCED MANUFACTURING PROGRAM (AMP) - WINNIPEG**

Winnipeg, Manitoba

Prepared by: T.B. (City per)

Checked by: S.E./M.M. (Responsible per)

Approved by: K.S. (Approved per)

PROJECT: Project Manager: Kevin Gallays (Administrateur de Projets: TP502)

Drawing Title: H.V.A.C. PLAN - LEVEL 1 - WEST

H.V.A.C. PLAN - LEVEL 1 - WEST

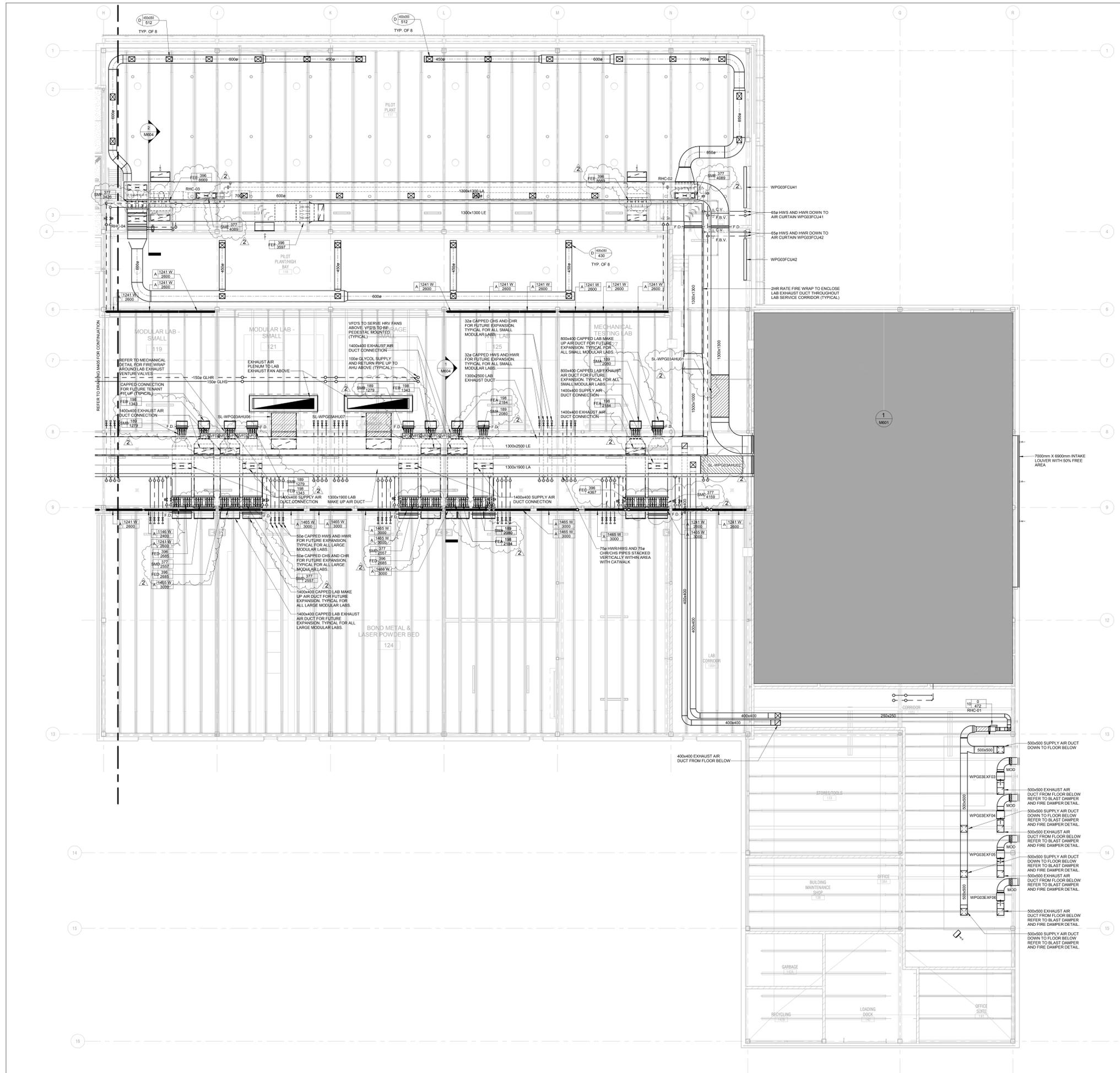
Scale: 1 : 100 Date: 20190513

Project No./No. du projet: NRC-0300W  
Drawing No./No. de dessin: R.076948.001  
Revision No.: 16705-000-002

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- GENERAL NOTES**
- DO NOT SCALE DRAWINGS. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR SPECIFIED THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE SITE CONDITIONS. REVIEW ALL REVISIONS WITH THE CONSULTANT.
  - FLOOR PLANS SHALL BE READ IN CONJUNCTION WITH SCHEMATICS. INFORMATION SHOWN ON FLOOR PLANS SHALL BE ASSUMED TO BE APPLICABLE TO THE RELATED SYSTEM SCHEMATIC AND VICE-VERSA TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM.
  - VERIFY STRUCTURAL INTEGRITY OF ALL TEMPORARY AND PERMANENT OPENINGS. ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY SHALL BE INCLUDED UNDER THIS CONTRACT.
- H.V.A.C. NOTES**
- ALL HWS AND HWR BRANCH PIPES SHALL BE MINIMUM 19MM (3/4 IN) UNLESS INDICATED OTHERWISE.
  - ALL CONTROL VALVES FOR PERIMETER TERMINAL UNITS AND RADIATION ARE TYPE-1 UNLESS INDICATED OTHERWISE.
  - ALL TRANSFER AIR DUCTS SHALL BE 600X400X1200 (WORK) ACoustically LINED ELBOW OR STRAIGHT DUCTS AS SHOWN ON UNLESS INDICATED OTHERWISE. TRANSFER AIR DUCTS SHALL NOT BE USED IN LIEU OF SILENCERS.
  - ALL POWER FOR ON-FLOOR CONTROL DEVICES SHALL BE OBTAINED FROM THE DEDICATED EMERGENCY POWER CIRCUIT IN ROOMS 700X.
  - ALL DUCTWORK DOWNSTREAM OF VAV BOXES AND FAN POWERED BOXES SHALL BE EQUAL TO THE BOX OUTLET SIZE (MINIMUM) OR LARGER AS INDICATED. WHERE OUTLET SIZES ARE 200 SIZES, THE DUCT SIZE SHALL BE ROUNDED UP TO THE NEAREST EVEN SIZE (I.E. 319MM (12.5 IN) OR 330MM (13 IN) SHALL BE 356MM (14 IN)). PROVIDE TRANSITION DUCTS AS REQUIRED.
  - ALL FLEXIBLE DUCTWORK LENGTHS SHALL BE NO LONGER THAN 1.5M (5 FT.) WHEN FULLY STRETCHED.
  - REFER TO ARCHITECTURAL REFLECTED CEILING PLANS FOR EXACT LOCATIONS OF GRILLES AND DIFFUSERS.
  - TEMPERATURE SENSORS ARE LOCATED TO AID IN PRICING ONLY AND ALL REQUIRED SENSORS MAY NOT BE SHOWN (REFER TO SPECIFICATIONS). COORDINATE FINAL LOCATION WITH THE ARCHITECT WITHIN 100MM (4 IN) OF LOCATION SHOWN. ALL RELOCATIONS OUTSIDE OF THIS RANGE SHALL BE REVIEWED WITH THE CONSULTANT.
  - TEMPERATURE SENSORS SHALL BE NOMINALLY 1200MM (48 IN) ABOVE THE FINISHED FLOOR UNLESS INDICATED OTHERWISE.
  - DIFFUSER DUCT RUN OUTS SHALL BE THE SAME SIZE AS THE DIFFUSER INLETS UNLESS INDICATED OTHERWISE.
  - AIR FLOW RATES SHALL BE BALANCED EQUALLY BETWEEN ALL INTERIOR DIFFUSERS BASED ON THE MAXIMUM AIR FLOW RATE SHOWN FOR THE ASSOCIATED VAV BOX.
  - MAINTAIN A MINIMUM OF 50MM (2 IN) CLEARANCE TO THE UNDERSIDE OF PIPES, DUCTS, CONDUITS, SUSPENDED EQUIPMENT, ETC. THROUGHOUT ACCESS ROUTES IN MECHANICAL ROOMS.
  - ALL PIPING SHALL BE OVERHEAD, TIGHT TO UNDERSIDE OF THE STRUCTURE WITH SUFFICIENT ROOM FOR INSULATION UNLESS INDICATED OTHERWISE.
  - CONTRACTOR TO VERIFY STRUCTURAL INTEGRITY OF TEMPORARY AND PERMANENT OPENINGS. ADDITIONAL FRAMING TO ENSURE STRUCTURAL INTEGRITY SHALL BE INCLUDED UNDER THIS CONTRACT.
  - EXPLOSION PROOF ENCLOSURES ARE REQUIRED ON ALL ACTUATORS WITHIN CLASS 1 ZONE 2 SPACES.

Public Works and Government Services Canada / Travaux publics et Services gouvernementaux Canada

**REAL PROPERTY SERVICES**  
Western Region  
SERVICES IMMOBILIERS  
Région de l'ouest

**NRC - CNRC**  
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CONTRACTOR MUST CHECK & VERIFY ALL DIMENSIONS ON THE JOB.

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No.	Description	Date
2	ISSUED FOR ADDENDUM #3	20190513
1	ISSUED FOR TENDER	20190328

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**APEGN**  
Certificate of Authorization  
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No. 5990

**NRC ADVANCED MANUFACTURING PROGRAM (AMP) - WINNIPEG**

Winnipeg, Manitoba

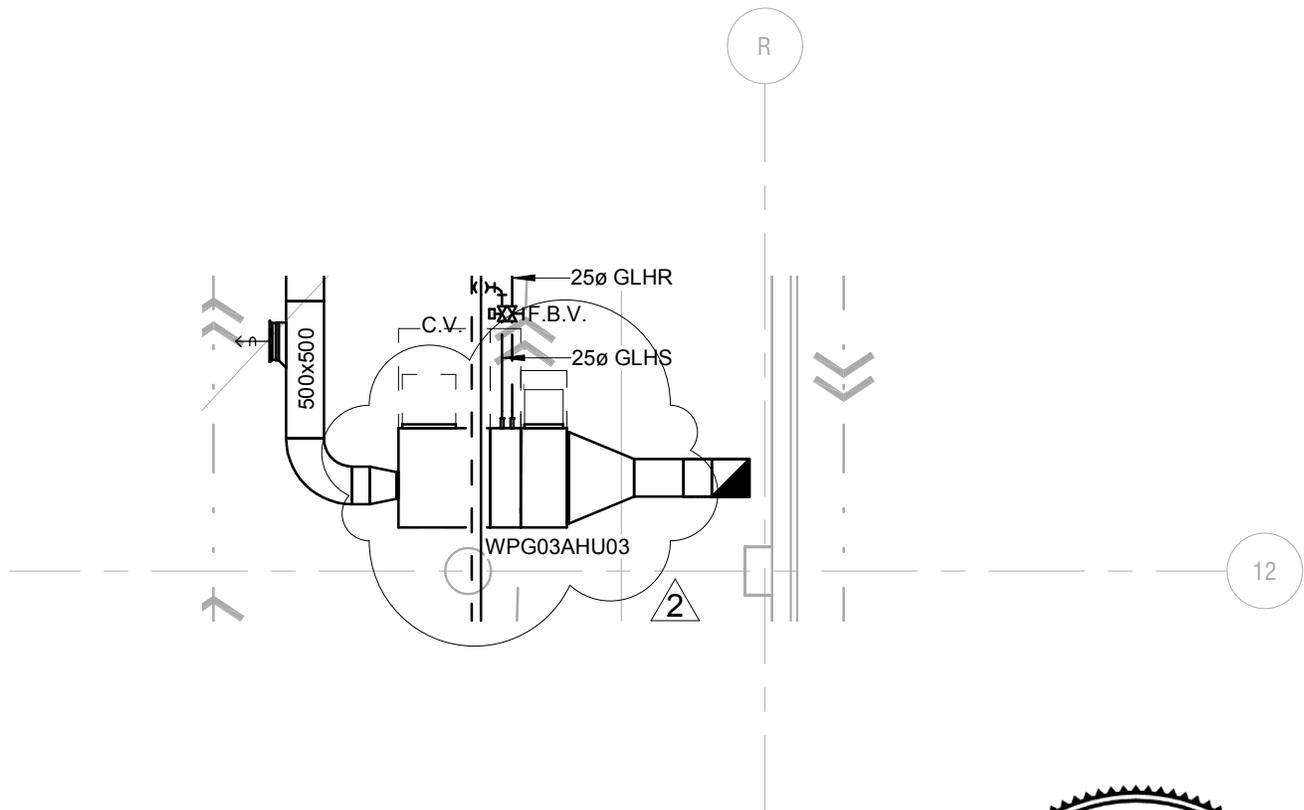
Prepared by: T.B. (City per)

Checked by: S.E./M.M. (Resident per)

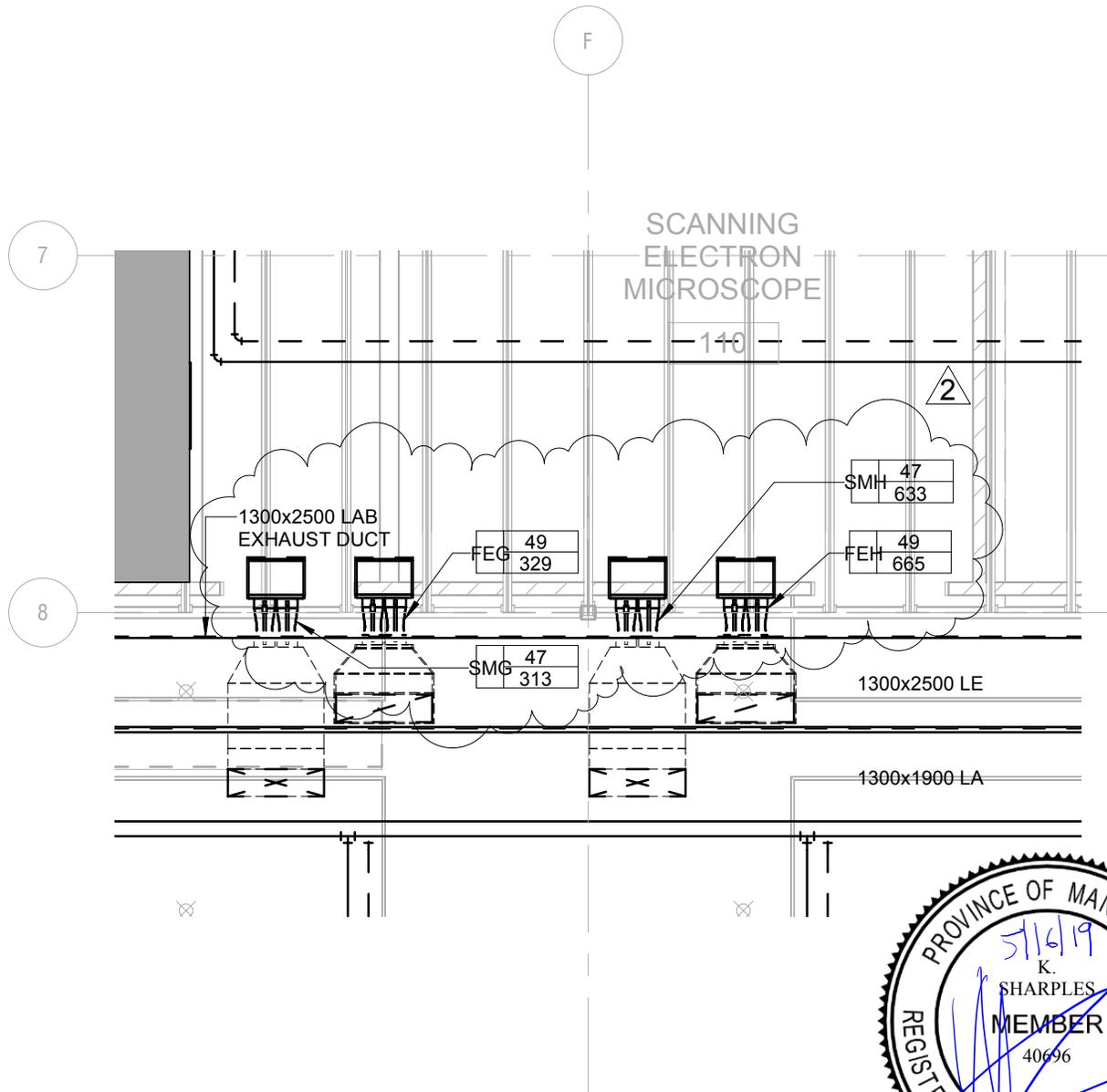
Approved by: K.S. (Approved per)

PROJECT MANAGER: KEVIN GALLAYS / Administrateur de Projets: TP502

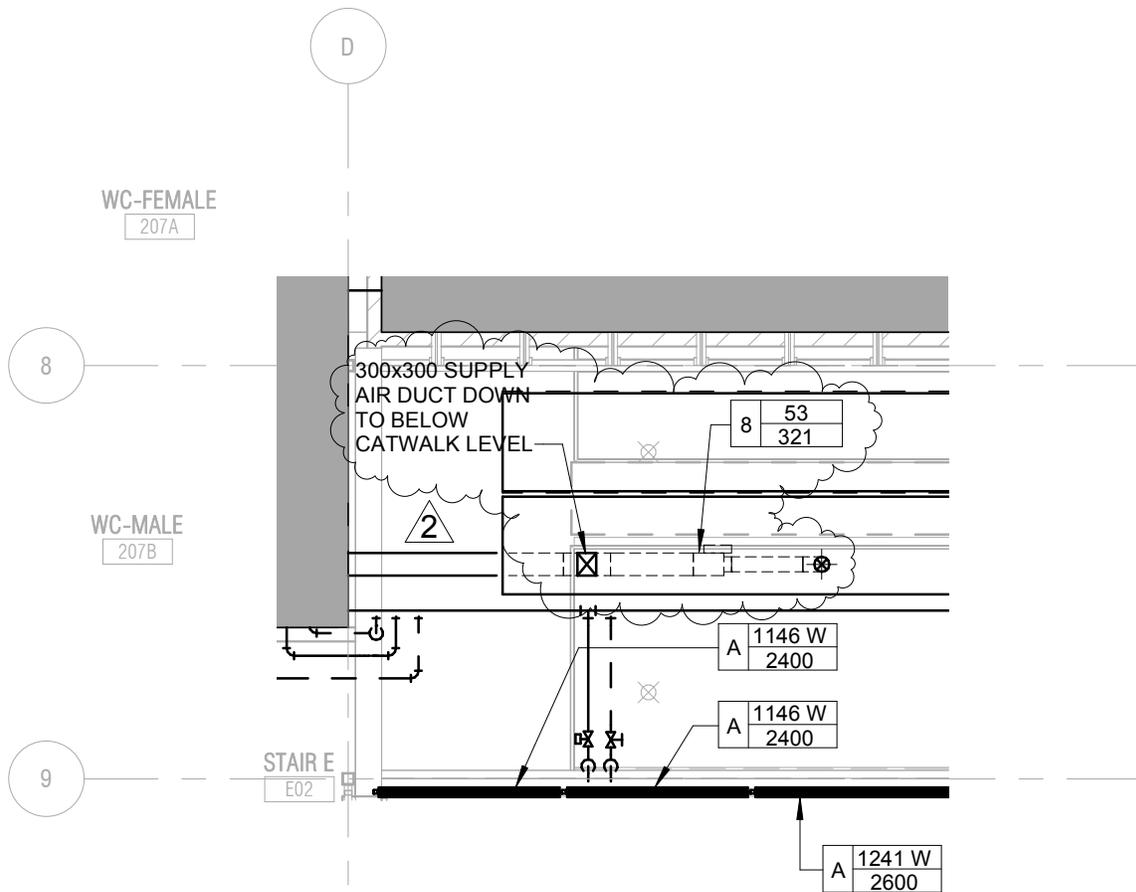
Drawing Title: H.V.A.C. PLAN - LEVEL 2 - EAST



project <b>NRC ADVANCED MANUFACTURING PROGRAM (AMP) - WINNIPEG</b> Red Fife Road, Winnipeg, Manitoba	projet Designed By TB Conçu par Date (yyyy/mm/dd)	Public Works and Government Services Canada Travaux publics et services gouvernementaux Canada
drawing <b>LEVEL 0 H.V.A.C. PLAN - EAST</b>	Reviewed By TB Examiné par Date (yyyy/mm/dd)	Project no. No. du projet <b>R.076948.001</b>
	Approved By KS Approuvé par Date (yyyy/mm/dd)	Drawing no. No. du dessin <b>MSK-01</b>
	Tender KEVIN GALLAYS Project Manager Administrateur de projets	Submission



project <b>NRC ADVANCED MANUFACTURING PROGRAM (AMP) - WINNIPEG</b> Red Fife Road, Winnipeg, Manitoba	project Designed By TB Date (yyyy/mm/dd) Drawn By MM Date (yyyy/mm/dd) Reviewed By TB Date (yyyy/mm/dd)	Conçu par (yyyy/mm/dd) Dessiné par (yyyy/mm/dd) Examiné par (yyyy/mm/dd)	Public Works and Government Services Canada Travaux publics et services gouvernementaux Canada
drawing <b>LEVEL 2 PLAN - H.V.A.C. - WEST</b>	dessin	Project no. <b>R.076948.001</b>	No. du projet Drawing no. <b>MSK-02</b>



project <b>NRC ADVANCED MANUFACTURING PROGRAM (AMP) - WINNIPEG</b> Red Fife Road, Winnipeg, Manitoba	project Designed By TB Conçu par Date (yyyy/mm/dd)	Public Works and Government Services Canada Travaux publics et services gouvernementaux Canada	
			Drawn By MM Dessiné par Date (yyyy/mm/dd)
drawing <b>LEVEL 2 H.V.A.C. PLAN - WEST</b>	Reviewed By TB Examiné par Date (yyyy/mm/dd)	Project no. No. du projet <b>R.076948.001</b>	
	Approved By KS Approuvé par Date (yyyy/mm/dd)		Drawing no. No. du dessin <b>MSK-03</b>
	Tender KEVIN GALLAYS Project Manager Administrateur de projets		