

# Addendum Addenda

No./No  1
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Project Description / Description de projet <b>M48 Test Cell 3 &amp; 4 Renovation/M48 Renovation des cellules d'essai 3 et 4</b>		
Project No./No de projet <b>5975</b>	Departmental Representative / représentant ministériel <b>Allan Smith</b>	Date <b>3-Jun-2022</b>
Solicitation No./N° de sollicitation <b>22-58005</b>		
Notice: This addendum shall form part of the tender documents and all conditions shall apply and be read in conjunction with the original plans and specifications.		
Nota: Cet addenda fait partie intégrale des dossiers d'appel; toutes les conditions énoncées doivent être lues et appliquées en conjonction avec les plans et les devis originaux.		

Item No	Description
1	Contractor to <b>carry a cash allowance</b> for balancing of entire facility in the amount of \$7000. Amount to be included in Total Tender Amount.
2	Add to General Notes all drawings to scan Walls and Floors prior to coring. Rebar cutting to be approved by Department Representative.
3	A02 1 add "after approval from Department Representative."
4	A02 Note 8 Delete "Refinish patched/repaired existing walls and new concrete block infills with matching epoxy paint." and replace with "Refinish patched/repaired existing walls and new concrete block infills with matching epoxy paint and all affected surfaces in interior and exterior of test cells 3 and 4 including ceiling.
5	A02 Note 10 Add "Frame to be painted to match existing frames."
6	A02 Concrete & Reinforcing Steel General Notes bullet 4 amend 1200 O.C. to 600 O.C
7	M01 Note 12 Add "Contractor to provide shop drawings depicting canopy all fastening points and all accessories including curtain details for review prior to construction."
8	M01 Note 14 Add "Contractor to provide shop drawings depicting ceiling grid and all fastening points and all accessories including ceiling panel and Curtain Details as a complete Package for review prior to construction."

- 9 M01 Detail 2/M01 Refrigerant line labelling reversed for 48PAS04 and 48PAS03. Review with Department Representative prior to demolition and new install of piping.
- 10 M01 Vipond is the existing sprinkler contractor at building M48.
- 11 Attached specification section 25 90 01 .01 Test cell #1 & #3 Sequence of Operation to form part of tender documents.
- 12 Question: What is the height for that rolling steel fire rated door we have the 3050 wide but not the height can you clarified please.  
Response: Door height 3250mm+/- . Final Height dimensions to be determined at Shop Drawing phase with awarded Contractor.

## **PART 1 - GENERAL**

### **1.1 Scope of Work :**

- .1 The intended sequences of operation for the mechanical and electrical systems of destructive test cells #1 and #3 are outlined in this section.
- .2 Provide all labour and materials required to design, install and commission the specified sequences.
- .3 Allow a reasonable amount of time for program changes which NRC may require due to unforeseen conditions with equipment performance, installation conditions or design intent.
- .4 Disconnect and remove control for exhaust canopy damper in test cells #2 and #4.

### **1.5 Occupant's Interaction:**

- .1 For Test Cell #1 and #3: occupant shall select what state the test cells shall be in using the master "Advanced Display" HMI's (human machine interfaces). The display will provide information on test cell mode (stand-by/ventilation, destructive/testing, small scale testing mode, or purge ventilation mode), test cell temperatures and static pressures, oxygen levels, status of thermal oxidizer (for test cells 1 and 3), status of deluge system in test cell #3, and any alarms associated with the test cells. Advanced Displays shall also send signal to thermal oxidizer to commence, display any alarm information from thermal oxidizer and confirm operation of thermal oxidizer.

## **PART 2 – SEQUENCE OF OPERATION**

### **2.3 Test Cells #1 and #3 (Destructive Test Cells):**

- .1 General Note on Operation of Test Cells 1 and 3:
  - .1 Note that test cells are exhausted through a thermal oxidizer unit with isolation dampers c/w end switches on exhaust canopies. There is an auxiliary exhaust fan used for small scale testing and purge ventilation, as well as emergency backup. Heating control is through wall mounted fin tube radiant heater (with modulating control valve). General ventilation is provided through variable volume valves (one supply, one exhaust) from central building systems.
  - .2 The thermal oxidizer unit allows only one test cell to operate in destructive test mode at any one time. Each test cell includes an oxygen sensor that will send a trouble signal to the BAS and end user if the oxygen levels drop below 19.5%. There are four modes selectable by the Advanced Display panels, each cell has its own controller that communicates between BAS, other test cells and thermal oxidizer:
    1. Standby/ General Ventilation.
    2. Destructive Test Mode.

3. Small Scale Test Mode.
4. Purge Ventilation Mode.
5. Control Panel shall have light indicating whether or not thermal oxidizer is running and temperature has reached required level.

.2 Standby/ General Ventilation:

- .1 In general the test cells will be kept at a slightly negative pressure to the central core of building M-48. Temperature in each individual test cell can be selected by the end user via a wall mounted controller located within each of the test cells. Range for temperature set-points shall be from 16°C (61°F) to 24°C (75°F) for heating.
- .2 Supply air valve to each test cell shall open to allow 71 L/s (150CFM) of air from the make-up air system into the test cell.
- .3 Exhaust air valve to each test cell shall open to allow 94 L/s (200CFM) of air to be exhausted the general building exhaust air system.
- .4 Pressure in each test cell shall be kept negative in comparison to the central core. Signal shall be sent to BAS indicating an issue if pressure becomes positive in comparison to building central core. If test cell's static pressure is at equal or positive pressure for more than 60 minutes alarm signal shall be sent and error message displayed.

.3 Destructive Test Mode:

- .1 Test cell #1 or #3 can be requested to go into destructive test mode via the Advanced Display (AD) human machine interfaces.
- .2 For Test Cell #3 only: BAS will verify if deluge system releasing circuit disable switch has been manually disabled. If the deluge system has not been disabled, an alarm will be generated and displayed on the AD panels and user will be prevented from proceeding to next steps.
- .3 BAS will verify the entrance door contacts to make sure test cell door is closed properly. An alarm will be generated and displayed on the AD panels if test cell door is not closed.
- .4 Signal is sent to fin-tube to shutdown (if functioning). No temperature control required in destructive test mode.
- .5 Damper on fume canopy of test cell in operation opens fully, the other fume canopy damper remains close. The BAS will monitor the end switch on the fume canopy exhaust damper to confirm damper is fully open. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
- .6 General exhaust air valve to test cell in operation shuts fully. General exhaust valve in other test cells remain at general ventilation set points. The controller on the air valve will relay a '0' flow feedback signal via BacNet to the BAS when in

- the shut off position. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
- .7 Supply air valve in test cell in use opens to allow 329 L/s (700CFM) of air to enter test cell. All other supply air valves to “dirty” test cells close to minimum. The controller on the air valve will relay a minimum flow feedback signal via BacNet to the BAS when in the minimum position. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal. “Clean” test cells (test cells 5 through 8) supply air valves shall remain in general ventilation mode.
  - .8 Pressure in test cell in destructive mode shall be kept negative in comparison to the central core. The BAS will monitor the differential static pressure and generate an alarm if it is positive.
  - .9 If there are no alarms generated from the previous steps, a signal is sent to the thermal oxidizer to start. The thermal oxidizer requires approximately 30 minutes to 1 hour to reach required temperatures.
  - .10 Once the thermal oxidizer reaches the required temperature, a signal will be sent to the BAS to give the end user the ‘green light’ (via the AD panel) that a destructive test can be started. If the BAS doesn’t receive feedback from the thermal oxidizer that the required temperature has been reached, the end user will not be given the ‘green light’ and the user will be notified via the AD panel.
  - .11 The BAS will monitor the thermal oxidizer feedback and generate an alarm if required.
  - .12 Test runs as long as end user requires. End user shall initiate test cell shutdown (including the shutdown of the thermal oxidizer). Once thermal oxidizer is fully shutdown, test cell returns to standby/ general ventilation mode. All other dirty test cells return to standby/ general ventilation modes.
  - .13 For Test Cell #3 only: BAS will verify if deluge system releasing circuit disable switch has been manually enabled. An alarm will be generated and displayed on the AD panels if the deluge system has not been enabled.
  - .14 If failure of thermal oxidizer occurs during testing, a signal shall be sent to end user’s display panel indicating failure of thermal oxidizer. BAS shall open motorized isolation damper for exhaust duct branch connected to auxiliary fan. BAS will monitor end switch on damper motor to confirm damper is fully open. BAS will then start auxiliary exhaust fan and shutdown oxidizer.
  - .15 If failure of Make-Up Air Unit 48AHU01 occurs, signal shall be sent to end user’s display (AD) indicating reason of failure (fan failure, high supply air temp, low supply air temp or general alarm). Thermal oxidizer shall continue to run until shut-down signal is sent by end user.
  - .16 Pressure shall be kept negative in comparison to the central core in each of the remaining dirty test cells not in use. Signal shall be sent to BAS indicating an issue if pressure becomes positive in comparison to building central core. If test
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cell's static pressure is at equal or positive pressure for more than 60 minutes alarm signal shall be sent and error message displayed.

.4 Small Scale Test Mode:

- .1 Test cell #1 or #3 can be requested to go into small scale test mode via the Advanced Display (AD) human machine interfaces.
  - .2 BAS will verify the entrance door contacts to make sure test cell door is closed properly. An alarm will be generated and displayed on the AD panels if test cell door is not closed.
  - .3 Signal is sent to fin-tube to shutdown (if functioning). No temperature control required in destructive test mode.
  - .4 Damper on fume canopy of test cell in operation opens fully, the other fume canopy damper remains close. The BAS will monitor the end switch on the fume canopy exhaust damper to confirm damper is fully open. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
  - .5 General exhaust air valve to test cell in operation shuts fully. General exhaust valve in other test cells remain at general ventilation set points. The controller on the air valve will relay a '0' flow feedback signal via BacNet to the BAS when in the shut off position. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
  - .6 Supply air valve in test cell in use opens to allow 329 L/s (700CFM) of air to enter test cell. All other supply air valves to "dirty" test cells close to minimum. The controller on the air valve will relay a minimum flow feedback signal via BacNet to the BAS when in the minimum position. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal. "Clean" test cells (test cells 5 through 8) supply air valves shall remain in general ventilation mode.
  - .7 Pressure in test cell in small scale test mode shall be kept negative in comparison to the central core. The BAS will monitor the differential static pressure and generate an alarm if it is positive.
  - .8 If there are no alarms generated from the previous steps, BAS shall open motorized isolation damper for exhaust duct branch connected to auxiliary fan. BAS will monitor end switch on damper motor to confirm damper is fully open. BAS will then start auxiliary exhaust fan.
  - .9 Once the auxiliary exhaust fan is running, BAS will give the end user the 'green light' (via the AD panel) that a small scale test can be started.
  - .10 Test runs as long as end user requires. End user shall initiate test cell shutdown, (including the shutdown of the auxiliary exhaust fan and close isolation damper). Test cell returns to standby/ general ventilation mode. All other dirty test cells return to standby/ general ventilation modes.
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- .11 If failure of auxiliary exhaust fan occurs during testing, an alarm shall be sent to end user's display panel indicating failure of exhaust fan.

.5 Purge Ventilation Mode:

- .1 Test cell #1 or #3 can be requested to go into purge ventilation mode via the Advanced Display (AD) human machine interfaces.
- .2 Damper on fume canopy of test cell needs purging opens fully, the other fume canopy damper remains close. The BAS will monitor the end switch on the fume canopy exhaust damper to confirm damper is fully open. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
- .3 General exhaust air valve to test cell in purging shuts fully. General exhaust valve in other test cells remain at general ventilation set points. The controller on the air valve will relay a '0' flow feedback signal via BacNet to the BAS when in the shut off position. An alarm will be generated and displayed on the AD panels if status deviates from the BAS signal.
- .4 All supply air valves to "dirty" test cells remain at general ventilation set point.
- .5 Pressure in test cell in purge ventilation mode shall be kept negative in comparison to the central core. The BAS will monitor the differential static pressure and generate an alarm if it is positive.
- .6 BAS shall open motorized isolation damper for exhaust duct branch connected to auxiliary fan. BAS will monitor end switch on damper motor to confirm damper is fully open. BAS will then start auxiliary exhaust fan.
- .7 Purge ventilation runs as long as end user requires. End user shall terminate test cell purge ventilation, shutdown the auxiliary exhaust fan and close isolation damper. Test cell returns to standby/ general ventilation mode.
- .8 If failure of auxiliary exhaust fan occurs during purging, an alarm shall be sent to end user's display panel indicating failure of exhaust fan.

**END OF SECTION**

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