

NOTIFICATION OF REVISION

Public Works and Government
Services Canada

Addendum No. 7

Solicitation Name: CFIA GTA Laboratory Expansion and Fit-up
Solicitation Number: R.061999.001

Date: Thursday February 5, 2015

1. ARCHITECTURAL

1.1 SPECIFICATIONS

- .1 Section 00 01 11 – List of Contents:
 - .1 Add to Division 00 – Procurement and Contracting Requirements,
 - .1 Section 00 01 20 – List of Drawings and Schedules add as follows:
 - 'Drawing A-403 Auto Door Bottom Detail' pages '1'
 - 'Schedule A-603 List of Unused Existing Casework' pages '1'
 - 'Schedule A-604 List of Spigots' pages '1'
 - 'Schedule A-701 Window Schedule' pages '1'
 - .2 Add to Division 02 – Existing Conditions the following attached sections:
 - .1 'Section 02 82 00.01 – Asbestos Abatement – Minimum Precautions' pages '9'
 - .2 'Section 02 82 00.02 – Asbestos Abatement – Intermediate Precautions' pages '11'
 - .3 'Section 02 83 10 – Lead – Base Paint Abatement – Minimum Precautions' pages '8'
 - .3 Add to Appendices the following attached report:
'Designated Substances and Hazardous Materials Survey 2301 Midland Avenue, Toronto, Ontario, November 19, 2013 prepared by XCG Consultants Ltd.'
- .2 Section 00 01 20 – List of Drawings and Schedules:
 - .1 Revise list as follows:
 - .1 Revise sentence 1.1.1.3 as follows to:
'Schedule: A-202 – Interior Colour and Finish Schedule Notes.'
 - .2 Add sentence as follows:
'1.1.1.9 Drawing: A-403 – Auto Door Bottom Detail' and renumber remaining sentences.
 - .3 Add sentence as follows:
'1.1.1.13 Drawing: A-603 – List of Unused Existing Casework.'
 - .3 Add sentence as follows:
'1.1.1.14 Drawing: A-604 – List of Spigots.'

- .4 Add sentence as follows:
'1.1.1.15 Drawing: A-701 – Window Schedule'
- .2 Schedule: Drawing No. A-201 – Room Finish Schedule
 - .1 Add note under remarks column for Corridor 319 Phases 1-3 as follows: 'Refer to Note No. 6'
 - .2 Add new Note as follows: 'No. 6 Paint existing concrete block walls between columns at grid lines B4 & B5, B5 & B6 and B7 & B8.'
- .3 Schedule: Drawing No. A-202 – Interior Colour and Finish Schedule Notes
 - .1 Add new notes as follows: 'RB-1 is for casework bases in rooms 317, 317a, 317b, 317, 321, 325, 327, 328, 328a and 337. Room 315 and 316 will have an integrated floor cove on casework base to match existing. In Rooms 341, 342 and 345 replace existing cove base where casework is relocated, colour to match existing. Use applicable silicone for bonding rubber cove base to casework metal base.'
 - .2 For RB-1, revise 'RWDC-38-C' to 'DC-38'
- .4 Schedule: Drawing No. A-301 – Door and Frame Schedule
 - .1 Door No. 315B – Delete as follows: 'ECA' under Specialty Hardware column.
 - .2 Door No. 337 and 317 – Under Remarks column revise as follows: 'Maintain fire separation.'
 - .3 Door No. 317C – Delete 'Type 1' and add under remarks, 'Hollow metal frame to suit existing drywall partition.'
 - .4 Door No. 325A – Delete 'Type 1' and add under Detail Ref. column '3b of 3/A-6.02'.
 - .5 Door No. 327 – Revise 'Type 1' to 'Type 3'.
 - .6 Door No. 337A – Delete 'Type 2' and add under Detail Ref. column '3a of 3/A6.02'.
- .5 Schedule: Drawing No. A-303 – Door Frame Details
 - .1 Delete from Frame 3 detail, 'New steel lintel above' and 'See lintel schedule'.
- .6 Schedule: Drawing No. A-401 – Door Hardware Schedule
 - .1 Door No. 315B – Delete as follows: 'ECA' under Specialty Hardware column.
 - .2 Door No. 337 and 317 – Under Remarks column revise as follows: 'Maintain fire separation.'
- .7 Schedule: Drawing No. A-501 – List of Existing and Proposed Equipment
 - .1 Heading, revise 'Verification/Calib. by CFIA' to 'Certification/Calib. by CFIA'.
 - .2 Equip. No. 9, revise New Room '325B' to '323'.
 - .3 Add 'Equip. No. 11 Data Logger', Exist. Room '355B', Exist Equip. 'X', Equipment to Remain in Prop. Rm. 'X'.
 - .4 Equip. No. 12, revise New Room '325B' to '343'.

- .5 Equip. No. 5 – 12, delete 'X' from Relocate by CFIA' and add 'X' to Relocate by GC as required. Add 'X' to Certification/Calib by GC.
- .6 Clarification, there are quantity (2) data loggers for Equip. No. 9 and 10. There are 10 in total including Equip't No. 11.
- .7 Equip. No. 106, delete 'X' from Certification/Calib. by GC . Add 'X' to Certification/Calib. by CFIA.
- .8 Equip. No. 110, delete 'X' from Certification/Calib. by GC . Add 'X' to Certification/Calib. by CFIA. Delete 'X' from Exhaust Duct.
- .9 Equip. No. 117, Add 'X' to Certification/Calib. by CFIA.
- .10 Equip. No. 120, Add 'X' to Certification/Calib. by CFIA. Delete 'X' from Exhaust Duct.
- .11 Equip. No. 155, delete 'X' from Exhaust Duct.
- .12 Equip. No. 312, delete 'X' from Relocate by CFIA. Add 'X' to Certification/Calib. by CFIA.

- .8 Refer to Schedule: Drawing No. A-601 – List of New Casework.
 - .1 Add the following: 'General Note No. 1 Fillers and trim pieces that are not listed are to be included as necessary to complete installation of casework.'
 - .2 Revise 'L1' to 'L' in heading. Total '1'.
 - .3 Revise 'M1' to 'M' in heading. Total '2'.

- .9 Add new Schedule: 'Drawing No. A-603 – List of Unused Existing Casework'. Refer to attachment.

- .10 Add new Schedule: 'Drawing No. A-604 – List of Spigots'. Refer to attachment.

- .3 Section 01 11 00 – Summary of Work:
 - .1 1.10 Owner Furnished Items
 - .1 Clause 1.10.3 Schedule of Owner and Furnished Items
 - .1 Delete Sentence '1.10.3.4 Electric strikes, for installation under Section 08 71 11.'
 - .2 1.11 Alterations to Existing Building:
 - .1 Revise Clause 1.11.1 as follows:

'Remove in good order, turn over to Department, and store within building where designated by Department Representative:

 - .1 Sinks and faucets
 - .2 Eyewashes
 - .3 Spigots
 - .4 Doors
 - .5 Door hardware
 - .6 Stainless steel benches
 - .7 Stainless steel canopies
 - .8 Light fixtures
 - .9 Fume hoods
 - .10 Stainless steel corner guards
 - .11 Interior Windows
 - .12 Vertical metal service enclosures'

- .2 Revise Clause 1.11.2 as follows:
 'Remove, temporarily store, clean, alter to suit and reinstall:
 - .1 Carpet tiles
 - .2 Casework
 - .3 Wood valance
 - .4 Ceramic wall tiles (for patching)
 - .5 Resilient flooring (for patching)
 - .6 Borosilicate piping
 - .7 Lab stainless steel counter sinks
 - .8 Lab stainless steel dump sink
 - .9 Interior Windows'

- .3 Revise Clause 1.11.3 as follows:
 'Remove, temporarily store and turn over to other sections for building in:
 - .1 Casework to be reinstalled under Section 12 35 53.
 - .2 Acoustic ceiling tiles to be reinstalled under Section 09 51 23.
 - .3 Resilient flooring to be reinstalled under Section 09 65 00 for any patching work.
 - .4 Carpet tile ; tiles to be steam cleaned as outlined in Section 01 74 11.
 - .5 Ceramic wall tiles to be reinstalled under Section 09 30 14 for any patching work.'

- .4 Add new Clause 1.11.7 as follows:
 'Remove, temporarily store and reinstall to new location:
 - .1 Lab equipment'

- .5 Add new Clause 1.11.8 as follows:
 'Remove, relocate and reinstall:
 - .1 Sprinkler heads
 - .2 Speakers
 - .3 Access panels
 - .4 Supply diffusers and return air grilles
 - .5 Snorkel/Articulating Arm including ceiling column, mounting base and fittings. Mechanical Contractor is to disconnect, dismantle, move, reassemble and reconnect to ductwork. General Contractor to reuse supports for extraction/articulating arm from existing Extraneous Lab 325A for reuse in new Extraneous Lab 328A.
 - .6 Spigots'

- .4 Addendum No. 1 Item 1.1.4
 Section 01 14 00 – Work Restrictions:
 - .1 1.6 Special Requirements
 - .1 Delete 'after hours work and' in Clause 1.6.3.
 - .2 Revise Clause number from '1.6.3' to '1.6.2'.

- .5 Section 02 41 23 – Selective Site Demolition:
 - .1 3.5 Removal Operations

- .1 Revise 3.5.7.2 sentence from 'Fire hose cabinet' to 'Snorkel/Articulating Arm including ceiling column, mounting base and fittings.'
- .2 Add new sentences as follows:
 - '3.5.7.23 Stainless steel casework benches.
 - 3.5.7.24 Stainless steel exhaust canopies.
 - 3.5.7.25 Stainless steel corner guards.
 - 3.5.7.26 Vertical metal service enclosures'
- .6 Add to Division 2 the following Abatement specifications sections:
 - .1 'Section 02 82 00.01 – Asbestos Abatement – Minimum Precautions'
 - .2 'Section 02 82 00.02 – Asbestos Abatement – Intermediate Precautions'
 - .3 'Section 02 83 10 – Lead – Base Paint Abatement – Minimum Precautions.'
- .7 Section 08 71 11 – Finish Hardware:
 - .1 Clause 2.2.5, Delete 'Owner' and add 'Security Contractor'.
- .8 Section 09 91 23 – Interior Painting:
 - .1 Add new Clause 2.5.1 to read as follows and renumber remaining Clauses: 'Concrete Horizontal Surfaces – floors
 - .1 INT 3.2C – Epoxy finish.
 - .2 Add new Clause 3.3.3.3 to read as follows:
 - 'Concrete: Maximum moisture content as indicated on Contract Drawings.'
- .9 Section 11 53 13 – Fume Hoods, Autoclave and Specialty Cabinets:
 - .1 Revise Clause 2.1.1.4 to read as follows:
 - 'Specialty cabinets to include acid and solvent storage cabinets, with two solvent cabinets located under one fume hood and two acid cabinets located under the other fume hood.'
- .10 Section 12 35 53 – Steel Laboratory Casework:
 - .1 Reissue Section 12 35 53 – Steel Laboratory Casework in its entirety (18 pages). Attachment.
 - .2 Reissue Section 12 35 53 – Steel Laboratory Casework
 - .1 In Clause 2.19.3 revise '50mm' casters to '125mm' casters.

1.2 DRAWINGS

- .1 Refer to drawing A-0.01 List of Drawings Site Plan-Existing
 - .1 Revise 'A-101' to 'A-201' Under List of Drawings, heading Note:
- .2 Refer to drawing A-0.02 Building Code Matrix Fire Separation Layout
 - .1 Revise 'Smoke' to 'Fire' in Note 7 under Fire Separation Notes.
 - .2 Add new Note 2 under Closure Notes as follows:

'Where existing doors are retrofitted with new door hardware and security hardware for access control, fire separation and access to labs are to be maintained.'

- .3 Refer to drawing A-0.03 Level 3 Floor Plan Existing Hoarding Plan.
 - .1 Add new note, 'Doors in Hoarding Notes'
 - .1 Single doors 915mm wide x 2133mm high x 45mm thick
 - .2 Double doors 762mm wide x 2133mm high x 45mm thick
 - .3 Doors to be hollow metal doors and frames with 3/4 Hour FRR
 - .4 Hardware: Lever handles with latching lockset on single door and on active leaf of double doors, closer on single door and on each leaf of double doors, manual flush bolts on inactive leaf of double doors. All door hardware to be fire rated, ULC listed.
 - .5 Doors and frames do not require painting.'
 - .2 Revise double doors in hoarding to actual size 762mm wide for each door and leaf in Microbiology 321 (1 set), Corridor 331 (2 sets) and Media Preparation (1 set).
 - .3 Add hoarding and 915mm wide door to west wall of Corridor 331. Hoarding to be placed outside the 4 windows along Grid Line 8 near grid lines F and F1. Hoarding approximately 4m long with 2 x 1m long returns back to west wall.
 - .4 Hoarding Notes: Add new note as follows: '5. Hoarding does not require painting.'
- .4 Refer to drawing,
A-1.01, Level 3 Floor Plan – Existing Floor Plan and Equipment Layout
 - .1 Extraneous Lab (325A): Add 2 sets of existing Compressed Air 'CA' and Dry Vacuum 'DV' spigots on east wall bench. Spigots not previously shown on drawing.
 - .2 Canning/Chemistry Lab (341): Add 1 existing Compressed Air 'CA' spigot on east bench of west aisle. Spigot not previously shown on drawing.
- .5 Refer to drawing,
A-1.02, Level 3 Floor Plan – Existing Floor Plan Existing Plan(Built-in Equipment)
 - .1 Add note 'For Reference Only' to drawing.
 - .2 Extraneous Lab (325A): Add 2 sets of existing Compressed Air 'CA' and Dry Vacuum 'DV' spigots on east wall bench. Spigots not previously shown on drawing.
 - .3 Canning/Chemistry Lab (341): Add 1 existing Compressed Air 'CA' spigot on east bench of west aisle. Spigot not previously shown on drawing.
- .6 Refer to drawings,
A-1.03, Level 3 Floor Plan – Existing RCP
A-1.04, Level 3 Floor Plan – Existing Floor Finishes Plan
 - .1 Add note 'For Reference Only' to drawings.
- .7 Refer to drawing,
A-1.03, Level 3 Floor Plan – Existing RCP

A-2.02, Level 3 Floor Plan – Deconstruction RCP

- .1 Delete 'Supply Air Diffuser Symbol' in Service Core (369)
- .8 Refer to drawing,
A-2.01, Level 3 Floor Plan – Deconstruction
 - .1 Extraneous Lab (325A): Add 2 sets of existing Compressed Air 'CA' and Dry Vacuum 'DV' spigots on east wall bench. Spigots not previously shown on drawing.
 - .2 Canning/Chemistry Lab (341): Add 1 existing Compressed Air 'CA' spigot on east bench of west aisle. Spigot not previously shown on drawing.
- .9 Refer to drawing,
A-2.04, Level 3 Floor Plan – Enlarged Floor Plan Deconstruction
 - .1 Microbiology Lab (321), revise tag '16a' to '16b' for 4 existing spigots (2 for Gas and 2 for Dry Vacuum) on east bench of west aisle.
 - .2 Existing Extraneous Lab (325A), delete tag '18a' from east wall.
- .10 Refer to drawings,
A-2.04, Level 3 Floor Plan – Enlarged Floor Plan Deconstruction
A-2.05, Level 3 Floor Plan - Enlarged Floor Plan Deconstruction
 - .1 Outline of Work Notes – Demolition
 - .1 Revise note 18a as follows: 'Items in Existing Extraneous Lab (325A) and Microscopy Room (337) to be removed and reinstalled on new gypsum board with 42mm furring channels over existing wall tile.'
 - .2 Revise in note 8, 'or reused as per Mechanical Drawings' to 'and returned to Owner in good condition.'
 - .2 Delete tag '18a' on drawing from west and east walls of Extraneous Lab (325A)
 - .3 Add note on drawings for valance on west wall of Open Office 330A as follows: 'Portion of existing wood valance light to be removed and returned to Owner in good condition.'
- .11 Refer to drawing,
A-2.05, Level 3 Floor Plan - Enlarged Floor Plan Deconstruction
 - .1 Revise tag '16a' to 16b' for 5 existing spigots (2 for Gas 'G', 2 for Dry Vacuum 'DV' and 1 for Compressed Air 'CA') on east bench of west aisle.
- .12 Refer to drawings,
A-3.01, Level 3 Floor Plan – Proposed Plan and Equipment Layout
A-3.02, Level 3 Floor Plan – Proposed Plan (Built-in Equipment)
 - .1 Method Development (317B): Add 2 new spigots, (1 for gas 'G' and 1 for dry vacuum 'DV') on east bench, over new service space.
 - .2 Transfer Lab (321): Delete 4 spigots (2 for gas 'G') and (2 for wet vacuum 'WV') from west bench of west aisle.
 - .3 Chemistry Lab (341): Add 2 new spigots (1 for gas 'G' and 1 one for dry vacuum 'DV') on west bench, over new service space. Add 1 new spigot for compressed air 'CA' on west bench, over new service space.

- .4 Canning Lab (342): Delete 2 spigots (1 for gas 'G' and 1 for dry vacuum 'DV') from east bench. Add 1 new spigot for Compressed Air 'CA' on east bench, over existing service space.
 - .5 Vestibule (316): Clarification, electrical receptacle is to be located on the east wall which is a Type 1 wall. Electrical receptacle is for Health Canada Bio Safety Cabinet.
 - .6 Microbiology (325): Revise raceways shown in plan on south wall of west and middle aisles to '1525mm' long. Locate clear and to the west of the existing electrical panels.
- .13 Refer to drawing A-3.03, Level 3 Floor Plan – Proposed RCP
- .1 Sample Reception (327), Extraneous Lab (328 and 328A)
 - .1 Add new supply air diffusers and return air diffusers as per Mechanical drawings.
 - .2 Reflected Ceiling Plan Symbol Legend
 - .1 Add 'symbol' for access panels, supply air diffusers and return air diffusers.
 - .3 Service Core (369)
 - .1 Delete supply air diffuser 'symbol'.
- .14 Refer to drawing A-3.05, Level 3 Floor Plan – Enlarged Floor Plan Proposed
- .1 Legend For New Construction Work
 - .1 Revise Wall Type1, from '3mm Peel and Stick Air Vapour Barrier in between 2 layers of gypsum board' to 'with 0.25mm Peel and Stick Air Vapour Barrier in between.'
 - .2 Revise circular tags to square tags for wall types 1, 3a, 3b & 3c.
 - .3 Revise cross hatch pattern in wall symbols to diagonal hatch pattern for wall types 3a, 3b & 3c which have masonry.
 - .4 Revise hatch pattern in wall symbol to a cross hatch pattern for wall type 1 which is a gypsum board assembly.
 - .2 Sample Reception (327)
 - .1 Revise cross hatch pattern to diagonal hatch pattern for new wall tag '3b' and add tag '10' to new west window wall.
 - .3 Corridor (319)
 - .1 Revise cross hatch pattern of concrete block infills to diagonal hatch pattern that have tags 3a.
 - .4 Spigot Locations
 - .1 Refer to attached drawings 'SK15-A3.05, SK16-A3.05 and SK17-A3.05' for spigot locations.
 - .5 Microbiology (325): Revise raceways shown in plan on south wall of west and middle aisles to '1525mm' long. Locate clear and to the west of the existing electrical panels.
- .15 Refer to drawing A-3.06, Level 3 Floor Plan – Enlarged Floor Plan Proposed
- .1 Legend For New Construction Work
 - .1 Revise Wall Type1, from '3mm Peel and Stick Air Vapour Barrier in between 2 layers of gypsum board' to 'with 0.25mm Peel and Stick Air Vapour Barrier in between.'
 - .2 Revise 'circular' tags to 'square' tags for wall types 1, 3a, 3b & 3c.

- .3 Revise 'cross hatch pattern' in wall symbols to 'diagonal hatch pattern' for wall types 3a, 3b & 3c which have masonry.
- .4 Revise 'hatch pattern' in wall symbol to a 'cross hatch pattern' for wall type 1 which is a gypsum board assembly.
- .2 Extraneous Lab (328a) and Open Workstations,
 - .1 Revise 'cross hatch pattern' to 'diagonal hatch pattern' for new walls with tag 3c.
- .3 Media Preparation Lab (345)
 - .1 Add dimensions to canopies over Autoclaves.
- .4 Wash-up (347)
 - .1 Add dimensions to canopies over Autoclaves and Dishwasher.
- .5 Spigot Locations
 - .1 Refer to attached drawing 'SK18-A3.06' for spigot locations.
- .16 Refer to drawing A-4.02, Level 3 Floor Plan – Phase 1 Existing
 - .1 Corridor (331)
 - .1 Add hoarding and 915mm wide x 2133mm high door to west wall of Corridor 331. Hoarding to be placed outside the 4 windows along Grid Line 8 near grid lines F and F1. Hoarding approximately 4m long with 2 x 1m long returns back to west wall.
 - .2 Add note to drawing as follows: 'Phase 1c to commence towards the end of Phase 1a.'
- .17 Refer to drawings,
 - A-4.06 Level 3 Floor Plan – Phase 3A1 Existing
 - A-4.07 Level 3 Floor Plan – Phase 3A1 Complete
 - .1 Incubator Room (323)
 - .1 Add note to drawing as follows: 'Relocate temporarily -86 degree C Freezer (EQ 337) and Freezer #9 (EQ 29) from existing Microbiology Lab (321) and existing Culture Room (317A) respectively to north wall of Incubator Room (323) and are to be kept operational at all times. At the end of Phase 3A1 Complete, (EQ 337) is to be returned to Method Development (317B) and Freezer (EQ 29) is to be returned to Biohazard Room (317A).'
- .18 Refer to drawings,
 - A-4.05 Level 3 Floor Plan – Phase 2 Complete
 - A-4.06 Level 3 Floor Plan – Phase 3A1 Existing
 - A-4.09 Level 3 Floor Plan – Phase 3A2 Complete
 - .1 Microbiology (325)
 - .1 Add note to drawing as follows: 'Relocate temporarily Refrigerator #22 (EQ 324) from north wall of existing Microbiology Lab (321) to north wall of new Microbiology Lab (325) after Phase 2 is complete. (EQ 324) is to be kept operational through Phase 3A1 existing. At Phase 3A2 Complete, (EQ 324) is to be returned to

the north wall of Transfer Lab (321). Microbiology Lab is to be kept operational during these phases.'

- .19 Refer to drawings:
 - A-4.07 Level 3 Floor Plan – Phase 3A1 Complete
 - A-4.08 Level 3 Floor Plan – Phase 3A2 Existing
 - A-4.10 Level 3 Floor Plan – Phase 3B Existing
 - A-4.11 Level 3 Floor Plan – Phase 3B Complete
 - A-4.12 Level 3 Floor Plan – Phase 3C Existing
 - A-4.13 Level 3 Floor Plan – Phase 3C Complete
 - A-4.14 Level 3 Floor Plan – Phase 3D Existing
 - A-4.15 Level 3 Floor Plan – Phase 3D Complete
- .1 Corridor (317)
 - .1 Revise door no.'315c' to '317'
- .20 Refer to drawing,
 - A-5.01 Level 3 Partial Floor Plan and Laboratory Casework Room/Casework Elevations
- .1 On Detail 1/A5.01, Partial Proposed Floor Plan: In Extraneous Lab 328 and 328A, Add a new elevation reference detail bubble 4/A501, Elevation 5 Similar. Locate bubble near Grid line E facing east. This is a new reference bubble for the tables along the east window wall of Extraneous Lab 328/328A. They are similar to the tables along the east window wall in Sample Reception 327.
- .2 On Detail 3/A5.01, Elevation 1:
 - .1 Revise two under counter storage units at desk area to each with two single top drawers and one single bottom drawer for file storage. Include hanging file hardware.
 - .2 Keyboard is sliding articulating type complete with mouse tray. Touch controls for raising, lowering and tilting.
- .3 On Detail 3/A5.01, Elevation 2: Clarification. Add 'X' through window area to show extent of windows to be removed.
- .4 On Detail 4/A5.01, Elevation 1: Add '(M)' after note 'Vertical Service Column'.
- .5 On Detail 4/A5.01, Elevation 2: Add '(M)' after note 'Vertical Wiremold Service Column (Power)'
- .6 On Detail 4/A5.01, Elevation 2: Keyboard is sliding articulating type complete with mouse tray. Touch controls for raising, lowering and tilting.
- .7 On Detail 4/A5.01, Elevation 5: Add bottom horizontal tubular square frames to side and back legs of mobile tables.
- .8 On Detail 5/A5.01, Elevation 1: Add note, ' Two solvent and two acid storage cabinets under fume hoods to be supplied by CFIA'.

- .9 On Detail 5/A5.01, Elevation 2: Update size of glass in door as shown on Type 3 Door on Drawing A-302.
- .10 On Detail 5/A5.01, Elevation 4: Near Grid line 9, switch drawer unit with double door unit.
- .11 On Detail 6/A5.01, Elevation 1, 2 and 3: Update spacing for posts and shelves to match spacing shown on casework in Microbiology (325) on floor plan A-3.05. Raceways to be extended to align with end of benches.
- .12 On Detail 6/A5.01, Elevation 3: Revise drawer cabinet unit nearest the new door to a single door cabinet unit.
- .13 On Detail 7/A5.01, Elevation 1: Update spacing for posts and shelves to match spacing shown on casework in Microbiology (325) on floor plan A-3.05. Raceways to be extended to align with end of benches.
- .14 On Detail 7/A5.01, Elevation 3: Add 'K1' to raceway. Add note, 'Reused table'. There are two located on south wall.
- .16 On Detail 7/A5.01, Elevation 3: Add '1525mm long raceways' for power, voice and data. One located on south wall of west aisle and one on south wall of middle aisle. Mount on wall to the west and clear of the existing electrical panels.
- .17 On Detail 8/A5.01, Elevation 3: Revise note to 'Add frosted glazing window film to existing window glass'.
- .18 On Detail 8/A5.01, Elevation 3: Revise 'power raceway' to 'raceway'.
- .21 Refer to drawing,
A-5.02 Level 3 Partial Floor Plan and Laboratory Casework Room/Casework Elevations.
 - .1 On Detail 1/A5.02, Partial Proposed Floor Plan: Relocate Equipment No. 110 to the counter over the open knee space F1 on counter along south wall.
 - .2 On Detail 3/A5.02, Elevation 1: Relocate Equipment No. 110 to the counter over the open knee space F1.
 - .3 On Detail 7/A5.02, Elevation 1: Add note to open space below counter: 'F1 Existing Knee Space'.
 - .4 On Detail 7/A5.02, Elevation 1: Delete 'dashed line' and 'Broken line denotes the extent of new GBD partition'. Delete 'Health Canada Lab'.
- .22 Refer to drawing,
A-5.03 Level 3 Partial Floor Plan and Laboratory Casework Room/Casework Elevations.
 - .1 On Detail 5/A5.03, Elevation 1:
 - .1 Add '(M)' after note 'Vertical Service Column'.
 - .2 Add '(L)' after note 'Vertical Service Enclosure'.

- .2 On Detail 5/A5.03, Elevation 3: Revise 'light grey shading' for Relocated Cabinet to 'dark grey shading' as shown for Existing Casework Relocated in the Casework Elevation Legend.
- .23 Refer to drawing, A-6.01, Level 3 Floor Plan – Sectional Details
 - .1 Details 5, 6, 7 & 9/A6.01 Level 3 –Technical Details
 - .1 Revise 140 mm new Gypsum Board Wall Partition, from '3mm Peel & Stick Air Barrier in between 2 layers of Gypsum Board' to 'with 0.25mm Peel & Stick Air Vapour Barrier in between.'
 - .2 Details 5, 6, 9 & 11/A6.01 Level 3 –Technical Details
 - .1 Revise note from 'New Raceway for Power and Data' to 'New Raceway with Separate Compartments for Power and Data.'
 - .3 Drawing 1/A6.01 Level 3 –Technical Details
 - .1 Revise note from 'Existing Spigots to be removed and reinstalled' to 'Existing Spigots to be removed'.
 - .4 Drawing 2/A6.01 Level 3 –Technical Details
 - .1 Revise note from 'Spigot to be removed and reused' to 'Spigots to be removed'.
 - .5 Drawing 5/A6.01 Level 3 –Technical Details
 - .1 Revise note from 'Relocated Spigot' to 'New Spigots'.
 - .6 Drawing 6/A6.01 Level 3 –Technical Details
 - .1 Delete note 'Existing Spigot' and spigot 'symbol' on bench.
 - .7 Drawing 7/A6.01 Level 3 –Technical Details
 - .1 Revise note from 'Relocated Spigots' to 'New Spigots'
 - .2 Revise note 'Relocated counter top w/sink' to 'New counter top with relocated sink'
 - .8 Drawing 8/A6.01 Level 3 –Technical Details
 - .1 Revise notes from 'Spigot to remain' and 'Spigot to be reused' to 'Existing Spigots to be removed.'
 - .9 Drawing 9/A6.01 Level 3 –Technical Details
 - .1 Revise notes from 'Spigot to remain' and 'New Spigots'
- .24 Refer to drawing A-6.02, Level 3 Floor Plan – Wall Type Assemblies and Miscellaneous Details
 - .1 Plan Details 4/6.02, Wall details 4a and 4b, revise wall type 1, from '3mm Peel & Stick Air Barrier in between 2 layers of Gypsum Board' to 'with 0.25mm Peel & Stick Air Vapour Barrier in between.'
 - .2 Plan Details 3/6.02, Wall detail 3b, add to note, '15.9mm gypsum board (Type X with mould resistance)' before 'Existing 140mm concrete block'

- .3 Plan Details 3/6.02, Wall detail 3b, add new note, 'Line of concrete block below window sill'.
- .25 Refer to drawing A-7.01, Level 0 Floor Plan - Existing Plan
 - .1 Mechanical Room B57, add 150mm high concrete pad for new UPS equipment with maintenance by-pass and battery cabinet. Refer to Drawing No. 'SK 14-07.01' attached.
 - .2 Add 'Phasing line and shading' for new Area of Construction Work in B57 and add note 'All Phases'.

END OF ADDENDUM

Room Name			COMPONENT I.D. (MOTTLAB SERIAL NUMBER)																								Comments						
	Exist Room	New Room	A1 (1710011)	A2 (1610011)	A3 (1610211)	1720011	B1 (1713011)	B2 (1613011)	C1 (1710022)	1610044	D1	D2 (1610090)	D3 (1610044)	D4 (1610055)	1680090	1720011	1720044	15A1 (3 door unit)	E1	E2	F1	G1	H1	H2	H3	J1		J1.1	J2	K1	L1	M1	
Microbiology	321	N/A	12	2						2				2	3							6			12	6	8						
Identification	317	N/A				2										1					2												
Canning/Chemistry Lab	341	N/A	1							1			1					1						4	2	2							
Media Preparation Lab	345	N/A																															
Total:			13	2	0	2	0	0	0	3	0	0	1	2	3	1	0	1	0	0	8	0	16	8	10	0	0	0	0	0	0	0	

List of Spigots

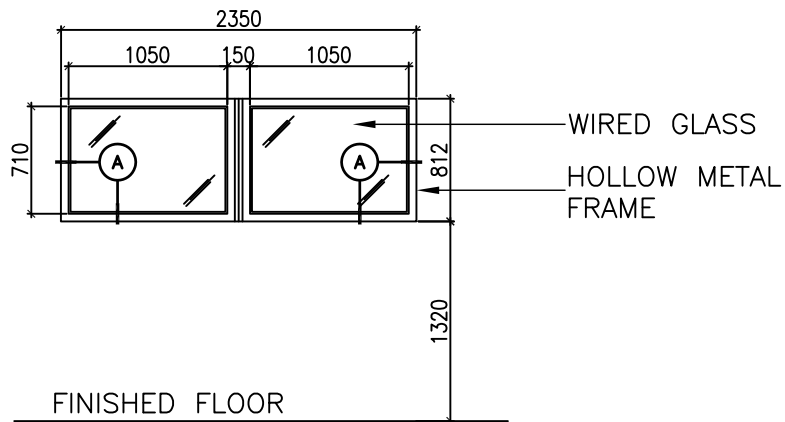
Drawing No. A-604

Existing Spigots and Spigots to be Deconstructed & Relocated:

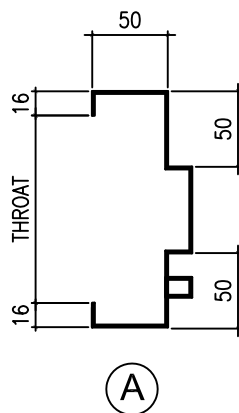
ITEM NO.	DWG No.	RM NO.	ROOM NAME	EXIST. (GAS)	EXIST. (DV)	TO BE DECONSTRU-CTED (GAS)	TO BE DECONSTRU-CTED (DV)	TO BE RELOCATED (GAS)	TO BE RELOCATED (DV)	EXIST. TO REMAIN (GAS)	EXIST. TO REMAIN (DV)
1	A-2.04	315	HC LAB	1	1	1	1	-	-	-	-
2	A-2.04	321	MICROBIOLOGY LAB	8	8	4	4	2	2	4	4
3	A-2.04	325A	EXTRANEIOUS LAB	5	5	5	5	5	5	-	-
4	A-2.05	341	CHEMISTRY LAB	11	10	5	4	1	1	6	6
5	A-2.05	345	MEDIA PREP. LAB	1	1	-	-	-	-	1	1
6	A-2.05	355A	PRE PC LAB	0	1	-	-	-	-	-	1
7	A-2.05	355C	POST PC LAB	0	1	-	-	-	-	-	1
				26	27	15	14	8	8	11	13

Existing to remain, Relocated & New Spigots:

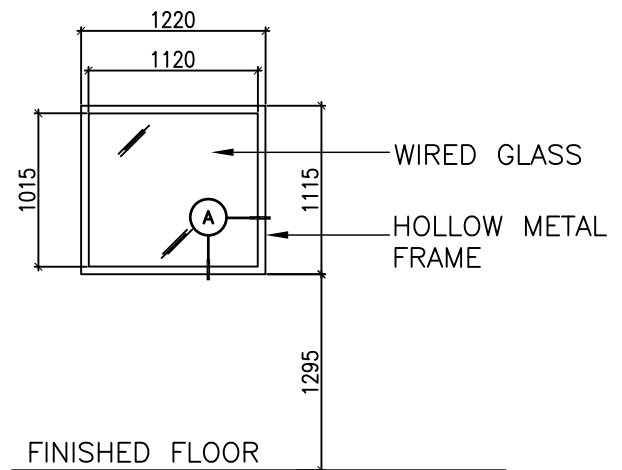
ITEM NO.	DWG No.	RM NO.	ROOM NAME	EXISTING TO REMAIN (GAS)	EXIST TO REMAIN (DV)	RELOCATED (GAS)	RELOCATED (DV)	NEW (GAS)	NEW (DV)
1	A-3.05	315	HC LAB	-	-	1	1	-	-
2	A-3.05	316	VESTIBULE	-	-	1	1	-	-
3	A-3.05	317B	METHOD DEVELOPMENT	-	-	1	1	-	-
4	A-3.05	321	TRANSFER LAB	4	4	-	-	-	-
5	A-3.05	325	MICROBIOLOGY LAB	-	-	1	1	2	2
6	A-3.06	328A	EXTRANEIOUS LAB	-	-	-	-	1	-
7	A-3.06	337	MICROSCOPY ROOM	-	-	-	-	1	-
8	A-3.06	341	CHEMISTRY LAB	5	5	2	2	1	-
9	A-3.06	342	CANNING LAB	1	1	2	2	1	-
10	A-3.06	345	MEDIA PREP. LAB	1	1	-	-	-	-
11	A-3.06	355A	PRE PCR LAB	-	1	-	-	-	-
12	A-3.06	355C	POST PCR LAB	-	1	-	-	-	-
				11	13	8	8	6	2



TYPE 1
NEW WINDOW
Scale-1:50



FRAME SECTION
NEW WINDOWS
Scale-1:5



TYPE 2
NEW WINDOW
Scale-1:50

Project title: SCARBOROUGH
CFIA
HEALTH CANADA BUILDING
2301 MIDLAND AVENUE

CFIA GTA LABORATORY

Drawing title: WINDOW SCHEDULE

Designed by : GL

Drawn by : LK

Approved by :

Bid: D. MAVROUDIS

Plot scale : AS NOTED

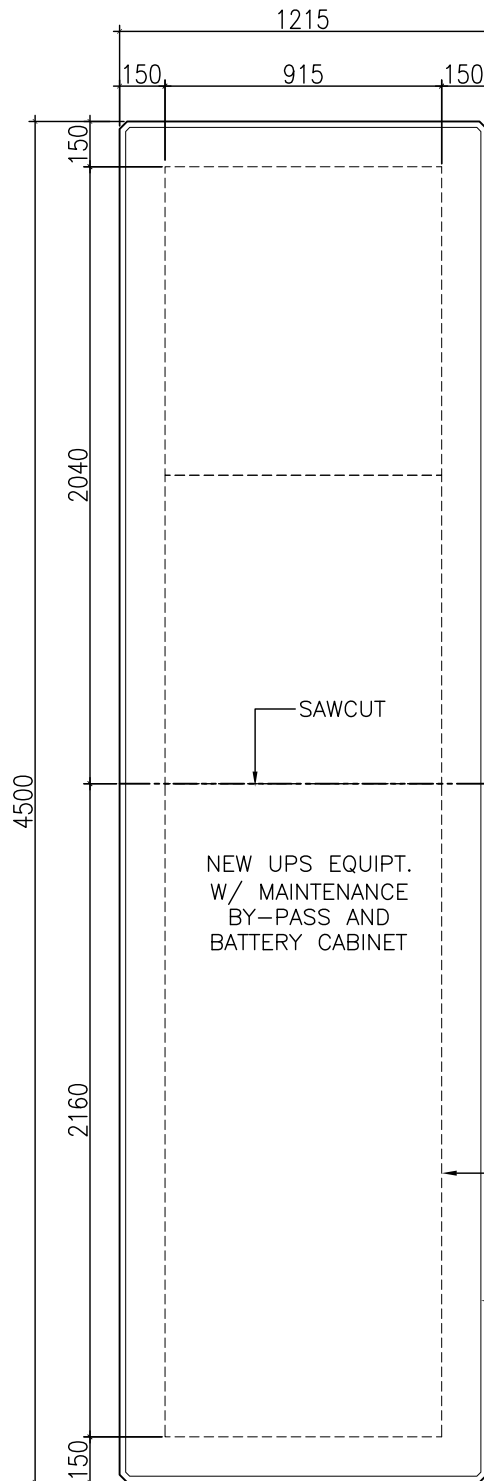
Drawing no.: **A-701**

Project no.: **R.061999.001**

Project date : **2015-02-02**

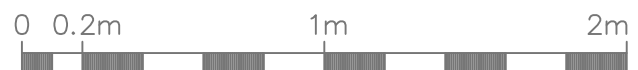
Date plotted : **2015-02-02**

Cadd file :



CONCRETE PAD DETAIL NOTES:
(REFER TO ELECTRICAL DRAWINGS)

1. REMOVE EXISTING EPOXY FLOOR FINISH TO EXPOSE TOP OF EXISTING CONCRETE SLAB ON GRADE TO THE EXTENT OF NEW PAD.
2. DRILL AND GROUT 10Mx8" LONG VERTICAL PINS (EMBED 4") INTO EXISTING SLAB AT MAX. 24" C/C EACH WAY.
3. PROVIDE MIN. 6" THICK NEW CONC. PAD REINFORCED WITH 10M AT 12" C/C MID-HEIGHT EACH WAY. THE SLAB TO BE LEVELED, WITH INCREASED THICKNESS DUE TO SLOPE OF THE EXISTING SLAB ON GRADE.
 - USE 25 MPa CONCRETE AT 28 DAYS (NON AIR, MIN. 265kg/m³ OF CEMENT, WITH CONCRETE RATIO IN THE RANGE OF 0.5).
 - EXTEND PAD MIN. 6" ALL AROUND THE UPS EQUIPMENT.
 - PROVIDE SAW CUTS 1.25" DEEP AT MAX. 10'-0" C/C.
 - PROVIDE DUST BARRIER AROUND WORK AREA.
4. STANDARDS CONFORMANCE FOR WORK:
 - CONCRETE – CSA A23.1-09, A23.2-09 AND A23.3-04.
 - REBAR – CSA G30.18, MIN. YIELD STRENGTH OF 400 MPa
5. NEW EPOXY COATING ON PAD TO TIE INTO EXISTING EPOXY COATING ON CONC. FLOOR SLAB. EPOXY COLOR TO MATCH EXISTING.
6. ACTUAL SIZE OF PAD TO BE DETERMINED BASED ON UPS EQUIPMENT SHOP DRAWINGS.
7. LOCATION OF CONCRETE PAD IN MECHANICAL ROOM B57 TO BE VERIFIED.
8. OVERALL FOOTPRINT DIMENSIONS SHOWN ARE APPROXIMATE.



Project title: **SCARBOROUGH**
CFIA
HEALTH CANADA BUILDING
2301 MIDLAND AVENUE

CFIA GTA LABORATORY

Drawing title: **UPS CONCRETE PAD**

Designed by : **GL**

Drawn by : **LK**

Approved by :

Bid: **D. MAVROUDIS**

Plot scale : **1:25**

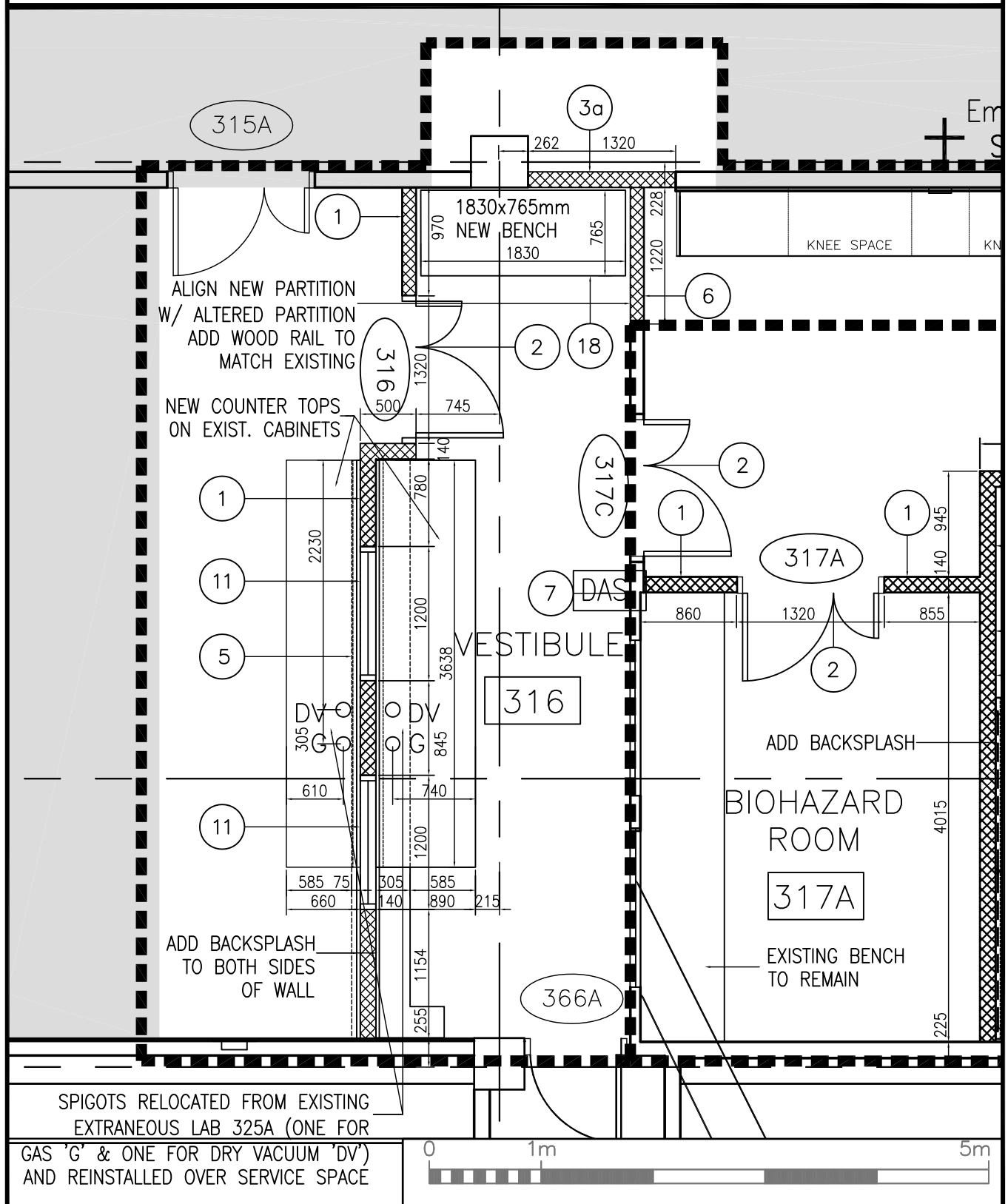
Drawing no.: **SK14-A7.01**

Project no.: **R.061999.001**

Project date : **2015-02-02**

Date plotted : **2015-02-02**

Cadd file :



Project title: SCARBOROUGH
CFIA
HEALTH CANADA BUILDING
2301 MIDLAND AVENUE

CFIA GTA LABORATORY

Drawing title: SPIGOT LOCATIONS
HC LAB (315) AND VESTIBULE (316)

Designed by : GL

Bid: D. MAVROUDIS

Drawn by : LK

Approved by :

Plot scale : 1:50

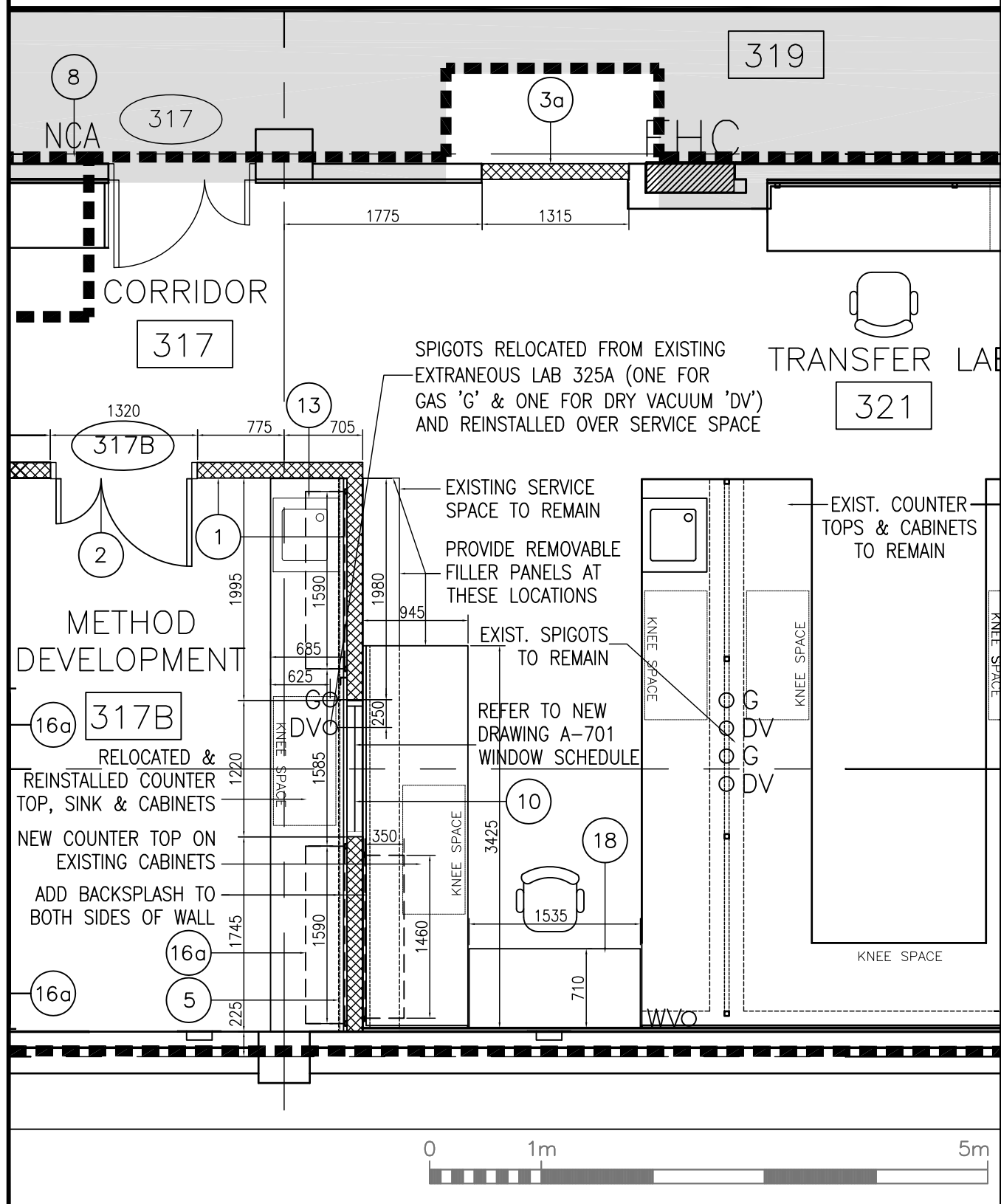
Drawing no.: SK15-A3.05

Project no.: R.061999.001

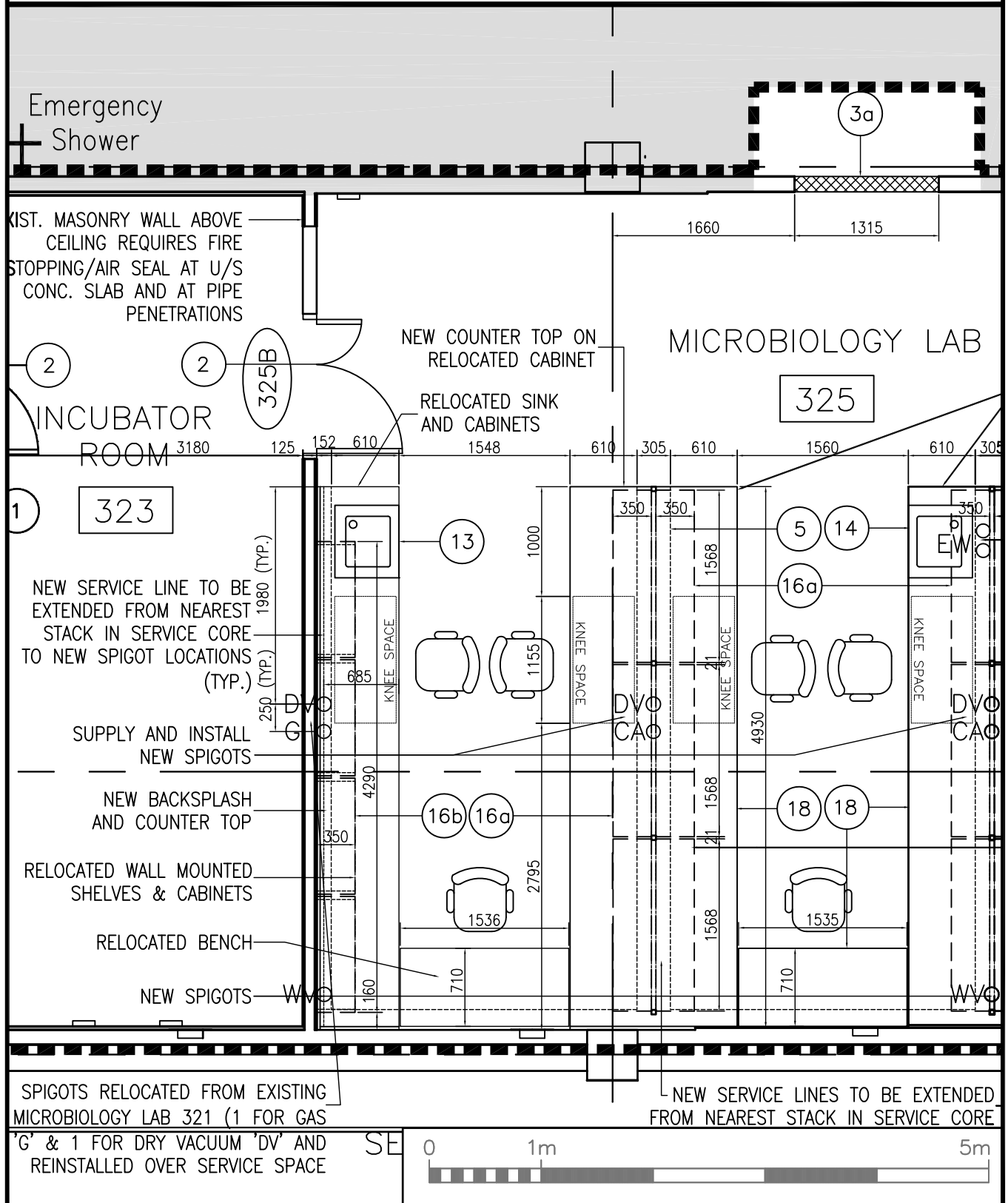
Project date : 2015-02-02

Date plotted : 2015-02-02

Cadd file :



Project title: SCARBOROUGH CFIA HEALTH CANADA BUILDING 2301 MIDLAND AVENUE CFIA GTA LABORATORY	Drawing title: SPIGOT LOCATIONS METHOD DEVELOPMENT (317B)		Drawing no.: SK16-A3.05
			Project no.: R.061999.001
	Designed by : GL	Bid: D. MAVROUDIS	Project date : 2015-02-02
	Drawn by : LK		Date plotted : 2015-02-02
	Approved by :	Plot scale : 1:50	Cadd file :



Project title: SCARBOROUGH
CFIA
HEALTH CANADA BUILDING
2301 MIDLAND AVENUE

CFIA GTA LABORATORY

Drawing title: SPIGOT LOCATIONS
MICROBIOLOGY LAB (325)

Designed by : GL

Drawn by : LK

Approved by :

Bid: D. MAVROUDIS

Plot scale : 1:50

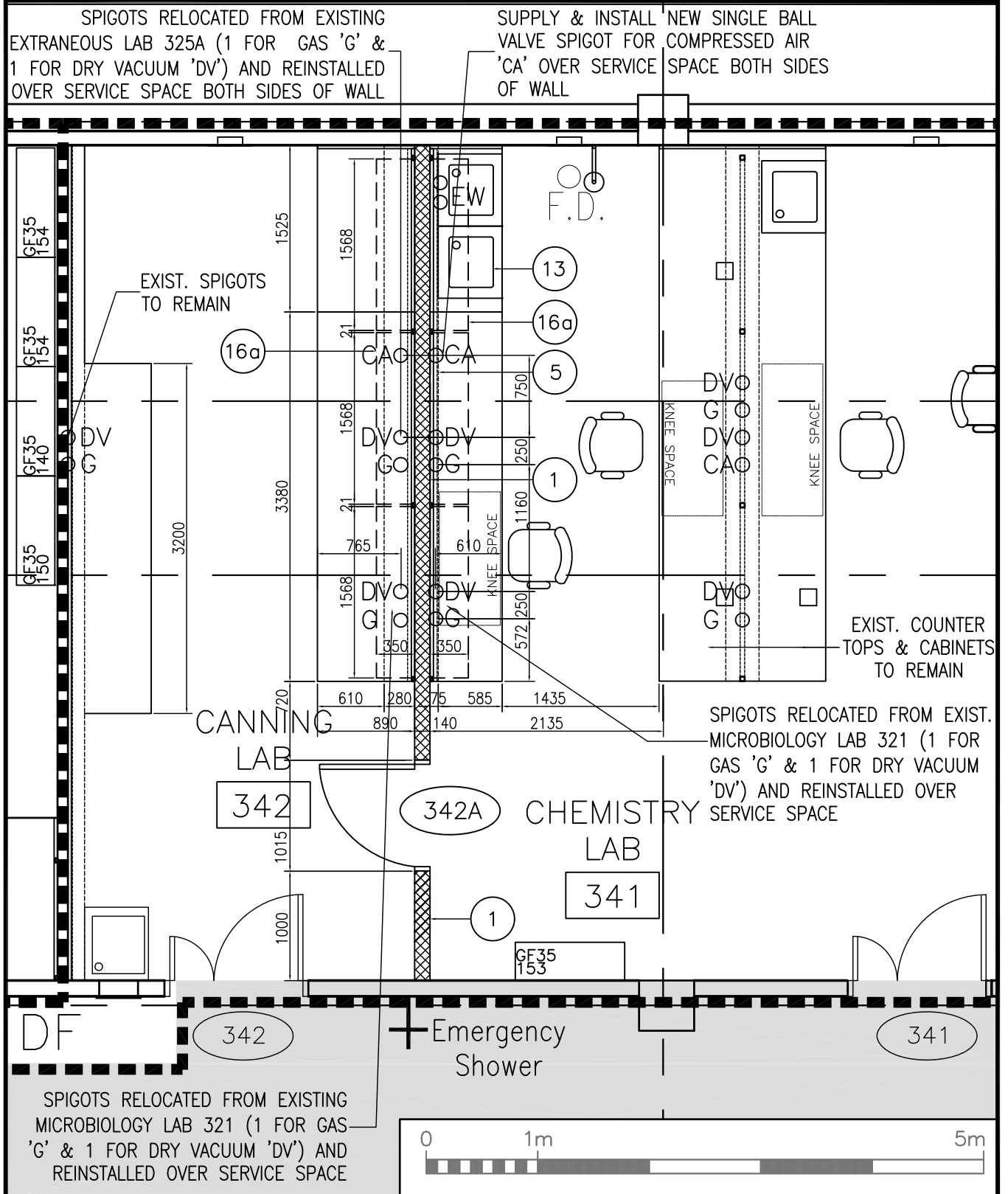
Drawing no.: SK17-A3.05

Project no.: R.061999.001

Project date : 2015-02-02

Date plotted : 2015-02-02

Cadd file :



Project title: SCARBOROUGH
CFIA
HEALTH CANADA BUILDING
2301 MIDLAND AVENUE
CFIA GTA LABORATORY

Drawing title: SPIGOT LOCATIONS
CHEMISTRY LAB (341) &
CANNING LAB (342)

Designed by: GL
Drawn by: LK
Approved by:
Bid: D. MAVROUDIS
Plot scale: 1:50

Drawing no.: SK18-A3.06
Project no.: R.061999.001
Project date: 2015-02-02
Date plotted: 2015-02-02
Cadd file:

PART 1 - GENERAL

1.1 PRODUCTS SUPPLIED BUT NOT INSTALLED UNDER THIS SECTION	.1	Faucets, tail pieces, strainers, traps, and drains.
1.2 REFERENCES	.1	<p>ASTM International (ASTM)</p> <p>.1 ASTM A167-99(2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.</p> <p>.2 ASTM A653/A653M-13, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.</p> <p>.3 ASTM B456-11e1, Standard Specification for Electrodeposited Coatings of Copper Plus Nickel Plus Chromium and Nickel Plus Chromium.</p> <p>.4 ASTM B117-11, Standard Practice for Operating Salt Spray (Fog) Apparatus.</p> <p>.5 ASTM D256-10, Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.</p> <p>.6 ASTM D570-98(2010)e1, Standard Test Method for Water Absorption of Plastics.</p> <p>.7 ASTM D635-10, Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.</p> <p>.8 ASTM D638-10, Standard Test Method for Tensile Properties of Plastics.</p> <p>.9 ASTM D695-10, Standard Test Method for Compressive Properties of Rigid Plastics.</p> <p>.10 ASTM D696-08e1, Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30°C and 30°C with a Vitreous Silica Dilatometer.</p> <p>.11 ASTM D785-08, Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.</p> <p>.12 ASTM D790-10, Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.</p> <p>.13 ASTM D2197-13, Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion.</p> <p>.14 ASTM D2247-11, Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.</p>

1.2 REFERENCES
(Cont'd)

- .1 (Cont'd)
 - .15 ASTM E54-80(1996), Standard Test Methods for Chemical Analysis of Special Brasses and Bronzes (Withdrawn 2002).
 - .16 ASTM E478-08, Standard Test Methods for Chemical Analysis of Copper Alloys.
- .2 National Electrical Manufacturers Association (NEMA)
- .3 Scientific Equipment & Furniture Association (SEFA).

1.3 DESIGN
REQUIREMENTS

- .1 Chemical resistance of all components of casework: No detectable change in working material from:
 - .1 Acetate, Amyl.
 - .2 Acetate, Ehtyl.
 - .3 Acetic Acid, 98%.
 - .4 Acetone.
 - .5 Acid Dichromate, 5%.
 - .6 Alcohol, Butyl.
 - .7 Alcohol, Ethyl.
 - .8 Alcohol, Methyl.
 - .9 Ammonium Hydroxide, 28%.
 - .10 Benzene.
 - .11 Carbon Tetrachloride.
 - .12 Chloroform.
 - .13 Chromic Acid, 60%.
 - .14 Cresol.
 - .15 Dichlor Acetic Acid.
 - .16 Dimethylformanide.
 - .17 Dioxane.
 - .18 Ethyl Ether.
 - .19 Formaldehyde.
 - .20 Furfural.
 - .21 Hydrogen Peroxide.
 - .22 Iodine, Tincture of.
 - .23 Methyl Ethyl Ketone.
 - .24 Methylene Chloride.
 - .25 Mono Chlorobenzene.
 - .26 Naphtalene.
 - .27 Phenol, 90%.
 - .28 Phosphoric Acid, 85%.
 - .29 Sodium Hydroxide, 10%.
 - .30 Sulfuric Acid, 33%.
 - .31 Zinc Chloride, Saturated.
- .2 Casework design to be as follows:
 - .1 Casework to be metric size to match existing casework.

-
- 1.3 DESIGN REQUIREMENTS (Cont'd)
- .2 Casework design to be as follows:(Cont'd)
- .2 Support systems must be a core and panel style support structure.
 - .3 Core structure can be supported by anchoring to suitable flooring material or may be supported by structural end gables (outrigger legs).
 - .4 Modular components to be suitable for single faced wall cores or double faced peninsula or island configuration.
 - .5 Core assemblies must have removable panels on all sides.
 - .6 Casework to include removable filler panels.
- 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 steel laboratory casework and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
- .1 Indicate on drawings:
 - .1 Details of laboratory casework construction and related and dimensional position, with sections.
 - .2 Location of each casework unit.
 - .3 Location for roughing-in of plumbing, including sinks, faucets, strainers and cocks and electrical services.
- .4 Samples:
- .1 Submit duplicate samples of:
 - .1 Countertop material, 300 x 300 mm including external corner.
 - .2 Standard colour of cabinet finish on 300 x 300 mm steel sheet.
 - .3 Cabinet hardware.
 - .4 Plumbing brass and electrical outlets.
 - .2 Submit one base cabinet complete with cupboard and drawers minimum 1200 mm long, including specified bench top, splashback, end return and curb shelf.
 - .3 Submit wall case minimum 600 mm long. If sliding doors used on project 875 mm minimum long.
-

1.4 ACTION AND
INFORMATIONAL
SUBMITTALS
(Cont'd)

- .5 Test Reports:
.1 Include test reports by independent testing laboratories indicating results of furniture finish tests.

1.5 QUALITY
ASSURANCE

- .1 Installers qualifications: Perform Work of this Section by a company that has a minimum of five years proven experience in the installation of laboratory casework of a similar size and nature and that is approved by manufacturer. Submit to Departmental Representative, installer's current certificate of approval by the material manufacturer as proof of compliance.
- .2 Perform work of this Section in accordance with SEFA recommended practices.
- .3 Attach labels to electrical equipment attesting to CSA or Ontario Hydro approval.
- .4 Mock-up:
.1 Construct one hinged door cabinet with in location acceptable to Departmental Representative.
.2 Arrange for Departmental Representative's review and acceptance, allow 48 hours after acceptance before proceeding with Work.
.3 Mock-up may remain as part of Work if accepted by Departmental Representative. Remove and dispose of mock-ups which do not form part of Work.
.4 Upon acceptance, mock-up shall serve as a minimum standard of quality for the balance of the work of this Section.

1.6 DELIVERY,
STORAGE AND
HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 and with manufacturer's written instructions.
- .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 in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect steel laboratory casework from nicks, scratches, and blemishes.

- | | | |
|--|----|--|
| 1.6 DELIVERY,
STORAGE AND
HANDLING
(Cont'd) | .3 | Storage and Handling Requirements:(Cont'd)
.3 Replace defective or damaged materials with new. |
| | .4 | Packaging Waste Management: remove for reuse and return by manufacturer of pallets, crates, padding and packaging materials as specified in accordance with Section 01 74 20. |
| 1.7 EXTENDED
WARRANTY | .1 | Submit a extended warranty for laboratory casework Work in accordance with General Conditions, except that warranty period is extended to 2 years.
.1 Against leaking of mechanical hardware including plumbing, warping or twisting of casework, and finish failure.
.2 Coverage: Complete replacement including affected adjacent parts. |

PART 2 - PRODUCTS

- | | | |
|--|----|--|
| 2.1 ACCEPTABLE
MANUFACTURERS(BUT
NOT LIMITED TO) | .1 | Acceptable manufacturers of new casework to include but not be limited to:
.1 Bedcolab Ltd., 1-800-461-6414, www.bedcolab.com .
.2 Fisher Hamilton Scientific Canada, 1-920-793-1121, www.hamiltonscientific.com .
.3 mottLAB Inc., (905) 331-1877, www.mottlab.com .
.4 VWR International, 1-800-932-5000, https/ca.vwr.com . |
| | .2 | New casework: Refer to Section 00 01 20 for a list of new casework required for this Project. |
| 2.2 EXISTING AND
SALVAGED CASEWORK | .1 | Existing laboratory casework:
.1 The manufacturer of existing laboratory casework is mottLAB Inc., (905) 331-1877, www.mottlab.com .
.2 Refer to List of Existing Relocated Casework (Drawing No. A-602).
.3 Doors and drawers: Prefinished steel colour 'Dove Gray (601008)'.
.4 Frames, back panels, side panels and post/pilasters: Prefinished steel colour 'Cool White (601009)'. |

-
- 2.2 EXISTING AND SALVAGED CASEWORK
(Cont'd)
- .2 Salvaged casework:
.1 Existing casework salvaged Section as required for the supply of salvaged casework to be resinstalled under this Section.
.2 Refer to Section 00 01 20 for list of relocated existing casework for this Project.
- 2.3 MATERIALS
- .1 Galvanized steel sheet: commercial quality to ASTM A653/A653M with Z275 zinc coating.
- .2 Cold rolled steel: Furniture grade, cold rolled painted steel conforming to SEFA requirements.
- .3 Stainless steel sheet: to ASTM A167, Type 304 and 316, with finish to match existing.
- .4 Stainless steel tubing: AISI Type 304, commercial grade, seamless welded, 1.5 mm wall thickness.
- .5 Glazing: In accordance with Section 08 80 00.
- .6 Sealants: In accordance with Section 07 90 00.
- 2.4 COUNTERTOP MATERIALS
- .1 Solid phenolic countertops:
.1 25 mm thick, solid phenolic countertop material in black colour with low gloss smooth finish.
.2 Phenolic material to meet the below criteria:
.1 Coefficient of linear expansion: to ASTM D696, 1.65×10^{-5} in/°C.
.2 Comprehensive strength: to ASTM D695, 43,000 psi.
.3 Fire resistance: To ASTM D635, self extinguishing.
.4 Flexural strength: to ASTM D790.
.1 Ultimate: 23,000 psi.
.2 Modulus: 15,000 psi.
.5 Impact strength: to ASTM D256, 0.68 ft-lbs in.
.6 Tensile strength: to ASTM D638.
.1 Ultimate: 22,000 psi.
.2 Modulus: 17,000 psi.
.7 Rockwell hardness: to ASTM D785, 120.
.8 Water absorption: to ASTM D570, 0.30%.
-

2.4 COUNTERTOP
MATERIALS
(Cont'd)

- .1 (Cont'd)
- .2 (Cont'd)
- .9 Direct flame resistance: Bunsen Burner, 3 minutes.
- .10 Chemical resistance: To meet requirements as outlined in Part of this Section.

2.5 COUNTERTOP
FABRICATION

- .1 Fabricate laboratory countertops and splashbacks in accordance with reviewed shop drawings, manufacturer's written instructions and to meet SEFA requirements.
- .2 Fabricate laboratory countertops and splashbacks as indicated.
- .3 Use specified materials in designated locations.
- .4 Fabricate countertop and splashback sections in as long a length as practicable in accordance with reviewed shop drawings.
- .5 Cut holes for fittings, accessories, and equipment.
- .6 Drip grooves to be provided on the underside at all exposed edges.
- .7 All exposed edges to be sanded to a smooth finish and, except as indicated below to be rounded to a 6 mm radius at front top edge and at vertical corners.
- .8 Fix work surface panels. Use manufacturer recommended metal screws sized to stop at least 3 mm short of the finished face. Pre-drill panel with an manufacturer recommended high speed drills bit aligned with required clearance holes in the supporting structure.
- .9 Curbs to be bonded to the top of the work surface to form a square joint.
- .10 Cutouts for under-mounted sinks to be routed and sanded to form smooth edged openings with the top edge radiused to approximately 3 mm. The bottom edge of the sink opening to be finished smooth with the edge broken to prevent sharpness. Corners of sink cutouts to be radiused not less than 19 mm. Under-mounted

- | | |
|---|--|
| 2.5 COUNTERTOP
FABRICATION
(Cont'd) | .10 (Cont'd)
sinks to be supported by brackets blind-fixed to the underside of the work surface. |
| | .11 Finish exposed edges and surfaces in same manner as specified for working surface of countertop material. |
| | .12 Make allowances around periphery and where fixed objects pass through or project into countertop material to permit normal movement without restriction. |
| | .13 Joints: field welded or mechanical watertight. |

- | | |
|------------------------------------|--|
| 2.6 LABORATORY
SERVICE FITTINGS | .1 Salvaged fittings:
.1 Existing fittings salvaged under Section 02 41 23 are to be reinstalled at existing casework that is to be relocated under work of this Section.
.2 Refer to Contract Drawings for types of fittings. Provide grey coloured corrosion resistant fittings matching existing type for salvaged casework to be relocated under this Section. |
| | .2 Metals: use min 80% red brass alloy for valve bodies.
.1 Make handles and turrets of brass forgings.
.2 Use solid brass bar stock or specially selected alloys for assembly components and operating parts such as valve stems, renewable seats and needle cones. |
| | .3 Completely enclose spring mechanisms.
.1 Design compression and needle valve stems to operate inside and make them replaceable.
.2 Include needle valves with stainless steel floating needles and removable seats. |
| | .4 Equip remote controls with universal joints. |
| | .5 Include fittings with wall flanges, shanks, lock nuts, couplings, nuts and tailpieces. |
| | .6 Identify fittings as to type of service with coloured plastic removable type buttons with engraved lettering and following colour |

2.6 LABORATORY .6 (Cont'd)
SERVICE FITTINGS
(Cont'd)

CODING

ENGLISH	FRENCH		
Cold Water	CW	EF	Green
Hot Water	HW	EC	Red
Distilled Water	DIW	ED	White
Demineralized Water	DEW	EDEM	White
Vacuum	VAC	VIDE	Yellow
Air	AIR	AIR	Orange
Gas	GAS	GAZ	Yellow-Orange
Oxygen	OXY	OXY	Green
Nitrogen	N	N	Blue
Argon	A	A	White
Steam	ST	VAP	Black

- .7 Finish exposed parts of service fittings to ASTM B456, service condition SC 4, coating classification CuNi30dCr.
- .8 Provide grey coloured corrosion resistant finish for service fittings at relocated casework to match existing type and chrome service fittings for all new casework required by this Section. Corrosion resistant finish to conform to following minimum requirements.
- .1 Acid resistance: acid applied at rate of 60 drops per minute for 10 minutes on fixture coatings held approximately at angle of 45 degrees:
- .1 Hydrochloric acid: 36.9%.
- .2 Nitric acid: 70.6%.
- .3 Sulfuric acid: 96.4%.
- .4 Acetic acid: 96.4%.
- .5 Discolouration and slight bubbling may occur with concentrated sulphuric acid only.
- .2 Resistance to alkali and organic solvents: reagents and solvents applied at rate of 60 drops per minute on fixture coatings held approximately at angle of 45 degrees: alkali (50% sodium hydroxide), ethyl alcohol, toluol, xylol, benzol, carbon tetrachloride, phenol and mineral oil.
- .3 Resistance to salt fog spray: samples of fixtures placed in salt fog cabinet for period of 125 hrs at temperature of 34-36 degrees C. Artificial sea water (composite per litre : 11 g

2.6 LABORATORY
SERVICE FITTINGS
(Cont'd)

- .8 (Cont'd)
- .3 Resistance to salt fog spray:(Cont'd)
MgC6H₁₀, 1.2 g NaSO₃, and 25 g NaCl). Fixtures
tested to ASTM B117 for 1000 hours.
- .4 Resistance to high humidity: samples of
fixtures placed in high humidity cabinet
maintained at 100% RH and 50 degrees C for
period of 125 hours.
- .5 Resistance to acid fumes: samples of
fixtures placed in closed cylindrical glass
containers approximately 20 L in volume,
together with beaker of concentrated
hydrochloric acid, nitric acid, and sulphuric
acid. Maintain 23 degrees C temperature for
period of 150 hours.

2.7 LABORATORY
SINKS

- .1 Salvaged sinks:
- .1 Supply of salvaged sinks to be in
accordance with Section 02 41 23.
- .2 Dump sink (Tage 349): Contractor to patch
holes of existing faucets in relocated large
stainless steel dump sink (Tag 349). Final
appearance of existing sink to meet the approval
of the Departmental Representative.
- .1 Provide two (2) new sets of faucets
and one (1) pre-rinse unit. Refer to
Section 22 42 03 for faucet and pre-rinse
unit.
- .2 Locate faucets on deck. One set to
433 mm o.c. to the left of centre-line of
sink basin and one set to 433 mm to the
right of centre-line of sink basin.
- .3 Locate pre-rinse unit on centre-line
of deck.
- .2 Faucets and pre-rinse units:
- .1 Refer to Section 22 42 03 for faucets and
pre-rinse units.
- .2 Provide gooseneck faucet for S-1 sink.
- .3 Equip laboratory sinks with tailpieces, cross
strainer, plug and overflow unless otherwise
indicated.
- .4 Provide standing overflow, when in position, 25
mm below flood level of sink. Include perforated
over-flow guard with top 12 mm below flood
level.
- .5 Locate waste outlets where indicated.

2.7 LABORATORY
SINKS
(Cont'd)

- .6 Stainless steel sinks (new): to ASTM E54 and ASTM E478, type 316 stainless steel, welded construction without solder or fill, exposed surface polished No. 4 finish.
- .1 Provide sink types S-1 for standard lab sinks and S-2 for new Microscopy dump sink.
 - .2 Apply sound deadening material undercoating to sinks and drainboards.
 - .3 Include stainless steel waste fittings.
 - .4 New stainless steel dump sink (S-2):
 - .1 Footprint: 1525 mm long x 790 mm wide x 915 mm high. Dimensions to be verified on site.
 - .2 Sink inside: 1325 mm long x 615 mm wide x 355 mm deep.
 - .3 Stand alone unit with minimum four (4) tubular frame square section legs, apron and open shelf below. Provide hat channels for support below top and shelf.
 - .4 Provide one (1) new set of faucets and one (1) pre-rinse sink. Refer to Section 22 42 03 for faucet and pre-rinse unit.
 - .5 Locate faucet on deck 316 mm o.c. to the right of centre line of sink basin.
 - .6 Locate pre-rinse unit on deck at centre line of sink basin.

2.8 ELECTRICAL
FITTINGS

- .1 Electrical outlets: to applicable NEMA standards and CSA approval.
- .1 Boxes for flush mounted outlets: of sufficient size, with galvanized finish.
 - .2 Surface mounted pedestal type outlets: polished chrome finish housing.
 - .3 Receptacles, standard blade configuration, grounded, to suit electrical requirements.
 - .4 Cover plates: No. 4 finish stainless steel.

2.9 CABINET
HARDWARE

- .1 To match existing cabinet hardware: Provide samples for the approval of the Departmental Representative.
- .2 Provide all hardware as required for complete installation of casework.

2.10 FABRICATION

- .1 Fabricate steel laboratory casework to details, and in accordance with reviewed shop drawings, manufacturer's written instructions and SEFA requirements, including but not limited to the following components:
 - .1 Modular support structure.
 - .2 Structural table base.
 - .3 Core support structures.
 - .4 Island core assemblies.
 - .5 Countertops.
 - .6 Cabinets.
 - .7 Doors.
 - .8 Drawers.
 - .9 Shelves and pilasters.
 - .10 Mobile tables.
 - .11 Filler panels.
- .2 Align end panels, top rails, bottoms and vertical posts, at intersections in same plane, without overlap.
- .3 Grind exposed welds flush and smooth, burnish to match adjacent surfaces.
- .4 Standard cabinet gauges: Conform to the following standard steel sheet thicknesses for casework components:
 - .1 Drawer bodies, shelves, door and drawer liners, removable backs: 0.91 mm (20 ga.).
 - .2 Cabinet gables, tops, bottoms, toekicks, outer door and drawer front panels, table frames, filler panels, sloping tops: 1.2 mm (18 ga.).
 - .3 Top and intermediate channels, table legs, base cabinet rear rail: 1.5 mm (16 ga.).
 - .4 Drawer suspension, hinge plates, base cabinet top rail: 1.9 mm (14 ga.).
 - .5 Cabinet leveller support: 3.04 mm (11 ga.).

2.11 MODULAR
SUPPORT STRUCTURE

- .1 Core or wall system must support work surfaces, under counter cabinets and overhead storage components.
- .2 Structural core systems may be configured for floor anchor alone or additional support legs may be used if floor is not of sufficient strength for cantilever support.

2.11 MODULAR
SUPPORT STRUCTURE
(Cont'd)

- .3 Core system to allow plumbing, electrical and other services to be installed using commonly available mounting systems.
- .4 Suspended cabinets must be supported using hook shaped rails attached near front and rear of cabinets. It must be possible to remove and relocate a fully loaded cabinet to any position between legs.
- .5 All access panels must be fastened with positive friction fit lift panels. Panel attachment system must not rely on adhesives. It must be possible to remove panels without removing suspended cabinets or base cabinets.
- .6 Upper storage cabinets must be adjustable vertically and laterally and be removable.
- .7 It must be possible to remove and relocate suspended cabinets without disturbing the countertop.
- .8 Vertical height of table work surfaces, upper storage units and shelves can be adjusted in 25 mm increments without the use of special tools.
- .9 It must be possible to install open shelving both above and below work surface.

2.12 STRUCTURAL
TABLE BASE

- .1 Used to attach to core and upright to provide support legs.
- .2 Structural table frame must provide channels from which suspended cabinets may be hung.
- .3 Weight Capacity: Work Surface plus 600 pounds.

2.13 CORE SUPPORT
STRUCTURE

- .1 Riser Uprights: 16 Ga. wipe coat galvanised steel (painted). Upright must have slot system allowing for components to be adjusted in 25 mm increments.
- .2 Upright connecting members 16 Ga wipe coat galvanised steel.
- .3 Base Cover: 18 gauge cold rolled steel.
- .4 Riser cap: PVC, ABS or cold rolled steel.

2.13 CORE SUPPORT STRUCTURE (Cont'd)	.5	Closure panels: 18 gauge cold rolled steel. Removable panels must be fastened with positive friction catch. Attachment method must not rely on adhesives of any kind.
	.6	Floor Mounting Brackets: Two per core assembly. Structural steel angle complete with levelling bolts and mounting holes.
2.14 ISLAND CORE ASSEMBLIES	.1	In sample preparation, island to be made of fixed base cabinets connected together and complete with phenolic top, having no shelves.
	.2	End of island as indicated to have a service column to accommodate power from the ceiling. Power is required for two refrigerators at end of island as shown.
2.15 CABINETS	.1	Construct cabinet bodies of sheet metal, flanged and returned at exposed gables to receive flush mounted drawer fronts and doors.
	.2	Flange and set back top rails and bottom panels.
	.3	At base cabinets include levelling screw for adjusting to floor variations, in gussets and accessible through plugged openings in bottom.
	.4	Include removable backs, knee space panels, removable filler panels (friction fit) or access doors where piping or wiring occur.
2.16 DOORS	.1	Fabricate doors of double pan construction, telescoped inner pan into outer pan with exposed vertical edge formed into channel shape having returned lip over inner pan, offset to receive lip.
	.2	Provide reinforcement for hardware attachment to inner pan and conceal. Install hardware.
	.3	Bevel inside edge of cutout in front panel of glass door.
	.4	Set glass in continuous rubber gasket between panels.

2.17 DRAWERS

- .1 Fabricate drawer fronts of double pan construction, telescoped inner pan with exposed vertical edge formed into channel shape having return lip over inner pan, offset to receive lip.
- .2 Weld drawer bodies to front through flanges on sides and bottom, and back through flanges at rear.
- .3 Extend flanges outward or downward, top of side and back rolled. Cove corners to 12 mm radius.
- .4 Include reinforcements for hardware and install finish hardware.

2.18 SHELVES AND
PILASTERS

- .1 Form shelves of steel sheet with front and rear edges flanged down 19 mm and hemmed back at 30 degrees to underside of shelf.
- .2 Support shelves with shelf clips inserted in slots in front stile and in formed channel in back and additional shelf supports as required for complete and secure installation.
- .3 Provide wall mounted pilasters as indicated on Contract Drawings, complete with blocking at top and bottom of pilasters and continuous sheet steel blocking between pilasters.

2.19 MOBILE TABLES

- .1 Form mobile tables with table legs and lower frames fabricated from steel tubing.
- .2 Table units to include a minimum of four (4) square tubular legs, horizontal tubular frames two (2) sides and back plus additional as required for complete and rigid installation.
- .3 Tables are complete with phenolic tops, suspended hanging cabinets where noted on Contract Drawings. Provide a minimum of four (4) casters for each table at 50 mm diameter and must have a minimum of two (2) front locking casters.

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- 2.20 FILLER PANELS .1 Provide filler panels where shown on Contract Drawings and as required to complete installation of laboratory casework.
- 2.21 FINISHING .1 Grind and polish spot weld marks from exposed surfaces.
- .2 Components to be cleaned in a four-stage chemical spray process that produces an iron phosphate coating bonded to the steel surfaces. Components to be thoroughly oven-dried before painting.
- .3 Components to be electrostatically coated with an epoxy/urethane powder applied in a controlled environment then baked/cured in a temperature controlled oven to assure a smooth hard finish. Surface to be a chemical resistant, high quality laboratory grade finish. The resulting paint coating to provide a minimum film thickness of 1.2 mils on all exposed parts and an average film thickness of 1.0 mils on all other surfaces.
- .4 Powder coating to meet the following minimum criteria:
- .1 Paint adhesion on steel:
- .1 To ASTM D2197, Two sets of eleven parallel lines 1.5 mm apart to be cut with a razor blade to intersect at right angles thus forming a grid of 100 squares. The cuts to be made deep enough to go through the coating, but not into the substrate. They must then be brushed lightly with a soft brush for one minute. Examine under 100-foot candles of illumination.
- .2 Ninety or more of the squares must show finish intact.
- .2 Humidity Resistance: No visible effect after a 1000 hour exposure in saturated humidity at 38°C(100°F) per ASTM D2247.
- .3 Salt Spray Resistance: No visible effect after a 250 hour salt spray test per ASTM B117.
- .4 Chemical resistance: To meet requirements as outlined in Part of this Section.
- .5 Colours: To match existing casework colours as indicated.
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PART 3 - EXECUTION

3.1 EXAMINATION

- .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for steel laboratory casework installation in accordance with manufacturer's written instructions.
 - .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.

3.2 INSTALLATION

- .1 Install laboratory casework in accordance with reviewed shop drawings, manufacturer's written instructions and to meet SEFA requirements.
- .2 Install laboratory casework plumb with countertops level to 1.5 mm in 3 m.
- .3 Bolt existing upper cabinets as indicated to concrete block walls where indicated. Ensure cabinets are installed level, secure and rigid.
- .4 Level base cabinets by adjusting levelling screws.
- .5 Fit closure strips and scribe to irregularities of adjacent surfaces, maximum gap opening 0.5 mm.
- .6 Support wall cabinets on continuous galvanized steel hanging brackets or by bolting directly to wall.
- .7 Bolt adjoining cabinets together, maximum width of joint 1 mm.
- .8 Sealant: Apply small bead of sealant at junction of countertop backsplash and adjacent wall finish. Silicone sealant to be applied in accordance with Section 07 90 00.
- .9 After installation, adjust operating hardware.

3.3 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.
 - .1 Touch up marred or abraded finished surfaces.
 - .2 Wipe down surfaces to remove fingerprints and markings.
- .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 20.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.4 PROTECTION

- .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by steel laboratory casework installation.

PART 1 - GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following work:
 - .1 Removing or disturbance of transite fume hoods and associated ducting and fire doors that are asbestos-containing material and are or removed without being broken, cut, drilled, abraded, ground, sanded or vibrated.
 - .2 Break, cut, grind, sand, drill, scrape, vibrate or abrade non-friable asbestos containing materials using non-powered hand-held tools, and the material is wetted to control the spread of dust or fibres.

1.2 SECTION INCLUDES

- .1 Requirements and procedures for asbestos abatement of non-friable asbestos-containing materials.

1.3 REFERENCES

- .1 O.Reg. 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
- .2 A Guide to the Regulations respecting Asbestos on Construction Projects and in Buildings and Repair Operations released in November 2007, <http://www.labour.gov.on.ca/english/hs/asbestos/index.html>.
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).
 - .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC). Transport Canada (TC).

1.4 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Amended Water: water with nonionic surfactant wetting agent added to reduce water tension to allow thorough wetting of fibres.
- .3 Asbestos-Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .4 Asbestos Work Area: area where work takes place which will, or may, disturb ACMs.
- .5 Authorized Visitors: Engineers, Consultants or designated representatives, and representatives of regulatory agencies.
- .6 Competent worker or person: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .7 Friable material: means material that:
 - .1 When dry, can be crumbled, pulverized or powdered by hand pressure, or
 - .2 is crumbled, pulverized or powdered.
- .8 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .9 Occupied Area: any area of the building or work site that is outside Asbestos Work Area.
- .10 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .11 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for work.

1.5 ACTION AND
INFORMATIONAL
SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos-containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos-containing waste and proof that asbestos-containing waste has been received and properly disposed.
- .6 Submit proof that all asbestos workers and/or supervisor have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene and work practices while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY
ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial, and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications, more stringent requirement applies. Comply with regulations in effect at time Work is performed.
- .2 Health and Safety:
 - .1 Perform construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
 - .2 Safety Requirements: worker protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:

.1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable-type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing shall consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing to include suitable footwear, and to be repaired or replaced if torn.

.2 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.3 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before

removal from the work area, and removed from the work area frequently and at regular intervals.

.4 Facilities for washing hands and face shall be provided within or close to the Asbestos Work Area.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are located as indicated on drawings.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper plastic polystyrene corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15mm thick (6 mil) bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.8 EXISTING
CONDITIONS

- .1 Reports and information pertaining to ACMs to be handled, removed, or otherwise disturbed and disposed of during this project are included in Annex A.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material pending instructions from Departmental Representative.

1.9 SCHEDULING

- .1 Hours of Work: perform during normal working hours in accordance with Section 01 14 00 Work Restriction.

1.10 PERSONNEL
TRAINING

- .1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, and in use, cleaning, and disposal of respirators and protective clothing.
- .2 Instruction and training related to respirators includes, following minimum requirements:
 - .1 Fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by a competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Drop Sheets:
 - .1 Polyethylene: 0.15 mm thick.
 - .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.
- .2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in a concentration to provide thorough wetting of asbestos-containing material.
- .3 Waste Containers: contain waste in two separate

containers.

- .1 Inner container: 0.15 mm thick sealable polyethylene waste bag.
- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix pre-printed cautionary asbestos warning in both official languages that is visible when ready for removal to disposal site.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
- .5 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under both dry conditions and wet conditions using amended water.

PART 3 - EXECUTION

3.1 PROCEDURES

- .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
- .2 Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.
 - .1 Remove visible dust from surfaces in the work area where dust is likely to be disturbed during course of work.
 - .2 Use HEPA vacuum or damp cloths where damp cleaning does not create a hazard and is otherwise appropriate.
 - .3 Do not use compressed air to clean up or remove dust from any surface.
- .3 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in Asbestos Work Area where dust and contamination cannot otherwise be safely contained. Drop sheets are not to be reused.
- .4 Wet materials containing asbestos to be cut, ground, abraded, scraped, drilled, or otherwise disturbed

unless wetting creates hazard or causes damage.

- .1 Use garden reservoir type low - velocity fine - mist sprayer.
- .2 Perform Work to reduce dust creation to lowest levels practicable.
- .3 Work will be subject to visual inspection and air monitoring.
- .4 Contamination of surrounding areas indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.
- .5 Frequently and at regular intervals during Work and immediately on completion of work:
 - .1 Dust and waste to be cleaned up and removed using a vacuum equipped with a HEPA filter, or by damp mopping or wet sweeping, and placed in a waste container, and
 - .2 Drop sheets to be wetted and placed in a waste container as soon as practicable.
- .6 Cleanup:
 - .1 Place dust and asbestos containing waste in sealed dust-tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste; wet and fold these items to contain dust, and then place in plastic bags.
 - .2 Clean exterior of each waste-filled bag using damp cloths or HEPA vacuum and place in second clean waste bag immediately prior to removal from Asbestos Work Area.
 - .3 Seal waste bags and remove from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal Authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that the appropriate guidelines and regulations for asbestos disposal are followed.
 - .4 Perform final thorough clean-up of Work areas and adjacent areas affected by Work using HEPA vacuum.

3.2 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, Departmental Representative to take air samples on a daily basis outside of Asbestos Work Area enclosures in accordance with Provincial/Territorial Occupational Health and Safety Regulations and PWGSC requirements.
 - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosures are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area Before beginning Work, isolate Asbestos Work Area using, minimum, preprinted

cautionary asbestos warning signs in both official languages that are visible at access routes to Asbestos Work Area.

- .3 Ensure that respiratory safety factors are not exceeded.
- .4 During the course of Work, Departmental Representative to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removing non-friable asbestos containing materials including: transite fume hoods and associated transite ducting by breaking, cutting, drilling, abrading, grounding, sanding or vibrating if:
 - .1 The material is not wetted to control the spread of dust or fibres, and
 - .2 The work is done only by means of non-powered hand-held tools.
 - .2 Removing non-friable asbestos containing materials including: transite fume hoods and associated transite ducting by breaking, cutting, drilling, abrading, grounding, sanding or vibrating if the work is done by means of power tools that are attached to dust-collecting devices equipped with HEPA filters.
 - .3 Removing asbestos-containing thermal pipe fitting insulation materials from a pipe, duct or similar structure using glove bag.
 - .4 Removing less than one square metre of friable asbestos-containing materials such as pipe insulation.

1.2 SECTION INCLUDES

- .1 Requirements and procedures for asbestos abatement of asbestos-containing materials of the type described within.

1.3 REFERENCES

- .1 O.Reg. 278/05, Designated Substance - Asbestos on Construction Projects and in Buildings and Repair Operations.
- .2 A Guide to the Regulations respecting Asbestos on Construction Projects and in Buildings and Repair Operations released in November 2007, <http://www.labour.gov.on.ca/english/hs/asbestos/index.html>.
- .3 Department of Justice Canada (Jus)
 - .1 Canadian Environmental Protection Act, 1999

(CEPA).

- .4 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 Underwriters' Laboratories of Canada (ULC)

1.4 DEFINITIONS

- .1 Amended Water: water with non-ionic surfactant wetting agent added to reduce water tension to allow wetting of fibres.
- .2 Asbestos Containing Materials (ACMs): materials that contain 0.5 per cent or more asbestos by dry weight and are identified under Existing Conditions including fallen materials and settled dust.
- .3 Asbestos Work Area: area where work takes place which will, or may disturb ACMs.
- .4 Authorized Visitors: Engineers, or designated representatives, and representatives of regulatory agencies.
- .5 Competent worker or person: in relation to specific work, means a worker who:
 - .1 Is qualified because of knowledge, training and experience to perform the work.
 - .2 Is familiar with the provincial and federal laws and with the provisions of the regulations that apply to the work.
 - .3 Has knowledge of all potential or actual danger to health or safety in the work.
- .6 Friable Materials: material that when dry can be crumbled, pulverized or powdered by hand pressure and includes such material that is crumbled, pulverized or powdered.
- .7 Glove Bag: prefabricated glove bag as follows:
 - .1 Minimum thickness 0.25 mm (10 mil) polyvinyl-chloride bag.
 - .2 Integral 0.25 mm (10 mil) thick polyvinyl-chloride gloves and elastic ports.
 - .3 Equipped with reversible double pull double throw zipper on top and at approximately mid-section of the bag.
 - .4 Straps for sealing ends around pipe.

- .8 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with filter system capable of collecting and retaining fibres greater than 0.3 microns in any dimension at 99.97% efficiency.
- .9 Non-Friable Material: material that when dry cannot be crumbled, pulverized or powdered by hand pressure.
- .10 Occupied Area: any area of building or work site that is outside Asbestos Work Area.
- .11 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects, over cuts and tears, and elsewhere as required to provide protection and isolation.
- .12 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must have appropriate capacity for scope of work.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Submit proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of asbestos containing waste in accordance with requirements of authority having jurisdiction.
- .3 Submit Provincial/Territorial and/or local requirements for Notice of Project Form.
- .4 Submit proof of Contractor's Asbestos Liability Insurance.
- .5 Submit to Departmental Representative necessary permits for transportation and disposal of asbestos containing waste and proof that asbestos containing waste has been received and properly disposed.
- .6 Submit proof satisfactory to Departmental Representative that all asbestos workers have received appropriate training and education by a competent person in the hazards of asbestos exposure, good personal hygiene, entry and exit from Asbestos Work Area, aspects of work procedures and protective measures while working in Asbestos Work Areas, and the use, cleaning and disposal of respirators and protective clothing.
- .7 Submit proof that supervisory personnel have attended asbestos abatement course, of not less than two days duration, approved by Departmental Representative.

Minimum of one supervisor for every ten workers.

- .8 Submit Worker's Compensation Board status and transcription of insurance.
- .9 Submit documentation including test results, fire and flammability data, and Material Safety Data Sheets (MSDS) for chemicals or materials including:
 - .1 Encapsulants;
 - .2 Amended water;
 - .3 Slow drying sealer.
- .10 Submit proof satisfactory to Departmental Representative that employees have respirator fitting and testing. Workers must be fit tested (irritant smoke test) with respirator that is personally issued.

1.6 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to asbestos, provided that in case of conflict among these requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at the time work is performed.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Asbestos Work Area include:
 - .1 Air purifying half-mask respirator with N-100, R-100 or P-100 particulate filter, personally issued to worker and marked as to efficiency and purpose, suitable for protection against asbestos and acceptable to Provincial Authority having jurisdiction. The respirator to be fitted so that there is an effective seal between the respirator and the worker's face, unless the respirator is equipped with a hood or helmet. The respirator to be cleaned, disinfected and inspected after use on each shift, or more often if necessary, when issued for the exclusive use of one worker, or after each use when used by more than one worker. The respirator to have damaged or deteriorated parts replaced prior to being used by a

worker; and, when not in use, to be stored in a convenient, clean and sanitary location. The employer to establish written procedures regarding the selection, use and care of respirators, and a copy of the procedures to be provided to and reviewed with each worker who is required to wear a respirator. A worker not to be assigned to an operation requiring the use of a respirator unless he or she is physically able to perform the operation while using the respirator.

.2 Disposable type protective clothing that does not readily retain or permit penetration of asbestos fibres. Protective clothing to be provided by the employer and worn by every worker who enters the work area, and the protective clothing to consist of a head covering and full body covering that fits snugly at the ankles, wrists and neck, in order to prevent asbestos fibres from reaching the garments and skin under the protective clothing. It includes suitable footwear, and it to be repaired or replaced if torn.

.3 Eating, drinking, chewing, and smoking are not permitted in Asbestos Work Area.

.4 Before leaving Asbestos Work Area, the worker can decontaminate his or her protective clothing by using a vacuum equipped with a HEPA filter, or by damp wiping, before removing the protective clothing, or, if the protective clothing will not be reused, place it in a container for dust and waste. The container to be dust tight, suitable for asbestos waste, impervious to asbestos, identified as asbestos waste, cleaned with a damp cloth or a vacuum equipped with a HEPA filter immediately before removal from the work area, and removed from the work area frequently and at regular intervals.

.5 Ensure workers wash hands and face when leaving Asbestos Work Area. Facilities for washing are located as indicated on drawings.

.6 Ensure that no person required to enter an Asbestos Work Area has facial hair that affects seal between respirator and face.

.7 Visitor Protection:

.1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors in the use of protective clothing, respirators and procedures.

.3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Asbestos Work Area.

1.7 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.
- .2 Remove from site and dispose of packaging materials at appropriate recycling facilities.
- .3 Collect and separate for disposal paper, plastic, polystyrene and corrugated cardboard packaging material in appropriate on-site bins for recycling in accordance with Waste Management Plan.
- .4 Separate for reuse and recycling and place in designated containers steel, metal and plastic waste in accordance with Waste Management Plan.
- .5 Place materials defined as hazardous or toxic in designated containers.
- .6 Handle and dispose of hazardous materials in accordance with the CEPA, TDGA, Regional and Municipal regulations.
- .7 Fold up metal banding, flatten and place in designated area for recycling.
- .8 Disposal of asbestos waste generated by removal activities must comply with Federal, Provincial/Territorial and Municipal regulations. Dispose of asbestos waste in sealed double thickness 0.15 mm thick (6 mil) bags or leak proof drums. Label containers with appropriate warning labels.
- .9 Provide manifests describing and listing waste created. Transport containers by approved means to licenced landfill for burial.

1.8 EXISTING CONDITIONS

- .1 Reports and information pertaining to ACMS to be handled, removed, or otherwise disturbed and disposed of during this Project are included in Annex A.
- .2 Notify Departmental Representative of friable material discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.9 SCHEDULING .1 Hours of Work: perform work during normal working hours in accordance with Section 01 14 00 Work Restriction.

1.10 PERSONNEL TRAINING

.1 Before beginning Work, provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of asbestos exposure, in personal hygiene and work practices, in use of glove bag procedures, and in use, cleaning, and disposal of respirators and protective clothing.

.2 Instruction and training related to respirators includes, at minimum:

- .1 Fitting of equipment.
- .2 Inspection and maintenance of equipment.
- .3 Disinfecting of equipment.
- .4 Limitations of equipment.

.3 Instruction and training must be provided by competent, qualified person.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Drop and Enclosure Sheets:

- .1 Polyethylene: 0.15 mm thick.
- .2 FR polyethylene: 0.15 mm thick woven fibre reinforced fabric bonded both sides with polyethylene.

.2 Wetting Agent: 50% polyoxyethylene ester and 50% polyoxyethylene ether mixed with water in concentration to provide thorough wetting of asbestos containing material.

.3 Waste Containers: contain waste in two separate containers.

- .1 Inner container: 0.15 mm thick sealable polyethylene bag or where glove bag method is used, glove bag itself.
- .2 Outer container: sealable metal or fibre type where there are sharp objects included in waste material; otherwise outer container may be sealable metal or fibre type or second 0.15 mm thick sealable polyethylene bag.
- .3 Labelling requirements: affix preprinted cautionary asbestos warning, in both official

languages, that is visible when ready for removal to disposal site.

- .4 Glove bag:
 - .1 Acceptable materials: safe-T-Strip products in configuration suitable for Work, or Alternative material approved by addendum during tendering period in accordance with Instructions to Tenderers.
 - .2 The glove bag to be equipped with:
 - .1 Sleeves and gloves that are permanently sealed to the body of the bag to allow the worker to access and deal with the insulation and maintain a sealed enclosure throughout the work period.
 - .2 Valves or openings to allow insertion of a vacuum hose and the nozzle of a water sprayer while maintaining the seal to the pipe, duct or similar structure.
 - .3 A tool pouch with a drain.
 - .4 A seamless bottom and a means of sealing off the lower portion of the bag.
 - .5 A high strength double throw zipper and removable straps, if the bag is to be moved during the removal operation.
- .5 Tape: tape suitable for sealing polyethylene to surfaces under both dry and wet conditions using amended water.
- .6 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual asbestos fibres.
 - .1 Sealer: flame spread and smoke developed rating less than 50 and be compatible with new fireproofing.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 Minimum of one Supervisor for every ten workers is required.
- .2 Approved Supervisor must remain within Asbestos Work Area during disturbance, removal, or other handling of asbestos-containing materials.

3.2 PROCEDURES

- .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
- .2 Before beginning Work, at each access to Asbestos Work Area, install warning signs in both official languages in upper case 'Helvetica Medium' letters reading as follows, where number in parentheses indicates font size to be used: 'CAUTION ASBESTOS HAZARD AREA (25 mm) / NO UNAUTHORIZED ENTRY (19 mm) / WEAR ASSIGNED PROTECTIVE EQUIPMENT (19 mm) / BREATHING ASBESTOS DUST MAY CAUSE SERIOUS BODILY HARM (7 mm)'.
- .3 Before beginning Work remove visible dust from surfaces in work area where dust is likely to be disturbed during course of work.
 - .1 Use HEPA vacuum or damp cloths where damp cleaning does not create hazard and is otherwise appropriate.
 - .2 Do not use compressed air to clean up or remove dust from any surface.
- .4 Prevent spread of dust from Asbestos Work Area using measures appropriate to work to be done.
 - .1 Use FR polyethylene drop sheets over flooring such as carpeting that absorbs dust and over flooring in work areas where dust or contamination cannot otherwise be safely contained.
 - .2 When removing suspended ceilings and walls themselves do not enclose work area and when removing asbestos containing material from piping or equipment and "glove bag" method is not used erect enclosure of polyethylene sheeting around work area, shut off mechanical ventilation system serving work area and seal ventilation ducts to and from work area.
- .5 Before removing suspended ceilings, remove friable material on upper surfaces using HEPA vacuum equipment.
 - .1 Remove and clean surfaces of ceiling panels using HEPA vacuum, wrap clean panels in 0.10 mm thick polyethylene, and store in building as directed by Departmental Representative.
 - .2 Clean "T" grid suspension system, disconnect, wrap in 0.10 mm thick polyethylene, and store in building as directed by Engineer.
- .6 Remove loose material by HEPA vacuum; thoroughly wet friable material containing asbestos to be removed or disturbed before and during Work unless wetting creates hazard or causes damage.
 - .1 Use garden reservoir type low - velocity sprayer or airless spray equipment capable of producing mist or fine spray.
 - .2 Perform Work in a manner to reduce dust creation to lowest levels practicable.

- .7 Pipe Insulation Removal Using Glove Bag:
 - .1 A glove bag not to be used to remove insulation from a pipe, duct or similar structure if:
 - .1 It may not be possible to maintain a proper seal for any reason including, without limitation:
 - .1 The condition of the insulation.
 - .2 The temperature of the pipe, duct or similar structure.
 - .2 The bag could become damaged for any reason including, without limitation.
 - .1 The type of jacketing.
 - .2 The temperature of the pipe, duct or similar structure.
 - .2 Upon installation of the glove bag, inspect bag for any damage or defects. If any damage or defects are found, the glove bag is to be repaired or replaced. The glove bag to be inspected at regular intervals for damage and defects, and repair or replaced, as appropriately. The asbestos containing contents of the damaged or defective glove bag found during removal are to be wetted and the glove bag and its contents are to be removed and disposed of in an appropriate waste disposal container. Any damaged or defective glove bags are not be reused.
 - .3 Place tools necessary to remove insulation in tool pouch. Wrap bag around pipe and close zippers. Seal bag to pipe with cloth straps.
 - .4 Place hands in gloves and use necessary tools to remove insulation. Arrange insulation in bag to obtain full capacity of bag.
 - .5 Insert nozzle of garden reservoir type sprayer into bag through valve and wash down pipe and interior of bag thoroughly. Wet surface of insulation in lower section of bag.
 - .6 To remove bag after completion of stripping, wash top section and tools thoroughly. Remove air from top section through elasticized valve using a HEPA vacuum. Pull polyethylene waste container over glove bag before removing from pipe. Release one strap and remove freshly washed tools. Place tools in water. Remove second strap and zipper. Fold over into waste container and seal.
 - .7 After removal of bag ensure that pipe is free of residue. Remove residue using HEPA vacuum or wet cloths. Ensure that surfaces are free of sludge which after drying could release asbestos dust into atmosphere. Seal exposed surfaces of pipe and ends of insulation with slow drying sealer to seal in any residual fibres.
 - .8 Upon completion of Work shift, cover exposed ends of remaining pipe insulation with polyethylene taped in place.
- .8 Work is subject to visual inspection and air monitoring. Contamination of surrounding areas

indicated by visual inspection or air monitoring will require complete enclosure and clean-up of affected areas.

- .9 Cleanup:
 - .1 Frequently during Work and immediately after completion of work, clean up dust and asbestos containing waste using HEPA vacuum or by damp mopping.
 - .2 Place dust and asbestos containing waste in sealed dust tight waste bags. Treat drop sheets and disposable protective clothing as asbestos waste and wet and fold to contain dust and then place in waste bags.
 - .3 Immediately before their removal from Asbestos Work Area and disposal, clean each filled waste bag using damp cloths or HEPA vacuum and place in second clean waste bag.
 - .4 Seal and remove double bagged waste from site. Dispose of in accordance with requirements of Provincial/Territorial and Federal authority having jurisdiction. Supervise dumping and ensure that dump operator is fully aware of hazardous nature of material to be dumped and that guidelines and regulations for asbestos disposal are followed.
 - .5 Perform final thorough clean-up of Asbestos Work Areas and adjacent areas affected by Work using HEPA vacuum.

3.3 AIR MONITORING

- .1 From beginning of Work until completion of cleaning operations, Departmental Representative to take air samples on daily basis outside of Asbestos Work Area enclosures in accordance with Provincial/Territorial Occupational Health and Safety Regulations and PWGSC requirements.
 - .1 Contractor will be responsible for monitoring inside enclosure in accordance with applicable Provincial/Territorial Occupational Health and Safety Regulations.
- .2 If air monitoring shows that areas outside Asbestos Work Area enclosures are contaminated, enclose, maintain and clean these areas in same manner as that applicable to Asbestos Work Area.
- .3 Ensure that respiratory safety factors are not exceeded.
- .4 During the course of Work, Departmental Representative to measure fibre content of air outside Work areas by means of air samples analyzed by Phase Contrast Microscopy (PCM).
 - .1 Stop Work when PCM measurements exceed 0.05 f/cc and correct procedures.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap on ceilings, doors and door frames and window frames as indicated on drawings.
 - .2 Removal of lead-containing coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter on ceilings, doors and door frames and window frames as indicated on drawings.
 - .3 Removal of lead-containing coatings or materials with non-powered hand tool, other than manual scraping and sanding on ceilings, doors and door frames and window frames as indicated on drawings.

1.2 REFERENCES

- .1 Ontario Ministry of Labour.
 - .1 Occupational Health and Safety Branch, Guideline Lead On Construction Projects, September 2004 (Revised April 2011).
- .2 Province of Ontario
 - .1 Ontario Regulation 490/09 - Designated Substances.
- .3 Department of Justice Canada
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .4 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .5 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .6 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .7 U.S. Environmental Protection Agency (EPA)

- .1 EPA 747-R-95-007-1995, Sampling House Dust for Lead.
- .8 U.S. Department of Health and Human Services/Centers for Disease Control and Prevention/National Institute for Occupational Safety and Health (NIOSH)
 - .1 NIOSH 94-113 - NIOSH Manual of Analytical Methods (NMAM), 4th Edition (1994).
- .9 U.S. Department of Labour - Occupational Safety and Health Administration (OSHA) - Toxic and Hazardous Substances
 - .1 Lead in Construction Regulation - 29 CFR 1926.62-1993.
- .10 Underwriters' Laboratories of Canada (ULC)

1.3 DEFINITIONS

- .1 HEPA vacuum: High Efficiency Particulate Air filtered vacuum equipment with a filter system capable of collecting and retaining fibres greater than 0.3 microns in any direction at 99.97% efficiency.
- .2 Authorized Visitors: Departmental Representative or designated representatives.
- .3 Polyethylene: polyethylene sheeting or rip-proof polyethylene sheeting with tape along edges, around penetrating objects over cuts and tears, and elsewhere as required to provide protection and isolation. For protection of underlying surfaces from damage and to prevent lead dust entering in clean area.
- .4 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Must be appropriate capacity for scope of work.
- .5 Action level: employee exposure, without regard to use of respirators, to airborne concentration of lead of 50 micrograms per cubic meter of air (50 ug/m³) calculated as 8-hour time-weighted average (TWA). Minimum precautions for lead abatement are based on airborne lead concentrations less than 0.05 milligrams per cubic meter of air for removal of lead based paint by methods noted in paragraph 1.1.
- .6 Competent person: individuals or Departmental Representative capable of identifying existing lead hazards in workplace taking corrective measures to eliminate them.
- .7 Lead dust: wipe sampling on vertical surfaces and/or horizontal surfaces, dust and debris is considered to be lead contaminated if it contains more than 40 micrograms of lead in dust per square foot.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Provide proof satisfactory to Departmental Representative that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .3 Provide proof of Contractor's General and Environmental Liability Insurance.
- .4 Quality Control:
 - .1 Provide Departmental Representative necessary permits for transportation and disposal of lead based paint waste and proof that lead based paint waste has been received and properly disposed.
 - .2 Provide proof satisfactory to Departmental Representative that employees have had instruction on hazards of lead exposure, respirator use, dress, and aspects of work procedures and protective measures.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead paint, provided that in case of conflict among those requirements or with these specifications more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Do construction occupational health and safety in accordance with Section 01 35 29 - Health and Safety Requirements.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers and visitors in work Area include:
 - .1 Respirator NIOSH approved and equipped with replaceable HEPA filter cartridges with an assigned protection factor of 10, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure. Provide sufficient amount of filters.
 - .2 Half mask respirator: half-mask particulate respirator with N, R, or P - series filter, and 95 % efficiency could be provided.

.2 Eating, drinking, chewing, and smoking are not permitted in work area.

.3 Ensure workers wash hands and face when leaving work area. Facilities for washing are located as indicated on drawings.

.4 Visitor Protection:

.1 Provide approved respirators to Authorized Visitors to work areas.

.2 Instruct Authorized Visitors procedures to be followed in entering and exiting work area.

1.6 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 20 - Construction/Demolition Waste Management and Disposal.

.2 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

.3 Disposal of lead waste generated by removal activities must comply with Federal, Provincial, Territorial and Municipal regulations. Dispose of lead waste in sealed double thickness 0.152 mm bags or leak proof drums. Label containers with appropriate warning labels.

.4 Provide manifests describing and listing waste created. Transport containers by approved means to licensed landfill for burial.

1.7 EXISTING CONDITIONS

.1 Reports and information pertaining to lead based paint to be handled, removed, or otherwise disturbed and disposed of during this Project are included in Annex A.

.2 Notify Departmental Representative of lead based paint discovered during Work and not apparent from drawings, specifications, or report pertaining to Work. Do not disturb such material until instructed by Departmental Representative.

1.8 SCHEDULING

.1 Not later than two days before beginning Work on this Project notify following in writing:

.1 Provincial Ministry of Labour.

.2 Disposal Authority.

- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Departmental Representative copy of notifications prior to start of Work.
- .4 Hours of Work: perform work during normal working hours in accordance with Section 01 14 00 Work Restriction.

1.9 PERSONNEL TRAINING

- .1 Provide Departmental Representative satisfactory proof that every worker has had instruction and training in hazards of lead exposure, in personal hygiene, in aspects of work procedures, and in use, cleaning, and disposal of respirators.
- .2 Instruction and training related to respirators includes, at minimum:
 - .1 Proper fitting of equipment.
 - .2 Inspection and maintenance of equipment.
 - .3 Disinfecting of equipment.
 - .4 Limitations of equipment.
- .3 Instruction and training must be provided by competent, qualified person.
- .4 Supervisory personnel to complete required training.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene 0.15 mm thick unless otherwise specified; in sheet size to minimize joints.
- .2 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .3 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for purpose of trapping residual lead paint residue.
- .4 Lead waste containers: metal or fibre type acceptable to dump operator with tightly fitting covers and 0.15 mm thickness sealable polyethylene liners.
 - .1 Label containers with pre-printed bilingual cautionary Warning Lead clearly visible when ready for removal to disposal site.

PART 3 - EXECUTION

3.1 SUPERVISION

- .1 One Supervisor for every ten workers is required.
- .2 Supervisor must remain within work area during disturbance, removal, or handling of lead based paints.

3.2 PREPARATION

- .1 Remove and store items to be salvaged or reused.
 - .1 Protect and wrap items and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Shut off and isolate HVAC system to prevent dust dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
 - .2 Pre-clean fixed casework and equipment within work area, using HEPA vacuum and cover and seal with polyethylene sheeting and tape.
 - .3 Clean work area using HEPA vacuum. If not practicable, use wet cleaning method. Do not raise dust.
 - .4 Seal off openings with polyethylene sheeting and seal with tape.
 - .5 Protect floor surfaces covered from wall to wall with polyethylene sheets.
 - .6 Maintain emergency fire exits or establish alternatives satisfactory to Authority having jurisdiction.
 - .7 Where water application is required for wetting lead containing materials, provide temporary water supply appropriately sized for application of water as required.
 - .8 Provide electrical power and shut off for operation of powered tools and equipment. Provide 24 volt safety lighting and ground fault interrupter circuits on power source for electrical tools, in accordance with applicable CSA Standard. Ensure safe installation of electrical cables and equipment.
- .3 Do not start work until:
 - .1 Arrangements have been made for disposal of waste.
 - .2 Tools, equipment, and materials waste containers are on site.
 - .3 Arrangements have been made for building security.

.4 Notifications have been completed and preparatory steps have been taken.

3.3 LEAD ABATEMENT

- .1 Removal of lead-containing coatings with a chemical gel or paste and fibrous laminated cloth wrap; or removal equipped with HEPA filters; or removal with using power tools non-powered hand tool, other than manual scraping and sanding.
- .2 Remove lead based paint in small sections and pack as it is being removed in sealable 0.15 mm plastic bags and place in labelled containers for transport.
- .3 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove from immediate working area to staging area. Clean external surfaces thoroughly again by wet sponging. Wash containers thoroughly pending removal to outside. Ensure containers are removed by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .4 After completion of stripping work, wire brush and wet sponge surface from which lead based paint has been removed to remove visible material. During this work keep surfaces wet.
- .5 After wire brushing and wet sponging to remove visible lead based paint, and after encapsulating lead containing material impossible to remove, wet clean entire work area, and equipment used in process. After inspection by Departmental Representative apply continuous coat of slow drying sealer to surfaces of work area. Do not disturb work area for 8 hours no entry, activity, ventilation, or disturbance during this period.

3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Departmental Representative will result in work stoppage, at no cost to Owner.
- .2 Departmental Representative will inspect work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 FINAL CLEANUP

- .1 Following cleaning and when lead wipe surfaces sampling are below acceptable concentrations, proceed with final cleanup.
- .2 Remove polyethylene sheet by rolling it away from walls to centre of work area. Vacuum visible lead containing particles observed during cleanup, immediately, using HEPA vacuum.
- .3 Place polyethylene sheets, tape, cleaning material, clothing, and contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.6 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

- .1 Repair or replace objects damaged in course of work to their original state or better, as directed by Departmental Representative DCC Representative Consultant.

END OF SECTION