

Date: May 10, 2013

This Addendum varies the Bidding and Contract Documents published for Tender on the MERX System on April 29, 2013.

This Addendum shall form part of the Contract Documents and is to be read, interpreted and coordinated with all other parts. The cost of all work contained herein shall be included in the Contract sum. The following revisions supersede the information contained in the original specifications and drawings issued for the above-named project.

1.0 **SPECIFICATIONS**

1.1 Index – Pages 1 - 7

- Revise the following to: Replace the pages with ones noted “Addendum No. 1 – May 8, 2013.

1.2 Reference Section 01 11 55 – General Instructions – Page 4 of 9

- Add the following to: Clause 1.11.1 (Regulatory Requirements) “Contact City of Vancouver (COV) Inquiry Centre (604) 873-7613 to get relevant Permit Fee Information”.

1.3 Reference Section 01 14 00 – work Restrictions – Page 2 of 3

- Delete in its entirety: Clause 1.7.2 (Security Clearance)
- Revise the following to: Clause 1.7.3.1 (Security Escort) “All personnel engaged for the work on this project must be escorted by a Commissionaire (Security Escort) at ALL times as well as for each separate parts of the building/site where the work is being done at the same time”.
- Revise the following to: Clause 1.7.3.2 (Security Escort) “Submit an Escort Request to PWGSC by e-mail at least 48 hours before service is needed. For requests submitted within the time noted above, escort will be arranged for by the Departmental Representative and costs will be tabulated for settlement with the Contractor. Refer to Item No. 7. Costs incurred for request made less than 48 hours will be the responsibility of the Contractor”.
- Revise the following to: Clause 1.7.3.3 (Security Escort) to delete “costs incurred by late request will be Contractor’s responsibility”.

1.4 Reference Section 01 14 00 – Work Restrictions – Page 3 of 3

- Add the following to: Clause 1.7.3.6 (Security Escort) “Contractor to identify the amount carried for Commissionaires Services in the Contract Cost Breakdown”.

1.5 Reference Section 02 83 10 – Lead-Base Paint Minimum Precautions – Pages 1 - 6

- Add in its entirety.

1.6 Reference Section 02 83 11 – Lead-Base Paint Intermediate Precautions – Pages 1 - 8

- Add in its entirety.

1.7 Reference Section 02 83 12 – Lead-Base Paint Maximum Precautions – Pages 1 - 8

- Add in its entirety.

1.8 Reference Section 08 71 00 – Door Hardware – Page 1 of 10

- Revise the following to: Hardware Set ST-10 , “3-A1, D2, B1, C1, J3, M2, M3, M4, F4, F5”.

1.9 Reference Section 08 87 53 – Security Films – Page 3 of 5

- Add the following to: Clause 2.1.1 (Security Film)
“.2 Decorative Glass Film
 - Transparent/Opaque 2, polyester, frost/matt, light transmittance 56%, wet application method”.

1.10 Reference Section 14 20 26 – Passenger Elevator – Page 25 of 28

- Add the following clause:

2.46 SYSTEM PROVISIONS

- .1 Provide a security system interface to provide restrictive operation to the hall calls of the elevators with a proximity card reader system. Security system will be supplied and installed by others. In general, security programming to be used the elevator to restrict car calls.
- .2 Provide as a minimum, two (2) pairs of twisted-shielded cables, 2/18 AWG and one (1) RG6 coaxial. Terminate cable in machine room within a junction box or terminal strip mounted exterior to controller, clearly designating these cables as for security system use.
- .3 Isolate all car and hall call circuits to prevent electrical feedback through any inter-connections with proximity card reader controls.

- .4 Run wiring between the elevator machine room and hall operating panels without splices, breaks, or joint connections.
- .5 Be responsible for coordinating the installation of the proximity card reader device as well as coordinating the interfacing and connection requirements to ensure a workable security system.
- .6 Provide ability to restrict call from any and all specific floors through provision of one relay per floor served.
- .7 Provide security override for Phase 1 and Phase II Firefighters' Emergency Operation.

1.11 Reference Section 23 36 00 – Air Terminal Units – Pages 1 – 4

- Add in its entirety.

1.12 Reference Section 23 81 23 – Computer Room Air Conditioning – Pages 1 - 4

- Add in its entirety.

1.13 Reference Section 27 10 05 – Structured Cabling for Communication systems – Page 1 of 2

- Add the following to: Clause 1.1 (Related Work)

“This Section of the Specification is provided for reference and coordination. Refer to Appendix C as specified in subsection 1.5.1. of this Section of the Specification for delineation of responsibilities”.

1.14 Reference Appendix C – IT Infrastructure Design Standard and Guidelines

- Delete document dated May 3, 2013 and replace in its entirety with document dated May 7, 2013 Noted Revision 2.

1.15 Reference Appendix E – Hazardous Material Site Assessment Report

- Delete Report dated March 28, 2013 and replace in its entirety with Report dated May 2, 2013.

2.0 DRAWINGS

2.1 Reference Drawing A202

Revise: Refer to attached **Sketch ASK-04**

2.2 Reference Drawing A203

Revise: Refer to attached **Sketch ASK-05**

2.3 Reference Drawing A401

Revise: Refer to attached **Sketches ASK-1, ASK-02, ASK-03**

2.4 Reference Drawing P-201

Delete: Key notes 3 about providing DHW, and SAN pipes for the dishwasher connection (no dishwasher installation).

2.5 Reference Drawing P-501

Delete: Key notes 3 about providing DHW and SAN pipes for the dishwasher connection (no dishwasher installation).

2.6 Reference Drawing M-201

Add: General Notes 9:

9. THE BRANCH DUCT SIZE SHALL BE THE SAME AS THE NECK SIZE OF EACH CONNECTED DIFFUSER, UNLESS OTHERWISE NOTED.

Add: General Notes 10.

10. PROVIDE FIRE DAMPERS AT ALL EXISTING AND NEW DUCT PENETRATION THROUGH FIRE RATED WALL AND FLOORS.

2.7 Reference Drawing M202

Add: General Notes 9 and 10 regarding the branch duct size and fire dampers as pre attached sketches **Add-M01-MSK01**.

Add: Fire dampers on the all duct penetration through the fire rated partition wall of mezzanine mechanical along the gridline 5 as pre attached sketches **Add-M01-MSK01**.

Add: Fire dampers on the all duct penetration through the fire rated partition wall of kitchen room M07 as pre attached sketches **Add-M01-MSK02**.

2.8 Reference Drawing M203

Add: General Notes 9:

9. THE BRANCH DUCT SIZE SHALL BE THE SAME AS THE NECK SIZE OF EACH CONNECTED DIFFUSER, UNLESS OTHERWISE NOTED.
10. PROVIDE FIRE DAMPERS AT ALL EXISTING AND NEW DUCT PENETRATION THROUGH FIRE RATED WALLS AND FLOORS.

2.9 Reference Drawing E001

Revise as follows:

.1 Replace Key Note 3 with the following:

- 3A. REPLACE EXISTING 12-CIRCUIT PANEL 'R' WITH NEW 225A, 3Ø, 4W, 42-CIRCUIT PANEL 'R'.
- 3B. INTERCEPT EXISTING BRANCH CIRCUIT WIRINGS FROM EXISTING LOADS OF PANELS 'R' AND 'Y'. EXTEND AND RE-TERMINATE TO NEW PANELS 'P', 'PA' AND 'R' (NEW).

.2 Revise Single Line Diagram as shown in attached sketch **ADD-E01-SKE01**.

2.10 Reference Drawing E002

Revise as follows:

.1 Revise the telecommunication Riser Diagram, General Notes and Key Notes as shown in attached sketch **ADD-E01-SKE02**.

2.11 Reference Drawing E100

Revise as follows:

.1 Revise MCC 'Z' Replacement Sequence notes 2b, 2c and 2d as follows:

- 2B. TRANSFER LOADS OF EXISTING PANELS 'Y' AND 'R' TO NEW PANELS 'P', 'PA' AND 'R'(NEW). PROVIDE NEW WIRING FROM EXISTING LOADS TO NEW PANELS. REFER TO PANELBOARD SCHEDULES FOR CIRCUIT CONNECTIONS.
- 2C. TRANSFER CIRCUITS OF EXISTING MCC LOADS THAT WILL BE PROVIDED WITH NEW VFDS TO NEW PANEL 'P', 'PA' OR 'R'(NEW). COORDINATE WITH MECHANICAL.
- 2D. REPLACE EXISTING PANEL 'R' AND REMOVE MCC SECTIONS PREVIOUSLY CONTAINING COMPONENTS FOR CHILLER 1, PANEL 'Y' AND EQUIPMENT PROVIDED WITH NEW VFDS.

- .2 Locate new panel 'PA' on wall near gridlines 2D outside Chiller Room B29.
- .3 Provide card reader for elevator access from Corridor B20.

2.12 Reference Drawing E301

Revise as follows:

- .1 In Kitchen 116, delete receptacle and wiring for dishwasher.
- .2 Revise General Notes B and C as follows:
 - B. TELECOM CABLES AND RECEPTACLES SHALL BE PROVIDED BY GMCS CABLING CONTRACTOR (GMSCC). EC TO COORDINATE WITH GMSCC FOR EXACT LOCATIONS AND ROUGH-IN REQUIREMENTS.
 - C. DESIGNATIONS FOR DATA OUTLETS ON THIS DRAWING ARE FOR REFERENCE ONLY. GMSCC SHALL PROVIDE THE FINAL DATA LABELLING.
- .3 Provide card reader for elevator access from Vestibule 100.

2.13 Reference Drawing E302

- .1 Revise Key Note 4 as follows:
 - 4. CABLE TRAY STUBBED TO EXISTING CABLE TRAY SHALL BE BY GMCS CABLING CONTRACTOR (GMSCC). COORDINATE EXACT LOCATION ON SITE.
- .2 Revise General Notes C and D as follows:
 - C. TELECOM CABLES AND RECEPTACLES SHALL BE PROVIDED BY GMCS CABLING CONTRACTOR (GMSCC). EC TO COORDINATE WITH GMSCC FOR EXACT LOCATIONS AND ROUGH-IN REQUIREMENTS.
 - D. DESIGNATIONS FOR DATA OUTLETS ON THIS DRAWING ARE FOR REFERENCE ONLY. GMSCC SHALL PROVIDE THE FINAL DATA LABELLING.
- .3 Provide card reader for elevator access from 2nd Floor elevator lobby.
- .4 Provide card reader in stairwell side of door M11 for access into Corridor M01.
- .5 Provide a door position switch and electric strike for door M11.

2.14 Reference Drawing E303

Revise as follows:

- .1 Revise Key Note 4 per Addendum No. 1 item 2.13.1.
- .2 Revise General Notes C and D per Addendum No. 1 item 2.13.2.

- .3 In Coffee Station 316, delete receptacle and wiring for dishwasher.
- .4 Provide card reader for elevator access from Lobby 319.

2.15 Reference Drawing E400

Revise as follows:

- .1 Revise Panelboard Schedule P.
- .2 Add Panelboard Schedules PA and R(NEW).
- .3 Refer to attached sketch **ADD-E01-SKE03** for details.

2.16 Reference Drawing E401

Revise as follows:

- .1 Delete connection to dishwasher from panel BA circuit 6 and panel CF circuit 36.
Retain circuit breakers.

End of Addendum No. 1

Base Building Retrofit and Fit-Up
Harry Stevens Building, Vancouver, B.C.
Project No. R.052411.001

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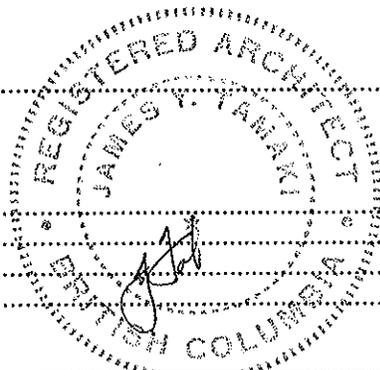
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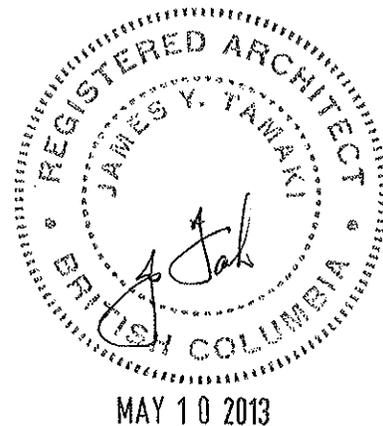


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- Appendix D - GC WP 2.0 Telecommunication Infrastructure
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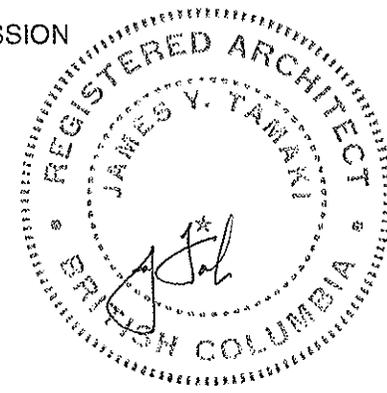


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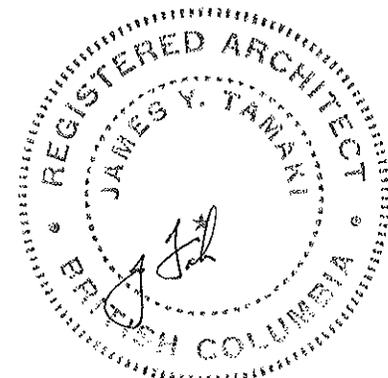
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PART 1 - GENERAL

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 floors, walls or ceilings.
 - .2 Removal of lead-containing coatings or materials using a power tool with an effective dust collection system equipped with a HEPA filter on floors, walls or ceilings.
 - .3 Removal of lead-containing coatings or materials with non-powered hand tool, other than manual scraping and sanding on floors, walls or ceilings.

1.2 REFERENCES

- .1 Department of Justice Canada
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .3 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-[1995], Sampling House Dust for Lead.
- .6 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).
- .7 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.
- .8 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, Consultant or designated representative.
- .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 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 Consultant 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/or Environmental Liability Insurance.
- .4 Quality Control:
 - .1 Provide Consultant 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 Consultant 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 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 29.06 - 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 P - series filter, and 100 % 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 will be located in the vicinity of the work area.

- .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 recycling in accordance with Section 01 74 21 - 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 and Municipal regulations. Dispose of lead waste in sealed double thickness 6 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 bound into this tender package.
- .2 Notify Consultant 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 Consultant.

1.8 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify following in writing:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Consultant copy of notifications prior to start of Work.
- .4 Hours of Work: If work is to be performed outside of normal working hours include in Contract Sum additional costs due to this requirement.

1.9 PERSONNEL TRAINING

- .1 Provide Consultant 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 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 Consultant 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 Consultant will result in work stoppage, at no cost to Owner.
- .2 Consultant 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 LEAD SURFACE SAMPLING - WORK AREAS

- .1 Final lead surface sampling to be conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by [Departmental Representative] [DCC Representative] [Consultant] and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of 8 hours has passed. [Departmental Representative] [DCC Representative] [Consultant] will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead wipe sampling is 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.

3.7 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.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from floors, walls or ceilings by scraping or sanding using non-powered hand tools.
 - .2 Manual demolition of lead-painted plaster walls or building components by striking wall with sledgehammer or similar tool.

1.2 REFERENCES

- .1 Department of Justice Canada
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .2 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .3 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .4 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .5 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-[1995], Sampling House Dust for Lead.
- .6 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).
- .7 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.
- .8 Underwriters' Laboratories of Canada (ULC)

1.3 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 Authorized Visitors: Departmental Representative, Consultant or designated representatives and representatives of regulatory agencies.
- .3 Occupied Area: areas of building or work site that is outside Work 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 Airlock: ingress or egress system, without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.

- .6 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another. Typically constructed as follows:
 - .1 Place two overlapping polyethylene sheets over existing or temporarily framed doorway, securing each along top of doorway, securing vertical edge of one sheet along one vertical side of doorway, and secure other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .7 Action level: employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic meter of air calculated as 8 hour time-weighted average (TWA). Intermediate precautions for lead abatement are based on airborne lead concentrations greater than 0.05 milligrams per cubic meter of air within Work Area.
- .8 Competent person: individuals capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.
- .9 Lead in Dust: wipe sampling on vertical 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 Consultant that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .3 Provide: Provincial requirements for Notice of Project Form.
- .4 Provide proof of Contractor's General and Environmental Liability Insurance.
- .5 Quality Control:
 - .1 Provide Consultant necessary permits for transportation and disposal of lead based paint waste and proof that it has been received and properly disposed.
 - .2 Provide proof satisfactory to Consultant that employees have had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Consultant. Minimum of one supervisor for every ten workers.
- .6 Product data:
 - .1 Provide 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

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial and local requirements pertaining to lead paint, 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 29.06 - 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 includes:
 - .1 Respirator NIOSH approved and equipped with filter cartridges with assigned protection factor, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.
 - .2 Disposable type protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.
 - .2 Requirements for workers:
 - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
 - .2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead - contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in Work Area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from Work Area or from Equipment and Access Room.
 - .3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not to use this system as means to leave or enter work area.
 - .3 Eating, drinking, chewing, and smoking are not permitted in Work Area.
 - .4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.
 - .5 Ensure workers wash hands and face when leaving Work Area. Facilities for washing are located will be located in the vicinity of the Work Area.
 - .6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.
 - .7 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.
 - .8 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to Work Areas.
 - .2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - 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 Provincial regulations. Dispose of lead waste in sealed double thickness 6 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 bound into this tender package.
- .2 Notify Consultant 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 Consultant.

1.8 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify the following in writing, where appropriate:
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.
- .3 Provide Consultant copy of notifications prior to start of Work.
- .4 Hours of Work: If work is to be performed outside of normal working hours include in Contract Sum additional costs due to this requirement.

PART 2 PRODUCTS

2.1 MATERIALS

- .1 Polyethylene: 0.15 mm unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for trapping residual lead paint residue.
- .5 Lead waste containers: metal type acceptable to dump operator with tightly fitting covers and 0.15 mm 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 Approved Supervisor must remain within Lead Work Area during disturbance, removal, or other handling of lead based paints.

3.2 PREPARATION

- .1 Remove and wrap items to be salvaged or reused, 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 areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .3 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.
 - .4 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .5 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
 - .6 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.
 - .7 At point of access to work areas 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:
 - .1 CAUTION LEAD HAZARD AREA (25 mm).
 - .2 NO UNAUTHORIZED ENTRY (19 mm).
 - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).
 - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
 - .8 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.
 - .9 Where water application is required for wetting lead containing materials, provide temporary water supply by use of appropriately sized hoses for application of water as required.
 - .10 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 lines and equipment.
- .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:
 - .1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the rest of suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities,

- equipment needed, and at least one worker allowing sufficient space to change comfortably.
- .2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
- .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closures comprising doorway always remains closed.
- .5 Separation of Work Areas from Occupied Areas
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
 - .2 Cover plywood with polyethylene sheeting and sealed with duct tape.
- .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in clean condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each work day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Consultant.

3.3 LEAD - BASE PAINT ABATEMENT

- .1 Removal of lead based paint to be performed by scraping or sanding using non-powered hand tools, or manual demolition of lead-painted plaster walls or building components by striking a wall with sledgehammer or similar tool.
- .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 before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room 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 work area including equipment and access room, and equipment used in process. After inspection by Consultant, apply continuous coat of slow drying sealer to surfaces. Do not disturb work for 8 hours with no entry, activity, ventilation or disturbance during this period.

- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from these requirements not approved in writing by Consultant will result in work stoppage, at no cost to Owner.
- .2 Consultant 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 When lead dust leakage from Work Area occurs Consultant may order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE SAMPLING - WORK AREAS

- .1 Final lead surface sampling to be conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by Consultant and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of 8 hours has passed. Consultant will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces where lead based paints have been removed must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples must be collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until fibre levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead wipe sampling is 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 equipment.
- .3 Place polyethylene seals, tape, cleaning material, clothing, and other contaminated waste in plastic bags and sealed labelled waste containers for transport.
- .4 Clean-up Work Areas, Equipment and Access Room, and other contaminated enclosures.
- .5 Clean-up sealed waste containers and equipment used in Work and remove from work areas, via Container and Equipment Decontamination Enclosure System, at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remains on surfaces as result of dismantling operations.

3.7 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.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Comply with requirements of this Section when performing following Work:
 - .1 Removal of lead based paint from floors, walls and/or ceilings using power tools with an effective dust collection system equipped with HEPA filter.
 - .2 Abrasive blasting of lead based paint on floors, walls and/or ceilings.
 - .3 Removal of lead-containing dust using air mist extraction system.

1.2 REFERENCES

- .1 Canadian Standards Association (CSA International)
 - .1 CAN/CSA-Z180.1-[00(R2005)], Compressed Breathing Air and Systems.
- .2 Department of Justice Canada
 - .1 Canadian Environmental Protection Act, 1999 (CEPA).
- .3 Health Canada
 - .1 Workplace Hazardous Materials Information System (WHMIS), Material Safety Data Sheets (MSDS).
- .4 Human Resources and Social Development Canada (HRSDC)
 - .1 Canada Labour Code Part II, - SOR 86-304 - Occupational Health and Safety Regulations.
- .5 Transport Canada (TC)
 - .1 Transportation of Dangerous Goods Act, 1992 (TDGA).
- .6 U.S. Environmental Protection Agency (EPA)
 - .1 EPA 747-R-95-007-[1995], Sampling House Dust for Lead.
- .7 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).
- .8 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.
- .9 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, Consultant] or designated representatives of regulatory agencies.
- .3 Occupied Area: area of building or work site outside Work Area.
- .4 Dioctyl Phthalate (DOP) Test: testing method used to evaluate particle penetration and air flow resistance properties of filtration materials - HEPA filter leak test.

- .5 Sprayer: garden reservoir type sprayer or airless spray equipment capable of producing mist or fine spray. Appropriate capacity for scope of work.
- .6 Airlock: ingress or egress system without permitting air movement between contaminated area and uncontaminated area. Consisting of two curtained doorways at least 2 m apart.
- .7 Curtained doorway: arrangement of closures to allow ingress and egress from one room to another while permitting minimal air movement between rooms, typically constructed as follows:
 - .1 Place two overlapping sheets of polyethylene over existing or temporarily framed doorway, secure each along top of doorway, secure vertical edge of one sheet along one vertical side of doorway, and secure vertical edge of other sheet along opposite vertical side of doorway.
 - .2 Reinforce free edges of polyethylene with duct tape and add weight to bottom edge to ensure proper closing.
 - .3 Overlap each polyethylene sheet at openings 1.5 m on each side.
- .8 Action level: employee exposure, without regard to usage of respirators, to an airborne concentration of lead of 50 micrograms per cubic metre of air calculated as an 8-hour time-weighted average (TWA). Maximum precautions for lead abatement are based on airborne lead concentrations greater than 1.25 milligrams per cubic meter of air within Work Area.
- .9 Competent person: individuals capable of identifying existing lead hazards in workplace and taking corrective measures to eliminate them.
- .10 Lead in Dust: wipe sampling on the vertical 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.
- .11 Negative Air Pressure Machine: extracts air directly from work area and filters extracted air through a HEPA filter, discharge air to exterior of building.
 - .1 Maintain pressure differential of 5 to 7 Pa relative to adjacent areas outside of work areas. Machine to be equipped with alarm to warn of system breakdown, and equipped with instrument to continuously monitor and automatically record pressure differences.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Provide submittals in accordance with Section [01 33 00 - Submittal Procedures].
- .2 Provide proof satisfactory to Consultant that suitable arrangements have been made to dispose of lead based paint waste in accordance with requirements of authority having jurisdiction.
- .3 Provide: Provincial requirements for Notice of Project Form.
- .4 Provide proof of Contractor's General and Environmental Liability Insurance.
- .5 Quality Control:
 - .1 Provide Consultant necessary permits for transportation and disposal of lead based paint waste and proof it has been received and properly disposed.
 - .2 Provide proof satisfactory to Consultant that employees had instruction on hazards of lead exposure, respirator use, dress, entry and exit from Work Area, and aspects of work procedures and protective measures.
 - .3 Provide proof that supervisory personnel have attended lead abatement course, of not less than two days duration, approved by Consultant. Minimum of one supervisor for every ten workers.

- .6 Product data:
 - .1 Provide 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.

1.5 QUALITY ASSURANCE

- .1 Regulatory Requirements: comply with Federal, Provincial/Territorial and local requirements pertaining to lead, in case of conflict among those requirements or with these specifications the more stringent requirement applies. Comply with regulations in effect at time work is performed.
- .2 Health and Safety:
 - .1 Require construction work to be in compliance with the occupational health and safety regulations in 01 35 29.06 - Health and Safety Requirements.
 - .2 Safety Requirements: worker and visitor protection.
 - .1 Protective equipment and clothing to be worn by workers while in Lead Work Area includes:
 - .1 Leads removal using power tool: respirator NIOSH approved and equipped with filter cartridges with assigned protection factor, acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Provide sufficient filters so workers can install new filters following disposal of used filters and before re-entering contaminated areas.
 - .2 Abrasive blasting of lead paint: NIOSH approved and equipped with filter cartridges with assigned protection factor acceptable to Authority having jurisdiction. Suitable for type of lead and level of lead dust exposure in Lead Work Area. Respirator to be equivalent Type CE abrasive blast supplied air respirator operated in a pressure demand or positive pressure mode with a tight-fitting full-face-piece. Compressed air used to supply supplied air respirators to meet breathing air purity requirements of CAN/CSA-Z180.1. Where an oil-lubricated compressor is used to supply breathing air, a continuous carbon monoxide monitor/alarm to be provided.
 - .3 Disposable protective clothing that does not readily retain or permit skin contamination, consisting of full body covering including head covering with snug fitting cuffs at wrists, ankles, and neck.
 - .2 Requirements for workers:
 - .1 Remove street clothes in clean change room and put on respirator with new filters or reusable filters, clean coveralls and head covers before entering Equipment and Access Rooms or Work Area. Store street clothes, uncontaminated footwear, towels, and similar uncontaminated articles in clean change room.
 - .2 Remove gross contamination from clothing before leaving work area. Place contaminated work suits in receptacles for disposal with other lead contaminated materials. Leave reusable items except respirator in Equipment and Access Room. When not in use in work area, store work footwear in Equipment and Access Room. Upon completion of lead abatement, dispose of footwear as contaminated waste or clean thoroughly inside and out using soap and water before removing from work area or from Equipment and Access Room.

- .3 Enter unloading room from outside dressed in clean coveralls to remove waste containers and equipment from Holding Room of Container and Equipment Decontamination Enclosure system. Workers not use this system as means to leave or enter Work Area.
- .3 Eating, drinking, chewing, and smoking are not permitted in Work Area.
- .4 Ensure workers are fully protected with respirators and protective clothing during preparation of system of enclosures prior to commencing actual lead abatement.
- .5 Ensure workers wash hands and face when leaving Lead Work Area. Facilities for washing will be located in the vicinity of the Work Area.
- .6 Provide and post in Clean Change Room and in Equipment and Access Room the procedures described in this Section, in both official languages.
- .7 Ensure no person required to enter Work Area has facial hair that affects seal between respirator and face.
- .8 Visitor Protection:
 - .1 Provide protective clothing and approved respirators to Authorized Visitors to work areas.
 - .2 Instruct Authorized Visitors in use of protective clothing, respirators and procedures.
 - .3 Instruct Authorized Visitors in proper procedures to be followed in entering into and exiting from Work Area.

1.6 WASTE MANAGEMENT AND DISPOSAL

- .1 Separate waste materials for recycling in accordance with Section 01 74 21 - 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 Provincial regulations. Dispose of lead waste in sealed double thickness 6 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 bound into this tender package.
- .2 Notify Consultant 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 Consultant.

1.8 SCHEDULING

- .1 Not later than two days before beginning Work on this Project notify the following in writing; where appropriate.
 - .1 Appropriate Regional or Zone Director of Medical Services Branch, Health Canada.
 - .2 Provincial Ministry of Labour.
 - .3 Disposal Authority.
- .2 Inform sub trades of presence of lead-containing materials identified in Existing Conditions.

- .3 Provide Consultant copy of notifications prior to start of Work.
- .4 Hours of Work: If work is to be performed outside of normal working hours include in Contract Sum additional costs due to this requirement.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Polyethylene 0.15 mm unless otherwise specified; in sheet size to minimize joints.
- .2 FR polyethylene: 0.15 mm woven fibre reinforced fabric bonded both sides with polyethylene.
- .3 Tape: fibreglass - reinforced duct tape suitable for sealing polyethylene under dry conditions and wet conditions using amended water.
- .4 Slow - drying sealer: non-staining, clear, water - dispersible type that remains tacky on surface for at least 8 hours and designed for trapping residual lead paint residue.
- .5 Lead waste containers: metal type acceptable to dump operator with tightly fitting covers and 0.15 mm 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 Approved Supervisor must remain within Work Area during disturbance, removal, or handling of lead based paints.

3.2 PREPARATION

- .1 Remove and wrap items to be salvaged or reused, and transport and store in area specified by Departmental Representative.
- .2 Work Area:
 - .1 Shut off and isolate HVAC system to prevent lead dust and particulate dispersal into other building areas. Conduct smoke tests to ensure duct work is airtight.
 - .2 Pre-clean fixed casework, and equipment within work areas, using HEPA vacuum and cover with polyethylene sheeting sealed with tape.
 - .3 Clean work areas using HEPA vacuum. If not practicable, use wet cleaning method. Do not use methods that raise dust, such as dry sweeping, or vacuuming using other than HEPA vacuum.
 - .4 Install negative pressure machine system and operate continuously from installation of polyethylene sheeting until completion of final cleanup. Provide automatic continuous monitoring and recording instrument of pressure difference.
 - .5 Seal off openings, corridors, doorways, windows, skylights, ducts, grilles, and diffusers, with polyethylene sheeting sealed with tape.
 - .6 Cover floor surfaces in work area from wall to wall with FR polyethylene drop sheets to protect existing floor during removal.
 - .7 Build airlocks at entrances and exits from work areas to ensure work areas are always closed off by one curtained doorway when workers enter or exit.

-
- .8 At point of access to work areas 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:
 - .1 CAUTION LEAD HAZARD AREA (25 mm).
 - .2 NO UNAUTHORIZED ENTRY (19 mm)
 - .3 WEAR ASSIGNED PROTECTIVE EQUIPMENT AND RESPIRATOR (19 mm).
 - .4 BREATHING LEAD CONTAMINATED DUST CAUSES SERIOUS BODILY HARM (7 mm).
 - .9 Maintain emergency and fire exits from work areas, or establish alternative exits satisfactory to Authority having jurisdiction.
 - .10 Where water application is required for wetting lead containing materials, provide temporary water supply by use of appropriately sized hoses for application of water as required.
 - .11 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 lines and equipment.
 - .3 Worker Decontamination Enclosure System:
 - .1 Worker Decontamination Enclosure System includes Equipment and Access Room and Clean Room, as follows:
 - .1 Equipment and Access Room: construct between exit and work areas, with two curtained doorways, one to the rest of the suite, and one to work area. Install waste receptor and storage facilities for workers' shoes and protective clothing to be re-worn in work areas. Build large enough to accommodate specified facilities, equipment needed, and at least one worker allowing sufficient space to change comfortably.
 - .2 Clean Room: construct with curtained doorway to outside of enclosures. Provide lockers or hangers and hooks for workers' street clothes and personal belongings. Provide storage for clean protective clothing and respiratory equipment. Install mirror to permit workers to fit respiratory equipment properly.
 - .4 Construction of Decontamination Enclosures:
 - .1 Construct framing for enclosures or use existing rooms. Line enclosure with polyethylene sheeting and seal with tape, apply two layers of FR polyethylene on floor.
 - .2 Construct curtain doorways between enclosures so when people move through or waste containers and equipment are moved through doorway, one of two closure comprising doorway always remains closed.
 - .3 Shower room in decontamination facility to be provided with the following:
 - .1 Hot and cold water or water of constant temperature not less than 40 degrees Celsius or more than 50 degrees Celsius.
 - .2 Individual controls inside to regulate water flow and temperature.
 - .4 Prior to each shift in which a decontamination facility is being used, a competent person should inspect the facility to ensure that there are no defects that would allow lead-containing dust to escape. Defects should be repaired before the facility is used. The decontamination facility should be maintained in a clean and sanitary condition.

- .5 Separation of Work Areas from Occupied Areas:
 - .1 Barriers between Work Area and occupied area to be constructed as follows:
 - .1 Construct floor to ceiling lumber or metal stud framing, cover with polyethylene sheeting and seal with duct tape. Apply plywood over polyethylene sheeting. Seal plywood joints and between adjacent materials with surface film forming sealer, to create airtight barrier.
 - .2 Cover plywood with polyethylene sheeting and sealed with duct tape.
 - .6 Maintenance of Enclosures:
 - .1 Maintain enclosures in tidy condition.
 - .2 Ensure barriers and polyethylene linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately.
 - .3 Visually inspect enclosures at beginning of each working day.
 - .4 Use smoke test method to test effectiveness of barriers as directed by Consultant.

3.3 LEAD - BASE PAINT ABATEMENT

- .1 Removal of lead based paint to be performed using power tools that are attached to dust-collecting vacuums with HEPA filters.
- .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 Wet method to be used to reduce dust generation. Examples of wet methods include wetting surfaces, wet scraping, and wet shovelling. Wet method not be used if it creates a hazard or cause damage to equipment or to project. Power tools to be equipped with a shroud, and to be kept flush with surface.
- .4 Seal filled containers. Clean external surfaces thoroughly by wet sponging. Remove immediate from working area to staging area. Clean external surfaces thoroughly again by wet sponging before moving containers to decontamination Washroom. Wash containers thoroughly in decontamination Washroom, and store in Holding Room pending removal to Unloading Room and outside. Ensure containers are removed from Holding Room by workers who have entered from uncontaminated areas dressed in clean coveralls.
- .5 After completion of stripping work, wire brush and wet sponge surface to remove visible material. During this work keep surfaces wet. After wire brushing and wet sponging, wet clean and HEPA vacuum entire work area including Equipment and Access Room. Compressed air or dry sweeping not be used to clean up lead-containing dust or waste. After inspection and approval by Consultant apply continuous coat of slow drying sealer to surfaces. Do not disturb work area for 8 hours, no entry, activity, or ventilation other than operation negative air machine during this period.
- .6 After enclosing lead painted surfaces, wet clean work area and equipment and access room. During settling period no entry, activity, or ventilation will be permitted.

3.4 INSPECTION

- .1 Perform inspection to confirm compliance with specification and governing authority requirements. Deviations from requirements not been approved in writing by Consultant will result in Work shutdown, at no cost to Owner.

- .2 Consultant will inspect work for:
 - .1 Adherence to specific procedures and materials.
 - .2 Final cleanliness and completion.
 - .3 No additional costs will be allowed for additional labour or materials required to provide specified performance level.
- .3 When lead dust leakage from Work Area occurs Consultant will order Work shutdown.
 - .1 No additional costs will be allowed by Contractor for additional labour or materials required to provide specified performance level.

3.5 LEAD SURFACE SAMPLING - WORK AREAS

- .1 Final lead surface sampling conducted as follows:
 - .1 After Work Area has passed a visual inspection for cleanliness approved by Consultant and acceptable coat of lock-down agent has been applied to surfaces within enclosure, and appropriate setting period of 8 hours has passed, Consultant will perform lead wipe sampling in Work Area.
 - .1 Final lead wipe sampling results from horizontal and vertical surfaces must show lead levels of less than 40 micrograms of lead in dust per square foot. Samples collected and analyzed in accordance with EPA 747-R-95-007.
 - .2 If wipe sampling results show levels of lead dust in excess of 40 micrograms per square foot, re-clean work area at contractor's expense and apply another acceptable coat of lock-down agent to surfaces.
 - .3 Repeat as necessary until lead dust levels are less than 40 micrograms per square foot.

3.6 FINAL CLEANUP

- .1 Following specified cleaning procedures, and when lead wipe sampling is 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 Clean up Work areas, Equipment and Access Room, and other contaminated enclosures.
- .5 Remove sealed waste containers and equipment used in Work and remove from work areas at appropriate time in cleaning sequence.
- .6 Conduct final check to ensure no dust or debris remain on surfaces as result of dismantling operations.

3.7 RE-ESTABLISHMENT OF OBJECTS AND SYSTEMS

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

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY

- .1 Section Includes:
 - .1 Electronic variable air volume boxes.

1.2 REFERENCES

- .1 American National Standards Institute (ANSI)
 - .1 ANSI/AMCA 210-1999, Laboratory Methods of Testing Fans for Aerodynamic Performance Rating.
 - .2 ANSI/NFPA 90A-2002, Standard for the Installation of Air Conditioning and Ventilating Systems.
- .2 Health Canada/Workplace Hazardous Materials Information System (WHMIS)
 - .1 Material Safety Data Sheets (MSDS).
- .3 International Organization of Standardization (ISO)
 - .1 ISO 3741-2001, Acoustics-Determination of Sound Power Levels of Noise Sources Using Sound Pressure - Precision Methods for Reverberation Rooms.
- .4 Underwriter's Laboratories (UL)
 - .1 UL 181-2003, Factory-Made Air Ducts and Air Connectors.

1.3 SYSTEM DESCRIPTION

- .1 Performance Requirements:
 - .1 Catalogued or published ratings for manufactured items: obtained from tests carried out by manufacturer or those ordered by manufacturer from certified ADC (Air Diffusion Council) testing agency signifying adherence to codes and standards.

1.4 SUBMITTALS

- .1 Product Data:
 - .1 Submit manufacturer's printed product literature, specifications and datasheet in accordance with Section 01 33 00 - shop drawings, product data and samples. Include product characteristics, performance criteria, and limitations.
- .2 Shop Drawings:
 - .1 Submit shop drawings in accordance with Section 01 33 00 – shop drawings, product data and samples.
 - .1 Shop Drawings: submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
 - .2 Indicate the following:
 - .1 Capacity.
 - .2 Pressure drop.
- .3 Quality assurance submittals: submit following in accordance with Section 01 33 00 – shop drawings, product data and samples.

- .1 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.
- .2 Instructions: submit manufacturer's installation instructions.
 - .1 Departmental Representative will make available one (1) copy of systems supplier's installation instructions.
- .4 Closeout Submittals:
 - .1 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- 1.5 QUALITY ASSURANCE**
 - .1 Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 33 - Health and Safety Requirements.
- 1.6 DELIVERY, STORAGE, AND HANDLING**
 - .1 Packing, shipping, handling and unloading:
 - .1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirement.
 - .2 Deliver, store and handle materials in accordance with manufacturer's written instructions.
 - .2 Waste Management and Disposal:
 - .1 Construction/Demolition Waste Management and Disposal: separate waste materials for recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
- 1.7 MAINTENANCE**
 - .1 Extra Materials:
 - .1 Provide maintenance materials in accordance with Section 01 78 00 - Closeout Submittals.
 - .2 Furnish list of individual manufacturer's recommended spare parts for equipment include:
 - .1 Bearings and seals.
 - .2 Addresses of suppliers.
 - .3 List of specialized tools necessary for adjusting, repairing or replacing.
- PART 2 - PRODUCTS**
 - 2.1 UNITS**
 - .1 Terminal units of the same type to be product of one manufacturer.
 - 2.2 ELECTRONIC VARIABLE AIR VOLUME BOXES**
 - .1 Pressure independent, reset to air flow between zero and maximum air volume.
 - .2 Unit with attenuator section.
 - .3 Air velocity sensor as standard to manufacturer.

- .4 Signals between temperature sensing device, velocity controller, velocity sensor and damper actuator digital as indicated. Shielded or twisted wire requirements is not acceptable.
- .5 Electronic thermostat furnished by terminal unit manufacturer and have set points and velocity adjustments located in thermostat. Heating and cooling set point range 13 to 30 degrees C. Set points not overlapping.
- .6 Electronic control package factory calibrated and set at factory. Features to accommodate field calibration and readjustment of air volume settings to include:
 - .1 Metre taps for balancing with digital DC voltmeter.
 - .2 Adjustable flow settings at thermostat.
- .7 Factory installed 20 VA transformer, 115 V to 24 V. Power consumption of terminal not to exceed 15 VA.
- .8 Terminal unit to be CSA certified.
- .9 Sizes and capacity: as indicated.

2.3 DUCT HEATERS

- .1 Duct heaters: factory supplied and mounted with the VAV box.
- .2 Elements:
 - .1 High grade nickel chrome elements.
- .3 Staging:
 - .1 Staged heaters: balanced line current at each stage.
 - .2 Each stage: uniform face distribution.
- .4 Controls:
 - .1 Factory mounted and wired in control box. Use terminal blocks for power and control wiring to thermostat and sail switch.
 - .2 Remote mounted as indicated with terminal strips in heater terminal box for power and control wiring.
 - .3 Controls mounted in a CSA Type enclosure and to include:
 - .1 Magnetic contactors.
 - .2 Control transformers.
 - .3 SCR controller.
 - .4 Where controls are mounted in heater, exercise care in mounting contactors to minimize switching noise transmission through ductwork.
 - .5 Communicate with existing DDC control system (by ESC).
- .5 Electrical:
 - .1 Duct heater rating: refer to mechanical drawings for detail.
- .6 Main isolation disconnect switch.

PART 3 - EXECUTION

3.1 MANUFACTURER'S INSTRUCTIONS

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

3.2 INSTALLATION

- .1 Install in accordance with manufacturers recommendations.
- .2 Support independently of ductwork.
- .3 Install with at least 1000 mm of flexible inlet ducting and minimum of four duct diameters of straight inlet duct, same size as inlet.
- .4 Locate controls, dampers and access panels for easy access.

3.3 CLEANING

- .1 Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION

PART 1 GENERAL

1.1 REFERENCES

- .1 CSA International
 - .1 CAN/CSA-C22.2 No 236/UL 1995, Performance Standard for Heating and Cooling Equipment.

1.2 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Shop Drawings, Product Data and Samples.
- .2 Product Data:
 - .1 Submit manufacturer's instructions, printed product literature and data sheets for [air conditioning components and accessories] and include product characteristics, performance criteria, physical size, finish and limitations.
- .3 Shop Drawings:
 - .1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of British Columbia, Canada.
 - .2 Indicate on drawings:
 - .1 Major components and accessories including sound power levels of units.
 - .2 Type of refrigerant used.

1.3 CLOSEOUT SUBMITTALS

- .1 Submit in accordance with Section 01 78 00 - Closeout Submittals.
- .2 Operation and Maintenance Data: submit operation and maintenance data for air conditioning components for incorporation into manual.

1.4 DELIVERY, STORAGE AND HANDLING

- .1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements 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 indoors and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
 - .2 Store and protect air conditioning components from nicks, scratches, and blemishes.
 - .3 Replace defective or damaged materials with new.
- .4 Packaging Waste Management: remove for reuse of packaging materials as specified in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

1.5 WARRANTY

- .1 For computer room air conditioning 12 months warranty period is extended to 60 months.

- .2 Contractor hereby warrants that computer room air conditioning will not spall or show visible evidence of cracking, except for normal hairline shrinkage cracks, in accordance with CCDC 2 General Conditions, but for 5 years.

PART 2 PRODUCTS

2.1 DESCRIPTION

- .1 System type: Direct Expansion Split System
- .1 Cooling: indoor unit with direct expansion coil, thermostatic expansion valve and filter drier.
- .2 Condensing: outdoor air cooled prop fan condensing unit.
- .2 Unit controls not to permit dehumidification and humidification to occur simultaneously.
- .3 Unit capacity: as indicated in mechanical drawings:

2.2 CABINET

- .1 The cabinet and chassis shall be constructed of heavy gauge galvanized steel and designed for easy installation and service access from front and bottom of unit, mounting bracket shall be factory-attached to the cabinet, internal cabinet insulation shall meet ASHRAE 62.1 requirements for Mold Growth, Humidity & Erosion, tested per UL 181 and ASTM 1338 standards.
- .2 Cabinet to house: cooling coil, reheat coil, fans, filters, humidifier, unit environmental control system, motor starters or contactors and electrical disconnect switch.
- .3 Include adequate access to components for servicing.
- .4 Plenum suitable for connecting to supply and return air ducting as indicated.

2.3 FAN

- .1 Quite double-inlet blower, statically and dynamically balanced, Direct drive, with self-aligning, permanently lubricated, 100,000 hours minimum life ball or roller bearings.

2.4 FAN MOTOR

- .1 Drip-proof permanently lubricated bearings for continuous duty, permanent-split capacitor, high efficiency type, equipment with two speeds for air flow modulation for precise dehumidification control.

2.5 FILTER

- .1 Filters: type: 4" MERV 11.
- .2 Mounting: with filter box.

2.6 REFRIGERANT PIPING, VALVES, FITTINGS AND ACCESSORIES WITHIN UNIT

- .1 To CSA B52. Include for each refrigerant circuit:
- .1 Provide a sweat adapter kit to permit field brazing of refrigerant line connections for application to air-cooled split systems.

- .2 Pre-changed refrigerant line sets shall be provided by manufacture in min. 45 feet for application to air-cooled split systems.

2.7 MICROPROCESSOR CONTROL

- .1 Microprocessor-based, factory-wired into the system and tested prior to shipment.
- .2 Wall-mounted operating panel with visual display, field-wired to the control board using 4-conductor field-supplied thermostat wire.
- .3 With 8-key membrane keypad for setpoint/program control.
- .4 For startup after power failure, the system shall provide automatic restart with programmable time delay from wall mounted controller and existing DDC control system.
- .5 The control shall be user-configurable to use a manual setpoint control or a programmable, time base setback control.
- .6 Panel to include following:
 - .1 Manual operation and adjustment:
 - .1 On-Off air conditioning system control.
 - .2 Room temperature set point, indicator and sensitivity adjustment controller.
 - .3 Fan speed.
 - .4 Room humidity set point, indicator and sensitivity adjustment controller.
 - .5 Alarm silencing switch for each alarm point.
 - .6 Alarm circuits test switch.
 - .2 Operational: Visual and Audible Alarm:
 - .1 High room temperature.
 - .2 Low room temperature.
 - .3 High humidity.
 - .4 Low humidity.
 - .5 High Head pressure.
 - .6 Loss of Power.
 - .7 Compressor short cycle.
 - .3 Operational: Visual display:
 - .1 Fan speed.
 - .2 Dehumidification.
 - .3 Filter Clog.

2.8 REMOTE CONTROL PANEL

- .1 With the Web/485 card w/ adapter to have BACnet IP communication to communicate with existing DDC control system (by ESC).
- .2 Each alarm shall be separately enabled or disabled to activate the common alarm.
- .3 A programmable common alarm shall be provided to interface user selected alarms with a remote alarm device.

- 2.9 REFRIGERANT CHARGE**
- .1 Charge refrigerant system at factory, seal and test.
 - .2 Holding charge of refrigerant applied at factory.
- 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 air conditioning components 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 GENERAL**
- .1 Install as indicated, to manufacturer's recommendations, and to EPS 1/RA/2.
 - .2 Manufacturer to certify installation.
 - .3 Run drain line from cooling coil condensate drain pan to terminate over nearest floor drain.
- 3.3 EQUIPMENT PREPARATION**
- .1 Provide services of manufacturer's field engineer to set and adjust equipment for operation as specified.
- 3.4 CLEANING**
- .1 Leave Work area clean at end of each day.
 - .2 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- 3.5 PROTECTION**
- .1 Protect installed products and components from damage during construction.
 - .2 Repair damage to adjacent materials caused by computer room air conditioning installation.

END OF SECTION

Base Building Retrofit and Fit-Up

Harry Stevens Building, Vancouver, B.C. IT INFRASTRUCTURE DESIGN STANDARD & GUIDELINES

Project No. R.052411.001

APPENDIX C

May 2013



IT Infrastructure Design Standards and Guidelines

FOR SERVICE CANADA CENTRES (SCCs)

Detailing Responsibilities of the
Landlord/General Contractor and
GMCS Cable Contractor

Revision 2
May 2012



ANNEX A - TELECOMMUNICATIONS SPECIFICATIONS FOR SCCs

1. GENERAL REQUIREMENTS

1.1. General Note

TIA-568-A (Commercial Building Standard for Telecommunications Pathways and Spaces) states that no telecommunications room should serve more than 1,000 m² of a single floor space.

Telecommunications room fit-up should follow the layout provided as a guide in Annex C where there are Centrex services available. Within a non-Centrex environment, (PBX, Key System, BCM) a second equipment rack may be required to allow for jack/patch panel fields for the PBX locals (as indicated in Annex D).

1.2. Government Managed Cabling Services

Service Canada and Shared Services Canada have subscribed to the Public Works and Government Service Canada (PWGSC) cable installation contract awarded to Bell Canada. As a result, the responsibility for the installation of communications cabling will be managed separately.

Important Note: This document contains specifications that apply to the Landlord and their General Contractor as well as the Cabling Contractor so all parties are aware of details but may not be their responsibility. Refer to project drawings for location and quantity of cables and jacks required.

Responsibility of the GMCS Contractor: Items designated with **(GMCS Contractor)** shall be the responsibility of the GMCS Cable Contractor to provide but are not limited to supply and installation of cable, jacks, faceplates, patch cords, patch panels, equipment rack and accessories.

Responsibility of the Landlord/General Contractor: Items designated with **(Landlord/General Contractor)** shall be the responsibility of the Landlord and General Contractor to provide and will typically be responsible for cable tray, all conduits, power and Technical Room (LAN / TeleCom Room) construction as detailed in this document.

1.3. Security Clearance

It is the responsibility of the landlord and PWGSC Project Manager to ensure all required security clearances for all trades is in place.



1.4. Continuation of Service (refits only)

Installation and removal of products and services are to be completed without disruption of voice and data services at any time during core hours of operation, 05:00 am to 8:00 pm, Monday through Friday, unless approved by the Project Authority.

1.5. Cut-Over times

Mutually agreeable cut-over times are to be arranged between Bidder, General Contractor and PWGSC on behalf of the Regional Accommodations Manager (RAM) and the Client including the SC (Service Canada) business lines and National Voice and Data Services.

1.6. Requirements for "Move Weekends"

Work outside core hours will likely be required during move weekends.

1.7. Vendor Certification and Qualification (GMCS Contractor)

- 1.7.1. The cabling Contractor must be a certified system vendor of the manufacturer's components and cable being bid.
- 1.7.2. Proof that each member of the installation team has successfully completed the connectivity product manufacturer's installation courses or equivalent industry-sponsored certificate courses.
- 1.7.3. Contractor must use only technicians fully trained and qualified on installation and testing of the components to be installed.
- 1.7.4. Proof of fire stop installation certification.
- 1.7.5. Contractors will be licensed or permitted to work in the province in which the work is being performed.
- 1.7.6. The Contractor shall provide certified documentation of the qualifications described above to PWGSC.
- 1.7.7. Failure to meet or provide such documentation will be the basis for disqualification of the cabling Contractor by PWGSC.

1.8. Telecommunication Backboards (Landlord/General Contractor)

- 1.8.1. All linear wall space used for anchoring equipment shall be lined on two adjacent walls; full Telecommunications Room width; with fire-rated 4 x 8 x 3/4" BCX plywood; smooth finish on one side (G1S). One of these walls should be directly behind the LAN rack. In some locations, there may be a requirement to cover three adjacent walls, which will be decided upon by the Telecom authority.
- 1.8.2. Smooth side shall be facing out and painted with light coloured acrylic, interior, fire-retardant paint.



- 1.8.3. All plywood used for supporting riser backbone cables shall be installed vertically, resting directly on the finished floor and anchored sufficiently to support a minimum of 1500 pounds of weight.
- 1.8.4. Screws used to mount and secure backboards shall not protrude past the face of the plywood.

1.9. Grounding and Bonding for Rack (Landlord/General Contractor)

- 1.9.1. The Telecommunication Room is to be equipped with a Telecommunications Grounding Bus-bar (TGB) mounted on the plywood wall in close proximity of the equipment racks - following TIA J-STD-607-A Standard.
- 1.9.2. The Telecommunication Main Grounding Bus shall be grounded to the building's main electrical service grounding electrode system. Ground loops to be avoided.
- 1.9.3. Ground cable shall be a minimum of No. 6 AWG insulated green jacket, stranded copper wire installed in each Telecommunications Room that connects to the building ground system.
- 1.9.4. This TGB shall be used to ground all telecommunications cable shields, equipment, racks, cabinets, raceways, and other associated hardware that has the potential for acting as a current carrying conductor.
- 1.9.5. All connectors and clamps shall be mechanical type made of silicon bronze.

1.10. HVAC Standard Requirements (Landlord/General Contractor)

- 1.10.1. The HVAC system must be capable of operating on a "24/7" basis.
- 1.10.2. Ventilation of the room must follow the standards outlined in Annex B attached.
- 1.10.3. The HVAC compressor must be located outside the Telecommunications/ Technical Room and evaporator wall mounted as high as possible to maximize usable space.

2. WORK REQUIREMENTS

2.1. Structured Wiring Cabling System (GMCS Contractor)

For existing office locations where Category 5e cabling exists, no upgrade is required. In offices where cabling must be upgraded, or installed, Category 6 should be used.

All cables will be certified/approved by CSA standard PCC FT4 or FT6 flammability test and UL CMR as required by local building codes.



Supply and install a certified structured wiring cabling system following the TIA-568-A standards including a minimum Category 5e or Category 6 cabling standard:

- 2.1.1. Provide and install the correct number of drops required by the design layout using 48-port modular 2U patch panels on a 19" free standing equipment rack in the Technical Room (TR) as specified to accommodate the needs of the office. The standard workstation will have two jacks, however special purpose workstations may require additional capacity.
- 2.1.2. Populate panels referenced above with specified number of RJ45 jacks to accommodate the port count.
- 2.1.3. Provide and install a vertical and horizontal cable management system outlined and described in paragraph 3.5.
- 2.1.4. Supply, install, test and label all cable runs with one end terminating on RJ45 jacks situated at locations identified on the floor plans and the other end being connected to RJ45 patch panels in the TR. These runs will be universal in nature and used for all communication purposes (Voice, Data and Video). The required locations will be identified on the site floor plan as follows:
 - 2.1.4.1. Location and Number of jacks terminating in various work areas as outlined on the site floor plans.
 - 2.1.4.2. Location and Number of jacked coiled spares to be left in each zoned ceiling area as outlined on the floor plan. Drawing jack symbol to be prefixed with "C" (coiled).
 - 2.1.4.3. Location and Number of jacks for data or telephone lines required in the Technical Room near the Security Alarm System for monitoring services.
- 2.1.5. Provide a 1-meter cable slack above the patch panels in the Telecommunications Room. Provide minimum 1.5m cable slack in ceiling for all far end cable terminations.
- 2.1.6. Supply and install the necessary horizontal conduit, cable trays, J-hooks or D-rings as required.
- 2.1.7. Supply, install and test all communication outlets, including associated cable.
- 2.1.8. Provide Category 5e or 6, to match cable grade, patch cords necessary to complete the communications network (description and quantities as per section 3.7 and section 3.8). All patch cords for complete project must be available prior to commencing installation.
- 2.1.9. Co-ordinate with Project Manager to determine the exact location of all jacks.
- 2.1.10. Provide any other materials and labour required to complete the certified cabling system.



- 2.1.11. All termination components and connectors used for the horizontal portion of the cabling shall meet Insulation Displacement Connector (IDC) type, certified Category level and be for use with solid core wire.
- 2.1.12. All spare cables shall be neatly coiled and securely attached to the ceiling slab, or other permanent structure above the t-bar ceiling, to allow easy access for future use. Spare cable must not be coiled tighter than the minimum radius recommended by the manufacturer.
- 2.1.13. All cable components must be from the certified system manufacturer.

2.2. Voice-specific Requirements (*GMCS Contractor*)

Supply and install a distribution wiring system for the voice services which includes:

- 2.2.1. If there is currently no demarcation point, arrangements must be made to provision one.
- 2.2.2. Provide and install category 3 riser cable from the building's main entrance cable to the technical room. Provide a minimum of 3 cable pairs per 7.4 square meters of usable floor space. Installed cable should be in multiples of 50 pairs. The backbone cabling shall be terminated and clearly labeled at both ends.
- 2.2.3. Provide and install the required number of 48-port RJ45 voice distribution panels to a 19" floor mounted equipment rack.
- 2.2.4. Wire all ports of the voice patch panels to the demarcation with appropriate Category wire and providing a 1-meter slack of cable above the voice panel.
- 2.2.5. Install the necessary cable tray to extend the voice services from the demarcation point on the wall (referenced in paragraph 2.2.1) to the RJ45 panel in the equipment racking (referenced in paragraph 2.2.3).
- 2.2.6. Each port on the Voice Panel must be wired to the corresponding pair on the demarcation point. For example, Port 26 on the Voice Panel must be wired to Pair 26 on the demarcation point. See Wiring Configuration for Horizontal Distribution Patch Panels drawing attached.
- 2.2.7. Provide the required patch cables as per Section 3.7.
- 2.2.8. Provide any other materials and labour required to complete the structured wiring system.

2.3. Cable Pathways - Horizontal and/or Vertical Conduit and Cable Tray (*Landlord/General Contractor*)

Specification and coordination with the General Contractor for cable pathways (conduit / cable tray) may be required from the building's main demarcation point to the SCC/HRSDC Telecommunications Room (TR), or wherever cable may be run through public areas. The Landlord / General Contractor shall supply and install two 103 mm (4") or greater continuous run EMT backbone conduits from the building's main cable entrance facility to the TR complete with bushings and



pull cords for copper and fibre optic cable. Copper and fibre-optic cables will not be housed in the same conduit. Specifications relating to horizontal cable pathways in Government of Canada owned building is covered as part of the "base building" while horizontal cable pathways in buildings that are not owned by the Government of Canada is covered under the terms of the specific lease agreement.

2.4. Cable Installation (*GMCS Contractor*)

It is the responsibility of all contractors to be aware of and fully compliant with current standards and regulations.

- 2.4.1. Install data cables between patch panels and outlets.
- 2.4.2. Terminate cables at outlets and at patch panel in Technical Room.
- 2.4.3. Install surface mounted wireway and outlet boxes where required.
- 2.4.4. All wiring shall be installed in a neat and tidy manner.
- 2.4.5. All cable should be coiled in the ceiling in large loops and in an irregular manner to reduce interference.
- 2.4.6. Cable runs shall not be installed near sources of electromagnetic interference (motors, distribution/isolation transformers) and the following clearances shall be adhered to:
 - 2.4.6.1. 1.2 meters (4 feet) from large motors or transformers.
 - 2.4.6.2. 0.3 meters (1 foot) from conduits or cables used for electrical power distribution.
 - 2.4.6.3. 12 centimeters (5 inches) from fluorescent lighting. Pathways should cross at 90 degrees from fluorescent lighting and electrical power cables or conduits.
- 2.4.7. Cables shall not be run near water pipes.
- 2.4.8. Cables should be velcro-wrapped as per the following:
 - 2.4.8.1. All cables should be suitably wrapped with Velcro straps at maximum intervals of 1500 mm (5 feet).
 - 2.4.8.2. All Velcro cable ties should be able to slide around the cable bundle.
- 2.4.9. All cables, not installed to the Project Manager's satisfaction shall be removed and re-installed. No additional costs shall be paid by the Client in this event.
- 2.4.10. Install cables on a cable tray, in conduit or loop through J-hooks.
- 2.4.11. Cables should be evenly distributed down both sides on rear of racks and strapped neatly in place.



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- 2.4.12. There should be no breaks in the cable run. That is, each cable is to be installed in one continuous run from the patch panel in the Telecommunications Room to the termination point (RJ45 jack in work area).
- 2.4.13. There should be cable slack of 1 (one) meter in the Telecommunications Room end immediately above the voice and data panels to allow free movement of panels within racks.
- 2.4.14. All spare runs should be long enough to reach all areas of the zone in which they are located.
- 2.4.15. No single cable run shall exceed 90 meters in length, measured from the patch panels in the Technical Room to each RJ45 jack located in the work area. The Contractor must ensure this distance is not exceeded before installing the cabling system.
- 2.4.16. Cables not installed in cable tray must be run in a uniform pattern, equivalent to a conduit system, and supported by J-hooks or D-rings affixed every 1500 mm (5 feet). No "shortest routes" will be accepted.
- 2.5. Installation of Fire Stop Materials as Required.
- 2.6. Provide of a twenty-five (25) year warranty on the entire system (described in section 4.6).
- 2.7. Provide a complete cabling labeling system (described in section 6).
- 2.8. Repair and make good any damage, including any necessary cleaning.
- 2.9. Provide complete and accurate documentation of wiring layout on the date the cabling system is handed over so that documentation can be maintained with each move/add/change. Documentation requirements are described in Section 4.
- 2.10. All work necessary for the completion of the intended communication cabling installation, whether shown or not on the drawings, shall be part of this contract.
- 2.11. Refer to Interior Design Standards, Zone and Function Standards Sheet for Technical Specifications for each operational area's requirements.

3. PRODUCT REQUIREMENTS (*GMCS Contractor*)

3.1. Product General Requirements

All components and products used from end to end, including patch cords and line cords, must be supplied from the same manufacturer, certified and warranted for 25 years as per section 4.6.

3.2. Unshielded Twisted Pair Cable Data

- 3.2.1. Transmission requirements shall conform to or exceed all applicable sections of TIA-568-A current specifications for Category 6 and components as required for the location. Category 5e is acceptable only to supplement and match existing for refit installations.



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- 3.2.2. All cabling will be 4-pair, 100-ohm, unshielded twisted pair, solid conductor, 24 AWG and certified Category 6. Category 5e acceptable only as noted.

3.3. Communication Outlets

- 3.3.1. 8 PIN, RJ45 configuration. Use as required.
3.3.2. To match cable rating category.
3.3.3. For surface, recess mounting or for modular furniture

3.4. Rack Unit with Power Bar

- 3.4.1. Free standing equipment rack(s) as indicated in Annex C.
3.4.2. Free standing 2075 mm (84") high rack(s) units, gangable.
3.4.3. Must provide 482.6 mm (19") rack(s) mount capability for rack mountable components.
3.4.4. Must provide 1925 mm (77") of vertical mounting space.
3.4.5. One Meter (40") clearances at the front and rear of each rack are necessary for access to network equipment.
3.4.6. All racks are to be adequately secured to the floor with four (4) $\frac{3}{4}$ " bolt down holes.
3.4.7. Must have threaded mounting holes front and rear to standard (EIA) hole pattern.
3.4.8. There shall be two (2) 20 amp, 120V, rack mounted non-switched power strips (power bar) that are surge suppressed. Each strip shall have six outlets and a ten (10) foot power cord with twist lock plug. The distribution of these power strips within the racks will vary depending on the number of racks required, which will be decided upon by the technical authority.
3.4.9. Supply and Install a 19" shelf unit to be mounted on rack unit as shown in Annex C. (If PBX phone switch is required, a separate shelf will be provided with unit, but rack space will have to be available).

3.5. Cable Management System

- 3.5.1. Supply and Install required 2U horizontal cable management system should be installed between each Panel and Switch as shown on Annex C.
3.5.2. Suitable for mounting on a 19-inch rack.
3.5.3. Install vertical cable management system a minimum of 6" wide to comfortably manage the number of patch cords for each patch panel. Mount on each side of rack as shown on Annex C.

3.6. Modular Patch Panels

- 3.6.1. To match cable rating category
3.6.2. 2U 48-port panels as specified in Work Requirements above (2.1.1).



3.6.3. Suitable for mounting on a 19 inch free standing rack.

3.7. Patch Cords

- 3.7.1. Should be of the same performance category or higher as the horizontal cables to which they connect.
- 3.7.2. Wired "straight through" to standard TIA EIA568-A.
- 3.7.3. Provide white color patch cords (or one other available color different than those supplied for data) to connect voice to voice patch panel in the following quantities:
- Total number of workstations and computer stations + 20% split in 4' and 7' lengths.
- 3.7.4. Provide red or green color patch cords for special purpose applications. Quantities are 5 each of 4', 7' and 10'.
- 3.7.5. Provide blue color cords to connect data to Ethernet switches in the following quantities:
- Total number of workstations and computer stations + 20% split in 4' and 7' lengths.

3.8. Workstation Patch Cords

- 3.8.1. Should be of the same performance category or higher as the horizontal cables to which they connect.
- 3.8.2. Wired "straight through" - to standard TIA EIA568-A
- 3.8.3. Provide blue color patch cables for workstations in the following quantities. :
- Total number of workstations and computer stations+ 20% split in 7' and 10' lengths.

3.9. Cable Tray and Conduit

Install all cables in a cable tray or conduit or install J hooks based on the infrastructure outlined in the electrical drawings.

3.10. Flush Faceplates for Wall-Mounted Outlets

- 3.10.1. For use on all flush mounted communication wall outlets.
- 3.10.2. Supply 2 or 4-port face plate. Install blanks on all unused ports.
- 3.10.3. For videoconferencing equipment in boardrooms, a 4-port face plate is required
- 3.10.4. Single gang, flush mounted – to match electrical plates.

3.11. Surface Mounted Adapters

- 3.11.1. For surface mounting on stand-alone pac poles, or other locations as specified on the drawings



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- 3.11.2. Must be 2, 3 or 4-ports. Install blanks on all unused ports.
- 3.11.3. Single gang, surface mounted – to match electrical plates.

3.12. Furniture Mounted Adapters

- 3.12.1. Must be 2, 3 or 4-ports.
- 3.12.2. Install blanks on unused ports.
- 3.12.3. All jacks must be installed face up and not suspended in the furniture service channel so all jacks and labels are visible.
- 3.12.4. Contractor is responsible to supply the appropriate adaptor plate.

3.13. Modular jacks

- 3.13.1. For installation in faceplates/adapters noted in sections 3.10 and 3.11 and 3.12.
- 3.13.2. Modular type connectors.
- 3.13.3. All jacks must match the category rating of the cable installed

4. DOCUMENTATION / AS-BUILTS / RECORDS (GMCS Contractor)

- 4.1. All documentation is to be provided both in paper and electronic formats compatible to Microsoft products such as Word, or Excel, Visio, or using AutoCAD on a CD or USB memory stick, as specified by the Telecom Authority.
- 4.2. One hard copy of the floor plan is to be provided upon completion of work and include the location and label of each installed jack and spares in the ceiling.
- 4.3. Provide paper and electronic formats of all test results.
- 4.4. Provide a certificate document issued by the cable/component manufacturer, guaranteeing the cabling system installed meets or exceeds the performance requirements of the applicable Standard as referenced in this document.
- 4.5. Manufacturer must guarantee that all material and labour is covered in this circumstance for the full certification period and in the event that the Contractor is no longer in business, the full certification remains valid.
- 4.6. The installed structured cabling system must be covered by a 25-year warranty which includes, as a minimum:
 - 4.6.1. Warranty against defects in material and workmanship from the date of installation.
 - 4.6.2. Repair or replacement of a failed component, covering parts and labour, at no charge to the owner. Response time onsite should be a maximum of 4 hours.
 - 4.6.3. Single point of contact for all warranty service.

5. TESTING (GMCS Contractor)

May 7, 2012

T:\TELECOM\Cable Specs Interior Design Spec 2012VApp 7 IT
Spec IDS for SCCs Turnkey WITH GMCS Rev. 2 May 2012.doc

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**5.1. Testing Cable**

- 5.1.1. Tests shall be completed pass rated in accordance with TIA/EIA-568-A and TIA/EIA-568-A.
- 5.1.2. All results recorded outside of applicable category limits for the wiring installed, shall require replacement of defective components or cables.

6. LABELING AND MARKING (GMCS Contractor)

- 6.1. Labels shall be of a permanent style, sleeve type label, conforming to AMS-DTL23053/5.
- 6.2. Both ends of each cable (at the patch panel and the workstation end) shall be labeled with the same designation and patch panel port ID to which it is connected.
- 6.3. Each RJ45 connection shall be labeled with the same designation and patch panel port ID to which it is connected.
- 6.4. Drop cable number shall be consecutively numbered.
- 6.5. The label format for the components is to follow the format "a.yy" where:
 - "a" indicates the panel letter (each panel being lettered consecutively)
 - "yy" indicates the port number (each panel will have number from 1-48)
- 6.6. For voice distribution panels, an additional label is placed on the front of each panel in a fashion so that the number of each port is visible at all times, for each jack.
- 6.7. All markings must be carefully done so as to present an easily-readable, neat appearance.
- 6.8. There shall be no hand-written labels of any kind.
- 6.9. Place a small, brightly colored sticker on the ceiling T-bar directly below where the spares will be placed. Sticker must be visible from the floor level.



ANNEX B - GENERAL IT FIT-UP STANDARDS AND GUIDELINES

Ideally, on-floor telecommunications rooms form part of the base building infrastructure, but are often constructed as part of the fit-up process. Technical Rooms are typically sized, secured, ventilated and air conditioned, to accommodate equipment racks, network cabling, communication switches and other passive and active equipment specifically related to the distribution of the SCC's telecommunications and security systems. The room is to be located as close as practicable to the centre of the area being served and preferably in the building core area. Technical Rooms, *a.k.a.* TRs complying with Telecommunications Industry Standards are sized as follows:

Minimum Room Size based on the number of racks. Size may vary based on barrier free standards and equipment requirements.

2 racks - 3.3 m x 3 m (11' x 10')

1 rack - 2.2 m x 3 m (7' x 10')

On-floor TRs may accommodate a single server in this space without exceeding the air cooling capacity specifications previously derived from heat load calculations of all active equipment. Under no circumstances are non-telecom equipment, active or not, or general office materials to be stored in this room. The TR is not a storage room.

The completion of the entire fit-up of the TR is a priority item entered into the site construction schedule and or re-fit schedule.

The following TR diagrams are indicative of a generic Technical Room fit-up. Questions pertaining to the specification provided should be forwarded to your local SCC/HRSDC Telecom authority.

Submitted expressions of interest must be forwarded to your local Telecom authority to identify that facilities are available at each of the locations. Verification of these locations will be forwarded to the Project Authority within 5 business days.

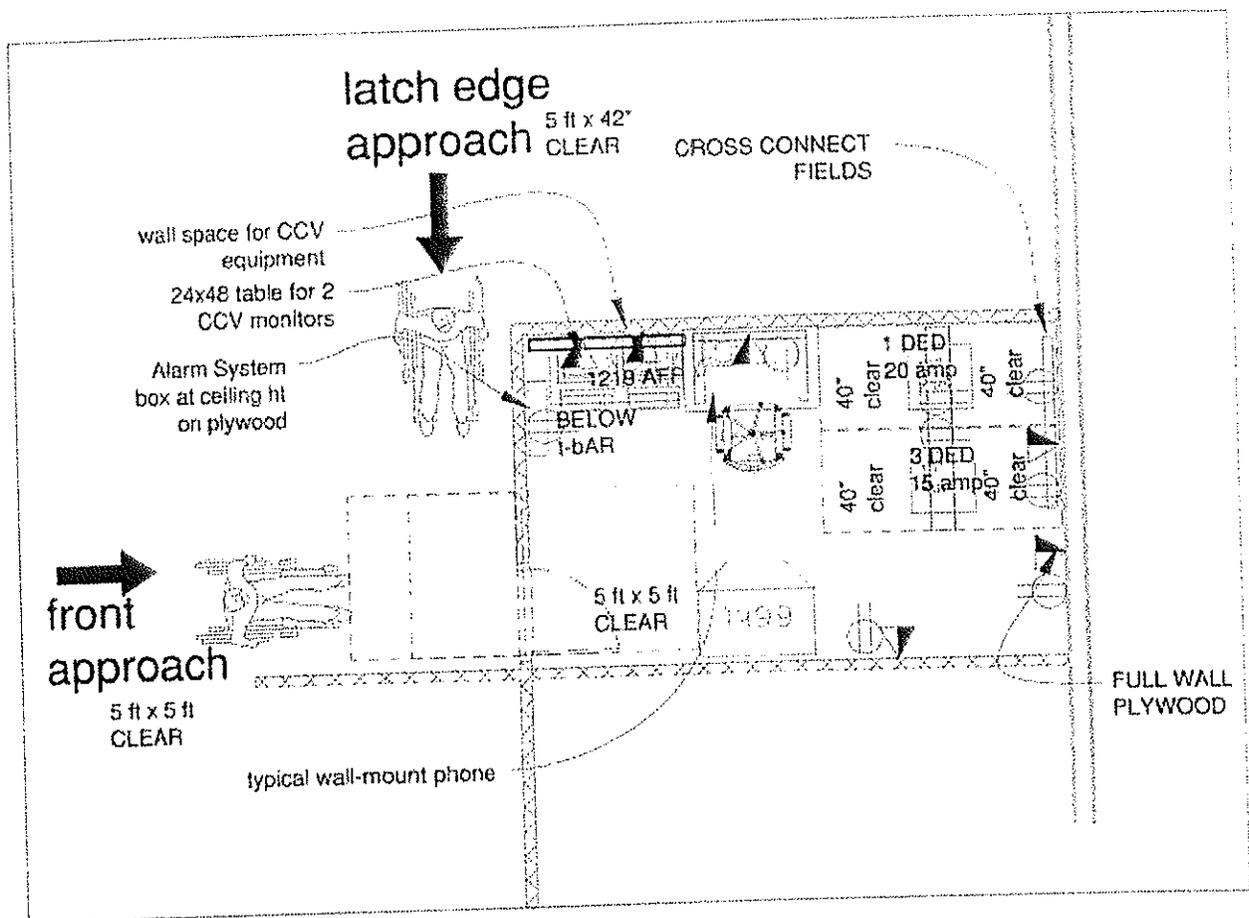
All IT plans must be reviewed and approved by the local Telecom authority prior to tendering.



TELECOMMUNICATIONS ROOM SPECIFICATIONS AND GUIDELINES

Provided are some typical small and medium size Technical Room a.k.a. Telecommunication or LAN Room layouts showing barrier free standards requirement. Security equipment should typically be wall mounted as high as possible and away from voice and data infrastructure. Security specs including closed circuit video, if required, to be provided by others. No piping, ductwork, mechanical equipment or power cabling should be allowed to pass through the TR. Avoid sources of flooding.

Note: Room dimensions depend upon equipment requirements and barrier-free standards determined during the design phase



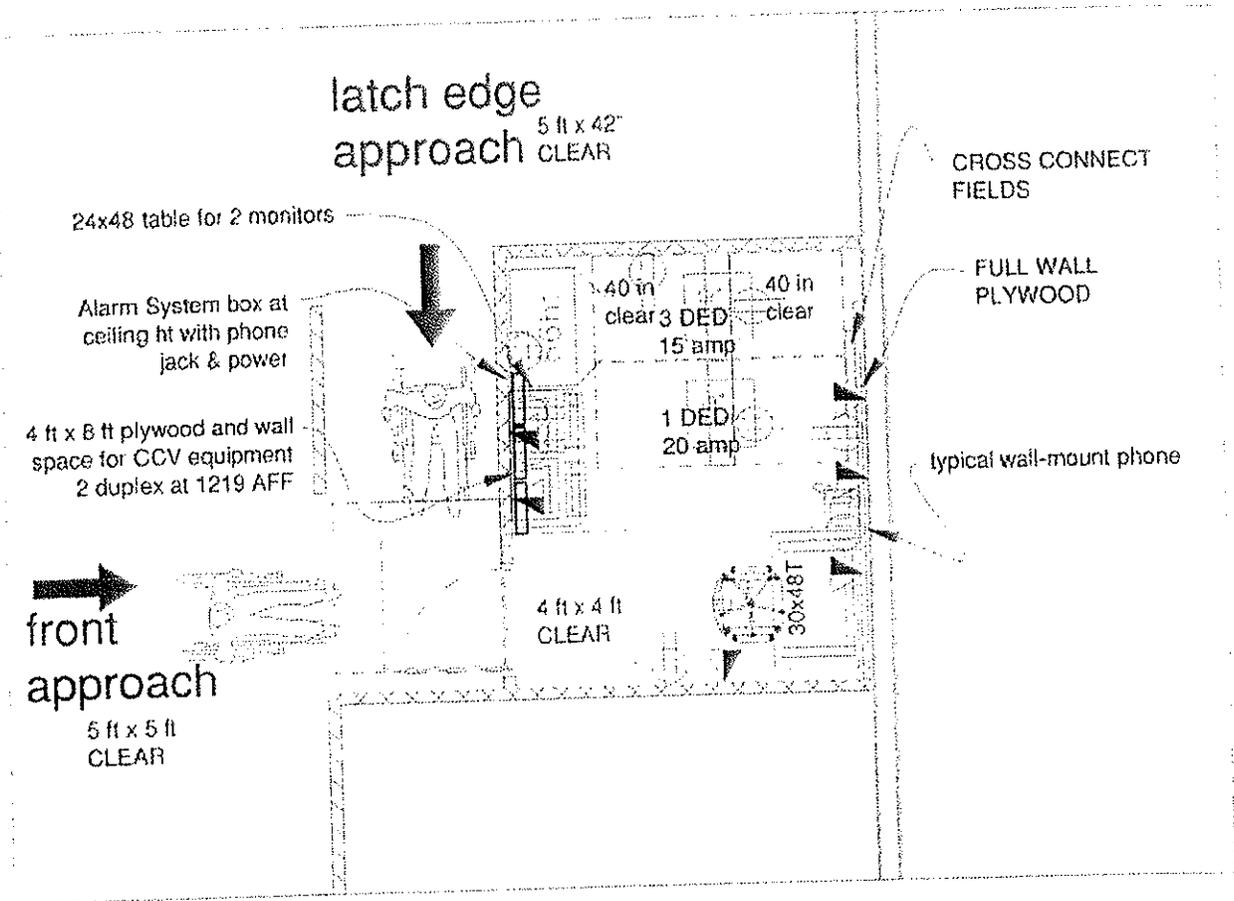
MEDIUM-LARGE SAMPLE 'A' - 2-RACK
TECHNICAL RM DOOR SWINGS INWARD

XXX



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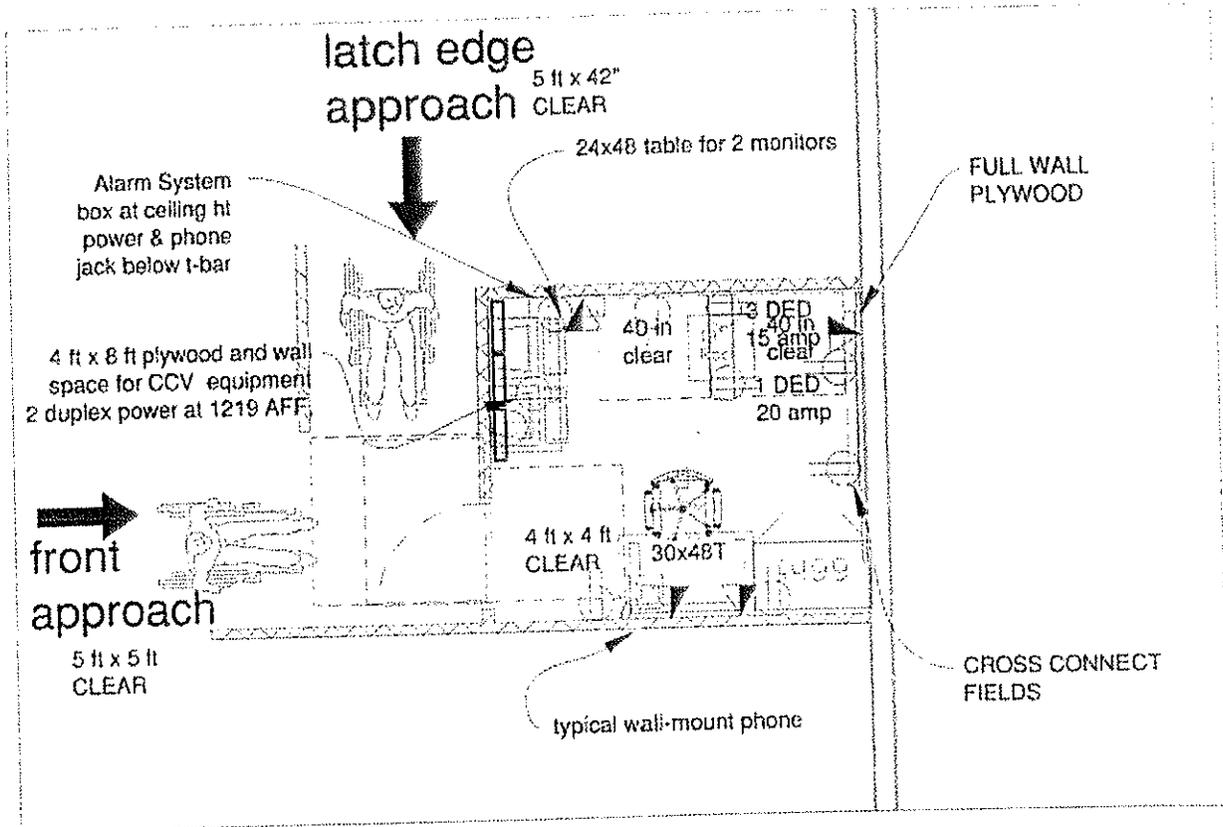
Note: Room dimensions depend upon equipment requirements and barrier-free standards determined during the design phase



MEDIUM-LARGE SAMPLE 'B' 2-RACK
TECHNICAL RM DOOR OUTWARD
xxx



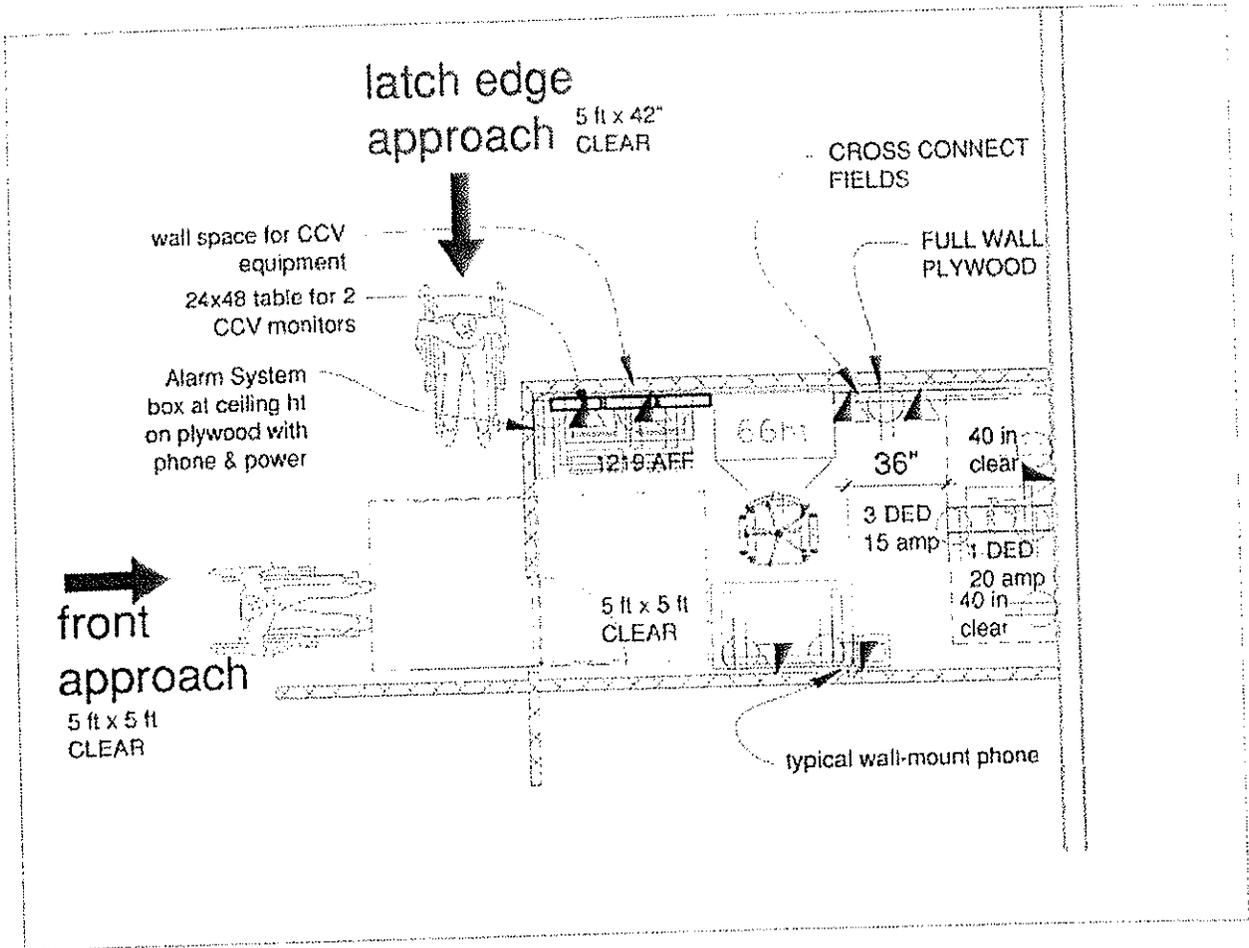
Note: Room dimensions depend upon equipment requirements and barrier-free standards determined during the design phase



SMALL OFFICE SAMPLE 'C' 1-RACK
TECHNICAL RM DOOR OUTWARD
XXX



Note: Room dimensions depend upon equipment requirements and barrier-free standards determined during the design phase

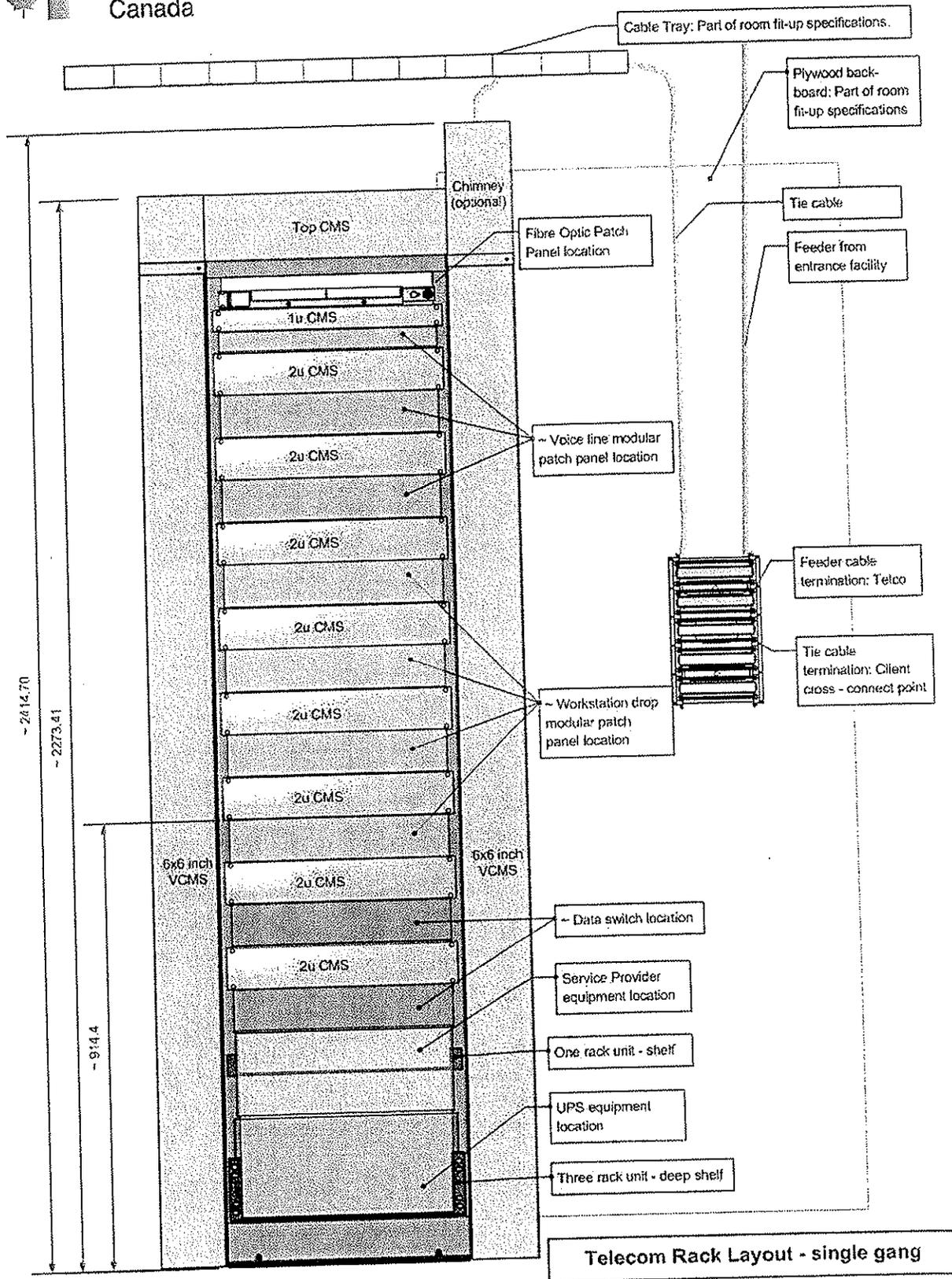


SMALL OFFICE SAMPLE 'D' 1-RACK
TECHNICAL RM DOOR SWINGS INWARD
xxx

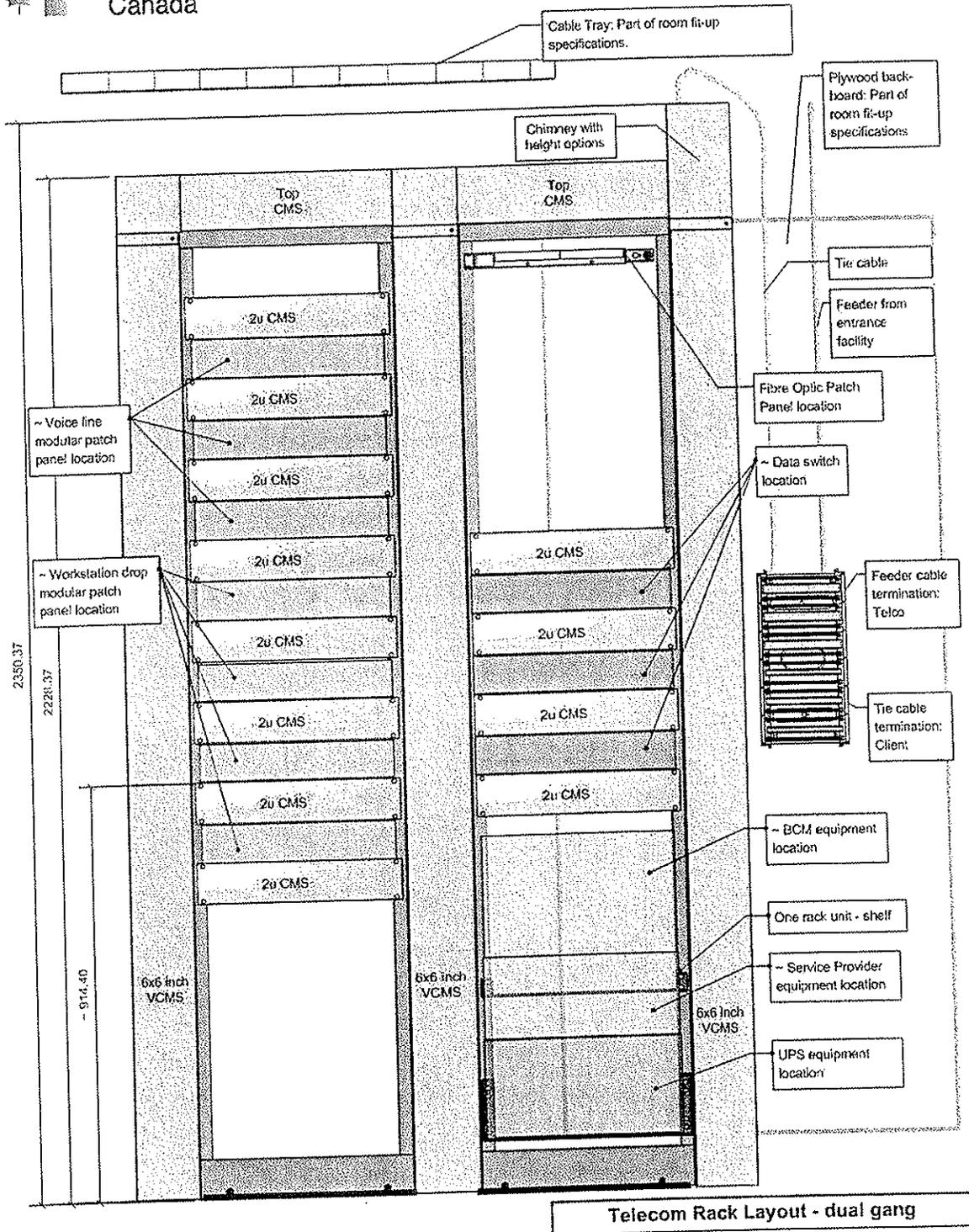


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ANNEX C – TELECOM RACK LAYOUT (TYPICAL)

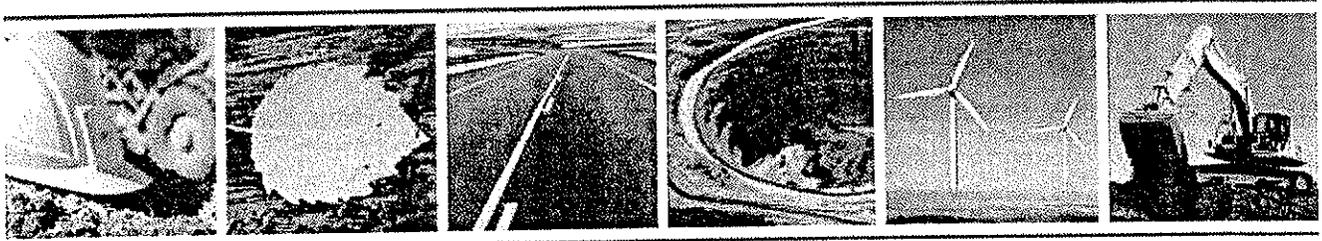


Telecom Rack Layout - single gang



PUBLIC WORKS AND GOVERNMENT SERVICES CANADA

**HAZARDOUS BUILDING MATERIALS ASSESSMENT
HARRY STEVENS BUILDING
125 EAST 10TH AVENUE, VANCOUVER, BC**

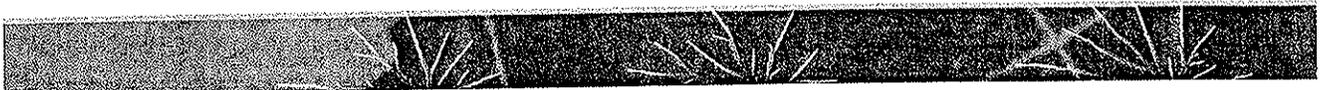


REPORT

MAY 2, 2013
ISSUED FOR USE
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A TETRA TECH COMPANY



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EBA, A Tetra Tech Company
#1 - 4376 Boban Drive
Nanaimo, BC V9T 6A7 CANADA
p. 250.756.2256 f. 250.756.2686

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FIGURES

Figure 1	Basement
Figure 2	First Floor
Figure 3	Second Floor
Figure 4	Third Floor
Figure 5	Roof and Penthouse

APPENDICES

Appendix A	Laboratory Certificate of Analysis (Asbestos and Lead)
Appendix B	EBA's General Conditions

1.0 INTRODUCTION

EBA Engineering Consultants Ltd., operating as EBA, A Tetra Tech Company (EBA) was retained by Public Works and Government Services Canada (PWGSC) to provide a hazardous building materials assessment of the Harry Stevens building located at 125 East 10th Avenue in Vancouver, BC (Subject Building).

This document provides an outline of:

- Applicable regulations;
- Background information regarding the purpose of the assessment;
- EBA's scope of services;
- Methodology;
- The findings of our assessment; and
- Based on our findings, provides appropriate recommendations.

EBA representative, Mr. Joel Shandro, completed the assessment on March 19, 2013.

2.0 BACKGROUND INFORMATION AND SCOPE OF SERVICES

2.1 Background Information

EBA understands that PWGSC is planning major renovations within the Subject Building and wished to retain a consultant to establish an inventory of existing hazardous building materials associated with the Subject Building.

The outlined proposal and work was completed in accordance with the Hazardous Materials Standing Offer Agreement: EZ899-103067/007/XSB.

2.2 Scope of Services

The scope of services for the assessment is outlined as follows:

- Assessment of all accessible areas of the Subject Buildings for the collection of the following suspect building materials:
 - Asbestos containing materials (ACM's); and
 - Lead based paints (LBP's).

- Visual assessment for items listed as “hazardous waste” within the British Columbia Hazardous Waste Regulation (B.C. Reg. 63/88, amended up to 63/2009) of the federal dangerous goods regulation as follows:
 - Ozone depleting substances (ODS);
 - PolyChlorinated biphenyl’s (PCB’s);
 - Radioactive sources in heat/fire detection systems;
 - Mercury containing equipment in thermostatic controls; and,
- Visual confirmation of mould impacts on building materials;
- Sample collection of suspected ACMs and LBPs for laboratory analysis;
- Interpretation of analytical data;
- Facility drawings of the Subject Building including sample point locations and drawing identification;
- Preparation of a final report, detailing the findings of our assessment outlining hazardous building materials identified within the Subject Building, if any; and,
- Preparation of technical abatement specifications for the abatement of hazardous building materials.

3.0 REGULATIONS AND GUIDELINES

The following sub-sections outline relevant provincial and federal regulations and guidelines as they pertain to hazardous materials management or abatement.

3.1 Federal Occupational Health and Safety Regulations

Within federal jurisdictions Occupational Health and Safety is regulated by Human Resources Skills Development Canada (HRSDC), under the Canada Labor Code, Part II – Occupational Health and Safety (Canada Labor Code). The Canada Labor Code defines the general duties and obligations of the employer, employees and others at federally regulated workplaces.

3.2 Provincial Occupational Health and Safety Regulations

Provincial workplace health and safety is regulated in British Columbia by WorkSafeBC under the *Workers’ Compensation Act* (the Act), as amended by the *Workers’ Compensation (Occupational Health and Safety) Amendment Act* (effective June 30, 2002). The Act defines the general duties and obligations of the employer, employees and others at the workplace.

The WorkSafeBC Occupational Health and Safety Regulation 296/97 (OH&S Reg.) (including amendments up to the date of this report) contains legal requirements that must be met by all workplaces under the inspection jurisdiction of WorkSafeBC. Many parts of the OH&S Regulation have associated guidelines, which are used to help interpret and apply the OH&S Regulation.

3.3 Asbestos Containing Material Regulations

The handling and management of asbestos containing materials are regulated by the Act under Part 6 of the OH&S Reg., within Section 6.1 of the OH&S Regulation, an “asbestos containing material” is defined as follows:

(a) a manufactured article or other material, other than vermiculite insulation, that would be determined to contain at least 0.5% asbestos if tested in accordance with one of the following methods:

(i) Asbestos, Chrysotile by XRD, Method 9000 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(ii) Asbestos (bulk) by PLM, Method 9002 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(iii) Test Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116, dated July 1993) published by the United States Environmental Protection Agency; and,

(b) vermiculite insulation that would be determined to contain any asbestos if tested in accordance with the Research Method for Sampling and Analysis of Fibrous Amphibole in Vermiculite Attic Insulation (EPA/600/R-04/004, dated January 2004) published by the United States Environmental Protection Agency.

WorkSafeBC has published “*Safe Handling of Asbestos, A Manual of Standard Practices*”. This manual outlines basic information on asbestos and asbestos products, health hazard requirements for worker protection, safe work procedures and principles that should be followed in selecting the most suitable technique for the safe abatement of asbestos-containing materials. This document provides a guide to current practices that are to be followed in the Province of British Columbia.

Officially, DND and PWGSC workers fall under the jurisdiction of the HRSDC, the Canada Labour Code and the COHS Regulations. However, the WorkSafeBC requirements for hazardous materials (asbestos, lead, etc.) tend to be more updated and thorough than the COHS Regulations requirements. Furthermore, any hazardous material removal work that may occur in the Subject Building will likely be conducted by an employer that is regulated by WorkSafeBC.

Under the Transportation of Dangerous Goods Act, Asbestos is classified under Class 9; Miscellaneous Products, Substances or Organisms.

3.4 Lead-Based Paint (LBP) Regulations

The handling and management of lead containing materials are regulated by the Act under Part 6 of the OH&S Reg. In 1976, the lead content in certain interior and exterior paint was limited to 0.5% by weight under the federal *Hazardous Products Act*. In April 2005, the Governor General in Council, on the recommendation of the Minister of Health, and pursuant to Section 5 of the *Hazardous Products Act*, annexed the *Surface Coating Materials Regulation 2005-109*.

The previous acceptable level of lead in paint was amended from 0.5% by weight (5,000 parts per million (ppm)) to 600 mg/Kg (600 ppm). Corrective action is taken on consumer paints that contain more lead than is allowed by law. In October 2010, the Government amended the *Surface Coating Materials Regulations* to include "*Consumer Products Containing Lead (Contact with Mouth) and Surface Coating Materials Regulation*." The amended *Surface Coating Materials Regulation* identifies that previously considered "safe" lead levels pose a significant risk to the public, especially to children and pregnant women. Therefore significantly lowering the level of total lead allowed in paints and other surface coating materials from 600 mg/Kg (600 ppm) to 90 mg/Kg (90 ppm) - which is equivalent to a lead concentration of 0.009%. This new lead limit is among the strictest in the world.

Under the *Hazardous Products Act*, identified LBP must undergo Toxicity Characteristic Leachate Properties (TCLP) to determine disposal procedures. The acceptable TCLP limit for disposal of LBP is less than 5 mg/L (5 ppm). If an identified LBP exhibits a TCLP result of less than 5 ppm, the paint is not considered a hazardous material and may be disposed of as general construction waste.

Under the Transportation of Dangerous Goods Act, lead in sheeting products is under Class 9; Miscellaneous Products, Substances or Organisms.

3.5 Ozone Depleting Substances Regulations

Provincial regulatory framework providing the requirements for the safe management, storage and disposal of Ozone-Depleting Substances (ODSs) is provided in British Columbia Regulation (BC Reg.) 387/99, as amended by BC Reg. 109/2002 - Ozone-Depleting Substances Regulation respecting the appropriate management of ODSs within the province of British Columbia. Schedule A in the regulation lists all ozone-depleting refrigerant types.

In 1994, the federal government filed the Ozone-Depleting Substances Regulations to amend controls on the production and consumption of chlorofluorocarbons (CFCs), halons, tetrachloride and methyl chloroform. The Federal Halocarbon Regulations, effective July 1, 1999, was filed to ensure uniformity with respect to the release, recovery and recycling of ODSs and their halocarbon alternatives in refrigeration and air conditioning equipment throughout the provinces of Canada. The Code of Practice for the Reduction of CFC Emissions from Refrigeration and Air Conditioning Systems (EPS/1/RA/1 March 1991, original date) provides Best Practice recommendations for the handling, storage, and disposal of such materials.

Under the Transportation of Dangerous Goods Act, Ozone Depleting Substances are under Class 2; Non-flammable Gas.

3.6 PolyChlorinated Biphenyl (PCB) Regulations

The manufacture and import of PCBs was banned in North America in 1977. The handling, storage and disposal of PCBs that were in use at the time of the ban, is strictly regulated by the federal government under the Canadian Environmental Protection Act (CEPA).

In 2008, Environment Canada introduced new PCB Regulations which seek to phase out the use and storage of PCBs, and to eliminate remaining PCB-containing electrical equipment by the end of 2025.

Under the Transportation of Dangerous Goods Act, polychlorinated biphenyl's are under Class 9; Miscellaneous Products, Substances or Organisms.

3.7 Additional Regulations and Guidelines

PWGSC had developed "Departmental Policy 057 – Asbestos Management", which outlines specific requirements regarding the management of ACMs. As of January 2011, all federal departments must also adhere to this policy.

3.8 Environmental Regulations

In British Columbia, environmental matters pertaining to waste generally fall under the jurisdiction of the British Columbia Ministry of Environment (MoE), pursuant to the British Columbia *Environmental Management Act* (EMA). The waste regulation under the EMA relating to the disposal of hazardous building materials is the Hazardous Waste Regulation (HWR), BC Regulation 63/88, including amendments up to BC Reg. 261/2006.

The HWR refers to the handling, storage, transportation, treatment, recycling and disposal of hazardous wastes in the province. The regulation outlines the materials and criteria to be used to characterize waste as hazardous.

BC MoE has recently indicated the intent to add mercury-containing products such as light bulbs and thermostats as recyclable products regulated under the BC Recycling Regulation (RR), BC Regulation 65/2006. At the time of decommissioning, the BC Recycling Regulation and amendments will need to be considered when disposing of any identified mercury-containing products.

The HWR defines waste asbestos as a waste containing friable asbestos fibres or asbestos dust in a concentration greater than 1% by weight either at the time of manufacture, or as determined using a method specified in section 40 (1).¹

3.9 Transportation Regulations

The transportation of hazardous wastes is governed under the Federal *Transportation of Dangerous Goods Act and Regulations* (1992) that outline the requirements for storage, handling, and transportation of such waste.

¹ 40 (1) For the purposes of the definition of "waste asbestos" in section 1 (1) of this regulation, if the concentration of asbestos in the waste is not determined by weight at the time of manufacture, it must be determined using one of the following:
(a) Method 600-R-93-116, as amended from time to time, published by the United States Environmental Protection Agency;
(b) NIOSH Method 9002, as amended from time to time, from the *NIOSH Manual of Analytical Methods*, 4th Edition, published by the National Institute for Occupational Safety and Health, United States.

4.0 HEALTH AND SAFETY

EBA completed a Health and Safety (H&S) plan specific to this project. The H&S plan included but was not limited to:

- Onsite hazards;
- Project specific personal protection equipment (PPE);
- Safety training;
- Location of nearest hospital in regards to each facility; and,
- Emergency contact information for onsite EBA employees.

The H&S plan was supplied to PWGSC prior to commencement of the scope of services. During the assessment, EBA employees had available the H&S plan at all times while onsite in the Subject Buildings.

EBA's work was completed in compliance with the appropriate general requirements of:

- WorkSafeBC;
- WHMIS; and
- TDG.

5.0 METHODOLOGY

The assessment included an intrusive (destructive) assessment to identify the potential presence of ACMs and LBPs, and a visual assessment for the presence of PCBs, ODS, radioactive sources Hg containing equipment and mould impacts.

5.1 Hazardous Building Materials Assessment

The room-by-room hazardous building materials assessment was intrusive (destructive) and focused on the following hazardous building materials in applicable applications:

- Architectural – applications of ACMs and mould impacts;
 - Sampling included all architectural finishes including but was not limited to; drywall, drywall taping compound, various flooring finishes, ceiling textures, ceiling tiles, mastics and other suspect materials as determined by the assessor;
- Mechanical - applications of ACMs and visual identification of halocarbons and mould impacts;
 - Sampling included all mechanical insulation, Heating Ventilation and Air Conditioning (HVAC) mastic, duct insulation, flexible duct joints, compressor and air handling systems, refrigeration systems and other suspect materials as determined by the assessor;
- Electrical - applications of ACMs, PCBs and mercury in thermostatic controls;

- Where wiring was exposed to full view and where the system was confirmed to NOT be energized; EBA sampled and/or assessed the following; textile wire coverings, visual identification of fluorescent light ballasts, thermostatic controls and oil in hydraulic ramps and elevators/lifting devices;
- Civil/ structural - applications of asbestos and mould impacts;
 - Sampling included exterior finishes including roofing, siding, window putty and other suspect materials as determined by the assessor; and
- Paint;
 - Sampling of paint for lead content included interior and exterior finishes.

6.0 ASSESSMENT RESULTS

The results of the assessment are provided in the following sub-sections.

6.1 Asbestos-Containing Materials (ACM); TDG Class 9

EBA collected and submitted fifty-eight (58) samples of suspected ACMs to the laboratory for analysis. Based on the findings of our assessment, ACMs were identified within some of the samples submitted.

Analytical results, sample point locations and descriptions of all materials assessed for asbestos content are summarized in Table 1. Materials confirmed to be asbestos containing are outlined in RED bold within Table 1.

The site location plan and sampling locations are shown within Figures 1 through 5. A copy of the analytical report for materials analyzed for asbestos content is provided in **Appendix A**.

Table 1: Results of Asbestos Analysis

Sample ID	Sample Description	Sample Location	Results (%)
125-01	Spray Fireproofing	Parkade East Storage	Non-Detect
125-02	Mechanical Pipe Insulation Lagging	Parkade East Storage	Non-Detect
125-03	Black Flooring	Parkade East Stairwell	Non-Detect
125-04	Wall Plaster	Parkade East Stairwell	1 – 5 % CH
125-05	Spray Fireproofing	Basement West Storage	Non-Detect
125-06	Grey HVAC Mastic	Basement West Storage	1 – 5 % CH
125-07	Masonry Grout	Basement West Storage	Non-Detect
125-08	Mechanical Pipe Insulation Lagging	Basement West Storage	Non-Detect
125-09	Drywall Joint Compound	Basement Storage Adjacent to Stairwell	Non-Detect

Table 1: Results of Asbestos Analysis

Sample ID	Sample Description	Sample Location	Results (%)
125-10	Wall Plaster	Boiler Room Hallway	Non-Detect
125-11	Drywall Joint Compound	Chiller Room	Non-Detect
125-12	Wall Plaster	Men's Washroom	Non-Detect
125-13	Drywall Joint Compound	Main Floor South Column	Non-Detect
125-14	Drywall	Main Floor Outside North West Stairwell	Non-Detect
125-15	Wall Plaster	Main Floor Mail Alcove	Non-Detect
125-16	Flooring Beneath Carpet	Main Floor Loading Dock Entrance	Non-Detect
125-17	Flooring Beneath Carpet	Main Floor North West Stairwell Entrance	Non-Detect
125-18	Black Flooring	Main Floor North West Stairwell Entrance	Non-Detect
125-19	Drywall Joint Compound	Main Floor North Column	Non-Detect
125-20	Grey Sheet Flooring	Main Floor Gallery Stairwell	Non-Detect
125-21	Drywall Joint Compound	Main Floor Gallery Stairwell	Non-Detect
125-22	Interior Window Gasket	Loading Dock	Non-Detect
125-23	Interior Window Putty	Loading Dock	Non-Detect
125-24	Interior Window Putty	Tall Windows in Stairwells	5 – 10 % CH
125-25	Cream Sheet Flooring	Gallery	Non-Detect
125-26	Grey Sheet Flooring	Outside Fan Room	Non-Detect
125-27	Drywall Joint Compound	Outside Fan Room	Non-Detect
125-28	Sheet Flooring	Gallery	Non-Detect
125-29	Red Penetration Mastic	Gallery	Non-Detect
125-30	Drywall Joint Compound	Kitchen Hallway	Non-Detect
125-31	Roofing Material	Central Roof	Non-Detect
125-32	Spray Fireproofing	Penthouse	DNQ
125-33	Duct Mastic	Penthouse	5 – 10 % CH
125-34	Seam Putty	Penthouse	5 – 10 % CH
125-35	Mastic Around Access Door	Penthouse	5 – 10 % CH
125-36	Roof Flashing Putty	Roof	Non-Detect
125-37	Exterior Grey Mastic Around Windows	Main Floor – South Side	Non-Detect

Table 1: Results of Asbestos Analysis

Sample ID	Sample Description	Sample Location	Results (%)
125-38	Exterior Black Rubber Gasket	Main Floor – South Side	Non-Detect
125-39	Flooring Beneath Carpet	Second Floor Boardroom	1 – 5 % CH
125-40	Flooring Beneath Sample 125-39	Second Floor Boardroom	Non-Detect
125-41	Interior Window Putty	Second Floor Boardroom	Non-Detect
125-42	Exterior Window Putty	Second Floor Boardroom	5 – 10 % CH
125-43	Flooring Beneath Carpet	Outside Second Floor North Stairwell	Non-Detect
125-44	Interior Window Putty	Second Floor South East Office	Non-Detect
125-45	Flooring Beneath Carpet	Second Floor South East Office	Non-Detect
125-46	Wall Plaster	Second Floor South East Column	Non-Detect
125-48	Drywall Joint Compound	Second Floor Central Column	Non-Detect
125-49	Flooring Beneath Carpet	Third Floor South West Office	Non-Detect
125-50	Wall Plaster	Third Floor Outside North West Stairwell	Non-Detect
125-51	Interior Window Putty	Third Floor North Window	Non-Detect
125-52	Drywall Joint Compound	Third Floor West Hallway	Non-Detect
125-53	Grey Sheet Flooring Beneath Carpet	Third Floor Board Room	Non-Detect
125-54	Cream HVAC Mastic	Third Floor South East Column	Non-Detect
125-55	Floor Beneath Carpet	Third Floor Outside South East Stairs	Non-Detect
125-56	Interior Window Putty	Third Floor North East	Non-Detect
125-57	Exterior Window Putty	Third Floor North East	Non-Detect
125-58	Sheet Flooring	Third Floor LAN Area	Non-Detect
125-59	Drywall Joint Compound	Third Floor LAN Area	Non-Detect

Note: Non -detect; no asbestos containing material identified within sample
 DNQ; Detected asbestos was not quantitated
 CH; Chrysotile Asbestos

Based on the findings of our assessment, the following ACMs were identified within the Subject Building at the time of EBA's assessment:

- Asbestos-containing wall plaster (EBA sample # 125-04), located within the parkade east stairwell. Further sampling and analysis may be required to determine the extent of asbestos containing wall plaster within the parkade east stairwell.
- Asbestos-containing grey HVAC duct mastic (EBA sample # 125-06) located within the basement east storage.
- Asbestos-containing interior window putty (EBA sample # 125-24) applied to the tall windows within the stairwells.
- Asbestos-containing spray fireproofing, duct and access door mastics and seam putty (EBA sample #'s 125-32 to 125-35) within the penthouse mechanical room.
- Asbestos-containing flooring beneath carpet (EBA sample # 125-39) located within the second floor boardroom. Further sampling and analysis may be required to determine the extent of asbestos containing flooring beneath carpet within the second floor.
- Asbestos-containing exterior window putty (EBA sample # 125-42) applied to the window of the second floor boardroom.
- Previously identified asbestos-containing mechanical pipe insulation (elbows) throughout the Subject Building. Approximately 200 asbestos-containing mechanical pipe insulation elbows were identified at the time of the assessment. Additional elbows may be contained within pipe chases and other inaccessible portions of the Subject Building.
- Previously identified boiler insulation applied to the two boilers in the boiler room of the Subject Building.

6.2 Lead-Based Paints (LBP); TDG Class 9

EBA collected and submitted nine (9) LBP samples for laboratory analysis. Based on the findings of our assessment, LBPs were identified within some of the samples submitted for the Subject Building.

Analytical results, sample point locations and descriptions of all materials assessed for LBP content are summarized in Table 2. Paint coverings confirmed to be lead based are outlined in RED bold within Table 2.

The site location plan and sampling locations are shown within Figures 1 through 5. A copy of the analytical report for materials analyzed for lead content is provided in **Appendix A**.

Table 2: Results of Lead Paint Analysis

Sample ID	Sample Description	ICP (mg/kg)
L125-01	Basement Stairwell - White Interior Wall	1290
L125-02	Basement Mechanical Room Hallway – Yellow Interior Wall	888
L125-03	Boiler Room – Grey Floor	322
L125-04	Main Floor – White Interior Wall	< 2.0
L125-05	Main Floor – White Interior Window Box	2.1
L125-06	West Side Second Floor – White Interior Wall	68.5
L125-07	Gallery – Green Interior Wall	88.9
L125-08	Third Floor – Interior White Wall	120
L125-09	East Side Second Floor – Interior White	247

Note: Lead detection limit = 2.0 mg/kg

Based on the findings of our assessment, the following LBPs were identified within the Subject Building at the time of EBA's assessment:

- White interior wall, yellow interior wall and grey floor paints (EBA sample #'s L125-01, L125-02 and L125-03), within the basement.
- White interior wall paints (EBA sample # L125-08 and L125-09), within the third floor and east side of the second floor.

Based on the results of the lead-based paint sampling, the laboratory was instructed to further analyze identified LBPs for leachability using toxicity characteristic leaching procedure (TCLP). Analytical results, sample point locations and descriptions for all materials investigated for lead leachability is summarized in Table 3, below. Samples confirmed to be leachable above the standards set out in the Hazardous Products Act are bold and red.

Sample	Sample Description	Sample Location	Results (mg/L)
L125-01	White Interior Wall Paint	Basement Stairwell	0.12
L125-02	Yellow Interior Wall Paint	Basement	< 0.1
L125-03	Grey Floor Paint	Boiler Room	5.58
L125-08	Interior White Wall	Third Floor	< 0.1
L125-09	Interior White Wall	Second Floor East Side	< 0.1

Based on the TCLP analytical results, the grey paint applied to the boiler room floor was found to exceed the standards set out in the Hazardous Products Act.

6.3 PolyChlorinated Biphenyl's (PCB); TDG Class 9

Based on the findings and limitations of our visual assessment, suspect PCB-containing electrical equipment (fluorescent lamp ballasts) is likely to be present within the Subject Building.

6.4 Ozone Depleting Substances (ODS); TDG Class 2

Based on the findings and limitations of our visual assessment, suspect ODS-containing equipment was identified within the Subject Building in the form of roof top air conditioning units containing an unknown quantity of refrigerant.

6.5 Elemental Mercury; TDG Class 8

Based on the findings and limitations of our visual assessment, mercury containing equipment was identified within the Subject Building in the form of fluorescent light tubes which are known to contain small amounts of mercury vapour.

6.6 Radio Active Sources

Based on the findings and limitations of our visual assessment, radio-active sources were not identified within the Subject Building at the time of EBA's assessment.

6.7 Mould

Based on the findings and limitations of our visual assessment, mould impacted building materials were not identified within the Subject Building at the time of EBA's assessment.

7.0 RECOMMENDATIONS

Based on our site assessment results, EBA formulated the following recommendations for each of the seven hazardous materials in our scope: ACM, LBP, PCB, ODS Mercury, radioactive sources and mould.

7.1 Asbestos-Containing Materials

ACMs were identified within the Subject Building. During renovation activities, ensure these materials are removed and disposed of in accordance with the requirements of BC Reg. 421/2004. Identified ACMs should be managed, removed and disposed of in accordance with the requirements of WorkSafeBC document "Safe Work Practices for Handling Asbestos", The Transportation of Dangerous Goods Act, and The British Columbia Ministry of Environment, namely the requirements outlined in BC Reg. 63/88, as amended by Reg. 319/2004.

7.2 Lead-Based Paints

LBP were identified within the Subject Building. During renovation activities, ensure LBPs are managed, removed and disposed of in accordance with the requirements of WorkSafeBC, the Transportation of Dangerous Goods Act and the British Columbia Ministry of Environment, namely the requirements outlined in BC Reg. 63/88, as amended by BC Reg. 319/2004. Prior to disturbance of identified LBPs during renovation activities, adequate safe work procedures and an exposure control plan must be developed to ensure workers are protected from lead exposure. The exposure control plan must meet the requirements of WorkSafeBC Regulation 5.54.

7.3 PolyChlorinated Biphenyls

Based on the findings and limitations of our visual assessment, suspected PCB-containing electrical equipment (fluorescent lamp ballasts) is likely to be present within the Subject Building. During EBA's assessment, lamp ballasts are systematically assessed and referenced against Environment Canada's document "*Environmental Protection Series – Identification of Lamp Ballasts Containing PCBs, August 1991.*" The lamp ballasts identified within the Subject Building did not exhibit identifiers for PCB content. However, identifiers may be present on the portion of the lamp ballast that is adhered to the light shield. Due to the lamp ballast being energized, EBA did not remove the ballast to assess for additional identifiers therefore the potential exists for PCB containing lamp ballasts to be present.

EBA recommends that identified PCB-containing lamp ballasts are inspected and removed from service by a qualified contractor and transported to a certified disposal station for proper recycling and disposal.

7.4 Ozone Depleting Substances

ODS-containing equipment was identified within the Subject Building. During renovation activities, ensure it is removed and disposed of in accordance with the requirements of WorkSafeBC, Federal Halocarbon Regulations, 2003 (SOR 2003/289), amended by SOR 2009/221, the Transportation of Dangerous Goods Act and the British Columbia Ministry of Environment, namely the requirements outlined in BC Reg. 63/88, as amended by BC Reg. 319/2004.

7.5 Elemental Mercury

Mercury-containing equipment was identified within the Subject Building. During renovation activities, ensure these materials are removed and disposed of in accordance with the requirements of WorkSafeBC, the Transportation of Dangerous Goods Act and the British Columbia Ministry of Environment, namely the requirements outlined in BC Reg. 63/88, as amended by BC Reg. 319/2004.

8.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of PWGSC and their agents. EBA, A Tetra Tech Company, does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than PWGSC or for any project other than due diligence for the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this report is subject to the terms and conditions stated in EBA's Geo-environmental Report - General Conditions are provided in Appendix B of this report.

We trust this report meets your present requirements. Should you have any questions or comments, please contact the undersigned at your convenience.

Sincerely,
EBA, A Tetra Tech Company

Prepared by:



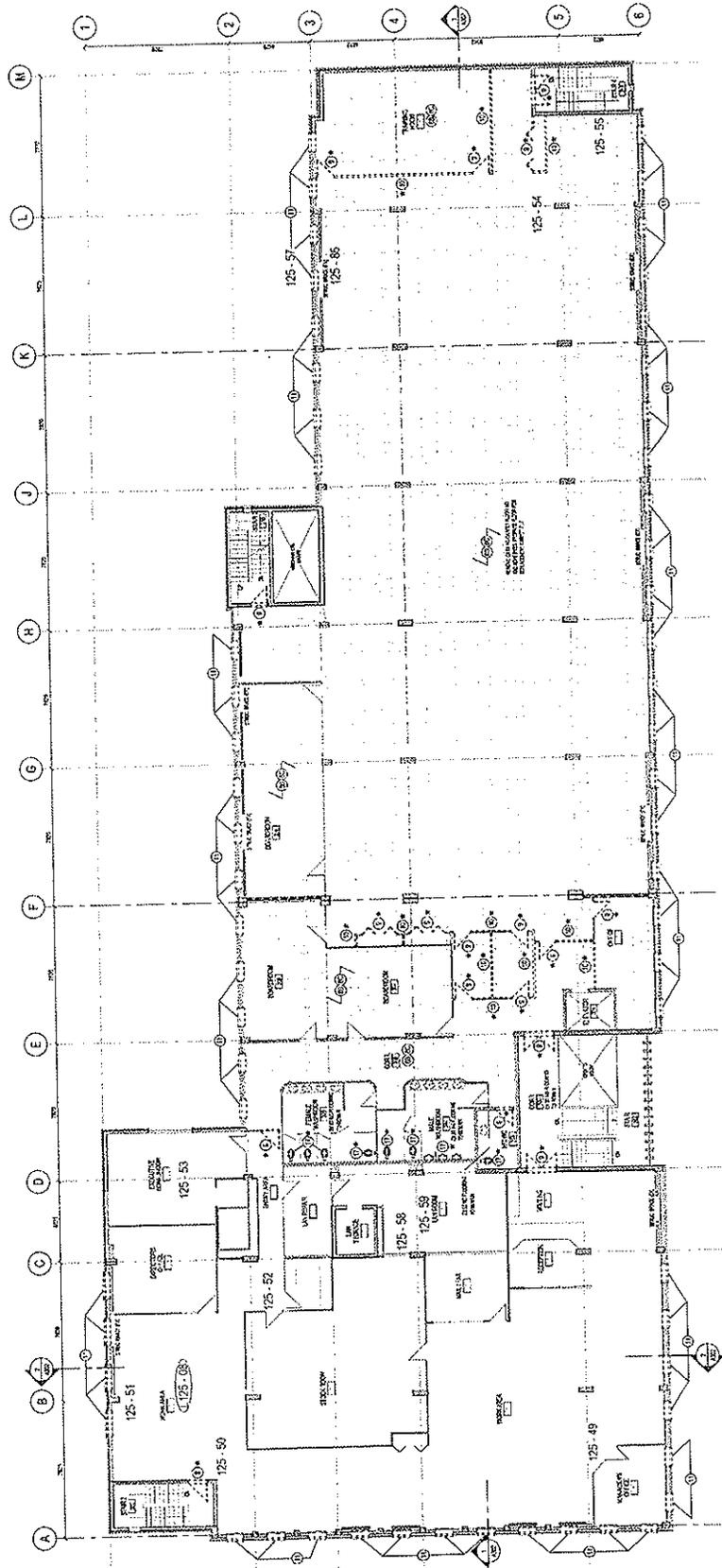
Joel Shandro, B.Sc.
Environmental Scientist
EBA, A Tetra Tech Company

Reviewed by:

Michael Glassco, ROHT
President
Sterling IAQ Consultants Ltd.

FIGURES

Figure 1	Basement
Figure 2	First Floor
Figure 3	Second Floor
Figure 4	Third Floor
Figure 5	Roof and Penthouse



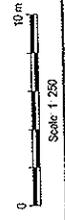
LEGEND

125-XX - APPROXIMATE NON-LEAD BASED PAINT SAMPLE POINT LOCATION

125-XX - APPROXIMATE LEAD BASED PAINT SAMPLE POINT LOCATION

125-XX - APPROXIMATE NON-ASBESTOS CONTAINING MATERIAL SAMPLE LOCATION

125-XX - APPROXIMATE ASBESTOS CONTAINING MATERIAL SAMPLE POINT LOCATION



NOTES:
Based on previous remediation investigations and construction process records

CCRM
 2013
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Project No: 12500002
 Office: EDM
 Date: May 2013

THIRD FLOOR PLAN
 AND SAMPLE LOCATIONS

Figure 4

APPENDIX A

APPENDIX A LABORATORY CERTIFICATE OF ANALYSIS (ASBESTOS AND LEAD)

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report
For EBA, A Tetra Tech Company [Nanaimo]

 #1 - 4376 Boban Drive
 Nanaimo, British Columbia Canada V9T 6A7

Location : 125 E 10th Ave [V23103082]

Vancouver BC

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst	ACM
1	125-01	Spray Fireproofing	Asbestos Fibres Not Detected 95 -100 % Fibrous Glass > 1 % Non-fibrous	Mar 26 2013	GN	---
* Sample Subjected To An Ashing Procedure						
2 . 1	125-02	Lagging Phase 1 Layer 1 White Weave	Asbestos Fibres Not Detected 70 - 80 % Cellulose Fibres > 20 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
2 . 2	125-02	Lagging Phase 1 Layer 2 Brown Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
2 . 3	125-02	Lagging Phase 1 Layer 3 Black	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
2 . 4	125-02	Lagging Phase 2 Layer 1 Foil	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
2 . 5	125-02	Lagging Phase 2 Layer 2 White Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
2 . 6	125-02	Lagging Phase 3 Orange Fibrous	Asbestos Fibres Not Detected 95 -100 % Fibrous Glass > 1 % Non-fibrous	Mar 26 2013	GN	---
* Phase Subjected To An Ashing Procedure						
3 . 1	125-03	Black Flooring Layer 1 Black	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN	---
* Layer Subjected To An Ashing And Acid Washing Procedure						

 Lab File 12494
 Client Id : 23103082

 Unit 170 2188 No. 5 Road Richmond British Columbia V6X 2T1
 American Industrial Hygiene Association BAPAT Lab. Id. No. 149340

(604) - 279 - 9445

Client Reference Id: V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

I2494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst	ACM
3 . 2	125-03	Black Flooring Layer 2 Beige * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---	LP 5 %
4	125-04	Plaster * Sample Subjected To An Ashing Procedure	1 - 5 % Chrysotile Asbestos DNQ Quartz > 95 % Non-fibrous	Mar 26 2013	GN .T.	
5	125-05	Spray Fireproofing * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Fibrous Glass > 1 % Non-fibrous	Mar 26 2013	GN ---	
6	125-06	Grey HVAC Mastic * Sample Subjected To An Ashing Procedure	1 - 5 % Chrysotile Asbestos > 95 % Non-fibrous	Mar 26 2013	GN .T.	
7	125-07	White Masonry Grout * Sample Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN ---	
8 . 1	125-08	Lagging Layer 1 Weave/Coating * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN ---	LP 55 %
8 . 2	125-08	Lagging Layer 2 Weave * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN ---	LP 20 %

Lab File 12494
Client Id : 23103082

Unit 170 2188 No. 5 Road Richmond British Columbia V6X 2T1
American Industrial Hygiene Association BAPAT Lab. Id. No. 149340

(604) - 279 - 9445

Client Reference Id: V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report
For EBA, A Tetra Tech Company [Nanaimo]
Location : 125 E 10th Ave [V23103082]
Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
8 . 3	125-08	Lagging Layer 3 Brown Fibrous * Layer 3 - 5 Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
8 . 4	125-08	Lagging Layer 4 Black Mastic	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 5 %
8 . 5	125-08	Lagging Layer 5 Brown Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
9	125-09	Drywall Joint Compound * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
10	125-10	Plaster * Sample Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN ---
11	125-11	Drywall Joint Compound * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
12 . 1	125-12	Plaster Layer 1 White/Coating * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 60 %
12 . 2	125-12	Plaster Layer 2 Grey Beige * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 40 %

 Lab File 12494
 Client Id : 23103082

 Unit 170 2188 No. 5 Road Richmond British Columbia V6X 2T1
 American Industrial Hygiene Association BAPAT Lab. Id. No. 149340

(604) - 279 - 9445

Client Reference Id: V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
13	125-13	Drywall Joint Compound	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
14 . 1	125-14	Drywall Joint Compound Layer 1 White/Coating	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 20 %
* Layer Subjected To An Ashing Procedure					
14 . 2	125-14	Drywall Joint Compound Layer 2 White/Coating	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 80 %
* Layer Subjected To An Ashing Procedure					
15	125-15	Plaster	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing And Acid Washing Procedure					
16 . 1	125-16	Flooring Beneath Carpet Layer 1 Yellow	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 2 %
* Layer Subjected To An Ashing Procedure					
16 . 2	125-16	Flooring Beneath Carpet Layer 2 Light Grey Marble	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 95 %
* Layer Subjected To An Ashing And Acid Washing Procedure					
16 . 3	125-16	Flooring Beneath Carpet Layer 3 Brown Fibrous	Asbestos Fibres Not Detected 30 - 40 % Cellulose Fibres > 60 % Non-fibrous	Mar 26 2013	GN --- LP 3 %
* Layer Subjected To An Ashing And Acid Washing Procedure					

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Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
17. 1	125-17	Flooring Beneath Carpet Layer 1 Yellow * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 2 %
17. 2	125-17	Flooring Beneath Carpet Layer 2 Light Grey Marble * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 78 %
17. 3	125-17	Flooring Beneath Carpet Layer 3 Fibrous Stnds * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
17. 4	125-17	Flooring Beneath Carpet Layer 4 Grey * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
18. 1	125-18	Black Flooring Layer 1 Black * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 98 %
18. 2	125-18	Black Flooring Layer 2 Yellow Patches * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 2 %
19. 1	125-19	Drywall Joint Compound Layer 1 White/Coating * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 99 %

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Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
19 . 2	125-19	Drywall Joint Compound Layer 2 White-Green Fibrous Patch	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 1 %
20 . 1	125-20	Grey Sheet Flooring Layer 1 Grey * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 70 %
20 . 2	125-20	Grey Sheet Flooring Layer 2 Brown Fibrous Weave * Layer 2 - 3 Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 20 %
20 . 3	125-20	Grey Sheet Flooring Layer 3 Yellow Patches	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
21 . 1	125-21	Drywall Joint Compound Phase 1 White/Coating * Phase Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 75 %
21 . 2	125-21	Drywall Joint Compound Phase 2 Cream Brown Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 20 %
21 . 3	125-21	Drywall Joint Compound Phase 3 Light Grey Fibrous	Asbestos Fibres Not Detected 1 - 5 % Cellulose Fibres 1 - 5 % Fibrous Glass > 90 % Non-fibrous	Mar 26 2013	GN --- LP 5 %
22	125-22	Window Gasket * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---

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Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
23	125-23	Window Putty	Asbestos Fibres Not Detected 1 - 5 % Cellulose Fibres 1 - 5 % Synthetic Fibres > 90 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
24	125-24	Window Putty (Stairwell)	5 - 10 % Chrysotile Asbestos > 90 % Non-fibrous	Mar 26 2013	GN .T.
* Sample Subjected To An Ashing Procedure					
25 . 1	125-25	Cream Sheet Flooring Layer 1 Cream Marbled	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 98 %
* Layer Subjected To An Ashing And Acid Washing Procedure					
25 . 2	125-25	Cream Sheet Flooring Layer 2 Brown Fibrous Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 2 %
* Layer Subjected To An Ashing Procedure					
26 . 1	125-26	Grey Sheet Flooring Layer 1 Light Grey Marbled	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 95 %
* Layer Subjected To An Ashing And Acid Washing Procedure					
26 . 2	125-26	Grey Sheet Flooring Layer 2 Brown Fibrous Weave Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 5 %
* Layer Subjected To An Ashing Procedure					
27	125-27	Drywall Joint Compound	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					

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Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
28 . 1	125-28	Gallery Sheet Flooring Layer 1 Cream Marbled	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 99 %
* Sample Composite Subjected To An Ashing And Acid Washing Procedure					
28 . 2	125-28	Gallery Sheet Flooring Layer 2 Brown Fibrous Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 1 %
29	125-29	Red Penetration Mastic	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
30	125-30	Drywall Joint Compound	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
31 . 1	125-31	Roofing Material Layer 1 Black Fibrous/Grey Pebbles	Asbestos Fibres Not Detected 20 - 30 % > 70 % Non-fibrous	Mar 26 2013	GN --- LP 90 %
* Layer Subjected To An Ashing					
31 . 2	125-31	Roofing Material Layer 2 Pink Brown Fibrous Clumps	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 10 %
* Layer Subjected To An Ashing Procedure					
32	125-32	Spray Fireproofing	See Vermiculite Report	Mar 26 2013	GN .T.
* Sample Subjected To An Ashing, Washing and Sieving Procedure					
33 . 1	125-33	Duct Mastic Layer 1 Black	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 50 %
* Layer Subjected To An Ashing Procedure					

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Unit 170 2188 No. 5 Road Richmond British Columbia V6X 2T1
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(604) - 279 - 9445
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V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report
For EBA, A Tetra Tech Company [Nanaimo]
Location : 125 E 10th Ave [V23103082]
Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
33 . 2	125-33	Duct Mastie Layer 2 Silver-Grey	5 - 10 % Chrysotile Asbestos > 90 % Non-fibrous	Mar 26 2013	GN .T. LP 50 %
* Layer Subjected To An Ashing Procedure					
34	125-34	Seam Putty	5 - 10 % Chrysotile Asbestos > 90 % Non-fibrous	Mar 26 2013	GN .T.
* Sample Subjected To An Ashing Procedure					
35	125-35	Mastic Around Access Panel	5 - 10 % Chrysotile Asbestos > 90 % Non-fibrous	Mar 26 2013	GN .T.
* Sample Subjected To An Ashing Procedure					
36	125-36	Roof Flashing Putty	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
37	125-37	Grey Mastic Around Window Frames	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
38	125-38	Black Rubber Around Window	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
39 . 1	125-39	Flooring Beneath Carpet Layer 1 Black Streaks	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 7 %
* Layer Subjected To An Ashing Procedure					

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Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report
For EBA, A Tetra Tech Company [Nanaimo]
Location : 125 E 10th Ave [V23103082]
Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
39 . 2	125-39	Flooring Beneath Carpet Layer 2 Cream * Layer Subjected To An Ashing And Acid Washing Procedure	1 - 5 % Chrysotile Asbestos 1 - 5 % Fibrous Glass > 90 % Non-fibrous	Mar 26 2013	GN .T. LP 90 %
39 . 3	125-39	Flooring Beneath Carpet Layer 3 Yellow Patches * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 3 %
40 . 1	125-40	Sample Beneath 125-39 Layer 1 Cream * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 95 %
40 . 2	125-40	Sample Beneath 125-39 Layer 2 Yellow * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected Trace Cellulose Fibres 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 5 %
41	125-41	Interior Window Putty * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
42 . 1	125-42	Exterior Frame Putty Layer 1 Light Grey * Layer Subjected To An Ashing Procedure	5 - 10 % Chrysotile Asbestos > 90 % Non-fibrous	Mar 26 2013	GN .T. LP 90 %
42 . 2	125-42	Exterior Frame Putty Layer 2 Cream Patch * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 10 %

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 American Industrial Hygiene Association (AIHA) BAPAT Lab. Id. No. 149340

 (604) - 279 - 9445
 Client Reference Id:

V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

Location : 125 E 10th Ave [V23103082]

For EBA, A Tetra Tech Company [Nanaimo]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst	ACM
43 . 1	125-43	Flooring Beneath Carpet Layer 1 Yellow Fibrous Patches * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 5 - 10 % Synthetic Fibres 1 - 5 % Cellulose Fibres > 85 % Non-fibrous	Mar 26 2013	GN	---
43 . 2	125-43	Flooring Beneath Carpet Layer 2 Cream * Layer 2 - 3 Composite Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN	---
43 . 3	125-43	Flooring Beneath Carpet Layer 3 Brown Fibrous Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN	---
44	125-44	Interior Window Putty * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 5 - 10 % Fibrous Glass > 90 % Non-fibrous	Mar 26 2013	GN	---
45 . 1	125-45	Flooring Beneath Carpet Layer 1 Brown Patches * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 5 - 10 % Cellulose Fibres 1 - 5 % Synthetic Fibres Trace Hair Fibres > 85 % Non-fibrous	Mar 26 2013	GN	---
45 . 2	125-45	Flooring Beneath Carpet Layer 2 Cream * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN	---
45 . 3	125-45	Flooring Beneath Carpet Layer 3 Brown Fibrous Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN	---
46	125-46	Plaster * Sample Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN	---

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Client Reference Id: V23103082

Wes-Har Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
48	125-48	Drywall Joint Compound	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing Procedure					
49 . 1	125-49	Flooring Beneath Carpet Layer 1 Ligth Grey	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 26 2013	GN --- LP 6 %
* Layer Subjected To An Ashing Procedure					
49 . 2	125-49	Flooring Beneath Carpet Layer 2 Cream	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 26 2013	GN --- LP 92 %
* Layer Subjected To An Ashing And Acid Washing Procedure					
49 . 3	125-49	Flooring Beneath Carpet Layer 3 Brown Fibrous Patches	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 26 2013	GN --- LP 2 %
* Layer Subjected To An Ashing Procedure					
50	125-50	Plaster	Asbestos Fibres Not Detected DNQ Quartz 95 -100 % Non-fibrous	Mar 26 2013	GN ---
* Sample Subjected To An Ashing And Acid Washing Procedure					
51	125-51	Interior Window Putty	Asbestos Fibres Not Detected 5 - 10 % Cellulose Fibres 5 - 10 % Fibrous Glass DNQ Quartz > 80 % Non-fibrous	Mar 27 2013	GN ---
* Sample Subjected To An Ashing Procedure					
52	125-52	Drywall Joint Compound	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN ---
* Sample Subjected To An Ashing Procedure					

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Wes-Har

Asbestos Analysis & Consulting Ltd.

Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
53 . 1	125-53	Grey Sheet Flooring Beneath Carpet Layer 1 Light Grey Colored Pattern * Layer 1 - 2 Composite Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 60 %
53 . 2	125-53	Grey Sheet Flooring Beneath Carpet Layer 2 Light Grey Brown Fibrous	Asbestos Fibres Not Detected 80 - 85 % Cellulose Fibres 1 - 5 % Synthetic Fibres 1 - 5 % Fibrous Glass DNQ Wollastonite > 5 % Non-fibrous	Mar 27 2013	GN --- LP 35 %
53 . 3	125-53	Grey Sheet Flooring Beneath Carpet Layer 3 Yellow * Layer 3 - 4 Composite Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 2 %
53 . 4	125-53	Grey Sheet Flooring Beneath Carpet Layer 4 White	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 3 %
54 . 1	125-54	Cream HVAC Mastic Phase 1 Light Grey Fibrous Clump * Sample Composite Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 30 %
54 . 2	125-54	Cream HVAC Mastic Phase 2 Grey	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres 5 - 10 % Synthetic Fibres > 1 % Non-fibrous	Mar 27 2013	GN --- LP 70 %
55 . 1	125-55	Flooring Beneath Carpet Layer 1 Yellow * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 5 - 10 % Cellulose Fibres 5 - 10 % Synthetic Fibres Trace Fibrous Glass > 80 % Non-fibrous	Mar 27 2013	GN --- LP 5 %

Lab File 12494
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Bulk Asbestos Report
For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
55 . 2	125-55	Flooring Beneath Carpet Layer 2 Beige * Layer Subjected To An Ashing And Acid Washing Procedure	Asbestos Fibres Not Detected 85 - 90 % Cellulose Fibres > 10 % Non-fibrous	Mar 27 2013	GN --- LP 85 %
55 . 3	125-55	Flooring Beneath Carpet Layer 3 Brown Weave * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 27 2013	GN --- LP 10 %
56	125-56	Interior Window Putty * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 1 - 5 % Fibrous Glass 1 - 5 % Cellulose Fibres > 90 % Non-fibrous	Mar 27 2013	GN ---
57	125-57	Exterior Frame Putty * Sample Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 1 - 5 % Cellulose Fibres Trace Fibrous Glass > 95 % Non-fibrous	Mar 27 2013	GN ---
58 . 1	125-58	Grey Sheet Flooring Phase 1 Grey Marbled * Phase [Composite] Ashing and Acid Washing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 60 %
58 . 2	125-58	Grey Sheet Flooring Phase 2 Layer 1 Light Colored Pattern	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 39 %
58 . 3	125-58	Grey Sheet Flooring Phase 2 Layer 2 Cream Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres Trace Fibrous Glass > 1 % Non-fibrous	Mar 27 2013	GN --- LP 1 %
59 . 1	125-59	Drywall Joint Compound Layer 1 White * Layer Subjected To An Ashing Procedure	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 60 %

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Bulk Asbestos Report

For EBA, A Tetra Tech Company [Nanaimo]

Location : 125 E 10th Ave [V23103082]

Project : V23103082

12494	23103082	Sample Location / Description	Result(s)	Analyzed	Analyst ACM
59 . 2	125-59	Drywall Joint Compound Layer 2 Brown Fibrous	Asbestos Fibres Not Detected 95 -100 % Cellulose Fibres > 1 % Non-fibrous	Mar 27 2013	GN --- LP 10 %
59 . 3	125-59	Drywall Joint Compound Layer 3 Light Grey Fibrous	Asbestos Fibres Not Detected 1 - 5 % Cellulose Fibres 1 - 5 % Fibrous Glass > 90 % Non-fibrous	Mar 27 2013	GN --- LP 10 %
59 . 4	125-59	Drywall Joint Compound Layer 4 Brown Mastic	Asbestos Fibres Not Detected 95 -100 % Non-fibrous	Mar 27 2013	GN --- LP 20 %

* Layer Subjected To An Ashing Procedure

Comments

Samples Analyzed In Accordance With The NIOSH ASBESTOS (bulk) by PLM Method 9002 [15 August 1994]

Visual Estimation Quantitation Limit For Asbestos Analysis Is 1 %

ACM Means Asbestos Containing Material; T - Present

LP - Means Percent : Layer or Phase o

DNQ - Means Detected Not Quantitated

Samples Submitted Will Be Retained For 30 Days After Receipt And Will Be Disposed Of Thereafter Unless Otherwise Notified In Writing

Sample Submitted By EBA, A Tetra Tech Company [Nanaimo]

March 27, 2013

[Facsimile]

G. Nawrocki

Analyst

G. Nawrocki

Reviewed By

Lab File 12494
Client Id : 23103082

Unit 170 2188 No. 5 Road Richmond British Columbia V6X 2T1
American Industrial Hygiene Association BAPAT Lab. Id. No. 149340

(604) - 279 - 9445

Client Reference Id: V23103082



Your Project #: N23W13082
Your C.O.C. #: G016111

Attention: Joel Shandro
EBA ENGINEERING CONSULTANTS LTD.
NANAIMO_
#1 - 4376 BOBAN DRIVE
NANAIMO, BC
Canada V9T 6A7

Report Date: 2013/03/25

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B322890
Received: 2013/03/22, 11:00

Sample Matrix: PAINT
Samples Received: 9

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICP-AES (acid extr. solid)	9	2013/03/25	2013/03/25	BBY7SOP-00018	SW846 6010C

* Results relate only to the items tested.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.

Kim Domino, Burnaby Senior Project Manager
Email: KDomino@maxxam.ca
Phone# (604) 638-5018

=====
Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total cover pages: 1

LEAD IN PAINT COLLECTED

Maxxam ID	FY6943	FY6944	FY6945	FY6946	FY6947	FY6948	FY6949	FY6950	FY6951	
Sampling Date	2013/03/19	2013/03/19	2013/03/19	2013/03/19	2013/03/19	2013/03/19	2013/03/19	2013/03/19	2013/03/19	
Units	L125.01	L125.02	L125.03	L125.04	L125.05	L125.06	L125.07	L125.08	L125.09	RDL
Total Metal (Pb)	1290	888	322	2.0	2.1	68.5	88.9	120	247	2.0
	mg/g									6681323

RDL = Reportable Detection Limit

General Content

QUALITY ASSURANCE REPORT

QC Batch	Parameter	Date	Method Blank	RPD	QC Standard
6681323	Total Lead (Pb)	2013/03/25	Value 2.0 Units mg/g	Value NC	Recovery 101 Limit 35 Limit 80 - 120

N/A = Not Applicable

RPD = Relative Percent Difference

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (RPD): The RPD was not calculated. The level of analyte detected in the parent sample and its duplicate was not sufficiently significant to permit a reliable calculation.



822890

CHAIN OF CUSTODY RECORD

Maxxim ASSO. 822890

Maxxim ASSO.

Maxxim

822890

NO. 1
NO. 2
NO. 3
NO. 4
NO. 5
NO. 6
NO. 7
NO. 8
NO. 9
NO. 10

Report To: _____
Company Name: _____
District Name: _____
Address: _____
City: _____
State: _____
Phone / Fax: _____

Invoice Reference:
Company Name: FBA
Contact Name: Maxxim
Address: Maxxim ASSO.
City: _____
State: _____
Phone / Fax: _____

ANALYSIS REQUESTED

Sample Identification	Lot	Sample Type	Quantity	Remarks
1. L125-01		Paint	10ml	SWAB
2. L125-02		Paint	10ml	SWAB
3. L125-03		Paint	10ml	SWAB
4. L125-04		Paint	10ml	SWAB
5. L125-05		Paint	10ml	SWAB
6. L125-06		Paint	10ml	SWAB
7. L125-07		Paint	10ml	SWAB
8. L125-08		Paint	10ml	SWAB
9. L125-09		Paint	10ml	SWAB
10.				
11.				
12.				

Special Instructions: _____
Date Requested: 08/27/07
Lab: _____
Phone: _____
Fax: _____

ANALYSIS REQUESTED: METALS TOXICOLOGY DRUGS ALCOHOL OTHER

Temperature on Receipt: 70 °F

Prepared by: Maxxim ASSO. Date: 08/27/07

Temperature on Receipt: 70 °F

Time: _____

Signature: _____

APPENDIX B

APPENDIX B EBA'S GENERAL CONDITIONS

GENERAL CONDITIONS

GEO-ENVIRONMENTAL REPORT

This report incorporates and is subject to these General Conditions

1.0 USE OF REPORT AND OWNERSHIP

This report pertains to a specific site, a specific development, and a specific scope of or. It is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site or proposed development could necessitate a supplementary investigation and assessment.

This report and the assessments and recommendations contained in it are intended for the sole use of EBA's client. EBA does not accept any responsibility for the accuracy of any of the data, the analysis or the recommendations contained or referenced in the report when the report is used or relied upon by any party other than EBA's Client unless otherwise authorized in writing by EBA. Any unauthorized use of the report is at the sole risk of the user.

This report is subject to copyright and shall not be reproduced either holly or in part without the prior, ritten permission of EBA. Additional copies of the report, if required, may be obtained upon request.

2.0 ALTERNATE REPORT FORMAT

Where EBA submits both electronic file and hard copy versions of reports, drawings and other project-related documents and deliverables (collectively termed EBA's instruments of professional service), only the signed and/or sealed versions shall be considered final and legally binding. The original signed and/or sealed version archived by EBA shall be deemed to be the original for the Project.

Both electronic file and hard copy versions of EBA's instruments of professional service shall not, under any circumstances, no matter who owns or uses them, be altered by any party except EBA. The Client warrants that EBA's instruments of professional service will be used only and exactly as submitted by EBA.

Electronic files submitted by EBA have been prepared and submitted using specific software and hardware systems. EBA makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

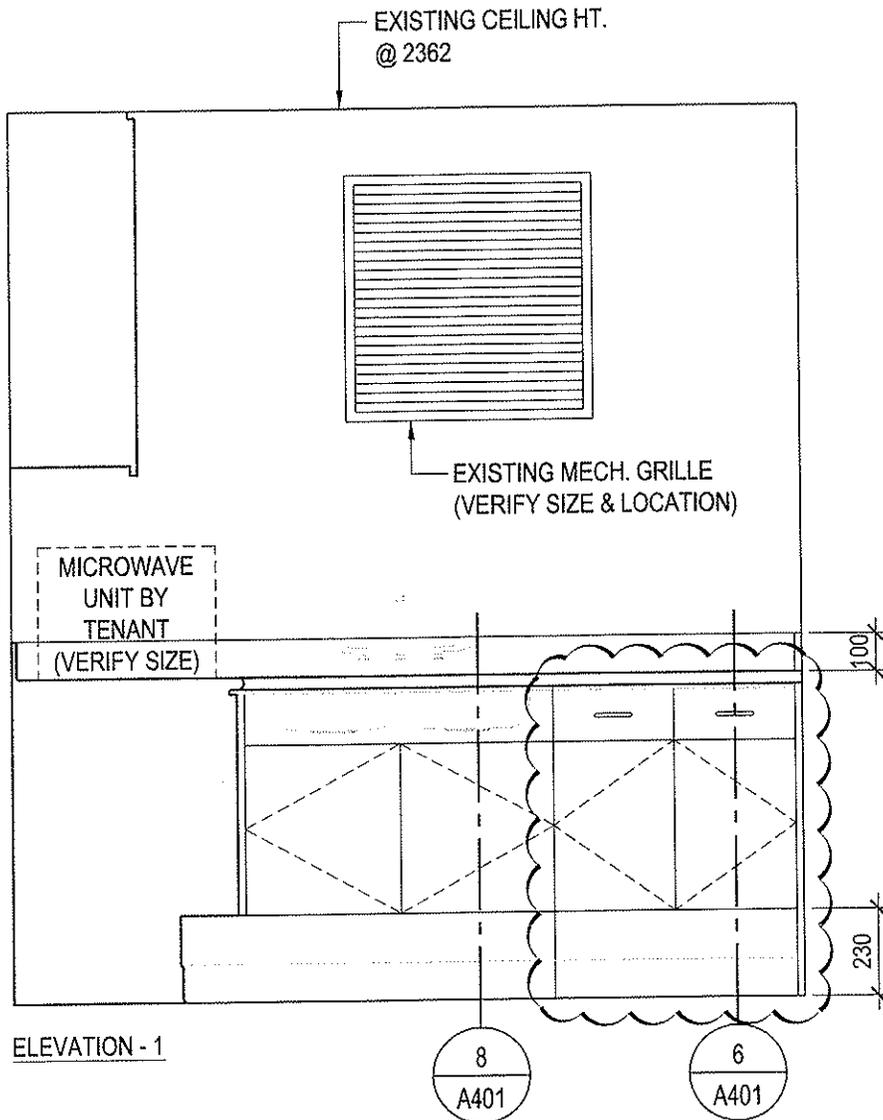
3.0 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by EBA in its reasonably exercised discretion.

4.0 INFORMATION PROVIDED TO EBA BY OTHERS

During the performance of the or and the preparation of the report, EBA may rely on information provided by persons other than the Client. While EBA endeavours to verify the accuracy of such information when instructed to do so by the Client, EBA accepts no responsibility for the accuracy or the reliability of such information which may affect the report.

REF. DWG. A401



ELEVATION - 1

1 MAIN FLOOR KITCHEN *
 - SCALE: 1:20

144312034 HSB



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 Fax. 604.696.8100
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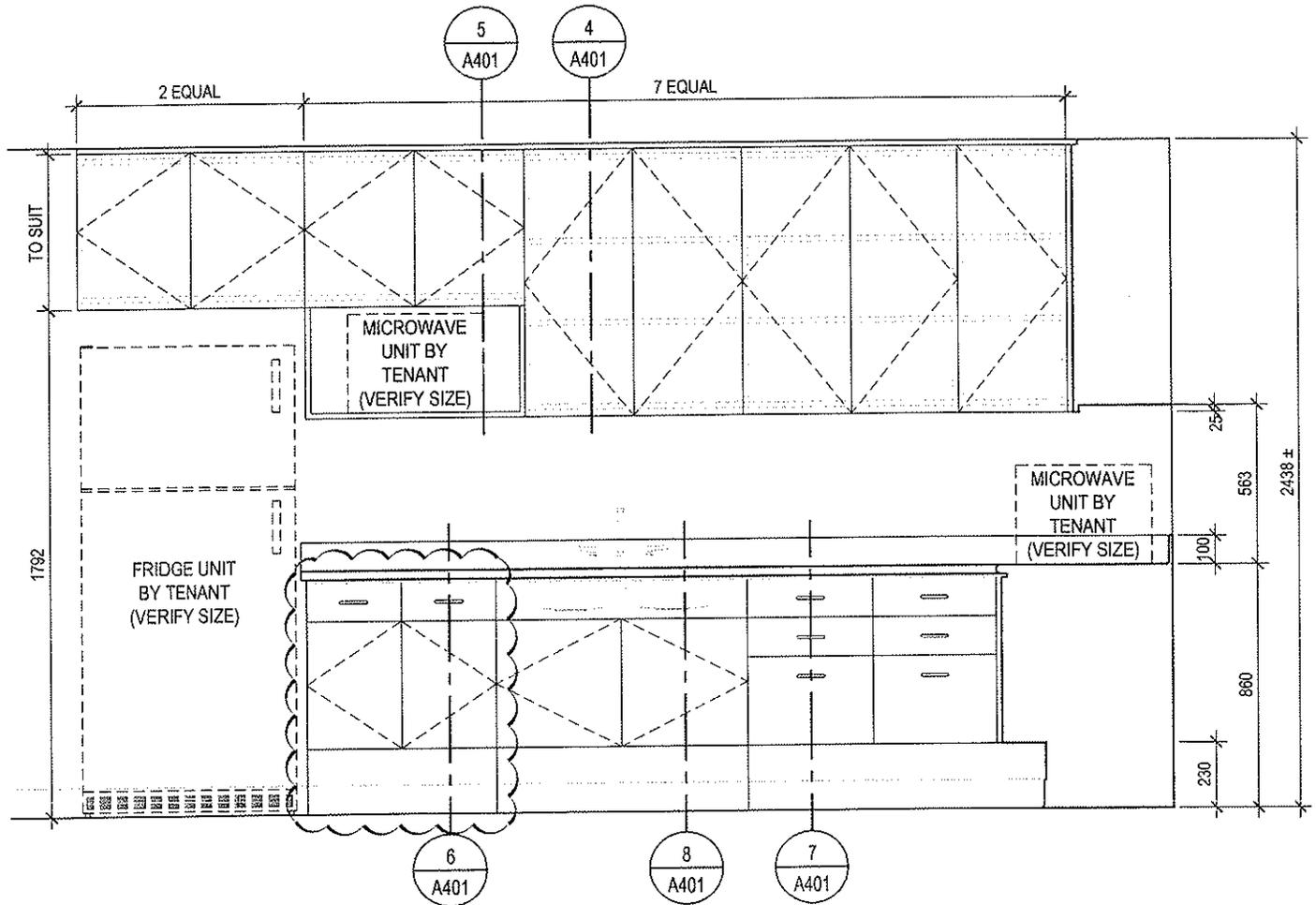
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By			Appd.		YY.MM.DD	
Project No.	144312034	Scale	1:20	RC	JT	13.05.02
				Dwn.	Chkd.	YY.MM.DD

Client/Project
 PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
 HARRY STEVENS BUILDING
 RETROFIT AND FIT-UP

Title
 MAIN FLOOR KITCHEN
 REVISED MILLWORK

Drawing No. ASK-01
 Sheet -
 Revision -

File Name:



2 SECOND FLOOR KITCHEN *
SCALE: 1:20

REF. DWG. A401

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1	ISSUED FOR ADDENDUM 1	RC	JT	13.05.10
Revision		By	Appd.	YY.MM.DD

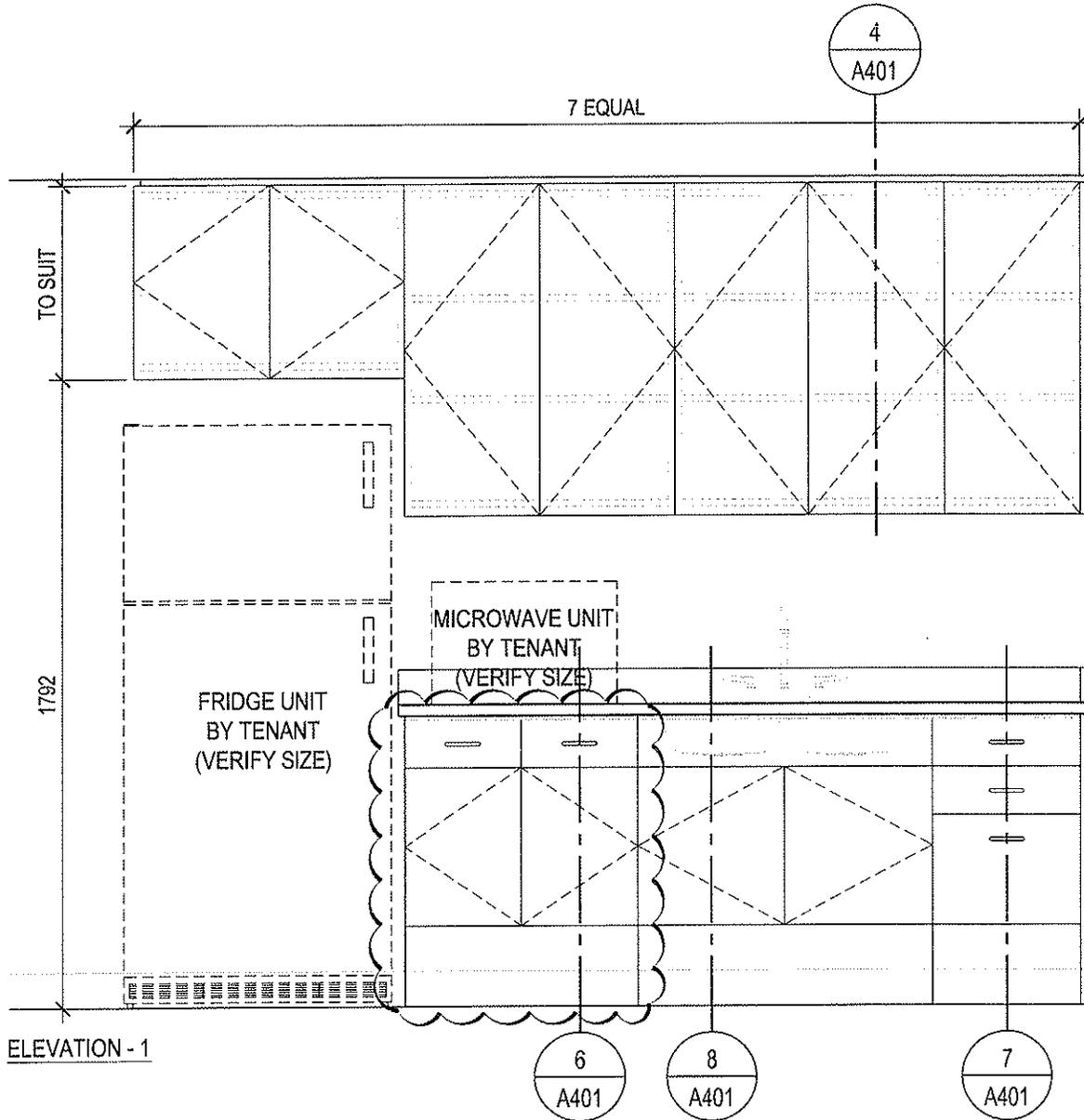
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144312034	1:25	Dwn.	Chkd.	YY.MM.DD

Client/Project
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
HARRY STEVENS BUILDING
RETROFIT AND FIT-UP

Title
**SECOND FLOOR KITCHEN
REVISED MILLWORK**

Drawing No. **ASK-02** Sheet Revision

File Name:



3 THIRD FLOOR COFFEE STATION *
 SCALE: 1:20

REF. DWG. A401



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Revision		By	Appd.	YY.MM.DD

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 HARRY STEVENS BUILDING
 RETROFIT AND FIT-UP

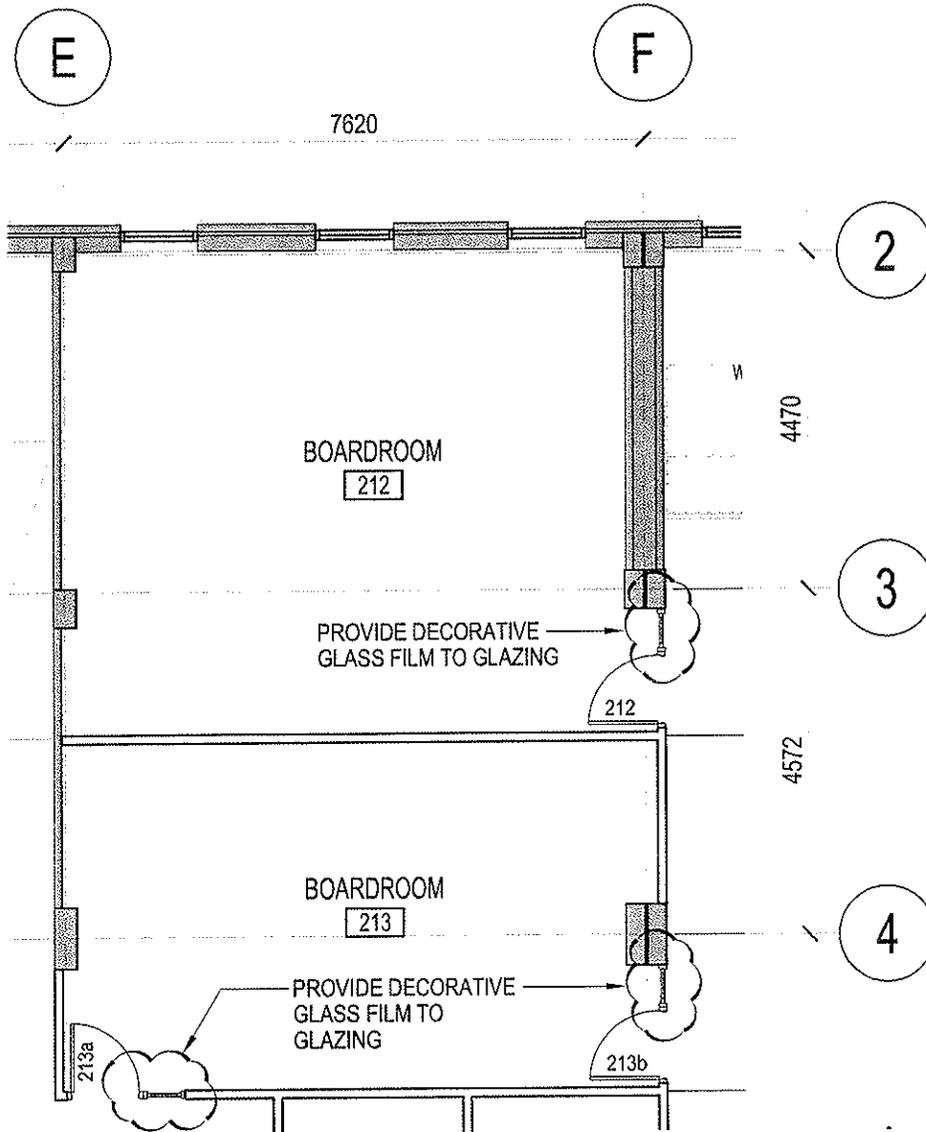
Title
 THIRD FLOOR COFFEE STATION
 REVISED MILLWORK

File Name:	Project No.	Scale	RC	JT	13.05.02
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Drawing No.	Sheet	Revision
ASK-03		

144312034 HSB

REF. DWG. A202



144312034 HSB



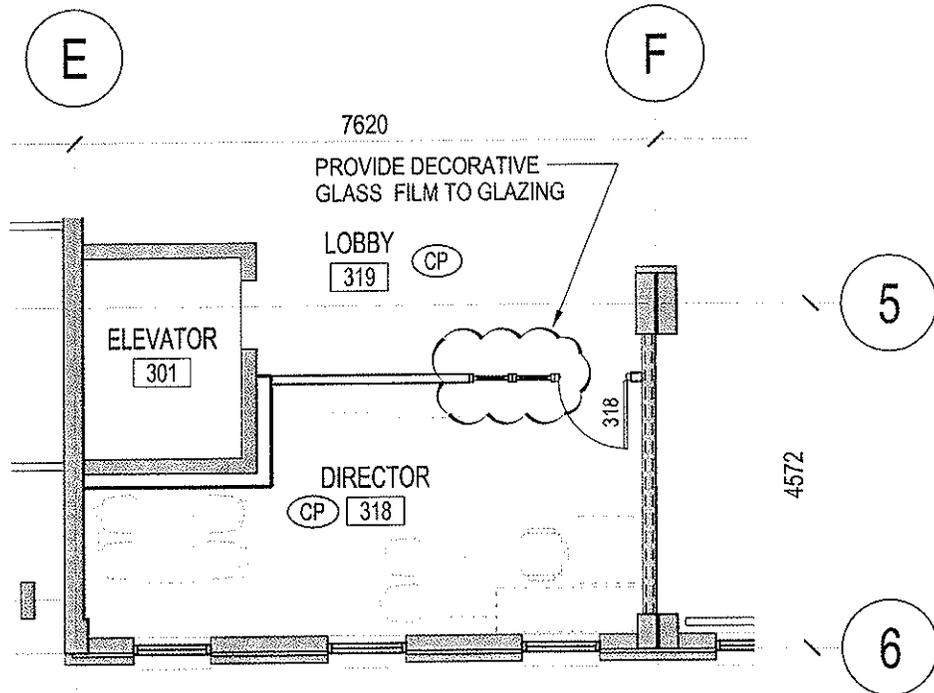
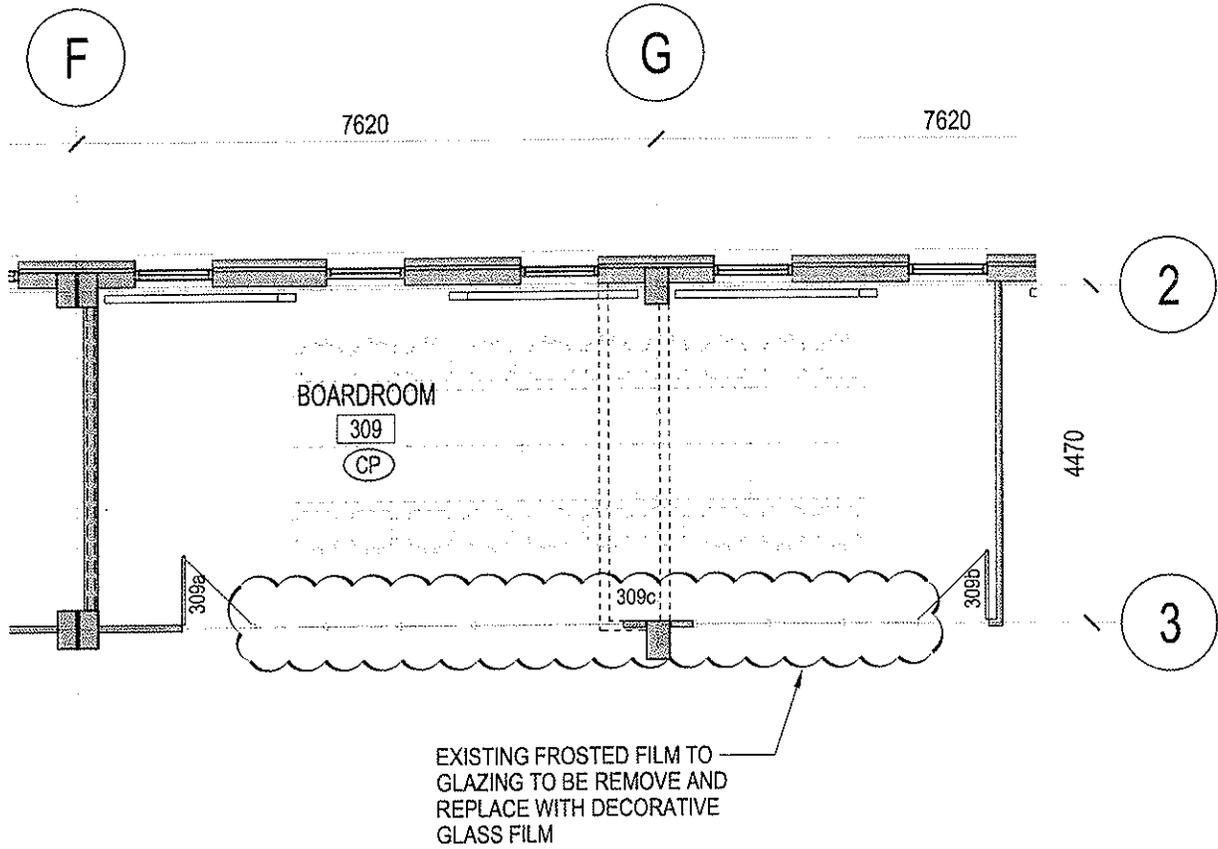
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Revision		By	Appd.	YY.MM.DD

Client/Project
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 HARRY STEVENS BUILDING
 RETROFIT AND FIT-UP

Title
 SECOND FLOOR PARTIAL PLAN
 BOARDROOM 212, 213

File Name:	Project No.	Scale	RC	JT	13.05.02	Drawing No.	Sheet	Revision
	144312034	1:100	Dwn.	Chkd.	YY.MM.DD	ASK-04	-	-



REF. DWG. A203

144312034 HSB



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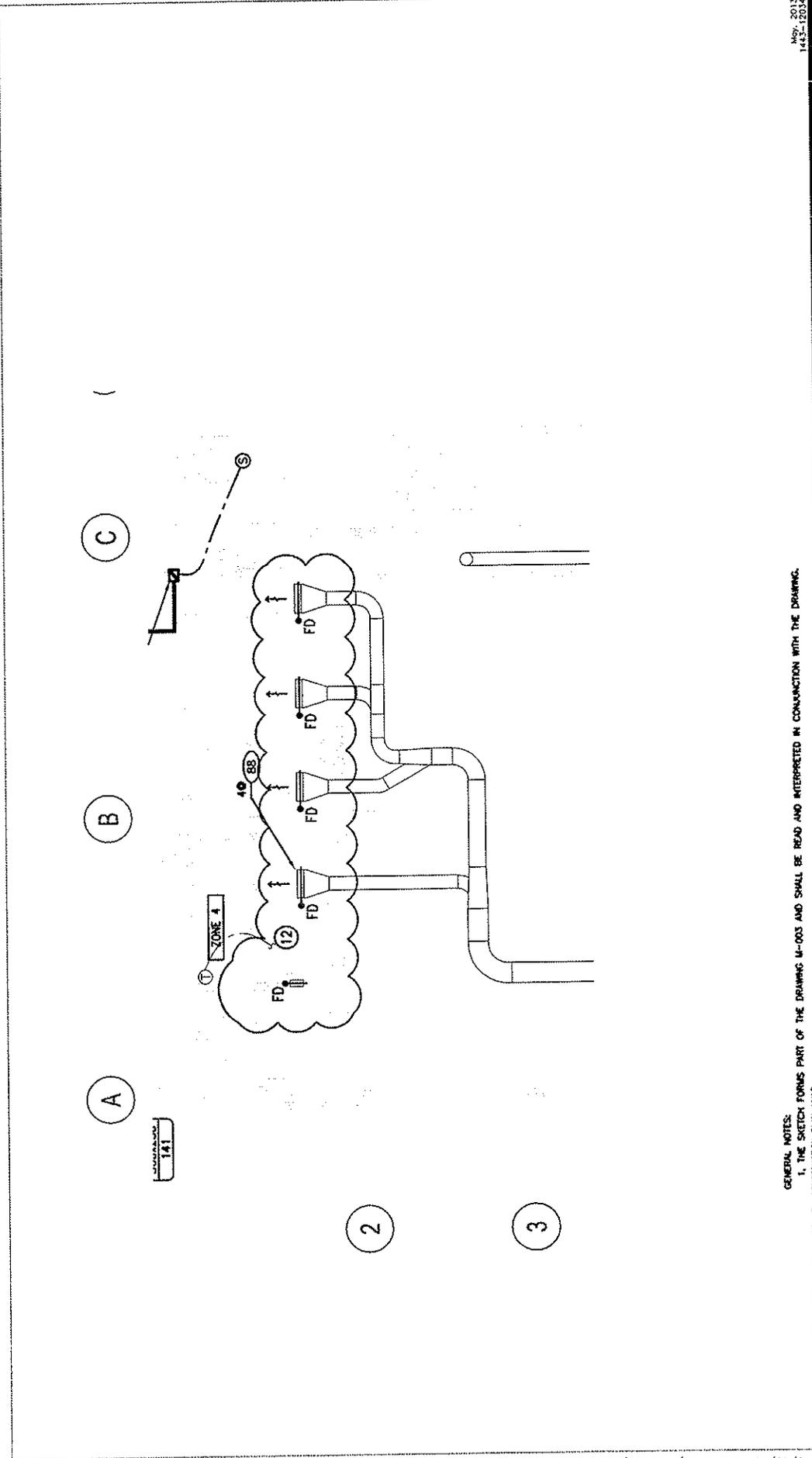
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Revision		By	Appd.	YY.MM.DD
Project No.	Scale	RC	JT	13.05.02
144312034	1:100	Dwn.	Chkd.	YY.MM.DD

Client/Project
 PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
 HARRY STEVENS BUILDING
 RETROFIT AND FIT-UP

Title
 THIRD FLOOR PARTIAL PLAN
 BOARDROOM 309, DIRECTOR 318

Drawing No. **ASK-05** Sheet Revision

File Name:



GENERAL NOTES:
1. THE SKETCH FORMS PART OF THE DRAWING M-003 AND SHALL BE READ AND INTERPRETED IN CONJUNCTION WITH THE DRAWING.
ORIGINAL SKETCH - 144312034-M202 SECOND FLOOR NEW CONSTRUCTION PLAN-HVAC

May 2013
1443-12034

Client/Project
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
BASE BUILDING RETROFIT AND FIT-UP
HARRY STEVENS BUILDING

Figure No.
ADD-M01-MSK02

Title
M202-SEC. FL NEW CONST. PL-HVAC

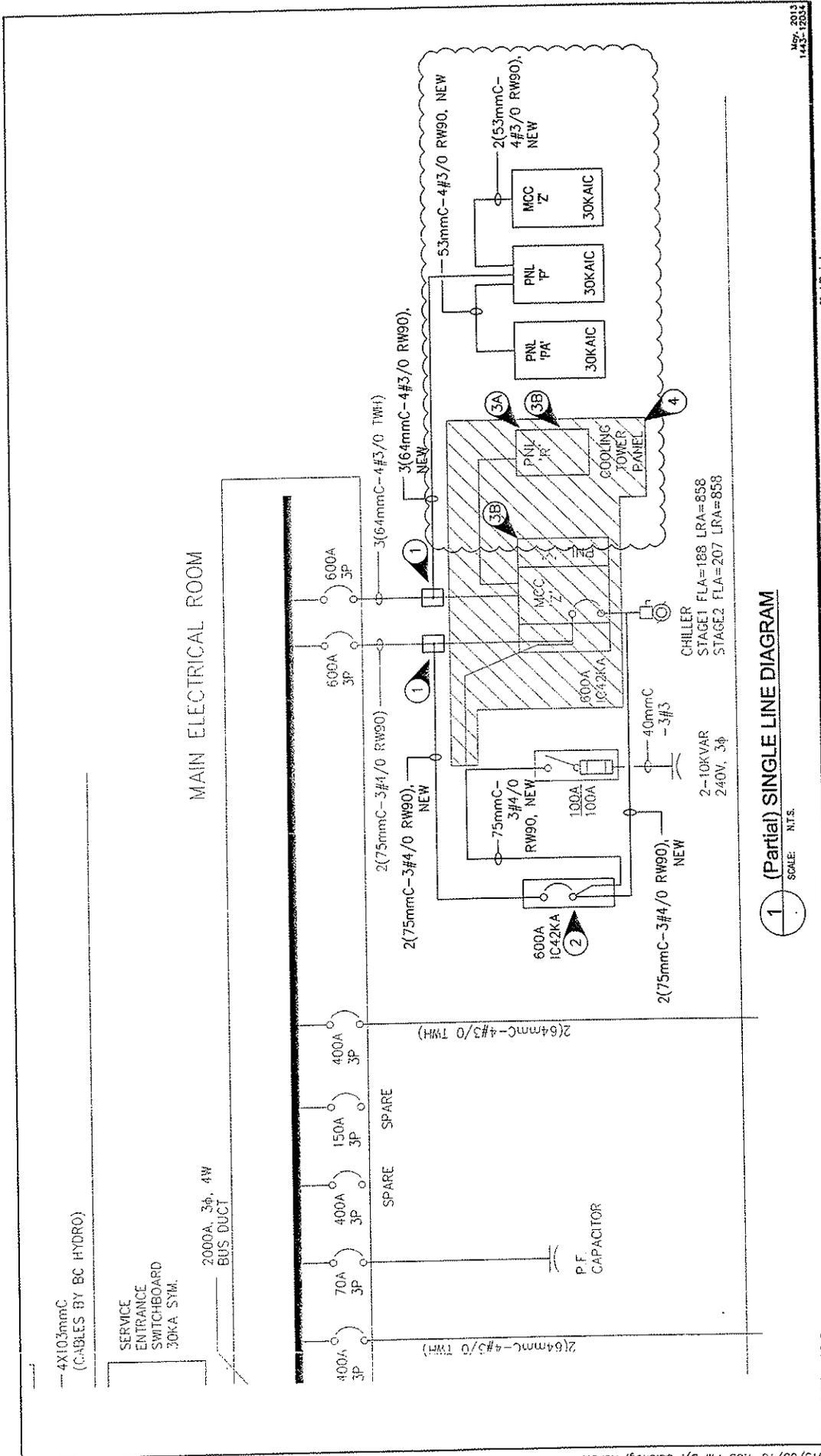
Notes

Legend

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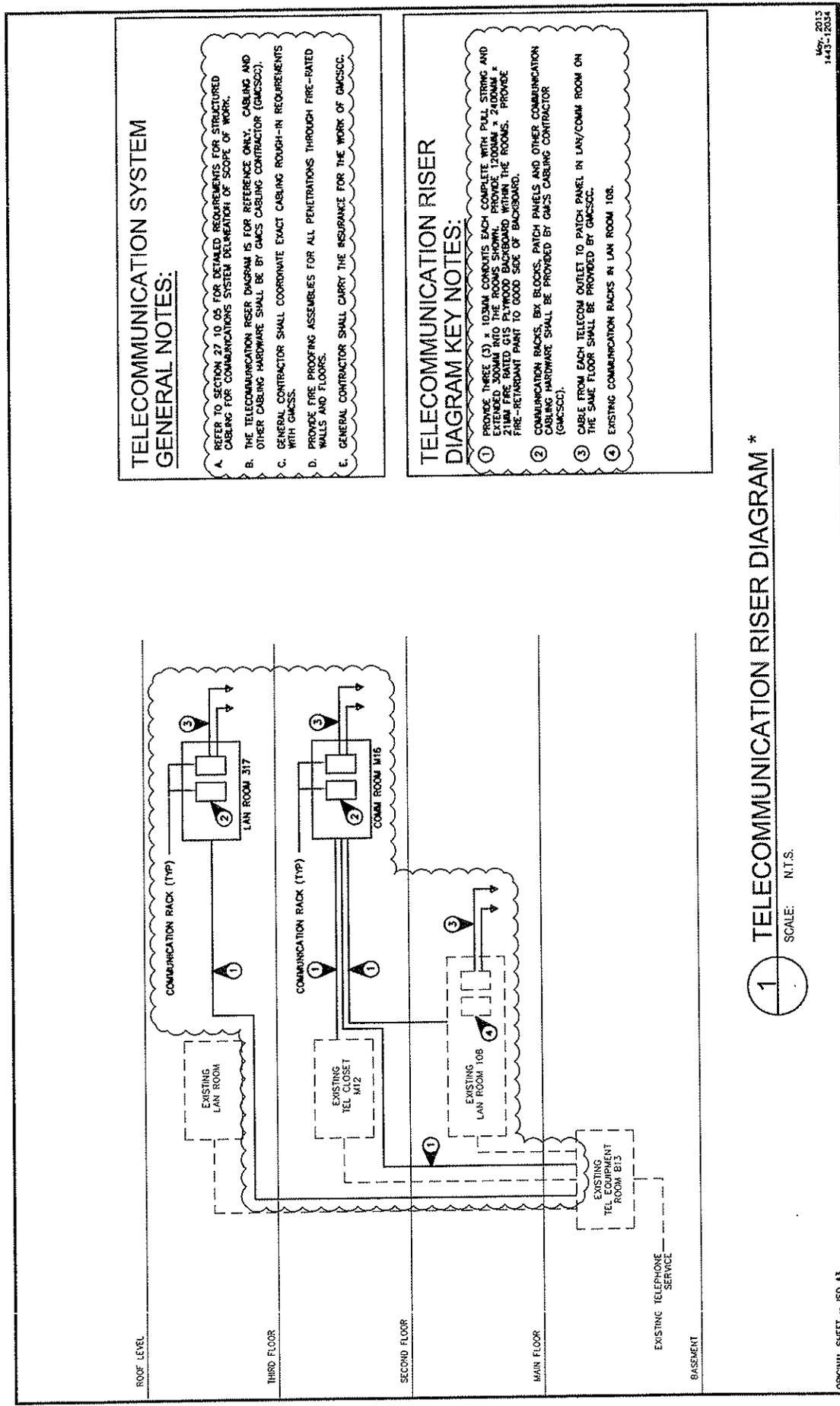


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ORIGINAL SHEET - A151 B

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PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
 BASE BUILDING RETROFIT AND FIT-UP
 HARRY STEVENS BUILDING
 Figure No. **ADD-E01-SKE01**
 Title **(Partial) SINGLE LINE DIAGRAM**



1 TELECOMMUNICATION RISER DIAGRAM *
SCALE: N.T.S.

1443-12034
MAY 2013

**TELECOMMUNICATION SYSTEM
GENERAL NOTES:**

- REFER TO SECTION 27.10.05 FOR DETAILED REQUIREMENTS FOR STRUCTURED CABLING FOR COMMUNICATIONS SYSTEM BELONGING TO SCOPE OF WORK.
- THE TELECOMMUNICATION RISER DIAGRAM IS FOR REFERENCE ONLY. CABLING AND OTHER CABLING HARDWARE SHALL BE BY GACS CABLING CONTRACTOR (GACSCC).
- GENERAL CONTRACTOR SHALL COORDINATE EXACT CABLING ROUGH-IN REQUIREMENTS WITH GACSCC.
- PROVIDE FIRE PROOFING ASSEMBLIES FOR ALL PENETRATIONS THROUGH FIRE-RATED WALLS AND FLOORS.
- GENERAL CONTRACTOR SHALL CARRY THE INSURANCE FOR THE WORK OF GACSCC.

**TELECOMMUNICATION RISER
DIAGRAM KEY NOTES:**

- PROVIDE THREE (3) x 10MM CONDUITS EACH COMPLETE WITH PULL STRINGS AND EXTENDED DOWN TO THE ROOM SHOWN. PROVIDE 20MM x 20MM x 20MM FIRE-RETARDANT PAINT TO GOOD SIDE OF BACKBOARD.
- COMMUNICATION RACKS, BX BLOCKS, PATCH PANELS AND OTHER COMMUNICATION CABLING HARDWARE SHALL BE PROVIDED BY GACS CABLING CONTRACTOR (GACSCC).
- CABLE FROM EACH TELECOM OUTLET TO PATCH PANEL IN LAN/COMM ROOM ON THE SAME FLOOR SHALL BE PROVIDED BY GACSCC.
- EXISTING COMMUNICATION RACKS IN LAN ROOM 108.

Client/Project
PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
BASE BUILDING RETROFIT AND FIT-UP
HARRY STEVENS BUILDING
Figure No. **ADD-E01-SKE02**
Title **TELECOMMUNICATION RISER DIAGRAM,
GENERAL NOTES, KEY NOTES**

ORIGINAL SHEET - ISO A3
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Vancouver BC Canada
V6B 6A3
Tel. 604.696.8000
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