1.0 GENERAL

.1 SCOPE

The RCMP Training Academy intends and this specification covers the removal of lead-contaminated materials from the Fire Arms Range at the RCMP Training Academy in Regina, Saskatchewan. The project will entail the removal of all lead-contaminated materials located within the facility. In general, the project involves the following:

A. Removal and disposal of all porous surface materials within the range.

B. Removal and disposal of range exhaust ducting back to the exhaust main.

C. Clean up of all remaining non-pourous items / surfaces within the Range. HEPA vacuuming as well as wet wiping / mopping of all surfaces to ensure all residual lead dust has been sufficiently removed.

The lead abatement project will be classified as a Moderate Risk Project employing a full enclosure system, negative pressure differential, and decontamination facilities. It will be the tenderer's responsibility to perform all take-offs and inspections to fully acquaint himself with the quantities and site conditions involved in the removal project.

.2 DESCRIPTION OF WORK

The work shall include, but not be limited to, the provision of all supervision, labour, goods, plant, services and facilities specified and/or required to perform the following:

a) The construction of physical barriers to isolate the lead abatement area(s) from adjacent areas of the facility. 6-mil polyethylene sheeting and 2"x 4" wood/metal studs will be used to construct the physical barriers. All penetrations shall be sealed with 6-mil polyethylene sheeting or expanding foam insulation. Mobilization will be designed in a manner that minimizes any disruption of daily activities within the facility. Mobilization plans must be approved by the building owner and/or Bersch & Associates Ltd. prior to any abatement activity.

b) The construction of personnel Decontamination Facility for workers leaving the contaminated work areas to adjacent clean areas.

c) Ensure the maintenance and security of the hoarding and lead abatement equipment.

d) Supply and operation of HEPA filtred venting systems to constantly maintain negative pressure, relative to adjacent areas. If possible, negative air units shall discharge exhaust air to the outside environment. Negative air units must show proof of certification within the past six (6) months.

e) Decontamination of contaminated areas following gross removal. Decontamination shall include:
- thorough pick up and HEPA vacuum cleaning of all debris.
- cleaning of visible debris from all surfaces.
- removal and disposal of all hoarding membranes.

f) Supply and operation of decontamination and material handling facilities.

g) Supply and maintenance of any laundry, lunch room and sanitary facilities required for the work.

h) Supply and maintenance of respirator equipment.

i) Dismantling and removal from site of hoarding and lead abatement equipment and materials.

j) Site Cleanup.

All work will be subject to frequent inspection and air monitoring by Bersch & Associates Ltd.

.3 INTENT OF SPECIFICATION

These specifications describe and specify the scope of work in broad terms only. It shall be the Contractor's responsibility, from his experience and standard practices, to detail and complete the work so as to satisfy The RCMP Training Academy with respect to design, performance, durability, operation and safety. By submitting a proposal on this Contract the tenderer shall certify that he performed all takeoffs and inspections to fully acquaint himself with quantities and site conditions involved.

.4 INSPECTIONS

Bersch & Associates Ltd. will conduct the follow-up site inspections for the lead abatement activities. It will be the contractor's responsibility to notify the designated representative when they are prepared for the inspections under .1, and .3.

.1 Pre-contamination Inspection - Site visit to ensure that the contractor has fully prepared the site, personnel are trained and equipment-materials are on hand as per specifications prior to the start of abatement activity.

.2 Site Inspections - Site visits during abatement activities to ensure work procedures are being followed, proper equipment is being used, and to ensure site security. Prepare written report to identify concerns that require corrective action and document the findings of the visit.

.3 Final Inspection - Visual inspection and air monitoring to ensure that the work area is clean and suitable for occupancy.

1.1 TERMINOLOGY (Definitions)

.1 Building owner – RCMP Training Academy or their authorized representative.

.2 Authorized Visitor - The Building Owner, or a representative of any regulatory or other agency having jurisdiction over the project.

.3 Abatement - Procedures to control release from lead abatement related activities.

.4 Removal - All herein specified procedures necessary to strip all lead-contaminated materials from the designated areas and to dispose of these materials at an acceptable site.

.5 Enclosure - All herein specified procedures necessary to complete enclosure of all lead-contaminated materials behind airtight, impermeable, permanent barriers.

.6 Air Monitoring - The process of measuring a specific volume of air in a stated period of time.

.7 HEPA Vacuum Equipment - High Efficiency Particulate Air filtered vacuuming equipment with a filter system capable of collecting and retaining lead dust. Filters should be of 99.97% efficiency for retaining fibers of 0.3 microns or larger.

.8 Airlock - A system for permitting ingress or egress without permitting air movement between a contaminated area and an uncontaminated area, typically consisting of two curtained doorways at least 1.8 meters (6 feet) apart.

.9 Curtained doorway - A device to allow ingress or egress from one room to another while permitting minimal air movement between the rooms, typically constructed by placing two overlapping sheets of plastic over an existing or temporarily framed doorway, securing each along the top of the doorway, securing the vertical edge of one sheet along one vertical side of the doorway, and securing the vertical edge of the other sheet along the opposite side of the doorway. Two curtained doorways spaced minimum of 1.8 meters apart form an airlock.

.10 Decontamination Enclosure System - A series of connected rooms, with curtained doorways between any two adjacent rooms, for the decontamination of workers or of materials and equipment. A decontamination enclosure system always contains at least one airlock.

.11 Worker Decontamination Enclosure System - A decontamination enclosure system for workers, typically consisting of a clean room, a shower room, and an equipment room.

.12 Equipment Decontamination Enclosure System - A decontamination enclosure system for materials and equipment, typically consisting of a designated area of the work area, a washroom, a holding area, and an uncontaminated area.

.13 Clean Room - An uncontaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of workers' street clothes and protective equipment.

.14 Shower Room - A room between the clean room and the equipment room in the worker decontamination enclosure system, with hot and cold or warm running water and suitable arrangements for complete showering during decontamination. The shower room comprises an airlock between contaminated and clean areas.

.15 Equipment Room - A contaminated area or room which is part of the worker decontamination enclosure system, with provisions for storage of contaminated clothing.

.16 Washroom - A room between the work area and the holding area, in the equipment decontamination enclosure system. The washroom comprises an airlock.

.17 Holding Area - A chamber between the washroom and an uncontaminated area in the equipment decontamination enclosure system. The holding area comprises an airlock.

.18 Fixed Object - A unit of equipment or furniture in the work area which cannot be removed from the work area.

.19 Movable Object - A unit of equipment or furniture in the work area which can be removed from the work area.

.20 HEPA filter - A High Efficiency Particulate Absolute (HEPA) filter capable of trapping and retaining 99.97% of fibers greater than 0.3 microns in length.

.21 Wet Cleaning - The process of eliminating lead-contamination from building surfaces and objects by using cloths, mops, or other cleaning tools which have been dampened with water, and by afterwards disposing of these cleaning tools as contaminated waste.

.22 Venting System - When lead-contaminated debris is disturbed, proper ventilating equipment must be used to exhaust air to the outdoors.

.23 Negative Pressure - Air pressure within a work area resulting from air movement equipment, installed in the work area capable of maintaining a minimum pressure differential of 0.5mm (0.02 in) of water column relative to adjacent unsealed areas.

.24 Certification - The testing of air movement equipment in accordance with the Province of Saskatchewan's Occupational Health & Safety Regulations Part XXIII Asbestos, section 339.

1.2 APPLICABLE REFERENCE DOCUMENTS

.1 The current issue of each document shall govern. Where conflict among requirements or with these specifications exist, the more stringent requirements shall apply.

A. Regulations: Comply with applicable Federal, Provincial, municipal, and local regulations. Province of Saskatchewan, Occupational Health and Safety Act and The Occupational Health and Safety Regulations December, 1996.

Transportation of Dangerous Goods Act Regulations and/or Waste Management Act Regulations. Province of Saskatchewan Dept. of Environment Regulations.

B. U.S. Federal Standard 209B “Clean Room and Work Station Requirements, Controlled Environment”

C. National Sanitation Foundation Standard NSF 49, Class II (Laminar Flow) Biohazard Cabinetry.

D. WorkSafe BC “Lead-Containing Paints and Coatings – Preventing Exposure in the Construction Industry"

.2 Codes and Standards

A. CSA-Canadian Standards Association.

.1) CSA Standard Z94.4-M1982 Selection, Care and Use of Respirators

.2) CSA Standard Z180.1-M85 Compressed Breathing Air And Systems

.3) ANSI Z88.2 - 1980 Practices for Respiratory Protection

B. Province of Saskatchewan

.1) Occupational Health & Safety Act, 1993

.2) Occupational Health & Safety Regulations, 1996 Part XXIII – Asbestos

C. United States Environmental Protection Agency

1) EPA 560/5-85-024 Guidance for Controlling Asbestos Containing Material in Buildings

1.3 SUBMITTALS AND NOTICES

.1 Prior to Commencement of Work Contractor shall:

.1 Provide in writing, details of proposed procedures covering all aspects of the contract with copies to the Building Owner.

.2 Submit proof, satisfactory to the Building Owner or his authorized representative, that all required permits and arrangements for transport and disposal of lead-contaminated materials have been obtained.

.3 Submit to the Building Owner or his authorized representative a copy of Pollution Insurance policy regarding hazardous materials.

.4 Submit to the Building Owner or his authorized representative a description of the plans for construction of decontamination enclosure systems.

.5 Submit documentation to the Building Owner or his authorized representative indicating employee instruction on the hazards of lead exposure, on use and fitting of respirators, on protective dress, on use of showers, on entry and exit from work areas, and on all aspects of work procedures and protective measures.

.6 Post warning signs where access to the work area is possible. Such signs shall be located on the Clean Room and on the Holding area of the Equipment Decontamination Enclosure System and shall delineate entry and protective equipment requirements and provide warning of the potential health consequences of exposure to lead.

.7 Submit names of supervisory personnel who will be responsible for work on each site. One of these supervisors must remain on site at all times work is occurring. Contractor shall submit proof that supervisory personnel have performed supervisory functions on at least two comparable projects. Substitution of these supervisors will only be allowed with written permission of the Building Owner or his authorized representative.

.8 For the work areas, submit for review drawings showing layout and construction of decontamination facilities and proposed location of negative pressure unit or units. Simple line drawings may be considered adequate, but must include details regarding walls, ceilings, doorways, water and service hookups.

.9 Submit to the Building Owner, documentation, including test results, of sealant materials proposed for use.

.10 Submit certification that vacuums and other equipment required to contain airborne fibres conform to the Province of Saskatchewan Occupational Health & Safety Regulations Part XXIII Asbestos Section 339. Certification must prove that the High Efficiency Particulate Air Vacuums and Negative Air Machines do not exceed a D.O.P. (di-2-ethyyl hexyl phthalate) penetration of 0.01 percent at any point. Where exterior ventilation is not possible, in-place D.O.P. filter testing is required for initial use and every four moves thereafter, provided the HEPA filters show no signs of physical damage during lead abatement operations. Certification of vacuums must be performed on site or if vented outside must show proof of certification within the last six (6) months.

.11 The Contractor and the Owner shall agree in writing on the condition of the building and fixtures, prior to commencement of the work.

1.4 PERSONNEL PROTECTION

.1 Prior to commencement of work, the workers shall be instructed, and shall be knowledgeable, in the areas described in Section 1.3. Submitals And Notices .1.5.

.2 Provide workers with personally issued and marked respiratory equipment approved by the Province of Saskatchewan Occupational Health and Safety Branch. Category II PAPR (Powered Air Purifying Respirators) equipped with HEPA filters will be used to conduct the removal of lead-contaminated material from within the Fire Arms Range at the RCMP Training Academy. An additional respirator must be available for every three workers during the removal in the event of damage or failure of one of the three respirators. The provisions of CSA Standard Z94.4-M1982 regarding the care, use and selection of respirators shall apply. A current list of persons utilizing respiratory equipment shall be displayed in the clean room. Filters shall be replaced every twelve hours of work or more frequently as indicated by on site manufacturers approved filter and flow testing equipment. No supervisors, workers or authorized visitors shall wear facial hair which affects respirator to face seal. Contractor shall provide sanitizing tablets or equivalent sanitizing agent.

.3 Provide authorized visitors with suitable respirators with new filters or cartridges whenever they are required to enter the work area, to a maximum of one (1) per day.

.4 Provide workers with sufficient sets of protective full body impervious clothing. Such clothing shall consist of full body coveralls and headgear. Non-disposable type protective clothing and footwear shall be left in the Contaminated Equipment Room until the end of the lead abatement work at which time such items shall be disposed of as contaminated waste. Disposable type protective clothing, headgear, and footwear may be provided.

.5 Provide authorized visitors with suitable protective clothing, headgear, eye protection and footwear, as described in Section 1.4.4, whenever they are required to enter the work area to a maximum of two sets per day.

.6 Provide and post, in the Equipment Room and the Clean Room, the decontamination and work procedures to be followed by workers, as described in Section 1.4.7 of these specifications.

.7 Protection Procedures

.1 Each worker and authorized visitor shall, upon entering the job site, remove street clothes in the clean change room and put on a respirator mask with new filters, and clean protective clothing, before entering the equipment room or the work area.

.2 Each worker or authorized visitor shall, each time he leaves the work area remove gross contamination from clothing, proceed to the equipment room and remove all clothing except respirator mask. Still wearing the respirator mask proceed naked to the showers, clean the outside of the respirator mask with soap and water while showering, remove the respirator mask, thoroughly shampoo and wash themselves, remove filters and dispose of filters in the container provided for the purpose; and wash and rinse the inside of the respirator mask.

.3 Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean change room and dress in clean clothes at the end of each day's work, or before eating, smoking, or drinking. Before re-entering the work area from the clean change room, each worker and authorized visitor shall put on a clean respirator mask with filters and shall dress in clean protective clothing, except that workers intending to re-use contaminated protective clothing stored in the equipment room shall enter the equipment room wearing only respirator mask.

.4 Contaminated work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement activity, 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 area. Store contaminated protective clothing in the equipment room for re-use or place in receptacles for disposal with other contaminated materials.

.5 Workers removing waste containers from the equipment decontamination enclosure shall enter the holding area from outside wearing full-body disposable coveralls and half-face passive respirators with approved HEPA filter cartridges. No worker shall use this system as a means to leave or enter the washroom or the work area.

.6 Workers shall not eat, drink, smoke, chew gum or tobacco at the work site except in designated areas.

.7 Workers shall be fully protected with respirators and protective clothing immediately prior to the first disturbance of lead-contaminated materials and until final clean-up is complete.

.8 Workers performing duties at risk of causing elevated lead concentrations shall be fully protected with respirators and protective clothing prior to the commencement of work.

.9 At all times, during abatement activity, the contractor will have a contact person outside the work area. This person should be knowledgeable in all aspects of the lead abatement activity being performed.

1.5 BUILDING PROTECTION

.1 If required, provide lockable doors sufficient to ensure work area security to the Clean Room and in the Holding area of the Equipment Decontamination Enclosure Systems of the Specified Work Areas.

.2 The Work Areas must be totally isolated from the rest of the building with posted warning signs identifying abatement in progress.

.3 If possible, the contractor will install exhaust ducting for the negative air units and duct the exhaust air outside through the nearest egress. Where exterior venting is not possible, in-place D.O.P. testing will be required for initial use and every four moves thereafter to ensure the equipment is operating within the acceptable limits as established by Occupational Health & Safety of the Province of Saskatchewan.

1.6 SCHEDULE

.1 The contractor shall provide the RCMP Training Academy with a Schedule which clearly indicates major proposed sectors of work, depicts and describes manpower loadings.

2.0 MATERIALS AND EQUIPMENT

.1 MATERIALS

.1 Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and the brand name.

.2 Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.

.3 Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with lead shall be disposed of in accordance with the applicable regulations.

.4 Plastic sheet - Of 0.15mm (6 mil) thick polyethylene, unless otherwise specified, sized to minimize frequency of joints.

.5 Tape - Capable of sealing joints of adjacent plastic sheets and for attachment of plastic sheet to finished or unfinished surfaces of dissimilar materials and capable of adhering under dry and wet conditions, including use of amended water.

.6 Impermeable containers - Suitable to receive and retain any lead-contaminated materials until disposal at an approved site. Two separate polyethylene bags of 0.15mm (6 mil) thickness or one bag used to line uncontaminated metal or fibre drums shall be used as appropriate. Containers must be air and water-tight and individually labeled.

.7 Warning labels and signs - Delineating entry and protective equipment requirements and providing warning of the potential health effects of exposure to lead.

.8 Other Materials - Provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.

2.2 TOOLS AND EQUIPMENT

.1 Provide all suitable tools for lead abatement activity. Submit a list of the equipment that will be provided to execute this contract.

.2 Air movement equipment - High Efficiency Particulate Air Filtration Systems shall be equipped with filtration equipment in compliance with ANSI Z9.2, Local Exhaust Ventilation. No air movement system or air equipment shall discharge lead dust outside the work area.

.3 Breathing air equipment - Shall meet the following requirements;

1) Approved by the Province of Saskatchewan Occupational Health and Safety Branch.

3.0 EXECUTION

.1 PREPARATION

.1 Work Area:

.1 For abatement activity identify all electrical devices, outlets, lines or junction boxes which will remain energized during the removal period. If necessary, provide temporary lighting and a temporary power supply incorporating ground fault interrupter circuits within the work area. Ground fault interrupter panels will be supplied by the abatement contractor.

.2 Seal off all openings, including but not limited to corridors, doorways, ducts, grilles, diffusers, and any other penetrations of the work areas, with 6-mil plastic sheeting sealed with tape. Doorways and corridors which will not be used for passage during work must be sealed with barriers.

.3 Build airlocks at entrances to and exits from the work areas.

.4 Maintain emergency and fire exits from the work areas, or establish alternative exits.

.5 Isolate all ventilation units by sealing with 6-mil plastic sheeting, and duct tape all openings or joints to ensure total isolation of ventilation equipment.

.6 If the contractor does not have a portable decontamination facility the contractor will erect a rigid decontamination enclosure, constructed of 50mm x 100mm (2 in. x 4 in.) timber studs on 600mm (24 inch) centers, sheathed in two layers of plastic sheeting, the top layer of 6 mil (0.15mm) woven polyethylene, and the bottom layer of 6 mil (0.15mm) polyethylene all securely fastened to the timber frame. Rigid hoarding of 12mm (1/2 inch) plywood is recommended.

.7 For the Work Area, set up negative air units to ensure safe replacement of primary filters, and duct the exhaust air to a location removed from potential inhalation of the exhaust. The negative air units will be tested for flow and are to have sufficient capacity to exchange the volume of the contaminated area 4 times per hour and maintain a negative air pressure in the contaminated area of 0.02" H_2O (5 Pa).

.8 Once venting equipment is in operation, construct the necessary walls to separate the abatement area from occupied or maintained areas as required.

.2 Decontamination Enclosure Systems:

.1 For the Specified Work Area(s) build a suitable framed Decontamination Enclosure. Line with plastic and sealed with tape at all lapjoints.

.2 In all cases access between contaminated and uncontaminated rooms or areas shall be through an airlock as described in Section 1.1.8. In all cases access between any two rooms within the decontamination enclosure systems shall be through a curtained doorway.

.3 Worker Decontamination Enclosure System: Construct a worker decontamination enclosure system for High Risk removals consisting of three totally enclosed chambers as follows:

.1 A shower room with two curtained doorways, one to the equipment room and one to the clean room. The shower room shall contain at least one shower for every five (5) workers in the area, with hot and cold or warm running water. Water supply will be taken from a suitable water source, (example: washroom) and will be disconnected at the end of every shift. Careful attention shall be paid to the shower enclosure to insure against leaking of any kind. Ensure an adequate supply of soap at all times in the shower room. Ensure that adequate drainage from the shower to the building sewer system is provided.

.2 A clean room with one curtained doorway into the shower and one entrance or exit to non-contaminated areas. The clean room shall have sufficient space for storage of the workers' street clothes, towels, and other non-contaminated items as well as provide room for a minimum of four (4) workers. Provide workers with lockers or hangers, benches, respirator storage space and mirror(s) to facilitate dressing, undressing and equipment adjustment and maintenance.

.3 Equipment Decontamination Enclosure System: Provide or construct an equipment decontamination enclosure system consisting of two totally enclosed chambers as follows:

.1 A washroom with sump pump, constituting an airlock, with a curtained doorway to a designated area of the work area and a curtained doorway to the holding area.

.2 A holding area, constituting an airlock, with a curtained doorway to an uncontaminated area.

.4 Separate the Lead Abatement Work Area from Occupied Areas which will remain in use by means of airtight barriers, constructed as follows:

.1 Build suitable wood or metal framing.

.2 Cover sheathing with plastic sheet, sealed with tape as specified on work area side.

.5 Maintenance of Enclosure Systems:

.1 Ensure that barriers and plastic linings are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery. Ensure that, prior to every shift start, the shift foreman inspects the enclosure barrier for leaks and that any leaks discovered are repaired before workers are allowed to enter work area.

.6 Lead abatement work shall not commence until:

.1 Arrangements have been made for disposal of waste at an acceptable site.

.2 Work area and decontamination enclosure systems (and parts of the building required to remain in use) are effectively segregated.

.3 Tools, equipment and material waste receptors are on hand.

.4 Arrangements have been made for building security.

.5 The consultant has conducted a Pre-contamination Inspection.

.6 All other preparatory steps have been taken and applicable notices posted and permits obtained.

3.2 LEAD ABATEMENT

.1 The primary method removal of the lead-contaminated materials shall be by manual handling and packaging.

.2 Remove and discard all porous materials from within the work enclosure. Remove all non-porous materials that have not been identified as salvageable by the RCMP. HEPA vacuum all remaining surfaces within the work area to remove any residual dust/debris. Following vacuum operations wet wipe / mop all surfaces. Place all lead-contaminated material in appropriate disposal bags.

3.3 CLEAN UP

.1 Following the removal of the lead containing materials, remove all visible accumulations of dust and debris with HEPA vacuum.

.2 HEPA filtered negative air pressure systems, air filtration, and decontamination enclosure systems shall remain in service at this time.

.3 Following HEPA vacuuming, wet wipe / mop all surfaces in the work area. Upon completion of the cleaning operation, perform a visual inspection of the work area to ensure that the work area is free of visible of all dust and debris.

.4 All equipment used in the work area shall be included in the clean-up and shall be removed from work areas at an appropriate time in the cleaning sequence.

.5 If the consultant finds visible accumulations of dust within the work area, the Contractor shall repeat the cleaning process at the Contractor's expense until the work area is, in the opinion of the consultant in an acceptably clean condition.

.6 Work area clearance shall be based largely on a visual inspection of the work area by the consultant. Final clearance shall be based on air monitoring undertaken by the building owner or his authorized representative. Following an adequate stand down time, air clearance samples will be collected within the work area. Clearance will be granted based upon the analytical results of the air monitoring performed within the work area(s).

.7 Following building owner approval, the decontamination enclosure systems shall be removed. A final check shall be carried out to ensure that no dust or debris remains on surfaces as a result of dismantling operations.

3.4 DISPOSAL

.1 As the work progresses, the contractor will not exceed available enclosed storage capacity on site. The personnel assigned to transport will be fully informed and equipped to handle a broken container in transport or disposal.

.2 Cooperate and comply with Federal, Provincial and Municipal authorities regarding the transport and disposal of all waste materials.

.4 Ensure that all transport and disposal activities are supervised by a representative of the contractor to ensure compliance with all applicable regulations.

3.5 CIRCUMSTANCES RESULTING IN AN IMMEDIATE SHUTDOWN

.1 Insufficient Negative Air Differential - The negative air differential between the removal area and the adjacent areas must be maintained at a level no lower than 0.02" H_2O.

.2 Water Leakage - Any leakage of water from the removal area or decontamination facilities will not be tolerated.

.3 Faulty Equipment - All equipment involved in the lead abatement activities must be maintained in good working order.

.4 Inadequate Supply of Materials - An adequate supply of materials must be available on site at all times (eg. disposable coveralls, respirators, HEPA filters, towels).

.5 Unsafe Activities - Any other circumstances which the site inspector feels are unsafe to the workers or occupants of the building.