Edmonton International Airport

Asbestos Guidelines

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EDMONTON INTERNATIONAL AIRPORT

EDMONTON AIRPORTS
PUBLIC SAFETY DEPARTMENT

ASBESTOS MANAGEMENT PROGRAM

AND

STANDARD OPERATING PROCEDURES

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A GUIDELINE FOR MANAGING ASBESTOS-CONTAINING MATERIALS IN THE AIR TERMINAL BUILDING AND SURROUNDING BUILDINGS AT THE EDMONTON INTERNATIONAL AIRPORT

1.0 INTRODUCTION

1.1 SCOPE

The purpose of producing the updated asbestos management program, providing awarewness training, and conducting a comprehensive asbestos survey for the Edmonton Regional Airports Authority is to increase awareness and inform all employees about the up and coming changes to applicable regulations in Alberta. Thus all employees will have a better understanding of where the asbestos is in the building, what their responsibilities are concerning asbestos, what the potential health hazards are, and what to do if the employee encounters asbestos that has been disturbed. In so doing, the risk to the health and safety of all building occupants will be greatly reduced and or eliminated.

1.2 BACKGROUND ON ASBESTOS CONTAINING MATERIALS

Asbestos is the term that has been given to a group of natural mineral fibres. Its name comes from the Greek word meaning indestructible. There are many types of asbestos. Classification of which depends upon the rock types from which the asbestos is formed. The most common types include:

Serpentine:	Chrysotile (white asbestos)
Amphiboles:	Actinolite
	Amosite (brown asbestos)
	Anthophylite
	Crocidolite (blue asbestos)
	Tremolite

Asbestos is extracted from open-pit mines in many countries including, Canada, United States, China, South Africa, and Australia. Canada is the world's largest producer of asbestos. Chrysotile, Amosite and Crocidolite are the types of asbestos that have been used most often in the past and are characterised as follows:

Chrysotile fibres are wavy and curly when viewed under the microscope. These bundles separate easily into smaller bundles and individual fibres when handled.

Amosite asbestos is made up of straight, rod-like fibres. These fibres will usually break before bending. The ends of Amosite fibres look like tooth picks under the microscope.

Crocidolite asbestos is made up of long thin fibres that resemble a stack of needles under the microscope. Crocidolite fibres are even more likely to break than Amosite fibres.

Chrysotile, the most commonly used asbestos, is found in about 95 percent of all commercially produced asbestos products (i.e., pipe insulation, texture coatings, spray fire proofing, etc.). Amosite and Crocidolite are used in the same products but in lesser quantities. Asbestos is a versatile material because of its resistance to fire, heat, friction and corrosion. It has been a popular substance in over 3,000 products ranging from children's clothing to potholders, brake linings and building materials. An asbestos product, such as sprayed on insulation, which may readily crumble or can be easily pulverised is said to be friable.

Asbestos can be classified according to how easily the mineral crumbles or by friability. Approximately 70% of all mined asbestos have been used industrially for such products as:

FRIABLE	NON-FRIABLE
pipe insulation	roof shingles
insulating blocks	asbestos cement pipes
decorative and acoustic textures	caulking compounds
spray fireproofing	floor tiles
thermal materials	papers
drywall jointing compounds	paints
condensation control	textiles
decorative millboards	cloths

The remaining 30% of all asbestos mined has been used commercially. For example:

FRIABLE	NON-FRIABLE
papers	brake linings and gaskets
electrical insulation	brake blocks and plastics
filters	clutch facings and textiles

In Alberta, and the rest of Canada, asbestos was widely used until 1973 as sprayed insulation material for fire protection and acoustical purposes. Pipe and boiler insulation containing asbestos was used much later, into the early 1980's. Eventually manufacturers voluntarily stopped using asbestos in their products and supplies. Accordingly, it is present in a large number of commercial buildings, including offices, schools, factories and air terminals.

Understandably, the association of Chrysotile, Amosite and Crocidolite asbestos in buildings has created enormous public apprehension. Asbestos is indeed, a potentially serious hazard to workers who are engaged in construction related activities. These tasks include asbestos removal and building demolition, and a wide variety of activities in the realm of building maintenance.

1.3 HEALTH EFFECTS

Asbestos diseases are a result of the inhalation (breathing in) of asbestos fibres. The inhalation of asbestos fibres is linked to a phenomenon known as a dose-response relationship. In general, as with the inhalation of tobacco smoke, the greater the exposure of an individual to asbestos (the dose), the greater the likelihood of disease (the response). Conversely, the lower the exposure of an individual to asbestos, the lower the likelihood of disease. However, at low levels of exposure, the assessment of disease risk is uncertain. The uncertainty arises from the limitations of epidemiological studies.

The three major diseases associated with the inhalation of asbestos fibres are as follows;

Asbestosis
Mesothelioma
Lung Cancer

Asbestosis

With the disease asbestosis, macrophages turn normal lung tissue into scar tissue (fibrosis) as they try unsuccessfully to digest the asbestos fibres. The lung becomes more rigid as the proportion of scar tissue increases, making it difficult to breathe. Once the fibrosis begins, it cannot be completely stopped even if occupational exposure to airborne asbestos stops. All types of asbestos are capable of producing this fibrosis.

Thirty years may pass before the symptoms of asbestosis become apparent. The primary sign is increased breathlessness, accompanied by sharp pains in the chest. Increased sputum and coughing follow later in the progression of the disease. Smokers often develop chronic bronchitis, as well.

The rate at which asbestosis develops depends on the level and duration of exposure to asbestos as well as the history of smoking. Presently, there is no specific treatment for the disease, which may be fatal.

Periodic lung function tests may detect the decrease in lung capacity associated with asbestosis. Additionally, a chest X-ray will show the scar tissue as an opaque white mass on the lungs.

Mesothelioma

Approximately 85% of those who contract this fatal cancer of the chest and abdominal cavities have been exposed to respirable airborne asbestos fibres. Although asbestos workers have an increased chance of developing Mesothelioma, occupational exposure is not necessary. Even household members of asbestos workers, who have brought asbestos home on their clothes, have contracted the disease.

Neither the amount nor the duration of exposure directly affects the development of Mesothelioma. Furthermore, the disease is not associated with smoking. Although 30 years may pass before the symptoms of the disease become apparent, death usually results within months of diagnosis.

Lung and Laryngeal Cancer

Although cancer of the respiratory tract is linked to inhalation of asbestos fibres, the relationship has not been clearly defined. Asbestos workers who smoke increase their risk of developing lung cancer by as much as 70 times over that of non-smoking, unexposed individuals. Very few individuals who develop lung cancer live more than five years after diagnosis. Each exposure to asbestos increases the risk of cancer; consequently, exposure events are cumulative. All common types of asbestos are capable of producing lung and laryngeal cancer. Typically, the cancer does not develop until 20 or more years after the first exposure.

There is strong evidence to suggest that Crocidolite and Amosite fibres tend to be more hazardous than Chrysotile fibres, primarily because they are more likely to conform to the most hazardous length and diameter, and because they are more likely to become airborne and hence to be respirable. All fibre types can cause all asbestos-related diseases, however, Mesothelioma is most likely to result from Crocidolite or Amosite exposure. Mesothelioma has a strong association with Crocidolite or Amosite exposure, and has a weak association with Chrysotile exposure.

There exists no relationship between smoking and Mesothelioma. There is evidence suggesting that smoking increases the chance of developing lung cancers. The evidence is clear that asbestos and smoking have a synergistic effect, which is greater than the additive effects of each alone.

1.4 ASBESTOS PRODUCTS USED, APPLICABLE CONTROL METHODS AND ASBESTOS JOB CLASSIFICATIONS

Although asbestos has been used in a wide variety of commercial and industrial products, the prevalent friable and non-friable asbestos products in the Terminal Building and surrounding buildings are as follows:

FRIABLE	NON-FRIABLE
electrical insulation	floor tiles
pipe insulation	asbestos cement pipes
insulating blocks	granite panel packing materials
sprayed fireproofing	transite board
texture spray	
duct insulation	
fire stop materials	
Amosite board	
Sewer and roof drain fitting packing	

The mere presence of a friable asbestos containing material does not imply that there is an actual elevation of airborne fibres. Numerous studies have indicated that elevated asbestos fibre levels are generally found when settled dust or friable asbestos materials are disturbed. Fibre levels may become elevated by routine maintenance, renovation, vibration, or by inadvertent contact. Numerous extensive studies have been conducted on airborne asbestos fibre levels in asbestos containing buildings. These studies indicate that airborne fibre levels in those buildings are no higher than the street outside, unless that material is physically disturbed. This was one of the major conclusions of the publigation "Ontario Royal Commission on Matters of Health and Safety Arising from the Use of Asbestos in Ontario."

The United States Environmental Protection Agency (USEPA) uses an asbestos exposure assessment algorithm to determine the potential risk from asbestos in buildings. These factors include: the condition of the asbestos material, water damage, activity, movement, exposed surface area, accessibility, friability and presence in an air stream. These factors often give some indication of the likelihood of fibre release, but are not in any way definitive in determining whether a hazard exists or not. That is, even if the most friable product exists in a building, elevated fibre levels will not likely occur unless there is some disturbance by physical contact, vibration or an air stream. It is also important to note that jacketed or coated asbestos containing pipe or mechanical insulation is not considered friable unless the jacketing is deteriorating or is disturbed by maintenance, renovation, or if there is no jacketing at all. Located in Appedix D is the "Evaluation and Recommendation Criteria for Control of Asbestos Containing Materials (ACM)". The criteria detailed in this appendix will provide an in depth way of assessing the health and safety hazard presented by asbestos containing materials.

There are four possible approaches to control exposure to airborne asbestos once an asbestos material is identified in a building. These methods briefly are as follows:

1) Removal - Asbestos material is removed and disposed of by burial and replaced by non-asbestos materials.

2) Encapsulation - Asbestos material is coated with a bonding agent called a sealant.

3) Enclosure - Asbestos-containing materials are separated from the building environment by barriers such as suspended ceilings or cladding materials.

4) Deferred action or management and custodial control - The area is inspected periodically for changes in exposure potential and maintenance staff is properly trained to work in asbestos environments. This control method is particularly appropriate for previously encapsulated material or mechanical insulation, which is already enclosed behind a physical covering.

As a general rule, removal provides the only permanent elimination of any potential for airborne fibre release in buildings. Encapsulation and enclosure are only temporary solutions since the asbestos remains in the building and may be subject to further disturbance and deterioration.

Asbestos Job Classifications

Asbestos-related work can be divided into three types, according to the risk of releasing fibres into the air and causing potentially harmful exposures.

Low Risk Work Activities

Installing or removing manufactured products containing asbestos, where sanding, cutting or similar operations are not required:

Using hand-powered tools to cut, shape, drill or remove manufactured non-friable asbestos products:

Working in close proximity to friable material containing asbestos, provided that the asbestos material is not disturbed:
Transporting or handling materials containing asbestos in sealed containers:

Removing a false ceiling or part of a false ceiling to gain access to a work area where asbestos containing materials are known to exist. Loose friable asbestos materials must not be lying on the surface of the false ceiling.

Moderate Risk Work Activities

Removing, encapsulating or enclosing less than 300 square mm of friable asbestos material:

Using a powered tool fitted with a HEPA filter dust collector, to cut, shape, or grind manufactured products containing asbestos;

Removing a false ceiling, or part of it, to gain access to a work area where there is, or is likely to be, friable asbestos material lying upon the surface of the false ceiling; and

Removing drywall materials where joint-filling materials containing asbestos have been used.

High Risk Work Activities

Removing, encapsulating or enclosing 300 square mm or more of friable asbestos material;

Cleaning, maintaining or removing air-handling equipment in buildings where sprayed asbestos materials have been applied to the airways or ventilation ducts;

Repairing, altering or dismantling a boiler, furnace kiln or similar device where asbestos-containing materials have been used; and

Demolishing, dismantling, altering or repairing any building structure, or parts of it, in which asbestos containing materials were used or in which asbestos products were manufactured.

It is important to note that some moderate risk work and all high-risk abatement should not be conducted by any Airport employee. Specific training, qualifications, as well as equipment and procedures are required, which are not mentioned in this manual.

1.5 REGULATIONS IN ALBERTA

1.5.1 Canada Labour Code - Part II (June 1996) - The Canada Labour Regulations deals with Hazardous Substances in part 10 of the Code. The Code states under Control of Hazards that no employee will be exposed to concentrations of an airborne chemical agent, other than grain dust, in excess of the value for the chemical agent adopted by the American Conference of Government Industrial Hygienists (ACGIH) and its publication entitled Threshold Value Limits (TLV's).

The general highlights of the Canada Labour Code refer to: employer and employee duties, the requirements of Hazard Investigations, Ventilation Requirements, Medical Examinations and Employee Education. It also defines regulations that refer to other chemicals, including Work Place Hazardous Materials Information Systems (WHMIS). The significant changes to the Canada Labour Code include:

Employers are required to prepare and maintain an inventory of all hazardous substances which are used, produced, handled or stored in the workplace.

Where there is a likelihood that employees may be exposed to a hazardous substance, the employer must appoint an individual competent in Industrial Hygiene to assess the potential exposure. The assessment must follow a prescribed protocol and must conclude whether or not the exposures are likely above an action limit of 50% of the exposure limit. Air monitoring is often required to provide this information.

If an exposure hazard exists, the employer must prepare a written control program, provide worker training, and medical testing for employees.

Federal occupational exposure limits are now based on the most recent values of the ACGIH rather than 1985 - 86 values.

1.5.2 Occupational Health and Safety Act (March 1995) - According to the Alberta Occupational Health and Safety Act, employers must protect their employees and contractors from health hazards and workers must help protect themselves and their co-workers by co-operating with their employer. Alberta Human Resources and Employment is the governmental department that is responsible for administering the OHS Act. The department does this by developing safe work practices and programs in conjunction with employers and employees, conducting workplace inspections, investigating serious work-related incidents and injuries, and responding to concerns about health and safety conditions at Alberta work-sites.

1.5.3 Chemical Hazards Regulation (June 1993) - The Chemical Hazards Regulation specifies; maximum allowable 8-hour and 15-minute exposure limits for airborne contaminants such as asbestos fibres, employers general duties, protective equipment when dealing with hazardous materials, worker health assessments and worker training, and the requirements for notifying Alberta Human Resources and Employment, Workplace Health and Safety 72 hours prior to commencing an asbestos project. The 15-minute exposure limit for asbestos fibres is 5 times the associated 8-hour exposure limit. This multiplication rule only applies to asbestos fibres, and does not work with other substances. It also defines regulations that deal with other chemicals, including Work Place Hazardous materials Information Systems (WHMIS). The Chemical Hazards Regulation combines the old Asbestos, Silica and Coal Dust regulation into one regulation. The Chemical Hazards Regulation Occupational Exposure Limits (OEL) for fibre substances are presented in Table 3.

Currently the Chemical Hazards Regulation is under review and the revision is anticipated to be released in January 2002. The revision will clarify some discrepancies in the current regulation and changes will be made to the Occupational Exposure Limits (OEL's). The new proposed OEL's are listed in Table 3.

TABLE 3 OF SCHEDULE 1

OCCUPATIONAL EXPOSURE LIMITS FOR ASBESTOS AND OTHER FIBRES

Fibre Type	Present 8 hour OEL (f/cc)	Proposed 8 hour OEL (f/cc)
Chrysotile	0.5	0.1
Amosite	0.2	0.1
Crocidolite	0.2	0.1
Tremolite	0.2	0.1
Talc (Fibrous)	2.0	Unknown
Fibrous Glass	1.0	Unknown
Mineral Wool	1.0	Unknown
Refractory Ceramic	0.5	Unknown

An eight-hour Occupational Exposure Limit (OEL) is “the time-weighted average concentration of an airborne substance listed in the Chemical Hazards Regulation for an eight-hour period.”

1.5.3 **Chemical Hazards Regulation**, Continued

Employer's General Duties

The employer dealing with asbestos materials must take the appropriate steps to:

minimise the release of asbestos into the air, and never exceed the Occupational Exposure Limit (OEL);

keep the work site clear of unnecessary accumulation of asbestos waste and materials containing asbestos;

ensure that decontamination of workers and material does not result in releasing airborne fibres;

ensure that asbestos waste containers are labelled to indicate asbestos waste as carcinogenic and that dust should not be inhaled;

ensure that waste is kept, stored and transported in sealed and impervious containers;

provide facilities to prevent workers' street clothes from being contaminated;

ensure that only authorised persons enter a restricted work area;

post signs at restricted area openings warning of the hazards, the signs will indicate that no eating drinking or smoking is prohibited in the area and will be maintained until the area is no longer restricted;

provide workers with protective clothing and respirators and ensure the equipment is properly used; and

ensure that workers decontaminate themselves before leaving the restricted work areas.

Worker Training

Advanced government approved worker training is required when a worker is expected to enter a containment. Containment's are considered restricted work areas. Restricted area means "an area of a work site where there is a reasonable chance of the concentration of airborne asbestos being at least 50 percent of the eight-hour Occupational Exposure Limit (OEL)."

An exposed worker is "a worker who may reasonably be expected to work in a restricted area during at least 30 work days in a 12-month period." Exposed workers are people likely to be exposed to more than 50 percent of the eight-hour OEL for asbestos, 30 days of the year.

The Chemical Hazards Regulation requires that all employees who work with asbestos must successfully complete a course approved by Alberta Human Resources and Employment, Workplace Health and Safety. The course is of two-day minimum duration requiring the participants to become familiar with the regulations, have a good understanding of asbestos abatement techniques, worker protection and safe work practices. An examination is completed and requires an 80 percent passing grade.

Employee Health Assessment

All exposed workers will undergo a health assessment within 30 days of becoming an exposed worker, and every two years thereafter. An exposed worker is defined as "a worker who may reasonably be expected to work in a restricted area during at least 30 work days in a twelve-month period". Exposed workers are people likely to be exposed to more than 50 percent of the eight-hour OEL for asbestos, 30 days of the year. The assessment is to be conducted by a qualified physician and consists of a chest x-ray, including a radiologist's report, pulmonary function test and employee's work history. The cost of medical testing and the time taken to undergo the tests must be borne by the employer. The worker may refuse the test by submitting a written refusal to the employer.

Notification of Project start-up (N.O.P.)

Written notification must be given to the Director of Inspection, Alberta Human Resources and Employment, Workplace Health and Safety at least 72 hours before commencement of an asbestos abatement project. This notification must include the location of the work site, the start and completion dates and a description of the work being conducted.

1.5.4 General Safety Regulation (April 1995) - The General Safety Regulation outlines a number of safety requirements, which may apply to asbestos projects ie; electrical hazards, fall protection and scaffold erection. There is also a section in the General Safety Regulation which deals with Respiratory Protective Equipment that includes; determination of the need for equipment, selection of the appropriate equipment, approval of equipment and codes of practice.

Respiratory Protection

The General Safety Regulation outlines the factors which determine the need for respiratory protection. Respiratory protective equipment must be provided and worn by the worker where a risk exists, or where a worker will be working in a restricted area. In selecting the appropriate equipment the worker or contractor must consider the following factors; the nature of the contaminants, the concentration of contaminants, the length of worker exposure, oxygen concentration and the need for emergency escape from the work area.

The General Safety Regulation also highlights equipment approval. All respirators and their constituent components must be approved by N.I.O.S.H. The air used for supplied air respiratory protection must comply with the CSA compressed breathing air standard. Other standards published by CSA are "Selection, Care and Use of Respirators" Z94.4-93, and "Compressed Breathing Air and Systems" Z180.1-00.

Alberta Human Resources and Employment has published a guide named, An Employer's Guide to Respiratory Protection Equipment which includes factors such as; proper respirator fit for each worker, workers to be clean shaven where the respirator meets the skin of the face and respirators will be stored, cleaned, inspected, serviced and used in accordance with manufacturer's specifications.

1.5.5 The Alberta Building Code (1990) - The Building Code mandates are to set standards to assist in providing a safe work environment for building occupants and includes regulations for asbestos building materials. The Alberta Building Code outlines which types of asbestos that may not be used in buildings, they are as follows;

- the use of materials containing Crocidolite (blue) asbestos
- the use of asbestos containing materials in a supply or return air plenum
- the installation of a product that has the potential for releasing asbestos fibres in a building (asbestos-cement pipe and asbestos cement board are exceptions as long as they are not installed in a supply or return air plenum)
- the installation of asbestos by spray application.

Also in existing buildings where there is a potential for the release of asbestos fibres, the Director of Building Fire Safety may declare an unsafe condition. In this case the material will be required to be removed, enclosed or encapsulated. In buildings or parts of buildings that are being demolished, materials having the potential for releasing asbestos fibres must be removed prior to demolition.

A building permit is required prior to any work being done, including demolition. An asbestos consultant will normally be required to develop the plans and specifications for dealing with asbestos in buildings, other than single family homes, however, this should be co-ordinated with a local building inspector.

1.5.6 Alberta Environment has published a document entitled, "Guidelines for the Disposal of Asbestos Waste", which includes the requirements of the Transportation of Dangerous Goods Regulations for shipment of asbestos waste. A shipping document must accompany the waste to the landfill. Regulations on how the waste is transported require that:

- bags are marked with shipping name and PIN number
- shipment vehicle is placarded
- vehicle operator has a valid Certificate of Training issued by the vehicle operator's employer
- asbestos is transported as directly as possible to the disposal site
- asbestos is not transported with any cargo in the same vehicle
- asbestos is not transported in a compacting type of waste haulage vehicle.

All containers leaving the work site will be free of punctures, tears or leaks and will be clearly labelled indicating asbestos content with a warning not to inhale dust. Friable asbestos waste should be transported only in vehicles equipped with emergency spill cleanup equipment including a shovel, wetting agent, protective clothing, a supply of 6 mil polyethylene bags and approved respiratory protection. Any friable asbestos waste that is in a container that is leaking will be double bagged immediately upon discovery, in two 6 mil polyethylene bags.

1.5.7 Asbestos Abatement Manual (1995) - A comprehensive manual produced by Alberta Labour which covers all aspects of asbestos in buildings includes: asbestos background, the health effects, legislation, abatement procedures, personal protective equipment, air monitoring and other health and safety considerations. This manual is under review and will be updated in January 2002.

2.0 RESPONSIBILITIES AND CONTROL PROCEDURES FOR AIRPORT STAFF DURING AN ASBESTOS SPILL

If accidental dislodgement occurs after regular working hours, the Airport Duty Manager (A.D.M) will be notified immediately at 890-8327.

If accidental dislodgement occurs during regular working hours, one of the following departments will be notified immediately at;

Maintenance Department

Structural Superintendent	890-8333
Mechanical Superintendent	890-8336
Electrical Superintendent	890-8335

Airport Planning and Engineering Department

Project Managers	890-8432

Responsibilities for asbestos control procedures and clean up of an asbestos spill will be specific to the department(s) conducting the asbestos related work.

Upon being notified that asbestos insulation has been dislodged to such an extent that employees or members of the public may become exposed to asbestos, the specific department will:

- Obtain the name and the location of the caller;

- Ascertain the location and extent of the asbestos spill;

- Visit the affected area wearing minimum NIOSH approved half-face piece respiratory protection and protective clothing, determine the degree of hazard and initiate corrective action.

- Complete the ASBESTOS SPILL CHECKLIST, sample of which is located in Appendix A.

NOTE: Whether a spill is a major or minor hazard will be determined by the qualified individual responding to the initial call and a consultant should declare and area clean only after a thorough visual inspection and air clearance sample has been collected and analysed.

2.1 ASBESTOS SPILL AND CLEAN UP PROCEDURES

The first qualified individual contacted from the above-mentioned department will determine whether an asbestos spill is a minor or major hazard to employees or the general public and he or she will initiate the clean up:

- Shutdown adjacent heating/cooling system if spill is major.
  Contact Mechanical Superintendent at 890-8336.

- Clear the area of all personnel, barricade the area to traffic and initiate clean up action without delay.

- Contact qualified designated cleaning staff or an external contractor to clean up the spill. Cleaners will wear appropriate respirators and disposable coveralls.

- HEPA vacuum clean or wet clean only. The wet method should always be used unless electrical hazards exist. A non-HEPA DOP tested vacuum must never be used for work with asbestos. Commercially available HEPA vacuums typically are unacceptable and do not pass DOP testing.

- The designated cleaning supervisor or cleaning contractor will ensure that the below mentioned items are implemented;

- For minor spills, respirators meeting NIOSH standards must be worn. In all cases the minimum respiratory protection will be half-face dual cartridge respirators with P100 HEPA filters.

- For major spills, respirators meeting NIOSH standard must be worn. The minimum respiratory protection will be full-face PAPR respirators with P100 HEPA filters.

- Ensure that the designated cleaning personnel are qualified and have been trained in the use of respiratory protection and asbestos cleaning procedures.

- Smoking, eating or drinking in the spill area is prohibited at all times.

- When a HEPA vacuum cleaner is used to remove dislodged asbestos fibres, care must be taken to ensure that exhaust air from the unit does not cause fibres to become airborne.

- If it is impractical to use a HEPA vacuum, all dislodged asbestos will be carefully pre-wet and placed in 6 mil plastic bags.

- Asbestos waste will be, double bagged, labelled for content and conveyed to a storage area to await disposal.

- Prior to leaving a contaminated area, HEPA vacuum cleaners and clean up tools will be washed, all contaminated material (e.g., coveralls, sheeting) will be disposed with asbestos waste and exposed skin areas of the body will be showed or wet clean.

NOTE: DOP test all HEPA vacuums in accordance with the Medical Research Council of Canada, 1980 Guidelines and/or the field applications of the United States Military Standards Number 282 U.S. Army Instruction Manual 136-300-175A. Asbestos cleaner will arrange, and pay for, DOP testing of all vacuums used on site. Testing certificates will be marked on applicable units and be provided in writing by testing agencies.

3.0 WORK PERMIT SYSTEM

In order too properly track low risk asbestos related activities within the Terminal and associated buildings a work permit system should be implemented. Maintenance activities are continually required in asbestos contaminated areas thus, employees and external contractors will be informed of all asbestos hazards and are required to have proper training and applicable qualifications prior to conducting the maintenance work. Employees and external contractors will be required to familiarise themselves with this manual and areas where asbestos exists in relations to where low risk work will be conducted.

Direction will be given to the employee or external contractor on whether low risk activities can be conducted in the effected area. The Supervisor of Maintenance and/or the Project Manager shall ensure that the work procedures required are low risk and not moderate or high risk work procedures. Once this has been determined the employee and/or external contractor will complete the ASBESTOS WORK PERMIT (Refer to Appendix B). One copy will be retained by the Maintenance Supervisor and/or Project Manager and one copy will be forwarded to the Airport Safety Officer.

The WORK PERMIT SYSTEM should be implemented and maintained by the following departments;

Maintenance Department

Structural Superintendent	890-8333
Mechanical Superintendent	890-8336
Electrical Superintendent	890-8335

Airport Planning and Engineering Department

Project Managers	890-8432

4.0 MAINTENANCE WORK IN AREAS CONTAINING ASBESTOS

High Risk asbestos abatement work shall not be conducted by Airport maintenance staff or other persons who are not trained and qualified and do not have the required equipment to conduct such work.

Precautions and work procedures for moderate risk work that may apply are as follows and are highlighted in Appendix C and Appendix E (SOP #2):

- Work will be preplanned to ensure that asbestos is not unnecessarily dislodged by work procedures. Ideally, the work should be conducted after regular working hours to reduce the number of people exposed should there be a spill.

- Staff or external contractors conducting the work will be equipped with approved respiratory equipment and full-body disposable coveralls.

- HVAC systems in work areas may have to be turned off in case of a spill or disturbance.

- Non-essential personnel will be denied access to the immediate work area.

- Floor areas and furniture in the immediate vicinity of the work area should be covered with 6 mil plastic sheeting and sealed with duct tape.

- When work is completed, workers will use DOP tested HEPA vacuum cleaners to vacuum clean their disposable clothing, work equipment and vacuum clean (or wet mop) the plastic sheeting and all equipment.

- Employees shall discard disposable clothing and plastic sheeting in properly labelled 6 mil plastic bags, which are then double bagged for disposal.

- In the event of a minor spill, floors in the work area not protected by plastic sheeting will be wet mopped or preferably vacuumed with a DOP-tested HEPA vacuum, carpets not protected by plastic sheeting shall be cleaned with a DOP-tested vacuum.

5.0 AIR MONITORING

In order to detect higher fibre concentrations, fibre counting through the use of Transmission Electron Microscopy (TEM) is necessary. The electron microscope detects many fibres too thin to be seen through the Phase Contrast Microscopy (PCM). Accordingly, a count of asbestos fibres in the building's air using electron microscopy will detect more fibres, to the extent of an order of magnitude of ten times as many fibres as a count through the phase contrast microscope. Industry standards have also been adopted which recommend that acceptable fibre levels for any public area should be 1/10th of the (OEL) when using the PCM counting method.

Air monitoring involves the process of measuring the fibre content of a specific volume of air in a stated period of time (i.e., f/cc). The asbestos management program relies on a Qualified Consultant to take the necessary air quality samples, conduct the associated analysis, and make recommendations based on the sample results. Alberta Human Resources and Employment's "Asbestos Abatement Manual" recommends that all glovebagging work be air monitored. In addition air monitoring is mandatory for all High risk work procedures.

APPENDIX A

ASBESTOS SPILL CHECKLIST

CHECKLIST FOR AN ASBESTOS SPILL

DATE:
TIME:

CHECKLIST	COMMENTS
NAME OF CALLER	
LOCATION OF CALLER	
PHONE # OF CALLER	
LOCATION OF HAZARD	
SIZE OF AREA AFFECTED	
EXTENT OF HAZARD: MAJOR SPILL : MINOR SPILL	
~Light dust on surfaces	
~Large chunks on surfaces	
~Broken away from:	
~About to break away	
~Visible dust in air	
~Improper procedures in progress by contractor or others (if known)	
HOW DID SPILL OCCUR (if known)	
OTHER INFORMATION OBTAINED	
NOTE TIME CONTACTED	
~Duty Manager	
~Cleaning Supervisor (MOT)	
~Cleaning Supervisor (Contractor)	
~Airport Safety Officer	

APPENDIX B

ASBESTOS WORK PERMIT

LOW POTENTIAL RISK

ASBESTOS WORK PERMIT
FOR LOW POTENTIAL RISK ONLY

PERMIT NO. _____ BUILDING: _____

DATE OF ISSUE: (YR/MO/DY) _____ ADDRESS: _____
_____
_____

DURATION OF PERMIT: _____TO _____ CONSULTANT: _____
_____
CONTRACTOR: _____

WORK REQUESTED BY: _____ PHONE: _____
CONTRACTOR REP: _____
TRADES: _____

WORK FLOOR(S) NUMBERS AND RESPECTIVE QUADRANTS: _____
_____
_____

YES	NO	ACTIVITIES		
____	____	LIFTING CEILING TILE		
		INSPECTION	_____	SPECIFIY: _____
		ELECTRICAL	_____	SEE BELOW
		MECHANICAL	_____	SEE BELOW
		OTHER WORK	_____	SEE BELOW
____	____	ELECTRICAL WORK		
		SPECIFY: _____		
		_____		
		_____		
____	____	MECHANICAL WORK		
		SPECIFY: _____		
		_____		
		_____		
____	____	OTHER WORK		
		SPECIFY: _____		
		_____		
		_____		

EQUIPMENT CHECK LIST: ___ RESPIRATOR ___ DISPOSABLE COVERALLS ___ AREA TO BE ISOLATED
____ HEPA VACUUM ___ 6 MIL DROPSHEET ___ SAFETY GLASSES
____ SIGNAGE ___ DISPOABLE BAGS ___ YES ___ NO AIR MONITORING

DECLARATION: The contractor representative shall follow the general instructions and work procedures detailed on Attachment A and agrees to be responsible for the performed work to be in accordance with Alberta Human Resources, Workplace Health and Safety's Asbestos Abatement Manual, the Occupational Health and Safety Act: Chemical Hazards Regulation and General Safety Regulation. The undersigned contractor representative hereby acknowledges his/her awareness of asbestos and the necessary precautions associated with this material.

NAME (PRINT) SIGNATURE

Contractor Representative _____ _____
Permit Issued &Approved
by Project Manager _____ _____

WHITE - - CONTRACTOR YELLOW - - SAFETY OFFICER PINK - - BUILDING OPERATOR

APPENDIX C

GLOVE-BAGGING FACTS

AND TECHNIQUES

GLOVE-BAGGING FACTS AND TECHNIQUES

GENERAL

The glove-bag is a man-made, purpose-made device to allow the removal of asbestos-contaminated or asbestos-containing pipe coverings from mechanical piping systems. The glove-bag can be modified for the removal of other types of insulation such as asbestos-contaminated duct insulation.

Note: Amosite asbestos materials should never be removed by the glove-bag method as well as pipe insulation's which do not have a canvas jacket.

The glove-bag system of removal does have its limitations:

1. It does not work at temperatures above 100 degrees Fahrenheit (65 degrees Celsius).

2. It does not work well in tight quarters where the bag is difficult to mount or when other pipe work interferes.

3. It will not work on piping that has a diameter greater than sixteen (16) inches.

The glove-bag will work however, on any pipe that can be accessed and that runs at a moderate temperature. This system can allow you to remove large amounts of asbestos without resorting to High risk procedures, which are more costly. The bags are very easy to use under these conditions, and with the right kind of tools, successful glove-bagging can be achieved.

There are two categories available:

1. Multi-use glove-bags are as implied; they can be used on the same line to remove more than three feet of material at one time. These bags are more expensive but if you are removing more than three feet then you have to consider the cost versus the amount being removed. This bag has a double throw zipper system, which allows you to go around objects like hangers and intersecting pipes.

2. Single-use bags are also as implied; they are tailored for the spot removal of asbestos. From a repair aspect they can also be helpful to determine where leaks in lines covered by asbestos are. The main advantage to these bags is the price, these bags are sometimes half the price of the multi-use bags. They cannot be used more than once because they do not attach to the pipe as easily as the multi-purpose bag.

SETUP EQUIPMENT REQUIRED FOR GLOVEBAGGING

1. Asbestos banner tape

2. Polyethylene drop sheet.

3. Ladders and scaffolding meeting all current requirements of the Occupational Health and Safety Act, General Safety Regulation.

4. A HEPA-equipped DOP tested vacuum will also be in the work area before the work proceeds.

5. Appropriate personal protective equipment. Half facemask respirator equipped with P100 HEPA filters, full body disposable coveralls, and any other PPE suited for work environment such as steel toed boots, safety glasses, and a hard hat.

6. Asbeguard Glovebags (Safe-T-strip PE or Safe-T-Strip reusable). Glovebag technology is patented and therefore these are the only glovebags that can be used without infringing on the patent rights of Asbeguard Equipment Inc.

7. Nashua duct tape and spray adhesive. Other product s may be used, however they should be designed for use with asbestos. Nashua spray adhesive and duct tape are stringer and stickier that commercially available products.

TOOLS

The tools that are used within the glove-bag are as follows:

1. Razor knife - used for splitting textile cladding.

2. End cutting wire cutters - cutting wire.

3. Flat scrapper - scraping hardened residue.

4. Soft wire brush - cleaning fittings and threads.

5. Tin snips - cutting banding or metal.

6. Wire saw - cutting around the diameter of insulation.

7. Scrub pads – cleaning residual asbestos debris from the pipe.

8. Garden sprayer - for spraying surface inside glove-bag. Should be filled with encapsulate.

9. HEPA Vacuum - used for cleaning the area and drawing out the air from within the glove-bag.

Generally the above tools are the most frequently used for the job but with a little ingenuity other tools could also be easily used within the bag.

For detailed procedures on how to conduct glovebagging refer to SOP #2 in Appendix E.

APPENDIX D

EVALUATION AND RECOMMENDATION CRITERIA FOR CONTROL OF ASBESTOS CONTAINING MATERIALS (ACM)

EVALUATION AND RECOMMENDATION CRITERIA

1. ASSESSMENT OF CONDITION

1.1 Spray Applied Fireproofing, Insulation and Texture Finishes

To evaluate the condition of ACM spray applied as fireproofing, thermal insulation, or texture decorative or acoustic finishes, the following criteria are applied:

GOOD

Surface of material shows no significant signs of damage, deterioration or delamination. Up to 1 percent visible damage to surface is allowed within range of GOOD. Evaluation of sprayed fireproofing requires the surveyor to be familiar with the irregular surface texture typical of sprayed asbestos products. GOOD condition includes unencapsulated or unpainted fireproofing or texture finishes, where no delamination or damage is observed, and encapsulated fireproofing or texture finishes where the encapsulation has been applied after the damage or fallout occurred.

POOR

Sprayed materials show signs of damage, delamination or deterioration. More than percent damage to surface of ACM spray.

In observation areas where damage exists in isolated locations, both GOOD and POOR condition may be reported. The extent or percentage of each condition will be recorded on the survey or re-assessment form. FAIR condition is not utilized in the evaluation of the sprayed fireproofing, sprayed insulation, or texture coat finishes.

The evaluation of ACM spray applied as fireproofing, non-mechanical thermal insulation, or texture, decorative or acoustic finishes which are present above ceilings, may be limited by the number of observations made, and by building components such as ducts or full height walls that obstruct the above ceiling observations. Persons entering the ceiling are advised to be watchful for ACM DEBRIS prior to accessing or working above ceilings in areas of buildings with ACM regardless of the reported condition.

1.2 Mechanical Insulation

The evaluation of the condition of mechanical insulation (on boilers, breaching, ductwork, piping, tanks, equipment etc.) utilizes the following criteria:

GOOD

Insulation is completely covered in jacketing and exhibits no evidence of damage or deterioration. No insulation is exposed. Includes conditions where the jacketing has minor surface damage (i.e., scuffs or stains), but the jacketing is not penetrated.

FAIR

Minor penetrating damage to jacketed insulation (cuts, tears, nicks, deterioration or delamination) or undamaged insulation that has never been jacketed. Insulation is exposed but not showing surface disintegration. The extent of missing insulation ranges should be minor to none.

POOR

Original insulation jacket is missing, damaged, deteriorated or delaminated. Insulation is exposed and significant areas have been dislodged. Damage cannot be readily repaired.

The evaluation of mechanical insulation may be limited by the number of observations made and building components such as ducts or full height walls that obstruct observations. It is not possible to observe each foot of mechanical insulation from all angles.

1.3 Non-friable and Potentially Friable Materials

Non-friable materials generally have little potential to release airborne fibres, even when damaged by mechanical breakage. However, some non-friable materials, i.e., exterior asbestos cement products, may have deteriorated so that the binder no longer effectively contains the asbestos fibres. In such cases of significantly deteriorated non-friable material, the material should be treated as a friable product.

2. EVALUATION OF ACCESSIBILITY

The accessibility of building materials known or suspected of being ACM is rated according to the following criteria:

ACCESS (A)

Areas of the building within reach (from floor level) of all building users. Includes areas such as mechanical rooms, workshops, and storage areas where activities of the building users may result in disturbance of ACM not normally within reach from floor level.

ACCESS (B)

Frequently entered maintenance areas within reach of maintenance staff, without the need for a ladder. Includes:

1. areas within reach from a fixed ladder or catwalk, i.e., tops of equipment, mezzanines.
2. frequently entered pipe chases, tunnels and service areas.

ACCESS (C) EXPOSED

Areas of the building above 8'-0" where use of a ladder is required to reach the ACM. Only refers to ACM that is exposed to view, from the floor or ladder, without the removal or opening of other building components such as ceiling tiles, or service access door or hatch. Does not include infrequently accessed service areas of the building.

ACCESS (C) CONCEALED

Areas of the building which require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems. Includes rarely entered crawl spaces, attic spaces, etc. Observations will be limited to the extent visible from the access points.

ACCESS (D)

Areas of the building behind inaccessible solid ceiling systems, walls or mechanical equipment, etc. where demolition of the ceiling, wall or equipment, etc. is required to reach the ACM. Evaluation of condition and extent of ACM is limited or impossible, depending on the surveyor's ability to visually examine materials in ACCESS D.

3. ACM DEBRIS

3.1 DEBRIS from Friable ACM

The presence of fallen ACM is noted separately from the presumed friable ACM source (sprayed fireproofing, thermal insulation, texture, decorative or acoustic finishes or mechanical insulation) and is referred to as DEBRIS.

3.2 DEBRIS from Damaged Non-Friable ACM

The presence of fallen ACM from damaged non-friable ACM is also reported separately from the non-friable ACM source. Only fallen non-friable ACM that has become friable is reported as DEBRIS.

The identification of the exact location or presence of DEBRIS on the top of ceiling tiles is limited by the number of observations made and the presence of building components such as ducts or full height walls that obstruct observations. Workers are advised to be watchful for the presence of DEBRIS prior to accessing or working in proximity to mechanical insulation or above ceilings in areas of buildings with ACM regardless of the reported presence or absence of DEBRIS.

4. ACTION MATRIX AND DEFINITIONS

The Asbestos Management Plan requires the following responses:
1. Immediately clean-up DEBRIS that is likely to be disturbed.
2. Remove, repair or enclose friable ACM in POOR or FAIR condition whose continued deterioration will result in DEBRIS that is likely to be disturbed.

The following factors are also considered in making site-specific recommendations for compliance with regulation and the practical implementation of the Asbestos Management Plan:

i ACM in POOR condition is not routinely repairable.

If an abatement action is necessary, removal is the recommended action (enclosure is a viable option in unusual circumstances).

ii Mechanical insulation in FAIR condition can be repaired or removed based on the following general recommendations applied on a case by case basis (Note: Either repair or removal are legally acceptable options for the treatment of ACM found in FAIR condition):

- Repair ACM mechanical insulation found in FAIR condition in ACCESS (B) or ACCESS (C EXPOSED) areas.
- Remove ACM mechanical insulation found in FAIR condition in ACCESS (B) and ACCESS (C EXPOSED) areas, where future damage to the ACM is likely to occur.
- Remove ACM mechanical insulation found in FAIR condition with ACCESS (A) to eliminate the potential for re-damaging ACM by all building users.

iii ACM in GOOD condition present in ACCESS (A) can be managed by surveillance, as long as it is not disturbed by future renovation, maintenance or demolition. However, pro-active removal of the ACM in ACCESS (A) should be considered where damage is possible by ongoing occupant activity (accidental or intentional).

iv Non friable or manufactured products are considered in the action matrix as follows:

- Non-friable or manufactured products reported in POOR condition or friable DEBRIS resulting from the deterioration of non-friable ACM are treated as friable materials and the appropriate Action, depending on accessibility, is determined from the Action Matrix for friable ACM.

- For non-friable or manufactured products reported in GOOD condition, Action 7 (surveillance) is recommended regardless of Accessibility.

v Remove all ACM from a particular area where small quantities of asbestos are present and removal will negate the need for the use of Asbestos Management Plan in that area.

With these principles in mind the following Action Matrix Tables establish the recommended asbestos control action. Note that factors not included in the above discussion, such as an owner's policy decision to remove material, knowledge of upcoming maintenance, etc., may result in a recommendation that differs from this table. The ACTIONS are described in full following the tables.

4.1 Action Matrix Tables

FRIABLE ACM

	CONDITION			
ACCESS	**GOOD**	**FAIR**	**POOR**	**DEBRIS**
(A)	ACTION 5/7[1]	ACTION 5/6[2]	ACTION 3	ACTION1
(B)	ACTION 7	ACTION 6/5[3]	ACTION 3	ACTION 1
(C) EXPOSED	ACTION 7	ACTION 6	ACTION 4	ACTION 2
(C) CONCEALED	ACTION 7	ACTION 7	ACTION 4	ACTION 2
(D)	ACTION 7	ACTION 7	ACTION 7	ACTION 7

[1] If material in ACCESS (A)/GOOD condition is not removed ACTION 7 is required.

[2] If material in ACCESS (A)/FAIR condition is not removed ACTION 6 is required.

[3] Remove ACM in ACCESS (B)/FAIR condition if ACM is likely to be disturbed.

4.2 Action Definitions

ACTION 1 - Immediate Clean-Up of DEBRIS that is Likely to be Disturbed

Restrict access that is likely to cause a disturbance of the ACM DEBRIS and clean up ACM DEBRIS immediately. Utilize correct asbestos procedures. This action is required for compliance with regulatory requirements. The surveyor should immediately notify the Asbestos Coordinator of this condition.

ACTION 2 - Type 2 Precautions for Entry into Areas with ACM DEBRIS

At locations where ACM DEBRIS can be isolated in lieu of removal or cleaned up, use appropriate means to limit entry to the area. Restrict access to the area to persons utilizing moderate risk asbestos precautions. The precautions will be required until the ACM DEBRIS has been cleaned up, and the source of the DEBRIS has been stabilized or removed.

ACTION 3 - ACM Removal Required for Compliance

Remove ACM for compliance with regulatory requirements. Utilize asbestos procedures appropriate to the scope of the removal work.

ACTION 4 – Moderate Risk Precautions for Access into Areas Where ACM is present and likely to be disturbed by Access

Use moderate risk asbestos precautions when entry or access into an area is likely to disturb the ACM. ACTION 4 must be used until the ACM is removed (Use ACTION 1 or 2 if DEBRIS is present).

ACTION 5 - Proactive ACM Removal

Remove ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.

ACTION 6 - ACM Repair

Repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work treat ACM as material in GOOD condition and implement ACTION 7. If ACM is likely to be damaged or disturbed, during normal use of the area or room , implement ACTION 5.

ACTION 7 - Routine Surveillance

Institute routine surveillance of the ACM. Trained workers or contractors must use appropriate asbestos precautions (Low risk or Moderate risk) during disturbance of the remaining ACM.

APPENDIX E

STANDARD OPERATING PROCEDURES

(SOP'S)

SOP #1

Description of work:

Accessing above ceiling spaces located below enclosed asbestos spray fireproofing where tiles may have asbestos fallout present or is likely to be present.

1. Remove any objects such as desks, chairs or other furnishings from the planned work area. Objects that cannot be easily moved should be covered with a layer of 6ml polyethylene and fastened to the floor with duct tape.

2. Isolate any sources of air movement that can be accessed without disturbing the asbestos fireproofing. Use polyethylene to cover any adjacent return or supply air systems.

3. Isolate the workspace located above, below, and adjacent to the work area. Use asbestos banner tape to restrict access to the work area. The banner tape should extend approximately 6m from the work area where ever possible.

4. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

5. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

6. Prior to entering the workspace a fit check (positive and negative pressure test) should be conducted to ensure that a good seal has been achieved between the respirator and the wearers face. Fit test information should be kept on record to verify that this practice is being followed.

7. The floor area under the planned work area should be covered with a layer of 10ml non-rip polyethylene.

8. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels as well as alcohol sanitation wipes must be present to allow for the workers to decontaminate after completion of their work.

9. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as, the ceiling tile, T-bar channels and any asbestos materials.

10. An approved ladder in proper working condition may be used to access the above ceiling area. Once the employee is wearing the proper PPE and all the above requirements have been met, the worker may very carefully lift one ceiling tile. The tile may be carefully moved over and gently placed on top of the adjacent tile if it can be done without allowing visible accumulations of asbestos debris to fall to the floor. If the worker finds that there is a heavy accumulation of asbestos on the chosen tile, then that tile should be carefully replaced and another tile should be selected. If all ceiling tiles have heavy accumulations of asbestos debris it may be necessary to erect a small cocoon of 10ml non-rip polyethylene taped to the T-bar channels and securely fastened to the floor with duct tape. A HEPA equipped vacuum may be used to provide negative air inside the cocoon. If a cocoon is required a qualified contractor should conduct the work.

11. Once the above ceiling area is opened, the worker must HEPA vacuum the T-bar channels and the tops of the tiles around the opening to the above ceiling area.

12. The worker must take care not to disturb the asbestos containing spray fireproofing during the work above the ceiling tiles. In the event that any fireproofing material is dislodged during the above ceiling work, the material should be gently misted with amended water (water with a surfactant added such as soap) and then immediately HEPA vacuumed.

13. Once the inspection or above ceiling work is complete, the worker may carefully return the ceiling tiles to their original position.

14. The worker must then use the HEPA equipped vacuum to thoroughly clean the ladder, all polyethylene in the work area, and himself of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed.

15. The polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

16. The worker must then complete a decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from himself with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

17. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

18. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP # 2

Description of work:

Using access panels or hatches through walls and doors, where asbestos spray fireproofing fallout may be present, in order to perform glovebag removals.

NOTE: G-COM Consulting Ltd. strongly recommends the use of a qualified asbestos abatement contractor for all Moderate and High-Risk asbestos removals. Glovebag removals of Amosite containing mechanical insulation require the construction of an airtight containment around the removal area. Airport employees should not attempt this type of asbestos removal.

1. Isolate the workspace located above, below, and adjacent to the work area. Use asbestos banner tape to restrict access to the work area. The banner tape should extend approximately 6m from the work area where ever possible.

2. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

3. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

4. Prior to entering the workspace a fit check should be conducted to ensure that a good seal has been achieved between the respirator and the worker's face. Fit test information should be kept on record to verify that this practice is being followed.

5. The floor area under or immediately adjacent to the access panel should be covered with a layer of 10ml non-rip polyethylene and securely fastened to the floor with duct tape to prevent slip hazards.

6. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels, as well as alcohol sanitation wipes must be present to allow for the workers to decontaminate after completion of their work.

7. All High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present during all glovebag removals to clean any spills, as well as any loose asbestos debris found during the work.

8. Once the employee is wearing the proper PPE and all the above requirements have been met, the worker may enter the work area through the access panel.

9. Once the employee has entered the work area, the worker should gently mist any loose asbestos debris with amended water. The worker must then HEPA vacuum any visible asbestos debris in and around the area where the glovebagging will be performed.

10. Prior to any glovebag removal, the worker must know what the status of the line to be worked on is (i.e., the temperature of the pipe, or whether or not the piping is under high pressure). If the temperature of the pipe will exceed 65 Celsius, a special Hot Glovebag is required. If the pipe is under high pressure and is in poor condition, another approach should be considered due to the possibility of injury to the worker.

11. The worker must then use the HEPA vacuum to pre-clean the section of mechanical insulation to be removed. HEPA vacuuming should include 1m of piping on either side of the removal area.

12. The glovebag must be attached to the pipe as per the manufacturer's recommendations. Ensure that all tools required for the removal have been placed inside the glovebag prior to disturbing the mechanical insulation. Attach the HEPA vacuum and the source of water through the glovebag. Seal these penetrations airtight using spray glue and duct tape. Check the quality of the seals by turning on the HEPA vacuum. The bag should immediately collapse indicating an airtight seal. An additional test called a positive pressure test can also be conducted. Squeeze the bag gentle and check for signs of leaks.

13. Once the glovebag is properly hung and is sealed airtight, the worker will thoroughly wet the mechanical insulation to be removed. If the piping has metal or canvass jacketing the insulation will need to be thoroughly wet down before and after removing the jacketing. The wetting process must be continued throughout the removal to minimize fibre generation and release. Once the bulk of the mechanical insulation has been removed, the worker must scrub or wire brush the piping and pipe threads to remove any residual asbestos. Seal the newly exposed ends of the mechanical insulation with duct tape.

14. Once the piping has been thoroughly cleaned the worker must wash down the interior of the bag with particular attention paid to the top portion of the glovebag. All tools should be removed from the glovebag by pulling through with glove. Twist the glove containing the tools and seal the glove with two separate beads of duct tape. The beads of tape should be approximately 5cm apart. Then cut the sealed glove off the glovebag by cutting between the layers of duct tape.

15. The worker must then spray an approved encapsulant throughout the glovebag, completely soaking everything inside the bag. The HEPA vacuum should then be turned on to remove any airborne fibres remaining after the encapsulation.

16. Seal the glovebag below the piping with duct tape while the vacuum is running. Place an asbestos labeled waste bag around the glovebag. Cut the glovebag above the duct tape seal and allow the glovebag to pass into the asbestos waste bag. Gooseneck the asbestos waste bag and seal with duct tape.

17. The worker must take care not to disturb any asbestos containing spray fireproofing during the glovebagging work. In the event that any fireproofing material is dislodged during the glove-bag removal, the material should be gently misted with amended water and then immediately HEPA vacuumed.

18. The worker must then use the HEPA equipped vacuum to thoroughly clean the work area, and himself of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed.

19. After exiting the accessed area the polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

20. The worker must then complete a decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

21. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

22. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP #3

Description of work:

Accessing above ceiling spaces through ceiling tiles or drywall located in the North Island Departure areas where asbestos containing texture overspray and fireproofing fallout is present to conduct work on the structural beams or Q-deck.

1. Remove any objects such as desks, chairs or other furnishings from the planned work area. Objects that cannot be easily moved should be covered with a layer of 6ml polyethylene and fastened to the floor with duct tape.

2. Isolate any sources of air movement that can be accessed without disturbing the asbestos. Use polyethylene to cover any adjacent return or supply air systems.

3. Isolate the workspace adjacent to the work area. Use asbestos banner tape to restrict access to the work area. The banner tape should extend approximately 6m from the work area where ever possible.

4. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

5. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

6. Prior to entering the workspace a fit test should be conducted to ensure that a good seal has been achieved between the respirator and the wearers face. Fit test information should be kept on record to verify that this practice is being followed.

7. The floor area under the planned work area should be covered with a layer of 10ml non-rip polyethylene and sealed to the floor with duct tape to prevent slip hazards.

8. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels, as well as alcohol sanitation wipes must be present to allow for the workers to decontaminate after completion of their work.

9. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as, the structural beams and Q-deck.

10. An approved ladder in proper working condition may be used to access the above ceiling area. Once the employee is wearing the proper PPE and all the above requirements have been met, the worker may then carefully vacuum and wet wipe the structural beams and Q-deck free of asbestos materials.

11. Once the above ceiling work is complete, the worker may carefully return the ceiling tiles to their original position or close the drywall access panel.

12. The worker must then use the HEPA equipped vacuum to thoroughly clean the ladder, all polyethylene in the work area, and himself of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed.

13. The polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

14. The worker must then complete a decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

15. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

16. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP #4

Description of work:

Accessing vertical pipe chases from the Arrivals level through the Departures level, where spray fireproofing is present or is likely to be present.

Note: Asbestos containing spray-on fireproofing remains on some of the structural beams inside the pipe chases. Some areas accessible through the pipe chases have been isolated with polyethylene barriers and signage warning of the presence of asbestos. The mechanical insulation inside these barriers is high percentage Amosite and does not have jacketing. This material releases airborne asbestos fibre very easily and should not disturbed except by a qualified asbestos abatement contractor. Edmonton International Airport employees should not enter these isolated areas or disturb the polyethylene barriers.

1. Remove any objects such as desks, chairs or other furnishings from the vicinity of the access panel and the planned work area. Objects that cannot be easily moved should be covered with a layer of 6ml polyethylene and fastened to the floor with duct tape.

2. Isolate any sources of air movement that can be accessed in the near vicinity of the access panel. Use polyethylene to cover any return or supply air systems.

3. Isolate the workspace located above, below, and adjacent to the work area. Use asbestos banner tape to restrict access to the work area. The banner tape should extend approximately 6m from the work area where ever possible.

4. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

5. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

6. Prior to entering the workspace a fit check (positive and negative test) should be conducted to ensure that a good seal has been achieved between the respirator and the wearer's face. Fit test information should be kept on record to verify that this practice is being followed.

7. The floor area adjacent to the access panel and the planned work area should be covered with a layer of 10ml non-rip polyethylene and should be securely fastened to the floor to prevent slips.

8. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels as well as alcohol sanitation wipes must be present to allow the workers to decontaminate after completion of their work.

9. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as, any loose or newly dislodged asbestos materials.

10. Once the access panel is opened, the worker must gently mist any loose asbestos debris with amended water. Then the worker must HEPA vacuum the loose debris adjacent to the entry to the planned work area. If a large quantity of debris is found, then the worker should delay the work until a qualified person can assess the extent of the contamination and decide the appropriate action required to clean the debris safely.

11. The worker must be very careful not to disturb the asbestos containing spray fireproofing during the work in all areas. In the event that any fireproofing material is dislodged during the planned work, the material should be gently misted with amended water and then immediately HEPA vacuumed.

12. If the employee is performing glovebag removals please follow Standard Operating Procedure #2 (SOP #2). Please note that glovebagging of non-jacketed Amosite pipe insulation is not advised. Since the glovebag will have to be attached to the bare Amosite pipe insulation resulting in high fibre generation.

13. Upon completion of work in a pipe chase the worker must then use the HEPA equipped vacuum to thoroughly clean any tools or equipment brought into the work area. Additionally, the worker must HEPA vacuum all polyethylene in the work area, as well as himself, of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed. These procedures may need to be completed on the polyethylene drop sheet adjacent to the access panel.

14. The polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

15. The worker must then complete a decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

16. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

17. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP #5

Description of work:

Accessing above ceiling areas through hatches or access panels in Electrical rooms, where spray on fireproofing and mechanical insulation is present or is likely to be present.

Note: Edmonton International Airport employees should only perform tasks that can be safely completed without disturbing asbestos products. If a significant disturbance of asbestos is likely to occur the work should only be performed by a qualified asbestos abatement contractor.

1. Remove any objects such as desks, chairs or other furnishings from the vicinity of the access panel and the planned work area. Objects that cannot be easily moved should be covered with a layer of 6ml polyethylene and fastened to the floor with duct tape.

2. Isolate any sources of air movement that can be accessed in the near vicinity of the access panel. Use polyethylene to cover any return or supply air systems.

3. Isolate the workspace located above, below, and adjacent to the work area. Use asbestos banner tape to restrict access to the work area. The banner tape should extend approximately 6m from the work area where ever possible.

4. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

5. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

6. Prior to entering the workspace a fit check (positive and negative pressure test) should be conducted to ensure that a good seal has been achieved between the respirator and the wearer's face. Fit test information should be kept on record to verify that this practice is being followed.

7. The floor area adjacent to the access panel and the planned work area should be covered with a layer of 10ml non-rip polyethylene and should be securely fastened to the floor to prevent slips.

8. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels, as well as alcohol sanitation wipes must be present to allow the workers to decontaminate after completion of their work.

9. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as any loose or newly dislodged asbestos materials.

10. Once the access panel is opened, the worker must gently mist any loose asbestos debris with amended water. Then the worker must HEPA vacuum the loose debris adjacent to the entry to the planned work area. If a large quantity of debris is found, then the worker should delay the work until a qualified person can assess the extent of the contamination and decide the appropriate action required to remove the debris safely.

11. The worker must be very careful not to disturb the asbestos containing spray fireproofing during the work in all areas. In the event that any fireproofing material is dislodged during the planned work, the material should be gently misted with amended water and then immediately HEPA vacuumed.

12. If the employee is performing glovebag removals please follow Standard Operating Procedure #2 (SOP #2).

13. Upon completion of work, the worker must then use the HEPA equipped vacuum to thoroughly clean any tools or equipment brought into the work area. Additionally, the worker must HEPA vacuum all polyethylene in the work area, as well as himself, of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed. These procedures may need to be completed on the polyethylene drop sheet adjacent to the access panel.

14. The polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

15. The worker must then complete a decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

16. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

17. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP #6

Description of work:

Disturbing asbestos containing textured ceiling material by removing light fixtures, and drilling or cutting small holes through the material where spray on fireproofing is not present.

Note: Edmonton International Airport employees should only perform tasks that can be safely completed without disturbing large quantities of asbestos containing products. If a significant disturbance of asbestos is likely to occur, a qualified asbestos abatement contractor must perform the work. It is not recommended that Airport employees conduct light fixture removal, cut small holes or drill through textured ceilings located below spray fireproofing.

1. Remove any objects such as desks, chairs or other furnishings from the vicinity of the planned work area. Objects that cannot be easily moved should be covered with a layer of 6ml polyethylene and fastened to the floor with duct tape.

2. Isolate any sources of air movement that can be accessed in the near vicinity of the planned work area. Use polyethylene to cover any return or supply air systems.

3. Use asbestos banner tape to isolate the work area and to restrict access to authorized personnel only. The banner tape should extend approximately 6m from the work area where ever possible.

4. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

5. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

6. Prior to entering the workspace a fit check (positive and negative pressure tests) should be conducted to ensure that a good seal has been achieved between the respirator and the wearer's face. Fit test information should be kept on record to verify that this practice is being followed.

7. The floor area under the planned work area should be covered with a layer of 10ml non-rip polyethylene and should be securely fastened to the floor to prevent slips.

8. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels as well as alcohol sanitation wipes must be present to allow the workers to decontaminate after completion of their work.

9. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as, any loose or newly dislodged asbestos materials.

10. When removing existing light fixtures (Note: always follow the proper electrical "Lock-out" procedures), care must be taken to prevent the possible release of asbestos materials. Once the light fixtures have been carefully lowered to the floor, the worker must gently mist any loose asbestos debris with amended water and use the HEPA vacuum to remove any debris on the light fixture. The worker must then HEPA vacuum (above the ceiling) around the immediate opening into which the light fixture will be re-suspended.

11. If the work entails drilling or cutting (small) holes into asbestos containing textured ceilings, the material should be gently misted with amended water prior to beginning the work. The worker should hold the vacuum hose in one hand and the drilling or cutting tool in the other (Note: two employees should work together [if possible] to properly perform this task). Run the HEPA vacuum simultaneously while drilling or cutting through the ceiling. The HEPA vacuum should be held as close as possible to the asbestos disturbing work to minimize the potential release of asbestos fibres generated from the drilling or cutting process. Any asbestos containing materials dislodged during the work must be immediately HEPA vacuumed.

12. The worker must be very careful not to disturb the asbestos containing texture during the work in all areas. In the event that any asbestos material is dislodged during the planned work, the material should be gently misted with amended water and then immediately HEPA vacuumed.

13. Upon completion of work, the worker must then use the HEPA equipped vacuum to thoroughly clean any tools or equipment brought into the work area. Additionally, the worker must HEPA vacuum all polyethylene in the work area, as well as himself, of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed. These procedures should be completed on the polyethylene drop sheet adjacent to the work area.

14. The polyethylene drop sheet should then be sprayed with an encapsulant and disposed of asbestos waste.

15. The worker must then complete the decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

16. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

17. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

SOP #7

Description of work:

Fit testing of all High Efficiency Particulate Air (HEPA) equipped half face respirators.

1. All employees who may be required to perform duties in or around asbestos containing materials must be issued a personal half face respirator equipped with P100 HEPA filters. HEPA filter equipped half face respirators are the minimum required respiratory protection for performing low and moderate risk asbestos work. Never allow the use of a DUST MASK for asbestos related activities. It should be noted that P100 HEPA filters remove only dust, mists, fumes and fibers and do not protect the worker against oxygen deficient atmospheres. In addition there are certain limitations to half facemask respirators, such as at fiber concentrations greater than 10 times the OEL different respirator protection is required.

2. The employee must select the proper respirator depending on the physical size of the employee as well as the shape of the employee's face. When an employee is issued a new respirator, they must become familiar with the respirator and its components. The employee should become proficient at respirator inspection and use.

3. The respirator must have all three diaphragms and the rubber must be not be distorted, cracked or damaged in any way. Prior to placing the respirator on first clean the respirator with a mild soapy solution or a sanitizing solution designed for use with respirators. The employee should put on the respirator and make any necessary adjustments to ensure the proper fit of the respirator.

4. Once the respirator is on the worker's face, negative and positive pressure testing should be completed. A negative pressure test is accomplished by gently covering the respirator filters with the palms of the employee's hands. The employee must take care not to push too hard on the filters which will cause the respirator to distort and allow air to enter the respirator improperly. If a proper negative pressure seal has been achieved, the mask should pull in against the employee's face when the employee inhales, but should not allow air to move into the respirator, i.e. no leaks.

5. The employee must also complete a positive pressure test by covering the exhalation valve (located on the bottom portion of the respirator) with the palm of the employee's hand. If a proper positive pressure seal has been achieved, the respirator should bulge outward from the worker's face when exhaling inside the respirator. A good seal is achieved if no leaks are detected.

6. If either of these tests fail the employee must adjust the straps to gently tighten or loosen the respirator and then repeat both tests.

7. Upon passing the negative and positive pressure tests, the irritant smoke testing can be completed. Irritant smoke is produced by air flowing through a commercially available smoke-tube normally used to check the performance of ventilation equipment.

8. The person performing the smoke test must ensure that there is adequate ventilation of the room the test is being conducted in. The worker must keep their eyes closed during the test and should speak, breath deeply, move the head from side to side and up and down while the smoke is being directed towards the respirator.

9. The smoke test should begin from a distance of approximately 600mm from the wearer's face by directing the smoke toward the worker's face. If the employee reports that no smoke has penetrated the respirator, then the smoke-tube should be moved to within 150mm of the wearer's face and the testing process repeated. Direct the smoke toward all the areas where the respirator touches the employee's face, in particular around the nose and under the chin. If the employee reports that smoke has penetrated the respirator, allow the employee to adjust the seal of the respirator and repeat the test. Uncontrollable coughing, throat and nose irritation and a smoky smell are signs of a failed smoke test and subsequently an improper fit. If all the above has been completed and the employee reports that no smoke has penetrated the respirator then a proper seal been achieved.

10. It may be very difficult to achieve a proper seal on some people and it may be necessary to try other sizes or even other makes of respirators. One major contributing factor to failing a fit test is the presence of facial hair interfering with the seal. The wearer must be clean shaved wear the respirator meets the face. Do not allow anyone to work with a respirator that does not pass all fit tests properly.

11. Never use a foreign substance to temporally seal a respirator (i.e., water, lotions, or petroleum jellies). Seals created in this manner will not protect the worker under actual working conditions. Additionally, petroleum products that come into contact with rubber products, like respirators, will cause serious deterioration of the respirator.

12. Each respirator an employee uses must be fit tested for that employee and fit testing should be repeated if any work has been done to the respirator. Fit test information should be kept on record to verify that this practice is being followed.

13. The positive and negative fit test should be done every time the respirator is donned, as well as during the work shift or when adjustments have been made to the respirator.

SOP #8

Description of work:

Emergency response procedures for an asbestos spill or incident.

Note: Determining whether a situation constitutes an asbestos emergency can be very difficult without the proper training and experience. Remember that asbestos fibers are so small that they are invisible to the naked eye, and as a result the magnitude of the emergency will not be readily evident.

1. If asbestos materials are continuing to be disturbed instruct those individuals responsible for the disturbance to stop their activities immediately. Take action to keep the problem from becoming worse.

2. Instruct all individuals in the facility of the incident to leave the area immediately. If any individuals were involved in the disturbance of the asbestos materials they must decontaminate their persons and any of their equipment.

3. Notify the appropriate personnel; such as the Duty Manager (8327), Mike Strang (8313) or cellular 990-6040, or John Cybruch 445-4182.

4. If the asbestos incident has just occurred or is continuing to occur the next step is to immediately isolate any sources of air movement that can be accessed in the near vicinity of the asbestos disturbance. Following this or if time has passed since the asbestos disturbance cordon off the affected area with asbestos banner tape.

5. Place asbestos warning signs indicating the potential health risks, the proper personal protective equipment (PPE) required and that only authorized personnel may enter the restricted area.

6. Any individual entering the workspace (area isolated with banner tape) should wear a properly fit tested (see SOP#7 on Fit Testing) half face respirator equipped with P100 HEPA filters and full body disposable coveralls. Do not use a DUST MASK.

7. Prior to entering the contaminated area a fit check (positive and negative pressure tests) should be conducted to ensure that a good seal has been achieved between the respirator and the wearer's face. Fit test information should be kept on record to verify that this practice is being followed.

8. If clean-up procedures are going to be attempted ensure that trained personnel conduct the clean-up. Clean-up should only be attempted if the amount of friable asbestos materials disturbed is minimal. All personnel entering the contaminated area must wear full body disposable coveralls.

9. Ensure that all required equipment and tools have been placed inside the work area. Water and rags or towels as well as alcohol sanitation wipes must be present to allow the workers to decontaminate after completion of their work.

10. Any High Efficiency Particulate Air (HEPA) equipment must pass Diocty-phthalate (DOP) testing prior to use. DOP testing must be done on-site and within the past thirty days. A HEPA equipped vacuum must be present to clean any spills, as well as, any loose or newly dislodged asbestos materials.

11. The worker must gently mist any loose asbestos debris with amended water (water with a surfactant such as soap). Then the worker must HEPA vacuum the loose debris from the work area. If a large quantity of debris is found, then the worker should delay the work until a qualified person can assess the extent of the contamination and decide the appropriate action required to clean the debris safely.

12. The worker must be very careful not to disturb the asbestos containing spray fireproofing during the work in all areas. In the event that any fireproofing material is dislodged during the planned work, the material should be gently misted with amended water and then immediately HEPA vacuumed. All surfaces (vertical and horizontal) must be cleaned of asbestos. The origin of the asbestos materials should be inspected if accessible to ascertain if additional cleaning of that surrounding area is required.

13. The worker must be very careful not to disturb the asbestos containing texture during the work in all areas. In the event that any asbestos material is dislodged during the planned work, the material should be gently misted with amended water and then immediately HEPA vacuumed.

14. Upon completion of work, the worker must then use the HEPA equipped vacuum to thoroughly clean any tools or equipment brought into the work area. Additionally, the worker must HEPA vacuum all polyethylene in the work area, as well as himself, of all visible asbestos debris or dust. A wet wiping of all equipment and surfaces in the work area should also be completed. These procedures should be completed on the polyethylene drop sheet adjacent to the work area.

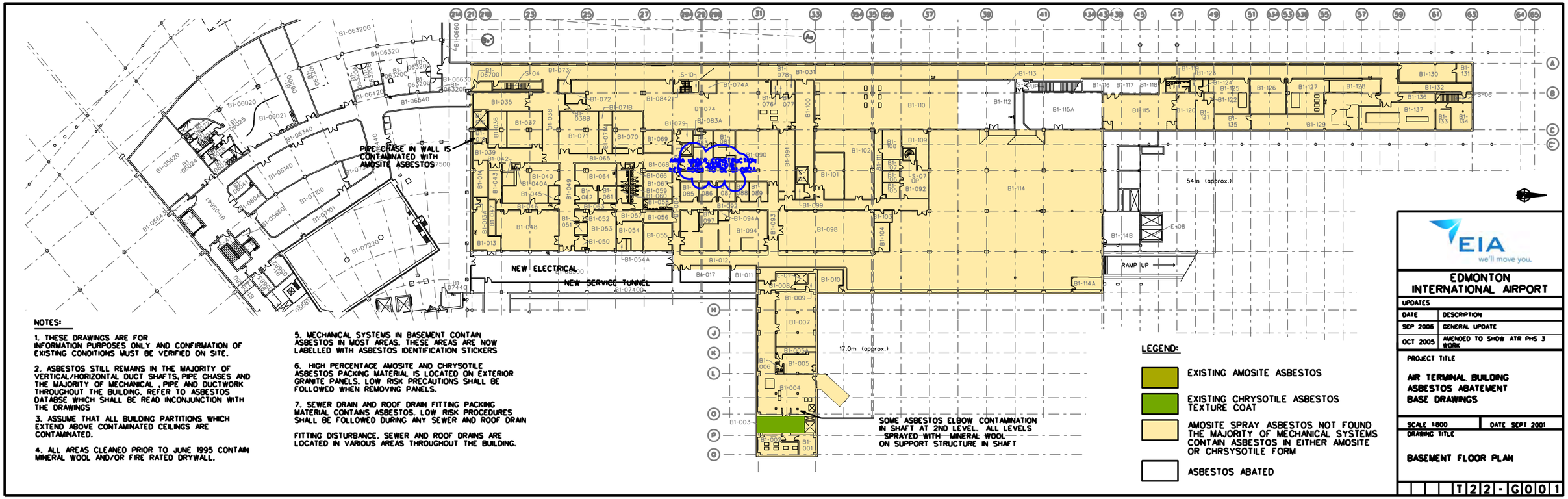
15. The worker must then complete the decontamination procedure prior to dismantling the banner tape isolating the work area. Decontamination should be completed by first removing any asbestos debris from the worker with the HEPA vacuum. The worker should then thoroughly wash hands and the respirator should be gently cleaned while still being worn. The worker's disposable overalls may then be carefully rolled off and disposed of in an approved asbestos waste bag. The worker may then exit the work area while still wearing the respirator. Once outside the work area the worker may then remove the respirator and compete the decontamination procedure.

16. The worker may then remove the banner tape, signage, and any remaining polyethylene and restore the work area to its original condition.

17. All waste generated from the work must be placed in asbestos waste bags, goose-necked and sealed with duct tape. All asbestos waste must be double-bagged and properly disposed of at an approved landfill.

APPENDIX F

ASBESTOS DRAWINGS



NOTES:

1. THESE DRAWINGS ARE FOR INFORMATION PURPOSES ONLY AND CONFIRMATION OF EXISTING CONDITIONS MUST BE VERIFIED ON SITE.

2. ASBESTOS STILL REMAINS IN THE MAJORITY OF VERTICAL/HORIZONTAL DUCT SHAFTS, PIPE CHASES AND THE MAJORITY OF MECHANICAL , PIPE AND DUCTWORK THROUGHOUT THE BUILDING. REFER TO ASBESTOS DATABSE WHICH SHALL BE READ INCONJUNCTION WITH THE DRAWINGS

3. ASSUME THAT ALL BUILDING PARTITIONS WHICH EXTEND ABOVE CONTAMINATED CEILINGS ARE CONTAMINATED.

4. ALL AREAS CLEANED PRIOR TO JUNE 1995 CONTAIN MINERAL WOOL AND/OR FIRE RATED DRYWALL.

5. MECHANICAL SYSTEMS IN BASEMENT CONTAIN ASBESTOS IN MOST AREAS. THESE AREAS ARE NOW LABELLED WITH ASBESTOS IDENTIFICATION STICKERS

6. HIGH PERCENTAGE AMOSITE AND CHRYSOTILE ASBESTOS PACKING MATERIAL IS LOCATED ON EXTERIOR GRANITE PANELS. LOW RISK PRECAUTIONS SHALL BE FOLLOWED WHEN REMOVING PANELS.

7. SEWER DRAIN AND ROOF DRAIN FITTING PACKING MATERIAL CONTAINS ASBESTOS. LOW RISK PROCEDURES SHALL BE FOLLOWED DURING ANY SEWER AND ROOF DRAIN

FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- AMOSITE SPRAY ASBESTOS NOT FOUND THE MAJORITY OF MECHANICAL SYSTEMS CONTAIN ASBESTOS IN EITHER AMOSITE OR CHRSYSOTILE FORM
- ASBESTOS ABATED

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UPDATES	
DATE	DESCRIPTION
SEP 2006	GENERAL UPDATE
OCT 2005	AMENDED TO SHOW ATR PHS 3 WORK

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:800 | DATE SEPT 2001

DRAWING TITLE

BASEMENT FLOOR PLAN

T22-G001

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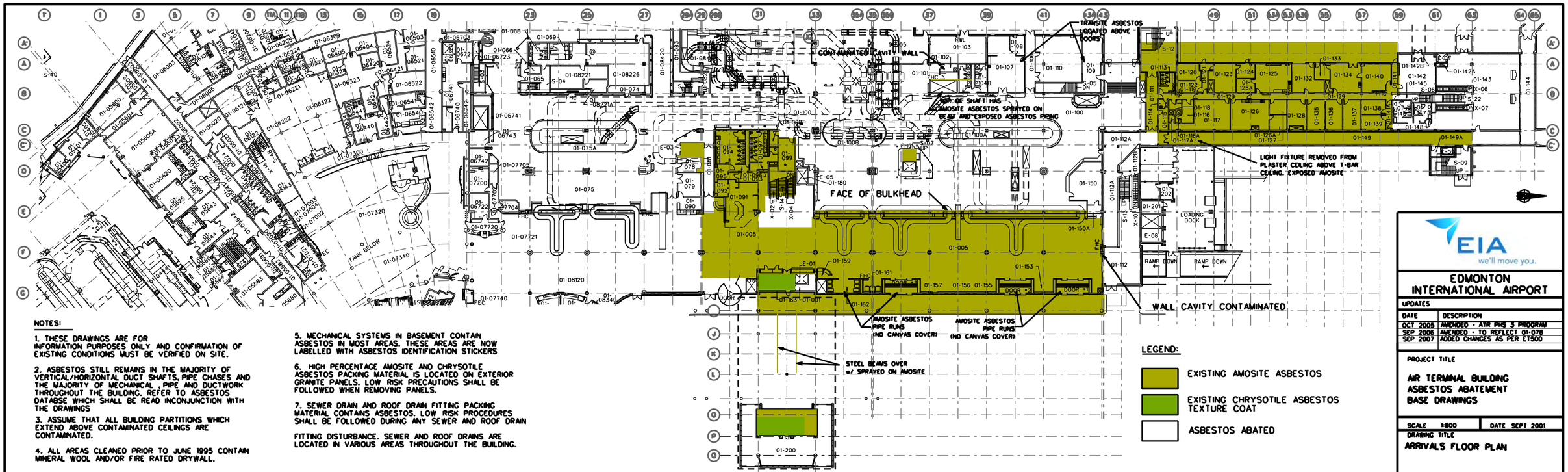

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3. ASSUME THAT ALL BUILDING PARTITIONS WHICH EXTEND ABOVE CONTAMINATED CEILINGS ARE CONTAMINATED.

4. ALL AREAS CLEANED PRIOR TO JUNE 1995 CONTAIN MINERAL WOOL AND/OR FIRE RATED DRYWALL.

5. MECHANICAL SYSTEMS IN BASEMENT CONTAIN ASBESTOS IN MOST AREAS. THESE AREAS ARE NOW LABELLED WITH ASBESTOS IDENTIFICATION STICKERS

6. HIGH PERCENTAGE AMOSITE AND CHRYSOTILE ASBESTOS PACKING MATERIAL IS LOCATED ON EXTERIOR GRANITE PANELS. LOW RISK PRECAUTIONS SHALL BE FOLLOWED WHEN REMOVING PANELS.

7. SEWER DRAIN AND ROOF DRAIN FITTING PACKING MATERIAL CONTAINS ASBESTOS. LOW RISK PROCEDURES SHALL BE FOLLOWED DURING ANY SEWER AND ROOF DRAIN

FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- ASBESTOS ABATED

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UPDATES

DATE	DESCRIPTION
OCT 2005	AMENDED - AIR PHS 3 PROGRAM
SEP 2006	AMENDED - TO REFLECT 01-078
SEP 2007	ADDED CHANGES AS PER ET500

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:800 | DATE SEPT 2001

DRAWING TITLE

ARRIVALS FLOOR PLAN

T22-G002

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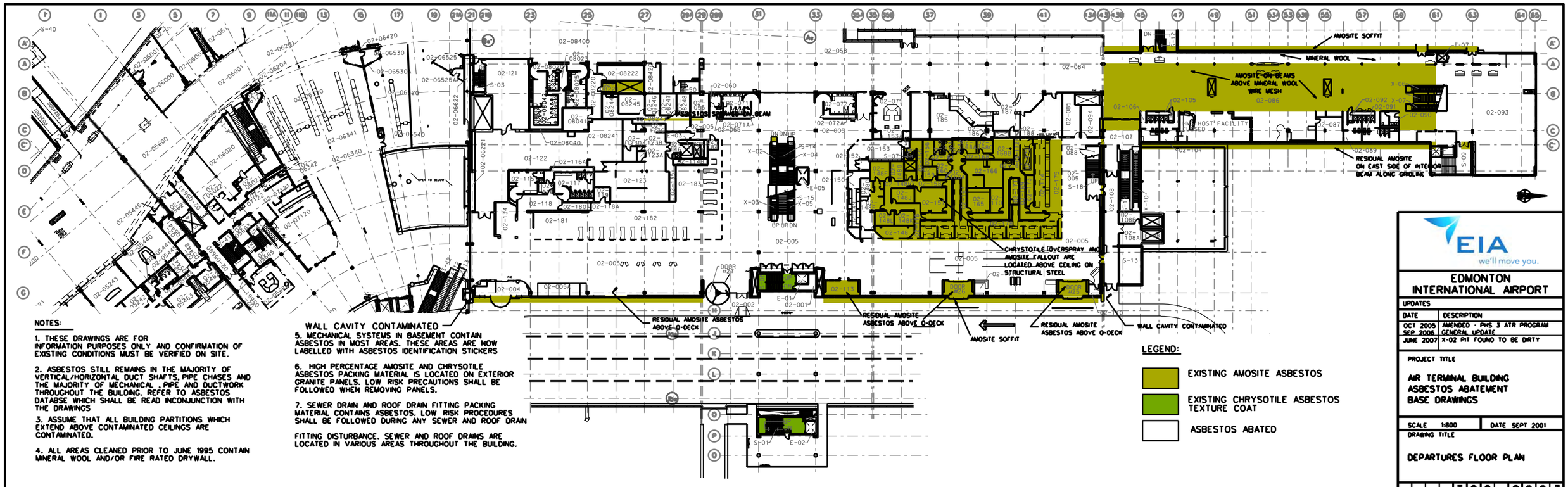

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3. ASSUME THAT ALL BUILDING PARTITIONS WHICH EXTEND ABOVE CONTAMINATED CEILINGS ARE CONTAMINATED.

4. ALL AREAS CLEANED PRIOR TO JUNE 1995 CONTAIN MINERAL WOOL AND/OR FIRE RATED DRYWALL.

5. MECHANICAL SYSTEMS IN BASEMENT CONTAIN ASBESTOS IN MOST AREAS. THESE AREAS ARE NOW LABELLED WITH ASBESTOS IDENTIFICATION STICKERS

6. HIGH PERCENTAGE AMOSITE AND CHRYSOTILE ASBESTOS PACKING MATERIAL IS LOCATED ON EXTERIOR GRANITE PANELS. LOW RISK PRECAUTIONS SHALL BE FOLLOWED WHEN REMOVING PANELS.

7. SEWER DRAIN AND ROOF DRAIN FITTING PACKING MATERIAL CONTAINS ASBESTOS. LOW RISK PROCEDURES SHALL BE FOLLOWED DURING ANY SEWER AND ROOF DRAIN FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

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EDMONTON INTERNATIONAL AIRPORT

UPDATES	
DATE	DESCRIPTION
OCT 2005	AMENDED - PHS 3 ATR PROGRAM
SEP 2006	GENERAL UPDATE
JUNE 2007	X-02 PIT FOUND TO BE DIRTY

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:800 | DATE SEPT 2001

DRAWING TITLE

DEPARTURES FLOOR PLAN

T22-G003

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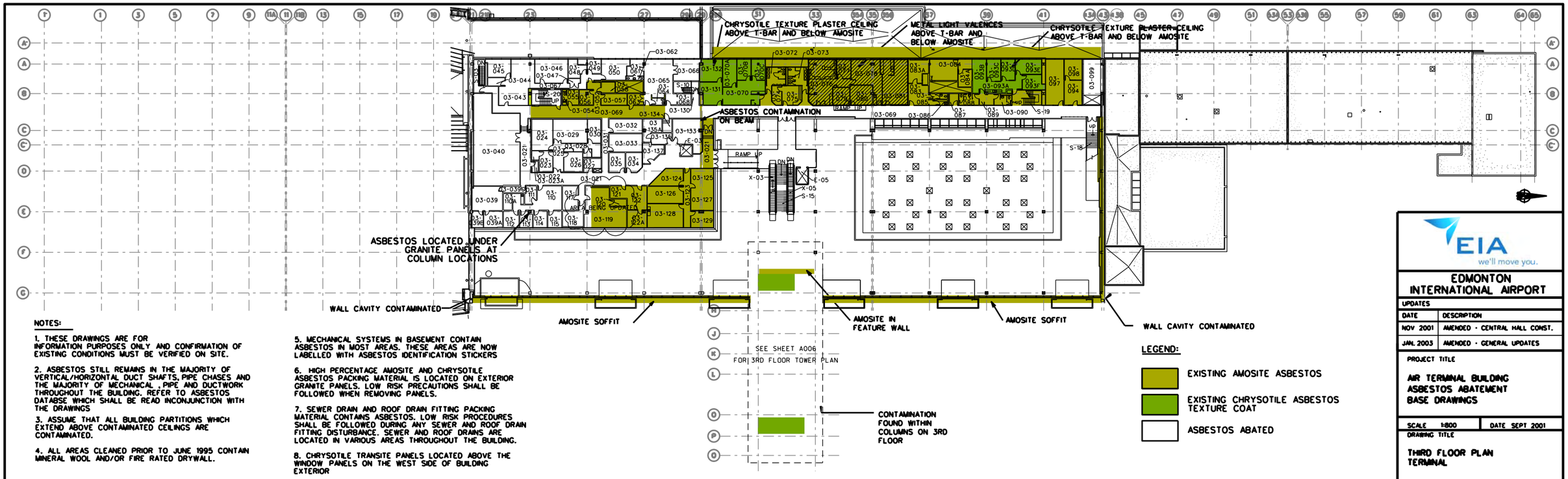

NOTES:

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3. ASSUME THAT ALL BUILDING PARTITIONS WHICH EXTEND ABOVE CONTAMINATED CEILINGS ARE CONTAMINATED.

4. ALL AREAS CLEANED PRIOR TO JUNE 1995 CONTAIN MINERAL WOOL AND/OR FIRE RATED DRYWALL.

5. MECHANICAL SYSTEMS IN BASEMENT CONTAIN ASBESTOS IN MOST AREAS. THESE AREAS ARE NOW LABELLED WITH ASBESTOS IDENTIFICATION STICKERS

6. HIGH PERCENTAGE AMOSITE AND CHRYSOTILE ASBESTOS PACKING MATERIAL IS LOCATED ON EXTERIOR GRANITE PANELS. LOW RISK PRECAUTIONS SHALL BE FOLLOWED WHEN REMOVING PANELS.

7. SEWER DRAIN AND ROOF DRAIN FITTING PACKING MATERIAL CONTAINS ASBESTOS. LOW RISK PROCEDURES SHALL BE FOLLOWED DURING ANY SEWER AND ROOF DRAIN FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

8. CHRYSOTILE TRANSITE PANELS LOCATED ABOVE THE WINDOW PANELS ON THE WEST SIDE OF BUILDING EXTERIOR

LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- ASBESTOS ABATED

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EDMONTON INTERNATIONAL AIRPORT

UPDATES	
DATE	DESCRIPTION
NOV 2001	AMENDED - CENTRAL HALL CONST.
JAN. 2003	AMENDED - GENERAL UPDATES

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:800 | DATE SEPT 2001

DRAWING TITLE

THIRD FLOOR PLAN
TERMINAL

T22-G004

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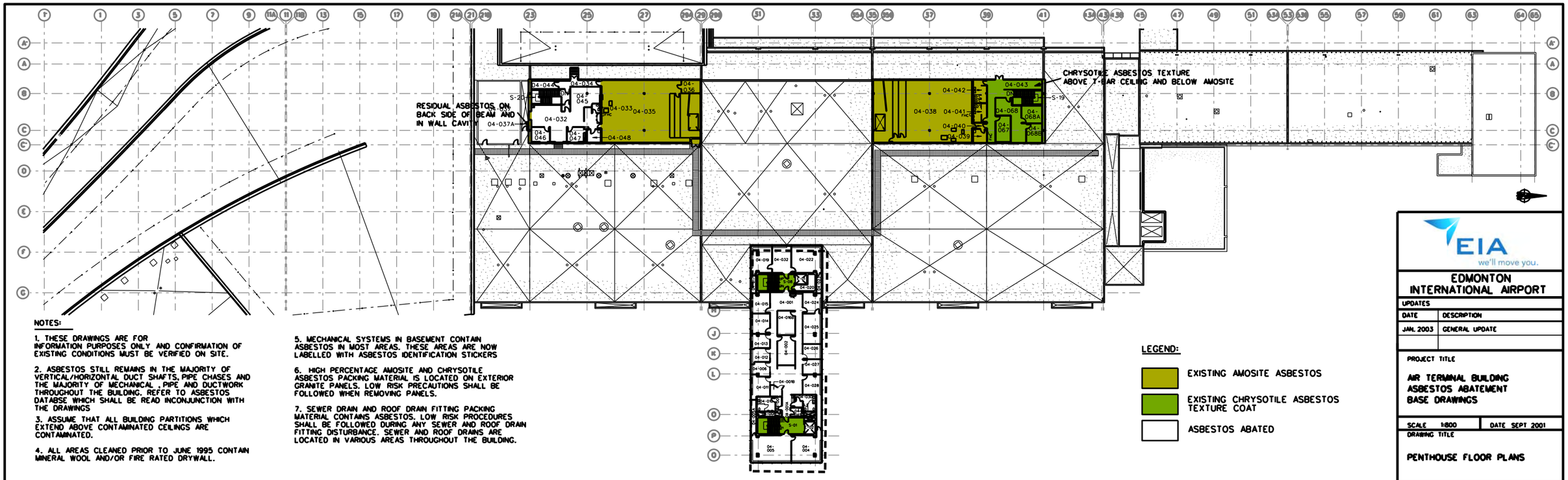

NOTES:

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2. ASBESTOS STILL REMAINS IN THE MAJORITY OF VERTICAL/HORIZONTAL DUCT SHAFTS, PIPE CHASES AND THE MAJORITY OF MECHANICAL PIPE AND DUCTWORK THROUGHOUT THE BUILDING. REFER TO ASBESTOS DATABSE WHICH SHALL BE READ INCONJUNCTION WITH THE DRAWINGS

3. ASSUME THAT ALL BUILDING PARTITIONS WHICH EXTEND ABOVE CONTAMINATED CEILINGS ARE CONTAMINATED.

4. ALL AREAS CLEANED PRIOR TO JUNE 1995 CONTAIN MINERAL WOOL AND/OR FIRE RATED DRYWALL.

5. MECHANICAL SYSTEMS IN BASEMENT CONTAIN ASBESTOS IN MOST AREAS. THESE AREAS ARE NOW LABELLED WITH ASBESTOS IDENTIFICATION STICKERS

6. HIGH PERCENTAGE AMOSITE AND CHRYSOTILE ASBESTOS PACKING MATERIAL IS LOCATED ON EXTERIOR GRANITE PANELS. LOW RISK PRECAUTIONS SHALL BE FOLLOWED WHEN REMOVING PANELS.

7. SEWER DRAIN AND ROOF DRAIN FITTING PACKING MATERIAL CONTAINS ASBESTOS. LOW RISK PROCEDURES SHALL BE FOLLOWED DURING ANY SEWER AND ROOF DRAIN FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- ASBESTOS ABATED

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EDMONTON INTERNATIONAL AIRPORT

UPDATES

DATE	DESCRIPTION
JAN. 2003	GENERAL UPDATE

PROJECT TITLE

AIR TERMINAL BUILDING ASBESTOS ABATEMENT BASE DRAWINGS

SCALE 1:800 | DATE SEPT 2001

DRAWING TITLE

PENTHOUSE FLOOR PLANS

T22-G005

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EDMONTON INTERNATIONAL AIRPORT

UPDATES	
DATE	DESCRIPTION
NOV 2001	AMENDED - CENTRAL HALL CONST.
SEP 2006	GENERAL UPDATE

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

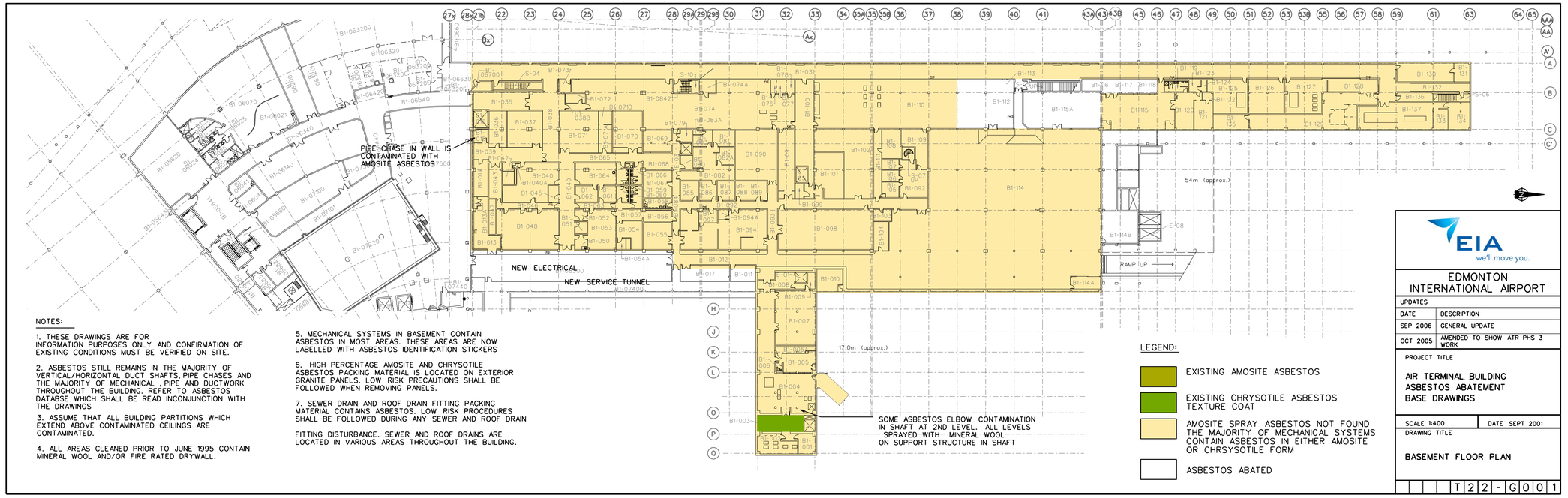
SCALE 1:500 DATE SEPT 2001

DRAWING TITLE

TOWER FLOOR PLANS
LEVELS 3 - 11

T22-G006

t22g006.dgn Default 01/23/2009 11:44:51 AM



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FITTING DISTURBANCE. SEWER AND ROOF DRAINS ARE LOCATED IN VARIOUS AREAS THROUGHOUT THE BUILDING.

LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- AMOSITE SPRAY ASBESTOS NOT FOUND THE MAJORITY OF MECHANICAL SYSTEMS CONTAIN ASBESTOS IN EITHER AMOSITE OR CHRSYSOTILE FORM
- ASBESTOS ABATED

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EDMONTON
INTERNATIONAL AIRPORT

UPDATES	
DATE	DESCRIPTION
SEP 2006	GENERAL UPDATE
OCT 2005	AMENDED TO SHOW ATR PHS 3 WORK

PROJECT TITLE

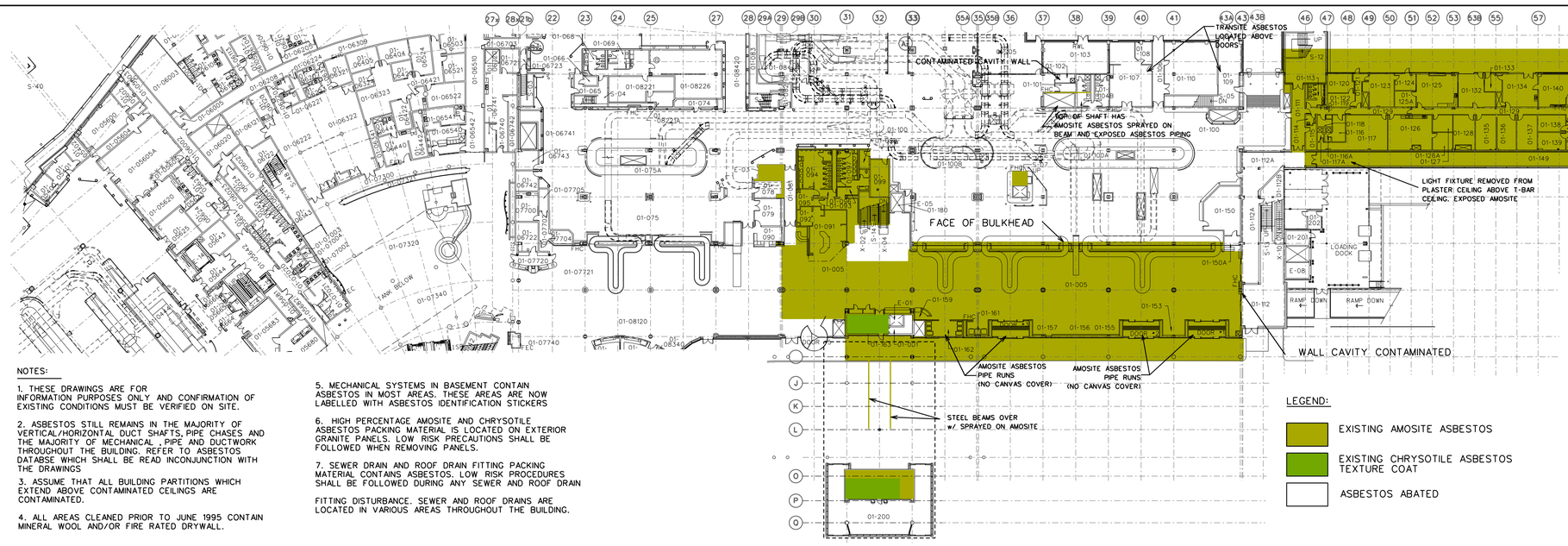
AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:400 | DATE SEPT 2001

DRAWING TITLE

BASEMENT FLOOR PLAN

T22-G001



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LEGEND:

- EXISTING AMOSITE ASBESTOS
- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- ASBESTOS ABATED

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EDMONTON INTERNATIONAL AIRPORT

UPDATES

DATE	DESCRIPTION
OCT 2005	AMENDED - AIR PHS 3 PROGRAM
SEP 2006	AMENDED - TO REFLECT 01-078
SEP 2007	ADDED CHANGES AS PER ET500

PROJECT TITLE

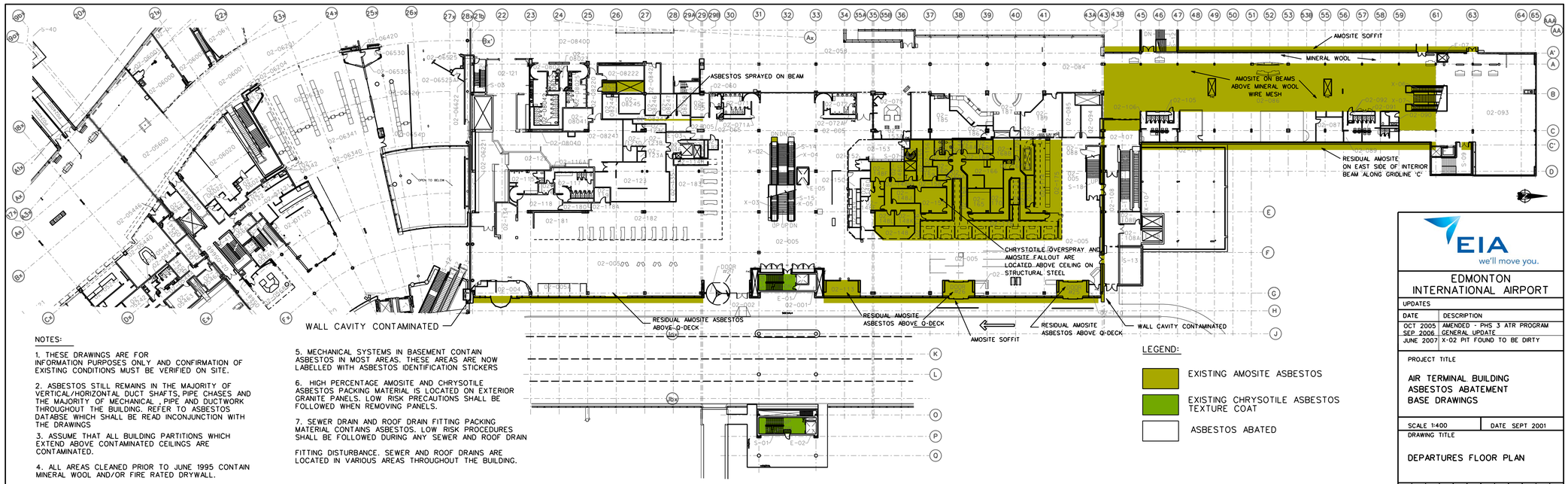
AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:400 | DATE SEPT 2001

DRAWING TITLE

ARRIVALS FLOOR PLAN

T22-G002



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- EXISTING CHRYSOTILE ASBESTOS TEXTURE COAT
- ASBESTOS ABATED

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UPDATES	
DATE	DESCRIPTION
OCT 2005	AMENDED - PHS 3 ATR PROGRAM
SEP 2006	GENERAL UPDATE
JUNE 2007	X-02 PIT FOUND TO BE DIRTY

PROJECT TITLE

AIR TERMINAL BUILDING
ASBESTOS ABATEMENT
BASE DRAWINGS

SCALE 1:400 | DATE SEPT 2001

DRAWING TITLE

DEPARTURES FLOOR PLAN

T22-G003