

Project Health and Safety Management Plan



Safety First

Project No: D265-193-00

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REVISION LOG

Revision	Date	Description Of change	By	Approved
10	Dec 17/09	Sec. 2.0 Site Map Update Sec. 6.0 Orientation Identifier Levels Sec. 7.1 Fence removed Sec. 22.2.3 Emergency Procedure Changes	AECOM	BR
9	June 5/09	All PH&SMP-Name Change UMA to AECOM Projects Canada Sec.2.0- Site Map Update	AECOM	BR
8	Sept 13/08	Revised Site Map	UMA	GJS
7	July 3/07	Revised site map/ General Revisions	UMA	GJS
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5	Nov 4/05	Revised with Changes	<i>Alltek/UMA</i>	<i>FDB</i>
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1. TERMINOLOGY

Accident

An unforeseen or unplanned occurrence in a sequence of events that results in unintended injury, death and/or property damage.

ALLTEK

ALLTEK Loss Prevention Inc. (Safety Consultant for the Program)

City or City of Winnipeg

Refers to The City of Winnipeg, as continued under The City of Winnipeg Act, Statutes of Manitoba 1989-90, C-10, and any subsequent amendments thereto.

Confined Space

- Enclosed or partially enclosed
- Not designed for continuous human occupancy
- Limited or restricted access for 1st Aid, rescue or response
- Large enough for a worker to enter

Competent Worker/Supervisor

- Adequately qualified
- Suitably trained, and
- With sufficient experience to safely perform work without supervision or with only a minimal degree of supervision.

Contract Administrator

The Construction Manager or his designate.

Construction Manager (CM) (interchangeable with Contract Administrator)

A person or persons designated and authorized by AECOM Canada Projects (CM) Ltd. to act on their behalf.

CM Safety Officer or Safety Coordinator

The person or persons designated and authorized by AECOM Canada Projects (CM) Ltd. to act as an integral part of the Construction Manager's team providing advice on health and safety matters.

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Contractor

A person, firm or corporation having a contract with The City of Winnipeg to perform a part or parts of the Work or to supply material or products worked to a special design according to the Contract Document, but does not include one who merely supplies materials not so worked.

Consultant

A person or company that provides a consultation services to the City of Winnipeg.

Imminent Danger

- A danger which is not normal for that occupation, or
- A danger under which a person engaged in that occupation would not normally work.

Incident

An undesired event that under slightly different circumstances could have resulted in injury, property damage or loss.

Owner

The City Of Winnipeg. (City)

PPE – Personal Protective Equipment

To be worn at all times while on the worksite or adjacent areas where work is being undertaken. Consists of a minimum of:

- CSA Certified Hard Hat
- CSA Certified Class A Boots
- High Visibility Vest or Coveralls with High Visibility Markings
- Safety Glasses (or side safety shields if prescription glasses are equipped with suitable plastic lenses)

Prime Contractor

The Prime Contractor for a worksite as referred to in definitions section of the Manitoba Safety and Health Act W.210. For the purposes of this Project, the Prime Contractor is AECOM Canada Projects (CM) Ltd.

Professional Engineer

A Professional Engineer registered in the jurisdiction where the Work is undertaken.

Project

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The location or locations at which the Work is to be performed, including rights of way, leases and temporary working spaces, and in Definitions (Act W.210), page 2.

Safe Work Plan

A plan assessing the level of hazards expected to be encountered on the site and as described on the City website: www.winnipeg.ca/matmgt/safety

Shall

Denotes a mandatory requirement.

Should

A recommendation that is a sound safety and health practice; it does not denote a mandatory requirement.

Subcontractor

Means a person contracting with the Contractor for the performance of a part or parts of the work or for the furnishing of plant or material and includes a subcontractor's subcontractor.

AECOM

AECOM Canada Projects (CM) Ltd.

Construction Emergency Response Plan

Means a plan that details required procedures to be enacted during an emergency at the Site.

Work

All labor, equipment and materials necessary to construct the facility in accordance with the Contract Documents and includes without limitation, all supervision, transportation and all things to be done, supplied, furnished, or performed which are mentioned in or contemplated by Contract.

Workplace Safety and Health Act W210 10/02 and Manitoba Regulations 217/2006

Governing Health and Safety in the province of Manitoba or those regulations that are in effect at the time of the work.

Project, Site, Workplace or Construction Worksite

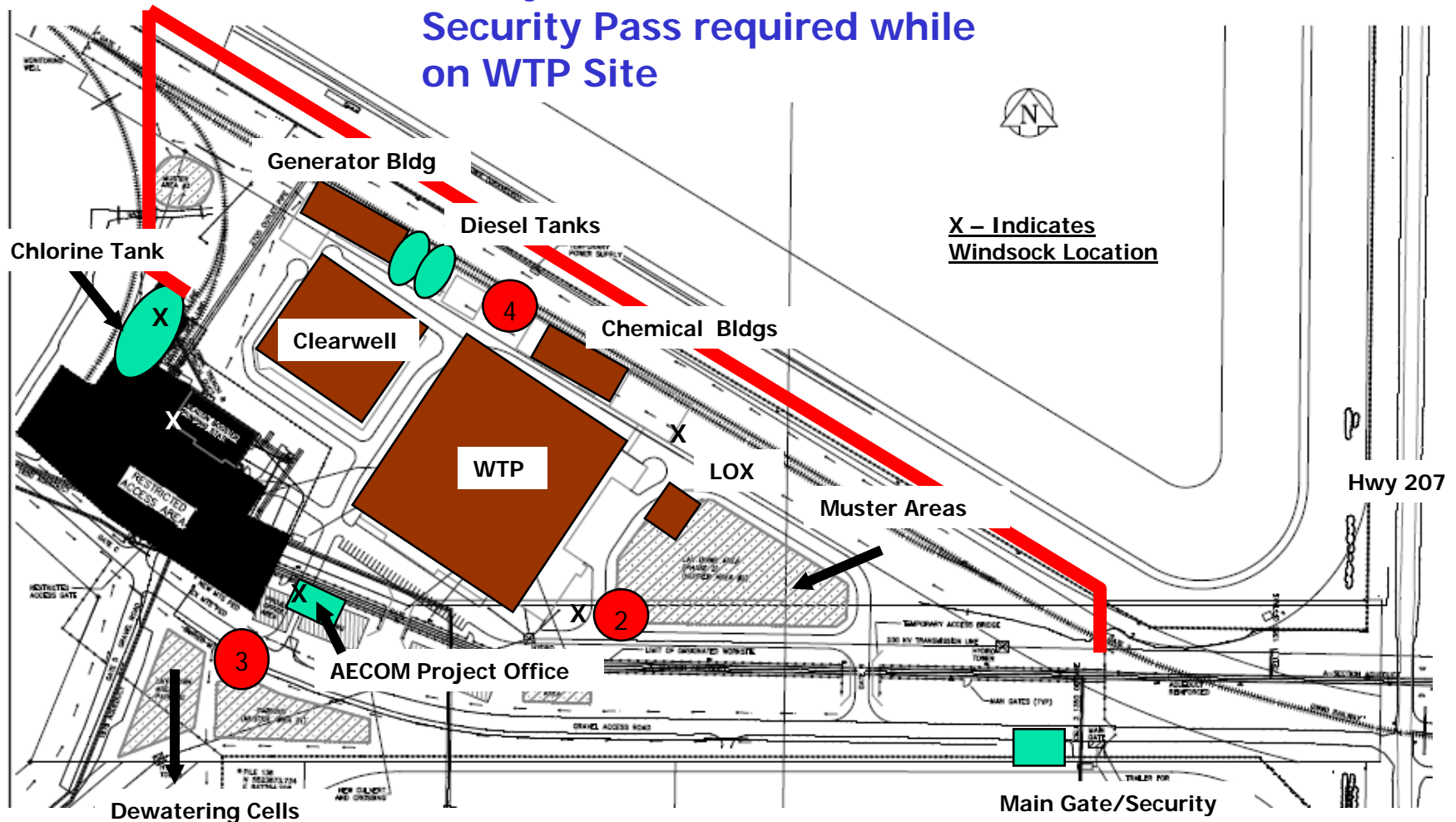
That area where construction is being undertaken and generally defined as the fenced area bounded on the north by fence at cell 1, on the east and west by the perimeter fencing and on the south by the aqueduct, or any adjacent areas where work is being undertaken. (see following Plan)

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2. Site Map

Site Map – Muster Pts. & Windsocks

Safety Orientation and Security Pass required while on WTP Site



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3. SCOPE

The Project Health and Safety Management Plan shall be regarded as the minimum standard for all construction work at the Project and shall be read in conjunction with City of Winnipeg Safety Plans and the Workplace Safety and Health Act and Regulation W.210. In the event of a conflict of standards the highest standard shall apply.

The purpose of the Project Health and Safety Management Plan is to:

- Provide a safe working environment for all Contractors and their workers.
- Provide uniformity in safety practices, standards, and enforcement for all Contractors and their workers.
- Ensure uniformity in fire prevention and protection for all Contractors on the Project.
- Minimize damage to equipment and property.
- Maximize safe production.
- Increase worker morale.

The Project Health & Safety Management Plan shall be reviewed at least annually to adjust for changing conditions, and any changes shall be conveyed to the Contractor and the City of Winnipeg in writing.

4. CONTRACTOR'S RESPONSIBILITIES

- To be in compliance with City of Winnipeg Safety Requirements as defined at www.winnipeg.ca/matmgt/safety
- Know, understand and comply with the Project Health & Safety Management Plan as it pertains to the worksite, and ensure that their employees abide by the safe work practices, procedures, and rules.
- Ensure that all their employees wear the appropriate safety equipment, personal protective devices, and clothing as required by the Project Health & Safety Management Plan.
- Notify the Construction Manager's Safety Officer of all accidents, incidents, spills and injuries as soon as possible.
- Notify the Construction Manager's Safety Officer of any unsafe conditions and practices that may be of danger to their employees, other employees or the environment.

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- Supply copies of all accident or incident reports as may be required in a timely manner.
- Ensure that safe work practices and job procedures are in place for the work being contracted and in accordance with legislated requirements, i.e. Workplace Safety and Health Act W.210 and all applicable Regulations under the Act.
- Assist the Construction Manager in hazard assessments, inspections, and accident investigations pertaining to the contracted work.
- Ensure that employees receive safety training in accordance with legislated requirements including, but not limited to, first aid, WHMIS, job specific training and environment protection and provide verification thereof if requested.
- Set a good example by following the Project Health & Safety Management Plan and good industry practices.
- Be part of a Safety Management Team and Safety Committee.
- Conduct weekly Tool Box meetings.
- Provide manpower list (PSI/Tailgates) daily and Tool Box Meeting minutes to CM.

5. DISCIPLINE POLICY

- A safety violation is a violation of any safety rule and/or regulation that applies on the Project, as shown herein and as updated from time to time.
- The City of Winnipeg, upon recommendation of the Contract Administrator has the right to terminate the contract of any Contractor if it is determined that:
 - The Contractor is not cooperating or participating fully in this Project Health & Safety Management Plan or
 - The Contractor has not provided the required Health and Safety staff and the support for them.
 - The Contractor fails to take immediate steps to correct a safety violation or has persistent safety violations
- The Contract Administrator may exclude any person from the Project and the City's Deacon Reservoir Property for allowing an unsafe condition to exist, or continue to exist or if that person is not cooperating or participating fully in the Project Health and Safety Management Plan or fails to properly display the Safety Orientation Identifier.
- Project privileges of any person may be terminated for the following causes, but not limited to:
 - Failure to use the proper PPE (Personal Protective Equipment) or to use the required PPE properly.
 - Failure to properly display the Project safety orientation sticker as shown in Clause 6 of this Project Health and Safety Management Plan.

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- Possession of or being under the influence of illegal drugs or alcohol on the Project.
- Failure to adequately supervise workers.
- Failure to replace handrails, covers, or other protective devices, including safety signs.
- Failure to lock out or unauthorized removal of another worker's lock.
- Failure to follow the requirements of this document.
- Unauthorized use or tampering with fire and safety equipment, or smoking in unauthorized areas.
- Theft or vandalism.
- Horseplay or fighting.
- Reporting false information on, or falsifying documentation.
- Harassment of other workers.
- Urinating or defecating in other than proper facilities.

6. ORIENTATION OF WORKERS

All personnel including consultants, vendor representatives, visitors and new-hire workers shall be given a safety orientation by the Contract Administrator before entering the Construction Worksite or other areas where work is being carried out related to this Project. This includes Subcontractors' employees.

Orientation Identifier Levels:

- White** – Full Site with restrictions – All workers are restricted to their designated areas of work. Workers will not enter any other area of plant without the express approval of the Contract Administrator and the City.
- Identifier/White Background

The above restrictions apply to all areas of the Winnipeg Water Treatment Plant.

The Orientation will include but not be limited to:

- Responsibilities of Management, Supervisors and Workers.
- Workers' right to refuse unsafe work.
- Hazards of the job.
- Personal Protective Equipment (PPE) that is required.
- Emergency and Evacuation Procedures, and muster points.

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- Where emergency equipment is located.
- How and when to report unsafe conditions and where to go with a health or safety concern.
- First aid reporting procedures.
- Fire prevention and protection.
- Accident/incident reporting procedures.
- WHMIS.
- The project discipline policy.

Workers may be required to have other specialized training, or the valid proof of training for some tasks. All personnel who have been absent from the Project site for six (6) months shall be re-oriented.

A person, once oriented, shall display the Project-approved safety insignia on their hard hat. Any person not displaying the insignia shall be asked to vacate the site until they have been properly oriented.

7. PROJECT CONDITIONS

7.1 SPECIAL PROJECT CONDITIONS

The following are special conditions that exist on this Worksite where extreme caution is to be taken or special provisions exist in carrying out the work. All work adjacent to or in the area of is to be undertaken only in consultation with the Contract Administrator

- Active GWWD rail lines exist along the north and west sides of the site and within the Construction Worksite. No equipment is to be placed on or operated over these lines without express permission of the Contract Administrator.
- The rail spur to the west of the Construction Worksite has a railcar containing chlorine. Chlorine is a deadly gas and Contractors are to make all workers aware of the special procedures relating to the potential of a chlorine leak:
 - Wind socks or flags in the area of the rail spur indicate the direction of wind flow.
 - In the event of an escapement, an alarm will sound and all workers on site are to immediately move perpendicular to the air flow to one of the Muster areas and remain there until advised otherwise by the CM Safety Officer.
 - Chlorine gas is heavier than air and will migrate to low areas such as excavations. Immediately leave all excavations, leaving equipment and personal belongings.

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- Roll call will be carried out by each contractor and verified by the Contract Administrator's personnel
- Major underground water supply pipes exist on site. Special rules, regulations and procedures exist for working in the vicinity of these pipes. Contractors are to ensure that they are familiar with these services prior to working within the main Construction Worksite area.
- The area along the south side of the main Construction Worksite designates the Aqueduct. Any vehicle travel over the aqueduct except over designated bridges is strictly prohibited.
- Manitoba Hydro power lines run along the south perimeter of the Construction Worksite. No hoisting is allowed within 7m (23ft) of these power lines and no storage of materials is allowed under these lines. Guy wires shall be protected against damage by on site equipment.
- The area at the SW corner of the main Construction Worksite, Deacons Booster Pumping Station, is a restricted area and entry is forbidden without the express approval of the Contract Administrator and the City.
- In case of emergency call 986-4781 (rather than 911) – The City personnel at McPhillips Street Control Centre will summon responders as required.

7.2 CONSTRUCTION EMERGENCY RESPONSE PLAN

A Construction Emergency Response Plan (CERP) has been developed and is available at the project site offices. The overall emergency procedures are covered in the orientation program. The intent of this program is to provide a plan for worker safety and evacuation in the case of an emergency.

7.3 GENERAL PROJECT CONDITIONS

- No riders are allowed in the back box of vehicles or in the bucket of any equipment.
- All vehicles used to transport workers shall comply with the WS&H and Motor Vehicle Regulations. All drivers of vehicles on the project shall have a current driver's license of the correct class.
- A spotter must direct all vehicles backing up if not equipped with a back-up alarm and/or when the operator's view is obstructed.
- All internal combustion engines used inside closed buildings or hoarded areas shall have the exhaust vented outside or have a properly operating exhaust scrubber.

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- To prevent vehicular damage, concrete traffic barriers shall be placed around all propane tanks and cylinders in excess of 100 pound capacity. These traffic barriers are to be in the 1800kg (4000lb.) weight category.
- The use of colors to identify hazards shall agree with ANSI Standard Z53.1: red for danger or stop, yellow for caution or slow, green for safe areas. Barrier tape shall be removed as soon as it is no longer needed.
- Plastic barrier tape shall not be used in place of wooden or tubular guardrails for fall protection.
- The Contractors shall be responsible for the security of all their materials, tools, equipment, and facilities.
- Where such items as protruding rebar and anchor bolts create an impalement hazard or tripping hazard, they shall be properly protected and conspicuously marked.
- Grade stake shall be made of wood or mild steel. Concrete reinforcing steel (rebar) shall not be used for this purpose or any load bearing purpose.
- Form retaining pins that are deformed, bent or have mushroomed heads shall be removed from service immediately. Rebar shall not be used for form retaining pins.
- An effective system and plan according to Part 9 Manitoba Regulation 217/2006 "Working Alone or in Isolation" to check on the well being of all workers required to work alone shall be in place. Saturday and Sunday Off Hours - After Work Permits are to be completed and submitted to the Contract Administrators Safety Officer by 1:00pm Friday.
- No products containing asbestos shall be utilized on the Project.
- A worker, on foot, shall precede all mobile cranes moving on the Project (all areas after leaving Hwy 207). The sole duty of the worker is to determine if there are any hazards or obstructions for the crane and to warn other workers of the crane movement.
- The tail swing area of mobile cranes and excavators shall be barricaded to prevent intrusion by workers when the bottom of the counterweight is less than 2.1m (7 ft.) above grade and there is less than 600mm (2 ft.) clearance between the counterweight and any obstruction.
- Pressurized pneumatic hoses shall have the couplings secured against disconnection and be secured to prevent whipping in the event of rupture.
- Trash barrels and 205 litre (45 gallon) drums shall not be hoisted by holes cut in the sides. Lifting devices designed and certified by a Professional Engineer shall be used.
- All tools and equipment shall be free from patent defects or meet the original manufacturer's specifications and/or those specifications set out by a Professional Engineer.
- No firearms or weapons of any sort are permitted on the site

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7.4 EXTREME WEATHER CONDITIONS

Contractors are to take precautions to protect workers from the effects of working in excessive heat or cold. If in the opinion of the Contract Administrator, the CM Safety Officer and Contractors supervisor(s) temperatures are such as to be potentially harmful to workers and suitable protection is not feasible, affected work may be suspended.

In the event of potential tornado or lightning in the area that is a risk to workers the Construction Manager, in conjunction with the CM Safety Officer and Contractor's supervisor(s), may suspend work.

8. REPORTING REQUIREMENTS

a) Daily, start of shift, Contractor reporting requirements include:

- Names of all workers on site, including Subcontractors.
- Area where work is going to be done.
- What work is being done?

Reports are to be filed daily by the Contractor's supervisor with the Contract Administrator.

The Contract Administrator will administer these daily lists and have available for roll call at the muster areas when an emergency exists.

b) Monthly Contractor reporting requirements include:

- To be reported on form F-0021 Monthly Safety Report.
- Total hours worked shall include Subcontractors'.

Reports are to be filed daily by the Contractor's supervisor with the Contract Administrator

c) Personal Injury Accidents

- **First aid injuries**
Shall be reported to the CM Safety Officer on the day the injury occurs.
- **Medical aid injuries**
Shall be reported to the Contract Administrator's Safety Officer within four hours of the time of accident.

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- **Lost time accidents**
Shall be reported to the Contract Administrator's Safety Officer within one hour of the time of accident when it is expected that the worker will not be able to return to work on the day following the injury (or within 2 hour on notification that the worker has not reported to work on the day following the injury).

9. SAFETY POLICY FOR SITES MANAGED BY AECOM

AECOM Commitment

AECOM is committed to providing a safe and healthy work environment for all of its employees, and clients, sub consultants, and others when they are at AECOM premises or sites under AECOM control. Our goal is ***an incident-free worksite.***

AECOM Objectives

To achieve safe and healthy workplaces, AECOM will implement a Health and Safety Program, which focuses on the following objectives:

- Compliance with Occupational Health and Safety Regulations.
- Cooperation and participation in Project Safety Plans and programs that include Hazard Assessments and Safe Work Practices and procedures.
- Provision of safety training for employees, including orientations and job-specific training.
- Regular safety visits and inspections of AECOM worksites and facilities.
- Incident investigations, corrective action and communication of findings to employees.
- Maintenance of accurate safety records, including statistics to determine incident trends and training needs.
- Provision of the resources to effectively implement the Program.

AECOM believes that accidents can be prevented or minimized with sound management. The Project Health and Safety Management Plan has been developed to effectively manage safety on sites. The Plan is based on industry experience, current standards, management responsibility to provide leadership and resources, and Contractor and Worker responsibility to cooperate and comply with its implementation. Local Occupational Health and Safety Regulations, where more stringent, will always take precedence over this aforementioned Plan.

AECOM and all Contractor(s) on sites managed by AECOM Canada Projects (CM) Ltd. must comply with this Project Health and Safety Management Plan, the Safe Work Plan and governing regulations.

Every Contractor on site must cooperate in working toward an incident-free worksite. All workers must follow site safety rules, establish safe work procedures and cooperate with their employer in matters of health and safety. All workers have the right to refuse work that involves uncontrolled hazards that pose a risk to their health and safety or that of others.

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10. CONTRACTOR'S HEALTH AND SAFETY PROGRAM

Prior to project mobilization the Contractor shall submit their safety program and a specific Safe Work Plan for the project to the Contract Administrator. The Contractor's Safe Work Plan shall be a written plan that states how the Contractor will implement their safety program and how the Contractor will achieve compliance with the CM's Project Health & Safety Management Plan.

Prior to project mobilization, the Contractor shall submit the name of their proposed health and safety representative for approval by the Contract Administrator. The Contractor shall provide a full time competent safety person to supervise the safety aspects of their work on the project when their total workforce, including sub-contractors, supervisors and administrative personnel, is greater than 25 people or whenever hazardous work of a critical nature is being performed, regardless of the size of the workforce.

The Contractor shall provide a current copy of their company health and safety program together with the health and safety program of all of their sub-contractors to the Contract Administrator before they mobilize on the project. The Contractor's safety program shall be current and specific for the work being undertaken, and shall include, but not be limited to, the following:

- Safety policy, which clearly indicates senior management's commitment to health and safety.
- A Drug and Alcohol Policy.
- Procedure manual – which shall be updated on a regular basis to reflect changing work or regulatory conditions.
- A hazard assessment process for all ongoing or new tasks, materials or equipment to determine potential hazards and plans for prevention or control.
- Inspections – The Contractor shall have a system for self-Inspection which follows written guidelines and which result in documented reports of findings and tracking of hazard correction.
- WHMIS – The Contractor shall have a system for proper storage and safe use of all controlled products and for the training of workers. A complete inventory of all controlled products shall be continuously maintained with a copy of all MSDS sheets shall be given to the Contract Administrator, before use of the controlled product by workers.
- Accident/Incident Investigation – The Contractor shall have a system for the accurate determination of root causes of accidents/incidents and methods to prevent recurrence.
- Communications – The Contractor shall have a system for ensuring accurate and rapid transfer of information to all of their supervisors and workers, and for workers to voice their concerns about a health or safety matter.
- Personal Protective Equipment (PPE) – The Contractor shall have a system for determining need, supply, training and inspection of all the required PPE. In no case shall the PPE be less than specified in this program or the statutory requirements.

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- Discipline – Procedures for disciplinary action regarding workers and supervisors shall be written, communicated to workers and supervisors, enforced and recorded.
- Emergency Response – Procedures for response to all emergencies shall be written and communicated to all workers, and should include provisions for communication, egress, and training compatible with the Construction Emergency Response Plan (available from the Contract Administrator)
- Training of Supervisors – All Contractor and sub-contractor supervisory personnel shall be trained in at least the following safety aspects before commencing their supervisory duties:
 - The Contractor's safety program
 - The Project Health & Safety Management Plan
 - Understanding of relevant WS&H Regulations
 - Understanding of Company, supervisor, and worker responsibilities
 - Accident / incident reporting and investigation
 - How to conduct safety meetings (Tool box meetings)
 - Emergency procedures as per Construction Emergency Response Plan
 - WHMIS (all employees)
 - Special project instructions / information
 - Discipline policy and procedure
- Line of accountability – Authority and responsibility for health and safety protection shall be stated. It shall be clearly defined that all levels of supervision are held accountable for health and safety conditions within their areas of responsibility.
- Resources – Commitment of adequate resources to health and safety, in staff, equipment, promotion, etc.
- Management Involvement – Senior management's involvement in worker health and safety concerns, including clear lines of communication with workers, Contractors and Subcontractors.

10.1 SUBCONTRACTORS

The Contractor will be responsible for ensuring that all of their subcontractors have safety programs that comply with the Project Health & Safety Management Plan.

The Contractor shall submit the list of subcontractors they propose to use on the project for prior approval by the Contract Administrator. The Contract Administrator has the right to refuse admission to the project any of the subcontractors whose safety programs do not meet the requirements of the Project Health & Safety Management Plan.

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10.2 CONTRACTOR SAFETY MEETINGS

- Contractor safety tool box meetings shall be held weekly in a location that is conducive to learning.
- The sole intent of these meetings is worker education. The Contract Administrator may distribute hazard alerts or safety topics with information that is currently relevant to the work.
- All workers and supervisors shall attend these meetings with records kept of the attendance and the material covered.

10.3 JOB HAZARD ASSESSMENT

Job Hazard assessment means identifying and controlling safety hazards at a worksite to protect the health and safety of the workers and the public. All jobs have inherent risks and dangers.

A written job hazard assessment shall be conducted prior to any critical task or any task for which a permit is required.

Hazard assessments shall be done for jobs or work processes which:

- Are new, changed, or which have never been previously assessed.
- Have had new equipment added.
- Are done infrequently.
- Involve inexperienced workers.
- Are associated with frequent accidents.
- Are critical, with the potential for serious injury.
- Involve a change in the operating procedure of a facility.
- Have the potential for severe property damage.
- Have the potential for significant interruption to production.
- Have the potential for serious health effects.

Each job or work process shall be assessed to determine what hazards or potential hazards exist. The tasks within the job shall be prioritized as to the degree of risk involved and the necessary control measures determined. Some of the control measures are:

- Elimination
- Substitution

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- Engineering controls
- Administrative controls
- Worker training. Ensure the work is performed by competent workers or is directly supervised by competent workers.
- Use of standard practices or safe work plans.
- Personal Protective Equipment (PPE), (used only in instances where administrative or engineering controls cannot be instituted).

10.4 ACCIDENT REPORTING and INVESTIGATION

10.4.1 TYPES OF ACCIDENTS/INCIDENTS REQUIRING REPORTING:

The following types of accidents and/or incidents shall be reported to the CM's Safety Officer:

- Any accident resulting in death or those of a critical nature with a serious risk of death.
- Any accident which resulted in injury requiring first aid or medical aid - (MA).
- Any incident which did not involve injury but had a potential for causing serious injury, or property damage – Near Miss Incident - (NMI).
- Any accident involving a major structural collapse or failure of a building or structure.
- Any spill or release of a toxic or hazardous substance. This incident requires immediate notification.
- Any accident that, by regulation, shall be reported to the Workplace Safety and Health Authority or other Regulatory Agencies.
- Any accident that caused damage to any piece of equipment or machinery and thereby caused it to become dangerous (e.g. upset of a crane).
- Any accident that results in lost workdays by the worker(s).

An investigation shall be undertaken as soon as the scene is secured from further damage and there is no risk to the investigation team. The scene shall not be disturbed until permission is given by the Contract Administrator and by a regulatory agency.

10.4.2 ACCIDENT REPORTING

The Chief Executive Officer or a person of equivalent position within the Contractor's organization shall be present at the Project within 24 hours of the occurrence of any serious accident. The purpose of this visit is for that person to explain to the Contract Administrator

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what precipitated the accident, what action has been taken to date, and what changes will be made to prevent recurrence.

Accidents that require the on-site presence of the Contractor's chief executive officer are:

- Any accident resulting in death or those of a critical nature with a serious risk of death.
- Any accident involving a major structural collapse or failure of a building or structure.
- Any spill or release of a toxic or hazardous substance.
- Any accident that, by regulation, shall be reported to the Minister or person appointed or designated by the Minister.
- Any accident that caused damage to any piece of equipment or machinery and thereby caused it to become dangerous (e.g. upset of a crane).

An investigation report of the accidents listed or which require the presence of a Contractor's chief executive officer, shall be submitted as soon as practical but not later than three (3) calendar days after the occurrence. The report shall include as a minimum: the particulars of the accident, the basic cause(s), the nature and severity of any personal injury, the number of work days lost or expected to be lost in respect of each lost time accident, and the preventative procedures that have been implemented to prevent recurrence.

11. WORKSITE INSPECTIONS

The Contractors' and Subcontractors' work areas, including laydown areas, lunchrooms, and offices shall be inspected to ensure they are free of Health, Safety and Fire hazards.

- Formal inspections of the Contractors' and Subcontractors' work areas shall be conducted at least weekly.
- The correction of deficiencies shall be assigned with completion times and dates. Work shall cease immediately if imminent safety hazards are present.
- Copies of all inspections and corrective action plans shall be posted in worker lunchrooms, as well as discussed at Crew Safety Meetings.

12. HOUSEKEEPING

All of the Contractors' work areas shall be kept clean, tidy and free of tripping and slipping hazards at all times.

- Combustibles shall not be allowed to accumulate.
- The Contractor is responsible for snow removal and sanding in his work and lay down areas.

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- All power and welding cables and hoses shall be coiled and stored if not in use. Welding leads, hoses, and extension cords shall be hung up with non-conductive material, off all floors, stairways and walkways.
- Access ways shall be kept clear of materials and are not to be used for storage areas.
- Oil, grease and other such liquid spills shall be cleaned up at the time of the spill and are not to be left unattended.
- Material, equipment, concrete forms, pipe, etc. are to be orderly stacked out of walkways and kept away from in front of doors, stairways, and ladders.
- If the Contractors' work areas are not maintained, written notice shall be given by the Contract Administrator to have the area cleaned up. Failure to abide by the notice will result in the clean up being performed by others with the Contractor back-charged for all associated costs.

13. FALL PROTECTION

Continuous (100%) fall protection shall be provided and used by all personnel who work from a temporary work area when the possibility of falling 2.5 metres (8ft) or more exists or if a fall from a lesser height may involve an unusual risk of injury; and used by personnel who work from a permanent work area when the possibility of falling 1.2 metres (4 ft.) exists.

The Contractor shall provide the Contract Administrator with a Fall Protection Plan that addresses the following as a minimum standard:

- Goals and Objectives
- Responsibilities
- Job Hazard Recognition and Evaluation
- Fall Prevention
- Fall Protection
- Personal Fall Arrest Systems
- Written Procedures
- Practical Field Training Before Use
- Issuance and Control of Personal Fall Arrest Equipment
- Maintenance
- Limitations
- Clearance Requirements
- Storage of Personal Fall Arrest Systems

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- Rescue
- Program Monitoring
- When not protected by any other means of Fall Protection, such as safety nets or scaffolds with proper guardrails, workers working higher than 2.5m (8ft) or within 2.5m (8ft) of an unprotected edge shall use a full body harness, shock absorbing lanyards with locking snap hooks, and an adequate anchorage point.
- Personal Fall Arrest Equipment is required when climbing, traveling from point to point, connecting structural steel, or erecting scaffolds or other temporary platforms. No worker or work operation is exempt from this requirement.
- Workers shall rig Personal Fall Arrest Equipment so that they can neither free fall more than 1.2m (4ft.) nor contact any lower object. Anchorage points for Personal Vertical Fall Arrest Equipment shall be capable of supporting a shock load of at least 22.3kN (5000 lb.) and should be located above the worker's body harness attachment point.
- All Personal Fall Arrest Equipment subjected to impacts caused by a free fall or by testing shall be removed from service, until fully re-certified by the Manufacturer or a Professional Engineer.

When vertical lifelines are used, a separate lifeline shall protect each worker. The lifeline shall be properly weighted at the bottom and terminated to preclude a device such as a rope grab from falling off the line.

- A professional Engineer shall design horizontal lifeline systems, if it is not part of an approved manufactured system.
- Horizontal lifelines are to be limited to two persons at one time between supports, unless specified by the Manufacturer or the Professional Engineer who designed the system.
- Prior to each use, workers shall visually inspect all Personal Fall Arrest Equipment for cuts, cracks, tears or abrasions, undue stretching, overall deterioration, mildew, operational defects, heat damage, or corrosion. Equipment showing any defect shall be removed from service.
- Workers shall not use Personal Fall Arrest Equipment until they have been properly trained in its use, maintenance and limitations.
- Supervisors shall ensure Personal Fall Arrest Equipment is available and used as required for all workers under their direction and control.
- Proper guardrails shall be installed on open sides of all walkways and runways where the fall distance exceeds 1.2m (4 ft.), and on all open-sided floors where the fall distance exceeds 1.2m (4 ft.).

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- All floor openings or floor holes shall be protected by guardrails or hole covers. If hole covers are used they shall be strong enough to support the maximum intended load, secured against displacement, and have proper warning signs attached, visible under all conditions. Removal of any guardrail or floor opening protection may only be done after have filed a Removal Permit with the Contract Administrator.
- Workers riding in a crane suspended work platform shall wear a full body harness and lanyard attached to a safety line that is secured above the load hook.
- Workers working on wall forms, rebar or other elevated work shall wear a full body harness and/or positioning device when exposed to a fall in excess of 2.5 m (8 ft.) or when hazard below puts worker at high risk.
- Stairs, ladders, or ramps shall be provided for all access ways where there is a change in elevation greater than 500mm (20 in.).
- Manila or synthetic rope is not to be used for guardrails. Wire rope may be used if given prior approval by the Contract Administrator. Wire rope guardrails shall have warning flags or signs attached every metre.
- Workers who are required to operate or work in any aerial work platform shall receive adequate training and demonstrate competency prior to use of the aerial work platform.
- All types of aerial work platforms shall have guardrails on all sides of the work platform and the door access chains or rails in place while being operated.
- Workers operating aerial work platforms shall wear a full body harness and lanyard attached to the designated anchor point(s) in the bucket or basket. Workers shall not attach the lanyard to an independent structure.

14. HOISTING AND RIGGING

14.1 EQUIPMENT

- All forklifts, forks and frames of Integrated Tool Carriers, Zoom Booms, aerial man lifts as well as all swing stages and their related components, and any other device used to suspend or hoist workers and materials, including the hoisting hook, shall be visual and non-destructive, tested in accordance with the Manufacturer's recommendations and CSA Z150-98 *Safety Code on Mobile Cranes*.
- Cranes involved in incidents that result in shock loading of the boom or other components shall be removed from service and subjected to a complete inspection and certification prior to resuming work. These inspections shall be done by a third party agency and a Professional Engineer shall stamp the certificate of inspection. Engineers

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shall be competent in the area of specific knowledge required for the certification of the crane or hoist.

- A copy of the Inspection Certificate(s) shall be given to the Contract Administrator before the equipment is put in service or returned to service after an incident.

14.2 RIGGING

- Rigging includes but is not limited to: wire rope, chain, polyester, Kevlar and nylon slings as well as come-a-longs, chain falls, shackles, hooks, spreader bars and other load bearing hoisting attachments. Components of cranes and hoists are not included.
- The safe working loads of rigging shall be based on a 5 to 1 safety factor. Any rigging components used for hoisting personnel shall be based on a 10 to 1 safety factor.
- Working loads on rigging shall not exceed the safe limits established by the manufacturer.
- All rigging shall be clearly and legibly marked with the SWL (Safe Working Load) or WLL (Working Load Limit) and the Manufacturer's name or mark.
- Any rigging fabricated by an employer such as spreader bars, links, lifting beams shall be designed and certified by a Professional Engineer.
- Wire rope, shall be considered unserviceable and shall be permanently removed from service and destroyed if:
 - In running ropes and wire rope slings, there are 6 randomly distributed wires broken in one rope lay, or 3 wires are broken in one strand in any one lay, or,
 - In standing ropes, there are 2 or more broken wires in one rope lay in sections between end connections, or more than one broken wire at an end connection, or,
 - Wear, or the effects of corrosion, exceeds 1/3 of the original diameter of outside individual wires, or,
 - There is evidence of kinking, bird-caging or any other damage resulting in distortion of the rope structure, or,
 - There is evidence of any heat damage, or,
 - There are reductions of normal rope diameter, from any cause in excess of:
 - (i) 1mm (3/64 in.), for diameters up to and including 19mm (3/4 in.), or,
 - (ii) 2mm (1/16 in.), for diameters 22 to 29mm (7/8 in. to 1 1/8 in.) inclusive, or,
 - (iii) 3mm (3/32 in.), for diameters 32 to 38mm (1 1/4 in. to 1 1/2 in.) inclusive.
- Synthetic fibre slings will be considered unserviceable and shall be permanently

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removed from service and destroyed if:

- Edge cut(s) exceed an amount equal to the thickness of the webbing.
- The penetration of abrasion exceeds 15% of the thickness of the webbing, taken as a proportion of all plies. Where abrasion occurs on both sides of the webbing, the sum of the abrasion on both sides shall not exceed 15% of the thickness of the webbing taken as a proportion of all plies.
- Warp thread damage up to 50% of the sling thickness extends to within 1/4 of the sling width of the edge or exceeds 1/4 the width of the sling.
- Warp thread damage to the full depth of the sling thickness extends to within 1/4 of the sling width of the edge or the width of damage exceeds 1/8 the width of the sling.
- Weft thread damage allows warp thread separation exceeding 1/4 width of the sling and extends in length more than twice the sling width.
- Acid or caustic burns are present.
- Melting or charring of any part of the sling is present.
- Stitches in load bearing splices are broken or worn.
- End fittings are excessively pitted or corroded, or are cracked, distorted or broken.
- Combinations of the above types of damage are present.
- Safe working loads shall be legible and attached to the sling.
- Lifting Definitions
 - Warp – The fibres that run lengthwise in a synthetic fibre sling.
 - Weft – The fibres that cross the warp fibres at a right angle in a synthetic fibre sling.

14.3 LIFT PLANS AND CRITICAL LIFT PLANS

A lift plan shall be submitted to the Contract Administrator for approval of all Standard and Critical plans.

- A lift plan shall precede all standard lifts less than 75% of the crane's rated capacity.
or
- When a lift is determined to be in excess of 75% of the crane's capacity a Critical Lift Plan shall be initiated prior to the lift. A Critical Lift Plan must also be initiated during/when:
 - Multiple Crane Lift
 - Hoisting Personnel

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- Lifting over process lines or facilities
- Personnel in High Risk Position
- Hoisting below grade
- Working near energized power lines
- Sling angles less than 30 degrees horizontal angle
- Temperatures below minus 40 degrees C/F

15. FIRE PROTECTION

The Contractor and their Subcontractors shall take all necessary precautions to protect workers and property from fire.

15.1 FIRE EXTINGUISHERS

The Contractor and their subcontractors shall provide a sufficient number of fire extinguishers to adequately protect their portion of the work and their mobile equipment.

Vehicles under 1 tonne, including automobiles that enter the Worksite or work areas	1 - 2.2 kg ABC Stored Pressure per unit
Vehicles over 1 tonne, including cranes, AWP's, light towers and generators	1 - 9 kg ABC Stored Pressure per unit
All other mobile equipment	1 - 9 kg ABC Stored Pressure per unit
Fuel Storage tanks and containers	2 - 9 kg ABC Stored Pressure within 6m
Office trailers and lunchrooms	2 - 9 kg ABC per trailer unit, mounted at the entrances
Tool cribs and storage trailers	1 - 9 kg ABC per unit, mounted at the entrance
Paint storage area	2 - 9 kg ABC Stored Pressure within 6m
Paint mixing or point of use area	1 - 9 kg ABC within 6m
Fuel gas storage racks	1 - 9 kg ABC Stored Pressure within 6m
Welding point of operation	1 - 9 kg ABC within 6 m. Note: 1 fire extinguisher may serve two welders
Confined spaces	1 - 9 kg ABC outside of all confined spaces

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Note: The standard Fire Extinguisher is a 9-kg (20-lb.) ABC, Stored Pressure model, unless otherwise specified.

15.2 SPECIAL FIRE PROTECTION CONDITIONS

The Fire Protection Plan shall include the following:

- Proper identification, storing, handling and use of flammable material to prevent accidental ignition.
- Providing adequate fire extinguishing equipment appropriate for the operations being performed.
- Using only work procedures which minimize fire hazards.
- Combustible debris and waste materials shall be collected and placed in the designated containers each day.
- Fuels, solvents, and other volatile or flammable liquids shall be stored away from the construction and storage areas in well marked safe containers.
- Good housekeeping is essential to fire prevention and shall be practiced by the Contractors and their Subcontractors throughout the construction period.
- Removing corrugated paper and fibre board cartons used for the storage or handling of materials as soon as its unpacked.
- Operating temporary heating facilities shall not be left unattended. Each unit shall have a 9kg ABC fire extinguisher within 6 metres.
- Supervisory personnel and that a sufficient number of workers shall be instructed in proper methods of extinguishing fires and shall be assigned specific fire protection duties.

15.3 GENERAL FIRE PROTECTION CONDITIONS

- No fires shall be allowed on site unless authorized in writing by the Contract Administrator.
- All fire extinguishers shall be properly mounted and have signs indicating their presence.
- No smoking shall be allowed near any flammable storage facility.
- All flammable liquids shall be stored in Underwriters Laboratories Approved metal or plastic containers.
- Contractors shall be responsible for keeping their work and lay down areas free of debris and other combustible materials.

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- All refueling of equipment shall be done with bonded fuel delivery hoses.

16. TRENCHING and EXCAVATIONS

16.1 GENERAL

The Contractor to comply with the requirements of Manitoba Labour for Trenching / Excavation / Shoring

- Prior to commencing any excavation or trench all underground utilities shall be located, and their positions identified.
- Extreme caution and care shall be exercised when excavating or trenching in the vicinity of underground utility systems; the final 300mm (12in.) around an existing cable or conduit and the final 600mm (24in.) around an existing pipeline shall be excavated by hand.
- Above ground hazards such as trees, buildings, boulders, and utility poles that encroach on the excavation may need to be secured or tied back.
- Proper access for the excavation or trench shall be provided; if ladders are used, they shall be placed every 15m (50ft.) or within 3m (10ft.) of a worker's position and shall extend 1m (3ft.) above the excavation or trench.
- Spoil piles shall be placed at least 1m (3ft.) back from the edge of an excavation or trench and sloped to prevent excavated material from sliding back into the excavation or trench or as directed by a Geotechnical Engineer retained by the Contractor.
- Barricades or warning devices shall be erected to protect the public and other workers from the excavation or trench.
- Frozen ground does not eliminate the need for shoring or sloping unless certified by a Professional Engineer retained by the Contractor.
- When shoring is used it shall be installed from the top down and removed in opposite order. No person (in the excavation) shall be outside of the protective shoring system.
- Water shall not be allowed to accumulate in any excavation or trench.
- The safe limits of approach for overhead electrical lines shall be observed when excavating or trenching in the vicinity of overhead power lines. (see section 18.3) If the safe limits of approach cannot be maintained the Utility Company shall be notified so the line can be de-energized.
- Excavations or trenches and the shoring or sloping systems shall be inspected before entry or after any major rainfall, or other upset condition.
- 600mm (2ft.) of clearance shall be maintained between the counterweight of any swing type of excavating machinery and the nearest object.
- Employees in an excavation or trench shall not work under the suspended bucket of the excavating machine or any load being placed by the machine.

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- Proper Personal Protective Equipment shall be used by anyone entering any excavation or trench.
- Certifications and manufacturers' instructions for trench cages must be on site and followed.

16.2 INTERNATIONAL COLOUR CODE FOR MARKING BURIED FACILITIES

RED	Electric Power Lines, Cable Conduit and Lighting Cables.
YELLOW	Gas, Oil, Petroleum and Gaseous Materials.
ORANGE	Telephone, Cable TV, Communication, Alarm and Signal Lines.
BLUE	Water Mains and Service Lines.
GREEN	Sanitary Sewers, Storm Sewers and Drain Lines.
PINK	Temporary Survey Markings

16.3 ENGINEERING CERTIFICATION OF EXCAVATIONS

Excavation work shall be carried out according to the specifications of a Professional Engineer for the following type of excavations:

- Excavations over 1.2m (4ft.) deep with sides sloped at an angle steeper than 3/4 horizontal to 1 vertical.
- Excavations more than 6m (20ft.) deep.
- Excavations adjacent to structures which apply loads to the soil in the excavated area.
- Excavations in soil subject to vibration or hydrostatic pressure.
- Excavations along natural or man-made side slopes which are steeper than 3/4 horizontal to 1 vertical.

16.4 INFORMATION REQUIRED ON CERTIFICATION DOCUMENTS

A certification of an excavation involves design specifications and job site inspections at regular intervals by a Professional Engineer. The engineer is required to assume full responsibility for the stability of the soil structure at all times work is being carried out inside, or in the vicinity of the excavation. He shall propose design specifications which, based on his professional judgment, provide a reasonable assurance that the soils surrounding an excavation are stable.

The engineer who certifies an excavation shall inspect the site at intervals which allow him to recognize any change in soil conditions from the original assessment. A signed

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inspection report shall contain a description of such changing soil conditions and action to be taken, if any.

The engineer may designate an experienced person on the job site to recognize changing soil conditions. The designated person will report any changes in soil conditions to the engineer who in turn shall inspect the site and issue an inspection report.

The certification documents, duly signed by a Professional Engineer, shall contain the following information:

- A description or drawing of the site or location for which the certification applies, with no need for verbal clarification.
- A drawing or description of excavation slope, depth, shoring, soil anchors, surface protection, drainage, etc., if applicable.
- A geotechnical description of the soil conditions.
- The date and time period for which the certification applies.
- The influence of changing weather conditions.
- The name of a designated person on the site authorized to determine changes in soil conditions, where applicable.

The Contractor shall carry out the excavation work accurately in accordance with the engineering drawings and specifications. Any deviations from the design shall be inspected and accepted in writing by the engineer.

17. CONFINED SPACE ENTRY

The Contractor to comply with the requirements of the Manitoba Regulation 217/2006 - Part 15 Confined Spaces.

The Contractor shall provide a Code of Practice for Confined Space Entry and train all of their workers and their supervisors who may be involved in entry of Confined Spaces.

The Code of Practice shall provide for but not be limited to:

- Training of Workers
- Attendant's duties and training
- Gas Testing and Monitoring
- Permit System
- Hazard Analysis
- Ventilation
- Communication
- Isolation / Lock-Out

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- Personal Protective Equipment requirements
- Rescue

A **Confined Space Entry Permit** issued by the Contract Administrator is required for all work where the area is considered Confined Space.

18. ELECTRICAL SAFETY

The Contractor shall test electrical cords for continuity and correct attachment of plugs and receptacles:

1. Before using new equipment.
2. Before using repaired equipment.
3. Before equipment is used after any incident that may have damaged it.

The Contractor shall use CSA approved Ground-Fault Circuit Interrupters (GFCIs) on all 120-volt, AC, single-phase 15-ampere through 20-ampere receptacles used by workers in all locations. The GFCI shall be in the first outlet from the receptacle or distribution panel.

There shall be a system to regularly test the GFCIs to ensure that they will operate properly.

CAUTION

- **Double-Insulated Power Tools do NOT protect against defects in the cord, plug or receptacle. Continuous inspection and maintenance by a competent person is required.**
- **A GFCI will NOT protect a worker from electrical shock or line-to-line electrical contact. A GFCI simply limits the duration of shock to approximately 0.025 seconds so the heart is not affected, but can still be intense enough to contribute to an accident.**

18.1 TEMPORARY LIGHTING

- ALL bulbs of temporary lighting shall be protected by guards that are connected to the electrical ground system.
- ALL temporary lighting systems shall be attached or suspended with non-conductive connections and not attached to any work surfaces or safety devices such as scaffolds or handrails.

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18.2 MISCELLANEOUS

- No “Y” type extension cords are allowed unless CSA approved.
- ALL single phase low-voltage extension cords shall be three-wire-conductor type with a minimum size of 14/3 industrial service.
- All cords, tools and equipment shall be maintained according to the Manufacturer's Recommendations. A competent person shall do the repair and maintenance of electrical cords, tools and appliances.

18.3 POWER LINES

- The Contractor shall ensure that no worker approaches and no equipment is operated within 7 metres (23ft.) of a live overhead power line unless:
 - (a) The worker is, or the operation is directed by, a competent utility worker within the meaning of the Electrical Utility Regulations, or
 - (b) At least the following clearances, as set out in the following table, are maintained between the worker or the equipment and the overhead power line conductors:

**Safe Limit of Approach Distances from Overhead
 Power Lines for Persons and Equipment**

Operating Voltage of Overhead Power Line Between Conductors	Safe Limit of Approach Distance for Persons and Equipment
0 - 750 volts Insulated or Polyethylene Covered Conductors (1)	300 millimetres
0-750 volts Bare, uninsulated	1.0 metre
Above 750 volts Insulated Conductors (1) (2)	1.0 m
750 - 40 kilovolts	3.0 m
69 kV, 72 kilovolts	3.5 m
138 kV, 144 kilovolts	4.0 m
230 kV, 240 kilovolts	5.0 m

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500 kilovolts	7.0 m
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- NOTES: (1) Conductors shall be insulated or covered throughout their entire length to comply with these groups.
(2) Conductors shall be manufactured to rated and tested insulation levels.

No equipment or materials are to be stored within the minimum power line clearances listed above.

ALL overhead power lines shall be considered as energized until the Owner of the line verifies in writing that it is not energized and until the line is visibly grounded.

19. WELDING AND CUTTING

- Welding and cutting shall only be performed by authorized and properly trained persons. Before welding or cutting is started, the area shall be inspected for potential fire hazards.
- When welding or cutting in elevated positions, precautions shall be taken to prevent sparks or hot metal from falling onto people or flammable material below.
- Suitable fire extinguishing equipment shall be within 6m (20ft) of all locations where welding and cutting equipment is used.
- Butane Lighters shall not be carried by welders or their helpers when engaged in welding or cutting operations.
- A Fire Watch shall be maintained wherever welding or cutting is performed in locations where combustible materials present a Fire Hazard. A fire check shall be made of the area 1/2 hour after completion of welding.
- Where combustible materials are present, the floor shall be swept clean for a radius of 9m before welding. Combustible floors shall be kept wet or protected by fire-resistant shields. Where floors have been wetted down, personnel operating arc-welding or cutting equipment shall be protected from possible shock.
- To protect the welder's eyes, face, and body during welding and cutting, the welder shall wear an approved helmet or goggles, proper protective gloves, and clothing. Helpers shall wear proper eye protection. Other employees shall not observe welding operations unless they use approved eye protection.
- Proper eye protection shall be worn to guard against flying particles when the helmet or goggles are raised.

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- Machinery, tanks, equipment, shafts, or pipes that could contain explosive or flammable materials shall be thoroughly cleaned and decontaminated prior to the application of heat.
- In dusty or gaseous spaces where there is a possibility of an explosion, welding or cutting equipment shall not be used until the space is adequately ventilated.
- Welders shall place welding cable, hoses, and other equipment so that it is clear of passageways, ladders, and stairways.
- Where the work space allows, the welder should be enclosed with non-combustible screens. Employees or other persons adjacent to the welding areas shall be protected from rays by shields or shall be required to wear appropriate eye and face protection.
- After welding or cutting operations are completed, the welder shall mark the hot metal or provide other means of warning other employees.
- Potentially hazardous materials are used in fluxes, coatings, covering, and filler metals used in welding and cutting or are released to the atmosphere during welding or cutting operations. While welding or cutting, adequate ventilation or approved respiratory protection equipment shall be used. Special precautions shall be taken when using materials that contain cadmium, fluorides, mercury, chlorinated hydrocarbons, stainless steel, zinc, galvanized materials, beryllium, and lead. Employees shall refer to the MSDS for specific requirements pertaining to the above listed hazardous materials.
- For gas welding and cutting only approved gas welding or cutting equipment and accessories shall be used.
- An approved flashback device shall be installed at each regulator and a back flow prevention device shall be installed in each hose at the torch end on all oxygen fuel systems.
- Welding hose shall not be repaired with tape or gear type (water hose) clamps.
- Matches shall not be used to light a torch; a torch shall not be lighted on hot work. A friction lighter or other approved device shall be used.
- Oxygen or fuel gas cylinders shall not be taken into confined spaces.
- For electric welding only approved electric welding equipment shall be used.
- The electric welding machine shall be properly grounded prior to use. Rules and instructions supplied by the manufacturer or affixed to the machine shall be followed.

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- Welders shall not strike an arc with an electrode, whenever there are persons nearby who might be affected by the arc.
- When electrode holders are to be left unattended, the electrodes shall be removed and the holders shall be so placed or protected that they cannot make electrical contacts with employees or conducting objects.
- When the welder must leave his work or stop work for any appreciable length of time, or when the welding machine is to be moved, the power supply switch to the equipment shall be opened.

20. COMPRESSED GASES

- Cylinders shall have the valve cap or valve protection device in place at all times, except when in actual use or connected to a welding set.
- Cylinders shall not be rolled and shall not be lifted by the valve or valve-cap; a suitable cradle or other device shall be used.
- Cylinders shall have their contents properly identified.
- Cylinders not having fixed hand wheels shall have keys, handles, or non-adjustable wrenches on the valve stems while the cylinders are in service.
- Compressed gas cylinders, whether full or empty, shall be stored and transported in an upright position and secured so they cannot fall or be upset.
- Compressed gas cylinders must be secured with non combustible material.
- Oxygen cylinders in storage shall be separated from fuel-gas cylinders or combustible materials (especially oil or grease) a minimum distance of 6m (20ft.) or by a 1.5m (5 ft.) high non-combustible barrier.
- Cylinders shall not be placed where they might become part of an electric circuit or within 1.5m (5 ft.) of an electrical outlet.
- Employees shall never force connections, which do not fit, nor shall they tamper with the safety relief devices of cylinder valves.
- Before the regulator is removed from a cylinder, the valve shall be closed and all pressure released from the regulator.
- A leaking cylinder shall not be used. Such cylinders shall be taken outdoors away from sources of ignition. The supervisor shall be notified.

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- A flame shall never be used to detect gas leaks.
- The recessed top of cylinders shall not be used as a place for tools.
- Oil, grease, or similar materials shall not be allowed to come in contact with any valve, fitting, regulator, or gauge of oxygen cylinders:
 - Oxygen shall never be used as a substitute for compressed air.
 - When an oxygen cylinder is in use, the valve should be opened fully in order to prevent leakage around the valve stem.
- Acetylene cylinders shall be properly secured and always used, transported and stored in a vertical position. Cylinders shall be protected from sparks, flames, and contact with energized electrical equipment:
 - An acetylene cylinder valve shall not be opened more than one and one half turns of the spindle and preferably no more than three fourths of a turn.
 - Employees shall not use acetylene in a free state at pressures higher than 103 kPa (15psi).
- For Gas Welding and Cutting only approved gas welding or cutting equipment and accessories shall be used.
- Welding hose shall not be repaired with tape or gear type (water hose) clamps.

21. COMPRESSED AIR

- Compressed Air Tools and Systems must be maintained according to the Manufacturer's specifications and applicable regulations.
- Air hoses shall have a minimum working pressure of 150% of the maximum pressure produced in the system and be designed for compressed air service.
- Air Receiver Tanks and Manifolds shall be equipped with an "EXCESS FLOW" valve, which will automatically shut off the air in the event of a hose rupture.
- All large diameter connections are to be equipped with "Whip Checks" and SMALL diameter connections are to be pinned or provided with an alternate system to ensure a positive connection.
- Air lines and hoses are to be relieved of pressure before being disconnected or disjointed. Hoses shall not be kinked to relieve pressure.

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- Breathing Air Fittings must not be compatible with Tool Air Fittings.
- Only clamps approved by the Manufacturer for compressed air service are to be used for attaching hoses to fittings, this does not include gear type clamps.
- Air pressure at the tool inlet, with the tool running, must not exceed the rated pressure capacity of the tool, as specified by the Manufacturer.
- When Quick Disconnect Couplings are used at a tool or at the end of a hose connected to the tool, the female coupling is to be installed upstream or on the pressure side. The female coupling must contain a valve, which closes automatically, when the coupling is disconnected. The male coupling shall be attached downstream of the coupling.
- Compressed air hoses are NEVER to be pointed at any part of an employee's body and are NEVER to be used for cleaning of employees' clothing or person.
- Compressed air hoses and fittings are to be inspected regularly, and damaged items are to be tagged and removed from service.
- When work involves removing debris with compressed air, the operator(s) must use the following PPE:
 - Eye Protection
 - Face Shield
 - Respiratory Protection
 - Hearing Protection
 - Appropriate protective clothing
- "Cleaning Up" with compressed air is to be used as a last resort. Vacuum or water wash should be first considerations so as not to redistribute the debris. Air pressure must be maintained at 210 kPa (30 psi) or less for clean-up. Only Pressure Limiting Safety Nozzles shall be used.
- Air hoses must be arranged so as not to create tripping hazards for employees, and where they will be protected from vehicles, tools, work processes, or mechanical damage.
- Compressed air must not be used to transfer flammable liquids.
- Compressed gases, such as Nitrogen, or Oxygen shall NEVER be used as a substitute for compressed air, for any purpose.
- Air hoses shall be inspected and coiled up after use and then stored in a proper location until they are required again.

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- Internal Combustion Engine driven air compressors must only be run in well ventilated areas.

22. ENVIRONMENTAL PROTECTION

The Worksite is part of the City of Winnipeg Water Supply System. Safe handling and storage of fuel, oils, and chemicals shall be of the highest priority and care. Any mishap shall be immediately reported to the Contract Administrator.

22.1 FUEL / OIL and CHEMICAL STORAGE

22.1.0 Definitions

Chemicals

Any compound that requires WHMIS documentation and/or may cause harmful effects to human health or the environment.

Container

Any portable device that has a capacity that does not exceed 454 litres (100 gallons) and is used to store fuel, oil, or chemicals.

Hazardous Wastes

Wastes which come under the Hazardous Chemicals Act.

Storage

The holding of fuel, oil or chemicals for a temporary period, at the end of which the fuel/oil or chemicals have either been transferred to equipment or waste to a designated facility for processing.

Storage Facility

A place where fuel/oil or chemicals are stored in tanks and containers and includes all associated land and structures.

Tank

Any stationary device which has a capacity in excess of 454 litres (100 gallons), and is used to store fuel, oil, or chemicals.

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22.1.1 General Rules

- Contractors shall supply their own waste containers and arrange for removal to proper handling facilities.
- Site generated waste shall be placed in approved containers, in designated areas.
- Site waste shall be segregated and handled in an acceptable manner.
- Dangerous, hazardous and toxic materials shall be marked, handled and contained in an acceptable manner.
- Vehicle service and wash down shall be only in approved areas.
- Fuel storage shall be in approved tanks in a bermed area with an impervious liner or other secondary containment system.
- All spills (fuel/oil and chemical) shall be reported and immediately cleaned up.
- There shall be no burning of any waste or waste products.
- Concrete mixer trucks shall only wash their drums or chutes in designated areas on the Project site.
- Storage Capacity
 - In the interest of safety and environmental protection the volume held in storage shall be minimized.
- A storage facility shall be located so that:
 - The facility shall be readily accessible for fire fighting and other emergency procedures.
 - The site is not subject to flooding.
 - The site will be chosen to minimize the potential for environmental damage, including:
 - Any threats to the quality of surface water and ground water; and to the health of humans, animals and plants from the normal operation of the facility and from any other causes.

22.1.2 Safety

- Fuel / oil and chemicals shall be stored in such a manner that they do not:
 - Generate extreme heat or pressure, fire or explosion or violent reaction.
 - Produce uncontrolled toxic gases or vapours in sufficient quantities to threaten human health.
 - Produce uncontrolled flammable gases or vapours in sufficient quantities to pose a risk of fire or explosion.

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- Damage the structural integrity of the storage facility and
- Threaten human health or impact the environment through other means.
- Access to a storage facility shall be limited to workers who have been instructed in normal and emergency procedures. The training and procedures shall be documented.
- A storage facility shall have signs indicating the stored products.
- Absorbent materials shall be stored near at hand in the event of a spill or leak.
- Contaminated soil/absorbent material shall be disposed of in a manner to comply with Environmental Regulations.

22.2 ENVIRONMENTAL PROTECTION MEASURES FOR STORAGE FACILITIES

22.2.0 Tanks

- All tanks in which fuel/oil or chemicals are stored shall be surrounded by a berm or other equivalent structure designed to contain the contents in the event of tank leaks or failure when:
 - the berm contains one tank, 120 percent of the capacity of the tank; or
 - the berm contains more than one tank, 120 percent of the volume of the largest tank within the berm area plus 20 percent of the aggregate capacity of all other tanks.
- The bermed area including the area underneath the tank shall have an impervious liner that is suitable for the product in the tanks.
- The berm shall be constructed to withstand the hydrostatic head associated with it being full of liquid.
- The bermed area shall be graded to a sump with necessary piping to pass over the dike for rainwater removal. There shall be no openings in the berm that provide a direct connection to any place beyond the berm area.
- Two 9 kg ABC stored pressure fire extinguishers shall be mounted within 6 metres of the storage facility.
- Bonded hoses of a diameter 38mm (1.5in.) or less shall be used to dispense stored fuels.
- All tanks shall be properly grounded with a minimum of 3m (10 ft.) grounding rod.

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- Tanks shall be locked at all times and open only when dispensing contents.

22.2.1 Containers (other than in a bermed area)

A storage facility where containers are stored shall consist of a structure with:

- A floor constructed of material which shall not react with or absorb any stored product or spills, and which has no drains that provide a direct connection to sewer;
- A continuous impervious curb, minimum height of 15cm (6 in.), placed on the perimeter of the floor in such a manner that product shall not escape between the floor and curb, the volume contained shall be at least 150% of the largest container.
- Appropriate side walls and roof to protect the containers from the weather; and
- A place to load or unload containers designed so that any spill shall be contained.

22.2.2 Requirements for Containers

- If a container begins to leak, the contents shall be transferred to a container that is in sound condition.
- Every container shall be labeled, according to the WHMIS regulations.
- A container shall be closed at all times except when product is added or removed.
- A container shall be handled in accordance with appropriate safety requirements, and any material lost during opening, handling or storage shall be contained, and properly disposed.

22.2.3 Emergency Procedures

When a spill occurs all reasonable efforts shall be made to control and contain the spilled product. Worker safety is the first consideration. Federal and Provincial agencies hold the discharger responsible for reporting the incident, to contain and clean up the spill or have these actions carried out to restore the site to pre-spill condition. Spillage of any hazardous materials or any liquid that could infiltrate the on-site Aqueduct system or contaminate a pipeline under construction shall immediately be reported to the Construction Coordinators and the Safety Coordinator. The Construction Coordinators, having determined that there may be a risk to the water system, shall notify the operator at the McPhillips Control Centre. The City will determine the steps to be taken to contain the spill and will direct clean-up. The City currently stores the following water treatment chemicals on the site: sodium hydroxide, sodium hypochlorite, ferric chloride, sulfuric acid, sodium bisulphate and hydrogen peroxide. Spill Kits for minor spills are available at the WTP Control Room on the WP245 level, WA 236 lower level

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by the Sulphuric acid dousing lines, WF 236 lower area near the sodium hydroxide dousing area, inside the Generator Building at the south wall and in the Bulk Chemical Storage Building mechanical room. The City is responsible for the clean up of water treatment chemical spills that occur during the Performance Verification and commissioning period and all ERP's & ESOP's for chemical spills must be followed. Only trained personnel shall attempt to clean-up any spill.

22.3 RECORD KEEPING

The Contractor shall retain documentation regarding all sections of their Health and Safety Program that pertains to the Project. This will allow the Contract Administrator to monitor their program for effectiveness and compliance with the Project's Health & Safety Management Plan.

The documentation to be retained shall include the following:

- Worker Orientation Records
- Hazard Assessment Forms
- Management / Supervisor / Worker Training Records
- Worksite Inspection Checklists and Reports
- Government Inspection Reports
- Accident / Incident Investigations
- Tool Box Safety Meeting Records
- First Aid Records
- Monthly Safety Reports
- Records of disciplinary action
- Any other forms required to be completed by the Contract Administrator.
- Equipment certification and inspection certificates.

Safety Reports are to be prepared using the following formulas for calculations:

Lost Time Accident Frequency

of Lost Time Injuries x 200,000

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Exposure Hours

Accident Severity

$$\frac{\text{\# of Compensable Days} \times 200,000}{\text{Exposure Hours}}$$

Total Recordable Injury Rate (TRIR)

$$\frac{\text{\# of Recordable Injuries} \times 200,000}{\text{Exposure hours}}$$

22.4 RECORD KEEPING TERMINOLOGY

The following terminology shall be used for determining the status of any work related injury or illness that occurs on the Project.

Compensable Days

The total days charged for work injuries. Days charged include actual calendar days of disability resulting from temporary total injuries and scheduled charges for deaths and permanent disabilities. 1200 days are charged for a death or permanent total disability, with proportionately fewer days for permanent partial disability. Refer to ANSI Z16.1 – Method of Recording and Measuring Work Injury Experience.

First Aid

Any one time treatment and subsequent observation of minor scratches, cuts, burns, splinters, foreign object in eye removal, which do not ordinarily require medical care. Such treatment and observation are considered first aid even if provided by a physician or registered professional personnel.

Examples Of First Aid:

- Application of ANTISEPTICS during first visit to medical personnel.
- Treatment of FIRST DEGREE BURN(S).
- Treatment of SECOND or THIRD DEGREE BURN(S) less than 1/2” in diameter.
- Application of BANDAGE(S) during any visit to medical personnel.
- Use of ELASTIC BANDAGE(S) during first visit to medical personnel.
- Removal of FOREIGN BODIES NOT EMBEDDED IN EYE if only irrigation is required and/or simple removal is performed using a wetted cotton swab, magnet or loop.
- Removal of FOREIGN BODIES FROM WOUND; if procedure is UNCOMPLICATED, and is, for example, by tweezers or other simple technique.

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- Use of NON PRESCRIPTION MEDICATIONS AND administration of single dose of PRESCRIPTION MEDICATION on first visit for minor injury or discomfort.
- SOAKING THERAPY on initial visit to medical personnel or removal of bandages by SOAKING
- Application of hot or cold COMPRESS(S) during first visit to medical personnel.
- Application of OINTMENTS to abrasions to prevent drying or cracking.
- Application of HEAT THERAPY during first visit to medical personnel.
- Use of WHIRLPOOL BATH THERAPY during first visit to medical personnel.
- NEGATIVE X-RAY DIAGNOSIS.
- OBSERVATION of injury during visit to medical personnel.
- Administration of TETANUS SHOT(S) OR BOOSTER(S) for preventive medicine.

Hospitalization

Occurs when a worker is admitted into the hospital. Emergency Room treatment is not considered hospitalization, if the worker is not subsequently admitted.

Lost Time Injury

A work injury that results in death, permanent disability, or inability of the injured worker to return to work on the next scheduled work day following the injury.

Lost Workdays

Are those workdays (consecutive or not) on which the worker would have worked but could not because of an occupational injury or illness. The number of lost workdays does not include the day of injury. The Contract Administrator considers these injuries to be Lost Time Accidents. Listed below are specific examples of lost workdays.

Weekends: If a worker who is scheduled to work Monday through Friday is injured on Friday and returns to work on Monday, the case does not involve any days away from work even if the worker was unable to work on Friday, Saturday, or Sunday. If this same worker had been scheduled to work on Saturday, even if that Saturday constituted overtime, the Saturday would be recorded as a Lost Time Accident.

Job Completion: If the job is finished and personnel are being laid-off, then the lost days would stop because the work no longer exists.

Holidays, Strikes, Vacation: Are not considered to be Lost Workdays. Lost Workdays include only those days in which the injured or ill worker would have worked but could not.

Medical Treatment

Includes treatment of injuries administered by physicians, or registered professional personnel. Medical treatment does not include first aid treatment (one time treatment and subsequent

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observation of minor scratches, cuts, burns, splinters, and so forth, which do not ordinarily require medical care) even though provided by a physician or registered professional personnel.

Examples Of Medical Treatment:

- Treatment of INFECTION.
- Application of ANTISEPTICS during second or subsequent visit to medical personnel.
- Treatment of SECOND OR THIRD DEGREE BURN(S) greater than 13mm (1/2in.) diameter.
- Application of SUTURES.
- Application of BUTTERFLY ADHESIVE DRESSING(S) or STERI-STRIPS in lieu of sutures.
- Removal of FOREIGN BODIES EMBEDDED IN EYE by minor surgery.
- Removal of FOREIGN BODIES FROM WOUND; if the procedure is complicated because of depth of embedment, size, or location.
- Use of PRESCRIPTION MEDICATIONS (except a single dose administered on first visit for minor injury or discomfort).
- Use of hot or cold SOAKING THERAPY during second or subsequent visit to medical personnel.
- Application of hot or cold COMPRESSE(S) during second or subsequent visit to medical personnel.
- CUTTING AWAY of DEAD SKIN (surgical debridement).
- Use of WHIRLPOOL BATH THERAPY during second or subsequent visit to medical personnel.
- POSITIVE X-RAY DIAGNOSIS (fractures, broken bones, etc.)
- ADMISSION TO A HOSPITAL or equivalent medical facility FOR TREATMENT.
- DRAINAGE of blood from BRUISES.

A WORK RELATED INJURY THAT REQUIRES MEDICAL TREATMENT IS CLASSED AS A RECORDABLE INJURY.

Modified Work

This is when a worker is not able to perform their regular assigned work as a result of a work related injury or illness. The number of workdays (consecutive or not) on which, because of injury or illness:

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- the worker was assigned to another job on a temporary basis; or
- the worker worked at a permanent job less than full time; or
- the worker worked at a permanently assigned job but could not perform all duties normally connected with it.

Days of modified work activity are meant to cover all days on which the worker was unable to contribute a full day's work on all parts of their normal job, but do not result in any lost workdays.

Occupational Illness

Any abnormal condition or disorder, other than one resulting from an occupational injury, caused by exposure to environmental factors associated with employment. It includes acute and chronic illnesses or diseases that may be caused by inhalation, absorption, ingestion, or direct contact. Illness cases result from anything other than instantaneous events (*see Occupational Injury*).

- Respiratory Conditions Due To Toxic Agents
- Poisoning (systemic effects of toxic materials)

Occupational Injury

Any injury such as a cut, fracture, sprain, amputation, etc., which results from a work accident or from a single instantaneous exposure in the work environment. Conditions resulting from animal bites, such as insect or snake bites, and from one-time exposure to chemicals are considered to be injuries, if they occur at work.

Recordable Injury

Any occupational injury requiring more than first aid, and all occupational illnesses. Recordable cases include:

1. Deaths, regardless of the time between the occupational injury or illness and death.
2. All occupational injuries resulting in any of the following:
 - (a) Lost workdays; either days away from work or days of restricted work activity.
 - (b) Medical treatment other than first aid.
 - (c) Loss of consciousness.
 - (d) Restriction of work or motion.
 - (e) Temporary or permanent transfer.
 - (f) Termination of injured or ill employee.
3. All occupational illnesses.

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23. FIRST AID SERVICES, SUPPLIES AND EQUIPMENT

Each Contractor shall provide first aid services, supplies and equipment as per SCHEDULE A, commensurate with his own work force.

First aid supplies, services and equipment are to be located at or near the worksite and to be made available and accessible during all working hours.

Ensure first aid supplies and equipment and supplies are maintained in a clean, dry and serviceable condition and clearly identified as first aid equipment and supplies.

The minimum number of first aiders required in a workplace shall be determined in accordance with the following Table:

SCHEDULE “A”

Number of Workers (per shift)	Close Workplace	First Aid (FA) kits as per 217/2006 Part 5		First Aid Room 217/2006 Part 5	
1 to 10	One FA1	Up to 25 workers	One FA Kit	-	-
11 to 40	One FA2	25 to 50 workers	Two FA Kits	-	-
41 to 100	Two FA2s	51 to 75 workers	Three FA Kits	At any workplace at which 100 or more workers are employed to perform work.	
101 to 199	Two FA2s	More than 75 workers	Four FA kits		
200 or more	Three FA2s	-	-		

Each Contractor will have on the site at all times the prescribed FA1 or FA2 and FA Kits commensurate with his own workforce. The names and proof of certification shall be registered with the Contract Administrator’s Safety Officer.

The Contract Administrator will provide a fully provisioned First Aid Room when total Project workforce exceeds 100 persons.

Note:

“FA1” means a first aider 1, “FA2” means a first aider 2

Definition:

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A first aider means a person who is:

- a) a first aider 1, first aider 2, or first aider 3 or
- b) a holder in good standing of an Emergency First Aid Certificate issued by St John Ambulance or the Canadian Red Cross Society, or who has qualifications that the director considers equivalent;

“first aider 1” means a person who is a holder on good standing of

- a) an Emergency First Aid Certificate issued by St John Ambulance or the Canadian Red Cross Society, and
- b) a Heart Saver Cardiopulmonary Resuscitation (CPR) Certificate issued by the Heart and Stroke Foundation of Manitoba,

Or other qualifications that the director considers equivalent;

“first aider 2” means a person who is a holder on good standing of

- a) a Standard First Aid Certificate issued by St John Ambulance or the Canadian Red Cross Society, and
- b) a Heart Saver Cardiopulmonary Resuscitation (CPR) Certificate issued by the Heart and Stroke Foundation of Manitoba,

Or other qualifications that the director considers equivalent;

“first aider 3” means a person who is a holder on good standing of

- a) an Advanced Level First Aid Certificate issued by St John Ambulance or the Canadian Red Cross Society, and
- c) a Heart Saver Cardiopulmonary Resuscitation (CPR) Certificate issued by the Heart and Stroke Foundation of Manitoba,

Or other qualifications that the Director of WS&H of Manitoba considers equivalent.

24. REPORTING FORMS

The following forms are available for viewing by contacting the Project Safety Officer at ph. 204-986-4222.

- 1 **Monthly Report F-001**
- 2 **First Aid F-002**

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- 3 Hazard / Risk Assessment F-003(long)**
- 3a Hazard / Risk Assessment F-003a (short)**
- 4 Accident / Incident Notification F-004**
- 5 Accident Investigation and Report F-005**
- 6 Accident Statement Record F-006**
- 7 Safety Inspection Record F-007**
- 8 Worksite Inspection Checklist**
- 9 Safety Meeting Record F-008**
- 10 Standard Lift Plan F-09**
- 11 Critical Lift Plan F-010**
- 12 Employee Orientation Record F-011**
- 13 Employee Medical Record F-012**
- 14 Employee Orientation Quiz F-013**
- 15 Crew Safety (Tool Box) Meetings**
- 16 All Training Records**
 - W.H.M.I.S.**
 - FALL Protection**
 - Lift Operation**
 - ETC.**
- 17 DISCIPLINARY FORMS**

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