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2 - Hazard Assessments

2.1. General Overview

GENERAL OVERVIEW

Hazard Assessments are an essential part of an effective health and safety program. When considering your health and safety system as a whole, hazard assessments are the foundation that the rest of the house is built on.

The identification of workplace hazards will be the responsibility of all employees of Canadian Road Builder Inc. In the Canadian Road Builder Inc. orientation, all employees review the hazard identification and reporting process.

Any person who recognizes or identifies a hazard has a responsibility to report it to a supervisor. All identified hazards will be addressed and corrected as soon as possible. If circumstances prevent the elimination of an identified hazard, the management will initiate suitable control methods to protect the workers, property and the environment.

Hazard identification may occur before/during any of the following:

- Site inspections
- Pre-job hazard identification (related to the task & work site)
- Pre-job planning (review critical work/jobs/tasks)
- Pre-job meeting (discuss the results of pre-job hazard assessment)
- Vehicle and equipment inspections
- Analysis of specific job descriptions, safe work procedures and Codes of Practice
- Sub-Contractors/Clients working on sight
- Review of accident, incident, near miss and hazard identification reports.
- Risk/Hazard Assessment of new or unknown task/job

Joint worksite health and safety committee representative assist with identification of hazards to workers or to other personal arising out of work activities at the work site. They are also assigned the duty to develop and promote measures to protect the health and safety of persons at the work site and checking the effectiveness of such measures.

2.2. Hazard Assessment Requirements

HAZARD ASSESSMENT REQUIREMENTS

1. Supervisors must ensure all work sites are assessed for existing and potential hazards before work begins at the site or prior to the construction of a new site.
2. All results of the hazard assessment must be documented and must show the methods to be used to eliminate or control the hazards. Documentation must also show the date and time the hazard assessment was prepared or revised and must be available for review at any time by affected workers.
3. The hazard assessment must be repeated:
 - At reasonably practicable intervals to prevent the development of unsafe or unhealthy working conditions.
 - When a new work product/material or equipment is introduced
 - When a work process or operations changes occur, or
 - Before significant change to a work site (i.e. weather or location)
4. Supervisors must ensure workers are involved in the hazard assessment and control, and inform affected workers, including subcontractors, of identified hazards and methods of control as they become involved in the work site.

2.3. Hazard Identification

HAZARD IDENTIFICATION

Workplace hazards are evident in the majority of industries. The road building industry is no exception. In order to minimize “losses” to personnel, property, equipment and materials, the hazards must be identified, evaluate the risks and control the hazards. The types of workplace hazards that personnel working for Canadian Road Builder Inc. may be exposed to are physical, chemical, ergonomic or physiological hazards.

Physical Hazards

- Excessive levels of noise, vibration, heat, cold
- Electrical shock and/or burns
- Manual lifting
- Vehicle accidents

Chemical Hazards

- Excessive airborne concentrations of mists, gases, vapors, fumes, dusts and fibers
- Skin contact with flammables, corrosives or reactive substances (Battery acids, solvents)
- By products/waste products from a process

Ergonomic Hazards

- Repetitive strain injuries
- Improper body positioning or movement

Physiological Hazards

- Fatigue - boredom on long hours or trips, stress, eye strain, repetitive strain injuries,
- Harassment - Personality conflicts between workers and/or management

Biological Hazards

- Sewage,
- Animals/pest waste,
- Pandemic/influenza,
- Bacteria, Fungi, viruses

2.5. Hazard Assessment

HAZARD ASSESSMENT

Identifying the hazards on the work site or areas is the beginning of the process, the next step is to decide if action is required to minimize the hazard or the effects it will have on the worker, property, production and public. This step of the process is to prioritize the hazards and the risk associated with them. There are two variables involved – determining the **Severity** of injury that the hazard could produce, and the **Probability** that the hazard will result in an accident.

Severity \ Probability	3 – Minor	2 – Serious	3 – Imminent Danger
A – Probable	Medium Risk	High Risk	High Risk
B – Reasonably Probable	Low Risk	Medium Risk	High Risk
C – Remote	Low Risk	Medium Risk	High Risk
D – Extremely Remote	Low Risk	Low Risk	Medium Risk

Conducting the Hazard Assessment is the responsibility of the Supervisor and must be conducted prior to starting work on a site. Encourage the workers to join in!

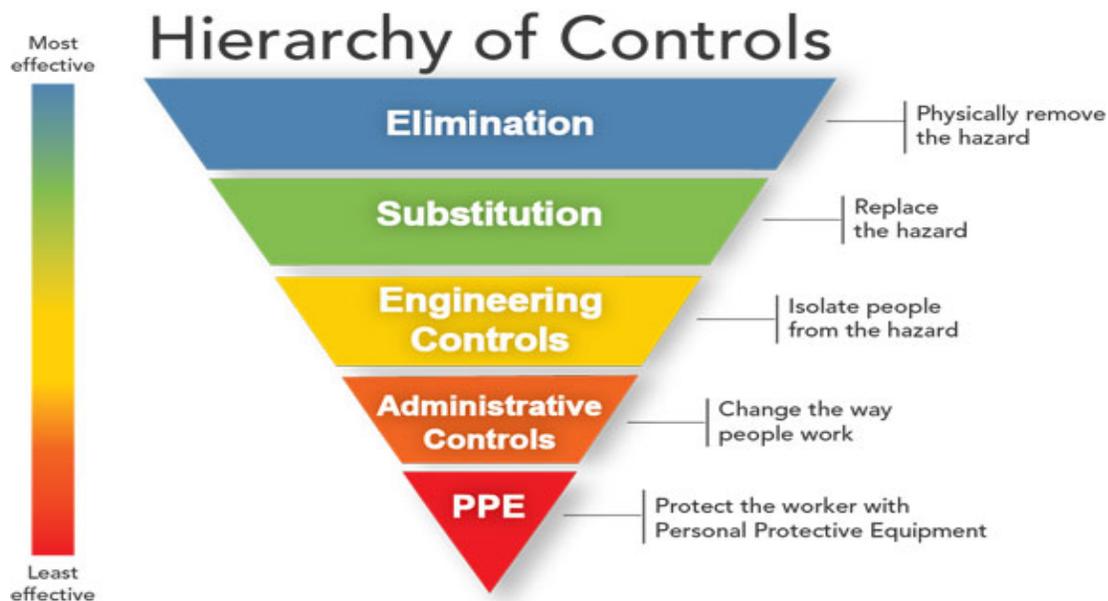
To conduct hazard assessment, proceed as follows:

1. Determine what people do (Tour the entire operation)
2. List all work tasks/activities
3. Identify hazard for each task (Keep asking “what if” on an ongoing basis)
4. Rank hazards according to risk
5. Find ways to eliminate or control hazards
6. Implement the selected controls
7. Communicate the hazards and follow the controls
8. Monitor the controls for effectiveness; and
9. Review and revise hazard assessment as needed.

2.6. Development of Hazard Control Programs

DEVELOPMENT OF HAZARD CONTROL PROGRAMS

As a first step in hazard control, determine if the hazard can be controlled at their source through applied engineering controls. If this does not work, try to put controls between the source and the worker. The closer a control is to the source of the hazard, the better. If this is not possible, hazards must be controlled at the worker level. Example: Workers can be required to use a specific work procedure or practice (Administrative control). Always as a last resort, to control the hazard Personal Protective Equipment should be used.



Control at the level of Worker

Engineering Controls

Engineering controls include the following:

- Substitution of a less harmful material
- Isolation or enclosure of the worker or the process
- Installation of abnormal operations sensors and emergency shutdown devices
- Dilution or local exhaust ventilation
- Use of specialized materials in the construction of the process
- Use of specific procedures to control emissions
- Use of blocks or barricades to prevent worker contact

Administrative Controls

Administrative controls are acceptable procedures to control worker exposure to harmful materials or procedures by:

- Developing and auditing safe work procedures
- Limiting the time of worker exposure (i.e., hot or noisy areas, etc.)
- Using watch men for critical tasks, (tank watch, fire watch, traffic control, security)
- Providing worker training and supervision

Personal Protective Equipment

The use of personal protective equipment is the least desirable control for workplace hazards; however, in some situations the only recourse available to provide adequate protection for the work is the use of personal protective equipment. Section 6 details the requirements, types, use and maintenance of personal protective equipment.

Control at the source

- Elimination – try eliminating the hazard. Getting rid of a hazardous job, tool, process, machine or substance may be the best way to protect the workers.
- Substitution – Try replacing hazardous substances or tools that can limit/eliminate the exposure.
- Redesign – Sometimes engineering can be used to redesign the layout of the workplace, improve lighting, etc.
- Isolation – Isolation, containing or enclosing the hazard is often use to control chemical hazards.
- Automation – Dangerous processes can sometimes be automated or mechanized.

Control the path from the hazard

Barriers – A Hazard can be blocked. Example: Guards on equipment protect against moving parts, Screens and barriers can block welding flash from reaching workers. \

Dilution – Some hazards can be diluted or dissipated. Example: General ventilation might dilute the concentration of hazards gas.

Selecting Controls

Selecting a control often involves:

- Evaluating and selecting temporary and permanent controls;
- Implementing temporary measure until permanent controls can be put in place and;
- Implementing permeant controls when reasonably practicable

2.7. Compliance Monitoring

COMPLIANCE MONITORING

Regardless of the control method used to protect the workers, property and the environment from specific hazards, routine and non-routine inspections, audits and specific monitoring is required to ensure that the control measures remain effective. If the controls are not achieving with the expected outcome, then a review of the controls and why they are not working shall be performed. Possibly other factors were not considered, or conditions have changed. Management will reinforce the controls and review them in safety meetings.

The monitoring may include any of the following:

- Worker drug testing and analysis
- Atmospheric evaluations to determine the presence and concentration of toxic materials
- Noise dosimeter and/or audio-metric testing
- Biological monitoring to determine levels of heavy metals in the body (lead, mercury, chromium, etc.)

Safety Advisors and the Joint Worksite Health & Safety Committee will monitor the effectiveness of the corrective action taken by the employer during inspections and other activities, and/or, in certain cases by OH&S or insurance companies

2.8. Formal Hazard Assessments

General

Formal hazard assessments involve the identification of all jobs and tasks performed by employees, and an assessment of the hazards associated with each task.

A formal hazard assessment is a look at the safety risks that exist within a workplace. This assessment is often performed by the safety team evaluating and ranking potential hazards by their estimated frequency and intensity and determining a margin of safety. Risk analysis is based on hazard assessments.

To obtain a copy of the Formal Hazard Assessment for a task about to be performed please see your supervisor. A copy of all formal hazard assessments will be accessible in each shop.

Procedure

1. Create an inventory of all job position with your organization
2. Form work groups comprised of employees with similar tasks and hazards associated with their job position.
3. List all tasks associated with the jobs performed.
4. Identify and list the hazards associated with each task.
5. Determine Inherent Hazards
6. Determine the existing hazard controls currently in place.
7. Identify controls
8. Rank Residual Risk
9. Determine Frequency in which they happen

Review

Formal Hazard Assessments are to be reviewed minimum every 3 years and/or when;

1. New; equipment, work processes, materials or operations are introduced
2. Operation or process are modified
3. Inspection or investigations identify an unrecognized hazard
4. Joint Worksite health and safety committee bring forward any concern related to a procedure or practice.

2.10. Risk Matrix

RISK		Severity (S)		Probability (P)		Likelihood (F)		Controls ©	
Rating	Focus	Rating	Focus	Rating	Focus	Rating	Focus	Rating	Focus
Critical	Risks that significantly exceed the risk acceptance threshold and need urgent and immediate attention.	Catastrophic (5)	Multiple fatalities or Permanent damage to multiple people.	Certain	Event that may occur with a high frequency during the life time of an operation.	Certain	Occurs more than Three times a year	Elimination (A)	Hazard is Removed
High	Risks that exceed the risk acceptance threshold and require proactive management. Includes risks for which proactive actions have been taken, but further risk reduction is impracticable. However active monitoring is required and the latter requires the s	Major (4)	Single fatality and/or sever irreversible damage or severe impairment to one or more person	Likely	Event may occur with a moderate frequency during the life time of an operation	Likely	Typically occurs once or twice per year	Engineering (B)	Isolates Hazard using Mechanical means
Moderate	Risks that lie on the risk acceptance threshold and require active monitoring. The implementation of additional measures could be used to reduce the risk further.	Serious (3)	Reversible injury or moderate irreversible damage or impairment to one or more persons. Typically a lost time injury	Possible	Event may occur during the life time of an operation	Possible	Typically Occurs once in 2-5 years	Administrative (C)	Limit Hazards using procedures/ training/ installations.
Low	Risks that are below the risk acceptance threshold and do not require active management. Certain risks could require additional monitoring.	Medium (2)	Reversible injuries requiring treatment but dose not lead to restricted duties. Typically a medical treatment.	Unlikely	Event that may occur seldom during the life time of an operation	Unlikely	typically occurs once in 5-10 years	PPE(D)	Controls hazard using Personal Protective Equipment
		Minor (1)	Low level short term subjective inconvenience or symptoms. Typically a first Aid and no medical treatment	Rare	Event that may occur very seldom during the life time of an operation.	Rare	Typically occurs once in 50 years.		
Consequence	1-Minor	2-Medium	3-Serious	4-Major	5-Catastrophic				
Likelihood									
A-Almost certain	Moderate	High	Critical	Critical	Critical				
B-Likely	Moderate	High	High	Critical	Critical				
C-Possible	Low	Moderate	High	Critical	Critical				
D-Unlikely	Low	Low	Moderate	High	Critical				
E-Rare	Low	Low	Moderate	High	High				

2.11. Hazard Definitions

This section has broken hazards down into group, for easier classification on the Formal Hazard Assessment. Under each heading there are number of hazard associated with in the group. Examples are given, if you need further assistance with understanding which class your hazard falls on please contact the Safety Manager for a full list of the hazards under each heading.

- a) Substance That of which a thing consists; physical matter or material i.e. Dust, Fumes
- b) Biological Any substance derived from animal products or other biological sources that could be harmful i.e. Sharps, rodents
- c) Climate The composite or generally prevailing weather conditions of a region, as temperature, air pressure, humidity, precipitation, cloudiness, and winds
- d) Lighting Effects Employees vision i.e. glare, night work.
- e) Ergonomics Employees capabilities and limitations in doing a task that could affect them physically i.e. Bending twisting, pushing, pulling...
- f) Electrical/ Magnetic Relating to or concerned with electricity i.e. Working near worker lines, Digging around utilities' ...
- g) Land Use Changing the original work area. I.e. trenching, clearing...
- h) Gravity Effects stability of the Equipment or worker i.e. slope stability, working at heights
- i) Mechanical Caused by or Derived from Machinery i.e. Pinch points
- j) Coactivity Actions by individuals that may affect the work place i.e. Drugs/alcohol, horse play...
- k) Pressure The exertion of force upon a surface by an object i.e. steam, wind blast
- l) Vibrations/Sound or Pressure waves that required hearing protection or limits to exposure
- m) Social/Cultural Decisions or action that could affect the company reputation
- n) Thermal/Fire/Explosion Handling hot product, may cause Fire or Explosion
- o) External threats Uncontrollable events that affect the work i.e. war, sabotage
- p) Waste Harmful products produced while in the process of doing a job i.e. toxic gases, oils or potential for a spill.
- q) Work Environment Condition at the work site that may cause incidents or harm to workers i.e. confined Space, housekeeping

2.12. Critical Task List: ACP Applied Products.

- | | |
|-----------------------------------|-----------------------------------------------------|
| 1. Driving commercial vehicles | 4. Applying chip seal, fiber matting and Coletanche |
| 2. Operating Equipment | 5. Cold Milling |
| 3. Fueling of vehicles& Equipment | 6. Welding and fabricating |

2.13 Critical Task List: Lafrentz Road Marking

- | | |
|------------------------------------|--------------------------------------------------|
| 1. Driving of commercial vehicles | 4. Producing & applying Thermo and cold plastics |
| 2. Operating equipment | 5. Filling and using propane |
| 3. Fueling of vehicles & equipment | 6. Operating a forklift |

2.14 Critical Task List: Gecan

- | | |
|------------------------------|------------------------------------|
| 1- Operating Lab Instruments | 4- Pouring mixtures |
| 2- Handling Chemicals | 5- Maintenance of Empty Containers |
| 3- Sampling | |

2.15. Formal Hazard Assessment TOC ACP Applied Products

- | | |
|----------------------------|---------------------------|
| 1. Challenger Sweeping | 13. Roller Operations |
| 2. Chip Seal | 14. Rosco Sweeper |
| 3. Coletanche | 15. Rubber Wheeler Roller |
| 4. Confined Space | 16. Shop |
| 5. Crack Sealing | 17. Site Inspections |
| 6. Equipment Repair | 18. Skid steer Operations |
| 7. Forklift Operations | 19. Snow Removal |
| 8. Guard Rail Installation | 20. Spray Patching |
| 9. Loader Operation | 21. Towing Equipment |
| 10. Lock Out Tag Out | 22. Worksite Signage |
| 11. Milling | 23. Yard Maintenance |
| 12. Plowing and Sanding | |

2.16 Formal Hazard Assessment TOC Lafrentz Road Marking

- | | |
|-------------------------------|----------------------------------|
| 1. Durables Markings | 8. Shipping and Receiving |
| 2. Cold Plastic Manufacturing | 9. Shop |
| 3. Equipment Repair | 10. Site Inspection |
| 4. Forklift Operations | 11. System 400 Spray Plastic |
| 5. Lock Out Tag Out | 12. Thermo Plastic Manufacturing |
| 6. Paint Marking | 13. Worksite Signage |
| 7. Power Sweeping | 14. Yard Maintenance |