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Ministry of Labour

400 University Avenue, 12th Floor

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Response to Consultation request: Construction Health and Safety Awareness Training.

General Observations

On the acknowledgements page it is obvious that small contractors (less than 20) had minimal representation in this group.

This being said the outcome of this draft standard (including potential costs of training) appear to be very much in favour of the large contractors. The financial burden is being placed directly on the small employers!

This standard is supposed to address Recommendation # 16 in the Expert Advisory Panel Report chaired by Tony Dean.

Recommendation 16

The Ministry of Labour and new prevention organization should develop mandatory entry-level training for construction workers as a priority and consult with stakeholders to determine other sectors that should be subject to mandatory training for workers.

Perhaps this recommendation should have been considered for construction workers when the the basic Health and Safety Awareness in 4 (or 5) steps was originally considered. (This program was a one shot deal with no upgrading or refreshers.)

It appears now that part of this program will be repeated in the entry level program.

Is the intention to train all 502,000 construction workers in the province (stats Canada June 2016) or was it to come up with a master plan (for new entrants to our industry) that would include curriculum in high schools and colleges and perhaps even grade schools?

There are many construction workers that have achieved various levels of Health and Safety training (e.g. Certified members, union sponsored multi-level training programs, training requirements for inter-provincial work permits, worker and supervisor training requirements within the COR^{TM} audit, not to mention trade specific training during apprenticeships.)

As much as we believe that one brush doesn't fit all applications we do believe that there are basics that are common to all construction sectors. This consultation addresses those common factors.

It is our opinion that to adequately address the requirements spelled out in section 9 of the Program Standard the following content should be included:

(* Items indicated in red are suggested additions to the program content.)

History – Metron

9.1 Legal framework and the roles of Workplace Parties

Partners in Health and Safety Ontario

Content

- Understanding Health and Safety Duties
  - Duties of Employers
    - Definition
    - Duties
    - Instruct, inform, supervise
    - Appoint competent supervision
  - Duties of Supervisors
    - Definition
    - Competent person
    - Responsibilities
    - Who and what a supervisor must know on a site.
  - Duties of Workers
    - Definition
    - Responsibilities
    - Rights
      - Know , participate and refuse
      - Refusal process
      - Repriasal
  - Duties of Health and Safety Rep's and Joint Committee Members
    - When required (more than 19)
    - Selection Process (by workers or Unions)
    - Certified Members (management – workers)
    - Worker Trades Committee (Caused by JHSC)
      - Representatives for all trades.
      - One member represents trades on JHSC.
    - Hazard reporting procedure
    - Additional resources for workers
  - Violence and Harassment policy
  - Fitness for duty requirements

Completion of part # 1

At this point in a normal classroom setting with twenty-four participants a quiz with approximately 20 questions would be handed out.

Time to complete and score the quiz would be about 30 minutes. (Quizzes are scored and passed to the facilitator for review to ensure participant understanding.)

This process is required by the standard before commencing with the balance of the program.

Estimated time (including one 20 minute break and 30 minute quiz) 3 hours.

Completion of part # 1 using a series of electronic quizzes throughout the program would take about 2 hours and fifteen minutes.

9.2 Hazard Identification, Risk Assessment and Control Activities.

- Classification of workplace hazards
  - Hazardous workplace conditions
  - Hazardous worker actions
  - Incident ratio study
- Recognizing Hazards in Construction
  - Fall hazards
  - Electrical hazards
  - Working with or around moving equipment
  - Materials handling hazards
  - Hazards in sewer and watermain construction
- Electronic participant workshop - How many hazards and legal contraventions can you spot in this picture? Three… Five … More than Five? To many to count!
- Review of identified hazards and contraventions. (12)
- Assessing and calculating risk.
- Participant workshop - Calculating and prioritizing hazard risk levels.
  - Frequency x probability x severity of outcome.
- Explaining the hierarchy of controls.
  - Can we eliminate the hazard at the source?
  - Can we contain the hazard along the path?
  - Can we revise the process to reduce the risk of the hazard?
  - Can we reduce the hazard by introducing PPE
- Address limitations of PPE.
- Control Activities must be documented and included in:
  - Worker orientation programs
  - Tool box talks
  - Site specific training programs (Emergency Response Procedures)
  - Site Health and Safety program reference documentation such as
    - Safe Work Policies and Practices
    - Safe Job Procedures as well as Emergency Response Procedures.

9.2 Evaluating your Hazard Assessment Program

Introduce a sample of a Hazard Risk Registry (showing risk level before implementing a control and the risk level after implementing a control & the % change.

You must evaluate your Health and Safety Management system and site(s) performance using a recognized audit tool that verifies required “performance” …. based on support documentation…. , “workplace and worker observations”….. and “interviews” .

Any gaps identified in your Health and Safety Management System evaluation should be prioritized by risk level and incorporated into your continuous improvement action plan.

Time to complete section 9.2 (including quiz & 20 min. break) 1 hour and 30 minutes

Completion of part # 2 using a series of electronic quizzes throughout the program would take about 1hr fifteen minutes

9.3.1 Housekeeping and Access and Egress

- Address common hazards associated housekeeping
- Address common hazards associated access and egress
- Address specific slip, trip and fall hazards due to housekeeping and weather conditions.
    - Ice and snow hazards
    - Freeze and thaw cycles
        - Frozen hazards hidden under snow
        - Hazards with spring thaw (mud)
    - Proper set up of ladders and scaffolds due to weather conditions.

9.3.2 Working with Occupational Health Hazards

Topics for Discussion include:

- Cold and Heat Stress and related sub-topics
- Noise
- Biohazardous Waste – Syringes etc.
- Designated Hazardous Substances such as:
- Asbestos - Lead – Silica;
- Animal and Insect Bites;
- Radiation Hazards and X-Rays.
- PCBs
- Moulds
- Contaminated soils – histoplasmosis
- Man-Made Vitreous Fibers
- Ergonomics and back care
- Sanitation, lunchroom and hygiene
- High Bacteria from lakes and rivers
- Office Ergonomics
- Hand-Arm Vibration Exposure
- Back Care
- Hygiene
- Bacteria (High bacteria can be found in and around lakes and rivers)

Introduction to WHMIS legislation and GHS Harmonization

WHMIS will be modified to incorporate GHS content. (Labels SDS's and training)

Other types of Health Hazards include:

- Dust
- Mist
- Vapour
- Fumes
- Liquids

9.3.3 Slips, Trips and Falls on the Same Level

- Slip, trip and fall hazards
- Walking and working around unprotected floor edges
- Improper use of step ladders

- Unsecured floor opening cover
- Setting up ladders and working in cluttered areas
- Working in cluttered or slippery work areas
- Tripping over electrical cords
- Jumping from heavy equipment
- Working from broken ladders

We need to put more emphasis on the basic causes of the falls. Slips and trips due to housekeeping or environmental hazards, improper use of access and elevating equipment (ladders scaffolds, stages, man lifts etc.).

9.3.4 Ladders and Work Platforms

Common methods of Personal Elevation

- Ladders
- Scaffolds
- Suspended access equipment
- Power elevating work platforms

Examples of where workplace fall protection applies.

Types of ladders:

- Portable
- Step
- Trestle and Platform Ladders
- Fixed Ladders
- Special Purpose Ladders
- Job Built Wooden Ladders

Grade 1 ladders will be required on all construction sites as of Jan. 2017

Scissors lifts , zoom booms and other types of elevating work platforms all have engineered anchor points where workers must attach their lanyards to complete their fall protection systems.

9.3.5 Confined Space

"Working in and around Confined Spaces"

Content

Introduce O. Reg. 632/05 Confined Spaces. Address the fact this regulation is applicable to all industry sectors.

Confined Space "…means a fully or partially enclosed space that:

A) is **not** both designed and constructed for continuous human occupancy, and

B) in which atmospheric hazards may occur because of its construction, location, or contents, or because of the work that is done in it.."

Examples of a fully or partially enclosed spaces would include:

- Vaults – tanks - pits – excavations - man holes etc.

Other examples might include spaces:

- to store material (silo or hopper etc)
- to transport product (tank truck)
- to enclose a process such as a mechanical or electrical room (elevator mechanical room) etc.

Examples … in which atmospheric hazards may occur because of its:

- Construction (trenches, crawl spaces, chaseways etc)

Examples of its location or contents .

- Underground transformer stations, telephone switch stations, sewers etc.)

Examples of the work that is done in it.

- Welding, cutting, braising, spray coating, sealing etc.

Insert a couple of Fatality reports that occurred in confined spaces.

Review that confined spaces can be as simple as:

- Hydro or Bell underground chambers
  or as complicated as active sewers,
- or tanks and ovens
- Tunnels, tanks, transmission pipes and manholes can all be confined spaces.

A Confined Space Program is a written document that includes:

- A method for recognizing each confined space to which the program applies
- A method for assessing the hazards to which the workers may be exposed
- A method for the development of confined space entry plans
- A method for training workers
- An entry permit system

Example of determining if a workplace is a confined space.

Example of a confined space program presented in a flow chart graphic

Estimated time (including one 20 minute break and quiz) 2 hours.

Completion of part # 3 using a series of electronic quizzes throughout the program would take about 1 hr 30 minutes.

9.4.1 Electrical and Energy Hazards

Electrical energy is the most common form of energy used in workplaces. It can be available live through power lines or it can also be stored, for example, in batteries or capacitors. Electricity can harm people in three ways:

- By electrical shock
- By secondary injury due to physical reaction to a shock …and
- By exposure to arc flash

Explain that electrical current will always take the path of least resistance.

- There is always a point of contact (entry) and an exit point.

Explain Current and the body's Reaction to contact with a power source

• 1 Milliampere	Perception level is a faint tingle
• 5 Milliamperes	Slight shock is felt, not painful. Average person can let go. Strong involuntary reactions to shocks in this range can lead to injuries
• 6-25 Milliamperes (women)	Painful shock, muscular control is lost.
• 9-30 Milliamperes (men)	This is called the freezing range or "No let go" range.
• 50-150 Milliamperes	Extreme pain, respiratory arrest, severe muscular contractions. Individual can not let go. Death is possible.
• 1000 – 4300 Milliamperes	Ventricular fibrillation. (The rhythmic pumping action of the heart ceases.) Muscular contraction and nerve damage occur. Death is likely!
• 10,000 Milliamperes	Cardiac arrest, severe burns and death is probable.

Show and discuss examples of common electrical hazards.

- Broken plug ends
- Missing ground pins
- Manufactured extension cords

Show and discuss powerline contacts by;

- Augering post holes
- Crane contacts
- Dump truck contact (raised box)
- Concrete drilling

Address faulty tools.

- damaged case, trigger switch or cord
- damaged extension cords
- failure to use GFI protected circuits.

Understanding "Arc Flash" Arc flash is a phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another, or to ground.

Discuss causes of Arc Flash:

- Dropped tools on an energy source
- Incorrect wiring
- Buildup of dust or moisture on surfaces
- Corrosion of parts and contacts
- Improper work procedures or use of non rated tools.

Disuss the results of Arc Flash when a human is to close to the arc flash. (serious injury and even death can occur).

The best way to avoid Arc Flash… is to completely de-energize and lock out hazardous energy sources.

Hazardous energy is defined as: "any electrical, mechanical, pneumatic, chemical, nuclear, thermal, gravitational, or other energy that can harm people".

In practice, lockout is the isolation of energy from the system (a machine, equipment, or process) which physically locks the system in a safe mode.

When should we use Lock Out?

When making repairs on any energized apparatus.This includes more than just electrical equipment. It could be pneumatic, hydraulic, steam, gas, momentum, chemical or radioactive energy.

- When cleaning or clearing a blocked or jammed mechanism.
- Any situation that requires routine maintenance or repair personnel to work on potentially hazardous equipment.

Common types of lock out tools and methods include:

- Locks
- Tags
- Scissor type Tongues
- Chains (with locks)
- Disconnects (locking valve covers)
- Grounding systems and ground rods
- Blanking and Bleeding of fluid steam, or air/gas systems
- Blocking springs or equipment parts that may have stored energy (momentum)

Discuss inspection criterion for power tools and equipment

Types of controls

- Use proper gage of wire extension cords.
- Protect extension and power cords in traffic areas.
- Use GFI protected circuits on site.
- Use GFI protected power bars.
- Use surge protectors in office computer applications.
- Keep cords and wires out of walkways.
- Remove faulty or damaged tools, equipment or cords immediately.

Use proper Lock Out procedures.

1. Notify employees.
2. Shut down the equipment
3. Isolate all energy sources.

4. Lock out the device and tag it appropriately
5. Identify and release any stored energy and/or block or pin equipment to prevent movement.
6. Verify the lockout.
7. Test the system and verify “0” energy.
8. Perform the work.

And… lead by example!

9.4.2 Falls from Heights

Discuss definitions and give examples of the parts of a fall prevention program.

- Fall protection
- Fall Arrest
- Fall Rescue

Identify and discuss that specific types of construction require special consideration. For example:

- sewer and watermain contractors
- utilities contractors
    - electrical power installations,
    - cable TV
    - telephone

All have their own specific worksite hazards especially when working in and around trenches and excavations.

Steel frame construction has its own unique hazards to deal with as well.

Fall protection planning is a major consideration for all of these activities as is access to and egress from the workplace should an unexpected situation occur.

Discuss that all trades can be subjected falls from heights when performing (installing) any of the following activities:

- Structural steel erection
- Installing Q decking insulation and roofing
- Installing concrete floor, wall & column reinforcing steel & forms
- Assisting with fly form systems
- Placing and finishing concrete
- Installing and removing re-shore posts and forms
- Installing perimeter guardrails on multi-level building projects
- HVAC systems
- Electrical conduit, fixtures and panels
- Fibre optics and specialized computer wiring
- Fire protection systems
- Framing, drywall and ceilings
- High pressure water systems
- Roofing systems
- Sheet metal flashing
- Curtain walls
- Pre-fab panels
- Masonry, brick and siding
- Stucco
- Flashing, caulking and painting etc.

We must continually identify and document potential Fall Hazards

- Masonry applications
  - improper set up of scaffolds
  - lack of proper guardrails
  - improper materials placing or overloading platforms
  - Q decking, insulating and roofing applications
  - tradesmen are constantly working live edges
  - working around roof openings

Other common construction hazards include:

- Unprotected floor openings
- Unguarded elevator shaft openings
- Improperly set up work platforms
- Improper or lack of guardrails and toe boards

Show and discuss hazards when working with ladders.

Show and discuss hazards when over or above operating machinery or water or other liquids.

Discuss O. Reg. 213/91, s. 26.1 (1) "a worker shall be adequately protected by a guardrail system that meets the requirements of subsections 26.3 (2) to (8).

Show and discuss different types of guardrails and their applications.

- Post and fence guardrail system
- Wooden guardrails
- Scaffold Guardrails
- Parapet clamp guardrails
- Permanement guardrails on equipment and machinery.

Workshop on how to properly remove a guardrail on a highrise project to accept a load from a crane.

Explain that if it is not reasonably possible to install a *guardrail system* as required, a worker shall be adequately protected by at least one of the following methods of fall protection:

- Travel restraint system
- A fall restricting system
- A fall arrest system (Used when working at heights over 3 metres).
- A safety net.

A travel *restraint system* meeting regulated requirements must be used if a worker is exposed to a fall of 2.4 metres (8 feet) or more where the worker has access to the perimeter or an open side of:

- a floor, including the floor of a mezzanine or balcony;
- the surface of a bridge;
- a roof while formwork is in place;
- a scaffold platform or other work platform, runway, or ramp.

A *fall restricting system* is designed to limit a worker's free fall to 0.6 metres (2 feet). Used primarily for ladder climbing and wood pole work.

An *approved safety net* designed, tested and installed as per ANSI standard is an acceptable type of fall protection (often used for bridge restoration work or exterior building renovations; especially in

metropolitan areas.) Nets are also used as protection from falling objects for public passing below the work areas.

Personal *Fall Arrest Systems* are used when working at heights over 3 metres.

Show and discuss the three basic parts to a fall arrest system:

- Body wear (Includes a number of different sizes and types of harnesses, belts and positioning systems);
- A connecting device (Includes a variety of materials including rope, wire, nylon and appropriate hardware etc.);
- An Anchorage point connection. (Could be any number of engineered points on a building or machine.)

Show and discuss the parts of a fall arrest system

- Group "A" fall arrest harness
- Lanyard
- Shock absorber
- Locking snap hook
- Carabeener and rope grab
- Lifeline
- Anchors

Show and discuss a Self Retracting lifeline

Discuss swing fall and fall distance and show calculation formula.

Workshop on calculating fall distance.

Show and discuss commonly used anchors and anchor points.

There are three types commonly used in construction:

- Permanent Anchors;
- Web and Beam Clamps; and
- Wood Roof Anchors

Show and discuss Aerial Work Platform Anchorages

- All aerial work platforms have engineered anchor points for fall arrest systems. Never use guardrails as anchor points.

9.4.3. Mobile Equipment and Vehicles

Show and review hazards when working with or around moving equipment.

- Backing up trucks or equipment
- Walking in and around equipment operating areas
- Operators blind spots
- Turn radius of cranes and backhoes
- Grinding and paving operations
- On site traffic control
- Pit and quarry conveyor systems

- Hoisting and rigging operations
- Night paving operations
- Flourscent clothing after dark.
- Limits of approach to powerlines
- Powerline contacts

Describe that roadway delineator set ups and traffic control can only be done by trained traffic controllers. (Reference book 7)

Onsite traffic control and backing up can be done by competent workers.

Emphasize the need to have visual contact with operators when backing up or directing onsite traffic.

9.4.4. Materials Handling

A construction project is simply a massive materials handling program from start to finish.

Materials handling starts with the removal of earth for excavations and ends with topping off the project.

Handling and storage of material;s involves many different activities such as:

- Hoisting steel beams
- Hoisting concrete
- Hoisting other materials and equipment
- Loading and unloading trucks
- Manual lifting and movement of building materials
- Stacking and storing materials of all sorts
- Manual movement with carts and dollies
- Uncrating materials
- Removing debris and garbage

Show and discuss hazards with materials handling and storage that include:

- Slips, trips and falls
- Poor housekeeping
- Poor access and egress
- Unprotected stairs
- Improperly placed electrical cords
- Poorly located lifting devices
- Improperly used lifting devices
- Improper manual lifting techniques
- Improperly stacked or stored materials
- Properly located storage areas (not under crane operating areas)

Types of controls require proper site planning that includes locations of:

- Offices
- Washrooms
- Storage areas
- Lay down areas

- Prefab areas
- Ensure a clear area around buildings for mobile cranes
- Set up a proper onsite traffic control system and proper signage.

Ensure that all materials delivered to the site are palletized, containerized and or bundled..

Use mechanical devices to move materials.

- Dollies
- Fork lift trucks
- Pallet movers
- Wheel barrows
- Providing dock level and ground level unloading areas

Maintain a good clean site at all times.

9.4.5 Excavations and Trenches

Address the differences between a trench and an excavation

- Trench width is narrower than its height
- Excavation width is greater than its height.

Show and discuss “Call before you dig” and colour coding of utilities.

Show and review underground hazards

- collapses
- equipment roll over
- underground services

Review soils types & minimum slope angle

- Type 1 & 2
- Type 3
- Type 4

Review Hazards consistent with work activities.

- Vibration
- Surcharge
- Trench Collapse
- Powerline contact
- Traffic control
- Position of spoil
- Potential atmospheric hazards

Show and discuss safe and unsafe access and egress to and from trenches.

Show and discuss trench shoring systems (Good and bad)

- Trench box
- Hydraulic shoring
- Sheeting and timbering

Emergency Planning and Crisis Management

Discuss that Emergency plans are required in all company workplaces. (Including offices, garages, warehouses, construction sites and maintenance areas). Department managers will be held responsible for plans being in place and appropriate to their respective work areas.and Crisis Management.

Discuss that The plan requires that all workplaces have:

- A written procedure for reporting an emergency
- A list of trained emergency responders and how to contact them. (Trained for Fire, explosion, fall rescue etc.)
- A posted list of phone numbers for emergency and support services (Fire, police MOL hospital etc.)
- A written procedure for incident investigation and corrective action.
- Assignment of a media relations person.
- There is an appropriate emergency warning or signalling device readily available. (On a major **construction site a siren may be required, but a small job may only require an air horn or loud haler.)** Ensure that the Emergency Plan is provided to all external rescue services (i.e. Fire, police, paramedics etc.)

Estimated time (including one 20 minute break and quiz) 3 hours.
Completion of part # 4 using a series of electronic quizzes throughout the program would take about 2 hours and fifteen minutes.

Recommendations

The requirements of this standard surpass a basic one day construction hazard awareness program.

We are confident that given the opportunity to review and adjust some of the content, a specific program outline complete with graphics and workshops could be conducted using a participant response system in a one day program. A complete database, tracking system and the production of certificates is already in place. (Actual training time including quizzes would be 6.5 hrs.)

A simple PowerPoint version of the exact same content can be provided but would likely take about 1.5 days for and instructor to properly deliver and would require a database, data entry time and the production of certificates.

An identical program prepared in an online format (allowing the participant to stop and start at will) can also be provided maintaining consistency of content. Certificates showing performance % would automatically be provided upon completion. (Access to the database could be provided to appropriate employers etc.) Data could be linked to MOL training information.

Using a participant response system in a face to face application would allow for more training time, create more interest and demand participant attention, as quiz answers are automatically registered on an excell spreadsheet and a pass/fail threshold must be met. (This threshold can be set to MOL requirements i.e. 75% - 80% - 90% etc.)

The provider standard appears to be a little too rigid taking into consideration that an employer who requires a JHSC can simply make adjustment to their orientation program to accommodate the requirements of the standard without having to get approval from the CPO.

The fact that specific program content is not addressed in the standard allows for a multitude of programs to be developed without any assurance that the standard is being met.

There is no way of ensuring that the 6.5 hours of training would actually take place.

How would an employer be able to ensure that a JHSC member or other employee for that matter is competent to train other workers to this standard?

Approach # 2 should be scratched!

In order to ensure consistency, specific content must be clearly identified and included in the standard. Specific workplace hazards must be covered in an employer's workplace orientation.

Consistency of program content and ultimately portability of participant program achievement should be the cornerstones of the this standard.