



HEAVY EQUIPMENT OPERATOR (HEO) and SKILLED LABOURER

Part I - Essential Skills & Employability Skills

Part II - PLAR

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Part I: Essential Skills & Employability Skills Curriculum

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Part I: Essential Skills & Employability Skills Curriculum

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Heavy Equipment Operator (HEO) and Skilled Labourer

**Part I: Essential Skills
&
Employability Skills
Curriculum**

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Introduction

Over the past couple of years considerable work has been completed to identify the essential and employability skills for heavy equipment operators (HEO) and skilled labourers. OARS training Inc. developed and piloted an entry-level curriculum for essential and employability skills for HEOs and skilled labourers, through a project funded by Workplace Education Manitoba Steering Committee (WEMSC). This report discusses the program development, participant selection, pilot deliveries, project evaluation, and recommendations for future application with prior learning strategies. This report is considered PART I of the HEO project and primarily addresses the process and training for the pilot including the curriculum. PART II of this report focuses on the PLAR aspects of the potential HEO worker and the labour market that hires them.

Program Development

An essential and employability skills curriculum was developed as a way to provide a pre-training assessment for potential labourers and heavy equipment operators. This program was designed to offer suitability and entry-level skill assessments for people interested in working in construction. The foundation of the program stems from the occupational standards newly set by the Manitoba Industry committee. Research looked at the core tasks from both the HEO and Skilled Labourer standards and compared this to the Building Trades Helper program from the NWT Apprenticeship and Occupational Certification Branch, 2005. The Curriculum and Standards Comparison can be seen in Appendix D. To ensure the core tasks were relevant to the local labour market, OARS training interviewed subject matter experts from Operating Engineers Training Institute of Manitoba (OETIM), Construction and Specialized Workers Union Local 1258, and Borland Construction to identify the competencies required to be an entry-level labourer and heavy equipment operator. From this research the Course Outline and Learning Outcomes were developed (see Appendix A). The course was designed to be progressive in skill development from an entry level Labourer to the skill level of an entry level HEO. The curriculum was designed in a modularized format, which is able to accommodate people who already have prior training or experience in some of the identified competency areas.

This report discusses the pilot training that was delivered in Winnipeg. Following the initial pilot the program was delivered a second time in Fisher River Manitoba and this report is attached as Appendix E Rural Delivery.

The course modules developed were as follows (see Appendix G):

- Safety: Introduction to Safety, Hearing Conservation, Excavation Safety, Trench Safety, Ladder Safety, Fall Protection, Confined Entry, WHMIS, and First Aid;
- Essential Skills: Communication Skills, Construction Measurement, Grade Stakes, and Introduction to Heavy Equipment Operation;
- Employability Skills: Labour Market and Job Search.

Worksite field days were scheduled to assess the effectiveness of the participants' skills when operating heavy equipment, basic hand tools, and practicing safety awareness on the worksite.

Program Instructors

Based on their training, experience and subject matter knowledge, two subject matter experts were involved in the development of this program. Laurie Todd, of Occupational Health and Safety Consulting, was the primary program facilitator and delivered the program with the assistance of Rick Kouk, of Operating Engineers of Manitoba. These instructors were instrumental in the assessment of the participants in the classroom and in the field. Both instructors also contributed to the program design by providing module-specific materials for adaptation and inclusion in the final curriculum.

Participant Selection

Information sessions were organized to provide details on this pilot training program and to identify potential program participants. For the first information session, a flyer was developed and circulated through various employment agencies including Employment and Training Services, as well as the Employment Centres in Winnipeg and Selkirk. It was also advertised in the *Winnipeg Sun* newspaper. Three people attended this session. Due to the poor turnout, a second session was necessary to provide a larger pool of applicants. A second flyer was circulated through targeted organizations including Labour and Immigration, Construction Employer groups, and the Operating Engineers of Manitoba. It was also advertised in the *Winnipeg Free Press*. The second session provided a larger number of potential applicants. A total of 31 people attended the sessions. Of the 31, four people attended for informational purposes, twenty-four applied for the program, and three people decided not to pursue the program.

The final ten participants were selected based on their answers to questions on the intake form and a construction suitability survey (see Appendix B) that the participants completed at the information sessions. The most important criteria screened for included: (a) valid class 5 driver's licence, (b) any construction experience or a related field, i.e., landscaping, and (c) availability. This selection process decreased the pool from 24 applicants to 13, and of the 13 applicants, 10 were accepted into the program.

The demographics of the participant group selected ranged by the following:

- work status (employed, unemployed, career transition)
- age (20 – 40 years)
- language (English, French, other)
- visible minority
- Métis
- experience (truck driving to mining exploration).

The group closely reflected the demographics of a typical job site. It is important to note that all of the participants were male. The only woman who showed interest in participating did not have a valid driver's license, one of the required criteria to participate in the program. It is also important to note that due to the nature of this pilot program, Employment Insurance did not support the training for clients, because it was not a recognized training or employment program. This made it difficult for E.I. recipients to participate in the program without consequence.

Pilot Delivery

The pilot was delivered April 17 to April 28, 2006, from 8:30 am to 4:30 pm. OETIM arranged the training locations for the field assessment and offered classroom space at their office. The field assessment was held on the property of A.P.E. Construction site in Woodlands, MB. The participants provided their own safety boots and hardhats. Acklands Grainger Inc. donated hearing protection and safety glasses for the participants in the program. The participants committed to attending the course free of charge and received no monetary compensation for their time spent.

The program was designed to mimic the worksite in as many ways as possible. The participants were informed to bring lunch conducive to a worksite where microwaves and fast food may not be readily available. Also, as on a typical construction site, every morning a tailgate meeting was held to discuss the prior day and outline the current day's events. At the end of every day, timesheets were completed reflecting the work they completed. In addition, the group also

elected a safety representative in the event of any incidents. The program provided the participants with First Aid Certification and WHMIS Information Certification.

For the two worksite field days, the participants were given directions to the site and were told to make their own way to the site on time and ready for work. The day was organized into two parts, HEO field assessment and basic hand tools activities. While one group worked on the equipment, the other group worked with the hand tools and then switched. The heavy equipment used at the site was an excavator and a dozer, because they are commonly used on worksites. The participants were assessed on these machines for overall operator potential, including performing a pre-operation inspection of the equipment. The field assessment tool used was provided by OETIM and has been a resource in the development of a new criteria-based field assessment (Appendix C). Good news for all when, based on their observation of the participants' skills on the site, A.P.E. Construction asked for a list of the participants for possible employment opportunities.

Project Evaluation

The project was evaluated on two levels, participant results and program evaluation. Although the participant results varied, eight out of ten were positively assessed as potential heavy equipment operators or skilled labourers. Two of the participants presented barriers to full employability. Since the completion of the course, two participants are confirmed to have found employment in operating heavy equipment at an entry-level. At the end of May, the other participants had not been contacted for follow-up.

The evaluation of the program was based on feedback from participants, instructors, employers, and overall project partners. The participants felt that the content was very relevant and reflective of working in construction, but anticipated more seat time on the equipment. They received a very clear picture of the real world of working in construction and benefited directly from Henry Borger of Borland Construction, an employer who came to speak with them.

The instructors recommended significant changes in the duration, content, and assessment process. The pre-training assessment was designed to identify participants with some experience in the industry. As a result, previous knowledge expedited learning, which indicated that the program could be condensed considerably and could be delivered in one week rather than two.

Therefore, with the screening of potential applicants and condensing the program, the training cost would be reduced and targeted to the workers who are assessed to be suitable for working in

construction. The modularized program was designed to follow the principles of prior learning assessment and recognition. This allowed participants who previously obtained certification with WHMIS and First Aid to be exempt from that section of the program.

One of the factors that added value to the program was the dynamic of the group. The networking provided by the participants with more experience in the field was remarkable, reflecting real life job search techniques and showing support for participants whose first language was not English.

The Construction Industry Employment Committee supporting the project identified the key employability skills required of the new employee as follows: be on time, ready to work, and aware of safety on the job site. The participants were measured in all three areas during the first week.

In analyzing the program overall, the success of the program can be measured in different ways. First, the participant selection process allowed people to self-assess their suitability for working in construction before entering into any employment or training situations, which they may not be suited to. Secondly, by developing a modularized program, participants took only the training they required, which again saved time and money. Thirdly, the program assessed the employability skills of the participants within the first few days of the program, by observing them consistently showing up on time, ready to work, and demonstrating basic knowledge of the industry.

Recommendations

This program could be used in several ways to assist the construction industry in recruiting entry-level labourers or heavy equipment operators more efficiently. One additional benefit is that it could be used as an effective screening tool, to assess workers against the skills required to be successful in this line of work. Therefore, we recommend:

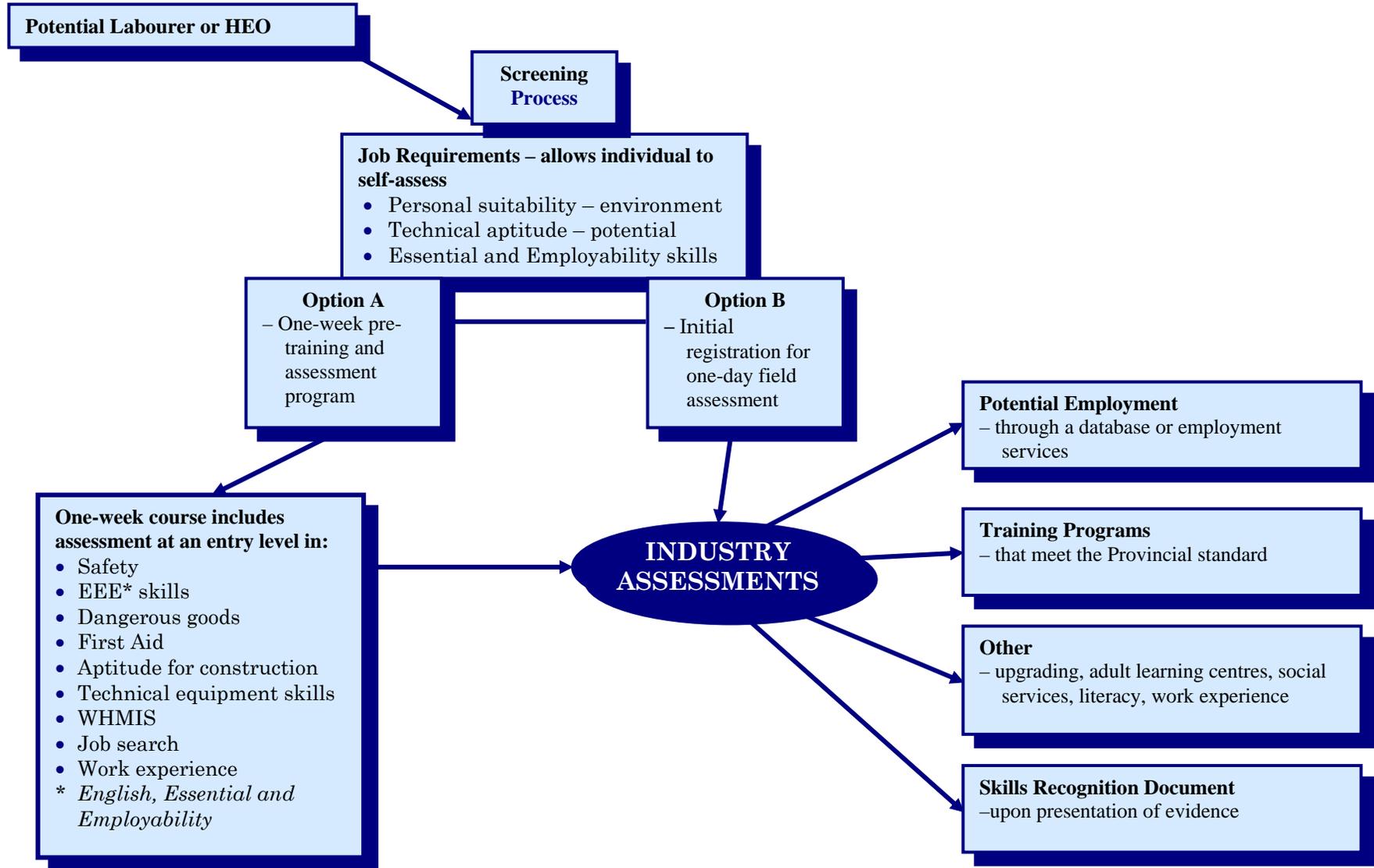
- Firstly, that anyone applying for heavy equipment operator training programs should be required to participate in a screening process, as a way to assess their suitability before entering a program. HEO training is usually six weeks long and currently costs anywhere from 14 to 18 thousand dollars per student. This screening benefit is for employers and workers alike. Neither would need to invest a lot of time and money into training to determine their suitability to construction.
- Secondly, if someone can illustrate their prior knowledge and skills of the work, they may not need an entire training program, just gap training.

- Thirdly, industry could adopt a labour market model, as seen on page six, which addresses how pre-screening is done and by whom, and make it available to small, medium and large employers who may not have the time or resources to pre-screen effectively.

Conclusion

Employers in need of heavy equipment operators would benefit largely, from a financial perspective if they could more easily access qualified entry level workers. The cost of equipment for training purposes is substantial, so the faster the assessment process, the less costly the training will be. The cost of turnover would decrease, because they would be hiring workers who are deemed suitable to work in the construction industry and therefore not spending time and resources on the workers who are not. Finally, the integration of essential and employability skills into occupation specific training and education institutions needs to be addressed, where it does not already exist. By integrating these skills into those programs, people completing these programs will have learned the skills necessary to enter and sustain employment in the construction industry.

The following flow chart model illustrates how HEOs could be easily identified and streamed through an appropriate assessment and certification process and on their way to employment or other necessary referrals. A full explanation of the worker intake model can be seen in PART II page 5.



Appendix A:
Learning Outcomes

LEARNING OUTCOMES

At the end of the training, the learner will be able to:

Essential/Employability Skills

- Demonstrate the use of both the imperial and metric systems of measurement.
- Perform basic measurement and math calculations used in construction.
- Describe roles and responsibilities of individuals on a work site.
- Communicate on the worksite including hand signals and signage.
- Demonstrate working as a team.
- Describe how to ask appropriate questions when necessary.
- Describe construction documents.
- Describe working conditions in construction.
- Describe the employment process and how to access it.
- Identify employers of each occupation.
- Illustrate entry-level employer requirements for skilled Labourer/HEO.
- Interpret personal suitability for construction and or HEO.
- Display examples of showing respect to others.
- Explain the importance of a positive attitude.
- List behaviours that illustrate initiative.
- Document their work time accurately.
- Navigate through the labour market information to target their job search.
- Interpret the labour standards for the construction industry.
- Recognize employer needs and customize their job search to meet those needs.

Equipment and Tool Usage

- Identify the types of heavy equipment used in construction.
- Describe the basic operations of a dozer, excavator.
- Explain what to look for when conducting a walk-around inspection of the work area.
- Perform the pre-operation inspection of equipment.
- Explain the correct way to mount/dismount heavy equipment using 3-point contact.
- Describe appropriate clothing/accessories to wear when operating heavy equipment.
- Describe basic hand and horn signals.
- Demonstrate the use of hand tools, power tools and fasteners.

LEARNING OUTCOMES - continued

Safety

- Identify the rights of construction workers regarding safe work practices.
- Describe safe work practices on a work site.
- Identify potential hazards on a work site.
- Describe ways to prevent hazards on a worksite.
- Demonstrate appropriate use of Personal Protective Equipment (PPE).
- Identify appropriate safety equipment for the work environment.
- Describe lock out and tag out procedures.
- Identify procedures for notifying supervisor of unsafe working conditions.
- Perform basic First Aid.
- Recognize WHMIS symbols and other related warning systems.
- Explain the dangers associated with each WHMIS symbol.
- Recognize the label or a “controlled product” (WHMIS label).
- Find information on a Material Safety Data Sheet (MSDS).
- Inspect a ladder, set-up and use a ladder safely, construct a wood-built ladder.
- Explain the common nomenclature used on grade stakes and the term “slope.”
- Identify types of excavation collapses.
- Identify the types of safe shoring/excavation techniques for working in trench excavations.
- Describe the basic procedures for installing wood shoring in a trench excavation.
- Describe how to work safety in a trench cage.
- Determine the type of wood shoring needed for a trench excavation using the Manitoba shoring tables.
- Recognize the WHMIS symbols and other related warning systems.
- Explain the dangers associated with each WHMIS symbol.
- Recognize the label for a “controlled product” (WHMIS label).
- Find information in a material safety data sheet.

Appendix B:

Intake Form and Suitability Survey

INTAKE FORM

Name _____ Email _____

Current Address _____ Postal Code _____

Daytime Number _____ Cell Number _____ SEX M F

Complete the following questions as accurately as possible.

EDUCATION:

Please circle last formal grade level completed: 7 8 9 10 11 12

Have you gone for further education since you left school? (Circle one) Yes No

If you have previously enrolled in any post-secondary education or training please list.
(i.e., College, University, Training programs, etc.)

| Institution | From MM-YY | To MM-YY | Partial or Completed | Program/ Courses |
|-------------|---------------|-------------|-------------------------|---------------------|
| | | | | |
| | | | | |
| | | | | |
| | | | | |

WORK HISTORY

Please list your most relevant work experience related to construction:

Previous Employer: _____

Address: _____

Job Title/Position: _____

Date (From MM/YY to MM/YY) _____

Reason for Leaving _____

What did you do at your last job? _____

1 = I don't know how to use
2 = I need a little help to use
3 = I can use this well
4 = I can show others how to

Identify your current skill level for the following tools and equipment by placing a check mark (✓) in the appropriate column using this scale. →

List any other tools or equipment you have used in the space provided.

| Tools | 1 | 2 | 3 | 4 |
|-----------------------|----------|----------|----------|----------|
| Tape measure | | | | |
| Screwdriver | | | | |
| Hammer | | | | |
| Sledge hammer | | | | |
| Shovels | | | | |
| Wheelbarrow | | | | |
| Portable circular saw | | | | |
| Quick saw | | | | |
| Chain saw | | | | |
| Drills | | | | |
| Other Tools | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| Equipment | | | | |
| Backhoe | | | | |
| Motor Scraper/Buggy | | | | |
| Farm Equipment | | | | |
| Forklift | | | | |
| Semi Trailer | | | | |
| Landscaping Equipment | | | | |
| Other Tools | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

SELF-ASSESSMENT

Name: _____

Is this the job for you?

Please write your name and then answer these questions, with a “✓”, as honestly as you can.

| Question | Yes | No | Not sure |
|--|------------|-----------|-----------------|
| Section A | | | |
| 1. Have you worked with Heavy Equipment before now? | | | |
| 2. Have you taken training in Heavy Equipment Operation (HEO) before now? If Yes, Where: When: | | | |
| 3. Average starting wages for HEOs working full time are about \$32,000. Is this okay for you? | | | |
| 4. Can you do the work of an HEO, for example walk, lift, bend and adjust equipment? | | | |
| 5. Do you have an up-to-date Class 5 driver's licence? | | | |
| 6. Are you able to move a heavy object that weighs more than 50 lb.? | | | |
| 7. Are you able to work at heights? | | | |
| 8. Do you have a good sense of balance? | | | |
| 9. Can you easily figure out distances between equipment? | | | |
| 10. Do you build things? | | | |
| 11. Do you fix things like motors or other machinery? | | | |
| 12. Do you use basic hand and power tools a lot? | | | |
| 13. When you've worked or have gone to school, did you show up most of the time? | | | |
| 14. When you've worked or have gone to school did you show up on time? | | | |
| 15. Are you able to work long hours or shifts, if this is necessary for a job, sometimes starting very early in the morning? | | | |

| Question | Yes | No | Not sure |
|--|-----|----|----------|
| Section B | | | |
| 16. Do you mind seasonal work, which is, working for a few months at a time, knowing that it affects the amount of money that you get? | | | |
| 17. Do you mind breaks in jobs, knowing that it affects the amount of money that you get? | | | |
| 17. Do you mind working outdoors in very hot or very cold weather? | | | |
| 18. Do you mind working in places where it is dirty, dusty, smoky and noisy? | | | |
| 19. Do you mind working underground? | | | |
| 20. Do you mind sitting in vehicles for a very long time? | | | |
| 21. Do you mind working with other people? | | | |
| 22. Do you mind taking directions from other people? | | | |
| Section C | | | |
| 23. Are you able to accept work that takes you away from home? | | | |
| 24. Is there someone who can take over if you need to work away from home? | | | |
| 25. If you have children, will you be able to get reliable childcare? | | | N/A |
| 26. Are you willing to leave your community to get work? | | | |
| 27. Do you have a telephone at home so you can get messages about a job site? | | | |
| 28. Do you have a way to get to a job site quickly and easily? | | | |

Appendix C:

Assessor Guide for Field Assessments

Recognition of Prior Learning as a Heavy Equipment Operator (HEO)

Recognition of Prior Learning as a Skilled Labourer

Recognition of Prior Learning as a Heavy Equipment Operator (HEO)

Field Test

Introduction

To address the need for work ready Heavy Equipment Operators (HEO), the Government of Manitoba has implemented an initiative to develop a field test to assess a person's overall suitability to work in the Heavy Construction industry. This field test, developed and validated by subject matter experts in the industry, reflects the 2004 industry-defined occupational standards of this occupation. It evaluates many aspects of HEO including health and safety requirements, required tools and equipment. The field test is primarily a demonstration of the person's knowledge, skills and attitudes when working in the industry.

What is competency-based assessment?

Competency is defined as a person's ability to demonstrate the skills and attitudes required for a particular job. The purpose of an HEO assessment is to identify where an individual's skills are compared to what is needed for an entry-level HEO. Not all applicants will be ready to work and there are a few instances when applicants fail completely. The assessment will also result in a clear understanding of any training that may be required. The assessment is intended to point the way to employers and employment or for referrals to further training, employment counselling, upgrading opportunities, or work experience.

Competency based assessment is not an isolated activity and usually form part of a pathway to a goal. Not all of the applicants will be successful; this ought not to be seen as a failure but as opportunities for further training or development. When assessments are undertaken in a fair and unbiased manner, there are very few instances when applicants fail completely. It is important that all applicants know in advance how this field assessment for an entry level HEO is structured.

What is the process to conduct a field assessment for an entry level HEO?

The goal of this field assessment is to gather sufficient, current and valid evidence of the applicant's ability to perform to the competencies expected of an entry level HEO. The process to conduct this field assessment in an ethical manner is as follows:

Prior to the Field Assessment

Review in detail the supporting documentation on the field assessment. In each of the skill demonstration components, a minimum of 80% of the competencies described must be demonstrated by the applicant. At this standard, the person is deemed to be competent in the area.

Ensure that the equipment used in the course of the field assessment is in good working condition, is currently used by employers and is available in a timely manner for the field assessment

Advise the applicant of the date, time and location of the field assessment and gave an overview of what will be undertaken in the course of the evaluation. If possible, indicate a timeline to the applicant. Advise the applicant that there is also a need to provide their own Personal Protective Equipment (PPE), be appropriately dressed to work on a construction site, bring current certificates and a driver's license. The certificates needed are First Aid, WHMIS, and Dangerous Goods. Check to ensure that the applicant has understood all that has been discussed.

Ensure that copies for all the necessary recording documentation is available.

During the Field Assessment

Record the name of the applicant and ensure that only pen is used to record the outcomes. If changes/errors are made, draw one line through the information and rewrite the corrected comments. Under no circumstances can a pencil or Wite-Out™ be used on the recording documentation.

When the applicant arrives on site, ensure that the person is dressed appropriately and has current PPE. 100% of the assessment criteria must be met. After the validity of their driver's licence has been clarified and the currency of Certificates (First Aid, WHMIS, and Dangerous Goods) confirmed, the field assessment continues as described.

Once the demonstration of the lock-out and tag-out procedure is completed and all of the required pre-op documentation completed, and a demonstration of the applicant's skills is needed. Depending on the type of equipment available for the field test, prepare in advance a job that an entry level HEO would be expected to perform. In the course of the applicant's preparation, demonstration, and completion of the job, assess, using the criteria described, how the applicant communicates, evaluates the job/site conditions and once completed, secures the equipment. If necessary, add explanatory notes.

Clarify information from the candidate if needed.

Do not attempt to calculate how the candidate has performed until the entire field assessment is completed.

After the Field Assessment is completed

- Review each section and determine whether or not competency has been attained in each of the skill sections
- Document on the final page the results of the assessment including the outcomes.
- Sign and date the required documentation
- Provide feedback to the applicant. This includes:
 - Clear, constructive and concise reasons for the decision
 - How to overcome any identified gaps
(An explanation of an appeals/reassessment process if appropriate)
- Ask for feedback from the applicant on the field assessment process.

PLAR - Heavy Equipment Operator (HEO)

Name of Applicant:
 Name of Assessor:
 Field Test Location:
 Date:
 Page:

| Topic | Assessment Method | Assessment Criteria | Performance Results | Comments |
|-------|--|--|-----------------------------|----------|
| OHS | Demonstrate the lock-out and tag-out procedure | <ul style="list-style-type: none"> <input type="checkbox"/> Shut down the equipment. <input type="checkbox"/> Disconnect the power supply or have it disconnected. <input type="checkbox"/> Note clearly on a plastic tag-out tag the problem with the equipment. <input type="checkbox"/> Hang a 'lock-out' tag to the ignition switch and ensure that it is visible. <input type="checkbox"/> Advise the supervisor ASAP of the problem. <input type="checkbox"/> Follow the instructions of the supervisor to either remove the equipment or leave it as is. <input type="checkbox"/> Secure the broken equipment with a padlock. <input type="checkbox"/> Retain the key until the machinery is repaired. | 100% of assessment criteria | |
| | | | Outcome: | |
| | Performs pre-operational inspection. | <p>Pre-Operational Inspection</p> <ul style="list-style-type: none"> <input type="checkbox"/> Check motor oil levels. <input type="checkbox"/> Check transmission, hydraulic and coolant levels <input type="checkbox"/> Do a walk around and ensure that there are no leakages. <input type="checkbox"/> Check to ensure that the parking brake has been applied. <input type="checkbox"/> Check the equipment's tires. <input type="checkbox"/> Start the machine and recheck to ensure that all fluid levels are appropriate. <input type="checkbox"/> Ensure that the gauges are working properly. <input type="checkbox"/> Test gauges if needed. <input type="checkbox"/> Do a sufficient warm-up prior to engaging the equipment. | 100% of assessment criteria | |
| | | | Outcome: | |

PLAR - Heavy Equipment Operator (HEO)

Name of Applicant:
 Name of Assessor:
 Field Test Location:
 Date:
 Page:

| Topic | Assessment Method | Assessment Criteria | Performance Results | Comments |
|------------------|--|---|-----------------------------|----------|
| Basic Operations | Communicate on the worksite | <ul style="list-style-type: none"> <input type="checkbox"/> Asks questions for clarification and is prepared to admit to concerns about the job or site. <input type="checkbox"/> Speaks assertively <input type="checkbox"/> Communicates on a one to one basis with people <input type="checkbox"/> Works as part of a team <input type="checkbox"/> Communicates respectfully with co-workers <input type="checkbox"/> Use hand signals to communicate with the various equipment operators. <input type="checkbox"/> Use radios to communicate with the various equipment operators. <input type="checkbox"/> Recognize signage on the site inc. caution tape and other signs e.g. the location of the fire extinguisher and the First Aid box. <input type="checkbox"/> Identify the muster area in the event of a serious accident. <input type="checkbox"/> Identify safety hazards as required. | 80% of assessment criteria | |
| | | | Outcome: | |
| | Evaluate job conditions and determine method of approach | <ul style="list-style-type: none"> <input type="checkbox"/> Determine soil conditions e.g. wet, dry, frozen or thawing <input type="checkbox"/> Determine the type of equipment depending on the job needed <input type="checkbox"/> Use Grade stakes <input type="checkbox"/> Work within boundaries <input type="checkbox"/> Solve basic problems related to conditions and equipment | 80% of assessment criteria | |
| | | | Outcome: | |
| | Secures unattended equipment | <ul style="list-style-type: none"> <input type="checkbox"/> Ensure that the equipment is parked on level ground. <input type="checkbox"/> Ensure that the parking brake is engaged. <input type="checkbox"/> Lower the equipment, i.e., the blade, rippers, bowls. <input type="checkbox"/> Lower the cab. | 100% of assessment criteria | |
| | | | Outcome: | |

Name: _____

Address: _____

Postal Code: _____

Tel. Number: _____

Expires:

Current Driver's Licence ID _____

Current WHMIS Certificate _____

Current First Aid Certificate _____

Current Dangerous Goods Certificate _____

Used PPE appropriately:

Yes No

Comments:

Demonstrated lock-out and tag-out procedure

Performed pre-operational inspection

Communicates on the worksite

Demonstrated on Site: Provide overview

Evaluated job conditions and determine method of approach

Secures unattended equipment

Essential Skills/Employability

Assessor:

Print Name:

Signature

Applicant:

Print Name:

Signature

Location of Field Test:

Date:

Field Test: Recognition of Prior Learning as a Skilled Labourer

Field Test

Introduction

To address the need for a steady supply of Skilled Labourers, the Government of Manitoba has implemented an initiative to develop a field test to assess a person's overall suitability to work in the Construction industry. This field test reflects the provincial standards of this occupation and evaluates many aspects of the occupation including health and safety requirements, required tools and equipment. The field test is primarily a demonstration of the person's knowledge, skills and attitudes when working in the industry as a skilled labourer.

What is competency-based assessment?

Competency is defined as a person's ability to demonstrate the knowledge, skills, judgments and attitudes required for a particular job. Assessment is the process of collecting evidence and making judgments on whether competency has been achieved. The purpose of this assessment is to confirm that an individual can perform the competencies expected of an entry-level skilled labourer; these competencies comply with the defined provincial standards.

Competency based assessment is not an isolated activity and usually form part of a pathway to a goal. Not all of the applicants will be successful; this ought not to be seen as a failure but as opportunities for further training or development. When assessments are undertaken in a fair and unbiased manner, there are very few instances when applicants fail completely. It is important that all applicants know in advance how this field assessment for an entry level skilled labourer is structured.

What is the process to conduct a field assessment for an entry level Skilled Labourer?

The goal of this field assessment is to gather sufficient, current and valid evidence of the applicant's ability to perform to the competencies expected of an entry level Skilled Labourer. The process to conduct this field assessment in an ethical manner is as follows:

Prior to the Field Assessment

Review in detail the documentation supporting the field assessment. In each of the skill demonstration components, a minimum of 80% of the competencies described must be demonstrated by the applicant. At this standard, the person is deemed to be competent in the area.

Ensure that the equipment used in the course of the field assessment is in good working condition, is currently used by employers and is available in a timely manner for the field assessment

Advise each applicant of the date, time and location of the field assessment and gave an overview of what will be undertaken in the course of the evaluation. If possible, indicate a timeline to the applicants. Advise the applicants that there is also a need to provide their own Personal Protective Equipment (PPE), be appropriately dressed to work on a construction site, and bring current certificates and a driver's license. The certificates needed are First Aid, WHMIS, and Dangerous Goods. Check to ensure that the applicants have understood all that has been discussed. It is proposed that the applicants work in pairs through the various remaining work stations and each applicant is individually assessed. The assessors will then collaborate to ensure that that both applicants demonstrated safety awareness and worked well with the other applicant.

Ensure that copies for all the necessary recording documentation are available.

During the Field Assessment

Record the name of the applicants and ensure that only pen is used to record the outcomes. If changes/errors are made, draw one line through the information and rewrite the corrected comments. Under no circumstances can a pencil or Wite-Out™ be used on the recording documentation.

When the applicants arrive on site, ensure that each person is dressed appropriately and has current PPE. 100% of the assessment criteria must be met. After the validity of their drivers' licences has been clarified and the currency of certificates (First Aid, WHMIS, and Dangerous Goods) confirmed, the field assessment continues as described.

Using the assessment criteria for each skills section, evaluate how each applicant completes each section. If necessary, add explanatory notes.

Clarify information from the applicant(s) if needed.

Do not attempt to calculate how the applicants have performed until the entire field assessment is completed.

After the Field Assessment is completed

- Review each section and determine whether or not competency has been attained in each of the skill sections
- Confer with the other assessor to finalize the outcomes for each applicant.
- Document on the final page the results of the assessment including the outcomes.
- Sign and date the required documentation.
- Provide feedback to each applicant. This includes:
 - Clear, constructive and concise reasons for the decision
 - How to overcome any identified gaps
(An explanation of an appeals/reassessment process if appropriate)
 - Ask for feedback from the applicant on the field assessment process.

PLAR - Skilled Labourer

Name of Applicant:
 Name of Assessor:
 Field Test Location:
 Date:
 Page:

| Topic | Assessment Method | Assessment Criteria | Performance Results | Comments |
|-------|--|---|-----------------------------|----------|
| OHS | Demonstrate the lock-out and tag-out procedure | <ul style="list-style-type: none"> <input type="checkbox"/> Shut down the equipment <input type="checkbox"/> Disconnect the power supply or have it disconnected <input type="checkbox"/> Note clearly on a plastic tag-out tag the problem with the equipment <input type="checkbox"/> Hang a 'lock-out' tag to the ignition switch and ensure that it is visible <input type="checkbox"/> Advise the supervisor ASAP of the problem <input type="checkbox"/> Follow the instructions of the supervisor to either remove the equipment or leave it as is <input type="checkbox"/> Secure the broken equipment with a padlock <input type="checkbox"/> Retain the key until the machinery is repaired. | 100% of assessment criteria | |
| | | | Outcome: | |
| | Use a ladder(s) safely | <ul style="list-style-type: none"> <input type="checkbox"/> Check that the ladder is in good repair i.e. no broken or damaged rungs <input type="checkbox"/> Ensure that the ladder is suitable for the job being performed i.e. not too long and not too short <input type="checkbox"/> Put the kicker at the bottom of the ladder. <input type="checkbox"/> Check that the ladder is on a solid surface and that it doesn't slip or slide <input type="checkbox"/> Climb the ladder, with a 'spotter' holding it <input type="checkbox"/> Tie the ladder at the top to a secure/solid location. A fastener can be used if necessary <input type="checkbox"/> If climbing onto a roof, the ladder must be a minimum of three feet beyond the roof or work area. | 100% of assessment criteria | |
| | | | Outcome: | |

PLAR - Skilled Labourer

Name of Applicant:
 Name of Assessor:
 Field Test Location:
 Date:
 Page:

| Topic | Assessment Method | Assessment Criteria | Performance Results | Comments |
|------------------|--|---|---|---------------------------------------|
| Use of Equipment | Use hand tools | <ul style="list-style-type: none"> <input type="checkbox"/> Identify the right tool on a consistent basis <input type="checkbox"/> Use the right tool for the job <input type="checkbox"/> Uses own tool(s) when appropriate <input type="checkbox"/> Demonstrate safe handling of tools, equipment and materials <input type="checkbox"/> Demonstrate proper handling of tools, equipment and materials <input type="checkbox"/> Clarifies for meaning when unsure and when in doubt asks. | Identify four of five pieces of equipment (80%) | A variety of hand tools available |
| | | | Outcome: | |
| | Use power tools and equipment | <ul style="list-style-type: none"> <input type="checkbox"/> Identify the right tool on a consistent basis <input type="checkbox"/> Use the right tool for the job <input type="checkbox"/> Use own tool(s) when appropriate <input type="checkbox"/> Demonstrate safe handling of tools, equipment and materials <input type="checkbox"/> Demonstrate proper handling of tools, equipment and materials <input type="checkbox"/> Clarifies for meaning when unsure and when in doubt asks <input type="checkbox"/> Can identify when s/he is not comfortable working with the equipment <input type="checkbox"/> Distinguish between domestic and industrial equipment and adjust significantly to the differences. | Identify four of five pieces of equipment (80%) | A variety of power tools available |
| | | | Outcome: | |
| Work with Others | Clean work area NOTE: Clean the work area and move tools, equipment and materials can be combined. | <ul style="list-style-type: none"> <input type="checkbox"/> Take the initiative to clean the area <input type="checkbox"/> Dispose of garbage appropriately <input type="checkbox"/> Work within own limitations <input type="checkbox"/> Recognize the difference between contaminated and non-contaminated garbage <input type="checkbox"/> Separate and store correctly reusable materials. | 80% of Assessment criteria demonstrated. | Scaffolding, or stacking of materials |
| | | | Outcome: | |

PLAR - Skilled Labourer

Name of Applicant:
 Name of Assessor:
 Field Test Location:
 Date:
 Page:

| Topic | Assessment Method | Assessment Criteria | Performance Results | Comments |
|-----------------|---------------------------------------|--|--|---|
| | Move tools, equipment, and materials. | <ul style="list-style-type: none"> <input type="checkbox"/> The person consistently retrieves the right piece of equipment <input type="checkbox"/> Identify the different materials e.g. 2x4, 2x6 <input type="checkbox"/> Demonstrate safe handling of tools, equipment and materials <input type="checkbox"/> Demonstrate proper handling of tools, equipment and materials <input type="checkbox"/> Clarifies for meaning when unsure and when in doubt asks. | <p>80% of assessment criteria demonstrated.</p> <hr/> <p style="text-align: center;">Outcome:</p> | |
| Basic Operation | Communicate on the worksite | <ul style="list-style-type: none"> <input type="checkbox"/> Asks questions for clarification and is prepared to admit to concerns about the job or site <input type="checkbox"/> Speaks assertively <input type="checkbox"/> Communicates on a one to one basis with people <input type="checkbox"/> Works as part of a team <input type="checkbox"/> Communicates respectfully with co-workers <input type="checkbox"/> Use hand signals to communicate with the various equipment operators <input type="checkbox"/> Use radios to communicate with the various equipment operators <input type="checkbox"/> Recognize signage on the site inc. caution tape and other signs e.g. the location of the fire extinguisher and the First Aid box <input type="checkbox"/> Identify the muster area in the event of a serious accident <input type="checkbox"/> Identify safety hazards as required. | <p>80% of assessment criteria</p> <hr/> <p style="text-align: center;">Outcome:</p> | Assessed when cleaning the work area and moving tools, equipment and materials. |

Name: _____

Address: _____

Postal Code: _____

Tel. Number: _____

Expires:

Current Driver's Licence ID _____

Current WHMIS Certificate _____

Current First Aid Certificate _____

Current Dangerous Goods Certificate _____

Used PPE appropriately:

Yes No

Comments:

Demonstrated lock-out and tag-out procedure

Performed pre-operational inspection

Communicates on the worksite

Demonstrated on Site: Provide overview

Evaluated job conditions and determine method of approach

Secures unattended equipment

Essential Skills/Employability

Assessor:

Print Name:

Signature

Applicant:

Print Name:

Signature

Location of Field Test: _____

Date: _____

Appendix D:

Curriculum and Standards Comparison

Comparison of Skilled Labourer/HEO Curriculum & Standards

| Core Entry Level Skills* | Core Occupational Standards for Skilled Labourer | Core Occupational Standards for Heavy Equipment Operator |
|--|---|---|
| <p>Task #1: Demonstrate Safe Work Practice:</p> <ol style="list-style-type: none">1. Wear appropriate clothing.2. Use PPE.3. Adhere to lock-out and tag-out procedures.4. Use tools and equipment safely.5. Use ladders safely.6. Respect the environment. | <p>Task #1: Coordinates and communicates with other jobsite personnel:</p> <ol style="list-style-type: none">1. Uses occupational communication and information technologies.2. Use technical documents.3. Interprets safety requirements.4. Provides skills, coaching and other work related guidance to learners. | <p>Task #1: Occupational Health and Safety (OHS) and the Environment:</p> <ol style="list-style-type: none">1. Complies with First Aid requirements.2. Complies with all requirements for the safe handling, storage and disposal of hazardous material.3. Complies with all requirements on OHS and the environment.4. Complies with employer/client OHS requirements inc. PPE, lock-out and tag-out procedures. |
| <p>Task #2: Demonstrate Trade Foundation Skills:</p> <ol style="list-style-type: none">1. Perform basic calculations.2. Describe construction documents.3. Describe roles and responsibilities of individuals on work site.4. Communicate on the work site. | <p>Task #2: Selects, uses and maintains tools and equipment:</p> <ol style="list-style-type: none">1. Uses hand/power tools and equipment inc. materials handling equipment.2. Unloads/loads construction materials and equipment.3. Uses winching, rigging and hoisting equipment/accessories. | <p>Task #2: Heavy Equipment Inspection and basic maintenance:</p> <ol style="list-style-type: none">1. Interprets manufacturer/employer documentation re: inspection/maintenance and other documents.2. Performs or arranges for servicing and scheduled maintenance.3. Performs per-operational/post operational inspection.4. Secures unattended equipment.5. Monitors/adopts operation regarding seasonal and atmospheric impacts on site conditions and equipment. |

Task #3:

Describe tools, equipment and materials:

1. Describe hand tools and equipment.
2. Describe power equipment.
3. Describe fasteners.
4. Describe sealants and adhesives.

Assist Tradespeople in the following:

1. Move tools, equipment and materials.
2. Use hand tools.
3. Use power tools and equipment.
4. Clean work area.

Task #3:

Prepares, organizes and maintains jobsite:

1. Perform duties re: general job site preparation and housekeeping.
2. Erects and /or assists in erection/dismantling of scaffold.
3. Erects, uses and inspects work platforms and ladders.
4. Performs demolition-related duties (explosive/non-explosive).

Task #3:

Work Planning and Co-ordination and site Preparation:

1. Communicate with supervisor and co-workers on the task at hand.
2. Evaluate job conditions and determine method of approach.

The left side of this chart illustrates the core learning outcomes from the entry-level construction course being used in the Northwest Territories. The middle and left charts illustrate the core competencies from the Manitoba Standards for Skilled Labourer and HEO. The comparison illustrates the near identical nature of the core skills required.

Source of Information:

**Building Trades Helper, NWT Apprenticeship and Occupational Certification, June 2005.*

Resource:

1. *Ready to Work (North) focuses on Attitudes, Skills and Knowledge of Industry and Organization*

Appendix E:
Report on Rural Delivery

Report on Rural Delivery

June 2006

Final Report Developed for:

Workplace Education Manitoba Steering Committee

Project Dates: February 1, 2005 to March 31, 2006

Introduction

An essential and employability skills curriculum was developed as a way to provide a pre-training assessment for potential labourers and heavy equipment operators. This curriculum was successfully piloted in Winnipeg, an urban centre, in April 2006 and then re-piloted in Fisher River, Manitoba, a rural community. This report discusses the modifications necessary when delivering programs such as this, in rural versus urban areas.

Participant Selection

The selection of participants was approached very differently in this pilot. Unlike the urban pilot, an information session was not required. The potential applicant pool is significantly smaller in a rural centre and is therefore more manageable. The representatives of the communities of Fisher River Cree Nation and Peguis First Nation agreed to identify participants. A revised version of the urban flyer was distributed to local agencies that support training in the community. These representatives administered the same suitability survey for anyone interested in the program. The criteria used for the selection of participants in the rural community were less rigorous than the urban program. For example, many of the applicants did not have a valid driver's licence but did have experience operating equipment. Eight applicants were selected in total, and one person opted out of the program, leaving seven participants that did complete.

Program Delivery

In acknowledgement of the recommendations based on the urban pilot, the program was changed from 10 days to 5 days. The program instructors and content remained the same. Penny Sinclair, the Fisher River Transition Program Coordinator, facilitated the labour market and job search portion of the program. The adult males in this program were a bit shy about seeking help with finding work. It seemed critical that Penny, as a local and someone they could trust, be available to them on a casual basis and one on one. The availability of jobs to apply for is inherently another consideration in a rural delivery. Many of the participants were only interested in employment opportunities close to home.

One factor to consider, in the delivery of a program in a rural setting, is the need for flexibility in the timing of the delivery. Community events may require the rescheduling of classes. The program was largely successful because of the encouragement of local persons in the recruitment of participants. Many participants had prior workplace experiences, in construction, which had failed. It could be that this has left the isolated job seekers sceptical of external opportunities.

Every year the Band of Fisher River offers two-week work projects to nearly the entire community. Having the external HEO training in the same time frame hindered our ability to get more participants.

The delivery was held May 8 to May 12 at the Vera Kirkness Centre for Higher Learning in Fisher River, Manitoba. The program was delivered utilizing a PLAR approach where participants were able to attend only the modules in which they needed training. The Field assessments were held at the same site as the urban pilot, A.P.E Construction in Woodlands, MB. Due to the road restrictions, the transportation of equipment to the community was not possible. One of the instructors took a tour of the community, with our local sponsor, to estimate the availability of local equipment to use for assessment and training purposes. The instructor reported that any available equipment was outdated and not utilized in the labour market anymore. The other available equipment that he viewed was in need of repair and not safe.

It is also important to note that accommodation is required for any outside trainers who travel to provide rural delivery. The Education authority allowed the use of an apartment that had been available for a previous sponsored program. The cost of the First Aid Certification was higher than the urban delivery to account for the travel costs of the instructor. The First Aid Training Company would only agree to a minimum number of participants for the rural delivery. Typically this would not be cost effective, because there would rarely be 10 people all wanting this training in a remote area. The suggestion to consider is sending the job seeker individually, or in small groups, to an urban area for First Aid training. Even with covering mileage costs this is a less expensive option.

In analyzing the program overall, the success of the program can be measured in ways similar to the urban delivery. First, the participant selection process allowed people to self-assess their suitability for working in construction before entering into any employment or training situations, therefore saving both time and money for themselves and potential employers. The Fisher River participants felt they clearly saw what was required and if they were willing and suitable for the work. Secondly, by developing a modularized program, participants took only the training they required, which again saved time and money. Thirdly, the program clearly illustrated the employability skills required in the workplace and the participants all demonstrated a sound willingness and capability to work in the construction sector.

Project Outcomes

The participants overall reaction to the program was positive. Several of the participants registered with a construction-related labour union that will help support them to find work in the industry. There are two recommendations to address this cost. First, use a local representative if one is available or, second, have participants come to Winnipeg for the training.

Conclusion

This rural pilot tested the five-day program successfully, which shows that this training can be appropriate in a rural location. The opportunities for work are limited locally, and so participants may require additional resources in order to travel to worksites outside the community. There are logistical challenges in coordinating equipment and training, and the primary need for workers is in the urban areas. It should be considered that this training and an assessment process can be made available in key locations and those wishing to be assessed for employment could travel to the key location closest to them. This approach is practical in the way the labour market hires construction workers. For example this program and assessment could be available in places like The Pas, Thompson, Brandon, Selkirk, and Winnipeg. Any job seekers in Manitoba could travel to the closest centre for assessment and job information. Instructors and equipment are available in these larger centres and far less expensive and more practical than moving it.

On a final note, it would be beneficial going forward to ensure Employer support of these programs. If there is truly a labour market need, it would be easy for local employers to support the assessment process, and they can access qualified workers quickly and efficiently.

Appendix F:

HEO Skills-Assessment Package

HEAVY EQUIPMENT OPERATOR

Towards Skill Recognition: Construction Series



HEAVY EQUIPMENT OPERATOR (HEO) Skills Assessment Package



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INTRODUCTION

The overall purpose of this assessment is to determine whether or not a person is suitable for the job of a Heavy Equipment Operator (HEO), and to what extent they possess the Essential and Employability skills required in this job.

Funded by Employment Training Services (Government of Manitoba), the process involves informing people about the environment within which a Heavy Equipment Operator works and assessing how suitable the person is to work in this situation. The final phase of this process is an assessment of the person's essential skills to work in an entry-level position as a heavy equipment operator.

INSTRUCTIONS FOR ASSESSOR

You will need the following materials:

- Separate rooms or area (to ensure confidentiality)
- Flipcharts/white board
- Pens
- Flipchart or dry erase markers
- Paper
- Name tag for Assessor
- Calculator

Copies of the following handouts are required for each person taking the assessment:

- Session Sign-in Sheet
- HEO Work Environment
- Government of Canada – NOC 7421-HEO
- HEO Self-Assessment – Is this the job for you?
- Computer Skills Assessment
- Technical Assessment
- Outcomes Technical Assessment Interview
- Essential Skills Assessment and Answer Key
- Assessment Results Sheet
- Pre-Training Assessment
- Job Goal Setting
- Community Resource Guide
- Personal Budgeting Information
- PLAR Information



| | |
|---|---|
| <p><i>NOTE:</i> Question #25 may not be an issue for some. If the person is still interested in being an HEO, the person takes the Technical Assessment and if successful, then the Essential Skills Assessment for HEO entry-level operator.</p> <p><i>NOTE:</i> The person may also decide that he/she no longer wants to be an HEO or has another job in mind. If there is another job in mind, the person then reviews the pre-training assessment for that job. If there is no other job in mind then the person can participate in the Goal Setting process.</p> <p>If a person says ‘no’ to one, two, or three questions in Section A and/or ‘yes’ to one, two, or three questions in Section B and has said ‘yes’ to all or most of the questions in Section C, then provide further information on HEO to the person. He/she also ought to be encouraged to go onto a job site to get a better sense of the work of an HEO. The person also might decide that he/she no longer wants to be an HEO or has another job in mind. If there is another job in mind the person then reviews the pre-training assessment for that job. If there is no other job in mind, then the person can participate in the Goal Setting process.</p> <p>10. If a person says ‘no’ to four or more questions in Section A and/or ‘yes’ to four or more questions in Section B and has said ‘no’ to all or most of the questions in Section C, then advise the person that the job of an HEO is not the best choice. If the person has another job in mind, he/she can review the pre-training assessment for any job. If there is no other job in mind, then the person can participate in the Goal Setting process.</p> <p>11. The person continues the assessment according to his/her scores. Work collaboratively with the person through the information, whether it is the Pre-training Assessment or the Job Goal Setting process.</p> <p>12. All participants are provided with the Community Resource Guide and, depending on the outcomes from the assessment process, direct them towards appropriate resources in the community.</p> <p>If requested, people can be provided with Personal Budgeting Information and PLAR Information. Encourage people to contact the Employment Training Services representative in their community.</p> <p>End of 1.5 hours</p> | <p>*Results are provided to the person on the assessment results sheets. The assessor makes a second copy of the results sheet.</p> <p>Pre-training Assessment or Job Goal Setting</p> <p>Government of Canada – NOC 7421-HEO</p> <p>Pre-training Assessment Job Goal Setting</p> <p>Job Goal Setting</p> <p>Community Resource Guide</p> <p>Personal Budgeting Information</p> <p>PLAR Information</p> |
|---|---|



HEO SELF-ASSESSMENT

Name: _____

Is this the job for you?

The following is about the job of Heavy Equipment Operator. Please write your name and then answer these questions, with a “✓”, as honestly as you can.

| Question | Yes | No | Not sure |
|--|-----|----|----------|
| Section A | | | |
| 1. Have you worked with Heavy Equipment before now? | | | |
| 2. Have you taken training in Heavy Equipment Operation (HEO) before now? I If Yes, Where: When: | | | |
| 3. Average starting wages for HEOs working full time are about \$32,000. Is this okay for you? | | | |
| 4. Can you do the work of an HEO, for example walk, lift, bend and adjust equipment? | | | |
| 5. Do you have an up-to-date Class 5 driver's licence? | | | |
| 6. Are you able to move a heavy object that weighs more than 50 lb.? | | | |
| 7. Are you able to work at heights? | | | |
| 8. Do you have a good sense of balance? | | | |
| 9. Can you easily figure out distances between equipment? | | | |
| 10. Do you build things? | | | |
| 11. Do you fix things like motors or other machinery? | | | |
| 12. Do you use basic hand and power tools a lot? | | | |
| 13. When you've worked or have gone to school, did you show up most of the time? | | | |
| 14. When you've worked or have gone to school did you show up on time? | | | |
| 15. Are you able to work long hours or shifts, if this is necessary for a job, sometimes starting very early in the morning? | | | |



| Question | Yes | No | Not sure |
|--|-----|----|----------|
| Section B | | | |
| 16. Do you mind seasonal work, which is, working for a few months at a time, knowing that it affects the amount of money that you get? | | | |
| 17. Do you mind breaks in jobs, knowing that it affects the amount of money that you get? | | | |
| 18. Do you mind working outdoors in very hot or very cold weather? | | | |
| 19. Do you mind working in places where it is dirty, dusty, smoky and noisy? | | | |
| 20. Do you mind working underground? | | | |
| 21. Do you mind sitting in vehicles for a very long time? | | | |
| 22. Do you mind working with other people? | | | |
| 23. Do you mind taking directions from other people? | | | |
| Section C | | | |
| 24. Are you able to accept work that takes you away from home? | | | |
| 25. Is there someone who can take over if you need to work away from home? | | | |
| 26. If you have children, will you be able to get reliable childcare? | | | N/A |
| 27. Are you willing to leave your community to get work? | | | |
| 28. Are you willing to leave your community to get training? | | | |
| 29. Do you have a telephone at home so you can get messages about a job site? | | | |
| 30. Do you have a way to get to a job site quickly and easily? | | | |



COMPUTER USE ASSESSMENT

Please answer the following questions.

1. Do you use a computer?
 Yes
 No

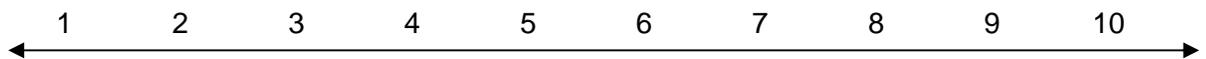
2. How often do you use a computer? Please “✓” your average use.
 Once a week
 Twice a week
 Three times a week
 Many times a week
 Every day of the week
 Other _____

3. Where is your computer? Please “✓”
 In my home
 In a family member’s house
 In a friend’s house
 In a school
 In a community centre
 Other _____

4. On a scale of 1 to 10, circle the number that relates to how comfortable you are when using a computer.

Not Comfortable

Very Comfortable



* If you rate yourself 6 or more, please continue.



COMPUTER USE ASSESSMENT

Please answer the following questions with a “✓” for either Yes or No.

| Question | Yes | No |
|--|-----|----|
| 5. Can you start up, reboot, and shut down a computer? | | |
| 6. Can you start and quit a software program stored on the hard drive? | | |
| 7. Can you save and retrieve files to and from a floppy or the hard drive? | | |
| 8. Can you cut/copy text from one source and paste it into another? | | |
| 9. Can you open, close and minimize menus and windows? | | |
| 10. Can you navigate a directory structure to find files? | | |
| 11. Can you rename files? | | |
| 12. Can you delete files? | | |
| 13. Can you type at least 30-40 words per minute? | | |
| 14. Can you create a word processing document? | | |
| 15. Can you print a word processing document? | | |
| 16. Can you use spell and grammar checking to revise your work? | | |
| 17. Can you log on to the Internet? | | |
| 18. Can you retrieve and delete email messages? | | |
| 19. Can you create, send, forward, reply, and save email messages? | | |
| 20. Can you distinguish between an email address and a website location? | | |

Adapted from © 2000 College of DuPage Center for Independent Learning.



TECHNICAL SKILLS INTERVIEW

The overall purpose of this technical assessment is to gain further insight into the person’s ability to work as an HEO. The person may have skills from having previously worked or trained as an HEO. He/she may have transferable skills from work in trucking, farming, and/or construction, or from hobbies such as carpentry, woodworking, or mechanics.

Name: _____

Phone Number: _____

Ask: Have you worked with heavy equipment before? If not, have you had experience as a long distance trucker or worked in a technically based environment such as drywalling, carpentry, construction, or farming? Alternatively, if no, have you any hobbies that involve working with your hands, such as fixing motors, woodworking, or any other hobby that involves the use of tools?*

Record answer.

** If a person has not had experience in any of these areas suggest that they might want to talk to an HEO or long distance trucker to get a real sense of the job. Provide the person with further information on HEO.*

Ask: What type of equipment did you use or tell me about your hobbies. Record answer.

Based on the person’s experience ask ONE set of the following questions.

- Set 1 – HEO experience
- Set 2 – Long distance truck driver or technically based environment such as drywalling, carpentry, construction, or farming.
- Set 3 – Mechanically based hobbies



SET 1:

If the person has experience as an HEO, ask the following questions and record the answers.

Types of equipment possible:

- Rock truck, water truck, packer

1. **Ask:** “What did you do to ensure that you were doing the best job possible?”

The following criteria are important.

- SAFETY awareness is the number one priority.
- If piles were being moved, did the person indicate that the piles were level when dumped?
- How was the cut, i.e. was it level?
- Did the person have a sense of the machine, i.e. balance?

2. **Ask:** “If there was a problem, what did you do?” *(The person needs to mention that steps were taken to resolve the matter, e.g. got help from somebody else or stopped the machine.)*

3. **Ask:** “What is the most important thing that you do before you dig?” *(Look for power lines, both above and underground.)*



SET 2:

If the person has experience as a long-distance trucker or working in a technically based environment such as drywalling, carpentry, construction, or farming, ask the following questions and record the answers.

1. **Ask:** “What did you do to ensure that you were doing the best job possible?”

The following criteria are important.

- SAFETY awareness is the number one priority.
- Describe the equipment you have used.

2. **Ask:** “If there was a problem, what did you do?” *(The person needs to mention that steps were taken to resolve the matter, e.g. got help from somebody else or stopped the truck.)*



SET 3:

If the person has experience in mechanically based hobbies, ask the following questions and record the answers.

1. Ask: “What did you do to ensure that you were doing the best job possible?”

The following criteria are important.

- SAFETY awareness is the number one priority.
- Did the person have a sense of the tools used?

2. Ask: “If there was a problem, what did you do?” *(The person needs to mention that steps were taken to resolve the matter, e.g. got help from somebody else or stopped using the tool.)*

Interviewer comments: _____



INSTRUCTIONS FOR ASSESSMENT

This assessment is divided into three main areas:

1. Basic Math
2. Measurement
3. Solving Basic Problems

The assessment reflects different duties that are used everyday while working as a heavy equipment operator.

It is **not** a timed assessment.

The documents to be used for each section are included in the booklet.

The questions can be answered directly on the question sheet.

A calculator can be used.

Please remember to write your name on the front of the booklet.

Good luck!

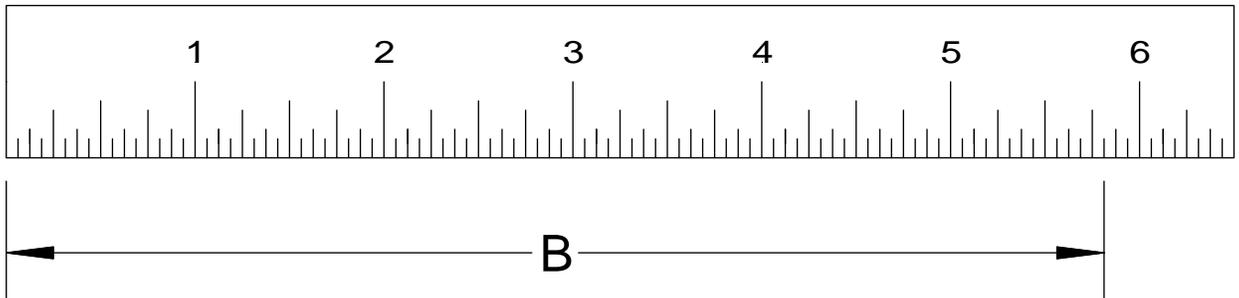
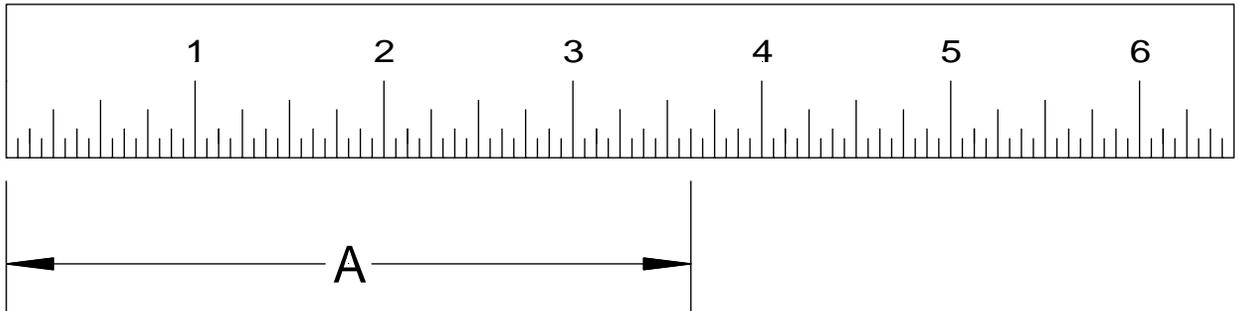
| |
|------------------------------|
| Result _____ / |
|------------------------------|



Name (please print): _____

Use the Imperial (English) rulers below to answer questions 1 to 5.

1. What is the length in inches of line A below? _____
2. What is the length in inches of line B below? _____
3. What is the length of line A plus line B? _____
4. What is the length of line B in decimal inches? _____



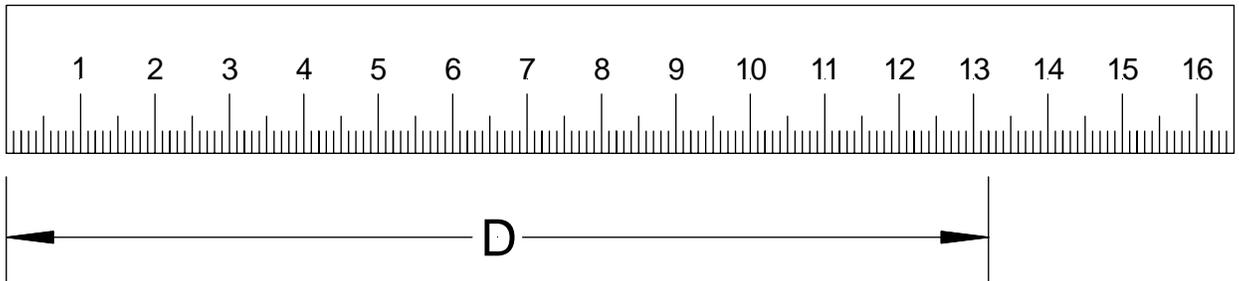
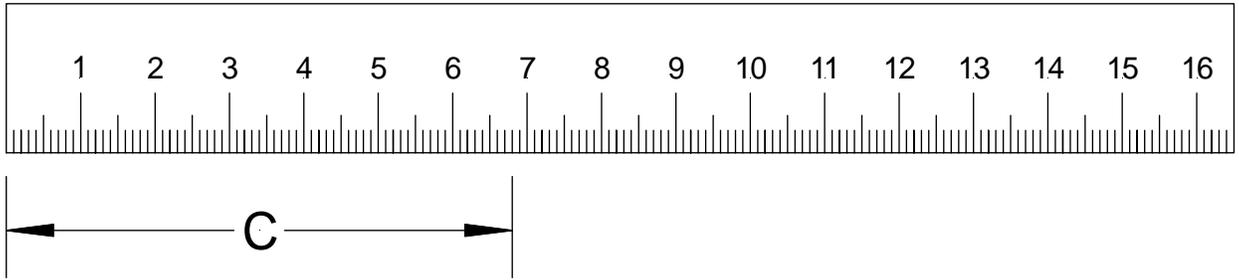
5. Mark the following measurements on the ruler below.

- a. $4 \frac{5}{16}$ "
- b. $3 \frac{3}{8}$ "
- c. $\frac{3}{4}$ "



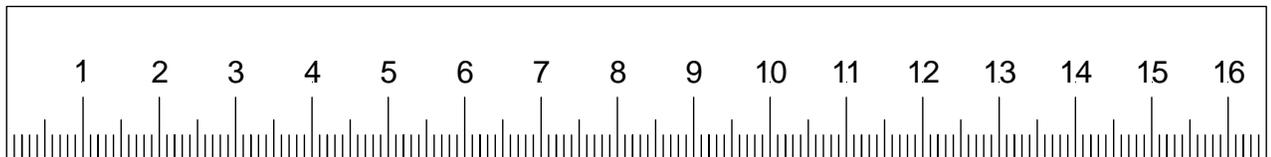
Use the Metric rulers below to answer questions 6 to 9:

- 6. What is the length of line C in centimetres? _____
- 7. What is the length of line D in centimetres? _____
- 8. How many centimetres shorter is line C than line D? _____
- 9. What is the length of line D in inches? Round your answer to one decimal place. (Hint: One inch = 2.54 cms) _____



10. Mark the following measurements on the ruler below:

- a. 11.5 cm
- b. 14.0 mm

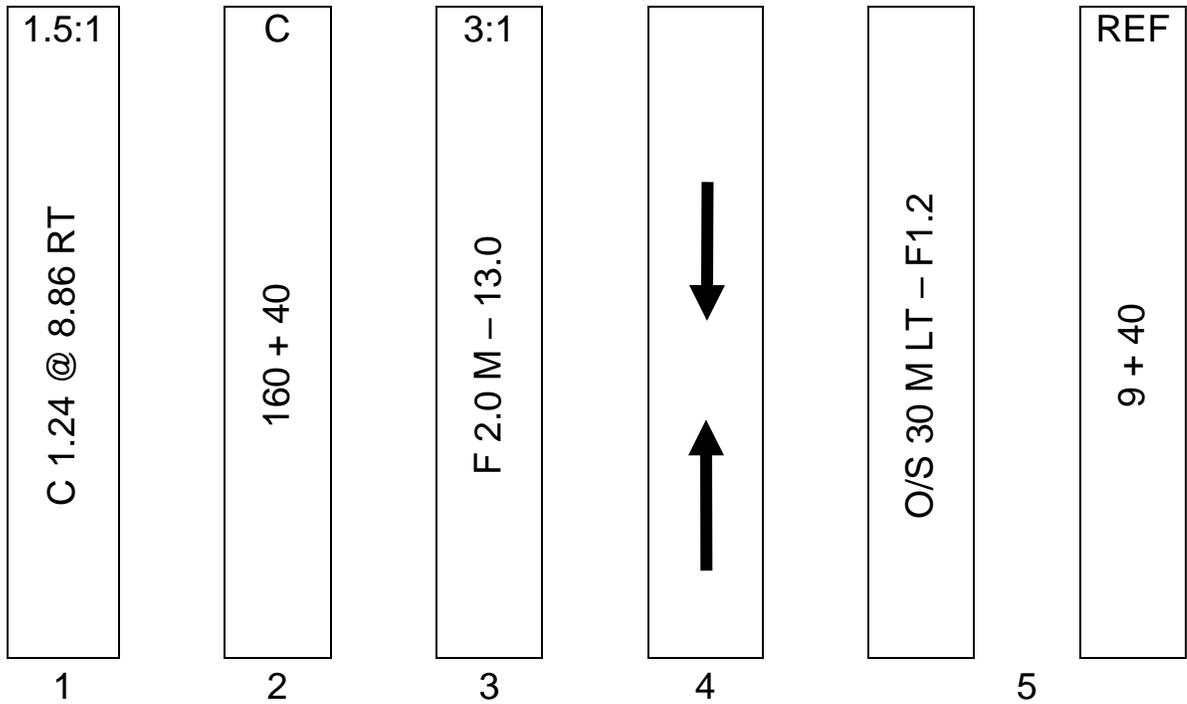


Use the timesheet below to answer questions 11 to 15:

- 11. What is Wayne Campbell's Employee Number? _____
- 12. How many hours did Rick Smith spend grading? _____
- 13. How many hours were spent clearing the lot? _____
- 14. How many hours were spent clearing, grading and levelling the lot? _____
- 15. Did any of the three employees work overtime? _____
(Assume that 8.0 hours is a regular shift.)

| Three-Way Heavy Equipment Operators | | | | |
|--|-------------------|-----------------|----------------|-----------------|
| Leaf Rapids, Manitoba | | | | |
| Timesheet for June 7, 2005 | | | | |
| Job: Prep lots in town for new houses | | | | |
| Name | Employee # | Clearing | Grading | Leveling |
| <i>Joe Soares</i> | 12585 | 2.5 | 3.5 | 2.0 |
| <i>Rick Smith</i> | 13562 | 3.5 | 4.5 | 0.5 |
| <i>Wayne Campbell</i> | 12391 | 1.5 | 1.2 | 3.5 |





Describe the following:

Based on the diagrams above, decide what the information appearing on each stake means and write your meaning in the numbered spaces appearing below.

- 16. Stake 1 _____

- 17. Stake 2 _____

- 18. Stake 3 _____

- 19. Stake 4 _____

- 20. Stake 5 _____



SUMMARY RESULTS SHEET

★ CONFIDENTIAL★

| | |
|-------------------------|---|
| Date: | |
| Name: | * |
| Mailing Address: | * |
| Phone Number: | * |

* Please print your name and contact information.

| Essential Skills | | |
|------------------|----------------------|--------|
| Question | Assessed | Result |
| 1-2 | Tape Measure | |
| 3-5 | Decimal/Fractions | |
| 6-10 | Imperial/Metric | |
| 11-15 | Navigating Documents | |
| 16-20 | Stakes and Grades | |

Signed by:

On behalf of OARS training Inc.
(Please Print)

Participant's Name
(Please Print)

*For further information contact:***OARS training Inc.**

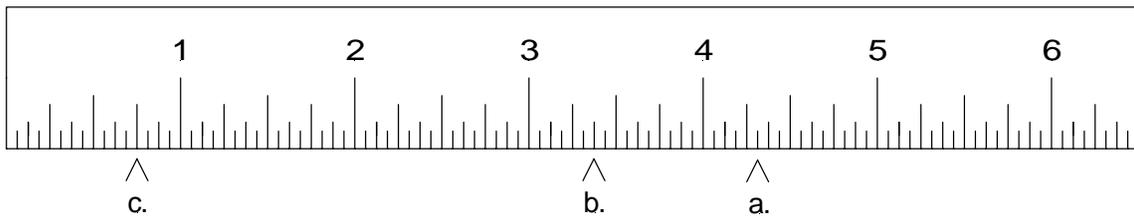
201 – 1311 Portage Avenue
Winnipeg, Manitoba, Canada R3G 0V3
Phone: (204) 284-4371
Toll-free: 1-866-385-2148
Fax: (204) 774-7051
Website: www.oarstraining.com
Email: info@oarstraining.com



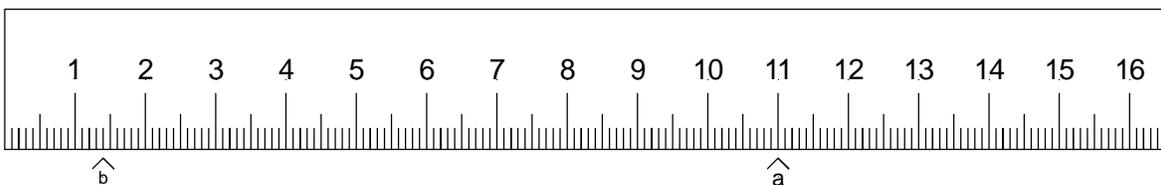
ESSENTIAL SKILLS ASSESSMENT – ANSWER KEY

Pass Rate: To be determined

1. Line A measures $3 \frac{5}{8}$ inches
2. Line B measures $5 \frac{13}{16}$ inches
3. Line A plus line B measure $9 \frac{5}{16}$
4. Line B measures 5.8125 in decimal inches
5. See ruler below:



6. Line C below measures 6.8 centimetres
7. Line D below measures 13.2 centimetres
8. Line C is 6.4 centimetres shorter than Line D
9. Line D measures 5.2 inches
10. See ruler below.



11. 12391
12. 4.5 hours
13. 7.5 hours
14. 22.7 hours
15. Rick Smith worked 0.5 hours overtime.
16. Stake 1: Cut stake markings
17. Stake 2: Centerline stake used to mark center survey line on a project
18. Stake 3: Fill stake markings
19. Stake 4: Haul stake markings

Stake 5: Reference (offset) stakes placed at every centerline stake away from the work site. Contains same info as centerline stake.



Appendix G:

Facilitator and Participant Curriculum Guides

- ***Appendix 1 - Facilitator Guide***
- ***Appendix 2 - Safety-Hearing***
- ***Appendix 3 - Introduction to HEO***
- ***Appendix 4 - Ladder Safety***
- ***Appendix 5 - Grade Stakes***
- ***Appendix 6 - Excavation Safety***
- ***Appendix 7 - Employability***
- ***Appendix 8 - Finding Employment***
- ***Appendix 9 - WHMIS in Your Workplace***

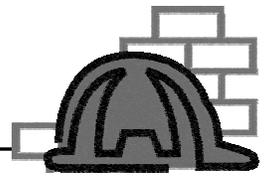
Working in Construction

Pilot Curriculum



Facilitator Guide





ACKNOWLEDGEMENTS

OARS training would like to thank the following organizations for their contribution to the development of the ‘Introduction to Skilled Labourer/Heavy Equipment Operation’ program.

Workplace Education Manitoba Steering Committee (WEMSC), Winnipeg, MB

Operating Engineers Training Institute of Manitoba, Winnipeg, MB

Occupational Health & Safety Consulting, Winnipeg, MB

Borland Construction Inc., Winnipeg MB

Acklands Grainger Inc., Winnipeg, MB

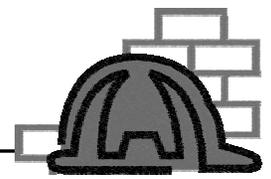
A.P.E. Construction, Woodlands, MB

Portions of the curriculum materials were adapted with permission from:

Occupational Health & Safety Consulting, Winnipeg, MB

Operating Engineers Training Institute of Manitoba, Winnipeg, MB

Literacy Link Eastern Ontario, Workplace Literacy Special Initiative, Skilled Trades Helpers & Labourers Curriculum, Kingston, ON



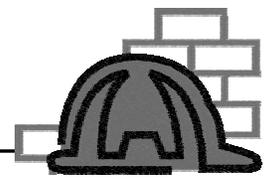
INTRODUCTION

The following program has been designed in a modular format to accommodate prior learning strategies. The facilitator and participant guides have been chunked into modules, which allows each one to be delivered independently or in its entirety, based on the individual needs of the participants. A local representative of St John's Ambulance of Canada should facilitate the First Aid Certification portion of the program.

The facilitator guide includes learning outcomes, a program overview and lesson plans. In addition, website links for labour market information are included at the end of the facilitator guide because the information is updated regularly. There are some modules that are delivered as hands on training; therefore a participant guide was not necessary.

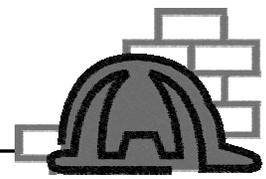
The program modules are as follows:

1. Introduction to Safety – Facilitator guide only
2. Safety and Hearing – Facilitator and Participant guides
3. Introduction to Heavy Equipment Operation – Facilitator and Participant guides
4. Ladder Safety – Facilitator and Participant guides
5. Grade Stakes – Facilitator and Participant guides
6. Excavation Safety – Facilitator and Participant guides
7. Construction Measurements – Facilitator guide only
8. Employability Skills – Facilitator and Participant guides
9. Job Search Skills – Facilitator and Participant guides
10. Workplace Hazardous Materials Information System (WHMIS) – Facilitator and Participant guides



PROGRAM OVERVIEW

| | Day 1 | Day 2 | Day 3 | Day 4 | Day 5 |
|----|--|---------------------------------------|---|--|---|
| AM | Introductions Introduction to Safety Safety and Hearing Introduction to HEO Ladder Safety Theory | Tailgate Meeting First Aid Day | Tailgate Meeting HEO Field Assessment with | Tailgate Meeting WHMIS | Tailgate Meeting Employability Skills |
| PM | Grade Stakes Theory Excavation Safety Construction Measurement Time sheets Wrap up | Wrap up | Hands on: <input type="checkbox"/> Quick Saw <input type="checkbox"/> Ladder Building <input type="checkbox"/> Grade Stake <input type="checkbox"/> Construction Measurement Wrap up | Employability Skills Wrap up | Finding Employment Wrap up |



LEARNING OUTCOMES: At the end of the training, the learner will be able to:

Essential/Employability Skills

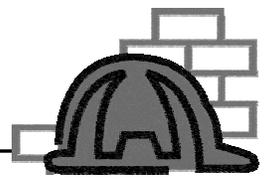
- Demonstrate the use of both the imperial and metric systems of measurement.
- Perform basic measurement and math calculations used in construction.
- Describe roles and responsibilities of individuals on a work site.
- Communicate on the worksite including hand signals and signage.
- Demonstrate working as a team.
- Describe how to ask appropriate questions when necessary.
- Describe construction documents.
- Describe working conditions in construction.
- Describe the employment process and how to access it.
- Identify employers of each occupation.
- Illustrate entry-level employer requirements for skilled Labourer/HEO.
- Interpret personal suitability for construction and or HEO.
- Display examples of showing respect to others.
- Explain the importance of a positive attitude.
- List behaviours that illustrate initiative.
- Document their work time accurately.
- Navigate through the labour market information to target their job search,
- Interpret the labour standards for the construction industry.
- Recognize employer needs and customize their job search to meet those needs.

Equipment and Tool Usage

- Identify the types of heavy equipment used in construction.
- Describe the basic operations of a dozer, excavator.
- Explain what to look for when conducting a walk-around inspection of the work area.
- Perform the pre-operation inspection of equipment.
- Explain the correct way to mount/dismount heavy equipment using 3-point contact.
- Describe appropriate clothing/accessories to wear when operating heavy equipment.
- Describe basic hand and horn signals.
- Demonstrate the use of hand tools, power tools and fasteners.

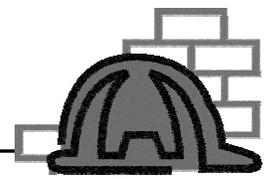
Safety

- Identify the rights of construction workers regarding safe work practices.
- Describe safe work practices on a work site.
- Identify potential hazards on a work site.
- Describe ways to prevent hazards on a worksite.
- Demonstrate appropriate use of Personal Protective Equipment (PPE).
- Identify appropriate safety equipment for the work environment.
- Describe lock out and tag out procedures.

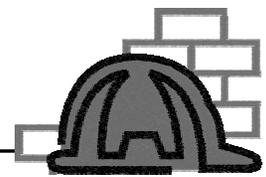


LEARNING OUTCOMES – continued

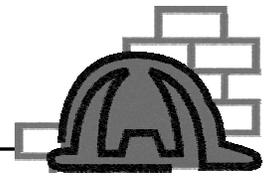
- Identify procedures for notifying supervisor of unsafe working conditions.
- Perform basic First Aid.
- Recognize WHMIS symbols and other related warning systems.
- Explain the dangers associated with each WHMIS symbol.
- Recognize the label or a “controlled product” (WHMIS label).
- Find information on a Material Safety Data Sheet (MSDS).
- Inspect a ladder, set-up & use a ladder safely, construct a wood-built ladder.
- Explain the common nomenclature used on grade stakes and the term “slope”.
- Identify types of excavation collapses.
- Identify the types of safe shoring/excavation techniques for working in trench excavations.
- Describe the basic procedures for installing wood shoring in a trench excavation.
- Describe how to work safely in a trench cage.
- Determine the type of wood shoring needed for a trench excavation using the Manitoba shoring tables.
- Recognize the WHMIS symbols and other related warning systems.
- Explain the dangers associated with each WHMIS symbol.
- Recognize the label for a “controlled product” (WHMIS label).
- Find information in a material safety data sheet.



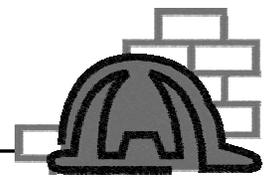
| Topic – Introduction to the Entry Level Labourer/HEO Program | | | |
|---|------------------------|--|--|
| Learning Outcomes – participants will be able to identify the course expectations | | | |
| Time | Steps | Activity | Materials |
| 30 min | Introduction | Welcome | |
| | Explain the Importance | Discuss the purpose of the program | |
| | Show Learners | Provide course overview <ul style="list-style-type: none"> ▪ Purpose of the pilot ▪ Definition of the pilot ▪ Learning Objectives ▪ Logistics – lunch, breaks, time ▪ Sign in Sheet ▪ Discuss Parking Lot ▪ Identify Ground Rules Daily Structure <ul style="list-style-type: none"> ▪ Tailgate Meeting – AM ▪ Wrap up & Timesheets | Binders Sign in Sheet Flip Chart Markers |
| | Learner Shows you | Participants complete the sign in sheet and participate in setting the ground rules | |



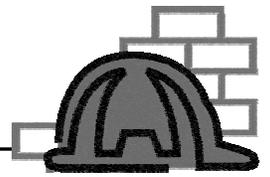
| Topic – Participant Introductions | | | |
|--|------------------------|---|-----------|
| Learning Outcomes – participant will be able to introduce themselves to potential co-worker or employers | | | |
| Time | Steps | Activity | Materials |
| 30 min | Introduction | Group inter-personal introductions | |
| | Explain the Importance | Introduce themselves to other participants. | |
| | Show Learners | <p>Group inter-personal introductions – The Handshake</p> <p>Ask participants to shake each other’s hands, give their name and 1 thing they want to learn from the course.</p> <p>Debrief: Ask them</p> <ul style="list-style-type: none"> ▪ How did that feel? ▪ What did you notice? ▪ Did they make eye contact? ▪ Do they remember any responses? <p>Illustrate that what each of them did was:</p> <p style="text-align: center;">Saw, Heard and Touched each other.</p> <p>These are things that happen on the job site. Some people may find it uncomfortable to do these things. For example eye contact. This group is reflective of the typical job site, diverse.</p> | |
| | Learner Shows you | In conclusion, we need to recognize that the workplaces of the future will be diverse and showing respect, earns respect. | |



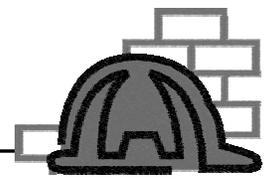
| Topic – Introduction to Safety in the Workplace Learning Outcomes – Participants will be able to identify the rights of construction workers regarding safe work practices. | | | |
|--|------------------------|--|--------------------------|
| Time | Steps | Activity | Materials |
| 75 min | Introduction | Introduction to Safety in the Workplace | |
| | Explain the Importance | Discuss the 3 R's Right to Know Right to Participate Right to Refuse | Flip chart or Whiteboard |
| | Show Learners | Play the Safety Video – Shake Hands with Danger Debrief the video referring to the 3 R's Ask participants to share their own stories | Safety Video |
| | Learner Shows you | Acknowledge that safety is not just for you, but also for everyone. | |



| Topic – Safety and Hearing Learning Outcomes – Participants will be able to demonstrate the proper use of hearing protection devices | | | |
|---|------------------------|---|--|
| Time | Steps | Activity | Materials |
| | Introduction | Introduce Hearing Conservation | |
| 45 min | Explain the Importance | <p>Discuss how heavy construction industry equipment and machinery can be very noisy, above the safe levels prescribed by regulation.</p> <p>Discuss hearing damage; the loss is permanent.</p> | |
| | Show Learners | <ul style="list-style-type: none"> ❑ Play video – “Invisible Hazard”. After completion, ask participants how they would feel if they experienced the amount of hearing loss described by one of the participants in the video. ❑ Work through handout – “Hearing Conservation”. Emphasize the fact that once damage to the hair cells in the inner ear, the damage is permanent. ❑ Explain Manitoba’s requirement for hearing protection. Note that above 85 dBA and less than 90 dBA, hearing protection is optional. Recommend that it should be worn. Above 90dBA – use of hearing protection devices (HPD’s) is compulsory. HPD’s must be provided by the employer. Also note that above 80dBA noise levels, annual hearing testing must be done by the employer. ❑ Demonstrate the proper way to insert an ear plug into the ear. Note that the ear canal must be straightened out by pulling up on the ear before inserting the plug. If using disposable foam plugs, mention the fact that these types of plugs present a hygiene issue, because the fingers must be clean before inserting them into the ears. Also mention that the plugs must be held in position for 30 seconds by holding them in place in the ear canal with a finger. Some people with smaller than average ear canals will often find this type of HPD uncomfortable due to pressure of the expanded foam. ❑ Show a pair of ear muffs. Inform participants that the cuff and dome must fit over the entire ears and that hair and arms for glasses will interfere with proper protection. | <p>Handout – “Hearing Conservation”</p> <p>Video – “Invisible Hazard” (approximately 10 minutes)</p> <p>Hearing protection devices – ear plugs for each participant (type with a stem – not disposable foam plugs!)</p> <p>A set of ear muffs for demonstration.</p> |
| | Learner Shows You | Have participant demonstrate inserting the earplug into their ears. | |



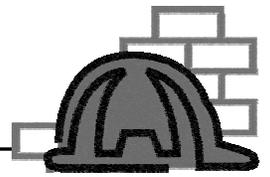
| | | | |
|--|--|--|--|
| | | Continue to talk to demonstrate that the HPD's do not block out all sound – they just cut down on the high end, damaging volume. | |
|--|--|--|--|



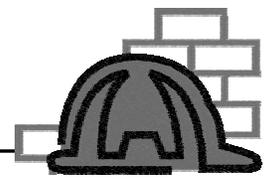
Topic – Introduction to HEO

Learning Outcomes – Participants will be able to: describe appropriate clothing/accessories to wear when operating heavy equipment; describe basic hand and horn signals; explain what to look for when conducting a walk-around inspection of the work area; explain the correct way to mount/dismount heavy equipment using 3 point contact.

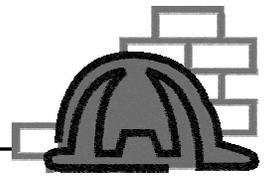
| Time | Steps | Activity | Materials |
|--------|------------------------|---|---------------------------------|
| | Introduction | Introduction to HEO | Handout – “Introduction to HEO” |
| 45 min | Explain the Importance | <p>Discuss the importance of signals to ensure site safety. Assessing worksite conditions are essential to safe production and operation.</p> <p>Discuss how proper attire will reduce the likelihood of injury on the job due to entanglement.</p> <p>Discuss the importance of proper entry and exit from equipment in reducing injury to operators.</p> | |
| | Show Learners | <ul style="list-style-type: none"> <input type="checkbox"/> Review handout. <input type="checkbox"/> Clothing & Accessories. During cold season or when constructing winter roads, additional clothing is essential in cases where equipment breaks through ice. <input type="checkbox"/> Signaling – stress the fact that the operator and signaler must understand the signals being used. Ensure there is good visibility between the two, and if you are the one giving signals, make sure you are in a safe location. <input type="checkbox"/> Work site conditions – Make the point, that as the operator, you are responsible for the operation of the piece of equipment. You are ultimately responsible to carry out the work safely and efficiently. You must check where underground utilities are located, overhead power lines are, watch for other vehicle/equipment traffic and workers/pedestrians are. <input type="checkbox"/> Equipment Entry & Exit - Explain to the participants that many operators are injured due to improper techniques for entering or exiting the cabs of equipment. Before leaving the cab, make sure the equipment is not going to move – put the bucket or blade on the ground, set the parking brakes and lock out the controls. When entering or getting to the cab, use the proper access ladders/steps and hand holds. | |
| | Learner Shows | Participants will demonstrate basic hand signals when | |



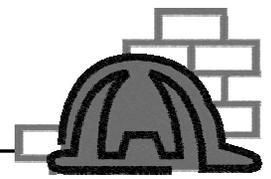
| | | | |
|--|-----|---|--|
| | You | prompted by the instructor. Instructor will give a signal and ask participant what it means. | |
|--|-----|---|--|



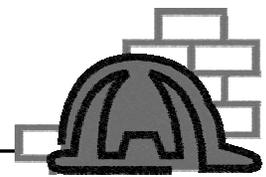
| Topic – Portable & Wood-built Ladders Learning Outcomes – Participants will be able to inspect a ladder, set-up & use a ladder safely, construct a wood-built ladder | | | |
|---|------------------------|---|---|
| Time | Steps | Activity | Materials |
| | Introduction | Portable & Wood-built ladders Why are ladders used in heavy construction? Explain that ladders are mainly used for access to or egress from excavations. The types of ladders primarily used in construction are Class 1 – Industrial rated for a 250 lb. Capacity or wood-built ladders fabricated on site. | |
| 30 min | Explain the Importance | Explain that many workers are injured due to inappropriate selection of ladders, use of faulty ladders and incorrect ladder set up. Ask participants their experiences working/using ladders. Emphasize points that correct set up and use are essential to reduce hazards of using portable ladders. | |
| | Show Learners | <ul style="list-style-type: none"> <input type="checkbox"/> Review handout. <input type="checkbox"/> Explain the way to inspect a ladder for defects before using. <input type="checkbox"/> Explain the correct/safe method of ladder set up. <input type="checkbox"/> Explain the correct/safe method for safe ladder use. <input type="checkbox"/> Emphasize 3-point contact when climbing ladders. <input type="checkbox"/> Explain the requirement of not using the top two rungs of a ladder. <input type="checkbox"/> Review the specifications for wood-built ladders. Explain what a spiked knot is – a flat knot that runs across the face of the rung that significantly weakens the strength of the rung. | Hand out – Portable & Wood-built ladders |
| 120 min | Learner Shows You | Construct a wood-built ladder (Field Day) Have participants work in pairs. If participants have not used an electric portable circular saw, demonstrate the proper and safe use of the saw. When ladders have been fabricated, have participants show the correct way to set up the ladder and demonstrate 3 point contact when climbing. | Safety Equipment: safety glasses hearing protection safety head wear Materials: 16 oz hammers 16’ tape measure Electrical circular |



| | | | |
|--|--|--|---|
| | | | <p>saw & power cord/supply</p> <p>For each ladder: 2-10' 2 x 4 spruce 2- 8' 1 x 4 spruce 2 – 1 x 2 spruce 2.5" coated nails – 0.75 lb</p> |
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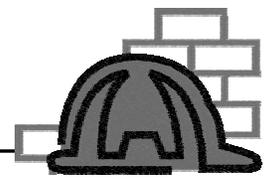
| Topic: Grade Stakes | | | |
|--|------------------------|--|--|
| Learning Outcomes – Participants will be able to explain the common nomenclature used on grade stakes and the term “slope”. | | | |
| Time | Steps | Activity | Materials |
| | Introduction | Introduce Grade Stakes | |
| 30 min | Explain the Importance | <p>Explain that grade stakes are used to layout the site and location of the work to be done.</p> <p>Explain that grade stakes are critical are not to be disturbed or moved or altered under any circumstances.</p> | Handout – “Grade Stakes” |
| | Show Learners | <ul style="list-style-type: none"> □ Explain that the “toe” is the bottom of a slope on a road bed or other similar construction. □ Explain the grade stakes are usually off set from the finished construction, so that equipment will not hit and destroy these stakes during construction. □ Explain “slope”. “Grade” is another term used on highway signage. A hill with 7% grade is a slope of vertical rise of 8’ for every 100’ horizontally | |
| 45 min | Learner Shows You | <p>Participants will layout using the lathes the location of an excavation that will be sloped at a 45 degree angle or 1 to 1 slope on all four sides. Have participants layout the location of an excavation that is 50’ long by 12’ wide and will be 15’ deep. Next, have the participants stake out the perimeter of the sloped walls on all four sides of this proposed excavation. Have participants determine the amount/volume of material that will be removed from this excavation.</p> | <p>100’/30 m tape measures or 16’ tape measure</p> <p>Bundle of 4’ wood lathes</p> |



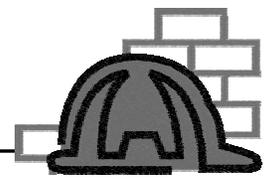
Topic – Excavation Safety

Learning Outcomes – Participants will be able to: identify types of excavation collapses; identify the types of safe shoring/excavation techniques for working in trench excavations; describe the basic procedures for installing wood shoring in a trench excavation; describe how to work safety in a trench cage; determine the type of wood shoring needed for a trench excavation using the Manitoba shoring tables.

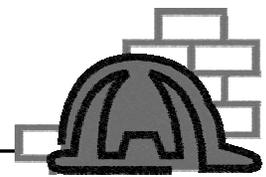
| Time | Steps | Activity | Materials |
|---------|------------------------|---|---|
| | Introduction | Excavation Safety | |
| 120 min | Explain the Importance | Working in trench excavations is hazardous due to soil collapse, restricted access into some trenches, potential for flooding, utility contacts, unstable trees and existing building foundations due to excavating near them. To protect workers in excavations it is necessary for these workers to understand how to work safely in an excavation by installing wood shoring, working inside a trench cage or in a properly sloped excavation. | |
| | Show Learners | <ul style="list-style-type: none"> <input type="checkbox"/> Review handout. <input type="checkbox"/> Before the Digging Starts – contractor must get an excavation permit from the Workplace Safety & Health Division and the utilities – Manitoba Hydro for electrical and gas clearances, MTS for telephones and fibre-optic cables as well as other communications companies, pipeline companies and cable companies. See the “Call Before You Dig – Manitoba” web site <input type="checkbox"/> Types of Soil Collapse – use the handout and draw the types of collapse on the board/white board <input type="checkbox"/> Protecting Workers – emphasize that wood shoring must be installed according to engineer’s certification if trenches exceed depths outlined in the trench shoring tables. A properly sloped excavation wall is at a 1 to 1 slope or 45 degree angle. <input type="checkbox"/> Wood Shoring Components – explain that most shoring made of wood consists of upright and cross braces called “struts”. The use of walers – the long horizontal members supporting several uprights is not used very often due to the size and weight and the time needed to install. Upper left drawing: D = strut spacing; A = upright spacing; C = wale spacing. Lower Right drawing: A = upright spacing; B = strut spacing. Note: if plywood is used as sheathing to support bank behind | Hand out – “Excavation Safety” Construction Industry Safety Regulations MR 189/85 – sections 107 to 139(3). |



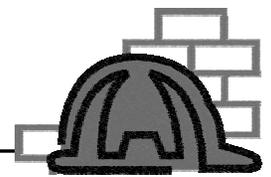
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| | | <p>the uprights, the struts/jacks must still bear on uprights. Ask participants why? Answer – if only bearing on plywood, struts/jacks could punch through sheathing.</p> <ul style="list-style-type: none"> □ Trench Shoring Tables – using shoring tables what shoring is needed for following trench excavations? a) shoring – no wales; 11’ deep, 3’-6” wide in soil likely to crack crumble. b) 3.8 metres deep X 1.3 metres wide in stiff/firm soils. c) 9’ deep and 6’ wide in loose soft soils – can’t shore this one because excavation wider than 5’. When using trench jacks, stress point that jacks can only extend according to manufacturer’s specifications. Max ratio of 2:1 of length of jack outside of pipe to amount inside of pipe. (an 18” screw jack can only be extended 12”) It is recommended that the extension ratio should be only 1:1. Make sure when jacks are placed against uprights or wales that the jack foot is placed across the grain of the wood – not parallel to the grain. This could cause the foot to punch through the upright. □ Installing Wood Shoring – the first or top strut is always placed/installed from outside of the excavation. The upright should extend 1’ past the top of the excavation. Mention the fact that the worker who installs the struts should be the one that removes them. This is so if there are changes in the pressure on the struts, the worker that installed them will most likely be familiar or remember how the struts went in and will recognize if there has been changes in pressure on the struts since the installation was done. □ Sloping Excavation Walls – when determining the width of a sloped excavation use the following formula: fully sloped at 45 degree angle: 2 times the depth + the width. Example – an excavation 12 feet deep and 4 feet wide will have to 28’ across at the top. If the excavation is sloped at a combination of 3’ vertical and then sloped at a 45 degree angle, the formula is: depth minus 3’ times 2 + the trench width. For the same excavation above, by using the combination straight cut and sloped the width across the top of the excavation is now 22’. | |
| | <p>Learner Shows You</p> | <p>Participant completes the question from Section 13 Access/Egress – section 13: answers a) 4’; b) 3’; c) 10’.</p> | |



| Topic – Construction Math – Reading a tape measure – imperial & metric Learning Outcomes – Participants will be able to demonstrate the use of both the imperial and metric systems of measurement. | | | |
|--|------------------------|--|--|
| Time | Steps | Activity | Materials |
| | Introduction | Heavy construction industry layout measurements use the metric system. | |
| 30 min | Explain the Importance | Participants should be able to use both the imperial and metric systems. | 16’/5m metric tape – marked in feet, inches and fractions of an inch + metres, centimetres & millimetres on the tape blade. It is essential that the metric portion is marked this way. Tapes that are only in centimetres and millimetres are not acceptable. |
| | Show Learners | <ul style="list-style-type: none"> ❑ Hand out to each participant a measuring tape. Have them extend the blade and show them the two measuring systems printed on the blade. ❑ Ask participants if they know the imperial system of measure. If not, then explain the gradations on the tape: show that the tape is marked in feet and inches, at each foot, the marking is in inches and feet: example at the three foot mark, the tape reads 36” and 3F for “feet”. ❑ Show participants how the inches are divided into half, quarters, eighths and sixteenths. Point out that the inch marks go full across the blade, the half inch marks are longer than the quarter inch marks, which are longer than the eighth, with the sixteenth marks the shortest. ❑ Show participants that after the 1 foot mark the numbering changes to 1, 2, 3 ... 11 in red numbers, as well as 13, 14, 15,23 in black numbers. So the imperial side goes all the way to 16’ in both feet & inches and in just inches. | |

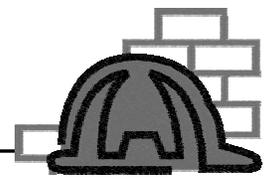


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| | | <ul style="list-style-type: none"> ❑ Explain that when measurements are given in imperial on blue prints/drawings, it will be written as feet and inches and fractions of an inch. Feet are designated by the (') and inches by the ("). A measurement of seven feet, ten and one half inches will be shown as 7' – 10 1/2". Notice there is a hyphen between the foot and inches. ❑ Explain the metric side of the tape measure. Point out the metric side is divided into metres, centimetres. The metres are marked as 1M, 2M etc. The meters are broken down into centimetres. Show that there are 100 centimetres in a metre. On the tape the small 1, 2, 35... 49 are centimetres. Each centimetre is divided into millimetres. Show that the “five millimetre mark is slightly longer than the other millimetre marks. ❑ Explain that when measurements are given in metric on blue prints/drawings, it will be written as 2.350m. This means 2 metres, 35 centimetres and 0 millimetres. For measurements of less than a metre, the nomenclature will start as 0.750 – which reads as 75 centimetres, 0 millimetres. | |
| <p>30 min</p> | <p>Learner Shows You</p> | <p>Field Day</p> <ul style="list-style-type: none"> ❑ Emphasis shall be focused on using the metric system. ❑ Have participant demonstrate use of the imperial measure. Have participants show where 6' 4 1/4" is on the imperial tape. Check each participant. ❑ Have participants show on the imperial tape where 53 3/8" is. ❑ Have participants show where 2metres and 55 centimetres (2.550) is on the tape. Check each participant. ❑ Have participants show where 1.893m is on the tape. ❑ Use more examples until all participants are able to use the metric tape. | |

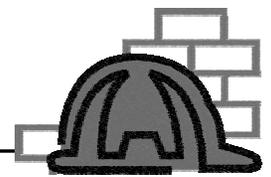


| Topic – Daily Tracking Time | | | |
|---|------------------------|--|------------------|
| Learning Outcomes – Participants will be able to document their work time accurately | | | |
| Time | Steps | Activity | Materials |
| 15 min | Introduction | Introduce time tracking | |
| | Explain the Importance | Tracking time worked on a site will ensure that you are paid properly. | Sample Timesheet |
| | Show Learners | Illustrate on a flip chart/whiteboard information that should be tracked <ul style="list-style-type: none"> ▪ Activity ▪ Hours Illustrate a sample of a time sheet | |
| | Learner Shows you | Participants complete their timesheet | |

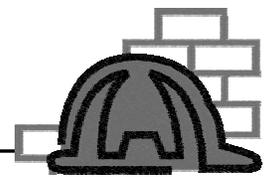
| Topic – Daily Wrap up | | | |
|---|------------------------|--|------------------|
| Learning Outcomes – Participants will be able to review and prepare for the next day | | | |
| Time | Steps | Activity | Materials |
| 15 min | Introduction | Introduce the daily wrap up process | |
| | Explain the Importance | Wrap up Review Questions Parking Lot Tomorrow's agenda | |
| | Show Learners | Complete Timesheets | Timesheet |
| | Learner Shows you | Verify the completeness of the timesheets Adjourn for the day | |



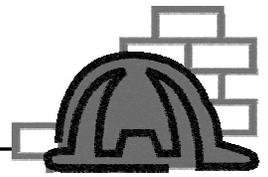
| Topic – Field Day | | | |
|--------------------------|------------------------|--|--------------------------|
| Learning Outcomes – | | | |
| Time | Steps | Activity | Materials |
| 8hours | Introduction | Describe the events of the day Hand on activities | |
| | Explain the Importance | Discuss the purpose of the Field Day as an opportunity to illustrate skill necessary for entry level Construction/HEO Discuss the assessment process Emphasize workplace safe practices | |
| | Show Learners | Participants are assessed on their skill with the equipment Hands on activities are in progress during individual assessments | Equipment and Hand tools |
| 30min 120min 45min | Learner Shows you | Participant operates machinery for assessment Participants illustrate the skills of basic hand tools <ul style="list-style-type: none"> <input type="checkbox"/> Quick Saw <input type="checkbox"/> Ladder Building <input type="checkbox"/> Grade Stakes <input type="checkbox"/> Construction Measurement | |



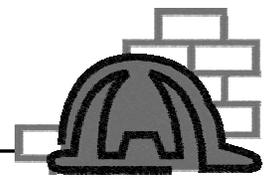
| Topic – WHMIS | | | |
|--|------------------------|--|--|
| Learning Outcomes – Participants will be able to: recognize the WHMIS symbols and other related warning systems; explain the dangers associated with each WHMIS symbol; recognize the label for a “controlled product” (WHMIS label); find information in a material safety data sheet | | | |
| Time | Steps | Activity | Materials |
| | Introduction | Introduce WHMIS | |
| 15 min | Explain the Importance | There are many chemicals that we work with and can be exposed to in the workplace. WHMIS is an information system consisting of symbols, labels, material safety data sheets, along with education and training to warn of hazardous ingredients that may be present in some of the chemical products we work with or could be exposed to. Some of these can cause serious health problems such as cancer or damage to our reproductive health. | |
| 2.5 hrs | Show Learners | <ul style="list-style-type: none"> <input type="checkbox"/> Review handout. <input type="checkbox"/> Hand out the chemical products 1 to each or a pair of participants. Have the participants to read the container or product label and explain the hazard information found on the label. Note that some of the products have WHMIS labels, some have the HMIS system from USA, and some are consumer labelled. Explain that containers not provided with a WHMIS label, must be properly labelled by the employer according to the WHMIS requirements, and the material safety data sheet for the product must be available at the work site. <input type="checkbox"/> Distribute the handout and discuss it with participants <input type="checkbox"/> Explain what WHMIS is [section 1 - What is WHMIS]. Ask what is the most important word in the title? Answer – information! That is all WHMIS is – an information system. Note the substances not covered by WHMIS. <input type="checkbox"/> Review other warning systems – Consumer Products & the HMIS system from USA. Note that both systems use a “hazard rating system” – one is by shape, the other by a numbering system. If there is no symbols on the container – use the magic phrase – “RTL” = Read the Label! And emphasize the need to read all of the label – some of the hazard warning information may be buried in the small print on the back of the container. <input type="checkbox"/> How do harmful substances enter the body? Other | <p>Chemical products: Have a number of chemical products - some with WHMIS labels, some with consumer labels, and some – if possible – with no label or with the HMIS label from USA (example – contact cement, caulking, glues, body filler putty, aerosol spray cans, labels from products such as fibreglass insulation, concrete, silica sand.</p> <p>Hand out –</p> |



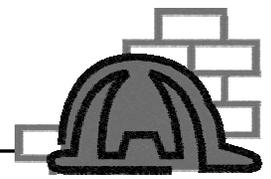
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| | | <p>exposures & routes of entry “injection/puncture”. Usually related to health care field where needle stick injuries are a major concern, or other workplaces where sharp objects may be present – construction – rebar etc.</p> <ul style="list-style-type: none"> ❑ Absorption by body – explain diagram. Ask “Why does the eyes and genital area have such a potentially high absorption rate? Answer – Thin outer skin/membrane covering these areas; high concentration of blood vessels close to surface and both areas tend to be moist. Why is forearm absorption rate so low? – for all the opposite reasons – surface skin is thick, layer of fat between skin and blood vessels, skin tends to be dry. ❑ Explain “The Basics for WHMIS” box. If a person is working with controlled products or any other chemical these are 4 basic things that should be known about the chemical one is working with. ❑ Section 6 – WHMIS labels. Read sample “Methanol” label. Ask if participants know what chemical splash goggles look like? Show both pair of goggles and have participants identify which is which. Show and explain difference. Ask what type of rubber gloves should be worn when working with methanol? Where would that information be found? – material safety data sheet ❑ Review and discuss each WHMIS class – section 7 to 12. Point out the symbol for each class/division and the hazard/danger associated with each symbol. ❑ Class b – section 8 – review types of fire extinguishers ❑ When discussing Class D2 – explain that this symbol has the most varied number of hazards of any other WHMIS symbol. Add also “irritant” to this group and explain that an irritant is the safest type of WHMIS product because it does not cause permanent health damage. ❑ Review sections that are found in a material safety data sheet. | <p>“WHMIS in Your Workplace”</p> <p>Handout exercise – “What WHMIS symbols should be on this can?”</p> <p>Quiz – “WHMIS Class Symbols Exercise”</p> <p>Props: 1 – chemical splash goggles 1 – safety goggles</p> <p>Material Safety Data Sheet – obtain an MSDS for “toluene”</p> |
| 45 min | Learner Shows You | <ul style="list-style-type: none"> ❑ When discussion of manual up to section 12 is completed, handout “What symbols should be on this can?” ❑ Answers are Class A, Class B, Class D1, Class D2. ❑ Hand out a copy of the MSDS for toluene to participants. Have them work in pairs for this exercise. | |



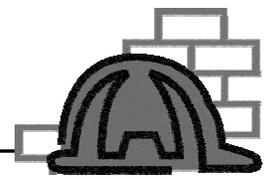
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| | | <p>Have the participants answer the 4 questions found on page 3 of the WHMIS handout in the box called “The Basics for WHMIS”. Instruct the participants to write down the section(s) and page in the data sheet where answers or the information to these four questions is found. Don’t have them write the information out, just identify where in the msds the answers to these 4 questions are found. What you will find, is that to answer these four questions, the whole MSDS will have to be read, because, for example, “What are the hazards?” will be found in a number of sections.</p> <ul style="list-style-type: none">□ Have participants complete the “WHMIS Class Symbols Exercise”. | |
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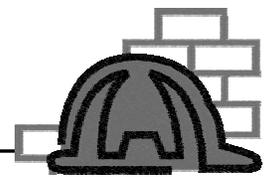
| Topic – Labour Market | | | |
|---|------------------------|---|-------------------------------|
| Learning Outcomes – participants will be able to: interpret the labour standards for the construction industry. | | | |
| Time | Steps | Activity | Materials |
| 120min | Introduction | Define Labour Market | |
| | Explain the Importance | What do you know about the labour market for construction/HEO? | |
| | Show Learners | Labour Market Topics – Heavy Equipment <ul style="list-style-type: none"> ▪ Wages ▪ Job Prospects ▪ Who Hires ▪ Skills required ▪ Employment Standards | Handout: Employment Standards |
| | Learner Shows you | Ask participants to locate specific information in the Employment Standards handout and record on a flip chart. <ol style="list-style-type: none"> 1. Minimum wages for construction work 2. Seven general holidays 3. Number of sick days per month | |



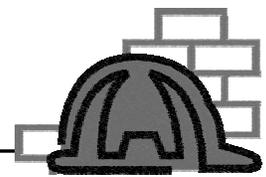
| Topic – Labour Market Learning Outcomes – participants will be able to: navigate the through the labour market information to target their job search. | | | |
|---|------------------------|---|---|
| Time | Steps | Activity | Materials |
| 60 min | Introduction | Review Labour Market | |
| | Explain the Importance | It is important to understand the labour market to identify the amount of work available, wages, working conditions, skills required. | Handout: Labour Market Participant package |
| | Show the Learner | Where can you find labour market information? Government websites, employment centres, phone books | Handout: Labour market bulletins: -Selkirk -Winnipeg -Southern MB -Northern MB Handout: Website printouts: -Industrial profiles – major industry group, construction. -Employment prospects – HEO and Labourer -Who Hires HEO and labourer for geographic area Phone books |
| | Learner Shows You | Ask participants to complete worksheet: Defining the Labour Market and targeting employers in the package. | Worksheet: Defining the Labour Market |



| Topic – Employability in Construction Learning Outcomes – participants will be able to: recognize employer needs and customize their job search to meet those needs. | | | |
|---|------------------------|--|---|
| Time | Steps | Activity | Materials |
| 60 min | Introduction | Discuss the differences between what employers want when they are hiring. | |
| | Explain the Importance | As someone looking for work, it is important to recognize employer wants to align your self to those needs. | |
| | Show Learners | Divide into 2 groups. Ask one group to identify what they think employers want in a new hire and the other to identify what they want in an employer. Ask them to record their responses on a flip chart and post on the wall. | Flip Chart and markers Painters tape |
| | Learners Show You | Each group presents their responses. As a large group, identify the similarities and differences between the two sides. Ideally, there are more similarities than differences. If they are very different, why is that? Employer or Employee expectations? Debrief with the Employer expectations clock and translate from the employee point of view. | Handout: Employer Expectation clock. |

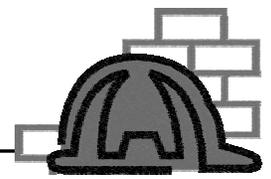


| Topic – Employability in Construction | | | |
|--|------------------------|--|-------------------------------|
| Learning Outcomes – participants will be able to: display examples of showing respect to others; explain the importance of a positive attitude; list behaviours that illustrate initiative on the job. | | | |
| Time | Steps | Activity | Materials |
| 60 min | Introduction | What do employers want from employees? <ol style="list-style-type: none"> 1. Show up on time (15 min early) 2. Follow instructions 3. Ask questions when needed 4. Be willing to learn 5. Work hard 6. Never use alcohol or drugs on the job Essential skills are: <ul style="list-style-type: none"> <input type="checkbox"/> Numeracy <input type="checkbox"/> Significant use of memory <input type="checkbox"/> Working with others | |
| | Explain the Importance | Identify your employability for employers | Handout – What employers want |
| | Show Learners | <ul style="list-style-type: none"> <input type="checkbox"/> Brainstorm strategies for showing up on time <input type="checkbox"/> Participants review the intake form they completed. See how well they can follow written instructions. Participants work in pairs. One reads the list of instructions out loud and the other performs the instructions. Do not correct or comment on how they perform the task. Do not reveal, reverse and retry. How different are the results and why? Memorization is very important with verbal instructions. Instructor reads a list of materials that the participants are to bring to class each day. Ask participants to memorize the list individually. Give about five minutes. Ask them to write down what they remembered. Not so easy, is it? There may be a need to take some notes. Discuss some strategies. <input type="checkbox"/> In pairs, ask participants to work on the asking questions example provided and debrief with the large group. <input type="checkbox"/> Discuss strategies on showing your willingness to learn. <input type="checkbox"/> Discuss the difference between working hard and hard work. Anticipation of work shows employers that you are thinking ahead. This will also prevent you from standing around looking unproductive and may help | |



| | | | |
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| | | <p>keep things moving. Employers appreciate that behaviour.</p> <ul style="list-style-type: none"> □ Discuss the usage of alcohol or drugs on the job. Ask group to provide reasons for not using on the job. Safety, Safety, Safety. | |
| | Learner Shows you | Participants will show these employers needs throughout the program. | |

| Topic – Employability in Construction | | | |
|---|------------------------|--|--------------------|
| Learning Outcomes – participants will be able to: communicate on the worksite including hand signals and signage, and describe how to ask appropriate questions when necessary. | | | |
| Time | Steps | Activity | Materials |
| 45 min | Introduction | Communication on the work site | |
| | Explain the Importance | People communicate constantly. It is important to talk to employers and co-workers appropriately. | Handout: Comm. Pkg |
| | Show Learners | <p>Discuss the charts illustrating the Face to Face vs. Phone communications.</p> <p>Ask participants to demonstrate the non-verbal languages.</p> <p>Discuss how your voice and can affect the message you send to others.</p> <p>Review effective listening.</p> | |
| | Learner Shows you | Ask participants to complete the worksheet on Effective listening including what they can do to improve their communication skills. | |

**Topic – Finding Employment**

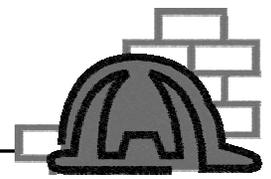
Learning Outcomes – participants will be able to: describe the employment process and how to access it, identify potential employers.

| Time | Steps | Activity | Materials |
|--------|------------------------|---|----------------------------|
| 60 min | Introduction | Strategies for Finding Work | |
| | Explain the Importance | Understanding how employers hire is the key to finding work. | |
| | Show Learners | Ask participants how they were hired at their last job. Record on a flip chart or whiteboard in unmarked columns for Visible and Hidden Job Market. Reveal the column headings to illustrate that a majority of people are hired through the hidden market. Define the difference between the two markets. Discuss the networking strategy and ask participants to list names of people they can network with using the contacts worksheet as a guide. How do you think employers in construction hire? Define cold calling. | Handout Job Search Package |
| | Learner Shows you | Ask participants to write a script they would say to potential employers. Name, experience, job openings, Ph #... | |

Topic – Resume Writing

Learning Outcomes – participants will be able to: build their own resume

| Time | Steps | Activity | Materials |
|--------|------------------------|---|--|
| 120min | Introduction | Resume Writing | |
| | Explain the Importance | Discuss the types of job search tools: Resume, cover letter, portfolio and introduction letter. | Handout Job Search package. |
| | | Review the guidelines for writing a resume and a sample resume. | |
| | | Participants use the worksheets to compile resume information. If computers are available, assist them in creating an electronic resume. | Data saving device: floppy, external drive, etc. |



Industry Profiles. Construction. http://lmi-imt.hrdc-drhc.gc.ca/standard.asp?ppid=117&lcode=E&prov=46&gaid=11326&naics_code=23&search_key=4&search_type=&new_search=&action=search

Employment Prospect. Heavy Equipment Operator. http://lmi-imt.hrdc-drhc.gc.ca/standard.asp?ppid=84&lcode=E&prov=46&gaid=11326&occ=7421&job=&search_key=3&search_type=1&employer_potential=&new_search=0

Employment Prospects. Construction Trades Helpers and Labourers. http://lmi-imt.hrdc-drhc.gc.ca/standard.asp?ppid=84&lcode=E&prov=46&gaid=11326&occ=7611&job=&search_key=3&search_type=1&employer_potential=&new_search=0

Who Hires. Heavy Equipment Operator. http://lmi-imt.hrdc-drhc.gc.ca/standard.asp?ppid=83&lcode=E&prov=46&gaid=11326&occ=7421&job=&search_key=3&search_type=&employer_potential=&new_search=

Who Hires. Construction Trades Helpers and Labourers. http://lmi-imt.hrdc-drhc.gc.ca/standard.asp?ppid=83&lcode=E&prov=46&gaid=11326&occ=7611&job=&search_key=3&search_type=&employer_potential=&new_search=

Working in Construction

Pilot Curriculum



Safety - Hearing

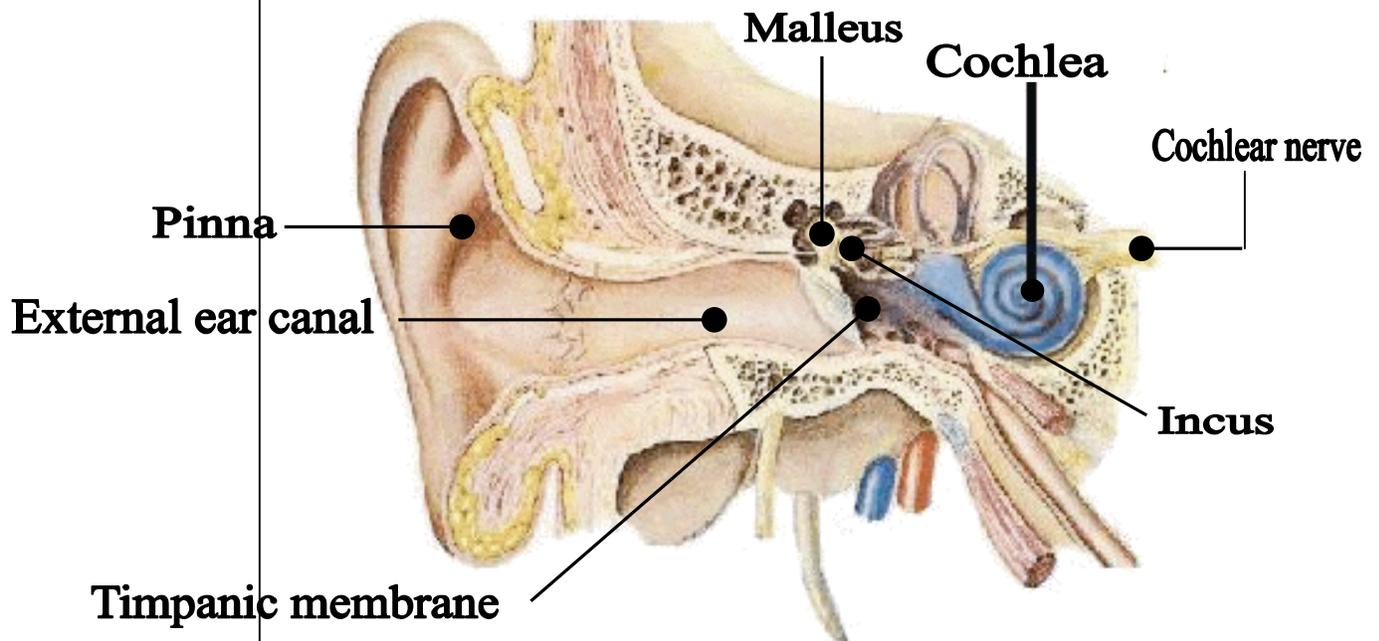




HEARING CONSERVATION

1. How hearing occurs

- Sound waves cause ear drum (timpanic membrane) to vibrate
- Vibrations are transmitted through the middle ear bones (malleus, incus) to the fluid in the inner ear (chochlea)
- Hair cells located in the inner ear change movement into nerve signals that are passed to the brain by the chochlear nerve



Parts of the Inner Ear

2. How hearing loss occurs

- Exposure to high levels of sound cause damage to the hair cells in the inner ear
- Damaged hair cells cannot be replaced or restored
- Damage to hearing is **permanent**



3. Exposure to sound

- Sound is measured in “decibels” (dBA)
- Sound levels less than 80 dBA will not cause damage to hearing
- Sound levels above 80 dBA will cause damage and hearing loss
- Sound at 90 dBA is 10X more intense than 80 dBA

| Exposure | Risk |
|--------------|----------|
| < 80 dBA | none |
| 80 - 85 dBA | very low |
| 85 - 90 dBA | low |
| 90 - 95 dBA | moderate |
| 95 - 100 dBA | high |
| > 100 dBA | severe |

4. Manitoba Requirements for Protection Against Hearing Loss

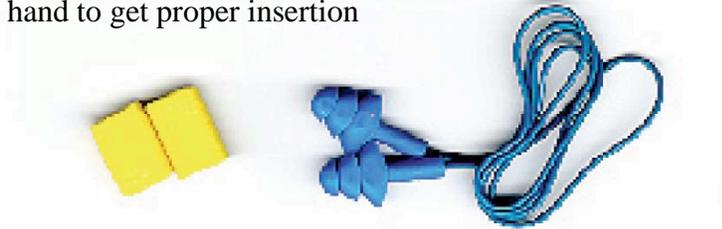
| workplaces below 80 dBA | workplaces above 80 dBA | workplaces above 85 dBA | workplaces above 90 dBA |
|-------------------------|--|---|--|
| No action required | Exposure measurements must be taken | All of 80 dBA | All of 80 dBA |
| | Results made available to workers | Muffs and/or plugs must be available for workers who want to use them | Employer must study workplace to limit exposure levels to 90 dBA or less |
| | Worker education on hearing conservation and noise control | Instruction on how to use muffs and plugs | If engineering controls cannot lower sound levels to 90 dBA or less, then wearing hearing protection devices (muffs and/or plugs) is mandatory |
| | Periodic testing of workers | | Areas must be posted with warning signs |





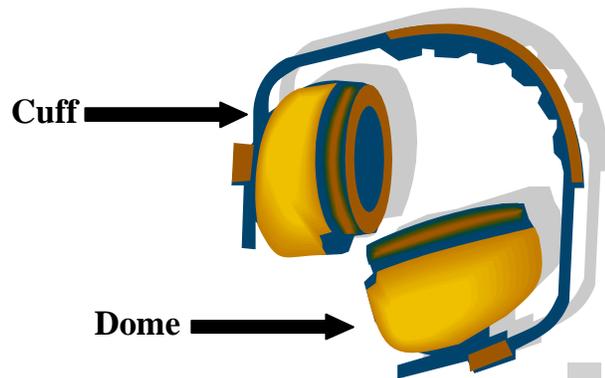
5. Hearing Protection Devices (HPDs)

Earplugs - ear canal must be straightened out by pulling on the outer ear with other hand to get proper insertion



| | |
|---------------------|--|
| Compressible | <ul style="list-style-type: none"> Made of compressible foam - roll between fingers before inserting, hold in place until foam has expanded to fill ear canal. One size fits most people. |
| Reusable | <ul style="list-style-type: none"> Made of plastic with single, double, or triple ridges to help seal the ear canal. Suitable for workers that may get hands/fingers dirty as the portion of plug that goes into ear canal is not handled Twist plug slightly as it is inserted into the ear. |
| Canal caps | <ul style="list-style-type: none"> Fit over the opening of the ear canal - not inserted into the canal as plugs are. |

Ear Muffs - domes must fit over entire ear to provide seal





Earmuffs continued

- Effectiveness of muff based on headband tension and fit of dome over the ears
- Hair, glasses, hats may interfere with proper fit of cuff and affect sound reduction
- Do not store hardhat mounted muffs with cuff pressing against the hardhat - this will flatten cuff and reduce its effectiveness

6. Selecting Hearing Protection Devices

CSA Standard Z94.2 - 94 - Hearing Protectors

| Noise Level | Recommended Hearing Protection |
|---------------|---|
| < 85 dBA | no protection required |
| up to 89 dBA | Class C |
| up to 95 dBA | Class B |
| up to 105 dBA | Class A |
| up to 110 dBA | Class A plug + Class A or B muff |
| > 110 dBA | Class A plug + Class A or B muff + limited exposure |

7. Noise Reduction Rating

The number gives the amount of noise reduction the hearing protection device provides

| | |
|---------|--------------|
| Class A | 24+ |
| Class B | 17 - 24 |
| Class C | less than 17 |





8. Factor Affecting Selection of Hearing Protection Devices

- Worker hearing ability. Workers with hearing impairment may find HPDs reduce sound levels too much and interfere with normal communication, backup alarms, etc.
- Communications demands on workers - frequent verbal communications may be affected by HPDs
- Use of other personal protective equipment - respirators, safety glasses
- Temperature and climate
- Work activity
- Physical restraints



NOISE: AUDITORY EFFECTS

Noise-induced permanent hearing loss is the main concern related to noise exposure.



Protect your hearing.... wear hearing protection.

This can include:

- Sudden hearing damage caused by a short burst of extremely loud noise such as a gun shot
- Ringing or buzzing in the ear
- Temporary hearing loss that happens after exposure to a high level of noise. Hearing comes back slowly when the affected person spends time in a quiet place. Complete recovery may take several hours.
- Permanent hearing loss that happens over time, being exposed to noise month after month and year after year. You notice the hearing loss when it starts to interfere with daily living. At this stage, permanent and irreversible hearing damage has occurred. It cannot be cured and worsens if noise exposure continues.

Some people are more susceptible to hearing loss than others.





ACTIVITY
NOISE: AUDITORY EFFECTS

What is the main concern related to noise?

Sudden hearing loss can be caused by...

How might you cure your temporary hearing loss?





NOISE: NON-AUDITORY EFFECTS

What does non-auditory mean?

Non-auditory means things not associated with hearing.

Auditory means concerned with hearing.

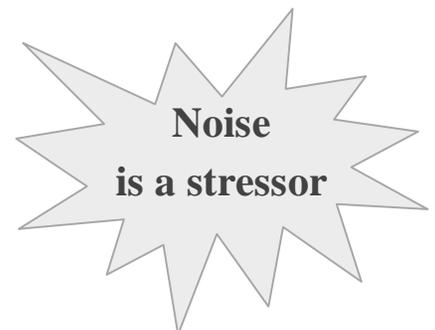


What are the non-auditory effects?

Hearing loss from long-term exposure to noise has been recognized as a hazard for a long time. However, what the non-auditory effects of noise are is still not certain.

It is believed that the following may be affected by noise:

- Heart and blood vessels
- Changes to blood pressure
- Hypertension
- Changes in breathing
- Annoyance
- Sleep
- Physical health
- Mental health
- Fatigue



It can cause stress.



NOISE: NON-AUDITORY EFFECTS

In the workplace, non-auditory affects of noise include:

- Problems with oral communications
- Absenteeism appears to be higher among workers in noisy places

Non-auditory effects can be divided into two categories: affects that happen within the body and performance effects.



The effects that happen within the body can be temporary or permanent.

Temporary effects are:

- Muscles contract
- Breathing changes
- Changes in heart beat pattern

As for permanent effects, the researchers disagree on whether or not there are permanent effects.



ACTIVITY
NOISE: NON-AUDITORY EFFECTS

Non-auditory means _____

List several things that may be affected by noise.

| | |
|-------|-------|
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

True or False?

- T F Sometimes workers are absent from work because of noise.
- T F Noise does not affect the heartbeat.
- T F Noise is a stressor.
- T F Muscles contract when loud noises are heard.



Working in Construction

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Introduction to HEO





CLOTHING AND ACCESSORIES

Construction workers using protective clothing and accessories decrease the risk of on the job injuries.

- Loose clothing, loose cuffs (on shirts or gloves); torn or ragged clothing. Loose or torn clothing can get caught on equipment or interfere with mount/dismount procedure and other operations.
- Greasy or oily clothing, gloves or boots. These cause you to slip or lose your grip; they may conduct electricity; they are also a fire hazard.
- Jewellery large, bulky rings or bracelets could get caught in equipment; neck chains are hazardous and must be worn under clothing, not hanging loose.
- Clothing made of synthetic fabric is readily ignited and melted by electric flash. Wear clothing made of cotton, wool or linen.



COMMUNICATING WITH HAND SIGNALS

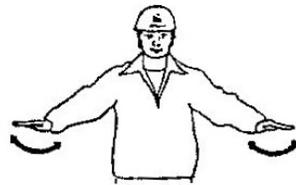
The following are basic rules and points to remember when giving or receiving hand signals.

- Hand signals must be given in a clear and concise manner.
- Signal person must be in full view of the operator at all times or the operator must stop.
- Take directions from only one designated signal person unless the signal is stopped.
- Not all personnel who give signals know or use the correct signals. Therefore, nothing moves until the operator and the signal person understand the meaning of every signal.
- Stop signal must be taken from anyone who gives it.



The following hand signals are recognized by many sectors of the industry.

Emergency Stop



Palms down, hands back and forth

Stop



Palms up facing operator

Stop



Palms down, hand back and forth

Start Engine



Point first, thumb up in direction of operator and rotate hand at wrist

Shut Off Engine



Palm down held at throat

Swing



Arm out – point in direction of swing

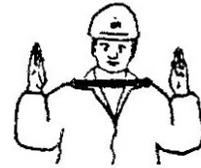


Hand Signals Continued

Move Toward

Move Away

Space Left



Palms away from operator, flex fingers

Palms face operator, flex hands at wrist

Palms up and facing distance left to

Dog Everything

Lock One Track Travel Opposite Track

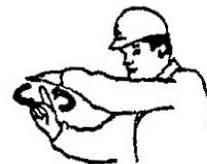


Clasp hands together

Fist up to lock track, rotate hand in the direction of travel of track

Raise Load or Bucket

Raise Load or Bucket Slowly



Point upward and rotate hand at wrist

Point upward to palm, rotate hand at wrist





COMMUNICATION WITH EQUIPMENT

Horn signals are used by operators of excavating equipment for the purpose of directing traffic. (i.e. positioning dump trucks for loading.) Like and signals, horn signals must be fully understood by everyone before they are used.

NOTE: Any horn sound when moving means STOP.



One blast – when moving (any direction) means STOP



One blast – when stopped means MOVE AHEAD



Two Blasts when stopped means REVERSE



SAFE OPERATING PRACTICES

The operator is responsible for the safety of all those who work around the equipment, the immediate work area and on the work-site.

The following work-site rules and safety tips are intended to maintain a safe and incident free work environment. The list below is not designed to cover all eventualities but rather to highlight some common practices, which contribute to safety. Always remember, site conditions change from location to location, in the amount of congestion or traffic and with changing weather. The best rule of thumb is always be aware of the surroundings, exercise extreme caution when operating and keep safe operating practices as a number one priority.



Safe Operating Practices Continued

Always.....always.....always....

- Wear seat belts when operating equipment.
- Lower all components/attachments to ground prior to exiting equipment.
- Be alert to your surroundings. Know where machinery is located and keep clear of swing areas.
- Make sure presence known to other operators. It is often difficult for an operator to see foot traffic.
- Come to a complete stop before shifting from forward to reverse or from reverse to forward.
- Keep front wheels/track idlers on ground during leader/dozer work.
- Keep idlers to the front and sprockets to the rear of the excavator when traveling or excavating whenever practical.
- Shut engines off prior to leaving equipment unattended for extended periods.
- Position the upper-structure of an excavator to ensure a clear view of the intended path of travel before moving in either direction.
- Use a signaller if the intended path of travel is not in clear view.
- Use extra caution when travelling or operating equipment in congested areas.
- Use extreme caution when travelling or operating near excavations and embankments.



**WORK SITE CONDITIONS**

Before starting any job, the operator should perform a walk-around inspection of the immediate work area and survey the conditions at the work-site. The checklist should include:

 Site Activity

Other work components of the project that are going on at the same time or others using or needing access to or through the work area.

 **Overhead Electrical Conductors**

Utility wires or support cables that are hanging within the safe limit of approach of the maximum vertical height or reach of the machine.

 Underground Utilities

Utility cables or pipes in or near the work area.

 Overhead/ground Level Obstacles

Overhead walkways, poles, fences, trees, manholes, etc., that will need to be moved or avoided in order to complete the job safely and efficiently.

 Traffic Conditions

Other machines operating in the same general area or public vehicles that will continue to operate near the work area during the operation.

 Other Personnel

Will other workers of the general public be near or within the work area?



Work Site Conditions Continued

Soil Conditions

Surface and soil characteristics of moisture content, composition and firmness that will determine the stability of the working surface. Will there be a need for special attachments or tools to break or move the surface layers.

Grade Conditions

Is the surface relatively level or are there embankments, slopes or drop-offs, which could pose a problem for machine stability?

Hidden Hazards

Objects which are not obvious or hidden from view by heavy brush, vegetation or other obstacles.

Heavy equipment operators have a lot of responsibility as they control the movement of machines capable of massive damage and destruction. With all the things an operator has to think about while doing the job, a pre-job walk-around can help expose any hazards or surprises. Also, a quick survey may lead to alternate plans on how to complete the work the quickest and most efficient way possible. The aim of the contractor is profitable operation with minimal down time or delays, so a few minutes on a survey of the work area is always a good idea.

**PRE-OP SEQUENCE EXAMPLE**

An example of a pre-operational sequence is performed in the following sequence:

- 1. Approach the machine**
 - inspect for leaks and signs of vandalism

- 2. In the engine compartment, check the following areas:**
 - oil
 - fuel system
 - exhaust
 - belt tension
 - electrical and hydraulic system for fluid levels
 - general condition
 - cooling system
 - air intake system
 - leaks
 - contaminants

- 3. In the cab**
 - set the controls
 - check the instruments
 - start the engine and re-check the instrument readings

- 4. Outside walk around**

Inspect the following for damage, wear, leaks and general condition.

 - attachments
 - undercarriage
 - hydraulic systems
 - connections

- 5. Return to the cab**
 - re-check the instrument readings



EQUIPMENT SYMBOL IDENTIFICATION/INDICATOR LIGHTS

Symbol Identifications

| | | | |
|--------------------------------------|---|--|---|
| Hydraulic – Oil Filter |  | Hydraulic Temperature |  |
| Lubricant - Grease |  | Lubricant - Oil |  |
| Engine Not Running |  | Engine Oil Filter |  |
| Engine Oil Level |  | Transmission or Converter Oil Filter Pressure |  |
| Engine Oil Pressure |  | Transmission or Converter Oil Filter Temperature |  |
| Light - Park |  | Engine Resolutions Per Minute or Running |  |
| Slow |  | Test |  |
| Transmission or Converter Oil Filter |  | Continuously Variable |  |

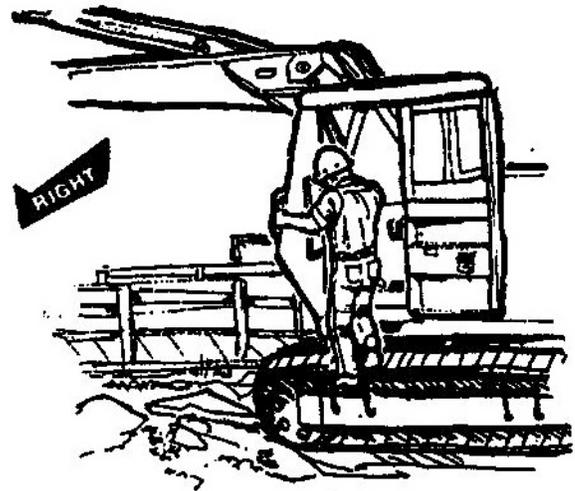


MOUNTING AND DISMOUNTING

Many equipment operators sustain injuries associated with mounting and dismounting trucks and heavy equipment. Part of the problem is the design of the machinery, but many injuries occur when operators jump down from the machines.

There is a correct mounting/dismounting procedure for each model of heavy equipment and operator must use.

Some machines, especially the older ones, have poor access to the operator's station and some of them do not have proper steps and handrails. Extra caution must be used when mounting and dismounting this type of equipment.



The correct procedure for mounting and dismounting equipment is the 3-point contact method. This procedure requires the operator to face the machine using two hands and one foot, or two feet and one hand. It is important to remain in contact with the equipment at all times and break the 3-point contact only upon reaching the ground, the cab or stable platform. If the 3-point contact is incomplete, the operator is in a potentially unstable position that can lead to a fall.

It is important to keep your balance while mounting and dismounting equipment. The greater the lateral movement, the more likely the operator will be in an unstable position.



EXITS AND ENTRIES

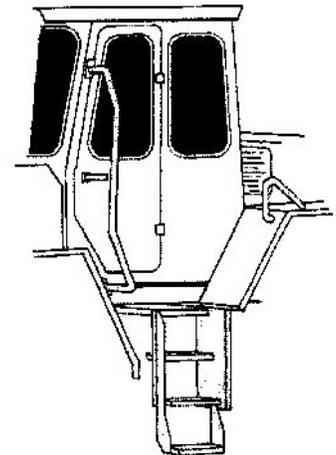
Always use the proper exits and entries while mounting and dismounting equipment. Some machines have more than one exit and entry (for example, bulldozers and loaders). On equipment like this the blade or bucket control is on the right hand side; therefore, the left hand side makes a safer exit and entry. Use the proper steps and handrails while mounting and dismounting equipment.

Make sure the bucket/blade is on the ground, parking brake and lock out controls are complete before exiting the machine.

Loose or torn clothing can cause problems while mounting or dismounting equipment. Jewellery can pose a hazard as well.

Exits and Entries

Position equipment so that hazards on the ground are avoided. Always plan where you are going to park your machine when you are getting on or off it. Many times Operators use the proper mounting and dismounting procedures, and trip and fall leaving the machine because they parked it near a hole or debris. Ice poses a wintertime hazard.



Correct positioning

Never mount a machine while it is in motion. This could lead to serious injury or fatality. Never allow riders, unless a seat is provided for, and used by, the rider.

Machine must be stopped

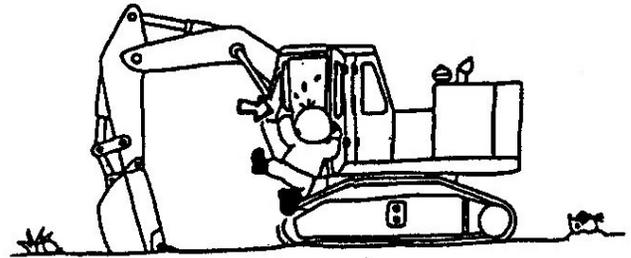
When operating swing-type equipment (for example, excavators), position the upper structure in line with the car body or track to provide safe exits and entries.



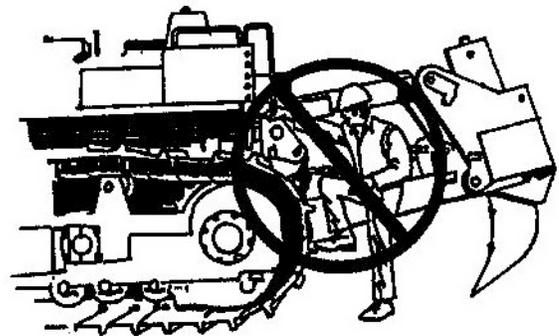
HOUSEKEEPING

Good housekeeping practices are necessary to avoid slips, falls and injuries. Running boards, treads, steps, footholds and platforms must be kept clear of mud, ice, snow and other hazards. Grease and oil spills should be wiped up immediately. Operators should clean their boots of excess mud before getting on a machine. Store tools, equipment and other objects properly to prevent tripping. Operators should never carry tools in their hands while mounting and dismounting equipment.

Machine levers are not designed to support the weight of an operator. They can bend or break. Control can be activated suddenly, moving components and causing injury to other personnel.



Using the steering wheel as a handhold on articulating machines can cause them to move. These machines also have pitch point, which could cause injury or death to other personnel.



Both machine levers and steering wheels, when used as hand holds can move causing the operator to become unbalanced and slip or fall and incur injury.

Using grousers on bulldozers is not recommended. The grouse does not always provide a sufficient toehold for the operator. In wet or muddy conditions, the tracks are very slippery and an operator could slip and incur serious injury.

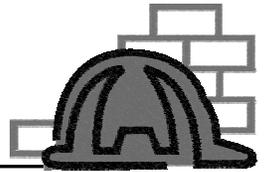
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Ladder Safety





PORTABLE AND WOOD-BUILT LADDERS

SPECIFICATIONS (portable ladders)

Portable ladders should be:

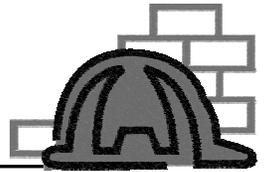
- ↑ ladders classed as CSA Type 1 - Industrial (working capacity of 250 lbs), or
- ↑ wood-built ladders meeting the requirements outlined below.

PROCEDURES

a. Inspecting Ladders

Before using any portable ladder, check to make sure:

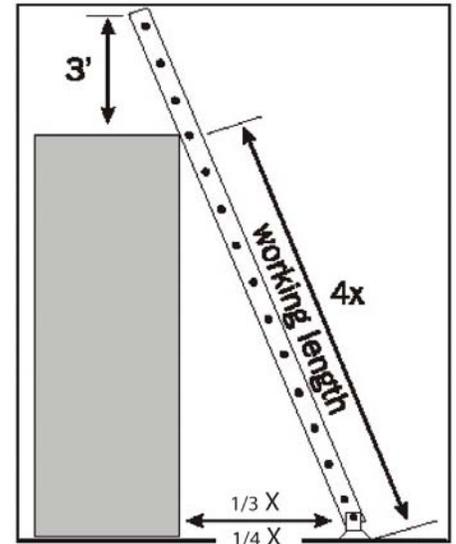
- side rails are straight with no bends, damage, cracks or splits;
- rungs are not missing, bent, broken, split or excessively worn;
- wood-built ladders do not have nails sticking out, on aluminum ladders the rivets are not loose;
- bracing is not broken or loose;
- non-skid feet or spurs are working properly and not worn or damaged;
- pull ropes for extension ladders are not frayed, worn or knotted;
- rope pulleys are not broken or defective;
- extension ladder locks are not broken or bent and work properly.
- **Remove and tag-out any defective ladder!**



b. Set-up

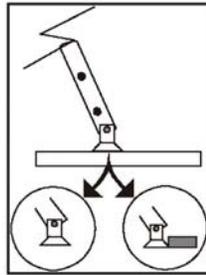
All portable ladders must be set-up the following way:

- locate ladder on a firm footing and make sure slip resistant feet are adequate or tie top/bottom of ladder off or use wood blocking or have someone hold the ladder
- place feet 1/4 to 1/3 of ladder's working length out from the base
- rest both ladder rails on the top bearing point - do not use the ladder rungs to support the top of the ladder
- extend ladder 1m (3') past the point of bearing

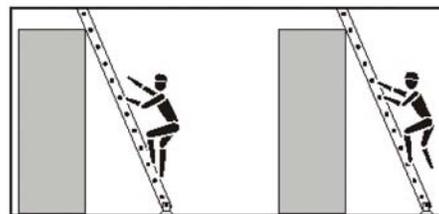


Portable ladder Set-up

c. Safe Use



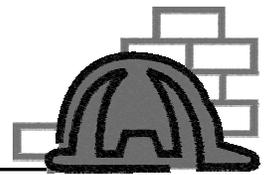
Ladder should have slip-resistant feet or wood blocking to prevent base sliding out.



3 Point Contact

- inspect all ladders before using
- select the right ladder for the job:
 - use non-conductive ladders when working near energized equipment or electrical circuits
- set up barricades and warning signs when ladders are set-up in doorways or passageways or any other location where the ladder could be struck
- get help when setting up a long or heavy ladder





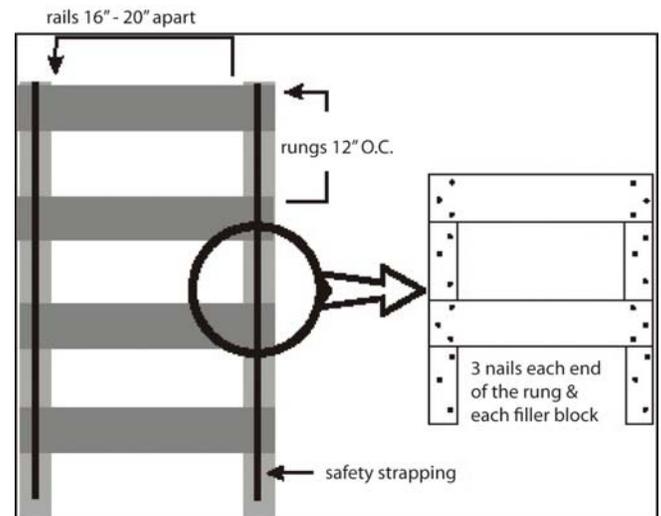
Safe use continued

- only one person should be on a ladder at a time
- face the ladder when going up or down
- use three point contact when climbing
- keep the centre of the body between the ladder rails
- clean muddy/slippery boot soles before getting on a ladder
- do not carry objects while on a ladder - hoist materials and attach tools to a belt or pouch
- do not step on the top two rungs of any ladder

SPECIFICATIONS (job – built wood ladders)

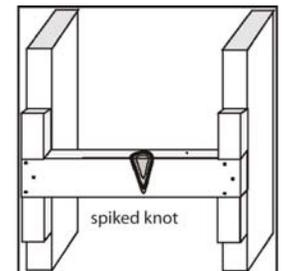
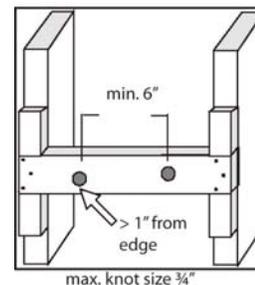
1. Ladder Construction

- Rails - 2" x 4" spaced 16" to 20" apart, to maximum length of 24'
- Rungs - straight grained 1" x 4" or 2" x 4" spaced 12" on centre
- Filler blocks - 1" x 2" or 2" x 2" secured with 3 nails
- Nails - use 2½" nails for 1" thick rungs and filler blocks and 3" nails for 2" thick rungs and filler blocks
- Safety strapping - the wire or banding must be secured to each rung and filler block



2. Knots in rungs

- maximum of 2 tight and sound knots per rung, minimum of 6" apart and more than 1" away from edge of the rung
- maximum knot diameter - ¾"
- spiked knots - not permitted in rungs



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Grade Stakes



Manitoba 
Building for the Future



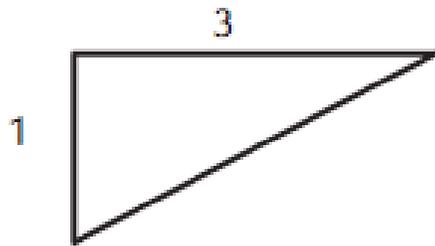
GRADE STAKES

Grade Stake Terms

| | |
|-----------|---------------|
| C = cut | F = fill |
| G = grade | O/S = off set |
| T = toe | STA = station |

Tolerance is 50mm/2” from measurements

Slope – measured as a ration of vertical to horizontal. The example means for every 3 metres horizontal, there is 1 metre vertical rise/fall.



Working in Construction

Pilot Curriculum



Excavation Safety





EXCAVATION SAFETY

Utility Codes

| | |
|--------|--|
| Red | Electric power lines, cables, conduit, and lighting cables |
| Orange | Communication, alarm or signal lines, cables, or conduit |
| Yellow | Gas, oil, steam, petroleum, or gaseous material |
| Green | Sewers and drain lines |
| Blue | Potable water |
| Violet | Reclaimed water, irrigation, and slurry Lines |
| Pink | Temporary survey markings, unknown/unidentified facilities |
| White | Proposed excavation limits or route |

1. Some Definitions

- a) “trench excavation” = depth > width
- b) “open excavation” = width \geq depth

2. Health & Safety Regulations for Excavation Work in Manitoba

- a) What is the name of the regulation for excavation work in Manitoba? Construction Industry Safety Regulations MR 189/85
- b) What sections in the regulation covers “trench excavations”?
Sections 135(1) to 139 (3)
- c) How deep can a trench excavation be dug before it needs shoring? 1.8 m (6') or soil conditions such that walls must be shored regardless of depth



3. Before the Digging Starts

- Planning the excavation – risk assessment
- Call utilities before you dig
- Call workplace Safety & Health Division



4. General Safety Requirements

| | | | |
|-----|--|---|--------------------|
| PPE | Site set up → Traffic control around the site → Public safety (barricading) → Access/egress | Engineering approvals → info on site | Hoisting equipment |
|-----|--|---|--------------------|



5. Types of Soil Collapse

- Zone of exposure
 - side wall shear
 - cave-in
 - rotation
 - spoil pile



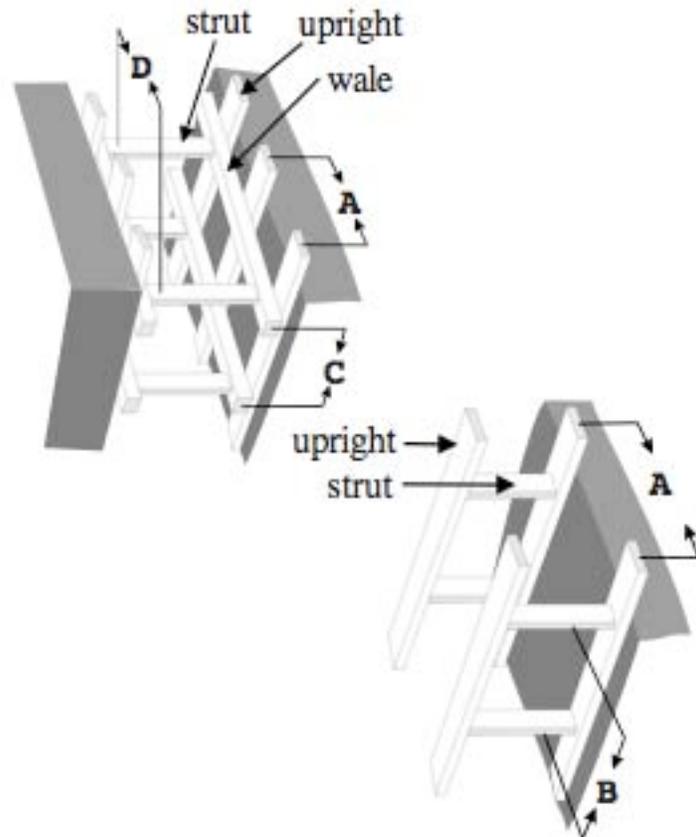


6. Protecting Workers in Excavations

- Wood shoring
- Trench cages
- Sloped walls



7. Wood Shoring Components





8. Trench Shoring Tables

| TRENCHES UP TO 5' WIDE | | SOIL TYPES | | | | |
|------------------------|---------------------------|------------|-----------|------------------------------|-----------|-------------|
| | | stiff/firm | | likely to crack/crumble/soil | | blowse/soil |
| TRENCH DEPTH | | 0 - 10' | 10' - 15' | 0 - 10' | 10' - 15' | 0 - 10' |
| UPRIGHTS | size | 2" x 8" | 2" x 8" | 2" x 8" | 2" x 8" | 2" x 8" |
| | spacing A | 3' | 3' | 3' | 3' | 3' |
| STRUTS | size | 4" x 4" | 4" x 4" | 4" x 4" | 4" x 4" | 4" x 4" |
| | vertical spacing B | 4' | 3' | 4' | 3' | 3' |
| WALES | wale size | 6" x 8" | 6" x 10" | 6" x 10" | 8" x 10" | 8" x 10" |
| | wale spacing C | 4' | 3' | 4' | 3' | 3' |
| | strut size | 4" x 6" | 4" x 6" | 6" x 6" | 6" x 8" | 6" x 8" |
| | strut spacing D | 6' | 6' | 6' | 6' | 6' |

| TRENCHES UP TO 1.5 M WIDE | | SOIL TYPES | | | | |
|---------------------------|---------------------------|------------|-----------|------------------------------|-----------|-------------|
| | | stiff/firm | | likely to crack/crumble/soil | | blowse/soil |
| TRENCH DEPTH | | 0 - 3m | 3m - 4.5m | 0 - 3m | 3m - 4.5m | 0 - 3m |
| UPRIGHTS | size (mm) | 38 x 191 | 38 x 191 | 38 x 191 | 38 x 191 | 38 x 191 |
| | spacing A | 0.9m | 0.6m | 0.6m | 0.6m | 0.6m |
| STRUTS | size (mm) | 89 x 89 | 89 x 89 | 89 x 89 | 89 x 89 | 89 x 89 |
| | vertical spacing B | 1.2m | 1m | 1.2m | 1m | 1m |
| WALES | wale size (mm) | 140 x 191 | 140 x 235 | 140 x 235 | 191 x 235 | 191 x 235 |
| | wale spacing C | 1.2m | 1m | 1.2m | 1m | 1m |
| | strut size (mm) | 89 x 140 | 89 x 140 | 140 x 140 | 140 x 191 | 140 x 191 |
| | strut spacing D | 1.8m | 1.8m | 1.8m | 1.8m | 1.8m |

Notes to Trench Shoring Tables

1. In loose soils over 10' (3m), use Vee trench with side walls sloped at 45° or use semi-vee with a trench cage.
2. Wood shoring must be SPF Species D, Aspen Species Group F, #2 Grade or better. Tables are based on graded nominal lumber dimensions. Ungraded full dimension poplar is considered equal.
3. Trenches less than 5' (1.5m) deep must be shored when dangerous ground movement is likely (hydrostatic pressure, vibration, etc.).
4. Two struts must be installed on each vertical plane where struts required.
5. Shoring for sand & gravel (loose/soft soils) may be sized for 'soils likely to crack/crumble'.
6. Steel trench jacks can be substituted for wood struts as below. Jacks must have end bearing area equal to wood struts.



| Imperial | | Metric | |
|------------|----------------|-----------------|----------------|
| Strut Size | Pipe I.D. Size | Strut Size | Pipe I.D. Size |
| 4" x 4" | 1½" Standard | 89 mm x 89 mm | 40 mm Standard |
| 4" x 6" | 2" Standard | 89 mm x 140 mm | 50 mm Standard |
| 6" x 6" | 2" Standard | 140 mm x 140 mm | 50 mm Standard |
| 6" x 8" | 3" Standard | 140 mm x 191 mm | 75mm Standard |
| 8" x 8" | 3" Standard | 191 mm x 191 mm | 75 mm Standard |





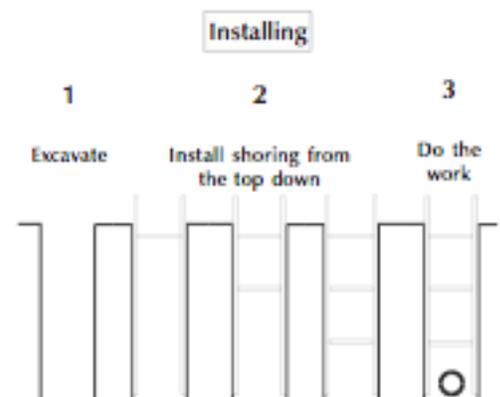
9. Installing Wood Shoring

The basics on wood shoring installation

- Install shoring as soon as possible after excavating completed.
- Minimum of 2 sets of shores in a trench.
- 2 Struts on each set of uprights
- Top strut – max. 18” below surface
- Bottom strut – max. 24” up from bottom
- **Shoring is installed from the top down.**
- **Shoring is removed from the bottom up.**
- Wood shoring must be installed according to the shoring tables.
- **Do not work past the point of shoring.**
- **Do not enter an unshored excavation.**

Installing wood shoring

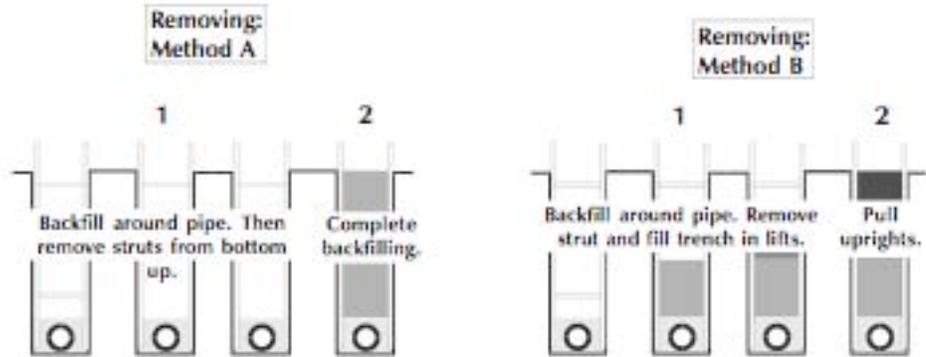
- Observer pm top keeps excavation under watch anytime a worker is in the excavation.
- Excavating machine must have bucket in trench directly in front of shores being installed.
- Machine operator must keep the workers putting in the shoring under observation.
- Put uprights in the trench – minimum of 2 sets.
- Install the top 2 struts before placing the bottom struts.
- Place first strut no lower than 18” below the surface – keep strut level.
- Install the second strut by working off a ladder. Keep vertical spacing as stated in shoring tables. Have the bucket of the machine in between the uprights while the struts are placed.
- Install lower struts – spacing as per shoring tables. Bottom strut – max 2’ up from trench bottom.





Removing wood shoring

- Remove shoring in reverse order – start from the bottom and work up.
- If backfilling in stages, do so in lifts one strut spacing at a time.





10. Using Trench Cages

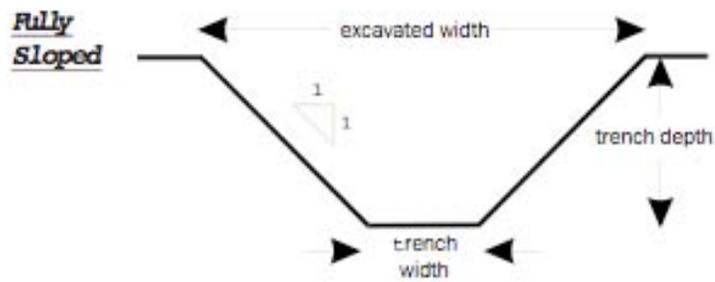
- Cages must be designed and approved by a professional engineer.
- Usual design criteria
 - 75 pounds/square foot/foot of depth
- Cages that are stacked must be secured to be able to transmit loading conditions from one cage to the other.
- Cages must have continuous sides.
- Cage sides must extend 2' above the vertical wall of the excavation.
- If workers are to remain in the cage when it is dragged, there must be some sort of protection against rigging failure.
- **No worker is to work outside the protection of the trench cage.**



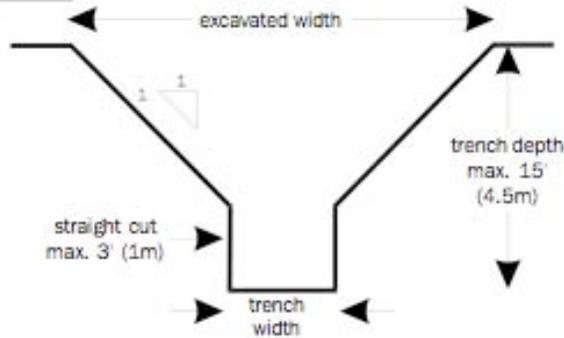


11. Sloping Excavation Walls

- Types → fully sloped
→ combination slope & straight cut
- Walls must be sloped at a 45° angle (1-to-1 slope).
- For combination slope & straight cut trenches, maximum height of straight cut is 3' (1m).
- Overall allowable depth for a combination & straight cut excavation is 15' (4.5m).
- Keep sides trimmed or scaled to prevent loose material rolling down into the excavation.
- Check excavation slopes daily for movement.



Combination Slope & Straight Cut





12. Excavated Material

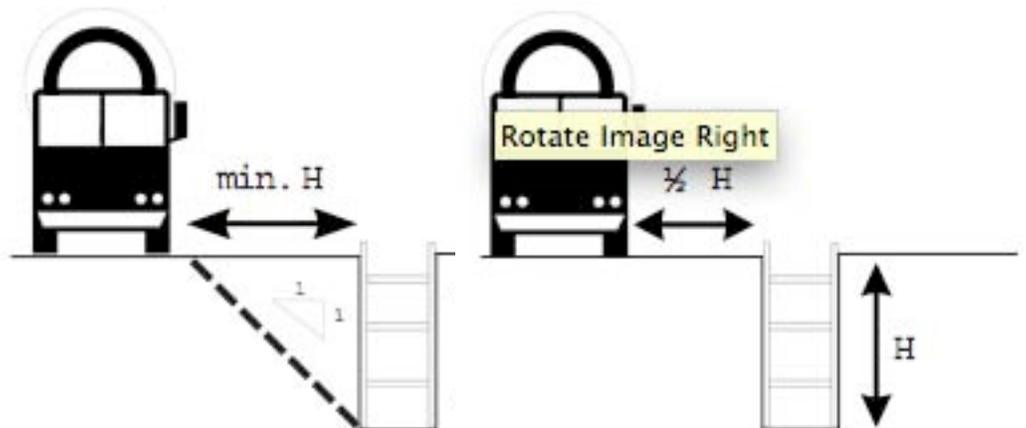
- Placed at least 3' away from edge of excavation.
- Piled so material will not fall into excavation.



13. Access / Egress

- How deep must an excavation be before a ladder is necessary for proper access and egress?
- How far must a ladder extend past the top of an excavation?
- How far must a ladder be positioned from a worker's position in the excavation?

14. Some Related Safety



- Keep equipment at least the tier depth away from edge of excava

- Equipment loading on excavation walls - with engineer's certification.



Working in Construction

Pilot Curriculum

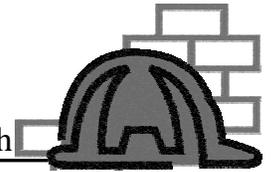


Employability



Labour Market ■ Communication





DEFINING THE LABOUR MARKET

The labour market research is the investigation of occupations and their salaries, working conditions, employment prospects and skills required.

Step 4
Identify potential employers
Websites, job advertisements,
phone books, networking

Step 3
Determine the categories you want to know about.
Wages, prospects, skills, etc.

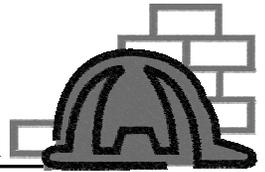
Step 2
Identify where to look for the labour market information
Websites, newspapers, publications

Step 1
Identify the occupations are you interested in
Type of construction

LABOUR MARKET RESEARCH

| | |
|----------------------|--|
| Occupation | |
| Where to look | |
| Wage Scales | |
| Prospects | |
| Skills | |
| Employers | |



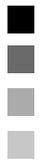
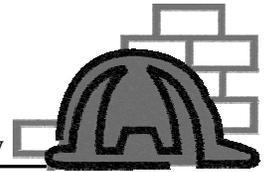


Employability

Which employers do you want to target for employment?

*We will use
these
employers to
help target
your job
search.*





EMPLOYABILITY
What else do employers want?

Extensive research has been done on the construction industry, which has shown an increased need in trades and equipment operators. Interviews with employers of varied sizes and most of them agree on some additional skills that they look for in an employee.

Additional worksite skills are:

1. Showing up on time
2. Follow instruction
3. Ask questions when needed
4. Be willing to learn
5. Work hard
6. Never use alcohol or drugs on the job

Skills that are essential to the occupation are:

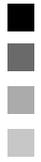
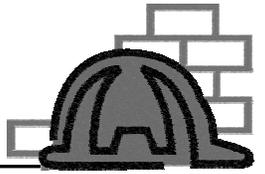
Numeracy

Significant use of memory

Working with others

The following exercises will illustrate how you can make yourself more employable.

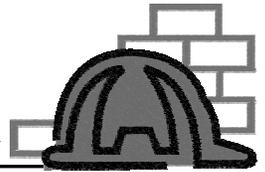




ACTIVITY 1
Showing up on time

Brainstorm strategies for showing up at the job site on time.

A large, empty rectangular box with a thin black border, intended for participants to write down their brainstormed strategies. The bottom right corner of the box is folded over, creating a triangular shadow effect.



ACTIVITY 2
Follow Instructions

Have your partner read this list of instructions to you. Follow the instructions as they are read to you. Do not correct or comment on how your partner is following the instructions.

Instructions:

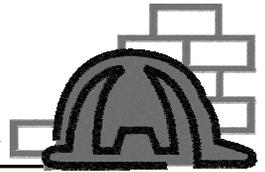
- Fold a piece of paper in half, like a greeting card.
- On the front of the card, write your birthday.
- Under that, write the numbers 1-19 from left to right.
- Open the card up.
- On the left side, draw a line from the top left corner to the bottom right corner.
- To the left of the line, draw a heart.
- To the right of the line, draw a diamond.
- On the back of the card, sign your name in the top left corner.
- Write today's date in the bottom right corner.

Do not reveal the results.

Switch roles and repeat the activity.

What happened?





Make your questions as direct as possible.

ACTIVITY 3
Asking Questions When Needed

Learning how to ask questions.

“I know what I want to ask...I just don’t know how to ask it.”

One of the most important things to think about when phrasing your question is...‘get to the point’. Make your questions as direct as possible.

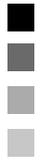
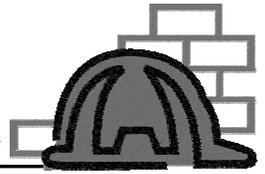
Try to begin your sentences with:

- “Can you re-phrase...?”
- “I don’t understand what you meant by...?”
- “I’ve never... before. Can you show me how to ...?”
- “Can you repeat that?”
- “Could you write that down for me?”
- “What did you mean by...?”
- “How do I...?”

For example:

Your boss asks you to “grab that load of wood over there and pile it out back”. You look around and see the wood he’s talking about but are not sure where he wants it piled ‘out back’. How would you ask him? What would you say?

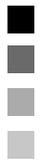
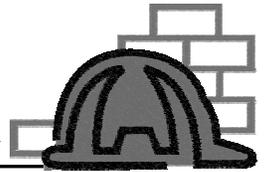




ACTIVITY 4
Be Willing to Learn

Brainstorm strategies for showing your willingness to learn.

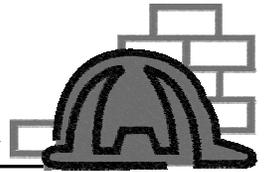
A large, empty rectangular box with a thin black border, intended for participants to brainstorm strategies. The bottom right corner of the box is folded over, showing a grey shadow.



ACTIVITY 5
Working Hard

Describe the difference between Hard Work and Working Hard.





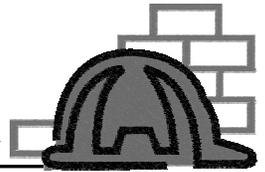
ACTIVITY 6
Never use Alcohol or Drugs on the Job

Brainstorm reasons for not using on the job.

Personal Plan

Describe what you will work on to improve your employability.





COMMUNICATION
Your speaking voice

When people listen to you speak, they might make up their minds about what kind of person you are because of the way you talk. It is important to think about how you say things.

Your voice tells people how you feel. If your voice sounds sad or angry, listeners will know this. **How** you say something is just as important as **what** you say.

Using the Right Words

Some things that you should avoid are:

- bad grammar
- slang
- swearing

Here are some things to think about:

Speak clearly.
Don't run your words together.

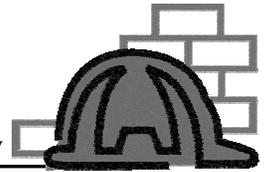
Don't speak too fast or too slow.

Don't speak too loud or too soft.

Try to pronounce words the right way.

What can you do to improve your communication with others?





COMMUNICATING WITH CO-WORKERS

Whenever you start a new job, you need to learn a new workplace “culture”. This is the way that people talk and act on the job. If you pay attention to your co-workers and boss, you will figure out how to act. Be careful not to pick up other workers bad habits. If you think they are doing, saying, or acting in a way that is unprofessional, you’re probably right. Don’t follow their example. Give yourself some time to fit in and don’t be upset if you don’t understand everything right away.

Don’t be afraid to ask questions. This is how you will learn to do your job better. Try not to ask just “yes’ and “no’ questions. There might be times or situations when it’s more appropriate to ask this: “Could you tell me or show me how you want me to do this?” When your co-worker or boss is talking to you, listen carefully.

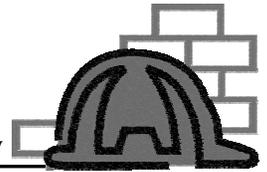
If you are criticized for your job performance, don’t take it personally. This is how you will learn your job. If someone criticizes you but doesn’t give you any advice on how to do the job better, ask them how you could do better. You can say, “How could I do this better next time?”

Also, if you are giving criticism, make sure you are positive and give constructive advice on how the person can improve their performance. Instead of just saying, “You did a bad job”, you can say, “Next time, you might try doing (offer suggestion). That way, you will avoid the same problem”.

Always remember that you are working as a part of a team. Be a team player by giving your ideas and suggestions to others. There might be co-workers that you don’t like. That is okay, however you do need to respect them as a co-worker. Try to look at their strong points and ignore the things about them that bother you.

Look after the space where you are working and the tools that you use. This shows that you are serious about your work and have respect for others.





EFFECTIVE LISTENING

Everybody thinks that they know how to listen. It's easy, right? However, there is a difference between *listening* and *hearing*. Are we really listening and understanding what the other person is saying? OR are we only hearing the words someone says?

Listening is a learned skill and it is the most important of all of our communication skills. It takes practice to be an effective listener.

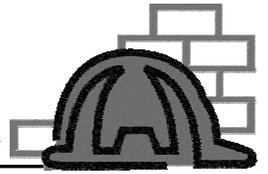
*Listening can be affected by what is going on around us
and what is going on in our own minds*

If we are in a noisy place or if we are angry or hungry, we can't listen as well.

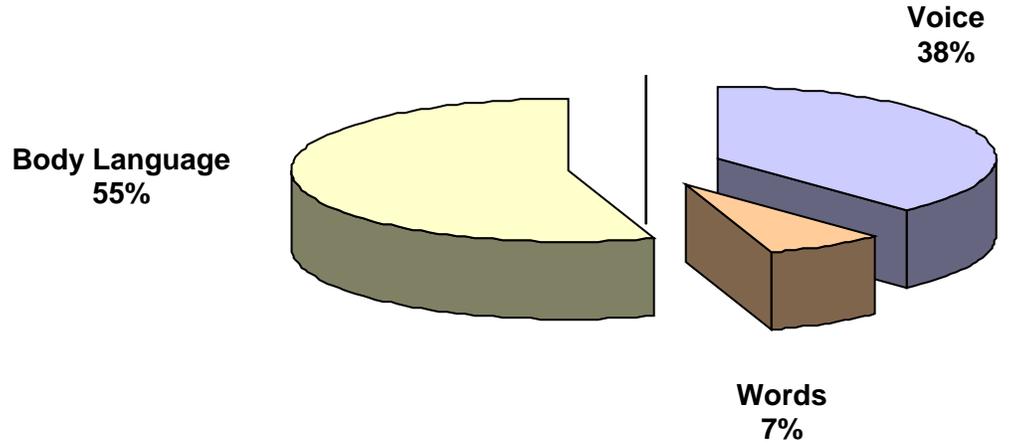
To be a good listener, we need to know some of the barriers that might get in the way of our understanding the message. We need to be aware of situations when we are not really listening.

Here are some things that can tell us if we are not really listening:

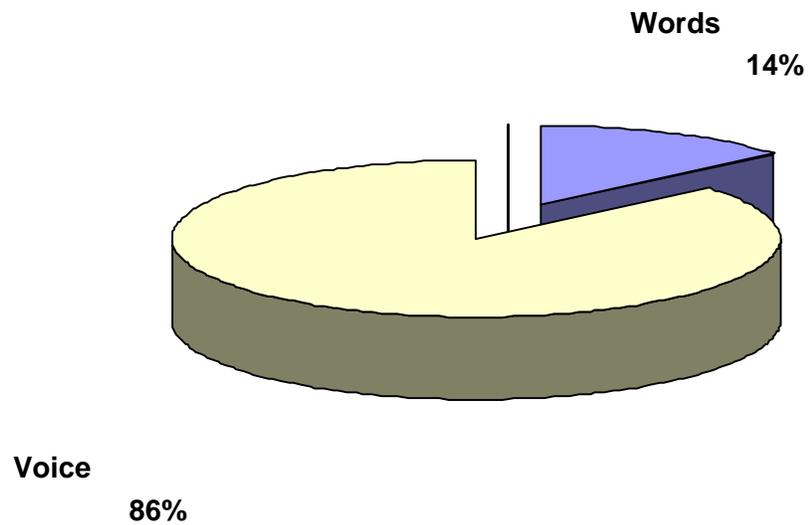
- daydreaming
- slouching in the chair
- looking at our watch, the floor or the ceiling
- playing with an object such as a pencil or a ball
- staring into space
- drumming our fingers on the table
- crossing our legs or bouncing or tapping our foot
- turning slightly away from the other person or crossing your arms across your chest
- yawning, rolling your eyes or showing other signs of boredom
- not looking at the speaker

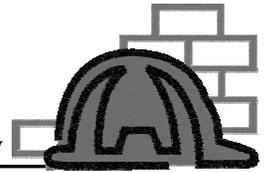


Face to Face Communication



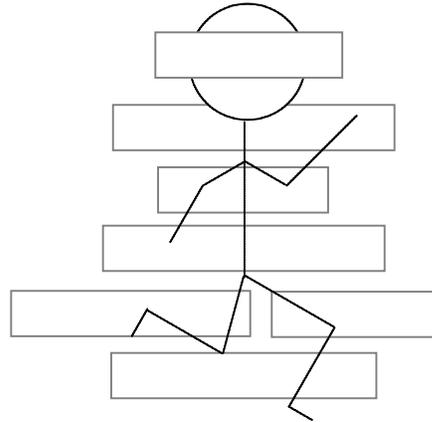
Telephone/Radio Communications





NON-VERBAL COMMUNICATION SKILLS

Your body “speaks” 7 languages. They are:



Body language is associated with different meanings in different cultures. The following suggestions represent commonly accepted interpretations in a North American workplace.

Eye contact

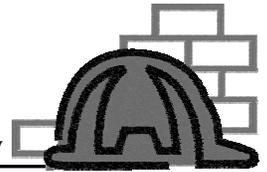
- Focus on the whole face as well as the eyes.
- Avoid staring by looking away from time to time.
- Be aware that direct eye contact may be construed as rude in certain cultures.

Facial expressions

- Ensure your facial expression is appropriate to the situation.

Posture

- When you keep your shoulders back and stand up straight, you will appear confident and energetic. It is also easier to breathe properly this way.
- When you slouch, you may give the impression of being shy, unavailable and tired.

**Body movements**

- Nod to show that you are paying attention or to state agreement.
- Lean forward to show attentiveness and interest.
- Move in a way that is appropriate to the situation. For example, moving while someone else is speaking may be perceived as rude, fidgety and shows disinterest.

Hand gestures

- Keep your palms open.
- Avoid jabbing the air with a pointed finger or fist to accentuate the points you are trying to make.

Touching

The only acceptable form of physical contact in a North American business environment is a handshake. Any other form of touching requires permission on the part of both parties. To give a handshake that says: “I’m good, I’m confident and I’m happy to meet you”, use these tips:

- Be aware of your strength – hold the other person’s hand firmly without squeezing too hard.
- If you shake hands with a “pumper” and want to end the handshake, try disengaging by taking a backward step.
- While shaking hands, avoid heartily gripping the other person on the arm or shoulder with your second hand. This is invasive.
- If someone doesn’t offer his or her hand, by all means offer yours.

Physical distance

- Maintain approximately 3 feet between you and the other person.
- Standing or sitting too close may be considered an invasion of personal space.
- Standing or sitting too far away may suggest that you do not want to get too close and are not interested in communicating with the other person.



Working in Construction

Pilot Curriculum



Finding Employment





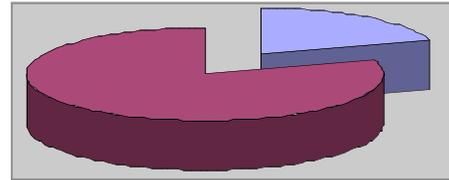
THE VISIBLE AND HIDDEN JOB MARKET

The Visible Job Market & Your Job Search

The Visible Job Market refers to jobs that are obviously available to the general public, for example, those seen in newspaper ads, Help-Wanted signs, the Internet, HRDC Job Banks.

Every job searcher should apply for visibly available jobs. However, be aware that the competition can be tough.

The Visible Job Market accounts for only 15-20% of all jobs.



The Hidden Job Market & Your Job Search

The Hidden Job Market accounts for 80-85% of all jobs.

The Hidden Job Market refers to those jobs not obviously available to the general public.

In today's highly-competitive labour market, most jobs are filled before they ever get advertised. As a job seeker, your objective is to make contact with employers before they realize they need your expertise. Quite often it is the most accessible candidate, and not the most qualified candidate that gets offered a position.

By being in the right place at the right time, you have the opportunity to make yourself known to the employer, with little or no competition.

The Hidden Job Market, can be accessed by: → Networking
→ Cold Calling



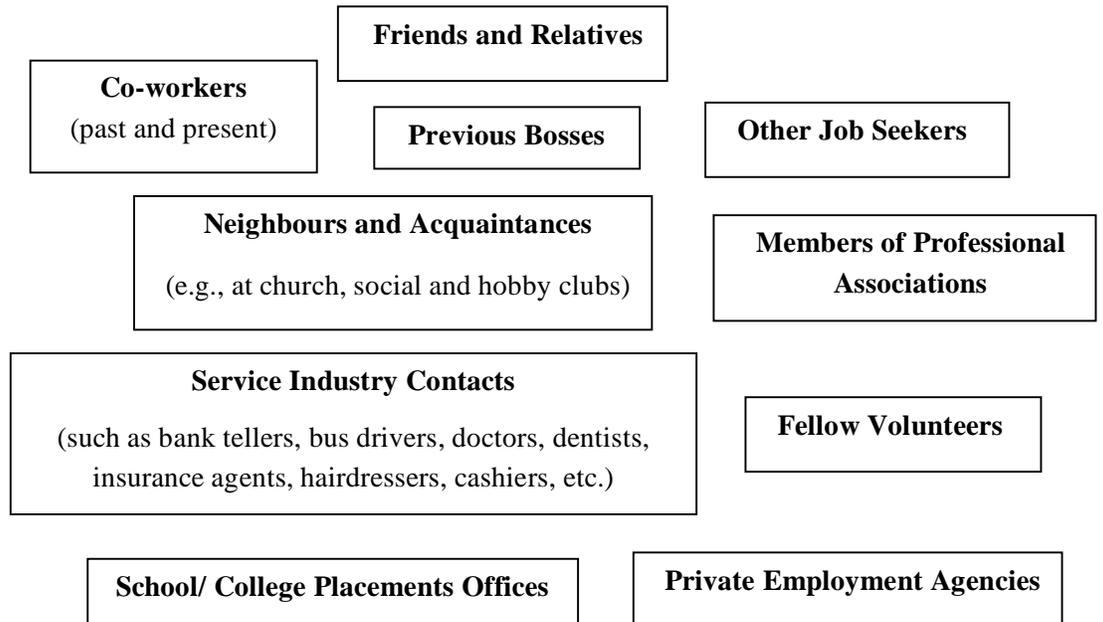
NETWORKING

Networking refers to the group of people who you enlist in helping with your job search. An effective job seeker contacts friends, acquaintances, colleagues, business associates, and even strangers.

Networking Tips:

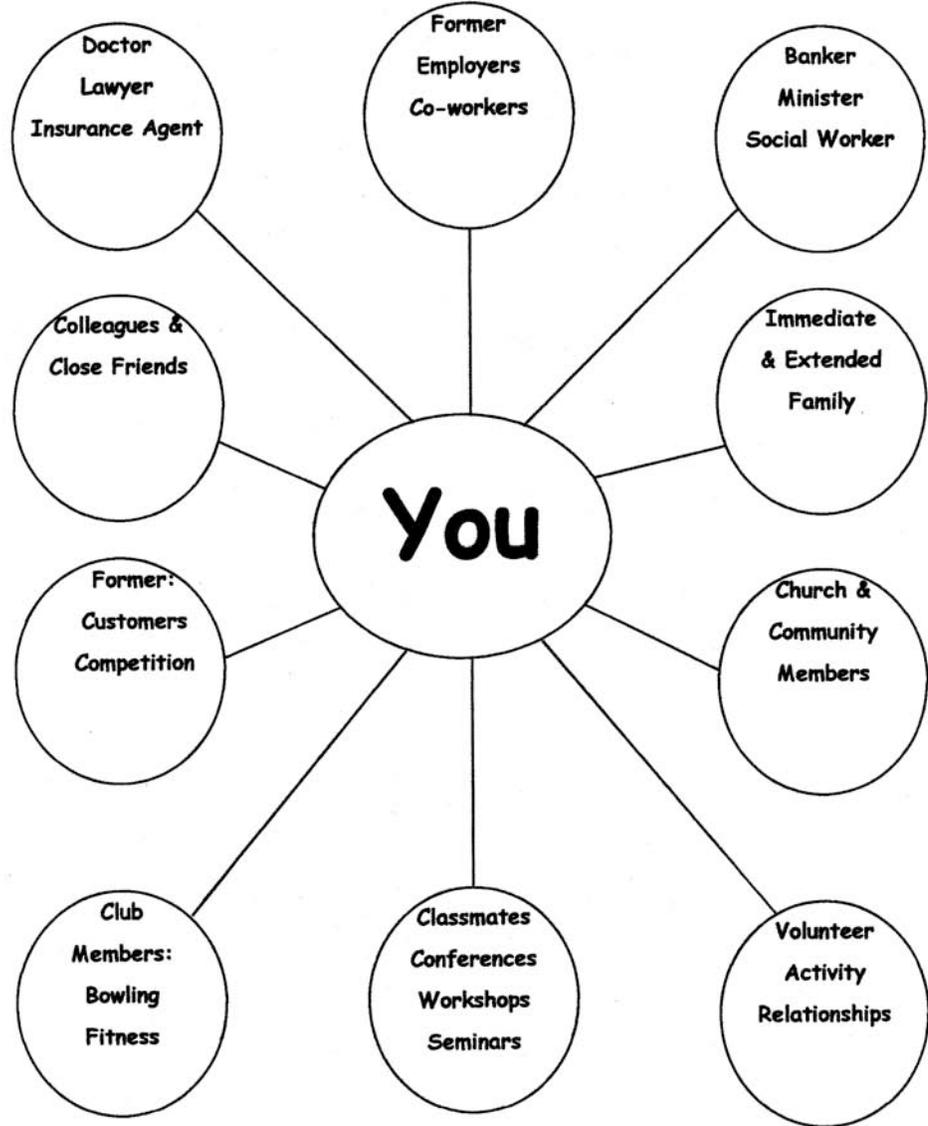
- Do not discount anyone. Sometimes, it is the least likely source that provides the most valuable contact.
- Start with people with whom you feel most comfortable, such as friends, family, neighbours, or former employers.
- Ask only for information, suggestions, advice, and assistance, not a job!
- Broaden your network to industries that interest you.
- Ask your contacts if they are aware of any suitable job openings for which you may be qualified.
- Tell your contact exactly what type of work you are looking for.
- Give copies of your résumé to your best contacts.

Remember, you can Network with ANYBODY:





YOUR NETWORK OF CONTACTS





COLD CALLING

Cold Calling is....

- contacting employers you do not know but who you are interested in working for.
- looking for those hidden, unadvertised job positions.
- selling yourself.

Cold Calling Tips

There are three main ways to cold call:

1. In person (walk-in)
2. By Telephone
3. By mail (this includes e-mail and fax)

Remember your cold call can also save a potential employer valuable time and money.

| In Person (Walk-In) | By Telephone | By Mail |
|--|--|---|
| <p>Allows you to make a positive and lasting impression and demonstrates that you are motivated</p> <p>■ ■ ■</p> <p>The interview begins as soon as you walk through the door so be prepared.</p> <p>■ ■ ■</p> <p>Be polite to the front desk staff and anyone else you come into contact with. You never know who may have influence on the hiring decisions.</p> <p>■ ■ ■</p> <p><i>If you are just dropping off a résumé, the above still applies.</i></p> | <p>Cost-effective method allowing you to cover a lot of ground in a short time.</p> <p>■ ■ ■</p> <p>The call should be clear, concise and to the point, lasting 3 minutes.</p> <p>■ ■ ■</p> <p>You can determine if there is enough interest to forward a résumé.</p> <p>■ ■ ■</p> <p>Be prepared – you may find yourself having an interview over the telephone, or be asked to come for an in-person interview.</p> <p>■ ■ ■</p> <p>Have answers ready as to why you called and why you may want to work for the employer.</p> | <p>Provides you an opportunity to introduce yourself with a letter of introduction.</p> <p>■ ■ ■</p> <p>Send a résumé and in the accompanying letter of introduction, state that you will follow up with a phone call.</p> <p>■ ■ ■</p> <p>Effective when you have identified a small group of target employers, or if you have been unable to make phone or in-person contact with the decision-maker.</p> <p>■ ■ ■</p> <p>Can be expensive so consider combining with telephone cold calling.</p> |





IDENTIFY YOUR SKILLS

It is sometimes difficult to identify your own strengths. The following activity is to ask others what strengths they see in you. Write the name of each person and identify at least one strength you see in that person.

| | |
|---|---|
| Name _____ Identify at least one skill you see in this person. _____ _____ | Name _____ Identify at least one skill you see in this person. _____ _____ |
|---|---|

| | |
|---|---|
| Name _____ Identify at least one skill you see in this person. _____ _____ | Name _____ Identify at least one skill you see in this person. _____ _____ |
|---|---|

| | |
|---|---|
| Name _____ Identify at least one skill you see in this person. _____ _____ | Name _____ Identify at least one skill you see in this person. _____ _____ |
|---|---|

| | |
|---|---|
| Name _____ Identify at least one skill you see in this person. _____ _____ | Name _____ Identify at least one skill you see in this person. _____ _____ |
|---|---|





HOW TO MATCH YOUR SKILLS TO AN EMPLOYER

Using the skills that others identified for you, write how that skill benefits the employer.

| | |
|---------------------------------|---|
| Skill Identified <hr/> <hr/> | How does this skill benefit the employer? |
|---------------------------------|---|

| | |
|---------------------------------|---|
| Skill Identified <hr/> <hr/> | How does this skill benefit the employer? |
|---------------------------------|---|

| | |
|---------------------------------|---|
| Skill Identified <hr/> <hr/> | How does this skill benefit the employer? |
|---------------------------------|---|

| | |
|---------------------------------|---|
| Skill Identified <hr/> <hr/> | How does this skill benefit the employer? |
|---------------------------------|---|

| | |
|---------------------------------|---|
| Skill Identified <hr/> <hr/> | How does this skill benefit the employer? |
|---------------------------------|---|





JOB SEARCH TOOLS

The following tools can be used to market yourself to contacts and employers. They can include a combination of the following:

| | |
|-------------------------------|---|
| Résumé | A summary of your credentials, work experience, skills and abilities, usually used for all applications. |
| Letter of introduction | Sent with a résumé when you contact a company or individual and ask that you be considered for present and future suitable opportunities. |
| Cover letter | Sent with resume when you are responding to an advertisement. |
| Portfolio | A binder/ folder containing evidence of your work, skills, abilities, training, education, letters of recommendation etc. |

The most effective job search tools are those, which specifically target a particular job, profession, company or organization. Generic job search tools are less effective.



RÉSUMÉS

Résumé Writing Guidelines

- Print on **good quality paper**.
- Check for typos, grammatical errors and coffee stains (use the spell check feature on your word processor and **ask someone to check for mistakes that it, and / or you may have missed**).
- **Type size should be readable**.
- It should be **no longer than 2 pages**
- **Give accurate information** e.g. correct dates and job titles.
- **Use the correct style of résumé** e.g. if seeking a job in an area in which you have no prior experience, use a functional or skills based style rather than a chronological.
- **Include specific accomplishments and achievements** that will make you unique from other candidates.
- **Do not give reasons for why you are no longer working at each job listed.**
- **Focus on what you done most recently** (it is not necessary to go back more than 10 years).
- **Target to the particular type of job or field of work.**

Do not include personal information such as marital status, age, race, etc.



WORK SHEET

Use the space provided below, fill in your **Paid Employment** history beginning with the most recent.

| | | | |
|-------------------------|--|--|----------------------------|
| Position | | | |
| Company Name | | | # of years employed |
| Responsibilities | | | |
| Skills | | | |

| | | | |
|-------------------------|--|--|----------------------------|
| Position | | | |
| Company Name | | | # of years employed |
| Responsibilities | | | |
| Skills | | | |

| | | | |
|-------------------------|--|--|----------------------------|
| Position | | | |
| Company Name | | | # of years employed |
| Responsibilities | | | |
| Skills | | | |





WORK SHEET

Use the space provided below to fill in your **Education** beginning with the most recent.

| | |
|----------------------------|--|
| Name of Institution | |
| Level Achieved | |
| Certificate/Diploma | |
| Degree | |
| Training Programs | |
| Workshops attended | |

| | |
|----------------------------|--|
| Name of Institution | |
| Level Achieved | |
| Certificate/Diploma | |
| Degree | |
| Training Programs | |
| Workshops attended | |





WORK SHEET

Putting together your Draft Résumé

In the space provided below, take the information from the previous worksheets and insert it into the table below.

| | |
|--|-------------|
| First Name | Last Name |
| Address | |
| City, Province | Postal Code |
| Email (if available) | |
| Professional Profile | |
| | |
| Skills | |
| | |





Drafting Your Résumé Continued

Experience

| |
|--|
| |
|--|

Education

| |
|--|
| |
|--|

References available upon request





*SAMPLE
Skill Based
Résumé*

KARINA MASON

400 Park Street
Winnipeg, Manitoba R2P 3N1
Phone: (204) 224-3344
Email: mboston@shaw.ca

PROFILE

- Experienced **Machinist** and proficient **CNC Operator**.
- Accurate **blueprint reading skills**.
- Formally trained **overhead crane and forklift operator**.
- **WHIMIS** trained, with **working knowledge of ISO applications**.
- **Motivated and adaptable**; thrive in fast-paced manufacturing environment.
- Able to **perform physically demanding tasks**.
- **Excellent work ethics**; punctual and reliable, with a positive attitude.

RELATED SKILLS

Machine Operation

- Read and Interpret blueprints to determine operation to be performed.
- Compute dimensions and tolerances and measure and lay out work pieces
- Verify dimensions of products for accuracy and conformance to specifications, using precision measuring instruments.
- Adjust and set up machine tools.
- Check dimensions of machined parts using verniers and callipers.
- Operate and set up machines to perform repetitive machining operations, such as drilling, boring and grinding.

Machine and Tool Utilization

- | | | | |
|-----------------------------------|--------------------------|------------------|-------------------------------|
| ▪ CNC (Wiedermann Punch Press) | ▪ Specialty Drill | ▪ Cut Off Saw | ▪ Copper Tube straightener |
| ▪ Brake (60, 100, & 120 ton) | ▪ Drill Bit Sharpener | ▪ Band Saw | ▪ Copper Tube Bender |
| ▪ Mechanical Punch Press | ▪ Drill Press | ▪ Shear | |
| | ▪ Radial Drill Press | ▪ Lathe | |





KARINA MASON

2

RELATED WORK EXPERIENCE

1999-2003

Machine Operator

Motor Coach Industries Limited – Winnipeg, Manitoba

1996-1999

Whitney Plasma Operator

Northern Blower Inc – Winnipeg, Manitoba

OTHER WORK EXPERIENCE

1992-1995

Maintenance Assistant

Convalescent Home of Edmonton – Edmonton, Alberta

1990-1992

Security Guard

Mobile Security – Edmonton, Alberta

TRAINING

| | |
|---|------|
| Blueprint Reading | 2001 |
| Overhead Crane Certificate | 2000 |
| Forklift License | 1999 |
| Red River College (Motor Coach Industries In-House) | |
| Winnipeg, Manitoba | |
| Sheet Metal Fabrication | 1996 |
| Industrial Training Centre – – Winnipeg, Manitoba | |

INTERESTS

Skiing, classic car restoration and basketball

REFERENCES

Available on request



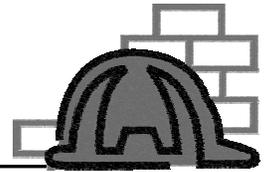
Working in Construction

Pilot Curriculum



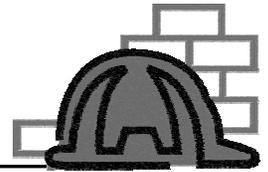
WHMIS
In your workplace





The workshop has four objectives. At completion, each participant should be able to:

1. Recognize the WHMIS symbols & other related warning systems
2. Explain the dangers associated with each WHMIS symbol
3. Recognize the label for a “controlled product” (WHMIS label)
4. Find information in a material safety data sheet



1. What is WHMIS?

- Workplace Hazardous Materials Information System
- a warning system consisting of labels, data sheets and training for work with “controlled products”*

* any product/material/substance specified in regulations under the Hazardous Products Act - Schedule II.

Not Covered by WHMIS

1. Exemptions
 - hazardous waste
 - pesticides
 - cosmetics, medical devices, drugs, food
 - consumer products
 - explosives
2. Exclusions
 - wood or products made of wood
 - tobaccos and products made of tobacco
 - manufactured articles

2. Other Common Warning Systems

a. Consumer Products/Pest Control Products



Poison



Corrosive



Flammable



Explosive



Danger
high hazard



Warning
moderate hazard



Caution
low hazard

b. HMIS Hazard Rating – USA

Flash points
 4 = < 70° F
 3 = < 100° F
 2 = < 200° F
 1 = > 200° F
 0 = Will not burn

4 = Very High
 3 = High
 2 = Moderate
 1 = Slight
 0 = Insignificant

Flammability



Health
 4 = Deadly
 3 = Extreme danger
 2 = Hazardous
 1 = Slightly hazardous
 0 = Normal material

Reactivity
 4 = May detonate
 3 = Shock/heat may detonate
 2 = Violent chemical change
 1 = Unstable if heated
 0 = Stable

Specific Hazard

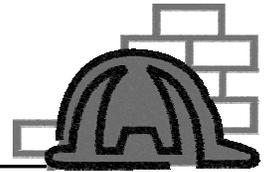
Oxidizer
 Corrosive
 Use NO WATER
 Radiation



c. What if there are NO Symbols?

The magic phrase _____



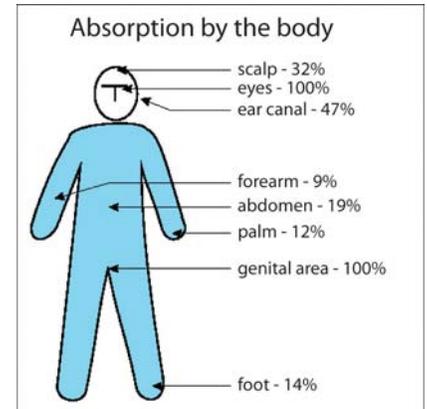
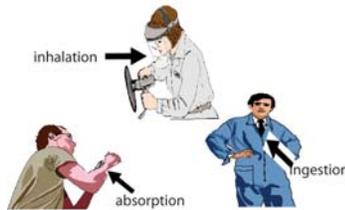


Other Exposures and Routes of Entry

- skin contact
- eye contact
- injection/puncture

3. How Do Harmful Substances Enter the Body?

- a. inhalation - through the lungs
- b. absorption - through the skin
- c. ingestion - through the mouth & stomach



4. Related info about health and chemicals

a. Health effects of materials

- acute health effects - occur within minutes or hours of exposure (headache, vomiting, unconsciousness, coma).
- chronic health effects - symptoms show up months or years after exposure.

b. Body responses to exposure

- inhalation - dizziness, intoxication, loss of coordination, fatigue, headache
- ingestion - cramps, vomiting, coma
- dermal contact/absorption - redness to skin, tingling sensation, pain

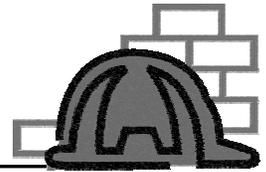
5. Making it happen – responsibilities

| Suppliers | Employers | Workers |
|---|--|---|
| use special labels to give hazard information | “controlled products” labelled | use “controlled products” safely - no risk to self/others |
| provide a material safety data sheet (MSDS) | MSDS’s readily available | follow work procedures |
| update MSDS every 3 years or 6 months on new health information | train workers on the safe use of “controlled products” | |

The BASICS for WHMIS
(or any other chemical)

What are the hazards?
 How do I protect myself?
 What do I do in an emergency?
 Where is more information?

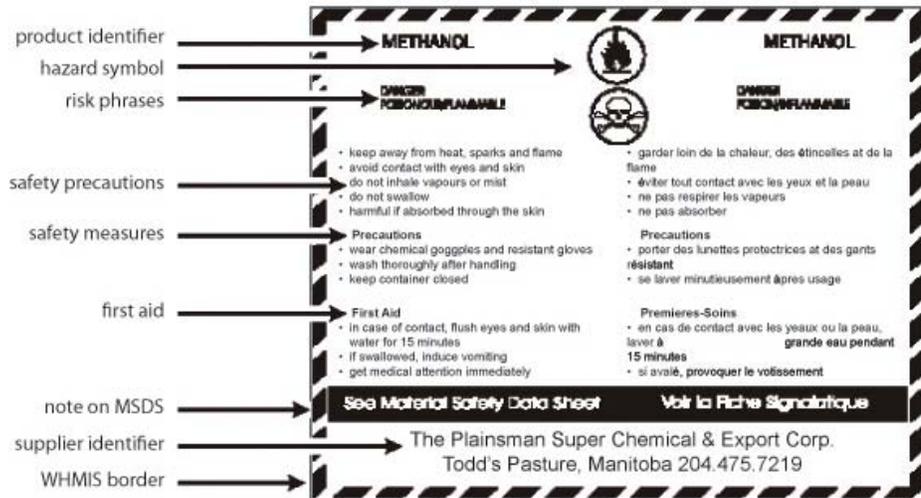




6. WHMIS labels

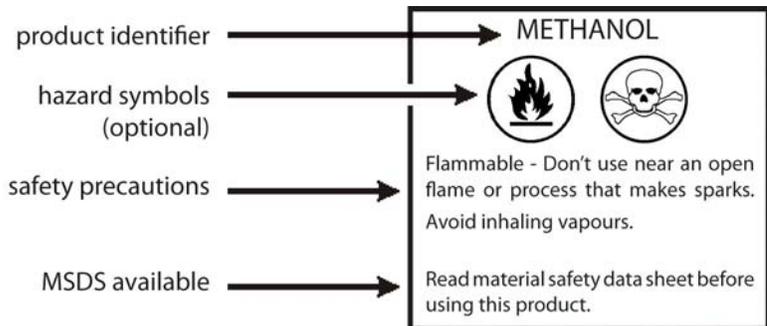
- Supplier label - for amounts > 100 ml/100 g
- Workplace label
 - for “controlled product” made in the workplace.
 - on container with “controlled product” put in it.

a. Supplier label



* both official languages

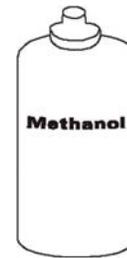
b. Workplace label

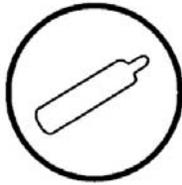
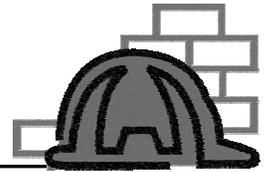


c. Workplace label – (Not Needed)

If the “controlled product” is:

- controlled & used only by worker filling the container
- used up during the shift
- the contents are clearly marked




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7. Class A - Compressed Gas

What is a compressed gas?

A gas that is under more than one atmosphere of pressure.

Hazards of compressed gas cylinders/spray cans

- explodes if struck or heated; puncture/broken valve stem can turn cylinder into a “missile
- frostbite (cryogenic) - gases have very low temperatures when released from cylinder
- some gases have other hazardous properties:
 - corrosive (ammonia)
 - toxic (chlorine)
 - flammable (acetylene, propane)
 - asphyxiant - displaces oxygen (nitrogen)

Hazard/Danger

explosive danger -
gases under pressure

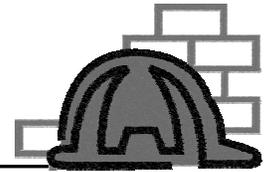
container could
explode if
heated/impacted

Handling and Storing Compressed Gases

- Read all information on the label & the MSDS.
- Check with your supervisor before using any new gas.
- Inspect cylinder & valve stem for damage, leaks.
- Keep cylinders in proper carriers - upright and secure.
- Keep the protective cap on cylinders until ready to use.
- Set regulator to correct setting for gas and application.
- Store cylinders in cool, dry, ventilated place that is fire resistant and away from heat sources/high temperatures (>51.5⁰C.)
- Store cylinders of different gases separately.
- Store empty cylinders separately from full cylinders & mark with “M.T.” or tag from supplier

Using Compressed Gases Safely

- Know safe operating procedures for the gas being used.
- If using compressed gas cylinders - crack open cylinder valve slowly - stand to side of the regulators when opening the valve.
- Close cylinder valve/regulator when not using.
- Use in well ventilated areas.



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Reactive Flammable

Can spontaneously burn when in reacts with water, or reacts with water to give off a flammable gas.



Keep reactive flammable materials dry and away from oxidizers (including isolation from air).

Divisions of Class B
(all use same symbol)

1. Flammable gas - propane, butane,
2. Flammable liquid - turpentine
3. Combustible liquid - kerosene
4. Flammable solid - charcoal
5. Flammable aerosol - spray paints, varnish
6. Reactive flammable material - acetylene, ammonia

8. Class B - Flammable & Combustible Material

a. Terms

Flash Point

Lowest temperature that a liquid/solid gives off enough vapour to explode/ignite if in contact with an ignition source.

Lower Explosive Level (LEL)

Lowest concentration of a gas/vapour that will explode/ignite when in contact with an ignition source.

Static Electricity

Electric charge developed by unlike materials contacting and separating from each other - controlled by bonding and grounding.

Upper Explosive Level (UEL)

Highest concentration of a gas/vapour that will explode/ignite when in contact with an ignition source

Hazard/Danger

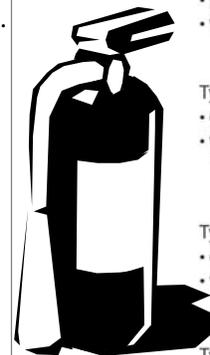
Material will burn or spontaneously ignite in air, or give off flammable gas on contact with water

May ignite if exposed to flames, sparks, heat, friction

b. Using flammable & combustible materials safely

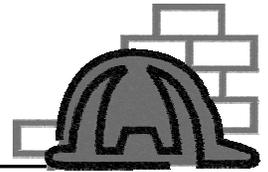
- Be aware of the hazards of the product - label & MSDS.
- Avoid all ignition sources - sparks, smoking, flames, and other hot sources.
- Store and use in well ventilated areas.
- Use proper equipment - safety cans, fire extinguisher, bonding wires, storage cabinets.
- Dispose all waste materials (rags, liquids) in properly rated waste containers.
- Good housekeeping practices
- Know what to do in an emergency involving fire or spills and the correct type of extinguisher or absorbents to use.

Types of fire extinguishers



- Type "A" - Ordinary Combustible
 - paper, wood, textiles
 - where quenching & cooling is required
- Type "B" - Flammable Liquid
 - oil, gasoline, paint, grease
 - where oxygen exclusion or flame interruption is essential
- Type "C" - Electrical Equipment
 - electrical wiring & equipment
 - where non-conductivity needed
- Type "D" - Combustible Metals
 - sodium, magnesium, potassium





SYMBOL

9. Class C - Oxidizing Materials

What is an “oxidizer”?

A chemical that causes other materials to burn more intensely or explode by supplying oxygen

Examples

- gas - oxygen, ozone, fluorine
- liquid - nitric acid, chromic acid
- solids - potassium permanganate, chromates/dichromates

Health Affects of “Oxidizers”

- skin - irritation, sensitization, eczema, dermatitis
- eyes - burns to mucous membranes & blindness
- respiratory - burns to mucous membranes, headache, coughing, intoxication, death from asphyxiation
- ingestion - nausea
- long term (chronic) - blood & nervous system damage, liver/kidney disease

Hazard/Danger

Fire &/or explosion risk in presence of Class B material - flammables & combustibles

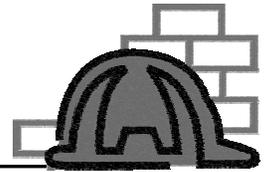
React violently or explode when contacting

Protecting Yourself

- Be aware of the hazards - read label and MSDS.
- Wear all protective clothing and equipment.
- Know proper methods of storage, use, disposal.

Storing “Oxidizers”.

- Don't store “oxidizers” with acids, combustibles, flammables, and reducing agents.
- Do not store near heat or electrical wiring, in sunlight.



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10. Class D - Poisonous & Infectious Materials

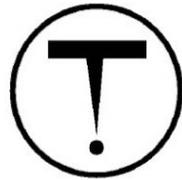
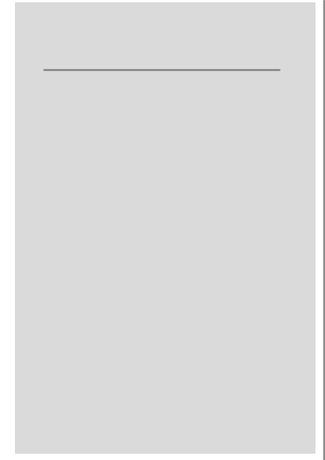
Division 1

Material causing immediate/serious toxic effect

- effects within minutes/hours after an exposure.
- can be fatal/cause permanent damage if inhaled, ingested or absorbed through skin.

Working safely with a Class D₁ material.

- substitute if possible
- avoid direct contact - wear PPE
- use good hygiene practices
- dispose in an approved way - see MSDS



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Division 2

Materials causing other toxic effects

- a poisonous material may not be immediately dangerous to health
- repeat exposures can cause death/permanent damage
- may be a sensitizer, cause cancer, birth defects, sterility

Health effects of Class D₂ materials

Carcinogen - ability to cause cancer

Embryotoxin - substance that can harm embryo

Mutagen - changes genetic DNA - can show up in child

Reproductive toxins - sterility, reduced fertility, miscarriages, birth defects

Teratogen - causes birth defects

Sensitizer - chemical allergic reaction (respiratory or skin)

Irritant - reversible damage (pH 2 - 4 & 8 - 11.5)

Hazard/Danger

Class D₂ materials causing other toxic effects

- a poison not immediately dangerous to life
- repeat exposures can cause death or permanent damage
- may be a sensitizer, cause cancer, birth defects, sterility



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Division 3

Biohazardous infectious material

- an organism or its toxins that causes illness or death

Sources of Class D₃ material

- bacteria, virus, parasites, fungus

Exposure to a Class D₃ material

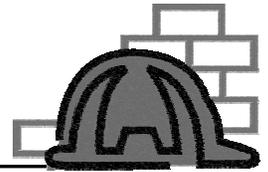
- ingestion, respiration, through the skin.

Hazard/Danger

Class D₃ biohazardous infectious material

- may cause serious disease resulting in illness or death





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11. Class E - Corrosive Material

What is a corrosives material?

a liquid, solid or gas that has a pH ≤ 2.0 (acid) or ≥ 11.5 (alkaline).

Working Safely With Corrosives.

- **Personal protection**

| | |
|------------------|---|
| Eyes | chemical splash goggles, full face shield, full face respirator. |
| Skin | gloves, aprons, boots, full body suits. |
| Breathing | air-purifying respirator with correct cartridges, supplied air respirators (airline/self contained) |

Hazard/Danger

Causes eye/skin tissue damage on contact

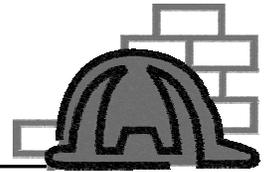
Severe tissue damage with prolonged contact

May be harmful if inhaled

- **Mixing** - always add small amounts of corrosive material to water and build up to desired strength/concentration. (If mixed the wrong way, an “eruption” could happen, splashing corrosive over a wide area.)
- **Storage** - store corrosives away from all other chemicals, especially Class C - Oxidizers.

Emergency Response to Corrosives

| Eyes | Skin | Inhalation | Ingestion |
|---|--|---|---|
| Flush with water for 15 - 20 minutes & get medical attention right away | Flush with water for 15 - 20 minutes, remove contaminated clothing, and get medical attention. | Get victim to fresh air immediately and get medical attention right away. | Do not induce vomiting, get medical attention right away. |



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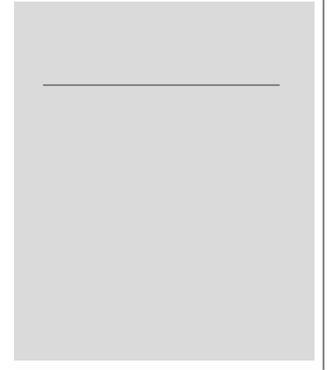
12. Class F - Dangerously Reactive Material

a. Why are Class F - Dangerously Reactive Materials unstable?

- Polymerization - addition, condensation
- Decomposition
- Self-reactive - shock, increased temperature or pressure

b. How are Class F materials used safely?

- Read all the information on the label/MSDS.
- Follow the safe operating instructions.
- Be aware of the hazards.
- Take measures to eliminate or control the hazards.



13. Material Safety Data Sheet (MSDS)

a. What is a material safety data sheet (MSDS)?

- A supplier document that gives important information on the safe use of the product.
- Lists hazardous ingredients $\geq 1\%$
- List carcinogens/reproductive toxins $\geq 0.1\%$
- Update MSDS every 3 years or in 6 months - if new health info available

b. What information is found in a MSDS

- | | |
|--|--|
| <input type="checkbox"/> hazardous ingredients | <input type="checkbox"/> health hazard information |
| <input type="checkbox"/> product identification | <input type="checkbox"/> preventive measures |
| <input type="checkbox"/> physical information | <input type="checkbox"/> first aid measures |
| <input type="checkbox"/> fire & explosion hazard | <input type="checkbox"/> preparation information |
| <input type="checkbox"/> reactivity information | |

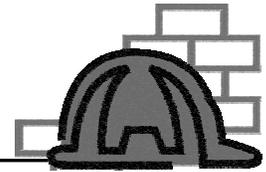
c. The employer's responsibility on MSDS's

*Have a MSDS
for each controlled
product*

*Make the MSDS's
readily available*

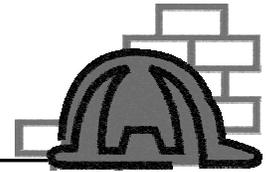
*Educate workers
on using MSDS's*





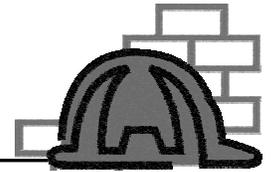
14. The WHMIS class symbols - a brief review

| Class | Symbol | Hazard/Danger |
|---|--------|--|
| A - Compressed Gas | | <ul style="list-style-type: none"> explosive danger because gases under pressure container could explode if heated or impacted |
| B - Flammable & Combustible | | <ul style="list-style-type: none"> will burn/spontaneously ignite in air give off flammable gas if in contact with water may ignite if exposed to flames, sparks, heat, friction |
| C - Oxidizing Material | | <ul style="list-style-type: none"> fire &/or explosion risk in presence of Class B material react violently or explode when contacting combustible materials |
| D - Poisonous & Infectious | | |
| D ₁ - Materials Causing Immediate & Serious Toxic Effect | | <ul style="list-style-type: none"> a potentially fatal poisonous substance may be fatal/cause permanent damage if inhaled, swallowed, absorbed |
| D ₂ - Materials Causing Other Toxic Effect | | <ul style="list-style-type: none"> a poison not immediately dangerous to life repeated exposures can cause death/permanent damage may be a sensitizer, cause cancer, birth defects, sterility |
| D ₃ - Biohazardous Infectious Material | | <ul style="list-style-type: none"> may cause serious disease resulting in illness or death |
| E - Corrosive Material | | <ul style="list-style-type: none"> causes eye/skin tissue damage on contact severe tissue damage with prolonged contact may be harmful if inhaled |
| F - Dangerously Reactive Material | | <ul style="list-style-type: none"> very unstable react with water to give off toxic gas may explode from shock, heat, friction undergoes polymerization/decomposition |



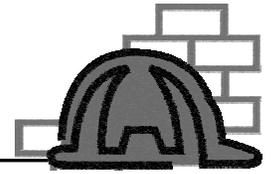
Sample Material Safety Data Sheet (MSDS) Format

| Section 1 - Production Identification and Use | | | | |
|--|-----------------------------|---|---|---|
| Product Identifier | | | Product Identification Number (PIN) | |
| Product Use | | | | |
| Manufacturer's Name | | | Supplier's Name | |
| Street Address | | | Street Address | |
| City | Province | City | Province | |
| Postal Code | Emergency Telephone No. () | Postal Code | Emergency Telephone No. () | |
| Section 2 - Hazardous Ingredients | | | | |
| Hazardous Ingredients | % | CAS Number | LD ₅₀ of Ingredients (specify species and route) | LC ₅₀ of Ingredients (specify species) |
| | | | | |
| | | | | |
| Section 3 - Physical Data | | | | |
| Physical State | Odour and Appearance | | | Odour Threshold (ppm) |
| Vapour Pressure (mmHg) | Vapour Density (Air = 1) | Evaporation Rate | Boiling Point (°C) | Freezing Point (°C) |
| pH | Specific Gravity | Coeff. Water/Oil Disp. (water-octanol part. coeff.) | | |
| Section 4 - Fire and Explosion Data | | | | |
| Flammability Yes <input type="checkbox"/> No <input type="checkbox"/> If Yes, Under Which Conditions? | | | | |
| Means of Extinction | | | | |
| Flashpoint (°C) and Method | | Upper Flammable Limit (% by Volume) | Lower Flammable Limit (% by Volume) | |
| Autoignition Temperature (°C) | | Hazardous Combustion Products | | |
| Explosion Data | Sensitivity to Impact | | Sensitivity to Static Discharge | |
| Section 5 - Reactivity Data | | | | |
| Chemical Stability Yes <input type="checkbox"/> No <input type="checkbox"/> If No, Under Which Conditions? | | | | |
| Incompatibility with Other Substances Yes <input type="checkbox"/> No <input type="checkbox"/> If So, Which Ones? | | | | |
| Reactivity and Under What Conditions | | | | |
| Hazardous Decomposition Products | | | | |



Sample Material Safety Data Sheet (MSDS) Format

| | | | |
|--|-----------------------|--------------------------|----------------------|
| Product Identifier | | | |
| Section 6 - Toxicological Properties | | | |
| Route of Entry Skin Contact <input type="checkbox"/> Skin Absorption <input type="checkbox"/> Eye Contact <input type="checkbox"/> Inhalation <input type="checkbox"/> Ingestion <input type="checkbox"/> | | | |
| Effects of Acute Exposure to Product | | | |
| Effects of Chronic Exposure to Product | | | |
| Exposure Limits | Purity of Product | Sensitization to Product | Carcinogenicity |
| Teratogenicity | Reproductive Toxicity | Mutagenicity | Synergistic Products |
| Section 7 - Preventive Measures | | | |
| Personal Protective Equipment | | | |
| Gloves (specify) | Respirator (specify) | Eye (specify) | |
| Footwear (specify) | Clothing (specify) | Other (specify) | |
| Engineering Controls (specify, e.g., ventilation, enclosed process) | | | |
| Leak and Spill Procedure | | | |
| Waste Disposal | | | |
| Handling Procedures and Equipment | | | |
| Storage Requirements | | | |
| Special Shipping Information | | | |
| Section 8 - First Aid Measures | | | |
| Specific Measures | | | |
| Section 9 - Preparation Date of MSDS | | | |
| Prepared by (group, department, etc.) | Phone Number | Date | |

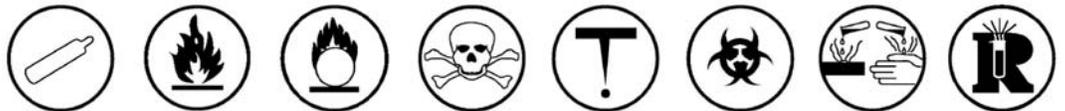


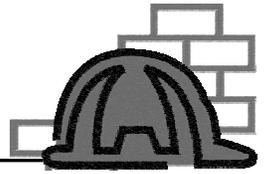
ACTIVITY

What WHMIS symbols should be on this container.
Read the back panel of this product. Circle the correct symbol(s).

DANGER! EXTREMELY FLAMMABLE. Do not spray near sparks, heat or open flame. Vapors will accumulate readily and may ignite explosively. Keep area well ventilated during use and until all vapors are gone. **DO NOT SMOKE.** Extinguish all flames, pilot lights and heaters. Turn off stoves, electric tools and appliances and any other sources of ignition. **CONTENTS UNDER PRESSURE.** Avoid prolonged exposure to sunlight or heat from radiators, soves, hot water and other heat sources that may cause bursting. Do not puncture, incinerate, burn or store above 120 degrees F. Do nor discard empty can in home garbage compactor. Contains Toluene, Xylene and Ketones. **VAPOR HARMFUL.** Use with adequate ventilation. Avoid continuous breathing of vapor and spray mist. To avoid breathing vapors or spray mist, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air or wear respiratory protection (NIOSH/MSHA TC 23C or equivalent) or leave the area. **HARMFUL OR FATAL IF SWALLOWED.** If swallowed do not induce vomiting. Get medical attention immediately. Avoid contact with eyes and skin. Wash hands after using. **FIRST AID:** In case of eye contact flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. **NOTICE:** Contains solvents which can cause permanent brain and nervous system damage. Intention misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.**

This product was manufactured and intended for consumer use. It is labelled according to the Federal Hazardous Substances Act. Should the product be used in the workplace, you mat get Material Safety Data Sheets (MSDS) by writing to the manufacturer.



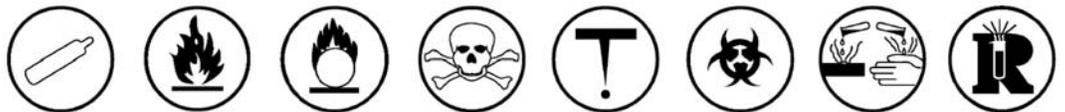


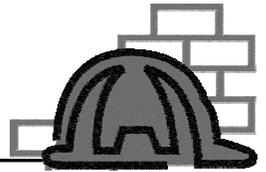
ANSWER KEY

The WHMIS symbols that should be on the container according to the back panel of this product are circled below.

DANGER! EXTREMELY FLAMMABLE. Do not spray near sparks, heat or open flame. Vapors will accumulate readily and may ignite explosively. Keep area well ventilated during use and until all vapors are gone. **DO NOT SMOKE.** Extinguish all flames, pilot lights and heaters. Turn off stoves, electric tools and appliances and any other sources of ignition. **CONTENTS UNDER PRESSURE.** Avoid prolonged exposure to sunlight or heat from radiators, soves, hot water and other heat sources that may cause bursting. Do not puncture, incinerate, burn or store above 120 degrees F. Do nor discard empty can in home garbage compactor. Contains Toluene, Xylene and Ketones. **VAPOR HARMFUL.** Use with adequate ventilation. Avoid continuous breathing of vapor and spray mist. To avoid breathing vapors or spray mist, open windows and doors or use other means to ensure fresh air entry during application and drying. If you experience eye watering, headaches, or dizziness, increase fresh air or wear respiratory protection (NIOSH/MSHA TC 23C or equivalent) or leave the area. **HARMFUL OR FATAL IF SWALLOWED.** If swallowed do not induce vomiting. Get medical attention immediately. Avoid contact with eyes and skin. Wash hands after using. **FIRST AID:** In case of eye contact flush thoroughly with large amounts of water for 15 minutes and get medical attention. For skin contact, wash thoroughly with soap and water. In case of respiratory difficulty, provide fresh air and call physician. **NOTICE:** Contains solvents which can cause permanent brain and nervous system damage. Intention misuse by deliberately concentrating and inhaling the contents can be harmful or fatal. **WARNING:** This product contains chemicals known to the State of California to cause cancer and birth defects or other reproductive harm. **DO NOT TAKE INTERNALLY. KEEP OUT OF REACH OF CHILDREN.**

This product was manufactured and intended for consumer use. It is labelled according to the Federal Hazardous Substances Act. Should the product be used in the workplace, you mat get Material Safety Data Sheets (MSDS) by writing to the manufacturer.





WHMIS CLASS SYMBOLS ACTIVITY

1. Draw a line between each Hazard Symbol and the Hazards/Danger that matches it.

Hazard Symbol

Hazards/Danger



Caustics or acids which can destroy skin or eat metals.

Can catch fire or explode in the presence of an ignition source.

Can explode from heat, shock or friction, or give off toxic gas if in contact with water.

Provides oxygen which increases risk of fire.

Can cause serious disease.

Can cause death if exposed to small amounts.

Can cause cancer, birth defects, sterility, sensitization, irritation.

Can explode if impacted or exposed to heat.

2. Name the WHMIS Hazard Class

Class A _____

Class B _____

Class C _____

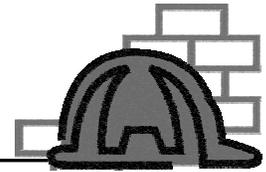
Class D – Div.1 _____

Class D – Div.2 _____

Class D – Div.3 _____

Class E _____

Class F _____



WHMIS CLASS SYMBOLS ANSWER KEY

1. Draw a line between each Hazard Symbol and the Hazards/Danger that matches it.

Hazard Symbol

Hazards/Danger



Caustics or acids which can destroy skin or eat metals.

Can catch fire or explode in the presence of an ignition source.

Can explode from heat, shock or friction, or give off toxic gas if in contact with water.

Provides oxygen which increases risk of fire.

Can cause serious disease.

Can cause death if exposed to small amounts.

Can cause cancer, birth defects, sterility, sensitization, irritation.

Can explode if impacted or exposed to heat.

2. Name the WHMIS Hazard Class

Class A Compressed Gas

Class B Flammable & Combustible

Class C Oxidizing Material

Class D – Div.1 Materials Causing Immediate & Serious Toxic Effect

Class D – Div.2 Materials Causing Other Toxic Effect

Class D – Div.3 Biohazardous Infectious Material

Class E Corrosive Material

Class F Dangerously Reactive Material

Part II: PLAR

June 2006

Final Report Developed for:

Workplace Prior Learning Assessment and Recognition Committee

Project Dates: November 1, 2005 to March 15, 2006

Heavy Equipment Operator (HEO) and Skilled Labourer

Part II: PLAR

Final Report March 31, 2006

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Background

About three years ago, Manitoba Advanced Education and Training (MAET) decided to improve the effectiveness of expenditures it was making for Heavy Equipment Operator (HEO) training. Training can cost close to 20 thousand dollars per individual and until recently, there were no standards to guide the quality of training or its purchase. Training was not always being conducted by certified or credible training organizations.

Employment Training Services (ETS) formed a committee of industry and labour representatives to create and support a set of standards for HEO. This was completed and signed by all participants in October 2004. Since then, a set of standards was created for Skilled Labourer. Both standards are envisioned to guide the purchase of training with, at the very least, government funded training. The industry training committee will review applications in response to government RFPs. The standards are a good representation of the technical skills required for these occupations but do not necessarily reflect the ES or employability skills which employers say are key at entry level positions.

In the past, many who received training for HEO were still not considered to be employable for a variety of reasons: experience, training on the right equipment, out of date training, lack of suitability to construction, and lack of employability and Essential skills. In addition, there are many individuals who have considerable and lengthy experience on a number of pieces of equipment but lack training and experience in several others and may not have current safety training. To date, there was no systematic and transparent way to determine what they know and can do. Thus, many were forced to take all training at a considerable cost.

It should be noted that in some provinces, HEO and skilled labourer are certified occupations and have standards and licenses. In several provinces, HEO is a regulated trade. Thus, there are a number of well-established curricula for training reflective of the standards within those provinces. In some national organizations, HEO is actually a sub-set of skilled labourer. In Manitoba, skilled labourer is considered to be the entry level occupation while HEO is regarded as one step up from that. The industry committee took this reflection one step further and conceptualized the occupation of HEO as Levels 1 and 2, organized around various pieces of equipment. HEO equipment is very expensive and can be dangerous, which causes many employers to be hesitant or adamant about individuals having the right training and experience.

As a result of all of this, over the past couple of years, considerable work has been completed to identify the full range of skills and industry occupational standards required for HEO and Skilled Labourer.

- 2004 – Industry Standards for HEO
- 2005 – Industry Standards for Skilled Labourer
- 2005 – Work Ready Passport – What will it take?
- 2005 – Essential and Employability Skills for HEO: Leaf Rapids Project
- 2006 - Essential and Employability Skills Curriculum for HEO and Skilled Labourer

These projects were initiated with partners for a variety of reasons such as:

- Creating quality training
- Including a diverse labour force
- Being responsive to rural and remote training needs and conditions
- Facilitating the training for major capital projects
-

This work has involved the following partners at various points including:

- Employment Training Services (ETS), Manitoba Advanced Education and Training
- Standards and project committees representing industry – Operating Engineers of Manitoba, Manitoba Heavy Construction Association, Government Services, Labourers Industrial Union and various companies
- Communities such as Fisher River, Leaf Rapids and Fox Lake
- Industry Training Partnerships, Manitoba Advanced Education and Training
- Manitoba Conservation
- Workplace Education Manitoba Steering Committee (WEMSC)
- Workplace Prior Learning Assessment and Recognition Committee (WPLAR)

Employment Training Services decided to create, through these two occupations, a multi-faceted labour market development model. Part 1 of these reports, (Essential and Employability Skills Curriculum) is the result of a desire to include ES and employability skills as being some of the most important skills that employers want. Part II, PLAR for HEO and Skilled Labourer,

describes the labour market development model and includes the recognition of prior learning within it as yielding benefits to the worker, governments and employers as follows:

- Workers – identifies and recognizes skills and knowledge, enhances suitable goal creation and maximizes training time.
- Governments – helps to ensure that training decisions are appropriate, training is targeted, and training results in valued outcomes thus maximizing training investments.
- Employers and related groups – helps to ensure that entry level workers are suitable to the industry and have the skills employers value.

Part II: PLAR for HEO and Skilled Labourer

This report presents a summary of a proposed model for labour market intake and development in the Heavy Construction Sector in Manitoba, specifically for the occupations of Skilled Labourer and Heavy Equipment Operator (HEO). The project transpired over several months in 2005 and 2006 and was designed to help the government plan a better process for the matching of workers in this sector and training.

Over the past several months, this project has sought out the opinion of a variety of heavy construction stakeholders including government, labour, industry organizations and companies (see Appendix D, Employer Survey with Prototype Field Test). Throughout this project the consultants worked with the government offices of Employment and Training Services and Industry Training Partnerships, through Workplace Prior Learning Assessment and Recognition and Workplace Essential Skills. There are multiple smaller projects within the overall project and this necessitated a two-part report. This paper is PART II, and a companion to Part I: Essential and Employability Skills Curriculum for Skilled Labourer and HEO.

This report discusses how the labour market functions in the construction sector and what it will take within a partnership model to address labour market shortages. The project also analyzed the newly developed industry standards for Skilled Labourer and HEO and identified how they relate to core competencies. The Essential and employability skills were added to the technical competencies for a full listing of core competencies for entry level positions. In addition to Essential Skills and employability skills assessments, a field test and process for assessment were created and were successfully piloted in a rural community. Finally, a check-list was created to guide the purchase of training.

Four Key Information Areas in the Labour Market

There are four major areas that converge to support the potential worker in navigating a successful labour market matching process. The first area is labour market information – what standards exist, what training is available, and what are the future prospects? The Government normally provides this information.

Secondly, the area of skill requirements and how they are applied is critical information for the potential worker. Can they apply what they have learned to the workplace? How? The worker should know for which occupational areas they are best suited.

The third key area important to the potential worker is the expectations of the employer. Workers should know the laws protecting them, the culture of the workplace they are considering, and the employer's expectations of showing up every day, on time, and ready to work. Information on wages and working conditions should be readily available.

The final area of key information for the job seeker, is the process itself of finding and keeping a job. Where does one find out about opportunities for employment and find help with resumes and interview skills? Where do potential workers find employers? These inter-related labour market information areas are the basis used to present and discuss the process of supply and demand of workers for the Construction Sector in Manitoba.

Conceptual Framework for Labour Market Facilitation

Some of the stakeholders in this process have been meeting over the last two years, and helped develop the new HEO Standards in the hopes of promoting skill development and quality training in this sector. The flow of information amongst these partners is illustrated in the **Conceptual Framework of Labour Market Facilitation** (see page 11) which illustrates the overall structure for partnerships and how they might share in the flow of labour market information or carry out their respective roles in helping to satisfy labour market demands.

The ongoing question for Government is about who should be involved in these partnerships and what is their role? The idea of an industry model to oversee the labour market process is not a new one but perhaps there are ways older models could be adjusted and adapted to better serve the purpose of all parties in today's economy as illustrated in the framework.

Government representatives have multiple roles in developing the current labour market practices, but generally speaking the government supports the development and maintenance of standards and regulations, as can be seen by Apprenticeship and sector groups. Governments

also coordinate the development of partnership processes and fund necessary employment and training programs. The government needs to be accountable to the taxpayer for the funding of employment and training services, while trying to encourage and lead other departments, the training institutions, professional bodies and employers to participate in the process and quality training.

There are many complexities and linkages in the government systems, both internally and externally. To ask individuals, employers, educators and all the other players to work together will not be easy. It will be important that all partners see the value in a seamless labour market model that produces a qualified workforce in a timely way. The first step will be to identify who really should be part of an inclusive and representative industry group. The next question is how representatives are selected as well as the delineation of the limits of authority for each party.

Worker Intake Model

The Worker Intake Model (see page 10) developed through this research project helps illustrate the integral linkages between the partners in the labour market matching process and the possible steps which could be taken to identify suitable workers and their training needs. This model begins in the top left with the entry of the potential Labourer or HEO. Ideally, the individual would be able to access information to inform their decision to proceed with a career in Heavy Construction.

In a PLAR process model, there would be sufficient information available to allow someone to appropriately assess what he or she knows and what he or she can do. For this project, the pilot participants completed a self-assessment package that accompanied the one-week curriculum package (see Part I, Appendix G). Participants went through a brief orientation that included information about the job and a self-assessment, addressing their perceived suitability to perform in the work environment. The Leaf Rapids Report (ETS 2005) had previously produced a package for HEO Essential Skills assessment and this was contextualized and piloted by the training program (see Part I, Appendix F).

There is a wide array of individuals trying to enter the construction labour market in Manitoba. People are well aware of the direct attention being paid to occupations in this field due to the Hydro and Floodway projects. Some potential workers in Manitoba are highly skilled already and just need help in assessing and presenting their skills to employers or trainers. Getting these individuals ready for work quickly is one step in the process. The pilot illustrated that an individual's suitability and placement advice is possible, following a one-day process of

assessment. The field assessment, along with the assessor guidelines, can be seen in Part I, Appendix B.

If training participants are screened prior to obtaining approval for pre-employment training dollars, there could be substantial savings to the provincial costs of training HEOs. The number of successful HEO training participants, could also improve rapidly.

The higher-calibre work entrant could be referred to an appropriate next step, at the end of the one-day assessment. There are four referral options presented in the worker intake model, seen down the right-hand side. Some of the individuals in the pilot program were ready to be referred directly to work or a job finding service. These individuals were easily assessed as having the desired Essential Skills levels and as suitable for success in a training program. It seems then, that these ‘work ready’ individuals should receive some sort of document that certifies this skill assessment. The question here relates directly to the relationship with industry. What is acceptable evidence of skill to the construction sector in Manitoba and who can give this documentation the “stamp of approval”? Suggestions about recognition documents are contained in Appendix A. A few were assessed as not yet ready for work, but in need of other government services, such as English language training, math upgrading, safety training or work experience.

The second option in the **Worker Intake Model** allows the applicant the option of a one-week training program to help prepare them for work in construction. The pilot program was initially two weeks, and upon review, it was determined that five days of assessment and training were sufficient for the worker who could succeed in this sector, but needs a little more support. A new immigrant, with prior construction experience, would benefit from the one-week program, as did pilot participants, in the second pilot, who were from a Northern Manitoba reserve. There are multiple assessments throughout the one-week program.

PLAR Assessment Criteria

The project revealed that a PLAR process would work well for this sector as many people do have experience that, if recognized, could expedite their labour market career progression. The research compared the competencies for Skilled Labourer in Heavy Construction, the competencies for Heavy Equipment Operators, and the competencies from **Building Trades Helper, NWT Apprenticeship and Occupational Certification, June 2005*, see Part I, Appendix D. The competencies were drafted into products and checklists to illustrate the practical application to the hiring process (see Part I, Appendix C: Assessor Guide for Field Assessments) and were used as the basis of the pilot program learning outcomes.

Assessment criteria were developed for each occupation with subject matter experts. Participants were asked to describe the performance typically expected for an entry-level HEO or Skilled Labourer. These criteria were then incorporated into the field test referred to earlier. The detailed PLAR assessment criteria are attached as (Part II, Appendices B and C).

Partnerships

Several employers participated in the project at different stages in the project development. Employer names were put forth by Steering Committee members and approached at the inception, during the development of criteria, and again to review the field assessment.

Employers were approached with the survey and field assessment prototype (Part II, Appendix D) which asked about difficulties with hiring and retention practices. The employers were also asked for their opinions concerning documentation of worker skills and what would be acceptable to them. The final area of questioning pertained to the employer's opinions regarding qualified assessors for new entrants.

Representatives from Employment Training Services, and Industry Training Partnerships continued to meet with OARS training Inc. on a project steering committee along with representatives from the employer industry group including Government Services, Manitoba Heavy Construction Association, The Operating Engineers Training Institute of Manitoba, and the Labourers International Union. Approximately 15 to 20 employers were queried at different points in the project, either through attending meetings, filling out surveys, or answering questions requiring subject matter expertise. It needs to be noted that individual employers themselves, are generally not part of the construction industry group, and yet, all the real data about job requirements was attained through the participation of these individual employers.

Utilizing existing databases and public sources of secondary source information, the project research was able to identify that many construction employers belong to the Manitoba Heavy Construction Association. The research indicates that larger companies are more likely to be members of this provincial organization. A correlation to membership lists indicated that only 3 in 10 employers, with less than 10 workers, are members of MHCA, and only 1/3 of Aboriginal owned companies are members. Whereas, 85% of companies having greater than 25 employees are members of Manitoba Heavy Construction Association, keeping in mind that only 5% of all Manitoba Construction employers are unionized.

If these project forms the basis for development of a Provincial Industry Labour Force Committee, then there needs to be developmental work to implement the principles of

partnership, as suggested in the conceptual framework as seen on page 11. It is not clear that all voices are heard, nor have all stakeholders been invited to participate. A broader outreach to all interested parties and a process for the group to dialogue and problem solve might help the government to determine where to apply their supports.

Sector Training

The training in this sector has provided very dim results in direct labour market benefit as seen in the Leaf Rapids Report, ETS (2005). The people and organizations that have delivered prior HEO training come from a variety of places and offer a variety of levels of training. Without standards and a process to maintain them the province was not able to control the quality or quantity of workers in this sector. It is apparent that industry committees need to agree on what skills they need in workers, what document(s) represents acceptable skill evidence, and what training needs to be available for potential workers.

To date there has been no process to validate HEO training that has been purchased and virtually no documentation trail to determine who has been trained and to what extent they can apply their learning. Further work is underway to address a common certification document and who will accept it.

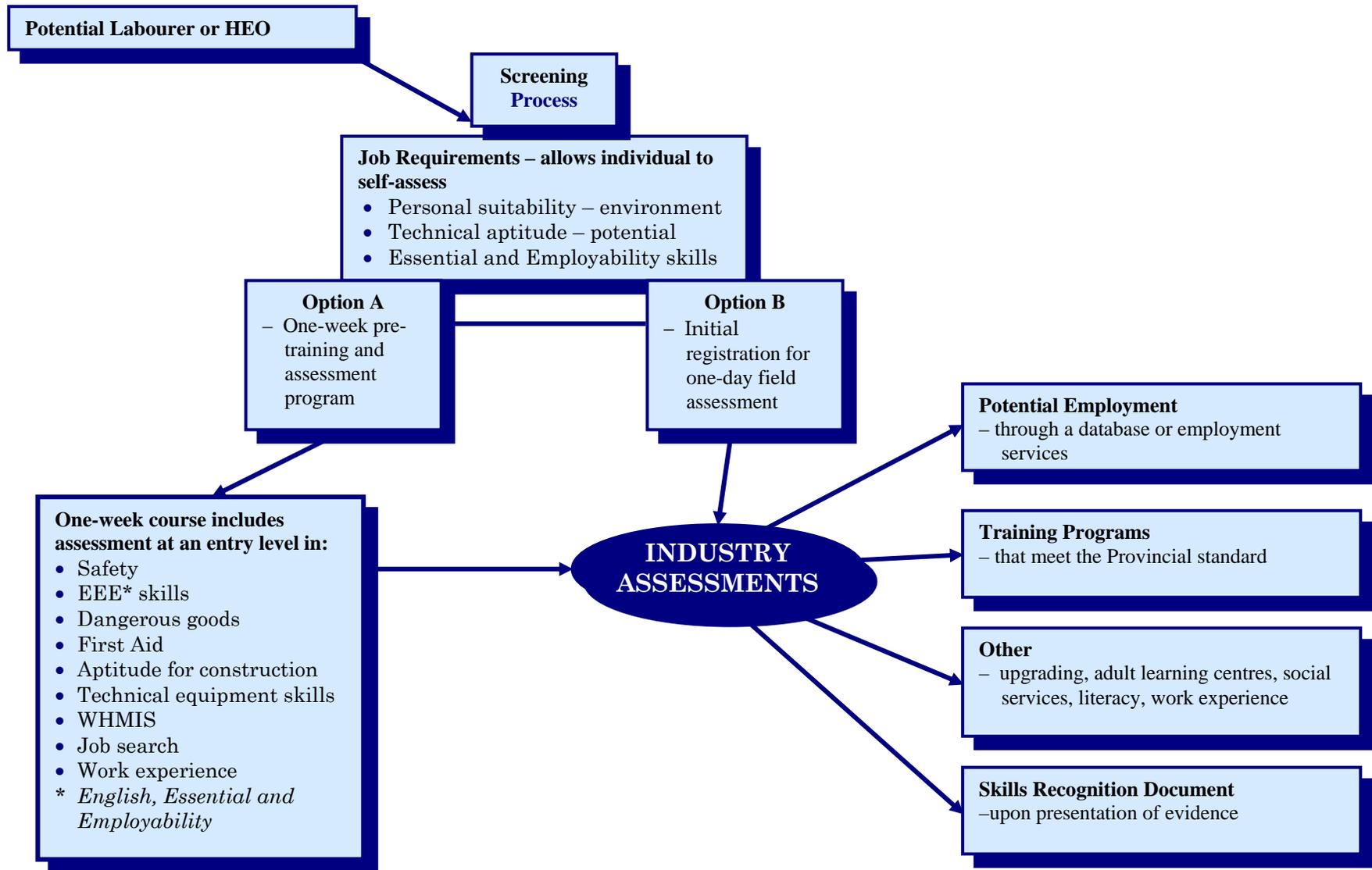
The project research timelines were too limited by the scope of this assignment to access the curriculum that is out there and most recently being used by some of the project partners and other trainers. It is clear that both the labour unions and MHCA offer some labour force related training. But there are many other organizations offering HEO training as well, like the Heavy Equipment Operator Training Academy of Manitoba (in Grunthal), Smooke Brothers Construction in Thompson, and even Red River College.

Summary

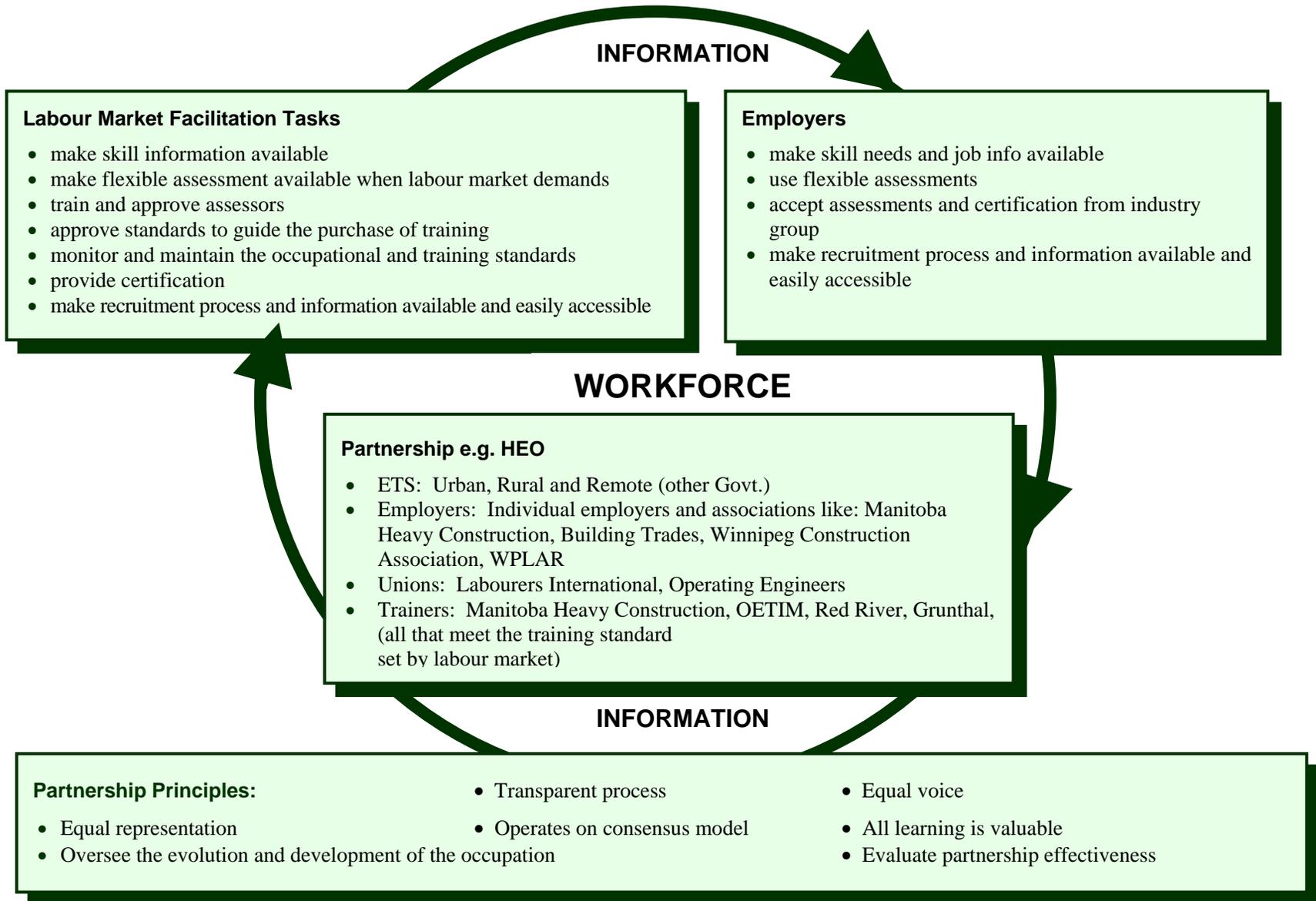
The existing Standards for Skilled Labourer and HEO were used as the basis of competency development and curriculum for these occupations. The criteria for performance of these standards was developed with guidance from the Project Steering Committee and validated with subject matter experts. The core competencies and criteria for entry level HEO and Skilled Labourer are attached (see Part II Appendices B and C). A process of assessment or PLAR was developed and piloted based on these competencies. The Assessment Package is contained in Part I.

Training was developed and piloted (Part I) and provided participants with a Certificate of Completion and a draft wallet card prototype was designed (see Part II, Appendix A).

Getting to the basics of what a person knows and can do will help to provide good workers in this sector but the training they receive will be critical to a sustainable labour market development model that adds value. To ensure that entry level Manitoban construction workers are qualified and certified, the training must also meet a standard. The need for guidance when purchasing HEO training is apparent. Therefore, evaluating and monitoring the training being purchased for HEO training is the final piece of the process. The project work includes a framework for assessing and evaluating training and can be seen as the Purchase of HEO Training (Appendix E).



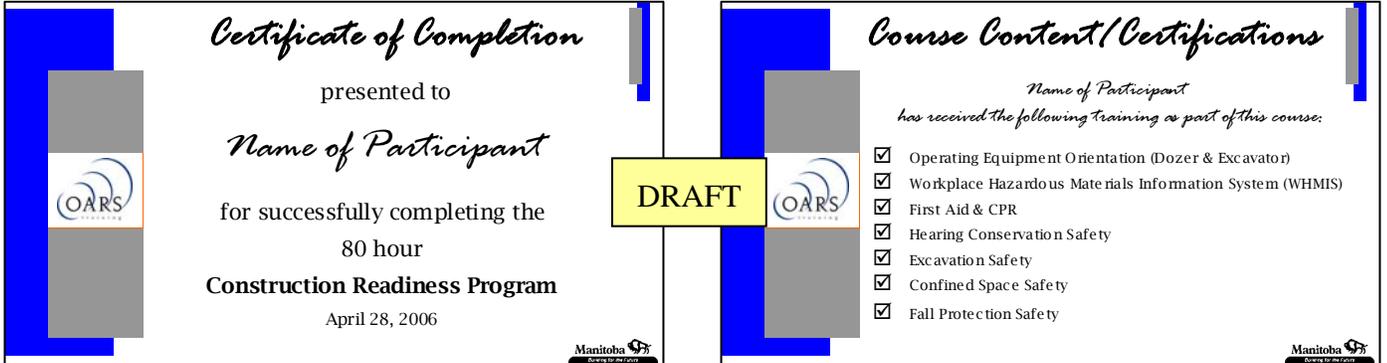
Conceptual Framework for Labour Market Facilitation



Appendix A:
Certification and Wallet Card Prototypes

Certification and Wallet Card Prototypes

Wallet Size Card



Certificate Size



Appendix B:
PLAR Assessment Criteria—Heavy Equipment Operator

Core Entry Skills A: Occupational Health and Safety (OHS) and the Environment

| Sub Skills | Assessment Criteria |
|---|---|
| 1. Complies with First Aid Requirements | <ol style="list-style-type: none"> 1. Have a current First Aid certificate. 2. Report near misses to supervisor or foreman. 3. Report any and <u>all</u> accidents or injuries to the supervisor or foreman. 4. Locate the First Aid box and Eye Station. 5. Recognize that workplace safety regulations differ between provinces and contractors. |
| 2. Complies with all requirements for the safe handling, storage and disposal of hazardous materials. | <ol style="list-style-type: none"> 1. Have a current WHMIS or Safe-T-Disk program certificate. 2. Have a current Dangerous Goods Transportation Certificate if applicable. 3. Locate the fire extinguisher 4. Identify the type of fire extinguisher(s) available. 5. Act appropriately to avoid fuel spills i.e do not overfill the tank. 6. Identify the muster area in the event of a serious accident. |
| 3. Complies with all requirements on OHS and the environment. | <ol style="list-style-type: none"> 1. Check to ensure that chemicals are labelled correctly. 2. Check to ensure that chemicals are stored correctly. 3. Check to ensure that materials are labelled correctly. 4. Check to ensure that materials are stored correctly. 5. Check to ensure that equipment is not leaking oil or fuels. 6. Ensure that site-specific environmental impact regulations are being followed. 7. Dispose of excess contaminated materials appropriately. |
| 4. Complies with employer/client OHS requirements inc PPE, lock-out and tag-out procedures. | <ol style="list-style-type: none"> 1. Recognize the impact of alcohol, drugs and medication on performance. 2. Wear current hardhat. 3. Wear approved construction safety glasses. 4. Wear appropriate hearing protection (earplugs and/or ear muffs). 5. Wear reflective safety vest. 6. Wear fire retardant coveralls if appropriate. 7. Use appropriate respiratory protection as needed. 8. Use appropriate hand protection (chemicals). 9. Use safety certified boots (appropriate to the job). <p>Lock-Out and Tag-Out Procedures:</p> <ol style="list-style-type: none"> 1. Shut down the equipment. 2. Disconnect the power supply or have it disconnected. 3. Note clearly on a plastic tag-out tag the problem with the equipment. 4. Hang a 'lock-out' tag to the ignition switch and ensure that it is visible. 5. Advise the supervisor ASAP of the problem. 6. Follow the instructions of the supervisor to either remove the equipment or leave it as is. 7. Secure the broken equipment with a padlock. 8. Retain the key until the machinery is repaired. |
| 5. Wear appropriate clothing | <ol style="list-style-type: none"> 1. Wear clothing in good condition i.e. not torn. 2. Wear nothing too loose inc. a sweater tied around the waist. 3. No jewellery specifically chains and earrings. No rings are preferred. 4. Clothing not too tight to ensure free movement. 5. Weather appropriate clothing. 6. No sleeveless shirts |

Core Entry Skills B: Heavy Equipment Inspection and Basic Maintenance

| Sub Skills | Assessment Criteria |
|---|--|
| 1. Interprets manufacturer/employer documentation re: inspection/maintenance and other documents. | <ol style="list-style-type: none"> 1. Completes Operation Manual appropriately. 2. Completes Equipment Checklist on a daily basis. 3. Complete Fuel and Oil forms 4. Use Maintenance manuals. 5. Read and interprets different types of gauges. |
| 2. Performs or arranges for servicing and scheduled maintenance. | <ol style="list-style-type: none"> 1. Identify when the equipment needs scheduled maintenance. 2. Document the need for servicing 3. Contact the appropriate person if required. 4. Identify the appropriate lubricant for each piece of the equipment. |
| 3. Performs pre-operational/post operational inspection. | <p>Pre-Operational Inspection</p> <ol style="list-style-type: none"> 1. Check Motor Oil levels 2. Check transmission, hydraulic and coolant levels 3. Do a walk around and ensure that there are no leakages. 4. Check to ensure that the parking brake has been applied. 5. Check the equipment's tires. 6. Start the machine and recheck to ensure that all fluid levels are appropriate. 7. Ensure that the gauges are working properly. 8. Test gauges if needed 9. Do a sufficient warm-up prior to engaging the equipment. <p>Post-Operational Inspection</p> <ol style="list-style-type: none"> 1. Check to ensure that oil, transmission, coolants, airbrakes and all other gauges are operating within defined limits. Adapt to weather conditions when required. 2. Identify when there are problems with the equipment. 3. Conduct inspection(s) during the shift. 4. Fuel the machine at the end of the shift 5. Clean the equipment and the work station at the end of the shift 6. Use PPE when taking a break during the shift or at any time outside of the cab. 7. Conduct a similar pre-operational inspection at the end of the shift. 8. Park on level ground. 9. Make the necessary adjustments on the equipment to prepare for the next shift. 10. Make the necessary adjustments on the equipment to minimize wear and tear. |
| 4. Secures unattended equipment | <ol style="list-style-type: none"> 1. Ensure that the equipment is parked on level ground. 2. Ensure that the parking brake is engaged. 3. Lower the equipment i.e the blade, rippers, bowls 4. Lower the cab. |
| 5. Monitors/adapts operation regarding seasonal and atmospheric impacts on site conditions and equipment. | <ol style="list-style-type: none"> 1. Identify the conditions of the site –wet, dry, frozen etc. 2. Determine the most appropriate means to do the job. 3. Identify the hazards associated with the job. 4. Recognize the effects of extremes in weather on the operation of machinery. |

Core Entry Skills C: Work Planning and Co-ordination and Site Preparation

| Sub Skills | Assessment Criteria |
|--|--|
| 1. Communicate with supervisor and co-workers on the task at hand. | <ol style="list-style-type: none">1. Asks questions for clarification and is prepared to admit to concerns about the job or site.2. Speaks assertively3. Communicates on a one to one basis with people4. Works as part of a team5. Communicates respectfully with co-workers6. Use hand signals to communicate with the various equipment operators.7. Use radios to communicate with the various equipment operators.8. Recognize signage on the site inc. caution tape and other signs e.g. the location of the fire extinguisher and the First Aid box.9. Identify the muster area in the event of a serious accident10. Identify safety hazards as required. |
| 2. Evaluate job conditions and determine method of approach. | <ol style="list-style-type: none">1. Determine soil conditions e.g. wet, dry, frozen or thawing2. Determine the type of equipment depending on the job needed3. Use Grade stakes4. Work within boundaries5. Solve basic problems related to conditions and equipment |

Appendix C:
PLAR Assessment Criteria—Skilled Labourer

(entry level)

Core Entry Skill #1 - Demonstrate Safe Work Practice

| Sub Skills | Assessment Criteria |
|---|--|
| 1. Wear appropriate clothing | <ol style="list-style-type: none">1. Wear clothing in good condition, i.e., not torn.2. Wear nothing too loose, including a sweater tied around the waist.3. No jewellery specifically chains and earrings. No rings are preferred.4. Clothing not too tight to ensure free movement.5. Weather appropriate clothing.6. No sleeveless shirts. |
| 2. Use PPE | <ol style="list-style-type: none">1. Wear current hardhat.2. Wear approved construction safety glasses.3. Wear appropriate hearing protection (earplugs and/or ear muffs).4. Wear reflective safety vest.5. Use appropriate respiratory protection as needed.6. Use appropriate hand protection (chemicals).7. Use safety certified boots (appropriate to the job). |
| 3. Adhere to lock-out and tag-out procedures. | <ol style="list-style-type: none">1. Shut down the equipment.2. Disconnect the power supply or have it disconnected.3. Note clearly on a plastic tag-out tag the problem with the equipment.4. Hang a 'lock-out' tag to the ignition switch and ensure that it is visible.5. Advise the supervisor ASAP of the problem.6. Follow the instructions of the supervisor to either remove the equipment or leave it as is.7. Secure the broken equipment with a padlock.8. Retain the key until the machinery is repaired. |
| 4. Use ladders safely | <ol style="list-style-type: none">1. Check that the ladder is in good repair, i.e., no broken or damaged rungs.2. Ensure that the ladder is suitable for the job being performed, i.e., not too long and not too short.3. Put the kicker at the bottom of the ladder.4. Check that the ladder is on a solid surface and that it doesn't slip or slide.5. Climb the ladder, with a 'spotter' holding it.6. Tie the ladder at the top to a secure/solid location. A fastener can be used if necessary.7. If climbing onto a roof, the ladder must be a minimum of three feet beyond the roof or work area. |
| 5. Respect the environment | <ol style="list-style-type: none">1. Check to ensure that chemicals are labelled correctly.2. Check to ensure that chemicals are stored correctly.3. Check to ensure that materials are labelled correctly.4. Check to ensure that materials are stored correctly.5. Check to ensure that equipment is not leaking oil or fuels.6. Ensure that site-specific environmental impact regulations are being followed.7. Dispose of excess contaminated materials appropriately. |

Core Entry Skill #2 - Demonstrate Trade Foundation Skills

| Sub Skills | Assessment Criteria |
|--|--|
| 1. Perform basic calculations | <ol style="list-style-type: none">1. Use a calculator to do basic calculations (addition, subtraction, multiplication and division).2. Use a Metric measuring tape to do basic measurements.3. Use an Imperial measuring tape to do basic measurements. |
| 2. Describe construction documents | <ol style="list-style-type: none">1. Use timesheets.2. Read and sign the WCB 'green' card (if there is an incident to report).3. Complete the TD1 income tax form.4. Review the company's policy and procedure and safety book.5. Complete the acknowledgement that this information was reviewed.6. Complete Hiring Information Form, i.e., contact numbers, next of kin, etc. |
| 3. Describe roles and responsibilities of individuals on work site | <ol style="list-style-type: none">1. Recognises the chain of command on the site.2. Approaches a job with a positive attitude.3. Recognises own limitations inc. the level of problems that can be solved. |
| 4. Communicate on the work site | <ol style="list-style-type: none">1. Asks foreman or co-worker when clarification is needed.2. Interact positively with co-workers.3. Communicate with co-workers, i.e, when in doubt ask and clarify if needed.4. Communicate respectfully with co-workers.5. Use hand signals to communicate with the various equipment operators.6. Use radios to communicate with the various equipment operators.7. Recognise signage on the site inc. caution tape and other signs, e.g., the location of the fire extinguisher and the First Aid box. |

Cored Entry Skill #3 - Demonstrate Tools, Equipment, and Materials

| Sub Skills | Assessment Criteria |
|-----------------------------|---|
| 1. Describe hand tools | <ol style="list-style-type: none">1. Identify the following equipment: 'spud' wrenches, 12", 18" and 24" pipe wrenches, 6", 12" and 18" crescent wrenches, aligning bar, asphalt rake, buck saw, burk bar, claw bar, claw hammer, concrete rake, crowsfoot (hammer), edgers, flat rake, flat shovel, floats, form scraper, hand saw, hydrospoon, ice scraper, joiners, pick-axe, rebar pliers, scoop shovel, side cutter pliers, sledge hammer, spade, twisters, water pump pliers. |
| 2. Describe power equipment | <ol style="list-style-type: none">1. Identify the following equipment: belt sander, chain saw, circular saw, disk sander, drills, grinders, jig saw, mitre saw, palm sander, planers, power sander, power screed, power trowels, reciprocating saw, rescue saw, routers, table saw, vibrators. |
| 3. Describe fasteners | <ol style="list-style-type: none">1. Identify nails.2. Identify snap ties.3. Identify tie wires. |

OARS training Inc.

| | |
|----------|-----------------|
| 4. Other | 1. Wheelbarrow. |
|----------|-----------------|

Core Entry Skill #4 - Assist Tradespeople

| Sub Skills | Assessment Criteria |
|---|---|
| 1. Move tools, equipment and materials. | <ol style="list-style-type: none">1. The person consistently retrieves the right piece of equipment.2. Identify the different materials, e.g., 2x4, 2x6.3. Demonstrate safe handling of tools, equipment and materials.4. Demonstrate proper handling of tools, equipment and materials.5. Clarifies for meaning when unsure and when in doubt asks. |
| 2. Use hand tools | <ol style="list-style-type: none">1. Identify the right tool on a consistent basis.2. Use the right tool for the job.3. Uses own tool(s) when appropriate.4. Demonstrate safe handling of tools, equipment, and materials.5. Demonstrate proper handling of tools, equipment, and materials.6. Clarifies for meaning when unsure and when in doubt asks. |
| 3. Use power tools and equipment | <ol style="list-style-type: none">1. Identify the right tool on a consistent basis.2. Use the right tool for the job.3. Use own tool(s) when appropriate.4. Demonstrate safe handling of tools, equipment, and materials.5. Demonstrate proper handling of tools, equipment, and materials.6. Clarifies for meaning when unsure and when in doubt asks.7. Can identify when s/he is not comfortable working with the equipment.8. Distinguish between domestic and industrial equipment and adjust significantly to the differences. |
| 4. Clean work area | <ol style="list-style-type: none">1. Take the initiative to clean the area.2. Dispose of garbage appropriately.3. Work within own limitations.4. Recognise the difference between contaminated and non-contaminated garbage.5. Separate and store correctly reusable materials. |

NOTES:

Demonstration is considered the most effective way of displaying competency. Completion of a course in Metal shop or Wood Shop is also favoured as an indicator of interest.

Appendix D:
Employer Survey with Field Test Prototype

HEO/PLAR Initiative

Script and Survey

1. Note the name of the company contacted.
2. Introduce and say, “I’m doing a survey that will help address the shortage of workers in the Heavy Construction Industry. It will take about 10 minutes to complete the survey. Is this a good time to discuss this?” **ASK IF THE PERSON HAS HAD A CHANCE TO REVIEW THE ASSESSMENT AND THE SURVEY.** If not arrange a call back time. **NOTE** Contact Name and Number. *IF Rick/Tim has a contact in the company, mention this in the introduction.*
3. Background Information: *Paraphrase*
To address the need for work ready Heavy Equipment Operators, the Government of Manitoba has implemented an initiative to develop a field test to assess a person’s overall suitability to work in the Construction industry. This field test, developed and validated by Subject Matter Experts in the Industry based committee, reflects the 2004 industry defined occupational standards of this occupation. It evaluates many aspects of HEO, including health and safety requirements, required tools and equipment. The field test is primarily a demonstration of the person’s knowledge, skills, and attitudes when working in the industry.
4. All information gathered is confidential and will not be disclosed or disbursed to any person or organization. Did you have any questions?”
5. “I will ask the questions and record your answers.”
6. At the end of the questionnaire, “Thank you for taking part in the survey. For this your name will be put into a draw for two regular-season, 50-yard-line Blue Bomber tickets.”

Heavy Construction Industry Survey - Field Assessment Prototype

| |
|---|
| Employer |
| Address |
| Postal Code |
| Contact Name |
| Contact Number |
| Contact Email |
| Product/Services |
| Number of Employees |
| Is the company unionized? Y/N |
| Does the company have an employee association? Y/N |
| Did you hire entry-level workers within the last year? Y/N |
| If Yes, are job vacancies advertised? |
| If Yes, was it difficult to hire people? |
| If Yes, was it difficult to retain or 'keep' people? |
| If No, do you have returning employees? |

I understand that you have had an opportunity to review the Field Assessment for Entry Level HEO. Do you have any questions or concerns about its content?

Please answer the following question as indicated.

1. Who could be authorized to conduct these field assessments? Please check *three* choices:

- A Heavy Equipment Operator (HEO) with two-five years experience
- A Heavy Equipment Operator with five-ten years experience
- A person who has worked as a HEO for five-ten years and also has instructional experience in an institutional setting.
- A person who has worked as a HEO for two-five years and also has instructional experience in an institutional setting.
- An instructor of Heavy Equipment Training at a non-profit training institution
- An instructor of Heavy Equipment Training at a post secondary institution
- An instructor of Heavy Equipment Training at a private training institution
- An officially certified assessor from an appropriate government department
- An officially certified assessor ratified by an industry committee

2. **Please check what could be needed in the documentation of this assessment.**

- Calculate basic math calculations related to Construction
- Current contact information (Name, mailing address, and postal code)
- Current driver's license
- Current First Aid certificate
- Current WHMIS certificate
- Demonstrate appropriate communication on the worksite
- Demonstrated sufficient knowledge of safety issues
- Demonstrated the lock-out and tag-out procedure
- Describe tools, equipment and materials related to Construction
- Phone number (cell or ground)
- Relevant training taken in the past five years
- Relevant training taken in the past two years
- Use basic construction documents
- Has PPE
- Has tools
- Other: _____

3. What format could this credential be? Please check your choices:

- Electronic: accessed through a secured central database
- Paper assessment
- Wallet sized card (laminated)
- Wallet sized card (laminated) and further information on paper available on request.
- Other: (specify) _____

4. What institutions/organizations could offer this credential?
- Educational Institution with necessary trades training and equipment
 - A private HR consulting firm with relevant construction experience
 - Provincial Government-Which Department(s): _____
 - Industry Organization: Name: _____
 - Employment Agencies
 - Other: _____
5. Where could the record of the outcomes of the field assessments be stored?
- A secured 'virtual' database
 - Post Secondary Educational Institution
 - A private HR consulting firm with relevant construction experience
 - Provincial Government-Which Department(s): _____
 - Industry Organization: Name: _____
 - Employment Agencies
 - Other: _____
6. For how long could the results of the field assessment remain valid?
- 6 months
 - One year
 - 18 months
 - Two years
 - More than two years: If yes, how long?

Survey cont'd: Heavy Equipment Operator (HEO)



Prototype Field Assessment for Entry-Level HEO



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Introduction

To address the need for work ready Heavy Equipment Operators (HEO), the Government of Manitoba has implemented an initiative to develop a field test to assess a person's overall suitability to work in the Heavy Construction industry. This field test, developed and validated by subject matter experts in the industry, reflects the 2004 industry-defined occupational standards of this occupation. It evaluates many aspects of HEO including health and safety requirements, required tools and equipment. The field test is primarily a demonstration of the person's knowledge, skills and attitudes when working in the industry.

What is competency-based assessment?

Competency is defined as a person's ability to demonstrate the skills and attitudes required for a particular job. The purpose of an HEO assessment is to identify where an individual's skills are compared to what is needed for an entry-level HEO. Not all applicants will be ready to work and there are a few instances when applicants fail completely. The assessment will also result in a clear understanding of any training that may be required. The assessment is intended to point the way to employers and employment or for referrals to further training, employment counseling, upgrading opportunities, or work experience.

What is the process to conduct a field assessment for an entry-level HEO?

When the applicant arrives on site, the person is checked to see if they are dressed appropriately and have current Personal Protection Equipment (PPE). After the validity of their driver's licence has been verified and the currency of Certificates (First Aid, WHMIS and Dangerous Goods) confirmed, the field assessment begins. In each of the skill demonstration components, a minimum of 80% of the competencies described must be demonstrated by the applicant. If, for example, there are 10 assessment criteria, then the applicant must demonstrate 8 of these to pass this area.

Once the demonstration of the lock-out and tag-out procedure and all of the required pre-op documentation is completed, a job that an entry-level HEO would be expected to perform is demonstrated. The type of job undertaken depends on the type of equipment available for the field test. At the end of the test, the assessor determines the results and informs the applicant of the results.

Basic Operations, continued

| Assessment Method: Evaluates job conditions and determines method of approach. | |
|---|--|
| Assessment Criteria | Results |
| <input type="checkbox"/> 1. Determines soil conditions, e.g., wet, dry, frozen or thawing. <input type="checkbox"/> 2. Determines the type of equipment depending on the job needed. <input type="checkbox"/> 3. Uses grade stakes. <input type="checkbox"/> 4. Works within boundaries. <input type="checkbox"/> 5. Solves basic problems related to conditions and equipment. | 80% of assessment criteria. 4 of the 5 criteria are required. Outcome: <div style="text-align: right; font-size: 2em;">/5</div> |
| Comments: <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | |

| Assessment Method: Secures unattended equipment. | |
|--|--|
| Assessment Criteria | Results |
| <input type="checkbox"/> 1. Checks that the equipment is parked on level ground. <input type="checkbox"/> 2. Checks that the parking brake is engaged. <input type="checkbox"/> 3. Lowers the equipment, e.g., the blade, rippers, bowls. <input type="checkbox"/> 4. Lowers the cab. | 100% of assessment criteria. All criteria are required. Outcome: <div style="text-align: right; font-size: 2em;">/4</div> |
| Comments: <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> | |

Name: _____

Address: _____

Postal Code: _____

Telephone Number: _____

Current Driver's Licence I.D. Y N Expires _____

Current WHMIS Certificate Y N Expires _____

Current First Aid Certificate Y N Expires _____

Current Dangerous Goods Certificate Y N Expires _____

Used PPE appropriately Y N

If *no*, suggested improvements:

Outcome:

Demonstrates lock-out and tag-out procedure _____ /8

Performs pre-operational inspection _____ /9

Communicates on the worksite _____ /10

Evaluates job conditions and determines method of approach _____ /5

Secures unattended equipment _____ /4

Demonstrated on-site (provide overview):

Essential Skills:

Employability:

Assessor:

PRINT SIGNATURE

Applicant:

PRINT SIGNATURE

Location of Field Test: _____

Date: _____

Summary of results: _____

Suggested training: _____

Appendix E:
Purchasing HEO Training

Purchasing HEO Training

Introduction

The industry stakeholders in the construction sector began the process of setting standards for training programs when they developed the HEO occupational standards, printed in the fall of 2004. One of the early goals of this group was to ensure quality training was available for suitable workers in Manitoba.

It is clear that a common standard to guide the purchase of training will benefit all the partners and government has acted as a catalyst for their development. The government's project officers are the managers of the public funds and will have the critical role of auditor for government funded training programs and will facilitate an industry committee to review proposals using the standards. The employment consultants or project officers from ETS are the intended users of the following suggestions for purchasing HEO training.

Benefits to Partners

Employers will benefit from training that consistently yields workers possessing the basic entry-level skills needed on the job. Thus, all training must be designed to meet the skill demands of the job as defined by the people that employ the workers.

Labour associations always intend to offer more and better services to their members and to provide quality training is a good service. Labour groups are very closely linked to the supply and demand of workers and often in the business of supplying training too. Following standards for the development and delivery of their training will help them provide credibility to the training they offer. Training that provides recognition of skills will help their current and new members attain success in the job market.

Employer organizations and professional groups involved in the labour market process have similar benefits to the labour groups as they also hope to provide service to members. Employer groups are typically the linking piece between government policies and employers' issues and opinions, and can help ensure the training outcomes are the best ones for their industry. Some groups like the Manitoba Heavy Construction Association are also training delivery agents and, like their labour partners, will benefit from clear directions and expectations for funded training programs.

Typical post-secondary training is not the norm for industry-based training delivery. Many other organizations have now become involved in the business of delivering HEO and construction-related training. By complying with a standard of development and delivery, the training deliverers will be able to assure their students of a program that is linked to a job and designed to

provide results. Training deliverers will add value to their training by providing a credential to their learners that signifies a province-wide acceptable standard. The process of meeting the government's standards for purchasing training will automatically add quality to any program.

Government as a labour market partner will benefit greatly from providing an expected standard for any training they purchase. Government staff and consultants can use the standards for purchasing training as both a job aid and as a way to evaluate spending. The process also helps to develop key linkages and partnerships to support ongoing forecasting and industry training development. Government will also be able to replicate the following process to other industries and begin to supply a basic entry-level credential.

Step1: Clarify the purpose of training to select standards.

Step 2: Identify acceptable evidence of standards.

Step 3: Agree on a rating system.

Step 4: Review independently and confer together.

Finally, responding to a Request for Proposals (RFP) which now demands adherence to a newly used standard may require some facilitation to ensure that the new RFP process is fair. All of the potential training organizations need to be notified and given time to respond to the call. There could be information packages developed, orientation sessions given and eventually interviews conducted to ensure that the training organization understands and responds to the expected standards in their response.

Step 1: Clarify the purpose of training to select standards

The standards need to be focused by a training purpose statement which sets the limits to which they are used. As a management or human resource development strategy, training can serve many purposes such as:

- Developing skills
- Supporting other interventions
- Making work and issues visible
- Focusing energy on issues.
- Promoting change

- Reducing risk
 - Building teams
 - Indoctrinating new staff
 - Communicating and disseminating knowledge and information
 - Certifying and licensing
 - Legitimising issues
 - Creating a community based on some shared experience
 - Rewarding past performance
 - Flagging ‘fast trackers’

Given the diverse array of purposes listed above, it seems logical to conclude that the results sought from the training would also be diverse. *The partners need to clearly define the reasons for this training as well as the expected results.* For example:

- Skilled labourer training for immigrants which includes skill development for language, essential and employability skills, safety and small tool use. The expected outcome is to make immigrants work ready for the heavy construction industry.

Step 2: Identify acceptable evidence of standards

The provincial representatives responsible for various training areas should work with the training institutions and trainers to define clear evidence of these standards. A practical approach to this might be a working session between government staff and subject matter experts or instructors to collaborate on identifying practical sources of evidence and collection processes.

Step 3: Agree on a rating system

Once the purpose for training has been clarified, boundaries set for the standards, and acceptable evidence agreed upon, then the committee can agree on a rating system. Some standards will require an absolute yes or no. Others can be viewed with varying degrees of acceptability but typically not more than five (e.g., not acceptable to more than acceptable) Some committees agree to rate each by a score, usually from 1 to 10. These can be compared, averaged or both. Notes can be included for later discussion.

Step 4: Review independently and confer together

Each member should review the training proposal using the selected standards and rating system. Once complete, the committee should meet and discuss the ratings until concurrence is reached. Results should be recorded so that if there is an appeal, the process is transparent and can be communicated.

Standards for the Purchase of Training

The following standards are adapted from Future Ed (1996), ETS (2005) Project Based Training Checklist (G. Langlais) and Oars training Inc. (2003). To fully implement standards, the partners will need to select which of the following suggested purchase of training standards they hope to apply to the review process and what level of evidence is acceptable for each.

| Recommended Provincial Standards for Purchasing HEO Training | The Proposed Training provides... | Yes or No | Rating out of 10 | Not applicable |
|---|--|-----------|------------------|----------------|
| 1. Clear need for training development or delivery should be identified and verified. | 1.1 a response to a Government issued RFP. 1.2 a response to a Government sought after partnership. | | | |
| 2. ETS should be contacted to consider the development or delivery of training. | 2.1 a clear plan for proposal development. 2.2 evidence of key partners, their roles and support needs. 2.3 verification of partner commitment prior to funding approval. 2.4 other partners who may be involved in funding or co-funding the program | | | |

| Recommended Provincial Standards for Purchasing HEO Training | The Proposed Training provides... | Yes or No | Rating out of 10 | Not applicable |
|---|---|-----------|------------------|----------------|
| <p>3. Training should take into consideration the labour force development needs of industry and the Manitoban economy.</p> | <p>3.1 a response to current business, labour and community needs.</p> <p>3.2 training related to identified economic development priorities of a geographic region or community</p> <p>3.3 individuals with support to obtain sustainable employment in/ outside of the community.</p> <p>3.4 evidence that program outcomes meet Industry driven standards</p> <p>3.4 occupational skill standards where they exist</p> <p>3.6 employability skills (Conference Board of Canada)</p> <p>3.7 Essential Skills (HRSDC)</p> | | | |

| Recommended Provincial Standards for Purchasing HEO Training | The Proposed Training provides... | Yes or No | Rating out of 10 | Not applicable |
|--|---|-----------|------------------|----------------|
| <p>4. Training programs should be developed and offered with the focus on learner success.</p> | <p>4.1 clear program objectives</p> <p>4.2 training intake process distinct from decisions about an individual's income support</p> <p>4.3 accessible information to help participants make informed decisions</p> <p>4.4 initial and ongoing counselling to participants</p> <p>4.5 formal assessment of skills and prior learning as part of the assessment process</p> <p>4.6 all the necessary assessments to ensure learner suitability to the program</p> | | | |

| Recommended Provincial Standards for Purchasing HEO Training | The Proposed Training provides... | Yes or No | Rating out of 10 | Not applicable |
|---|--|-----------|------------------|----------------|
| <p>5. Delivery of training should be planned by a qualified training institution with experience in curriculum design and qualified instructors</p> | <p>5.1 programs should take place in clean, safe and accessible facilities, where up-to-date equipment is available to all learners.</p> <p>5.2 teaching materials, tools and equipment are appropriate and of the highest quality.</p> <p>5.3 teachers/instructors have qualifications in appropriate educational, vocational or professional skills</p> <p>5.4 realistic and adequate time frames for delivery.</p> <p>5.5 evidence of variety in delivery techniques reflecting the needs of multiple learning styles and consistently linking lessons to the workplace and industry standards where available.</p> <p>5.7 evidence of a superior track record of student placements and employment success.</p> <p>5.8 ethical guidelines for all staff and students, including an appeal process.</p> <p>5.9 cost</p> | | | |

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|---|---|-----------|------------------|----------------|
| <p>6. A program should incorporate a number of monitoring and evaluation practices.</p> | <p>6.1 PLAR to maximize existing knowledge and minimize unnecessary retraining</p> <p>6.2 provision of credit or advanced standing where appropriate</p> <p>6.3 frequent feedback throughout the program on progress by the instructor to the learner</p> <p>6.4 varied measurement techniques, including:</p> <ul style="list-style-type: none"> – formal written and oral assignments and exams – self-assessment by learners – demonstration of skills and knowledge through projects – ongoing, competency-based assessment <p>6.5 plans for completing within program and after program evaluations on the program, facilities and instructors</p> <p>6.6 feedback from the learners and instructors on the program design and teaching materials</p> <p>6.7 feedback on the application or transfer of learning as job performance</p> <p>6.8 feedback of the benefit of training outcomes in support of high priority business need</p> <p>6.9 should demonstrate financial, legal and ethical accountability, including substantial administrative capacity</p> | | | |