DALHOUSIE UNIVERSITY

Department of Facilities Management

Occupational Health and Safety

Safe Use of Scaffolding Program

August 2015

1.0 INTRODUCTION

This policy has been developed to provide guidance to managers, supervisors and employees involved in the use of various types of access frame scaffolding and suspended scaffolding. The first part of the program deals with fall protection and fall protection equipment and the second part deals with the erection, use and inspection of scaffolding. Scaffolding is addressed in this program because the hazard of falling is inherent to work performed on scaffolds.

2.0 PURPOSE

The purpose of this program is to:

- ensure the health and safety of employees
- eliminate or minimize the risk associated with a hazard of falling.
- ensure that any work involving the hazard of falling at any Dalhousie University campus or facility is done in compliance with the OHS Act, the Fall Protection and Scaffolding Regulations, all appropriate CSA Standards and this program.
- ensure that all scaffolds used at Dalhousie Campuses are erected and used safely and that they inspected as required.
- ensure that all employees working at height where there is a hazard of falling have the training and knowledge to do so safely and effectively.

3.0 APPLICATION

This program applies to all work at height performed on Dalhousie University properties by Facilities Management employees, or contractors, where a falling hazard exists.

4.0 DEFINITIONS

The definitions provided in the legislation, regulations and standards listed below under References must be used at all times to ensure that all employees understand and apply the same meaning to all words and terms associated with scaffolding and elevated work platforms.

5.0 REFERENCES

The following is a listing of the legislation, regulations and standards that apply to scaffolding used by Facilities Management employees.

Applicable to Fall protection and Scaffolding

- Nova Scotia Occupational Health and Safety Act
- Nova Scotia Workplace Health and Safety Regulations
- Nova Scotia Fall Protection and Scaffolding Regulations

- CSA Standard Z91-02, Suspended Equipment Code
- CSA Standard Z797, Code of Practice for Access Scaffolds
- CSA Standard Z271, Safety Code for Suspended Platforms
- CSA Standard B354.1, Portable Elevation Work Platforms
- CSA Standard B354.2, Self-Propelled Elevating Work Platforms
- CSA Standard C225, Vehicle Mounted Aerial Devices
- ANSI A10.11, American National Standard for Construction and Demolition Operations - Personal Safety Nets
- All Manufacturer's Specifications and Standards
- Fall Protection Guideline; Safe Work Manitoba

Note: Depending on the work being performed and the equipment being used additional regulations and CSA or other Standards may be applicable.

6.0 RESPONSIBILITIES

6.1 Supervisors shall be responsible for ensuring:

- that only properly trained and certified employees are allowed to erect and / or use scaffolds.

- that only properly trained and certified employees erect, use, maintain and inspect scaffolding

- that depending on the height of the working surface either a safe work plan or a safe work procedure is completed in writing.

- all safety related information is communicated to the employees involved in the use of a scaffolding at each particular work site.

6.2 The Working Foreperson or Employee in charge of a work site shall:

- ensure that a rescue plan and procedures are prepared for each work site.

6.5 Program Managers are responsible for:

- ensuring they receive user scaffold training as specified by CSA Z797-09 Code of Practice for Access Scaffolds before accessing any scaffold system. (See Section 21 of this program.)

- ensuring that all contractors and / or sub-contractors performing work at Dalhousie University involving the use of scaffolding have a written scaffolding safety program. Upon request a copy of the scaffolding safety program must be provided to the Dalhousie Environmental Health and Safety Office for approval.

Access Scaffolding

1.0 STANDARDS FOR SCAFFOLDING

Any scaffolding required to safely perform work at Dalhousie University worksites must be erected, installed, assembled, used, handled, stored, adjusted, maintained, repaired, inspected or dismantled in accordance with the latest version of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

Any scaffold used by Facilities Management employees must be designed to support the loads specified in Section 23.3(2) of the Workplace Health and Safety Regulations.

All other design and working requirements shall be in compliance with CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

2.0 HAZARDS AND SCAFFOLD ERECTION PLANNING AND USE

When planning the safe erection and use of scaffolding, supervisors and employees must, as a minimum, consider the following hazards identified in CSA standard CSA Z797, “Code of Practice for Access Scaffold”:

- fall hazards for employees erecting, climbing and / or using the scaffold;

- overturning of the scaffold;
- collapse of all or part of the scaffold;

- hazards involving material loading, handling and storage on the scaffold;

- making contact with energized electrical sources;

- working in confined spaces

2.1 Selecting the Right Type of Scaffold

Supervisors and employees must take great care in selecting the proper type of scaffold for each job. The extra time and effort taken to choose the right scaffold will help ensure its safe and efficient erection and use.

The following criteria must be considered when selecting the correct type of scaffold for a particular job:

- any unusual conditions arising from the type of work that will be done from the scaffold;

- platform load capacity (if other than workers and their tools), including the physical size and weight

- the objects or material to be supported;

- site conditions, including

    - surfaces to be used for support of sills, etc.;
    - adjacent structures to be accessed or used for support;
    - environmental effects of weather or nearby processes / activities; and
    - proximity to vehicular and pedestrian traffic zones;

- size, elevation, orientation, and numbers of platforms;

- access to the platforms;

- requirements to relocate or remove guardrails to provide working access or handle materials;

- provisions for fall protection during erection and use, including identification of anchor points;

- proximity to electrical hazards;

- requirements for enclosing the scaffold;
- the duration of the work; and

- the training and experience of the workers with the type of scaffold being considered.

3.0 ERECTING AND MOVING OF SCAFFOLDING

Only a competent supervisor or employee that has experience in erecting the type of scaffold to be used at any worksite on Dalhousie University campuses shall supervise the erection and moving of the scaffold.

Any employee involved in the erection or moving of a scaffold must be able to show proof that they meet the training requirements set out in Clauses 9.1 and 9.2 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

The employee supervising the erection of a scaffold shall ensure that:

- the scaffold is built in accordance with:

    - the design or erection drawings, as applicable;
    - manufacturer’s specifications and supplier’s literature; and
    - good building practices;

- the correct components and materials are being used;

- access and egress means are installed as erection takes place;

- tie-ins, bracing, and connections are installed in sequence as erection progresses;

- no excessive settlement takes place;

- weather conditions, such as thawing or heavy rains, do not adversely affect soil or base stability;

- the scaffold system is capable of withstanding all erection loads, including eccentric loads, as erection progresses;

- increased caution is exercised when erecting a scaffold in adverse weather conditions, such as wind, ice, or snow;

- all scaffold access means, guardrails, and platforms are kept free of accumulated ice and snow while the scaffold is in use;

- a scaffold will not restrict the width of a permanent surface that is used as a walkway to less than 0.56 m (22 in);

- a scaffold will not impede access to a fire hose cabinet, fire extinguisher, station emergency equipment, exit door, or electrical panel;

- scaffold components, such as tube ends, do not create a hazard by protruding into areas used for work or access/egress;

- a scaffold will not negatively affect the performance of a building fire sprinkler;

- the scaffold is protected from contact by vehicles or machines;

- a scaffold erected on or within 1.5 m (5 ft) of a fixed or overhead crane is checked for interference with stationary structures and the crane's own travel by means of a "crane travel test run". If a test run cannot be performed, or the scaffold is in the crane's path, arrangements shall be made to lock the crane out of service prior to further scaffold work;

- if cutting of metal scaffold material is necessary, all sharp edges and burrs shall be removed; and

- on completion of erection or alteration and final inspection of the scaffold, the user is notified that the scaffold is ready for use.

3.1 Instructions for Erecting Access Frame Scaffolding

The following sources of information shall be used by supervisors and employees involved in the erection of scaffolds:

- The manufacturer's plans and instructions which will provide step-by-step guidance about the proper way to erect each type of scaffold; and,

- CSA standard CSA Z797, "Code of Practice for Access Scaffold", Clauses 5.1 through Clause 5.20. By following the information in these Clauses, work relating to the following subjects will be performed in compliance with the law.

    - General requirements to be considered prior to and during erection
    - Proximity to energized electrical conductors
    - Inspection of components prior to and during scaffold erection
    - Corrective measures regarding deficient components

- Soil characteristics
- Foundations and sills
- Base plates and screw jacks
- Assembly
- Scaffold stability
- Bridge sections
- Scaffold platforms
- Guardrails
- Access and egress
- Scaffold enclosures
- Engineered scaffolds
- Hoisting loads
- Protection from falling objects
- Alterations to scaffolds
- Moving of assembled scaffolds
- Dismantling of scaffolds

The above requirements apply to all applicable Facilities Management employees and the employees of any contractor performing work at Dalhousie University that involves the erection, inspection and use of any type of scaffolding.

4.0 FALL PROTECTION ON SCAFFOLDING

All employees involved in the erection, use and inspection of scaffolds must be properly trained and certified in the use of fall protection. Such training shall include specific reference to the proper selection, inspection, assembling, use and removal of fall protection systems appropriate for tasks performed when erecting and using a scaffold.

Any work on scaffolding requiring the use of fall protection is to be performed in compliance with Part 21 of the Workplace health and Safety Regulations and Clause 6.0 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

5.0 ENSURING SAFE USE OF THE SCAFFOLD BY USERS

Anyone supervising work on a scaffold must be properly trained and have experience in the use of the type of access scaffold being used in order to ensure employees use the scaffold safely. Any employees working on the scaffold must meet the training requirements in Clauses 9.1 and 9.3 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

5.1 Platform Loading

Overloading causes excessive deflection in planks and can lead to deterioration and breaking. Overloading occurs most often in the masonry trade where skids of material can exceed 1,500 kg (3,000 lb.). If material is left overhanging the scaffold platform it can cause an imbalance leading to the scaffold overturning.

Maximum allowable loads (duty ratings) for the storage of tools, materials and equipment on scaffold work platforms and the hoisting of loads to and from a scaffold platform must be done in compliance with the general requirements of Clause 7.4 and more specifically with the requirements of Clause 5.11.2 and other relevant subsections of Clause 5.11 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

See Appendix A for weights of some of the materials used in construction. This information will be helpful in calculating loads.

6.0 Scaffold Inspections

All scaffolds shall be **inspected by the user prior to their initial use** or by a competent person chosen by the user to perform the inspection. In addition to the pre-use inspection any scaffold in use at a workplace **shall be inspected daily** prior to the start of work.

The frequency of inspections should be increased when concerns arise about things such as environmental conditions, the type of structure the scaffold is tied into or other similar potential problems.

All scaffolds erected, and used, by Facilities Management employees must be inspected as required by Section 23.9(1) and (2); “Inspections of Scaffolds” of the Workplace Health and Safety Regulations and as required by Clauses 8.1 through 8.6 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

The following provides general guidance regarding scaffold inspection. For specific or more in-depth information employees involved in scaffold inspection shall refer to the above referenced documents.

All scaffolds components used by Facilities Management employees shall be inspected:

- By the erectors prior to and during erection;
- by the user prior to initial use; and,
- by the user prior to the start of work each day during use.

6.1 Inspections Prior To and During Scaffold Erection

Inspection of sawn wooden components shall be done by a competent person and confirm that all sawn lumber used for scaffold planks meets one of the following:

- the planks must be No.1 grade or Select Structural Spruce – Pine – Fir (S-P-F) grade and sized 51 mm thick and 254 mm wide; or,

- the planks must be No. 2 grade or better and sized no smaller than 38mm thick and 235 mm wide rough sawn lumber, and are doubled up and fastened one on top of the other.

The planks must also be inspected for:

- applicable expired test date markers;

- physical damage; and,

- any defects that could negatively impact the integrity of the plank.

Annex “D” of CSA standard CSA Z797, “Code of Practice for Access Scaffold” for more detailed information about inspection, storage and disposal requirements for sawn lumber scaffold planks.
Laminated lumber and manufactured scaffold planks and decks shall be inspected for physical damage, defects that could negatively impact performance and checked to ensure they are the required capacity. For detailed information about inspection, storage and disposal requirements for laminated lumber scaffold planks refer to Annex F and for manufactured planks and decks refer to Annex G in CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

Additional information about assembly requirements for timber scaffolds can be found in Annex C of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

During the inspection all metal scaffold components shall be checked for:

- cracks
- bends
- splits
- deformation of any type
- broken welds
- corrosion

- missing components
- burrs
- tape or tape residue
- foreign materials; and,
- any other defect that could compromise the integrity of the component.

If consideration is being given to using components from different systems, or from different manufacturers, their compatibility must be confirmed before they are used.

Damaged and / or sub-standard components are to be stored in such a way that they cannot be mixed in with components in good condition and they must be disposed of in an approved fashion.

6.2 Pre-Use Inspections

A scaffold shall be inspected prior to its initial use by the user(s) or by a properly trained competent person acting on behalf of the user(s). The inspection must include confirmation of the following:

- there are no missing or improperly installed components
- there are no damaged or unusable parts or components
- the loading and use of the scaffold are in compliance with the duty rating; and,
- there is a method in place for communicating the results of the inspection.

6.3 Daily Inspections

Any scaffold used by Facilities Management employees must be inspected each day before any work is started. All requirements in CSA standard CSA Z797, “Code of Practice for Access Scaffold” that are applicable to periodic inspections apply to the daily inspections required by this program.

The required frequency of scaffold inspections shall be recorded on the appropriate inspection checklist. If the frequency of inspections increases due to changing conditions or for some other reason the new frequency must be recorded on the checklist and communicated to of the scaffold users. The date of each inspection shall be recorded in the appropriate column of the inspection checklist and communicated to users.

Daily inspections shall be conducted to ensure:

- the scaffold is being properly maintained

- the scaffold is not undergoing detrimental deformation
- the duty rating of the scaffold has be communicated to the user(s) and that it is not being exceeded.

Daily scaffold inspections shall be performed by competent employees and documented by using the checklist that is appropriate for the type of scaffold being used. The following two forms are available:

- Access Scaffolding Inspection Checklist; and,

- Suspended Scaffold Inspection Checklist

Upon completion of an access scaffold inspection the scaffold shall be classified as required by Sections 5.1 and 5.2 of this program and Clause 7.2.2 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

Inspection results are to be communicated to scaffold users prior to the scaffold being used for the first time and following each daily inspection during the period of time that the scaffold is being used. Refer to Section 5.2 of this program for further information.

6.4 Dealing With Deficiencies

Any hazards, deficiencies, bends, breaks, cracks, splits, deteriorating ties or guys, deteriorating support surfaces or any other defect that could compromise the integrity of the scaffold and the safety of the users must be dealt with as specified in Section 5.2.

7.0 COMMUNICATION OF INSPECTION INFORMATION

Inspection tags shall be used by any Facilities Management employee that inspection a scaffold as one of . The tags are to be used as a method of communicating the safety status of a scaffold to anyone about to use the scaffold

The employee that performs the inspection shall:

- Communicate information about the status of the scaffold to the supervisor in charge of the job and to the users prior to the start of each work day. The process to be used for communicating this type of information must be covered as part of employee training. Information about the status of a scaffold shall be communicated as follows:

    - By using a “Tag” system as described above. Tags are to be visibly posted at all points of access to the scaffold.

- By the supervisor verbally informing all users about the safety status of the scaffold and any control measures necessary to deal with hazards or other problems prior to the start of work each day.

- By posting a copy of the completed inspection form, including recommendations for dealing with hazards, at the main point of access to the scaffold.

- Post a tag at all access points to the scaffold following the pre-use inspection and if necessary change the tag following a daily inspection to indicate the ongoing safety status of the scaffold. The following tags are to be used:

    - Safe for use (Green Tag)

    - A potential or unusual hazard exists and caution is required (Yellow Tag); or,

    - The scaffold is unsafe for use (Red Tag)

If an inspection indicates a change in the safety status of the scaffold, the scaffold must be immediately retagged with the appropriate coloured tag.

If a scaffold inspection indicates the existence of a potential or unusual hazard, the hazard should be corrected immediately. If the hazard cannot be corrected immediately, temporary control measures are to developed and implemented. These control measures are to be communicated to all users and incorporated into their standard daily work practices until corrective action can be taken.

If an inspection indicates that a scaffold is unsafe for use this information shall be immediately documented and a red tag indicating ‘DANGER: DO NOT USE” shall be posted at all scaffold access points. Access to the scaffold shall also be blocked with warning tape and all users shall be informed that the scaffold has been removed from service. The scaffold cannot be returned to service until all necessary repairs have been completed and the scaffold has been re-inspected and confirmed as safe for use.

Scaffold tags are intended to communicate information that is critical to the safety of scaffold users. As such, any actions to be taken with regard to tags that are missing, user responses to different coloured tags, placement of tags, the intended warning associated with each tag and the information contained on each coloured coded tag must be in compliance with the requirements specified in Clauses 7.3.2, 7.3.3 and 7.3.4 of CSA standard CSA Z797, “Code of Practice for Access Scaffold”.

8.0 INSPECTION RECORDS

Inspection records or up to date copies of inspection records are to be kept at the work site where the scaffold is being used. A copy of the manufacturer's documentation that was used to erect the scaffold must also be kept at the work site.

9.0 ADDITIONAL INFORMATION

Supervisors in charge of jobs involving scaffolds and employees that are scaffold users must ensure they are in compliance with all special requirements (warnings) and all requirements regarding alterations to scaffolds, electrical hazards, access and egress, housekeeping, equipment on scaffolds, change of use of a scaffold and additional safe use practices for rolling scaffolds specified in Clauses 7.5 through 7.12 of CSA standard CSA Z797, "Code of Practice for Access Scaffold".

Suspended Platforms

Facilities Management will contract out all work requiring the use of suspended scaffolding.

If Facilities Management employees are required to be on or work from a suspended platform their activities must be carried out in compliance with CSA standard CSA Z271-10; "Safety Code for Suspended Platform" and CSA Z91-02; Suspended Equipment Code.

The following information provides guidance with regard to the more critical requirements covered by the above CSA standards. It is intended as general guidance for any Facilities Management employees that are required to use suspended platforms.

If more specific information is required, occupants and operators of this equipment shall refer to the Workplace Health and Safety Regulations and the above referenced CSA standards.

1.0 TRAINING

Any employee operating suspended scaffold equipment shall have classroom and hands on training that meets the minimum requirements specified in Clause 3.0 of CSA standard Z79-02; Suspended Equipment Code.

Any employee that will be an occupant of a suspended scaffold shall receive the basic training specified in Clause 3.0 of standard CSA Z79-02 as it relates to the specific type of suspended scaffold being used.

All trainees shall complete a written test and operator trainees shall also be given a “hands on” practical test. Supervisors must regularly monitor operators to ensure they can demonstrate the required knowledge and skill on the type of suspended system and safety equipment being used.

2.0 GENERAL REQUIREMENTS

All operations / activities shall be carried out with appropriate regard to personal safety, the safety of all other persons, as well as the prevention of damage to equipment and property.

The use of suspended equipment by Facilities Management employees is prohibited during periods of high winds, inclement weather, or extreme temperatures where such conditions are likely to impair safe use of the equipment.

Employees shall ensure that construction tools, maintenance equipment, painting equipment, window-cleaning equipment, hand tools, chemical sprays, and cleaning solutions are used and stored in such a manner as to prevent them form constituting a hazard to the user and to any other persons, including passers-by, and to minimize damage to property.

Barriers or other overhead protection capable of providing employees operating and working on a suspended scaffold with an adequate level of protection shall be erected where there is a danger of falling materials, equipment or other objects.

Prior to any work beginning warning signs with warnings such as; “DANGER – DO NOT ENTER” or “DANGER – OVERHEAD WORK” shall be posted in as many locations and in sufficient numbers to provide ample warning to other employees and any other persons that suspended equipment operations are being performed overhead.

Appropriate fall protection must be worn by operators and occupants at all times while working from suspended scaffolds.

Any time a suspended scaffold / work platform is out of level by greater than 10% all work on the scaffold must stopped until corrective action is taken. When such a situation exists the platform shall only be moved to allow adjustments that return the scaffold to level.

3.0 EQUIPMENT OPERATION

Any Facilities Management on a suspended scaffold as a user shall ensure the contractor / operator checks the equipment maintenance and inspection logs to ensure that the equipment has been installed, maintained and inspected as required. If the logs cannot be found or they do not indicate that required maintenance and inspections have been performed the equipment shall not be used until appropriate corrective measures are taken.

Before any Facilities Management employees do anything as a user on a contractors suspended scaffold they must confirm with the contractor that all suspended lines and lifelines, fall arrest equipment, lifeline and tie-back anchors, support systems, suspended working units and acceptable landings have been designed, constructed and will be used in accordance with CSA standard CSA Z271-10; “Safety Code for Suspended Platform” and any or all other applicable CSA standards specified in CSA Z271-10.

4.0 WORKING AROUND ELECTRICAL EQUIPMENT

All necessary control measures must be implemented to ensure protection against any electrical hazard that may constitute a hazard to any operator or occupant on a suspended scaffold.

The clearance distances indicated in the following table must be maintained from energized outdoor overhead electrical conductor indicated at all times. If it is not possible to maintain these clearances additional protective measures must be implemented to ensure the safety of employees. If necessary, the Electrical Shop or power company should be called for their assistance in dealing with such problems.

Voltage Rating of Conductor and Minimum Distance

Voltage rating of conductor	Minimum distance, m
From 750 up to and including 150 000 V	3.0
Over 150 000 up to and including 250 000 V	4.5
Over 250 000 V	6.0

5.0 INSPECTION AND TESTING OF TEMPORARY EQUIPMENT

Before getting on a contractor’s suspended scaffold as a user, Facilities Management employees shall ensure that all required daily inspections, periodic inspections, testing and servicing of the scaffold has been performed in compliance with the manufacturer’s recommendations and any damaged or defective parts have been removed from use and replaced with approved parts and that all necessary repairs have been performed before they use the scaffold.

6.0 EQUIPMENT DOCUMENTATION

The contractors Suspended Equipment Daily Checklist must be completed before any Facilities Management employee uses a suspended scaffold to ensure scaffold is erected and maintained properly by the contractor's equipment operator.

Appendix A

APPROXIMATE WEIGHTS OF BUILDING MATERIALS

Material	**Metric Unit Weight**	**Imperial Unit Weight**
Aluminum	2643 kg/cu m	165 lb/cu ft
Iron (Wrought)	7769 kg/cu m	485 lb/cu ft
Steel	7849 kg/cu m	490 lb/cu ft
Nickel	8730 kg/cu m	545 lb/cu ft
Glass (plate)	2563 kg/cu m	160 lb/cu ft
Lumber (dry)		
Cedar (white)	352 kg/cu m	22 lb/cu ft
Douglas Fir	513 kg/cu m	32 lb/cu ft
Maple	689 kg/cu m	43 lb/cu ft
Red Oak	657 kg/cu m	41 lb/cu ft
Spruce	433 kg/cu m	27 lb/cu ft
Concrete	2403 kg/cu m	150 lb/cu ft
Granite	2803 kg/cu m	175 lb/cu ft
Brick 1922 –	2243 kg/cu m	120 - 140 lb/cu ft
Limestone, Marble	2643 kg/cu m	165 lb/cu ft
Sandstone	2082 kg/cu m	130 lb/cu ft
Steel Pipe (standard)		
1" I.D.	2.49 kg/m	1.68 lb/ft
2" I.D.	5.43 kg/m	3.65 lb/ft
3" I.D.	11.27 kg/m	7.58 lb/ft
4" I.D.	16.05 kg/m	10.79 lb/ft
Copper Pipe		
1" I.D.	2.71 kg/m	1.82 lb/ft
2" I.D.	6.28 kg/m	4.22 lb/ft
3" I.D.	13.02 kg/m	8.75 lb/ft
4" I.D.	19.20 kg/m	12.90 lb/ft
Aluminum Pipe (standard)		
1" I.D.	0.86 kg/m	0.58 lb/ft
1-1/2" I.D.	2.40 kg/m	1.61 lb/ft
2" I.D.	3.08 kg/m	2.07 lb/ft
3" I.D.	4.57 kg/m	3.07 lb/ft
Drywall (1/2" thick)	10.25 kg/m2	2.10 lb/ft2