Residential Roof Truss
Installation Procedures
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Installation Procedures
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This manual was developed, reviewed, and endorsed by the Residential Sector Labour-Management Health and Safety Committee in association with IHSA.

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Revised, November 2013
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October 1, 2013

Mr. Sandro Pinto and Mr. Jason Ottey, chair and cochair
Low-rise Residential Sector Labour Management Health and Safety Committee
C/o Infrastructure Health and Safety Association (IHSA)
5110 Creekbank Road, Suite 400
Mississauga, ON L4W0A1

Dear Mr. Pinto and Mr. Ottey

Re: Residential Roof Truss Installation Procedure

Thank you for providing Ministry of Labour with a copy of the revised residential roof truss installation procedure developed by the low rise residential sector Labour management health and safety committee.

I fully support your initiative for the development of residential roof truss installation procedures and for your efforts in assisting the members of the low-rise residential sector in the implementation of your document which will provide guidance in fall protection for workers during placing an installation of roof truss assemblies.

The Ministry of Labour recognizes that any work activity that places workers in a hazard of falling becomes a first priority for employers and supervisors in developing plans and procedures to protect worker safety.

The Ministry of Labour accepts this document as a best practice which has been approved by the Labour management health and safety committee for the low-rise residential sector. However, the content of this document does not supersede the legal requirements of the Occupational Health & Safety act and the regulations for construction projects.

Where there is a conflict between the content of this document and the Occupational Health & Safety act or regulation the requirements of the act and the regulation will prevail.

Ministry of Labour inspectors carry out workplace inspections to assess compliance with relevant provisions of the Occupational Health & Safety act and its regulations and will pay significant attention to hazards such as falls that represent sent a serious threat to worker health and safety.
I am pleased on behalf of the ministry of labor to see the industry taking a leadership role in developing installation procedures to minimize the risk to workers and I wish you every success in their implementation.

Yours truly

Michael Chappell  
Provincial Coordinator 
Construction Health and Safety Program  
Ontario Ministry of Labor
Introduction

The following procedures have been developed to provide information on fall protection to workers during the placing and installation of roof trusses. These procedures are based on research, field tests, and accepted industry practices, and are intended to provide workers and employers with safe and productive means of performing this challenging phase of construction.

Fall hazard awareness and the proper use of fall protection are critical to worker safety during the installation, use, and removal of the systems described in this document. It is also necessary to clearly understand and follow the manufacturer’s instructions, the Occupational Health and Safety Act, and the Regulations for Construction Projects.

The use of this document or any procedure developed from this document does not exempt employers and workers from compliance with the Occupational Health and Safety Act or the Regulations for Construction Projects.
Terminology

Three types of scaffold are described below. Procedures for using these types of scaffold to install roof trusses are explained in this document.

**Exterior Bracket Platform Scaffold**

An exterior bracket platform scaffold is a scaffold that consists of engineered and manufactured brackets which are hung or otherwise suspended from the wall framing to the outside of the perimeter of the house. These brackets are used to support planks and guardrails in order to create a work platform in compliance with the *Occupational Health and Safety Act* and Regulations for Construction Projects. An exterior bracket platform scaffold is to be used in conjunction with an interior walking platform scaffold when installing roof trusses.

**Interior Bracket Platform Scaffold**

An interior bracket platform scaffold is a scaffold that consists of engineered and manufactured brackets which are hung or otherwise suspended from the wall framing to the inside of the perimeter of the house. These brackets are used to support planks and guardrails in order to create a work platform in compliance with the *Occupational Health and Safety Act* and Regulations for Construction Projects. An interior bracket platform scaffold is to be used in conjunction with an interior walking platform scaffold when installing roof trusses.

**Interior Walking Platform Scaffold**

An interior walking platform scaffold is a scaffold that consists of engineered and manufactured OR engineered and job-built frames placed along the interior of the building, parallel to and directly under the ridge line. These frames are used to support planks in order to create a work platform in compliance with the *Occupational Health and Safety Act* and Regulations for Construction Projects. An interior walking platform scaffold is to be used in conjunction with either the exterior or interior bracket platform scaffold when installing roof trusses.
Method 1:

Installing Trusses Using an Exterior Bracket Platform Scaffold

The use of an exterior bracket platform scaffold hanging from the top plate of an adequately braced and supported wall can facilitate the installation of trusses in low-rise residential construction. A competent worker shall oversee the installation of a scaffold system. Employers must ensure that all workers are trained in how to properly install scaffold systems.

The manufacturer’s instructions, Occupational Health and Safety Act and Regulations for Construction Projects must be followed. The procedures outlined in this document do not supersede manufacturer’s instructions or legislative requirements. The manufacturer’s/fabricator’s instructions for the device must be supplemented with engineering documentation that addresses the stability requirements of the wall for attachment, as well as the connection methods of the work platform. If field conditions vary and create situations beyond the scope of the manufacturer’s instructions, additional engineering may be required.

Below are some of the benefits of using an exterior bracket platform scaffold system to erect trusses.

- Workers have a wide, guardrailed work platform.
- Work is situated at a comfortable and ergonomically correct height.
- The height of the top plate above the platform allows the wall to act as a barrier from falling to the inside of the house. (If not, fall protection must be used.)
- Aligning and squaring trusses, toe-nailing and securing, installing fascia board, and installing the first row of roof sheathing can be done from the platform.
- The platform can be left in place for other trades following the framing of the roof.
The main challenge of using an exterior bracket platform scaffold system to erect trusses is that fall protection may be required when installing and removing the system.

**Procedure**

The steps below explain how to use an exterior bracket platform scaffold to install trusses in low-rise residential construction projects. The procedure is divided into five main steps, and each step is further broken down.

**Step 1—Walls**

(a) Prior to installing the platform, a competent worker must ensure that the walls are built and braced as required by the platform manufacturer’s instructions.

(b) Measure and mark the location of the brackets on walls as per manufacturer’s instructions.

(c) Arrange with the truss manufacturer to have trusses stacked and delivered in the order they will be installed.

(d) Receive/place trusses on top of the wall, ensuring manufacturer’s instructions are followed for truss rigging and hoisting. It is advisable to place the trusses on the walls before installing the exterior bracket platform scaffold to avoid any obstruction caused by bracket locations.

(e) Ensure that brackets do not exceed the maximum allowable distance. Supports for wood planks can not be more than 2.1m apart.

(f) Assemble all the components needed to completely surround the perimeter of the house.

(g) A competent worker must inspect all components before installation.

**Step 2—Installing exterior bracket components**

(a) Prior to placing brackets on the exterior of the house, ensure that the area below is clear of all workers. Post warning signs at ground level and at access points of the house.
(b) Ensure that a competent worker supervises the installation of the scaffold.
(c) If required, use a portable ladder from the inside of the house to place and secure brackets over the top plate according to manufacturer’s instructions.

When using a ladder supported against the top plate, always keep your feet at least 0.9m (3ft.) below the top plate so it can guard against a fall to the outside.
(d) If a worker installing components is exposed to a fall greater than 3 metres*, the worker must be trained in fall protection and a fall protection system must be used.

**Remember always to use manufacturer’s original parts or approved replacements. Do not replace damaged or missing parts with non-approved materials.**

**Step 3—Placing planks and guardrails**

(a) Always follow manufacturer’s instructions when installing planks and guardrails.
(b) Ensure that all components of the system—including platform members—are cleated or otherwise secured against slipping.†

*For a complete list of conditions requiring workers to use fall protection, see O.Reg. 213/91, Section 26.
† For a complete list of conditions relating to scaffold platforms, see O.Reg. 213/91, Section 135.
(c) The first bay installed will be the last bay removed. To make removal safer and easier, begin installation at a door or window opening. You will be able to pass components through the opening during the dismantling phase.

(d) From the inside of the building, use a ladder to place the first bay of planks on the brackets. This is best done as a two-person operation: one worker on the floor passes planks up to the other worker on the ladder. Then the worker on the ladder lifts the plank over the top plate and places it on the bracket. *When possible, use a lift truck or other mechanical hoisting or lifting device to place planks directly on the brackets. This eliminates the need for a worker to reach over the top plate from a ladder and install planks.*

(e) If the system requires, and if the worker can reach from a safe position on the ladder, install the guardrail posts and guardrails. If these components can’t be installed from the ladder, they can be installed from the platform. Installation from the platform requires a complete fall protection system (commonly a full-body harness, double lanyard, and adequate means of attachment to the top plate).
(f) To allow for fall protection and to prevent overexertion, it is important to install the exterior bracket platform in sequence, one bay after another, until the perimeter of the building is completely surrounded.

(g) Provide a ladder for access to the platform from the inside of the building in accordance to the Regulations for Construction Projects (i.e., extending 900 mm above the platform and tied off since it is the regular means of access).

**Remember always to use proper fall protection when exposed to a fall hazard. Reaching over the top plate to install components may create a fall hazard—be aware and tie off.**

**Step 4—Spreading Trusses**

(a) To facilitate the placement of trusses, install an interior walking platform scaffold along the centre of the house and parallel to the roof peak.

(See Appendix A.)

(b) While working from the platform, spread and stand trusses. To brace the trusses, follow the manufacturer’s instructions.

(d) The workers on the exterior bracket platform scaffold align and toe-nail the trusses, place the fascia board, and place the first row of sheathing.

(e) Ensure that all workers use a fall protection system when placing sheathing beyond the first row.

**Fall protection must be worn whenever a worker leaves the platform and is exposed to a fall hazard.**

*Brackets are placed all the way around the top plate on buildings with full hip roofs.*
Step 5—Dismantling

(a) The dismantling of the scaffold system must be supervised by a competent worker.

(b) Workers must be tied off to an adequate anchor point (e.g., the roof) prior to removing any component of the scaffold.

(c) Starting from the last section that was installed, begin removing components in accordance with the manufacturer’s instructions.

(d) If a lift truck or other suitable lifting or hoisting device is available, place components on a properly secured pallet on the roof of the building for removal.

If a lift truck or other suitable lifting or hoisting device is not available, pass components through window or door openings to workers on the inside of the house.

(e) If construction of the exterior bracket platform was started near a window or door opening as described in Step 3, the last two planks to be removed should be adjacent to a window or door opening. Workers on the floor inside the building can reach out and remove the last two planks through the opening. Fall protection must be used as required.

(d) From the inside of the house, dismantle the brackets and lower them to the ground by appropriate means or bring them into the house, depending on the manufacturer’s instructions and construction conditions.

If a worker is exposed to a fall greater than 3 metres* while dismantling components, fall protection must be used.

Never drop any material or components from heights.

*For a complete list of conditions requiring workers to use fall protection, see O.Reg. 213/91, Section 26.
Method 2:
Installing Trusses Using an Interior Bracket Platform Scaffold

The use of an interior bracket platform scaffold hanging from the top plate of an adequately braced and supported wall can facilitate the installation of trusses in low-rise residential construction. A competent worker shall oversee the installation of a scaffold system. Employers must ensure that all workers are trained in how to properly install scaffold systems.

The manufacturer’s instructions, Occupational Health and Safety Act and Regulations for Construction Projects must be followed. The procedures outlined in this document do not supersede manufacturer’s instructions or legislative requirements. The manufacturer’s/fabricator’s instructions for the device must be supplemented with engineering documentation that addresses the stability requirements of the wall for attachment, as well as the connection methods of the work platform. If field conditions vary and create situations beyond the scope of the manufacturer’s instructions, additional engineering may be required.

Below are some of the benefits of using an interior bracket platform scaffold system to erect trusses.

- Workers have a work platform and walkway.
- Work is situated at a comfortable and ergonomically correct height.
- It is a cost-efficient and time-efficient method.
- Provided the platform is between 0.9m and 1.1m below the top plate, there is no requirement for a guardrail to be installed to the outside of the house, since the framing itself will prevent workers from falling.
• The height of the platform from floor level inside the house may not require the use of a guardrail (as long as all floor openings are adequately covered, and other regulation requirements are met).
• Aligning and squaring trusses, toe-nailing and securing, and installing fascia board* can be done from the platform.

Below are some of the challenges of using an interior bracket platform scaffold system to erect trusses.

• When installing the fascia board, workers may require additional fall protection measures if it is done from the platform.*
• The first full row of sheathing cannot be installed from the platform.
• Midrails and toeboards may be required at window and door openings.
• Interior structures, such as walls, prevent a continuous platform.
• Workers have to repeatedly bend down under trusses to walk across the work platform. Alternatively, workers must climb down a ladder to the floor, walk across the house and access another part of the platform using another ladder.

Procedure

The steps below explain how to use an interior bracket platform scaffold to install trusses in low-rise residential construction projects. The procedure is divided into five main steps, and each step is further broken down.

Step 1—Walls
(a) Prior to installing the platform, a competent worker must ensure that the walls are built and braced as required by the platform manufacturer’s instructions.
(b) Measure and mark the location of the brackets on walls as per manufacturer’s instructions.
(c) Ensure that brackets do not exceed the maximum allowable distance. Supports for wood planks should not be more than 2.1m apart.

*The ability of the worker to safely install fascia from an interior bracket platform can be affected by the worker’s height and reach, slope of roof, overhang distance, etc.
(d) Assemble all the components needed to completely surround the perimeter of the house.

(e) A competent worker must inspect all components before installation.

Step 2—Installing interior bracket components

(a) Ensure that a competent worker supervises the installation of the system.

(b) If required, use a portable ladder inside of the house to place brackets over the top plate and secure according to manufacturer’s instructions. When using a ladder supported against the top plate, always keep your feet at least 0.9m (3ft.) below the top plate to prevent a fall to the outside.

(c) Continue placing and securing brackets until they are all in place and secure.

Step 3—Placing planks and guardrails

(a) Always follow manufacturer’s instructions when installing planks and guardrails (if guardrails are required, e.g., open to area below).

(b) Ensure that all components of the system—including platform members—are cleated or otherwise secured against slipping.*

* For a complete list of conditions relating to scaffold platforms, see O.Reg. 213/91, Section 135.
(c) Most planks and guardrail components can be installed from the floor level of the house. If a worker installing components is exposed to a fall greater than 3 metres*, the worker must be trained in fall protection and a fall protection system must be used.

**Remember always to use manufacturer’s original parts or approved replacements. Do not replace damaged or missing parts with non-approved materials.**

**Step 4—Spreading Trusses**

(a) Arrange with the truss manufacturer to have trusses stacked and delivered in the order that they will be installed.

(b) Receive/place trusses on top of the completed walls, ensuring manufacturer’s instructions are followed for truss rigging and hoisting.

(c) To facilitate the placement of trusses, install an interior walking platform along the centre of the house and parallel to the roof peak (see Appendix A).

(d) While working from the platform, spread and stand the trusses. To brace the trusses, follow the manufacturer’s instructions.

(e) As the trusses are put in place, workers will have to bend down to walk under them, or climb down from the platform and walk across the floor. Climbing up and walking on the top plate or on the trusses is not a safe option.

(f) Align and toe-nail the trusses from the platform.

*For a complete list of conditions requiring workers to use fall protection, see O.Reg. 213/91, Section 26
(g) Install fascia board from the platform. Whether or not this can be done safely depends on the height of the worker, pitch of the roof, width of the overhang, and type of roof. Never reach too far over or climb over the top plate and expose yourself to a fall greater than 3 metres* without a full fall protection system. The same is true when installing sheathing.

(h) Install partial width sheathing from the interior platform.

**Step 5—Dismantling**

(a) The dismantling of the scaffold system must be supervised by a competent worker.

(b) If required, use a portable ladder from the inside of the house to remove components according to manufacturer’s instructions. Always follow manufacturer’s instructions when removing planks and guardrail systems (if guardrails are required, e.g., open to area below).

(c) Most planks and guardrail components can be dismantled from the floor level of the house. If a worker dismantling components is exposed to a fall greater than 3 metres*, fall protection must be used.

Never drop any material or components from heights.

*For a complete list of conditions requiring workers to use fall protection, see O.Reg. 213/91, Section 26.
Method 3: 
Assembling the Roof on the Ground and Hoisting into Place

A third option when constructing a roof for low-rise residential projects is to assemble it at ground level and hoist it into place.

The manufacturer’s instructions, *Occupational Health and Safety Act* and Regulations for Construction Projects must be followed. The procedures outlined in this document do not supersede manufacturer’s instructions or legislative requirements. The manufacturer’s/fabricator’s instructions for the device must be supplemented with engineering documentation that addresses the stability requirements of the wall for attachment, as well as the connection methods of the work platform. If field conditions vary and create situations beyond the scope of the manufacturer’s instructions, additional engineering may be required.

Below are some of the benefits of assembling the roof on the ground and hoisting it into place.

- The risk of working at heights is minimized
- Work is situated a few feet above the ground, which is a more comfortable and ergonomically correct work height.
- Most of the sheathing and shingling can be completed while roof is at ground level.
- Fall protection anchor points can be installed on the roof for use after it is hoisted into place.

Below are some of the challenges of using this method of roof assembly:

- Additional adequate hoisting equipment is required.
- The hoisting area must be free from overhead obstructions.
• There must be sufficient space on site to build the roof on the ground and hoist it into place without blocking access for emergency vehicles.
• Fall protection may be required to complete certain phases of assembly.

Written procedures are required for building, hoisting, and placing the roof. Workers who are involved at any stage of the procedure must be instructed on the procedures and must follow them.

**Procedure**

**Step 1—Assembly on the Ground**

(a) Consult with the truss manufacturer to identify a method of hoisting the roof once it is assembled. This includes identifying the engineered lifting points. The truss manufacturer should provide the design assumptions (load) with their systems.

(b) Locate an area in which assembly of the roof structure can take place. Ensure that there is enough space to set up adequate hoisting equipment. This area should be firm and level to facilitate the work. An area free from mud, ice, snow etc. is recommended.

(c) Construct a template structure to assemble the roof on.

(d) Assemble the roof trusses according to the design layout. If there is a risk of falling more than 3 metres* (10 ft), the worker must be trained in fall protection and must use a fall protection system.

*For a complete list of conditions requiring workers to use fall protection, see O.Reg. 213/91, Section 26.
(e) Ensure that the roof assembly will fit onto the constructed walls of the building. The safest place to make changes to the assembly is when it is still at ground level.

(f) Install fall protection anchors on the roof before the roof is raised into position. The anchors points should be easy to reach and tie off to. These anchors are needed for fall protection systems when workers are disconnecting hoist lines and finishing the roof. Follow manufacturer’s instructions when installing anchors. If it is necessary for workers to access the roof to unhook the rigging system, they must connect to a fall protection system before getting up onto the roof.

(g) Install sheathing. Use edge protection/support brackets on the roof to help worker positioning.

(h) Ensure housekeeping around the roof area is maintained.

(i) If shingling is required, proceed using required methods of fall protection.

**Step 2—Hoisting the Roof**

(a) Define the weight of the roof, the distance to where it will be placed, rigging requirements, tag lines, etc.

(b) Consult with the hoisting company/operator and select the appropriate size and type of equipment.

(c) Ensure that there is an adequate area to set up for the hoisting operation.

(d) Make sure there is a competent signal person available.
(e) Securely cover all floor openings in the house.

(f) Limit the number of workers in the house and in the hoisting area to only those needed to perform the required work. All other workers MUST be out of the structure and in an area where the load will not pass over them.

(g) Hoist the roof into position. Workers in the house must use tag lines to help land the roof on the walls.

(h) If minor repositioning is required, only use proper pry bars

(i) Unhook the rigging system from the landed roof. Workers performing this task must be protected with a fall protection system prior to getting up onto the roof.

(j) Finish the roof (sheathing, shingling, miscellaneous work) using complete fall protection at all times).

Workers should never position any part of their body between the top of a wall and the roof as it is descending.
Appendix A

Constructing an Interior Walking Platform

The following procedure details the installation of a free-standing platform in the interior of the house. This platform provides workers a safe position from which to install roof trusses. This procedure is based on accepted industry practices and is to be considered as one part of the solution for regulation compliance. This interior walking platform is to be used in conjunction with a perimeter scaffold system (i.e., an interior or exterior bracket platform scaffold) to provide workers with fall protection during the truss installation phase.

Procedure

Step 1—Install Platform

(a) If using a job-built wood platform, fabricate and install posts, braces, and platform deck according to engineered details (see sample at the end of appendix).

OR

If using masonry scaffold frames (30” or 5’ width), install frames, braces, and platform deck in accordance with the Occupational Health and Safety Act and the Regulations for Construction Projects.
(b) Install the platform along the centre of the structure, parallel to the roof peak. Make sure that all openings on the floor beneath the platform are completely and securely covered.

(c) Construct guardrails for door, window, and other openings in the exterior framing. Provide ladder access to the interior platform.

**Step 2—Position, Erect, and Brace Trusses**

(a) Use a lift truck or crane (if possible) to place bundles of trusses on top of the completed wall framing.

(b) From the interior walking platform and the interior or exterior bracket platform, pull trusses from the pile and spread them over the structure.

(c) From the interior walking platform and the interior or exterior bracket platform, erect and brace the trusses according to manufacturer’s instructions.

(d) From the interior or exterior bracket platform, nail trusses to top plate, nail fascia board to the ends of the trusses, and install first row or sheathing. All of this must be with the required fall protection.
Residential Roof Truss Installation Procedures

INTERIOR WALKING PLATFORM

END VIEW

ELEVATION (SIDE VIEW)

Plan

Two 2" x 10" planks

1" x 6" cross bracing

6' - 6" max for free-standing scaffold

INTERIOR WALKING PLATFORM
About IHSA

IHSA’s vision is workplaces without injuries, illnesses, or fatalities.

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