
Infrastructure Health and Safety Association

List of Solutions and/or Controls for the Top Primary Causal Factors Identified for Siding and Outside Finishing Trades

Defined Risk Statement: Working at heights can pose serious unintended and adverse effects to the safety and well-being of a siding installer, outside finishing worker and nearby fellow workers.

Background:

Originally in 2015 and then again in 2019, IHSA partnered with the Ministry of Labour, Training and Skills Development (MLTSD) and industry-recognized subject matter experts to conduct a root-cause analysis on the causes construction workers in residential roofing falling while working at heights.

A total of **48 primary causal factors** were identified, ranked, and prioritized. All 48 primary causal factors were voted on, and based on the votes, a **Top 10** list was created. This collective process was open, transparent, and collaborative. The ranking and prioritization of causal factors was done using employer and worker votes only. The MLTSD and IHSA did not participate in voting.

Based on the results of the Phase One Working at Heights Root Cause sector workshop, it was determined that the most effective way to complete the solutions and controls portion was to conduct individual trade specific workshops. Having Phase 2 split out into specific trades allowed for more targeted solutions and recommendations to emerge to reflect the uniqueness and complexity of the varied work tasks involved in working at heights during residential construction

Siding and Outside Finishing trades Root Cause Control Workshop Introduction:

On July 20, 2021 IHSA hosted, an in-person Root Cause Control Workshop was convened to determine the top health and safety concerns within the **Residential siding and outside finishing trades**.

This workshop included peer-recognized subject matter experts from labour and management, who came together in person to identify and prioritize causal factors for the Siding and Outside Finishing Trades in Residential construction. Then most importantly the group identified solutions and controls for the top ranked causal factors. Note that the scope of this exercise did not include assessment of the listed solutions/controls. This list provides information on specific controls or activities that can be undertaken by the industry and/or regulator for the development or the support of a control. Although not part of the scope, it is understood that control performance should be specified, observable, measurable and auditable.

This is a supporting document for [the root-cause control workshop](#) report (a separate document) that should be referred to when using this information.

SIDING / OUTSIDE FINISHING TRADES

Top 10 Root-Causes: Worker Falls When Working at Heights

Priority	Category	Root-Causes
1	Process	Builder Scheduling
2	Environment	Piecework
3	Tools & Machines	Equipment Availability & Selection
4	Environment	Site Conditions, Ground Access
5	Environment, Culture, People	Environment and Oversight, Culture, Government (Enforcement, Regulation)
6	Culture	Underground Economy
7	Tools & Machines	Personal Protective Equipment (PPE)
8	Environment	Weather, Work Access
9	Culture	Safety Culture
10	People	Mental Health / Worker Fitness

Root-Cause details & Solutions/Controls that may reduce risk

1. Builder Scheduling (Process)

- a) Builder work scheduling does not factor in construction delays.
- b) Other trades are working at same time resulting in work overlap.
- c) Unsupervised work occurs on weekends where there is no MLTSD enforcement.
- d) Timing and speed at which homes are built results in many unsafe conditions.
- e) Poor scheduling causes unsafe working conditions on site.
- f) Scheduling often fails to plan for delays (weather, materials etc.).
- g) Poor scheduling causes delays, resulting in work being done too quickly.
- h) When there is a specific completion deadline for house construction, the builder often assigns many workers / trades in order to meet timeline. This creates unsafe conditions due to number of workers at the project.
- i) Worksite conditions and work scheduling are often not aligned.
- j) Time required to clean the mess around worksites made by others results in wasted time, causing delays and results in workers cutting corners on their own work.
- k) Builder pushes manager / manager pushes worker / worker gets hurt.
- l) Builder cuts corners (e.g. chicken boards for up and down stairs etc.).
- m) House repairs are often required for siding work and it does not get properly scheduled nor completed properly.
- n) There is always a rush to complete siding work.
- o) Safety straps are required every 8 feet are rarely in place.
- p) Pieceworkers are independent contractors and if they get hurt are not covered by employer benefits (WSIB, CPP, UIC etc.). If they are injured on the job they keep working (in order to maintain income), and are not covered for WSIB.
- q) Members believe if independent workers were employees and properly covered, they would be less willing to cut corners and would reduce the frequency or risk of injury.
- r) Hourly-paid workers also have management putting the pressure on them to complete work timelines.

Solutions:

Item	Suggested Controls and Solutions
1	Government intervention is required with respect to setting construction standards; minimum 6 month window (build timeframe).
2	Permits – Establish timelines regarding <i>confirmation</i> of building permits.
3	Establish work completion deadline prior to start of work to allow for efficient scheduling (so trades are not working on top or below other workers).
4	Establish a specific orderly sequence of trades, for safe completion of exterior work.
5	Make management jobsite inspections a requirement prior to start of work.
6	Establish a minimum callout rate by task.
7	Establish a deadline for notification of contract closing, in order that builders can award and notify successful bidder in sufficient time to schedule work plans (labor and materials etc.).
8	Set notification and lead-time periods for procurement of supplies & labour.

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9	Create regulatory timeline requirements for builders to accommodate procurement of supplies and adequate lead-time for scheduling of labour.
10	Require construction tenders to include a <i>minimum 30 days'</i> notice to successful bidder.
11	Designate a maximum allowed number of workers per area (e.g. - square footage area, lot size, number of homes etc.).
12	Weekend work should NOT be permitted.

2. Piecework (Environment)

- a) Piecework encourages workers to rush to complete work.
- b) Encourages workers to take shortcuts to make up time due to delays.
- c) Trades are paid by piecework that encourages faster, unsafe work.
- d) Builders try to cheat the process in order to make profit.
- e) Workers have no time off and feel they must work additional hours and weekends when requested.
- f) Culture of piecework makes things generally unsafe.
- g) Piecework promotes debris on ground and uncleanliness of site.
- h) Need to slow down work in order to make work site safer.
- i) No ownership of who is responsible to clean up or remove materials.
- j) Working from ladder often happens.
- k) Piecework reduces the cost for completion of a work component at a project. Establish a “Book Price” per job list.
- l) This industry has a piecework mentality where productivity trumps safety.
- m) Piecework paid trades typically rush to complete work, whereas hourly workers do not have this stress.
- n) Pressure is on workers to get the work completed quickly and cut corners to get the job done.

Solutions:

Item	Suggested Controls and Solutions
1	Make this type of work a Certified Trade with an established pay scale and formalized training. Develop training best practice procedures to prevent unsafe work shortcuts.
2	Establish a rate schedule (Book Price) for completion of piecework at construction projects.
3	Establish a balance between productivity and safety.
4	Political will to manage the “piecework mentality” to ensure safety.
5	Need well-defined plan to minimize rushing (E.g. Delivery schedules, proper housekeeping, account for weather, etc.).
6	Limiting the speed of the build (e.g. limit workers/acre).
7	Hourly paid workers do not have the stress of “always rushing”.
8	Proper supervision / oversight to ensure safety protocols are observed. (Builder, constructor, contractor) Designate authority and control to change condition.
9	Implement financial incentives for training and safe practices.
10	Establish Trade standards supported by the union contract.
11	Better coordination of work scheduling.
12	Mandate a standard number of supervisors and workers per site (ratios).

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13	Develop required pre-start work standards, conditions and requirements.
14	Supervisor on site must be accountable to inspect and release the house.
15	Establish a book rate for specific labour work.

3. Equipment availability and selection (Tools / Machines)

- a) Workers receive inadequate/insufficient training on the equipment operated.
- b) Equipment is not designed for site conditions (hazards due to poor ground conditions etc.).
- c) Selection of equipment can be difficult and creates a need to use a ladder (due to convenience, less cost, work speed, ground, and access).
- d) Time and cost is a big factor regarding equipment being used by builders.
- e) Use of ladders creates a considerable risk of fall.
- f) Builders have the cost of cherry-picker equipment factored into their contract.
- g) Green book is too vague on ladder requirements tie off etc.
- h) Stationary stairs – some stairs should be permanently put in place until the job/project is complete.
- i) Having safety reminders/nudges/signs on the wall.
- j) Cherry picker equipment - safe but cannot always access the work (also may not be available for weekend work).

Solutions:

Item	Suggested Controls and Solutions
1	Scaffold the entire house.
2	Regulate training standards required for equipment being operated.
3	Designate and assign more appropriate machines and equipment for the work, the site and conditions.
4	Design the specifications of machines for use on rough terrain.
5	Develop Lot line limitations.
6	Develop Provincial requirements for standardized lot lines.
7	Determining access equipment by hierarchy.
8	Mandate use of two booms pieces of equipment.
9	Develop engineering standards for building access points.
10	Greater clarification of regulatory language.
11	Greater enforcement is required on site.
12	Implement financial incentives for site and equipment set-up.

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4. Site Conditions (Environment)

- a) Site conditions and work access that is cluttered from debris caused by working quickly, creates unsafe work conditions.
- b) Inadequate parking causes congestion on site and inconvenience when vehicles are continually being required to move.
- c) Cluttered worksite not being cleaned due to rushing caused by piecework, results in many hazards.
- d) No one cleans up the site/mess.
- e) Limited site access points due to poor quality temporary stairs / guardrails (if any).
- f) Insufficient machine access.
- g) Builders do not assist to make the physical work site more accessible and leave it to the trades on hand.
- h) Adequate site access is often not available for cherry pickers equipment to avoid ground obstructions (materials / vehicles etc.) minimizing property damage and/or hazards.
- i) Multiple builders on one site results in multiple trades on one site (congestion) creating the potential for many hazards.
- j) Other builder construction startup interferes with existing work (multiple builder sites).

Solutions:

Item	Suggested Controls and Solutions
1	Builder must sign off on designated equipment to be used.
2	Ground site inspection to be signed-off by builder.
3	Develop standards on how work is to be performed.
4	Builder must be required to have regular, property maintenance to make certain worksite (e.g. ground) is safe.
5	Designated parking and a traffic management system.
6	Builders are not providing optimal equipment to workers for the job.
7	Builder schedule must be prioritized by trade specific work.
8	Greater enforcement of work site housekeeping is required.
9	Industry Standard requirement for a dedicated safety professional on site.

5. Environment and Oversight, Culture, Government (Enforcement, Regulation)

- a) Scaffold is not utilized or mandated.
- b) If zero lot lines were mandated everyone would be on a level playing field.
- c) Equipment setup standards are required.
- d) Political corruptness.
- e) “Green book” (construction regulation) is vague – a better/updated version required.
- f) More MLTSD inspectors to support “prevention” and compliance assistance.
- g) Standardize enforcement.
- h) Consistent MLTSD enforcement is needed.
- i) Enforce sight conditions requirements.
- j) Authority and enforcement on worksites needs to be monitored.

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- k) Use of fines and penalties as appropriate.

Solutions:

Item	Suggested Controls and Solutions
1	MLTSD inspectors to be trained on sector/trade.
2	Information from MLTSD should be incorporated into worker training.
3	Review Fines and penalties.
4	Technology – Use of remote security (cameras, drones) should be required.
5	Mandate safety performance mechanisms.
6	Implement a system that monitors joint worker and employer accountability (e.g. CVOR).
7	Develop a progressive disciplinary process for worker violations.
8	Inconsistency of enforcement – make MLTSD accountable.
9	Eliminate interaction with enforcement (worker, builder all).
10	Mandate a zero lots line requirement to allow space for scaffold.

6. Underground Economy (Culture)

- a) More of a chance during renovation siding job.
- b) Underground company is not playing by the rules.
- c) Underground economy has a different and lower pay scheme.
- d) Underground workers are willing to work unsafe to save time and cost.
- e) Companies are paid cash by homeowner.
- f) Homeowner does not have the knowledge of risk.
- g) Workers do not follow regulatory requirements.
- a) Building permits are not being obtained.
- b) Unskilled / Unlicensed workers are utilized.
- c) The work is undocumented (no reporting, receipts etc.).
- d) Underground economy pay scheme is typically lower.
- e) Contractor does not have the knowledge.
- f) Homeowner not willing to pay more.
- g) Homeowner and contractor willing to take risk (re liability) as workers are not covered by WSIB and other employment benefits.
- h) New builds vs Renovation.
- i) Renovation projects more unsafe.
- j) Siding/finishing trades are the last trade in to complete a home and there is pressure to complete work with a timeline.

Solutions:

Item	Suggested Controls and Solutions
1	Make a building permit a mandatory requirement specific to this work.
2	More government enforcement on Underground Economy is required.
3	Greater education / awareness for the homeowner (re risks, liability).
4	Prevention task force.

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5	Implement financial incentive for homeowner to contract with a registered contractor.
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7. Personal Protective Equipment (PPE) - (Tools / Machines)

- a) Improper PPE is often used (belt vs. harness for WAH).
- b) The right tool for the job is required re comfort and design or manufacturer.
- c) Full harness PPE requirements for specific applications (when moving around the work area etc.).
- d) Harnesses can sometimes be too heavy.
- e) Upgraded guidelines specific to the task regarding use of PPE are required.
- f) Comfort and design of PPE.
- g) Cost factor is also an influence.

Solutions:

Item	Suggested Controls and Solutions
1	Research various available studies with PPE equipment manufacturers.
2	Develop guidelines on use (when and which application) and type required.
3	Develop PPE guidelines specific to this trade.

8. Work Access, Weather (Environmental)

- a) Weather – ice, rain creates many hazards when work must be completed to meet deadlines.
- b) Work access is often compromised and unsafe due to poor ground condition.
- c) Other trades will not perform work if proper stairs are not installed however; framing/finishing workers are required to work regardless.
- d) Siding workers need appropriate access to their work.
- e) Lot access / zero lot line to accommodate scaffold access.

Solutions:

Item	Suggested Controls and Solutions
1	Weather delays etc., should be factored into schedules and closing dates to avoid the need for workers to rush and or work in unsafe conditions.
2	Zero lot line standards to accommodate equipment access.
3	Engineering design in the building to allow attachments for access structures.

9. Safety Culture (Culture)

- a) Workers often do not utilize the safe practices they are taught during training.
- b) Internal responsibility system Responsibility.
- c) Emphasis is on cost productivity over safety.
- d) Supervisor has competing priorities.
- e) Ineffective or poorly functioning internal responsibility system (IRS).

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Solutions:

Item	Suggested Controls and Solutions
1	Employers and supervisors to regularly communicate to work safe because it is the right thing to do.
2	Worker / employer mindset that everyone is responsible (IRS) for safety.
3	Greater emphasis is need on “what’s in it for me” regarding work safety.

10. Mental Health / Worker Fitness (Culture)

- a) Worker fitness.
- b) Substance abuse.
- c) Stress form work / financial pressure.
- d) Lack of resources – Employee family assistance plan.
- e) Worker treated like number not a person.
- f) Lifestyle choices.
- g) Addiction.
- h) Fatigue – physical and mental.

Solutions:

Item	Suggested Controls and Solutions
1	Employee care and check-ins by employer.
2	Supportive HR / employee relations.
3	Provide information and resources to employees on available assistance and support.
4	Availability of an employee assistance plan.
5	Peer to peer support program.

Recommendations and Conclusions:

The controls and solutions listed in this document are for the top primary causal factors that may contribute to workers falling, while working at heights, in the Roof Shingling trade in the low rise residential construction sector. Given recent fatalities in the sector, along with injury/fatality data available from the Workplace Safety and Insurance Board (WSIB) for Residential Roofing, it is important that specific solutions targeting systemic weaknesses be implemented immediately.

Based on the list of controls/solutions provided by the subject matter experts from industry, research and government (regulator), the following five action items are recommended:

- 1. Development of Builder Schedule Standards for project timeline regarding work completion**
 - ✓ Prepared with consideration to work safety and construction closing deadlines.

- 2. Address the lack of political will through greater enforcement of non-compliance and collaboration to focus on top industry issues identified in this workshop report (i.e. underground economy, equipment use and practices)**
 - ✓ Sector must address the identified key issues impacting safety in the sector.

- 3. Promotion of industry specific fit for duty, mental health and wellness resources.**
 - ✓ Provide tailored support to workers, supervisors and other support staff.

- 4. Greater implementation and enforcement of trade specific working at heights training.**
 - ✓ Trade and or site specific training and practices to be adopted and enforced.

- 5. Address the negative impacts of the piecework culture**
 - ✓ Adverse effects of the piecework culture must be addressed.

The above five recommendations provide a systemic foundation for reduction in siding and outside finishing related trades incidents/injuries. If ignored, the solutions listed for the top ranked primary causal factors will just serve as “band-aid” solutions. Based on the Swiss Cheese model of accident causation, risk assessment and root-cause analysis theory, we must focus on the causal factors and not just the symptoms.