Objectives

- Review the “Residential Construction Local Emphasis Program” and statistics
- Review the top 5 hazard categories in residential construction
- Overview of current safety resources for residential construction
Reasoning for the Initiative

Residential construction has been experiencing moderate growth during the past few years which has contributed to the higher injury rates and fatalities in construction. According to the U.S. Bureau of Labor Statistics, the total case incident rate (TCIR) for Michigan construction increased from 2.6 injuries and illnesses per 100 full-time workers in 2011 to 5.0 in 2012. Over the last five years, from 2008 – 2013, over 37% of construction fatalities in Michigan have occurred in the residential industry.
Initiative Components

Outreach:
- Initiative letter mailed to Residential Construction NAICS codes
- Dedicated “Residential Initiative” web page
- Development of Case Studies, Fact Sheets, and Training Materials and Seminars
- Development of Residential Construction Inspection Checklist
- Working with the Home Builders Association and material vendors to provide free training seminars

Enforcement:
A Residential Construction Local Emphasis Program (LEP) - Increasing inspections of single and multi-family home construction concentrating on the “Top 5” serious hazard categories commonly associated with residential construction including:
- Falls,
- Scaffolds,
- Ladders,
- PPE/Tool Guarding, and
- Electrical.
Who Can Afford an Injured Worker?

- MIOSHA Fines
  - More frequent residential inspections
  - Increased penalty for repeat violations
  - Multiple “Serious” citations could result in high penalties
- Higher Workers Compensation Insurance premiums
- Lawsuits
- Time to deal with an injury
- Professional Image
- Employee Morale

First Thing: Have a Safety Plan

You need an Accident Prevention Program:
- MIOSHA provides a Template
- Implement an effective system for safety
- Understand your training requirements
Safety Plan Should Address…

- Shall include hazards that employees are exposed to, how to correct and avoid those hazards.
- Example: If your work operation includes the use of ladders, then employees need training on the proper use of ladders.

TOP FIVE HAZARDS IN RESIDENTIAL CONSTRUCTION
Residential Top Five Serious Hazard Categories

- Personal Protective Equipment (PPE) and Tool Guarding
- Falls
- Ladders
- Scaffolds
- Electrical

PERSONAL PROTECTIVE EQUIPMENT
Personal Protective Equipment

PPE is required for safety hazards that expose employees to injury of the:
- Head
- Eyes
- Feet
- Hands
- Body

Employer Responsibilities

At a minimum the employer shall:
- Assess the workplace and operations to identify hazards that employees are exposed to
- Shall provide at no cost to employees the personal protective equipment necessary to guard against known hazards
- Require employees to wear Personal Protective Equipment
**Head Protection**

An employer shall ensure that each affected employee is provided with, and wears, head protection for exposure to head hazards such as: hoisting operations, standing up walls, concrete pumper trucks, use of scaffolds, etc.

**Face & Eye Protection**
Face & Eye Protection

Shall be used when any of these hazards are present:
- Flying objects or particles (metal shavings or sawdust)
- Harmful contacts (objects dropped onto head)
- Liquids that may splash
- Intense light from welding, lasers, electrical flash

But You Have Got to Wear It

Johan Franzen 2011: Went back out to play, looking like this. STILL refused to wear a face mask.
Guarding of Tools

A circular table saw shall have a hood type guard covering the blade at all times.

- The hood type guard shall enclose the blade above the table and above the material by adjusting automatically to the thickness of the material being cut.
- Or it may be a fixed or manually adjusted hood-type guard if the hood remains in contact with the material.

Foot Protection

Shall be provided if conditions of the job are likely to cause a foot injury.

- Heavy objects (barrels or tools).
- Sharp objects such as nails or spikes that might pierce ordinary shoes.

The employee shall provide the foot protection.
Hand Protection

Employees who handle rough, sharp edged, abrasive materials or whose work subjects the hands to lacerations, punctures, burns, or bruises shall wear hand protection suitable for the work being performed.

Body Protection

When an employee is exposed to hazards such as radiation, alkalis, acids, abrasives, and temperature extremes other than those caused by weather conditions, appropriate head, body, and hand protection shall be worn to protect the employee from that hazard. Such personal protective equipment shall be provided by the employer.

- Example: Brick cleaning with acid.
Summary

- Assess the workplace for hazards.
- Use engineering and work practice controls to eliminate or reduce hazards before using PPE.
- Select appropriate PPE to protect employees from hazards that cannot be eliminated.
- Train workers:
  - What
  - When
  - Where
  - How
  - Why
- Require workers to wear selected PPE.

FALL PROTECTION
Residential Construction

Definition:
The end use of the structure must be home or residence. The structure must be built using traditional wood framing materials and methods.

Part 45 Fall Protection

- Any work 6 feet or more above lower levels will require some type of fall protection
- Examples:
  - Foundation form work
  - Installing floor trusses and sheathing
  - Building second floor walls
  - Wall openings, stairs and holes
  - Installing roof trusses and sheathing
  - Roofing (tear-off and installing new shingles)
Typical Fall Protection Systems

- Guardrail systems
- Personal fall arrest systems
- Fall restraint / work positioning systems
- Hole Covers
- Controlled Access Zone
- Fall Protection Plan

Guardrail System

- Top-rail @ 42"
- Mid-rail @ 21"
- Toeboard min. 3-1/2"
Building second floor walls
Residential Guardrail Systems

You have options!
Wall Openings
Definition:
Wall openings are more than 30” in height & 18” wide need fall protection

Ramps, Runways, and Other Walkways
Stairways:
- Guardrail on open side of stairs and stair landings
- Handrail on right side descending

Ramps
- Minimum 2 planks wide
- 3 planks if wheel barrow is used
- Guardrail if over 6 feet or hazardous conditions
Anchorage

A secure point of attachment for lanyards or lifelines.

- Must support 5000 pounds.
- Or 2 times the intended load as part of a complete system
Manufacturer’s Instructions
Some Anchor Point Options

Have you been trained for that?
Swing Fall Hazard
Safety In Residential Construction

Revised 06/27/14
Holes

Definition:
A hole is any opening in a horizontal plane, typically a floor or roof, that is 2” or more in it’s least dimension.

Holes must be covered and covers must be:
- Able to support 2 times the intended load
- Marked with the word “Hole” or “Cover”
- Secured in Place
Fall – Roofer – Residential
Date & Time: 07/07/09 at 9:21 p.m.
Age 19

Roofing employees were wrapping up for the night installing a tarp on a steep roof when an employee stepped onto the tarp causing him to slip and fall 19 feet approximately to the ground level.
Citations Issued

408.40114(1)(a) No Accident Prevention Program
408.40115 No written certification of fall protection training
408.40132(3) No one on site was first aid certified
408.40622(1) No hard hats
408.40045(12) Steep roof with no use of fall protection
408.41121(3)(a) Split side rails of ladder
408.41124(5) Ladder not extended 3 feet past landing surface
408.41139(1) Employer did not report fatality within 8 hours
408.41862(3) Plastic gas can

Other options for working at heights

- Ladders
- Scaffolds
- Project Planning
PORTABLE LADDERS

Part 11. Ladders
Part 11. Ladders

- Type 1 or heavier duty
- Extend 3’ above
- On firm ground
- Tied off at top
- 4 to 1 pitch
- Never over-reach to the side. Over-reaching means both shoulders outside the rails.

Work From Ladders

- Never over-reach to the side. Over-reaching means both shoulders outside the rails.
- Don’t carry items up the ladder that could cause you to lose your balance.
- Maintain 3 points of contact while moving up or down the ladder.
Portable Ladders – Power Lines

- Watch for power lines above.
- Keep aluminum ladders at least 20 feet away from power lines.
- Fiberglass ladders must be at least 10 feet away.

Portable Ladders – Stepladders

- Unless the stepladder is equipped with a handrail, the top step and cap shall not be used to stand on.
- An employee shall not use the backside of a stepladder for climbing.
SCAFFOLDS & SCAFFOLD PLATFORMS

Work From Scaffolding
Construction and Capacity

◆ A scaffold shall be designed, constructed, erected, and used in accordance with the provisions of this part. A scaffold shall be designed by a qualified person.

Scaffolds – Competent Person

◆ A “competent person” must supervise the construction and dismantling of a scaffold
◆ The competent person must inspect the scaffold before each shift.
◆ Scaffolds must be built on firm foundation, free of settling.
Scaffolds - Construction

- Scaffold uprights must be on base plates. Base plates shall rest on mudsills or other firm foundation (such as concrete floor).
- A “mudsill” is a section of a 2” x 10” plank. You cannot use single OSB, 2” x 4”s, 4” x 4”s or other job site trash as mudsills.
- Never use concrete blocks or other unstable items to level the scaffold.
- Instead, use screw-jacks to raise or lower the height.
Planking and Scaffold Platforms

- The platform shall consist a minimum of 2 planks laid side by side.
- Each platform on all working levels shall be fully planked or decked between uprights.
- Wood planks shall be scaffold-grade, a minimum of 1500 psi.
- Planks shall be 2" x 10".

Planking and Scaffold Platforms

- All defective wood planks, laminated planks, manufactured work platforms, and picks shall be removed from service.
**Planking and Scaffold Platforms**

- Extend over the bearer a min. of 6 inches, but not more than 12 inches.
- Be cleated or fastened down to prevent shifting and be uniform in thickness, except where lapped.
- Hook on type platforms may be used if they are secured to the bearer.

**Scaffold – Guardrails**

- Guard rails must be on the back and the sides of scaffold when it is 10’ or higher.
Crossbraces as Guardrails

A cross brace may be used as part of the guardrail system as follows:

- If pivot occurs from 36” to 48” above the platform… install a midrail.
- If pivot occurs from 18” to 36”… install a top rail.
- If pivot occurs less than 18” or more than 48”… install both.
Safety In Residential Construction

Ladder Jacks

Pump Jack Scaffolding
Forklift Scaffold

The basket for a rough terrain fork truck scaffold:

- Shall not extend more than 10” to either side of the load bearing tires or outriggers.
- Be attached to the forks by mechanical means
- Have pockets that fully envelope the forks
- Have a guard rail that fully encloses the basket
- Be of all mild steel construction
- And have a tag indicating the weight and capacity of the basket

Rough Terrain Forklift Platforms
Does this platform meet the specifications?

Working from Rough Terrain Forklift Platforms

- Employees in the basket must wear a harness and be tied off to a secure anchor point
- Employees shall not climb the boom of the truck to enter or exit the basket
- The Fork Truck shall not be repositioned while employees are in the basket.
Fatal Fall

Commercial - Laborer

Age: 45

The employee was using an 8 feet stepladder on a rough terrain fork truck platform to gain additional reach when he fell 30 feet from the platform to the ground. Employee was installing leaf guard on rain gutters. Chippewa Co
Foundation Form Work
Summary

- Employees trained by a Qualified Person
- Designate employee on site as Competent Person
- Inspect scaffold daily
- Follow manufacturer instructions
- Proper access and stable base
- Use fall protection
- Protection from falling objects
- Comply with all MIOSHA Standards
ELECTRICAL

Exposure To Live Parts

- Must guard against exposed live parts over 50 volts
- Must stay at least 10’ away from overhead power lines
Overhead Power Lines

- No insulated lines
- Contact owner of utility to determine voltage
- Three Options:
  - De-energize & Ground
  - Cover
  - Or have them moved

Do You Have A License To Do That?

An employer shall assure that an employee does not engage in the installation activities to which this part applies unless the employee is a licensed electrician, or the employee is working with or under the supervision of a licensed electrician.
Lock Out / Tag Out

An employee shall not be permitted to be in proximity to any part of an electric power circuit that he or she may contact unless the employee is protected against electric shock by de-energizing the circuit and locking out and tagging it, or unless the employee working on an energized circuit is guarded by insulation, insulated tools, or insulating matting or blankets sufficient to protect against the voltage involved.

GFCI’s In Wet Locations

A portable electric tool used in a wet atmosphere or environment shall be protected by a GFCI.

- Anytime work outside (rain or shine).
- Damp areas (basements, water on the floor).
- Hot, humid, sweaty conditions.
GFCI’s In Wet Locations

- Shall be protected against damage
- Have a plug body... to prevent strain

Extension Cords

- An extension cord used with a portable electric tool or appliance shall be a 3-wire type.
Establish and follow safe work procedures.
Wear proper personal protective equipment.
Implement and follow lockout/tagout procedures.
Comply with MIOSHA, NEC, NFPA.
Provide training to recognize and eliminate electrical hazards.
What are YOU going to do to be safer?

ONLINE RESOURCES
Residential Construction Initiative

Residential construction has experienced moderate growth these past few years, which has contributed to the higher injury rates and fatalities in construction. According to the U.S. Bureau of Labor Statistics, the total case incident rate (TCIR) for Michigan construction increased from 2.6 injuries and illnesses per 100 full-time workers in 2011 to 5.0 in 2012. Over the last five years (2008 – 2013) over 57% of construction fatalities in Michigan have occurred in the residential industry. The following resource has been developed to assist employers and employees in protecting their workers from common hazards associated with residential construction.

Don't forget to sign up for “Building Up Residential Safety Day” on August 14, 2014!

Fatality Summaries

| Worker falls to his death installing shingles on a dormer. |
| Worker falls 28 feet from a rough terrain work platform. |
| Worker died from head injuries when struck by nail from pneumatic nail gun. |
| Worker was electrocuted when aluminum extension ladder hits power line. |
| Worker died from fall from an extension ladder. |
| Complete List of MIFACE Case Studies |

MOSHA Residential Fall Protection Webcast

Training Resources

- Construction Tool Box Talks
- Safety In Residential Construction PowerPoint Handouts
- Residential Construction Initiative Training Calendar
- Complete list of upcoming MOSHA Training Programs: www.michigan.gov/moshatraining

Related Standards

- Part 46: Fall Protection
- Part 1: General Rules
- Part 6: Personal Protective Equipment
- Part 9: Excavation, Trenching & Shoring
- Part 11: Fixed & Portable Ladders
- Part 12: Scaffolds & Scaffold Platforms
- Part 19: Tools
- Part 32: Aerial Work Platforms
- Complete List of Construction Safety & Health Standards

Policies & Procedures

- Residential Construction Local Emphasis Program (COM-14-1)
- Residential Fall Protection Compliance Criteria (COM-04-1R1)

MOSHA Fact Sheets

- Residential Fall Protection
- Threshold Heights Requiring Fall Prevention/Protection
- Dangers of Pneumatic Nail Guns With Contact Triggers
- MOSHA Fatal Facts: Falls That Kill
- Highlights of the Fall Protection Standard
- Falls - Unprotected Sides, Openings, & Floor Holes
Residential Construction Initiative
continued…

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Federal OSHA Website

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Safety In Residential Construction

Hazard and Solutions

Residential construction has less restrictive building codes than commercial construction. This gives builders the flexibility to build homes to the homeowners’ specifications. With so many ways to build a house, residential construction workers face a unique set of hazards and safety considerations. The following links provide information that may be helpful when identifying the hazards of residential construction and solutions to those hazards.

**General**

- **Safe at Work**: OSHA summarizes the state of workplace injuries and how OSHA can help. OSHA, (2013).
- **OSHA eTool**: OSHA's safety and health information on hazards and solutions. OSHA, (2016).
- **OSHA: Construction Hazards**: OSHA provides a safety guide to construction hazards. OSHA, (2008).
- **OSHA Publication 312-182**: OSHA provides an overview of construction hazards. OSHA, (2013). Also available as a PDF, 12 pages.
- **OSHA Publication 2202**: OSHA provides an overview of construction hazards. OSHA, (2011). Also available as a PDF, 72 pages.
- **OSHA’s Construction Industry: OSHA’s Resources for Industry**: OSHA provides resources for the construction industry. OSHA, (2011). Also available as a PDF, 12 pages.
- **Selected Construction Regulations for the Home Building Industry**: OSHA, (1997). Also available as a PDF, 32 pages. Identifies OSHA standards applicable to the hazards most commonly found at worksites in the residential construction industry and those most likely to have a significant negative impact on the safety and health practices of contractors within this industry.
- **PDFs**: OSHA includes links to OSHA fact sheets, QuickTips, training programs, and other resources.
- **Control of Exposures to Silica Dust Exposure**: US Department of Health and Human Services (NIOSH), National Institute for Occupational Safety and Health (NIOSH) Publication No. 95-105, (1995, June). Provides information on ways to control and dispose of dust from drywall sanding.
- **Construction Safety and Health**: National Institute for Occupational Safety and Health (NIOSH) Workplace Safety and Health Topic. Compares accidents in the construction industry to all other industries and lists NIOSH success stories.
- **For additional information, see OSHA’s Construction Industry Safety and Health Topic Page.**

**Electrical Safety**

- **Controlling Electrical Hazards**: OSHA has a comprehensive guide on controlling electrical hazards. OSHA, (2013). Also available as a PDF, 71 pages. Provides an overview of basic electrical safety on the job.
- **For additional information, see OSHA’s Electrical Safety and Health Topic Page.**

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National Association of Home Builders (NAHB)

[Image of NAHB website]

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Other Resources

- Manufacturers of tools, equipment, & materials
- Construction Consultants
- Internet

Thank You For Attending This Presentation

Michigan Occupational Safety & Health Administration
Consultation Education & Training Division
525 W. Allegan Street, P.O. Box 30643
Lansing, Michigan 48909-8143

For further information or to request consultation, education and training services, call (517) 284-7720 or visit our website at www.michigan.gov/miosha