Construction hazards in fiber cement siding

By Lorena Elliot, Sr. Health Compliance Officer, Oregon OSHA

History

Fiber cement siding is a composite material made of sand, cement, and cellulose fibers, which is used in siding as an exterior building material for both commercial and residential applications. In appearance, it often consists of overlapping horizontal boards, imitating wooden cladding, clapboard, and imitation shingles and tiles.

Fiber cement products came about as a replacement for the widely used asbestos cement sheeting product manufactured until the late 1980s. These external cladding products are a popular, cost-effective replacement for wood and require very little maintenance once installed and painted.

Silicosis

The dust created from drilling, cutting, and grinding during installation of fiber cement products can contain silica particles that are small enough to be inhaled and deposited in the deepest part of the lung. Silica dust causes scar tissue to develop in the lungs which may be permanent and may cause silicosis, a disabling lung disease, and cancer. There is no cure for silicosis.

Crystalline silica is regulated under Oregon OSHA's ***Hazard Communication*** standard, ***Oregon Rules for Air Contaminants***, and ***Respiratory Protection*** requirements. Oregon OSHA-regulated businesses must provide employees with information and training and assess the amount and types of exposure that may require respiratory protection if silica materials contain 0.1 percent or more crystalline silica.

Emphasis program

Oregon OSHA has developed an ***emphasis program*** to reduce workers' exposure to crystalline silica. Inspections at construction sites have addressed silica dust exposures where workers were exposed significantly above permissible levels. Workers have been observed in visible dust without engineering controls or respiratory protection.

Oregon OSHA is evaluating air monitoring results and collecting data to determine the most effective prevention efforts. Initial testing has indicated significant reduction of dust exposures for workers who use a specialized cement shear or fiber cement saw blade instead of traditional circular saw blades. Additional testing needs to be completed during the drier summer season to determine if these specialized blades are an effective engineering control.

Protecting workers

Controlling exposures to silica dust when workers are installing and handling fiber cement siding should be the primary means for protecting workers from silicosis. Steps to follow include understanding specific tasks that may expose employees to silica dust and identifying practical ways to reduce exposures to silica. Tasks that may expose employees to silica dust include drilling, cutting, and grinding fiber cement siding.

How to reduce silica exposures

- Work outdoors when possible and use mechanical exhaust or dust collection systems.
- Use fiber cement shears for cutting or, where not feasible, use a dust-reducing fiber cement saw blade. Saw blades and jigsaw blades with polycrystalline diamond tips are specifically designed for cutting fiber cement boards and are recommended for reducing silica dust exposures.
- Locate the cutting station down wind and on the ground to reduce exposures of co-workers. Warn others in the immediate area.
- Conduct air monitoring to determine what type of respiratory protection is needed.
- During clean-up, use HEPA vacuums or wet cleanup methods – never dry sweep.

Confined space: Fed OSHA proposes a new rule in construction

Federal OSHA is proposing a ***new rule*** to protect construction workers from hazards in confined spaces. Under the proposed rule, an employer would determine if there is a confined space at a jobsite and, if so, the nature of the hazards in the space. Spaces that had existing or potential hazards would be classified in one of four ways:

- *Continuous-system permit-required confined space*; part of a larger confined space – such as a sewer – that cannot be isolated from the larger space and could expose workers to hazards in the larger space.
- *Permit-required confined space*; a confined space that has a hazardous atmosphere that ventilation cannot control, sloping surfaces that trap or asphyxiate a worker, a hazard that could bury a worker, or any other physical hazard.
- *Controlled-atmosphere confined space*; a confined space in which ventilation alone will control atmospheric hazards at safe levels.
- *Isolated-hazard confined space*; a confined space in which the employer has isolated all physical and atmospheric hazards.

OSHA says the new rule addresses factors unique to the construction industry such as high employee turnover, the changing status of jobsites, and contractors who may need to perform work in confined spaces but who are not familiar with the potential hazards.

Note: Oregon OSHA will likely initiate rulemaking for its own construction-related confined space rule later this year. If you're interested in being part of a stakeholder group to work with Oregon OSHA on developing a new confined space rule, email Dave McLaughlin at Dave.J.Mclaughlin@state.or.us.

Confined space: The 2005 Irrigon, Ore., accident - a summary

Federal OSHA's recently proposed confined-space rule requires construction employers to take a comprehensive approach to confined-space safety, including requiring contractors to coordinate confined-space operations with other employers at a jobsite. According to OSHA, many construction contractors who perform work in confined spaces are unfamiliar with the potentially lethal hazards that employees may encounter. This 2005 confined-space accident involving a contractor and the city of Irrigon, Ore., illustrates the point.

The accident

The project involved converting Irrigon's septic tank and sealed pressure sewer system into a gravity system. About 600 septic tanks were discharging water into the system. During the conversion, the contractor connected the new system to a "live" sewer line, which contained a lethal concentration of hydrogen sulfide gas.

A company employee climbed down a fixed ladder into an 18-foot deep manhole to retrieve a plug that kept sewer gasses from diffusing into an upstream manhole. After he reached the bottom of the manhole, which had sewage running through it, he told his spotter he was coming up. He climbed part way up the ladder but slid back down and didn't respond when his spotter asked if he was OK.

The spotter called 911 and a company superintendent. When emergency responders and the superintendent arrived at the scene, the superintendent asked one of the responders for an "oxygen mask" and climbed down the ladder to rescue the unconscious employee. When he reached the employee, his mask came off and he lost consciousness, as well.

The Irrigon Volunteer Fire Department removed both victims from the manhole and took them to Good Shepherd Medical Center in Hermiston, Ore.

Not long after the accident, Oregon OSHA measured hydrogen sulfide concentrations in the manhole in excess of 600 parts per million – more than six times the level designated by NIOSH as immediately dangerous to life and health (IDLH).

Why it happened

Company employees were not aware of the hazard. Though the sewer had a distinct "rotten egg" odor and the manholes were discolored – both indications of hydrogen sulfide – company employees didn't think they were in danger. Hydrogen sulfide has a distinct odor at low concentrations, but at higher levels the gas can paralyze the sense of smell. The only way to

safely detect a hazardous atmosphere is with a calibrated direct reading instrument as described in *1910.146, Permit-required confined spaces*.

The company did not have permit-required confined-space entry procedures. Company employees assumed that they would not enter “live” sewers that would expose them to atmospheric hazards. However, all sewers could have atmospheric hazards. The company should have determined that the sewer was a permit-required confined space and employees should have entered using procedures required by *1910.146, Permit-required confined spaces*.

The company did not have appropriate equipment for permit-required confined-space work. Appropriate equipment includes air monitors, a winch, a tripod, a harness, a ladder, and ventilation devices that enable workers to safely enter and exit the space.

Company employees were not trained to work in or around permit-required confined spaces. Trained workers know the hazards associated with permit-required confined spaces, understand procedures for entering permit-required confined spaces, and know what equipment will control or eliminate potential hazards.

The company did not have a written respiratory protection program. Employees didn’t have appropriate respirators and the company did not have procedures for selecting respirators, conducting medical evaluations, or fit-testing.

The company did not follow an emergency plan. Not knowing what to do in an emergency puts both the worker and the attendant at risk. Would-be rescuers make up 60 percent of confined space fatalities because they act on impulse rather than a predetermined emergency plan.

Scaffolds: Temporary platforms can lead to permanent injury

By Tasha Hodges, Research Analyst, DCBS Information Management Division

Scaffolds, elevated platforms used to support tools, materials, and workers, are often used in construction. Most of these are complex structures that should only be assembled by those who have been properly trained. Incorrectly constructed scaffolds are prone to collapse. Also, workers may slip or lose their balance even on sound scaffolds, and without appropriate protection they are vulnerable to serious injury.

From 2002 to 2006, the Department of Consumer and Business Services received notification of 247 accepted disabling claims caused by falls from scaffolds, an average of almost 50 disabling injuries per year. Sixty-two percent of these injuries occurred in the construction industry. Carpenters were the most commonly injured workers, accounting for 16.2 percent of these claims, followed by general construction laborers (15.4 percent).

Falls from scaffolds most commonly resulted in fractures (43.3 percent of claims) or sprains and strains (33.2 percent). Workers who fell from scaffolds were most likely to injure multiple body parts (31.6 percent) or their lower extremities (23.3 percent).

Workers on scaffolds more than 10 feet above a lower level must have fall protection, such as guardrails and harnesses. However, a fall from even a relatively short drop can still cause severe injury or death. In 2006, a drywall hanger died when he fell from a 7-foot scaffold system on wheels. While hanging drywall, the victim pushed away from the wall causing the scaffold system to move. He lost his balance and fell head first to the ground. He died from severe head injuries. A later investigation found that the company's employees were not properly trained to use scaffolding and the scaffold had not been properly braced to prevent racking or collapsing.

Oregon OSHA offers a comprehensive guidebook to help design, construct, and use scaffolds safely. *Scaffolds: Temporary Elevated Work platforms* can be found on the Oregon OSHA Web site.

Oregon OSHA's requirements for sanitary facilities at construction sites

Recently, we've received questions about Oregon OSHA's sanitation requirements for construction sites, perhaps raised by concern for methicillin-resistant Staphylococcus aureus (MRSA), a staph infection that occurs typically in hospitals and healthcare facilities. Here's a summary:

Potable water

An adequate supply of drinking water must be available at the site. Drinking water containers must be constructed of materials that maintain the water quality. They must have a tap and be kept tightly covered. Water cannot be dipped from containers, and use of a common drinking cup is prohibited. There must be a sanitary container for unused single cups and a receptacle for disposing of used cups. Containers must be cleaned regularly and refilled at least daily. Clearly mark containers so that they are used only for drinking water.

Nonpotable water

Nonpotable water outlets (for industrial use or firefighting) must have signs that clearly indicate the water is not to be used for drinking, washing, or cooking. There can be no connection between nonpotable and potable water systems.

Toilets

(The following requirements do not apply to mobile crews that have readily available transportation to nearby toilet facilities.)

Toilets and urinals must be provided for employees as follows:

Number of employees	Number of toilets and urinals
Up to 20	1 toilet
20-199	1 toilet and 1 urinal per 40 employees
200 or more	1 toilet and 1 urinal per 50 employees

Sites that do not have sanitary sewers must have one of the following, unless prohibited by local codes:

- Privies that do not contaminate ground or surface water
- Chemical toilets
- Recirculating toilets
- Combustion toilets

Construction projects that have an estimated cost of $1 million or more must have flush toilets and washing facilities that include wash basins, warm water, and soap.

Hand-washing facilities must also be available at any site where employees are exposed to hazardous substances that can damage skin or be absorbed through the skin. Toilets and facilities must be clean, sanitary, and well maintained.

Simple suggestions for hand-washing facilities

- Keep wash water between 70 and 90 degrees Fahrenheit.
- Provide individual hand towels from a sanitary dispenser and a receptacle for disposing of used towels.
- Provide hand soap and an industrial hand cleaner for removing paint, herbicides, insecticides, or other contaminants.
- Prohibit use of gasoline or solvents for hand washing.
- Keep floors dry to prevent slips or falls.

Washing with an alcohol-based hand sanitizer

Consider using alcohol-based hand sanitizers, which don't require water, when soap and water aren't available. They are actually more effective than soap and water in killing bacteria and viruses that cause disease. Commercially prepared hand sanitizers contain ingredients that help prevent skin dryness. Using these products can result in less skin dryness and irritation than hand washing. Not all hand sanitizers are created equal, though. Some waterless hand sanitizers don't contain alcohol. Use only the alcohol-based products.

Raising the bar on rebar

What's the most common injury event associated with working on or around rebar at construction sites? Falling or stumbling onto unprotected rebar? Not really. According to the *DCBS Information Management Division*, of the 234 accepted disabling claims that involved bars, rods, or rebar from 2002 to 2006, nearly half resulted from being "struck by or against" bars, followed by "overexertion from handling bars." "Falls" onto bars accounted for just 6 percent of the total as shown in the table below.

Accepted disabling claims involving bars, rods, or rebar: 2002-2006

Event	Number	Percent
Struck by or against bars, rods, or rebar	105	44.9
Overexertion from handling bars, rods, or rebar	89	38.0
Caught in or between bars, rods, or rebar	22	9.4
Falls on bars, rods, or rebar	15	6.4
Contact with bars, rods, or rebar (injury event is unknown)	2	0.9
Violently assaulted with a bar, rod, or rebar	1	0.4

Source: Information Management Division, Oregon Department of Consumer and Business Services.

Of course, falling on unguarded rebar is likely to result in a serious injury. For more information about rebar hazards, see ***Unguarded Protruding Steel Rebars*** on Federal OSHA's Construction eTool page.

Oregon OSHA proposes changes in rules for Successor employers, Safety committees, and Silica

Successor employers

Some Oregon employers change their business status to avoid responsibility for workplace safety and health violations. HB 2223, passed into law by the 2007 Oregon Legislature, enables Oregon OSHA to hold these "successor employers" responsible for such violations. The ***proposed rule*** establishes criteria in Division 1, General Administrative Rules, for classifying an existing violation as a repeat violation or attributing knowledge of a violation to the successor employer.

A public hearing on the proposed rule is scheduled for Thursday, Jan. 31, 2008, starting at 9 a.m. at the Labor and Industries Building, 350 Winter Street NE, Salem, Ore. Oregon OSHA will take comments through Tuesday, Feb. 19, 2008.

Safety committees

Oregon OSHA proposes to change its ***Division 1, Safety Committee rule***, 437-001-0765, to allow safety meetings for employers who have 10 or fewer employees. The changes to the rule, now titled, *Rules for Workplace Safety Committees and Safety Meetings*, will affect all Oregon employers. Requirements for establishing and administering safety committees or for holding safety meetings are also specified in the rule.

Public hearings are scheduled on the following dates:

- *Monday, Feb. 4, 2008*, starting at 10 a.m. at Associated General Contractors (AGC), 9450 SW Commerce Circle, Suite 200, Wilsonville, Ore.
- *Wednesday, Feb. 6, 2008*, starting at 9:30 a.m. at the Labor and Industries Building, 350 Winter Street NE, Salem, Ore.
- *Friday, Feb. 8, 2008*, starting at 1 p.m. in the Roxy Ann Grange, 1850 Spring St., Medford Ore.

Oregon OSHA will take comments through Tuesday, Feb. 19, 2008.

Silica

Oregon OSHA proposes to change the permissible limit (PEL) for ***airborne concentrations of silica*** to a fixed limit of 0.05 milligrams per cubic meter (mg/m3). The formula and footnote "e" for Silica in *Table Z-3* in the *Air Contaminants* standards in general industry and construction will also be amended. Both changes reflect better scientific processes for determining airborne exposures.

Crystalline silica, also known as quartz, is a natural constituent of the earth's crust and is a basic component of sand and granite. Airborne exposures to silica can lead to silicosis, a lung disease that reduces the lungs' ability to work to extract oxygen from the air.
Oregon OSHA is extending the ***comment period*** through Monday, Feb. 4, 2008.

New program directive on focused inspections in construction

Oregon OSHA has issued a ***new policy*** for conducting enforcement inspections of employers participating in workplace safety and health programs recognized by industry trade associations.

The policy will allow compliance officers to focus on fall, electrical, struck-by, and caught-in/between hazards and spend less time on reviewing records or other written materials.

New publications: motor vehicle safety and ergonomics

Oregon OSHA: Vehicle safety for the construction industry

Vehicle Safety for Small Businesses in the Construction Industry, a new publication from Oregon OSHA, covers vehicle safety best practices for small-business owners and their employees. The guide also includes a CD that has a sample vehicle safety program that employers can modify for their own use. An effective motor vehicle safety program is one of the best ways for employers to protect their employees and control costs.

Vehicle safety was produced with help from the Oregon OSHA's *Construction Advisory Committee* and is part of the agency's motor vehicle safety campaign, which began in October. Motor vehicle crashes are the leading cause of unintentional injury and death in Oregon, have far-reaching effects on victims and their families, and cost Oregon employers millions of dollars annually.

The Construction Advisory Committee, which began in 2001, represents labor, employers, trade organizations, and other government agencies, and meets monthly to address workplace safety issues affecting the Oregon construction industry. For more information about the committee, click the "Collaborations' tab on Oregon OSHA's Web site.

Copies of Vehicle safety are available from Oregon OSHA's Resource Center; call (800) 922-2689 or (503) 947-7447. The guide is also available in PDF format from *Oregon OSHA's Web site*.

NIOSH: Ergonomics for construction workers

NIOSH recently published a new ergonomics guide for the construction industry, *Simple Solutions: Ergonomics for Construction Workers*. Intended for construction workers, unions, supervisors, contractors, safety specialists, and human resources managers, the guide suggests many practical ways to make construction tasks easier to use and safer for construction workers.

Ask an expert

What is the best practice for fall protection when a person is working from a "zoom boom" (boom-supported elevating platform) or "scissor lift" (self-propelled elevating work platform): fall restraint or fall arrest?

The employer should determine which method – fall arrest or fall restraint – is practical and provides the safest protection for the employee. In making the decision to use fall restraint or fall arrest protection, it's important to understand why the employee must wear the equipment.

Personnel lifts, such as scissor lifts, do not require additional fall protection devices because of their operating characteristics (they just go up and down) and because they are equipped with primary fall protection (such as a guardrail system). Requirements for using scissor lifts come from a consensus standard, the *American National Standards Institute A92.6*. The design standard for the scissor lift platform, since at least 1979, requires standard guardrails with the top rail being 42 inches above the platform floor, a midrail at 21 inches, and toe boards on all sides with the exception of the access point. Removable guarding or gates may be used at the access point and must be secured prior to operation of the lift.

Boom supported elevating work platforms/extensible/zoom booms have additional fall protection requirements. *ANSI A92.5* provides the consensus standard for safe operation. Individual manufacturers such as JLG, Genie or Gradall follow the *A92.5* standards. In addition to stating that **"you must follow all operating and maintenance instructions and recommendations of the manufacturer,"** Oregon OSHA's requirements for personnel protection [437-003-0073(2)] state that **"workers must use personal fall protection that complies with Subdivision 3/M...when working in these devices."** The requirements for using this equipment are in ***Scaffolding, Subdivision 3/L***.

The lifts you mention are equipped with guardrails that serve as a primary fall protection system. The reason for an additional fall restraint or fall arrest system is to prevent the operator from being thrown from the lift should it get hit or a wheel drops into a depression.
Whether you use fall arrest or fall restraint, the system must meet the requirements in ***Fall Protection, Subdivision 3/M***. The anchor used with the harness or belt must be capable of meeting the specific strength requirements. As stated in the rule, **"Personal fall restraint systems**

shall be rigged to prevent the user from falling any distance. Personal fall arrest systems, when stopping a fall, must be rigged so that an employee can neither free fall more than 6 feet nor contact any lower level."

For more information see Program Directive A-242, *Fall Protection: Personnel Lifts Used in Construction*.

Questions? Contact Ron Haverkost at (503) 947-7421 or (Ronald.L.Haverkost@state.or.us).