Chapter 9: Steel

- Concrete Strength
- Decking
- Proper Rigging
- Securing Bolts
- Shear Connector
- Erecting Steel Structures

AGC Tool Box Safety Talk

CONCRETE STRENGTH

INTRODUCTION

1. Review any accidents or “near accidents” from the past week.

2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Concrete footings and walls are commonly used to support structural steel members. Beginning the steel erection process before the concrete has properly cured can provide serious safety hazards. These hazards could include: Employee falls, equipment damage and catastrophic failure and collapse.

- Make sure that the concrete has been properly tested with appropriate American Society for Testing and Materials standard test methods designed to indicate that the concrete has gained sufficient strength to support its weight and superimposed loads.

- Do not erect steel unless the concrete has attained, on the basis of an appropriate ASTM standard test method of field-cured samples, either 75 percent of the intended minimum compressive design strength or sufficient strength to support the loads imposed during steel erection.

- Column anchor bolts must be installed per the plan and may not be modified or repaired without the approval of the Engineer of Record.

AGC Tool Box Safety Talk

DECKING

INTRODUCTION

1. Review any accidents or "near accidents" from the past week.

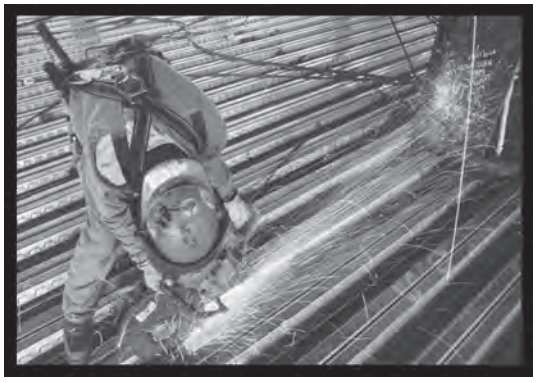
2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Many accidents that occur on decking are the result of falls that occur while stepping onto or working on unsecured decking that slipped out of place when fall protection was not provided or used. Take the following steps to help reduce accidents on decking:

- Develop a fall protection program before starting steel erection. Include all phases of the steel erection in the program and eliminate, to the extent possible, employee exposure to falls.

- Install safety nets or a fully planked or decked floor directly under any erection work being performed within two stories or 30 feet, whichever is less.



- Protect employees walking/working on surfaces with an unprotected edge more than 15 feet above a lower level from fall hazards with a guardrail system, safety net systems, personal fall arrest systems, positioning device systems or fall restraint systems.

- Make sure holes or roof openings are adequately guarded or covered.

- Mark the CDZ clearly so that employees who are not engaged in leading-edge work and properly trained in the hazards involved are prohibited from entering the CDZ.

- No more than 3000 square feet of decking may be installed before being secured and attached to the structure.

AGC Tool Box Safety Talk

PROPER RIGGING

INTRODUCTION

1. Review any accidents or "near accidents" from the past week.

2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Rigging and hoisting of steel members and materials are essential parts of the steel erection process. However, in addition to the dangers usually associated with cranes and derricks, steel erection can also create hazards, such as suspended loads over employees. Because of the specialized hazards, take these precautions when rigging and hoisting steel:

- Inspect rigging and all equipment before each shift. If a competent person determines that there is a deficiency, remove the equipment from service until the deficiency is corrected.

- Make sure slings are not kinked and that the load is balanced and secured. Position the hoist line so that it is vertical prior to the lift.

- Make sure all rigging is done by qualified riggers

- Take up slack slowly. Do not lift loads over the rated capacity.

- Check tags on slings for load capacity. Take care to avoid tip loading and loading on the latch hook. Avoid side pulls or end pulls, and quick reversal operations.

- These can cause the hoist rope to slip out of the drum groove, damaging the rope or destabilizing the crane or hoist.

- Do not lift people; do not lift loads over people, and never ride the hoisting load.

AGC Tool Box Safety Talk

SECURING BOLTS

INTRODUCTION

1. Review any accidents or "near accidents" from the past week.

2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Handling and installation of steel securing bolts presents many safety hazards. Containers used to haul and store connectors are heavy and must be moved in accordance with safe lifting practices. Store containers outside of main walkways or near equipment traffic to prevent them from being knocked over. Keep the area under the steel that is being connected clear of personnel.

- Provide containers for storing and carrying bolts, drift pins, and rivets.
- Secure the containers against accidental displacement when aloft.
- When knocking out bolts or drift pins, provide a means to keep them from falling.
- Securely bolt or fasten into position each structural steel member with at least two (2) bolts before releasing from the load line. Cantilevered or systems engineered steel may require more bolts.
- Anchor all columns by a minimum of four anchor bolts.
- Do not repair, replace or field modify anchor bolts without the approval of the project structural engineer of record.
- Always wear approved eye protection.

AGC Tool Box Safety Talk

SHEAR CONNECTOR

INTRODUCTION

1. Review any accidents or "near accidents" from the past week.

2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Shear connectors such as headed steel studs, steel bars, or steel lugs pose tripping hazards on walking surfaces during steel assembly, and can worsen the risks of falls from elevations. Use the following safe procedures when installing shear connectors:

- When using shear connectors in construction of composite floors, roofs and bridge decks, lay out and install the shear connectors after the metal decking has been installed, using the metal deck as flooring or provide some other form of access.

- Do not attach shear connections to the top flanges of beams, joists or beam attachments so that they project vertically from or horizontally across the top flange of the member until after the metal decking, or other walking/working surface, has been installed or where appropriate fall protection is in place.

- Do not install shear connectors within a Controlled Decking Zone.

- Ensure that fall protection systems are in place when working on members with shop or pre-installed shear connectors.

- Always wear a Personal Fall Arrest System when walking/working on a surface with an unprotected edge.

AGC Tool Box Safety Talk

ERECTING STEEL STRUCTURES

INTRODUCTION

1. Review any accidents or "near accidents" from the past week.

2. Describe the hazards of the work as they relate to your project. Explain or show the SAFE way of doing the job.

3. Give the TOOL BOX SAFETY TALK

Working with steel poses many fall hazards. Hoisting, connecting, welding, bolting and rigging structural steel are all activities that can put the worker at risk of a fall. Take these precautions to help protect against fall hazards:

- Use conventional fall protection (PFAS, safety nets, or guardrail systems) if there of risk of falling more than 15 feet doing most iron work, including bolting, welding etc.) Fall protection may be required at 6 feet on some projects.

- Ensure that connectors wear a complete PFAS or other allowable fall protection device and wear equipment necessary for tying off while working at heights over 15 and up to 30 feet. Or two stories, whichever is less. Fall protection may be required at 6 feet on some projects.

- A Controlled Decking Zone (CDZ) may be established as a substitute for positive fall protection where metal decking is initially being installed and forms the leading edge of a work area over 15 and up to 30 feet above a lower level. Fall protection may be required at 6 feet on some projects. Allow only employees are who are engaged in leading-edge work and properly trained in the hazards involved to enter the CDZ.

- Guard all protruding reinforcing steel to prevent impalement hazard.