Job hazard analysis (JHA): Steel erection

Task: Steel erection	**Site or job:**
Crew:	**Date:**
Supervisor:	

No.	Job step	Hazard	Controls (most effective first)
1	Get approval and plan the site and sequence	Steel is erected on foundations not ready for the loads	**Administrative control:** Do not erect steel until the steel erector has written notice that the concrete in the footings, piers and walls has reached 75 percent of its intended minimum compressive design strength, or enough strength to carry the erection loads. (29 CFR 1926.752(b)) **Administrative control:** Provide the written notifications before erection is authorized. (29 CFR 1926.752(a)) **Administrative control:** Pre-plan all hoisting operations so the working-under-loads rules are met. Lay out laydown areas and travel routes as good practice. (29 CFR 1926.752(d))
2	Set and check column anchorage	Column falls or collapses when loaded	**Engineering control:** Anchor every column with at least four anchor rods. (29 CFR 1926.755(a)(1)) **Engineering control:** Set columns on level finished floors, pre-grouted leveling plates, leveling nuts or shim packs adequate to transfer construction loads. (29 CFR 1926.755(a)(3)) **Administrative control:** Confirm the anchor rods match the drawings before the first column is set.
3	Inspect the crane and plan the hoist	Load falls or crane fails during hoisting	**Administrative control:** Have a competent person visually inspect cranes used in steel erection before each shift. (29 CFR 1926.753(c)(1)(i)) **Administrative control:** Pre-plan the routes for suspended loads so that no employee is required to work directly below one, except for the permitted tasks. (29 CFR 1926.753(d)(1)) **Administrative control:** Use multiple lift rigging only if the criteria in the standard are met. (29 CFR 1926.753(e)(1))
4	Set beams and columns	Member shifts or is released before it is secured	**Engineering control:** Do not release the load from the hoisting line until the member is secured with at least two bolts per connection, as the standard requires. (29 CFR 1926.756(a)(1)) **Engineering control:** Keep the structure stable at all times during erection. (29 CFR 1926.754(a)) **Administrative control:** Use a tag line to control the load, and keep the area below clear.

No.	Job step	Hazard	Controls (most effective first)
5	Connect the steel at height	Connector falls at the leading edge	**Eliminate:** Pre-assemble sections on the ground to reduce work at height. **Engineering control:** Protect connectors from fall hazards of more than two stories or 30 feet, whichever is less, and others from more than 15 feet. (29 CFR 1926.760(b)(1)) **Engineering control:** Use guardrails, safety nets, personal fall arrest, positioning device or fall restraint systems for others over 15 feet. (29 CFR 1926.760(a)(1)) **PPE:** Use fall protection equipment that meets the criteria in 1926.502, such as a full-body harness tied off to a rated anchor, and plan for prompt rescue. (29 CFR 1926.760(d)(1))
6	Connect the steel at height	Tripping over studs or shear connectors	**Engineering control:** Do not attach shear connectors or similar devices to the top flanges until the metal decking or other walking surface is installed. (29 CFR 1926.754(c)(1)) **Administrative control:** Keep the walking surface clear and mark hazards.
7	Secure tools and materials aloft	Dropped tools and bolts strike people below	**Engineering control:** Secure all materials, equipment and tools not in use against accidental displacement. (29 CFR 1926.759(a)) **Engineering control:** Bar other construction processes below steel erection unless overhead protection is provided. (29 CFR 1926.759(b)) **Administrative control:** Use tool lanyards and bolt bags. **PPE:** Wear a hard hat with a chin strap in wind.
8	Train the crew and communicate	Crew does not understand the fall hazards or the plan	**Administrative control:** Have a qualified person train each employee exposed to a fall hazard, as the standard requires. (29 CFR 1926.761(b)) **Administrative control:** Hold a daily huddle on the erection plan, the sequence and the changes since yesterday.
9	Inspect, close out and plan the next lift	Hidden defects remain after a shift	**Administrative control:** Walk the erected steel at the end of the shift for loose bolts, unsecured members and missing protection. **Administrative control:** Tag any unsafe steel and keep people off until a competent person releases it.

Required PPE

- Hard hat
- Full-body harness with energy-absorbing lanyard (29 CFR 1926.760(d)(1))
- Safety glasses
- Cut-resistant gloves
- Steel-toe boots

OSHA sections

29 CFR 1926.752 Site layout, site-specific erection plan and construction sequence; 29 CFR 1926.755 Column anchorage; 29 CFR 1926.753 Hoisting and rigging; 29 CFR 1926.756 Beams and columns; 29 CFR 1926.754 Structural steel assembly; 29 CFR 1926.760 Fall protection; 29 CFR 1926.759 Falling object protection; 29 CFR 1926.761 Training

Reviewed with the crew. Names and signatures

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