

LBNL SITE SPECIFIC STEEL ERECTION PLAN

In accordance with the LBNL ES&H Manual Pub-3000, this plan is required to protect employees from the hazards associated with steel erection activities involved in the construction, alteration, and/or repair of single and multi-story buildings, bridges, and other structures where steel erection occurs. The requirements apply to employers engaged in steel erection unless otherwise specified.

Overview:

The requirements of this plan apply to all Construction Subcontractors and lower-tier subcontractor (hereafter referred to as "Subcontractor") activities which require personnel to work erecting steel on a construction/LBNL site. Subcontractors must have in place all the components of this plan to work safely. All work will be performed with adherence to the LBNL ES&H Manual (Pub-3000).

The Subcontractor shall prepare the Steel Erection Plan to include, at a minimum, the following information: **(Delete all red type before submission)**

1. Location of Work:

The work to be completed under this Steel Erection Plan will be performed at:

Lawrence Berkeley National Laboratory
One Cyclotron Road
(area or building)

2. Key Personnel:

Program Administrator: **(name)**

Competent Person: **(name)**

Note: The competent person shall conduct worksite visual inspections on a daily basis or more often as necessary.

3. Schedule:

Approximate Start Date: **(Date)**

Approximate Completion date: **(Date)**

4. Crew:

- **(List all crew members with title associated with steel erection)**

5. Sequence of steel erection activities (Add any additional comments to LBNL's requirements)

(a) Materials deliveries:

- Adequate access roads into and through the site for the safe delivery and movement of derricks, cranes, trucks, other necessary equipment, and the material to be erected shall be provided as well as means and methods for pedestrian and vehicular control.

(b) Material staging and storage:

- Materials will be unloaded in the location nearest the dedicated storage area or erection point to minimize overhead hazards of materials flying into the site or work location. The area will be delineated to keep unauthorized personnel out.

(c) Coordination with other trades and construction activities:

- Other trades will be briefed daily at the morning POD (Plan of the Day meeting) to discuss the path of overhead loads, equipment paths, equipment and materials storage areas, and all other work that could be harmful or pose a danger to workers on site.

6. Description of the cranes and derrick selection and placement procedures (Add any additional comments to LBNL's requirements)

(a) Site Preparation:

- A firm, properly graded, drained area, readily accessible to the work with adequate space for the safe storage of materials and the safe operation of the erector's equipment will be provided.

(b) Path for overhead loads/Working under loads

(Use Cal/OSHA Title 8 Subchapter 4 Article 15 1616.4 for reference)

- Routes for suspended loads shall be pre-planned to ensure that no employee is working below a suspended load.
- Materials being hoisted shall be rigged to prevent unintentional displacement.
- Hooks with self-closing safety latches or their equivalent shall be used to prevent components from slipping out of the hook.
- All loads shall be rigged by a qualified rigger.

(c) Critical Lifts, rigging supplies and equipment (Hoisting and rigging)

(Use Cal/OSHA Title 8 subchapter 4 Article 29 1710(d) for reference)

o Critical Lift/High Consequence Lift/High Value Lift defined in PUB 3000 Chapter 27.

- A competent person shall visually inspect Cranes being used in steel erection activities prior to each shift; the inspection shall include observation for deficiencies during operation.
- If any deficiency is identified, the competent person shall make an immediate determination as to whether the deficiency constitutes a hazard.
- If the deficiency is determined to constitute a hazard, the hoisting equipment shall be removed from service until the deficiency has been corrected.
- The operator shall be responsible for those operations under the operator's direct control. Whenever there is any doubt as to safety, the operator shall stop and refuse to handle loads until safety has been assured.
- A qualified rigger (a rigger who is also a qualified person) shall inspect the rigging prior to each shift.
- Safety latches on hooks shall not be deactivated or made inoperable except:
 - o When a qualified rigger has determined that the hoisting and placing of purlins and single joists can be performed more safely by doing so. Such instances must be formally documented
 - o When equivalent protection is provided in a site-specific erection plan
- **See LBNL Site Specific Crane Plan for all rigging supplies and equipment**

7. Description of steel erection activities and procedures (Structural steel assembly)

Provide a narrative description of general steel erection that will take place on site. Address all noted procedures listed below (a-i). Specify all work will be performed with adherence to the LBNL ES&H Manual (Pub-3000). **(Delete all red type when completed).**

- (a) Stability considerations requiring temporary bracing or guying
- (b) Erection bridging terminus point
- (c) Anchor Rod(bolt) notifications regarding repair, replacement, and or modifications
- (d) Beams and Columns
Use Cal/OSHA Title 8 subchapter4 Article 29 1710(g) for reference
- (e) Connections
- (f) Open web steel joist
Use Cal/OSHA Title 8 subchapter4 Article 29 1710(h) for reference
- (g) Ornamental and Misc. iron
- (h) Decking Installation
- (i) CDZ
Use Cal/OSHA Title 8 subchapter4 Article 29 1710(n) for reference

8. Hoisting, Landing, and placing of metal decking bundles (Add any additional comments to LBNL's requirements)

- Bundle packaging and strapping shall not be used for hoisting unless specifically designed for that purpose.
- If loose items such as dunnage, flashing, or other materials are placed on the top of metal decking bundles to be hoisted, such items shall be secured to the bundles.
- Bundles of metal decking on joists shall be landed in accordance with OSHA standards.
- Metal decking bundles shall be landed on framing members so that enough support is provided to allow the bundles to be unbanded without dislodging the bundles from the supports.
- Unbanded metal decking shall be secured against displacement

9. Fall protection

- Attach an LBNL Site Specific Fall Protection Plan

10. Falling Objects (Add any additional comments to LBNL's requirements)

Use Cal/OSHA Title 8 subchapter4 Article 29 1710(j) for reference

- Secure loose items aloft. All materials, equipment while aloft, shall be secured against accidental displacement and any tools used shall be tethered.
- Protection from falling objects other than materials being hoisted. The controlling contractor shall bar other construction processes below steel erection unless overhead protection for the employees below is provided.

11. Permanent Flooring (Add any additional comments to LBNL's requirements)

Use Cal/OSHA Title 8 subchapter4 Article 29 1710(j) for reference

- The permanent floors shall be installed as the erection of structural members progresses, and there shall be not more than eight stories between the erection floor and the uppermost permanent floor, except where the structural integrity is maintained as a result of the design.

- At no time shall there be more than four floors or 48 feet, whichever is less, of unfinished bolting or welding above the foundation or uppermost permanently secured floor, except where structural integrity is maintained as a result of the design.

12. Temporary Flooring (Add any additional comments to LBNL's requirements)

Use CAL/OSHA Title 8 subchapter 4 Article 29 1710(I) for reference

- The derrick or erection floor shall be solidly planked or decked except for access openings. Planking or decking of equivalent strength, shall be of proper thickness to carry the working load. Planking shall be not less than 2 inches thick full size undressed and shall be laid tight. Both planking and decking shall be secured.
- On buildings or structures not adaptable to temporary floors, and where scaffolds or approved fall protection is not used, safety nets shall be installed and maintained whenever the potential fall distance exceeds 6 feet. [See LBNL PUB 3000 Chapter 30.7 Work Process G]
- The exposed edges of all temporary planked and metal decked floors at the periphery of the building, or at interior openings, such as stairways and elevator shafts shall be protected by a passive guardrail system. This system shall consist of a top rail, midrail (or equivalent protection), toeboards, and posts. All guardrails (including their connections and anchorage) shall be designed for a live load of 20 pounds per linear foot applied either horizontally or vertically downward at the top rail.
 - o Top rails shall have a vertical height within the range of 42 inches to 45 inches from the upper surface of the top rail to the floor, platform, runway, or ramp level. Midrail shall be approximately halfway between the top rail and the floor, platform, runway, or ramp. The top of the toeboard shall be not less than 3 1/2 inches above the platform, walkway, or other working level and the bottom clearance shall not exceed 1/4-inch.

13. Roof and Floor holes and openings (Add any additional comments to LBNL's requirements)

Use CAL/OSHA Title 8 subchapter 4 Article 19 1632 for reference

- Metal decking at roof and floor holes and openings shall be installed as follows:
 - i. Metal deck openings shall have structural members turned down to allow continuous deck installation except where not allowed by structural design constraints or constructability.
 - ii. Roof and floor holes and openings shall be decked over. Where large size, configuration or other structural design does not allow openings to be decked over (such as elevator shafts, stair wells, etc.) employees shall be protected in accordance with OSHA standards.
 - iii. Metal decking holes and openings shall not be cut until immediately prior to being permanently filled with the equipment or structure needed or intended to fulfill its specific use and which meets the strength requirements, or shall be immediately covered.
 - iv. Covers for roof and floor openings shall be capable of supporting, without failure, twice the weight of the employees, equipment and materials that may be imposed on the cover at any one time.
 - v. All covers shall be secured when installed to prevent accidental displacement by the wind, equipment or employees per applicable OSHA standards.
 - vi. All covers shall be painted with high-visibility paint or shall be marked with the word "HOLE" or "COVER" to provide warning of the hazard or other appropriate required language.
 - vii. Smoke dome or skylight fixtures that have been installed are not considered covers for the purpose of this section unless they meet the strength requirements.

viii. Certain State OSHA regulations vary and should be referred and followed per their specifications during steel erection

14. Description of special procedures required for hazardous non-routine tasks

- **Provide a narrative description if needed**

15. Training records

a. Competent Person (General Awareness and OSHA 30)

i. (See attached)

b. Steel erection training

i. (See attached)

c. Fall protection

i. (See attached)

d. Rigging

i. (See attached)

e. Crane operator

i. (See attached)

Date Prepared: _____

Prepared By: _____
(Signature, name, and title)