	NORTH CAROLINA DEPARTMENT OF LABOR	**No. 17-11**
	OSH DIVISION	**Date: 03/2011**
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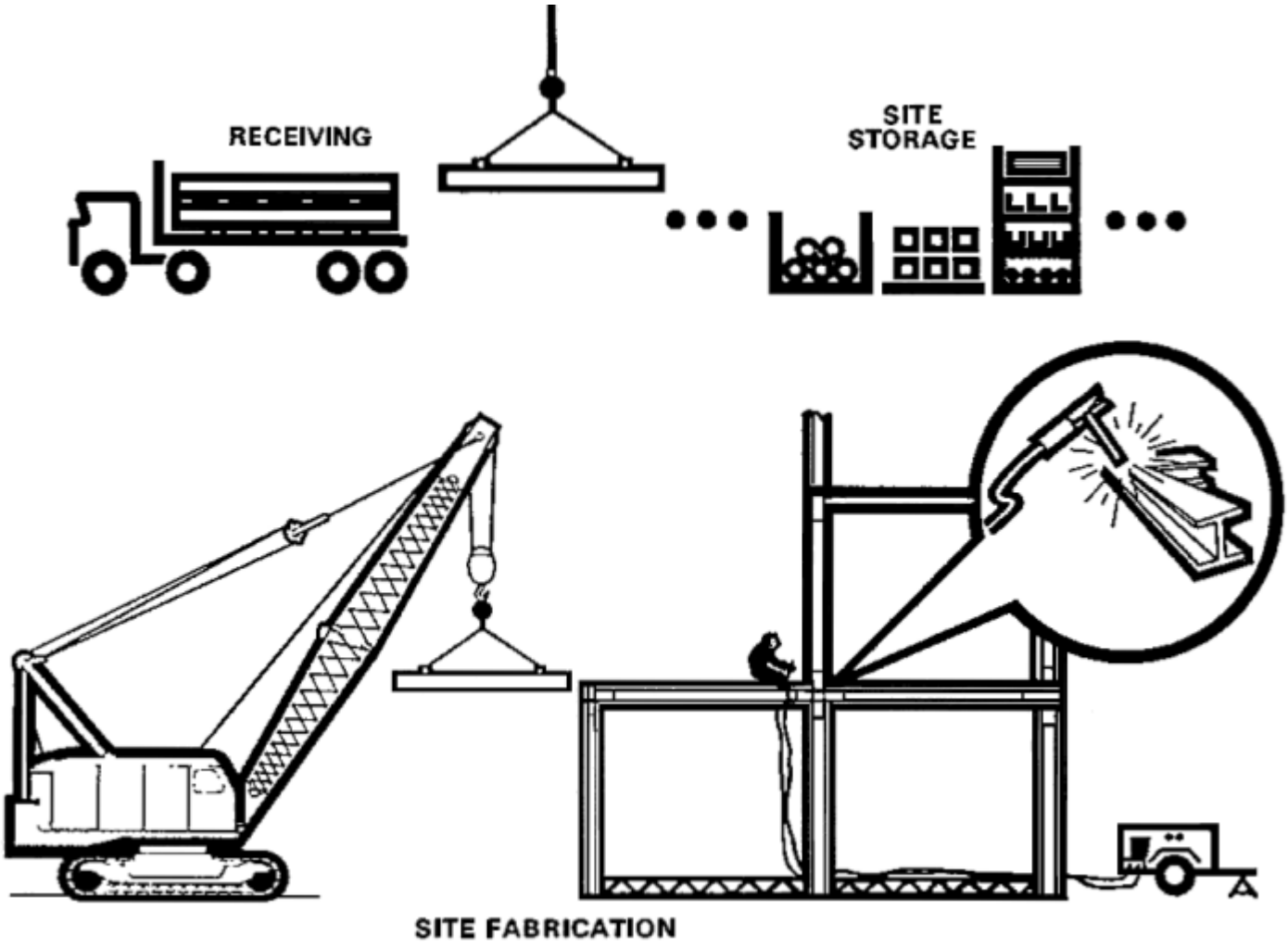
Industry: **Construction**	Sub-Group: **Structural Steel and Precast Concrete Contractors**
SIC: **1791**	NAICS: **238120**

PROCESS DESCRIPTION: Structural steel erection is defined by ANSI A10.13 1972 as handling, fitting, fastening and dismantling of structural and plate steel at a final in-place field erection. The process may involve any or all of the following operations: delivery of structural steel members, bar stock, grating, hardware, etc., unloading, stacking, and site storage of materials and equipment; rigging and crane operation for material handling; site fabrication, repairs, renovation and/or alteration; raising, connecting, bolting, plumbing, tightening, welding and grinding of steel members and accessories; and topping out building. Other operations that may be done by a structural steel contractor are pile driving, metal deck placing, roof deck installation and crane-derrick use.

PROCESS FLOW:



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Hazards Analysis

Major Hazards			Other Hazards		
Location	**Item**	**Hazard**	**Location**	**Item**	**Hazard**
Material receiving and storage area	Material handling	Shifting or dropped material causing serious injury or death	Material receiving and storage areas	Material handling and rigging	Hands caught between sling and load; head and body injury from contact with swinging loads or equipment
Job site	Overhead haul	Impact injuries from falling tools and hardware	Job site	Manual material and equipment handling	Muscle strain and back injuries from lifting and pushing
	Above ground work locations	Serious injury or death from falls from elevated work locations		Housekeeping	Slips, trips and falls
	Welding and burning	Hand and body burns from hot metals		Welding and motorized equipment	Inhalation of toxic gases and vapors from welding operations and motor exhausts in confined spaces
	Welding, burning and grinding	Eye injuries from welding radiation or flying particles from grinding		Testing joint welds	Radiation burns or poisoning from x-ray or other sources
	Portable power tools	Burns or fatal injuries from faulty electrical tools or equipment		Crane operation and material handling	Electrocution from lead or cable coming into contact with power lines
	Power tools and equipment	Excessive noise exposure from pneumatic or impact tools			

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Key OSHNC Standards

Reference	29 CFR 1926 — Construction Industry Standards
13 NCAC 7F.0207	Bloodborne Pathogens
Subpart C and 13 NCAC 7F.0202	General Safety and Health Provisions - federal and state-specific requirements (for 1926.28)
Subpart D and 13 NCAC 7F.0203	Occupational Health and Environmental Controls - federal and state-specific requirements (for 1926.54)
Subpart E and 13 NCAC 7F.0204	Personal Protective and Lifesaving Equipment - federal and state-specific requirements (for 1926.104)
Subpart F	Fire Protection and Prevention
Subpart G	Signs, Signals, and Barricades
Subpart H	Materials Handling, Storage, Use, and Disposal
Subpart I	Tools - Hand and Power
Subpart J	Welding and Cutting
Subpart K	Electrical
Subpart L	Scaffolds
Subpart M	Fall Protection
Subpart O	Motor Vehicles, Mechanized Equipment, and Marine Operations
Subpart P	Excavations
Subpart Q	Concrete and Masonry Construction
Subpart R and 13 NCAC 7F.0205	Steel Erection - federal and state-specific requirements (for 1926.750 and .754)
Subpart X	Stairways and Ladders
Subpart CC	Cranes and Derricks
1926.556	Aerial Lifts

Inspection Analysis

Inspection normally begins with ground levels operations such as material handling, cranes, material storage, etc. and proceeds through bolt-up and welding operations, floor decking, and finally to fitting-up or connecting work. The most hazardous operation is connecting or fitting-up loose steel at heights, followed by welding, bolt up, and placing deck on elevated levels. There is a basic reluctance in this industry to use safety nets so the proper use of adequate personal protective equipment is imperative. Interviews should be conducted with at least a connector, a welder and the crane operator. Care must be taken during this type of inspection to avoid personal exposure to hazards such as unguarded floor openings, open-sided floors and unguarded stairs. Most of this inspection will have to be done from the ground or completed floor levels, thus the use of binoculars is highly recommended.

Other Pertinent Comments: Available in the NCDOL Library is a book that is a good source for technical information on steel work, *Manual of Steel Construction*, seventh edition by the American Institute of Steel Construction, Inc.