	NORTH CAROLINA DEPARTMENT OF LABOR	**No. 32-1**
	OSH DIVISION	**Date: 10/2009**
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Industry: **Stone, Clay, Glass and Concrete Products**	Sub-Group: **Concrete Block and Bricks**
SIC: **3271**	NAICS: **327331**

PROCESS DESCRIPTION: Concrete masonry units are made by combining aggregates (natural or manufactured), cement and water in the proper proportions. These materials are stored in silos and/or bins and then measured by weight to obtain the desired consistency. Once measured they are mixed and fed into the block machine, where the green material is formed into the desired shape. After being formed these fragile units are moved to storage racks. The racks are transported by forklift to curing kilns. The block remains inside the kilns for 24 hours at a temperature of approximately 175ºF with a very high humidity. This condition is obtained by the introduction of live steam within the closed kilns.

After the curing cycle the masonry units are removed and placed on equipment to separate them from the racks. Once removed they travel by conveyor to the cubing machine where they are stacked into cubes. These cubes then travel by roller conveyor into the strapping station, where metal bands are applied to form a secure unit which can be handled by forklift truck. The forklift moves the finished products to the open yard for storage. From the storage yard they are loaded on delivery trucks and transported to the construction site. At the job side the packages of masonry units are unloaded with a boom that is a part of the delivery truck. Masonry units are divided into two classes: (1) lightweight blocks (manufactured lightweight aggregate, cement, water) (2) normal weight blocks. The standard masonry unit is the 8 inch regular block (8"x8"x16"). Approximately 120 different types of units are in current use.

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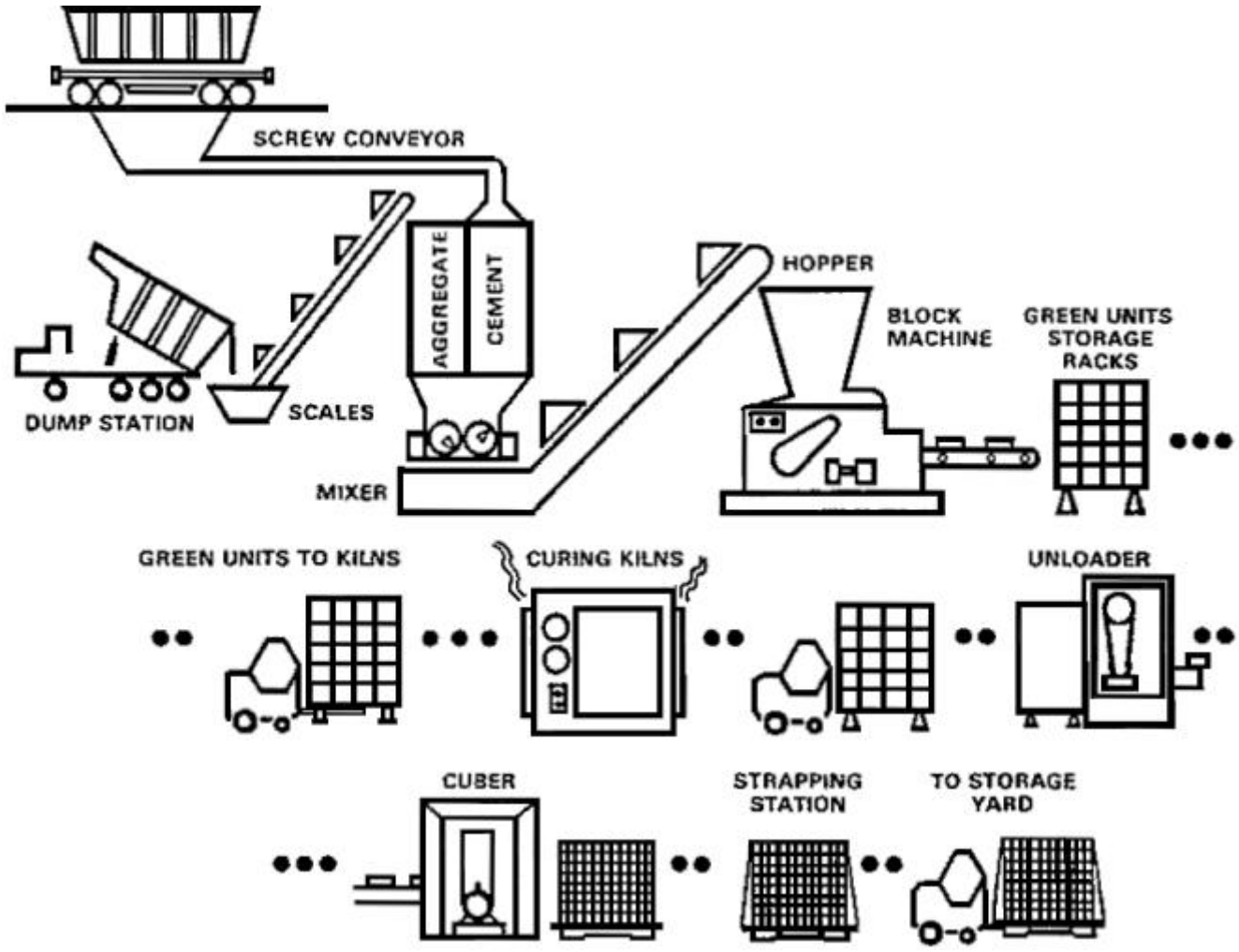
PROCESS FLOW:



Hazards Analysis

Major Hazards			Other Hazards		
Location	**Item**	**Hazard**	**Location**	**Item**	**Hazard**
Silos	Ladders	Falls	Rail siding	Open pit	Falls
Mixing	Railings	Falls into pits below mixer	Screw conveyor	Open screw conveyor	Amputation and crushed limbs

Block machine	Mechanical power transmission apparatus	Amputations and crushed limbs	Conveyors	Material falling	Head injuries from falling material
Loader	Power transmission and point of operation	Moving parts result in foot and head injuries from falling material	Bucket hoist	Chain and parts	Contact with moving parts
Unloader	Broken material	Falling objects, hand injuries	Throughout	Housekeeping (spillage, broken blocks, water) Noise	Slips, trips or falls Hearing Loss
Strapping station	Metal straps	Eye injuries	Block machine	Dust	Inhalation, silica exposure
Shipping and Receiving	Powered Industrial Trucks	Carbon Monoxide, accidents			
Yard	Cranes, hoists	Crushing injuries			

Key OSHNC Standards

Reference	29 CFR 1910 — General Industry Standards
Subpart D	Walking and working surfaces
Subpart I	Personal protective equipment
Subpart O	Machinery and machine guarding
Subpart S	Electrical
1910.95	Occupational noise exposure
1910.146	Permit required confined space entry
1910.147	Control of hazardous energy (lock-out/tag-out)
1910.176	Materials handling
1910.178	Powered industrial trucks
1910.180	Truck Cranes
1910.1000	Air contaminants
1910.1200	Hazard Communication

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Inspection Analysis

The inspection should begin where raw materials, sand, aggregate and cement or natural materials are received either by truck or rail. Check power transmission apparatus at conveyors for proper guarding. Holes and open pits must be covered when not used. Sand, aggregate and cement silos have ladders with heights of 45 to 50 feet, requiring cage, well or other safety devices. Screw conveyors are very dangerous and must be completely enclosed at all points to prevent contact with moving screw. The mixer is located where the bucket hoist goes under the mixer. The pit requires guard rails to prevent falls. At the block machine (high noise level area) ear protection is required for all personnel in area. Noise level readings vary from 97 to 106 dB(A). Personal protective equipment such as hard hats, safety toe footwear and gloves, and in certain areas face shields and eye protection are required. Moving parts, power transmission apparatus, and point of operation guards are required on all machinery. Due to breakdowns and stoppages, locking and tagging procedures must be used when cleaning, performing maintenance, making adjustments and doing repairs on block machine, loader and unloader. Falling objects from block machine create a hazard. Spillage, broken blocks and debris from material require continuous housekeeping efforts. Material handling equipment (forklift trucks) is in use constantly, handling heavy loads. Special attention must be given to overhead guards, truck operations, traveling (with heavy loads), loading on trucks, stacking and maintenance. Operators must be authorized and trained in proper operating procedures. In the storage yard items must be stored in a secure manner. Leaning stacks create a hazard to personnel working below. Stacks must also be limited in height.

Truck cranes must be checked for inspection procedures, records, markings and overall condition. Operators must be checked for inspection procedures, records, markings and overall condition. Operators must be properly trained. Kilns (although not covered by any standard) should be constructed with escape doors and proper passageways within. Heat and high pressure steam lines must be properly covered with heat insulating material.

Other Pertinent Comments: