

APOLLO INDUSTRIAL SAFETY AND HEALTH PROGRAM

Title	MOVING AND SETTING OF EQUIPMENT AND STRUCTURES	Number AISH 31	Revision 01
		Effective Date 03/01/17	Page 1 of 5

1.0 Purpose

- 1.1 To define responsibilities and safety requirements for roofing, insulating and waterproofing, rock crushing, gravel washing, hot mix plants, moving structures and to ensure compliance with all Federal and State regulations.

2.0 Responsibility

- 2.1 The Key Supervisor shall be responsible for the following:
 - 2.1.1 Monitoring the operations of those moving and setting equipment and structures.
 - 2.1.2 To ensure compliance with all Federal and State regulations.
 - 2.1.3 To ensure all pre-job planning documents (AISH 5) are completed, submitted and approved prior to the start of work.
- 2.2 Employees shall be responsible for complying with the provisions of this procedure.

3.0 Definitions

Not Applicable

4.0 General Requirements

- 4.1 Moving of Structures and Equipment
 - 4.1.1 When structures are being raised, lowered, temporarily held in position or moved laterally, you must exercise care to prevent the possibility of mishap.
 - 4.1.2 You must carefully compute weights to be moved and furnish equipment to provide a safety factor of 5.
 - 4.1.3 Where excavations exist you must shore them in compliance.
 - 4.1.4 Cribbing and blocking shall be set on level and firm foundations.
 - 4.1.5 Dollies and rollers must be securely blocked except when structure is being moved by power equipment.
 - 4.1.6 Jacks must comply with all Federal and State regulations.

- 4.1.7 You must make provisions to maintain a minimum clearance of 10 feet from all electrical conductors with the following exceptions:
- (a) When a representative of the owner of the electrical conductors is present and directs the handling of all said conductors.
 - (c) Where there must be existing and/or erected mechanical barriers to prevent contact of structure or workers with said electrical conductors. Barriers must be installed by or under the direction of the owners of the conductors.
 - (d) Where said electrical conductors have been de-energized and grounded by the owners of the conductors.
 - (e) By relocation of said electrical conductors by the owners of the conductors. The 10 foot requirement must not be reduced by movement due to strains being imposed upon the conductors or the structures supporting the conductors or upon any fixtures or attachments thereon.
- 4.1.8 When a structure is being lifted, shoring must be provided at all times and be kept up to the object until the desired height is reached, and then it must be blocked or cribbed immediately.
- 4.1.9 Timbers must be in sound condition and of a size sufficient to maintain not more than one inch deflection for each 200 inches of unsupported span.
- 4.1.10 The cross member used on the front dolly, or the fifth wheel on the truck, must be of construction and size to preclude any deflection. All floor joists of the building being moved must be firmly supported on either the running members or on the cross members, which in turn ride on or are firmly attached to the running members.
- 4.1.11 When timbers are used as the cross member, you must use a steel saddle or cradle which will distribute the load evenly over the cross members, which in turn ride on or are firmly attached to the running members.
- 4.1.12 When timbers are used as the cross member, you must use a steel saddle or cradle which will distribute the load evenly over the cross sectional area of said timber where the timber is supported over the dolly or fifth wheel. This saddle or cradle must be equipped so as to be interchangeable on any standard fifth wheel when such operation is used. Cross members of any other material used on fifth wheel loading must also be so equipped.
- 4.1.13 When running members are secured to the lower side of the cross member supported by the fifth wheel or front dolly, the primary support must be 3/4 inch steel bolts placed one on either side of each member and spaced from such members by 1/2 inch steel plate shaped to act as a template for placement on the top of the cross member and beneath the running member. You must use 3/4 by 3" nuts to tighten the above described clamp in a secure fashion. You must use a secondary binding of chain or cable with

chain binder or jacks to securely fasten the running members to cross members.

Note: Chains or cables securely tightened can be used. A secondary chain or safety chain should also be used in the event that the main chain should snap.

- 4.1.14 You must use safety chains between the running members and the towing truck to supplant the tow bar, and will be secured so as to preclude any possibility of the running timbers being pulled off the cross members on the truck or from the dollies.
- 4.1.15 For the purpose of computing weights to determine the axle and tire loadings, you must use the cubic volume of the building (length, width and height), including walls, floors and ceiling joists, allowing 5 pounds per cubic foot. You must use this method of computing weight to determine if larger equipment need be employed on any given move.
- 4.1.16 When fastening structures to tractor, and runners are clamped to headers, you must use steel chains or the equivalent. If steel chains are used, you must tighten said chains by railroad jacks or the equivalent.
- 4.1.17 All motor vehicles must conform to motor vehicle laws of the state in which they operate in.
- 4.1.18 A fifth wheel type suspension with two non-steering dollies must be acceptable for moving buildings which do not exceed 46 feet in length. You must obtain permission to move larger structures with this type of suspension from the department.
- 4.1.19 Pushing from the rear is prohibited unless a system of signals is used to control the driver.
- 4.1.20 You must carry blocks capable of holding the unit being moved, and in case of winching operations, you must keep them close to the downhill side of the wheel of each dolly to prevent a runaway should the cable slip.
- 4.1.21 Trailers in temporary storage shall be secured in such a manner that winds in excess of 60 mph cannot dislodge trailers off temporary blocks.

4.2 Know the force required to push or pull by using the following chart:

Level & Incline Planes		[For Estimation Only] ⑥
Legend	Formulas	
W = Weight of load	Level: $CF \times W = F$	
CF = Coefficient of Friction	Uphill: $[CF \times W \times (R/L)] + [(H/L) \times W] = F$	
F = Force required to move load	Downhill: $[CF \times W \times (R/L)] - [(H/L) \times W] = F$	
H = Height in feet		
R = Run, horizontal distance in feet		
L = Length of ramp in ft.		

Example

Uphill: $[.15 \times 28,000 \times (10/10.44)] + [(3/10.44) \times 28,000] = F$

$4,032 + 8,120 = F$

$12,152 \text{ lbs.} = F$

Coefficients of Friction			
Concrete on concrete	.65	Wood on metal	.30
Metal on concrete	.60	Cast iron on steel	.25
Wood on wood	.50	Continuous lubricated surface	.15
Wood on concrete	.45	Steel on steel	.10
		Load on wheels	.05
		Load on ice	.01
		Load on air	.002

4.3 Manual-lever-operated hoists/Ratcheting action chain falls (wire rope, chain, and web-strap types) used to pull, lift or drag shall be equipped with a load limiting device. The Load Limiter alerts operator of a possible overload by allowing the handle to rotate without pulling, lifting or dragging the higher-than capacity load.

4.4 The placement of wheels, roller dollies, rolling pins, etc. underneath the load can be used.

4.5 Labels shall be affixed to the hoist or load block and shall display the word WARNING or other legend designed to bring the label to the attention of an operator.

4.5.1 The label shall contain cautionary language against any of the following:

- a) Lifting more than the rated load.
- b) Operating a hoist when it is restricted from forming a straight line with the direction of loading.
- c) Operating the hoist with twisted, kinked, or damaged wire rope, chain, or webbing strap.
- d) Operating damaged or malfunctioning hoists.
- e) Lifting personnel or lifting loads above personnel.

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- f) Operating a hoist with lever extensions (for lever-operated hoists).
- g) Removing or obscuring warning labels.

4.6 Operator Training/Qualification

4.6.1 Hoist operators shall be trained and qualified for the inspection, use and maintenance of hoist.

5.0 Procedure

Not Applicable.

6.0 Records

Not Applicable

7.0 References

<p>AISH 5 29 CRF 1926 WAC 296-155</p>	<p>Pre-job Safety planning Safety and Health Standards for Construction (OSHA) Safety Regulations for Construction Work (WISHA), Part R</p>
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8.0 Attachments

Not Applicable