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SAFETY MANUAL FOR CONTRACTORS

FOR USE ON ALL CONTRACTED WORK IN THE TEXAS DIVISION

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THE DOW CHEMICAL COMPANY

Engineering & Construction Services

July, 1965

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SAFETY

MANUAL FOR CONTRACTORS

FOR USE ON ALL CONTRACTED WORK
IN THE TEXAS DIVISION

This manual supersedes Safety Rules & Procedures for Contractors dated August, 1963.

THE DOW CHEMICAL COMPANY
Engineering & Construction Services
July, 1965

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SAFETY MANUAL FOR CONTRACTORS

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INTRODUCTION

This safety manual contains the minimum safety rules and procedures for performance of work by contractors and their subcontractors as required by the Texas Division, The Dow Chemical Company. Contractor assumes and has the full responsibility and liability for the safety of its agents, servants and employees and for the compliance of its subcontractors and anything contained herein does not relieve the contractor of such responsibility or liability. The Dow Chemical Company is hereinafter referred to as "Owner." The Owner will be represented on construction as defined in the contract and hereinafter referred to as "Owner's Representative."

Safety rules and procedures are an integral part of each contract and must be carried out fully, as any other specification for the job. The contractor will be held responsible for his subcontractors conforming with these safety rules and procedures. Any exception to the rules set forth herein must have prior written authorization from the Owner's Representative.

Contractor supervision unable or unwilling to secure personnel performance in keeping with these rules will not be acceptable as supervisors. Contractor employees who exhibit a poor attitude toward safe work and safety procedures will not be acceptable. Employees leaving a job due to safety violations will not be allowed to return to any Owner's work without proper authorization from the Owner. The contractor's safety

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record will be one criteria used to judge his qualifications for bidding.

In addition to the rules set forth herein, contractors working in or near an existing operating facility must be cognizant of and conform to Owner's safety rules for that area and any federal, state or local laws governing.

Should any procedure set forth herein conflict with applicable federal, state or local laws, the latter will apply

1.0 GENERAL SAFETY RULES

1.1 The contractor shall actively and adequately promote safe working performances on the part of his employees. He shall participate in activities to this end, such as safety organizations, special drives, contractor-owner programs, etc. It is expected that each contractor will conduct his own safety programs to best suit his particular needs.

1.2 Prior to starting any field work on each job, the Owner's Representative will conduct a pre-job safety conference with an authorized representative of the contractor, a Process Representative, available subcontractor's representatives and Owner's Safety Department representative, when available. At this time, the nature of any chemical hazards or special safety rules for the area will be reviewed with the Process Representative and the contractor will be provided with printed copies of area rules where applicable. When the "pre-job safety check sheet" form is completed, it will be retained by the Construction Department and a copy furnished to the contractor.

Sample as follows:

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PRE JOB SAFETY CHECK SHEET

JOB AREA

C O NUMBER CONTRACTOR

1	Standard Emergency signals fully understood?	Yes [ ]	No [ ]
2	Contractor responsible to inform all employees of emergency signals understood?	Yes [ ]	No [ ]
3	Fire and ambulance telephone numbers known?	Yes [ ]	No [ ]
4	Areas for possible evacuation designated?	Yes [ ]	No [ ]
5	Special safety rules and signals for this area known? (Owner will provide printed special rules where available.)	Yes [ ]	No [ ]
6	Nature of chemical or special hazards for area reviewed with Process Representative?	Yes [ ]	No [ ]
7	Special safety equipment for this area known?	Yes [ ]	No [ ]
8	Safety Showers and Eye Wash locations known?	Yes [ ]	No [ ]
9	Safe work permit understood? (Designated places to obtain known?)	Yes [ ]	No [ ]
10	Red Tag rule understood?	Yes [ ]	No [ ]
11	Smoking area designated?	Yes [ ]	No [ ]
12	Contractor scaffold rules known?	Yes [ ]	No [ ]
13	Do you have a copy of and understand "Safety Manual for Contractors?"	Yes [ ]	No [ ]
14	Are your Sub Contractors aware of above rules and procedures?	Yes [ ]	No [ ]

REMARKS (Explain all "No" answers.)

Contractor Representative	Date	Sub Contractor	Date
Owner's Representative	Date	Sub Contractor	Date
Process Representative	Date	Sub Contractor	Date

1.3 Contractors are responsible to inform all their employees of all safety rules and all safety procedures before working in an Owner's plant.

1.3.1 When new employees are hired, they must be thoroughly indoctrinated with the safety rules.

1.3.2 Contractors must inform all of their employees of the location and use of nearest safety shower, eye bath and emergency equipment such as gas masks, fire extinguishers, and fire blankets.

1.4 Orderliness is a basic requirement for all jobs and must be maintained at all times. Special attention must be given to maintaining clear walkways and roadways, removal of trash, removal of slipping and tripping hazards and proper stacking of materials.

1.4.1 Temporary buildings and material storage areas shall be lined up as squarely as possible with the job site in keeping with an orderly appearance.

1.5 Contractors must report to the Owner's Representative, by name, those employees discharged for safety rule infractions.

2.0 EMERGENCY PROCEDURES

2.1 The following procedure must be used to call an ambulance, report a fire, spill of hazardous materials or release of hazardous gases.

2.1.1 Dial 666 and state the type of emergency.

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2.1.2 Give your name, the nature of the emergency and its exact location including building number and door letter, if applicable.

2.1.3 Stay on the line until sure that the message is understood and confirmed.

2.1.4 Station someone on the road to direct emergency equipment to the scene.

2.1.5 If the "666" number does not answer, dial "0."

2.2 In the event of an explosion or fire, contractor personnel working in the area affected must observe the following rules:

2.2.1 Shut down all of your equipment in operation and leave at once.

2.2.2 Report to your company field office immediately, in person or by phone.

2.2.3 DO NOT re-enter the area until authorized by the Owner's Representative in charge of the job.

2.2.4 The contractor must notify the proper Owner's headquarters in person or by telephone as soon as possible that all employees in the area are accounted for or that specific employees cannot be accounted for.

2.3 Personnel must know the location of any plant alarm horns. In case of a gas release, observe the wind direction as indicated by the alarm horn and wind vane indicator and proceed

to go crosswind. STANDARD EMERGENCY SIGNALS are as follows:

2.3.1 GAS RELEASE _____ (continuous) Shut down all of your equipment in operation. All safe work permits in that area are automatically cancelled. Personnel in other areas downwind must be alert for signals in their area or verbal instructions.

2.3.2 ALERT – – – – –(series of short blasts) Shut down all of your equipment in operation. All safe work permits in that area are automatically cancelled. Personnel in other areas downwind must be alert for signals in their area or verbal instructions.

2.3.3 EVACUATE --- --- --- (series of 3 short blasts) Observe the wind direction as indicated by the alarm horn and wind vane indicator and proceed to go crosswind.

2.3.4 ALL CLEAR ——— ——— ——— (series of 3 long blasts) When this signal is given, personnel may re-enter the work area. Safe work permits must be reissued prior to starting work.

2.4 If operating a motor vehicle in an area where emergency signals are given, turn off the engine, get out of the vehicle, and be prepared to leave the area if necessary. Motor vehicles, other than emergency units, must not be driven into an area downwind of a gas release signal. Barricades across plant roads must be honored by all vehicles at all times.

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2.5 Emergency horns are tested each Monday at 1:00 noon with the "All Clear" signal given first and last in the test cycles.

2.6 The Power Plant whistle is sounded in case of a fire.

3.0 FIRST AID – INJURIES – REPORTS

3.1 Employees must report any injury to their immediate supervisor even though it may be considered slight.

3.1.1 The contractor will assure that all injured personnel report to a recognized medical facility. A First Aid Station is available at Plant A and the Community Hospital Emergency Room is at Plant B. The contractor is responsible to furnish treatment reports if medical facility other than above is used.

3.1.2 In the event of eye injuries or any serious injury, the ambulance must be called as instructed in paragraph 2.1.

3.1.3 In the event of accidents, ambulance runs, etc., contractors must exert all possible effort to keep onlookers from the scene. The only personnel required in such areas are those directly engaged in assisting in the emergency.

3.2 Employees must not attempt to remove foreign material from the eyes, except by washing with water. If foreign material gets in the eye, the eye must be washed immediately with potable running water, preferably at an eyewash station and the washing continued uninterrupted

for at least fifteen minutes. It is vital that the injured employee and others who are able to help him make sure that thorough and complete washing of the eye is accomplished. The ambulance must be called as instructed in paragraph 2.1

3.3 If chemicals come in contact with the body, the affected parts must be washed with running water for at least fifteen minutes. To make sure that adequate washing is accomplished, shoes and clothing covering affected parts must be removed. The Owner's Representative must be consulted before reuse of clothing and shoes that may have been contaminated.

3.4 The Owner's Representative shall be notified immediately in the event of any death, occupational disease, disabling injury or potentially significant injury to a contractor employee (whether or not it is determined that "lost time" will be involved) while at work on the Owner's job.

3.4.1 The contractor must thoroughly investigate, determine and report all details of an accident.

3.4.2 A detailed written report shall be submitted to the Owner's Representative as soon as possible, but no later than 10:00 A.M. the following day. Accident forms are available from the Owner's Representative.

3.4.3 If details warrant, or upon request, the contractor will supplement the report in para-

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graph 3.4.2 with a more detailed letter and affidavits of witnesses.

3.5 All fires must be reported, regardless of duration or extent.

3.6 The contractor will report verbally, or in writing upon request, any potentially dangerous event or situation encountered on his job even though no injury or accident occurred.

4.0 INDIVIDUAL ACTION

4.1 Horseplay in any form is not allowed.

4.2 Running in the plant must be avoided except in case of an emergency.

4.3 Personnel must not climb through, under, over or between railroad cars of a train except in the performance of assigned duties.

4.4 Personnel must not make inoperative or operate safety devices such as relief valves, deluge valves, gate valves, electrical and mechanical interlocks, guards, electrical switches, etc.

4.4.1 Any accidental interruption of lines or equipment in service or any irregularities observed must be reported to the Owner's Representative and/or the Owner's operating personnel immediately.

4.5 Unsafe shortcuts, such as walking pipelines, sliding down pipe or stanchions and cutting corners to save a few steps, must be avoided.

4.6 Tools, materials or equipment must not be intentionally dropped or thrown from one level to another unless adequate precautions have been taken to assure that no injury to persons or damage to equipment will occur.

4.7 Contractor personnel must not ride a load being handled by a crane. Slings, hooks, etc. may not be ridden, except where a crane basket or a bosuns' chair and safety belt are used.

4.8 Personnel must not walk, drop or jump onto a transite roof, whether existing roof or one being installed. Where a permanent platform or walkway is not provided, a temporary walkway or spread footing shall be used to distribute the load over a large area of the transite.

5.0 VEHICLES AND TRAFFIC

5.1 Personnel working on Owner's property will comply with all safety rules and signs regarding traffic and vehicles at all times.

5.2 The maximum speed limit on open roads in the plant is 30 miles per hour and 10 miles per hour within block limits, unless otherwise designated by signs.

5.3 Vehicles must not pass a plant bus in either direction while it is stopped on plant roadways for the purpose of loading or discharging passengers except, after coming to a complete stop, the vehicle may proceed around the bus at

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no more than 10 miles per hour provided the way is clear.

5.4 Smoking will not be permitted in vehicles in designated "NO SMOKING" areas.

5.5 Hauled material that overhangs the sides or ends of a truck must be red flagged at the extent of the overhang. Loads must not be hauled from a single suspension cable that allows free swinging beyond the sides of the truck. Dragging or skidding material and objects along plant roadways is prohibited.

5.6 Fuel tanks on motorized equipment must not be filled while the engine is running or when welding or other hot work is being done nearby. Smoking will not be allowed during fueling operations.

5.7 Equipment such as welding machines, pumps, etc., shall not be transported with the engine running.

5.8 All equipment must be in safe mechanical working condition at all times. In addition to complying with state requirements as to brakes, lights, signals, horns, mufflers, etc., vehicles must be periodically inspected by a representative of the contractor. Necessary repairs and adjustments must be made prior to their use on Owner's property.

5.9 The use of winch trucks, flatbeds, stakebeds, etc., as transportation for personnel will not be permitted unless adequate safety provisions are made and the vehicle is adapted for

that purpose. In any case the number of personnel must not cause overcrowding or exceed the rated capacity in pounds of the vehicle involved.

5.10 Riding of "Cherry Pickers" or yard cranes is permitted only when adequate safety provisions such as seats, platforms, rails, etc., are provided for passengers.

5.11 The maximum number of people who may ride in a pickup truck is three in the cab and six seated on the floor of the bed, or on approved "built-in" seats.

5.12 Personnel must be sitting down at all times when the vehicle they are riding is in motion and must not have any part of their body over the sides.

5.13 Pedestrian paths and walkways must be used whenever provided. In their absence, personnel using streets and roadways must walk facing approaching traffic.

5.14 The following rules must be observed by personnel in the operation of cranes, cherry pickers, winch trucks and similar equipment having booms or extended loads in excess of 15 feet in front of or to the rear of the equipment.

5.14.1 Stop at all stop signs.

5.14.2 At intersections, when the equipment is to proceed straight across a main thoroughfare or turn either way, the operator must stop; the flagman must get off the equipment, clear all traffic, then flag the equipment through the intersection or around the corner.

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5.14.3 Before entering any thoroughfare, street, road, etc., from a work area within a block, the flagman must clear the traffic and flag the equipment onto the road.

5.14.4 All booms or loads extending more than 15 feet must be marked or flagged with high visibility material when moving on plant roads.

5.14.5 While carrying long loads, a flagman must be provided and swinging must be controlled with a tag line when moving in a congested area or where there is personnel.

5.14.6 Loads or vehicles that extend out of the normal road lanes require flagman or escorts.

5.14.7 Contractors must check vertical clearances on the route to be used prior to moving equipment or high loads.

5.15 Contractors must determine from the Owner's Representative when and which roads are to be used, prior to moving extremely heavy loads such as large rubber-mounted equipment and low-boy loads.

6.0 PROTECTIVE EQUIPMENT AND CLOTHING

6.1 The contractor and his employees shall recognize the importance and the use of special protective equipment and clothing.

6.1.1 The contractor shall be responsible for knowing and enforcing special Owner area or job rules requiring special personnel protection.

6.1.2 Contractors shall provide their employees with the proper protective equipment required.

6.2 Approved safety glasses with side shields will be a minimum requirement on all contractor jobs at all times.

6.2.1 Approved safety glasses with side shields must fulfill federal requirements (GGG-G-513) for drop ball testing and safety code for polarized "Strain" pattern. The minimum thickness of lens shall be 3MM.

6.2.2 Employees wearing contact lens must wear chemical goggles.

6.3 Chemical goggles are required for working in or entering certain chemical areas which are posted with signs.

6.3.1 All employees working in the vicinity of chemicals must know where the nearest safety shower and eye bathing facilities are located.

6.3.2 When chemical type goggles are in use, the headband must be around the back of the head, not around the safety hat.

6.4 Approved plastic safety hats are required for all contractor work. The use of metal safety hats is prohibited.

6.4.1 Approved plastic safety hats must fulfill requirements in Federal Specification GGG-11-142b. The major requirement in this specification says "The specimen must withstand the drop of an 8-pound spherical weight, approximately 3.8 inches in diameter, from a distance of 5 feet, without breaking the hat, bottoming out or breaking suspension." Most skull caps, scalp guards, bump helmets, etc. will not meet this test.

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6.5 The contractor shall furnish and be responsible that all of his employees wear air hoods, or equivalent, supplied with filtered air, when sandblasting or applying volatile or toxic material inside tanks, rooms or any other area not adequately ventilated.

6.6 Safety belts or harnesses, with lifelines attached, are to be worn by employees when performing work in elevated positions where the use of scaffolds or ladders is impractical and where a slip might result in a serious fall.

6.7 Personnel must wear Coast Guard approved life jackets or otherwise be protected by handrails or lifelines when working over water wherein a drowning hazard exists.

6.8 Employees are expected to wear personal clothing that is safe and proper for their job. Wearing of canvas shoes, sneakers or houseshoes and working in an undershirt, shorts or stripped to the waist is prohibited. Safety shoes are strongly recommended.

7.0 FIRE PROTECTION

7.1 Accumulation of trash, oily rags, combustible materials and similar fire hazards of any nature will not be permitted.

7.2 The area around welding operations must be kept free of hoses and flammable material of all kind.

7.2.1 Special care must be taken during overhead welding operations to safeguard personnel and prevent falling sparks from starting a fire.

7.3 Tarpaulins shall be flame-proofed and identified as such

7.3.1 Contractors must inspect and tag each tarpaulin at least once each six months to insure flame resisting qualities

7.4 Fire plugs, extinguishers, hose racks and other emergency equipment, shall not be covered or blocked and fire equipment lanes must always be kept clear.

7.5 All heating units for offices, shops, work areas, change rooms, etc., must be in good working order, periodically inspected and provided with a "flame out" protective device. ALL HEATING UNITS SHALL BE CUT OFF AFTER WORKING HOURS 7.6 Flammable or explosive type material such as fuel, oil, cleaner, etc., must be properly contained, clearly identified, separately stored and kept clear of work areas. Appropriate signs must be provided in storage areas.

7.7 All cans used for transporting or transferring gasoline or fuel must be labeled by Underwriters' Laboratories or Factory Mutual Laboratories.

7.8 Fuel storage tanks, filler hoses and the dispersing vehicle or container must be properly grounded. The equipment being fueled must also be bonded to the dispersing vehicle or storage tank.

7.8.1 A shut-off valve is required on the dispensing end of fuel hoses.

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7.8.2 Equipment fuel tanks must not be filled while the engine is running.

7.8.3 Smoking, welding or any spark-or flame-producing operation must be stopped in the immediate area during refueling operations.

7.9 Welding rod cabinets presenting a fire or safety hazard will not be permitted. Cabinets of fireproof materials equipped with strip heaters are recommended. If light bulbs are used, they must be securely guarded with adequate spacing in regard to the cabinet and to stored material. Metal cabinets must be grounded in an approved manner.

7.10 Volatile materials must not be applied near an open flame. If such material is to be applied in a vessel, or other poorly ventilated, confined area, only explosion-proof lights and connections will be used. The contractor must designate such areas as "No Smoking."

7.11 The type of heating equipment for freeze protection of concrete must be approved by the Owner's Representative prior to use.

7.12 Welding or cutting torches and hoses must not be connected to cylinders when stored in any enclosure or building. When work is shut down and equipment is unattended, close all valves at the acetylene and oxygen cylinders, bleed lines and check five minutes later for pressure build-up. If there is no build-up, bleed hoses at the torch, remove hoses from cylinders and store. No smoking will be permitted during this shutdown procedure.

7.13 Gas and oxygen cylinders must be handled with care, properly supported in an upright position away from any source of heat or flame and securely tied off. All oxygen cylinders not in use must have their caps in place and stored as above.

7.13.1 Oxygen cylinders in storage and not in use must be separated from gas cylinders by a fire retardant partition or a minimum distance of 10 feet.

7.13.2 When gas and oxygen cylinders are lifted by hoisting equipment, a basket, cradle or similar handling device must be used. Slings may be used only if the cylinders are specifically equipped for such handling. Cylinders must not be lifted by the valve protection caps.

7.14 All "No Smoking" restrictions in specified areas must be strictly observed. Smoking is not permitted in vehicles in designated "No Smoking" areas.

7.15 Compressed gases must not be used for cleaning of clothes, the body or work areas. Oxygen must not be used for pressure testing purposes.

7.16 Adequate ventilation must be provided when cleaning agents are used.

7.17 Contractors must not dump flammable or toxic materials into sanitary sewers or waste water system without prior clearance of the Owner's Representative.

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8.0 MACHINERY, TOOLS AND EQUIPMENT

8.1 The designed capacity of any tool or piece of equipment must not be exceeded or modified in any manner that affects the original designed performance of the equipment.

8.2 All contractor owned, leased or rented equipment must be in safe mechanical working condition to render efficient service at all times.

8.2.1 Equipment must be inspected by contractor supervision prior to its use on a job and periodically thereafter to insure that it is in safe working order. Special attention must be given to such items as cables, guards, booms, blocks, hooks, grounds, electrical cords and safety devices. Equipment must be shut down before repairs or adjustments are made.

8.2.2 Defective tools and equipment must be removed from the job immediately and if repairable, must be properly repaired before reuse on Owner's job.

8.2.3 Machinery, tools and equipment must not be operated without all guards and safety devices in place and functioning properly.

8.3 Equipment with exposed gears, belts, couplings, etc., must be provided with proper guards.

8.4 Pressure vessels including boilers must receive an annual hydrostatic test equal to 1-1/2 times the maximum allowable working pressure of the unit as well as a thorough visual external inspection. At this time, safety and relief valves, properly sized and set for the vessel, will be checked for freedom of operation.

8.4.1 Written certification of compliance to this rule will be furnished the Owner's Representative on first arrival of the equipment at the plant or job site and annually thereafter.

8.5 Electrical tools and equipment operating at more than 32 volts must be properly grounded. Certain test equipment such as oscilloscopes, vacuum tube voltmeters and signal generators, as well as certain areas where exposed d.c. equipment is used, do not require grounding and proper operational procedures must be ascertained from the Owner's Representative in the above areas.

8.6 Only 32-volt transformers are to be used in connection with drop lights when working inside metallic vessels, unless 115-volt service is essential for the operation of equipment.

8.7 Material that is being arc welded must have the grounding lead connected near the welding operations. Special care must be taken to insure that the grounding lead is within the area as limited on the safe work permit.

8.8 Any contract provision for connections to an Owner's plant services for construction use must be cleared with the Owner's Representative. Authorized connections must be made under the direction of the Owner's personnel.

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The turning off and on of the supply shall be done only by authorized Owner's personnel.

8.9 Gloves must not be worn while using grinders, drills, saws or any tools where gloves are apt to become entangled.

8.10 Loose clothing must not be worn while working around machinery.

8.11 Personnel must request the use of and obtain Owner's "manlift elevator safety instruction" procedure prior to using any manlift.

8.12 Personnel must not crank any machinery with their feet.

8.13 Contractors' temporary buildings must be properly tied down immediately upon placement at the job site. A minimum of four 4" screw anchors a minimum of 2' in the ground are required. A minimum of two such anchors are required for portable toilets.

8.13.1 Metal buildings served with electricity must have the skin of the building properly grounded, as well as the service entrance switch.

8.14 Hose connectors and adaptors must be of a standard manufacture and used only for the type of service intended.

8.14.1 In order to insure positive locking at all times, connectors must be in good condition and not abused.

8.14.2 Air pressure on pneumatic tools must be bled down before tools are disconnected from air supply.

9.0 LADDERS AND SCAFFOLDS

9.1 Contractor employees must make certain that ladders are of the proper length and in good condition before using them. All unacceptable ladders must be immediately removed from Owner's property.

9.1.1 Ladders are not to be painted with anything other than clear paint.

9.1.2 All straight ladders must be tied off or held and stepladders higher than ten feet must be tied off at the top or held at the bottom by another workman. Employees must not stand on the top step of a stepladder.

9.1.3 Face the ladder and keep both hands free for climbing.

9.1.4 Where practical, grasp the ladder by the side rails rather than the rungs.

9.1.5 Set straight ladders so that the bottom is out from the vertical about one-fourth of the distance from the upper support to the bottom.

9.1.6 All ladders should be provided with adjustable feet.

9.1.7 The area around the bottom of all ladders must be free from slippery substance and tripping hazards.

9.2 Makeshift scaffolds such as boxes, crates and drums must not be used.

9.3 Wood scaffolding is not permitted ex-

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cept in special cases as specified ~~in operating area rules and~~ job specifications or by prior written approval from the Owner's Representative. ~~Aluminum scaffolding is not permitted except~~ on prior written approval from the Owner's ~~Representative~~.

9.4 The following rules apply to all patented metal scaffolds:

9.4.1 Scaffolds must be erected with proper appurtenances and fixtures made for each type of scaffolding. Scaffolds and associated equipment must not be modified in any manner that affects the manufacturer's designed performance.

9.4.2 All equipment must be kept in good repair, avoid rusting, the strength of rusted materials is not known.

9.4.3 Never use any equipment that is damaged or deteriorated to the extent that it is unsafe.

9.4.4 Compensate for unevenness of ground by using adjusting screws in addition to proper blocking.

9.4.5 Do not force braces to fit. Adjust evenness of scaffold until the proper fit can be made with ease.

9.4.6 Use ladders when climbing scaffold rather than the cross braces & HAND RAILS.

9.4.7 Horizontal diagonal bracing shall be used to prevent racking of all scaffolds at bottom and intermediate levels of thirty feet.

9.4.8 Planking overhang shall be 3-5/8" on stackup scaffolds. 1" x 4" wood cleats shall be

nailed across top of planking at each end outside end frames. 2" x 2" cleats shall be bolted underside each end of plank with 2 1/4" galvanized stove bolts.

9.4.9 Guy or tie off all fixed towers every 18' of elevation.

9.5 The following rules apply to rolling tower scaffolds:

9.5.1 Towers of a height greater than three times the minimum base dimension must be guyed or tied off while being used.

9.5.2 Caster brakes must be applied when not in motion.

9.5.3 Towers must be free of men, material and equipment before being moved. Care must be exercised while moving.

9.5.4 Make sure that the surface area where tower is being moved is free of rubble, material or any small object that may cause the tower to tip.

9.5.5 Don't attempt to move a rolling tower without sufficient help.

9.5.6 Do not extend adjusting screws more than 12".

9.5.7 Use 6" casters regardless of tower

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height. Scaffolds higher than 25' are unstable while in motion, therefore stability must be maintained either with outriggers or hand lines.

9.5.8 Horizontal diagonal bracing is to be used at the bottom and at intermediate levels of 30 feet.

9.5.9 Do not use knee braces on rolling towers.

9.6 The following rules apply to suspended scaffolds:

9.6.1 Chains shall be used to support suspended scaffolds. All suspended scaffolds shall be anchored to prevent swinging. Chains so used shall be made of not less than 1/4" links * and shall be inspected immediately prior to each use.

9.6.2 The suspended support must be insulated when arc welding is to be performed from platform, thus avoiding accidental arcing and subsequent failure.

* 1/4" proof coil loading chain Safe load	900 Lbs.
5/16" proof coil loading chain Safe load	1360 Lbs.
5/16" proof coil loading chain Proof tested	2720 Lbs.
5/16" proof coil loading chain Unlimited	5440 Lbs.

9.7 The following rules apply to all scaffolds:

9.7.1 Scaffolds and related material shall be carefully inspected at regular intervals and particularly just before using.

9.7.2 Provide sufficient sills or underpinning on all scaffolds to be erected on filled or otherwise soft ground. Scaffold boards shall not be used for this purpose.

9.7.3 All scaffolds must be plumb and level at all times.

9.7.4 Anchor running scaffolds to wall approximately every 28' of length and 18' of height. Use additional care when using pulley arms.

9.7.5 Handrailing and access ladders must be used on all scaffolds regardless of height. Scaffolds higher than 30 feet around columns, tanks, etc., must have access ladders constructed on the inside, unless a ladder cage is provided.

9.7.6 Scaffolds must not be used as material hoist towers or for mounting derricks without first determining the loads and stresses involved.

9.7.7 Erect scaffold in such a manner that ladder is accessible and lined up from top to bottom.

9.7.8 Lumber used in the construction of platforms shall be of good quality and reasonably straight grained. It shall be free from injurious ring shakes, checks, splits, cross grains, unsound knots, knots in groups, decay and growth

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characteristics which materially decrease the strength of the lumber. Planking shall not be painted all over, as this would conceal any defects. Scaffold boards shall be identified by painting each end. All scaffold boards shall be used exclusively for that purpose.

9.7.9 The normal size of planking shall be determined from Table I. These values are for planks with the wide face up, with the loads concentrated at the center. Loads given in the table are net. Allowance has been made for the weight of the planking. If select structural coast region douglas fir, merchantable structural square and sound southern pine are used, the loads may be increased 15 percent.

9.7.10 Planks used for platforms shall be of uniform thickness, laid close together. These planks must be overlapped at the bearers. An overlap of at least two feet must be allowed with the bearing in the center of the overlap. When planks overhang a bearer more than one tenth of the length of the span, the planks must be securely fastened to the bearer at the opposite end to prevent tipping.

9.7.11 All nails used in scaffold construction shall be driven full length. No nail smaller than 8d shall be used in this construction and enough nails must be driven to support the designed loads. The design must be such that no nail is subject to a direct pull.

9.7.12 Where beams are used in scaffolding, the schedule of loads shown in Table II, shall be

followed. Loading on cantilever type beams used for tool and material hoists is shown in Table III. It should be noted that the loading at the center of bearing point is 4 times as great as the load being lifted and the bearing should be checked to ascertain if it will support the contemplated load. The inboard end of the beam has a force upward of twice the load and must be securely fastened with no nails in direct pull.

9.7.13 Platforms shall be kept clear of slippery substances.

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TABLE I
SAFE CENTER LOADS FOR SCAFFOLD PLANK IN POUNDS

SIZE OF PLANK

Span In Feet	2 x 10 Dressed To 1⅝ x 9¼	2 x 12 Dressed To 1⅝ x 11½	3 x 10 Dressed To 2⅝ x 9¼	3 x 12 Dressed To 2⅝ x 11½
6	256	309	667	807
8	192	232	500	605
10	153	186	400	484
12	128	155	333	404
14	110	133	286	346
16		116	250	303

TABLE II
SAFE CENTER LOADS ON TIMBER USED AS BEAMS IN POUNDS

LENGTH OF SPAN IN FEET

Nominal Timber Size	5	6	8	10	12	14	16	20	24
2 x 4	440	290	210						
4 x 4	725	575	420	330	260	215			
2 x 6	780	650	470	360	290	240	190		
2 x 8	1400	1150	850	660	530	450	370	270	190
2 x 10	2190	1820	1350	1050	860	710	600	450	320
2 x 12	2800	2630	1950	1530	1250	1050	890	670	510
3 x 8	2100	1730	1290	990	810	680	560	410	290
3 x 10	3290	2750	2120	1590	1300	1070	900	670	490
3 x 12	4525	3940	2920	2300	1880	1570	1340	1000	660

TABLE III
SAFE LOADING FOR SIMPLE MATERIAL HOIST ON CANTILEVER BEAM IN POUNDS

LENGTH OF CANTILEVER (B) IN FEET

Beam Size	2	3	4	5	6	7	8
4 x 4	220	160	105	80	65		
4 x 6	495	320	260	190	150	125	105
6 x 6	740	490	360	285	230	190	160
6 x 8	1325	875	650	515	420	350	300
8 x 6	1765	1165	865	685	560	470	400

Horizontal dimension from front bearing to rear anchor must be equal to or greater than cantilever projection "B" in table

10.0 DANGER, WARNING AND CAUTION TAGS

10.1 Danger Tags (Red)

10.1.1 To insure that operating status of equipment is not changed while it is being used or worked on, Red Danger Tags must be attached to the controls so that personnel will know not to use them. These tags must be used to protect personnel exposed to hazards of equipment and must be respected by all personnel. The personnel responsible for the operation of equipment or their designee must clear and tag the equipment. Any personnel whose safety could be endangered while working on this equipment must affix their tag. Violation of Red Danger Tag Rules will result in disciplinary action up to and including rejection from any work on Owner's property.

10.1.2 No control such as a valve, switch, clutch, etc., is to be operated by anyone while a Red Danger Tag is attached. If a control must be operated intermittently such as for testing equipment, the Red Danger Tag must be properly removed before each operation. Attachment of danger tags to equipment controls does not mean that equipment has been cleared to work on. When work is to be done on tagged-out equipment, personnel responsible for the operation of the equipment are responsible for clearing the equipment and making it safe for others to work on.

10.1.3 Whenever the operation or use of any equipment may endanger anyone, a request must be made to supervision of the group which operates the equipment to clear and tag the equipment.

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"Clearing" means making the equipment inoperable and safe for others to work on. The authority to clear and tag equipment may be delegated by this supervision to any qualified personnel after supervision has assured themselves that the person delegated can properly clear the particular job involved.

10.1.4 After the group which operates the equipment has cleared and tagged the equipment, each worker or group of workers who may be exposed to the hazards must tag the equipment for their protection. When Red Danger Tags are attached to equipment by persons other than those responsible for its operation, prior approval from the person responsible shall be obtained.

10.1.5 As the individual jobs have been completed, each worker or group of workers must remove their tags immediately.

10.1.6 The group responsible for the equipment must place their tag first and remove their tags last.

10.1.7 Red Danger Tags may be removed only upon authorization of the person designated on the tag. The supervisor of any person who fails to remove a Red Danger Tag when a job has been completed may authorize the removal of the tag after he has determined to his complete satisfaction that the equipment can be operated in a safe manner. In the space on the tag entitled "Removal Will be Ordered By_____..." it is permissible to designate a classification such as shift foreman, electrician, or machinist instead of a specific individual's name.

10.1.8 At the discretion of the supervisor, locks may be used on valves and switches in addition to, but not replacing, Red Danger Tags.

10.1.9 Tags removed must be filled out and turned in to the Owner's Representative.

10.2 Warning Tags (Green)

10.2.1 When it is necessary to convey instructions or information prior to operation of equipment controls, Green "Warning" Tags are to be attached to the controls.

10.2.2 Green "Warning" Tags should be removed when conditions set forth on the tag have been met.

10.3 Caution Tags (White)

10.3.1 White caution tags are affixed to mechanical or electric equipment by the Owner's Representative to prevent operation of such equipment by anyone until items on the tag have been completed.

10.3.2 The tag provides spaces for megger-ing, rotation, final alignment and lubrication of equipment. When appropriate action has been taken, the personnel performing the work signs and dates the tag.

10.3.3 When tagged equipment is released to the Owner, a representative of Operations and the Owner's Representative sign the tag which is kept by the Owner's Representative until job completion.

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11.0 SAFE WORK PERMITS

11.1 Safe Work Permits issued by the Owner to contractor personnel are required for certain hazardous locations and conditions. These permits are designed to provide a means of checking at the job site the safety of such jobs as, but not limited to, entering closed vessels, working on electrical gear, welding, cutting on, breaking into or repairing pipelines or vessels in operation or under pressure or that have contained hazardous materials. These permits also cover work involving the use of flame or spark producing equipment in hazardous areas or near an open ditch and work on machinery.

11.2 Contractor supervision must be in close contact with the progress of work as well as communicating with the Owner's Representative for up to date status of operations. Further, contractor supervision must be certain that all personnel involved are informed as to specific procedures and changes in the situation.

11.3 Safe Work Permits are to be initially requested through the Owner's Representative and issued by the Owner's operating area or facility supervision involved on any job where the Safe Work Permit is applicable. More than one Safe Work Permit may be required on certain jobs which will be ascertained upon obtaining each Safe Work Permit

11.4 Personnel must give a careful and complete description of the work to be done to the person issuing the Safe Work Permit.

11.4.1 Where a job presents a serious man hazard due to chemical, mechanical, electrical, temperature or height exposure, it is mandatory that a written, safe job procedure accompany the request for the Safe Work Permit. This procedure is to be signed by the Owner's Representative (E & C S or Plant Maintenance Services), Process Representative, and the contractor, who thereby agree that the procedure allows the job to be done safely.

11.5 Directions and restrictions noted on Safe Work Permits must be carefully followed.

11.6 A Safe Work Permit must be reissued for a job if there is evidence that conditions have changed subsequent to the issuance of the original Safe Work Permit.

11.7 Permits issued for jobs that last longer than one day will normally be issued for that job each day. By mutual consent of the parties involved, permits for these jobs may be issued for longer or shorter periods of time.

11.8 Vessels in an existing facility to be entered must be made safe for personnel by such measures as disconnecting, blinding, or double block and bleed on connecting piping. If such precautions are impractical, a detailed procedure for performing the work in a safe manner must be prescribed as specified in paragraph 11.4.1.

11.9 Vessels in an existing facility to be welded on, or cut, must be positively checked inside for flammable or explosive gas and/or

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liquids and Safe Work Permit issued before heat is applied.

11.10 The contractor may request Safe Work Permits for his own protection. Safety checks by the Owner for dangerous gases or chemicals should be requested through the Owner's Representative when there is any uncertainty.

11.11 Safe Work Permits are required for all excavation work done with machinery, i.e., gradalls, draglines, augers, ditching machines, etc.

11.12 All Safe Work Permits in the area affected are automatically cancelled when an emergency signal is sounded and must be reissued after the all clear signal.

12.0 EXCAVATIONS, FLOOR OPENINGS, BARRICADES

12.1 Where a safety hazard would be created for the personnel involved, and/or others, excavations such as ditches, trenches, or bell holes should be sloped sufficiently to prevent cave-ins or slides. If sloping is impractical, shoring must be used in cases whenever the vertical dimension exceeds four feet.

12.1.1 Personnel removing shoring after completion of work must not be in the bottom of the excavation. Shoring must be removed in such a manner to prevent cave-in on personnel.

12.2 Contractors must provide adequate barricades, signs, signals, flagmen, or other appropriate warning devices to protect personnel near any hazardous operation or excavation, floor

openings, open trenches, missing handrails, etc., where conditions create a hazard to personnel.

12.2.1 Contractors must notify the Owner's Representative of necessary obstruction on road shoulders on the day it occurs.

12.3 Grade lines, ropes, chains, etc., must be sufficiently marked in order to be visible day or night.

12.4 No obstruction of any kind, whether permanent or temporary, is permitted within 8'-9" horizontally from the center line of any railroad track and within 22'-6" vertically from the top of the rail. Specific authorization from the Owner's Representative as well as blue flags are required prior to boring under or excavating adjacent to railroad tracks.

12.5 In locations where strictly temporary loading or unloading operations are to be undertaken, BLUE FLAGS AND portable derails must be used by personnel engaged in these operations to prevent overrunning of the cars by a train.

12.6 Blue flags ~~meeting ICC specifications,~~ available through the Owner's Representative, must be placed on railroad tracks when the entrance of a train would present a hazard to personnel or equipment. ~~and in addition to, or in conjunction with, derails during loading or unloading operations.~~ Blue lights, available from the Owner's Representative, must be attached to blue flags at night.

12.6.1 Blue flags must be placed on the tracks so they will be in unobstructed view of the train crew and they must be placed a minimum

NOTIFY R.R. (TRAFFIC DEPT.)—

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of two car lengths (100 feet) in front of the end car they are intended to protect. Exceptions to the minimum distance may be made by the Owner's Representative where existing installations do not allow sufficient space.

12.6.2 Blue flags must be removed immediately when the hazard for which they were installed no longer exists.

13.0 RADIATION

13.1 In locations where a radiation source is used or stored, regulations require that it be marked with a "Radiation Material" sign. This sign is for the purpose of informing anyone in the area that such material is present, and not that a safety hazard due to radiation exists.

13.1.1 Only authorized personnel may enter an area marked by "Radiation Area" sign.

13.1.2 All areas where a radiation hazard exists must be marked conspicuously by standard signs at a safe distance from the source of radiation. These signs bear the radiation symbol of magenta (or purple) on a yellow background with the words "Caution – Radiation Area."

13.1.3 "Radiation Area" signs must be removed when a radiation hazard no longer exists in the affected area.

13.2 Equipment containing a source of radiation must not be handled, uncrated or installed without prior clearance with the Owner's Representative.

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