

CHAPTER 5207
DEPARTMENT OF LABOR AND INDUSTRY
STANDARDS FOR CONSTRUCTION

OCCUPATIONAL SAFETY AND HEALTH STANDARDS FOR CONSTRUCTION; GENERAL		5207.0410	PERSONNEL PLATFORMS SUSPENDED FROM CRANES AND DERRICKS.
5207.0005	STANDARD INDUSTRIAL CLASSIFICATION LIST FOR AWAIR.	5207.0500	ENCLOSURES AT CONSTRUCTION OR ENGINEERING PROJECTS.
5207.0010	ANCHOR BOLTS.	5207.0510	WELLS, PITS, SHAFTS, AND OTHER SIMILAR SPACES.
5207.0020	BAR, FLOOR, AND ROOF JOISTS.	5207.0520	WARNING SIGNS AT CONSTRUCTION OR ENGINEERING PROJECTS.
5207.0030	DEMOLITION OPERATIONS.	5207.0530	SIDEWALK SHEDS.
5207.0035	DEMOLITION, RESTORATION, REMODELING ASBESTOS SURVEY.	5207.0540	LIGHTS AT SIDEWALK SHEDS.
5207.0040	SPRAY PAINTING OF BUILDING INTERIORS.		
5207.0050	WIRE ROPE CLIPS.		
5207.0060	FLAMMABLE LIQUID TANK SUPPORTS.		
	PERSONAL PROTECTIVE EQUIPMENT		
5207.0100	HIGH VISIBILITY PERSONAL PROTECTIVE EQUIPMENT.	5207.0600	LOCKOUT DEVICES.
		5207.0610	MOTOR START BUTTON.
		5207.0620	MACHINE CONTROLS AND EQUIPMENT.
		5207.0630	FOOT ACTUATED MACHINES.
	WALKING, WORKING SURFACES		
5207.0200	SHIPS LADDERS.		
5207.0210	SHIPS LADDERS, SPECIAL REQUIREMENTS.	5207.0700	COMPRESSED GAS CONTAINERS.
5207.0250	WALKING, WORKING SURFACES.	5207.0710	PRESSURE HOSES.
		5207.0720	ALTERATION OF TOOLS AND EQUIPMENT.
		5207.0730	LUBRICATION OF MOVING MACHINERY.
		5207.0740	SCISSOR POINT PROTECTION.
	CONFINED SPACES		
5207.0300	CONFINED SPACES.		
5207.0301	DEFINITIONS.		
5207.0302	OPERATING PROCEDURES AND WORKER TRAINING.	5207.0800	PRIVIES AT CONSTRUCTION AND ENGINEERING PROJECTS.
5207.0303	PREENTRY PROCEDURES.	5207.0810	JOBSITE SHELTER.
5207.0304	ENTRY INTO AND WORK WITHIN CONFINED SPACES.	5207.0850	MOTORIZED SELF-PROPELLED VEHICLES.
5207.0310	CARBON MONOXIDE MONITORING.		
	ENVIRONMENTAL CONTROLS		
5207.0320	GAS FIRED MACHINES AND APPLIANCES.	5207.0900	POWERED INDUSTRIAL TRUCK OPERATIONS.
	CRANES, HOISTS, AND DERRICKS	5207.0910	SERVICING MULTIPIECE AND SINGLE PIECE RIM WHEELS.
5207.0400	CRANES, HOISTS, AND DERRICKS.	5207.1000	OPERATION OF MOBILE EARTH-MOVING EQUIPMENT.

**OCCUPATIONAL SAFETY AND HEALTH
STANDARDS FOR CONSTRUCTION; GENERAL**

5207.0005 STANDARD INDUSTRIAL CLASSIFICATION LIST FOR AWAIR.

Employers in the standard industrial classifications applicable to construction listed in part 5208.1500 must comply with Minnesota Statutes, section 182.653, subdivision 8. The standard industrial classifications in part 5208.1500 are those defined by the Office of Management and Budget published in the Standard Industrial Classification Manual, 1987 edition.

Statutory Authority: *MS s 182.655*

History: *22 SR 2086; 23 SR 2060*

5207.0010 ANCHOR BOLTS.

During the erection phase of any structure, if the size, weight, or balance of any structural member is such that temporary anchoring with two bolts does not provide adequate support to secure it, additional support shall be provided.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0020 BAR, FLOOR, AND ROOF JOISTS.

Where bar, floor, or roof joists are set in place overhead, they shall be field bolted or welded.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0030 DEMOLITION OPERATIONS.

The cutting or removal of reinforcing steel or cables that are suspending debris, or the removal of columns or studs that support debris, shall not take place in close proximity to any area where employees are working unless the area has been isolated by protection to separate the work area from falling or sliding debris.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0035 DEMOLITION, RESTORATION, REMODELING ASBESTOS SURVEY.

Before permitting employees to start any demolition, restoration, or remodeling project where an employer has, or should have, reason to believe there are asbestos containing materials, a survey by a qualified person shall be made to determine if there are asbestos containing materials present in the structure. The project controlling employer shall have written evidence that an evaluation has been performed. If asbestos containing material is to be disturbed, removed, replaced, or repaired, the provisions of Code of Federal Regulations, title 29, section 1926.1101, apply.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 21 SR 1897*

5207.0040 SPRAY PAINTING OF BUILDING INTERIORS.

Subpart 1. **Nonflammable paints.** Where spray painters are applying nonflammable paint on walls, ceilings, or fixtures, at times when employees other than painters are employed in or near such areas, safeguarding measures shall be taken to protect the lives and health of spray painters and others as per code:

A. Where required, respiratory protection and/or fresh air hoods shall be provided for spray painters by employers at no cost to spray painters.

B. Personal respiratory protective equipment shall be selected and used according to Code of Federal Regulations, title 29, section 1926.103.

C. Areas being spray painted shall be sealed off from other areas of the building by means of curtains. Employees other than painters shall not be required to work in enclosed areas.

D. Curtains shall have no openings except entry ways, which shall be kept closed during painting.

E. Cross ventilation shall be provided to remove spray paint vapors from the enclosures to the outside air by means of either mechanical exhaust or window ventilation.

F. Provisions shall be made to prevent exhaust vapors from reentering any part of the building.

Subp. 2. **Flammable paints.** In addition to meeting the requirements of subpart 1, where flammable paints are being applied, the following requirements also apply:

A. All motors, lights, switches, and electrical appliances shall be deenergized. Exception: portable vapor proof lights may be used when located 20 feet or more from the painting area.

B. The Air Quality Division of the Minnesota Pollution Control Agency should be consulted for any air pollution control measures required.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 21 SR 1897*

5207.0050 WIRE ROPE CLIPS.

Subpart 1. **Location of U-bolts.** Wire rope clips attached with U-bolts shall have the U-bolts on the dead or short end of the rope.

MINNESOTA RULES 2001

5207.0050 STANDARDS FOR CONSTRUCTION

350

Subp. 2. **Clip construction.** Clips shall be made of drop forged steel. All nuts on the clip bolts of a newly installed rope shall be retightened after the first hour of service.

Subp. 3. **Clip spacing.** Spacing and number of clips shall be in accordance with the table below:

Rope Diameter (inches)	Number of Clips Drop Forged	Minimum Spacing (inches)
1/8	2	3/4
3/16	2	1- 1/8
1/4	2	1- 1/2
5/16	2	1- 7/8
3/8	2	2- 1/4
7/16	2	2- 5/8
1/2	3	3
5/8	3	3- 3/4
3/4	4	4- 1/2
7/8	4	5- 1/4
1	5	6
1- 1/8	6	6- 1/4
1- 1/4	6	7- 1/2
1- 3/8	7	8- 1/4
1- 1/2	7	9

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0060 FLAMMABLE LIQUID TANK SUPPORTS.

Tank supports shall be installed on firm foundations. Tank supports must be of concrete, masonry, or protected steel. Single wood timber supports (not cribbing) may be used for outside aboveground tanks if the fall potential of the tank is not more than 12 inches at the lowest point of the tank.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

PERSONAL PROTECTIVE EQUIPMENT

5207.0100 HIGH VISIBILITY PERSONAL PROTECTIVE EQUIPMENT.

Subpart 1. **General requirement.** Each employee exposed to or working adjacent to moving motor vehicles as part of the employee's assigned job shall be provided with and required to wear a high visibility warning vest or other high visibility garment. A high visibility garment is defined as being a Class 2 garment or greater as specified by ANSI/ISEA Standard 107-1999. Some smaller garments may not meet the background material specifications for Class 2 as defined in ANSI/ISEA 107-1999. In these cases, the garment must be rated by the manufacturer as greater than or exceeding Class 1 requirements.

Subp. 2. **Maintenance of garments.** If the high visibility personal protective equipment becomes faded, torn, dirty, worn, or defaced, reducing the equipment's performance below the manufacturer's recommendations, the high visibility personal protective equipment shall be immediately removed from service and replaced.

Subp. 3. **Exception.** Where permanent or semipermanent barricades designed to stop or deflect vehicular traffic upon impact are in place to protect employees from moving motor vehicles, employees are not required to wear high visibility personal protective equipment while working inside these protected areas.

MINNESOTA RULES 2001

351

STANDARDS FOR CONSTRUCTION 5207.0250

Subp. 4. **Electrical work.** For work within the flash protection boundary as defined by NFPA 70E 2-1.3.3.2, high visibility garments constructed of material that complies with NFPA 70E shall be worn.

Subp. 5. **Effective date.** The employer shall provide and ensure the use of garments with the class specifications required in subpart 1 by January 1, 2002.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 25 SR 1241*

WALKING, WORKING SURFACES

5207.0200 SHIPS LADDERS.

Subpart 1. **Requirement.** Employers shall replace fixed and portable ladders with ships ladders whenever possible.

The angle of rise of ships ladders shall be between 50 and 60 degrees measured from the horizontal.

Subp. 2. **Soffits.** Where ladders are located one above the other, soffits shall be enclosed except where solid treads and risers are provided.

Subp. 3. **Treads.** Treads shall be uniformly spaced eight to 12 inches vertically. Tread surfaces other than steel grating shall be provided with skid resistance. Treads shall be flat steps that are a minimum of six inches wide and at least 24 inches long.

Subp. 4. **Handrails.** Handrails shall be provided on both sides of ladders and shall be placed to run parallel with stringers and be positioned 12 to 14 inches measured vertically, from the stringers. Handrail diameters shall be 1-1/4 to 1-5/8 inches outside diameter. When ships ladders serve door entrances, handrails shall continue to the door.

Subp. 5. **Stringers.** Ladder stringers shall be at least six inches in depth and permanently attached at terminations.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0210 SHIPS LADDERS, SPECIAL REQUIREMENTS.

Ships ladders shall be provided in all buildings where mechanical equipment is located on the roof in order to make all equipment accessible to maintenance and inspection personnel. Ships ladders shall be placed at an angle between 50 and 60 degrees measured from the horizontal. The opening in ceilings and building roofs shall have a minimum area of nine square feet and a minimum width of two feet. No ships ladders shall be located in or pass through elevator shafts, elevator penthouses, or elevator machine rooms.

Inside a penthouse, handrails shall continue through ceiling and roof openings to a distance of 36 inches. A guardrail and intermediate rail shall be provided on all open sides with a substantial chain guard on the entrance.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0250 WALKING, WORKING SURFACES.

Subpart 1. **Labeling floor or wall opening covers.** In those instances where floor or wall opening covers are used, they shall be labeled, "Floor Opening -- Do Not Remove," or "Wall Opening -- Do Not Remove" as applicable with lettering at least two inches in height.

Subp. 2. **Displacement.** Floor or wall opening covers shall be secured against accidental displacement.

Subp. 3. **Tripping and impaling hazards.** Where employees are exposed to tripping or impaling hazards caused by projecting conduit ends, reinforcing rods, pipe ends, or similar objects, these hazards shall be barricaded, guarded, or otherwise covered.

Subp. 4. **Construction stairways.** In addition to the requirements of Code of Federal Regulations, title 29, section 1926.501, semifinished permanent stairways or temporary stairways to a second floor are to be in place before supports or structure to the sixth floor are raised. Similarly, the supports or structure on multifloored buildings shall never be more than five floors ahead of stairways.

A. On steel frame buildings, stairways shall extend to the uppermost floor that has been planked or decked. Ladders for access purposes may be used only above that point.

B. A second means of egress remote from the prime means of egress shall be provided, for emergency use, when any multifloored structure reaches the 30-foot level or the fourth floor.

C. Ladders which meet the requirements of Code of Federal Regulations, title 29, section 1926.450 may be used as a second means of egress.

Subp. 5. **Roofs.** Employees on flat roofs, other than those actually engaged in roofing operations (roofers), shall be protected from potential fall hazards as required by Code of Federal Regulations, title 29, section 1926.500(d)(1), or equivalent protection such as warning lines or tying off to a substantial building structure using an approved safety belt and lanyard.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0260 [Repealed, 22 SR 1162]

CONFINED SPACES

5207.0300 CONFINED SPACES.

Subpart 1. **Scope.** Parts 5207.0300 to 5207.0304 prescribe minimum standards for preventing worker exposure to dangerous air contamination, oxygen deficiency, or oxygen enrichment as defined under part 5207.0301, within such spaces as silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins, tubs, pits, and other similar spaces. A tank or other vessel under construction may not meet the definition of "confined space" until it is completely enclosed. Parts 5207.0300 to 5207.0304 do not apply to underwater operations conducted in diving bells or other underwater devices or to supervised hyperbaric facilities.

Subp. 2. [Repealed, 23 SR 2132]

Statutory Authority: *MS s 182.655*

History: *12 SR 1754; 23 SR 2132*

5207.0301 DEFINITIONS.

Subpart 1. **Scope.** The terms used in parts 5207.0300 to 5207.0304 have the meanings given them in this part.

Subp. 2. **Confined space.** "Confined space" is defined as a special configuration that could result in any of the following:

A. atmospheric condition, a condition in which a dangerous air contamination, oxygen deficiency, or oxygen enrichment may exist or develop;

B. entry or exit access, a condition where the emergency removal of a suddenly disabled person is difficult due to the location or size of the access opening; or

C. engulfment condition, a condition where the risk of engulfment exists or could develop.

Subp. 3. **Confined space entry.** "Confined space entry" means any action resulting in any part of the worker's face breaking the plane of any opening of the confined space, and includes any ensuing work activities inside the confined space.

Subp. 4. **Dangerous air contamination.** "Dangerous air contamination" is an atmosphere presenting a threat of death, acute injury, illness, or disablement due to the presence of flammable, explosive, toxic, or otherwise injurious or incapacitating substances.

A. Dangerous air contamination due to the flammability of a gas or vapor is defined as an atmosphere containing the gas or vapor at a concentration greater than ten percent of its lower explosive (lower flammable) limit.

B. Dangerous air contamination due to a combustible particulate is defined as a concentration greater than ten percent of the minimum explosive concentration of the particulate.

C. Dangerous air contamination due to a toxic, corrosive, or asphyxiant substance listed in Code of Federal Regulations, title 29, part 1910, subpart Z, is defined as a concentration above the listed numerical value of the permissible exposure limit (PEL). In addition, an atmospheric concentration above the numerical limit listed on the Material Safety Data Sheet prepared for a hazardous substance in conformance with Code of Federal Regulations, title 29, section 1910.1200(g)(2)(vi) or the Minnesota Employee Right-to-Know Standards, chapter 5206.

D. Dangerous air contamination that presents an acute illness hazard represents an atmospheric concentration immediately dangerous to life and health (IDLH); for example, above a maximum concentration from which one could escape within 30 minutes or the length of time a worker will be exposed, whichever is longer, without any escape impairing symptoms or any immediate severe health effects. "Immediate severe health effect" means that an acute clinical sign of a serious, exposure-related reaction is manifested within 72 hours after exposure.

Subp. 5. **Engulfment.** "Engulfment" means the surrounding and effective capture of a person by finely divided particulate matter or a liquid.

Subp. 6. **Oxygen deficiency.** "Oxygen deficiency" is defined as an atmosphere containing oxygen at a concentration of less than 19.5 percent by volume.

Subp. 7. **Oxygen enrichment.** "Oxygen enrichment" is defined as an atmosphere containing oxygen at a concentration greater than 23 percent by volume.

Statutory Authority: *MS s 182.655*

History: *23 SR 2132*

5207.0302 OPERATING PROCEDURES AND WORKER TRAINING.

Subpart 1. **Implementation.** The employer shall implement the provisions of this part before any worker is allowed to enter a confined space.

Subp. 2. **Entry permit system.** The employer shall develop, implement, and use an entry permit system that includes a written permit procedure that provides all the means necessary to:

A. determine all confined spaces and identify them to the workers to prevent unauthorized entry;

B. determine the actual and potential hazards associated with the space at the time of entry so the employer can choose the appropriate means to execute a safe entry;

C. ensure by appropriate testing that the control measures used are effective; and

D. provide for preplanned emergency rescue.

Subp. 3. **Entry permit.** A written permit form must be completed before allowing a worker to enter a confined space. The written permit must contain the following minimum specific information for each permit entry space:

A. date;

- B. location;
 - C. time of issue;
 - D. time of expiration;
 - E. names of workers assigned to enter;
 - F. name and position of the person authorizing or in charge of the entry;
 - G. description of the hazards known or reasonably expected to be present in the confined space;
 - H. atmospheric testing required to be done immediately before and during the entry period;
 - I. designated individual responsible for performing the tests;
 - J. personal protective equipment required, including respiratory protection, clothing, or harnesses required for entry and rescue;
 - K. description of any additional hazards that may be reasonably expected to be generated by the entrants' activities in the space;
 - L. identification of all special work practices or procedures to be followed;
- and
- M. specification of all means of isolation, cleaning, purging, or inserting to be done before entry to remove or control those hazards, or certification that these procedures have been done if a hazardous air contamination or oxygen deficient condition exists.

Subp. 4. Duration and retention of permit. The maximum duration for which a permit form may be issued is one shift except as indicated in part 5207.0304, subpart 1. Each written permit form for confined space entry must be retained for a minimum of 30 days. Permits shall be readily available to all workers before entering a confined space, and the permits shall remain at the work site as long as the work is being performed there. Where atmospheric testing showed a dangerous air contamination, oxygen deficiency, or oxygen enrichment, the employer shall retain the written permit form or record showing the results of the atmospheric testing for a minimum of one year.

Subp. 5. Operating procedures.

A. Written, understandable operating and rescue procedures shall be developed and provided to affected workers.

B. When respiratory protection is used, a respiratory protection program as outlined in Code of Federal Regulations, title 29, section 1910.134, shall be in place.

C. Operating procedures shall conform to the applicable requirements of parts 5207.0303 and 5207.0304 and shall include provision for surveillance of the surrounding area to avoid hazards such as drifting vapors from other work operations.

Subp. 6. Worker training.

A. Workers who will enter the confined space and standby persons required by part 5207.0304 shall be trained in operating and rescue procedures and on the hazards they may encounter. This training shall be conducted annually or before confined space entry.

B. Workers who will perform atmospheric monitoring in confined spaces shall be trained on the use of such equipment according to the manufacturer's instructions before confined space entry and then on an annual basis thereafter.

Statutory Authority: *MS s 182.655*

History: *23 SR 2132*

5207.0303 PREENTRY PROCEDURES.

Subpart 1. **Application.** The applicable provisions of this part shall be implemented before entry into a confined space is permitted.

Subp. 2. **Disconnection of lines.** Lines that may convey flammable, explosive, toxic, or otherwise injurious or incapacitating substances into the space shall be disconnected,

blinded, locked out, or blocked off by other positive means to prevent the development of dangerous air contamination, oxygen deficiency, or oxygen enrichment within the space. The disconnection or blind shall be so located or done in such a manner that inadvertent reconnection of the line or removal of the blind is effectively prevented. Code of Federal Regulations, title 29, section 1910.147, applies where lockout devices are required.

This subpart does not apply to public utility gas distribution or gas transmission systems.

This subpart does not require blocking of all laterals to sewers or storm drains. Where experience or knowledge of industrial use indicates materials resulting in dangerous air contamination may be dumped into an occupied sewer or storm drain, all such laterals shall be blocked.

Subp. 3. Calibration of testing and monitoring equipment. Air testing and monitoring equipment shall be maintained and calibrated according to manufacturers' instructions. This equipment shall be periodically calibrated with an appropriate test gas to ensure proper operation. Records of such calibration and field tests shall be maintained for a minimum of one year. Calibration and field test information, including type of test required, date tests were due, and date tests were completed, shall be affixed to the instrument or be readily available at the time of use.

Subp. 4. Air tests. The air in confined spaces shall be tested with an appropriate device or method to determine whether dangerous air contamination, oxygen deficiency, or oxygen enrichment exists before entry is made. While occupied, additional continuous or periodic monitoring for dangerous air contamination, oxygen deficiency, or oxygen enrichment shall be done. A written record of the testing results shall be made and kept at the work site for the duration of the work. Affected workers or their representatives shall be afforded an opportunity to review and record the testing results.

Subp. 5. Injurious corrosive substances. Workers in confined spaces that have last contained injurious substances to the eyes or body shall be provided with, and shall be required to wear, appropriate personal protective clothing or devices in accordance with Code of Federal Regulations, title 29, section 1910.132. In addition, an eyewash and safety shower as required by Code of Federal Regulations, title 29, section 1910.151, shall be provided within the work area outside of the confined space for immediate emergency use.

Subp. 6. Interconnected spaces. Where interconnected spaces are blocked off as a unit, each space shall be tested and the results recorded in accordance with subpart 4. The most hazardous condition found shall govern procedures to be followed.

Subp. 7. Ventilation. Where the existence of dangerous air contamination, oxygen deficiency, or oxygen enrichment is demonstrated by tests performed under subpart 4, existing ventilation shall be augmented by appropriate means if practical and feasible. When additional ventilation provided in accordance with this subpart has removed dangerous air contamination, oxygen deficiency, or oxygen enrichment as demonstrated by additional testing conducted and recorded under subpart 4, entry into and work within the space may proceed subject to part 5207.0304.

Subp. 8. Ignition sources. No sources of ignition may be introduced into the space until implementation of appropriate provisions of this part has ensured that dangerous air contamination due to flammable or explosive substances does not exist.

Subp. 9. Oxygen consuming equipment. Whenever oxygen consuming equipment is to be used, measures shall be taken to ensure adequate combustion air and exhaust gas venting.

Subp. 10. Oxygen enrichment condition or use of oxygen enrichment equipment. Whenever oxygen enrichment is possible due to conditions within the space, or oxygen enrichment equipment is to be used, measures shall be taken to ensure that the oxygen level does not exceed 23 percent in the confined space. If tests indicate the oxygen level

to be greater than 23 percent, hot work is prohibited until ventilating techniques have reduced the oxygen level to less than 23 percent.

Subp. 11. **Smoking.** Smoking shall not be allowed in confined spaces or within 20 feet of a confined space opening.

Subp. 12. **Automatic fire protection systems.** Where there is no ready exit from spaces equipped with automatic fire suppression systems employing harmful design concentrations of toxic or oxygen displacing gases, or total foam flooding, such systems must be deactivated. When it is not practical or safe to deactivate such systems, the provisions of part 5207.0304, subpart 3, shall apply during entry into and work within the spaces.

Statutory Authority: *MS s 182.655*

History: 23 SR 2132

5207.0304 ENTRY INTO AND WORK WITHIN CONFINED SPACES.

Subpart 1. **Class I; confined spaces where an atmosphere with dangerous air contamination, oxygen deficiency, or oxygen enrichment is unlikely to develop.**

A. Employers whose operations require workers to perform routine repetitive entry into low hazard chambers such as boilers, vaults, vessels, tanks, bins, and vats, where no risk of engulfment can exist, and where the atmosphere cannot develop a dangerous air contaminant or oxygen enrichment, and where all known sources of hazard are positively controlled, may issue an annual permit for this type of entry instead of separate permits for each space, if established entry practices and procedures are in effect as outlined below. The employer may, at its discretion, allow entry by one or more workers without a standby person when work under the following conditions is performed:

(1) Establish specific entry practices and procedures as required in part 5207.0302, subpart 3, items A, B, and D to I, that must be followed for entry by annual permit before any worker may be authorized to make an entry.

(2) Train workers in the practices and procedures required for such entries.

(3) Ensure that one or more of the following requirements are met:

(a) the space has been ventilated before entry using a mechanically powered ventilator for not less than is specified in the ventilation nomograph prepared for that ventilator, and that ventilation continues throughout the entry;

(b) all areas of the confined space are continuously and effectively ventilated; such ventilation shall provide positive ventilation of clean air at a rate of at least 200 cubic feet per minute per occupant, or in confined spaces larger than 2,000 cubic feet, six air changes of the confined space volume per hour; or

(c) there is no effective ventilation, but appropriate continuous oxygen monitoring is performed to ensure that permit conditions are maintained.

(4) Revoke the permit whenever any tests performed during confined space occupancy show deviation from acceptable conditions to a hazardous condition. In these circumstances, entry may be made only by an entry procedure as outlined in subpart 2 or 3.

B. Employers whose operations require workers to perform routine repetitive entry into confined spaces where entry permits are required and that are unlikely to develop a dangerous air contaminant, oxygen deficiency, or oxygen enrichment and have no potential for an engulfment condition, may issue an annual permit for this type of entry instead of separate permits for each space if established entry practices and procedures are in effect as outlined below. The employer may, at its discretion, allow entry by one or more workers without a standby person when work under the following conditions is performed:

MINNESOTA RULES 2001

357

STANDARDS FOR CONSTRUCTION 5207.0304

(1) Establish specific entry practices and procedures as required in part 5207.0302, subpart 3, items A, B, and D to I, that must be followed for entry by annual permit before any worker may be authorized to make an entry.

(2) Train workers in the practices and procedures required for such entries.

(3) Ensure that whenever entry into a confined space is to be made, workers test the atmosphere before entry using an appropriate direct reading instrument (or other device capable of quantitatively identifying anticipated contaminants) with a remote sampling probe, testing for the following conditions and in the following order: oxygen concentration, combustible gas, and suspected toxic material, if any. While occupied, additional continuous monitoring for these gases or vapors shall be done during the entry period to ensure that a potentially dangerous atmosphere does not develop in the confined space.

(4) Ensure that continuous and effective positive ventilation is provided to the confined space at a minimum rate of 200 cubic feet per minute of clean air per occupant or, in confined spaces larger than 2,000 cubic feet, an exchange of six air changes of the confined space volume per hour.

(5) Revoke the permit whenever any tests performed during confined space occupancy show deviation from acceptable conditions to a hazardous condition. In these circumstances, entry may be made only by an entry procedure as outlined in subpart 2 or 3.

Subp. 2. Class II; confined spaces where an atmosphere free of dangerous air contamination, oxygen deficiency, or oxygen enrichment has been verified.

A. At least one person shall stand by on the outside of the confined space ready to give assistance in case of emergency.

B. Visual, voice, or signal line communications shall be maintained between all individuals in the confined space and the standby person.

C. An approved safety belt or harness with an attached line shall be used where practical and feasible. The free end of the line shall be secured outside the entry opening. The line shall be at least 2,000 pounds test.

D. The standby person shall not enter the confined space without alerting an emergency response team such as the fire department or other trained rescue workers of the intent to enter the confined space. Entry shall only occur after proper tests have been performed to show that a dangerous air contamination, oxygen deficiency, or oxygen enrichment does not exist or the standby person is protected as prescribed in subpart 3, items C and D, subitem (1).

Subp. 3. Class III; confined spaces where an atmosphere free of dangerous air contamination, oxygen deficiency, or oxygen enrichment cannot be verified. The requirements of this part apply to entry into and work within a confined space whenever an atmosphere free of dangerous air contamination, oxygen deficiency, or oxygen enrichment cannot be verified through the implementation of the applicable provisions of part 5207.0303, or whenever due to an emergency, dangerous air contamination, oxygen deficiency, or oxygen enrichment cannot be prevented through the implementation of the applicable provisions of part 5207.0303.

A. Tanks, vessels, or other confined spaces with side and top openings shall be entered from side openings when practicable. For the purposes of this part, side openings are those within 42 inches of the bottom.

B. Appropriate, approved respiratory protective equipment, in accordance with Code of Federal Regulations, title 29, section 1910.134, shall be provided and worn.

C. An approved safety belt or harness with an attached line must be used. The free end of the line shall be secured outside the entry opening. The line shall be at least 2,000 pounds test.

D. At least one person shall stand by on the outside of the confined space ready to give assistance in case of emergency.

MINNESOTA RULES 2001

5207.0304 STANDARDS FOR CONSTRUCTION

358

(1) The standby person shall have appropriate, approved, respiratory protective equipment, including an independent source of breathing air that conforms with Code of Federal Regulations, title 29, section 1910.134(d), available for immediate use.

(2) A standby person protected as prescribed by items C and D may enter the confined space, but only in case of emergency and only after donning the required personal protective equipment and alerting an emergency response team such as the fire department or other trained rescue workers of their intention to enter the confined space.

(3) Visual, voice, or single line communications shall be maintained between all individuals in the confined space and the standby person.

E. When entry must be made through a top opening, the requirements in subitems (1) and (2) also apply.

(1) The safety harness shall be of the type that suspends a person in an upright position.

(2) An approved hoisting device or other effective means shall be provided for lifting workers out of the space.

F. Work involving the use of flame, arc, spark, or other source of ignition is prohibited within a confined space (or any adjacent space having common walls, floor, or ceiling with the confined space) that contains, or is likely to develop, dangerous air contamination due to flammable or explosive substances.

G. Whenever gases such as nitrogen are used to provide an inert atmosphere for preventing the ignition of flammable gases or vapors, no flame, arc, spark, or other source of ignition may be permitted unless the oxygen concentration is maintained at less than 20 percent of the concentration that will support combustion.

(1) Testing of the oxygen content shall be conducted with sufficient frequency to ensure conformance with this requirement.

(2) A written record of the results of such testing shall be made and kept at the work site for the duration of the work.

H. Only approved lighting and electrical equipment may be used in confined spaces subject to dangerous air contamination by flammable or explosive substances.

Subp. 4. Precautions for emergencies involving work in confined spaces. At least one person trained in first aid and cardiopulmonary resuscitation (CPR) shall be immediately available whenever the use of respiratory protective equipment is required by this part. Standards for CPR training shall follow the principles of the American Heart Association or the American Red Cross.

Statutory Authority: *MS s 182.655*

History: *23 SR 2132*

5207.0310 CARBON MONOXIDE MONITORING.

The employer shall monitor environmental exposure of employees to carbon monoxide whenever internal combustion engines discharge engine exhaust gases indoors or unvented space heaters are operated indoors to ensure that carbon monoxide levels do not exceed those given in Code of Federal Regulations, title 29, section 1926.55, Appendix A. The air monitoring shall be done during initial operation and at least quarterly thereafter and during a period representing highest usage in areas where carbon monoxide exposure is most likely.

Statutory Authority: *MS s 182.655*

History: *12 SR 1754; 21 SR 1897*

MINNESOTA RULES 2001

359

STANDARDS FOR CONSTRUCTION 5207.0520

ENVIRONMENTAL CONTROLS

5207.0320 GAS FIRED MACHINES AND APPLIANCES.

The flame of the gas pilot, burner, or burners in gas fired units shall be protected by a quick acting flame sensitive safeguard that will automatically shut off the fuel supply in case of pilot or burner failure.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

CRANES, HOISTS, AND DERRICKS

5207.0400 CRANES, HOISTS, AND DERRICKS.

Subpart 1. **Scope.** This part applies to any crane, hoist, or derrick having a maximum rated capacity of one ton or less; to railway and automobile wrecking cranes; skip hoists; hoistlike units used for horizontal pulling only; mine hoists; conveyors and shovels; drag line excavators; backhoes; and any equipment such as mobile scaffolds, towers, and platforms.

Subp. 2. **General requirements.** Cranes, hoists, or derricks within the scope of this part shall meet the requirements of parts 5205.1200 to 5205.1210.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0410 PERSONNEL PLATFORMS SUSPENDED FROM CRANES AND DERRICKS.

The design, construction, testing, use, and maintenance of personnel platforms and the hoisting of personnel platforms on the load lines of cranes or derricks shall meet the requirements of Code of Federal Regulations, title 29, 1926.550, paragraph (g).

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 17 SR 1273*

5207.0500 ENCLOSURES AT CONSTRUCTION OR ENGINEERING PROJECTS.

The ground actually occupied by the building construction operations or engineering project shall be shut off by an enclosure from places accessible to the public. The enclosure shall be such as to avoid any risk that might arise from the fall of any objects whatsoever. Places on the building site that are accessible to the workers shall be protected in a similar manner.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0510 WELLS, PITS, SHAFTS, AND OTHER SIMILAR SPACES.

All wells, pits, shafts, and other similar spaces shall be barricaded or covered. Upon completion of exploration and similar operations, temporary wells, pits, shafts, and other similar spaces shall be backfilled.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0520 WARNING SIGNS AT CONSTRUCTION OR ENGINEERING PROJECTS.

Warning signs, or warning signs and red lights shall be conspicuously placed and maintained at all dangerous places on the job.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0530 SIDEWALK SHEDS.

Whenever a building shall be erected or increased over two stories in height, or whenever a building of more than 25 feet in height is to be demolished upon any street of a municipality on which municipal regulations will not allow sidewalks to be blockaded, the owner, builder, or contractor constructing, repairing, or demolishing the building shall erect and maintain, during the period of construction and repair, a shed which shall extend over not less than one-half the width of the sidewalk and shall have a minimum width of three feet. The side wall toward the building shall be sealed with boards. The roof over the shed shall be constructed to support the approximate load carried, but in no case shall the planks on the roof be less than two inches thick or at least 3/4-inch plywood. The street side of the sidewalk shed shall have a hand and an intermediate rail.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0540 LIGHTS AT SIDEWALK SHEDS.

Every sidewalk shed shall be kept in good repair, free from unnecessary obstruction, and properly lighted at night. The ends of the sidewalk shed walk shall be marked with red lights on the street side.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

MACHINE GUARDING**5207.0600 LOCKOUT DEVICES.**

Subpart 1. **Electrical power disconnect.** Any main electrical power disconnect means which controls a source of power or material flow shall be locked out with a lockout device whenever employees are maintaining, cleaning, adjusting, or servicing machinery or equipment, if the disconnect is not in clear sight of the employee. A "Do Not Start" tag as described in Code of Federal Regulations, title 29, section 1910.145(f)(4), shall be affixed to all operating controls.

Subp. 2. **Pneumatic and hydraulic lines.** The pressure shall be eliminated from any pneumatic and hydraulic lines that activate a mechanism or machine, and the valve holding back the activating substance shall be locked out before an employee works on that mechanism or machine.

Subp. 3. **Spring tension mechanisms.** Mechanisms under spring tension or compression shall be blocked, clamped, secured in position, or the compression or tension totally relieved before being worked on by an employee.

Subp. 4. **Suspended mechanisms.** Suspended mechanisms or parts that normally cycle through a lower position shall be lowered to the lowest position, and shall be clamped, blocked, or otherwise secured in position before being worked on by an employee.

Subp. 5. **Individual lockouts.** Where more than one employee is engaged in working on machinery or equipment, each employee shall affix the employee's individual lockout device or lock to the disconnect switch or power supply.

Subp. 6. **Exemption.** Utility companies, when working on lines and equipment, will be exempt from this standard but must comply with the requirements of Code of Federal Regulations, title 29, section 1926.950(d).

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 21 SR 1897*

5207.0610 MOTOR START BUTTON.

The motor start button on machines with exposed points of operation, pinch points, or nip points shall be physically protected against unintended operation.

Statutory Authority: *MS s 182.655*

History: *12 SR 1754*

5207.0620 MACHINE CONTROLS AND EQUIPMENT.

On machines with points of operation, pinch points, or nip points, each machine shall be equipped so it is possible for the operator to cut off the power to each machine without leaving the position at the point of operation.

Statutory Authority: *MS s 182.655*

History: *12 SR 1754*

5207.0630 FOOT ACTUATED MACHINES.

The treadle or pedal of foot actuated machines, tools, or equipment shall be physically protected to prevent unintended operation.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

MAINTENANCE AND REPAIR OF EQUIPMENT**5207.0700 COMPRESSED GAS CONTAINERS.**

Valves on compressed gas containers shall be protected from damage while in use or storage.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0710 PRESSURE HOSES.

All hand held pressure hoses and nozzles that could cause injury when the hose or nozzle is not being held, including air, water, hot water and steam, and all high temperature hoses or nozzles including hot water and steam, shall have a constant pressure control.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0720 ALTERATION OF TOOLS AND EQUIPMENT.

All tools and equipment, whether powered or manually operated, shall be used only for their intended purpose. Tools and equipment shall not be altered, modified, or used for other than their intended purpose without the manufacturer's written approval, or unless under the direction of a competent person in accordance with accepted engineering requirements to prevent creating an additional hazard.

Statutory Authority: *MS s 182.655*

History: *12 SR 1754*

5207.0730 LUBRICATION OF MOVING MACHINERY.

Machinery or equipment shall be shut down during manual lubrication unless access to lubrication fittings is safeguarded or is located far enough away from moving parts that employees cannot contact them.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.0740 SCISSOR POINT PROTECTION.

Scissor points on all rubber tired skid steer equipment including front end loaders shall be guarded to protect the operator.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

SANITATION

5207.0800 PRIVIES AT CONSTRUCTION AND ENGINEERING PROJECTS.

Privies shall be provided on all construction and engineering projects. Privies shall be placed inside of heated buildings wherever possible to do so. Where privies are not placed inside of heated buildings, provisions shall be made for heating privies to a minimum of heat that can be emitted from the installation of a 1,300 watt heater or other type equivalent heater.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 21 SR 1897*

5207.0810 JOBSITE SHELTER.

Subpart 1. **Definitions.** "Suitable place" means an enclosed shed, designated area within a new or existing structure, or van, panel truck, or mobile home. A "worker day" is equivalent to one person working an eight-hour shift.

Subp. 2. **Scope.** The provisions of this standard apply to those construction projects which have exceeded 30 worker days.

Subp. 3. **Place to change and eat.** From November 1 to March 15 of each winter season, all construction jobs shall be provided with a suitable place for employees to change their clothes and eat their lunch.

Subp. 4. **Size.** The size of jobsite shelters shall be based on the maximum number of employees using the room at one time. The minimum space requirements, in square feet per person, shall be determined by the values as shown below:

- A. 25 or fewer employees, 13 square feet;
- B. 26 to 74 employees, 12 square feet;
- C. 75 to 149 employees, 11 square feet; and
- D. 150 employees and over, ten square feet.

Subp. 5. **Temperature.** Jobsite shelters shall be heated to a temperature of at least 50 degrees Fahrenheit during all periods when the shelter is occupied.

Subp. 6. **Contaminated clothing storage.** If toxic or harmful substances are handled so that work clothes become contaminated, facilities shall be provided so that street clothes and work clothes will not be stored in contact with each other.

Subp. 7. **Lighting.** Jobsite shelters shall be lighted with not less than ten footcandles of light.

Subp. 8. **Crew mobility.** The requirements of this standard can be met by furnishing transportation to a reasonably convenient location which meets the other requirements of this standard.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 17 SR 1279*

5207.0850 MOTORIZED SELF-PROPELLED VEHICLES.

Subpart 1. **Scope.** This part applies to all motorized, self-propelled vehicles used off the highway including industrial type trucks, crawler equipment, and rubber-tired vehicles. This part shall not apply to vehicles with less than a 20 horsepower motor.

Subp. 2. **General requirements.** Motorized, self-propelled vehicles shall meet the requirements of Code of Federal Regulations, title 29, sections 1926.600, 1926.601, and 1926.602.

Subp. 3. **Transportation of employees.** Vehicles being used to transport employees shall be equipped with a seating arrangement securely anchored, a rear-end gate, a guardrail and steps or a ladder for mounting and dismounting.

A. Under no circumstances shall any employee be allowed to ride in a standing position or with arms or legs outside of the vehicle body, or seated on the side

MINNESOTA RULES 2001

363

STANDARDS FOR CONSTRUCTION 5207.1000

fenders, cabs, cabshields, rear of vehicle, or on the load unless such a position is dictated by a job assignment.

B. No explosives, flammable materials, excepting normal fuel supply, or toxic substances shall be transported in the passenger carrying area of vehicles carrying employees.

C. No vehicle transporting employees shall be moved until the driver has ascertained that all employees are seated and required guardrails and end gates are in place and doors closed.

D. No employee shall be allowed to get on or off any vehicle while it is in motion.

Subp. 4. **Vehicle inspection.** Code of Federal Regulations, title 29, section 1926.601(b)(14), shall apply to all vehicles covered in Code of Federal Regulations, title 29, section 1926.602.

Statutory Authority: *MS s 182.655*

History: *21 SR 1897*

VEHICLES

5207.0900 POWERED INDUSTRIAL TRUCK OPERATIONS.

Subpart 1. **Restricted use.** All industrial trucks designed and constructed solely for use on solid hard level surfaces shall be restricted to such operations.

Subp. 2. **Surface condition.** All solid hard level surfaces must be free of cracks, irregularities, or holes that could upset the balance of the industrial truck.

Subp. 3. **Load positioning.** When a fork truck operator is positioning a load in an area that is not fully visible to the fork truck operator, the operator shall be assisted by a designated person who shall direct the safe placing of the load by using predetermined signals.

Statutory Authority: *MS s 182.655*

History: *12 SR 634; 21 SR 1897*

5207.0910 SERVICING MULTIPIECE AND SINGLE PIECE RIM WHEELS.

Subpart 1. **Scope.** This subpart applies to the servicing of multipiece and single piece rim wheels used on large vehicles such as trucks, tractors, off road machines, and similar vehicles used on construction sites. It does not apply to the servicing of rim wheels used on automobiles or pickup trucks and vans using automobile tires or truck tires designated "LT."

Subp. 2. **General requirements.** Servicing of multipiece and single piece rim wheels on large vehicles on construction sites shall meet the requirements of Code of Federal Regulations, title 29, section 1910.177.

Statutory Authority: *MS s 182.655*

History: *12 SR 634*

5207.1000 OPERATION OF MOBILE EARTH-MOVING EQUIPMENT.

Subpart 1. **Scope.** This part identifies minimum safety requirements for the safe operation of mobile earth-moving equipment used for earth moving, building, or road construction or demolition, including, but not limited to, bulldozers, motor graders, scrapers, loaders, skid-steer loaders, compaction equipment, backhoes, end dumps, side dumps, and dump trucks. This part pertains to operators of the equipment and exposed employees, including, but not limited to, grade checkers, grade persons, rod persons, stake hops, stake jumpers, and blue toppers working in the area.

Subp. 2. **Training requirements.**

A. Mobile earth-moving equipment operators and all other employees working on the ground exposed to mobile earth-moving equipment shall be trained in the

safe work procedures pertaining to mobile earth-moving equipment and in the recognition of unsafe or hazardous conditions.

B. Training programs shall be developed and instructed by competent individuals who have knowledge, training, experience, and the demonstrated ability to identify existing and predictable hazards related to the subject matter.

C. Training programs must include the following elements:

(1) safe work procedures on how to approach mobile earth-moving equipment, whether in use or idling, including:

(a) visual, voice, or signal communication that shall be made with the operator prior to approaching earth-moving equipment;

(b) maintaining one's visibility to the operator while approaching the equipment; and

(c) operator responsibilities, such as placing the transmission in neutral, setting the parking brake, and indicating that it is safe to approach the equipment;

(2) identification of the operator's blind spots on various earth-moving equipment used;

(3) instruction for mobile earth-moving equipment operators in conducting daily equipment inspections according to the manufacturer's recommendations, and checking the area around the equipment for a clear path prior to beginning operation;

(4) safe operating procedures of equipment, including traveling, backing, parking, loading for transport, maintenance, and operation;

(5) safe work procedures when working around or adjacent to overhead or underground utilities, as described in Code of Federal Regulations, title 29, parts 1926.600(a)(6) and 1926.651(b); and

(6) additional hazards that could be created by changing conditions.

Subp. 3. **Training frequency.** Employees shall be trained initially before beginning work that exposes them to mobile earth-moving equipment. Employee training records shall be retained by the employer for the duration of the project.

Subp. 4. **High visibility personal protective equipment.**

A. Each employee working on the ground who is exposed to mobile earth-moving equipment shall be provided with and required to wear a high visibility warning vest or other high visibility garments. A high visibility garment is defined as being a Class 2 garment or greater as specified by ANSI/ISEA Standard 107-1999.

B. High visibility apparel, as described in item A, shall comply with the specifications in part 5207.0100.

Subp. 5. **Equipment requirements.**

A. All mobile earth-moving equipment shall comply with Code of Federal Regulations, title 29, part 1926.602(a)(9)(ii) for back-up alarms or signal persons if applicable.

B. When mobile earth-moving equipment is operated during times of darkness or low light conditions, the equipment, if designed to function equally in both forward and reverse directions, such as compaction equipment, bulldozers, motor graders, loaders, and skid-steer loaders, shall be equipped with at least two headlights for forward travel and adequate rear lights for reverse travel unless other adequate lighting is provided.

Subp. 6. **Contractor responsibility.**

A. If the mobile earth-moving equipment contractor exposes other contractor's employees to the hazard of mobile earth-moving equipment, the controlling employer, such as general contractor or construction manager, for the project shall coordinate a joint contractor-employee safety awareness meeting between contractors and employees on site. Discussion elements for employee awareness training can be found in subparts 2, item C; and 4.

MINNESOTA RULES 2001

365

STANDARDS FOR CONSTRUCTION 5207.1000

B. The employee safety awareness meeting shall be documented, identifying when the meeting was held and who attended, including a brief summary of what was reviewed. Documentation shall be retained for the duration of the project.

Subp. 7. **Electrical work.** For work within the flash protection boundary as defined by NFPA 70E 2-1.3.3.2, high visibility garments constructed of material that complies with NFPA 70E may be worn.

Subp. 8. **Effective date.** The employer shall provide and ensure the use of garments with the class specifications required in subpart 4, item A, by January 1, 2002.

Statutory Authority: *MS s 182.655*

History: *24 SR 519; 25 SR 1241*