



**LOGAN  
DRILLING  
GROUP**

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**[Table of Regulations](#)**

**[Main Site](#)**

**[How current is this regulation?](#)**

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**NEWFOUNDLAND AND LABRADOR  
REGULATION 5/12**

*Occupational Health and Safety Regulations, 2012*  
under the  
*Occupational Health and Safety Act*  
(O.C. 2012-005)

*(Filed January 17, 2012)*

Under the authority of section 65 of the *Occupational Health and Safety Act*, the Lieutenant-Governor in Council makes the following regulations.

Dated at St. John's , January 17, 2012.

Robert Thompson  
Clerk of the Executive Council

**REGULATIONS**

*Analysis*

**[1. Short title](#)**

PART I  
GENERAL

**[2. Interpretation](#)**

**[3. Application](#)**

**[4. Responsibility of division](#)**

**[5. Right to refuse work](#)**

**[6. Stop work orders](#)**



**LOGAN  
DRILLING  
GROUP**

7. Appeal

PART II

NOTICE REQUIREMENTS

8. New project

9. Notifiable occupational diseases

10. Serious injury

11. Notification to utilities

PART III

GENERAL DUTIES

12. Occupational health and safety program

13. Occupational health and safety policy

14. General duties of employers

15. Working alone

16. Safe working load of equipment

17. General duties of workers

18. Safety inspections

19. Co-ordination of work

20. Two or more employers

21. Appointment of qualified co-ordinator

22. Violence prevention

23. Procedures and policies

24. Instruction to workers

PART IV

OCCUPATIONAL HEALTH AND SAFETY COMMITTEES, REPRESENTATIVES AND DESIGNATES

25. Operations of committees, representatives and designates

PART V

GENERAL HEALTH AND SAFETY REQUIREMENTS

26. Personal conduct

27. Travel over and work on ice

28. Guardrails

29. Roof work

30. Openings, pits and tanks

31. Material storage

32. Signage

33. Overcrowding

34. Slipping hazards



**LOGAN  
DRILLING  
GROUP**

- [35. Barriers](#)
- [36. Illumination](#)
- [37. Compressed air](#)
- [38. Emergency plan risk assessment](#)
- [39. Emergency procedures](#)
- [40. Emergency lighting](#)
- [41. Emergency training](#)

**PART VI**

**OCCUPATIONAL HEALTH REQUIREMENTS**

- [42. Hazardous substances](#)
- [43. Health surveillance](#)
- [44. Thermal environment](#)
- [45. Ventilation](#)
- [46. Silica regulation](#)
- [47. Silica medical surveillance](#)
- [48. Asbestos](#)
- [49. Lead exposure control plan](#)
- [50. Musculoskeletal injury prevention](#)
- [51. MSI: risk control](#)
- [52. MSI: education and training](#)
- [53. MSI: evaluation](#)
- [54. MSI: consultation](#)
- [55. Seating or standing work](#)
- [56. Lifting and handling](#)
- [57. Permitted quantities](#)
- [58. Incompatible substances](#)
- [59. Storage of hazardous substances](#)
- [60. Dispensing](#)
- [61. Toilet facilities](#)
- [62. Washing facilities](#)
- [63. Emergency washing facilities](#)
- [64. Work clothing and accommodations](#)
- [65. Eating areas](#)
- [66. Supply of drinking water](#)
- [67. Sanitary and orderly conditions](#)



**LOGAN  
DRILLING  
GROUP**

[68. Noise hazards](#)

[69. Painting, coating and working with plastics/resins](#)

**PART VII**

**PERSONAL PROTECTIVE EQUIPMENT**

[70. Definitions](#)

[71. Selection, use and maintenance](#)

[72. Instruction](#)

[73. Personal clothing and accessories](#)

[74. General requirements of safety headgear](#)

[75. Eye and face protection](#)

[76. Prescription safety eyewear](#)

[77. Contact lenses](#)

[78. General requirements of limb and body protection](#)

[79. Leg protection](#)

[80. Foot protection](#)

[81. High visibility apparel](#)

[82. Flame resistant clothing](#)

[83. Respiratory protection program](#)

[84. Respiratory protection](#)

[85. Respiratory protection equipment](#)

[86. Inspection and maintenance of respiratory protection equipment](#)

**PART VIII**

**MACHINERY AND EQUIPMENT**

[87. Definitions](#)

[88. Safe machinery and equipment](#)

[89. General requirements](#)

[90. Standards](#)

[91. Guards](#)

[92. Identifying unsafe equipment](#)

[93. Operating controls](#)

[94. Machinery location](#)

[95. Marking of hazards](#)

[96. Piping systems](#)

[97. Restraining devices](#)

[98. Rotating hazards](#)



**LOGAN  
DRILLING  
GROUP**

- [99. Flywheels and pulleys](#)
  - [100. Conveyor standards](#)
  - [101. Power presses, brake presses and shears](#)
  - [102. Exception for custom work](#)
  - [103. Cutting and cooling material containment](#)
  - [104. Standards for abrasive equipment](#)
  - [105. Powder actuated tools standards](#)
  - [106. Powder actuated tool use](#)
  - [107. Limitations on use of powder actuated tools](#)
  - [108. Chippers](#)
  - [109. Chain saws](#)
  - [110. Automotive lifts and vehicle supports](#)
  - [111. Pneumatic nailing and stapling tools](#)
  - [112. Drilling equipment - general requirements](#)
  - [113. Drilling equipment use](#)
  - [114. Drilling procedures](#)
  - [115. Rod handling](#)
  - [116. Self-propelled drills](#)
  - [117. Cleaning drilled holes](#)
  - [118. Abrasive blasting and high pressure washing definitions](#)
  - [119. Risk assessment](#)
  - [120. Work procedures outside a cabinet](#)
  - [121. Substitution of abrasive blasting materials](#)
  - [122. Cleanup](#)
  - [123. Engineering controls](#)
  - [124. Exhaust ventilation](#)
  - [125. Restricted work zones](#)
  - [126. Operating procedures](#)
- PART IX  
DE-ENERGIZATION AND LOCKOUT
- [127. Definitions](#)
  - [128. General requirement](#)
  - [129. When lockout required](#)
  - [130. Lockout procedures](#)
  - [131. Checking locked out equipment](#)



**LOGAN  
DRILLING  
GROUP**

- [132. Worker responsibilities](#)
- [133. Removal of locks](#)
- [134. Group lockout procedure](#)
- [135. Alternative procedures](#)
- [136. Where locks not required](#)
- [137. Work on energized equipment](#)

**PART X  
FALL PROTECTION**

- [138. Definitions](#)
- [139. Training requirement](#)
- [140. Fall protection systems](#)
- [141. General requirements](#)
- [142. Fall arrest system](#)
- [143. Nets](#)
- [144. Debris nets](#)
- [145. Travel restraint](#)
- [146. Temporary flooring](#)

**PART XI  
SCAFFOLDS, STAGES AND WORK PLATFORMS**

- [147. Definition](#)
- [148. Portable ladder standards](#)
- [149. Job built ladders](#)
- [150. Protective coatings](#)
- [151. Inspection](#)
- [152. Inclination and support](#)
- [153. Length](#)
- [154. Restrictions on use](#)
- [155. Fixed ladders](#)
- [156. Special purpose ladders](#)
- [157. Definitions](#)
- [158. Responsibilities](#)
- [159. Standards](#)
- [160. Scaffold stability](#)
- [161. Guardrails and toeboards](#)
- [162. Grounding](#)





**LOGAN  
DRILLING  
GROUP**

- [163. Lumber planks](#)
- [164. Manufactured planks](#)
- [165. Securing planks](#)
- [166. Access to scaffolds](#)
- [167. Vertical ladders](#)
- [168. Erection and dismantling.](#)
- [169. Spacing of components](#)
- [170. Bracing of uprights](#)
- [171. Cross bracing](#)
- [172. Wood scaffolds](#)
- [173. Extension of uprights](#)
- [174. Laminated uprights](#)
- [175. Bearer supports](#)
- [176. Pumpjack scaffold](#)
- [177. Definitions](#)
- [178. Manufacturers specifications](#)
- [179. Compatibility](#)
- [180. Engineering requirements](#)
- [181. Adjustable height bases](#)
- [182. Spacing](#)
- [183. Couplings](#)
- [184. Height restriction](#)
- [185. Outriggers](#)
- [186. Wheels](#)
- [187. Moving restrictions](#)
- [188. Surface conditions](#)
- [189. Components of tube and coupler scaffold](#)
- [190. Cross bracing](#)
- [191. Work platforms supported by a crane or hoist](#)
- [192. Crane capacity](#)
- [193. Eccentric loading](#)
- [194. Rigging](#)
- [195. Two block prevention](#)
- [196. Powered booms and winches](#)
- [197. Fall protection - suspended work platforms](#)



**LOGAN  
DRILLING  
GROUP**

- [198. Articulating booms prohibited](#)
- [199. Travelling restriction](#)
- [200. Communications](#)
- [201. Definitions -elevating work platforms](#)
- [202. Standards](#)
- [203. Operating and maintenance manuals](#)
- [204. Inspection and maintenance records](#)
- [205. Shift inspection](#)
- [206. Annual inspection and certification](#)
- [207. Fall protection - elevating work platform](#)
- [208. Safe access](#)
- [209. Rated capacity](#)
- [210. Outriggers](#)
- [211. Controls](#)
- [212. Immobilization of vehicles](#)
- [213. Shear hazard](#)
- [214. Warning devices](#)
- [215. Transporting workers](#)
- [216. Lift truck platform](#)
- [217. Fall protection - lift truck](#)
- [218. Swing stages - definitions](#)
- [219. Rated load](#)
- [220. Weight identification](#)
- [221. Prior permission](#)
- [222. Attachment points](#)
- [223. Securing suspension lines](#)
- [224. Hook and clamp working load limit](#)
- [225. Hook and clamp engagement](#)
- [226. Tiebacks](#)
- [227. Thrust-out beams](#)
- [228. Counterbalance of thrust-out beams](#)
- [229. Hook closures](#)
- [230. Protection against damage](#)
- [231. Fibre rope suspension](#)
- [232. Wire rope suspension](#)





**LOGAN  
DRILLING  
GROUP**

[233. Length of suspension ropes](#)

[234. Hoisting devices](#)

[235. Hangers or stirrups](#)

[236. Platform width](#)

[237. Safety factor](#)

[238. Rated load](#)

[239. Guardrails](#)

[240. Toeboards and netting](#)

[241. Equipment inspection](#)

[242. Fall protection - swing stage](#)

[243. Boatswain's chairs](#)

[244. Definitions](#)

[245. Permanent powered platforms](#)

[246. Portable powered platforms](#)

[247. Fall protection - powered platform](#)

[248. Maintenance and operating records](#)

[249. Window cleaning](#)

## PART XII

### POWERED MOBILE EQUIPMENT

[250. Definitions](#)

[251. Operation and maintenance](#)

[252. Competency and testing operators](#)

[253. Operator's responsibility](#)

[254. Supervisor's responsibility](#)

[255. Warning signal device](#)

[256. Lights](#)

[257. Rear view mirrors](#)

[258. Load handling attachments](#)

[259. Load ratings](#)

[260. Operative protective structures](#)

[261. Rollover protective structures](#)

[262. Rollover protective structure standards](#)

[263. Rollover protective structure certification](#)

[264. Rollover protective structure identification](#)

[265. Effect of rollover protective structure on visibility](#)



**LOGAN  
DRILLING  
GROUP**

[266. Seating and standard requirements](#)

[267. Start of shift inspection](#)

[268. Securing tools and equipment](#)

[269. Unattended equipment](#)

[270. Securing elevated loads](#)

[271. Swinging equipment](#)

[272. Obstructed view](#)

[273. Guy lines](#)

[274. Pedestrian and equipment traffic](#)

[275. Securing loads](#)

[276. Restraint for cylindrical objects](#)

[277. Lift truck loads](#)

[278. Tire installation](#)

[279. Equipment and procedures](#)

#### PART XIII

##### TRANSPORTATION OF WORKERS

[280. Application](#)

[281. Seat belts](#)

[282. Securing equipment](#)

[283. Hazardous materials](#)

[284. Passenger compartments](#)

[285. Boarding and leaving](#)

[286. Seating design](#)

#### PART XIV

##### CRANES, HOISTS AND OTHER LIFTING EQUIPMENT

[287. Definitions](#)

[288. Cranes, derricks and hoists](#)

[289. Identification](#)

[290. Rated capacity](#)

[291. Rated capacity indication](#)

[292. Boom angle indicator](#)

[293. Boom extension and load radius indicators](#)

[294. Support structure](#)

[295. Manual](#)

[296. Inspection and maintenance](#)



**LOGAN  
DRILLING  
GROUP**

[297. Inspection and maintenance records](#)

[298. Certification](#)

[299. Audible warning](#)

[300. Molten metal](#)

[301. Two-block protection](#)

[302. Sheave guards](#)

[303. Ungrounded supply](#)

[304. Controls](#)

[305. Operator protection](#)

[306. Cab windows](#)

[307. Storage](#)

[308. Fire extinguisher](#)

[309. Operator qualifications](#)

[310. Shift inspection](#)

[311. Load weight](#)

[312. Calibration](#)

[313. Unsafe lift](#)

[314. Swing hazards](#)

[315. Position of equipment](#)

[316. Multiple crane lift](#)

[317. Travelling with a load](#)

[318. Loads over work areas](#)

[319. Unattended loads](#)

[320. Hook position](#)

[321. Signals](#)

[322. Alternative to hand signals](#)

[323. Dedicated radio system](#)

[324. Unhooking loads](#)

[325. Riding hook or load](#)

[326. Induced voltage](#)

[327. Uptravel limit](#)

[328. Electrical conductors](#)

[329. Power shutoff](#)

[330. Direction markings](#)

[331. Manually powered hoists](#)



**LOGAN  
DRILLING  
GROUP**

- [332. Cranes on floating supports](#)
- [333. Level turntable](#)
- [334. Outriggers](#)
- [335. Tires](#)
- [336. Supporting surface](#)
- [337. Travelling with a load](#)
- [338. Boom inspection](#)
- [339. Tower cranes](#)
- [340. Verification before use](#)
- [341. Identification](#)
- [342. Structural inspection](#)
- [343. Structures kept clean](#)
- [344. Communication](#)
- [345. Wind limitations](#)

PART XV  
RIGGING

- [346. Definitions](#)
- [347. Qualified riggers](#)
- [348. Use of rigging](#)
- [349. Component identification](#)
- [350. Design factors](#)
- [351. Natural fibre rope](#)
- [352. Wedge socket connections](#)
- [353. Open hook restriction](#)
- [354. Securing pins](#)
- [355. Replacing pins](#)
- [356. Securing ropes to drums](#)
- [357. Wraps required](#)
- [358. Sheaves](#)
- [359. Guylines](#)
- [360. Spooling tape](#)
- [361. Termination efficiencies](#)
- [362. Wire rope clips](#)
- [363. Restriction on foldback eyes](#)
- [364. Slings standards](#)



**LOGAN  
DRILLING  
GROUP**

- [365. Inspection before use](#)
- [366. Storage](#)
- [367. Knots](#)
- [368. Sharp edges](#)
- [369. Slinging loads](#)
- [370. Multiple piece lifts](#)
- [371. Below-the-hook lifting devices](#)
- [372. Part of lifted load](#)

PART XVI  
TRAFFIC CONTROL

- [373. Traffic control](#)
- [374. Traffic control person](#)
- [375. Traffic control signals](#)

PART XVII  
CONSTRUCTION, EXCAVATION AND DEMOLITION

- [376. Definitions](#)
- [377. Temporary floors](#)
- [378. Protection from falling materials](#)
- [379. Chutes](#)
- [380. Chutes and hoists](#)
- [381. Glass panels](#)
- [382. Temporary support](#)
- [383. Supervision](#)
- [384. Concrete placing hazards](#)
- [385. Inspections](#)
- [386. Pre-use inspections](#)
- [387. Controls](#)
- [388. Emergency shutoff](#)
- [389. Agitator guarding](#)
- [390. Concrete pump lines](#)
- [391. Equipment inspection](#)
- [392. Repair certification](#)
- [393. Restriction on use](#)
- [394. Operator's duties](#)
- [395. Hopper signal device](#)



**LOGAN  
DRILLING  
GROUP**

- [396. Underground utilities](#)
- [397. Structural integrity](#)
- [398. Hazardous materials](#)
- [399. Disconnecting services](#)
- [400. Glass removal](#)
- [401. Stabilizing walls](#)
- [402. Dismantling buildings](#)
- [403. Stairways](#)

PART XVIII  
EXCAVATION, UNDERGROUND WORK AND ROCK CRUSHING

- [404. Definition](#)
- [405. Entrapment danger](#)
- [406. Pre-excavation requirements](#)
- [407. Excavation or access](#)
- [408. Removal of material](#)
- [409. Faces and slopes](#)
- [410. Excavation safety](#)
- [411. Underground workings](#)
- [412. Internal combustion engines](#)
- [413. Air quality](#)
- [414. Rock crushing control measures](#)
- [415. Diesel engines underground](#)
- [416. Falling ground](#)

PART XIX  
GENERAL BLASTING

- [417. Definitions](#)
- [418. Employer's responsibility](#)
- [419. Role of certified blaster](#)
- [420. Security and report requirements](#)
- [421. Examination](#)
- [422. Records](#)
- [423. Suspension or seizure of certificate](#)
- [424. Custody of certificates](#)
- [425. Day box or magazine](#)
- [426. Prohibitions](#)





**LOGAN  
DRILLING  
GROUP**

- [427. Storage and handling](#)
- [428. Transportation](#)
- [429. Drilling](#)
- [430. Handling in special circumstances](#)
- [431. Preparing the blast loading](#)
- [432. Safety fuse](#)
- [433. Loaded holes](#)
- [434. Restrictions](#)
- [435. Electrical initiation](#)
- [436. Pre-firing](#)
- [437. Protection](#)
- [438. Firing](#)
- [439. Post-firing](#)
- [440. Unique blasting operation](#)
- [441. Seismic blasting](#)
- [442. Misfire](#)

PART XX  
FIRE PREVENTION AND CONTROL

- [443. Fire protection](#)
- [444. Fire and explosion](#)
- [445. Trucks loading and unloading](#)
- [446. Combustible substances](#)
- [447. Combustible gas propellants](#)
- [448. Hot work](#)

PART XXI  
WELDING, BURNING AND CUTTING OPERATIONS

- [449. Gas welding and burning](#)
- [450. Compressed gas cylinders](#)
- [451. Oxygen](#)
- [452. Radiation protection](#)
- [453. Burning and welding](#)
- [454. Ventilation](#)
- [455. Coatings on metals](#)
- [456. Receptacles for stubs](#)
- [457. Respiratory protection](#)



**LOGAN  
DRILLING  
GROUP**

PART XXII  
ACCESS AND EGRESS

[458. Access, egress and movement](#)

[459. Exits and doors](#)

[460. Stairs](#)

PART XXIII  
DIVING AND OTHER MARINE OPERATIONS

[461. Definitions](#)

[462. Wharves, platforms, etc.](#)

[463. Ladders and gang planks](#)

[464. Lifesaving equipment](#)

[465. Floating work platforms](#)

[466. Personal flotation devices](#)

[467. Occupational diving operations](#)

[468. Instruction](#)

[469. Slipping and tripping hazards](#)

[470. Galley requirements](#)

PART XXIV  
WOODWORKING AND WOOD PRODUCTS MANUFACTURING

[471. Circular saws](#)

[472. Operator protection](#)

[473. Cutting heads](#)

PART XXV  
FORESTRY OPERATIONS

[474. Felling](#)

[475. Brush saws](#)

[476. Hauling](#)

PART XXVI  
ELECTRICAL OPERATIONS

[477. Definitions](#)

[478. Electrical requirements](#)

[479. Poles and structures](#)

[480. Service rooms](#)

[481. Space around equipment](#)

[482. Testing equipment](#)

[483. Powerline hazards training](#)



**LOGAN  
DRILLING  
GROUP**

[484. Low voltage electrical equipment - disconnection and lockout](#)

[485. Low voltage electrical equipment](#)

[486. Working close to low voltage energized equipment](#)

[487. Low voltage electrical equipment - controls](#)

[488. Grounding portable low voltage electrical equipment](#)

[489. Low voltage electrical equipment - ground fault interrupters](#)

[490. Isolation and lockout](#)

[491. Warning signs](#)

[492. De-energized high voltage systems - isolation and lockout](#)

[493. Person in charge](#)

[494. Switching sequences](#)

[495. Isolating devices](#)

[496. Grounding and blocking](#)

[497. Multiple authorities](#)

[498. Minimum clearance - high voltage equipment and conductors](#)

[499. Assurance in writing](#)

[500. Assurance not practicable](#)

[501. Emergency work](#)

[502. Authorization by owner](#)

[503. Tree pruning etc. - preliminary inspection](#)

[504. Tree pruning etc. in hazardous area](#)

[505. Qualifications](#)

[506. Control systems - general requirements](#)

[507. Programmable control systems](#)

[508. Automatic control systems](#)

[509. Remote control systems](#)

[510. Wireless remote control](#)

#### PART XXVII

##### CONFINED SPACE ENTRY

[511. Confined space entry](#)

[512. Corrective precautions](#)

[513. Work procedures](#)

[514. Entry into confined space](#)

[515. Explosives or flammable atmosphere](#)

[516. Rescue from confined space](#)



**LOGAN  
DRILLING  
GROUP**

PART XXVIII  
GENERAL MINING REQUIREMENTS

- [517. Definitions](#)
- [518. Application](#)
- [519. Mine design](#)
- [520. Scaling procedures](#)
- [521. Procedure where flow of gas](#)
- [522. Examination of mine](#)
- [523. Unventilated or unsafe mine area](#)
- [524. Ground control procedures](#)
- [525. Ground control log book](#)
- [526. Ground control](#)
- [527. Rock bolts](#)
- [528. Water accumulation in mine workings](#)
- [529. Conveyor belts](#)
- [530. Emergency stops, warning device and guarding](#)
- [531. Conveyors general requirements](#)
- [532. Conveyor systems](#)
- [533. Motor vehicle braking systems](#)
- [534. Braking requirements](#)
- [535. Warning to traffic](#)
- [536. Wheel chocks](#)
- [537. Overload](#)

PART XXIX  
UNDERGROUND OPERATIONS

- [538. Definitions](#)
- [539. Application](#)
- [540. Mining method](#)
- [541. Mine rescue emergency procedure](#)
- [542. Tests and reports of emergency warning system](#)
- [543. Tallying](#)
- [544. Ambient air quality monitoring program](#)
- [545. Record of result of ambient air quality monitoring program](#)
- [546. Calibrating monitors and meters](#)
- [547. Voice communication](#)



**LOGAN  
DRILLING  
GROUP**

- [548. Old or abandoned workings](#)
- [549. Underground illumination](#)
- [550. Cap lamps](#)
- [551. Shaft pillar](#)
- [552. Boundary pillar](#)
- [553. Procedure when handling material](#)
- [554. Steeply inclined raises](#)
- [555. Raise climbers](#)
- [556. Use of raise climbers](#)
- [557. Overspeed safety device](#)
- [558. Electrically powered raise climber](#)
- [559. Electrical supply to raise climber](#)
- [560. Presence on sub-level prohibited](#)
- [561. Precautions for chutes](#)
- [562. Mucking](#)
- [563. Entry prohibited](#)
- [564. Plotting of diamond drill holes](#)
- [565. Escape exits from underground](#)
- [566. Refuge station](#)
- [567. Building near headframes, shaft house or portal house](#)
- [568. Air supply for hoist operator](#)
- [569. Fire doors](#)
- [570. Boilers, engines and compressors](#)
- [571. Reciprocating type air compressors](#)
- [572. Noncombustible material to be used](#)
- [573. Fire suppression system](#)
- [574. Storage of flammable material](#)
- [575. Fueling vehicles underground](#)
- [576. Fuel transfer or delivery systems](#)
- [577. Fuels on surface](#)
- [578. Prohibition of transfer of fuel by air](#)
- [579. Combustible refuse](#)
- [580. Process producing flammable mixture](#)
- [581. Hot work in mines](#)
- [582. Mine ventilation and auxiliary ventilation systems](#)



**LOGAN  
DRILLING  
GROUP**

- [583. Fire protection for ventilating systems](#)
- [584. Fans](#)
- [585. Booster fan](#)
- [586. Auxiliary fans](#)
- [587. Brattice or vent tubes](#)
- [588. Operating procedure for booster and auxiliary fans](#)
- [589. Stopping fan](#)
- [590. Ventilation monitoring](#)
- [591. Propane installations](#)
- [592. Internal combustion engines underground](#)
- [593. Replacement engines](#)
- [594. Operating vehicles](#)
- [595. Underground locomotives](#)
- [596. Remote controlled equipment](#)
- [597. Clearances for rail haulage](#)
- [598. Clearances for mobile equipment](#)
- [599. Safety stations](#)
- [600. Operation of vehicles on ramps](#)
- [601. Boreholes in advance of working face](#)
- [602. Dams and bulkheads](#)
- [603. Placement of fill material in mine workings](#)

**PART XXX**  
**SHAFTS, HOISTS AND CONVEYANCES**

- [604. Application](#)
- [605. Safety standard](#)
- [606. Record books](#)
- [607. Shaft installations](#)
- [608. Shaft inspection](#)
- [609. Protection of workers](#)
- [610. Staging or equipment suspended in shaft](#)
- [611. Use of buckets](#)
- [612. Regular examination of safety catches](#)
- [613. Chairing devices](#)
- [614. Hoisting persons](#)
- [615. Shaft conveyances](#)





**LOGAN  
DRILLING  
GROUP**

- [616. Content of certificate](#)
- [617. Shaft conveyance without cagetender](#)
- [618. Operation of conveyance](#)
- [619. Riding in bucket](#)
- [620. Prohibition of certain sinking buckets](#)
- [621. Load in sinking bucket](#)
- [622. Work at different elevations](#)
- [623. Shaft mucking machine](#)
- [624. Application](#)
- [625. Test specimen](#)
- [626. Examination of mechanical parts](#)
- [627. Defects](#)
- [628. Machinery record book](#)

PART XXXI  
EXPLOSIVES IN MINES

- [629. Definitions](#)
- [630. Application](#)
- [631. Blasting in mines](#)
- [632. Storage of explosives in mines](#)
- [633. Transporting explosives](#)
- [634. Magazine locked](#)
- [635. Maintenance of magazines](#)
- [636. Grounding](#)
- [637. Permit](#)
- [638. Log book](#)
- [639. Explosives used underground](#)
- [640. Manufacturing explosives](#)
- [641. Cutting or piercing](#)
- [642. Cartridge explosives](#)
- [643. Tools](#)
- [644. Unwinding detonator leg wires](#)
- [645. Sequential firing](#)
- [646. Detonator leg wires](#)
- [647. Wiring of magazines for explosives and detonators](#)
- [648. Bulk explosives vehicle](#)



**LOGAN  
DRILLING  
GROUP**

[649. Electric blasting](#)

[650. Electrical blasting devices](#)

[651. Procedures for hazardous dust explosions](#)

PART XXXII

OPEN CUT WORKINGS IN MINING OPERATIONS

[652. Definitions](#)

[653. Application](#)

[654. Protection of workings, pits and quarries](#)

[655. Protective curbs or berms](#)

[656. Heights of faces and benches](#)

[657. Face of open pit or quarry](#)

[658. Lifelines](#)

[659. Undercutting of face](#)

[660. Working of unconsolidated material](#)

[661. Dumping from vehicle](#)

[662. Ramps](#)

[663. Rotary drilling](#)

[664. Parking of vehicles](#)

[665. Operation of equipment](#)

[666. Light vehicle equipment](#)

[667. Lighting](#)

[668. Clearance lights](#)

[669. Mine road design](#)

[670. Bench and berm widths - quarries and open pits](#)

[671. Water control](#)

[672. Stockpiles](#)

[673. Waste dumps](#)

[674. Reverse when dumping](#)

[675. Dump raised](#)

PART XXXIII

USE OF ELECTRICITY IN MINES

[676. Definitions](#)

[677. Application](#)

[678. Codes and standards](#)

[679. Notices and information](#)



**LOGAN  
DRILLING  
GROUP**

- [680. Fire extinguishing devices](#)
- [681. Restrictions for hazardous locations](#)
- [682. Electrical equipment rooms](#)
- [683. Transformers](#)
- [684. Switchgear](#)
- [685. Trailing and cable repair](#)
- [686. Protection of trailing cables](#)
- [687. Electrical trailing cable reels](#)
- [688. Trailing cable connectors](#)
- [689. Quick connect cable couplers](#)
- [690. Electrical protection and control devices](#)
- [691. Protection of underground cables](#)
- [692. Out of service wiring](#)
- [693. Supply systems for mobile electrical equipment](#)
- [694. Shaft sinking equipment](#)
- [695. Lightning protection](#)
- [696. Radio controlled equipment](#)
- [697. Underground electrical protection](#)
- [698. Grounding](#)
- [699. Unprotected electrical cable](#)

**PART XXXIV  
REPEAL AND COMMENCEMENT**

- [700. CNLR 1145/96 Rep.](#)
- [701. NLR 70/09 Rep.](#)
- [702. Commencement](#)

[Schedule](#)

**Short title**

1. These regulations may be cited as the *Occupational Health and Safety Regulations, 2012* .

**PART I  
GENERAL**

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

## Interpretation

2. (1) In these regulations
- (a) "accident" includes
    - (i) an event occasioned by a physical or natural cause, or
    - (ii) disablement arising out of and in the course of employment;
  - (b) "ACGIH" means the American Conference of Governmental Industrial Hygienists;
  - (c) "Act" means the *Occupational Health and Safety Act* ;
  - (d) "administrative controls" means the provision, use and scheduling of work activities and resources in the workplace, including planning, organizing, staffing and coordinating, for the purpose of controlling risk;
  - (e) "ASHRAE" means the American Society of Heating, Refrigeration and Air Conditioning Engineers;
  - (f) "authorized" means, in reference to a person, a qualified person designated by an employer to carry out specific functions;
  - (g) "commission" means the Workplace Health, Safety and Compensation Commission established under the *Workplace Health, Safety and Compensation Act* ;
  - (h) "competent" means a person who is
    - (i) qualified because of that person's knowledge, training and experience to do the assigned work in a manner that ensures the health and safety of every person in the workplace, and
    - (ii) knowledgeable about the provisions of the Act and these regulations that apply to the assigned work, and about potential or actual danger to health or safety associated with the assigned work;
  - (i) "construction" means building, erection, excavation, alteration, repair, renovation, dismantling, demolition, structural maintenance, painting, moving, land clearing, earth moving, grading, street and highway building, concreting, equipment installation and alteration and the structural installation of construction components and materials in any form or for any purpose, and work in connection with it;
  - (j) "CSA " means the Canadian Standards Association;
  - (k) "engineering controls" means the physical arrangement, design or alteration of workstations, equipment, materials, production facilities or other aspects of the physical work environment, for the purpose of controlling risk;
  - (l) "hazardous health occupation" means an occupation from which an occupational disease may arise;



**LOGAN  
DRILLING  
GROUP**

- (m) "hot work" means work which involves burning, welding, cutting, grinding, using fire or spark producing tools or other work that produces a source of ignition;
- (n) "injury" means
  - (i) an injury as a result of a chance event occasioned by a physical or natural cause,
  - (ii) an injury as a result of wilful and intentional act, not being the act of the worker,
  - (iii) disablement,
  - (iv) occupational disease, or
  - (v) death as a result of an injury arising out of and in the course of employment and includes a recurrence of an injury and an aggravation of a pre-existing condition but does not include stress other than stress that is an acute reaction to a sudden and unexpected traumatic event;
- (o) "ISO" means the International Organization for Standardization;
- (p) "mine" means mine as defined in the *Mining Act* ;
- (q) "occupation" means an employment, business, calling or pursuit but does not include an endeavour that is not included in one of the classes of occupations in the current National Occupational Classification List developed by the Department of Human Resources and Social Development Canada in collaboration with Statistics Canada;
- (r) "occupational disease" means a disease prescribed by regulations under section 90 of the *Workplace Health, Safety and Compensation Act* and another disease peculiar to or characteristic of a particular industrial process, trade or occupation;
- (s) "occupational health service" means a service established in or near a workplace to maintain and promote the physical and mental well-being of workers and may include personnel, equipment, transportation, supplies and facilities;
- (t) "plant" means buildings, equipment and facilities where a worker or self-employed person is engaged in an occupation;
- (u) "professional engineer" means a person who holds a certificate of registration to engage in the practice of engineering under the *Engineers and Geoscientists Act* ;
- (v) "proof test" means a test applied to a product to determine material or manufacturing defects;
- (w) "qualified" means being knowledgeable of the work, the hazards involved and the means to control the hazards, by reason of education, training, experience or a combination of them;
- (x) "TLV" means the documentation of threshold limit values for chemical substances and physical agents in the work environment published annually or more frequently by the ACGIH; and





**LOGAN  
DRILLING  
GROUP**

(y) "work platform" means an elevated or suspended temporary work base for workers.

(2) In these regulations, a reference to a code or guideline, unless otherwise stated, includes amendments to that code or guideline and a reference shall be presumed to be a reference to the most current code or guideline.

(3) Where there is a conflict between a standard established by these regulations or a code or standard adopted by these regulations, the more stringent standard applies.

[Back to Top](#)

#### **Application**

3. These regulations apply to all employers and self-employed persons and workers and other persons to whom the Act applies except where the context of the regulations indicates otherwise.

[Back to Top](#)

#### **Responsibility of division**

4. The division may approve and distribute educational material, information and statistics required in the administration of the Act.

[Back to Top](#)

#### **Right to refuse work**

5. (1) Where an employer cannot resolve an issue in the workplace regarding occupational health and safety and there is a refusal to work, the issue shall be referred to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate, and the employer shall notify the division.

(2) Where a notification under subsection (1) is made orally, the employer shall provide the division with a written confirmation of the notification within 5 days of the oral notification.

(3) Where action has been taken by a worker to exercise the right to refuse to work under the Act, the employer shall not assign a substitute worker to perform those duties unless the substitute worker has been informed of the prior refusal and the reason for that refusal.

[Back to Top](#)

#### **Stop work orders**

6. (1) Stop work orders shall

- (a) be posted in the workplace; and
- (b) where applicable, state the remedial action to be taken.





**LOGAN  
DRILLING  
GROUP**

(2) A copy of a stop work order shall be provided by the division to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate.

(3) A stop work order shall not be cancelled or removed from the workplace until the remedial action has been taken to the satisfaction of an officer.

[Back to Top](#)

### **Appeal**

7. (1) An appeal under section 33 of the Act or an application under section 51 of the Act to the board shall contain

- (a) the name and address of the person making the appeal or the application;
- (b) the names and addresses of all other parties involved in the appeal or application; and
- (c) a statement of the grounds on which the appeal or application is being made.

(2) The board shall

- (a) give notice of the appeal or application; and
- (b) send one or more copies of the appeal or application

to all parties considered by the board to be affected by the appeal or application.

(3) The parties referred to in subsection (2) shall, within 14 calendar days of receiving a copy of the appeal or application, file a reply with the board.

## **PART II NOTICE REQUIREMENTS**

[Back to Top](#)

### **New project**

8. Before beginning a new construction project or an industrial enterprise that is intended to continue for 30 days or more, an employer shall

- (a) send a written notice to the minister containing the name of the plant or construction site, its location, the mailing address to which correspondence should be directed, the nature of the work, the numbers of workers to be employed and the name of the firm under which the business is to be carried on; and
- (b) in the case of a plant, provide the minister, upon request, with plans showing the plant buildings and the main disposition of equipment and information relevant to processes and the nature of the substances that may be used.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Notifiable occupational diseases**

9. (1) The occupational diseases for which notification is required under section 60 of the Act shall be those set out in the Schedule.

(2) Notwithstanding that it is not a disease referred to in the Schedule, an employer shall inform the minister of a disease or illness affecting a worker in his or her employ that is determined by a medical practitioner to be an occupational or work related disease or illness.

(3) Where an employer is advised by or on behalf of a worker that the worker has an occupational disease or that a claim in respect of an occupational disease has been filed with the Workplace Health, Safety and Compensation Commission by or on behalf of the worker, the employer shall give notice to the division within 3 days of being advised.

[Back to Top](#)

#### **Serious injury**

10. (1) In this section, "serious injury" includes an injury that

- (a) places life in jeopardy;
- (b) produces unconsciousness;
- (c) results in substantial loss of blood;
- (d) involves the fracture of a leg or arm but not a finger or toe;
- (e) involves the amputation of a leg, arm, hand, foot, finger or toe;
- (f) consists of burns to a major portion of the body; or
- (g) causes the loss of sight in an eye.

(2) An employer shall, within 3 days after an accident happens to a worker that results in a serious injury to the worker, provide written notice to the minister advising the minister that an accident has occurred and containing the following information:

- (a) the nature of the accident;
- (b) the time and place of the accident;
- (c) the name and address of the worker injured in the accident; and
- (d) the name and address of the physician who treated or is treating the worker for the injury.



**LOGAN  
DRILLING  
GROUP**

(3) A fatality shall be reported to the minister immediately by telephone, or by whatever other means of communication that are readily available and that report shall be followed up in writing within 5 days.

(4) For the purpose of subsection (2), a copy of the applicable report of injury form is acceptable.

(5) Where the minister finds that it is impractical to conduct an investigation respecting an accident, the report of the investigation by the employer conducted in consultation with the occupational health and safety committee or the worker health and safety representative or the workplace health and safety designate shall be forwarded to the minister.

(6) Where a medical practitioner requires a worker to be examined to determine

(a) the extent of an injury suffered in the course of his or her occupation; or

(b) whether he or she suffers from an occupational disease,

the medical report of the commission may be accepted.

[Back to Top](#)

#### **Notification to utilities**

**11.** An employer whose work activities result in a hit or damage to a pipeline, buried electrical cable, overhead cable or other utility shall notify the owner of the utility without delay.

### **PART III GENERAL DUTIES**

[Back to Top](#)

#### **Occupational health and safety program**

**12.** (1) An occupational health and safety program required under section 36.1 of the Act shall be signed and dated by the employer and by the person or persons responsible for the management of the employer's operations in the province and shall include:

(a) a statement of the employer's commitment to cooperate with the occupational health and safety committee and workers in the workplace in carrying out their collective responsibility for occupational health and safety;

(b) a statement of the respective responsibilities of the employer, supervisors, the occupational health and safety committee and workers in carrying out their collective responsibility for occupational health and safety;

(c) procedures to identify the need for, and for the preparation of written safe work procedures to implement health and safety practices, including practices required by the Act and the regulations, or as required by an officer;



**LOGAN  
DRILLING  
GROUP**

- (d) written work procedures appropriate to the hazards and work activity in the workplace;
- (e) a plan for orienting and training workers and supervisors in workplace and job-specific safe work practices, plans, policies and procedures, including emergency response, that are necessary to eliminate, reduce or control hazards;
- (f) provisions for establishing and operating an occupational health and safety committee, including provisions respecting
  - (i) maintenance of membership records,
  - (ii) procedural rules,
  - (iii) access by the committee to management staff with the authority to resolve health and safety issues and to information about the employer's operations required under the Act and the regulations, and
  - (iv) a plan for training committee members as required under the Act;
- (g) a system for the recognition, evaluation and control of hazards that includes:
  - (i) evaluation and monitoring of the workplace to identify potential hazards and the associated risks,
  - (ii) procedures and schedules for regular inspections by management and committee members,
  - (iii) procedures for the identification, reporting and control or correction of hazards,
  - (iv) procedures for the prompt investigation of hazardous occurrences to determine the cause of the occurrence and the actions necessary to prevent a recurrence,
  - (v) identification of the circumstances where the employer is required to report hazards to the committee and the procedures for doing so, and
  - (vi) measures for the accountability of persons responsible for the reporting and correction of hazards;
- (h) a plan for the control of biological and chemical substances handled, used, stored, produced or disposed of at the workplace and where appropriate, the monitoring of the work environment to ensure the health and safety of workers and other persons at or near the workplace;
- (i) a system to ensure that persons contracted by the employer or for the employer's benefit comply with the program developed under this section and the Act and regulations;
- (j) an emergency response plan;
- (k) maintenance of records and statistics, including occupational health and safety committee minutes, reports of occupational health and safety inspections and



investigations, with procedures to allow access to them by persons entitled to receive them under the Act; and

(l) provision for monitoring the implementation and effectiveness of the program.

(2) An employer that is required to establish and maintain an occupational health and safety program under section 36.1 of the Act shall

(a) implement the occupational health and safety program; and

(b) review and, where necessary, revise the occupational health and safety program as follows:

(i) at least every 3 years,

(ii) where there is a change of circumstances that may affect the health and safety of workers, and

(iii) where an officer requests a review.

### [Back to Top](#)

#### **Occupational health and safety policy**

**13.** (1) An occupational health and safety policy required under section 36.2 of the Act shall be signed and dated by the employer and by the person or persons responsible for the management of the employer's operations in the province, and shall contain a statement of the employer's commitment to occupational health and safety that includes:

(a) a statement of the employer's commitment to cooperate with the worker health and safety representative or the workplace health and safety designate and workers in the workplace in carrying out their collective responsibility for occupational health and safety; and

(b) a statement of the respective responsibilities of the employer, supervisors, the worker health and safety representative or the workplace health and safety designate and other workers in carrying out their collective responsibility for occupational health and safety.

(2) An employer that is required to establish and maintain an occupational health and safety policy under section 36.2 of the Act shall review and, where necessary, update the policy at least annually, in consultation with the worker health and safety representative or the workplace health and safety designate.

### [Back to Top](#)

#### **General duties of employers**

**14.** (1) An employer shall ensure, so far as is reasonably practicable, that all buildings, structures, whether permanent or temporary, excavation, machinery, workstations, places of employment and equipment are capable of withstanding the stresses likely to be imposed upon them and of safely performing the functions for which they are used or intended.



**LOGAN  
DRILLING  
GROUP**

(2) An employer shall ensure that necessary protective clothing and devices are used for the health and safety of his or her workers.

(3) The employer shall ensure that safe work procedures are followed at all workplaces.

(4) An employer shall ensure, so far as is reasonably practicable, that work procedures promote the safe interaction of workers and their work environment to minimize the potential for injury.

[Back to Top](#)

### **Working alone**

**15.** (1) In this section, "to work alone or in isolation" means to work in circumstances where assistance would not be readily available to the worker

(a) in case of an emergency; or

(b) in case the worker is injured or in ill health.

(2) An employer shall conduct a risk assessment where a worker is assigned to work alone or in isolation;

(3) Where a risk assessment required under subsection (2) identifies a hazard, appropriate controls shall be implemented to eliminate, or where elimination is not practicable, minimize the risk associated with the hazard;

(4) An employer shall develop and implement a written procedure for checking the well-being of a worker assigned to work alone or in isolation;

(5) A procedure referred to in subsection (4) shall include the time interval between checks and the procedure to follow in case the worker cannot be contacted, including provisions for emergency response;

(6) A person shall be designated to establish contact with the worker at predetermined intervals and the results shall be recorded by the person;

(7) A procedure referred to in subsection (4) shall be developed in consultation with the worker assigned to work alone or in isolation, the occupational health and safety committee, the worker health and safety representative or designate, whichever applies;

(8) A procedure referred to in subsection (4) shall be reviewed at least annually, or more frequently if there is

(a) a change in work arrangements that may adversely affect a worker's well-being or safety; or

(b) a report that procedures are not working effectively.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Safe working load of equipment**

16. (1) Except as provided elsewhere in these regulations, the safe working load of equipment shall be that specified by the manufacturer.

(2) The safe working load of equipment shall be certified by a suitably qualified and registered professional engineer or other person named by the employer and acceptable to the assistant deputy minister where

- (a) the manufacturer's specification or other acceptable warranty cannot be produced;
- (b) the equipment has been modified in a manner that changes its safe working load;
- (c) wear, corrosion, damage or signs of fatigue are found which may reduce the safe working load;
- (d) the equipment is used in a manner or for a purpose other than that for which it was originally designed, where that use changes the safe working load; or
- (e) the provision of the certification is considered to be necessary by an officer.

[Back to Top](#)

### **General duties of workers**

17. (1) A worker shall make proper use of all necessary safeguards, protective clothing, safety devices, lifting devices or aids, and appliances

- (a) designated and provided for his or her protection by the employer; or
- (b) required under these regulations to be used or worn by a worker.

(2) A worker shall follow the safe work procedure in which he or she has been instructed.

(3) A worker shall immediately report a hazardous work condition that may come to his or her attention to the employer or supervisor.

[Back to Top](#)

### **Safety inspections**

18. (1) Regular inspections of all buildings, excavations, structures, machinery, equipment, work practices and places of employment shall be made by the employer or his or her representative at intervals to ensure that safe working conditions are maintained and that unsafe conditions found as a result of the inspection are remedied without delay.

(2) Where an unsafe condition is discovered by a person, it shall be reported as soon as practicable to a supervisor who shall ensure that appropriate action is taken, without delay, to prevent a worker from being injured.

(3) Where emergency action is required to correct a condition that constitutes an immediate threat to workers, only those qualified and properly instructed workers necessary to



**LOGAN  
DRILLING  
GROUP**

correct the unsafe condition shall be exposed to the hazard and every possible effort shall be made to control the hazard while the corrective action is taking place.

[Back to Top](#)

#### **Co-ordination of work**

19. (1) An owner shall ensure that all workers and other persons at the workplace are informed of

- (a) the hazards of an owner's operations or site conditions; and
- (b) the health and safety activities to be used to address the hazards.

(2) A principal contractor shall ensure work schedules and tasks are organized to provide safe working conditions for workers.

[Back to Top](#)

#### **Two or more employers**

20. Where a construction project involves the work of 2 or more employers or their workers,

- (a) the principal contractor shall ensure compliance with the regulations where conditions or activities affect the workers of more than one employer; and
- (b) each employer shall notify the principal contractor in advance of an undertaking likely to create a hazard for a worker of another employer.

[Back to Top](#)

#### **Appointment of qualified co-ordinator**

21. Where, at a work location, the overlapping or adjoining work activities of 2 or more employers create a hazard to workers and the combined work force at the workplace is more than 5 persons, the principal contractor shall

- (a) ensure that an individual is designated at the work location to coordinate communication for the purpose of ensuring health and safety on the worksite; and
- (b) where the principal contractor is not at the work location the principal contractor shall designate a person to assume the duty.

[Back to Top](#)

#### **Violence prevention**

22. (1) In this section and sections 23 and 24, "violence" means the attempted or actual exercise by a person, other than a worker, of physical force to cause injury to a worker, and



**LOGAN  
DRILLING  
GROUP**

includes threatening statements or behaviour which gives a worker reason to believe that he or she is at a risk of injury.

(2) An employer risk assessment shall be performed in a workplace in which a risk of injury to workers from violence arising out of their employment may be present.

(3) The risk assessment shall include the consideration of

- (a) previous experience in the workplace;
- (b) occupational experience in similar workplaces; and
- (c) the location and circumstances in which work may take place.

[Back to Top](#)

#### **Procedures and policies**

**23.** Where a risk of injury to workers from violence is identified by an assessment performed under section **22** the employer shall

- (a) establish procedures, policies and work environment arrangements to eliminate the risk to workers from violence; and
- (b) where elimination of the risk to workers is not possible, establish procedures, policies and work environment arrangements to minimize the risk to workers.

[Back to Top](#)

#### **Instruction to workers**

**24.** (1) An employer shall inform workers who may be exposed to the risk of violence of the nature of the risk and the precautions that may be taken.

(2) The duty to inform workers in subsection (1) includes a duty to provide information related to the risk of violence from persons who have a history of violent behaviour and whom workers are likely to encounter in the course of their work.

### **PART IV OCCUPATIONAL HEALTH AND SAFETY COMMITTEES, REPRESENTATIVES AND DESIGNATES**

[Back to Top](#)

#### **Operations of committees, representatives and designates**

**25.** (1) An employer shall ensure that

- (a) an occupational health and safety committee is established;
- (b) a worker health and safety representative is appointed; or



**LOGAN  
DRILLING  
GROUP**

(c) a workplace health and safety designate is designated; and

(d) a copy of the Act and regulations under the Act are easily accessible to an employee.

(2) Minutes of all regular meetings and special committee meetings shall be recorded in the form prescribed by the commission and one copy shall be kept on file with the committee, one copy shall be filed with the commission and one copy shall be posted in a prominent place in the workplace.

(3) A worker health and safety representative or a workplace health and safety designate shall report to the commission in the form required by the commission.

(4) An occupational health and safety committee shall

(a) meet within 2 weeks of its establishment;

(b) elect co-chairpersons as required by subsection 38(6) of the Act; and

(c) notify the commission of the elected co-chairs.

(5) A quorum of the committee shall consist of one-half of its membership, provided that both employer and worker members are equally represented.

(6) Where an agreement cannot be reached between co-chairpersons on convening a meeting of the committee, the minister may be requested to intervene.

(7) The minister may require that a committee have monthly meetings where a particular hazard is involved, the operations are particularly complex or large numbers of workers are involved.

(8) A representative of the employer and

(a) the workers of an occupational health and safety committee;

(b) the worker health and safety representative; or

(c) the workplace health and safety designate, except where the workplace health and safety designate is the employer,

have the right to accompany an officer of the division when the health and safety inspections are being conducted.

(9) Copies of all health and safety inspection reports made by an officer of the division, shall be circulated by the employer to

(a) the occupational health and safety committee;

(b) the worker health and safety representative; or

(c) the workplace health and safety designate.





**LOGAN  
DRILLING  
GROUP**

## PART V GENERAL HEALTH AND SAFETY REQUIREMENTS

[Back to Top](#)

### Personal conduct

26. (1) A worker with a medically documented physical or mental impairment shall not be assigned to work where those impairments endanger the health and safety of that worker or other workers.

(2) An employer, supervisor or worker shall not enter or remain on the premises of a workplace or at a job site while his or her ability to perform work responsibilities is impaired by intoxicating substances or another cause that endangers his or her health or safety or that of other workers.

(3) A person shall not engage in horseplay, scuffling, unnecessary running or jumping, practical jokes or other similar activity or behaviour that may create or constitute a hazard to workers.

(4) Before tools, machinery or equipment is put into operation, the person responsible for doing so shall ensure that all guards are in place and that putting the equipment into operation does not endanger a person.

[Back to Top](#)

### Travel over and work on ice

27. (1) Where a worker is to travel over or work on ice and the water beneath the ice is more than one metre deep at any point, the employer of the worker shall ensure the ice supports the load to be placed on it.

(2) The employer shall test the ice for the purpose of subsection (1)

(a) before work begins; and

(b) as often during the work as necessary to ensure the safety of the workers.

[Back to Top](#)

### Guardrails

28. (1) Guardrails shall be installed where an open-sided floor, working platform, runway, walkway or balcony is over 1.22 metres above the existing floor or ground level.

(2) Detour guardrails shall be installed where a stairway ends in direct proximity to dangerous traffic or other hazards.

(3) An employer shall ensure that a guardrail is secured so that it cannot move in any direction if it is struck or if a point on it comes in contact with a worker, materials or equipment.



**LOGAN  
DRILLING  
GROUP**

(4) Guardrails shall be installed on walkways over open tanks containing harmful substances or over open tanks 1.22 metres or more in depth.

(5) Walkways and platforms installed over machinery and work areas shall be equipped with toe boards at least 10 centimetres high along all sides of the walkway or platform.

(6) A guard rail shall have a top rail located at least .9 metres but not more than 1.1 metres above the working surface and an intermediate rail located midway between the top rail and the working surface.

### [Back to Top](#)

#### **Roof work**

**29.** (1) Where work is being done at a distance greater than 2 metres from the edge of a roof that has a slope of less than 3/12, the employer shall implement control zones to alert workers upon entering within 2 metres of the edge without an appropriate means of fall protection.

(2) Where work is being done from the edge of a roof or within 2 metres of the edge of a roof that has a slope of less than 3/12 in circumstances described in paragraph 141 (a), (b) or (c), fall protection shall be used, in accordance with paragraph 141 (d), (e), (f), (g), or (h).

(3) Where work is being done from or on a roof that has a slope that is equal to or greater than 3/12 but less than 6/12, under circumstances described in paragraph 141 (a), (b) or (c)

- (a) a fully decked scaffold with toeboards installed continuously along the edge of the roof,
- (b) roof brackets, guardrails and toeboards installed continuously along the edge of the roof, or
- (c) a fall arrest system in accordance with paragraph 141 (d)

shall be implemented.

(4) Where work is being done from a roof that has a slope that is equal to or greater than 6/12 but less than 9/12, under circumstances described in paragraph 141 (a), (b) or (c), a combination of 2 of the following shall be implemented:

- (a) roof brackets,
- (b) a fully decked scaffold with toeboards installed continuously along the length of the eave, and
- (c) a fall arrest system in accordance with paragraph 141 (d).

(5) Where work is done from or on a roof that has a slope equal to or greater than 9/12, under circumstances described in paragraph 141 (a), (b) or (c), roof brackets with planks and a fall arrest system shall be used in accordance with these regulations.

(6) Crawl boards and ladders used for roof work shall be securely fastened over the ridge of the roof or be otherwise effectively anchored.





**LOGAN  
DRILLING  
GROUP**

(7) An eavestrough shall not be used to support a crawl board or ladder on a roof.

[Back to Top](#)

#### **Openings, pits and tanks**

**30.** (1) Where a worker is employed around an open tank containing liquid or a harmful substance, the sides of the tanks shall be constructed to extend at least 91.44 centimetres above a working platform or standard guardrails shall be provided to prevent the worker from falling into the tank.

(2) A hole or pit in a floor, roof, walkway or work area accessible to a worker shall be securely covered and identified.

(3) Where a vehicle service pit is used so frequently that compliance with this section is impractical, the perimeter of the pit shall be delineated by high visibility, luminescent, skid-resistant paint instead of guardrails.

(4) A vehicle service pit shall have a fixed ladder at each end.

[Back to Top](#)

#### **Material storage**

**31.** (1) Material and equipment shall be placed, stacked or stored in a stable and secure manner that does not constitute a hazard to a worker who is in the area or who is manually stacking the items.

(2) Stacked material or containers shall be stabilized where necessary by interlocking, strapping or other effective means of restraint.

(3) A worker shall not enter or remain in a place where there is a danger of entrapment or engulfment unless

(a) safe access and a safe work area is provided by catwalks, walkways, barriers or other means; or

(b) measures are taken, where practicable, to control the risk of entrapment or engulfment and, where the risk is not eliminated, the worker

(i) shall use a lifeline and harness prescribed in Part X that keeps the worker in a position to be able to be rescued, and

(ii) is continuously tended by a standby person who is equipped for and capable of effecting immediate rescue.

(4) An area in which material may be dropped, dumped or spilled shall be guarded to prevent inadvertent entry by a worker, or protected by adequate covers and guarding.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Signage**

32. Signs posted in a workplace for the purpose of providing information about health and safety shall conform with the requirement of a standard acceptable to the minister.

[Back to Top](#)

#### **Overcrowding**

33. An employer shall, to the extent reasonably practical, ensure that a workplace or an area in that workplace is not so overcrowded as to cause risk of injury to the health or safety of a worker.

[Back to Top](#)

#### **Slipping hazards**

34. (1) Where the regular work process results in liquid spilling on to the floor or work areas, and where this spillage could introduce a slipping or other hazard, floor drains shall be installed or other suitable means used or adopted to eliminate this hazard.

(2) Only an approved non-combustible grease and oil absorbent shall be used to eliminate a hazard referred to in subsection (1).

(3) Where wet processes are used, an employer or contractor shall ensure that reasonable drainage is maintained and that false floors, platforms, mats or other dry standing places are provided and kept clean.

[Back to Top](#)

#### **Barriers**

35. Where a worker may be exposed to flying fragments or particles, he or she shall be protected by an appropriate barrier or wear appropriate personal protection equipment.

[Back to Top](#)

#### **Illumination**

36. (1) An employer shall provide sufficient and suitable lighting, whether natural or artificial, in every part of a workplace while a worker is present and the illumination shall comply with the standards set by the American National Standards Institute - Illuminating Engineering Society, or other standards acceptable to the minister.

(2) An artificial light source or reflective surface shall be positioned, screened or provided with a shade to prevent glare or discomfort or the formation of shadows that cause eyestrain or a risk of accident or injury to workers.



**LOGAN  
DRILLING  
GROUP**

(3) Where the visibility in a work area is restricted due to the presence of smoke, steam or other substances in the atmosphere, and where this condition may result in injury to workers, corrective measures shall be taken to eliminate, control or reduce the hazard.

(4) Handling, storage and disposal of fluorescent bulbs shall be in accordance to manufacturers' instructions.

(5) Fluorescent bulbs shall be stored in suitable containers.

(6) Where fluorescent bulbs are disposed of by crushing or compacting, it shall be done in an area adequately ventilated to protect the health and safety of the worker and the worker shall be provided with and use appropriate protective equipment.

[Back to Top](#)

#### **Compressed air**

**37.** Compressed air shall not be used to clean clothes, machinery, work benches or floors.

[Back to Top](#)

#### **Emergency plan risk assessment**

**38.** (1) An employer shall conduct a risk assessment in a workplace in which a need to rescue or evacuate workers may arise.

(2) Where the risk assessment required by subsection (1) shows a need for evacuation or rescue, appropriate written procedures shall be developed and implemented and a worker assigned to coordinate their implementation.

(3) Written rescue and evacuation procedures are required for but not limited to

- (a) work at high angles;
- (b) work in confined spaces or where there is a risk of entrapment;
- (c) work with hazardous substances;
- (d) underground work;
- (e) work in close proximity to power lines;
- (f) work on or over water; and
- (g) workplaces where there are persons who require physical assistance to be moved.

(4) Where a workplace is a low risk workplace in the opinion of an employer, the employer shall post information about escape routes and conduct emergency drills he or she considers appropriate.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

### **Emergency procedures**

39. (1) An emergency exit route shall be provided from a work area in which the malfunctioning of equipment or a work process could create an immediate danger to a worker and the regular means of exit could become dangerous or unusable.

(2) An emergency exit route shall be designed and marked to provide quick and unimpeded exit.

(3) At least once a year an emergency drill shall be held to ensure awareness and effectiveness of the emergency exit routes and procedure, and a record of the drill shall be kept for a period of 5 years.

[Back to Top](#)

### **Emergency lighting**

40. (1) Where a failure of a lighting system would create conditions dangerous to the health and safety of workers, an emergency lighting system shall be provided for the workplace and the exit routes.

(2) An emergency lighting system shall provide dependable illumination while the primary lighting system is off to enable all emergency measures to be carried out, including

- (a) emergency shutdown procedures, and
- (b) evacuation of workers from the premises.

[Back to Top](#)

### **Emergency training**

41. (1) A worker shall be given adequate instruction in the fire prevention and emergency evacuation procedures applicable to his or her workplace.

(2) A worker assigned to firefighting duties in a workplace shall be given adequate training by a qualified instructor in fire suppression methods, fire prevention, emergency procedures, organization and chain of command, firefighting crew safety and communications applicable to the workplace in accordance with National Fire Protection Association standards.

(3) Retraining for firefighting duties shall be provided periodically, but not less than once a year.





**LOGAN  
DRILLING  
GROUP**

## PART VI OCCUPATIONAL HEALTH REQUIREMENTS

[Back to Top](#)

### Hazardous substances

42. (1) An employer shall monitor the use or presence of substances at the workplace that may be hazardous to the health and safety of workers.

(2) In accordance with subsection (1), an employer shall implement a chemical and biological control program commensurate with the associated risks.

(3) In accordance with subsection (1), an employer shall eliminate hazardous substances from the workplace and where this is not practicable substitute a less hazardous substance.

(4) Where hazardous substances exist, an employer shall employ engineering and administrative controls to ensure their safe use.

(5) An employer shall ensure that a substance produced, used or handled at a workplace which by reason of toxicity, flammability or reactivity creates a risk to the health or safety of workers is controlled in accordance with the Material Safety Data Sheet or manufacturer's specifications.

(6) Where the minister determines that the use or presence of a hazardous substance at a place of employment may be injurious to the health of workers, the minister may inquire into the substance and may prohibit, restrict or modify the use of the substance until a time that an employer establishes to the minister that its use or presence is not injurious to the health of workers.

(7) An employer shall ensure that

- (a) atmospheric contamination of the workplace by hazardous substances is kept as low as is reasonably practicable;
- (b) a worker is informed of the nature and degree of health effects of the hazardous substances to which the worker is exposed;
- (c) exposure of a worker to hazardous substances is as minimal as is reasonably practicable, and where a threshold limit value has been established by the ACGIH, exposure shall not exceed the threshold limit value;
- (d) except as otherwise determined by the division, a worker is not exposed to a substance that exceeds the ceiling limit, short-term exposure limit or 8-hour TWA (time weighted average) limit prescribed by ACGIH; and
- (e) where a substance referred to in paragraph (d) has an 8-hour TWA limit, a worker's exposure to the substance does not exceed
  - (i) 3 times the 8-hour TWA limit for more than a total of 30 minutes during the work period, and



**LOGAN  
DRILLING  
GROUP**

(ii) 5 times the 8-hour TWA limit.

(8) Where extended work periods exist where the work period is more than 8 hours in a 24 hour day, the 8 hour exposure shall be adjusted accordingly as outlined in the ACGIH "Threshold Limit Values (TLVs)" Manual.

(9) Adjustment of TLVs, as required, shall be done in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as appropriate.

(10) Where a worker is exposed to a substance which is designated as a reproductive toxin or a sensitizer, an employer shall develop policy and procedures appropriate to the risk, which may include protective reassignment.

(11) Where workers may be exposed to contact with chemicals harmful to the skin, facilities shall be available for the worker to effectively cleanse the contaminated body areas, including, where corrosive chemicals are involved, emergency water baths, showers, jump tanks, eyewash facilities or other effective means of treatment.

(12) The policy and procedures required by subsection (10) shall include

- (a) informing workers about the reproductive toxin and identifying ways to minimize exposure to the toxin for a worker who has advised the employer of pregnancy or intent to conceive a child; and
- (b) identifying ways to eliminate exposure to a sensitizer for a worker who is or may become sensitized to that substance.

(13) Solvents, oils, greases, paints or other flammable substances shall be cleaned up by using an approved non-combustible grease and oil absorbent which shall be placed in covered metal containers before disposal.

(14) Containers referred to in subsection (13) shall not be stored in work areas.

### [Back to Top](#)

#### **Health surveillance**

**43.** (1) In accordance with subsection **42** (2), an employer shall assess the need for and extent of health surveillance of his or her workers.

(2) Based on the results of the assessment under subsection (1), an employer shall establish and maintain a program for the surveillance of the health of workers, which shall be in accordance with the following guidelines

- (a) the International Code of Ethics for Occupational Health Professionals; and
- (b) the International Labour Organization's Technical and Ethical Guidelines for Health Surveillance.

(3) In addition, to subsections (1) and (2), the minister may





**LOGAN  
DRILLING  
GROUP**

- (a) designate a workplace or class of workplaces as requiring an occupational health surveillance program; or
  - (b) make requirements for modifications to an occupational health surveillance program.
- (4) An employer shall ensure that an occupational health surveillance program in a workplace is communicated to employees of that workplace.
- (5) The minister may require a worker to undergo a medical examination as part of a health surveillance program where it may be necessary for the prevention of occupational disease.
- (6) A medical examination shall be performed during normal working hours without loss of pay to workers.
- (7) Where the minister has been advised by a physician that a worker has been adversely affected by a hazardous substance in the workplace and requires temporary removal or workplace accommodation from that workplace or hazard, the minister may require the employer to provide without loss of pay to the worker temporary alternative work for the time period required.
- (8) An employer shall keep records of a health surveillance program for a period of time specified by the minister, and these records shall be made available to
- (a) an employee who requests information pertaining to his or her health surveillance records; and
  - (b) where a physician is no longer able to keep medical records pertaining to an occupational exposure, the minister shall be notified in advance to make alternate arrangements that are in accordance with the guidelines of the College of Physicians and Surgeons of Newfoundland and Labrador regarding the retention and storage of medical records.

### [Back to Top](#)

#### **Thermal environment**

- 44.** (1) An employer shall ensure that a thermal environment which is reasonable and consistent with the nature and degree of the work performed, as established by the ACGIH, is provided and maintained in a workplace.
- (2) An employer shall provide appropriate and suitable monitoring equipment in a workplace where the thermal environment is likely to pose a hazard to a worker.
- (3) Under unusually hot or cold working conditions an employer shall make further provision for the health and safety and reasonable thermal comfort of a worker, which may include:
- (a) regular monitoring, posting of warning devices and additional first aid measures;
  - (b) provision of special equipment and clothing;
  - (c) provision of screens or shelters;



**LOGAN  
DRILLING  
GROUP**

- (d) medical supervision, hot or cold drinks and acclimatization procedures;
- (e) limited work schedules with rest periods; and
- (f) other appropriate controls and measures.

(4) In a workplace, an open flame, steampipe or other high temperature source shall be identified at the source and positioned or shielded to prevent contact by a worker, unless the exposed source is necessary for work processes and cannot be appropriately controlled by engineering means.

(5) Where a source referred to in subsection (4) is necessarily exposed, a worker shall wear appropriate personal protective equipment.

### [Back to Top](#)

#### **Ventilation**

**45.** (1) An employer shall ensure that

- (a) there is appropriate circulation of clean and wholesome air;
- (b) there is adequate ventilation; and
- (c) impurities are made harmless and inoffensive

in a workplace in accordance with standards established by ASHRAE and ACGIH.

(2) Where a work or process gives off dust, fumes, vapour, mist or other impurity of a kind and quantity liable to be injurious or offensive to a worker, an employer shall provide, maintain and ensure the proper use of a ventilation system sufficient to protect the worker against inhalation of impurities and to prevent impurities accumulating in the work space.

(3) Where practicable, local exhaust ventilation shall be installed and maintained near to the point of origin of an impurity to prevent it entering the air of the workplace and the breathing zone of its workers.

(4) Impurities removed under subsections (2) and (3) shall be exhausted clear of a workplace and prevented from entering a workplace.

(5) An employer shall ensure that,

- (a) all parts of a ventilation system are maintained;
- (b) louvers are cleaned regularly; and
- (c) ventilation openings are free of obstruction and sources of contamination.

(6) Where possible, exhaust from an internal combustion engine operated indoors shall be vented to the outdoors.



**LOGAN  
DRILLING  
GROUP**

(7) Where mobile equipment powered by an internal combustion engine is operated indoors or in an enclosed work area

- (a) the engine shall be adequately serviced and maintained to minimize the concentration of air contaminants in the exhaust to the applicable ACGIH Standards, and
- (b) the work area shall be assessed to determine the potential for exposure of workers to harmful levels of exhaust components.

(8) Where a worker is or may be exposed to an exhaust gas component in concentrations exceeding the applicable exposure limits, exhaust gas scrubbers, catalytic converters, or other engineering controls shall be installed.

(9) An employer, contractor or owner shall ensure that

- (a) the mechanical ventilation system
  - (i) including humidification equipment, is constructed and maintained to minimize the growth and dissemination of micro-organisms, insects and mites through the ventilation system, and
  - (ii) where reasonably practicable, is readily accessible for cleaning and inspection;
- (b) a qualified person inspects and maintains all parts of a mechanical ventilation system, cleans all louvers and replaces or adequately cleans all filters at a frequency that is sufficient to protect the health and safety of workers;
- (c) a record of all inspections, maintenance and cleaning of the mechanical ventilation system is
  - (i) completed by a qualified person who performs the work, and
  - (ii) readily available for examination by the occupational health and safety committee, or worker representative or designate or, where there is no committee, representative or designate, by the workers and the occupational health and safety officer;
- (d) when mechanical ventilation is required, the ventilating fans are located to prevent recirculation of contaminated air; and
- (e) measurements of the air volume of the mechanical ventilation system are taken at suitable intervals to ensure compliance with the minimum air volume requirements in accordance with standards established by ASHRAE, ACGIH or other applicable standard approved by the minister.

(10) An employer shall ensure that, wherever possible, a less hazardous substance or work process is used in preference to a more hazardous substance or process.

(11) A ventilation system used to control airborne contaminants shall have electrical and mechanical systems designed to control all potential ignition sources and meet the requirements of the Canadian Electrical Code.



[Back to Top](#)

**Silica regulation**

**46. (1) In this section**

- (a) "blasting" means the cleaning, smoothing, roughening or removing of part of the surface of an article by the use as an abrasive of a jet of sand, metal shot or grit or other material propelled by compressed air or steam or by a wheel;
- (b) "blasting chamber" means a blasting enclosure into which workers enter;
- (c) "blasting enclosure" means a chamber, barrel, cabinet or other similar enclosure designed for the purpose of blasting in it;
- (d) "cleaning of castings" means, where done as an incidental or supplemental process in connection with the making of metal castings, the freeing of the castings from adherent sand or other substance, and includes the removal of cores and the general smoothing of the castings where the freeing is done, but does not include the freeing of castings from scale formed during annealing or heat treatment;
- (e) "sandblasting" means the process of projecting sand by means of compressed air or steam or by a wheel;
- (f) "silica dust" means dust of respirable particle size and composed substantially of uncombined silica (Silicon Dioxide  $\text{Si O}_2$ );
- (g) "silica flour" means the ground material produced by the milling of siliceous rocks or other siliceous substances, including diatomite (Kieselguhr, diatomaceous earth);
- (h) "uncombined silica" means silica which is not combined chemically with another element or compound; and
- (i) "use of a parting material" means the application of a material to a surface of a pattern or of a mould to facilitate the separation of the pattern from a mould or the separation of parts of the mould.

(2) The provisions of this section apply wherever workers are employed in a silica process, including

- (a) sandblasting;
- (b) the cleaning of castings;
- (c) the blasting, fettling, grinding or dressing of a surface containing silica, including the engraving or abrasive cleaning of gravestones, buildings or structures of siliceous stones or rocks;
- (d) a process in which silica flour is used;





**LOGAN  
DRILLING  
GROUP**

- (e) the manufacture of silica-containing refractory bricks or silica-containing substances and the dismantling or repair of the refractory lining of furnaces;
  - (f) a process which the chief occupational medical officer has reason to believe creates a risk to the health of workers by silica dust; and
  - (g) a process that includes the getting, cutting, splitting, crushing, grinding, milling, drilling, sieving, or other mechanical manipulation of gravel or siliceous stone or rock where there is potential for exceeding 1% free silica or 50% of TLV.
- (3) An employer shall ensure that at every silica process except sandblasting to which subsection (12) applies, the entry into the air of silica dust is prevented where reasonably practicable by the provision of
- (a) total or partial enclosure of the process;
  - (b) efficient local exhaust ventilation;
  - (c) jets or sprays of water or other suitable wetting agent; and
  - (d) another method considered suitable by the assistant deputy minister.
- (4) An employer shall ensure that
- (a) enclosure apparatus and exhaust ventilation equipment used or likely to be used to contain silica dust is maintained and is inspected at least once in every 7 days and is certified by a competent person at least once in every calendar year; and
  - (b) effective means is provided to collect silica dust removed by exhaust ventilation equipment and to prevent its re-entry into a workroom, and every filtering or settling device situated in a workroom is completely separated from the general air of that workroom in an enclosure ventilated to the open air.
- (5) Where it is not reasonably practicable to prevent the entry into the air of silica dust, the employer shall provide for the isolation of the worker from the air containing silica dust.
- (6) Where it is not reasonably practicable to prevent the entry into the air of silica dust nor practicable to isolate the worker from the air containing silica dust, and for all cleaning and maintenance work, the employer shall provide for the use of each worker who may be exposed to silica dust
- (a) approved respiratory protective equipment; and
  - (b) protective clothing, including coveralls and headgear, that, when worn, exclude silica dust and that is maintained and cleaned in a safe manner.
- (7) A worker shall not be required to perform work for which respiratory protective equipment and clothing is provided unless fully instructed in the need for and proper use of that equipment and clothing.
- (8) An employer shall ensure that all places where silica dust may accumulate are regularly cleaned using vacuum methods wherever practicable.



**LOGAN  
DRILLING  
GROUP**

(9) An employer shall ensure that the standard for dust levels does not exceed the threshold limit value (TLV) established by the ACGIH.

(10) A worker who in the course of his or her employment is likely to be engaged in a silica process shall be warned by the employer of the danger to his or her health of inhaling silica dust and that the risk of injury is made greater by smoking.

(11) Persons under the age of 18 shall not be employed in a silica process nor in cleaning or maintenance work likely to involve exposure to silica dust except work that is a recognized part of apprenticeship or comparable course of training.

(12) An employer shall ensure that

- (a) sandblasting is not done outside a blasting enclosure to an article which it is practicable to introduce into a blasting enclosure;
- (b) sand or other substance containing more than 1% by weight of respirable dust is not introduced into a blasting enclosure;
- (c) sandblasting is not done except with the written permission of the officer and in accordance with the conditions and to the extent that he or she may prescribe; and
- (d) sandblasting is not done underground,

and sandblasting shall not be undertaken nor performed by an employer, worker or self-employed person other than those registered for that purpose with the division.

(13) An employer shall ensure where practicable that castings, gravestones and other articles which are liable to give rise to silica dust by blasting are not blasted except in a blasting enclosure, and that work is not performed in a blasting enclosure except blasting and work immediately incidental to that and the cleaning and repairing of the enclosure and of plant and appliances situated in that enclosure.

(14) An employer shall ensure that every blasting enclosure which is liable to contain silica dust is

- (a) constructed, operated and maintained to prevent the escape of dust;
- (b) provided with an efficient dust extraction system, which is kept in continuous operation whenever the blasting enclosure is in use whether or not blasting is actually taking place, and a blasting chamber is in operation when a worker is inside the chamber;
- (c) specially inspected by a competent person once in every week in which it is used for blasting, and the enclosure, the apparatus connected with it and the ventilating plant associated with it is thoroughly examined and tested by a competent person once every month, and all results of required inspection, examinations and tests are recorded and all defects remedied without avoidable delay; and
- (d) provided with efficient apparatus for separating where practicable the abrasive from other dust, and the abrasive is not again introduced into the blasting apparatus until it has been separated.





**LOGAN  
DRILLING  
GROUP**

(15) An employer shall provide and maintain for workers who work in a blasting chamber, whether in blasting or other work, protective blasters' helmets supplied with clean and not unreasonably cold air of not less than 6 cubic feet a minute, and the helmets shall be used by workers whenever they are in the blasting chamber.

(16) Suitable gauntlets and coveralls shall be provided for the use of, and shall be worn by, all workers while performing blasting or assisting at blasting, and suitable provision shall be made for the storage, regular cleaning by vacuum and maintenance in good condition of the gauntlets and coveralls.

(17) When a worker is engaged in the cleaning of a blasting apparatus or enclosure, ventilating or separating plant, or the surrounds, all practical measures shall be taken to prevent the inhalation of silica dust or its dissemination into the air and all the cleaning shall be by vacuum or hosing by water whenever practicable.

(18) An employer shall ensure that silica flour

- (a) is not manufactured except under standards prescribed by the division;
- (b) is not used for a purpose for which a less hazardous substance may be substituted; and
- (c) is not used in the manufacture of scouring powder or abrasive soaps or as an abrasive in a process.

(19) The examining physician shall record in the log the date and nature of the certificate he or she issues to each worker he or she has medically examined.

### [Back to Top](#)

#### **Silica medical surveillance**

**47.** (1) An employer shall establish and maintain a system for the surveillance of the health of his or her employees arising from silica dust exposure in accordance with the silica health surveillance guidance document prescribed by the minister.

(2) An employee who requires silica related health surveillance is one who:

- (a) works in an industry where he or she is potentially affected by a silica process as defined in this subsection **46** (2);
- (b) is potentially exposed to silica levels in excess of the ACGIH TLV- TWA ; and
- (c) has been determined, through the company's silica control program, to require silica health surveillance as prescribed in the general health surveillance section.

(3) An employer shall not regularly employ a worker in a silica process unless the employer has been assured by a medical practitioner by a written notification that the worker is medically fit for the work being undertaken.

(4) An employer shall keep at the place of employment to be readily available to an officer a log recording the name of every worker referred for medical examination.



**LOGAN  
DRILLING  
GROUP**

(5) The initial health assessment shall be carried out under the direction of a physician and shall include

- (a) an occupational history;
- (b) a respiratory questionnaire;
- (c) a pulmonary/lung function test;
- (d) a chest x-ray (Full size PA view); and
- (e) a medical history and physical examination emphasizing the respiratory system.

(6) A periodic health assessment shall comply with the following requirements:

- (a) the frequency of chest x-rays shall be in accordance with the silica health surveillance document;
- (b) the medical examination emphasizing the respiratory system shall be repeated annually unless prescribed otherwise by the physician; and
- (c) the pulmonary /lung functions tests including FEV1, FVC, and DLCO standardized for alveolar volume shall be repeated annually unless prescribed otherwise by the physician.

(7) Where an employee is undergoing health surveillance for silica, the physician shall ensure, as soon as practicable, that

- (a) the employee is notified of the results, together with a necessary explanation of these results;
- (b) the employer is notified of the general outcome of a worker's health surveillance and is advised on the need for remedial actions; and
- (c) the minister is notified of a prescribed adverse health effect that had been detected which is consistent with exposure to silica.

(8) Where an employer has been advised by the physician on the need for remedial action, the employer shall, as soon as practicable, re-evaluate the assessment of the employee's exposure to silica and implement the control measures required.

(9) An employer shall ensure employees are informed of the purpose and procedures for health surveillance and make arrangements for employees to participate in the health surveillance program.

[Back to Top](#)

#### **Asbestos**

**48.** (1) When work or manufacturing processes cause or are likely to cause workers to be exposed to asbestos, or dusts containing asbestos, means shall be provided to control asbestos dust



**LOGAN  
DRILLING  
GROUP**

from exceeding the threshold limit value established by the ACGIH or lower where practically attainable.

(2) Dust arising from the cutting and shaping of block and pipe insulation materials, whether by power saws or hand saws, shall be controlled by adequate local exhaust ventilation with the discharged air passed through an effective filter.

(3) Where mortar containing asbestos is mixed, dust concentrations shall be controlled by adequate local exhaust ventilation with discharged air passed through an effective filter or other effective means.

(4) Where work is being done with asbestos containing materials, dust concentrations shall be controlled through adequate local exhaust ventilation with discharged air passed through an effective filter or other effective means.

### [Back to Top](#)

#### **Lead exposure control plan**

49. (1) An employer shall develop an exposure control plan for lead where

(a) a worker at a work site may be exposed to airborne lead in excess of its occupational exposure limit for more than 30 days in a year; or

(b) a worker's exposure to lead at a work site could result in an elevated body burden of lead through a route of entry.

(2) The exposure control plan shall include

(a) a statement of purpose and the responsibilities of individuals;

(b) methods of hazard identification, assessment and control;

(c) worker education and training;

(d) safe work practices as required;

(e) descriptions of personal and work site hygiene practices and decontamination practices;

(f) processes of health monitoring, including biological testing;

(g) methods of documentation and record keeping; and

(h) procedures for maintenance of the plan, including annual reviews and updating.

(3) A worker shall follow the exposure control plan and practice the personal and work site hygiene practice established by the employer to minimize lead exposure at the work site.

(4) Where there is potential for a worker to be exposed to lead in harmful amounts at a work site, an employer shall ensure that air monitoring and surface testing for lead is regularly conducted to confirm that the controls in place are effective.



**LOGAN  
DRILLING  
GROUP**

(5) Where a worker at a work site could reasonably be expected to have an elevated body burden of lead, an employer shall establish a system for the surveillance of the health of their employees arising from lead exposure in accordance with the lead health surveillance guidance document as prescribed by the minister.

(6) An employer shall ensure that a worker who has been exposed to lead is informed of the health surveillance requirements.

[Back to Top](#)

### **Musculoskeletal injury prevention**

**50.** (1) For the purpose of this section and sections **51 to 54**, "musculoskeletal injury (MSI )" means an injury or disorder of the muscles, tendons, ligaments, joints, nerves, blood vessels or related soft tissue, including a sprain, strain and inflammation, that may be caused or aggravated by work.

(2) An employer shall

- (a) recognize factors in the workplace that may expose workers to a risk of musculoskeletal injury; and
- (b) evaluate the risk to workers presented by the factors that have been recognized under paragraph (a).

[Back to Top](#)

**MSI** : risk control

**51.** (1) An employer shall eliminate, or where elimination is not practicable, minimize the risk of musculoskeletal injury to a worker through the implementation of a control measure that may include one or more of the following:

- (a) providing, positioning and maintaining equipment that is designed and constructed to reduce or eliminate the risk of musculoskeletal injury;
- (b) developing and implementing safe work procedures to eliminate or reduce the risk of musculoskeletal injury;
- (c) implementing work schedules that incorporate rest and recovery periods, changes to workload or other arrangements for alternating work; and
- (d) providing personal protective equipment in accordance with Part VII .

(2) Personal protective equipment may only be used as a substitute for engineering or administrative controls where it is used in circumstances in which those controls are not practicable.

(3) An employer shall, without delay, implement interim control measures when the introduction of permanent control measures are delayed.





**LOGAN  
DRILLING  
GROUP**

### [Back to Top](#)

MSI : education and training

52. An employer shall ensure that a worker who is or may be exposed to a risk of musculoskeletal injury is

- (a) educated in risk identification related to work, including the recognition of early signs and symptoms of musculoskeletal injury and its potential health effects; and
- (b) trained in the use of specific control measures, including, where applicable, work procedures, mechanical aids and personal protective equipment.

### [Back to Top](#)

MSI : evaluation

53. An employer shall

- (a) monitor the effectiveness of a control measure implemented to eliminate or reduce the risk of musculoskeletal injury; and
- (b) where the monitoring referred to in paragraph (a) identifies a risk of musculoskeletal injury that is not or has not been eliminated or reduced, implement additional control measures, where reasonably practicable.

### [Back to Top](#)

MSI : consultation

54. (1) An employer shall consult with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.

- (2) An employer shall, when performing a risk assessment, consult with
  - (a) workers with signs or symptoms of musculoskeletal injury; and
  - (b) a representative sample of the workers who are required to carry out the work being assessed.

### [Back to Top](#)

#### **Seating or standing work**

55. (1) Where a worker in the course of his or her work has a reasonable opportunity to sit without detriment to his or her work, an employer shall provide and maintain suitable seating for the worker's use to enable him or her to take advantage of that opportunity.

(2) Where a substantial proportion of work can be done while seated, an employer shall provide and maintain for a worker a seat suitably designed, constructed, dimensioned and





**LOGAN  
DRILLING  
GROUP**

supported for the worker to do the work, including, where necessary, a footrest that can readily and comfortably support the feet.

(3) Where a worker is required to stand for long periods in the course of his or her work, an employer or contractor shall provide an antifatigue mat, footrest or other suitable device to provide relief.

[Back to Top](#)

#### **Lifting and handling**

**56.** (1) An employer or contractor shall ensure, where reasonably practicable, that suitable equipment is provided and used for the handling of heavy or awkward loads.

(2) Where use of equipment is not reasonably practicable, an employer or contractor shall take all practicable means to adapt heavy or awkward loads to facilitate lifting, holding or transporting by workers, or to otherwise minimize the manual handling required.

[Back to Top](#)

#### **Permitted quantities**

**57.** (1) The amount of a hazardous substance in a work area shall not exceed the quantity reasonably needed for work in progress, normally in one work shift.

(2) Bulk or reserve quantities of a hazardous substance shall be stored in a designated area separate from the work area.

[Back to Top](#)

#### **Incompatible substances**

**58.** Substances which are incompatible shall not be stored in a manner that would allow them to mix in the event of container leakage, breakage or other similar circumstance.

[Back to Top](#)

#### **Storage of hazardous substances**

**59.** (1) A hazardous substance shall be stored in a designated area, in a manner which ensures that it can not readily fall, become dislodged, suffer damage, or be exposed to conditions of extreme temperature.

(2) A designated storage area for a hazardous substance shall be

- (a) designed and constructed to provide for the safe containment of the contents;
- (b) clearly identified by signs, placards or similar means;



**LOGAN  
DRILLING  
GROUP**

- (c) designed and maintained to allow the safe movement of workers, equipment and material;
- (d) provided with adequate ventilation and lighting; and
- (e) in a location not normally occupied by workers, including a lunchroom, eating area, change room, clothing storage locker or passenger compartment of a vehicle.

[Back to Top](#)

#### **Dispensing**

**60.** Where a flammable liquid is dispensed or transferred inside a flammable liquids storage room,

- (a) the storage room shall be mechanically ventilated at a rate of at least 18 m<sup>3</sup>/hr a square metre of floor area (1 cfm/sq ft), but not less than 250 m<sup>3</sup>/hr (150 cfm);
- (b) exhaust air shall be discharged to the outdoors, and makeup air provided;
- (c) makeup air duct passing through a fire separation shall be equipped with an approved fire damper; and
- (d) doors shall be self-closing.

[Back to Top](#)

#### **Toilet facilities**

**61.** (1) An employer shall provide, maintain and keep clean sufficient and suitable toilet facilities for workers and shall make effective provision for lighting and heating the toilet facilities.

- (2) Sufficient and suitable toilet facilities referred to in subsection (1) include the following:
  - (a) one suitable toilet to be provided for up to 10 workers and one additional toilet for every 20 workers or fraction of those likely to be present;
  - (b) additional toilets to be provided where toilet facilities are likely to be used by persons in addition to workers;
  - (c) where both males and females are employed, separate toilets shall be provided and suitably identified for workers of each sex;
  - (d) where a toilet is designated for males, the employer may replace not more than two thirds of the toilets with urinals;
  - (e) where more than 100 males work or are likely to work on a shift and sufficient urinal accommodations are provided, the requirements of paragraph (a) may be reduced at the discretion of an officer;



**LOGAN  
DRILLING  
GROUP**

- (f) a toilet that is under cover and positioned and partitioned off to secure privacy shall have a proper door and fastenings;
- (g) doors and partitions shall extend at all parts from not more than 30.48 centimetres and not less than 1.83 metres above floor level;
- (h) a supply of toilet tissue shall be maintained in a toilet stall at all times and easily cleanable covered receptacles shall be provided for waste materials; and
- (i) the toilets shall be conveniently accessible to the workers at all times during work.

### [Back to Top](#)

#### **Washing facilities**

**62.** (1) An employer shall provide and maintain for the use of workers

- (a) adequate and suitable facilities for personal washing; and
- (b) a supply of clean hot and cold or warm water, soap and clean towels or other suitable means of cleaning or drying.

(2) Where there is a high risk of contamination of workers by hazardous substances, infectious or offensive materials as a part of the regular work processes at a place of employment, an employer shall

- (a) where reasonably practicable, provide and maintain suitable, adequate and clean facilities for changing and showering; and
- (b) allow sufficient time during normal working hours for a worker to use those facilities without loss of pay or other benefits.

### [Back to Top](#)

#### **Emergency washing facilities**

**63.** An employer shall ensure that

- (a) appropriate emergency washing facilities are provided in a work area where a worker's eyes or skin may be exposed to harmful or corrosive materials or other materials which may burn or irritate;
- (b) only a potable water supply is used in a plumbed emergency eyewash facility and that only potable water or an isotonic saline flushing solution is used in a portable (non-plumbed) eyewash unit;
- (c) access to emergency eyewash and shower facilities is not blocked by material or equipment; and
- (d) selection of emergency washing facilities is based upon an assessment of the risks present in the workplace.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Work clothing and accommodations**

64. (1) An employer shall provide and maintain, for the use of workers, clean, adequate, appropriately located and suitable accommodations for street clothing not worn during working hours and where it is necessary to protect the street clothing from becoming wet, dirty or contaminated by work clothing, separate accommodation shall be provided.

(2) Where a worker's work clothing or skin is likely to be contaminated by hazardous substances, an employer shall

- (a) provide protective clothing and head cover appropriate to the work and hazard;
- (b) provide a suitably located changing area; and
- (c) ensure that the clothing and head cover are handled and cleaned or disposed of in a manner that prevents worker exposure to hazardous substances.

[Back to Top](#)

#### **Eating areas**

65. Where a substance used in the work or a work process is likely to contaminate a worker's person, clothing or food, an employer, contractor or owner shall ensure that a clean eating area, separate from the worksite, is available and close to washing facilities.

[Back to Top](#)

#### **Supply of drinking water**

66. An employer shall provide and maintain at suitable points conveniently accessible to all workers, an adequate supply of wholesome drinking water from a public main or other source approved by the appropriate health authority.

[Back to Top](#)

#### **Sanitary and orderly conditions**

67. An employer shall ensure that the workplace is sanitary and kept as clean as is reasonably practicable and that

- (a) accumulated dirt and refuse is removed daily by a suitable method from floors, working surfaces, stairways and passages;
- (b) floors are cleaned at least once a week by washing, vacuum cleaning or other effective and suitable means;





**LOGAN  
DRILLING  
GROUP**

- (c) interior walls and partitions, ceilings, passages and staircases are kept in a reasonable state of repair and suitably finished and maintained; and
- (d) floors, platforms, stairs and walkways used by workers are kept in a state of good repair and free of hazards.

[Back to Top](#)

#### **Noise hazards**

**68.** (1) When a worker is required to work in an area in which noise levels exceed the criteria for permissible noise exposure established by the ACGIH Noise Threshold Limit Values (TLVs)

- (a) the employer shall first take appropriate action to implement control measures to reduce noise to acceptable levels; and
- (b) where it is not practicable to reduce the noise to acceptable levels or to isolate workers from the noise, the workers shall wear personal protective equipment in accordance with CSA Z94.2 "Hearing Protection Devices - Performances, Selection, Care and Use".

(2) Where conditions referred to in subsection (1) exist, an employer shall establish and maintain a hearing conservation program.

(3) A hearing conservation program established under subsection (2) shall comply with the following minimum requirements:

- (a) a noise survey of the workplace to identify high noise areas shall be performed in accordance with CSA Z107.56 "Procedures for the Measurement of Occupational Noise Exposure";
- (b) hearing tests for every worker exposed to noise levels in excess of permissible levels to be conducted on an annual basis or where recommended by an audiologist or occupational physician;
- (c) a hearing test, within 3 months of commencement of employment, for each new worker who is exposed to noise in excess of the permissible levels; and
- (d) mandatory training and education for all workers in the health hazards of noise and the fitting, maintenance, care and use of hearing protection.

(4) A hearing conservation program shall be documented and those records shall be kept by the employer or the employer designate while the worker remains employed by the employer.

(5) An employer shall post and maintain signs at entrances to or on the periphery of areas where persons are exposed to high noise levels in excess of the threshold limit.

(6) A sign referred to in subsection (5) shall clearly state that a noise hazard exists and shall describe the personal protective equipment that is required.

(7) Upon termination of employment, a worker may request from the employer a record of noise exposure during the term of employment.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Painting, coating and working with plastics/resins**

69. (1) This section applies to a workplace in which there is spraying or the use of paint or a similar coating, fibre-reinforced resin, thermoplastic material, an expandable resin form or other similar materials.

(2) Spraying a flammable or other hazardous product is prohibited within a general work area unless effective controls have been installed to control the fire, explosion and toxicity hazards.

(3) Where practicable, a coating shall not be applied to a material that is about to be welded.

(4) A work area or enclosure where hazardous materials are handled or used shall be posted with suitable signs or placards warning workers of the hazards within the identified restricted access area and stating the precautions for entry into the area.

(5) Where practicable, a ventilated spray booth or other enclosure designed to control worker exposure shall be used during

- (a) an operation or process which involves spraying paint or resin;
- (b) lay-up or moulding of reinforced plastic; or
- (c) an application of a paint, coating or insulation containing a sensitizer including an isocyanate compound, or similar operations using toxic materials.

(6) The air velocity through a horizontal flow spray booth, a vertical flow, down-draft or other enclosure required by subsection (5) shall be as prescribed by a standard acceptable to the minister.

(7) In outdoor applications of materials or processes listed in subsection (5), an air velocity across the work area of at least 50 fpm shall be assured, by mechanical means where necessary, to carry vapours and aerosols away from the breathing zone of a worker.

(8) A ventilation system subject to heavy concentrations of over-spray from the operation shall have an arrester filter which is maintained in good operating condition and replaced when the pressure drop across the filter exceeds the design criteria.

(9) A worker who is or may be exposed to an airborne contaminant generated by a spray operation involving a sensitizing agent shall be provided with and shall wear air-supplied respiratory protection.

(10) Only a qualified person authorized by the employer may operate

- (a) an airless spray unit of the type which atomizes paint and fluid at pressure;
- (b) a spray paint powered by compressed air in excess of 10 psi; or
- (c) a chopper spray gun unit.



**LOGAN  
DRILLING  
GROUP**

- (11) An airless spray gun shall have
- (a) a means to electrically bond the gun to the paint reservoir and pump;
  - (b) a guard that protects against trigger activation where the gun is dropped; and
  - (c) a trigger function configured to require two distinct operations by the user to activate the release of paint or fluid through the nozzle, or a safety device which prevents the nozzle tip from coming into contact with the worker.

(12) Emissions from operations involved in heating plastics to temperatures which may release thermal decomposition products shall be removed from the workplace by local exhaust ventilation when there is a risk of harm to a worker from exposure to these emissions.

(13) A resin foam installation process performed indoors shall be controlled or contained so that an unprotected worker is not exposed to emissions by using an enclosure or portable local exhaust ventilation or by scheduling arrangements.

(14) A resin foam installation process performed outdoors and relying on natural ventilation shall be completed in an area restricted to authorized personnel wearing adequate personal protective equipment.

(15) Safe work procedures shall be developed for lead paint removal operations, including provisions for warning unauthorized persons, worker training, containment, ventilation, work practices, personal protective equipment worker decontamination and safe means of disposal.

## **PART VII PERSONAL PROTECTIVE EQUIPMENT**

[Back to Top](#)

### **Definitions**

**70.** In this Part

- (a) "fit check" means a negative or positive pressure check of a respirator's fit, performed in accordance with the respirator manufacturer's instructions;
- (b) "fit test" means a quantitative or qualitative fit test performed in accordance with procedures in CSA Standard CAN/CSA -Z94.4 "Selection, Use, and Care of Respirators"; and
- (c) "flame resistant", in reference to clothing, means made of a material that, due to its inherent properties or as a result of treatment by a flame retardant, slows, terminates or prevents flaming combustion.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Selection, use and maintenance**

#### **71. Personal protective equipment shall**

- (a) be selected and used in accordance with recognized standards and provide effective protection;
- (b) not in itself create a hazard to the wearer;
- (c) be compatible so that one item of personal protective equipment does not make another item ineffective; and
- (d) be maintained in good working order and in sanitary condition.

[Back to Top](#)

### **Instruction**

**72.** An employer shall ensure that a worker who wears personal protective equipment is adequately instructed in the correct use, limitations and assigned maintenance duties for the equipment to be used.

[Back to Top](#)

### **Personal clothing and accessories**

**73. (1)** The personal clothing of a worker shall be of a type and in a condition which does not expose the worker to an unnecessary or avoidable hazard.

(2) Where there is a danger of contact with moving parts of machinery or with electrically energized equipment, or where the work process presents similar hazards

- (a) the clothing of a worker shall fit closely about the body;
- (b) dangling neckwear, bracelets, wristwatches, rings or similar articles shall not be worn, except for medical alert bracelets which may be worn with transparent bands that hold the bracelets snugly to the skin; and
- (c) cranial and facial hair shall be confined or worn at a length which shall prevent it from being snagged or caught in the work process.

[Back to Top](#)

### **General requirements of safety headgear**

**74. (1)** Safety headgear shall be worn by a worker where there is a danger of head injury from falling, flying or thrown objects, or other harmful contacts.

(2) Safety headgear shall meet the requirements of CSA Standard CAN/CSA -Z94.1 "Industrial Protective Headwear" or, in the case of emergency response personnel, the applicable National Fire Protection Association Standard.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Eye and face protection**

**75.** Where a worker handles or is exposed to materials or conditions that are likely to injure or irritate the eye or face, an employer shall ensure that he or she wears properly fitting face and eye protection appropriate to the conditions of the workplace and in accordance with the requirements of CSA Standard CAN/CSA Z94.3 "Industrial Eye and Face Protectors".

[Back to Top](#)

#### **Prescription safety eyewear**

**76.** (1) Prescription safety eyewear shall meet the requirements of CSA Standard CAN/CSAZ94.3 "Industrial Eye and Face Protectors".

(2) Bifocal and trifocal glass lenses shall not be used where there is a danger of impact unless the lenses are worn behind impact-rated goggles or other eye protection acceptable to the minister.

(3) Where the use of polycarbonate or plastic prescription lenses is impracticable due to the conditions of the workplace and there is no danger of impact, a worker may use prescription lenses made of treated safety glass meeting the requirements of ANSI Standard Z87.1 "Practice for Occupational and Educational Eye and Face Protections".

[Back to Top](#)

#### **Contact lenses**

**77.** Adequate precautions shall be taken where a hazardous substance or condition may adversely affect a worker wearing contact lenses.

[Back to Top](#)

#### **General requirements of limb and body protection**

**78.** Where there is a danger of injury, contamination or infection to a worker's skin, hands, feet or body, the worker shall wear properly fitting protective equipment appropriate to the work being done and the hazards involved.

[Back to Top](#)

#### **Leg protection**

**79.** A worker operating a chain saw shall wear a leg protective device with a label permanently affixed to the outer surface of the device indicating the standard it meets.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Foot protection**

**80.** (1) A worker's footwear shall be of a design, construction, and material appropriate to the protection required.

(2) To determine the appropriate protection under subsection (1) the following factors shall be considered:

- (a) slipping;
- (b) uneven terrain;
- (c) abrasion;
- (d) ankle protection;
- (e) foot support;
- (f) crushing potential;
- (g) temperature extremes;
- (h) corrosive substances;
- (i) puncture hazards;
- (j) electrical shock; and
- (k) another recognizable hazard.

(3) Where a determination has been made that safety protective footwear is required to have toe protection, metatarsal protection, puncture resistant soles, dielectric protection or a combination of these, the footwear shall meet the requirements of CSA Standard CAN/CSA -Z195, Protective Footwear.

[Back to Top](#)

#### **High visibility apparel**

**81.** A worker whose duties are regularly performed in areas and under circumstances where he or she is exposed to the danger of moving vehicles or heavy equipment shall wear distinguishing apparel containing highly visible material suitable for daytime or night time use, as appropriate.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Flame resistant clothing**

**82.** (1) Where a worker may be exposed to a flash fire or electrical equipment flashover, an employer shall ensure that the worker wears flame resistant outerwear and uses other protective equipment appropriate to the hazard.

(2) A worker shall ensure that clothing worn beneath flame resistant outerwear and against the skin is made of flame resistant fabrics or natural fibers that do not melt when exposed to heat.

[Back to Top](#)

### **Respiratory protection program**

**83.** Where required, an employer shall establish, implement and maintain, and revise where necessary, a written respiratory protection program in accordance with CSA Standard Z94.4 "Selection, Use and Care of Respirators".

[Back to Top](#)

### **Respiratory protection**

**84.** (1) When a worker is or may be exposed to an oxygen deficient atmosphere or harmful concentrations of air contaminants, atmospheric contamination shall be prevented to the extent practicable by accepted engineering controls and when engineering or other controls are not practicable, appropriate respiratory protection equipment shall be used in accordance with this section.

(2) Respiratory protection equipment shall be provided by an employer when the equipment is necessary to protect the health of a worker.

(3) An employer shall ensure that compressed air, compressed oxygen, liquid air and liquid oxygen used for respiration comply with the specifications of CSA Code Z180.1 Compressed Breathing Air and Systems.

(4) An employer shall ensure that compressed oxygen is not used in atmosphere-supplying respiratory equipment that has previously used compressed air.

(5) Access points shall display signs warning that respiratory protection equipment is required and naming the contaminant or hazard involved.

(6) An employer shall ensure that sufficient workers who are trained in rescue procedures are immediately available whenever workers are working in areas where an oxygen deficient atmosphere or hazardous contaminants may be present.

(7) A rescue worker referred to in subsection (6) shall have immediate access to appropriate breathing apparatus or other aids necessary to effect a rescue.

[Back to Top](#)

### **Respiratory protection equipment**



**LOGAN  
DRILLING  
GROUP**

85. (1) An employer shall select and provide appropriate respiratory protection equipment based on the respiratory hazard to which a worker is exposed and workplace and user factors that affect the performance and reliability of the equipment.

(2) The equipment referred to in subsection (1) shall be certified by the National Institution of Occupational Safety and Health and used in compliance with the conditions of its certification.

(3) An employer shall identify and evaluate the respiratory hazards in the workplace, and the evaluation shall include an employee's potential exposure to respiratory hazards and an identification of the contaminant's chemical composition and physical state.

(4) Where an employer cannot identify the exposure referred to in subsection (3), the employer shall take immediate precautions to protect a worker from immediate danger.

(5) An employer shall not permit a respirator with a tight-fitting facepiece to be worn by an employee who has

(a) hair on the face or scalp that is likely to prevent effective sealing of the facepiece to the facial skin; or

(b) a condition that interferes with the face to facepiece seal or valve function.

(6) Where an employee wears corrective glasses or goggles or other personal protective equipment, the employer shall ensure that the equipment is worn in a manner that does not interfere with the seal of the facepiece to the face of the user.

(7) Where a tight-fitting respirator is used by an employee, an employer shall ensure that the employee performs a user seal check before each use.

[Back to Top](#)

#### **Inspection and maintenance of respiratory protection equipment**

86. (1) Respiratory protection equipment that is issued for the exclusive use of an employee shall be cleaned and disinfected as often as necessary to maintain it in a sanitary condition.

(2) Respiratory protection equipment that is issued for the use of more than one employee shall be cleaned and disinfected before being worn by different individuals.

(3) An employer shall ensure that respiratory protection equipment is inspected as follows:

(a) equipment used in routine situations is inspected before each use and after cleaning;

(b) equipment maintained for use in emergency situations is inspected at least once monthly and according to the manufacturer's recommendations, and is checked for proper function before and after each use; and

(c) emergency escape only equipment is inspected before being carried into the workplace for use.



**LOGAN  
DRILLING  
GROUP**

(4) Where an inspection conducted under subsection (3) reveals damage, the equipment shall be discarded.

## **PART VIII MACHINERY AND EQUIPMENT**

### [Back to Top](#)

#### **Definitions**

**87.** In this Part

- (a) "guard" means a type of safeguard consisting of a physical barrier which prevents a worker from reaching over, under, around or through the barrier to a moving part or point of operation;
- (b) "point of operation" means the danger area in a machine where a part is being formed or work is being done;
- (c) "power transmission part" means a moving part of a machine that transfers power from a power source to a point of operation;
- (d) "safeguard" means the use of a guard, a safety device, a shield, an awareness barrier, warning signs, or other appropriate means, either singly or in combination, to provide effective protection to workers from hazards;
- (e) "safety device" means a type of safeguard consisting of an arrangement of operating controls, an active or passive physical restraint, an interlock, or a presence sensing device which ensures that a worker cannot access or be in a hazardous area while a machine is operating; and
- (f) "shield" means a type of safeguard consisting of a physical cover or barrier which restricts but does not prevent access to a hazardous moving part or a point of operation.

### [Back to Top](#)

#### **Safe machinery and equipment**

**88.** (1) An employer shall ensure that each tool, machine and piece of equipment in the workplace is

- (a) capable of safely performing the functions for which it is used; and
- (b) selected, used and operated in accordance with
  - (i) the manufacturer's recommendations and instructions, where available,
  - (ii) safe work practices, and
  - (iii) the requirements of these regulations.



**LOGAN  
DRILLING  
GROUP**

(2) Except as otherwise provided in these regulations, the installation, inspection, testing, repair, maintenance or modification of a tool, machine or piece of equipment shall be carried out

- (a) in accordance with the manufacturer's instructions or a standard acceptable to the minister; or
- (b) as specified by a professional engineer.

(3) Where equipment or a structure is dismantled in whole or in part and subsequently reassembled, it shall not be used until completely checked and found to be safe for operation or occupancy.

[Back to Top](#)

### **General requirements**

**89.** Except as otherwise provided in these regulations, an employer shall ensure that machinery and equipment is fitted with adequate safeguards that

- (a) protect an employee from contact with hazardous power transmission parts;
- (b) ensure that an employee cannot access a hazardous point of operation; and
- (c) safely contain material ejected by the work process that could be hazardous to an employee.

[Back to Top](#)

### **Standards**

**90.** (1) The application, design, construction and use of safeguards, including an opening in a guard and the reach distance to a hazardous part, shall meet the requirements of CSA Standard Z432 "Safeguarding of Machinery".

- (2) A safeguard shall be capable of effectively performing its intended function.

[Back to Top](#)

### **Guards**

**91.** (1) A fixed guard shall not be modified to be readily removable without the use of tools.

(2) A guard shall be designed, where practicable, to allow lubrication and routine maintenance without the removal of the guard.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Identifying unsafe equipment**

92. An unsafe tool, machine or piece of equipment shall be removed from service and identified in a manner that ensures that it is not inadvertently returned to service until it has been made safe for use.

[Back to Top](#)

### **Operating controls**

93. (1) Powered equipment other than portable powered tools or mobile equipment shall have

- (a) starting and stopping controls located within easy reach of the operator;
- (b) controls and switches clearly identified to indicate the functions that they serve;
- (c) controls positioned, designed or shielded to prevent inadvertent activation;
- (d) where two-hand controls are installed, controls designed to require concurrent use of both hands to operate the equipment, and to require both controls to be released before another machine cycle can be initiated; and
- (e) control systems meeting the requirements of these regulations.

(2) Portable powered tools and mobile equipment shall have operating controls that conform to an appropriate standard acceptable to the minister.

[Back to Top](#)

### **Machinery location**

94. A machine shall be located or safeguarded so that operation of the machine does not endanger a worker using a normal passage route about the workplace or operating an adjacent machine.

[Back to Top](#)

### **Marking of hazards**

95. A physical hazard shall be identified and marked in a manner that clearly identifies the hazard to an affected worker in accordance with a standard acceptable to the minister:

[Back to Top](#)

### **Piping systems**

96. A piping system containing substances shall be clearly identified in a manner known to an affected worker and the identification markings on a piping system shall be maintained in a legible condition.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Restraining devices**

97. Effective means of restraint shall be used

- (a) on a connection of a hose or a pipe where inadvertent disconnection could be dangerous to a worker;
- (b) where unplanned movement of an object or component could endanger a worker; or
- (c) to secure an object from falling and endangering a worker.

[Back to Top](#)

#### **Rotating hazards**

98. Where a worker may be exposed to contact with rotating parts, such as friction drive, shafts, couplings and collars, set screws and bolts, keys and keyways, and projecting shaft ends, the parts shall be guarded.

[Back to Top](#)

#### **Flywheels and pulleys**

99. A pit for a flywheel or pulley shall have curbs or toeboards around the upper edge of the pit.

[Back to Top](#)

#### **Conveyor standards**

100. (1) Except as otherwise provided in these regulations, a conveyor shall meet the requirements of ANSI Standard ANSI /ASME B20.1-1993 "Safety Standards for Conveyors and Related Equipment" .

(2) A conveyor shall have guards or sideboards to prevent material from falling from the conveyor into areas occupied by workers where the falling material creates a risk of injury.

(3) A conveyor shall have an emergency stopping system except where worker access to the conveyor is prevented by guarding.

(4) Where a conveyor emergency stopping system uses a pull wire, the system shall activate by a pull of the wire in any direction, or by a slack cable condition.

(5) A conveyor emergency stopping system shall be designed and installed so that after an emergency stop manual resetting is required before the conveyor can be restarted.

(6) A conveyor shall not be restarted after an emergency stop until inspection has determined it can be operated safely.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Power presses, brake presses and shears**

**101.** Point of operation safeguarding, and the design, construction and reliability of the operating controls of a power press, brake press, ironworker or shear shall meet the requirements of the following applicable standard:

- (a) CSA Standard CAN/CSA -Z142 "Code for Power Press: Health, Safety, and Guarding Requirements";
- (b) ANSI Standard B11.4-1993 "American National Standard for Machine Tools -- Shears -- Safety Requirements for Construction, Care, and Use"; or
- (c) ANSI Standard B11.5-1988 (R1994) "American National Standard for Machine Tools -- Ironworkers -- Safety Requirements for Construction, Care, and Use" .

[Back to Top](#)

#### **Exception for custom work**

**102.** The safeguarding for the point of operation of a brake press may be removed upon application to and approval by the minister where custom or different bends are being done with each cycle of the machine, provided that safe work procedures are followed, and safeguarding is replaced upon completion of the custom work.

[Back to Top](#)

#### **Cutting and cooling material containment**

**103.** Cutting or cooling fluids, metal chips and turnings from machine tool work shall be contained.

[Back to Top](#)

#### **Standards for abrasive equipment**

**104.** An abrasive wheel shall be guarded, used and maintained to meet the requirements of ANSI Standard B7.1-1988 "The Use, Care and Protection of Abrasive Wheels" .

[Back to Top](#)

#### **Powder actuated tools standards**

**105.** A powder actuated fastening system, consisting of the tool, power loads and fasteners, shall meet the requirements of:

- (a) ANSI Standard A10.3-1995 "American National Standard for Construction and Demolition Operations -- Safety Requirements for Powder-Actuated Fastening Systems";



**LOGAN  
DRILLING  
GROUP**

- (b) CSA Standards for Powder Actuated Devices; or
- (c) other authority acceptable to the minister.

[Back to Top](#)

**Powder actuated tool use**

**106.** (1) A low velocity powder actuated tool, with a fastener test speed rating of less than 100 metres a second, shall be used unless no low velocity tool available on the market is capable of doing the fastening task.

(2) Two separate and distinct operations shall be required to activate a powder actuated tool and the final firing movement shall be separate and subsequent to depressing the tool into the firing position.

(3) A powder actuated tool shall be designed so that positive means of varying the power level is available, or can be made available, to enable the operator to select a power level appropriate to perform the desired work.

(4) A powder actuated tool shall be marked with the manufacturer's name or trademark, model number and serial number.

(5) When not in use, a powder actuated tool shall be unloaded and the tool and power loads shall be securely stored and be accessible only to qualified and authorized persons.

(6) Powder loads of different power levels and types shall be kept in different compartments or containers.

(7) A worker shall not operate a powder-actuated tool until he or she

(a) has been trained in the use of the specific make and model of tool and is in possession of a valid operator's certificate issued by the manufacturer or other qualified instruction agency;

(b) has demonstrated that he or she can use the tool effectively and safely;

(c) is familiar with these regulations;

(d) has been authorized by his or her supervisor to use the tool; and

(e) is wearing the personal protective equipment required by sections 70 to 86 .

(8) When using or servicing a powder-actuated tool, an operator shall have immediately available

(a) a copy of the manufacturer's operating instructions for the tool;

(b) a copy of the powder load and fastener charts for the tool; and



**LOGAN  
DRILLING  
GROUP**

- (c) accessories or tools needed for use or field servicing of the tool, including personal protective equipment.
- (9) A powder-actuated tool shall not be used in an explosive or flammable atmosphere.
- (10) A powder-actuated tool may only be loaded where it is being prepared for immediate use, and shall be unloaded at once where work is interrupted after loading.
- (11) A powder-actuated tool shall not be pointed at a person.
- (12) Where a powder-actuated tool misfires, the operator shall hold the tool firmly against the work surface for at least 5 seconds, then follow the manufacturer's instructions for those occurrences and, until the cartridge has been ejected, keep the tool pointed in a direction that cannot cause injury to a person.

[Back to Top](#)

#### **Limitations on use of powder actuated tools**

- 107.** (1) A powder-actuated tool fastener shall not be driven into very hard or brittle materials, including cast iron, glazed tile, hardened steel, glass block, natural rock, hollow tile, and most brick.
- (2) A powder-actuated tool fastener may only be driven into easily penetrated or thin materials or materials of unknown resistance where the receiving material is backed by a material that prevents the fastener from passing completely through.
- (3) A powder-actuated tool fastener shall not be driven into steel within 13 millimetres of an edge, or within 5 centimetres of a weld except for special applications permitted by the manufacturer.
- (4) Except for special applications recommended by the manufacturer, a powder-actuated tool fastener may not be driven into masonry materials
- (a) within 7.5 centimetres of an unsupported edge with a low velocity tool; or
  - (b) within 15 centimetres of an unsupported edge with a medium or high velocity tool.
- (5) A powder-actuated tool fastener shall not be driven
- (a) into concrete unless material thickness is at least 3 times the fastener shank penetration;
  - (b) into a spalled area; or
  - (c) through existing holes unless a specific guide means, recommended and supplied by the manufacturer, is used to assure positive alignment.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Chippers**

**108.** (1) A hand-fed mobile chipper shall have a barrier or baffle installed on the feed side of the rotor to prevent ejection of chipped material.

(2) A self-feeding chipper shall have a table or apron extending at least 1.5 metres back from the rotor with sides sufficiently high to prevent a worker from reaching in and contacting the rotating knife.

(3) A driven-feed chipper shall have a guard chute or apron extending at least 90 centimetres from the feed rollers and a panic bar to stop the feed rollers.

(4) On a mobile chipper which gravity feeds material through a vertical hopper to the rotor, the sides of the hopper shall be of a sufficient depth to prevent the operator from reaching in and contacting the rotor, but in no case not less than 90 centimetres measured from the top edge of the hopper to the periphery of the rotor.

### [Back to Top](#)

### **Chain saws**

**109.** (1) A chain saw shall meet the requirements of CSA Standard Z62.1 "Chain Saws" .

(2) A chain saw shall have a chain brake that activates automatically upon kickback regardless of the position of the power head or operator's hands.

(3) A chain saw chain shall be stopped before the saw operator moves from cut to cut, unless the next cut is in the immediate area and the saw operator can safely move to the next cutting position.

### [Back to Top](#)

### **Automotive lifts and vehicle supports**

**110.** (1) An automotive lift or hoist shall meet the requirements of ANSI Standard ANSI /ALIALCTV-2006 "American National Standard for Automotive Lifts -- Safety Requirements for the Construction, Care, and Use" .

(2) A shop crane, jack, axle stand, ramp or other type of vehicle support shall meet the requirements of the applicable section of ANSI Standard ASME PALD-2005 "Safety Standard for Portable Automotive Lifting Devices" .

(3) Operation, inspection, repair, maintenance and modification of a vehicle support or lift shall be carried out according to the manufacturer's instructions or the written instructions of a professional engineer.

(4) The employer shall keep a maintenance and inspection record for each automotive lift or hoist for not less than 5 years.

(5) The rated capacity shall be marked on each automotive lift or hoist, shop crane, jack, axle stand, ramp or other vehicle support and shall not be exceeded.





**LOGAN  
DRILLING  
GROUP**

(6) The control for an automotive lift shall require continuous pressure by the operator when raising or lowering the unit, and the control shall return to the neutral position when released.

[Back to Top](#)

#### **Pneumatic nailing and stapling tools**

**111.** (1) A hand held pneumatic nailing or stapling tool capable of driving fasteners larger than 1.2 millimetres (18 gauge ASWG) shall not activate unless the operator performs 2 actions, one of which is to place the tool against a work surface.

(2) The trigger of a pneumatic nailing or stapling tool shall not be taped or otherwise secured in the "on" position, or held in the "on" position while moving between operations.

(3) The air supply to a pneumatic nailing or stapling tool shall be disconnected before adjusting or servicing the tool.

[Back to Top](#)

#### **Drilling equipment - general requirements**

**112.** An employer shall ensure that before drilling

- (a) the back, face and sides of the work area have been scaled and stabilized;
- (b) the working face and surrounding area have been thoroughly washed; and
- (c) remnants of holes have been inspected for explosives and distinctively marked.

[Back to Top](#)

#### **Drilling equipment use**

**113.** (1) An employer shall ensure that

- (a) a rock drill is not used unless equipped with a water jet or other device capable of suppressing rock dust; and
- (b) adequate restraining devices are installed on hose connections under pressure, where inadvertent disconnection could endanger workers.

(2) Operating controls shall not be installed on the feed side of a top-hammer percussion drill.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Drilling procedures**

**114.** A driller shall ensure that

- (a) the cut is not drilled in the same location as the previous round;
- (b) holes are not drilled within 15 centimetres of a part of a bootleg; and
- (c) there is no drilling at a face when a hole is loaded or being loaded with explosives except in conformity with the requirements on drilling to re-fire a misfire, as specified in PART XIX.

[Back to Top](#)

### **Rod handling**

**115.** (1) A drill operator shall not manually add or remove drill steel, a drill bit or service drilling equipment while the drill is rotating under power.

(2) A worker assisting the drill operator with drill bit or drill steel handling shall remain clear of rotating parts of the drill system.

(3) Except as provided in subsection (4), a boom-mounted percussion drill being used with multiple lengths of coupled drill steel shall have a rod changer or other effective device installed and used to add or remove drill steel.

(4) Where it is not practicable to fit a rod changer to a boom-mounted percussion drill, adequate written safe work procedures for adding and removing drill steel shall be available and the drill shall be operated in accordance with those procedures.

[Back to Top](#)

### **Self-propelled drills**

**116.** (1) An operator or other worker may only ride on a self-propelled drill where he or she is in a safe position inside a roll over protective structure.

(2) Where there is no roll over protective structure, the drill shall have controls for machine travel located to allow the operator to move the machine from a position off the machine and clear of hazard should the drill roll or slide downhill.

[Back to Top](#)

### **Cleaning drilled holes**

**117.** Where a drilled hole is being cleaned using an air or water pressure blowpipe, the operator shall ensure that all persons are clear of the area made hazardous by blowback.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Abrasive blasting and high pressure washing definitions**

**118.** For the purpose of this section and sections **119** to **126**,

- (a) "cabinet" means an enclosure designed to permit abrasive blasting, high pressure washing or a similar operation to be conducted safely inside the enclosure by a worker who is outside the enclosure;
- (b) "enclosure" means a temporary or permanent enclosure of a work area provided with exhaust ventilation and makeup air to reduce exposure of workers inside the enclosure and prevent the uncontrolled release of air contaminants from the enclosure; and
- (c) "high pressure washing" or "jetting" means the use of water or other liquid delivered from a pump at a pressure exceeding 34 MPa (5,000 psi), with or without the addition of solid particles, to remove unwanted matter from a surface or to penetrate into the surface of a material for the purpose of cutting that material.

[Back to Top](#)

### **Risk assessment**

**119.** An employer shall ensure that a risk assessment is done before any abrasive blasting activity, high pressure washing process, or related cleanup is started which may cause release of a harmful level of an air contaminant from a surface or coating containing a toxic heavy metal or hazardous substance.

[Back to Top](#)

### **Work procedures outside a cabinet**

**120.** Where abrasive blasting, high pressure washing or a similar operation is conducted by a worker outside a cabinet, written safe work procedures addressing the hazards and necessary controls shall be prepared and implemented by the employer.

[Back to Top](#)

### **Substitution of abrasive blasting materials**

**121.** Abrasive blasting materials containing crystalline silica shall be replaced with less toxic materials, where practicable.

[Back to Top](#)

### **Cleanup**

**122.** (1) Used abrasive blasting materials which contain a hazardous substance shall be removed from the work area using effective procedures designed to minimize the generation of airborne dust and wearing suitable personal protective equipment.

- (2) Removal under subsection (1) shall take place by the end of each shift except where



**LOGAN  
DRILLING  
GROUP**

- (a) a risk assessment establishes that the risks from removal exceed the risks from leaving the materials in place;
- (b) a worker will not be exposed to the materials before removal occurs; or
- (c) the materials cannot be separated from the environment in which the abrasive blasting takes place.

(3) Where removal is delayed under subsection (2), an employer shall assess the risks arising from delay and develop written safe work procedures.

[Back to Top](#)

#### **Engineering controls**

**123.** Engineering controls, including an enclosure or local exhaust ventilation with dust collection, shall be used to maintain airborne contaminant levels below exposure limits, where practicable.

[Back to Top](#)

#### **Exhaust ventilation**

**124.** (1) Where abrasive blasting or a similar operation is conducted within a structure, the process shall be isolated in a separate, properly ventilated enclosure or cabinet to minimize worker exposure to air contaminants generated by the process.

(2) Where abrasive blasting or a similar operation is conducted inside an enclosure or cabinet, the enclosure or cabinet shall have exhaust ventilation that

- (a) maintains air pressure below the air pressure outside the enclosure or cabinet, to prevent the escape of air contaminants from the enclosure or cabinet to other work areas; and
- (b) minimizes worker exposure inside the enclosure.

[Back to Top](#)

#### **Restricted work zones**

**125.** (1) Where abrasive blasting or a similar operation is conducted outside a structure, the process shall be restricted to a work zone which is identified by warning signs or similar means as a contaminated area.

(2) Only a properly protected worker who is necessary to perform the work shall be permitted inside an enclosure or a restricted work zone where abrasive blasting or a similar operation is conducted.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### Operating procedures

126. (1) The operating controls for a sandblasting machine or jetting gun shall be

- (a) located near the nozzle in a position where the operator's hands are when using the device;
- (b) a continuous pressure type that immediately stops the flow of material when released; and
- (c) protected from inadvertent activation.

(2) Where hand operated controls are impracticable, subsection (1)(a) does not apply and an operator shall use a foot operated control or equivalent safety device, of a design acceptable to the minister.

(3) A jetting gun shall not be modified except as authorized by the manufacturer.

(4) A worker shall not hand hold an object while it is being cleaned or cut by a jetting gun.

(5) High pressure hoses, pipes, and fittings shall be supported to prevent excessive sway and movement.

(6) A nozzle or jetting gun operator shall wear personal protective clothing and equipment on the body, hands, arms, legs and feet, including the metatarsal area, made of canvas, leather or other material which will protect the worker's skin from injury in the event of contact with the flow from the nozzle.

(7) Except where the process is isolated from the operator in a separate cabinet, suitable respiratory protective equipment shall be provided and worn whenever abrasive blasting or a similar operation is conducted.

### **PART IX DE-ENERGIZATION AND LOCKOUT**

[Back to Top](#)

### Definitions

127. In this Part

- (a) "control system isolating device" means a device that physically prevents activation of a system used for controlling the operation of machinery or equipment;
- (b) "energy isolating device" means a device that physically prevents the transmission or release of an energy source to machinery or equipment;
- (c) "energy source" means an electrical, mechanical, hydraulic, pneumatic, chemical, thermal or other source of energy of potential harm to workers;
- (d) "key securing system" means a system which physically prevents access to keys when locks or positive sealing devices are applied in a group lockout procedure;





**LOGAN  
DRILLING  
GROUP**

- (e) "lockout" means the use of a lock to render machinery or equipment inoperable or to isolate an energy source in accordance with written procedure;
- (f) "maintenance" means work performed to keep machinery or equipment in a safe operating condition, including installation, repair, cleaning, lubrication and the clearing of obstructions;
- (g) "normal production" means work that is routine, repetitive, and integral to the normal use of machinery or equipment for production; and
- (h) "personal lock" means a lock provided by the employer for use by a worker to ensure personal lockout protection such that each lock, when applied, is operable only by a key in the worker's possession, and by a key under the control of the supervisor or manager in charge.

[Back to Top](#)

#### **General requirement**

**128.** Where the unexpected energization or startup of machinery or equipment or the unexpected release of an energy source could cause injury, the energy source shall be isolated and effectively controlled.

[Back to Top](#)

#### **When lockout required**

**129.** (1) Where machinery or equipment is shut down for maintenance, no work may be done until

- (a) all parts and attachments have been secured against inadvertent movement;
- (b) where the work would expose workers to energy sources, the hazard has been effectively controlled; and
- (c) the energy isolating devices have been locked out as required by this Part.

(2) Where machinery or equipment is in use for normal production work, subsection (1) applies where a work activity creates a risk of injury to workers from the movement of the machinery or equipment, or exposure to an energy source, and the machinery or equipment is not effectively safeguarded to protect the workers from the risk.

[Back to Top](#)

#### **Lockout procedures**

**130.** (1) Where lockout of energy isolating devices is required, the devices shall be secured in the safe position using locks in accordance with procedures that are made available to all workers who are required to work on the machinery or equipment.



**LOGAN  
DRILLING  
GROUP**

(2) An employer shall ensure that each worker required to lock out has ready access to sufficient personal locks to implement the required lockout procedure.

(3) Combination locks shall not be used for lockout.

(4) A personal lock shall be marked or tagged to identify the person applying it, the equipment being locked out and the date the lock was applied.

(5) Procedures shall be implemented for shift or personnel changes, including the orderly transfer of control of locked-out energy isolating devices between outgoing and incoming workers.

(6) Where the use of a personal lock is not practicable for lockout, other effective means approved by the minister may be used in place of a personal lock to secure an energy isolating device in the safe position.

(7) Where an energy isolating device is locked out, the lock shall not prevent access to other energy isolating devices supplying machinery or equipment that could cause injury to workers.

[Back to Top](#)

#### **Checking locked out equipment**

**131.** (1) Effective means of verifying lockout shall be provided and used.

(2) Before commencing work, a worker shall verify that all energy sources have been effectively locked out.

[Back to Top](#)

#### **Worker responsibilities**

**132.** A worker who works on machinery or equipment requiring lockout is responsible for

- (a) locking out the energy isolating devices before starting work except as provided by section **134** ;
- (b) removing personal locks on the completion of his or her work; and
- (c) maintaining immediate control of the key to personal locks throughout the duration of the work.

[Back to Top](#)

#### **Removal of locks**

**133.** (1) A personal lock shall only be removed by the worker who installed it, or where this is not possible, the matter shall be referred to the supervisor who shall be responsible for its removal.

(2) A supervisor shall



**LOGAN  
DRILLING  
GROUP**

- (a) make every reasonable effort to contact the worker who installed the lock;
  - (b) ensure that the machinery or equipment can be operated safely before removing the lock; and
  - (c) ensure that locks that are not in active use are removed from machinery or equipment.
- (3) A worker shall be notified at the start of his or her next shift where the worker's personal lock has been removed since the worker's previous shift.

[Back to Top](#)

#### **Group lockout procedure**

**134.** (1) Where a large number of workers are working on machinery or equipment or a large number of energy isolating devices are to be locked out, a group lockout procedure that meets the requirements of this section may be used.

- (2) In a group lockout procedure, 2 qualified workers shall be responsible for
  - (a) independently locking out the energy isolating devices;
  - (b) securing the keys for the locks used under paragraph (a) with personal locks or other positive sealing devices acceptable to the minister; and
  - (c) completing, signing and posting a checklist that identifies the machinery or equipment components covered by the lockout.
- (3) Before commencing work, a worker working on the locked out components shall apply a personal lock to the key securing system referred to in paragraph (2)(b).
- (4) Workers may lock out a secondary key securing system where 2 qualified workers lock out the primary key securing system and place their keys in the secondary system.
- (5) On completion of his or her work, a worker referred to in subsections (3) and (4) shall remove his or her personal lock from the key securing system.
- (6) Where the requirements of subsection (5) have been met and it has been determined that it is safe to end the group lockout, 2 qualified workers shall be responsible for removing their personal locks or the positive sealing device from the key securing system containing the locks referred to in paragraph (2)(a), and when those keys are released, the system is no longer considered to be locked out.
- (7) The written group lockout procedure shall be conspicuously posted at the place where the system is in use.

[Back to Top](#)

#### **Alternative procedures**

**135.** (1) Where lockout of energy isolating devices as required by section **129** is not practicable,



**LOGAN  
DRILLING  
GROUP**

- (a) in the case of a power system as defined in Part XXVI, the requirements of that Part shall be followed;
- (b) in the case of mobile equipment as defined in Part XII, the requirements of that Part shall be followed;
- (c) in the case of machinery equipment designed and equipped with effective control system isolating devices, the devices shall be locked out as required by sections **130 to 134** and subsection (2); and
- (d) in an emergency, the energy isolating devices or control system devices shall be effectively controlled to prevent inadvertent start-up or hazardous energy release.

(2) Control system isolating devices and the procedures for their use shall be approved in writing by the minister and shall be used by a qualified worker authorized to carry out the work.

[Back to Top](#)

#### **Where locks not required**

**136.** The application of a lock is not required under section **129** or **135** where

- (a) the energy isolating device is under the exclusive and immediate control of the worker at all times while working on the machinery or equipment; or
- (b) a tool, machine or piece of equipment that receives power through a readily disconnected supply, including an electrical cord or quick release air or hydraulic line, is disconnected from its power supply and its connection point is kept under the immediate control of the worker at all times while the work is being done.

[Back to Top](#)

#### **Work on energized equipment**

**137.** Where it is not practicable to shut down machinery or equipment for maintenance, only the parts which are vital to the process may remain energized and the work shall be performed by a qualified worker who has been authorized by the employer to do the work and provided with and follows written safe work procedures.

### **PART X FALL PROTECTION**

[Back to Top](#)

#### **Definitions**

**138.** In this Part

- (a) "anchorage point" means a secure point of attachment for a lifeline or lanyard;





**LOGAN  
DRILLING  
GROUP**

- (b) "arborist" means a worker trained and employed, in whole or in part, to climb trees for an economic or scientific purpose, including
  - (i) detection and treatment of disease, infections or infestations,
  - (ii) pruning, spraying or trimming,
  - (iii) repairing damaged trees,
  - (iv) assessing growth or harvesting potential, or
  - (v) scientific research;
- (c) "body belt" means a belt worn by a worker as a means of fall restraint;
- (d) "debris net" means a net that is used to catch material and debris that can drop from work areas;
- (e) "fall arrest system" means a system of physical components attached to a worker that stops a worker during a fall;
- (f) "full body harness" means a harness consisting of leg and shoulder straps and an upper back suspension unit that distributes and reduces the impact force of a fall;
- (g) "guardrail" means a system of vertical and horizontal members that warns of a fall hazard and reduces the risk of a fall;
- (h) "lanyard" means a flexible line used to secure a worker to a lifeline, a static line or a fixed anchor point;
- (i) "lifeline" means a vertical line attached to a fixed anchor point or a static line and to which a lanyard and a ropegrab may be attached;
- (j) "means of fall protection" means a fall protection system and includes a harness, net, rope, body belt, structure or other equipment or device or means of
  - (i) restraining a worker who is at risk of falling, or
  - (ii) stopping a worker who has fallen;
- (k) "personnel safety net" means a net that is used to catch a worker during a fall;
- (l) "ropegrab" means a mechanical fall-arrest device that
  - (i) is attached to a lifeline and a lanyard, and
  - (ii) locks itself immediately on the lifeline in the event of a fall;
- (m) "safe surface" means a surface at a workplace that
  - (i) has sufficient size and strength to adequately support a worker who falls on to the surface, and





**LOGAN  
DRILLING  
GROUP**

- (ii) is sufficiently horizontal to prevent a further fall from the surface by a worker who has fallen on to the surface;
- (n) "softener" means padding or hoses that are used with a lifeline or static line to prevent a rope from being cut or chafed; and
- (o) "static line" or "horizontal life line" means a rope
  - (i) that is attached horizontally to 2 or more fixed anchor points, and
  - (ii) to which a fall arrest system is attached.

[Back to Top](#)

#### **Training requirement**

**139.** A worker shall not use fall protection equipment after January 1, 2012 unless he or she has completed a training program on fall protection prescribed by the commission.

[Back to Top](#)

#### **Fall protection systems**

**140.** Where an employer determines it is impractical to provide adequate work platforms or staging, the employer shall ensure that fall protection systems are used by all workers who are exposed to the hazard of falling, as required in section **141**.

[Back to Top](#)

#### **General requirements**

**141.** Where a worker is exposed to the hazard of falling from a work area that is

- (a) 3 metres or more above the nearest safe surface or water;
- (b) above a surface or thing that could cause injury to the worker if the worker were to fall on the surface or thing; or
- (c) above an open tank, pit or vat containing hazardous material,

the employer shall ensure that

- (d) the worker is provided with a fall arrest system that meets the requirements of section **142**;
- (e) a guardrail that meets the requirements of section **28** is constructed or installed at the work area;
- (f) a personnel safety net that meets the requirements of section **143** is installed at the work area;



**LOGAN  
DRILLING  
GROUP**

- (g) temporary flooring that meets the requirements of section 146 is constructed or installed at the work area; or
- (h) the worker is provided with another means of fall protection that provides a level of safety equal to or greater than a fall arrest system that meets the requirements of section 142 .

[Back to Top](#)

#### **Fall arrest system**

**142.** (1) A fall arrest system that is provided in accordance with section 141 shall

- (a) be adequately secured to
    - (i) an anchorage point, or
    - (ii) a lifeline that is
      - (A) securely fastened to anchor points, or
      - (B) attached to a static line that is securely fastened to anchorage points and that is capable of withstanding either the maximum load likely to be imposed on the anchorage point or a load of 22.2 kilonewtons, whichever is the greater;
  - (b) include a lanyard
    - (i) that is attached to an anchorage point or lifeline, where practicable, above the shoulder of the worker, and
    - (ii) that complies with CSA Standard Z259.11 "Energy Absorbers and Lanyards";
  - (c) prevent a free fall greater than 1.22 metres where
    - (i) the fall arrest system is not equipped with a shock absorption system that complies with CSA Standard Z259.11 "Energy Absorbers and Lanyards" and that reduces the shock level of a fall to less than 4 kilonewtons, or
    - (ii) the combined free fall and shock absorbed deceleration distance exceeds the distance between the work area and a safe surface; and
  - (d) include a full body harness that
    - (i) is attached to a lanyard,
    - (ii) is adjusted to fit the user of the harness, and
    - (iii) complies with CSA Standard Z259.10 "Full Body Harnesses".
- (2) Where a fall arrest system includes a lifeline, the lifeline shall



**LOGAN  
DRILLING  
GROUP**

- (a) comply with CSA Standard Z259.2.1 "Fall Arresters, Vertical Lifelines and Rails";
  - (b) extend to a safe surface below the work area and be securely attached to an anchorage point;
  - (c) be secured at the bottom of the lifeline to prevent tangling or disturbance of the line and be free of knots, lubricants and imperfections;
  - (d) be free of splices, except where they are necessary to connect the lifeline to an anchorage point;
  - (e) be provided with softeners at all sharp edges or corners to protect against cuts or chafing; and
  - (f) be clearly identified as a lifeline by colour or by another means that provides an equivalent level of safety.
- (3) No worker shall
- (a) use a lifeline in a fall arrest system while that fall arrest system is being used by another worker; or
  - (b) provide a rope for use, or permit a rope to be used, as a lifeline in a fall arrest system where the rope has been used for another purpose.
- (4) Where a fall arrest system provided to a worker includes a ropegrab, the ropegrab used shall comply with CSA Standard Z259.2.1 "Fall Arresters, Vertical Lifelines and Rails".
- (5) An employer who provides a worker with a fall arrest system shall ensure the fall arrest system is inspected by a qualified person before each work shift undertaken by the worker.
- (6) A qualified person who carries out an inspection of a fall arrest system shall advise the employer where a component of the system is defective in condition or function and the employer shall ensure that the system is not used until the defective component is replaced or repaired.
- (7) Where a fall arrest system has arrested the fall of a worker at a work area, the employer shall ensure that the fall arrest system
- (a) is removed from service and inspected by a qualified person; and
  - (b) is repaired, before it is reused, to the original manufacturer's specifications, where an inspection under paragraph (a) reveals that a component of the system is defective.
- (8) Where a fall arrest system includes a static line, the static line shall
- (a) have a nominal diameter of at least 12.7 millimetres and be made of improved plow wire rope;
  - (b) be equipped with vertical supports at least every 9 metres and have a maximum deflection, when taut, of no greater than 381 millimetres for a 9 metre span;



**LOGAN  
DRILLING  
GROUP**

- (c) be equipped with turnbuckles or other comparable tightening devices that provide an equivalent level of protection, at the ends of the static line;
  - (d) be equipped with softeners at all sharp edges or corners to protect against cuts or chafing;
  - (e) be made only of components that are able to withstand either the maximum load likely to be imposed on the components or a load of 8 kilonewtons, whichever is the greater; and
  - (f) comply with CSA Standard Z259.13 "Flexible Horizontal Lifeline Systems" and CSA Standard Z259.16 "Design of Active Fall Protection Systems".
- (9) Where a fall arrest system is provided to an arborist, the fall arrest system shall
- (a) include a tree climbing or tree trimming harness or saddle;
  - (b) be adequately secured to
    - (i) an anchorage point, or
    - (ii) a lifeline that is
      - (A) securely fastened to anchorage points, or
      - (B) attached to a static line that is securely fastened to anchorage points;
  - (c) include a climbing rope or safety strap;
  - (d) where practicable, include a second climbing rope or safety strap that
    - (i) provides additional stability, and
    - (ii) back-up fall protection; and
  - (e) be capable of withstanding either the maximum load likely to be imposed or a load of 22.2 kilonewtons, whichever is the greater.
- (10) Where an employer uses a fall arrest system or a personnel safety net as a means of fall protection, the employer shall have a written fall protection plan that specifies
- (a) the procedure to assemble, maintain, inspect, use and disassemble the fall arrest system or personnel safety net; and
  - (b) the procedure for the rescue of a worker who has fallen and is suspended by the fall arrest system or personnel safety net, but is unable to effect self-rescue.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

## Nets

**143.** (1) Where a personnel safety net is installed in accordance with section **141**, an employer shall ensure that it

- (a) is installed
  - (i) not more than 4.6 metres below the work area,
  - (ii) to ensure that no obstructions or intervening members may be struck by a worker during a fall between the work area and the personnel safety net, and
  - (iii) maintained so that the maximum deflection when arresting the fall of a worker does not allow a part of the worker to contact another surface;
- (b) extends 2.4 metres on all sides beyond the work area; and
- (c) where connected to another personnel safety net, the splice joints connecting it with the other personnel safety nets are equal to, or greater in strength than, the strength of the weakest of the personnel safety nets.

(2) Notwithstanding subsection (1), an employer shall ensure that a personnel safety net is manufactured, used, maintained, inspected and stored in accordance with ANSI Standard A10.11-1989 "Safety Nets Used During Construction, Repair and Demolition Operations".

## [Back to Top](#)

## Debris nets

**144.** (1) Where a worker having access to an area below an elevated work area is exposed to the hazard of falling objects or debris from the work area, an employer shall ensure that

- (a) a debris net is installed below the work area in accordance with subsection (2); or
  - (b) other means of protection are provided that provide an equivalent level of protection from falling objects and debris.
- (2) An employer shall ensure that a debris net under subsection (1) is
- (a) manufactured, used, maintained, inspected and stored in accordance with ANSI Standard A10.11-1989 "Safety Nets Used during Construction, Repair and Demolition Operations"; and
  - (b) installed not more than 4.6 metres below the elevated work area.

## [Back to Top](#)

## Travel restraint

**145.** An employer shall ensure that a body belt provided in accordance with section **141** complies with CSA Standard Z259 "Body Belts and Saddles for Work Positioning and Travel Restraint".





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Temporary flooring**

- 146.** Temporary flooring that is constructed or installed in accordance with section **141** shall
- (a) be constructed or installed at each floor level of the work area where work is in progress;
  - (b) extend over the whole work area except for openings necessary for the carrying out of work;
  - (c) be able to withstand 4 times the maximum load likely to be imposed on it; and
  - (d) be securely fastened to and supported on members that are able to withstand 4 times the maximum load likely to be imposed on them.

### **PART XI SCAFFOLDS, STAGES AND WORK PLATFORMS**

[Back to Top](#)

#### **Definition**

**147.** In this Part, "eccentric loading" means a load that is applied off the central axis of a structural member.

[Back to Top](#)

#### **Portable ladder standards**

- 148.** (1) Except as otherwise permitted by this Part, portable ladder design, construction and use shall meet the requirements of
- (a) CSA Standard CAN3-Z11 "Portable Ladders";
  - (b) ANSI Standard A14.1-1990 "Safety Requirements for Portable Wood Ladders";
  - (c) ANSI Standard A14.2-1990 "Safety Requirements for Portable Metal Ladders"; or
  - (d) other standard acceptable to the minister.
- (2) A manufactured portable ladder shall be
- (a) marked for grade and use; and
  - (b) used in accordance with the manufacturer's instructions.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Job built ladders**

**149.** Where a portable wooden ladder is constructed at the job site,

- (a) the side rails
  - (i) shall be of 38 millimetres by 89 millimetres nominal dimensions for lengths up to 5 metres, and 38 millimetres by 140 millimetres nominal dimensions for lengths from 5 metres to 7.3 metres, and
  - (ii) shall not be notched, dapped, tapered or spliced,and the distance between the inner faces of the side rails shall not be less than 38 centimetres or more than 50 centimetres;
- (b) cleats shall be
  - (i) 19 millimetres by 64 millimetres for ladder lengths up to 5 metres,
  - (ii) 19 millimetres by 89 millimetres for ladder lengths from 5 metres to 7.3 metres,
  - (iii) spaced at 30 centimetres centres, and
  - (iv) nailed directly onto the smaller surfaces of the side rails, using three 57 millimetres wire nails on each end of the 89 millimetre cleats, and two similar nails on each end of the 64 millimetre cleats;
- (c) the spaces on the side rails between the cleats shall be filled with close fitting and well secured filler pieces that are the same thickness as the cleats; and
- (d) a double cleat ladder shall have 3 rails evenly spaced, and be 107 centimetres to 127 centimetres wide and have continuous cleats which extend the full width of the ladder.

### [Back to Top](#)

### **Protective coatings**

**150.** A protective coating applied to a wooden ladder, other than a small amount for identification purposes, shall be transparent to allow defects to be discovered by inspection.

### [Back to Top](#)

### **Inspection**

**151.** Portable ladders shall be inspected before use, and ladders with loose, broken or missing rungs, split side rails or other hazardous defects shall be removed from service.

### [Back to Top](#)

### **Inclination and support**



**LOGAN  
DRILLING  
GROUP**

**152.** Where a portable single or extension ladder is in use

- (a) the ladder shall be placed so that the horizontal distance from the base to the vertical plane of support is approximately one-quarter of the ladder length between supports; and
- (b) the lower ends of the ladder side rails shall rest on a firm and level base and the upper support of the side rails shall be rested on a bearing surface strong enough to safely withstand the applied load.

[Back to Top](#)

#### **Length**

**153.** A ladder shall be of sufficient length to project approximately one metre above the level of the upper landing to which it provides access, except where there is limited clearance and the ladder is adequately secured.

[Back to Top](#)

#### **Restrictions on use**

**154.** (1) Except as otherwise permitted by a manufacturer, a worker shall not work from either the top 2 rungs of a portable single or extension ladder or the top 2 steps of a stepladder.

(2) A ladder shall not be used as a scaffold component or as a horizontal walkway, ramp or work platform support except where the ladder is part of a premanufactured or engineered system.

- (3) A worker shall maintain 3 points of contact when using a ladder.
- (4) A worker may only work from a portable ladder without fall protection where
  - (a) the work is a light duty task of short duration at each location;
  - (b) the worker's centre of gravity is maintained between the ladder side rails; and
  - (c) the ladder is not positioned near an edge or floor opening that would significantly increase the potential fall distance.

[Back to Top](#)

#### **Fixed ladders**

**155.** (1) A fixed ladder shall comply with the requirements of ANSI Standard A14.3 - 2002 "American National Standard for Ladders - Fixed Safety Requirements" or other standard acceptable to the minister.

- (2) All fixed ladders, where a potential fall is more than 7.32 metres in length, shall be
  - (a) provided with platforms at intervals not greater than 7.32 metres;



**LOGAN  
DRILLING  
GROUP**

- (b) provided with safety cages starting at 2.13 metres and a maximum of 2.44 metres from the base of the ladder; or
  - (c) provided with acceptable devices to prevent workers from falling.
- (3) Fixed ladders shall be anchored at intervals of not more than 3.05 metres for the entire length of the ladder.
- (4) A continuous clearance of at least 17.78 centimetres shall be provided at the back of rungs of fixed ladders.
- (5) Ladder rungs shall be omitted above the landing and the side rails shall extend at least 1.07 metres above the landing.
- (6) Where acceptable devices to prevent workers from falling are used, platforms shall be provided at intervals not greater than 45.72 metres where the continuous length of climb is greater than 45.72 metres and every 45.72 metres afterward.

[Back to Top](#)

#### **Special purpose ladders**

**156.** A special purpose ladder, including a ship's ladder, escape ladder, individual rung ladder or a ladder visible to the audience in a theatre scenic unit or prop, shall be engineered or constructed to a standard acceptable to the minister.

[Back to Top](#)

#### **Definitions**

**157.** For the purpose of this section and sections **158** to **200**,

- (a) "building tie" means a connection between a standing scaffold and a permanent structure;
- (b) "double-pole scaffold" means a scaffold with both ends of the bearers supported by connections to posts or uprights;
- (c) "heavy duty" means intended to support both workers and stored or stacked materials, including bricks and masonry, where the maximum load capacity does not exceed 366 kilograms a square metre;
- (d) "light duty" means intended to support workers, their personal hand tools and material for immediate use only where the maximum load capacity does not exceed 122 kilograms a square metre;
- (e) "painter's plank" means a single manufactured extension staging;
- (f) "running scaffold" means a double-pole scaffold comprised of 2 or more bays;



**LOGAN  
DRILLING  
GROUP**

- (g) "scaffold" or "scaffolding" means a temporary work platform and its supporting structure used for supporting workers or materials or both; and
- (h) "single pole scaffold" means a scaffold with the outer ends of the bearers supported on ledgers secured to a single row of posts or uprights, and the inner ends of the bearers supported on or in a wall.

[Back to Top](#)

### **Responsibilities**

**158.** (1) Employers shall ensure that scaffolds used by their workers are in safe condition, regardless of who erected the scaffolds.

(2) A scaffold shall be erected, altered and dismantled by, or under the direct supervision of, qualified workers.

(3) A scaffold shall be inspected daily before use and after a modification.

(4) A damaged scaffold component shall not be used until it has been effectively repaired.

[Back to Top](#)

### **Standards**

**159.** Unless otherwise permitted by this Part, a scaffold shall be designed, erected and maintained in accordance with the requirements of

- (a) ANSI Standard A10.8 -1988 "American National Standard for Construction and Demolition Operations - Scaffolding - Safety Requirements";
- (b) ANSI Standard A14.7- 1991 "Safety Requirements for Mobile Ladder Stands and Mobile Ladder Stand Platforms";
- (c) CSA Standard CAN/CSA -Z271 "Safety Code for Suspended Powered Platforms";
- (d) another standard acceptable to the minister; or
- (e) the written requirements of a professional engineer.

[Back to Top](#)

### **Scaffold stability**

**160.** (1) A scaffold shall be erected with vertical members plumb and ledgers and bearers level.

(2) The lower end of the vertical support of a scaffold shall be supported by firm and adequately sized foundations or sills.





**LOGAN  
DRILLING  
GROUP**

(3) The poles, legs and uprights of a scaffold shall be securely and rigidly braced to prevent swaying and displacement.

(4) A scaffold shall be effectively guyed or secured to a building or structure where the height of the scaffold exceeds 3 times its minimum base.

(5) Where building ties or guys are used

(a) the first level of ties or guys shall be placed at a height not exceeding 3 times the scaffold minimum base dimension, and additional building ties or guys placed at vertical intervals not exceeding 6 metres; and

(b) the ties or guys shall be placed at horizontal intervals of every third bay or 6.4 metres, whichever is the lesser, and at the ends of the scaffold.

(6) A building tie shall be capable of resisting a working load of 4 kilonewtons, applied horizontally and perpendicular to the structure, or a proportionately equivalent load where ties are spaced closer together or guying is employed.

(7) Where a scaffold is enclosed by a tarp or other cover, bracing for the scaffold shall be installed in accordance with the manufacturer's instructions or those of a professional engineer to meet design criteria for induced loads.

[Back to Top](#)

#### **Guardrails and toeboards**

**161.** (1) Except as otherwise provided by subsection (2), a work platform 1.22 metres or more above grade or floor level shall have guardrails on all open sides and ends which comply with the requirements of sections **28** and **30**.

(2) Where an edge of the work platform is adjacent to a structure that provides protection equivalent to guardrails, guardrails may be omitted on that edge and there may be an open space of up to 30 centimetres between the work platform and the structure.

(3) Toeboards shall be provided and comply with all the requirements for toeboards set out in these regulations.

[Back to Top](#)

#### **Grounding**

**162.** A metal scaffold located in proximity to a high voltage energized electrical conductor or equipment shall be effectively grounded where a hazardous level of electrical charge is likely to be induced in the scaffold.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Lumber planks**

**163.** (1) Scaffold planks shall

- (a) be rough sawn and of not less than 5.08 centimetres by 25.40 centimetre dimensions;
- (b) extend not less than 15.24 centimetres and not more than 30.48 centimetres beyond the supporting members;
- (c) be supported at intervals not exceeding 3.05 metres for light work and 2.13 metres for heavy work, including bricklaying and masonry;
- (d) be of uniform thickness in adjoining planks; and
- (e) have maximum allowable deflection not exceeding the span length divided by 80.

(2) Each lumber scaffold plank shall be visually inspected for defects before each installation and shall be removed from service where it is found to be defective.

[Back to Top](#)

### **Manufactured planks**

**164.** (1) A manufactured scaffold plank shall meet the requirements of section **163** and shall be used in accordance with the manufacturer's instructions and limitations, except as provided in subsection (2).

(2) A single manufactured extension staging painter's plank may be used for the support of one worker only.

[Back to Top](#)

### **Securing planks**

**165.** Each lumber and manufactured scaffold plank installed for use shall be secured against dislodgement.

[Back to Top](#)

### **Access to scaffolds**

**166.** (1) Access to otherwise inaccessible working levels of a scaffold up to 9 metres above a floor or grade shall be provided by

- (a) end frames providing a ladder-like structure having horizontal members uniformly spaced at approximately 30 centimetres on centre; or
- (b) a vertical or portable ladder or stairway, attached to the scaffold.

(2) Access to otherwise inaccessible working levels of a scaffold over 9 metres above a floor or grade shall be provided by



**LOGAN  
DRILLING  
GROUP**

- (a) a stairway erected for the full height of the scaffold;
  - (b) a temporary passenger hoist approved for use under the *Public Safety Act* ;
  - (c) an attached vertical ladder, with rest platforms at least every 6.1 metres which are fully guarded except at the ladder location; or
  - (d) end frames with a ladder-like structure having horizontal members uniformly spaced at 30 centimetres on centre, and rest platforms at least every 6.10 metres which are fully guarded except at the ladder location.
- (3) A worker shall not climb the outside of scaffold frames between landings.

[Back to Top](#)

#### **Vertical ladders**

**167.** (1) A vertical ladder providing access to working levels of a scaffold shall

- (a) be adequately fastened to the scaffold;
- (b) be configured so that its siderails extend approximately one metre above the uppermost working level; and
- (c) have rungs spaced at 30 centimetres on centre and have a clear space of at least 15 centimetres behind each rung.

(2) A ladder attached to a scaffold shall be positioned so that its use will not cause the scaffold to become unstable.

[Back to Top](#)

#### **Erection and dismantling.**

**168.** The requirements of sections **141** to **146** apply to the erection and dismantling of a scaffold.

[Back to Top](#)

#### **Spacing of components**

**169.** The horizontal spacing between uprights, guardrail posts and bearers in a wood scaffold shall not exceed

- (a) 3 metres for a light duty scaffold; or
- (b) 2 metres for a heavy duty scaffold.

[Back to Top](#)



### Bracing of uprights

170. Adjacent uprights shall be connected with horizontal runners (ledgers and bearers) to ensure that the unbraced vertical length of an upright does not exceed 2.4 metres.

[Back to Top](#)

### Cross bracing

171. A scaffold shall be adequately supported in 2 directions by a system of diagonal cross braces secured to the uprights as close to the ledgers as possible.

[Back to Top](#)

### Wood scaffolds

172. (1) Components of a light duty single-pole wood scaffold shall have minimum nominal dimensions conforming to the following table:

Component	Dimensions
Uprights up to 6.10 metres	5.08 by 10.16 centimetres
Uprights 6.10 to 15.24 metres	10.16 by 10.16 centimetres
Bearers- 91.44 centimetres span	2.54 by 15.24 centimetres
Bearers 152.40 centimetre span	5.08 by 15.24 centimetres
Ledgers	2.54 by 15.24 centimetres
Braces	2.54 by 15.24 centimetres
Wall-scabs and bearer blocks	5.08 by 15.24 centimetres
Minimum platform width	2-5.08 by 25.4 centimetres
Top guardrails	5.08 by 10.16 centimetres
Intermediate guardrails	2.54 by 15.24 centimetres
Toe-boards	2.54 by 10.16 centimetres

(2) Components of double-pole scaffolds shall have minimum nominal dimensions conforming to the following table:

[Back to Top](#)

Components	Dimensions	
	Light duty	Heavy duty
Uprights to 6.10 metres	5.08 by 10.16 centimetres	5.08 by 15.24 centimetres
Uprights 6.10 metres to 15.24 metres	10.16 by 10.16 centimetres	10.16 by 15.24 centimetres
Bearers- 152.4 centimetres span	2-2.54 by 15.24 centimetres or	2-5.08 by 15.24 centimetres or



**LOGAN  
DRILLING  
GROUP**

	1-5.08 by 15.24 centimetres	1-5.08 by 25.4 centimetres
Ledgers	2.54 centimetres by 15.24 centimetres	2.54 by 15.24 centimetres
Braces	2.54 centimetres by 15.24 centimetres	2.54 centimetres by 15.24 centimetres
Minimum platform width	2-5.08 by 25.4 centimetres	4-5.08 by 25.4 centimetres
Top guardrails	5.08 by 10.16 centimetres	5.08 by 10.16 centimetres
Intermediate guardrails	2.54 by 15.24 centimetres	2.54 by 15.24 centimetres
Toeboards	2.54 by 10.16 centimetres	2.54 by 10.16 centimetres
Note: Spacing of building ties	Vertical: 4.57 metres	Horizontal: 6.10 metres

#### **Extension of uprights**

**173.** (1) A wood upright may only be extended using a butt joint, strengthened by two wooden splice plates not less than 1.2 metres long.

(2) The splice plates for wood uprights shall have a minimum thickness of 38 millimetres and be of the same width as the spliced members.

(3) The combined cross-sectional area of the splice plates shall be at least that of the vertical upright member.

#### **[Back to Top](#)**

#### **Laminated uprights**

**174.** When wood uprights are fabricated by the lamination of two or more pieces of material to obtain the required cross-sectional dimensions, the distance between joints shall be at least 1.2 metres.

#### **[Back to Top](#)**

#### **Bearer supports**

**175.** (1) The inner ends of bearers on single-pole scaffolds shall be supported by bearer blocks and securely fastened to wall scabs.

(2) Manufactured bearer supports shall be

(a) of a design acceptable to the minister; and





**LOGAN  
DRILLING  
GROUP**

(b) secured to solid wall materials.

(3) Bearer hooks which engage holes in the wall sheathing shall be adequately supported by stiffeners secured to wood studs or blocking.

[Back to Top](#)

#### **Pumpjack scaffold**

**176.** (1) A pumpjack scaffold made of metal

(a) shall not be more than 13.7 metres in height; and

(b) shall be braced every 4.6 metres, starting at the base of the scaffold.

(2) A pumpjack scaffold that includes one or more supports made of wood

(a) shall not be more than 7.3 metres in height; and

(b) shall be braced every 3 metres, starting at the base of the scaffold.

(3) A pumpjack scaffold

(a) shall be used only as a light duty scaffold; and

(b) shall not be used by more than 2 workers at one time.

(4) A pumpjack scaffold shall have guard rails in accordance with section **28**.

[Back to Top](#)

#### **Definitions**

**177.** For the purpose of this section and sections **178 to 200**,

(a) "end frame scaffold" means a system of fabricated tubular metal frames (panels) that are connected in the field with bracing members;

(b) "system scaffold" means a scaffold consisting of posts with fixed connection points which accept runners, bearers and diagonal braces that can be interconnected at predetermined levels;

(c) "tower scaffold" means a double-pole scaffold comprised of only one bay;

(d) "tube and coupler scaffold" means an assembly of tubing members (posts, bearers, runners, diagonal braces, ties), a base supporting the posts and special couplers to connect the uprights and to join the various members; and

(e) "tubular metal scaffold" means a scaffold with members made primarily of steel or aluminium tubing.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Manufacturers specifications**

**178.** Except as provided in section **179** , a tubular metal scaffold shall

- (a) be erected in accordance with the manufacturer's instructions and specifications, including bracing in both vertical and horizontal planes;
- (b) have all components installed and connected using the fasteners specified by the manufacturer, or fasteners of equivalent quality; and
- (c) be maintained in a condition which meets the manufacturer's specifications.

[Back to Top](#)

#### **Compatibility**

**179.** Where a scaffold is erected using components made by different manufacturers, the employer shall ensure that the components are compatible.

[Back to Top](#)

#### **Engineering requirements**

**180.** A scaffold shall be erected and used in accordance with the written instructions of a professional engineer where the scaffold

- (a) exceeds 25 metres in height;
- (b) exceeds 20 metres in height where stairways are included as part of the scaffold;
- (c) is used to support a temporary floor;
- (d) is subject to loads which can cause overturning; or
- (e) is suspended from a structure.

[Back to Top](#)

#### **Adjustable height bases**

**181.** (1) A scaffold shall be erected plumb using adjustable height bases under the uprights to accommodate foundation settlement and uneven, sloping or stepped surfaces.

(2) Unless otherwise specified by the manufacturer, a height adjustment device shall not extend more than the lesser of two-thirds of its total length or 60 centimetres.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Spacing**

**182.** Spacing between frames or uprights shall not exceed the maximum allowable span for work platform components and for the intended loading.

[Back to Top](#)

#### **Couplings**

**183.** (1) Vertical frames and uprights shall be joined using coupling or stacking pins to ensure proper vertical alignment.

(2) Where uplift could occur and cause components to separate, height adjusting screws, castors, coupling pins, frames and uprights shall be secured to prevent separation of components.

[Back to Top](#)

#### **Height restriction**

**184.** The height of a free-standing tower or rolling scaffold shall not exceed 3 times its minimum base dimension.

[Back to Top](#)

#### **Outriggers**

**185.** (1) Where outriggers are used to increase the minimum base dimension of a tower or rolling scaffold, the outriggers shall be installed on both sides of the scaffold structure.

(2) Notwithstanding subsection (1), where outriggers are used to increase the minimum base dimension of a tower or rolling scaffold erected adjacent to a building or other structure, the scaffold shall be braced against the structure, and outriggers used on the opposite side.

[Back to Top](#)

#### **Wheels**

**186.** (1) The wheels on at least one end of a rolling scaffold shall be the swivel type.

(2) The wheels of a rolling scaffold shall not be less than 13 centimetres in diameter and shall be secured in the scaffold leg to prevent the wheel from falling out while the scaffold is being erected, used or dismantled.

(3) Height adjusting screws for castors of a rolling scaffold shall extend not more than two-thirds of their total length or 30 centimetres whichever is the lesser.



**LOGAN  
DRILLING  
GROUP**

(4) A wheel of a rolling scaffold shall be equipped with effective brakes or locking devices which shall be applied when workers are working on the scaffold.

(5) A rolling scaffold mounted on pneumatic tires shall have supports in addition to pneumatic tires while the scaffold is being erected or dismantled or when a worker is on it.

[Back to Top](#)

#### **Moving restrictions**

**187.** A worker is not permitted on a rolling scaffold while it is being moved.

[Back to Top](#)

#### **Surface conditions**

**188.** To ensure the stability of a rolling scaffold, the floor or surface over which it is moved shall be sufficiently firm, within 3° of level, and free from pits, holes, depressions and obstructions.

[Back to Top](#)

#### **Components of tube and coupler scaffold**

**189.** (1) Where 48 millimetres outside diameter aluminium or steel tube components are used in a tube and coupler scaffold

- (a) the spacing of standards shall not exceed 3 metres;
- (b) standards shall be connected with ledgers and transoms at a vertical spacing not to exceed 2 metres; and
- (c) transoms constructed from 48 millimetres outside diameter aluminium or steel tubing shall be limited to 1.2 metre bearing length.

(2) A tube and coupler scaffold system which does not comply with the requirements of subsection (1) shall be constructed in accordance with the design of a professional engineer.

[Back to Top](#)

#### **Cross bracing**

**190.** (1) A running scaffold shall have internal horizontal cross-bracing installed in the bay immediately adjacent to and at the level of a building tie unless equivalent bracing is achieved by use of fabricated scaffold planks secured by end hooks to provide a fully decked work platform at this level.

(2) A double-pole tube and coupler scaffold shall have internal bracing in accordance with subsection (1).



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Work platforms supported by a crane or hoist**

191. A work platform suspended from a crane or hoist, or attached to a crane boom shall be approved and certified by a professional engineer.

[Back to Top](#)

#### **Crane capacity**

192. The weight of a work platform suspended from a crane or hoist or attached to a crane boom, and its rigging, plus the rated capacity, shall not exceed 25% of the crane's rated capacity at the working radius.

[Back to Top](#)

#### **Eccentric loading**

193. Where a work platform attached to a crane boom causes eccentric loading on the boom, the rated capacity of the crane shall be reduced and shall be determined and certified by the crane manufacturer or a professional engineer.

[Back to Top](#)

#### **Rigging**

194. Rigging used to suspend a work platform from a crane or hoist shall have a safety factor of at least 10, and shall be used exclusively for suspending the work platform.

[Back to Top](#)

#### **Two block prevention**

195. Where a crane or hoist is being used to hoist personnel with a load line, the line shall have a device to prevent two-blocking.

[Back to Top](#)

#### **Powered booms and winches**

196. (1) A crane used to suspend a work platform shall have a powered boom or a fixed boom.

(2) A hoist used to raise or lower a work platform suspended from a crane shall be capable of lowering under power.

(3) A free running boom or hoisting winch, controlled only by brakes, shall not be used to raise or lower a work platform.





**LOGAN  
DRILLING  
GROUP**

(4) Hoisting and lowering speed of a crane or hoist shall be kept as slow as practicable while supporting a work platform.

[Back to Top](#)

#### **Fall protection - suspended work platforms**

**197.** (1) An occupant of a work platform suspended from a crane or hoist shall use a personal fall arrest system with a shock absorbing lanyard secured to a designated anchorage point on the platform or above the load hook.

(2) Where a work platform suspended by a crane or hoist is occupied by a worker with a personal fall arrest system attached to the platform, the platform shall have a safety strap that prevents the platform from falling more than 15 centimetres where the platform becomes dislodged from the hook.

(3) Each occupant of a work platform attached to a crane boom shall use a personal fall arrest system secured to a designated anchorage point on the boom.

[Back to Top](#)

#### **Articulating booms prohibited**

**198.** A work platform shall not be

- (a) suspended from an articulating boom crane; or
- (b) attached to an articulating boom crane unless the installation is approved by the crane manufacturer.

[Back to Top](#)

#### **Travelling restriction**

**199.** Travelling with a worker in a work platform supported by a crane or hoist is not permitted except where the platform is supported by a rail-mounted crane.

[Back to Top](#)

#### **Communications**

**200.** The operator of a crane or hoist used to suspend a work platform shall have an effective means of constant communication with a person on the platform.

[Back to Top](#)

#### **Definitions -elevating work platforms**

**201.** For the purpose of this section and sections **202** to **217**,



**LOGAN  
DRILLING  
GROUP**

- (a) "aerial device" means a vehicle-mounted device having a boom which may be telescoping or articulating, or both, with a work platform on the boom, which is used to position personnel;
- (b) "aerial ladder" means a vehicle-mounted aerial device with a single or multiple-section ladder with or without a platform at the top;
- (c) "boom-supported elevating work platform" means an elevating work platform or aerial device which has its platform supported by an elevating device that elevates and rotates relative to the machine base;
- (d) "elevating work platform" means a work platform or aerial device which self-elevates to overhead work locations and includes other similar devices not covered elsewhere in these regulations; and
- (e) "self-propelled" means the capability of an elevating work platform to be power propelled with the primary controls on the work platform.

### [Back to Top](#)

#### **Standards**

**202.** (1) A self-propelled work platform comprising a boom-supported elevating platform, which telescopes, articulates, rotates or extends beyond the base dimensions, and is not mounted on a separate self-propelled vehicle shall meet the requirements of

- (a) CSA Standard CAN/CSA -B354.4 "Self-propelled Boom-Supported Elevating Work Platforms";
- (b) ANSI Standard ANSI /SIA A92.5 "Boom-Supported Elevating Work Platforms"; or
- (c) other standard acceptable to the minister.

(2) A self-propelled integral chassis elevating work platform having a platform that cannot be positioned laterally completely beyond the base and for which primary functions are controlled from the platform shall meet the requirements of

- (a) CSA Standard CAN/CSA -B354.2 "Self-Propelled Elevating Work Platforms";
- (b) ANSI Standard ANSI /SIA A92.6 "American National Standard for Self-Propelled Elevating Work Platforms"; or
- (c) other standard acceptable to the minister.

(3) A manually propelled, integral chassis elevating work platform having a platform that cannot be positioned laterally completely beyond the base, which may be adjusted by manual or powered means and which shall not be occupied when moved horizontally, shall meet the requirements of

- (a) CSA Standard CAN/CSA -B354.1 "Portable Elevating Work Platforms";



**LOGAN  
DRILLING  
GROUP**

(b) ANSI Standard ANSI /SIA A92.3 "American National Standard for Manually Propelled Elevating Aerial Platforms"; or

(c) other standard acceptable to the minister.

(4) A telescopic aerial device, aerial ladder, articulating aerial device, vertical tower, material-lifting aerial device or a combination of these, when vehicle-mounted, whether powered or manually operated, shall meet the requirements of CSA Standard CAN/CSA -C225 "Vehicle-Mounted Aerial Devices" or other standard acceptable to the minister.

(5) An elevating work platform of a type other than that referred to in subsections (1) to (4) shall meet a standard acceptable to the minister.

[Back to Top](#)

#### **Operating and maintenance manuals**

**203.** (1) The equipment manufacturer's

(a) operation manual; and

(b) maintenance manual, containing maintenance instructions and replacement part information

for each elevating work platform in use at the workplace shall be available at the workplace.

(2) Where either of the manuals referred to in subsection (1) is not available, the equipment shall not be used until the manual is obtained, or until written instructions for the safe operation and maintenance of the equipment are supplied by a professional engineer.

[Back to Top](#)

#### **Inspection and maintenance records**

**204.** (1) Records of inspection, maintenance, repair and modification shall be kept for an elevating work platform by the equipment operator and a person inspecting and maintaining the equipment.

(2) Where the inspection and maintenance records required under subsection (1) are not available, an elevating work platform shall be inspected and certified by a professional engineer before use, and an inspection and maintenance recording system shall be established as required by subsection (1).

[Back to Top](#)

#### **Shift inspection**

**205.** An elevating work platform shall be inspected by the operator before use on each shift and a condition that could endanger workers shall be remedied before the platform may be used.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Annual inspection and certification**

**206.** (1) An elevating work platform shall be inspected, maintained, repaired and modified in accordance with

- (a) the manufacturer's instructions;
- (b) the relevant CSA Standard as specified in section **202** ;
- (c) the direction of a professional engineer; or
- (d) another standard acceptable to the minister.

(2) An insulated aerial device shall be dielectrically tested at least annually in accordance with CSA Standard CAN/CSA -C225 "Vehicle Mounted Aerial Devices" or other standard acceptable to the minister and the insulating capability of the aerial device shall be certified by the testing agency.

[Back to Top](#)

#### **Fall protection - elevating work platform**

**207.** (1) A person on an elevating work platform shall wear a personal fall arrest system secured to an anchorage point that is approved by the manufacturer or professional engineer.

(2) A worker on an aerial ladder shall be continuously protected by means of a personal fall arrest system as required by Part X or shall maintain 3 points of contact with the ladder at all times.

[Back to Top](#)

#### **Safe access**

**208.** Safe means shall be provided to get on and off the platform of an elevating work platform.

[Back to Top](#)

#### **Rated capacity**

**209.** The rated capacity of an elevating work platform

- (a) shall be marked on the platform; and
- (b) shall not be exceeded.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Outriggers**

**210.** (1) An outrigger on an elevating work platform shall be used in accordance with the manufacturer's instructions.

(2) Where an elevating work platform has outriggers, notices indicating the circumstances specified by the manufacturer for which the outriggers are to be used shall be clearly displayed at the operating controls for the platform.

[Back to Top](#)

### **Controls**

**211.** (1) Each control on an elevating work platform shall be clearly identified to indicate its function.

(2) Controls on an elevating work platform shall be 'hold-to-run' (continuous pressure) type that return to the neutral or stop position when released.

(3) Controls on an elevating work platform shall be protected against inadvertent operation.

(4) Each set of operating controls of an elevating work platform shall be provided with an emergency stop device.

(5) An emergency stop device referred to in subsection (4) shall be

(a) within easy reach of the operator;

(b) clearly labelled 'STOP'; and

(c) red in colour.

(6) An elevating work platform shall have a clearly marked overriding lowering control to enable a worker at the lower controls to stop and lower the platform in the event of an emergency.

[Back to Top](#)

### **Immobilization of vehicles**

**212.** (1) The carrier vehicle of an elevating work platform shall be secured against inadvertent movement before a worker occupies the platform.

(2) Where a manufacturer permits an elevating work platform to be elevated on sloping ground, the vehicle's wheels shall be secured according to the manufacturer's instructions and where no instructions have been provided, the wheels shall be chocked.

[Back to Top](#)

### **Shear hazard**





**LOGAN  
DRILLING  
GROUP**

**213.** An elevating work platform lifting mechanism which creates a shear hazard to workers shall be adequately guarded or identified with signs, decals or similar markings warning of the hazard.

[Back to Top](#)

#### **Warning devices**

**214.** An elevating work platform, other than a vehicle-mounted aerial device which complies with the requirements of CSA Standard CAN/CSA -C225 "Vehicle Mounted Aerial Device", shall have a warning system consisting of an intermittent horn and flashing light which is automatically activated during motion of the work platform.

[Back to Top](#)

#### **Transporting workers**

**215.** A worker may not be transported on an elevated work platform unless the transport is in accordance with the manufacturer's instructions.

[Back to Top](#)

#### **Lift truck platform**

**216.** A work platform mounted on the forks of a lift truck shall be designed by an engineer or conform to a standard acceptable to the minister and

- (a) securely attached to the lifting carriage or forks;
- (b) provided with perimeter guardrails meeting the requirements of sections **28** and **30** ;
- (c) equipped with guarding to prevent occupants from contacting a hazardous part of the lifting machinery; and
- (d) clearly marked with the rated load of the platform.

[Back to Top](#)

#### **Fall protection - lift truck**

**217.** Where a worker is elevated on a work platform supported by a lift truck,

- (a) the lift truck operator shall remain at the controls of the lift truck;
- (b) the lift truck mast shall be kept vertical;
- (c) the lift truck shall not be moved except for minor adjustments necessary to facilitate positioning of the platform; and
- (d) a platform occupant shall use a personal fall protection system as required by Part X.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### Swing stages - definitions

**218.** For the purpose of this section and sections **219** to **242**

- (a) "bridging" means using a deck or planking to span a gap between two independent work platforms;
- (b) "rated load" means the maximum load, designated by the manufacturer, that may be placed safely on a swing stage, and includes the weight of the workers, their tools and equipment, material to be transported and allowances for loads including trailing electric power supply cords, compressed air supply lines, abrasive blasting feed supply lines, or other loads, but does not include the weight of the work platform or its supporting rigging;
- (c) "safe lower landing" means an area onto which a swing stage or other suspended platform system can be lowered that is capable of safely supporting the weight of the swing stage plus the rated load of the system and which can be accessed safely by workers;
- (d) "static load" means
  - (i) for suspension by 2 or more lines, the rated load of the swing stage plus half the weight of the stage including the working platform, hangers or stirrups, hoisting units and suspension lines, and
  - (ii) for suspension by a single line, the rated load plus the weight of the stage;
- (e) "suspension height" means the distance from the upper attachment points of the suspension line to the safe lower landing for the swing stage; and
- (f) "swing stage" means a temporary suspended work platform used to support workers, tools, equipment and materials, which is raised and lowered by manually controlled hoisting equipment.

[Back to Top](#)

#### Rated load

**219.** The rated load

- (a) shall be permanently marked upon a swing stage and clearly readable by workers on the stage; and
- (b) shall not be exceeded.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Weight identification**

**220.** A swing stage platform and a hoist unit shall have its weight clearly marked on it.

[Back to Top](#)

#### **Prior permission**

**221.** A swing stage shall not be used without the prior permission of the minister when

- (a) there are 2 or more work platforms at different levels on one swing stage assembly;
- (b) one swing stage is used above or below a portion of another swing stage;
- (c) there is bridging between swing stages;
- (d) a work platform exceeds 10 metres in length; or
- (e) the suspension height exceeds 90 metres.

[Back to Top](#)

#### **Attachment points**

**222.** A swing stage shall be suspended from parapet clamps, cornice hooks, thrust-out beams or other solid anchorages having a working load limit that is at a minimum equivalent to that of the suspension system for the swing stage.

[Back to Top](#)

#### **Securing suspension lines**

**223.** A suspension line for a swing stage shall be secured at the upper end using a safety hook, shackle or other method acceptable to the minister.

[Back to Top](#)

#### **Hook and clamp working load limit**

**224.** The working load limit of a cornice hook or parapet clamp shall be determined by the manufacturer or professional engineer and be clearly marked on the hook or clamp.

[Back to Top](#)

#### **Hook and clamp engagement**

**225.** (1) A cornice hook or parapet clamp shall be installed to engage structurally sound portions of a building or structure having adequate strength for the purpose.



**LOGAN  
DRILLING  
GROUP**

(2) Where the structural adequacy of the building or structure at the point of attachment of a cornice hook or parapet clamp is not known, a professional engineer shall determine and certify the attachment points.

[Back to Top](#)

#### **Tiebacks**

**226.** (1) A cornice hook, parapet clamp or thrust-out beam shall be secured by a tieback to a solid anchorage on the building or structure or to another parapet clamp secured on the far side of the structure.

(2) The securing, rigging and anchorage required under subsection (1) shall have an ultimate strength of at least 22.2 kilonewtons.

(3) A tieback referred to in subsection (1) shall, to the extent practicable, be rigged at a right angle to the building face.

[Back to Top](#)

#### **Thrust-out beams**

**227.** (1) A thrust-out beam used to support a swing stage shall provide a minimum safety factor of 4, based on the ratio of the ultimate load carrying capacity of the thrust-out beam to the static load.

(2) The rated load for the allowable thrust-out beam projections shall be determined by the beam manufacturer or a professional engineer and clearly marked on the beam.

[Back to Top](#)

#### **Counterbalance of thrust-out beams**

**228.** (1) A thrust-out beam used for supporting a swing stage shall be counterbalanced to support a load of at least 4 times the static load.

(2) A counterweight used to counterbalance a thrust-out beam shall be

- (a) clearly marked to indicate its weight;
- (b) of solid material not subject to loss of weight through attrition; and
- (c) secured to the thrust-out beam.

[Back to Top](#)

#### **Hook closures**

**229.** (1) A hook used in a swing stage suspension system shall be moused or have a safety latch.



**LOGAN  
DRILLING  
GROUP**

(2) Subsection (1) does not apply to the connection between a cornice hook and the structure.

[Back to Top](#)

#### **Protection against damage**

**230.** (1) Where a suspension line, tieback, lifeline or other part of the rigging for a swing stage comes into contact with a rough or sharp edge, the line shall be protected from damage.

(2) Padding shall be used to minimize loss of rope strength where a line supporting a swing stage makes a sharp bend over an edge.

[Back to Top](#)

#### **Fibre rope suspension**

**231.** Fibre rope used to suspend a swing stage or similar equipment shall

- (a) provide a safety factor of at least 10, based on the ratio of the rope manufacturer's rated breaking strength for the rope to the load on the rope due to the static load;
- (b) be made of synthetic fibre having a breaking strength of at least 22 kilonewtons;
- (c) be reeved through a block and tackle system comprising at least one double upper and one single lower block, for each hanger;
- (d) have the hauling line secured to prevent free running of the line;
- (e) be free of knots or splices except for terminal eye-splices; and
- (f) not be used where exposed to adverse effects of chemicals, unless the rope is made of materials inert to the chemicals.

[Back to Top](#)

#### **Wire rope suspension**

**232.** Wire rope used to suspend a swing stage or similar equipment shall

- (a) provide a safety factor of at least 10, based on the ratio of the manufacturer's rated breaking strength of the wire rope on the load on the rope due to the static load;
- (b) be a type recommended for that use by the rope manufacturer, and recommended for use by the hoist manufacturer; and
- (c) be continuous and unspliced, except for terminal eye-splices or other types of terminal connections required under Part XV, but fold back eyes secured by only a pressed metal sleeve shall only be used where the sleeve manufacturer approves the use of the sleeve





**LOGAN  
DRILLING  
GROUP**

for this application, and the eyes are made in accordance with the manufacturer's instruction and proof tested.

[Back to Top](#)

#### **Length of suspension ropes**

**233.** (1) Suspension ropes for a swing stage shall be of sufficient length to permit the work platform to be lowered to a safe lower landing.

(2) Where a swing stage or platform is suspended over water, or where it is impractical to lower the work platform to a safe lower landing, lower limit travel devices, compatible for safe use with the hoist system, shall be used to ensure the working platform shall not be lowered beyond the safe lower limit of travel.

[Back to Top](#)

#### **Hoisting devices**

**234.** Winches and other mechanical devices used for hoisting and lowering swing stages or similar equipment shall have automatically operated locking mechanisms that prevent slipping of the suspension ropes.

[Back to Top](#)

#### **Hangers or stirrups**

**235.** A hanger or stirrup used for supporting a swing stage shall

- (a) be made of mild steel or other metal having similar properties, but shall not be made of wire rope;
- (b) have a minimum safety factor of 10 based on the ratio of the ultimate load carrying capacity of the stirrup or hanger to the static load; and
- (c) be effectively fastened to the swing stage platform to prevent inadvertent separation.

[Back to Top](#)

#### **Platform width**

**236.** A swing stage work platform shall be at least 50 centimetres wide.

[Back to Top](#)

#### **Safety factor**

**237.** A swing stage work platform shall have a safety factor of at least 4, based on the ratio of the ultimate load carrying capacity of the work platform to the rated load.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Rated load**

**238.** The rated load for a swing stage platform shall be established by the platform manufacturer or a professional engineer.

[Back to Top](#)

#### **Guardrails**

**239.** (1) A swing stage shall have guardrails with

(a) a top rail of 1.07 metres high on all sides of the platform and an intermediate rail, located midway between the top rail and the platform floor, or top of the toeboard, where applicable; or

(b) other type of guarding providing equivalent protection and satisfactory to the minister.

(2) Guardrails on a swing stage shall be adequately supported and shall be able to withstand an ultimate load of 900N concentrated at any point on the top rail.

[Back to Top](#)

#### **Toeboards and netting**

**240.** A swing stage on which loose material or equipment is carried shall have toeboards at least 10 centimetres high along all sides of the work platform, and netting with a mesh opening of less than 2.5 centimetres extending from the toeboard to the top rail on the backside.

[Back to Top](#)

#### **Equipment inspection**

**241.** (1) A swing stage and associated equipment shall be thoroughly inspected before use on each shift and defective equipment shall not be used.

(2) A swing stage that has been subjected to a sudden drop, contact with exposed energized electrical equipment or conductors, or shows signs of a structural failure shall be removed from service until certified safe for use by the manufacturer or a professional engineer.

[Back to Top](#)

#### **Fall protection - swing stage**

**242.** A worker on a swing stage which is 3 metres or more above grade or a safe lower landing, or where a fall from a lesser height may involve an unusual risk of injury, shall use a personal fall arrest system meeting the requirements of Part X secured to an anchor independent of the swing stage system.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Boatswain's chairs**

**243.** (1) A boatswain's chair shall meet the requirements of the applicable CSA standard or be acceptable to a professional engineer.

(2) A boatswain's chair shall provide stable and adequate support for the user.

(3) A boatswain's chair shall be suspended from a parapet clamp, cornice hook, thrust-out beam or other solid anchorage having a working load limit at least equivalent to that of the suspension system for the boatswain's chair.

(4) A counter weight shall be

(a) positively secured to thrust outs; and

(b) tied back to an anchorage that is capable of withstanding 22 kilonewtons static load where a counter weight configuration has not been designed into the building.

(5) Where a boatswain's chair is supported by block and tackle

(a) the rope shall be synthetic fibre rope with a breaking strength of at least 22 kilonewtons;

(b) the rope shall be reeved through not less than one single lower block and one double upper block and secured to prevent the line from free running; and

(c) block hooks shall be moused, or otherwise secured against dislodgement.

(6) Fibre rope used to suspend a boatswain's chair other than with a block and tackle system shall be synthetic fibre rope having a breaking strength of at least 27 kilonewtons and of a type compatible for use with the rigging hardware in the suspension system.

(7) Wire rope used to suspend a boatswain's chair shall be a type recommended for that use by the rope manufacturer or a professional engineer and suitable for the hoist being used.

(8) A worker in a boatswain's chair which is 3 metres or more above grade or a safe lower landing, or where a fall from a lesser height may involve an unusual risk of injury, shall use a personal fall arrest system meeting the requirements of Part X independent of the boatswain's chair system.

(9) A boatswain's chair shall not be used where the suspension height exceeds 92 metres without the prior permission of the minister.

(10) A thorough inspection shall be made of a boatswain's chair and associated equipment before use each day and defective equipment shall not be used.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

## Definitions

**244.** For the purpose of sections **245** to **249**

- (a) "permanent powered platform" means a powered platform which is a permanent installation on a particular building or structure;
- (b) "portable powered platform" means a powered platform any part of which is not permanently installed or attached to a particular building or structure and which may be removed and relocated elsewhere where required; and
- (c) "powered platform" means a suspended swing stage which is raised or lowered by other than manual means.

### [Back to Top](#)

#### Permanent powered platforms

**245.** A permanent powered platform shall meet the requirements of CSA Standard CAN3-Z271 "Safety Code for Suspended Powered Platforms" or other standard acceptable to the minister and shall be of a design and construction certified by a professional engineer.

### [Back to Top](#)

#### Portable powered platforms

**246.** (1) A portable powered platform shall meet

- (a) the requirements for a swing stage regarding suspension, construction and use of fall protection; and
- (b) the requirements of CSA Standard CAN3-Z271 "Safety Code for Suspended Powered Platforms" for hoist units and controls.

(2) Where a portable powered platform is raised and lowered by 2 separately controlled hoists operated by a single occupant on the platform, the controls shall be located so that they can be used simultaneously by the occupant.

### [Back to Top](#)

#### Fall protection - powered platform

**247.** (1) Except as permitted by subsection (2), where a powered platform is 3 metres or more above a grade or a safe lower landing or where a fall from a lesser height may involve an unusual risk of injury, a worker on the platform shall use a personal fall arrest system meeting the requirements of Part X secured to an anchor independent of the powered platform system.

(2) A worker supported on a permanent powered platform having 4 or more suspension ropes shall be attached to a secure anchorage on the platform by means of a personal fall arrest system and the installation shall meet the requirements of CSA Standard CAN3-Z271 "Safety Code for Suspended Powered Platforms" or other standard acceptable to the minister.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Maintenance and operating records**

**248.** Records of inspection and maintenance shall be maintained for 5 years by the operator and another person inspecting and maintaining a permanent powered platform.

[Back to Top](#)

#### **Window cleaning**

**249.** A window cleaning operation shall be conducted in accordance with the requirements of CSA Standard CAN/CSA -Z91 "Health and Safety Code for Suspended Equipment Operations" or other standard that the minister may consider appropriate.

### **PART XII POWERED MOBILE EQUIPMENT**

[Back to Top](#)

#### **Definitions**

**250.** In this Part

- (a) "mobile equipment" means a wheeled or tracked vehicle which is engine or motor powered, together with attached or towed equipment, but does not include a vehicle operated on fixed rails or tracks;
- (b) "no significant hazard of rollover" means an area in which there are no grades exceeding 10%, no operating areas with open edges, and no open ramps, loading docks, ditches or other similar hazards which may cause a rollover; and
- (c) "specific location" means a yard, plant or other clearly defined and limited area in which mobile equipment is operated, but does not include a entire municipality, district, transient forestry operation or construction site.

[Back to Top](#)

#### **Operation and maintenance**

**251.** (1) Mobile equipment shall be maintained in safe operating condition and operation, inspection, repair, maintenance and modification shall be carried out in accordance with the manufacturer's instructions or, in the absence of instructions, as approved by a registered professional engineer.

- (2) Servicing, maintenance and repair of mobile equipment shall be done
  - (a) when the equipment is not in operation; or





**LOGAN  
DRILLING  
GROUP**

(b) when the equipment is in operation, where continued operation is essential to the process and a safe means is provided.

(3) The design, fabrication, use, inspection and maintenance of mobile equipment shall meet the requirements of the following applicable standard or other standards acceptable to the minister:

<b>Equipment</b>	<b>Applicable Standard</b>
Mobile and Locomotive Cranes	CSA Standard Z150, "Safety Code for Mobile Cranes"
Vehicles with Mounted Aerial Devices (except fire-fighting equipment)	CSA Standard C225 "Vehicle-Mounted Aerial Devices"
Vehicles with Mounted Aerial Devices (fire fighting equipment)	NFPA 1911 "Standard for Inspection, Maintenance, Testing and Retirement of In-Service Automotive Fire Apparatus, 2007 Edition"
Safety and Hazard Warnings	ISO Standard 9244:1995 "Earth moving machinery -- safety signs and hazard pictorials -- General principles"
Lift Truck and Associated Operator training	CSA Standard B335 "Safety Standard for Lift Trucks"

(4) Maintenance and inspection records shall be maintained and made reasonably available to the operator and maintenance personnel during work hours.

(5) Mobile equipment used off maintained roads shall be appropriate and safe for the intended use taking into account factors including the nature of the travel surface and its slope and the activities to be undertaken.

(6) Adequate and approved fire suppression equipment shall be provided where required by the minister.

[Back to Top](#)

#### **Competency and testing operators**

**252.** (1) A person shall not operate mobile equipment unless he or she

- (a) has received adequate instruction and has demonstrated to a supervisor or instructor that he or she is a competent equipment operator;
- (b) has been authorized to operate mobile equipment;



**LOGAN  
DRILLING  
GROUP**

- (c) is familiar with the operating instructions for particular equipment before he or she attempts to operate it; and
- (d) has, where required to operate an air brake equipped vehicle, evidence of successful completion of a course on air brake systems issued by an organization acceptable to the minister.

(2) Subsection (1) does not apply where a trainee operates the equipment under the supervision of a qualified instructor or supervisor as authorized by the employer.

[Back to Top](#)

#### **Operator's responsibility**

**253.** (1) The operator of mobile equipment shall operate the equipment safely, maintain full control of the equipment, and comply with the laws governing the operation of the equipment.

(2) The operator of mobile equipment shall ensure that a worker is not in close proximity to the swing radius of the equipment while it is in operation.

[Back to Top](#)

#### **Supervisor's responsibility**

**254.** A supervisor shall not knowingly operate, or permit a worker to operate, mobile equipment which is, or which could create, an undue hazard to the health or safety of a person, or which is in violation of these regulations.

[Back to Top](#)

#### **Warning signal device**

**255.** (1) Mobile equipment shall be equipped with an audible warning signal device as follows:

- (a) where the mobile equipment is capable of a forward speed exceeding 8 kilometres an hour;
- (b) where mobile equipment operates in reverse motion, it shall be equipped with a suitable audible warning device that initiates automatically when the equipment starts to move in reverse and which continues to operate while the equipment is moving in reverse; and
- (c) where the mobile equipment is not capable of speeds greater than 8 kilometres an hour, the minister may, in exceptional circumstances, order the use of an audible warning device.

(2) Where an audible warning device referred to in subsection (1) cannot be clearly heard or identified above the noise of other equipment or surrounding noise, another warning device or measure shall be utilized.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Lights**

**256.** (1) Mobile equipment used during the period from 1/2 hour after sunset to 1/2 hour before sunrise, or when a person or vehicle is not clearly discernible at a distance of 150 metres shall have and use light to adequately illuminate

- (a) the direction of travel;
- (b) the working area about the mobile equipment; and
- (c) the cab instruments.

(2) A headlight and backing light required by paragraph (1)(a) shall meet the requirements of Society of Automotive Engineers (SAE ) J1029 MAR 86 "Lighting and Marking of Construction and Industrial Machinery".

[Back to Top](#)

#### **Rear view mirrors**

**257.** (1) Mobile equipment shall have a mirror providing the operator with an undistorted reflected view to the rear of the mobile equipment or combination of mobile equipment, except as provided in subsection (2).

(2) Where necessary to improve rear vision, a combination of parabolic and flat mirrors may be used.

[Back to Top](#)

#### **Load handling attachments**

**258.** Buckets, forks, booms, hoists and other load handling attachments shall only be installed on mobile equipment as specified by the equipment manufacturer or where certified by a professional engineer for use on the equipment.

[Back to Top](#)

#### **Load ratings**

**259.** (1) Mobile equipment designed and used for lifting, hoisting or similar operations shall have a permanently affixed notation, legible and visible to the operator, stating the rated load of the equipment.

(2) A load chart shall be displayed in the operator's cab where the rated load varies with the reach of the equipment.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Operative protective structures**

**260.** (1) An equipment operator shall be protected against falling, flying or intruding objects or materials by means of a suitable cab, screen, grill, deflector or guard that meets the design criteria of the Society of Automotive Engineers applicable recommended practice.

(2) A worker shall not remain in the cab of a vehicle while loads are elevated over the cab unless the cab is protected by an adequate overhead guard.

[Back to Top](#)

#### **Rollover protective structures**

**261.** (1) The following types of mobile equipment weighing 700 kilograms or more shall have rollover protective structures ("ROPS"):

- (a) crawler tractors, dozers, loaders and skidders;
- (b) wheeled tractors, dozers, loaders and skidders;
- (c) motor graders;
- (d) self-propelled wheel scrapers;
- (e) agricultural and industrial tractors;
- (f) compactors and rollers; and
- (g) self-propelled rock drills moved by an on-board operator.

(2) The minister may require a rollover protective structure to be installed on mobile equipment, other than mobile equipment referred to in subsection (1), where the design of the equipment or circumstances of use indicate the need.

[Back to Top](#)

#### **Rollover protective structure standards**

**262.** A rollover protective structure shall meet the requirements of one of the following applicable standards or other standard acceptable to the minister:

- (a) CSA Standard B352.0-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 1: General Requirements",
  - (i) CSA Standard B352.1-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 2: Testing Requirements for ROPS on Agricultural Tractors", or





**LOGAN  
DRILLING  
GROUP**

- (ii) CSA Standard B352.2-95 "Rollover Protective Structures (ROPS) for Agricultural, Construction, Earthmoving, Forestry, Industrial, and Mining Machines -- Part 3: Testing Requirements for ROPS on Construction, Earthmoving, Forestry, Industrial, and Mining Machine";
- (b) Society of Automotive Engineers (SAE ) Standard J1040 MAY 94 "Performance Criteria for Rollover Protective Structures (ROPS) for Construction, Earthmoving, Forestry, and Mining Machines"; and
- (c) ISO Standard 3471: 1994 "Earth-moving Machinery -- Rollover Protective Structures -- Laboratory Tests and Performance Requirements".

[Back to Top](#)

#### **Rollover protective structure certification**

**263.** (1) A rollover protective structure shall be certified by the manufacturer or a professional engineer as meeting a standard specified in section **262** .

(2) An addition, modification, welding or cutting on a rollover protective structure shall be done in accordance with the instructions of, and be recertified by, the manufacturer or a professional engineer.

[Back to Top](#)

#### **Rollover protective structure identification**

**264.** (1) The following information shall be permanently marked upon a rollover protective structure:

- (a) the name and address of the manufacturer or the professional engineer who certified the rollover protective structure;
- (b) the model number or other effective means of identifying the machine for which the rollover protective structure was designed;
- (c) the serial number or other unique means of identifying the rollover protective structure;
- (d) the maximum weight of the machine for which the rollover protective structure was designed; and
- (e) the standard to which the rollover protective structure conforms.

(2) A modified rollover protective structure shall be permanently marked with the following information:

- (a) an identification of the modifications effected;
- (b) the date of recertification; and
- (c) the name and address of the recertifying engineer.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Effect of rollover protective structure on visibility**

**265.** A rollover protective structure or other structure required by this Part for the protection of the operator shall be designed and installed to provide an adequate view to allow the operator to safely use the machine.

[Back to Top](#)

#### **Seating and standard requirements**

**266.** (1) A well designed and constructed, safely located and securely mounted seat and seat belt or other safe facilities shall be provided for the operator of powered mobile equipment and a passenger.

(2) Safe facilities for an equipment operator, referred to in subsection (1), shall include:

- (a) footboards or platforms upon which the workers stand or sit, located to protect workers from accidental contact; and
- (b) handholds; or
- (c) safety-belts, harnesses, guardrails or other effective means of restraint.

(3) Subsection (1) does not apply to mobile equipment designed to be controlled by an equipment operator in a standing position.

(4) Where mobile equipment is equipped with seat belts, in conformity with these regulations or other applicable federal or provincial legislation, the installations shall be maintained and they shall be worn by the equipment operator and passengers at all times while the equipment is in motion, or when operated in a stationary mode.

(5) Where a road grader is operated with cab doors open, and the equipment operator is necessarily in a standing position and unable to comply with subsection (4), additional restraining devices approved by the minister shall be installed and used to prevent occupants from falling from the cab.

(6) Where an equipment operator is required to operate in a standing position, there shall be protection provided equivalent to the protection required under subsection (5) in the form of a restraining harness designed to prevent the equipment operator being thrown from the cab in a roll-over situation, but the restraining harness shall have a quick release device.

[Back to Top](#)

#### **Start of shift inspection**

**267.** (1) An operator shall inspect the mobile equipment before the start of operation on the shift and after that where required to ensure the safe operating condition of the equipment and a defect



**LOGAN  
DRILLING  
GROUP**

or other condition affecting the safe operation of the equipment shall be reported immediately to the supervisor or employer.

(2) A repair or adjustment necessary for the safe operation of the equipment shall be made before the equipment is used.

[Back to Top](#)

#### **Securing tools and equipment**

**268.** An operator shall maintain the cab, floor and deck of mobile equipment free of material, tools or other objects which could create a tripping hazard, interfere with the operation of controls, or be a hazard to the operator or other occupants in the event of an accident.

[Back to Top](#)

#### **Unattended equipment**

**269.** An operator of mobile equipment shall not leave the controls unattended unless the equipment has been secured against inadvertent movement, including by setting the parking brake, placing the transmission in the manufacturer's specified park position and by chocking wheels where necessary, and buckets and blades shall be landed in a safe position before equipment controls are left unattended.

[Back to Top](#)

#### **Securing elevated loads**

**270.** (1) An elevated load, part, extension or machine, shall not be left unattended by an operator unless it has been immobilized and secured against inadvertent movement.

(2) Where a worker is required to work beneath an elevated part of mobile equipment, the elevated part shall be securely blocked.

(3) An hydraulic or pneumatic jack shall not be used for blocking unless it has been fitted with a device to prevent collapse in the event of loss of hydraulic or pneumatic pressure.

[Back to Top](#)

#### **Swinging equipment**

**271.** Where the swinging movement of a load, cab, counterweight or other part of mobile equipment creates a hazard, a worker shall not be within range of the swinging load or equipment, and the operator shall not move the equipment when a worker is so exposed.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Obstructed view**

**272.** Where a mobile equipment operator's view of the work area is obstructed, the operator shall not move the equipment until precautions have been taken to protect the operator and another worker from injury, including

- (a) immediately before the movement, the inspection by the operator on foot of the area into which the equipment is being moved;
- (b) direction by a signaller
  - (i) stationed in a safe position in continuous view of the operator,
  - (ii) having an unobstructed view of the area into which the equipment is being moved, and
  - (iii) not being otherwise occupied while the equipment is in motion; or
- (c) direction by a traffic control or warning system.

[Back to Top](#)

### **Guy lines**

**273.** (1) Guy lines passing over travelled roads shall be rigged at a sufficient height to clear all traffic.

(2) Guy lines which are not at sufficient height to clear all traffic shall be clearly identified in accordance to standards acceptable to the minister.

[Back to Top](#)

### **Pedestrian and equipment traffic**

**274.** (1) Where practicable, designated walkways shall be used to separate pedestrian traffic from areas of operation of mobile equipment.

(2) Where it is impracticable to provide designated walkways, adequate safe work procedures to minimize the possibility of collision shall be used in hazardous work areas, including

- (a) use of a traffic control system;
- (b) enforcement of speed limits for mobile equipment; and
- (c) a requirement for the pedestrian and the mobile equipment operator to acknowledge each other's presence before the pedestrian proceeds through the hazardous area; or
- (d) other effective means.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### Securing loads

275. (1) When material or equipment is being transported, it shall be loaded or secured to prevent movement of the load which could create a hazard to workers.

(2) To protect the crew of a vehicle transporting a load which may shift on rapid deceleration, a means of load restraint shall be provided that

- (a) prevents significant load shift relative to the carrier under emergency stopping conditions; and
- (b) meets a standard acceptable to the minister.

[Back to Top](#)

### Restraint for cylindrical objects

276. Cylindrical objects transported on their sides shall be effectively restrained against inadvertent movement.

[Back to Top](#)

### Lift truck loads

277. (1) A unitized load transported on a lift truck shall not project a distance greater than half its height above the fork carriage, back rest or back rest extension of the lift truck.

(2) No part of a load comprised of loose objects may project above the fork carriage, back rest or back extension of a lift truck.

(3) A load which could shift during transportation shall be restrained where shifting would result in the instability of the load or the lift truck.

[Back to Top](#)

### Tire installation

278. (1) An employer shall

- (a) establish and implement safe work procedures for servicing mobile equipment, tires, rims and wheels, including
  - (i) inspecting tire, rim and wheel components,
  - (ii) mounting a tire to the rim and wheel, and inflating a tire,
  - (iii) installing and removing tire assemblies from mobile equipment, and
  - (iv) demounting tires from the rim and wheel assemblies; and
- (b) ensure that tire limits are not exceeded.





**LOGAN  
DRILLING  
GROUP**

(2) A worker assigned to work on tires, rims and wheels shall be trained in and follow the safe work procedures established under subsection (1).

[Back to Top](#)

#### **Equipment and procedures**

**279.** (1) A tire shall be deflated before demounting, and deflation shall be done in an area where ignition sources are controlled or removed.

(2) A tire, rim and wheel part shall be cleaned and inspected for damage before mounting, and a cracked, broken, bent or otherwise damaged part replaced.

(3) A tire shall be inflated using a remote chuck with a sufficient length of hose and an inline, hand operated valve with a gauge so the worker is outside the likely trajectory should wheel components separate during inflation.

(4) A tire mounted on a multipiece rim wheel shall be placed in a cage or other restraining device when it is being inflated.

(5) Where a bead expander is used to seat the beads of a tire, it shall be removed before the tire is inflated to more than 34.5 kPa (5 psi).

(6) Welding or heating on an assembled rim or wheel part is not permitted, except that limited heating to facilitate removal of a wheel from a hub is acceptable after the tire has been deflated by removing the valve core.

(7) A tire on a multipiece rim wheel shall be deflated to atmospheric pressure by removing the valve core or by other effective means before demounting, and in the case of a dual wheel arrangement, both tires shall be deflated to atmospheric pressure before a wheel nut is loosened.

(8) Multipiece rim and wheel components shall not be interchanged except as permitted by rim/wheel charts from the appropriate rim/wheel manufacturer.

(9) A multipiece rim wheel which has been used at less than 80% of the recommended inflation pressure for that application shall be deflated, disassembled and inspected before reinflation.

### **PART XIII TRANSPORTATION OF WORKERS**

[Back to Top](#)

#### **Application**

**280.** This Part applies to all persons, including the operator, engaged in transporting a worker by a vehicle operated on behalf of the employer except for the transportation of a worker by

- (a) a public transportation system including a taxi, bus line, chartered air service or airline;
- or





**LOGAN  
DRILLING  
GROUP**

(b) personal transport of the worker on public roads before or following a work shift.

[Back to Top](#)

#### **Seat belts**

**281.** (1) Where reasonably practicable, a vehicle used to transport workers shall have seats with full seat backs.

(2) A seated worker shall wear a seat belt while being transported in a vehicle equipped with seat belts and the number of workers being transported shall not exceed the number of seat belts available in the vehicle.

[Back to Top](#)

#### **Securing equipment**

**282.** (1) Materials, goods, tools or equipment carried in a portion or compartment of a vehicle in which a worker is riding shall be located and secured to prevent injury.

(2) Materials, goods, tools or equipment regularly carried in a vehicle in which a worker is riding shall be transported in a designated area in the vehicle.

[Back to Top](#)

#### **Hazardous materials**

**283.** Where a volatile, flammable or otherwise hazardous material is transported in a vehicle transporting workers, it shall be carried in an isolated compartment that is

- (a) accessible only from the outside of the vehicle, securely fastened and fitted with adequate ventilation and drainage facilities; or
- (b) where internal to the vehicle, separated from the crew compartment by an approved firewall.

[Back to Top](#)

#### **Passenger compartments**

**284.** An enclosed portion or compartment of a vehicle in which a worker is transported shall be provided with

- (a) effective ventilation, independent of doors, providing clean air;
- (b) adequate lighting and means for heating and cooling;
- (c) an effective means of communication between the operator and the passengers; and



**LOGAN  
DRILLING  
GROUP**

- (d) more than one means of egress.

[Back to Top](#)

#### **Boarding and leaving**

**285.** A worker shall not board or leave a vehicle while it is in motion, except in case of an emergency.

[Back to Top](#)

#### **Seating design**

**286.** A vehicle used to transport workers shall be equipped with seats that

- (a) are safely located and securely attached to the vehicle with a width of at least 41 centimetres for each passenger and an upholstered seat and seat back which provide normal and comfortable seating for passengers;
- (b) face to the front or the rear of the vehicle, unless installed otherwise by the vehicle manufacturer; and
- (c) provide a spacing of at least 66 centimetres measured between the face of the seat back at seat level and the back of the seat or other fixed object in front.

### **PART XIV**

#### **CRANES, HOISTS AND OTHER LIFTING EQUIPMENT**

[Back to Top](#)

#### **Definitions**

**287.** In this Part

- (a) "anti-two block device" means a device that, when activated, disengages all crane functions whose movement may cause two-blocking; and
- (b) "safe working load" means the load a crane or hoist may safely lift in a particular situation, taking into account factors including wind load, extremes of temperature and load sail area, which load may be equal to or less than the rated capacity or rated load.

[Back to Top](#)

#### **Cranes, derricks and hoists**

**288.** Except as otherwise provided in these regulations, a crane, derrick, hoist and similar equipment shall be designed, constructed, erected, maintained, operated, inspected, disassembled and modified as specified by the manufacturer to meet the requirements of



**LOGAN  
DRILLING  
GROUP**

- (a) the applicable CSA standard;
- (b) a professional engineer; or
- (c) other standard acceptable to the minister.

[Back to Top](#)

#### **Identification**

**289.** (1) A crane or hoist shall be permanently identified by the legible display of the manufacturer's name, model and serial number on the structure.

(2) Each major interchangeable structural component of a crane or hoist shall be legibly marked to identify compatibility with the crane or hoist, and be uniquely identified.

[Back to Top](#)

#### **Rated capacity**

**290.** (1) The rated capacity of a crane or hoist shall not be exceeded.

- (2) The safe working load as determined by
  - (a) the original manufacturer of the equipment;
  - (b) a professional engineer; or
  - (c) other persons with qualifications acceptable to the minister

shall not be exceeded.

[Back to Top](#)

#### **Rated capacity indication**

**291.** (1) The rated capacity of a crane or hoist shall be permanently indicated on the superstructure, hoist and load block of the equipment.

(2) Notwithstanding subsection (1), rated capacity indication shall not be required where it is affected by

- (a) the vertical or horizontal angle of a boom or jib;
- (b) the length of a boom or jib;
- (c) the position of a load supporting trolley; or
- (d) the use or position of outriggers to increase the stability of the structure.



**LOGAN  
DRILLING  
GROUP**

(3) Where the rated capacity is affected by a factor set out in paragraph **287** (b), a legible load chart, showing the rated capacity in all permitted working positions and configurations of use shall be

- (a) permanently posted on the equipment; or
- (b) issued to the equipment operator, who shall have the legible load chart available at all times when operating the equipment.

[Back to Top](#)

#### **Boom angle indicator**

**292.** A crane or hoist with a boom movable in the vertical plane shall be equipped with a device to indicate the boom angle where the rated capacity is affected by the boom angle, and the device shall be readable by the operator at the control station.

[Back to Top](#)

#### **Boom extension and load radius indicators**

**293.** A crane or hoist shall have a means or device to indicate the boom extension or load radius where the rated capacity of the equipment is affected by boom extension or load radius.

[Back to Top](#)

#### **Support structure**

**294.** The rated capacity of a hoist shall not exceed the capacity of the structure supporting the hoist.

[Back to Top](#)

#### **Manual**

**295.** (1) The manufacturer's manual for a crane or hoist shall be reasonably available at the workplace where the equipment is being used.

(2) The manual referred to in subsection (1) shall show the approved methods of erection, dismantling, maintenance and operation of the component parts and of the assembled crane or hoist.

(3) The portions of the manufacturer's manual, or a copy of them, related to safe operation of the crane or hoist shall be available at the workplace where the equipment is being used.

(4) A crane or hoist shall not be used in a manner other than that referred to in the manual referred to in subsection (1) unless that use has been approved by the manufacturer or by a professional engineer, and the modifications and deviation shall be recorded in the manual.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Inspection and maintenance**

**296.** (1) A crane or hoist shall be maintained in accordance with the manufacturer's specifications and the applicable CSA standard and inspected at a frequency and to the extent required to ensure that each component is capable of carrying out its original function with an adequate margin of safety.

(2) A crane or hoist shall not be used until a condition that could endanger workers is remedied.

(3) A repair to a load bearing component of a crane or hoist shall be certified by a professional engineer or the original equipment manufacturer as having returned the component to a condition capable of carrying out its original design function with an adequate margin of safety.

[Back to Top](#)

#### **Inspection and maintenance records**

**297.** (1) A log book or other record shall be provided and maintained for a crane, derrick or similar hoisting equipment showing the maintenance history and structural modification and inspection of the equipment.

(2) The log book or record referred to in subsection (1) shall be available at all times to the operator and to a worker concerned with the maintenance and safe operation of the equipment, and that worker shall be responsible for recording defects, operating difficulties, and the need for maintenance and all maintenance and modification work performed.

[Back to Top](#)

#### **Certification**

**298.** Before a crane or hoist is placed in service, a professional engineer shall inspect, proof test and certify in writing the rated capacity of a crane or hoist in accordance with criteria established by the manufacturer or applicable design or safety standard where

- (a) the equipment is new;
- (b) the origin or rated capacity of the equipment cannot be determined;
- (c) the continued safe use of the equipment cannot be assured due to its age or history;
- (d) repairs or modifications have been made to load carrying components;
- (e) modifications have been made which affect the rated capacity; or
- (f) the crane or hoist has been in contact with an electric arc or current.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Audible warning**

**299.** An effective audible warning signal device shall be installed on a crane, derrick or other hoisting equipment where accidental contact with, or inadvertent release of, the load could injure a worker or cause damage to equipment.

[Back to Top](#)

#### **Molten metal**

**300.** A crane or hoist that handles molten metal shall have 2 holding brakes on the hoist mechanism.

[Back to Top](#)

#### **Two-block protection**

**301.** (1) On a telescopic and conventional boom crane, an anti-two-block device shall be provided for all parts of two-blocking which is capable of preventing damage to the hoist rope, boom-tip sheaves and to other machine components when hoisting the load, extending the boom or lowering a boom on a machine that has a stationary winch mounted to the rear of the boom hinge.

(2) The anti-two-block device referred to in subsection (1) shall prevent contact between the travelling block or headache ball and the boom tip.

[Back to Top](#)

#### **Sheave guards**

**302.** A running line sheave on a crane or hoist shall be equipped with a device to retain the rope in the sheave groove.

[Back to Top](#)

#### **Ungrounded supply**

**303.** An electric crane or hoist shall be grounded appropriately.

[Back to Top](#)

#### **Controls**

**304.** (1) A control on a crane or hoist shall have its function clearly identified and be maintained in good condition.



**LOGAN  
DRILLING  
GROUP**

(2) Controls for a crane or hoist that are not operated from a cab shall be located to provide a safe distance between the operator and the load being lifted.

(3) A pendant control for a crane or hoist shall be supported independently from its electrical conductors.

[Back to Top](#)

#### **Operator protection**

**305.** The operator of a crane or hoist shall be protected against hazardous conditions, including falling or flying objects, swinging, and excessive heat or cold that could adversely affect the health or safety of the operator.

[Back to Top](#)

#### **Cab windows**

**306.** (1) A cab window on a mobile crane shall be made of safety glazing material that meets the requirements of ANSI /SAE Z26.1 "American National Standard for Safety Glazing Materials for Glazing Motor Vehicles and Motor Vehicle Equipment Operating on Land Highways - Safety Code".

(2) A cab window on a crane or hoist which is not a mobile crane may be made of laminated glass, tempered glass, wired glass or clear polycarbonate plastic.

(3) An operator's cab window shall be kept clear and provide an unobstructed field of vision toward the load hook and shall have functional window wipers.

[Back to Top](#)

#### **Storage**

**307.** (1) The cab of a crane or hoist shall be kept free of unnecessary tools, material and equipment.

(2) Adequate storage facility shall be provided where it is necessary to keep tools or equipment in the operator's cab of a crane or hoist.

[Back to Top](#)

#### **Fire extinguisher**

**308.** A fire extinguisher with at least a 10 BC rating shall be immediately available in the cab of each crane.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Operator qualifications**

**309.** (1) A crane or hoist shall only be operated by a qualified person who has been authorized to operate the equipment.

(2) An operator of a crane shall have an appropriate trade qualification valid in the province or be an apprentice indentured in the appropriate trade in the province, or have equivalent qualifications as determined by the Industrial Training Division of the Department of Education after the following dates:

- (a) for a mobile crane operator, other than a boom truck operator, after January 1, 2011 ;
- (b) for a tower crane operator in the construction industry, after January 1, 2011 ; and
- (c) for an operator of a boom truck with a rated capacity of more than 10 tonnes, after January 1, 2012 .

### [Back to Top](#)

### **Shift inspection**

**310.** (1) An operator shall inspect the crane or hoist at the beginning of each shift and shall test control and safety devices in accordance with the manufacturer's specifications and the applicable safety code and regulations.

(2) A defect found by an operator during the inspection referred to in subsection (1) or during the use of the crane or hoist shall be:

- (a) recorded in the inspection and maintenance record log; and
- (b) reported to the supervisor who shall determine the course of action to be taken.

(3) Where a defect affects the safe operation of the crane or hoist, the equipment shall not be used until the defect has been remedied.

### [Back to Top](#)

### **Load weight**

**311.** (1) The weight of a load to be hoisted by a crane or hoist shall be determined by the equipment operator and communicated to a worker involved in the hoisting operation.

(2) Where the weight of a load cannot be determined, the crane or hoist to be used for the lift shall have either a load weight indicator or a load limiting device.

### [Back to Top](#)

### **Calibration**



**LOGAN  
DRILLING  
GROUP**

**312.** A load weighing device, including a load movement indicator, on a crane or hoist shall be calibrated in accordance with the manufacturer's specifications or at more frequent intervals and the date of calibration shall be recorded in the inspection and maintenance records system.

[Back to Top](#)

#### **Unsafe lift**

**313.** An operator of a crane or hoist shall not attempt to move a load where he or she has reason to doubt that the load can be safely handled.

[Back to Top](#)

#### **Swing hazards**

**314.** A worker shall not remain within range of the swing of the load or equipment where the swing movement of the load, cab, counterweight or another part of the crane or hoist creates a hazard and the operator shall not move the equipment when a worker is so exposed.

[Back to Top](#)

#### **Position of equipment**

**315.** (1) Equipment shall be positioned so that no moving part of the equipment comes within 60 centimetres of an obstruction in an area accessible to workers.

(2) Where the clearance required under subsection (1) cannot be provided, entry to an area referred to in subsection (1) shall be prevented by barriers or other effective means.

[Back to Top](#)

#### **Multiple crane lift**

**316.** (1) A multiple crane lift shall be under the direction of a competent supervisor who shall be responsible for the safe conduct of the operation.

(2) A written procedure shall be prepared for a multiple mobile crane lift where the load on a crane exceeds 75% of its rated capacity or where other factors make the lift complex.

(3) A written procedure shall be prepared for a lift in which 3 or more cranes are used at one time to hoist a load.

(4) Multiple crane lift procedures shall address rigging details, wind speed, hoist line speed, crane travel speed, load distribution and other considerations that may be necessary.

(5) The procedures for a multiple crane lift referred to in subsection (2) shall be communicated to all persons involved before hoisting operations are commenced by the supervisor.



**LOGAN  
DRILLING  
GROUP**

(6) A means of effective communication shall be established and maintained between all persons involved during a multiple crane lifting operation.

[Back to Top](#)

#### **Travelling with a load**

**317.** (1) Where an operator is travelling with a load, the operator shall ensure that the load is carried as close to the ground or grade as possible and that it is rigged to control load swing.

(2) Where necessary, a worker designated as a signaller shall walk ahead of a moving load and warn workers to keep clear.

[Back to Top](#)

#### **Loads over work areas**

**318.** (1) An employer shall arrange work to prevent passing a load over workers wherever possible.

(2) A crane or hoist operator shall not pass a load over workers unless no practicable alternative exists and the lifting procedure has been communicated to all affected workers.

(3) A worker shall not stand or pass beneath a suspended load except as permitted under subsection (2).

[Back to Top](#)

#### **Unattended loads**

**319.** A load shall not be left suspended from the load hook of a crane or hoist when an operator is not at the controls.

[Back to Top](#)

#### **Hook position**

**320.** The hook or load block of a crane or hoist shall be positioned over the load to prevent side loading of the crane when the load is hoisted.

[Back to Top](#)

#### **Signals**

**321.** The operator of a crane or hoist shall act only on the directions of a designated and competent signaller where the operator does not have a clear and unobstructed view of the load hook and load throughout the whole range of the hoisting operation.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Alternative to hand signals**

**322.** Two-way radio or other audio or video systems shall be used where distance, atmospheric conditions or other circumstances make the use of hand signals hazardous or impracticable.

[Back to Top](#)

#### **Dedicated radio system**

**323.** (1) A two-way radio system used to direct crane or hoist movement shall operate on a dedicated radio channel.

(2) Multi-channel radios shall not be permitted for use to direct crane or hoist movement.

[Back to Top](#)

#### **Unhooking loads**

**324.** A load on a crane or hoist shall be safely landed and supported, before being unhooked.

[Back to Top](#)

#### **Riding hook or load**

**325.** A worker shall not ride on a load, sling, hook or other rigging equipment.

[Back to Top](#)

#### **Induced voltage**

**326.** (1) Before a crane or hoist is operated near a source, including a radio transmitter or energized high voltage electrical equipment, capable of inducing an electric charge which may pose a hazard to workers

- (a) the crane or hoist shall be effectively grounded;
- (b) any induced electric charge shall be dissipated by applying grounding cables or by other effective means before the workers come into contact with the load; and
- (c) all flammable materials shall be removed from the immediate work area.

(2) Paragraphs (1)(a) and (b) do not apply where work is being performed on a power system in accordance with Part XXVI.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Uptravel limit**

**327.** (1) A bridge, gantry or other overhead travelling crane shall be equipped with a device that prevents hook travel beyond the safe upper limit at all design hoist speeds.

(2) The uptravel limit device required under subsection (1) shall be tested at the beginning of each shift, and the test results recorded in the equipment record system.

[Back to Top](#)

#### **Electrical conductors**

**328.** Electrical conductors for the bridge and trolley shall be located or guarded to prevent contact by workers.

[Back to Top](#)

#### **Power shutoff**

**329.** An electrically powered crane shall have a means for the operator to safely interrupt the main electric circuit under a load condition.

[Back to Top](#)

#### **Direction markings**

**330.** A bridge, gantry, or overhead travelling crane operated by a pendant or remote control shall have markings on the crane structure or building, visible to the operator, clearly indicating the direction of hook, bridge and trolley motions compatible with those marked on the controls.

[Back to Top](#)

#### **Manually powered hoists**

**331.** (1) A hand operated hoist shall be provided with a ratchet and pawl, load brake or other mechanism which shall hold the load at a desired height.

(2) A crank operated winch that is not fitted with automatic load brakes shall be provided with a means of preventing the crank-handle from slipping off the crank-shaft while hoisting.

(3) A crank handle shall be removed from the crank shaft before the load is lowered on the winches referred to in subsection (2).

(4) Subsections (2) and (3) do not apply where a crank handle have been replaced by permanently secured, smooth rimmed hand wheels.

[Back to Top](#)

#### **Cranes on floating supports**



**LOGAN  
DRILLING  
GROUP**

**332.** (1) The rated capacity and allowable operating radius of a crane or boom truck designed for use on land shall be modified where it is used on a floating support, considering list and trim for each installation as specified by the crane manufacturer or a professional engineer.

(2) A mobile crane or boom truck equipped with outriggers, operating on a floating support, shall be supported on its outriggers during lifting operations unless the instructions required by subsection (1) specifically allow otherwise.

(3) Where a crane or boom truck is used on a floating support, a device to measure the list of the floating equipment shall be provided and be readable by the operator while in the operating position.

(4) A mobile crane or boom truck being used on a floating support shall be blocked and secured to prevent it shifting relative to the bearing surface of the floating support.

[Back to Top](#)

#### **Level turntable**

**333.** (1) A mobile crane or boom truck shall be operated with the turntable level, except as permitted by the manufacturer.

(2) Level indicating devices shall be provided to permit the operator to determine whether the crane turntable or boom truck frame is level within the limits specified by the manufacturer.

[Back to Top](#)

#### **Outriggers**

**334.** (1) Outrigger beams on a crane or boom truck shall be marked to indicate when the necessary extension has been achieved.

(2) Floats shall be secured to the outrigger jacks of a crane or boom truck when outriggers are used.

[Back to Top](#)

#### **Tires**

**335.** Mobile crane or boom truck tire type, condition and inflation shall be as specified by the manufacturer when lifting on rubber.

[Back to Top](#)

#### **Supporting surface**

**336.** (1) A mobile crane or boom truck shall only be used on a surface capable of supporting the equipment and a hoisted load without failure.



**LOGAN  
DRILLING  
GROUP**

(2) Where a crane or hoist is used adjacent to an excavation, slope or backfilled area, a qualified person shall determine the location for the equipment for hoisting operations.

[Back to Top](#)

#### **Travelling with a load**

**337.** A mobile crane or boom truck may travel with a suspended load only where the crane manufacturer specifies load ratings for this operation.

[Back to Top](#)

#### **Boom inspection**

**338.** (1) A crane boom used for driving piles with a vibratory hammer shall be inspected in accordance with good engineering practice, and certified safe for continued use by a professional engineer at least every 3 months, and before being returned to lifting service.

(2) A crane boom used with a vibratory pile extractor or for dynamic compaction shall be inspected in accordance with good engineering practice, and certified safe for continued use by a professional engineer at least monthly, and before being returned to lifting service.

[Back to Top](#)

#### **Tower cranes**

**339.** (1) The foundation for support of a tower crane shall be certified by a professional engineer.

(2) The design of shoring and bracing to support a tower crane shall be certified by a professional engineer, and the shoring and bracing shall be constructed as specified by the design.

(3) Where a tower crane is supported partially or fully by, or connected to, a building or structure, the connections to and bracing or shoring of the building or structure necessary to support the tower crane shall be certified by a professional engineer.

[Back to Top](#)

#### **Verification before use**

**340.** (1) A tower crane erector shall verify that the crane has been erected according to the manufacturer's specifications before it is put in service.

(2) Where a tower crane is not erected according to the manufacturer's specifications a professional engineer shall certify that it is safe for use before the crane is put in service.

(3) Before a tower crane is used following repositioning of the mast, a professional engineer shall certify that the parts of the crane affected by the climbing process have been properly installed and required reshoring for and bracing to the supporting structure is in place.





[Back to Top](#)

#### **Identification**

**341.** The structural components of a tower crane shall be uniquely identified and that unique identification shall be used when referring to a structural component in reports for inspection and testing, and certifications for repairs and modifications.

[Back to Top](#)

#### **Structural inspection**

**342.** (1) Before erection of a tower crane, the structural components of the crane shall be

- (a) inspected to determine their integrity by a qualified person using non-destructive testing (NDT) methods meeting the requirements of the Canadian General Standards Board (CGSB); and
- (b) repaired where necessary and those repairs certified by a professional engineer as safe for use.

(2) Where a tower crane remains erected at a workplace for more than 12 months

- (a) its structural components shall be inspected to determine their integrity by a qualified person using NDT methods meeting the requirements of the CGSB; and
- (b) after the inspection required by paragraph (a), the crane, including necessary repairs, shall be certified by a professional engineer as safe for use.

(3) The inspection and certification of a tower crane scheduled to be dismantled within 15 months of erection may be delayed until before the next erection of the crane.

[Back to Top](#)

#### **Structures kept clean**

**343.** A tower crane structure shall be kept clean and free of concrete and other debris that may hinder inspection and the base area shall be clear of debris and the accumulation of water.

[Back to Top](#)

#### **Communication**

**344.** A tower crane operator shall have an effective two-way voice communication with another tower crane or equipment operator where contact between the tower crane and another tower crane or equipment operator could occur.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Wind limitations**

**345.** In the absence of the manufacturer's specifications for maximum permitted wind speed during crane operation, the maximum allowable wind speed in which a tower crane may be used is 50 kilometres an hour measured at the operator's cab, or less where a load cannot be handled safely because of wind.

## **PART XV RIGGING**

### [Back to Top](#)

### **Definitions**

**346.** In this Part

- (a) "design factor" means the theoretical reserve capability of a product, usually determined by dividing the breaking strength by the working load limit; and
- (b) "rigging" means fibre ropes, wire ropes, chains, slings, attachments, connecting fittings and associated components.

### [Back to Top](#)

### **Qualified riggers**

**347.** Rigging and slinging work shall be done by or under the direct supervision of a qualified worker familiar with the rigging to be used and with the code of signals acceptable to the minister for controlling hoisting operations.

### [Back to Top](#)

### **Use of rigging**

**348.** The load applied to rigging or a rigging assembly shall not exceed the working load limit (WLL ).

### [Back to Top](#)

### **Component identification**

**349.** (1) Rigging fittings shall be marked with the manufacturer's identification, product identifier and the working load limit or sufficient information to readily determine it.

(2) The working load limit of existing fittings not identified as required by subsection (1) shall be determined by the manufacturer or a professional engineer.

### [Back to Top](#)

### **Design factors**



**350.** (1) Except as otherwise specified in these regulations, the design factor based on breaking strengths for a rigging component shall be at least equal to the values given in the following table:

[Back to Top](#)

<b>Component</b>	<b>Design Factor</b>
Nylon fibre rope sling	9
Polyester rope sling	9
Polypropylene rope sling	9
Alloy steel chain sling	4
Wire rope sling	5
Metal mesh sling	5
Synthetic web sling	5
Chain fittings	5
Wire rope sling fittings	5
Other fittings	as specified by manufacturer
Nonrotating wire rope	as specified by manufacturer but not less than 5
Conventional wire rope	5

(2) The design factor for a rigging assembly used to support a worker shall be at least 10.

**Natural fibre rope**

**351.** Natural fibre rope shall not be used for hoisting.

[Back to Top](#)

**Wedge socket connections**

**352.** Where a wedge socket is used as a wire rope termination, the dead end of the rope shall be secured to prevent release of the wedge or rope slippage at the socket.

[Back to Top](#)

**Open hook restriction**

**353.** (1) An employer shall ensure that a hook has a safety latch, mousing or shackle where the hook could cause injury if it is dislodged while in use.



**LOGAN  
DRILLING  
GROUP**

(2) Notwithstanding subsection (1), where a competent worker disconnecting the hook would be in danger if the hook has a safety latch, mousing or shackle, the employer may use another type of hook.

(3) Notwithstanding subsection (1), an employer may use a sorting hook for hoisting a skeleton steel structure or for performing similar operations where a sorting hook is safer to use than a hook with a safety latch, mousing or shackle.

(4) During a hoisting operation in a caisson, an employer

(a) shall not use a spring loaded safety latch hook; and

(b) shall use a shackle assembly consisting of a pin fully shouldered into the eyes of the shackle and secured by a nut that is prevented from rotating by a cotter pin.

[Back to Top](#)

#### **Securing pins**

**354.** (1) A shackle-pin, heel-pin and similar device shall be secured against dislodgement.

(2) The pin in a screw-pin type shackle shall be wired or otherwise secured against rotation when used in applications that may cause the pin to loosen.

[Back to Top](#)

#### **Replacing pins**

**355.** A shackle-pin shall not be replaced with a bolt or other makeshift fitting.

[Back to Top](#)

#### **Securing ropes to drums**

**356.** (1) A rope shall be secured to its winding drum, unless the line is required to automatically disengage from the drum.

(2) A rope shall not be fastened to a drum by a knot tied in the rope.

[Back to Top](#)

#### **Wraps required**

**357.** At least 3 full wraps of rope shall remain on winding drums where the load hook is in the lowest position.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Sheaves**

**358.** A sheave shall be

- (a) correctly sized for the rope;
- (b) equipped with a device to retain the rope within the groove; and
- (c) removed from service where it has a damaged groove or flange.

### [Back to Top](#)

### **Guylines**

**359.** (1) The strength of each guyline and its anchor shall exceed the breaking strength of the load-line rigging arrangement.

(2) A guyline anchor shall be placed so that the interior angle between the guyline and the horizontal plane does not exceed 45 degrees.

(3) Guylines shall be arranged so that the hoisting line pull in any direction is shared by 2 or more guys.

(4) Guylines and anchor systems, where certified by a professional engineer, may deviate from the requirements of subsections (1) to (3).

### [Back to Top](#)

### **Spooling tape**

**360.** (1) A worker shall not use his or her hands or feet or a hand-held object to guide the rope when spooling the rope onto a drum.

(2) Notwithstanding subsection (1), in an emergency a worker may use a steel guide bar of acceptable design to guide the rope onto the drum but the line speed shall be kept as low as practicable and the worker shall be positioned to be clear of the drum.









### [Back to Top](#)

### **Termination efficiencies**

**361.** Except as otherwise permitted by the manufacturer, the working load limit shall be reduced in accordance with the efficiency rating for the type of termination specified as follows:



**LOGAN  
DRILLING  
GROUP**

Open Type	Closed Type	
		
SWAGED SOCKET .....		100%
		
WIRE ROPE SOCKET - SPELTER ATTACHMENT .....		100%
		
PRESSED SLEEVE LOOP BACK THIMBLE ATTACHMENT		
25mm (1 in) diameter and smaller .....		90%
29mm (1 1/8 in) diameter and larger .....		95%
		
FLEMISH LOOP WITH MECHANICAL SLEEVE ATTACHMENT		
25mm (1 in) diameter and smaller .....		85%
29mm (1 1/8 in) diameter and larger .....		92.5%
		
WEDGE SOCKETS (depending on design) .....		75 -90%
		
CLIPS (number of clips varies with size of rope) .....		80%
		
THIMBLE SPLICE - HAND TUCKED		
6mm (1/4 in) .....	13mm (1/2 in) .....	86%
8mm (5/16 in) .....	16mm (5/8 in) .....	84%
10mm (3/8 in) .....	19mm (3/4 in) .....	82%
11mm (7/16 in) .....	22mm (7/8 in) .....	80%
		
LOOP SPLICE - HAND TUCKED		
Efficiencies of loop splice are the same as those given for thimble splice.		

[Back to Top](#)

**Wire rope clips**

362. (1) Where a manufacturer's specifications for installing and using wire rope clips cannot be determined, the number of clips and the installation torque shall be in accordance with the following table:

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

Diameter of rope (millimetres)	Number of clips	Spacing between clips (centre to centre in millimetres)	Torque (newton metres)
6	2	38	20
8	2	51	41
10	2	57	61
11	2	64	88
13	3	76	88
16	3	102	129
19	4	114	176
22	4	133	305
25	4	152	305
29	5	178	305
32	5	203	488
38	6	229	488
44	7	267	630
51	8	305	881
54	8	330	881
57	8	356	881

#### **Restriction on foldback eyes**

**363.** (1) A wire rope termination using a swaged fold back eye shall be identified with a serial number or other unique identification code and proof-tested before being placed in service and a record of the proof test shall be kept available for the service life of the termination.

(2) A swaged fold back eye termination shall be identified with the working load limit.

#### **[Back to Top](#)**

#### **Slings standards**

**364.** Except where otherwise required by these regulations, wire rope, alloy steel chain, metal mesh, synthetic fibre rope and synthetic fibre web slings shall meet the requirements of ASME B30.9-1990, "Slings".

#### **[Back to Top](#)**

#### **Inspection before use**

**365.** Slings and attachments shall be visually inspected before use and defective equipment shall be immediately removed from service.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Storage**

366. A sling shall be stored to prevent damage when not in use.

[Back to Top](#)

#### **Knots**

367. A sling with a knot shall not be used.

[Back to Top](#)

#### **Sharp edges**

368. Where a sling is applied to a sharp edge of a load, the edge or the sling shall be protected to prevent damage to the sling.

[Back to Top](#)

#### **Slinging loads**

369. (1) A sling shall be selected and used to prevent slipping or overstressing the sling or the load.

(2) A load consisting of 2 or more pieces of material over 3 metres long shall be slung using a 2-legged sling arrangement that is positioned to keep the load horizontal during the lift and each sling shall be choked around the load with a double wrap.

[Back to Top](#)

#### **Multiple piece lifts**

370. For each multiple piece lift,

- (a) each member of the lift that is being delivered to a different spot shall be independently slung back to the main load hook or master link using graduated length slings;
- (b) a lifted member shall not support another lifted member; and
- (c) a crane equipped with power controlled lowering shall be used.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Below-the-hook lifting devices**

**371.** (1) A spreader bar or other specialized below-the-hook lifting devices shall be constructed, inspected, installed, tested, maintained and operated in accordance with the requirements of ASME B30.20-1993 "Below-the-Hook Lifting Devices" and its working load limit shall be certified by a professional engineer or established by its manufacturer.

(2) A spreader bar or specialized below-the-hook lifting device shall display a nameplate or other permanent marking showing the

- (a) manufacturer's name and address;
- (b) serial number;
- (c) weight of the device where it weighs more than 45 kilograms; and
- (d) working load limit.

[Back to Top](#)

#### **Part of lifted load**

**372.** A spreader bar and other specialized below-the-hook lifting device shall be considered part of the lifted load.

### **PART XVI TRAFFIC CONTROL**

[Back to Top](#)

#### **Traffic control**

**373.** (1) For the purpose of this Part, "traffic control" includes

- (a) patrol vehicles;
- (b) traffic lights;
- (c) signs ;
- (d) barricades;
- (e) cones ;
- (f) detours ;
- (g) traffic control persons; and
- (h) other techniques and devices necessary according to the particular circumstances.



**LOGAN  
DRILLING  
GROUP**

(2) Where the movement of vehicular traffic constitutes a hazard to workers, effective traffic control shall be provided.

(3) Traffic control procedures shall at minimum meet the requirements of the Department of Transportation and Works "Traffic Control Manual for Roadway Work Operations" or procedures established by a municipality that have been approved by the minister and all relevant specifications.

(4) Notwithstanding subsection (3), an officer may require those additional or alternate traffic control procedures and equipment that are necessary in the particular circumstances.

[Back to Top](#)

#### **Traffic control person**

**374.** (1) A traffic control person shall be employed

(a) according to the criteria established by the Department of Transportation and Works "Traffic Control Specification"; or

(b) where required by an officer and where one may be necessary under the particular circumstances.

(2) A traffic control person shall

(a) stand in a safe position, preferably on the driver's side of the lane under the traffic control person's control, be clearly visible, and have an unobstructed view of approaching traffic; and

(b) be positioned at least 25 metres away from the work area unless circumstances or space requirements, including working at or near an intersection, dictate otherwise.

(3) Where 2 or more traffic control persons are working as a team, the employer shall ensure that one traffic control person is responsible for traffic co-ordination and for the initiation of changes in the direction of traffic flow in order to create a cycle which results in minimum traffic delay and maximum protection for the workers.

(4) Traffic control persons shall perform their duties responsibly and in accordance with the Department of Transportation and Works "Traffic Control Manual".

(5) A person shall not work as a traffic control person after January 1, 2011 unless he or she has completed a traffic control training program prescribed by the commission.

[Back to Top](#)

#### **Traffic control signals**

**375.** (1) An employer shall ensure that where traffic control persons are working as a team, methods of communication shall be determined and understood by personnel using them before the commencement of the flagging operations.



**LOGAN  
DRILLING  
GROUP**

(2) Where traffic is diverted onto dusty surfaces, good visibility shall be maintained by the suppression of dust through periodic application of an approved substance.

## **PART XVII CONSTRUCTION, EXCAVATION AND DEMOLITION**

### [Back to Top](#)

#### **Definitions**

##### **376. In this Part**

- (a) "adjacent to an excavation" means within a distance less than or equal to the overall depth of the excavation measured from a vertical line through the toe of the excavation face;
- (b) "construction project" means erection, alteration, repair, dismantling, demolition, structural or routine maintenance, painting, land clearing, earth moving, grading, excavating, trenching, boring, drilling, blasting, concreting, installation of machinery or other work considered to be construction by the minister;
- (c) "demolition" means the tearing down, destruction, breakup, razing or removal of the whole or part of a building or structure, or of free-standing machinery or equipment that is directly related to the function of the structure;
- (d) "falsework" means structural supports and the necessary bracing required for the support of temporary load during construction;
- (e) "formwork" includes the foundation, supporting structure, and mould into which concrete may be placed;
- (f) "tilt-up construction" means a system of building construction in which concrete wall panels are placed in position in the permanent structure and temporarily braced or supported; and
- (g) "trench" means an excavation less than 3.7 metres wide at the bottom, more than 1.2 metres deep, and of any length.

### [Back to Top](#)

#### **Temporary floors**

**377. (1)** During the erection of a building or structure of skeleton construction, a temporary floor, decking or formwork shall be installed at the main working level where work is being done.

(2) Where compliance with subsection (1) is not practicable, a temporary floor or other effective means of protection shall be installed not more than 2 levels or 8 metres below the main working level.





**LOGAN  
DRILLING  
GROUP**

(3) Subsections (1) and (2) do not apply to the initial connection of structural members where it is not practicable to provide a floor or decking.

(4) A safe means of access and egress to a main working level referred to in subsection (1) shall be provided.

(5) A stairway comprised, at a minimum, of framing, treads, midrail and a handrail shall be provided to each floor level before construction of the next floor or deck surface is undertaken, and the treads on the stairway shall not create a tripping or slipping hazard.

[Back to Top](#)

#### **Protection from falling materials**

**378.** (1) Where falling material could endanger workers

- (a) the danger area shall be barricaded or effectively guarded to prevent entry by workers, and conspicuous warning signs shall be displayed on all sides and approaches;
- (b) adequate protective canopies shall be installed over the danger area; or
- (c) adequate catch platforms or nets shall be provided to prevent materials from falling into areas accessible to workers.

(2) Temporary washroom facilities, offices and similar structures on a construction site shall be

- (a) located outside areas where there is the potential of being hit by falling materials; or
- (b) covered by adequate protective canopies.

(3) Protective canopies shall be designed and constructed to safely support all loads that may reasonably be expected to apply to them.

[Back to Top](#)

#### **Chutes**

**379.** (1) Chutes shall be provided where the free fall of materials or debris being removed exceeds 6 metres.

(2) Vertical chutes shall be completely enclosed and have gates at each point of entry.

(3) The discharge area of a chute shall be barricaded or effectively guarded to prevent workers being injured by falling or flying debris and conspicuous signs shall be posted near a chute outlet to warn of danger.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Chutes and hoists**

**380.** The roof edge about a chute, bitumen spout and material hoist shall have guardrails meeting the requirements of sections **28** and **30** on each side of the work area.

[Back to Top](#)

### **Glass panels**

**381.** A glass panel installed during construction shall be marked to clearly indicate its presence or effectively guarded at the time of installation.

[Back to Top](#)

### **Temporary support**

**382.** During the erection or dismantling of a structure or equipment, the employer shall ensure that a partially assembled structure or component is to safely withstand loads likely to be imposed on it.

[Back to Top](#)

### **Supervision**

**383.** (1) A qualified supervisor shall supervise the erection and use of formwork and falsework.

(2) A worker shall be properly instructed on the hazards that he or she may be exposed to and on the precautions to be taken while around or on formwork or falsework.

[Back to Top](#)

### **Concrete placing hazards**

**384.** (1) A protruding end of reinforcing steel that is hazardous to a worker shall be removed or effectively guarded.

(2) Where a worker is required to be underneath the formwork during a concrete pour or placement of another significant load, the worker shall be restricted from the areas where the loads are placed.

(3) A worker shall be restricted from the area under a portion of formwork where a load or concrete has been placed until it can be ensured that the formwork can withstand the load.

(4) Placement of concrete or other loads shall cease in the event of weakness, undue settlement or excess distortion of formwork and may only restart after the formwork has been repaired or strengthened as specified by a professional engineer.

(5) A load shall not be applied to an uncured concrete structure except where permitted by the erection drawings and supplementary instructions.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

### **Inspections**

**385.** Immediately before the placement of concrete or other loading, an employer shall ensure that the concrete formwork and falsework is inspected by a qualified person.

[Back to Top](#)

### **Pre-use inspections**

**386.** (1) An operator shall inspect a concrete placing boom or mast and test its safety and control devices before use on each shift and record the results of the inspection and tests.

(2) A defect found in the concrete placing boom or mast shall be recorded and reported immediately to the supervisor or employer who shall determine the course of action.

(3) Where a defect may affect the safe operation of the concrete placing boom or mast, the equipment shall not be used until the defect has been remedied.

[Back to Top](#)

### **Controls**

**387.** A control for a concrete placing boom or mast shall have its function clearly identified.

[Back to Top](#)

### **Emergency shutoff**

**388.** A concrete pump shall have a clearly labelled emergency stop switch near the hopper.

[Back to Top](#)

### **Agitator guarding**

**389.** (1) Concrete pump agitator guarding shall be maintained to the pump manufacturer's specifications, with reasonable allowance for wear.

(2) Bent bars in a concrete pump agitator grill guard shall be repaired.

(3) Concrete pump grill bar spacing may be increased to a maximum bar spacing of 8 centimetres where

(a) pumping concrete mixes with a slump of 5 centimetres or less; and

(b) specific instructions are given to the crew regarding the hazard present due to the larger openings in the grill guard.



**LOGAN  
DRILLING  
GROUP**

(4) The distance from the grill bars to the concrete pump's agitator shall be at least 7.5 centimetres.

(5) A concrete pump agitator grill guard shall be hinged or bolted in place.

(6) A person shall not stand on the grill when the concrete pump or agitator is running.

[Back to Top](#)

#### **Concrete pump lines**

**390.** Where the disconnection of concrete pump discharge line couplings could cause injury to workers, the discharge line shall be guarded and the guards shall be positioned so as to deflect a jet of concrete resulting from disconnection in a safe direction.

[Back to Top](#)

#### **Equipment inspection**

**391.** A concrete placing boom and mast shall be

(a) inspected in accordance with good engineering practice at intervals not exceeding 12 months;

(b) repaired where necessary; and

(c) certified safe for use by a professional engineer, the manufacturer or the manufacturer's authorized agent.

[Back to Top](#)

#### **Repair certification**

**392.** Replacement parts used for repair of a concrete placing boom or mast shall meet or exceed the original manufacturer's specifications or be certified by a professional engineer.

[Back to Top](#)

#### **Restriction on use**

**393.** A concrete placing boom or mast shall not be used to hoist loads.

[Back to Top](#)

#### **Operator's duties**

**394.** The operator of a concrete placing boom or mast shall



**LOGAN  
DRILLING  
GROUP**

- (a) have full control of the pump and placing equipment controls whenever the equipment is operating; and
- (b) not engage in other duties while operating the concrete pump and placing boom or mast.

[Back to Top](#)

#### **Hopper signal device**

**395.** Where a concrete placing boom operator is unable to see and monitor the hopper on the concrete pump from every location the operator shall be present during the pumping activity, there shall be a device at the hopper for the concrete delivery truck driver and other workers to signal the pump operator in the event of a problem at the pump or hopper.

[Back to Top](#)

#### **Underground utilities**

**396.** (1) Before excavating or drilling with powered tools and equipment, the location of all underground utility services in the area shall be accurately determined and a danger to workers from those services shall be controlled.

(2) Excavation and drilling work in proximity to an underground service shall be undertaken in conformity with the requirements of the owner of the service.

(3) Pointed tools shall not be used to probe for underground gas and electrical services.

(4) Powered equipment used for excavating shall be operated so as to avoid damage to underground utility services and danger to workers.

[Back to Top](#)

#### **Structural integrity**

**397.** (1) Where a structure is to be demolished in whole or in part, the structure and all adjoining structures, the integrity of which could be compromised by the demolition, shall be supported to the extent and in a manner prescribed by a professional engineer.

(2) The design of the support system referred to in subsection (1) shall include a schedule, based on the stages of demolition, for installation of the components of the support system, and a copy of the support system, design and schedule shall be available at the demolition site.

(3) Where salvage is taking place before or during the demolition process, the integrity of the structure shall be maintained.

(4) Engineered demolition plans and designs shall not be required where the nature and method of demolition will not endanger workers or compromise the stability of adjoining grounds and structures.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Hazardous materials**

**398.** Before work begins on the demolition or salvage of machinery, equipment, buildings or structures, the employer or owner shall

- (a) inspect the site to identify asbestos, lead, biological or other heavy metal or toxic, flammable or explosive materials that may be handled, disturbed or removed;
- (b) make the results of the inspection available at the worksite, including drawings, plans or specifications showing the location of hazardous substances;
- (c) ensure that hazardous materials found are safely contained or removed; and
- (d) where hazardous materials that were not identified in the inspection under paragraph (a) are discovered during demolition work, ensure that all work ceases until those materials are contained or removed.

[Back to Top](#)

#### **Disconnecting services**

**399.** Demolition shall not proceed until all electric, gas and other services that may endanger a worker have been disconnected as required by the owner of the applicable utility.

[Back to Top](#)

#### **Glass removal**

**400.** (1) Glass in a building or other structure that could endanger workers shall be removed before demolition commences.

(2) Glass removal shall proceed in an orderly manner from the top to the bottom of the structure.

[Back to Top](#)

#### **Stabilizing walls**

**401.** Where a dangerous or unstable wall is to be left standing, it shall be adequately braced.

[Back to Top](#)

#### **Dismantling buildings**

**402.** (1) During the dismantling or renovation of a building or structure, materials of a size or weight that may endanger workers shall not be loosened or allowed to fall, unless procedures are used that adequately protect workers.



**LOGAN  
DRILLING  
GROUP**

(2) Demolition shall proceed in an orderly manner from the top to the bottom of the structure.

[Back to Top](#)

#### **Stairways**

**403.** Stairways, complete with handrails, shall be left intact until access to the level served by the stairway is no longer required.

### **PART XVIII EXCAVATION, UNDERGROUND WORK AND ROCK CRUSHING**

[Back to Top](#)

#### **Definition**

**404.** In this Part, "excavation" means a cut, cavity, trench or depression in the earth's surface resulting from rock or soil removal.

[Back to Top](#)

#### **Entrapment danger**

**405.** (1) A worker shall not enter a place where there is a danger of entrapment unless safe access has been provided by catwalks, walkways or other acceptable means or he or she wears retrieval equipment satisfying the requirements of Part XXVII and is attended by another worker who is stationed, equipped and capable of immediately effecting a rescue.

(2) An area in which materials may be dropped, dumped or spilled shall be barricaded and protected by warning signs to prevent the inadvertent entry of workers.

[Back to Top](#)

#### **Pre-excavation requirements**

**406.** (1) Before beginning excavation work with power tools or equipment in an area likely to have underground conduits, cables or pipelines, the location of the service facilities shall be accurately determined by the employer, marked by suitable means and communicated to the employee.

(2) Powered equipment shall not be used in a manner that exposes workers to harmful effects resulting from the damage to service facilities.

(3) Trees, boulders or other unsecured material located within 1.83 metres of the area to be excavated shall be secured or removed before excavation begins.

(4) A worker shall not enter an excavation over 1.22 metres deep unless



**LOGAN  
DRILLING  
GROUP**

- (a) the sides of the excavation are sloped to a safe angle and have been secured by the use of sheet piling, shoring and bracing or a trench box; or
  - (b) the worker is protected by other effective means.
- (5) Added loads shall be considered in the design of the support system where
- (a) equipment or other heavy objects are located or operated close to the edge of excavations;
  - (b) excavations are adjacent to or abutting buildings or other structures; or
  - (c) hazards are created by vibration from nearby equipment or passing vehicular traffic.
- (6) Where there is a danger of undermining adjacent foundations, excavation work shall be done in short sections and the building walls shall be effectively shored or braced.

[Back to Top](#)

#### **Excavation or access**

**407.** (1) Where a worker is required to enter an excavation greater than 1.22 metres deep, a ladder shall be provided in the immediate area where the worker is employed, extending from the bottom of the excavation to at least 0.91 metres above the top of the excavation.

- (2) Walkways entering excavations shall be
  - (a) not less than 50.80 centimetres wide;
  - (b) equipped with guardrails when over 1.22 metres above grade; and
  - (c) provided with cleats when the grade is over 1/6.
- (3) A runway which is used by mobile equipment shall be equipped with curbs.

[Back to Top](#)

#### **Removal of material**

**408.** (1) A worker shall not permit excavated material to remain

- (a) within 1.22 metres of the edge of a trench-type excavation; or
- (b) within 1.52 metres of the edge of a pit-type excavation.

(2) Where skips or buckets are used to remove material from excavations, a horizontal shoring member shall be protected against dislodgement by the installation of vertical planking.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Faces and slopes**

**409.** (1) Where work is being carried on in an excavation

- (a) the slopes shall be scaled and trimmed or otherwise stabilized to prevent slides of material or falls of rock;
- (b) overhanging banks and trees or stumps and overburden shall be removed in the area within 5 metres from the edge of the excavation; and
- (c) means shall be provided to prevent the erosion of the slope by surface water.

(2) Except where the minister, in writing, permits otherwise, in a pit, quarry or similar excavation

- (a) the height of a face of which the material is not at a safe angle of repose shall not be greater than the height which can be safely reached by the equipment being used; and
- (b) the bench height for sand, gravel and unconsolidated materials shall not exceed 5 metres and, in any event, shall not be higher than can be reached with equipment in use.

(3) A worker engaged in scaling, sloping or trimming banks or faces shall use a fall protection system that meets the requirements of Part X.

(4) Scaling and similar work shall be undertaken from the top down and the areas into which material may fall shall be kept clear of workers and equipment.

### [Back to Top](#)

### **Excavation safety**

**410.** (1) Excavations shall be guarded by effective railings or barriers to prevent workers from falling in to excavations.

(2) Subsection (1) does not apply to a pit created to provide earth that can be used as fill at another site, referred to as a borrow pit.

(3) The accumulation of water in an excavation shall be prevented by effective means.

### [Back to Top](#)

### **Underground workings**

**411.** (1) In an underground place of employment, including an excavation, natural entry, tunnel, raise, shaft or chamber, that is not a mine, the employment of workers shall be in accordance with

- (a) standard engineering practices for the type of work being performed;
- (b) the applicable requirements of these regulations; and
- (c) additional requirements that the minister may consider necessary.





**LOGAN  
DRILLING  
GROUP**

(2) Where an employer proposes to use methods or equipment that are new or do not comply with standard practices in underground workings, he or she shall first submit details of the proposed methods and equipment to the minister for approval and the submission shall include evidence of engineering feasibility with respect to the safety of the workers.

[Back to Top](#)

#### **Internal combustion engines**

**412.** An internal combustion engine fuelled by gasoline, naphtha or liquified petroleum gas shall not be operated in an underground project.

[Back to Top](#)

#### **Air quality**

**413.** (1) An employer shall ensure that

- (a) the respirable air in all underground workings is free from hazardous amounts of dusts, vapours and gases, and does not contain less than 20% oxygen; and
- (b) appropriate tests for harmful vapour, gases, fumes, mists, dusts or explosive substances and oxygen deficiency are made and recorded
  - (i) before entry,
  - (ii) after an interruption in the work procedures, and
  - (iii) at appropriate intervals.

(2) An employer who employs workers at a mine or quarry where silica is mined or quarried, or where it is present, shall comply with the Silica Code of Practice.

(3) The tests required under paragraph (1)(b) shall be performed by a person who has appropriate training in the proper use of testing and monitoring equipment.

(4) A worker employed in surface rock-excavating workings shall be protected from harmful dust concentrations by

- (a) the use of suppression;
- (b) dust removal by mechanical means; or
- (c) another acceptable engineering control.

(5) Where a worker is exposed to dusting resulting from loading, transporting or conveying rock at surface operations, the dust shall be reduced to non-harmful concentrations by the application of water or by other effective methods.

(6) An employer shall ensure that dust caused by drilling or handling rock at underground rock-excavating workings is effectively suppressed by a means acceptable to the division.





**LOGAN  
DRILLING  
GROUP**

(7) A rock drill, that is, a machine or device for drilling a hole in rock for the purpose of blasting, usually powered by compressed air but in which electricity or steam may be used, shall be equipped with a water jet, spray or other device acceptable to the minister to effectively suppress drilling dust.

(8) Subsection (7) does not apply to hand-drilling procedures.

(9) A water spray shall be used in every development heading unless written permission has been received from the assistant deputy minister to work the heading without a water spray.

(10) Effective dust-control measures shall be employed during the handling and loading of broken rock.

(11) Mechanical ventilation shall be provided to produce a minimum air volume of 15.24 cubic metres a minute a square metre of working face in the work area.

[Back to Top](#)

#### **Rock crushing control measures**

**414.** Rock-crushing plants shall be equipped with dust controls and

- (a) rock crushers, including jaw, roll, cone or hammermills shall have an adequate mechanical exhaust system;
- (b) the screen discharge hopper shall be enclosed and shall have an adequate mechanical exhaust system or an adequate water spray system;
- (c) screens shall have partial covers and shall have an adequate mechanical exhaust system or an adequate water spray system;
- (d) material-transfer points shall have an adequate mechanical exhaust system or an adequate water spray system; and
- (e) discharge from a mechanical exhaust system shall be located to prevent the recirculation of contaminated air to areas occupied by a worker.

[Back to Top](#)

#### **Diesel engines underground**

**415.** (1) Where diesel engines are used underground, mechanical ventilation shall effectively ventilate all work areas.

(2) Where a diesel engine is used

- (a) it shall be equipped with suitable exhaust-gas conditioners which are properly maintained and regularly serviced;
- (b) gasoline or other highly volatile fuels shall not be used with a starting mechanism or device;



**LOGAN  
DRILLING  
GROUP**

- (c) instructions shall be issued to all workers to shut down all engines immediately where ventilation ceases to function, and to keep the engines shut down until ventilation is again made effective; and
  - (d) a fire suppression system, suitable for extinguishing oil fires shall be provided for each engine.
- (3) Tests for carbon monoxide and nitrogen dioxide shall be conducted by a qualified person at least weekly.
- (4) Where a diesel engine operates underground, records shall be maintained and be accessible to all workers concerned and shall include
- (a) inspection and certification of each shift for the condition of the diesel engine and exhaust-gas conditioner;
  - (b) gas inspection tests made for carbon monoxide and nitrogen dioxide, including the time and location of tests;
  - (c) at least once a week, or where directed by the officer, the volume of ventilating air delivered to each underground heading;
  - (d) tests for combustible gas, including location, time and results as directed by an officer;
  - (e) an unusual occurrence of findings or action; and
  - (f) the signature of the worker recording each entry.

[Back to Top](#)

#### **Falling ground**

**416.** (1) The walls, roof and face of an underground working shall be kept free of loose or fissured rocks and stones, and ground support shall be installed where necessary.

(2) An adequate supply of properly dressed scaling bars or other scaling equipment shall be available at the worksite for scaling.

### **PART XIX GENERAL BLASTING**

[Back to Top](#)

#### **Definitions**

**417.** In this Part

- (a) "blaster" means a person who holds a valid blaster's certificate granted by the province;



**LOGAN  
DRILLING  
GROUP**

- (b) "blasting activity" includes storing, handling, transporting, preparing and using explosives, and drilling conducted at a blasting area or in relation to the use of explosives;
- (c) "blasting area" means the zone extending at least 50 metres in all directions from the place in which explosives are prepared, handled or loaded for firing, or in which misfired explosives exist or are believed to exist and from which hazards shall be excluded to avoid an accidental explosion;
- (d) "blasting machine" means an electrical or electro-mechanical device which provides electrical energy for the purpose of energizing electric detonators and electrical circuits for continuity, resistance, stray currents and other pertinent measurements;
- (e) "blasting switch" means a device used to permit the firing of electric blasting circuits from power lines and constructed so that the door may be closed and locked with the switch in the "OFF" position;
- (f) "danger area" means the zone in which there exists a possibility of hazard to person or property from fly rock, fume, air blast or ground vibrations;
- (g) "day box" means a portable unit used for keeping explosives in during the day and which meets the requirements of "Storage Standards for Industrial Explosives" published by the Explosives Division of Natural Resources Canada;
- (h) "detonator" includes electric blasting caps of instantaneous and delay types, blasting caps for use with safety fuses, detonating cord, delay connectors and non-electric instantaneous and delay blasting caps which use detonating cord, shock tube, gas tube and another replacement for electric leg wires and another similar device;
- (i) "explosive" means a substance, including a detonator or primed explosive, that is manufactured or used to produce an explosion by detonation or deflagration and that is regulated by the *Explosives Act* (Canada), but does not include ammunition for weapons or fireworks;
- (j) "extraneous electricity" means unwanted electrical energy greater than 50 milliamps that is present at the blasting area that could enter an electric blasting circuit including stray current, static electricity, radio frequency energy and time-varying electric and magnetic fields;
- (k) "magazine" means a fixed unit used for the unattended storage of explosives overnight and which meets the requirements of the "Storage Standards for Industrial Explosives" published by the Explosives Division of Natural Resources Canada;
- (l) "misfired hole" means a charge of explosives in a hole or part of a hole which has failed to fire as planned and "misfire" has a corresponding meaning;
- (m) "prime charge" means to position a detonator for use in firing an explosive charge;
- (n) "primed explosive" means an explosive containing a detonator; and
- (o) "stemming" means clean, crushed angular shaped stone, 12.5% of the borehole diameter in size, which provides confinement for explosive energy.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Employer's responsibility**

**418.** Nothing in this Part relieves an employer of the responsibility

- (a) to provide adequate direction and instruction of workers and to assign work only to those workers who are qualified;
- (b) to ensure that measurement of air volume is taken at the end of the ventilation duct near the working face underground and that records are maintained of all air-volume measurements; and
- (c) to ensure that a worker does not return to the scene of a blasting operation until the air contaminants have been reduced to concentrations below their respective threshold limit values and the concentration of oxygen is at a respirable level.

[Back to Top](#)

#### **Role of certified blaster**

**419.** (1) Blasting shall be performed under the direct supervision of a blaster who is present at the project and who holds a valid blaster's certificate which authorizes the performance of the particular type of work that the blaster is to conduct or supervise.

(2) Direct supervision under subsection (1) includes a requirement that the blaster have a direct line of sight of the work area.

(3) The site supervisor shall consult with a blaster so that both are aware of all work being conducted in a blasting area and no work shall be conducted in a manner which creates risk of an accidental explosion.

(4) Where more than one blaster is involved in a blasting operation, an employer shall

(a) before the commencement of the blasting operation, designate one blaster who shall have principal responsibility for the blast;

(b) ensure that all persons in the blasting area are advised of the identity of the principal blaster; and

(c) ensure that all blasters and supervisors performing or directing the work in a blasting area consult sufficiently to coordinate the safety of the activity.

(5) A person, other than a blaster, shall not

(a) prime a charge;

(b) make a connection which leads or which may lead from the explosive charge to a blasting machine, a blasting switch, safety fuse or a shock tube initiating system including a NONEL;





**LOGAN  
DRILLING  
GROUP**

- (c) connect a delay or sequencing device or program the delay or sequence for the blast; or
- (d) fire an explosive charge.

(6) An explosive charge shall not be fired until the blaster or principal blaster, where one is designated, has ensured that the placement of the charge and all other features of the blasting activity are adequate to ensure the safety of persons at or near the workplace.

[Back to Top](#)

#### **Security and report requirements**

**420.** (1) Only a person authorized by the employer shall have access to the explosives.

(2) When explosive materials or initiating systems are brought to the blast site, the employer and a blaster shall

- (a) ensure that the blast site is attended and barricaded; and
- (b) post warning signs stating "Danger", "Explosives" or "Keep Out" or flag the blast site against unauthorized entry.

(3) A theft or attempted theft of explosives shall be reported by the employer to the minister immediately upon becoming aware of the theft.

(4) An employer shall immediately notify and send written notice within 24 hours to the minister when a blasting accident occurs in which a personal injury is sustained or where there is an unusual occurrence in which explosives are involved, whether or not personal injury is sustained, together with the blaster's certificate of the blaster involved.

(5) A report referred to in subsection (4) shall contain

- (a) the names and certificate numbers of all blasters involved;
- (b) the names and occupations of injured workers;
- (c) the type of explosives, detonators and blasting machines used;
- (d) a factual account of the events relating to the accident;
- (e) date, time and location of the accident; and
- (f) the action taken by the employer.

(6) The minister shall determine from the circumstances of the incident what action shall be taken, including whether the blaster's certificate required under subsection (4) may be returned to the blaster.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

### **Examination**

**421.** A thorough examination shall be made after charges have been fired and before drilling recommences to ascertain that no unexploded charges remain.

[Back to Top](#)

### **Records**

**422.** (1) A field journal or equivalent record shall be provided at the blasting site and the blaster in charge shall record the results of his or her examination on it.

(2) An employer shall ensure that a blaster keeps an updated field journal or equivalent record.

(3) A blaster shall keep blasting records for 5 years following a blast, and shall keep his or her records available for inspection by an officer or employer at all reasonable times.

(4) An employer shall ensure that the employee in charge of explosive magazines maintains an inventory record, available to an officer, that records, for each magazine, the amount of detonators and other explosives stored in the magazine for at least the 3 previous years and a copy of the inventory record shall be kept at a place other than in the magazine.

(5) The inventory record referred to in subsection (4) shall include the following information:

- (a) for the detonators, the period, leg wire length and series; and
- (b) for other explosives, the type of explosives.

[Back to Top](#)

### **Suspension or seizure of certificate**

**423.** (1) Where the holder of a blaster's certificate has failed to comply with

- (a) a blasting requirement of these regulations;
- (b) the manufacturer's recommendations; or
- (c) recognized safe blasting practices,

the employer shall immediately investigate the incident and may suspend the blaster from performing the duties of a blaster.

(2) The employer shall submit a report of the investigation carried out under subsection (1) to the minister.

(3) The minister may seize a blaster's certificate where he or she has reason to believe that the safety of a person has been or may be endangered by the blaster and the seizure of the certificate shall continue until the minister determines the action to be taken.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Custody of certificates**

**424.** A blaster shall

- (a) retain his or her blaster's certificate and keep it in a safe place at the workplace while carrying out his or her duties; and
- (b) upon the request of an officer, produce his or her blaster's certificate.

[Back to Top](#)

#### **Day box or magazine**

**425.** (1) A day box or magazine shall be licensed according to applicable legislation.

(2) A day box shall have "Explosives" marked conspicuously on it where required by an officer.

(3) The ground within at least 10 metres of a magazine or day box shall be kept clear of long grass, brush and other readily combustible or flammable materials.

(4) A magazine or unattended day box containing a detonator shall not be placed within 50 metres of a magazine or day box containing another explosive except where an officer authorizes a lesser distance.

(5) A detonator shall not be placed in

- (a) a magazine or day box with other types of explosives; or
- (b) a compartment of a vehicle with another explosive unless they are separated by use of a day box and unless there is compliance with all applicable legislation respecting the transportation of explosives.

(6) An explosive shall be attended at all times by a person authorized by the employer unless it is placed in a locked day box or locked magazine.

[Back to Top](#)

#### **Prohibitions**

**426.** (1) A person shall not smoke, and an open flame or article liable to spontaneously ignite or likely to cause an explosion or fire is not permitted within 10 metres of an explosive, magazine, day box or blasting area.

(2) Tools or other implements used to open containers of explosives shall be made of non-sparking material.

(3) A person shall not prime a charge in an area where explosives are stored.



**LOGAN  
DRILLING  
GROUP**

- (4) A person shall not carry an explosive in his or her clothing.

[Back to Top](#)

#### **Storage and handling**

**427.** (1) The handling and transport of explosives shall be conducted in accordance with the applicable provisions of the *Explosives Act* (Canada), the *Fire Prevention Act, 1991* and the *Dangerous Goods Transportation Act* and regulations under those Acts.

(2) Explosives shall be stored, handled and used in the manner recommended by the manufacturer.

[Back to Top](#)

#### **Transportation**

**428.** (1) A passenger, other than a person assigned to assist in handling explosives, shall not be permitted in a vehicle which is transporting explosives.

(2) A vehicle used to transport explosives shall

- (a) be in sound mechanical condition;
- (b) be suitable for and capable of safely transporting explosives;
- (c) be appropriately placarded; and
- (d) transport explosives only in containers that are lined with non-sparking material and that are secured against inadvertent movement.

(3) Reasonable quantities of flammable or combustible materials may be carried by a conveyance transporting explosives provided that those materials are contained in a manner which does not cause or transmit fire in an explosion and are adequately separated from explosives containers on the conveyance.

(4) Where equipment, including a drilling rig, is located in a blasting area, sufficient precautions, including ensuring adequate traction and stability, shall be taken to prevent toppling, sliding, or other unplanned movement of the equipment.

[Back to Top](#)

#### **Drilling**

**429.** (1) A drill hole shall be of a sufficient size to admit the free insertion of explosives to the bottom of the hole without ramming, pounding or undue pressure.

(2) Drilling shall not be done in a previously blasted area until the surface to be drilled is carefully examined for remnants of explosives or holes containing explosive materials.



**LOGAN  
DRILLING  
GROUP**

(3) Where a remnant or a hole containing explosives is found, this explosive shall be dealt with as a misfire before drilling commences.

(4) Drilling shall not be done closer to a part of a hole containing an explosive than the distance equal to half the total depth of the hole being drilled and in no instance closer than 6 metres from a part of a hole containing an explosive.

(5) Notwithstanding subsection (4), where

- (a) a blaster determines that a particular misfire cannot be more safely treated by another means and it is necessary to drill an adjacent hole in a manner inconsistent with subsection (4);
- (b) the nature of the ground being drilled makes it necessary to load a hole immediately after it is drilled and to subsequently drill an adjacent hole in a manner inconsistent with subsection (4);
- (c) a loaded hole caves in and a blaster determines that the unexploded hole cannot be reprimed or otherwise more safely treated, and it is necessary to drill an adjacent hole in a manner inconsistent with subsection (4); or
- (d) it is necessary to use a drill to remove obstacles from a previously drilled hole which does not contain explosives and to do so would be inconsistent with subsection (4)

a written safe work procedure, developed in consultation with a blaster, shall be followed where the employer has notified the minister in writing that the safe work procedure is being implemented, including the reason for its implementation.

(6) The safe work procedure referred to in subsection (5) shall be authorized in writing by the minister before the commencement of the work.

(7) Where a safe work procedure referred to in subsection (5) is implemented, the details of the procedure and the reasons for its implementation shall be communicated to persons remaining in the blasting area who shall adhere strictly to its terms.

### [Back to Top](#)

#### **Handling in special circumstances**

**430.** (1) Explosives affected by cold temperatures shall only be used as recommended by the manufacturer.

(2) Waste and deteriorated, damaged or time-expired explosives shall be destroyed promptly by

- (a) a blaster;
- (b) a representative of the explosive manufacturer; or





**LOGAN  
DRILLING  
GROUP**

- (c) a qualified member of the Royal Canadian Mounted Police, the Department of National Defence, the Explosives Division of Natural Resources Canada or the Royal Newfoundland Constabulary using methods approved by the manufacturer.

[Back to Top](#)

#### **Preparing the blast loading**

**431.** (1) A detonator shall be kept and handled separately from other types of explosives until the last practicable moment when the blaster primes the charge.

(2) A hole shall not be loaded with an explosive before it is necessary before firing.

(3) A nitroglycerine-based product shall not be unwrapped.

(4) A non nitroglycerine-based product shall remain in its original wrapping until the last practicable moment before use.

(5) An electric detonator shall be kept shunted or short circuited until it is used, except during the testing of the detonator.

(6) An employer shall ensure that tamping rods and other similar devices are made of wood or other non-sparking materials.

(7) Primed explosives shall not be slit or tamped.

(8) Undue pressure or pounding shall not occur during tamping.

(9) Where pneumatic loading of ammonium nitrate and fuel oil occurs, only a semi-conductive hose shall be used and the loader shall be effectively grounded and the bottom priming of drill holes shall be done with non-electrical initiation.

(10) A blaster, using a blasting meter, shall personally test the continuity of a loaded hole containing an electric detonator before the hole is stemmed with a suitable material.

(11) An explosive charge shall not be connected to another or by a means of initiation, including detonating cords, until the last practicable moment before firing.

[Back to Top](#)

#### **Safety fuse**

**432.** (1) Only a federally authorized safety fuse assembly shall be used and fuse capping is not permitted.

(2) A safety fuse assembly shorter than one metre shall not be used.

(3) Where it is necessary to fire more than one safety fuse assembly at a time, only one igniter cord or approved equivalent shall be lit.





[Back to Top](#)

**Loaded holes**

**433.** (1) The location of a loaded hole shall be visually identified by either placing individual markers at the hole or marking off the perimeter of the area containing loaded hole by a display of warning tape or other highly visible indicator.

(2) A hole which has been loaded, but not fired by the end of the working day, shall not be left unattended, whether primed or not.

(3) A worker shall be posted to ensure that a hole is not tampered with when the work crew is absent from the site.

(4) Security procedures shall be used to prevent access to a loaded hole by a person who has not been authorized by the blaster.

[Back to Top](#)

**Restrictions**

**434.** (1) A vehicle or other mechanical equipment shall not be driven or moved over an explosive, a blasting accessory or a hole containing an explosive.

(2) A blaster shall ensure that unused explosives and detonators are returned to the day box or magazine before the blast is initiated.

(3) Drill cuttings shall not be used for stemming material.

[Back to Top](#)

**Electrical initiation**

**435.** (1) Where there is danger from extraneous electricity, a blasting operation shall be fully non-electric.

(2) A blasting operation or handling of an explosive shall not be carried out on the approach of or during an electrical storm and persons shall remain outside the danger area at that time.

(3) To minimize hazards from radio frequency energy, electrical blasting shall not be carried out at a distance from a transmitter less than shown in Table 1 or Table 2, whichever is applicable:

**Table 1**

Recommended Safe Distances for Commercial  
AM Broadcast Transmitters 0.535 to 1.705 MHz

<b>Transmitter Power (watts)</b>	<b>Minimum Distance (metres)</b>
Up to 4,000	220
5,000	244
10,000	345



25,000	546
50,000	762
100,000	1,098
500,000	2,439

**Table 2**

Recommended Safe Distances for Mobile Transmitters  
and Cellular Telephones

Transmitter Power (watts)	Minimum distances (metres)				
	MF 1.7 to 3.4 MHz Fixed Mobile Maritime	HF 28 to 29.7 MHz Amateur	VHF 35 to 36 MHz Public Use 42 to 44 MHz Public Use 50 to 54 Mhz Amateur	VHF 144 to 148 MHz Amateur 150.8 to 161.6 MHz Public Use	UHF 450 to 470 MHz Public Use Cellular Telephones Above 800 MHz
1	5	14	11	4	2
5	10	32	25	8	5
10	14	45	35	12	8
50	31	101	79	26	17
100	44	143	112	37	24
150	59	191	150	49	32
200	62	202	158	52	34
250	70	225	177	58	38
500	98	319	249	82	53
600	108	349	273	90	58
1,000	139	451	353	116	75
1,500	170	552	432	141	91
10,000	438	1,425	1,116	365	236

(4) An employer shall ensure that during the commencement of a blasting operation and while it is in progress

(a) where it is an electric blasting operation, a sign bearing the words "Blasting Operations, Turn Off Radio Transmitter" is posted on all public roads leading to a blasting area and is visible to persons entering the area; or

(b) where it is a fully non-electric blasting operation, a sign bearing the words "Blasting Operations" is posted on all public roads leading to a blasting area and is visible to persons entering the area; and



**LOGAN  
DRILLING  
GROUP**

- (c) a sign bearing the words "End of Blasting" is posted on all public roads leading from a blasting area and is visible to persons leaving the area.
- (5) A sign required under subsection (4) shall have letters not less than 15 centimetres high on a contrasting background and shall be 90 centimetres wide and 120 centimetres tall.
- (6) Where a sign referred to in this section is required to be visible to persons entering a blasting area, it shall be located at a distance from the blasting area of
  - (a) 100 metres where the speed limit on the road is 50 kilometres an hour or less; or
  - (b) 300 metres where the speed limit on the road is greater than 50 kilometres an hour.
- (7) An employer shall ensure that a sign required under this section is removed or covered when the blasting operation is completed.
- (8) In addition to the other requirements of this section, the following precautions shall be adopted to reduce the potential hazards of electrical blasting near radio frequency energy sources:
  - (a) mobile transmitters shall be kept away from the blasting area and where absolute control cannot be exercised, warning signs shall be posted to remind vehicle operators to turn off transmitters and, where necessary as determined by the blaster, flagmen shall be posted to instruct operators accordingly; and
  - (b) blasting circuits shall be kept on the ground and bare connections shall be elevated sufficiently to prevent current leakage.

### [Back to Top](#)

#### **Pre-firing**

- 436.** (1) An electric blasting circuit shall be tested personally by a blaster with a blasting meter to ensure that readings are consistent with the values calculated for the blast before the lead wire is connected to the blasting machine or blasting switch.
- (2) The connection of the lead wires to the blasting machine or blasting switch shall be the last connection made before the blast.
  - (3) Only a blasting machine or blasting switch shall be used to fire an electric circuit.
  - (4) A blaster shall ensure that the capacity of the blasting machine as designated by the manufacturer is not exceeded.
  - (5) An employer shall ensure that a blasting machine is maintained in good working order and is inspected at least once every 12 months by a service representative authorized to work on the machine by its manufacturer or approved by the minister.
  - (6) Records verifying the condition of the blasting machine at the time of the annual inspection shall be kept by an employer until the next annual inspection.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Protection**

**437.** (1) An employer shall take precautions to ensure that persons and property at or near the workplace are protected and that hazards of flying material, airblast, ground vibration or fumes from the blast are minimized.

(2) Where there is a danger to the safety of persons or property, a blasting mat of adequate size and strength or adequate cover shall be used.

[Back to Top](#)

#### **Firing**

**438.** (1) A blasting machine shall not be used to fire an explosive charge unless it is designated and approved by the manufacturer for the sole purpose of energizing electric detonators.

(2) After blasting by electricity, a blaster shall not allow another person to enter a place where charges have been fired until he or she has

- (a) disconnected the firing cables from the blasting machine;
- (b) short-circuited the lead wires; and
- (c) personally examined the blasting area and given permission for work to proceed.

(3) A blasting meter shall not be used to take measurements pertinent to blasting unless it is approved and designed by the manufacturer for that sole purpose.

(4) Electric blasting circuits shall not be fired from a power transmission line unless a blasting operation is conducted in underground tunnelling and a blasting switch is used.

(5) A blasting switch shall not be used for firing electric blasting circuits from a power line unless it is approved and designed by the manufacturer as suitable for that purpose and constructed so that the door may be closed and locked with the switches in the "OFF" position.

(6) A blaster shall ensure that the blasting switch is kept locked and inaccessible until it is required to fire the explosive charge.

(7) Where an electrical power transmission line is present and electric blasting initiation is to be used, a cable used to fire the blast shall be anchored securely to avoid being thrown into contact with the power lines.

(8) An employer shall ensure that empty explosive cartons and boxes are

- (a) collected from the site before blasting; and
- (b) appropriately disposed after the blasting is completed.

(9) Before firing, a blaster shall ensure that





**LOGAN  
DRILLING  
GROUP**

- (a) sufficient audible and visual warning is given to persons in or near the danger area;
- (b) roads and approaches to the danger area are guarded or barricaded in order to prevent anyone from entering; and
- (c) persons and equipment are at a safe distance and under sufficient protective cover.

[Back to Top](#)

#### **Post-firing**

**439.** (1) Immediately after firing electrically, a blaster shall disconnect and shunt or short circuit the lead wires from the blasting machine or the blasting switch and pull out and lock a blasting switch.

(2) After firing the blast, a blaster shall make a thorough inspection of the site, and after ascertaining that no unexploded charges remain, shall permit other employees to return to work or allow traffic to proceed.

(3) An employer shall ensure that loose rocks are scaled off the faces of excavations and removed from the crest after completion of the blasting operation and before work is resumed.

[Back to Top](#)

#### **Unique blasting operation**

**440.** (1) An employer shall ensure that, in addition to the requirements of these regulations, a safe work procedure is developed for the use and handling of explosives in the following circumstances:

- (a) in a confined space other than underground;
- (b) underwater;
- (c) for demolition of above-ground buildings, stacks, or other structures including beaver dams;
- (d) for ice control;
- (e) in theatrical applications where the special effects are explosives other than fireworks;
- (f) for oil and gas well control;
- (g) where black powder is used; or
- (h) at the request of an officer who concludes that a procedure involves an unusual use of explosives in the operation.

(2) In the case of a conflict between the safe work procedure referred to in subsection (1) and these regulations, these regulations shall apply.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

### Seismic blasting

**441.** (1) Where seismic blasting is carried out in an isolated location, loaded holes may be left unattended only where the blaster has first ensured that

- (a) leg wires are shunted together;
- (b) drill cuttings are spread out and levelled;
- (c) leg wires are coiled as close to the ground as possible while not exceeding 15 centimetres above the ground level; and
- (d) holes are suitably user identified, recorded in the blasting log and blasted within 30 days.

(2) In a seismic blasting operation the firing line may be left connected to the firing switch and disconnected at the hole where a recorder can confirm complete detonation.

(3) A misfired or unfired charge in a seismic blasting operation, may be left unfired only where

- (a) it cannot be conventionally and safely detonated;
- (b) it is in an isolated location and at least 6 metres deep; and
- (c) its location is effectively marked.

(4) A seismic water tank truck with open flame water heaters shall not be used to transport explosives unless

- (a) the distance between the heat tube and the outside of the tank is at least 35 centimetres;
- (b) the heater, where woodburning, has a fire box of a type that fully contains the fuel and 2 dampers mounted in the heat tube, one at the vent end and the other at the fire box, so the flame may be shut in instantaneously in the event of an accident; and
- (c) the detonator storage is located on the opposite side of the vehicle from the explosive magazine and both are built to type 6 magazine standard.

(5) In a seismic operation where there is no alternate route, a vehicle may be driven over a loaded hole where

- (a) bypassing the hole is not practicable;
- (b) operational planning minimizes the requirement to travel through a loaded area;
- (c) safe work procedures are developed and communicated to workers before work is started;



**LOGAN  
DRILLING  
GROUP**

- (d) loaded holes comply with subsection (1);
- (e) explosive charges are at a minimum depth of 6 metres;
- (f) radio transmission equipment is turned off or transmission capability is disabled by disconnecting the microphone; and
- (g) electrical equipment, including cellular phones and other types of mobile telephone equipment which continuously transmit a radio signal when turned on shall be turned off when driving over a loaded hole.

### [Back to Top](#)

#### **Misfire**

**442.** (1) Where a charge has misfired or is suspected of having misfired, a person shall not move about the danger area until the expiry of the required waiting time in subsection (2).

- (2) Where a charge has misfired or is suspected of having misfired, a blaster shall
  - (a) where using a safety fuse, wait 30 minutes after the last charge was due to explode before entering the blasting area;
  - (b) where using a means of initiation other than a safety fuse, wait 10 minutes after the last charge was due to explode before entering the blasting area; and
  - (c) where using an electric detonator, immediately disconnect the firing cable from the blasting machine or blasting switch and shunt the lead line

and at the end of the required waiting time, approach the misfired hole to assess the potential hazard.

(3) Where there is a misfire or a suspected misfire, a person shall not use metallic equipment in a blasting area until a blaster has inspected the site and authorized the use of the equipment and the following procedure shall be used:

- (a) the site shall be fully illuminated;
- (b) the work shall be directly and constantly supervised by a blaster; and
- (c) precautions shall be taken to prevent injury from accidental explosion.

(4) An employer shall ensure that a misfire is treated at a safe and suitable time under the direction of a blaster in order to ensure the removal of hazards from the misfire in a manner that complies with these regulations.

(5) A blaster, in consultation with a supervisor, shall determine the safest and most practicable means of treating a misfire, either by reblasting or otherwise, and shall ensure compliance with these regulations.



**LOGAN  
DRILLING  
GROUP**

(6) An employer shall, where practicable, ensure that the cause of a misfire is established and that corrective action is taken to prevent recurrence.

## **PART XX FIRE PREVENTION AND CONTROL**

[Back to Top](#)

### **Fire protection**

**443.** (1) The design and occupancy of structures and the provision of fire alarm and detection equipment and fire protection equipment, in places of employment, shall comply with the *Fire Prevention Act, 1991* and an employer shall ensure that work is carried out according to the applicable provisions of that Act and the National Fire Code.

(2) Fire alarm and detection equipment and fire protection equipment shall be maintained according to the manufacturer's instructions and any other requirements of provincial legislation.

(3) An employer that has

- (a) controlled products as defined in the *Workplace Hazardous Materials Information System (WHMIS) Regulations* ;
- (b) explosives;
- (c) pesticides;
- (d) radioactive material;
- (e) consumer products; or
- (f) hazardous waste

in quantities which may endanger fire-fighters at a workplace shall ensure that the local fire department is notified of the nature and location of the hazardous materials or substances and methods to be used in their safe handling.

(4) Subsection (3) does not apply to a workplace:

- (a) where materials are kept on site for less than 5 days, where the employer ensures that an alternate and effective means of notification of the fire department, appropriate to the hazard, is in place in the event of a fire or other emergency; or
- (b) which is not within the service area of a fire department.

[Back to Top](#)

### **Fire and explosion**

**444.** (1) Where a worker is employed in or about a bilge, tank, compartment or cargo space of marine equipment or in an area where there is a possibility of the presence of a volatile or



**LOGAN  
DRILLING  
GROUP**

flammable substance, gas or vapour, an employer shall institute a system of inspections and tests to determine the presence of that substance, gas or vapour before work is commenced.

(2) Where a volatile or flammable substance, gas or vapour is present or arises from the work process, the hazard shall be removed or controlled by ventilation or other effective means.

(3) Where work or manufacturing processes involve the use of a flammable liquid, vapour or gas, the concentration of the liquid, vapour or gas in the work area shall be maintained below the lower explosive limit (LEL) of the substance involved.

(4) A container used to carry, transfer, or store a flammable solvent shall meet the requirements of the CSA Standards and shall be electrically grounded or bonded while the contents are transferred from one container to another.

(5) Waste material contaminated with a solvent, oil, grease, paint or other flammable substance shall be placed in covered metal containers before disposal and shall not be stored in work areas.

(6) Where a volatile or flammable substance, gas or vapour is present, or arises out of material or equipment or from a work process, existing or potential sources of ignition shall be controlled or eliminated.

(7) For the purpose of subsection (6), a source of ignition includes an open flame, spark-producing mechanical equipment, welding and cutting processes, smoking, static discharge, electrical equipment or an installation that is not approved for hazardous locations, as specified by the Canadian Electrical Code.

(8) Where work involves more than one employer, a principal contractor shall ensure that sources of ignition resulting from the work of one employer are eliminated or adequately controlled where a flammable gas or a flammable liquid is handled, used or stored by another employer.

[Back to Top](#)

#### **Trucks loading and unloading**

**445.** (1) A truck shall be electrically bonded and grounded when loading and unloading bulk petroleum products.

(2) A vehicle shall not be started or have its motor running in a loading area where a tank truck containing a flammable vaporizing liquid is being connected or disconnected.

(3) Where a tank truck is being loaded through a dome hatch and it is necessary to observe the fluid level,

- (a) a platform shall be provided for the loader;
- (b) shut-off controls shall be located at the platform; and
- (c) approved illumination shall be provided during the hours of darkness.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

#### **Combustible substances**

**446.** (1) Where a work process releases finely-divided combustible dust within an enclosed area where workers are employed, effective dust control equipment shall be used.

(2) A collector of combustible dusts, other than that of the liquid spray type, shall be

(a) located outside or in isolated enclosures removed from or protected against sources of ignition; and

(b) provided with explosion relief vents.

(3) Electrical wiring and equipment in a combustible dust collector and associated rooms or enclosures shall be of the explosion-proof type.

(4) Where combustible dust collects in a building, structure, machinery or equipment, it shall be removed before the accumulation of the dust creates a fire or explosion hazard.

[Back to Top](#)

#### **Combustible gas propellants**

**447.** Combustible gas or vapour shall not be used as a propellant for spray coatings.

[Back to Top](#)

#### **Hot work**

**448.** Fire suppression equipment shall be readily available and appropriate to the potential loss exposure at a location where hot work takes place.

### **PART XXI**

#### **WELDING, BURNING AND CUTTING OPERATIONS**

[Back to Top](#)

#### **Gas welding and burning**

**449.** (1) Welding, cutting, and similar processes shall be carried out according to the requirements of

(a) CSA Standard W117.2 in "Safety in Welding, Cutting and Allied Processes" or another standard acceptable to the minister;

(b) the manufacturer's instructions and recommendations for the equipment being used; and

(c) the applicable requirements of these regulations.

(2) Cylinders, piping and fittings of compressed and liquefied-gas systems shall be located or protected in a manner that prevents physical damage to them.





**LOGAN  
DRILLING  
GROUP**

(3) A worker shall prevent a spark or flame from coming into contact with a cylinder, regulator or hose of a compressed-gas system and charged gas cylinders shall be protected from a source of heat in excess of 54.44 ° Celsius.

(4) Before gas-welding or burning equipment is put into use, a worker shall ensure that parts are free from defects, leaks or oil and grease and only standard fittings, designed and manufactured for the specific compressed gas service shall be used.

(5) A regulator or an automatic reducing valve of welding equipment shall only be used for the gas for which it was designed.

[Back to Top](#)

### **Compressed gas cylinders**

**450.** (1) A compressed gas cylinder

(a) shall be

(i) secured during storage, transportation or use, and

(ii) stored, transported and used only in accordance with the manufacturer's instructions, applicable CSA and NFPA standards and applicable legislation; and

(b) shall not be hoisted by slings, dropped or subjected to impact.

(2) A cylinder valve shall be closed and a hose drained when work is finished or when a cylinder is empty, and a valve protection cover shall be kept in position when a cylinder is not connected for use.

[Back to Top](#)

### **Oxygen**

**451.** A worker shall not

(a) permit oil or grease to contact an oxygen cylinder, valve, regulator or other fitting; or

(b) handle an oxygen cylinder or apparatus with oily or greasy hands or gloves.

[Back to Top](#)

### **Radiation protection**

**452.** (1) Arc welding shall not be carried out unless a worker who may be exposed to radiation from the arc flash is protected by an adequate screen, curtain or partition or wears suitable eye protection.

(2) A screen, curtain or partition near an arc welding operation shall be made of or treated with a flame-resistant material or coating, and have a nonreflective surface finish.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Burning and welding**

**453.** (1) Burning, welding or other hot work shall not be done in an area where there is a likelihood of the presence of flammable substances until

- (a) tests have been done to ensure that work may be safely performed; and
- (b) suitable procedures have been adopted to ensure that all existing or potential sources of ignition have been eliminated or effectively controlled.

(2) Where testing procedures are used, tests shall be conducted at intervals to ensure the continuing safety of workers.

(3) Burning, welding or cutting shall not be done where there is a danger of extreme heat coming into contact with a concrete surface unless that surface is protected from the source of heat.

(4) Suitable safety devices to prevent reverse gas flow and to arrest a flashback shall be installed according to the manufacturer's instructions on each hose in an oxygen system between the torch and the regulator.

[Back to Top](#)

#### **Ventilation**

**454.** Effective local exhaust ventilation shall be used at a fixed work station to minimize worker exposure to harmful air contaminants produced by welding, burning or soldering.

[Back to Top](#)

#### **Coatings on metals**

**455.** A coating on metal which could emit harmful contaminants, including lead, chromium, organic materials, or toxic combustion products shall be removed from the base metal, whenever practicable, before welding or cutting.

[Back to Top](#)

#### **Receptacles for stubs**

**456.** Receptacles for electrode stubs shall be provided and used.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Respiratory protection**

**457.** Respiratory protective equipment shall be provided and worn where an effective means of natural, mechanical or local exhaust ventilation is not practicable.

## **PART XXII ACCESS AND EGRESS**

### [Back to Top](#)

### **Access, egress and movement**

**458.** (1) All workplaces shall have safe and appropriate means of access and egress.

(2) Work areas shall be arranged to allow the safe movement of workers, equipment and materials.

(3) An aisle or passageway designated for pedestrian traffic shall be clearly indicated by markings or other means and, where practicable, floor or grade markings shall be used.

(4) Practical means of emergency escape shall be provided from a work area in which work processes could create an immediate threat to workers, and where regular means of egress could be rendered dangerous or unusable.

(5) A walkway shall not be less than 50.80 centimetres wide and shall be accessible by means of a fixed ladder or stairway.

(6) A curb shall be installed on an elevated thoroughfare to prevent equipment from running off the open edge of the thoroughfare.

### [Back to Top](#)

### **Exits and doors**

**459.** (1) An emergency exit shall be designed and marked to provide quick and unimpeded exit, and periodic emergency drills shall be held to ensure workers' awareness of the availability of the exits.

(2) A door shall not open directly onto a stairway, but shall open onto a floor or a landing having a width that exceeds the swing of the door.

(3) A double-acting swing door shall be designed and installed to permit an adequate view through the door where the door presents a safety hazard.

(4) A transparent glass door or a glass panel that extends less than 30.48 centimetres from the floor and which could be mistaken for a doorway, shall be constructed of laminated, tempered or wired safety glass meeting the requirements of the National Building Code of Canada.

(5) Subsection (4) does not apply where the glass is fitted with bars, or other devices or markings which clearly indicate the presence and position of the door or panel.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Stairs**

**460.** (1) A flight of stairs with more than 4 risers shall be equipped with handrails as follows:

- (a) on all open sides of stairway;
- (b) on one side of an enclosed stairway 1.12 metres in width; and
- (c) on both sides of enclosed stairways over 1.12 metres wide.

(2) The height of the upper surface of a stair rail from and perpendicular to the forward edge of the tread shall be not less than 91.44 centimetres and not more than 1.07 metres.

### **PART XXIII DIVING AND OTHER MARINE OPERATIONS**

[Back to Top](#)

#### **Definitions**

**461.** In this Part

- (a) "lifejacket" means a device that, when worn correctly, provides a specified buoyancy that turns the wearer face-up on entering the water and keep him or her in this position;
- (b) "master" means a person in overall command of a commercial fishing vessel but does not include a pilot; and
- (c) "personal flotation device" means a device that, when worn correctly, provides a specified buoyancy to support a conscious person in an upright or backward leaning position, but is not designed to turn a person from a face-down to a face-up position in the water.

[Back to Top](#)

#### **Wharves, platforms, etc.**

**462.** (1) Floors, platforms and decks of wharves and floating equipment shall be kept in good repair and free from hazards.

(2) Clear passageway shall be provided on a wharf deck in an area where lines may be handled.

(3) Curbs and bullrails shall be installed on open sides of floats, docks, wharves, piers and other areas where mobile equipment is used.

(4) Curbs or bullrails shall be of substantial construction and shall be a height of at least 25.40 centimetres above the deck level.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Ladders and gang planks**

**463.** (1) A dock, wharf or pier shall be provided with ladders regularly spaced at intervals not exceeding 30.5 metres about its perimeter and which extend from the deck to at least one metre below water level.

(2) A fixed or portable ladder, gangplank or other safe means shall be provided and used where necessary to board and leave floating equipment.

(3) Portable means of access shall be secured to prevent dislodgement.

(4) A gangplank shall be provided with a guardrail in accordance with section **28**, and where practicable, equipped with intermediate rails.

(5) The surface of a gangplank shall be provided with a means to prevent slipping.

[Back to Top](#)

#### **Lifesaving equipment**

**464.** (1) Appropriate lifesaving equipment shall

(a) be provided and maintained for the rescue of a worker in danger of drowning; and

(b) be positioned at intervals not exceeding 50 metres in conspicuous locations as near as practicable to the danger area.

(2) A throwing line fitted to a lifebuoy or similar equipment shall be of suitable size and length and made of buoyant material.

(3) Lifesaving equipment shall meet the requirements of standards acceptable to the minister.

(4) A suitable boat shall be provided and kept ready for immediate use where a worker is employed in a situation where a boat is necessary for rescue or evacuation.

[Back to Top](#)

#### **Floating work platforms**

**465.** (1) A floating work platform shall be designed by a professional engineer or other person acceptable to the minister.

(2) A floating work platform shall be used in such a manner that a worker is not endangered by instability or excessive movement of the platform.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Personal flotation devices**

**466.** (1) Where a worker is employed under conditions which expose him or her to a risk of drowning, he or she shall wear a personal flotation device appropriate to the work environment and hazards.

(2) The personal flotation device referred to in subsection (1) shall be labelled and meet the requirements and standards of the Canadian General Standards Board.

(3) A personal flotation device or lifejacket is not required when a personal fall protection system, safety net or other satisfactory means is being used according to Part X.

(4) A personal flotation device shall not be dependent on manual manipulation to provide the buoyant effect.

[Back to Top](#)

#### **Occupational diving operations**

**467.** (1) The following standards respecting diving operations are adopted and constituted as part of these regulations:

(a) CAN/CSA -Z275.4-02 "Competency Standard for Diving Operations"; and

(b) CAN/CSA -Z275.2-04 "Occupational Safety Code for Diving Operations".

(2) Notwithstanding paragraph (1)(a), the following modifications to CAN/CSA -Z275.4-02 "Competency Standard for Diving Operations" apply to seafood harvesting and aquaculture diving operations:

(a) clause 7, SCUBA Supervisor (Restricted and Unrestricted) is struck and the following substituted:

(i) individuals who have successfully completed a five-day Surface Safety Attendant's course approved by the commission may supervise seafood harvesting and aquaculture diving operations.

[Back to Top](#)

#### **Instruction**

**468.** (1) Before the start of each fishing season, the master shall ensure that each crewmember is instructed in the operational characteristics of the fishing vessel including

(a) the location and use of safety equipment, engine room components and controls;

(b) deck equipment and rigging;



**LOGAN  
DRILLING  
GROUP**

- (c) navigation equipment and electronic aids;
- (d) fishing equipment and its use, including safe work practices for each fishery the vessel may be engaged in;
- (e) procedures for anchoring the vessel;
- (f) the location and use of emergency equipment, including firefighting and radio equipment; and
- (g) escape routes in the event of fire.

(2) A master shall ensure, where reasonably practicable, that the instruction required by subsection (1) results in each crewmember being able to apply the information where needed to protect his or her health and safety.

(3) A new crewmember joining the vessel shall be instructed in accordance with the requirements of this section at the time that he or she joins the vessel.

[Back to Top](#)

#### **Slipping and tripping hazards**

**469.** (1) A work area on a vessel shall be kept

- (a) clear of unnecessary obstructions; and
- (b) free of slipping and tripping hazards.

(2) Decks shall have non-skid surfaces except in those locations where a smooth deck is required for handling fish.

(3) Tools and equipment shall be securely stowed when not in use.

[Back to Top](#)

#### **Galley requirements**

**470.** (1) A galley stove on a vessel shall be fitted with rails or other means to restrain the movement of cooking utensils, and to prevent inadvertent contact by a crewmember.

- (2) Stove fuel supply tanks and line
  - (a) shall be fitted with a shutoff valve at the tank; and
  - (b) shall not be located directly above the stove.

(3) Galley stoves shall

- (a) be secured to prevent movement; and



**LOGAN  
DRILLING  
GROUP**

- (b) have sufficient clearance to permit the effective cleanup of oil and grease.

**PART XXIV  
WOODWORKING AND WOOD PRODUCTS MANUFACTURING**

[Back to Top](#)

**Circular saws**

**471.** (1) A circular saw having a rip-type tooth shall be provided with non-kickback fingers or dogs located so that they oppose the thrust or tendency of the saw to pick up the material or to throw it back and the dogs shall be designed to provide adequate holding power for the thickness of the material being cut.

(2) A hand fed circular rip saw shall be equipped with a splitter or spreader designed so that material is prevented from binding on the saw blade and the saw withstands work stresses.

(3) A spreader referred to in subsection (2) shall be attached so that it remains in alignment with the saw, even when either the saw or table is tilted, and shall be placed so that the space between the spreader and the back of the saw when the largest blade is mounted in the machine does not exceed 1.27 centimetres.

(4) The use of a spreader or splitter in connection with grooving, dadoing or rabbeting is not required but on completion of these operations, the spreader or splitter shall be replaced immediately.

(5) A rip-saw shall be located so that a worker cannot work in line with the saw unless protected by a barrier to prevent him or her from being struck by material kicked back by the saw.

(6) A swing cut-off saw shall be provided with an effective device to return the saw automatically to the back of the table when released at a point of its travel and the functioning of the device shall not depend on a fibre rope, cord or spring.

(7) Where a counterweight is used on a swing cut-off saw, it shall be provided with a substantial safety chain or cable or shall be otherwise secured against falling wherever there is danger to a worker.

(8) A swing saw shall be provided with a limit chain, or other equally effective device to prevent the saw from swinging beyond the front of the table or beyond a forward position where the gullets of the lowest saw teeth rise above the table top.

(9) A swing saw shall be prevented from rebounding by a latch or other effective device.

(10) A radial arm saw cutting table shall be of a width that no part of the saw blade overhangs the forward edge of the table, or a stop shall be installed to limit the forward travel of the saw to that effect.

(11) An operator of a swing cut-off saw shall take a position so that no part of his or her body is in line with the saw and an operating handle shall be on the side of the saw from which the material is fed and operated by the hand closest to the saw.



**LOGAN  
DRILLING  
GROUP**

(12) A dull, badly set, improperly filed or improperly tensioned saw or an inserted-tooth saw with poorly fitting shanks or worn bits shall be immediately removed from service.

(13) A hand-fed tenoning machine shall have a device which holds the material being cut.

(14) A hand-held circular saw shall have a guard which automatically adjusts to the thickness of the material being cut, and which, when the saw is withdrawn from the material, completely covers the cutting area of the blade.

(15) An operator shall visually inspect a saw before use and a concern identified during the inspection shall be adequately addressed before the saw is used.

### [Back to Top](#)

#### **Operator protection**

**472.** (1) Where material is manually fed to equipment which does not have a means to prevent workers' fingers entering the dangerous point of operation, a special hand tool shall be used.

(2) A template, jig, or pushstick shall be used where there is a risk of injury to a worker's hands when feeding woodworking machinery.

(3) Where the use of a guard on woodworking machinery is clearly impracticable for a specific operation, the guard may be removed, but an appropriate pushstick, jig, feather board or similar device shall be used to prevent the operator encroaching into the cutting area, and upon completion of the operation the guard shall be replaced.

(4) A guard may otherwise only be removed where the guard itself creates a hazard, or where its removal is necessary for maintenance.

(5) A machine requiring hand-fed or manual-fed operations shall be equipped with a device to hold the material being cut.

(6) Where a knife, saw, cutting head or other sharp-edged device is handled or transported, the cutting edge shall be guarded or other methods adopted to minimize the danger to a worker.

(7) Where loads of veneer are stacked in the vicinity of work areas or passage ways, they shall be rigidly supported and there shall be at least 3 spacing blocks between unit loads.

### [Back to Top](#)

#### **Cutting heads**

**473.** (1) A hand-fed wood jointer with a horizontal head shall be equipped with a cylindrical cutting head.

(2) All knives and cutting-heads of woodworking machines shall be kept sharp, properly adjusted and firmly secured.

(3) Where 2 or more knives are used in one head, they shall be properly balanced.





**LOGAN  
DRILLING  
GROUP**

(4) A cutting head on a woodworking tool or piece of equipment, including a router, shaper and sticker shall be

- (a) properly adjusted and secured; and
- (b) fitted with a protective hood that is sufficiently strong to contain flying metal fragments in the event that the cutting head components fail.

#### **PART XXV FORESTRY OPERATIONS**

#### [Back to Top](#)

#### **Felling**

**474.** (1) Snags or dangerous stubs which may interfere or create a hazard shall be cleared away before a tree is felled.

(2) A worker shall not work closer than 30.48 metres from another worker who is in the act of felling a tree unless he or she is assisting that person.

(3) When workers are strip-cutting and felling trees, they shall not work opposite each other or closer than 30.48 metres on adjacent strips unless an uncut strip is left between.

(4) Before the felling cut is started, a tree shall be under-cut in the direction it is to be felled.

(5) When there is a lodged tree, an employer shall ensure that

- (a) the immediate area of the lodged tree is properly marked or flagged to alert another of the hazard;
- (b) the tree is felled as soon as possible using appropriate equipment;
- (c) the tree is not climbed by a worker; and
- (d) the tree is not lowered by felling another tree onto the lodged tree or by cutting a supporting tree.

(6) An employer or contractor shall ensure that no worker, other than the worker who is felling a lodged tree, enters the felling area unless it is safe to do so.

(7) A worker shall not stand on a tree or log when de-limbing it.

(8) Once a felling cut has been started on a tree, a worker shall not leave the tree to carry on other work until felling has been completed.

(9) A decayed or partially decayed tree or stub shall not be used as a block tree.

(10) A decayed or partially decayed tree or stub which constitutes a hazard at a yard or bucking and piling area shall be felled before the site is used.





**LOGAN  
DRILLING  
GROUP**

(11) A choker cable, twitching chain or dog shall be released and pulled away from the log or tree before it is slashed, bucked or measured.

(12) An axe shall not be used to cut wire rope.

(13) A skidder's winch shall only be operated from the seat unless remote controls are used or the worker is letting out cable.

### [Back to Top](#)

#### **Brush saws**

**475.** An employee who operates a brush saw or a clearing saw shall

- (a) operate and maintain the saw in accordance with the manufacturer's specifications;
- (b) ensure that the saw is equipped with an adequate blade guard;
- (c) maintain a minimum 10 metre distance from another person while operating the saw;
- (d) regularly inspect the blade and file it when necessary;
- (e) replace the blade at the first sign of cracks or fractures;
- (f) fit the saw only with blades and component parts specified by the manufacturer;
- (g) use a harness suitable for use with the saw;
- (h) ensure that the harness is well maintained and properly adjusted and that the emergency release on the harness functions properly;
- (i) stop the engine before a manual adjustment, cleaning, clearing of debris or other work is carried out on the blade or blade guards; and
- (j) not start the saw while it is attached to the harness.

### [Back to Top](#)

#### **Hauling**

**476.** (1) A truck, trailer or semitrailer used for transporting logs shall be equipped with bunks and stakes of adequate design and construction to safely perform their intended function.

(2) A stake referred to in subsection (1) shall be constructed so that keeper pins are secured against unintended release.

(3) A worker shall not ride on logs, pulpwood or other material loaded on or drawn by a motor vehicle while it is in transit.



**LOGAN  
DRILLING  
GROUP**

(4) A road, bridge, elevated platform or other structure used by a vehicle transporting workers, logs or other forest products in forestry operations shall be constructed and maintained to a standard that permits safe transit.

(5) The open sides of a bridge, elevated truck weigh scale and associated elevated ramp approach, and other elevated structures used by logging trucks shall be equipped with substantial and well secured continuous bull rails to prevent vehicles from running off the structure that are of sufficient height and in any event not less than 25 centimetres high.

## **PART XXVI ELECTRICAL OPERATIONS**

### [Back to Top](#)

#### **Definitions**

##### **477. In this Part**

- (a) "conductor" means a wire, cable or other metal component installed for the purpose of conveying electric current from one piece of equipment to another or to ground;
- (b) "control system" means a manual, remote, automatic or partially automatic system for controlling the operation of equipment;
- (c) "electrical equipment" includes machinery, a plant, works, wires, pipes, poles, conduits, apparatus, appliances and equipment, designed or used or intended for use for or in connection with the generation, transmission, supply, distribution or use of electrical energy for any purpose;
- (d) "high voltage" means a potential difference (voltage) of more than 750 volts between conductors or between a conductor and ground;
- (e) "isolated" means that normal sources of energy have been disconnected by opening and securing all associated switches, and that mechanical equipment has been rendered and secured non-operative by disconnecting, stopping, depressurizing, draining, venting or other effective means;
- (f) "low voltage" means a potential difference (voltage) from 31 to 750 volts inclusive, between conductors or between a conductor and ground;
- (g) "power system" means a plant and equipment essential to the generation, transmission or distribution of electricity, including a plant or equipment that is out of service, being constructed or being installed; and
- (h) "safety protection guarantee" means an assurance that a power system or part of the power system is isolated and will remain isolated.

### [Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### Electrical requirements

**478.** (1) An electrical installation, equipment, apparatus and appliance shall conform to the requirements of the Canadian Electrical Code as adopted in the *Electrical Regulations* under the *Public Safety Act* .

(2) Only a worker qualified to work on electrical conductors and equipment shall be authorized to do the work.

(3) Work shall not be done on an energized electrical conductor or equipment unless a hazard assessment is completed that includes determining the number of qualified workers that should be present while the work is being performed.

### [Back to Top](#)

### Poles and structures

**479.** Before a worker climbs or is supported by a pole or structure, or before work is done that may affect its stability

- (a) the pole or structure shall be assessed for soundness and stability;
- (b) where there is doubt concerning the soundness or stability, the pole or structure shall be effectively supported before wires or cables are changed, and the supports shall be left in place until workers are clear of the pole or structure; and
- (c) poles shall be installed or removed using equipment manufactured for this purpose or by a method acceptable to the minister.

### [Back to Top](#)

### Service rooms

**480.** Where practicable, a service room or electrical vault shall be used only for the purpose for which it was intended.

### [Back to Top](#)

### Space around equipment

**481.** (1) Passageways and working space around electrical equipment

- (a) shall be kept clear of obstructions and arranged to give authorized persons ready access to all parts requiring attention; and
- (b) shall not be used for storage.

(2) Flammable material shall not be stored or placed close to electrical equipment.

(3) A worker shall not use oil-base paint or other volatile flammable substance in an electrical substation or confined area where high voltage electrical current passes through.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Testing equipment**

**482.** (1) Electrical test equipment may be used by qualified workers if it meets the requirements of

- (a) CSA Standard C22.2 No. 160, "Voltage and Polarity Testers"; or
- (b) CSA Standard CAN/CSA -22.2 No. 231 Series-M89, CSA "Safety Requirements for Electrical and Electronic Measuring and Test Equipment".

(2) Appropriate safe work procedures shall be established and followed for testing electrical equipment and circuits.

[Back to Top](#)

#### **Powerline hazards training**

**483.** A person shall not operate a mobile crane, boom truck or similar equipment that has the capacity of encroaching on a power line without having first completed a safety training program on power line hazards required by the commission.

[Back to Top](#)

#### **Low voltage electrical equipment - disconnection and lockout**

**484.** (1) Low voltage electrical equipment shall be completely disconnected and locked out where required by Part IX before work is started on it.

(2) Where it is not practicable to completely disconnect low voltage electrical equipment, work shall be performed in accordance with an electrical safety program in accordance with a standard acceptable to the minister that

- (a) includes emergency procedures and emergency release of victims;
- (b) requires the use of appropriate electrical protective equipment, including flame retardant clothing, voltage-related rubber gloves and cover up and other necessary live line tools;
- (c) provides that, where practicable, uncontrolled liquid is not permitted close to a worker working on the equipment;
- (d) prohibits the use of metal ladders, wooden ladders with wire reinforced side rails, metal scaffolds or metal work platforms; and
- (e) has available up to date diagrams.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Low voltage electrical equipment**

**485.** Before completing installation and after energizing low voltage electrical equipment, conspicuous signs visible to a worker shall be placed close to the equipment stating "Danger, Energized Equipment".

[Back to Top](#)

#### **Working close to low voltage energized equipment**

**486.** (1) Uninsulated, energized parts of low voltage electrical equipment shall be guarded by approved cabinets or enclosures unless the energized parts are in a suitable room or similar enclosed area that is accessible only by qualified persons.

(2) An entrance to a room or other guarded location containing uninsulated and exposed energized parts shall be marked with a conspicuous warning sign limiting entry.

(3) Where uninsulated energized parts are not guarded with approved cabinets or enclosures

(a) a suitable barrier or cover shall be provided where a worker unfamiliar with the hazards is working within the limited approach boundary of 1.07 metres of the uninsulated, energized parts; or

(b) a worker shall be informed of the potential hazards and provided with and follow appropriate written safe work procedures.

[Back to Top](#)

#### **Low voltage electrical equipment - controls**

**487.** An electrical distribution switch, circuit breaker and control shall be clearly marked to indicate the equipment it serves.

[Back to Top](#)

#### **Grounding portable low voltage electrical equipment**

**488.** (1) Portable electrical equipment having double insulation or equivalent protection and so marked, is not required to be grounded.

(2) Portable electrical equipment, required to be grounded and not permanently connected to the wiring system, shall be effectively grounded by the use of approved cords and polarized plugs inserted in grounded polarized receptacles.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

#### **Low voltage electrical equipment - ground fault interrupters**

**489.** (1) When used outdoors or in a wet or damp location, portable electrical equipment shall be protected by an approved, CSA Certified, ground fault circuit interrupter.

(2) A ground fault circuit interrupter shall not be used as a substitute for grounding.

[Back to Top](#)

#### **Isolation and lockout**

**490.** (1) High voltage electrical equipment shall, where practicable, be completely isolated, grounded and locked out where required by these regulations before work is started on it.

(2) Where it is not practicable to completely isolate high voltage electrical equipment an employer shall conduct a formal hazard assessment and develop an electrical safety program that includes

- (a) written safe work procedures;
- (b) the number of qualified persons required to be present while the work is being done; and
- (c) providing appropriate electrical protective equipment, including rubber blankets, hoses, hoods, gloves and live line tools that shall be selected, used, stored, tested and maintained in accordance with a standard acceptable to the minister.

(3) A worker shall not work on an energized electrical conductor or equipment, unless procedures satisfactory to the minister are used and the worker is provided with and trained in the use of special tools, approved for use by an authority acceptable to the minister.

[Back to Top](#)

#### **Warning signs**

**491.** Before completing installation and after energizing high voltage electrical equipment, conspicuous signs visible to a worker shall be placed close to the equipment stating "Danger, Energized Equipment".

[Back to Top](#)

#### **De-energized high voltage systems - isolation and lockout**

**492.** (1) Before working on a high voltage power system that, for reasons of safety, shall be de-energized, the worker in charge shall ensure that the part of the system being worked on is isolated and grounded and locked out where required by these regulations.

(2) A barrier or other form of distinctive identification shall be used to differentiate high voltage electrical equipment which has been de-energized for safety reasons from similar energized equipment at the work location where a lack of identification would result in undue risk to workers.



**LOGAN  
DRILLING  
GROUP**

- (3) Where it is impracticable to lock out a power system or part of a power system,
  - (a) the boundaries of the power system or part shall be clearly defined;
  - (b) written work procedures respecting safety protection guarantees and complying with the requirements of sections **493** to **497** shall be followed; and
  - (c) major equipment used to establish safety protection guarantees shall be uniquely identified at a conspicuous place on or near the equipment.

[Back to Top](#)

#### **Person in charge**

**493.** (1) Only one person at a time shall be assigned as the person in charge with the exclusive authority to establish the conditions for, and to issue safety protection guarantees for, the power system or part of it.

- (2) The person in charge referred to in subsection (1) shall
  - (a) ensure that the status of the power system or assigned part of the power system is accurately represented on a mimic display;
  - (b) maintain a log of switching details, safety protection guarantees and operational events; and
  - (c) authorize the commencement of work on the power system or assigned part of it.

(3) There shall be an effective communication system between the person in charge and workers doing the work.

(4) Only a worker specifically authorized by an owner may receive a safety protection guarantee or do work on the power system or assigned part of the power system.

[Back to Top](#)

#### **Switching sequences**

**494.** Where a switching sequence requires the operation of 3 or more devices, a written switching order shall be prepared and followed.

[Back to Top](#)

#### **Isolating devices**

**495.** (1) An isolating device used to provide a safety protection guarantee shall provide for visual verification of the opening of an isolation point.

(2) A lockable isolating device shall be locked in the position or condition required to protect a worker before work commences under a safety protection guarantee.



**LOGAN  
DRILLING  
GROUP**

(3) A distinctive "DO NOT OPERATE" tag shall be placed securely on an isolating device used for a safety protection guarantee.

[Back to Top](#)

#### **Grounding and blocking**

**496.** (1) While a safety protection guarantee is in effect, the equipment to be worked on shall be tested to verify isolation before grounding and blocking begin.

(2) After the testing referred to in subsection (1) has been done, the person at the worksite responsible for a crew shall verify that the required grounding and blocking devices are in place before work begins.

(3) Grounding and blocking of equipment that may be hazardous to workers shall be carried out as closely as practicable to the worksite.

(4) Where grounding and blocking is not safe or practicable, written safe work procedures acceptable to the minister shall be followed.

(5) Grounding and blocking devices may be removed for the purpose of conducting tests after lockout procedures have been followed.

[Back to Top](#)

#### **Multiple authorities**

**497.** Where a safety protection guarantee involves 2 or more power systems or 2 or more persons in charge of different parts of a system, appropriate written procedures shall be established and followed to ensure that the safety protection guarantee is effective.

[Back to Top](#)

#### **Minimum clearance - high voltage equipment and conductors**

**498.** (1) A worker shall not cause or permit material to be piled, stored or handled, a scaffold to be erected or dismantled or mobile crane, boom truck or similar equipment to operate in an area where overhead or underground conductors are located that are capable of energizing the material, mobile equipment or its load unless the employer has obtained in writing the voltage and minimum clearance distance required by the power utility.

(2) Where the written clearance referred to in subsection (1) is unavailable from the power utility, a minimum 5.5 metres shall be maintained.

(3) An employer shall ensure that at least the minimum applicable distance specified in the following table is maintained between exposed, energized high voltage electrical equipment and conductors and a worker, work, tool, machine, equipment or material, except as otherwise permitted by this Part or a standard acceptable to the minister:



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

Voltage Phase to Phase	Minimum Distance
Over 750 V to 75 kV	3 metres
Over 75k V to 250 kV	4.5 metres
Over 250 kV to 550 kV	6 metres

(4) An employer shall accurately determine the voltage of energized electrical equipment or conductor and the minimum distance from it required under subsection (3).

#### Assurance in writing

**499.** (1) Where the minimum distance set out in subsection **498** (3) cannot be maintained because of the circumstances of work or the inadvertent movement of persons or equipment, an assurance in writing on a form acceptable to the minister and signed by a representative of the owner of the power system, shall be obtained.

(2) An assurance under subsection (1) shall state that while the work is being done, electrical equipment and conductors will be displaced or rerouted from the work area, where practicable.

(3) Where compliance with subsection (2) is not practicable, an assurance under subsection (1) shall state that the electrical equipment will be isolated and grounded, but where isolation and grounding is not practicable, the assurance shall state that the electrical equipment will be visually identified and guarded.

(4) Safeguards specified in an assurance under subsection (1) shall be in place before work commences and shall be effectively maintained while work is taking place.

(5) Where guarding is used,

(a) neither equipment nor unqualified persons shall touch the guarding; and

(b) a safety watch shall be designated, or range limiting or field detection devices acceptable to the minister shall be used.

(6) An assurance under subsection (1) shall be available for inspection at the workplace, as closely as practicable to the area of work and shall be made known to all persons with access to the area.

[Back to Top](#)

#### Assurance not practicable

**500.** (1) Where exposed high voltage electrical equipment and conductors cannot be isolated, rerouted or guarded, work shall not be done within the minimum distance specified under subsection **498** (3) until approval is obtained from the minister and the following precautions are taken:





**LOGAN  
DRILLING  
GROUP**

- (a) the area within which equipment or materials are to be used shall be barricaded and supervised to restrict entry only to those workers necessarily engaged in the work;
- (b) a safety watcher shall be designated; and
- (c) a positive means shall be provided for the safety watcher to give a clear, understandable stop signal to workers in the area, and watcher shall not give the stop signal by another means.

(2) While equipment is in motion in an area in proximity to energized electrical equipment or conductors, a person other than the equipment operator shall not touch a part of the equipment or the material being moved by it.

(3) A person shall not move a load or rigging line from its position of natural suspension where the load or rigging line is in proximity to an energized electrical conductor or equipment.

[Back to Top](#)

#### **Emergency work**

**501.** (1) Sections **497** to **500** do not apply to an emergency action close to energized high voltage electrical equipment or conductors that is carried out by a worker who has undergone a course of instruction approved by the minister.

(2) During an emergency action referred to in subsection (1), every reasonable precaution shall be taken to control hazards, including, where practicable,

- (a) restricting entry into the area within which equipment or materials are to be moved to a worker necessarily engaged in the work;
- (b) designating a safety watcher;
- (c) where equipment is in motion, preventing a person other than the equipment operator from touching a part of the equipment or the material being moved by it; and
- (d) requiring an equipment operator to operate the controls from
  - (i) the seat provided on the equipment,
  - (ii) a metal stand that is integral with the frame of the equipment and clear of the ground, or
  - (iii) a metallic mat bonded to the frame of the machine and located on the ground beside the machine.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

#### **Authorization by owner**

**502.** A qualified worker may work within the minimum distances to energized high voltage electrical equipment and conductors specified in subsection **498** (3) provided that the worker is authorized by the owner of the power system and uses work procedures acceptable to the minister.

[Back to Top](#)

#### **Tree pruning etc. - preliminary inspection**

**503.** Before commencing tree pruning or felling close to energized high voltage overhead conductors, the worksite shall be inspected by a qualified person, authorized by the owner of the power system, to identify a hazard, including situations where a part of the tree to be pruned or felled is within the applicable minimum distance from an energized conductor specified in subsection **498** (3) or may fall within that distance.

[Back to Top](#)

#### **Tree pruning etc. in hazardous area**

**504.** Tree pruning or falling shall not commence in a hazardous area until

- (a) an assurance is issued by the owner of the power system in accordance with section **499** that a reclose feature is disabled; and
- (b) a worker is informed of the voltages of the conductors.

[Back to Top](#)

#### **Qualifications**

**505.** (1) Tree pruning or falling within the minimum distances specified in subsection **498** (3) from overhead energized high voltage conductors shall be carried out by a qualified worker who has been authorized by the owner of the power system to perform the work.

(2) Tree pruning or falling is not permitted within the minimum distances specified in subsection **498** (3) from overhead high voltage energized conductors unless

- (a) a qualified worker is present at the site and directing the work; and
- (b) at least one additional person, trained in appropriate emergency rescue procedures, is present.

[Back to Top](#)

#### **Control systems - general requirements**

**506.** (1) A control system shall be designed, installed, operated and maintained by a qualified person in accordance with a standard acceptable to the minister.



**LOGAN  
DRILLING  
GROUP**

(2) Where practicable and required to minimize risk to workers, a control system shall be designed so that

- (a) the controlled equipment cannot be inadvertently activated;
- (b) an effective basic diagnostic capability is incorporated;
- (c) hardwired emergency stop devices are provided at operator stations; and
- (d) operator controls other than emergency stop devices can be activated at only one station at a time.

(3) A control system shall be used to prevent automatic startup after a power interruption or low voltage occurrence where automatic startup in those circumstances is likely to create a hazard to workers.

(4) A control system shall be designed, where practicable, so that the controlled equipment does not create a hazard to workers where the system fails or is shut down.

(5) Equipment operated by a new or altered control system shall not be used until the control system has been thoroughly checked and tested to verify that it functions in the intended manner.

(6) An employer shall ensure that there is up-to-date documentation that is readily available to an affected worker that describes the design, installation, operation and maintenance of a control system.

(7) Control system hardware shall be protected from circumstances that could adversely affect the performance of the system, including mechanical damage, vibration, extreme temperatures or humidity level, high electromagnetic field levels and power disturbances.

(8) Written safe work procedures shall be developed for the use of equipment operated by a control system, including lockout procedures as required by these regulations.

[Back to Top](#)

#### **Programmable control systems**

**507.** (1) Documentation provided for a programmable control system shall include a copy of the control program that allows the equipment to be reprogrammed where necessary to ensure the safe operation of the system.

- (2) Only a qualified person may have access to the installed control system software.

[Back to Top](#)

#### **Automatic control systems**

**508.** Where practicable and required to prevent a hazard to workers, a control system shall be designed so that during an automatic sequence



**LOGAN  
DRILLING  
GROUP**

- (a) an operator may make an emergency stop of the controlled equipment;
- (b) an operator may, where safe, be allowed manual control of the equipment; and
- (c) the sequence aborts where a protective timer completes its assigned time without an expected event occurring.

[Back to Top](#)

#### **Remote control systems**

**509.** (1) The maximum distance from which an operator may control equipment operated by a remote control system shall be specified by the manufacturer.

- (2) Written safe procedures shall be established that
  - (a) specify the maximum distance from which the operator is allowed to remotely control the equipment; and
  - (b) ensure that a worker remains at a safe distance from remotely controlled moving parts and a remotely controlled mobile machine.

[Back to Top](#)

#### **Wireless remote control**

**510.** A wireless remote control system shall incorporate

- (a) error checking to prevent the controlled equipment from responding to corrupt data; and
- (b) identification coding methods to prevent a transmitter other than the designated transmitter from operating the equipment.

### **PART XXVII CONFINED SPACE ENTRY**

[Back to Top](#)

#### **Confined space entry**

**511.** (1) An employer shall perform an assessment of the work area to determine whether it contains a confined space.

- (2) For the purpose of this Part, "confined space" means an enclosed or partially enclosed space that
  - (a) is not designed or intended for human occupancy except for the purpose of performing work;



**LOGAN  
DRILLING  
GROUP**

- (b) has restricted means of access and egress; and
- (c) may become hazardous to a person entering it as a result of
  - (i) its design, construction, location or atmosphere,
  - (ii) the materials or substances in it, or
  - (iii) any other conditions relating to it.

(3) A worker shall not work in a confined space after January 1, 2013 unless he or she has completed a confined space entry program prescribed by the commission.

(4) An employer shall inform a worker who may have to work in a confined space of a hazard by posting signs or other equally effective means of advising of the existence of and dangers posed by confined spaces.

### [Back to Top](#)

#### **Corrective precautions**

**512.** (1) Upon first entering a confined space, a worker shall assume the space is hazardous until the contrary is demonstrated.

- (2) An employer shall ensure that a worker does not enter a confined space until
  - (a) an adequate assessment of the hazards related to the confined space has been carried out;
  - (b) a source containing a hazardous substance leading to the confined space is safely and completely blocked off or disconnected;
  - (c) a test required under subsection (11) has been completed;
  - (d) the worker is qualified to safely enter and perform duties within the confined space;
  - (e) a written work permit documenting the tests and safety precautions has been completed; and
  - (f) a set of written safe work procedures has been developed and a worker has been instructed in these procedures.
- (3) The assessment referred to in paragraph (2)(a) shall be recorded in writing and shall consider, with respect to each confined space,
  - (a) the hazards that may exist due to the design, construction, location, use or contents of the confined space; and
  - (b) the hazards that may develop while work is done inside the confined space.
- (4) The record of the assessment may be incorporated into an entry permit.





**LOGAN  
DRILLING  
GROUP**

(5) Where 2 or more confined spaces are of similar construction and present the same hazards, their assessments may be recorded in a single document, but each confined space shall be clearly identified in the assessment.

(6) The employer shall appoint a person with adequate knowledge, training and experience to carry out the assessment and shall maintain a record containing details of the person's knowledge, training and experience.

(7) The assessment shall contain the name of the person who carries out the assessment.

(8) The person shall sign and date the assessment and provide it to the employer.

(9) On request, the employer shall provide copies of the assessment and of the record to

(a) the joint health and safety committee or the health and safety representative; or

(b) every worker who performs work to which the assessment relates, where the workplace has no joint health and safety committee or health and safety representative.

(10) The employer shall ensure that the assessment is reviewed as often as necessary to ensure that the assessment referred to in paragraph (2)(a) remains current.

(11) Appropriate tests for harmful vapours, gasses, fumes, mists, dusts or explosive substances and oxygen deficiency shall be made and recorded

(a) before entry into the confined space;

(b) after an interruption in the work procedures; and

(c) at appropriate intervals.

(12) Where a test made under subsection (11) indicates an unsafe condition, the confined space shall be ventilated or cleaned or both and periodically retested to ensure that:

(a) the oxygen content is between 20% and 22%;

(b) the concentration of flammable substances is maintained below 10% of the lower explosive limit (LEL) of that substance or substances; and

(c) a worker's exposure to harmful substances is maintained at acceptable levels in accordance the TLVs established by ACGIH.

(13) Where a test under subsection (11) indicates the presence of a harmful or explosive substance and it is not feasible to provide a safe respirable atmosphere, an employer shall ensure that

(a) a worker entering the confined space is provided with and wears respiratory and personal protective equipment appropriate to the hazards likely to be encountered; and

(b) where a flammable or explosive gas or liquid is present all sources of ignition are controlled or eliminated.





**LOGAN  
DRILLING  
GROUP**

(14) Where control measures referred to in subsection (13) cannot be implemented, a worker shall leave the confined space.

(15) Tests made under in subsection (11) shall be performed by a person who has been adequately trained in the proper use of testing and monitoring equipment.

(16) Equipment used in testing and monitoring shall be calibrated and monitored according to the manufacturer's instructions.

(17) The completed permit referred to in paragraph (2)(e) shall be made available at the time of entry to all authorized personnel by posting it at the entry portal or by another effective means.

### [Back to Top](#)

#### **Work procedures**

**513.** (1) An employer shall ensure that a worker who is required or permitted to enter a confined space in which a harmful atmosphere exists or may develop or where he or she may become entrapped by material

- (a) wears appropriate retrieval equipment which would keep the worker in a position to be rescued; and
- (b) has a life-line attached to the retrieval equipment which is tended at all times by a person, stationed outside the entrance to the confined space who shall be equipped for and capable of effecting rescue

and the employer shall prevent entanglement of life-lines and other equipment where one or more workers enter the confined space.

(2) Notwithstanding subsection (1), the use of a lifeline is not required where an obstruction or other condition makes its use impractical or unsafe but, in that case, an employer shall implement procedures to ensure the safety of the worker.

(3) Where a worker is required to enter a confined space his or her employer shall ensure that an attendant

- (a) is assigned the worker;
- (b) is stationed outside and near
  - (i) the entrance to the confined space, or
  - (ii) where there is more than one entrance to the confined space, the one that best allows the attendant to perform his or her duties under subsection (4);
- (c) is in continuous communication with the worker using the means of communication described in the relevant safe work procedure; and
- (d) is provided with a device for summoning an adequate rescue response.



**LOGAN  
DRILLING  
GROUP**

(4) An attendant shall not enter a confined space and shall, in accordance with the required safe work procedure,

- (a) monitor the safety of the worker in the confined space;
- (b) provide assistance to him or her; and
- (c) summon an adequate rescue response where one is required.

[Back to Top](#)

#### **Entry into confined space**

**514.** A confined space shall be entered only where

- (a) the opening for entry and exit is sufficient to allow safe passage of a person wearing personal protective equipment;
- (b) mechanical equipment in the confined space is
  - (i) disconnected from its power source, and
  - (ii) locked out and tagged;
- (c) pipes and other supply lines whose contents are likely to create a hazard are blanked off;
- (d) measures have been taken to ensure that, where appropriate, the confined space is continuously ventilated;
- (e) liquid in which a person may drown or a free-flowing solid in which a person may become entrapped has been removed from the confined space;
- (f) adequate explosion-proof illumination is provided where appropriate; and
- (g) adequate barriers are erected to prohibit unauthorized entry.

[Back to Top](#)

#### **Explosives or flammable atmosphere**

**515.** An employer shall ensure that a worker does not enter or remain in a confined space that contains or is likely to contain an explosive or flammable gas or vapour, unless

- (a) the worker is performing only inspection, work that does not produce a source of ignition and, in the case of an explosive or flammable gas or vapour, the atmospheric concentration is less than 25% of its lower explosive limit, as determined by a combustible gas measuring instrument;
- (b) the worker is performing only cold work and, in the case of an explosive or flammable gas or vapour, the atmospheric concentration is less than 10% of its lower explosive limit as determined by combustible gas instruments; or



**LOGAN  
DRILLING  
GROUP**

- (c) the worker is performing hot work and all of the following conditions are satisfied:
- (i) in the case of an explosive or flammable gas or vapour, the atmospheric concentration is less than 5% of its lower explosive limit, as determined by a combustible gas instrument,
  - (ii) the atmosphere in the confined space does not contain, and is not likely to contain while a worker is inside, an oxygen content greater than 23%,
  - (iii) the atmosphere in the confined space is monitored continuously,
  - (iv) the entry permit includes adequate provisions for hot work and corresponding control measures, and
  - (v) an adequate alarm system and exit procedures are provided to ensure that workers have adequate warning and are able to exit the confined space safely where either or both of the following occur, in the case of an explosive or flammable gas or vapour
    - (A) the atmospheric concentration exceeds 5% of its lower explosive limit, or
    - (B) the oxygen content of the atmosphere exceeds 23% by volume.

[Back to Top](#)

#### **Rescue from confined space**

**516.** An employer shall ensure that emergency rescue procedures are established and followed where workers are trained in the event of an accident or other emergency in or near the confined space, including immediate evacuation of the confined space.

### **PART XXVIII GENERAL MINING REQUIREMENTS**

[Back to Top](#)

#### **Definitions**

**517.** In this Part

- (a) "motor vehicle" means a vehicle propelled, driven or controlled otherwise than by muscular power, other than a trailer or a locomotive;
- (b) "trailer" means a vehicle which has no motive power of its own and which is attached to a truck, or truck tractor or other motor vehicle but does not include
  - (i) an implement of husbandry temporarily attached to another vehicle,
  - (ii) a side car attached to a motorcycle, or



**LOGAN  
DRILLING  
GROUP**

- (iii) a tow dolly designed to be used to tow another motor vehicle where one or more axles of the towed vehicle rest on the tow dolly;
- (c) "working face" means the surface from which variable material, overburden or waste material is being removed.

[Back to Top](#)

**Application**

**518.** This Part applies to a mine.

[Back to Top](#)

**Mine design**

**519.** (1) An employer of an underground mine or an open pit mine in which 3 or more benches are to be mined, shall

- (a) develop and maintain a mine design certified by a professional engineer assessing the ground stability of the active and proposed workings of the mine;
  - (b) operate the mine in accordance with the design;
  - (c) assess and update the design at least annually and before an alteration is made to the mine that may significantly affect the ground stability of the mine; and
  - (d) keep the design readily available at the mine site for review by an officer and by the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable .
- (2) The underground mine design shall consist of drawings, plans or specifications and shall
- (a) describe the geology of the mine including structural features;
  - (b) outline the geometry of existing and proposed excavations;
  - (c) describe previous occurrences of ground instability;
  - (d) describe the mining method including stope sequencing and blasting methods;
  - (e) specify the ground support system;
  - (f) describe measures planned and used to assess potential ground instability, including instrumentation and computer modelling;
  - (g) include ground control procedures;
  - (h) include blasting procedures to be used;
  - (i) include provisions for ground water control; and





**LOGAN  
DRILLING  
GROUP**

- (j) provide a geological characterization and composition analysis of the rock to be mined or quarried.
- (3) Where 3 or more benches are to be mined in an open pit, the open pit mine design shall consist of drawings, plans or specifications and shall include
  - (a) the general layout;
  - (b) bench heights and berm widths;
  - (c) ramp design;
  - (d) overall slopes;
  - (e) stability studies;
  - (f) blasting procedures to be used;
  - (g) provision for water removal;
  - (h) scaling techniques;
  - (i) additional wall support;
  - (j) a wall monitoring program; and
  - (k) the location of overburden and waste stockpiles.

### [Back to Top](#)

#### **Scaling procedures**

**520.** (1) During scaling procedures in a workplace, an employer shall not permit other work to be carried out that affects or could affect the safety of a worker carrying out a scaling procedure or a worker in the immediate area.

(2) Where workplaces, travelways or other areas of a mine cannot be maintained in a safe condition by scaling, the employer shall ensure that they are suitably supported by rock bolting, timber or shotcrete, or cased or lined.

- (3) Scaling bars shall
  - (a) be readily available to mine workers;
  - (b) be adequately dressed; and
  - (c) be of such length and rigidity that they can be used at a 45 ° angle from the horizontal.
- (4) A worker who is scaling using a scaling bar shall
  - (a) remain on a firm, stable surface;





**LOGAN  
DRILLING  
GROUP**

- (b) take up a stable position; and
- (c) ensure that there is a free space to allow for sudden retreat.

[Back to Top](#)

#### **Procedure where flow of gas**

**521.** (1) Where, during a drilling operation, a worker encounters a flow of gas from the rock, the worker shall immediately

- (a) evacuate the area and close it to all persons; and
  - (b) notify the worker's supervisor.
- (2) The employer shall
- (a) examine the area referred to in subsection (1) and identify the gas; and
  - (b) establish and enforce written safe work procedures by which the work can be continued safely.

[Back to Top](#)

#### **Examination of mine**

**522.** An employer at a mine shall ensure that a supervisor

- (a) examines, during each shift, the parts of the mine where work is being performed;
- (b) examines, at least once a week, the other portions of the mine not closed off under section **523** ; and
- (c) takes an action necessary to correct unsafe conditions noted during the examinations.

[Back to Top](#)

#### **Unventilated or unsafe mine area**

**523.** (1) An employer shall ensure that a section of a mine that is not ventilated or maintained in a safe condition

- (a) is effectively barricaded to prevent inadvertent entry; and
- (b) is posted with signs warning that entry is prohibited.

(2) Before a person enters or is permitted to enter a section of a mine that is not ventilated or maintained in a safe condition, the employer shall ensure that the atmosphere is tested and conditions are examined by a competent person and hazard control measures are implemented prior to entry.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Ground control procedures**

**524.** (1) An employer shall ensure that written ground control procedures are prepared for an underground mine to prevent the unplanned fall of rock.

- (2) The ground control procedures shall include the following details:
- (a) existing geological conditions, including the thickness of relevant seams;
  - (b) the type and thickness of strata between the roof and the surface and below the floor for a depth of 3 metres below the strata being mined;
  - (c) the mining methods to be used;
  - (d) hazards related to ground control and an outline of the manner in which these hazards will be handled;
  - (e) the planned width of openings and size of pillars;
  - (f) the method of permanent and temporary ground support, including
    - (i) pillars, mechanical devices or other methods to be used; and
    - (ii) the type, sequence and spacing of permanent and temporary ground support materials or devices;
  - (g) a plan showing the location, size and spacing of pillars, mechanical devices or other methods of support;
  - (h) the work procedures used to assess ground conditions;
  - (i) the work procedures used to install ground control devices;
  - (j) where instruments or devices are installed to monitor ground conditions, a description of how and when measurements will be taken and a description of how results will be recorded;
  - (k) the work procedures used to construct, inspect, maintain and regularly monitor the instruments and devices used to monitor the ground control system;
  - (l) a system that ensures that, on a plan included as part of the ground control procedures, a record is made of an unplanned fall of rock or a rockburst that
    - (i) impairs ventilation;
    - (ii) impedes the passage of persons;
    - (iii) causes injury to a person;



**LOGAN  
DRILLING  
GROUP**

- (iv) causes a person to withdraw from an area; or
  - (v) disrupts activities for more than one hour;
  - (m) an adequate testing procedure for the ground supports; and
  - (n) how the effectiveness of the ground control procedures will be evaluated.
- (3) An employer shall maintain a written record of the results obtained from an instrument or device used to monitor the ground control system and shall keep the record for at least 2 years after the earlier of the following dates:
- (a) the date that the underground area of the mine that is covered by the record becomes abandoned; and
  - (b) the date that the instrument or device is no longer used.

[Back to Top](#)

#### **Ground control log book**

- 525.** An employer shall maintain a ground control log book for surface and underground mines, showing
- (a) the time, date and location of all tests relating to the requirements of the ground control procedures;
  - (b) in the event there is ground movement in the mine, details of the records of the ground monitoring devices in the area affected before the ground movement;
  - (c) details of uncontrolled falls of ground;
  - (d) details of working ground, tension cracks or other signs of instability;
  - (e) details of rockburst and seismic events;
  - (f) damaged supports; and
  - (g) measurements taken from monitoring devices.

[Back to Top](#)

#### **Ground control**

- 526.** (1) A person shall not work or travel in an underground area of a mine unless that area has been assessed and secured in accordance with the ground control procedures established under section **524**.
- (2) Where a cap lamp does not provide adequate illumination for a person to assess ground conditions underground, an employer shall supply, and the person shall use, auxiliary lighting sufficient for effectively carrying out the assessment.



**LOGAN  
DRILLING  
GROUP**

(3) A worker at an active working face underground shall inspect the roof, sides and face of the work area for unsafe ground conditions before beginning work.

(4) A competent person shall install ground support devices required by the ground control procedures in a manner that is suitable for the ground conditions in the area.

(5) In an underground area of a mine where roof bolting is the primary means of ground support, warning devices shall be embedded in the roof to monitor downward movement in the roof strata.

(6) Travel ways used by workers underground shall be adequately supported by rock bolts and screened to 50% of the height of the walls from the roof.

[Back to Top](#)

### **Rock bolts**

**527.** (1) Rock bolts or similar devices installed in a mine on or after the effective date of these regulations shall comply with the following:

- (a) the requirements of CSA standard CAN/CSA-M430, "Roof and Rock Bolts, and Accessories"; or
- (b) generally accepted engineering principles.

(2) Rock bolts shall be properly installed and tested in accordance with the ground control procedures established under section **524**.

(3) Rock bolts shall be installed to within 1.5 metres of the face.

(4) The rock bolts shall be installed after each hole is drilled.

(5) A record of the tests required by subsection (2) shall be made available to an officer upon request.

[Back to Top](#)

### **Water accumulation in mine workings**

**528.** (1) An employer shall take precautions to prevent unsafe accumulations of water in raises, ore and waste passes, chutes and other mine workings used for the storage or transfer of ore, waste or fill.

(2) Where a raise, ore or waste pass, chute or other mine working containing ore, waste or fill could contain an unsafe accumulation of water, a worker shall not pull material from the place until his or her employer has implemented a written safe work procedure.

(3) Underground work shall not be done within 100 metres of the vertical plane expressing the margin of a body of water or water-saturated surface feature until the mine plans and work procedures have been approved by a professional engineer.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

### **Conveyor belts**

**529.** (1) An employer shall ensure that conveyor belts installed underground, in an enclosed building or closed in structure, or another place at a mine where, because of limited access, a fire could endanger the lives of workers,

- (a) are equipped with a device that guards against excessive slip or blockage between the belt and driving pulley; and
- (b) are made of flame retardant material or provided with an automatic fire extinguishing system that protects the entire length of the belt.

(2) Conveyor belts shall meet the requirements of CSA Standard CSA M422 "Fire-Performance and Antistatic Requirements for Conveyor Belting".

(3) A worker shall not ride on a conveyor belt.

(4) A worker shall not clean manually a conveyor belt or its rollers or pulleys while the belt is in motion.

(5) Servicing or cleaning up spillage on or around a moving conveyor belt shall be carried out only

- (a) where the conveyor system is so constructed that the work can be done safely and without removing a protective fence or guard; and
- (b) by a person fully trained and authorized by the employer to do the work.

[Back to Top](#)

### **Emergency stops, warning device and guarding**

**530.** An employer shall provide and maintain on a conveyor belt

- (a) guards that extend at least one metre from the pinch point at the head, tail, drive, snub and tension pulleys or drums;
- (b) a pull cord or emergency shut down device along the full length of the conveyor by means of which the conveyor can be stopped but not restarted;
- (c) a means to warn persons along the full length before the conveyor belt is started whenever the full length of the conveyor belt is not within sight of the starting control;
- (d) guards on the load bearing rollers, return rollers and idler assemblies within 2.13 metres of the ground, a walkway or platform;
- (e) guards along the take up pulleys or systems; and
- (f) guards or barriers along the counter weights and tensioning drums.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Conveyors general requirements**

**531.** (1) Conveyors that operate over areas used by workers shall be designed to prevent broken parts of the conveyor from falling into these areas.

(2) Return rollers or idler assemblies shall be guarded along the underside of the conveyors.

(3) Walkways and throughways under conveyors used by workers shall have guardrails installed along the access route and an overhead canopy installed with an engineered protection plate able to withstand a belt impact from belt breakage.

(4) Walkways and throughways that cross a conveyor shall be not less than one metre in width and shall be equipped with guardrails on the open sides.

(5) A worker shall not cross a conveyor except at walkways and throughways established in accordance with subsections (3) and (4).

(6) Access ladders on conveyors shall have self closing gates on the ladder exits.

(7) Nip points along receiving hoppers and belts shall be effectively guarded.

(8) An effective dust control system shall be used to suppress or remove dust that may be generated along the conveyor belts and transfer points.

[Back to Top](#)

#### **Conveyor systems**

**532.** (1) A conveyor-control system shall incorporate a pre-start warning circuit that sounds an audible alarm throughout the length of the conveyor.

(2) An employer shall post warning signs at each access point of a conveyor that starts automatically, indicating that the conveyor is subject to an automatic start.

[Back to Top](#)

#### **Motor vehicle braking systems**

**533.** (1) An employer shall develop and implement a written brake testing and monitoring program in accordance with these regulations and the manufacturer's specifications for a motor vehicle operating in a mine.

(2) The brake system on a motor vehicle that is operated on a grade, slope or ramp shall be able to perform the individual system function requirements of

(a) a service brake system;

(b) an emergency brake system; and



**LOGAN  
DRILLING  
GROUP**

- (c) a parking brake system.
- (3) The capacity of retarders shall not be considered in determining the capacity of the brake systems described in paragraphs (2)(a), (b) and (c).
- (4) A combination of the system function requirements described in paragraphs (2) (a), (b) and (c) may be performed by a single brake system.
  - (5) Each brake system shall be capable of being
    - (a) tested independently; and
    - (b) readily applied by a worker seated in the driver's seat.
  - (6) The service brake system and the emergency brake system shall be capable of safely stopping the motor vehicle while it is being operated
    - (a) on the maximum grade, slope or ramp in its area of operation;
    - (b) at its maximum authorized speed; and
    - (c) with its maximum authorized load.
  - (7) The parking brake system shall be capable of holding the motor vehicle stationary, with its maximum authorized load, on the maximum grade, slope or ramp in its area of operation.
  - (8) The emergency brake system shall be set up so that after the brake is applied automatically or manually, a deliberate act is required to release the brake.
  - (9) Before a motor vehicle is first put into service and as required by the manufacturer's specifications, the following systems shall be tested by a competent person for proper operation:
    - (a) service brake;
    - (b) emergency brake;
    - (c) parking brake;
    - (d) steering;
    - (e) warning devices; and
    - (f) lighting.
  - (10) A record of the tests made under subsection (9)
    - (a) shall be signed by the competent person who performed the tests;
    - (b) shall be kept by the employer as long as the motor vehicle is in service; and



**LOGAN  
DRILLING  
GROUP**

(c) shall be made available to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.

(11) In the operation of a motor vehicle in an underground mine

(a) the maximum load to be carried;

(b) the maximum speed; and

(c) the gear selection to be used,

on a grade or ramp shall be established and made known to the operator by the supervisor in charge of the mine.

(12) Before ascending or descending a main access ramp in an underground mine, the operator of a motor vehicle shall

(a) fully engage the forward-reverse lever;

(b) select the proper gear; and

(c) test the service and emergency brakes.

[Back to Top](#)

#### **Braking requirements**

**534.** (1) The brake system of a rubber-tired motor vehicle used in an underground mine shall meet the requirements of CAN/CSA-M424.3 "Braking Performance - Rubber-Tired, Self-Propelled Underground Mining Machines".

(2) The brake system of a rubber-tired motor vehicle used in a surface mine shall meet the requirements of CSA-M3450 "Braking systems of rubber-tired machines - Performance requirements and test procedures".

(3) The brake system of a tracked motor vehicle used in an underground mine or in a surface mine shall meet the requirements of ISO 10265 "Earth-moving machinery - Crawler machines - Performance requirements and test procedures for braking systems".

(4) A motor vehicle that is operated underground shall be equipped with

(a) a device that automatically applies the emergency brake system and stops the vehicle before the vehicle's stored energy brake system, torque converter or transmission pressure reaches the critical level of pressure; and

(b) a device that warns the operator that the emergency brake system is about to be applied.





**LOGAN  
DRILLING  
GROUP**

(5) For the purpose of this section, the critical level of pressure is the level of pressure in a motor vehicle's stored energy brake system, torque converter or transmission below which the manufacturer has determined that the motor vehicle is unsafe to operate.

[Back to Top](#)

#### **Warning to traffic**

**535.** Where a motor vehicle is disabled or parked in the travelled portion of a roadway, a warning to approaching traffic shall be provided by

- (a) flashing lights;
- (b) flares;
- (c) reflectors;
- (d) lamps; or
- (e) traffic control procedures in accordance with Part XVI.

[Back to Top](#)

#### **Wheel chocks**

**536.** (1) Wheel chocks shall be used to block movement whenever a motor vehicle

- (a) is left unattended on a slope; or
- (b) is being maintained or repaired.

(2) Wheel chocks shall comply with the requirements of the Society of Automotive Engineers Standard SAE J348 "Wheel Chocks".

[Back to Top](#)

#### **Overload**

**537.** An employer shall ensure that haulage trucks are not overloaded and shall provide a means to measure the weight of the load.

### **PART XXIX UNDERGROUND OPERATIONS**

[Back to Top](#)

#### **Definitions**

**538.** In this Part



**LOGAN  
DRILLING  
GROUP**

- (a) "bulkhead" means a structure built for the purpose of impounding water or hydraulic backfill in a drift, cross-cut or other mine opening, and constructed in a manner as to completely close off the mine opening;
- (b) "dam" means a structure built for the purpose of impounding water in a drift, cross-cut or other mine opening, and constructed in a manner as to permit an unobstructed overflow of the water;
- (c) "remote control unit" means a remote control unit, system, device or controller that produces radio frequencies or radiates electromagnetic energy;
- (d) "remote controlled equipment" means equipment that can be operated or moved by use of a remote control unit.

[Back to Top](#)

#### **Application**

**539.** In this Part

- (a) sections **541**, **542**, **549**, **550**, **565**, **569**, **570**, **571** and **574**, which refer to an "underground place of employment", apply to a mine and to an underground place of employment referred to in subsection **411** (1); and
- (b) the remaining sections apply only to a mine.

[Back to Top](#)

#### **Mining method**

**540.** A method of mining practised in an underground mine shall be safe and applicable to the structure of the ore deposit or part of the deposit being mined.

[Back to Top](#)

#### **Mine rescue emergency procedure**

**541.** An employer at an underground place of employment shall

- (a) establish in writing a procedure to be followed that effectively provides for the safety of all workers in the event of an emergency and the control of a fire whether on the surface or underground;
- (b) post copies of the procedure established under paragraph (a), or extracts from the procedure, in conspicuous places on the surface and underground;
- (c) instruct each worker respecting
  - (i) the procedure established under paragraph (a) that relates to the worker's safety in the event of an emergency,



**LOGAN  
DRILLING  
GROUP**

- (ii) the recognition of an emergency warning system in use at the place of employment, and
- (iii) the escape exits from the underground place of employment;
- (d) maintain for instant use, an emergency warning system,
  - (i) capable of promptly and effectively warning all workers underground or on the surface of an emergency requiring speedy evacuation of the place of employment, and
  - (ii) equipped with a primary back-up means of activation;
- (e) establish, equip, maintain and operate a mine rescue station in compliance with applicable guidelines or codes and standards set by the commission;
- (f) require that workers attend training courses in mine rescue work as prescribed by the commission;
- (g) provide and maintain the mine rescue equipment as an officer considers necessary and store this equipment at an approved location;
- (h) be responsible for the supervision and direction of mine rescue crews in all mine rescue and recovery operations conducted at an underground place of employment;
- (i) provide self rescuers for workers in an underground place of employment;
- (j) ensure self rescuers are worn on the belt of the workers unless permitted by the minister to do otherwise;
- (k) notwithstanding paragraph (g), determine the self rescuers referred to in paragraphs (i) and (j) by an assessment of the work location, considering distance from the refuge station, work activity and other factors that the employer considers relevant; and
- (l) ensure that a suitable number of workers are trained in the emergency procedures.

[Back to Top](#)

#### **Tests and reports of emergency warning system**

**542.** (1) At least once in each year, with each shift, an employer at an underground place of employment shall

- (a) make a test of the effectiveness of the procedures and emergency warning system or systems referred to in section 541 ; and
- (b) submit a report within 7 days after the test to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.



**LOGAN  
DRILLING  
GROUP**

(2) Where a test shows that a procedure or emergency warning system is ineffective, the employer shall

- (a) immediately make a change necessary to make the procedure or system effective and re-test the effectiveness of the procedure and the system; and
- (b) submit a report within 7 days of the re-test to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.

[Back to Top](#)

#### **Tallying**

**543.** (1) An employer shall establish and maintain a written procedure to record every person going underground and every person returning to the surface.

(2) Every person who goes underground and every person who returns to the surface shall check in and check out in accordance with the procedure established under subsection (1).

[Back to Top](#)

#### **Ambient air quality monitoring program**

**544.** (1) An employer shall prepare and implement a written ambient air quality monitoring program for a mine to monitor contaminants in the air underground.

(2) An ambient air quality monitoring program required by subsection (1) shall:

- (a) be developed by a competent person and certified as adequate by one of the following persons:
  - (i) a professional engineer;
  - (ii) an occupational hygienist registered with the Canadian Registration Board of Occupational Hygienists; or
  - (iii) an industrial hygienist certified by the American Board for Industrial Hygiene;
- (b) identify sampling procedures using plans and instructions, and detail the instruments to be used for the procedures; and
- (c) identify the contaminants to be monitored including, at a minimum, carbon monoxide, oxides of nitrogen, sulphur dioxide and nitrogen dioxide, and the frequency for monitoring those contaminants.

(3) An ambient air quality monitoring program shall ensure sufficient air quality is provided to the active workings underground by ensuring that any contaminants are diluted below the occupational exposure limit.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Record of result of ambient air quality monitoring program**

**545.** The results of the monitoring performed under the ambient air quality monitoring program required by section **544** shall be recorded and made available to an officer upon request.

[Back to Top](#)

#### **Calibrating monitors and meters**

**546.** (1) An employer shall maintain a written schedule of calibration for the monitors and meters required by these regulations.

(2) Calibration shall be conducted in accordance with the schedule under subsection (1) at a frequency equal to or greater than the frequency indicated in the manufacturer's specifications.

[Back to Top](#)

#### **Voice communication**

**547.** (1) An employer shall ensure that a mine has a voice communication system between the surface and underground in adequate locations that consists of interconnected voice communication stations.

(2) An employer shall ensure that a voice communication system has a separate back-up power supply that operates in the event of a power failure.

[Back to Top](#)

#### **Old or abandoned workings**

**548.** (1) A working in a mine shall not approach or be conducted within 100 metres of an old working or abandoned working until the employer

- (a) has caused an examination in accordance with subsection (2) by a professional engineer of the old working or abandoned working to determine its condition; and
- (b) has made the findings respecting the examination available to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.

(2) The examination required under paragraph (1)(a) shall be in writing and shall include

- (a) a soil distribution study;
- (b) a study of the mechanical properties of the soil above the panel or stope;
- (c) a study of the mechanical properties of the rock above the panel or stope;



**LOGAN  
DRILLING  
GROUP**

- (d) a study of the hydrogeological conditions;
- (e) where applicable, recommended terms or conditions that, in the engineer's opinion, are necessary for the protection of the health and safety of persons who might be affected by an unexpected collapse, including recommended monitoring or alternatives and the results to be expected; and
- (f) the engineer's opinion that the ground at the surface above the abandoned panel or abandoned stope will not collapse in a manner that might endanger persons on the surface or underground.

[Back to Top](#)

#### **Underground illumination**

**549.** (1) An employer shall have suitable permanent lighting installed in an underground place of employment to provide adequate illumination in the following locations:

- (a) workshops, service garages, and other places where moving machinery or equipment could be a hazard;
- (b) main shaft stations and active shaft landings;
- (c) first aid stations;
- (d) conveyor galleries, drives, and transfer stations; and
- (e) as required by an officer.

(2) A worker in an underground place of employment shall wear retro-reflective material on headgear and outer clothing.

[Back to Top](#)

#### **Cap lamps**

**550.** (1) An employer shall provide every person entering an underground place of employment with an approved cap lamp and the person shall keep the lamp in his or her possession while he or she is underground.

(2) A cap lamp shall be capable of providing a peak luminance of at least 1,500 lux at 1.2 metres from the light source, throughout a working shift.

(3) An employer shall develop a written procedure for assessing and maintaining cap lamps and a copy of the procedure and the results of the assessment shall be made available upon request to an officer.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Shaft pillar**

**551.** Stopping shall not be done within 60 metres of a shaft that is used for transporting persons unless authorized by the minister.

[Back to Top](#)

#### **Boundary pillar**

**552.** A pillar of not less than 30 metres shall be maintained on either side of a party boundary adjoining underground mining properties.

[Back to Top](#)

#### **Procedure when handling material**

**553.** Where material is being loaded, unloaded or moved in a bucketway or material slide, the employer shall establish and the worker shall follow a written procedure to prevent injury from falling objects.

[Back to Top](#)

#### **Steeply inclined raises**

**554.** An employer shall ensure that a raise being driven that is inclined at more than 50 ° from the horizontal, and that is to be more than 16 metres slope length and into which a worker shall enter

- (a) is driven by a raise climber or other hoisting device that protects the worker from falling material while ascending and descending; or
- (b) is divided into at least 2 compartments, one of which is maintained as a ladderway and is timbered to within a safe distance of the face, but that distance shall not exceed 7.5 metres.

[Back to Top](#)

#### **Raise climbers**

**555.** An employer shall ensure that a raise climber or other hoisting device referred to in section **554** is equipped with

- (a) at least 2 independent means of braking,
  - (i) each of which is capable of stopping and holding the climber with its maximum rated load,
  - (ii) each of which is arranged to permit independent testing, and
  - (iii) one of which is as close as practicable to the final drive of the motor;



**LOGAN  
DRILLING  
GROUP**

- (b) an automatic overspeed brake to safely decelerate and hold the climber in the event of the climber travelling at a speed in excess of a predetermined rate;
- (c) a notice attached to the conveyance showing the maximum load that can be carried, as certified by the manufacturer;
- (d) when driven by electrical power,
  - (i) a suitable emergency switch in the cab that cuts off the power to the drive motors in the event the main control contactor fails to open, and
  - (ii) a means by which the power can be isolated from the raise service area; and
- (e) a suitable headcover after 8 metres of advance.

### [Back to Top](#)

#### **Use of raise climbers**

**556.** (1) When a raise climber or other hoisting device referred to in section **554** is used, the employer shall ensure that

- (a) a stop block is in a position that prevents the climber from being taken beyond the track, except when the track is being extended;
- (b) an effective means of communication is established between the climber and the raise service area;
- (c) the climber is operated by a person authorized by the employer;
- (d) means are available by which workers can escape from the climber;
- (e) where the total length of raise to be driven exceeds 200 metres, a mechanical means by which workers can be reached and removed from the climber is available for use in the event of a malfunction of the climber or rails;
- (f) the climber is equipped with a first aid kit as required under the *Occupational Health and Safety First Aid Regulations* ;
- (g) the climber is examined and tested
  - (i) each shift before being used, to determine that the brakes and controls are functioning effectively, and
  - (ii) weekly, respecting its mechanical and electrical parts and safety devices, by a competent person, and for the purpose of the examination the climber shall be thoroughly cleaned;
- (h) the main shafting of the drive train is examined by a competent person using ultrasonic methods to determine that it is in sound condition





**LOGAN  
DRILLING  
GROUP**

- (i) before the raise climber is first put into service, and
  - (ii) during each major overhaul of the climber and at least once every 500 hours of use; and
- (i) a log book is maintained at a location conveniently available to the operator in which shall be recorded
- (i) the examination required by paragraph (g),
  - (ii) the findings from the examination,
  - (iii) a repair or modification, and the signature of the person performing the examination, repair or modification, and
  - (iv) the signature of the supervisor authorizing the repair or modification referred to in subparagraph (iii).
- (2) A worker shall not load or operate a raise climber or other hoisting device in excess of the capacity certified by the manufacturer.
- (3) Where a cable lift raise platform is to be used, the employer shall, before installation, submit to the minister
- (a) drawings of the device and installation; and
  - (b) the written procedure to be followed for the examination, testing and use of the system.

[Back to Top](#)

#### **Overspeed safety device**

**557.** An employer shall ensure that a raise climber has an overspeed safety device that:

- (a) meets the requirements of paragraph **555** (b);
- (b) is approved by the manufacturer of the climber;
- (c) is overhauled at least once every 3 years by the manufacturer or by another competent person; and
- (d) bears a suitable mark identifying the serial number of the device, the most recent date on which the device was overhauled and the name of the person who performed the overhaul.

[Back to Top](#)

#### **Electrically powered raise climber**

**558.** An employer shall ensure that a raise climber that is electrically powered



**LOGAN  
DRILLING  
GROUP**

- (a) is not operated in excess of 750 volts;
- (b) is protected by a ground fault system;
- (c) meets the requirements of paragraph 555 (d); and
- (d) has a switch at the raise service area by which its power can be safely interrupted.

[Back to Top](#)

#### **Electrical supply to raise climber**

**559.** The electrical supply to a raise climber shall be disconnected while explosives and electric caps are being loaded into a position for blasting.

[Back to Top](#)

#### **Presence on sub-level prohibited**

**560.** Where a mechanical raise climber or hoisting device is the sole means of access for persons to and from the workplace, a worker shall not remain on a sub-level, landing, staging or other place in a raise when the mechanical raise climber or hoisting device is moved from the place.

[Back to Top](#)

#### **Precautions for chutes**

**561.** (1) Where there are chutes for the control of ore, waste or other material, the employer shall

- (a) ensure that the chutes are so constructed, and their parts and controls so arranged that workers are safe from an anticipated surge or spillage of material;
- (b) establish a written procedure to be followed in the event of an unexpected surge or spillage; and
- (c) ensure that workers do not enter the discharge end of a chute for the purpose of clearing a chute.

(2) Where ore, waste, fill or other material is pulled from a chute or drawpoint and the settling of the broken material above the chute or drawpoint could endanger a person, the employer shall ensure that

- (a) every worker in the area is notified of the hazard;
- (b) the area that could be affected by settling of the material is protected by signs and barricades or guarding; and
- (c) the area is examined and made safe before the signs and barricades are removed.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

### **Mucking**

**562.** (1) Where there is mucking from a pile of unconsolidated material underground, a worker shall not

- (a) undercut a mucking face; or
- (b) except where the equipment is operated by remote control, keep a vertical height of the mucking face greater than can be reached by the equipment being used.

(2) Notwithstanding paragraph (1)(b), where mobile equipment is used in underground mucking operations, the employer shall protect the operator from striking the walls by

- (a) locating the operator's position within the physical dimensions of the equipment;
- (b) guarding of the operator's position; or
- (c) locating the operator in a position remote from movement of the mobile equipment.

[Back to Top](#)

### **Entry prohibited**

**563.** A worker shall not enter a drawpoint, chute, transfer raise or other mine opening used for the passage of ore, rock or other material by gravity in which the material is hung up, unless

- (a) a written hazard assessment is conducted by the supervisor and the worker; and
- (b) appropriate safe work control measures have been implemented.

[Back to Top](#)

### **Plotting of diamond drill holes**

**564.** (1) An employer shall plot diamond drill holes and other drill holes over 6 metres in length, excluding blast holes, on the working plans.

(2) The employer shall establish a written procedure by which all workers involved are advised of the intersection of a diamond drill hole before the heading is within 8 metres of the intersection.

(3) The employer shall mark the collar and points of intersection of the drill holes referred to in subsection (1)

- (a) at the time when drilling is discontinued or an intersection made; and
- (b) with a single capital letter "H" in a conspicuous paint, measuring at least 300 millimetres in height and within at least 1,200 millimetres of the collar or intersection.



**LOGAN  
DRILLING  
GROUP**

- (4) The employer shall grout the diamond drill holes
  - (a) drilled from the surface to a depth of at least 30 metres below an elevation at which flows of water might occur, and the grouting shall be done before the hole is abandoned or the casing is pulled; and
  - (b) drilled from underground which intersect a water source of potential danger to the mine workings and the grouting shall extend at least 30 metres from the water source.
- (5) The employer shall ensure that the approach to the collar or to an intersection or breakthrough is securely closed or guarded when
  - (a) mining is in progress toward the hole; or
  - (b) blasting is to be done within 5 metres of an intersection of the hole.

[Back to Top](#)

#### **Escape exits from underground**

**565.** Except during the initial exploration and development stages of an underground place of employment, an employer at an underground place of employment shall provide and maintain at all times 2 independent means of exit from the underground workings to the surface, which shall be

- (a) at a distance of more than 30 metres from one another;
- (b) isolated underground one from the other by fire doors that meet the requirements of subsection **569** (2);
- (c) of sufficient size to afford passage for mine rescue crews wearing self-contained breathing apparatus;
- (d) provided with ladders from the deepest workings to the surface;
- (e) marked on all levels by conspicuous signs with arrows pointing toward and marking the exits in a manner to expedite evacuation of the underground place of employment; and
- (f) covered by a structure constructed of material with at least a one hour fire-resistance rating.

[Back to Top](#)

#### **Refuge station**

- 566.** (1) An employer shall install, equip and maintain a refuge station underground.
- (2) An employer shall ensure that an underground refuge station is
- (a) excavated in solid host material or constructed of steel;
  - (b) separated from adjoining workings by fire doors or stoppings that are





**LOGAN  
DRILLING  
GROUP**

- (i) designed to prevent noxious fumes from entering the refuge station, and
  - (ii) constructed of materials that have at least a one-hour fire resistance rating;
- (c) located
- (i) where reasonably practicable, in a fresh air circuit;
  - (ii) at least 100 metres away from a fuel station, explosive storage area or other fire hazard; and
  - (iii) accurately on a map of the surface;
- (d) designed to accommodate the number of workers who may reasonably be expected to use the refuge station;
- (e) clearly marked;
- (f) readily accessible;
- (g) properly maintained and the area around the entrance is kept free of combustible material; and
- (h) suitably located underground to allow access within 15 minutes by walking from the work area or within 300 metres of the work area.
- (3) An employer shall ensure that an underground refuge station is equipped with the following:
- (a) at least 48 hours of breathable air for the number of workers who may reasonably be expected to use the refuge station in accordance with the procedure established under section **541** ;
  - (b) food and potable water for the number of workers who may reasonably be expected to use the refuge station in accordance with the procedure established under section **541** ;
  - (c) lights;
  - (d) appropriate first aid supplies;
  - (e) sanitation facilities;
  - (f) suitable fire-fighting equipment;
  - (g) an effective means of communication with the surface;
  - (h) sufficient seating;
  - (i) an adequate supply of door sealant to stop air from entering the refuge station;
  - (j) blankets and a stretcher;



**LOGAN  
DRILLING  
GROUP**

- (k) a copy of the procedures for fire fighting underground and a plan showing the ventilation system and routes to the escape exits, both of which are to be posted;
- (l) where required, a source of heat to maintain a minimum temperature of 10 ° C in the refuge station; and
- (m) an air supply independent of the mine air system and designed to provide a supply of air for as many persons as the refuge station is designed to shelter or an equivalent closed circuit system.

[Back to Top](#)

#### **Building near headframes, shaft house or portal house**

**567.** (1) An employer shall not erect or permit the erection of a building at a distance of less than 15 metres from a closed-in portion of the headframe, shaft house or portal house.

(2) Notwithstanding subsection (1), a building may be erected closer than 15 metres to a headframe, shaft house or portal house where

- (a) a second means of exit has been provided from the underground;
- (b) the headframe, shaft house or portal house and the buildings within 15 metres and the buildings adjoining it
  - (i) are constructed of noncombustible materials,
  - (ii) have a fire wall of 2 hour fire resistance rating separating the headframe, shaft house or portal house from adjoining buildings, and
  - (iii) are not used for the storage of flammable or combustible materials.

(3) Where a hoist is located above a mine shaft, the employer shall ensure that the supporting and enclosing structure of the hoist is constructed of noncombustible material.

[Back to Top](#)

#### **Air supply for hoist operator**

**568.** Where, in an underground or tower mounted hoist room, the normal air supply could become contaminated in an emergency, the employer shall provide and keep available uncontaminated air available to the hoist operator by means of

- (a) an enclosed booth with a positive supply of uncontaminated air; or
- (b) one or more self-contained breathing apparatus, together with a fully charged cylinder of breathable air to allow safe evacuation of all underground workers.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

### **Fire doors**

**569.** (1) An employer at an underground place of employment shall provide and maintain fire doors that

- (a) isolate the shaft or the main entrance and the workings directly associated with it from other workings;
  - (b) isolate the 2 independent means of exit from the underground workings from each other; and
  - (c) close off from other underground workings each
    - (i) service garage, and
    - (ii) oil storage place where more than 1,000 litres of oil, grease or flammable liquid are stored.
- (2) Fire doors installed under subsection (1) shall be
- (a) constructed of noncombustible material;
  - (b) maintained to preclude more than a minimum leakage of air when closed;
  - (c) kept clear of obstructions; and
  - (d) provided with a securing device that
    - (i) can be opened from either side, and
    - (ii) prevents the door from being opened by a reversal of the air current.

### [Back to Top](#)

### **Boilers, engines and compressors**

**570.** An employer at an underground place of employment shall not

- (a) install within 23 metres of the collar or other opening to the underground place of employment
  - (i) a steam boiler,
  - (ii) a diesel engine, or
  - (iii) a compressor, or
- (b) install, service, garage or store an engine using gasoline or other flammable liquid or gases within
  - (i) 15 metres of the building housing the hoist; or



**LOGAN  
DRILLING  
GROUP**

- (ii) 30 metres of a shaft or other opening to the underground workings.

[Back to Top](#)

#### **Reciprocating type air compressors**

**571.** (1) In an underground place of employment, a reciprocating type air compressor driven by a prime mover exceeding 30 kW, that is lubricated by oil and discharges to a closed system at a pressure greater than 100 kPa, shall have

- (a) a temperature-indicating device installed at the high-pressure discharge pipe; and
- (b) the normal operating temperature marked on the device.

(2) The discharge air temperature of an air compressor referred to in subsection (1) shall be

- (a) read by a qualified person at least once every operating shift; and
- (b) recorded in a compressor log book maintained by the employer.

(3) Subsection (2) does not apply where an automated, continuous monitoring system designed to be fail safe has been installed.

(4) Where an air compressor driven by a prime mover exceeding 25 kW is installed in an underground place of employment, the compressor shall be

- (a) designed and installed to minimize the hazard of fire or explosion due to the accumulation of carbonaceous materials in the air system;
- (b) provided with protective devices that prevent its operation where
  - (i) the temperature of the air at the discharge line is in excess of normal,
  - (ii) the temperature of the compressor cooling water and cooling air is in excess of normal,
  - (iii) the flow and pressure of compressor lubricating oil is below normal, or
  - (iv) carbon monoxide content of compressed air between the high pressure discharge and receiver exceeds 25 ppm;
- (c) provided with an alarm that
  - (i) is audible and visible to the worker in charge of the compressor,
  - (ii) operates when a protective device referred to in paragraph (b) is activated, and
  - (iii) operates as long as the conditions exist that direct a device as referred to in paragraph (b) to operate; and
- (d) provided with other suitable protective devices.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Noncombustible material to be used**

**572.** An employer shall ensure that only noncombustible materials are used for the construction of structures and enclosures underground for

- (a) shops and lunchrooms;
- (b) housing and supporting machinery powered by an electrical or internal combustion engine;
- (c) the storage of material that will readily burn; and
- (d) a heating device.

[Back to Top](#)

#### **Fire suppression system**

**573.** An employer shall provide and maintain a fire suppression system consisting of sprinklers, foam or other suitable means of suppressing a fire

- (a) on each piece of equipment containing more than 25 litres of flammable fluids;
- (b) on each piece of equipment operated by remote control;
- (c) at each underground fuel storage area or fueling area where more than 500 litres of oil, grease or combustible liquids are stored; and
- (d) in a building or structure, except a fan house located above or adjacent to an opening to an underground mine.

[Back to Top](#)

#### **Storage of flammable material**

**574. (1)** An employer at an underground place of employment shall not store or permit the storage of volatile flammable liquids, oil, grease or other combustible material in a headframe, shaft house or portal house, shaft station or building in which the outbreak of fire might endanger an entrance to the underground workings.

(2) Subsection (1) does not prohibit the storing of an amount of lubricating oil or grease which does not exceed the requirements for one day's operation.

(3) An employer shall not store or permit to be stored at an underground place of employment

- (a) a flammable or combustible liquid that is not in a closed container; or



**LOGAN  
DRILLING  
GROUP**

- (b) a lubricating oil or hydraulic oil underground in excess of the requirements for 7 days use.

[Back to Top](#)

#### **Fueling vehicles underground**

**575.** Where an internal combustion engine is fuelled underground, the employer shall ensure that

- (a) except in the case where it is not practicable, the engine is fuelled in a fueling station;
- (b) a fueling station
  - (i) has a concrete floor,
  - (ii) has a curb or sump to contain spills of fuel,
  - (iii) has a supply of noncombustible absorbent material to be used to absorb a spillage of fuel that could occur,
  - (iv) is conspicuously marked by signs bearing the words "Shut Off Engine While Refuelling" and "No Smoking",
  - (v) is designed and protected to prevent inadvertent entry of an uncontrolled motor vehicle,
  - (vi) is located so that in the event of a fire or explosion in the fuelling station there will be a minimum effect on working areas of the mine or on underground installations, including shafts, magazines, refuge stations, transformer installations and other installations,
  - (vii) provides clearance around the vehicles being fuelled to permit the safe performance of all work being performed, and
  - (viii) is separate from a service garage;
- (c) before refuelling, the engine is shut off and the battery isolated;
- (d) where a mobile fuelling supply tank is used, the tank is of an approved design and is clearly labelled with "no smoking" signs; and
- (e) arrangements are made so that a spillage in the fuelling operation is removed at once, deposited in a fireproof receptacle and removed without undue delay.

[Back to Top](#)

#### **Fuel transfer or delivery systems**

**576.** (1) Where fuel for an internal combustion engine is to be taken or delivered underground, the employer shall



**LOGAN  
DRILLING  
GROUP**

- (a) before the beginning of an installation of a fuel transfer or delivery system, submit a plan of the system to the minister;
- (b) ensure that the receiving tanks in a fixed delivery system incorporate a bottom filling arrangement; and
- (c) when the storage capacity of an area exceeds 1,000 litres, provide an enclosing structure constructed of noncombustible material and arranged so that the openings close automatically in the event of a fire.

(2) Fuel handling, transfer, storage and dispensing systems in an underground mine shall be designed according to applicable engineering standards and subjected to a fire safety hazard review before first use.

(3) An employer, in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, shall develop safe guards and written procedures for the safe handling, transfer, storage and dispensing of fuel in an underground mine.

[Back to Top](#)

#### **Fuels on surface**

**577.** Where liquid or liquefied petroleum gases are used or stored on the surface, the employer shall ensure that they are stored at a location

- (a) more than 30 metres from a shaft or other opening to the underground workings; or
- (b) where the drainage from the storage site is in a direction away from the location of a shaft or other opening to the underground workings.

[Back to Top](#)

#### **Prohibition of transfer of fuel by air**

**578.** A worker shall not transfer a flammable or combustible liquid by the direct application of air under pressure.

[Back to Top](#)

#### **Combustible refuse**

**579.** An employer shall ensure that

- (a) underground workings, shaft stations, headframes and buildings are kept clear of accumulations of combustible materials; and
- (b) underground timber which is not in use and not intended for use in current operations, is promptly removed from underground.



**LOGAN  
DRILLING  
GROUP**

### [Back to Top](#)

#### **Process producing flammable mixture**

**580.** A process that is likely to produce a gas, vapour, dust or fume to such an extent as to be capable of forming a flammable mixture with air shall be carried out in an area which

- (a) is isolated from other operations;
- (b) has a system of ventilation which removes the gas, vapour, dust or fume;
- (c) has no potential sources of ignition; and
- (d) has vents, baffles, chokes, dampers or other means to reduce the effects of an explosion, as may be required.

### [Back to Top](#)

#### **Hot work in mines**

**581.** (1) Where gas or electric welding or cutting equipment, blow torches or other heat-producing devices or materials for doing hot work are used underground, or in a headframe, shaft house or portal house or building in which the outbreak of fire might endanger an entrance to the underground workings, the employer shall establish and implement a written safe work procedure for the prevention of fires.

(2) Combustible material within a radius of 3 metres, or upon which sparks or hot metal could fall, shall be made wet with water before hot work is begun, and again after hot work is finished.

(3) The area where hot work is done shall be inspected for smoldering fires at regular intervals after hot work is finished.

(4) Fire-fighting equipment shall be on hand at all times during the operation and until completion of the inspection referred to in subsection (3).

(5) Hot work shall not be done within 10 metres of the place where an explosive is stored or being transported.

(6) Except when used for burning or cutting, propane or other similar fuel that is heavier than air when in a gaseous state shall not be permitted or kept underground.

### [Back to Top](#)

#### **Mine ventilation and auxiliary ventilation systems**

**582.** (1) An employer shall ensure a ventilation plan is implemented, maintained and periodically reviewed.





**LOGAN  
DRILLING  
GROUP**

(2) An employer shall develop operating procedures for the ventilation system that are certified by a professional engineer.

(3) An employer shall ensure that every mine working that is to be advanced more than 30 metres from a source of fresh air is equipped with suitable, effective auxiliary ventilation.

(4) The employer shall install a fresh air supply system in

(a) every raise;

(b) every subdrift more than 10 metres in length driven from a raise; and

(c) every stope, development heading and production heading without through ventilation.

(5) The fresh air supply system referred to in subsection (4) shall be

(a) independent of air supplied to a machine or drill used in the workplace;

(b) controlled from a place outside the entrance to the heading; and

(c) operated after each blast that has been fired in the workplace.

(6) A person shall not enter or remain in, or be permitted to enter or remain in, a workplace affected by blasting contaminants until

(a) the ventilation system removes the airborne contaminants; and

(b) the removal of contaminants has been verified by atmospheric monitoring equipment applicable to the hazard.

### [Back to Top](#)

#### **Fire protection for ventilating systems**

**583.** (1) An employer using an oil or gas fired system for heating ventilating air shall ensure that

(a) the system is installed and maintained in accordance with CSA B139 Installation Code for Oil-Burning Equipment, CSA B149.1 Natural Gas and Propane Installation Code and the National Fire Code of Canada; and

(b) a log book is kept and maintained, in which are recorded the service, maintenance and tests of the system.

(2) An employer shall ensure that

(a) structures housing fans that ventilate a part of the underground workings are constructed of noncombustible materials; and

(b) pipes or ducts used to convey ventilating air are fabricated of material which will not continue to burn after removal of the heat source.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Fans**

**584.** An employer shall ensure that

- (a) the main fans in a mine have an automatic ventilating pressure recording device that is always operating and is monitored daily;
- (b) a mine has a standby main fan; and
- (c) a mine has an emergency power supply capable of running the main fans in the event the principle source of power fails.

[Back to Top](#)

#### **Booster fan**

**585.** An employer shall ensure that a booster fan

- (a) does not restrict the free passage of air delivered by a main fan in the event the booster fan stops;
- (b) stops in the event a main fan stops; and
- (c) is continuously monitored by a system that alarms at a permanently attended monitoring station in the event the fan stops or its performance falls below an established efficiency level.

[Back to Top](#)

#### **Auxiliary fans**

**586.** (1) An employer shall ensure that a heading that is advanced more than 10 metres from the main ventilation circuit and a raise or subdrift that is more than 10 metres from the main ventilation circuit has an auxiliary ventilation system, or a system of line brattices, to direct ventilation so that the face of the heading is swept by the ventilating air supply.

(2) The distance referred to in subsection (1) shall be measured from the nearest rib.

[Back to Top](#)

#### **Brattice or vent tubes**

**587.** (1) Where brattice or vent tubes are used to ventilate the working face, an employer shall ensure that the brattice or vent tubes are kept advanced as close as possible to the working face.



**LOGAN  
DRILLING  
GROUP**

(2) An employer shall ensure that brattice or vent tubes used in a mine are constructed of materials that meet the requirements of CSA Standard CSA M427, "Fire-Performance and Antistatic Requirements for Ventilation Materials".

[Back to Top](#)

#### **Operating procedure for booster and auxiliary fans**

**588.** (1) An employer shall ensure that

- (a) in the event a booster fan or auxiliary fan stops, workers in an area that is affected by the stopping move to a place that is adequately ventilated; and
- (b) a competent worker tests the affected area to ensure it is adequately ventilated before other workers enter the area.

(2) An employer shall ensure that an auxiliary fan is not restarted unless a competent worker has

- (a) inspected the area underground that is serviced by the auxiliary fan and has tested for flammable gases;
- (b) declared in writing that it is safe to restart the auxiliary fan; and
- (c) included a copy of the declaration in the supervisor's shift report.

[Back to Top](#)

#### **Stopping fan**

**589.** (1) A worker shall not stop a fan that provides ventilation for a mine without the consent of the mine manager.

(2) Where workers withdraw because a fan stops or there is a decrease in ventilation, an employer shall ensure that a worker is not readmitted to the mine, to part of the mine or to a split until

- (a) the fan is in operation and ventilation is restored;
- (b) the work areas are examined by a competent person;
- (c) a report that the workings are safe is made by a supervisor in a book that is kept at the mine for that purpose; and
- (d) a copy of the report is posted in a conspicuous location.

(3) The prohibition on readmission under subsection (2) does not apply to a competent person who is examining the work area.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Ventilation monitoring**

**590.** (1) An employer shall appoint a competent worker who shall measure the barometric pressure outside the mine and the velocity and quantity of air in the airways and old workings of the mine that are accessible to workers.

(2) An employer shall ensure that measurements under subsection (1) are, at a minimum, taken

(a) at the main airway as near as is reasonably practicable to the point at which the air enters or leaves the mine;

(b) within each split or part of the mine

(i) as near as is reasonably practicable to the points at which air enters and leaves the split or part of the mine, and

(ii) in longwall workings, within 10 metres of the working face in the intake and return airways;

(c) in other mining methods, as near as is reasonably practicable to the last open cross cut;

(d) as near as is reasonably practicable to the working face of each active heading; and

(e) at seals along intake air courses where intake air passes by a seal to ventilate active working sections.

(3) An employer shall ensure that the measurements under subsection (1) are taken at least once a week.

(4) Where the quality or quantity of air passing a place where the measurements are taken may be substantially affected because the ventilation system of a mine is altered, an employer shall ensure that the appointed worker repeats the measurements as soon as the effect of the alteration would be apparent.

[Back to Top](#)

#### **Propane installations**

**591.** (1) An employer shall ensure that propane installations in proximity to underground workings are installed and maintained in accordance with the manufacturer's specifications and the *Public Safety Act*.

(2) An employer shall ensure that propane installations are inspected once each week by a competent worker to ensure the propane does not leak into an underground working or ventilation system of the mine or a building or other structure.

(3) An employer shall ensure that a detection system operates at all times that





**LOGAN  
DRILLING  
GROUP**

- (a) will detect propane leaking into the ventilation system of a mine; and
- (b) visibly or audibly warns workers of the leak.

[Back to Top](#)

#### **Internal combustion engines underground**

**592.** (1) An employer shall not install or operate, or permit to be installed or operated, an internal combustion engine underground unless

- (a) the engine has been approved as being suitable for underground use by a testing laboratory and the approval specifies the amount of ventilation required; and
- (b) before taking the engine underground for the first time, the employer submits to the minister an application for approval to use the equipment underground with
  - (i) particulars of the approval referred to in paragraph (a),
  - (ii) a plan showing the areas of the mine in which the unit will be operated, and
  - (iii) details of the ventilation system to be provided.

(2) Notwithstanding paragraph (1)(a), in the absence of an approval required by that paragraph, ventilation shall be maintained at 144.8 CFM per BHP.

(3) An internal combustion engine that uses gasoline, propane or another volatile substance as a fuel shall not be used underground.

(4) When an internal combustion engine is operated underground, an employer shall

- (a) provide and maintain a quantity of ventilating air past the engine as specified by the approval referred to in paragraph (1)(a) or, in the absence of that approval, as provided in subsection (2);
- (b) where more than one engine is operating in the same ventilating circuit, provide an amount of ventilating air which amounts to the sum of
  - (i) 100% for the largest engine,
  - (ii) 75% for the second largest engine, and
  - (iii) 50% for additional engines, to a minimum of 2.81 m<sup>3</sup> a minute for each kilowatt of the aggregate engines in the circuit;
- (c) ensure that tests are made of the undiluted exhaust gases with respect to carbon monoxide and diesel particulate, and where the tests are conducted on the surface, of respirable combustible particulates,
  - (i) before being used underground,



**LOGAN  
DRILLING  
GROUP**

- (ii) following a major overhaul of the engine, and
  - (iii) not less than once in every 12 month period, or more often when requested by the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate;
- (d) ensure that tests are made of the atmosphere at the operator's position for carbon monoxide and oxides of nitrogen at least weekly or on the request of the operator;
- (e) ensure that the volume of air flowing in each workplace affected by the exhaust from diesel-powered equipment, is measured weekly or sooner at the request of the operator or the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable; and
- (f) maintain a log book or recording system in which are recorded
- (i) the results of tests and measurements required under paragraphs (c), (d), and (e), and
  - (ii) reports of engine maintenance and repairs which may affect the engine exhaust.
- (5) Respecting the tests and measurements required under subsection (4),
- (a) the maximum allowable volume of carbon monoxide in undiluted exhaust gases shall be less than 300 ppm for new equipment and less than 600 ppm for existing equipment;
  - (b) the tests for diesel particulate shall be conducted in accordance with NIOSH Method 5040 from the NIOSH Manual of Analytical Methods, published by the National Institute for Occupational Health and Safety, United States, and not exceed the time weighted average of 0.4 mg/m<sup>3</sup>; and
  - (c) the method of testing shall be in accordance with the Emissions Monitoring and Control Procedures as prescribed by the division.
- (6) An employer shall order the immediate shutdown of an internal combustion engine that is operated underground where
- (a) carbon monoxide in the undiluted exhaust exceeds the levels provided in paragraph (5)(a); or
  - (b) carbon monoxide or another exhaust contaminant exceeds the time weighted average in the general operating area at the operator's position.
- (7) In this section, "BHP" means brake horse power.

[Back to Top](#)

#### **Replacement engines**

**593.** Engines for which particulars, plans and details are submitted as required by section **592** may be replaced with identical engines when the changes are



**LOGAN  
DRILLING  
GROUP**

- (a) recorded in the log book; and
- (b) reported to an officer.

[Back to Top](#)

### **Operating vehicles**

**594.** (1) A worker shall not

- (a) keep a diesel engine running underground for more than 10 minutes when not in use; or
- (b) leave a diesel powered locomotive unattended, unless the brakes have been set and the engine shut off.

(2) Diesel vehicles underground shall meet the requirements of CSA Standard CSA M424.2 "Non-Rail-Bound Diesel-Powered Machines for Use in Non-Gassy Underground Mines".

(3) A worker operating a vehicle underground shall

- (a) drive at a reasonable and prudent speed having regard to the actual and potential hazards of the area, and shall not proceed where a person's safety is endangered;
- (b) ensure that the lights are operative;
- (c) sound the audible warning device
  - (i) when approaching a pedestrian,
  - (ii) when approaching travelways unless alternative protection is provided,
  - (iii) whenever a person's safety may be endangered by the vehicle's movement, and
  - (iv) where the vehicle travels on rails, before starting;
- (d) trim and secure a load being transported to prevent spillage and damage;
- (e) ensure before moving the vehicle that each passenger is seated and his or her seatbelt is secured; and
- (f) where the vehicle is electrically powered, set the brakes, place the control lever in the neutral position, and disconnect the source of power before leaving the vehicle unattended.

[Back to Top](#)

### **Underground locomotives**

**595.** (1) An employer shall provide and maintain on an underground locomotive

- (a) a light that provides illumination in the direction of travel;



**LOGAN  
DRILLING  
GROUP**

- (b) an audible warning device;
- (c) brakes that will stop and hold the locomotive and its train of cars under full load conditions on a grade on which it operates;
- (d) when the locomotive is electrically powered, control levers so attached that they cannot be removed when the power is on;
- (e) an enclosure that will protect the driver in the event of a collision or impact;
- (f) when operated by remote control or by an automatic system, a means by which, in the event of failure of a part of the control or system, the brakes will be applied immediately; and
- (g) a restraining device that prevents a failure of the drive shafts or couplings from causing damage to the vehicle control systems.

(2) A worker shall not operate a train of cars without a taillight on the last car.

(3) Where the motor crew includes a switchperson, the employer, in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate,

- (a) may designate riding zones; and
- (b) shall develop written procedures to ensure the safety of the operation.

(4) Where an automated or remotely controlled tramming system is to be installed, an employer shall submit details of the system and procedures to be used to the minister before the system is installed or used.

### [Back to Top](#)

#### **Remote controlled equipment**

**596.** (1) Where remote controlled equipment is used,

- (a) the employer shall, in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, develop a written procedure for use of the remote controlled equipment to ensure the health and safety of workers;
- (b) the employer shall ensure that the equipment is operated on a frequency such that
  - (i) a remote control unit used to operate one piece of equipment cannot be used to operate another piece of equipment, and
  - (ii) the equipment cannot be affected by another remote control unit or radio communications at the site;





**LOGAN  
DRILLING  
GROUP**

- (c) the equipment shall have a selector device that enables the operator to control the equipment either manually or by remote;
  - (d) the equipment shall be used within the operator's sight, except where a robot system is used, in which case access to the working site where the robot system is used shall be barricaded and under camera surveillance; and
  - (e) the entrance to the site at which the equipment is being used shall clearly identify by means of a sign that remote controlled equipment is being used at that site.
- (2) A remote control unit used to operate equipment shall be operated only by the designated operator who is in charge of that equipment.
- (3) When a remote control unit is used to operate or move equipment, the employer shall maintain a log book setting out the make, model, serial number, identification code, frequency and maintenance record of the unit, and other particulars relating to the unit.
- (4) An employer shall ensure that a remote control unit
- (a) is equipped with a means or device that, when it reaches an incline or decline of 45 °from the horizontal, automatically stops the engine and applies the brakes on the equipment;
  - (b) answers or responds to the frequency assigned to it, which frequency can operate only one piece of equipment;
  - (c) is equipped with an emergency switch that stops the engine on the remote controlled equipment instantly and applies the brakes on the equipment;
  - (d) is disconnected and locked by a safety device when not in use; and
  - (e) is not capable of firing a detonator.
- (5) An employer shall ensure that the emergency switch referred to in paragraph (4)(c) is marked in red and operational when pressed.
- (6) The procedures for selecting or altering a frequency for a remote control unit shall be kept sealed.

[Back to Top](#)

#### **Clearances for rail haulage**

**597.** On each level underground on which mechanical track haulage is employed, an employer shall maintain

- (a) a minimum total clearance of at least 1.2 metres between sides of the haulageway;
- (b) a clearance of 600 millimetres on one side of the vehicle; and
- (c) safety stations in the walls of the haulageway.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Clearances for mobile equipment**

**598.** (1) In an underground haulageway where mobile equipment is used, an employer shall maintain

- (a) a minimum total clearance of 1.5 metres between the sides of the workplace and the mobile equipment;
- (b) a clearance of 300 millimetres above equipment having a covered cab;
- (c) safety stations, at intervals not exceeding 30 metres, when the working is simultaneously used for pedestrian traffic and there is less than 2.1 metres total horizontal clearance; and
- (d) a minimum one side clearance of 600 millimetres.

(2) On a ramp in an underground haulageway where mobile equipment is used, the safety station may consist of a slash taken up-ramp to provide one face perpendicular to the ramp.

[Back to Top](#)

#### **Safety stations**

**599.** A safety station shall

- (a) be plainly marked;
- (b) be clean and free of obstructions;
- (c) be cut perpendicular to the haulageway; and
- (d) provide clearances for rail haulage that are at least
  - (i) one metre in depth, in addition to the existing clearance between the vehicle and the wall,
  - (ii) 2 metres in height, and
  - (iii) 1.5 metres in width.

[Back to Top](#)

#### **Operation of vehicles on ramps**

**600.** (1) An employer shall provide a vehicle to transport workers up and down a ramp.

(2) An employer shall submit a written procedure at the request of an officer which



**LOGAN  
DRILLING  
GROUP**

- (a) regulates vehicular traffic on a ramp; and
  - (b) includes provisions respecting personnel vehicles, transportation of explosives, and emergency situations.
- (3) Ramps and haulageways shall be engineered and built to permit the safe travel of vehicles in regular services.
- (4) Ramps and haulageways shall be graded and maintained by placement of crushed rock material.

[Back to Top](#)

#### **Boreholes in advance of working face**

**601.** Where a workplace in a mine approaches abandoned or other workings which cannot be inspected and in which there is or could be an accumulation of water, the employer shall

- (a) ensure that boreholes are kept at least 6 metres ahead of the working face; and
- (b) take those additional measures as are considered necessary by the employer or the minister to preclude a sudden breakthrough of water.

[Back to Top](#)

#### **Dams and bulkheads**

**602.** (1) An employer shall ensure that the location of every underground dam and bulkhead is clearly shown on mine plans.

(2) An employer shall construct a dam or bulkhead underground as designed by a professional engineer.

[Back to Top](#)

#### **Placement of fill material in mine workings**

**603.** (1) An employer shall not place or permit to be placed fill material by hydraulic means in a stope or other mine working before the proposed system for underground transfer, storage, placing, containment and water removal is certified by a professional engineer.

(2) Before material containing cyanide is used for back fill in an underground mine, an assessment shall be conducted to determine the precautions to be taken to protect the health and safety of workers.

(3) Backfill materials shall be assessed for other hazardous materials to protect the health and safety of workers.



**LOGAN  
DRILLING  
GROUP**

(4) Where bulk fill is to be placed, the proposal referred to in subsection (1) shall include written procedures for monitoring fill and water inflows, drainage, saturation calculations and hydrostatic pressure on confining bulkheads.

(5) Where bulk fill is to be placed, an employer shall ensure that

- (a) the proposed system referred to in subsection (1) and subsection (4) is constructed, operated, monitored and maintained in accordance with the certified design;
- (b) records are maintained of the quantity of fill placed, the quantity of water inflow and outflow, and observations of hydrostatic pressures; and
- (c) written procedures are developed assigning responsibilities and action levels, where
  - (i) blasting is conducted in the immediate area,
  - (ii) saturation of the fill mass exceeds 90%, or
  - (iii) hydrostatic pressures reduce the effective factor of safety of bulkheads below 5.

(6) When material is dumped from a vehicle that is occupied by a person, the dump point shall include features designed to prevent the vehicle from going over the bank, into a raise or other open hole.

#### **PART XXX SHAFTS, HOISTS AND CONVEYANCES**

[Back to Top](#)

##### **Application**

**604.** This Part applies to a mine.

[Back to Top](#)

##### **Safety standard**

**605.** A shaft, hoist and conveyance operation shall comply with the Newfoundland and Labrador Safety Standard for Shafts, Hoists and Conveyances as prescribed by the minister.

[Back to Top](#)

##### **Record books**

**606.** An employer shall maintain the following record books for a mine where a hoist is used for hoisting persons or material in a shaft:

- (a) hoist operator's log book;
- (b) machinery record book;





**LOGAN  
DRILLING  
GROUP**

- (c) rope record book;
- (d) shaft inspection record book; and
- (e) electrical hoisting equipment record book.

[Back to Top](#)

#### **Shaft installations**

**607.** An employer shall ensure that every shaft or raise opening made at the surface of an underground mine is

- (a) solidly collared to bedrock with concrete;
- (b) constructed in accordance with Newfoundland and Labrador Safety Standard for Shafts, Hoists and Conveyances; and
- (c) securely fenced, covered, or otherwise guarded.

[Back to Top](#)

#### **Shaft inspection**

**608.** (1) An employer at a mine at which a hoist is in use shall ensure that at least once in each week

- (a) a thorough examination is made of the operating compartments of each shaft; and
  - (b) a report is made and signed in the shaft inspection record book of
    - (i) the examination required under paragraph (a), and
    - (ii) the work and repairs done as a result of the examination.
- (2) The supervisor in charge of the maintenance of the shaft and headframe shall
- (a) at least once in each week, review the entries made in the shaft inspection record book during the preceding week;
  - (b) ascertain that the examination required under subsection (1) has been made and that the necessary servicing and repairs are completed, in progress or scheduled for repair without undue delay;
  - (c) upon completion of the review required under paragraph (a), certify in the shaft inspection record book that the supervisor has complied with paragraphs (a) and (b); and
  - (d) record over the supervisor's signature in the shaft inspection record book a dangerous condition reported concerning the shaft and the action taken to correct the condition.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Protection of workers**

**609.** (1) A worker shall not work or conduct an examination

- (a) in a shaft compartment, above or below the shaft collar, while hoisting operations are in progress in the compartment, except where the hoisting operation is necessary to perform the work or examination; or
- (b) in a shaft or in a workplace that is part of, or adjacent to, the shaft, unless the worker is protected from accidental contact with a moving shaft conveyance or counterweight and objects falling in the shaft.

(2) A worker shall not enter or cross a hoisting compartment of a shaft in which hoisting operations are in progress, except for the purpose of entering or leaving the shaft conveyance in the compartment, or making the examination required under paragraph **608** (1)(a).

[Back to Top](#)

#### **Staging or equipment suspended in shaft**

**610.** (1) An employer shall not use or permit the use of open hooks in conjunction with the suspension of a staging, working platform or equipment in a shaft.

(2) Where a worker is required to be on or below a staging or work platform suspended in a shaft, or where the staging or work platform is being moved, the employer shall ensure that a means of support is used in addition to the means of suspension.

[Back to Top](#)

#### **Use of buckets**

**611.** Where a bucket is used in a shaft for other than sinking purposes, an employer shall

- (a) not permit simultaneous operations to be carried out at more than one elevation until the service doors required in the Newfoundland and Labrador Safety Standard for Shafts, Hoists and Conveyances have been installed at the collar and at every point of service in the shaft;
- (b) ensure that the service doors are kept closed at all times when tools, supplies or materials are being loaded into or taken out of the bucket at the location; and
- (c) provide and direct to be used a suitable landing or platform at every working level to enable the safe loading and unloading of persons.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Regular examination of safety catches**

- 612.** (1) An employer shall designate a worker who shall
- (a) at least once in each operating day, examine the safety catches to be sure they are clean and in proper adjustment and working condition; and
  - (b) at least once in every 3 months, perform a drop by releasing the conveyance suddenly from rest to ensure that the safety catches are operating correctly.
- (2) A worker making the examination and tests required under subsection (1) shall
- (a) record the results of the examination and tests in the machinery record book and sign the record; and
  - (b) immediately report a malfunction to the worker's supervisor.
- (3) Where the safety catches do not operate correctly, the employer shall not permit the conveyance to be used for hoisting persons unless the safety catches have been repaired and proven to operate correctly.

[Back to Top](#)

#### **Chairing devices**

- 613.** (1) Where chairs are used for the purpose of landing a shaft conveyance at a point in a shaft, an employer shall arrange the chairs so that they
- (a) clear the shaft when the conveyance is lifted off the chairs; and
  - (b) can only be operated from outside the conveyance.
- (2) A worker shall not use chairs for the purpose of landing a shaft conveyance at a point in a shaft
- (a) where persons are on the shaft conveyance; or
  - (b) without having given a proper chairing signal to the hoist operator.

[Back to Top](#)

#### **Hoisting persons**

- 614.** (1) A person shall not be hoisted in a shaft or other underground opening unless the person is
- (a) in a cage constructed in accordance with the Newfoundland and Labrador Safety Standard for Shafts, Hoists and Conveyances;
  - (b) in or on a raise climber or scaling platform;



**LOGAN  
DRILLING  
GROUP**

- (c) hoisted by means, certified by a professional engineer, for hoisting persons engaged in construction, repair or maintenance work; or
- (d) inside a bucket
  - (i) during shaft sinking, or
  - (ii) before the installation of permanent shaft conveyances.
- (2) While employed in shaft inspection and maintenance, workers may be hoisted
  - (a) in a bucket or skip; or
  - (b) on top of a conveyance, where
    - (i) a safety cover, either permanent or temporary, is installed overhead to prevent danger from falling objects,
    - (ii) the conveyance top consists of a platform equipped with a guard-rail that allows the workers to perform their work safely, or
    - (iii) suitable fall arrest system in accordance with Part X is used by the workers.
- (3) Persons may be hoisted in a skip to clear them from the mine or to rescue persons where the equipment normally used for hoisting persons is unserviceable because of failure or defect.
- (4) In accordance with the Newfoundland and Labrador Safety Standard for Shafts, Hoists and Conveyances and in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, the employer may permit persons to be hoisted in a skip where a conveyance normally used for hoisting persons is unserviceable and arrangements are made for loading and unloading that preclude danger to persons.
- (5) A conveyance shall not travel in excess of one-half its normal speed and in no case shall the speed be permitted to exceed 5 metres per second.

### [Back to Top](#)

#### **Shaft conveyances**

**615.** When a shaft conveyance is operated in a shaft or other underground opening, the employer shall ensure that

- (a) the shaft conveyance is in the charge of a cagetender or skiptender who is competent in those duties; and
- (b) a certificate issued by a professional engineer is posted at the collar of the shaft or winze showing the number of persons allowed to ride in the cage, skip or bucket, and the weight of materials allowed to be loaded on the conveyance.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Content of certificate**

**616.** (1) The data shown on the certificate issued by a professional engineer under section **615** shall be determined in accordance with the maximum material load on a shaft conveyance which shall not exceed the lesser of

- (a) the maximum allowable suspended load for the hoist, less the sum of the weight of the hoisting ropes, the weight of tail ropes, and the weight of the conveyances and attachments;
- (b) the breaking strength of the rope, divided by the required factor of safety, minus the maximum weight of rope suspended in one compartment, minus the weight of the conveyance and attachments in the compartment, but where multiple ropes are used, the lowest breaking strength of a rope is used for all ropes in load calculations; and
- (c) the maximum allowable load for which the conveyance is rated by the manufacturer.

(2) The unbalanced load on the hoist as rated by the manufacturer or as certified by a professional engineer competent in the design of mine hoisting plants shall not be exceeded.

(3) For the purpose of this section, the factor of safety of a rope, when new, means the number of times the breaking strength of the rope is greater than the total weight supported by the rope at a definite place in the rope and the breaking strength of a rope means the breaking strength of the rope as shown in the manufacturer's certificate.

[Back to Top](#)

#### **Shaft conveyance without cagetender**

**617.** Notwithstanding paragraph **615** (a), a shaft conveyance may be operated without a cagetender when the installation is designed and installed in compliance with the requirements of CSA Standard M421 "Use of Electricity in Mines".

[Back to Top](#)

#### **Operation of conveyance**

**618.** (1) The cagetender or skiptender authorized to be in charge of a shaft conveyance under paragraph **615** (a) shall

- (a) not load or permit the conveyance to be loaded in excess of the number of persons or weight of material shown in the certificate issued under paragraph **615** (b);
- (b) not permit the hoisting of a person while ore or waste material is being hoisted
  - (i) in the skip of a skip-cage combination, or
  - (ii) in a skip which is in balance with the cage;



**LOGAN  
DRILLING  
GROUP**

- (c) permit only those workers required to handle material or equipment to be in or on the shaft conveyance while material or equipment is being hoisted;
- (d) ensure that material and equipment is loaded and secured so as to prevent it from shifting its position or catching the shaft timber or any obstacle;
- (e) notify the hoist operator of an unusually heavy or irregularly shaped load on or under the shaft conveyance, and not permit a person to ride in the conveyance when the load is being carried;
- (f) except during shaft inspection, close and keep closed the conveyance doors and hatch covers until a full stop is made at the destination signalled for, unless there are no persons riding in the conveyance; and
- (g) where not riding in the conveyance, remain available within hearing of the shaft signal at all times that persons are underground in an area serviced by the conveyance.

(2) A cagetender or skiptender who is authorized to be in charge of the shaft conveyance and who is a member of the only crew working on a particular level may leave the vicinity of the shaft after giving the conveyance release signal where

- (a) no person is on another level; or
- (b) no person, or group of persons, on another level is without a person authorized to give signals.

(3) In the case of an inadvertent stop in the shaft, the cage doors may be opened and persons may leave the shaft conveyance on instruction to do so from the supervisor in charge of the mine after the supervisor has advised the hoist operator.

### [Back to Top](#)

#### **Riding in bucket**

**619.** Where persons are transported in a bucket during shaft sinking operations, the shift leader shall ensure that

- (a) the bucket is steadied before leaving the top or bottom of the shaft;
- (b) the bucket, when descending, is brought to a complete stop at least 5 metres above the shaft bottom and remains there until a separate signal to lower has been given to the hoist operator;
- (c) the bucket, when ascending from the bottom, is brought to a complete stop at the crosshead, and a distinct pause is made before hoisting is resumed; and
- (d) on the initial trip after a blasting operation, the bucket
  - (i) is stopped at the point where, owing to the blast, it might be unsafe to proceed without careful examination, and the point is not lower than 15 metres above the blasting site, or elevation of the blasting operation,



**LOGAN  
DRILLING  
GROUP**

(ii) is lowered slowly from the point referred to in subparagraph (i) on signal from a worker in the bucket and at the speed as to be fully under control, by signal, of the worker, and

(iii) carries on the trip only sufficient workers as are required to examine the shaft.

[Back to Top](#)

#### **Prohibition of certain sinking buckets**

**620.** An employer shall not permit the use in a shaft of a sinking bucket with a ball and chain attached which could inadvertently dump the bucket.

[Back to Top](#)

#### **Load in sinking bucket**

**621.** A worker shall not fill a sinking bucket so that a piece of loose rock projects above the rim.

[Back to Top](#)

#### **Work at different elevations**

**622.** An employer shall not permit work to be done simultaneously in a shaft at more than one elevation unless the workers in the lower elevation are protected from the danger of falling objects by a covering extending over as much of the shaft as necessary to provide complete protection from the danger.

[Back to Top](#)

#### **Shaft mucking machine**

**623.** A worker shall not be on or below a shaft mucking machine unless the machine is secured in position by 2 independent means, each capable of supporting the full load.

[Back to Top](#)

#### **Application**

**624.** Sections **625** to **628** apply to mine hoists.

[Back to Top](#)

#### **Test specimen**

**625.** Wire rope used for hoisting shall be in accordance with test procedures of CSA Standard CSA G4, "Steel Wire Rope for General Purpose and for Mine Hoisting and Mine Haulage".



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Examination of mechanical parts**

**626.** (1) An employer shall implement and document in writing a procedure, consistent with the requirements of this section, for the systematic examination, testing and maintenance of the hoist, safety devices and controls, sheave wheels, hoisting ropes, rope attachments, shaft conveyances and counterweights, and the procedure shall prescribe

- (a) the frequency of each examination and test;
- (b) the method to be used in each examination and test; and
- (c) the criteria for assessing the results of each examination and test.

(2) The procedure referred to in subsection (1) shall be developed and overseen by a professional engineer.

[Back to Top](#)

#### **Defects**

**627.** (1) Where on an examination a weakness or defect is discovered by which the safety of persons could be endangered, the person discovering that weakness or defect shall immediately report it to the hoist operator and the person's supervisor.

(2) Except for remedial measures, until the weakness or defect referred to in subsection (1) is remedied

- (a) the hoist operator shall not operate the hoist or conveyance; and
- (b) the employer shall not direct or permit the hoist to be operated.

[Back to Top](#)

#### **Machinery record book**

**628.** (1) An employer shall ensure that there is recorded in the machinery record book an entry of

- (a) every examination and test that is required under these regulations, as specified in the book;
- (b) a failure of or accident involving the hoist, rope, conveyance or shaft; and
- (c) a correction of or repair to, the hoist, hoist controls, signalling systems, hoisting rope, shaft conveyance or another part of the hoisting, dumping or loading equipment.

(2) An entry referred to in subsection (1) shall be signed by the worker making the examination or report.





**LOGAN  
DRILLING  
GROUP**

(3) The entries referred to in subsection (1) shall be read and signed by the supervisor of the worker performing the functions referred to in subsection (1).

## **PART XXXI EXPLOSIVES IN MINES**

[Back to Top](#)

### **Definitions**

**629.** (1) In this Part

- (a) "bulk explosives vehicle" means a vehicle that is used to transport bulk explosives;
  - (b) "director" means the director responsible for the Occupational Health and Safety Division.
- (2) The definitions in section **417** apply in this Part.

[Back to Top](#)

### **Application**

**630.** This Part applies to a mine.

[Back to Top](#)

### **Blasting in mines**

**631.** (1) The use of explosives at a mine shall be in a safe manner and as required in Part XIX.

(2) The handling and use of explosives in a mine shall only be conducted by competent individuals qualified by the manufacturer of the explosives being used at the mine.

(3) An employer shall develop written blasting procedures and a copy of the procedures shall be made available upon request to an officer.

[Back to Top](#)

### **Storage of explosives in mines**

**632.** (1) Explosives including detonators at a mine shall be stored in a magazine with written permission of the director.

(2) Where less than 160 kilograms of explosives are stored in an underground mine they may be stored in storage receptacles at locations removed from drilling operations or to the capacity of the magazine as stated on the permit.



**LOGAN  
DRILLING  
GROUP**

(3) Where long hole blasting is followed in an underground mine, the quantities of explosives that can be loaded in a 24 hour period only may be stored at the blast loading place.

(4) Explosives shall not be stored within 60 metres of

- (a) a hoistroom;
- (b) a shaft station;
- (c) a refuge station;
- (d) a transformer station;
- (e) a fuel storage area;
- (f) a garage or shop;
- (g) an access ramp; or
- (h) where a vehicle may collide with the stored explosives.

(5) Explosives that are unattended shall not be left in or about a work area and shall be returned to storage.

[Back to Top](#)

#### **Transporting explosives**

**633.** (1) A vehicle transporting explosives shall, in addition to the requirements in Part XIX,

- (a) be conspicuously marked by red signals or flags easily visible from the front, rear and both sides;
- (b) have metal parts that could come in contact with containers of explosives, covered with wood, tarpaulin or a similar non-sparking material; and
- (c) be equipped with an adequate fire extinguisher.

(2) Made-up primers shall be transported

- (a) in separate, suitable, closed containers conspicuously marked with the words "DANGER. EXPLOSIVES"; and
- (b) in a separate vehicle or conveyance from other explosives.

(3) When transporting explosives in a shaft conveyance, the worker in charge of the operation shall give or cause to be given notice of the operation to the deck attendant and hoist operator.



**LOGAN  
DRILLING  
GROUP**

(4) A worker shall not place in, take out of, or have while in, a shaft conveyance an explosive, except under the immediate supervision of a worker authorized for the purpose by a supervisor.

(5) Another material shall not be transported with explosives in a shaft conveyance.

(6) Explosives shall be removed without delay from

(a) near the shaft collar;

(b) other entrances to the underground workings; and

(c) a shaft station.

[Back to Top](#)

#### **Magazine locked**

**634.** A magazine shall be constructed, maintained and locked as required by the requirements of the explosives magazine application and licence and in accordance with "Storage Standards for Industrial Explosives," Explosives Division, Natural Resources Canada.

[Back to Top](#)

#### **Maintenance of magazines**

**635.** (1) A magazine shall be maintained in a clean state, free from grit.

(2) Metallic equipment shall not be stored inside a magazine.

(3) Flammable material shall not be stored in or around a magazine.

(4) The floors and shelves of a magazine where nitroglycerine explosives are kept shall be treated with a neutralizing agent to remove any traces of nitroglycerine.

[Back to Top](#)

#### **Grounding**

**636.** An explosives magazine on the surface shall be electrically grounded.

[Back to Top](#)

#### **Permit**

**637.** The explosives magazine permit issued by the director shall be posted inside the magazine.

[Back to Top](#)



**LOGAN  
DRILLING  
GROUP**

#### **Log book**

638. A blaster shall maintain a log book of explosives at the magazine.

[Back to Top](#)

#### **Explosives used underground**

639. (1) Explosives used in an underground mine shall be of Fume Class 1 rating as established by the Explosives Division of the Department of Natural Resources Canada.

(2) Notwithstanding subsection (1), where an explosive is rated other than Fume Class 1, a procedure shall be prepared in writing, and implemented, that will ensure that a worker is not exposed to fumes that may endanger the worker's health and safety.

(3) A copy of the procedure referred to in subsection (2) shall be submitted to the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, as applicable.

(4) Subsections (1) and (2) do not apply to an explosive used for a detonating purpose or as a primer.

[Back to Top](#)

#### **Manufacturing explosives**

640. An employer shall not manufacture or mix or permit the manufacturing or mixing of an explosive, or a material for use as an explosive

- (a) underground in a mine; or
- (b) on surface at a mine except when licensed to do so under the *Explosives Act* and *Explosives Regulations* (Canada ).

[Back to Top](#)

#### **Cutting or piercing**

641. An employer and a blaster shall ensure that an explosive is sectioned, cut or pierced only

- (a) with tools made of non-sparking material; and
- (b) on a clean, wooden surface free from grit or other foreign matter.

[Back to Top](#)

#### **Cartridge explosives**

642. (1) An employer shall ensure that cartridge explosives are not removed from their original outer cover.





**LOGAN  
DRILLING  
GROUP**

- (2) A person shall not remove a cartridge explosive from its original outer cover.

[Back to Top](#)

#### **Tools**

**643.** An employer shall provide workers with standard crimping tools and a safe location for

- (a) crimping detonators to detonating cord; and
- (b) cutting fuses.

[Back to Top](#)

#### **Unwinding detonator leg wires**

**644.** (1) An employer and a blaster shall ensure that a worker unravels or unwinds detonator leg wires slowly when a charge is lowered into a drill hole or borehole.

- (2) A worker shall not unravel or unwind detonator leg wires by
  - (a) throwing them on the ground; or
  - (b) dragging them along the ground.

[Back to Top](#)

#### **Sequential firing**

**645.** A blaster shall ensure that detonating connectors used to provide sequential firing are delayed to minimize misfires resulting from cutting off holes.

[Back to Top](#)

#### **Detonator leg wires**

**646.** (1) An employer and a blaster shall ensure that detonator leg wires of loaded drill holes and bore holes

- (a) are not exposed for more than 600 millimetres above ground level;
- (b) are shunted; and
- (c) are wrapped on a wooden or plastic lath or wire pin flag.

(2) An employer shall ensure that the position of a drill hole or bore hole is marked by setting the base of the wooden or plastic lath or wire pin flag in the drill hole or bore hole.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Wiring of magazines for explosives and detonators**

**647.** (1) Electrical equipment in explosives or detonator magazines shall be suitable for Class II, Division 2 hazardous locations, as defined in the Canadian Electrical Code.

(2) Explosives or detonator magazines on the surface shall be located at least 60 metres from overhead lines and at least 100 metres from electrical substations.

(3) Overhead lines supplying explosives or detonator magazines shall be protected against lightning surges.

[Back to Top](#)

#### **Bulk explosives vehicle**

**648.** (1) A bulk explosives vehicle shall be provided with a fire suppression system that uses sprinklers, foam or another suitable means of suppressing fire.

(2) When a bulk explosives vehicle is not in use, it shall be parked in a place designated as a safe parking place by the employer.

(3) A place may be designated as a safe parking place for the purpose of subsection (2) only where it is located at least 60 metres away from

- (a) the main access into or from a mine;
- (b) key mechanical and electrical installations that remain in service during a mine emergency;
- (c) areas of refuge or other areas where workers may congregate; and
- (d) storage areas for fuel or other potential sources of fire.

(4) Plans and specifications showing the design and location of the designated safe parking places shall be kept readily available at the mine site.

(5) Subsections (2), (3) and (4) do not apply during the initial stages of development and exploration in a mine.

(6) A bulk explosives vehicle shall not be parked in a magazine.

(7) An employer shall, in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, develop a written procedure for the regular power washing of bulk explosives vehicles, including the frequency of washing.

(8) Before a bulk explosives vehicle enters a garage for maintenance,

- (a) the explosives, detonators and explosive residue shall be removed from the vehicle; and



**LOGAN  
DRILLING  
GROUP**

- (b) the vehicle shall undergo power washing in accordance with the procedure developed under subsection (7).

[Back to Top](#)

**Electric blasting**

**649.** (1) An isolated, ungrounded power source shall

- (a) be used for electrical blasting;
- (b) have adequate capacity for the number of caps involved; and
- (c) not be used for another purpose.

(2) Acceptable blasting-circuit conductors shall be

- (a) not less than No. 12 AWG;
- (b) without splices as far as practicable; and
- (c) readily identifiable as being for blasting use, red in colour.

(3) Where expendable connecting wires are used from the lead wires to the leg wires of the blasting caps, they shall not be less than No. 20 AWG.

(4) Where the power-distribution system is not used for blasting, an employer shall establish alternative written safe work procedures.

(5) An employer shall have written safe work procedures to prevent inadvertent detonation of electrical blasting caps in the presence of radio transmitters or other radio-frequency fields including cellular phones, global positioning system devices and portable hand-held radios.

(6) Where electric blasting caps are used

- (a) the protective shunt shall not be removed from the leg wire until connections are made;
- (b) the leg wire shall not be shortened to less than one metre;
- (c) the firing cables leading to the face or faces shall be short circuited while the leads from the blasting caps are being connected to each other and to the firing cables;
- (d) the short-circuit prescribed in paragraph (c) shall not be removed until all workers have left the workplaces to be affected by the blasting operation; and
- (e) the short-circuit prescribed in paragraph (c) shall be located so that a premature explosion will be harmless to the worker opening the short-circuit.

(7) Blasting cables and blasting wires shall

- (a) be distinguished from other cables and wires;



**LOGAN  
DRILLING  
GROUP**

- (b) be used for blasting purposes only; and
- (c) not come into contact with
  - (i) detonating cords,
  - (ii) power, lighting or communication cables, or
  - (iii) pipes, rails or other continuous metal grounded circuits.
- (8) When a common electrical source is used to fire blasts in more than one workplace, provision shall be made for
  - (a) the continued shorting of the blasting cables;
  - (b) a three-way switch for each individual blasting circuit which can be locked in either the shorted or closed position to provide for
    - (i) shorting of the circuit,
    - (ii) energizing the circuit, or
    - (iii) testing of the circuit;
  - (c) identification of blasting cables and switches; and
  - (d) a written blasting procedure setting forth
    - (i) the method of connecting the blasting wires to the electrical supply,
    - (ii) the evacuation of all workers from the area of the blast, and
    - (iii) the method of testing the system to ensure that the proper connections have been made.

### [Back to Top](#)

#### **Electrical blasting devices**

- 650.** (1) Where a programmable logic controller or computer is used to control or initiate a blast, the system shall be approved by a professional engineer.
- (2) When blasting by electricity, the blaster shall not enter, or allow another person to enter, the area until
- (a) the firing cables have been disconnected from the firing device and short circuited; or
  - (b) in the case of a blasting operation using a power or lighting circuit, the switches of the blasting circuit have been locked in the open position.





**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Procedures for hazardous dust explosions**

**651.** Where in a mine there exists the hazard of sulfide dust explosion owing to high sulfide content of ore, written procedures shall be developed to prevent explosions including

- (a) washing of headings, raises and other workplaces within 30 metres of a blasting site to remove dust prior to firing the blast; and
- (b) gas testing after a blast and before work commences to ensure that workers will not be exposed to toxic fumes and gas.

#### **PART XXXII**

#### **OPEN CUT WORKINGS IN MINING OPERATIONS**

[Back to Top](#)

#### **Definitions**

**652.** In this Part

- (a) "angle of repose" means the steepest angle of descent or dip of the slope relative to the horizontal plane when material on the slope face is on the verge of sliding;
- (b) "berm" means an embankment or ridge of earth that functions as a protective barrier that will prevent a piece of mobile equipment from going over its side; and
- (c) "catchment berm" means a bench designed to arrest material which sloughs from a face or wall at elevations above the face being worked.

[Back to Top](#)

#### **Application**

**653.** This Part applies to open cut workings in mining operations.

[Back to Top](#)

#### **Protection of workings, pits and quarries**

**654.** An employer shall ensure that a surface mine working or open face is securely fenced or otherwise protected against inadvertent entry by persons where

- (a) the working constitutes a hazard by reason of its depth;
- (b) the approaches to and openings of the working are not readily visible; or



**LOGAN  
DRILLING  
GROUP**

- (c) the hazard caused by the working is greater than the hazard caused by natural topographical features within 600 metres of the working.

[Back to Top](#)

**Protective curbs or berms**

**655.** (1) An employer shall maintain a protective curb or berm of material at an open pit or quarry along the outer edge of

- (a) a ramp;
- (b) a roadway that is within 20 metres of a hazardous slope in the open pit or quarry;
- (c) a bench, where mobile equipment other than a drilling machine is operated within 8 metres of the edge of the bench;
- (d) waste dumps;
- (e) an access ramp
  - (i) used to feed a hopper, crusher, or conveyor system, or
  - (ii) when required by an officer;
- (f) a road that has a vertical fall of greater than 2.5 metres and is used for the haulage of quarried or mined material whether in its raw or concentrate form.

(2) An employer shall ensure that

- (a) a portion of a surface haul road that exposes mobile equipment to a vertical fall of greater than 3 metres is protected by a berm that is equivalent to at least one half the height of the largest haulage truck tire in use on that haul road; and
- (b) a break in the berm of a surface haul road is not greater than the width of the smallest haul truck in regular service on that road.

(3) Where it appears that the waste dump is slumping, written safe work procedures shall be developed to address the placement of material on the slumping dumps.

(4) Berms or curbs shall be made of unconsolidated material.

[Back to Top](#)

**Heights of faces and benches**

**656.** (1) The bench or face height for quarries with unconsolidated material including sand and gravel shall not exceed 5 metres and, in any event, shall not be higher than can be reached with equipment in use.



**LOGAN  
DRILLING  
GROUP**

(2) The bench or face height for quarries with consolidated material shall not exceed 10 metres and, in any event, shall not be higher than can be reached with equipment in use.

(3) The bench or face height for open pits with consolidated material shall not exceed 20 metres and, in any event, shall not be higher than can be reached with equipment in use.

(4) When a quarry referred to in subsection (1) is worked in 2 or more benches, it shall be worked at a 45 ° angle with catchment berms left in place to collect material falling to the bench below.

(5) When a quarry referred to in subsection (2) is worked in 2 or more benches, it shall be worked at a 55 ° angle with catchment berms left in place to collect material falling to the bench below.

(6) A part of a face or wall of a surface mine or quarry shall not overhang.

[Back to Top](#)

#### **Face of open pit or quarry**

**657.** Before permitting a person to work near the face of an open pit or quarry, an employer shall ensure that a supervisor examines the face for hazardous conditions

- (a) following a blast; and
- (b) daily.

[Back to Top](#)

#### **Lifelines**

**658.** A worker shall not work on the wall of an open pit or quarry or within 2 metres of the crest where there is danger of the worker falling more than 3 metres, unless the worker utilizes an appropriate fall arrest system as required under Part X.

[Back to Top](#)

#### **Undercutting of face**

**659.** An employer or worker shall not direct or permit a working face to be advanced by undercutting.

[Back to Top](#)

#### **Working of unconsolidated material**

**660.** In workings of clay, sand, gravel or other type of unconsolidated material, an employer shall ensure that, where ripping is required to loosen frozen material, the equipment



**LOGAN  
DRILLING  
GROUP**

- (a) is operated perpendicularly to the working face; and
- (b) does not approach closer to the working face than a distance equal to the height of the face.

[Back to Top](#)

#### **Dumping from vehicle**

**661.** (1) Where material is dumped from a vehicle into a raise or over a bank or bench, an employer shall

- (a) provide and maintain a bumper block or berm of material that prevents the vehicle from sliding into the raise or over the bank or bench;
  - (b) not direct or permit material to be dumped at a location where the ground at the dumping place could fail to support the weight of a loaded vehicle; and
  - (c) ensure that trucks or vehicles approach the dump in a manner that affords the operator an unobstructed view of the raise, bank or bench.
- (2) An employer shall ensure that a person does not dump material from a haulage vehicle
- (a) over a bank that is more than 3 metres high; or
  - (b) within 3 metres of the berm crest when the bank is more than 3 metres high.

[Back to Top](#)

#### **Ramps**

**662.** (1) Where 2 lane traffic exists on a ramp, an employer shall ensure that the width of the ramp is not less than 3 times the width of the widest vehicle using the ramp on a regular basis, plus 3 metres.

(2) Where single lane traffic exists the width shall be not less than 2 times the width of the widest haulage vehicle used on the road, plus 3 metres.

(3) Open pit mine haul roads, ramps and surface shall be graded, maintained and have adequate dust suppression used to control dust generation.

(4) A worker shall not use a device other than a towbar for towing equipment down a ramp.

[Back to Top](#)

#### **Rotary drilling**

**663.** (1) An operator of a rotary drill shall not remain on the deck while the drill is running.





**LOGAN  
DRILLING  
GROUP**

(2) Production or development drills shall be equipped with an adequate dust suppression system to control dust emissions from the drilling operations.

(3) In the event of a power failure, an operator shall ensure that the controls on a rotary drill are placed in the off or neutral position to avoid possible hazards caused by an inadvertent start-up.

[Back to Top](#)

#### **Parking of vehicles**

**664.** An operator shall not park small vehicles where the operator is or could be endangered by an operating shovel, loader, production truck or bulldozer.

[Back to Top](#)

#### **Operation of equipment**

**665.** An operator of a mechanical shovel, loader or backhoe shall not operate the equipment in a manner that the load passes over unprotected workers.

[Back to Top](#)

#### **Light vehicle equipment**

**666.** (1) A vehicle that weighs 4,500 kilograms or less shall, in addition to the equipment required for highway driving, be equipped with

- (a) a whip antenna that is fitted with a flag high enough to be visible to the drivers of production vehicles; and
- (b) a flashing light mounted above the cab of the vehicle.

(2) Subsection (1) does not apply to a vehicle that is used directly for production in an operating open pit.

[Back to Top](#)

#### **Lighting**

**667.** Where a hazard would be caused by the lack of artificial lighting, an employer shall provide suitable lighting at

- (a) areas where trucks are being loaded and dumped;
- (b) dumps; and
- (c) areas where the loading of explosives is being carried out.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

#### **Clearance lights**

**668.** (1) An employer shall ensure that powered mobile equipment has clearance lights that

- (a) indicate clearly from both the front and rear of the machine the overall width of the machine; and
- (b) meet the requirements of the Society of Automotive Engineers (SAE) Standard J2042, "Clearance, Sidemarkers, and Identification Lamps for Use on Motor Vehicles 2032 mm or More in Overall Width".

(2) An employer shall ensure that the clearance lights of powered mobile equipment are on when the engine of the machine is on.

(3) For the purpose of subsection (1), the overall width shall not include

- (a) blades on motor graders or rubber-tired dozers; or
- (b) buckets on front-end loaders.

[Back to Top](#)

#### **Mine road design**

**669.** (1) An employer shall prepare traffic control procedures and plans, showing the maximum allowable speeds for the vehicles in use, rules for passing, "stop" and "yield rules," priority rules for various vehicles, rules for night operation, maximum operating grades, emergency runoff protection lanes, berms, and other information that may be required to ensure the safe operation of all types of vehicles on the mine site.

(2) An employer shall ensure that

- (a) appropriate signage is maintained in the open pit; and
- (b) accurate mine plans are updated in accordance with good engineering practice.

[Back to Top](#)

#### **Bench and berm widths - quarries and open pits**

**670.** Where a surface mine is worked in benches

- (a) each catchment berm shall be designed so that its final width is not less than 8 metres;
- (b) loose rock and soil shall not be allowed to accumulate on a bench or catchment berm in a manner that endangers a person working on a lower bench; and



**LOGAN  
DRILLING  
GROUP**

- (c) where loose rock accumulates and where access cannot be gained to clean the catchment berm, and a danger exists to a person working below, a written safe working procedure shall be developed.

[Back to Top](#)

#### **Water control**

**671.** An employer shall ensure that

- (a) open pits are dewatered by sumps, ditching or other effective means;
- (b) surface run-off is controlled by ditching or other effective means; and
- (c) overburden dumps are maintained free from water run-off by ditching to channel water flows away from overburden material.

[Back to Top](#)

#### **Stockpiles**

**672.** (1) An employer shall ensure that stockpiles of unconsolidated material are

- (a) inspected for hazardous conditions regularly by a competent person;
- (b) made safe before a worker is allowed to work close to or on top of the stockpile; and
- (c) sloped to the angle of repose.

(2) An employer shall ensure that the vertical height of the working face of stockpiled material is no more than 2 metres above the maximum reach of equipment being used.

(3) Notwithstanding subsection (2), where the vertical height of the working face of stockpiled material is greater than 2 metres above the maximum reach of equipment being used, the work shall be performed in accordance with written safe work procedures certified by a professional engineer.

(4) When a tunnel is used under a stockpile for the purpose of reclaiming material from the stockpile, at least 2 exits shall be provided from the tunnel.

[Back to Top](#)

#### **Waste dumps**

**673.** (1) An employer shall ensure that waste dumps are inspected by a competent person

- (a) for hazardous conditions prior to being used, and made safe before a worker is allowed to work close to or on top of the waste dump; and
- (b) at least once each shift when material is being dumped.



**LOGAN  
DRILLING  
GROUP**

(2) The person who conducts an examination under subsection (1) shall record the details of the examination.

(3) An employer shall develop written safe work procedures and implement them when hazardous conditions are found at a waste dump.

[Back to Top](#)

#### **Reverse when dumping**

**674.** A driver of a haulage truck shall not

- (a) operate the vehicle in reverse for a distance greater than 4 truck lengths on a dump; or
- (b) operate the vehicle in reverse for a distance greater than 4 truck lengths on a stockpile, ramp, road, or a ramp or road that is under construction, unless the stockpile, ramp or road has a positive gradient of more than 5% or the driver is trained in an approved written safe work procedure for the task.

[Back to Top](#)

#### **Dump raised**

**675.** A driver of a haulage truck shall not operate a vehicle with a dump raised for a distance of greater than 3 truck lengths.

### **PART XXXIII USE OF ELECTRICITY IN MINES**

[Back to Top](#)

#### **Definitions**

**676.** In this Part

- (a) "electrical equipment" has the same meaning as in paragraph **477** (c) of these regulations;
- (b) "electrical work" means the installation, replacement, removal, connection, disconnection, alteration, maintenance or repair of electrical systems and equipment coming within the scope of the Canadian Electrical Code, Part I;
- (c) "mobile electrical equipment" means equipment that is designed to be energized while in operation.

[Back to Top](#)





**LOGAN  
DRILLING  
GROUP**

## Application

677. This Part applies to a mine.

[Back to Top](#)

## Codes and standards

678. (1) Notwithstanding section 4 of the *Electrical Regulations* made under the *Public Safety Act* and section 478 of these regulations, electrical equipment in a mine shall be designed, constructed, installed, maintained and operated and electrical work in a mine shall be conducted in accordance with the requirements of CSA Standard M421 "Use of Electricity in Mines", in conjunction with the requirements of the Canadian Electrical Code, Part I.

(2) Where there is a conflict between the CSA Standard M421 "Use of Electricity in Mines" and the Canadian Electrical Code, Part I, the CSA Standard M421 "Use of Electricity in Mines" prevails.

(3) Notwithstanding subsection 2 (3), where there is a conflict between the CSA Standard M421 "Use of Electricity in Mines" and a more stringent standard established in Part XXVI of these regulations, the CSA Standard M421 "Use of Electricity in Mines" prevails.

[Back to Top](#)

## Notices and information

679. (1) An employer shall develop a plan, approved by a registered electrical engineer, for the use of electrical energy at a mine, and shall follow the plan.

(2) A plan shall also be required for increases in capacity of an existing installation by more than 500 kva.

(3) The plan referred to in subsection (1) shall show

- (a) the areas at the mine where the electrical energy is to be transmitted and used, including schematic drawings;
- (b) the location of fixed electrical equipment;
- (c) the paths of the fixed supply conductors and the grounding networks; and
- (d) the power of the electrical conductors and of the electrical equipment on a single-line diagram.

[Back to Top](#)

## Fire extinguishing devices

680. (1) A fire extinguishing device shall be provided at each electrical equipment room, vault, switch house, sub station, mobile electrical equipment and underground garage.



**LOGAN  
DRILLING  
GROUP**

(2) The fire extinguishing devices shall be approved for use on electrical fires, appropriate for the type of equipment, located at an exit from the area and maintained.

[Back to Top](#)

#### **Restrictions for hazardous locations**

**681.** An employer shall ensure that electrical equipment used in a hazardous location, as defined in the Canadian Electrical Code, is approved for use in the location and for the specific gas, vapour, or dust that is or may be present.

[Back to Top](#)

#### **Electrical equipment rooms**

**682.** (1) The location, construction and installation of a room containing electrical equipment shall ensure the protection against

- (a) fire propagation;
- (b) water and dust ingress; and
- (c) corrosive atmosphere.

(2) An electrical equipment room shall be sufficiently ventilated to maintain equipment at safe temperatures.

(3) Lighting shall be sufficient to enable equipment to be clearly distinguished and instruments and labels to be read.

(4) Outdoor electrical equipment shall be fenced or guarded in accordance with the Canadian Electrical Code.

(5) Material shall not be stored against the fence work, and the enclosure shall be maintained free of run off water, sloughing of debris and vegetation.

(6) Controlled devices installed outdoors shall be of an approved type and suitably protected from the weather.

(7) An uninsulated energized conductor less than 2.5 metres above the floor or the ground shall be protected by a barrier or a shield and the floor or the ground shall be covered with a non-conductive material.

[Back to Top](#)

#### **Transformers**

**683.** (1) Transformers shall be of a type and design suitable for the location in which they are to be installed.



**LOGAN  
DRILLING  
GROUP**

- (2) Where installed underground, a transformer shall
  - (a) be protected against physical damage;
  - (b) be guarded to prevent access by unauthorized persons;
  - (c) be in an electrical equipment vault;
  - (d) be separated from explosives storage areas by 15 metres of undisturbed rock or a distance of 60 metres; and
  - (e) have clearances around it to permit safe access for inspection, maintenance, and repairs.

[Back to Top](#)

#### **Switchgear**

**684.** (1) Switchgear, terminals, connectors, soldered lugs, cable terminals, cable joints, cable taps or connection of apparatus shall

- (a) be regularly cleaned to prevent the accumulation of ore dusts or other conducting matter; and
- (b) be protected against physical damage and be guarded in a manner that access by unauthorized persons is prevented.

(2) Switchgear shall be installed at a convenient location on the surface to provide the means for isolating underground circuits.

(3) A switchboard installed underground shall be located

- (a) where it is separated from travelways or haulageways;
- (b) where a floor is installed, so that water cannot accumulate on it;
- (c) at least 3.5 metres from the timbering of a shaft; and
- (d) at least 15 metres from an explosive storage area.

[Back to Top](#)

#### **Trailing and cable repair**

**685.** (1) An employer shall, in consultation with the occupational health and safety committee, the worker health and safety representative or the workplace health and safety designate, conduct a formal hazard assessment and develop a written safe work procedure for the handling, use and maintenance of electrical trailing cables in accordance with CSA Standard M421 "Use of Electricity in Mines".



**LOGAN  
DRILLING  
GROUP**

(2) Trailing cables supplying mobile electrical equipment at a voltage of more than 300 volts, including grounding conductors, shall meet CSA Standard C-22.2 #96M "Portable Power Cables" and the following specifications:

- (a) the cable-filling material shall be rubber or another synthetic material with similar properties;
  - (b) the phase conductors shall be of a gauge equal to or larger than No. 8 AWG;
  - (c) the grounding conductors shall be uninsulated or shall be covered with a semi-conducting insulation or shall have a total conductance equal to or greater than 60% of that of the largest phase conductor;
  - (d) the grounding conductors shall be equal to or larger than No. 8 AWG;
  - (e) where the insulated monitoring conductor in a cable supplying energy to a single piece of equipment is supplied to it by a separate power source, the energy supplying the equipment shall be disconnected when the conductors of the separate energy source are cut or when a grounding conductor is broken;
  - (f) where they are transmitting electrical power at a potential exceeding 750 volts to ground, they shall have a grounded sheathing consisting of tinned copper wire mesh or equivalent around each power conductor;
  - (g) the cables shall enter metal frames of motors, splice boxes, and electric compartments only through acceptable termination fittings;
  - (h) the trailing cables shall be secured to machines and to the switchgear by approved cable gland or plug and socket couplings, to protect the cables from damage and to prevent strain on the electrical connections;
  - (i) the trailing cables to transportable electrical equipment shall be provided at its point of entry of supply with a switch or equivalent disconnecting device;
  - (j) where conducting-rubber materials are used in cable construction, the control switch shall provide sensitive ground-fault protection capable of automatically tripping the control switch at a ground-fault level of 750mAa or less;
  - (k) the jackets on cables shall be unpainted; and
  - (l) where for underground use, they shall have a non-flammable covering, suitably identified.
- (3) Where a person is handling an energized trailing cable, he or she shall use suitable protective equipment.
- (4) A trailing cable in use shall be tested by an electrician at regular intervals and by the operator prior to start of shift.
- (5) Damaged trailing cables shall be inspected by a qualified person before they are returned to service, to ensure that they are in safe operating condition and defective trailing cables shall be removed from service.





**LOGAN  
DRILLING  
GROUP**

(6) Permanent repairs to damaged trailing cables shall be made by a qualified person who shall examine and test the trailing cables for continuity and insulation integrity before they are allowed to go back into service.

(7) Permanent splices or repairs in trailing cables shall be mechanically strong, with equivalent electrical conductivity as other sections of the cable and be effectively insulated and sealed to prevent moisture penetration.

[Back to Top](#)

#### **Protection of trailing cables**

**686.** (1) Trailing cables shall be routed to avoid accumulation of water and damage and be kept visible by being mounted on suitable markers at regular intervals throughout the cable route.

(2) Cable couplers shall be suitably supported off the ground.

(3) Where trailing cables cross haulageways, or where equipment shall pass the cables, cables shall be isolated by elevation or be protected from crushing.

(4) A cable assembly operating at a voltage in excess of 300 volts shall be provided with a visible means of identifying the equipment to which it is connected or by other means acceptable to the minister.

(5) Trailing cables shall be kept under observation by the machine operator or assistant to effectively prevent damage to them.

(6) Where trailing cables receive mechanical or electrical damage they shall be removed from service immediately.

(7) A worker shall not drive a vehicle over an unprotected trailing cable.

[Back to Top](#)

#### **Electrical trailing cable reels**

**687.** Electrical trailing cable reels installed on mobile equipment shall

(a) be operational at all times;

(b) be designed to meet the bending-ratio requirements of Canadian Electrical Code, Part I;

(c) be provided with a limit switch that prevents the removal of all of the electrical cable during normal operation;

(d) be provided with

(i) a grounding slip ring,

(ii) a ground-check slip ring suitable for control and signal circuits, and



**LOGAN  
DRILLING  
GROUP**

- (iii) power conductor slip rings; and
- (e) have access to slip rings controlled by a
  - (i) mechanical interlock, to ensure that access is available only after the power supply has been isolated from the supply portable power cable; or
  - (ii) substantial steel cover plate affixed by a multibolt system requiring the use of hand held tools to release and shall carry the warning "DANGER: ISOLATE AT SUPPLY SOURCE BEFORE REMOVING THIS COVER".

### [Back to Top](#)

#### **Trailing cable connectors**

**688.** (1) Cable couplers on circuits operating at voltages higher than 300 volts shall be

- (a) of a type designed for the cable on which they are used;
- (b) equipped with covering, hoods or seals to cover the unprotected ends when they are disconnected;
- (c) equipped with cable clamps and gaskets on the joints to prevent an infiltration of water; and
- (d) designed to prevent accidental disconnection when they are energized.

(2) A disconnecting device shall be installed on the end of each trailing cable connected to a piece of mobile electrical equipment.

### [Back to Top](#)

#### **Quick connect cable couplers**

**689.** (1) A quick connect coupler used to join portable cables or a cable and a flange mount receptacle, operating at a voltage in excess of 300 volts shall have

- (a) a mechanical fastening arrangement, to join the coupler, with a tensile strength greater than that of the portable power cable;
- (b) strain relief devices suitable for the intended portable power cable;
- (c) a means to prevent the ingress of moisture;
- (d) a means to mechanically lock the coupler, where the circuit voltage exceeds 750 volts;
- (e) a pin arrangement that
  - (i) the ground conductor makes before and breaks after the phase conductors, and
  - (ii) the ground check circuit makes after and breaks before the phase conductors;



**LOGAN  
DRILLING  
GROUP**

(f) ground fault protection and ground conductor monitoring at the source of supply; and

(g) a disconnecting device placed less than one metre from the receptacle.

(2) A disconnecting device shall be used to de-energize the receptacle before a plug is connected or disconnected.

[Back to Top](#)

#### **Electrical protection and control devices**

**690.** Electrical protection and control devices shall be placed, labelled or marked so as to identify the circuits or the electrical equipment protected or controlled by them.

[Back to Top](#)

#### **Protection of underground cables**

**691.** (1) Suitable circuit breakers and disconnectors shall be inserted in the feeder conductors connected to underground cables.

(2) Circuit breakers and disconnectors shall be readily accessible and as close as practicable to the point of connection between the supply circuit and underground cables.

(3) Instruments indicating the presence of ground leaks shall be installed on an ungrounded distribution network whose voltage exceeds 300 volts.

(4) Ground leak protection devices to automatically isolate a defective circuit shall be installed on a neutral grounded distribution network whose voltage exceeds 300 volts.

[Back to Top](#)

#### **Out of service wiring**

**692.** Damaged or out of service wiring and electrical equipment shall be disconnected from its source of power and removed.

[Back to Top](#)

#### **Supply systems for mobile electrical equipment**

**693.** (1) Supply systems for mobile electrical equipment shall be tested before being put into service, and at least once a year thereafter, in order to prove the effectiveness of the ground fault tripping and the ground conductor monitoring circuits.

(2) A record of the tests required under subsection (1) shall be kept at the mine and shall be available for examination.



**LOGAN  
DRILLING  
GROUP**

(3) There shall be separate disconnecting means, overload protection, and ground-fault protection for each motor or group of motors.

(4) Grounding and bonding of electrical apparatus on board mobile electrical equipment shall be in accordance with the Canadian Electrical Code, Part I.

[Back to Top](#)

#### **Shaft sinking equipment**

**694.** Shaft sinking equipment operating at voltages in excess of 300 volts shall be supplied by portable power cable and have ground fault protection and ground conductor monitoring.

[Back to Top](#)

#### **Lightning protection**

**695.** (1) Equipment for lightning protection shall include lightning arrestors, surge capacitors, high speed protection gaps, guard wires, guard structures and air terminals.

(2) Where overhead lines traverse an area higher in elevation than the sites on a mine property that they interconnect, and where natural conditions require those measures, an overhead lightning-protection wire with supplementary ground electrodes at the high points shall be provided.

(3) Where mine headframes, pipe services, tracks, cables, or other non-system conductors that enter the mine are in danger of being struck or charged by lightning, they shall be protected at the surface by lightning-protection wires or structures grounded by low-resistance grounds as in lightning arrestors.

[Back to Top](#)

#### **Radio controlled equipment**

**696.** Where radio-frequency equipment is used to remotely control machines, cranes, or other devices, written procedures shall be implemented to ensure that the transmitter and receiver are correctly matched as a unique set.

[Back to Top](#)

#### **Underground electrical protection**

**697.** (1) Where electrical energy is taken underground, provisions shall be made so that the current can be cut off on the surface.

(2) Conductors, cables, or portable power cables supplying power to fixed equipment at voltages-to-ground in excess of 150 volts shall be protected by armour or conduit and shall be suitably designed for the conditions under which they will be operated.





**LOGAN  
DRILLING  
GROUP**

- (3) Electrical supply lines installed in boreholes shall be armoured.
- (4) Unless they are effectively guarded at places where they may be inadvertently touched by persons or objects, trolley wires underground shall be
  - (a) at least 2.4 metres vertically above the top surface of the trolley track rails when operating at 300 volts or less;
  - (b) at least 2.7 metres vertically above the top surface of the trolley track rails when operating in excess of 300 volts and less than 750 volts; and
  - (c) at least 4 metres vertically above the top surface of the trolley track rails when operating in excess of 750 volts.
- (5) Trolley wires shall be supported by insulated hangers, solidly attached to the roof or ceiling, and may not zigzag.
- (6) The tracks in a trolley transport system that are used for current return shall be electrically bonded by linkages at the switches, the frogs and other openings to provide electrical continuity for the rails, and cross bonding shall be installed between the 2 rails at more than 60 metre intervals.
- (7) The ends of trolley line conductors or feeders shall be dead-ended by strain insulators.

[Back to Top](#)

#### **Grounding**

- 698.** (1) The metallic covering of a cable shall not be used as the sole grounding conductor.
- (2) Electrical motors, component parts, or chambers associated with assembly of machines or equipment shall be grounded with copper conductors to the power supply ground system and the conductance of this ground conductor shall be more than 50% of the conductance of the largest power conductor and have a minimum size of No. 10 AWG.

[Back to Top](#)

#### **Unprotected electrical cable**

- 699.** A worker shall not drive a vehicle over an unprotected electrical cable.

### **PART XXXIV REPEAL AND COMMENCEMENT**

[Back to Top](#)

#### **CNLR 1145/96 Rep.**

**700.** The *Mines Safety of Workers Regulations*, Consolidated Newfoundland and Labrador Regulations 1145/96, are repealed.



**LOGAN  
DRILLING  
GROUP**

[Back to Top](#)

**NLR 70/09 Rep.**

**701. The *Occupational Health and Safety Regulations, 2009* , Newfoundland and Labrador Regulations 70/09, are repealed.**

[Back to Top](#)

**Commencement**

**702. These regulations come into force 60 days after their publication in the *Gazette* . (In force - Mar. 20/12)**

[Back to Top](#)

### Schedule

**List of occupational diseases:**

1. Diseases caused by agents
  - 1.1 Diseases caused by chemical agents
    - 1.1.1 Diseases caused by beryllium or its toxic compounds
    - 1.1.2 Diseases caused by cadmium or its toxic compounds
    - 1.1.3 Diseases caused by phosphorus or its toxic compounds
    - 1.1.4 Diseases caused by chromium or its toxic compounds
    - 1.1.5 Diseases caused by manganese or its toxic compounds
    - 1.1.6 Diseases caused by arsenic or its toxic compounds
    - 1.1.7 Diseases caused by mercury or its toxic compounds
    - 1.1.8 Diseases caused by lead or its toxic compounds
    - 1.1.9 Diseases caused by fluorine or its toxic compounds
    - 1.1.10 Diseases caused by carbon disulphide
    - 1.1.11 Diseases caused by the toxic halogen derivatives of aliphatic or aromatic hydrocarbons
    - 1.1.12 Diseases caused by benzene or its toxic homologues
    - 1.1.13 Diseases caused by toxic nitro- and amino-derivatives of benzene or its homologues



**LOGAN  
DRILLING  
GROUP**

- 1.1.14 Diseases caused by nitroglycerine or other nitric acid esters
- 1.1.15 Diseases caused by alcohols, glycols or ketones
- 1.1.16 Diseases caused by asphyxiants: carbon monoxide, hydrogen cyanide or its toxic derivatives, hydrogen sulphide
- 1.1.17 Diseases caused by acrylonitrile
- 1.1.18 Diseases caused by oxides of nitrogen
- 1.1.19 Diseases caused by vanadium or its toxic compounds
- 1.1.20 Diseases caused by antimony or its toxic compounds
- 1.1.21 Diseases caused by hexane
- 1.1.22 Diseases of teeth due to mineral acids
- 1.1.23 Diseases due to pharmaceutical agents
- 1.1.24 Diseases due to thallium or its compounds
- 1.1.25 Diseases due to osmium or its compounds
- 1.1.26 Diseases due to selenium or its compounds
- 1.1.27 Diseases due to copper or its compounds
- 1.1.28 Diseases due to tin or its compounds
- 1.1.29 Diseases due to zinc or its compounds
- 1.1.30 Diseases due to ozone, phosgene
- 1.1.31 Diseases due to irritants: benzo quinone and other corneal irritants
- 1.1.32 Diseases caused by any other chemical agents not mentioned in the preceding items 1.1.1 to 1.1.31, where a link between the exposure of a worker to these chemical agents and the diseases suffered is established
  
- 1.2 Diseases caused by physical agents
  - 1.2.1 Hearing impairment caused by noise
  - 1.2.2 Diseases caused by vibration (disorders of muscles, tendons, bones, joints, peripheral blood vessels or peripheral nerves)
  - 1.2.3 Diseases caused by work in compressed air
  - 1.2.4 Diseases caused by ionizing radiations



**LOGAN  
DRILLING  
GROUP**

- 1.2.5 Diseases caused by heat radiation
  - 1.2.6 Diseases caused by ultraviolet radiation
  - 1.2.7 Diseases due to extreme temperature (e.g. sunstroke, frostbite)
  - 1.2.8 Diseases caused by any other physical agents not mentioned in the preceding items 1.2.1 to 1.2.7, where a direct link between the exposure of a worker to these physical agents and the diseases suffered is established
- 
- 1.3 Biological agents
    - 1.3.1 Infectious or parasitic diseases contracted in an occupation where there is a particular risk of contamination
- 
- 2. Diseases by target organ systems
    - 2.1 Occupational respiratory diseases
      - 2.1.1 Pneumoconioses caused by sclerogenic mineral dust (silicosis, anthraco-silicosis, asbestosis) and silicotuberculosis, provided that silicosis is an essential factor in causing the resultant incapacity or death
      - 2.1.2 Bronchopulmonary diseases caused by hard metal dust
      - 2.1.3 Bronchopulmonary diseases caused by cotton, flax, hemp or sisal dust (byssinosis)
      - 2.1.4 Occupational asthma caused by recognized sensitizing agents or irritants inherent to the work process
      - 2.1.5 Extrinsic allergic alveolitis caused by the inhalation of organic dusts as prescribed by national legislation
      - 2.1.6 Siderosis
      - 2.1.7 Chronic obstructive pulmonary diseases
      - 2.1.8 Diseases of lung, due to aluminium
      - 2.1.9 Upper airways disorders caused by recognized sensitizing agents or irritants inherent to the work process
      - 2.1.10 Any other respiratory disease not mentioned in the preceding items 2.1.1 to 2.1.9, caused by an agent where a direct link between the exposure of a worker to this agent and the disease suffered is established





**LOGAN  
DRILLING  
GROUP**

- 2.2 Occupational skin diseases
  - 2.2.1 Skin diseases caused by physical, chemical or biological agents not included under other items
  - 2.2.2 Occupational vitiligo
  
- 2.3 Occupational musculo-skeletal disorders
  - 2.3.1 Musculo-skeletal diseases caused by specific work activities or work environment where particular risk factors are present Examples of such activities or environment include:
    - (a) rapid or repetitive motion
    - (b) forceful exertion
    - (c) excessive mechanical force concentration
    - (d) awkward or non-neutral postures
    - (e) vibration Local or environmental cold may potentiate risk
  
- 3. Occupational cancer
  - 3.1 Cancer caused by the following agents:
    - 3.1.1 Asbestos
    - 3.1.2 Benzidine and salts
    - 3.1.3 Bis chloromethyl ether (BCME)
    - 3.1.4 Chromium and chromium compounds
    - 3.1.5 Coal tars and coal tar pitches; soot
    - 3.1.6 Betanaphthylamine
    - 3.1.7 Vinyl chloride
    - 3.1.8 Benzene or its toxic homologues
    - 3.1.9 Toxic nitro- and amino-derivatives of benzene or its homologues
    - 3.1.10 Ionizing radiations
    - 3.1.11 Tar, pitch, bitumen, mineral oil, anthracene, or the compounds, products or residues of these substances



**LOGAN  
DRILLING  
GROUP**

- 3.1.12 Coke oven emissions
  - 3.1.13 Compounds of nickel
  - 3.1.14 Dust from wood
  - 3.1.15 Cancer caused by any other agents not mentioned in the preceding items 3.1.1 to 3.1.14, where a direct link between the exposure of a worker to this agent and the cancer suffered is established
- 
- 4. Others
  - 4.1 Miners' nystagmus

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