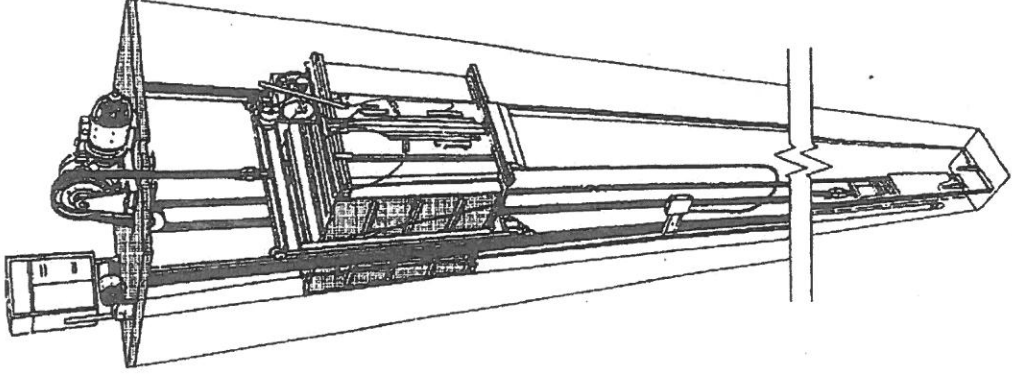


Alberta Elevator Industry

Safe Work Procedures Handbook



OCCUPATIONAL HEALTH AND SAFETY ACT

PERTINENT GENERAL SAFETY REGULATION SECTIONS FOR ELEVATOR INDUSTRY AND PARTICULARLY THOSE REFER- ENCED IN THIS MANUAL

1. Interpretation
2. Part 1 Sections 2, 3, 4, 5, 6, 7, 8, 9, 14,
15, 16, 19, 20, 21
- Part 2 Sections 34, 35, 36, 37, 38, 39
- Part 3 Sections 51, 52, 53, 54, 55, 57, 59, 60, 61, 63, 64, 67
- Part 4 Sections 70, 71, 72, 73, 74, 75, 76, 77, 78, 79
- Part 5 Sections 82, 83, 86, 87, 88, 89, 90, 91, 92

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Their commitment, expertise, foresight and time, has resulted in the development of a Safe Work Procedures manual that will prove, if applied, to be invaluable as a guideline for day to day activities in the industry, with the end result being a safer work environment for all involved.

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SUGGESTED PERSONAL PROTECTIVE EQUIPMENT

ITEM
BACK SUPPORT BELT
EAR PLUGS
FIRST AID KIT
GROUND FAULTS
HARD HAT
LOCKS AND TAGS
SAFETY GLASSES
SAFETY HANDBOOK
SAFETY HARNESS/LANYARDS
SAFETY SHOES/BOOTS
WORK GLOVES
BURNING GOGGLES
DUST MASKS
EAR MUFFS
FACE SHIELDS
FIRE EXTINGUISHER
GOGGLES, CLEAR
HAND CLEANER
KNEE PADS
RESPIRATOR
RESPIRATOR CARTRIDGES
RUBBER GLOVES
WELDING GLOVES

FORWARD

Elevators, escalators and moving walkways are complex mechanical devices which consist of interconnected electrical, mechanical and hydraulic systems. Due to their design and application, potential and kinetic energy sources can cause serious injury and extensive property damage if not properly managed. These systems are assembled in so many configurations that specific codes of practice cannot be envisioned for all applications. Occupational Health and Safety legislation does not provide specific guidance for the elevator industry.

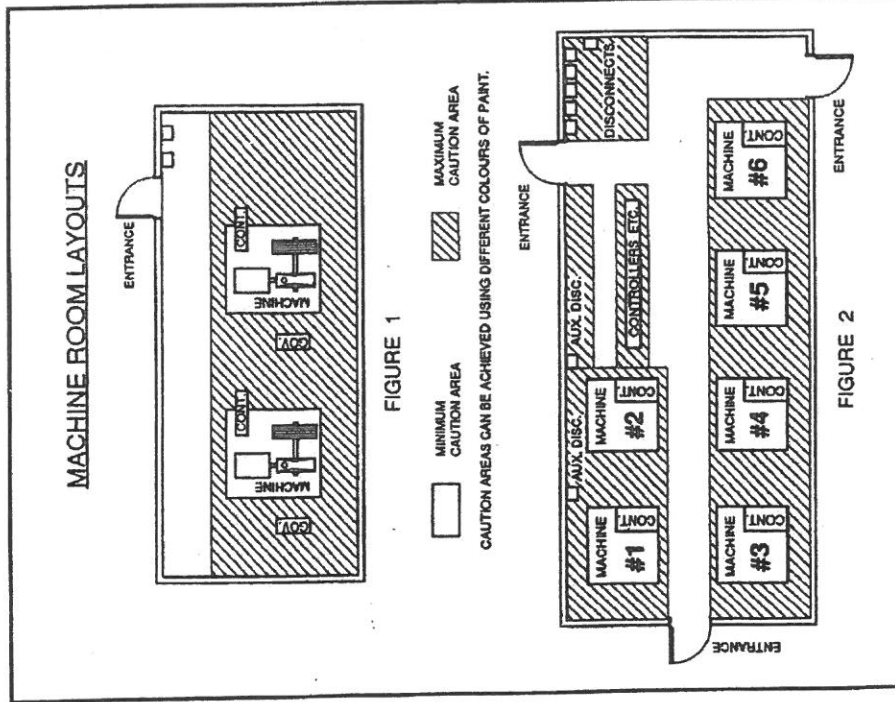
However, we recognize and accept our responsibility to comply with the standards that are reasonably practicable for our industry. A generic code of practice is needed to provide basic standards to ensure a minimum acceptable level of safety is maintained.

NOTE:

Any reference in this document to "worker" refers to a "competent worker".

Interpretation - General Safety Regulation, Alberta Regulation 448/83 "competent", in relation to a worker, means adequately qualified, suitably trained and with sufficient experience, to safely perform work that is the subject-matter of the relevant provision of this regulation without or with only a minimal degree of supervision.

Diagram 7



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SAFE WORK PROCEDURES

PURPOSE

The purpose of this guide is to establish safe work procedures to be followed by the elevator industry in the Province of Alberta. This guide addresses access and egress, lockout, guarding, falling hazards, lighting, and personal protective equipment.

SCOPE

These safe work procedures address the construction, servicing, repairs, tests, adjustments, inspections or surveys of work performed on this equipment.

RESPONSIBILITY

1. It shall be the responsibility of all supervisors of workers performing such operations to:
 - (a) Instruct their workers as to the content of these safe work procedures.
 - (b) Periodically follow-up to ensure compliance of these safe work procedures.
 - (c) If it is determined that this is not being complied with, immediately initiate corrective action.
2. It shall be the responsibility of all workers to:
 - (a) Follow safe work procedures as written and/or instructed.
 - (b) Test and verify proper operation of safety circuits
 - (c) Notify supervisor if circumstances are such that the safe work procedures cannot be followed.

11.4 APPLICATION OF GUARDING

- 11.4.1 All belts, pulleys, shafts, flywheels, couplings, sheaves, and other moving power transmission parts, where possible, be guarded or painted bright orange or yellow.
- 11.4.2 Projecting shaft ends must be guarded by non-rotating caps or safety sheaves or railings or painted bright orange or yellow.
- 11.4.3 Machine room and pit doors equipped with an applicable sign.
- 11.4.4 Define safe walk areas (Reference Diagram #7)
- 11.4.5 The employer and employee are responsible for maintaining and inspecting guards and protection devices.

11. SAFE WORK PROCEDURES FOR THE GUARDING OF EQUIPMENT

11.1 REASONS FOR GUARDING

- 11.1.1 To prevent accidental contact with moving parts.
- 11.1.2 A dangerous mechanical condition may catch a person off guard during a moment of inattention.
- 11.1.3 Control the hazard and reduce the chance of injury.

11.2 AREAS REQUIRING GUARDING

- 11.2.1 Moving belts, rollers, gears, drive-shafts, keyways, pulleys, sprockets, and cables.
- 11.2.2 Reciprocating, rotating or moving parts.
- 11.2.3 Pinch points.
- 11.2.4 Exposed energized parts.

11.3 TYPES OF GUARDS

11.3.1 Whenever the actions or motions of a machine present a hazard, it is essential that workers be protected by well constructed and effective guards.

- (a) Fixed enclosure guard prevents access to dangerous moving parts and restrains broken and flying machine parts.
- (b) When fixed guarding is not practicable, an interlocking should be the first alternative.
 - (i) One type shuts off or disengages power, preventing the machine from running.
 - (ii) Another type uses an electrical contact or mechanical stop that shuts down when any part of the body enters the danger zone.

SAFE WORK PROCEDURES FOR ACCESS AND EGRESS

1. SAFE WORK PROCEDURES FOR ACCESS AND EGRESS

SAFETY NOTE:

- Before attempting to gain access to the hoistway, it should be decided if the work to be done will require:
 - (a) personal fall protective equipment (eg. body harness).
 - (b) electrical power supply. If not, position the car, tag and lock out the main line switch.
- Test and verify proper operation of all safety devices.
- Place a sign on the controller to warn other service workers you are working on the elevator.
- Not all units are the same. This is a guide and must be adapted for other types of equipment. Consult with your supervisor for instruction.

SAFE WORK PROCEDURES FOR THE GUARDING OF EQUIPMENT

1.1 CAR TOP ACCESS

1.1.1 CAR TOP PROCEDURES (General)

1.1.1.1 Before getting on top of the car from the landing, mechanically block the hoistway doors in the open position. Then reach in and:

- (a) Set the emergency stop button in the STOP position.
- (b) Set the inspection switch to the INSPECT position.
- (c) Turn the car work light on.

1.1.1.2 Make sure that the car top is clean. Make sure that there are no grease or oil spills, and no loose objects. Make sure nothing is left behind when you leave the car top.

1.1.1.3 Secure tools or anything else needed for the job on the car top, make sure that they will be out of your standing area, and that they do not project over the edge of the car top.

10. HOUSEKEEPING

- 10.1 Each work site shall be kept clean and free from slipping and tripping hazards.
 - 10.2 Used waste, used rags and materials shall not accumulate around equipment, endangering workers or otherwise restricting safe access to, or egress from, the equipment and should be removed from site.
 - 10.3 Clean waste, rags and materials shall be stored in appropriate/approved containers.
 - 10.4 Elevator machine room shall not be used as storage for any material other than related to elevator equipment
-
- 1.1.1.4 Be sure you have a surface to stand on that will support your weight. Do not stand on light fixtures and use special care where the car tops are curved or domed. Emergency exit cover should be checked to ensure it can support weight.
 - 1.1.1.5 Have a firm hand hold on the crosshead or other part of the car structure when the car is moving. Never hold on to 2:1 ropes.
 - 1.1.1.6 When you are on the car top:
 - (a) Make sure that any protective equipment that you are wearing cannot become entangled or catch on any protrusions.
 - (b) Do not wear a tool belt, and never carry tools that protrude from your pocket.
 - (c) Remove bulky pagers or radios from your belt before working from car top and store in a safe, out of the way location.
 - 1.1.1.7 Always keep all parts of your body within the limits of the hoistway of the elevator being inspected. Be especially careful if there is an elevator running along side.
 - 1.1.1.8 Never hang an electric extension light from the car or counterweight ropes. Severe damage may result if the hoist ropes are exposed to electric current flow caused by a short or ground.
 - 1.1.1.9 Where overhead clearance is limited always be aware of any overhead obstructions.
 - 1.1.1.10 **AND, MOST IMPORTANT:** Always be alert and always be aware of your surroundings and the conditions that exist where you are working.

1.1.2 USING THE ACCESS KEY SWITCH (Preferred Method)

SAFETY NOTE:

Not all hoistway access systems operate the same. Listed below is one of the more common systems. If you are not familiar with a particular system, consult with your supervisor.

HOUSEKEEPING

- 1.1.2.1 Position the car at the access floor on independent service.
- 1.1.2.2 Turn the INSPECTION switch in the car operating panel from the NORMAL to the INSPECT position.
- 1.1.2.3 Step out of the car. Place a blocking device against the bottom of the hoistway door.
- 1.1.2.4 Insert key(s) in the Access Switch and turn the key switch to the "D" (DOWN) position. The car will move only as long as the key is held in one of the directional positions. Remove the key(s) from the access switch when the car has reached the desired level.
- 1.1.2.5 The car door may close as soon as it disengages from the hoistway door. If not, close it manually as soon as the car is stopped and secure, as in Section 1.1.2.6.
- 1.1.2.6 Before stepping onto the car top, reach in and set the EMERGENCY STOP switch on the car top inspection box to the STOP position. Turn the INSPECTION switch on the car top inspection box to the INSPECT position. Turn on the car top work light.
- 1.1.2.7 Step onto the car top and close the hoistway door, making sure that it locks.
- 1.1.2.8 Release the EMERGENCY STOP switch by resetting it to the ON position.

- (i) by padding where it passes over sharp edges, and
- (ii) from heat, flame, abrasion and corrosive materials during use, and
- (b) does not pass through any obstruction which could create a danger to a worker should any platform on which the worker is working fail;

(2) a life-line

- (a) is attached to a fixed anchor capable of supporting the shock load which may be applied, and
 - (b) has its lower end enclosed or secured to prevent fouling;
- (3) a safety harness is
- (a) properly adjusted to fit the worker securely, and
 - (b) attached by means of a lanyard to a fixed anchor or a life-line;
- (4) a safety harness, lanyard or life-line is assembled and used in a manner that will
- (a) prevent a worker from striking a surface below where he will work with undue force, and
 - (b) protect the worker from receiving a serious injury due to the action of the harness, lanyard or life-line.

9.6.4

- An employer shall ensure that
- (a) safety harness, life-lines and lanyards are protected from heat, flame, abrasion and corrosive materials during storage,
 - (b) a life-line is not attached to the same anchor points as the suspension lines of a work platform,
 - (c) all metal parts of, or hardware attached to, a safety harness, lanyard or life-line are of draw, rolled or forged metal with a load arresting capacity of not less than 17.8 kilonewtons, and a protective thimble is used to connect ropes or straps to eyes or rings used in a safety harness, lanyard or life-line.

1.1.2.9 The car may now be run by using the 'U' and 'D' and 'COMMON' buttons on the car top inspection box.

CAUTION: Some car top controls may not have a COMMON button.

1.1.2.10 When car top work is complete, position the car at the access landing.

1.1.2.11 Using the following steps, take the car off of inspection:

- (a) Set the emergency stop switch on the car top inspection box to the STOP position.
- (b) Open the hoistway door, block the door, turn off the work light, and exit the car top.

CAUTION: Slowly open the hall door making sure no one enters, then mechanically block the door and exit to the landing from the car top.

- (c) Open the car door manually.
- (d) From the landing, reset the INSPECTION SWITCH to normal and set the EMERGENCY STOP switch to the ON position.
- (e) Using the access key switch move the car UP. Make sure that the car door clutch vane re-engages the rollers on the hoistway door correctly.
- (f) Fully enter the car. Turn the INSPECTION switch in the car operating panel from the INSPECTION to the NORMAL position.

CAUTION: The car may level into the landing.

- (g) Lock the panel.
- (h) Check the operation of the elevator and return it to the cus-

1.1.3 USING THE HALL DOOR UNLOCKING DEVICE (No Hoistway Access Switch)

SAFETY NOTE:

Serious hand injury may result from using the hall door unlocking device. Be aware the door may open while attempting to use this device.

- 1.1.3.1 Any landing above the lowest, and which has a hall door unlocking device may be selected for gaining access to the top of the car.
- 1.1.3.2 Run the car to the landing immediately below the one selected for access.

CAUTION: Be aware of the distance to the car top.

- 1.1.3.3 Change the INSPECTION switch in the car panel (may be key switch or behind locked panel) from NORMAL to INSPECTION. Turn the car light switch OFF. Place an "OUT OF SERVICE" flag and barricade the door opening on the cab side of the car doors. Lock the panel.

- 1.1.3.4 Go to the landing above and using the door unlocking device, open the hoistway doors to access the top of the car.

CAUTION: On multiple car installations make sure you are opening the door on the appropriate car.

- 1.1.3.5 Before stepping onto the car top, reach in and set the EMERGENCY STOP switch in the car inspection box to the STOP position and move the inspection switch to the INSPECT position. Next, switch ON the car top work light if safely accessible from the landing.

- 1.1.3.6 The car door may close as soon as it is put on inspection. If not, close it manually as soon as the car is secured.

is approved and is appropriate to the work being done and the hazard involved.

- 9.3.2 A worker shall not perform electric arc welding when another worker may be exposed to radiation from the arc unless the other worker is wearing suitable eye protection or is protected by a screen.

9.4 FOOT PROTECTION

- 9.4.1 Where a danger of injury to a worker's foot exists or may exist, his employer shall ensure that the worker wears safety footwear that is approved and appropriate to the nature of the hazard associated with the particular process.

9.5 LIMB AND BODY PROTECTION

- 9.5.1 Where there is a danger of injury to a worker's hands, arms or legs or the trunk of his body, his employer shall ensure that the worker wears properly fitting hand, arm, leg or body protective equipment (as the case may be) that is appropriate to the work being done and the nature of the hazard involved. (e.g. proper gloves when using a cutting torch.)

9.6 SAFETY HARNESS, LANYARDS AND LIFE-LINES

- 9.6.1 A worker shall wear an approved safety harness and lanyard and use life-lines that are compatible.

9.6.2 Life lines shall be:

- (a) made of material that is capable of withstanding the shock load which may be applied to it, and
- (b) of a diameter sufficient to ensure that a rope grab being used will operate properly.

- 9.6.3 A worker shall ensure that

- (1) a life-line or lanyard
 - (a) is protected

9. SAFE WORK PROCEDURES FOR PERSONAL PROTECTIVE EQUIPMENT

9.1 GENERAL PROVISIONS

9.1.1 An employer shall take reasonable measures to institute engineering techniques, systems, work practices or administrative controls that eliminate or reduce to a practical minimum those hazards for which personal protective equipment is or would otherwise be required.

9.1.2 If the measures do not, or it is impracticable to, eliminate or reduce a hazard to a point where there is no danger to the safety or health of workers, then

- (a) the employer shall ensure that workers use the appropriate personal protective equipment, and
- (b) workers shall use that equipment.

9.1.3 Where personal protective equipment is or may be required, an employer shall ensure that it is in a condition to perform the function for which it was designed.

9.1.4 A worker shall not use personal protective equipment which is not in a condition to perform the function for which it was designed.

9.1.5 A worker is responsible for maintaining personal protective equipment in serviceable and sanitary condition. If a replacement is necessary, the worker should request same from his supervisor.

9.1.6 Posted requirements of personal protective equipment shall be followed.

9.2 HEAD PROTECTION

9.2.1 Where a danger of injury to a worker's head exists or may exist, then, an employee shall wear approved industrial protective headwear.

9.3 EYE PROTECTION

9.3.1 Where there is a danger of injury to or irritation of worker's eyes, a worker shall wear properly fitting eye protective equipment that

1.1.3.7

Step onto the car top in an area where you can easily operate the controls and close the hoistway door, making sure that it locks.

CAUTION: *Make sure you are in a safe and secure position before proceeding.*

1.1.3.8

Reset the EMERGENCY STOP switch to re-energize the car top controls. The car is now ready to run, using the 'U' and 'D' buttons on the top of car inspection box.

1.1.3.9 When car top work is complete, make sure that the car is properly positioned at the access landing for easy and safe exit, then:

- (a) Set the EMERGENCY STOP switch on the inspection box to the STOP position.
- (b) Slowly open the hall door making sure no one enters, then mechanically block the door and exit to the landing from the car top.
- (c) From the landing reset the INSPECTION switch to normal operation.
- (d) Turn off the car top work light (if safely accessible from the landing; otherwise, turn it off from a safe position on the car top).
- (e) From the landing, reset the EMERGENCY STOP switch on the car inspection box, then close the hoistway doors, making sure that they lock.
- (f) Return to the car at the level below and use the hall door unlocking device to gain entry to car.
- (g) Remove "OUT OF SERVICE" flag and the barrier, turn on the car lights, and turn the INSPECTION switch on the car operating panel back to NORMAL.
- (h) Check the operation of the elevator and return it to the customer.

1.1.4 NO TOP OF THE CAR CONTROL (Inspection Buttons)

SAFETY NOTE:

This is a two worker job. One worker must be stationed at the landing door to make sure no one boards the elevator, or enters the shaft, while steps 1.1.4.2 and 1.1.4.3 (below) are being performed by a second worker in the machine room. There **MUST** be clear communication between the two workers (e.g. radios).

- 1.1.4.1 Make sure that there are no passengers in the elevator, park the car at the top floor and leave a worker standing guard.
- 1.1.4.2 Go to the machine room and prepare to move the elevator down with the doors blocked open.

CAUTION: On multiple car installations verify you are working on the appropriate controller.

- 1.1.4.3 Make sure you have clear communication with the worker left standing guard at the elevator at the top floor, and that this worker is standing clear of the car before any attempt to move the car is made.
- 1.1.4.4 Using insulated clip jumpers, set up the circuits needed to make the elevator run in the DOWN direction at inspection speed, or slower. There are several ways for the worker in the machine room to determine how far to run the car down.
 - (a) On the traction elevators: Using a point on the drive sheave, hoist ropes, or selector as a reference, run the car DOWN until the top of the car is level with the landing at which car top access is possible.
 - (b) On hydraulic elevators: Use a watch to measure the length of time the down-levelling solenoid is energized. At the level-

SAFE WORK PROCEDURES FOR PROTECTIVE EQUIPMENT

ling speed of 8 to 10 feet per minute (2.4 to 3 metres per minute) it will take approximately 35 to 45 seconds for the elevator to lower 6 feet (1.8 metres).

1.1.4.5 When the elevator car top has reached a level where it can be accessed easily and safely, REMOVE ALL JUMPERS used to move the car with hall and car doors open.

1.1.4.6 Manually close the car doors.

1.1.4.7 Before stepping on the car top make sure you have good, clear and constant communication with worker controlling the movement of the car. All communications for movement must be verified by both parties before car is moved, e.g. "Go up" -- "going up".

1.1.4.8 Check to confirm opening the hall door stops the elevator. This is one safety device available to you to prevent the car's accidental movement.

1.1.4.9 If possible, elevator should only be moved at speeds of 100 feet per minute (30.4 metres per minute) or slower.

1.1.4.10 After all work in the hoistway or on the car top is complete, and the car top is cleaned off and cleared of all tools, level the car off at a floor.

1.1.4.11 Manually open the car doors (make sure the clutch is properly engaged).

1.1.4.12 Slowly open the hall door making sure no one enters, then mechanically block the door and exit to the landing from the car top.

1.1.4.13 Turn off the car top work light and close the hall door.

1.1.4.14 The worker in the machine room should be notified you are clear of the car and the doors are closed and the unit is now ready to be put back in service.

CAUTION: Remove all jumpers

1.1.4.15 Ride the elevator and check the operation before returning it to the customer.

1.2

PIT ACCESS

CAUTION: *Make sure the pit you are entering is the elevator you have disabled.*

1.2.1 PIT ACCESS PROCEDURES (General)

- 1.2.1.1 Before attempting to gain access to the pit, the elevator must first be taken out of service. This can be done by turning the main power source off and locking it out or by keying off the inspection or stop switch in the car.
- 1.2.1.2 The pit stop switch must be activated (circuit open) and the pit lights turned on before entering the pit.
- 1.2.1.3 Make sure the pit is clean and well lighted, (lights must have guards). Make sure there are no grease or oil spills or loose objects. Make sure nothing is left behind after work is complete.
- 1.2.1.4 Always keep all parts of your body within the limits of the hoistway of the elevator pit in which you are working.
- 1.2.1.5 Never enter a wet pit. When there is any source of electrical power present, the water must be removed and the pit dried out prior to working in the pit.
- 1.2.1.6 Where clearances are limited be aware of obstructions.

- (c) Must prevent accidental movement of elevator by means of opening the safety circuit.
- (d) Fall arrest equipment must be attached to a suitable anchor point if elevator is not moving.
- (e) Be in safe area and if deemed necessary disconnect the fall arrest equipment before moving elevator.
- (f) If equipment must be checked while elevator is moving at maintenance speed, a worker outside safe work area must be anchored by fall arrest equipment in such a way to prevent entanglement and the elevator controlled by another worker, who is in constant communication with the worker who is anchored.
- (g) Employer shall train workers in falling hazard procedures.
- (h) If abnormal situations arise, notify your supervisor or another worker for assistance in assessing the fall hazard and forming appropriate procedure.

8. SAFE WORK PROCEDURES FOR FALLING HAZARDS

- 8.1 Where it is possible for a worker to fall a vertical distance greater than 11.5 feet (3.5 metres) from a temporary work area or 4 feet (1.2 metres) from a permanent work area, the worker shall be protected from falling by
- (a) a guardrail around the work area,

CAUTION: *If guardrail is added to cartop, ensure it does not interfere with overhead clearances.*

- (b) a safety net,
 - (c) a fall arresting device,
 - (d) a safety harness securely attached to an anchor point,
 - (e) safe work area (See 8.2 for definition), or
 - (f) an alternative means of protection acceptable to an Occupational Health and Safety Director of Inspection.
- 8.2 A SAFE WORK AREA will consist of:
- (a) any area 18 inches (203 mm) from the perimeter of the car top where there is a falling hazard, or
 - (b) area on hall door side of crosshead if protected on both sides by equipment or guardrails, or
 - (c) by a wall not more than 8 inches (203 mm) from perimeter of elevator car top.

- 8.3 After appropriate training and supervision, where a worker wearing fall arresting equipment is required to work on a completed elevator, while on elevator car top:
- (a) It is the worker's responsibility to assess the falling hazard and take appropriate action.
 - (b) Worker must be in full control of the elevator by means of top of car inspection buttons.

1.2.2 WALK IN PITS (Preferred Method)

SAFETY NOTE:

All walk in pit doors should be identified as such and posted with signs warning of rotating equipment and of entry by authorized personnel only. All multiple pits should have unit numbers posted in them.

- 1.2.2.1 The pit stop switch must be activated (circuit open) and the pit lights turned on before entering the pit.
- 1.2.2.2 Close the door behind you, after entering the pit, to prevent unauthorized personnel from entering.
- 1.2.2.3 If access to the desired pit must be through an active pit area, you must first disable the elevator in that shaft (e.g. pit switch) before proceeding. Should the equipment be arranged such that passing through an active pit will not place the worker in danger or in close proximity to rotating or moving equipment then the worker can pass through this active area, however, extreme caution must be taken.
- 1.2.2.4 Upon leaving the pit area, make sure lights are off, pit switch is turned on, door is closed and locked, and you have removed all the tools and materials.

1.2.3 USING THE HALL DOOR UNLOCKING DEVICE

SAFETY NOTE:

- When accessing the pit make sure no one can walk into the open shaft. If the hall door has to be left open, the entrance must be protected using barricades or leaving another worker standing guard.
 - Do not leave an open shaft unattended!
 - Serious hand injury may result from using the hall door unlocking device. Be aware the door may open while attempting to use this device.
-

SAFE WORK PROCEDURES FOR FALLING HAZARDS

- 1.2.3.1 The pit stop switch must be activated (circuit open) and the pit lights turned on before entering the pit.
- 1.2.3.2 Mechanically block the hall door open.
- 1.2.3.3 Do not attempt to use the pit ladder while carrying tools. Have another worker pass the tools down to you after you are in the pit or lower the tools into and out of the pit using a rope.
- 1.2.3.4 After you are in the pit, the hall door must be closed or have barricades in place or have a worker standing guard.
- 1.2.3.5 When opening the hoisrway door from the inside of the shaft to exit the pit, do so slowly, so that someone does not try to step in from the hall area thinking the car has arrived.
- 1.2.3.6 Upon leaving the pit area, make sure lights are off, pit switch is turned on, door is closed and locked, and you have removed all the tools and materials.

7. SAFE WORK PROCEDURES FOR TEMPORARY LIGHTING IN THE WORK AREA

- 7.1 Lighting shall be provided by principal contractor in main traffic areas such as accesses, stairways, hallways.
- 7.2 On construction sites, temporary lighting installations must meet the electrical code.
- 7.3 All areas in which a worker is present, including means of access and egress, adequate illumination shall be provided.
- 7.4 Adequate illumination shall be provided in all working areas taking into consideration:
- (a) Nature of work involved.
 - (b) Accepted standards of quantity and quality of light requirements.
 - (c) Accepted levels of illumination are tabulated by
 - (i) Canadian Standards Association, or
 - (ii) Illuminating Engineering Society
 - (d) When visibility in a work area is restricted due to smoke or other factors suitable means shall be adopted to correct hazard.
 - (e) Where lighting levels are not adequate notify your supervisor and the general contractor's superintendent immediately.

SAFE WORK PROCEDURES FOR LOCKOUT

2. SAFE WORK PROCEDURES FOR LOCKOUT

2.1 Any worker whose duties require exposure of themselves or fellow workers to the hazards of equipment must assure safety by taking appropriate steps, such as those outlined below for personal protection. Understand the equipment and be aware of its potential hazards. If it is not understood, contact the supervisor before proceeding.

2.2 On electrical equipment, where the accidental starting of the equipment would put workers safety at risk.

- (a) Open the switch to shut off the power.

CAUTION: *There may be more than one power source. If necessary, lock out the car lighting supply circuit as well as any other auxiliary source of power.*

- (b) Open the switch cover to visually inspect to ensure it is mechanically disconnected.
- (c) After power is shut off use a volt meter to check the power terminating connections on the equipment to be serviced to ensure it was shut off.
- (d) Apply a personal lock identified with workers name.
- (e) Apply a non-conductive "DO NOT START" tag indicating:
 - i) words directing persons not to start to operate machinery.
 - ii) the date when the tag was installed.
 - iii) the worker's printed name and signature.
- (f) Where it is impossible to lock the switch, the fuses must be removed or assurance made that the circuit is dead. A "DO NOT START" tag will be placed by the worker at the point where the circuit was disabled (fuse pullers to be used when removing fuses).

SAFE WORK PROCEDURES FOR TEMPORARY LIGHTING IN THE WORK AREA

2.3

Before working on hydraulic or compressed air equipment, make sure the system is understood:

- a) Hydraulic systems often store energy even though the power is shut off. The stored energy can result in violent movement of a machine part, such as a cylinder rod, when work is done on another portion of the circuit.
- b) If the portion of the system to be worked on can be isolated and the pressure in that portion of the system released by bleeding, it is not necessary to shut down the entire system. However, the valves and controls which could readmit pressure to the system must be identified with "DO NOT START" tags and locked out.
- c) If a lock out is not possible, other positive actions must be taken to assure that the equipment will not be energized.
- d) Check flange connections, cylinder heads, or plate-mounted components.

The sticking of a gasket can hold the parts together while bolts are removed and then come apart violently under stored pressure.

If it is not understood, contact your supervisor for instructions.

Each worker who performs duties described above will be provided with an individual lock out device by the company, identified with their name. If more than one worker is assigned to a task, each worker will be responsible for placing his own lock and "DO NOT START" tag, so the controls cannot be operated.

If controls are so located that only one lock can be accommodated, a multiple lockout device must be used.

No worker shall remove a lock-out device or tag except:

- (a) The worker who installed it

(b) In an emergency if it is necessary to operate a piece of equipment which is locked out, every effort must be made to locate the worker whose lock is on the equipment.

- (i) If he cannot be located, and after positive assurance is made that no one is working on the locked out equip-

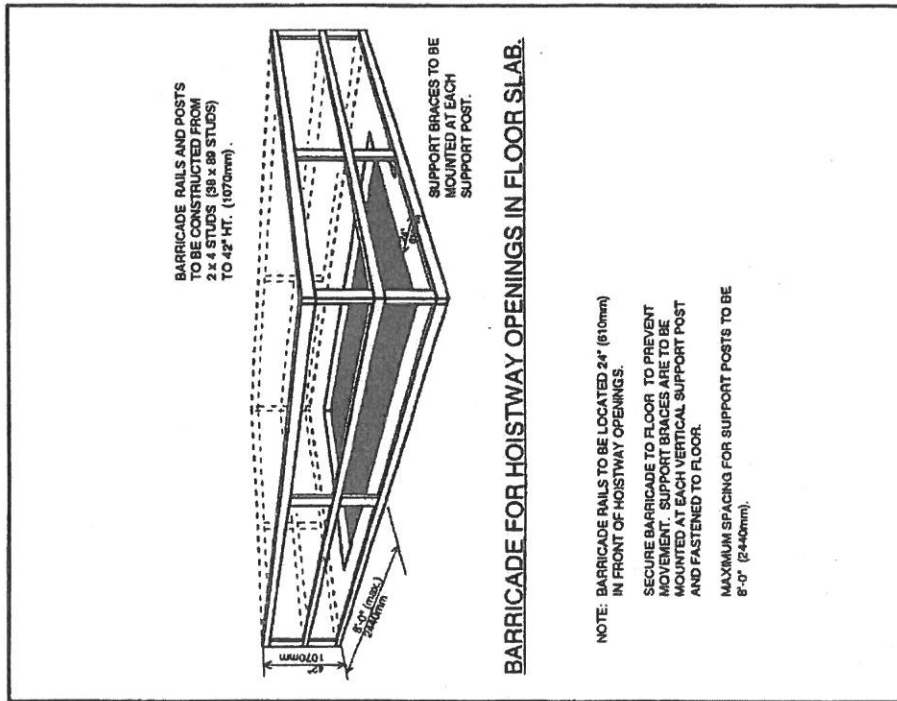
2.4

2.5

2.6

REQUIREMENTS FOR BARRIAGES FOR FLOOR OPENINGS (No Workers in Shaft)

DIAGRAM 6



ment, the supervisor may personally remove the lock or instruct another worker to do so.

- (ii) The supervisor must assure that the equipment is once again locked out before the worker resumes work or inform the worker directly that the equipment has been released to operate.

CAUTION: *The supervisor must remember that there is an inherent danger of the worker involved returning, thinking the machine is still locked out, when actually it has been reactivated.*

- 2.7 When the work is complete, and the equipment is ready for testing, check the area for workers, tools, etc., prior to removing the lock(s) and tag(s).
- 2.8 Where the nature of a work process requires that a worker service, repair, test or adjust machinery while it is in motion and the activity endangers or may endanger a worker, another worker should be stationed at the controls of the machinery and an effective means of direct communication (e.g. radios) exist between the 2 workers to prevent any injury from occurring.

If it is necessary to disable a piece of equipment for repairs and you will not be returning to the site, some method other than your personal lock must be used e.g. a secondary lock system with common keys to be used by all workers. Contact your supervisor.

YOUR PERSONAL LOCK IS FOR YOUR PERSONAL PROTECTION

**6. SAFE WORK PROCEDURES FOR
COVERING OF DANGEROUS
HOLES AND OPENINGS**

- 6.1 Protection must be provided if an opening or a hole through which a worker could fall exists.
- 6.2 Protection shall consist of:
- (a) a securely installed temporary covering that will withstand the loading effect from the combined maximum weight of the most probable assemblage of workers, equipment and materials, without exceeding the allowable unit stress from each material used, or
 - (b) a guardrail and toe boards (Reference Diagram #6)
- 6.3 Where the temporary covering, guardrail or toe boards or any part of them is removed for any reason, an effective alternative means of protection shall be immediately provided.
- 6.4 A temporary covering shall have a warning sign or markings affixed clearly indicating the nature of the hazard and instructing that the covering should not be removed unless an effective alternative means of protection is immediately provided.
- 6.5 If barricades or coverings on dangerous hole or openings are not installed or maintained in place notify your supervisor or the general contractor's superintendent immediately.

**SAFE WORK PROCEDURES
FOR GUARDRAILS AND TOE BOARDS**

3. SAFE WORK PROCEDURES FOR GUARDRAILS AND TOE BOARDS

3.1 GUARDRAILS

3.1.1 The running platform (running cat, temporary work platform, elevator platform) is required to have standard guardrails (top rail, intermediate rail and toe board) on three sides. A secured work-bench on the back side of the platform is acceptable protection, if the bench covers the full width of the platform: the front of the platform shall be protected by a removable guard rail 2 inches by 4 inches (38 mm x 89 mm), secured in "L" shaped slots which shall be attached securely to the right and left guard.

3.1.2 A guardrail shall be capable of resisting any lateral load likely to be applied to it and shall have a height of not less than 36 inches (920 mm) and not more than 42 inches (1.07 metres) above the surface, floor, scaffold or roof on which it is installed.

3.1.3 A wooden guardrail shall be free of splinters and protruding nails and shall consist of:

- (a) A top rail of nominal size of not less than 2 inches by 4 inches (38 mm x 89 mm) securely supported on posts which are of nominal size of not less than 2 inches by 4 inches (38 mm x 89 mm) and spaced at intervals of not more than 8 feet (2.4 metres), and
- (b) An intermediate rail of nominal size of not less than 1 inch by 4 inches (19 mm x 89 mm) securely fastened to the inner side of the posts midway between the top rail and the toe board, and
- (c) A toe board securely fastened to the posts or other vertical supports and extending from the surface, floor, scaffold or roof to height of not less than 5.5 inches (140 mm).

SAFE WORK PROCEDURES FOR COVERINGS OF DANGEROUS HOLES AND OPENINGS

5. SAFE WORK PROCEDURES FOR PROTECTION FROM FALLING OBJECTS

- 5.1 If a danger from falling objects exists notify your supervisor and the general contractor's superintendent immediately. i.e. Site contractor shall notify all affected workers when relocating or removing overhead protection.
- 5.2 Where there is likely to be workers in a work area as part of their regular duties and a danger to the safety of the workers exists or may exist from falling objects, the employer responsible for the work site shall provide overhead protection designed to withstand the shock loads from objects that may fall.
- 5.3 When working on false cars or car slings during construction, a temporary roof must be built above the car to stop falling objects. Should be as large as physically possible (same size as car floor), be constructed from 3/4 inch (19 mm) plywood with a support structure capable of supporting a minimum of 300 pounds (136 kg). To remain in place until such time as car cabs are constructed.
- 5.4 Where workers may be in a work area other than as part of their regular duties and a danger to their safety exists or may exist from falling objects, the employer responsible for the work site shall
- provide overhead protection designed to withstand the shock loads from the falling objects, or
 - place appropriate and adequate warning signs, horns, flashing lights or similar devices to warn workers about those hazards.
- 5.5 Paragraph 5.4 refers to workers' responsibility to be aware of danger of falling objects in areas outside their normal work area.

3.2 TOE BOARDS

- 3.2.1 Where there may at any time be workers below, a toe board not less than 5.5 inches (140 mm) in height above the surface of the work area is required when:
- A permanent floor, platform, mezzanine, walkway, ramp, runway or other surface where guardrails have been installed or where it is possible for materials to fall more than 6 feet (1.8 metres), or
 - Temporary scaffolding or a work platform where it is possible for materials to fall more than 11.5 feet (3.5 metres),
 - Toe boards shall be installed at its outer edge above the work area.
- 3.2.2 Paragraph 3.2.1 does not apply at an entrance or exit opening of a loading or unloading area where the employer has taken other precautions to ensure that materials will not fall from the permanent surface.
- 3.2.3 If barricades and toe boards are not properly installed or maintained in place notify your supervisor and the general contractor's superintendent immediately.

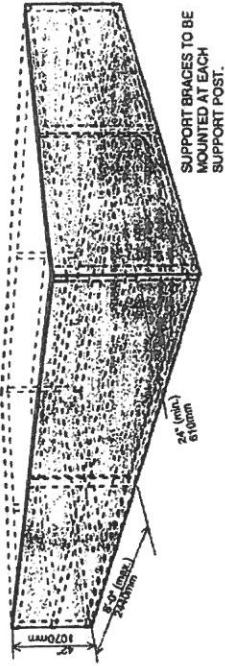
**SAFE WORK PROCEDURES
FOR PROTECTION FROM
FALLING OBJECTS**

REQUIREMENTS FOR HOISTWAY PROTECTION

DIAGRAM 5

**SAFE WORK PROCEDURES
FOR BUILDING SHAFTS**

BARRICADE TO BE
CONSTRUCTED FROM
3/8" (9.5mm) PLYWOOD SHEATHING OVER
2 x 4 STUDS (50 x 89 STUDS)
TO 42" HIGH. (1070mm)



SUPPORT BRACES TO BE
MOUNTED AT EACH
SUPPORT POST.

BARRICADE FOR HOISTWAY OPENINGS IN FLOOR SLAB.

NOTE: BARRICADE RAILS TO BE LOCATED 24" (610mm)
IN FRONT OF HOISTWAY OPENINGS.

SECURE BARRICADE TO FLOOR TO PREVENT
MOVEMENT. SUPPORT BRACES ARE TO BE
MOUNTED AT EACH VERTICAL SUPPORT POST
AND FASTENED TO FLOOR.

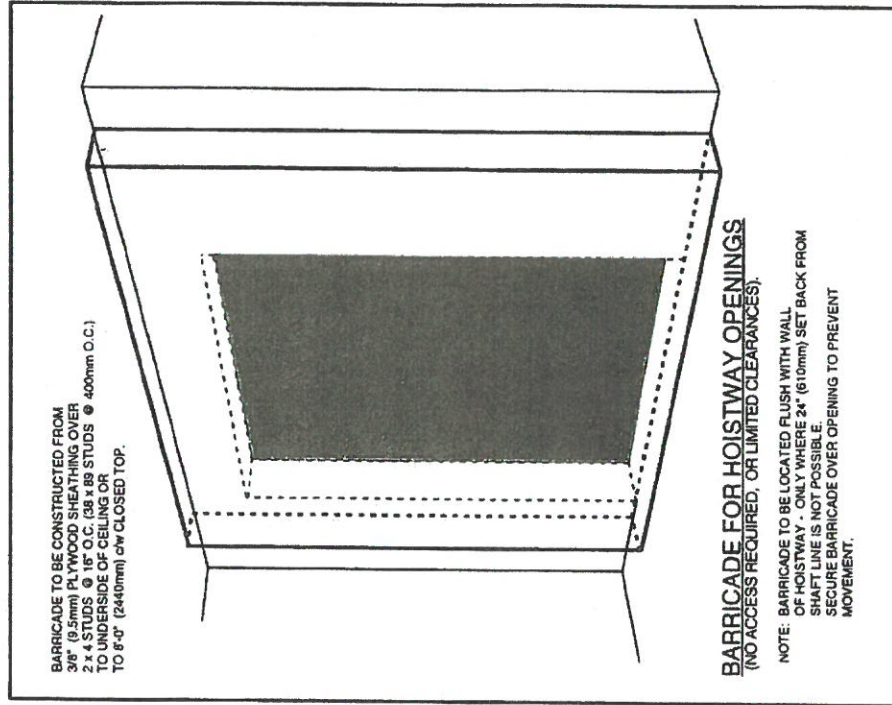
MAXIMUM SPACING FOR SUPPORT POSTS TO BE
8'-0" (2440mm).

4. SAFE WORK PROCEDURES FOR BUILDING SHAFTS (Workers in Shaft)

- 4.1 Where work is being done in a building shaft under conditions where a work platform is necessary to ensure the safety of workers above and below, the following must be adhered to:
- (a) a work platform that is completely decked and designed to support any anticipated load, and
 - (b) a second platform not more than 13 feet (4 metres) below that work platform;
- 4.2 Where there is no work platform at a doorway or opening to a building shaft, the doorway or opening must be completely enclosed and the enclosure is at least 8 feet (2.4 metres) in height with a closed top or to ceiling height, 2 feet (609 mm) out from wall and includes an access door opening out from the enclosed area padlocked with lock accessible from both sides. Access restricted to elevator workers only. (Reference Diagrams #1, #2, #3, #4)
- 4.3 During construction of a building shaft, at least one warning sign indicating an open building shaft is placed on each doorway to the shaft.
- 4.4 Confined space located in shear wall or blind hoistways will have temporary openings during construction to allow for exit of personnel in case of an emergency. Holes to be a minimum of 32 inches x 32 inches (813 mm x 813 mm) and not more than 36 feet (10.9 metres) apart. Access holes must be covered and covers must be easily removable from either side and identified with open shaft signage.
- 4.5 Barricades for open hoistways or escalator wellways should be at least 8 feet (2.4 metres) in height. They should be so constructed that some part is removable to permit access without disassembling. (Reference Drawing #3)

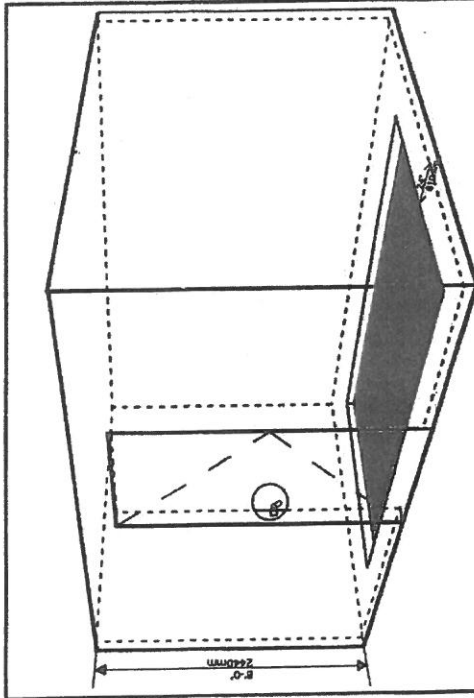
REQUIREMENTS FOR HOISTWAY PROTECTION (Workers in Shaft)

DIAGRAM 4



REQUIREMENTS FOR HOISTWAY PROTECTION (Workers in Shaft)

DIAGRAM 3



BARRICADE FOR HOISTWAY OPENINGS IN FLOOR SLAB.

BARRICADE TO BE CONSTRUCTED FROM
3/8" (9.5mm) PLYWOOD SHEATHING OVER
2 x 4 STUDS @ 16" O.C. (381 x 89 STUDS @ 400mm O.C.)
TO UNDERSIDE OF CEILING OR
TO 8'-0" (2440mm) LOW CLOSED TOP.

NOTE: BARRICADE TO BE LOCATED 24" (610mm) IN FRONT
OF HOISTWAY AND ESCALATOR WELLWAY
OPENINGS AND FLUSH WITH SIDE WALLS.

SECURE BARRICADE TO FLOOR TO PREVENT
MOVEMENT. PROTECT EXISTING FLOORING
AS REQUIRED IN EXISTING BUILDINGS.
PROVIDE 3' x 7' (915 x 2100mm) ACCESS DOOR c/w HASP AND
PAD LOCK AND 6" dia. (150mm) HANG HOLE THRU DOOR
FOR ACCESS TO LOCK FROM BOTH SIDES.

4.6 On jobs where worker is in the shaft or the general public is present outside of shaft, solid barricades of sufficient height must be used to fully enclose the work areas of open hoistways and escalator wellways. They must be properly secured to avoid movement or unauthorized access. (Reference Diagrams #1, #2, #3, #4 & #5)

4.7 A temporary barricade of the three section hinged type may be used for short durations and only when an attendant is present.

4.8 Where there is likely to be workers in a work area as part of their regular duties and a danger to the safety of the workers exists or may exist from falling objects, the employer responsible for the work site shall provide overhead protection designed to withstand the shock loads from objects that may fall.

4.9 Wire rope barricades are not acceptable as shaft protection.

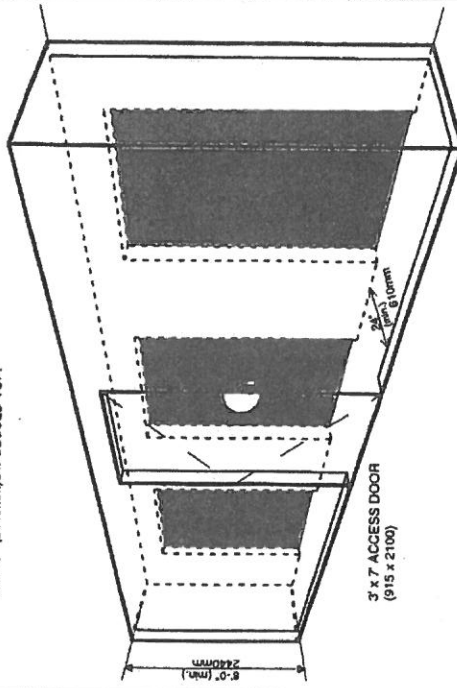
4.10 If shaft protection is not properly installed or in place, notify your supervisor and the general contractor's superintendent immediately.

4.11 When working in a multiple shaft condition where an adjacent car is in service and its unpredictable movement may endanger workers, adequate protection shall be provided between hoistways.

REQUIREMENTS FOR HOISTWAY PROTECTION
(Workers in Shaft)

DIAGRAM 1

BARRICADE TO BE CONSTRUCTED FROM
3/8" (9.5mm) PLYWOOD SHEATHING OVER
2" x 4" STUDS @ 16" O.C. (38 x 69 STUDS @ 400mm O.C.)
TO UNDERSIDE OF CEILING OR
TO 8'-0" (2440mm) w/ CLOSED TOP.



BARRICADE FOR MULTIPLE HOISTWAY OPENINGS

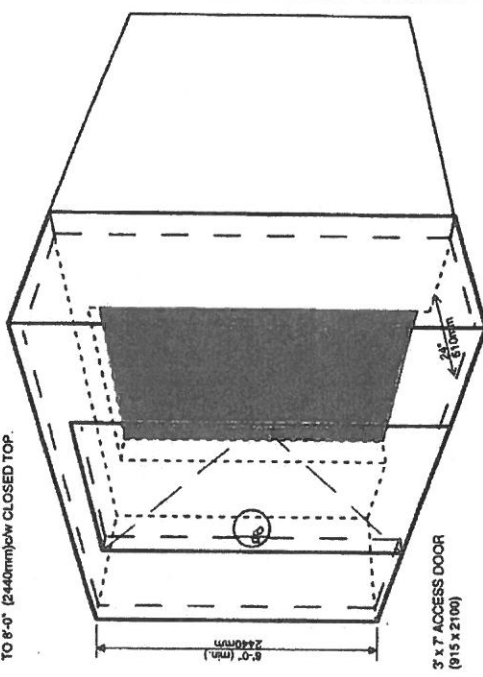
NOTE: BARRICADE TO BE LOCATED 24" (610mm) IN FRONT OF HOISTWAY AND ESCALATOR WELLWAY OPENINGS AND FLUSH WITH SIDE WALLS.

SECURE BARRICADE TO FLOOR TO PREVENT MOVEMENT. PROTECT EXISTING FLOORING AS REQUIRED IN EXISTING BUILDINGS.
PROVIDE 3' x 7' (915 x 2100mm) ACCESS DOOR c/w HASP AND PAD LOCK AND 6" dia. (150mm) HAND HOLE THRU DOOR FOR ACCESS TO LOCK FROM BOTH SIDES.

REQUIREMENTS FOR HOISTWAY PROTECTION
(Workers in Shaft)

DIAGRAM 2

BARRICADE TO BE CONSTRUCTED FROM
3/8" (9.5mm) PLYWOOD SHEATHING OVER
2" x 4" STUDS @ 16" O.C. (38 x 69 STUDS @ 400mm O.C.)
TO UNDERSIDE OF CEILING OR
TO 8'-0" (2440mm) w/ CLOSED TOP.



BARRICADE FOR SINGLE HOISTWAY OPENINGS

NOTE: BARRICADE TO BE LOCATED 24" (610mm) IN FRONT OF HOISTWAY AND ESCALATOR WELLWAY OPENINGS AND FLUSH WITH SIDE WALLS.

SECURE BARRICADE TO FLOOR TO PREVENT MOVEMENT. PROTECT EXISTING FLOORING AS REQUIRED IN EXISTING BUILDINGS.
PROVIDE 3' x 7' (915 x 2100mm) ACCESS DOOR c/w HASP AND PAD LOCK AND 6" dia. (150mm) HAND HOLE THRU DOOR FOR ACCESS TO LOCK FROM BOTH SIDES.