

Vermont Passenger Tramway Safety Rules  
And Addendum to 2022 ANSI B77.1

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Article I. General Provisions

Section 1.01 Declaration of Policy

- (a) It shall be the policy of the State of Vermont to prevent unnecessary hazards in the operation of ski tows, lifts, and tramways (collectively referred to as passenger tramways), to ensure that reasonable design and construction are used, that accepted safety devices are provide for and that periodic inspections and adjustments are made, all for the purpose of making safe the operation of passenger tramways (31 V.S.A. §701). The board shall have no jurisdiction over the construction, modification, or periodic inspection of a passenger tramway at a private residence when such passenger tramway is not used, or intended to be used, by the general public.

Section 1.02 Authority

- (a) These rules are adopted under the provisions of 31 VSA § 704 authorizing the Passenger Tramway Board to adopt reasonable rules relating to public safety in the construction, operation, maintenance, and inspection of passenger tramways.

Section 1.03 Penalties

- (a) Operating without passing inspection: Any owner/authorized operator who operates a passenger tramway without first passing the annual inspection by the Department shall be fined not more than \$1000.00 for each day of operation.
- (b) Operating without paying fee-due-State: Any owner/authorized operator who operate a passenger tramway without paying the fee-due-State as provided in 31 V.S.A. § 707 of this title shall be fined not more than \$50.00 for each day of operation.
- (c) Operating after an order to cease: Any owner/authorized operator who operates a passenger tramway after being ordered to cease operations shall be fined not more than \$5000.00 for each day of illegal operation. (31 V.S.A. §712).

Section 1.04 Adoption of Standards Applicable to Passenger Tramways

- (a) The American National Standard for Passenger Ropeways – Aerial tramways and lifts, surface lifts tows and conveyors- Safety Requirement, ANSI B77.1-2022, except as amended, altered or added to in this rule, shall apply to all construction, operation, and maintenance of passenger tramways.
- (b) In addition to the standards and codes cited in ANSI B77.1 2022 as supplemented the following standards shall apply:
- (i) Vermont standard Specifications for Construction, Division 500, Section 501, “Structural Concrete” and Section 507 “Reinforcing Steel”.
- (ii) ACI-318 may be used as a reference for structural concrete design.
- (iii) National Fire Protection Association (NFPA): “Life Safety Code”- NFPA #101 (editions adopted by the Department of Public Safety).
- (iv) Nondestructive testing as defined by American Society for Nondestructive Testing (ASNT), current edition.

- (v) American Welding Society (AWS) Standard Welding Procedure Specifications (SWPS), current editions
- (vi) National Electrical Code NFPA 70, current edition.
- (vii) Vermont Fire and Building Safety Code, current edition.

#### Section 1.05 Definitions

**All definitions found in A.N.S.I B77.1 Section 1-1.4 apply.**

**All definitions found in 31 V.S.A. §702 apply.**

**“ANSI B77.1” refers to the current version of ANSI B77.1**

**“Attendant”** The individual assigned to particular duties or functions in the operation of a passenger ropeway.

**“Carrier, work”** Structural and mechanical assemblage in or on which authorized personnel and equipment are transported on a limited basis to perform line maintenance. Unless qualified, the work carrier includes, for example, the carriage, grip or clip, hanger, and work platform.

**“Certified Welder”** A person who has met the requirements of the American Welding Society for the type of welding to be performed.

**“Circuit (s), bypass”** A circuit (s) that partially or entirely circumvents monitoring devices and remote signal inputs of a malfunctioning device to allow operation of the system, under the specific conditions set forth for each ropeway type.

**“Commissioner”** Commissioner of the Department of Labor

**“Department”** the Passenger Tramway Division of the Department of Labor.

**“Limits of tramway”** An area defined by the outward swing clearance of the carriers or tow handles as they move around the bull wheel and along the line as defined by ANSI. This defines the jurisdiction of the Passenger Tramway Board.

**“Other classifications”** Tramway configurations that do not conform to any of the classifications specifically provided for in these rules shall be evaluated by the Department on the basis of relevant codes and standards subject to wide enough use to justify a separate category and addition to this code.

**“Owner/Authorized Operator”** A person, who owns, manages or directs the operations and maintenance of a passenger ropeway, or the authorized operator by such owner.

**“Passenger Ropeway/Passenger Tramways”** Includes all devices that carry, pull, or push passengers along a level or inclined path (excluding elevators) by means of a haul rope or other flexible element that is driven by a power unit remaining essentially at a single location. This

includes aerial tramways, detachable grip aerial lifts, fixed grip aerial lifts, surface lifts, tows, and conveyors.

**“Qualified personnel”** Individuals who, as a result of training and experience, understand and demonstrate competence with the design, construction, operation or maintenance of a passenger ropeway and associated hazards.

**“Recreational Device”** Tube, sled, luge, cart, etc., except a skier, which is pulled uphill on the surface with a passenger riding on the device.

**“Passenger Ropeway modifications”** as described by ANSI B77.1 Section 1, 1-1.2.4.4 with the following additions:

A change in the lift’s electrical drive unit from AC or DC.

All modifications to be reviewed by a Qualified Engineer.

**“Tramway”** See passenger Ropeway

**“Safeguarding”** Protection of personnel from hazards by the use of guards, devices, or methods.

**“Skier”** A skier is any person utilizing a device that attaches to at least one foot or the lower torso for the purpose of sliding on a slope. The device slides on the snow or other surface of a slope and is capable of being maneuvered and controlled by the person using the device.

**“SMB”** (Sit-Ski, Mono-Ski, Bi-Ski) Common Adaptive Ski Equipment. Includes (Sit-Ski) structures in which the skier sits with metal edges attached underneath for control and maneuverability, skiing equipment consisting of a body support structure mounted over one ski (Mono-Ski) or tow skis (Bi-Ski) that articulate when the device leans side-to-side (\*ANSI B77.1, Section 1 (1-1.4)).

**“Vermont Passenger Tramway Technician”** person hired by the State of Vermont to inspect passenger ropeways for public safety and monitor construction, operations, and maintenance of passenger ropeways with the State.

**“Unseated Passenger”** A passenger who is unable to get seated in a chair on an aerial ropeway during the loading process, or who fails to stay seated between the loading point and unloading point, resulting in being suspended or falling from the chair.

Article II. Vermont Tramway Rules

Section 2.01 Registration and Fees

- (a) Registration and Fees shall be determined and submitted in accordance with 31 V.S.A. §707.
- (b) The registration plate shall be posted in public view at the lift to which it pertains.

Section 2.02 Tramway Inspections

- (a) An annual inspection for the entire installation shall be made by a Vermont Passenger Tramway Technician and a copy of the inspection report shall be filed promptly with the Department and with the owner/authorized representative.
- (b) An additional inspection is required prior to operating outside the scope of the current inspection (i.e., summer, special events, modifications, and night operation). Other demonstrations, tests, or inspections may be required as they pertain to the safe operation of the passenger ropeway.
- (c) During the annual inspection, the area owner/authorized representative shall be prepared to demonstrate the following, as applicable:
  - (i) Operation of the auxiliary power unit (APU) motor and related emergency evacuations procedure during a total loss of control power. AUP shall operate the lift at a minimum of 100 feet per minute.
  - (ii) Operation of the evacuation power unit and related emergency evacuation procedures, evacuation power unit shall operate the lift at a minimum of 100 feet per minute.
  - (iii) Proper function of all stop and slow buttons at both terminals.
  - (iv) Brake Testing, Service Brake, Bull Wheel Brake, Rollback Device(s) High-speed backstop.
  - (v) Tension System: Demonstrate low pressure will stop the lift, demonstrate high pressure will stop the lift. Lock all check valves.
  - (vi) All required signs in place
  - (vii) Lift houses and terminals. Appropriate fire extinguishers in place as required with current inspection tags. Smoke and carbon monoxide detectors in place as required.
  - (viii) Documentation. Pertinent NDT records (grips, hangers, bull wheels, carriers, and similar as required.
  - (ix) Wire rope annual inspection report.
- (d) RPD (Rope Position Detection) Switch check records ( Detachable lifts)
- (e) MRT (Magnetic Rope Testing) testing records
  - (i) Electrical Testing, Over-speed at 110%, Over-speed at 115%, Phase loss, Field loss, Tach loss, Overcurrent
- (f) Reference ANSI B77.1 Section4-Table 4-4 for minimum and maximum stopping times and distance.

### Section 2.03 Department Notification Requirements

- (a) Prior to construction, modification, or relocations of a tramway this owner/operator shall submit a complete set of design specifications to the Department in English, at least 15 business days in advance.
- (b) Construction
  - (i) Blasting with high explosives within 100 feet of any tramway location shall require verbal permission from the Department. (Section 4.03 for Blasting Requirements)
  - (ii) Excavation deeper than 12 inches within 15 feet of any tramway structure shall require verbal permission from the Department.
  - (iii) As pertaining to rock anchors, a verbal notification to the Departments required at least 24 hours prior to performing any of the following: drilling holes, setting of anchors, proof testing of anchors or grouting.
  - (iv) Placement of concrete tower or terminal foundations require a verbal notification to the Department at least 24- hours prior.
  - (v) Any special events involving a passenger ropeway require a verbal notification to the Department at least 24-hours prior. (May require section 2.02 Tramway inspection)
- (c) Maintenance/Repair
  - (i) Communication line, Prior to repairing or replacing a communication line, the operator owner/authorized operator shall notify the Department and lift manufacturer. The operator owner/authorized operator are responsible for verifying and documenting tower and wind loads, proper switch function and annunciation..
  - (ii) Haul rope, In the event of rope damage, other rope repairs or splicing, the Department shall be notified verbally, and it will require an inspection after repairs. The Department requires verbal notification within 48 hours of any rope splice, repair or inspection to be done. In emergency situations, the Department will respond as quickly as possible. (Wire Rope Splice or Repair Report)
  - (iii) The Department shall be notified verbally if a failed electrical circuit is bypassed. Additionally, before resuming normal public operations, the following requirements met as to: (ANSI B77, section 2-2.3.2.5.9.). This shall also be noted in the operational log.

## Section 2.04 Incident Reporting Requirements

- (a) All tramway incidents shall be reported immediately to the Vermont Department of Labor, Passenger Tramway Division.
- (b) An "Incident" is defined as any one of the following:
  - (i) Tramway-related serious injury or death (a serious injury is defined as one where rescue staff is called to assess the injured person and that person is referred to a higher level of care).
  - (ii) A passenger has fallen six feet or more from the passenger tramway.
  - (iii) The tramway must be closed during public operation for repairs, including incidents that require lift evacuation by Auxiliary Power Unit (APU) or rope.
- (c) Incident Report Documentation
  - (i) A detailed report of any incident which occurs during public operation of a tramway shall be sent to the Department within 72 hours from the time of the incident.
  - (ii) Report shall include pertinent information such as name /gender/age of injured person(s) as well as a description of the incident.
  - (iii) Following an incident, the Department may require interviews with the following people, including but not limited to, the injured person (s), lift operators, lift maintenance personnel, ski patrol, and the owner/authorized representative.  
The Incident Form is available from the Department or online (Vermont Tramway Incident Form). <http://www.labor.vermont.gov>

## Section 2.05 Variances

- (a) The Board may, upon written application, grant a variance from the strict application of these rules if it determines that the passenger ropeway will be at least as free from danger to persons using it as if it met the express requirements of these rules. The burden of proof shall be on the applicant. Variances shall be in writing.
- (b) Each owner/authorized operator requesting any variance is required to submit an application with supporting documentation. Any one variance shall not apply to more than one passenger ropeway.

## Section 2.06 Violation of Rules

- (a) Passenger Ropeway Shutdown
  - (i) Items which may warrant immediate tramway shut down by the Department include Failure of protection circuits, operation circuits, supervision circuits, improperly functioning brakes or back stops. Line sheave failure or potential failure conditions sheave train misalignment. An inadequate counterweight or carriage clearance restricted counterweight or carriage movement. Any other condition, which may affect safe operation of passenger ropeway.
- (b) Orders
  - (i) The Department may request an engineering review of a passenger ropeway or specific components (s) by the lift manufacturer and/or qualified lift engineer. The request shall be made by the Department in writing to the passenger ropeway owner or authorized operator.
  - (ii) If, after investigation, the Department finds that a violation of any of these rules exists, or that there is a condition in the passenger ropeways construction, operation or maintenance or any other condition endangering the public, it shall forthwith issue its written order setting forth its finding, the corrective action to be taken, and fixing a reasonable time for compliance therewith. The order shall be served upon the owner/authorized operator involved by registered mail or in person and shall become final unless the owner/authorized operator applies to the Vermont Passenger Tramway Board for a hearing in the manner provided in section 709 of the title. (31 V.S.A. § 708)
- (c) Emergency Orders
  - (i) Whenever the condition is deemed to be imminently hazardous, involving safety of passengers, the Department's representative shall be authorized to order the owner/authorized operator in writing to immediately suspend operation of the passenger ropeway, until such time as the hazardous condition has been remedied. (31 V.S. A. §708)
- (d) Suspension

- (i) If any owner/authorized operator fails to comply with a lawful order issued under 31 V.S. A. §708 and 31 V.S.A. §709 the Department may order the owner/authorized operator to cease operations for such time as it considers necessary for the protection of the safety of the public (31 V.S.A. §711).

### Article III. Operation & Maintenance for Passenger Ropeways

#### Section 3.01 General

##### (a) Devices Transported on a Passenger Ropeway

- (i) Owner/Authorized operator may permit the use of hang-gliders, ski bobs, tubes, sleds, bicycles or other devices to be transported on their passenger ropeway by providing safeguards for public and lift equipment.
- (ii) The Department shall be notified in writing of devices to be transported on passenger ropeways beyond what is described in ANSI B77.1 as meeting the definition of “skier”. Notification shall include passenger ropeways permitting additional devices, operating procedures, staff training, and evacuation plan for guests/devices. Additionally, owner/authorized operator shall be prepared to perform a demonstration of evacuation during inspection of the passenger ropeway.
- (iii) Equipment used for ski patrol/rescue operations (i.e., toboggans, sleds) and adaptive equipment (i.e., SMB: sit-ski, mono-ski, bi-ski, and similar) are exempt from the rule.
- (iv) Devices to be transported on passenger ropeways must have an adequate safety leash.

##### (b) Reverse Operation

- (i) For any passenger ropeway that is designed to operate in reverse direction, the owner/authorized operator shall post signs for the public notifying them that the lift may operate in a controlled manner in reverse.

##### (c) Drones (Unmanned Aerial Aircraft)

- (i) Drones may not be operated directly over any tramway, or within the clearing envelope, during public operation of the tramway. (reference ANSI B77.1 Section 2-2.1.1.4)
- (ii) Drones must remain sufficiently clear of all tramway cables, towers, structures, carriers, other components, and the entire clearing envelope including the space from any supporting overhead cable to the surface, so as to not create a hazard to persons or property.
- (iii) The owner/authorized operator of the tramway shall develop rules/procedures for drone use in the vicinity of tramways.

##### (d) Signs

- (i) All passenger ropeways shall have a sign reading as follows posted near the loading area/lift instructions: “if you are unfamiliar with the use of this lift, please ask attendant.”

- (ii) Signs not specifically required by the ANSI B77.1 2022 annex D, or this rule may be required by the Department to cover special needs.
- (iii) Any additional signage that may affect safety and/or wind loading shall have Department approval before installation.

### Section 3.02 Certification, Calibration and Testing

#### (a) Certification

- (i) NDT: (non-destructive testing). All Non-destructive testing (NDT) certifications and annual eye exams, including outside contractors, shall be on file in one location and shall be available to the Vermont Passenger Tramway Technician upon request. Training of all NDT personnel shall be per ASNT-TC-1A. Reference document ASNTCP 189-2001 for certifications and specific written practices, audited every five years by an independent NDT Level III Technician. The results of this audit are to be forwarded to the Department of Labor, Passenger Tramway Division.
- (ii) Welding: Welding on any passenger ropeway shall only be performed by persons possessing the proper certification for the specific type of welding in accordance with the American Welding Society standards. Welding procedure for work being performed must come from a qualified engineer or manufacturer. Welding performed on any passenger ropeway must have NDT completed prior to public operation.
- (iii) Tools and Equipment: All torque wrenches and dynamometers required for assembly/testing of components, including during new construction, must be calibrated annually. The calibration certificate must be kept on file and an inspection sticker shall be placed on test equipment.

#### (b) Testing

##### (i) Non-Destructive Testing (NDT)

- (A) Each year on all passenger ropeways, the minimum grip, clip, hanger and carrier NDT shall be a rotating sample of 10 units or 20% of total units, whichever is greater. If any of the first units are rejected per the manufacturers criteria, another 20% or 10 units, whichever is greater, shall be tested. Any rejections in the second sample group shall be cause for 100% of the units to be tested. If the manufacturer's recommendations are stricter than this, then those recommendations shall be followed. The Passenger Tramway Technician shall be notified of these rejected components.
- (B) Each new grip and hanger shall have documented NDT prior to public use.
- (ii) Brake Testing: All brakes shall pass a torque test at an interval not to exceed 30 days. A brake test log shall be kept at each drive and shall include the most recent test results, the date, and the name of the person performing the test.

- (iii) Annual Wire Rope Inspection: An annual wire rope inspection shall be performed by an independent wire rope specialist who has been approved by the Department and shall include the haul rope, counterweight rope, backstay support rope sockets and other auxiliary ropes. A Wire Rope Inspection Report shall be filed with the Department or online (Wire Rope Inspection).
- (iv) MRT. (Magnetic rope testing) – Detachable Ropeways, Trams & Relocations: MRT is required on all detachable ropeways and trams within one year of installation and every three years thereafter. MRT is required on all passenger ropeway relocations. A qualified rope specialist shall review the MRT report, and all anomalies are to be addressed. A copy of the MRT inspection shall be filed with the area, the Department and the rope specialist.
- (v) Wire Rope Splice & Repair: Splicing of hauling wire ropes shall be done by a wire rope specialist approved by the Department or under the supervision of a qualified person recognized by the Department. The use of micro-press clips or similar devices is prohibited. A certification of Wire Rope Splice or Repair form shall be filled out and filed with the Department for all splicing or repair of wire haul ropes. This form is available from the Department or online (Wire Rope Splice/ Repair Certification).

### Section 3.03 Lift Evacuation Plan

- (a) Lift Evacuation Plan
  - (i) A comprehensive plan shall be documented and filed with the Department for review each operating season. All area operators shall assure that their plan meets the requirement of ANSI B77.1 Section 2: 2.3.2.5.7. and ANSI-ASSE Z359.
  - (ii) Lift Evacuation plans shall include the location of equipment, process for evacuation, and consideration for special circumstance (i.e., night evacuation, evacuation of disabled persons, and evacuation during summer operations and special events).
- (b) Lift Evacuation Training
  - (i) Lift evacuation training shall be conducted prior to each operating season and shall continue throughout the operating season, at intervals not to exceed 30 days. Ongoing training can include but not limited to classroom instruction, video instruction, and hands on.
  - (ii) All training shall be documented and made available to the Department for review, as requested.
- (c) Lift Evacuation Equipment
  - (i) The use of line savers or other rope protection devices shall be used whenever the loaded rope contacts the haul cable.
  - (ii) The owner/authorized operator shall maintain an equipment inspection log for all equipment directly used to evacuate passengers.
  - (iii) All evacuation gear shall be available for inspection by the Department.
  - (iv) Reference (ANSI B77.1 Section 2: 2.3.2.5.7).

- (d) Lift Evacuation Demonstration
  - (i) Prior to each operation season, to include night operations and special events, a lift evacuation demonstration shall be performed at an area designated by the Vermont Passenger Technician.

#### Section 3.04 Acceptance & Dynamic Testing

- (a) Acceptance Testing (ANSI B77.1 Section 2: 2.1.1.11). Before an aerial lift that is new or relocated, or that has not been operated for routine maintenance within the previous 2 years, is opened to the public, it shall be given thorough tests by qualified personnel to verify compliance with the plans and specifications of the designer. The designer or manufacturer shall propose and submit an Acceptance Test Procedure (ANSI B77.1 Section 2: 2.1.1.11). Prior to the Acceptance Inspection and the Acceptance Test, the aerial lift shall be continuously operated with empty carriers on the line as follows: 6 hours on each power unit classified as a prime mover; 1 hour on each power unit classified an evacuation power unit operating the lift.
  - (i) Stops shall be minimized to replicate normal operation during the continuous operation.
  - (ii) All terminal, line structures, and line equipment shall be thoroughly checked both before and during the continuous run test to check for overheating of moving parts, excessive vibration or deflection or mechanical or structural components, free movement of tension systems, and other related conditions (ANSI B77.1 Section 2: 2.1.1.11.1).
  - (iii) It shall be the responsibility of the owner/authorized operator to see that the following condition have been met: Tightness of all structural connections; Lubrication of all moving parts; Alignment and clearances of all open gearing; Installation and alignment of all drive system components; Position and freedom of movement of counterweights or other tension systems and carriages; Haul rope alignment at entrance to bull wheels; Operation of all electrical components, including circuit protection and grounding; Adjustment of brakes for stopping distance and brake torque testing; Minimum clearances for carriers, track cable and haul rope sags under the most adverse static loading; Proper alignment to track cable saddles ( as applicable ) and haul rope sheave units; Proper track cable to saddle angles and unhindered inline motion of track cable in saddles as applicable; Actual testing of evacuation equipment and procedures at the most difficult location; Proper location of towers and terminals in accordance with the plans and specifications. Terminal and tower rope/cable working points shall be documented by an "as built:" survey, and any variation from the design drawings shall be noted and approved by the engineer responsible for design (ANSI B77.1 Section 2: 2.1.1.11.2)

- (b) Dynamic Testing (ANSI B77.1 Section 2: 2.3.4.4) Dynamic testing shall be performed at intervals not exceeding seven (7) years. A written schedule for systematic dynamic testing shall be developed and followed. The owner/authorized operator shall provide qualified personnel to develop the test procedure and conduct the dynamic test. The schedule shall establish specific frequencies and conditions for dynamic testing. The testing shall simulate or duplicate inertial loadings. The test load shall be 110% of the design live load. The results of the testing shall be documented in the maintenance log. The testing shall include, but not limited to the following: Braking systems; Evacuation power units; Tension system; Electrical systems.

### Section 3.05 Personnel and Safety

- (a) Personnel
  - (i) Resort owner/authorized operator shall ensure that all lift attendants are able to read and understand lift instructions and are able to give and receive verbal communication to other attendants and passengers.
  - (ii) The Vermont Passenger Tramway Board does not allow one attendant to operate more than one lift (load/unload conveyors are exempt).
  - (iii) Resort owner/authorized operator must ensure that all attendants have been properly trained in the operation of the lift prior to performing work on any passenger ropeway.
  - (iv) Personnel participating in the operation or maintenance of any passenger ropeway shall be at least sixteen (16) years of age consistent with the provisions of USDOL Wage and Hour Division Fact Sheet 43, Child Labor Provisions of the Fair Labor Standards Act (FLSA) for Nonagricultural Occupations (12/16). Personnel participating in the maintenance of any passenger tramway shall be at least eighteen (18) years of age, with the exception of 16- and 17- year-olds participating in the registered apprenticeship program administered by the Vermont Ski Areas Association.
- (b) Personnel Safety
  - (i) Procedures for performing operation and maintenance functions require precautionary measures necessary to ensure the safety of the personnel involved in conformance with applicable Vermont Occupational Safety and Health standards and codes. Implementation of the procedures intended for the protection of the public and operating and maintenance personnel is the responsibility of the owner/authorized operator.
  - (ii) One or more persons trained to provide first aid/emergency care at the Basic Life Support (BLS) level, including CPR, shall be available at all times when a passenger ropeway is operating and transporting passengers. There shall be ready access to first aid/emergency care supplies and equipment, including provisions for transporting an injured person to an enclosed and, if required, heated shelter.
- (c) Emergency Lighting

- (i) ANSI B77.1 Section 2: 2.2.12.4. This shall also include maintenance work areas not otherwise covered by NFPA (National Fire Protection Association) Life Safety Code, as well as drive and return terminals of passenger ropeways.
- (d) Fire Alarm Systems
  - i) Fire alarm systems shall be installed in all drive and return terminals that are not visible to the operator. The system shall be monitored at the operator's work position by use of approved notification devices.
  - ii) Any structure closer than 100 feet to any part of a passenger ropeway shall have a method to notify the lift operator of a fire.
  - iii) Fire alarm initiation and notification devices shall be installed in accordance with the National Fire Alarm and Signaling Code (NFPA 72) current edition as adopted by the Vermont Fire and Building Safety Code.
  - iv) Installation and maintenance of the system shall comply with the Vermont Fire and Building Safety Code.
  - v) NOTE: Any building connected to a passenger ropeway shall comply with the rules of the Division of Fire Safety of the Department of Public Safety.
- (e) Smoke & Carbon Monoxide Detectors
  - (i) Smoke detectors are to be installed in all lift terminals and operator buildings.
  - (ii) Carbon monoxide detectors are to be installed in all lift buildings where emission-producing fuels are burned.
- (f) Loading and Unloading
  - (i) Lift attendants responsible for loading and unloading foot passengers shall stop the lift for special situations. The resort owner/authorized operator is required to have written procedures outlining what should be done when confronted with special loading or unloading situations including, but not limited to, the infirm, elderly, adaptive, or more than one small child per riding adult.
  - (ii) The load and unload stations shall be equipped with a means of stopping the lift at any point along the load/unload platform when operating primarily for foot passengers.
  - (iii) It is required that a permanent red "stop" be provided on the ramp where downhill loading occurs. The location of the stop line is to be determined taking into account the length of the ramp and the speed of the lift making certain the chair stops on the ramp once the stop occurs.
  - (iv) All foot passengers shall be loaded and unloaded at speed not to exceed 250 feet per minute.
  - (v) The passenger (s) must have the restraint bar fully closed except when they are embarking or disembarking the lift.
- (g) Maintenance / Electrical Failure Log

- (i) A daily log of all mechanical and electrical failures shall be maintained and such failures affecting safety shall be reported verbally to the Department forthwith.

Section 3.06 Surface Lift & Tows (ANSI B77.1 Section 5 & 6)

- (a) This includes T-Bar, J-Bar, platter lift, handle tow, fiber and wire rope tows, and similar type devices.
  - (i) All bull wheels shall be equipped with plane monitoring switches.
  - (ii) All tows used for tubing operations must have a rollback device installed that act directly on the drive sheave assembly.
  - (iii) No personnel shall be allowed between the stop gate and bull wheel while the lift is in operation.
  - (iv) Terminal areas: Stop gates shall be installed on the incoming side so that the distance from the stop gate to the first obstruction is more than 150% of the distance required to stop the empty tow operating at maximum speed. The stop device shall extend across the tow beneath the incoming rope and the outgoing rope (ANSI B77.1 Section 6-6.2.3.3).
  - (v) All terminals shall have a barrier to prevent unauthorized or inadvertent access.
  - (vi) Prior to construction, modification, or relocations of any surface lift or tow the owner/operator shall submit a complete set of design specifications to the department in English, 15 business days in advance.
  - (vii) All surface lifts and tows shall be equipped with a start alarm.
  - (viii) On a speed change command, a time delay needs to be included to allow the cable to come to the desired speed for a time to stabilize the cable before another speed change can happen. (Fast to slow, Slow to Fast commands).
  - (ix) NDT (non-destructive testing) is required on all grips, and hangers as spelled out in Article 3 Section 3.02.

Section 3.07 Conveyors (ANSI B77.1 Section 7)

- (a) Conveyor: An outdoor transportation system wherein passengers are transported uphill on a flexible moving element (conveyor belt) ANSI B77.1 Section 7
- (b) Maximum conveyor speed is 160 feet/minute (0.8 meter/second).
- (c) A conveyor relocated within the physical boundaries of a resort need not comply with the latest edition of ANSI B77.1 so long as the slope on which the relocated conveyor is placed is equal to, or less than original design by the manufacture.
- (d) Maintenance snow removal operations shall follow manufacturer's recommendations and lock out procedures.
- (e) All conveyors shall be equipped with a start alarm. (ANSI B77.1 Section 7 7.2.9)
- (f) Night Operation reference (ANSI. B77.1 Section 7 7.2.12).

Section 3.08 Chair Lifts (ANSI B77.1 Section 2, 3, & 4)

- (a) This includes fixed grip, detachable grip, gondolas and aerial tramways.
- (b) Lift Speed Protocol for Detachable Grip Lifts. For areas that are installing their first detachable lift, the following protocol will be in effect. Before a detachable lift may be operated at design speed for the public it must be run at:
  - (i) 75% of full design speed for 32 hours.
  - (ii) 90 % of full design speed for 64 hours. During this reduced speed period the lift may be operating for the public.
- (c) All bull wheels shall be equipped with plane monitoring switches.
- (d) Each chair shall be equipped with a restraint device (restraint bar), which shall not yield to forward pressure applied by passenger (s).
- (e) Auxiliary engines shall be checked and started each day prior to operation and shall be run online at least every 30 days for minimum of 15 minutes.
- (f) Lanyard stops shall be provided in all drive and return terminals and must be equipped with appropriate signage.
- (g) A stop gate or other device shall prevent a chair with the restraint device down from entering the load area.
- (h) Failures in the tower derail detection function, including open, ground fault and crossed loop conditions or any other circuit that could impact the safe operation of the lift shall be detected.
- (i) Work Carrier: Reference ANSI B77.1 Section 3, work carrier design 3.1.4.4.5, requirements for all work carriers 3.1.4.4.5.1, Exceptions for reduced speeds 3.1.4.4.5.2, Exceptions for dedicated grips at reduced speeds 3.1.4.4.5.3, work carrier 3.3.2.4.4.
- (j) Under chair and gondola cabins on the uphill and downhill sides of the lift line, no items are to be installed or placed. (Snowmaking guns, Snowmaking hydrants, fence post, building etc.) so as not to create a fall hazard.
- (k) On a speed change command, a time delay needs to be included to allow the cable to come to the desire speed for a time to stabilize the cable before another speed change can happen. (Fast to Slow, Slow to Fast Commands)
- (l) Auxiliary and evacuation power units must have at each motor, a written and posted operating procedure.
- (m) Lift Carrier Evacuation Demonstration
  - (i) Annually a work carrier evacuation demonstration to be performed by area maintenance personnel.
  - (ii) Lift work carrier to be installed on line and moved to an area designated by Vermont Passenger Tramway Technician.

### Section 3.09 Load Conveyor (ANSI B77. 1 Annex C)

- (a) This includes conveyors for loading and unloading of lifts.
- (b) Load conveyors: an endless belt that assists in loading and unloading ropeway passengers.
- (c) Load conveyor shall be accessible by foot and adaptive passengers.
- (d) It shall be possible to maintain lift operation and passenger loading/unloading even when the conveyor is not operating.
- (e) Each load/unload conveyor shall be registered with the Department as specified in Section 2.01.

### Section 3.10 Summer Operations

- (a) Lift loading and unloading speed not to exceed 250 feet/minute.
- (b) Ground below lift line shall be maintained for lift evacuation purposes.
- (c) All loading and unloading areas shall be equipped with a means of stopping the lift.
- (d) Loading and unloading areas shall be constructed in compliance with American Disabilities Act (ADA) guidelines.
- (e) Mountain bike racks are to be non-destructive testing (NDT) annually.

## Article IV. Construction and Design Rules

### Section 4.01 Plan and Review and Approval

- (a) 15 business days prior to construction, modification or relocation of a passenger ropeway the owner/authorized operator must submit to the Department for review a complete electronic set of final design specifications written in the English language and stamped by a Professional Engineer licensed in the State of Vermont. This shall include a profile of the lift line, the anchoring system, and a plan showing the proximity of power lines, highways and rivers, lifts, and other structures. Any changes or modifications to the design or specifications shall be submitted to the Department for review prior to making the change or modification.
- (b) A copy of the Passenger Tramway Construction Guidelines and Requirements is available from the Department and online (Tramway Construction Guidelines).

#### Section 4.02 Anchor Review and Approval

- (a) The type of bolt and system of anchoring shall be mechanical and shall be approved by the Department. Installation, testing, grouting and design shall conform to the recommendations of the anchor system manufacturer or application designer.
- (b) The Department shall be verbally notified at least 24 hours in advance of any drilling of holes, setting of anchors, proof testing of anchors or grouting. A Vermont Passenger Tramway Technician, qualified engineer or their assignee shall witness the drilling of rock anchor holes and the placing, tensioning and locking of all rock anchors.

#### Section 4.03 Construction Activities

- (a) Placement of Concrete
  - (i) Before any concrete is placed in any foundation or for the base of a tower, a Vermont Passenger Tramway Technician of the Department shall ascertain that the foundation extends below the frost line or is adequately anchored to rock. The frost line is assumed to be a minimum of 4 feet.
  - (ii) Concrete used in the construction of passenger ropeways shall have minimum compression strength of Class B 3,500 PSI at 28 days. Concreting shall be per Vermont Standard Specification for Construction, Division 500, Section 501 "Structural Concrete" and Section 507 "Reinforcing Steel". ACI-318 may be used as a reference for structural concrete design.
  - (iii) When pouring concrete, the end of the spout may not be greater than 6-feet above the final placement of concrete (i.e., concrete may not freefall more than 6-feet).
  - (iv) The Vermont Passenger Tramway Technician, a qualified engineer or their assignee shall witness the placing of the concrete; ensure proper testing and taking of samples to assure that the concrete work is executed in accordance with the plans and specifications.
  - (v) The taking of concrete samples and testing shall be performed by a third-party vendor, not affiliated with the concrete contractor. A minimum of two (2) samples is required from each concrete truck at the time of delivery. The third party shall provide results in writing to the Department as soon as possible following each cylinder test.
  - (vi) The Department shall be notified verbally at least 24 hours in advance of pouring the concrete to allow the presence of a Vermont Passenger Tramway Technician.

- (b) Blasting
  - (i) PPV (Peak Partial Velocity) to less than 0.5/sec, for frequencies less than 40 hertz and PPV less than 2.0 in/sec for frequencies less than 40 hertz.
  - (ii) The Department may require the use of seismometer for close structures and foundations. If a seismometer is used, a report must be filed with the Department.
- (c) Location and Restricted Activities
  - (i) Passenger ropeways shall not be located so close to electric power lines, snowmaking lines, features of terrain, trees or structures so as to be considered a hazard to the safe operation of the tramway.
  - (ii) No exposed power line in excess of 50 volts shall be located closer than 100 feet from a passenger ropeway line, measured from the centerline of the haul rope, without the written approval of the Department.
- (d) Passenger Ropeway Protection of Electronic Components
  - (i) Exposed distribution or transmission power lines shall be located so that, in the event of failure, no portion of the energized line will contact the lift.
  - (ii) All exposed AC wiring over 120v shall be installed in a UL-approved raceway, per NEC-70 (current version). When a manufacturer finds that it is not possible to comply with this section, a pre-construction meeting with the Department shall be required.
- (e) Radios and similar
  - (i) The installation of radio transmitters, cellular equipment, wind towers and similar in, on, or near, passenger ropeways shall not be done without written authorization of the Department. Written approval from the lift manufacturer shall be required, or if the manufacturer is no longer in business, from a qualified engineer.

#### Article V. Effective Dates

##### Section 5.01

- (a) The Effective date of these Passenger Tramway Rules is ----- (not yet determined)-----
- (b) Any passenger tramway construction or modification commenced after the effective date of these rules shall be made in conformance with these rules and with ANSI B77.1-2022.

Any passenger tramway construction or modification commenced prior to the effective date of these rules, but subsequent to the 2013 Rule amendments, shall be made in conformance with the Vermont Passenger Tramway Safety Rules- 2013, and with ANSI B77.1- 2011, ANSI B77.1A – 2012 supplement, ANSI B77.1- 2017, or ANSI B77.1-2022.