

**Forest Service Manual
National Headquarters (Washington Office)
Washington, DC**

**Forest Service Manual 7300 – Buildings and Other Structures
Chapter 7320 – Passenger Ropeways: Tramways, Funiculars, Ski Lifts, Conveyors and Tows**

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Digest: Following is an explanation of the changes throughout the directive by section.

Section 7321: Changes section title from “Passenger Ropeway Projects” to “Ropeway Projects” and sets forth direction.

Section 7321.4: Establishes code, caption, and set forth direction on Minimum Procedures.

Section 7321.4a: Establishes code, caption, and set forth direction on Inspections.

Section 7321.4b: Establishes code, caption, and set forth direction on Additional Procedures for Construction.

Section 7321.4c: Establishes code, caption, and set forth direction on Additional Procedures for Modifications.

Section 7321.4d: Establishes code, caption, and set forth direction on relocation of Portable Ropeways.

Section 7322: Changes section tile from “Passenger Ropeway Operations” to “Ropeway Operations” and sets forth direction.

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7320.01 – Authority

FSM 2701 lists the Federal laws and regulations that govern use and occupancy of National Forest System (NFS) lands. The principal regulations applicable to Forest Service special use authorizations are found at 36 CFR Part 251, Subpart B.

7320.02 – Objectives

Monitor ropeways authorized by the Forest Service to:

1. Address concerns relating to public health, safety, and the environment.
2. Address holder compliance with applicable safety codes, standards, and technical requirements in the special use authorization for planning, location, design, construction, operation, and maintenance (FSM 2340).

7320.03 – Policy

Before they are authorized, ensure that all ropeways comply with clauses II.B and II.E in form FS-2700-5b, Ski Area Term Special Use Permit, or clause C-18 in FSH 2709.11, chapter 50, section 52.3, as applicable. Require the holder to ensure that all ropeways comply with the latest edition in effect of American National Standards Institute (ANSI) Standard B77.1, American National Standard for Passenger Ropeways – Aerial Tramways, Aerial Lifts, Surface Lifts, Tows and Conveyors – Safety Requirements (ANSI B77.1), or ANSI Standard B77.2, Funiculars – Safety Requirements (ANSI B77.2), as applicable (FSM 2721.39 and 2721.6), or applicable State standards that have been certified in writing by a qualified ropeway engineer to be more restrictive than ANSI B77.1 or B77.2 (hereinafter “more restrictive State standards”). The effective date of the latest edition of ANSI B77.1 or B77.2 is 1 year from the date of its approval by ANSI.

Require the holder at the holder’s expense to have all ropeways inspected annually by a qualified ropeway engineer or qualified ropeway specialist before commencement of the primary season of use and while the ropeways are not in use by the public. Require the holder to have the inspection documented in a report and to make the report available for Forest Service review. At a minimum, require the holder to have an annual general inspection conducted in accordance with the inspection and testing requirements in ANSI B77.1 or B77.2, as applicable, or more restrictive State standards.

Prior to public operation of a ropeway, require the holder to provide a written certification of inspection attesting that any deficiencies identified in the inspection report have been corrected and that the ropeway is ready for public use as required by clause III.T in form FS-2700-5b, or clause C-19 in FSH 2709.11, chapter 50, section 52.3, as applicable.

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Monitor ropeways for compliance with the terms of their special use authorization, even in States that have an obligation to inspect ropeways under State law.

7320.04 – Responsibility

See FSM 2342.04, 2704, and 2710.4.

7320.04a – Washington Office, Director of Engineering

The Washington Office, Director of Engineering is responsible for:

1. Developing, issuing, reviewing, and maintaining engineering directives, including standards and criteria, for NFS programs (FSM 7320.41).
2. Supporting the National Ropeway Services Team and regional ropeway engineers in monitoring compliance with applicable safety standards and technical requirements in special use authorizations for ropeways.

7320.04b – Regional Foresters

Regional Foresters are responsible for:

1. Providing direction, consultation, assistance, technology transfer, and training to administrative units and ranger districts under their jurisdiction for all aspects of monitoring special use authorizations for ropeways.
2. Obtaining assistance from the National Ropeway Services Team when the region has insufficient ropeway engineering knowledge, skills, experience, and expertise to conduct ropeway monitoring.
3. Reviewing and recommending approval of site development plans, building designs, and construction proposals for all ropeways to be located on NFS lands under their jurisdiction. In accordance with FSM 7310.42, paragraph 3, the technical responsibility for reviewing and recommending approval of these documents is delegated to the Regional Director of Engineering.
4. Coordinating with State agencies through a memorandum of understanding in locations where they share responsibilities associated with installation, operation, inspection, and other activities concerning ropeways.

7320.04c – Regional Director of Engineering

For special use authorizations for ropeways in their region, Regional Directors of Engineering are responsible for assisting authorized officers and special use authorization administrators by:

1. Existing Ropeways.

- a. Recommending whether to grant or deny a proponent's request for an exception from ANSI B77.1 and B77.2 or more restrictive State standards.
- b. Conducting ropeway monitoring, including:
 - (1) Monitoring pre-operational inspections and annual, winter, or summer operations as requested by the authorized officer. The authorized officer may use form FS-7300-0004, Forest Service Engineering Services for Aerial Tramways, Aerial and Surface Lifts, Tows, Conveyors, and Funiculars, Natural Resource-Based Recreational Facilities, and Other Structures and Ancillary Projects, for this purpose.
 - (2) Ensuring that inspection reports accurately reflect the condition of ropeways.
 - (3) Reviewing the holder's operation and maintenance procedures to ensure compliance with operating plan requirements.
 - (4) Submitting reports documenting any recommendations and noncompliance with the holder's special use authorization for a ropeway identified during ropeway monitoring and notifying the authorized officer of any corrective actions needed to be taken by the holder.
- c. Maintaining a regional inventory of ropeways by type, including reversible aerial tramways, funiculars, fixed-grip chairlifts, detachable-grip chairlifts, surface lifts, conveyors, and wire and fiber rope tows.
- d. Providing technical expertise and training on ropeways.
- e. Helping with calculation of the slope transport feet percentage (STFP) required in clause III.A.21 in form FS-2700-5b.

2. New and Modified Ropeways.

- a. Recommending whether to grant or deny a proponent's request for an exception from ANSI B77.1 and B77.2 or more restrictive State standards.

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- b. Reviewing the sufficiency of required ropeway plans, drawings, specifications, related data, and certifications submitted by the holder, including certification by the qualified ropeway engineer that the ropeway meets ANSI B77.1 or B77.2, as applicable, or more restrictive State standards.
- c. Monitoring construction, when applicable, to ensure that the construction certification and reports accurately reflect the design criteria of ropeways.
- d. Recommending to the authorized officer technical approval of plans, specifications, and construction proposals for all construction and modification of ropeways located on NFS lands.
- e. Filing ropeway plans, drawings, specifications, and other documents in accordance with regional practice.
- f. Reviewing all supporting documentation for inspection, maintenance, and operation of ropeways as constructed or modified for sufficiency and consistency with plan and specification requirements.
- g. Conducting ropeway monitoring, including:
 - (1) Monitoring acceptance tests and inspections.
 - (2) Conducting preconstruction, exception request, and project compliance reviews requested by the authorized officer. The authorized officer may use form FS-7300-0004 for that purpose.
 - (3) Coordinating ropeway monitoring with the holder to ensure that the holder's representatives, including the holder's qualified ropeway engineer or qualified ropeway specialist, are present.
 - (4) Submitting ropeway monitoring reports on the ropeway installer's construction quality assurance (QA) program and methodology, acceptance tests and inspections, and final documentation.

3. Additional Responsibilities for New Ropeways.

- a. Reviewing site development plans for ropeways, terminals, and other ancillary buildings and recommending to the authorized officer whether to require the holder to submit any site-specific studies and other pertinent information, such as documentation of compliance with applicable accessibility requirements.
- b. Recommending technical approval of site development and ancillary building plans for ropeways to be located on NFS lands.

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4. Additional Responsibility for Ropeway Modifications.

Recommending to the authorized officer requirements for plan submittals and certifications for all modifications to ropeways on NFS lands under their jurisdiction and providing ropeway engineering assistance for the modifications.

7320.04d – Authorized Officers

See FSM 2340.5 and FSH 2709.11, chapter 10, section 10.5, for general guidance on authorized officers' responsibilities.

For special use authorizations for ropeways in their administrative unit, authorized officers are responsible for:

1. Authorizing new or modified ropeways and relocation of portable ropeways.
2. Ensuring compliance with the terms of the special use authorizations.
3. Overseeing and supporting all aspects of administration of special use authorizations for ropeways.
4. Obtaining ropeway engineering assistance (form FS-7300-0004 may be submitted for that purpose) for:
 - a. Review of ropeway plans, specifications, and records for compliance with ANSI B77.1 and B77.2 or more restrictive State standards.
 - b. Review and acceptance of changes to operating plans that involve ropeway monitoring and incident reporting (FSM 2341.4).
 - c. Ropeway monitoring.
 - d. Requesting recommendations from the National Ropeway Services Team regarding corrective actions needed to be taken by the holder based on ropeway monitoring.
5. Obtaining regional ropeway engineers or qualified ropeway engineering consultants, as necessary.
6. Obtaining a recommendation from a regional ropeway engineer before granting an exception to ANSI B77.1 or B77.2 or more restrictive State standards requested by the holder (FSM 7321.2).

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7. Providing opportunities for appropriate Forest Service personnel to obtain sufficient technical expertise and training to conduct ropeway monitoring.
8. Calculating the STFP required in clause III.A.21 in form FS-2700-5b.
9. Following direction and procedures in FSM 7321.2, 7321.31, 7321.32, and 7321.33.

7320.05 – Definitions

Aerial Tramway, Aerial or Surface Lift, Tow, Conveyor, or Funicular (Ropeway). Any device, other than an elevator, that carries, pulls, or pushes passengers along a level or inclined path by means of a haul rope or other flexible element that is driven by a power unit remaining essentially at a single location (ANSI B77.1, section 1.4).

Modification. For purposes of this chapter, any change to a ropeway which results in a modification as defined in ANSI B77.1 and B77.2, thereby requiring certification by a qualified ropeway engineer.

Monitoring. See 36 CFR 251.51 and FSM 2710.5.

National Ropeway Services Team. A cadre of Forest Service engineering experts who provide technical expertise nationally in support of monitoring special use authorizations regarding application processing; review of plans, specifications, and exception requests; and construction, acceptance testing and inspection, annual pre-operational inspections, and operation and maintenance of ropeways and natural resource-based recreational facilities (FSM 7330.5).

Portable Ropeway. A ropeway that is expressly designed and certified to be movable and that has been designed to operate within a specified minimum and maximum profile range.

Qualified Ropeway Engineer. A professional engineer who has acquired the requisite knowledge, skills, experience, and expertise to determine compliance with ANSI B77.1 and B77.2, or more restrictive State standards and is licensed to practice ropeway engineering in the State where a ropeway is located.

Qualified Ropeway Specialist. A professional who has acquired the requisite knowledge, skills, experience, and expertise to determine compliance with ANSI B77.1 and B77.2 or more restrictive State standards and has the requisite certification or other qualifications to perform ropeway inspections.

Quality Assurance (QA) Program. For purposes of this chapter, a program developed by a ropeway designer, manufacturer, installer, or holder and utilized to ensure the integrity of

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the design, manufacture, installation, operation, and maintenance of ropeways and compliance with applicable safety standards and technical requirements.

Regional Ropeway Engineer. For purposes of this chapter, a Forest Service engineer designated by one or more Regional Directors of Engineering who has acquired the requisite knowledge, skills, experience, and expertise to determine compliance with ANSI B77.1 and B77.2 or more restrictive State standards and is licensed, certified, or otherwise qualified to provide ropeway engineering assistance to Regional Foresters, Forest Supervisors, and authorized officers.

Risk Assessment. A documented analysis of risks and mitigations associated with a ropeway, including the need for protective measures, that is conducted by a qualified ropeway engineer.

Ropeway Monitoring. On-site monitoring of a special use authorization for a ropeway, which may include but is not limited to:

1. Conducting spot checks to verify the ropeway installer's compliance with the applicable construction QA program and methodology.
2. Checking the holder's QA procedures and systems.
3. Checking compliance with requirements for acceptance testing and inspection of authorized ropeways.
4. Reviewing final engineering documentation such as certifications, as-built plans, and site maps upon completion of ropeway construction.
5. Conducting spot checks of ropeway operations.

7321 – Ropeway Projects

7321.1 – Ropeway Engineering

Regional ropeway engineers shall assist authorized officers with assessment of technical requirements associated with all phases of proposed ropeway projects, including environmental analysis, planning, location, design, construction and reconstruction, post-construction inspection, and acceptance testing.

7321.2 – New Materials and Techniques

The authorized officer may have to consider technological advances in materials and techniques adopted by ropeway designers and manufacturers. If a proponent proposes a ropeway utilizing materials or techniques that are not covered by ANSI B77.1 or B77.2 or more

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restrictive State standards, the authorized officer shall require the proponent to submit design and testing information for or a risk assessment of the proposed ropeway that is prepared and certified by a qualified ropeway engineer.

7321.3 – Exceptions from Applicable Standards

Consistent with ANSI B77.1 and B77.2, sections 1.2.3, strict compliance with ANSI B77.1 or B77.2 or more restrictive State standards may not be necessary or appropriate in every instance. When deemed necessary or appropriate by the Forest Service or a State, the Forest Service or a State may allow the proponent to use other devices or methods that are comparable to those in ANSI B77.1 or B77.2 or more restrictive State standards or grant other exceptions to ANSI B77.1 or B77.2 or more restrictive State standards for proposed or existing ropeways.

Where ropeways are located on NFS lands in a State that has authority to regulate ropeways, the Regional Forester may execute a memorandum of understanding (MOU) with the State to coordinate and establish procedures for granting exceptions to ANSI B77.1 and B77.2 or more restrictive State standards.

If an MOU providing for the State to grant exceptions has not been executed, the authorized officer shall retain the authority to grant exceptions to ANSI B77.1 and B77.2 or more restrictive State standards for proposed and existing ropeways on NFS lands, pursuant to the following procedures.

1. Except as provided in FSM 7321.3, paragraph 2, a proponent's written request for an exception must include:
 - a. A depiction of the current condition via a written description, photographs, a video, or engineering drawings and a statement as to why the current condition does not conform to ANSI B77.1 and B77.2 or more restrictive State standards.
 - b. A description of the work to be performed or the operational conditions that would have to be implemented to meet ANSI B77.1 and B77.2 or more restrictive State standards, including a statement as to how meeting ANSI B77.1 and B77.2 or more restrictive State standards would constitute an unreasonable operational or design condition, and an estimate of the time and cost, for example, engineering, materials, equipment, and labor, that would be involved.
 - c. A statement as to why granting the exception would not create a safety hazard. At a minimum, the statement should include the operational history for an existing ropeway, any devices or methods that enhance the safety of the ropeway, and the operational history of similar ropeways under similar conditions.

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- d. The work to be performed or the operational conditions that would be implemented by the proponent under the exception if it were granted.
- e. For a proposed ropeway, a letter with an original seal, consisting of a rubber stamp, signature, and date of a qualified ropeway engineer, attesting that the ropeway is to be designed, constructed, and operated using devices or methods that are comparable to those required in ANSI B77.1 and B77.2 or more restrictive State standards.
- f. For an existing ropeway:
 - (1) A letter with an original seal, consisting of a rubber stamp and dated signature of a qualified ropeway engineer, attesting that the ropeway is operated using devices or methods that are comparable to those required by ANSI B77.1 and B77.2 or more restrictive State standards; and
 - (2) A written certification from the holder stating that the ropeway has been operated safely and without any ropeway incidents related to the feature for which the exception is requested and stating that the request for an exception is supported by the information required in FSM 7321.3, paragraph 1. A risk assessment of granting the exception may also be required, as appropriate.
- 2. Authorized officers may grant an exception even if the proponent does not satisfy all the certification requirements in FSM 7321.3, paragraphs 1e and 1f.
- 3. At a minimum, granting an exception, requires a determination by the authorized officer, after consultation with the National Ropeway Services Team or regional ropeway engineer (FSM 7320.44), that the exception request does not involve changing the applicable equipment design or operating parameters or safety standards certified by a qualified ropeway engineer.
- 4. The authorized officer shall notify the proponent in writing of the grant or denial of an exception. Granting an exception does not obligate the Forest Service to allow the same or similar exception for another ropeway of the same or similar design. A decision to grant an exception must state whether the approval is for a limited duration and requires renewal upon application by the proponent at a specified time or applies until the authorized officer determines changed conditions or new information indicate that reapproval is required. A decision to grant an exception must also state that the approval is subject to periodic review to determine whether reapproval is needed.
- 5. To address any concerns associated with granting an exception, the authorized officer may require special tests or review by a qualified ropeway engineer (FSM 7320.5) who is

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independent from the holder and who is agreed upon by the authorized officer and the holder. Any special tests or independent review required shall be conducted at the expense of the proponent requesting the exception.

7321.4 – Minimum Procedures for Inspections

Authorized officers shall require the holder to follow the inspection requirements for ropeways in clause III.T in form FS-2700-5b, or clause C-19 in FSH 2709.11, chapter 50, section 52.3, as applicable. In addition, to ensure that annual pre-operational inspection requirements for ropeways are met, authorized officers shall:

1. Require the inspection report to specify any items of noncompliance and the work that must be done to bring those items into compliance, and require the inspection report to be made available for review by appropriate Forest Service personnel.
2. Review and act upon any authorized officers shall, at a minimum, follow the following procedures for submittal of plans, specifications, and records, construction, acceptance testing and inspection, and final documentation.
3. Pursuant to clause III.T in form FS-2700-5b or clause C-19 in FSH 2709.11, chapter 50, section 52.3, as applicable, ensure that the holder's written certification of inspection is submitted to the Forest Service prior to commencement of the primary season of use.

7321.5 – Minimum Procedures for Construction and Modification

Prior to public operation of a new, relocated, or modified ropeway, authorized officers shall, at a minimum, follow the following procedures for submittal of plans, specifications, and records, construction, acceptance testing and inspection, and final documentation.

1. Review an application for construction or modification of a ropeway for compliance with clauses II.A through II.E in form FS-2700-5b or clause C-18 in FSH 2709.11, chapter 50, section 52.3, and corresponding clauses in another special use authorization form, as applicable.
2. Require the holder to have all plans, drawings, and specifications and any revisions to them to be prepared by a qualified ropeway engineer and to be submitted, per professional licensure seal requirements in the State where the ropeways will be located, to the authorized officer and the Regional Director of Engineering at least 45 days prior to commencement of construction. All submitted plans, specifications, and other documents must be in English.
3. The holder may request approval from the authorized officer to accelerate the construction or modification schedule. The authorized officer may grant the request,

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provided that the authorized officer has accepted all required submissions in writing. Approval to accelerate the construction or modification schedule must be in writing and must be granted before commencement of construction or modification.

4. The holder shall designate a construction engineer and shall require that the ropeway installer's construction QA program and methodology be followed. The QA program and methodology shall include verification and documentation that the ropeway installation or modification conforms to the applicable design criteria. Any modification to general plans and specifications by the ropeway installer shall be clearly marked on-site and documented in a signed and dated inspection report prepared by the holder's qualified ropeway engineer.
5. Ensure that the ropeway installer's QA program and methodology and any other construction or modification-related information supporting verification of compliance with the QA program and methodology include, at a minimum:
 - a. Applicable material certifications, testing, and inspection reports.
 - b. Drawing control procedure to ensure that installation, engineering revisions, and as-built information are documented.
 - c. Change order and component control procedures to ensure that materials, processes, and components will meet engineering specifications.
 - d. The construction or modification schedule, name of and contact information for the construction engineer, the name of the laboratory and geotechnical engineering firms utilized, certifications for qualified ropeway engineers, and the name and contact information for the holder's representative.
 - e. Procedures to ensure that appropriate inspections are conducted of installed facilities to inform certification of concrete construction by a qualified ropeway engineer.

Before commencement of construction or modification, ensure that all plans, drawings, specifications, testing records, and related data are reviewed by the Regional Director of Engineering to determine that all required documentation and certifications are sufficient, including the certification that the ropeway design complies with ANSI B77.1 or B77.2 or more restrictive State standards. All required submissions must be accepted by the authorized officer in writing before commencement of construction or modification.

Require the holder to furnish any certifications, as-built plans, and maps, accompanied by a letter documenting that all applicable requirements in paragraphs 1 through 5 of this section, as applicable, have been met, upon completion of ropeway construction or modification.

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The authorized officer, in consultation with the regional ropeway engineer, must determine whether all required submissions are sufficient and may be accepted. Acceptance of all required submissions in writing by the authorized officer is a prerequisite to authorization of a new, relocated, or modified ropeway for public operation.

7321.6 – Additional Minimum Procedures for Construction

Prior to public operation of a new or relocated ropeway, authorized officers shall follow the following additional procedures for submittal of plans, specifications, and records, construction, acceptance testing and inspection, and final documentation.

1. Require the holder to submit site development information showing the location of all proposed ropeways, terminals, and other associated buildings.
2. Require that ropeway plans, drawings, calculations, and specifications include, at a minimum:
 - a. Profile drawings.
 - b. Foundation drawings.
 - c. Preliminary drawings and sketches of components unique in design or function to ropeways.
 - d. Design calculations for ropeways, their foundations, and other components.
 - e. Preliminary equipment data.
3. A preconstruction review meeting may be held as needed prior to authorizing the proponent to begin ropeway construction. A preconstruction review meeting should include the holder and the holder's construction representative, a Forest Service qualified engineer, and the Forest Service special use authorization administrator.
4. Require the holder to submit or make available for review the following prior to an acceptance test and inspection:
 - a. The design certification, per ANSI B77.1 and B77.2 or more restrictive State standards.
 - b. The acceptance test procedures 14 days in advance of testing, per ANSI B77.1 and B77.2 or more restrictive State standards.

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- c. Certification of concrete construction, including verification by a qualified ropeway engineer that the design engineer's construction specifications for the foundation (for example, for soils, concrete tests, rebar, anchor bolts, backfill, and a compaction test) have been met (ANSI B77.1 and B77.2 or more restrictive State standards).
 - d. The final drawing log.
 - e. The certified wire rope test report and magnetic rope testing report, if wire ropes are relocated (ANSI B77.1, Annex A, or more restrictive State standards).
 - f. The splice certification, per ANSI B77.1 and B77.2 or more restrictive State standards.
 - g. Grip non-destructive testing results, per ANSI B77.1 and B77.2 or more restrictive State standards.
 - h. Grip fatigue testing results, if the design is new or the specifications have been revised, per ANSI B77.1 and B77.2 or more restrictive State standards.
 - i. Documentation of acceptance of the main electrical service disconnect by an electrical utility or by a licensed electrical engineer.
 - j. As applicable, certification of compliance of fuel tank installation by a State or local agency with authority to regulate fuel tanks and certification of any addition or other modification to a fuel tank by a qualified engineer.
 - k. Certification of a double-loaded carrier passing around a bull wheel without any yielding, if applicable (ANSI B77.1 or more restrictive State standards).
 - l. Concrete compressive strength test results (ANSI B77.1 and B77.2 or more restrictive State standards).
 - m. Verification of continuous operation (ANSI B77.1 and B77.2 or more restrictive State standards).
 - n. An as-built survey (ANSI B77.1 and B77.2 or more restrictive State standards).
 - o. Operation and maintenance manuals (ANSI B77.1 and B77.2 or more restrictive State standards).
5. Require the holder to submit or make available for review the following prior to public operation of a new or relocated ropeway:

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- a. The certification of electrical system acceptance tests by a qualified ropeway engineer, if applicable (ANSI B77.1 and B77.2 or more restrictive State standards).
- b. The final acceptance test and inspection report (ANSI B77.1 and B77.2 or more restrictive State standards).
- c. The final evacuation plan and documentation of the actual testing of the evacuation equipment and procedures at the most difficult location (ANSI B77.1 and B77.2 or more restrictive State standards).
- d. Software security procedures developed by a ropeway designer or manufacturer or a qualified ropeway engineer, if applicable (ANSI B77.1 and B77.2 or more restrictive State standards).

7321.7 – Additional Minimum Procedures for Modifications

Prior to public operation of a modified ropeway, authorized officers shall follow the following additional procedures for submittal of plans, specifications, and records, construction, acceptance testing and inspection, and final documentation.

1. Require the holder to address all aspects of the proposed modification, including changes to equipment.
2. Require the holder to submit any acceptance test procedures developed by the ropeway designer or manufacturer or a qualified ropeway engineer and to conduct an acceptance test and inspection for any of the following modifications:
 - a. An increase in the design speed of the ropeway that was certified by the ropeway designer or manufacturer or a qualified ropeway engineer during acceptance testing. An increase in the design speed must be documented in the special use authorization or operating plan for the ropeway.
 - b. A change in the design parameters for the number of carriers, spacing of carriers, or load capacity of carriers (the number of passengers that can be carried), for example, changing a ropeway from double-chair to triple-chair. Adding or removing carriers to accommodate normal rope stretch or relocation from a rope splice and changing the number or spacing of carriers within the design parameters do not constitute modifications for purposes of FSM 7321.7.
 - c. A change in the path of the ropeway from its certified design parameters, which may be caused, for example, by moving a tower, changing the tower height or

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number of towers, or changing the gauge of the ropeway. Moving a terminal or tower may require prior written approval from the authorized officer. Per ANSI B77.1 or more restrictive State standards, a change in the height of the ropeway to address normal changes in operational requirements, such as adjusting terminals or tower rope height because of snow depth, does not constitute a modification for purposes of FSM 7321.7 if within the ropeway's original certified design parameters.

- d. A change in the type of brakes or backstop devices or their components, such as a change in the application mechanism that sets the brake (converting from weights to springs or springs to hydraulics or using different types of weights, springs, or hydraulics); a change in the type of brake pump (converting from manual to electric); a change in the brake pump configuration; or relocation of the actuator for the hand pump.
- e. A structural change, such as a change in the tower cross-arm, the tower and terminal support, or the certified structural design of carriers or welding; adding reinforcement steel on a bull wheel; adding gussets to carriers; repairing a damaged structural component; changing the support or depression assembly to a combination sheave assembly; changing the number of sheaves in an assembly; adding, moving, or changing lifting frames, ladders, platforms, or catwalks; or adding a communications line.
- f. A change in the power or type of motor, such as increasing or decreasing the horsepower of an electrical motor or internal combustion engine; changing from alternating to direct current; changing an internal combustion engine to an electric engine; changing the arrangement of the gearbox, fluid coupling, torque converter, V-belt drive, pulleys, U-joints, and shaft couplings; changing a fluid coupling to a torque converter; or changing a V-belt to a gear box.
- g. A change in the control system logic, such as replacement or upgrade of a control system or any change in the function of control software or relay logic, or modification of operation, supervision, or protection circuits, including changing ropeway position detectors or the type of deropement switch (for example, switching from a break fork to a proximity switch) or converting the anti-collision system from analog to digital drives. Any modification to the certified electrical design must be tested and shown to meet the requirements of ANSI B77.1 and B77.2 or more restrictive State standards, and those test results must be recorded (ANSI B77.1 and B77.2 or more restrictive State standards) before the modification can be approved. Any modification to the certified electrical design must be approved in writing by a qualified ropeway engineer.

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3. Require the holder to submit any acceptance test procedures developed by the ropeway designer or manufacturer or a qualified ropeway engineer and conduct an acceptance test and inspection for any other modifications when required by the ropeway designer or manufacturer, a qualified ropeway engineer, or a State agency with authority to regulate ropeways (FSM 7320.3).

7321.8 – Relocation of Portable Ropeways

Require the holder to submit or make available for review the following items for relocation of portable ropeways prior to public operation:

1. Original design certification. Any portable ropeway must be certified by a qualified ropeway engineer as operating within the specified design minimum and maximum profile range (FSM 7320.5).
2. Profile drawings.
3. Foundation and anchorage drawings.
4. General construction and installation specifications and applicable construction QA program and methodology, including verification and documentation that the installation conforms to ANSI B77.1 or other applicable design criteria.
5. Acceptance testing procedures.
6. The final acceptance testing and inspection report.

7322 – Ropeway Operations

7322.1 – Incident Review and Notification

See FSM 2716.7 for requirements related to incidents generally, including ropeway incidents. Provisions specified in FSM 2716.72 relating to notification of incidents shall be included in all operating plans for ropeways.

Authorized officers may use form FS-7300-0004 to request engineering support for incident reviews.

7322.2 – Notification of Inspection and Testing

Require the holder to notify the Forest Service of all dates for inspection and acceptance and dynamic testing as soon as possible, but at least 7 days prior to any scheduled inspections or tests.

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7322.3 – Monitoring

The National Ropeway Services Team, regional ropeway engineers, special use authorization administrators, and other specialists shall assist the authorized officer in monitoring holders' special use authorizations for ropeways, including inspection requirements in the authorizations.