May 25,2022

Staff Memo to the Alta Planning Commission

RE: Alta Ski Area Request for a Conditional Use Permit for eight (8) Wyssen Tower Remote Avalanche Control Systems on Mount Baldy. Eleven (11) total, but three(3) on Forest property, eight (8) on private property under Planning Commission purview.

The Alta Ski Area (Alta) is requesting a Conditional Use Permit (CUP) to install 11 Wyssen Tower Remote Avalanche Control Systems (RACS), 8 on their private property and 3 on Forest property, in the Mount Baldy Area.

Alta's letter of application and background materials on the Wyssen Towers, Department of Justice ATF Approval letter and Forest Service approval letter for the towers on Forest property are attached. The application letter and attachments provide a detailed description of the proposal.

The Forest Service has jurisdiction over the RACS installations on Forest property. The town has jurisdiction over the private property requests. The RACS on Alta's property are property zoned FR-50 and require CUP approval prior to construction. They also require a variance since they will be constructed on slope over 30%, but that is an issue for the Land Use Appeal Authority and will be dealt with separately.

In the FR-50 zone, anything but a single-family dwelling and accessory uses to single family dwellings requires a CUP. The ski area is a conditional use under "Commercial and private recreation" and the RACS qualify as conditional uses since they are "accessory uses and structures customarily incidental to a conditional use."

10-6A-3: CONDITIONAL USES:

All conditional uses are subject to sections 10-6A-4 through and including 10-6A-9 of this article, except that the regulations of sections 10-6A-4 through 10-6A-9 of this article may be modified by the town council as they relate to Public Use and Quasi-Public Uses.

Accessory uses and structures customarily incidental to a conditional use.

Commercial and private recreation.

Staff analysis of Alta's CUP application:

The requirements don't really apply to the current RACS proposal. Those requirements, 10-6A-4-9, are attached separately. The requirements, established over 50 years ago, anticipated dealing with more traditional buildings and structures, not modern-day remote-controlled avalanche mitigation systems. With Alta's request there are no issues with the standard requirements such as lot size, coverage, parking, setbacks, waterway setbacks or wastewater systems. Alta will follow the Forest approvals revegetation plan for any disturbance, even on their private lands. It seems the only applicable regulations would be slope, height and building material. Slope will be delt with by the Appeal Authority. Height is determined by the avalanche paths and terrain. Building material has been determined by the design requirements of the specialized manufacturer of the racs.

Alta's application letter does an excellent job of defining the installation, character and need for the Wyssen Towers. The addition of the Department of Justice's ATF approval letter, the Forest Service

Decision Memo and the Foundation Instruction and Assembly information of the Wyssen Avalanche Structures give even more dept to the project and need. The Forest Service has jurisdiction over any structures on Forest property and has given their approval. Alta will follow the same requirements of the Forest Service and the ATF approval and conditions for the installation of the structures on their private land now under Planning Commission purview.

These racs will replace the use of military weapons for avalanche control, and the hazards associated with the use of military weapons. Plus, the Department of Defense has targeted 2025 for the discontinuation for the use of military weapons for avalanche control. It is best to get ahead of that deadline with the installation and use of modern alternative avalanche control methods like the RACS in this request.

The proposed RACS, if successful, would eliminate the need for a tram to Mount Baldy to transport ski area personnel to conduct avalanche control with hand charges, exposing those personnel to both avalanche and explosive risk.

Recommendation

Staff recommends approval of the structures as submitted, with the same requirements and conditions issued under Forest Service and Department of Justice ATF approval letters as attached as well as the Wyssen Avalanche Structure Foundation installation instructions, also attached.

FR-50 Conditional Use Requirements and Special Regulations

10-6A-4: LOT AREA, LOT WIDTH AND SLOPE REQUIREMENTS:

FR-50	50 acres	300 feet

The term "Net Developable Acreage", as used in this article, shall be deemed to be defined as set forth in section 10-1-6 of this title. (Ord., 6-8-1989)

In all FR zones, as delineated above, no construction shall be permitted on any lot or portion thereof where the ground slope exceeds thirty percent (30%). Where exceptional and extraordinary conditions exist, resort may be made to the appeal authority. (Ord., 6-8-1989; amd. 2010 Code; Ord. 2021-O-1, 3-10-2021)

10-6A-5: YARD REGULATIONS:

Because of the unique nature of topography and climatic conditions within the town, the side, rear and front yard requirements will be determined on an individual basis by the town council, acting upon the recommendation of the planning commission. (Ord., 6-8-1989)

10-6A-6: HEIGHT REQUIREMENTS:

No single-family dwelling shall be erected to a height greater than three (3) stories, nor less than one story, and the maximum height of any single-family dwelling shall be thirty-five feet (35') above the lower of the Established Grade or Finished Grade. Any single-family dwelling which complied with the height requirements on March 10, 2021, and no longer complies with this section is a valid complying structure as to height. (Ord., 6-8-1989; Ord. 2021-O-1, 3-10-2021)

10-6A-7: MAXIMUM LOT COVERAGE:

A. The maximum coverage for the aggregate of all buildings, structures, graded surfaces, paved areas, overhangs, driveways, decks, parking areas and walkways shall be limited by the following schedule.

Zone	Maximum Lot Coverage
FR-50	2 percent of the net developable acreage

B. The following areas shall not be counted as coverage: Areas that may have been graded but remain vegetated and open to the sky, such as ski trails or lawn areas.

C. The following areas shall be counted as coverage: Green or planted roofs shall be counted as coverage. (Ord., 6-8-1989; amd. Ord. 2021-O-1, 3-10-2021)

10-6A-8: WASTEWATER SYSTEM UABPOZ:

Prior to submittal for a building permit for any occupied structure in the UABPOZ applicant shall show and guarantee ability to connect to a public sewer system. This provision does not apply to dwellings located within the UABPOZ which legally existed at the time this chapter was passed. (Ord. 2021-O-1, 3-10-2021)

10-6A-9: SPECIAL REGULATIONS:

A. Natural Hazards: Construction of permanent or temporary structures shall not be permitted, erected, established or performed in such a manner as to place real and personal property and/or individuals at unreasonable risk of harm or injury from natural, geographic or topographic hazards, namely: floods, landslides, avalanches, a high-water table, or inordinate soil erosion. In addition to compliance with the provisions of the building code governing topographic, structural, construction and design standards necessary to meet the maximum foreseeable risk of such hazards, persons developing, improving, managing or owning such property shall have the obligation and bear the burden of so developing and/or improving the property in such a manner that the property and/or the general public are safeguarded from unreasonable risk of harm or injury from such natural hazards to the satisfaction of the planning commission and the building official.

B. Board Of Health Approval: Prior to issuance of a conditional use permit by the planning commission or the town council, or issuance of a building permit by the building official, approval of all uses, regardless of size or number of units, shall be given in writing by the Salt Lake Valley health department, who shall certify as to the adequacy of the culinary water system and the sewage system. The approval of all culinary water and sewage facilities shall be in accordance with the regulations of the Salt Lake Valley health department and the state division of health.

C. Sewage System: Site plan approvals, conditional use permits or building permits shall not be issued until the complete sewage system design and specifications have been approved in writing by all appropriate governmental agencies with jurisdiction.

D. Building Materials: Buildings shall be designed to preserve the natural beauty of the canyon area. Only those building materials which will blend harmoniously into the natural environment shall be permitted. The use of wood and stone and other harmonious materials is encouraged.

E. Grading: To reduce the possibility of erosion and eliminate unsightly scars on the mountain slopes, all excavation, grading and cut and fill operations shall be done under the strict control and approval of the building official. All areas disturbed by construction activities shall be revegetated and maintained in accordance with an approved plan. No certificate of occupancy for any project shall be issued by the building official until all revegetation is complete.

F. Natural Vegetation: All existing and proposed vegetation shall be shown on the approved site plan, and existing vegetation shall not be removed except as shown thereon. The design of the project shall be such as to retain as much of the existing natural vegetation as possible.

G. Stream Regulations:

1. No dwelling unit, structure, improvement or appurtenance shall be constructed, raised or established within fifty feet (50') from the high-water line of any Waterway or within the Top of Bank as determined by the building official.

2. Notwithstanding (1) above, in the Upper Albion Basin Protection Overlay Zone, no dwelling unit, structure, improvement or appurtenance shall be constructed, raised or established, within one hundred feet (100') from the high-water line of any Waterway or within twenty feet (20') from the Top of Bank as determined by the building official.

3. Notwithstanding (1) and (2) above, On U.S. Forest Service property, Structures which are not Buildings and are for Commercial Recreation ski area operation or campground operations, such as lift towers, signs, avalanche control devices, snowmaking equipment, picnic tables and fire pits, are exempt

from these setbacks so long as and only if, such structures comply with requirements of the regulatory bodies having jurisdiction, including US Forest Service , U.S. Army Corp Engineers, State Engineer's Office, Utah Division of Water Rights, Salt Lake Valley Health Department and the Salt Lake City Division of Public Utilities and such approval, if required by the regulatory bodies having jurisdiction, shall be submitted to the Building Official prior to the Structure being put in place. Written notification of the installation or construction of any Structure, whether or not an approval from the regulatory bodies is required, must be given to the Town Administration prior to the Structure being put in place or any site preparation for the structure.

4. The approved site plan shall depict the Waterway and Top of Bank setbacks and also indicate the extent and specific design of the proposed method of control of erosion during and after construction activities. The complete, approved erosion control system shall be installed and approved by the building official prior to commencement of any construction activities on any site.

H. Rehabilitation Of Existing Landscape Scars: In conjunction with submission of plans and documents for building permit plan or conditional use approval, the applicant shall submit for approval a detailed program for rehabilitation of existing scars on the landscape, if any, caused by unused roads, mine dumps, excavation, construction or other causes. A bond, in an amount determined by the building official, covering such rehabilitation program shall be deposited with the town to ensure that such rehabilitation will be completed. No certificate of occupancy shall be issued by the building official until all approved rehabilitation work is complete.

I. Parking Requirements: The planning commission shall determine the number of parking spaces required; however, the minimum requirements of chapter 12 of this title shall be satisfied. Covered parking is encouraged.

J. Utilities: All utilities shall be placed underground.

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May 23, 2022

Town of Alta

Attn. John Gulder
Town of Alta Administrator

For Distribution to:
Alta Planning Commission
Town Council, Town of Alta

Background:

Since 1948 Alta Ski Area has relied heavily on the use of military artillery for avalanche mitigation on the avalanche paths not only above the Town, but also within the developed ski area. This artillery is the property of the United States Army and falls under the supervision of that entity. In recent years the Army has made it clear that the termination of artillery uses within Little Cottonwood Canyon to include that of Alta Ski Area is both desired and imminent. The Army has set a deadline of 2025 for the end of the use of these weapons.

One of the primary uses for military artillery has historically been to mitigate the avalanche hazards of Mount Baldy. Avalanche mitigation on Mount Baldy is critical for public safety and for Alta Ski Area to provide skiing in a significant portion of the Collins Gulch.

Although other methods of avalanche mitigation exist for Mount Baldy in the form of the Avalauncher system or the running of hand routes, these methods create undue hazard to the avalanche worker and are not feasible at times due to storm conditions or the inaccuracy of the Avalauncher system. In recent years alternative methods for avalanche mitigation have been developed allowing for the reduction and eventual elimination of the artillery program. These systems widely consist of the Remote Avalanche Control Systems (RACS). These systems have been widely implemented within both the ski area as well as over the Town and Highway 210. These systems have proven highly effective in avalanche mitigation as well as providing a highly increased level of safety to avalanche mitigation teams.

In the interest of the increased level of safety to the employees and customers of Alta Ski Area, Alta intends to install a RACS system on the North facing slopes of Mount Baldy, beginning in the summer of 2022. This system consists of the Wyssen device and a total of 11 Wyssen systems that will be installed over two phases of work. This system is already widely in use within Little Cottonwood Canyon; installed above the Town of Alta on the Emma Ridges, the East Castle Area within the Albion Basin, and the Mineral Basin Area of Snowbird Resort.

The system is installed on steep terrain within the avalanche starting zones using deep rock drilling (3 Meters min.) and a poured concrete footing. A 12 Meter tower is installed on this footing. The installation is largely helicopter dependent.

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Request for Variance and Conditional Use Permit:

Alta Ski Area requests from the Town of Alta the issuance of a Conditional Use Permit for installation of the Wyssen System on the private lands of Mount Baldy. Alta Ski Area also requests the issuance of a Variance to allow construction of the system on slopes over 30% in steepness.

The system will be installed in terrain of up to 45° in steepness and has been previously installed in terrain 50° in steepness. The installation design for the device (attached) allows for the installation of the footing for the device on terrain much steeper than this. The installation teams which do this work are highly experienced in working in this high angle terrain. The installation consists of hand leveling a location, followed by deep rock drilling to secure the footing to the slope.

The Towers for the Wyssen system stand at a height of 12 meters. An explosive magazine is placed on top of this tower which is remotely controlled to deliver an explosive charge for triggering unstable snow. This system is approved by the Bureau of Alcohol Tobacco Firearms and Explosives (approval attached). Further the system is approved by the United States Forest Service (approval attached), for installations which occur on public lands.

By design the majority of towers have been placed in locations below ridgeline so as to protect the view shed. Three towers will appear to break the ridgeline by a proximately two meters within the Perlas area on the East side of Mount Baldy when viewed from directly below the mountain.

The installation of the tower footings has a disturbance of under 30 square feet (photos below). The total ground disturbance for the project will be under one acre of land.

Wyssen footing disturbance

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Completed Wyssen footing

When completed the towers present very little visual impact and are difficult to locate within the winter months. They are slightly more visible during summer months yet still difficult to see as shown by the photos below. This is particularly true on North facing terrain where the sunlight on the towers is limited.

In reference to Town of Alta code requirements for conditional use:

Under code 10-9-2: Conditional Use permit.

10-9-2 Section A requirements are met through this process of requesting permit from the Alta Planning Commission.

10-9-2 Section B.

1. Site plans for this project are depicted in attached images. There will be no required snow removal or erosion control for the project. Further, no roads, pathways, parking or grading will take place. There will be no requirement for access by either fire or police. No accessory structures will be built.
2. These structures do not fit the description of “buildings” by code definition. However, installation plans for the towers are attached to this document.
3. Other supporting documents from the Bureau of Alcohol, Tobacco, Firearms, and Explosives as well as permitting from the United States Forest Service for permitting on public land are attached to this document.

10-9-2 Section C, D

1. Requirements for this section are met through this process.

10-9-2 Section E.

2. The proposed use of this location meets the requirements for a conditional use. The location is desirable to provide an installation of equipment which will provide for an increased level of safety to the employees and guests of Alta Ski Area. Thus, an increase to the general well being through the protection of life and property.
3. Use of the proposed equipment will not be detrimental to the health and well being of persons residing in the general vicinity. Conversely, the installation by design is to increase the safety of

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those persons.

In reference to Town of Alta code for Variances:

Under code 10-5-11: Variances.

10-5-11 Section A-E.
Pursuant to this section. It is understood by the applicant the application process and the appeal authority. It is understood that the burden of proof lies upon the applicant, and that application shall mitigate any harmful effects of the variance.

Under code annotated 10-9a-702. Variances
Applicant responses below meet the requirements of (2)(a):

(i) Literal enforcement of the variance for slope would be unreasonable in the case of this project. The terrain is substantially steeper than the 30% stated in code. As an avalanche mitigation tool, the installation must be installed in steep avalanche terrain.
(ii) There are special circumstances which apply to this area based on avalanche hazard and limited and inadequate other methods of avalanche mitigation available.
(iii) Granting the variance is essential to the operation of the ski area and opening of ski terrain moving into the future
(iv) The isolation of the terrain and the limited disturbance of installation will not by any definition be contrary to the public interest or the general plan. By definition, the improved level of safety provided by the installation is in fact in the interest of the public.
(v) The applicant seeks to observe the spirit of the land use ordinance and will continue to do so.

(2) (b)

(i) Enforcement of the land use ordinance will not cause undue hardship under subsection (2)(a):
A. The property for which the variance is sought consists of private property on Mount Baldy consisting of topographically extreme terrain
B. Due to the extreme nature of the terrain in topography, conditions are not general to the neighborhood.
(ii) The request for the variance is terrain based and not economic or self-imposed.

(2)(c)

(i) Special Circumstances apply based on the needed protection of life and property as well as the circumstances regarding extreme terrain.
(ii) Similar installations have been installed and permissions granted within the Town of Alta on both public and private lands. Permission for installation on United States Forest lands within the same area of Mount Baldy is attached to this document.

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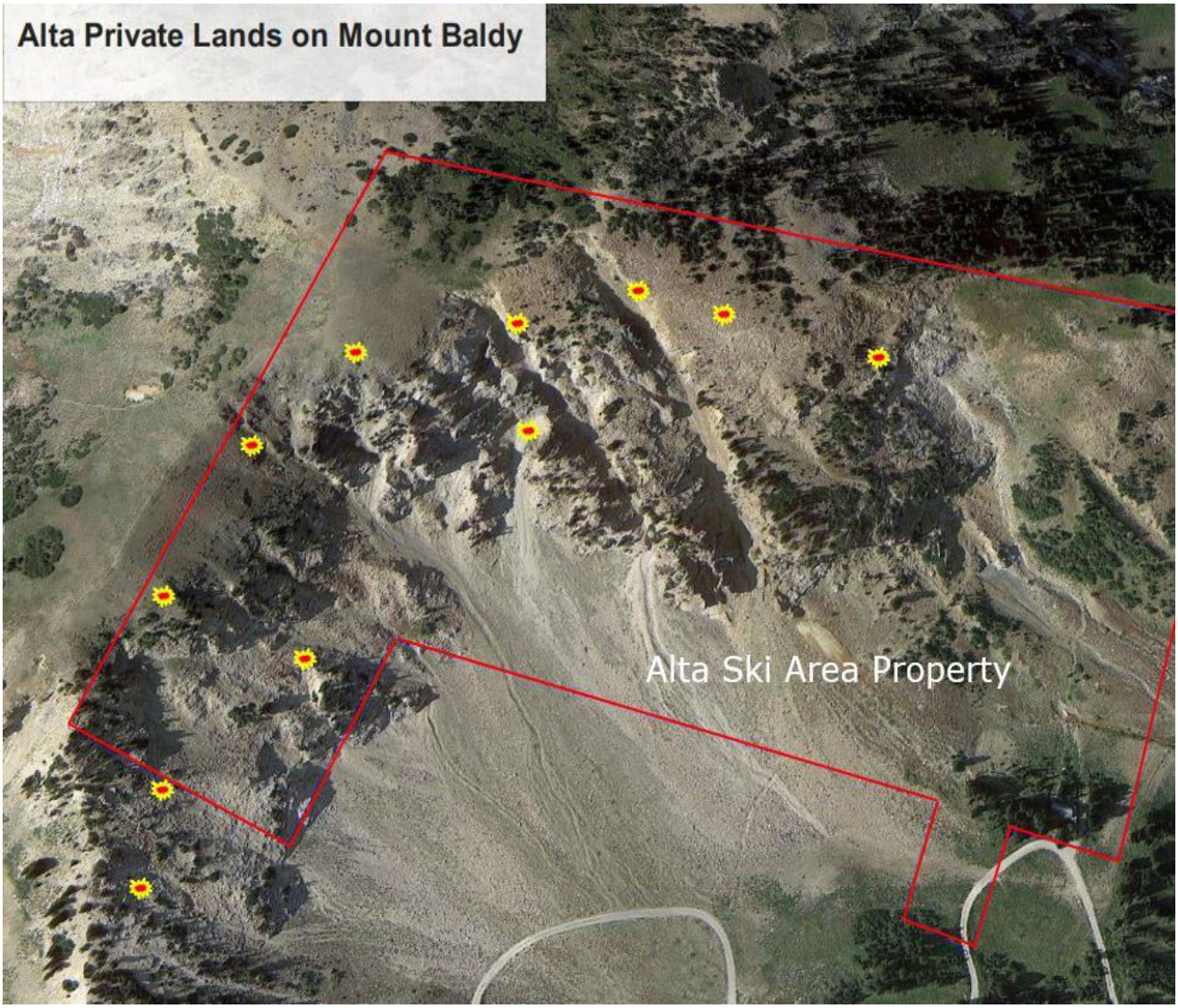
See installation locations on property map below:



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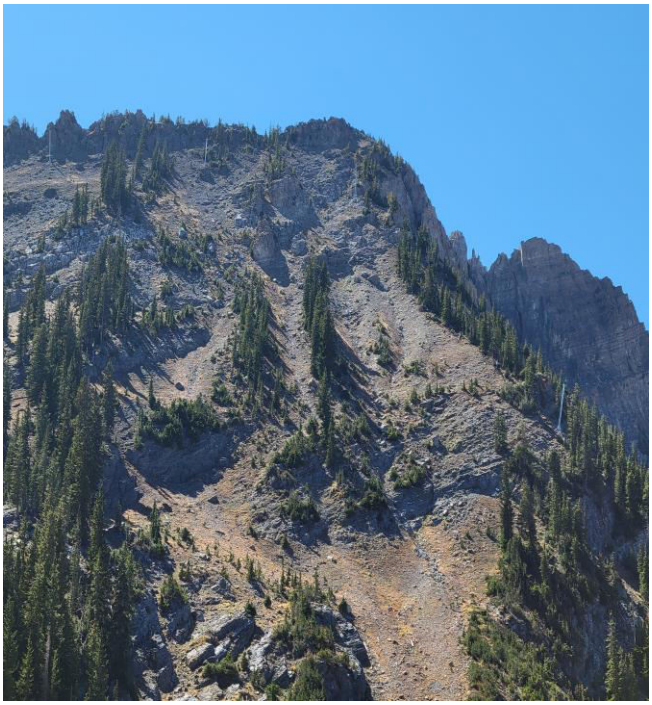
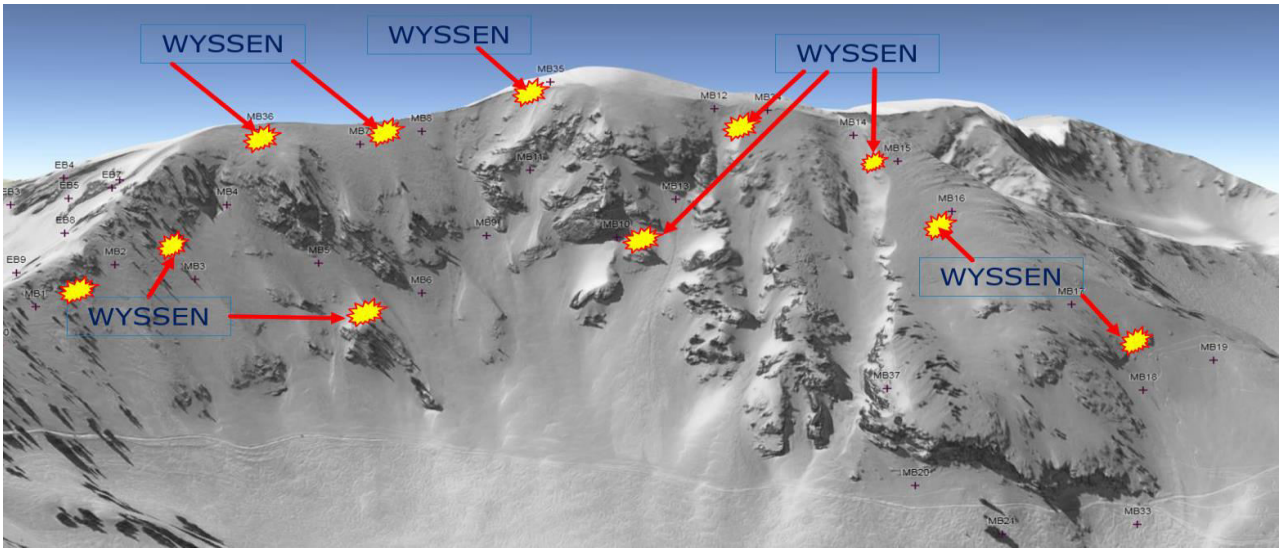
East Castle Wyssen installation (two towers visible)



East Castle Wyssen installation (four towers visible)

The overview of the plan can be seen in the image below:



Mount Baldy Wyssen layout

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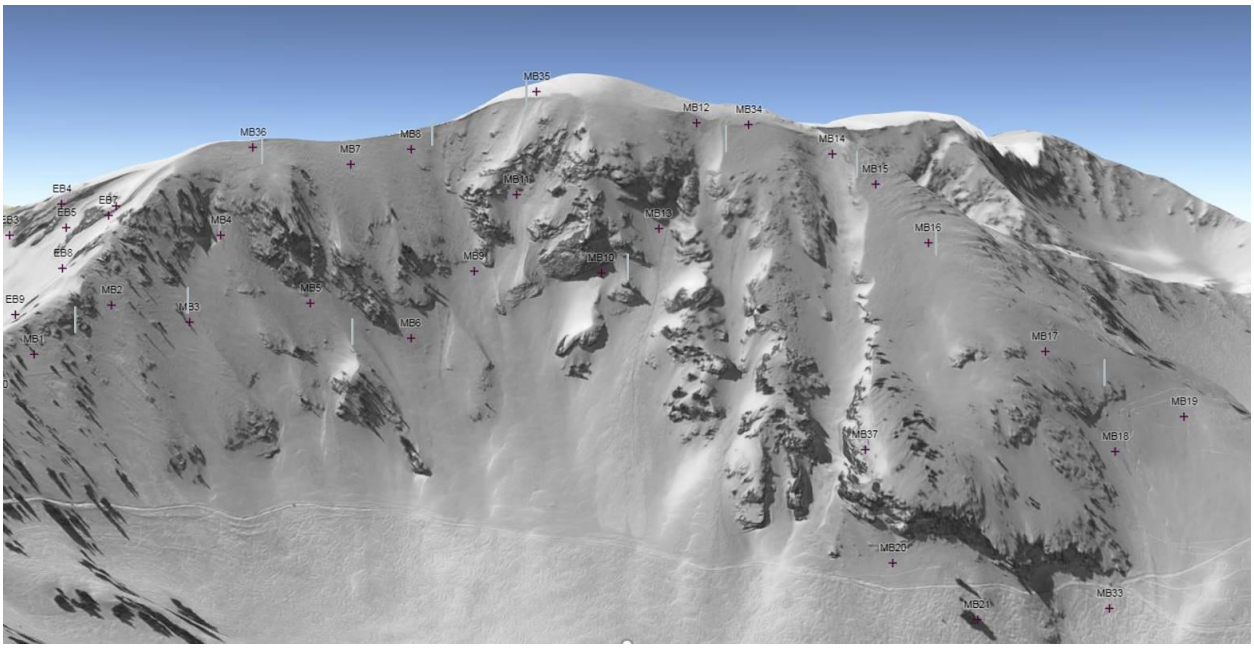
Mount Baldy Wyssen Plan with towers drawn to scale. (Summer)



Mount Baldy Wyssen Plan with towers drawn to scale (summer)

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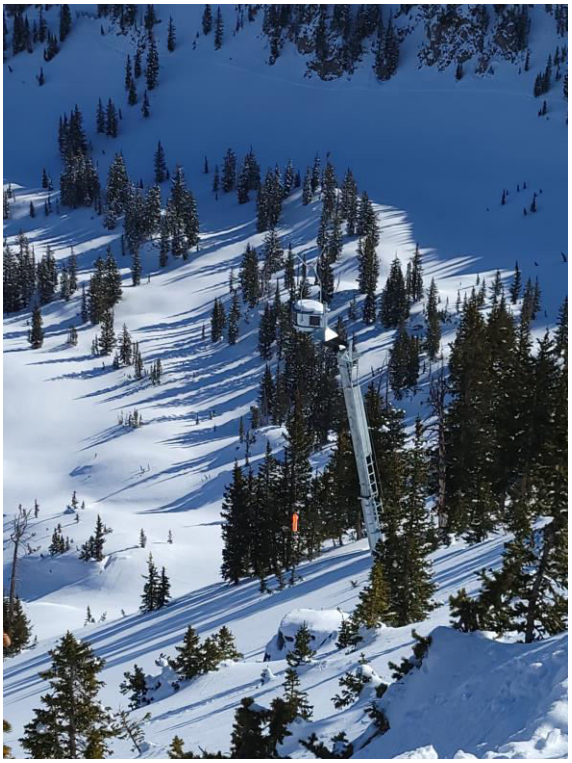

East Castle towers 3 and 4

Summary:

Alta Ski Area requests approval of a Conditional Use Permit and Slope Variance to install Wyssen towers on the slopes of Mount Baldy to begin in late June 2022. The Installation will increase the level of safety provided to the employees and customers of Alta Ski Area. Further, the installation will allow the ski are to provide skiing in the upper Collins Gulch on a more reliable basis. The system is proven as an effective measure for the protection of life and property. Further there exists overwhelming precedent for the installation of this system within the mountainous terrain of Alta and upper Little Cottonwood Canyon as previously approved on both public and private lands and installed by Alta Ski Area and the Utah Department of Transportation within the Town of Alta.

Thank you very much for your consideration of this matter. We look forward to hearing a response from you soon.

Sincerely,

David Richards
Alta Ski Area
Director, Avalanche Office

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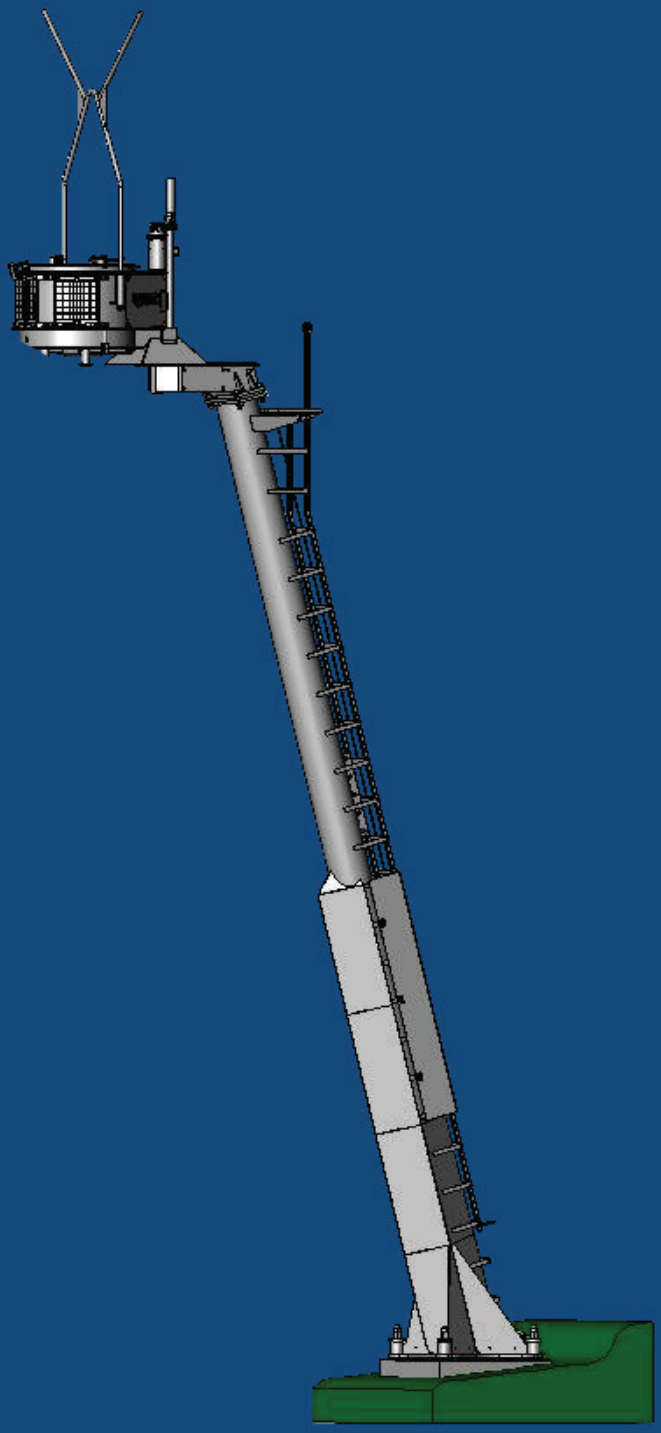
Foundation Instructions

Wyssen Avalanche tower LS12-5

Instructions for building the foundation and erection of the tower



Snow is our element

Safety through technology is our strength

wyssen switzerland avalanche control

V 1.0
10/2014

Safety Information

This manual contains information that must be observed for your personal safety, the safety of other persons and for the prevention of material damage. Such information is highlighted by a warning triangle and displayed depending on the degree of risk in the following manner.

Danger
Danger indicates that death or severe bodily injury will occur if the corresponding safety measures are not taken.

Warning
Warning indicates that death or severe bodily injury can occur if the corresponding safety measures are not taken.

Caution
Caution with a warning triangle indicates that light to moderately severe injury can occur if the corresponding safety measures are not taken.

Caution
Caution without a warning triangle indicates that material damage can occur if the corresponding safety measures are not taken.

Tip
Indicates useful or necessary user information.

Qualified Personnel

Personnel operating the Wyssen avalanche towers or the Wyssen helicopter latch must be officially appointed by the company management. Furthermore, the staff must also possess personal certification of training on the installations carried out by the manufacturer as well as a nationally valid licence for the artificial release of avalanches with explosives for operating the avalanche tower.

Instructions by colleagues within the company are not valid as a replacement for the installation training by the supplier. Persons who have not been trained by the supplier and who do not have the above-mentioned certification may not operate these installations.

If required, refresher training courses from the supplier may be requested at any time by the operator of the installations.

Intended Use

The avalanche tower is designed to trigger controlled avalanches by blasting. This is to safeguard avalanche-endangered installations, ski slopes, buildings, transport routes etc. where uncontrolled avalanches could lead to injury or damage to persons or property.

The intended use of this equipment is solely for the controlled release of avalanches and may only be operated by trained personnel in accordance with the regulations and after precise assessment of the current situation with regard to residual risks.

The installation is only to be used in conjunction with other devices and components that are recommended or approved by Wyssen Avalanche Control AG.

The proper and safe operation of the product requires correct transportation, assembly, storage as well as careful operation and maintenance.

List of Contents

1 Description of the tower

1.1 General Information

The supporting tower is designed to hold the charge magazine, from which explosive charges are dropped and ignited by remote-control, in order to artificially release avalanches. Since the system is installed in potential avalanche slopes, the tower is exposed to the forces of snow and avalanche pressure if it is not located on a prominent elevation.

1.2 Dimensions and weights

The standard tower consists of 2 parts. A 5m high pedestal and a head end in lengths of 3, 5 and 7m. Thus the heights of the mast can be 8m, 10m or 12m.

The separate parts of the tower can be flown in either individually or as an assembled unit. The individual pieces weigh a maximum of 900kg, depending on the version; see table 3.7. They can thus be flown by almost any operating transport helicopter. The base plate is fixed with 4 vertical rock anchors or micropiles as well as a horizontal anchor on the upper slope side to relieve the shear forces. A concrete pedestal with a minimal surface area of 1m x 1m serves as a foundation.

1.3 Maximum forces on the tower and foundation

In order to check the resistance of the present construction method to avalanches, various avalanche scenarios were tested and for each scenario the pressure on the tower was calculated.
The resistance to avalanches was tested with the aid of the calculations carried out and static analyses.

The tests showed that the impact of avalanches can be absorbed to a certain degree by the blasting installations, without any damage occurring to the equipment. However, it was also shown that very large avalanches can damage or destroy avalanche towers.
In particular for possible avalanches that reach speeds of over 25m/sec.
In addition to the impact of the flowing avalanche there is also a powder avalanche impact on the whole avalanche tower. In this case, a more precise testing by Wyssen Avalanche Control AG is necessary.

2 Building and installing the foundation

2.1 General Information

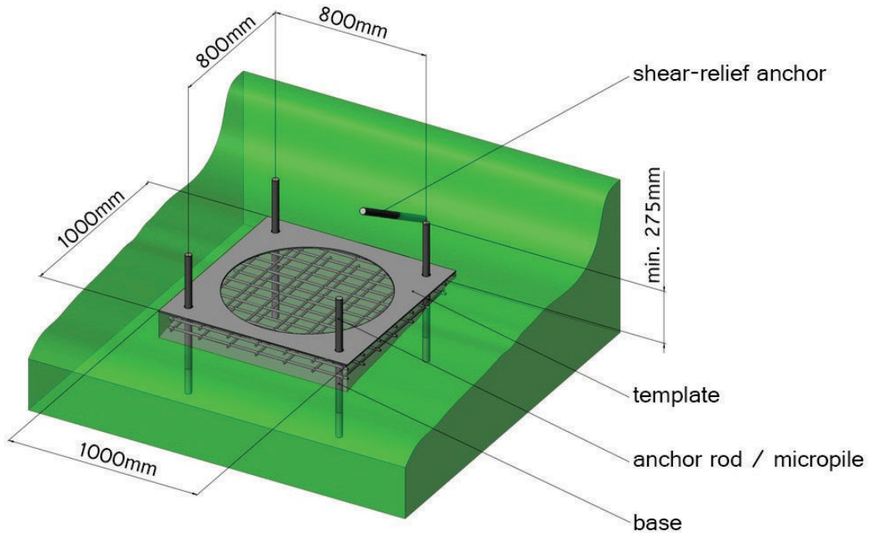
The commissioned builder is responsible for building and installing the foundation.
It is absolutely necessary to comply with the details described in these instructions.
Basically, the appropriate Swiss Guidelines for avalanche protection structures in the release zone, the ONR 24806 (Austria) and the current relevant national guidelines have to be considered when constructing or using rock anchors/micropiles. Any deviations in the details given in this document are to be reported to the manufacturer. The present instructions are based on the above-mentioned guidelines; however, in some cases modifications have been made to increase safety.

2.2 Earthing

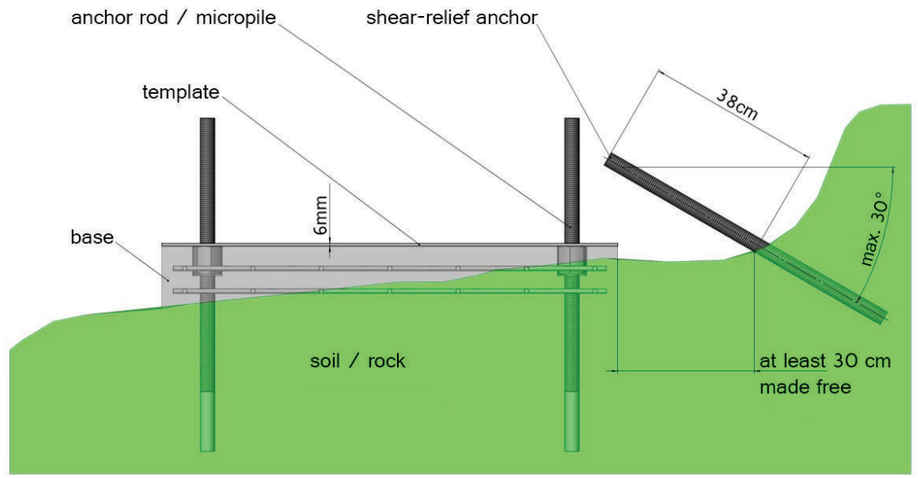
The tower must be adequately earthed in order to protect the machine and persons. In the case of loose earth such as humus, sand or loose rock, the builder lays 3 radially arranged earthing straps with a cross-section of 3 x 30mm and a length of at least 25 m (in total at least 75m), and which are well earthed. The earthing straps must all have a hole of ø 14 mm at one end for fixing onto the foot of the tower. The M12x30mm bolts, M12 nuts and M12 spring washers for fixing the straps to the tower are preferably attached to the strap prior to transportation.
In the case that the tower location is predominantly on hard and compact rock, further assessments concerning earthing must be carried out by the Wyssen Company.

2.3 Layout and dimensions

The dimensions which are essential for the fitting to the base plate are shown in the figure below. It is important that the surface of the concrete base is exactly horizontal. The concrete may not protrude above the template.



Avalanche tower foundation



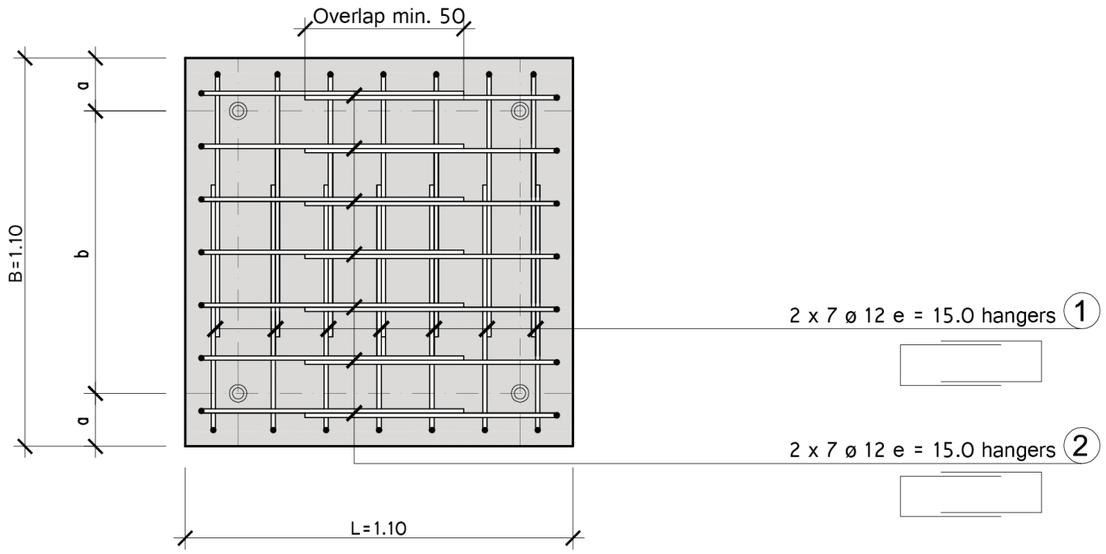
Shear-relief anchor design

2.4 Foundation by Rock Anchors or Micro Piles

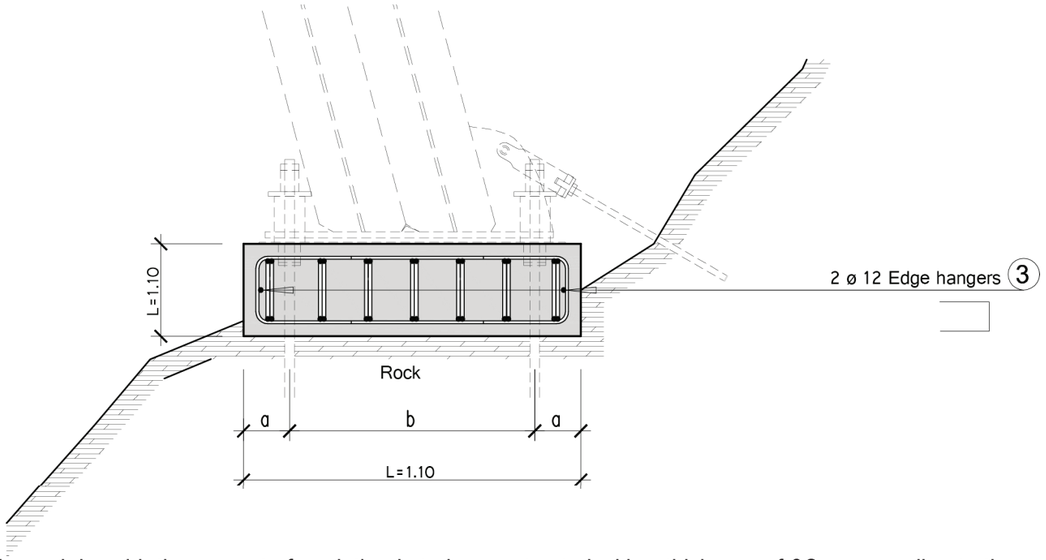
2.4.1 Structure of the Foundation

If not otherwise specified, the foundation by rock anchors and micropiles consists of a horizontal base whose side edges correspond with the line of the main slope lying underneath it.
Four vertical anchors, a template as an anchor bond and an anchor for relief of shear forces.
The drill holes must be prepared at the designated location in the terrain with the assistance of the pre-delivered template. After installation of the anchor/micropiles, the template is accurately aligned in the horizontal position and supported on the four anchor nuts.

After the location under the template has been thoroughly cleaned and loose stones have been removed, shutter boards can be prepared and pre-mixed dry concrete poured in under the template. After pouring the concrete it should be vibrated thoroughly.
care must be taken to ensure the the complete template sits over the base and that no cement protrudes, so that a good even surface is guaranteed for the foot of the tower.

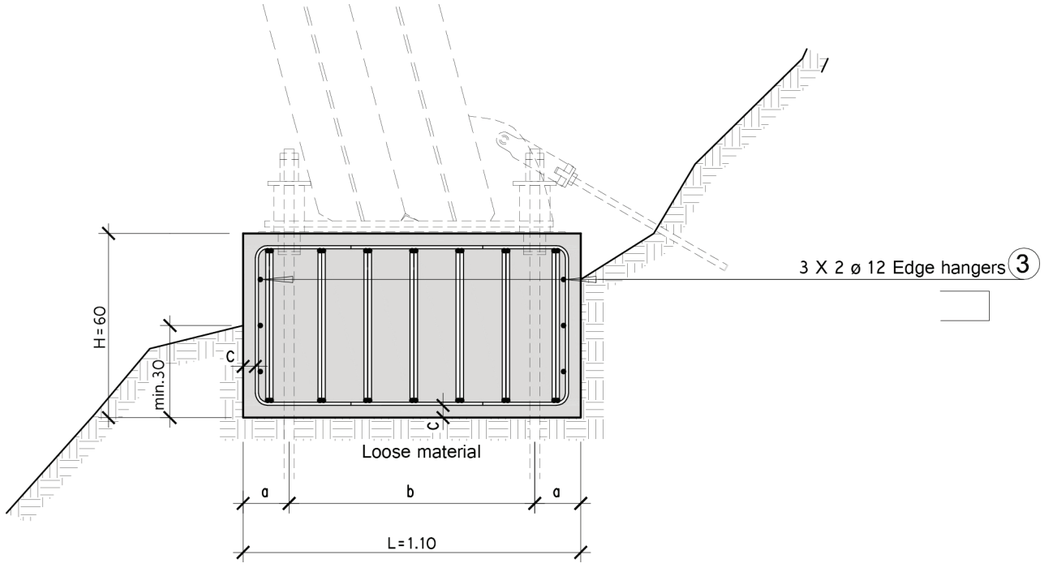


2.4.2 Foundation for rock



If the rock is sold, the concrete foundation is to be constructed with a thickness of 30cm according to the figure above.

2.4.3 Foundation for loose material



If the rock is loose, the concrete foundation is to be constructed with a thickness of 60cm.
The anchoring depth of 30cm must be complied with.

The spacings a nd b for the micropile boreholes and the shear-relief anchor are to be ensured according to the previous chapter. The reinforcement cover c is completed as follows:

c = 40mm generally
c = 50mm on prepared subsoil
c > 90mm on unprepared subsoil

2.5 Length of anchors and diameter of drill holes

In order that the maximum anchor strength can be attained in the vertical direction, the minimum anchor lengths must be compliant with according to the table below.

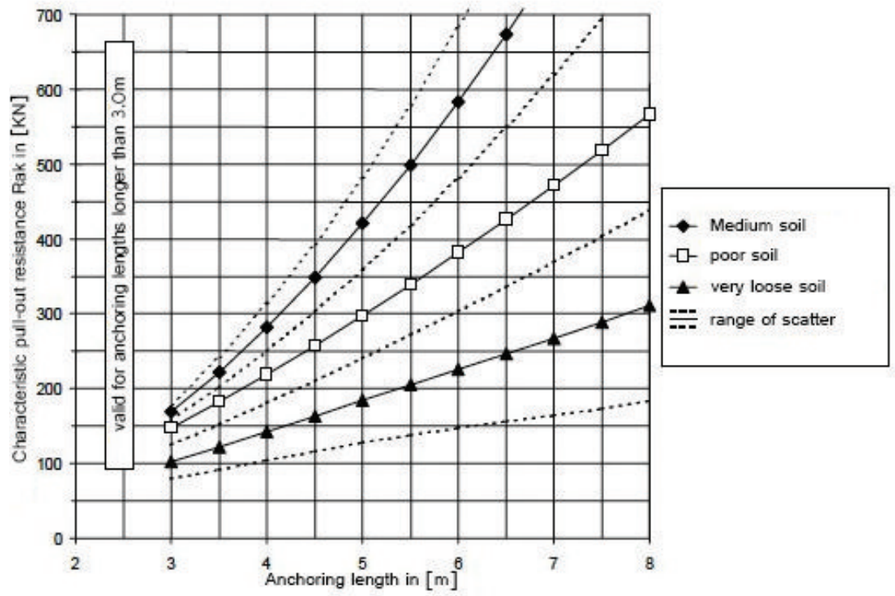
Type of anchor	Soil conditions	Anchor length in the earth	Drill hole
Rock anchor	rock largely free of fissures	min. 3.0m	min. 52mm
Micropile / self-drilling anchor*	Medium soil	min. 5.0m	min. 90mm
	Poor soil	min. 8.0m	min. 90mm*
	Drill hole ø70mm possible for coated anchor		

Definition of poor soil:
Loose soil, non-cohesive, non-binding fine material (e.g. moist, clayey weathered products that only allow poor interlocking with the anchor and the soil), scree.

Definition of medium soil:
Densely packed with cohesive fine material (e.g. coarse scree blocks with some parts of binding fine material, dry gravel sand).

2.5.1 Assessment and differentiation of the soil types

The following characteristic pull-out resistances of the soil, taken from the Swiss Guidelines for avalanche protection structures, are adopted for pre-dimensioning the anchor lengths.
The final specification of the anchor lengths takes place on location by establishing the pull-out resistances during assessment of the soil by the contracting company / geologists.



Calculation of characteristic pull-out resistance

2.5.2 Rock anchors

Provided that sound rock is found in the subsoil, the foundation can be be started with rock anchors.
The following requirements must be observed:

- The drill hole diameters must be at least 1.5 times greater than the anchor diameter.
- The minimum grout cover of the anchor must be 10 mm (corrosion protection).
- The anchor lengths must be specified corresponding to the maximum forces and the rock quality. The first half metre in the rock may not be included in the calculation. The minimum length of the anchors is 3.0m.
- The anchor bar is to be centred in the drill hole.
- Before injecting grout into the drill hole, it must first be cleaned by blowing out.
- A suitable anchor grout is to be used that is low-shrinkage and is capable of swelling.
- The drill hole must be filled with grout from the bottom, so that the anchor bar is grouted full-face and without air pockets.

2.5.3 Micropile

Micropiles are used for medium or poor soils, and are particularly sensitive to shear forces, since in contrast to rock, such forces cannot be absorbed by the relocated soil. The following requirements must be observed:

- The minimum drill hole diameter is 90 mm.
- The maximum mash width of the net stockings is 10 mm; however, if possible the use of a stocking is to be avoided.
- The grout cover of the anchor member must be at least 20 mm.
- The anchor lengths must be specified corresponding to the maximum forces and the soil quality. The first half metre in the soil may not be included in the calculation. The minimum length of the anchor is 5m.
- The anchor is to be centred in the drill hole.
- The drill hole must be filled with grout from the bottom, so that the anchor bar is grouted full-face and without air pockets.
- If larger anchor diameters have to be utilised due to the geology, then adapters have to be used in the area of the foundation.
- A suitable anchor grout is to be used that is low-shrinkage and is capable of swelling.

2.5.4 Shear-relief anchor (horizontal anchor)

The shear-relief anchor must be set up according to the instructions in chapter 2.3 An additional jig may be obtained from the Wyssen Company for drilling the shear-relief anchor.
The anchor bar must be centred in the drill hole, which can be achieved by using a spacer or centring components. The anchor must not be installed at an angle flatter than 15° to the horizontal. The minimum length of an anchor is 6m. The final length will be decided upon by Wyssen Avalanche Control AG.

If a reinforced tower is utilised, a minimum free working length of 1m is to be included for the anchor. This is achieved by overlaying a PVC tube beforehand with a marginally larger diameter than the anchor. The 70cm long PVC tube must be flush with the earth and reach into the interior.

2.5.5 Record book and confirmation of execution

A record book with the Company's stamp and signature, containing at least the details listed below, is to be drawn up and presented to the client.

General Information:
- Name and address of the contracting company
- Name of the builder on location
- Execution date

Anchor data:
- Number and diameter
- Anchoring lengths
- Situation and inclination of each anchor
- Anchor capacity

Drilling:
- Drilling process
- Borehole length and diameter
- known drilling obstacles
- Sketch of the subsoil properties encountered while drilling

Grouting:
- Type of cement
- Cement consumption
- W/C ratio
- Additives
- Type of injection
- Temperature and weather conditions

Tip
In addition to the record sheet, a confirmation of the execution is to be handed over in which the contacting company confirms that the foundation and assembly has been carried out in accordance with the present instructions and the state of the art. There is a template for this in the annex.

2.5.6 Material required for construction of the foundation (excluding general building tools)

Number	Article	Dimension Comments	Supplier Material
1 pc	Template	lxwxh: 1000 x 1000 x 6mm Weight: 25Kg	Wyssen Avalanche Control AG
4 pcs	Anchor rod	nominal-ø: Length:	e.g. SwissGewi anchor from SpannStahl
8 pcs	Anchor nut	nominal-ø: 32mm / Length: 60 mm	ditto
4 pcs	Lock nut	nominal-ø: 32 mm / Length: 30 mm	ditto
3 pcs	Earthing strap	Cross-section: 3 x 30 mm Length: 3 x 25 m (total at least 75 m) Galvanised steel or copper	Galvanised steel or copper
	Anchor mortar	Quantity according to supplier's details and depth of anchor	e.g. Avalanche defence mortar from Sakret
	Dry concrete	For base, quantity dependent on terrain	
2 pcs	Reinforcing grid	l x w: 1000 x 1000 mm Wire diameter: 8 mm, mesh width 15cm Material: e.g. K335	
	Water	Plan in sufficient quantity.	
Additional material for the shear-relief anchor (horizontal anchor)			
1 pc	Drilling jig Shear-relief anchor	l x w x h: 940 x 480 x 380 mm Weight: 30 kg	Wyssen Avalanche Control AG
1 pc	shear-relief anchor	Wyssen Art. Nr. 411.430A consisting of: Anchor hub: 411.435 Support plate: 411.437	ditto
1 pc	Hex bolt	M36 x 120, DIN 931	ditto
1 pc	Safety hex nut	M36, DIN 985	ditto
1 pc	Anchor rod	nominal-ø: 1.0 or 40 mm Length: depending on the foundation (++10cm to the drilling depth)	e.g. SwissGewi anchor from SpannStahl
1 pc	Lock nut	nominal-ø: 1.0 or 40 mm Length: 30 mm	ditto
1 pc	PVC tube	nominal-ø: 34 mm or 42 mm Length: 70 cm (Only for reinforced towers)	Wyssen Avalanche Control AG

2.5.7 Important when leaving the construction site - preparatory work for assembly

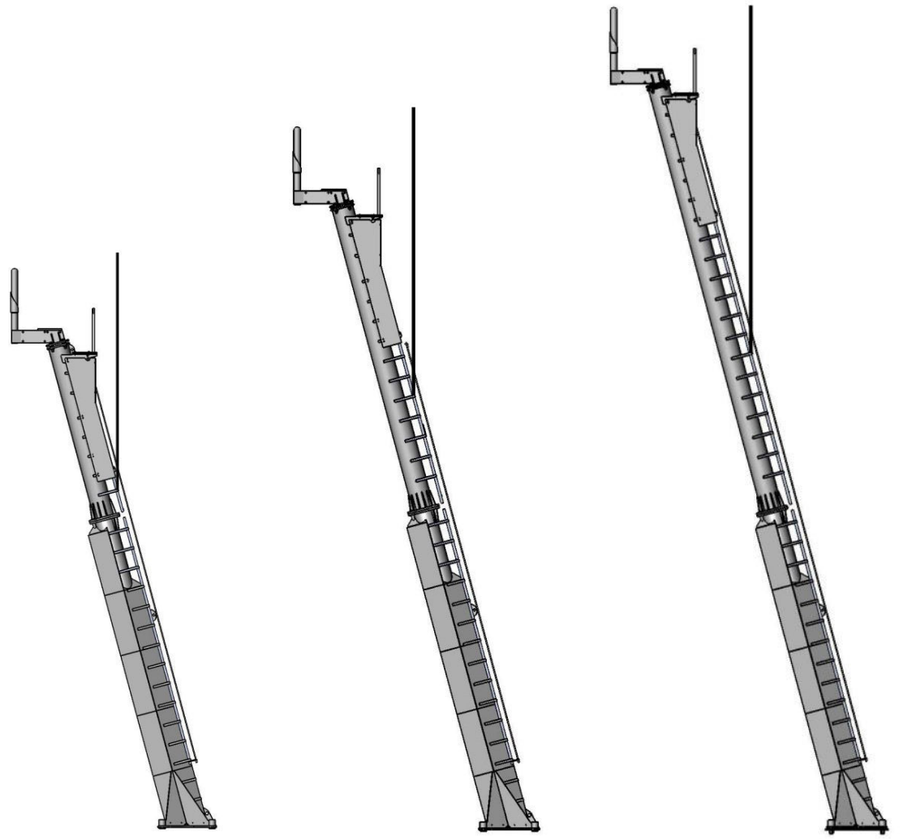
After completion the foundation must be left so that the tower can be assembled without any further preparation.

- ✖ An anchor nut and lock nut must be prepared for each anchor rod.
- ✖ The thread must be clean, so that the nut can be freely threaded by hand.
- ✖ There must be no surplus material on the base that is higher than the template.
- ✖ Shear-relief anchor rods must be sawn off flush with the template.
- ✖ The construction site must be left clean.

3 Erection of the tower

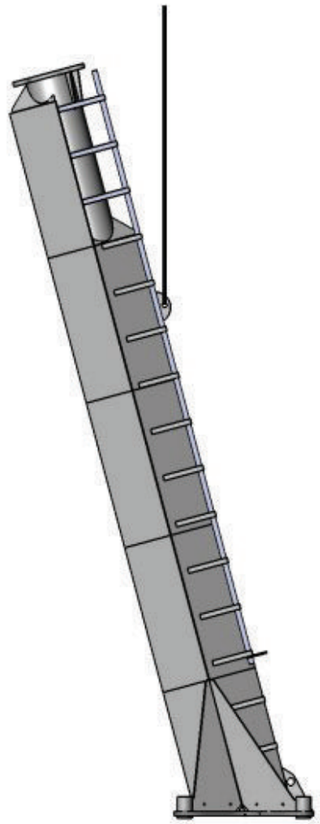
3.1 Placement of the complete tower

It is very important that material and tools required according to tables 2.5.6, 3.6.1 and 3.6.2 are placed ready at the foundation before placing the tower. In addition the assembly mandrel, onto which the magazine is placed, must be thoroughly cleaned and lubricated with a cold-resistant grease.
The elements of the two-part tower can be transported either individually or as an assembled unit. For helicopter transport these are suspended from a single point for easier assembly, transported and set down at the foundation. At least 3 men are necessary for acceptance of the tower and its alignment over the foundation anchor rods.



Tower 8m Tower 10m Tower 12m

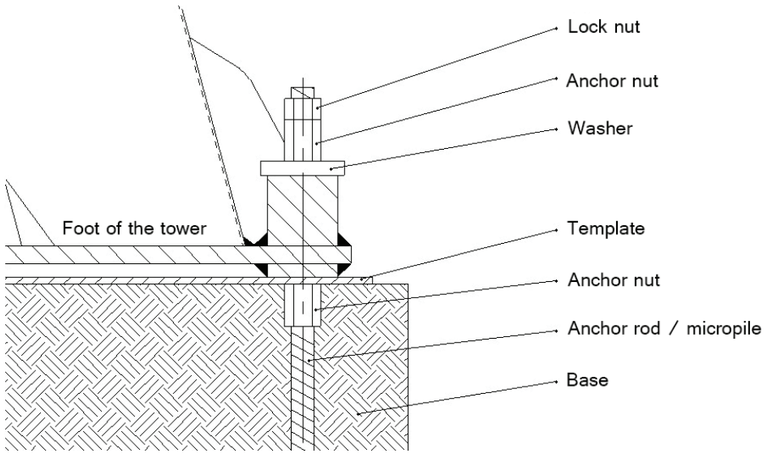
3.2 Placement of the pedestal of the 2-part tower



Pedestal of the 2-part tower with fixation point for helicopter transportation

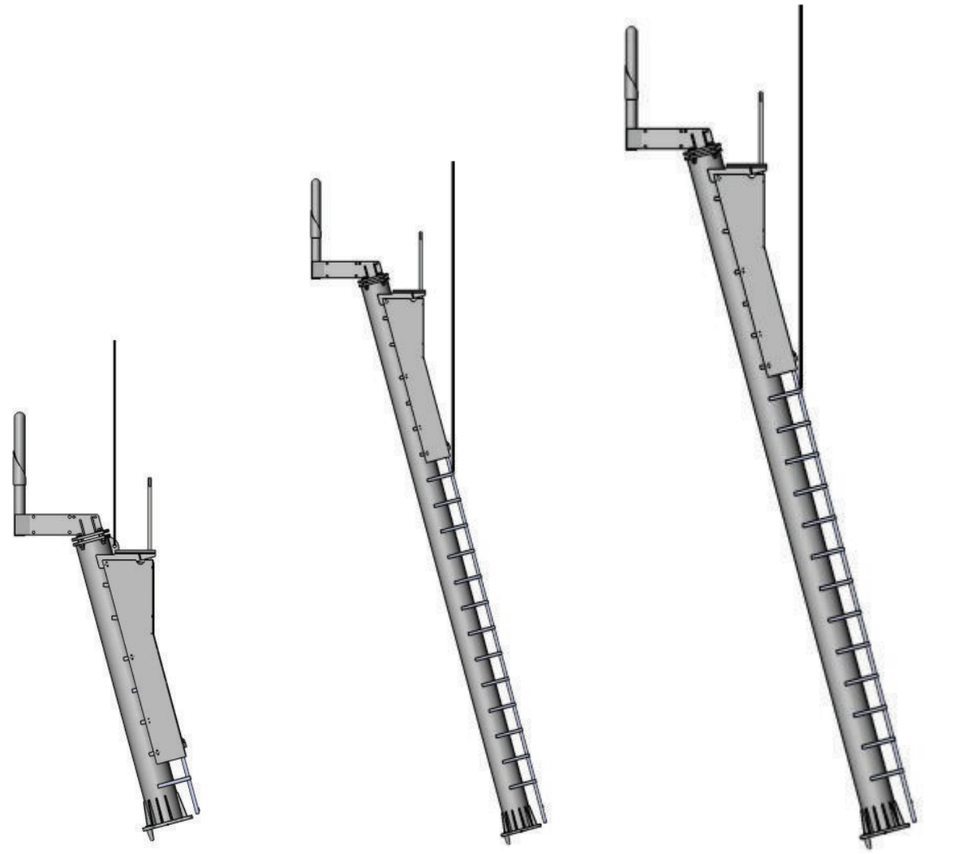
The weight of the tower's pedestal is given in table 3.7.
After the tower pedestal has been set down, the 4 U washers and then on anchor nut per anchor rod must be fitted and tightened by hand, before the helicopter completely releases its load.
Afterwards the nuts can be tightened with the torque wrench and finally the half nuts can be locked in place.

At the end the anchor head piece is protected with a bandage impregnated with an anti-corrosion compound.



Tower pedestal configuration

3.3 Placement of the top pieces of the 2-part tower



Tower pedestal 3m | Tower pedestal 5m | Tower pedestal 7m

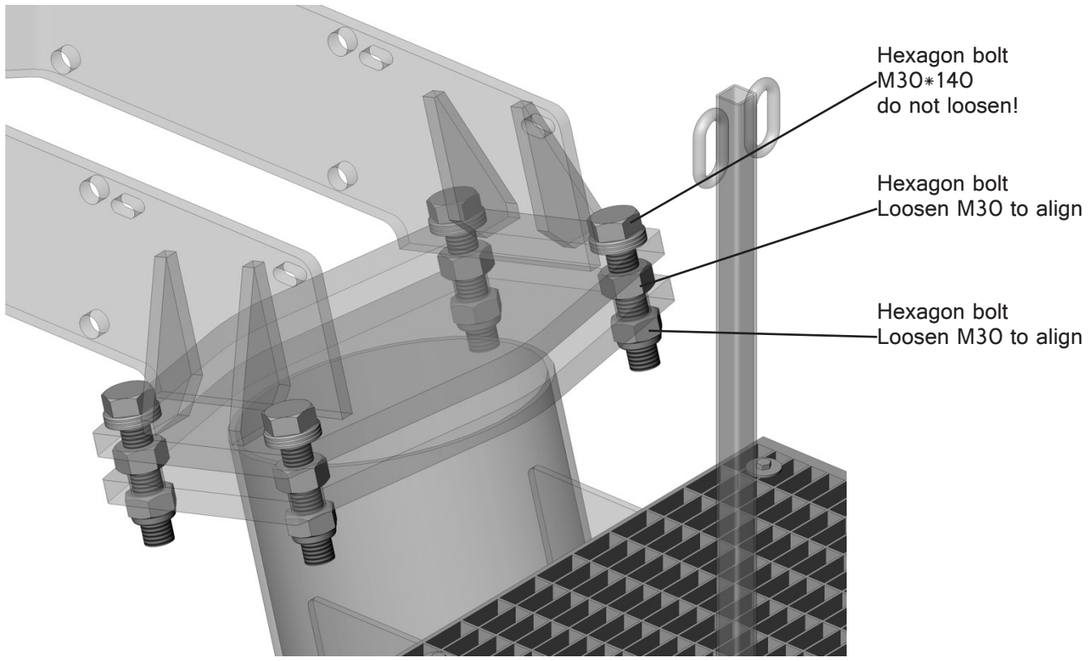
The weights of the above towers are also given in table 3.7.
The tower top piece is brought by helicopter to the pedestal. For precise positioning, the conical pins are guided into the corresponding feed holes in the pedestal. On the upper slope side at least 4 M-20 bolts must be fully tightened by hand before the helicopter pilot can release the load.
Following this, a bolt with two washers and an M-20 nut must be fitted in each hole of the connection flange and tightened with a torque wrench to 450Nm.

3.4 Earthing of the tower

After the tower has been correctly and securely bolted to the foundation as specified in chapter 3, the earth straps as described in chap. 2.2 are connected with the foot of the tower. With 3 M12x30mm bolts, M12 nuts and spring washers, the straps are bolted to the holes provided on the foot of the tower.

3.5 Aligning and lubricating the assembly mandrel

The assembly mandrel is lubricated ex works with a cold-resistant grease. If due to transportation and installation the grease no longer covers the whole surface, the mandrek must be re-greased.
After the tower has been correctly and securely bolted to the foundation, the assembly mandrel must be aligned exactly perpendicular. For this the 4 M30 hex bolts at the top of the tower, between the top plate of the tower and the bottom plate of the assembly mandrel, have to be loosened a little. The inclination of the mandrel can be set with the adjusting nuts between the plates as shown in the figure below. It is important that the mandrel is exactly perpendicular, so that no jamming occurs when placing and removing the magazine with the helicopter. Afterwards the hexagon bolts can be tightened with the torque wrench (1650Nm).



Detail for alignment of assembly mandrel

3.6 Required materials and tools for erecting the tower

3.6.1 Delivered by wyssen avalanche control AG

	Article	Dimension Comments/Purpose
4 pcs	U washer	
12 pcs	HT bolts	M20 x 95 (Hex bolt with nut and 2 washers) to connect the tower foot and head piece at the flange
3 pcs	Hex bolt	Fastening the earth straps
3 pcs	Hex nut	Fastening the earth straps
3 pcs	spring washers	Fastening the earth straps
Material for the shear-relief anchor (horizontal anchor), see table 2 Foundation material		

3.6.2 Required materials and tools from the client / builder

	Article	Dimension Comments/Purpose
2 pcs	Flat / ring spanner	Width over flats 55 and 60 (for Swiss Gewi) Tightening the anchor nuts
1 pc	Flat / ring spanner	Width over flats 50 Tightening the lock nuts
2 pcs	Flat spanner	Width over flats 46 Adjusting and fixing the assembly mandrel
2 pcs	Flat / ring spanner	Width over flats 32 Fastening the flange connection between the foot and top piece of the tower
1 pc	torque wrench with socket	Width over flats 30, 32, 46 Fastening the connections
2 pcs	Flat / ring spanner	Width over flats 19 Fastening the earth straps
1 item each	Flat spanner	Width over flats 13/17 Fastening the fall-bloc safety cable
1 item each	Broom and scraper	For cleaning the base
1 pc	3 square file	for any repairing to damaged threads
1 pc	Cordless drill	Drilling bolt holes for the earth straps
1 pc	Drill ø 13 mm	Drilling bolt holes for the earth straps
1 pc	Metal cutting saw	For cutting the earth straps on the tower to length
1 pc	Side cutters	
1 pc	Pliers	
1 pc	Hammer	
1 pc	Cable shears	For shortening the fall-bloc safety cable
1 pc	Insulating tape	
1 pc	Spirit level (plumb level)	For aligning the mandrel
As equired	Bandage for corrosion inhibitor	Corrosion inhibiting wrapping of the anchor head

3.7 Weights of the towers

For transportation of the tower by helicopter not only the effective weights are crucial, but also the air temperature and the height above sea-level. Precise details can be obtained from the respective helicopter transport company.

Art. no.	Design type	Total tower length	Weight individual	Weight with mandrel	Total weight incl. pedestal, mandrel and disks etc.
411.401-14 411.401-14V	Tower pedestal 5m		800kg 890kg		
411.403	Tower top piece 3m with locking door	8m	350kg	520kg	1,450 kg
411.405	Tower top piece 5m with locking door	10m	495kg	665kg	1,600 kg
411.407	Tower top piece 7m with locking door	12m	approx. 630kg	approx. 800kg	approx. 1,750 kg
411.440L-2	Tower extension 2 m	2m	approx. 225kg		

4 Recommended literature

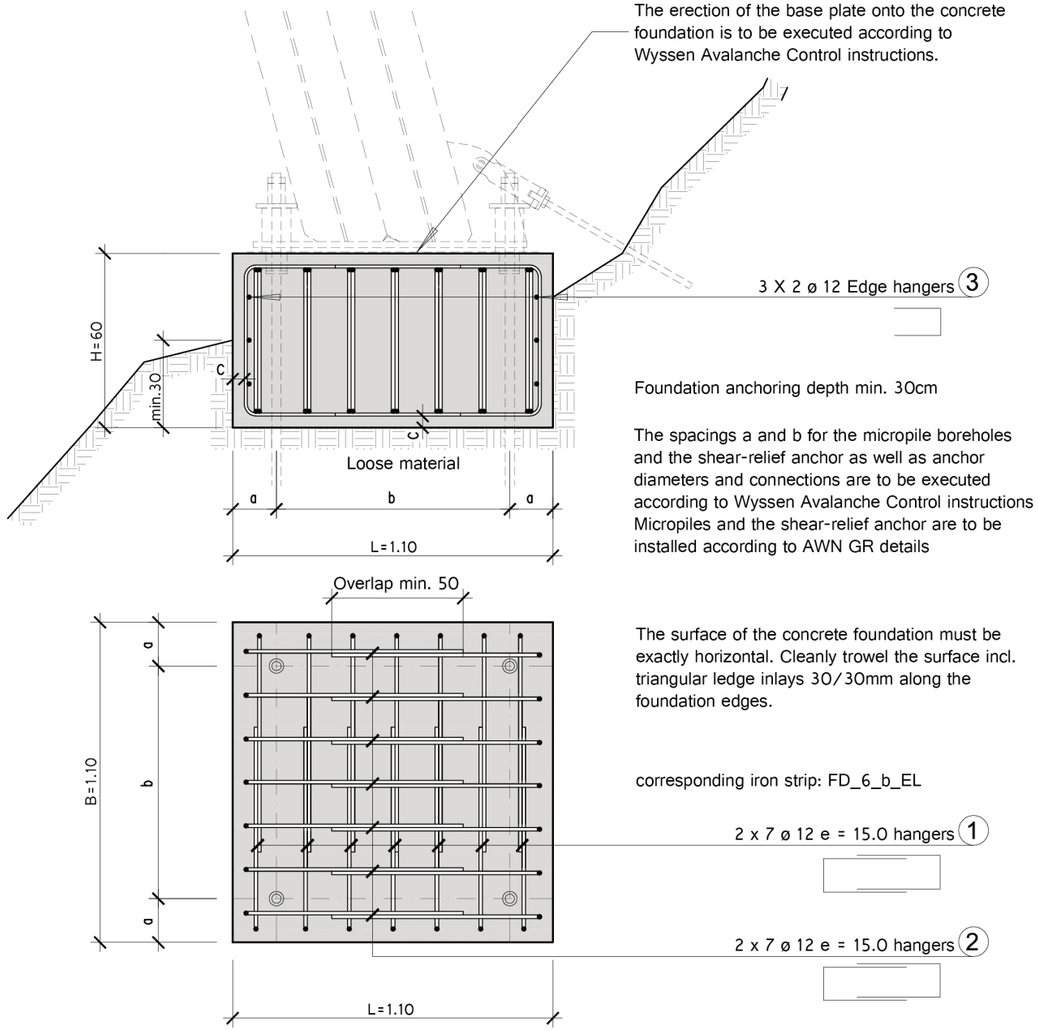
Margreth, S.: Avalanche protection structures in avalanche fracture zones (in German) Technical guidelines as aid to implementation Environmental enforcement no. 0704. Federal Office for the Environment, WSL Swiss Federal Institute for Snow and Avalanche Research SLF Davos 2007 Edition 2009-06-04.

ÖNORM-Regel 24806: Permanent technical avalanche protection - dimensioning and constructive design

5 Annex

5.2 Wyssen avalanche tower foundation in loose material

FOUNDATION OF WYSSEN AVALANCHE TOWER CAST-IN-PLACE CONCRETE FOUNDATION, TYPE LOOSE MATERIAL



The erection of the base plate onto the concrete foundation is to be executed according to Wyssen Avalanche Control instructions.

3 X 2 ø 12 Edge hangers (3)

Foundation anchoring depth min. 30cm

The spacings a and b for the micropile boreholes and the shear-relief anchor as well as anchor diameters and connections are to be executed according to Wyssen Avalanche Control instructions Micropiles and the shear-relief anchor are to be installed according to AWN GR details

The surface of the concrete foundation must be exactly horizontal. Cleanly trowel the surface incl. triangular ledge inlays 30/30mm along the foundation edges.

corresponding iron strip: FD_6_b_EL

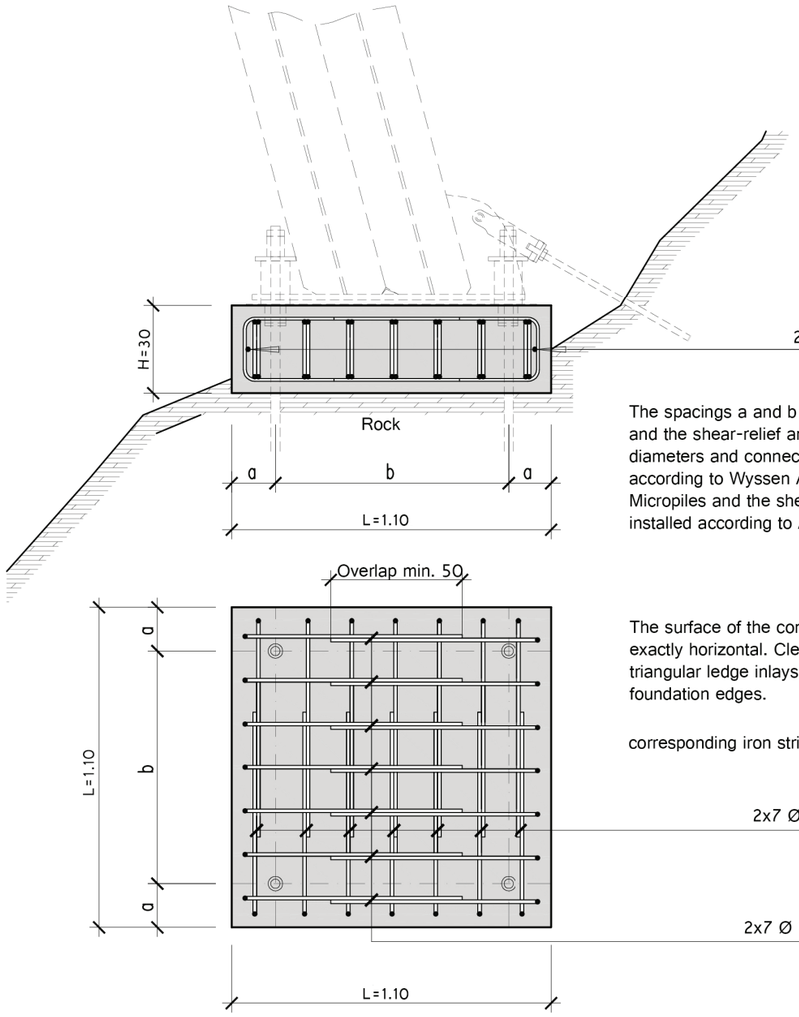
2 x 7 ø 12 e = 15.0 hangers (1)

2 x 7 ø 12 e = 15.0 hangers (2)

Dimensioning	Type of concerte / type of formwork	Steel quality
The length of anchor L is dependent on the project-specific characteristic values of the soil. Ra,k is to be determined with pull-out trials according to SIA 267/1.Length of anchor L for micropile and shear-relief anchor according to AWN GR details Steel quality and diameter according to details of the system supplier.	Foundation from cast-in-place concrete according to SN EN 206-1, (NPK concrete type D) C25/30, XF2 (CH) Formwork: type 2 triangular ledge inlays Reworking of the surface (high spots)	Reinforcing steel B 500 B Reinforcement cover: c = 40 [mm] generally c = 50 (mm) on prepared subsoil c = 90 (mm) on unprepared subsoil

5.3 Wyssen avalanche tower foundation in rock

FOUNDATION OF WYSSEN AVALANCHE TOWER CAST-IN-PLACE CONCRETE FOUNDATION, TYPE ROCK



2 ø 12 Edge hangers (3)

The spacings a and b for the micropile boreholes and the shear-relief anchor as well as anchor diameters and connections are to be executed according to Wyssen Avalanche Control instructions Micropiles and the shear-relief anchor are to be installed according to AWN GR details.

The surface of the concrete foundation must be exactly horizontal. Cleanly trowel the surface incl. triangular ledge inlays 30/30mm along the foundation edges.

corresponding iron strip: FD_6_a_EL

2x7 Ø 12e=15.0 hangers1 (1)

2x7 Ø 12e=15.0 hangers 2 (2)

Demensioning	Type of concrete / type of formwork	Steel quality
The length of anchor L is dependent on the project-specific characteristic values of the soil. Ra,k is to be determined with pull-out trials according to SIA 267/1. Length of anchor L for micropile and shear-relief anchor according to AWN GR details Steel quality and diameter according to details of the system supplier.	Foundation from cast-in-place concrete according to SN EN 206-1, (NPK concrete type D) C25/30, XF2 (CH) Formwork: type 2 triangular ledge inlays Reworking of the surface (high spots)	Reinforcing steel B 500 B Reinforcement cover: c = 40 [mm] generally c = 50 (mm) on prepared subsoil c = 90 (mm) on unprepared subsoil

5.4 Confirmation of execution of foundation and assembly

Project

Town, Postal Code .....

Region .....

Avalanche towers	Name	Anchor length	Anchor inclination	Anchor capacity

Confirmation

The construction of the foundation and the assembly of the Wyssen avalanche tower were complied with according to

- ✖ State of the Art
- ✖ Manufacturer's guidelines as described in the "Foundation Instructions of the Wyssen avalanche tower LS12-5".

The prescribed specifications in the instructions can be met by the foundation.

Name and address of the Company

Signature, Company Stamp

Place, Date

in Switzerland
Wyssen Avalanche Control AG
CH-3713 Reichenbach i.K.

Tel: +41 033 676 76 76

E-Mail: avalanche@wyssen.com

In Austria:
Wyssen Austria GmbH
AT-6020 Innsbruck

Tel: +43 664 460 30 10

E-mail: austria@wyssen.com

For further information
visit us at
www.wyssen.com

wyssen switzerland avalanche control

Decision Memo
Baldy RAC Sites
Project number in the Planning, Appeals, and Litigation System database: 61387
United States Forest Service
Salt Lake Ranger District, Uinta-Wasatch-Cache National Forest
Salt Lake County, Utah
January 2022

This decision incorporates all information in this document and included in the project file.

1.0 DECISION AND RATIONALE

This document details my decision to authorize Alta Ski Area's (Alta) proposal to install Remote Avalanche Control (RAC) devices on Mount Baldy to determine if they offer a viable alternative to the Baldy Tram. A total of 11 RAC devices may be required to replace the 105mm Howitzer. Eight devices would be installed on Alta's private land, and up to three would be installed on Forest Service land on the north-facing side of Mount Baldy. These are labeled as RAC #1, RAC #10 and RAC #11 on the project map.

Each RAC installation would consist of an approximately 1-square-meter concrete footing drilled into rock outcroppings and a tower mounted to the footing. Equipment, personal, and materials would be transported to the site via helicopter. On-site work would be done by hand. Once the towers are in place, helicopters would be used to place the O'bellx or devices on the towers and service them during the winter season. The devices would be removed during the summer.

When in place and armed, a remote signal would be used to trigger the devices. Detonations will occur in the air above the snowpack for better effect on weak layers and triggering of avalanche releases.

Each installation would disturb less than 250 square feet. Alta proposes to install RAC #1 during the summer of 2022. Dependent on its performance, RACs #10 and #11 would be installed the subsequent summer.

Based on environmental analysis and input from an interdisciplinary team of Uinta-Wasatch-Cache National Forest resource specialists, I have determined that this action may be categorically excluded from documentation in an environmental assessment or an environmental impact statement. In particular, this action falls under: **Category 3: Approval, modification, or continuation of special uses that require less than 20 acres of NFS lands (36 CFR 220.6(e)(3)).**

The Environmental Analysis Review section documents rationale to support my finding that no extraordinary circumstances exist, along with findings required by other applicable laws and regulations to demonstrate compliance with the regulatory framework for the activities authorized by this decision. Specifically, the National Forest Management Act, National Environmental Policy Act, Endangered Species Act of 1973, as amended; Clean Water Act; Congressional designated areas such as wilderness, wilderness study areas, or National Recreation Areas; Inventoried Roadless Areas; Research Natural Areas; Native American religious or cultural sites, archaeological sites, or historical properties or areas; Migratory Bird Treaty Act; Environmental Justice (Executive Order 12898).

I find that the proposed action is fully consistent with the 2003 Revised Wasatch-Cache National Forest Plan, as well as in compliance with all applicable laws, regulations, and policies.

Prescription 4.5 emphasizes developed recreation areas, which include, developed facilities such as campgrounds, trailheads, boat docks, and resorts as well as adjacent areas associated with these sites. High levels of visitor interaction can be expected where sights and sound of others are noticeable and there are moderate to high opportunities for social interaction… Management visibility is high with managers focusing on public safety, service education, user ethics, and enforcement… Because of the large capital investments in these areas, site protection is paramount.

Project is consistent with Recreation Desired Future Conditions in the Forest Plan, "Additional development….will generally involve the replacement and/or modification of existing facilities, modifications of existing ski runs, and adjustments to evolving technologies and user preference" (p. 4-161).

2.1 Design Criteria - The following Design Criteria will be required as part of this decision:

Engineering:

1. Submit detailed design drawings that include site plan, architectural, structural, plumbing, mechanical, and electrical requirements. Plans should include:
    a. Site plan – location of proposed and existing structures and constructed features, utilities, related roads and parking areas, accessible routes to/from the proposed structures.
    b. Architectural Plans - dimensioned plans with foundation plan, floor plans, roof plan, door and window requirements, stair and railing, building elevation, and any other accessible features. Include exterior building materials and colors.
    c. Structural Plans – size and requirements for structural members, supports, connectors, shearwalls, etc.
    d. Electrical Plans – Include location of electrical service on the site plan, electrical plan for building with building service panel identified. Include grounding details.
2. The drawings must be stamped by the Professional Engineer and Architect responsible for the design, and must comply with all current building codes (IBC, IPC, IMC, NEC, etc.), standard, and other safety requirements.
3. Submit Structural Calculations for the structure (building, tower, etc.) that includes loads required by IBC, ASCE-7 and TIA-222-G (vertical and lateral). Structural calculations must be stamped by the structural engineer responsible for the design. Schedule - Indicate approximate starting date for construction of the improvement(s) and/or related infrastructure.
4. If required, obtain the appropriate building permits from the local building permitting agency with jurisdiction prior to beginning work. Provide copy of permit or documentation of application for permit.

Provide a construction schedule for all elements that will be built.

Recreation:

Make sure the recreating public doesn't have access to the project site during the construction phases of the project. Place signs up notifying the public that construction is in progress once the project begins. Follow BMP's outlined in the 2018ALTA MDP EA for similar remote avalanche control technology installation.

Scenery:

Per the Scenery Conversion Table in the 2003 Forest Plan, Alta Ski Lifts has a Landscape Character Theme of Resort Natural Setting with a High Scenic Integrity Objective (p.4-93). Visual impacts will be present during the construction phase of the project. Alta Ski Lifts will follow ski area Best Management Practices to rehab project sites so they will blend in with the natural surroundings once construction is complete.

Alta Ski Lifts will treat the galvanized steel on the towers of the Wyssen Towers so they aren't as reflective in the non-winter months.

Vegetation:

Surveys conducted on August 11th, 2021 detected a population of *Erigeron garrettii* within the project area. Locally common in area, this population extends outside of project area to top of ridgeline. This project May Impact Individuals or their Habitat But Will Not Likely Contribute To A Trend Towards Federal Listings or Loss of Population Viability. There were no noxious or invasive weed populations detected in the project area. Follow BMP's to prevent the spread of noxious and invasive weeds:

1. All existing infestations within/adjacent to project area should be treated prior to project implementation.
2. Do not stage equipment, materials, or crews in invasive plant populations.
3. All equipment should be cleaned and free of vegetation, soil, and debris prior to beginning work on Forest Service land.
4. Revegetation should be initiated as promptly as practical. Seed only where natural regeneration of desirable species is unlikely or is susceptible to or threatened by invasive or noxious plants. Seed mix will be approved by the Forest Service and certified weed free.

5. For at least three years after project completion, treat invading noxious weeds as needed on areas impacted by ground disturbing operations.

4.0 AGENCIES, ORGANIZATIONS & PERSONS CONTACTED

The Forest Service conducted internal scoping with the interdisciplinary team of Uinta-Wasatch-Cache National Forest resource specialists at the September 2021 Small NEPA meetings and external scoping by entering the project into the Planning, Appeals, and Litigation System database (PALS).

6.0 ADMINISTRATIVE REVIEW PROCESS AND IMPLEMENTATION

Decisions that are categorically excluded from documentation in an Environmental Assessment (EA) or Environmental Impact Statement (EIS) are not subject to an administrative review process (Agriculture Act of 2014 [Pub. L. No. 113-79], Subtitle A, Sec. 8006). The project may be implemented immediately.

7.0 CONTACT PERSON

For additional information about the project, contact Ben Kraja, arben.kraja@usda.gov, (385) 421-1458

DAVID WHITTEKIEND Digitally signed by DAVID WHITTEKIEND
Date: 2022.01.10 16:04:16 -07'00'

David Whittekiend **Date**
Forest Supervisor
Uinta-Wasatch-Cache National Forest

U.S. Department of Justice

Bureau of Alcohol, Tobacco,
Firearms and Explosives

Washington, DC 20226

www.atf.gov

March 03, 2021

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555.208; 555.213
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Mr. Dave Richards
Director, Avalanche Office
Alta Ski Area
P.O. Box 8007
Alta, Utah 84092-8007

Federal Explosives License Numbers: 9-UT-035-33-00104; 9-UT-035-20-00574

Dear Mr. Richards:

This is in response to your letter dated December 22, 2020, to the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). You requested a variance from the Federal explosives regulations at 27 CFR, Part 555. We are approving your request to store primed explosives in Wyssen Towers at your ski area, as described below.

Alta Ski Area (Alta) plans to install nine Wyssen Towers in the "Mount Baldy" area to protect the Main Street, Mambo, Ballroom and Baldy Shoulder ski runs, and the Collins Lift Angle Station from the threat of avalanches. Your letter included GPS coordinates for the specific location of each planned tower. Because the Wyssen Tower relies upon the storage of high explosives with detonators installed, and the deployment boxes are not explosives magazines, you require permission from ATF for its use.

You explained that Alta manages the avalanche risk in the area with a Howitzer, an Avalauncher, and with charges manually deployed by ski patrollers. In addition, Alta uses four O'Bellx® remote avalanche control systems (RACS), which mix oxygen with a flammable gas in a collector. When the mixture is ignited, it creates an explosion in the starting zone without the use of traditional high explosives. You stated that while these methods are useful for avalanche mitigation, the Wyssen Tower has advantages over all of them. Use of the Wyssen Tower will substantially decrease the time spent on avalanche mitigation and the time that Alta personnel spend in direct contact with explosives, compared to the Howitzer, Avalauncher and manual placement methods. Like the O'Bellx RACS, the Wyssen Tower is remotely controlled, minimizing the direct handling of explosives by ski patrollers in difficult terrain and sometimes adverse weather conditions. However, the Wyssen Tower has a much greater effective radius than other RACS, thus fewer units and concrete foundations are needed. In addition, because the

Wyssen Tower uses high explosive charges, no gas lines are required. The result is less cost and less impact on the environment, and less risk to construction teams, who have to access and work in mountainous areas. Finally you noted that the U.S. Army has set a 2025 deadline for decommissioning all Howitzers on loan to the U.S. Forest Service and used by ski areas for avalanche control.

Each Wyssen Tower will be approximately 40 feet high, and installed on a concrete base (see Figure 1 below). At the top is a deployment box that holds twelve 11-pound high explosive cartridges with two detonators each, totaling approximately 132 pounds of explosives. Each primed explosive charge sits in a tube on a carousel. When a charge is to be deployed, the carousel rotates so a live charge is directly over a hole in the bottom of the deployment box. The charge drops through the hole and comes to rest at the end of a rope above the avalanche field and two pull fuze-style igniters are initiated, further initiating a time fuse. The explosive charges detonate after a short delay. The shock wave and vibration from the explosion triggers avalanches near the tower. The deployment box can be lifted from the tower by helicopter and brought to a station building for reloading or maintenance.

Figure 1 – Wyssen Tower with Deployment Box

The shortest distance from a planned deployment box to a road would be 979 feet; however, this road is not open during the months when explosives will be stored in the deployment boxes. The distance from a public highway that is open during the ski season (Utah State Highway 210) to the nearest planned deployment box would be 7551 feet; the distance from an inhabited building (chair lift) to the nearest deployment box would be 1369 feet; and the distance from an explosives magazine to the nearest deployment box would be 1297 feet. The distances between any two deployment boxes will be greater than 200 feet. The nearest passenger railway is over 13 miles from the nearest planned deployment box. The unbarricaded distances required from a magazine holding 132 pounds of high explosives to these receptors are 318 feet (high volume highway or passenger railway); 430 feet (inhabited building); 38 feet (other magazine). The distances from deployment boxes at your planned locations meet the minimum distances in the table of distances at 27 CFR § 555.218. There are few backcountry hikers and skiers in the area of the proposed installations during the winter months when explosives will be stored in the deployment boxes. The deployment boxes will be taken down and any leftover charges will be properly stored from approximately May through October of each year.

Detonators Stored with Other Explosives

You requested permission to store high explosive charges primed with detonators in the deployment boxes from approximately November through April, when there is avalanche risk, and when snow cover and resort operations limit the backcountry use of the avalanche area. The rest of the year, the deployment boxes will be emptied of explosives and stored disassembled at another location. The Federal explosives regulation at 27 CFR § 555.213 generally prohibits the storage of detonators with other explosive materials.

Pursuant to 27 CFR §555.22, ATF may approve the use of an alternate method or procedure in lieu of a method or procedure specifically prescribed in Part 555 when: (1) Good cause is shown for the use of the alternate method or procedure; (2) The alternate method or procedure is within the purpose of, and consistent with the effect intended by, the specifically prescribed method or procedure and that the alternate method or procedure is substantially equivalent to that specifically prescribed method or procedure; and (3) The alternate method or procedure will not be contrary to any provision of law and will not result in an increase in cost to the Government or hinder the effective administration of Part 555.

The storage of high explosives with detonators increases the risk of accidental detonation. However, the reduction in the use of hand-deployed charges, Howitzers, and Avalaunchers in proximity to the public, and the various other stated advantages over the other avalanche mitigation methods provide good cause for ATF to consider your request to use the Wyssen Tower. Your planned locations exceed the minimum distance requirements to the nearest inhabited building, highway, railway, and explosives storage magazine under 27 CFR § 555.218. You also noted that there are few backcountry hikers and skiers in the proposed area during the time when explosive materials will be stored. Based upon these considerations, we are approving your request to store up to 132 pounds of high explosives with detonators attached in each Wyssen Tower at the proposed locations.

Bullet-Resistance

The Federal explosives regulations at 27 CFR § 555.208 require that magazines containing high explosives be bullet-resistant. Specifically, the exterior of a type 2 magazine is to be constructed of ¼-inch steel lined with at least 2 inches of hardwood. Alternate construction methods for bullet-resistance appear in ATF Ruling 76-18.

The Wyssen Tower deployment box sides are 5 mm (.187 inches) thick steel, and the bottom is 8 mm (.314 inches) thick steel. The top (lid) is 8 mm (.314 inches) thick aluminum. As noted above, the bottom has a hole through which a charge departs the deployment box prior to initiation. This construction does not meet the bullet-resistance standards noted above. However, the likelihood of bullet penetration is very low because the area in which the towers would be located is remote and seldom visited by backcountry hikers during the time when explosive materials will be stored. Further, rifle hunting is not allowed at any time in Salt Lake County.

We agree that these factors render the likelihood of bullet penetration of the Wyssen Tower deployment boxes at your proposed locations very low. Therefore, we are approving your use of the Wyssen Tower deployment boxes constructed as described above, each containing approximately 132 pounds of high explosives with detonators inserted, provided you place them as described in your letter and attachments, and you adhere to the storage time frames noted above.

Security

The regulations at 27 CFR § 555.208 require that a type 2 explosives magazine be theft-resistant. Among the options for locking are two hooded padlocks per door. The padlocks must have case-hardened steel shackles and five tumblers. You proposed to equip each of your Wyssen Tower deployment boxes with 3 unhooded padlocks meeting these shackle and tumbler requirements.

Your proposed locking method does not meet the locking standard above, in that you will not cover the locks with hoods. However, you suggested that the overall level of security of the deployment boxes is equivalent to the standards in the regulations. Each padlock must be defeated for the top door to open. In addition, the ladder to each deployment box will be equipped with a barrier and one unhooded padlock of the same description. Further, the deployment boxes will contain explosives only during the winter, high on a mountain. The inhospitable conditions under these circumstances greatly reduce human presence and the likelihood of a theft attempt.

We are approving your request to use three unhooded padlocks on the lid of your Wyssen Tower deployment boxes, provided the locks meet the shackle and tumbler requirements for padlocks under 27 CFR, Part 555, and the access ladders are locked with a padlock meeting these requirements.

ATF may modify or rescind these variances should we determine that they pose a threat to public safety, cause the Government to incur additional costs to administer, or do not provide levels of safety and security equivalent to those of the regulations prescribed under 27 CFR, Part 555.

These approvals do not convey any rights or privileges contrary to any other Federal, State, and/or local laws. You should make a copy of this letter part of your permanent records and have it available for inspection by any ATF officer.

We trust the foregoing has been responsive to your request. If you have additional questions, please feel free to contact the Explosives Industry Programs Branch at (202) 648-7120.

Sincerely yours,

Annette Butler
Chief, Explosives Industry
Programs Branch

cc: Deputy Assistant Director, Industry Operations
Director, Industry Operations, Denver Field Division
Area Supervisor, Salt Lake City Area Office
Chief, Federal Explosives Licensing Center
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June 5, 2022

Dave Richards Director
Alta Avalanche Office
P.O. Box 8007
Alta, Utah 84092-8007

Re: Conditional Use Permit Approval for 8 Wyssen Towers on Mount Baldy

Dear Dave:

On June 2, 2022, the Alta Planning Commission met, discussed, and approved Alta Ski Area's (Alta) request to construct eight (8) Wyssen Tower Remote Avalanche Control Systems (RACS) in the locations identified on Alta's private land on Mount Baldy.

The Commission's approval was subject to the conditions and requirements from your letter to the Planning Commission and Town Council of May 23, 2022, The Forest Service Decision Memo of January 2022, The U. S. Department of Justice's Bureau of Alcohol, Tobacco, Firearms and Explosives letter dated March 3, 2021, the Foundation Instructions for the Wyssen Avalanche tower LS12-5 and the May 25, 2022, Staff Memo to the Alta Planning Commission, all of which are attached hereto.

The Commission commended you on the completeness of your application and description of the project during the meeting. During that discussion, the earlier idea of a tram to service Mount Baldy for avalanche control operations was discussed. The discussion evolved around the thought that if the RACS worked as they should, the need for a tram to Mount Baldy would be eliminated. The Commission emphasized that point and hoped that the RACS would eliminate the need for that tram. You also noted that the manufacturer will spray the towers with a watershed friendly solution so the towers will more quickly dull from exposure to the elements to blend in more with the surroundings.

The Commission realized that the next step in this request is a request for a variance the Land Use Appeal Authority to install the RACS on slope over 30% on Mount Baldy. The Commission realized that the very nature of ski areas and avalanche control devices requires construction on slope over 30%. The Commission wished to express their recommendation for a positive consideration of that variance request to the Appeal Authority for the installation of these state-of-the-art RACS.

Congratulations on your successful request. Best of luck with the installation this summer.

If you have any questions, please don't hesitate to contact me.

Best!

john

John H. Guldner
Town Administrator
Town of Alta

Attachments

CC: Alta Planning Commission
Alta Town Council
Polly McLean
Mike Maughan