



**Application**  
**to the Maine Department of Conservation**  
**for upgrading the existing**  
**Public Safety Radio Communications Facilities**  
**on Mt. Blue**  
**in Franklin County**  
**Avon Maine**

submitted by  
**MSCommNet**  
**(Maine State Communications Network)**

Radio Services Division  
Office of Information Technology  
Department of Administrative and Financial Services  
State of Maine

**April 26, 2010**  
(updated May 13, 2010)

**Elements of application from the Department's Policy on  
Use and Management of State-Owned Mountaintops for Communication Facilities.**

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Date: April 26, 2010

To: Eliza Townsend, Commissioner, Maine Department of Conservation  
cc: Will Harris, Director, Bureau of Parks and Lands, Maine Department of Conservation

From: Shawn Romanoski, Director, Radio Operations, Maine Office of Information Technology

**Subject: Proposal to upgrade the public safety radio communications facility on Mt. Blue**

**Proposal.** The State of Maine MSCommNet (Maine State Communications Network) project office is proposing to the Department of Conservation, Maine Bureau of Parks and Lands, to upgrade the public safety radio communications tower and facilities on Mt Blue, to better serve the law enforcement, public safety, and public service agencies in the Western Mountain and Lakes Region.

MSCommNet is primarily designed to upgrade the existing communications infrastructure statewide for Maine State agencies including the State Police, Game Wardens, Forest Rangers, Maine Emergency Management Agency (MEMA), and others such as local, county, and federal partners.

We understand that the site upon which the State of Maine Radio Services group currently operates a public safety radio communications facility is owned and managed by the Maine Department of Conservation, Bureau of Parks and Lands on behalf of the citizens of Maine; and that the placement of a new communications facility on Mt Blue must be in conformance with the Department's Policy on Use and Management of State-Owned Mountaintops for Communication Facilities. Operation of the communications facility was transferred from DOC to OIT in 2005 when the State consolidated numerous public communications systems into a unified system<sup>1</sup>.

**Local partners.** The new MSCommNet system is designed to continue to communicate with local and county, and federal public agencies. Additionally, opportunities for co-location of local and county public safety communications equipment are possible and will be considered. The radio project office is currently evaluating a proposal from Tim Hardy, Director of the Franklin County Emergency Management Agency, to collocate County radio communications

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<sup>1</sup> Maine Revised Statutes Title 5 §1520. Statewide Radio and Network System Reserve Fund

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equipment on the proposed upgraded Mt. Blue tower. We are also working with the US Customs and Border Protection radio project at this site and others, to co-locate equipment, to share funding, and also to reduce the total tower footprint statewide.

We understand that there will be an opportunity for public review and comment of any formal proposals as part of the approval process; and that the MSCommNet Radio Project Office will make a formal presentation at a public hearing in Avon Maine, hosted by the Bureau of Parks and Lands. The MSCommNet project team will continue to communicate and proceed openly and inclusively. We would like to commence and complete construction during the 2010 building season.

**Fire Tower Replica.** The current proposed tower design plan is to construct a close replica of a traditional Maine forest fire lookout tower. The microwave antennae (round white dishes) will be housed inside the cab; the “stick” antennas will be attached to the outside of the cab; and the tower will incorporate a viewing platform, below the cab, available to the public. Whereas the existing forest fire tower is in shambles, we believe that this will restore the traditional public use of the fire tower on Mt. Blue for the purpose of hikers accessing the panoramic viewing platform. The proposed “fire tower replica” will not be used for the purposes of detecting forest fires. There will be no access to the “cab” other than for radio technicians to conduct routine maintenance and emergency repairs. An equipment shelter will be sited adjacent to the tower.

**Interagency Agreement.** Whereas the State of Maine is upgrading its public safety land mobile radio network statewide; and that the Department of Conservation is a partner in the State’s public safety community; and that the summit of Mt. Blue is a prime location to serve the purpose of public safety communications for the surrounding area, has been, and continues to serve as a radio communications facility in the State’s public safety radio communications network; and that the Department of Conservation has traditionally operated at this location; we hereby ask for permission to continue to use this site for an upgraded public safety/public service radio communications facility.

We request to enter into an interagency agreement, between the State’s Office of Information Technology, and the Bureau of Parks and Lands/Department of Conservation, to grant the continued right of access to and on the Premises for the purpose of installation, maintenance, and operation of a communications facility, including a helicopter landing zone, a telecommunications tower, antennas, equipment shelters, power supplies including solar array, batteries, and backup generator, and related communications equipment.

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**Safety.** All MSCommNet radio sites and facilities are engineered to modern safety standards. The proposed facilities upgrade on the existing Mt. Blue site meets or exceeds the standards published by the Maine Department of Conservation, Policy On Use and Management of State-Owned Mountaintops for Communications Facilities in Maine, dated August 2005, Appendix 2, Technical Requirements for Use of Communications Sites.

**Elements of application from the Department's Policy on Use and Management of State-Owned Mountaintops for Communication Facilities.** The following lettered paragraphs are listed in the Department's policy under APPLICATIONS FOR USE. Some of the previous discussion has been reiterated under this format.

**A. Statement of service to be provided and justification.**

The State of Maine MSCommNet (Maine State Communications Network) project office is proposing to the Maine Bureau of Parks and Lands to upgrade the public safety radio communications tower and facilities on Mt Blue, to better serve the law enforcement, public safety, and public service agencies in the Western Mountain and Lakes Region. MSCommNet is primarily designed to upgrade the existing communications infrastructure for Maine State agencies including the State Police, Game Wardens, Forest Rangers, MEMA and others.

We understand that the site upon which the State of Maine currently operates a public safety radio communications facility is owned and managed by the Maine Department of Conservation, Bureau of Parks and Lands (see Figure 3); and that the placement of a new communications facility on Mt Blue, must be in conformance the Department's Policy on Use and Management of State-Owned Mountaintops for Communication Facilities.

The new MSCommNet system is designed to continue to communicate with local and county public agencies. Additionally, opportunities for co-location of local and county public safety communications equipment are possible and will be considered. The radio project office is evaluating a proposal from Tim Hardy, Director of the Franklin County Emergency Management Agency, to collocate County radio communications equipment on the proposed upgraded Mt. Blue tower. We are also working with the US Customs and Border Protection radio project to co-locate equipment, to save funding, and also to reduce the total tower footprint statewide.

**B. Description of other alternatives considered and reasons against their selection.**

OIT Radio Services originally selected the 76 tower locations that were being operated by 7 state agencies for the purpose of public safety communications. The final MSCommNet system has 43 towers. Mt. Blue has hosted fire lookout operations and radio operations for many years and

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the State continues to operate at the site and maintains the helicopter landing zone for maintenance. An additional criterion that is selected is HAAT (Height Above Average Terrain) on any location. The greater the HAAT, the greater the coverage provided by any one site. This process greatly reduces the overall tower “footprint” on a statewide basis and this reduction also reduces the overall cost to the state for sustained tower maintenance and operations. Many other sites were evaluated and some were quickly eliminated from consideration as they were not suitable based upon inadequate elevation or overlap in coverage.

Dolly Mountain in Byron was analyzed and was discounted because of the many high mountains surrounding the location preventing a large area of coverage.

Tumbledown and Little Jackson Mountain Township 6, North of Weld, were also analyzed and while further east than Dolly Mountain, both are 9-10 miles west of the Mt Blue site, and were still able to provide the coverage of Mt Blue.

Saddleback was determined too far north and left coverage gaps in areas where we have now have coverage, and Day Mt did not have the elevation required.

Based upon access, location, coverage, HAAT and user concentration, Mt Blue was the natural choice. The unique location of Mt Blue at the junction of the foothills and the plains makes this an optimum location for a public safety communications site.

The State of Maine commissioned a study by Macro Corporation<sup>2</sup> to determine alternative strategies for rebuilding and modernizing the State’s aged public safety radio communications system. The “Macro study” was published in 2006.

The strategy selected and currently being implemented as MSCommNet — which includes the existing Mt. Blue site — was chosen for its minimal footprint upon the landscape statewide, financial feasibility, and optimal geographical coverage, among other considerations. The summit of Mt. Blue is now and has historically been a public safety communications site as it provides best geographical coverage in that area of the state, to serve the local population (see Figures 1, 2 & 3).

A premise of the study was to continue to use sites that were already owned and operated by the State, rather than to acquire new sites; this would avoid the development of untouched

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<sup>2</sup> State of Maine, Statewide Radio and Network System, Coverage Design Report, FINAL, Appendix C, Predicted Digital Coverage, August 14, 2006, Macro Corporation.

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mountaintops and lands, and also avoid the need for additional funding. On behalf of Maine taxpayers, this is both a prudent environmental choice as well as a pragmatic financial decision. Complete plans of proposed installation including the expected period and duration of construction and operation.

Dimensional drawings of the proposed tower are attached at (see Figures 9). The exact engineering plans cannot be finalized until MSCommNet receives approval from the Department regarding the proposed design concept, that is, a “fire tower lookalike” public safety radio communications tower. This structure would replace the current dilapidated forest fire tower and the radio shack.

Attached are photos of the current facilities (see Figure 3), as well as some historic photos of the original fire tower (Figures 1) and interim facilities on the site (Figure 2) which have since been substantively removed.

We would like to commence and complete construction during the current 2010 building season. The actual construction phase, on the ground, will take about two months.

The current draft “zoning drawings” are attached as Exhibit B<sup>3</sup>. This exhibit includes the most current draft drawings for: a boundary and topographic survey plan of the fire tower, helicopter landing site, and radio building; a demolition plan showing the existing tower to be removed; an overall site plan; an enlarged site plan, and a tower elevation drawing.

The tower will not need lights for marking and clearance; however, there will be lights available for maintenance purposes. It will be erected upon the same footprint as the current tower. The accompanying communications building will be adjacent to the tower, replacing the current radio shack which appears at the trailhead.

**C. Detailed specifications including type, frequency, size, and proposed location of receiving and/pr transmission units and antennas.**

**The proposed “fire tower lookalike”** (see Figures 4 through 7) will contain the microwave and other telecommunications equipment and appear to be a traditional forest fire tower, as one might expect to encounter on a mountaintop in Maine during the last century. (see Exhibit B)

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<sup>3</sup> Zone Drawings for MSCommNet Mt Blue Tower Site, Avon Maine, April 20, 2010

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**The “cab”** will contain the microwave dishes internally, so as not to be visible close-up from the mountaintop or elsewhere from a distance. These dishes will point towards other towers in the MScCommNet system — Granite Hill in Augusta, and West Kennebago Mountain in Oxford, connecting the site with the statewide public safety communications network. The microwave dishes are of the Andrews variety (see Figure 11) and vary from 4 to 8 feet in diameter depending on distance to other sites and signal loss. The microwave interconnectivity with the other sites will be with 960 MHz and 6 GHz links to ensure reliable interconnectivity and to meet public safety standards.

**The “stick” antennas** — Bird COL54 Collinear antennas — will be attached to the four corners on the outside of the “fire tower” cab (see Figure 10). The specific assigned frequencies of the VHF equipment are subject to final system engineering, but will be within the 138-175 MHz range for public safety communications<sup>4</sup>.

**The “solar panels”**, now located in the clearing on the mountaintop, will be relocated to the cliff face in front of the existing tower (see Figure 4). This placement is intended to prevent the panels from obstructing the panoramic view from the summit, or from the tower; and to minimize visual detection from valley views by placing the panels against the mountainside, rather than being silhouetted against the sky.

**The “emergency generator”**, powered by propane, will be housed in an adjacent building (see Figure 6). The equipment shelter will be aesthetically rustic, similar to the traditional forest watchman buildings found on Maine mountaintops.

### **D. Analysis of compatibility with existing facilities (intermodal studies) and power requirements.**

The existing and proposed public safety communications devices are the only telecommunications equipment to be located on the Mt. Blue site. There are no electrical utilities running to this site; and none are planned or conceived. The existing facility is powered

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<sup>4</sup>Frequency assignments between US and Canadian users are closely coordinated since much of the Canadian population is within VHF radio range of the US border. The general services in the VHF band are:

- 138–144 MHz: Land mobile, auxiliary civil services, satellite, space research, and other miscellaneous services
- 144–148 MHz: [Amateur radio band 2 Meters](#)
- 148–150 MHz: Land mobile, fixed, satellite
- 150–156 MHz: "VHF [Business band](#)," the unlicensed [Multi-Use Radio Service](#) (MURS), and other 2-way land mobile, FM
- 156–158 MHz: [VHF Marine Radio](#); narrow band FM, 156.8 MHz (Channel 16) is the maritime emergency and contact frequency.
- 160–161 MHz: Railways <sup>[4]</sup>
- 162.40–162.55: [NOAA Weather Stations](#), narrowband FM

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by solar panels, which are located in the clearing on top of the existing “radio shack”; and the new equipment will continue to be primarily powered by a solar array. To meet public safety communications standards, a backup generator will be installed to supplement the solar array, as was done in past configurations.

**E. Written documentation that installation meets ANSI standards for controlled and uncontrolled human exposure to radio frequency electromagnetic fields. Cumulative effects of the proposed installation together with the existing facilities shall be considered.**

The MSCommNet radio project office follows federal guidelines and rules, and other published standards in the engineering of the MSCommNet system. Radio frequency safety guidelines and rules are published by the Federal Communications Commission (FCC) Office of Engineering & Technology (OET). Regarding potential biological effects and hazards from radio sites, MSCommNet follows FCC/OET guidance: OET#56<sup>5</sup> - Questions and Answers about Biological Effects and Potential Hazards of Radiofrequency Electromagnetic Fields; and OET#65<sup>6</sup> - Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields. The entire site will be constructed to ANSI/TIA 222-G-2005 standards as per the State’s contract with Harris Corp<sup>7</sup>. There are many other design and construction standards such as the NFPA (Fire Code).

**F. For sites not designated in Appendix 1, justification of that includes the following:**

- a. **Where some development already exists.** The proposed replacement tower will be located on the footprint of the existing tower structure (see Exhibit A). The existing radio shack will be removed from the premises and a new structure sited adjacent to the tower. Debris on the mountaintop remaining from previous structures will be removed.
- b. **Where such use will be compatible with long-range multiple use plans.** The proposed replacement tower will sustain two of the three traditional uses: public safety radio communications and public access to the panoramic viewing platform. The “fire tower replica” form is a façade to mask the radio equipment and the tower will not be seasonally occupied for forest fire detection as was done with the original

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<sup>5</sup> OET#56. The expanding use of radiofrequency technology has resulted in speculation concerning the alleged "electromagnetic pollution" of the environment and the potential dangers of exposure to non-ionizing radiation. This publication is designed to provide factual information to the public by answering some of the most commonly asked questions. It includes the latest information on FCC guidelines for human exposure to RF energy.

<sup>6</sup> OET#65. This OET provides assistance in determining whether proposed or existing transmitting facilities, operations or devices comply with limits for human exposure to radiofrequency (RF) fields adopted by the Federal Communications Commission (FCC).

<sup>7</sup> (Available for viewing upon request, about 500 pages in print).

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tower. The “fire tower replica” was chosen specifically to continue the traditional experience.

- c. **Where structures and towers will not be aesthetically objectionable.** The Mt. Blue summit and trail were originally constructed for forest fire detection. The tower and facilities have changed over the years and the tower has diminished in stature over years, with an accompanying decrease in its safe use for climbing to access the panoramic view. The proposed “fire tower replica” was chosen specifically to continue this traditional experience as well as to disguise the modern telecommunications equipment. We have studied past “iterations” of the facility, some of which are quite obtrusive, and we believe that our current concept meets the intent of the Department’s guidelines. The adjacent building that will house the generator, will, like the tower, be finished with Hardiplank<sup>8</sup>, which will appear as traditional wood siding with a color scheme to simulate the original forestry buildings. Colors for all building materials will be selected to blend in with the natural surrounds as practicable. The emergency generator will be operated primarily during [one hour after sunset], and not later than [one hour before sunrise] in consideration of potential sunset and sunrise hikers; and otherwise only during emergencies if required.

Additionally, the MSCommNet project design includes bird strike mitigation. We will reduce the total number of ‘guyed’ towers statewide which will mitigate potential bird strikes. This is in accordance with Communication Towers, Lights, and Birds: Successful Methods of Reducing the Frequency of Avian Collisions, published by Dr. Paul Kerlinger et al. Dr. Kerlinger reviewed the tower footprint of the MSCommNet project and states that we should have little problem with bird strike issues.

- d. **Where access and power requirements can be adequately met without additional major development.** Currently and traditionally, no electrical utilities are run up from the valley to the summit, and we intend to provide power to the site as it has been done traditionally, primarily through solar panels with emergency backup power provided by a propane-powered emergency generator.

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<sup>8</sup> Hardiplank: Hardiplank falls in the *fiber-cement siding* class, which means that it is a combination of cellulose fibers, along with cement-like materials. In other words, it’s partly wood, partly cement.

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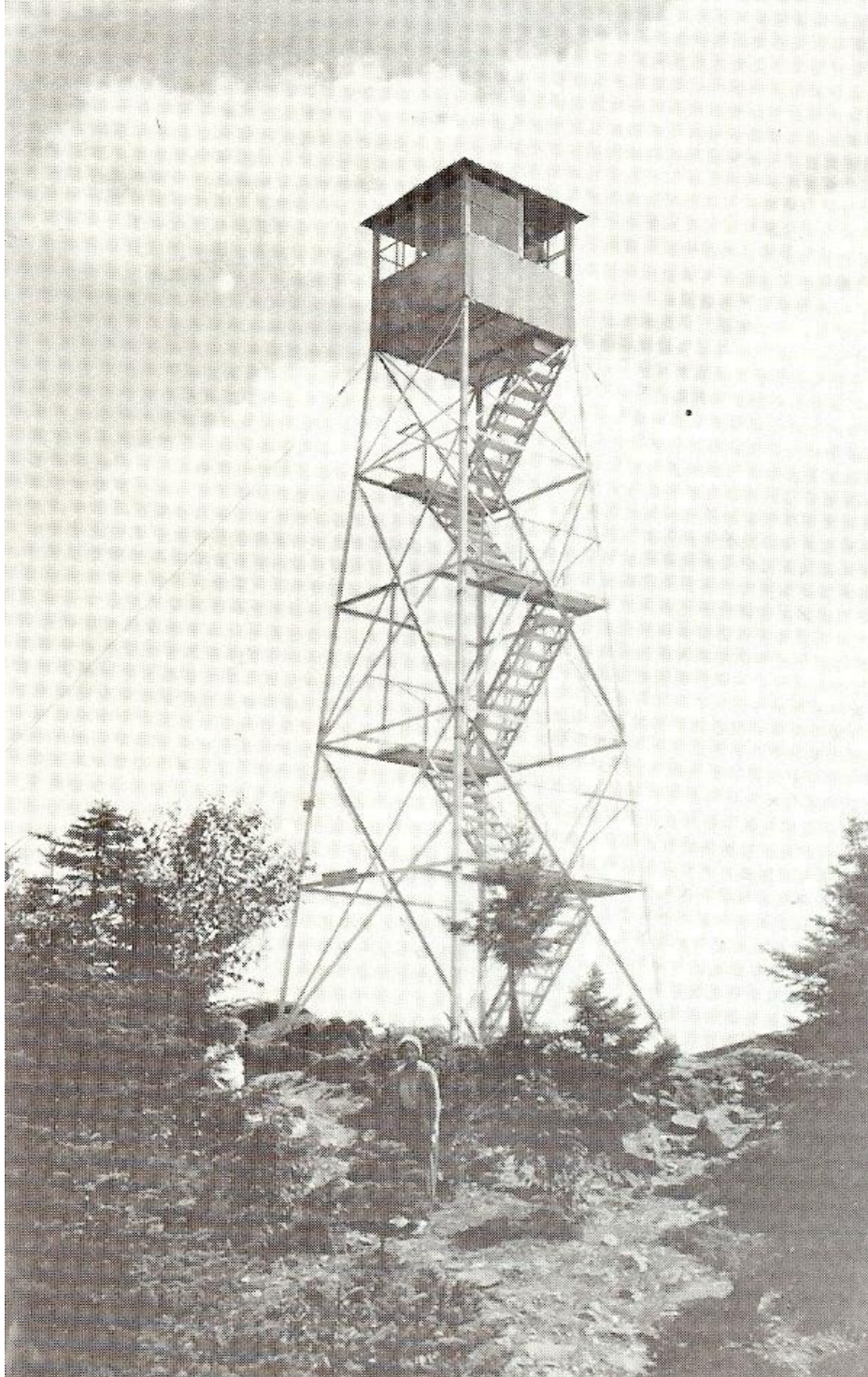
- e. **Where impacts on natural and recreational resources can be minimized.** The current plan eliminates the existing radio shack which is the first structure appearing upon entering the summit clearing from the primary hiking trail. Continued use of the Mt. Blue summit precludes possible new development on adjacent mountaintops; none of which could reasonably be identified as alternatives.
- G. The applicant will post a bond sufficient to ensure that the costs of site cleanup will be met at the termination of the lease/use agreement.** The prime contractor, Harris Corporation, has a five million dollar (\$5,000,000) performance bond in place to cover Mt. Blue and other sites in the project. The bond is for construction only and does not cover potential removal in later years. The Office of Information Technology will enter into an interagency agreement with the Department of Conservation for this site. We expect that the site will be used for public safety radio communications in perpetuity; however, in the event that facilities are no longer necessary for the State's public safety radio communications network, and a decision is made to discontinue use of the site for public safety radio communications, OIT will be responsible for removing all communications equipment and, working with the Department of Conservation or successors to determine a mutually agreeable solution for the remainder of the facilities.

The current dilapidated fire tower is a liability for the State; and the new tower will allow hikers with safe access to an observation deck in accordance with OSHA standards.

A building permit is required by the Town of Avon; all permits are the responsibility of the Harris Corporation and will be permitted and licensed according to the requirements.

## Figures and Exhibits

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**Figure 1: Original forest fire tower on Mt. Blue summit**

## Figures and Exhibits



**Figure 2: Fire tower on Mt. Blue summit (circa 1984)**



Site Photographs



*Overall Site*



*Existing (Abandoned) Fire Lookout Tower*

*Motorola – CBP Maine  
SM Mount Blue*

*CFE TELECOM  
Page 5*

**Figure 3: Mt Blue as it is today (Fall 2009)**

## Figures and Exhibits

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Figure 4: Artist conception of new Mt Blue public safety radio communications tower (aerial)

## Figures and Exhibits

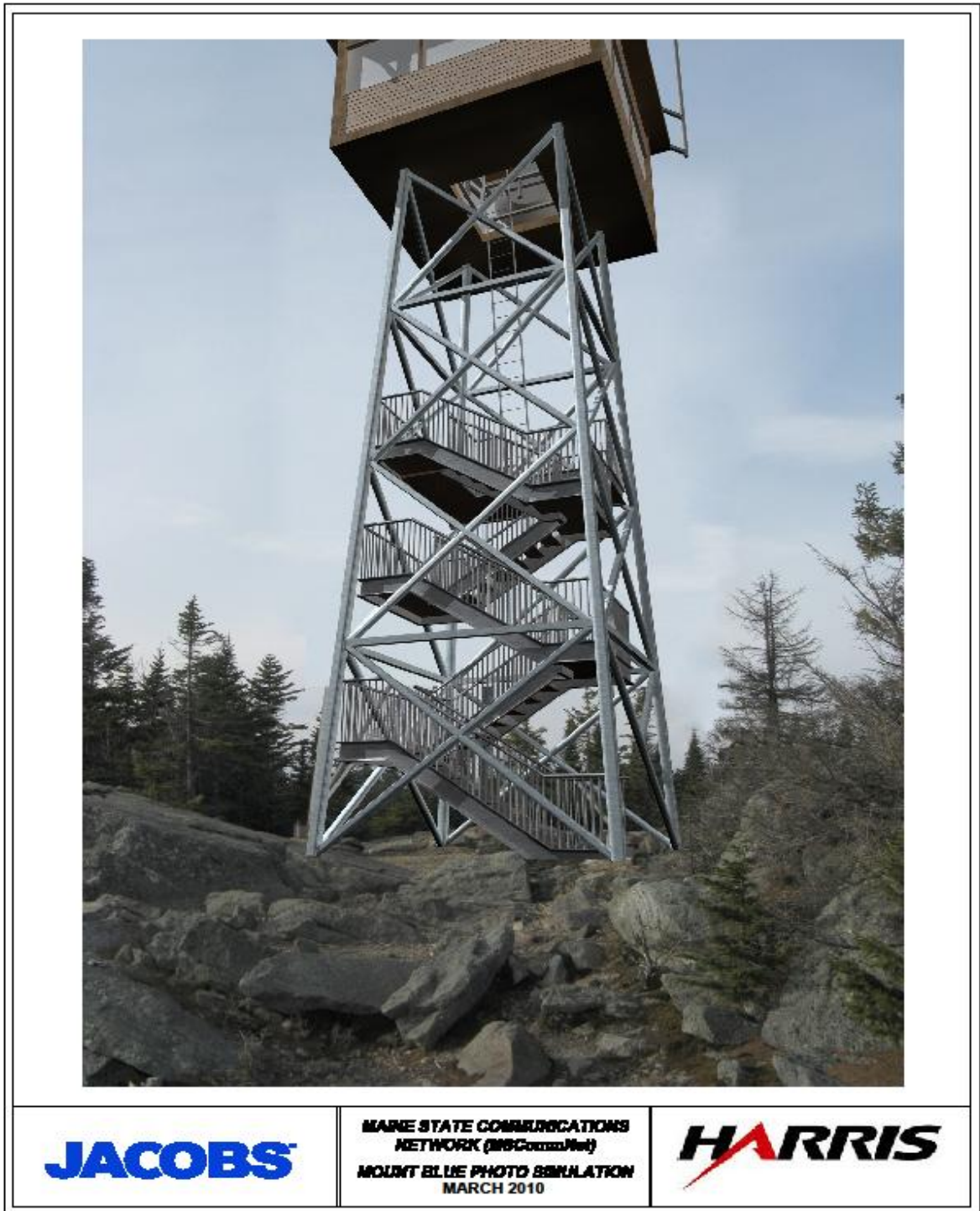


Figure 5: Artist conception of new Mt Blue public safety radio communications tower (closeup)

## Figures and Exhibits

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Figure 6: Artist conception of new Mt Blue public safety radio communications tower from the summit clearing

## Figures and Exhibits

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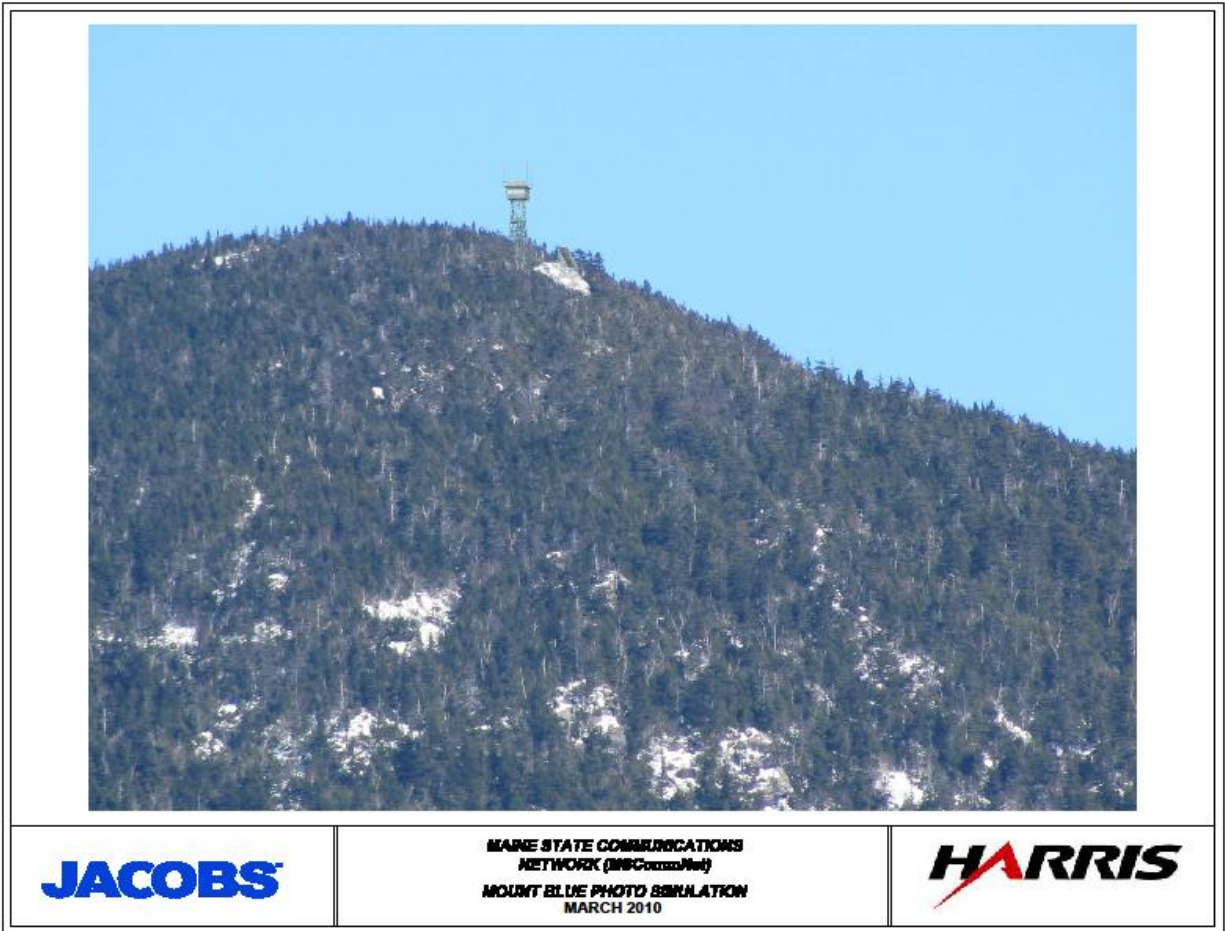
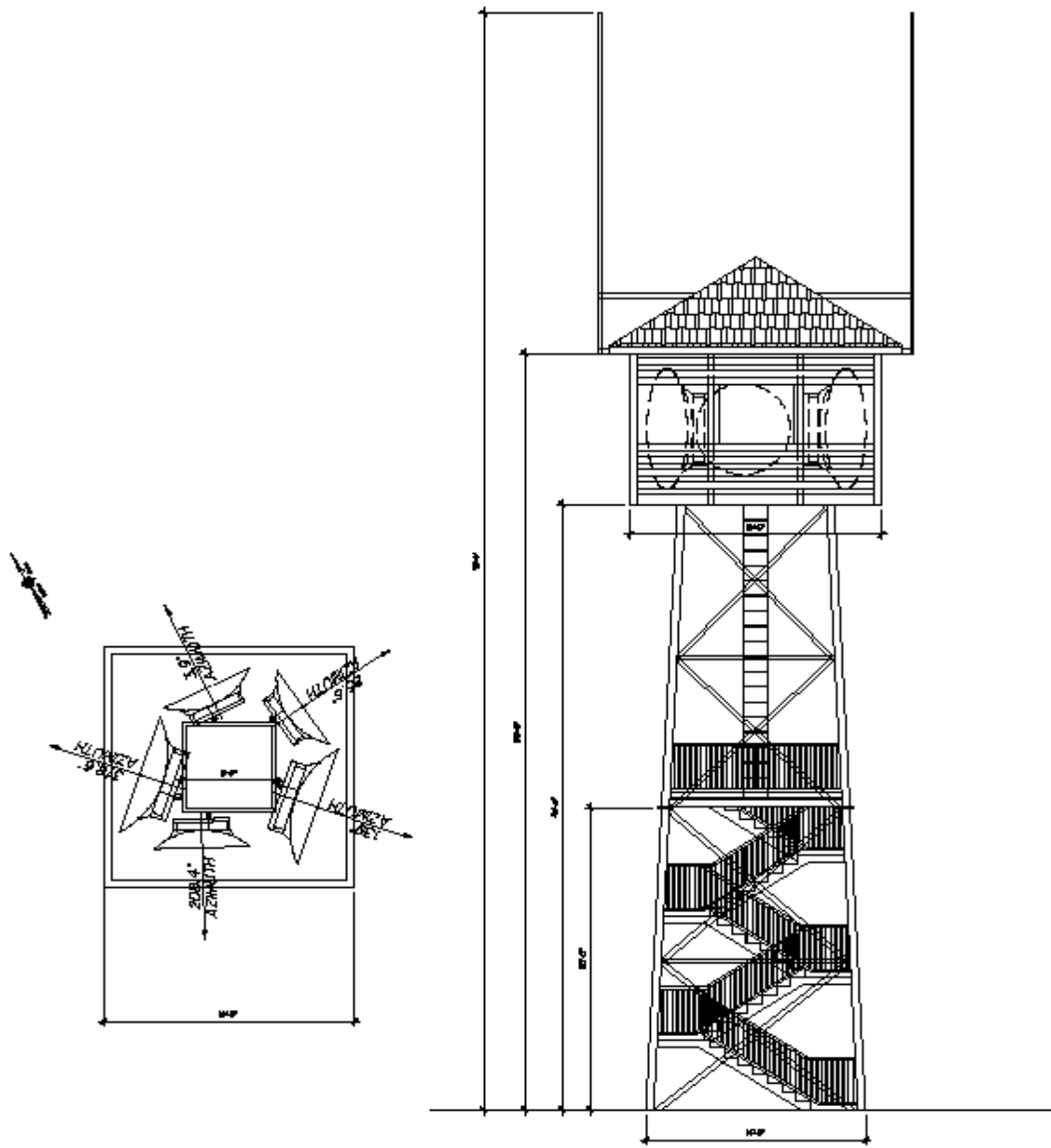


Figure 7: Artist conception of new Mt Blue public safety radio communications tower from the valley (landscape view)

## Figures and Exhibits

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**Figure 7: Dimensional drawing (original PDF prints higher resolution on 11x17)**

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Application for continued use of Mt. Blue for a public safety radio communications facility

## Figures and Exhibits

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Exhibit A  
**Real Property Description**  
**State of Maine Tower Area**  
**Avon, Maine**

A certain lot or parcel of land with the improvements thereon situated in the Town of Avon, County of Franklin, on the summit of Mount Blue in Mount Blue State Park, in the State of Maine, more particularly described as follows:

Beginning at a point located S 5° 14' 18" W, a distance of 56.22 feet from an aluminum disk set in ledge stamped "PLISGA & DAY CONTROL POINT REF1", having coordinates of Northing: 690,677.75 U.S. Survey feet, Easting 2,907,228.35 U.S. Survey feet;

thence N 57° 33' 26" W, through the lands of the Grantor, a distance of 200.00 feet to a point located S 42° 42' 19" W, a distance of 50.81 feet from said "PLISGA & DAY CONTROL POINT REF1";

Thence N 32° 26' 34" E through the lands of the grantor, a distance of 150.00 feet to a point located N 27° 16' 11" E, a distance of 100.41' from said "PLISGA & DAY CONTROL POINT REF1";

Thence S 57° 33' 26" E through the lands of the grantor, a distance of 100.00 feet to a point;

Thence S 32° 26' 34" W through the lands of the grantor, a distance of 60.00 feet to a point located N 04° 10' 02" E, a distance of 45.42' from an NGS disk with designation "MT BLUE", having coordinates of Northing 690,706.07 U.S. Survey feet, Easting 2,907,183.81 U.S. Survey feet;

Thence S 57° 33' 26" E through the lands of the grantor, a distance of 100.00 feet to a point located N 65° 09' 53" E, a distance of 47.55 feet from said "PLISGA & DAY CONTROL POINT REF2", having coordinates of Northing 690,766.40 U.S. Survey feet, Easting 2,907,088.89 U.S. Survey feet;

Thence S 32° 26' 34" W through the lands of the grantor, a distance of 90.00 feet to the point of beginning;

Containing 0.55 acres.

Being part of the same premises described in a deed recorded in Volume 334, Page 415. More particularly described in a deed recorded in Volume 270, Page 36.

Together with two rights of way for ingress and egress to the above described parcel; the first intended for foot traffic only, generally described as follows; beginning in the Mount Blue State Park, parking lot at the trailhead of Mount Blue, thence in an easterly direction to the above described lot on the summit of Mount Blue. The second right of way is intended for ingress and egress over an existing gravel road from the public road located in Weld, Maine to said parking lot at the trailhead

Said rights of way being located within the premises described in a deed recorded in Volume 334, Page 415 in the towns of Weld and Avon Maine.

Bearings and coordinates referenced herein are oriented to Grid North, Maine State Coordinate System of 1983, West Zone, as determined by a survey conducted by Keith E. Blanchard PLS #2383 of Plisga & Day Land Surveyors.

Figures and Exhibits

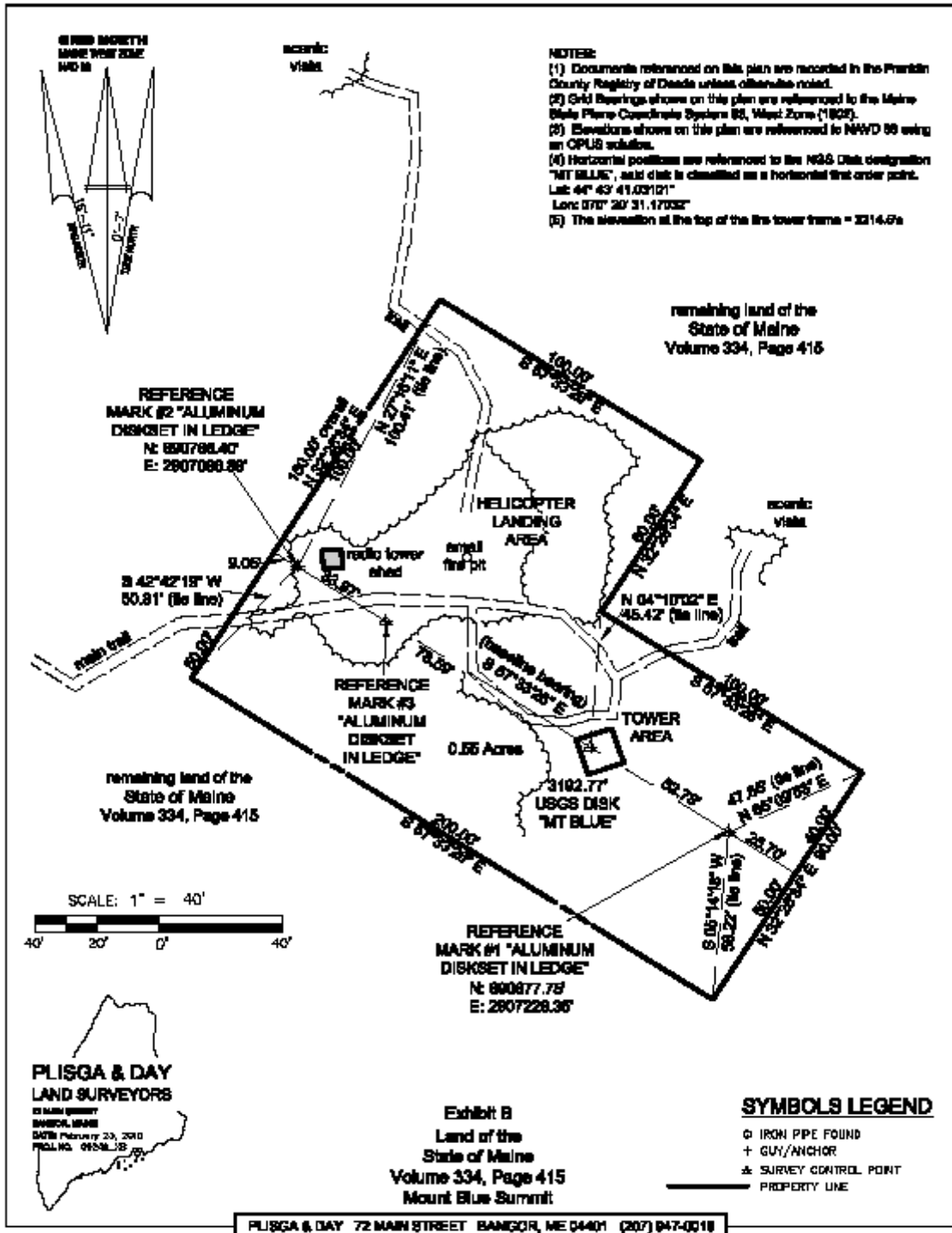


Figure 8: Survey of Mt. Blue summit



**Figure 9: VHF  
Meander  
Collinear  
Antenna**



**Figure 10: Andrews Point to Point Antennae (dish)**