

An aerial photograph of Mount Washington, showing the rugged, rocky terrain with patches of brown and green vegetation. A winding road leads up the mountain, and a large, circular building complex, the Yankee Building, is visible near the summit. The sky is clear and blue.

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Mount Washington Yankee Building Assessment

DRAFT 06-21-19

New Hampshire Department of
Natural & Cultural Resources



The H.L. Turner Group Inc. – Project management, architecture, structural engineering.

Turner Building Science & Design, LLC – Mechanical and plumbing engineering.

Green Mountain Communications – Communications assessment and review.

All-Points Technology Corporation, P.C. – Structural engineering specializing in telecommunications.

Lee Carroll Electrical Consultants – Electrical engineering and fire alarm assessment.

SFC Engineering Partnership – Fire protection engineering and code consultant.

Mike Pelchat – Mt. Washington State Park Manager (Retired 2016) – Consultant*.



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Task 1 – Assessment of Yankee Building and Recommendations for Improvements

Task 2 – Assessment of Fire Protection and Fire Alarm Systems at Yankee Building

Task 3 – Yankee Building Tenant Survey and Response Tabulation


Task 4 – Assessment of Factors Affecting Radio Broadcast

Task 5 – Assessment of Other Types of Communications Equipment on Summit

Task 6 – Alternatives for Yankee Building Use with Recommendations

Task 7 – Opinion of Cost for Reconstruction of Yankee Building and New Tower
to Replace Armstrong and RCA Communications Equipment Towers

Final Task - Proposed Summit Site Plan, Reconstructed Yankee Building and New Tower



Task 1 – Assessment of Yankee Building and Recommendations for Improvements

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Left: Winter Entrance, Right: Summer Entrance



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West Facing Foundation

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Penthouse Roof Antennas

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Access To Penthouse

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Penthouse Roof Antennas

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Water Damaged Wall Sheathing

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Roof Replacement 2012

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2017 Conditions
(Roof Replaced 2019)

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Window

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DE



Floor



Basement Storage

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Basement Emergency Generator – Not Used Since After 2003 Fire



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Snow Infiltration

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Task 2 – Assessment of Fire Protection and Fire Alarm Systems at Yankee Building

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Old Generator Building Fire 2003

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Burning of Old Tip Top House - Aug. 29, 1915.

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All buildings on summit, except Tip Top House, destroyed by fire 1908

It is recommended that the building be protected with two automatic fire suppression systems. The first recommendation is to install a typical NFPA 13 compliant automatic sprinkler system throughout the entire building. A new water supply will need to be established on the site to feed the system. It is possible to use the currently inaccessible well to supply a water storage tank. That tank could be a gravity tank supplying a fire pump or a pressure tank depending on final design. The purpose of the sprinkler system is to protect the combustible building structure itself as well as all the common areas in the building.

In addition to the sprinkler system, SFC recommends local, total flooding clean agent suppression systems be installed in each of the equipment shelter rooms. Clean agent systems are more effective in extinguishing fires in electrical enclosures as they apply the suppressing agent from all sides. The system should be designed to activate before the sprinkler system would activate. By staging the activations in this sequence, the damage caused by water will be minimized.

An addressable notification system would help pin point the room where the sensor that tripped the alarm is located thereby saving time in searching for the activation zone. The fire alarm system should be upgraded with addressable sensors connected to a main fire alarm panel located where staff reside in the Sherman Adams Building connected to the Yankee Building, and eventually to all summit buildings via lightning resistant fiber optic cable. Fiber cable is already in place between Yankee, WHOM Transmitter Building and the Adams Building. Fiber optic cabling would also need to be installed to connect the Tip Top Historic Site and Summit Stage Office Building.



Water Infiltration

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Task 3 – Yankee Building Tenant Survey and Response Tabulation

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The scope of work charged to the Turner Group in this study includes evaluating possible alternatives to the Yankee Building for communications services which may include the following potential options:

- Construction of a new communications building at the current site of the existing Yankee Building.
- Construction of a new communications building at the site of the old WMTW-TV8 generation and transmitting buildings.
- Construction of a new communications facility at another location to be determined on the summit.

The Turner Group's work will include the following specific tasks:

- Assessing and considering the communications potential of existing summit buildings, communications structures and available utilities.
- Surveying Yankee Building communications tenants regarding their needs for equipment, space, security and other concerns.
- Helping DNCR develop a strategy and consider options for improving summit communications facilities including how best to provide support of both traditional uses and potential new uses.
- Estimating the cost of the various options offered to allow cost-benefit comparisons.

Some of the options that will be under consideration in this study are the following: (We recognize that other options may come forward in the course of the study that will also be worthy of consideration.)

- Keeping the Yankee Building as is or upgrading the building as needed.
- Adding a fire suppression system and a security system to protect the building
- Hardening the north wing of the Yankee Building and adding height for vertical antenna separation. Making expanded use of antenna combiners.
- Building a work road around the Yankee Building in order to provide better access to microwave dishes and building-mounted antennas.
- Moving radios and equipment that need a south and west exposure into a rebuilt north wing of the Yankee Building.
- Repairing the old south wing of the Yankee Building and re-purposing it to be better utilized.
- Building a new hardened communications building on the existing foundations of the old WMTW-TV8 building.
- Moving radios that need an easterly or southerly exposure to a new WMTW building.

- Constructing a new tower for FM radio and future communication needs.
- Reassigning existing tower space to better suit tenant needs.
- Removing and replacing the 1939 vintage Armstrong Tower.
- Improving the cabling and utility delivery systems on the summit.
- Improving staff access between buildings by constructing enclosed over-ground walkways.

Task 4 – Assessment of Factors Affecting Radio Broadcast

The H.L. Turner Group Inc.

27 Locke Road Concord, NH 03301 t: 603.228.1122 hlturner.com

Mount Washington Yankee Building Tenant Survey

Respondent's Name _____

Brief Description of equipment you currently have on Mt. Washington summit. _____

Please comment on the following topics below as it affects your operation: (please mark all that apply)

- 1. Please mark any Yankee building deficiencies that are of concern to you. a. Access Limitations b. Power c. Generator Backup d. Backhaul e. Security f. Space limitations g. Environmental control of equipment space
2. If more equipment space was available, would you increase equipment? Yes No Possibly
3. If you were to increase your equipment, could you indicate the projected electrical power requirements that would be required?

Yankee Bldg Tenant Survey - ttg 4645

1 of 4

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antenna space concerns.
Locations for mounting antennas
Height to hit target location
Priority of available locations

Antenna locations or height became available, would you utilize those

Rate your annual excess repairs due to environmental damage, ice and wind?

\$0,000
\$10,000
\$20,000

In favor of locating antennas within a protective structure if available?

Willing to consider sharing in the cost of constructing this structure?

Fire, safety, fire detection and fire suppression systems adequate for your

Environmental controls for heating, cooling and humidity adequate for your purposes?

Yankee Bldg Tenant Survey - ttg 4645

2 of 4



Encounter radio Interference Issues?

Would you believe a combiner system would resolve these issues or benefit the users at Mt. Washington?

Would you be willing to share a generator backup system?

Would you experience issues from electric power performance, delivery or back-up power?

Would you have interest in a shared generator backup system?

Would you experience issues relating to backhaul/fiber infrastructure issues?

Are restrooms, work space and parking available for maintenance staff adequate?

Would you experience equipment outages that could be prevented by hardening the Mt. Washington communication facility?

Describe any concerns regarding the ability to maintain your equipment and outline suggestions that could relieve those concerns.

Yankee Bldg Tenant Survey - ttg 4645

3 of 4



Yankee Bldg Tenant Survey - ttg 4645



4 of 4

Any building improvements that you feel would aid in future communications development:

Any questions?

Thank you for your time, effort and response to this essential survey. Please provide contact information for a tenant representative who would be willing to discuss issues and survey response.

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Task 3 - Yankee Building Tenant Survey and Response Tabulation

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4 Towers

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Armstrong, RCA, WHOM Towers

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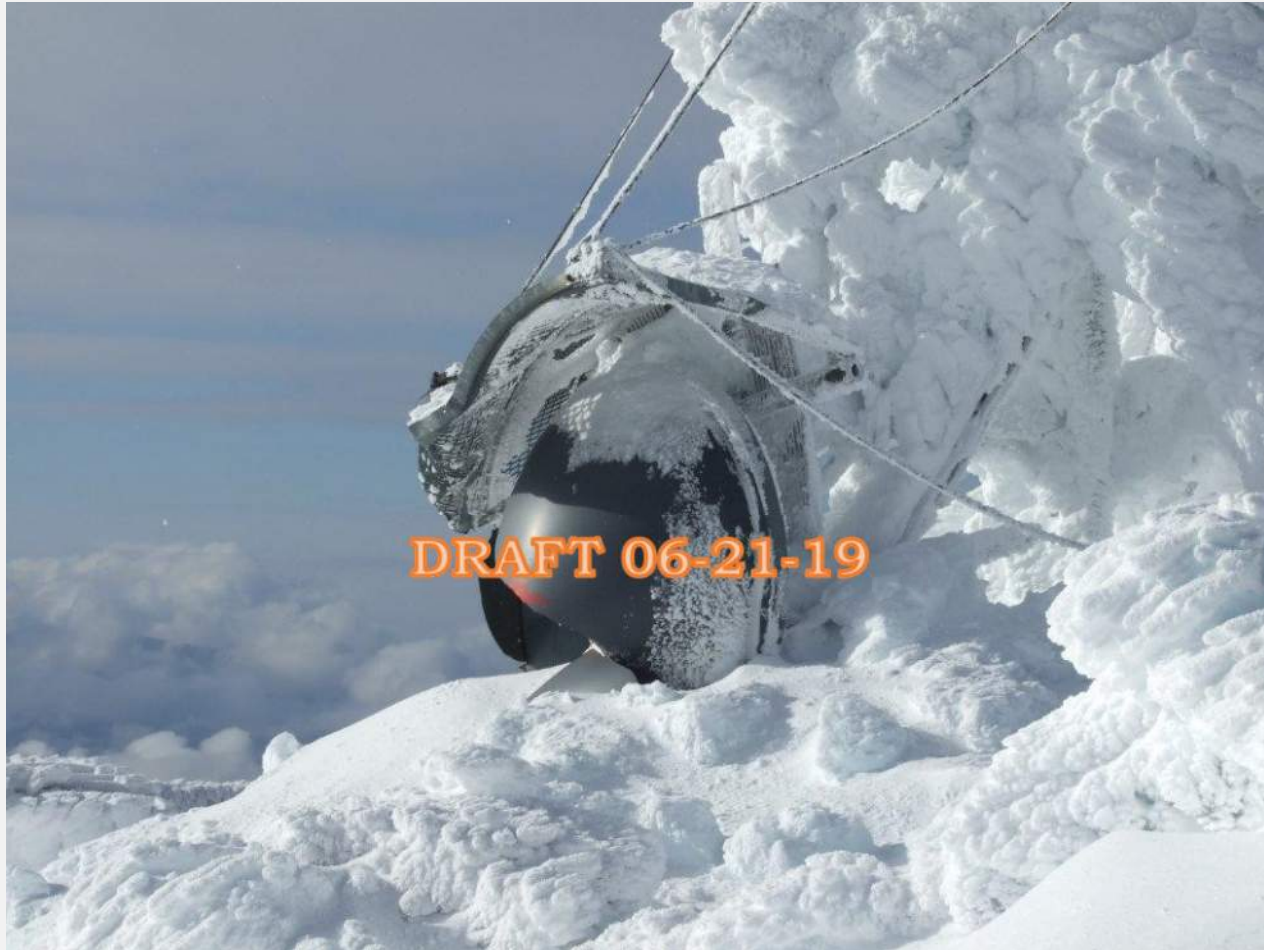
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Federal Radios: Plastic Where Roof Leaked



Ice Storm



Equipment Damage

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Task 5 – Assessment of Other Types of Communications Equipment on Summit

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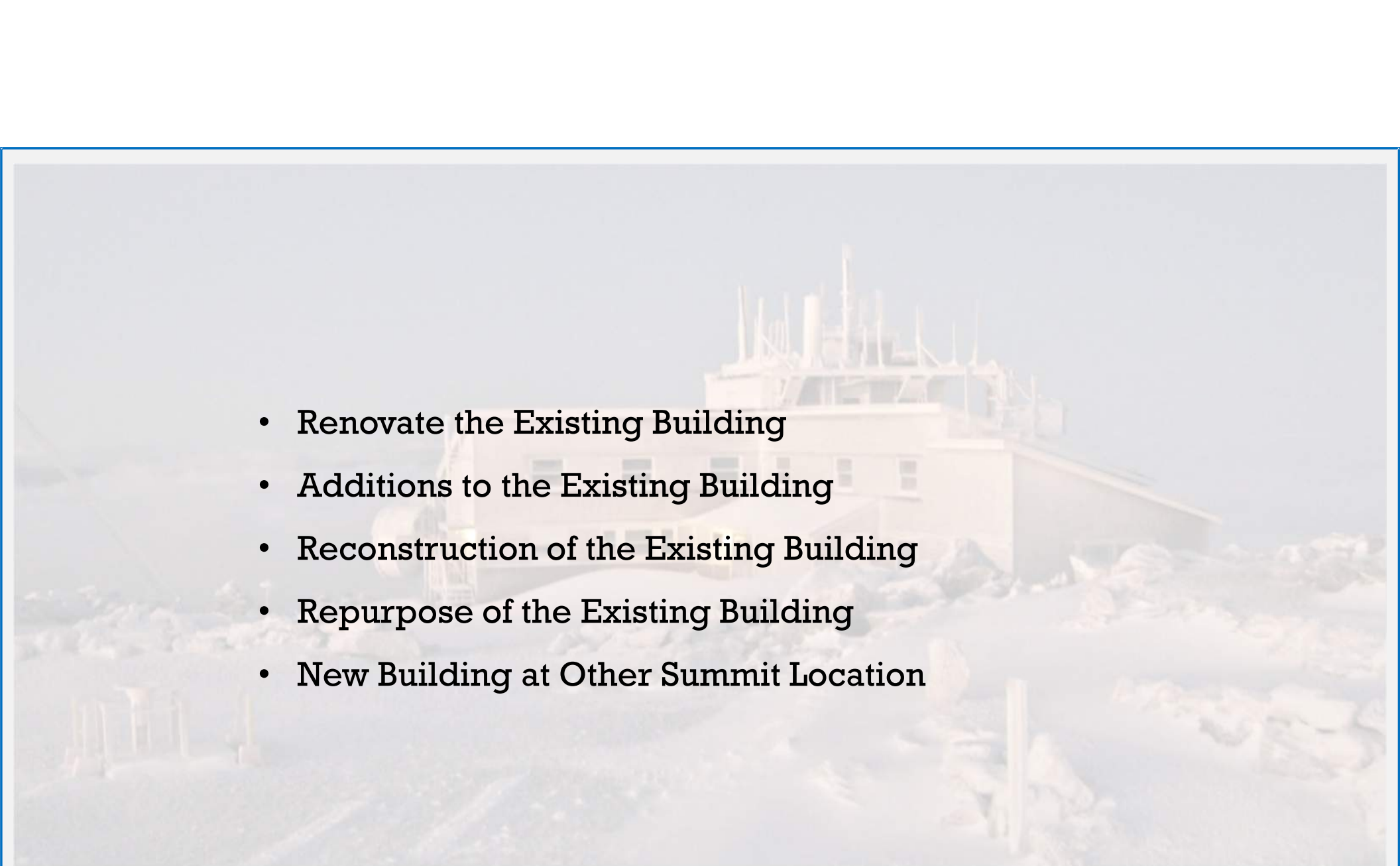
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Task 6 – Alternatives for Yankee Building Use with Recommendations

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- 
- Renovate the Existing Building
 - Additions to the Existing Building
 - Reconstruction of the Existing Building
 - Repurpose of the Existing Building
 - New Building at Other Summit Location



Task 7 – Opinion of Cost for Reconstruction of Yankee Building and New Tower
to Replace Armstrong and RCA Communications Equipment Towers

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PHASE 1 - NORTH WING YANKEE BUILDING

DEMO / HAUL YANKEE BUILDING	1,750 SF	\$ 350,000
NEW 2-STORY PRECAST BUILDING	2,280 SF	
ARCHITECTURAL		\$ 684,000
STRUCTURAL		\$ 540,200
CIVIL / SITEWORK		\$ 135,800
MECHANICAL		\$ 545,000
PLUMBING		\$ 273,500
FIRE PROTECTION		\$ 150,000
ELECTRICAL		\$ 275,000
FIRE ALARM		\$ 130,000
STEALTH RF SHEATHING	800 SF	\$ 400,000
<i>Based on 800 SF stealthing (estimate)</i>		
SUBTOTAL		\$3,483,500
SOFT COSTS		\$ 870,875
GENERAL CONDITIONS		\$ 696,700
<i>Includes contractor's overhead and profit</i>		
TOTAL - PHASE 1		\$ 5,051,075

PHASE 2 - SOUTH WING YANKEE BUILDING

DEMO / HAUL YANKEE BUILDING	3,200 SF	\$ 640,000
NEW 1-STORY PRECAST BUILDING	1,334 SF	
ARCHITECTURAL		\$ 402,000
STRUCTURAL		\$ 320,160
CIVIL / SITEWORK		\$ 80,400
MECHANICAL		\$ 320,000
PLUMBING		\$ 160,000
Including new well pump		
FIRE PROTECTION		\$ 547,000
ELECTRICAL		\$ 80,000
Including new emergency generator		
FIRE ALARM		\$ 80,000
STEALTH RF SHEATHING	500 sf	\$ 250,000
Based on 500 SF stealthing (estimate)		
SUBTOTAL		\$ 2,879,560
SOFT COSTS		\$ 719,890
GENERAL CONDITIONS		\$ 575,912
Includes contractor's overhead and profit		
TOTAL - PHASE 2		\$ 4,175,362

PHASE 3 - NEW TOWER

To replace Armstrong Tower and RCA Tower

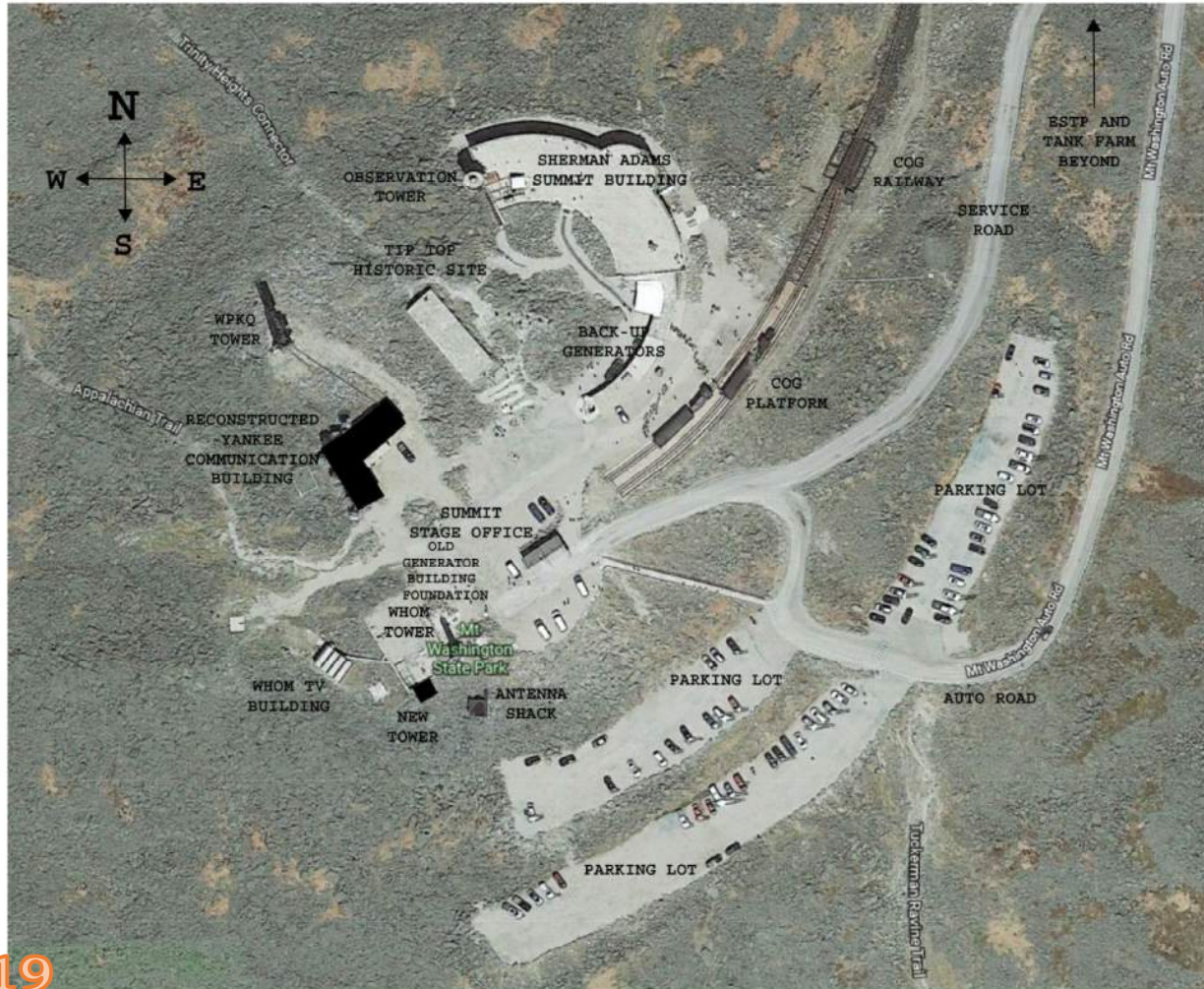
DEMO ARMSTRONG TOWER		\$ 300,000
DEMO RCA TOWER		\$ 300,000
TOWER		\$ 990,000
STEALTH RF SHEATHING	250 SF	\$ 125,000
Based on 250 SF stealthing		
SUBTOTAL		\$ 1,715,000
SOFT COSTS		\$ 428,750
GENERAL CONDITIONS		\$ 343,000
TOTAL - PHASE 3		\$ 2,486,750
SUBTOTALS:		
PHASE 1		\$ 5,051,075
PHASE 2		\$ 4,175,362
TOWER		\$ 2,486,750
TOTAL		\$11,713,187
CONTINGENCY - 10%		\$ 1,171,318
GRAND TOTAL		\$ 12,884,505



Final Task - Proposed Summit Site Plan, Reconstructed Yankee Building and New Tower

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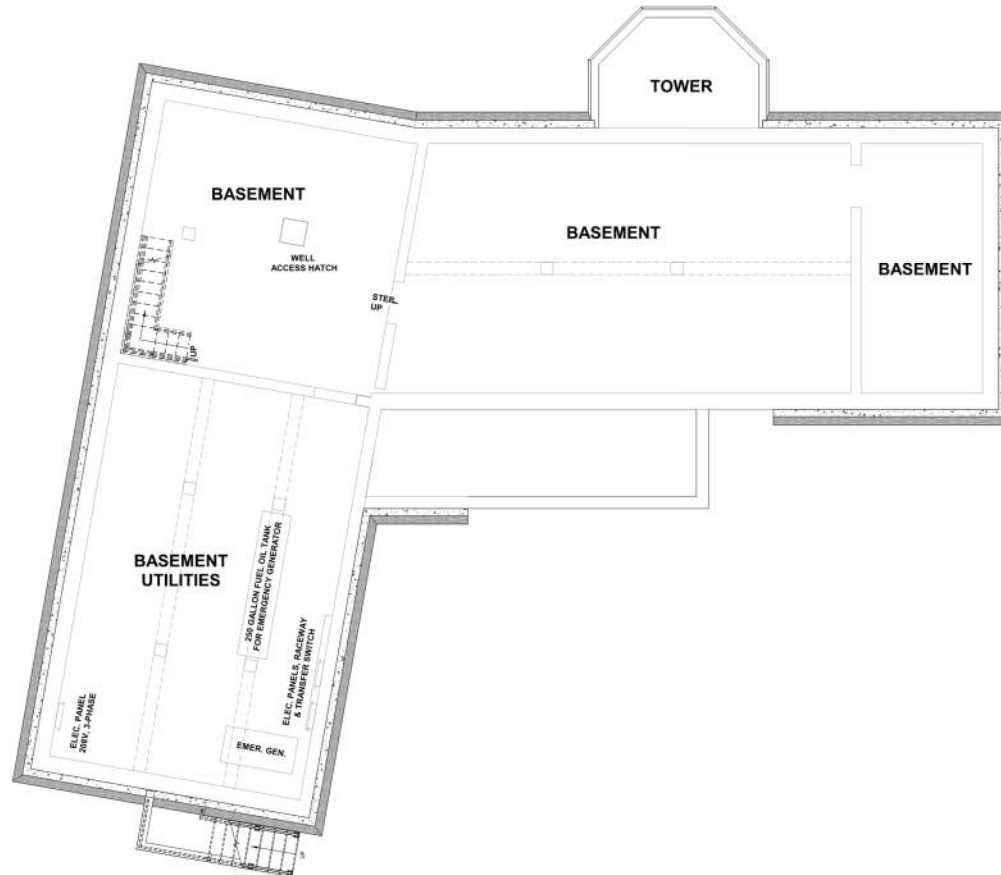
MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING DRAFT MOUNT WASHINGTON SUMMIT AERIAL SITE PLAN

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SCALE: AS NOTED
DATE: 07/19/2019
PROJECT: MOUNT WASHINGTON





Graphic Scale:

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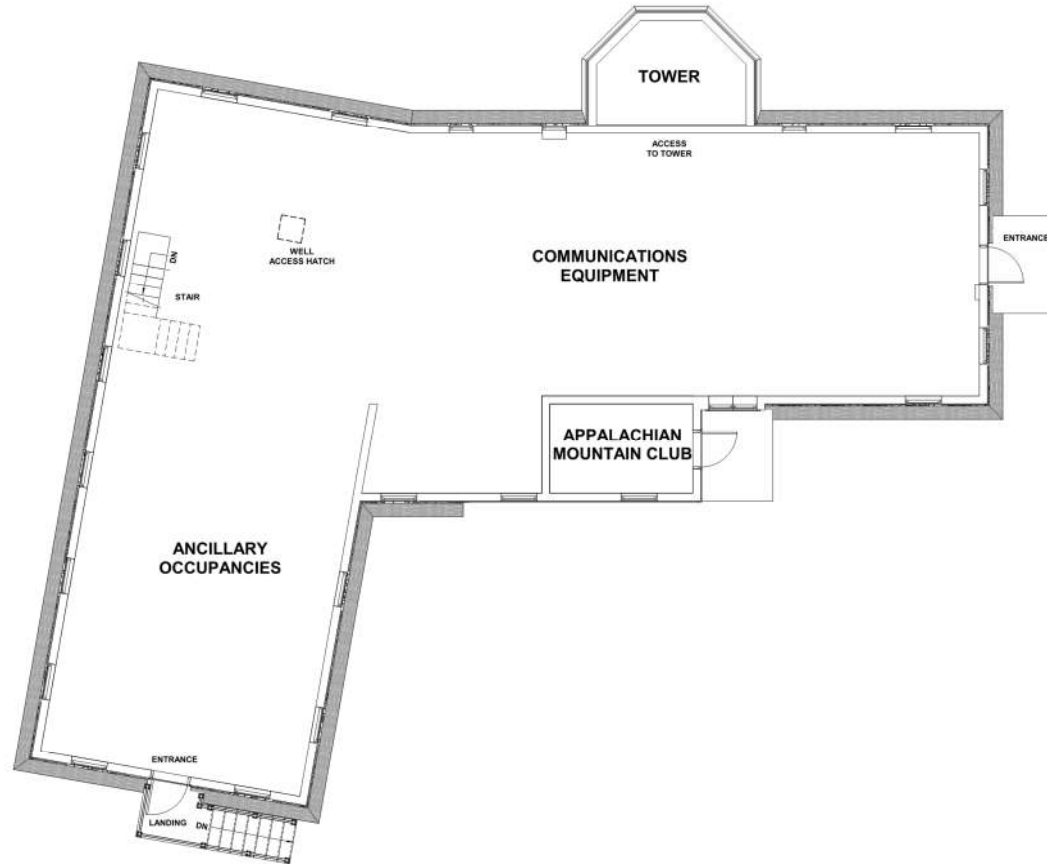
PROPOSED YANKEE COMMUNICATIONS BUILDING

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CONCEPTUAL BASEMENT FLOOR PLAN

SCALE: AS NOTED
DATE: 07/19/2019
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PROPOSED YANKEE COMMUNICATIONS BUILDING

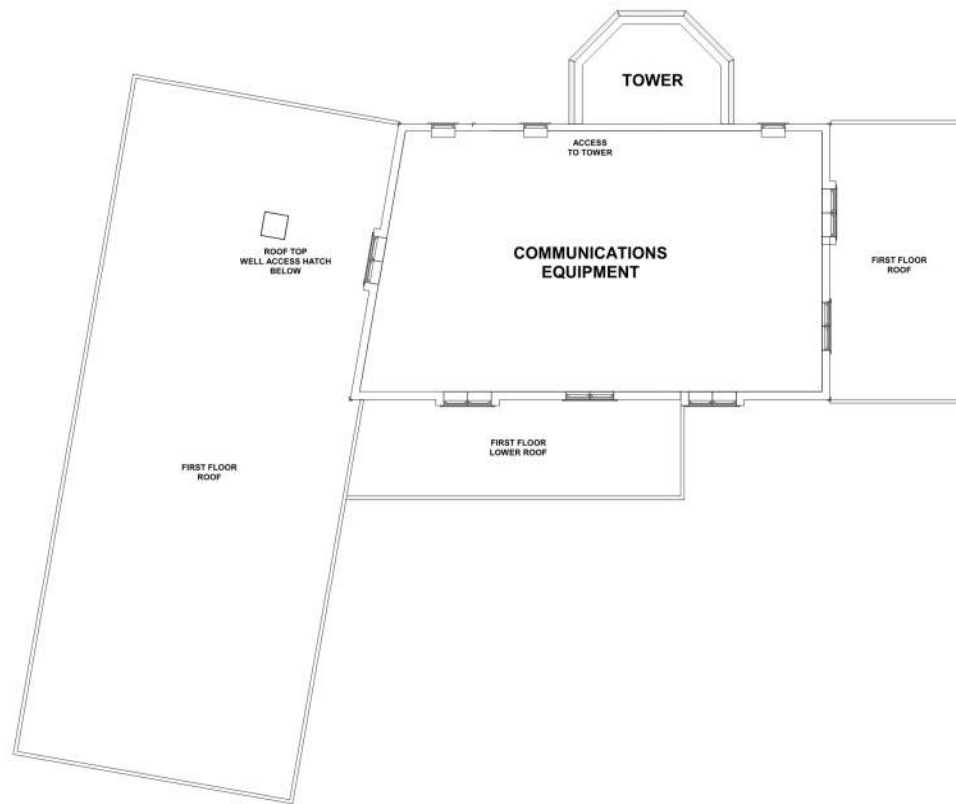
CONCEPTUAL FIRST FLOOR PLAN

SCALE: AS NOTED
DATE: 07/19/2019

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PROPOSED YANKEE COMMUNICATIONS BUILDING

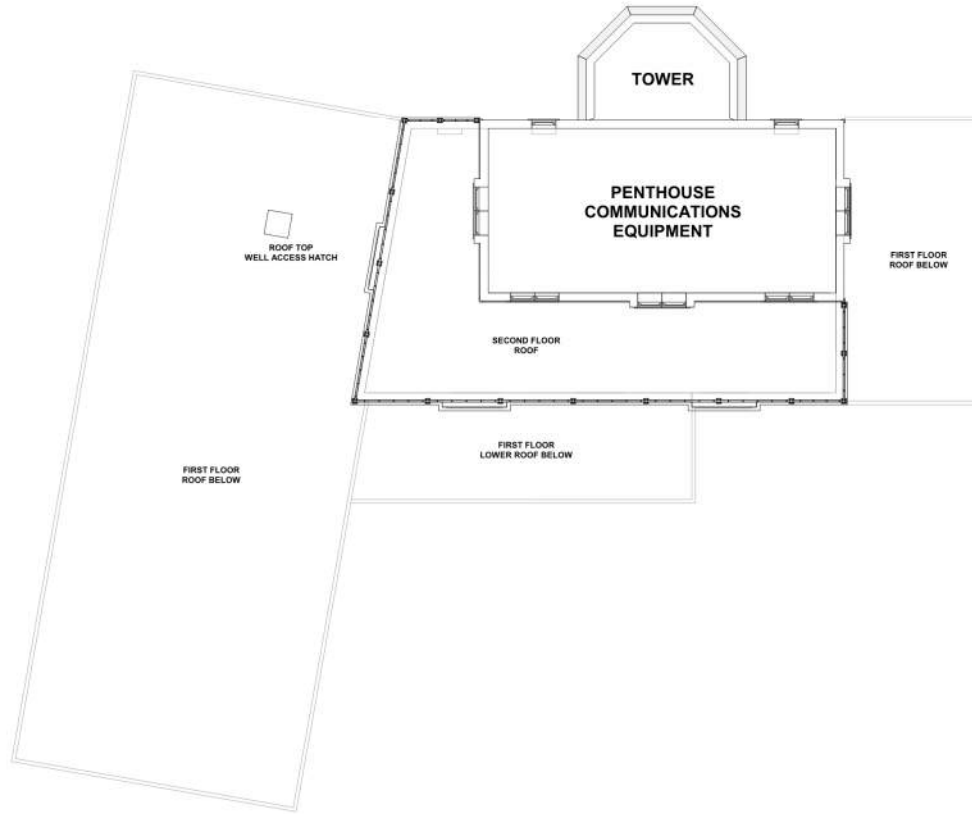
CONCEPTUAL SECOND FLOOR PLAN

SCALE: AS NOTED
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PROPOSED YANKEE COMMUNICATIONS BUILDING

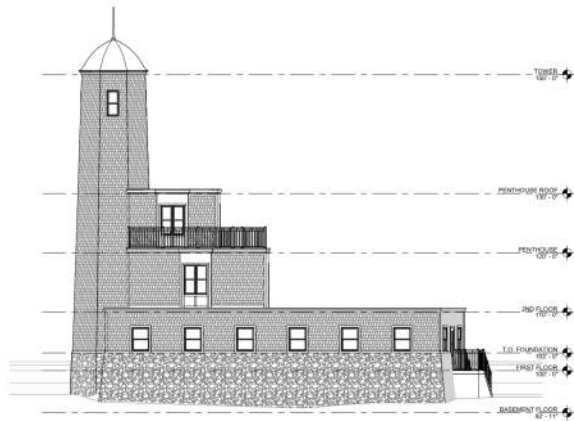
CONCEPTUAL PENTHOUSE FLOOR PLAN

SCALE: AS NOTED
DATE: 07/18/2019
DRAWN BY: MTC/MLC



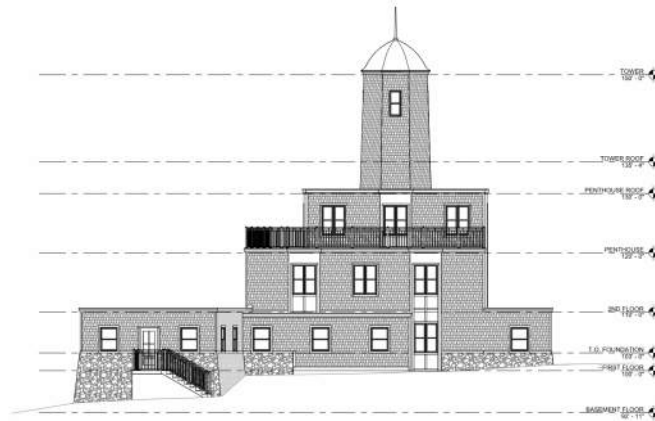
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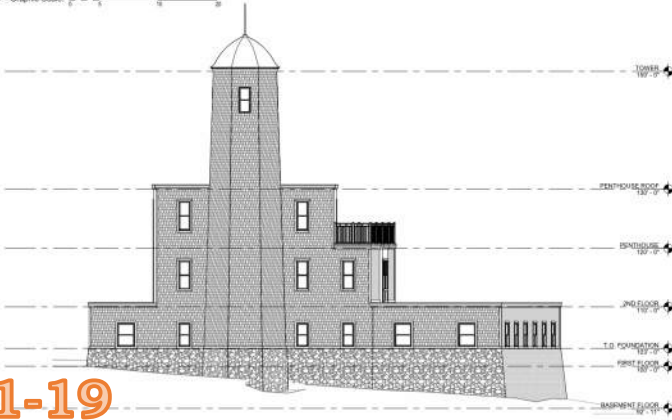
1 SOUTH ELEVATION

Graphic Scale: 1" = 10'-0"



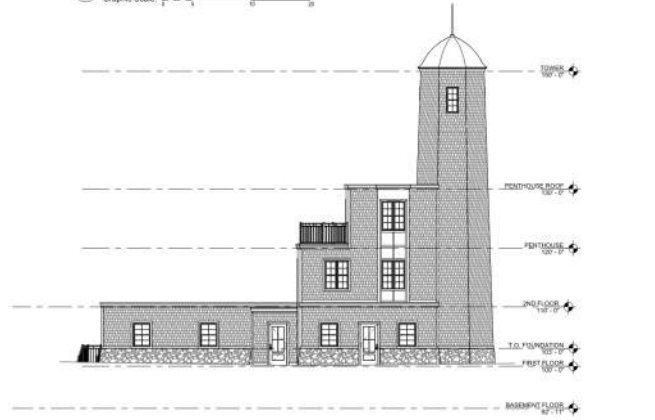
2 EAST ELEVATION

Graphic Scale: 1" = 10'-0"



3 WEST ELEVATION

Graphic Scale: 1" = 10'-0"



4 NORTH ELEVATION

Graphic Scale: 1" = 10'-0"

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PROPOSED YANKEE COMMUNICATIONS BUILDING

CONCEPTUAL EXTERIOR ELEVATIONS

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PROPOSED YANKEE COMMUNICATIONS BUILDING

CONCEPTUAL YANKEE BUILDING RENDERING

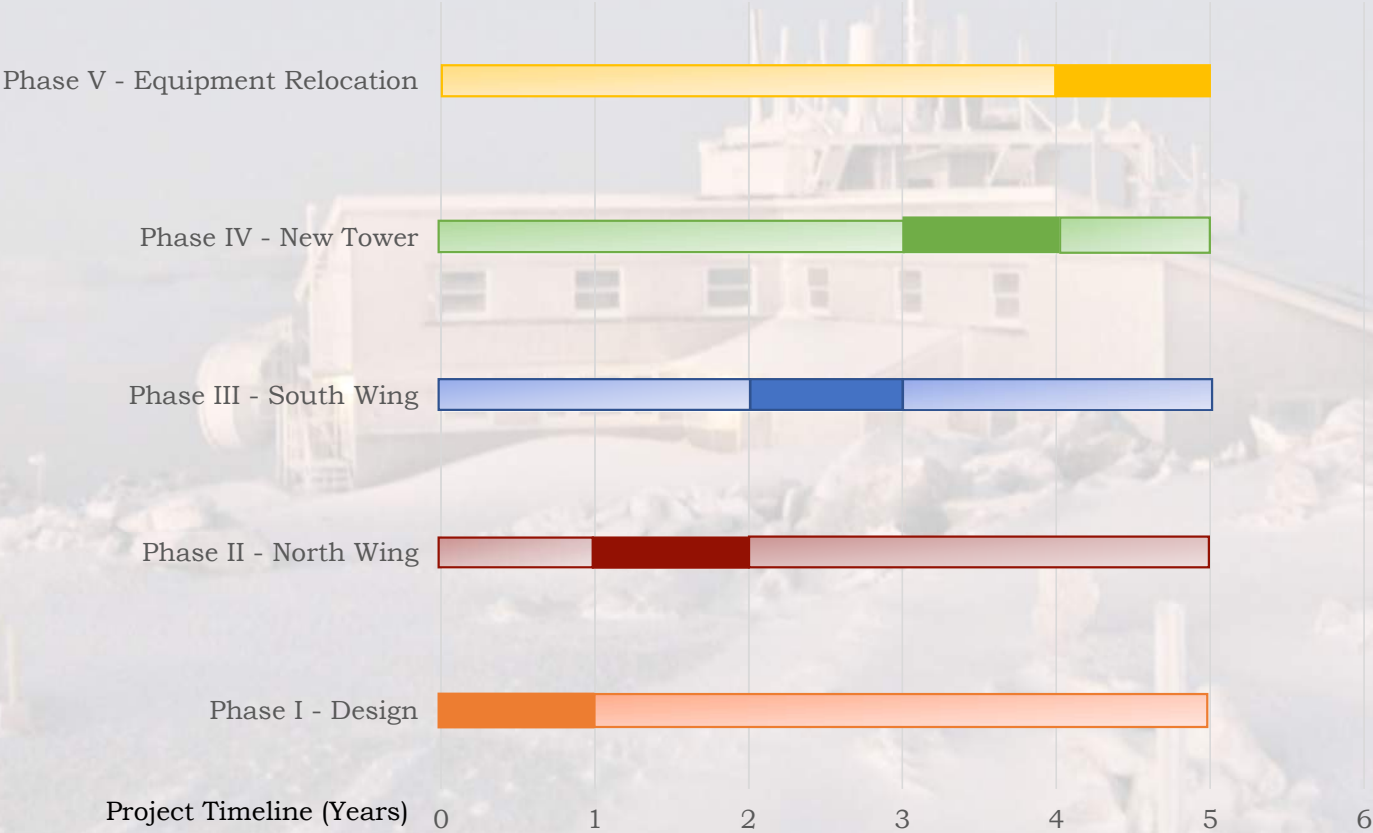
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Project Schedule



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Thank You
Questions?

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