

An aerial photograph of a mountainous landscape. The terrain is rugged and rocky, with patches of brown and green vegetation. A winding road leads up the slope to a cluster of buildings, including a large, circular structure. The sky is clear and blue.

TURNER GROUP

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*.



DRAFT 06-21-19

TURNER GROUP

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

DRAFT 06-21-19

TURNER GROUP



Left: Winter Entrance, Right: Summer Entrance



DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



D

DRAFT 06-21-19

TURNER GROUP



West Facing Foundation

DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



Penthouse Roof Antennas

DRAFT 06-21-19

TURNER GROUP



Access To Penthouse

DRAFT 06-21-19

TURNER GROUP



Penthouse Roof Antennas

DRAFT 06-21-19

TURNER GROUP



Water Damaged Wall Sheathing

DRAFT 06-21-19

TURNER GROUP



Roof Replacement 2012

DRAFT 06-21-19

TURNER GROUP



2017 Conditions
(Roof Replaced 2019)



Window

DE



Floor



Basement Storage

DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



Basement Emergency Generator – Not Used Since After 2003 Fire



DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



Snow Infiltration

DRAFT 06-21-19

TURNER GROUP




DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



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

DRAFT 06-21-19

TURNER GROUP



Old Generator Building Fire 2003

DRAFT 06-21-19

TURNER GROUP



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

DRAFT 06-21-19

TURNER GROUP



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

DRAFT 06-21-19

TURNER GROUP



Task 3 – Yankee Building Tenant Survey and Response Tabulation

DRAFT 06-21-19

TURNER GROUP

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

ARCHITECTS • ENGINEERS • BUILDING SCIENTISTS

antenna space concerns. locations for mounting antennas _____

ability to hit target location _____

availability of available locations _____

if antenna locations or height became available, would you utilize those _____

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

Less than \$1,000

\$1,000 - \$10,000

More than \$20,000

Do you favor of locating antennas within a protective structure if available? _____

Are you willing to consider sharing in the cost of constructing this structure? _____

Are fire, safety, fire detection and fire suppression systems adequate for your _____

Are environmental controls for heating, cooling and humidity adequate for your purposes? _____

Yankee Bldg Tenant Survey - ttg 4645

2 of 4



Do you encounter radio Interference Issues? _____

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

Are you licable _____

Do you experience issues from electric power performance, delivery or back-up power _____

Do you have interest in a shared generator backup system? _____

Do you experience issues relating to backhaul/fiber infrastructure issues? _____

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

Do you have any equipment experience 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



Are there any building improvements that you feel would aid in future communications development? _____

Do you have any questions? _____

Please provide your name, 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. _____

###

Yankee Bldg Tenant Survey - ttg 4645

4 of 4



Task 3 – Yankee Building Tenant Survey and Response Tabulation

DRAFT 06-21-19

TURNER GROUP



4 Towers

DRAFT 06-21-19

TURNER GROUP



Armstrong, RCA, WHOM Towers

DRAFT 06-21-19

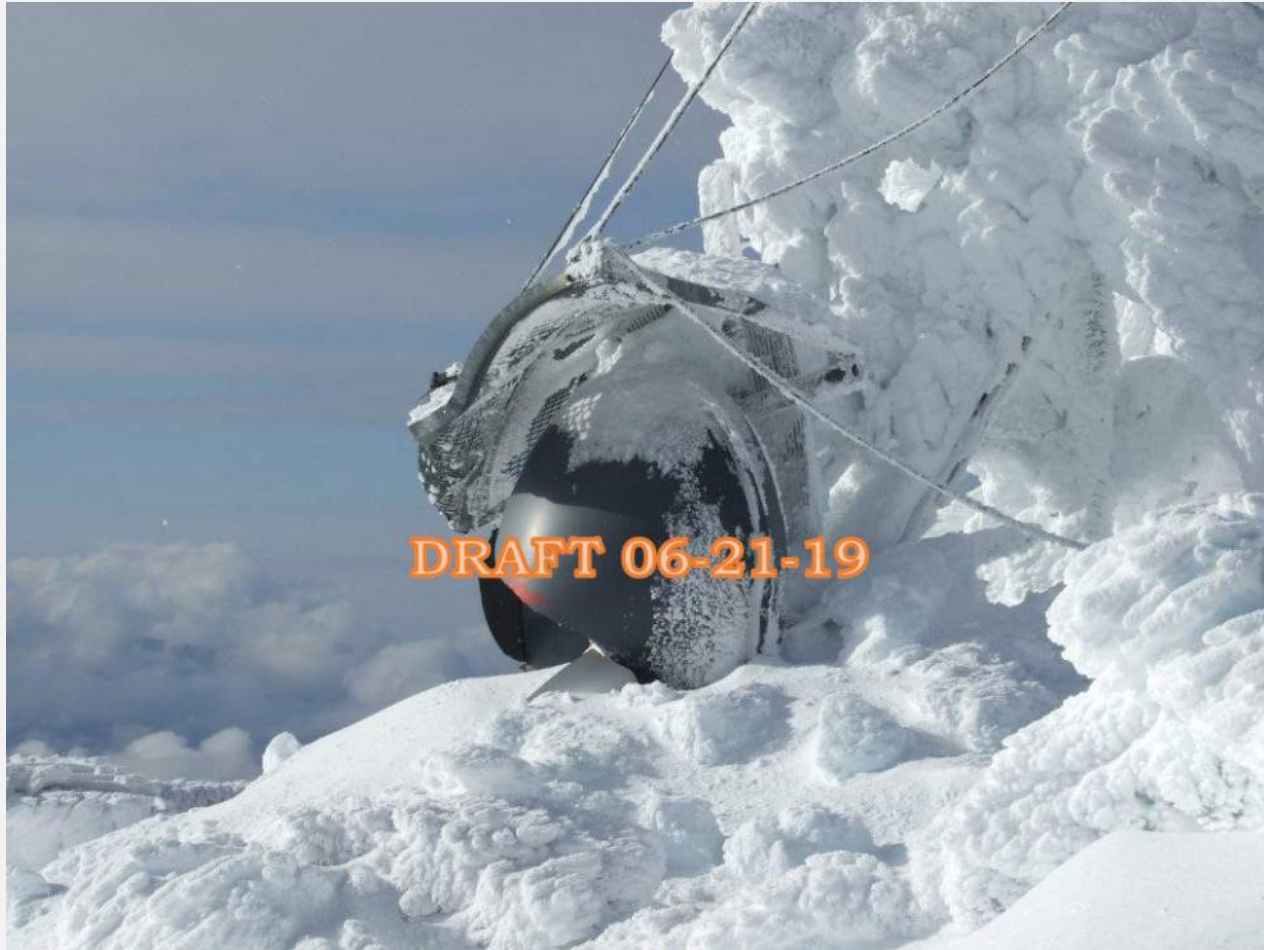
TURNER GROUP



Federal Radios: Plastic Where Roof Leaked



Ice Storm



Equipment Damage

DRAFT 06-21-19

TURNER GROUP



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

DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

TURNER GROUP

DRAFT



Photo Credit: FAMARTIN

DRAFT 06-21-19

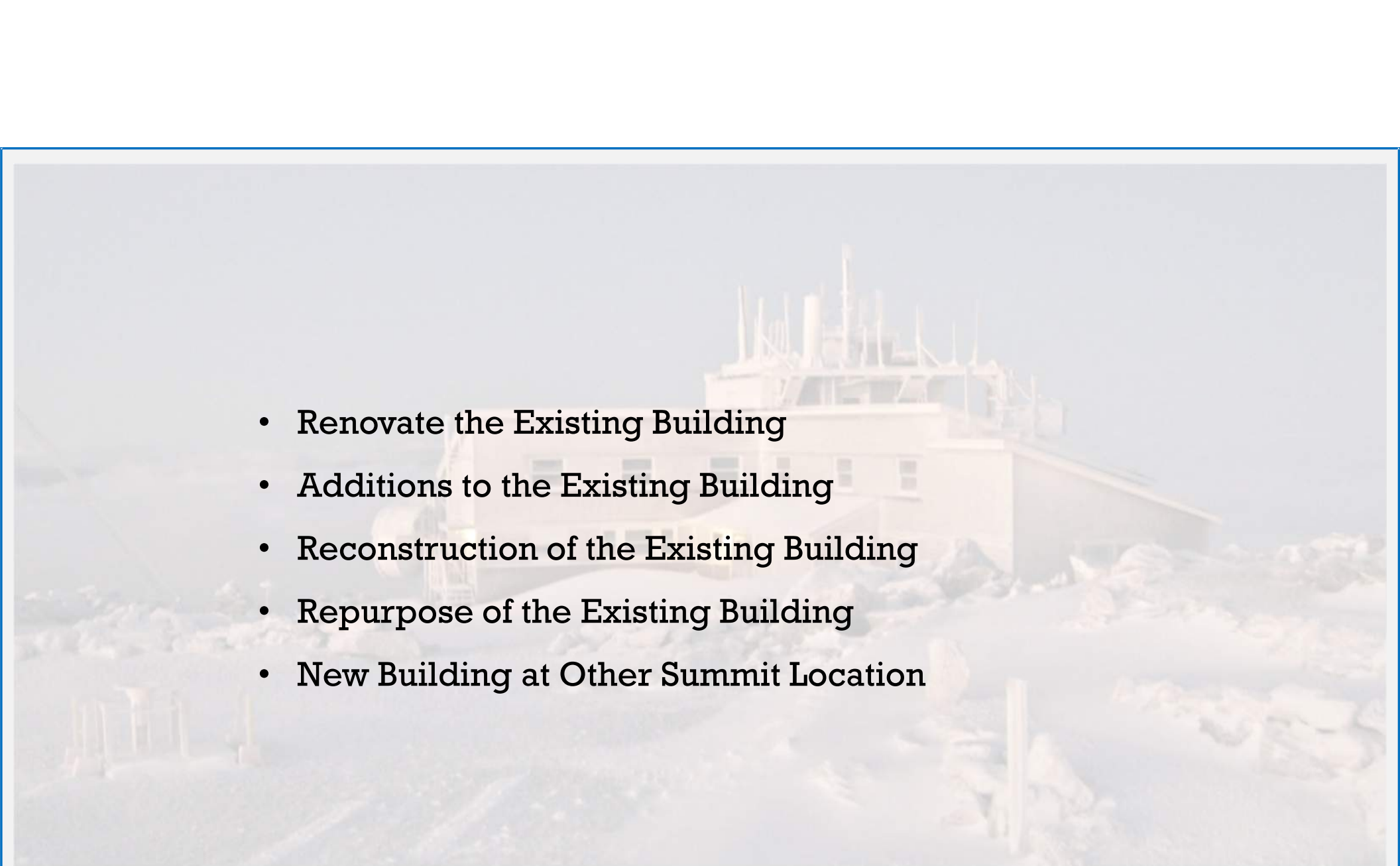
TURNER GROUP



Task 6 – Alternatives for Yankee Building Use with Recommendations

DRAFT 06-21-19

TURNER GROUP

- 
- 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**

DRAFT 06-21-19

TURNER GROUP

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

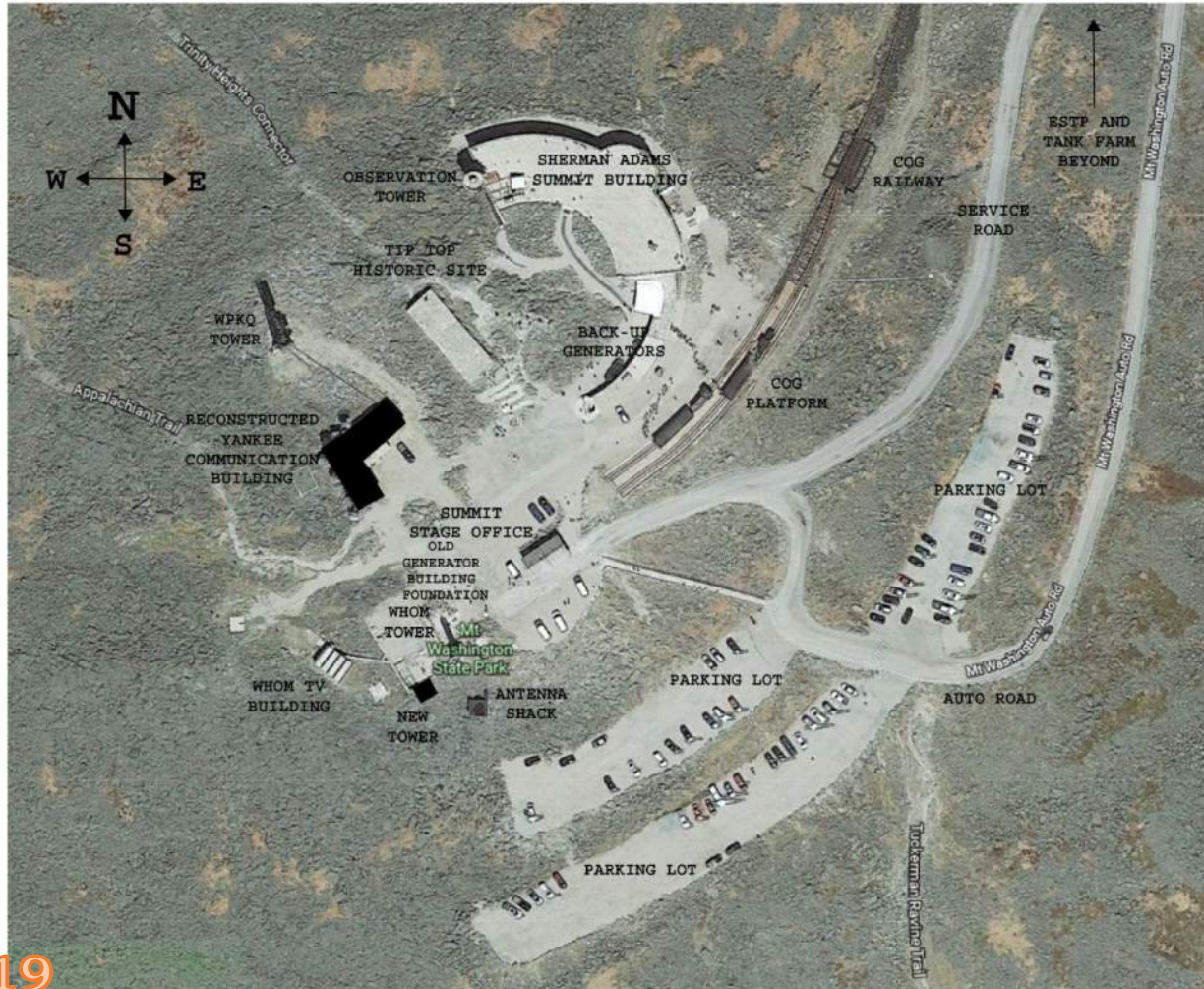
GRAND TOTAL **\$ 12,884,505**



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

DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

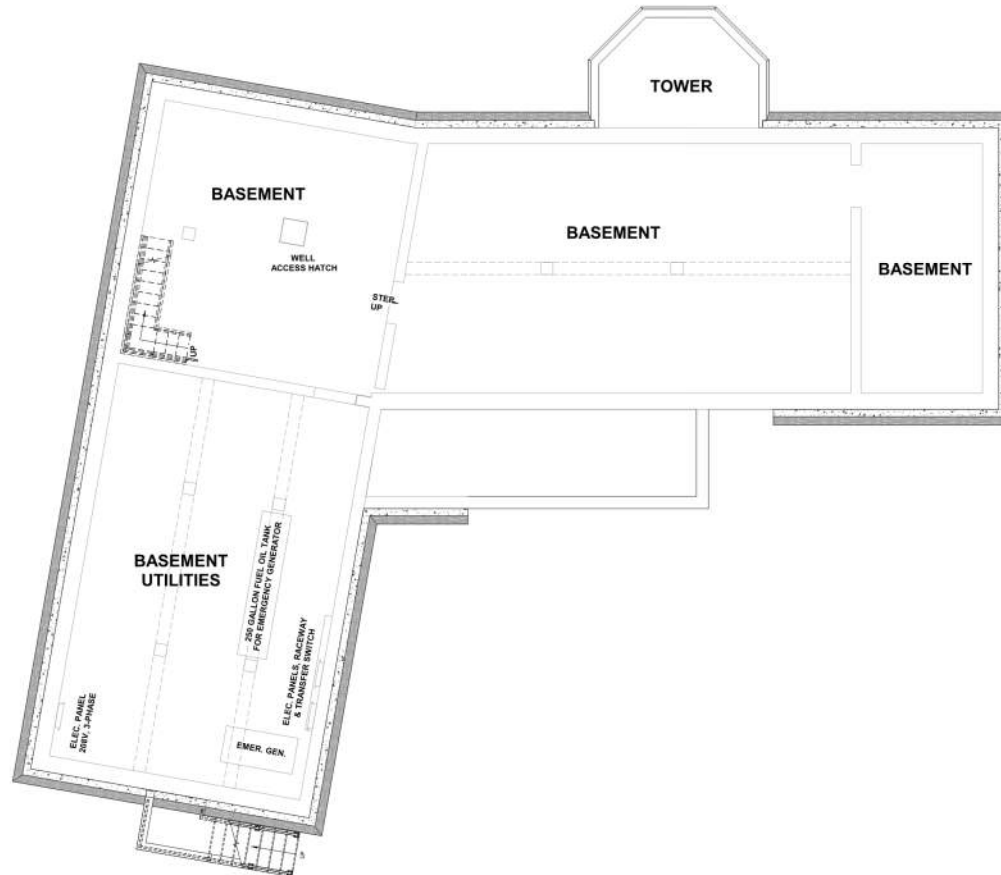
MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING DRAFT MOUNT WASHINGTON SUMMIT AERIAL SITE PLAN

PREPARED BY: H.L. TURNER GROUP, INC. ■ ARCHITECTS ■ ENGINEERS ■ BUILDING SCIENTISTS ■ 27 LOCKE RD., CONCORD, NH 03301, USA ■ 603.228.1122 ■ 603.228.1124 ■ www.HTurner.com

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





Graphic Scale:

DRAFT 06-21-19

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

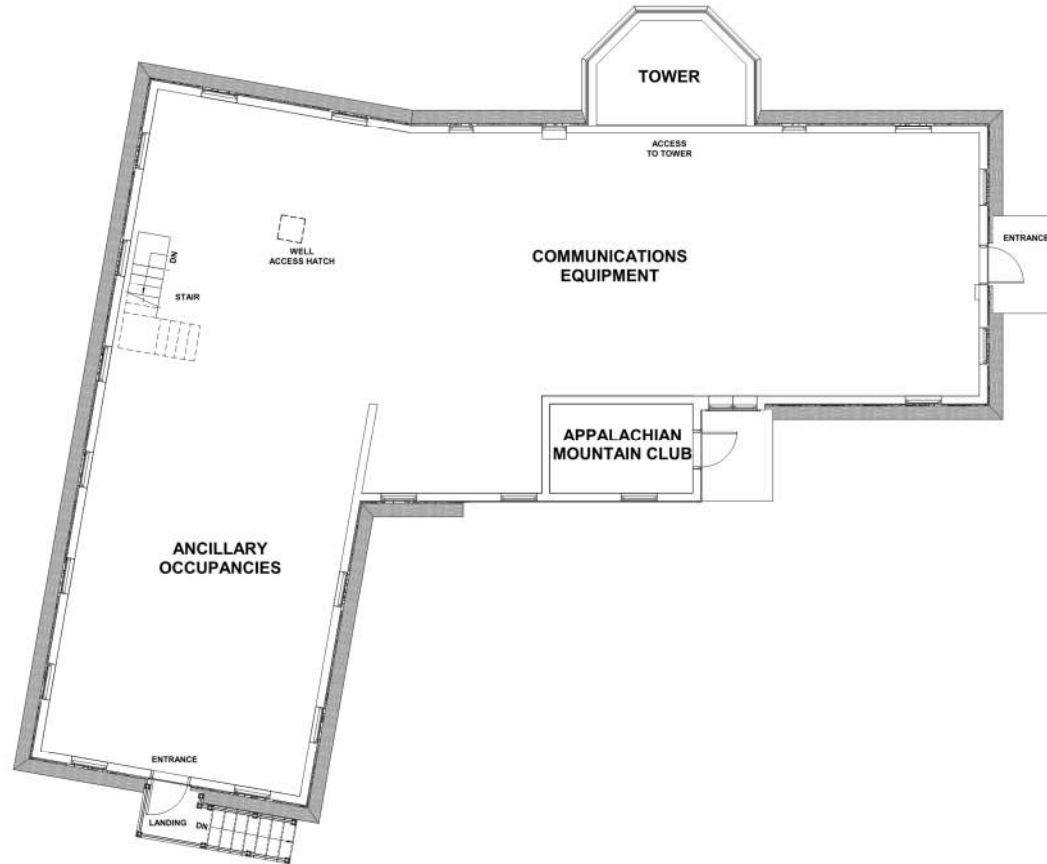
DRAFT 06-21-19

CONCEPTUAL BASEMENT FLOOR PLAN

SCALE: AS NOTED
DATE: 07/19/2019
REV: 01

PREPARED BY: H. TURNER GROUP, INC. ■ ARCHITECTS ■ ENGINEERS ■ BUILDING SCIENTISTS ■ 27 LOCKE RD., CONCORD, NH 03301, USA ■ 603.228.1122 ■ 603.228.1124 ■ www.hturner.com





DRAFT 06-21-19

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

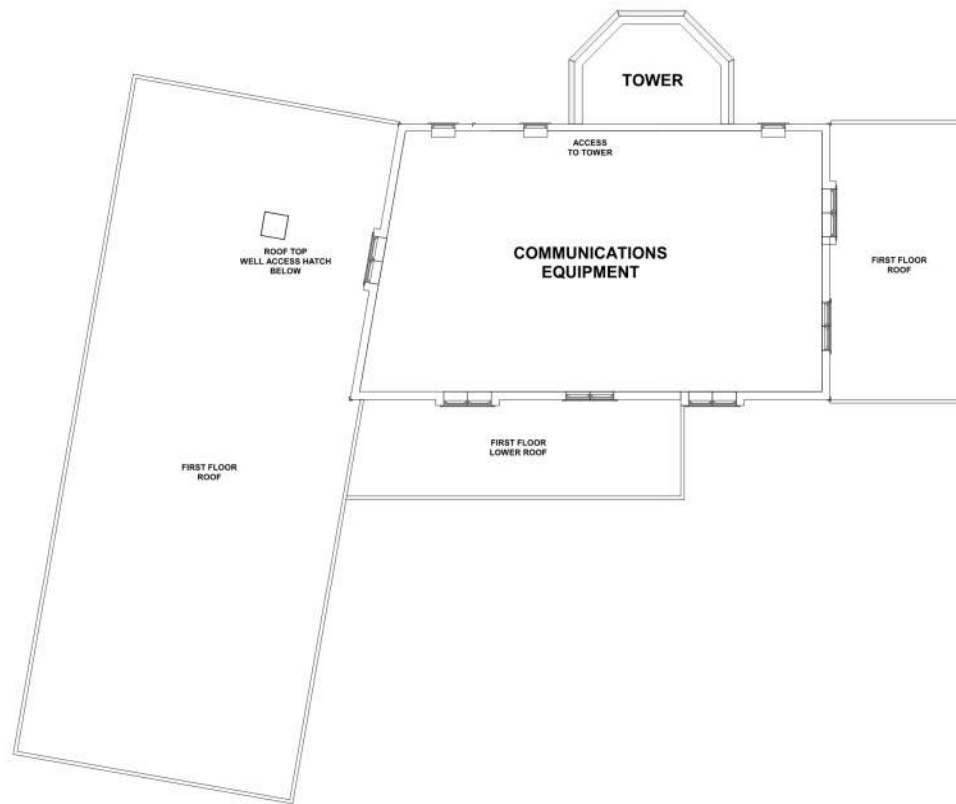
CONCEPTUAL FIRST FLOOR PLAN

SCALE: AS NOTED
DATE: 07/19/2019

PREPARED BY: H. TURNER GROUP, INC. • ARCHITECTS • ENGINEERS • BUILDING SCIENTISTS • 27 LOCKE RD. CONCORD, NH 03301, USA • 603.226.1122 • 603.226.1124 • www.hturner.com

DRAFT 06-21-19





DRAFT 06-21-19

Graphic Scale:

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

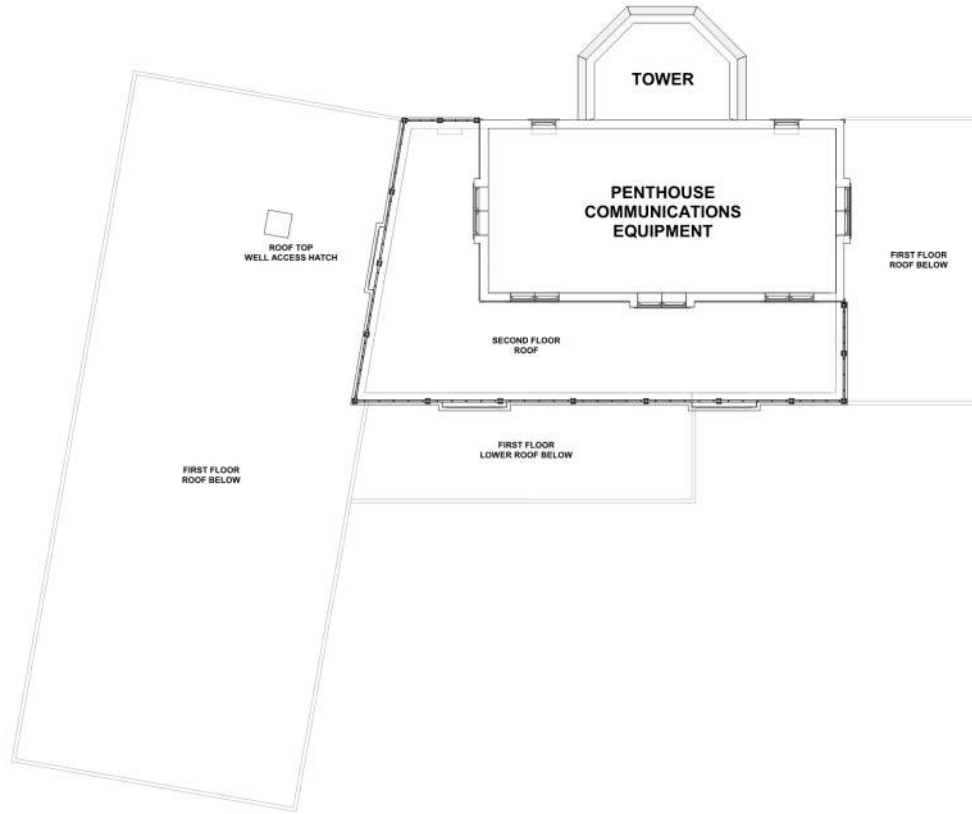
CONCEPTUAL SECOND FLOOR PLAN

PREPARED BY: H. TURNER GROUP, INC. ■ ARCHITECTS ■ ENGINEERS ■ BUILDING SCIENTISTS ■ 27 LOCKER RD., CONCORD, NH 03301, USA ■ 603.228.1122 ■ 603.228.1124 ■ www.HTurner.com

SCALE: AS NOTED
DATE: 07/19/2019
PROJECT: CAP1816



DRAFT 06-21-19



DRAFT 06-21-19

Graphic Scale:

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

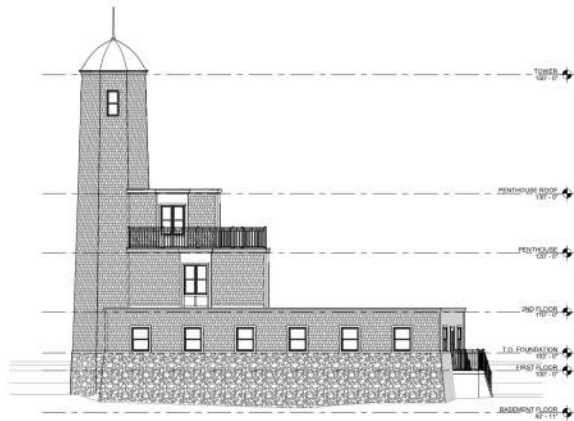
CONCEPTUAL PENTHOUSE FLOOR PLAN

SCALE: AS NOTED
DATE: 07/18/2019
ISSUED: MODEL CONCEPT



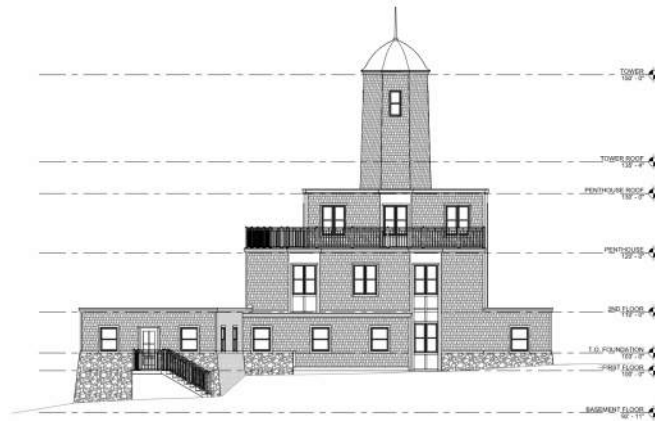
PREPARED BY: H. TURNER GROUP, INC. • ARCHITECTS • ENGINEERS • BUILDING SCIENTISTS • 27 LOCKE RD., CONCORD, NH 03301, USA • 603.228.1122 • 603.228.1124 • www.HTurner.com

DRAFT 06-21-19



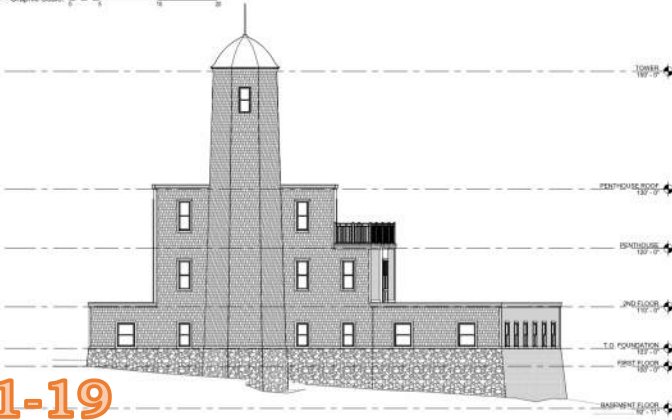
1 SOUTH ELEVATION

Graphic Scale: 1" = 10'-0"



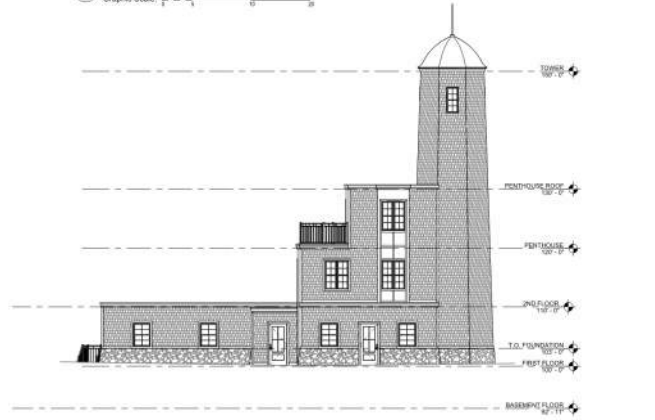
2 EAST ELEVATION

Graphic Scale: 1" = 10'-0"



3 WEST ELEVATION

Graphic Scale: 1" = 10'-0"



4 NORTH ELEVATION

Graphic Scale: 1" = 10'-0"

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

CONCEPTUAL EXTERIOR ELEVATIONS

SCALE: AS NOTED
DATE: 07/19/2018
DRAWN BY: PROJECT OFFICE



PREPARED BY: HL TURNER GROUP, INC. ■ ARCHITECTS ■ ENGINEERS ■ BUILDING SCIENTISTS ■ 27 LOCKE RD. CONCORD, NH 03301, USA ■ 603.228.1122 ■ 603.228.1124 ■ www.hturner.com

DRAFT 06-21-19

DRAFT 06-21-19



Photo Credit: FAMARTIN

DRAFT 06-21-19

TURNER GROUP



DRAFT 06-21-19

MT. WASHINGTON COMMUNICATIONS FACILITIES RECOMMENDATIONS - NH PROJECT CAP1816

PROPOSED YANKEE COMMUNICATIONS BUILDING

CONCEPTUAL YANKEE BUILDING RENDERING

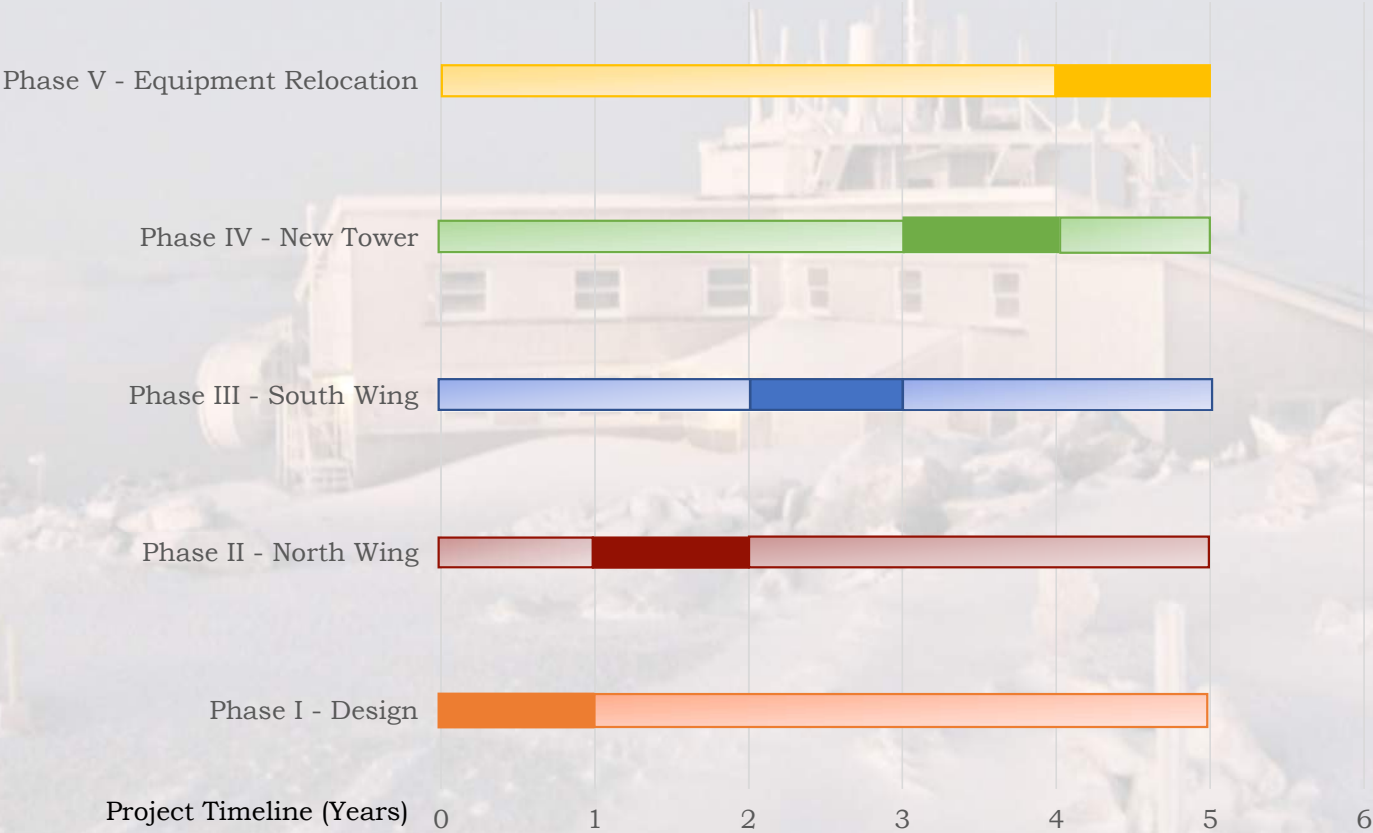
PREPARED BY: H. TURNER GROUP, INC. ■ ARCHITECTS ■ ENGINEERS ■ BUILDING SCIENTISTS ■ 1000 W. WASHINGTON ST. ■ SUITE 200 ■ PORTSMOUTH, NH 03801 ■ TEL: 603.228.1122 ■ 603.226.1124 ■ www.htgroup.com

DRAFT 06-21-19

SCALE: AS NOTED
DATE: 07/19/2019
PROJECT: PROJECT CAP1816




Project Schedule



DRAFT 06-21-19

TURNER GROUP



**Thank You
Questions?**

DRAFT 06-21-19