

Project Title: _____

PEPC Project Number: _____

Recommended by the following compliance specialists:

NEPA

Doug Madsen *Digital Signature:* _____

Raymond McPadden *Digital Signature:* _____

NHPA

Tobin Roop *Digital Signature:* _____

Superintendent Review and Approval

The Environmental Screening Form has been reviewed.

AND

The Assessment of Actions Having an Effect on Historic Properties has been reviewed. The proposed work conforms to the *NPS Management Policies* and *Cultural Resource Management Guideline*, and I have reviewed and approve the recommendations, stipulations, or conditions noted in Section C of this form.

AND

The Categorical Exclusion has been reviewed. Decision: I find that the action fits within the categorical exclusion below. Therefore, I am categorically excluding the described project from further NEPA analysis. No extraordinary circumstances apply.

**Superintendent
Approval**

Digital Signature: _____



ENVIRONMENTAL SCREENING FORM (ESF)

Updated Sept 2015 per NPS NEPA Handbook

A. PROJECT INFORMATION

Project Title: Access Parks - Broadband Internet for Employees and Visitors
PEPC Project Number: 89100
PMIS Number:
Project Type: Construction Permit (CONP)
Project Location:
County, State: Fremont, Idaho
County, State: Gallatin, Montana
County, State: Park, Montana
County, State: Park, Wyoming
County, State: Teton, Wyoming
Project Leader: Bret De Young

B. PROJECT DESCRIPTION

Access Parks (AP) has submitted an application for a Right of Way (ROW) permit to the National Park Service (NPS) proposing the installation of wireless radios, licensed microwave point-to-point, licensed point-to-multipoint, and license exempt indoor Wi-Fi installations in major developed areas of the park where Wi-Fi is allowed under the park's Wireless Communications Plan / EA as amended.

Installation of indoor Wi-Fi networks and associated equipment would benefit park employees and visitors. This service would be provided in park lodging facilities and employee housing. The project would be funded by Xanterra Travel Collection. No new towers or communication sites would be built under this proposal. No antennas or equipment would be installed in backcountry areas, along park roads, in campgrounds or picnic areas. The new wireless equipment would be installed on existing structures. The Wi-Fi service area would be limited to the general footprint of each facility included in the proposal, and would not extend into backcountry areas, recommended wilderness or along road corridors.

AP's wireless communication system would cover Canyon Village, Grant Village, Lake, Mammoth Hot Springs, and Old Faithful. Equipment for this project include five microwave antenna locations, twelve wireless backhaul antennas (dish-type) ranging between three and six feet in diameter, and four hundred and eighty four (484) transceivers of 11 inch diameter or less installed on receiving structures.

In addition to the areas above, a network of 36 additional antennas (dish-type), 2-foot and 3-foot in diameter, would be required. These antennas would deliver service from Mount Washburn directly to the five developed areas named above. Smaller 11-inch antennas would pick up the service-signal in the developed areas. Of the 6 microwave dishes installed at Mount Washburn, three would be placed on the existing antenna mounting structure surrounding the Fire Lookout and three installed in the concealed vaults below the structure. Three 6-foot diameter microwave dishes would be installed (one each) on existing towers at Old Faithful, Grant Village, and Fishing Bridge. The full Access Parks proposal is attached and describes all proposed antenna types, locations, and placement. Photo simulations are provided throughout.

Four hundred thirteen (413) of the impacted buildings have been identified as either eligible for inclusion on the National Register of Historic Places, as contributors to historic districts, or as National Historic Landmarks. The Historic Properties identified include Canyon Lodge, Lake Hotel, the Lake Hamilton Store, 78 Lake Hotel Guest Cabins, 64 Lake Lodge Guest Cabins, Seagull Dormitory, Mammoth Hotel, 97 Mammoth Guest Cabins, the Mammoth Dining Hall, Lodgepole Dormitory, Juniper Dormitory, Spruce Dormitory, Old Faithful Inn, Old Faithful Lodge, 161 Old Faithful Guest Cabins, Laurel Dormitory, and Columbine Dormitory.

Seventy one (71) impacted buildings have been deemed ineligible for inclusion on the National Register of Historic Places. Of these, 31 are ineligible based on age, 31 are located in historic districts but have been determined to be non-contributing structures, and 9 have been determined ineligible on their own.

Installation on Historic Properties will use existing penetrations into buildings. Most installations will be inconspicuous because locations have been selected in attic spaces, under eaves, and on roof sections that are screened from view for most visitors. Consultation with the Wyoming State Historic Preservation Office concluded in March 2020 when they concurred that with the park's finding that National Register eligible districts, National Register listed districts, and National Historic Landmarks will not be adversely affected by this undertaking as planned.

This categorical exclusion has been prepared for the entire project. A test roll-out would be conducted at Old Faithful to ensure signal strength and performance are satisfactory. Pending a successful test at Old Faithful, the entire project would proceed as described above.

C. RESOURCE IMPACTS TO CONSIDER:

Resource	Potential for Impact	Potential Issues & Impacts
Air Air Quality	None	
Biological Nonnative or Exotic Species	None	
Biological Species of Special Concern or Their Habitat	None	
Biological Vegetation <i>Vegetation</i>	Potential	Impact: No ground disturbance is planned for this project. All new infrastructure would be mounted on existing communications support structures or on existing buildings.
Biological Wildlife and/or Wildlife Habitat including terrestrial and aquatic species	None	
Cultural Archeological Resources	None	

Cultural Cultural Landscapes <i>Cultural Landscapes</i>	Potential	<p>Issue: Changes to historic setting</p> <p>Impact: All exterior antennas would be located out of view wherever possible and, if visible, the installations would be painted to match the buildings on which they are installed. Because antennas have generally been located out of view or camouflaged from visitors, impacts to cultural landscapes would be minimal.</p>
Cultural Ethnographic Resources	None	
Cultural Museum Collections	None	
Cultural Prehistoric/historic structures <i>Historic buildings and viewsheds in historic districts</i>	Potential	<p>Issue: Antennas would be mounted on many historic buildings which could affect viewsheds. Some new holes may need to be made in buildings.</p> <p>Impact: Some additional infrastructure (antenna) would be visible on roofs of some historic buildings and within historic districts. Most of the antennae are small in size (11-inch or less). More than 75% of the antennas on National Register of Historic Places eligible structures would be located in attic spaces or under eaves. The vast majority of installations would be through existing penetrations in buildings. In some cases new holes may be drilled through walls or rooftops to minimize the visibility of wiring on the exterior and allow for short connections to interior antenna.</p>
Geological Geologic Features	None	
Geological Geologic Processes	None	
Lightscapes Lightscapes	None	
Other Human Health and Safety	None	
Socioeconomic Land Use	None	
Socioeconomic Minority and low-income populations, size, migration patterns, etc.	None	
Socioeconomic Socioeconomic	None	
Soundscapes Soundscapes	None	

Viewsheds Viewsheds <i>Viewsheds</i>	Potential	<p>Issue: Non-natural items visible to park visitors</p> <p>Impact: Additional antennas/dishes would be placed on existing building roofs, in attic spaces, or on existing towers or mounting structures used for communications within the park. No new communication sites would be constructed for this project. New antennas would add to the number of human-made items visible in the park's developed areas, which may concern some visitors or degrade their experience. However, visitors in major developed areas already see numerous human-made objects such as buildings, utility boxes, propane tanks and electric lines. These objects have been sited discreetly and camouflaged, where possible. The antennas/dishes and other equipment associated with this project will largely blend with existing built environment. Further, most visitors report very high levels of satisfaction and enjoyment, particularly in major developed sites such as Old Faithful (NPS Summer Visitor Use Survey, 2018), where many man-made objects are currently visible. The addition of new antenna on existing towers and communications structures, such as atop Mount Washburn, will not measurably degrade viewsheds, as the panels are similar in size, or smaller than, existing antenna on the towers.</p>
Visitor Use and Experience Recreation Resources	None	
Visitor Use and Experience Visitor Use and Experience <i>Visitor Experience</i>	Potential	<p>Issue: Visitor and employee connectivity</p> <p>Impact: Both visitors and employees would have improved opportunities to conduct personal business, access real-time information about the park and conditions, and to use the internet for other purposes. Internet access and connectivity via Wi-Fi while in a national park may frustrate some visitors, based on personal values. These visitors do not have to use Wi-Fi, but they may still see or hear others making Wi-Fi calls or using personal devices.</p>
Water Floodplains	None	
Water Marine or Estuarine Resources	None	
Water Water Quality or Quantity	None	
Water Wetlands	None	
Wilderness Wilderness	None	

D. ESF ADDENDUM QUESTIONS:

Question	Answer	Notes
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Reviewers:

Doug Madsen

Optional Signatures:

Compliance Specialists:

NEPA _____ **Date:** _____
Doug Madsen

NEPA _____ **Date:** _____
Raymond McPadden

NHPA _____ **Date:** _____
Tobin Roop

Approved:

Superintendent: _____ **Date:** _____



Categorical Exclusion Documentation Form (CE Form)

Project: Access Parks - Broadband Internet for Employees and Visitors

PEPC Project Number: 89100

Description of Action (Project Description):

Access Parks (AP) has submitted an application for a Right of Way (ROW) permit to the National Park Service (NPS) proposing the installation of wireless radios, licensed microwave point-to-point, licensed point-to-multipoint, and license exempt indoor Wi-Fi installations in major developed areas of the park where Wi-Fi is allowed under the park's Wireless Communications Plan / EA as amended.

Installation of indoor Wi-Fi networks and associated equipment would benefit park employees and visitors. This service would be provided in park lodging facilities and employee housing. The project would be funded by Xanterra Travel Collection. No new towers or communication sites would be built under this proposal. No antennas or equipment would be installed in backcountry areas, along park roads, in campgrounds or picnic areas. The new wireless equipment would be installed on existing structures. The Wi-Fi service area would be limited to the general footprint of each facility included in the proposal, and would not extend into backcountry areas, recommended wilderness or along road corridors.

AP's wireless communication system would cover Canyon Village, Grant Village, Lake, Mammoth Hot Springs, and Old Faithful. Equipment for this project include five microwave antenna locations, twelve wireless backhaul antennas (dish-type) ranging between three and six feet in diameter, and four hundred and eighty four (484) transceivers of 11 inch diameter or less installed on receiving structures.

In addition to the areas above, a network of 36 additional antennas (dish-type), 2-foot and 3-foot in diameter, would be required. These antennas would deliver service from Mount Washburn directly to the five developed areas named above. Smaller 11-inch antennas would pick up the service-signal in the developed areas. Of the 6 microwave dishes installed at Mount Washburn, three would be placed on the existing antenna mounting structure surrounding the Fire Lookout and three installed in the concealed vaults below the structure. Three 6-foot diameter microwave dishes would be installed (one each) on existing towers at Old Faithful, Grant Village, and Fishing Bridge. The full Access Parks proposal is attached and describes all proposed antenna types, locations, and placement. Photo simulations are provided throughout.

Four hundred thirteen (413) of the impacted buildings have been identified as either eligible for inclusion on the National Register of Historic Places, as contributors to historic districts, or as National Historic Landmarks. The Historic Properties identified include Canyon Lodge, Lake Hotel, the Lake Hamilton Store, 78 Lake Hotel Guest Cabins, 64 Lake Lodge Guest Cabins, Seagull Dormitory, Mammoth Hotel, 97 Mammoth Guest Cabins, the Mammoth Dining Hall, Lodgepole Dormitory, Juniper Dormitory, Spruce Dormitory, Old Faithful Inn, Old Faithful Lodge, 161 Old Faithful Guest Cabins, Laurel Dormitory, and Columbine Dormitory.

Seventy one (71) impacted buildings have been deemed ineligible for inclusion on the National Register of Historic Places. Of these, 31 are ineligible based on age, 31 are located in historic districts but have been determined to be non-contributing structures, and 9 have been determined ineligible on their own.

Installation on Historic Properties will use existing penetrations into buildings. Most installations will be inconspicuous because locations have been selected in attic spaces, under eaves, and on roof sections that are screened from view for most visitors. Consultation with the Wyoming State Historic Preservation Office concluded in March 2020 when they concurred

that with the park's finding that National Register eligible districts, National Register listed districts, and National Historic Landmarks will not be adversely affected by this undertaking as planned.

This categorical exclusion has been prepared for the entire project. A test roll-out would be conducted at Old Faithful to ensure signal strength and performance are satisfactory. Pending a successful test at Old Faithful, the entire project would proceed as described above.

Project Locations:

Location 1

County:	Fremont	State:	ID
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Location 2

County:	Gallatin	State:	MT
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Location 3

County:	Park	State:	MT
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Location 4

County:	Park	State:	WY
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Location 5

County:	Teton	State:	WY
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Mitigation(s):

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed sites. All staging and stockpiling areas would be returned to pre-construction conditions following construction. Construction zones and staging areas would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction.
- All project zones will be kept trash free at all times.
- Project Manager must provide advance notice to designated resource advisor before project begins in order to monitor activities related to natural and cultural resource mitigation measures.
- The contractor would ensure that all employees are informed of the penalties for illegally collecting artifacts or intentionally damaging paleontological materials, archeological sites, or historic properties. Contractors and subcontractors would also be instructed on procedures to follow in case previously unknown paleontological or archeological resources are uncovered during construction.
- Contractors would coordinate with park staff to reduce disruption in normal park activities (i.e. facilitate emergency traffic, and hauling material, to allow for visitor use in areas where no conflicts or safety concerns exist).

CE Citation: C.14 Issuance of rights-of-way for minor overhead utility lines not involving placement of poles or towers and not involving vegetation management or significant visual intrusion in an NPS-administered area.

CE Justification:

Decision: I find that the action fits within the categorical exclusion above. Therefore, I am categorically excluding the described project from further NEPA analysis. No extraordinary circumstances apply.

Signature

Superintendent: _____ **Date:** _____

Extraordinary Circumstances:

If implemented, would the proposal...	Yes/No	Notes
A. Have significant impacts on public health or safety?	No	
B. Have significant impacts on such natural resources and unique geographic characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands (Executive Order 11990); floodplains (Executive Order 11988); national monuments; migratory birds; and other ecologically significant or critical areas?	No	
C. Have highly controversial environmental effects or involve unresolved conflicts concerning alternative uses of available resources (NEPA section 102(2)(E))?	No	
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?	No	
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?	No	
F. Have a direct relationship to other actions with individually insignificant, but cumulatively significant, environmental effects?	No	
G. Have significant impacts on properties listed or eligible for listing on the National Register of Historic Places, as determined by either the bureau or office?	No	
H. Have significant impacts on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have significant impacts on designated Critical Habitat for these species?	No	
I. Violate a federal, state, local or tribal law or requirement imposed for the protection of the environment?	No	
J. Have a disproportionately high and adverse effect on low income or minority populations (EO 12898)?	No	
K. Limit access to and ceremonial use of Indian sacred sites on federal lands by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)?	No	
L. Contribute to the introduction, continued existence, or spread of noxious weeds or non-native invasive species known to occur in the area or actions that may promote the introduction, growth, or expansion of the range of such species (Federal Noxious Weed Control Act and Executive Order 13112)?	No	



ASSESSMENT OF ACTIONS HAVING AN EFFECT ON HISTORIC PROPERTIES

A. DESCRIPTION OF UNDERTAKING

1. **Park:** Yellowstone National Park

2. Project Description:

Project Name: Access Parks - Broadband Internet for Employees and Visitors

Prepared by: Thomas James **Date Prepared:** 09/10/2019 **Telephone:** (307) 344-2715

PEPC Project Number: 89100

Locations:

County, State: Fremont, ID

County, State: Gallatin, MT

County, State: Park, MT

County, State: Park, WY

County, State: Teton, WY

Describe project:

Access Parks (AP) has submitted an application for a Right of Way (ROW) permit to the National Park Service (NPS) proposing the installation of wireless radios, licensed microwave point-to-point, licensed point-to-multipoint, and license exempt indoor Wi-Fi installations in major developed areas of the park where Wi-Fi is allowed under the park's Wireless Communications Plan / EA as amended.

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Area of potential effects (as defined in 36 CFR 800.16[d])

Parkwide developed areas

3. Has the area of potential effects been surveyed to identify historic properties?

☐ No
☒ Yes

Source or reference:

4. Potentially Affected Resource(s):

Archeological Resources Present: No

Historical Structures/Resources Present:

Historical Structures/Resources Notes: All park residential buildings. See Attached spreadsheets.

Cultural Landscapes Present: Yes

Cultural Landscapes Notes: All park residential areas. See Attached spreadsheets for specific buildings.

Ethnographic Resources Present: No

5. The proposed action will: (check as many as apply)

☐ Destroy, remove, or alter features/elements from a historic structure
☐ Replace historic features/elements in kind
☒ Add non-historic features/elements to a historic structure

No Alter or remove features/elements of a historic setting or environment (inc. terrain)
Yes Add non-historic features/elements (inc. visual, audible, or atmospheric) to a historic setting or cultural
 _____ landscape
No Disturb, destroy, or make archeological resources inaccessible
No Disturb, destroy, or make ethnographic resources inaccessible>
Yes Potentially affect presently unidentified cultural resources
Yes Begin or contribute to deterioration of historic features, terrain, setting, landscape elements, or
 _____ archeological or ethnographic resources
No Involve a real property transaction (exchange, sale, or lease of land or structures)
 _____ Other (please specify): _____

6. Supporting Study Data:

(Attach if feasible; if action is in a plan, EA or EIS, give name and project or page number.)

B. REVIEWS BY CULTURAL RESOURCE SPECIALISTS

The park 106 coordinator requested review by the park's cultural resource specialist/advisors as indicated by check-off boxes or as follows:

No Reviews From: Curator, Archeologist, Historical Architect, Historian, 106 Advisor, Other Advisor, Anthropologist, Historical Landscape Architect

C. PARK SECTION 106 COORDINATOR'S REVIEW AND RECOMMENDATIONS

1. Assessment of Effect:

_____ No Potential to Cause Effects
 _____ No Historic Properties Affected
 X No Adverse Effect
 _____ Adverse Effect

2. Documentation Method:

[X] A. Standard 36 CFR Part 800 Consultation

Further consultation under 36 CFR Part 800 is needed.

[] B. Streamlined Review Under the 2008 Servicewide Programmatic Agreement (PA)

The above action meets all conditions for a streamlined review under section III of the 2008 Servicewide PA for Section 106 compliance.

Applicable Streamlined Review Criteria

(Specify 1-16 of the list of streamlined review criteria.)

[] C. Undertaking Related to Park Specific or Another Agreement

The proposed undertaking is covered for Section 106 purposes under another document such as a park, region or statewide agreement established in accord with 36 CFR 800.7 or 36 CFR 800.14.

[] D. Combined NEPA/NHPA Process

Process and documentation required for the preparation of an EA/FONSI or an EIS/ROD to comply with Section 106 is in accord with 36 CFR 800.8.c.

[] E. Memo to Project File

3. Consultation Information

SHPO Required: Yes

SHPO Sent: Sep 9, 2019

SHPO Received: Mar 20, 2020

THPO Required: No

THPO Sent:

THPO Received:

SHPO/THPO Notes: Concurrence from WYSHPO of No Historic Properties Adversely Affected on 3/20/2020.
Reaffirmation of this concurrence from WYSHPO on 7/1/2020.

Advisory Council Participating: No

Advisory Council Notes:

Additional Consulting Parties: No

4. Stipulations and Conditions: Following are listed any stipulations or conditions necessary to ensure that the assessment of effect above is consistent with 36 CFR Part 800 criteria of effect or to avoid or reduce potential adverse effects.

5. Mitigations/Treatment Measures: Measures to prevent or minimize loss or impairment of historic/prehistoric properties: (Remember that setting, location, and use may be relevant.)

Required Mitigations - For the proposed project actions to be within compliance requirements during construction and/or project implementation, the following mitigations must be adhered to:

- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed sites. All staging and stockpiling areas would be returned to pre-construction conditions following construction. Construction zones and staging areas would be identified and fenced with construction tape, snow fencing, or some similar material prior to any construction activity. The fencing would define the construction zone and confine activity to the minimum area required for construction.
- All project zones will be kept trash free at all times.
- Project Manager must provide advance notice to designated resource advisor before project begins in order to monitor activities related to natural and cultural resource mitigation measures.
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- Contractors would coordinate with park staff to reduce disruption in normal park activities (i.e. facilitate emergency traffic, and hauling material, to allow for visitor use in areas where no conflicts or safety concerns exist).

6. Assessment of Effect Notes:

D. RECOMMENDED BY PARK SECTION 106 COORDINATOR:

Compliance Specialist:

NHPA Specialist

Tobin Roop _____ **Date:** _____

E. SUPERINTENDENT'S APPROVAL

The proposed work conforms to the NPS *Management Policies* and *Cultural Resource Management Guideline*, and I have reviewed and approve the recommendations, stipulations, or conditions noted in Section C of this form.

Signature

Superintendent: _____ **Date:** _____



Other Compliance/Consultations Form

Park Name: Yellowstone National Park

PEPC Project Number: 89100

Project Title: Access Parks - Broadband Internet for Employees and Visitors

Project Type: Construction Permit

Project Location:

County, State: Fremont, ID

County, State: Gallatin, MT

County, State: Park, MT

County, State: Park, WY

County, State: Teton, WY

Project Leader: Bret De Young

ESA

Any Federal Species in the project Area? No

If species in area: No Effect

Was Biological Assessment prepared? No

If Biological Assessment prepared, concurred?

Formal Consultation required? No

Formal Consultation Notes:

Formal Consultation Concluded: Aug 6, 2019

Any State listed Species in the Project Area? No

Consultation Information:

General Notes: No proposed work would impact wildlife in the project area. All areas are within existing developments of the park.

Data Entered By: Doug Madsen

Date: Aug 6, 2019

ESA Mitigations

No ESA mitigations are associated with this project.

Floodplains/Wetlands/§404 Permits

Question	Yes	No	Details
A.1. Is project in 100- or 500-year floodplain or flash flood hazard area?		No	Not in floodplain or flash flood hazard area.

A.2. Is Project in wetlands as defined by NPS/DOI?		No	Not in wetland as defined by NPS/DOI.
B. COE Section 404 permit needed?		No	No placement of fill in waters of the United States.
C. State 401 certification?		No	
D. State Section 401 Permit?		No	Issue Date: Expiration Date:
E. Tribal Water Quality Permit?		No	
F. CZM Consistency determination needed?			N/A
G. Erosion & Sediment Control Plan Required?		No	
H. Any other permits required?		No	Permit Information:
Other Information:			

Data Entered By: Doug Madsen

Date: Aug 6, 2019

FloodPlains & Wetlands Mitigations

No FloodPlains & Wetlands mitigations are associated with this project.

Wilderness

Question	Yes	No	
A. Does this project occur in or adjacent to Designated, Recommended, Proposed, Study, Eligible, or Potential Wilderness?		No	
B. Is the only place to conduct this project in wilderness?		No	
C. Is the project necessary for the administration of the area as wilderness?		No	
D. Would the project or any of its alternatives adversely affect (directly or indirectly) Designated, Recommended, Proposed, Study, Eligible, or Potential Wilderness? (If Yes, Minimum Requirements Analysis required)		No	
E. Does the project or any of its alternatives involve the use of any of the Wilderness Act Section 4(c) prohibited uses: commercial enterprise, permanent road, temporary road, motor vehicles, motorized equipment, motorboats, landing of aircraft, mechanical transport, structure, or installation? (If Yes, Minimum Requirements Analysis required)		No	

If the answer to D or E above is "Yes" then a Minimum Requirements Analysis is required. Describe the status of this analysis in the column to the right.			Initiation Date: Completed Date: Approved Date: Date:
Other Information:			

Data Entered By: Doug Madsen
 Date: Aug 6, 2019

Other Permits/Laws *Questions A & B are no longer used.*

Question	Yes	No
C. Wild and scenic river concerns exist?		No
D. National Trails concerns exist?		No
E. Air Quality consult with State needed?		No
F. Consistent with Architectural Barriers, Rehabilitation, and Americans with Disabilities Acts or not Applicable? (If N/A check Yes)	Yes	
G. Other:		No

Other Information:

Data Entered By: Doug Madsen
 Date: Aug 6, 2019

Broadband Installation/ROW Plan

Yellowstone National Park
Employee Housing & Xanterra Properties
Updated March 3, 2020



Trade Secret Confidential – FOIA Exempt

Experience



Solution highlights



Team experience as end-to-end wireless ISP to remote federal property. Now focused exclusively on public lands and surrounding communities



Authorized
Concessioner

25+ Mbps
Broadband speeds



1 million+
Global hotspots



Military/government portfolio snapshot



National Park Service



U.S. Marine Corps



Dept. of Homeland Security



FBI



U.S. Air Force



U.S. Army

Experience bringing Broadband to hundreds of remote federal facilities, worldwide

Proposed Right-of-Way Areas of Coverage

Yellowstone Employee Housing & Xanterra Lodging

Overview of Backha

West

Mt. W

Old Fa

Grant

Canyo

Fishin

Mam



buildings



Mt. Washburn Verizon Tower; AccessParks Repeater Equipment



Mount Washburn – Wireless Telecommunications Hub for Yellowstone NP
Tower Coordinates: 44.798N, -110.434W

AccessParks Antenna Plan

Existing Mt. Washburn Verizon Tower# 27660

1. To West Yellowstone

- (1) 3-ft antenna, [REDACTED]-deg azimuth
- Located in West Vault

2. To Old Faithful

- (1) 3-ft antenna, [REDACTED]z, 223-deg azimuth
- Located in West Vault

3. To Canyon Village

- (1) 2-ft antenna, [REDACTED]. 212-deg azimuth
- Located on lattice, 11-ft AGL, beneath existing 3-ft antenna

4. To Grant Village

- (1) 3-ft antenna, [REDACTED] GHz, 191-deg azimuth
- Located on lattice structure, 17-ft CL

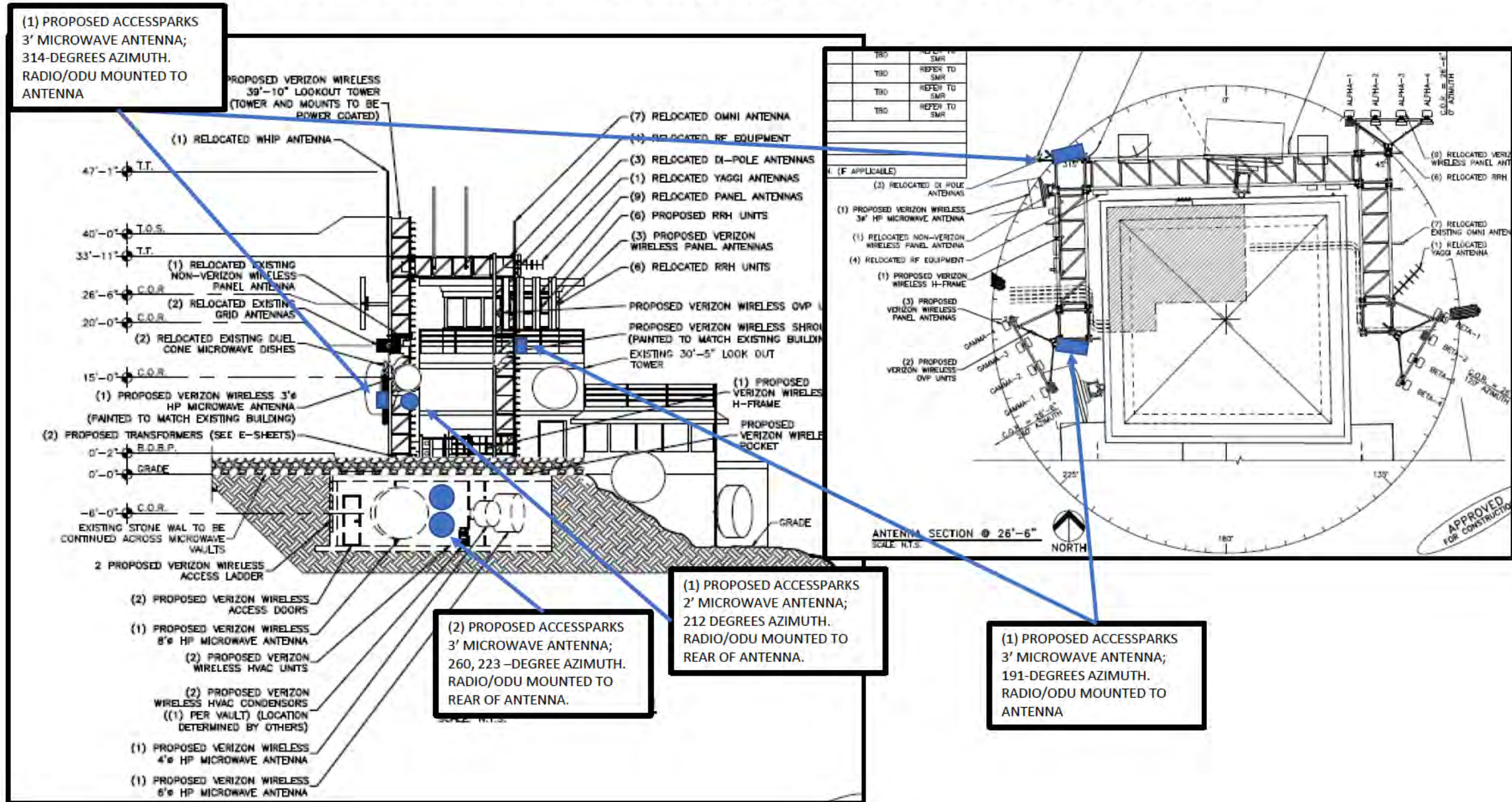
5. To Fishing Bridge

- (1) 3-ft antenna, [REDACTED] GHz, 162-deg azimuth
- Located in East Vault

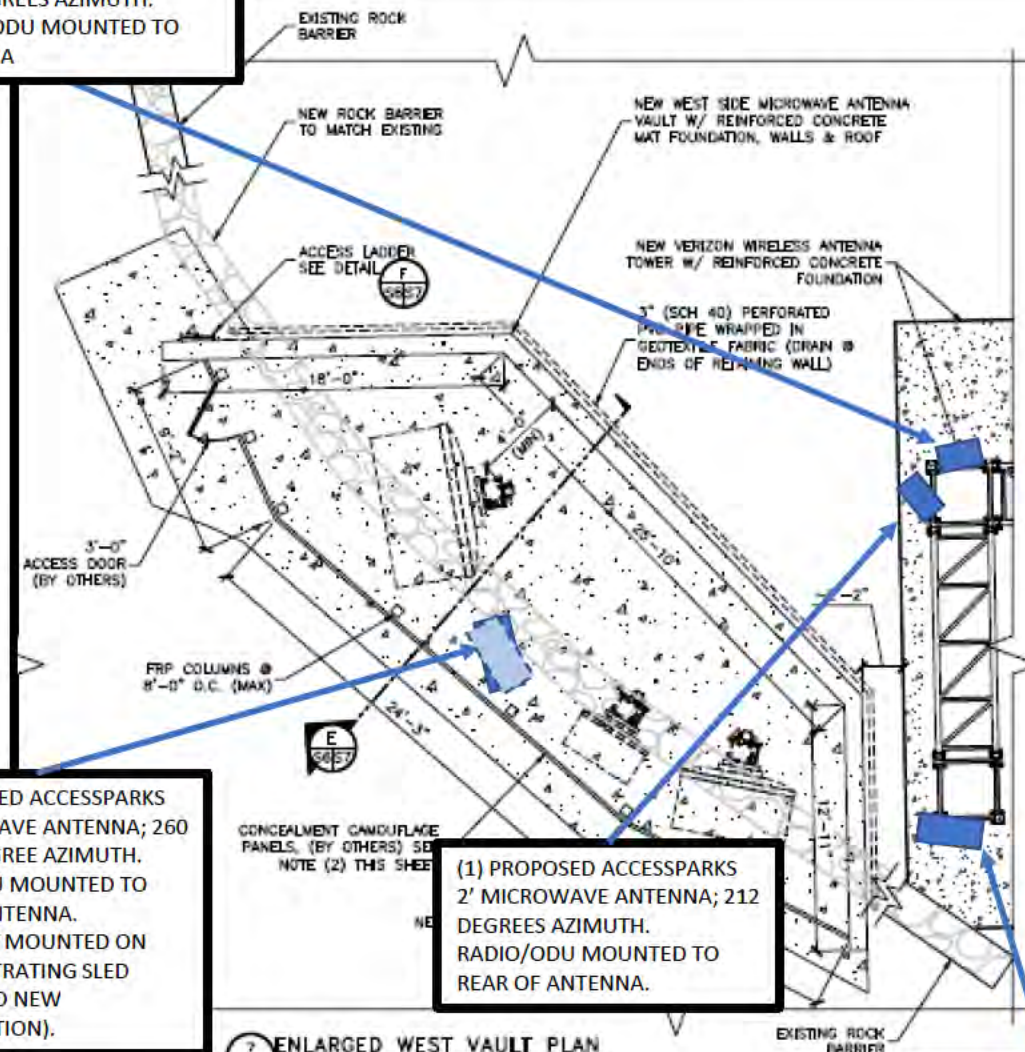
6. To Gardiner

- (1) 3-ft antenna, [REDACTED] GHz, 314-deg azimuth
- Located on lattice structure, 13-ft CL

Verizon Tower, West View; Proposed AccessParks Antennae



(1) PROPOSED ACCESSPARKS
3' MICROWAVE ANTENNA;
314-DEGREES AZIMUTH.
RADIO/ODU MOUNTED TO
ANTENNA

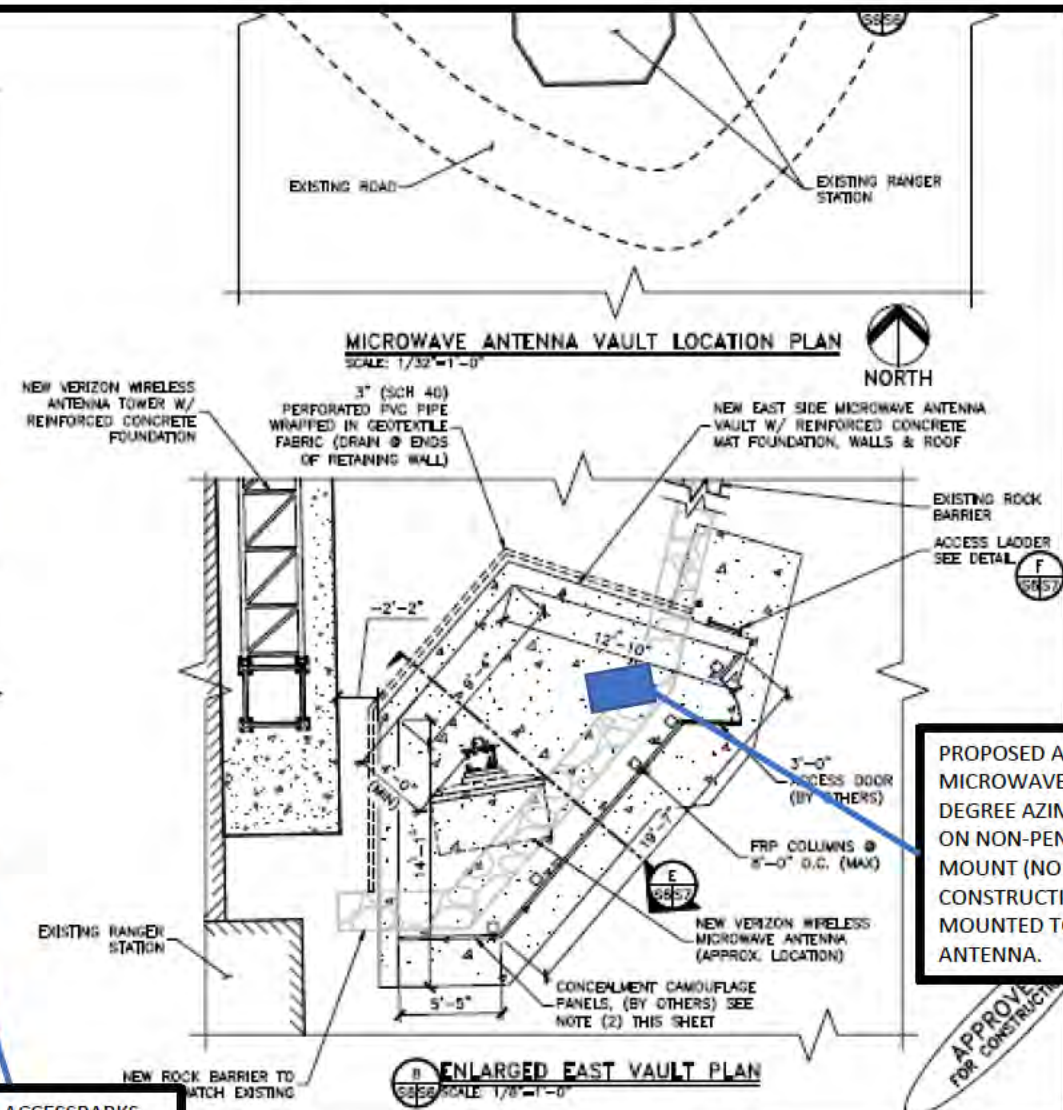


7 ENLARGED WEST VAULT PLAN
SCALE: 1/8" = 1'-0"

(2) PROPOSED ACCESSPARKS
3' MICROWAVE ANTENNA; 260
& 223 -DEGREE AZIMUTH.
RADIO/ODU MOUNTED TO
REAR OF ANTENNA.
VERTICALLY MOUNTED ON
NON-PENETRATING SLED
MOUNT (NO NEW
CONSTRUCTION).

(1) PROPOSED ACCESSPARKS
2' MICROWAVE ANTENNA; 212
DEGREES AZIMUTH.
RADIO/ODU MOUNTED TO
REAR OF ANTENNA.

(1) PROPOSED ACCESSPARKS
3' MICROWAVE ANTENNA;
191-DEGREE AZIMUTH.
RADIO/ODU MOUNTED INSIDE
SHELTER.

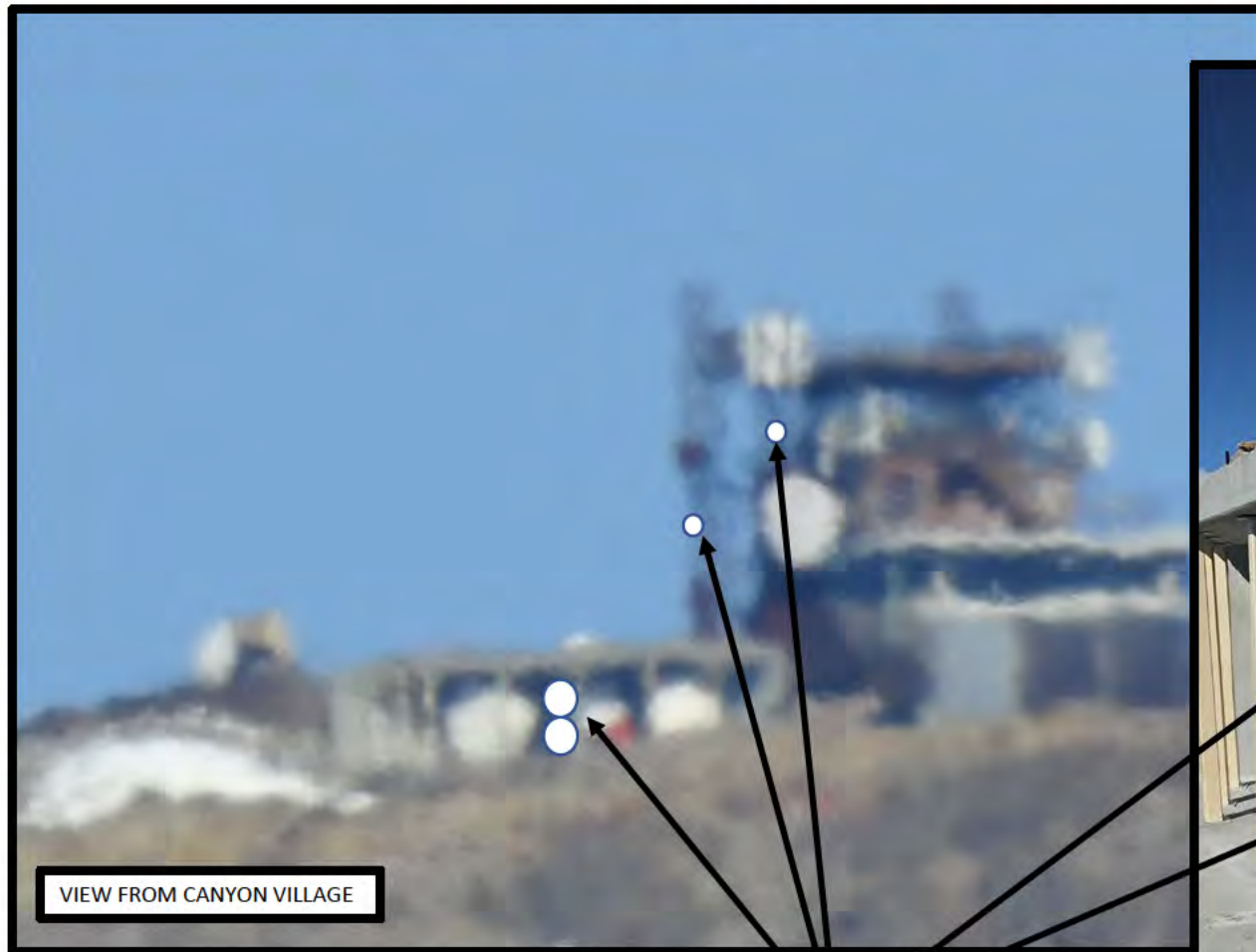


8 ENLARGED EAST VAULT PLAN
SCALE: 1/8" = 1'-0"

PROPOSED ACCESSPARKS 3'
MICROWAVE ANTENNA; 162-
DEGREE AZIMUTH. MOUNTED
ON NON-PENETRATING SLED
MOUNT (NO NEW
CONSTRUCTION). RADIO/ODU
MOUNTED TO REAR OF
ANTENNA.

APPROVE
FOR CONSTRUCTION

Verizon Tower, West View; Proposed AccessParks Antennae



WEST SIDE: PROPOSED FOUR
(4) ACCESSPARKS MICROWAVE
ANTENNAE.

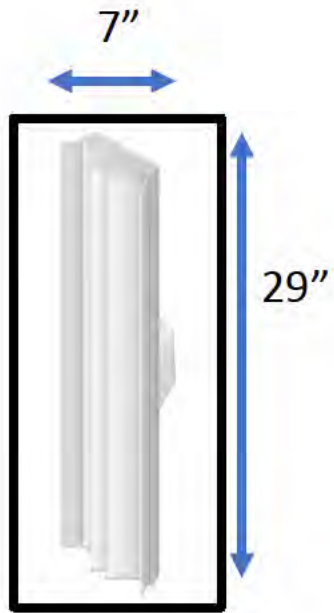
NOTE: TWO (2) EXTERIOR-
MOUNTED ANTENNAE TO BE
PAINTED TO MATCH
BACKGROUND



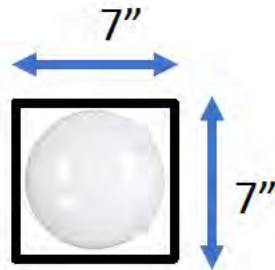
AccessParks

Typical Local Wireless Network Architecture

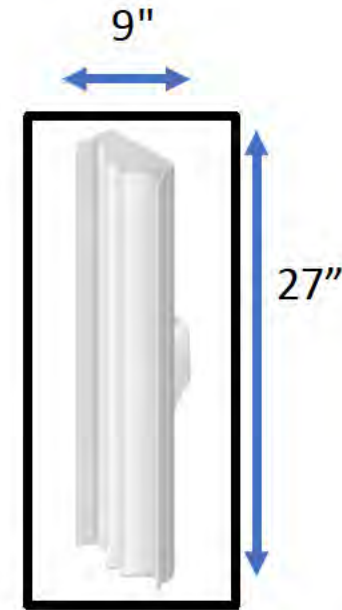
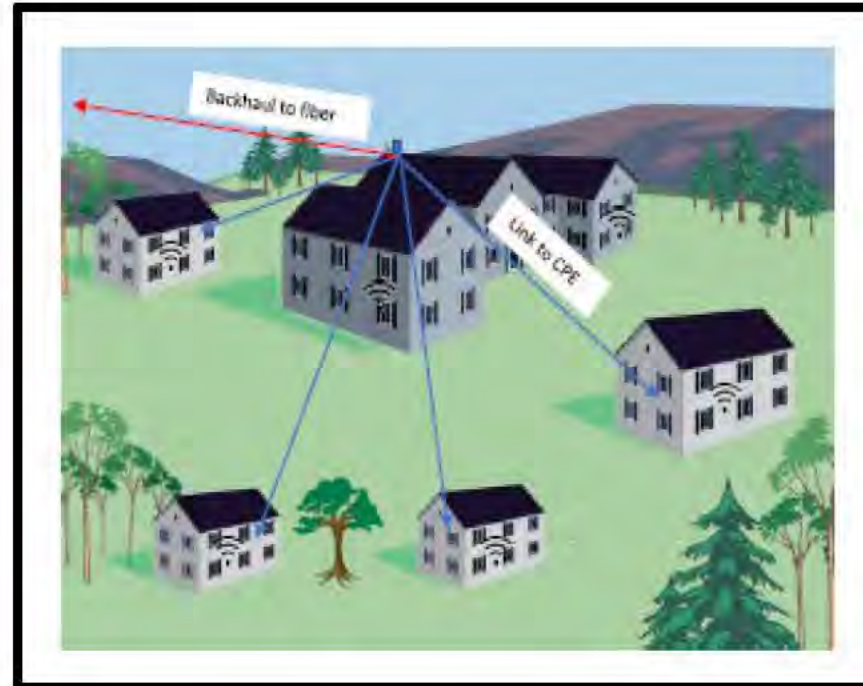
Point-to-Multipoint; Area Distribution



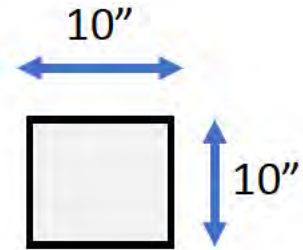
6GHz PMP Access Point; provides connectivity for 100 CPE



6GHz Customer Premises Equipment (CPE); one per building



5GHz PMP Access Point; provides connectivity for 100 CPE

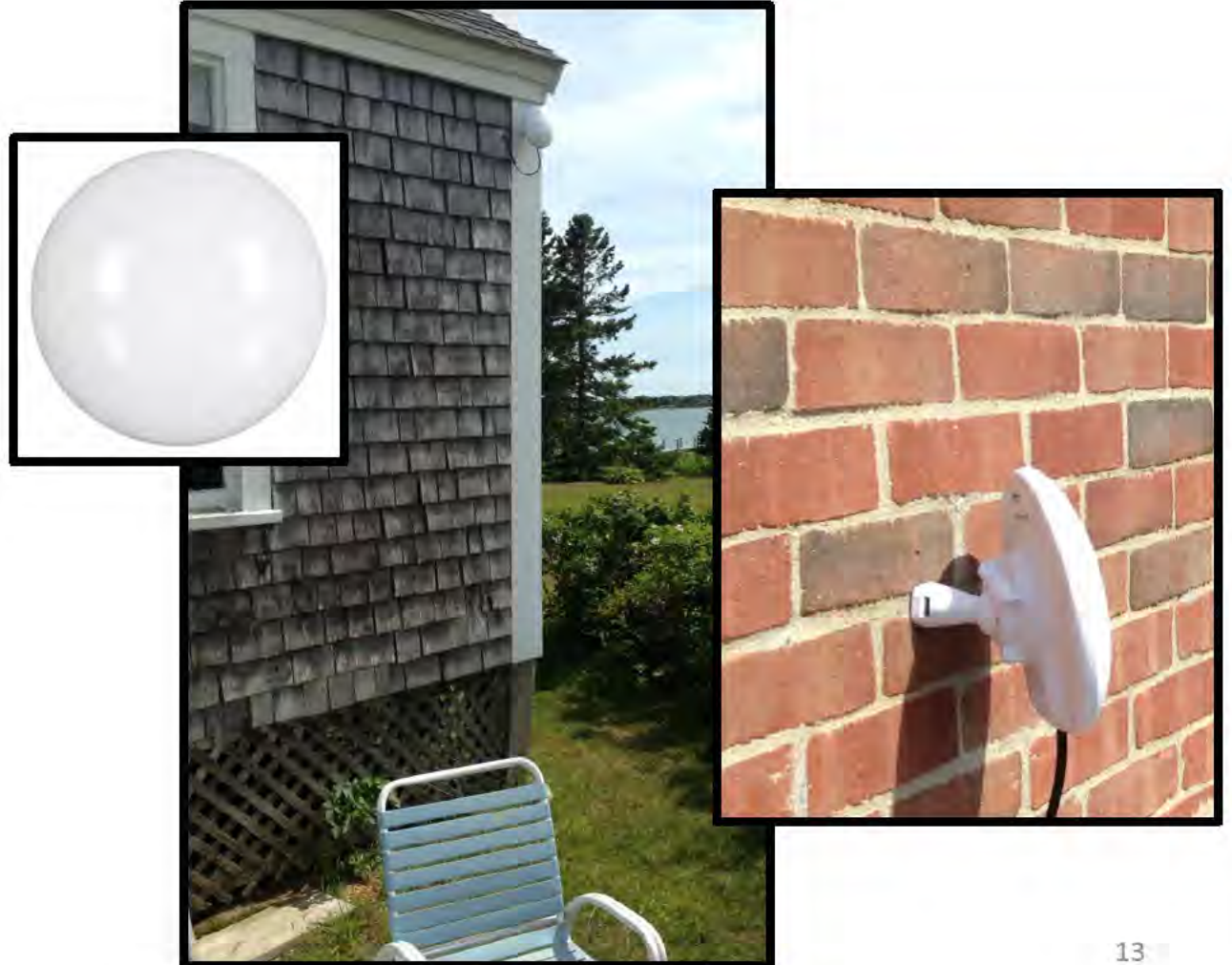


5GHz Customer Premises Equipment (CPE); one per building

■ GHz Licensed Point-to-Multipoint; Area Distribution

Customer Premises Equipment (CPE)

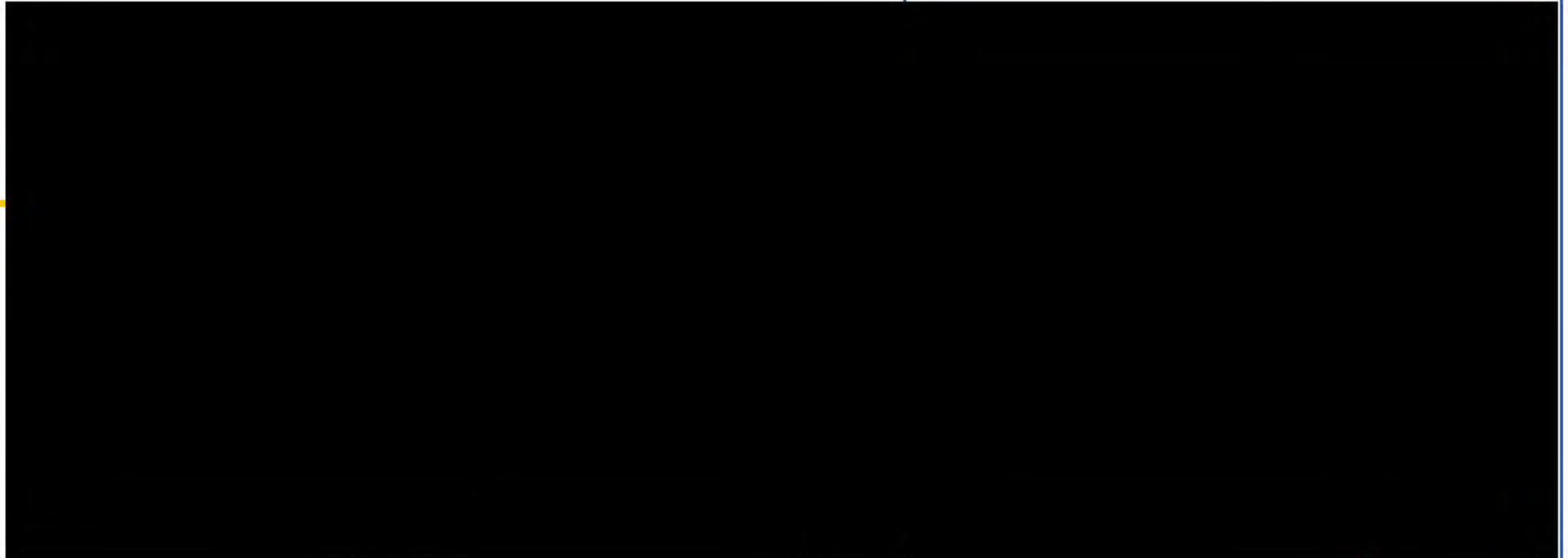
- 7" diameter
- One per building
- Mounted using one screw
- Painted to match wall
- Capacity of up to 500 Mbps
- ■ GHz; FCC Part 15 Compliant
- Powered through Ethernet cable from Wi-Fi router inside building (one cable for data and power). No new electrical service required.
- Ethernet cable to interior using existing wall penetrations



AccessParks Broadband; Lodge Coverage



Gigabit fiber-optic to Internet



Cabling Notes:

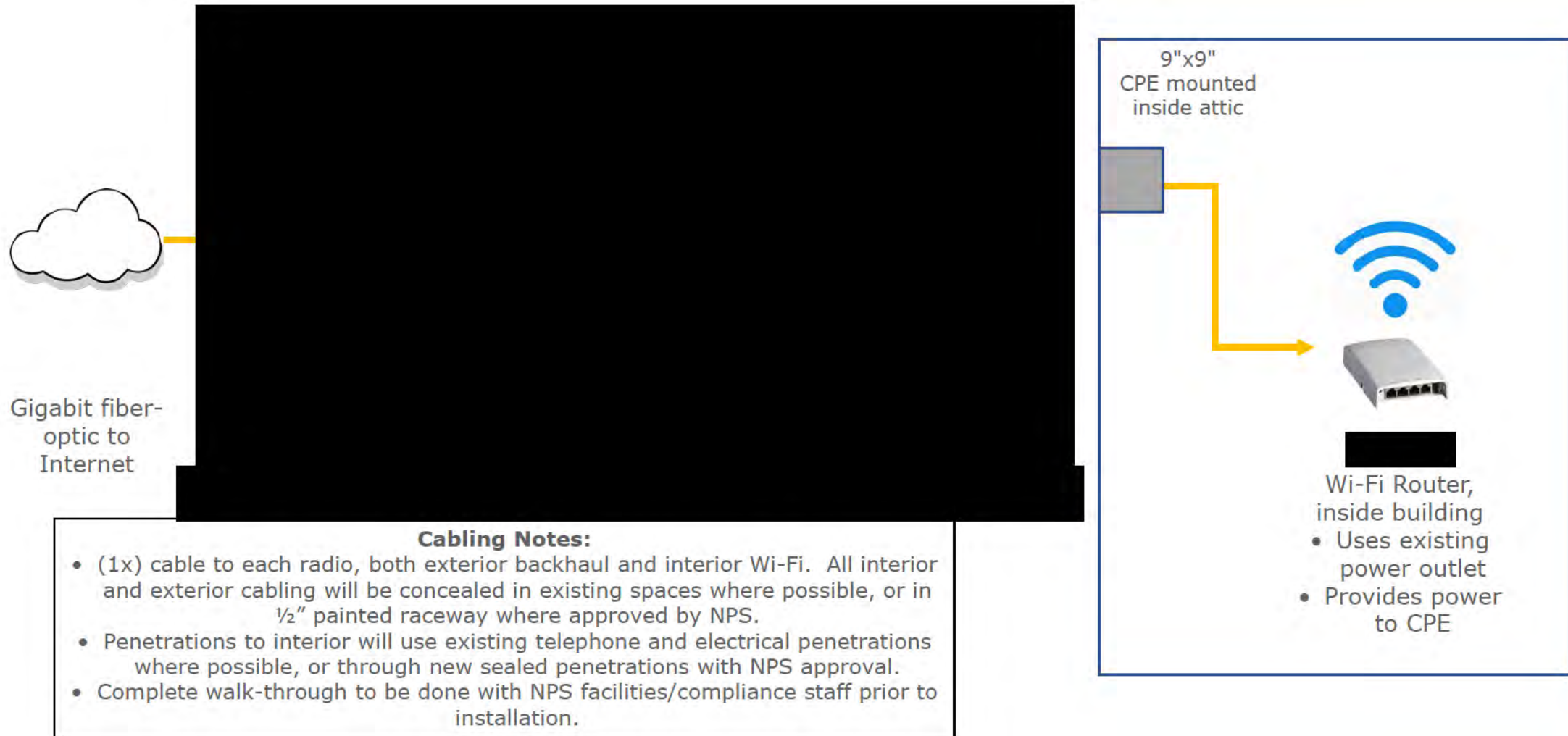
- (1x) cable to each radio, both exterior backhaul and interior Wi-Fi. All interior and exterior cabling will be concealed in existing spaces where possible, or in 1/2" painted raceway where approved by NPS.
- Penetrations to interior will use existing telephone and electrical penetrations where possible, or through new sealed penetrations with NPS approval.
- Complete walk-through to be done with NPS facilities/compliance staff prior to installation.



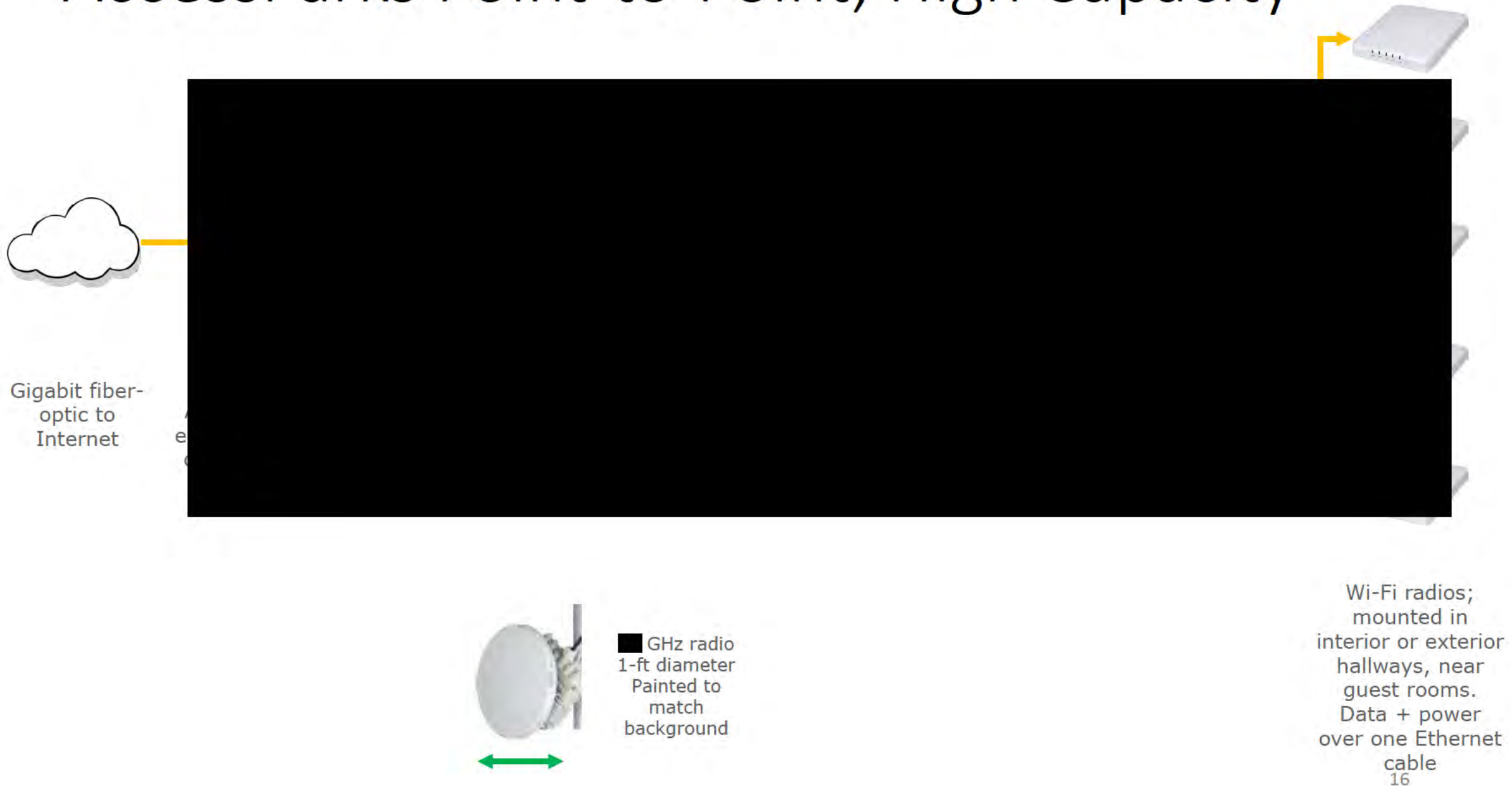
Wi-Fi radios; mounted in interior or exterior hallways, near guest rooms. Data + power over one Ethernet cable

AccessParks Broadband

Historic Cabin Coverage (no external CPE)



AccessParks Point-to-Point; High Capacity



■ GHz Point-to-Multipoint (PMP)



- ■ CPE is 7"x5"x3"
- Interference-free, due to .9-degree beamwidth
 - ■ Mbps (1 Gbps throughput per CPE)
 - ■ -ft range, Line of Sight, LOS
- Used for high-density buildings/lodges

Wi-Fi Access Points (APs)

In-Building Wi-Fi Access

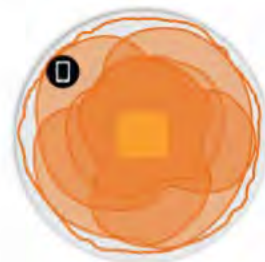


- Ceiling mounted, Power over Ethernet (PoE)
- 6.6"(L) x 6.49"(W) x 1.6"(H)
- 802.11n/ac, 2x2 MIMO beamforming antenna



- Wallplate mounted in lodge room Power over Ethernet (PoE)
- 3.54"(L) x 6.73"(W) x 1.14"(H)
- 802.11n/ac, 2x2 MIMO beamforming antenna

Figure 1. Example of BeamFlex+ pattern



Client Composite Pattern BeamFlex+

Figure 2. R510 2.4GHz Azimuth Antenna Patterns



Figure 3. R510 5GHz Azimuth Antenna Patterns



Figure 4. R510 2.4GHz Elevation Antenna Patterns



Figure 5. R510 5GHz Elevation Antenna Patterns



Public Safety – Indoor Localization

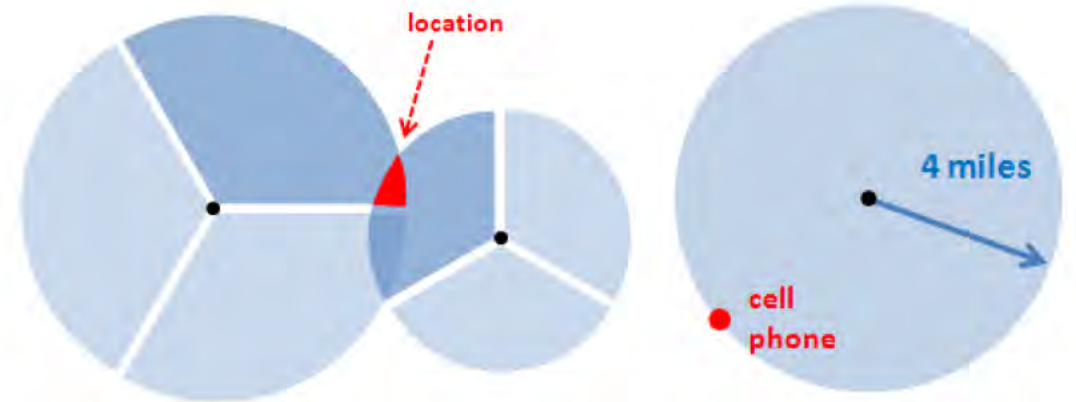
Problem:

Consumer telecom within national parks is limited to cellular, and usually only Verizon (2% of global devices). Cellular phones within parks only transmit home address to 911. Calls to 911 within the park must be triangulated from cell towers, and have **3/4 –mile accuracy, in two dimensions**. This adds precious minutes to EMS response time.

Solution:

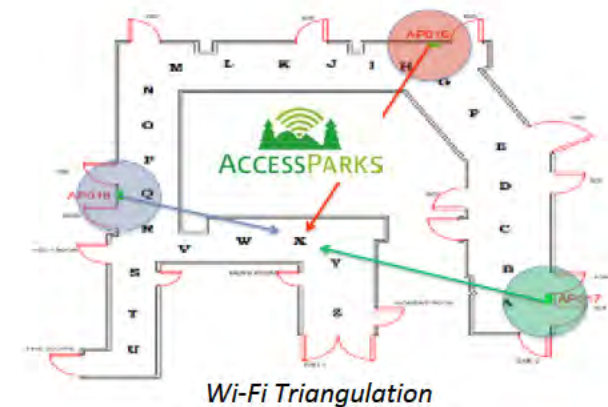
Wi-Fi Positioning System (WiPS) from AccessParks. Next-Generation E911 (NGE911)-compliant, with every Wi-Fi radio as a registered location in national database. Instant geolocation of cellular 911 caller, to within **15 feet and identifying the floor of the caller (z-axis)**. GIS information is automatically sent to the Public Safety Access Point (PSAP) for 100% coverage of visitors.

AccessParks Wi-Fi is Passpoint-enabled for carrier-neutral data and phone offloading to AT&T, Sprint, Verizon, T-Mobile, etc.



Cell phone detected within a certain distance of two cell towers with directional antennae.

Cell phone detected within a certain distance of a single tower.



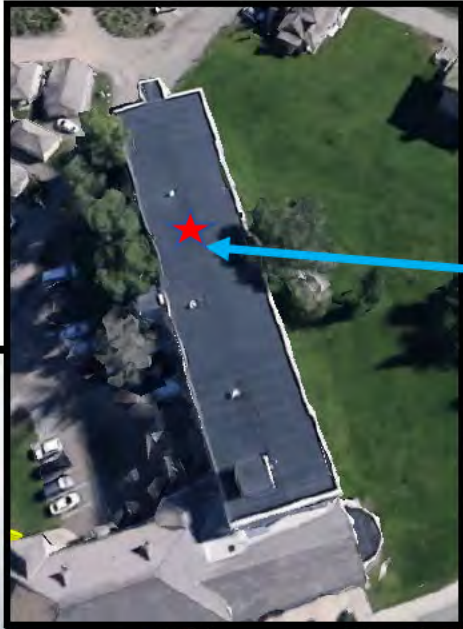
AccessParks
Proposed Network Architecture;
Yellowstone National Park

Mammoth Hot Springs – Existing Wireless Coverage (known)



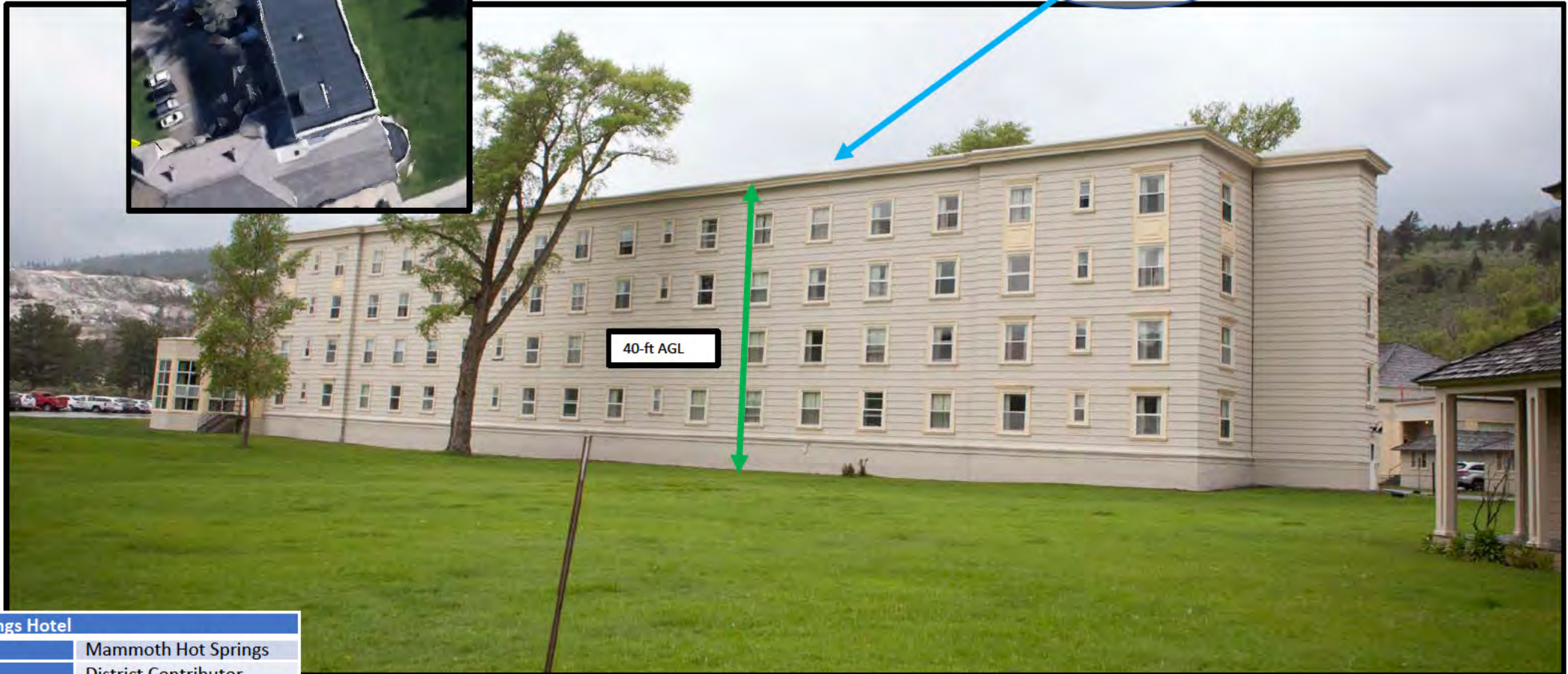
Mammoth Hot Springs – Proposed Wireless Coverage





Cylindrical RF-transparent Screenwall

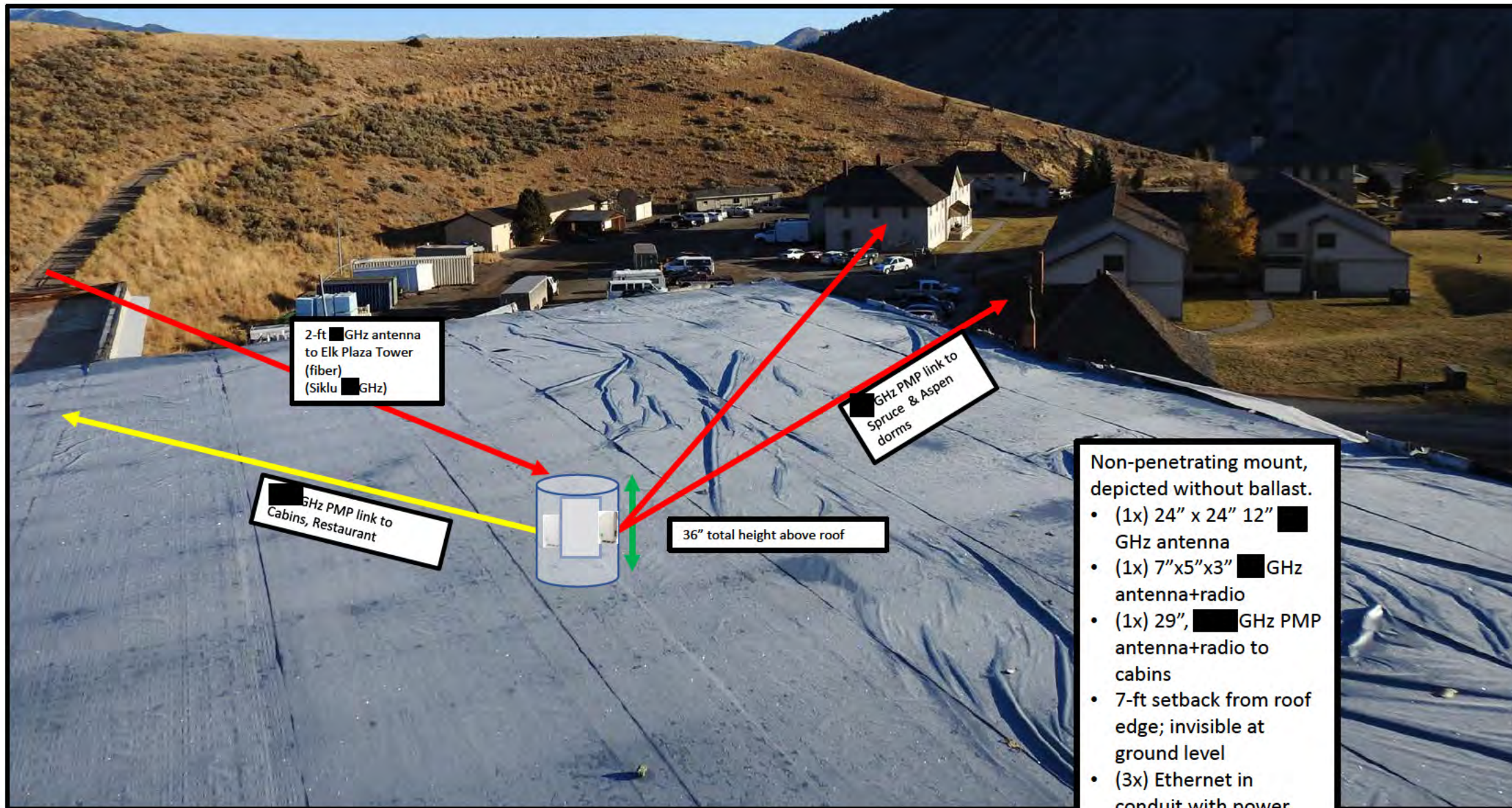
- 36" total height above roof, 24" diameter
- Color matched to background; RGB Color Code: 238, 239, 244



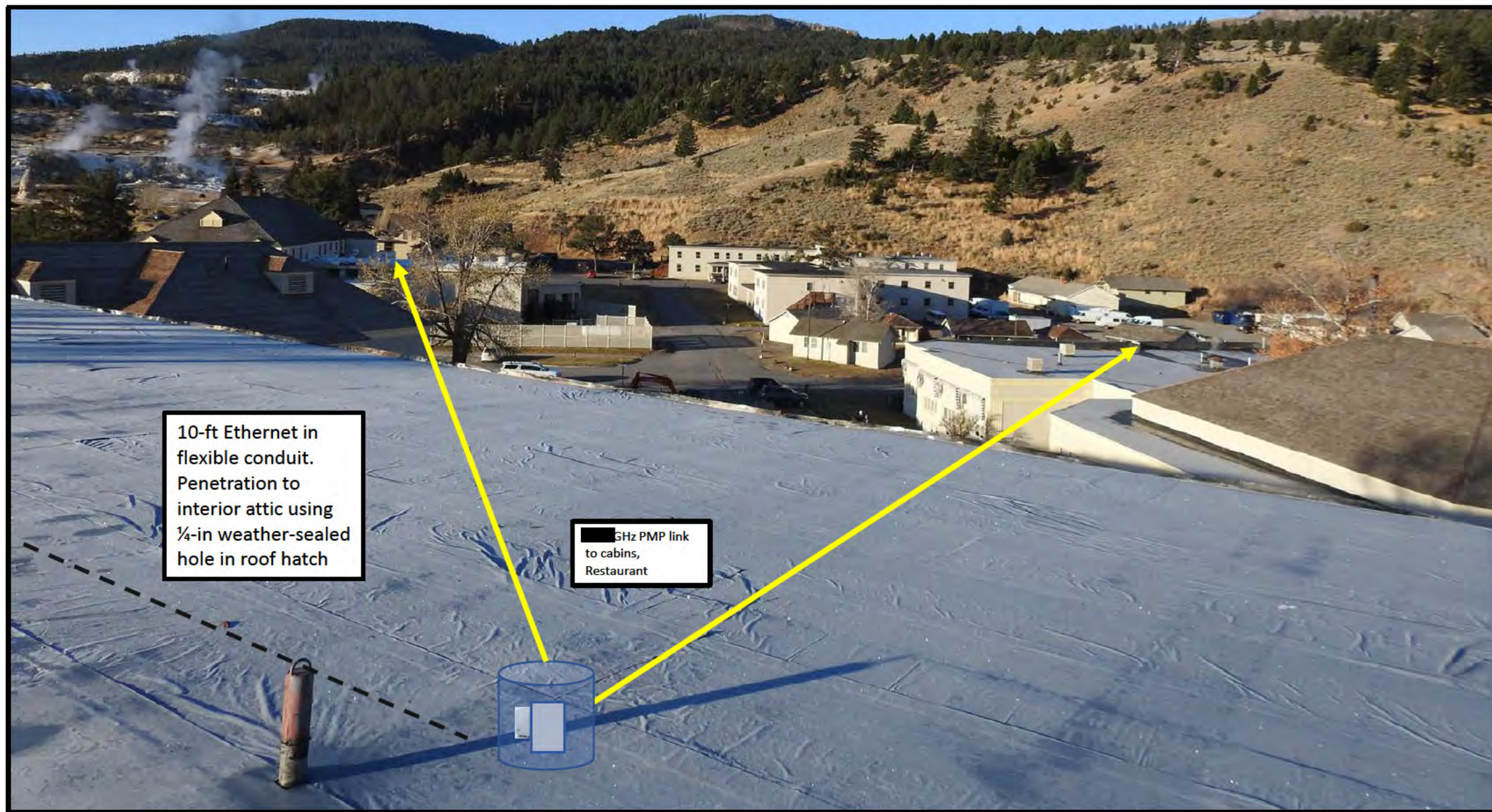
40-ft AGL

Mammoth Hot Springs Hotel	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributor
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes

Mammoth Hot Springs Hotel
Coordinates: Coord: 44.9768N, -110.7014W



Mammoth Hot Springs Hotel



10-ft Ethernet in flexible conduit. Penetration to interior attic using 1/4-in weather-sealed hole in roof hatch

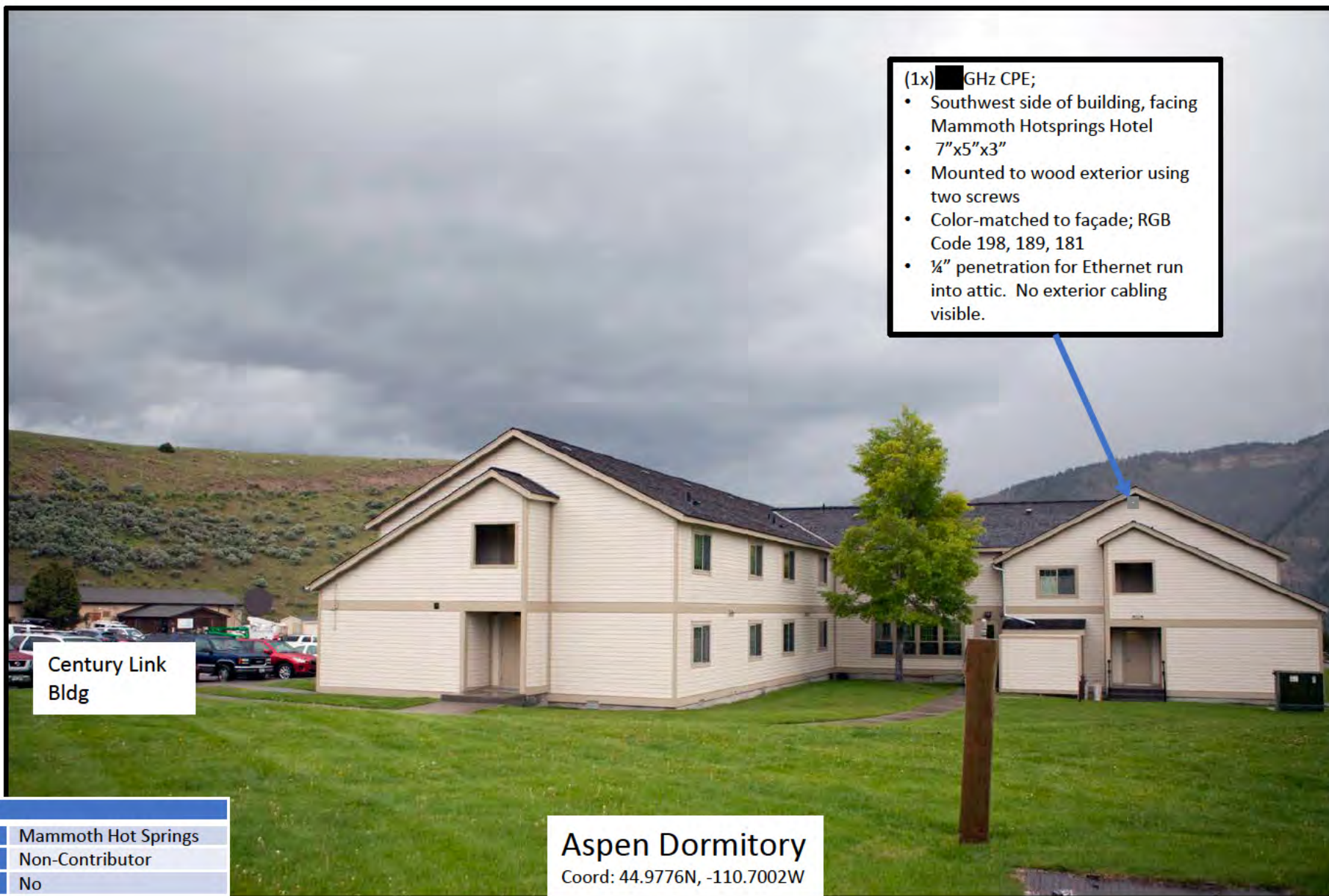
5GHz PMP link to cabins, Restaurant

Mammoth Hot Springs Hotel



Ethernet in flexible conduit. Penetration to interior attic using 1/4-in weather-sealed hole in roof hatch frame

Mammoth Hot Springs Hotel

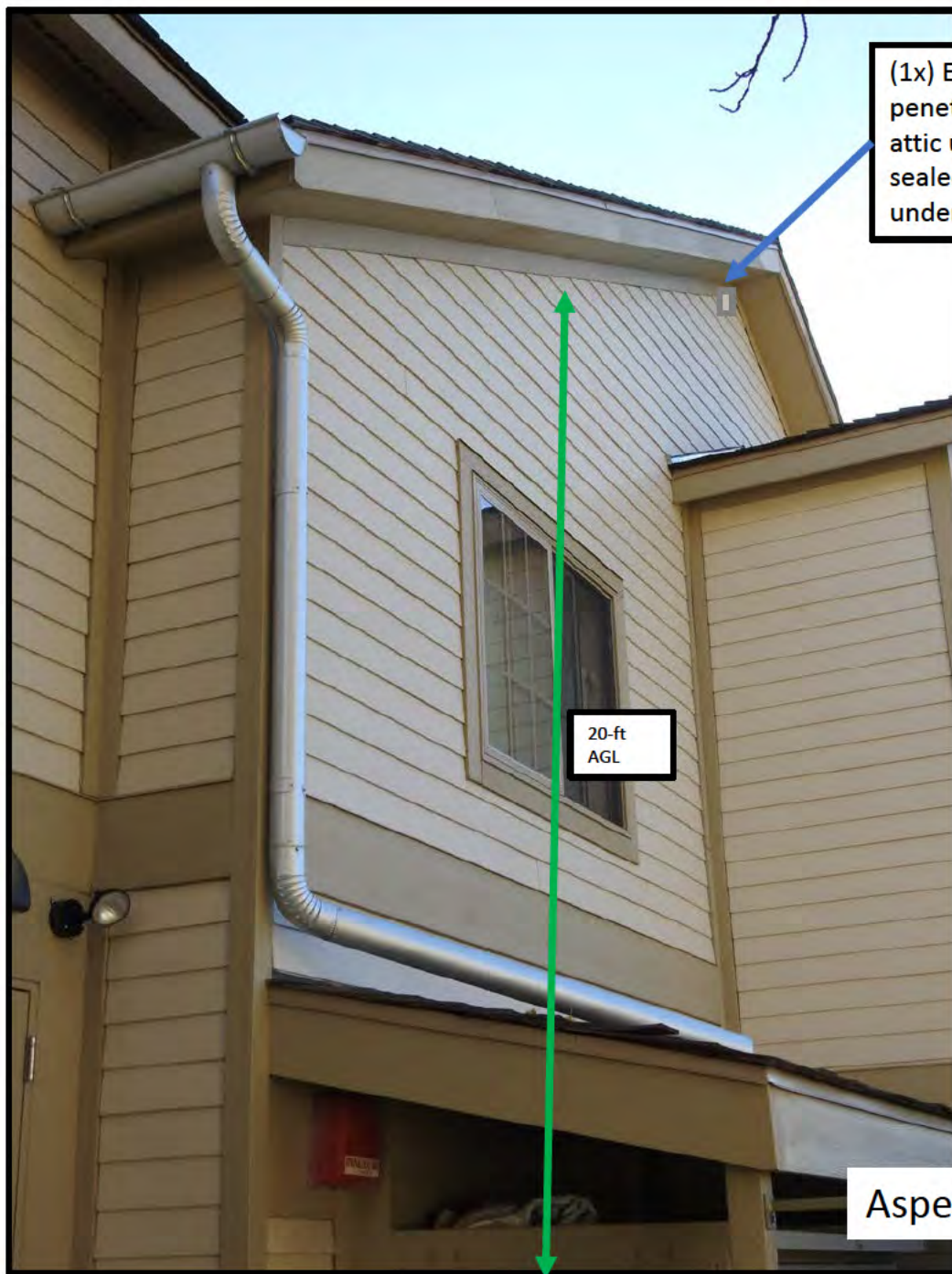


Century Link
Bldg

- (1x) █ GHz CPE;
- Southwest side of building, facing Mammoth Hotsprings Hotel
 - 7"x5"x3"
 - Mounted to wood exterior using two screws
 - Color-matched to façade; RGB Code 198, 189, 181
 - ¼" penetration for Ethernet run into attic. No exterior cabling visible.

Aspen Dormitory	
Area	Mammoth Hot Springs
NRHP Eligibility	Non-Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Aspen Dormitory
Coord: 44.9776N, -110.7002W



(1x) Ethernet to interior;
penetration to interior
attic using ¼-in weather-
sealed hole in siding,
under eave.

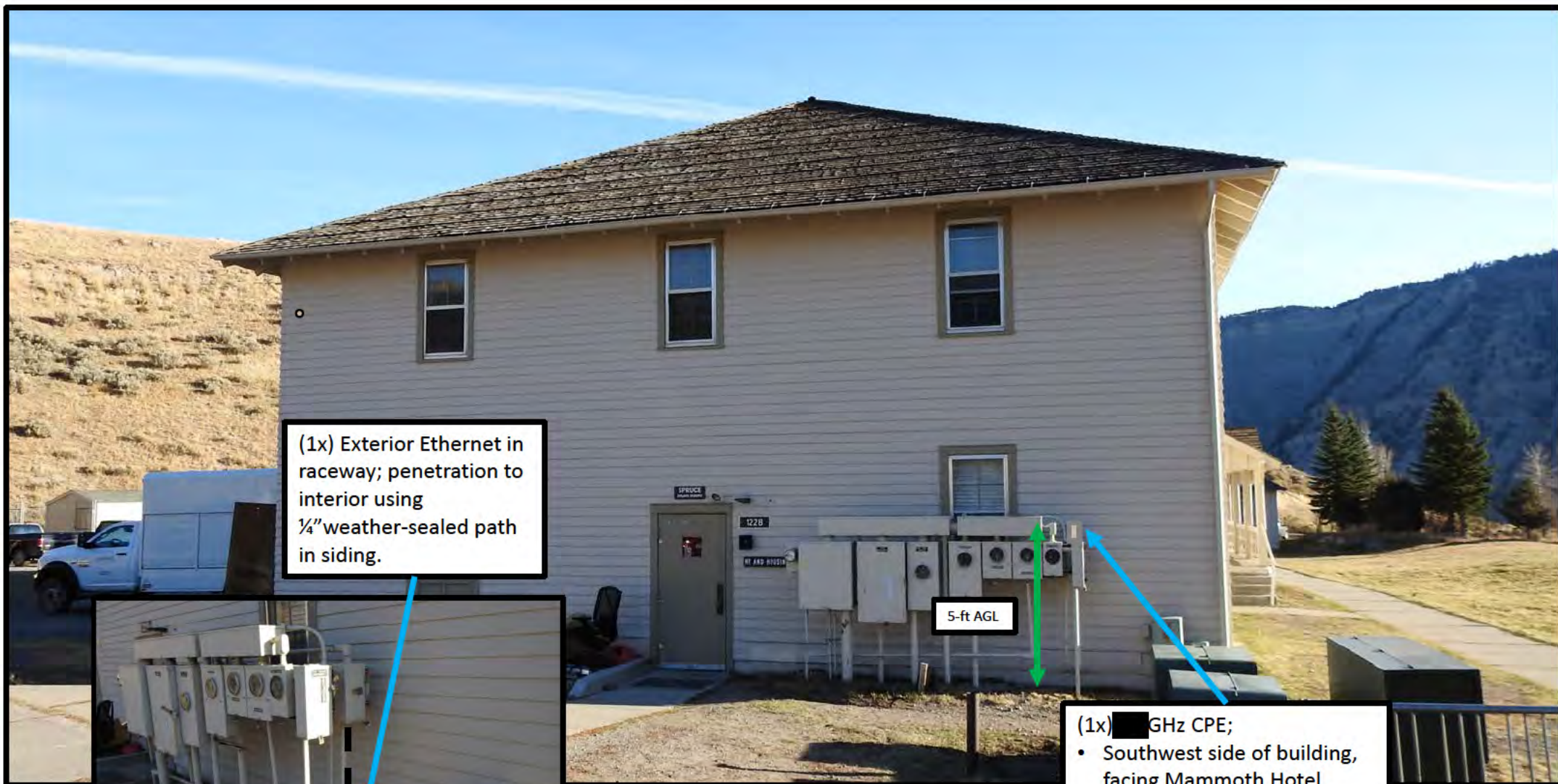
20-ft
AGL

Aspen Dormitory

Wi-Fi Access Points

- Mounted to metal T-bars
- PoE Ethernet cabling run inside dropped ceiling to switch in closet.

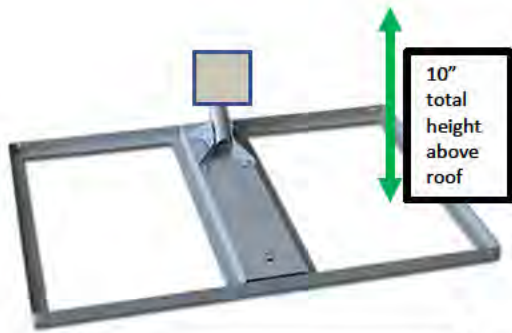




Spruce Dormitory	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

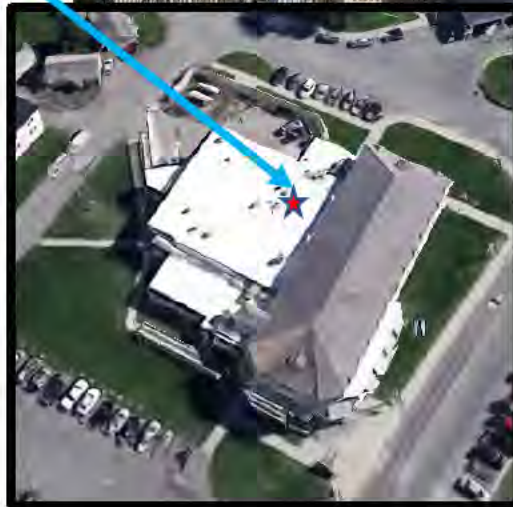
Spruce Dormitory

Coords: 44.9780N, -110.7001W



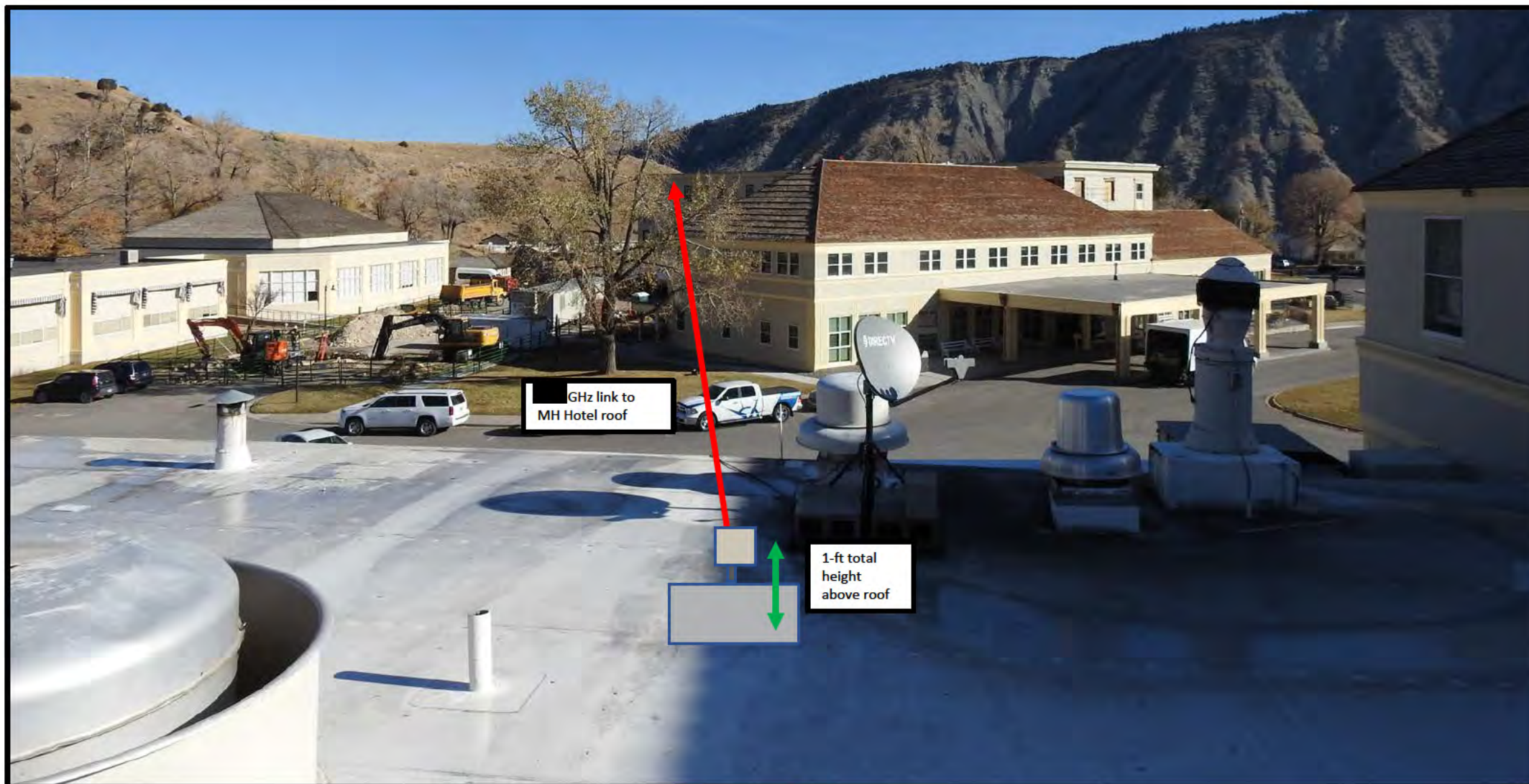
Non-penetrating mount, depicted without ballast.

- (1x) 9"x9"x3" XXXX GHz radio
- Setback 10-ft from roof edge; invisible to ground level
- All equipment painted to match background
- Ethernet with power from interior switch



Restaurant Building

Restaurant	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributor
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	No



Restaurant Building
Rooftop with existing wireless equipment



Restaurant Building

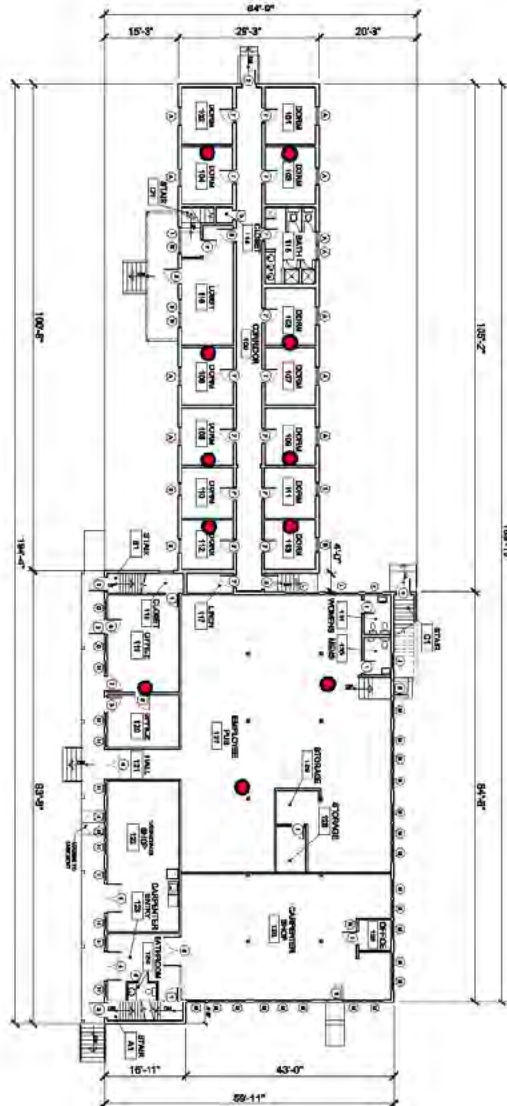


Lodgepole Dormitory
(existing fiber-optic
backhaul)

Lodgepole Dormitory	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

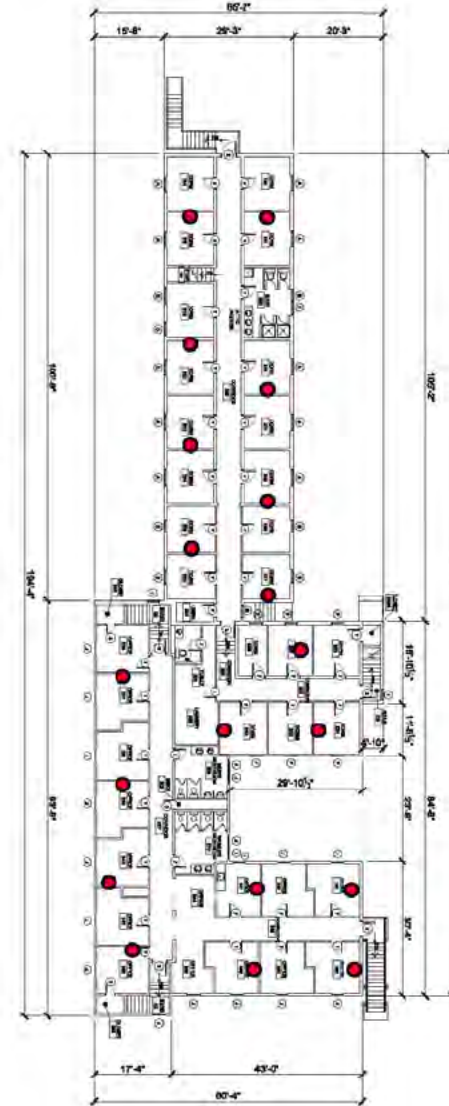
Lodgepole Dormitory APs – Floor 1

Total Access Points:
11



Lodgepole Dormitory APs – Floor 2

Total Access Points:
19



Wi-Fi AP Placement

- One AP per two rooms, located in rooms, ceiling mounted
- Ethernet cabling in 2" raceway in hallways

Lodgepole Dormitory



- Ethernet (x1) in 2" raceway, run in corner on both sides of hallway.
- All equipment painted to match background

AP Placement:

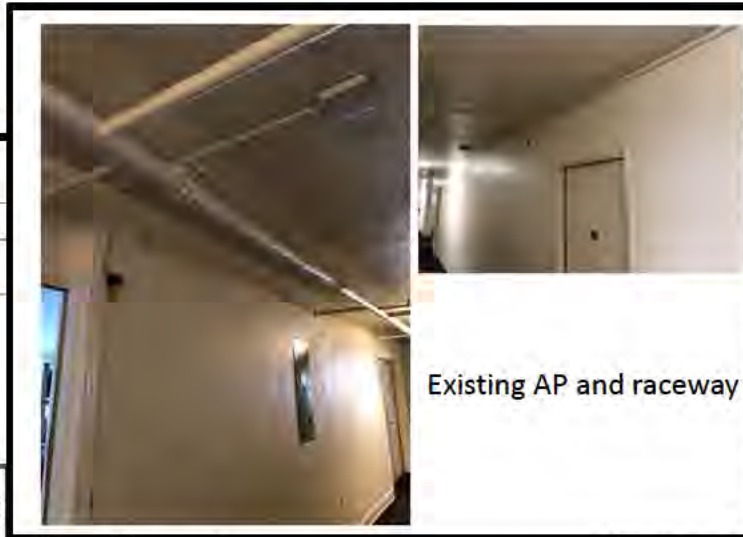
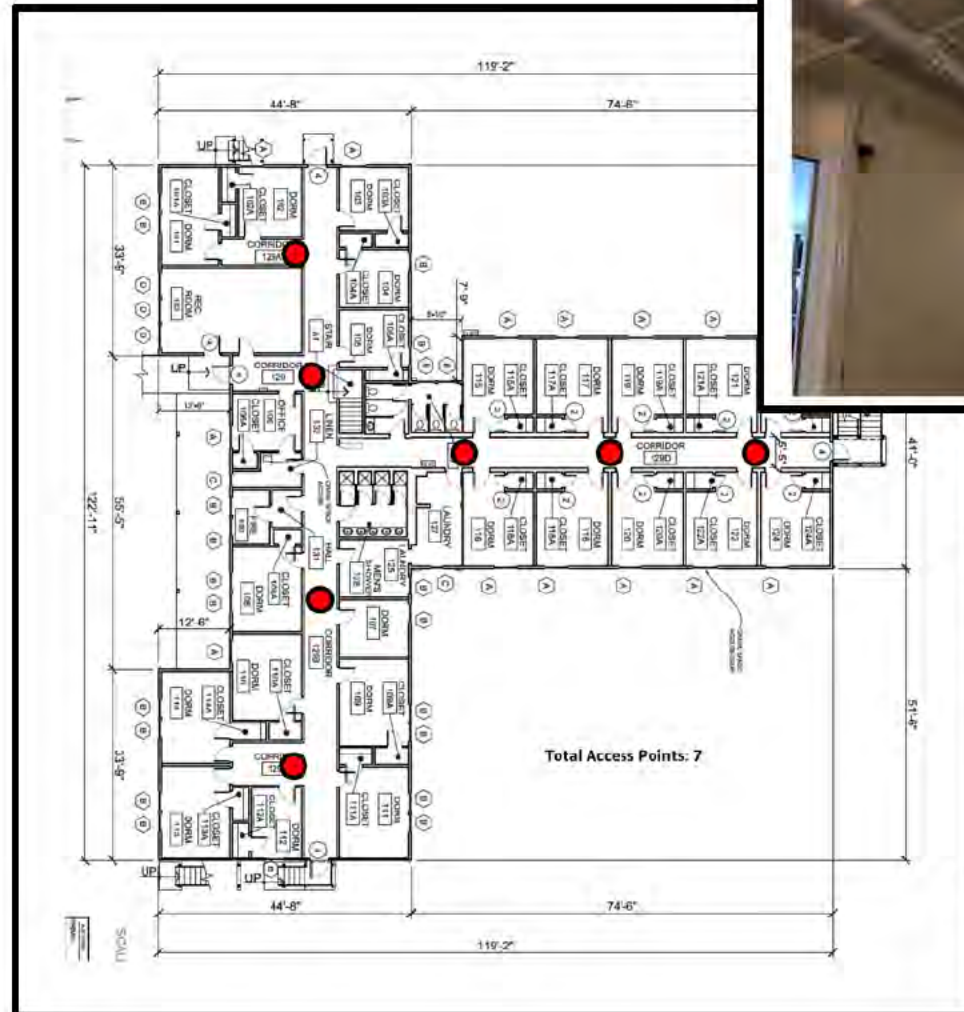
- ¼" wall penetration to ceiling AP location Inside rooms
- Ceiling mounted in room, next to wall; no visible raceway
- 2 rooms per AP

Lodgepole Dormitory



Juniper Dormitory
(existing fiber-optic backhaul)

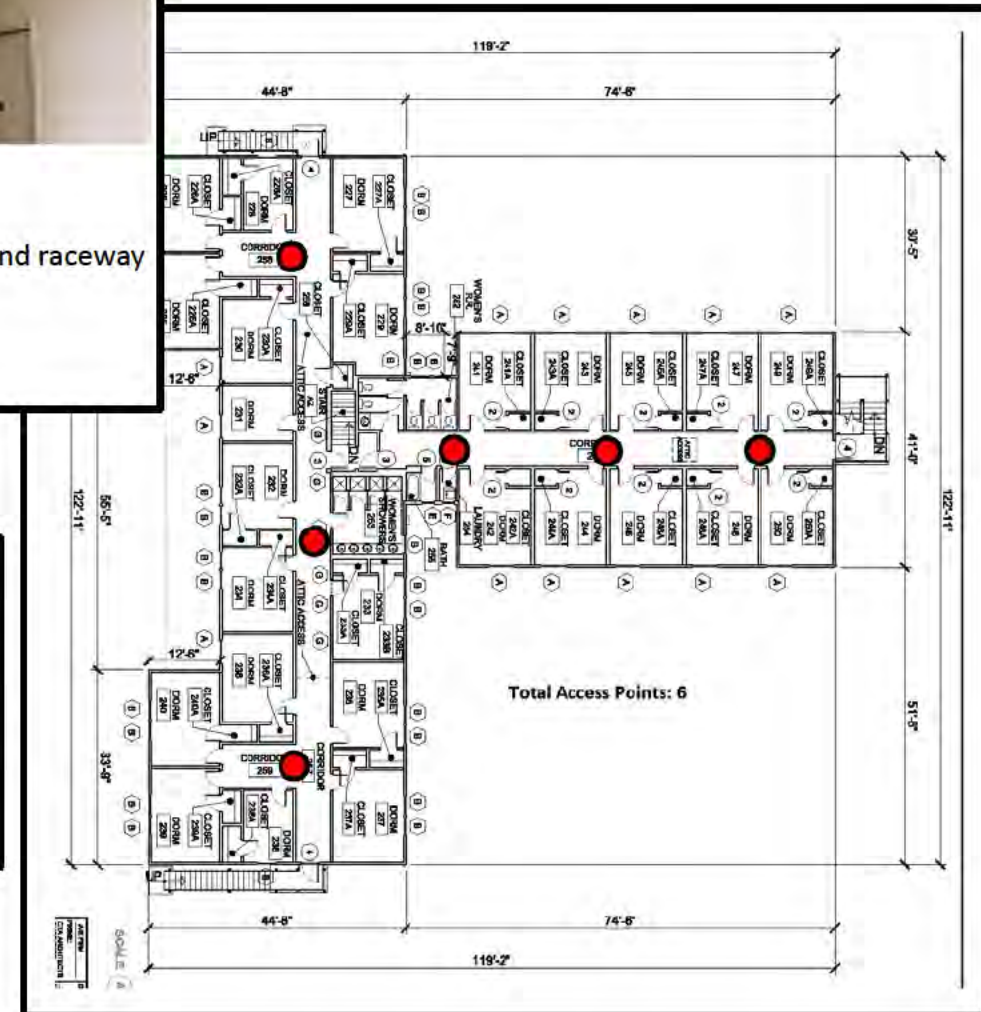
Juniper Dormitory	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No



Existing AP and raceway

AP Placement:

- In hallways
- Ceiling mounted
- 4 rooms per AP
- Existing 1" Ethernet in raceway to be extended, color matched



Juniper Dormitory



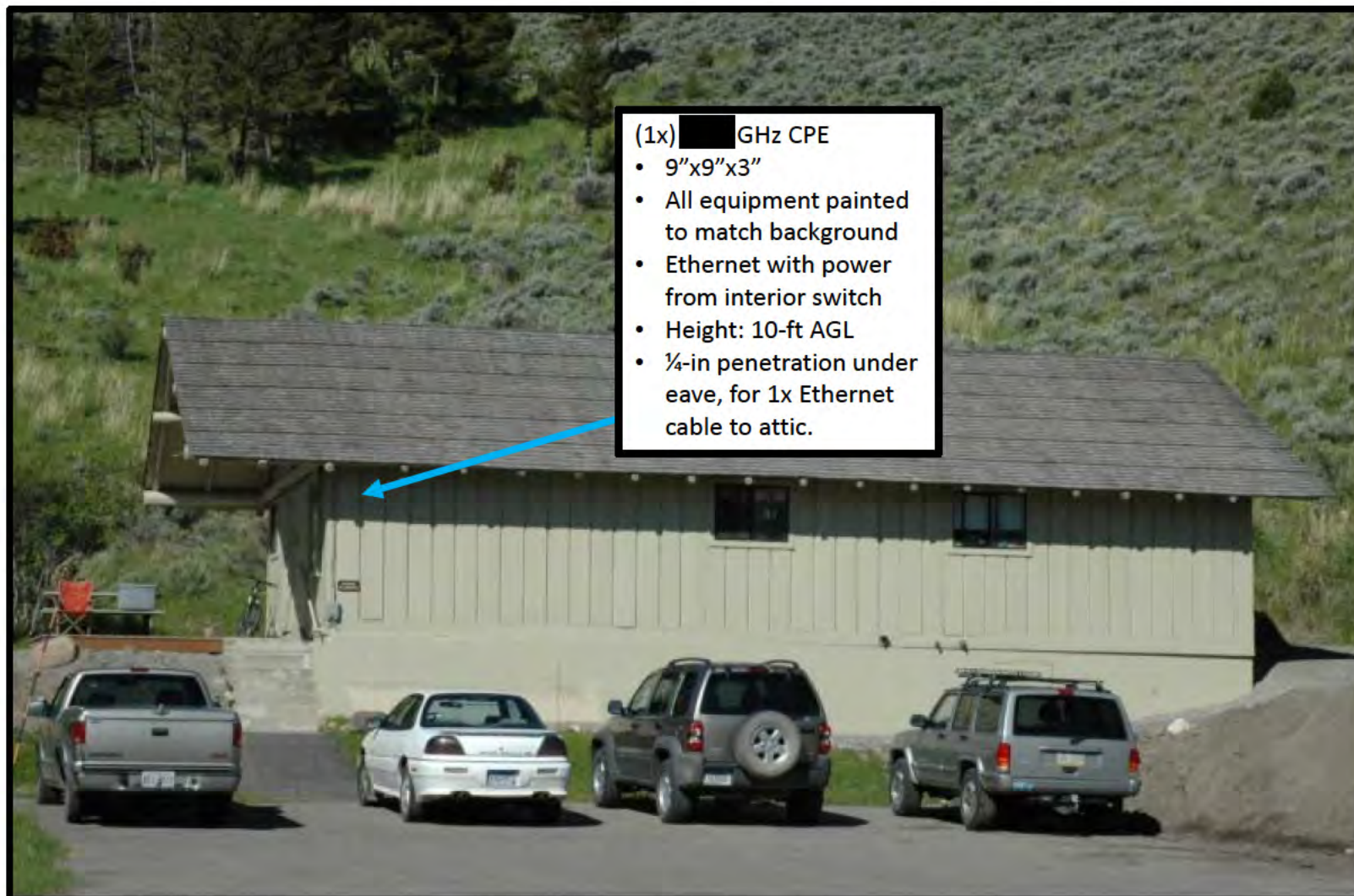
Mammoth Hot Springs Guest Cabins (x97)

Coordinates: 44.977N, -110.703W

Mammoth Hot Springs Guest Cabins	
Area	Mammoth Hot Springs
NRHP Eligibility	District Contributors
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No



Mammoth Hot Springs Hotel; Cabins (typical)
(x97)



Hamilton Dormitory/YPSS

Coordinates: 44.977N, -110.704W

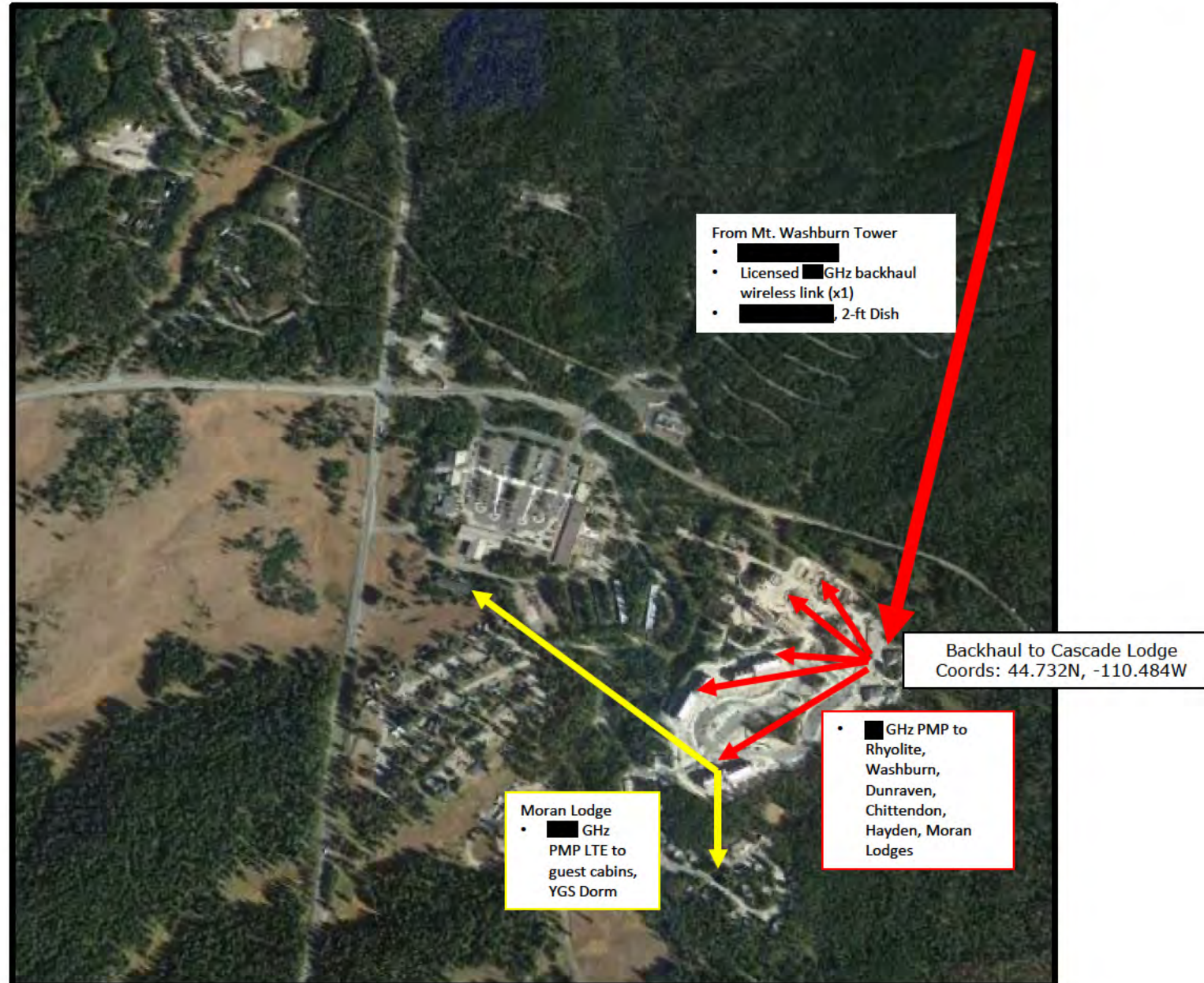
YPSS Dormitory	
Area	Mammoth Hot Springs
NRHP Eligibility	Non-Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Canyon Village

Canyon Village Area Existing Wireless Coverage (known)



Canyon Village Area; Proposed Wireless Coverage



Canyon Village Area – Proposed Building Coverage



- Canyon Village Lodge
- YGS Dormitory
- Bighorn Dormitory
- Wapiti Dormitory
- Grizzly Dormitory
- Rhyolite Lodge
- Washburn Lodge
- Bison Dormitory
- Cascade Lodge
- Dunraven Lodge
- Chittendon Lodge
- Hayden Lodge
- Moran Lodge
- Canyon Village Lodge Cabins



Canyon Lodge

Backhaul using existing fiber

Coords: 44.734, -110.490

Canyon Lodge	
Area	Canyon Village
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

Canyon Lodge

Existing fiber backhaul to building



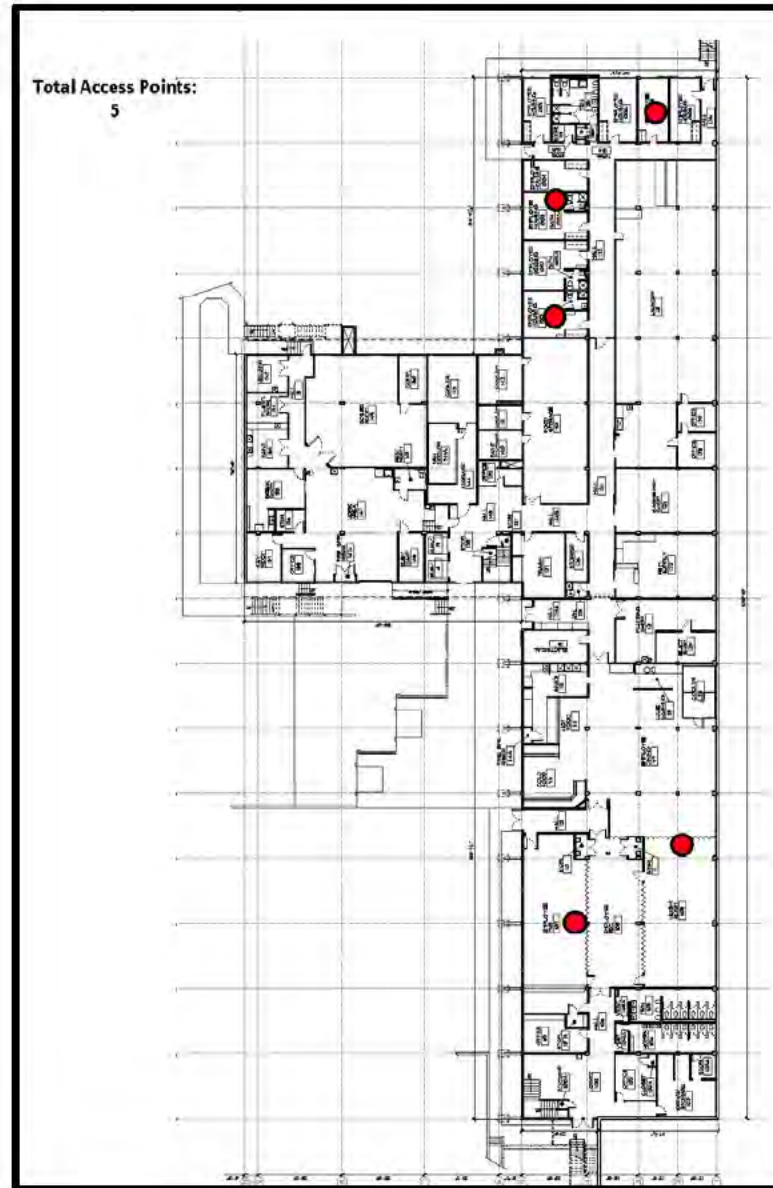
Wi-Fi radios in hallways

- 6"x6"x2" Wi-Fi AP
- All radios painted to match background
- Ethernet with power from interior switch in crawlspace above
- Cabling secured in crawlspace; no exposed cabling/raceway
- ¼-in penetration in ceiling for Ethernet cable to attic.

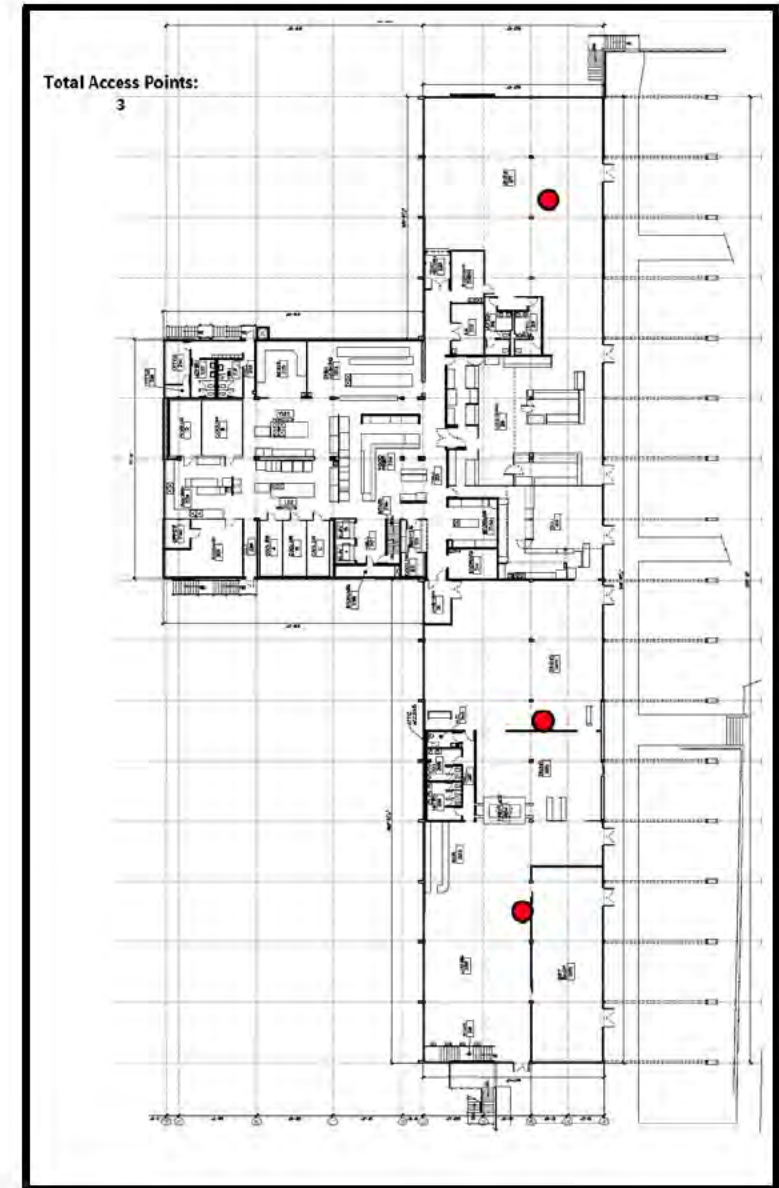


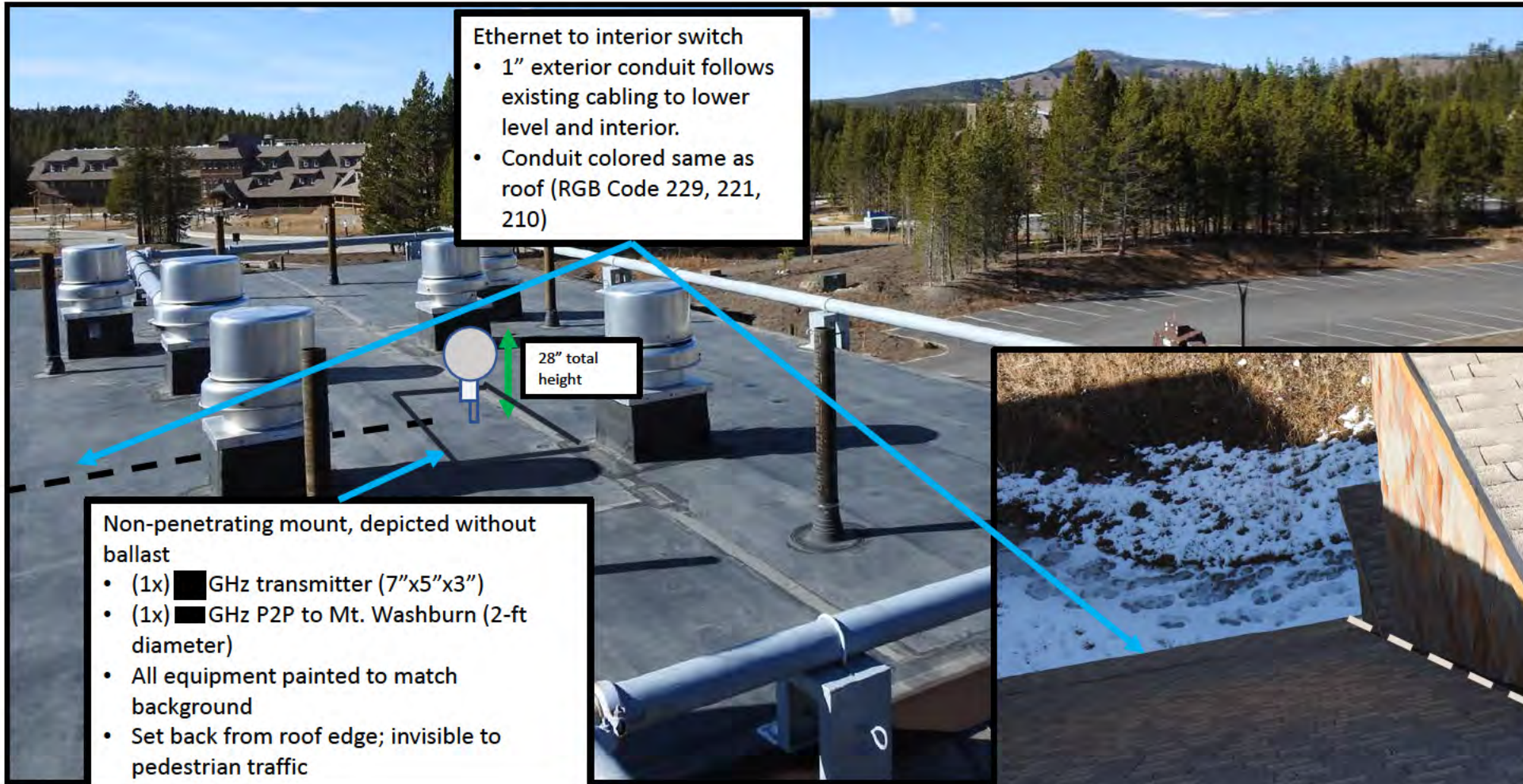
Access to crawlspace

Canyon Lodge APs – Floor 1



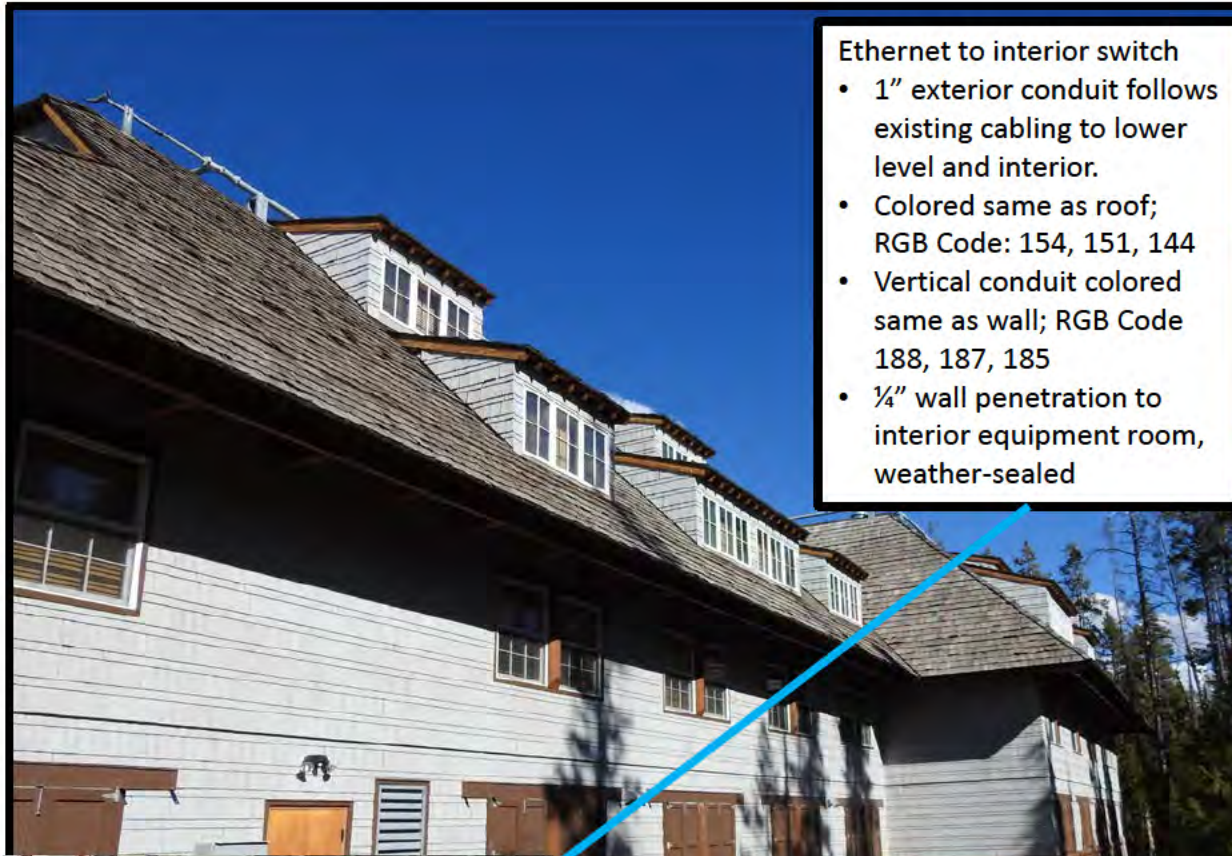
Canyon Lodge APs – Floor 2



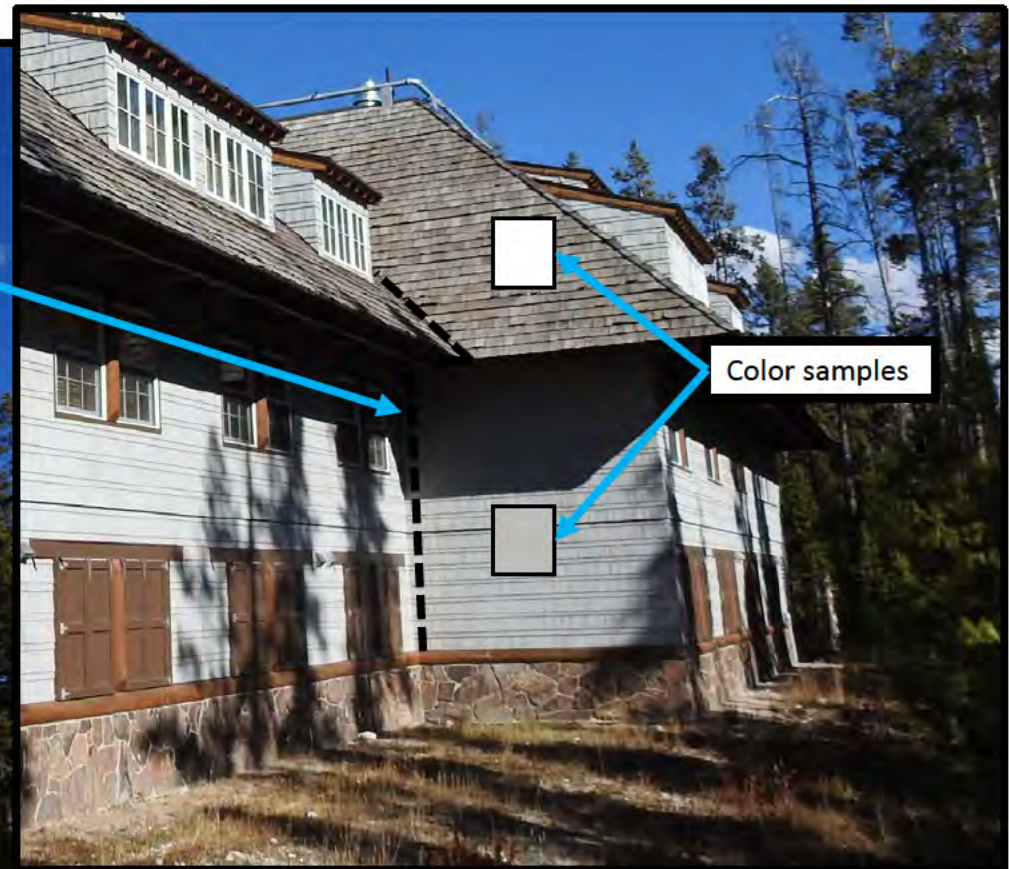


Cascade Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	No

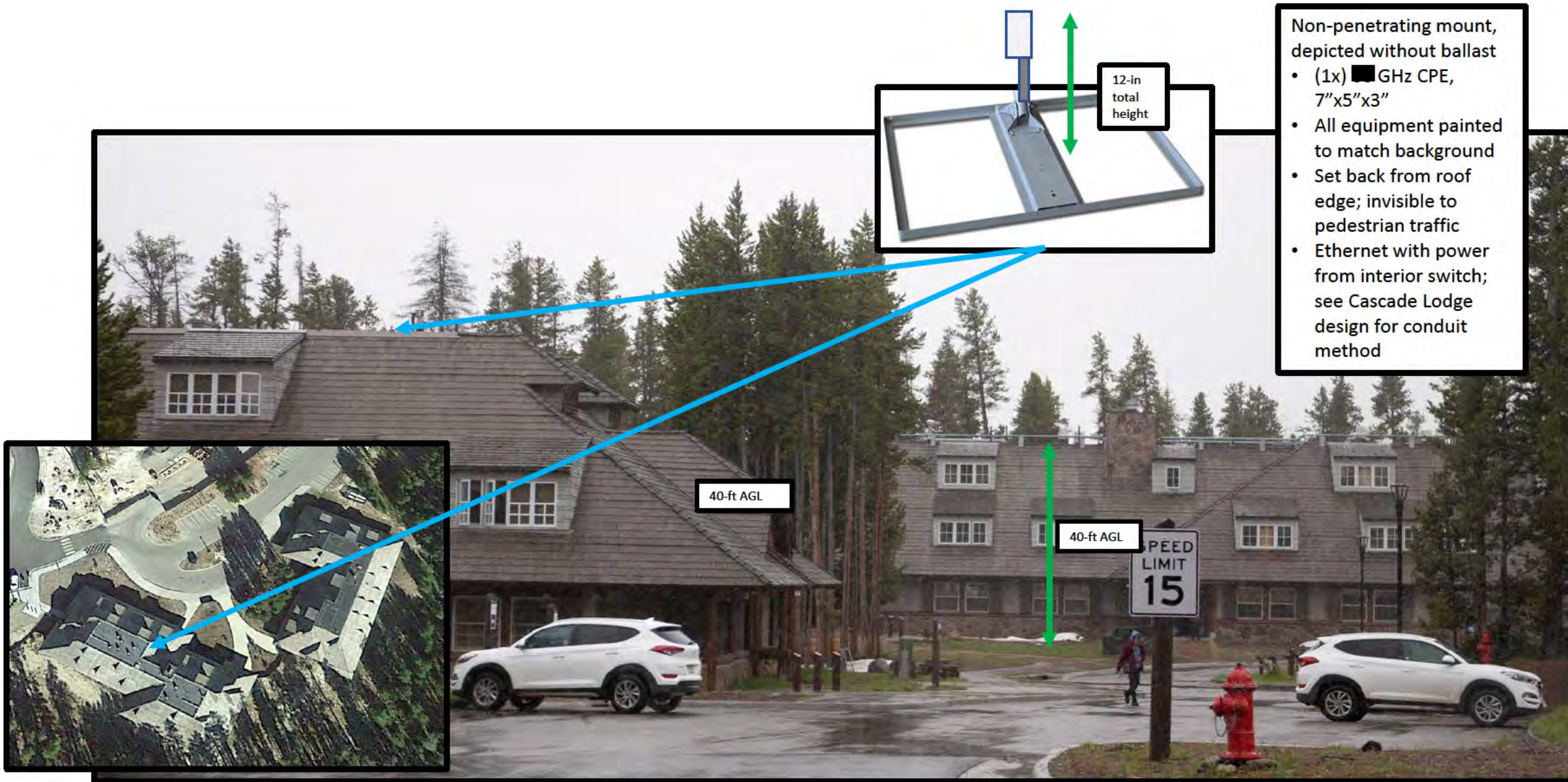
Cascade Lodge
 Wireless backhaul to Canyon Village from Mt. Washburn
 Coords: 44.742, -110.484



- Ethernet to interior switch
- 1" exterior conduit follows existing cabling to lower level and interior.
 - Colored same as roof; RGB Code: 154, 151, 144
 - Vertical conduit colored same as wall; RGB Code 188, 187, 185
 - ¼" wall penetration to interior equipment room, weather-sealed



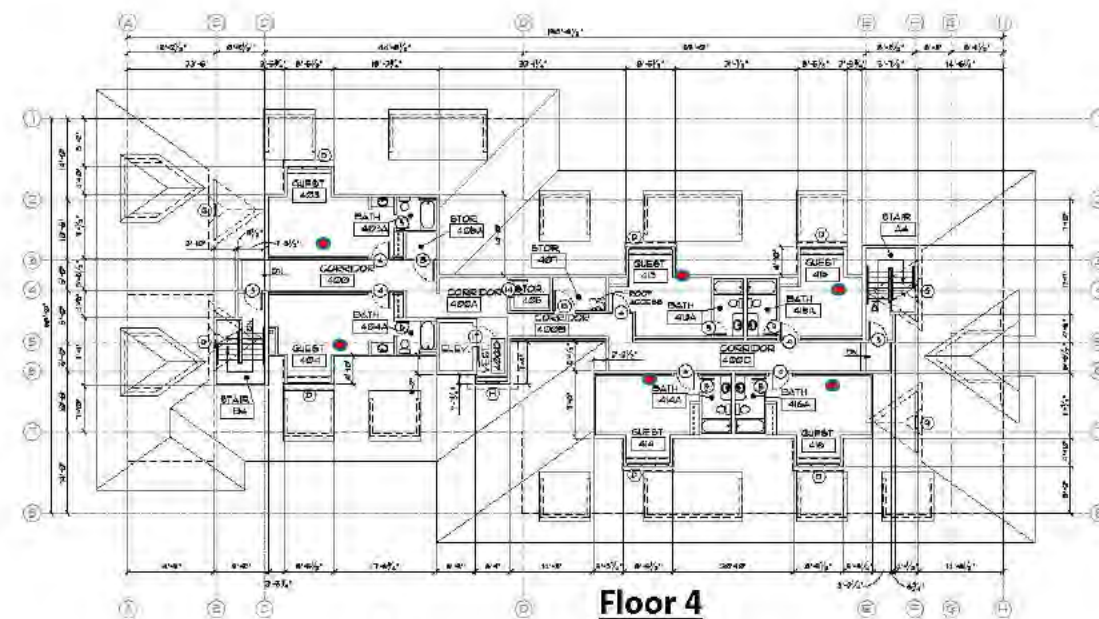
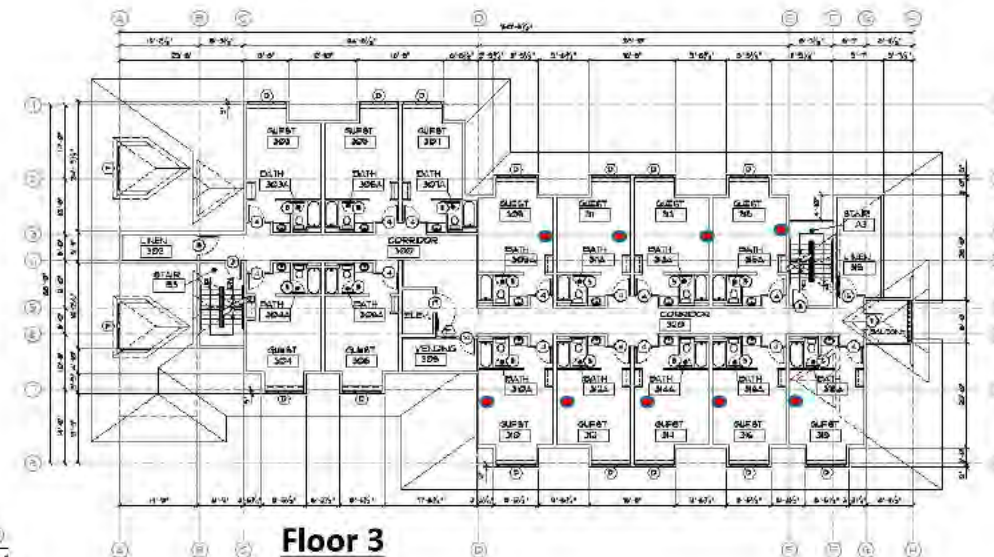
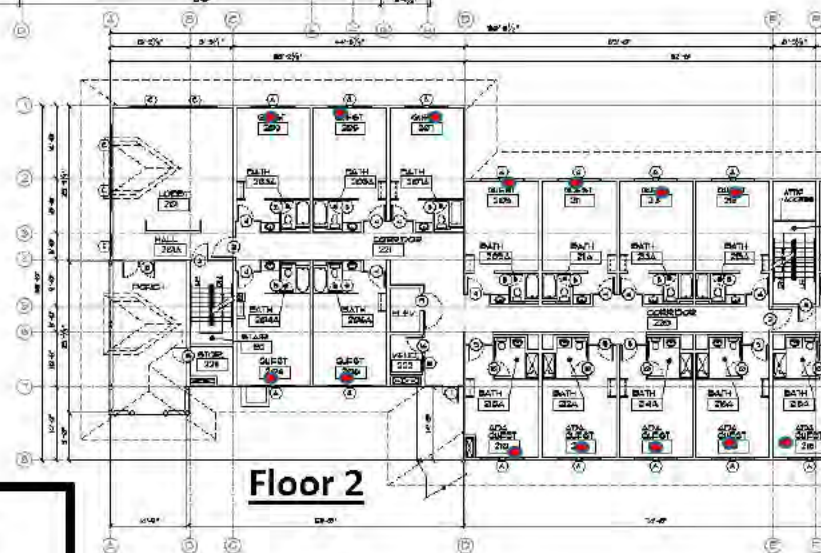
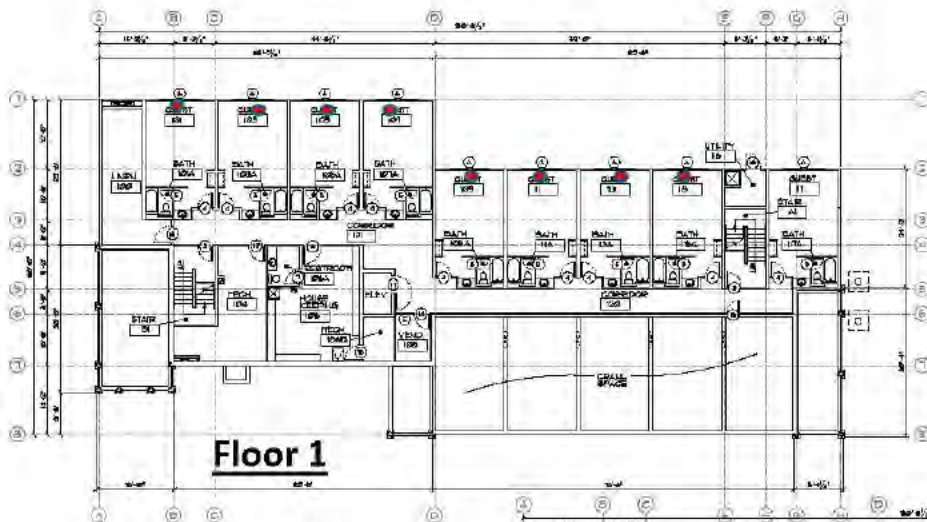
Cascade Lodge
(typical of rear-facing sides of Dunraven, Moran, Hayden,
Chittendon, Washburn, Rhyolite Lodges)



Dunraven Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes

Dunraven Lodge

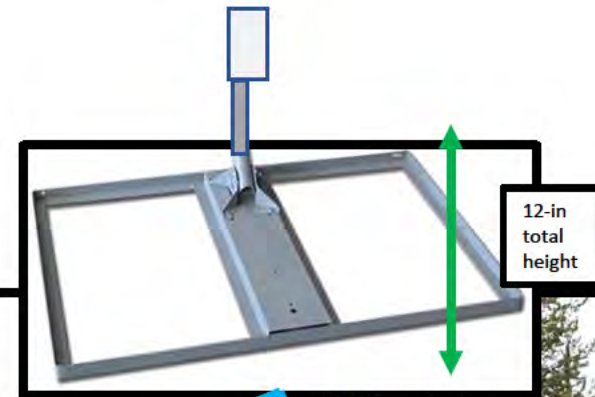
Coords: 44.742N, -110.484W



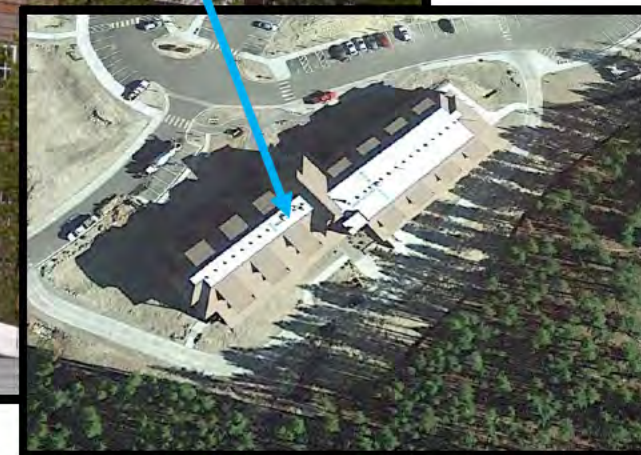
Wi-Fi AP Placement

- One AP per room, wallplate-mounted
- Existing data cabling to wall outlets
- 45 total APs

Dunraven Lodge



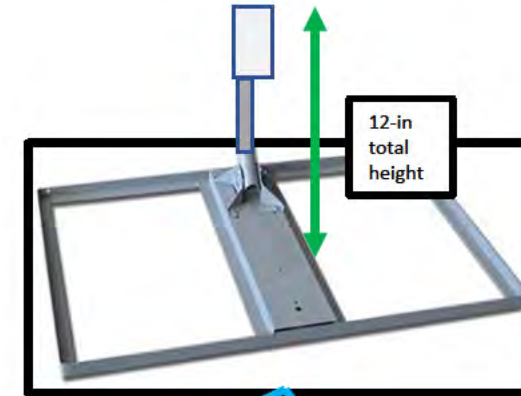
- Non-penetrating mount, depicted without ballast
- (1x) ████ GHz CPE
 - All equipment painted to match background
 - Set back from roof edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch; see Cascade Lodge design for conduit method



Moran Lodge

Coords: 44.730N, -110.487W

Moran Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes



Non-penetrating mount, depicted without ballast

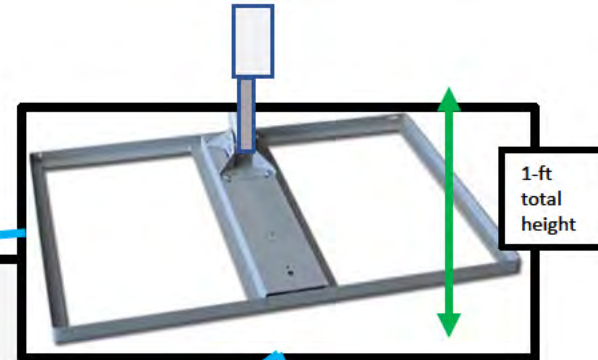
- (1x) █ GHz CPE, 7"x5"x3"
- All equipment painted to match background
- Set back from roof edge; invisible to pedestrian traffic
- Ethernet with power from interior switch; see Cascade Lodge design for conduit method



Hayden Lodge

Coords: 44.732N, -110.488W

Hayden Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes



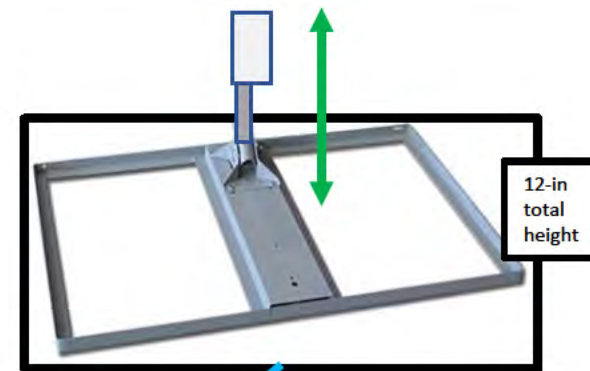
- Non-penetrating mount, depicted without ballast
- (1x) █ GHz CPE
 - All equipment painted to match background
 - Set back from roof edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch
 - Ethernet with power from interior switch; see Cascade Lodge design for conduit method



Chittendon Lodge

Coords: 44.732N, -110.487W

Chittendon Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes



12-in
total
height

- Non-penetrating mount, depicted without ballast
- (1x) 60 GHz CPE, 7"x5"x3"
 - All equipment painted to match background
 - Set back from roof edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch; see Cascade Lodge design for conduit method

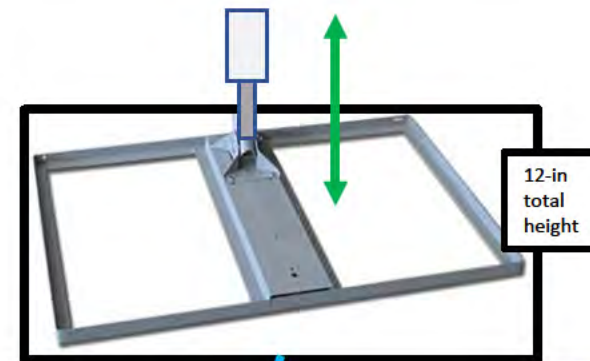


40-ft AGL

Washburn Lodge

Coords: 44.732N, -110.486W

Washburn Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes



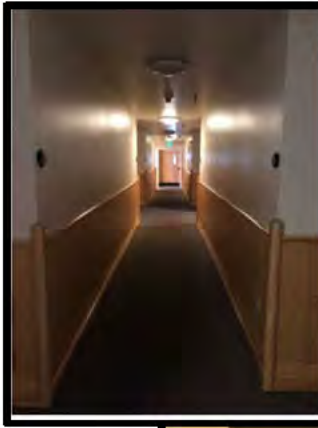
- Non-penetrating mount, depicted without ballast
- (1x) GHz CPE
 - Set back from roof edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch; see Cascade Lodge design for conduit method



Rhyolite Lodge	
Area	Canyon Village
NRHP Eligibility	Age Ineligible
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes

Rhyolite Lodge

Coords: 44.733N, -110.485W



Wi-Fi Access Points:

- Existing CAT5e to every room. Install wall-plate AP in each room
- Hidden behind nightstand

**Dunraven, Moran, Hayden, Chittendon, Washburn,
Rhyolite Lodges**



Bighorn Dormitory	
Area	Canyon Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

Bighorn Dormitory

Existing fiber backhaul

Coords: 44.733N, -110.488W



Wapiti Dormitory

Existing fiber backhaul
Coords: 44.733N, -110.489W

Wapiti Dormitory	
Area	Canyon Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No



Grizzly Dormitory	
Area	Canyon Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

Grizzly Dormitory

Existing fiber backhaul
Coords: 44.733N, -110.489W

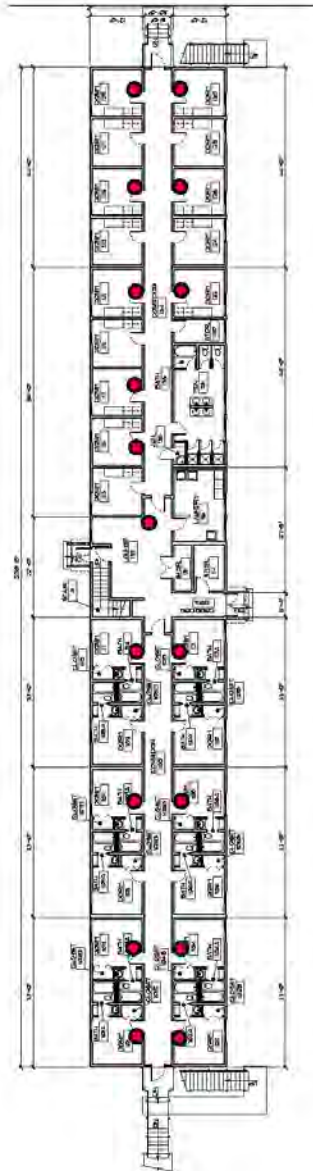


Bison Dormitory

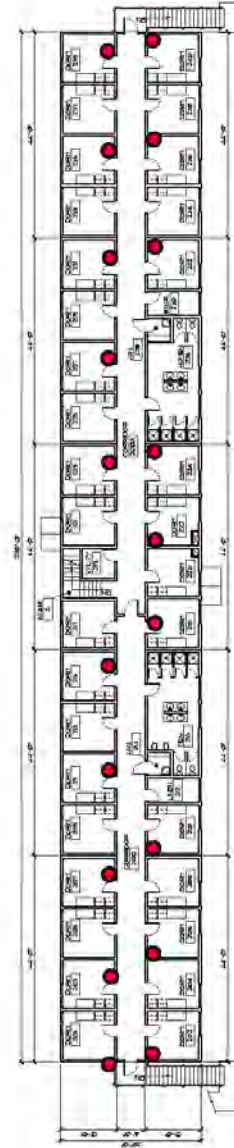
Existing fiber backhaul
Coords: 44.733, -110.490

Bison Dormitory	
Area	Canyon Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

Total Access Points: 17



Total Access Points: 19



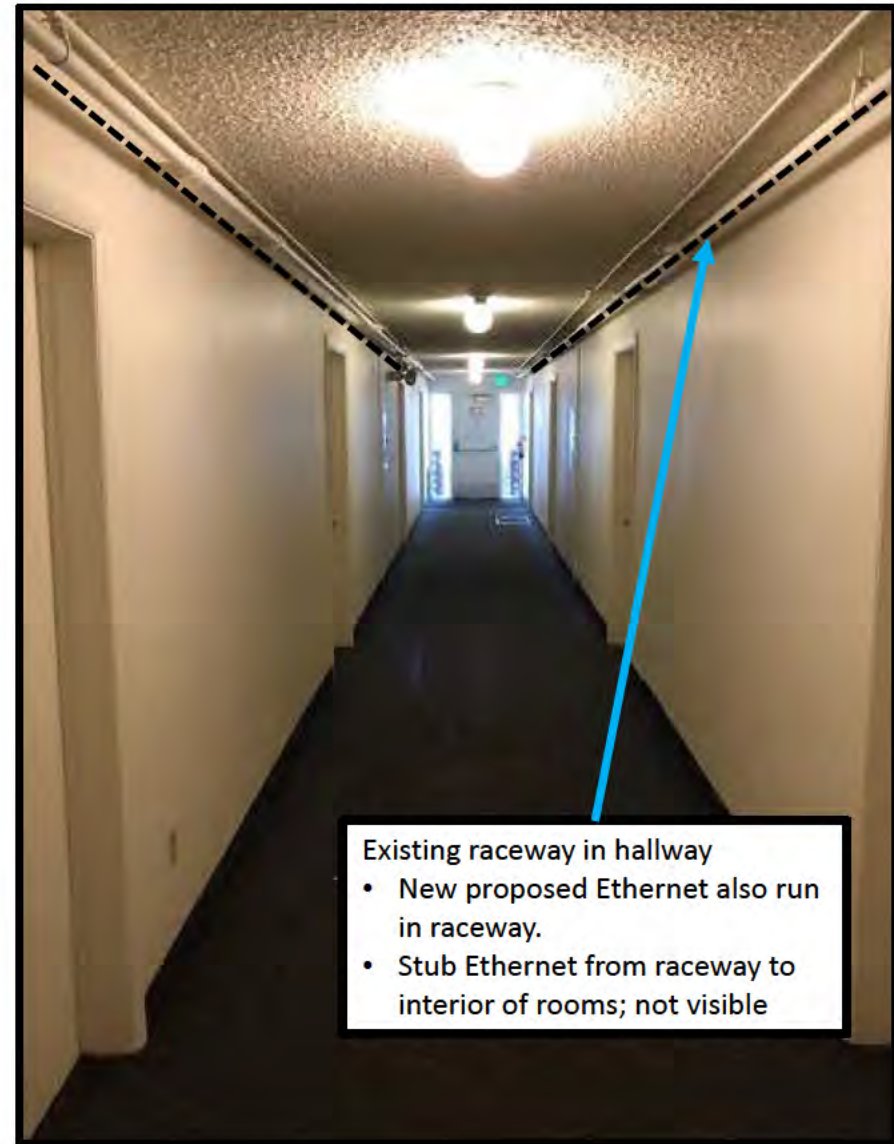
Wi-Fi AP Placement

- Four dorms have similar floorplans
- One AP per two (2) rooms, ceiling-mounted inside rooms
- 36 total APs per dorm; 144 total

Bighorn, Bison, Grizzly, Wapiti Dormitories



- Ceiling AP; one per two rooms
- Four dorms have similar floorplans
 - One AP per two (2) rooms, ceiling-mounted inside rooms
 - 6"x6"x2"
 - Attached using bracket with two screws.
 - Ethernet cable (x1) from hallway raceway; no exposed cable/raceway inside room



- Existing raceway in hallway
- New proposed Ethernet also run in raceway.
 - Stub Ethernet from raceway to interior of rooms; not visible

Bighorn, Bison, Grizzly, Wapiti Dormitories
(Typical)

- (1x) [REDACTED] GHz CPE
- Attached using two (2) screws in wooden facade
- All equipment painted to match background; RGB Color 83, 51, 38
- Ethernet with power from interior switch
- ¼-in penetration under eave, for 1x Ethernet cable to attic; no visible cable/conduit



YGS Dormitory	
Area	Canyon Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

YGS Dormitory

Coords: 44.733N, -110.492W



Canyon Village Guest Cabins	
Area	Canyon Village
NRHP Eligibility	Non-Contributors
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Canyon Village; Guest Cabins

(x26 Buildings)

Coordinates: 44.729N, -110.488W



- (1x) [redacted] GHz CPE
- 9"x9"x3"
 - All equipment painted to match background; RGB Code 141, 148, 156 or 36, 30, 32
 - Ethernet with power from interior switch
 - Height: 10-ft AGL
 - ¼-in penetration under eave, for 1x Ethernet cable to attic.



Canyon Village; Guest Cabins
(typical)



- (1x) Wi-Fi radio per cabin
- 6"x6"x2"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic. No raceway required
 - ¼-in penetration in ceiling for Ethernet cable to attic. Sealed and painted.

Canyon Village; Guest Cabins
(typical interior)

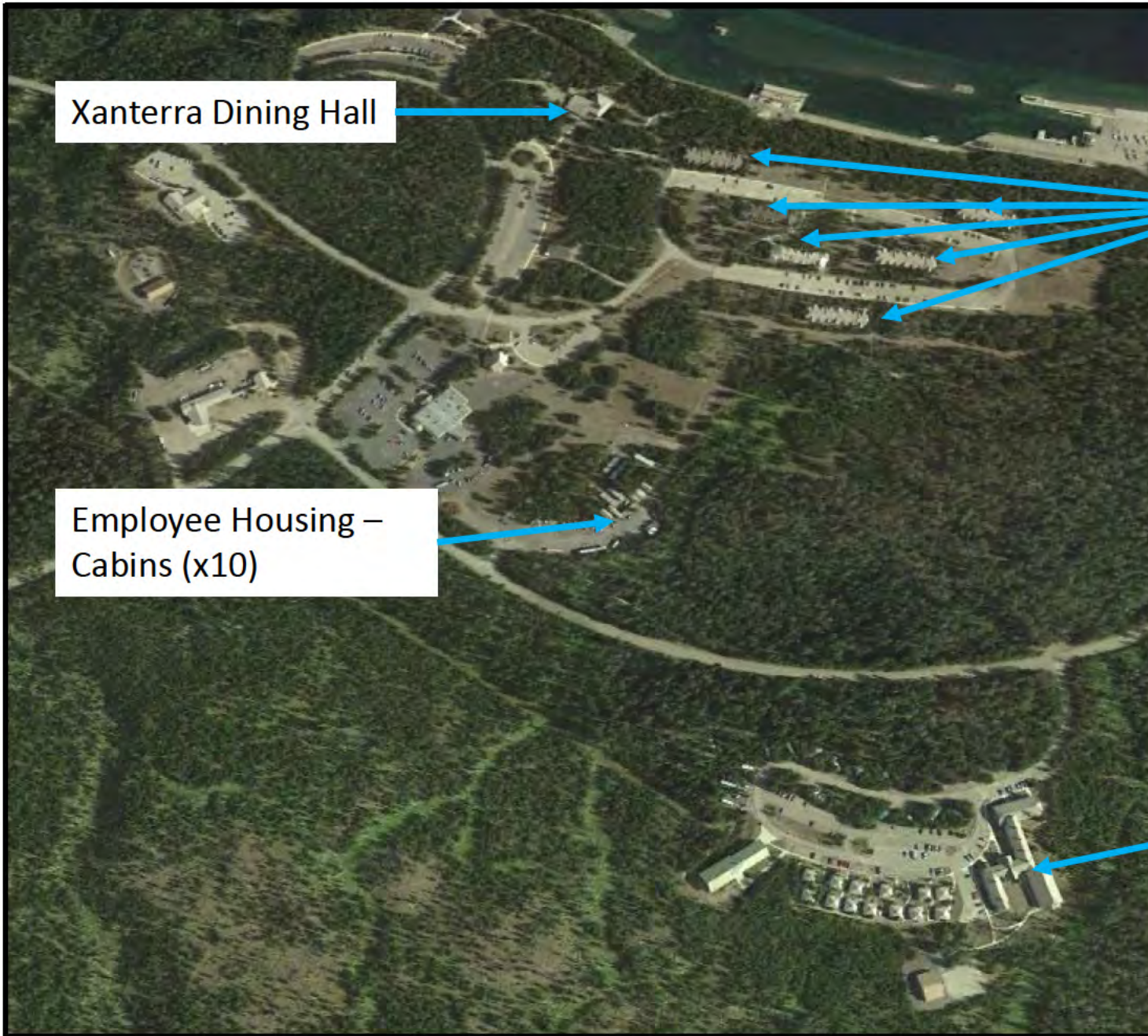
Grant Village Area

Grant Village Area Existing Wireless (known)



Grant Village Area Proposed Wireless





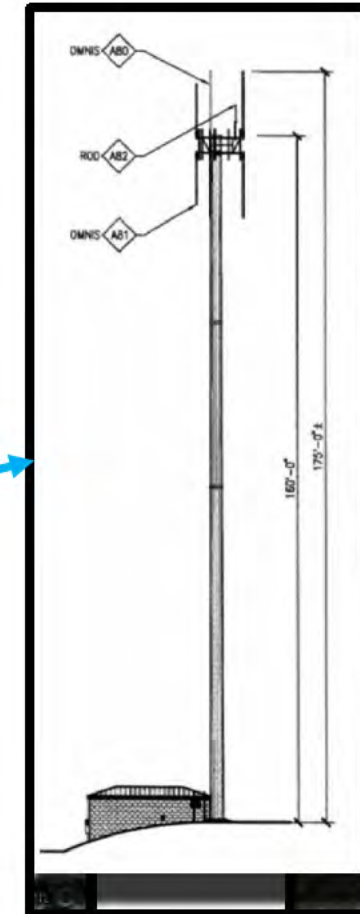
Xanterra Dining Hall

Employee Housing –
Cabins (x10)

- Xanterra Lodges (x6)
- Antelope
 - Bear
 - Coyote
 - Fox
 - Elk
 - Deer

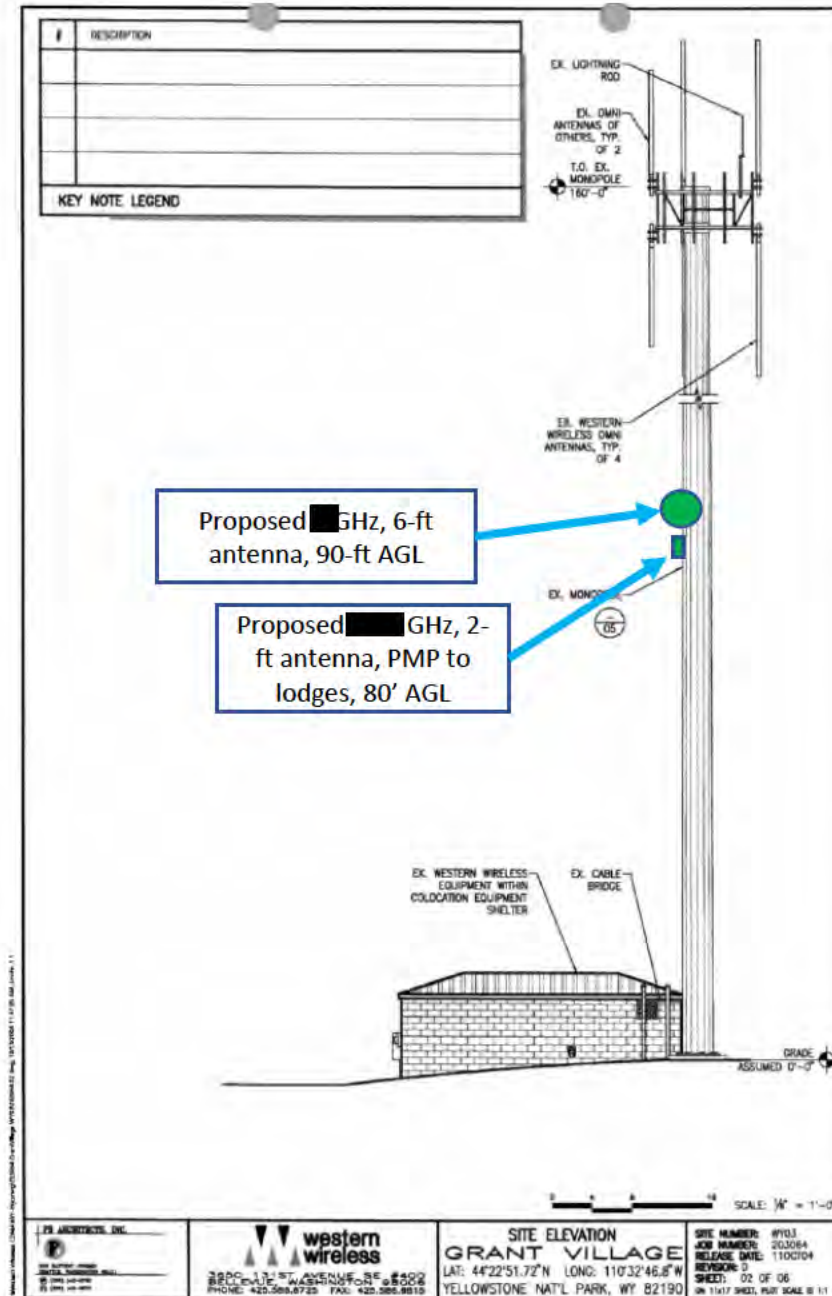
Employee Housing –
Grayling Dormitory

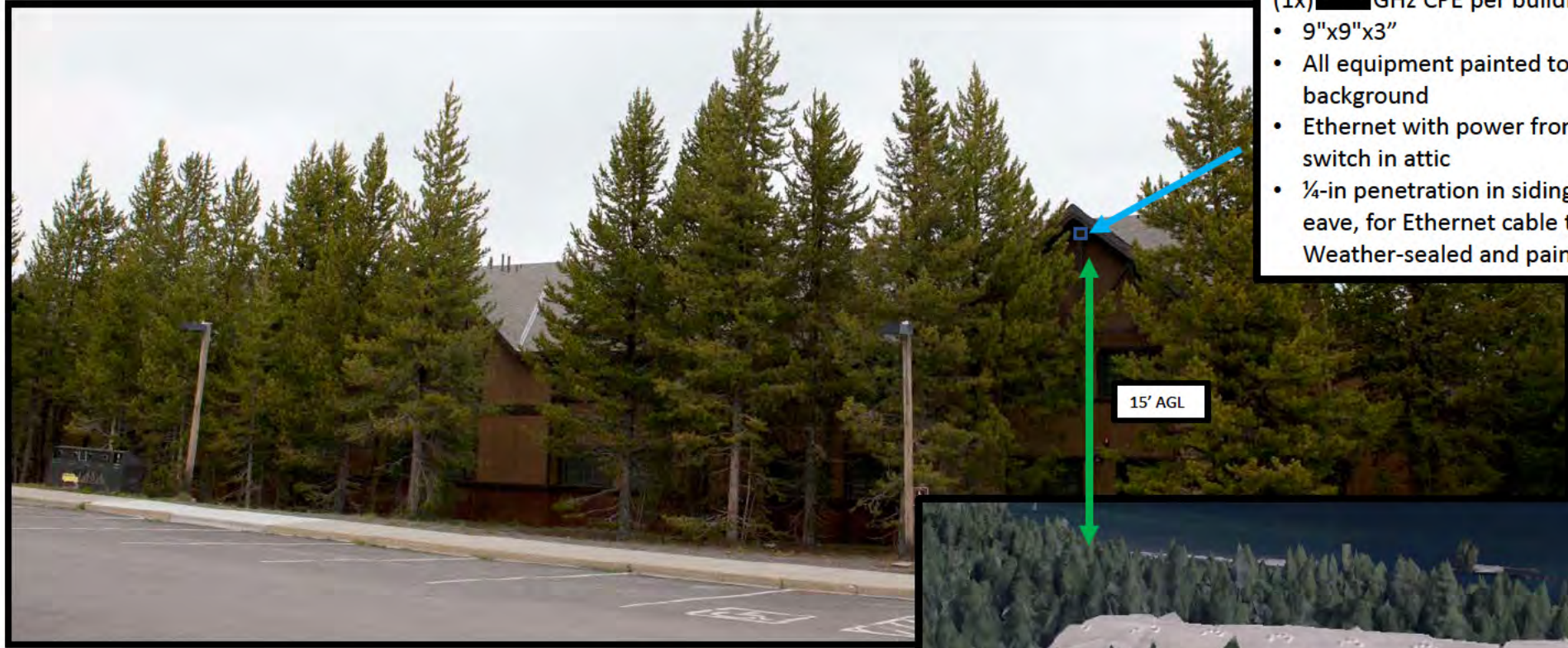
Grant Village Area – Existing Verizon Tower #27658



Grant Village Tower

Proposed colocation on existing Verizon tower #27658
Coordinates: 44.380N, -110.547W





- (1x) [redacted] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

15' AGL



Antelope Lodge

Coords: 44.392N, -110.553W

Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



- (1x) XXXX GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Fox Lodge

Coords: 44.391N, -110.550W



- (1x) [redacted] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.



15' AGL

Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Elk Lodge

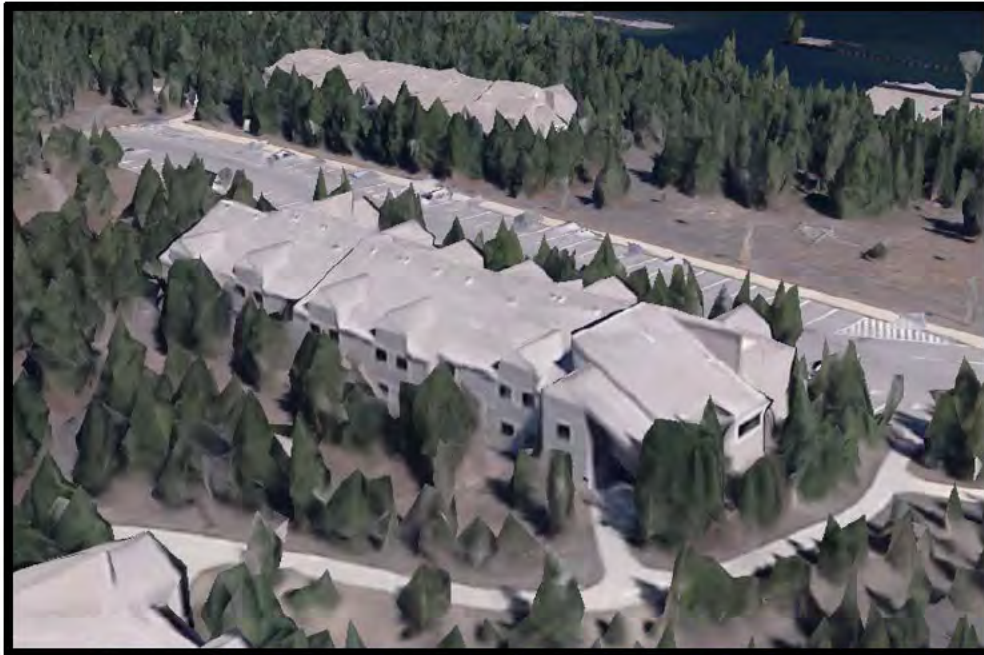
Coords: 44.391N, -110.551W



- (1x) [redacted] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Bear Lodge
 Coords: 44.391N, -110.552W



- (1x) [redacted] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.



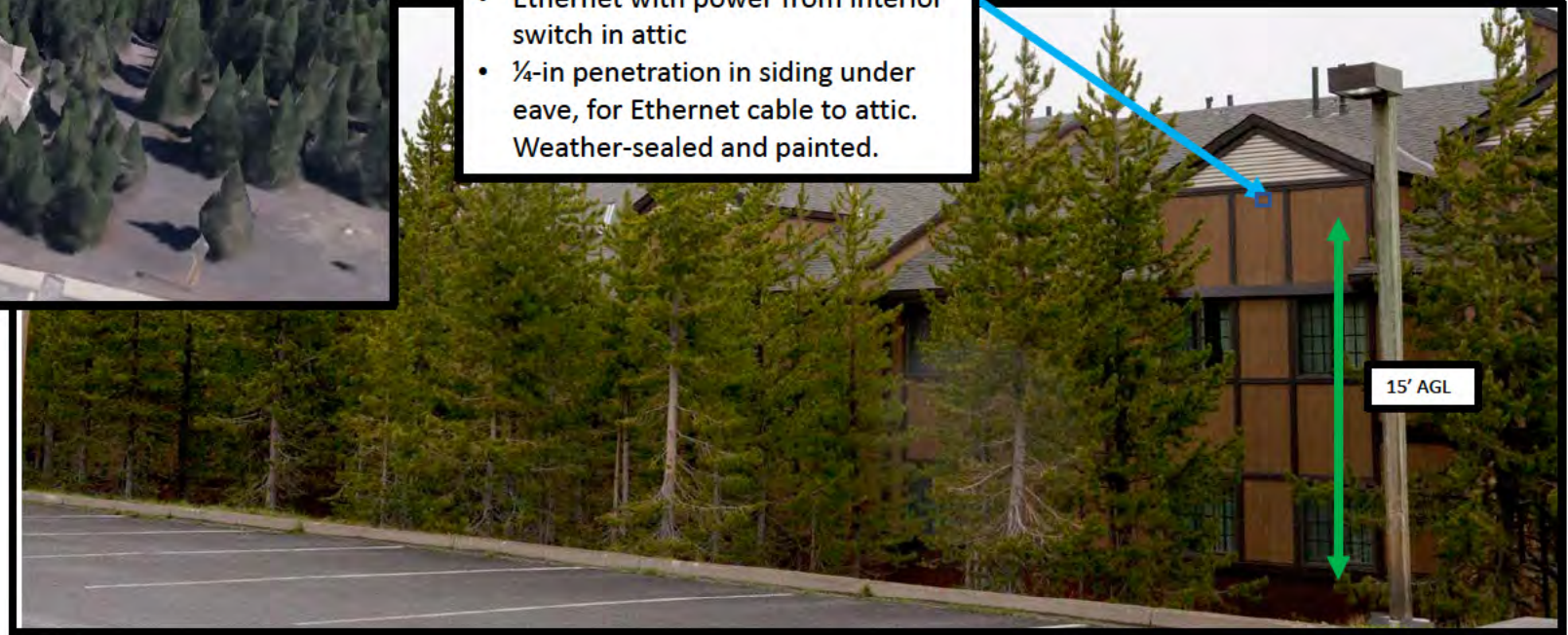
Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Coyote Lodge

Coords: 44.391N, -110.552W



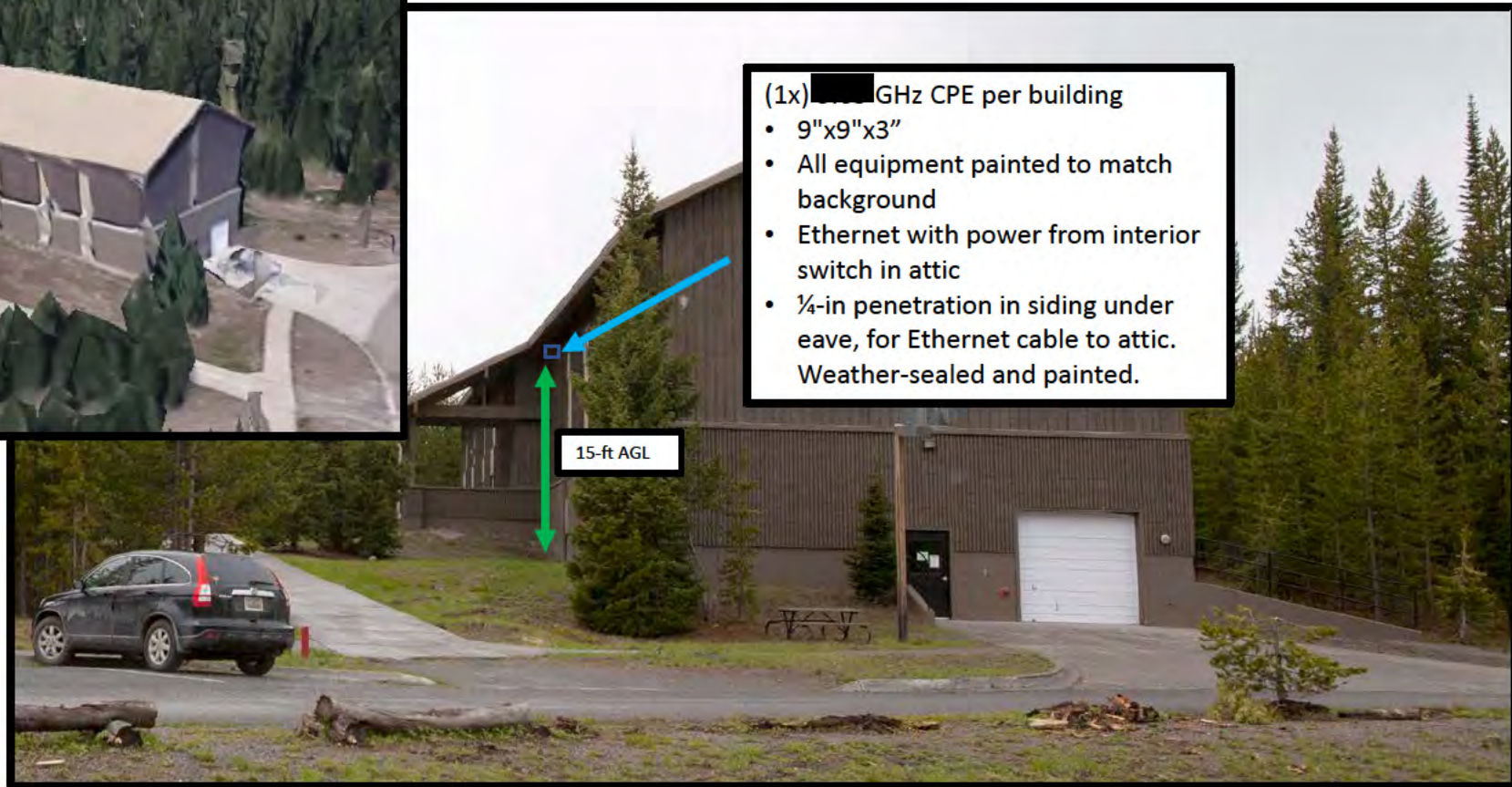
- (1x) [REDACTED] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.



Deer Lodge

Coords: 44.390N, -110.552W

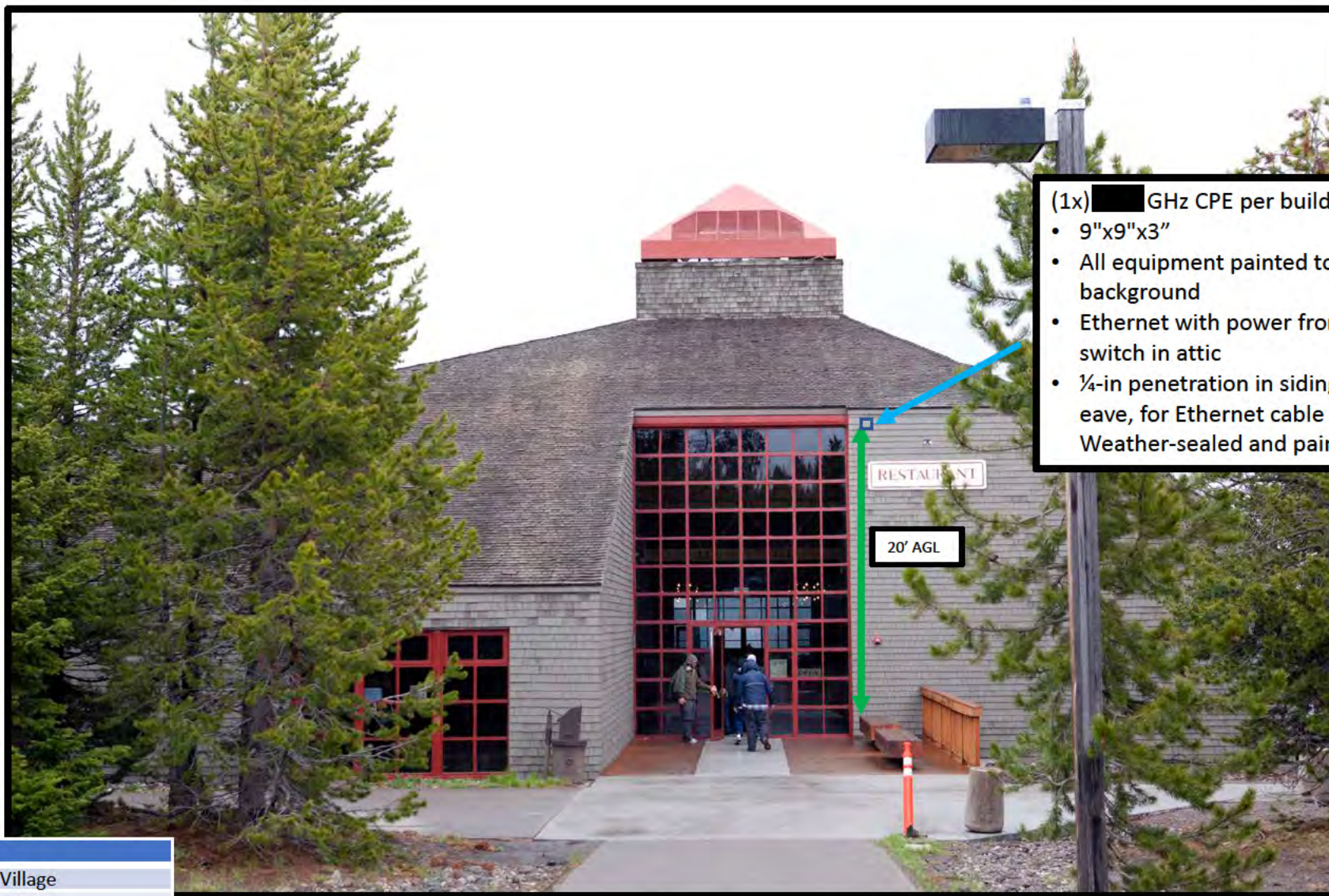
Grant Village Lodges	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



YGS Dormitory	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

YGS Dormitory

Coords: 44.385N, -110.553W



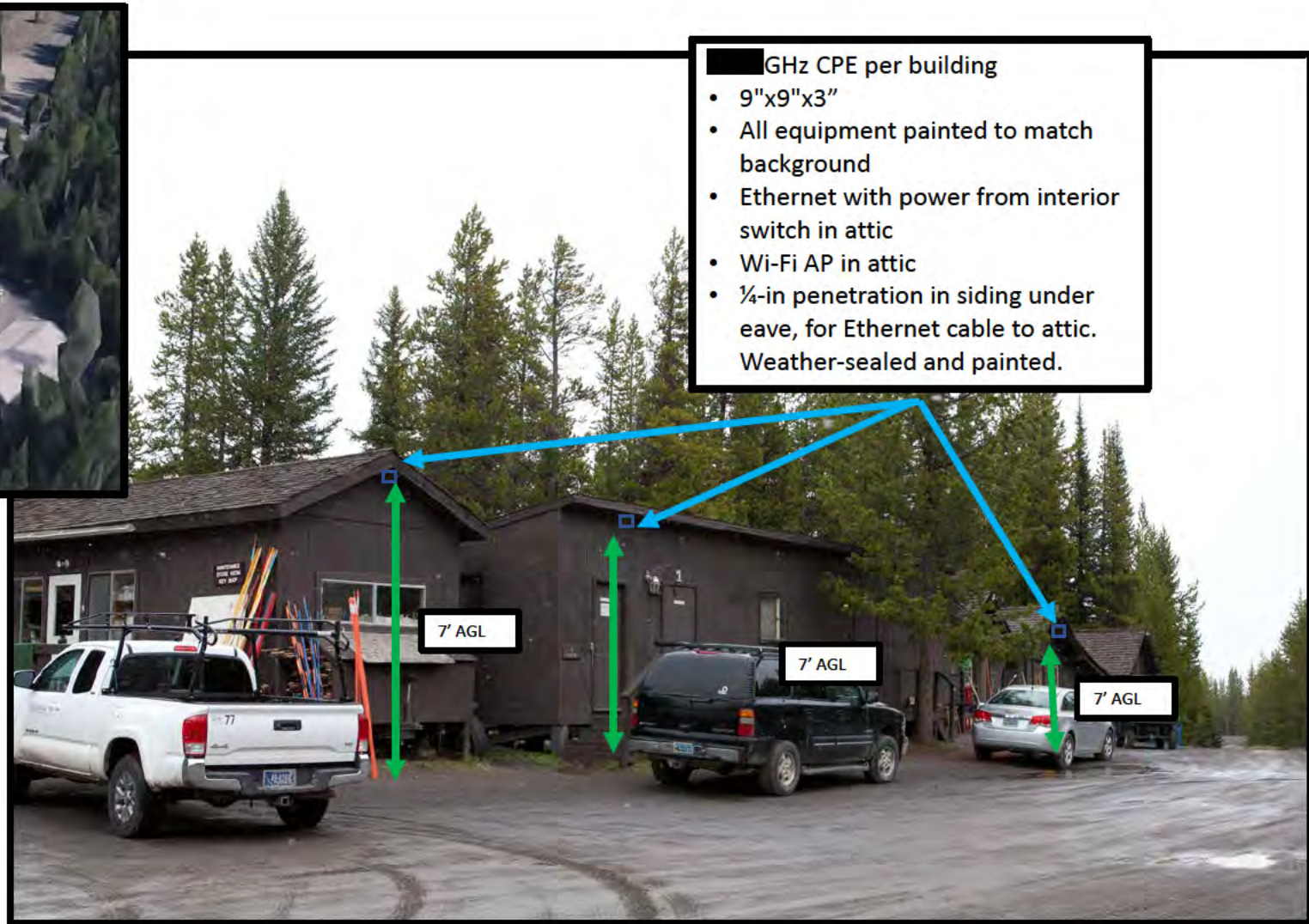
- (1x) [redacted] GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

20' AGL

Grant Village Restaurant	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Grant Village Restaurant

Coords: 44.392N, -110.555W



- GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - Wi-Fi AP in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

Grant Village Employee Housing (typical)

Coords: 44.388N, -110.554W

Grant Village Employee Housing	
Area	Grant Village
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

- ██████ GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.



Grayling Dormitory
Coords: 44.385N, -110.550W

Grayling Dormitory	
Area	Grant Village
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Fishing Bridge / Lake Area

Fishing Bridge

Century Link Tower (WY3 Lake JC; US-WY-8047)

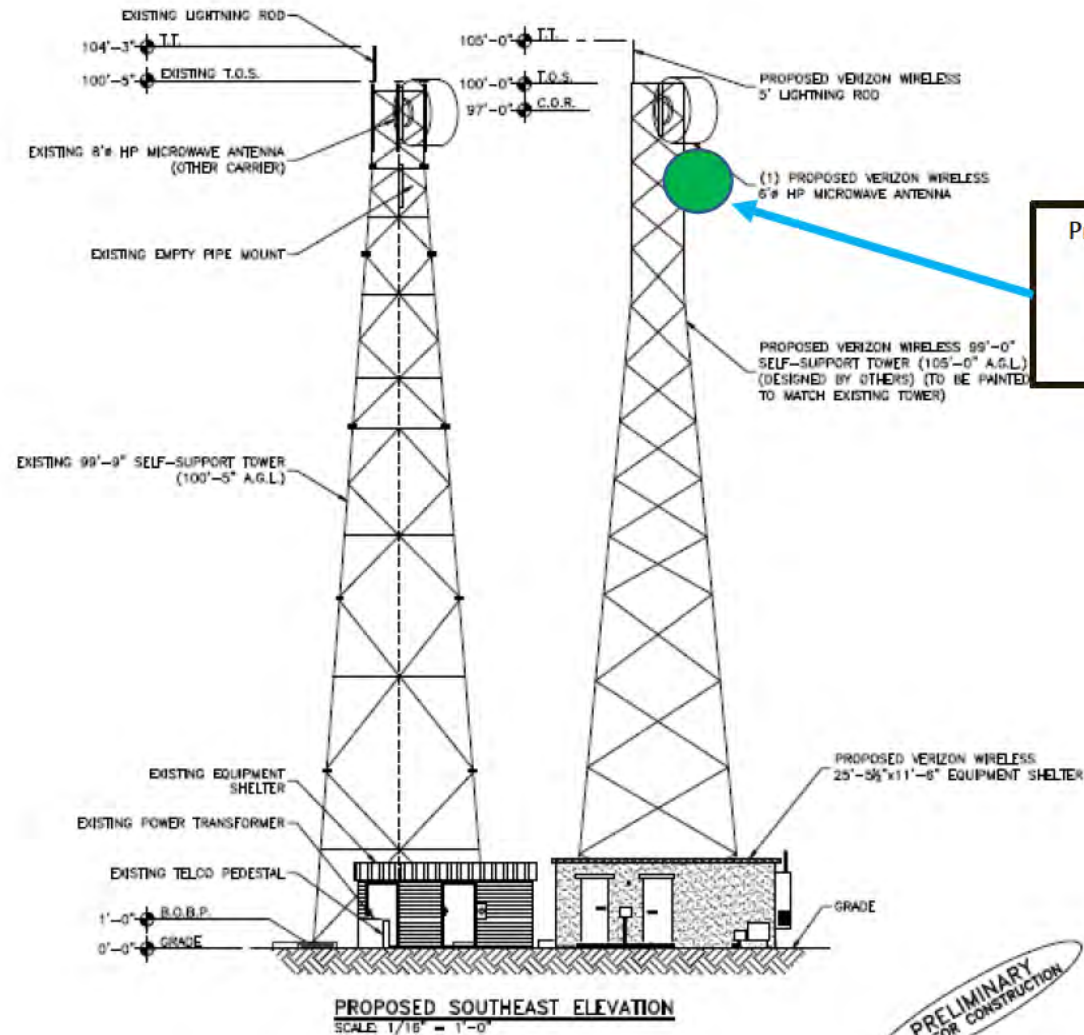


Proposed Wireless Coverage

Coords: 44.574N, -110.384W

Fishing Bridge

Century Link "WY3 Qwest Lake JC" Tower
(Constructed)

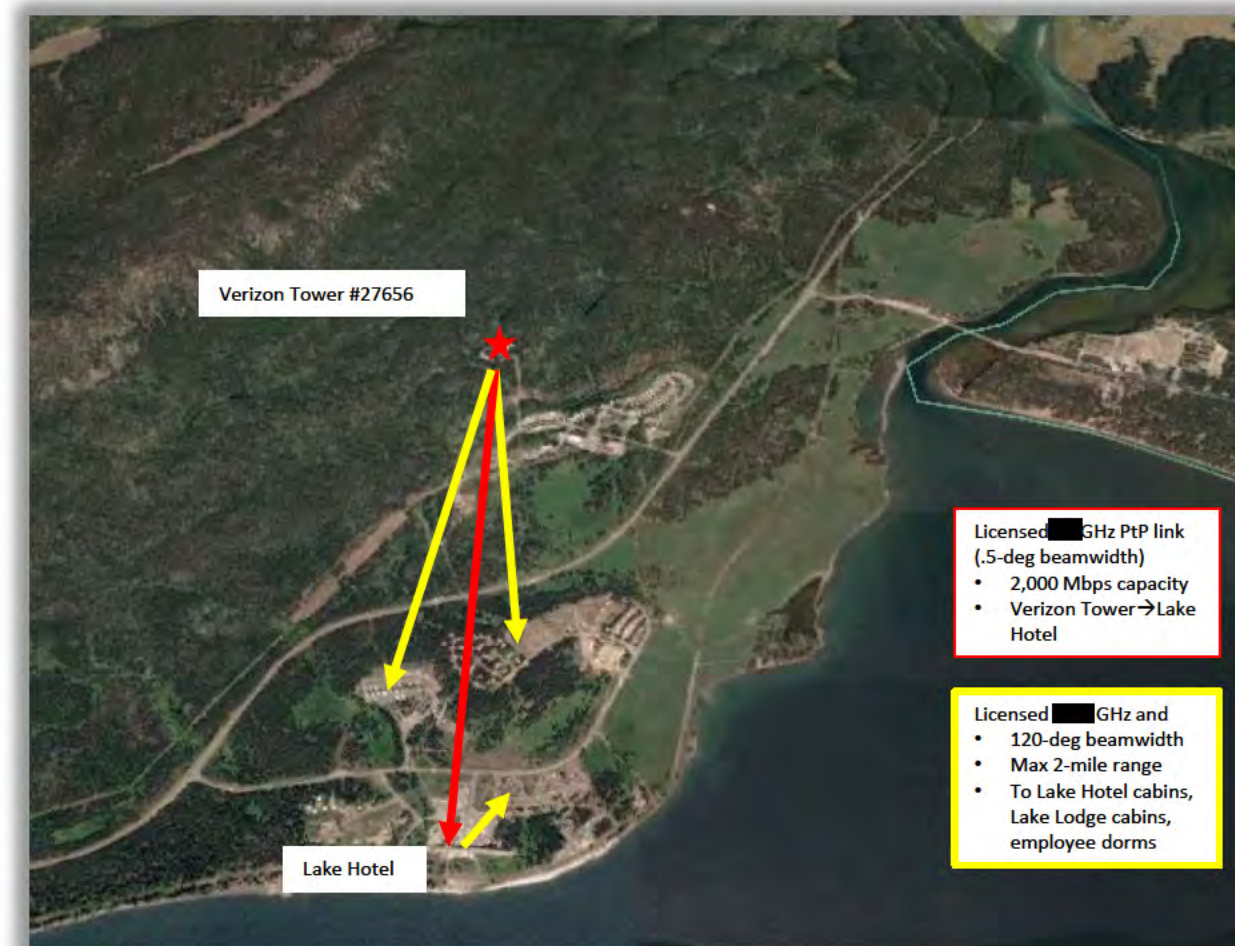


Lake Area

Existing wireless coverage (known)

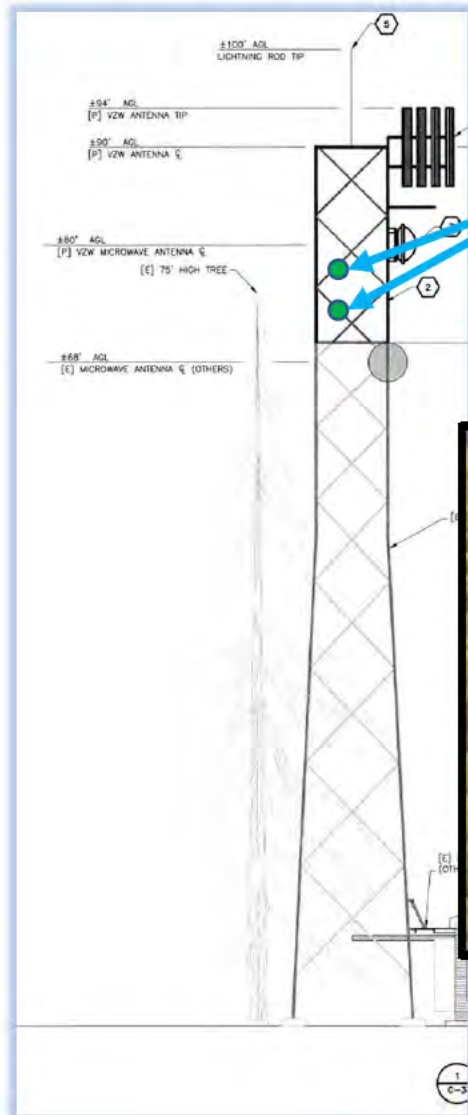


Lake Area - Proposed Wireless Coverage



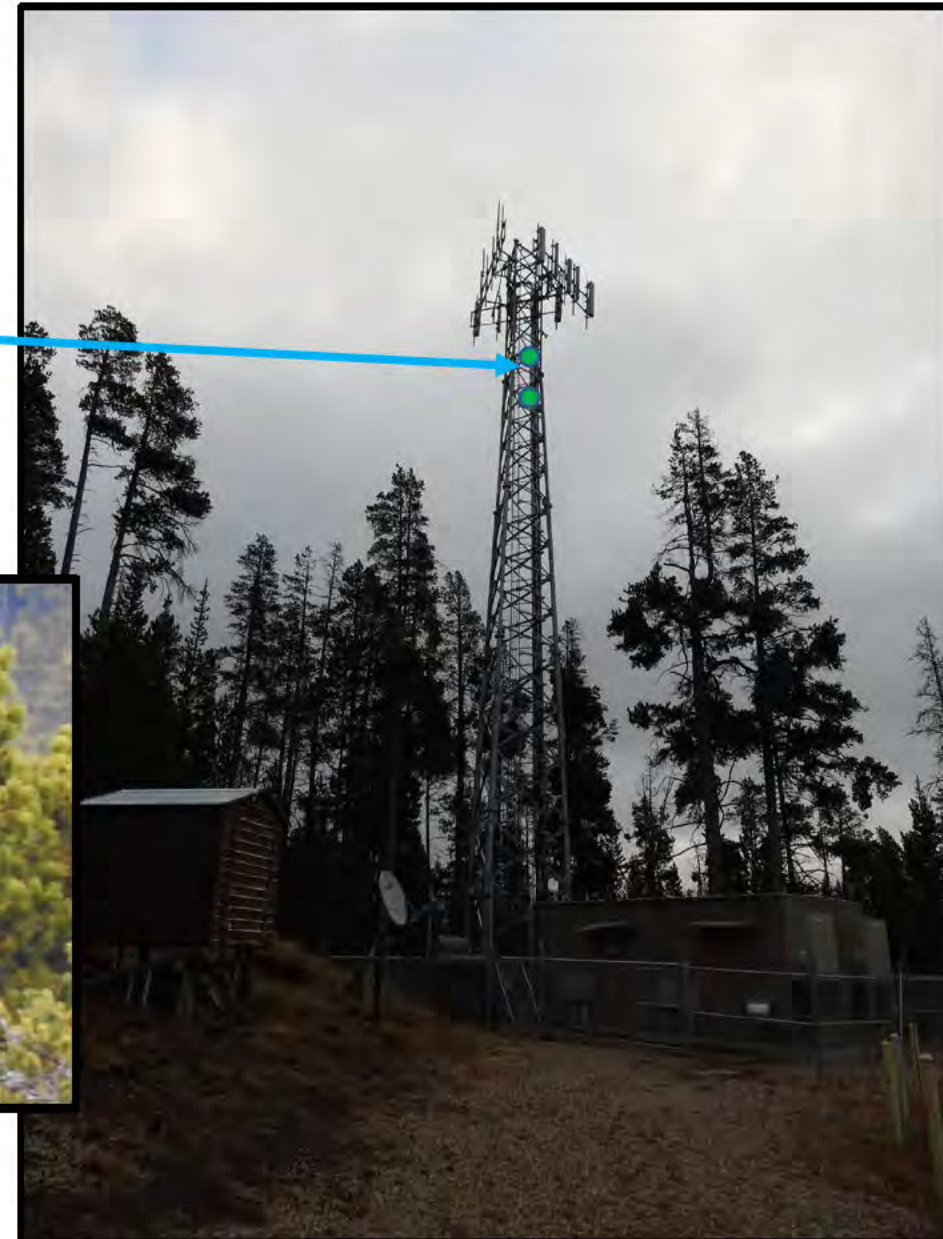
Lake Area Tower

Verizon Tower #27656 (WY3 Fishing Bridge)



Proposed antenna

- 2-ft [REDACTED] GHz antenna, 168-deg azimuth, 75-ft AGL centerline
- 2-ft, [REDACTED] GHz antenna, 180-deg azimuth, 70-ft centerline
- Fiber backhaul through existing conduit to "WY3 Lake JC" tower



Lake Hotel

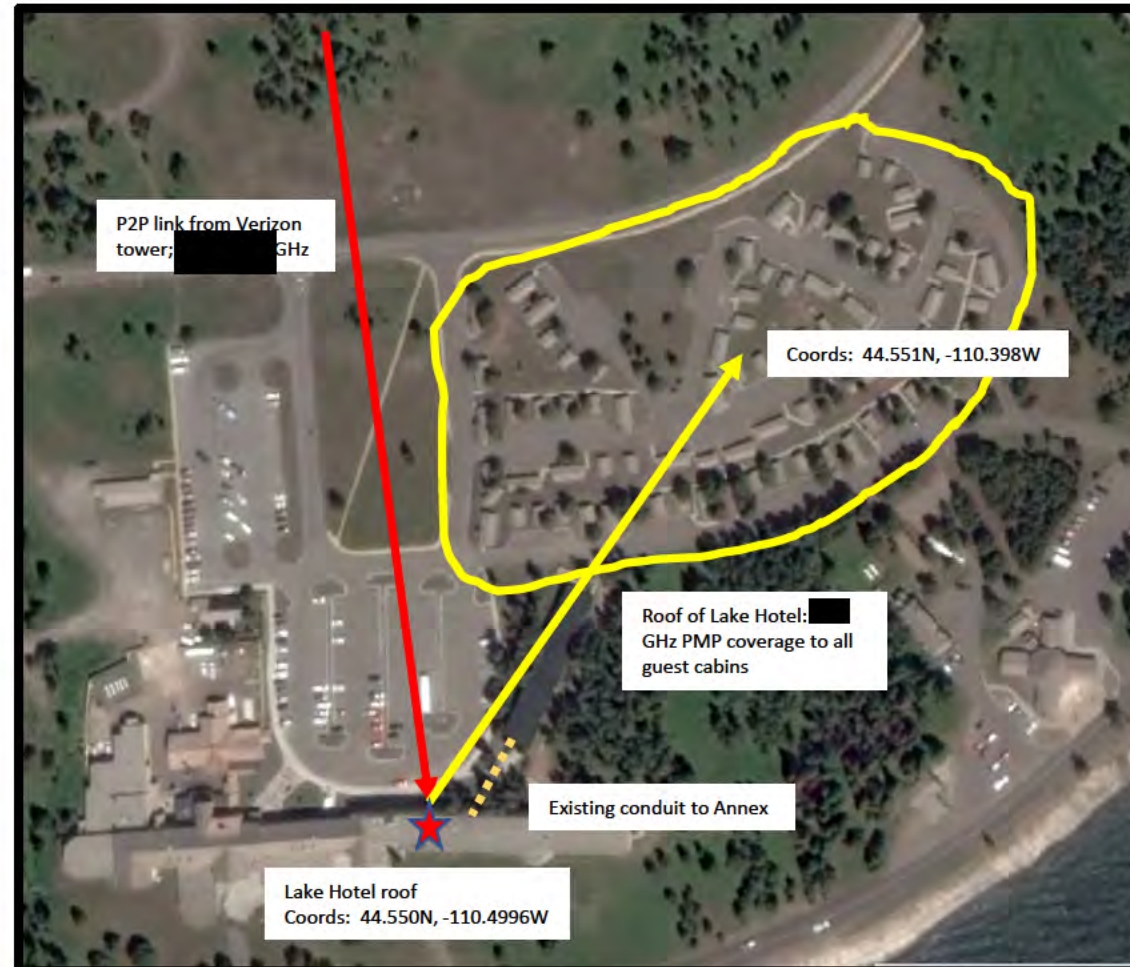
Lake Hotel Area

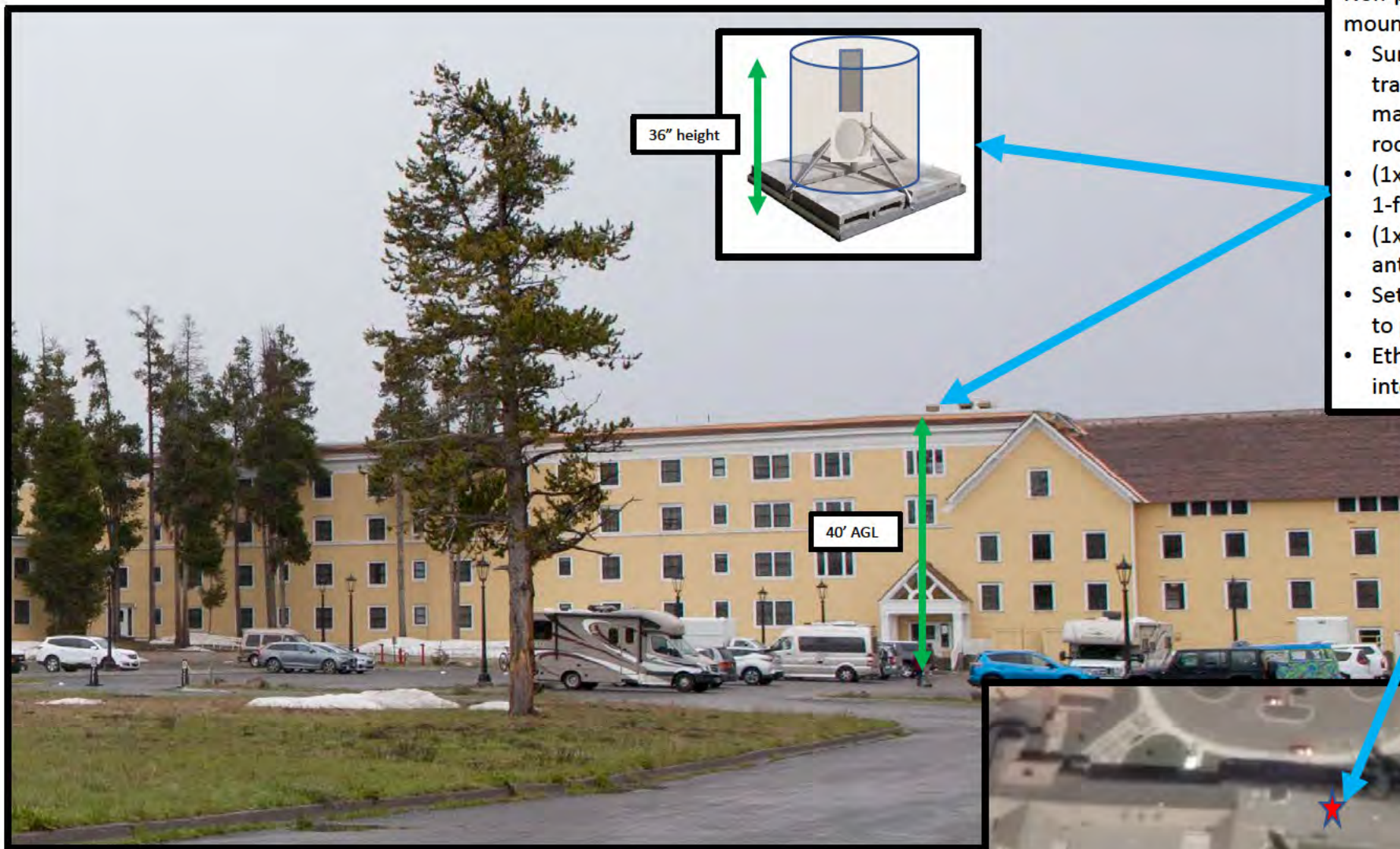
Existing wireless coverage (known)



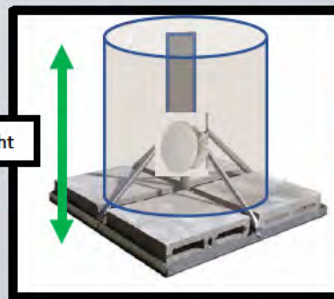
Yellowstone Lake Hotel Area

Proposed wireless coverage





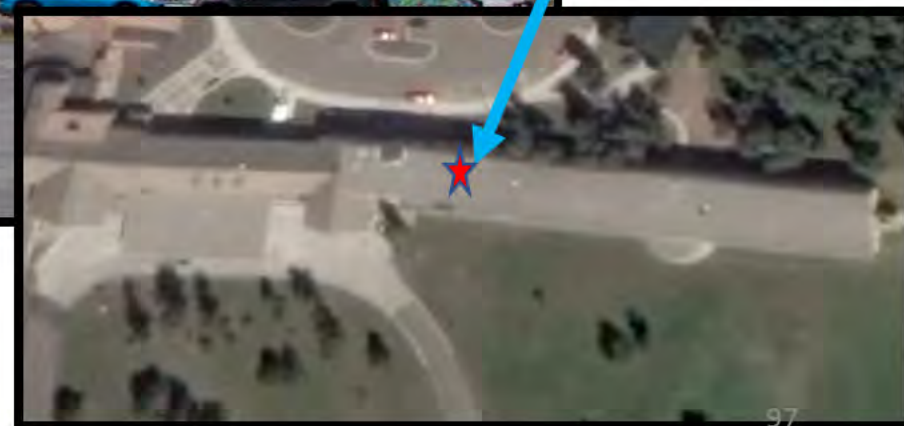
36" height



Non-penetrating, self-ballasted mount

- Surrounded by RF-transparent screen, color matched to existing vents on roof
- (1x) █ GHz station antenna, 1-ft diameter
- (1x) █ GHz Licensed PMP antenna
- Set back from edge; invisible to pedestrian traffic
- Ethernet with power from interior switch

40' AGL

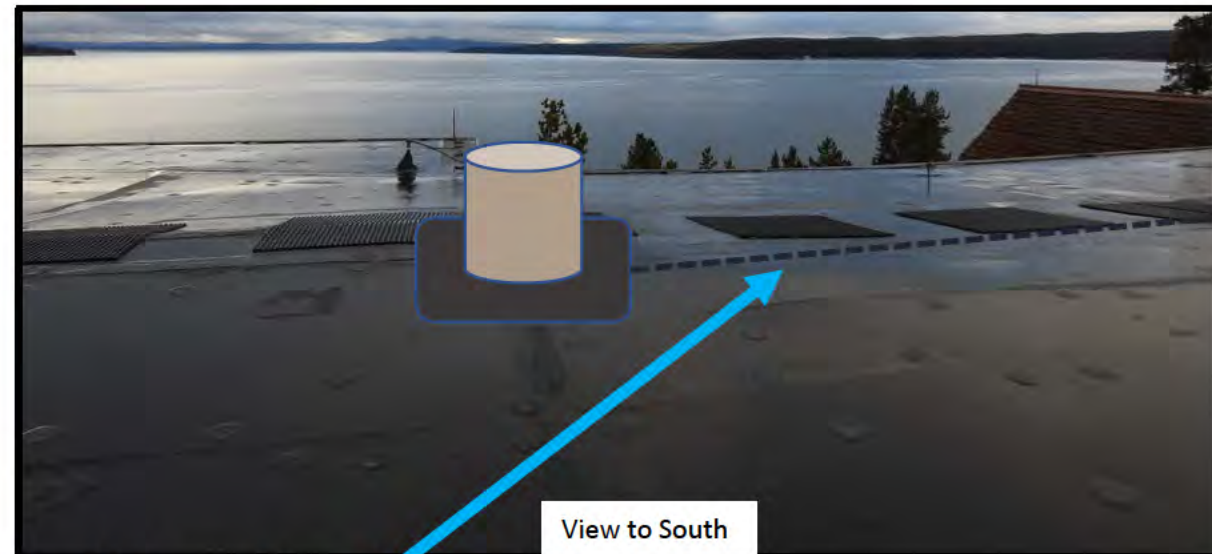
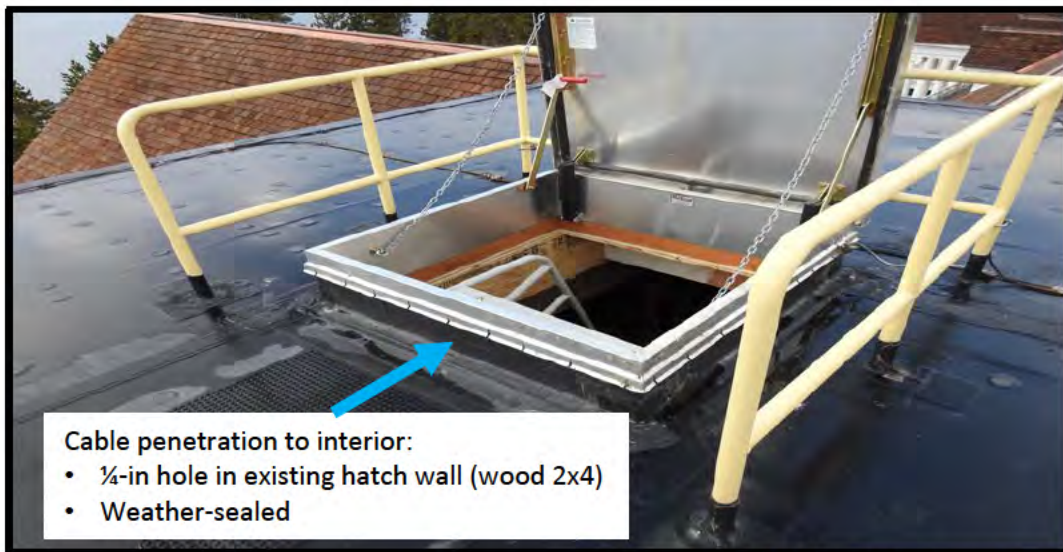


Lake Yellowstone Hotel

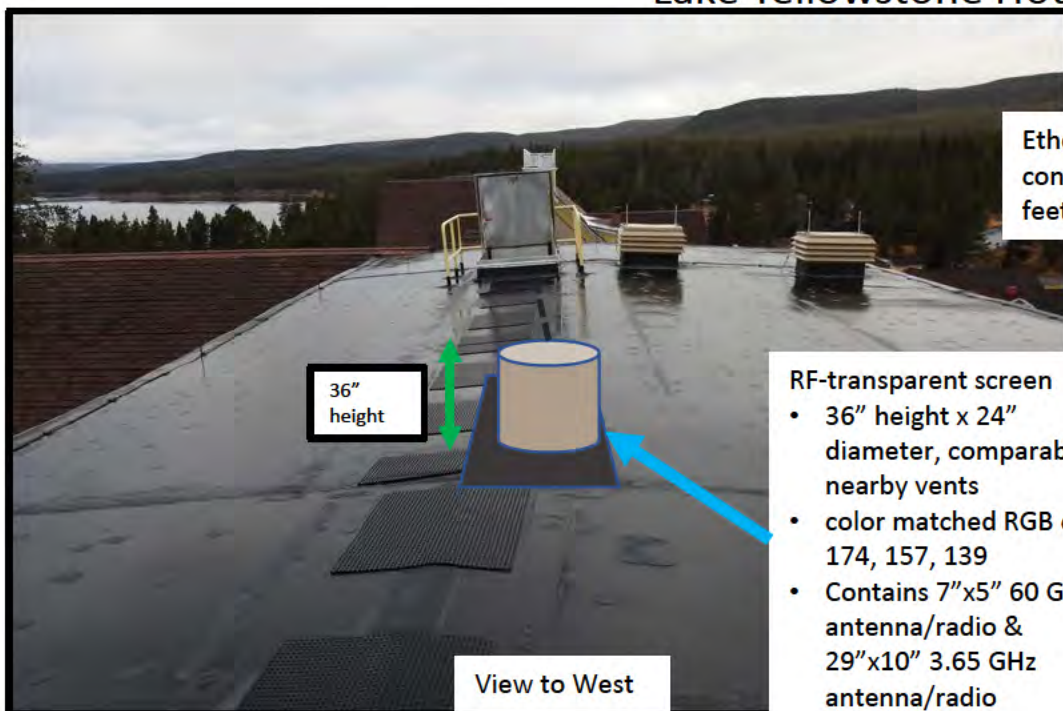
Area	Lake Hotel
NRHP Eligibility	District Contributor
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes

Lake Yellowstone Hotel

(Wi-Fi proposed only for Annex)



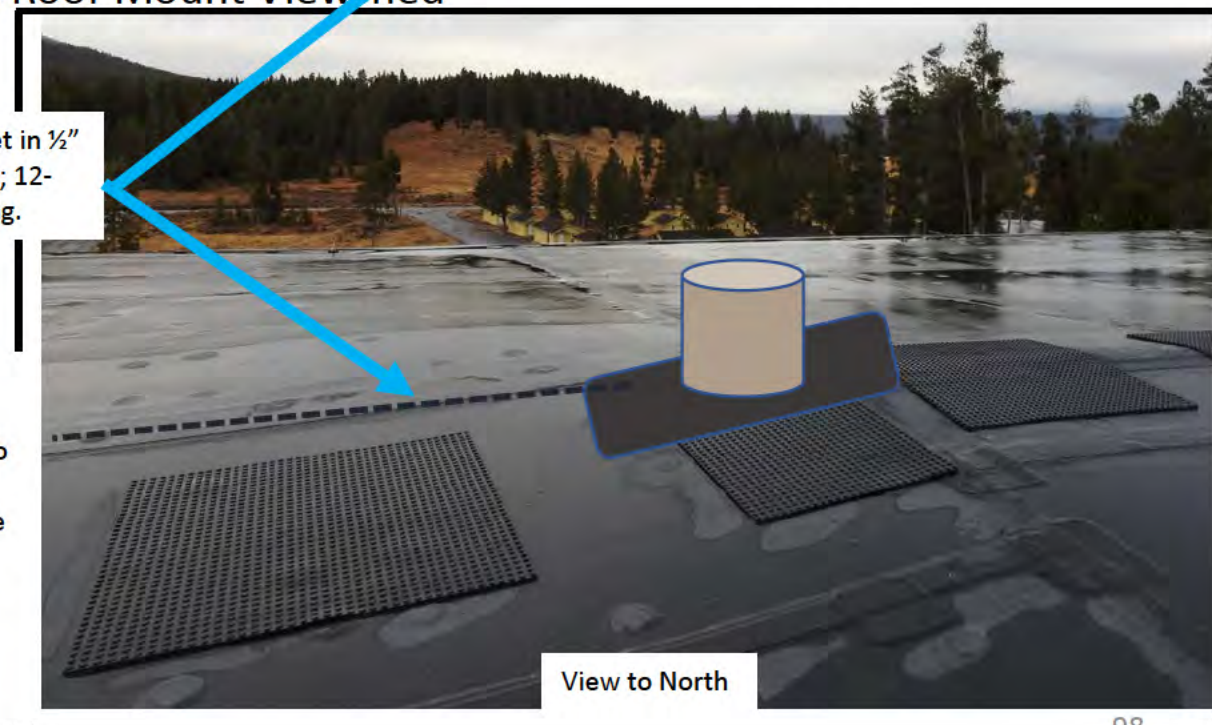
Lake Yellowstone Hotel; Roof Mount Viewshed



Ethernet in 1/2" conduit; 12-feet long.

RF-transparent screen

- 36" height x 24" diameter, comparable to nearby vents
- color matched RGB code 174, 157, 139
- Contains 7"x5" 60 GHz antenna/radio & 29"x10" 3.65 GHz antenna/radio

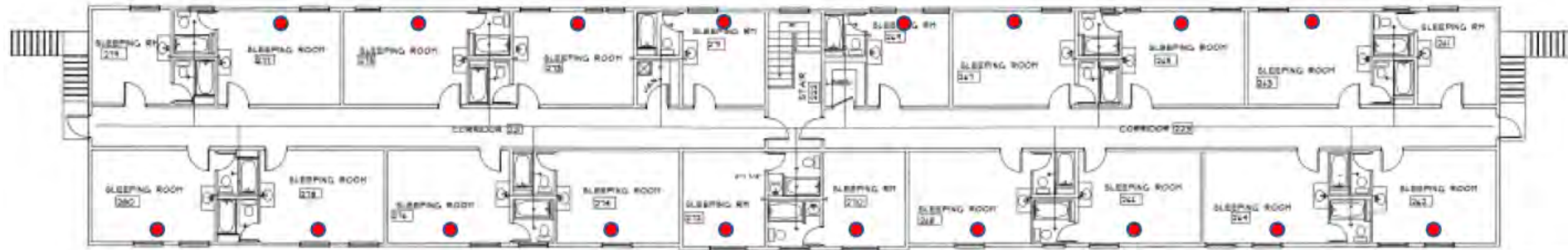




Lake Yellowstone Hotel - Annex	
Area	Lake Hotel
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	No

Lake Yellowstone Hotel – Sandpiper Lodge (“Annex”)

Coordinates: 44.550N, 110.399W



NEW BATHROOM LAYOUT SECOND FLOOR ROOMS

scale: 1" = 0' = 1/8"

Wi-Fi AP placement:

- One per room
- Ethernet cabling to be concealed in attic and basement
- 1st floor AP uses wall-plate AP. 2nd floor is ceiling mounted AP. No visible Ethernet cabling/raceway



NEW BATHROOM LAYOUT FIRST FLOOR ROOMS

scale: 1" = 0' = 1/8"

NOTES

- ◆ PENDANT
- ◁ GLOBE PENDANT
- UPRIGHT TO ATTIC

NPS DRAWING NO	REVISIONS		sheet no.	Title:
	FEB 5, 2001			FIRST FLOOR

Lake Yellowstone Hotel – Sandpiper Lodge (“Annex”)

CPE

- All [REDACTED] GHz CPEs and Wi-Fi APs mounted in interior of cabin attic (invisible to guests)



Lake Hotel Guest Cabins	
Area	Lake Hotel
NRHP Eligibility	District Contributors
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No

Lake Hotel Guest Cabins (x78)

(typical)

Coordinates: 44.551N, -110.398W

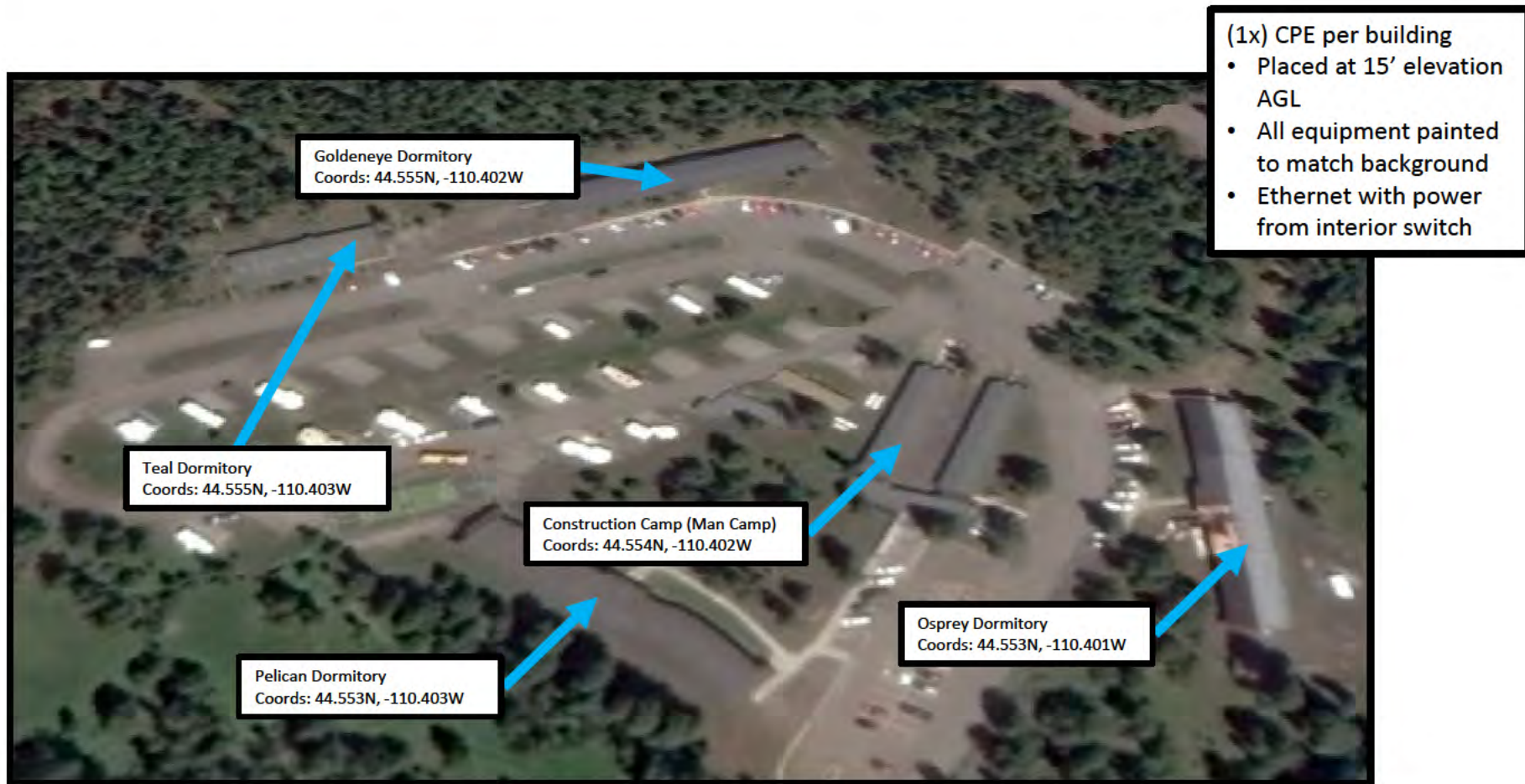


- GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

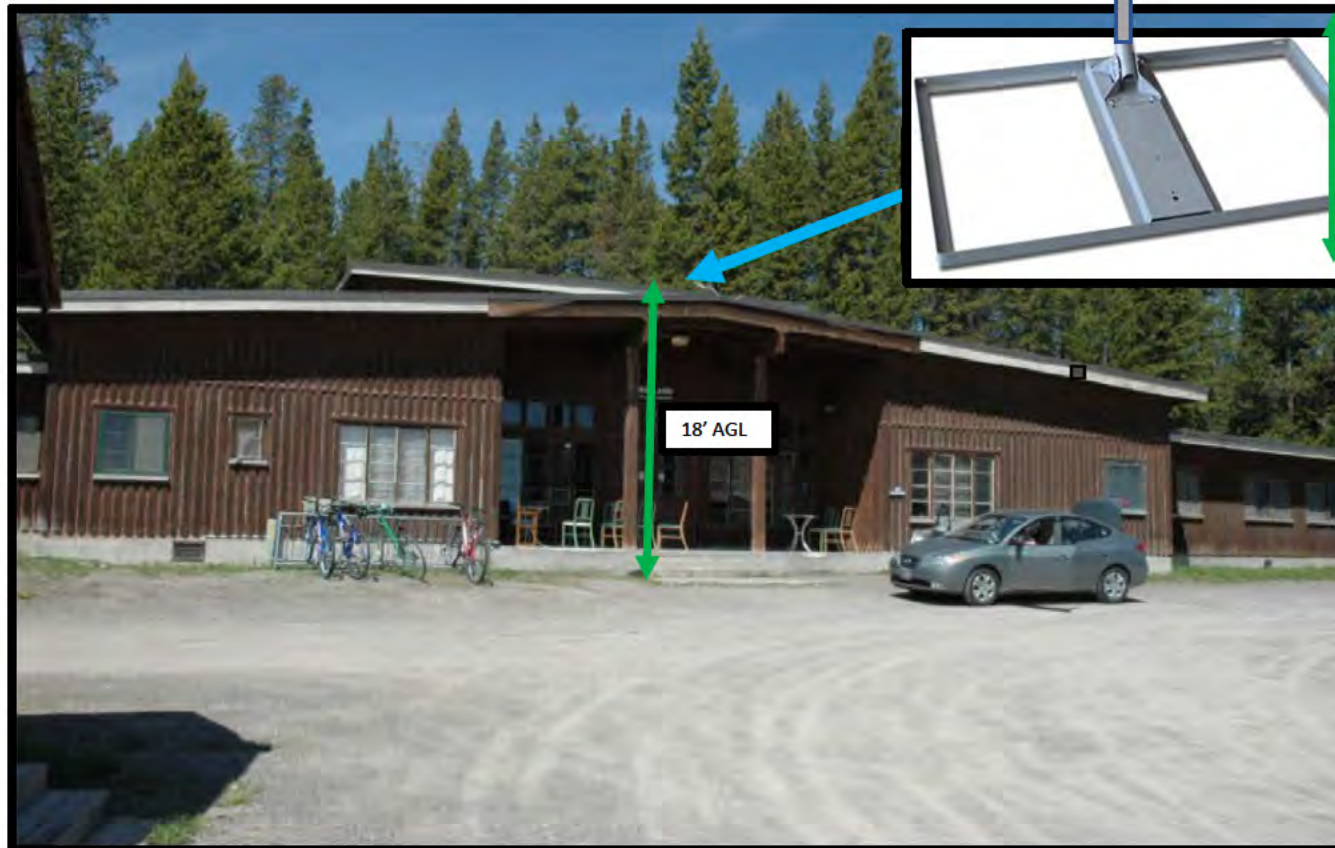
YGS Dormitory

Coords: 44.550N, -110.397W

YGS Dormitory	
Area	Lake Hotel
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



Lake Lodge Area Dormitories



2-ft
total
height

Non-penetrating mount,
depicted without ballast

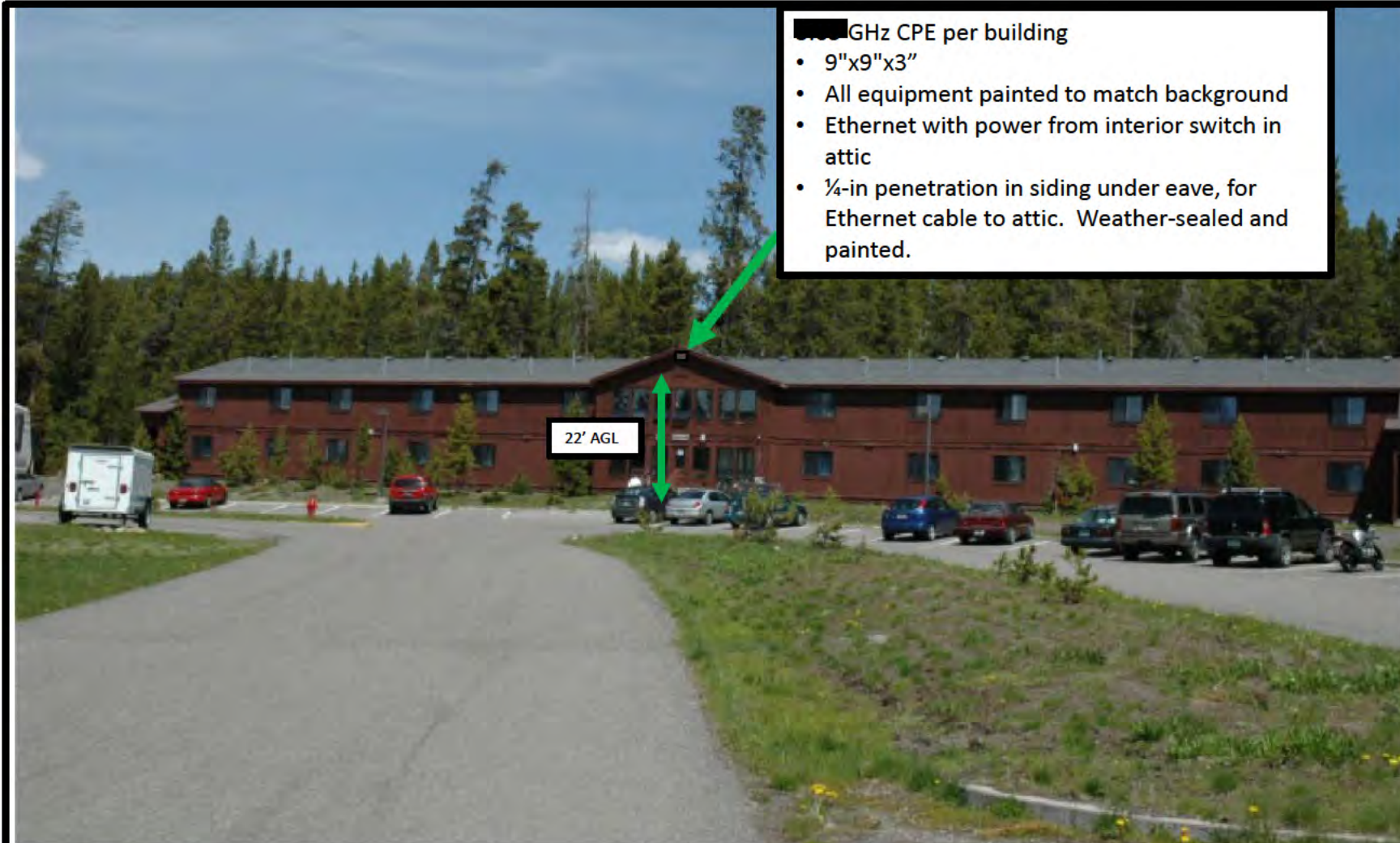
- (1x) ████ GHz CPE
- All equipment painted to match background
- Set back from roof edge; invisible to pedestrian traffic
- Ethernet with power from interior switch
- ¼-in wall penetration for Ethernet cable, sealed and painted.



Mallard Dormitory

Coords: 44.555N, -110.397W

Mallard Dormitory	
Area	Lake Hotel
NRHP Eligibility	Unknown
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes



- ██████ GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

22' AGL

Goldeneye Dormitory

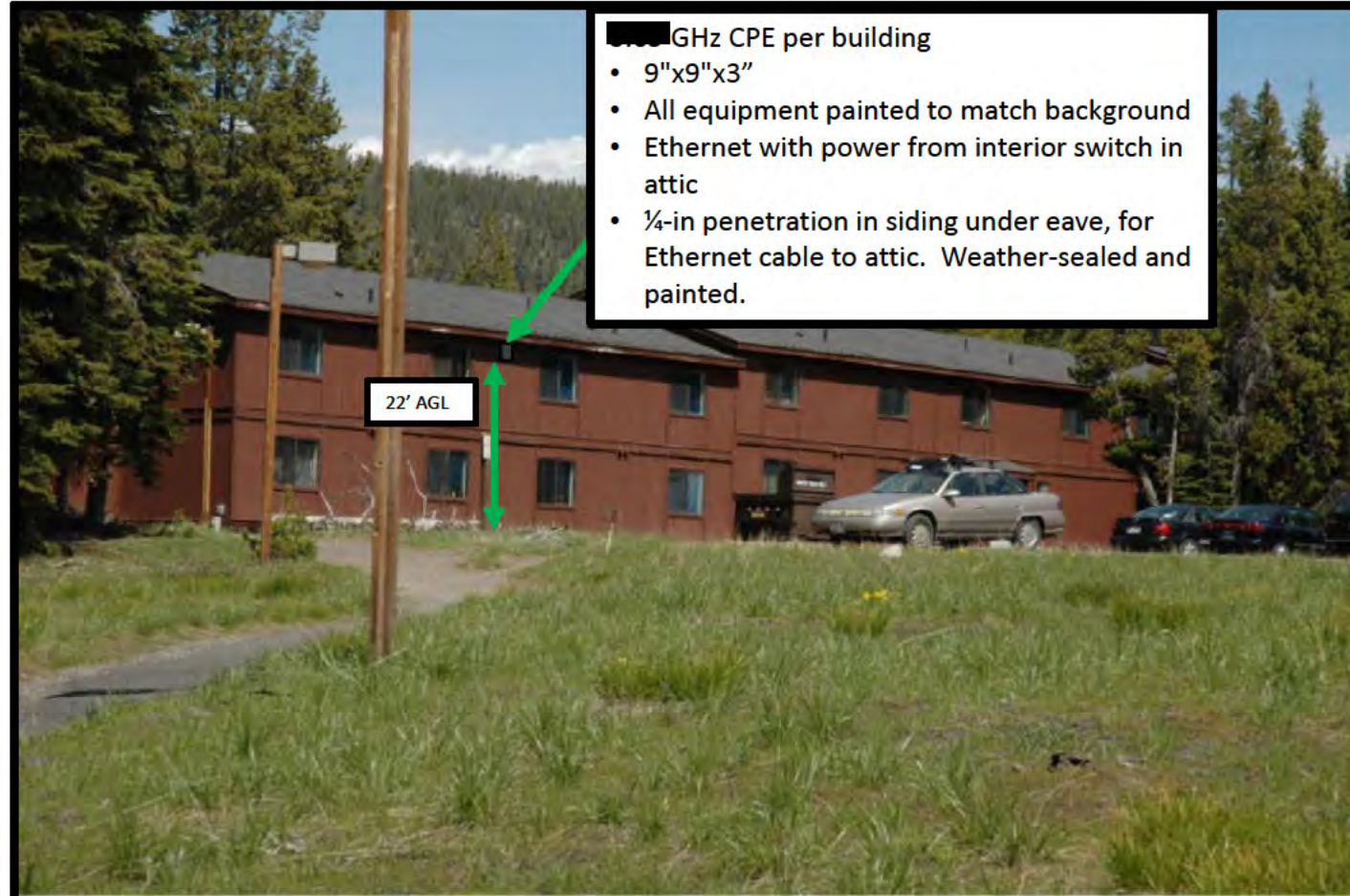
Goldeneye Dormitory	
Area	Lake Hotel
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



- GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

Teal Dormitory	
Area	Lake Hotel
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Teal Dormitory
Coords: 44.555N, -110.403W

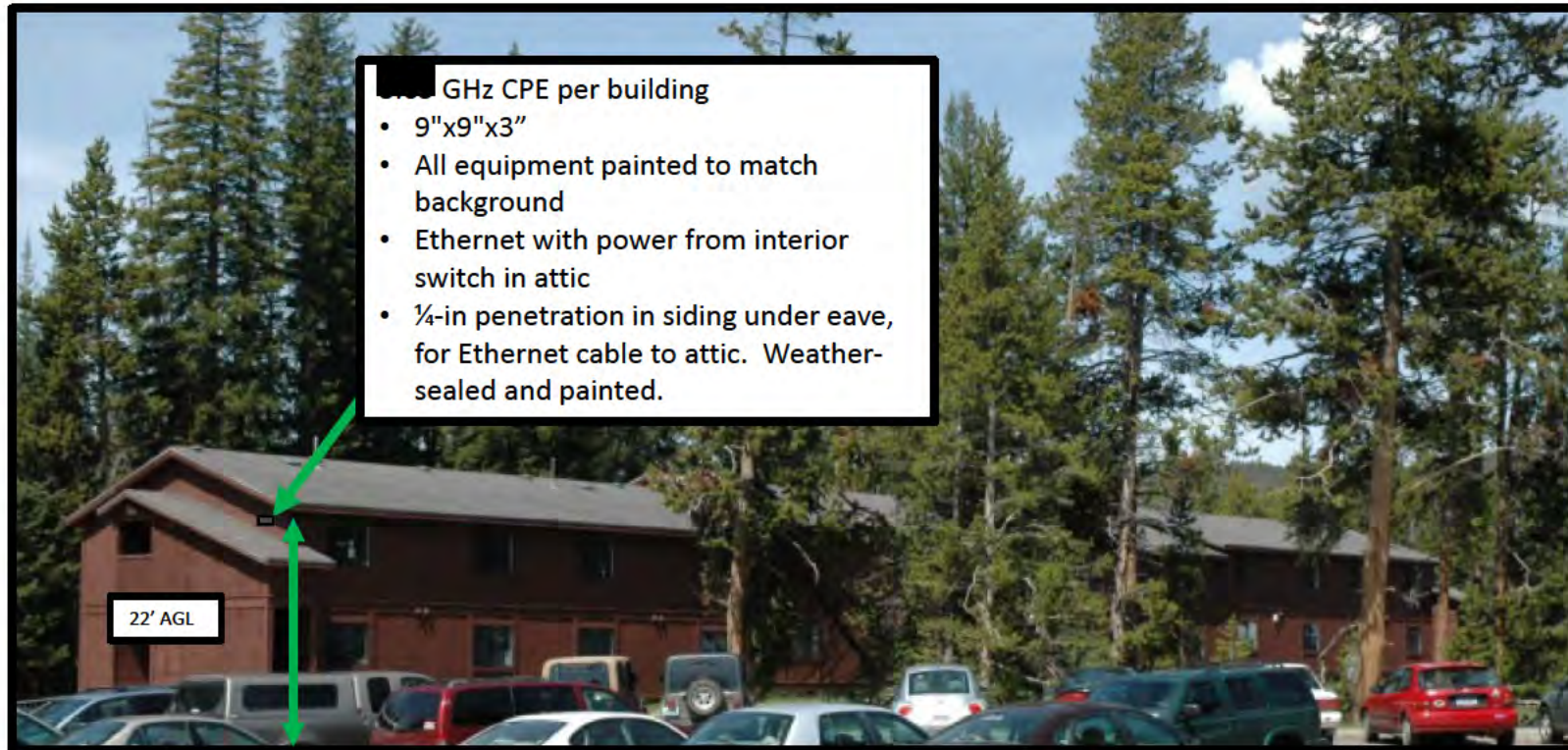


- ██████████ GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

22' AGL

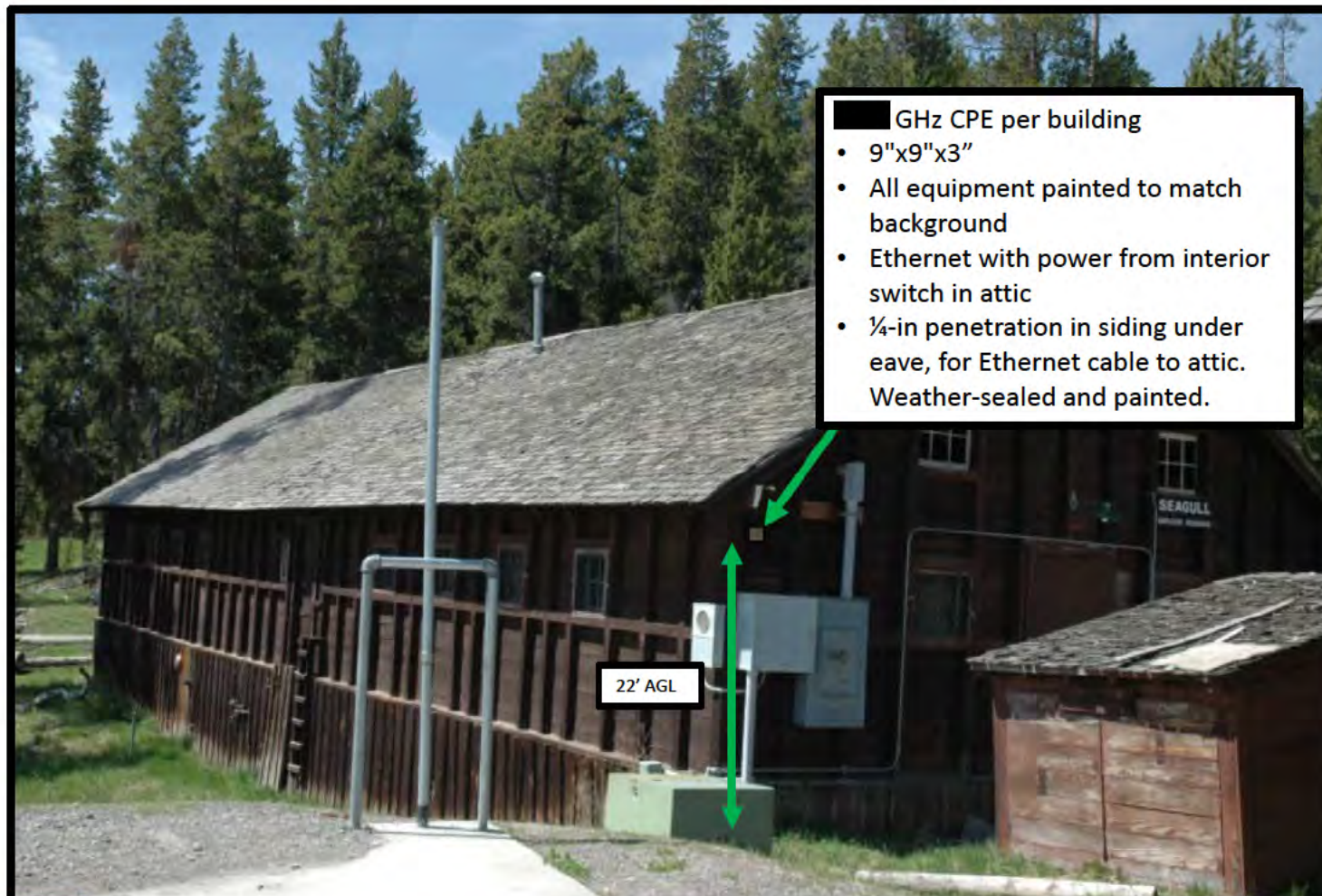
Osprey Dormitory

Osprey Dormitory	
Area	Lake Hotel
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



Pelican Dormitory

Pelican Dormitory	
Area	Lake Hotel
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



- GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - ¼-in penetration in siding under eave, for Ethernet cable to attic. Weather-sealed and painted.

22' AGL

Seagull Dormitory

Seagull Dormitory	
Area	Lake Hotel
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes



- GHz CPE per building
- 9"x9"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch in attic
 - Ethernet cabling to interior using existing penetrations.
 - CPE at 15-ft AGL

Construction Dormitory ("Man Camp")	
Area	Lake Hotel
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

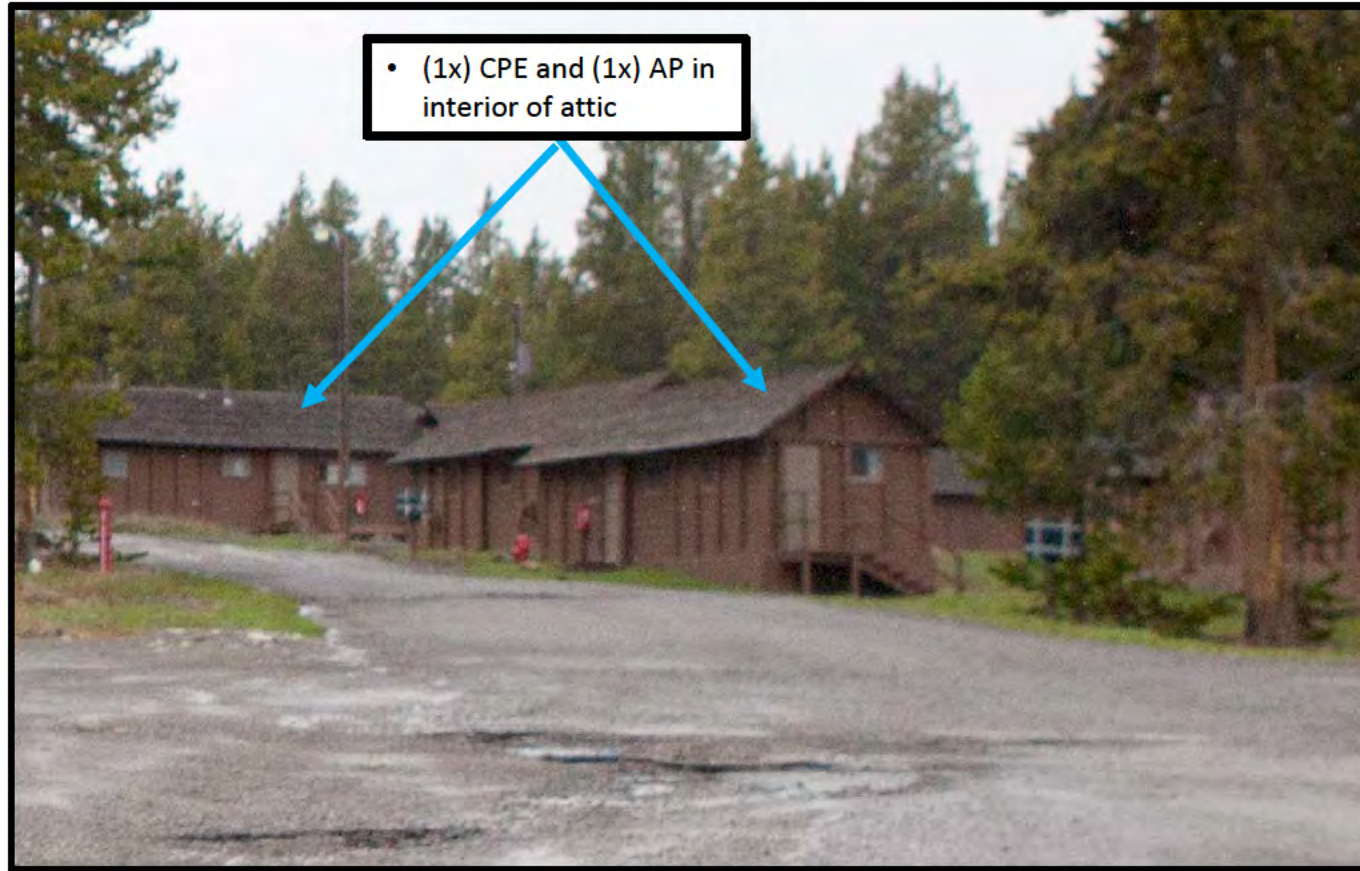
Construction Camp ("Man Camp") Dormitory

Proposed Coverage; Lake Lodge Guest Cabins (x64 Units)

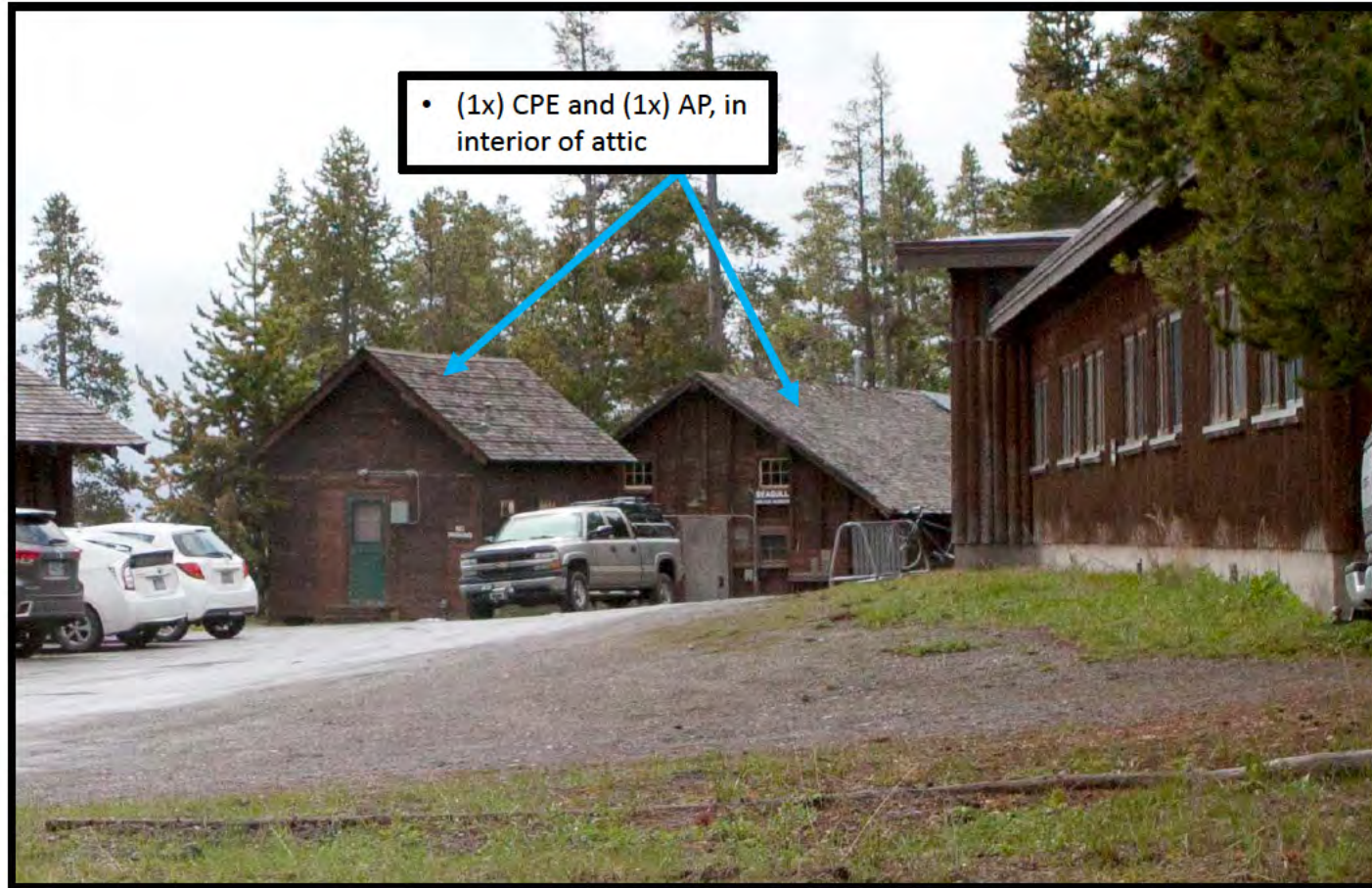


- One (1x) ████ GHz CPE per cabin
- CPE, switch and Wi-Fi AP located in interior of attic.
 - Ethernet with power from interior switch.

Lake Lodge Guest Cabins	
Area	Lake Hotel
NRHP Eligibility	District Contributors
Roof Setback?	No
Interior Installation Only?	Yes
New Penetrations?	No



Lake Lodge Guest Cabins
(typical)

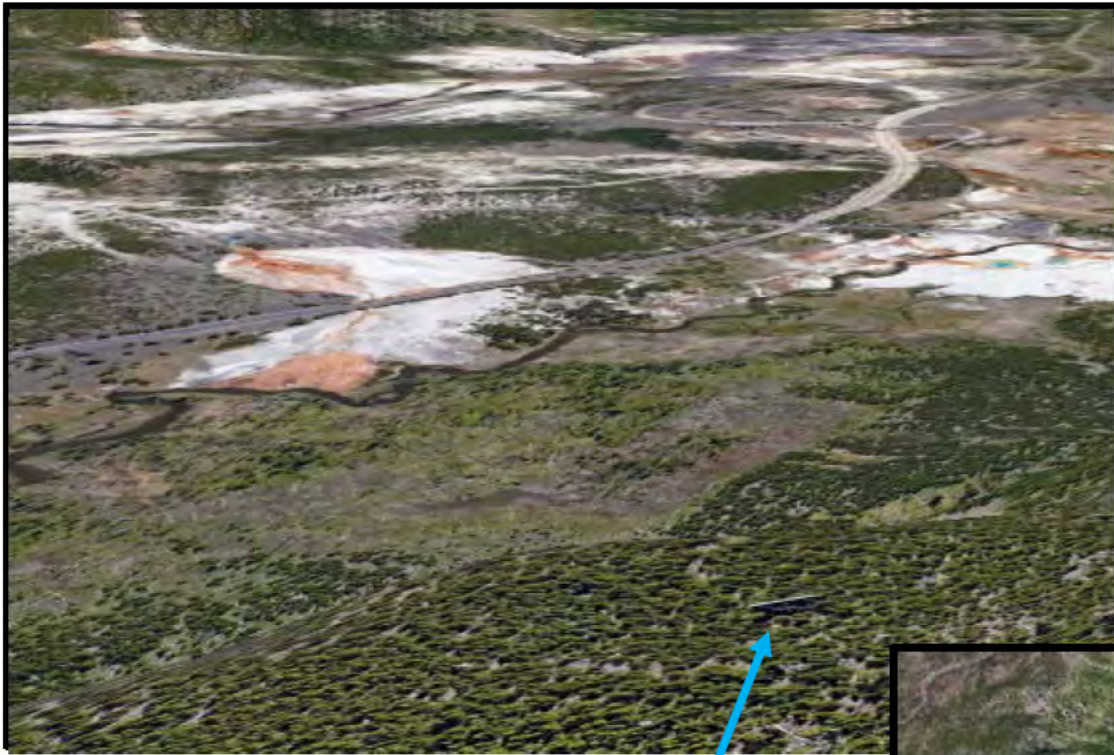


Lake Lodge Guest Cabins
(typical)

Old Faithful

Old Faithful Area

Existing wireless coverage (known)

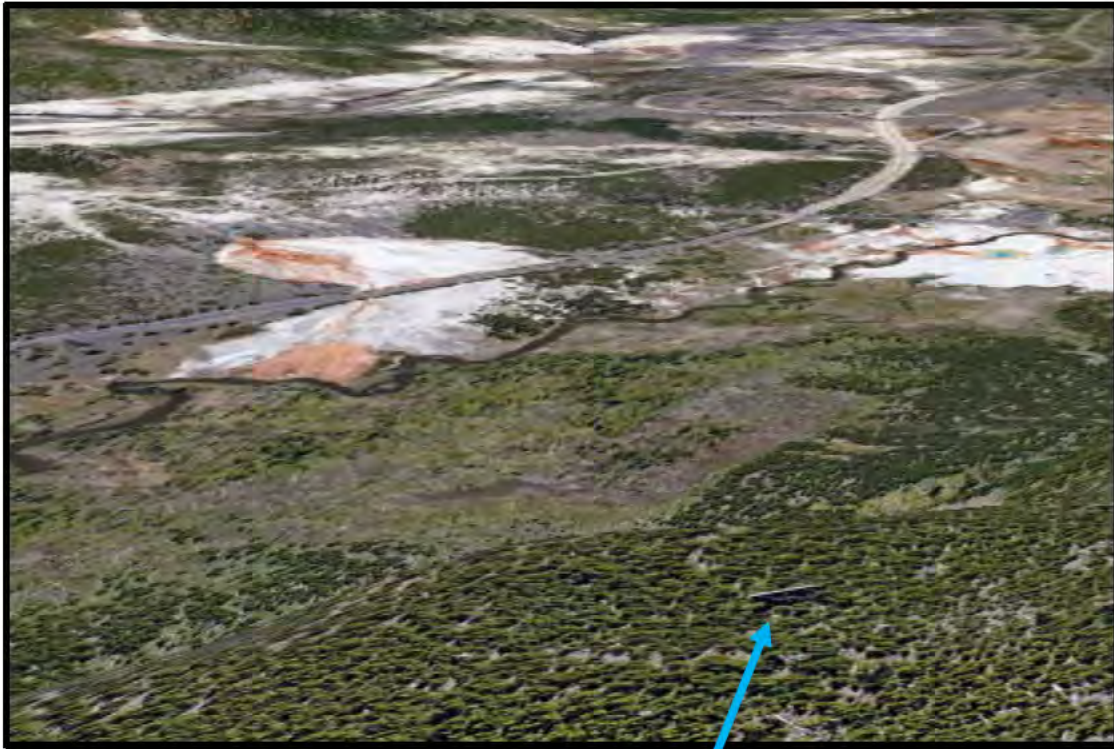


Existing tower (Century Link)
Coords: 44.457N, -110.831W



Existing passive reflector
(Century Link)
Coords: 44.467N, -110.867W

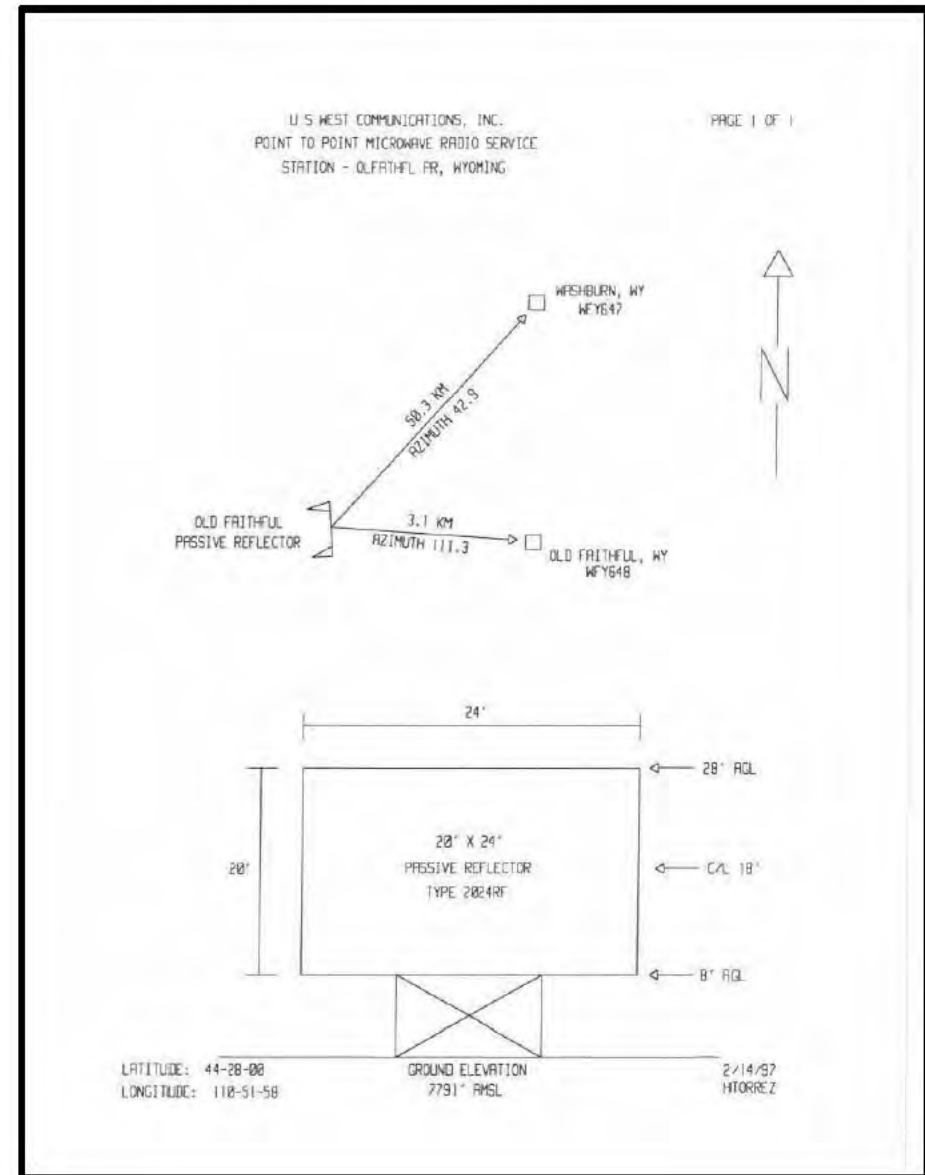




Existing passive reflector
(Century Link)
Coords: 44.467N, -110.867W

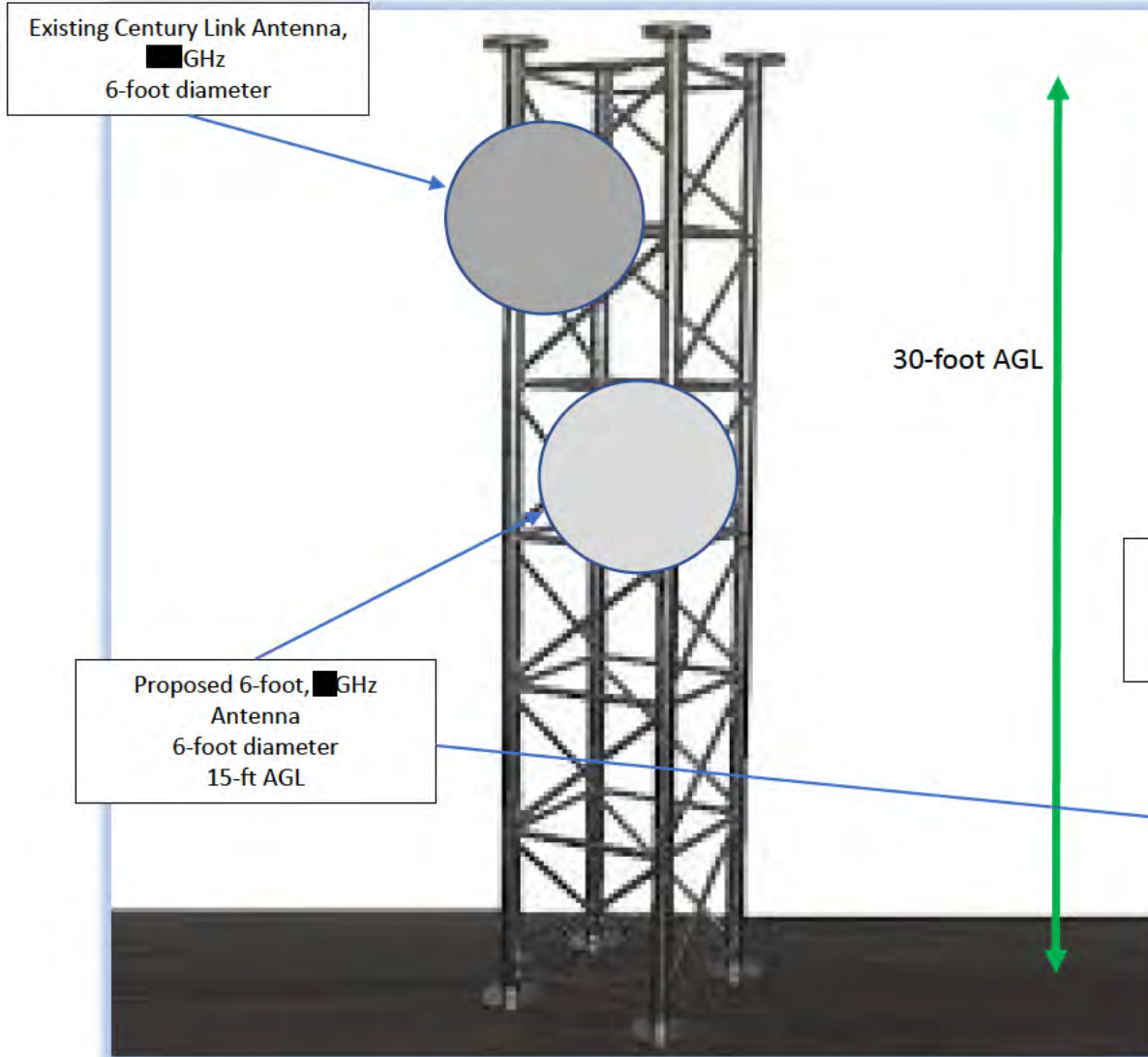
Old Faithful Area

Existing Century Link Passive Reflector

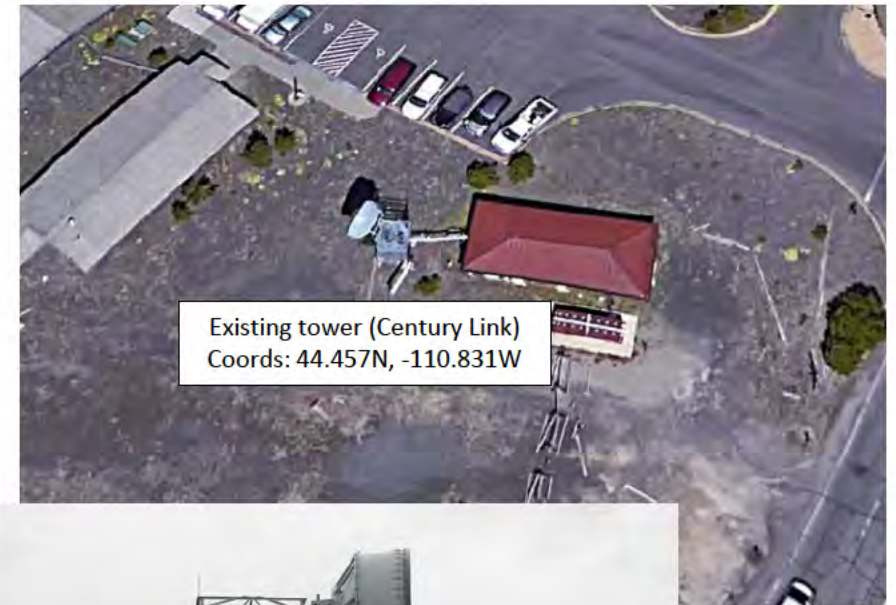


Old Faithful Area

Century Link Tower - Detail



Century Link has no site plan or elevation drawings. Full architectural survey and engineering to be completed prior to installation.



Old Faithful Area

Proposed wireless coverage



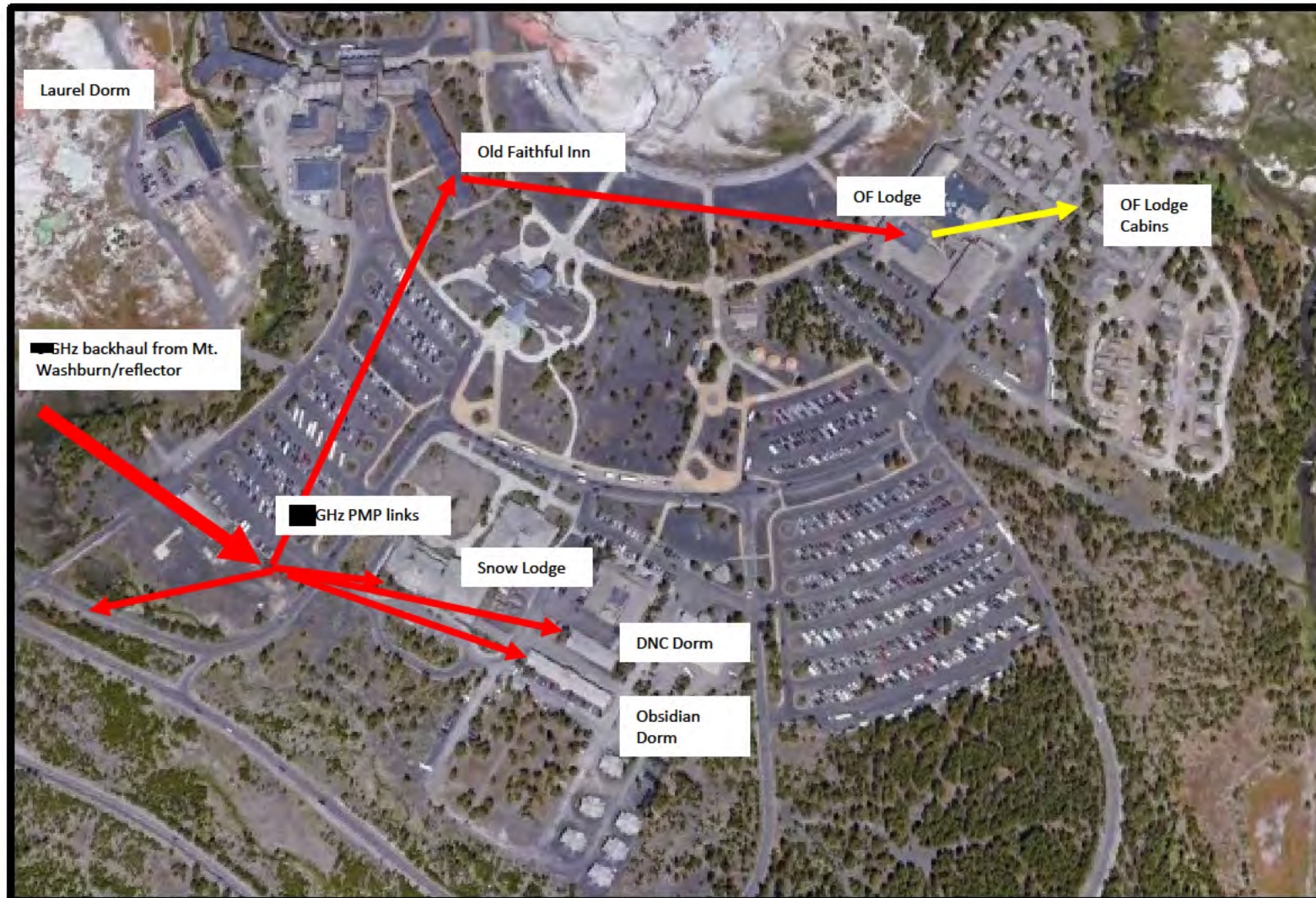
Old Faithful Area

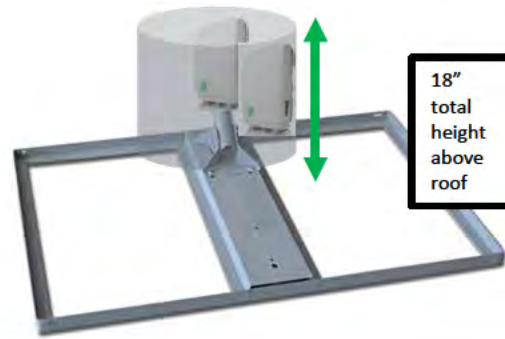
Existing wireless coverage (known)



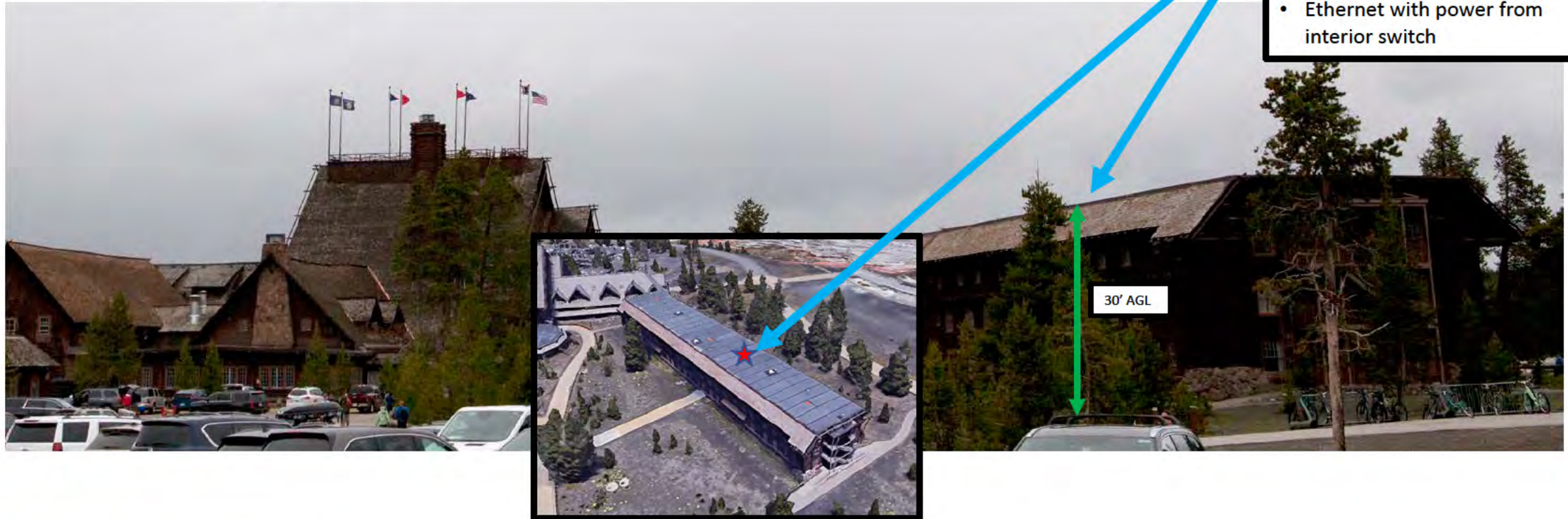
Old Faithful Area

Proposed wireless coverage





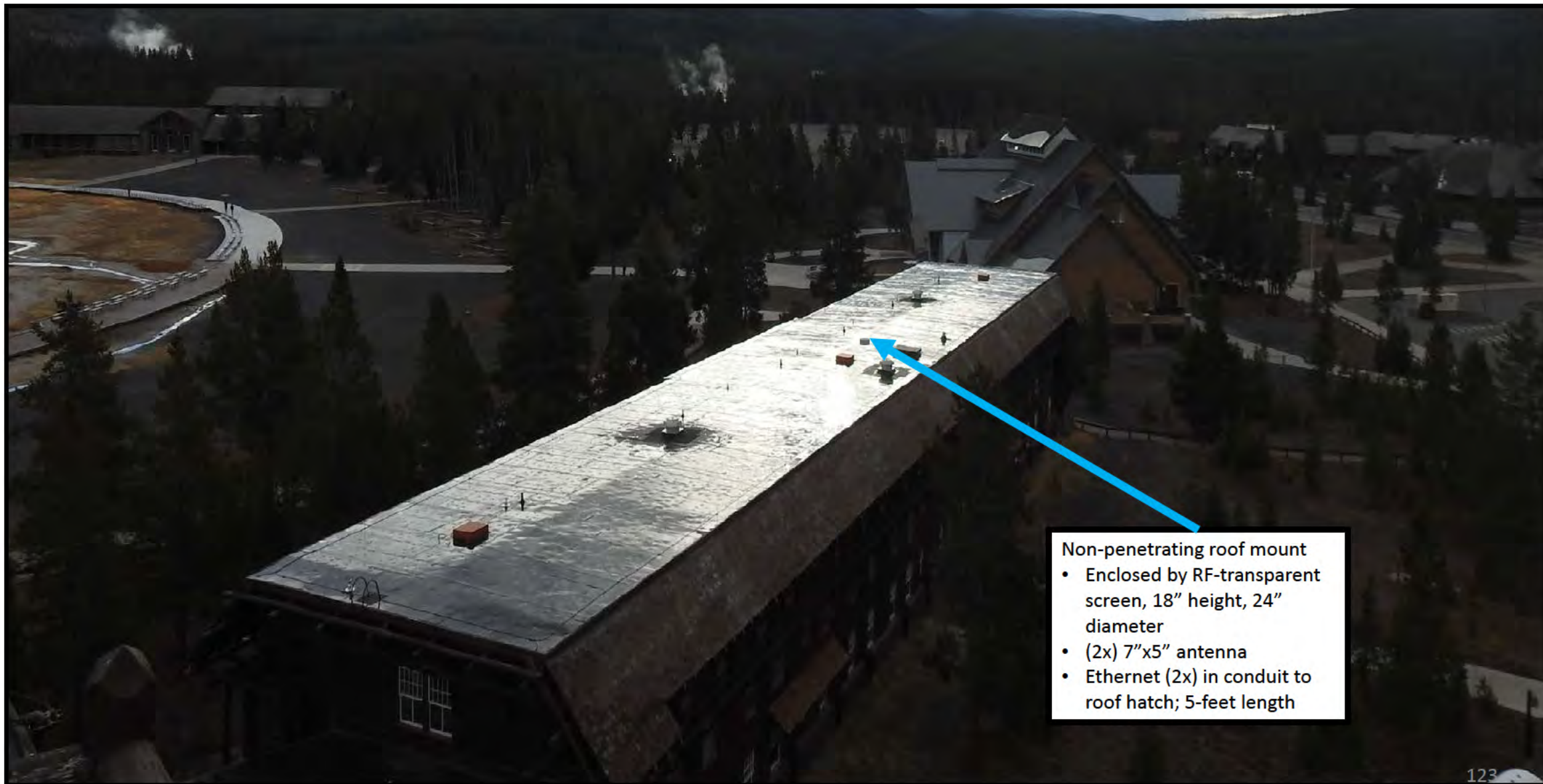
- RF-transparent screen wall
- 18" height, 24" diameter
 - Contains (2x) █ GHz radios, 7"x5"x3"
 - All equipment color-matched to background
 - 10-ft setback from edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch



Old Faithful Inn	
Area	Old Faithful
NRHP Eligibility	National Historic Landmark
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	Yes

Old Faithful Inn
Coords: 44.459N, -110.830W

Old Faithful Inn – Roof Antenna



Non-penetrating roof mount

- Enclosed by RF-transparent screen, 18" height, 24" diameter
- (2x) 7"x5" antenna
- Ethernet (2x) in conduit to roof hatch; 5-feet length

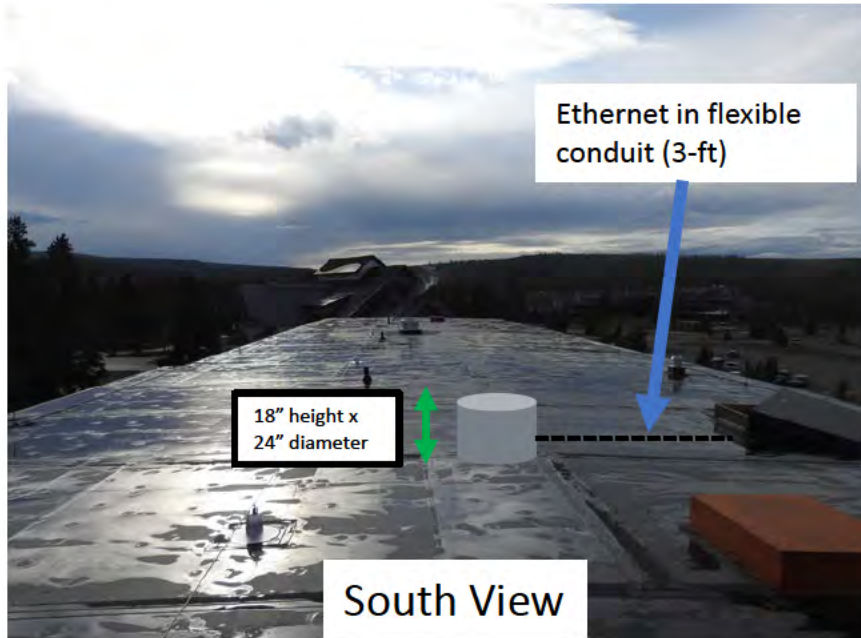
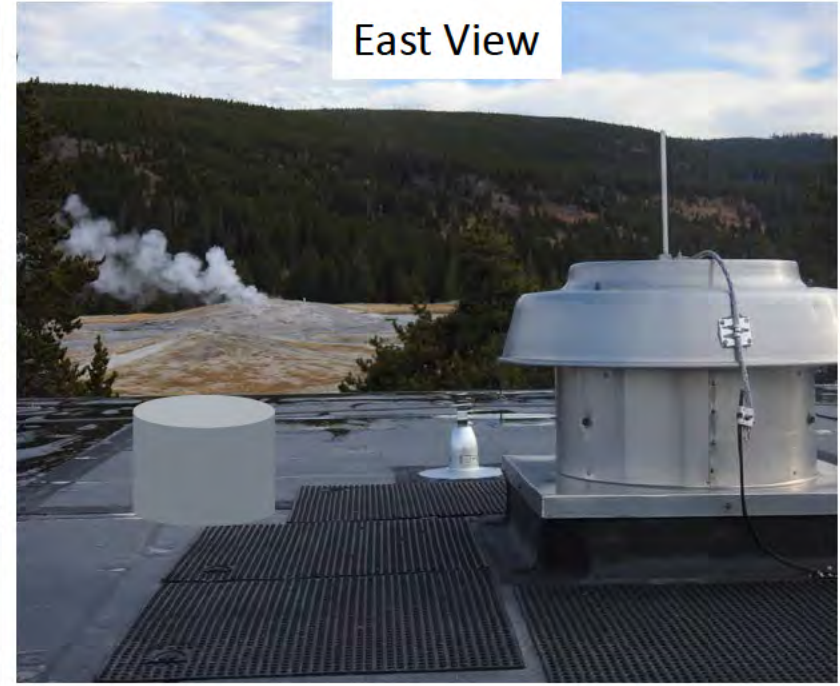
West View

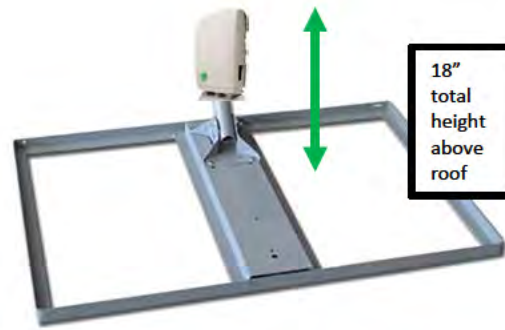


North View



East View





18"
total
height
above
roof

- Non-penetrating, self-ballasted mount
- (1x) 6 GHz CPE; 7"x5"x3"
 - All equipment painted to match background
 - Set back from edge; invisible to pedestrian traffic
 - Ethernet with power from interior switch, using existing penetrations



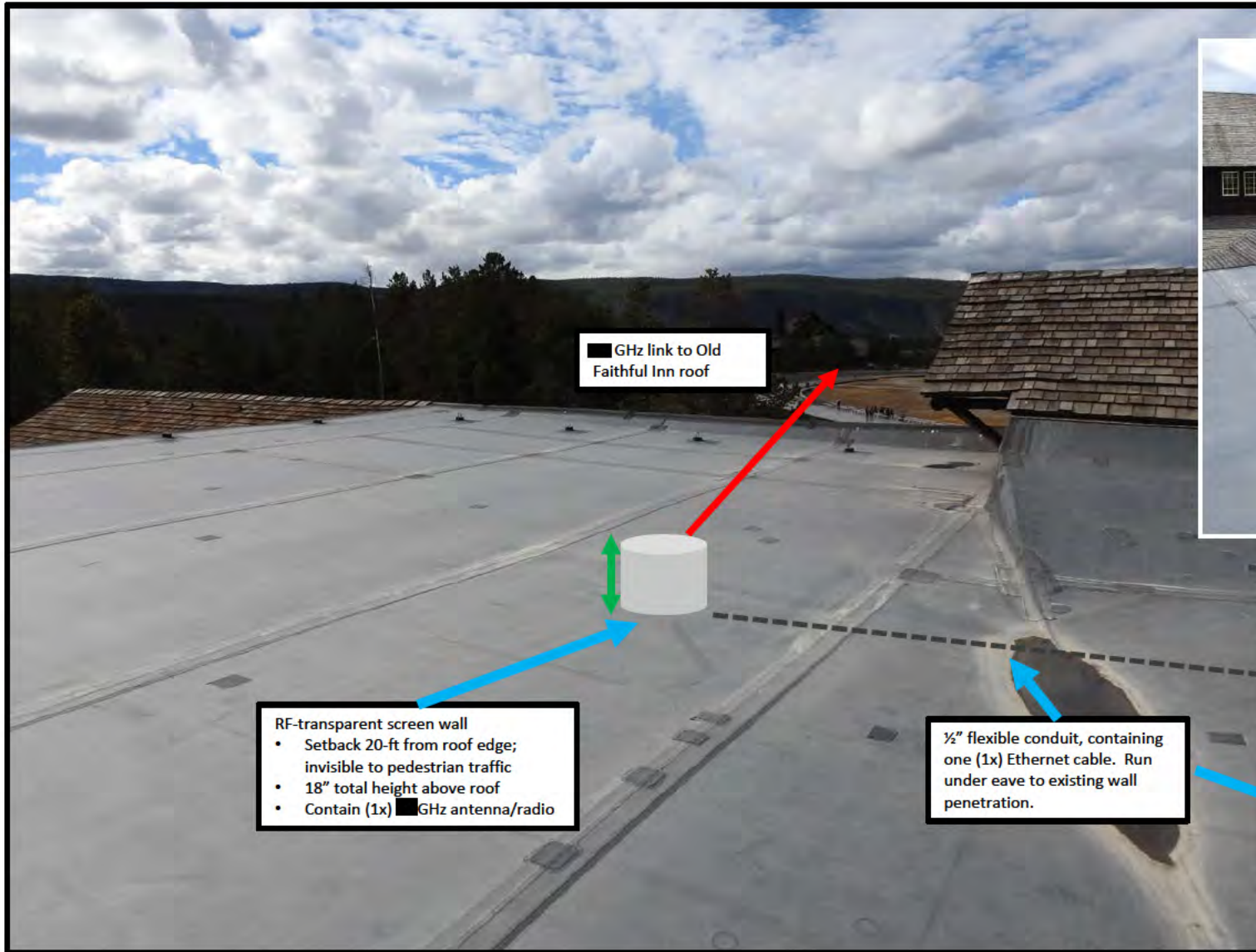
20' AGL



Old Faithful Lodge	
Area	Old Faithful
NRHP Eligibility	District Contributor
Roof Setback?	Yes
Interior Installation Only?	No
New Penetrations?	No

Old Faithful Lodge

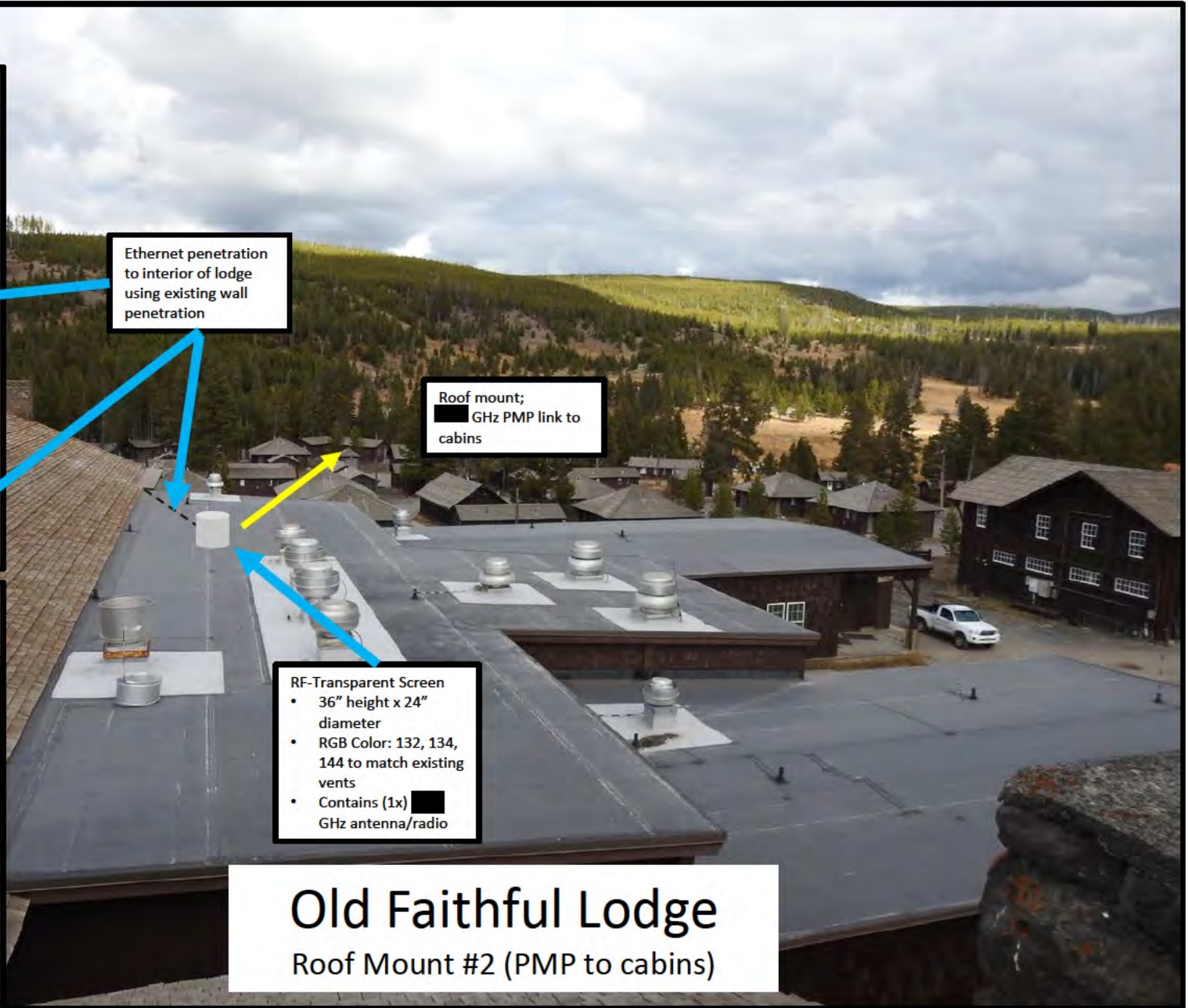
Coords: 44.459N, -110.826W



Old Faithful Lodge
Roof Mount #1 (backhaul)



Ethernet penetration
to interior of lodge
using existing wall
penetration



Roof mount;
GHz PMP link to
cabins

RF-Transparent Screen

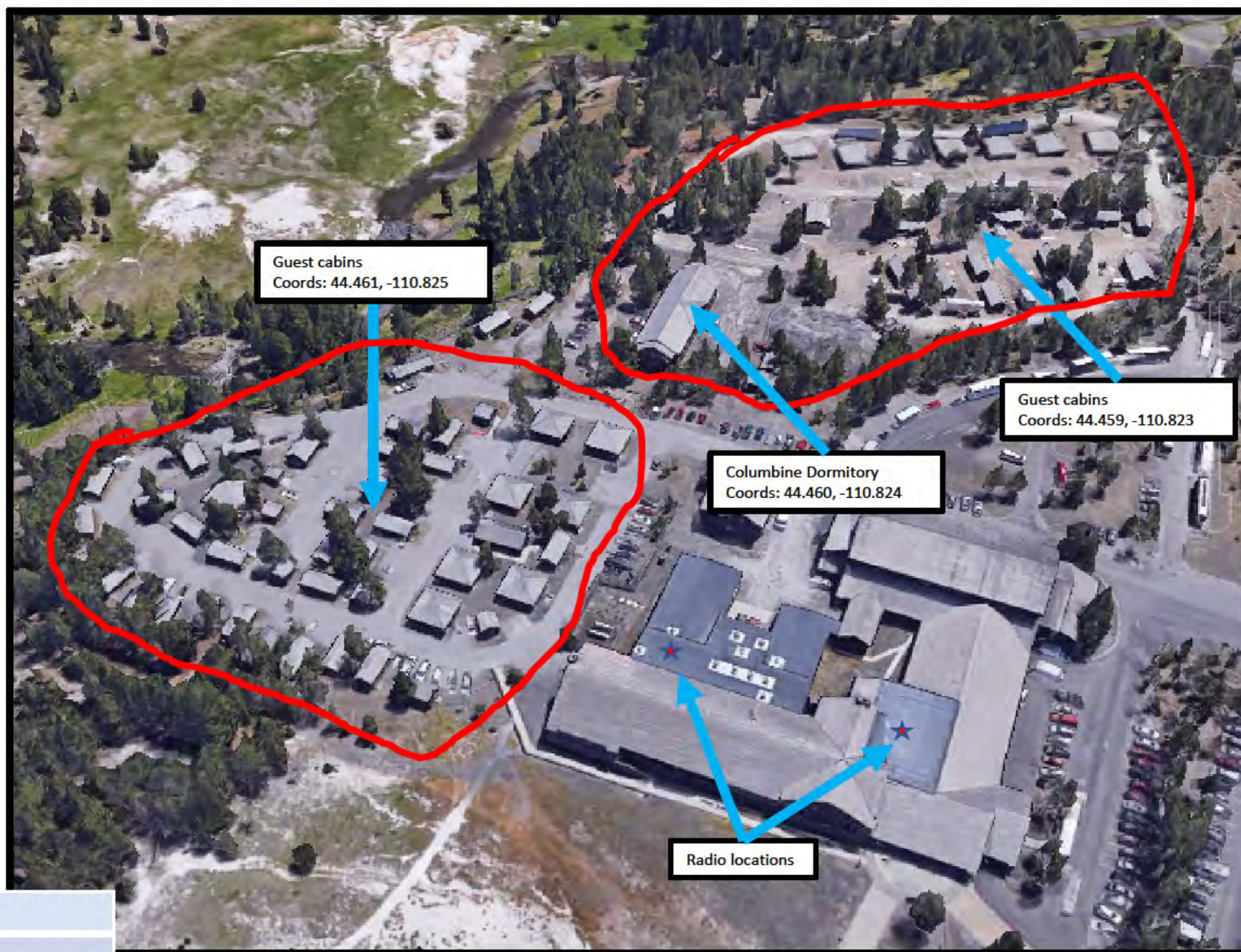
- 36" height x 24" diameter
- RGB Color: 132, 134, 144 to match existing vents
- Contains (1x) GHz antenna/radio

Old Faithful Lodge

Roof Mount #2 (PMP to cabins)

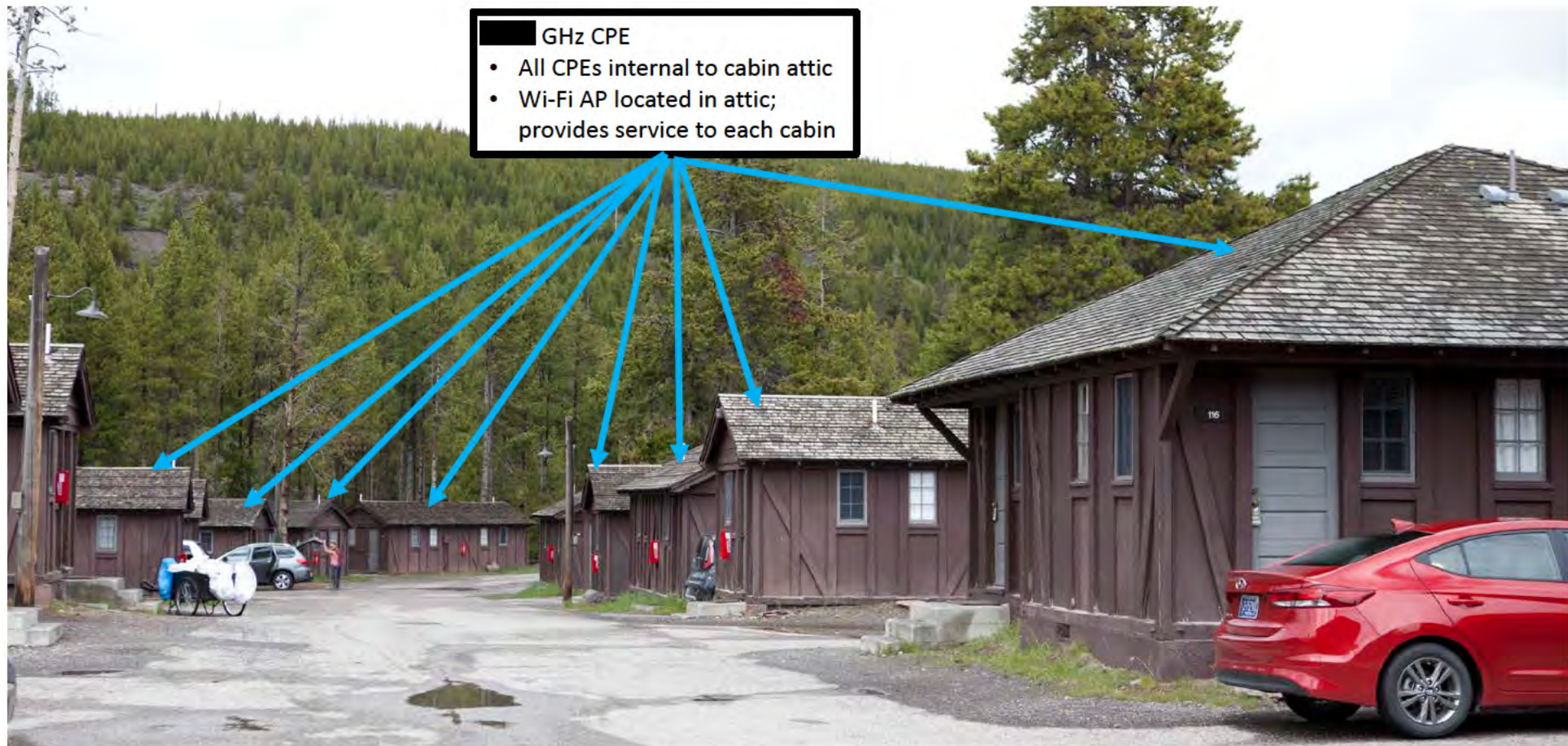


Views from OF Lodge Cabins



Year Built	Varies
Status	Contributor
ACHP Program Comment Cat.	VII.C.1

Old Faithful Lodge – 161 Guest Cabins



Old Faithful Lodge – Guest Cabins
(161 units - typical)

Coords: 44.460, -110.825



- GHz CPE
- Equipment painted to match background
 - Ethernet with power from interior switch
 - ¼" wall penetration under eave, for cabling to attic. Weather-proofed and painted



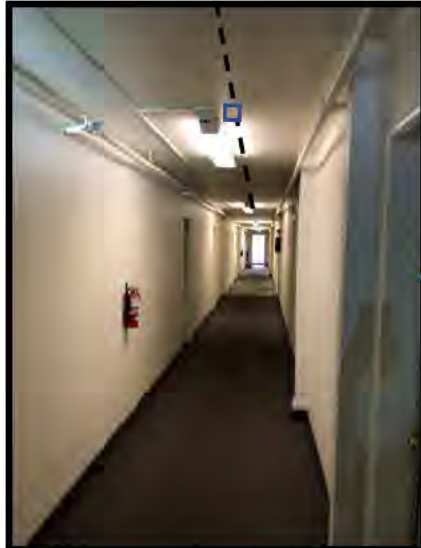
Columbine Dormitory	
Area	Old Faithful
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Columbine Dormitory

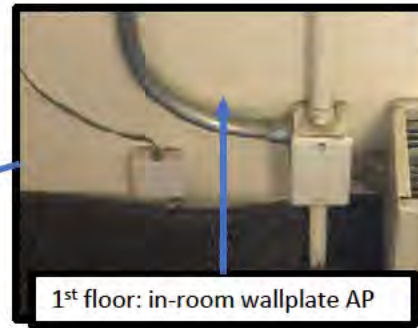
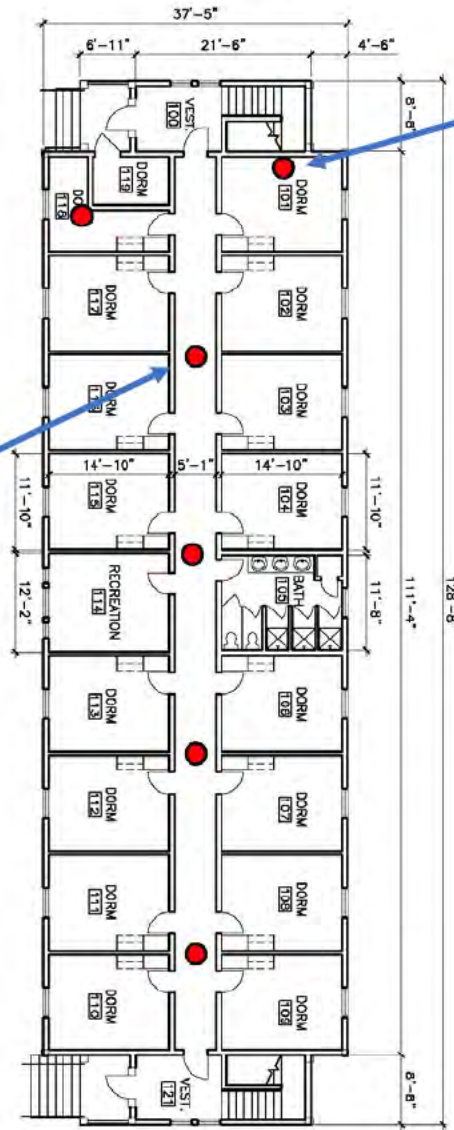
Coords: 44.883N, -110.459W

1st Floor

First Floor: 6
Second Floor 6
Total 12 Access Points



1st floor: extend existing raceway in hallway



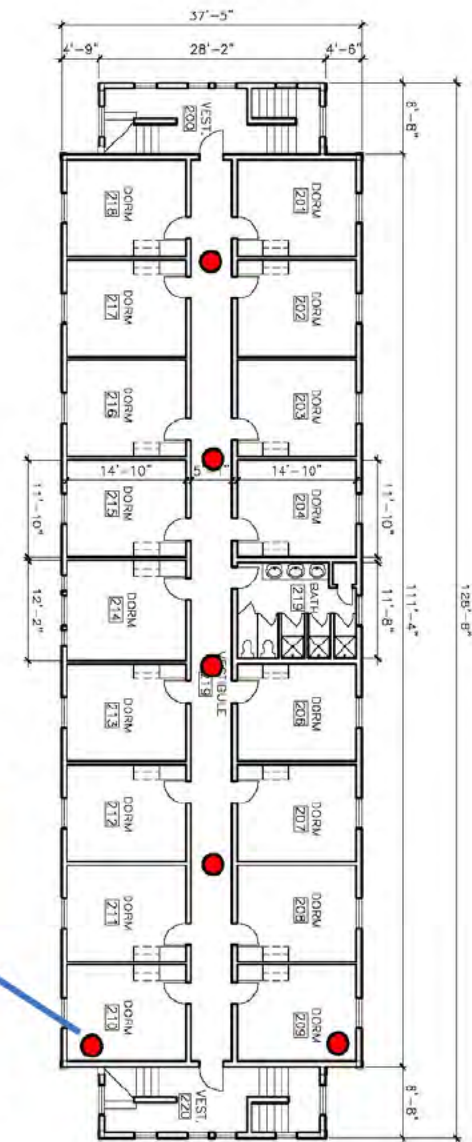
1st floor: in-room wallplate AP

Wi-Fi AP Placement

- Hallway raceway only on 1st floor
- 2nd floor access/cabling from attic; no exposed raceway/cabling



2nd Floor



Columbine Dormitory

(1x) █ GHz CPE at rear of building



Snow Lodge	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Snow Lodge
Coord: 44.457N, -110.829W



- GHz CPE**
- 7"x5"x3"
 - Equipment painted to match background
 - Ethernet with power from interior switch
 - ¼-in penetration in siding under eave, for Ethernet cable to interior. Weather-sealed and painted.



View from CPE
to OF Tower



Laurel Dormitory

Coords: 44.459N, -110.833W

Laurel Dormitory	
Area	Old Faithful
NRHP Eligibility	District Contributor
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

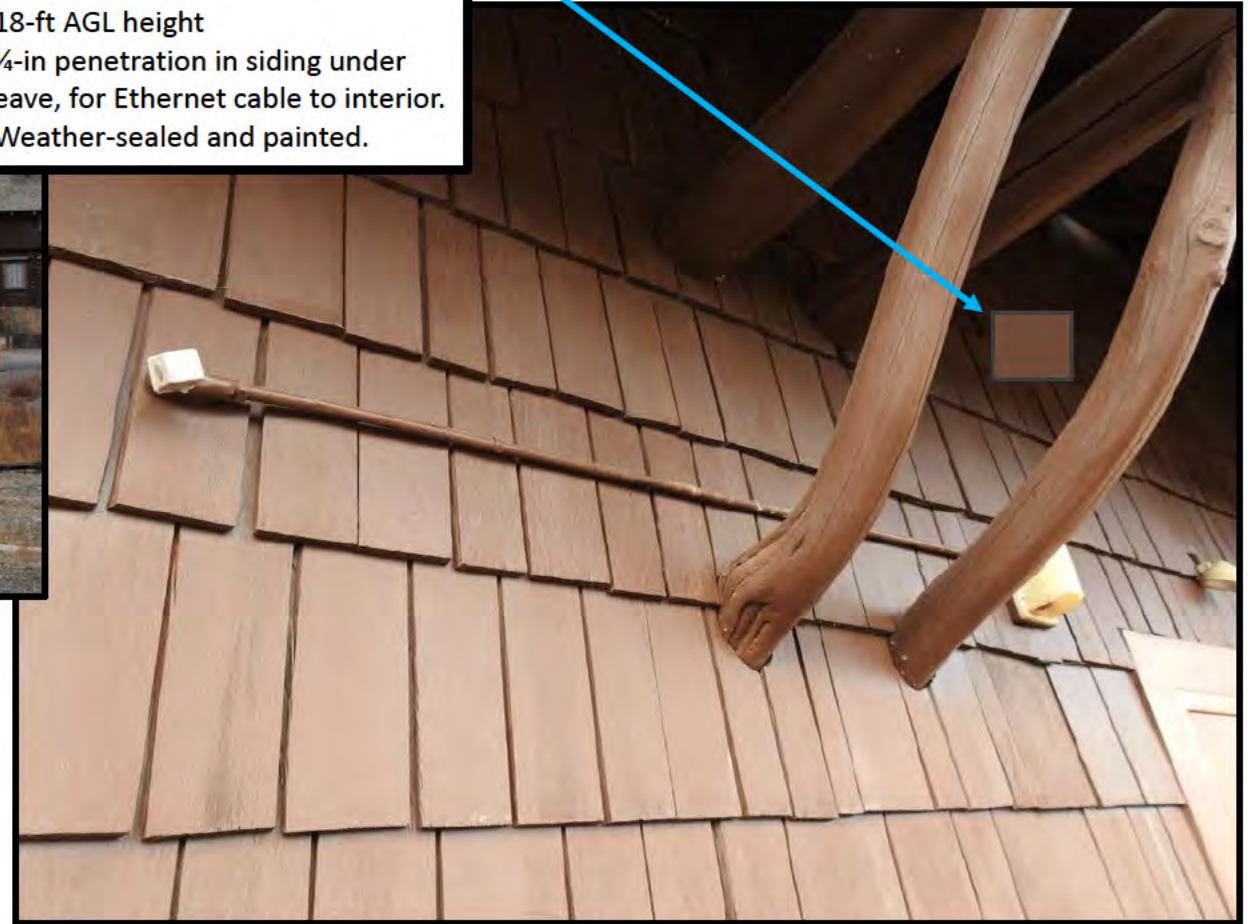
GHz CPE

- 7"x5"x3"
- All equipment painted to match background
- Ethernet with power from interior switch
- ¼-in penetration in siding under eave, for Ethernet cable to interior. Weather-sealed and painted.



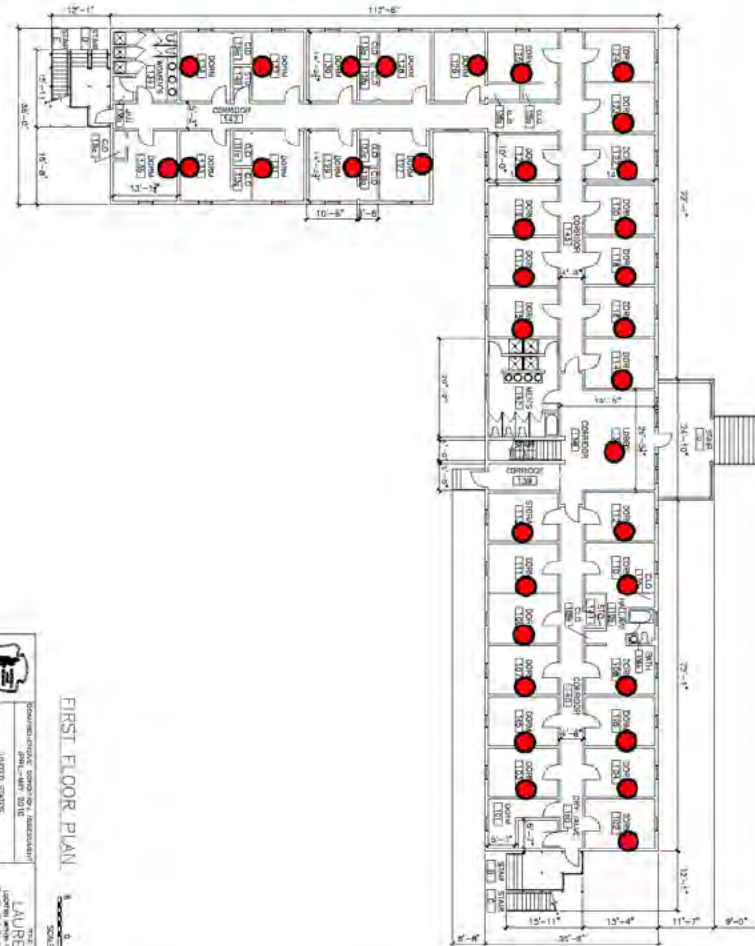


- GHz CPE
- 7"x5"x3"
 - Painted to match façade; RGB code 113, 76, 58
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - 18-ft AGL height
 - ¼-in penetration in siding under eave, for Ethernet cable to interior. Weather-sealed and painted.



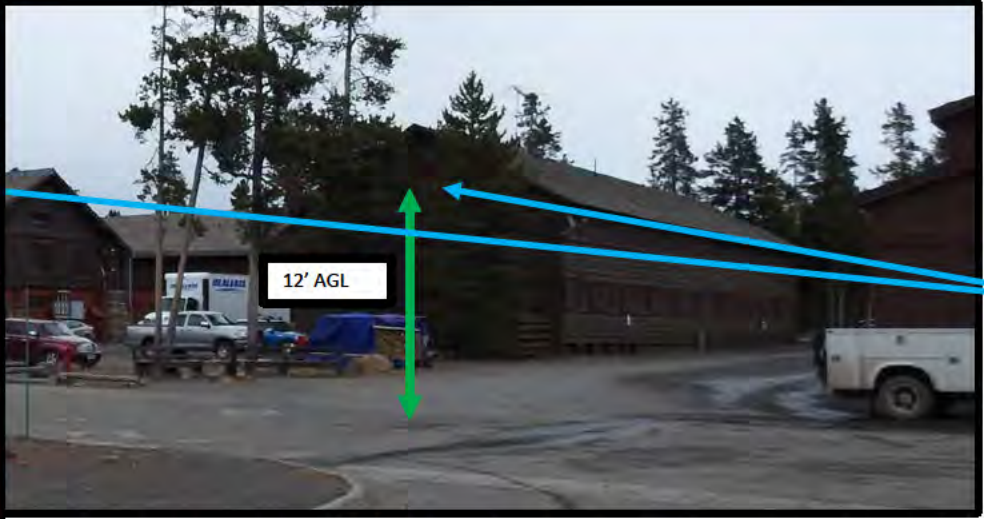
Laurel Dormitory
Coords: 44.459N, -110.833W

Total 73 Access Points

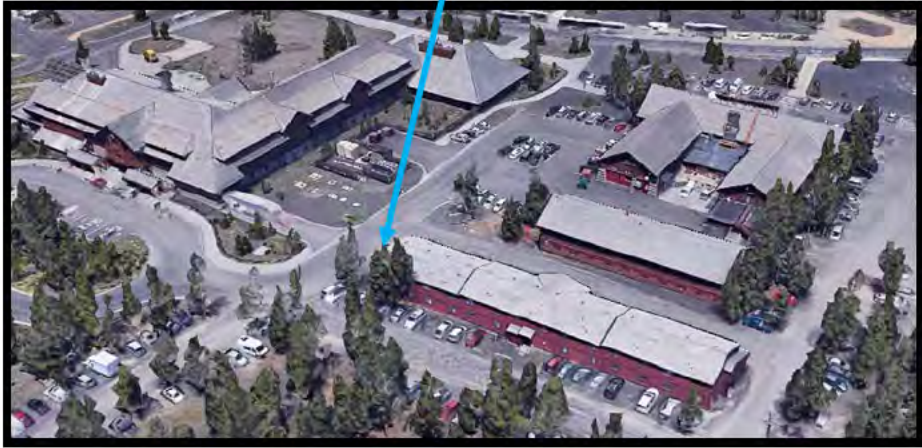


- One AP per room; wallplate mounted
- Access from attic and basement allow for AP placement
- All cable runs hidden inside attic or basement

Laurel Dormitory



- GHz CPE
- 7"x5"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - ¼-in penetration in siding under eave, for Ethernet cable to interior. Weather-sealed and painted.



Obsidian Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Obsidian Dormitory
 Coords: 44.456N, -110.828W

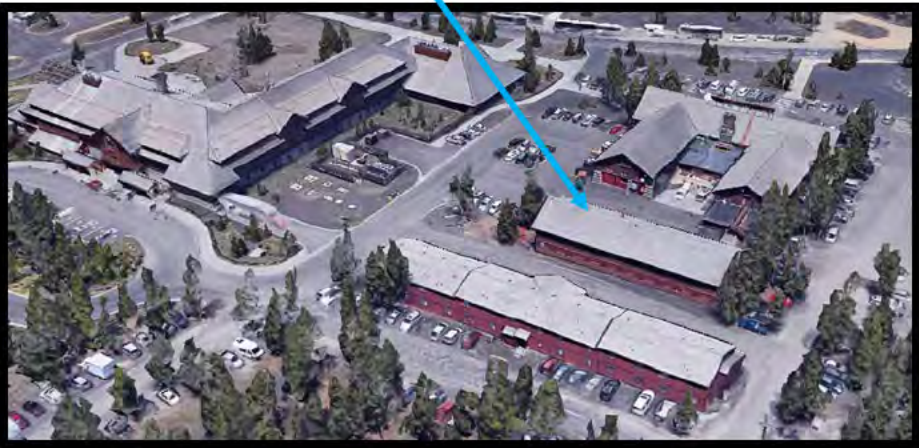


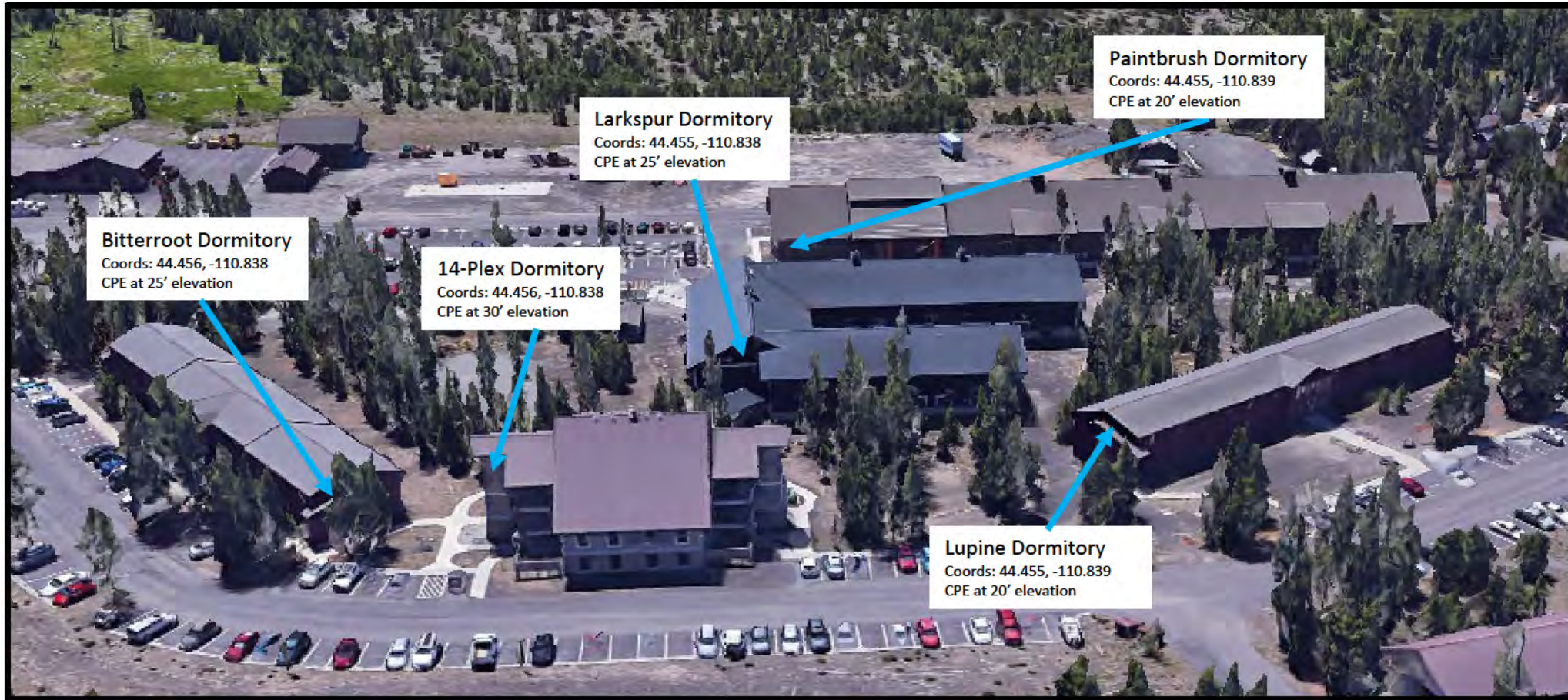
- GHz CPE
- 7"x5"x3"
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - Ethernet cabling to interior using existing building penetration for TV antenna

Delaware North Dormitory

Coords: 44.456N, -110.828W

OF-Delaware North (YGS) Dormitory	
Area	Old Faithful
NRHP Eligibility	Unknown
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	No





Old Faithful Utility Area - Dormitories



3.65 GHz CPE

- 9"x9"x3" 3.65 GHz CPE
- All equipment painted to match background
- Ethernet with power from interior switch
- Ethernet cabling to interior using existing building penetration for TV antenna
- CPE at 20' elevation



Wi-Fi AP Placement:

- Attached to dropped ceiling T-bar.
- Cabling run above dropped ceiling

Lupine Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	No

Lupine Dormitory

Coords: 44.455N, -110.839W



- GHz CPE**
- 9"x9"x3" 3.65 GHz CPE
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - Ethernet cabling to interior using ¼" wall penetration under eave, to interior attic
 - CPE at 30' elevation

14-Plex Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

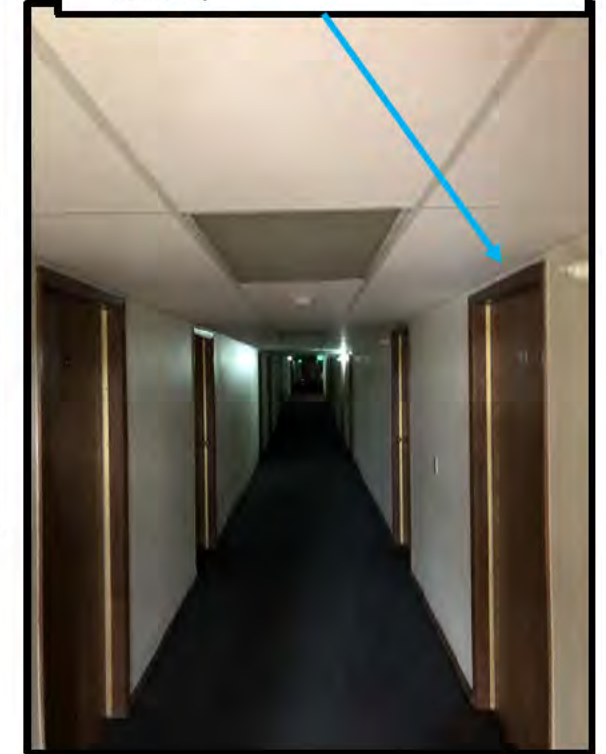
14-Plex Dormitory

Coords: 44.456N, -110.838W



- GHz CPE**
- 9"x9"x3" ■ GHz CPE
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - Ethernet cabling to interior using ¼" wall penetration under eave, to interior attic
 - CPE at 20-ft AGL

- Wi-Fi AP Placement**
- One AP per room; ceiling mounted
 - Ethernet run to rooms from within dropped ceiling. No exposed raceway.



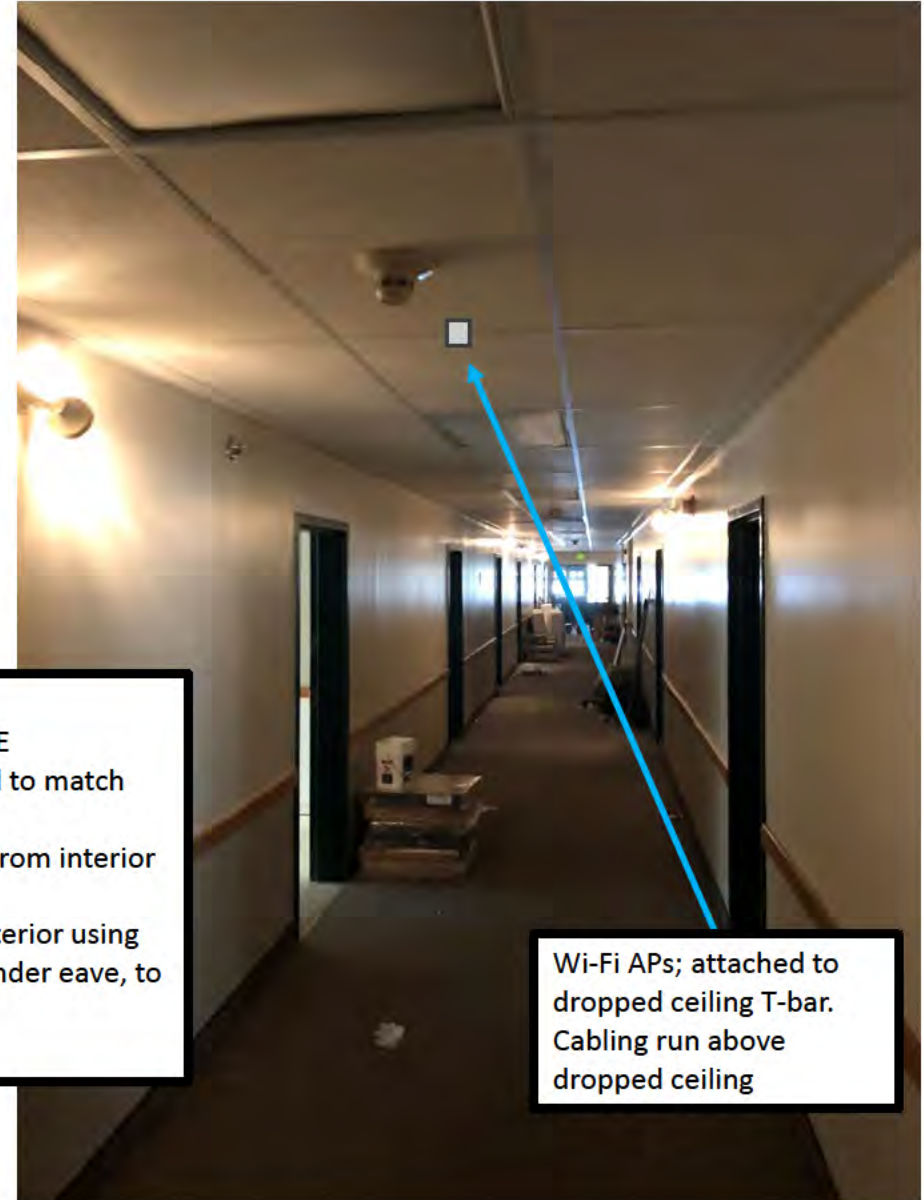
Bitterroot Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Bitterroot Dormitory

Coords: 44.456N, -110.838W



- 3.65 GHz CPE
- 9"x9"x3" 3.65 GHz CPE
 - All equipment painted to match background
 - Ethernet with power from interior switch
 - Ethernet cabling to interior using 1/4" wall penetration under eave, to interior attic
 - CPE at 25-ft AGL



Wi-Fi APs; attached to dropped ceiling T-bar. Cabling run above dropped ceiling

Larkspur Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Larkspur Dormitory

Coords: 44.455N, -110.838W



■ GHz CPE

- 9"x9"x3" 3.65 GHz CPE
- All equipment painted to match background
- Ethernet with power from interior switch
- Ethernet cabling to interior using ¼" wall penetration under eave, to interior attic
- CPE at 20-ft AGL



Wi-Fi APs; attached using same method as existing APs; cabling run in ceiling soffit

Paintbrush Dormitory	
Area	Old Faithful
NRHP Eligibility	Age Ineligible
Roof Setback?	No
Interior Installation Only?	No
New Penetrations?	Yes

Paintbrush Dormitory

Coords: 44.455N, -110.839W



ACCESSPARKS

Broadband as Great as
the Outdoors



March 20, 2020

Cameron Sholly
Yellowstone National Park
P.O. Box 168
Yellowstone National Park, WY 82190

re: Proposed Wireless Broadband Right of Way and Equipment Installation,
Yellowstone National Park, DBI_WY_2019_1763, 1019BAB001

Dear Mr. Sholly:

Thank you for consulting with the Wyoming State Historic Preservation Office (SHPO) regarding the above referenced undertaking. We have reviewed the associated report and find the documentation meets the Secretary of the Interior's Standards for Archaeology and Historic Preservation (48 FR 44716-42). Thank you for providing the "Trade Secret Confidential" visual simulations of the proposed undertaking for our review and comment.

We understand this project will take place in the National Register eligible Canyon Village Historic District (48YE999) and Lake Historic District (48YE852), National Register listed Mammoth Hot Springs Historic District (48YE486) and Old Faithful Historic District (48YE682), and the Lake Hotel National Historic Landmark (48YE676), and the National Historic Landmark Old Faithful Inn (48YE517).

The majority of the installations in the historic districts will be placed in attic spaces and will not be visible. The installations on the Lake Hotel National Historic Landmark and the Old Faithful Inn National Historic Landmark will be placed on sections of flat roofs and will not be readily visible from the ground. The roofs on these buildings have been replaced during extensive recent renovations of the facilities and the proposed installation will not cause damage to the historic nature or fabric of the roofs.

Based on these considerations we concur with your finding under 36 CFR Part 800 the above listed National Register eligible districts, National Register listed districts, and National Historic Landmarks will not be adversely affected by the undertaking as planned.

Mark Gordon | Governor
Darin J. Westby, P.E. | Director
Sara Needles | Deputy Director
Mary Hopkins | SHPO Officer



**ARTS. PARKS.
HISTORY.**
Wyoming State Parks & Cultural Resources

We recommend that the undertaking proceed in accordance with state and federal laws subject to the following stipulations:

If any cultural materials are discovered during construction, work in the area shall halt immediately, the federal agency must be contacted, and the materials evaluated by an archaeologist or historian meeting the Secretary of the Interior's Professional Qualification Standards (48 FR 22716, Sept. 1983).

This letter should be retained in your files as documentation of a SHPO concurrence with your finding of no historic properties adversely affected. Please refer to SHPO project DBI_WY_2019_1763 on any future correspondence regarding this undertaking. If you have any questions, please contact me at 307-777-8594.

Sincerely,
%USRSignature%
Brian Beadles
Historic Preservation Specialist

Mark Gordon | Governor
Darin J. Westby, P.E. | Director
Sara Needles | Deputy Director
Mary Hopkins | SHPO Officer



**ARTS. PARKS.
HISTORY.**
Wyoming State Parks & Cultural Resources