NPS Form 10-900a OMB No. 1024-0018

(8-86)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES CONTINUATION SHEET

Section _____ Page ___

==========

SUPPLEMENTARY LISTING RECORD

NRIS Reference Number: 09000620 **Date Listed: 01/14/2015**

Bird Park Road/Mauna Loa Truck Trail	Hawaii	HI
Property Name	County	State

N/A
Multiple Name

This property is listed in the National Register of Historic Places in accordance with the attached nomination documentation subject to the following exceptions, exclusions, or amendments, notwithstanding the National Park Service certification included in the nomination documentation.

Signature of the Keeper	1/14/2015 Date of Action

==========

Amended Items in Nomination:

Resource Count
The Resource Count is revised to add two contributing buildings—the Powder House (at Resource #6) and the Picnic Shelter at Bird Park Day Use Area (Resource #3). [The narrative describes these historic resources in great detail, and while they are modest in scale, their contribution to the character of their respective contributing sites is sufficient to merit individual recording, consistent with other park resources within the nominated boundaries.] Total contributing building = 4; Total contributing resources = 10.

Significance
Recreation/Entertainment is added as an area of significance. [This reflects the road's importance as a direct response to calls for the enhancement of the visitor experience in the park. Park trails and roads, as outlined in the historic park master plans, were seen as an important element of the visitor's recreational experience. In addition, the ongoing internal conflicts regarding the proposed extension of the (public) roadway within the sensitive wilderness areas of the park reflected rather unique aspects of the history of recreational development within this particular national park.

These clarifications were confirmed with the NPS FPO office.

DISTRIBUTION:
National Register property file
Nominating Authority (without nomination attachment)

NPS Form 10-900 OMB No. 1024-0018

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions.

1. Name of Property

Historic name: Bird Park Road/Mauna Loa Truck Trail

Other names/site number: Mauna Loa Road, Mauna Loa Strip Road

Name of related multiple property listing:

N/A

(Enter "N/A" if property is not part of a multiple property listing

2. Location

Street & number: Mauna Loa park road from Crater Rim Drive to a defined area at its northerly terminus

City or town: Hawaii Volcanoes National Park State: HI County: Hawaii

Not For Publication: ☐ Vicinity: ☐

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this _X_ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property _X_ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___national _X_statewide ___local

Applicable National Register Criteria:

_X_A ___B _X_C ___D

Robert J. Cleveland Deputy FPO November 25, 2014

Signature of certifying official/Title: **Date**

National Park Service

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official: **Date**

Title : **State or Federal agency/bureau or Tribal Government**

NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires 1-31-2009)

620

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

==========

1. Name of Property

==========

historic name Mauna Loa Road

other names/site number N/A

==========

2. Location

==========

street & number Hawaii Volcanoes National Park not for publication____
city or town Hilo vicinity X
state Hawaii code HI county Hawaii code 001 zip code 96718

==========

3. State/Federal Agency Certification

==========

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this ✓ nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ✓ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ✓ nationally ___ statewide ___ locally. (____ See continuation sheet for additional comments.)

Mary A. McMahon 6/22/2009
Signature of certifying official Date

State of HAWAII Historic Preservation Division
State or Federal Agency or Tribal government

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

_____
Signature of commenting official/Title Date

_____
State or Federal agency and bureau

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in National Register Bulletin, *How to Complete the National Register of Historic Places Registration Form.* If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. **Place additional certification comments, entries, and narrative items on continuation sheets if needed (NPS Form 10-900a).**

1. NAME OF PROPERTY

historic name Bird Park Road/Mauna Loa Truck Trail

other names/site number Mauna Loa Road, Mauna Loa Strip Road

2. LOCATION

street & number Mauna Loa park road from Crater Rim Drive to a defined area at its northerly terminus

N/A	not for publication
N/A	vicinity

city or town Hawaii National Park

state Hawaii code HI county Hawaii code 001 zip code 96718

3. STATE/FEDERAL AGENCY CERTIFICATION

As the designated authority under the National Historic Preservation Act, as amended,

I hereby certify that this ✓ nomination ___ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.

In my opinion, the property ✓ meets ___ does not meet the National Register Criteria. I recommend that this property be considered significant at the following level(s) of significance:

___ national ✓ statewide ___ local

Signature of certifying official/Title — Date 7.28.14

NPS, Hawaii Volcanoes NP

State or Federal agency/bureau or Tribal Government

In my opinion, the property ___ meets ___ does not meet the National Register criteria.

Signature of commenting official — Date

Title — State or Federal agency/bureau or Tribal Government

4. NATIONAL PARK SERVICE CERTIFICATION

I hereby certify that this property is:

___ entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

Signature of the Keeper — Date of Action

4. National Park Service Certification

I hereby certify that this property is:

X entered in the National Register

___ determined eligible for the National Register

___ determined not eligible for the National Register

___ removed from the National Register

___ other (explain:) _____

Signature of the Keeper

1/14/2015
Date of Action

5. Classification

Ownership of Property

(Check as many boxes as apply.)

Private: ☐

Public – Local ☐

Public – State ☐

Public – Federal ☐

Category of Property

(Check only **one** box.)

Building(s) ☐

District ☐

Site ☐

Structure ☐

Object ☐

5. CLASSIFICATION

Ownership of Property
(Check as many boxes as apply.)

	private
	public - Local
	public - State
X	public - Federal

Category of Property
(Check only one box.)

	building(s)
X	district
	site
	structure
	object

Number of Resources within Property
(Do not include previously listed resources in the count.)

Contributing	Noncontributing	
2	0	buildings
4	0	sites
4	0	structures
0	0	objects
10	0	**Total**

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing)

N/A

Number of contributing resources previously listed in the National Register

N/A

6. FUNCTION OR USE

Historic Functions
(Enter categories from instructions.)

Education (research facility)
Landscape (natural feature)
Recreation (outdoor recreation)
Transportation (road-related)

Current Functions
(Enter categories from instructions.)

Education (research facility)
Landscape (natural feature)
Recreation (outdoor recreation)
Transportation (road related)

7. DESCRIPTION

Architectural Classification
(Enter categories from instructions.)

National Park Service Rustic Style Architecture
NPS Naturalistic Design

Materials
(Enter categories from instructions.)

foundation: Masonry (lava stone); Concrete
walls: Wood (dimensional lumber, logs); Masonry (lava stone)
roof: Asphalt Shingle; Lava Stone; Corr. Metal
other: Asphalt; Masonry (lava stone); Earth

Narrative Description

Summary Paragraph

The historic Bird Park Road/Mauna Loa Truck Trail[1] runs northwesterly from Crater Rim Drive within Hawai'i Volcanoes National Park (HAVO) for approximately 11.4 miles in its ascent up the south slope of Hawaii Island's Mauna Loa, the

[1] May be referred as Mauna Loa Road (current name) when context is appropriate.

world's largest active shield volcano, to an elevation above sea level of approximately 6,765 feet. The Mauna Loa Trail, a non-vehicular walking path, then extends from this end point for nearly 7,000 feet to the summit of Mauna Loa at 13,678 feet; only the first 300 feet of the trail is not included as part of this nomination. The historic Bird Park Road/Mauna Loa Truck Trail, or as it is currently named, and as may be referenced hereafter, Mauna Loa Road, is presented in **two** distinct construction **segments** evolving under three separate project timeframes.

Descriptive Overview

Segment 1 in its entirety is historically known as Bird Park Road, and is 1.6-miles in length consisting of two sections, one representing the earliest park construction from 1934, and the other representing the most recent from 1962. Roads that were more akin to rough trails to Bird Park were already in place by the 1920s, and probably earlier. The earliest section of **Segment 1**, originally part of the 4.672-mile Halema'uma'u Crater-Uwekahuna Bluff-Bird Park Road project, was designed to provide public access from Uwekahuna Bluff at Kilauea to Bird Park with a paved, two-lane visitor-friendly surface. The later section consisting of a 2,900-foot realignment from 1962, and beginning at what is now Crater Rim Drive east of the 1934 road, is also paved with two-lanes, albeit more pronounced as a thoroughfare, but was designed to provide an efficient linking up of the Tree Molds Outdoor Exhibit Area with the 1934 Bird Park Road. In addition, the 1962 realignment was prompted by the construction of a simultaneous bypass road that would eliminate through-traffic within the primary visitor area of Hawaii Volcanoes National Park (HAVO), resulting in a truer and complete park loop road around the Kilauea Crater. All of **Segment 1** was clearly designed with public use in mind and contains three distinct developed areas.

This early section of **Segment 1** was coordinated by the National Park Service (NPS), but completed in 1934 by a private contractor, E.E. Black.[2] While this early incarnation of the roadway extended from the Halema'uma'u Crater Parking Area at the Kilauea Caldera floor to Bird Park, Mauna Loa Road today is defined by the later section where it begins at its junction on the north side of Highway 11, which, for the purposes of this nomination serves as its point of beginning. However, part of Segment 1 does include an abandoned 444-foot long section of roadway originally completed in 1962; it occurs immediately south of Highway 11 and is directly aligned with the later realignment at the point-of-beginning of the Bird Park Road (Mauna Loa Road) roadway. This small length of road, along with the entire 1.6-mile segment was sometimes referred to as the Mauna Loa Strip Road, which has since been changed to Mauna Loa Road.

Segment 2 was completed in 1936 at approximately 9.8 miles in length with labor assistance from the Civilian Conservation Corps (CCC) and began as the limited access Mauna Loa Truck Trail intended solely for use by park personnel and scientists. In 1935, Superintendent Wingate suggested a strong need for the road in order to facilitate quicker response and better access to recurring wildfire problems occurring on the slope area. This later segment served as an extension from the Bird Park Road terminus (4.672-mile section) as mostly a one-lane roadway to the 6,765-foot elevation where it now ends at the small parking area marked by the pavement's end; this parking area is referenced historically as being completed during November 1937, two months after final work on the truck trail. The difference in use intent (hence, each segment's historic name references) resulted in clearly recognizable design differences between the two road segments that remain evident in how the overall Mauna Loa Road corridor transitions to its terminus. This terminus is considered a developed area and by early 1938 consisted of several connecting projects including the Mauna Loa Trailside Shrine, or Museum, Seismograph Vault, and the Mauna Loa Trailhead which continues to be accessed from this point, which then leads to the summit.

Mauna Loa Road's original design adhered to the general principles and philosophy that national park roads be minimally invasive, and that they harmonize with their surrounding natural environments and resultant landscapes. These design notions were being echoed as part of U.S. national park design from even before the NPS was established in 1916 by Robert E. Marshall who was the Superintendent of U.S. National Parks prior to that time. Later NPS designers would heed this admonition by formalizing Naturalistic design standards from influences generated even further back in time to nineteenth century landscape designers who sought to naturalize designed landscapes by blending human built constructs into them with the use of locally available materials and native vegetation, while softening built forms so that the visitor could experience in a more subtle manner what appeared to be a remote, yet accessible natural environment as its wonder captured the human eye. This resulted in an influential public use design paradigm that also served architectural constructs as evidenced in the Park Rustic Style that began in the 1920s and became solidly established as part of overall master planning effort during the 1930s. The main thrust of naturalizing human constructs in the landscape, as well as, inserting structures using the Park Rustic Style into those landscapes is evident along Mauna Loa Road. The NPS, in collaboration with the Bureau of Public Roads (BPR) in the 1920s and 1930s, "produced a distinctive 'park road' aesthetic...[that] drew heavily on nineteenth-century carriage design techniques but updated these practices to accommodate the demands of automobile traffic and the geographic diversity of the national parks" (Davis, 2004, p. 5).

NPS personnel implemented these principles by aligning park roads to highlight scenic vistas while paying close attention

[2] See the *April-1934 Final Construction Report: Uwekahuna Bluff-Bird Park*, Project No. 4, Bureau of Public Roads.

to what the natural topography of the land could impart to human inserts regarding harmonizing the two. For example, unexpected and transitioned turnouts gave motorists the opportunity to stop and gaze at the landscape without necessarily creating unnatural cleared points along routes. The creation of systematic scenic vistas presented opportunistic, rather than required stopping points for observing vast panoramas by prescribing vegetation management, introducing traffic calming measures such as keeping roadways narrow and laying them out in sinuous curving patterns so that drivers could not hurry from one point to another, rounding and smoothing (naturalizing) unsightly cuts and fills in the earth, and utilizing native materials in construction (Davis, 2004, Duensing, 1999). Of course, the basic tenants of these underlying standards continued into the 1960s with the creation of the NPS Park Road Standards and the challenges of Mission 66, through today's highly technical and interdisciplinary planning and design efforts such as occurred through the process of protecting the historic integrity of the Blue Ridge Parkway (NPS-BLRI, 2010).

Resource Inventory

Since NPS roads were designed to enhance visitors' experiences who traveled along them, associated resources like picnic facilities, interpretive displays, turnouts, parking areas, and scenic lookouts became integral to the roadway as a single combined unit, with the road path being the central connecting structure of the district. The linear roadway within a prescribed right-of-way bounded further by a contextual corridor, along with the associated buildings and structures found within the corridor and in the developed areas all appear as a seamless whole through the use of naturalistic landscape design methods and the NPS Rustic Style of architecture, which incorporate native materials and forms into the built constructs, thereby blending together to a higher degree, the natural and built environments. The Mauna Loa Road district reflects historically-significant sites, buildings, and structures that consist of its primary physical roadway structure, separately counted buildings and structures, and sites. In all, there are 10 contributing and zero non-contributing resources.

RESOURCE #1	STATUS	TYPE	YEAR BUILT
Mauna Loa Road Right-of-Way (LCS ID #58430 & #800347)	**Contributing**	**Structure**	**1933-34, 1935-36, 1961-62**

For the purposes of this nomination, the Mauna Loa Road right-of-way structure is a single contributing historic resource consisting of 69 acres (3.009 million square feet) that includes its various structural components within the historic physical right-of-way of the roadway such as the defined road path and substructure (pavement is not included as contributing), shoulders, immediate turnouts, trails and trailheads, immediate parking areas, guardrails, cattle guards, and other miscellaneous road infrastructure – all of which are known to be from the period of significance. Other contributing resources such as the historic entry pylons are counted and listed separately even though they are also located within the right-of-way corridor; however, their individual significance warrants a separate listing. Of course, certain sites are also counted separately, and include acreage in addition to Resource #1. Except for interpretive kiosks (historically referred to as trailside shrines), signage and gate systems are not described or included as contributing resources, individually or cumulatively. To better understand the complex features of an irregularly shaped road system such as Mauna Loa Road, the two paragraphs immediately following provide overall context, followed by the right-of-way as a structure described according to its distance sections, and finally, more specific descriptions of the separately counted contributing resources as referenced according to Resource #.

Mauna Loa Road allows motorists to drive along a curving road through contrasting natural environments and landscapes including stands of *ohi'a* trees and *koa* groves[3], native ferns and other species, grassy fields, naturalistic lava bridges between fingers of lava flows, and barren lava rubble fields and flows while gradually ascending Mauna Loa (e.g., see Figure 1). Though some of the lushest landscape in the park is experienced along certain sections of Mauna Loa Road, the reality of the volcanic landscape emerges almost immediately in pockets delivering barely describable, yet highly educational experiences to the visitor as to the forces of nature with its devastating, yet reclaiming effects. The road's fixed horizon is always brief and oscillates between disappearing and emerging again around each turn unfolding into changing scenes that are unduplicated. Turnouts and development areas along the way provide interpretive exhibits, visitor amenities, and opportunities to explore these wonders of natural landforms and native environments. In ascending order, these include the Tree Molds Outdoor Exhibit Area, Bird Park Day Use Area, Bird Park (Kipuka Puaulu), the Powder House Area, and the Mauna Loa Road terminus and lookout. Scenic vistas that are direct constructions along Mauna Loa Road, such as from the historic Ke'amoku Lava Flow afford visitors expansive views not only of the upward Mauna Loa shield dome, but also back into the park of the eruption plume of Kilauea and its surrounding volcanic and forested landscapes, and toward the Hawaiian coast.

[3] Except for proper names of places and things, Hawaiian words, including plant names that are commonly used are *italicized* throughout this nomination.

While various maintenance projects have been programmed throughout its history, it is important to note that in 2011, a total of 12,509 feet of Mauna Loa Road and its developed area roads at its lower elevations were rehabilitated as part of the Mauna Loa Road Rehabilitation Project.[4] This recent project concentrated on all of the existing **Segment 1** (except for the 570-foot section south of Highway 11) and that part of **Segment 2** up to the first cattle guard (2.1 miles from the entry pylons that signify the beginning of the truck trail). Generally speaking, the project replaced a zero to three inch base below an asphalted surface of up to 1.5 inches thickness with a four-inch base and two-inch overlay of asphalt on the main road. Both sections of **Segment 1** of Mauna Loa Road were originally constructed with an 18-foot pavement of three-inch oil macadam, two-foot gravel shoulders, and a four-foot wide ditch, while **Segment 2** was constructed with eight feet of loose gravel with sand and dirt filler material. Actual widening of the upper sections of **Segment 2** was not achieved until at least 1955 where an emulsified asphalt surface was applied on the first 2.3 miles after Bird Park. By the beginning of 1959, the upper reaches were still a rough trail until April when the surface lengths there were chip-sealed. Surficial paving improvements on the very upper reaches occurred much later with a chip seal during the 1970s. Visitors currently access Mauna Loa Road from Highway 11 (Mamalahoa Highway).

While many alterations to the road's surface have taken place over the decades, the historic right-of-way and circulation path, as well as, most of the ditches and shoulder materials still remain, though with slight realignments and widenings, as contributing factors to its integrity and historicity. Timothy Davis (2004) recognized the fact that most roads in national parks have been altered to certain degrees as time and culture required ongoing maintenance and responses to technological and cultural changes. Fortunately, these impacts are minimal on Mauna Loa Road, in spite of it being subjected to the unique and harsh environmental conditions influenced by an erupting volcano, not typical of other national parks. Today's motorist can see the detrimental physical effects of the naturally emerging and encompassing vegetation on the upper, older portions of roadway as they ripple and buckle from the rapidly expanding tree roots; of course, the effects of age and seismic activity cannot be discounted as evidenced by apparent buckling and material separation of the surface at various points. While the vastness of open space is a high mark of much of Mauna Loa Road, along some sections, the roadway seems to be embraced from paved edge to paved edge by tall grasses or walled trees and shrubs creating a clearly defined, partially enclosed pathway, while other sections resemble tunnels, or alles that are completely enclosed by natural vegetative blankets. The unique and minimally disturbed path of circulation from its original construction, the natural surroundings that remain fairly undisturbed, the separation of the developed areas from the roadway while still being connected, and the sensitive placement of harmonious structures that have been well-maintained enhance the integrity of location, design, materials, association, setting, and feeling for the Mauna Loa Road corridor and the wilderness experiences of its visitors.

1962 Bird Park Road Realignment Section-South of Highway 11: Crater Rim Drive to Highway 11 (444 feet)

This later section of road is closed to public traffic and is now characterized as a limited-use utility access and employee portal, controlled by an electronic gate system (road barrier) installed in 2011 that was placed approximately 236 feet north of the centerline of Crater Rim Drive, which prevents automobile traffic from using it. Each of the road's end points provide visible evidence of earlier road barriers with still extant post holes at approximately 67 feet north of the centerline of Crater Rim Drive, and a second set approximately 50 feet south of the centerline of Highway 11. Expanded from its original 18-foot width, the existing pavement width along this section now varies from 20'2" to 20'6" with well-defined three-foot shoulders, reflecting modernization and gradual overlays of ongoing pavement restoration and preservation programming. The existing pavement is worn and cracking with a grayed coloring. The surrounding landscape of sporadic *ohi'a* trees is only slightly different here in that it is less lush and seemingly more arid in setting than what occurs north of Highway 11.

1934/1962 Bird Park Road Section-North of Highway 11: Mile 0 – 1.6

As one turns onto Mauna Loa Road at its point of beginning with Highway 11, a first impression could be the spectacular backdrop of the enormity and expanse of Mauna Loa's dome form in the distance with its various shades of colored landforms and vegetation creating a mosaic of patterns, textures, and shapes. Otherwise, once the gaze settles down, the first few miles of Mauna Loa Road are revealed as a freshly resurfaced, two-lane roadway leading into scrubby woodland of *ohi'a* trees with a speed limit of 35 miles per hour. Less than one-third of the entire Mauna Loa Road is two-lane, while the remaining two-thirds, consisting of its up-slope section is distinctly true to its early grading and single-lane construction. This section is further characterized as an immediate curved path that becomes a long straight corridor with a gently rolling flow. The first 500 feet are unnaturally elevated with fill that quickly conforms to the surrounding natural lay of the land. The overall section of roadway was rehabilitated in 2011, and consists of an approximate two-inch asphalt surface over refined subsurface of up to 21-foot width, adjoined by up to fairly defined four-foot shoulders within an approximate 30-foot right-of-way. The historic construction that also included the extension from the Uwekahuna Bluff (all of **Segment 1**) utilized an 18-foot pavement width with two-foot shoulders, but the historic corridor width is relatively unchanged. The historic surface

[4] See SSFM International, U.S. Department of Transportation (FHA), & Department of the Interior (NPS). (2011). Plans for proposed reconstruction of Crater Rim Drive & Mauna Loa Road: PLHD/HAVO 10(3). Denver: CO.

depth was specified for three inches but cost limitations resulted in a surface depth of between two and two and one-half inches. The increased pavement width from its original 18-foot width is primarily due to modernization for increased visitor usage and traffic safety enhancement of minimum road lane widths.

However, the 30-foot historic right-of-way and general feeling and experience of the road as it travels through *ohi'a* forest and lava fields is virtually unchanged in spite of this spreading out of the roadway surface. In fact, roadway preservation standards for modern roadway improvements in scenic areas including national parks is well documented as having the potential for being less intensive and disturbing than much of the historic activity that produced the roads in the first place. Since the corridor right-of-way, as the more important historic element has not changed, the increase in pavement width to this point poses no detrimental or diminishing effects on historic character and integrity, and this nomination places a recognizable measure for considering future road enhancements. The primary reason for the resulting unadulterated right-of-way (and wider corridor) is due to the naturally occurring lava forms that remain from the original construction that now create a "historic" channel recognized by park officials as a defining feature to be preserved rather than altered.

Within 350 feet from the point of beginning, the visitor can turn east onto a spur road to the first developed area, the **Tree Molds Outdoor Exhibit Area (contributing site)**. This one-lane, asphalted historic spur road completed in January 1962 measures from 10-12½ feet in surface width, with a clearly defined corridor unaltered from its historic width. It extends for approximately 2/10 mile to the northeast where it meets a junction that diverts into a one-way loop road of approximately 3/10 miles in length past several tree mold exhibits and back to the junction. The immediate area around the tree molds is served by a small parking area with six historic tree mold enclosures (exhibits) of various dimensions; the tree molds themselves were formed as early as the seventeenth century according to Holcomb (1987). Along the loop road's final section is a single historic 1959 NPS Type No. 9 Guardrail that appears to protect another historic tree mold (and vehicles) of magnanimous proportion. Returning back toward Mauna Loa Road, the spur road intersects with a gated road that retains a worn, yet recognizable paved surface. Though not included as part of this nomination, this road right-of-way has historic significance in that has been preserved by the NPS as part of its 1921 acquisition to serve as emergency access and for administrative use purposes, but is also an older section of road formerly serving as the gateway to the Bird Park Area prior to the 1962 spur road connection. A historic stable, rebuilt in 1959 after a wind event destroyed the prior stable, is accessed directly off of the road on its way north. The road also served private activities including access to a local golf course and local ranching conduits, the latter attributable to the Keauhou Ranch headquarters located to the east of this area. Just prior to returning to Mauna Loa Road at approximately 190 feet is a small historic trailhead leading to an old section of the Mauna Loa Trail on the north side of the spur road that allows a hiker to begin a journey with a spectacular and simultaneous view of Mauna Loa and Mauna Kea. This trail is unnamed.

At the 1.3-mile point on Mauna Loa Road, still characterized by the scrubby *ohi'a* vegetation and rubbly mounds that border the drive, and also off of another historic spur road on the east side is the second developed area, the **Bird Park Day Use Area (contributing site)**. At the approach to the spur road, the speed limit is reduced to 15 miles per hour in anticipation of the increased parking and pedestrian activity ahead at the traffic circle. The historic Bird Park Day Use Area, formerly known as the Bird Park Picnic Ground is accessed by a paved, one-lane spur road completed in 1935 ranging between 13'6" – 17 feet in width, narrowing to 11'6" in width at one point within a terminal loop located at an approximate distance of 400 feet from Mauna Loa Road. This area was purposefully developed in 1935 subsequent to the 1934 Bird Park Road construction, with its spur road and general layout more specifically defined as a result of that to include picnic grounds facilities and amenities. The spur road leads to a three separated, historic picnic grounds placed along the spur road and at the historic terminal loop. The first picnic grounds are on the north (left) side as a cleared area amid prominent and remarkable lava rock outcroppings that provide an intimate sense of natural context given the otherwise hidden volcanic surroundings in this area. Also included here is a historic, tapered, five layered fire pit made of cut lava stones. The construction date of this structure has not yet been determined; however, it appears to have been designated for use as a small incinerator at least as early as 1948.

It must also be mentioned that across the spur road from this picnic grounds is a gated gravel road with a 1926 bench mark that leads to the emergency access road referenced under the Tree Molds Outdoor Exhibit Area, above. Both intersections with this emergency access road from the spur roads, as contained within the expanded 25-foot corridor are considered contributing historic resources to each site, without including the entire road length. The second historic picnic grounds is simply a cleared area with a single picnic table, while the large historic picnic grounds at the terminal loop has an asphalted historic parking area bordered by large lava boulders, an adjoining non-historic privy,[5] a historic 1963 partially enclosed, rustic picnic shelter with a chimneyed pair of fire pits made of lava stone and projecting through and above the roof, and two historic, free-standing, concrete and wood picnic tables installed in 1955.

[5] Good (1938) drew a slight distinction between privy and comfort station in that the former utilizes a non-flush system.

After leaving the Bird Park Day Use Area spur road and travelling north for 3/10 mile, Mauna Loa Road forms a wide, large traffic circle with a center, vegetated island at the 1.6 mile point. However, this only marks the end of the original Bird Park Road (completed in 1934). This historic, yet widened loop road with pavement width of over 50-foot serves as a turnaround device for those visitors not wanting to proceed further up the Mauna Loa Road; it also allows on-pavement vehicle parking for those stopping to walk the Bird Park Nature Trail. The circle marks the terminus of **Segment 1** of Mauna Loa Road, originally called the Bird Park Road, completed in 1934.

The 2011 reconstruction project significantly widened the demarked travel and parking lands, and also added a concrete drainage flume along the inside western pavement edge of the circle. The circle was also constructed in 1934 with a width of 18 feet, and, while the center island is still present, it now includes a concrete drainage ditch running along its western inner ring. The widened traffic circle is a fairly-documented structural component of Mauna Loa Road and currently has a 50-foot pavement width. Because it is structurally part of the Mauna Loa Road vehicular travel way, it is considered part of the Mauna Loa Road structure and is not counted as a separately contributing resource, though it is contributing and is one of the most important features of the Mauna Loa Road overall structure and retains integrity in spite of its expansion. A unique feature of this circle is that it benefits from being installed within what appears to be a natural circular lava ring that appears around its outer perimeter, allowing it to blend in nicely through a naturalistic design feeling, in spite of it being cut into this lava form during its original construction. The elimination of visible cuts and equipment markings contribute to naturalizing the effects of it through earlier sensitive treatment and time highlight the NPS's early and ongoing design philosophy. Early on, extensive lava stone curbing was placed around the road perimeter, which has since been removed.

Adjoining the traffic circle to the east is the third developed area known as **Bird Park (contributing site)**, also known as Kipuka Puaulu. This area is accessed through a roadside trailhead by first stopping at a historic rustic trailside shrine and following a leader trail to the approximately one-mile long historic Bird Park Nature Trail, which leads hikers through a mature forest of native trees and meadowland that begins at a small trailhead on the road's east side. Bird Park is an example of a *kipuka*, a Hawaiian term for a vegetated area protected from lava flows and contains over 40 species of native Hawaiian trees. While Bird Park was originally established prior to the period of significance, its more refined development pursuant to NPS standards with revised vehicular access, interpretation trailhead, defined trail structure, and physical orientation to the 1934 Bird Park Road project is representative of the desire of the NPS to link natural sites and resources with park roadways for public access and enjoyment.

Mauna Loa Truck Trail Entry Section: Mile 1.6 – 2.8

At around the midpoint of the traffic circle's outer ring, the second segment of Mauna Loa Road begins, and is accessed through two historic 1937 lava stone **entry pylons (contributing structure)** serving as a symbolic gateway to the upper Mauna Loa elevations. A metal road barrier at the pylons is used by the NPS to close off the road during periods of drought when the fire risk is high. The character of this segment of the road is markedly different in scale because it was originally developed as the Mauna Loa Truck Trail, completed in 1936 for less-purposeful public use. For approximately two miles from this point, the roadway is a marked, two-lane surface of a lesser width with a 16-foot paved surface with limited shoulders and a 25 mile per hour speed limit. This section was originally paved with a 14-foot width of emulsified asphalt in 1955, set in a cleared right-of-way of at least 16 feet. The corridor begins with a 30-foot right-of-way, which narrows to a 20-foot right of way at Kipuka Ki, eventually forming a final historic corridor width of 15-16 feet further up from this point (at the upcoming first cattle guard) to its terminus just before the 6,765 foot elevation.

A historic intersection with a fire road appears on the west side at approximately 375 feet from the pylons. From this point, Mauna Loa Road is engulfed by mid story soapberry trees quickly transitioning to *koa* forest. A small historic turnout lined with placed basalt boulders appears on the east side at 2.3 miles. This turnout, one of several to be described is marked with a large *koa* tree of approximately 5.7-foot diameter. One of the largest *koa* trees on record was also found near here at over 10 feet in diameter. It is also at this point that an apparent decline in tree health begins, as evidenced by the throngs of ashen, lifeless *ohi'a* tree trunks and limbs. However, there is a modicum of health reserved for emerging *ohi'a* trees, which do not seem to be so affected. Tree decline has been an ongoing problem here and elsewhere in the park, attributable to a variety of circumstances from drought, to pests, to acid rain. Notwithstanding these episodes of dead tree fields, Mauna Loa Road quickly recovers its dense foliage as it ascends again through tall grasses and forests of *koa* trees whose branches form a healthy canopy over large sections of the roadway.

Kipuka Ki Section: Mile 2.8 – 5.9

At about 2.8 miles, Mauna Loa Road begins its traverse through Kipuka Ki, a mesic forest designated as a Special Ecological Area (SEA). SEA's are "intensive management and research units" delineated within the park that focus scientific study and observation on a variety of flora and fauna considerations[6]. The forest dies off again but re-emerges as

[6] Tunison & Stone, 1992, p. 781.

one travels to the 2.9-mile point, where another historic turnout on the east side of the roadway is marked. This particular turnout is a simple semi-circle configuration with an earthen surface but provides access to the fourth developed area known as the **Powder House Area (contributing site)** constructed during 1936 in a rough *a'a* lava pit approximately 250 feet east from the roadway.

The Powder House structure is important to the history of the roadway as it was used for storing explosive materials used in the early clearing of the historic Mauna Loa Truck Trail. It was common during the early construction, at least into the late 1960s, for the park superintendent to approve off-site lava pits clearly separated from view from the roadway, from where road construction materials could be obtained. There are several notations found in various monthly superintendent reports regarding these extraction areas, along with how they were reclaimed upon exhausting their use. The original construction involved the use of a portable rock crusher that was moved along the road corridor as it was cleared and the base was laid.[7] Later road maintenance and reconstructions were accomplished with a rock crushing and screening plant where aggregate materials were produced by park personnel at a permanent site and then hauled to various locations throughout the park. The CCC workers from the 1930s who were working to clear the roadway were cutting up to 11-foot swaths through the herd *pahoe'hoe* lava formations, much of this work being done by manual means without the aid of specialized machinery, which gives the roadway a more hand-crafted persona. While it has become overgrown with vegetation, access to the historic Powder House structure and the pit area included a rough spur truck trail and turn around.[8]

At 3.7 miles further up Mauna Loa Road, an approximate six-car parking area with an earthen surface appears on the west side shrouded beneath a mature *koa* forest. Just past this historic parking area is a five-foot deep horizontal, historic cattle guard (rails replaced in 1948) with a road barrier and fencing that serves as the border between Mauna Loa Road's two-lane and single-lane sections. In addition, it is at this point that the roadway narrows yet again, to an 11-foot wide road surface with no reasonable shouldering. Here, the Mauna Loa Road right-of-way narrows to its most enclosed width of 15 feet generally. This point also marks the beginning of a reduction in travel speed to 15 miles per hour, which is the travel speed for the remainder of the roadway to its terminus. A small historic trailhead without vehicle parking in an open *koa* and grassy area appears on the west side at 4.1 miles. Another historic trailhead appears on the east side at approximately 4.5 miles with a small grassed turnoff on the west side. It must be noted that the cattle guard and the tall grasses provide evidence of the historic use of this slope area for livestock grazing, which was prevalent between the 4,500 – 6,700-foot elevations prior to the establishment of the 1916 Hawai'i National Park at least through the late 1940s.[9] Cattle and other animal grazing severely affected the growth of new *koa* trees during those activities.

The first panoramic view of the Mauna Loa shield dome from beyond the entry pylons occurs at 4.2 miles as the vegetation becomes sparse and the height of the tree canopy lowers. Providing public access to such views within national park settings was one of NPS Director Stephen Mather's most basic vision fundamentals (McClelland, 1998), and was strongly supported and later carried out by the land acquisition emphasis urged by Horace Albright during the first years of the NPS.[10] In fact, Albright was outspoken in his support for constructing an improved to the summit of Mauna Loa. At 5.9 miles, a historic telephone line right-of-way intersects with the roadway creating an expansive open area with trails following each direction of the corridor. An undefined access road leading to the northwest with a non-historic metal gate is also present here. The immediate roadway areas reveal a mixed gravel and earth surface and serve as non-historic, non-designed parking areas. A second historic cattle guard of 7½-foot horizontal run also appears at this point where the roadway width narrows slightly to an approximate 10½-foot pavement width (rails replaced 1948).

Lava Flow Section: Mile 5.9 – 10.3

Up to the beginning of this section, the lushness of the vegetation within the SEA lasted for approximately three miles, where lava flows could be seen only intermittently as ribbons through the landscape. Now, that lushness provides a sharp contrast to the barren expanses here where historic lava flows have created large swaths of devastation and remnant walls of lava formations. Coincidentally, it is here that the road surface begins to reveal the requirement for ongoing maintenance in the increased occurrences of chuck-holes to be maneuvered around. This contrast is perhaps most evident in this area, and is especially pronounced just beyond the second historic cattle guard area where an *a'a* lava flow is present for approximately 2/10 of a mile and ends suddenly with another patch of *koa* and grass.[11] Of course, the emergent native shrubs and trees that now dot the otherwise barren lava fields prove how resilient the vegetation is as it adapts to the changed environmental conditions. At approximately 8.0 miles (6.4 miles from the Bird Park traffic circle), the

[7] See photographs from Merel Sager's *Narrative Report to the Chief Architect, October 20 to November 20, 1935*, HAVO Archives.
[8] See Feb. 1936 HAVO Superintendent Report (E. G. Wingate), HAVO Archives.
[9] See the 1962 *General Development Plan, Hawaii National Park*, HAVO Archives.
[10] See the 1920 NPS Director's Annual Report, HAVO Archives.
[11] *A'a* lava is one of two main types of lava flow in Hawai'i and is characteristic of uneven, broken, lava rocks and pieces resembling piles of rubble. The other type of lava is known as *pahoe'hoe* lava and is more ribbon-like and smooth flowing.

second view of the Mauna Loa shield dome looking northwest becomes available for a distance just before reaching the Ke'amoku Flow at 8.2 miles. This spectacular historic lava flow, appearing as both rivers and valleys of lava debris and reaching heights of over 10 feet at the road, and nearly double that height in other areas is keenly visible for only about one tenth of a mile across Mauna Loa Road at the 5,630-foot elevation. This flow dates as early as 1823, yet the blackness of its deposit appears as if it only recently appeared. From several vantage points around the flow, including a small historic turnout, historic viewsheds are available of both the Mauna Loa shield dome looking northwest, and the plume from the Halema'uma'u Crater looking south. From this point, and for the remaining ascent, ancient lava flows are visible as they become increasingly hidden under the less-luxuriant *koa* forest as it re-emerges sporadically in patches within one's field of vision of the available landscape terrain.

Upper Section: Mile 10.3 – 11.6

Another remarkable viewshed appears at 10.3 miles where multiple views of Halema'uma'u are available along a rather lengthy stretch of Mauna Loa Road looking southeast toward Halema'uma'u. By mile 10.9, Mauna Loa Road reaches the 6,500-foot elevation before terminating at the historic **1937 parking area (contributing structure**) at the 6,765-foot elevation, which is the staging area for the fifth and final developed area, the Mauna Loa Road terminus. Though this area was specifically designed as an area of development activity, it is not considered a unified site because of the evolving schism that attempted to justify publicly available infrastructure for vehicular access to it. Therefore, it is not officially named, but includes multiple, individually contributing structures within a delineated 400-foot diameter circle from the pavement edge that are described based on their individual significance and importance. The paved roadway surface retains its 10'6" width to this point.

The parking area that begins at the terminus, while completed in 1937 is not particularly defined, represented by a cleared area with an earthen/gravel surface transitioning from the paved road surface. However, it is part of, and leads to other important structures that combine to create a larger developed area that includes the historic **1937 Mauna Loa Trailhead (contributing structure)**, **1937 Seismograph Vault (contributing building),** and the **1938 Trailside Museum (contributing building)**. The Mauna Loa Trailhead is just upslope of the parking lot and includes a vault toilet erected in 2009, an interpretive sign 7½ feet in height, and the Mauna Loa Trail connector to the summit. Also, a short distance from the parking area along a widened, but primitive truck trail is the 1937 Seismograph Vault used by scientists to monitor the volcanic activity of Mauna Loa. Finally, the octagonal Mauna Loa Trailside Museum, completed in 1938 is an intact example of the NPS Rustic Style of architecture, and provides visitors with a 180-degree viewshed that includes Mauna Loa and its summit, the downward slopes of Mauna Loa toward the coastal areas of HAVO, and the Kilauea Caldera, including the volcanic plume from the Halema'uma'u Crater. The entire area is shrouded under a dense canopy of *koa* trees.

RESOURCE #2	STATUS	TYPE	YEAR BUILT
Tree Molds Outdoor Exhibit Area	**Contributing**	**Site**	**1962-1963**

The Tree Molds Outdoor Exhibit Area was a walkable destination as early as 1920 when it appeared on a map entitled "Kilauea Section of Hawaii National Park." The site also appeared on the park's 1931 Master Plan drawing as a natural feature accessible along a hiking trail and a very primitive auto trail. However, the site was not actually developed formally for the current Mauna Loa Road linkage until the 1962 realignment of Bird Park Road, thereby creating an NPS-established access route along with a revamped developed amenity oriented toward Mauna Loa Road. In April 1960, original survey work for the realignment, and the loop through the exhibit area was already in progress as part of the planning for expanding the visitor potential of Mauna Loa Road. The Tree Molds Outdoor Exhibit Area, including its 50-foot spur road corridor is an 8.45-acre site accessed via the one-lane spur road turning east from Mauna Loa Road at about the one-tenth of a mile from the beginning point. This one-lane spur road surfaced in asphalt measures from 10-12½ feet in surface width, with a clearly defined corridor unaltered from its historic width. It extends for approximately 2/10 mile to the northeast where it meets a junction that diverts into a one-way loop of approximately 3/10 mile past several tree molds exhibits and back to the junction. As of 2014, a plan for increasing access for the physically challenged to one tree mold exhibit and the trailside shrine is in progress.

The tree mold exhibit immediate area is served by a small parking area marked off by a series of lava boulders, with six tree mold enclosures (exhibits) of various dimensions and a trailside shrine with a gable roof clad in wood shingles dating to 1963 (non-historic wood shingles replaced at later date); the shrine is supported by 6"x6" (actual) posts with the roofing frame made of nominal 2x4 lumber. This shrine replaced the original structure that was constructed in 1937, and that matched the historic example still extant at the Bird Park Trailhead. Large lava boulders separate the vehicle parking area from the shrine. The tree molds themselves were formed as early as the seventeenth century according to Holcomb (1987). Tree molds result when hot, moving lava engulfs a tree trunk and hardens as it reacts with the moisture in the tree trunk. Though the lava cools around the trunk, the tree still burns completely, leaving behind a mold of its circumference

and bark texture. Also, this interaction between lava and tree trunk can reveal the depth of the lava flow, as evidenced by the depths of the molds present. In order to preserve the natural exhibits, and for visitor safety, later railings have been installed around the exhibits; these railing systems are made of recycled plastic posts and metal cylinders and form various dimensions of square and rectangular shapes around each tree mold. While the protective barrier railings are not historic, the actual tree molds and the grounds that comprise them are historic to the 1962 construction of the spur road, loop, and parking area linking them to the historic Mauna Loa road system. Along the loop road's final section is a single NPS Type No. 9 Guardrail from 1959 that appears to protect another tree mold (and vehicles) of magnanimous proportion.

Returning back toward Mauna Loa Road, the spur road adjoins a gated road that retains a worn, yet recognizable paved surface of approximately 10-foot width. This road, according to HAVO Master Plan drawings of the 1930s, correlates with the location of the earlier access road to the Tree Molds area and to Bird Park. It presently serves as an emergency access and administrative use road, but was abandoned for public use after the 1962 Bird Park Road realignment. Though not included as part of this nomination, this road right-of-way has historic significance in that has been preserved by the NPS as part of its 1921 acquisition to serve as emergency access and for administrative use purposes, but is also an older section of road formerly serving as the gateway to the Bird Park Area prior to the 1962 spur road connection. A historic stable, rebuilt in 1959 after a wind event destroyed the prior stable, is accessed directly off of the road on its way north. The road also served private activities including access to a local golf course and local ranching conduits, the latter attributable to the Keauhou Ranch headquarters located to the east of this area.

Just prior to returning to Mauna Loa Road at approximately 190 feet is a small historic trailhead with an unnamed trail on the north side of the spur road that allows a hiker to begin a journey with a spectacular and simultaneous view of Mauna Loa and Mauna Kea. This trail is unnamed.

The Tree Molds Outdoor Exhibit Area is a contributing site that includes its grounds, spur roadway, interpretive trailside shrine, tree mold exhibits, and NPS Type No. 9 Guardrail as a developed area along the Mauna Loa Road circulatory system. NPS road design emphasized the alignment of park roads to interact with the natural features of the landscape, whereby visitors could easily experience them through purposely-designed roadway turnoffs with visitor-friendly amenities. Even though there are structures present outside of the period of significance, the unique and minimally disturbed path of circulation and the orientation of the exhibits to the 1934 developed construction, the natural surroundings that remain fairly undisturbed, and the separation of this developed area from the roadway while still maintaining a connection with Mauna Loa Road enhance the integrity of location, design, materials, association, setting, and feeling for Mauna Loa Road and the wilderness experiences of its visitors.

RESOURCE #3	STATUS	TYPE	YEAR BUILT
Bird Park Day Use Area	**Contributing**	**Site**	**1933-1935, 1939, 1963**

At approximately 1.4 miles along Mauna Loa Road is another historic spur road leading east to the Bird Park Day Use picnic and open space area. This historic area, including its spur road and loop corridor consisting of 7.8 acres, was cleared beginning in 1933, and significantly and purposefully developed in 1935 using CCC labor as part of the planning effort related to the 1934 roadway extension, with its spur road and general layout more specifically defined as a result of that to include picnic facilities and amenities. Historically, this area is referred to as the Bird Park Picnic Grounds and was the most popular picnic area in the park during most of the middle part of the twentieth century. The site is accessed by the historic paved, one-lane spur road ranging between 13'6" – 17 feet in width, narrowing to 11'6" in width at one point with gravel shoulders of up to two feet on each side within a terminal one-way loop located at an approximate distance of 400 feet from Mauna Loa Road.

Visitors travel to the eastern point of the loop road where a parking area is bordered by large lava boulders, creating a separation between it and the later, non-historic privy, and the partially enclosed, historic rustic picnic shelter completed by February 1963 with a chimneyed pair of fire pits made of lava stone and projecting through and above the flat roof; several picnic tables are placed within the shelter. Outside of the shelter, two remaining picnic tables are historically significant to the site in that their concrete structural forms and flat wood surfaces remain from the original installation of four tables at the site in 1955. The overall shelter structure at first appears as a connected quad, however, closer inspection reveals that its northeast component is actually separate from the L-shaped shelter, and covers a large fiberglass water tank. The northeast component appears to be of a later construction and is characterized by standard dimensional lumber construction that is out of synch with the larger shelter. The modern, non-historic single-use privy added after the 1990s is faced with a lava stone veneer, which provides a questionable sensitive addition of the structure to the historic character and theme of the site. The L-shaped timber shelter reveals exposed *ohi'a* timbers for framing posts, and also features built-in benches along its walls, with its sides clad in alternating six and 12-inch horizontal clapboards; the roof is made of corrugated metal panels. The dimensional lumber framing of the roof is exposed on the interior, revealing the use of metal straps attached to the *ohi'a* posts and framing to provide additional support. The additions of the dimensional 2x4s as upper framing sills appear to have been provided for both stability and to increase the roof pitch for water runoff. The floor

was specified for concrete. It must be noted that this new historic structure replaced an original structure constructed in 1935, yet has achieved historic significance attributable to its age and distinctive rustic design using native materials of lava stone and *ohi'a* timbers. However, the existing fiberglass water tank is likely a replacement of a metal tank that, in turn, replaced the original wood stave tank in 1957. Therefore, for the purposes of this nomination, the water tank and its shelter are not considered historic elements of the more historic shelter from 1963, though the spatial dimension accommodating the area of the tank is historic. As of 2014, a plan is in progress to enhance accessibility to the shelter and an outdoor grill through an asphalt trail.

Leaving the loop area, there are two additional historic picnic areas dating to 1935 (cleared 1933) areas along the spur road entrance nearer to Mauna Loa Road. The first is simply a cleared area with a modern picnic table; the second is also a cleared area partially defined by purposely laid lava boulders, the entire area appearing amid a small canyon of lava rock outcroppings that provide an intimate sense of natural context given the otherwise hidden volcanic surroundings in this area. Included here is a tapered, five-tiered fire pit made of cut lava stones at approximately 40 inches in height, constructed in 1939 with dimensions of 60 inches at its base and 46 inches at its top. The design of this structure is unique and photographic and written documentation from 1948 confirms its original use as a small incinerator for the area.[12] Therefore, it is considered to contribute to the historic character of the site. It must also be mentioned that across the spur road from this picnic grounds is a closed gravel road with a 1926 USGS bench mark that leads to the emergency access road referenced under the Tree Molds Outdoor Exhibit Area, above. Both intersections with the access road from the spur roads, as contained within the expanded 25-foot corridor are considered contributing historic resources to each site. Though not included as part of this nomination, this road's right-of-way has historic significance in that has been preserved by the NPS as part of its 1921 acquisition to serve as emergency access and for administrative use purposes, but is also an older section of road formerly serving as the gateway to the Bird Park Area prior to the 1962 spur road connection. A historic stable outside of the nomination area, rebuilt in 1959 after a wind event destroyed the prior stable, is accessed directly off of the road on its way south toward the Tree Molds Outdoor Exhibit Area. The road also served private activities including access to a local golf course and local ranching conduits, the latter attributable to the Keauhou Ranch headquarters located to the east of this area.

The Bird Park Day Use Area is a contributing site that includes its grounds, spur roadway, and picnic shelter as a developed area along the Mauna Loa Road circulatory system. NPS road design emphasized the alignment of park roads to interact with the natural features of the landscape, whereby visitors could easily experience them through purposely-designed roadway turnoffs with visitor-friendly amenities. Even though there are structures present that were developed decades after the original construction of the picnic grounds, the unique and minimally disturbed path of circulation and the orientation of the grounds and structures to the 1935 developed spur road, the natural surroundings that remain fairly undisturbed, and the separation of this developed area from the roadway while still maintaining a connection with Mauna Loa Road enhance the integrity of location, design, materials, association, setting, and feeling for Mauna Loa Road and the wilderness experiences of its visitors.

RESOURCE #4	STATUS	TYPE	YEAR BUILT
Bird Park (Kipuka Puaulu)	**Contributing**	**Site**	**1933-1934**

At approximately 1.5 miles along Mauna Loa Road is a large, Mauna Loa Road becomes a wide traffic circle with a center vegetated island that marks the end of the original Bird Park Road (constructed from 1933-1934). The widened circle, as part of Mauna Loa Road's structure, historically served in a primary capacity for allowing roadside parking for those visitors either stopping to walk the historic Bird Park Nature Trail, and/or who wanted to spend more time at the nearby historic picnic ground. Bird Park (also known as Kipuka Puaulu) adjoins this paved area to the east and is accessed by an approximately one-mile loop trail through a mature forest of native trees and meadowland that begins at a small trailhead on the road's east side. Enrollees of the CCC and Civil Works Administration (CWA) workers were both involved in establishing the trail and removing exotics from the area. In addition, CCC enrollees assisted with transplanting many specimens of plants, as well as, soils from this area for placement around buildings near the park headquarters. At the open, historic trailhead abutting the roadway pavement and marked off by large lava boulders is a historic, rustic wood trailside shrine also originally constructed by the CCC dating to 1937. It is characterized by a gable roof clad in replaced wood shingles above an interpretive display. The trailside shrine supported by eight-foot tall 9"x9" square wood posts, which were specified to reveal an "adzed" look. The trailside shrine as it is often called historically, is built upon a raised earthen platform defined by both natural and placed lava stones and formations, and was one of four similar structures constructed; a second was constructed at the Tree Molds Outdoor Exhibit Area, that one having been replaced in 1963. The 1937 trailside shrine has been altered through materials replacement since its construction. Though it appears to be in excellent condition, a recent windstorm in 2013 caused it to topple over. It has since been returned to an upright position in 2014. The shrine invites the visitor to it because of its strong stature, which these structures were often intended to do (see Good, 1938). The trail was specifically identified in a public brochure describing it from a series of trail brochures

[12] See July 1948 Superintendent Report (F. R. Oberhansley), HAVO Archives.

promulgated by park officials in 1937. Two small sections of lava stone trail edging from CCC construction during July 1934 are still extant near the beginning and end points of the loop. Water breaks and wood cribbing make up a significant portion of the trail structure, and have been installed since at least 1960.

Consisting of 111.6 acres, Bird Park is an example of a *kipuka*, a Hawaiian term for a vegetated area protected from lava flows and contains over 40 species of native Hawaiian trees. Bird Park is internationally renowned, not only for the variety of birds inhabiting it, but for the contrast it provides between much of the surrounding arid scrublands; it has long been a popular area in the park, also appearing in a 1929 Hawaii National Park circular and on the 1931 Master Plan of the park. One of the earliest NPS references to Bird Park is from the March 1923 Superintendent's Report where it is described by Thomas Boles as "a well-kept English park." A collapsed lava tube occurs along the trail. While Bird Park was originally established prior to the period of significance, its more refined development pursuant to NPS standards with vehicular access, interpretation trailhead, and trail structure is representative of the 1934 completion of Bird Park Road.

Bird Park is a contributing site that includes its grounds, trailhead, interpretive trailside shrine, and nature trail as a developed area along the Mauna Loa Road circulatory system. NPS road design emphasized the alignment of park roads to interact with the natural features of the landscape, whereby visitors could easily experience them through purposely-designed roadway turnoffs with visitor-friendly amenities. Even though there are structures present outside of the period of significance, the unique and minimally disturbed path of circulation of the Bird Park Nature Trail structure and its orientation to Mauna Loa Road and the 1934 traffic circle developed exclusively to serve the Bird Park area, the natural surroundings that remain fairly undisturbed, and the separation of this developed area from the roadway while still maintaining a connection with Mauna Loa Road enhance the integrity of location, design, materials, association, setting, and feeling for Mauna Loa Road and the wilderness experiences of its visitors.

RESOURCE #5	STATUS	TYPE	YEAR BUILT
Mauna Loa Truck Trail Entry Pylons	**Contributing**	**Structure**	**1937**

Two lava stone pylons flank the entry point to the Mauna Loa Truck Trail. The masonry details of the structures are typical of NPS masonry design and CCC construction occurring during this time. Each pylon is constructed of mortared lava stones tapering from a 40-inch wide base to 30 inches ending at a height of 44 inches from the ground. A five-inch thick, 36-inch square lava stone cap tops each pylon. Slumped concrete is evident at the base of each pylon; the left (west) pylon reveals a portion of this concrete as partially covering two undetermined metal components at ground level. Metal hardware is inserted into the vertical walls of the pylons for a movable road barrier arm that allows closure of the road to vehicular access, mainly during the fire season. The park's superintendent reports identify the initial installation of road barriers along the Mauna Loa Truck Trail in 1937, and the remnant metal attachments to the pylons, as well as, the need by park officials to keep the road closed to public access at that time dictated the need to construct the pylons to serve as a clearly defined gateway. The pylons are a contributing resource, representing the NPS Rustic Style with its emphasis on using native materials so that structures harmonize with the surrounding environment. Their original placement representing the gateway to the Mauna Loa summit area, as well as, their good condition enhance the integrity of location, design, materials, association, setting, and feeling for this historic resource.

RESOURCE #6	STATUS	TYPE	YEAR BUILT
Powder House Area (LCS #58273)	**Contributing**	**Site**	**1936**

Located off of Mauna Loa Road on the east side approximately 250 feet in a lava pit is the Powder House, a utilitarian building originally intended for storing explosive materials that were used in cutting through the hard *pahoe'hoe* lava formations along the 1935 surveyed route of the Mauna Loa Truck Trail. The nearly square building has footprint dimensions of 8' x 7'3", and has a shed roof clad in corrugated metal. The degree of the pitch is made evident from its 11-foot high frontal elevation angling down to the 9-foot high rear elevation. The flat metal exterior siding is applied horizontally, around a central, reinforced access door made of 3⅛-inch thick vertical boards, clad in flat metal sheets. The foundation consists of 5½" x 9½" wood beams and blocks. One interesting aspect of this structure is its interior, which reveals tight tongue-and-groove boarding applied horizontally up to a "floating" wood ceiling and framing, giving off a closet feel to the interior. The access road and turn around to the building are barely distinguishable due to vegetation growth and fallen trees, however, the Powder House Area is a 1.6-acre contributing site that includes its grounds, access truck trail and turn around, and building representing a functional area used in the development and construction of the historic Mauna Loa Truck Trail. The site's original and unchanged placement representing the desire by the NPS to hide functional and utility areas so as not to disturb the landscape setting, as well as, the site's relatively good condition enhance its integrity of location, design, materials, association, setting, and feeling as a historic resource.

RESOURCE #7	STATUS	TYPE	YEAR BUILT
Mauna Loa Road Terminus Parking Area	**Contributing**	**Structure**	**1937**

The up-slope terminus of Mauna Loa Road is located near the 6,765-foot elevation where a cleared area forms a loosely defined dirt and gravel parking area that transitions from the paved road surface. This parking structure is specifically documented in historic records from 1937 as being part of the truck trail project indicating its importance to the completion of the roadway, as well as, the intention of park officials in using it as a disembarking area for access to other buildings and structures developed nearby. Short trails from the parking area lead to the **Mauna Loa Trailhead** (1937), **Seismograph Vault** (1937), and the **Mauna Loa Trailside Museum (Observation Shelter-**1938). Though containing individually described contributing resources, the terminus area is a 2.8-acre site delineated by a 400-foot diameter circle of influence that reaches to the Seismograph vault and just beyond to provide context of the natural surroundings. The Mauna Loa Road Terminus Parking Area is a contributing resource, representing a functional structure used in the development and construction of the historic Mauna Loa Truck Trail. Its original and unchanged placement and good condition enhance its integrity of location, design, materials, association, setting, and feeling as a historic resource.

RESOURCE #8	STATUS	TYPE	YEAR BUILT
Mauna Loa Trailhead	**Contributing**	**Structure**	**1937**

The Mauna Loa Trailhead is just upslope of the parking area and includes a non-historic privy, a non-historic interpretive sign 7½ feet in height, and the historic Mauna Loa trail connector to the summit. The privy is a single-use vault toilet constructed of wood with a pitched flat roof. It replaced the prior structure in 2009 and is a non-contributing resource, but not listed separately since it is part of the larger trailhead structure. A 300-foot section of the historic Mauna Loa Trail (LCS #58428) as it extends from the trailhead is included as part of this contributing resource in order to identify the important and significant connection between the two structures. This 300-foot section is really just a widened dirt path that narrows into an approximate 50-inch wide trail as it emerges from beneath the immediate *koa* canopy. Though the trail itself was originally constructed prior to the period of significance, the importance of it to the trailhead and the linkage to Mauna Loa Road lies in its relationship to the road as a terminal junction to it, and the consideration of it for extending an actual road for vehicular purposes to the summit, first as a rustic motorcycle trail, and then as a more fully developed automobile system, which of course, never came to fruition. The Mauna Loa Trailhead, in serving as a terminal point for Mauna Loa Road, and providing public access to the summit of Mauna Loa creates a significance for it as a contributing historic resource. Its original and unchanged placement and good condition enhance its integrity of location, design, materials, association, setting, and feeling as a historic resource.

RESOURCE #9	STATUS	TYPE	YEAR BUILT
Mauna Loa Seismograph Vault (LCS #58267)	**Contributing**	**Building**	**1937**

A short distance from the parking area along a widened, but primitive truck trail is the 1937 Mauna Loa Seismograph Vault used by early and current scientists to monitor the volcanic activity of Mauna Loa. Access to the building is via a primitive truck trail leading uphill from the 1937 parking area's northwest side for approximately 330 feet to the seismograph vault entrance at approximately the 6,800-foot elevation. The vault is included within the 400-foot radius drawn from the pavement end of Mauna Loa Road. The vault is a concrete structure set into an excavated solid rock outcropping leaving between two to three-foot gaps between the outer concrete wall surface and the vertically dug lava rock walls. Per the original design drawings, the enclosed concrete structure itself has an 8'x10' footprint with an interior space of only 60 square feet reduced by the thick, eight-inch concrete walls. The entry elevation is a 10-inch thick masonry wall rising to form an exposed parapet; a concrete lintel and a wood door complete the entry. A three-foot wide lava stone step system flanked on two sides by angled lava stone walls at the front elevation leads down to the entry (see Figure 2). Both the floors and roof are made of special reinforced concrete slabs; however, the roof reveals an additional reinforced slab constructed as a 4'4" on-center, four-beam system tied directly into the natural rock as a floating system above the inner vault. [13] Modern scientific equipment is visible on the rooftop today on which loose lava rock has been placed to create a level platform. The Mauna Loa Seismograph Vault is a contributing resource, representing a functional building used pursuant to, and as a major purpose for the development and construction of the historic Mauna Loa Truck Trail. Its original and unchanged placement and good condition enhance its integrity of location, design, materials, association, setting, and feeling as a historic resource.

[13] Trailside Museum and Seismograph Vault: Mauna Loa-Hawaii National Park. Original 1937 drawing by NPS Branch of Plans and Designs.

RESOURCE #10	STATUS	TYPE	YEAR BUILT
Mauna Loa Trailside Museum (LCS #58266)	**Contributing**	**Building**	**1937-1938**

The octagonal Trailside Museum, commenced for construction in 1937 and completed in February 1938 is an intact example of the NPS Rustic Style of architecture constructed by the CCC.[14] Park structures and buildings with hexagonal or octagonal plans "occur rather infrequently" in park architecture, "although the forms are particularly well-suited to overlooks having views in several directions," such as in this case where visitors could look out over the slopes of Mauna Loa (Good, 1938, p. 101). Its battered lava rock walls and low-pitch roof mimic the local environmental forms and follow the NPS design principle of using native materials and forms to create structures that harmonize with the landscape (see Figure 3). Further, its four large, 4'x4' viewing openings provide visitors with at least a 180-degree view that includes Mauna Loa and its summit, the downward slopes of Mauna Loa toward the coastal horizon, and the Kilauea Caldera, including the volcanic plume from Halema'uma'u Crater. The Trailside Museum, (also known as the Observation Shelter) is shrouded under a dense canopy of *koa* trees. Though infrequent structure types, as referenced above, other examples using local materials were constructed in various national parks in the U.S. during the time period.

The building, originally specified on the 1937 plans as a "Trailside Museum" was built in tandem with the historic Seismograph Vault, serving as both a scientific observatory and a public overlook and destination point for visitors not wishing to make the longer, arduous trek to Mauna Loa's summit. It appears today much as it did when originally constructed in 1937, and according to drawings prepared by the NPS Branch of Plans and Designs. The four-inch thick concrete floor and seven-foot high walls with a 13-foot diameter interior from opposing vertical wall surfaces are still extant. A single entryway leads to a central picnic table where the four open, viewing windows are quickly noticed and beckon visitors to capture framed views. The octagonal hipped roof reveals a three-foot overhang with enclosed soffit of parallel eight-inch boards. These wood boards provide a consistency with the ceiling design, which is similarly constructed. The original roof, as specified in the historic drawings, was clad in in asbestos cement shingles, which were removed and abated in 2003 and replaced with asphalt shingles as part of a historically-sensitive structural renovation of the roof and ceiling systems. Three exhibit cases along the north walls were originally enclosed behind glass, but the glass has been removed and the displays are merely framed wood panels.

Currently, the Mauna Loa Trailside Museum retains a high degree of integrity when comparing it to the 1937 plans, in spite of the roof replacement, which can be considered ongoing maintenance, and the fact that the replacement was done in a historically-sensitive manner and was well documented. Trees and other vegetation have matured around most of the shelter building blocking up-slope views; however, a 2011 tree clearing project restored much of the downward slope viewshed. The Mauna Loa Trailside Museum's association with the CCC, naturalistic landscape design and the NPS Rustic Style, and purpose as a visitor destination point along the Mauna Loa Road circulation system make it a contributing resource. Its original and unchanged placement representing the desire by the NPS to blend functional buildings into the landscape, as well as, its good condition enhance its integrity of location, design, materials, association, setting, and feeling as a historic resource.

[14] Ibid.

8. STATEMENT OF SIGNIFICANCE

Applicable National Register Criteria
(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

[X] A Property is associated with events that have made a significant contribution to the broad patterns of our history.

[ ] B Property is associated with the lives of persons significant in our past.

[X] C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

[ ] D Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria Considerations
(Mark "x" in all the boxes that apply.)

Property is:

[ ] A Owned by a religious institution or used for religious purposes.

[ ] B removed from its original location.

[ ] C a birthplace or grave.

[ ] D a cemetery.

[ ] E a reconstructed building, object, or structure.

[ ] F a commemorative property.

[ ] G less than 50 years old or achieving significance within the past 50 years.

Areas of Significance
(Enter categories from instructions.)

Transportation
Landscape Architecture
Architecture
Science

Period of Significance

1933-1963

Significant Dates

April 1934 (Bird Park Road completed)
October 1936 (Mauna Loa Truck Trail constructed)
January 1962 (Realigned to add developed area)

Significant Person
(Complete only if Criterion B is marked above.)

Cultural Affiliation

N/A

Architect/Builder

National Park Service, Bureau of Public Roads, Civilian Conservation Corps

Period of Significance (justification): 1933-1963
The period of significance represents the original construction timeframe for the Bird Park Road/Mauna Loa Truck Trail system that was started with its earliest extension from the primary park road beginning in 1933 (1.6 miles) to the Bird Park developed area thereby creating an initial gateway to the slope area of Mauna Loa, followed by the original construction of the Mauna Loa Truck Trail in 1936 (9.8 miles) that extended the overall road system up the southern slope of Mauna Loa. In 1962, a portion of the 1934 completed roadway was realigned to include the Tree Molds developed area, resulting in a more inclusive, publicly accessible roadway system. The year 1963 added significant structural elements to certain sites.

Criteria Considerations (explanation, if necessary): N/A

Statement of Significance Summary Paragraph

Summary

The Bird Park Road/Mauna Loa Truck Trail (Mauna Loa Road) and its associated sites, buildings, and structures were primarily constructed from 1933 - 1938 under the unique design standards implemented by the National Park Service (NPS) from 1916 – 1942, and as part of a realignment for a 2,900-foot section from 1961 - 1962. As a result of the 1962 realignment, structural elements were constructed to replace older resources; these "newer" structures have achieved significance in their own right based on their unique construction and design. The above-referenced standards sought to harmonize built constructs with the surrounding natural environment, and Mauna Loa Road, as part of two distinct roadway constructions, was a direct recipient of thoughtful design carried out under opportunities related to President Franklin D. Roosevelt's New Deal programming and the immediate growth of the NPS in the first two decades after its establishment in 1916. While the idea of developing the roadway as a basic truck trail was to further scientific study of the dynamic volcanoes and volcanic activity within which makes up its setting, it almost immediately became a conduit for public recreation use as increased visitation to U.S. national parks resulted from increased automobile usage and ownership as a means of personal travel. The necessity of the Mauna Loa Road circulatory system for assuaging the visitor flux became even more pronounced as volcanic eruptions and activity in turn placed pressure on national park administrators to accommodate the mass desire for outdoor experiences while preserving the natural conditions that national parks were known for sustaining. Thusly, the history of Mauna Loa Road represents a significant example of national park road development during this time and finds merit for historic significance under National Register Criteria A and C.

Extended Narrative-Statement of Significance

See Continuation Sheet Section 8

Developmental History & Additional Historic Context Information: Historic Background

Summary

As NPS Historian Dawn Duensing (1999) pointed out in her research on park roads, "most of the roads in Hawaii Volcanoes National Park were built between the 1920s and the 1970s to provide park visitors with improved automobile access to volcanic eruptions and their associated landscape features" (p. 9). Using road policies formulated during this time, especially early on in the NPS's history, the challenges of building park roads were often constrained by natural forces, cost prohibitions, land acquisition, and conflicting issues of access. Mauna Loa Road is presented in two distinct construction segments evolving over three separate project timeframes.

Segment 1, in its entirety is historically known as Bird Park Road and is 1.6-miles in length. It consists of two sections, one representing the earliest construct of an actual road from 1934, and the other representing the most recent from 1962. The earliest section of Segment 1, originally part of the Halema'uma'u Crater-Uwekahuna Bluff-Bird Park Road project, was designed to provide public access from Uwekahuna Bluff at Kilauea to Bird Park with a paved, two-lane visitor-friendly surface. The later section from 1962 beginning at Crater Rim Drive is also paved with two-lanes, albeit more pronounced as a thoroughfare, but was designed to provide an efficient linking up of the Tree Molds Outdoor Exhibit Area with the Bird Park Road from 1934. In addition, the 1962 realignment was prompted by the construction of a simultaneous bypass road that would eliminate through-traffic within Hawaii Volcanoes National Park (HAVO) and finally result in a truer and complete loop road around the Kilauea Caldera.

Segment 2, originally serving as a gateway to Mauna Loa's summit area, was completed in 1936, and is the truer incarnation of a rustic truck trail for accessing the upper slopes of Mauna Loa. It begins at the terminus of the original Bird Park Road (marked by a large traffic circle), and ends at the 6,765-foot elevation marked by an octagonal lava stone trailside shrine. The road is characterized as being mostly one lane-wide with an original intent to limit public access, though two quasi-developed areas do occur: one being a utility area used during road and development construction, and the other at its terminus where a shelter overlook, trailhead, and seismograph vault are located. The difference in use intent resulted in clearly recognizable design differences between the two road segments that remain evident in how the overall Mauna Loa Road corridor transitions from the more developed area of the park to its terminus upslope.

Cont...See Continuation Sheet Section 8

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bird Park Road/Mauna Loa Truck Trail
Name of Property
Hawaii, HI
County and State
N/A
Name of multiple listing (if applicable)

Section number 8 Page 1

Narrative Statement of Significance (Provide at least **one** paragraph for each area of significance.)

Extended Narrative

Mauna Loa Road and its associated buildings and structures that occur as part of a wilderness road system ascending the southern slope of Mauna Loa in Hawaii Volcanoes National Park (HAVO) are significant at the local/state level under National Register Criteria A and C. Linda Flint McClelland (1995) established a broad contextual basis for historic park landscapes being nominated to the National Register under the widely recognized multiple property group National Register nomination entitled "Historic Park Landscapes in National and State Parks." In her subsequent book, *Building the National Parks: Historic Landscape Design and Construction*, McClelland (1998) listed a framework of four guiding qualities that serve as a checklist for evaluating and revealing the significance of Mauna Loa Road and its associated historic resources as a larger, integrated circulation system. Under McClelland's framework, a landscape should first "be associated with the twentieth-century movement to develop national parks for public enjoyment, to conserve natural features and scenic areas as public parks, to organize statewide systems of state or local parks, or to develop natural areas, including sub-marginal lands, for public recreational use" (p. 511). The Mauna Loa Road circulation system fulfills this because the road and its developed areas were built primarily between 1916 and 1942 as part of the national park system, to facilitate administrative and visitor travel to the slope areas of Mauna Loa, and as a gateway to its summit, as part of the world's largest shield volcano, eventually contributing to visitor attraction to Hawaii National Park (as it was then known).

Secondly, McClelland suggested that a historic park landscape needed to "retain several or all of the physical characteristics...which were developed for that area during or before the New Deal era (1933-42)" (p. 512). The original buildings and structures within the Bird Park Road/Mauna Loa Truck Trail District remain almost completely intact from their original construction periods beginning in 1933. The circulation corridor of present-day Mauna Loa Road also remains intact to a great degree, as well, but has been realigned along certain segments to increase visitor appeal and to provide additional linkages and public access to purposely developed park areas. The Civilian Conservation Corps (CCC) played an important role in its development during part of its history. In fact, a 200-man CCC camp was established in Hawaii National Park after enrollment for the national program began in early 1934, and crews undertook much of the work required to lay out the road, much of it by hand, to construct its historic resources. Their work is evident in the still extant roadway alignment of much of the first segment, and the still extant narrow roadway that makes up the entire second segment; the buildings and structures built by them also have a high degree of integrity.

Thirdly, McClelland wrote that a landscape should "reflect the...principles and practices of park landscape design developed and used by the National Park Service in national parks from 1916 to 1942...through ECW, CCC, PWA, or PWA projects from 1933 to 1942" (p. 512). These principles and practices included, for example, the creation, presentation, protection and/or preservation of the natural and human-made environments and scenic vistas according to established NPS standards of design, construction, and maintenance, as well as, the prohibition of non-native species. The Bird Park Road/Mauna Loa Truck Trail District typifies the principles of NPS master planning begun in 1925 as voluntary five-year plans, which expanded upon the park village concept to include nodes of development established at strategic points with undisturbed natural areas between them. Multiple roadside turnouts, as well as, the overlook at the Mauna Loa Trailside Museum at the roadway's terminus continue to provide scenic vistas that solicit gazes framed by picturesque natural scenes. The alignment and realignments of Mauna Loa Road as a meandering route through natural forests and barren lava fields reveals the NPS design philosophy that the journey through the landscape was just as important as its points of destination. The building's blending into the contours and lay of the land so that its physical imprint is barely noticeable is similar to Thomas Vint's vision that good design amounts to "the preservation of the native landscape" when locating buildings and structures within it (McLelland, 1998, p. unk.).

While the later segment of Mauna Loa Road was initially laid out as a non-public means for accessing the backcountry areas of Mauna Loa and its summit, its design during the period of significance took on a responsible, aesthetically-pleasing approach, as it harmonized with its natural surroundings, which included the volcanic landscape of *a'a* (rough) and *pahoe'hoe* (smooth) lava flows, steep inclines, and lush vegetation through hardwood forests. Much of the road can be considered hand-crafted as the CCC used hand tools and sheer grit to excavate the hard lava forms that made up vast sections of the intended road's centerline. Even much of the base course, in tandem with using the portable rock crusher that moved along with the crew's progress, was laid by hand rather than by heavy machinery. The still extant structures constructed in association with Mauna Loa Road were carefully naturalized through the use of native materials such as lava rock and the purposeful use of natural forms that complimented the natural land forms, all which typify the NPS Rustic Style and Naturalistic design philosophy and their goals of incorporating local conditions and materials into a local design language.

Finally, McLelland wrote that a landscape should

> possess historic integrity of location, setting, design, materials, workmanship, feeling, and association and overall reflect the physical appearance and condition of the landscape during the period of significance. Changes and additions to the landscape since the period of significance including new campgrounds, buildings, trails, roads, lakes, and recreational areas, diminish historic integrity and are considered noncontributing. Historic park landscapes containing such changes are eligible for listing despite these changes if the overall historic plan is intact and a substantial number of historic characteristics possessing integrity of design, location, materials, and workmanship are present. (p. 512)

Mauna Loa Road and its associated developments possess a remarkable degree of integrity in spite of the constantly changing conditions to which it is subjected. Ongoing maintenance and minor alterations have been necessarily made both to Mauna Loa Road and the buildings and structures within its system due to use and natural phenomena, such as erosion and weather, but the roadway ascent and travel path, as they merge with the landscape interface along its route that creates the unique landscape experience for visitors is still present.

Criteria

Mauna Loa Road, in its entirety, meets National Register **Criterion A** because of its association with the development of the U.S. national park system and its road development programs, the work of the CCC, who provided much of the manpower during the 1930s up to WWII for implementing much of the roads and infrastructure in Hawaii National Park and throughout the national park system in a broad sense, and with the science of volcanology. Mauna Loa Road is significant as part of the early and present-day **transportation** circulation system of HAVO, serving as the primary road that provides visitors and park personnel with backcountry access to the southern slope areas of Mauna Loa. Mauna Loa Road is therefore significant as an example of early road construction in the national park system that illustrates how NPS designers, along with the BPR developed roads to be unobtrusive elements in the landscape. From the establishment of the NPS in 1916 until 1942 when World War II halted development in national parks, NPS designers based in the Branch of Plans and Design (divided in 1934 into the Western Division and Eastern Division) developed a vocabulary of design and construction to be utilized at parks across the country with adaptations to the particular environment and landscape of each park.

Park administrators, such as those at HAVO, supported the creation of drawn park master plans complete with roads, trails, and development areas for both administrative and visitor uses; these design-oriented plans assisted in guiding development of parks based on enhancing visitors experiences and the necessary administrative functions that followed. At HAVO, the road system was designed to provide access to the natural features of the park via a system of primary and secondary roads. While Mauna Loa Road does not venture all the way to Mauna

Loa's summit, the history of the road is characterized by debates over this ultimate extension. Such debates reflect the tension and balance between providing public access and promoting safety and environmental protection. Mauna Loa Road is also significant from a **science** standpoint through its association with volcanology led by the renowned volcanologist Thomas A. Jaggar, who was instrumental not only in the initial establishment of the historic roadway, but who also founded the science of volcanology in Hawaii through his coordination of the Hawaiian Volcano Observatory during the early part of the twentieth century.

The road meets National Register **Criterion C** because it embodies the standards of NPS road design and construction techniques, which included the Naturalistic principles of nineteenth century landscape architects, and the Park Rustic Style, which evolved from naturalistic principles, but was formulated specifically for the NPS during the early twentieth century.[1] The result of this merging of architecture and landscape design, along with civil engineering, was a direct result of the formative years of NPS road design that experimented with materials, available forms and themes in the landscape, to create a standardized design that allowed local character to be evident in the human construct. Therefore, Mauna Loa Road is significant in **landscape architecture and architecture** for its adherence to these NPS road design and construction principles, and illustrates the ability of the NPS to blend sensitive road construction intended for public use with extremely harsh natural environments. During the 1916 - 1942 time period, NPS "landscape architects, architects and engineers forged a cohesive style of landscape design which fulfilled the demands for park development while preserving the outstanding natural qualities for which each park has been designated (McClelland, 1998, p. 1). Roads were considered an integral component of landscape design, and the NPS worked with the BPR to develop safe and aesthetically pleasing road systems throughout the national park system. Park roads were to only minimally impact the land and closely follow the topography of the landscape through which they traveled. On the Mauna Loa Road, the alignment of curves by following the contours of the land while steadily ascending the summit to the nearly 6,800-foot elevation with changing viewsheds and minimal observances of straight road corridors cutting through the wilderness captures this succinctly, enhanced by the required naturalization of necessary cuts and fills. Therefore, Mauna Loa Road is specifically significant in **landscape architecture** as the NPS developed methods for preserving natural environments and their scenic wonders, while also promoting increasing public access to them; this endeavor of balancing goals resulted a widely recognized vocabulary of architecture and landscape design methods used throughout not only the national parks, but in state and local parks, as well. In addition, NPS design called for the journey through the landscape to be just as important as the destination point, so the road was laid out to take advantage of landscape features like the *koa* forests and lava flows.

NPS policy at the time supports a significance for **architecture** that encouraged the design and construction of structures that harmonized with the landscape through the use of native materials and forms. This was the guiding principle of the Park Rustic Style, developed through experimentation by both NPS landscape architects and architects. Along the Mauna Loa Road corridor, the Bird Park Trailhead Kiosk and the Mauna Loa Trailside Museum (Observation Shelter) exemplify the Park Rustic Style. Albert Good (1938), an architectural consultant to the NPS, catalogued many of the buildings and structures that exemplified the Park Rustic Style, helping to standardize park architecture and NPS design principles. Park structures were ultimately subordinate to their surroundings and merely part of a larger, comprehensive park plan. Good defined "successfully handled" Rustic architecture as

> a style which, through the use of native materials in proper scale, and through the avoidance of severely straight lines and over-sophistication, gives the feeling of having been executed by pioneer craftsmen with limited hand tools. It thus achieves sympathy with natural surroundings and with the past. (p. 5)

[1] Much work has been done on the history of National Park Service road design and architecture. See for example, McClelland (1998), esp. Chapter 6: "Principles and Practices for Naturalistic Roads and Trails"; Carr, (1998); Davis, Croteau, & Marston (2004); and Soulliere (1995), among others.

Mauna Loa Road retains a high degree of integrity as explained in the Description Narrative of Section 7. The integral characteristics of park road design can still be seen on Mauna Loa Road: A narrow roadway, a sinuous alignment, and a blending of it with the surrounding natural environment through the use of natural materials and siting of the road to take advantage of landscape features. In addition, the land remains undeveloped aside from purposely planned development along the road's route for perpetuating the NPS mission, which includes the Tree Molds Outdoor Exhibit Area, Bird Park Day Use Area, Bird Park, the Powder House Area, and the Mauna Loa Road terminus, reflecting NPS master planning philosophy.

Developmental history/additional historic context information (if appropriate)

Historical Background

Road Development in the Parks

It is important to include the broader NPS program for developing park roads in order to better understand why the construction of Mauna Loa Road is significant. The NPS worked with the BPR to implement a unified road construction program in the parks. The relationship was formalized through an inter-bureau agreement signed on January 18, 1926. The NPS focused on the aesthetics of the road while the BPR supplied daily construction activities and the engineering and technical expertise, resulting in a "distinctive cultural landscape that has become a defining characteristic, not just of national park roads, but the National Park System in general" (Davis, 2005, p. 4). In addition, during the 1920s, Daniel Hull, a landscape engineer, and Thomas Vint, a landscape architect, began working on creating a distinct style of environmentally and contextually-sensitive architecture that utilized the earlier work of landscape architects like Andrew Downing and Frederick Law Olmsted, while also taking into consideration sound elements of "scenic preservation." The influences from consultant Henry Hubbard, the Harvard-educated landscape architect, can also be understood though his early admonishments that parks develop roads that served as circuits between features, but that such development be done gently and in a sensitive manner.

Although Hull left the NPS in 1927, Vint went on to develop the landscape program through the Western Field Office, which began implementing master plans throughout the national park system and developing park infrastructure designs that harmonized with the landscape (Carr, 1998). The result of the leadership and vision of Vint and the Western Field Office was a set of general principles to guide park road construction. The most important principle was that even during construction, the landscape had to be protected as much as possible. Throughout the 1920s and 1930s, NPS designers worked on creating standards guiding the sloping and naturalization of road banks, drainage structures, parking areas, masonry work, and other structures like guard rails, tunnels, and bridges (McClelland, 1998). In addition, they formulated purposeful architectural elements that would best fit into, and harmonize with the local landscapes they were working with. These standardized designs were published in *Portfolio of Comfort Stations and Privies* (DOI-NPS,1934), *Portfolio of Park Structures* (DOI-NPS,1934), *Park Structures and Facilities* (DOI-NPS, 1935), and *Park and Recreation Structures* (Good, 1938).

In May 1968, the NPS published its *Park Road Standards*, outlining the purpose and design of park roads, which reveals that the basic principles developed during the 1920s and 1930s that had survived. George B. Hartzog, NPS Director, described the place of the road in the national parks in the following excerpt

> Park roads are designed with extreme care and located with a sensitive concern for the environment....These roads can take you close to America's most breathtaking places of beauty and history. To experience park at its best, try getting away from your car.... The next best thing, for those who have neither time nor zest for roughing it, is a judicious use of park roads....But park roads are for leisurely driving only. If you are in a hurry, you might do well to take another route now, and come back when you have more time.[2]

The roads in the national parks were to incorporate the experiential aspect of the landscape as well as the visual, rather than simply being paths leading visitors to the most sought after destinations. In addition, the standards suggested that "every segment of every park road should relate to the environment through which it passes in a meaningful way, and should, to the extent possible, constitute an enjoyable and informative experience in itself"

[2] Excerpt from George B. Hartzog, see NPS, *Park Road Standards,* p. unk.

(NPS, 1968, p. unk.). To enhance the experience of driving through the park, the roads should be minimally invasive and concealed rather than simply running in highly visible straight runs that appeared unnatural. In addition, NPS designers recommended providing points like parking lots, turnouts, and vistas at which visitors could leave their automobiles and connect with the landscape.

The design standards of road construction in the parks were explicitly stated. Foremost among the principles was that new roads fit to the lay of the land to which they were being applied. To achieve this, designers had to eschew cuts and fills whenever possible, instead choosing to follow the topography of the landscape. The scenic qualities of the landscape had to be used to their best advantage to create a "sense of intimacy with the countryside through which it is passing" (NPS, 1968, p. unk.). Ditches and slopes were to be carefully blended into the roadside by rounding slopes, blending them into existing vegetation, and planting them with native vegetation. For vertical grades, the maximum was seven percent with 8-10 percent allowed for short distances. To make sure that visitors were able to experience the landscape, park roads were to be designed for 25 mph speed limits for major and minor roads in areas of natural or cultural resources, 45 mph for parkways and major roads in recreational areas, and 15 mph for special and interpretive roads. These standards and guidelines were applied on the Mauna Loa Road but adapted to the particular environment through which the alignment would run. Yet the adherence to the basic principles of NPS road design and construction create a sense of continuity not only with the other roads and structures located within the park but also within the national park system as a whole

Detailed History of HAVO Roads

The road network in HAVO began prior to it becoming a national park, and prior to the establishment of the National Park Service, with basic road systems in place during the late nineteenth century. However, as the U.S. national park system became established through congressional authorization, and its leadership began articulating its mission through a build-up of policy-driven mechanisms, road systems in national parks became an immediate priority. Through interagency agreements such as occurred in 1926 with the BPR, the NPS meshed their design philosophies for road construction with the technical expertise and strategic planning strengths of others. Much of this history is captured succinctly by Dawn Duensing (1999) in the following eleven paragraphs.

> Early park administrators followed many of the classic road-building policies that were used in national parks throughout the nation. Borrow pits were located out of sight of the roads to preserve scenery. Construction crews worked in the rights-of-way to avoid unnecessary scarring of the landscape. The needless cutting of trees was avoided and in one case, on Crater Rim Drive, a new alignment was rejected because the proposed project would destroy too many large tree ferns. Trees, however, could be thinned to open vistas and improve scenic features. Roadways were located so that they curved and flowed with the natural contours of the land. Roads were designed with radial curves rather than sharp switchbacks. Gentle grades of no more than 5 percent were another goal, although in some cases, steeper grades were unavoidable. Shoulders were sloped to prevent erosion and present a more natural appearance. A classic park design strategy, the circuit road, was employed twice to facilitate more pleasurable travel, including Crater Rim Road and Chain of Craters-Kalapana Road. The use of native stone for walls, curbs, and drainage systems was prevalent throughout the park [(McClelland, 1993)].
>
> Road projects at HAVO involved some of the most prominent names in the National Park Service. Assistant to the Director (later Director) Horace Albright helped conceptualize the Mauna Loa Road and asserted that HAVO needed roads to fulfill its mission. BPR engineer Frank Kittredge, who became the NPS chief engineer in 1927, investigated HAVO roads and advised the park on surveys and development. Landscape architect Merel Sager was assigned to HAVO during a prolific era of road development projects during the Great Depression. Landscape architect Thomas Vint was involved in a number of park road projects, most notably the Chain of Craters-

Kalapana Road. Vint had a forty-year career with the NPS and was appointed chief landscape engineer in 1927. According to historian Ethan Carr, "No individual influenced Park Service planning process and design details in the late 1920s and 1930s more than Thomas Chalmers Vint" [(Carr, 1998, p. 190)]. Another prominent NPS landscape architect, John B. Wosky, was heavily involved in HAVO road development and also served as superintendent of the park during the 1950s.

Unique Conditions in Hawaii Volcanoes National Park

The Hawaii Volcanoes National Park road system has been affected by a combination of natural phenomena that are unique in the National Park System. Lava flows, volcanic ash, earthquakes, heavy rain, and heavy vegetation created unusual conditions for road building and also damaged and destroyed many miles of HAVO roads. Due to these conditions, numerous sections of road have been realigned during the last fifty years. Lava flows are one of the most prominent landscape features in Hawaii Volcanoes National Park. Throughout the park's history, lava has repeatedly destroyed roads and necessitated reconstruction or realignment. Volcanic activity was unpredictable and new roads and realignments were never guaranteed to be unaffected by future eruptions.

Geological features created by lava have created unusual problems for road surveyors and engineers. Roads in HAVO were likely to be constructed over hollow underground lava tubes. It was difficult to ascertain where lava tubes were or how thick the ceiling of the lava tube might be. Therefore, engineers were uncertain whether the lava tube "roof" would withstand the weight of the road and its traffic. Over the years, there have been several ways of dealing with the problem. HAVO's first superintendent, Thomas Boles, thought that he could "sound out" the lava surface by driving a heavy truck over a proposed route. This would assure engineers and contractors that the surface would support a road. Decades later, a geologist asserted that lava tubes could be mapped. He disagreed with Boles' theory of "sounding out" the lava's surface and recommended that roads be built at least 75' from known lava tubes.[3]

The presence of underground lava tubes also made it difficult for engineers to estimate how much fill they could get from road excavations. Due to the hollow nature of the numerous lava tubes, there was sometimes less material to excavate than had been estimated. When this happened, there was not enough material to balance cuts and fills and materials had to be trucked in from other locations.

Earth movement has always been a road maintenance problem in HAVO. Earthquakes often sent the roadway into adjacent volcanic craters. Earthquakes also made pavements heave or crack. Cracking in the road could vary from just a few inches to several feet wide and hundreds of feet deep. Heaved pavement could result in a slight hump in the road or a piece of pavement so large that a car could not drive over or around it.

Due to the threatening nature of volcanic eruptions and earthquakes, pipe barrier gates were used extensively at HAVO to control access to different sections of the park. Barrier gates could be drawn across the roads at numerous locations throughout the park in order to close them during an emergency. Barrier gates were also useful for prohibiting entry into areas affected by drought

[3] See May 1922 HAVO Superintendent Report (Boles), HAVO Archives; and John Aubuchon, Acting Superintendent, HAVO, Memorandum to Superintendent Fred T. Johnston, 22 May 1962, "Kalapana-Chain of Craters Road, Project 2-C1, June 1956-July 1962" folder, File D30, HAVO Archives.

and threatened by fire. In recent years, the gates have also closed a road to protect the endangered *Nene* during its nesting season.

Climate also caused road problems in HAVO. In both desert and rain forest, the park received heavy rainfall during storms and in the winter rainy season. For example, in 1929, HAVO recorded 74" of rain. In November 1929, 20" of rain fell in one storm, with 7" recorded in only eight hours. Heavy rains could wash out roads or undermine the road surface.[4] Drainage was a concern on many park roads.

With Hawaii's year-round growing season, vegetation also caused unique conditions for roads in the national park. Tree roots frequently undermined the road pavement and forced it to break. Heavy vegetation often obscured road shoulders. Vegetation also blocked vistas created for motorists to view the park's natural beauty. (pp. 9-12)

The Evolution of a Mauna Loa Slope Road.

The desire for a road up to the summit of Mauna Loa was an issue even prior to the establishment of Hawaii National Park in 1916. Dr. Thomas A. Jaggar and local businessman Lorrin A. Thurston developed the idea of a truck trail extending from Kilauea to the Mokuaweoweo Crater at the summit of Mauna Loa for use by both scientists and tourists. They hoped that Hilo businessmen would provide the funds for construction in anticipation of the road bringing increased tourism dollars to the island (Jackson, 1972). Jaggar, a world-renowned volcanologist, had already established the Hawaiian Volcano Observatory at Kilauea in 1912, and wanted to expand his study area to include a wider range of lands in hopes that such access could enhance his ability to predict where future lava flows were most likely to take place. He felt that the narrow strip of park land that connected the park with the summit at the time was insufficient to allow the breadth of scientific understanding for volcanic activity taking place within Mauna Loa's wider influence. It was his hope that predictability through ongoing study could save lives and property and this premise was received quite favorably by many in the public and private sector (Jackson, 1972).

Jaggar spent much time lobbying for a road to make Mauna Loa more accessible, arguing that the volcano had both scientific and aesthetic merits. Jaggar's fascination with the volcano is evident in the following excerpt:

> Its great walls are avalanching, its bottom is heating and cooling, it is always smoking inside, it is swelling up and sinking down, it becomes snow-covered for winter sports, and its glazed rifts are brilliantly colored with cones and caverns of all shapes and sizes, and covered with stalactites and stalagmites in the caves. It is utterly unexplored, for the few parties who have been there have been weary and eager to get home. It is the greatest and most active volcano center in the world, it is in the middle of the greatest belt of the earth's internal fire in the world; namely, the shores surrounding the Pacific Ocean. If these are not reasons enough for building a road to it, the eruptions being spectacular but not dangerous, then there is no reason for any scenic road anywhere.[5]

Joining Jaggar in this crusade was Thurston, an influential politician and publisher of the *Pacific Commercial Advertiser* (now known as *The Honolulu Advertiser*). Thurston too was an avid supporter of the park's establishment and road construction, seeing park development as a way to boost tourism to Hawaii. In September 1915, Jaggar, Thurston, and a U.S. Army representative conducted a survey to determine a route up to Mauna

[4] See Nov. 1929 HAVO Superintendent Report (T. J. Allen), HAVO Archives.
[5] T.A. Jaggar, Volcanologist, to E.G. Wingate, Superintendent, Hawaii National Park, January 18, 1934 in Folder: "Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1934," 631-01, available from HAVO Archives.

Loa. The following month, soldiers from the 25th Infantry Regiment arrived at Mauna Loa to construct a rudimentary access trail, which was completed a mere two months later up to the 10,000-foot elevation.[6] The 25th Infantry was one of four all African-American regiments in the U.S. Army, the others being the 24th Infantry and the 9th and 10th Cavalries. Collectively, the African-American regiments were known as "Buffalo Soldiers." The 25th Infantry resulted from a consolidation in 1869 of the 39th Infantry (Greenville, LA) and 40th Infantry (Washington, DC), both of which had been created by an Act of Congress in 1866 "to provide military careers for free slaves." The four regiments (9th and 10th Cavalries and 24th and 25th Infantries) made up ten-percent of the troops stationed in the West from 1866-1891. The War Department ordered the regiment (consisting of 29 officers and 801 enlisted men) to Hawaii in 1913, where they were based out of Schofield Barracks in Honolulu.[7] Little else is known about the regiment's work in Hawaii and even less about their work on this initial trail on Mauna Loa. Remnants of the original trail are still visible in places along the alignment of the current Mauna Loa Road, but little written evidence has been found documenting its route, construction, and use.

Following the construction of the 25th Infantry's trail up the slope of Mauna Loa was the establishment of Hawaii National Park in 1916 and the acquisition of additional lands for the park from 1916-1922.[8] Even though the minimal trail was constructed, the problem of providing the public access to Mauna Loa via an improved roadway continued to press Park administrators since the trail still represented an arduous journey not conducive to the capabilities of the general public, and portions of it fell outside the newly established park boundaries. Tensions were building between the NPS and private land owners regarding overlapping of uses and access issues.[9] That same year, Jaggar and the Park's first Superintendent Thomas Boles surveyed another potential route to the summit; however, Boles apparently was not convinced that a road to the summit would necessarily benefit the Park's mission and goals. First, he felt that an improved horse trail would be simpler to construct with less impact to the land, and inherently cost less and be more amenable to the problem of financing the project.[10] Second, he insisted that only a basically minimal roadway was needed since weather conditions and unpredictable eruption patterns on Mauna Loa's summit would preclude popular interest and usage of such access. Finally, Boles had very real concerns about visitor safety. Mauna Loa's high elevation could pose problems to inexperienced hikers and those with health problems. Boles argued only "experienced mountain climbers, or people whose heart action has been thoroughly tested by a competent physician" should be allowed to make the trek.[11] Thus, his concerns about frequency of use (or lack of it) and resulting expenditure of park resources, as well as, visitor safety delayed the establishment of an improved and route up Mauna Loa. Therefore, the establishment of an improved roadway up the Mauna Loa slope also seemed to be out of reach to Jaggar's stronger inclination.

Regardless of Boles' initial concerns, by 1925, a crew working under the Highway Engineer from the BPR had completed several line surveys "in order to determine the economical route, as well as the route which will connect with the various points of interest along this road."[12] Crews had difficulty in routing the lower part of the road since

---

[6] As referenced in *Hawaii Nature Notes*, *V*(2), 1953.

[7] *The Service: Devoted to the Army and Navy in Hawaii, Honolulu, HI*, 7, no. 38 (March 17, 1916), retrieved 10/2006 from http://www.buffalosoldiermuseum.com 10/2006; and retrieved 10/2006 from http://www.buffalosoldiers.com/; also see Nankivell (1927) as referenced in Bibliography.

[8] Hawaii National Park, as it was called, originally encompassed both this park and Haleakala on the Island of Maui until 1961, when the two were divided into separate parks. The lands on the island of Hawaii became Hawaii Volcanoes National Park and those on Maui became Haleakala National Park.

[9] See April 1922-1923 HAVO Superintendent Report (T. Boles), HAVO Archives.

[10] See Feb. 1923 HAVO Superintendent Report (T. Boles), HAVO Archives.

[11] Letter from Thomas Boles, Superintendent, to George E. Goodwin, Chief, Civil Engineering, NPS, Portland, OR, May 31, 1923 in RG 79, Records of the Branch of Engineering, General Records of the Engineering Division, 1917-26, National Archives and Records Administration, College Park, Maryland (hereafter cited as NARA).

[12] Letter from Thomas Boles, Superintendent, to George E. Goodwin, Chief, Civil Engineering, NPS, Portland, OR, April 20, 1925, in RG 79, Records of the Field Headquarters in San Francisco, Classified Files, 1925-36, Parks Hawaii, Box 31, Entry

privately owned lands used for grazing cattle had to be avoided. The selected route rested "almost entirely on lands owned by the Territory of Hawaii" in the hopes that the territory would donate the needed land to the park.[13] When Arno B. Cammerer, Assistant Director of the NPS visited the park in 1926, he deemed the BPR survey unsatisfactory and recommended undertaking another survey. However, the BPR apparently disregarded the concerns of Cammerer and developed plans for the construction of the road without any revisions. The BPR engineers wrote that the "regularity of the topography on Mauna Loa make it evident that there is an indefinite number of possible routes." One route could start at the summit before making its "descent on the maximum grade by spiraling the mountaintop," which would provide views in all directions. Another possible route would "follow the general line of the rift by use of numerous switch-back curves."

A limited length auto trail had already been in existence that allowed access to the Bird Park area during the 1920s, and there was probably some sort of access even earlier, since Thomas Boles recognized Bird Park as an attraction in his 1923 Annual Superintendent's Report. By November of 1927, the park was already concentrating efforts on improving what was a 2.4-mile road to Bird Park "passable to all types of autos" by "filling with rock and gravel on both sides of the many sharp lava outcrops and reducing the sharpest curves." In addition, Boles also made reference to the 4/10 mile section of the roadway to the Tree Molds as having been "relocated so as to encroach as little as possible on the Kilauea golf course."[14] The route as realigned remained "outside the fence until near No. 7 green where it enters the new gate...and runs directly to the Tree Molds, thus crossing only one fairway." Such references certainly suggest the difficulties of balancing the public/private land and access issues at the time; of course, they also suggest the earlier considerations that set the stage for linking up park scenic areas along a more extensive roadway leading up the slope of Mauna Loa.

Though initial NPS-sponsored surveys for a summit road formulated by 1925, it wasn't until 1933 that authorization for improving a new roadway from the Halema'uma'u Crater to at least part of the way up the slope of Mauna Loa to Bird Park came to fruition. This project was considered to be an extension of the earlier road (completed 1910) that traveled around the caldera from the opposite direction ending at the crater's esteemed fire pit. Including this earlier roadway that was improved during 1931 - 1932 with a macadam surface, an overall project scope was created that divided it into sections with assigned project numbers. The Uwekahuna Bluff-Bird Park Road project was designated as Project No. 4 and extended from the crater firepit up to the segment of the Around-the-Island Belt Road that ran through the park (now Crater Rim Drive) to Bird Park. There were two possible routes for this project. One option was to "flatten the grade from the so-called Big Koa" to Bird Park and then continue the route to the Around the Island Highway about 1/2 mile from Kilauea Military Camp.[15] The BPR thought this path was a little dull, however, and suggested that if the lower part of the route could go into the Bishop Estate lands, it would be more interesting. The second option was to "descend on the maximum grade" to just below Bird Park and then connect with the Around-the-Island highway; the BPR recommended this route.

Project No. 5 (NR-5) extended from Bird Park to Red Hill Road, where a rest house was located at the approximate 10,000-foot elevation. This represented an overall roadway about 20 miles in length. The BPR attempted to site the road so that it would connect to as many volcanic attractions as possible, while at the same time meeting economic challenges. The BPR could foresee that the Territory of Hawaii would at some future date be interested in a road between Mauna Loa and Mauna Kea, so they routed the "Mauna Loa survey" to go "as far in the direction of the Mauna Kea pass as possible." The final section was labeled Project No. 6, Mauna Loa Summit Road. It ran from the rest house at the 10,000-foot elevation to the summit of Mauna Loa, a total of 13

29, NARA; September and October 1925 Monthly Reports from Superintendent Report 1922-28, HAVO Archives.

[13] See Oct. 1925 HAVO Superintendent Report (T. Boles), HAVO Archives.

[14] See Nov. 1927 Superintendent Report (R. T. Evans), HAVO Archives.

[15] Letter from Thomas Boles, Superintendent, to George E. Goodwin, Chief, Civil Engineering, NPS, Portland, OR, April 20, 1925, in RG 79, Records of the Field Headquarters in San Francisco, Classified Files, 1925-36, Parks Hawaii, Box 31, Entry 29, NARA; September and October 1925 Monthly Reports from Superintendent Report 1922-28, HAVO Archives.

miles.[16] The final surveyed route, including all sections, did indeed extend from near the Kilauea Crater to the summit of Mauna Loa.

The BPR also provided road construction specifications, which were revised in the field later to accommodate site conditions (Bureau of Public Roads, April 1934). For Project No. 4, they specified that the road be 16 feet wide with grades not to exceed five percent, although for short distances of 300 feet to 400 feet, a six percent grade could be used. The surface of the planned road was to be surfaced with three quarter-inch crushed rock. For Project Nos. 5 and 6, the BPR decided that "a very narrow roadway upon a good grade ranging from 4% to 7% and upon alignment which would be safe" was sufficient. There were to be no curves sharper than a 100' radius. Finally, this section was to be surfaced with three quarter-inch lava rock and cinders.[17]

Master plans for road development in the park completed in 1931 and 1939, and a preliminary drawing of the Mauna Loa Truck Trail from 1935 provide information as to how potential routes to the summit of Mauna Loa were considered from mere walking trails to actual improved roadways, and how they were laid out in comparison to the original 1925 survey. The 1931 Hawaii National Park General Development Plan's "Roads and Trails System" map depicts a completed trail, but not a vehicular path, from Bird Park up to the summit of Mauna Loa with the Uwekahuna Bluff-Bird Park Road proposed as a future road with a 1.1-mile length. According to the November 1931 Superintendent Report, the Mauna Loa Trail alignment as indicated on the 1931 Master Plan was chosen "to get the best views, the shortest course, and keep the best grades so as to provide safe and easy passage for pack and saddle animals and foot travelers." The alignment began "at Bird Park, leads through *ohia* forests, past tree molds, over old *a'a* lava flows, then through tropical vegetation, past the Giant Koa Tree, then into meadows of rolling land, across other lava flows, beds of *pahoe'hoe* lava and as rifts and pit formations to the Rest House, better known as Red Hill," and then continued to the summit. The superintendent reported that the park used "native labor" to build the trail. Workers removed vegetation from the pathway in the forest and meadow portions of the route, while blasting had to be done through sections of *pahoe'hoe*. The blasted lava rock was then used as fill and surfacing material.[18] The work was done as part of a realignment of Thomas Boles' original 1923 horse trail between the 10,000-foot elevation at the Red Hill Rest House and Bird Park to make it fall entirely within NPS boundaries (Jackson, 1972, pp. 228-229). The actual truck trail that allowed travel by vehicles, albeit at a limited degree, was not indicated on park planning drawings until 1936, when it becomes clearly delineated as an already completed "existing, low standard" road terminating at its present end point.[19]

In August 1935, A.H. Wong, Associate Engineer of Hawaii National Park, began the survey work for what would be the first vehicular route toward the summit known as the Mauna Loa Truck Trail. The 1935 Preliminary Mauna Loa Truck Trail Location drawing by the Branch of Plans and Design delineates the 1925 surveyed segments with deviations occurring from Bird Park to approximately the 7,000-foot elevation. The overall plan was for an 11.5-mile truck trail with an average grade of five-percent and a width of eight feet; the Mauna Loa Trail is also delineated and reveals a much straighter run. The deviated sections up to 7,000 feet were indicated as "unsurveyed" suggesting a more accessible and shorter route that stayed within park boundaries, and that terminated in a desirable area for establishing a scientific observation point, as opposed to the continuous route

---

[16] "Report to Dr. L.I. Hewes, Deputy Chief Engineer, U.S. Bureau of Public Roads," by F.A. Kittredge, Highway Engineer, U.S. Bureau of Public Roads, November 1925, in Folder: "Investigation Road Program, Hawaii National Park F. A. Kittredge, 1925," HAVO Archives.

[17] Report to Dr. L.I. Hewes, Deputy Chief Engineer, U.S. Bureau of Public Roads," by F.A. Kittredge, Highway Engineer, U.S. Bureau of Public Roads, November 1925, in Folder: "Investigation Road Program, Hawaii National Park F. A. Kittredge, 1925," HAVO Archives.

[18] See Nov. 1931 Superintendent Report (E. P. Leavitt), HAVO Archives.

[19] See the *1936 Special Areas and Fire Control Plan*, Drawing No. AW-3031-A, Part of the Master Plan for Hawaii National Park, Branch of Plans and Design, HAVO Archives.

that was proposed in 1925.[20] The Uwekahuna Bluff-Bird Park Road had already been completed in 1934 using CCC labor, and is also shown on this drawing as Project 4. NPS personnel further decided that any road constructed past the 7,000-foot elevation should only be for scientific purposes and recommended a four-foot wide trail with a 15 percent maximum grade.[21] Of course, the reference to an 11.5-mile length is somewhat erroneous and misunderstood since the actual completed truck trail was 9.8 miles long.

In October of 1935, construction finally started on the Mauna Loa Truck Trail and was completed by October 1936, with the parking area at the truck trail's terminus completed the following November.[22] Around that time, Merel Sager reported that the CCC quickly started the reconstruction of the existing road, taking "more than usual interest in the work."[23] The crew, consisting of a foreman and about 30 workers, stayed at a camp located at the approximately 6,500-foot elevation so that the difficult work of blasting through the *pahoe'hoe* lava could be done in shifts.[24] Equipment problems delayed the work in the late fall and winter of 1935-1936. The truck trail consisted of "loose gravel with sand and dirt filler," since it was intended primarily for administrative and scientific use such as dealing with backcountry fire control and accessing the soon to be completed Seismograph Vault at the truck trail's terminus.[25] The CCC had to widen and deepen existing ditches and build and enlarge dry wall drains in 1937 after heavy rains washed out the original ditches.[26] The parking area at the end of the road was completed by November 1937, along with the Seismograph Vault. The scientific vault, a short 330-foot distance northwest of the parking area, was constructed as part of scientific monitoring of Mauna Loa's volcanic activity by Thomas Jaggar and volcanologists at the Hawaiian Volcano Observatory. The Mauna Loa Trailside Museum, visible and also a short distance from the parking area, but in the opposite direction of the Seismograph Vault, was completed in February of 1938 by the CCC following plans drawn by the NPS Branch of Plans and Design.

Part of the Master Plan for the General Development Plan of the park from 1939 delineates the completed truck trail as constructed in 1936, along with a proposed motorcycle trail from that point to the summit of approximately 22.8 miles distance. The Mauna Loa Trail from Bird Park to the summit is also delineated as completed. The Bird Park Road with its recognizable traffic circle stands out, as well.

The Public Interest. The initial master plans made it clear that the NPS designers did not intend to create an easily-accessible road that reached to the summit of Mauna Loa, but outside interests still rallied for a public access road. Throughout the 1930s, there was discussion about completing such a road suitable for automobiles. On December 4, 1933, the City Planning Commission of Honolulu passed a resolution supporting "construction of the long planned automobile road to the top of Mauna Loa, and also requesting that a copy of this resolution be forwarded to proper authorities in Washington."[27] The commission believed that the construction of the summit

[20] See *1935 Preliminary Mauna Loa Truck Trail Location*, Hawaii National Park, Proposed E.C.W. Project, Branch of Plans and Design, HAVO Archives.
[21] Cammerer to Mr. Demaray and Vint, March 7, 1934, in Folder: Mauna Loa Road (Proposed), 1916, 1925, 1931-38, 1944-48, 631-01, HAVO Archives. Sager estimated that during inactive periods, there would be as few as five visitors a day to the summit of Mauna Loa. Also, see "Proposed Mauna Loa Highway" report, 10, 17, in Folder: Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1954, 631-01, HAVO Archives.
[22] See 1936 and 1937 Annual Superintendent Reports (E. G. Wingate), both in HAVO Archives.
[23] "Narrative Report to the Chief Architect through the Superintendent of Hawaii National Park," by Merel S. Sager, Associate Landscape Architect, Sept 20 to Oct 20, 1935, HAVO Archives.
[24] See July 1936 Superintendent Report, (E. G. Wingate), HAVO Archives.
[25] "Report of W.J. Stephens, Project Superintendent, EDW to the Park Superintendent, Hawaii National Park, for the Month Ending September 30th, 1936," from Superintendent Report 1936, HAVO Archives.
[26] Report of the Acting Camp Director, W.J. Stephens to the Park Superintendent, Hawaii National Park, for the Month Ending January 31st, 1937, from Superintendent Report 1937, HAVO Archives.
[27] J.D. McInerny, President, City Planning Commission, to E.G. Wingate, Superintendent, December 5, 1933 in Folder, Mauna Loa Road, 1933, pp. 631-01, HAVO Archives.

road would improve visitation to the park by opening new sights to the public and encouraging longer visits as a result. They also saw the road as a way to advance scientific research as urgently proposed by Thomas Jaggar, who thought that accurate predictions of impending volcanic eruptions could benefit from such access and therefore enhance the protection of life and property. Jaggar noted that the volcano had a pattern of erupting on average every three years, which was, when comparing to other volcanoes, relatively often, and that the wealth of opportunities for consistent, ongoing scientific study of the Mauna Loa volcano phenomena should not be ignored.

The Territory of Hawaii, specifically the stakeholders on the Island of Hawaii had vested interest in the construction of a road to the summit of Mauna Loa. Island of Hawaii residents worried that the impending 1935 completion of Haleakala summit road on the Island of Maui would draw visitors away, reducing tourist revenues. The importance of having two accessible volcano roads on a single island was, in their collective minds, a high priority for piquing the interest of people contemplating visiting the island. Enthusiasm for the summit road was nurtured by rumors of an available pot of construction money from the Public Works Administration, and began to circulate, along with scientific evidence building of an impending Mauna Loa eruption.[28]

The Waning NPS Interest. Although Park Superintendent Boles had not been in support of road construction on Mauna Loa, the later superintendent in the 1930s, Ernest P. Leavitt, seemed to support it more wholeheartedly. Leavitt noticed that only Kilauea Military Camp visitors and local residents used the existing Mauna Loa Trail to the summit regularly, but believed the limited usage was a direct result of the limited access, whereas, an improved road would obviously increase usage. He justified the construction of an improved summit road by arguing in 1933 that it was not only necessary only for scientific study, but also for increasing tourism since it would serve to open up a new part of the park that he thought held a great deal of "scenic interest."[29] By this time, BPR and top NPS officials, began arguing against constructing a road to the summit. F.A. Kittredge, Chief Engineer of the San Francisco-based Branch of Engineering for the BPR, expressed his opinion of the matter. While Kittredge was very interested in a summit road and thought that it would increase tourist interest, he wrote to Superintendent Leavitt, he questioned the priority of it, suggesting that other projects took precedence.[30] The Acting Director of the NPS, Arthur Demaray held concerns about the profitability of the construction. He pointed out that even if "all the automobiles on the Island of Hawaii were operated over the new road at least once a week and paid the Federal gas tax...there would not be enough revenue to justify this expenditure."[31] Demaray even doubted that a toll on the road would produce enough revenue. As an apparent final dagger to the heart of the matter, Horace Albright, Director of the NPS, stated unequivocally "in view of the present condition of the Federal Treasury there is no possibility of our giving the project any consideration now or in the early future." If funding ever became available, the road could be used by scientists who needed a "quick means of access to the summit of Mauna Loa in the case of volcanic activity" rather than as a tourist route.[32]

The desire of park administrators' to extend the road to the summit was not only diminished by financial constraints and management concerns, but also was constrained by accessibility and landscape issues. John B. Wosky, NPS Landscape Architect, had inspected the Mauna Loa Trail to Red Hill during his visit from 1931-1932. Wosky noted that the preliminary 1925 survey of the route "switches back and forth across the trail and the

---

[28] See "Proposed Mauna Loa Highway" report, 10, 17, in Folder: Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1954, 631-01, HAVO Archives. Proposed Mauna Loa Highway.

[29] E. P. Leavitt, Superintendent to Frank Kittredge, February 24, 1933 in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.

[30] F.A. Kittredge to E.P. Leavitt, Superintendent, March 8, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.

[31] A.E. Demaray, Acting Director, DOI, NPS to Frank Kittredge, Chief Engineer, Branch of Engineering, San Francisco, March 14, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.

[32] Horace Albright, Director, to E.P. Leavitt, January 6, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.

scenery is identical to that on the trail."[33] He also implied that the local fervor supporting the building of the road was due to the possibility of having the government provide a road to the Territory of Hawaii at no cost; further implying that such interest would wane if the territory had to pay the construction bill instead. In 1934, Merel Sager, another NPS Landscape Architect, also investigated the possibility of a summit road. He concluded that up to the 6,500-foot elevation, visitors would be able to see some interesting views, but that a road to the summit from there would not necessarily be scenic. In supporting his perspective, he suggested that there would not be a "changing series of attractive landscapes" once visitors got closer to the summit; instead, they would encounter a "desolate area of unaltering sameness."[34] Furthermore, Sager argued "there is a human trait to want to get high in order to see far...but here too there is disappointment" because the views were restricted. In his opinion, experiencing Mauna Loa required "solitude" that could not be achieved if a "tourist highway" was constructed. In 1935, Superintendent Wingate certainly saw the benefit of the road to allow access for firefighting purposes.

An Eventual Summit Road. After the completion of the road to the 6,765-foot elevation in 1936, the discussion about building a road to the summit subsided over the next decade. Even though a road to the summit through the park did not come to fruition as part of NPS planning and design, discussions persisted about establishing routes to the summit outside of the park boundary by private and non-profit entities. In 1948, the Hilo Lions Club obtained funding for constructing a summit road elsewhere. The work was contracted to the Kulani Prison crew at a rate of completion of nearly four miles per month.[35] On June 11, 1951, the Territory of Hawaii was authorized to construct an access road to a scientific observatory at the summit. The NPS granted permission for the last few miles of this new road to be built within park boundaries; however approaching from the north side of Mauna Loa.[36] NPS Landscape Architect Thomas E. Carpenter surveyed a route and found that the type of lava to be crossed would be the determining factor since *a'a* lava types were easier to build on the *pahoe hoe*, and therefore less costly. Road construction through *a'a* lava could be accomplished through simple grading with a bulldozer; it was more work-intensive with *pahoe'hoe* lava, which required removal of the lava through various means of extraction, followed by the placement of a "cushion of *a'a* lava" that was extracted from an off-site location and hauled to the site. The Department of Institutions, Territory of Hawaii and the NPS made the final decision as to the route, and by 1951, a rough 26-mile road requiring a four-wheel drive vehicle had been completed to a prefabricated weather observatory closer to the summit.[37]

---

[33] "Report to Chief Landscape Architect on Inspection Trip Made by John B. Wosky, Assistant Landscape Architect to Hawaii National Park Dec. 30, 1931 to Feb. 16, 1932," written February 23, 1932, sent to Thomas Vint, Chief Landscape Architect, March 17, 1932, in Folder: Inspection Trip, Report on Landscape Architect John B. Wosky, 1931 Dec. 31-1932 Feb. 16 later A5427, D5815, HAVO Archives.

[34] See "Proposed Mauna Loa Highway" report, 10, 17, in Folder: Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1954, 631-01, HAVO Archives. Proposed Mauna Loa Highway, pp. 7-8.

[35] See July 1948 Superintendent Report (F. R. Oberhansley): "Dramatic Scenic Highway," *The Honolulu-Advertiser*, December 22, 1949, 8 in Folder: Mauna Loa Road (Proposed), 1949-52, 631-01, HAVO Archives.

[36] See Aug., Nov. 1952 Superintendent Reports (F. R. Oberhansley), HAVO Archives.

[37] Landscape Architect Thomas Carpenter to Assistant Regional Director Sanford Hill, Subject: Report of Preliminary Survey Inspection for Mauna Loa Summit Road, Hawaii National Park, in Folder: Mauna Loa Summit Road, Report of Preliminary Survey Thomas E. Carpenter, Landscape Architect August 1951, 614-01; Landscape Architect Thos. E. Carpenter to Asst. Regional Director, Planning and Construction, Subject: Supplemental Report of Survey Inspection for Mauna Loa Summit Road, Hawaii National Park, November 14, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01; Acting Superintendent to Regional Director, Region 4, Subject: Progress Report on Mauna Loa Summit Road and Observatory, October 23, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01; "Vance Says Mauna Loa Road will Sharpen Islands Appeal," *Honolulu Star-Bulletin*, October 18, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01, all in HAVO Archives.

A ceremony on August 27, 1963, dedicated the opening of the road, which was proclaimed the "highest" road in the Pacific.[38] Despite the roughness of the road, there was optimism about its benefit to the island: "it is the beginning of what is destined to be an important scientific and tourist asset to the territory."[39] Some saw the road as a valuable tourist attraction because it would provide opportunities for winter sports. Mokuaweoweo crater on Mauna Loa was touted as having "advertising and promotional value that would add to Hawaii's fame as a resort area." There were also potential scientific benefits, as outlined by Thomas Jaggar, who "explained that a road passable to jeeps would enable the erection of weather stations, seismographs, tilt machines and other scientific paraphernalia to study earth movements in the Mauna Loa area."[40] The pronouncements about the importance of the road to the summit of Mauna Loa proved short lived. By March 1970, the road had to be closed because of the dangers to vehicles and visitors unprepared for the ascent, as well as, the damage being caused by the use of 4-wheel vehicles. In 1975, the trail reopened for use by jeeps.[41] The magnificence and wilderness of Mauna Loa ultimately never attained the popularity of Kilauea, due primarily to the difficulties of access, even with the construction of this subsequent road to the summit.

Regardless of the roadwork that would take place on lands outside of the park, ongoing maintenance such as repairing erosion spots and clearing runoff debris took place on the Mauna Loa Truck Trail, and in 1949, the lower five miles were realigned along some sections (Jackson, 1972, p. 234). However, there is no evidence that suggests major deviations in the alignment project. In reading the various documentations of the road's evolution, realignments often were referenced as resurfacing or widening projects. In some cases, realignments took place within only a few feet of the original roadway clearing. Except for the upper section, a comparison of the 1935 Preliminary Mauna Loa Truck Trail Location delineation with the 1936 delineation, as well as, the current delineation from the HABS/HAER (HI-47) drawing, reveals little, if any, deviation in the travel path of the roadway. Regarding the upper section as proposed in 1935, it is clear that the path delineated was not constructed, favoring a route that is more aligned with the present-day path; this is clarified by the *1936 Special Areas & Fire Control Plan* that reveals its modern day relationship. Therefore, the integrity of the Mauna Loa Road right-of-way, and its wider 50-foot corridor is considered to be of a high degree, even with its historical "realignments" and continual maintenance activities over several decades.

Beginning in September 1955, the right-of-way for the first 2.6 miles of the Mauna Loa Truck Trail north of the traffic circle at Bird Park was widened from its original eight-foot width to a 16-foot width, with actual pavement of emulsified asphalt laid to a 14-foot width.[42] While the superintendent's reporting suggests that the pavement widening took place up to the 2.6-mile mark beyond the Bird Park entry pylons, physical evidence today suggests that it stopped at the 2.1-mile mark. In May of 1956, three miles of the roadway south of the terminus were graded and the right-of-way widened as to enhance visitor access to the trailside museum. Aside from widening and ongoing maintenance and repairs, Mauna Loa Road has not been drastically altered since its initial completion in 1936. It must be noted that two of the most common maintenance problems along Mauna Loa Road throughout its history are from erosion due to heavy rainfall (early) and pavement cracking (later) caused by the ever-expanding root systems of *koa* trees.[43]

---

[38] "Mauna Loa Road Pacific's Highest," *Honolulu Advertiser*, April 18, 1963, in Folder: D30, Mauna Loa Road, 12/23/55 to 11/63, HAVO Archives.

[39] "Opening Mauna Loa Wonders to Science and Tourists," *Honolulu Star-Bulletin*, October 19, 1951, In Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01, HAVO Archives.

[40] "Mauna Loa Road Needed if Hilo is to be Warned of Eruption, Dr. Jaggar Reports," *Honolulu Star-Bulletin*, February 1, 1950 in Folder: Mauna Loa Road (Proposed), 1949-52, 631-01, HAVO Archives.

[41] "Closure of Old Jeep Trail at National Park Boundary," stamped April 6, 1970, and Arthur Hewitt Jr., Acting Supt. To Director, Western Region, Subject: Mauna Loa Jeep Route, March 25, 1970 both in Folder: D30 Roads and Trails, January 1969 to October 1971, both in HAVO Archives.

[42] See Sept., Oct. 1955 Superintendent Reports (J. B. Wosky), HAVO Archives.

[43] Dennis E. Footer, Facility Manager, Hawaii Volcanoes National Park to Chief, Engineering and Safety Service, Western

In any case, various sections of the road were under continual maintenance and periodically sealed and paved due to heavy rains and erosion processes.[44] By 1960, visitors to the park were staying longer and the demand for access to the upward reaches of Mauna Loa increased dramatically as a result of the more mobile, post WWII culture. The slopes of Mauna Loa within the park were increasingly being used by visitors as their lengths of stay increased, allowing them more time for exploring its most remote wilderness areas. Due to this increase in interest, park administrators wanted to widen and improve the surface of the existing gravel road, recommending that part of it be widened to 18 feet with no shoulders, this being "the minimum width considered safe for two-way traffic."[45]

Conclusion

Although Mauna Loa Road is a secondary road within the Hawaii Volcanoes National Park road system, it is the critical connector between providing visitor access to the natural landforms and environment of the largest shield dome volcano in the world, and the human-built developments along the route. In addition, Mauna Loa Road serves important administrative functions in regard to fire control and other emergency services, and natural science monitoring and studies. Mauna Loa Road presents a compelling study specifically of how the NPS developed roads that responded to the particular geographical challenges of the terrain, as well as, to tourism and visitor use pressures, while balancing the dual mission of providing access to the resource while also protecting it and its visitors. The road also exhibits NPS road design principles coordinated through interagency cooperation with the U.S. Bureau of Public Roads, as well as, the use of the Park Service Rustic Style and naturalistic design in structures built along the road. Finally, Mauna Loa Road has important associations with the science of volcanology and Thomas Jaggar, a world-renowned volcanologist of the early twentieth century, and the Civilian Conservation Corps under the New Deal program. Its significance is illustrated through these associations and design qualities, all of which are still reflected amid the surrounding natural environment, which reinforces its strong setting and the feelings of historicity that remain.

Region, January 2, 1985 in Folder: D30 Roads and Trails (includes bridges, tunnels, runways, and launching ramps, etc.) 1978-82, HAVO Archives.

[44] Bureau of Public Roads, Department of Commerce, "Report on Maintenance of Major Roads in Hawaii National Park," made by J.R. Lewis, District BR Engineer on February 18, 1955, in Folder: D30 Roads and Trails September 1954- October 1959; Memo from Fred T. Johnston, Superintendent to Regional Director, Western Region, Subject: Resealing Bituminous Roads, November 29, 1962, in Folder: D30 Roads and Trails March 1960-November 1962, all in HAVO Archives. For example, in 1955, 2.6 miles of road were base sealed and paved, while in 1958, 1.4 miles were resealed and chipped.

[45] P.E. Smith, Supervisory Engineer, and C.E. Krueger, Supervisory Landscape Architect, to Chief, WODC, Subject: Trip Report, Roads, Hawaii National Park, March 18, 1960 in Folder: D30 Roads and Trails 3/60-11/62, HAVO Archives.

9. MAJOR BIBLIOGRAPHICAL REFERENCES

NOTE: Typically, only works that represent major findings contributing the research herein are included under this section. Lesser works are identified as footnotes.

Bureau of Public Roads. (April 1934). *Final construction report: Uwekahuna Bluff-Bird Park Project No. 4.* Hawaii National Park, HI.

Carr, E. (1998). *Wilderness by Design: Landscape Architecture and the National Park Service.* Lincoln, NE: Univ. of Nebraska Press.

Davis, T. (2004). Drawing on the Road. In T. Davis, T. A. Croteau, & C. Marston (Eds.), *America's National Park Roads and Parkways: Drawings from the Historic American Engineering Record (unk. pp.).* Baltimore: The Johns Hopkins Univ. Press.

_____. (2005). Historic Roads. *Landscape Lines, 16,* pp. 1-60.

Davis, T., Croteau, T. A., & Marston, C. H. (2004). *America's National Park Roads and Parkways: Drawings from the Historic American Engineering Record.* Baltimore: Johns Hopkins Univ. Press.

Duensing, D., & National Park Service. (1999). *Hawaii Volcano National Park Roads. (HAER No. HI-47).* Washington D.C.: Historic American Engineering Record, U.S. Department of the Interior.

_____. (1999). *Mauna Loa Road. (HAER No. HI-50).* Washington D.C.: Historic American Engineering Record, U.S. Department of the Interior.

Good, A. H. (1938). *Park and Recreation Structures.* Boulder, CO: Graybooks.

HAVO Superintendent Reports. (1922-1963). Monthly and Annual Reports (Various Superintendents). Hawaii Volcanoes National Park: Archives. (See applicable footnote)

Holcomb, R. T. (1987). Eruptive history and long-term behavior of Kilauea Volcano. In R. W. Decker, T. L. Wright, & P. H. Stauffer (Eds.) *Volcanism in Hawaii.* (261-350). Washington: U.S. G.P.O.

Jackson, F. (1972). *An Administrative History: History of Hawaii Volcanoes National Park.* Honolulu, HI: National Park Service.

McClelland, L. F., & National Register of Historic Places. (1993). *Presenting nature: The historic landscape design of the National Park Service, 1916 to 1942.* Washington, D.C: U.S. Dept. of the Interior, National Park Service, Cultural Resources, Interagency Resources Division, National Register of Historic Places.

McClelland, L. F. (1995). *Historic park landscapes in national and state parks.* Multiple property group National Register nomination. Washington DC: National Park Service.

_____. (1998). *Building the national parks: Historic landscape design and construction.* Baltimore, MD: Johns Hopkins University Press.

Nankivell, John H. (1927). *History of the Twenty-fifth Regiment United States Infantry, 1869-1926.* Ann Arbor, MI: Univ. of Michigan Negro Universities Press.

NPS. (1968). *Park Road Standards.* Washington, DC: U.S. Government Printing Office.

NPS-BLRI. (2010). *Roadside barrier warranting and assessment of adverse effects screening methodology: A Guide to Assessing the Effects of Roadside Safety.* Asheville: NC.

Soulliere, L. E., & NPS. (1995). *Historic Roads in the National Park System—Special Historic Study.* Denver: NPS.

Tunison, J. T., & Stone, C. P. (1992). Special Ecological Areas: An approach to alien plant control in Hawaii Volcanoes National Park. In C. P. Stone, C. W. Smith, & J. T. Tunison (Eds.), *Alien plant invasions in native ecosystems of Hawai'i: Management and research* (781-798). Honolulu: Univ. of Hawai'i at Manoa.

Historic Maps (available at HAVO)

U.S. Department of the Interior, National Park Service. (1935). *Preliminary Mauna Loa Truck Trail Location: Hawaii National Park, Proposed ECW Project.* As traced by the Branch of Plans and Design from BPR Survey of 1925, June 28, 1935. San Francisco.

_____. (1937). *Mauna Loa Truck Trail, Bird Park to Volcano House: Hawaii National Park* (8 Sheets). Branch of Engineering, NPS Regional Office.

U.S. Department of the Interior, National Park Service, Branch of Plans and Design. (1939). *General Development Plan, Part of the Master Plan for Hawaii National Park.* San Francisco.

Drawings (available at HAVO)

U.S. Department of the Interior, National Park Service. (1931). *Roads and Trails System, Part of the General Development Plan for Hawaii National Park.* San Francisco, CA: Landscape Division.

U.S. Department of the Interior, National Park Service. (1935). *Preliminary Mauna Loa Truck Trail Location: Hawaii National Park.* San Francisco, CA: Branch of Plans and Design.

U.S. Department of the Interior, National Park Service. (1937). *Trailside Museum and Seismograph Vault: Preliminary Sketch, Mauna Loa-Hawaii National Park.* San Francisco, CA: Branch of Plans and Design.

Previous documentation on file (NPS):

___ preliminary determination of individual listing (36 CFR 67 has been requested)
___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey #_____
X recorded by Historic American Engineering Record # HI-47, HI-50
___ recorded by Historic American Landscape Survey # _____

Primary location of additional data:

___ State Historic Preservation Office
___ Other State agency
X Federal agency
___ Local government
___ University
X Other
Name of repository: HAVO Archives

Historic Resources Survey Number (if assigned): N/A

10. GEOGRAPHICAL DATA

Acreage of Property 201.75

Latitude/Longitude Coordinates

(Follow similar guidelines for entering the lat/long coordinates as describe on page 55, *How to Complete the National Register Registration Form* for entering UTM references. For properties less than 10 acres, enter the lat/long coordinates for a point corresponding to the center of the property. For properties of 10 or more acres, enter three or more points that correspond to the vertices of a polygon drawn on the map. The polygon should approximately encompass the area to be registered. Add additional points below, if necessary.)

NAD 83 Quads: 1) Kilauea Crater, HI-1995; 2) Kipukapakekake, HI-1995

UTM References

A	5	259790	2149860	C	5	257807	2151072
	Zone	Easting	Northing		Zone	Easting	Northing
B	5	258302	2150736	D	5	256811	2151415
	Zone	Easting	Northing		Zone	Easting	Northing

E	5	255132	2151965	F	5	254823	2152233
	Zone	Easting	Northing		Zone	Easting	Northing
G	5	254647	2153091	H	5	253589	2153369
	Zone	Easting	Northing		Zone	Easting	Northing
I	5	253536	2154094	J	5	252111	2155103
	Zone	Easting	Northing		Zone	Easting	Northing
K	5	250989	2155183	L	5	250938	2156040
	Zone	Easting	Northing		Zone	Easting	Northing
M	5	250000	2155921	N	5	249700	2156848
	Zone	Easting	Northing		Zone	Easting	Northing
O	5	260305	2149913	P	5	249630	2157072
	Zone	Easting	Northing		Zone	Easting	Northing

Verbal Boundary Description

The boundaries of the nominated district are generally delineated by the meandering course of the historic Bird Park Road/Mauna Loa Truck Trail as determined in two related but non-contiguous sections: the **first section** beginning at its centerline point 25 feet north of its intersection with the centerline of Crater Rim Drive, for a distance of 444 feet to a point 50 feet south of its intersection with the centerline of Highway 11, all inclusive of a 50-foot wide lineal corridor determined by delineating a 25-foot width distance drawn perpendicular to the centerline of the road pavement to each side; the **second section** beginning at its centerline point 50 feet north of its intersection with the centerline of Highway 11, for a distance of 59,664 feet (11.3 miles) northwesterly to a terminal semi-circle drawn from a 400-foot radial point at the centerline of the upslope pavement end of present day Mauna Loa Road; all said boundaries being inclusive of intersections with various spur roads described elsewhere in this nomination, and also inclusive of a 50-foot wide lineal corridor determined by delineating a 25-foot width distance drawn perpendicular to the centerline of all main and spur road pavements affected to each side. Please refer to the Sketch Map.

The actual Bird Park Road/Mauna Loa Truck Trail overall right-of-way width contained within the larger 50-foot wide corridor varies along its entire course as it corresponds to the roadway design, however, it is generally defined by a 10 to 21-foot wide paved surface abutted by zero to four-foot shoulders, which also vary in size and profile, and which cumulatively result in a fifteen to 30-foot actual, historic right-of-way; it must be noted that this right-of-way is sometimes determined to a degree by the naturally-occurring elements of lava formations and forests occurring along the roadway that have not been significantly altered since their original construction. The expanded lineal corridor is provided to give a landscape context.

The historic spur roads and the Bird Park Road/Mauna Loa Truck Trail terminus area included herein by their being part of larger developed areas (contributing historic sites or individual resources) that are outside of the prescribed lineal corridor yet connected to, and integral parts of the historic Bird Park Road/Mauna Loa Truck Trail circulatory system according to the natural land forms or designed layout and resulting boundaries that make the sites and resources historically significant. These include the five identified developed areas of the Tree Molds Outdoor Exhibit Area, Bird Park Picnic Ground, Bird Park, Powder House Area, and the Mauna Loa Road terminus (delineated as a 400-foot radius from the Mauna Loa Road pavement edge). While Mauna Loa Road's first 1.6 miles rise and decline, the elevations above sea level for the roadway structure generally represent an incline from the point of beginning at approximately 4,108 feet to 6,765 feet at its end point parking area, and approximately 6,800 feet at the historic Seismograph Vault.

Boundary Justification

The boundaries are generally coterminous with the Bird Park Road/Mauna Loa Truck Trail's historic right-of-way. The beginning and end points signify the current and historic extent of the road not yet included in other established historic districts. Since National Park Service roads were often designed to accommodate developed areas providing visitor amenities or serving administrative functions along their routes, these areas are also included.

11. FORM PREPARED BY

name/title Justine Christianson, Historian//Larry Frey, Historic Landscape Architect (HAVO)

organization Heritage Documentation Programs, NPS//HAVO CRM date July 2007//July 2014

street & number 1201 Eye Street, NW, 2270//1 Crater Rim Drive telephone 202-354-2183//808-985-6135

city or town Washington//Hawaii National Park state DC/HI zip code 20005//96718

e-mail Justine_Christianson@nps.gov//Larry_Frey@nps.gov

ADDITIONAL DOCUMENTATION

Submit the following items with the completed form:

- **Continuation Sheets** (Enclosed separately).
  - **Section 8**
  - **Additional Information**
    - **List of Figures**
    - **Digital Photographs Log**

- **Maps** (Enclosed separately).
  - A **USGS Maps** (7.5 or 15 minute series) indicating the property's location.
  - A **Sketch Maps** for historic districts and properties having large acreage or numerous resources. Key all photographs to this map.

PHOTOGRAPHS

Submit clear and descriptive photographs. The size of each image must be 1600x1200 pixels at 300 ppi (pixels per inch) or larger. Key all photographs to the sketch map.

See Continuation Sheet: Additional Information/Digital Photographs Log.

PROPERTY OWNER (Complete this item at the request of the SHPO or FPO.)

name N/A

street & number _____ telephone _____

city or town _____ state _____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.460 et seq.).
Estimated Burden Statement: Public reporting burden for this form is estimated to average 18 hours per response including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Office of Planning and Performance Management. U.S. Dept. of the Interior, 1849 C. Street, NW, Washington, DC.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bird Park Road/Mauna Loa Truck Trail
Name of Property
Hawaii, Hawaii
County and State
N/A
Name of multiple listing (if applicable)

List of Figures

Figure 1. Mauna Loa Truck Trail

Name of Property:	Bird Park Road/Mauna Loa Truck Trail
City or Vicinity:	Hawaii Volcanoes National Park
County:	Hawaii
State:	HI
Name of Photographer:	Merel Sager
Date Photographed:	1935
Description of Photograph:	Early photograph shows an unknown section of road identified as the Mauna Loa Truck Trail prior to NPS construction of the designed road. Location unknown.
Location of Original Digital Files:	Catalog #4959, HAVO Archives.

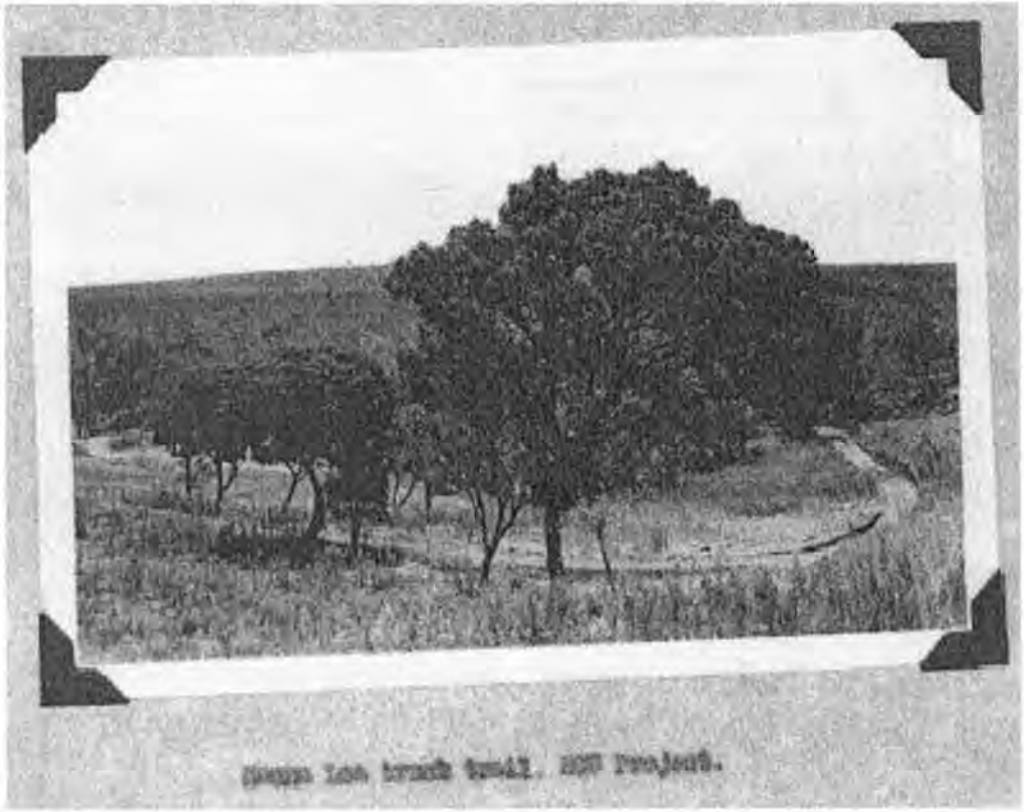


Fig. 1. Mauna Loa Truck Trail, ECW Project. Photographed by: Merel Sager, 1935. Source: HAVO Archives.

Figure 2. Mauna Loa Seismograph Vault

Name of Property:	Bird Park Road/Mauna Loa Truck Trail
City or Vicinity:	Hawaii Volcanoes National Park
County:	Hawaii
State:	HI
Photographer:	Unknown
Date Photographed:	1934-1938
Description of Photograph:	South façade/entry view facing northwest soon after construction.
Location of Original Digital Files:	Catalog #4959, File Codes 610-01 thru 660-04.1, 1934-38, HAVO Archives.

Fig. 2. Seismograph Vault. Photographed by: Unknown. 1934-1938. Source: HAVO Archives.

Figure 3. Mauna Loa Trailside Museum

Name of Property:	Bird Park Road/Mauna Loa Truck Trail
City or Vicinity:	Hawaii Volcanoes National Park
County:	Hawaii
State:	HI
Name of Photographer:	Unknown
Date Photographed:	1945
Description of Photograph:	Southwest façade view from Mauna Loa Road looking northeast.
Location of Original Digital Files:	Photographic travelogue, c.1945, in Pacific Great Basin Support Office, NPS, Oakland, CA.

Fig. 3. Mauna Loa Trailside Museum. Photographed by: Unknown. 1945. Source: Photographic travelogue, c.1945, in Pacific Great Basin Support Office, NPS, Oakland, CA.

United States Department of the Interior
National Park Service

National Register of Historic Places Continuation Sheet

Bird Park Road/Mauna Loa Truck Trail
Name of Property
Hawaii, Hawaii
County and State
N/A
Name of multiple listing (if applicable)

Section number ADDITIONAL INFORMATION Page 4

Digital Photographs Log

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Section 1
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #1 of 18 (HI_Hawaii County_Mauna Loa Rd_0001.TIFF).
West façade showing entry portal looking east.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Mauna Loa Road Section 2 entry
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #2 of 18 (HI_Hawaii County_Mauna Loa Rd_0002.TIFF).
Entry to Mauna Loa Road from Highway 11 looking northwesterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Tree Molds Outdoor Exhibit Site area
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #3 of 18 (HI_Hawaii County_Mauna Loa Rd_0003.TIFF).
View of interpretive kiosk, tree mold exhibit, and portion of parking area looking southerly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Bird Park Day Use Area
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #4 of 18 (HI_Hawaii County_Mauna Loa Rd_0004.TIFF).
View of partial picnic ground, 1963 shelter, and 1955 picnic table looking northeasterly

Cont.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-traffic circle
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #5 of 18 (HI_Hawaii County_Mauna Loa Rd_0005.TIFF).
Traffic circle entry and exit looking northwesterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Bird Park site entry
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #6 of 18 (HI_Hawaii County_Mauna Loa Rd_0006.TIFF).
View of Bird Park and nature trail entry, trailside shrine, and connector trail to Bird Park looking easterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-entry pylons
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #7 of 18 (HI_Hawaii County_Mauna Loa Rd_0007.TIFF).
Double entry pylons from traffic circle (Bird Park Road) to Mauna Loa Truck Trail looking northwesterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-example of Segment 2 roadway
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #8 of 18 (HI_Hawaii County_Mauna Loa Rd_0008.TIFF).
Example of Mauna Loa Truck Trail (Segment 2) with curving character through forest travelling upslope

Cont.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-powder house
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #9 of _18_ (HI_Hawaii County_Mauna Loa Rd_0009.TIFF).
Oblique view of frontal entry looking northeasterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-road character change
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #10 of _18_ (HI_Hawaii County_Mauna Loa Rd_0010.TIFF).
View of Segment 2 truck trail change from two lanes to single lane travelling upslope.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-road description and view with shoulders
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #11 of _18_ (HI_Hawaii County_Mauna Loa Rd_0011.TIFF).
View of Mauna Loa from Segment 2 truck trail approximately 5,400' elevation looking northwesterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-road description through Ke' amoku lava flow
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #12 of _18_ (HI_Hawaii County_Mauna Loa Rd_0012.TIFF).
View of Segment 2 road as it travels through historic lava flow travelling downslope at 5,630' elevation.

Cont.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-road description and view of Kilauea Crater
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #13 of 18 (HI_Hawaii County_Mauna Loa Rd_0013.TIFF).
View of Kilauea Crater volcano plume from Segment 2 truck trail approximately 6,100' elevation looking downslope southerly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-road description retaining wall construction
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #14 of 18 (HI_Hawaii County_Mauna Loa Rd_0014.TIFF).
East side of road revealing built-up retaining wall construction of Segment 2 truck trail approximately 6,500' elevation looking downslope southerly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Terminus Parking Area
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #15 of 18 (HI_Hawaii County_Mauna Loa Rd_0015.TIFF).
View of terminus parking area at 6,765' elevation looking upslope northeasterly.

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Mauna Loa Trail Trailhead
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #16 of 18 (HI_Hawaii County_Mauna Loa Rd_0016.TIFF).
View of trailhead connecting to historic Mauna Loa Trail to the summit looking upslope northeasterly

Name of Property: Bird Park Road/Mauna Loa Truck Trail-Seismograph Vault
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #17 of 18 (HI_Hawaii County_Mauna Loa Rd_0017.TIFF).
View of obscured 1937 Seismograph Vault entry looking northerly.

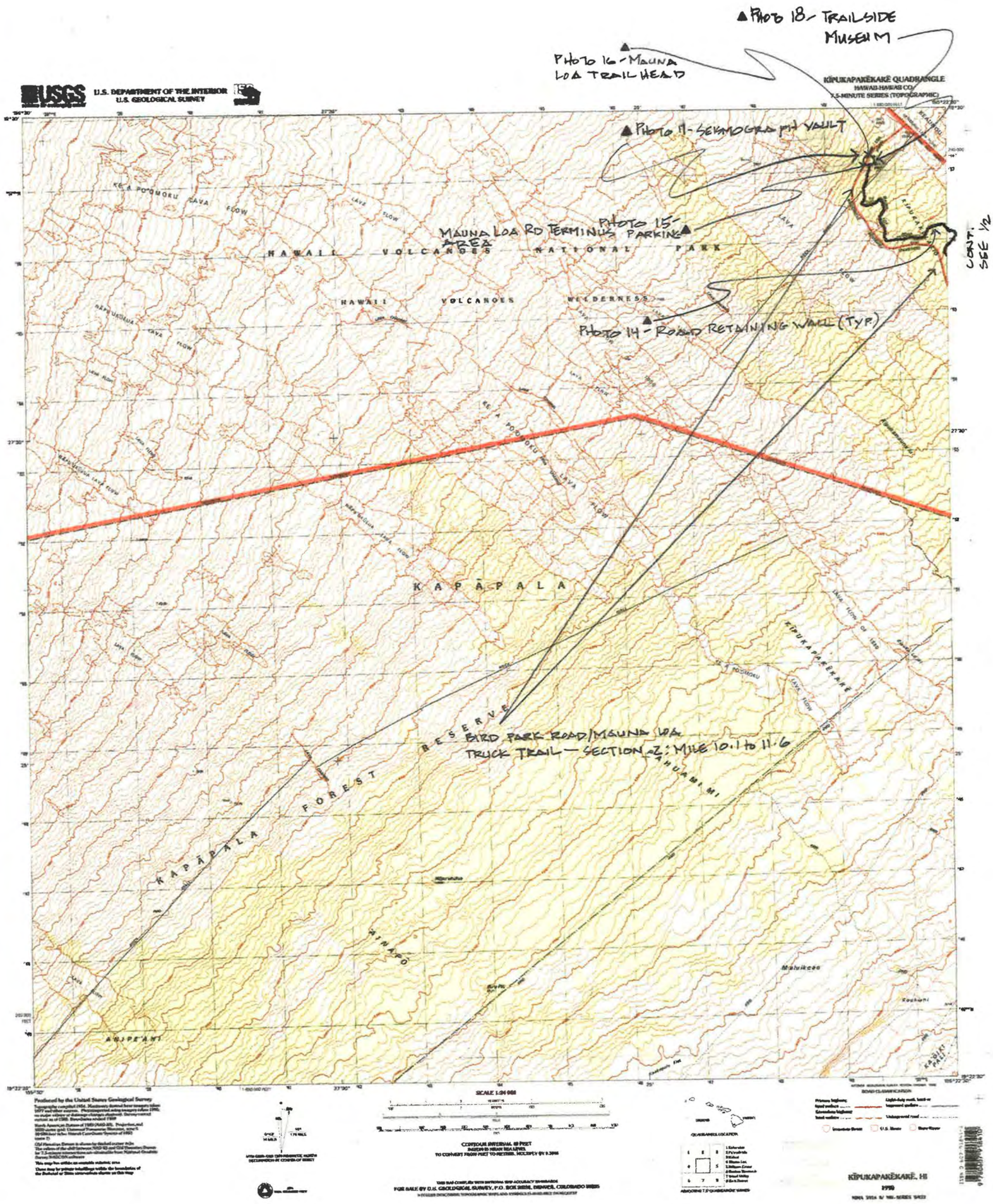
Name of Property: Bird Park Road/Mauna Loa Truck Trail-Trailside Museum
City or Vicinity: Hawaii Volcanoes National Park
County: Hawaii
State: HI
Name of Photographer: Larry Frey
Date Photographed: August 2012
Location of Original Digital Files: CRM Division, Hawaii Volcanoes National Park

Photo #18 of 18 (HI_Hawaii County_Mauna Loa Rd_0018.TIFF).
View of entry portal to octagonal 1938 Trailside Museum looking easterly.

SKETCH MAP

BIRD PARK ROAD/MAUNA LOA TRUCK TRAIL

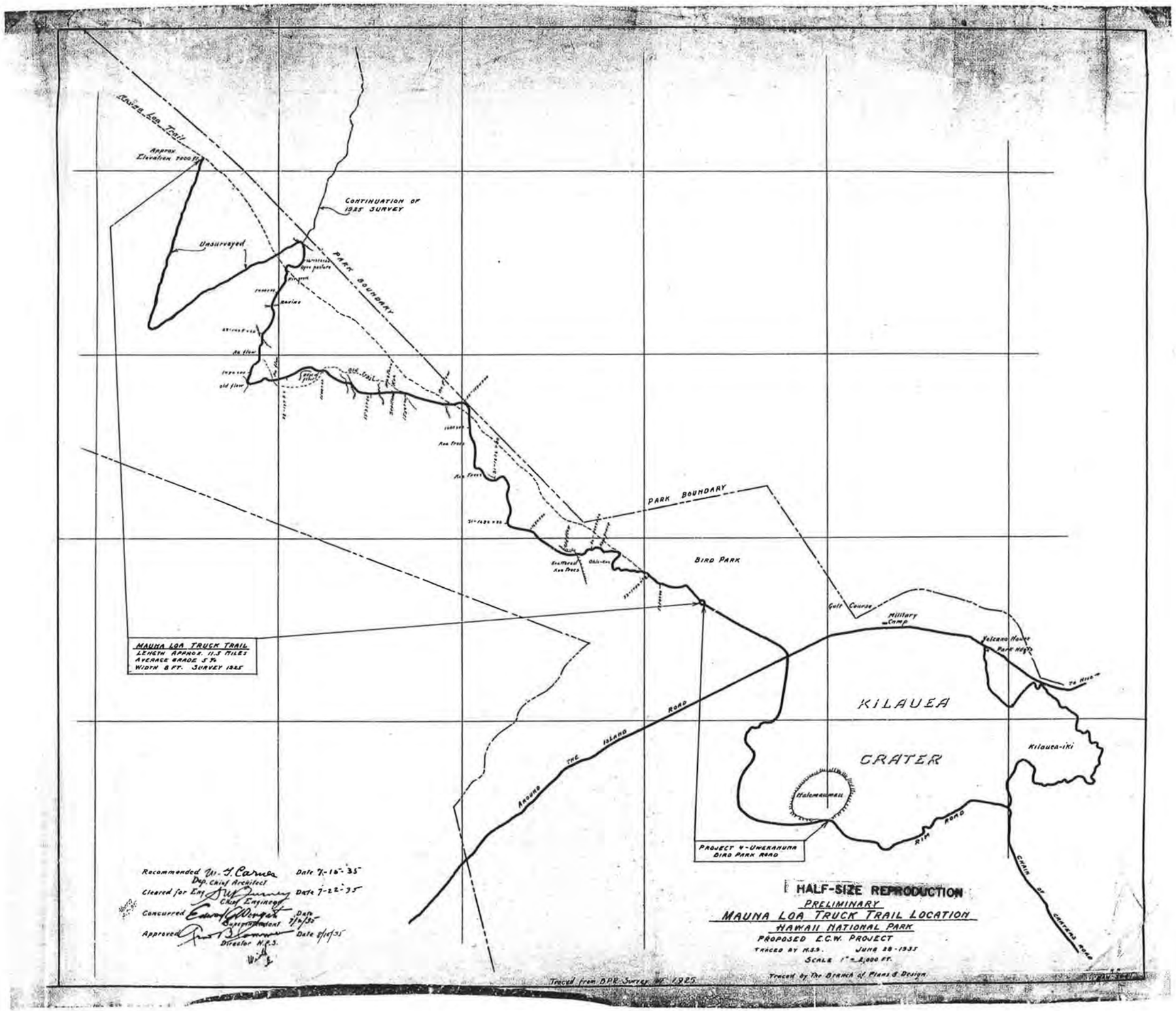
HAWAII VOLCANOES NATIONAL PARK (HAVO)	NATIONAL REG. NOMINATION PACKAGE	AUGUST - 2012	1/2



SKETCH MAP

BIRD PARK ROAD / MAUNA LOA TRUCK TRAIL

HAWAII VOLCANOES NATIONAL PARK (HAVO) NATIONAL REG. NOMINATION PKG.	AUGUST - 2012	2/2



MAUNA LOA ROAD
HAWAII COUNTY, HI

MAUNA LOA ROAD

HAWAII COUNTY, HI

Pu'u 'Ula'ula
(Red Hill) Cabin
10035 ft

Trail

Proposed Road to Summit

SEISMO-GRAPH VAULT C

OBSERVATION BUILDING C

Mauna Loa Lookout
6662ft
#6

Old Truck Trail

Trail

Keamoku Flow
#5

Red Hill Trail

Mauna Loa Road

Kipuka Ki
#4

TURNAROUND C

DAY USE AREA C

Kipuka Puaulu C
#2

Mauna Loa Trail
#1

Tree Molds C

LAVA ROCK PYLONS C
#3

Mamalahoa Highway (11)

Old Peter Lee Road

Crater Rim Drive

Kilauea Caldera

LINE INDICATES APPROXIMATE BOUNDARY

LEGEND

N
W E
S

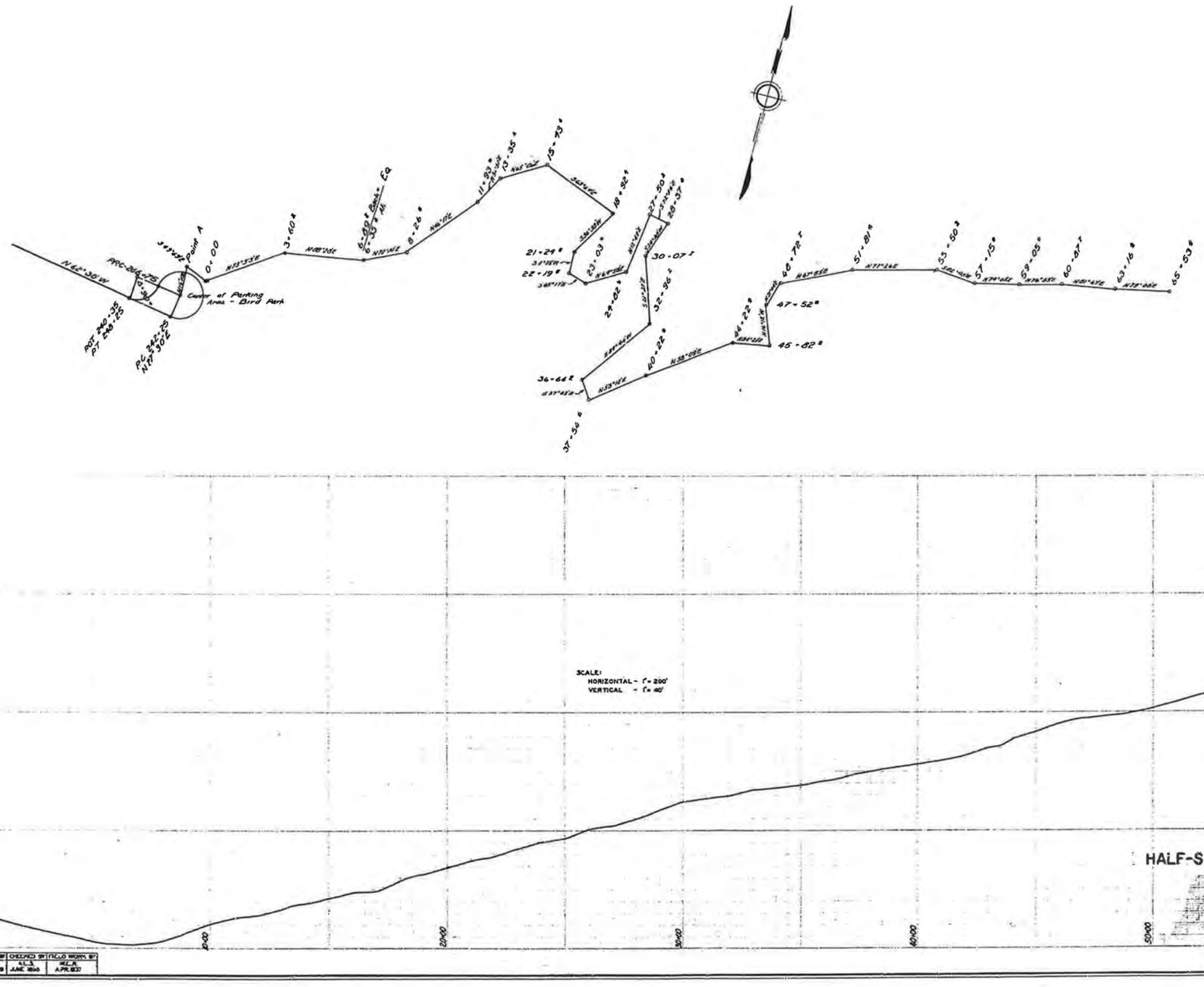
- Park Boundary
- Current Roads
- Old Road Alignments
- Trails
- Proposed Roads

KEY

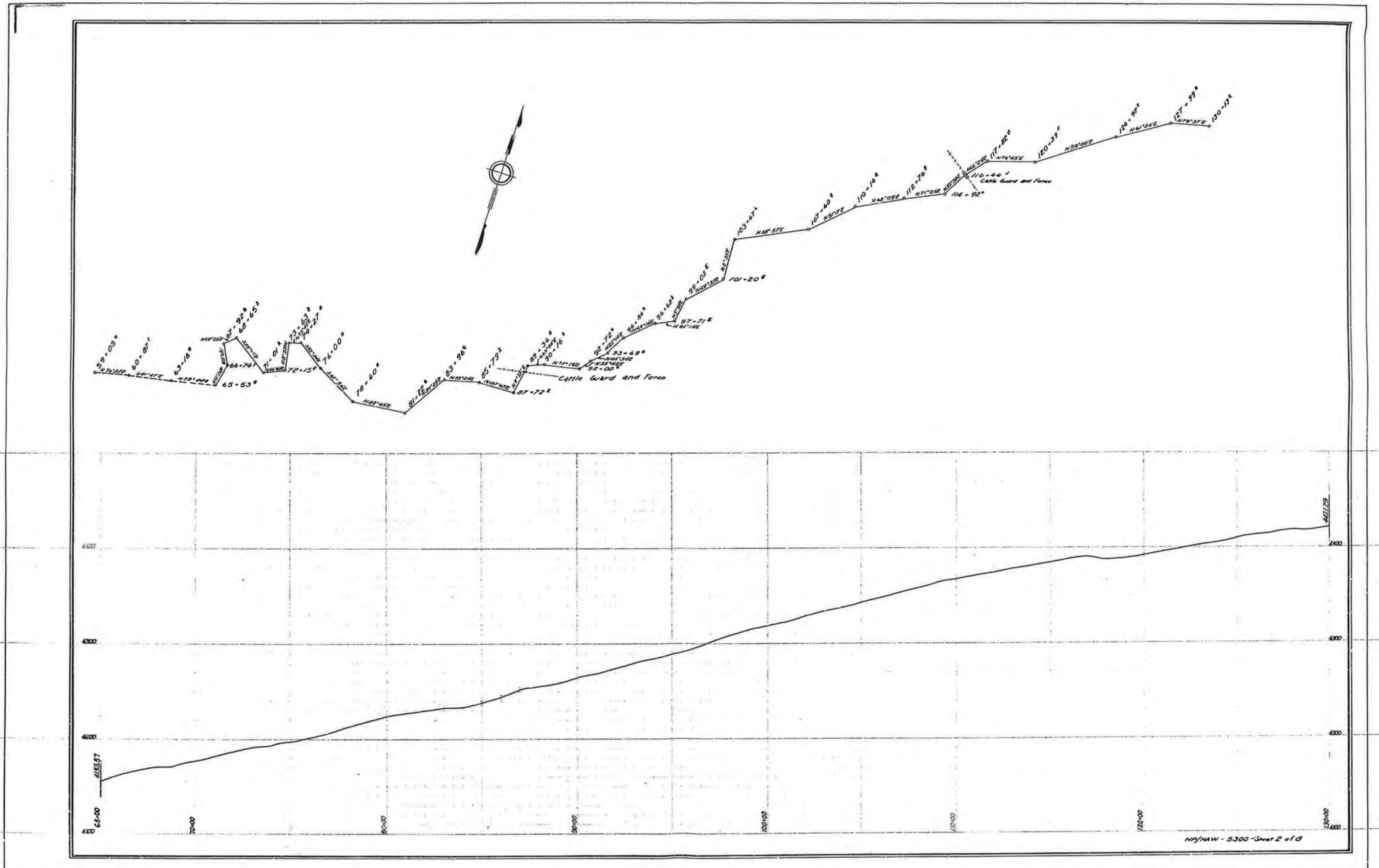
Scale: 1"= 2,000'

0 4,000 8,000 16,000 24,000 feet

DELINEATED BY: STACY DAO 2006



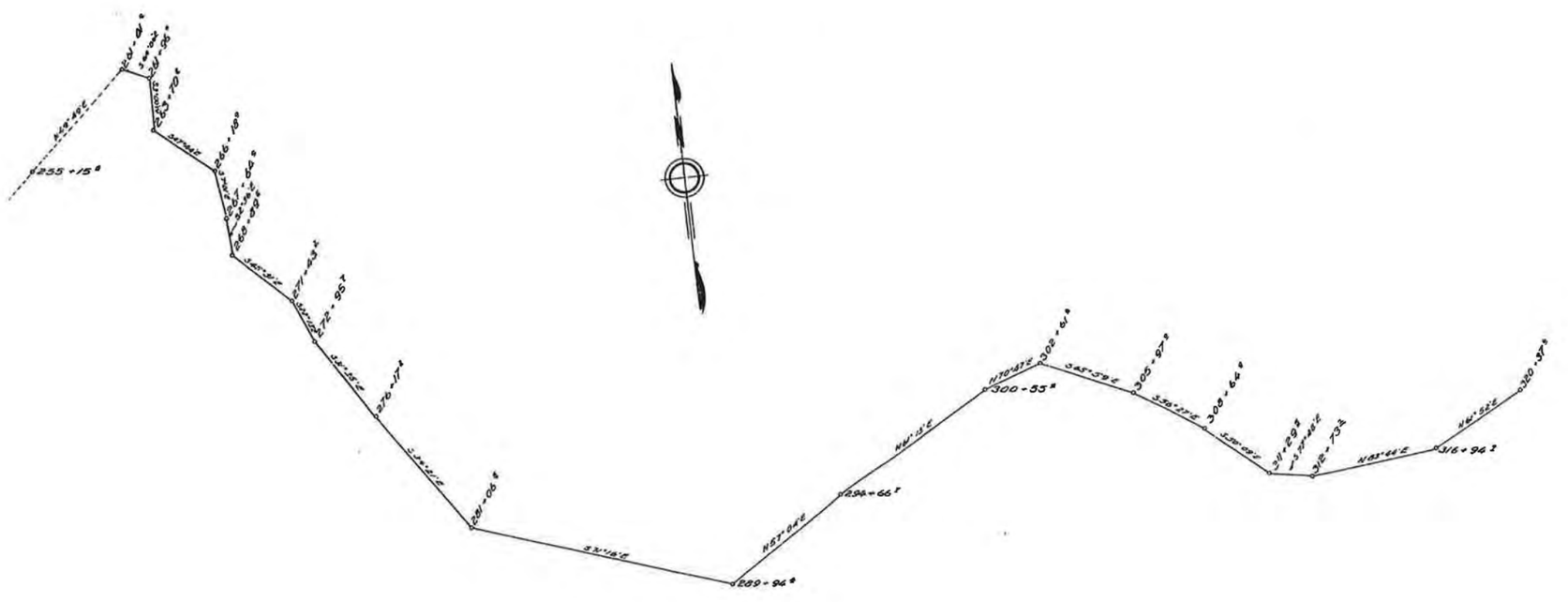
MAUNA LOA ROAD HAWAII COUNTY HI

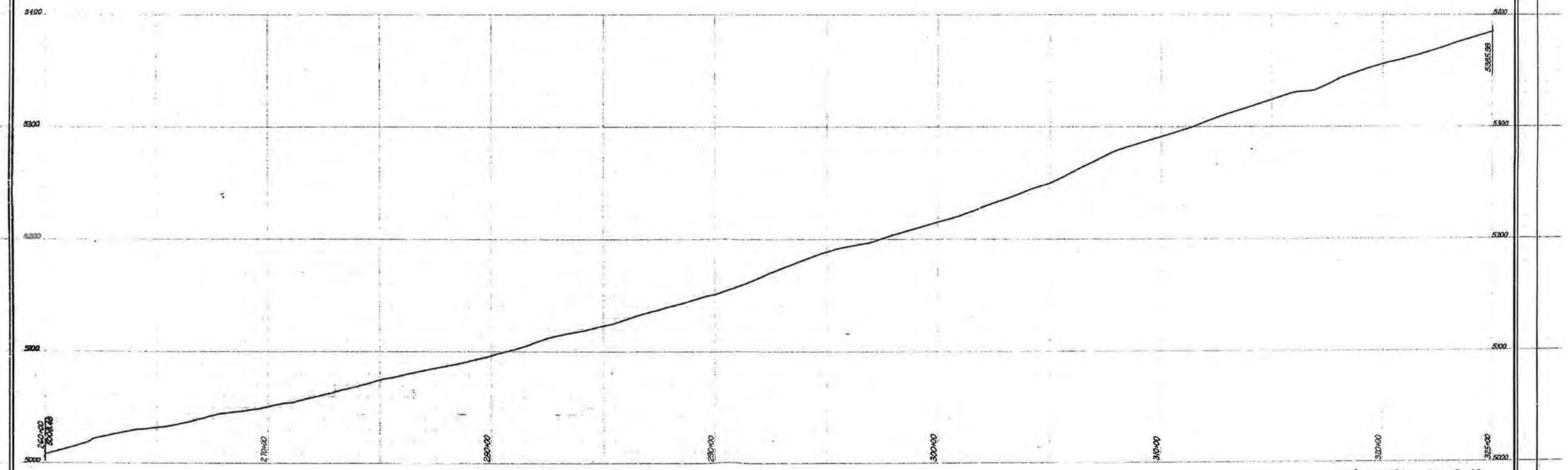


MAUNA LOA ROAD HAWAII COUNTY HI

MAUNA LOA ROAD HAWAII COUNTY HI

MAUNA LOA ROAD HAWAII COUNTY HI



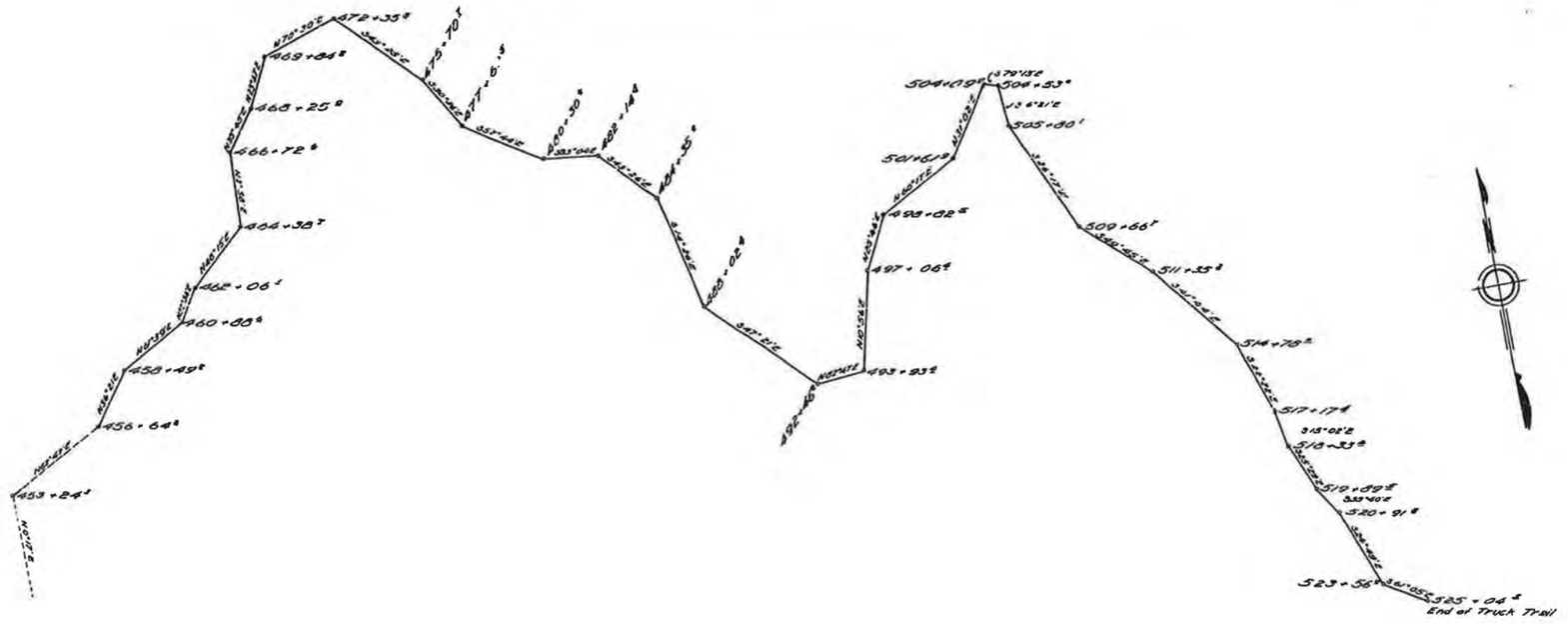


MAUNA LOA ROAD HAWAII COUNTY HI

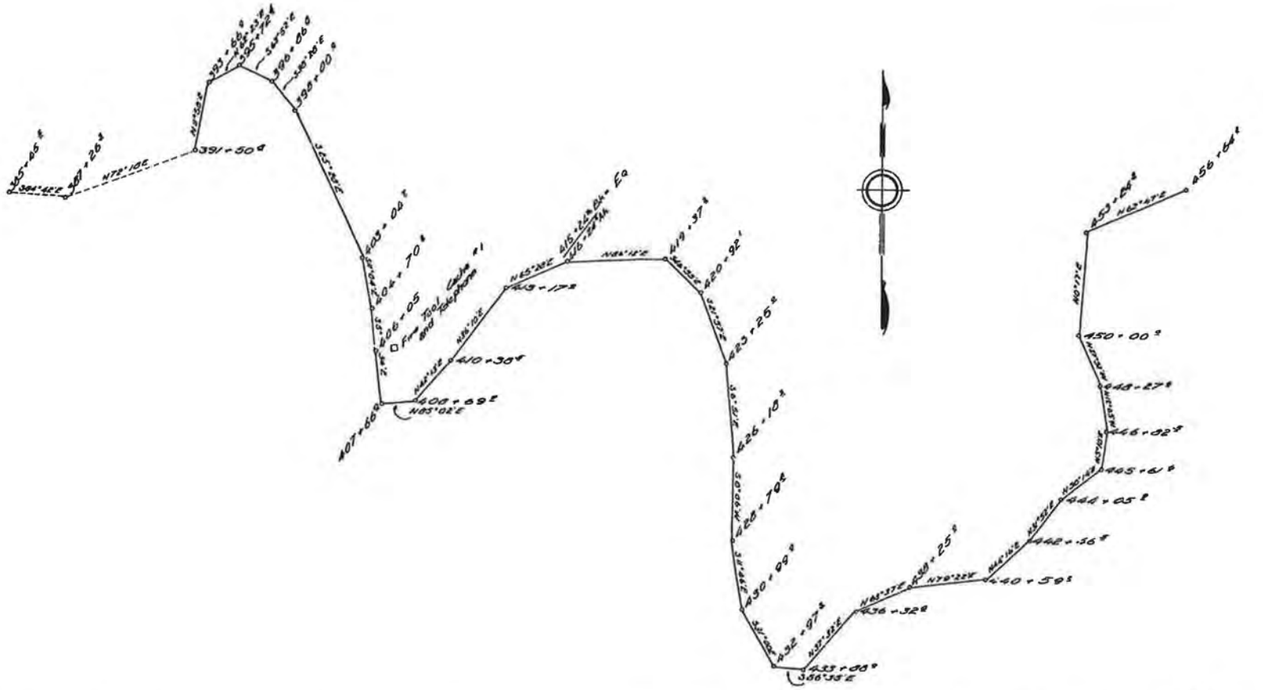
Identical

NP/HAW - 5300 - Sheet 6 of 9

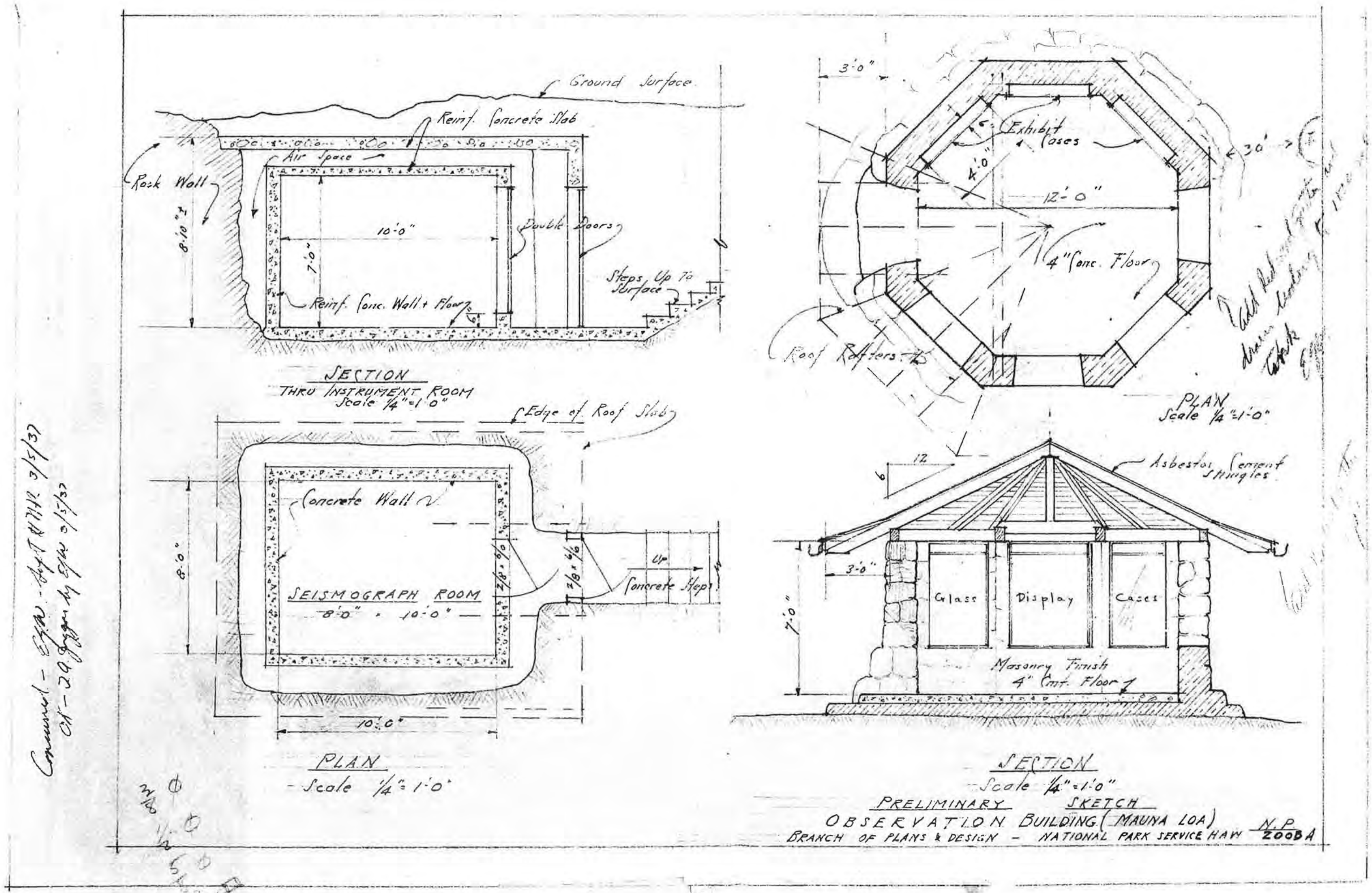
MAUNA LOA ROAD HAWAII COUNTY HI



MAUNA LOA ROAD HAWAII COUNTY HI



MAUNA LOA ROAD HI HAWAII COUNTY

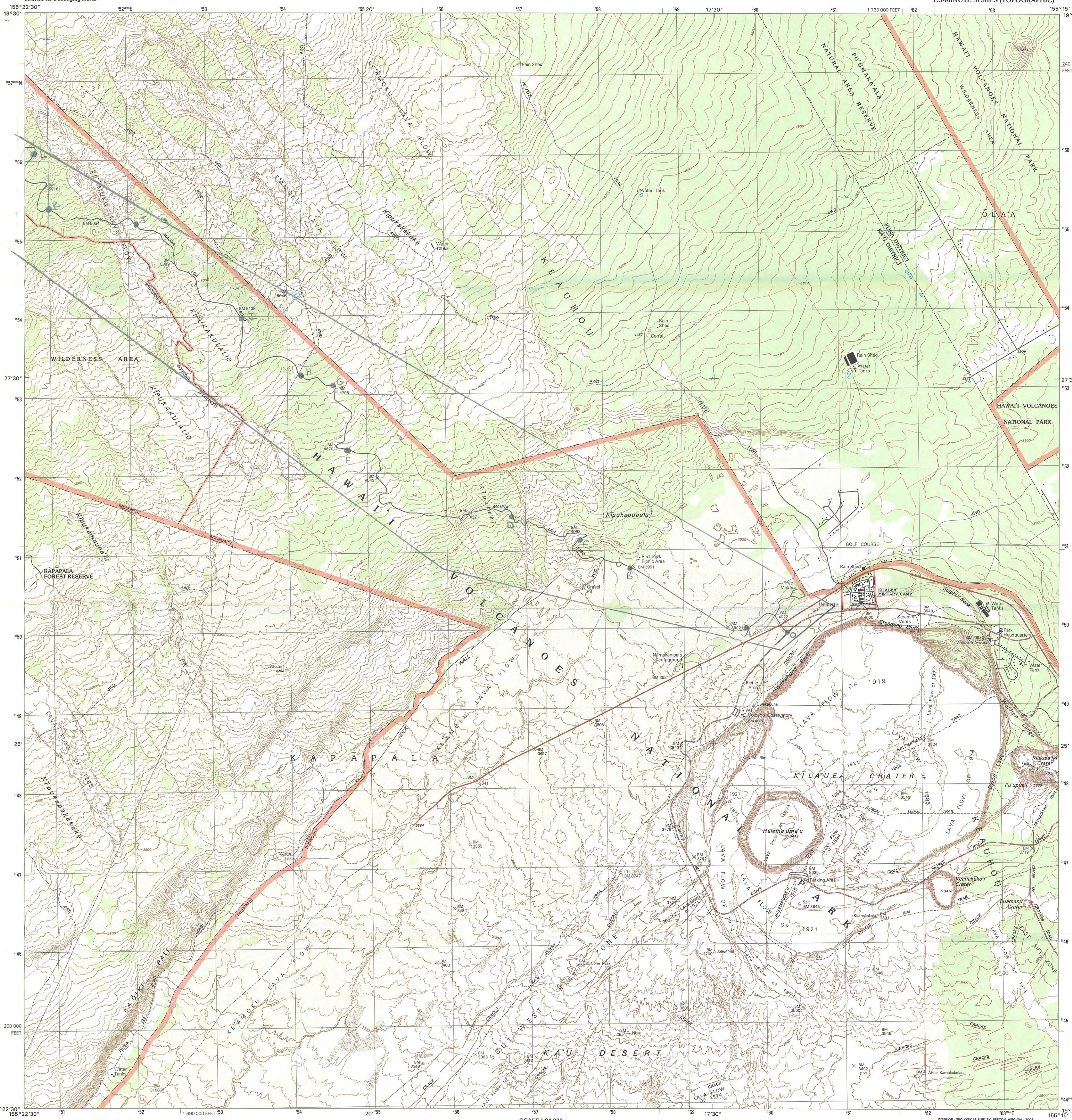


MAUNA LOA ROAD
HAWAII COUNTY
HI

USGS science for a changing world

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

KĪLAUEA CRATER QUADRANGLE
HAWAII-HAWAII CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)



Produced by the United States Geological Survey

Topography compiled 1954. Planimetry derived from imagery taken 1977 and other sources. Photoinspected using imagery taken 1995; no major culture or drainage changes observed. Survey control current as of 1980. Boundaries revised 2000

North American Datum of 1983 (NAD 83). Projection and 1 000-meter grid: Universal Transverse Mercator, zone 5
10 000-foot ticks: Hawaii Coordinate System of 1983 (zone 1)

Old Hawaiian Datum is shown by dashed corner ticks
The values of the shift between NAD 83 and Old Hawaiian Datum for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

This map lies within an unstable volcanic area

There may be private inholdings within the boundaries of the National or State reservations shown on this map

GN MN 0° 46′ 14 MILS 10° 178 MILS

UTM GRID AND 2003 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

20% TOTAL RECOVERED FIBER

SCALE 1:24 000

CONTOUR INTERVAL 20 FEET
DATUM IS MEAN SEA LEVEL
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048

FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

1	2	3
4		5
6	7	8

1 Pu'u'ula'ula
2 Kūlani
3 Pu'umaka'ala
4 Kīpukapakēkakē
5 Volcano
6 Wood Valley
7 Ka'ū Desert
8 Makaopuhi Crater

ADJOINING 7.5' QUADRANGLES

INTERIOR - GEOLOGICAL SURVEY, RESTON, VIRGINIA - 2003

ROAD CLASSIFICATION

Primary highway hard surface .... Light-duty road, hard or improved surface ......
Secondary highway hard surface .... Unimproved road ......
Interstate Route U.S. Route State Route

UTM POINTS A, O, B-L

KĪLAUEA CRATER, HI
1995
NIMA 5916 IV NE-SERIES W833

ISBN 0-607-91845-4

U.S. DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY

KĪPUKAPAKĒKAKĒ QUADRANGLE
HAWAII-HAWAII CO.
7.5-MINUTE SERIES (TOPOGRAPHIC)

Produced by the United States Geological Survey

Topography compiled 1954. Planimetry derived from imagery taken 1977 and other sources. Photoinspected using imagery taken 1995; no major culture or drainage changes observed. Survey control current as of 1980. Boundaries revised 1999

North American Datum of 1983 (NAD 83). Projection and 1000-meter grid: Universal Transverse Mercator, zone 5
10 000-foot ticks: Hawaii Coordinate System of 1983 (zone 1)

Old Hawaiian Datum is shown by dashed corner ticks
The values of the shift between NAD 83 and Old Hawaiian Datum for 7.5-minute intersections are obtainable from National Geodetic Survey NADCON software

This map lies within an unstable volcanic area

There may be private inholdings within the boundaries of the National or State reservations shown on this map

UTM GRID AND 1999 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

CONTOUR INTERVAL 40 FEET
DATUM IS MEAN SEA LEVEL
TO CONVERT FROM FEET TO METERS, MULTIPLY BY 0.3048

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, P.O. BOX 25286, DENVER, COLORADO 80225
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ADJOINING 7.5' QUADRANGLE NAMES

1	2	3
4		5
6	7	8

1 Kōkoʻolau
2 Puʻuʻulaʻula
3 Kūlani
4 Mauna Loa
5 Kīlauea Crater
6 Keaīwa Reservoir
7 Wood Valley
8 Kaʻū Desert

INTERIOR - GEOLOGICAL SURVEY, RESTON, VIRGINIA - 1999

ROAD CLASSIFICATION

Primary highway hard surface
Secondary highway hard surface
Light-duty road, hard or improved surface
Unimproved road
Interstate Route
U.S. Route
State Route

UTM POINTS M,N,P

KĪPUKAPAKĒKAKĒ, HI

1995

NIMA 5916 IV NW-SERIES W833

ISBN 0-607-91841-1
9 780607 918410


DO NOT
ENTER


MAUNA LOA ROAD
Tree Molds
Bird Park 1.5
End of Road 11.5
35


Tree Molds
HMU 705


KEEP
RIGHT


Kipuka Ki 1
Lookout 10


Ke Amoku
Flow
ELEVATION 5630


Mauna Loa Trail

National Register of Historic Places
Memo to File

Correspondence

The Correspondence consists of communications from (and possibly to) the nominating authority, notes from the staff of the National Register of Historic Places, and/or other material the National Register of Historic Places received associated with the property.
Correspondence may also include information from other sources, drafts of the nomination, letters of support or objection, memorandums, and ephemera which document the efforts to recognize the property.

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: RESUBMISSION

PROPERTY NAME: Mauna Loa Road

MULTIPLE NAME:

STATE & COUNTY: HAWAII, Hawaii

DATE RECEIVED: 11/28/14 DATE OF PENDING LIST:
DATE OF 16TH DAY: DATE OF 45TH DAY: 1/14/15
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 09000620

DETAILED EVALUATION:

___ACCEPT ___RETURN ___REJECT _____DATE

ABSTRACT/SUMMARY COMMENTS:

The Bird Park Road/Mauna Loa Truck Trail is significant under National Register Criteria A and C in the areas of Transportation, Recreation/Entertainment, Science, Architecture and Landscape Architecture. Largely completed by 1938 with extensive assistance from the CCC, the 11.4 mile trail/road was a significant addition to Hawaii National Park, serving not only scientific research needs, but also broadening recreational access to remote areas of the park. The construction of the trail reflected the common patterns of transportation infrastructure development within the national parks during the early twentieth century, from master planning and resource conservation aspects to rustic design forms and recreational opportunities.

RECOM./CRITERIA Accept Criteria A+C

REVIEWER Paul R. Lusignan DISCIPLINE Historian

TELEPHONE 202-354-2229 DATE 1/14/2015

DOCUMENTATION see attached comments Y/N see attached SLR (Y)/N

NPS Form 10-900
(Rev. Aug. 2002)

OMB No. 1024-0018
(Expires 1-31-2009)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
REGISTRATION FORM

This form is for use in nominating or requesting determinations for individual properties and districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If any item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials, and areas of significance, enter only categories and subcategories from the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

==========

1. Name of Property

==========

historic name Mauna Loa Road

other names/site number N/A

==========

2. Location

==========

Returned

street & number Hawaii Volcanoes National Park not for publication____
city or town Hilo vicinity X
state Hawaii code HI county Hawaii code 001 zip code 96718

==========

3. State/Federal Agency Certification

==========

As the designated authority under the National Historic Preservation Act, as amended, I hereby certify that this 1 nomination ____ request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property ✓ meets ____ does not meet the National Register Criteria. I recommend that this property be considered significant ✓ nationally ___ statewide ___ locally. (____ See continuation sheet for additional comments.)

Mary A. McMahon 6/22/2009
Signature of certifying official Date

State of HAWAII Historic Preservation Division
State or Federal Agency or Tribal government

In my opinion, the property ____ meets ____ does not meet the National Register criteria. (___ See continuation sheet for additional comments.)

Signature of commenting official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I, hereby certify that this property is:

____ entered in the National Register _____
___ See continuation sheet.
____ determined eligible for the _____
National Register
___ See continuation sheet.
____ determined not eligible for the _____
National Register
____ removed from the National Register _____

____ other (explain): _____

_____
Signature of Keeper Date of Action

5. Classification

Returned

Ownership of Property (Check as many boxes as apply)

___ private
___ public-local
___ public-State
X public-Federal

Category of Property (Check only one box)

___ building(s)
X district
___ site
___ structure
___ object

Number of Resources within Property

Contributing	Noncontributing	
2	0	buildings
3	0	sites
2	0	structures
0	0	objects
7	0	Total

Number of contributing resources previously listed in the National Register N/A

Name of related multiple property listing (Enter "N/A" if property is not part of a multiple property listing.) N/A

6. Function or Use

Historic Functions (Enter categories from instructions)

Cat:		Sub:	
	Recreation		outdoor recreation
	Transportation		road-related
	Landscape		natural feature

Current Functions (Enter categories from instructions)

Cat:		Sub:	
	Recreation		outdoor recreation
	Transportation		road-related
	Landscape		natural feature

7. Description

Architectural Classification (Enter categories from instructions)
OTHER: National Park Service Rustic architecture

Materials (Enter categories from instructions)
foundation masonry (lava rock)
roof corrugated metal
walls timber, masonry (lava rock)
other asphalt, masonry (lava rock)

Returned

Narrative Description (Describe the historic and current condition of the property on one or more continuation sheets.)

8. Statement of Significance

Applicable National Register Criteria (Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing)

X A Property is associated with events that have made a significant contribution to the broad patterns of our history.

____ B Property is associated with the lives of persons significant in our past.

X C Property embodies the distinctive characteristics of a type, period, or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.

____ D Property has yielded, or is likely to yield information important in prehistory or history.

Criteria Considerations (Mark "X" in all the boxes that apply.)

____ A owned by a religious institution or used for religious purposes.

____ B removed from its original location.

____ C a birthplace or a grave.

____ D a cemetery.

____ E a reconstructed building, object, or structure.

____ F a commemorative property.

____ G less than 50 years of age or achieved significance within the past 50 years.

Areas of Significance (Enter categories from instructions)
transportation
landscape architecture

Period of Significance 1915-1938

Significant Dates 1915
1925
1933-38

Significant Person (Complete if Criterion B is marked above) _____

Cultural Affiliation N/A

Architect/Builder 25th Infantry Regiment, Thomas Jaggar, Lorrin Thurston, Bureau of Public Roads, Civilian Conservation Corps, National Park Service, Thomas Vint

Narrative Statement of Significance (Explain the significance of the property on one or more continuation sheets.)

9. Major Bibliographical References

(Cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS)
___ preliminary determination of individual listing (36 CFR 67) has been requested.
___ previously listed in the National Register
___ previously determined eligible by the National Register
___ designated a National Historic Landmark
___ recorded by Historic American Buildings Survey # _____
X recorded by Historic American Engineering Record # HI-47, HI-50

Primary Location of Additional Data
___ State Historic Preservation Office
___ Other State agency
___ Federal agency
___ Local government
___ University
X Other
Name of repository: Hawaii Volcanoes National Park archives

10. Geographical Data

Acreage of Property _____

UTM References (Place additional UTM references on a continuation sheet)

	Zone	Easting	Northing		Zone	Easting	Northing
1	__	_____	_____	3	__	_____	_____
2	__	_____	_____	4	__	_____	_____

X See continuation sheet.

Verbal Boundary Description (Describe the boundaries of the property on a continuation sheet.)

The boundaries of the nominated district are generally delineated by the course of Mauna Loa Road. The right-of-way is approximately 12' wide and is variable along the entire length of the road. The district begins with the road's starting point at Highway 11 (Mamalahoa Highway) and extends northwest a distance of approximately 11.2 miles. The road ends at approximately 6,700' in elevation. The nodes of development along the road's alignment are also part of the district, including the Tree Molds site, the day use area, the Observation Building and the seismograph vault.

Boundary Justification (Explain why the boundaries were selected on a continuation sheet.)

The boundaries are generally coterminus with the Mauna Loa Road's historic right-of-way. The beginning and end points signify the current extent of the road. Since National Park Service roads were designed to have nodes of development providing visitor amenities or serving an administrative function, sites along the route of Mauna Loa Road have also been considered.

11. Form Prepared By

name/title Justine Christianson, Historian
organization Heritage Documentation Programs, National Park Service date July 2007
street & number 1201 Eye Street, NW, 2270 telephone 202-354-2183
city or town Washington state DC zip code 20005

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps
A USGS map (7.5 or 15 minute series) indicating the property's location.
A sketch map for historic districts and properties having large acreage or numerous resources.

Photographs
Representative black and white photographs of the property.

Additional items (Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name _____

street & number _____ telephone _____

city or town _____ state _____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties, and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C. 470 et seq.). A federal agency may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a valid OMB control number.

Estimated Burden Statement: Public reporting burden for this form is estimated to range from approximately 18 hours to 36 hours depending on several factors including, but not limited to, how much documentation may already exist on the type of property being nominated and whether the property is being nominated as part of a Multiple Property Documentation Form. In most cases, it is estimated to average 36 hours per response including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form to meet minimum National Register documentation requirements. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, 1849 C St., NW, Washington, DC 20240.

Returned

NARRATIVE DESCRIPTION

The Mauna Loa Road runs northwest from Highway 11 (Mamalahoa Highway) about 11.2 miles up the side of Mauna Loa to approximately the 6,700' elevation. A hiking trail extends from the road's end to the summit of Mauna Loa, the largest active volcano on Earth. Mauna Loa Road originally combined two road segments. The first section was the Uwekahuna-Bird Park Road (completed in 1934), extending from Halemaumau on Kilauea Crater to Bird Park. The construction of the Highway 11 bypass around the park in the early 1960s and subsequent realignment of Crater Rim Drive made a portion of Uwekahuna-Bird Park road obsolete, and it was abandoned. The starting point of Mauna Loa Road then became its intersection with the new alignment of Highway 11. The second section was a truck trail completed in 1936 for park personnel and scientists that extended the road from the terminus of Uwekahuna-Bird Park Road to the 6,700' elevation where it ended in a parking lot with an Observation Building nearby and a trail continuing to the summit.[1]

Mauna Loa Road's design followed the general principle of park road construction that roads and associated structures be minimally invasive, in essence so that they would "lie lightly on the land." The National Park Service (NPS), in collaboration with the Bureau of Public Roads (BPR) in the 1920s and 1930s, "produced a distinctive 'park road' aesthetic…[that] drew heavily on nineteenth-century carriage design techniques but updated these practices to accommodate the demands of automobile traffic and the geographic diversity of the national parks."[2] NPS personnel accomplished this by aligning park roads to highlight scenic vistas and to follow the topography of the land. Turnouts gave motorists the opportunity to stop and gaze at the landscape. Other techniques included creating scenic vistas through vegetation management, introducing traffic calming measures such as narrow roadways and sinuous curves so that drivers could not hurry from one point to another, naturalizing cuts and fills, and utilizing native materials in construction.[3]

The characteristics of NPS park road design can be seen along the Mauna Loa Road and ultimately create a pleasurable visual experience for visitors. Motorists drive along a curving road through koa groves and lava flows while gradually ascending Mauna Loa. A few nodes of development provide interpretive exhibits, visitor amenities, and opportunities to explore the landscape. These include the Tree Molds site, a day use area, and Bird Park. Along the way, scenic vistas give visitors the opportunity to look out over the landscape, as does the Observation Building at the road's terminus. The road adheres to the principles of National Park Service road design and construction with its curving switchbacks ascending the side of Mauna Loa; its narrow alignment, which allows visitors to experience the landscape

[1] Dawn Duensing, "Hawaii Volcanoes National Park," HAER No. HI-47, Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1999, 94-101.
[2] Timothy Davis, "Drawing on the Road," in Timothy Davis, Todd A. Croteau and Christopher Marston, *America's National Park Roads and Parkways: Drawings from the Historic American Engineering Record* (Baltimore: The Johns Hopkins University Press, 2004), 5.
[3] Davis, "Drawing on the Road," 1-13.

by driving through it at a slow pace; and the naturalized cut and fill through lava flows. The structures associated with the road, like the Observation Building, reflect the NPS Rustic style.

Current Appearance

Visitors currently access Mauna Loa Road from Highway 11 (Mamalahoa Highway). The first point of interest along Mauna Loa Road is located at less than .1 mile from its current beginning point at Highway 11. A one-lane spur road measuring approximately 11' wide extends to the northeast and provides access to the Tree Molds site [C], adjoining the privately owned Volcano Golf Course. Tree molds result when lava surrounds a tree trunk and cools. The trunk burns, leaving a cylinder of lava that often has bark impressions inside. The site includes a number of scattered tree molds and a wood kiosk with interpretive signage.

The next point of interest on Mauna Loa Road is a day-use area [C] at mile 1.3 accessed by a paved spur road ending in a turnaround. Visitors can park in the parking lot bordered by lava rock boulders. An L-shaped timber shelter with a cistern at the rear is available for use by visitors who wish to picnic. The Rustic style shelter features benches along its walls and a double fireplace faced with lava rock. A modern comfort station faced with lava rock and scattered picnic tables add to the available visitor amenities.

Mauna Loa Road makes a wide turnaround [C] at mile 1.6, marking the end of the original Uwekahuna-Bird Park Road (constructed from 1933-34). Bird Park (Kipuka Puaulu) [C] is located here. Bird Park is a kipuka (an oasis protected from lava flows) with an approximately one-mile loop trail through a mature forest of native trees and meadowland. A wood kiosk with interpretive signage provides information.

At the turnaround, Mauna Loa Road continues through lava rock pylons [C]. A metal gate at the pylons is used by park staff to close off the road during periods of drought when the fire risk is high. The character of this portion of the road is markedly different because it was originally the Mauna Loa Truck Trail, completed in 1936 for use by park personnel and scientists only. Therefore, the paved road is much narrower at an average 12' wide with little or no shoulder and no sites along the way as in the Uwekahuna-Bird Park Road section.

Once past the lava rock pylons, Mauna Loa Road continues up the side of the volcano, winding through stands of koa trees whose branches form a canopy over the road and provide a sharp contrast with the periodic lava flows (located at mile 2.5, mile 6, mile 8.2 where the Keamoku Flow dating to 1823 is visible, and mile 10.4) that characterize the rest of the landscape. To ease the ascent, the alignment of the road includes switchbacks, such as the one located at mile 2.3 near the 4,000' elevation. By mile 9.3, the road has ascended to the 6,000' elevation before terminating at mile 11.2 at the nearly 6,700' elevation. At the terminus of the road is a gravel parking area. The trailhead to the summit of Mauna Loa is located off the parking lot as well as an Observation Building [C]. Constructed from 1937 to 1938,

the octagonal Observation Building is an intact example of the National Park Service Rustic style. The battered lava rock piers and walls as well as the hipped roof of the building follow the NPS design principle of using native materials and forms to create structures that harmonize with the landscape. The Observation Building provided visitors with views of the Mauna Loa summit, but the vegetation has since obscured them. A short distance from the terminus of Mauna Loa Road is an extant seismograph vault [C] dating from 1937 used by scientists to monitor the activity of Mauna Loa.

RESOURCE INVENTORY

In addition to the road itself, other resources along its alignment were considered as part of the district. Since National Park Service roads were designed to provide a particular experience for the visitor traveling along them, features like day use areas and observation buildings are integral to the road infrastructure. The physical road and the structures contained in the nodes of development along it are integrated as a seamless whole through the use of the Rustic style, native materials, and the blending of the natural and built environments. Therefore, this resource inventory not only includes the structures associated with the roadway but also those associated with visitor and park personnel usage.

Returned

RESOURCE	STATUS	TYPE	YEAR BUILT
Tree Molds Site	**C**	**S**	**ca. 1920**

The Tree Molds site is accessed via a one-lane spur road turning off from Mauna Loa Road at about the .1 mile marker. The spur road extends to the northeast and measures approximately 11' wide. Visitors to the Tree Molds park in a paved lot bordered by lava rock boulders. A wood kiosk with a shingle roof is located near the parking lot and has interpretive signage. The tree molds are scattered along the site. In order to protect them and for visitor safety, the NPS recently installed fencing of recycled plastic posts and metal pipe railings around each mold. The Tree Molds site was a park feature as early as 1920 when it appears on a map entitled "Kilauea Section of Hawaii National Park." The area appeared on subsequent maps as well, including one completed in 1929 and the park's 1931 Master Plan. The Tree Molds site is a contributing feature as a point of interest along the road. Park Service road design emphasized taking advantage of interesting landscape and historical features by aligning the road to run near them and providing stopping points with various amenities at them.

Day Use Area	**C**	**S**	**Unknown**

Near mile 1.3 on Mauna Loa Road, an approximately 14' wide paved spur road extends to the northeast and terminates in a loop. This spur road accesses a day use area, which includes a comfort station, shelter and picnic tables. The recently built comfort station is clad in lava rock and has a corrugated metal roof. The Rustic style L-shaped shelter is constructed of timber framing and siding with a corrugated metal roof. The shelter has a cistern at the rear, nestled in the corner made by the two wings of the building. The front and right walls of the shelter are open, except for timber

posts supporting the roof. The timber framing of the roof is exposed on the interior, revealing the use of metal straps attached to the posts and framing to provide additional support. The day use area is a contributing feature as a point of interest along the road. Park Service road design emphasized having selected nodes of development providing visitor amenities and serving administrative functions interspersed with long stretches of seemingly undisturbed wilderness.

Bird Park (Kipuka Puaulu) **C** **S** **ca. 1929**
At mile 1.6 on the Mauna Loa Road is Bird Park, a forest and meadow kipuka with a one-mile trail loop. Bird Park is renowned for the variety of birds inhabiting it and has long been a popular area in the park, appearing on a 1929 Hawaii Volcanoes National Park circular and in the 1931 Master Plan of the park. A wood kiosk at the trailhead has a shingle roof and contains informational signage for visitors. The park is a contributing feature as a point of interest along the road. Park Service road design emphasized taking advantage of interesting landscape and historical features by aligning the road to run near them and providing visitors with a chance to stop and explore the landscape at various destination nodes.

Turnaround **C** **STR** **1933-34**
The turnaround marks the terminus of the first section of Mauna Loa Road, originally the Uwekahuna-Bird Park Road, completed in 1934. Visitors usually park along the periphery of the turnaround while visiting the nearby Bird Park.

Pylons **C** **STR** **ca. 1936**
Lava rock pylons with lava rock caps flank what was originally the Mauna Loa Truck Trail extending from the turnaround to the 6,700' elevation. In addition, a gate is located at the pylons for use by Park Service personnel to close off this portion of the road to visitors during fire season. The date of construction of these pylons has not been determined, but presumably they date to the construction of this later section of road. They are a contributing feature, representing the Rustic style with its emphasis on using native materials so that structures harmonize with the surrounding environment.

Observation Building **C** **B** **1937-38**
Mauna Loa Road ends at the approximately 6,700' elevation with a parking area. An Observation Building at the road's terminus served as the destination point for visitors not wishing to make the long trek to Mauna Loa's summit by providing expansive views of Mauna Loa's slopes. The octagonal building is representative of the National Park Service Rustic style. A preliminary sketch of the "Observation Building," as it was designated, shows that the Branch of Plans and Designs of the NPS designed the building. The plans specified a 4" concrete floor and 7' high walls with a 12' diameter interior. The hipped roof, covered with asbestos cement shingles, had a 3' overhang. Three glass display cases were located along one wall. An entrance door and windows punctuated the other walls.[4]

[4] U.S. Department of Interior, National Park Service, Branch of Plans and Design, "Observation Building (Mauna Loa)," Preliminary Sketch, 1937, HAVO Archives.

Currently, the Observation Building retains a high degree of integrity as compared to the original plans. The battered lava rock piers and walls exhibiting the Rustic style use of native materials. Five elevations provide views of Mauna Loa's slope and the surrounding area while three are closed and have interpretive signage, just as specified in the construction drawings. Vegetation has grown up and screens some of the building and the views, but the form and material remain intact. Even when first constructed and with little vegetation in the immediate vicinity, the building was inconspicuous due to its low-slung profile, use of native materials, and muted colors. The Observation Building's high degree of integrity, use of the Rustic style, and purpose as a destination point on Mauna Loa Road make it a contributing element of the district.

Seismograph Vault **C** **B** **1937**

The 117 square foot seismograph vault is accessed by a trail that extends uphill from the parking lot at the road's terminus. The vault was built into a slope so only the front, lava rock clad elevation and the roof with scientific equipment are visible. A set of stairs at the front elevation leads down to a wood door with a concrete lintel. The interior room of the seismograph is 8' x 10'. The vault sits on a reinforced concrete pad and actually consists of a double set of reinforced concrete walls and ceilings separated by a pocket of air space, according to construction drawings. The seismograph is a contributing element because of its high degree of integrity and its use by Hawaiian Volcano Observatory volcanologists to study Mauna Loa's activity.[5]

[5] "Observation Building (Mauna Loa)," drawing includes a the seismograph room; Carey & Co. Inc., "Hawai'i Volcanoes and Haleakala National Parks: The Early Years (1916-1945)," Historic Resources Study, August 30, 2002, 64.

STATEMENT OF SIGNIFICANCE

Summary

Mauna Loa Road is part of the road system of Hawaii Volcanoes National Park, serving as a secondary road that provides visitors and park personnel with backcountry access to Mauna Loa as well as other points of interest. The road is significant for its association with the history of National Park Service road design and construction principles, and illustrates the difference between park roads intended for visitor use and truck trails for administrative use. The first portion of Mauna Loa Road, originally the Uwekahuna-Bird Park Road, was designed to provide visitor access from Uwekahuna at Kilauea to Bird Park on the slopes of Mauna Loa. The second portion of Mauna Loa Road from the terminus of the original Uwekahuna-Bird Park Road (marked by a turnaround) to the 6,700' elevation was originally constructed as a truck trail for use by park personnel. This difference in intent resulted in a design difference in the road segments. The first section is markedly wider and has nodes of development at the Tree Molds, a day use area, and Bird Park that allowed visitors to stop and experience different landscapes. The truck trail part of the road is only one lane wide with no development nodes until its terminus where an Observation Building and seismograph vault are located. Mauna Loa Road is also significant for its association with volcanology, advanced by Thomas Jaggar at Kilauea and Mauna Loa through the Hawaiian Volcanoes Observatory.

The road meets National Register Criterion A because of its association with the development of the national park system and the work of the Civilian Conservation Corps (CCC). From the establishment of the NPS in 1916 until 1942 when World War II halted development, Park Service architects and landscape architects based in the Branch of Plans and Design (divided in 1934 into the Western Division and Eastern Division) developed a vocabulary of design and construction to be utilized at parks across the country with adaptations to the particular environment and landscape of the park. Park administrators, such as those at Hawaii Volcanoes National Park, created master park plans complete with roads, trails, and nodes of development for administrative and visitor use that guided development. At Hawaii Volcanoes National Park, Park Service personnel designed a road system to provide access to the natural features of the park to visitors and staff via both primary and secondary roads (of which Mauna Loa is one). Mauna Loa Road exemplifies both the tourist and administrative functions that park roads served. The Uwekahuna-Bird Park Road section gave tourists access to such points of interest as the Tree Molds and Bird Park. The Mauna Loa Truck Trail section gave park personnel and volcanologists access to a seismograph vault, the trails leading to the summit, and the back country. While the two sections as a whole only provided automotive access up to the 6,700' elevation, the history of the road is characterized by debates over constructing a public access road to the summit. These debates reflect the tension between providing visitor access while promoting safety and environmental protection. Throughout the national park system, including Hawaii Volcanoes National Park, men enrolled in the CCC built roads and various types of structures and buildings, including the Mauna Loa Road.

The road meets National Register Criterion C because it embodies the tenets of National Park Service road design and construction techniques as well as the Rustic style.[6] During the 1916-42 time period, Park Service "landscape architects, architects and engineers forged a cohesive style of landscape design which fulfilled the demands for park development while preserving the outstanding natural qualities for which each park has been designated."[7] Roads were considered an integral component of landscape design, and the NPS worked with the Bureau of Public Roads (BPR) to develop safe and aesthetically pleasing road systems throughout the national park system. Park roads were to lie lightly on the land, following the topography of the landscape through which they traveled. On the Mauna Loa Road, the alignment curves following the contours of the land while steadily ascending the summit to the nearly 6,700' elevation. Any necessary cuts and fills have been naturalized. In addition, Park Service design called for the journey through the landscape to be just as important as the destination point, so the road was laid out to take advantage of landscape features like the koa forests and lava flows. NPS policy also encouraged the design and construction of structures that harmonized with the landscape through the use of native materials and forms. This was the guiding principle of the National Park Service Rustic style, developed by Park Service landscape architects and architects. On Mauna Loa Road, the shelter at the day use area, the informational kiosks, lava rock pylons, seismograph vault, and the Observation Building exemplify the Rustic style. Albert Good, an architectural consultant to the Park Service, drew plans, elevations and sections for the 1938 *Park Structures and Facilities*, a publication that helped standardize park architecture and set out design principles. Good defined "successfully handled" Rustic architecture "as a style which, through the use of native materials in proper scale, and through the avoidance of severely straight lines and over-sophistication, gives the feeling of having been executed by pioneer craftsmen with limited hand tools. It thus achieves sympathy with natural surroundings and with the past."[8] Park structures were ultimately subordinate to their surroundings and merely part of a larger, comprehensive park plan.[9]

Mauna Loa Road is therefore significant in the area of transportation as an example of early road construction in the national park system and illustrates how National Park Service designers along with the Bureau of Public Roads developed roads to be unobtrusive elements in the landscape. The road is significant in landscape architecture as Park Service personnel developed methods of "scenic preservation" while also providing access to visitors and created a vocabulary of architecture used throughout the national parks. On Mauna Loa Road, this is exhibited by the siting of

---

[6] Much work has been done on the history of National Park Service road design and architecture. See for example, Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction* (Baltimore: The Johns Hopkins University Press, 1998), see especially Chapter 6: "Principles and Practices for Naturalistic Roads and Trails"; Ethan Carr, *Wilderness by Design: Landscape Architecture and the National Park Service* (Lincoln: University of Nebraska Press, 1998); Timothy Davis, Todd A. Croteau and Christopher Marston, eds., *America's National Park Roads and Parkways: Drawings from the Historic American Engineering Record* (Baltimore: Johns Hopkins University Press, 2004); and Laura E. Soulliere, *Historic Roads in the National Park System—Special Historic Study* (U.S. Department of the Interior, National Park Service, Denver Service Center, 1995), among others.

[7] McClelland, 1.

[8] Albert H. Good, *Park and Recreation Structures* (Boulder: Graybooks, 1990; reprint, U.S. Department of the Interior, National Park Service, 1938), 5.

[9] Good, 6.

the road to take advantage of views and the preservation of groves of koa trees that form a canopy over sections of the roadway. Mauna Loa Road is also associated with influential organizations and persons like the 25th Infantry Regiment, Thomas Jaggar, and Lorrin Thurston, as well as government entities like the Bureau of Public Roads and the Civilian Conservation Corps.

Mauna Loa Road retains a high degree of integrity, which Linda Flint McClelland defines in *Building the National Parks* as "historic integrity of location, setting, design, materials, workmanship, feeling and association and overall reflect the physical appearance and condition of the landscape during the period of significance."[10] The integral characteristics of park road design can still be seen on Mauna Loa Road: a narrow roadway, a sinuous alignment, and an association with the surrounding natural environment through the use of natural materials and siting of the road to take advantage of landscape features. In addition, the land remains undeveloped aside from planned nodes of development along the road's route, which includes the Tree Molds site, day use area, Bird Park, and the Observation Building, reflecting National Park Service master planning philosophy.

Historical Background

The construction of a road up to the summit of Mauna Loa was an issue even prior to the establishment of the park in 1916. Dr. Thomas Jaggar and Lorrin Thurston developed the idea of a truck trail extending from Kilauea to Mokuaweoweo on Mauna Loa for use by scientists and tourists. They hoped that Hilo businessmen would provide the funds for construction in anticipation of the road being a boon to the tourist industry of the island.[11] Jaggar, a volcanologist, had established a permanent observatory at Kilauea in 1912 while head of geology at the Massachusetts Institute of Technology (MIT), and he wanted to expand the area available for study.[12] He lobbied for a road to make Mauna Loa more accessible, arguing that the volcano had both scientific and aesthetic merits.

> Its great walls are avalanching, its bottom is heating and cooling, it is always smoking inside, it is swelling up and sinking down, it becomes snow-covered for winter sports, and its glazed rifts are brilliantly colored with cones and caverns of all shapes and sizes, and covered with stalactites and stalagmites in the caves. It is utterly unexplored, for the few parties who have been there have been weary and eager to get home. It is the greatest and most active volcano center in the world, it is in the middle of the greatest belt of the earth's internal fire in the world; namely, the shores surrounding the

[10] McClelland, 512.

[11] Frances Jackson, *An Administrative History: History of Hawaii Volcanoes National Park* (Honolulu, HI: Haleakala National Park, 1972), 104; "Development," *Hawaii Nature Notes: The Publication of the Naturalist Division, Hawaii National Park and the Hawaii Natural History Association* V, no. 2 (November 1953). *Hawaii Nature Notes* which have been digitized and are available online at http://www.nps.gov/history/history/online_books.

[12] Jackson, *Administrative History*, 40; Frances Jackson and Mara Durst, "A History and Historic Resource Study of the Lower Portion of the 'Ili'Aina of Keauhou District of Ka'u, Hawaii National Park," Draft, August 2003, 32, 40.

Pacific Ocean. If these are not reasons enough for building a road to it, the eruptions being spectacular but not dangerous, then there is no reason for any scenic road anywhere.[13]

His partner in lobbying was Lorrin Thurston, an influential politician and publisher of the *Pacific Commercial Advertiser* (now known as *The Honolulu Advertiser*). He was an avid supporter of the park's establishment and road construction, seeing park development as a way to boost tourism to Hawaii.

In September 1915, Jaggar, Thurston, and a U.S. Army representative conducted a survey to determine a route up Mauna Loa. The following month, soldiers from the 25th Infantry Regiment arrived at Mauna Loa to construct a truck trail, which was completed a mere two months later upon the 10,000' elevation.[14] The 25th Infantry was one of four all African-American regiments in the U.S. Army, the others being the 9th and 10th Cavalry and the 24th Infantry. Collectively, the African-American regiments were known as "Buffalo Soldiers." The 25th resulted from a consolidation in 1869 of the 39th Infantry (Greenville, LA) and 40th Infantry (Washington, DC), both of which had been created by an Act of Congress in 1866 "to provide military careers for free slaves." The four regiments (9th and 10th Cavalry and 24th and 25th Infantry) made up 10 percent of the troops stationed in the West from 1866-91. The 25th participated in the Indian Wars of 1867-99, in addition to escorting supply trains, guarding passes, posts, and stagecoach stations, and helping survey the Great Plains. During the Spanish-American War, the 25th fought in Cuba, where they were assigned to the 2d Brigade, 2d Division. They also served in the Philippines War (1899-1902). The War Department ordered the regiment (consisting of twenty-nine officers and 801 enlisted men) to Hawaii in 1913, where they were based out of Schofield Barracks in Honolulu. Little is known about the regiment's work in Hawaii and even less about their work on the Mauna Loa Truck Trail.[15] Remnants of the original trail are still visible in places near the alignment of the current Mauna Loa Road, but little written evidence has been found documenting its route, construction, and use.

Concurrent with the construction of the Mauna Loa Truck Trail was the establishment of the park within the National Park Service system in 1916 and the acquisition of land for the park from 1916-22.[16] Park staff wrestled with the problem of providing the public access to Mauna Loa via a road. The recently built Mauna Loa Truck Trail was not a viable park road since portions of it fell outside the newly established park boundaries. The April 1923 Superintendent

[13] T.A. Jaggar, Volcanologist, to E.G. Wingate, Superintendent, Hawaii National Park, January 18, 1934 in Folder: "Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1934," 631-01, available from Hawaii Volcanoes National Park Archives (hereafter cited as HAVO Archives).

[14] See "Hawaii Nature Notes," V, no. 2 (11/1953).

[15] "The Service: Devoted to the Army and Navy in Hawaii," Honolulu, HI, 7, no. 38 (March 17, 1916); http://www.buffalosoldiermuseum.com, accessed 10/2006; http://www.buffalosoldiers.com/ accessed 10/2006; Capt. John H. Nankivell, *The History of the Twenty-Fifth Regiment United States Infantry 1869-1926*, 138, 141, 144.

[16] Hawaii National Park, as it was called, originally encompassed both this park and Haleakala on the Island of Maui until 1961, when the two were divided into separate parks. The lands on the island of Hawaii became Hawaii Volcanoes National Park and those on Maui became Haleakala National Park.

Report indicated that the road to Bird Park went into private ranchland property for 1/2 mile and that private gates were being left open to the consternation of the rancher owner.[17] That same year, park Superintendent Thomas Boles along with Thomas Jaggar surveyed a route to the summit. Boles had three reasons for wanting the road to merely be a horse trail rather than an automobile route, the most concrete of which was a lack of funds.[18] Ideologically, Boles could not support a summit road either. He stated it was not "worthwhile to build anything but a very narrow road, rolled surface, for the upper ten miles," because "this crater is in action only at long intervals and elevation and weather conditions are severe at the upper end." Finally, Boles had very real concerns about visitor safety. Mauna Loa's high elevation could pose problems to inexperienced hikers and those with health problems. He argued only "experienced mountain climbers, or people whose heart action has been thoroughly tested by a competent physician" should be allowed to make the trek.[19] The concerns of park personnel about frequency of use and resulting expenditure of park resources as well as visitor safety dictated the eventual establishment and route of Mauna Loa Road.

By 1925, a crew working under the Highway Engineer from the Bureau of Public Roads (who cooperatively worked with the NPS in designing park roads) had completed several line surveys "in order to determine the economical route, as well as the route which will connect with the various points of interest along this road."[20] Crews had difficulty in routing the lower part of the road since privately owned lands used for grazing cattle had to be avoided. The selected route rested "almost entirely on lands owned by the Territory of Hawaii" in the hopes that the territory would donate the needed land to the park.[21] When Arno B. Cammerer, Assistant Director of the NPS, visited the park in 1926, he deemed the Bureau of Public Roads (BPR) survey unsatisfactory and recommended undertaking another survey. The BPR forged ahead, however, in developing plans for the construction of the road.

The BPR engineers believed that the "regularity of the topography on Mauna Loa make it evident that there is an indefinite number of possible routes." One route could start at the summit before making its "descent on the maximum grade by spiraling the mountaintop," which would provide views in all directions. Another possible route would "follow the general line of the rift by use of numerous switch-back curves." The proposed Mauna Loa Road was divided into sections and given project numbers. Project Number 4 was identified as Bird Park Road. This section extended two miles from the Around the Island Road (an island belt road) to Bird Park. There were two possible routes for Project 4. One option was to "flatten the grade from the so-called Big Koa" to Bird Park and then continue the

[17] April 1923 Superintendent Report from Superintendent Report 1922-23, 3, HAVO Archives.
[18] February 1923 Monthly Report from Superintendent Report 1922-28, HAVO Archives; Jackson, *Administrative History*, 223.
[19] Letter from Thomas Boles, Superintendent, to George E. Goodwin, Chief, Civil Engineering, NPS, Portland, OR, May 31, 1923 in RG 79, Records of the Branch of Engineering, General Records of the Engineering Division, 1917-26, National Archives and Records Administration, College Park, Maryland (hereafter cited as NARA).
[20] Letter from Thomas Boles, Superintendent, to George E. Goodwin, Chief, Civil Engineering, NPS, Portland, OR, April 20, 1925, in RG 79, Records of the Field Headquarters in San Francisco, Classified Files, 1925-36, Parks Hawaii, Box 31, Entry 29, NARA; September and October 1925 Monthly Reports from Superintendent Report 1922-28, HAVO Archives; Jackson, *Administrative History*, 224.
[21] October 1925 Monthly Report from Superintendent Report 1922-28, HAVO Archives.

route to the Around the Island Highway about 1/2 mile from Kilauea Military Camp. The BPR thought this path was a little dull, however, and suggested that if the lower part of the route could go into the Bishop Estate lands, it would be more interesting. The second option was to "descend on the maximum grade" to just below Bird Park and then connect with the Around the Island highway. The BPR recommended this route. Project Number 5 extended from Bird Park at the approximately 4,000' elevation to Red Hill Road, where a rest house was located at the 10,000' elevation. This section was about 20 miles long. The BPR tried to route the road contained within Project 5 so that it would touch as many of the volcanic attractions as possible and at the same time be economical. The BPR could foresee that the Territory would at some future date be interested in a road between Mauna Loa and Mauna Kea, so they routed the "Mauna Loa survey" to go "as far in the direction of the Mauna Kea pass as possible." The final section was labeled Project Number 6, Mauna Loa Summit Road. It ran from the rest house at the 10,000' elevation to the summit of Mauna Loa, a total of 13 miles.[22] The final surveyed route, including all sections, extended from near Kilauea to the summit of Mauna Loa.

The BPR also provided road construction specifications. For the Project 4 section, they specified that the road be 16' wide with grades not to exceed 5 percent, although for short distances of 300' to 400', a 6 percent grade could be used. The surface of the planned road was to be surfaced with 3/4" crushed rock. For projects 5 and 6, the BPR decided that "a very narrow roadway upon a good grade ranging from 4% to 7% and upon alignment which would be safe" was sufficient. There were to be no curves sharper than a 100' radius. Finally, this section was to be surfaced with 3/4" lava rock and cinders.[23]

In 1927, the park devoted time to making the 2.4-mile road to Bird Park "passable to all types of autos" by "filling with rock and gravel on both sides of the many sharp lava outcrops and reducing the sharpest curves." In addition, the .4 of a mile to the Tree Molds "was relocated so as to encroach as little as possible on the Kilauea golf course." The route as realigned remained "outside the fence until near No. 7 green where it enters the new gate...and runs directly to the Tree Molds, thus crossing only one fairway."[24]

Master plans for road development in the park completed in 1931 and 1939 and a preliminary map of Mauna Loa from 1935 provide information as to how the route of the Mauna Loa Road changed from the preliminary surveys. The 1931 "Roads and Trails System" of the General Development Plan for the park depicts the route up to the summit of Mauna Loa. The Uwekahuna-Bird Park Road made up the first section. It ran from Uwekahuna at Kilauea, crossed the Around the Island Road, and then extended northwest past the Tree Molds to Bird Park. At Bird Park, the road became a truck trail that closely followed the park boundary with stops at Bates Camp and Red Hill Rest House before reaching

[22] "Report to Dr. L.I. Hewes, Deputy Chief Engineer, U.S. Bureau of Public Roads," by F.A. Kittredge, Highway Engineer, U.S. Bureau of Public Roads, November 1925, in Folder: "Investigation Road Program, Hawaii National Park F. A. Kittredge, 1925," HAVO Archives
[23] "Report to Dr. L.I. Hewes."
[24] November 1927 Monthly Report from Superintendent Report 1922-28, HAVO Archives.

Mokuaweoweo Crater on the summit of Mauna Loa.[25] According to the 1931 Superintendent's Report, the Mauna Loa trail alignment as indicated on the master plan from that year, was chosen "to get the best views, the shortest course, and keep the best grades so as to provide safe and easy passage for pack and saddle animals and foot travelers." The alignment began "at Bird Park, leads through ohia forests, past tree molds, over old aa lava flows, then through tropical vegetation; past the Giant Koa Tree, then into meadows of rolling land, across other lava flows, beds of pahoehoe lava and as rifts and pit formations to the Rest House, better known as Red Hill," and then continued to the summit. The superintendent reported that the park used "native labor" to build the trail. Workers removed vegetation from the pathway in the forest and meadow portions of the route, while blasting had to be done through sections of pahoehoe. The blasted lava rock was then used as fill and surfacing material.[26] The work was done as part of a realignment of the original 1923 trail between the 10,000' elevation at the rest house and Bird Park to make it fall entirely within NPS boundaries.[27]

A 1935 map with the location of the trail up Mauna Loa shows that it deviated from the 1931 alignment. The NPS Branch of Plans and Designs who created the map traced the trail from the 1925 survey done by the Bureau of Public Roads. The 1935 plan shows the length of the road divided into two sections: Uwekahuna-Bird Park Road section (labeled Project 4 and coinciding with the Project 4 in the BPR survey) extending from Uwekahuna on Kilauea, crossing the Around the Island Road and ending at the Bird Park turnaround, and the Mauna Loa Truck Trail section extending from Bird Park. The end portion was indicated as not surveyed. The Uwekahuna-Bird Park Road had been completed in 1934 using CCC labor.[28] The NPS wanted to be sure that few people reached the summit and that little development took place. As a result, a notation on the map recommends that the road have a 5 percent maximum grade, measure 8' wide, and have an alignment that would allow for future widening to the nearly 7,000' elevation point. NPS personnel further decided that any road constructed past the 7,000' elevation should only be for scientific purposes and recommended a 4' wide trail with a 15 percent maximum grade.[29]

In August 1935, A.H. Wong, Associate Engineer of Hawaii National Park, began the survey work for what was called the Mauna Loa Truck Trail, to be located within park boundaries and used "for protection and administrative purposes only." It would extend up to the 7,000' elevation for a distance of 10.5 miles at 8' wide, with the Civilian Conservation

---

[25] U.S. Department of the Interior, National Park Service, "Roads and Trails System, Part of the General Development Plan for Hawaii National Park," Drawn by the Landscape Division from NPS Data as of October 1, 1931, HAVO Archives. Thomas Vint recommended the plan in March 1932.

[26] November 1931 Monthly Report from Superintendent Report 1932, HAVO Archives.

[27] Jackson, *Administrative History*, 228-229.

[28] "Preliminary Mauna Loa Truck Trail Location," Hawaii National Park, Proposed ECW Project, June 28, 1935, HAVO Archives. W. Carnes, Deputy Chief Architect, recommended the location in 1935.

[29] Cammerer to Mr. Demaray and Vint, March 7, 1934, in Folder: Mauna Loa Road (Proposed), 1916, 1925, 1931-38, 1944-48, 631-01, HAVO Archives. Sager estimated that during inactive periods, there would be as few as five visitors a day to the summit of Mauna Loa. See "Proposed Mauna Loa Highway" report, 10, 17, in Folder: Mauna Loa Road (Proposed), Merel S. Sager, Landscape Architect, 1954, 631-01, HAVO Archives.

Corps doing the work.[30] The next month, construction finally started on the Mauna Loa Truck Trail and was completed a year later.[31] That fall, Sager reported the CCC quickly started the reconstruction of the existing road, taking "more than usual interest in the work."[32] The crew, consisting of a foreman and about thirty workers, stayed at a camp located at the approximately 6,500' elevation so that the difficult work of blasting through the pahoehoe lava could be done in shifts.[33] Equipment problems delayed the work in the late fall and winter of 1935-36. By September 1936, the road had been completed. It was 9.8 miles long and consisted of "loose gravel with sand and dirt filler," since it was intended primarily for administrative use such as accessing the seismograph at the road's end.[34] The CCC had to widen and deepen existing ditches and build and enlarge dry wall drains in 1937 after heavy rains washed out the original ditches.[35]

At the road's terminus, an Observation Building was constructed in the late 1930s following plans drawn by the NPS Branch of Plans and Design. The octagonal shelter had an asbestos cement shingle roof and battered lava rock piers and walls with windows and display cases. The shelter followed the principles of the Rustic style developed by the NPS by using native materials, in this case lava rock, to create a building that harmonized with the surrounding landscape. Park structures with hexagonal or octagonal plans "occur rather infrequently" in park architecture, "although the forms are particularly well-suited to overlooks having views in several directions," such as at the Mauna Loa Observation Building where visitors could look out over the slopes of Mauna Loa.[36] Another feature a short distance from the road's end was a below ground vault constructed of reinforced concrete with double walls and doors that held a seismograph and other instruments. Volcanologists at the Hawaiian Volcanoes Observatory operated the seismograph as part of their monitoring of Mauna Loa's volcanic activity.[37]

---

[30] Press Bulletin, Edward G. Wingate, Superintendent, August 19, 1935, from Superintendent Report 1936, HAVO Archives.
[31] Jackson, *Administrative History*, 229; "Narrative Report to the Chief Architect through the Superintendent of Hawaii National Park," by Merel S. Sager, Associate Landscape Architect, July 20 to August 20, 1935, in Folder: Narrative Report…Landscape Architect Merel Sager 1933 Oct. 17-1936 March 29, 1935, HAVO Archives. Crews began work on September 3, 1935. Photos show workers using a portable rock crusher and rolling subgrade. See 1936 Annual Report from Superintendent Report 1927-45, and 1937 Annual Report from Superintendent Report 1927-45, both in HAVO Archives.
[32] "Narrative Report to the Chief Architect through the Superintendent of Hawaii National Park," by Merel S. Sager, Associate Landscape Architect, Sept 20 to Oct 20, 1935 in Folder: Narrative Report…Landscape Architect Merel Sager 1933 Oct. 17-1936 March 29, 1935, HAVO Archives.
[33] "Report of the Camp Director to the Superintendent, Hawaii National Park, Month of July, 1936," in Superintendent Report 1936, HAVO Archives.
[34] Jackson, *Administrative History*, 229; "Report of W.J. Stephens, Project Superintendent, EDW to the Park Superintendent, Hawaii National Park, for the Month Ending September 30th, 1936," from Superintendent Report 1936, HAVO Archives.
[35] Report of the Acting Camp Director, W.J. Stephens to the Park Superintendent, Hawaii National Park, for the Month Ending January 31st, 1937, from Superintendent Report 1937, HAVO Archives.
[36] Albert H. Good, "Recreational and Cultural Facilities," Part II, in *Park and Recreation Structures* (Boulder, CO: Graybooks, 1990, reprint of 1938 edition published by U.S. Department of the Interior, National Park Service), 101; "Observation Building (Mauna Loa)."
[37] "Observation Building (Mauna Loa)," seismograph room.

The General Development Plan of the park from 1939 shows the trail to the summit, which closely follows the indicated 1931 alignment, still in existence. The road to Bird Park remains with its distinctive turnaround, although seemingly slightly altered. The 1935 preliminary alignment from Bird Park appears to have lost some of the sharper curves in favor of more rounded ones, although the switchbacks remain. The trail from Bird Park to approximately the 6,700' elevation is indicated on the 1939 plan and labeled "Mauna Loa Truck Trail," as well as the location of the seismograph vault. From the end of the "Mauna Loa Truck Trail" to the summit, the trail is labeled "Motorcycle Trail" with an annotation indicating "for quick access to scientific instruments, not for public use." The "motorcycle trail" was a more sinuous route than that indicated on the 1931 plan.[38]

The master plans make clear that NPS personnel did not intend to create an automobile-accessible road to the summit of Mauna Loa, but outside interests still rallied for a public access road. Throughout the 1930s, there was discussion about completing a road suitable for automobile use to the summit of Mauna Loa. On December 4, 1933, the City Planning Commission of Honolulu passed a resolution supporting "construction of the long planned automobile road to the top of Mauna Loa, and also requesting that a copy of this Resolution be forwarded to proper authorities in Washington." The commission believed that the construction of the summit road would improve visitation to the park by opening new sights to the public and encouraging longer visits as a result. They also saw the road as a way to advance scientific research "as repeatedly outlined by Prof. T.A. Jaggar, Jr., leading American volcanologist, and also might enable accurate prediction of pending volcanic outbreaks, with possible safeguards, to life and property." Jaggar noted that the volcano had a pattern of erupting an average of every three years and even in dormancy provided opportunities for scientific study.[39]

The Territory of Hawaii and the Island of Hawaii had vested interest in the construction of a road to the summit of Mauna Loa. Island residents worried that the completion of Haleakala Road on the Island of Maui would draw visitors away from Hawaii. They thought that having a road accessing another volcano on the island would pique the interest of people contemplating visiting the island. Enthusiasm remained when rumors of an available pot of construction money from the Public Works Administration circulated, as well as evidence of an impending Mauna Loa eruption.[40] Although Park Superintendent Boles had not been in support of road construction on Mauna Loa, his predecessor, Superintendent Leavitt, initially supported NPS involvement. Leavitt noticed that only Kilauea Military Camp users and locals used the trail to the summit regularly but believed that a road would increase traffic. He justified the construction by arguing in 1933 that it was necessary for scientific study and would increase tourism by opening a new part of the park that he thought held a great deal of "scenic interest."[41]

---

[38] United States Department of the Interior, National Park Service, Branch of Plans and Design, "General Development Plan, Part of the Master Plan for Hawaii National Park," as of Jan. 1939, HAVO Archives.
[39] J.D. McInerny, President, City Planning Commission, to E.G. Wingate, Superintendent, December 5, 1933 in Folder, Mauna Loa Road, 1933, 631-01, HAVO Archives.
[40] "Proposed Mauna Loa Highway."
[41] E.P. Leavitt, Superintendent to Frank Kittredge, February 24, 1933 in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.

BPR and NPS top officials, on the other hand, argued against a road to the summit. F.A. Kittredge, Chief Engineer of the San Francisco-based Branch of Engineering for the Bureau of Public Roads, expressed his opinion of the matter. Although "personally I am very much interested in a road to the Summit and believe that it would be a very fine attraction," Kittredge wrote to Superintendent Leavitt, he questioned the "advisability of undertaking the construction or pushing it until other projects which appear more urgent are taken care of."[42] The Acting Director of the National Park Service, Arthur Demaray, had concerns about the profitability of the construction. He pointed out that even if "all the automobiles on the Island of Hawaii were operated over the new road at least once a week and paid the Federal gas tax…there would not be enough revenue to justify this expenditure." Demaray even doubted that a toll on the road would produce enough revenue.[43] Horace Albright, Director of the NPS, stated unequivocally "in view of the present condition of the Federal Treasury there is no possibility of our giving the project any consideration now or in the early future." If funding ever became available, the road could be used by scientists who needed a "quick means of access to the summit of Mauna Loa in the case of volcanic activity" rather than a tourist route.[44]

NPS personnel's reluctance to extend the road to the summit was not only financially motivated but also was influenced by accessibility and landscape interest. John B. Wosky, Landscape Architect, had inspected the Mauna Loa trail to Red Hill in 1931-32. His comments reveal the concern NPS officials had with roads providing scenic experiences. Wosky noted that the preliminary survey of the route "switches back and forth across the trail and the scenery is identical to that on the trail." He also hinted that the local fervor supporting the building of the road was due to the possibility of having the government provide a road to the territory at no cost so interest would wane if the territory had to pay the construction bill.[45] In 1934, Merel Sager, NPS Landscape Architect, investigated the possibility of a summit road. He concluded that up to the 6,500' elevation, visitors would be able to see some interesting views, but that a road to the summit would not be scenic. There would not be a "changing series of attractive landscapes" once visitors got closer to the summit; instead, they would encounter a "desolate area of unaltering sameness." Furthermore, Sager argued "there is a human trait to want to get high in order to see far…but here too there is disappointment" because the views were restricted. In his opinion, experiencing Mauna Loa required "solitude" that could not be achieved if a "tourist highway" was constructed.[46] After the completion of the road to the 6,700' elevation in 1937, the discussion about building a road to the summit subsided for a while.

---

[42] F.A. Kittredge to E.P. Leavitt, Superintendent, March 8, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.
[43] A.E. Demaray, Acting Director, DOI, NPS to Frank Kittredge, Chief Engineer, Branch of Engineering, San Francisco, March 14, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.
[44] Horace Albright, Director, to E.P. Leavitt, January 6, 1933, in Folder: Mauna Loa Road, 1933, 631-01, HAVO Archives.
[45] "Report to Chief Landscape Architect on Inspection Trip Made by John B. Wosky, Assistant Landscape Architect to Hawaii National Park Dec. 30, 1931 to Feb. 16, 1932," written February 23, 1932, sent to Thomas Vint, Chief Landscape Architect, March 17, 1932, in Folder: Inspection Trip, Report on Landscape Architect John B. Wosky, 1931 Dec. 31-1932 Feb. 16 later A5427, D5815, HAVO Archives.
[46] "Proposed Mauna Loa Highway," 7-8.

Work occurred on Mauna Loa Road in 1949, when the lower five miles were realigned.[47] Various sections of the road were periodically sealed and paved.[48] By 1960, Mauna Loa was increasingly being used as visitors stayed longer in the park and therefore had more time to explore. Park personnel wanted to widen and surface the road, recommending widening the road to 18' with no shoulders, "the minimum width considered safe for two-way traffic."[49] In 1955, the road was widened from 8' to 16'.[50] The last three miles of road were "widened and graded to allow tourists to travel to roads end, a distance of ten miles from Bird Park" in 1956.[51] Ongoing maintenance problems are caused by the koa tree roots, which cause the pavement to crack in areas.[52] Aside from widening and repairs, the Mauna Loa Road has not been drastically altered since its completion.

Even though the NPS had firmly decided against a summit road, there was still discussion about routes outside park property. In 1948, the Hilo Lions Club obtained funding for constructing a summit road. The work was contracted to the Kulani prison crew at a rate of completion of nearly 4 miles a month.[53] On June 11, 1951, the Territory of Hawaii was authorized to construct an access road to a scientific observatory at the summit. The NPS granted permission for the last few miles of the new road to be built within park boundaries, coming from the north side of Mauna Loa.[54] NPS Landscape Architect Thomas E. Carpenter surveyed a route and found that the type of lava to be crossed would be the determining fact since aa was easier to build on and therefore cheaper. Road construction through aa lava required grading with a bulldozer while pahoehoe was much more complicated, requiring tearing out the pahoehoe lava and then putting down a "cushion of aa lava" that would have to be excavated from elsewhere to avoid scarring the roadside. The Department of Institutions, Territory of Hawaii and the National Park Service made the final decision as to the route, and by 1951, a rough 26-mile road that required four-wheel drive had been completed to a prefabricated weather observatory at the summit.[55]

---

[47] Jackson, *Administrative History*, 234.

[48] Bureau of Public Roads, Department of Commerce, "Report on Maintenance of Major Roads in Hawaii National Park," made by J.R. Lewis, District BR Engineer on February 18, 1955, in Folder: D30 Roads and Trails September 1954- October 1959; Memo from Fred T. Johnston, Superintendent to Regional Director, Western Region, Subject: Resealing Bituminous Roads, November 29, 1962, in Folder: D30 Roads and Trails March 1960-November 1962, all in HAVO Archives. For example, in 1955, 2.6 miles of road were base sealed and paved, while in 1958, 1.4 miles were resealed and chipped.

[49] P.E. Smith, Supervisory Engineer, and C.E. Krueger, Supervisory Landscape Architect, to Chief, WODC, Subject: Trip Report, Roads, Hawaii National Park, March 18, 1960 in Folder: D30 Roads and Trails 3/60-11/62, HAVO Archives.

[50] September 1955 and October 1955 Monthly Reports, from Superintendent Report 1955, HAVO Archives.

[51] Memo to Park Engineers from Supervisor, Construction and Maintenance, Report for the Month of May, 1956 from Superintendent Report 1956, HAVO Archives.

[52] Dennis E. Footer, Facility Manager, Hawaii Volcanoes National Park to Chief, Engineering and Safety Service, Western Region, January 2, 1985 in Folder: D30 Roads and Trails (includes bridges, tunnels, runways, and launching ramps, etc) 1978-82, HAVO Archives.

[53] July 1948 Monthly Report from Superintendent Report 1948; "Dramatic Scenic Highway," *The Honolulu-Advertiser*, December 22, 1949, 8 in Folder: Mauna Loa Road (Proposed), 1949-52, 631-01, HAVO Archives.

[54] August 1952 and November 1952 Monthly Reports, from Superintendent Report 1952, HAVO Archives.

[55] Landscape Architect Thomas Carpenter to Assistant Regional Director Sanford Hill, Subject: Report of Preliminary Survey Inspection for Mauna Loa Summit Road, Hawaii National Park, in Folder: Mauna Loa Summit Road, Report of Preliminary Survey Thomas E. Carpenter, Landscape Architect August 1951, 614-01; Landscape Architect Thos E. Carpenter to Asst Regional Director, Planning and Construction,

A ceremony on August 27, 1963, dedicated the opening of the road, which was proclaimed the "highest" road in the Pacific.[56] Despite the roughness of the road, there was optimism about its benefit to the island: "it is the beginning of what is destined to be an important scientific and tourist asset to the territory."[57] Some saw the road as a valuable tourist attraction because it would provide opportunities for winter sports. Mokuaweoweo crater on Mauna Loa was touted as having "advertising and promotional value that would add to Hawaii's fame as a resort area." There were also potential scientific benefits, as outlined by Thomas Jaggar, who "explained that a road passable to jeeps would enable the erection of weather stations, seismographs, tilt machines and other scientific paraphernalia to study earth movements in the Mauna Loa area."[58] The pronouncements about the importance of the road to the summit of Mauna Loa proved short lived. By March 1970, the road had to be closed because of the dangers to vehicles and visitors unprepared for the ascent as well as the damage being caused by the use of 4-wheel vehicles. In 1975, the trail reopened for use by jeeps.[59] Mauna Loa ultimately never attained the popularity of Kilauea, due to the difficulties of access even with the construction of a road to the summit, and the Mauna Loa Road remains a secondary road in the park's road system.

Road Development in the Parks

The National Park Service worked with the U.S. Bureau of Public Roads to implement a unified road construction program in the parks. The relationship was formalized with an interbureau agreement signed on January 18, 1926. The NPS focused on the aesthetics of the road while the BPR supplied the engineering and technical expertise, resulting in a "distinctive cultural landscape that has become a defining characteristic, not just of national park roads, but the National Park System in general."[60] In addition, in the 1920s, Daniel Hull, a landscape engineer, and Thomas Vint, a landscape architect, began working on creating a distinct National Park Service Rustic style that utilized the earlier work of landscape architects like Andrew Downing and Frederick Law Olmsted while also taking into consideration "scenic preservation." Although Hull left the National Park Service in 1927, Vint went on to develop the landscape

Subject: Supplemental Report of Survey Inspection for Mauna Loa Summit Road, Hawaii National Park, November 14, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01; Acting Superintendent to Regional Director, Region 4, Subject: Progress Report on Mauna Loa Summit Road and Observatory, October 23, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01; "Vance Says Mauna Loa Road will Sharpen Islands Appeal," *Honolulu Star-Bulletin*, October 18, 1951, in Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01, all in HAVO Archives.

[56] "Mauna Loa Road Pacific's Highest," *Honolulu Advertiser*, April 18, 1963, in Folder: D30, Mauna Loa Road, 12/23/55 to 11/63, HAVO Archives.

[57] "Opening Mauna Loa Wonders to Science and Tourists," *Honolulu Star-Bulletin*, October 19, 1951, In Folder: Mauna Loa Summit Observatory & Access Road, 1950-54, 614-01, HAVO Archives.

[58] "Mauna Loa Road Needed if Hilo is to be Warned of Eruption, Dr. Jaggar Reports," *Honolulu Star-Bulletin*, February 1, 1950 in Folder: Mauna Loa Road (Proposed), 1949-52, 631-01, HAVO Archives.

[59] "Closure of Old Jeep Trail at National Park Boundary," stamped April 6, 1970, and Arthur Hewitt Jr., Acting Supt. To Director, Western Region, Subject: Mauna Loa Jeep Route, March 25, 1970 both in Folder: D30 Roads and Trails, January 1969 to October 1971, both in HAVO Archives.

[60] Timothy Davis, Lead Historian, National Park Service, Park Historic Structures and Cultural Landscapes Program, "Historic Roads," *Landscape Lines*, 16, Draft, 4.

program through the Western Field Office, which began implementing master plans in the parks and developing park infrastructure designs that harmonized with the landscape.[61] The result of the work of the Western Field Office and Vint was a set of general principles to guide park road construction. The most important principle was that even during construction, the landscape had to be protected as much as possible. Throughout the 1920s and 1930s, park service designers worked on creating standards guiding the sloping and naturalization of road banks, drainage structures, parking areas, masonry work, and other structures like guard rails, tunnels, and bridges.[62] In addition, park designers worked on creating various types of park structures so that they too could harmonize with the landscape. These standardized designs were published in *Portfolio of Comfort Stations and Privies* (1934), *Portfolio of Park Structures* (1934), *Park Structures and Facilities* (1935), and *Park and Recreation Structures* (1938).

In May 1968, the National Park Service published "Park Road Standards" outlining the purpose and design of park roads, which reveals that the basic principles developed in the 1920s and 1930s had survived. George B. Hartzog, Director, described the place of the road in the national parks:

> Park roads are designed with extreme care and located with a sensitive concern for the environment....These roads can take you close to America's most breathtaking places of beauty and history. To experience park at its best, try getting away from your car.... The next best thing, for those who have neither time nor zest for roughing it, is a judicious use of park roads....But park roads are for leisurely driving only. If you are in a hurry, you might do well to take another route now, and come back when you have more time.[63]

The roads in the national parks were to incorporate the experiential aspect of the landscape as well as the visual, rather than simply being paths leading visitors to "scenic wonders." In addition, "every segment of every park road should relate to the environment through which it passes in a meaningful way, and should, to the extent possible, constitute an enjoyable and informative experience in itself."[64] To enhance the experience of driving through the park, the roads should be "laid lightly on the land" rather than simply running in straight lines. In addition, park service planners recommended providing points like parking lots, pulloffs, and vistas at which visitors could leave their automobiles and connect with the landscape. The design standards of road construction in the parks were explicitly stated. Foremost among the principles was that "the road is molded to the terrain through which and upon which it is passing." To achieve this, designers had to eschew cuts and fills whenever possible, instead choosing to follow the topography of the landscape. The scenic qualities of the landscape had to be used to their best advantage to create a "sense of intimacy

---

[61] Linda Flint McClelland, *Building the National Parks: Historic Landscape Design and Construction* (Baltimore: The Johns Hopkins University Press, 1998), see Chapters 5 & 6. See also Ethan Carr, *Wilderness by Design: Landscape Architecture & the National Park Service* (Lincoln: University of Nebraska Press, 1998).
[62] McClelland, Chapter 6.
[63] George B. Hartzog, Director, in U.S. Department of the Interior, National Park Service, *Park Road Standards* (Washington, DC: U.S. Government Printing Office, May 1968), np.
[64] *Park Road Standards*, np.

with the countryside through which it is passing." Ditches and slopes were to be carefully blended into the roadside by rounding slopes, blending them into existing vegetation, and planting them. For vertical grades, the maximum was 7 percent with 8-10 percent allowed for short distances. To make sure that visitors were able to experience the landscape, park roads were to be designed for 25 mph for major and minor roads in areas of natural or cultural resources, 45 mph for parkways and major roads in recreational areas, and 15 mph for special and interpretive roads.[65] These standards and guidelines were applied on the Mauna Loa Road but adapted to the particular environment through which the alignment would run. Yet the adherence to the basic principles of NPS road design and construction create a sense of continuity not only with the other roads and structures located within the park but also within the national park system as a whole.

Conclusion

Although Mauna Loa Road is a secondary road within the Hawai'i Volcanoes National Park road system, it plays an important role in providing visitor access to both points of interest along the route, such as the Tree Molds, koa groves, Bird Park, and the Observation Building and to hikers embarking on the trek to the summit. In addition, Mauna Loa Road serves an important administrative function by giving park personnel backcountry access as well as volcanologists accessing a seismograph located at road's end. Mauna Loa Road presents a compelling study of how the NPS developed roads that responded to the particular geographical challenges of the terrain as well as to tourism and visitor use pressure, balancing the dual mission of providing access to the resource while also protecting it and visitors. Finally, the road exhibits NPS road design principles developed in cooperation with the U.S. Bureau of Public Roads as well as the use of the Rustic style in structures along the road, all of which retain a high degree of integrity.

[65] *Park Road Standards*, np.

Major Bibliographical References

Duensing, Dawn. "Hawaii Volcano National Park Roads." HAER No. HI-47. Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1999.

_____. "Mauna Loa Road." HAER No. HI-50. Historic American Engineering Record, National Park Service, U.S. Department of the Interior, 1999.

Hawaii Volcanoes National Park archives, vertical files and Superintendent Reports.

Jackson, Frances. *An Administrative History: History of Hawaii Volcanoes National Park.* Honolulu, HI: Haleakala National Park, 1972.

Nankivell, Capt. John H. *The History of the Twenty-fifth Regiment United States Infantry 1869-1926.*

"Preliminary Mauna Loa Truck Trail Location," Hawaii National Park, Proposed ECW Project. June 28, 1935.

"The Service: Devoted to the Army and Navy in Hawaii." 7, no. 38 (Honolulu, HI, March 17, 1916).

U.S. Department of the Interior, National Park Service, Branch of Plans and Design. "General Development Plan, Part of the Master Plan for Hawaii National Park." January 1939.

_____. "Observation Building (Mauna Loa)." Preliminary Sketch. 1937.

U.S. Department of the Interior, National Park Service. "Roads and Trails System, Part of the General Development Plan for Hawaii National Park." Drawn by the Landscape Division from NPS Data as of 10/1/1931.

NPS Form 10-900-a
(8-86)

OMB No. 1024-0018
(Expiration 1-31-2009)

United States Department of the Interior
National Park Service

NATIONAL REGISTER OF HISTORIC PLACES
CONTINUATION SHEET

Section 10 Page 1

Mauna Loa Road
name of property
Hawaii, Hawaii
county and state

Geographic Data, UTM References

Zone	Easting	Northing
5	878736	2159841
5	879434	2159860
5	879791	2159081
5	880487	2158850
5	880863	2158150
5	881991	2157947
5	885982	2154445
5	887390	2154340
5	890111	2153017
5	889412	2152653
5	886729	2154059
5	884942	2154125
5	880907	2157666
5	880147	2157780
5	879200	2158359

Returned

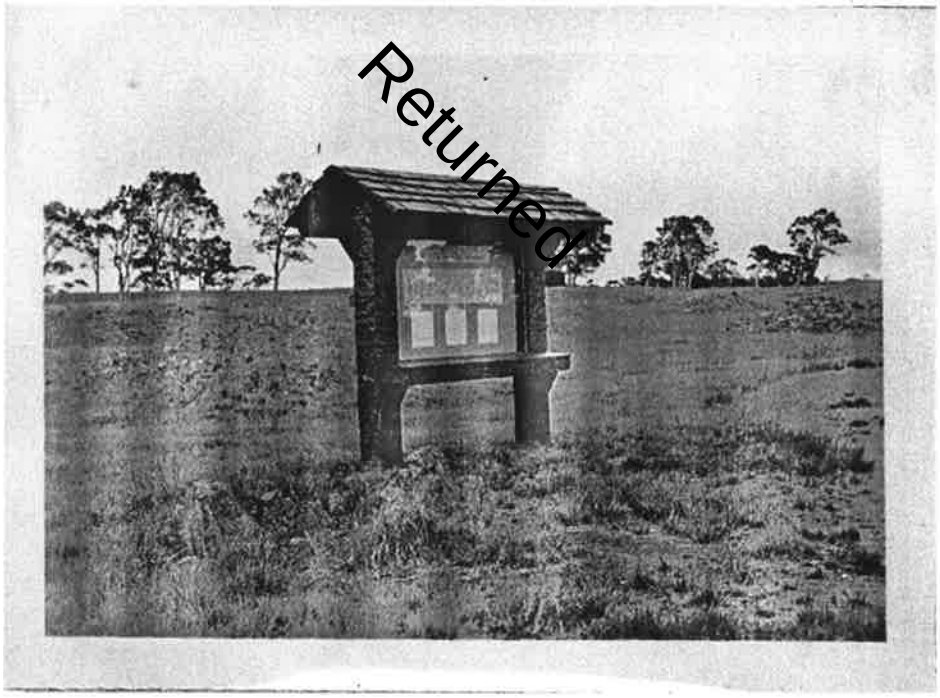
Quads: Kilauea Crater, Kipuka Pakekake

Old Hawaiian Datum

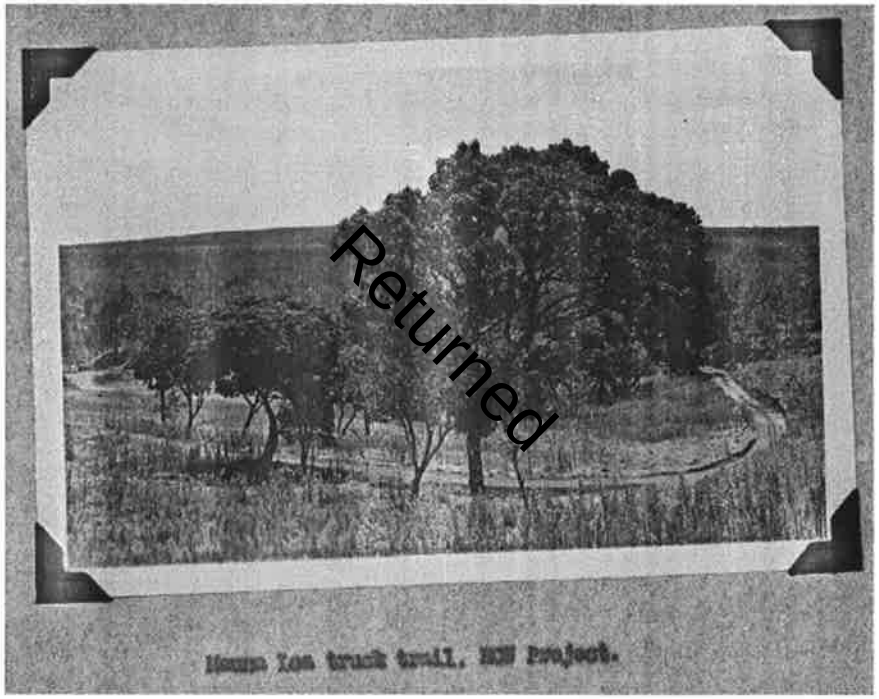
RELATED DOCUMENTATION

Historic Photographs

The following selection of historic photographs help document the construction and as built condition of the road and associated structures.



Tree Molds interpretive signage. From HAVO-370, Catalog # HAVO 4959, File Codes 610-01 thru 660-04.1, 1934-38, HAVO Archives.



Caption reads: "Mauna Loa truck trail, ECW Project." From Landscape Architect Merel Sager report, 1933-Oct. 17, 1936 August 1-30, 1935, Accession 370, Catalog #4959, HAVO Archives.

Seismograph. From HAVO-370, Catalog # HAVO 4959, File Codes 610-01 thru 660-04.1, 1934-38, HAVO Archives.

Mauna Loa Observation Building. From Photographic travelogue, c.1945, in Pacific Great Basin Support Office, National Park Service, Oakland, California.

Historic Maps (all available at HAVO)

U.S. Department of the Interior, National Park Service. "Preliminary Mauna Loa Truck Trail Location," Hawaii National Park, Proposed ECW Project. Traced by the Branch of Plans and Design from BPR Survey of 1925, June 28, 1935.

_____. "Mauna Loa Truck Trail, Bird Park to Volcano House," Hawaii National Park. Branch of Engineering, Prepared by Regional Office, 1937. 8 Sheets.

Drawing (available at HAVO)

U.S. Department of the Interior, National Park Service. "Preliminary Sketch, Observation Building (Mauna Loa)." Branch of Plans and Design, 1937.


Returned


Returned


Returned


Returned


Returned


Returned

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES
EVALUATION/RETURN SHEET

REQUESTED ACTION: NOMINATION

PROPERTY NAME: Mauna Loa Road

NR file copy

MULTIPLE NAME:

STATE & COUNTY: HAWAII, Hawaii

DATE RECEIVED: 7/8/2009 DATE OF PENDING LIST: 7/27/09
DATE OF 16TH DAY: 8/11/2009 DATE OF 45TH DAY: 8/22/09
DATE OF WEEKLY LIST:

REFERENCE NUMBER: 09000620

REASONS FOR REVIEW:

APPEAL:	N	DATA PROBLEM:	N	LANDSCAPE:	Y	LESS THAN 50 YEARS:	N
OTHER:	Y	PDIL:	N	PERIOD:	N	PROGRAM UNAPPROVED:	N
REQUEST:	N	SAMPLE:	N	SLR DRAFT:	Y	NATIONAL:	Y

COMMENT WAIVER: N

___ACCEPT ___RETURN ___REJECT_____DATE

ABSTRACT/SUMMARY COMMENTS:

RETURN

SEE ATTACHED COMMENTS

RECOM./CRITERIA Return

REVIEWER Paul Lusignan DISCIPLINE Historian

TELEPHONE_____ DATE 8/21/09

DOCUMENTATION see attached comments (Y/N) see attached SLR Y/N

If a nomination is returned to the nominating authority, the nomination is no longer under consideration by the National Park Service.

MAUNA LOA ROAD
Hawaii County, HI

National Register of Historic Places – Return/Review Comments:

The current nomination is being returned for technical and substantive revisions. The basic documentation outlines a property potentially eligible for listing in the National Register. Final review will be completed upon correction of the items noted below and resubmission of the required materials to the National Park Service.

Certification
The FPO certification box was not completed.

Location
The street address should be amended to add: *Mauna Loa park road from Highway 11 to Observatory Building; Hawaii Volcanoes National Park.*

Classification
The Resource Count needs to be revised to reflect the corrected status of several properties, see *Description* below. In particular, an additional contributing resource should be noted for the roadway system itself. The current discussion accounts for all of the nodes and various use areas, but neglects to count the roadway as a contributing structure.

Description
Day Use Site. The Day Use Site contains two physical resources that were not included in the resource count. If worthy of discussion as prominent recreational features of this site, they should be separately enumerated. This includes the (non-contributing?) comfort station and the historic(?) rustic shelter. Since the narrative does not provide a date for the *Day Use Site*, it is unclear how the resource(s) were defined as contributing. What basis is there for determining that the site dates from within the period of significance? Does it appear on maps, or in management plans of the period? Do the buildings or landscape elements reflect common historic forms see elsewhere in the park? Some form of circa date should be provided in order to assess the contributing status of the resources. (See Verbal Boundary Description discussion below regarding ongoing boundary issues.)

Bird Park. Does the site include the one-mile trail loop? Is the trail loop historic? Does it contain any common park features? We can assume that the information kiosk is not of sufficient scale to be regarded as a separate resource, yet the roadway's various kiosks are specifically called out in the significance statement on 8.2. (see Verbal Boundary Description discussion below regarding boundary issues at this site).

Roadway. The roadway itself is not given any in-depth description. Other than citing its general width are there any other distinctive historic engineering/construction features of the roadway system? Were there any shoulders or gutters? Were substantial cut and fill segments

completed? Does the road engineering itself still reflect historic materials and design specifications, or is it a "modernized roadbed" merely following the trace of the earlier roads? It would be nice to know if the roadway itself was an important physical component reflecting historic NPS design standards or merely a connecting link. (See resource count issue above, and the Verbal Boundary Description and Significance discussions below for more details.)

Where historic plans are provided for certain buildings the narrative should include references to those materials. It might also be useful to include copies of the HABS/HAER digitized drawings where relevant for describing certain roadway and building features.

Significance

The appropriate level of significance should be *local.* The SHPO certification marked national, but the current nomination does not provide justification for such a designation. The proper context for understanding the significance of this road is found at the park/local level. National significance is not necessarily established simply by virtue of the roadway being located in a National Park, or developed in line with broad National Park Service design policies. In the case of the Mauna Loa Road, the resource is a fine local manifestation of larger public policies and served an important infrastructure role in local park development. Unless the documentation can show how the efforts here set a significant precedent for later park designs or other transportation/recreation systems, or how this secondary road represents an exceptional example of its type within a national context, then national significance is not appropriate

Recreation/Entertainment could be considered as an additional area of significance to reflect the road's importance to the enhancement of the visitor experience in the park. Park trails and roads, as outlined in the historic park master plans, were seen as an important element of the visitor's recreational experience. In addition, the ongoing internal conflicts regarding the possible extension of the roadway reflected rather unique aspects of the history of recreational development within this particular park.

Period of Significance. The current period of significance runs from the initial development period in 1915 up to 1938. Little if any direct justification is provided, however, for starting the period at 1915. While initial planning and consideration of a route to serve Mauna Loa may have begun as early as 1915, the physical resources, as documented in this nomination, all appear to date from later NPS-initiated efforts. The earliest extant resource appears to date from c. 1920 (Tree Mold Site) and most date from the period 1929-1938. The narrative statement of significance in particular points to the involvement of the CCC as a major factor in the development of the current system. Consideration should be given to amending the period of significance to reflect the narrower period during which the road attained its current configuration and which is actually conveyed by the extant built resources.

It is not clear from the narrative the degree to which the 1949 improvements noted on 8.11 altered the earlier historic resource. The short notation that, "Work occurred on Mauna Loa Road in 1949, when the lower five miles were realigned," begs the question "To what extent does this portion of the 11-mile long road retain integrity from the 1929-1938 period?" Likewise, additional work on the roadway in 1955 to widen the road surface from 8' to 16' is treated as only a minor deviation instead of the major alteration to the historic fabric and experiential nature of travel on the roadway. Loosing small portions of the shoulder of a road is

one thing, but the wholesale doubling of the road surface is more than a minor alteration and should be scrutinized much more carefully to assess whether or not the resource being nominated truly conveys its historic period integrity of design, materials, workmanship, setting and feeling. It is troubling that the nomination makes note of these changes only in a single paragraph hidden within the statement of significance rather than in the narrative description of the property (see Description concerns above). The period of significance may need to acknowledge these physical changes depending on the outcome of the more detailed integrity evaluation.

Geographical Data

There was no acreage provided for the nomination.

An original USGS map was not provided. The UTM Coordinates could not be verified at this time.

Verbal Boundary Description. The current verbal boundary description does not adequately describe the nominated resources. Inclusion of a properly scaled (1" = 200') sketch map could assist, particularly for the development node areas, but the narrative also needs to be revised to better address the full extent of the historic features associated with this property. Limiting the boundary to a 12' wide right-of-way corridor may encompass the limits of the paved roadway, but may fail to account for the significant contributions of the road's immediate setting to its design and the overall travel experience. (How does this match the issue of widening to 16' noted in 8.11?) In addition, limiting the bounds may not always take into account the various features of the road corridor (drainage features, etc.) along the roadway.

The current description fails to address exactly how the boundary will conform to the planned nodes of development. Is it limited to the outside dimensions of the physical resources or does it encompass broader setting and physical use areas? While the bounds should not include unnecessary buffers or viewsheds, they should acknowledge the surrounding immediate setting and landscape. The description narratives are not always clear on the inclusion of trails or overlook features and the full extent of the built up areas.

If you have questions regarding these comments, please contact me directly at the number or e-mail listed below.

Paul R. Lusignan, Historian
(for) Keeper of the National Register
(202) 354-2229
Paul_lusignan@nps.gov

S:\nr\lusi\slrtemp\maunaloaroad.rtn

United States Department of the Interior

NATIONAL PARK SERVICE
Hawai'i Volcanoes National Park
Post Office Box 52
Hawaii National Park, Hawaii 96718

IN REPLY REFER TO:
HAVO A.2

Memorandum

To: Associate Director, Cultural Resources
Attention: Chief Historian

From: Superintendent, Hawai'i Volcanoes National Park

Subject: Resubmission of National Register Nominations for Hawai'i Volcanoes National Park Roads: Crater Rim Drive, Hilina Pali, and Mauna Loa

In 2007 the park transmitted three nominations your office that were reviewed and returned to the park with comments by National Register Historian, Paul Lusignan. Additional comments from the Pacific West Regional Historian, David Louter, were also provided to the park.

The original nominations had also been submitted to the State of Hawaii Historic Preservation Division, and were accepted as additions to the State Register. The current submission includes a new nomination for Crater Rim Drive (CRD), with extensively updated information for the other two road nominations; Hilina Pali, and Mauna Loa. The comments from the two reviewers have been incorporated into all of the current nominations.

The primary writer of the new work is Dr. Larry Frey, Historic Landscape Architect. Because Justine Christianson established much of the original formatting and research for the Hilina Pali and Mauna Loa Road nominations, she is listed as a co-author. Upon receipt of comments from your office, we will provide the State Historic Preservation Division with the updated nominations.

If you have any questions regarding this submission, please contact Laura C. Schuster, Chief of Cultural Resources at (808)985-6130 or laura_c_schuster@nps.gov or Larry Frey at (808)985-6135 or larry_frey@nps.gov.

Attachments (3)

cc: David Louter, Pacific West Regional Office

United States Department of the Interior

NATIONAL PARK SERVICE
1849 C Street, N.W.
Washington, DC 20240

November 25, 2014

Memorandum

To: Acting Keeper of the National Register of Historic Places

From: Deputy Federal Preservation Officer, National Park Service

Subject: Resubmission of National Register Nominations for Mauna Loa Road and Hilna Pali Road Historic District, Hawaii Volcanoes National Park

I am forwarding the resubmitted National Register nominations for two properties within Hawaii Volcanoes National Park: Mauna Loa Road and the Hilna Pali Road Historic District. The nominations were originally submitted in 2007 and returned by the National Register program for revisions. Comments received in 2007 have been incorporated into the revised documents. The revised documents have been reviewed and found to meet the requirements for listing in the National Register at the statewide level of significance, with the addition of minor changes, which will be met through use of Supplementary Listing Records.