

TRAIL RIDGE ROAD
Rocky Mountain National Park
Between Estes Park and Grand Lake
Estes Park vicinity
Larimer County
Colorado

HAER No. CO-31

HAER
COLO
35-ESP.V
7

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
P.O. Box 37127
Washington, D.C. 20013-7127

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Location: Traversing Rocky Mountain National Park from
Estes Park to Grand Lake, Colorado.

Quadrangle and UTM: East end: Fall River Entrance
Estes Park quad 13/448191/4470700

West end: Grand Lake Entrance
Grand Lake quad 13/428765/4456351

Construction Date: 1926-1949

Present Owner: Rocky Mountain National Park, National Park
Service

Present Use: Park scenic highway

Significance: Trail Ridge Road has national, state, and
local significance as an engineering feat--
the highest continuous highway in the United
States--and for its role in the development
of the Rocky Mountain National Park road
system.

Project
Information: Documentation of Trail Ridge Road is part of
the National Park Service Roads and Bridges
Recording Project, conducted during the
summer of 1993 under the co-sponsorship of
HABS/HAER and Rocky Mountain National Park.

Richard Quin, HAER Historian, August 1993

II. HISTORY

The highest road in the national park system, and the highest continuous paved highway in the United States, the Trail Ridge Road is the principal highway crossing Rocky Mountain National Park between the park border communities of Estes Park and Grand Lake. The road was constructed largely between 1929 and 1932 to replace the Fall River Road; after its completion, the western portion of the old road was abandoned, and the eastern segment became a one-way uphill road. The new Trail Ridge Road became the only through route across the park.

Trail Ridge Road was built under Bureau of Public Roads (U.S. Department of Agriculture) construction supervision by various contractors. In the final location survey, station numbers were established running downhill from Fall River Pass (station 0). The road was then divided into contract sections and these segments were advertised for construction to various companies and subcontractors. The road was still under construction during the Depression and provided considerable relief work for the area's unemployed.

Although some travel accounts and signage suggest that the Trail Ridge Road begins at Deer Ridge, construction contracts were eventually awarded for reconstruction of existing roadway from the Fall River Entrance into Horseshoe Park and for a connector road from Horseshoe Park to Deer Ridge. (Present maintenance contracts cover the road from the Fall River Entrance on the east edge of the park to Grand Lake in the southwest corner. This section is a continuation of U.S. Highway 34 across the park.)

The road enters the park along the Fall River, following the general route of the old Fall River Road west into Horseshoe Park. In the wide riverside meadows, the Trail Ridge Road crosses Fall River and climbs on the 1926 connector section to the Deer Ridge junction with the present main park entrance road from Beaver Meadows. The scenic highway then drops over Deer Ridge into Hidden Valley, following Hidden Valley creek for a mile and a half before climbing a long switchback (Many Parks Curve) to reach Trail Ridge. This is a high spur range extending east from the main range of the Rockies and forms the divide between Fall River and the Big Thompson River. Its flat top

varies from one-quarter mile to a mile in width. The road crosses and recrosses the crest of the ridge in numerous places, offering stunning views into various side canyons.¹

Near Lava Cliffs, formerly known as the Iceberg Lake area, west of Tundra Curves, the road reaches its high point of 12,183'. This is the highest elevation attained by a continuous highway in the United States, though dead-end roads farther south in Colorado climb Mount Evans (14,264') and Pikes Peak (14,110'). From the high point the road drops to Fall River Pass at 11,797', then drops to the Continental Divide at Milner Pass (elev. 10,758'). Another series of switchbacks is descended at Farview Curve, then the road follows the floor of the North Fork Colorado River Valley south to the Grand Lake Entrance.

Across the Great Divide

Trail Ridge was evidently once used by native Americans to cross the mountains between their home lands on the west side of the range and hunting grounds to the east. A party of elderly Arapahoe Indians invited to Estes Park in 1914 identified the ridge as the location of a trail they called *taieonbaa*, or "Where the Children Walked," as the trail was so steep that children could not be carried on travois but rather had to walk alongside.² The Ute tribe crossed the mountains at Forest Canyon Pass, supposedly marking the route with stone cairns. The present park Ute Trail generally follows a part of this ancient route.

On the west side of the present park, rough wagon roads serving gold and silver distant mines were constructed long before the park was established. The first of these was constructed up the Kawuneechee Valley over Lulu Pass (now Thunder Pass), connecting with a stage road to the mining town of Teller. During the subsequent mining boom, a wagon road was constructed from the town of Grand Lake, then the county seat of Grand County, north to the mining camps of Lulu City and Gaskil, where a connection

¹ S.A. Wallace, Chief of Survey, "Report of Surveys, Rocky Mountain National Park, Colorado" (Denver, CO: United States Department of Agriculture, Bureau of Public Roads, 1928), 2.

² Mary Lyons Cairns, *Grand Lake: The Pioneers* (Denver, CO: The World Press, 1946), 71.

was made with the Teller stage road. From 1880 to 1883, this road was used to transport freight to and from the mines. The mining boom proved short-lived, however, and the camps were deserted by the mid-1880s. Following the abandonment of the mines, the road fell into disuse, but was used occasionally by hunting and tourist parties. Robert L. "Squeaky Bob" Wheeler opened the first dude ranch in the area, which he called "Camp Wheeler" or the "Hotel de Hardscrabble," along the old road near Phantom Creek; this became the Phantom Valley Ranch.³

In 1913, the State of Colorado and Larimer and Grand counties began construction of the Fall River Road [HAER No. CO-73], the first transmontane road across the Continental Divide in the area now encompassed within the park. The road was intended to provide a connection between Estes Park and Grand Lake, and incidentally, to serve the increasing numbers of tourists visiting the area. By the end of 1915, when Rocky Mountain National Park was established, the road had only progressed a short distance into the park on the east side from Estes Park, while Grand County was only beginning the relocation of the old wagon road on the west side. The work was pushed along for another five years, and the Fall River Road was completed in September 1920.

While the Fall River Road was a popular road on account of the stunning scenery, it proved difficult for many vehicles to traverse and required costly periodic maintenance. Its curves were of tight radius, the grade was steep, the roadway was narrow, and snow accumulated to great depths over much of the distance. Some motorists were too frightened to drive over the road, and others found their vehicles could not negotiate the grade on account of low gear ratios or gravity-feed fuel systems.

³ T. Ferrel Atkins, Ranger/Historian, Rocky Mountain National Park, "Colorado's Spectacular Trail Ridge Road," *Colorado Heritage News*, February 1985, 5; Robert Coffey, Chief Engineering Inspector-Superintendent, U.S. Department of Agriculture, Bureau of Public Roads, "Final Construction Report (1930-31-32) on Fall River Pass National Park Highway, Project 1-C, Larimer and Grand Counties, State of Colorado" (Denver, CO: Bureau of Public Roads, District No. 3, 20 May 1933), 3; Lloyd K. Musselman, *Rocky Mountain National Park Administrative History, 1915-1916* (Washington, D.C.: National Park Service, Office of History and Architecture, Eastern Service Center, July 1971), 11-14.

Only two years after the Fall River Road opened, Park Superintendent Roger W. Toll suggested the construction of a new road from the Moraine Park Road or the "Highdrive" up Trail Ridge to the Fall River Pass. The section would alleviate many of the problems of the eastern side of the old route. While nothing was done to act immediately on Toll's proposal, by the mid-1920s the National Park Service was considering construction of a new, more carefully located highway across the park. This was prompted by the \$7.5 million roads appropriation for the national parks, of which Rocky Mountain National Park was assured a sizeable share. In 1925, resident park engineer George A. Gregory began conducting investigations for the relocation of a portion of the older "Highdrive" route in the eastern section of the park. The new section he surveyed would become the Hidden Valley section of the Trail Ridge Road.⁴ Planning for the new road was turned over to the Bureau of Public Roads (BPR) after the National Park Service agreed to turn over its major road projects to the Bureau for construction planning and supervision.

This report traces the construction of the road section-by-section, in the order in which the various contracts which were awarded for the work.

Horseshoe Park--Deer Ridge, Project 1-A

The connecting road between the Fall River Road in Horseshoe Park and Deer Ridge was the first segment of the new highway to be constructed. The new road would replace the northern part of the old "Highdrive" scenic loop road into the park from Estes Park. The project was the one of the first major road construction projects undertaken under the 1926 three-year park road reconstruction program (see the overview, pages 35-40). On 20 May 1926, the Bureau of Public Roads advertised bids for the Project No. 2, reconstruction of 1.8 miles of the "Highdrive" on the north side of Deer Ridge. BPR engineer W. L. Lafferty spent several days in the park inspecting the proposed line and going

⁴ Roger W. Toll, Superintendent, Rocky Mountain National Park, Superintendent's Annual Report, 1922, 16; Superintendent's Monthly Report, May 1925, 7; Superintendent's Monthly Report, June 1925, 7; Superintendent's Monthly Report, July 1925, 8; Glen Kaye, *Trail Ridge* (Estes Park, CO: Rocky Mountain Nature Association, 1982), 4.

over the project with prospective bidders. Lafferty remained in the park as resident engineer.⁵

On 10 June, the \$44,000 contract was let to Luke E. Smith & Co. for construction. The contract included construction of a stone-faced reinforced concrete bridge over Fall River. Unfortunately, no construction reports for this segment were located, and details on the contractor's operations cannot be described. The work was completed in October and was inspected by Superintendent Toll and BPR District Engineer Junius W. Johnson. NPS Associate Landscape Engineer Thomas C. Vint inspected the work in November and accepted it for his division.⁶

The new Horseshoe Park Bridge was a stone-faced "rustic style" bridge designed by the National Park Service's Engineering Division. Like bridges constructed at Yellowstone, Yosemite, Mount Rainier and several other parks, the Fall River Bridge appeared to be of stone construction; actually, it was a reinforced concrete structure faced in native stone.⁷

Location Survey and Design

Planning and design of the major portion of the road, from Deer Ridge to Grand Lake, began in 1926. The National Park Service desired a road with more moderate grades, gentler curves, fewer places of heavy snow accumulation, and better scenic opportunities. That year Superintendent Toll, Assistant Superintendent Edmund Rogers, and Park Service landscape architect Howard Baker accompanied Steven A. Wallace, location engineer for the Bureau of Public Roads, on a reconnaissance of possible

⁵ Toll, Superintendent's Monthly Report, May 1926, 4; Superintendent's Monthly Report, June 1926, 3.

⁶ Idem, Superintendent's Annual Report, 1926, 8, 15; Superintendent's Annual Report, 1927, 6; Superintendent's Monthly Report, October 1926, 3; Allen, Superintendent's Monthly Report, November 1926, 1.

⁷ For construction plans, see National Park Service, Engineering Division, "Horseshoe Park Bridge, Rocky Mountain National Park," construction drawing RM 4720 (Portland, OR: National Park Service, Engineering Division, 26 November 1925). This bridge was replaced in 1963.

locations for a new road route over Trail Ridge. Following the tour, Wallace was instructed to conduct a formal location survey of the Trail Ridge route. He was to try to locate a line with a 5 percent maximum grade providing the best access to the most outstanding scenery.⁸

Wallace was a skilled surveyor who had come to the BPR from work with the Santa Fe railway. His BPR contemporaries called him the "Bull of the Woods" for his achievement in locating roads through difficult terrain. One recalled that he had "an elusive trait of having a "feel" for the country," or a full understanding of physiography and topographic features.⁹

The location survey began in 1926 and was completed the following spring. The party packed in on horses, establishing field camps 6 miles apart, so they had to carry their heavy equipment for distances of 3 miles or less. Wallace ranged ahead of his crew, establishing control points for the centerline survey. He also made trips into the park during the winter to investigate snow and avalanche conditions.¹⁰

In the survey report, Wallace suggested there would be no serious construction problems on the route. Only a few sections would require heavy excavation. The road could be constructed without seriously interfering with traffic, which would continue to use the Fall River Road while construction was underway. A ruling grade of 5 percent was specified, with a few short stretches up to 7 percent; as over 3,400' in elevation was gained by the route, maximum grades would be required for most of the distance. The minimum radii for open curves would be 100' and 200' for blind curves. (By contrast, the Fall River Road had grades up to 16 percent and curves with extremely narrow 20' radii.) The location report also hailed the scenic attributes of the proposed route.

⁸ Atkins, 5; Daniel C. Harrington, "The Trail Ridge Saga," typed transcript of an address delivered at Rocky Mountain National Park, 17 July 1982. RMNPHC.

⁹ Harrington, 2-3.

¹⁰ Ibid., 4.

The surveyed route via Trail Ridge is one of unsurpassed mountain scenery, high mountains, deep canyons, many lakes and perpetual snow, alpine flower gardens and wooded areas all combining to make a trip over not to be forgotten. . . . This route is needed, to better the snow conditions and provide a road that will be open to traffic a longer period of the year, reduce the cost of maintenance, and most of all to relieve traffic congestion.¹¹

The report also described a new route from Fall River Pass down to Milner Pass. Rather than follow the old road route over Forest Canyon Pass and down the steep switchbacks to Milner Pass, the new road was to drop around a single switchback (Medicine Bow Curve) and follow a lower line down the ridge closer to the Cache la Poudre River, about half a mile northwest of the old road. The road would pass around the northeast side of Poudre Lakes,¹² meeting the old road just beyond at Milner Pass. From there, the road would follow the old route for the first 2 miles, although the alignment and grade would be improved. From "Far View Curve," the road would turn back northeast towards the Colorado River where better grades could be obtained. (The old road continued due west from Far View Curve down a series of seven steep switchbacks). The new road would be somewhat longer, but this undesirable increase in length was necessary to obtain easier grades. The lower section of the road along the Colorado River needed only widening and minor changes to alignment. However, after the new road from Estes Park was completed, this section would require reconstruction as well. At the time of the survey, approximately 2 1/2 miles of the route was located in the adjacent Arapahoe National Forest; however, with the 1930 extension of the park boundaries to include the North Fork Colorado River valley and much of the Never Summer Range, all of the project would be located in the national park. BPR Senior Highway Engineer A. E. Palen, accompanied by Superintendent Toll and Assistant Superintendent Thomas J. Allen, Jr., inspected the

¹¹ Wallace, 2-4.

¹² Originally two shallow ponds, since 1965 considered "Poudre Lake."

proposed line for the relocation of the section between Milner Pass and the Colorado River in September 1927.¹³

Following acceptance of the survey report, plans and estimates for the new road were prepared in the District No. 3 office of the Bureau of Public Roads in Denver in 1927 and 1928. The 18' 1926 Forest Highways Standard was used as the basis for the design. This called for a 22' roadbed with a 3' ditch in cut sections, and again, a maximum grade of 7 percent, and 100' minimum radii for open curves and 200' radii for blind curves. The new route would be constructed with balanced quantities of materials, meaning there should be no excessive waste or side borrowing. It was designed to flow across but not dominate the landscape.¹⁴

The new road would generally follow the route of the existing pack trail, which climbed from Deer Ridge up Hidden Valley, then over the crest to Poudre Lake and on to Phantom Valley Ranch on the west side of the park. It would not be constructed directly atop the old trail, but generally crossed it at right angles, leaving segments intact as foot trails or pack routes.¹⁵

Wallace's proposed route was checked again by Edmund Rogers (now park superintendent), landscape architect Baker, and BPR engineer Clyde E. Learned. A few line changes were recommended "to enhance landscape objectives." The revised survey was then accepted and the Bureau of Public Roads began the preparation of construction drawings and specifications for the new road and its accompanying structures.¹⁶

¹³ Ibid., 5-6; Coffey, 5; Toll, Superintendent's Monthly Report, September 1927, 1.

¹⁴ Coffey, 5.

¹⁵ Ibid., "Roads and Trails of the Rocky Mountain National Park, Estes Park, Colorado (Estes Park, CO: National Park Service, Rocky Mountain National Park, n.d.), 3. RMNPHC.

¹⁶ W.L. Lafferty, Assistant Highway Engineer, U.S. Department of Agriculture, Bureau of Public Roads, "Final Construction Report (1929-30-31-32) on Fall River Pass National Park Highway, Trail Ridge Section, 1-B, Rocky Mountain National Park, Larimer County, State of Colorado" (Denver, CO: Bureau of

BPR Western Regional Office Chief Laurence I. Hewes and District Engineer Junius W. Johnson inspected the proposed route in August 1928. The proposed line was reviewed later in the month by Frank A. Kittredge, NPS Chief Engineer. Kittredge had surveyed and overseen construction of the famous Going-to-the-Sun Highway [HAER No. MT-67] in Glacier National Park and much of the road reconstruction work in Yosemite National Park [HAER No. CA-117] before becoming chief of the Engineering Division. Kittredge walked over the route of the survey line and made a number of recommendations for possible changes. At the end of the month, NPS Chief Landscape Architect Thomas C. Vint (promoted that year to division chief) also inspected the proposed line, paying particular regard to landscape considerations.¹⁷

In October 1928, Wallace conducted additional survey work to determine the feasibility of relocating the line along the alternate sections suggested by Kittredge. Another inspection of the route was made the following spring by Merel S. Sager, Assistant Landscape Architect from the Park Service's San Francisco office.¹⁸ Such involvement between the Engineering and Landscape Architecture divisions of the National Park Service and the Bureau of Public Roads is characteristic of the close cooperation between the two agencies.

National Park Service Director Horace M. Albright announced in the spring of 1929 that Rocky Mountain National Park was to be appropriated \$1.75 million for a ten-year road construction and improvement program. A new, \$650,000 "wonder road" would climb

Public Roads, 12 June 1933), 5; Harrington, 4.

¹⁷ Thomas J. Allen, Jr., Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, August 1928, 1-2.

¹⁸ Idem, Superintendent's Monthly Report, September 1928, 1; Rogers, Superintendent's Monthly Report, June 1929, 1. Sager also worked on the main entrance road in Mesa Verde National Park [HAER No. CO-xx] and the Generals Highway [HAER No. CA-140] in Sequoia National Park. Sager was one of a number of assistant landscape architects who were assigned to several parks in the summer and spent the winter in the San Francisco office preparing plans for their projects.

Trail Ridge toward Milner Pass, superseding the Fall River Road.¹⁹

A March 1929 Park Service press release estimated the cost of the "Deer Ridge Highway over Fall River Pass" at at least \$1,000,000. Grading was expected to cost \$800,000 and surfacing at least \$200,000. Total length of the project would be 30.27 miles. (These figures do not include the extension of the road for the final few miles down the Kawuneechee Valley to Grand Lake.) Construction was expected to last for three seasons.²⁰ No decision had yet been made concerning the future use of the Fall River Road. In a May 1929 article in the *Estes Park Trail*, Superintendent Rogers stated that it might continue in use or could be converted to a pack trail.²¹

Kittredge, Vint and Sager all visited the park again in June to review the final proposed line for the new road. Director Albright made a personal inspection of the route in August and gave his approval for the construction to begin.²²

East Side Construction, Project 1-B

In April 1929, Congress appropriated \$450,000 for the construction of the first segment of the road. The work was advertised in August in the (Denver) *Rocky Mountain News* and the *Salt Lake [UT] Tribune*, and on 3 September, the first contract (Project 1-B) was awarded to W. A. Colt and Son of Los Animas, Colorado. The \$393,674.80 award was for the 17.2-mile east side section between Deer Ridge and the Fall River Pass. (An additional \$18,325.20 was added for contingencies, and another

¹⁹ Musselman, 77.

²⁰ "Government Will Abandon Fall River Road for Trail Ridge Highway," *Estes Park [CO] Trail*, 29 March 1929.

²¹ Edmund B. Rogers, "Trail Ridge Road Will Be Highest in National Parks," *Estes Park [CO] Trail*, 24 May 1929.

²² Idem, Superintendent's Monthly Report, July 1929, 3; Superintendent's Monthly Report, August 1929, 1.

\$42,050 for BPR engineering fees.) Colt established his construction camp at Hidden Valley and began work on 28 September.²³

Colonel W. A. Colt was seventy-three years old when he received the award for the project. Colt had built a number of other roads in high mountain passes, including the road over Wolf Creek Pass (elev. 10,850) in the San Juan Mountains of southwestern Colorado. He began his career working on the Erie Canal in the 1870s, then on the Texas & Pacific Railway and the Jay Gould Lines in Missouri. He also constructed the St. Louis, Iron Mountain & Southern Railroad. He came to Colorado while building a segment of the Missouri Pacific railway.²⁴ (All of these railroads eventually were controlled by speculator Jay Gould.) When he was awarded the Trail Ridge Road contract, Colt, now a large general contractor, had just completed surfacing project the park's Bear Lake Road.

Colt's road camp was constructed so that it could be moved by trucks as the road work proceeded. The camp buildings consisted of composition board nailed to wooden frames and were topped by tarpaper roofs. By placing the structures on the right-of-way, damage to the surrounding landscape was minimized. Even a moveable road camp could not stay close to the early clearing and grubbing crews, and one worker later recalled that Colt worked three crews--one working, one leaving, and one on the way! In addition to Colt's moveable camp, which was eventually relocated to four different places, a subcontractor for the rubble masonry and concrete work established a separate camp near the middle of the project.²⁵

Colt began clearing operations at Deer Ridge, using a light gas shovel to "pioneer" along the staked centerline. However, this small shovel could only handle material that could easily be

²³ Idem, Superintendent's Annual Report, 1929, 4; Lafferty, 5-7; Musselman, 91; Atkins, 6.

²⁴ "Builder of Trail Ridge Road Honored," *Longmont [CO] Times*, 16 February 1955.

²⁵ Lafferty, 7-8; Musselman, 90-91.

sidecasted, about 35 percent of the total excavation to be removed. By the end of October, the shovel had advanced about three miles from the eastern end of the project.²⁶

Salvageable timber was stacked along the way for use by the Park Service, and the lumber was subsequently used in the construction of sundry park structures. Slash was burned in the right-of-way and cull timber was salvaged for construction use. By the end of January 1930, most of the clearing and brush disposal had been completed. The steam shovel had advanced to station 767, approximately 5 miles above the eastern end of the project. The construction crew consisted of about 45 men.²⁷

In February, the contractor brought in a smaller gasoline shovel to begin rock excavation work; the other shovel continued with the pioneer work. Other equipment used in the first season included two air compressors mounted on trucks, a Caterpillar tractor, eight dump trucks, and three service trucks. Winter weather forced a brief shutdown in February and a three-week suspension in March.²⁸

To accelerate the work, Colt purchased another gas shovel and a new air compressor. The work resumed in early April with the new shovel assigned to finish the grading operations. At first, the equipment worked on the lower section of the road, snow and frozen earth prohibiting work higher up. While the clearing and pioneer road construction continued, a small crew of eight men began construction of 8' x 6' reinforced concrete box culverts at stations 901 and 950.²⁹

²⁶ Lafferty, 8; Rogers, Superintendent's Monthly Report, October 1929, 2.

²⁷ Harrington, 5; Lafferty, 8-10, Rogers, Superintendent's Monthly Report, January 1930, 2.

²⁸ Lafferty, 10-11; Rogers, Superintendent's Monthly Report, February 1930, 1-2.

²⁹ Lafferty, 11-13; Rogers, Superintendent's Monthly Report, May 1930, 2-3.

With all three shovels now in operation, rough grading for the lower 3 1/2 miles of the road was soon completed. One of the shovels then began the pioneer grading for the remainder of the road. A fourth gas shovel was purchased on about 1 June, and as soon as snow had been cleared from the Fall River Road two weeks later, it was sent to station 0 at Fall River Pass to begin grading down eastward from the top. By mid-August, it had prepared a rough grade extending east from the pass for four miles and began rock excavation on the intervening section. A fifth shovel arrived on 18 August and began work from the west end. Twelve men with two tractors, a grader, and four horses, were assigned to trim slopes, remove rocks from the roadbed and construct ditches, and another twelve men were assigned to work on hand-laid rock embankments. (Most of the rock work on this segment was, however, done by a subcontractor.) The contractor's forces now consisted of a superintendent and 100 men. A new road camp was established at the old Timberline Road Camp on the Fall River Road. Superintendent Rogers described it as consisting of four bunk houses and a cook shack mounted on a truck chassis.³⁰

As the work progressed, it was constantly monitored in inspections by the park superintendent and by staff from the Park Service Landscape Architecture and Engineering divisions. NPS Assistant Engineer A. van V. Dunn from the San Francisco office spent the summer of 1930 in the park devoting his time to engineering problems. Chief Engineer Kittredge joined Dunn in August to review the road work. (While in the park, the two made a climb of Longs Peak on 10 August.) Kittredge made another trip in October, and Thomas Vint made several visits for the Landscape Architecture Division. Director Albright made a personal inspection of the road in late June. Bureau of Public Roads district and regional office personnel also made continual inspections of the project. Assistant District Engineer Palen reviewed the project's progress in late June. Dr. Laurence I. Hewes, Chief of the Bureau's Western Regional Office, accompanied by District Engineer Clyde Learned from the BPR's Denver office, inspected the work in July. Palen and BPR Assistant Construction Engineer G. W. Mayo reviewed the work again at the end of September.³¹

³⁰ Lafferty, 11-13; Rogers, Superintendent's Monthly Report, June 1930, 3-4; Superintendent's Monthly Report, September 1930, 3.

As road crews began work above timberline, a number of problems were encountered. Normal drills would not penetrate the frozen tundra, and new equipment had to be designed. Harsh weather and the thin air over 11,000' made heavy labor difficult. High winds and snowstorms hampered operations.³²

In August, twelve men began drilling operations at "Rock Cut" on Monument Ridge. A new Ingersoll-Rand compressor and drill rig was employed along with several portable compressors. A gas shovel was sent to the Iceberg Lake area to complete the grading work, under strict orders that construction work be kept within the staked area so not to damage to the fragile alpine tundra. A foreman and ten men were detailed to finishing work, such as ditch construction, slope rectification and blading. Their equipment consisted of a tractor, two blades, two trucks, two fresnos, and four horses. Another crew of ten men were engaged in placing corrugated metal pipe culverts ahead of the grading. The subcontractor's crew constructing the hand-placed rock embankments was increased to a foreman and twenty-three men. In an effort to prosecute the work more rapidly, Colt increased his own work force considerably. At the end of the month, it consisted of a project superintendent, six foremen, eight shovel operators, eight oilers, five cooks, three blacksmiths, two mechanics, and one hundred and fifty laborers. The major equipment included five gas shovels, the Ingersoll-Rand compressor and four portable air compressors, three tractors, three blades, four fresnos, twenty trucks and eight horses.³³

Heavy excavation was done with the gas shovels and with explosives. Some of the blasting involved immense charges of powder. One such blast at the Rock Cut involved 178 shots wired

³¹ Rogers, Superintendent's Monthly Report, June 1930, 1-2; Superintendent's Monthly Report, July 1930, 2; Superintendent's Monthly Report, August 1930, 1; Superintendent's Monthly Report, September 1930, 2; Superintendent's Monthly Report, October 1930, 1.

³² Musselman, 91.

³³ Rogers, Superintendent's Monthly Report, August 1930, 4-5; Superintendent's Monthly Report, September 1930, 3.

together and fired at one time, using a half ton of explosives. Most other blasts involved 30 shots fired together.³⁴

Good progress was made in September, but by the first of October blowing snow and heavy winds curtailed work at the higher elevations. The timberline camp was relocated to a lower elevation and the two shovels working on the upper section were brought down to complete the rough grading behind the pioneer shovel. The bad weather followed a month later, and by 15 November Colt laid off most of his crew, retaining a few men and two shovels for rock work until adverse conditions forced a total shutdown in mid-February. By this point, 40 percent of the excavation between stations 0+00 and 257 and 75 percent of the excavation between stations 520 and 993 had been completed; no excavation had been done on the central section. Clearing was complete over the entire portion covered with timber. For the entire contract, 69 percent of the work had been completed in 66 percent of the allotted time.³⁵

While the clearing and excavation work was underway, the subcontractor completed work on a reinforced concrete box culvert with cement rubble wing walls at station 951+50 and most of the other rubble masonry work. The resident engineer commended the subcontractor (unfortunately nameless in the construction reports) as "well qualified" as a stonemason as well as a concrete man. Several stretches of hand-placed rock embankment were also constructed under the subcontract.³⁶

Despite the winter weather, some work was carried out in December. Two shovels were operated on the unfinished lower sections between stations 690 and 705 and stations 780 and 796. Some drilling was done in these sections, but progress was slow

³⁴ "New Ridge Road Eighth Wonder of Modern World," Estes Park [CO] Trail, 18 September 1931, 1.

³⁵ Lafferty, 13-15.

³⁶ Ibid., 14.

on account as the jackhammers continually froze. About thirty men were engaged during the month.³⁷

A spark escaping from a construction camp cabin set off a forest fire in Hidden Valley on the night of 12 December. Park rangers, responding with a Pacific pumper, joined 25 men from the construction crew in fighting off the blaze. A violent wind made suppression difficult, but the fire was brought under control in mid-morning. If the wind had not been from the east, the construction camp would have been entirely burned.³⁸

Colt was unable to resume the work until the middle of June 1931 on account of lingering bad weather. All the shovels were now assigned to work from the eastern end of the contract. This was the most difficult terrain yet encountered on account of the large number of large boulders. Work between stations 525 and 545 was classified as 100 percent rock. In mid-July, a shovel was sent to station 430 and directed to work westward on the rough grade. Due to a lack of material for a good wearing surface, and the necessity of cleaning up embankment slopes and removing waste rock that had fallen below the grade, more delays were occasioned, but the rough grading was completed in August.³⁹

A small shovel mounted on a truck chassis was used to widen the pioneer road between Fall River Pass and station 135. However, this rig proved too light and was called off the work. One of the larger shovels was moved back to Rock Cut to assist in the heavy excavation. Two other shovels were assigned to the section between stations 255 and 440 for widening the pioneer road and constructing fill sections. The remaining shovel was sent to excavate rock ledges and construct ditches along the pioneer road between stations 440 and 545. A crew was engaged in cleanup work and bringing up fill slopes to a uniform line. The work force

³⁷ Rogers, Superintendent's Monthly Report, December 1930, 2.

³⁸ Ibid., 4-5. The old burn is now a splendid aspen grove.

³⁹ Lafferty, 15-16.

had shrunk to 108 men, but the contractor aimed to complete all operations in November.⁴⁰

More project inspections were carried out in 1931. A. E. Palen, now Acting District Engineer for the BPR, was in the park in May and July of 1931 in connection with the project. NPS Chief Engineer Kittredge returned in June. Secretary of the Interior Ray Lyman Wilbur, accompanied by Director Albright, was conveyed over the completed eastern sections of the road. The project was also visited by a Congressional party from the House Committee on Appropriations that same month. BPR Western Regional Office Chief Hewes, again accompanied by Palen, made another visit in August, and Palen came again the following month. Thomas MacDonald, Chief of the Bureau of Public Roads, inspected the work in October, indicating the undertaking was a project of major significance to the Bureau.⁴¹

Workers now concentrated on the heavy rock work in the middle part of the project. The BPR resident engineer thought the contractor's equipment was too light for work in the heavier rock cuts, and reported that progress was "exceedingly slow." Part of the blame he attributed to incompetent powdermen. Although the contractor brought in additional equipment in the hopes of completing the work before bad weather returned, winter conditions forced another shutdown on 20 October; the project was now 94 percent complete, and 94 percent of the allotted time had been consumed.⁴²

Final work on this section began in late May 1932 with snow removal from the roadway so that the unfinished section could be reached. This took until 1 July, at which time the excavation work resumed. Only a month was required for the remaining effort, and the project was ready for inspection by 1 August.

⁴⁰ Rogers, Superintendent's Monthly Report, August 1931, 7-8.

⁴¹ Idem, Superintendent's Monthly Report, May 1931, 2; Superintendent's Monthly Report, June 1931, 2-3; Superintendent's Monthly Report, August 1931, 2; Superintendent's Monthly Report, September 1931, 2; Superintendent's Monthly Report, October 1931, 2.

⁴² Lafferty, 16-18.

The work was inspected by BPR inspector Learned, Superintendent Rogers and NPS Junior Landscape Architect Howard Baker, who all approved the work. Colt had used 492 of his allotted 500 days, or 98 percent of his contract time. Baker remained in the park for a while to prepare designs for parking areas. The total cost of the Colt contract, including the BPR engineering fees, was \$440,940.87.⁴³

West Side Construction, Project 1-C

In the fall of 1929, an inspection was made of the west side segment by officials from the Bureau of Public Roads and the NPS Landscape Architecture Division. Park Service Landscape Architect Merel Sager recommended a change in route in order to avoid scarring of the meadow below Poudre Lakes. The original line would have carried the road across the meadows to cross the north shore of the lakes. Sager wanted the line relocated to higher ground on the south side. This route was inspected by staff from both bureaus again in 1930 and a compromise was reached. The road would keep to the north side but was relocated to a lower elevation; such a design would reduce the scarring caused by construction of highway embankments. Masonry walls would be constructed along the sides of the lakes in order to preserve the shorelines.⁴⁴

Another \$500,000 was appropriated for the road work in 1930. The Interior Department approved \$455,000 for construction of the 10.2-mile west side segment, extending from Fall River Pass to the upper Kawuneechee Valley, Project 1-C. The allotment included a contingency fund of \$22,821.70 and engineering fees of \$45,000. On 19 May, the Department released \$100,000 for construction and \$15,000 for engineering expenses for the first season.⁴⁵

The project had been preadvertised in the fall of 1929, but early snows prevented interested contractors from making inspections. Following the change in route in the Poudre Lakes area, the

⁴³ Ibid.; Rogers, Superintendent's Monthly Report, August 1932, 2-3; Superintendent's Annual Report, 1929, 4.

⁴⁴ Coffey, 5-6.

⁴⁵ Ibid., 6.

project was advertised again in August 1930. Bids were opened at the BPR Denver office on 9 September. The low bid of \$437,138.30 was submitted by the L.T. Lawler Construction Company of Butte, Montana. Lawler had completed other work in national parks and national forests and some Federal Aid Highway Projects and his work had been deemed satisfactory; therefore, the BPR district engineer recommended acceptance of his bid. The award was formally approved by the Secretary of the Interior on 18 September and the contractor was ordered to start thirty days later.⁴⁶

Late in September, a representative from Lawler's company arrived in the park and negotiated a lease of temporary quarters and a camp site from the owners of the Phantom Valley Ranch, which was located near the end of the project. Construction began on 8 October, with a 10-man crew clearing a section of the right-of-way. This force was doubled once the construction camp was set up. The clearing was done with hand labor and the logs were skidded and piled with two teams of horses. During the first season, clearing was largely completed between sections 135 and 574+50. Merchantable timber was salvaged, cut into log lengths, and piled on the upper slopes so that it could be easily loaded by park crews. The remaining trees and slash were piled in the right-of-way and burned after sufficient snow had fallen for safe conditions.⁴⁷

While the clearing was underway, Lawler moved in his grading equipment from the railhead at Granby, thirty miles south of the project. The equipment included two gas shovels, four large portable air compressors with drilling tools, three dump trucks, two service trucks, and supplementary smaller gear. Grading operations started on 23 October near Phantom Valley Ranch and at Farview Curve. In the first season, the shovels, working toward each other, were able to complete 300' of grading and to build a short pioneer road to a point where a box culvert would be constructed the following spring. Bad weather conditions in mid-

⁴⁶ Ibid., 8. Four other bids were received:

V.P. Strange, Salt Lake City, Utah	\$442,919.00
Cook and Ransom, Ottawa, Kansas	\$447,462.90
E.H. Hannen, Colorado Springs, Colorado	\$491,127.10
Morrison-Knudsen, Boise, Idaho	\$446,770.90

⁴⁷ Ibid., 8-9.

winter made it necessary to cease operation of the shovels in the upper section of the road, but the clearing crews continued their work, burning brush from stations 288 to 523. On 26 November, weather conditions had become so severe that the contractor was forced to shut down.⁴⁸

By this point, the contractor had completed two construction camps. The first, located at the Phantom Valley Ranch site, consisted of twelve frame cabins and a corrugated metal blacksmith shop. This base camp was provided with electricity from a portable Kohler power plant. A smaller second camp with five cabins was located near Poudre Lakes. Two more cabins were built for the BPR engineers near the southern end of the project. The camps cost approximately \$7,500.⁴⁹

In early April 1931, the contractor's forces cleared snow from the base camp and from the old road as far north as Poudre Lakes. Two more power shovels were brought in over the old Fall River Road from the east side railhead at Lyons after Park Service crews had cleared snow from the road, making for a total of four shovels available for the work. Other new equipment brought up from Lyons included two large compressors, four jackhammers, a steel sharpener, two Caterpillar tractors and a Caterpillar 9-foot grader, a portable welding machine, and sundry hand tools. Four trucks were purchased in Denver to carry the crews and supplies. A portable camp of five buildings was constructed in Estes Park; this was moved over the Fall River Road to Fall River Pass in late May. Like Colt's moving camp, this camp was relocated as work progressed.⁵⁰

Construction operations formally resumed in May. Over the season, the four shovels, working in double shifts, completed 8 miles of grading. The hauling work was sublet to Harry L. Bracken of Salt Lake City, who furnished eight Mack trucks and two 3-cubic yard caterpillar treaded "Iron Mules." Clearing continued on the unfinished section around timberline. Grubbing was done with power shovels, except for a few large stumps pulled

⁴⁸ Ibid.; Rogers, Superintendent's Monthly Report, November 1930, 3.

⁴⁹ Coffey, 10; attached BPR photo #29784.

⁵⁰ Ibid., 11-12.

with tractors from locations which could not be reached by the shovels. Most of the required corrugated metal pipe culverts were placed in the 1931 season. Considerable difficulty was encountered by the shovel working near Poudre Lakes on account of swampy conditions. Another shovel operating between stations 355 and 363 made slow progress on account of slide material. A third shovel working down from station 0 at Fall River Pass and the fourth operating between stations 510 and 519 both made satisfactory progress.⁵¹

The swampy material encountered near Poudre Lake forced the contractor to obtain "special hauling equipment," not otherwise specified in project reports. Other major equipment in use in the 1931 season included the four shovels, eight 5-ton dump trucks, six large compressors and eleven jackhammers. The 160 men at work over the summer worked double shifts; by fall the force had increased to almost two hundred workers.⁵²

Two structures were largely completed during the 1931 season. A reinforced concrete box culvert at station 205+10 was completed except for the cement rubble masonry retaining walls, and a cement rubble masonry retaining wall on the north side of Poudre Lakes was 70 percent finished by the end of the season. Work on the segment between station 380 and Poudre Lakes at station 230 was delayed until the end of the tourist season. A shovel began work on this section in September.⁵³

More trouble occurred between stations 46 and 98 when frost was encountered, forcing the contractor to resort to drilling and blasting before material could be removed. Underground springs and more frost between stations 232 and the lower end of the project caused more delays. However, all of the clearing and most of the excavation work was completed by fall. Weather conditions began deteriorating in late October and the project was closed down on 17 November. At this time, the contractor had

⁵¹ Ibid., 11-14; Rogers, Superintendent's Monthly Report, June 1931, 7.

⁵² Rogers, Superintendent's Monthly Report, July 1931, 5; Superintendent's Monthly Report, September 1931, 8.

⁵³ Idem, Superintendent's Monthly Report, August 1931, 9; Superintendent's Monthly Report, September 1931, 7.

completed 75 percent of the work but had consumed only 45 percent of his allotted time.⁵⁴

The masonry work, including reinforced box culverts and a stone retaining wall at Farview Curve, was subcontracted to Oliver H. Lindstrom & Son of Boulder. The firm employed about 20 men on the subcontract and used two concrete mixers, an aggregate hatcher, a double drum hoist, five dump trucks and a 5-ton Mack truck in the work. The crew was first located in a park campground, but was later relocated to a construction camp near Farview Curve. By the end of the 1931 season, 75 percent of the work on the culverts and 50 percent of the masonry had been completed. Aggregates for the masonry were obtained from a pit in the Colorado River, and stone for the wall was quarried from the south side of Little Sheep Mountain near Milner Pass. To avoid a road scar from the quarry site, an incline was constructed to deliver the stone to a loading platform on the old road. Stone for the masonry headwalls for the culverts was obtained from a rockslide 4 miles below the project.⁵⁵

Work on Project 1-C was ordered resumed by the BPR on 4 June 1932. The same equipment remained in use, except that one of the shovels was removed and a Caterpillar tractor and a heavy grader were added. As the park traffic continued to rely on portions of the road, some delays were encountered until motorists could be rerouted over completed sections of the new road. Other delays were occasioned between stations 400 and 436, as the ground here was thoroughly saturated and the shovels and "Iron Mules" had to be operated from timber mats or over temporary corduroy road surfaces. Numerous slides were encountered, forcing the shovels to repeat much work just to keep the section open. This segment was excavated 2'-4' below grade and backfilled with rock to provide a stable roadbed and to facilitate drainage. Rubble drains and intercepting ditches were constructed to control heavy spring run-offs. Structure work included completion of the box culverts, construction of masonry headwalls for various other drainage structures, and the masonry retaining wall at Farview Curve. This wall was topped with 515 cubic feet of "Type 3".

⁵⁴ Idem, Superintendent's Monthly Report, September 1931, 8-9; Coffey, 13-15.

⁵⁵ Coffey, 14, 20.

masonry guard wall, a crenelated parapet wall constructed of native stone.⁵⁶

Work on the lower 4 miles of the contract was completed in August and traffic was allowed over the section between Farview Curve and Poudre Lake on the 23rd. The upper section was completed a few days later and the entire project was inspected and approved by the Park Service and the Bureau of Public Roads on 28 August. Lawler had completed the project in only 342 working days, or 68% of the contract time, and was commended by the BPR resident engineer for his excellent progress and satisfactory work. BPR Senior Highway Engineer Clyde E. Learned inspected the project in the company of park officials in September and praised the work on the section.

The finished contract shows excellent workmanship throughout, the high cutbanks, especially in solid ledge rock, being true to line and presenting a very neat appearance. Uniformity has been built into the road throughout the entire section, both the inside and outside shoulders presenting neat and uniform lines. The masonry work in both the headwalls and box culverts shows excellent workmanship, and presents an artistic appearance. The Bureau's engineer and the contractor deserve considerable credit for this excellent piece of spectacular mountain road construction.⁵⁷

Landscape Considerations

Construction by both contractors on the upper sections of the road was carried out with extra care in order to protect the fragile alpine landscape. Log cribbing was used in several places, especially around the Window Rocks and Rock Cut, in order to protect the surroundings from blasting damage. Toe walls were constructed at the base of embankments and fill areas to contain

⁵⁶ Ibid., 15-17.

⁵⁷ Clyde E. Learned, Senior Highway Engineer, Bureau of Public Roads, "Report on Fall River, West Side Section C (Final Construction)," 27 September 1932, attached to Ibid..

the materials. Whenever blasting threw rocks down slopes, contractors had to retrieve them.⁵⁸

Clearing specifications required that trees over 10' in height be left in the fill slopes and not more than one-tenth of their height was to be covered. Small unmerchantable timber was used for lagging to protect these trees. Wood with commercial value was retrieved by the Park Service and taken to a mill at Estes Park; the lumber was then used in the construction of park structures. Smaller wood was sold to the Rocky Mountain Transportation Company as firewood for the various park hotels and lodges.⁵⁹

Surplus stone left from the clearing was placed on the surface with the lichen sides up. Only native stone or rocks matching those found on the surrounding terrain were used in the construction of retaining walls and stone embankments. Tundra sod was salvaged and used to cover embankments. Such landscape details amounted to 15 percent of the road budget.⁶⁰

The quasi-permafrost covering the tundra was a special challenge. It could not be drilled or blasted as it had a rubber-like consistency, so it was stripped off in shallow layers between periods of thawing. Although this caused delays, the procedure worked better than blasting, as excavated material could be well utilized in embankments; if frozen material had been placed, an undue amount of settlement could have been expected. Each season, snow was removed with power shovels to expose the roadway line.⁶¹

All work was carried out under the supervision of the Bureau of Public Roads. W. L. "Bill" Lafferty was resident engineer, and was assisted by Robert Coffey; their supervisor was BPR Senior Highway Engineer Learned. Park Superintendent Rogers and landscape architect Baker maintained supervisory inspection

⁵⁸ Atkins, 6; Harrington, 6; Musselman, 92.

⁵⁹ Coffey, 13.

⁶⁰ Kaye, 7.

⁶¹ Harrington, 6; Lafferty, 19.

control for the National Park Service. Rogers walked over the line twenty or so times before construction began and closely monitored the ensuing work. He also dictated changes at the Rock Cut and several other points of afford better scenic vistas.⁶²

An Emergency Conservation Works crew under the supervision of Assistant Landscape Architect Benson cleared a vista between stations 935 and 945 on section 1-B in the summer of 1933. The road at this point followed a glacial moraine overlooking Horseshoe Park, and had been laid out with this view in mind. The work involved the removal of a stand of trees which blocked the view.⁶³

Labor

Colt and Lawler both used horse teams for clearing and power shovels for heavy excavation. These were supplemented with dump trucks, compressors, and drilling equipment. Both contractors worked double shifts and together engaged more than three hundred men in the work. Local labor was secured when available, but insufficient numbers could be secured from the Estes Park and Grand Lake areas, forcing the contractors to engage other men from Denver, Loveland, Fort Collins, and other cities.⁶⁴ As the Depression deepened, local unemployment lists provided them with a number of workers.

Daniel C. Harrington, Bureau of Public Roads inspector for the subsequent surfacing work, praised the workers who constructed the road.

To appreciate the scope of this endeavor one must remember the main ingredient in the accomplishment of the work was brawn, tempered by a tough and willing work ethic. It was done without benefit of the bulldozer, which was just coming onto the scene. This may be a surprise to the people today who believed bulldozers came with the territory. The work force were tough, skilled, and resourceful. They were expert

⁶² Harrington, 7; Musselman, 93.

⁶³ Rogers, Superintendent's Monthly Report, July 1933, 6.

⁶⁴ Harrington, 5; Coffey, 18.

powdermen, stone masons, timbermen, and machine operators. They knew how [to] drill and control blasting to most efficiently reduce the rock excavation to rubble without littering and damaging the adjacent landscape. All of this and there was not one hard hat on the entire operation! Also there were no fatalities.⁶⁵

The construction took place at high altitudes, and workers had to cope with thin air, electrical storms, and sleet and snow and numbing cold. Lingering snows and the early advent of winter conditions sometimes restricted the work season to mid-June to early October, though some work could be carried out longer at lower elevations.

First segments open

While the road work was still underway, the *Estes Park Trail* reported that President Herbert Hoover might come to the park to dedicate the road, which it called the "Eighth Wonder of the Modern World." Against the advice of contractors, the newspaper urged motorists to travel up the Fall River Road and then return over the completed east side section. Although the correspondent insisted that "mere words are entirely inadequate," he reported that "intrepid globe-trotters" were calling it a trip of more majestic vistas than any other road in the world.⁶⁶

With the completion of the Colt Project 1-B contract, the 15 July 1932 issue of the *Trail* reported that the eastern segment (Deer Ridge--Fall River Pass) of the new Trail Ridge Road would open the following day.

Tomorrow will mark the culmination of almost 3 years of hard work performed under adverse conditions when the internationally famed Trail Ridge road across the Continental Divide will be open to public travel as far as the shelter cabin at Fall River pass thereby permitting the tourist to make a complete round trip and not have to cover the same ground twice [this refers to a loop trip up the old Fall River Road and

⁶⁵ Harrington, 5-6.

⁶⁶ "New Ridge Road Eighth Wonder of Modern World."

down the new Trail Ridge Road segment] according to an announcement made here early this week by Edmund D. Rodgers [sic], superintendent of the Rocky Mountain National Park....

The west end of the road from Poudre lakes to Grand Lake has not yet been opened although the old road will take care of all traffic until the new highway has been completed. The Park superintendent and officials of the interior department at Washington are planning a formal opening and dedication of the highway as the west side is completed.⁶⁷

Despite the mention of a planned dedication, no ceremony appears to have been held. This is somewhat unusual, considering the difficult nature of the work and the fact that the National Park Service generally held dedication ceremonies on the completion of other major roads in the park system.

The old Fall River Road remained in use, allowing visitors to make a round trip to Fall River Pass without repeating any stretch of their journey. The old road was designated as a one-way uphill drive. A small amount of work on the east section remained, and was completed by contractor Colt on 1 August. The west side segment between Fall River Pass and Poudre Lakes opened on 23 August.⁶⁸

BPR Post Construction Administration

As the road was located at high altitudes with considerable snowfall and a heavy spring runoff, the Bureau of Public Roads asked to retain maintenance supervision for the road in order that slide control, settlements, and drainage control could be attended to before a formal transfer of the road was made to the Park Service. Under terms of a 1932 agreement with Superintendent Rogers, the BPR was to undertake this work for \$17,700 plus another \$1,000 in engineering fees for the 1932-1933 calendar years. The Park Service would provide equipment and

⁶⁷ "Trail Ridge Road Officially Opened to Car Travel Tomorrow," *Estes Park [CO] Trail*, 15 July 1932.

⁶⁸ *Ibid.*; Rogers, Superintendent's Annual Report, 1932, 7; Musselman, 92.

tools, while the Bureau would be responsible for labor and project supervision. The BPR engaged the labor in the first year, while in 1933 skilled labor was provided through the park employment office; unskilled labor came from area unemployed. Much of the work consisted of slide removal, redressing of surfaces, widening and reestablishing shoulder lines, and blading and dragging. Some additional slope stabilization was carried out as well. The maintenance crews were quartered at the BPR engineering camp at Hidden Valley, while the Park Service provided food and a cook for the mess.⁶⁹

Under terms of the agreement, the Bureau was responsible for snow removal operations for several years. An additional \$3,000 was added to the ongoing maintenance and betterment contract, and an 8-man crew under BPR supervision began work on 5 May. The crew utilized a Snogo rotary plow, a 5-ton truck equipped with a snow plow, a grader and a 3/4-ton commercial truck. Blasting was necessary where snow accumulated to depths greater than 4'-5'. About 40' of snowbank was blasted at a time, then the plow moved in. Plowing had to be done immediately after blasting, otherwise the snow would compact so rapidly that explosives would have to be employed again. On sidehill sections and wherever the cover was relatively light, the truck with the plow windrowed the snow to the center of the roadway, after which the Snogo disposed of the windrows. In the first season, crews used 5,450 pounds of TNT, 1,150 pounds of 40 percent dynamite, and 725 pounds of 60 percent dynamite. The cost of snow removal was totalled at \$1,946.73, and the remaining funds were reassigned for further maintenance and betterment work. In 1933, 77,000 tons of snow was removed, in 1934, about 49,700 tons, and in 1935, about 121,000 tons.⁷⁰

⁶⁹ Lafferty, "Final Betterments and Maintenance Report (1932-1933) and Spring Snow Removal for 1933 on Fall River Pass National Park Highway, Projects 1-A, B & C, Rocky Mountain National Park, Larimer and Grand Counties, State of Colorado" (Denver, CO: Bureau of Public Roads, 12 April 1934), 1-3.

⁷⁰ Coffey, 20, 23; Lafferty, "Final Post Construction and Maintenance Report (1934-35-36) on Fall River Pass National Park Highway, Project 1-A, B, C, Rocky Mountain National Park, Larimer and Grand Counties, State of Colorado" (Denver, CO: Bureau of Public Roads, District No. 3, 9 March 1937), 3-4, 6-9.

While snow removal was in progress, maintenance crews under direct BPR supervision cleaned out ditches and repaired washed shoulders caused by the spring runoff. Several earth slides which occurred over the winter were cleared away with a power shovel. These operations were timed to allow the road to be opened by 15 June, the official opening of the park summer season.⁷¹

Post construction work carried out under the same agreement included flattening of bank slopes, construction of rubble underdrains, widening of shoulders, subgrade reinforcing, and placement of 400 square feet of metal cribbing on the west side of the project. A parking area, bordered with rustic log guard rails, was constructed at the beaver ponds along Hidden Valley Creek in the 1934 season. In July 1934, the contract for base course surfacing was completed. To maintain the light oil surface which had been applied required intensive maintenance in order to provide for a smooth riding surface.⁷²

In 1936, park crews began maintaining the Trail Ridge Road for winter travel as far as Hidden Valley on account of increasing public interest in winter sports activities. A force account crew under Bureau of Public Roads supervision constructed a parking area at Hidden Valley in the fall of 1937. The BPR installed routed wooden station posts along the Trail Ridge Road in the spring and summer of 1939.⁷³ Many of these can still be seen, particularly above timberline.

Projects 1-B and 1-C, Guardrails

On 10 August 1932, the Bureau of Public Roads received bids for the construction of 1,400' of masonry guard rail for the east side of the road (the Project 1-A section). Collier & Latimer, Inc. of Denver, submitted the low bid of \$27,376 and was awarded the contract. The firm was allotted 100 working days to complete the work. A construction camp was established in Hidden Valley,

⁷¹ Lafferty, "Final Post Construction and Maintenance," 5.

⁷² Ibid..

⁷³ Allen, Superintendent's Monthly Report, December 1936, 3; Canfield, Superintendent's Monthly Report, December 1937, 4; Superintendent's Monthly Report, April 1939, 4.

and work got underway in September. William Lafferty of the BPR served as supervising engineer for this small project. Bad weather forced a shutdown on 6 October. At this point, the contractors had expended 40 percent of their allotted time but had only completed 21 percent of the work.⁷⁴

The lack of progress led Collier & Latimer to give up the project in July 1933, apparently without resuming operations. The bonding company then entered into a new contract with Lindstrom & Son of Boulder, previous subcontractors on the 1-C section, to complete the work. The project resumed on 14 July. The firm made good progress and completed the contract in the fall. The project was inspected by Superintendent Rogers and BPR personnel on 1 September. All work was completed four days later and a recommendation for acceptance was issued.⁷⁵

Following the completion of the Project 1-B contract, the BPR advertised a second guardrail project for the western section 1-C in September. Bids were not opened until 30 January 1934. The project was awarded to Edward Selander of Greeley on the basis of his low bid of \$50,852.50, and the *Estes Park Trail* reported that he would hire about fifty men for the work. In June, however, Selander subcontracted the work to Starr and Jensen. The project involved construction of retaining walls to hold back a large slide area at station 434 between Farview Curve and Phantom Valley Ranch, guard rails at various locations along the road, and a sidewalk and curb at Farview Curve. Work began late in the month. The work was completed in the fall and recommendation for acceptance was made by park officials on 17 October. Superintendent Rogers called the rock work "the best in the park."⁷⁶

⁷⁴ "Work Starts on Guard Rail Job," *Estes Park [CO] Trail*, 26 August 1932, 1; Rogers, Superintendent's Annual Report, 1932, 8; Superintendent's Monthly Report, August 1932, 5; Superintendent's Monthly Report, September 1932, 7; Superintendent's Monthly Report, October 1932, 4.

⁷⁵ Rogers, Superintendent's Monthly Report, July 1933, 5; Superintendent's Monthly Report, September 1933, 2, 6.

⁷⁶ *Idem*, Superintendent's Monthly Report, January 1934, 5; Superintendent's Monthly Report, June 1934, 6; Superintendent's Monthly Report, August 1934, 6; Superintendent's Monthly Report, October 1934, 5; "Ed. Selander Awarded Stone Work Contract,"

A \$90,735.25 contract for the construction of more guard rails and landscaping along sections 1-A, B, C & D was awarded in August 1936 to Selander, who beat out a competing bid from C. V. Hallenbeck. The work included construction of a guard rail at Rainbow Curve, enlargement of the parking area at the Fall River Pass, retaining walls on the new section 1-D, and also guard walls at Horseshoe Park on the Fall River Road. A failed section of guard wall at Farview Curve was replaced. During the course of the work, Selander's crews were quartered in a temporary construction camp located at Milner Pass.⁷⁷

Project 1-A, B & C Palliative Oil Treatment

A \$110,588 palliative oil surfacing contract for the entire road was awarded on 24 October 1932 to the Albuquerque, New Mexico firm of Everly & Allison. (Palliative oil surfacing is used to stabilize crushed rock roadways and, importantly, to provide a measure of dust control.) This contract also included construction of a rubble masonry retaining wall at Many Parks Curve. Due to winter conditions having set in, the work did not begin until the following year. Another contract, for reconstruction of the old road between Grand Lake and Phantom Valley Ranch (the west end of Lawler's contract) was authorized but the funds were not immediately released.⁷⁸

Everly & Allison began surfacing operations on 21 June 1933 with the removal of rock and mud slides on the Project 1-C section. Over the next month, the contractor's forces removed about 10,000 cubic yards of slide materials and 4,000 yards for shoulder widening and landscaping. Once the road was cleared, the crews established a construction camp near a surfacing materials pit on the old Fall River Road 1.5 miles west of Fall River Pass at the

Estes Park [CO] Trail, 2.

⁷⁷ Allen, Superintendent's Monthly Report, August 1936, 5; Superintendent's Monthly Report, June 1937, 7; Preston, Superintendent's Monthly Report, July 1937, 5; David H. Canfield, Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, August 1937, 4; Superintendent's Monthly Report, October 1937, 3.

⁷⁸ Rogers, Superintendent's Monthly Report, October 1932, 4-5.

head of Forest Canyon. A crushing and screening plant was erected at the site, and the power shovel that had been used in the slide removal work began excavating material to be crushed.⁷⁹

Actual surfacing began on 24 July. The employer worked 125 to 150 men in four 5-hour shifts daily; the crews worked both directions down from Fall River Pass. Many of these were local men, otherwise unemployed on account of the Depression. Operations from the Forest Canyon Pass pit were completed about September 15, by which time all of Project 1-C had been surfaced. The crushing plant and related equipment were then shifted to Many Parks Curve on the east side, where the remaining surfacing material was obtained. (The curve was quarried and a parking area was constructed on the excavated area.) The construction camp was relocated to Hidden Valley, about 1 1/2 miles below Many Parks Curve. All surfacing work was completed on 11 November 1933. Approximately 5,000 cubic yards of surplus material was stockpiled for base course material to be used the following year. The contractor was ordered to shut down operations on 1 December on account of weather conditions.⁸⁰

The project resumed on 11 June 1934. Construction of the crenelated masonry guard wall at Many Parks Curve was sublet to Lindstrom & Son, who had built the wall at Farview Curve on

⁷⁹ Lafferty, "Final Construction Report (1933-34) on Fall River Pass National Park Highway, Project 1-A, B, & C Surfacing, Rocky Mountain National Park, Larimer and Grand Counties, State of Colorado" (Denver, CO: Bureau of Public Roads, District No. 3, 23 April 1935), 5-6; Rogers, Superintendent's Monthly Report, June 1933, 7. The quarry and construction camp site were located in a 1989 archaeological survey at Forest Canyon Pass. The quarry was located in a pegmatite dike (Marie Mayer, *Forest Canyon Pass, Rocky Mountain National Park, Larimer County, Colorado: A High Altitude Survey* (Denver: Denver Chapter, Colorado Archeology Society, 30 June 1989), 137-39, 165.)

⁸⁰ Lafferty, "Final Construction Report, 1-A, B & C Surfacing," 7; Rogers, Superintendent's Monthly Report, July 1933, 3, 5.

Project 1-C. The subcontractor employed six masons and twelve laborers, and completed the wall in just over a month.⁸¹

Meanwhile, work began on application of the palliative oil treatment. A steam boiler and pumping plant, together with a 9,000 gallon oil storage plant, was installed at the Many Parks Curve site. The oil was obtained from the Standard Oil Company plant at Casper, Wyoming, from which it was shipped by rail to Loveland and transported to the project in tanker trucks. The oiling project included the connector between Horseshoe Park and Deer Ridge (Project 1-B) as well as Projects 1-A and 1-C. Operations began on 11 June on the 1-B section, and only six days later this segment and the east side of the Trail Ridge Road as far as Fall River Pass had been surfaced.⁸²

Depending on road conditions, between 5"-8" of crushed rock was applied. The rock was hauled to the project in dump trucks, dropped in windrows along the road, then bladed several times. Traffic was then allowed over the road for several days, at which time the surface was rebladed. As a result, very good compaction was obtained. Some 62,740 tons of material was placed in the work. The palliative oil applied to the surfacing was No. 50 road oil applied at a rate of a third of a gallon to the square yard. The oil was heated and applied to half the roadway surface at a time with a pressure spraying distributor. Before the oil was applied, loose or unbound material was swept to the side; after the oil had penetrated the roadway, this material was then spread over the treated portion to absorb any excess oil. Traffic continued to use the road during the project; control was accomplished with flagmen and a pilot car, and delays were kept to 15 minutes or less.⁸³

On 18 June, the oiling plant was relocated to the lower end of the west side of the road, and application of the palliative oil treatment continued. By 7 July 1934, all of the road had been treated. With the completion of the masonry work at Many Parks

⁸¹ Lafferty, "Final Construction Report, 1-A, B & C Surfacing," 7, 9.

⁸² Ibid., 7, 11.

⁸³ Ibid., 8, 12-13.

Curve a week later, the project was completed and accepted by the Bureau of Public Roads and the National Park Service.⁸⁴

Kawuneechee Valley, Project 1-D-1

A location survey for section 1-D-1, extending the road 8 miles from station 576+50 at Phantom Valley Ranch, the southern end of section 1-C, to station 1010+00, a point 4 miles north of Grand Lake, was conducted in the fall of 1931 by a BPR crew under Highway Engineer W. H. Curwen. NPS Chief Landscape Architect Vint inspected the proposed line in October. Following his approval, the project was turned over to the BPR, and the Bureau's office in Denver prepared plans and specifications for the new segment. The standard adopted called for a 24' shoulder-to-shoulder roadway with a minimum ditch width of 5' and rounded cut slopes. Three reinforced concrete box culverts with masonry wingwalls, a number of corrugated metal pipe culverts, and 2,000' of vitrified tile underdrains would be required for drainage.⁸⁵

The project was advertised in the *Rocky Mountain News* and the *Salt Lake Tribune* in October 1934. Bids were opened at the BPR Denver office on 13 November and C. V. Hallenbeck of Denver was recommended for the project on the basis of his low bid of \$103,494. The contractor had previously completed several projects for the BPR and the Bureau indicated he was well-qualified for the work. The contract was accepted by the Secretary of the Interior on 20 November, and Hallenbeck was directed to begin operations by 22 December. The concrete and masonry work was subcontracted to Carl J. Jensen of Denver. Hallenbeck leased buildings at Pontiac Lodge, just outside the park boundary, for his construction camp. The main building was

⁸⁴ Ibid., 8-9; Rogers, Superintendent's Annual Report, 1934, 17.

⁸⁵ Rogers, Superintendent's Monthly Report, September 1931, 8; Superintendent's Monthly Report, October 1931, 2; Coffey, "Final Construction Report (1934-1936), Project NR-1-D1 Grading, Fall River Highway, Rocky Mountain National Park, Colorado" (Denver, CO: Bureau of Public Roads, 7 March 1937), 2-3.

used as the office and cookhouse and the cabins were sleeping quarters for the crew.⁸⁶

Clearing of the right-of-way began on 22 November at the upper end of the project; the crew consisted of a superintendent, a foreman, and twelve men. As the timber on the right-of-way was too small to be of merchantable value, the National Park Service allowed local residents adjacent to the project to remove it for firewood. This arrangement saved the contractor the considerable expense of disposing of the logs. An early snowfall allowed burning of the slash as the work progressed. All clearing was completed by Christmas.⁸⁷

Excavation began in late November. Two diesel tractors with bulldozer blades were used along with a scarifier for breaking up the frozen ground. This equipment was used to construct a pioneer road and for short hauling until winter weather conditions forced a project shutdown on 29 December. At the close of the season's operations, the project was 12 percent complete and only 7 percent of the allotted time had been consumed.⁸⁸

A resume work order was issued by the BPR on 9 April 1935. The contractor began laying corrugated metal pipe culverts and moving in his heavy equipment. A new diesel shovel was purchased and delivered by rail to Granby, from where it moved under its own power to the project about 1 May. Other equipment used in the season included two air compressors mounted on trucks, a 10-foot grader, a Galion maintainer, a multiple blade road drag, a concrete mixer, five 2 dump trucks, three service trucks, and sundry small tools. A second shovel was moved to the project after it was released from the Section 1-A, B & C oiling contract. Poor weather forced a second shutdown on 24 April.

⁸⁶ Coffey, "Final Construction Report, NR-1-D1 Grading," 4-5, 12.

⁸⁷ Ibid., 5.

⁸⁸ Ibid., 5-6.

Snowstorms occurred on almost a daily basis until 1 June, rendering the roadway surface impassable for travel or for moving heavy equipment.⁸⁹

The project resumed for the season on 3 June, and the contractor made good progress with the rough grading. At the same time, two other crews were employed on the construction of the box culverts and the placement of the remaining corrugated metal pipe culverts. This was done ahead of the grading wherever possible. Temporary bridges and bypasses had to be constructed at two of the box culvert sites to allow park traffic to proceed.⁹⁰

Much of the route passed through low, swampy land, requiring the crews to excavate the roadway 3'-5' below grade and backfill the area with stone. Tile and rubble underdrains were employed for additional drainage. Removed material was used to obliterate the old road and cover the new embankments.⁹¹

In late July, the contractor brought additional equipment onto the job, consisting of another gas shovel, a truck-mounted shovel, and five more dump trucks. This new machines were used for subgrade stabilization and finishing work including cut slope treatment, removal of rock from the subgrade, and finishing up ditches. The average force employed during the season consisted of 70 men working two 5-hour shifts on the grading work and 8-hour shifts on the concrete and masonry. Work continued until 26 October when winter weather forced another suspension.⁹²

Operations resumed on 1 June 1936 and Hallenbeck moved a portion of his heavy equipment back to the project. The old road camp at Pontiac Lodge was vacated and crews established a new camp on the old road opposite station 635, the same location used during the earlier oiling contract. Work in the 1936 season consisted of masonry work on culvert headwalls, ditch paving, slope stabilization, and obliteration of the old roadway. The contract

⁸⁹ Ibid., 6-7.

⁹⁰ Ibid., 7-8.

⁹¹ Ibid., 8.

⁹² Ibid..

was completed on 10 July. Hallenbeck used 190 days or 90 percent of the contract time. Final inspection of the project was made by BPR Senior Highway Engineer Learned and Assistant Highway Engineer Lafferty on 13 July.⁹³

Hallenbeck also received a \$125,000 contract in October 1934 for laying a 3" bituminous oil mat over the 32 miles of completed road and for a new connecting road from the Bear Lake Entrance. A crushing plant was established at station 550, which on account of its high altitude, hampered operations. The location was later to be converted to a parking area. Additional fines material was taken from roadside slopes where the banks were too steep. Surfacing of sections 1-A and 1-2 was completed in June 1935.⁹⁴

In the fall of 1935, Hallenbeck was awarded a \$78,800 contract for slope stabilization on sections 1-A, B & C. The work involved preparation of sub-drainage, flattening of cut slopes, installation of metal cribbing, some planting, the construction of more cement rubble masonry retaining walls, and the widening of a number of ditches. The metal cribbing was installed that autumn at station 435, where mud slides had periodically closed the road. The remaining work was carried out the following year.⁹⁵

The Larson Construction Company of Steamboat Springs, Colorado laid a gravel subsurface and preliminary oil coat on section 1-D-

⁹³ Ibid., 9-10.

⁹⁴ Rogers, Superintendent's Monthly Report, October 1934, 5; Superintendent's Monthly Report, November 1934, 5; Superintendent's Monthly Report, December 1934, 4; Superintendent's Monthly Report, January 1935, 5; Superintendent's Monthly Report, May 1935, 4; Superintendent's Monthly Report, June 1935, 6-7; Superintendent's Monthly Report, August 1935, 6; Superintendent's Monthly Report, October 1935, 4; Superintendent's Monthly Report, November 1935, 4; Allen, Superintendent's Annual Report, 1936, 9; Superintendent's Monthly Report, July 1936, 4.

⁹⁵ Rogers, Superintendent's Monthly Report, September 1935, 5; Superintendent's Monthly Report, November 1935, 5; Allen, Superintendent's Annual Report, 1936, 9-10.

1 in 1937, completing the work in June. Final inspection of the project was made on 2 July by Superintendent Allen, BPR engineer Learned, and park resident landscape architect Lloyd J. Fletcher. The section was resurfaced with a 3" palliative oil coat in 1939 and opened to travel. Until the completion of this project, the Trail Ridge Road technically remained under the control of the Bureau of Public Roads. In 1938, it was finally turned over officially to the National Park Service for maintenance.⁹⁶ Still, it would be eleven years before the road was completed all the way to Grand Lake.

In July 1940, the Public Roads Administration (late Depression-era successor to the Bureau of Public Roads) received \$15,000 for post construction work on section 1-D-1. As the project had not been completed, park officials asked that the funds be reauthorized for expenditure on sections 1-B and 1-C.⁹⁷

Kawuneechee Valley to Grand Lake, Project 1-D-2

A Bureau of Public Roads survey crew under Robert Coffey's supervision ran several location lines for final segment 1-D-2, which would extend the road south to Grand Lake, in December 1934. Following inspection by BPR and Park Service personnel, the crew was instructed to run a final location survey. The final survey was completed in January 1935. Preliminary plans for the project were then worked up by the BPR and forwarded to the park in May for review.⁹⁸

In 1935, funds were allotted for this final 2.8-mile section. A contract was not immediately issued because no decision had been reached on the final route. Citizens of Grand Lake wanted the

⁹⁶ Allen, Superintendent's Annual Report, 1937, 21; Superintendent's Monthly Report, June 1937, 7; John C. Preston, Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, July 1937, 5; Canfield, Superintendent's Annual Report, 1939, 16; Kaye, 9.

⁹⁷ John S. McLaughlin, Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, July 1940, 4.

⁹⁸ Rogers, Superintendent's Monthly Report, December 1934, 5; Superintendent's Monthly Report, January 1935, 5; Superintendent's Monthly Report, May 1935, 4.

road to terminate in the village, while the Park Service and the Bureau of Public Roads wanted to study a route bypassing the town.⁹⁹ In the end, a decision was reached to bypass the village of Grand Lake and terminate the road about a mile to the west. However, acquisition of the necessary right-of-way delayed the project.

In August 1940, the National Park Service obtained the deed for a right-of-way across the Harbison Ranch on the west side of the park, finally allowing contracts to be let for the last section of the road, Project 1-D-2. The \$67,687 grading and clearing contract was awarded soon afterwards to the Gerard Knutson firm of Kansas City, Missouri. The rough grading was completed in June 1941, and the firm began the application of the primary dirt cover. Crushing and placing of the gravel surface began in July. The surface was sprayed with 23,000 gallons of MC-1 oil and then sod was placed on embankments and cut slopes. Following construction, the old section of road was obliterated. All work was completed in early fall and the project was formally accepted by the Park Service on 15 September.¹⁰⁰

The finished Trail Ridge Road was 24' wide, with extra widening on curves. Eleven miles ran over 11,000' in elevation, and 4 miles over 12,000'. Final cost of the road project was about \$950,000 for the original 28 miles, or about \$34,000 per mile. This was at or near the original bid prices. The subsequent relocation of the road in the Grand Lake area brought the project cost to around \$1.25 million. The *Estes Park Trail* reckoned the total cost of the road at \$2 million.¹⁰¹

⁹⁹ Idem, Superintendent's Monthly Report, May 1935, 4.

¹⁰⁰ John E. Doerr, Jr., Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, August 1940, 1; Canfield, Superintendent's Annual Report, 1941, 13; Superintendent's Annual Report, 1942, 6; Superintendent's Monthly Report, November 1940, 3; Superintendent's Monthly Report, June 1941, 3; Superintendent's Monthly Report, July 1941, 3; Superintendent's Monthly Report, August 1941, 3.

¹⁰¹ *Estes Park Trail*, 15 July 1932; Rogers, Superintendent's Annual Report, 1932, 13; Musselman, 93.

Bituminous Surfacing, Project 1-D-2

The Bureau of Public Roads conducted surveys and prepared plans and estimates for the bituminous surfacing of section 1-D-2 in 1938 and 1939; however, due to cutbacks during and following World War II, a contract was not awarded until 1949.¹⁰²

Bids were opened by the Public Roads Administration (PRA) in May 1949. The low bid of \$40,171 was submitted by the Northwestern Engineering Company of Denver. Although this exceeded the engineers' estimates somewhat, the PRA recommended acceptance, and the firm was awarded the contract. The contractor began work on 5 June, preparing materials for the work. The firm took over maintenance of the road section, patching holes and preparing the surface for application of the oil mat. Surfacing materials were taken from a borrow pit west of station 1019. For crushing, the contractor used a portable tandem plant fed from the pit by a 3/4-yard dragline, a tractor with bulldozer blade and three dump trucks. The base course material was used to prepare a 2" leveling course. Aggregates were loaded from the crusher stockpile with a shovel, transported in dump trucks, and spread and windrowed with power graders. The bituminous material was a heated medium curing asphalt. Power graders spread the material, after which it was rolled with a 10-ton tandem grader and opened to vehicular traffic. After 24 hours or so, the roadway was rolled again to eliminate irregularities which developed under the traffic. The compacted mat averaged 2" in thickness. The project was completed in the autumn and the final inspection was made by park staff and BPR engineer Lafferty on 24 October. Lafferty stated in his final construction report that the contractor had mismanaged the project in almost every detail, and suffered a loss of \$2,800 on the contract. Nevertheless, the work was of good quality and was accepted.¹⁰³

¹⁰² Lafferty, "Final Construction Report (1949) on Fall River National Park Highway Project 1-D-2 Bituminous Surfacing, Rocky Mountain National Park, State of Colorado" (Denver, CO: Bureau of Public Roads, Division 9, 17 May 1950), 2-3.

¹⁰³ Ibid., 3-12, *passim*; Canfield, Superintendent's Annual Report, 1949, 16; Superintendent's Monthly Report, May 1949, 2; Superintendent's Monthly Report, June 1949, 3; Superintendent's Monthly Report, October 1949, 1.

Lafferty also noted that the surfacing project completed the new Trail Ridge Road to the standard of a graded, drained, and bituminous surfaced highway; however, section 1-C had deteriorated due to subgrade failure to the point that reconstruction was necessary.¹⁰⁴

Centerline Striping

In order to reduce traffic hazards, 11.5 miles of the road, from timberline to timberline, was center-line striped in the summer of 1941. Another 11.5 miles around curves and in other potentially dangerous areas was also marked. Elsewhere on the road, some masonry guard walls on the west side were realigned where settlement had occurred.¹⁰⁵

The center striping of the road east from Fall River Pass to the Fall River Entrance was completed in August 1950. An invitation for bids for resealing a large portion of the road went out the same month, but brought only one bid, which was rejected. This project was subsequently awarded to the Brown Construction Company, which carried out the work during the summer of 1951. Final inspection of the project was made on 28 and 29 August.¹⁰⁶

The remainder of the Trail Ridge Road was striped by the Colorado state highway department in 1952 and 1953. (The park purchased the paint for the work.) Superintendent David H. Canfield reported "the stripe will be of great benefit and safety to the traveling public." The project was completed in August 1953.¹⁰⁷

¹⁰⁴ Lafferty, "Final Construction Report, 1-D-2 Bituminous Surfacing," 2.

¹⁰⁵ Canfield, Superintendent's Monthly Report, July 1941, 3.

¹⁰⁶ Idem, Superintendent's Monthly Report, August 1950, 2, 6; Francis D. LaNoue, Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, July 1951, 3; Acting Superintendent's Monthly Report, August 1951.

¹⁰⁷ Canfield, Superintendent's Monthly Report, September 1952, 4; LaNoue, Acting Superintendent's Monthly Report, August 1953, 3.

Over the years since, the roads have been striped by the state, by firms under contract, and by park crews.

Section 1-C Surfacing and Stabilization

In November 1950, the BPR (which had been reconstituted, though transferred to the Department of Commerce) advertised for the resurfacing and for slope stabilization of the deteriorated section 1-C. The \$489,955 contract was awarded in January 1951 to the Northwestern Engineering Company of Denver. The project had been planned by the Public Roads Administration in March 1945, and the specifications were revised by the reconstituted Bureau of Public Roads in 1946 and 1950. The project, which entailed stabilization of the roadway with a new base course 4" deep, topped with a 22'-wide 2" bituminous mat, began in June 1951 with excavation for a minor alignment change and for placement of new corrugated pipe culverts. When work got underway, the contractor complained that beaver activity was flooding a new road fill near Poudre Lakes, and asked the park to remove some of the animals. The road work was hampered in July by inclement weather, a truck drivers' strike, and heavy tourist traffic. Production and placement of the base course material began in August and was complete on in October. Priming of the base course began at the end of August and continued until 1 October, when time limitations specified in the contract necessitated a shutdown. The contractor began crushing and stockpiling the plant mix aggregate in September and finished on 13 October. The plant was then converted for the production of cover aggregate, which was all crushed and stockpiled.¹⁰⁸

A hot plant heated the mixed aggregate and asphalt together. The material was conveyed in trucks to a Barber-Greene paving machine which spread it 2" thick. Eight to ten ton flat-wheeled rollers then compacted the roadway, following which the seal coat was applied. The bituminous materials were hauled from Denver or

¹⁰⁸ Albert H. Patterson, Project Engineer/Highway Engineer, U.S. Department of Commerce, Bureau of Public Roads, "Final Construction Report (1951-52) on Rocky Mountain National Park Project Trail Ridge Road 1-C Bituminous Surfacing and Stabilization, Counties of Larimer and Grand, State of Colorado" (Denver, CO: Bureau of Public Roads, Division Nine, 16 June 1954), 1-6, 10; Canfield, Superintendent's Monthly Report, June 1951, 3; Superintendent's Monthly Report, September 1952, 4; LaNoue, Acting Superintendent's Monthly Report, July 1951, 3-4.

from Cheyenne, Wyoming; aggregates were obtained from a pit on the 1-D section.¹⁰⁹

Following a winter shutdown, operations resumed in June 1952. The contractor reshaped the base course and cleaned out ditches after the heavy spring runoff. The application of additional selected subgrade and base course material started in July and was completed on 10 September. The remaining priming work was completed on 23 September. Chipsealing was done with a specially-designed distributor mounted on a surplus army halftrack. By the end of the September, all of the work was complete except for roadside and gravel pit cleanup. As part of the contract, slide areas at stations 324+50 and 349+25 were removed and the slopes stabilized. Metal cribbing was installed at station 324+50, and new underdrains were employed in several places. Final inspection was made on 10 October and the project was accepted. The total project cost, including BPR engineering fees, was \$514,467.46. Upon completion of the project, 21.6 miles of the road from Fall River Pass to the southwest was surfaced to the standards of the day; BPR project engineer Albert H. Patterson noted that the remaining 21.1 miles east of Fall River Pass had a bituminous surface but considered it substandard and in need of improvement.¹¹⁰

Mission 66

In December 1954, managers of the chambers of commerce of Estes Park, Loveland and Greeley met with park officials to urge that the Trail Ridge Road be kept open all winter, or that an alternate all-weather route be constructed through the park. The park officials insisted that the plans were not feasible due to weather conditions and the high cost of maintaining the high altitude road.¹¹¹

¹⁰⁹ Patterson, 4-5.

¹¹⁰ Ibid., 1-8, 13-14; J. Barton Herschler, Acting Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, October 1952, 2.

¹¹¹ "Valley Towns Urge Trail Ridge Be Kept Open Winters," Estes Park [CO] Trail, 24 December 1954, 1.

The completed road had proved one of the most popular attractions in Rocky Mountain National Park. In June 1956, the park produced a new brochure on the Trail Ridge Road to hand out to motorists. The brochure was keyed to numbered posts erected along the road late in the month. Signs were erected at the stations in July 1957.¹¹²

By the mid-1950s, traffic was causing real problems, and the limited parking areas were frequently over-crowded, encouraging roadside parking. Park Superintendent James V. Lloyd complained in his 1956 annual report that the road was inadequate and potentially hazardous.

The Trail Ridge Road continues increasingly hazardous, due to the outmoded type of construction. A lack of sufficient width, an inadequate number of turnouts and an almost complete absence of road shoulders in many places, is making this very heavily used highway a serious traffic menace.¹¹³

In 1956, National Park Service Director Conrad L. Wirth announced the "Mission 66" development program for the national parks, a major ten-year endeavor to provide for improvements to park infrastructures. The program called for the reconstruction of sections 1-A and 1-C of the Trail Ridge Road, a project estimated to cost \$625,000. Other road improvements specified under the program were doubling of the parking area at Fall River Pass (\$5,000), reconstruction of the Hidden Valley parking area (\$76,500), construction of 40 small turnouts (\$40,000), and relocation of the entrance to the Timber Creek Campground (\$3,500). A new Alpine Visitor Center would be constructed at the Fall River Pass.¹¹⁴

Park crews began construction of a new parking area at Forest Canyon Overlook in September 1957. Other parking areas were laid

¹¹² James V. Lloyd, Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, June 1956, 7; Superintendent's Monthly Report, July 1957, 5.

¹¹³ Idem, Superintendent's Annual Report, 1956, 11.

¹¹⁴ "Improvements Report, Rocky Mountain National Park, September 1955." RMNPHC.

out at this time, at Little Rock Cut and two at Tundra Curves. Four parking areas at lower elevations were completed in October. Clearing and grading for a new Grand Lake Entrance was completed in October 1958.¹¹⁵

The park administration urged the reconstruction of the Fall River Entrance under the program as "of urgent and extreme importance." The park proposal complained that the narrow road had a 5 percent grade, and vehicles tended to vapor lock while motorists waited to obtain permits. Traffic sometimes exited the park at high rates of speed through the entrance, endangering the personnel. The park proposed widening the entrance, flattening the grade, and constructing a divider. The project was approved and in 1960, the BPR supervised construction of the new entrance roadway, consisting of three westbound and one eastbound lane, for the Fall River Entrance. Slides on section 1-C were also corrected in the work. The Eagle Construction Company of Loveland, Colorado, was awarded the \$377,252 contract, which also included new grading and bituminous surfacing for the Bear Lake Road and construction of a new bridge over the Big Thompson River on the latter route. All work was completed in November 1960.¹¹⁶

Other funds were allocated in 1960 for additional slide correction on the road. A new entrance station plaza was constructed at Grand Lake in 1966 at a cost of \$12,323. The proposed new access road to the Timber Creek Campground was completed the same year for \$17,697, considerably more than had been estimated. New parking areas were constructed at Phantom Valley Ranch, the Gore Range Overlook, and for the new Alpine Visitor Center. A number of trees were cleared from the Farview

¹¹⁵ Lloyd, Superintendent's Monthly Report, September 1957, 8; Superintendent's Monthly Report, October 1957, 8; Superintendent's Monthly Report, October 1958, 9.

¹¹⁶ John W. Gibbs, Area Engineer, U.S. Department of Commerce, Bureau of Public Roads, "Final Construction Report (1960), Project 1-A, Checking Station, Project 1-C, Slide Alleviation, Trail Ridge Road; Project 3-B, Grading and Bituminous Surfacing, Bear Lake Road, Rocky Mountain National Park, Class 1 National Park Highway, Larimer and Grand Counties, State of Colorado" (Denver, CO: Bureau of Public Roads, Region Nine, 1 May 1963), 2-6.

Curve overlook, and sections of the road were reseeded in a landscape revegetation effort.¹¹⁷

In December 1962, the Siegrist Construction Company of Denver was awarded a contract for the reconstruction of the Project 1-A section between Horseshoe Park and Deer Ridge. A. E. Scott of the Bureau of Public Roads was resident engineer for the project. The contractor's operations began in January 1963 with snow removal from the section, and grading work was underway in February. Materials used in the project were taken from a borrow pit at Lake Estes. The clearing was completed in April and most of the culverts were in place. The surfacing work was carried out over the summer and early fall and final project acceptance was made in October. During the project, the rustic Horseshoe Park Bridge across Fall River was replaced with a plain reinforced concrete and steel girder span.¹¹⁸

Project 1-B-2, Pavement Recycling and Surfacing

In 1982, the Federal Highway Administration (FHWA, the successor to the Bureau of Public Roads) supervised a pavement recycling and surfacing project for section 1-B-2, a 9-mile section between Hidden Valley and Iceberg Lake. The \$1,627,788 contract, which consisted of cold asphalt recycling and application of a hot-mix

¹¹⁷ Superintendent's Annual Report, 1960, 8; Fred J. Novak, Superintendent, Rocky Mountain National Park, Superintendent's Annual Report, 1966, 8; Richard A. Strait, Park Landscape Architect, Rocky Mountain National Park, Park Landscape Architect's Monthly Report, June 1964, 1; Park Landscape Architect's Monthly Report, September 1964, 1; Park Landscape Architect's Monthly Report, October 1964, 1.

¹¹⁸ Allyn F. Hanks, Superintendent, Rocky Mountain National Park, Superintendent's Monthly Report, December 1962, 8; Superintendent's Monthly Report, February 1963, 7; Superintendent's Monthly Report, March 1963, 8; Superintendent's Monthly Report, April 1963, 9; Superintendent's Monthly Report, October 1963, 8; William C. James, Acting Superintendent, Rocky Mountain National Park, Acting Superintendent's Monthly Report, September 1963, 9.

bituminous surfacing, was awarded to the Flatiron Paving Company of Boulder, Colorado. The contract period began on 22 May.¹¹⁹

Drainage improvements included clearing of culverts and the reconstruction of stone culvert headwalls. New slotted insert drains and underdrains were installed at several locations. The recycling was carried out by a subcontractor, the Valentine Surfacing Company; this phase of the project began in August. This work and the bituminous surfacing was done at night in order to cause less inconvenience for park visitors. Daily rains and cool nighttime temperatures hampered operations.¹²⁰

The old pavement was torn up with a 12' excavator, which lifted it to a 30" crusher where it was ground to pass a 2" sieve. From the crusher, the material passed to a pugmill atop an electronic scale. The scale weighed the material and controlled the pump to provide the proper amount of the pavement rejuvenator, a petroleum-based product called Reclimate. The pugmill mixed the old pavement with the rejuvenator at a rate of 1.1 percent to the recycled material. The mixed material was windrowed, then picked up by a Cocal machine and spread with a Barber Greene 150 paver. The surface was then rolled with a double-drum vibratory roller and a 10-wheel pneumatic-tired roller. Almost-daily rains added moisture to the curing roadway and seemed to help prevent unraveling.¹²¹

¹¹⁹ Dean Weisbeck, Project Engineer, U.S. Department of Transportation, Federal Highway Administration, "Final Construction Report on Rocky Mountain National Park Project 1-B(2) Trail Ridge Road Recycling Asphalt Pavement and Hot Bituminous Surfacing, Larimer County, Colorado" (Denver, CO: Federal Highway Administration, Central Direct Federal Division, Region 16, 14 August 1987), 1-2; U.S. Department of Transportation, Federal Highway Administration, "Plans for Proposed Project 1-B(2), Recycling and Resurfacing, Trail Ridge Road, Rocky Mountain National Park Road System, Larimer County, Colorado," construction drawing NPS No. 121-80900 (Denver, CO: Federal Highway Administration, 13 August 1982). National Park Service, Denver Service Center, Technical Information Center files.

¹²⁰ Weisbeck, 2-3.

¹²¹ Ibid., 3-4.

Placement of the hot-mixed bituminous surfacing began on 7 August and was completed three weeks later. Paving of the parking areas and curbs was finished in September. Ditches were paved with a hydraulic screed extension with a variable slope shoe. A 6:1 slope was maintained only with difficulty, as the machine tended to drift downslope on account of the steep grade. Following the surfacing work, the section was striped by the In-Line Traffic Marking Company. Final cleanup took until 12 October.¹²²

Section 1-C Bituminous Surfacing

The west side of the road (section 1-C) was provided with a new bituminous surfacing in 1983, 1984 and 1985 by Peter Kiewit Sons' Company of Littleton, Colorado, under FHWA supervision. Work got underway in July 1983 with clearing at the Harbison borrow pit near the Grand Lake Entrance and along the roadway. This phase was completed in October. A crusher was set up at the Harbison Pit in August and production began of base course material, asphalt aggregate, granular backfill, friction course material and chips for the final seal. The crusher was operated on two shifts for eight weeks, and again in November.¹²³

Excavation and embankment work began in August. Backhoes were used for the subexcavation work, working north from the south end of the project. Large amounts of wet and unsatisfactory material were encountered. The road had been originally constructed with embankments built directly over topsoil or peat, requiring considerable deep excavation to suitable subsurfaces. Light cuts and fills were done with two scrapers. Most excavation could be handled with trucks and loaders; only about 15 percent was drill-and-shoot work. Such rock as was blasted was used as foundation material for embankments. Numerous new drainage structures were installed through the valley section. Slotted underdrain pipe with granular backfill and filter cloth was used extensively. Once the drainage structures were in place, subgrade placement

¹²² Ibid., 4.

¹²³ Ernest B. Reusch, Project Engineer, U.S. Department of Transportation, Federal Highway Administration, "Final Construction Report on Route 1, Trail Ridge Road Proj. 1-C(1) & 1-D(1), Rocky Mountain National Park, Grading and Bituminous Surfacing, Grand and Larimer Counties, Colorado" (Denver, CO: Federal Highway Administration, Region 16, 19 August 1991), 5.

began. Winter weather conditions forced a project shutdown on 10 November.¹²⁴

Construction resumed in May 1984. A dragline was used to excavate some deep fills which were below the water table of the nearby Colorado River, and for the shaping of higher cuts and fills. In July, the contractor set up a Boeing asphalt plant near the borrow pit. Eighteen belly-dump trucks hauled materials from the plant to the paving machine. Paving on the upper section was done over 15 nights during restricted traffic conditions. Parking areas and pullouts on the upper section were surfaced in the next two weeks. Ditches were paved with a road widener and a bulldozer. Operations then shifted to the lower section, and continued until weather forced another shutdown in October.¹²⁵

The contractor's work began again in June 1985, and consisted of the final paving, placement of the open-graded asphalt friction course, and chipsealing. Finishing operations included centerline and edge striping, slope seeding, and final cleanup. All work was complete in July; the total cost of the project was \$5.67 million.¹²⁶

¹²⁴ Ibid., 5-6.

¹²⁵ Ibid., 6.

¹²⁶ Ibid.

Recent Construction and Maintenance

Two metal bin walls or cribs below Farview Curve and the material behind them were removed in 1972 to alleviate the danger of a rockslide at this point. The walls had been badly distorted by pressure from behind and by earth movement. A contract was also let this year for resurfacing of the road between Deer Ridge and lower Hidden Valley. The work was awarded to the Sterling Paving Company of Greeley, Colorado, and was completed and accepted on 21 June 1973. New rock retaining walls were constructed at the Gore Range and Forest Canyon overlooks in 1974, ostensibly to reduce trampling and erosion caused by visitors.¹²⁷

In 1981, the park proposed to upgrade the 10.7 miles of road between Grand Lake and Phantom Valley, Sections 1-D-1 and 1-D-2. The work would include improvements to deteriorated stretches, realignment of hazardous curves, and increased parking at trailheads and scenic vistas. The roadway varied from 19' to 22' in width, mostly the narrower and was far below the standard of the approach highway from the south which featured wide paved shoulders and turn lanes. Frost action and water saturation had damaged the road base and pavement edges were ragged. Motorists found no shoulders in many places and others were overgrown. The turnouts were not designed for safe entries or exits nor were they large enough to accommodate the increasing number of visitors, many of whom resorted to illegal roadside parking. Of all the roadside facilities, only the Alpine Visitor Center was accessible to the disabled.¹²⁸

The proposal called for reconstruction of the section as a 22' roadway with paved 3' shoulders and improved drainage. Seventeen parking areas would be constructed, expanded, or improved, and log or stone wheelblocks would be installed to keep cars within

¹²⁷ Jimmie L. Dunning, Superintendent, Rocky Mountain National Park, Superintendent's Annual Report, 1972, 18, 21; Superintendent's Annual Report, 1973, 12; Roger J. Contor, Superintendent, Rocky Mountain National Park, Superintendent's Annual Report, 1974, 16.

¹²⁸ National Park Service, Denver Service Center, "Environmental Assessment for Road Improvements to Trail Ridge Road, Grand Lake to Phantom Valley, Rocky Mountain National Park, Colorado" (Denver, CO: National Park Service, Denver Service Center, August 1981), 1-4.

their bounds. Stalls at each area would be designated for the disabled.¹²⁹

Deteriorated rock walls at Rock Cut and Medicine Bow Curve were reconstructed in 1982. Park crews removed the old walls, poured new reinforced concrete footings, and replaced the old stones in their original configuration. The new walls have the same appearance as the historic walls. Seven hundred feet of wall was reconstructed at the two curves, and another 75' at other locations on the road; total cost of the project was \$44,069. Two years later, 800' more was reconstructed at various locations at a cost of \$95,015, and another 600' in 1986 for \$50,053.38.¹³⁰

Many Parks Curve was provided with a new pedestrian walkway constructed on the outside of the stone retaining wall. The curve had been considered too narrow for the safe use of pedestrians, as westbound traffic was too constricted. The new walkway was constructed from prefabricated wooden deck units and a guardrail, constructed out from the wall on wooden posts. The walkway, designed by Park Engineering Technician Joe Arnold, was constructed in 1984.¹³¹ The Beaver Ponds Boardwalk on Hidden Valley Creek also dates from this time.

Following the FHWA pavement recycling project, NPS day labor crews chipsealed 3.4 miles of Trail Ridge Road from Lower Hidden Valley to "Trail 3" in the summer of 1984. The parking lots in the area were crack-sealed in the same project. Slopes were seeded by hydro-mulching. Seven miles of the road from Rainbow Curve progressing downhill to Deer Ridge Junction were chipsealed by park crews in August 1986. Centerlines and edge lines were restriped. This contract was done in conjunction with a chipseal

¹²⁹ Ibid.

¹³⁰ "Completion Report 1520-0064-293, Replace Unsafe Rock Walls--Trail Ridge Road," 12 April 1983; "Completion Report 1520-4113-291, Stabilize Rock Walls on Trail Ridge Road Sec. 3," 31 July 1986; "Completion Report 1520-4108-291, Stabilize Rock Walls On Trail Ridge Road Sec. 4," 31 August 1986. ROMO Maintenance files.

¹³¹ Joe Arnold, Engineering Technician, Rocky Mountain National Park, "Many Parks Curve Development/Study Package Proposal," 27 October 1982. ROMO Maintenance files.

project for the Bear Lake Road at a combined cost of \$139,333.18.¹³²

The park has recently been experimenting with precast rock wall sections at several locations along Trail Ridge Road. The precast walls attempt to convey the character of the historic rock work along the road on a more cost effective basis. The walls were employed after Craig Axtell, Chief of Resource Management for Rocky Mountain National Park, indicated in December 1989 the possible need for 7,789 linear feet of wall at approximately thirty locations. The retaining walls would be used to stabilize slopes and prevent uphill slopes from eroding or sliding down onto the road, reducing the money and labor spent on ditch clearing and boulder removal.¹³³

Park mason Greg Dannels designed the new walls, which were constructed of precast reinforced concrete faced with a 3"-4" stone veneer, resting on a reinforced concrete footing. The slope was backfilled with gravel and weepholes or perforated pipe drains were provided for drainage. The walls were precast in the park shops in a unique park-built form designed by Dannels and Park Engineer Joe Arnold. The 1990 cost for a 10' 6" section cast in 1990 was \$16.70 per square foot.¹³⁴ These walls are employed in several places between Many Parks Curve and Fall River Pass.

Trail Ridge Road Recognized

On 17 July 1982, a ceremony was held at Hidden Valley to mark the fiftieth anniversary of the opening of the Trail Ridge Road. Attendance was limited on account of the devastating Lawn Lake

¹³² "Completion Report 1520-7616-593, Recycle 3.4 Miles Trail Ridge Road," 9 May 1985; "Completion Report 1520-1068-290, Chipseal 18 Miles Various Park Roads," 31 October 1986. ROMO Maintenance files.

¹³³ Greg Dannels, Mason, Rocky Mountain National Park, "Proposal for Precast Rockwall Sections, Trail Ridge Road" (MSS report, 2 February 1990). ROMO Maintenance Division files.

¹³⁴ Ibid.

Flood which had occurred two days earlier.¹³⁵ The ceremony is interesting to note as no ceremony was held when the road was actually opened in 1932.

Since the 1940s an annual ceremony has been held to mark the annual opening of the road, usually held in late May or early June soon after the removal of snow from the road. The event was originally called "Hands Across the Mountain;" in 1966, this was changed to "Hands Across the Nation." Participants have usually included political and commercial entities from Larimer and Grand counties and representatives of the state government, along with National Park Service personnel.

Trail Ridge Road was listed in the National Register of Historic Places in 1985 for its national significance in transportation as being the highest continuous road in the United States and for its role in park development.

¹³⁵ Chester L. Brooks, Superintendent, Rocky Mountain National Park, Superintendent's Annual Report, 1982, 1.

DESCRIPTION

Although some guides state that the Trail Ridge Road begins at Deer Ridge Junction, construction contracts and park maintenance files consider the road to begin at the Fall River Entrance, from where it enters Horseshoe Park, climbing a connecting section (Project 1-A) to the Deer Ridge Junction, then follows Trail Ridge to the Fall River Pass (Project 1-B). From there, it drops to cross the Continental Divide at Milner Pass, descends a series of switchbacks at Farview Curve, and emerges in the Colorado River Valley for the final southward stretch to Grand Lake (Projects 1-C and 1-D). The road is a continuation of U.S. Highway 34 across the park.

The Fall River Entrance, the eastern terminus of the road, is located 3 miles northwest of Estes Park at 8,160' above sea level, and the Kawuneechee Valley at an elevation of 9,020'. Between these two points, the road climbs rapidly above timberline, reaching a maximum height of 12,183' near Lava Cliffs above the Tundra Curves. Eight miles of road is located above 11,000', and nearly 3 miles above 12,000'.¹³⁶

For the first 2 miles, the road follows a reconstructed portion of the old Fall River Road west into Horseshoe Park. At this point, the older road continues west to Endovalley and on to Fall River Pass. The Trail Ridge Road climbs out of the park to the southeast along the 1926 Project 1-B section. Crossing the crest of Deer Ridge, it reaches a junction with the 1959-60 road (U.S. Highway 36) from the Beaver Meadows Entrance.

Deer Ridge is located in the upper reaches of the Rocky Mountain montane forest zone, dominated by ponderosa pines on the drier, south-facing slopes, but interspersed with quaking aspens, lodgepole pines and Douglas fir in disturbed areas. Open meadows are common in the vicinity: Moraine Park, 2 miles south, is the one of the largest in the park, but several smaller ones are passed over the next 2 miles in Hidden Valley.

From the junction, the Trail Ridge Road drops the ridge to follow Hidden Valley Creek for about 3 miles. A picnic area is passed on the north side after 2 miles, and a little further a turnout provides access to an interpretive trail on a boardwalk above a series of beaver ponds. A mile farther, the road makes a sharp

¹³⁶ Kaye, 6.

return curve, from the center of which leads off a dead-end access road to the old Hidden Valley ski area, now a picnic area. From this point, the road climbs steeply, running southeast three miles to Many Parks Curve (once called Many Park View), where a parking area and scenic vista offer views of the Thompson River valley, Moraine Park, and the High Plains in the distance. The overlook is bordered by crenelated retaining wall, altered in 1984 to provide a wooden sidewalk or observation platform on the outside edge.

One mile west of Many Parks Curve, the road passes through a cut in the "Iron Dike," an andesite intrusion into the native granite. The dike extends 40 miles from south of Boulder northwest across the Front Range. Its dark reddish-brown color is indicative of its high magnetite content.¹³⁷

Here the road has entered the subalpine forest zone, characterized by subalpine fir and Engelmann spruce. The forest becomes thinner and patchier as tree line is approached; finally the trees give way altogether. Conditions are generally too severe for trees to thrive above 11,000' at this latitude, though some pockets of trees occur in sheltered places. Many of the trees display evidence of *krummholz*, "the flagged tree" effect, a deformity caused by wind and ice.

The road climbs for 2 miles on a steady grade around the head of Hidden Valley. After crossing the upper reaches of Hidden Valley Creek near the 2-mile elevation (10,560') point, the road curves northeast a mile to Rainbow Curve, the end of a spur of Trail Ridge separating Hidden Valley and Hanging Valley (Sundance Creek). A large parking area is located on the outside of the curve; the lot is bordered with a crenelated masonry retaining wall atop a hand-placed stone embankment. Rainbow Curve offers a magnificent panorama of the Mummy Mountain and the Mummy Range to the north, McGregor Mountain and Deer Mountain to the west, and the open meadows of Horseshoe Park below.

Trail Ridge Road follows the curve and climbs the northwest flank of the spur to reach the top of Trail Ridge. For the first mile and a half, the road runs toward the southwest, then winds generally northwest 7 miles to Fall River Pass. Only a mile or

¹³⁷ Audrey DeLella Benedict, *The Southern Rockies: A Sierra Club Naturalist's Guide* (San Francisco, CA: Sierra Club Books, 1991), 60.

so from Rainbow Curve, the patchy remnants of the subalpine forest yields to the open tundra. Though covered with snow much of the year, in the summer the alpine flowers provide another source of delight to the visitors already enthralled by the majestic mountain scenery.

Two miles beyond Rainbow Curve, a small turnout on the south of the road provides access to the old Ute Trail, which drops from the road to down Windy Gulch into the Big Thompson River Valley and then down the valley to Beaver Meadows. This trail is a remnant of the historic Indian crossing. It once extended across the ridge to Milner Pass, but the section west of Ute Crossing is no longer maintained and has been removed from park maps.

A larger parking area a mile west provides access to the Forest Canyon Overlook. A short interpretive trail leads to an overlook of the deep Forest Canyon of the Big Thompson River two thousand feet below; across the way to the southwest is a splendid vista of Terra Tomah Mountain, Mount Ida, and the Gorge Lakes, a fine string of glacial paternoster (chain) lakes. This is one of the heaviest used areas along the road.

The road continues to climb Trail Ridge. Two miles northwest of Forest Canyon Overlook, it reaches 12,000' elevation and passes through the Rock Cut, an uneroded rock dike which had to be cut through for the road to pass. Passing through the rock fins, the road is supported on high hand-placed stone embankments topped by crenelated retaining wall. Just west of the cut is a large parking area. A short trail leads to a monument to former Superintendent Roger W. Toll, who incidentally was the first to propose construction of what became the Trail Ridge Road. This portion of the ridge was once called Monument Ridge.

A mile farther west, the road drops to Iceberg Pass (11,827'), climbs an intervening ridge, then drops around a sweeping double switchback to cross the narrowest part of Trail Ridge. The Tundra Curves, as the switchbacks are called, offer more marvelous views. Small parking turnouts are located to either side of the road.

The old Fall River Road can be seen climbing its final grades to the north. Another parking area offers an overlook of the basaltic columns of the Lava Cliffs. Over the crest to the north is Iceberg Lake, so-called because it is often covered with some floating ice. Just beyond the Lava Cliffs area, the road reaches its high point of 12,183'. Trail Ridge Road continues northwest

another mile to the Gore Range Overlook, another parking area, where it curves sharply northwest and drops a mile to Fall River Pass at elevation 11,796'.

Fall River Pass, the approximate mid-point on the road, was station 0 for the construction contracts and marked the boundary of the two main sections, Project 1-B to the east and Project 1-C to the west. The pass was crossed by the Fall River Road and today the old road reaches its western terminus and a junction with Trail Ridge Road. The Fall River Road section to the west of Fall River Pass was abandoned as far as Milner Pass following the completion of the Trail Ridge Road; today that segment is a park trail, designated a segment of the aforementioned Ute Trail. The Alpine Visitor Center, the Trail Ridge Store (the old visitor center), an abandoned rustic stone ranger station are located at the pass, and a short trail climbs several hundred steps to a scenic overlook. The large parking lot is frequently overcrowded in the summer season.

From Fall River Pass, the road continues north a half mile to a sharp switchback, Medicine Bow Curve, the northernmost point on the Trail Ridge Road. A turnout here offers a scenic vista of the Medicine Bow Mountains to the northwest and Wyoming 35 miles off in the distance. From Medicine Bow Curve, the road drops down a steady grade into the upper valley of the Cache la Poudre River. Surface rock in this area is old volcanic ash from the nearby Never Summer Range. Tree line is reached a mile below the curve at about 11,000' elevation. Four miles down the grade, the road reaches the headwaters of the river at Poudre Lake and just beyond, Milner Pass (10,758') on the Continental Divide. Many visitors are curious why the divide lies at the lower Milner Pass, rather than at the higher Fall River Pass. The Continental Divide actually marks only the heads of watersheds, not the highest points along the mountain range. Northeast of Milner Pass, the Cache la Poudre River flows into the Platte and Missouri River systems before entering the Gulf of Mexico (Atlantic Ocean) from the Mississippi. To the southwest, waters flow down Beaver Creek into the North Fork of the Colorado, and eventually reach the Gulf of California (Pacific Ocean) if they are not diverted along the way.

Three-quarters of a mile southwest of Milner Pass, the road passes an old road maintenance camp, now the Lake Irene Picnic Area. The old log roadworkers' cabin is now used for park housing. The road continues another mile and half downgrade to Farview Curve. A roadside parking area supported on more parapeted stone retaining wall allows visitors to take in a view

down the Kawuneechee (Coyote) Valley of the North Fork of the Colorado River and the Never Summer Mountains across the valley 3 miles to the west.

From Farview Curve, the road drops northwest down five switchbacks, reaching the bottom of the valley in just over 2 miles. The road then makes a turn to the south; it will continue on a generally southward course all the way to Grand Lake. A mile and a half south of the final curve, the site of the old Phantom Valley Ranch was located. This was the location of a construction camp and marked the boundary between Projects 1-C and 1-D-1. The latter section runs just over 8 miles to the Green Mountain Ranch area. Over the section, Beaver Creek is crossed in the first mile on a small stone-faced arched box culvert. The road then passes a series of beaver ponds and then the Timber Creek Campground on the west of the road. Just before the reconstructed campground entrance road, Timber Creek is crossed on a high arched reinforced concrete culvert faced with native stone. A mile farther south is the old Holzwarth place, interpreted by the park as the "Never Summer Ranch." An unpaved parking areas provides access to the short trail to the old ranch cabins. Three miles farther south, the road crosses another small stone-arched box culvert spanning Onahu Creek. Throughout this section, the road keeps to the east side of the Colorado River. Scenery is much different than that on the east side. The lodgepole pine forest gives way along the river to willow carrs and aspen groves, which thrive in the damp bottoms where the conifers cannot take hold. Much of the bottom land is open meadowland or sagebrush flat.

The final 1-D-2 section carries the road to its end near Grand Lake, a distance of about 4 miles. The Grand Lake Entrance Station is located about one mile north of the junction with the business spur into Grand Lake village. Near the entrance station, a short spur roads leads a half mile to the Grand Lake Lodge Historic District. Several hundred yards south of the entrance station is the Kawuneechee Visitor Center. A new sign marks the park boundary. From here, U.S Highway 34 continues south through the Arapahoe National Recreation Area (U.S. Forest Service) into Middle Park to the town of Granby.

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TRAIL RIDGE ROAD - Rocky Mountain National Park Roads & Bridges
Between Estes Park and Grand Lake
Estes Park Vicinity
Larimer County
Colorado

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Photographs 1-12 Arnold Thallheimer, photographer, August 1985
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- CO-31-1 TRAIL RIDGE ROAD, GORE RANGE OVERLOOK, FACING SOUTHWEST
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- CO-31-4 FOREST CANYON OVERLOOK, FACING SOUTHWEST
- CO-31-5 RAINBOW CURVE PULLOUT, FACING NORTHEAST
- CO-31-6 RAINBOW CURVE PULLOUT, FACING EAST, HIGHWAY IN BACKGROUND.
- CO-31-7 RAINBOW CURVE PULLOUT, FACING SOUTHEAST.
- CO-31-8 RAINBOW CURVE PULLOUT, SHOWING RETAINING WALL, FACING NORTH.
- CO-31-9 MANY PARKS CURVE PULLOUT, RETAINING WALL AND VIEWING WALK, FACING NORTH.
- CO-31-10 RETAINING WALL BETWEEN MANY PARKS CURVE AND ESTES PARK, FACING NORTHEAST.
- CO-31-11 RETAINING WALL BETWEEN MANY PARKS CURVE AND ESTES PARK, FACING SOUTHEAST.
- CO-31-12 TRAIL RIDGE ROAD, ROAD SCAR FROM RAINBOW CURVE, FACING SOUTHEAST
- CO-31-13 TRAIL RIDGE ROAD, ROAD SCAR ABOVE HIDDEN VALLEY, FACING SOUTH
- CO-31-14 ROCK CUT, FACING EAST
- CO-31-15 RETAINING WALL AT ROCK CUT, FACING EAST
- CO-31-16 RETAINING WALL AT ROCK CUT, FACING NORTH
- CO-31-17 TUNDRA CURVES, FACING NORTHWEST
- CO-31-18 RETAINING WALLS ALONG POUDE LAKE, FACING NORTH
- CO-31-19 BEAVER CREEK CULVERT, FACING EAST
- CO-31-20 TIMBER CREEK CULVERT, FACING EAST
- CO-31-21 ONAHU CREEK CULVERT, FACING EAST

HISTORIC AMERICAN ENGINEERING RECORD

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ADDENDUM TO
TRAIL RIDGE ROAD
Rocky Mountain National Park Roads & Bridges
Between Estes Park and Grand Lake
Estes Park Vicinity
Larimer County
Colorado

HAER NO. CO-31

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CO-31-1 to CO-31-21 were previously transmitted to the Library of Congress.

INDEX TO COLOR TRANSPARENCIES

All color xeroxes were made from a duplicate color transparency.

Brian C. Grogan, photographer, July 1993.

CO-31-22 ROCK CUT, FACING EAST



KODAK SAFETY FILM

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SO 11 K O D A K

SO 11 K O D A K

HAER NO CO-31-1





HAE R NO Co-31-2

HARER NO CO-31-3





HAEER NO CO-31-4



HAEK NO 60-31-5



HAER NO CO-31-6



HAEER NO 60-31-7

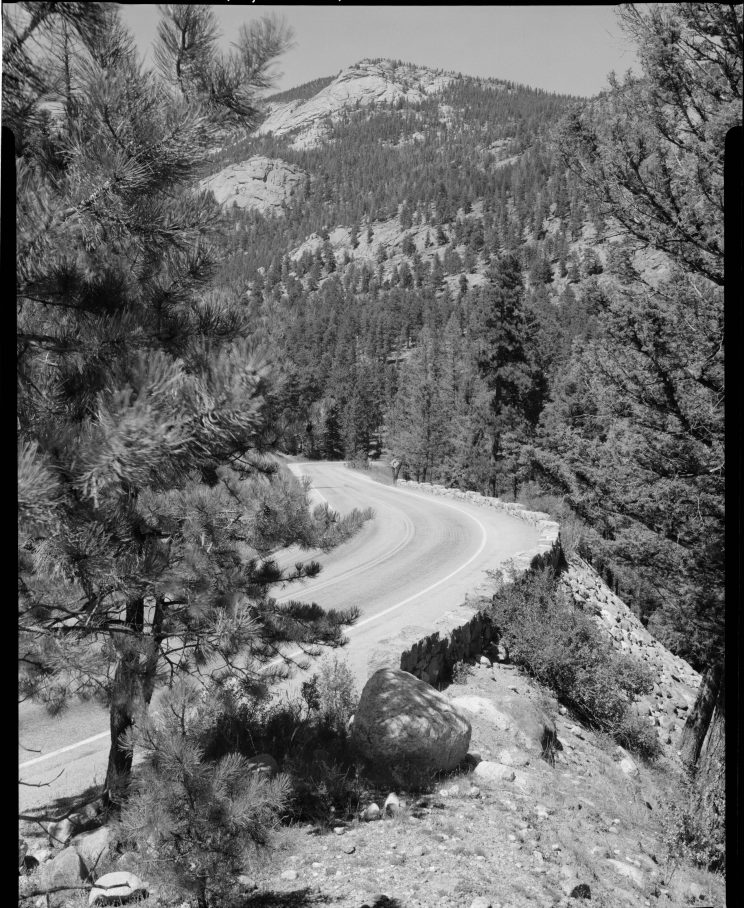
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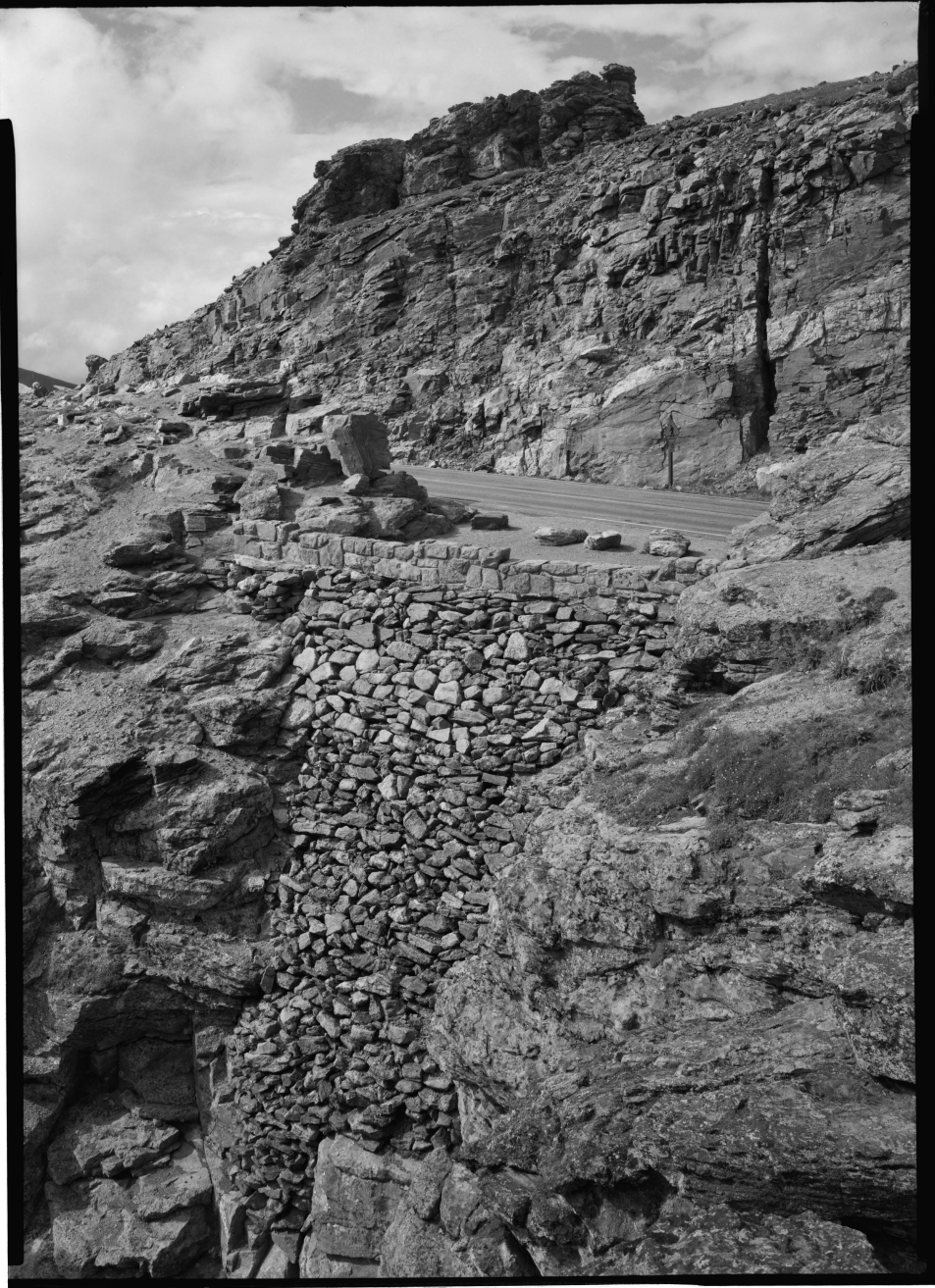
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HAER NO. C9-31-18

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HAER NO. CO-31-70



Shank
Creek

HAER NO. CO. 31-21