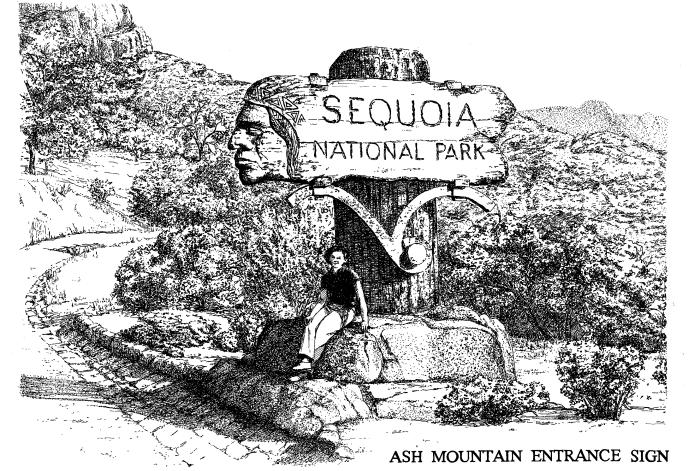
SEQUOIA NATIONAL PARK, CALIFORNIA

GENERALS HIGHWAY

BRIDGES, DETAILS, AND LANDSCAPE



This project is part of the Historic American Engineering Record (HAER), a long range program to document historically significant engineering and industrial works in the United States. The HAER program is administered by the Historic American Buildings Survey/Historic American Engineering Record Division (HABS/HAER) of the National Park Service, U.S. Department of the Interior. The Generals Highway, Sequola National Park recording project was cosponsored during the summer of 1993 by HAER under the general direction of Dr. Robert J. Kapsch, Chief; the National Park Service Roads and Bridges Recording Project; Tom Mulhern, Cultural Resource Division of

the Western Regional Office; and by Sequoia National Park, J. Thomas Ritter, Superintendent.

The field work, measured drawings, historical reports, and photographs were prepared under the direction of Eric N. Delony, Chief of HAER, and project leader Todd A. Croteau. The recording team consisted of Carolyn J. Kiernat, team supervisor and architectural technician, Arizona State University; B.Devon Perkins, architectural technician, Yale University; Renata Stachanczyk, landscape architect, ICOMOS, Poland; Christina Slattery, historian, Ball State University; and large format photography by Brian C. Grogan, photographer.



begun in 1909, was only completed from Camp Sequoia at Commissary Curve to Eleven Range Point, never connecting with the power company road at Hospital

The wagon roads, constantly in disrepair, were anticipated to be inadequate for automobile traffic, and under the recommendation of National Park Service Director Stephen T. Mather, a new road was surveyed to access the Giant Forest. The Peters survey, completed in 1919, was to become the route of the Generals Highway. The new road would connect the existing Mt. Whitney Power Co. route to Hospital Rock, with the Giant Forest by way of a switchback section through Deer Ridge. The original design laid out a one-way road into the park, with the Colony Mill route serving as the exit road for outgoing traffic. Construction of the one-way highway began in 1921, but by 1923 the road design was widened to a two-way road. The Colony Mill Road was abandoned with the completion of the Generals Highway to Giant Forest in 1926.

The highway's extension from Giant Forest Village to the northern park boundary and on to General Grant National Park was begun by the Bureau of Public Roads in 1926. The National Park Service and the Bureau of Public Roads signed a joint agreement, in January of 1926, for the survey, construction, and improvement of roads and trails within the National Parks and Monuments. Under this agreement the Bureau of Public Roads supervised the extension of the highway from Giant Forest Village to the Park's northern boundary at Lost Grove, the construction of bridges and culverts, the reconstruction of the road below Hospital Rock, and the paving of the highway. The Generals Highway was dedicated on June 23, 1935 as a one-day scenic loop connecting Sequoia and General Grant national parks.

the park's early managers, as a road was desperately needed to reach the highly desirable Giant Forest area of the Big Trees. For many years a lack of funding prohibited road improvements within the Park, but finally in 1900 the Park received its first appropriation and the extension of the Colony Mill Road to the Giant Forest was completed in 1903.

The need for improved roads in Sequoia was apparent to

Sequoia was designated a national park on September

25, 1890. The early military superintendents of the park

soon discovered that only two wagon roads entered the park: the Mineral King and Colony Mill Roads. These two roads, although steep, prone to winter washout, and narrow, would remain the primary roads into the Park

until the opening of the Generals Highway in 1926. The

connected the footbill community of Three Rivers with the mining community of Mineral King. The Colony Mill

Road, also known as the Giant Forest Road, was begun

by the socialist Kaweah Colony in 1886 as a link to their

land claims in the Giant Forest area and the nearby mill.

The colonists' road was only completed to their mill site,

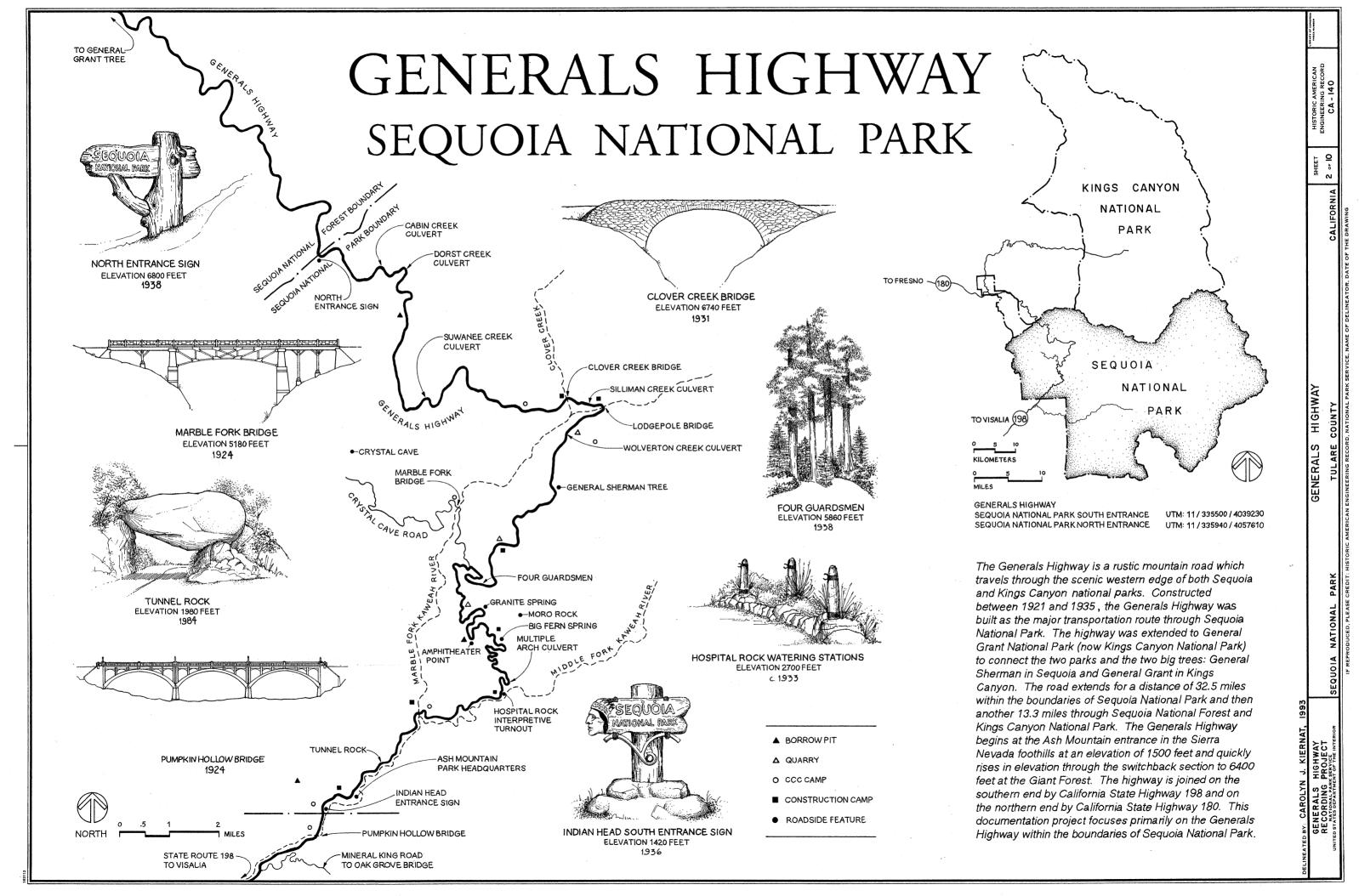
8.7 miles below the Giant Forest.

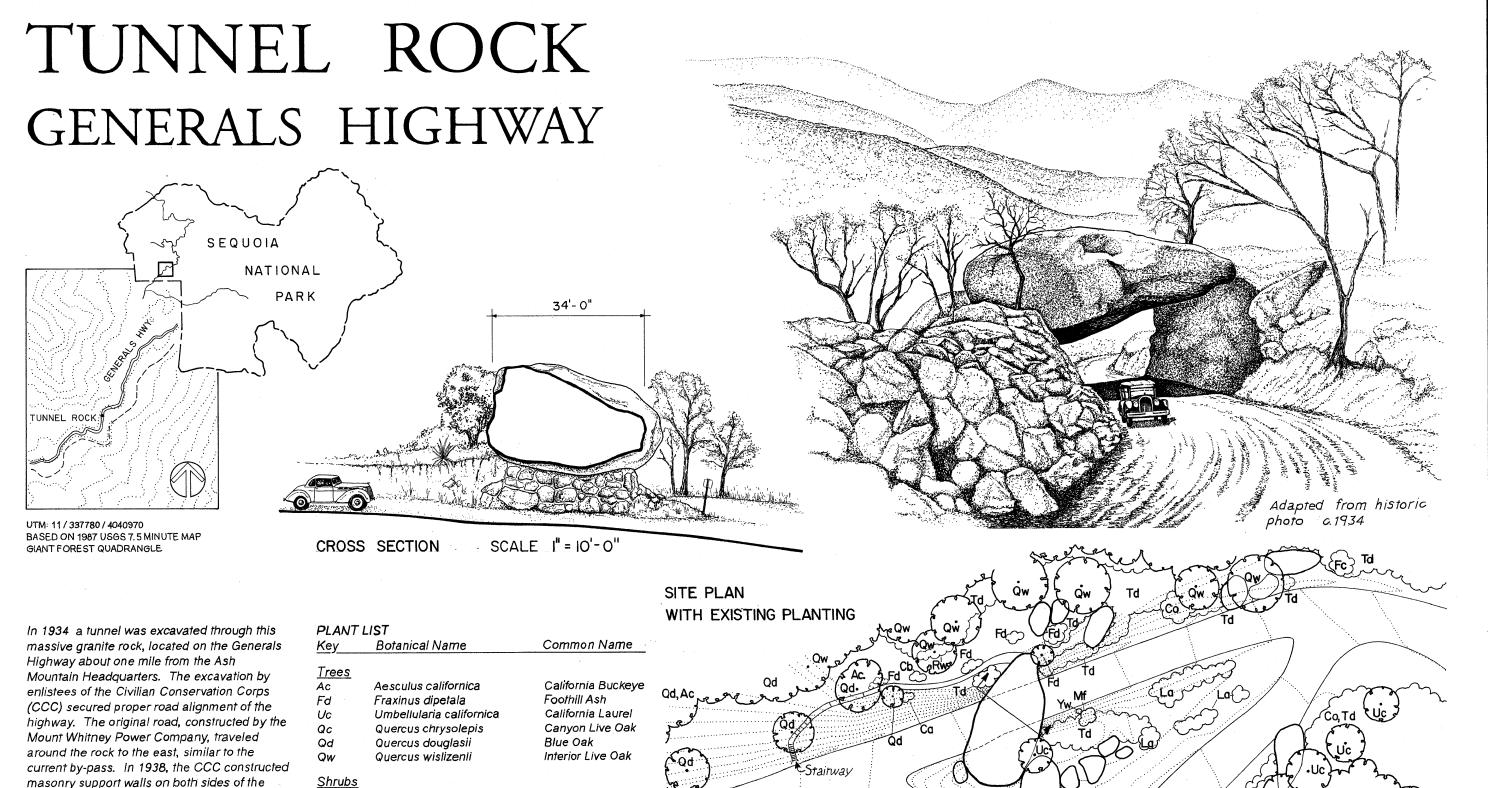
Mineral King Wagon and Toll Road, built in 1879, provided an access route into the new Park as it

CALIFORNIA

SEQUOIA NATIONAL PARK

The Mount Whitney Power Co. Road or Elk Park Road, was the third road to enter the Park prior to the construction of the Generals Highway. The power company was granted a right of way, by contract with the Department of the Interior, allowing for the construction of flumes, ditches, etc. within the park. In this agreement the power company constructed a \$25,000 wagon road along the right of way up the Middle Fork Canyon to Hospital Rock. The Park in anticipation began the construction of a road down from Giant Forest to meet with the road to Hospital Rock. The "Smith Grade,"





masonry support walls on both sides of the tunnel to stabilize the earth walls. The CCC also built a stone stairway climbing to the top of the rock. The drawing on this page was adapted from an historic photograph and shows both the rock excavated from the boulder and the tunnel prior to the construction of the masonry support walls.

Arctostaphyllos viscida Ceanothus cuneatus

Cercocarpus betuloides

Cercis occidentalis

Fremontodendron

Lupinus arboreus

Toxicodendron

Yucca whipplei var. caespitosa

La

Td

californicum

Malvastrum fremonti

diversilobum

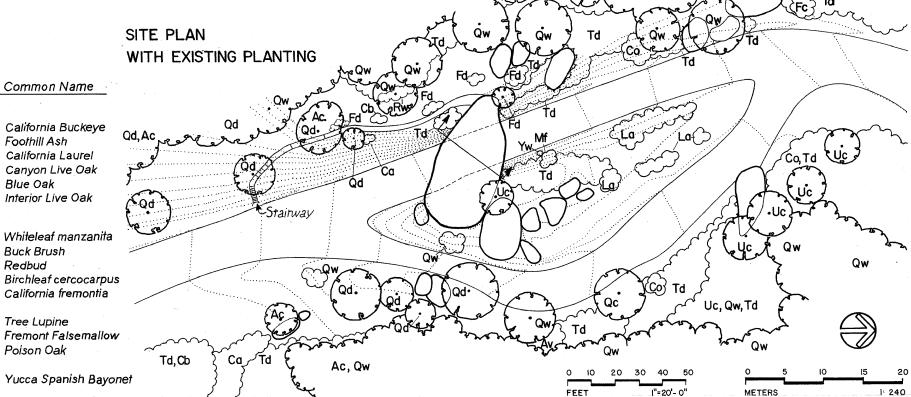
Buck Brush

Tree Lupine

Poison Oak

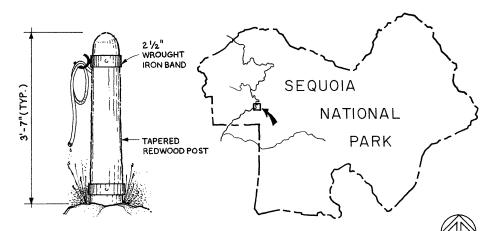
Redbud

Drawings based on field measurements, historical photographs, and original design documents.



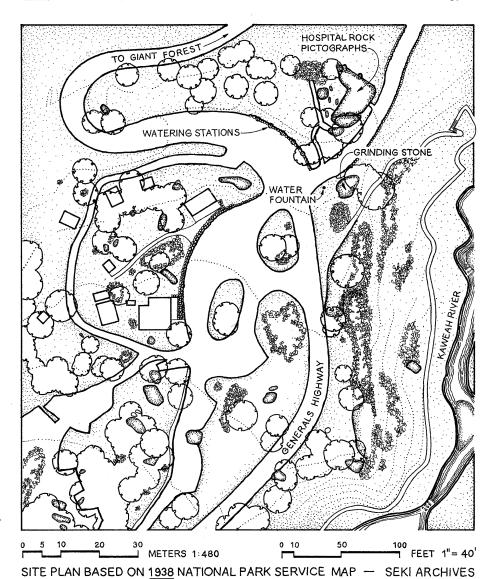
HOSPITAL ROCK

GENERALS HIGHWAY



ELEVATION 1" = 1'-0"

U.T.M. II/34I490/4043030



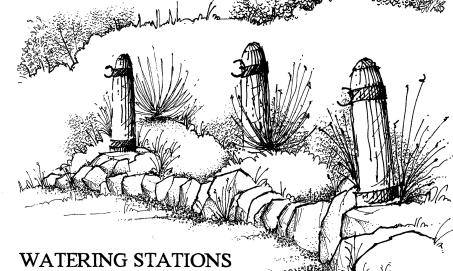
Hospital Rock interpretive turnout is located on Generals Highway 6.1 miles from the Ash Mountain Park entrance. Hospital Rock was the site of a Native American village of the Potwisha tribe. A large granite rock 60' long and 20' thick overhangs to create a spacious room which was used by the tribe as a shelter for the sick and as a gathering and ceremonial space for the village. Located adjacent to the rock are grinding holes which were used by the tribe to grind acorns to create flour for food preparation. Evidence of habitation prior to the Potwisha can be seen in the collection of pictographs painted on the rock face. The meanings of the painted designs are not known, but similar designs among other tribes

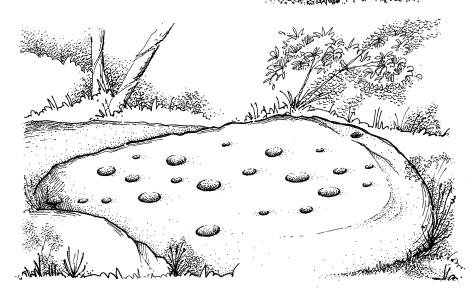
The site earned the name "Hospital Rock" in 1873, ten years after the Potwisha tribe had abandoned the village, when it was used by some of the first explorers of the area to shelter and aid an injured man.

have often had religious, ritual or magical significance.

The development of the site as an interpretive turnout was largely completed by enrollees of the Civilian Conservation Corps (CCC) from November 1933 to April 1934. The men of the CCC laid out a parking area and campground, built a natural stone stairway to replace the wooden stairs reaching the pictographs, constructed automobile watering stations, completed roadside planting In the area and constructed a stone drinking fountain to mimic the character of the Native American grinding holes. Today the site serves as a reminder of the early inhabitants of the area prior to its creation as a national park.

SEQUOIA NATIONAL PARK





NATIVE AMERICAN GRINDING HOLES



GRANITE WATER FOUNTAIN



NATIVE AMERICAN PICTOGRAPHS

DELINEATED BY: CAROLYN J. KIERNAT, 1993

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RECORDING PROJECT
NATIONAL PARK SERVICE
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GENERALS HIGHWAY

TULARE COUNTY

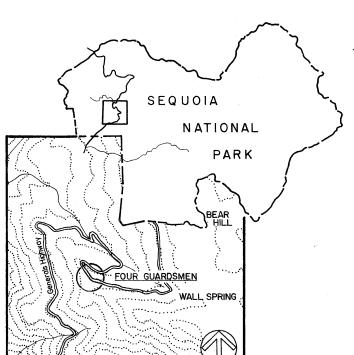
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FOUR GUARDSMEN GENERALS HIGHWAY



UTM: 11/340520/4046740 BASED ON 1987 USGS 7.5 MINUTE MAP GIANT FOREST QUADRANGLE

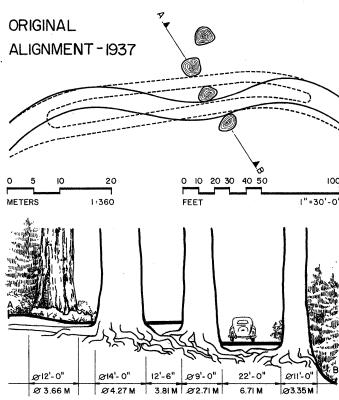
The FOUR GUARDSMEN, also called the Four Guardians and the Gateway Group, are four large sequoia trees growing closely together which have been intersected by the Generals Highway.

The Four Guardsmen, located about 14.9 miles above the Ash Mountain entrance and 2 miles below the Giant Forest Village, form a natural gateway to Giant Forest. The group of four trees were named by George Welsh, surveyor of the first road through the area.

The original road design was a two-way single lane road between two of the trees. The narrow width of the road led to a bottleneck of traffic at the point and in 1939 a second lane was constructed cutting between the four trees. This area is a good example of road design which used the natural landscape elements to create a unique experience for park visitors.

The Four Guardsmen are located among the other big trees in the forested (middle) elevation zone.

SOURCES: SEKI Archives, NPS Construction Documents HABS/HAER Field Survey, 1993



CROSS SECTION-1993

SURVEY OF EXISTING PLANTING - 1993

PLAN LEGEND



Shrubs and Ferns

White Fir

Sugar Pine

Incense Cedar

Giant Seguoia

PLANT LIST

Kev Botanical Name Common Name

<u>Trees</u>	
Ac	Abies concolor
Cd	Calocedrus de

ccurens Pinus lambertiana Sequoiadendron giganteum

Shrubs and Ferns

Ceanothus integerrimus

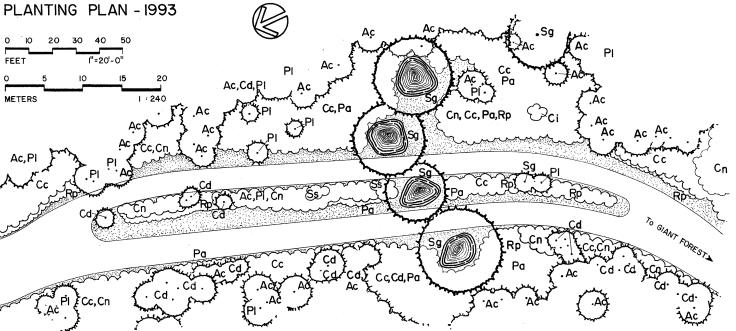
Cornus nuttallii Corylus cornuta var. calif. Pteridium aquilinum RpRubus parviflorus

Salix scoulerana

Deer Brush Pacific Dogwood California Hazelnut Bracken Fern Thimbleberry Scouler Willow

VIEW LOOKING NORTH, NO SCALE

EXISTING



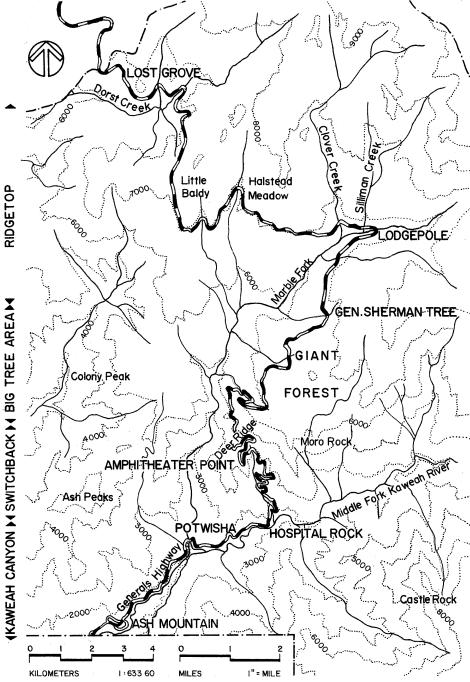


HIGHWAY

ROAD DESIGN

GENERALS HIGHWAY SEQUOIA NATIONAL PARK

The Generals Highway route was dictated by topography and points of scenic and historic interest offering visitors a road distinct in character from that of an urban highway. The highway was carefully designed by National Park Service landscape architects to lay gently on the land, ensuring the protection of the existing landscape and providing for scenic vistas. The Generals Highway travels through four distinct areas offering a varied road character and visual experience.



BASED ON 1967 USGS 15 MINUTE MAP, SEQUOIA AND KINGS CANYON NATIONAL PARKS AND VICINITY

KAWEAH CANYON

From Ash Mountain entrance to Hospital Rock the road is constructed on a bench cut from the north wall of the canyon. The narrow and winding road follows the path of the Kaweah River and offers several spectacular views of the river as well as distant views of Moro Rock and the Great Western Divide.

SWITCHBACK

In the area between Hospital Rock and Giant Forest the road makes the most dramatic elevation gain by rising 3,600 feet in only 10.5 miles. The path of the road derives a serpentine character by continually changing direction to follow the contours of the landscape. This section of road with its 23 major switchbacks and some 200 curves offers many viewsheds of the canyon, vast panoramas of the surrounding landscape, and glimpses of the road itself.

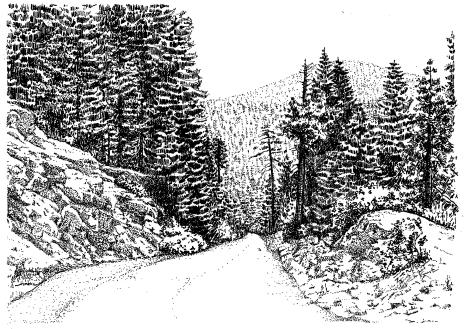
THE BIG TREE AREA

In the area from Giant Forest to the General Sherman Tree the road blends into the gently rolling terrain with wide sweeping curves through the Giant Sequola forest. The visitor experience is dominated by the large trees and a spatial sense of closure created by their height and crowns.

RIDGETOP

In the area extending from the General Sherman Tree to Lost Grove, the highway generally follows the ridge and reflects the less severe terrain of the area. The road winds through the mixed conifer forest and granite rock outcrops along gentle broad curves. The top ridge provides occassional viewsheds of the San Joaquin Valley and Kings Canyon.

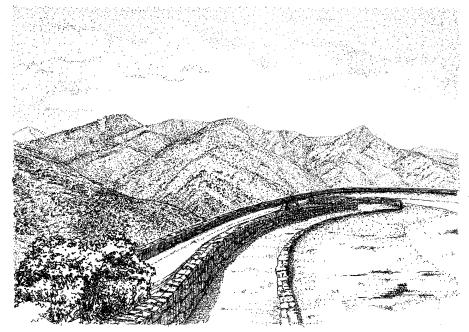
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VIEW OF RIDGETOP AREA



VIEW OF BIG TREE AREA



VIEW OF AMPHITHEATER POINT IN SWITCHBACK SECTION



VIEW OF KAWEAH CANYON

DELINEATED BY: RENATA STACHAŃCZYK, 1993

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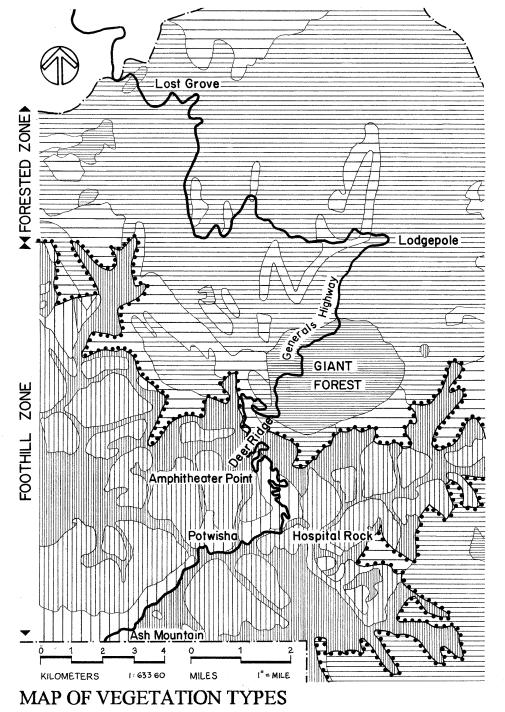
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ROADSIDE VEGETATION GENERALS HIGHWAY

The topography of Sequoia National Park results in several ecological zones. The region is classified into three zones of elevation each having a distinct flora. They are the foothill (Upper Sonoran) zone, the forested (Transition, Canadian and Hudsonian) zone, and the high treeless (Arctic-Alpine) zone. Since the Generals Highway passes through only the low and middle elevations it explores only the foothill and forested zones.



MIXED CONIFER FOREST



VIEW OF BIG TREE COMMUNITY IN FORESTED ZONE



VIEW OF WOODLAND GRASS AREA IN FOOTHILL ZONE

FOOTHILL

This vegetation may be observed along the road between Park Headquarters and Deer Ridge (1500-5000 feet).

WOODLAND - Grassland: This area consists of open stands of broadleaf species with a grass or herbaceous understory. Common species found here include: Blue Oak (Quercus douglasii), Interior Live Oak (Quercus wislizenii), and Canyon Live Oak (Quercus chrysolepis).

CHAPARRAL: This dense shrub community is characteristic of hot, dry, south-facing exposures. Dominant plants include: Chamise (Adenostoma fasiculatum), Manzanita (Arctostaphylos viscida), Birchleaf Mountain Mahagony (Cercocarpus betuloides), and Buckbrush (Ceaonthus cuneatus), with occasional oak species and California Buckeye (Aesculus californica).

BROADLEAF FOREST: This is a forest in which broad-leaf evergreen trees form a complete canopy obscuring the understory vegetation from view. Typical plants found in this area are: Canyon Live Oak (Quercus chrysolepis), Black Oak (Quercus kellogii), and California Bay (Umbellularia californica).

FORESTED AREA

A coniferous forest grows along the road from near Deer Ridge to Lost Grove (5000-7300 feet).

PINE: This is a mostly pine forest including Ponderosa and Jeffrey Pine (Pinus ponderosa and Pinus jeffreyi) as well as Incense Cedar; this community grows best on dry or west-facing slopes.

MIXED CONIFER: This forest area consists of mixed stands dominated by White Fir (Abies con∞lor), Sugar Pine (Pinus lambertiana), or pure fir stands with White Fir (Abies concolor) and Shasta Red Fir (Abies magnifica shastensis).

BIG TREE: The giant sequoia trees (Sequoiadendron giganteum) are seldom found in pure stands, but are most often associated with Sugar Pine (Pinus lambertiana) and White Fir (Abies concolor). The majority of the Big Trees grow between 5500 and 7500 feet in elevation.

Sources: Road Character Guidelines. Sequoia and Kings Canyon National Parks. National Park Service, 1990 and SEKI Archives.

RENATA STACHAŃCZYK

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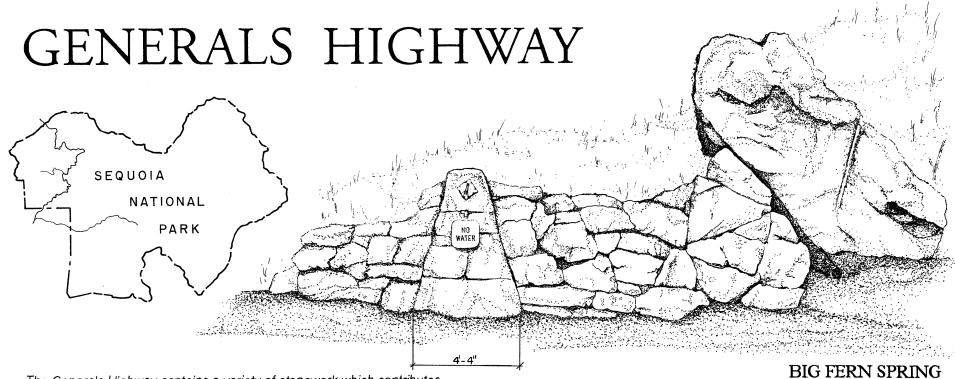
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STONEWORK



The Generals Highway contains a variety of stonework which contributes to the rustic character of the road. The stonework within the park reflects its surroundings through the use of local schist and granite stone. Much of the stonework was constructed by the Civilian Conservation Corps (CCC) between 1933 and 1942. As a New Deal program the CCC was established to provide jobs for unemployed young men through work with the government. The contributions of the ten CCC camps within Sequoia were numerous and included extensive stonework along the highway. The CCC worked to improve road drainage through the construction of schist gutters and accompanying drop culverts in 1936 from the southern park boundary to just beyond the park headquarters. The CCC also improved the springs along the highway, including the construction of a stone wall and watering station at Big Fern Spring in 1934.

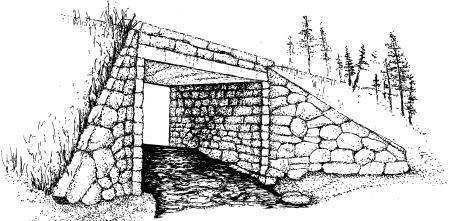
The Suwanee Creek Culvert is located on the highway between the Clover Creek Bridge and Dorst Creek. Designed in 1930 by the Bureau of Public Roads, this culvert is a true stone masonry arch with an entire length of over 150'. The opening is 6' wide and 7' high with an arch radius of 3'.

The Silliman Creek Culvert is located on the highway between the Lodgepole and Clover Creek Bridges. It was built during 1930 and 1931 under the same Bureau of Public Roads contract as the bridges. The structure is a reinforced concrete slab which spans 16' between rubble masonry abutments. The interior walls are 9'-6" high at the upstream elevation and are also of stone.

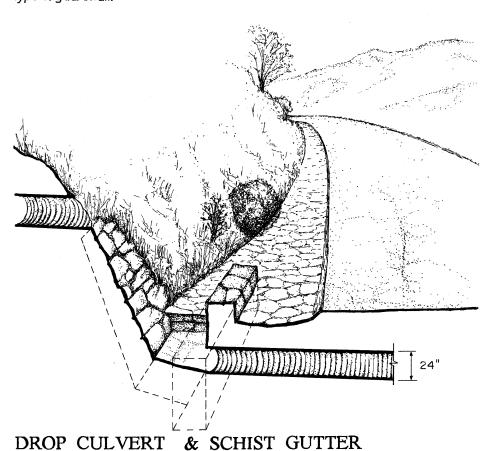
Along the Generals Highway a variety of stone guardwalls have been constructed using materials corresponding to the stone of the area. Mostly low smooth profile stone walls are used to outline parking areas and road edges, but one location has a crenellated wall. The Kaweah Canyon and switchback areas contain mostly schist walls but also some granite, while the big tree area uses large granite blocks which relate better to the scale of the sequoia trees. In the ridgetop area, granite is also the more common type of guardwall.



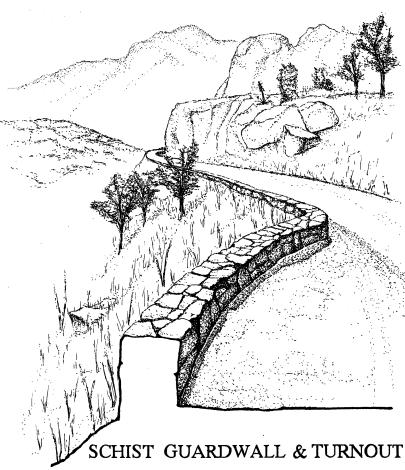
SUWANEE CREEK CULVERT



SILLIMAN CREEK CULVERT



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DELINEATED BY: B. DEVON PERKINS, 1993

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