

CALIFORNIA INCLINE BRIDGE

(Bluffs Bridge; Pacific Coast Highway (Bluff);
California Incline; California Avenue Incline
Bridge; Linda Vista Drive)

BRIDGE NO. 53C-0543

EA 07-464604 BRLS-5107 (002)

CITY OF SANTA MONICA

LOS ANGELES COUNTY, CALIFORNIA

WRITTEN AND HISTORICAL DATA

HISTORIC AMERICAN ENGINEERING RECORD

National Park Service
U.S. Department of the Interior
1849 "C" Street NW
Washington, DC 20240-0001

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HISTORIC AMERICAN ENGINEERING RECORD

CALIFORNIA INCLINE BRIDGE

(Bluffs Bridge; Pacific Coast Highway (Bluff); California Incline; California Avenue Incline Bridge; Linda Vista Drive)

HAER No. XX-##

Location: Santa Monica, Los Angeles County, California, 0.1 mile south from the Pacific Coast Highway (PCH) to Ocean Avenue. UTM: Zone 11S; 361175.34E/3765206.90N.

Dates of Construction: California Incline was constructed 1906. The California Incline Bridge was constructed 1932, as an improvement of the existing roadway.¹

Architect/Engineer/Builder: Howard B. Carter, City Engineer

Original Owner/Occupant and Use: The City of Santa Monica. Used as a vehicular and pedestrian bridge.

Present Owner/Occupant and Use: Same.

Significance: The California Incline (Bridge No. 53C-0543) is significant as a contributing element (Contributor) to Palisades Park. It was determined eligible for listing in the National Register of Historic Places (NRHP) on October 13, 1998, under Criterion A, as a Contributor to the Palisades Park Historic District, at a local level of significance. Palisades Park, formerly known as Linda Vista Park, appears to have been determined eligible for listing in the NRHP in 1994 as a Historic District under Criterion A, because it is important to the development of parks and recreation in the City of Santa Monica. The first automobile access from the park to the beach was provided by Linda Vista Drive, later known as the California Incline.

Description: The California Incline is a roadway about two city blocks long cut into the steep bluff above the PCH. It climbs 85 feet from its intersection with the PCH to Palisades Park, at an average grade of about 7 percent.

A portion of the California Incline is Bridge No. 53C-0543, an eight-inch thick reinforced concrete (RC) slab on RC transverse floor beams. The slab is supported on the northeast by earth and on the southwest by an RC longitudinal beam resting on earth and intermittently on RC columns on spread footings. The number of columns appears to be at least fifteen. There are twenty 8-foot spans,

¹ *Evening Outlook* "California Incline Finally Completed," August 30, 1932, page 1.

not continuous, measured along the longitudinal beam for a total bridge length of 160 feet. The bridge is composed of five “structures” or “slabs,” areas where the beam spans gullies in the hillside of more than a few feet. The bridge width is 39 feet, curb face to curb face, with a 5.5-foot sidewalk, for a total width of 44.5 feet. There are two uphill through traffic lanes and one downhill. The RC bridge rail is ornamental, State Division of Highways standard design. The alignment is a tangent with a curve at the south end. The wearing surface of the deck is 3 inches of asphalt concrete (AC); the total slab thickness is 8 inches.

The original c. 1905 roadway, known as Linda Vista Drive, was 20 feet wide with Portland cement concrete (PCC) curb and gutters 3 feet wide on the southwest side only. The PCC curb and gutters were unreinforced. The surface of the roadway was a 3-inch layer of fine gravel over a 9-inch layer of coarse gravel. The road was widened and completely reconstructed to its current plan and profile in 1932. Today, there are many cracks in the supporting columns, beams, and especially the deck. Steel is exposed and rusting in the ornamental railing and throughout the structure.

The California Incline is listed erroneously as Category 5, ineligible for the NRHP, in the Caltrans Historical Significance – Local Agency Bridges Inventory of November 2014. According to the report that found the California Incline eligible for the National Register under Criterion A, Drawings in the City of Santa Monica Department of Engineering establish that the Incline was planned as part of the park as early as 1904. “The Incline appears to have been constructed in 1905, and was originally called ‘Linda Vista Drive,’ a name which associated it with the park and with the adjacent real estate tract, as well as distinguished it from the adjacent Linda Vista Walk.”² The drawing accompanying the report has a note that specifies plain concrete curb and gutters along one side of the roadway; however, it depicts a roadway surface made of fine gravel over coarse gravel atop graded earth, not a concrete surface.³ There is also no indication of a rail or fence. Historic photographs of the California Incline show a gravel or dirt road. They also show the original cut into the bluff provided sufficient land on the west side of the roadway to allow plantings and trails, which were in effect parkland. “The border fence along the western edge of the road was planned as a plain, straight-rail fence of redwood covered in cement. It was executed, however, as a rustic split-wood style fence which matched that of the park, strengthening the visual connection between the road and the park.”⁴ A gate in the fence provided access to the parkland near the face of the bluff.

The Incline suffered loss of integrity with respect to Design, Materials and Workmanship dating to 1905 when the current concrete slab structure was built in 1932. The erosion of the narrow strip of land west of the Incline has progressed to the extent that no parkland exists there any longer. Likewise, there

² Beck, Laura, and Christy J McEvoy. *Historic Resource Evaluation Report (HRER) for Properties in the Beach Improvement Group: The California Avenue Incline (#53C-543), Robert E. McClure Tunnel (#53-08), The Santa Monica Pier Bridge and Pier Sign.* (City of Santa Monica, 1998), page 4.

³ Ibid. 30.

⁴ Ibid. 4.

is no longer any visual connection between the park and the Incline because the bridge rail (or sidewalk handrail) is of standard design (1932 State Division of Highways ornamental railing), which matches neither the park fence now nor the park fence at the time it was built. The railing is in poor condition; there are many spalls and cracks exposing rusted rebar. The AC surface of the road also has many cracks and is in poor condition.

History:

For unknown reasons, Bridge No. 53C-0543 was not identified in either the original California Bridge Survey of 1986⁵ or the Caltrans Statewide Historic Bridge Inventory Update Survey and Evaluation of Common Bridge Types of 2004.⁶ The original survey considered only bridges built before the year 1942. With respect to bridges by type, it identified 35 concrete slab bridges, of which seven were determined eligible for listing in the NRHP. Of the 35 concrete slab bridges, none was designed by out-of-state consulting engineers, 7 were designed by California consulting engineers, 20 were designed by County Surveyors or City Engineers, 7 were designed by the State Division of Highways, and the designer of 1 of the concrete slab bridges was classified as unknown or other. With respect to date of construction, none of the seven concrete slab bridges found NRHP eligible was built between 1931 and 1940.

The 2004 Update considered bridges built in 1960 or earlier, evaluating 20 bridges belonging to the 10 Common Bridge Types for NRHP eligibility. Caltrans added to the inventory of California's historic bridges *Bridge 53C-1380* in Los Angeles County, a concrete slab bridge constructed in 1933 and eligible under Criterion C for its Art Deco design and ornamental embellishment. The 2004 Update noted that of approximately 2,200 extant concrete slab roadway bridges built in California before 1960, only one is actually *listed* in the NRHP (as a Contributor to the Presidio of San Francisco). Eleven concrete slab bridges that are part of the Arroyo Seco Parkway have been determined *eligible* for listing in the NRHP, as have three others that are contributors to larger properties. The 2004 Update did not add the California Incline Bridge to the group of three concrete slab bridges that are eligible as contributors to larger properties and did not change its Category 5 NRHP status code in the Local Agency Bridges Inventory.

Only two of the seven concrete slab bridges found *individually eligible* for the NRHP by the original survey remained in 2004:

- South Sutter Road over Mormon Channel in Stockton (29C-0232). Built in 1915, this bridge is one of only two remaining examples in the state of the “mushroom” system developed by the engineer C.A.P. Turner in 1910.
- County Road 118 over Cameron Creek (46C-0410). Also built in 1915, this

⁵ Federal Highway Administration (FHWA) and California State Historic Preservation Officer (SHPO). *National Register Determination of Eligibility: Historic Bridges in California: Concrete Arch, Concrete Girder, Concrete Slab, Canticrete, Stone Masonry, Suspension, Steel Girder and Steel Arch (THEMATIC), CONSENSUS Determination of Eligibility* (September 1986).

⁶ Hope, Andrew. *Caltrans Statewide Historic Bridge Inventory Update, Survey and Evaluation of Common Bridge Types*. California Department of Transportation (Caltrans), November 2004. Accessed Online at http://www.dot.ca.gov/hq/env/cultural/history/cso_common_br_types_2004.pdf on April 22, 2015.

bridge was an experimental design that uses steel trusses encased in concrete, forming the bridge railings, to support the concrete slab roadway.

The noted historian Carl Condit observed that reinforced concrete "... whose structural properties were being explored only in the last quarter of the nineteenth century, rapidly became the dominant building material of the twentieth." He went on to state in Volume II of his classic *American Building Art*:

"By 1900 all builders thoroughly understood that reinforcing bars in a concrete member subject to deflection had to be located in the region of maximum tension. In the case of a simple beam, for example, they would have to be placed near the lower surface; in a continuous beam, near the lower surface at the mid-portion between supports, and at the upper surface in the region of the support. What was less obvious but equally crucial is that the bars must also be located in regions of maximum shear. This is a complicating factor that makes the basic principle alone an oversimplification, since shear acts both longitudinally and transversely, thus producing a critical diagonal tension in the member, and since the regions of maximum shearing stress may be entirely different from those of tensile stress.

These principles are predicated on the existence of a uniformly distributed dead load. But a live, or moving, load alters the stress distribution to a greater or less degree, so that the engineer must have an accurate representation of the changing distribution of stress, or isostatic pattern, for various conditions of loading. As a matter of fact, his reinforcing must be arranged to meet the worst possible condition. Thus the number and distribution of reinforcing bars will change between the support and the midpoint of a beam, or between the support and the edge of a slab, following the change in the bending moment, and the bars themselves will be bent into polygonal forms approximating the isostatic curves. The resistance to longitudinal shear requires the location of bars at the neutral axis and in the region of the support, while transverse shear must be met by vertical hook- or stirrup-shaped rods. This organic accuracy of design can be achieved only by thorough investigation of the internal action of the member. It is for this reason that we may think of building in concrete as the most scientific of structural techniques."⁷

"The main techniques that have been developed to meet the peculiar stress characteristics of column-and-slab construction are flaring the upper end of the column, thickening the slab in the region of the column, and introducing radial and concentric annular reinforcing around the column capital."⁸

Of course, all bridge structures are subject to live loads, which depend on the weight of the vehicles (or trains or pedestrians) passing over them. Within

⁷ Condit, Carl. *American Building Art, Volume II* (Oxford University Press 1960) 151–152.

⁸ *Ibid.* 167.

weeks of its completion, the Santa Monica City Council restricted the California Incline to a 3,000-pound vehicle gross weight limit.⁹

The problem was summarized years later by W.R. Baker, Associate Bridge Engineer, as follows:

“The undated detail sheet supplied by the City of Santa Monica was checked for accuracy and completeness by physically exposing the reinforcing in the deck and floor beams. A Tinius Olsen S-2 Strain Gauge was placed on the longitudinal deck steel and a loaded 3-axle truck positioned on the structure so as to produce the greatest theoretical stress in the steel. Negligible stress was recorded. This indicated that the deck was acting as an un-reinforced section, which is to be expected considering the slab depth and short spans. A working stress analysis was made using the field checked detail sheet. The feature limiting the load carrying capacity of the structure is the deck which is too lightly reinforced.”¹⁰

Baker appears to be saying that a greater quantity of reinforcing steel should have been specified for the deck and perhaps the floor beams. The arrangement of the reinforcing steel is not at issue. Caltrans used his analysis to limit the legal load capacity of Bridge No. 53C-0543 to 13 tons per vehicle, 21 tons per semi-trailer combination and 24 tons per truck and full trailer.¹¹

A report prepared by consulting engineers in 1989 concluded that the slab thickness had to be increased by six inches, to a total thickness of 6+8=14 inches, for the bridge to support the 11-ton (23,500 lbs.) limit it otherwise could have supported, if it were not for the weak deck.¹²

An interesting fact surfaced more than 50 years after the bridge was built: “The deck soffit and girders near the columns one, two, and three as well as other locations are still covered with the timber forming used in the construction of the bridge.”¹³ Experienced workmen under adequate supervision would have removed the board forms when the concrete had cured.

No information has been located at the City of Santa Monica regarding the contract or how long construction lasted. Although the California Incline begins at a signalized intersection with the PCH, the State Division of Highways did not design this structure or award the construction contract. The City of Santa Monica presumably was in possession of this information at one time, together with the historic construction drawings, but it appears this information was not archived for long-term retention.

In 1890, the founders of Santa Monica, Senator John P. Jones and Colonel

⁹ *Evening Outlook*, “Ordinance No. 502, Section 50-a,” September 8, 1932.

¹⁰ Bridge Inspection report dated May 7, 1973, Bridge No. 53C-543, sheet 3. Accessed at District 7 via BIRIS.

¹¹ Order Establishing Load Limit on Bridge No. 53C-543, California Incline, in Santa Monica. June 21, 1973. Accessed on BIRIS.

¹² Moffatt & Nichol, Engineers, 1989, sheet 9C. Accessed at District 7 via BIRIS.

¹³ Bridge Inspection report dated June 12, 1990, Bridge No. 53C-543, sheet 1 of 3.

Robert S. Baker, deeded forever to the public the strip of land along the edge of the palisades from the north city limits to Montana Avenue. The remainder of Palisade Park's 26 acres was donated in 1897 by the Santa Monica Land and Water Company, which was headed by Robert C. Gillis, a wealthy land developer who owned most of the Santa Monica Beach.¹⁴ This land consisted of the portion "from Montana Avenue to the south city limits," which was then along Railroad Avenue (now called Colorado Avenue). By 1901, Santa Monica was a thriving seaside tourist destination and Gillis had subdivided his holdings on the beach for residential and commercial development (Sunset Tract).

The palisades or bluffs facing Santa Monica Bay formed a natural barrier for persons desiring access to the beach from the park above. The face of the bluff was subject to slides and slip-outs. Trails were hazardous. In the 1880s, an enterprising carpenter constructed the 99 Steps, connecting Palisades Park to the beach in the vicinity of Arizona Avenue. The 99 Steps were modified in the 1890s, when the Southern Pacific Railroad laid tracks along the base of the cliffs as part of the project to construct the Long Wharf. Still later, they were modified to span Palisades Beach Road, a narrow (40-foot right-of-way, two traffic lanes) city street parallel to the cliffs and shoreline. Finally, the 99 Steps were reconstructed as an RC pedestrian overcrossing spanning the PCH.

Automobile traffic along Ocean Avenue grew into a fairly steady stream very early in the 20th century, leading the city to plan for automobile access to the beach. According to an article in *The Evening Outlook*, the city council held a meeting on July 18, 1904, attended by the widow of Colonel Baker, Arcadia Bandini de Baker and Roy Jones, son of Senator J. P. Jones, in the matter of acquiring right-of-way for a road to the beach. The Jones and Baker interests owned large holdings in the district to be assessed for the cost of these improvements. Their land was needed for the proposed alignment. On July 22, 1905 Contract No. 110 for the Improvement of the California Incline Roadway and the Sunset Trail was entered into between the city and C. W. Street, the successful bidder against J. D. Kneen and M. K. French. The records for Assessment Roll No. 100 were said to contain an assessment map showing the roadways to be improved together with the property frontage to be assessed for these improvements.¹⁵

The Official Map of the City of Santa Monica, prepared by the City Engineer and dated April 1906, depicts "Palisades Park," "Roadway to the beach (under construction)," and a "walk," all presumably in the location of the contract to construct the California Incline Roadway and the Sunset Trail. Ocean Avenue, California Avenue, Palisades Beach Road, and the Southern Pacific-Pacific Electric tracks are also shown on this map. No changes to any of those streets or the tracks are seen on a 1930 map of Santa Monica north of Colorado Avenue and west of 9th Street. The California Incline is parallel to Ocean Avenue for two city blocks (California to Washington to Idaho Avenues), reaching

¹⁴ Santa Monica Public Library, Santa Monica Facts: "Palisades Park." Accessed online April 3, 2015, at <http://digital.smpl.org/cdm/singleitem/collection/smfacts/id/1754/rec/3>. Marquez, Ernest. *Santa Monica Beach: A Collector's Pictorial History*. (Angel City Press: 2004) 50-51.

¹⁵ *Evening Outlook* "Here Are Divergent Views on City Plans for Buying Palisades Bluff," September 26, 1930, page 16.

Palisades Beach Road below Idaho Avenue. A footpath beginning near Idaho Avenue joins the Incline north of the projected centerline of Washington Avenue, at the Incline's midpoint.

The California Incline was constructed on a new alignment rather than on preexisting alignment such as a trail. Confusion has arisen among local historians because of photos depicting a monumental gate made of rustic split wood or branches and bearing the sign "Sunset Trail to Palisades Beach Road." There is no historic association between the California Incline and this trail or any trail other than the "walk" shown on the 1906 map, which has been referred to as the "Idaho foot path."¹⁶

The California Incline had a rustic branch fence until 1932. Palisades Park had a rustic branch fence from 1905 until sometime after World War II. "At some point after WWII the rustic branch fence at Palisades Park was replaced with two types: a pre-cast concrete fence with a criss-cross design and a wood board fence. Bartlett photographs of Palisades Park dated 1946 show the rustic branch fence and the wood rail fence."¹⁷ The installation of the wood rail fence started at the north end of the park, near Inspiration Point. Gradually, the rustic branch fence was replaced entirely.

The Idaho foot path from the California Incline to Palisades Park provided pedestrian access to the Santa Monica Beach. Throngs of beachgoers arrived via the Pacific Electric (P.E.) Red Cars at the Palisades Park Station on Ocean Avenue or at a stop along the P.E. line at the foot of the bluff. The California Incline and Idaho foot path were part of a designed landscape whose plantings included a large century plant. Bartlett photos taken near the Idaho foot path show the plant was there in 1938, but gone in 1946. Due to the 1932 road widening and continuous erosion of the face of the bluff, nearly all of the 1905-era plantings along the Incline were lost by 1948.

The California Incline Bridge, (53C-0543) was built in 1932 under the direction of the City Engineer, Howard B. Carter (1888–1958). As has been pointed out earlier in this report, the majority of California's historic concrete slab bridges were designed by County Surveyors or City Engineers. According to the U.S. Census, Carter resided in Santa Monica with his wife, son, and daughter. His occupation was listed as Civil Engineer, working for wages or salary in government work. He told the Census "College, 4th year" when asked highest grade completed, but curiously, answered "No" in response to "Attended school or college?"¹⁸ His biographer tells us: "Howard Baker Carter was educated in the public schools of California, and received a special technical training under experts in that line, also many practice honors. He entered the engineering field

¹⁶ UCLA Library Digital Collections, Bartlett (Adelbert) Papers, Collection 1300, accessed online May 4, 2015. The images are under copyright, but the metadata for 85 negatives whose subject is the California Incline (Santa Monica, California) includes descriptive information handwritten on the negative sleeves. Adelbert Bartlett photographed the "Idaho foot path" between 1928 and 1952.

¹⁷ Ibid. Metadata from Collection 1300.

¹⁸ Year: 1940; Census Place: Santa Monica, Los Angeles, California; Roll: T627_256; Page: 8A; Enumeration District: 19-758. Ancestry.com, 1940 United States Federal Census [database on-line] Provo, UT, USA.

in 1904, in irrigation work in Northern California, and became greatly interested in municipal work and large community and mining development.” Furthermore: “Since settling here he has been made City Engineer (1923) and so admirably and along such modern, progressive lines has he carried on the duties of the office that he has been retained ever since.”¹⁹ Left unsaid is the fact that Carter’s brother was the Mayor of Santa Monica.

The project to widen and improve the Incline was delayed for many years, along with plans to widen Palisades Beach Road.²⁰ Ultimately, it was the Great Depression that served as a catalyst for the construction of this bridge. In the waning months of the Hoover Administration, unemployment levels had reached crisis proportions. In Santa Monica, municipal relief officers assigned unemployed men to work on the construction of the Incline. Although there may have been “experienced men” among the crew of 130 who labored with pick and shovel on the project, most had no prior construction work in their personal histories. For some, the work meant the difference between eating and starvation. During construction, human remains were discovered buried in a redwood coffin 60 feet below the upper edge of Palisades Park.²¹ It is ironic that as Los Angeles hosted the opening ceremonies of the X Olympiad, one of the unemployed men working on the California Incline had been an Olympic contender.²²

Sources:

Beck, Laura, and Christy J McEvoy. *Historic Resource Evaluation Report (HRER) for Properties in the Beach Improvement Group (BIG): The California Avenue Incline (#53C-543) Robert E. McClure Tunnel (#53-08) (Coastal Corridor Gateway) The Santa Monica Pier Bridge and Pier Sign* Santa Monica, Calif.: City of Santa Monica, 1998.

Bridge Inspection Reports, Bridge Number 53C-543, dates May 7, 1973, 1989, and June 12, 1990 on file at Caltrans District 7, accessed via BIRIS.

Condit, Carl W. *American Building Art, Volume II*. New York: Oxford University Press, 1960.

Evening Outlook (Santa Monica)

“Here Are Divergent Views on City Plans for Buying Palisades Bluff.” September 26, 1930.

“Ordinance No. 502, Section 50-a.” September 8, 1932.

“Ancient Bones of Man Found Deep in Bluff.” March 4, 1932.

“P.E. Seeks to Abandon Line at Foot of Bluff.” March 4, 1932.

“YES IT’S TRUE: Patrick Molyneaux, An Olympic contender of 1910 was among the men who worked on the California Incline.” July 22, 1932.

Federal Highway Administration (FHWA) and California State Historic

¹⁹ Warren, Charles S. “History of the Santa Monica Bay Region,” 1934, pages 110–113.

²⁰ *Evening Outlook*, “Ancient Bones of Man Found Deep in Bluff,” March 4, 1932, page 1.

²¹ *Evening Outlook*, “P.E. Seeks to Abandon Line at Foot of Bluff,” March 4, 1932, page 1.

²² *Evening Outlook*, “YES IT’S TRUE: Patrick Molyneaux, An Olympic contender of 1910 was among the men who worked on the California Incline,” July 22, 1932, page 1.

Preservation Officer (SHPO). *National Register Determination of Eligibility: Historic Bridges in California: Concrete Arch, Concrete Girder, Concrete Slab, Canticrete, Stone Masonry, Suspension, Steel Girder and Steel Arch (THEMATIC), CONSENSUS Determination of Eligibility* Washington, D.C.: National Park Service, 1986.

Hope, Andrew. *Caltrans Statewide Historic Bridge Inventory Update, Survey and Evaluation of Common Bridge Types*. California Department of Transportation, November 2004. Accessed online April 3, 2015 at http://www.dot.ca.gov/hq/env/cultural/history/cso_common_br_types_2004.pdf.

Marquez, Ernest. *Santa Monica Beach: A Collector's Pictorial History*. Santa Monica, California: Angel City Press, 2004.

Santa Monica Public Library, Santa Monica Facts: "Palisades Park." Accessed online April 3, 2015 at <http://digital.smpl.org/cdm/singleitem/collection/smfacts/id/1754/rec/3>.

UCLA Library Digital Collections, Bartlett Papers, accessed online May 4, 2015. The images are under copyright, but the metadata for 85 negatives whose subject is the California Incline includes descriptive information handwritten on the negative sleeves. Adelbert Bartlett photographed the "Idaho foot path" between 1928 and 1952.

United States Census Bureau. Year: 1940; Census Place: *Santa Monica, Los Angeles, California*; Roll: T627_256; Page: 84; Enumeration District: 19-758. Ancestry.com, 1940 United States Federal Census [database on-line] Provo, UT, USA.

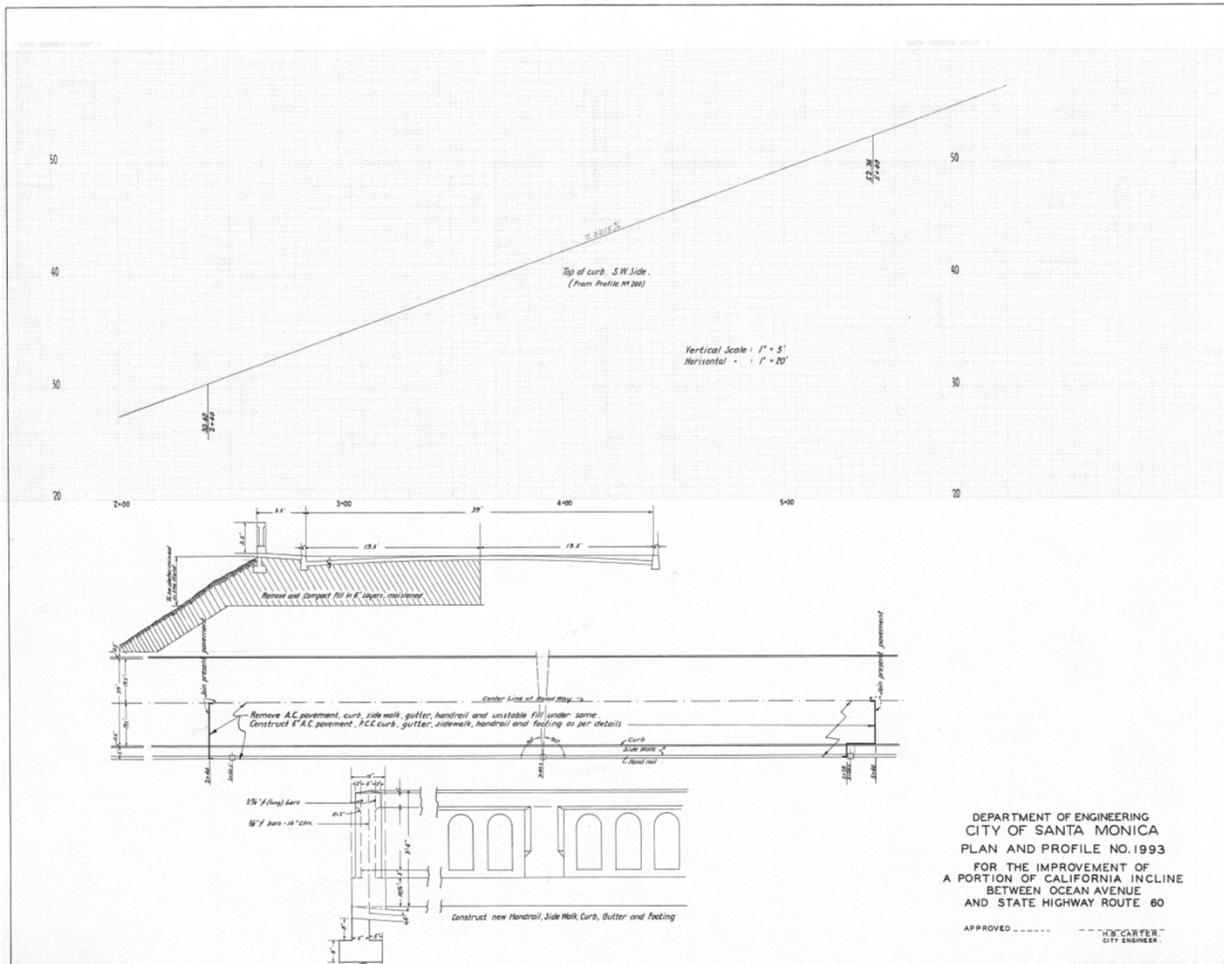
Warren, Charles Sumner. *History of the Santa Monica Bay Region: in Two Parts, Narrative and Biographical*. Santa Monica, Calif.: Cawston, 1934.

Historian: Eugene Heck, M.A., July 21, 2015.

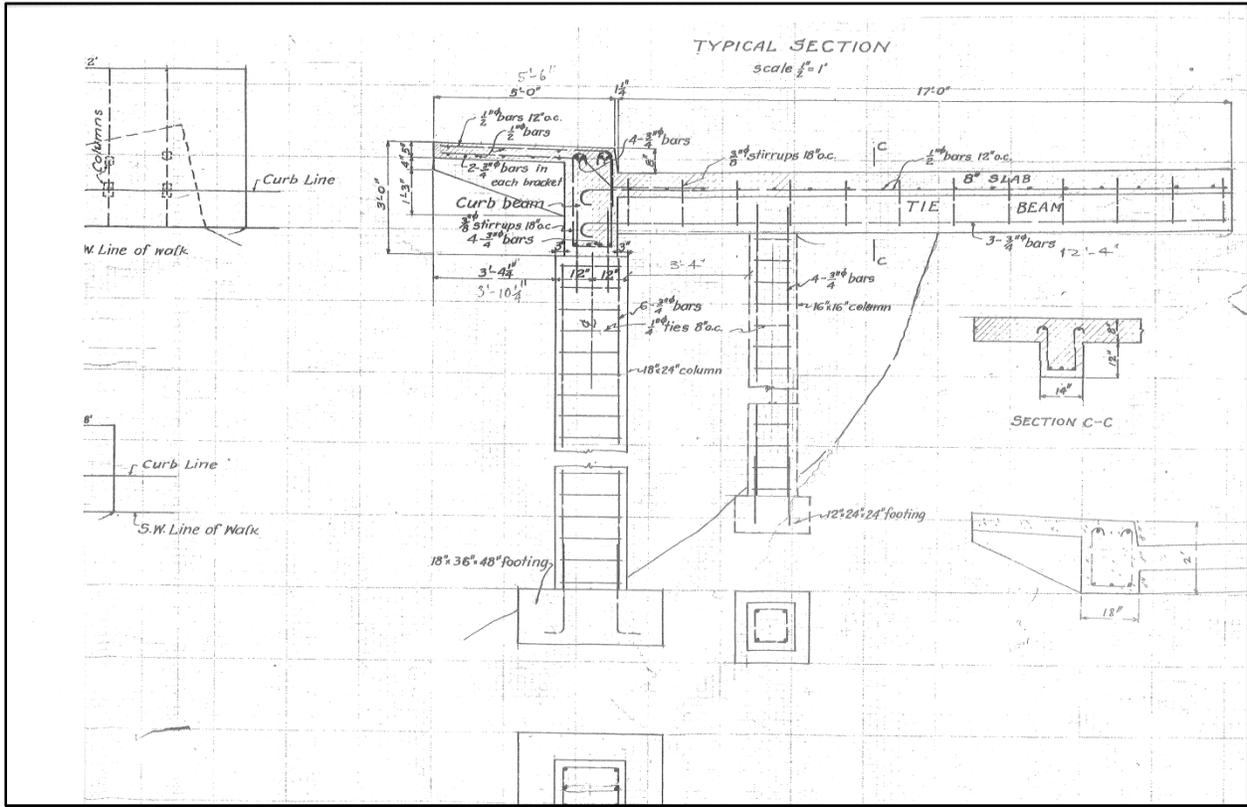
Project Information: This Historic American Engineering Report has been prepared to fulfill, in part, requirements of the Memorandum of Agreement (MOA) between the California Department of Transportation (Caltrans) and the California State Historic Preservation Officer (SHPO), signed May 5, 2011, for the California Incline Replacement Project, in the City of Santa Monica, Los Angeles County, California. Caltrans District 7 (District 7) and the City of Santa Monica participated in the consultation process and were concurring signatories on the MOA. Architectural Historian Eugene Heck of LSA Associates, Inc. prepared this document for Caltrans. Mr. Heck conducted the field inspection in April 2015. Historic Photographs and Local History References were obtained through the generous assistance of Susan K. Lamb of the Santa Monica Public Library. Suzanne Oatey of the

Huntington Library provided assistance in obtaining negatives and prints from the Ernest Marquez Collection of historic photographs. Large Format Photography was provided by Dennis Hill. The City of Santa Monica provided undated engineering drawings and the Demolition Plans, which describe the existing bridge and roadway. District 7 provided access to the BIRIS.

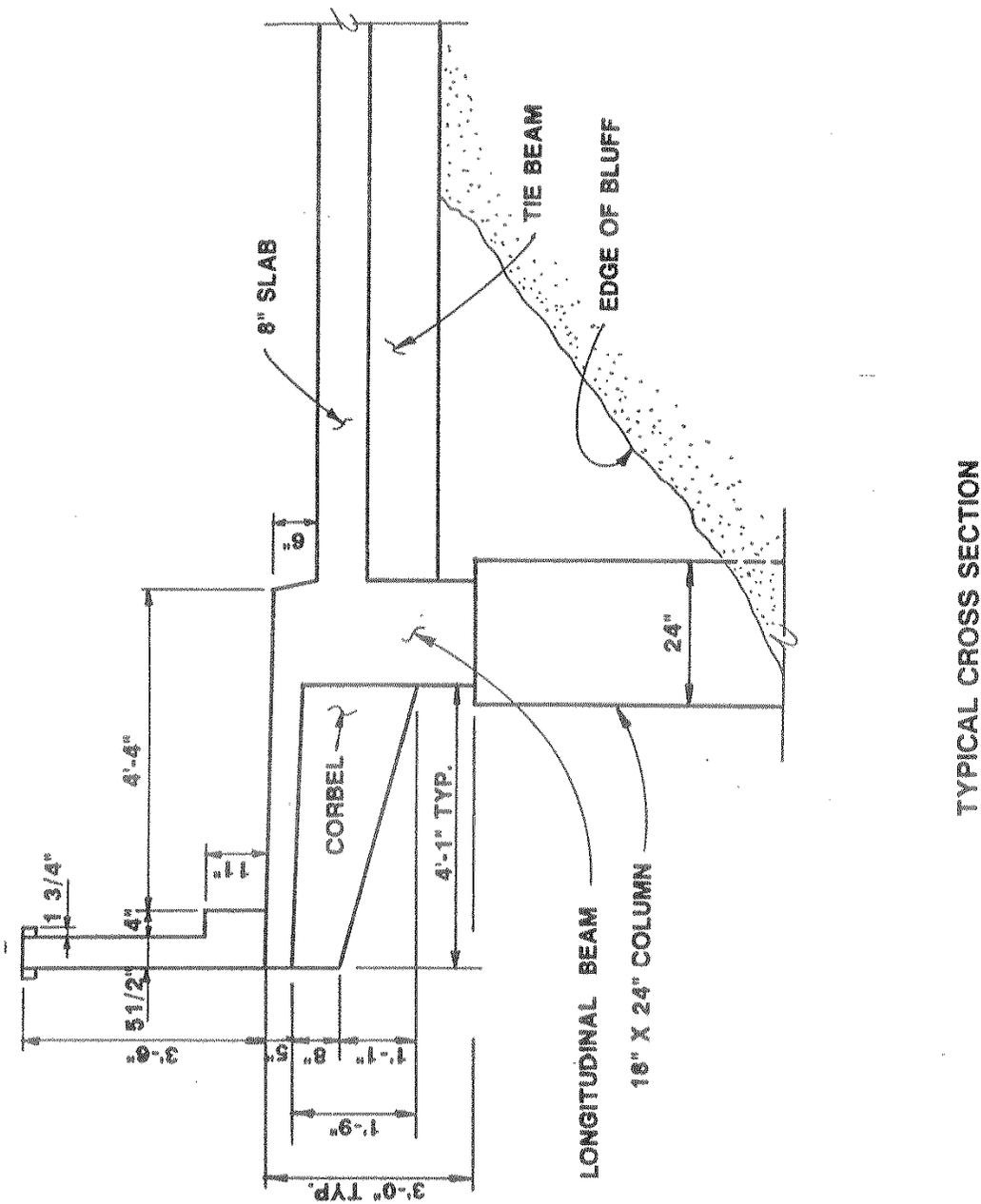
Engineering Drawings



Source: City of Santa Monica. Undated Plan and Profile for a project to remove AC pavement, construct new handrail, sidewalk, curb and gutter, and footings. The State Division of Highways standard design for the railing is shown. The original fill upon which the California Incline was built proved unstable. These plans were approved by H.B. Carter, City Engineer, sometime after construction of the Incline and before his death; probably in 1935, the year a large State Division of Highways project was completed, to widen Palisades Beach Road (Roosevelt Highway, the PCH) northerly, starting at the foot of the California Incline.



Source: City of Santa Monica. Undated Typical Section showing the pattern of reinforcing steel used in the deck and columns. There were 14 outer columns on 18" x 36" x 48" footings and at least one inner column on a 12" x 24" x 12" footing.

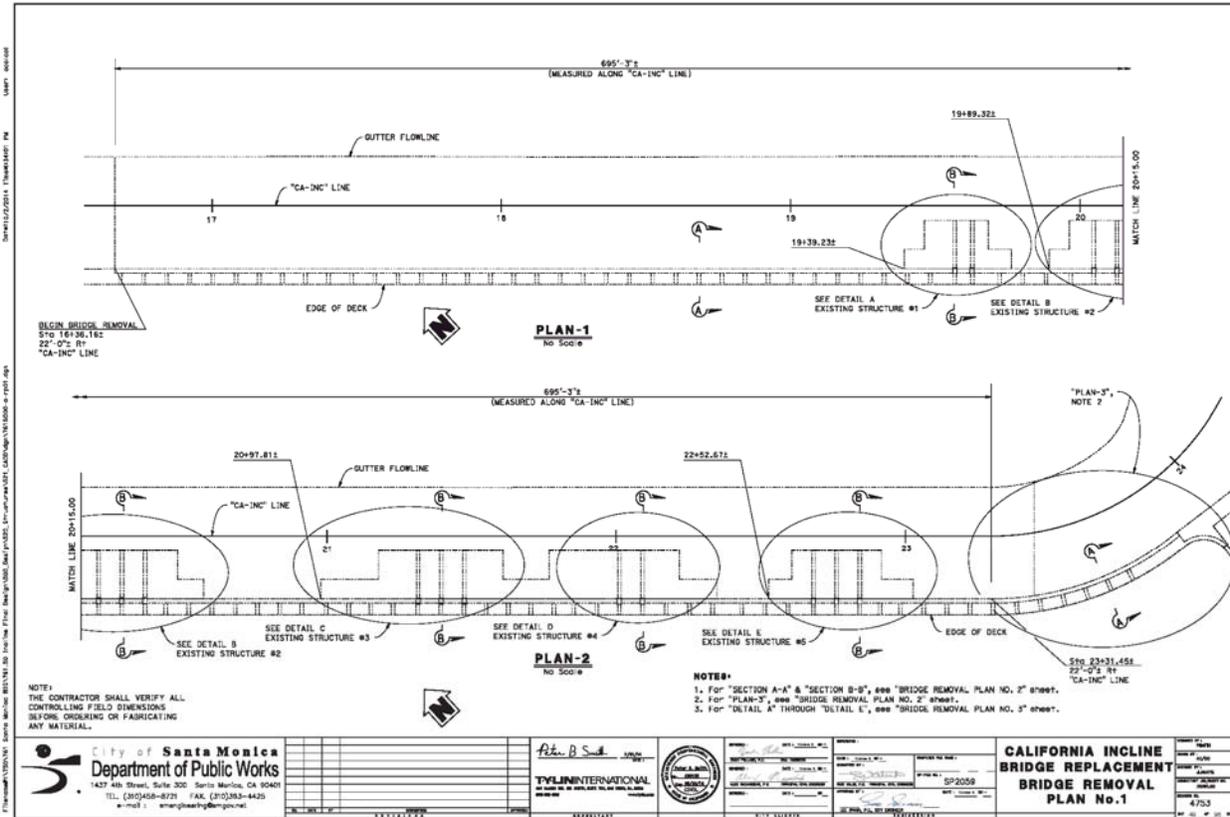


TYPICAL CROSS SECTION

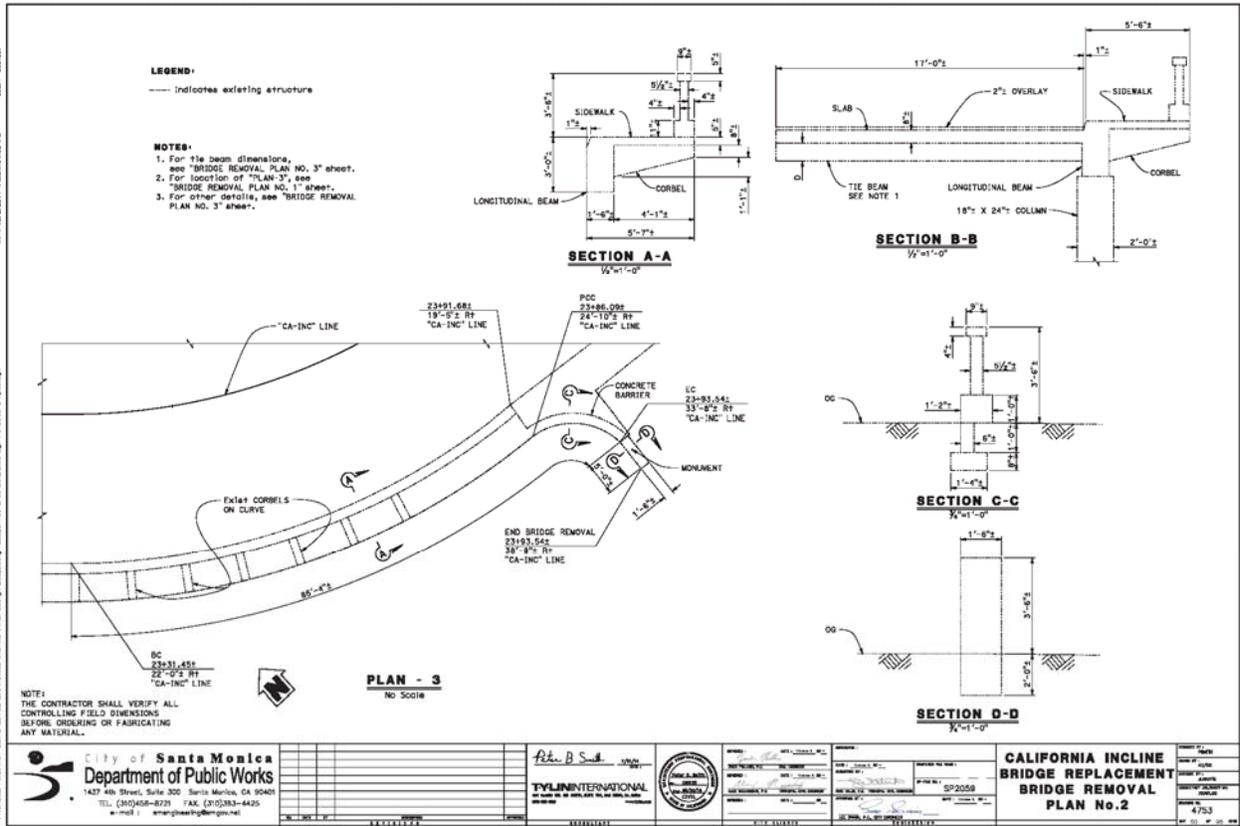
FIGURE 4

MOFFATT & NICHOL ENGINEERS		CITY OF SANTA MONICA CALIFORNIA INCLINE	JOB NO. 2632
SCALE NONE	DRAWN BY MJA		 OF
DATE 1-27-89	IN CHARGE RM		

Source: City of Santa Monica. The 1989 study by consulting engineers Moffatt & Nichol concluded that the 8-inch slab bridge deck needed to be thickened an additional 6 inches. The original 1932 design specified an 8-inch slab.



Source: City of Santa Monica. The portion of the California Incline, which is a bridge, not a road, is depicted here in the details of the demolition plan. Note the locations of the five slabs at the south end of the tangent, near the curve.



Source: City of Santa Monica. Bridge rails and the corbels on the curve near Palisades Park are among the most visible elements of the structure.

Index to Photographs

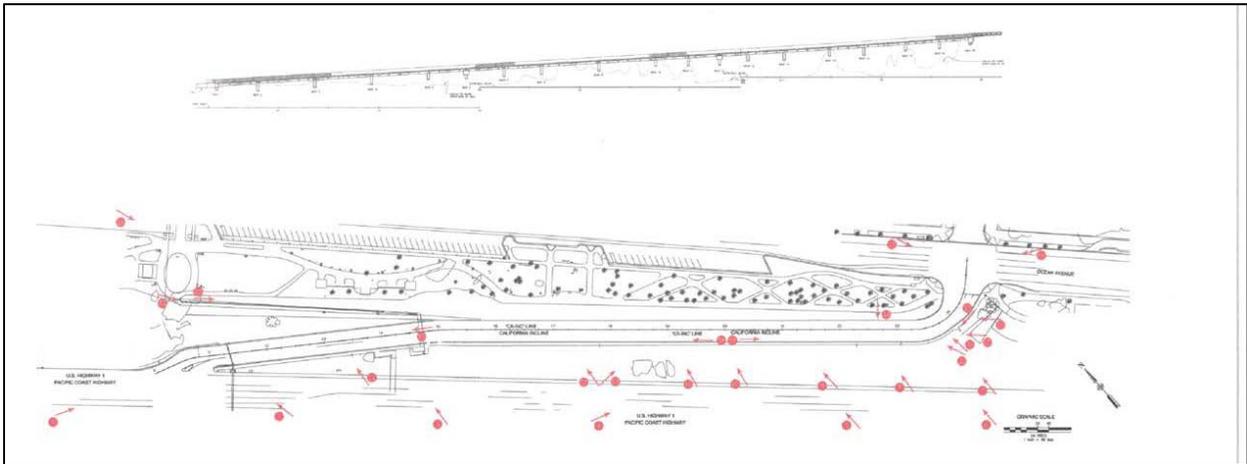
Photographer: Dennis Hill, Content Creation
www.dennishill.com • creator@dennishill.com

March–April 2015

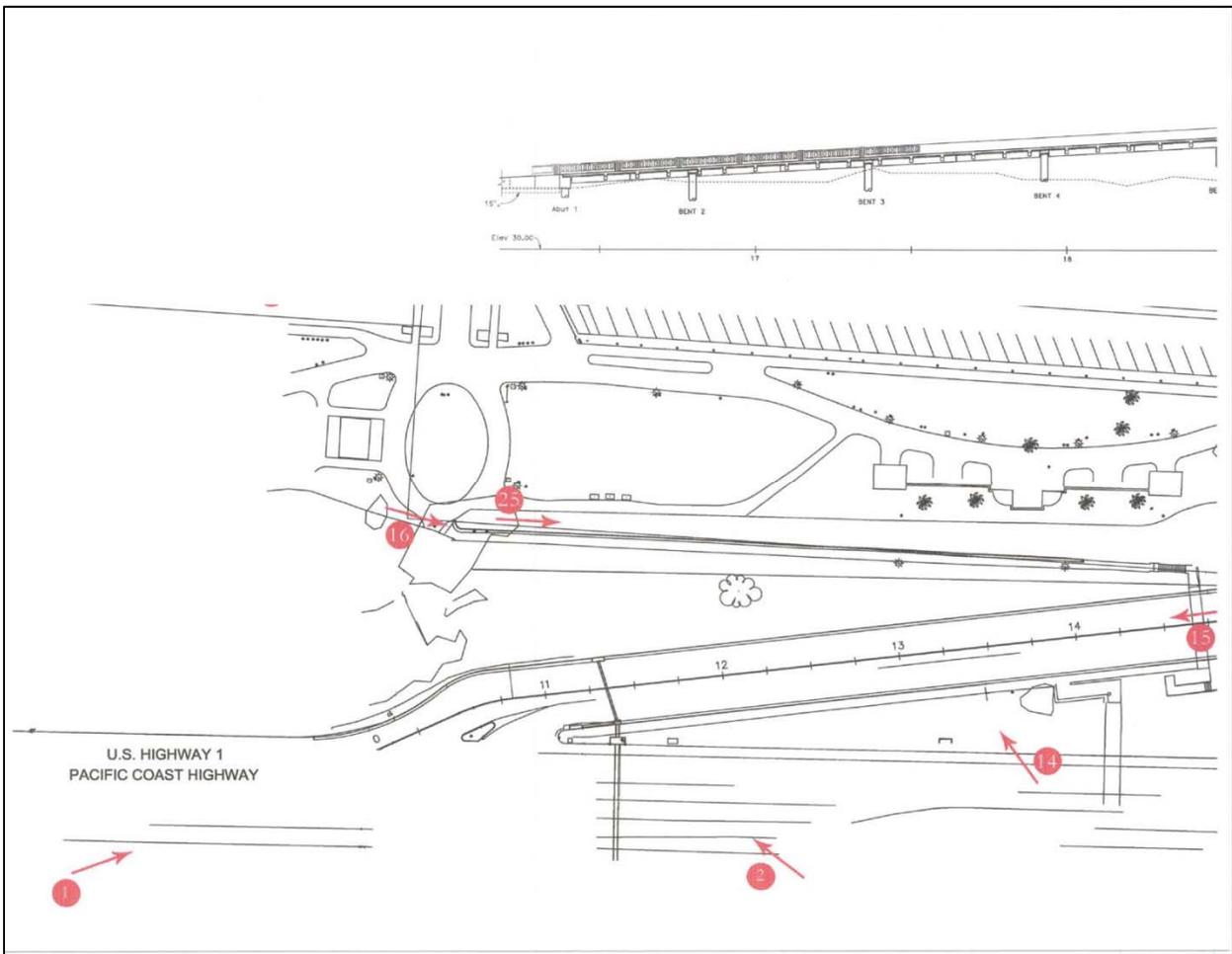
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PAGE 18, BOTTOM	PHOTOGRAPHIC KEY MAP DETAIL, LEFT
PAGE 19	PHOTOGRAPHIC KEY MAP DETAIL CENTER
PAGE 20	PHOTOGRAPHIC KEY MAP DETAIL, RIGHT
PAGE 21, TOP	CA-INCLINE-01. MARCH 30, 2015. CONTEXTUAL VIEW OF NORTHERN ABUTMENT AT PACIFIC COAST HIGHWAY LOOKING EAST FROM WEST SIDE OF PACIFIC COAST HIGHWAY.
PAGE 21, BOTTOM	CA-INCLINE-02. MARCH 30, 2015. CONTEXTUAL VIEW OF NORTHERN ABUTMENT AT PACIFIC COAST HIGHWAY LOOKING NORTH FROM WEST SIDE OF PACIFIC COAST HIGHWAY.
PAGE 22, TOP	CA-INCLINE-03. MARCH 30, 2015. CONTEXTUAL VIEW OF CALIFORNIA INCLINE AND PEDESTRIAN BRIDGE OVER PACIFIC COAST HIGHWAY FROM PACIFIC COAST HIGHWAY LOOKING NORTH.
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PAGE 23, TOP	CA-INCLINE-05. MARCH 30, 2015. CONTEXTUAL VIEW FROM PACIFIC COAST HIGHWAY LOOKING NORTH SHOWING INCLINE, BLUFF AND PALISADE PARK FENCE.
PAGE 23, BOTTOM	CA-INCLINE-06. MARCH 30, 2015. CONTEXTUAL VIEW OF FROM WEST SIDE OF PACIFIC COAST HIGHWAY SHOW UPPER PORTION OF INCLINE LOOKING NORTH.
PAGE 24, TOP	CA-INCLINE-07. MARCH 31, 2015. VIEW SHOWING UNDERSIDE OF SOUTHERN END OF INCLINE LOOKING NORTH.
PAGE 24, BOTTOM	CA-INCLINE-08. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING NORTH.
PAGE 25, TOP	CA-INCLINE-09. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING NORTH.
PAGE 25, BOTTOM	CA-INCLINE-10. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING NORTH.
PAGE 26, TOP	CA-INCLINE-11. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING NORTH.
PAGE 26, BOTTOM	CA-INCLINE-12. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING EAST.
PAGE 27, TOP	CA-INCLINE-13. MARCH 31, 2015. VIEW OF UNDERSIDE OF INCLINE LOOKING NORTH.
PAGE 27, BOTTOM	CA-INCLINE-14. MARCH 31, 2015. VIEW OF RETAINING WALL WITH BOARD FORMS LOOKING NORTH.

PAGE 28, TOP	CA-INCLINE-15. MARCH 31, 2015. VIEW FROM PEDESTRIAN BRIDGE OVER INCLINE LOOKING NORTHWEST.
PAGE 28, BOTTOM	CA-INCLINE-16. MARCH 31, 2015. VIEW OF PALISADES PARK, PATH TO PEDESTRIAN BRIDGE AND INCLINE, LOOKING SOUTHEAST.
PAGE 29, TOP	CA-INCLINE-17. MARCH 31, 2015. VIEW OF ROADWAY, RAILING AND BLUFF LOOKING NORTHWEST.
PAGE 29, BOTTOM	CA-INCLINE-18. APRIL 1, 2015. CONTEXTUAL VIEW OF SOUTHERN ABUTMENT AT OCEAN AVENUE, LOOKING WEST.
PAGE 30, TOP	CA-INCLINE-19. APRIL 1, 2015. CONTEXTUAL VIEW OF SOUTHERN ABUTMENT AT OCEAN AVENUE LOOKING SOUTH.
PAGE 30, BOTTOM	CA-INCLINE-20. APRIL 1, 2015. VIEW OF CENTER LINE OF ROADWAY SHOWING RAILING, BLUFF AND PALISADES PARK LOOKING NORTHWEST.
PAGE 31, TOP	CA-INCLINE-21. APRIL 1, 2015. DETAIL VIEW SHOWING SOUTHWEST SIDE OF RAILING, LOOKING NORTH.
PAGE 31, BOTTOM	CA-INCLINE-22. APRIL 1, 2015 VIEW OF RAILING AND PACIFIC COAST HIGHWAY LOOKING NORTHWEST.
PAGE 32, TOP	CA-INCLINE-23. APRIL 1, 2015. DETAIL VIEW OF RAILING AT SOUTHERN END AND ABUTMENT OF INCLINE AND VIEW OF BEACH, LOOKING SOUTHWEST.
PAGE 32, BOTTOM	CA-INCLINE-24. APRIL 1, 2015 DETAIL VIEW OF RAILING AT SOUTHERN END OF INCLINE AND VIEW OF BEACH, LOOKING SOUTHWEST.
PAGE 33, TOP	CA-INCLINE-25. APRIL 1, 2015 VIEW OF PALISADES PARK, INCLINE AND SANTA MONICA PIER, LOOKING SOUTHEAST.
PAGE 33, BOTTOM	CA-INCLINE-26. APRIL 1, 2015 VIEW OF PALISADES PARK ENTRANCE MONUMENTS WITH SANTA MONICA PIER, LOOKING SOUTH.
PAGE 34, TOP	CA-INCLINE-27. APRIL 1, 2015 VIEW OF INCLINE ROADWAY, RAILING AND BLUFF FROM INCLINE LOOKING SOUTHEAST.
PAGE 34, BOTTOM	CA-INCLINE-28. APRIL 1, 2015 VIEW OF INCLINE ROADWAY, RAILING AND BLUFF FROM INCLINE LOOKING NORTHWEST.

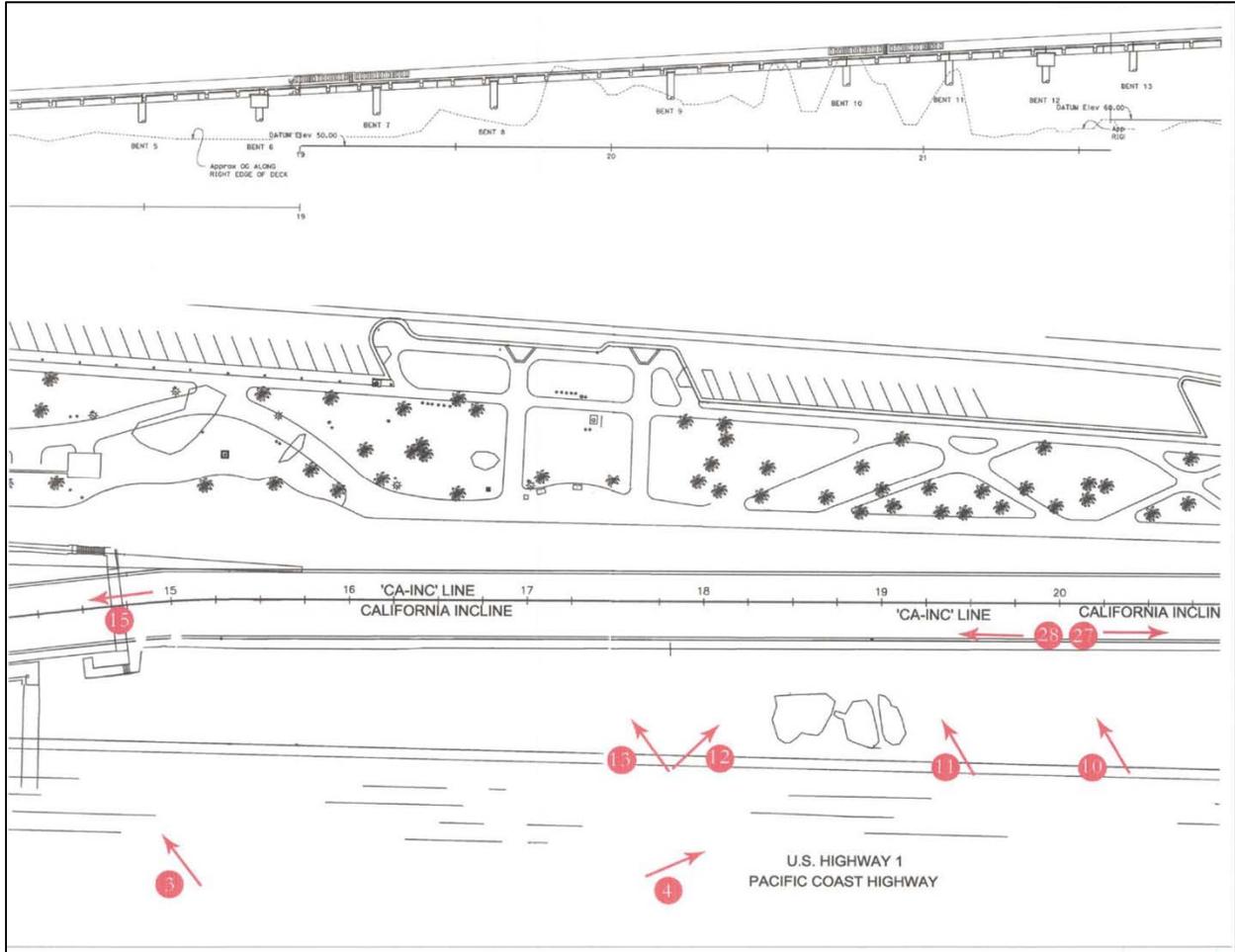
PHOTOGRAPHIC KEY MAP



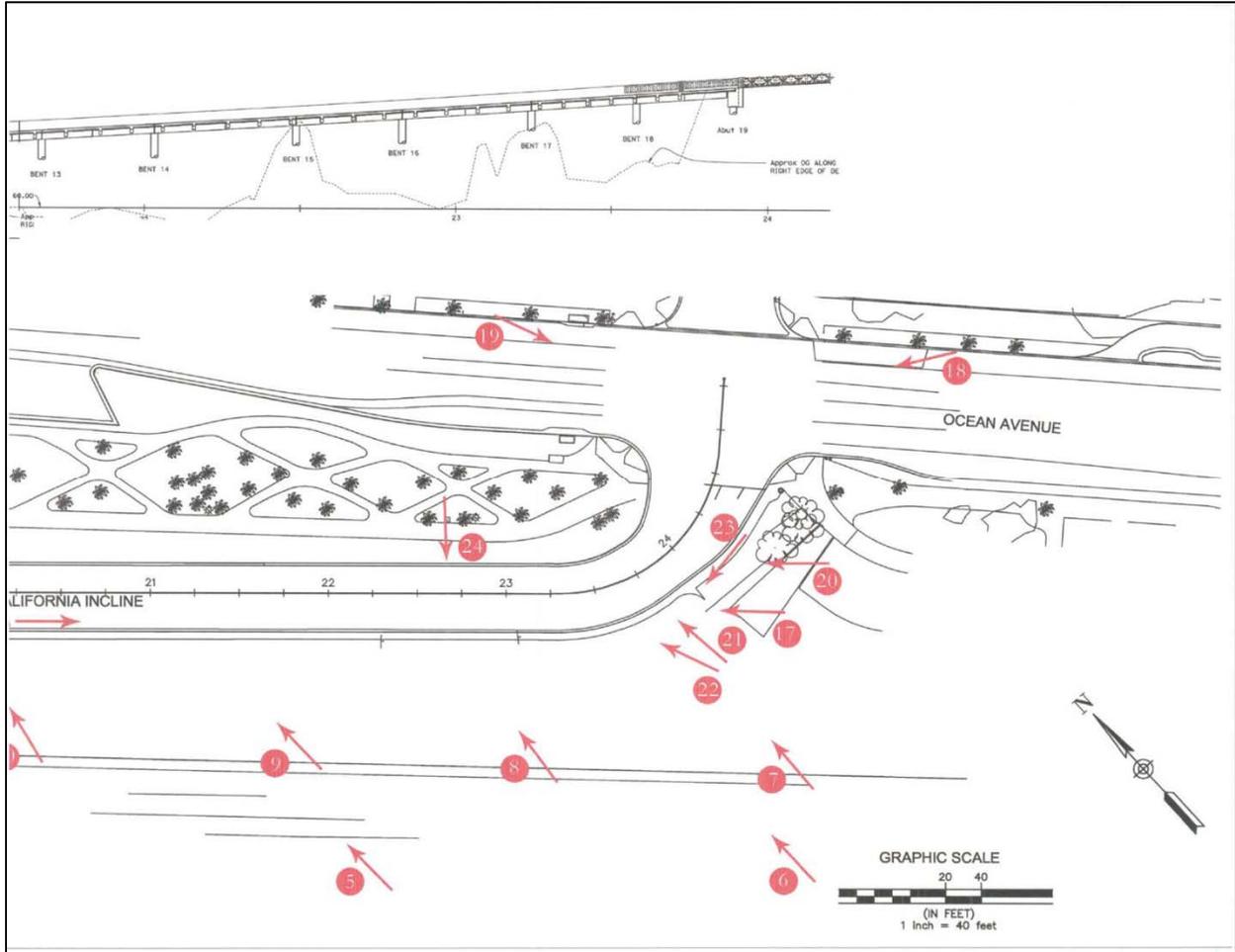
Photographic Key Map Detail, Left



Photographic Key Map Detail, Center



Photographic Key Map Detail, Right





CA-Incline- 01



CA-Incline- 02

Top: CA-Incline-01. Dennis Hill, photographer. March 30, 2015. Contextual View of northern abutment at Pacific Coast Highway looking east from west side of Pacific Coast Highway.

Bottom: CA-Incline-02. Dennis Hill, photographer. March 30, 2015. Contextual view of northern abutment at Pacific Coast Highway looking north from west side of Pacific Coast Highway.



CA-Incline- 03



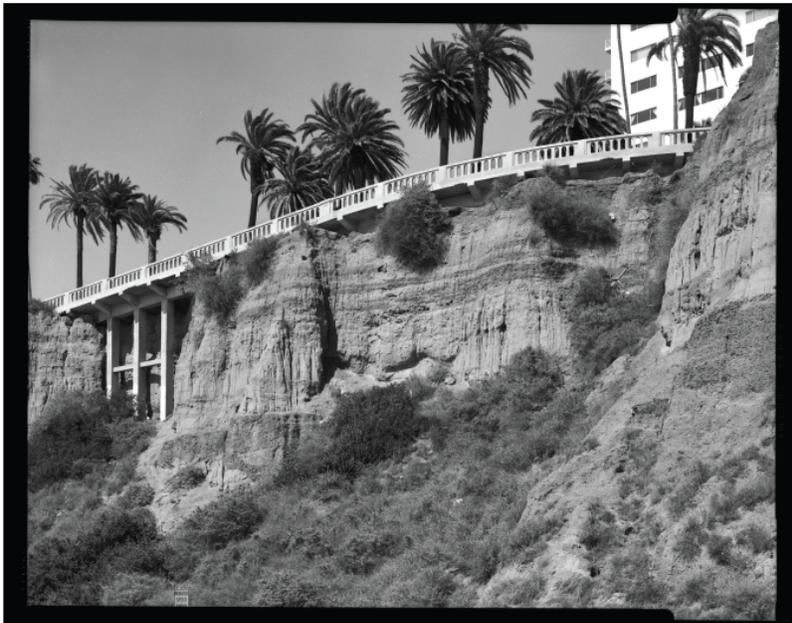
CA-Incline- 04

Top: CA-Incline-03. Dennis Hill, photographer. March 30, 2015. Contextual view of California Incline and pedestrian bridge over Pacific Coast Highway from Pacific Coast Highway looking north.

Bottom: CA-Incline-04. Dennis Hill, photographer. March 30, 2015. Contextual view from Pacific Coast Highway looking east showing incline and bluffs.



CA-Incline- 05



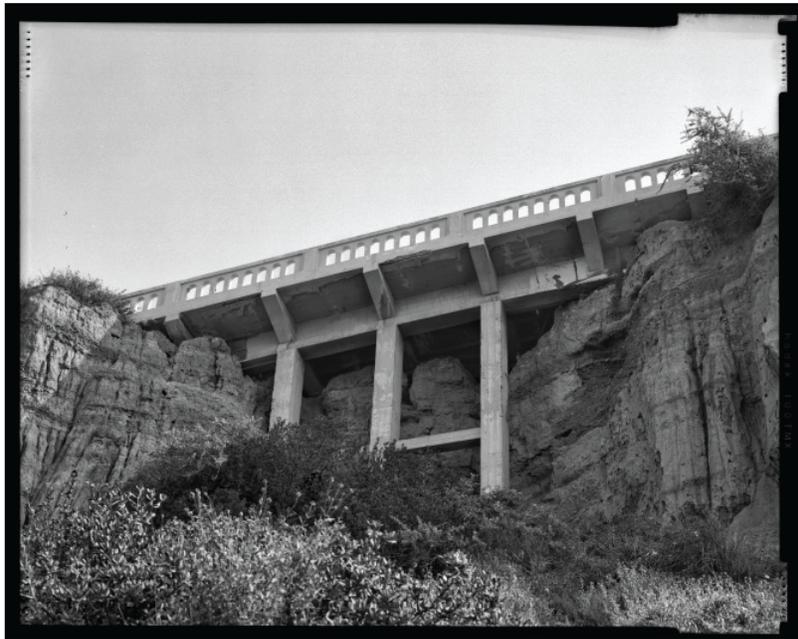
CA-Incline- 06

Top: CA-Incline-05. Dennis Hill, photographer. March 30, 2015. Contextual view from Pacific Coast Highway looking north showing incline, bluff and Palisade Park fence.

Bottom: CA-Incline-06. Dennis Hill, photographer. March 30, 2015. Contextual view of from west side of Pacific Coast Highway show upper portion of incline looking north.



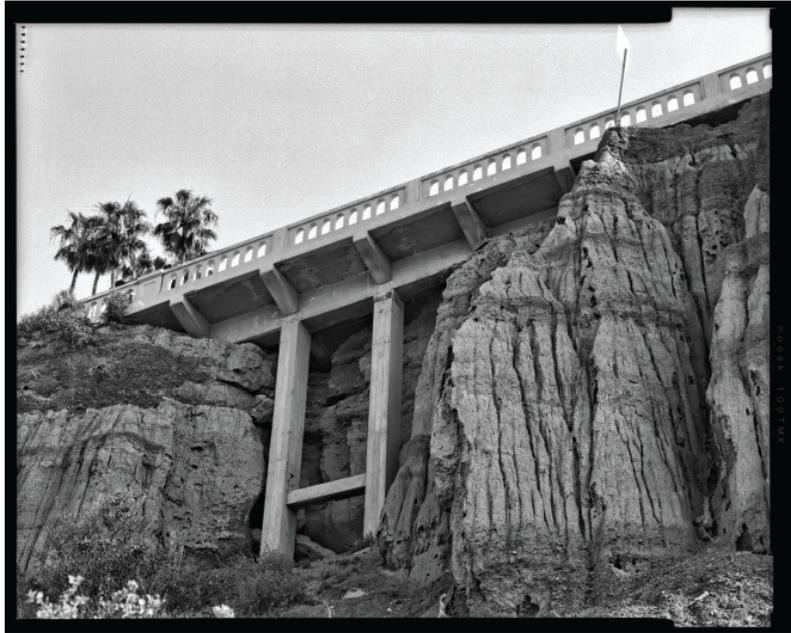
CA-Incline- 07



CA-Incline- 08

Top: CA-Incline-07. Dennis Hill, photographer. March 31, 2015. View showing underside of southern end of incline looking north.

Bottom: CA-Incline-08. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking north.



CA-Incline- 09



CA-Incline- 10

Top: CA-Incline-09. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking north.

Bottom: CA-Incline-10. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking north.



CA-Incline- 11



CA-Incline- 12

Top: CA-Incline-11. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking north.

Bottom: CA-Incline-12. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking east.



CA-Incline- 13



CA-Incline- 14

Top: CA-Incline-13. Dennis Hill, photographer. March 31, 2015. View of underside of incline looking north.

Bottom: CA-Incline-14. Dennis Hill, photographer. March 31, 2015. View of retaining wall with board forms looking north.



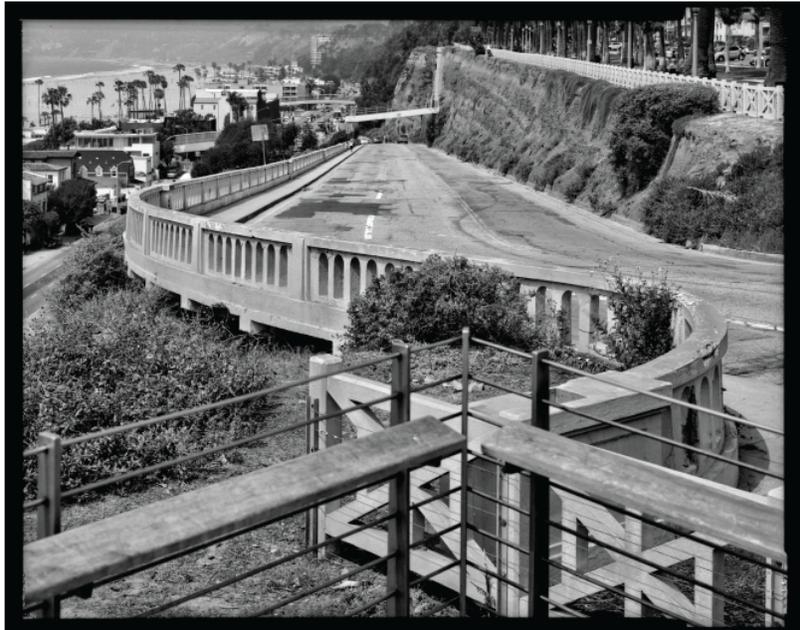
CA-Incline- 15



CA-Incline- 16

Top: CA-Incline-15. Dennis Hill, photographer. March 31, 2015. View from pedestrian bridge over incline looking northwest.

Bottom: CA-Incline-16. Dennis Hill, photographer. March 31, 2015. View of Palisades Park, path to pedestrian bridge and incline, looking southeast.



CA-Incline- 17



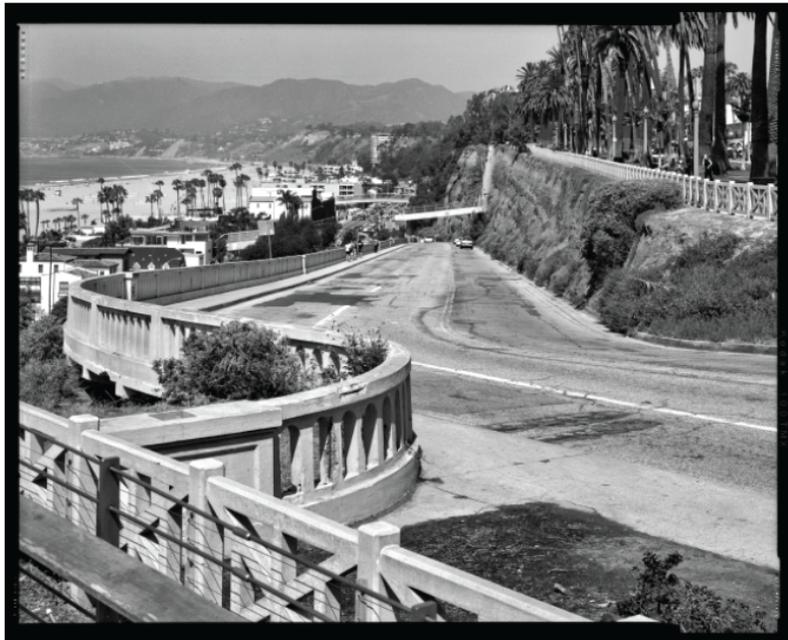
CA-Incline- 18

Top: CA-Incline-17. Dennis Hill, photographer. March 31, 2015. View of roadway, railing and bluff looking northwest.

Bottom: CA-Incline-18. Dennis Hill, photographer. April 1, 2015. Contextual view of southern abutment at Ocean Avenue, looking west.



CA-Incline- 19



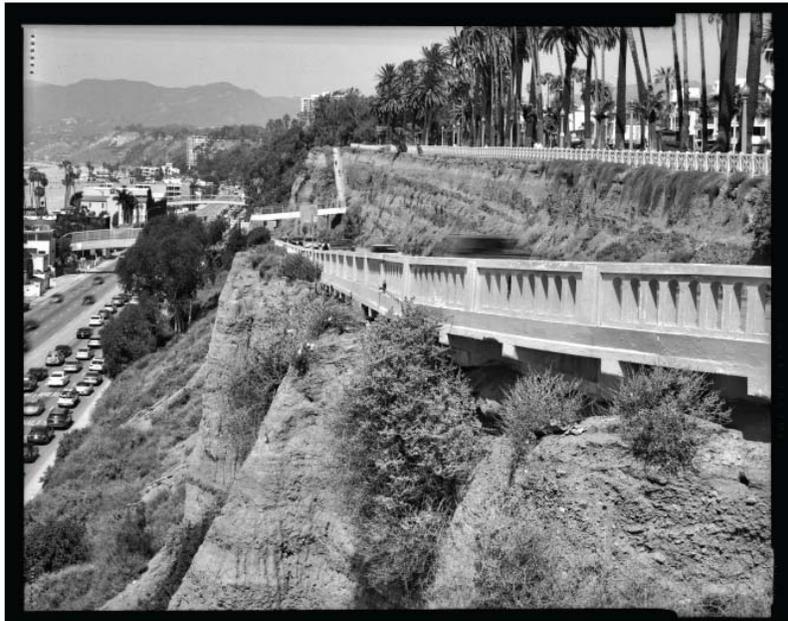
CA-Incline- 20

Top: CA-Incline-19. Dennis Hill, photographer. April 1, 2015. Contextual view of southern abutment at Ocean Avenue looking south.

Bottom: CA-Incline-20. Dennis Hill, photographer. April 1, 2015. View of center line of roadway showing railing, bluff and Palisades Park looking northwest.



CA-Incline- 21



CA-Incline- 22

Top: CA-Incline-21. Dennis Hill, photographer. April 1, 2015. Detail view showing southwest side of railing, looking north.

Bottom: CA-Incline-22. Dennis Hill, photographer. April 1, 2015. View of railing and Pacific Coast Highway looking northwest.



CA-Incline- 23



CA-Incline- 24

Top: CA-Incline-23. Dennis Hill, photographer. April 1, 2015. Detail view of railing at southern end and abutment of incline and view of beach, looking southwest.

Bottom: CA-Incline-24. Dennis Hill, photographer. April 1, 2015. Detail view of railing at southern end of incline and view of beach, looking southwest.



CA-Incline- 25



CA-Incline- 26

Top: CA-Incline-25. Dennis Hill, photographer. April 1, 2015. View of Palisades Park, incline and Santa Monica Pier, looking southeast.

Bottom: CA-Incline-26. Dennis Hill, photographer. April 1, 2015. View of Palisades Park entrance monuments with Santa Monica Pier, looking south.



CA-Incline- 27



CA-Incline- 28

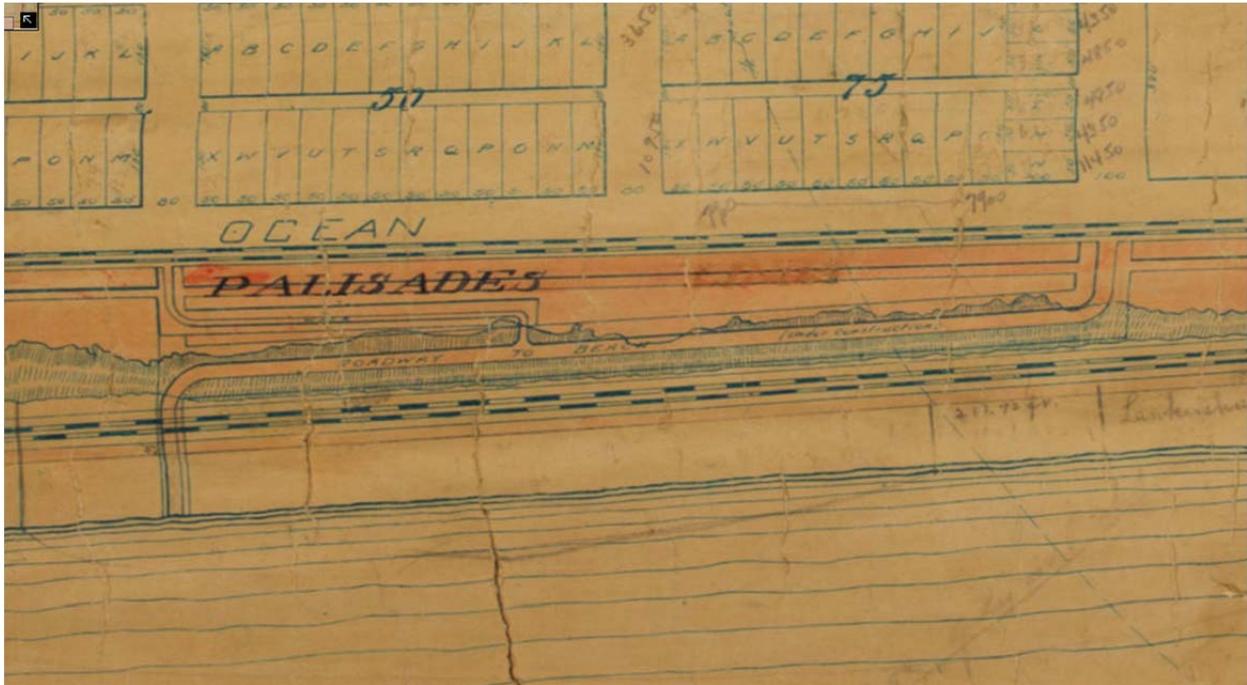
Top: CA-Incline-27. Dennis Hill, photographer. April 1, 2015. View of incline roadway, railing and bluff from incline looking southeast.

Bottom: CA-Incline-28. Dennis Hill, photographer. April 1, 2015. View of incline roadway, railing and bluff from incline looking northwest.

APPENDIX: ADDITIONAL MAPS AND PHOTOGRAPHS



Santa Monica Public Library Historical Maps: "Official Map of the City of Santa Monica, California, April, 1906."



This is an enlarged portion of the 1906 map. It shows Ocean Avenue, Palisades Park, “walk” and “Roadway to Beach (under construction).” The Southern Pacific-Pacific Electric tracks and the High Water Line and Low Water Line are also shown. Note that the right-of-way for the California Incline crosses the tracks and reaches the High Water Line.



Source: *Los Angeles Times* Photo Gallery, accessed April 16, 2015. Ernest Marquez Collection. Undated (ca. 1916) view south. The rustic eucalyptus tree branch fence provides visual continuity between Palisades Park and the California Incline. The surface of the road is gravel or dirt; the horse pulls the wagon up the narrow road as the driver of the automobile gets out near the gate leading to a hazardous foot path high upon the face of the bluff.



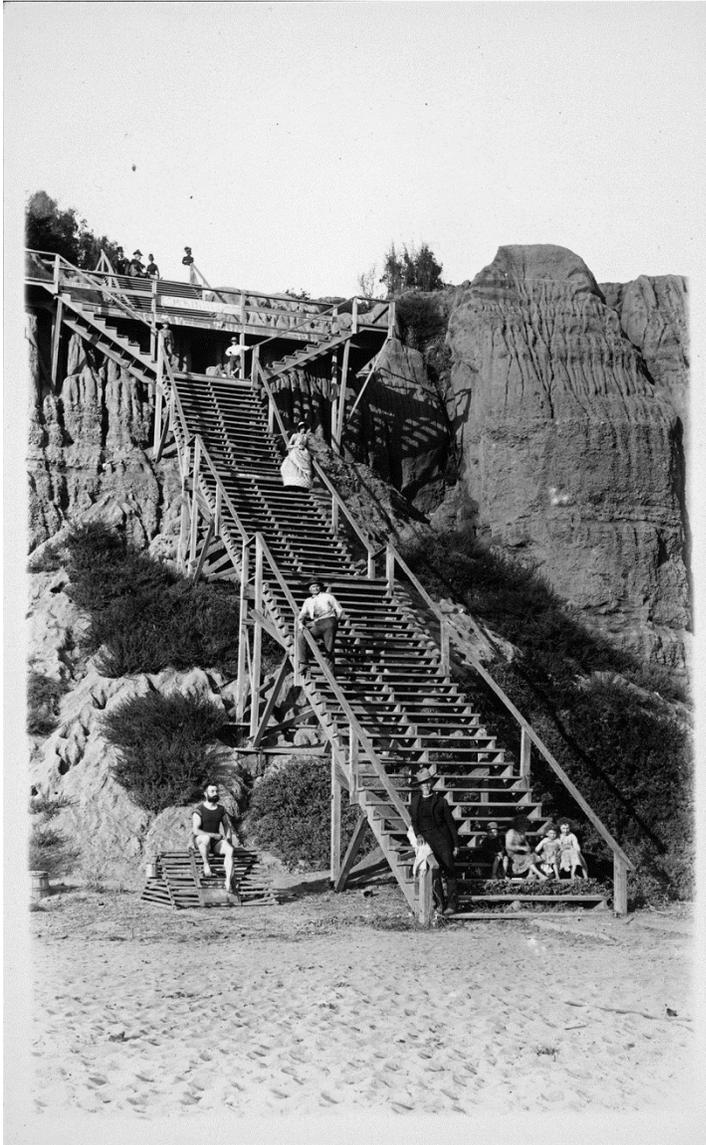
Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1932) view north of the newly improved California Avenue Incline Bridge (53C-0543). To the left of the automobile are the Jonathan Club and Palisades Beach Road; to the right of the automobile, the "Idaho foot path" ascends from the California Incline to Palisades Park. Note the absence of any pedestrian overcrossing of the California Incline.



Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1894) view north of Palisades Park showing Santa Monica Mountains, Southern Pacific tracks, and Long Wharf into Santa Monica Bay.



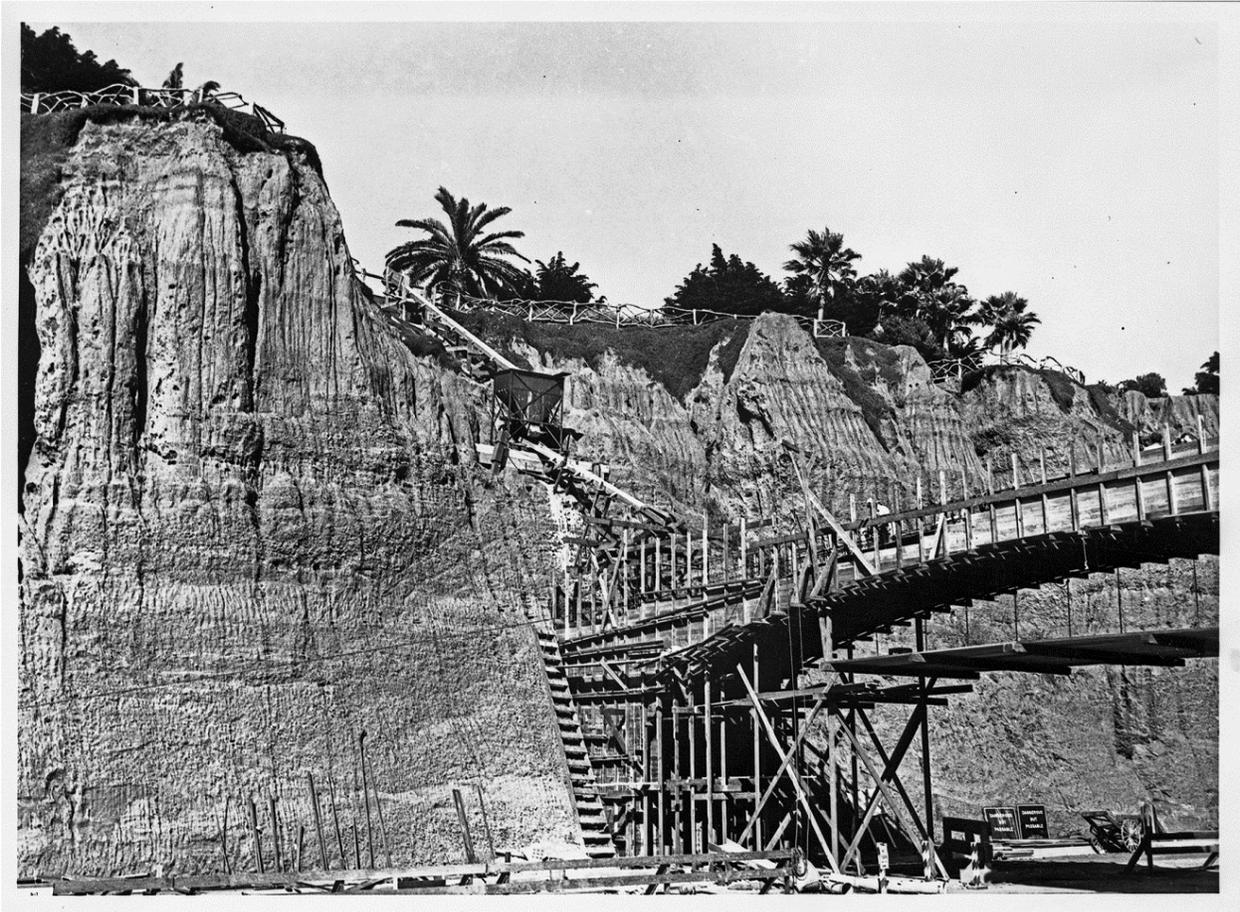
Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1916) view south showing the Santa Monica Municipal Pier, Sunset Beach development, the 99 Steps, Palisades Park Road, and the Southern Pacific-Pacific Electric Railway tracks. In the center of the photo is a structure known as a “groin” or “groyne.” R.C. Gillis received permission from the city to build the groin, whose purpose was to expand the sandy beach.



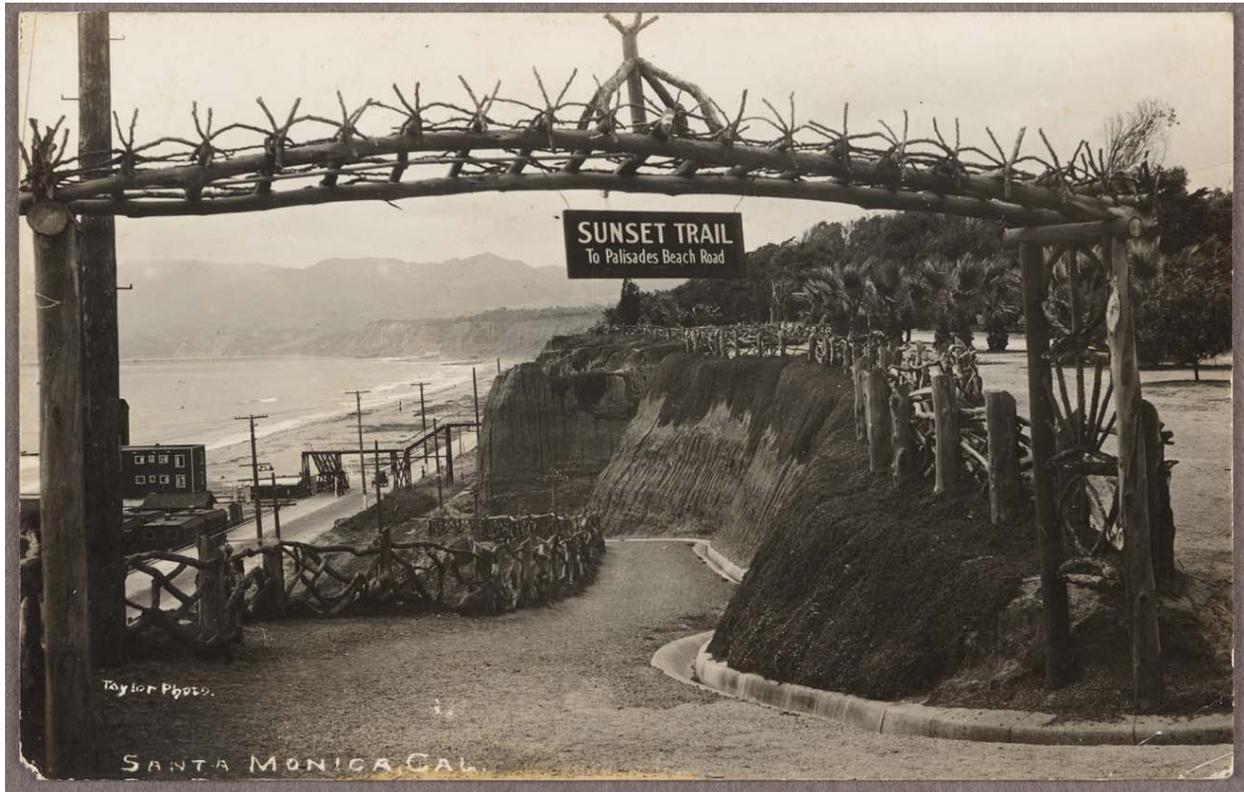
Source: Huntington Library, Ernest Marquez Collection. Date: 1886, view east of the 99 Steps.



Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1920) photo of the 99 Steps after alteration to span tracks and road. Note fire hydrant. Water, sewer, gas and electric utilities were brought to surfside development of Sunset Tract.



Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1936) view east showing the rebuilding of the 99 Steps as a reinforced concrete pedestrian overcrossing of the PCH (Roosevelt Highway). Note board forms used for cast in place concrete.



Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1916) view north of a trail known as the Sunset Trail. Note the continuity of the trail fence with the Palisades Park rustic branch fence. Also, note the 99 Steps spanning Palisades Beach Road and the railroad tracks near the Sunset Beach development.



Source: Huntington Library, Ernest Marquez Collection. Undated (ca. 1901?) view of same gateway monument seen in the previous photo.

Color images below by Dennis Hill, Content Creation



View CA-Incline-01 above, View CA-Incline-02 below



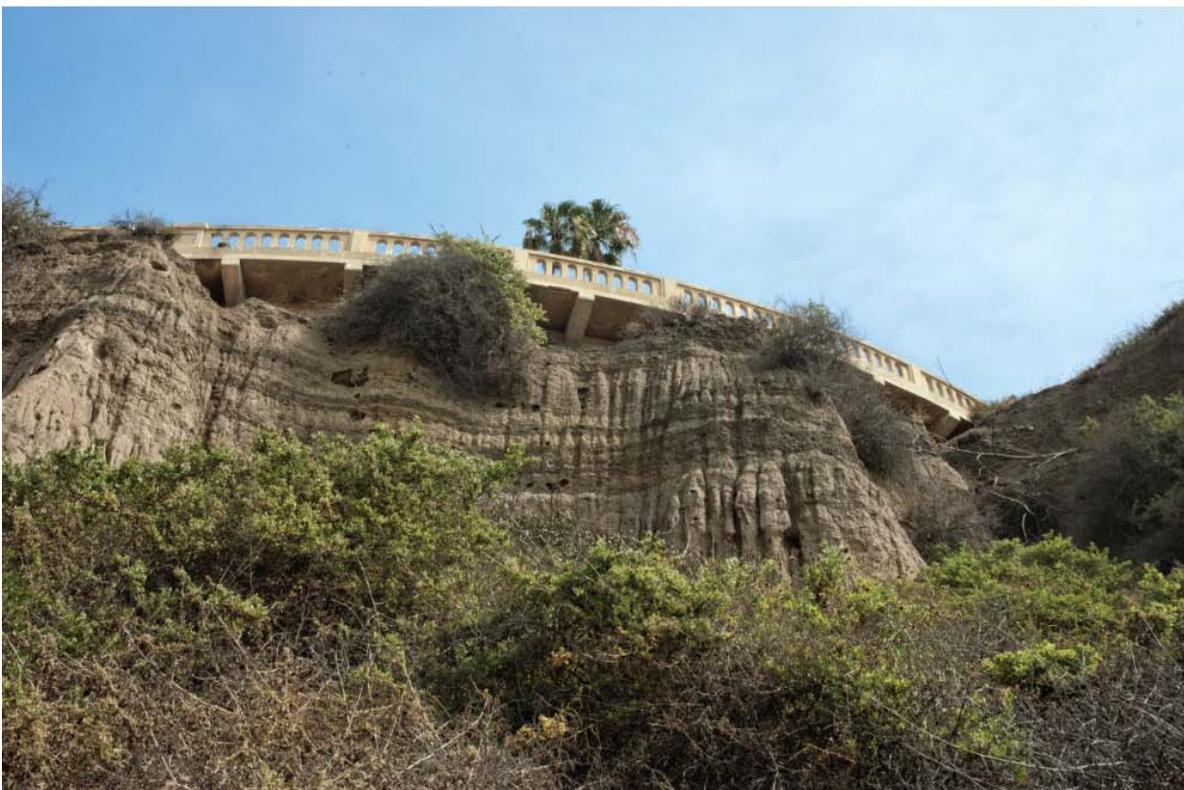


View CA-Incline-04 above, View CA-Incline-05 below





View CA-Incline-06 above, View CA-Incline-07 below





View CA-Incline-08 above, View CA-Incline-09 below





View CA-Incline-10above, View CA-Incline-11 below



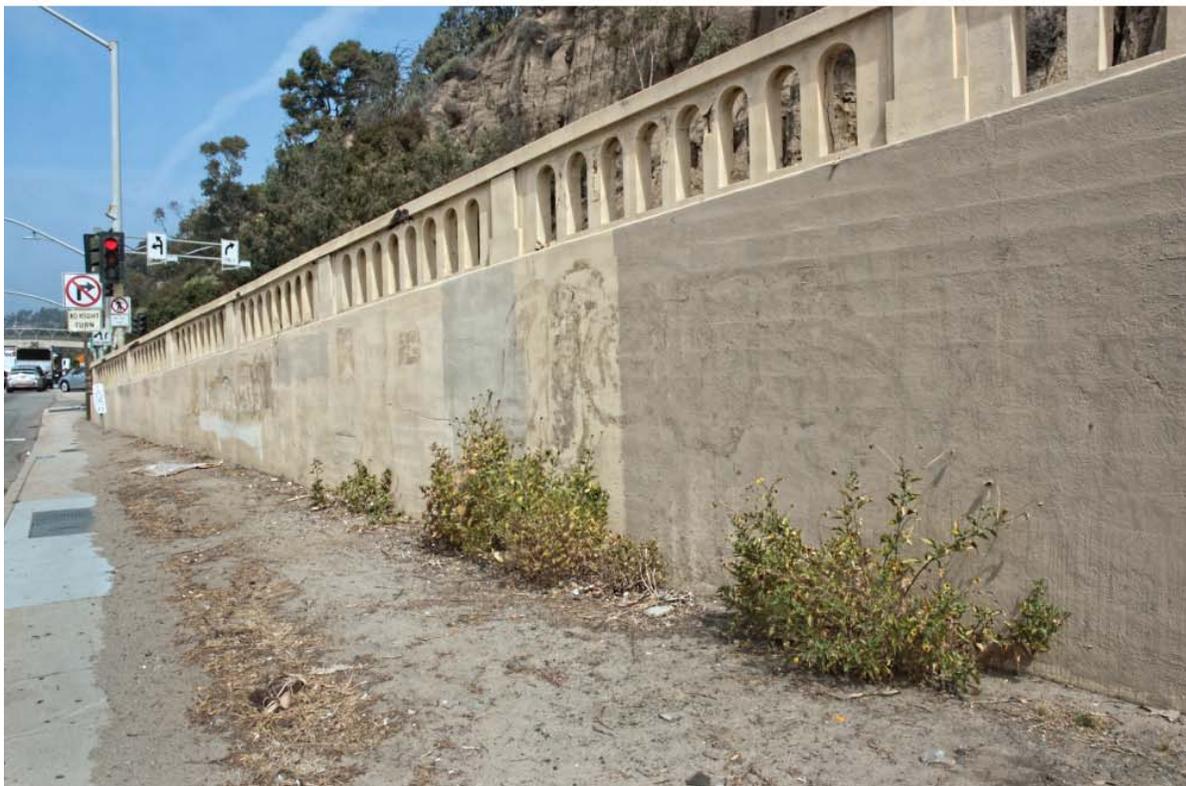


View CA-Incline-12 above, View CA-Incline-12 detail below



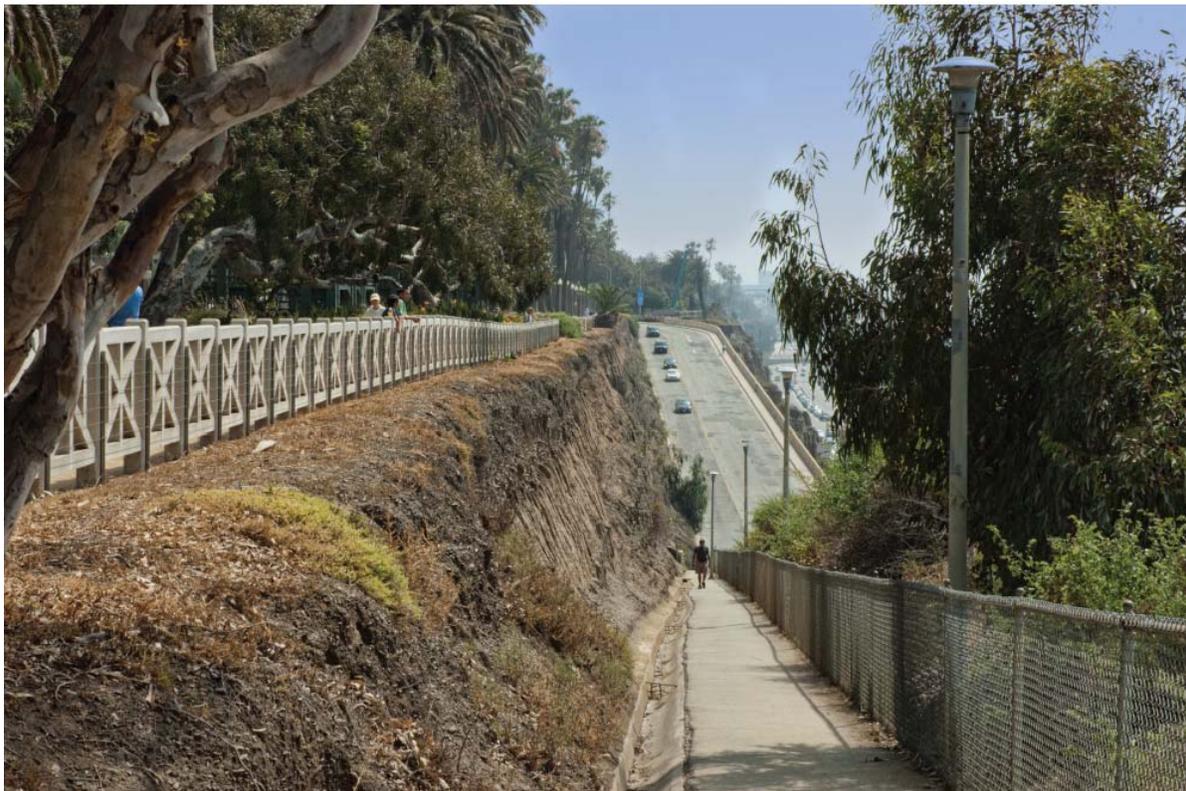


View CA-Incline-13 above, View CA-Incline-14 below





View CA-Incline-15 above, View CA-Incline-16 below



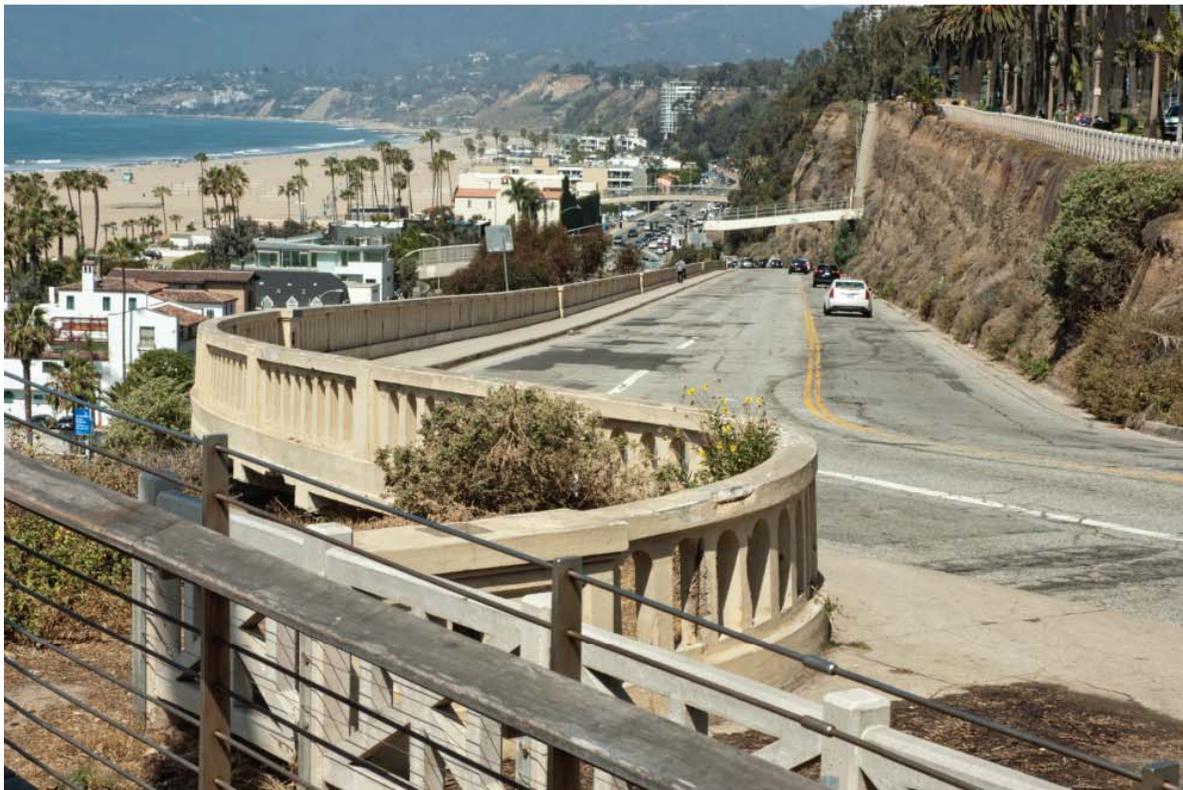


View CA-Incline-17 above, View CA-Incline-18 below





View CA-Incline-19 above, View CA-Incline-20 below





View CA-Incline-21 above, View CA-Incline-22 below





View CA-Incline-23 above, View CA-Incline-24 below





View CA-Incline-26 above, View CA-Incline-27 below





View CA-Incline-28 above, color photographs below by Claudia Bauer

