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State of California
Department of Public Works
Division of Highways

LOAD-CONDITION STUDIES

in cooperation with

U. S. BUREAU OF PUBLIC ROADS

DATA ON

ROADWAY STRUCTURE AND ROADWAY CONDITION

Prepared by

MATERIALS AND RESEARCH DEPARTMENT

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Research No. 00258
Work Order No. 13NN26

August 15, 1953

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August, 1953

LOAD-CONDITION STUDIES
ROADWAY STRUCTURE AND ROADWAY CONDITION

In memoranda to Division Engineers dated May 25, 1950, and May 10, 1951, Mr. H. S. Fairbank, Deputy Commissioner, U.S. Bureau of Public Roads outlined an expansion of the survey of truck traffic volumes and weights that had been in progress since 1942. He requested the cooperation of the States in carrying out the expanded program. Under this program, quarterly truck traffic volumes and weights were to be taken at selected locations and pavement conditions in a 1,000 or 2,000 foot section of pavement near each selected weighing location were to be evaluated. Information requested by the Bureau was to be classified in the following groups:

1. Traffic Characteristics
2. Roadway structure
3. Roadway condition
4. Roadway costs

Data pertaining to Items 1 and 4 were assembled by the Planning Survey Department. All work in connection with Items 2 and 3 above was assigned to the Materials and Research Department under Work Order No. 13NN26. Approximate locations for the test sections were selected in advance of field crew operations by a group of representatives from the U.S.B.P.R., Headquarters Design Department and the Materials and Research Department. Starting on January 22, 1951, one field crew worked intermittently through October 15, 1952 establishing the pavement sections selected for test throughout the State and collected the data requested by the Bureau. A total of 25

sections was established at, or near, 20 selected locations for collecting truck traffic volumes and weights.

In general, sections were 1,000 feet in length, with a few exceptions when local conditions made it desirable to increase or decrease the total length.

The limits of all test sections established were marked with lath and survey markers. Letters have been sent to each District in which test sections were established, advising the District Engineer of the general location and specific stationing of the sections, and requesting that the limits of the section be marked by the Maintenance Department with culvert markers. Culvert markers were to have the top four inches painted with federal yellow paint and were to show the station of the beginning or end of the section.

Data requested by the Bureau on test sections with portland cement concrete pavements differed markedly from that on sections with asphaltic mix surfaces. Descriptions of field operations have accordingly been divided into two groups.

Portland Cement Concrete Pavements

Within the general area selected, a section of pavement, 1,000 feet in length, was established. Exact location of each section was made on the basis of various factors, including uniformity of pavement, shoulders, drainage and side slopes, as well as its suitability to adequate traffic control during the time the crew was working.

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A total of nine sections was established in which the pavements were portland cement concrete.

Each section was first laid out in a "grid" system - each 10 foot longitudinal interval was indicated with a "+" mark of white traffic lacquer. Each 50 foot point and each station were indicated with a "+" mark and the applicable figures. Exact procedure varied according to the number of lanes of pavement involved in the section. At locations in which the pavement was the ordinary two lane roadway, each edge and the centerline of pavement were stationed and marked at 10 foot intervals as outlined above. Where there were three lanes of pavement, only one of the outer lanes was considered as comprising the section and both inner and outer edges of the one lane were stationed. In the case of multi-lane divided highways, two adjacent lanes with traffic in the same direction make up the section and the edges and centerline of the lanes were stationed. The grid system was used in locating all items on diagrams as noted below.

At each section, a comprehensive survey of the roadway and roadside conditions was made. Plan diagrams of the roadway within the section limits were prepared in the field and are reproduced in this report. Shown graphically are all joints, cracks, corner breaks, intersecting roads, road approaches, culverts, bridges, side drains, shoulders, patches, subsealing or mudjacking holes and steel pins set for levels. Noted also are the condition of joint and crack seal, extent and class of

pumping, depth of faulting and amount of spalling at cracks and joints, and the condition of pavement and shoulders.

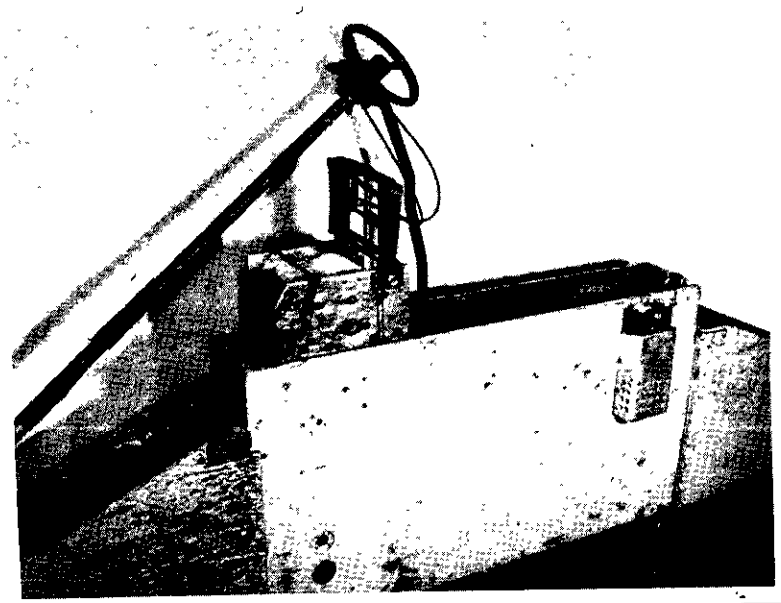
On sheets accompanying the diagrams are cross-section notes to indicate drainage conditions. Notes are recorded as fractions, the numerator indicating the elevation of and the denominator the distance to the point.

The Bureau memoranda requested information on "joint and crack openings". It is presumed that this request refers to the width of opening. Attempts to obtain measurements of width were unsuccessful because of edge rounding and joint and crack sealing. An alternative method of installing gage points across each joint and crack was considered. Such an operation would be time-consuming and costly. A large number of measurements would be required to permit separation of the effects of moisture and temperature variations from long time changes. Furthermore, the data would not yield information on the total width of opening. For these reasons no data are reported on widths of joints and cracks.

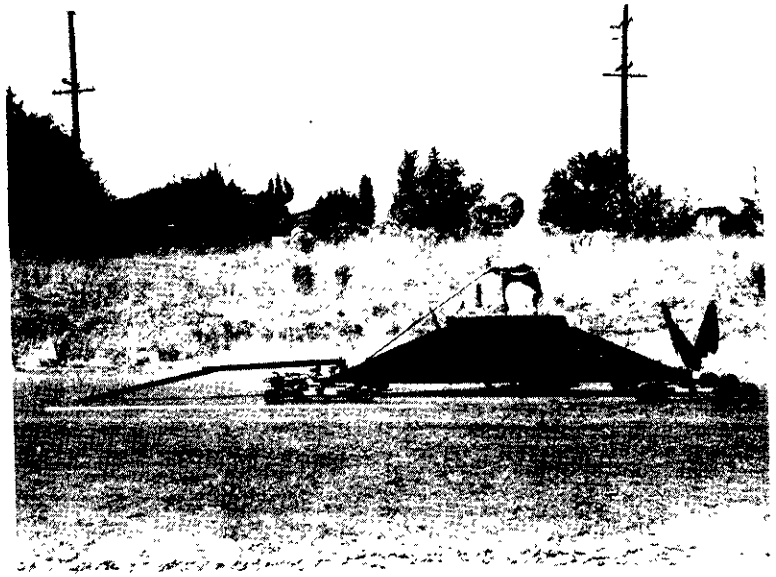
The Bureau memoranda placed considerable emphasis on pavement roughness measurements of the various sections. The Profilograph of the Materials and Research Department was used to obtain these measurements.

Pictures of the Profilograph and a typical record obtained with it are shown on Page 5.

Longitudinal profilograph records, indicating surface roughness, curling, etc., were taken of each lane of pavement



RECORDING MECHANISM

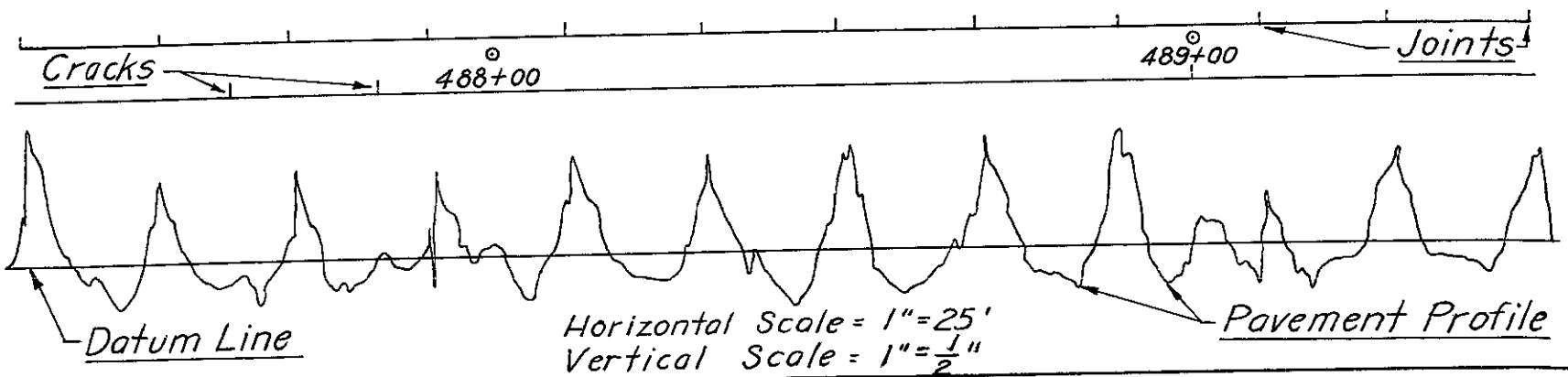


READY FOR USE

~ PROFILOGRAPH ~

State of California ~ MATERIALS & RESEARCH DEPT. ~ Division of Highways

Portion of Longitudinal Profilograph Record



Load-Condition Study

in each section. These records were made with the recording wheel as close as possible to a wheel track in each lane. All records have been labeled and are on file in the Sacramento Laboratory.

In order to obtain samples of soils supporting the roadway pavement 8" diameter holes were drilled in two or three locations in each section. "In-place" density tests, using the California Sand-Volume equipment modified to fit an 8" diameter core hole, were taken to a depth of at least 12" below the bottom of the pavement. Materials from the "in-place" density tests were forwarded to the Sacramento Laboratory in sealed cans for determination of "relative density in place" and moisture content.

When information obtained from the various districts indicated courses of imported material immediately below the bottom of pavement (or cement-treated base), this material was sampled in one layer, if 10" or less in thickness. If the imported material was indicated to be 12" or more in thickness, it was sampled in two layers. When district information indicated no imported material underlying the pavement or cement-treated base, supporting soils were sampled in layers 5" to 8" in thickness. A typical structural section drawn from test hole results is included in the report for each section.

At each section, bench marks were established near the ends of the section. Location and descriptions of bench marks will be found in the individual files for the various sections.

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Steel pins were placed in the pavement slabs by means of a "Ramset" gun and levels were run over these pins. Elevations so established are for the purpose of noting any vertical movement of the slabs in the future. Levels were taken with care by ordinary but not "precise" methods. Errors in closure were in excess of 0.016 foot in a few instances. The possible error in the recorded elevation of any point may approach 0.02 foot and this should be borne in mind in evaluating indicated movements as the result of future level readings.

Photographs were taken of each section as a whole and individual photographs were taken of some of the worst cracks and joints in the section.

Asphaltic Mix Surfaces

Exact location of each section was determined as for the Portland Cement Concrete Pavement sections.

A total of 16 sections was established in which the pavements were of asphaltic mix.

Each section was laid out in a grid system with each 10 foot longitudinal interval indicated with a "+" mark of white traffic lacquer. Each 50 foot longitudinal interval and each station were indicated with a "+" and the applicable figures. In addition to the traffic lacquer marking, steel pins were placed in the pavement at 20 foot longitudinal intervals by means of a "Ramset" gun. These pins were used for elevations and transverse profiles as noted below.

Load-Condition Study

In general, the longitudinal lines of pins and marks were placed along the centerline and the edges of pavement of the section lanes. In some sections where the pavement was abnormally wide, it was necessary to place four lines of pins and marks in the section, instead of the usual three. Where this became necessary a line of pins and marks was placed in the approximate center of each lane of pavement, and along each edge of the travelled way. The grid system was used for locating all items on diagrams as noted below, as well as for elevations and transverse profiles.

At each test section a comprehensive survey of the roadway and roadside conditions was made. Plan diagrams were prepared in the field, of the roadway within the section limits. Shown graphically on these diagrams are all intersecting roads, culverts, bridges, side drains, shoulders, cracks, areas of alligator cracking, areas of raveling, areas of surfacing shoving or creeping, patches, shoulder and drainage conditions, and location of steel pins set for levels and transverse profiles.

Samples of underlying soils were taken in the same manner described under the Portland Cement Concrete Pavement test sections. A typical structural section of the roadway, drawn from test hole results, is included in the individual report for the section.

In the sections of asphaltic mix surfacing, the Bureau memoranda requested that roughness measurements be made both longitudinally (in the outer wheel track of each pavement lane)

Load-Condition Study

to show shoving of the pavement, and transversely to show lateral flow out of the wheel tracks. The Profilograph of the Materials and Research Department was used for these measurements.

The determination of transverse profiles by means of a level was considered but was abandoned in favor of an adaptation of the longitudinal Profilograph.

In brief, the device consisted of a 14 foot length of 6 inch aluminum channel which served as a platform for the recorder carriage. The channel was fitted with short fixed length (6"±) legs on one side and with adjustable legs on the other. Along one side of the channel a piece of flat steel stock was secured to act as a guide, while along the other side a brass rack was secured. A small carriage was built of aluminum to which the recorder from the Profilograph could be fastened. A train of gears was built into the carriage so that combined with the gearing of the recorder, an approximate 1:4 ratio was obtained, thus providing that 3"(±) on the record equalled one foot of pavement. An arm carrying a small rubber tired wheel was pivoted at the forward end of the carriage and connected through an arm to the recording pen of the Profilograph recorder. The connecting arm was provided with an adjustable reduction ratio device so that records could be made on a 1:1, 1:2, 1:3 or 1:4 ratio.

The two fixed length legs of the Transverse Profilograph were equipped with "feet" which were machined to fit over the heads of the steel pins that were placed in the pavement at 20

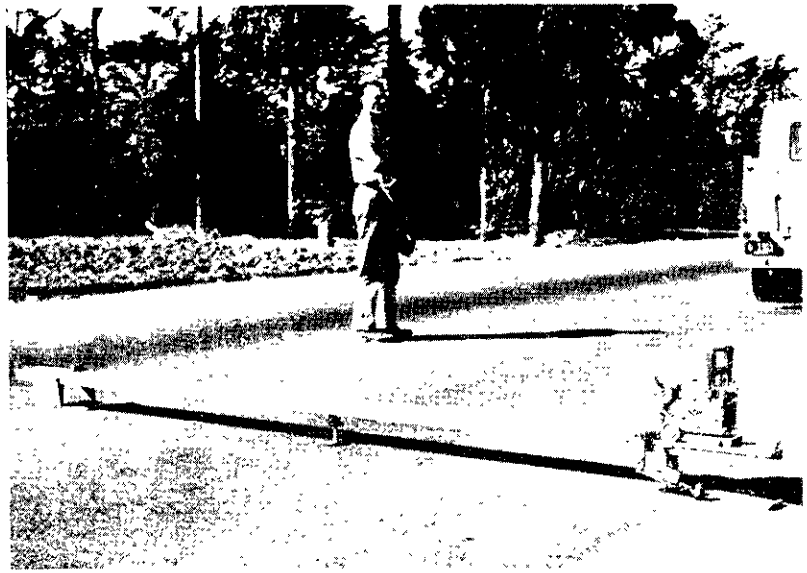
foot intervals. In the field, the fixed length legs were placed on the pins, the channel was leveled by the adjustable legs and the carriage was pushed across the pavement lane, obtaining a graphic record of the pavement surface referred to the plane of the channel. Familiarity with the machine led to an increased speed of operation so that usually all transverse profiles in a test section were taken in 4 to 5 hours. Pictures of the machine and a typical record obtained with it are shown on Page 11.

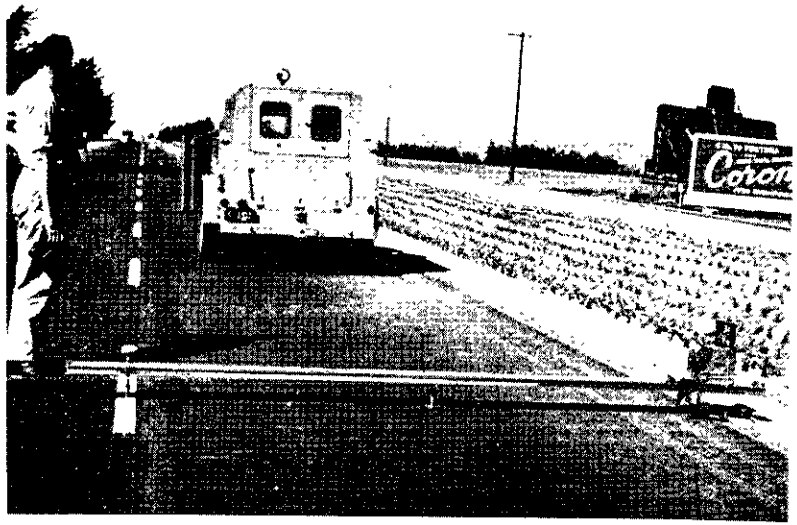
Bench marks were established near the ends of each test section and elevations, based either on actual or assumed bench mark elevations, were taken on the steel pins placed in the pavement. Comparative elevations on these pins were to be the basis for the future comparison or original and subsequent transverse profilograph records.

As stated with reference to rigid pavements, the recorded elevation of any point may be in error by as much as 0.02 foot. However, relative future movements within a distance of a few feet as indicated by records taken with the longitudinal and transverse Profilographs should be subject to a much smaller degree of error.

Cross-sections were taken over the roadway and shoulders and adjacent land to show drainage. Cross-section notes are included as a part of the individual report on each section.

Photographs were taken of the test section as a whole as well as any particularly severe cracks or breaks in the pavement.





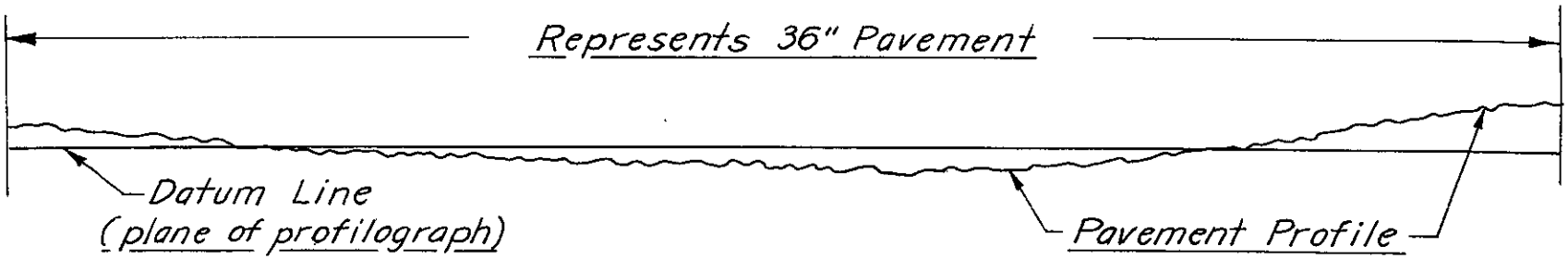
READY FOR USE

TRANSVERSE PROFILOGRAPH

State of California ~ MATERIALS & RESEARCH DEPT. ~ Division of Highways

Portion of Transverse Profilograph Record

Vertical Scale - Normal
Horizontal Scale - $\frac{1}{4}$ Normal



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Soil Tests

All soil samples taken in connection with the establishment of the pavement sections were forwarded to Sacramento for testing. As requested by the Bureau, tests made on base, subbase, and/or basement soil samples included Liquid Limit, Plastic Limit, Mechanical Analysis (one hour hydrometer), Compaction and Moisture Content and the calculation of "in-place" density and percent compaction.

Liquid Limit, Plastic Limit and Mechanical Analysis (one hour hydrometer) tests were made in accordance with prescribed A.S.T.M. procedures.

Compaction tests were made by the California Field or Impact Method of Compaction, detailed in A.S.T.M. "Procedures for Testing Soils - 1950", pgs. 209-211, and the California Division of Highways Standard Specifications, January 1949, pg. 25. Relative compaction of material in place was calculated on the basis of these tests.

The relationship between the results of the California Method and A.A.S.H.O. Method T 99-49 is not constant for all soils. In general the density obtained by the California method exceeds that by the A.A.S.H.O. method by about 5 percent on sandy type soils and about 20 percent on clay type soils.

Test results for soils sampled in each pavement section are summarized and made a part of the report for the individual section.

Load-Condition Study

Scope of Report

This report is intended to present complete data of all original studies relative to roadway structure and roadway condition. The traces obtained with the longitudinal and transverse Profilograph have not been reproduced for inclusion with this report however, since they would greatly increase the bulk of the report and would serve no useful purpose until subsequent profiles have been taken. Profilograph records are on file in the office of the Materials and Research Department. The extent of future movements can be determined at any point traversed by the Profilograph by comparison of the recorded traces.

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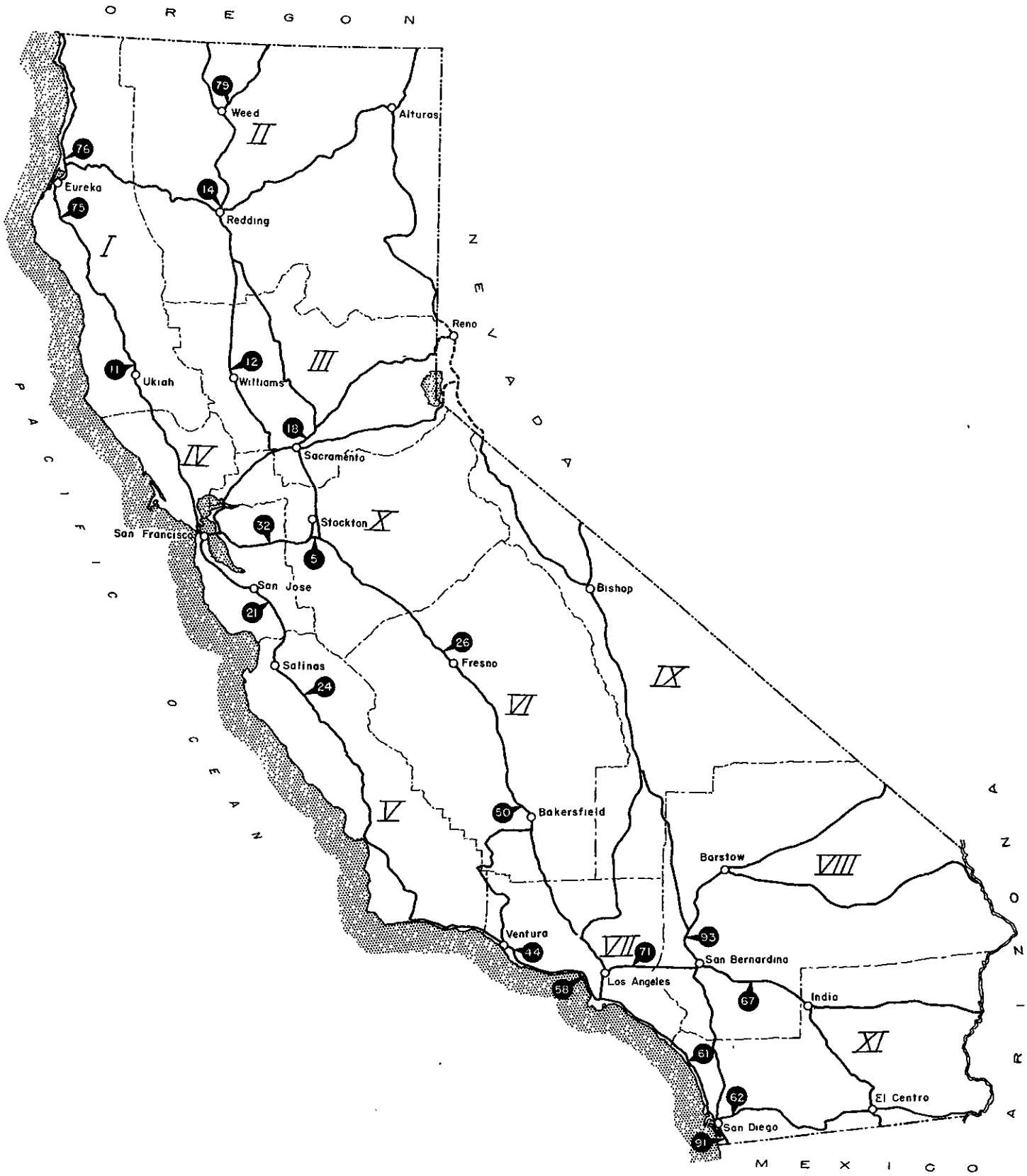
OREGON
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
Weed
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Eureka
Redding
Reno
Ukiah
Williams
Sacramento
San Francisco
Stockton
San Jose
Bishop
Salinas
Fresno
Bakersfield
Barstow
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3

LOCATION OF TEST SECTIONS

Loadometer Station			Test Sections	
No.	Location	Dist.Co.Rte.Sec.	Station	Location with Respect to Load Station
76	Arcata	I-Hum-1-I	100+00 to 110+00	0.2 mi. N.
75	Scotia	I-Hum-1-E	147+00 to 157+00	0.5 mi. N.
11	Ukiah	I-Men-1-C	189+65 to 199+65	0.1 mi. N.
79	Weed	II-Sis-72-A	153+00 to 163+00	0.2 mi. N.E.
14	Redding	II-Sha-3-B	42+00 to 52+00	Adjacent
12	Williams	III-Col-7-B	480+00 to 490+00	0.2 mi. N.
18	Fulton Ave.	III-Sac-3-B	299+70 to 309+00	0.1 mi. N.E.
21	Coyote	IV-SCl-2-B	690+00 to 700+00	2.0 mi. S.
32	Greenville	IV-Ala-5-A	Section "F" - 558+00 to 568+00	0.4 mi. W.
24	Soledad	V-Mon-2-D	Section "C" - 72+00 to 82+00	1.0 mi. N.
24	Soledad	V-Mon-2-D	565+00 to 575+00	1.5 mi. S.
26	Herndon	VI-Fre-4-C	351+00 to 361+00	2.0 mi. S.
50	Bakersfield	VI-Ker-4-D	290+00 to 300+00	0.2 mi. N.
50	Bakersfield	VI-Ker-4-D	330+00 to 340+00	0.8 mi. N.
44	Ventura	VII-Ven-2-C	332+60 to 343+50	1.7 mi. S.E.
44	Ventura	VII-Ven-2-C	388+00 to 398+00	0.8 mi. S.E.
58	Culver City	VII-L.A-60-C	25+90 to 36+00	0.1 mi. N.
71	West Covina	VII-L.A-26-WCov	83+00 to 93+00	Adjacent
93	Cajon	VIII-SBd-31-B	Section "A" - 411+00 to 421+00	7.0 mi. S.
67	Whitewater Junction	VIII-Riv-26-C	290+00 to 300+00	2.5 mi. W.
5	Mossdale Junction	X-S.J-66-A	234+00 to 244+00	Adjacent
61	Oceanside	XI-S.D-2-C	117+50 to 127+50	0.2 mi. S.
61	Oceanside	XI-S.D-2-C	Section "D" 313+00 to 333+00	6.0 mi. N.
91	Chula Vista	XI-S.D-2-F	287+50 to 298+50	Adjacent
62	El Cajon	XI-S.D-12-C	299+00 to 309+00	Adjacent

4

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 12 is located 0.3 miles north of the north city limits of Williams, Road III-Col-7-B.

The section selected for test is located approximately 1.5 miles north of the Loadometer Station.

LENGTH: The section is established between Sta. 480+00 and Sta. 490+00, total length - 1000 feet. Roadway is a 2-lane highway. Section includes both lanes.

SURFACE:

Type: Portland cement concrete, constructed in 1931, reinforced as noted below.

Width: 2 lanes, each 10 feet wide, total width 20 feet.

Reinforcing: All reinforcing steel is 1/2" square deformed bar. Edges of each 10 ft. lane are reinforced with 2 bars 20 ft. 10 in. long, spaced 4 in. from edges of slab and 4 in. apart vertically. Ends of each bar are fixed at one transverse joint and extend through the next joint into 12 in. metal sleeves which are fixed in the slab.

At each transverse joint, 2 bars, 9 ft. 8 in. long are placed on each side of the joint. Bars are spaced 4 inches horizontally from the

Loadometer Station No. 12
Road III-Col-7-B

ROADWAY STRUCTURE

SURFACE:

Reinforcing: (Continued)

joint, 4 inches apart vertically and extend to within 2 inches of the edges of the slab.

Joints:

Spacing and Dowels:

A longitudinal weakened plane joint between the lanes extends throughout the section. Information furnished by the District indicates that tie bars, 12" x 3/4", were installed at 48 inch centers along this longitudinal joint. Transverse joints are spaced 20 feet apart. Each 3rd joint is an expansion joint, remainder are weakened plane contraction joints. As noted above, longitudinal reinforcing steel extends through all transverse joints. Contraction joints have no load transfer devices of dowels other than such dowel action as the steel provides. In addition to reinforcing steel passing through them, the expansion joints have 24" x 3/4" dowels spaced at 28" centers starting 32" from the edge of pavement. (3 per 10-foot lane.)

Thickness:

Each lane is of 9"-7"-7"-9" cross-section. Transition from 9" to 7" is made in a distance of 2 ft. from the edges of the slab. At areas sampled 7" thickness of pavement was found.

Loadometer Station No. 12
Road III-Col-7-B

ROADWAY STRUCTURE

BASE:

Type and Thickness: Imported sand and gravel base. Construction plans indicate a total thickness of 12" of this material but thicknesses found in sampling varied from 4-3/4" to 7".

Soil Classification: A-2-4 and A-6

BASEMENT SOIL:

Type: Mottled brown and blue adobe clay, very wet and plastic. Sampled to depths of from 17-1/2" to 21" below the bottom of pavement.

Soil Classification: A-7-6

SIDE DITCH DRAINAGE: The section roadway is entirely in a shallow fill. Profile grade of the roadway is level for all practical purposes. When constructed, pavement sloped uniformly from right edge down to the left edge of pavement. Subsequent faulting, etc., have modified this condition but it is still generally true.

On the left of the section, there are no clearly defined side ditches. Paralleling the roadway throughout the section, beyond the right of way line, is a swamp area which is from 2.0 to 3.0 ft. below the elevation of the pavement.

On the right, the paved shoulder and area beyond it slope down from the edge of pavement

Loadometer Station No. 12
Road III-Col-7-B

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

to a ditch which parallels the roadway at a distance of 53 to 56 feet from centerline. Ditch flow line elevation is 3.0 to 3.5 feet below the pavement, and drainage is towards the north.

There are no culverts or bridges within the section.

ROADWAY CONDITION:

GENERAL:

The pavement in the section shows a large number of short (1.5 ft. or less in length) severe cracks, too numerous and too short to show graphically on the plan diagram.

In the left lane, cracks are short, severe and parallel to centerline between Sta. 484+00 and Sta. 490+00, end of the section.

In the right lane, cracks are short, severe and transverse, and are especially noticeable in these areas:

Station 483+50 to Station 484+00
Station 485+50 to Station 485+70
Station 487+10 to Station 488+00

SPECIAL CONDITIONS:

(1) Roadway Section:

As noted above, the section roadway is entirely in a shallow fill, and present pavement elevation

Loadometer Station No. 12
Road III-Col-7-B

ROADWAY CONDITION:

SPECIAL CONDITIONS:

(1) Roadway Section: (Continued) is from 2.0 to 3.0 ft. above that of the surrounding areas.

(2) Pumping: There are no evidences of pumping throughout the section. Pavement has warped severely and permanently at joints, but there is no visual evidence that this warping has been followed by pumping.

(3) Faulting: There is considerable faulting at joints and cracks in various places throughout the section. This has been indicated on the plan diagram. Throughout the section, the longitudinal joint between lanes shows faulting which varies from 0.17" to more than 1.00". The right (northbound traffic) lane is lower than the left lane.

(4) Shoulders: Throughout the section, there are asphaltic mix shoulders which vary in width from 4.0 to 4.5 feet. Shoulders are in generally fair condition, but there are many areas in which the mix has rutted and cracked badly under traffic.

(5) Miscellaneous: Pavement throughout the section was subsealed with asphalt during the winter of 1949-50.

Loadometer Station No. 12
Road III-Col-7-B

ROADWAY CONDITION:

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established at the section for use in taking cross-sections and pavement levels.

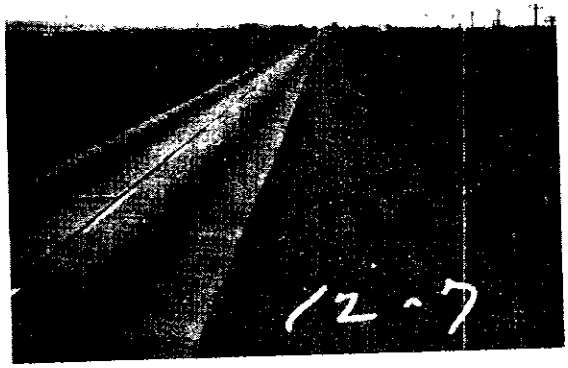
B.M. No.	Location	Description	Elevation
1	60' rt. of ℄, Sta. 479+80	Wire in top of R/W monument	85.000 (Assumed)
2	39.5' lt. of ℄, Station 490+19.5	1/4" diam. pin in pipe cap	83.119

Profilograph Records: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the travelled way surface. Records were made with the recording wheel of the machine 30" from the outer edge of each lane.

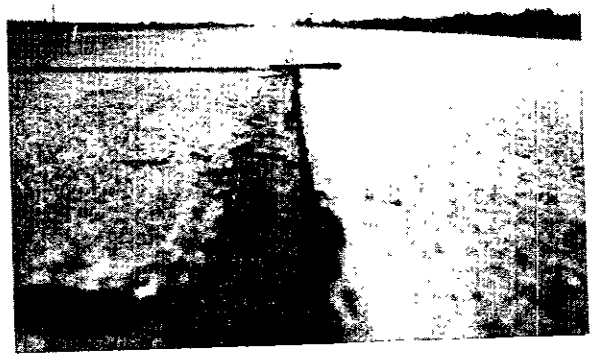
Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 12

III-Col-7-B

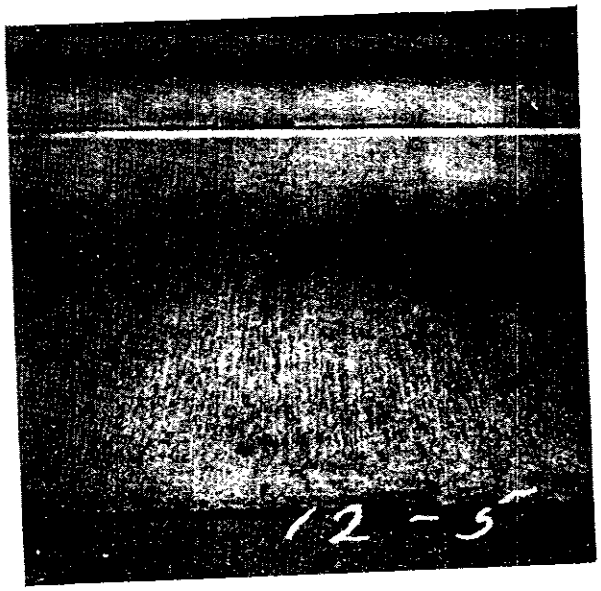


Ahead on line from Sta. 479+80



Faulting along longitudinal joint, back from Sta. 480+10

Longitudinal Cracking in Lt. lane. Sta. 487+40 to Sta. 487+50



Transverse Crack in R. lane Station 489+79

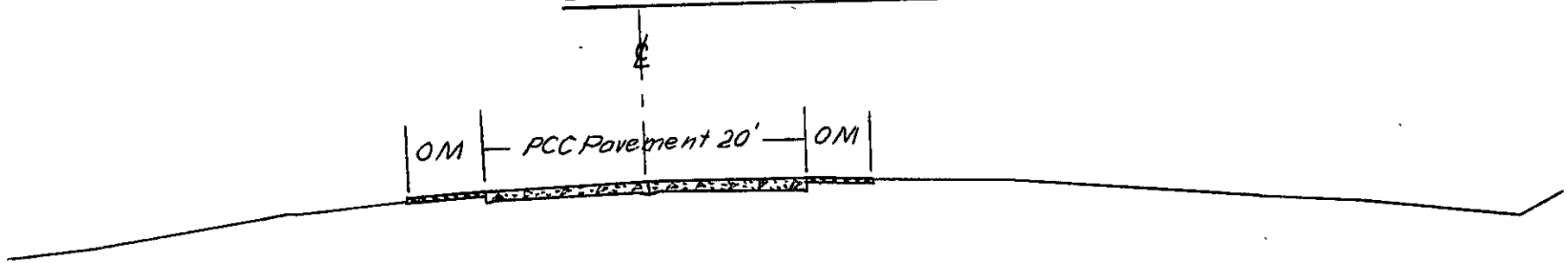
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BR 12
III-Col-7-B

ROADWAY CONDITION SURVEY

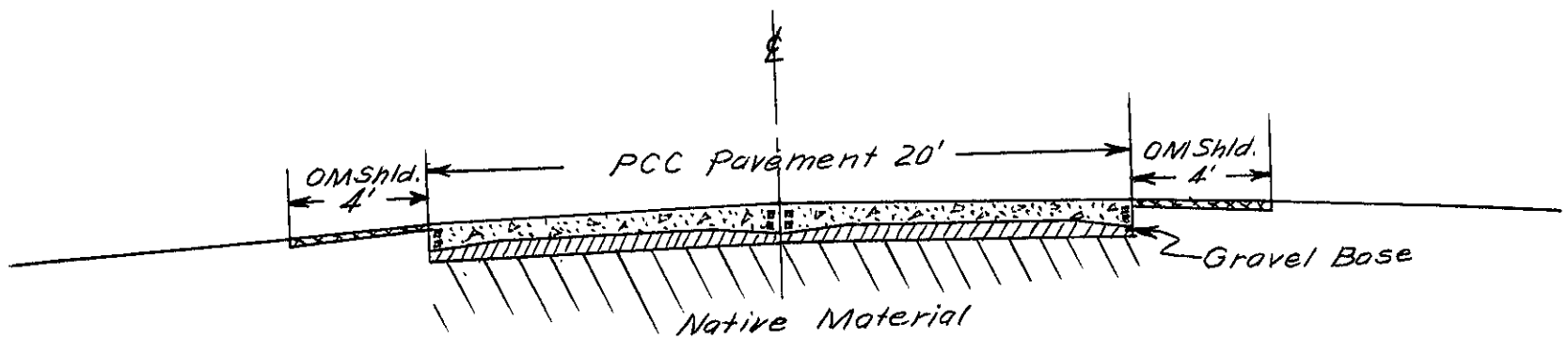
Scale: 1" = 10'

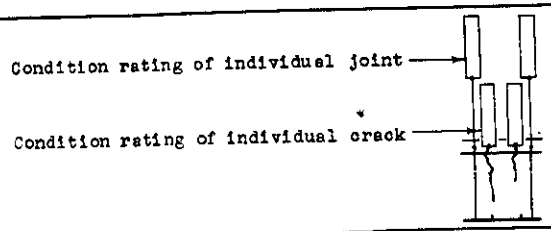
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





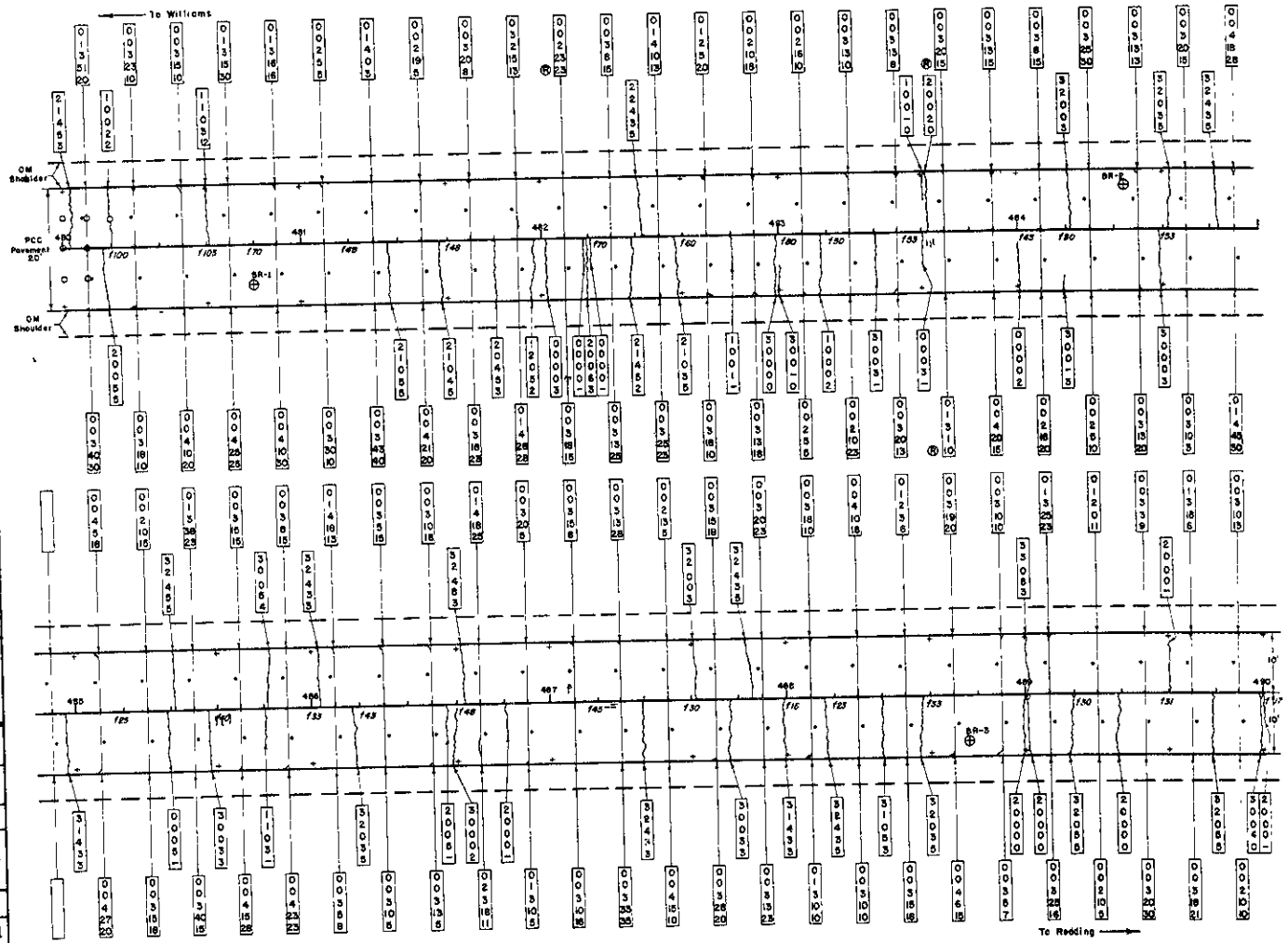
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

LOADOMETER STA. NO. 12
III-Col-7-B

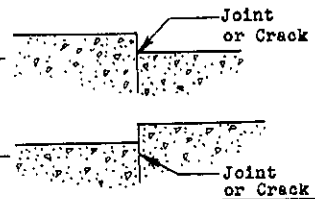


TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC

NORMAL FAULTING — — —

REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —



LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the <u>low</u> side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 12
III-Col-7-B

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Fld.	Lab.	Station	Position	Type	Thick-ness	Depth below Btm. Pav't.	Layer Des cription
1	BR-1-A	51-4029	480+80	6.6' Rt. of centerline	PCC	7"	0 - 4-3/4"	Base
2	BR-1-B	51-4030	480+80	same	PCC	7"	4-3/4"-10½"	Subbase
3	BR-1-C	51-4031	480+80	same	PCC	7"	10½" - 17½"	Basement
4	BR-2-A	51-4032	484+44	7.4' Lt. of centerline	PCC	7"	0 - 5"	Base
5	BR-2-B	51-4033	484+44	same	PCC	7"	5" - 13"	Subbase
6	BR-2-C	51-4034	484+44	same	PCC	7"	13" - 21"	Basement
7	BR-3-A	51-4035	488+76	7.7' Rt. of centerline	PCC	7"	0" -7"	Base
8	BR-3-B	51-4036	488+76	same	PCC	7"	7" - 21"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	6	145	104	7	139	A-2-4	2.65	2.68
2	27	103	90	17	114	A-7-6	2.61	
3	26	100	89	16	112	A-7-6	2.61	
4	7	148	106	7	139	A-2-4	2.65	2.63
5	27	98	89	17	111	A-7-6	2.56	
6	30	92	84	18	109	A-7-6	2.59	
7	9	137	100	9	137	A-2-6	2.64	2.65
8	26	101	91	18	111	A-7-6	2.60	

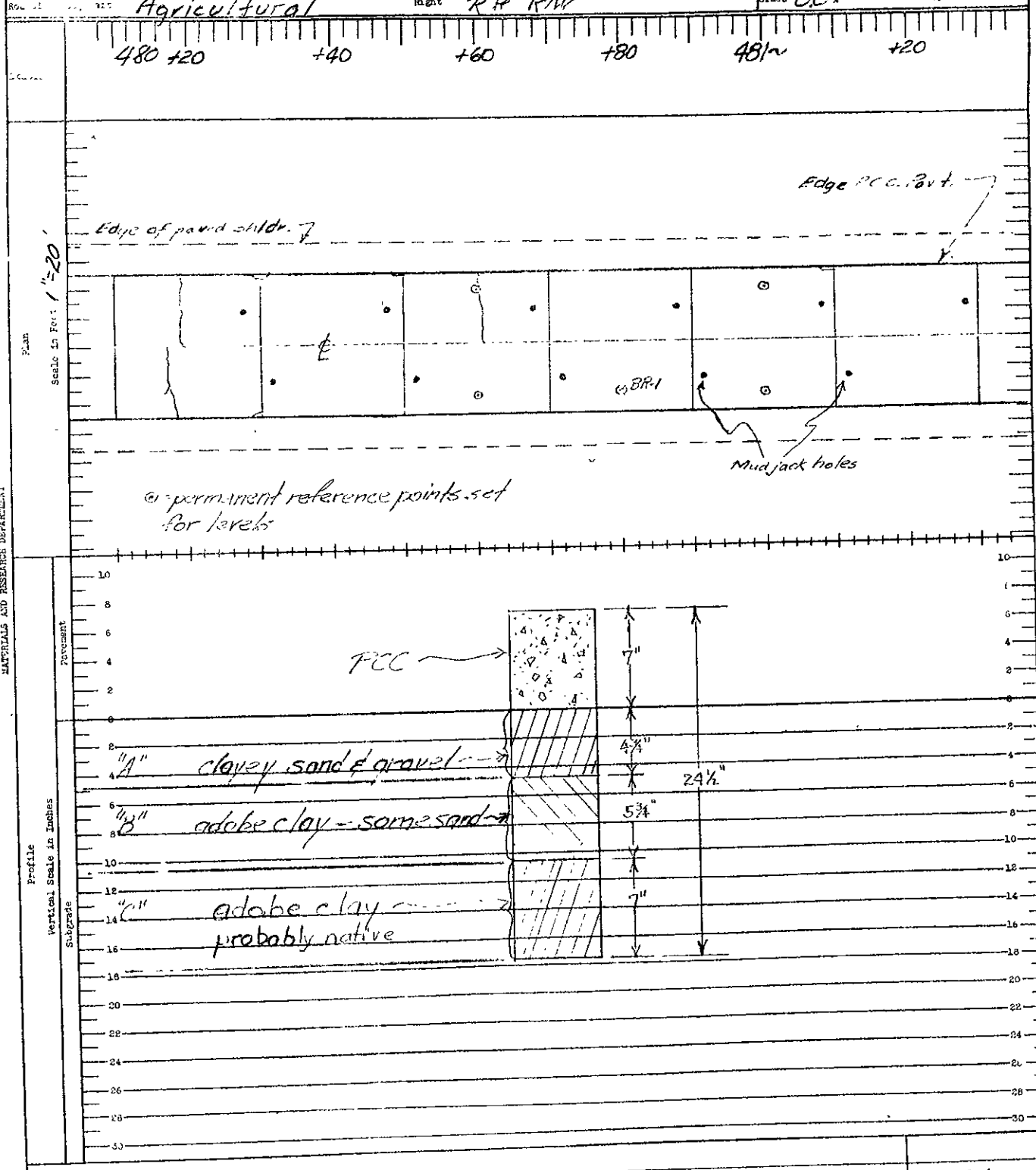
Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	100	94	63	53	44	36	34	12	11	7	26	16
2			100	99	98	97	96	91	81	57	46	20
3						100	99	97	95	51	52	21
4	100	92	65	52	43	36	28	17	16	8	26	16
5			100	99	99	99	99	97	97	54	54	24
6						100	99	98	98	57	54	24
7	100	94	73	63	56	49	39	26	23	13	31	16
8			100	99	99	98	97	95	93	62	49	22

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. III	Co. Col	Rte. 7	Sec. B	Contract No.	Date of Constr. 1931
Test Hole No. BR-1					
Rt. & Lt.	Arg. 32'	Dist. from End of Fill	No. of Lanes two	Traffic Med to Hvy	
Cut		Dist. from End of Cut	Side Ditches Rt & Lt.	Depth Rt 7.9" Lt. 0.5"	Date of Sampling 10-17-51
Road [illegible] Agricultural		Right RR R/W		Grade 0.0 %	Up



Remarks

Party: Confal, Humbert, Clawson

Drawn By Coan

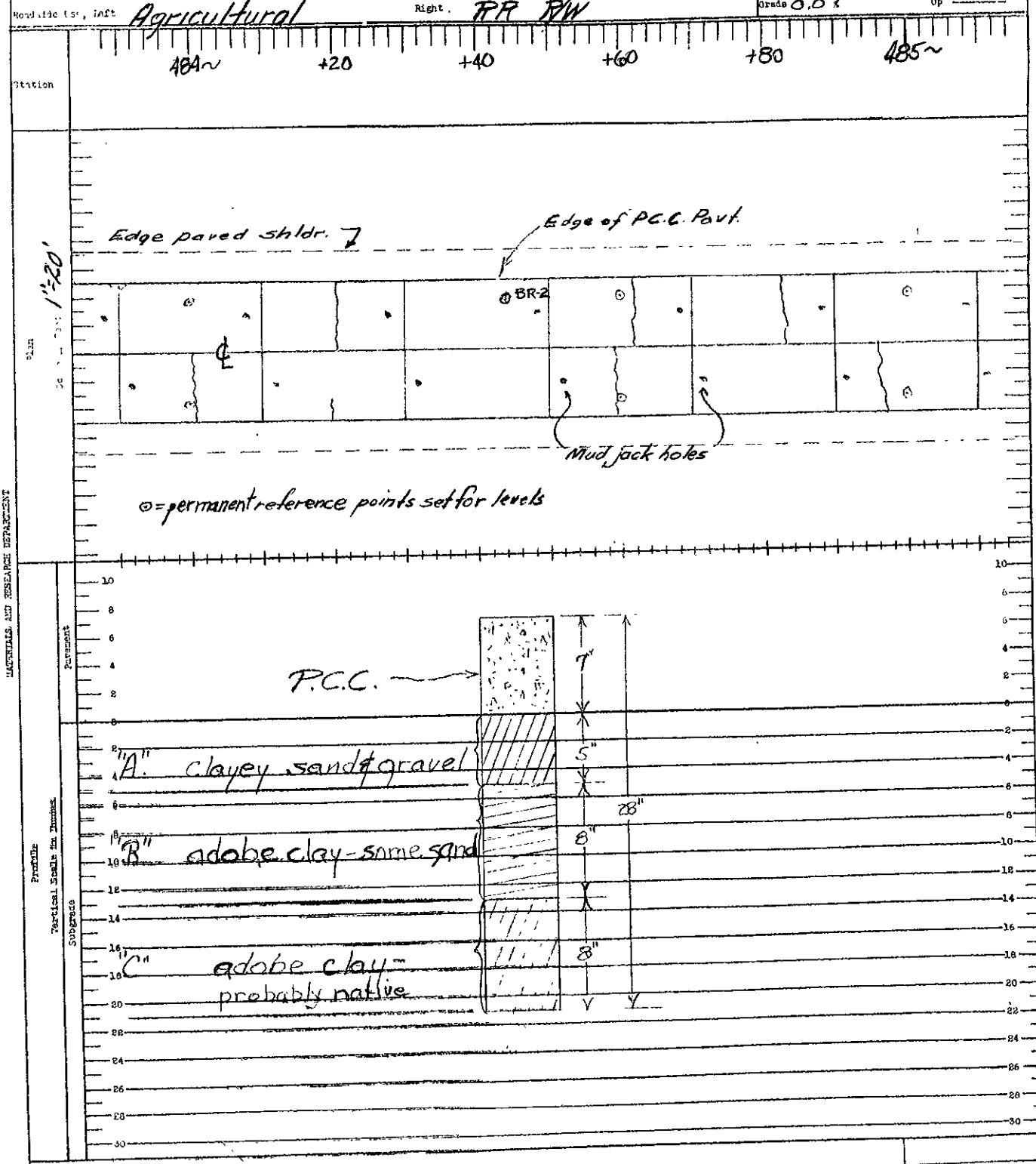
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. III Co. Col	Rte. 7	Sec. B	Contract No. —	Date of Constr. 1931	Test Hole No. BR-2
Fill Rt & Lt	Approx. Height Avg. 3'	Dist. from End of Fill	No. of Lanes two	Traffic Med to Hvy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt & Lt	Depth Rt 1.9 Lt 0.5	Date of Sampling 10-17-51
Roadside Use, Left Agricultural		Right RR R/W		Grade 0.0 %	Up —



Remarks:

Party: Confal, Humbert, Clawson

Drawn By: Coan

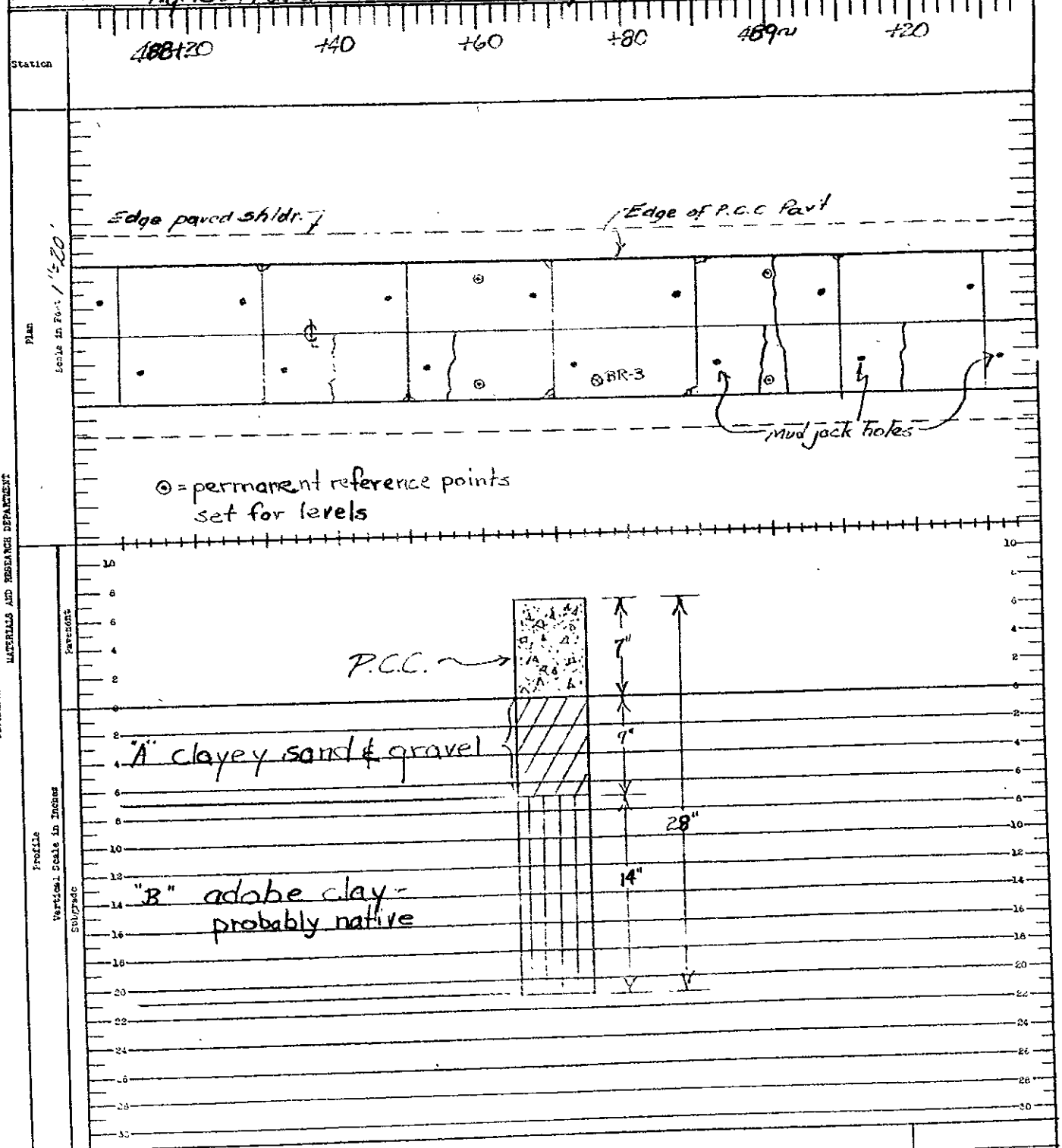
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. III Co. Col Rte. 7 Sec. B		Contract No.	Date of Constr. 1931		Test Hole No. BR-3
Fill Rt & Lt	Approx. Height Avg. 3°	Dist. from End of Fill	No. of Lanes Two	Traffic Med to Hvy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt & Lt	Depth Rt. 5' Lt. 6'	Date of Sampling 18 Of 51
Roadside Use, Left Agricultural		Right RR R/W		Grade 0.0%	Up —



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

Party Confal
Humbert
Clawson

Drawn by Coan

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 12
Dist. III Co. Col Rte. 7 Sec. B
Loc. Design BR
Sta. 480+00 to 483+00
Sheet No. 1 of 2

Drainage Cross Sections
ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
			Toe of Fill	Shldr Paint	Edge Pavd Shldr.	Edge Conc.	℄ Left Lane	℄ Right Lane	Edge Conc.	Edge Pavd Shldr.			Ditch	Ditch Bank.
483+00		82.9 39.5	83.2 32.5	85.2 22.5	85.62 14.5	85.72 10.0	85.89 5.0	85.86 5.0	85.89 10.0	85.73 14.0	85.5 22.5	83.9 41.5	82.4 54.5	
+50		82.9 39.5	83.4 32.0	85.2 23.0	85.55 14.0	85.70 10.0	85.94 5.0	85.92 5.0	85.93 10.0	85.70 14.5	85.3 23.5	84.6 40.5	82.3 54.0	
482+00		82.9 39.5	83.5 31.5	85.0 23.0	85.53 14.0	85.65 10.0	85.89 5.0	85.87 5.0	85.90 10.0	85.62 14.5	85.1 25.0	84.0 42.0	82.4 56.5	
+50		82.9 39.5	83.2 33.0	84.9 24.0	85.48 14.0	85.73 10.0	85.87 5.0	85.86 5.0	85.90 10.0	85.62 14.5	85.3 23.9	84.0 43.5	83.0 53.5	83.7 59.5
481+00		82.8 39.5	83.3 32.0	85.3 22.5	85.59 14.5	85.68 10.0	85.89 5.0	85.89 5.0	85.91 10.0	85.73 14.0	85.3 24.0	84.6 43.5	82.9 53.5	83.8 59.5
+50		83.0 39.5	83.3 33.0	85.1 24.0	85.54 14.5	85.74 10.0	85.95 5.0	85.90 5.0	85.97 10.0	85.71 14.0	85.5 23.0	84.1 43.5	82.8 54.0	83.9 59.0
480+00		83.0 39.5	83.3 32.5	85.1 23.5	85.65 14.5	85.70 10.0	85.93 5.0	85.86 5.0	85.92 10.0	85.65 14.5	85.4 23.8	84.6 43.5	82.8 54.5	83.9 59.5

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. III Co. Col Rte. 7 Sec. B
Load. Sta. No. 12
Loc. Design BR.
Sta. 484+00 to 490+00
Sheet No. 2 of 2

Drainage Cross-Sections

ROADWAY CONDITION SURVEY

	Left of Roadway						℄	Right of Roadway						
			Toe of Fill	Shldr Point	Edge Paved Shldr.	Edge Conc.	℄ Left Lane	℄ Right Lane	Edge Conc.	Edge Paved Shldr.			Ditch	Ditch Bank
490+00		82.7	82.9	85.0	85.61	86.02	86.16	86.16	86.15	85.96	85.7	84.0	82.9	83.9
		40.5	31.0	22.0	14.0	10.0	5.0	5.0	10.0	14.5	20.5	45.0	54.0	59.0
489+00		82.9	83.1	85.1	85.63	85.97	86.15	86.16	86.20	85.97	85.5	84.1	82.5	83.7
		39.5	31.0	22.0	13.8	10.0	5.0	5.0	10.0	14.0	23.5	40.0	54.5	61.0
488+00		82.8	83.1	85.0	85.57	85.40	86.04	86.08	86.13	85.91	85.6	84.0	82.4	83.7
		39.5	32.5	22.5	14.5	10.0	5.0	5.0	10.0	14.5	22.5	43.0	55.5	60.0
487+00		82.6	83.0	85.1	85.54	85.50	85.48	85.45	86.00	85.74	85.3	83.9	82.5	83.3
		40.0	33.0	22.0	14.0	10.0	5.0	5.0	10.0	14.5	22.5	41.5	55.0	60.0
486+00		82.7	83.1	85.2	85.48	85.75	85.92	85.89	85.97	85.68	85.2	83.8	82.6	83.7
		39.5	32.0	22.0	14.5	10.0	5.0	5.0	10.0	14.5	23.0	43.5	55.0	59.5
485+00		82.8	83.1	84.9	85.45	85.73	85.93	85.91	85.96	85.76	85.5	83.8	82.8	83.7
		39.5	33.5	22.5	14.5	10.0	5.0	5.0	10.0	14.0	22.0	44.5	54.0	59.5
484+00		82.8	83.1	85.0	85.52	85.64	85.89	85.93	85.91	85.73	85.2	83.7	82.4	83.4
		40.0	33.0	22.0	14.5	10.0	5.0	5.0	10.0	14.5	23.5	43.0	54.5	59.5

Form T-527

5

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 18
Road III-Sac-3-B

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 18 is located 0.2 miles northeast of the junction of Route 3 and Route 98, toward Roseville.

The section selected for test is located immediately northeast of the Loadometer Station, the beginning of the section being 120 feet from the station.

LENGTH: The section is established between Sta. 299+70 and Sta. 310+00, total length - 1030 feet. Roadway is a three lane highway. The section covers only the right (northeast bound traffic) lane.

SURFACE:

Type: Portland cement concrete constructed in 1930 reinforced as noted below.

Width: The section lane is 10 feet in width.

Reinforcing: All reinforcing steel is 1/2" square deformed bar. Edges of each 10 ft. lane are reinforced with 2 bars 20 ft. 10 in. long, spaced 4 inches from edges of slab and 4 inches apart vertically. Ends of each bar are fixed at one transverse joint and extend through the next joint into 12" metal sleeves which are fixed in the slab.

Loadometer Station No. 18
Road III-Sac-3-B

ROADWAY STRUCTURE:

SURFACE:

Reinforcing: (Continued)

At each transverse joint, 2 bars, 9'8" long, are placed on each side of the joint. Bars are spaced 4" horizontally from the joint, 4" apart vertically and extend to within 2" of the edges of the slab.

Joints:

Spacing and Dowels:

A longitudinal weakened plane joint between lanes extends throughout the section. So far as can be determined from District records, there are no tie bolts between adjacent lanes. Transverse joints are spaced 20 feet apart. Each 3rd joint is an expansion joint, remainder are weakened plane contraction joints. As noted above, longitudinal reinforcing steel extends through all transverse joints. Contraction joints have no load transfer devices or dowels other than such dowel action as the steel provides. In addition to reinforcing steel through them, the expansion joints have 24" x 3/4" dowels spaced at 28" centers starting 32" from edge of pavement. (3 per lane.)

Thickness:

The section lane is of 9"-6"-6"-9" cross-section. Transition from 9" to 6" is made in a distance of 2 feet from the edges of the

Loadometer Station No. 18
Road III-Sac-3-B

ROADWAY STRUCTURE

SURFACE:

Thickness: (Continued) slab. At areas sampled, 6-1/2" to 6-3/4" thickness of pavement was found.

BASE:

Type and Thickness: No evidence of any imported material. At areas sampled, material was a sandy adobe clay with some gravel. Sampled to a depth of 13-1/2" below the bottom of pavement.

Soil Classification: A-4

SIDE DITCH DRAINAGE: The section roadway is in a slight cut on the right and in fill on the left. Profile grade of the roadway is level for all practical purposes. Natural drainage in the area is generally transverse from right to left across the line of the roadway.

On the right, side drainage flows in both directions from Sta. 302+50. Side drainage back is carried under the roadway in an 18" C.M.P. culvert at Sta. 299+70. This culvert empties into a reinforced concrete drop inlet box with cast steel grating on the left of the roadway.

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

Side drainage ahead from Sta. 302+50 is carried under the roadway in an 18" C.M.P. culvert at Sta. 309+02.5. This culvert empties into an RC drop inlet box with cast steel grating on the left of the roadway. Between Sta. 308+38 and Sta. 308+48 on the right, side drainage ahead is carried under a residence driveway in a 12" C.M.P. culvert parallel to centerline. Both RC drop inlet boxes referred to above also serve as collectors for 12" C.M.P. side drains along the left of the roadway. Depths of the side drains vary from 3 to 6 feet below shoulder grade and centerline of the drains varies from 3 to 7 feet left of the left edge of P.C.C. pavement. Flow in the 12" C.M.P. side drain, left, is towards the beginning of the section. At Sta. 299+70, all drainage from the side drain and the 18" C.M.P. under the roadway flows out of the RC drop inlet box through an 18" C.M.P. which empties into a natural draw, away from the roadway.

There are no clearly defined side ditches along

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

the roadway, although the area which carries side drainage on the right of the roadway is from 0.1 to 0.7 ft. lower than the elevation of the pavement. On the left there is no ditch along the toe of the fill.

ROADWAY CONDITION

GENERAL:

The surface of the pavement throughout the section shows fairly heavy surface wear with much of the exposed aggregate having a high polish. The joint near Sta. 304+10 and the slabs adjacent to it have settled. This settling has caused a fault along the longitudinal joint between lanes beginning at Sta. 304+04, reaching its greatest depth at the joint at Sta. 304+10 and decreasing toward the transverse cracks at Sta. 304+21.

SPECIAL CONDITIONS:

(1) Roadway Section:

As noted above, the roadway is in a very slight cut on the right and in a fill on the left. Present pavement elevations are from 0.1 to 0.7 ft. higher than the gutter on the right and from 0.1 to 0.6 ft. lower than the surrounding area. On the left roadway pavement, elevations are from 2.0 to 3.0 feet higher than

Loadometer Station No. 18
Road III-Sac-3-B

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Roadway Section (Continued) — the surrounding area.

(2) Pumping: There are no evidences of pumping throughout the section.

(3) Faulting: There is some faulting at joints and cracks in the section. It has been indicated on the plan diagram. Maximum faulting along the longitudinal joint near Sta. 304+10 is 0.75".

(4) Shoulders: Throughout the section there are asphaltic mix shoulders which vary from 2.0 to 3.0 feet in width. Shoulders are in generally good condition.

(5) Miscellaneous: There are several small patches in the section at locations where joints or cracks have spalled out and been repaired. The area has been subsealed in the past, but the dates were not available as to when this was done.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established at the section for use in taking cross-sections and pavement levels.

Loadometer Station No. 18
Road III-Sac-3-B

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

B.M. No.	Location	Description	Elevation
1	50' rt. ℄ Sta. 299+70	1/4" diam. steel pin in PCC H/W	60.000 (Assumed)
2	46' rt. ℄ Sta. 309+02	1/4" diam. steel pin in PCC H/W	61.363

Profilograph Records:

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of the section lane. Records were made with the recording wheel of the machine 30" from the outer edge of pavement. Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 18

III-Sac-3-B

Ahead on line from Sta.

299+70

Transverse Crack at Sta.

301+00

Corner Break at Station

305+65

Patched break adjacent

to Station 306+85

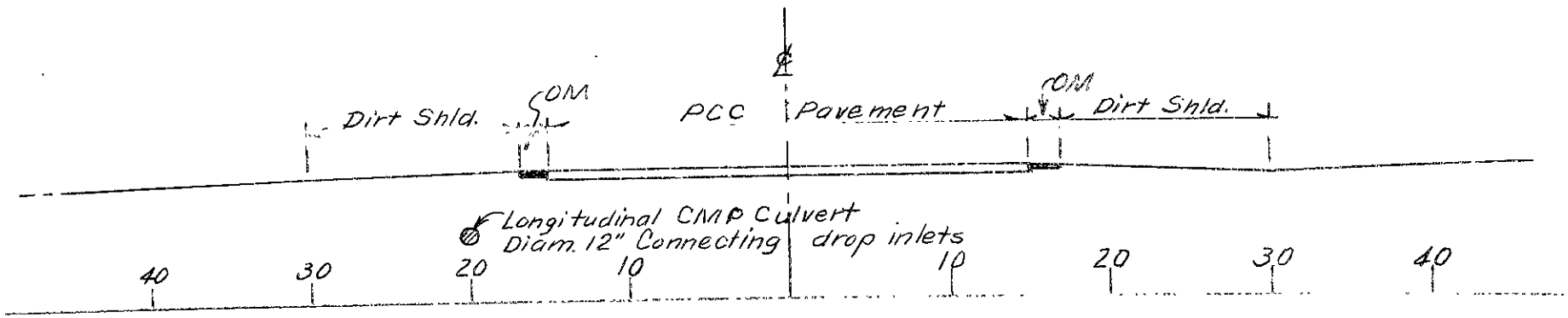
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BI 18
III-Sac-3-B

ROADWAY CONDITION SURVEY

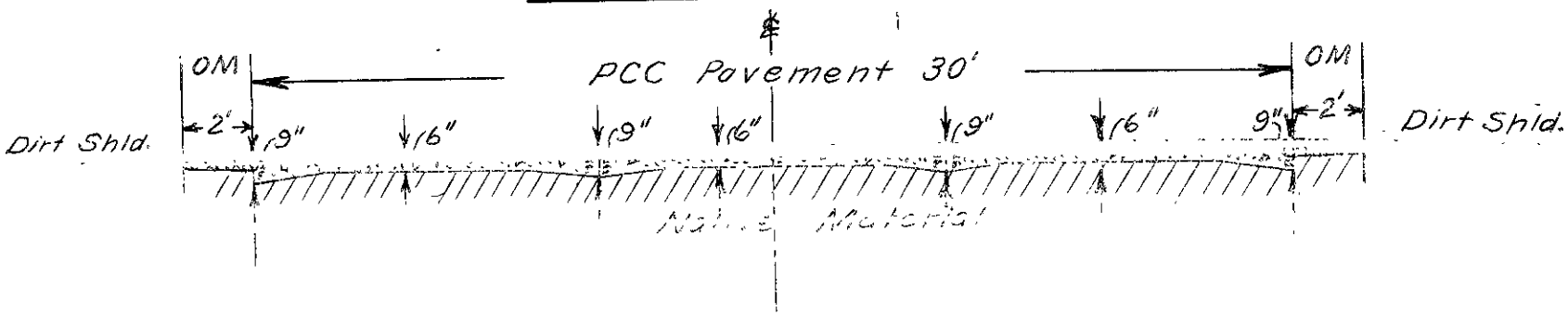
Scale: 1" = 10'

TYPICAL ROADWAY SECTION



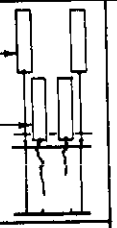
Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION



Condition rating of individual joint

Condition rating of individual crack



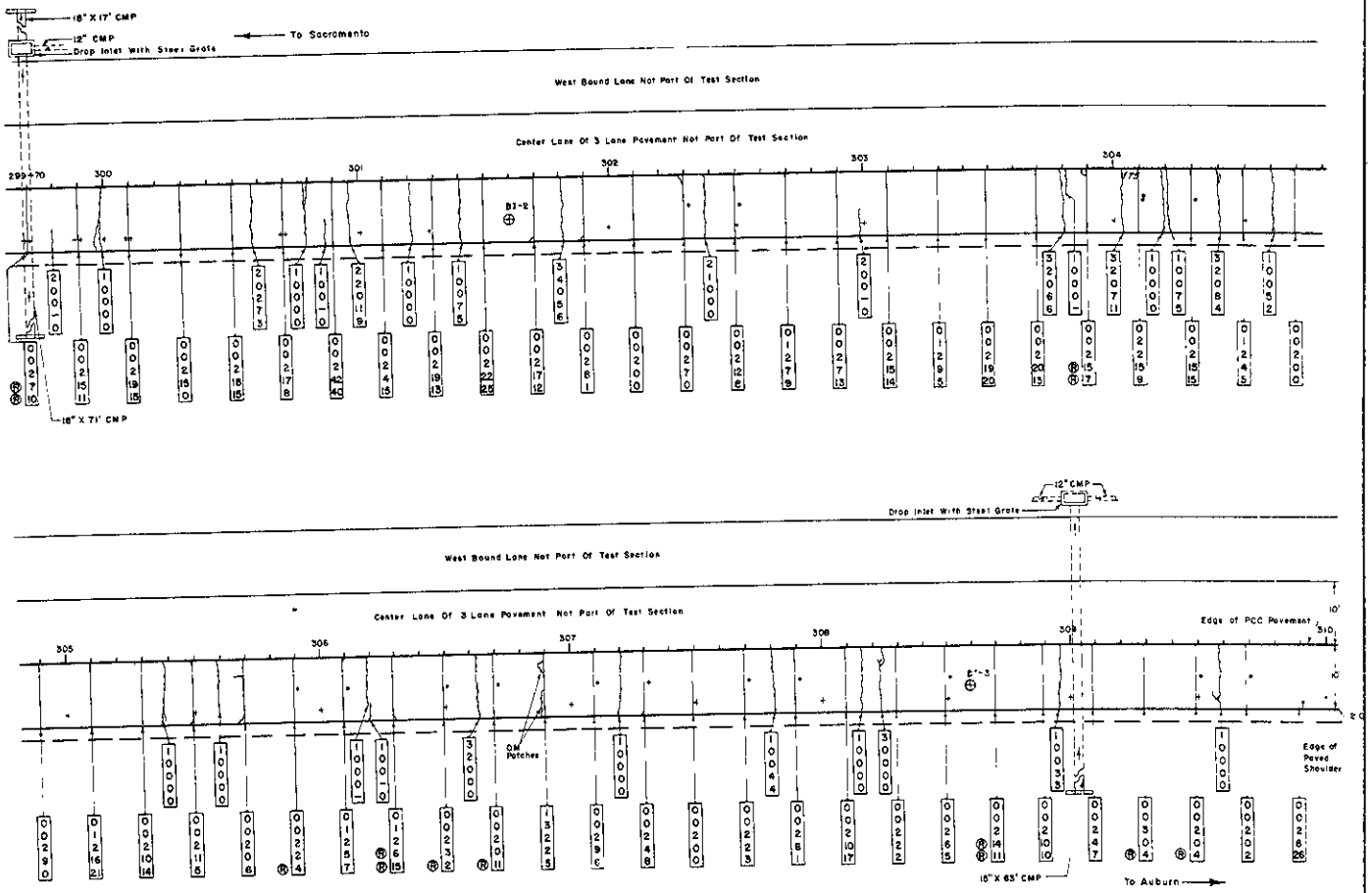
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

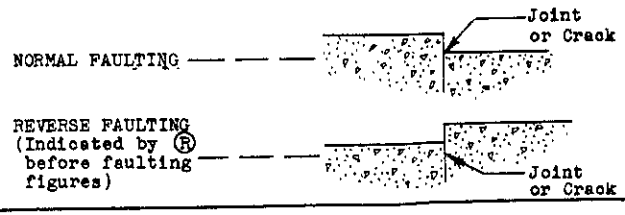
Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

LOADOMETER STA. NO. 18
III-Sac-3-B



TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC



LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the low side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 18
III-Sac-3-B

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BI-2-A	51-2851	301+60	3½' left of right E.P.	PCC	6-3/4"	0 - 6-1/4"	Basement
2	BI-2-B	51-2852	301+60	same	PCC	6-3/4"	6¼ - 13-3/4"	Basement
3	BI-3-A	51-2853	308+59	4' left of R.O.E.P.	PCC	6-1/2"	0 - 9"	Basement
4	BI-3-B	51-2854	308+59	same	PCC	6-1/2"	9 - 13-1/2"	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	9	123	93	9	.32	A-4	2.64	
2	16	101	83	13	.21	A-4	2.63	
3	13	114	89	10	.28	A-4	2.64	2.77
4	14	106	83	10	.28	A-4	2.63	2.75

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	99	99	99	98	96	83	50	44	16	19	14
2	100	97	96	92	89	84	74	42	36	12	26	19
3	100	94	92	91	90	86	75	48	41	16	23	14
4	100	89	86	84	83	79	69	42	38	13	22	14

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. ~~00000~~ 00258

Dist. III Co. Sac. Rte. 3	Sec. B	Contract No. —	Date of Constr. 1929	Test Hole No. BI-2	
Fill Bt. E 11	Approx. Height Bt. 1½ Lt. 2½ Ave	Dist. from End of Fill	No. of Lanes 3	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth 0 —	Date of Sampling 8-1-51
Roadside Use, Left undeveloped		Right Roadside businesses		Grade 0 %	Up —

Station: 301~ +20 +40 +60 +80 .302~ +20

Plan — Scale in Feet 1"=20'

← To Sacramento

Edge paved shldr. ↓

Edge P.C.C. Pav't.

BI-2

Edge paved shldr. ↑

⊙ = permenent reference points

Test Section in Right Lane only

Profile — Vertical Scale in Inches

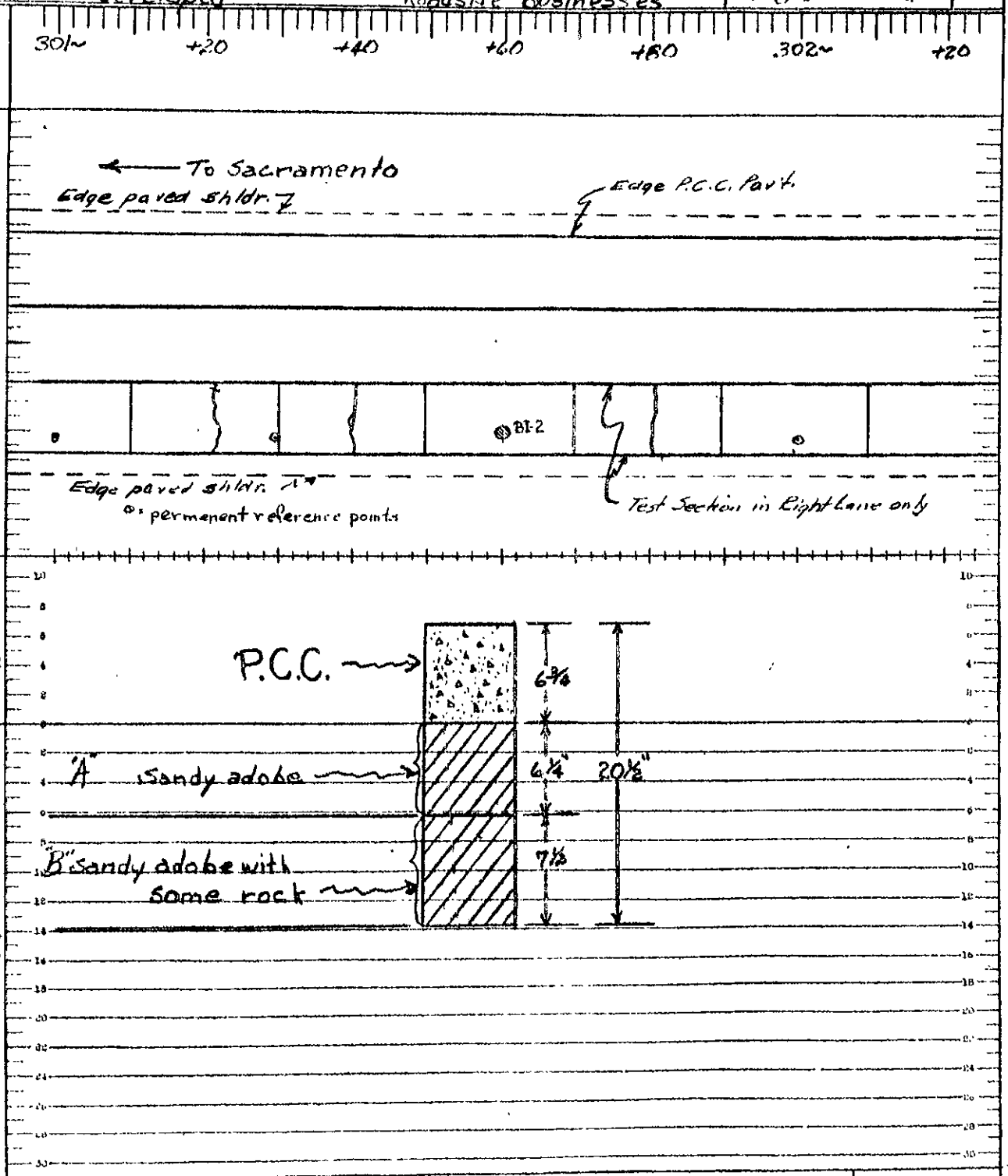
Pavement

Subgrade

P.C.C. → 6¾

"A" Sandy adobe → 6¼" 20½"

"B" Sandy adobe with some rock → 7½



Party Clawson Control

Drawn by Coan

LOCATION AND PROFILE SKETCH

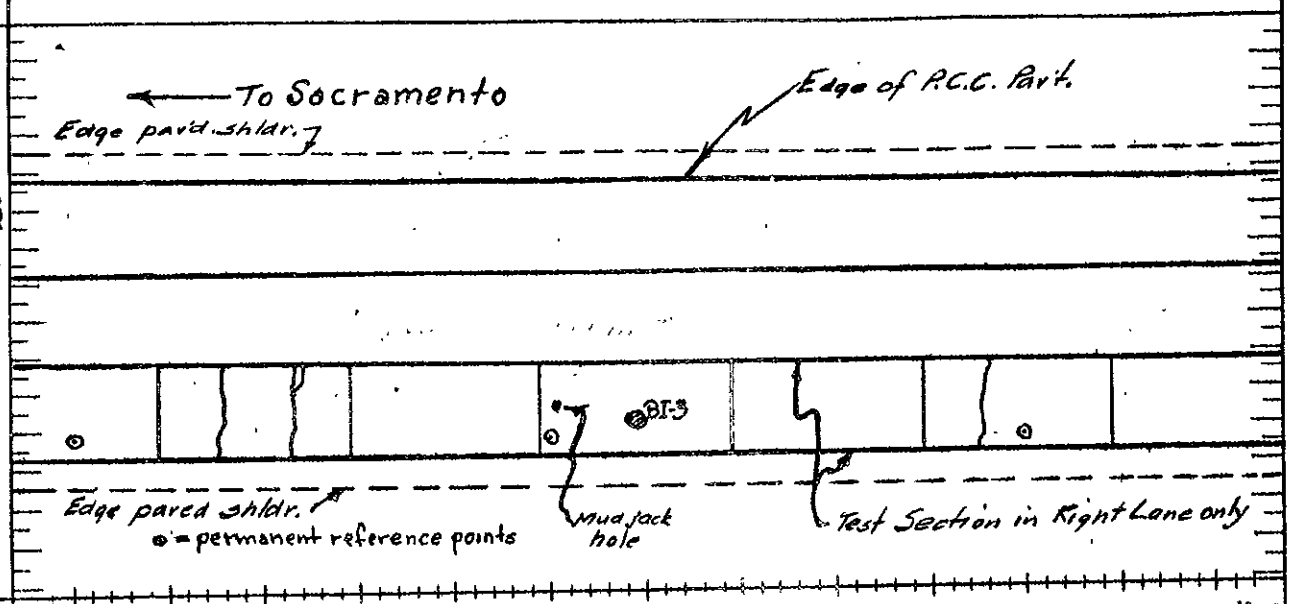
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

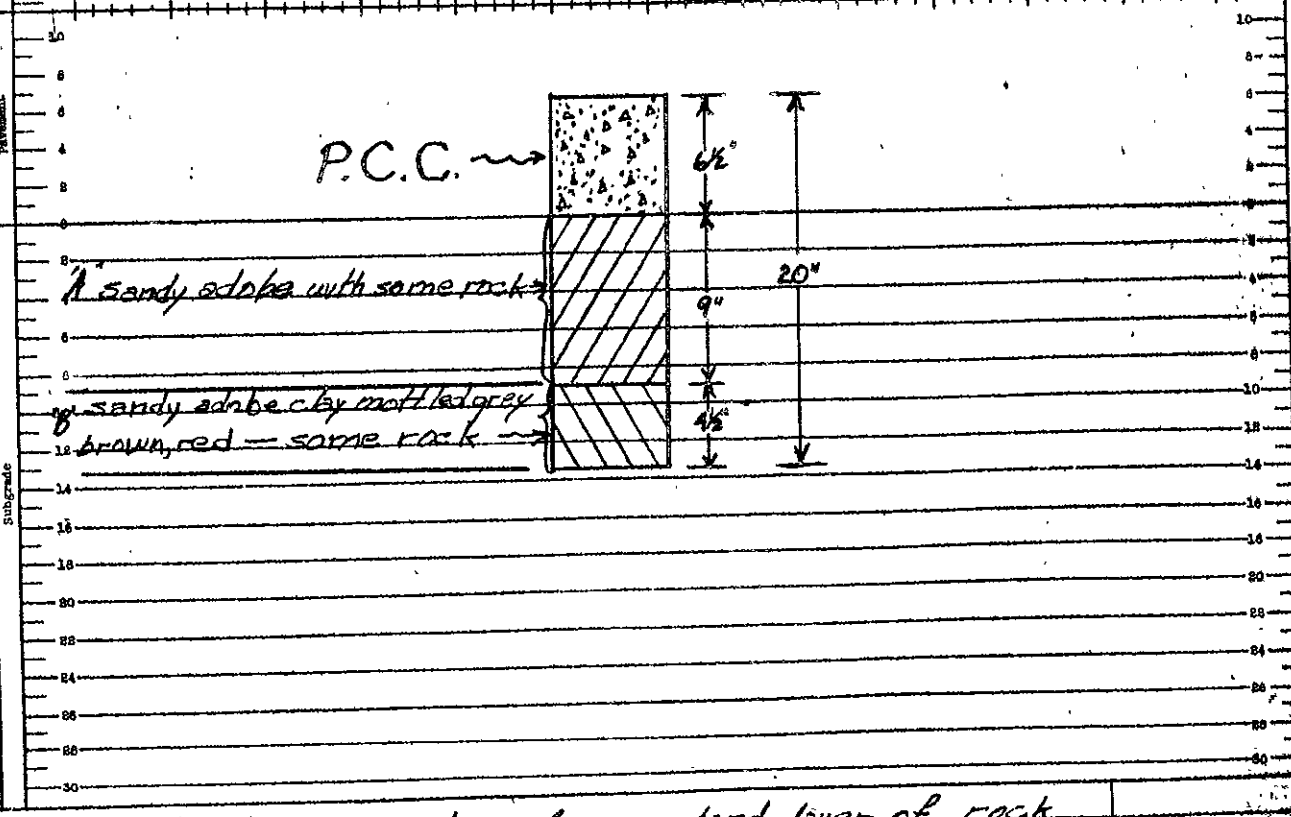
Dist. III Co. Sac Rte. 3 Sec. B		Contract No. —	Date of Constr. 1929	Test Hole No. BI-3	
Fill Bt. & Lt	Approx. Height Rt. 19' Lt. 28' Ave	Dist. from End of Fill	No. of Lanes 3	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not Clearly defined	Depth 0"	Date of Sampling 8-9-51
Roadside Use, Left Undeveloped		Right Residences (2)		Grade 0%	Up —

Station: 308~ +20 +40 +60 +80 309~ +20

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks: At 20" below pavement surface — hard layer of rock & old Oil Mix. — apparently broken up during construction & covered with excavation material.

Party Clawson
Conlal

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

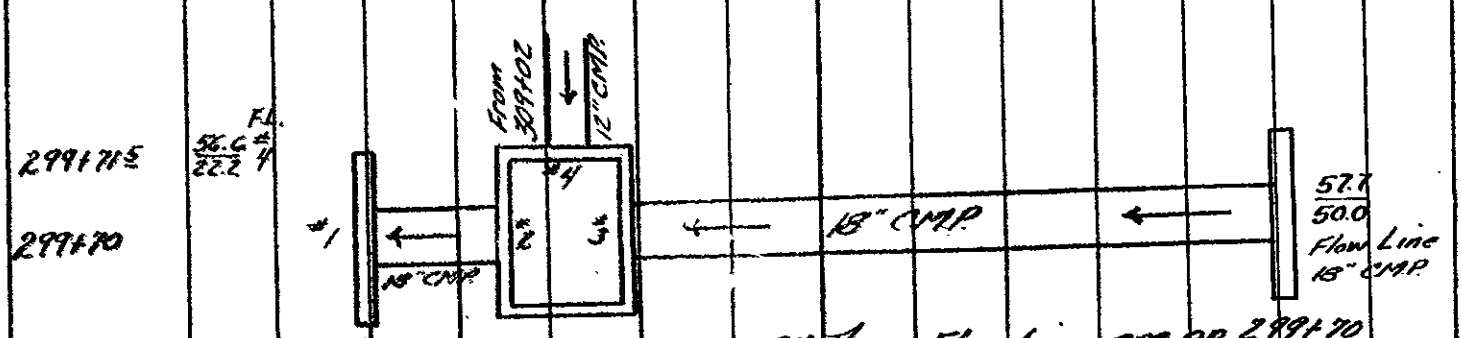
State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 18
Dist. III Co. Sac. Rte. 3 Sec. B
Loc. Design BI
Sta. 299+70 to 304~
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left of Roadway				Right of Roadway			
	Field Shots	Field Shots	Dirt Shldr.	Edge Pav't	Edge Pav't	Dirt Shldr.	Gutter	Field Shots
304~		61.3 45.0	62.3 29.5	62.66 15.0	62.73 15.0	62.4 30.5		63.0 40.5
303~		60.6 45.0	62.2 28.5	62.73 15.0	62.79 15.0	62.1 29.5		63.1 43.5
302~	59.9 43.5	Dirt Shldr. 62.2 33.5	62.2 28.5	62.85 15.0	62.95 15.0	62.2 29.5	61.5 46.0	
301~	60.5 45.5	Dirt Shldr. 62.5 33.0	62.5 28.5	62.90 15.0	62.97 15.0	62.4 28.5	61.5 45.0	
300		58.3 43.5	62.6 35.0	62.92 15.0	63.02 15.0	62.1 34.5	61.2 45.0	



Note: All These Flow Lines are on 299+70

299+70		58.1 46.5	61.9 29.0	62.96 15.0	63.01 15.0	62.0 31.0	59.5 52.5	

Form T-527

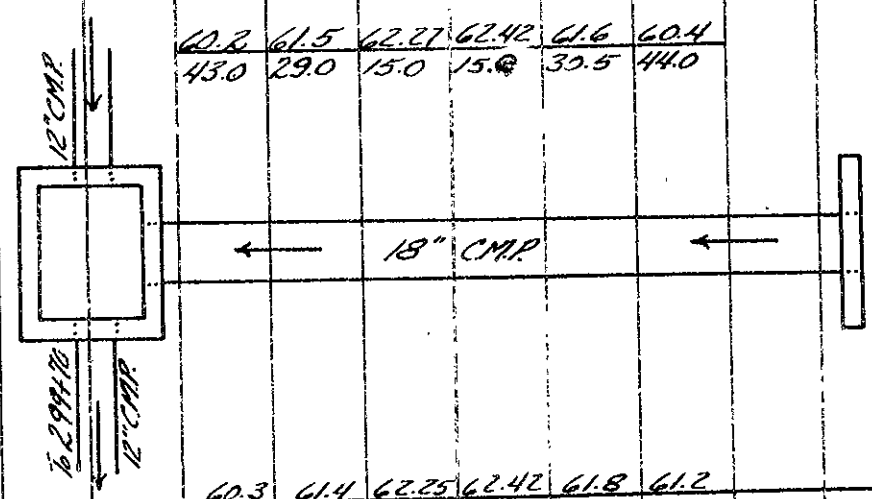
State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 18
Dist. III Co. Sac Rte. 3 Sec. B
Loc. Design BI
Sta. 305~ to 310~
Sheet No. 2 of 2

Drainage Cross-Sections
ROADWAY CONDITION SURVEY

℄

	Left of Roadway						Right of Roadway						
				Field Shots.	Edge Dirt Shldr.	Edge of Pav't	Edge of Pav't.	Edge Dirt Shldr.	Field Shots.				
310~				60.2 / 43.0	61.5 / 29.0	62.27 / 15.0	62.42 / 15.0	61.6 / 30.5	60.4 / 44.0				
	Flow line Elev.												
309+04	58.4 / 18.0	12" CMP.											
309+02.5	58.4 / 17.0	18" CMP.										59.0 / 46.0	Flow Line 18" CMP
309+01	58.2 / 18.0	12" CMP.											
309~				60.3 / 45.5	61.4 / 30.5	62.25 / 15.0	62.42 / 15.0	61.8 / 30.5	61.2 / 43.5				
+48										59.1 / 45.0	Flow line shots on 12" CMP. side drain under drive way		
+28										59.2 / 45.0			
308~				60.4 / 42.0	61.8 / 29.5	62.38 / 15.0	62.45 / 15.0	62.0 / 29.5	61.4 / 43.5				
307~				61.2 / 43.0	62.2 / 29.5	62.45 / 15.0	62.55 / 15.0	61.9 / 30.5	61.9 / 44.5				
306~				61.8 / 43.5	62.3 / 30.5	62.54 / 15.0	62.66 / 15.0	62.1 / 30.0	62.6 / 42.5				
305~				62.1 / 43.5	62.4 / 29.5	62.59 / 15.0	62.68 / 15.0	62.6 / 30.0	63.0 / 43.0				



Form T-527

6

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 32
Road IV-Ala-5-F

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 32 is located 0.5 mile west of Greenville, IV-Ala-5-A, at the west end of Altamont Pass.

The section selected is located 0.4 miles west of the Loadometer Station on Road IV-Ala-5-F.

LENGTH: The section selected for test is established between Sta. 558+00 (east) and Sta. 568+00, (west), a total length of 1000 feet. Roadway is a 4-lane divided expressway. The section is established in the two right (westbound traffic) lanes.

SURFACE:

Type: Portland cement concrete, not reinforced. Constructed in 1949-50.

Width: Two 12 foot width lanes, total width 24 feet.

Joints: Transverse weakened plane contraction joints.

Spacing, etc. No dowels or load transfer devices. "Cold" or contact transverse joint at end of each day's work.

Longitudinal joint between lanes is a tongue and groove or keyed joint. There are 30" x 5/8" tie bolts, at 30" centers along the longitudinal joint between lanes.

Thickness: 8" uniform section, each lane.

Loadometer Station No. 32
Road IV-Ala-5-F

ROADWAY STRUCTURE

BASE:

Type and Thickness: Cement-treated base, 3-1/2" to 4" in thickness.

Soil Classification: Not sampled

SUBBASE:

Type and Thickness: Clean sand and gravel. Thickness varied from 11-1/4" to 12". Refer to typical section for this test section for placement of this material in the prism.

Soil Classification: A-1-A

BASEMENT SOIL:

Type and Thickness: Black and gray adobe clay, sampled to a depth of 22" below the bottom of pavement.

Soil Classification: A-4 and A-7-6

SIDE DITCH DRAINAGE: Entire section roadway is in a slight fill. The section pavement has a profile grade of -0.65% and drainage is from east (Sta. 558) to west (Sta. 568). Pavement slopes down from inner edge to outer edge, all drainage from pavement itself thus being taken off to the outside shoulder.

Center of the division strip between the two roadways is depressed and acts as a longitudinal

Loadometer Station No. 32
Road IV-Ala-5-F

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

surface drain for both roadways. Center of strip is from 1.1 to 1.7 feet below the elevation of the shoulder. Drainage along the section in this center strip flows into drop inlet boxes on the outside of the roadway fill. Drainage along the outer fill slope of the section flows in a ditch which parallels the roadway. This ditch is from 0.7 to 1.4 feet below the elevation of the shoulder. Drainage along the outer slopes also flows into the drop inlet boxes at Sta. 560+50 and Sta. 565+06. All drainage into these drop inlets is then carried out under the adjacent service roads in 12" C.M.P. culverts which drain into surface ditches.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Roadway Section: As noted above, the section roadway is entirely in fill. Present pavement elevations are from 1.5 to 2.0 feet above the surrounding areas.

(2) Pumping: There are no evidences of any pumping in the section.

(3) Faulting: There is some slight faulting at joints and cracks which is noted on the plan diagram.

Loadometer Station No. 32
Road IV-Ala-5-F

ROADWAY CONDITION

SPECIAL CONDITIONS:

(4) Shoulders: Asphaltic plant mixed surfacing shoulders border the pavement throughout the section. On the inner edge of pavement, shoulders are 2.0 ft. wide, with a heavy asphaltic penetration treatment adjacent to that, giving in effect a surfaced shoulder 5.5 feet wide. There is very poor bond between the pavement and shoulder along the inner edge. Shoulder has pulled away from the pavement throughout the section. In places the opening between the pavement and shoulder is 3/4" wide and open to a depth of 3". Along the outer edge of pavement, shoulders of plant mixed surfacing are 7.5 feet in width. This surfacing has not pulled away from the pavement so severely as has the inner shoulder but there are many places where it has done so. No asphaltic seal has been applied between the pavement and shoulders.

(5) Miscellaneous: Throughout the section there are several transverse joints which are "wavy" and which will probably develop serious spalling in the future. Some of these have already spalled to some extent.

Loadometer Station No. 32
Road IV-Ala-5-F

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Two bench marks were established at the section for use in taking cross-sections and pavement levels:

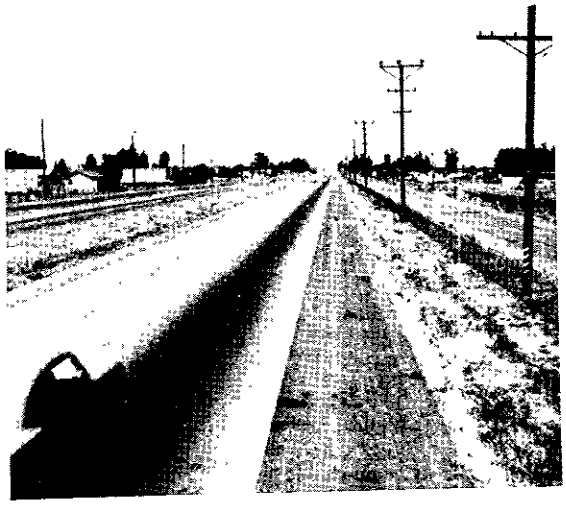
B.M. No.	Location	Description	Elevation
1	40' rt. of ℄ Sta. 556+14	1/4" diam. steel pin in W. curb D.I.	500.00 (Assumed)
2	40' rt. of ℄ Sta. 569+48	1/4" diam. steel pin in E. curb D.I.	491.316

Profilograph Records; By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Records were made with the recording wheel of the machine 30" into each lane from the outside edge of pavement in each lane.

Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

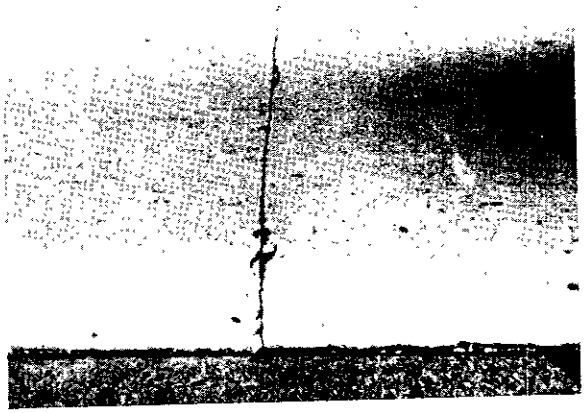
Loadometer Sta. No. 32

IV-Ala-5-F



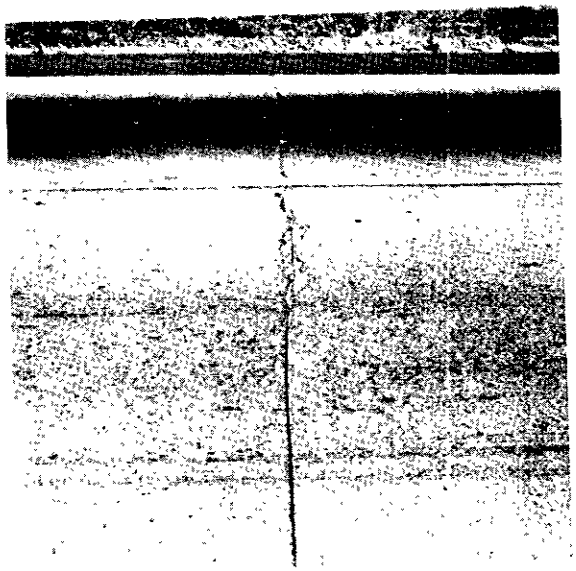
Ahead on line from

Station 558+00



Spalled Joint in Right

Outer Lane Sta. 559+74



Spalled Joint in Right

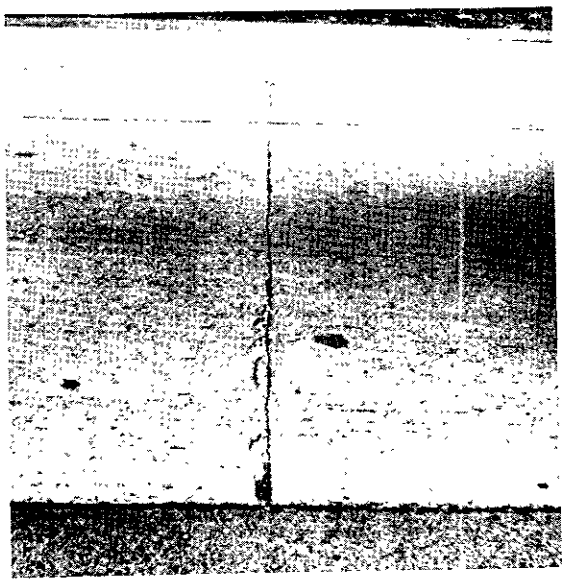
Inner Lane Sta. 560+35

Spalled Joint in Right

Inner Lane Sta. 562+30

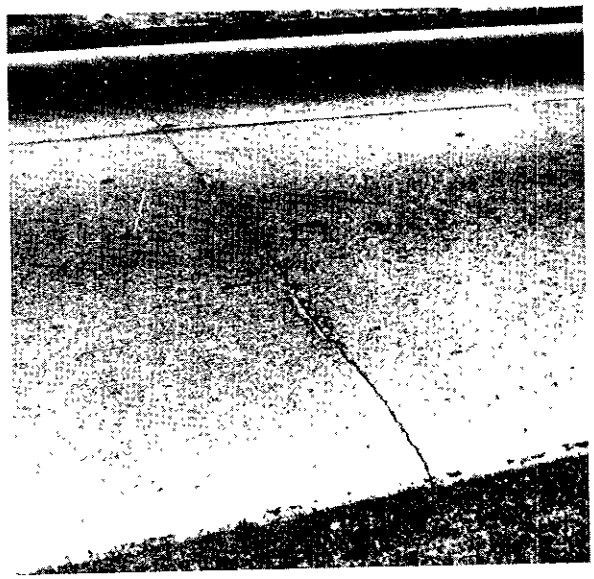
Loadometer Sta. No. 32

IV-Ala-5-F



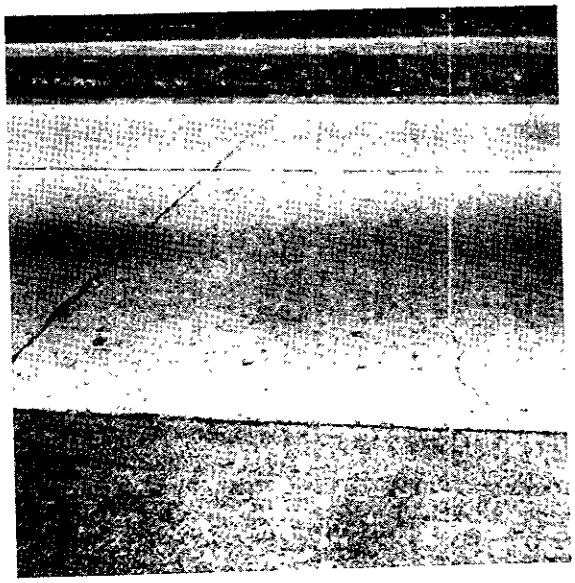
Spalled Joint Right

Outer Lane Sta. 564+10

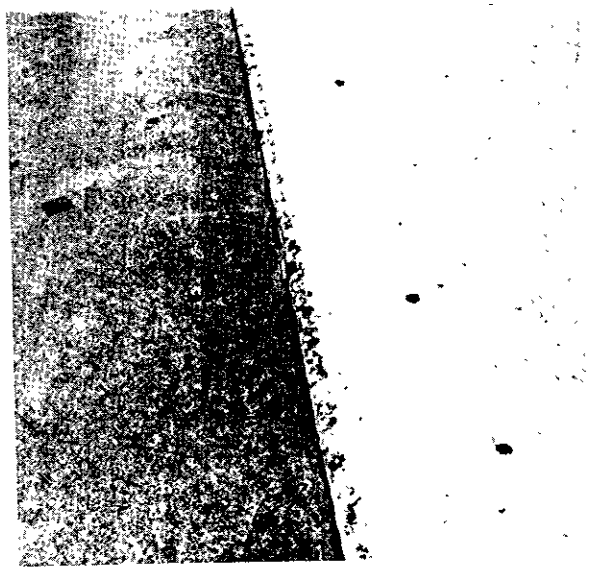


Spalled Joint Right Inner

Lane Sta. 565+90



Spalled Joint and Corner
Crack in Right Outer
Lane Sta. 566+65



Opening Between Inner
Shoulder and Edge of
Pavement Sta. 567+90

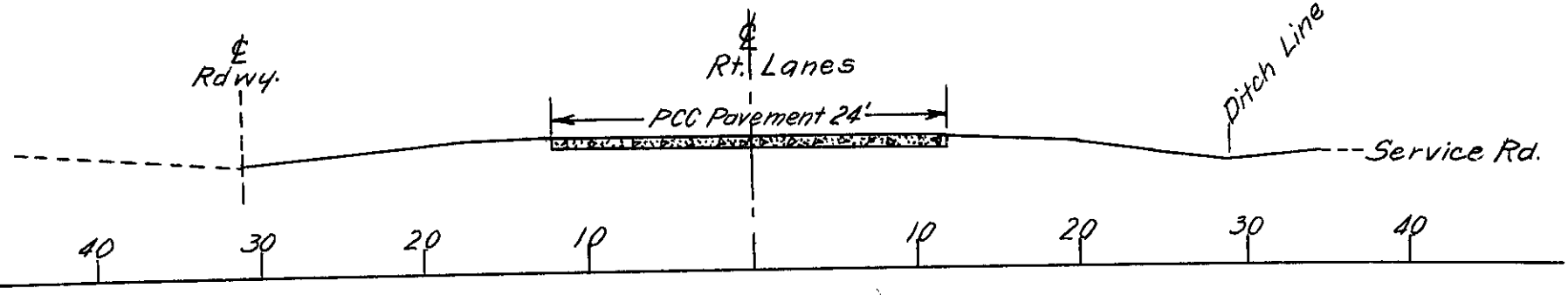
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CB 32
IV-Ala-5-B

ROADWAY CONDITION SURVEY

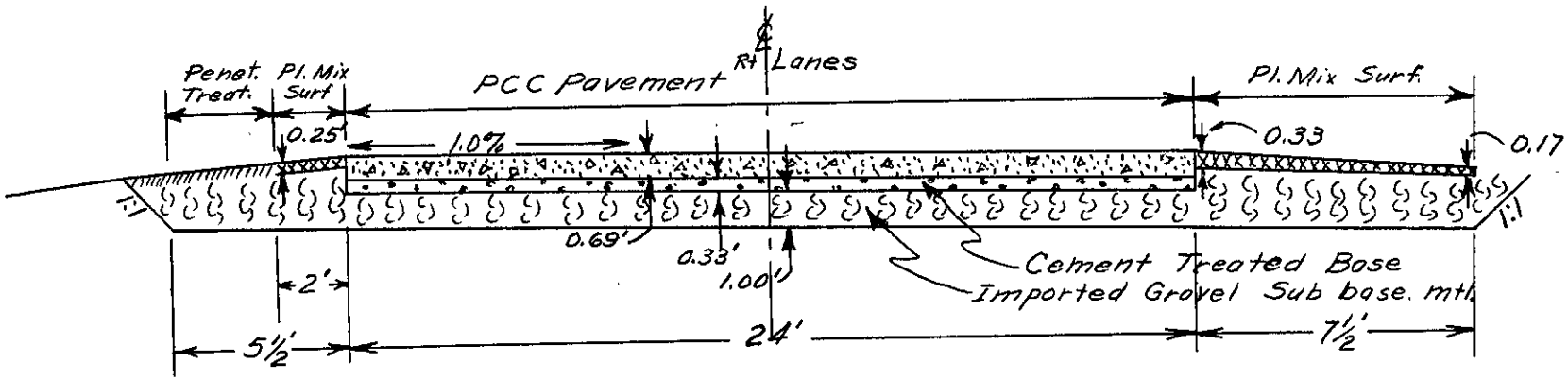
Scale: 1" = 10'

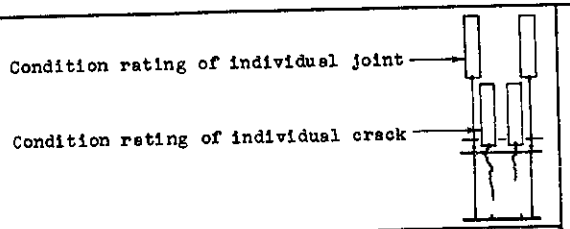
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





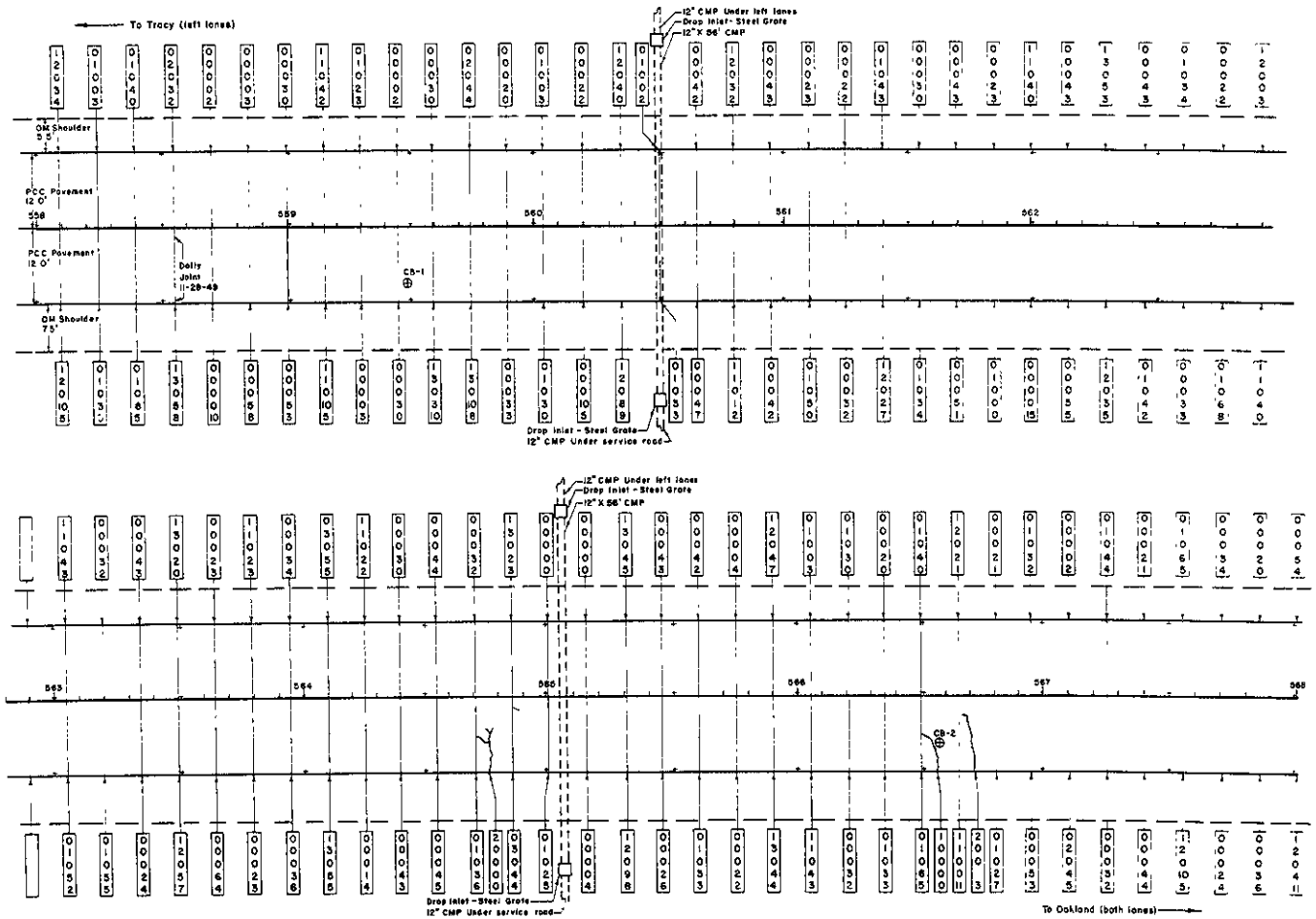
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

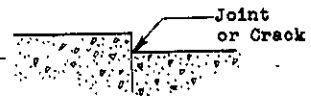
LOADOMETER STA. NO. 32
IV-Ala-5-F



TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC →

NORMAL FAULTING — — —



REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —

LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the <u>low</u> side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 32
IV-Ala-5-F

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	CB-1-A	52-3003	559+48	3' left of R.O.E.P.	PCC CTB	8-1/2 3-1/2	3½" - 15½"	Subbase
2	CB-1-B	52-3004	559+48	Same	PCC CTB	8-1/2 3-1/2	15½" - 22"	Basement
3	CB-2-A	52-3005	566+57	4.5' left of R.O.E.P.	PCC CTB	8 4	4" - 15-3/4"	Subbase
4	CB-2-B	52-3006	566+57	Same	PCC CTB	8 4	15-3/4" - 22"	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	5	144	70	5	142	A-1-a	2.70	2.67
2	18	103	85	14	122	A-4	2.59	
3	4	143	99	5	144	A-1-a	2.71	2.70
4	19	106	93	[illegible]	114	A-7-6	2.58	

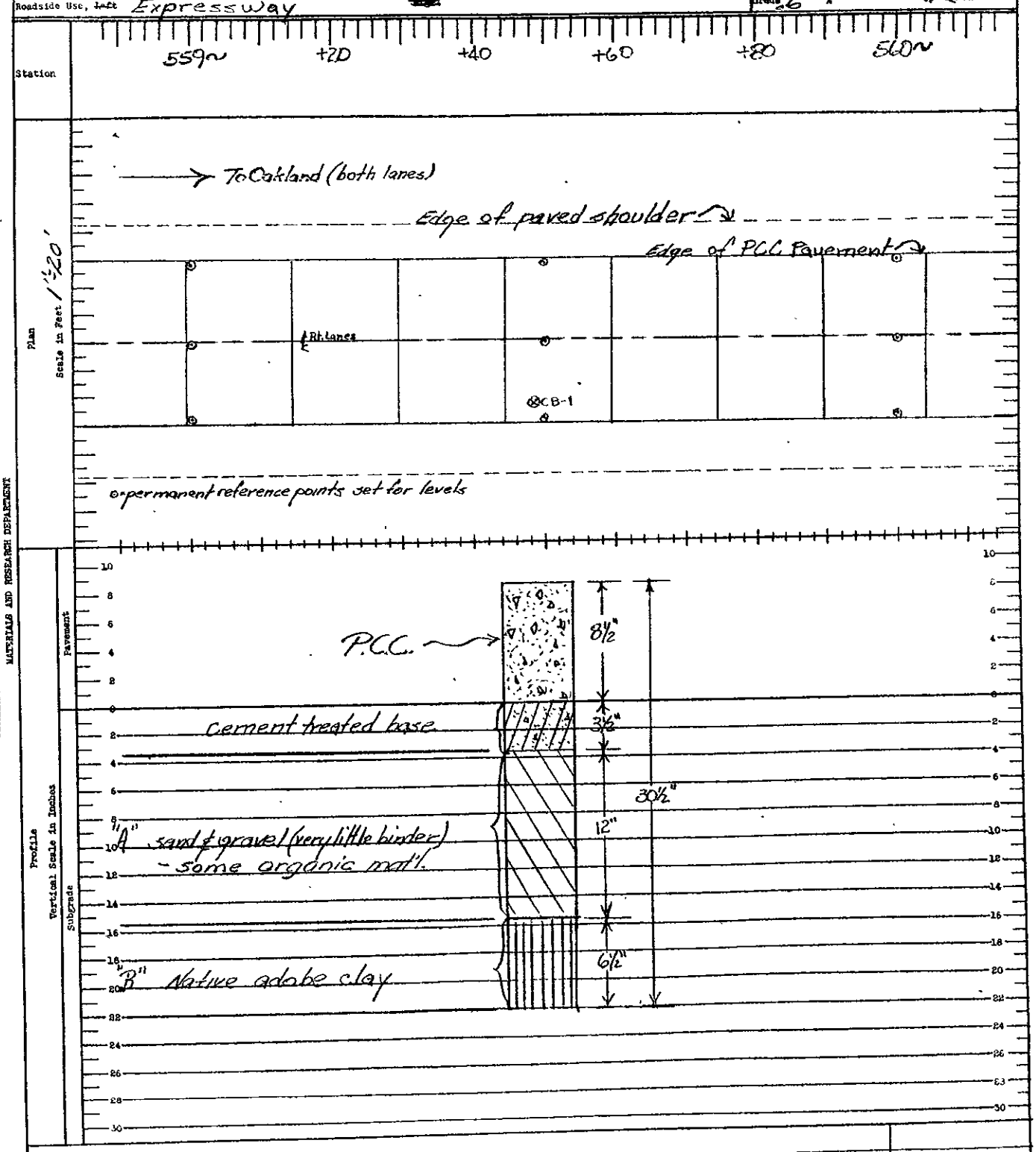
Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	99	73	40	32	24	18	13	[illegible]	6	3	22	[illegible]
2		100	99	98	96	92	94	[illegible]	2	28	24	[illegible]
3	99	72	38	29	22	16	12	[illegible]	[illegible]	3	23	[illegible]
4			100	99	99	99	96	88	82	40	43	20

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 602-58

Dist. IV	Co. Ala	Rte. 5	Sec. F	Contract No. —	Date of Constr. 1949-1950
Test Hole No. CB-1					
Fill —	Approx. Height Ave. 1'	Dist. from End of Fill —	No. of Lanes four-Div.	Traffic Hvy	
Cut —	Approx. Depth —	Dist. from End of Cut —	Side Ditches Rt. & Lt.	Depth Rt/Lt 12"	Date of Sampling 7-24-52
Roadside Use, ~~left~~ Expressway				Grade .6 %	Up ←



Remarks:

Party Smith, Clawson

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

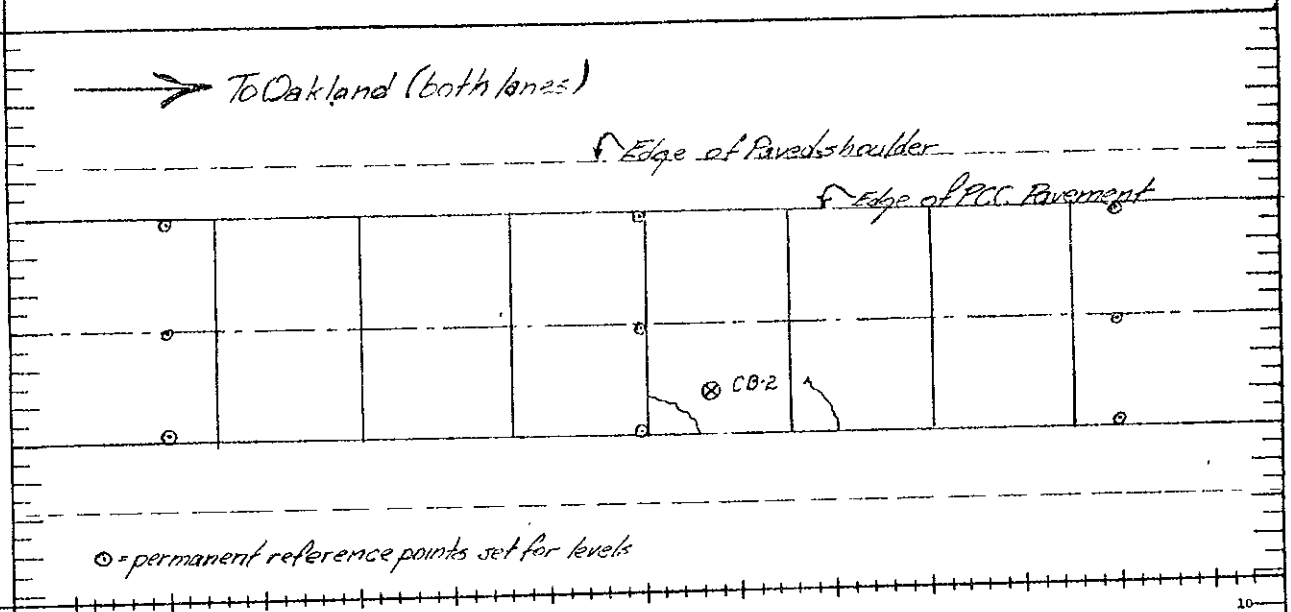
RESEARCH NO. ~~[illegible]~~ 00258

Dist. II Co. Ala Rte. 5 Sec. F			Contract No. —	Date of Constr. 1949-1950	Test Hole No. CB-2
Fill ←	Approx. Height Ave. 1'	Dist. from End of Fill →	No. of Lanes four-Div.	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut →	Side Ditches Rt & Lt	Depth Rt 1'	Date of Sampling 7-25-52
Roadside Use, ~~Left~~ Expressway			~~Right~~	Grade .6 %	Up ←

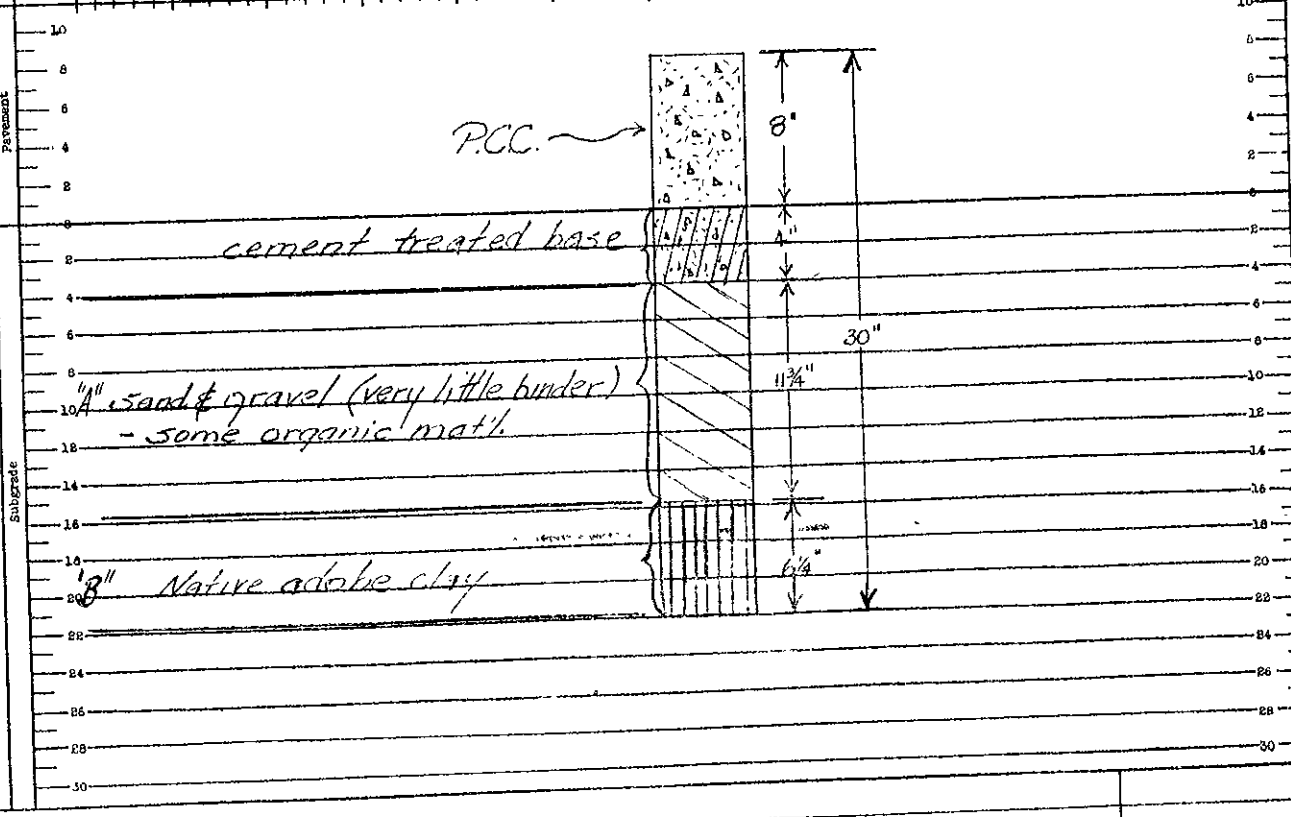
STATE OF CALIFORNIA
DIVISION OF HIGHWAYS
DEPARTMENT OF PUBLIC WORKS
MATERIALS AND RESEARCH DEPARTMENT

Station: 566~ +20 +40 +60 +80 567~

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Party Smith
Clawson

Drawn by Cain

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 32
Dist. IV Co. Ala Rte. 5 Sec. F
Loc. Design CB
Sta. 558+00 to 562+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄ Right Lanes

	Left					Right				
	Ditch ℄ division strip	outer edge of paved shoulder	inner edge of paved shoulder			inner edge of paved shoulder	outer edge of paved shoulder	break in slope	Ditch	Top of service road fill
562~	496.6 31.0	498.00 17.5	498.28 12.0			498.13 12.0	497.76 19.5	497.1 26.0	496.8 29.0	497.4 35.0
561~	497.1 31.0	498.70 17.5	498.98 12.0			498.78 12.0	498.37 19.5	497.6 26.0	497.3 29.0	497.8 35.0
	Flow line of 12" CMP					Flow line of 12" CMP				
150	495.51 29.0								495.29 27.0	
	Drop Inlet-Steel grate					Drop Inlet-Steel grate				
560~	498.1 31.0	499.43 17.5	499.63 12.0			499.39 12.0	498.97 19.5	498.4 26.0	497.9 29.0	498.3 35.0
559~	498.5 31.0	500.09 17.5	500.28 12.0			500.05 12.0	499.63 19.5	498.9 26.0	498.5 29.0	499.0 35.0
558~	499.1 31.0	500.72 17.5	500.94 12.0			500.69 12.0	500.29 19.5	499.5 26.0	498.9 29.0	499.7 35.0

Form T-57

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 32
Dist. IV Co. Ala Rte. 5 Sec. F
Loc. Design CB
Sta. 563+00 to 568+00
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄ Right Lanes

	Left					Right				
	ditch & division strip		outer edge of paved shoulder		inner edge of paved shoulder	inner edge of paved shoulder	outer edge of paved shoulder	Break in Slope	Ditch	Top of service road fill.
568~	493.0		494.19		494.46	494.22	493.79	493.0	492.8	493.3
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0
567~	493.4		494.86		495.15	494.87	494.42	493.8	493.6	494.0
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0
566~	494.2		495.45		495.70	495.51	495.04	494.4	494.2	494.7
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0
	Flow line of a 12" CMP					Flow line of a 12" CMP				
+06~		493.2						492.9		
		29.0						27.0		
	Drop Inlet-Steel grate					Drop Inlet-Steel grate				
565~	494.9		496.17		496.38	496.19	495.90	495.2	495.4	495.5
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0
564~	495.4		496.74		497.08	496.80	496.54	495.9	495.6	496.2
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0
563~	495.9		497.42		497.71	497.48	497.07	496.4	496.1	496.7
	31.0		17.5		12.0	12.0	19.5	26.0	29.0	35.0

Form T-527

7

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 26
Road VI-Fre-4-C

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 26 is located 7.5 miles north of the north city limits of Fresno, near the Fresno-Madera County Line, road VI-Fre-4-C. The section selected for test is approximately 5.5 miles north of the north city limits of Fresno, and 2.0 mi. south of the Loadometer Station.

LENGTH: The section is established between Sta. 351+00 and Sta. 361+00, a total length of 1000 feet. Roadway is a 3-lane highway, outer lanes of P.C.C. and middle lane of asphaltic concrete pavement. The section covers only the right (northbound traffic) lane.

SURFACE:

Type: Portland cement concrete, reinforced as noted below. Constructed in 1937.

Width: 10 feet

Reinforcing: Transverse only, 1/2 square deformed bar on each side of each joint, and 11" from the joint.

Joints:

Spacing and Dowels: Joints are spaced 20 feet apart. Each third joint is an expansion joint. Remainder are weakened plane contraction joints.

Loadometer Station No. 26
Road VI-Fre-4-C

ROADWAY STRUCTURE

SURFACE:

Joints:

Spacing and Dowels: (Continued)

Each transverse joint has nine 3/4" dowels through it on 14" centers, starting 4" from edge of pavement.

Thickness:

The lane selected for testing is of 9"-6½"-6½"-9" cross-section. Transition from 9" to 6-1/2" is made in a distance of 2 feet from each edge.

BASE:

Type and Thickness:

Clean sand, clayey sand and gravel
Thickness varies from 6-1/4" to 15-3/4".
Material also serves as a cushion course as noted below.

Soil Classification:

A-1-b, and A-2-4

NOTE: At all locations sampled, below the base and cushion course, an old asphaltic mix pavement was encountered, thickness unknown.

SIDE DITCH DRAINAGE:

The section roadway is entirely in fill. Profile grade of the roadway is level for all practical purposes.

On the left, there are no clearly defined ditches. Agricultural lands border the right of way on the left and side drainage apparently

Loadometer Station No. 26
Road VI-Fre-4-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

runs off onto these lands and is absorbed. On the right, the roadway is paralleled by the Valley Line of the Southern Pacific Railroad. Toe of fill for the railroad is approximately 55' from the right edge of pavement in the section. The area between the toe of roadway fill and toe of railroad fill serves to accomodate drainage from both. The area has been rough bladed, has no defined ditch, varies from two to four feet below the elevation of the edge of pavement and has a slight slope to the north. There are no culverts or bridges within the section.

ROADWAY CONDITION:

SPECIAL CONDITIONS:

(1) Roadway Section: As noted above, the entire section roadway is in fill. Present pavement elevations are from 1.0 to 4.0 feet above the surrounding areas.

(2) Pumping: There are no evidences of pumping in the section.

(3) Faulting: There is some faulting at joints and cracks which is indicated on the plan diagram.

Loadometer Station No. 26
Road VI-Fre-4-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(4) Shoulders: Throughout the section, the outer lanes of P.C.C. pavement are bordered by asphaltic mix shoulders, which are in generally good condition.

On the left of the roadway, shoulders are 15 to 17 feet in width.

On the right of the roadway, total shoulder width is 8.5 feet. Immediately adjacent to the section lane is a recent, extra blanket of asphaltic mix which extends 3.5 to 4.5 feet from the right outer edge of pavement.

(5) Miscellaneous: There are no evidences of the section lane having been mudjacked or subsealed.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Two bench marks were established at the section for use in taking cross-sections and pavement levels.

B.M. No.	Location	Description	Elevation
1	25'rt. of rt. edge pavement Sta. 346+50	1/4" diam. steel pin set in P.C.C. headwall	300.000 (Assumed)

Loadometer Station No. 26
Road VI-Fre-4-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

B.M. No.	Location	Description	Elevation
2	40' rt. of rt. edge pavement Sta. 360+85	1/4" diam. steel pin set in R. R. spike in telegraph pole	297.910

Profilograph Records:

By means of the Profilograph, records were made of the longitudinal profiles of the section lane of the traveled way surface. Records were made with the recording wheel of the machine 30" into the lane from each edge of pavement.

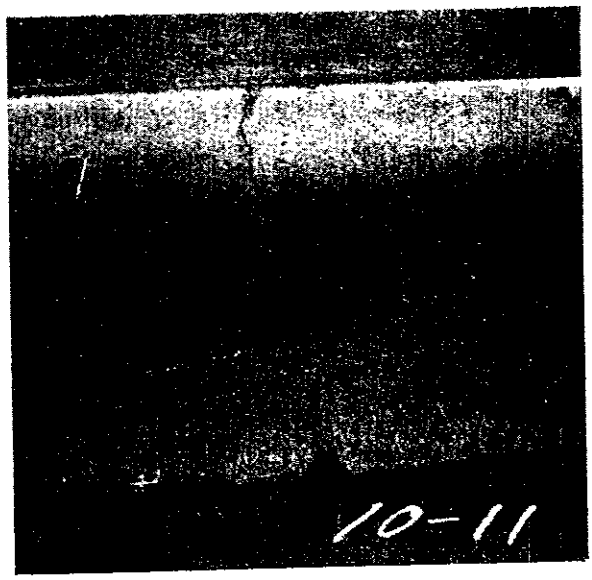
Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 26

VI-Fre-4-C

Ahead on Line from Sta.

351+00



Transverse Crack at

Station 352+13

Transverse Crack at Sta.

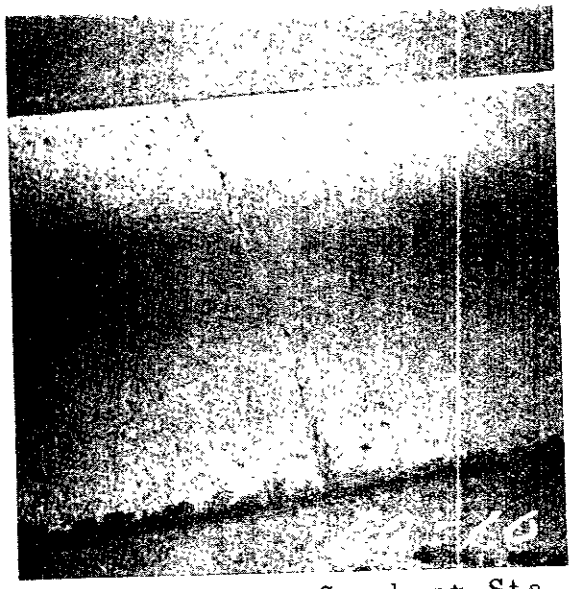
353+10

Transverse Cracks at

Station 353+90

Loadometer Sta. No. 26

VI-Fre. 4-C

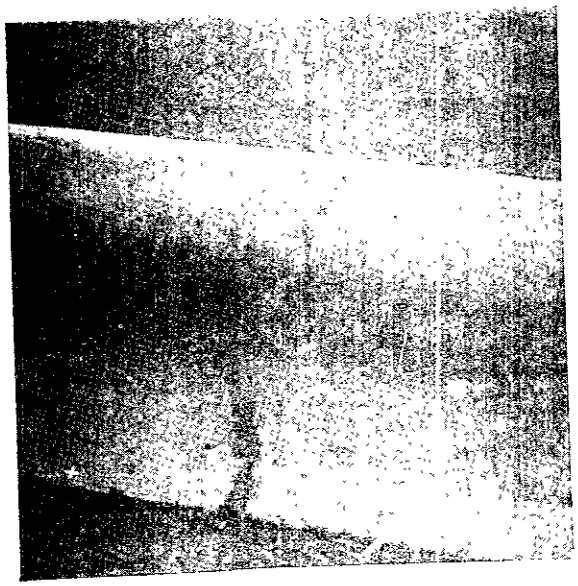


Transverse Crack at Sta.

354+49

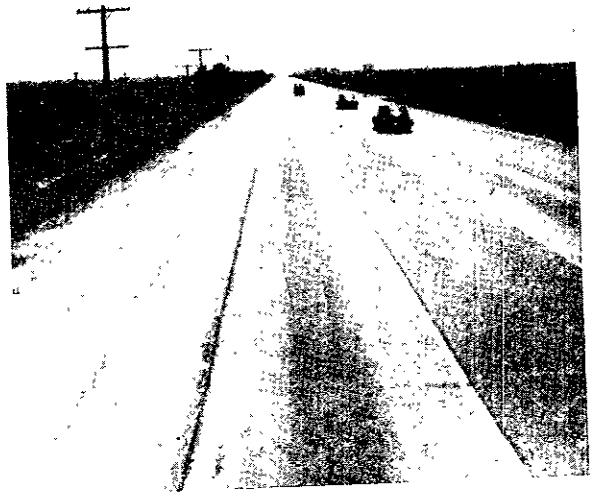
Transverse Crack at Sta.

356+30



Transverse Crack at

Station 357+92



Back on line from Sta.

361+00

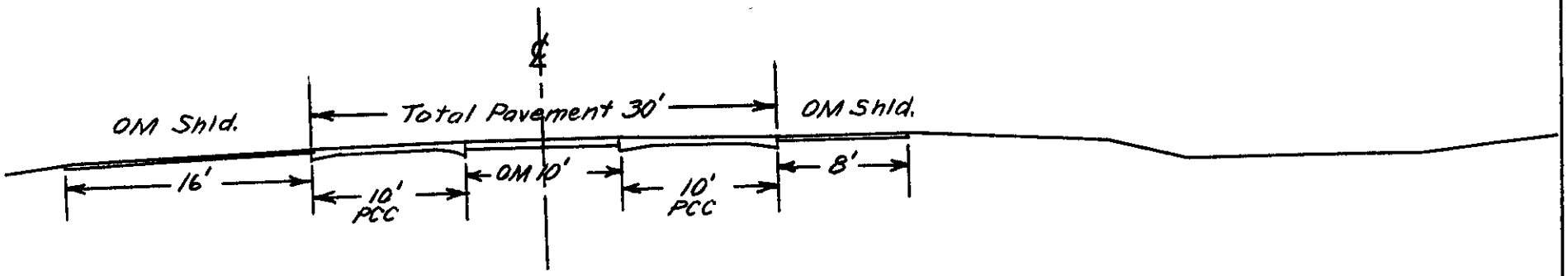
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BZ 26
VI-Fre-4-C

ROADWAY CONDITION SURVEY

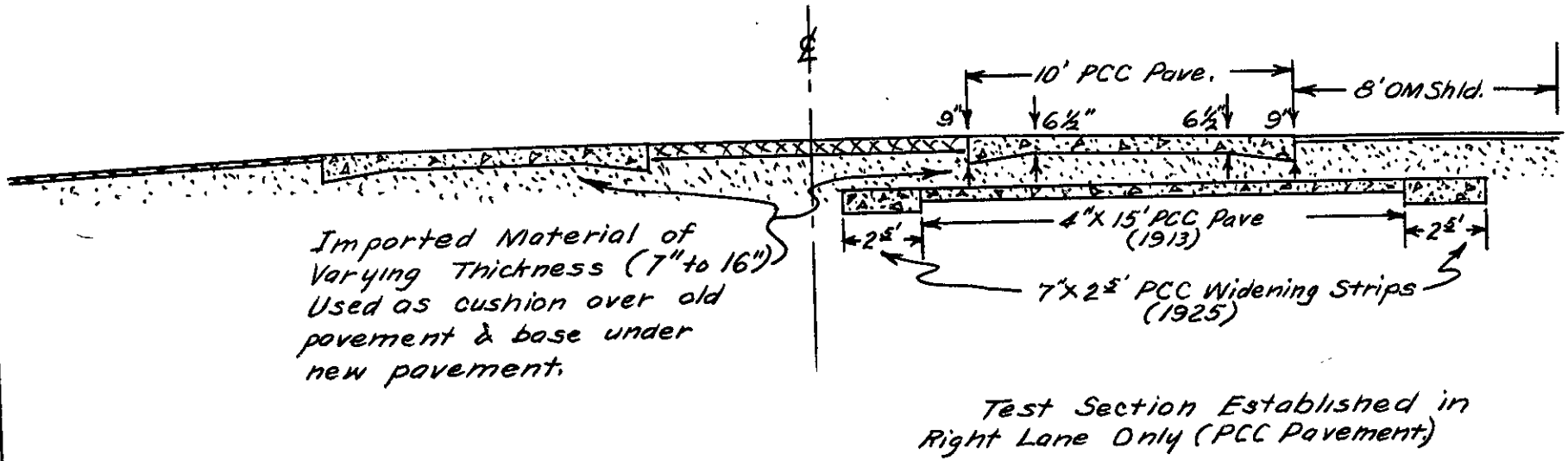
Scale: 1" = 10'

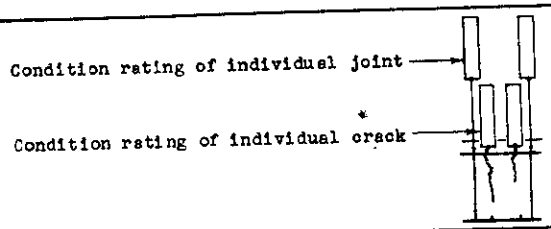
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





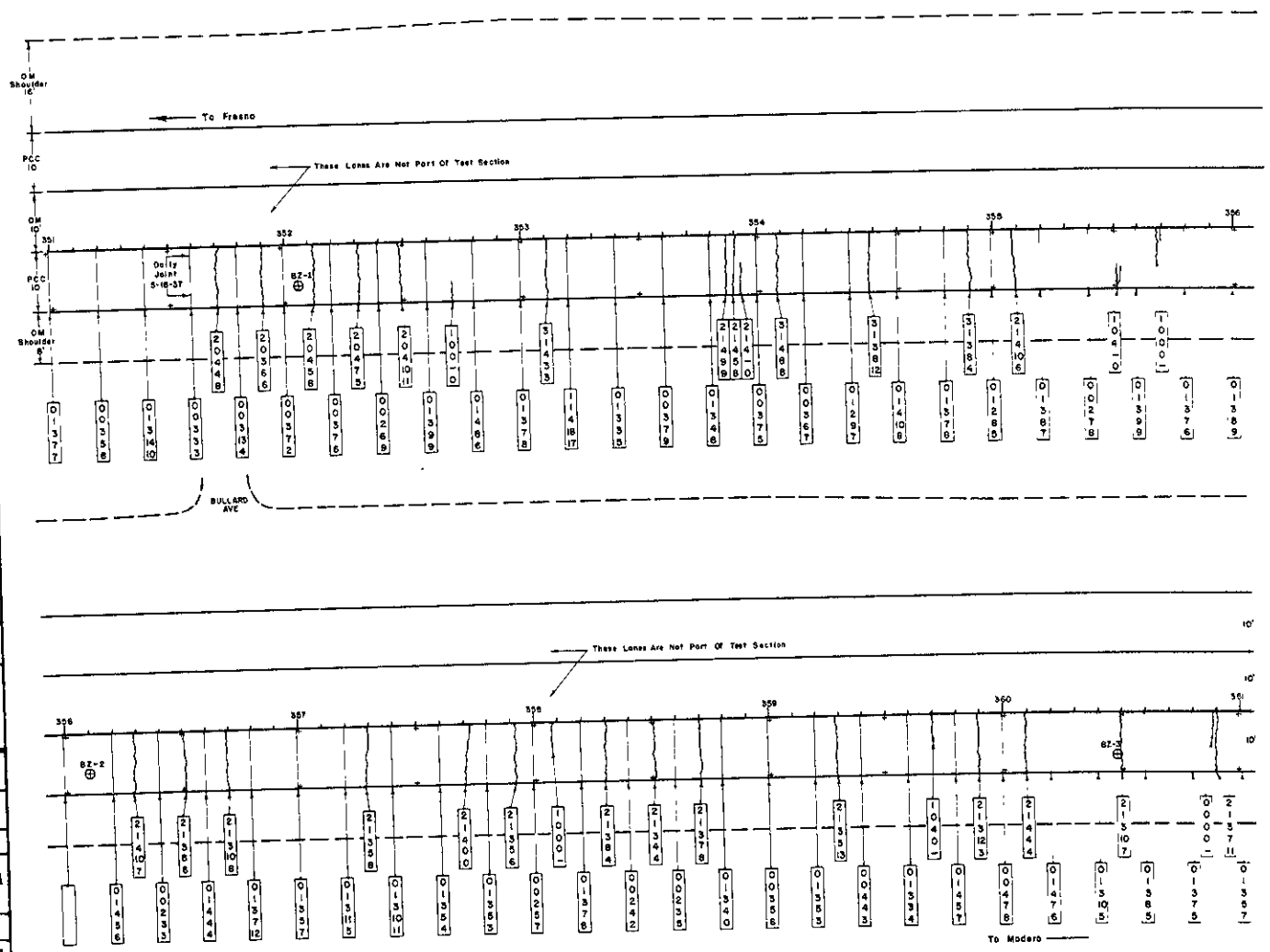
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

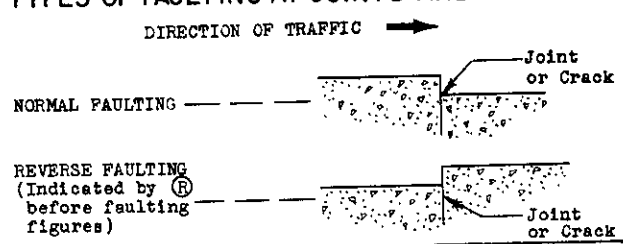
*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

ODOMETER STA. NO. 2
[illegible]



TYPES OF FAULTING AT JOINTS AND CRACKS



LEGEND

- ⊕ 8" diameter core hole for soil samples
- ○ 5" diameter core hole
- • Mudjacking or subsealing for holes
- + Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the low side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 26
VI-Fre-4-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thick-ness	Depth below Btm. Pav't.	Layer Des-cription
1	BZ-1-A	52-1710	352+06	3.3' left of R.O.E.P.	PCC	6-3/4"	0-6-3/4"	Base
2	BZ-1-B	52-1711	352+06	same	PCC	6-3/4"	6-3/4"-14¼"	Subbase
3	BZ-2-A	52-1712	356+10	3.3' left of R.O.E.P.	PCC	6-3/4"	0 - 6-1/4"	Base
4	BZ-3-A	52-1978	360+48	same	PCC	6-3/4"	0 - 7-1/4"	Base

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	8	127	96	8	132	A-2-b	2.60	
2	12	135	100	8	135	A-2-4	2.68	
3	11	117	91	9	129	A-2-4	2.65	
4	7	126	93	7	135	A-2-4	2.64	

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	100	98	94	89	79	61	43	20	17	6	N	P
2		100	99	97	91	75	56	33	22	8	16	15
3		100	99	94	85	70	51	21	18	3	N	P
4		100	98	93	84	68	47	25	22	5	N	P

LOCATION AND PROFILE SKETCH

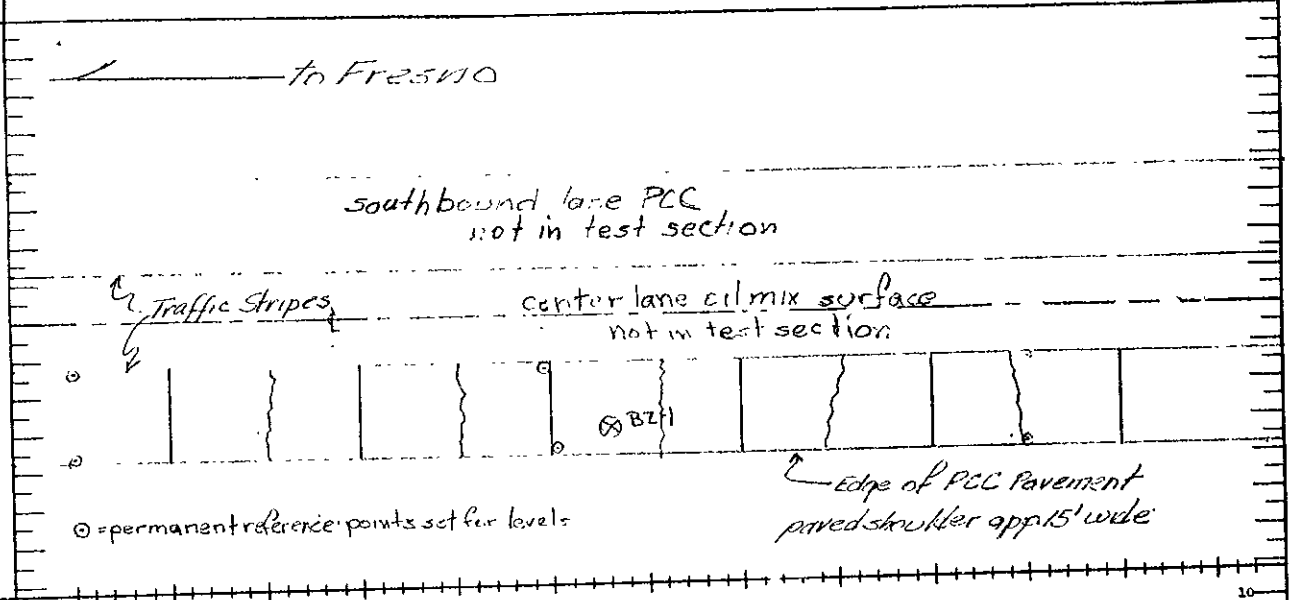
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00259

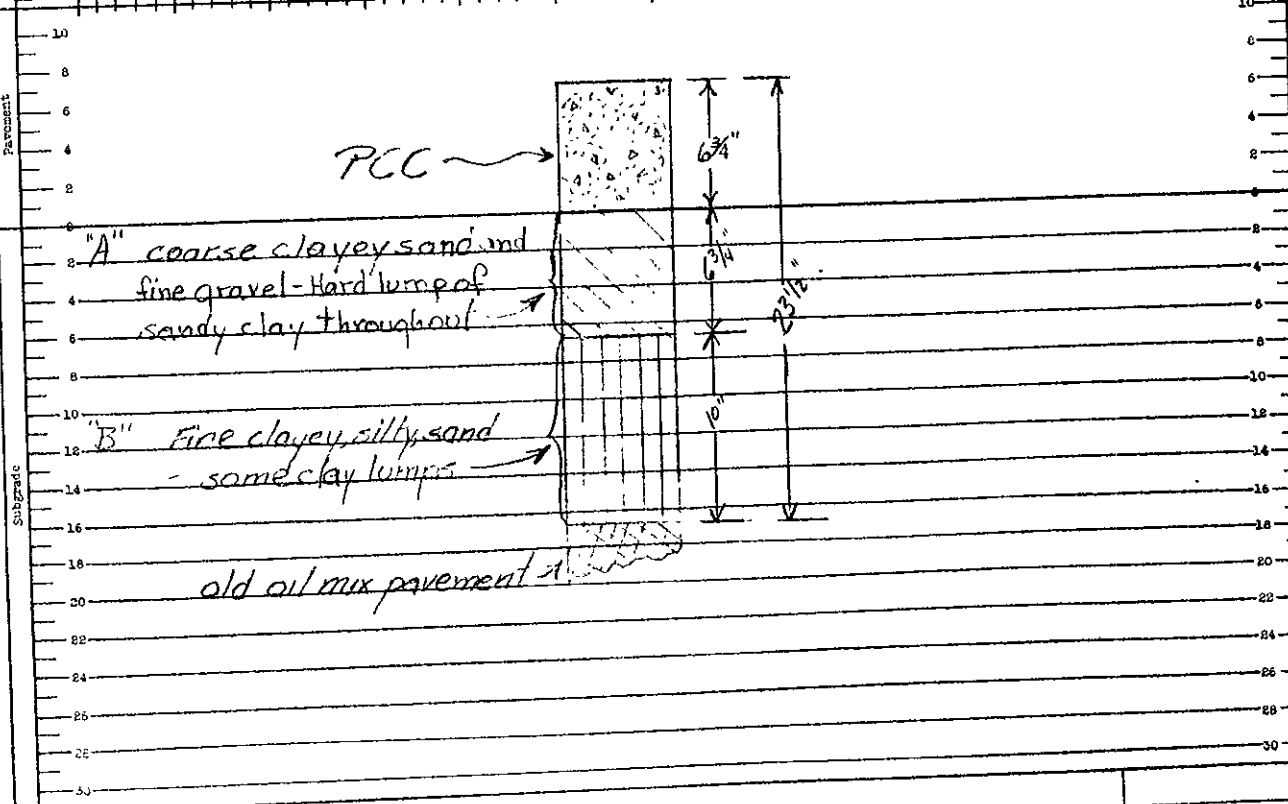
Dist. VI Co. Fre Rte. 4 Sec. C			Contract No. —	Date of Constr. 7-1957	Test Hole No. BZ-1
Fill X	Approx. eight 1.5' to 2'	Dist. from End of Fill	No. of Lanes three	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date of Sampling 4-21-52
Roadside Use, left Agricultural		Right RR R/W		Grade 0 %	— Up —

Station: +60, +80, 3520, +20, +40, +60

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks

Party Smith, Clawson

Drawn by Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~CONTROL~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00256

Dist. VI	Co. Fre	Rte. 4	Sec. C	Contract No. —	Date of Constr. ? - 1937
Test Hole No. BZ-2					
Fill X	Approx. Depth 1.5' to 2'	Dist. from End of Fill	No. of Lanes three	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date of Sampling 4-22-52
Roadside Cov. Agricultural		Right RR - R/W		Grade 0 %	Up —

Station: +60, +80, 556~, +20, +40, +60

Plan — Scale in Feet 1" = 20

to Fresno

PCC Pavement - not in test section

Oil mix pavement - not in test section

Traffic Stripes

BZ-2

Edge of PCC Pavement

Paved shoulder app. 15' wide

⊙ = permanent reference points - set in levels

Profile — Vertical Scale in Inches

Pavement

Subgrade

PCC

6 3/4"

13"

6 1/4"

"A" mixture of sand & plastic clay - somewhat hard clay lumps

old oil mix pavement

Party Smith, Clawson

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted]

Dist. VI	Co. Fre	Rte. 4	Sec. C	Contract No. —	Date of Constr. 2 - 1937
Test Hole No. BZ-3					
Fill X	Approx. Height 15' to 2'	Dist. from End of Fill	No. of Lanes three	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date of Sampling 4-30-52
Roadside Use, Left Agricultural		Right RR R/W		Grade 0 %	Up —

Station: 360+ +20 +40 +60 +80 361+

Plan — Scale in Feet 1" = 20'

← to Fresno

PCC Pavement - not in test section

Traffic Stripes — Oil Mix Pavement - not in test section

BZ-3

Edge of PCC Pavement

paved shoulder app 15' wide

⊙ permanent reference points set for levels

Profile — Vertical Scale in Inches

Pavement

PCC — 6¾" — 16"

Subgrade

"A" silty sand & fine gravel some clay lumps — 9¼"

old oil mix pavement

Remarks

Party: Smith, Clawson

Drawn by: Cogan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. CC258
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 26
Dist. VI Co. Fre Rte. 4 Sec. C
Loc. Design BZ
Sta. 351+00 to 356+00
Sheet No. 1 of 2

Drainage Cross Sections
ROADWAY CONDITION SURVEY

℄

	Left							Right						
			Right way line	Shoulder Point	outer edge of paved Shoulder	Left outer E.P.	Left inner E.P.	Right inner E.P.	Right Outer E.P	edge Shoulder resurface	outer edge of paved Shoulder	Shoulder Point		Toe of R.R fill
356~			297.7	298.0	298.14	298.63	298.73	298.72	298.61	298.55	298.36	297.9	295.9	296.7
			50.0	39.0	31.0	15.0	5.0	5.0	15.0	19.5	23.5	35.0	51.0	71.0
+50			297.6	298.1	298.35	298.73			298.72	298.68	298.50	298.1	297.3	297.3
			50.0	38.0	31.0	15.0	5.0	5.0	15.0	19.5	23.5	35.0	45.0	72.0
355~			297.6	298.2	298.40	298.83	298.92	298.94	298.82	298.76	298.82	298.1	297.6	298.0
			50.0	37.0	31.0	15.0	5.0	5.0	15.0	19.0	23.5	36.0	46.0	73.0
+50			297.7	298.1	298.39	298.97			298.88	298.93	298.81	298.3	298.1	298.2
			50.0	38.0	32.0	15.0	5.0	5.0	15.0	19.5	23.5	35.0	52.0	70.0
354~			297.2	298.4	298.55	299.16	299.23	299.24	299.13	299.09	298.94	298.5	297.6	298.0
			50.0	36.0	31.0	15.0	5.0	5.0	15.0	19.5	23.5	36.0	50.0	70.0
+50			297.5	298.3	298.68	299.25			299.28	299.18	299.00	298.6	297.1	297.7
			50.0	36.0	32.5	15.0	5.0	5.0	15.0	18.5	23.5	34.0	51.0	72.0
353~			297.8	298.4	298.89	299.43	299.55	299.52	299.43	299.38	299.15	298.6	296.9	296.6
			50.0	38.0	32.0	15.0	5.0	5.0	15.0	18.5	23.5	33.0	50.0	73.0
+50			297.8	298.8	299.08	299.59			299.59	299.52	299.40	299.0	297.0	296.9
			50.0	36.0	32.0	15.0	5.0	5.0	15.0	18.5	23.5	33.0	50.0	73.0
352~			297.9	299.0	299.30	299.74	299.85	299.84	299.75	299.65	299.52	298.9	297.4	297.4
			50.0	36.0	30.5	15.0	5.0	5.0	15.0	18.5	23.5	36.0	52.0	70.0
+50			298.4	299.2	299.45	299.89			299.91	299.81	299.66	299.1	297.5	297.4
			50.0	35.0	30.5	15.0	5.0	5.0	15.0	19.5	23.5	33.0	50.0	70.0
351~			298.4	299.4	299.58	300.04	300.16	300.15	300.07	299.98	299.77	299.2	297.5	297.5
			50.0	36.0	30.5	15.0	5.0	5.0	15.0	19.5	23.5	33.0	48.0	70.0

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Drainage Cross Sections

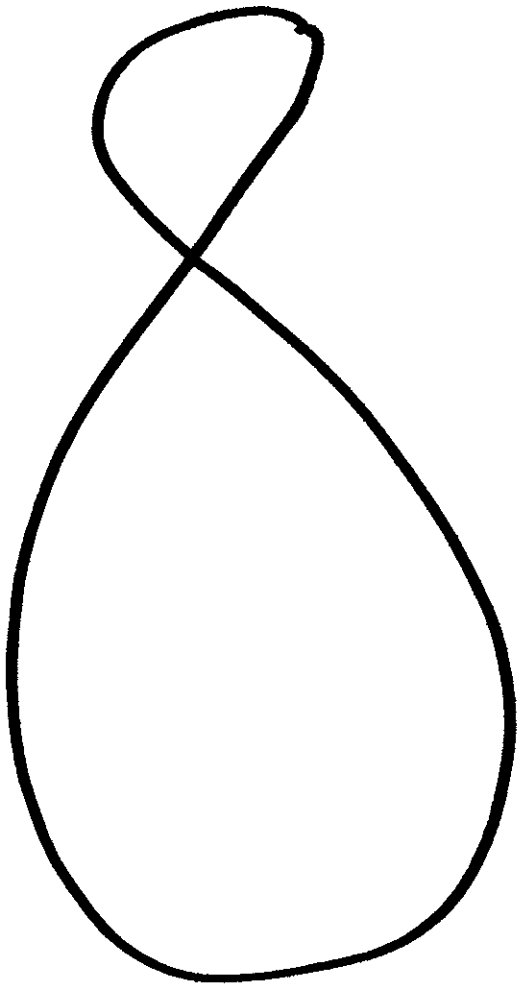
Load. Sta. No. 26
Dist. VI Co. Fre Rte. 4 Sec. C
Loc. Design BZ
Sta. 356+50 to 361+00
Sheet No. 2 of 2

ROADWAY CONDITION SURVEY

℄

	Left							Right						
			Right of Way Line	Shoulder Point	Outer edge of paved Shoulder	Left outer E.P.	Left inner E.P.	Right inner E.P.	Right outer E.P.	Edge Shoulder resurface	Outer edge of paved Shoulder	Shoulder Point		Toe of R.R. fill
361~			296.7	297.5	298.01	298.64	298.75	298.73	298.64	298.54	298.32	297.4	295.3	296.5
			50.0	39.0	31.0	15.0	5.0	5.0	15.0	19.5	23.5	35.0	45.0	73.0
+50			296.7	297.1	297.98	298.59			298.61	298.53	298.33	297.4	296.2	296.8
			50.0	40.0	31.0	15.0	5.0	5.0	15.0	19.5	24.0	36.0	50.0	73.0
360~			296.8	297.2	297.97	298.54	298.68	298.67	298.54	298.46	298.23	297.1	295.1	295.5
			50.0	40.0	31.0	15.0	5.0	5.0	15.0	19.0	23.5	35.0	50.0	73.0
+50			296.6	297.3	297.95	298.53			298.52	298.43	298.23	297.2	295.1	295.8
			50.0	37.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	35.0	50.0	73.0
359~			296.8	297.1	297.94	298.49	298.60	298.59	298.47	298.42	298.27	297.5	296.7	297.4
			50.0	40.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	34.0	45.0	73.0
+50			296.7	297.2	297.96	298.47			298.50	298.45	298.29	297.5	296.7	297.4
			50.0	40.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	35.0	49.0	73.0
358~			296.8	297.7	297.90	298.44	298.54	298.56	298.46	298.41	298.23	297.4	296.4	297.5
			50.0	38.0	32.0	15.0	5.0	5.0	15.0	18.5	23.5	33.0	50.0	73.0
+50			296.9	297.4	297.91	298.48			298.44	298.40	298.23	297.3	296.4	296.6
			50.0	39.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	34.0	45.0	73.0
357~			296.9	297.4	297.87	298.52	298.57	298.59	298.48	298.40	297.23	297.2	295.9	296.3
			50.0	41.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	35.0	45.0	73.0
	Bullard Avenue on left between Sta. 356+62 and Sta. 356+82													
356+50			297.0	297.4	297.98	298.57			298.53	298.47	298.27	297.4	294.8	295.7
			50.0	40.0	32.0	15.0	5.0	5.0	15.0	19.0	23.5	34.0	50.0	73.0

Form T-527



Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 44
Road VII-Ven-2-C

DATA OF SECTION SELECTED FOR TEST

This section is the second of two sections established in conjunction with Loadometer Station No. 44 and is designated as Location "B".

ROADWAY STRUCTURE:

LOCATION: Loadometer Station No. 44 platform scales are located 2.3 miles east of the junction of Route 2 and Route 79, approximately 5 miles east of the east city limits of Ventura, Road VII-Ven-2-C.

The section selected for test is located 1.7 miles southeast of the Loadometer Station approximately 4.0 miles southeast of the junction of Route 2 and Route 79.

LENGTH: The section is established between Sta. 332+60 and Sta. 343+50 a total length of 1090 feet. Roadway is a 3-lane highway. The section covers only the left (southeast bound traffic) lane.

SURFACE:

Type and Width: Portland cement concrete reinforced and unreinforced. (See Location and Profile Sketches of areas sampled.) The lane selected for testing is 10.0' in width and was constructed in 1925-26 over old (1917) P.C.C. pavement 15' wide.

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY STRUCTURE

SURFACE:

Reinforcing: Steel mesh and steel bar reinforcing were found in pavement cores. Information as to details of pavement reinforcing are not available.

Joints: Joints have no regular spacing. Original slab lengths varying from 34 ft. to 143 ft. Information as to dowels etc., is not available.

Spacing and Dowels:

Thickness: Pavement thickness is variable. At one sample hole the core was 13" thick in one slab, at another core was 13" thick in two slabs, and at the third sample hole, core was 14" thick in two slabs.

BASE:

Type and Thickness: Clean sand 20" in thickness found only at Sta. 338+45.0. District construction records indicate no base or subbase material was placed under P.C.C. pavement.

Soil Classification: Material found at Sta. 338+45 classified as A-1-b and A-3.

BASEMENT SOIL:

Type and Thickness: Black and brown silty adobe clay. Native soil found immediately below pavement at Sta. 33+60.5 and 342+10.0, and below the sand base at Sta. 338+45.0. Sampled to depths of from 12" to

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY STRUCTURE

BASEMENT SOIL:

Type and Thickness: (Continued) 13-1/2" below bottom of pavement.

Soil Classification: A-4 and A-6

SIDE DITCH DRAINAGE: The section is generally in a slight fill. The section roadway is on a +0.5% profile grade with surface drainage generally flowing from Sta. 343+50 (northwest) back towards the beginning of the section.

On the right, parallel to the roadway, 25.0 to 26.0 ft. from the right edge of pavement, is a ditch from 2.0' to 2.5' in depth. Drainage is carried from northwest to southeast under several road approaches to local business and residences in C.M.P. culverts.

On the left of the roadway, the Coast Route of the Southern Pacific Railroad parallels the roadway and the R.R. right of way adjoins the highway right of way. Area between railroad and highway fills has been bladed to a comparatively uniform section. Approximate center of the area is lower than the remainder and carries drainage runoff, from northwest to southeast of the Santa Clara River.

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

There are no culverts or bridges under the roadway within the section.

SPECIAL CONDITIONS:

(1) Roadway Section: As noted previously, the entire section roadway is in a slight fill. Present pavement elevations are from 0.5' to 1.0' above those of the surrounding areas.

(2) Pumping: There are no evidences of pumping in the section, although many slabs show visible movement under truck traffic.

(3) Faulting: All joints and many of the cracks in the section pavement are faulted. Joint faulting varies from 0.05" to 0.24", crack faulting varies from 0.02" to 0.30". Depth of faulting is noted on the plan diagram.

(4) Shoulders: Asphaltic mix shoulders from 8.0' to 9.0' in width border the pavement slabs throughout the section. Shoulders have shoved, cracked and rutted and are in generally poor condition.

(5) Miscellaneous: The section area was subsealed with asphalt in 1948.

Where spalling has become severe and where small slabs have settled, there are oil mix patches.

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels:

Two bench marks were established at the section by the field crew for use in taking cross-sections and pavement levels.

B.M. No.	Location	Description	Elevation
1	23' rt. of rt. outer E.P. Sta. 332+50	1/4" diam. steel pin in PCC H/W	100.000 (Assumed)
2	25' rt. of rt. outer E.P. Sta. 341+92	Same as above	101.77

Profilograph Records:

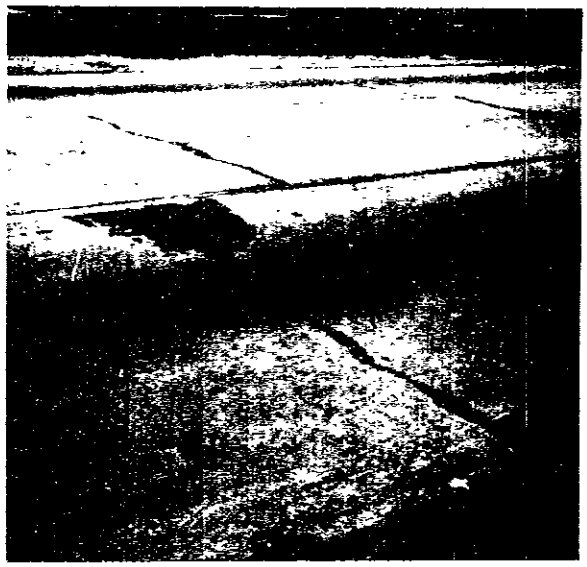
By means of the Profilograph, records were made of the longitudinal profiles of the section lane of traveled way surface. Records were made with the recording wheel of the machine 30" from the left outer edge of pavement.

Profilograph Records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 44

VII-Ven-2-C

Full depth of Pavement.



Severe Crack at Station

Station 335+69

Badly Cracked Area Sta.

339+40 to Sta. 339+50

Interior Corner Break

Station 341+30

State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

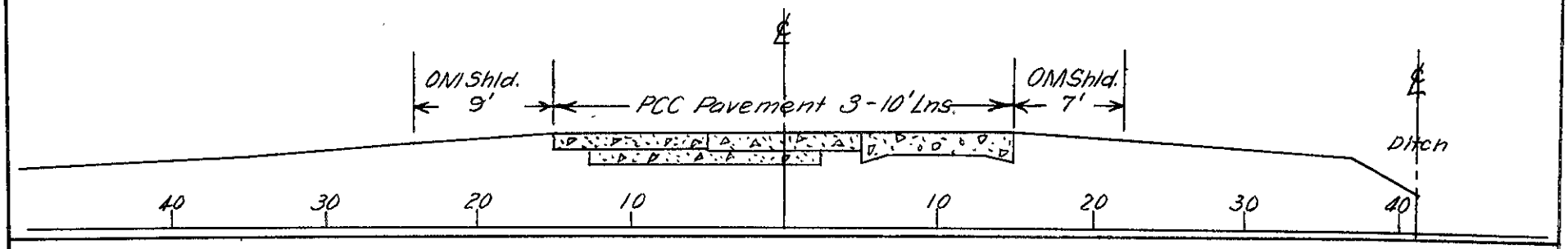
Loadometer Station No. AVb 44

VII-Ven-2-C

ROADWAY CONDITION SURVEY

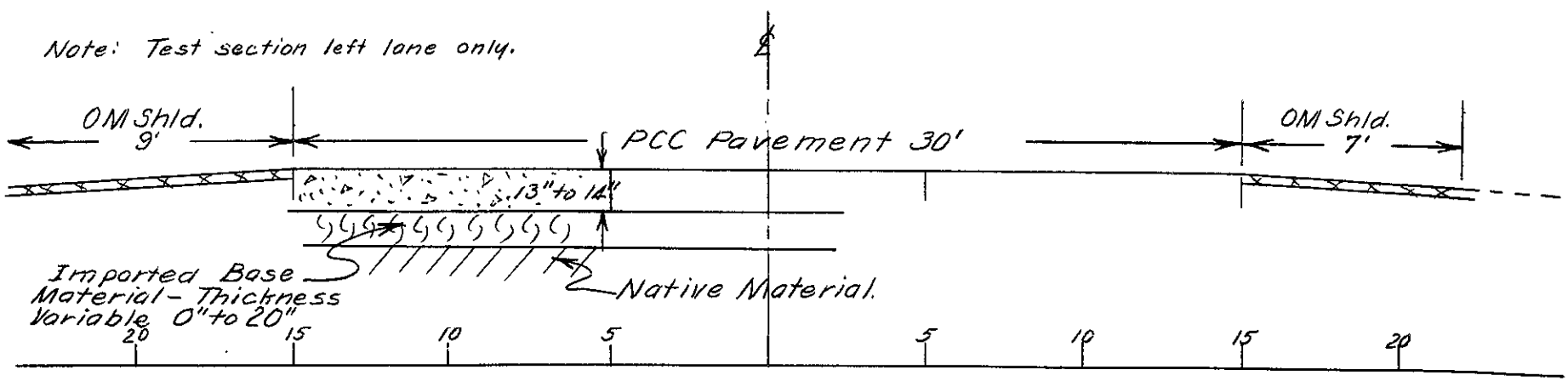
TYPICAL ROADWAY SECTION

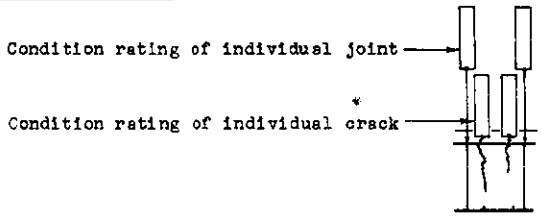
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





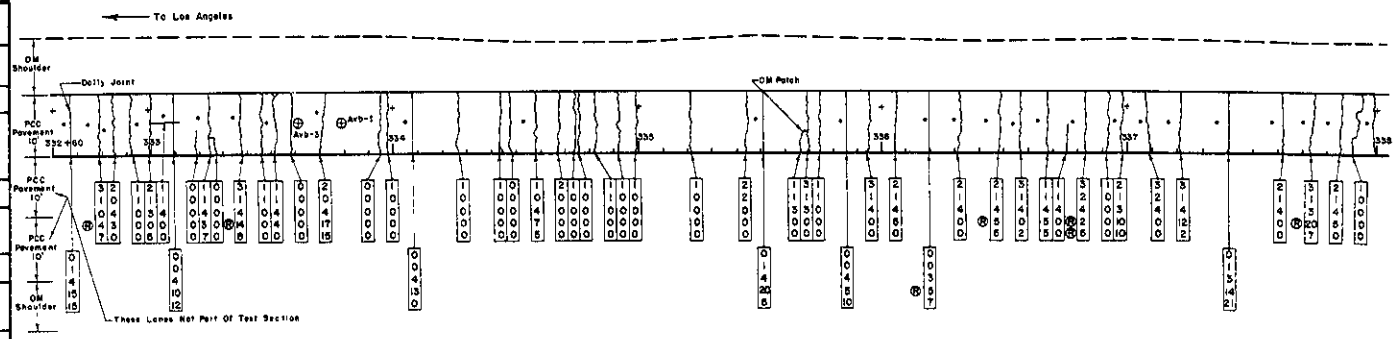
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

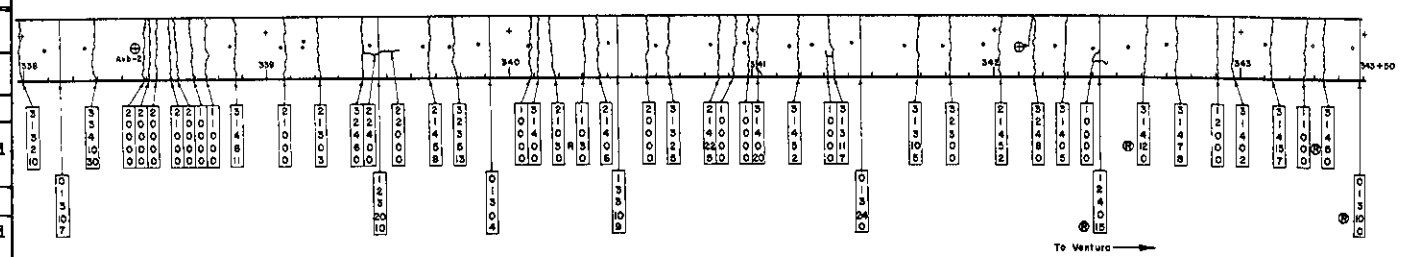
Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

LODOMETER STA. NO. 44
VII-Ven-2-C



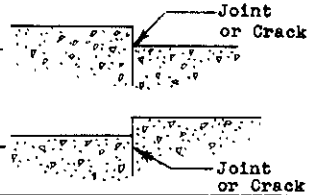


TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC →

NORMAL FAULTING — — —

REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —



LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the <u>low</u> side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 44
VII-Ven-2-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thick-ness	Depth below Btm. Pav't.	Layer Des-cription
1	AVb2A	51-730	338+45	Centerline left lane	PCC	0-13"	0 - 7"	Base
2	AVb2B	51-730A	338+45	Same	PCC	0-13"	7 - 20"	Subbase
3	AVb3A	51-731	333+61	Centerline left lane	PCC	0-14"	0 - 6"	Basement
4	AVb3B	51-731A	333+61	Same	PCC	0-14"	6 - 12"	Basement
5	AVb4A	51-732	342+10	Centerline left lane	PCC	0-13"	0 - 7"	Basement
6	AVb4B	51-732A	342+10	Same	PCC	0-13"	7 - 14"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	4	91	81	13	113	A-1-b	2.64	
2	7	95	86	14	110	A-3	2.63	
3	21	98	80	11	122	A-4	2.62	
4	20	100	81	12	122	A-4	2.62	
5	24	96	83	14	116	A-6	2.58	
6	27	85	75	14	114	A-6	2.58	

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	100	97	94	92	88	74	43	6	4	4	N	P
2		100	99	99	97	90	57	9	7	6	N	P
3					100	99	97	76	71	17	28	19
4					100	99	96	76	70	25	28	19
5				100	98	96	89	76	72	29	34	21
6			100	99	98	95	87	76	72	27	38	23

LOCATION AND PROFILE SKETCH

[illegible] PAVEMENT INVESTIGATION

RESEARCH NO. [illegible] 00258

Dist. VII	Co. Ven	Rte. 2	Sec. C	Contract No. —	Date of Constr. 1926, 1933
Fill ✓	Approx. Height 1°	Dist. from End of Fill		No. of Lanes 3	Traffic Hwy
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Right - ditches & pipes; Left - no clear ditch line	Depth Rt 29.0 Lt 12.0
Test Pole No. AVb-1 & AVb-3	Date of Sampling 1-29-51				
Roadside Use, Left R.R. & Hwy R/W	Right Ser. stations & commercial	Grade +0.5%	Up →		

Station: 333+00 +50 334+00 +20

Plan — Scale in Feet 1" = 1.0'

← To Los Angeles

E E

AVb-3 AVb-1

Passing lane - Not in Test Section

⊙ permanent points set for levels

Profile — Vertical Scale in Inches

Pavement

Subgrade

• = Holes used in subsealing, 1948

AVb-3 AV-b-1

To Ventura →

½ reinf. steel

P.C.C. P.C.C. P.C.C.

7¾" 14" 6¼" 13"

A B

Brown, blue & black silty sand (Native Mat'l)

Brown, blue & black silty sand (Native Mat'l.)

Clean sand & fine gravel (1")

Brown blue & black silty sand - native mat'l.

NOT SAMPLED

Note variation in pavement construction & base material between two core holes only 18' apart

Party: Keyser, Bowne, Clawson

Drawn by Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~CONCRETE~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00[illegible]

Dist. VII	Co. Ven	Rte. 2	Sec. C	Contract No. —	Date of Constr. 1926
Test Hole No. AV b-2					
Fill /	Approx. Height 1°	Dist. from End of Fill	No. of Lanes 3	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt-ditches & pipes Lt-no clear ditch line	Depth 2½ (±) 1 (±)	Date of Sampling 1-26-51
Roadside Use, Left R.R & Hwy R/W		Right Ser Stations & commercial		Grade C.3	Up →

Station 338+00 +50 339+00 +20

Plan — Scale in Feet 1" = 20'

← To Los Angeles

E

AVb-2

Passing lane. Not in Test Section

⊙ permanent points set for Levels

AV b-2

• = Holes used in subsealing, 1948

To Ventura →

Profile — Vertical Scale in Inches — Pavement — Subgrade

½" reinf. steel

13" P.C.C.

7"

6"

8"

7"

A, B Fairly clean sand, small amount fine gravel (Imported Base Mat'l.)

Blue, black & brown silty sand (Native Mat'l.)

Remarks:

Party: Reynor, Bourne, Clawson

Drawn By Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. VII Co. Ven Rte 2 Sec. C		Contract No. —	Date of Constr. 1926, 1933	Test Hole No. AV b-4	
Fill ✓	Approx. Height 1'	Dist. from End of Fill	No. of Lanes 3	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt - Ditches & pipes Lt - No clear ditchline	Depth Rt 2.5(+) Lt 1.5(+)	Date of Sampling 1-30-51
Roadway Left RR & Hwy. R/W		Right Service Stations & Commercial		Grade 0 %	Up →

Station: 341+50 342+00 342+50 +70

Plan — Scale in Feet 1" = 20'

← To Los Angeles

E E

AV b-4

passing lane - Not in Test Section

⊙ permanent points set for Levels

AV b-4

.. Holes used in subsealing, 1948

To Ventura →

Profile — Vertical Scale in Inches

Pavement

Subgrade

Heavy wire mesh reinforcing

8½"

13"

4½"

7"

13½"

6½"

A Black adobe clay brown silty sand & chunks of brick (Native mat'l)

B Black adobe clay brown silty sand & chunks of brick (Native mat'l)

Same as 'A' & 'B'. Not sampled

Drawn by Clawson

Party Rogers Bourne Clawson

STATE OF CALIFORNIA DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00658
W.O. No. 13N426
Job Number

Dist. VII Co. Len Rte. 2 Sec. C
Loc. Design AVB
Sta. 332+60 to 335+50
Sheet No. 1 of 3

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left						℄	Right					
			Ditch	Toe of Slope	outer edge of paved Shldr.	Left edge of Pav't			outer edge of paved Shldr.	Shoulder Point	Ditch		
+50			98.4	98.5	99.9	100.2							
			54.0	38.0	24.0	15.0							
335~			98.3	98.4	99.8	100.1							
			53.0	37.0	23.0	15.0							
+50			98.1	98.5	99.5	99.9							
			53.0	36.0	23.0	15.0							
334~			98.1	98.3	99.3	99.9							
			54.0	35.0	24.0	15.0							
+50			97.8	97.9	98.9	99.5							
			54.0	33.0	24.0	15.0							
333~			97.7	98.3	99.3	99.7			99.4	98.6	96.3		
			53.0	35.0	24.0	15.0			22.0	37.0	41.0		
332+60			97.3	98.0	99.2	99.6							
			51.0	35.0	24.0	15.0							

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN20
Job Number

Drainage Cross Sections.

Load. Sta. No. [illegible]
Dist. [illegible] Co. [illegible] Rte. [illegible] Sec. [illegible]
Loc. Design [illegible]
Sta. [illegible] to [illegible]
Sheet No. [illegible] of [illegible]

ROADWAY CONDITION SURVEY

℄

	Left							Right						
			Ditch	Toe of Slope	outer edge of paved Shoulder	Left edge of Pav't.			outer edge of paved Shoulder	Shoulder Point	Ditch			
+50			99.5 49.0	99.5 35.0	100.8 22.5	101.0 15.0								
339~			99.3 52.0	99.4 37.0	100.7 23.0	100.9 15.0								
+50			99.3 54.0	99.0 37.0	100.5 23.0	100.7 15.0								
338~			99.1 55.0	99.2 36.0	100.4 23.0	100.7 15.0								
+50			98.9 54.0	99.4 35.0	100.2 23.0	100.5 15.0								
337~			98.9 54.0	98.8 37.0	100.2 23.5	100.5 15.0								
+50			98.8 56.0	98.6 38.0	100.0 23.0	100.4 15.0								
336~			98.4 54.0	98.6 38.0	100.0 23.5	100.3 15.0								

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Dist. VII Co. Ven Rte. 2 Sec. C
Loc. Design AVb
Sta. 340+00 to 343+50
Sheet No. 3 of 3

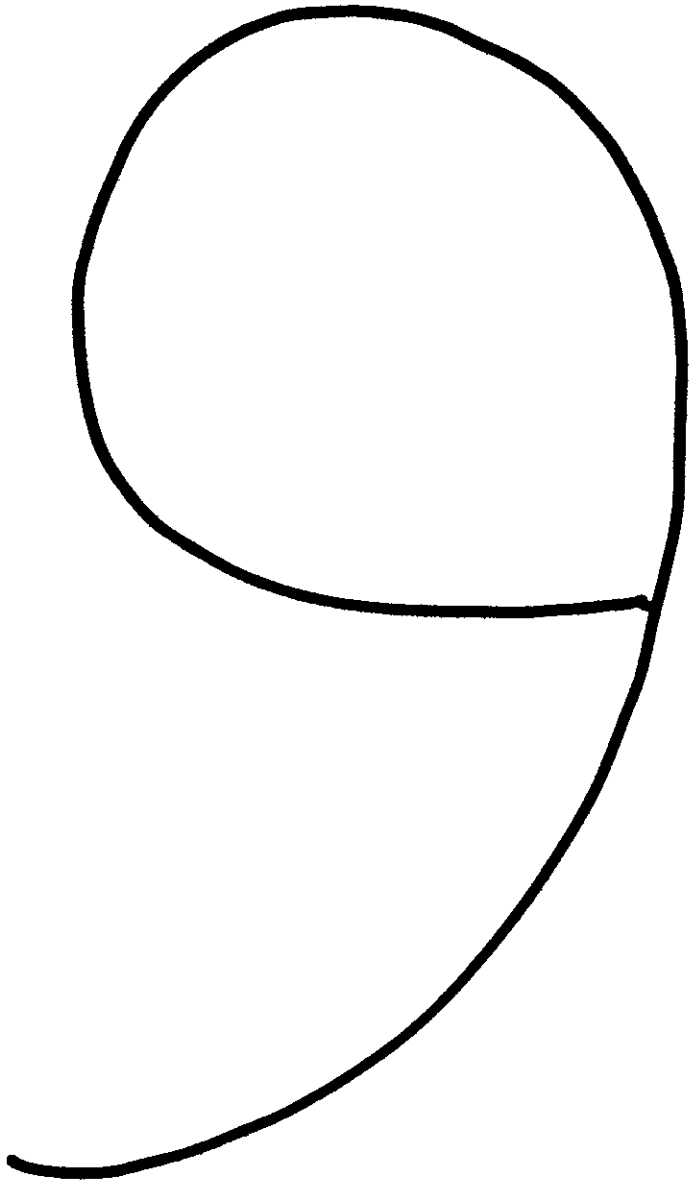
Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄

	Left						Right					
	Ditch	Toe of Slope	Shoulder Point	outer edge of paved Shoulder	Left edge of Pavt.		outer edge of paved Shoulder	Shoulder Point	Ditch			
+50	100.1 52.0	101.1 31.0	102.2 28.0	102.4 21.0	102.6 15.0		102.3 23.0	101.9 34.0	99.4 40.0			
343~	100.0 52.0	100.8 31.0	101.6 28.0	102.2 21.0	102.4 15.0		102.1 22.5	101.7 34.0	99.0 40.0			
+50	99.9 51.0	100.5 31.0	101.2 28.0	102.0 21.0	102.2 15.0							
342~	99.9 49.0	100.0 31.0	101.0 28.0	101.8 20.5	102.0 15.0		101.7 23.0	101.2 36.0	98.7 40.0			
+50	99.3 50.0	100.1 31.0	100.8 27.0	101.1 19.5	101.3 15.0							
341~	99.3 49.0	99.7 31.0	100.4 28.0	101.2 21.0	101.5 15.0							
+50	99.6 48.0	99.4 33.0	100.2 30.0	101.1 21.0	101.3 15.0		101.0 23.0	100.5 36.0	98.3 41.0			
340~	99.5 48.0	99.3 33.0	100.0 31.0	101.0 21.0	101.1 15.0							

Form T-527



DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE:

LOCATION: Loadometer Station No. 58 is located 1.6 miles northwest of the Junction of Route 60 and Route 174, toward Santa Monica.

Section selected for test is located 1.7 mile northwest of the Junction of Route 60 and Route 174, (250 ft. north of Loadometer Station No. 58).

LENGTH: The section is established between Sta. 25+90 (north) and Sta. 36+00 (south), a total length of 1010 feet.

Roadway is a 4 lane undivided highway. The section includes the two left (northbound traffic) lanes only.

SURFACE:

Type: Portland cement concrete, constructed in 1931-1932. No information available on reinforcing or dowels.

Width: Two lanes, each 10 feet wide; total width 20 feet.

Thickness: Designed section: 9"-7"-7"-9". As sampled, thickness of pavement varied from 8-3/4" to 9" at center line of left outer lane.

BASE:

Type and Thickness: Silty sand. Thickness variable as sampled, from 6-1/4" to 8" on centerline of left outer

Loadometer Station No. 58
Road VII-LA-60-C

ROADWAY STRUCTURE

BASE:

Type and Thickness: (Continued) lane. Construction plans indicate no imported base - probably a selected material from roadway excavation to the south.

Soil Classification: A-2-4

SUBBASE:

Type and Thickness: Silty sand, with some adobe clay. As sampled, thickness varies from 18" to 29-1/2".

Soil Classification: A-2-4

SIDE DITCH DRAINAGE: The section roadway is entirely in fill. Profile grade of the roadway pavement is -0.20%. On the roadway, gutters parallel the pavement at a distance of 13 to 16 feet from the outer edges of pavement, right and left. Gutters are from 0.4 to 0.8 feet lower in elevation than the edges of pavement, and drainage flows from both ends of the section toward the culvert at centerline Station 34+10. Berms on the outer edges of the fill keep drainage from eroding the slopes. Opposite Sta. 29+25, Sta. 33+29 and Sta. 34+31 are 12" CMP down drains which intercept some of the drainage from the gutters and lead it to the toe of fill slope.

Loadometer Station No. 58
Road VII-LA-60-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE (Continued)

On the left, there are no clearly defined side ditches along the toe of fill slope.

On the right, starting opposite the end of the 4' x 3.5' R.C. box culvert, a ditch starts which extends to the end of the section, Sta 36+00. Ditch has a bottom width of 2.5', varies from 0.8 to 1.1 feet in depth, and its centerline varies from 37.5 to 38.5 feet from right edge of pavement. There is little grade in the ditch. Main function of the ditch and culvert appear to be as "equalizers" between the two sides of the roadway fill. There are no other culverts or bridges in the section than those listed above.

ROADWAY CONDITION

GENERAL:

Many slabs throughout the section show surface checking in varying degrees of severity. Listed below are the most noticeable of these:

LEFT OUTER LANE:

Sta. 31+40 to 31+80	Severe
Sta. 32+20 to 32+40	Fairly Severe
Sta. 34+40 to 34+60	Fairly Severe
Sta. 35+00 to 36+00	Fairly Severe

LEFT INNER LANE:

Sta. 27+60 to 27+80	Severe
Sta. 30+00 to 30+20	Severe
Sta. 31+40 to 34+20	Fairly Severe
Sta. 35+00 to 35+20	Fairly Severe
Sta. 35+60 to 35+80	Fairly Severe

Loadometer Station No. 58
Road VII-LA-60-C

ROADWAY CONDITION:

SPECIAL CONDITIONS:

(1) Roadway Section: As previously noted, the section roadway is entirely in fill. Present pavement elevation is from 3.0' to 4.0' above surrounding agricultural lands.

(2) Pumping: There are no evidences of pumping in the section.

(3) Faulting: There is some faulting in the section. All faulted joints and cracks are indicated on the plan diagram.

(4) Shoulders: Throughout the section, pavement is bordered by asphaltic mix shoulders which vary in width from 7.0' to 9.5'. Shoulders are in generally fair condition, although there are some areas of alligator cracking. As indicated on the cross-section notes, shoulders at some locations are from 0.1' to 0.2' below the elevation of the edges of the pavement, immediately adjacent to the pavement. Water pockets in these low areas during and after rains.

(5) Miscellaneous: There are no evidences of the pavement ever having been mudjacked or subsealed.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Four bench marks were established at the section for use in taking cross-sections and pavement levels.

Loadometer Station No. 58
Road VII-LA-60-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

B.M. No.	Location	Description	Elevation
1	13' lt. of lt. edge pavement Sta. 22+95	1/4" steel pin in P.C.C. head-wall	20.00 (Assumed)
2	30.5' lt. of lt. edge pavement Station 34+26	Same	16.48
3	31.0' rt. of rt. edge of pavement Station 23+95	Same	19.01
4	31.0' rt. of rt. edge of pavement Station 33+85	Same	16.36

Profilograph Records:

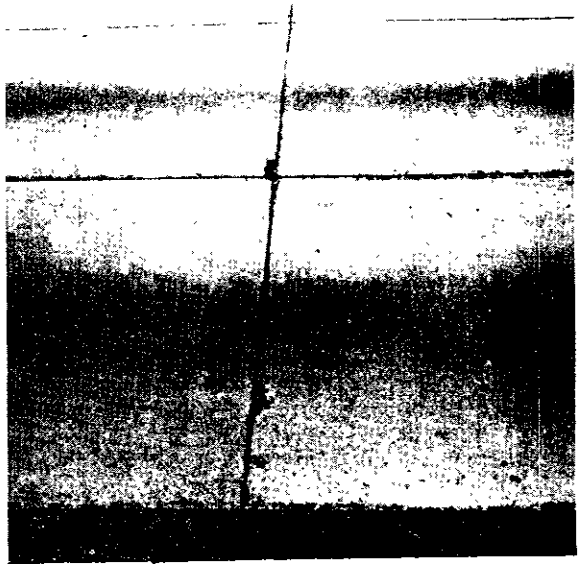
Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Records were made with the recording wheel of the machine 30" into the lane from the outer edge of the outer lane and from the inner edge of the inner lane. Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 58

VII-L.A-60-C

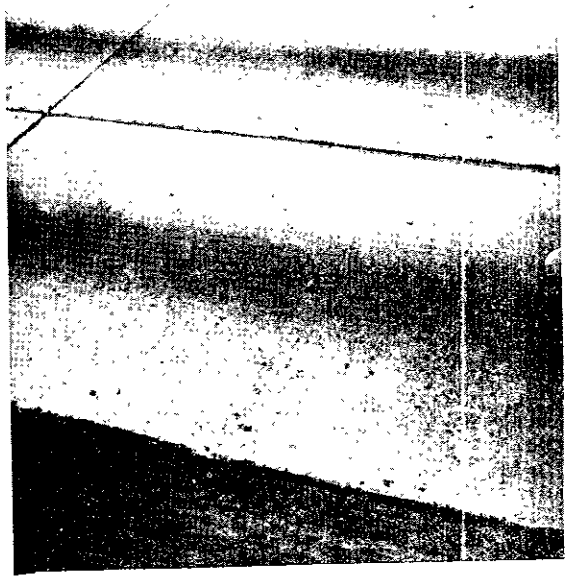
Ahead on Line from

Station 25+90



Spalled Joint at

Station 31+98



Shoulder Cracking at

Station 34+30

Back on Line from

Station 36+00

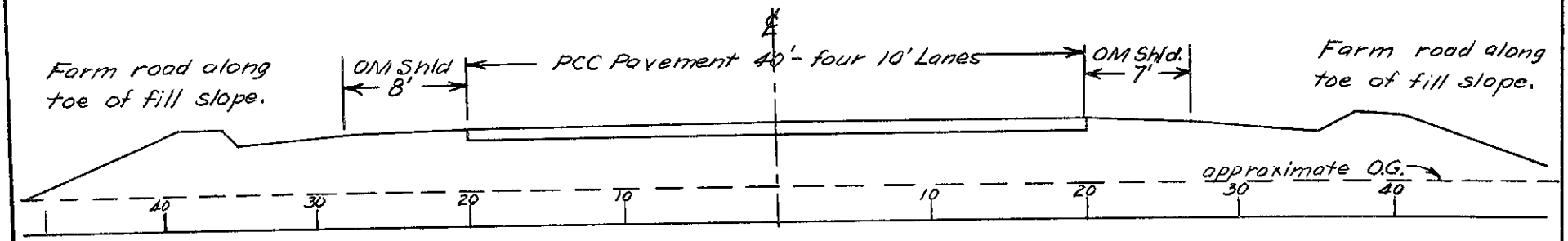
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. AW 58
VII-L.A-60-C

ROADWAY CONDITION SURVEY

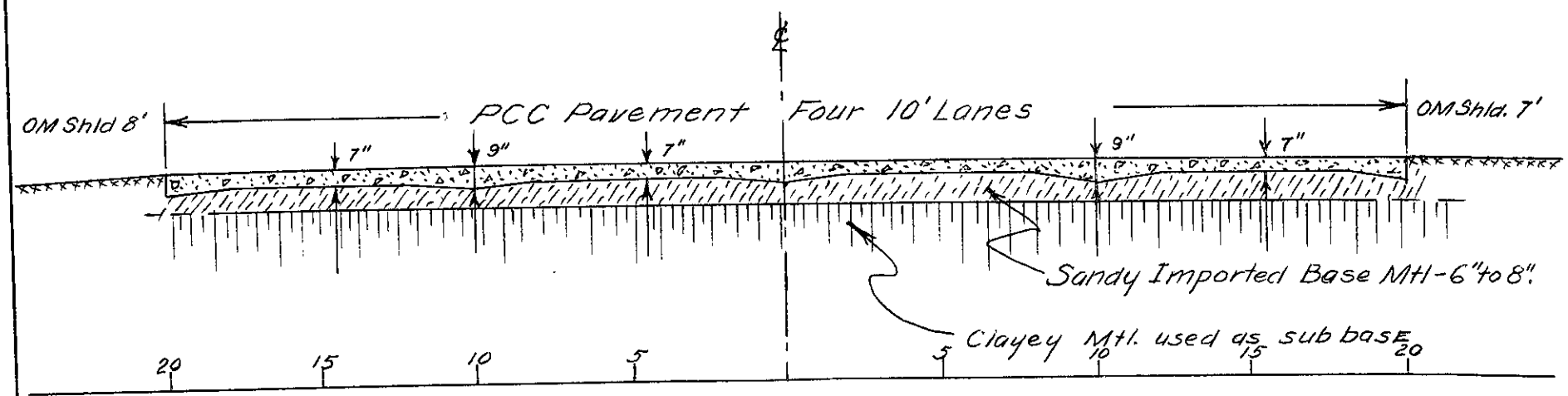
Scale: 1" = 10'

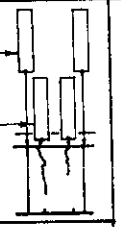
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





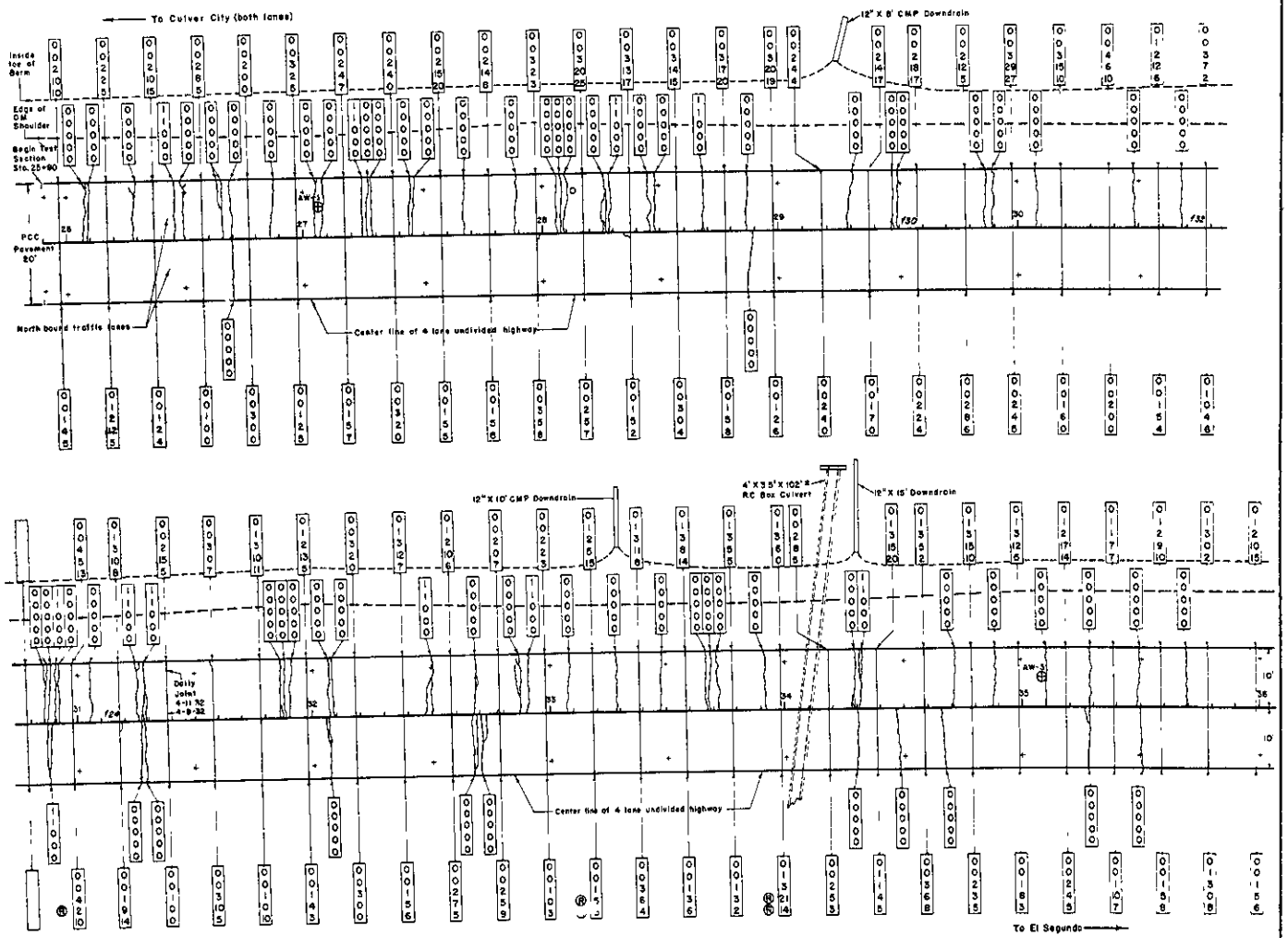
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

LOADOMETER STA. NO. [illegible]
VI-[illegible]



TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC →

NORMAL FAULTING — — —

REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —

LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the low side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 58
VII-L.A-60-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Brm. Pav't.	Layer Description
1	AW-1-A	51-900	27+06	℄ lt. outer lane	PCC	8-7/8	0 - 6-5/8	Base
2	AW-1-B	51-900A	27+06	Same	PCC	8-7/8	6-5/8-12-5/8	Subbase
3	AW-1-C	51-900B	27+06	Same	PCC	8-7/8	12-5/8 - 33"	Subbase
4	AW-2-A	51-901	31+08	℄ lt. outer lane	PCC	8-7/8	0 - 8"	Base
5	AW-2-B	51-901A	31+08	Same	PCC	8-7/8	8 - 13-3/4"	Subbase
6	AW-2-C	51-901B	31+08	Same	PCC	8-7/8	13-3/4 - 26"	Subbase
7	AW-3-A	51-902	35+08	℄ lt. outer lane	PCC	8-3/4	0 - 6-1/4"	Base
8	AW-3-B	51-902A	35+08	Same	PCC	8-3/4	6¼" - 12"	Subbase
9	AW-3-C	51-902B	35+08	Same	PCC	8-3/4	12 - 26¼"	Subbase

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	14	117	98	12	119	A-2-4	2.66	
2	8	137	105	9	130	A-2-4	2.62	
3	7	136	105	9	129	A-2-4	2.63	
4	12	118	98	12	120	A-2-4	2.61	
5	8	137	108	10	127	A-2-4	2.62	
6	9	131	101	9	129	A-2-4	2.63	
7	15	115	102	13	113	A-2-4	2.64	
8	7	138	108	10	128	A-2-4	2.67	
9	7	136	105	9	129	A-2-4	2.62	

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4	4	8	16	30	50	200	270	5M	LL	PL
1				100	99	97	81	18	16	10	N	P
2					100	98	70	27	26	10	N	P
3					100	98	68	22	21	8	N	P
4				100	99	97	76	17	15	9	N	P
5					100	97	66	19	18	9	N	P
6					100	97	65	21	19	9	N	P
7				100	99	96	85	12	10	6	N	P
8					100	98	66	20	18	9	N	P
9					100	99	68	19	18	8	N	P

LOCATION AND PROFILE SKETCH

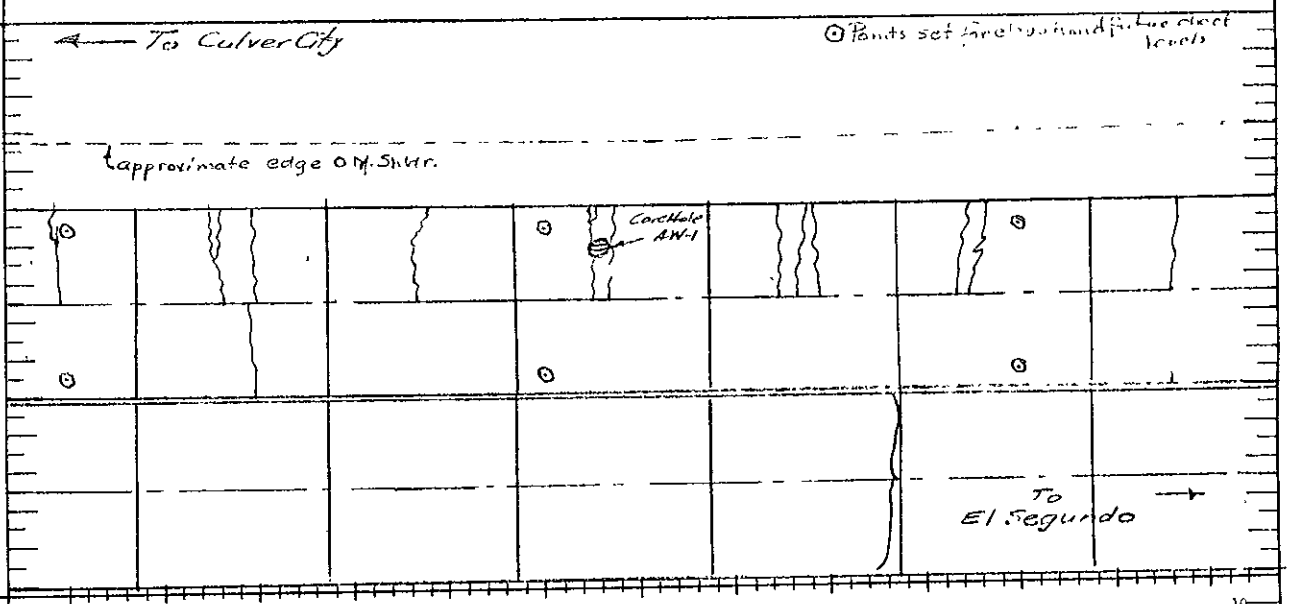
~~CONCRETE~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

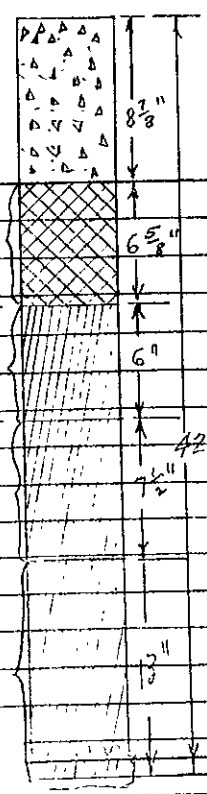
Dist. VII Co. LA Rte. 60 Sec. C		Contract No.	Date of Constr. April, 1952	Test Hole No. AW-1	
Fill ✓	Approx. Height 32	Dist. from End of Fill 50m' / 50m'	No. of Lanes 4-undivided	Traffic Heavy	
Cut	Approx. Depth	Dist. from End of Cut	Side Ditches None	Depth -	Date of Sampling 2-19-51
Roadside Left Truck gardening		Right Truck gardening		Grade [illegible] %	Up

Station: 26+50 27+00 +50

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Pavement

Imp. Subgrade Matl. - Reddish brown silty sand A

Blue, black silty sand & adobe & reddish silty sand. B
Probably deficiency borrow

Blue, black silty sand & adobe clay - probably deficiency borrow. C

Mixture of varied colored silty sand, sand & lenses of adobe clay.
Deficiency borrow

NOTE:
All material below sample 'A' is a varied colored mixture of sand, silty sand & adobe clay. Impossible to take samples as individual strata. - Sampled as layers to determine compaction, etc.
All material below sample 'A' appears to be deficiency borrow

Remarks: Below - 42" below part. surface material to micaceous silty sand Too deep to sample

Party: [illegible] / [illegible] / Clawson

Drawn By Clawson

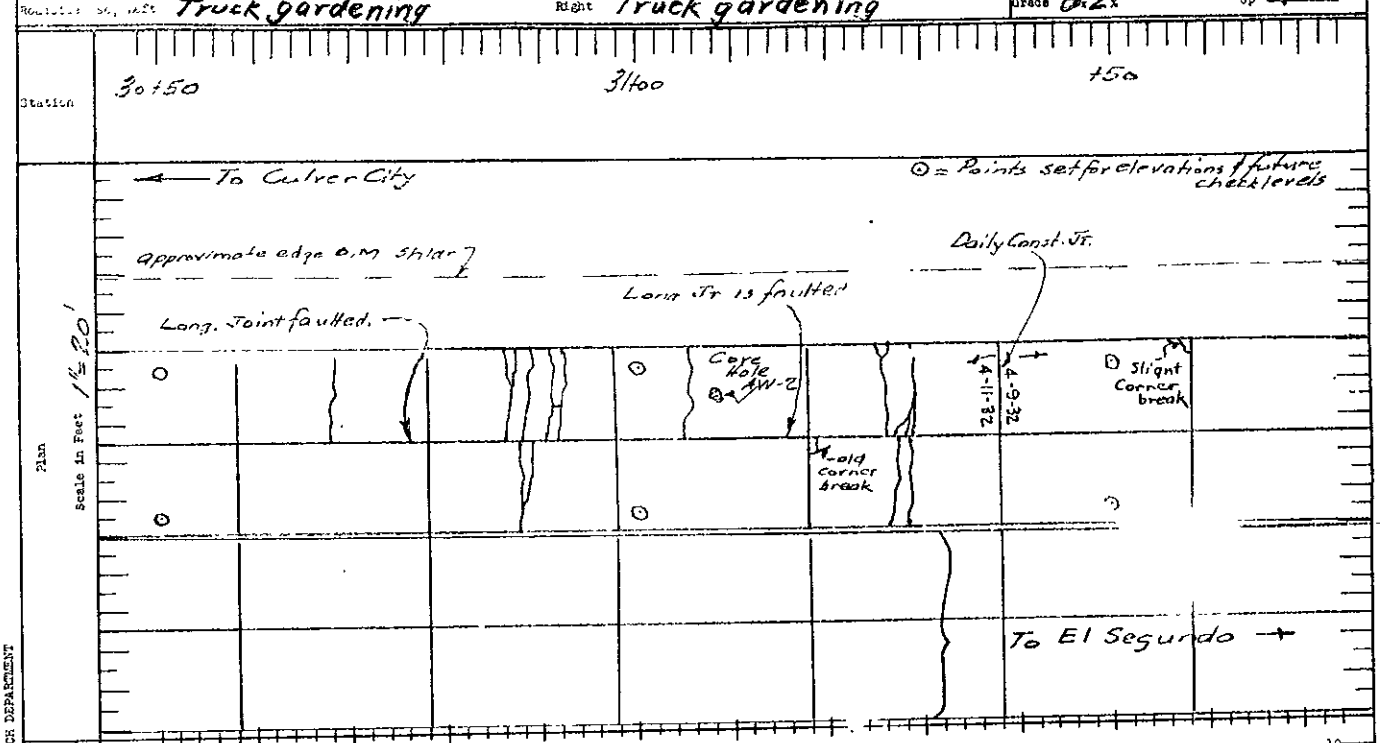
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

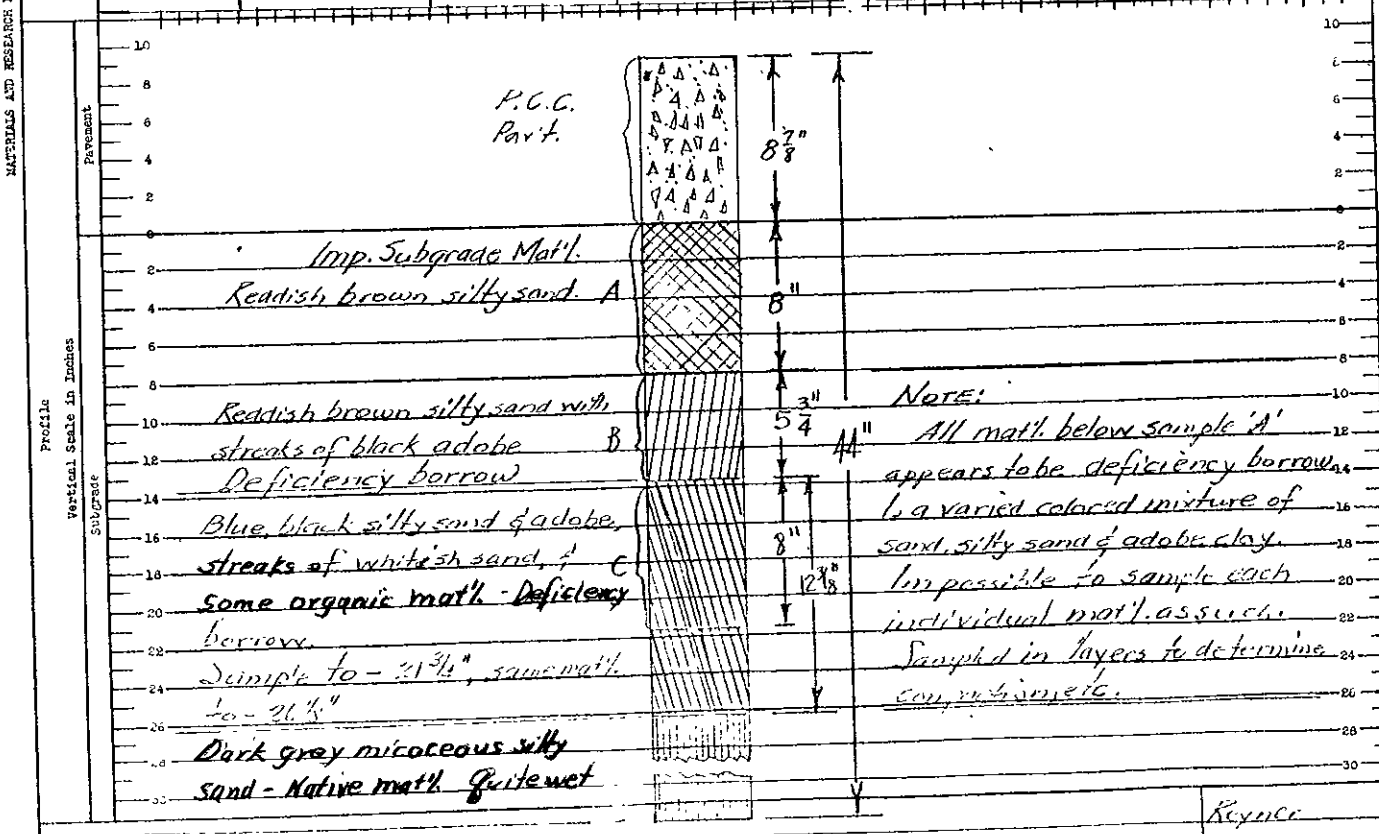
LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 002-3

Dist. VII Co. LA Rte 60 Sec. 3		Contract No.	Date of Constr. April. 1932	Test Hole No. AW-2	
Fill ✓	[illegible] 25	Dist. from End of Fill 5400 | 3600	No. of Lanes 4-undivided	Traffic Heavy	
Cut —	[illegible] Depth	Dist. from End of Cut	Side Ditches None	Depth	Date of Sampling 2-20-51
Roadside Sq. Left Truck gardening		Right Truck gardening		Grade 0.2%	Up ←





NOTE:
All mat'l. below sample 'A' appears to be deficiency borrow, a varied colored mixture of sand, silty sand & adobe clay. Impossible to sample each individual mat'l. as such. Sampled in layers to determine composition etc.

Party Reyner, Bourne, Clawson

Drawn by [illegible]

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SECTION

[illegible] INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. VII	Co. LA	Rte. 60	Sec. C	Contract No.	Date of Constr. April, 1932
Test Hole No. AW-3					
Fill ✓	Approx. Height 3°	Dist. from End of Fill 5800 | 3200	No. of Lanes 4-undivided	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None-left, Right - 57 to 60' from ℄	Depth 1' to 1.5'	Date of Sampling 2-20-51
Roadside Gas, Left Truck Gardening		Right Truck Gardening		Grade 0.20 %	Up →

Station: 34+50 — 35+00 — +50

Plan — Scale in Feet 1" = 20'

← To Culver City

⊙ = Points set for elevations & future check levels

Approximate edge O.M. Shldr.

Core Hole AW-3

To El Segundo →

Profile — Vertical Scale in Inches

Pavement

P.C.C. Pav't. — 8 3/4"

Subgrade

Imported subgrade Mat'l. - Reddish brown silty sand — A — 6 1/4"

Reddish silty sand - streaks of black adobe — B — 5 3/4"

Deficiency borrow

Reddish silty sand - streaks of black adobe, blue, black silty sand & whitish sand. Sample to - 19 3/4". Same material to - 26 1/4". — C — 7 3/4" — 44 1/2"

Deficiency borrow — 6 1/2"

Grey sand — 3"

Def. borrow

Red sand, fairly clean. Very wet — 6 1/2"

Def. borrow

Micaceous silty sand. Native Mat'l

NOTE:
All mat'l below Sample 'A' appears to be deficiency borrow to - 35 3/4", & is a varied colored mixture of sand, silty sand & adobe clay. Impossible to sample each material as a separate layer. Sampled as composite layers to determine compaction, etc.

Keyner
Bourne
Clawson

Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Dist. VII Co. LA Rte. 60 Sec. C
Loc. Design AW
Sta. 25+90 to 29+25
Sheet No. 1 of 3

Load. Sch. No. 58

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left							℄ Right						
	Toe of fill slope	Top of berm outer edge	Top of berm inner edge	Gutter line	Outer edge O.M. Shldr.	O.M. Shldr adj. to P.C.C. Pav't.	Edge of P.C.C. Pav't.	Edge of P.C.C. Pav't.	O.M. Shldr adj. to P.C.C. Pav't.	Outer edge of paved Shldr.	Gutter line	Top of berm inner edge	Top of berm outer edge	Toe of fill slope
29+25	CMP Down Drain: Inlet opposite +25; 37° left of ℄ Elev at inlet = 18.3. Berm is narrowed from inner edge to provide inlet gutter to mouth of bell.													
29+00	16.0	19.9	19.9	18.9	19.4	19.5	19.6	19.6	19.5	19.4	19.0	19.9	19.5	15.4
	39.0	38.5	36.5	34.5	27.5	20.0	20.0	20.0	20.0	27.5	34.5	36.0	39.0	55.0
28+00	16.2	20.0	20.1	19.2	19.5	19.7	19.8	19.7	19.6	19.4	19.2	19.9	19.8	15.4
	48.0	38.0	36.5	35.0	28.5	20.0	20.0	20.0	20.0	28.5	35.0	36.5	38.0	53.0
27+00	16.4	20.3	20.2	19.6	19.8	19.9	20.0	20.0	19.9	19.7	19.3	20.4	20.2	15.6
	48.0	38.5	36.0	34.5	27.0	20.0	20.0	20.0	20.0	27.5	36.0	37.0	38.5	53.0
26+00	17.0	20.7	20.7	19.9	20.0	20.1	20.2	20.2	20.1	19.9	19.6	20.7	20.7	17.4
	47.0	38.5	36.0	34.0	27.5	20.0	20.0	20.0	20.0	27.5	35.5	37.5	39.0	53.0
25+90	17.1	20.5	20.7	19.9	20.0	20.2	20.2	20.2	20.2	20.1	19.6	20.4	20.4	17.0
	47.0	39.0	35.0	34.0	27.0	20.0	20.0	20.1	20.0	26.5	36.5	37.0	39.0	54.0

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. [illegible]58
W.O. No. 13NN26
Job Number

Load. Sta. No. 58
Dist. VII Co. LA Rte. 60 Sec. C
Loc. Design AW
Sta. 29+30 to 33+55
Sheet No. 2 of 3

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄

	Left							Right						
	Toe of fill slope	Top of berm outer edge	Top of berm inner edge	Gutter Line	Outer edge Paved Shoulder	O.M. Shldr. adj. to P.C.C. Pav't.	Edge P.C.C. Pav't	Edge P.C.C. Pav't.	O.M. Shldr. adj. to P.C.C. Pav't.	Outer edge of paved Shoulder	Gutter Line	Top of berm inner edge	Top of berm outer edge	Toe of fill slope
33+55 / 33+40	Farm road left. Starts 36.0' left of ℄. Elevation 18.7													
33+29	C.M.P. downdrain left. Normal to ℄ 12" CMP onto 16" CMP bell at inlet. Berm is narrowed from inner edge to provide inlet to CMP. Inlet 37.5 left; Elev. 17.7 Outlet 47.5 left; Elev. 15.3													
33+00	15.4 / 52.0	19.1 / 39.5	19.3 / 37.0	18.2 / 35.0	18.5 / 28.0	18.8 / 20.0	18.8 / 20.0	18.8 / 20.0	18.7 / 20.0	18.4 / 27.5	17.9 / 35.0	18.3 / 37.5	18.2 / 41.0	15.2 / 57.0
32+00	15.4 / 49.0	19.1 / 39.0	19.2 / 36.5	18.5 / 35.0	18.8 / 29.0	19.0 / 20.0	19.0 / 20.0	19.0 / 20.0	19.0 / 20.0	18.7 / 27.0	18.2 / 35.5	19.3 / 37.5	19.1 / 40.5	15.3 / 54.0
31+00	15.6 / 49.0	19.6 / 39.0	19.5 / 36.0	18.8 / 34.0	19.0 / 27.5	19.1 / 20.0	19.2 / 20.0	19.2 / 20.0	19.1 / 20.0	18.8 / 27.0	18.4 / 33.0	19.3 / 36.0	19.2 / 38.5	15.2 / 52.0
30+00	15.5 / 48.0	19.7 / 38.5	19.8 / 36.0	18.9 / 33.0	19.1 / 27.5	19.3 / 20.0	19.4 / 20.0	19.3 / 20.0	19.2 / 20.0	19.0 / 27.0	18.7 / 33.5	19.5 / 35.0	19.5 / 37.0	15.5 / 52.0
29+30	C.M.P. downdrain Left 12" CMP onto 16" bell of CMP Not normal to ℄ outlet opposite +30 45.5' Left Elev. of outlet 15.2													

Form T-527

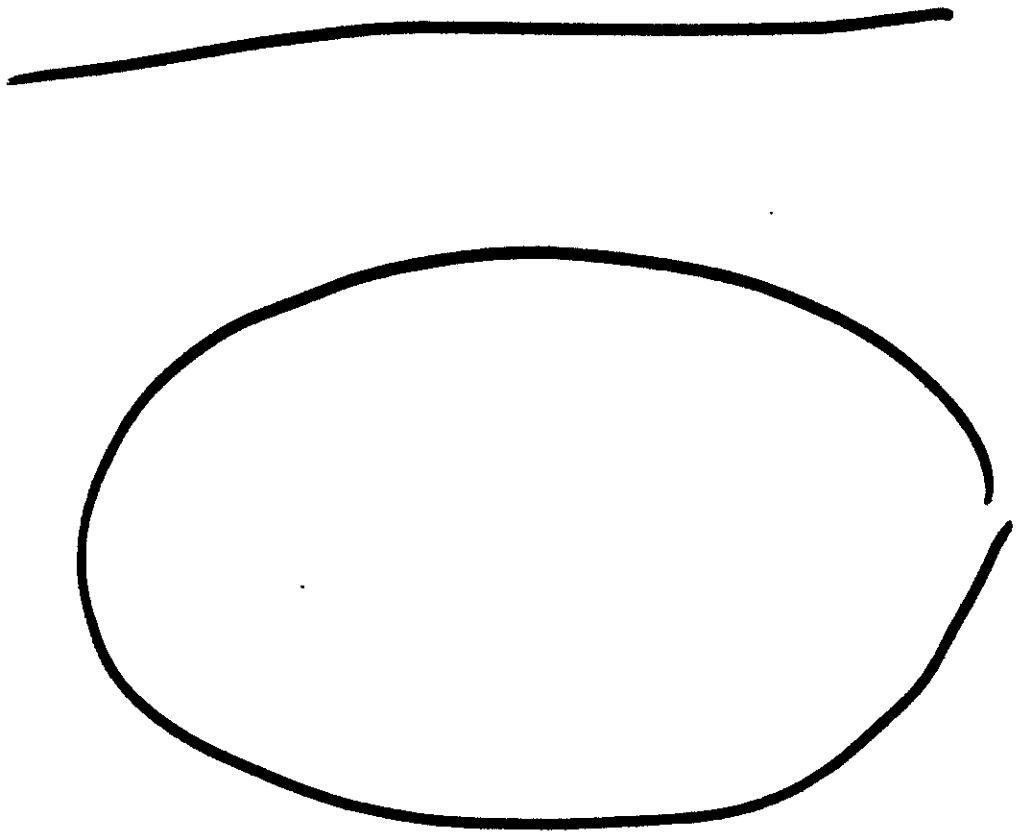
State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VII Co. LA Rte. 60 Sec. C
Loc. Design AW
Sta. 33+57 to 36+00
Sheet No. 3 of 3

Drainage Cross Sections
ROADWAY CONDITION SURVEY

	Toe of fill Slope	Top of berm outer edge	Top of berm inner edge	Gutter Line	outer edge O.M. Shoulder	O.M. Shoulder adj. to P.C.C. Pav't.	Edge of PCC Pav't.	Edge of P.C.C. Pav't.	O.M. Shoulder adj. to P.C.C. Pav't.	outer edge of O.M. Shoulder	Gutter Line	Top of berm inner edge	Top of berm outer edge	Toe of fill slope
36+00	15.2	19.3	19.3	18.8	18.9	19.0	19.0	18.9	18.9	18.6	18.1	19.0	18.8	18.8
	52.0	40.0	35.5	34.5	29.5	20.0	20.0	20.0	20.0	29.0	34.5	37.5	44.5	51.5
												Top ditch Slope	bottom ditch	bottom ditch
												14.8	14.0	14.0
												54.0	56.5	59.0
35+97 / 35+82	Farm road right Starts 36.0 right of ℄ Elev. 18.5 Concrete pipe culvert carries side ditch under farm road													
35+00	15.1	19.2	19.4	18.4	18.6	18.7	18.8	18.7	18.7	18.5	18.3	19.0	18.9	15.1
	52.0	41.0	37.0	34.5	29.5	20.0	20.0	20.0	20.0	29.0	34.0	37.5	41.0	54.0
												Top ditch Slope	bottom ditch	bottom ditch
34+31	12" CMP downdrain left 12" onto 16" bell at inlet. Starts 36.8 left ℄ Elev. 18.4 Ends 51.5' left ℄ Elev. 14.4. Inlet plugged.											15.1	14.0	14.0
												56.0	57.5	60.0
34+24 / 34+20	Left (East) end of 4x3.5' RCB. culvert Elev. at end now 14.4. Original flowline Elev. was 12.4. Culv. has 2.3' of silt in it and now acts as an equalizer between fields on opposite sides of roadway. Left end has 1.3' clear waterway. End is 50.8' Left of ℄. No definite inlet ditch.													
												Top Ditch Slope	Bottom Ditch	Bottom Ditch
												14.5	13.7	13.7
												55.0	57.0	59.0
34+00	15.1	19.0	19.0	18.1	18.4	18.6	18.6	18.6	18.6	18.1	17.4	18.7	18.7	14.5
	51.0	38.5	36.0	34.0	28.0	20.0	20.0	20.0	20.0	29.0	35.5	39.5	43.5	53.5
33+97.5	A CMP. normal to roadway ℄, starts 39.9 right of ℄. Elev. 17.8; Ends 52.0 right of ℄, Elev 13.6. Outlet is plugged. Berm is narrowed to provide inlet to CMP.													
33+89 / 33+85	Right (West) end of 4x3.5' RCB culvert: Elev. at end now 14.4' original flowline was 11.4'. Culvert has 3.0 feet of silt. End is 51' right of ℄. Culvert now acts as equalizer only. (See elev. of opposite end above) Right end has only 0.5' clear waterway. At +85 outlet ditch has been cleaned below culvert level. Present flowline Elev. 13.6 Bottom of ditch is 2.5' wide.													
33+75 / 33+57	Farm road on right of roadway. Starts 38.5' right of ℄. Elevation 17.4													

Form T-527



Research No. 00258
W.O. Number 13NN26

Loadometer Station No. 71
Road VII-LA-26-W.Cov.

DATA OF SECTION SELECTED FOR TEST

NOTE

At the time sections were selected for testing in Los Angeles County, it was agreed that a crack survey would be adequate for this site, since much information on surfacing, base and subbase conditions was on file at the Materials and Research Department from a previous pavement investigation in this area.

This Loadometer Station was abandoned in 1951 as being too dangerous to operate.

Information available on pavement, base, and subbase is detailed for this site in the same form as for all other sections.

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 71 is located 2.7 miles east of the Junction of Route 26 and Route 170. Test section is located adjacent to the Loadometer Station.

LENGTH: The section selected for test is located at the Loadometer Station, between Sta. 83+00 and Sta. 93+00, a total length of 1000 feet. Roadway is a 4-lane undivided highway. The section is established in the two right (eastbound traffic) lanes only.

SURFACE:

Type: Portland cement concrete, reinforced as noted below. Inner lane constructed 1933-34. Outer lane constructed 1936-37.

Loadometer Station No. 71
Road VII-LA-26-W.Cov.

ROADWAY STRUCTURE

SURFACE:

Width: 2 lanes, each 10' wide, total width 20 feet.

Reinforcing: INNER LANE: All reinforcing steel is 1/2" square deformed bar. Edges of lane are reinforced with 2 bars 20 feet 10 inches long, spaced 4" from edges of slab and 4" apart vertically. Ends of each bar are fixed at one transverse joint and extend through the next joint into 12" metal sleeves which are fixed in the slab.

At each transverse joint, 2 bars 9 feet 8 inches long, are placed on each side of the joint. Bars are spaced 4" horizontally from the joint, 4" apart vertically and extend to within 2 inches of the edges of the slab.

OUTER LANE: No longitudinal reinforcing steel. At transverse joints, 2 1/2" deformed steel bars, spaced 4" apart vertically are placed on each side of the joint 11" from the joint.

Joints:

Spacing and Dowels: INNER LANE: Transverse joints are spaced 20 feet apart. Each 5th joint is an expansion joint. Remainder are weakened plane contraction joints. As noted above, longitudinal reinforcing steel extends through all transverse

ROADWAY STRUCTURE

SURFACE:

Joints:

Spacing and Dowels: (Continued)

joints. Weakened plane contraction joints have no dowels or load transfer devices other than the dowel action of the reinforcing steel. Expansion joints have, in addition to the reinforcing steel, 5 dowels, 3/4" in diameter spaced at 28" centers starting 4" from edge of pavement. Dowels are fixed at one end and sleeved at the other end.

OUTER LANE: Transverse joints are spaced 20 feet apart. Each 3rd joint is an expansion joint. Remainder are weakened plane contraction joints. All transverse joints have 9 dowels, 3/4" in diameter spaced on 14" centers.

Thickness:

INNER LANE: 9"-7"-7"-9" cross section

OUTER LANE: 9"-6-1/2"-6-1/2"-9" cross-section

BASE:

Information given below on base and subbase soils and conditions was accumulated during a pavement investigation by the Materials and Research Department in 1944-45.

Type and Thickness:

INNER LANE: Construction records indicate "1' or less of native soil, local borrow and salvaged surfacing". Samples were taken under the left outer slab in 1944-45. Taken in two

Loadometer Station No. 71
Road VII-LA-26-W.Cov.

ROADWAY STRUCTURE

BASE:

Type and Thickness: (Continued)

sample layers, 0 to 6" below bottom of pavement and 6" to 12" below bottom of pavement.

OUTER LANE: Construction records indicate "Blended subgrade, 1.0', under 10' PCC lane". Samples were taken under the right outer slab in 1944-45. Taken in two sample layers, from 0 to 3", and from 3" to 8" or 9" below the bottom of pavement. All samples taken in 1944-45 which are applicable to this section were taken in the vicinity of Station 65.

Soil Classification:

INNER LANE: A-4 and A-6

OUTER LANE: A-1-b

SIDE DITCH DRAINAGE:

Detailed study was not made at this location other than a survey of actual pavement surface conditions. In general however, both sides of the roadway have asphalt treated shoulders which slope down to side ditches. Ditches are from 0.8' to 1.3' below the elevation of the pavement, and are 20' (±) from the edges of the pavement.

There are no culverts or bridges in the section.

Loadometer Station No. 71
Road VII-LA-26-W.Cov.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Roadway Section: Entire section roadway is in a slight fill from 0.8' to 1.5' above the surrounding areas.

(2) Pumping: There are no evidences of pumping in the section.

(3) Faulting: There is some faulting in the section, particularly in the outer lane. This has been indicated on the plan diagram.

(4) Shoulders: Asphalt treated shoulders throughout the section from 10 to 12 feet in width.

(5) Miscellaneous: Especial notice should be taken of the difference in the amount of cracking present in the inner and outer lanes.

ROUGHNESS MEASUREMENTS:

No roughness measurements were taken in the section.

Loadometer Sta. No. 71

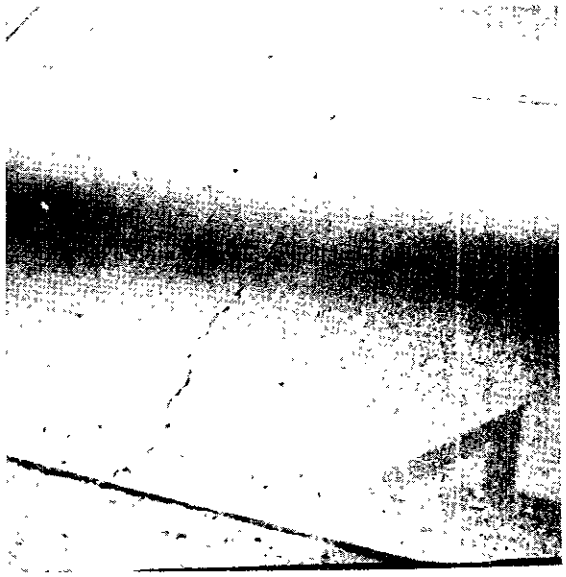
VII-L.A.-26-W. Cov.

Ahead on line from Sta.

83+00

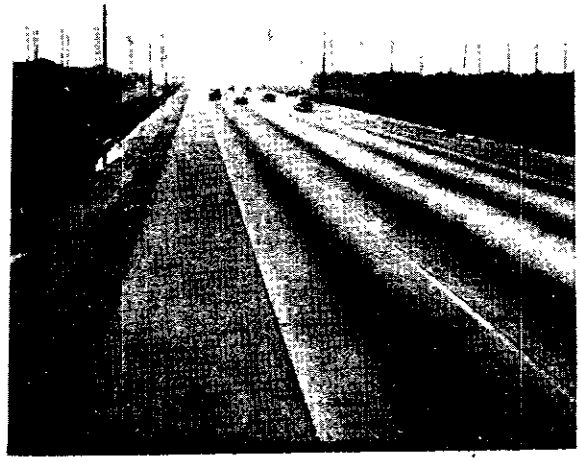
Transverse Crack in Rt.

Outer Lane Sta. 88+11



Transverse Crack in Rt.

Outer Lane Sta. 88+90



Back on Line from Sta.

93+00

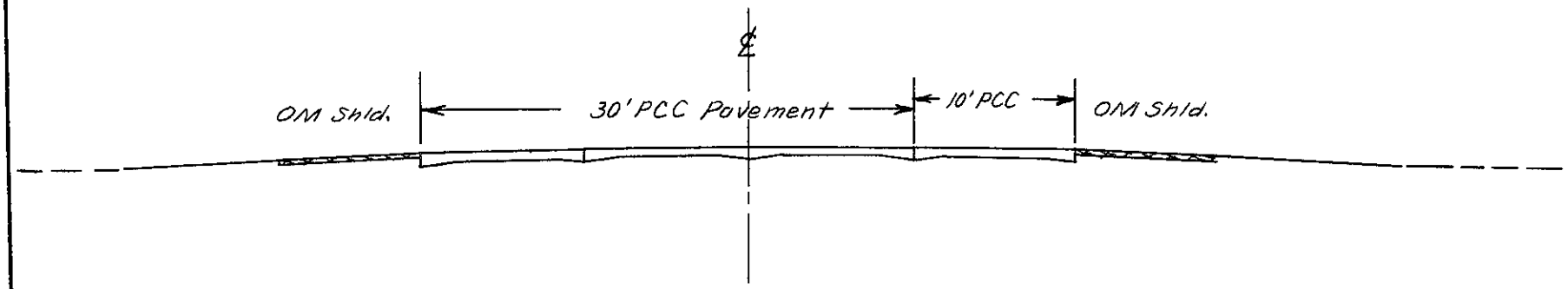
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. 71
VII-L.A-26-W.Cov

ROADWAY CONDITION SURVEY

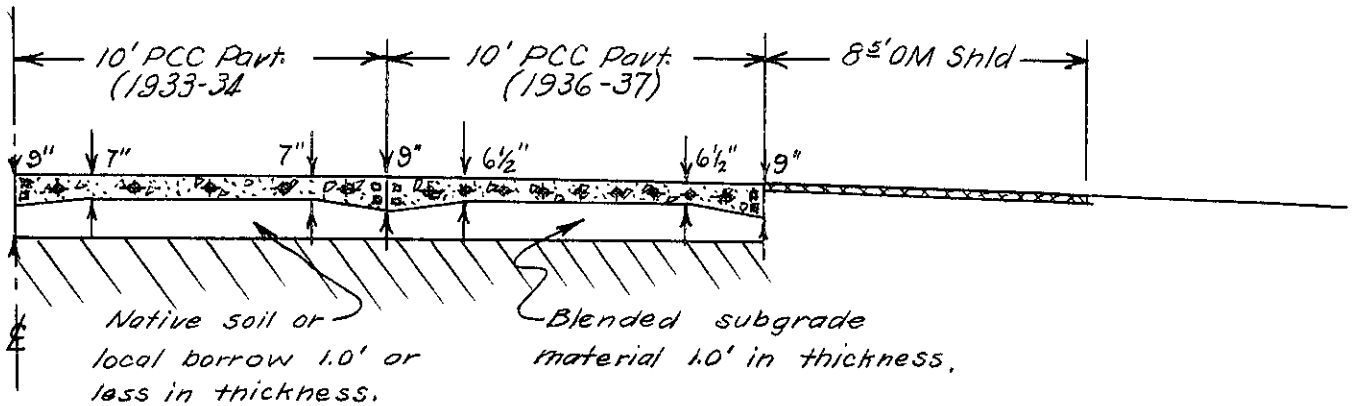
Scale: 1" = 10'

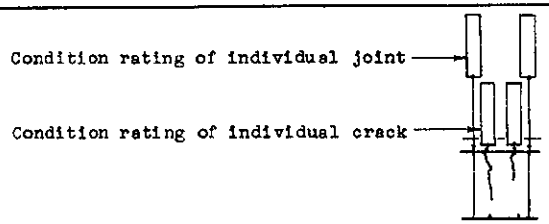
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





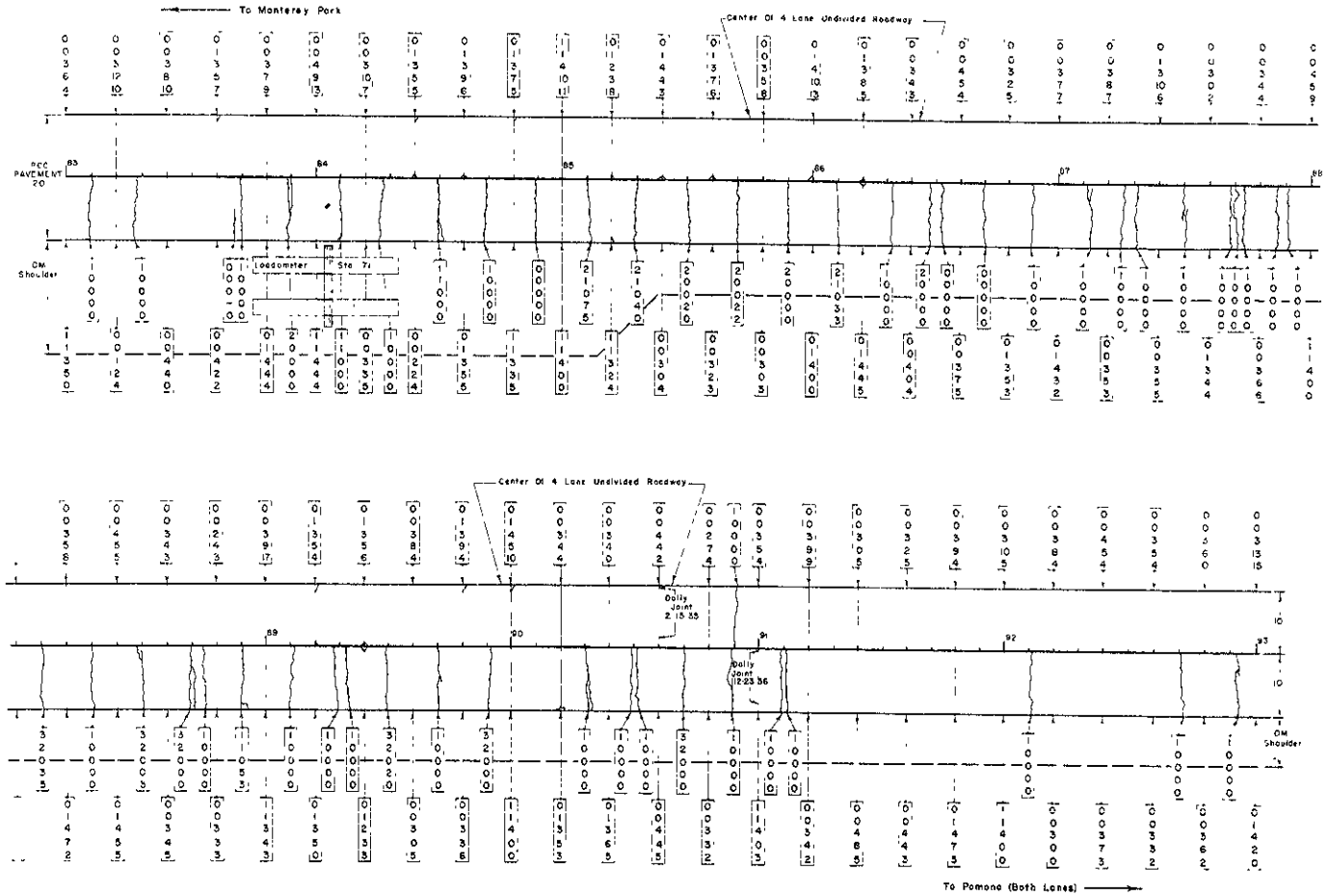
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

LOADOMETER STA. NO. 71
VII-1.A-26-W.Gov.

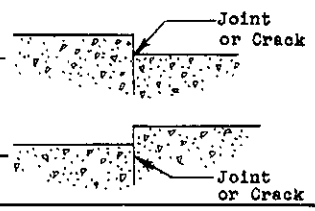


TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC →

NORMAL FAULTING — — —

REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —



LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate faulting along the longitudinal joint between lanes. Figures are placed on the low side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 71
VII-L.A-26-C.W.Cov.

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	K-16-A		64+99	16' lt. rdwy. ℄	PCC	7"	0 to -6"	Base
2	K-16-B		64+99	Same	PCC	7"	-6" to -12"	Subbase
3	K-17-A		65+30	15' lt. rdwy. ℄	PCC	7"	0 to -6"	Base
4	K-17-B		65+30	Same	PCC	7"	-6" to -12"	Base
5	K-18-A		65+01	16' lt. rdwy. ℄	PCC	7"	0 to -6"	Base
6	K-18-B		65+01	16' lt. rdwy. ℄	PCC	7"	-6" to -12"	Subbase
7	K-19-A		65+10	15' rt. rdwy. ℄	PCC	6-7/8"	0 to -3"	Base
8	K-19-B		65+10	Same	PCC	6-7/8"	-3" to -8"	Base
9	K-20-A		65+02	Same	PCC	6-7/8"	0 to -3"	Base
10	K-20-B		65+02	Same	PCC	6-7/8"	-3" to -9"	Base

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	10.1	120	95	10.0	126	A-6	2.67	
2	11.5	98	79	11.1	124	A-4	2.67	
3	8.7	119	95	11.1	124	A-4	2.67	
4	9.4	102	82	11.1	124	A-4	2.67	
5	10.1	120	96	10.0	126	A-4	2.67	
6	12.5	99	80	11.1	124	A-4	2.67	
7	4.6	123	92	6.0	134	A-1-b	2.61	
8	4.9	134	100	6.0	134	A-1-b	2.61	
9	5.2	122	91	6.0	134	A-1-b	2.61	
10	5.6	135	101	6.0	134	A-1-b	2.61	

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1		100	99	96	93	87	79	45	39		15	2
2			100	99	97	95	89	54	48		N	P
3			100	99	95	92	86	50	45		N	P
4			100	97	98	96	89	57	51		N	P
5		100	98	92	89	84	77	43	38		15	2
6		100	97	95	94	91	84	51	45		N	P
7			100	99	84	62	44	17	14		N	P
8	98	96	93	85	72	59	44	19	16		N	P
9		100	98	96	80	60	41	16	14		N	P
10	100	97	93	87	74	64	50	24	23		N	P

Research No. 00258
W.O. Number 13NN26

Loadometer Station No. 5
Road X-SJ-66-A

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 5 is located approximately 0.3 mile east (toward Manteca) of the junction of State Highway Route 5 (U.S. 50) and State Highway Route 66 (Sign Rt. 120).

The end station of the section selected for test is approximately 200' east of the Loadometer Pit. Stations increase from east to west.

LENGTH: The section is established on 1000' of two lane pavement between Station 234+00 and Station 244+00.

SURFACE:

Type: Pavement is reinforced Portland cement concrete placed in 1933.

Width: Section consists of two 10' wide lanes of P.C.C. with 2 foot asphaltic mix shoulders on each side of pavement.

Reinforcing and Dowels: The only dowels are at the transverse expansion joints which are at sixty (60) foot intervals. These dowels are three-quarter (3/4) inch round, twenty-four (24) inches long and spaced 28 inches on centers, 3 per lane starting 32" from edge of pavement. Dowels have one end fixed and the other in a metal sleeve, to form a slip joint. There are six dowels at each transverse expansion joint.

Loadometer Station No. 5
Road X-SJ-66-A

ROADWAY STRUCTURE

SURFACE:

Reinforcing and Dowels (Continued)

Each sixty foot section is divided into 20 foot panels by two weakened plane joints. There is a longitudinal weakened plane joint running along the center of pavement.

All reinforcing steel is one-half inch square deformed bars. In each 20 foot panel there are eight longitudinal bars, twenty feet ten inches long with metal sleeves at transverse joints (expansion and weakened plane) and 8 transverse bars, 9 feet eight inches long. There are 10 bar supports per panel.

Longitudinal bar reinforcing consists of eight bars placed in two layers on four inch vertical spacing, with pairs of bars located four inches from the edges of pavement and four inches to each side of the longitudinal joint.

Transverse bar reinforcing, being one-half of pavement width in length, consists of eight bars placed in two layers with four inch vertical spacing; the pairs of bars located four inches on each side of expansion joints and weakened plane joints. The uppermost transverse bar was placed two inches below the finish surface with longitudinal bars wired to their lower side at points of contact.

Loadometer Station No. 5
Road X-SJ-66-A

ROADWAY STRUCTURE

SURFACE:

Thickness: Section consists of two thickened edge lanes. Each lane is 7-1/4" thick for the center six feet increasing in the outer two feet on each edge to a thickness of 9".

BASE:

Type and Thickness: The base material is a micaceous silty sand with some fine gravel and broken pieces of asphaltic mix. In two locations sampled this material varied in thickness from 4-1/2" to 13".

Soil Classification: A-1-b and A-2-4

SUBBASE:

Type and Thickness: At one location the material underlying the base was sampled and found to be a 7-3/4" layer of black sandy silt with some gravel and broken pieces of asphaltic mix.

Soil Classification: A-2-4

SIDE DITCH DRAINAGE: The section pavement was construction on a low "fill". Centerline profile grade is a minus 1/2% from east to west.

Runoff to the left is carried by a side ditch parallel to the roadway to a culvert outlet at Sta. 243+53 and thence by natural water course away from the roadway.

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

Runoff to the right drains into a wide, low area between the roadway and a railroad fill approximately 90' right. This area in turn is drained by the culvert at 243+53.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Roadway Section: As noted previously, the section is in a slight roadway fill. Present pavement elevations are approximately one foot above the surrounding area.

(2) Pumping: There are no evidences of pumping in the section.

(3) Faulting: All transverse joints are faulted. The longitudinal joint between lanes also shows some faulting. Depth of faulting is shown on the plan diagram.

(4) Shoulders: Asphaltic mix shoulders averaging two feet in width border the pavement in the section. Maintenance bladed dirt shoulders extend ten feet more on the right and fourteen feet on the left.

Loadometer Station No. 5
Road X-SJ-66-A

ROADWAY CONDITION:

ROUGHNESS MEASUREMENTS:

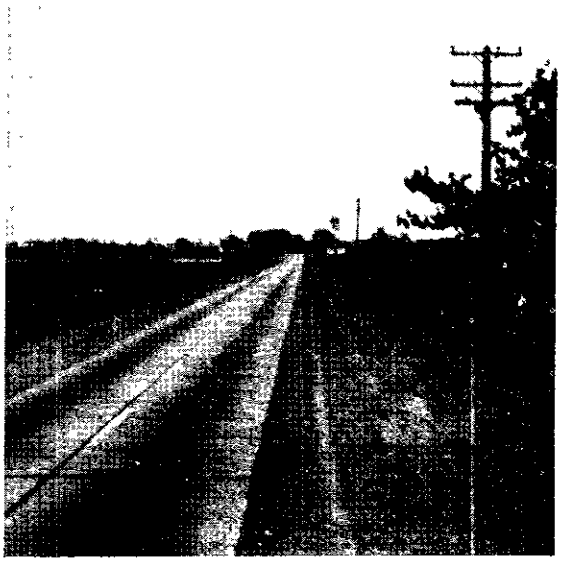
Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section.

B.M. No.	Location	Description	Elevation
1	80' Rt. Sta. 234+46	1/4" diam. steel pin in RR spike in telephone pole	50.000 (assumed)
2	34' left Sta. 243+53	1/4" diam. steel pin in PCC H/W	46.610

Profilograph Records: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Records were made with the recording wheel of the machine 30" left of the right outer edge of pavement and again with the recording wheel 30" right of the left outer edge of pavement. Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 5

X-S.J-66-A



Ahead on Line from

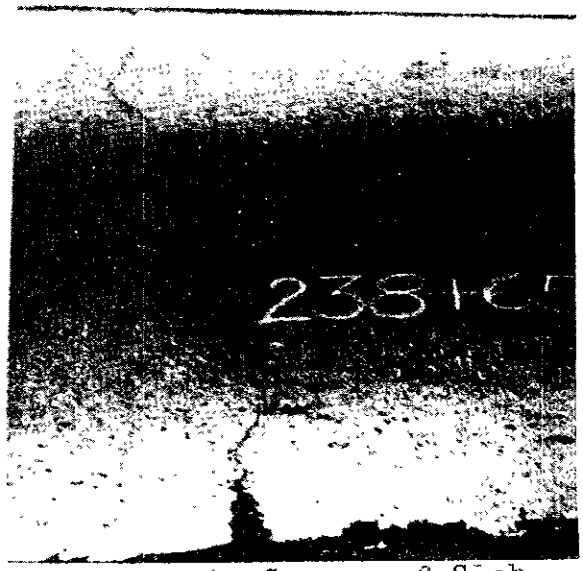
Station 234

Crack 1/3 slab ahead of

Joint Right Lane Sta. 234+62

Crack 2/3 Slab Ahead of

Joint Right Lane Sta. 235+06



Crack in Center of Slab

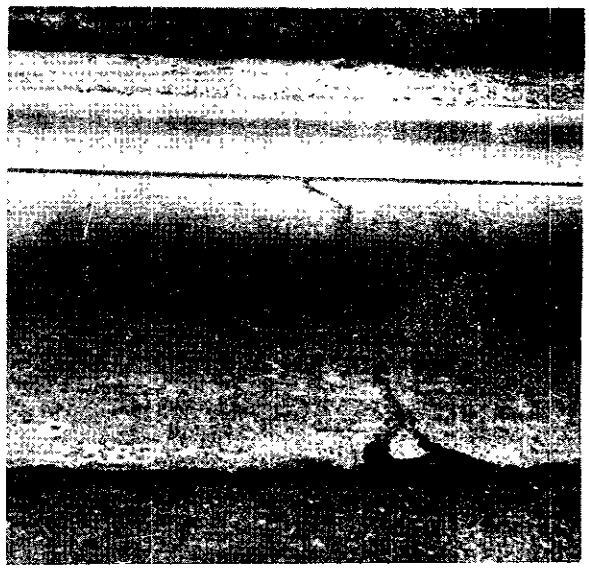
Left Lane Sta. 238+65

Loadometer Station #5

X-S.J-66-A

Maintenance Rework On

Joint Sta. 236+14

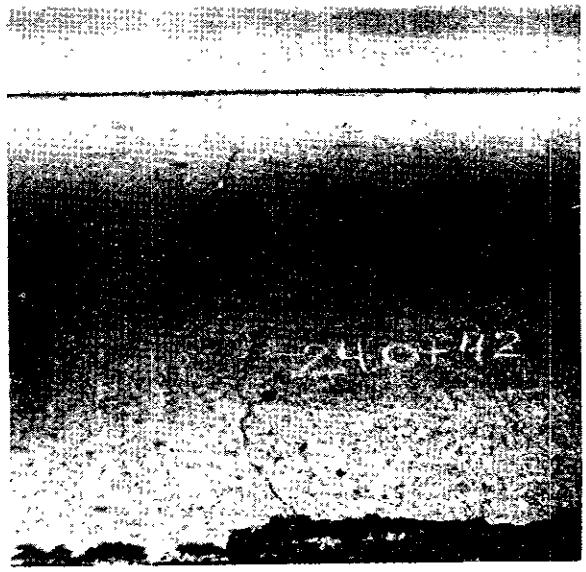


Crack in Center of Slab

Right Lane Sta. 238+03

Joint Spalling

Left Lane Sta. 239+95



Crack 1/3 Slab Ahead of
Joint Right Lane
Station 240+42

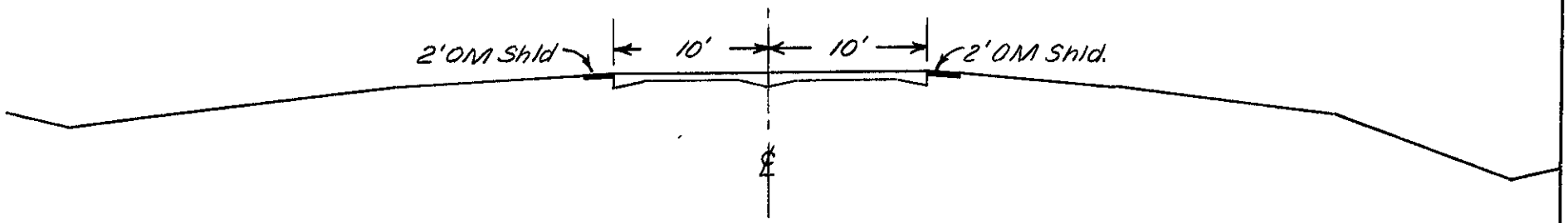
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BV 5
X-S.J-66-A

ROADWAY CONDITION SURVEY

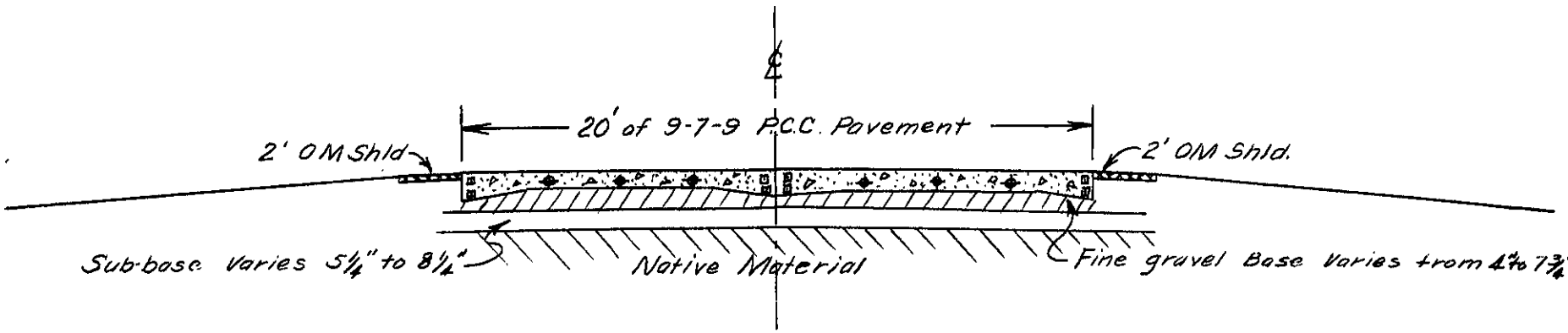
TYPICAL ROADWAY SECTION

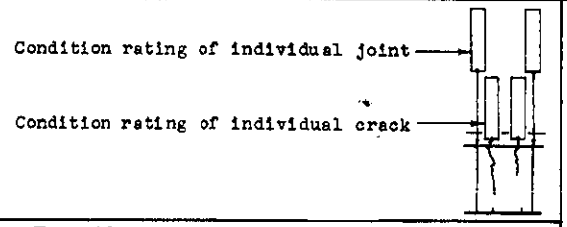
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





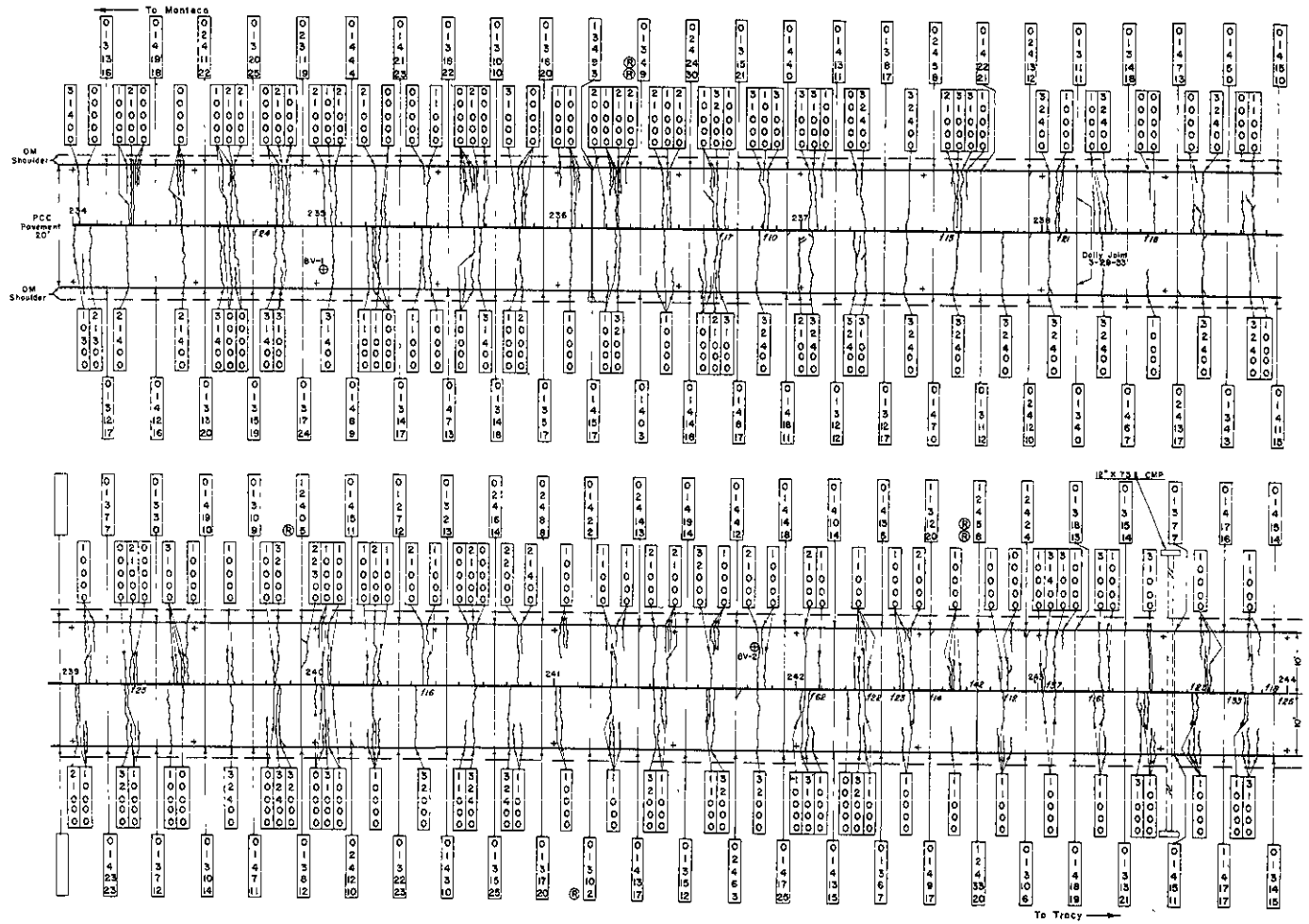
The table below indicates the significance of arrangement of the numbers in the rating "flag", and the values used in rating the condition of the individual joint or crack:

Position of Number in Flag	JOINTS				
	0	1	2	3	4
	"SECONDARY" CRACKING NEAR SPALLS*				
TOP NUMBER	None	Some Secondary Cracking			
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Complete
	CONDITION OF SEAL				
THIRD NUMBER	None	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF JOINT. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF JOINT. (Measured at a point 18" from the outer pavement edge.)				

*"Secondary" cracking as used above refers to the more or less concentric cracking frequently found adjacent to spalled areas.

Position of Number of Flag	CRACKS				
	0	1	2	3	4
	DEGREE OF CRACKING				
TOP NUMBER	Tight but Definite	Very Definite	Marked	Extreme	Shattered Area
	DEGREE OF SPALLING				
SECOND NUMBER	None	Slight	Marked	Extreme	Shattered Area
	CONDITION OF SEAL				
THIRD NUMBER	Not Sealed	Excellent	Good	Fair	Poor
	FAULTING, in 100ths of an inch				
FOURTH NUMBER	AT INNER END OF CRACK. (Measured at a point 18" from the longitudinal joint.)				
FIFTH NUMBER	AT OUTER END OF CRACK. (Measured at a point 18" from the outer pavement edge.)				

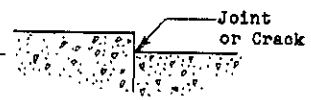
LOADOMETER STA. NO. 5
X-S.J-66-A



TYPES OF FAULTING AT JOINTS AND CRACKS

DIRECTION OF TRAFFIC →

NORMAL FAULTING — — —



REVERSE FAULTING (Indicated by Ⓡ before faulting figures) — — —

LEGEND

⊕ 8" diameter core hole for soil samples

○ 5" diameter core hole

• Mudjacking or subsealing for holes

+ Permanent reference points set for levels

Figures preceded by this symbol *f* indicate feulting along the longitudinal joint between lanes. Figures are placed on the <u>low</u> side of the joint.

TEST RESULTS SUMMARY

Load. Sta. No. 5
X-S.J-66-A

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BV-1-A	52-3007	235+03	3.0' left of rt. edge pav't.	PCC	7¼"	0 - 7-3/4"	Base
2	BV-1-B	52-3008	235+03	Same	PCC	7¼"	7-3/4-13"	Subbase
3	BV-2-A	52-3009	241+83	3.2' rt. of lt. edge of pav't.	PCC	7¼"	0 - 4"	Base
4	BV-2-B	52-3010	241+83	Same	PCC	7¼"	4½" - 12¼"	Subbase
5	BV-2-C	52-3011	241+83	Same	PCC	7¼"	12¼ - 20"	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	9	117	94	10	125	A-2-4	2.64	2.58
2	6					A-1-b	2.64	2.58
3	8	126	101	10	122	A-2-4	2.68	
4	6	141	103	6	13	A-2-4	2.61	2.64
5	19	102	87	14	[illegible]	A-4	2.53	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	98	93	92	92	86	75	18	22	7	N	P
2	100	95	68	61	57	52	43	17	14	5	N	P
3	100	99	96	96	95	92	83	22	24	4	N	P
4	100	91	51	47	42	36	29	14	13	5	27	19
5	100	100	100	100	98	95	85	51	48	26	32	22

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 00253

Dist. X	Co. SJ	Rte. 66	Sec. A	Contract No. —	Date of Constr. 1932	Test Hole No. BV-1	
Fill ✓	Approx. Height 15'	Dist. from End of Fill		No. of Lanes two	Traffic Lt. to Med		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Ditch on left not clearly defined on right	Depth Lt. 1'-2'	Date of Sampling 7-28-52	
Roadside Use, Left Agricultural			Right RR R/W		Grade 0.5%	Up	

Station: +60, +80, 23+00, +20, +40, +60

Plan — Scale in Feet 1" = 20'

To Manteca

Edge of PCC Pavement — Edge of paved shoulder

℄

BV-1

To Tracy

⊙ = permanent reference points set for levels

Profile — Vertical Scale in Inches

Pavement: P.C.C. 7¼"

Subgrade:

A: Micaceous silty sand, some fine gravel, a few pieces of broken up Oil Mix — 7¾"

B: Similar to layer A but with a larger quantity of broken up O.M. — 5½"

20'4"

Remarks

Party Smith

Drawn By

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00259

Dist. X Co. SJ Rte. 66 Sec. A		Contract No. —	Date of Constr. 1932	Test Hole No. BV-2	
Fill ✓	Approx. Height 1°	Dist. from End of Fill	No. of Lanes Two	Traffic Light to Medium	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Ditch on left. Not clearly defined on right	Depth 1.5'-2'	Date of Sampling 7-29-52
Roadside Use, Left Agricultural		Right R.R. R/W		Grade 0.4%	Up

Station: +40 +60 +80 242 +20 +40

Plan — Scale in Feet 1"=20'

← To Manteca

Edge paved shldr.

BV-2

Edge P.C.C.

Edge paved shldr.

To Tracy →

⊙ = permanent reference points set for levels

Profile — Vertical Scale in Inches

Pavement

P.C.C.

7¼"

Subgrade

Micaceous silty sand - Some fine gravel & broken up Oil Mix

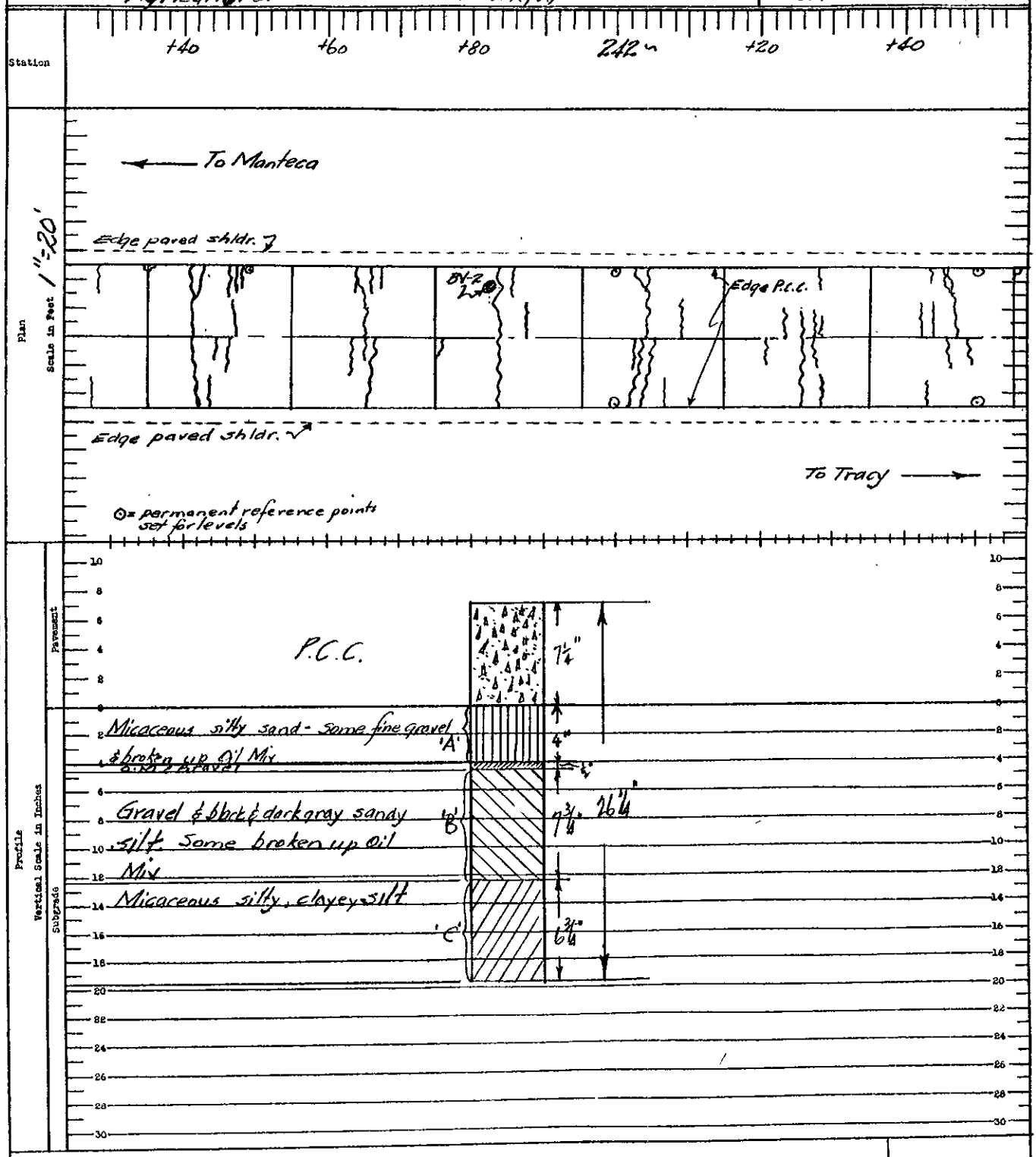
'A' 4"

Gravel & black & dark gray sandy silt. Some broken up Oil Mix

'B' 7¾" 26¼"

Micaceous silty, clayey silt

'C' 6¾"



Remarks:

Party Smith

Clawson

Drawn By Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 15NN26
Job Number _____

Dist. 7 Co. SD Rte. 66 Sec. A
Load. Sta. No. 5
Loc. Design BV
Sta. 234+00 to 239+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
				Bank Shot.	Gutter Line	Dirt Shldr. Point	Edge Paved Shldr.	Edge Paved Shldr.	Dirt Shldr. Point	Break in Slope	Toe Slope	Ditch		
239~				49.5	48.4	50.1	50.98	50.78	49.7	48.5	46.7	44.7		
				47.5	44.5	26.5	12.0	12.0	22.0	31.0	44.5	51.0		
+50				50.1	48.4	50.3	51.19	51.15	50.2	49.0	47.4	45.5		
				47.5	44.0	26.0	12.0	12.0	22.0	32.5	41.0	49.0		
238~				50.0	49.0	50.7	51.52	51.44	50.3	49.0	46.4			
				48.0	44.5	26.0	12.0	12.0	22.5	35.5	46.0			
+50				50.1	49.1	51.0	51.81	51.70	50.5	49.5	46.6			
				48.0	44.0	26.0	12.0	12.0	21.0	36.0	47.0			
237~				50.4	49.2	51.2	52.04	51.97	51.2	49.6	45.6			
				48.5	45.0	26.0	12.0	12.0	22.0	36.0	47.0			
+50				51.1	49.5	51.4	52.24	52.20	51.0	49.6	46.5			
				48.5	44.5	26.0	12.0	12.0	24.5	35.5	44.0			
236~				50.9	49.6	51.3	52.41	52.43	51.7	50.0	45.2			
				48.0	44.5	26.0	12.0	12.0	20.5	34.5	52.0			
+50				51.6	50.0	51.5	52.57	52.61	51.8	50.2	46.3			
				50.0	44.0	26.5	12.0	12.0	21.5	36.5	50.0			
235~				51.8	50.4	51.7	52.68	52.73	52.0	51.3	46.1			
				49.5	43.5	26.0	12.0	12.0	22.0	35.5	51.0			
+50				52.4	50.5	51.8	52.80	52.75	52.1	50.9	46.3			
				49.0	48.5	27.0	12.0	12.0	21.0	39.0	51.0			
234~				52.5	50.8	52.0	52.84	52.81	52.2	51.5	45.7			
				50.0	43.0	26.0	12.0	12.0	22.5	37.0	55.0			

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 5
Dist. X Co. S.J. Rte. 66 Sec. A
Loc. Design BV
Sta. 239+50 to 244+00
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
				Bank Shot	Gutter Line	Dirt Shldr. Point	Edge Paved Shldr.	Edge Paved Shldr.	Dirt Shldr. Point	Break in Slope	Toe of Slope			
244~			46.1	47.1	46.7	47.8	48.69	48.89	48.2	47.5	46.7	47.4	47.4	
			49.0	37.5	33.0	26.0	12.0	12.0	24.5	42.0	44.0	48.0	60.0	
+53	44.7 / 36.0	Outlet	Flow	Line	12" CMP			Flow	Line	12" CMP		45.4 / 37.4	Inlet	
+50			45.6	46.0	47.1	47.9	48.74	48.89	48.1	47.7	46.2	46.0	48.4	47.9
			49.0	40.0	35.0	25.5	12.0	12.0	25.0	36.0	39.0	43.0	50.0	60.5
243~				46.2	46.4	47.8	48.90	49.01	48.1	47.3	46.3	47.6	47.6	
				49.0	43.5	27.5	12.0	12.0	26.0	42.5	46.0	50.0	60	
+50				46.8	46.3	48.1	49.15	49.11	48.3	47.3	46.9	48.0	48.0	
				46.5	44.5	27.0	12.0	12.0	26.0	41.5	45.5	50.0	60.0	
242~				47.1	46.4	48.4	49.31	49.34	48.5	47.9	47.0	48.3	48.3	
				46.5	44.0	26.0	12.0	12.0	26.0	40.5	45.0	50.0	60.0	
+50				47.8	47.0	48.5	49.51	49.56	48.6	48.0	47.2	48.5	48.5	
				47.5	43.5	26.0	12.0	12.0	25.0	40.5	45.0	49.5	61.0	
241~				48.3	47.3	48.9	49.83	49.92	49.2	48.1	47.3	49.2	49.4	
				47.0	43.5	25.5	12.0	12.0	24.0	37.1	45.5	50.0	62.0	
+50				49.0	47.8	49.2	50.12	50.15	49.3	48.1	47.6	50.8	50.7	
				47.0	42.0	26.0	12.0	12.0	22.0	32.0	42.0	50.0	62.0	
240~				48.8	48.0	49.4	50.40	50.40	49.4	48.1	51.9	51.0		
				48.0	44.0	26.5	12.0	12.0	23.0	31.0	42.0	48.0		
239+50				48.8	48.1	49.7	50.71	50.55	49.6	48.3	46.4	45.5		
				48.0	44.5	26.5	12.0	12.0	22.0	35.0	47.0	57.0		

Form T-527

12

Research No. 00268
Work Order 13NN26

Loadometer Station No. 76
Road I-Hum-1-I

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 76 is located 1.1 miles north of the junction of Route 1 and Route 20 approximately 3 miles north of the north city limits of Arcata.

The section selected for test is located 1.0 mile north of Loadometer Station No. 76, approximately 4 miles north of the north city limits of Arcata.

LENGTH: The section selected for test is established between Sta. 100+00 and Sta. 110+00.

Section includes both lanes of a 2-lane roadway.

SURFACE:

Type: Dense graded asphaltic plant mixed surfacing with coarse seal coat wearing surface.

Plant mixed surfacing blanket was placed in 1950 over other P.M.S. which is over an open graded oil mix surfacing.

Width: Traveled way is 20 feet wide (2-10' lanes).

Total width of pavement, edge to edge, is approximately 25 feet. Present surfacing tapers abruptly to the older pavement outside of each 10 foot lane.

Thickness: Dense graded asphaltic P.M.S. is 3-1/2" thick.

Open graded mix varies from 2" to 3" in

Loadometer Station No. 76
Road I-Hum-1-I

ROADWAY STRUCTURE

SURFACE:

Thickness: (Continued) thickness. Total pavement thickness varies from 5-1/2" to 6-3/8".

BASE:

Type and Thickness: Crusher run base, 8" to 8-1/2" in thickness. Material was placed in 1929 and served as roadway surfacing until asphaltic mix surfacing was placed.

Soil Classification: A-2-4

SUBBASE:

Type and Thickness: Clean coarse sand and gravel. Minimum thickness, 8".

Soil Classification: A-1-a

SIDE DITCH DRAINAGE: Section is entirely in fill. Section roadway is for all practical purposes level. There are no berms or gutters adjacent to the traveled way, all drainage apparently going over the fill slope. Side ditch parallel the roadway at the toe of fill slope throughout the section. Ditches average 1 foot lower in elevation than the original ground and average from 3 to 4 feet lower than pavement elevation. Drainage is carried from south to north.

Loadometer Station No. 76
Road I-Hum-1-I

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued) There are no culverts or bridges within the section.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Crackings: There are no areas of alligator crackings in the section.

(2) Areas of Raveling: There are no areas of raveling in this section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping in the section.

(4) Patches: There are no patches in the section.

(5) Roadway Section: Section roadway is entirely in fill. Traveled way pavement averages 0.3 ft. above dirt shoulder elevations and from 3 to 6 ft. above original ground elevations.

(6) Shoulders: Shoulders in this section vary from 4 to 6 ft. in width (edge of traveled way to edge of fill.) Throughout the section old pavement averages 2.5 ft. in width in the shoulder areas and 0.3 ft. below traveled way elevation. Remainder of shoulder area is an unimproved dirt shoulder.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: A District bench mark is established on top

Loadometer Station No. 76
Road I-Hum-1-I

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: of a right of way monument 50 ft. right of centerline, Sta. 100+00, with an elevation of 38.17 ft.

The District bench mark was used as bench mark No. 1 for the section. Bench mark No. 2 for the section was established on top of a right of way monument 50 ft. lt. of centerline, Sta. 110+00 with an elevation of 34.285 ft. Three lines of permanent reference pins were set in the section; one line on the traffic stripe and lines 12.0 ft. left and right of the stripe. Outer pin lines average 0.5 foot from the outer edges of pavement.

Profilograph Records:

Transverse: The permanent reference points set for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records in each lane were made at 20 foot longitudinal intervals throughout the section.

Loadometer Station No. 76
Road I-Hum-1-I

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

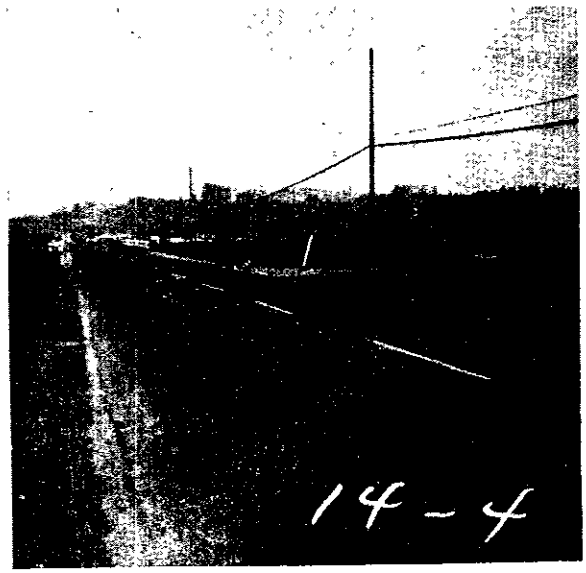
Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles in each lane of the traveled way surface. Four parallel lines were recorded. In the right lane runs were made 24" right of center pin line and 33" left of right pin line. In the left lane they were made 24" left of center pin line and 33" right of left pin line. All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. #76

I-Hum-1-I

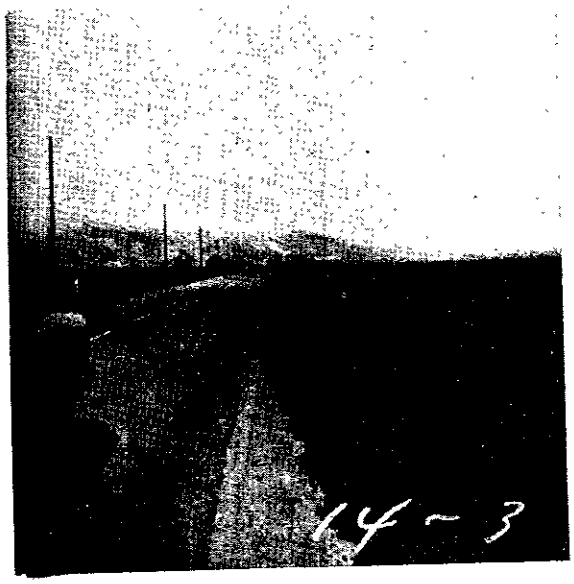
Edge of Blanket on Right

Back from Sta. 106+50



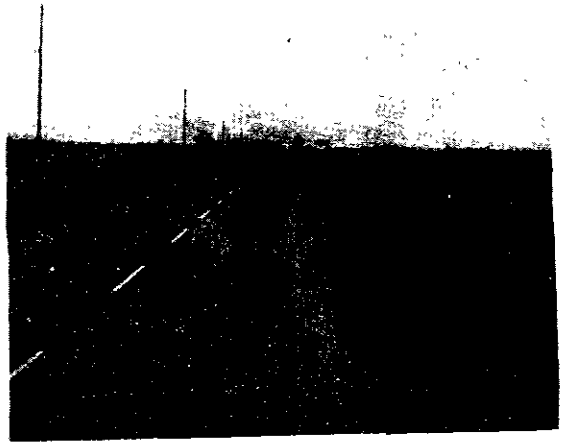
County Road Junction

Right of Sta. 110+00



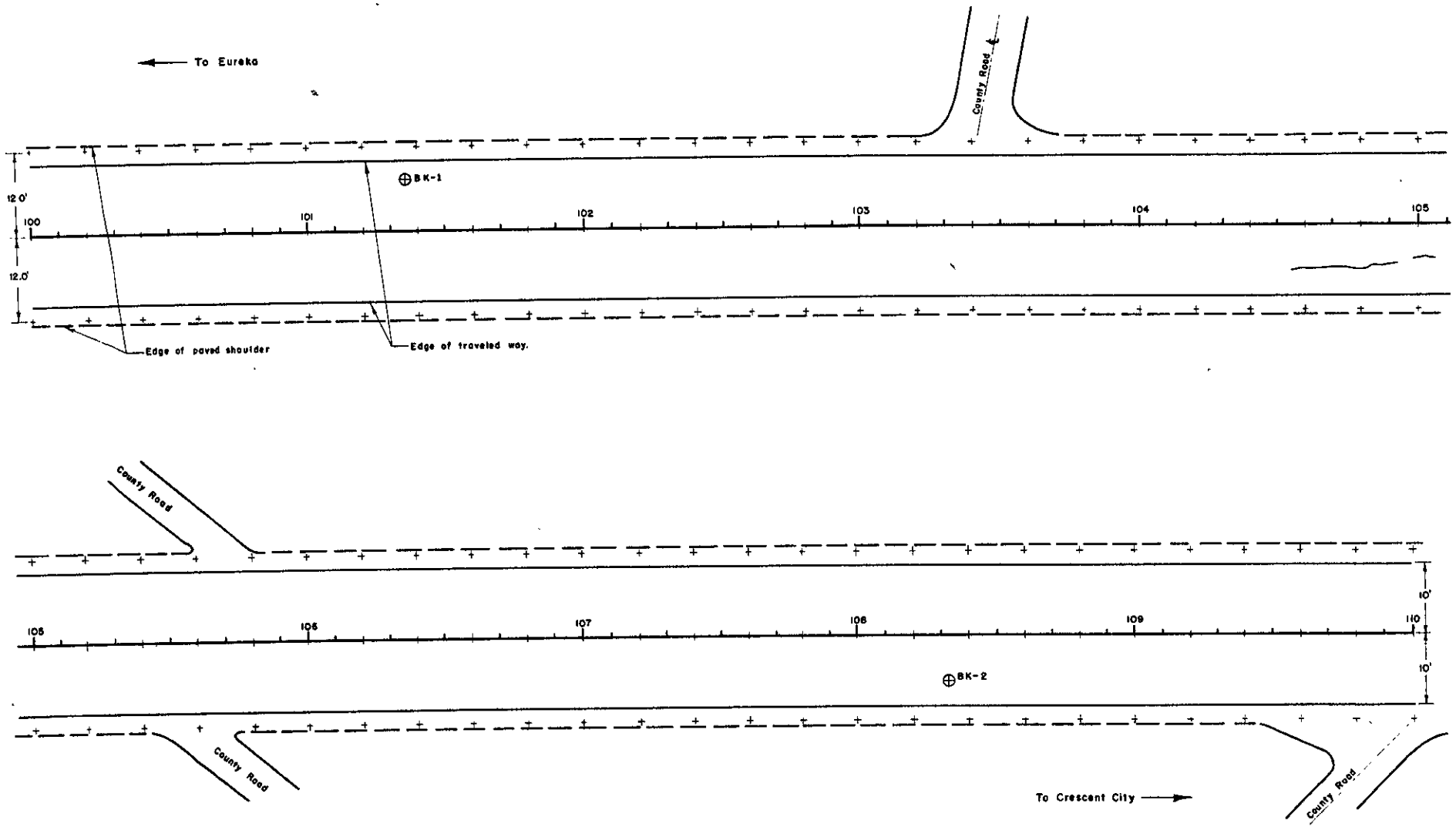
Edge of Blanket on Left

Back from Sta. 110+00



Back on Line From

Station 110+00



PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 76
I-Hum-1-I

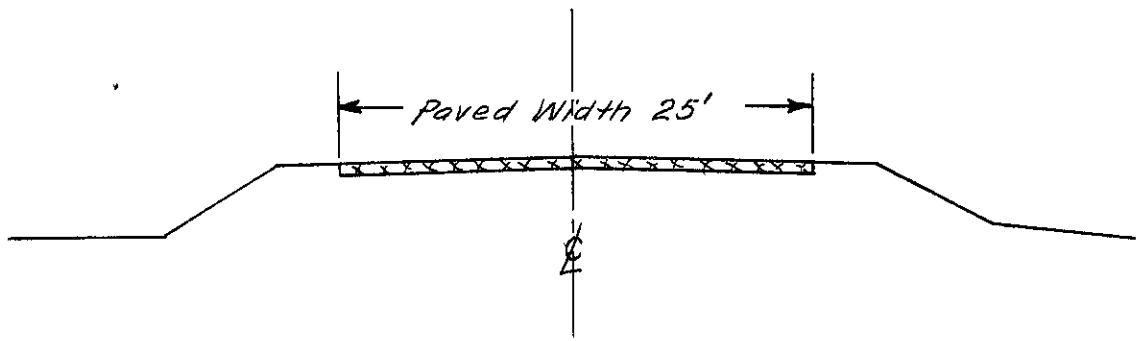
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BK 76
I-Hum-1-I

ROADWAY CONDITION SURVEY

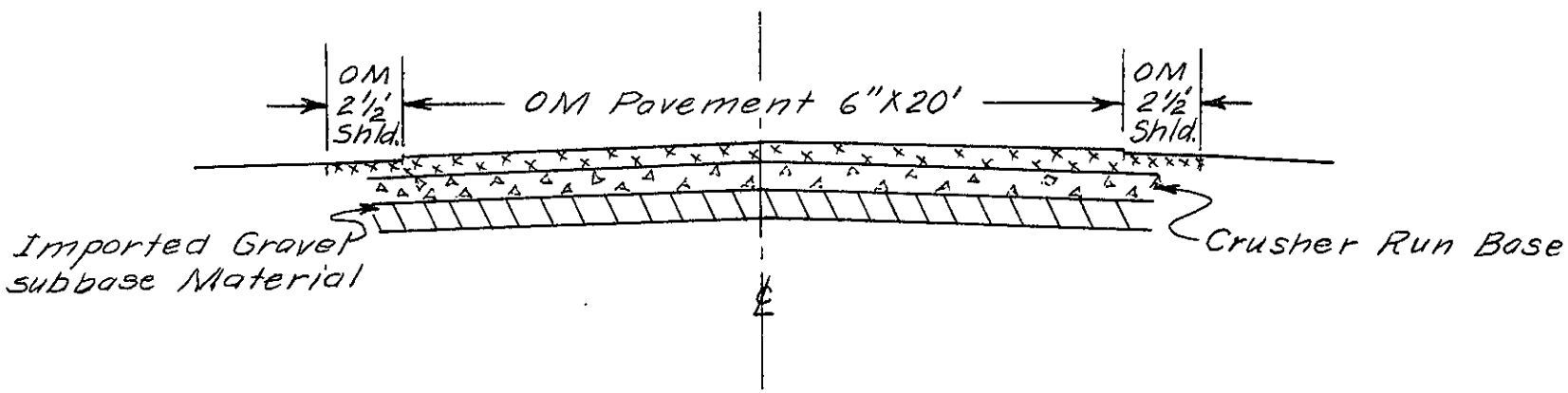
Scale: 1" = 10'

TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION



TEST RESULTS SUMMARY

Load. Sta. No. 76
I-Hum-1-I

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BK-1-A	51-3461	101+36	7.3' left of centerline	OM	6-1/8"	0 - 8-5/8	Base
2	BK-1-B	51-3462	101+36	same	OM	6-1/8"	8-5/8"-17-5/8	Subbase
3	BK-2-A	51 3463	108+33	6.3' right of centerline	OM	5-1/2"	0 - 8-1/2"	Base
4	BK-2-B	51-3464	108+33	same	OM	5-1/2"	8-1/2-16-1/2	Subbase

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	3	155	110	6	141	A-2-4	2.70	2.64
2	3	146	104	7	140	A 1-a	2.77	2.63
3	4	157	108	7	146	A-2 4	2.73	2.66
4	5	143	99	6	145	A-1-a	2 73	2.64

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	91	39	3	25	8	12	7	6	2	23	16
2	96	83	58	50	42	26	10	5	4	2	N	P
3	100	90	37	27	22	17	14	9	9	3	25	18
4	100	88	59	46	38	25	5	9	8	2	N	P

LOCATION AND PROFILE SKETCH

[redacted] INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. I	Co. Hum	Sta. 1	Sec. I	Contract No.	Date of Constr. 1929 & 1950
Fill ✓	Rt = 3° Lt 3°	Dist. from Ctr. of Fill	No. of Lanes 2	Traffic Heavy	Test Hole No. BK-1
Cut		Dist. from Ctr. of Cut	Side Ditches Well defined Rt & Lt	Depth 1° both	Date of Sampling 9-11-51
No. of Lanes Left Agricultural		Right Agricultural		Grade 0 %	Up

Station: 101~ +20 +40 +60 +80 102~

Plan — Scale in Feet 1" = 20'

Edge of pavement

BK-1

⊙ = permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches

Pavement

Subgrade

Dense Oil Mix

Oil Mix

"A" Crusher Run Base

"B" Fairly clean sand & gravel

3½"

2⅞"

8⅝"

9"

6⅜"

17⅝"

24"

Party Clawson

Coan

Drawn By Coan

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. I Co. Hum Rte. 1 Sec. I		Contract No. —	Date of Constr. 1929 & 1950	Test Hole No. BK2	
Fill ✓	Approx. Height Rt 5½ Lt 5½	Dist. from End of Fill	No. of Lanes 2	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Well defined Rt & Lt	Depth 1½ both	Date of Sampling 9-11-51
Roadside Use, Left Agricultural		Right Agricultural		Grade 0 %	Up —

Station: 107+80, 108~, +20, +40, +60, +80, 109~

Plan — Scale in Feet 1"=20'

Edge of pavement

℄

BK-2

⊙ permanent reference points set for Levels + Transverse profiles

Profile — Vertical Scale in Inches

Pavement

Subgrade

Dense Oil Mix

Oil Mix

"A" crusher run base

"B" fairly clean sand & gravel

3½"

2"

8½"

8"

5½"

16½"

22"

Remarks:

Party Clawson

Coan

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. I Co. Hum Rte. 1 Sec. I
Load. Sta. No. 76
Loc. Design BK
Sta. 100+00 to 105+00
Sheet No. 1 of 2

Drainage Cross-Section

ROADWAY CONDITION SURVEY

STATION	Left of ℄ Roadway							Right of ℄ Roadway						
				Ditch	Toe of Fill	Edge of Dirt Shldr	Edge of Pavt Trvl	Edge of Pavt Trvl	Edge of Dirt Shldr	Toe of Fill	Ditch			
105+00				35.7	35.7	39.0	39.32	39.51	39.2	36.1	35.6			
				30.0	22.0	15.5	10.0	9.0	16.0	22.0	30.0			
104+00				36.6	36.6	39.1	39.43	39.47	39.1	36.1	35.8			
				32.0	23.0	16.0	10.0	9.5	16.0	21.0	30.0			
103+00				35.3	35.7	39.3	39.60	39.60	39.3	37.5	37.1			
				32.0	23.0	15.5	10.0	9.5	18.0	26.0	32.0			
102+00				35.9	36.1	39.3	39.62	39.42	39.1	35.8	35.6			
				30.0	22.0	16.0	10.0	10.0	16.0	23.0	30.0			
101+00				37.6	37.6	39.7	39.84	39.71	39.3	36.6	36.5			
				30.0	24.0	16.0	10.0	9.5	17.0	24.5	31.5			
100+00				38.3	38.1	39.4	39.74	39.79	39.4	38.6	38.6			
				35.5	26.0	17.0	10.0	9.0	18.5	26.0	29.5			

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00256
W.O. No. 13NN26
Job Number

Dist. I Co. Hum Rte. 1 Sec. I
Loc. Design BK
Sta. 105+00 to 110+00
Load. Sta. No. 76
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄ Roadway

STATION	LEFT OF ℄ ROADWAY							RIGHT OF ℄ ROADWAY						
				Ditch	Toe of Fill	Edge of Dirt Shldr.	Edge of Pavt. T.W.	Edge of Pavt. T.W.	Edge of Dirt Shldr	Toe of Fill	Ditch			
												Road Approach		
110+00				33.6	34.4	39.3	39.57	39.69	39.5			38.3		
				42.0	23.0	14.0	10.0	9.5	15.5			45.0		
109+00				33.7	34.1	39.2	39.59	39.61	39.0	34.1	33.3			
				40.0	24.0	15.5	10.0	9.5	15.5	23.5	32.0			
108+00				33.6	34.4	39.2	39.65	39.68	39.3	32.6	32.7			
				33.0	22.5	14.5	9.5	10.0	15.0	26.0	45.0			
107+00				33.0	33.9	39.3	39.64	39.69	39.2	34.6	34.3			
				42.0	24.5	15.0	10.0	9.0	15.0	27.0	32.0			
106+00				33.7	34.7	39.1	39.51	39.65	39.3	34.7	34.1			
				32.0	22.0	16.0	10.0	9.5	15.5	22.5	32.0			

Form T-527

13

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 75
Road I-Hum-1-E

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Sta. No. 75 is located north of Eel River Bridge on State Highway Route 1 (U.S. 101), 2.2 miles south of Scotia south city limits.

The section selected for test is located 0.5 mi. north of Loadometer Sta. No. 75, approximately 1.7 mi. south of south city limits of Scotia.

LENGTH: The section is established between Sta. 147+00 and Sta. 157+00, and includes both lanes of a 2-lane roadway.

SURFACE:

Type : Asphaltic plant mix surfacing, constructed in 1948.

Width: Traveled way is 22' wide (two 11' lanes). Total paved width edge to edge is 32 feet.

Thickness: Varied from 3-1/2 to 4" in areas sampled.

BASE:

Type and Thickness: A cement treated base varied in thickness from 3-3/4" to 6-3/4" in areas sampled.

SUBBASE:

Type and Thickness: Creek run gravel used in some portions as a cushion over an old PCC pavement, believed to be constructed in 1925-26. Thickness varies

Loadometer Station No. 75
Road I-Hum-1-E

ROADWAY STRUCTURE

SUBBASE:

Type and Thickness: (Continued)

from a minimum of 6" in an area sampled over the old concrete to 24" in an area sampled to the left of the old concrete.

Soil Classification:

A-2-4 and A-1-a

SIDE DITCH DRAINAGE:

For most part the section is in side hill construction. Right of roadway is in cut and left of roadway is in fill.

Roadway of the section is on a slight vertical curve, with approximately -1% from beginning toward Sta. 154+00 and approximately +1% from Sta. 154+00 toward end.

On the right, a clearly defined ditch with an average depth of two feet drains runoff parallel to roadway in both directions to culvert inlets at Stations 147+77, 150+58 and 154+20.

To left of roadway, embankment drops sharply to edge of right of way and runoff goes into a field used as pasture.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking in the section.

Loadometer Station No. 75
Road I-Hum-1-E

ROADWAY CONDITION

SPECIAL CONDITIONS:

(2) Areas of Raveling: There are no areas of raveling in the section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping in the section.

(4) Patches: There are no patched areas in the section.

(5) Roadway Section: Section is side hill construction cut on right, fill on left. Fill portion varied from 6' to 15'.

(6) Shoulders: Paved shoulders in the section vary from 4 to 6 feet in width. On the right, pavement extends to within two or three feet of the ditch line. On the left there is an average of 11' of dirt shoulder outside the pavement. In addition, on the left, there are two "daylighted" areas which provide off the road parking space for vehicles.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section. Bench Mark No. 1 is established on a steel pin set in the southeast corner of a culvert headwall right of Sta. 157+75 at an elevation of 129.040'. Bench Mark No. 2 was established on a steel pin set in southeast corner of a culvert headwall right of

Loadometer Station No. 75
Road I-Hum-1-E

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

Sta. 146+77 at an elevation of 129.564'. Elevations are based on a District bench mark on a culvert headwall right of Sta. 154+20, elevation 127.26'.

Permanent reference pins were placed in three lines parallel to centerline roadway. One line is on the centerline of pavement; the other two are 12.3' left and 12.3' right of centerline.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 foot longitudinal intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles in each lane of the traveled way surface. Four parallel lines were recorded. In the right lane runs were made 24" right of center pin line and 33" left of right pin line. In the left lane, they were made 24" left of center pin line and 33" right of left

Loadometer Station No. 75
Road I-Hum-1-E

ROADWAY CONDITION

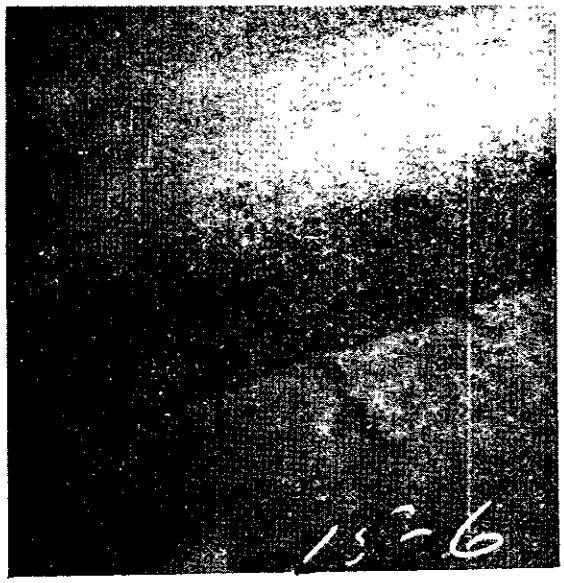
Profilograph Records:

Longitudinal: pin line.

All Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 75

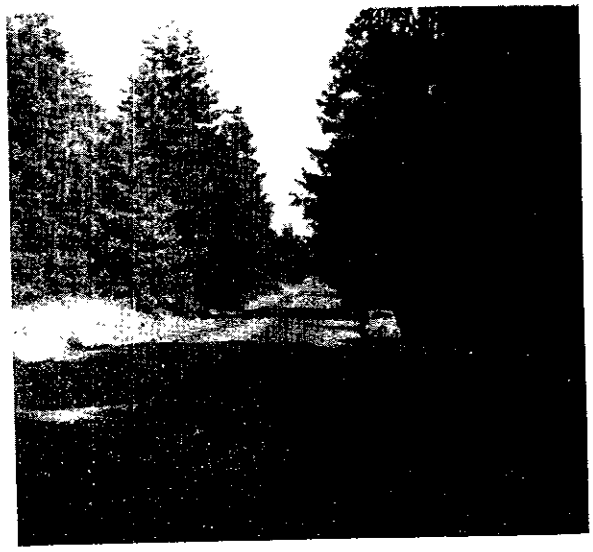
I-Hum-1-E



Transverse Crack in Shoulder and Right Lane Sta. 149+23

Longitudinal Crack Right of Sta.153+50 to Sta.153+65

Transverse and Longitudinal Cracks Sta. 154+58



Back on Line from Station 157+00

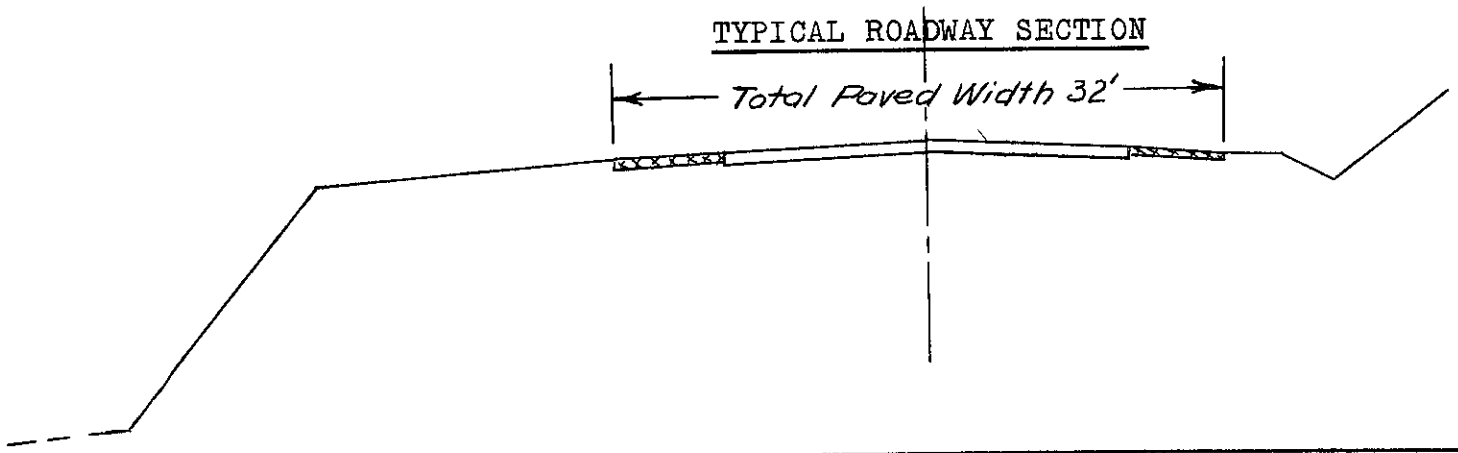
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BL 75
I-Hum-1-E

ROADWAY CONDITION SURVEY

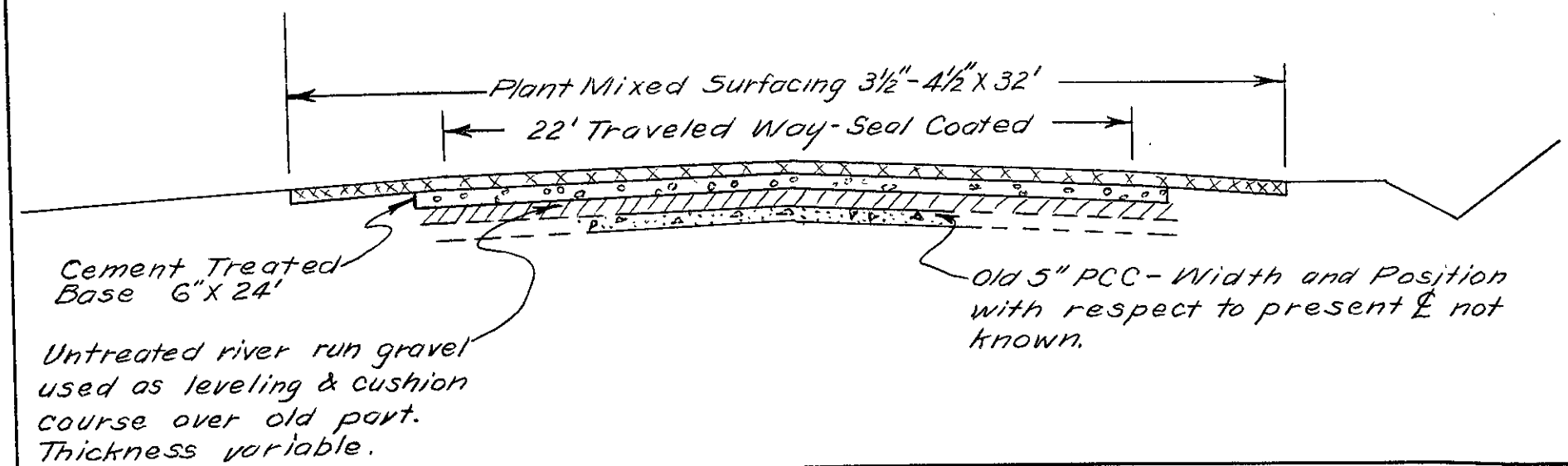
Scale: 1" = 10'

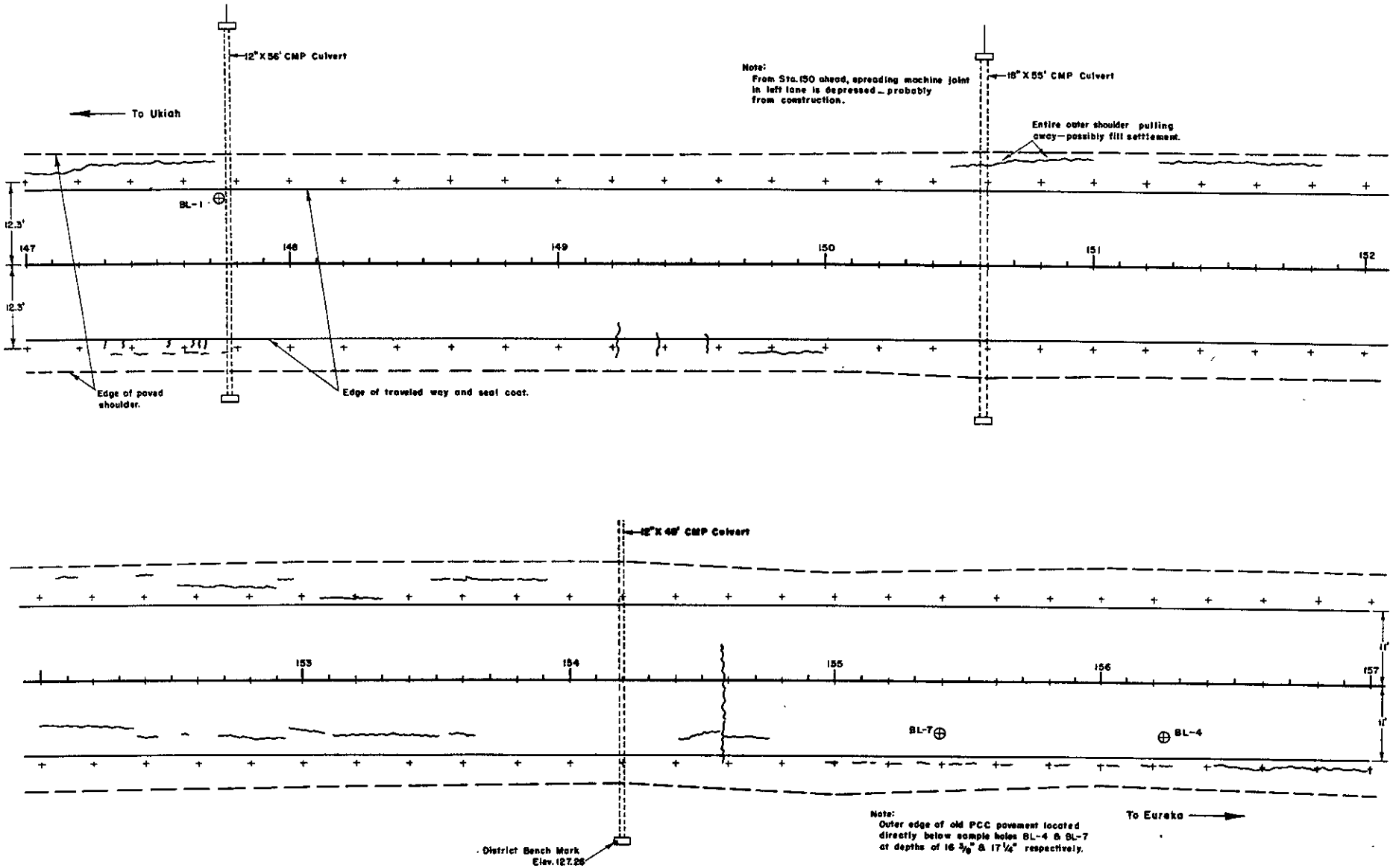
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 75
I-Hum-1-E

TEST RESULTS SUMMARY

Load. Sta. No. 75
I-Hum-1-E

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BL-1-A	51-3387	147+73	9.8' left of centerline	PMS CTB	3-3/4" 3-3/4"	0 - 24-1/2"	Subbase
2	BL-4-A	51-3388	156+24	7.8' right of centerline	PMS CTB	3-1/2" 6-3/4"	0 - 7"	Subbase & Cushion
3	BL-7-A	51-3389	155+40	7.5' right of centerline	PMS CTB	3-7/8" 6-1/2"	0 - 6"	Subbase & Cushion

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	3	150	106	5	141	A-2-4	2.68	2.66
2	3	143	99	6	145	A-1-a	2.70	2.64
3	3	156	108	6	145	A-1-a	2.84	2.63

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	86	62	32	25	19	14	11	7	6	4	27	17
2	96	75	42	33	24	18	14	5	5	2	N	P
3	100	74	40	31	22	17	14	6	5	2	N	P

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(4) Patches: (Continued)

Left Lane:

Sta. 1+05 to Sta. 1+10, in alligator cracked area
Sta. 3+10 to Sta. 3+20, Same
Sta. 2+90 to Sta. 3+70, Along edge of pavement
Sta. 4+05 to Sta. 4+70, Same
Sta. 4+85 to Sta. 5+10, In alligator cracked area
Sta. 5+35 to Sta. 5+40, Same
Sta. 5+55 to Sta. 5+70, Same
Sta. 7+15 to Sta. 7+20, Along edge of pavement

Right Lane:

Sta. 4+80 to Sta. 5+15, along edge of pavement
Sta. 7+50 to Sta. 7+95, Same
Sta. 9+25 to Sta. 9+35, Same

(5) Roadway Section: Elevation at centerline of roadway is for the most part, the same as the elevation in fields on either side.

(6) Shoulders: There are no paved shoulders in the section. However, the roadway pavement extends somewhat beyond the regularly traveled way and may be considered as shoulders. Edges of this pavement have broken and raveled away to a greater or lesser degree throughout the section. In some areas it has necessitated patching.

ROUGHNESS MEASUREMENTS:

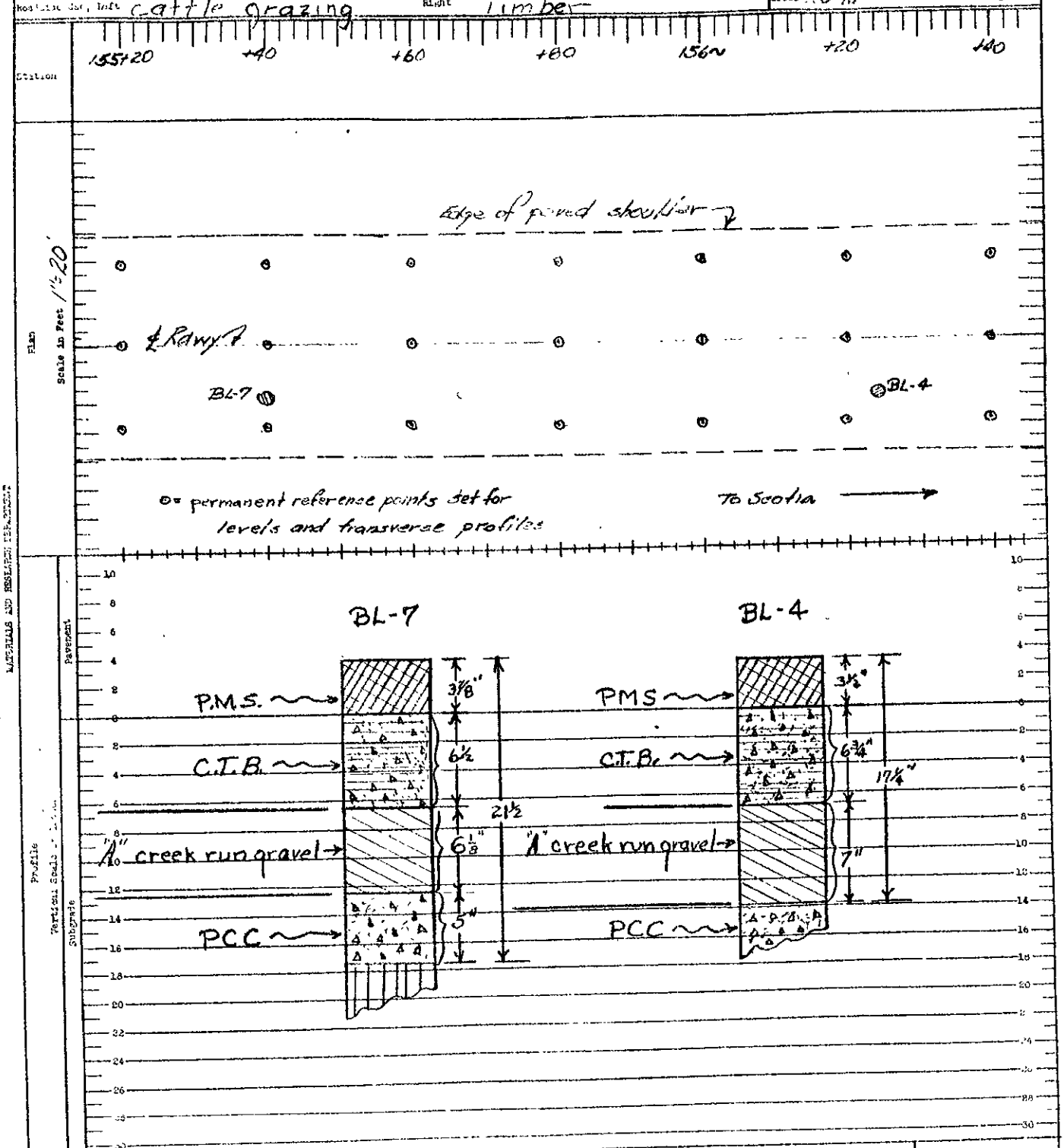
Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section. Elevations were carried from USGS BM #V-104 approximately one-

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. I	Co. Hum	Rte. 1	Sec. E	Contract No. –	Date of Constr. 1948
Test Hole No. BL-4 & 7					
Fill left side	Approx. Height 1.0	Dist. from End of Fill	No. of Lanes 2	Traffic Med. Heavy	
Cut-on rt. side	Approx. Depth 5.0	Dist. from End of Cut	Side Ditches None left Right 25' from ℄	Depth 1.5'	Date of Sampling 9-6-51
Roadside Use, Left cattle grazing		Right Timber		Grade 1.0%	Up →



Party Clawson
Cam
Inspected by Cam

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 75
Dist. 1 Co. Hum Rte. 1 Sec. E
Loc. Design B2
Sta. 147+00 to 151+00
Sheet No. 1 of 2

ROADWAY CONDITION SURVEY

Station	Left of ℄ Roadway							Right of ℄ Roadway						
				Toe of Fill	Shldr Point	Edge of Pavt.	Edge T.W.	Edge T.W.	Edge of Pavt	Top of Ditch	Btm. of Ditch	Outside Ditch bank		
151+00				123.2	128.3	129.46	129.92	129.86	129.39	129.2	126.5	128.4		
				36.3	26.8	16.8	11.1	11.1	16.3	18.3	24.5	33.3		
150+58 18" CMP			Flow Line 18" CMP	121.4	128.5	129.71	130.23	130.03	129.53	129.3	128.2		Flow Line 18" CMP 126.0	
				31.3	25.3	16.8	11.3	11.3	16.3	17.8	23.3		27.8	
150+00				116.4	129.4	130.40	130.73	130.59	130.12	130.1	129.0	133.6		
				43.3	32.3	16.3	11.4	10.8	15.8	18.8	21.3	27.3		
149+00				122.2	130.1	131.39	131.60	131.23	130.82	130.6	130.1	136.0		
				59.3	36.3	16.1	11.1	11.1	15.8	18.3	20.3	28.3		
147+77 12" CMP			Flow Line 12" CMP	119.1	130.5	131.35	132.08	131.99	131.56	131.2	127.9	Flow Line 12" CMP		
				36.8	23.3	16.3	11.3	10.9	15.8	18.5	20.3			
147+00				122.4	131.1	132.24	132.66	132.61	132.29	132.0	(Ditch Btm.) 131.4	131.4	Bank of Ditch 133.7	134.1
				33.3	23.8	16.5	11.1	11.3	15.9	16.1	20.3	27.3	24.3	32.3

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 75
Dist. 1 Co. Hum Rte. 1 Sec. E
Loc. Design BL
Sta. 152+00 to 157+00
Sheet No. 2 of 2

ROADWAY CONDITION SURVEY

	Left of ℄ Roadway							Right of ℄ Roadway						
					Shldr	Edge of Pavt.	Edge TW	Edge TW	Edge of Pavt	Shldr	Btm. of Ditch			
	← Daylight Area →													
157		130.6 36.3	130.5 23.5	128.9 25.3	129.9 23.3	130.20 16.3	130.60 11.1	130.81 11.0	130.50 16.3	129.5 38.3	127.5 56.8			
156+00			125.3 47.0	126.9 37.0	128.9 26.0	129.92 16.8	130.21 11.6	130.17 10.8	129.80 15.3	129.6 18.3	128.5 20.8	134.1 28.3	134.4 40.3	
		← Daylight Area →												
155+00		128.9 32.3	128.7 21.3	127.7 19.8	128.8 17.3	129.02 15.8	129.44 10.6	129.56 11.6	129.24 16.8	128.0 26.3	127.0 37.3			
154+20 12" CMP				Flow Line 12" CMP 123.9 25.0 Outlet	128.2 24.3	128.64 17.3	129.00 11.7	128.95 10.6	128.55 15.3	128.2 19.3	Flow Line 12" CMP. 125.5 24.3 Inlet	126.1 32.3		
											(← Ditch →)			
153+00				122.3 38.3	127.3 28.3	128.35 17.3	128.80 11.4	128.89 10.9	128.46 15.8	128.1 18.3	126.9 20.8	126.9 22.3	128.3 25.3	128.5 29.8
152+00				123.9 36.3	127.8 31.3	128.85 16.8	129.27 11.2	129.27 11.1	128.88 16.3	128.5 18.3	Ditch 126.4 22.8	130.5 32.3		

Form T-527

14

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 11

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 11 is located at the junction of State Highway Route 1, (US 101), and State Highway Route 15. Pit is opposite the Ukiah Maintenance Station and weighs vehicles northbound on Route 1. The section selected for testing is established approximately 500 ft. north of Loadometer Station between Sta. 189+65 and Sta. 199+65. It includes both lanes of a two lane pavement. The north city limits of Ukiah is approximately 3 miles south of the section.

LENGTH: The section includes 1000' of roadway between Sta. 189+65 and Sta. 199+65, established by the laboratory field crew and hereafter referred to as Sta. 0+00 to Sta. 10+00.

SURFACE:

Type: Asphaltic mix probably a road mix construction; date unknown.

Width: Paved roadway varies from 30' to 32' in width in the limits of the section.

Thickness: In the two locations sampled, the total pavement thickness was 1-3/8" and 2".

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY STRUCTURE:

BASE:

Type and Thickness: A granular material approximately 7" thick serves as a base. However, there is no abrupt transition to the material below it.

Soil Classification: A-1-a

SUBBASE:

Type and Thickness: The subbase is a clayey sand and gravel native material, distinguished from the base by an increased amount of fines.

Soil Classification: A-2-4

SIDE DITCH DRAINAGE: The section roadway is entirely in an "in grade" section. The section is on a vertical curve, grades of +1.0%, Sta. 0+00 to Sta. 7+00 and -1.0%, Sta. 7+00 to Sta. 10+00. Side ditches consist for most part of maintenance bladed gutter lines and average one foot below centerline elevation. Roadway runoff is carried both north and south from the vicinity of Sta. 7+00. There are no culverts under driveway turn-offs in the section.

ROADWAY CONDITION

GENERAL: It should be noted when consideration is given to the pavement thickness and apparent age, that

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY CONDITION

GENERAL: (Continued)

the riding quality of the surface is generally very good.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking

Areas of alligator cracking are shown graphically on the plan diagram and are listed below for convenience:

Left Lane:

Sta. 0+42 to Sta. 1+10, 1.8' wide, severe
Sta. 1+34 to Sta. 1+36, 5.5' wide, fairly severe
Sta. 1+72 to Sta. 3+21, Ave. 4' wide, severe
Sta. 4+05 to Sta. 4+12, 4.5' wide, fairly severe
Sta. 4+80 to Sta. 5+19, 4.6' wide, severe
Sta. 5+32 to Sta. 5+44, 3.5' wide, severe
Sta. 5+55 to Sta. 6+20, Ave. 6' wide, severe

Right Lane:

Sta. 0+00 to Sta. 0+07, 2' wide, failed
Sta. 1+38 to Sta. 1+40, 6' wide, failed
Sta. 6+30 to Sta. 6+40, 4' wide, severe

(2) Areas of Raveling:

There are no obvious areas of raveling in the traveled way of the sections.

(3) Areas of Shoving or Creeping:

There are no areas of shoving or creeping in the section.

(4) Patches:

For most part, patches in the section are located on the edges as mentioned above. These and other patched areas are shown graphically on the plan diagram and are listed below for convenience:

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(4) Patches: (Continued)

Left Lane:

Sta. 1+05 to Sta. 1+10, in alligator cracked area
Sta. 3+10 to Sta. 3+20, Same
Sta. 2+90 to Sta. 3+70, Along edge of pavement
Sta. 4+05 to Sta. 4+70, Same
Sta. 4+85 to Sta. 5+10, In alligator cracked area
Sta. 5+35 to Sta. 5+40, Same
Sta. 5+55 to Sta. 5+70, Same
Sta. 7+15 to Sta. 7+20, Along edge of pavement

Right Lane:

Sta. 4+80 to Sta. 5+15, along edge of pavement
Sta. 7+50 to Sta. 7+95, Same
Sta. 9+25 to Sta. 9+35, Same

(5) Roadway Section: Elevation at centerline of roadway is for the most part, the same as the elevation in fields on either side.

(6) Shoulders: There are no paved shoulders in the section. However, the roadway pavement extends somewhat beyond the regularly traveled way and may be considered as shoulders. Edges of this pavement have broken and raveled away to a greater or lesser degree throughout the section. In some areas it has necessitated patching.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section. Elevations were carried from USGS BM #V-104 approximately one-

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

half mile east of the section.

B.M. No.	Location	Elevation
1	31.8' Rt. Sta. 0+03	644.985
2	25.3' Rt. Sta. 10+80	649.962

Permanent reference pins were set in three parallel lines 12.3 feet apart. Edges of pavement and centerline stripe deviate sufficiently from these parallel lines to indicate that the section roadway is on a very slight curve to the right.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface, in each lane, were made at 20 foot longitudinal intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way, surfaced in four parallel lines as follows:

Loadometer Station No. 11
Road I-Men-1-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

Longitudinal: (Continued) 36" left of right pin line, 24" right of center pin line, 24" left of center pin line and 24" right of left pin line.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 11

I-Men-1-C

Ahead on Line from

Station 0+00

Showing Pavement Left of Centerline. Back from Station 3+00

Showing Pavement Left of Centerline. Sta. 4+80 to Sta. 5+20

Showing Pavement Left of Centerline. Sta. 5+30 to Sta. 6+20

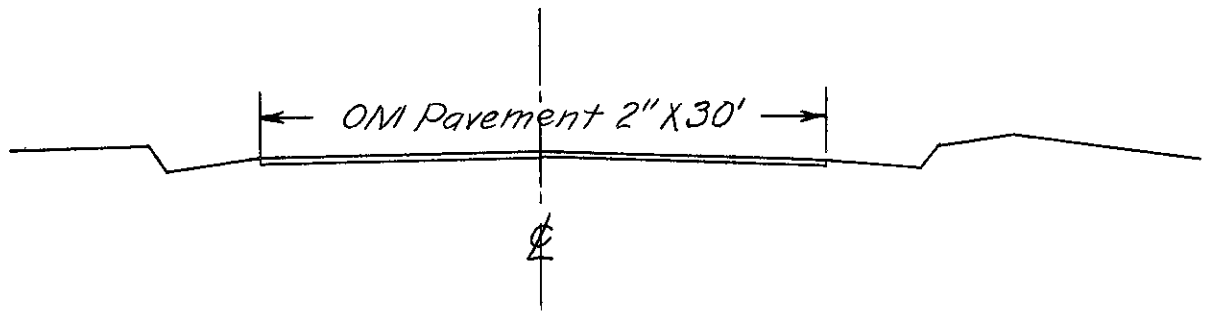
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BM 11
I-Men-1-C

ROADWAY CONDITION SURVEY

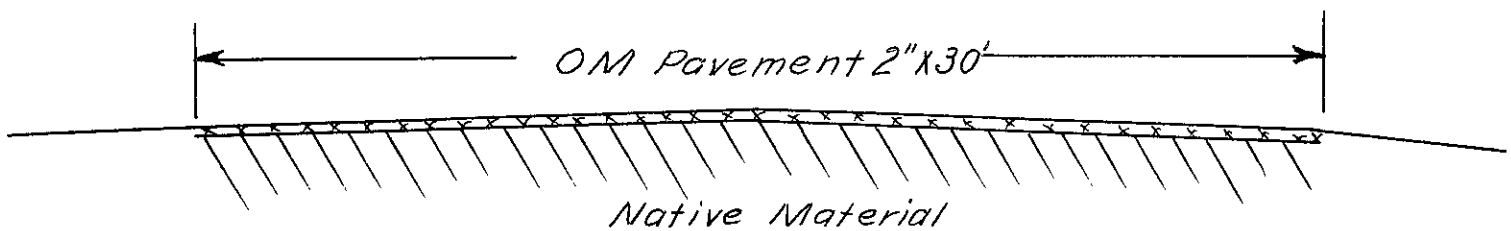
TYPICAL ROADWAY SECTION

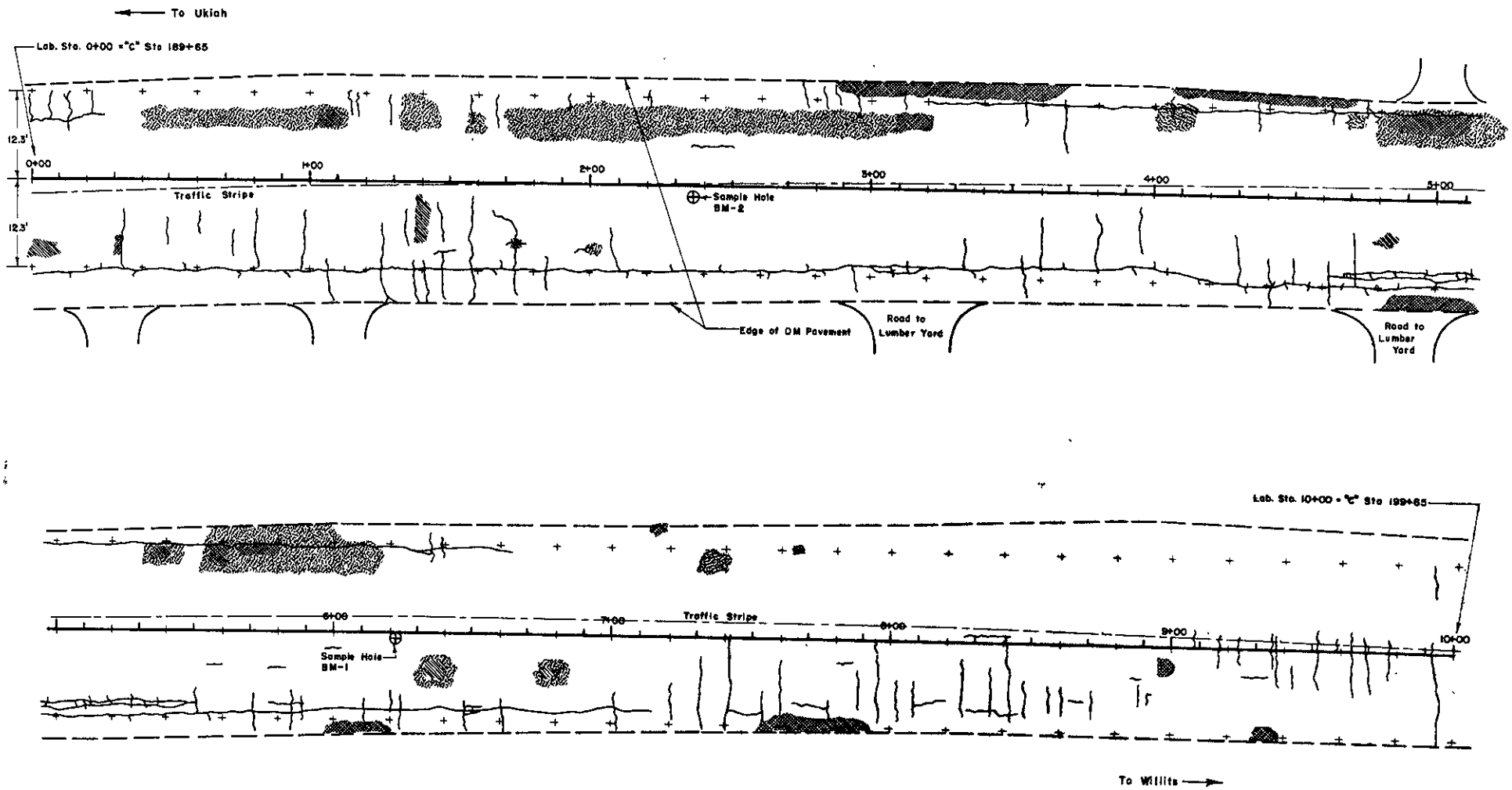
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 11
I-Men-1-C

TEST RESULTS SUMMARY

Load. Sta. No. 11
I-Men-1-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thick-ness	Depth below Btm. Pav't.	Layer Des-cription
1	BM-1-A	51-3339	6+22	9" right of centerline	OM	2"	0 - 6-1/2"	Base
2	BM-1-B	51-3340	6+22	same	OM	2"	6-1/2"-16"	Basement
3	BM-2-A	51-3341	2+36	18" right of centerline	OM	1-3/8	0 - 6-1/2"	Base
4	BM-2-B	51-3342	2+36	same	OM	1-3/8	6-1/2-16"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	2	147	102	7	144	A-1-a	2.70	2.66
2	5	135	99	8	137	A-2-4	2.68	2.52
3	2	147	104	6	142	A-1-a	2.70	2.66
4	5	127	94	9	135	A-2-4	2.70	2.55

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	97	85	52	41	32	24	17	10	9	3	N	P
2	100	98	85	75	67	59	48	32	29	12	22	17
3	100	83	50	43	36	28	21	12	10	3	N	P
4	100	99	83	70	61	52	43	27	25	11	N	P

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

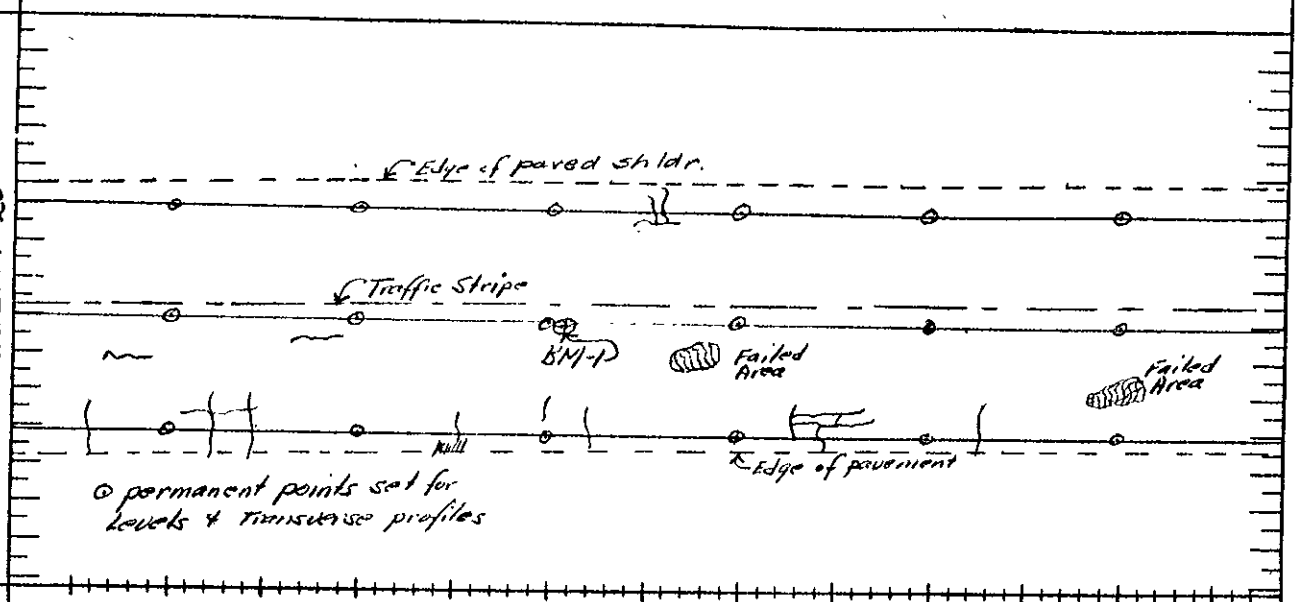
RESEARCH NO. [redacted] 00258

Dist. I Co. Men Rte. 1 Sec. C			Contract No.	Date of Constr. Unknown	Test Hole BM-1
Fill grade	Approx. Height —	Dist. from End of Fill —	No. of Lanes Two	Traffic Med Heavy	No.
Cut —	Approx. Depth —	Dist. from End of Cut —	Side Ditches Approx. 20' Rt & Lt	Depth Rt=0.7' Lt=0.4'	Date of Sampling 8-30-51
Roadside Use, Left Orchard		Right Vineyard		Grade 1.0 %	Up →

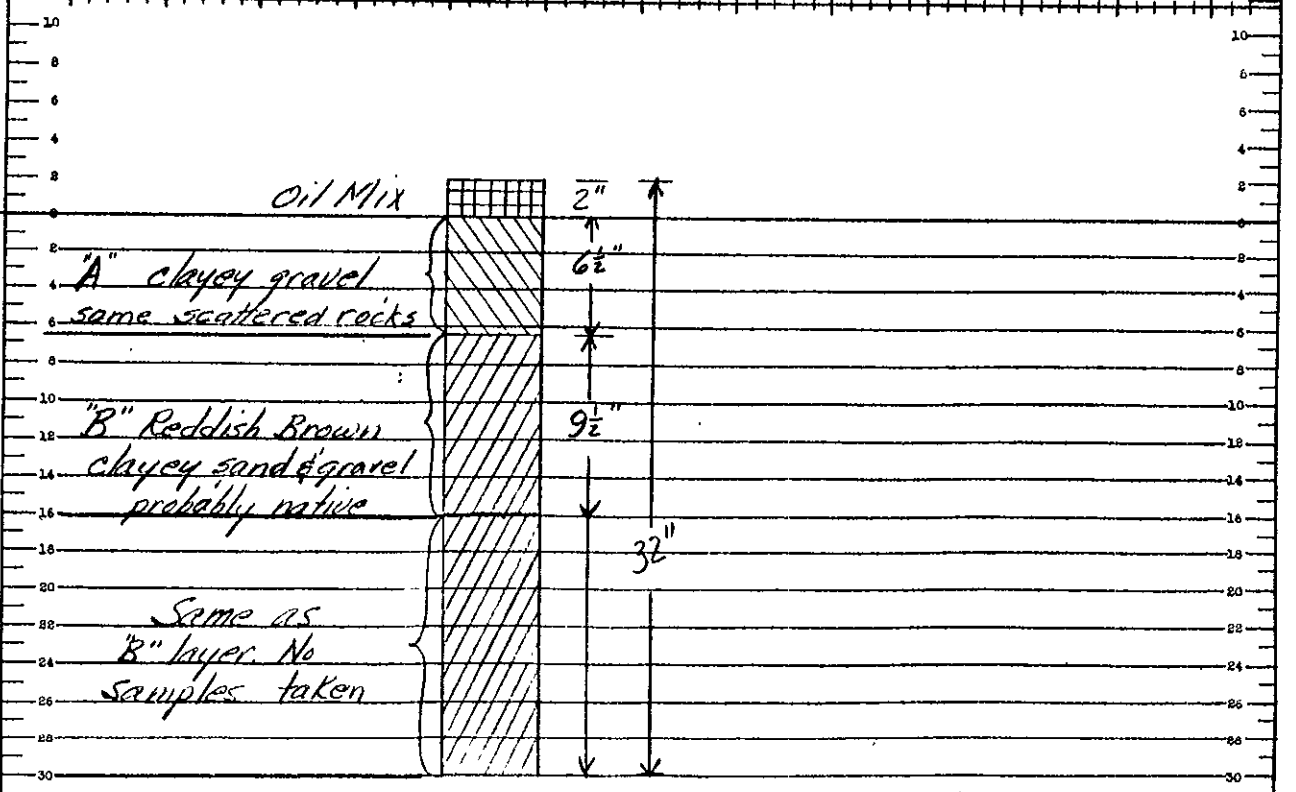
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

Station: 5+80, 6+00, +20, +40, +60, +80

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Party Clawson
Coan

Drawn by Smith

LOCATION AND PROFILE SKETCH

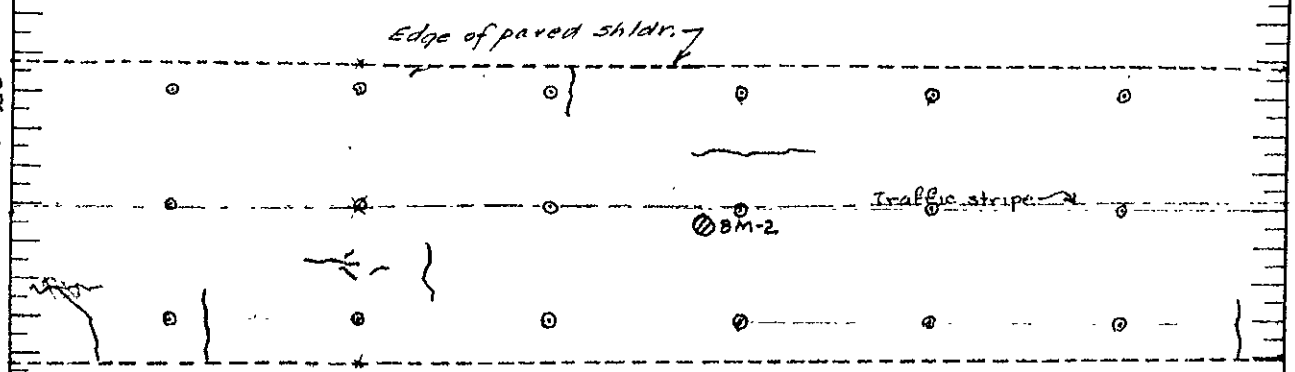
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. ~~00904~~ 00258

Dist. I	Co. Men	Rte. 1	Sec. C	Contract No. —	Date of Constr. Unknown
Fill in grade	Approx. Height	Dist. from End of Fill	No. of Lanes 2	Traffic Med Heavy	Test Hole No. BM-2
Cut	Approx. Depth	Dist. from End of Cut	Side Ditch Approx 2' Lt. & Rt.	Depth Rt 0.7' Lt 0.8'	Date of Sampling 8-30-51
Roadside Use, Left Orchard		Right Vineyard		Grade 1.0%	Up —

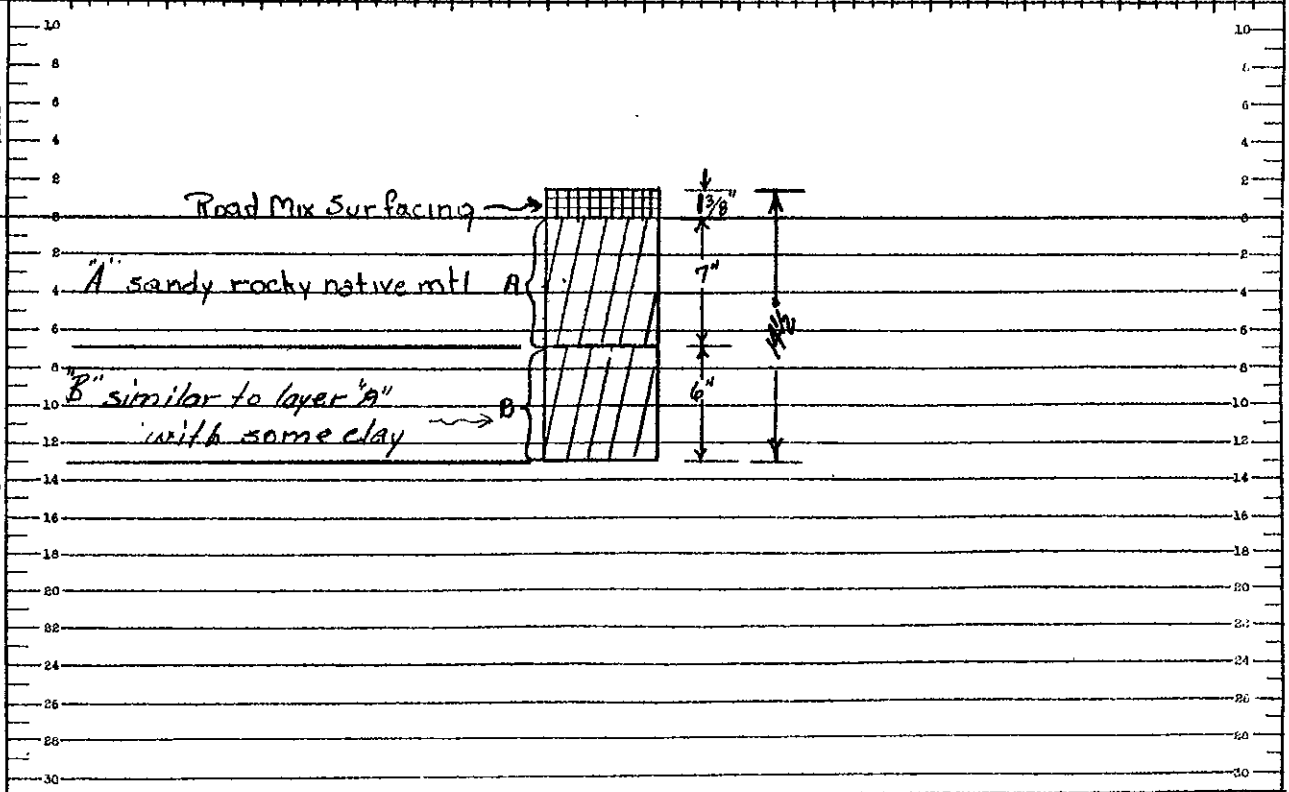
Station: 1+80, 2~, +20, +40, +60, +80

Plan — Scale in Feet 1"=20'



o = permanent reference points set for levels & transverse profiles

Profile — Vertical Scale in Inches



Remarks:

Party Clawson

Coan

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. 1 Co. Men Rte. 1 Sec. C
Load. Sta. No. 11
Loc. Design BM
Sta. 0+00 to 5+00
Sheet No. 1 of 2

Drainage Cross-Sections

ROADWAY CONDITION SURVEY

						Gutter	Edge of Pavt.	Traffic Stripe & Roadway	Edge of Pavt.	Gutter	Bank Shols			
5+00				648.2	648.1	647.9	647.86	648.10	647.67	647.5	648.2			
				36.5	21.5	17.0	13.8	1.8 Left	15.3	18.3	36.8			
4+00				648.0	648.4	646.9	647.49	647.78	647.22	646.5	648.0	647.7	647.5	
				28.0	21.0	20.0	15.3	1.3 Left	15.3	20.8	21.3	25.3	34.8	
3+00				647.2	647.6	645.9	646.71	647.17	646.76	646.3	647.2			
				32.5	22.0	20.8	15.3	0.7 Left	15.8	20.3	36.8			
2+00				646.2	646.5	644.8	645.59	646.34	645.77	644.6	647.0	646.4		
				35.2	22.3	21.3	14.8	0.0	16.8	22.8	24.3	34.8		
1+00				645.5	645.6	644.1	644.83	645.39	644.77	644.0	644.3			
				34.3	23.3	22.3	14.8	0.8 Right	17.3	23.3	33.3			
0+00			644.5	644.0	643.0	643.0	643.85	644.25	643.66	642.9	644.3	644.6		
			30.8	23.3	21.3	16.9	13.1	2.0 Right	18.3	26.3	27.3	34.3		

Road Approach

Road Approach

Road Approach

NOTE: All distances are measured from center Pin Line

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN06
Job Number

Load. Sta. No. 11
Dist. 1 Co. Men Rte. 1 Sec. C
Loc. Design EM
Sta. 6+00 to 10+00
Sheet No. 2 of 2

Drainage Cross-Sections

ROADWAY CONDITION SURVEY

℄ Roadway

NOTE: All distances are measured from center Pin Line

						Gutter	Edge of Pav't	Traffic Stripe	Edge of Pav't	Gutter	Bank Shots			
10+00				648.3	648.7	648.0	648.31	648.78	648.05	647.2	648.2	648.7	648.2	
				32.3	21.0	20.0	16.3	0.6 Left	12.9	18.3	19.3	25.3	34.3	
9+00				647.6	647.7	647.2	648.04	648.91	648.47	647.3	648.0	647.6		
				36.0	23.5	22.5	17.8	1.6 Left	12.5	18.3	19.3	34.3		
8+00			648.5	649.1	648.7	648.0	648.40	648.98	648.41	646.8	647.9	647.5		
			36.5	23.5	21.3	20.8	16.3	22 Left	12.6	18.3	19.3	34.3		
7+00				649.5	650.2	648.3	648.63	649.14	648.48	647.8	648.9	649.5	649.0	
				35.5	20.8	19.5	15.6	2.25 Left	13.4	18.3	19.3	23.3	32.3	
6+00				648.9	649.4	647.9	648.35	648.82	648.43	647.7	649.6	650.4	649.4	
				36.5	21.0	20.3	15.3	22 Left	14.3	18.8	20.3	23.3	33.3	

Form T-527

15

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 79
Road II-Sis-72-A

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Sta. 79 on Road II-Sis-72-A, is located 2.6 miles NE of the Jct. Route 72 and Route 3 towards Macdoel. There are no major road or highway turnoffs between the Station and the section.

The section selected for test is located 2.8 miles NE of the Jct. Rte. 72 and Route 3, 1000 feet NE of Loadometer Sta. 79.

LENGTH: The section is located between Sta. "A" 153+00 and Sta. "A" 163+00, a total length of 1000 feet. Roadway at the section location is a 2-lane highway. The section selected for test is established in both lanes.

SURFACE:

Type: Plant mixed surfacing, constructed in 1943.

Width: Traveled way is 22 feet wide

Thickness: Variable from 3-1/2" to 4"

BASE:

Type and Thickness: Silty sand and gravel native material. Sampled to a depth of 17-1/2 inches below the bottom of the pavement. District information shows a penetration treatment of native material in 1943.

Soil Classification: A-1-b

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 79
Road II-Sis-72-A

DATA OF SECTION SELECTED FOR TEST

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Type and Thickness: Silty sand and gravel native material. Sampled to a depth of 17-1/2 inches below the bottom of the pavement. District information shows a penetration treatment of native material in 1943.

Soil Classification: A-1-b

Loadometer Sta. No. 79
Road II-Sis-72-A

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE:

The section roadway is generally in cut on the right and in fill on the left.

The section is established on a slight vertical curve, the maximum grade being 1%. The highest point on the section is at Station 160+00. Drainage is carried by ditches which parallel the roadway 37' to 39' left and 31' to 40' right, at an elevation of 2.0 to 2.5' below the shoulder point. Drainage from the beginning of the section to Sta. 160+00 is back to the southwest. From Sta. 160+00 to the end of the section, drainage is ahead to the northeast.

There are no culverts or bridges within the limits of this section.

ROADWAY CONDITION

GENERAL:

There are no paved shoulders within the limits of the section. At the edge of pavement there is a vertical drop averaging 0.1 foot to the dirt shoulder.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking:

There are no areas of alligator cracking within the section.

Loadometer Station No. 79
Road II-Sis-72-A

ROADWAY CONDITION

SPECIAL CONDITIONS:

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There is a small area between Sta. 156+79 and Sta. 156+88, 8' to 10' left of centerline that shows shoving and signs of incipient failure.

(4) Patches: There are no patches within the section.

(5) Roadway Section: The section is generally in cut on the right and in fill on the left. The present surface elevation corresponds roughly with that of the surrounding area.

(6) Shoulders: There are no paved or treated shoulders within the section limits. The native material is bladed to the gutter line and serves as a dirt shoulder.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the test section.

B.M. No.	Location	Description	Elevation
1	50' lt. of T.S. @ Sta. 153+58	1/4" steel pin in RR spike in 6" pin	3490.000 (Assumed)
2	44' rt. of T.S. @ Sta. 163+60	Highest spot on large boulder. B.M. marked with paint	3491.721

Loadometer Sta. 79
Road II-Sis-72-A

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

Permanent reference pins were established in 3 lines parallel to centerline. One pin line was along the traffic stripe and the other two were set 10.5' right and left of the traffic stripe, 0.5 ft. inside the edge of pavement.

Profilograph Records:

Transverse:

The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 foot longitudinal intervals throughout the section.

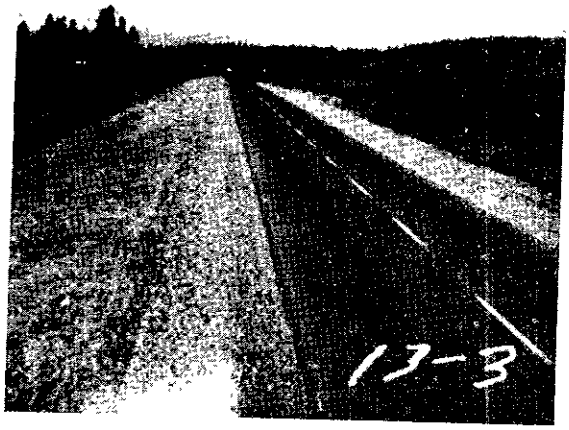
Longitudinal:

By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In each lane, a line of profiles was run with the recording wheel 24" inside the outer pin line.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

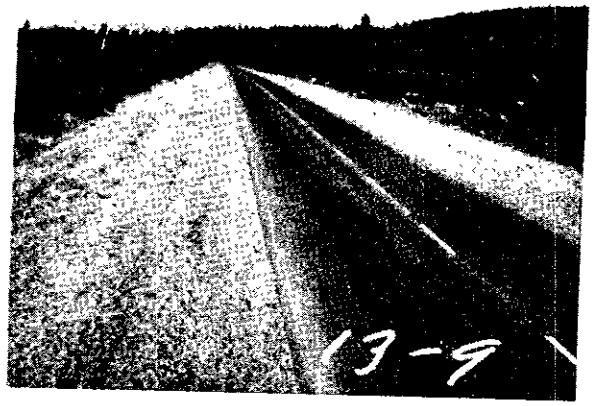
Loadometer Sta. No. 79

II-Sis-72-A



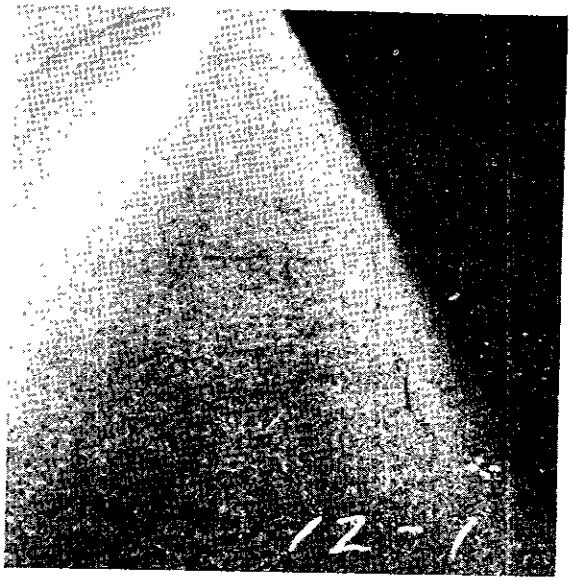
Ahead on Line from

Station 153+00



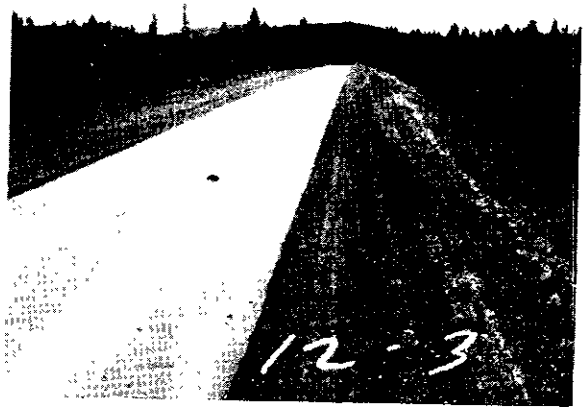
Ahead on Line from

Station 158+00



Minor Crack Left Sta.

160+20 to Sta. 160+40



Back on Line from

Station 163+00

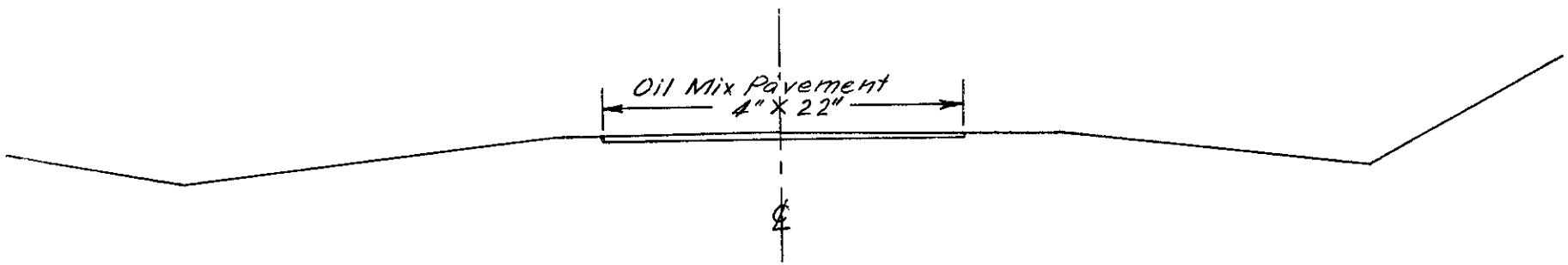
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BO 79
II-Sis-72-A

ROADWAY CONDITION SURVEY

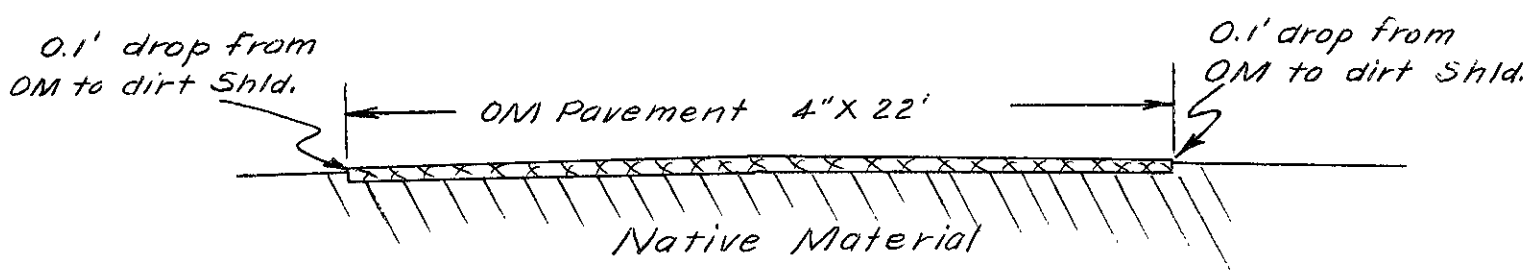
Scale: 1" = 10'

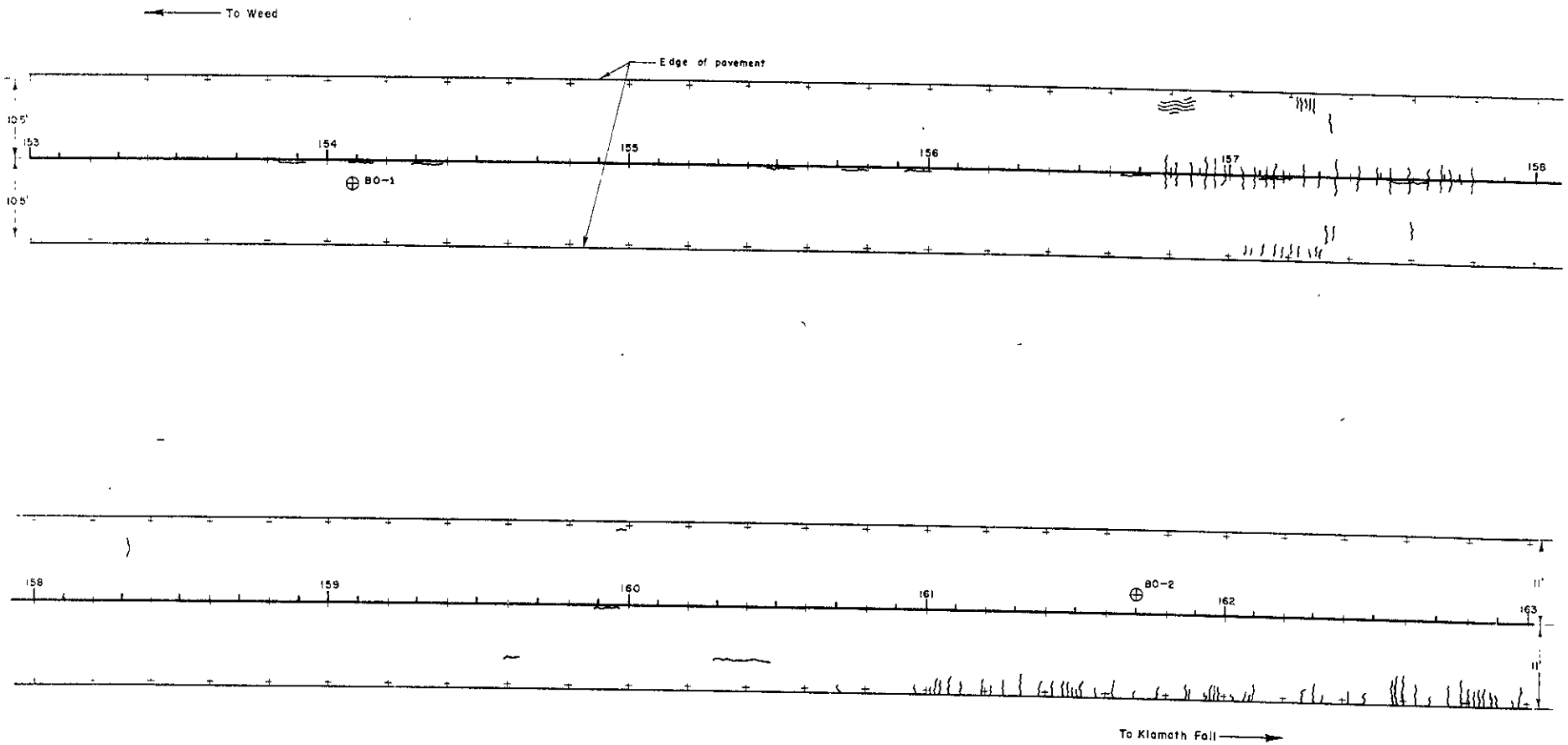
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

IOADOMETER STA. NO. 79
II-Sis-72-A

TEST RESULTS SUMMARY

Load Sta. No. 79
II-Sis-72-A

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BO-1-A	51-3911	154+09	3' right of centerline	OM	4"	0 - 7½"	Base
2	BO-1-B	51-3912	154+09	same	OM	4"	7½" - 17½"	Subbase
3	BO-2-A	51-3913	161+70	2.5' left of centerline	OM	3-1/2	0 - 7"	Base
4	BO-2-B	51-3914	161+70	same	OM	3-1/2	7 - 13"	Subbase

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	7	116	98	11	118	A-1-b	2.67	2.21
2	7	113	97	13	116	A- -b	2.68	2.22
3	7	122	102	11	120	A-1-b	2.59	2.18
4	9	118	103	14	115	A-1-b	2.61	2.16

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	91	80	68	63	58	48	36	14	12	3	N	P
2	100	92	82	77	70	57	41	14	11	2	N	P
3	100	89	69	61	53	46	37	18	15	4	N	P
4	100	94	81	75	67	57	45	19	16	4	N	P

LOCATION AND PROFILE SKETCH

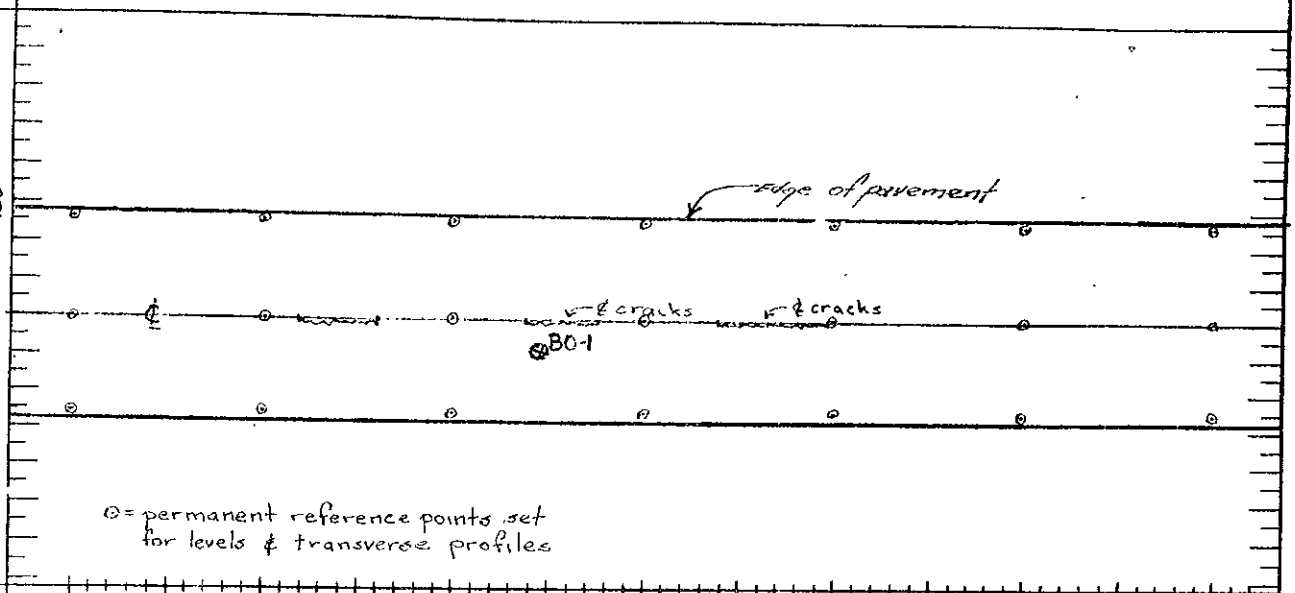
PAVEMENT INVESTIGATION

RESEARCH NO. 00252

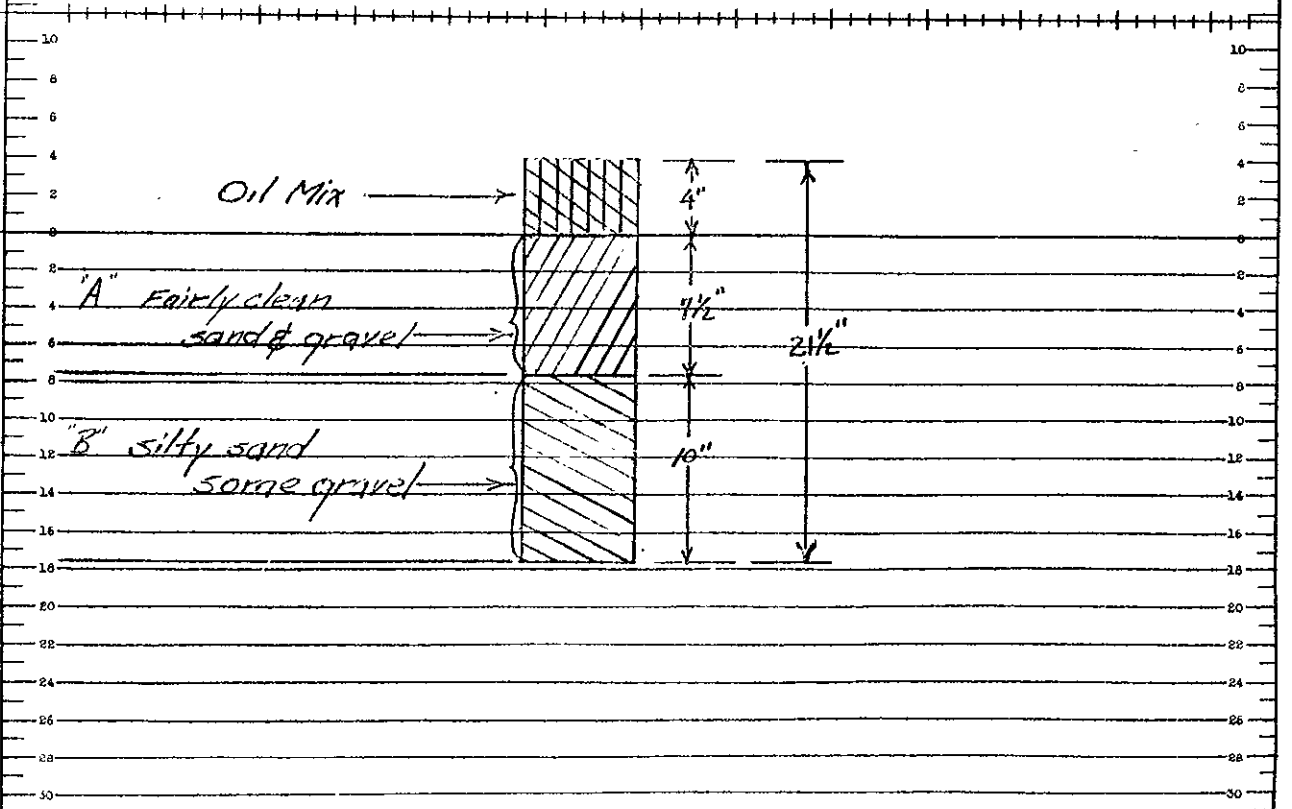
Dist. II Co. Sis. Rte. 72 Sec. A		Contract No.		Date of Constr. 1943	Test Hole No. BO-1
Fill	Dist. from End of Fill	No. of Lanes 2		Traffic light	
Cut Lt & Rt.	Dist. from End of Cut	Side Ditches Rt. & Lt.		Depth 2' Ave.	Date of Sampling 10-9-51
Roadside Use, Left underbrush		Right underbrush		Grade 1 %	Up →

Station: +60, +80, 154+, +20, +40, +60, +80

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Party: Conrad, Clawson, Humbert

Drawn by Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 002 53

Dist. II	Co. Sis	Rte. 78	Sec. A	Contract No. —	Date of Constr. 1943	Test Hole No.	BO-2
Fill on Left	Approx. Depth Lt. Ave. 2'	Dist. from End of Fill		No. of Lanes two	Traffic light		
Cut on Right	Approx. Depth Rt. Ave. 1'	Dist. from End of Cut		Side Ditches Rt. & Lt	Depth 2' Ave.	Date of Sampling	10-9-51
Roadside Use, Left Undeveloped			Right Undeveloped		Grade .5 %	Up ←	

Station: 161 +20, +40, +60, +80, 162N, +20

Plan — Scale in Feet 1" = 20'

Edge of pavement

BO-2

℄

⊙ permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches

Pavement

Subgrade

Oil Mix — 3½"

"A" silty, clayey, sand & gravel — 7"

"B" silty sand with fine gravel — 6"

16½"

Remarks:

Party: Contal, Humbert, Clawson

Drawn By: Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. SIS Rte. 22 Sec. A
Load. Sta. No. 79
Loc. Design 80
Sta. 153+00 to 158+00
Sheet No. 1 of 2

Drainage Cross-Sections
ROADWAY CONDITION SURVEY

	Left							Right						
		Top Slope		Ditch		Dirt Shldr. at E.P.	Edge Pav't	Edge Pav't.	Dirt Shldr. at E.P.		Ditch		Top Slope	
158+00		3488.1 49.0	3490.2 38.0	3489.0 37.0	3491.5 16.0		3491.72 11.0	3491.76 11.0		3491.6 16.0	3489.6 40.0	3490.1 43.0	3491.8 47.0	
157+00		3489.5 46.0		3488.3 37.0	3490.8 17.0	3491.08 11.0	3491.15 11.0	3491.10 11.0	3490.94 11.0	3491.0 11.0	3489.0 39.0		3492.9 48.0	
156+00		3489.8 46.0		3487.7 38.0	3490.1 15.0	3490.18 11.0	3490.39 11.0	3490.40 11.0	3490.27 11.0	3490.1 17.0	3488.1 38.0		3495.5 49.0	
155+00		3489.5 47.0		3487.1 38.0	3489.3 15.0	3489.44 11.0	3489.54 11.0	3489.43 11.0	3489.33 11.0	3489.2 18.0	3487.4 35.0	3488.1 38.0	3493.6 48.0	
154+00		3489.3 50.0		3486.0 38.0	3488.4 14.0	3488.48 11.0	3488.58 11.0	3488.51 11.0	3488.42 11.0	3488.2 17.0	3486.2 36.0		3492.4 48.0	
153+00		3488.7 49.0		3485.0 38.0	3487.3 14.0	3487.35 14.0	3487.45 11.0	3487.45 11.0	3487.34 11.0	3487.2 17.0	3485.4 34.0	3486.5 38.0	3491.5 48.0	

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. Sis Rte. 72 Sec. A
Load. Sta. No. 79
Loc. Design 80
Sta. 159+00 to 163+00
Sheet No. 2 of 2

Drainage Cross-Sections
ROADWAY CONDITION SURVEY

	Left							Right						
		Top Slope		Ditch		Dirt Shldr at E.P.	Edge Pav't	Edge Pav't	Dirt Shldr at E.P.		Ditch		Top Slope	
163+00	3489.2	3489.2		3488.5	3491.0		3491.30	3491.44		3491.2	3489.4	3489.1	3492.3	
	48.0	38.0		36.0	15.0		11.0	11.0		17.0	32.0	41.0	48.0	
162+00	3489.9	3489.8		3489.0	3491.4		3491.16	3491.79		3491.6	3490.6	3489.8	3493.0	
	48.0	40.0		37.0	16.0		11.0	11.0		17.0	31.0	40.0	48.0	
161+00	3489.6	3489.6		3489.1	3491.8		3492.02	3492.06		3491.8	3489.9	3489.8	3492.4	
	47.0	39.0		37.0	14.0		11.0	11.0		17.0	32.0	41.0	47.0	
160+00		3489.3		3488.9	3491.9	3492.02	3492.15	3492.17		3492.0	3489.9		3491.8	
		48.0		39.0	16.0	11.0	11.0	11.0		15.0	40.0		45.0	
159+00		3488.9		3489.0	3491.7	3491.86	3491.99	3491.99		3491.7	3489.7		3491.9	
		49.0		39.0	16.0	11.0	11.0	11.0		18.0	40.0		47.0	

Form T-527

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 79
Road II-Sis-72-A

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Sta. 79 on Road II-Sis-72-A, is located 2.6 miles NE of the Jct. Route 72 and Route 3 towards Macdoel. There are no major road or highway turnoffs between the Station and the section.

The section selected for test is located 2.8 miles NE of the Jct. Rte. 72 and Route 3, 1000 feet NE of Loadometer Sta. 79.

LENGTH: The section is located between Sta. "A" 153+00 and Sta. "A" 163+00, a total length of 1000 feet. Roadway at the section location is a 2-lane highway. The section selected for test is established in both lanes.

SURFACE:

Type: Plant mixed surfacing, constructed in 1943.

Width: Traveled way is 22 feet wide

Thickness: Variable from 3-1/2" to 4"

BASE:

Type and Thickness: Silty sand and gravel native material. Sampled to a depth of 17-1/2 inches below the bottom of the pavement. District information shows a penetration treatment of native material in 1943.

Soil Classification: A-1-b

Loadometer Sta. No. 79
Road II-Sis-72-A

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE:

The section roadway is generally in cut on the right and in fill on the left.

The section is established on a slight vertical curve, the maximum grade being 1%. The highest point on the section is at Station 160+00. Drainage is carried by ditches which parallel the roadway 37' to 39' left and 31' to 40' right, at an elevation of 2.0 to 2.5' below the shoulder point. Drainage from the beginning of the section to Sta. 160+00 is back to the southwest. From Sta. 160+00 to the end of the section, drainage is ahead to the northeast.

There are no culverts or bridges within the limits of this section.

ROADWAY CONDITION

GENERAL:

There are no paved shoulders within the limits of the section. At the edge of pavement there is a vertical drop averaging 0.1 foot to the dirt shoulder.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking:

There are no areas of alligator cracking within the section.

Loadometer Station No. 79
Road II-Sis-72-A

ROADWAY CONDITION

SPECIAL CONDITIONS:

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There is a small area between Sta. 156+79 and Sta. 156+88, 8' to 10' left of centerline that shows shoving and signs of incipient failure.

(4) Patches: There are no patches within the section.

(5) Roadway Section: The section is generally in cut on the right and in fill on the left. The present surface elevation corresponds roughly with that of the surrounding area.

(6) Shoulders: There are no paved or treated shoulders within the section limits. The native material is bladed to the gutter line and serves as a dirt shoulder.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the test section.

B.M. No.	Location	Description	Elevation
1	50' lt. of T.S. @ Sta. 153+58	1/4" steel pin in RR spike in 6" pin	3490.000 (Assumed)
2	44' rt. of T.S. @ Sta. 163+60	Highest spot on large boulder. B.M. marked with paint	3491.721

Loadometer Sta. 79
Road II-Sis-72-A

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

Permanent reference pins were established in 3 lines parallel to centerline. One pin line was along the traffic stripe and the other two were set 10.5' right and left of the traffic stripe, 0.5 ft. inside the edge of pavement.

Profilograph Records:

Transverse:

The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 foot longitudinal intervals throughout the section.

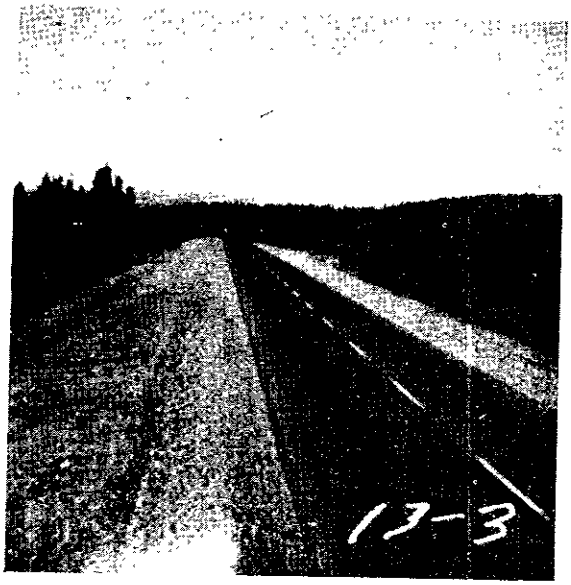
Longitudinal:

By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In each lane, a line of profiles was run with the recording wheel 24" inside the outer pin line.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

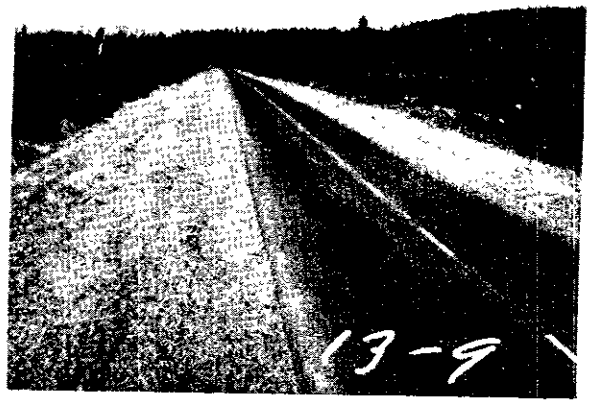
Loadometer Sta. No. 79

II-Sis-72-A



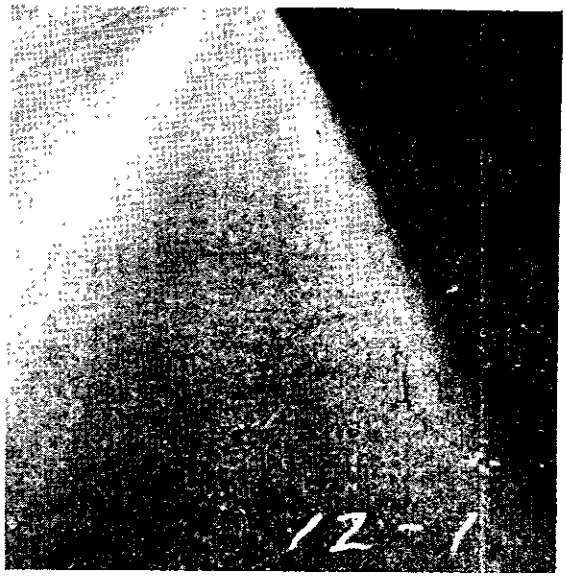
Ahead on Line from

Station 153+00



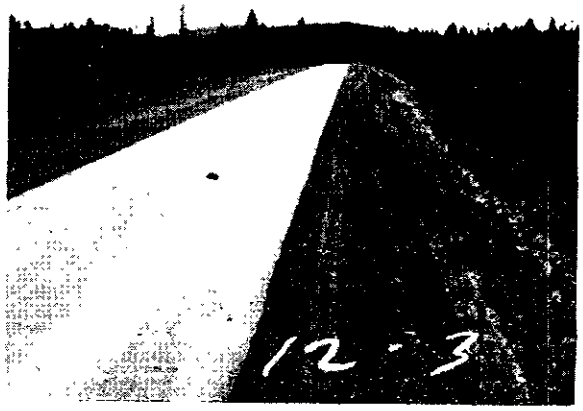
Ahead on Line from

Station 158+00



Minor Crack Left Sta.

160+20 to Sta. 160+40



Back on Line from

Station 163+00

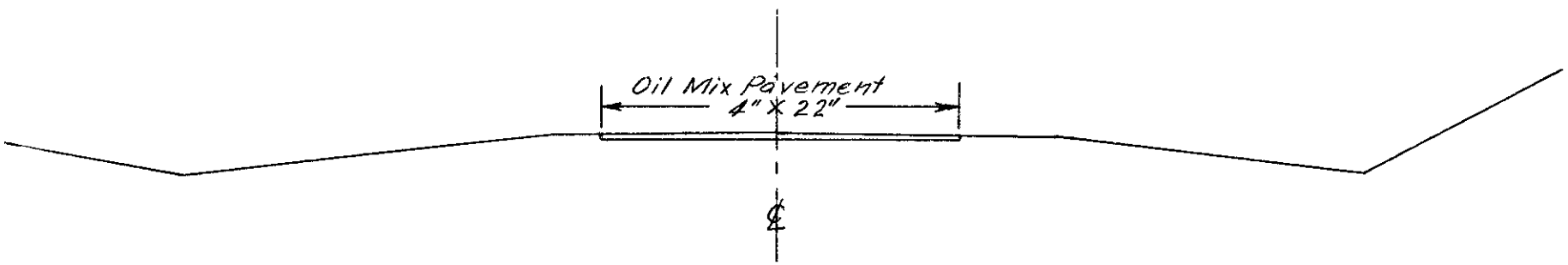
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BO 79
II-Sis-72-A

ROADWAY CONDITION SURVEY

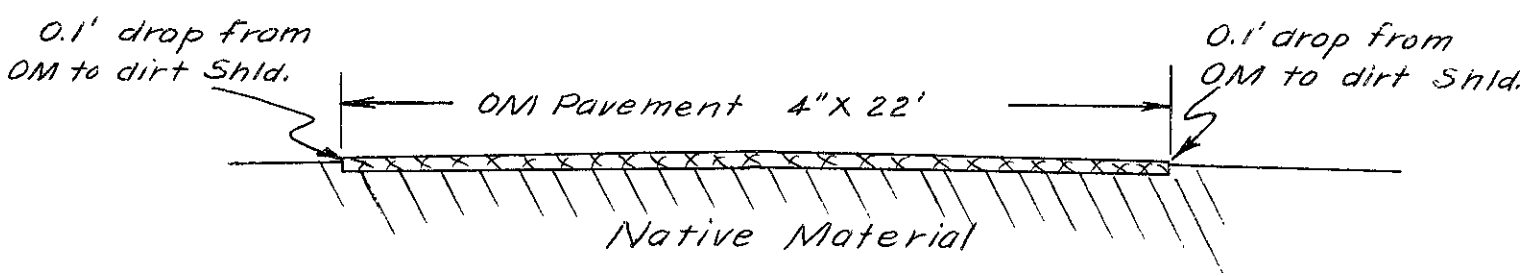
TYPICAL ROADWAY SECTION

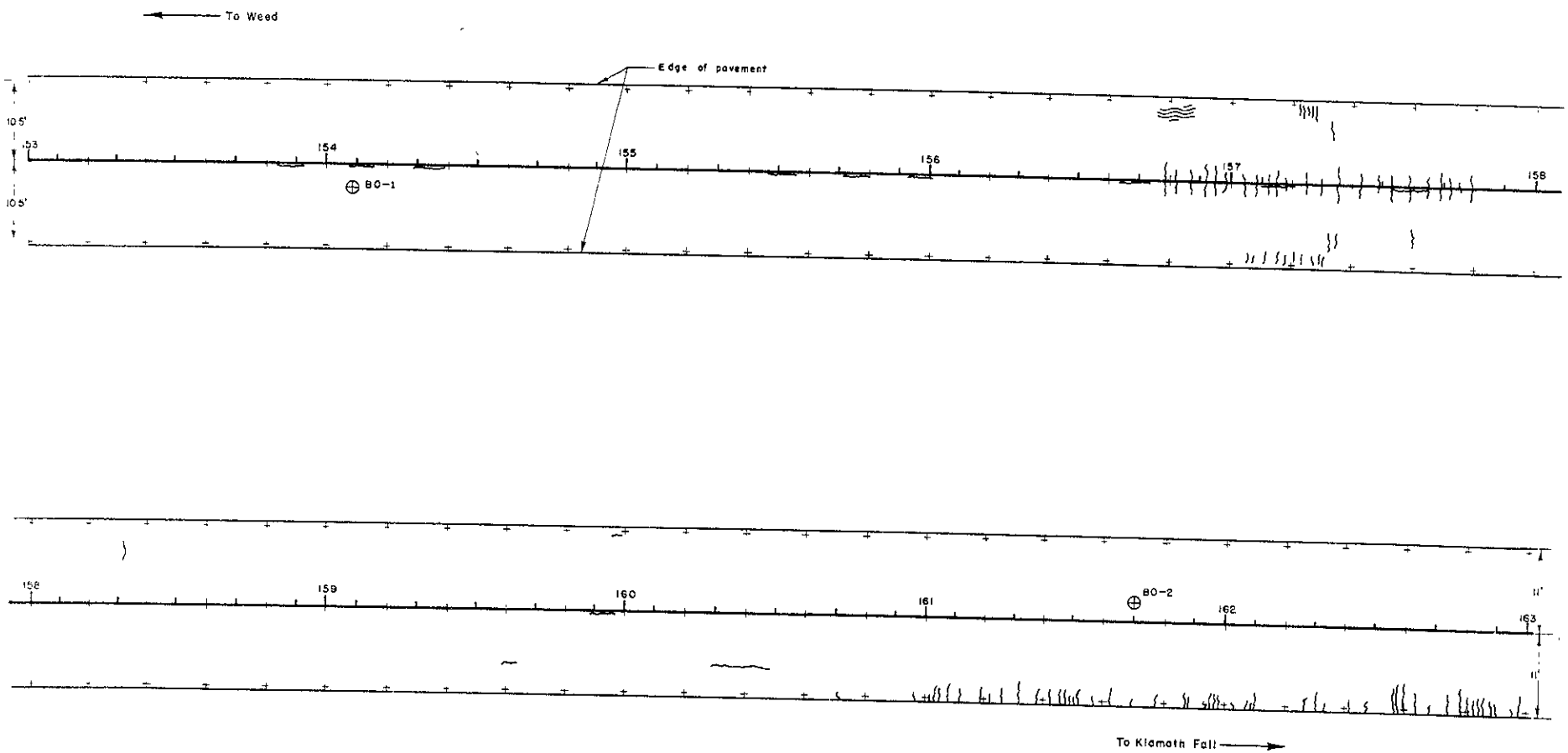
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 79
II-Sis-72-A

TEST RESULTS SUMMARY

Load Sta. No. 79
II-Sis-72-A

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	BO-1-A	51-3911	154+09	3' right of centerline	OM	4"	0 - 7½"	Base
2	BO-1-B	51-3912	154+09	same	OM	4"	7½" - 17½"	Subbase
3	BO-2-A	51-3913	161+70	2.5' left of centerline	OM	3-1/2	0 - 7"	Base
4	BO-2-B	51-3914	161+70	same	OM	3-1/2	7 - 13"	Subbase

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	7	116	98	11	118	A-1-b	2.67	2.21
2	7	123	97	13	116	A-1-b	2.68	2.22
3	7	122	102	11	120	A-1-b	2.59	2.18
4	9	118	103	14	115	A-1-b	2.61	2.16

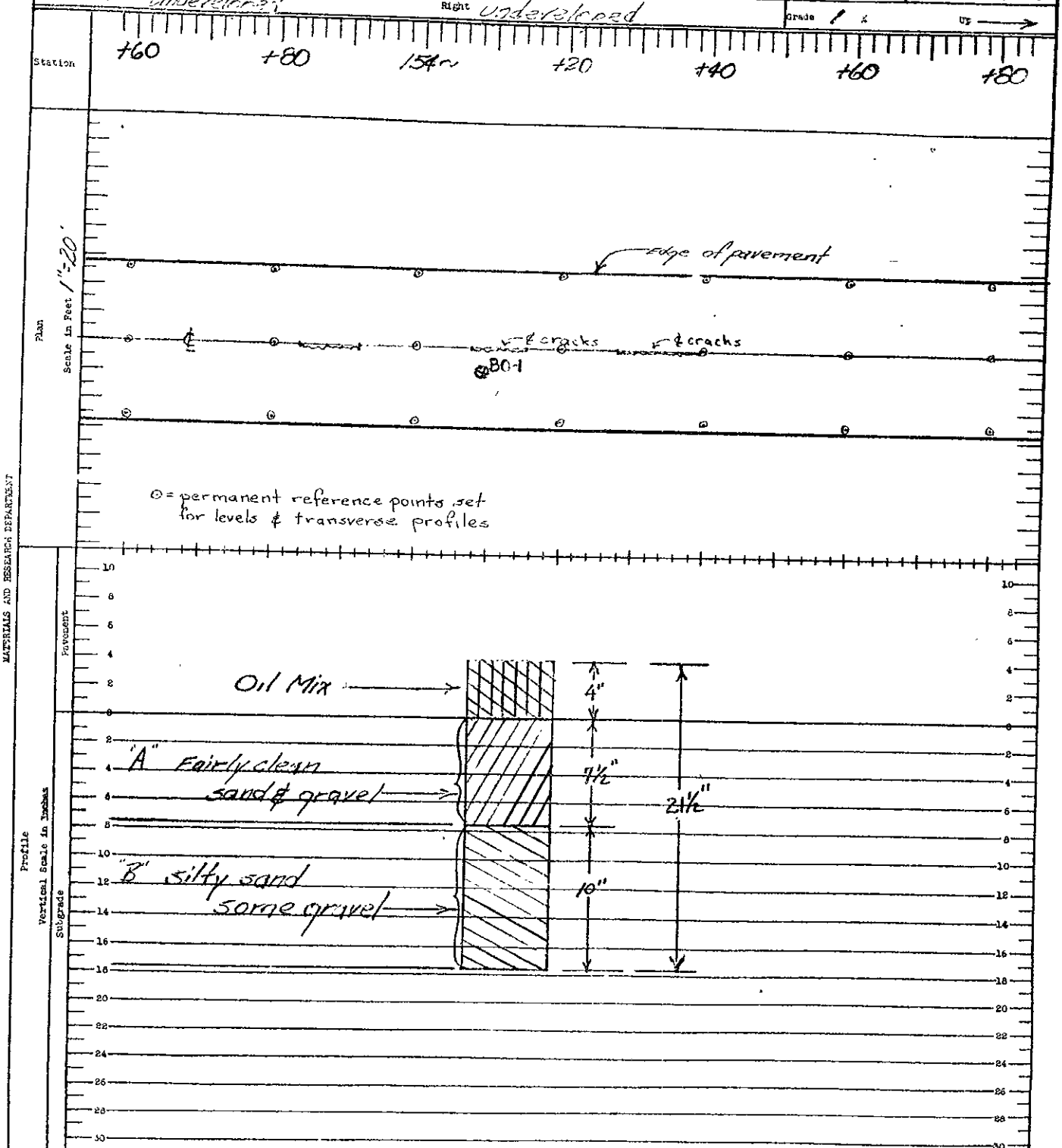
Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	91	80	68	63	58	48	36	14	11	3	N	P
2	100	92	82	77	70	57	47	24	17	2	N	P
3	100	89	69	61	53	40	30	18	15	4	N	P
4	100	94	81	75	67	57	45	19	16	4	N	P

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. II Sis.	Rte. 72	Sec. A	Contract No.	Date of Constr. 1943	Test Hole No. BO-1
Fill	A Cut	Dist. from End of Fill	No. of Lanes 2	Traffic light	
Cut Lt & Rt.	Depth Lt Ave 0.5 Rt Ave 4.0	Dist. from End of Cut	Side Ditches Rt & Lt	Depth 2.0 Ave.	Date of Sampling 10-9-51
Roadside Use, Left undeveloped		Right undeveloped		Grade 1 %	Up →



Remarks:

Party: Confal, Clawson, Humbert

Drawn By Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

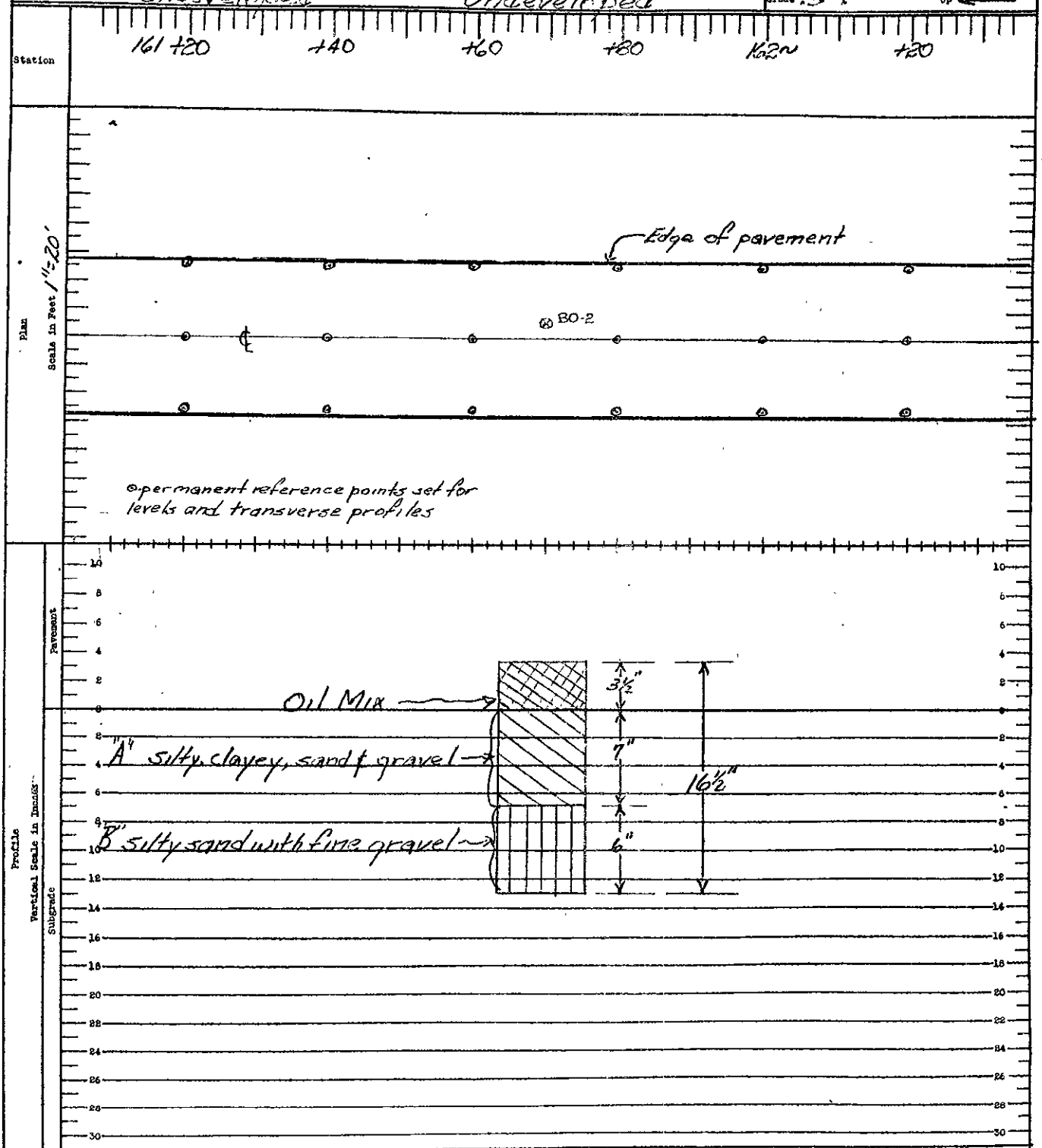
LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 00253

Dist. II	Co. Sis	Rte. 72	Sec. A	Contract No. —	Date of Constr. 1943
Test Hole No. BO-2					
Fill on Left	Approx. Height Lt. Ave. 2'	Dist. from End of Fill	No. of Lanes two	Traffic light	
Cut on Right	Approx. Depth Rt. Ave. 1'	Dist. from End of Cut	Side Ditches Rt. & Lt	Depth 2' Ave.	Date of Sampling 10-9-51
Roadside Use, Left Undeveloped		Right Undeveloped		Grade .5 %	Up ←

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT



Remarks:

Party Contal, Humbert, Clawson

Drawn by Coan

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. Sis Rte. 72 Sec. A
Load. Sta. No. 79
Loc. Design BO
Sta. 153+00 to 158+00
Sheet No. 1 of 2

Drainage Cross-Sections

ROADWAY CONDITION SURVEY

	Left						Right					
	Top Slope		Ditch		Dirt Shldr. at E.P.	Edge Pav't	Edge Pav't.	Dirt Shldr. at E.P.		Ditch		Top Slope
158+00	3488.1 49.0	3490.2 38.0	3489.0 31.0	3491.5 16.0		3491.72 11.0	3491.76 11.0		3491.6 16.0	3489.6 40.0	3490.1 43.0	3491.8 47.0
157+00	3489.5 46.0		3488.3 37.0	3490.8 17.0	3491.08 11.0	3491.15 11.0	3491.10 11.0	3490.94 11.0	3491.0 11.0	3489.0 39.0		3492.9 48.0
156+00	3489.8 46.0		3487.7 38.0	3490.1 15.0	3490.18 11.0	3490.39 11.0	3490.40 11.0	3490.27 11.0	3490.1 17.0	3488.1 38.0		3495.5 40.0
155+00	3489.5 47.0		3487.1 38.0	3489.3 15.0	3489.44 11.0	3489.54 11.0	3489.43 11.0	3489.33 11.0	3489.2 18.0	3487.4 35.0	3488.1 38.0	3493.6 48.0
154+00	3489.3 50.0		3486.0 38.0	3488.4 14.0	3488.48 11.0	3488.58 11.0	3488.51 11.0	3488.42 11.0	3488.2 11.0	3486.2 36.0		3492.4 48.0
153+00	3488.7 49.0		3485.0 38.0	3487.3 14.0	3487.35 11.0	3487.45 11.0	3487.45 11.0	3487.34 11.0	3487.2 17.0	3485.4 34.0	3486.5 38.0	3491.5 48.0

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. Sis Rte. 72 Sec. A
Load. Sta. No. 79
Loc. Design 80
Sta. 159+00 to 163+00
Sheet No. 2 of 2

Drainage Cross-Sections
ROADWAY CONDITION SURVEY

	Left							Right						
		Top Slope		Ditch		Dirt Shldr at E.P.	Edge Pav't	Edge Pav't	Dirt Shldr at E.P.		Ditch		Top Slope	
163+00	3489.2	3489.2		3488.5	3491.0		3491.30	3491.44		3491.2	3489.4	3489.1	3492.3	
	48.0	38.0		36.0	15.0		11.0	11.0		17.0	32.0	41.0	48.0	
162+00	3489.9	3489.8		3489.0	3491.4		3491.16	3491.79		3491.6	3490.6	3489.8	3493.0	
	48.0	40.0		37.0	16.0		11.0	11.0		17.0	31.0	40.0	48.0	
161+00	3489.6	3489.6		3489.1	3491.8		3492.02	3492.06		3491.8	3489.9	3489.8	3492.4	
	47.0	39.0		37.0	14.0		11.0	11.0		17.0	32.0	41.0	47.0	
160+00		3489.3		3488.9	3491.9	3492.02	3492.15	3492.17		3492.0	3489.9		3491.8	
		48.0		39.0	16.0	11.0	11.0	11.0		15.0	40.0		45.0	
159+00		3488.9		3489.0	3491.7	3491.86	3491.99	3491.99		3491.7	3489.1		3491.9	
		49.0		39.0	16.0	11.0	11.0	11.0		18.0	40.0		47.0	

Form T-527

16

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 14
Road II-Sha-3-B

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Pit No. 14 on Road II-Sha-3-B is located 1.0 mile south of Jct. Rte. 3 and Rte. 28 towards Redding. The section selected for test is located on the tangent adjacent to the loadometer pit.

LENGTH: The section is located between Sta. "B" 42+00 and Sta. "B" 52+00, a total length of 1000 feet.

Roadway at the section location is a 2-lane highway, both lanes of which are included as part of the section.

SURFACE:

Type: Construction records show a plant mixed surfacing placed in 1948 over an open graded plant mixed surfacing placed in 1943. The original surfacing was road mix placed in 1935.

Width: Traveled way is 25 feet wide. The right lane is 12 ft. and the left lane is 13 ft. in width. The total width of pavement within the section limits varies from 32 feet to 40 feet. The areas on the right of roadway between Sta. 45+60 and Sta. 47+60 and between Sta. 48+40 and Sta. 52+00 and the area on the left between Sta. 45+20 and Sta. 50+50 have been filled to

Loadometer Station No. 14
Road II-Sha-3-B

ROADWAY STRUCTURE

SURFACE:

Width: (Continued) within 1.5' - 2.0' of roadway grade to accommodate traffic into roadside businesses. Some areas have been paved with oil mix surfacing; other areas have a gravel surface.

Thickness: Plant mixed surfacing is 1 inch thick. The open graded plant mixed surfacing varies from 2-3/4" to 3-1/4". The road mix is from 2" to 3" in thickness. Total pavement thickness varies from 5-3/4" to 7-1/4". In the sample taken at Sta. 47+19 no open graded mix was found. Total pavement thickness was 5-1/2".

BASE:

Type and Thickness: Crusher run base 3-3/4" to 5-1/2" in thickness. Material was placed in 1935.

Soil Classification: A-1-a

SUBBASE:

Type and Thickness: Silty sand and gravel. Apparently roadway excavation from just north of the test section used to raise roadway grade above the surrounding ground level. Total thickness sampled from 7-3/4" to 13".

Soil Classification: A-1-b; A-2-4; A-4

Loadometer Station No. 14
Road II-Sha-3-B

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE:

Section roadway is entirely in fill. The section has a level profile grade. There are no clearly defined ditches within the section limits.

Generally, drainage in the area of the section selected for test is transverse to roadway centerline from left to right.

From Sta. 42+00 to the vicinity of Sta. 45+00 the drainage is back toward the beginning of the section. Drainage is carried from left to right of roadway through a 24" C.M.P. at Sta. 41+66, and away from the roadway in a natural swale.

A 24" C.M.P. at Sta. 51+63 carries drainage from left to right to a drop inlet box with a cast steel grating 64.5' feet right of Sta. 51+41. From there, drainage is carried away from the roadway under the roadside business in a 30" C.M.P.

Fill for roadside business was placed with no apparent provisions made for drainage which flows away from the roadway in all cases. Once off the filled area, this runoff water must seek its own outlet through natural drainage

Loadometer Station No. 14
Road II-Sha-3-B

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

channels to the nearby Sacramento River.

ROADWAY CONDITION

GENERAL:

From Sta. 42+00 to Sta. 47+30 the pavement of the traveled way is in excellent condition. From Sta. 47+30 to end of section the pavement shows considerable distress in the form of alligator cracking. There is no readily apparent reason for this difference of surface condition.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking:

Areas of alligator cracking are shown graphically on the plan diagram and are listed below for convenience:

Left Lane:

Sta. 47+30 to Sta. 47+57, 7.5 to 11.0' lt. ℄ 3.5' wide - Severe
Sta. 48+35 to Sta. 48+62, 6.5 to 9.5' lt. ℄, 3.0' wide, fairly severe
Sta. 48+70 to Sta. 48+84, 2.0 to 5.0' lt. ℄ 3.0' wide, not too severe
Sta. 48+90 to Sta. 48+98, 7.0 to 9.5' lt. ℄, 2.5' wide, not too severe
Sta. 49+12 to Sta. 49+17, 6.0 to 9.0' lt. ℄, 3.0' wide, not too severe
Sta. 49+14 to Sta. 49+30, 2.0 to 3.0' lt. ℄, 1.0' wide, not too severe
Sta. 49+23 to Sta. 50+25, 6.0 to 9.0' lt. ℄, 3.0' wide, severe
Sta. 49+41 to Sta. 49+51, 2.0 to 4.0' lt. ℄, 2.0' wide, not too severe
Sta. 49+60 to Sta. 50+42, 1.0 to 4.0' lt. ℄, 3.0' wide, severe

Loadometer Station No. 14
Road II-Sha-3-B

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

Left Lane (Continued)

Sta. 51+73 to Sta. 51+86, 1.5 to 3.0' lt. ℄ 1.5' wide, not too severe

Right Lane:

Sta. 57+57 to Sta. 57+65, 2.0 to 3.5' rt. ℄, 1.5' wide, not too severe
Sta. 48+60 to Sta. 50+36, 2.5 to 5.0' rt. ℄, 2.5' wide, severe
Sta. 49+00 to Sta. 49+15, 7.0 to 10.0' rt. ℄, 3.0' wide, not too severe
Sta. 49+90 to Sta. 50+32, 7.0 to 9.5' rt. ℄, 2.5' wide, fairly severe
Sta. 50+55 to Sta. 50+70, 9.0 to 10.5' rt. ℄, 1.5' wide, not too severe
Sta. 50+80 to Sta. 50+96, 2.0 to 4.5' rt. ℄, 2.5' wide, not too severe

(2) Areas of Raveling: There are no areas of raveling in the section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping in the section.

(4) Patches: There are no patched areas within the section.

(5) Roadway Section: The section roadway is entirely in fill. Pavement surface is from 4.0 to 5.5' above the surrounding areas.

(6) Shoulders: Throughout the section there are asphaltic mix shoulders which vary in width from 3.0 to 5.0'. Shoulders are in generally fair condition. There are areas adjacent to the roadway that have been filled and paved for roadside

ROADWAY CONDITION

SPECIAL CONDITIONS:

(6) Shoulders: (Continued) business as was noted previously in this report.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section in P.C.C. headwalls.

B.M. No.	Location	Description	Elevation
1	35' lt. of Sta. 41+66	Ramset pin in center of PCC headwall	598.718
2	32' lt. of Sta. 51+65	Ramset pin in NW corner PCC headwall	600.00 (Assumed)

Permanent reference pins were established in 3 lines parallel to centerline. One pin line was along the traffic stripe, one pin line was set 11 feet left of the stripe, 1.7 to 2.5 feet inside the edge of traveled way. The third pin line was set 11 feet right of the stripe, 2.0 to 2.8 feet inside the edge of the traveled way.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine

Loadometer Station No. 14
Road II-Sha-3-B

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

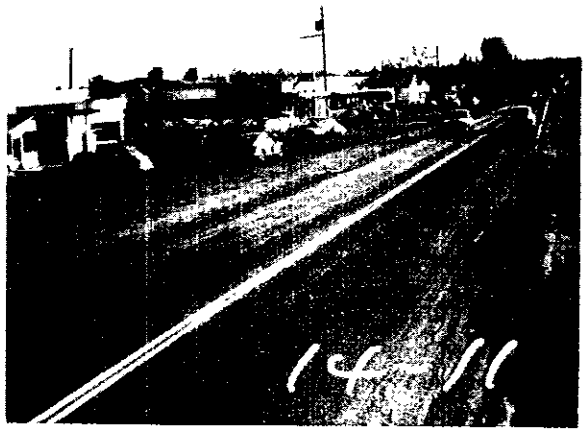
Profilograph Records:

Transverse: (Continued) developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 foot longitudinal intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In each lane, a line of profiles was run with the outer wheels of the Profilograph along the outer pin lines. All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 14

II-Sha-3-B



Widening Strip Right Back

from Station 52+00

Widening Strip Left Back

from Station 52+00

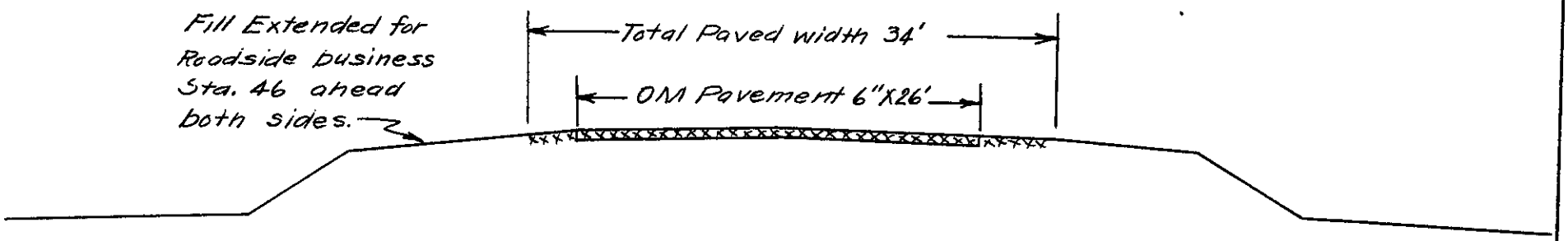
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BN 14
II-Sha-3-B

ROADWAY CONDITION SURVEY

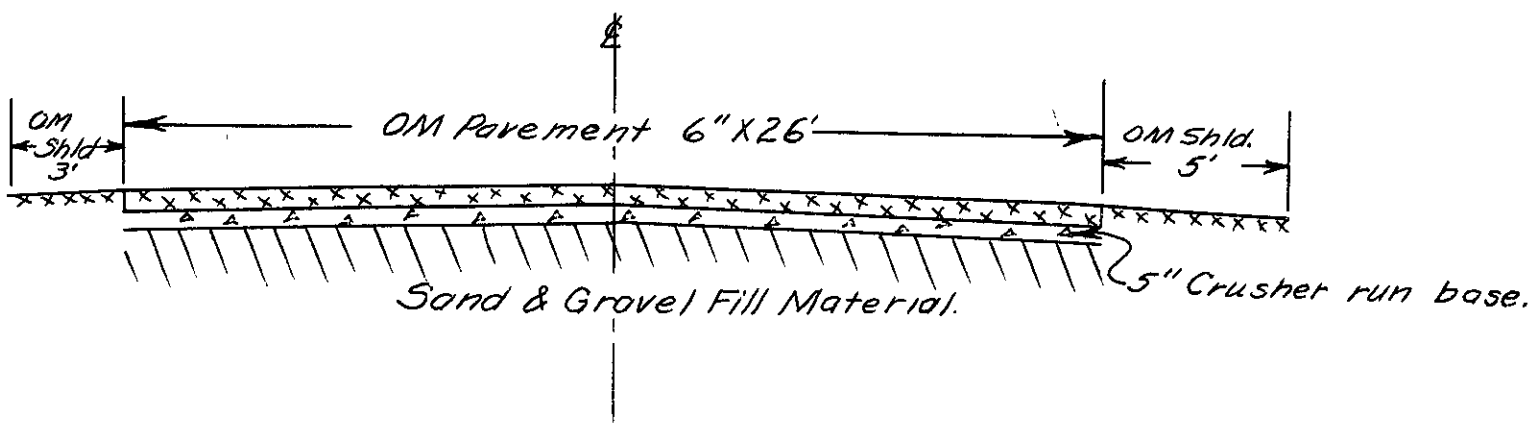
TYPICAL ROADWAY SECTION

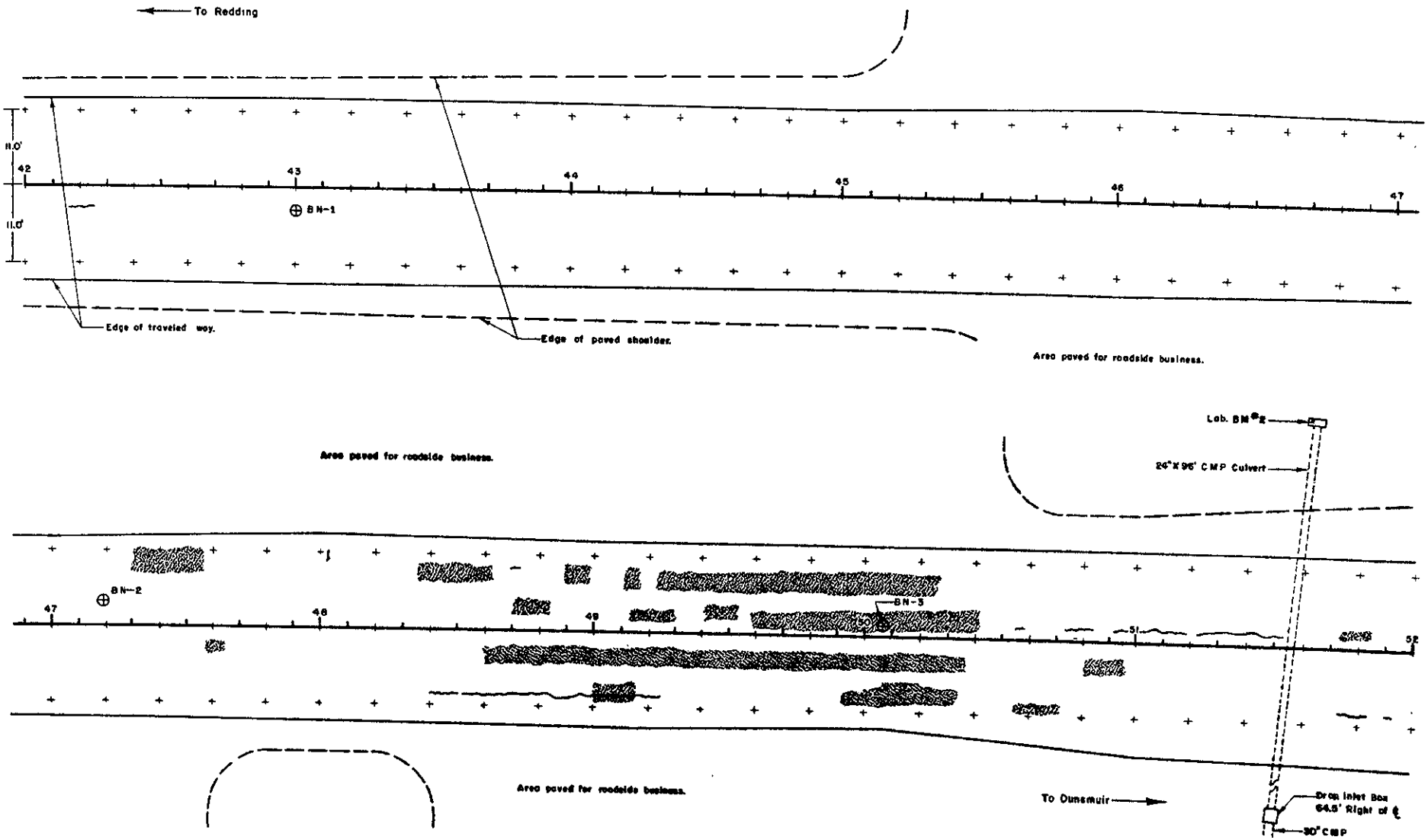
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking

Failure

Block Cracking

Shoving

Patch

⊕ Location of Sample Hole

\+ Location of Permanent Reference Points

LOADOMETER STA. NO. 14
II-Sha-3-B

TEST RESULTS SUMMARY

Load. Sta. No. 14
II-Sha-3-B

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth Below Btm. Pav't.	Soil Samples Layer Description
1	BN-1-A	51-3712	43+00	3.2' rt. of ℄	OM	7¼"	0-3-3/4"	Base
2	BN-1-B	51-3713	43+00	Same	OM	7¼"	3-3/4-7-3/4"	Subbase
3	BN-1-C	51-3714	43+00	Same	OM	7¼"	7-3/4-16-3/4	Probably Basement
4	BN-2-A	51-3715	47+19	3.4' lt. of ℄	OM	5½"	0-5-1/2	Basement
5	BN-2-B	51-3716	47+19	Same	OM	5½"	5½ - 10½"	Subbase
6	BN-2-C	51-3717	47+19	Same	OM	5½"	10½ - 14¼	Probably Basement
7	BN-3-A	51-3718	50+07	1.5' lt. of ℄	OM	5-3/4	0 - 4-3/4	Base
8	BN-3-B	51-3719	50+07	Same	OM	5-3/4	4-3/4 - 7-3/4	Subbase
9	BN-3-C	51-3720	50+07	Same	OM	5-3/4	7-3/4-14¼"	Probably Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	3	165	115	7	143	A-1-a	2.70	2.70
2	8	136	103	10	132	A-1-b	2.69	
3	11	130	99	10	131	A-2-4	2.68	
4	3	152	106	6	143	A-1-a	2.73	2.68
5	18	109	94	17	116	A-4	2.73	
6	11	124	92	10	135	A-2-4	2.73	2.70
7	4	160	110	7	145	A-1-a	2.75	2.68
8	9	124	95	11	130	A-2-4	2.69	
9	10	132	101	12	131	A-2-4	2.65	2.62

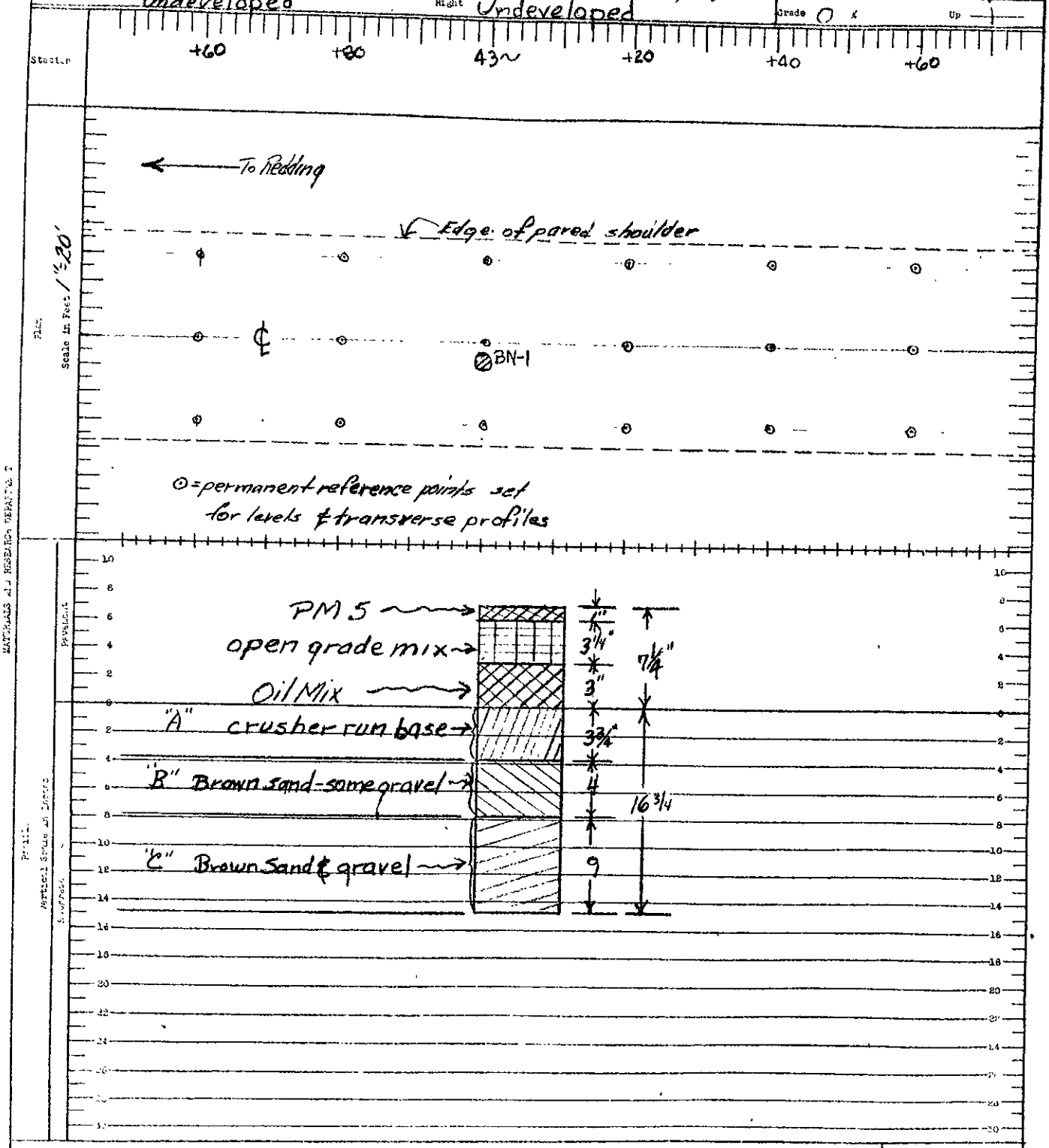
Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	91	53	45	39	31	23	13	13	5	25	19
2	100	96	89	84	76	62	39	16	14	4	N	P
3	94	90	84	80	74	65	50	25	23	9	N	P
4	100	87	40	32	24	18	14	8	8	4	24	18
5				100	99	98	89	42	36	10	N	P
6	100	86	72	68	63	55	44	26	24	9	30	21
7	100	91	46	37	30	24	17	11	10	4	23	18
8	100	95	90	83	77	67	48	17	14	6	N	P
9	100	97	89	82	77	67	47	17	14	6	27	20

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. II	Co. Sha	Rte. 3	Sec. B	Contract No. —	Date of Constr 1935-1943-1948
Fill ✓	Approx. Height 3' to 4'	Dist. from End of Fill 200' | 150'	No. of Lanes 2	Traffic Med Heavy	Test Hole No. BN-1
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None clearly defined	Depth —	Date of Sampling 9-27-51
Road Type, Left Undeveloped		Right Undeveloped		Grade 0 %	Up —



Party Clawson
Coan

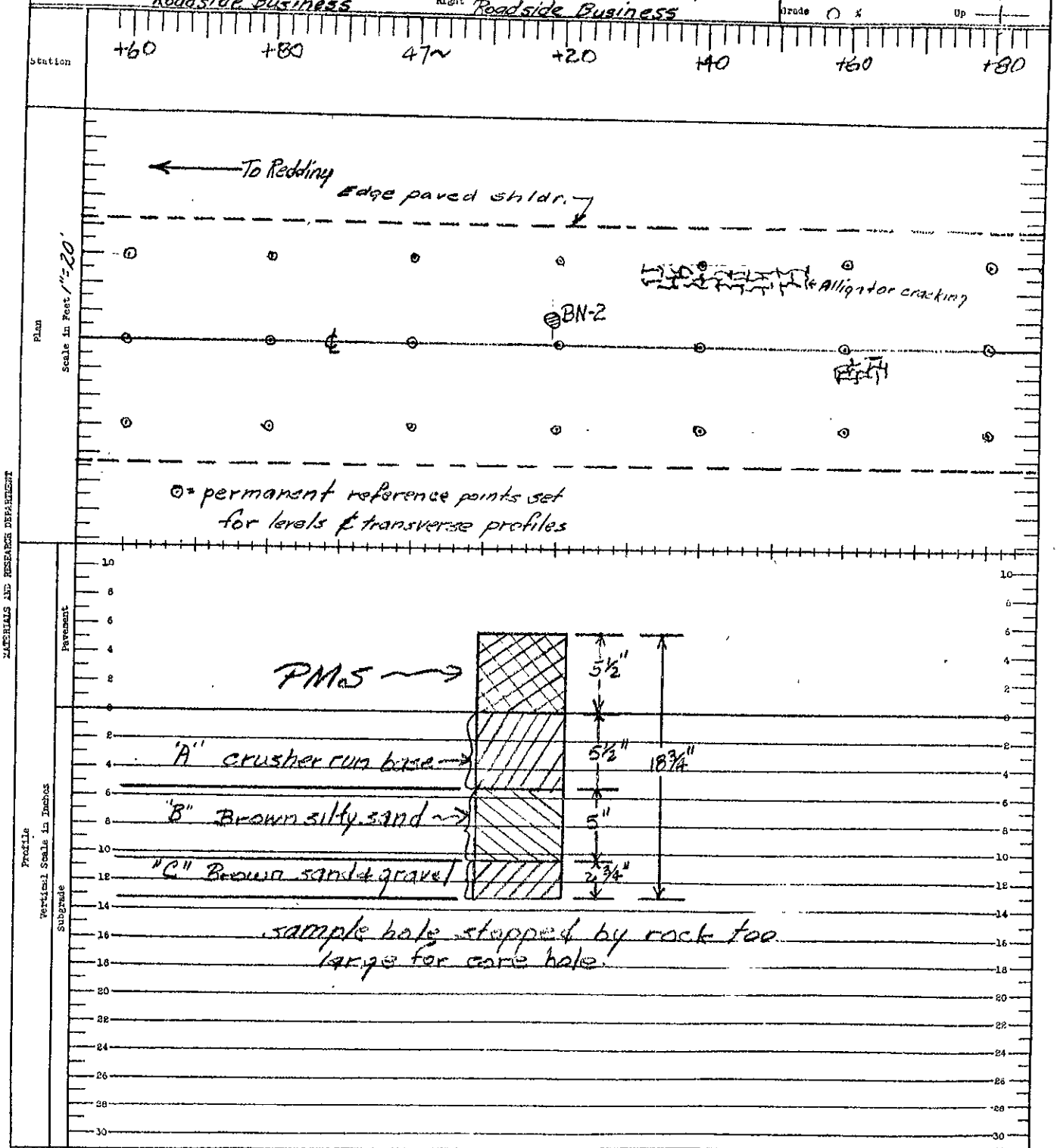
Drawn By Coan

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. II	Co. Sha	Rte. 3	Sec. B	Contract No. —	Date of Constr. 1935-1943-1948
Fill ✓	Approx. Height 3'	Dist. from End of Fill	No. of Lanes 2	Traffic Med Heavy	Test Hole No. BN-2
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None clearly defined	Depth —	Date of Sampling 9-28-52
Roadside Use, Left Roadside Business		Right Roadside Business		Grade 0 %	Up —



Remarks:

Party Clawson

Coan

Drawn By Coan

DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. II	Co. Sha	Rte. 3	Sec. B	Contract No. —	Date of Constr. 1935-1945-1949
Fill ✓	Approx. Height 3'	Dist. from End of Fill		No. of Lanes 2	Traffic Med Heavy
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches None clearly defined	Depth —
Roadside Use, Left Roadside Business		Right Roadside Business		Grade 0%	Up —

Test Hole No. BN-3

Date of Sampling 9-28-52

Station: +60 +80 50~ +20 +40 +60

Plan — Scale in Feet 1"=20'

← To Redding

Edge paved shldr.

Note: Areas adjacent to roadway have been raised with gravel fill and paved to accomodate traffic into roadside businesses.

BN-3

⊙ = permanent reference points set for levels & transverse profiles

Profile — Vertical Scale in Inches

Pavement

Subgrade

PMS

open grade mix

Oil Mix

"A" crusher run base

"B" brn. sand some gravel

"C" brn. sand & gravel

1"

2¾"

2"

5¾"

4¾

3"

6½"

20"

Remarks:

Party Clawson

Coan

Drawn by Coan

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. Sha Rte. 3 Sec. B
Load. Sta. No. 14
Loc. Design BN
Sta. 42+00 to 47+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
			Field Shots	Toe of Fill	Top of Fill	Edge Paved Shoulder	Edge Travelwy.	Edge Travelwy	Edge Paved Shldr.	Top of Fill	Toe of Fill	Field Shot		
47+00	Paved for roadside business				602.1 40.0	602.60 16.0	602.11 12.8	602.68 13.1	602.41 17.8	602.1 30.0	600.7 52.0	Paved for roadside business		
46+00	Paved for roadside business			600.9 51.0	601.6 32.0	602.45 17.0	602.58 13.3	602.67 13.7	602.56 16.8	601.5 38.0	601.1 50.0	Paved for roadside business		
45+00	Paved for roadside business				601.6 39.0	602.41 17.5	602.74 12.7	602.74 13.4	602.49 18.8	601.8 32.5	597.5 48.0	597.1 60.0		
44+00			597.9 53.0	598.3 32.9	601.6 27.3	602.54 16.5	602.72 12.8	602.61 13.7	602.43 18.4	601.5 28.0	598.1 34.7			
43+00			597.0 55.0	597.7 34.4	601.6 27.8	602.34 16.0	602.59 13.0	602.66 13.8	602.39 18.0	601.8 27.2	598.1 34.0	597.5 50.0		
42+00			597.0 53.0	597.7 33.5	601.5 28.1	602.50 15.6	602.68 12.5	602.63 13.6	602.51 17.4	602.1 27.7	598.2 35.7	597.0 60.0		
				595.9 34.0 inlet	Flow Line of 24" CMP						595.4 36.0 outlet			

Form

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. II Co. Sha. Rte. 3 Sec B
Load. Sta. No. 14
Loc. Design BN
Sta. 48+00 to 52+00
Sheet No. 2 of 2

Drainage Cross-Sections

ROADWAY CONDITION SURVEY

	Left						Right						
	Roadside		Business		Edge Pav't	Edge T.W.	Edge T.W.	Edge Pav't	Roadside		Business		
52+00	597.1 60.0	598.5 45.0	602.1 40.0	602.3 26.0	602.56 21.0	602.77 13.0	602.47 17.4	602.50 21.0	601.85 28.0	600.5 53.0			
	Sta. 51+63 32' Left ℄ Inlet 24" CMP. Standard P.C.C. Headwall Flow line Elev. 597.1						Sta. 51+41 64.5' Right ℄ Drop Inlet with standard frame + grate for side drainage. 24" CMP. from Sta. 51+63 empties into D.I. Box at Fl. Elev 596.8. Drainage removed by 30" CMP (200)' long under roadside Business Buildings to the East						
51+00			599.9 61.0	601.9 27.0	602.39 18.3	602.65 13.5	602.76 16.6	602.13 22.7	600.5 51.0				
50+00			600.5 50.0	601.6 26.0	602.35 17.0	602.58 13.0	602.69 13.3	602.46 19.0	(Paved) 602.33 27.2	602.20 44.0			
49+00		601.1 45.0	601.1 29.0	601.9 22.0	602.34 17.8	602.62 13.0	602.65 13.8	602.52 21.3	(Paved) 601.99 53.0				
48+00			600.9 44.0	601.4 32.0	602.16 23.0	602.67 13.7	602.51 13.5	602.36 18.0	Top of Fill 601.5 38.3	Toe of Fill 597.8 47.0	592.1 60.0		

Form T-527

17

Research No. 00258
W.O. Number 13NN26

Loadometer Station No. 21
Road IV-SCl-2-B

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Sta. No. 21 on Road IV-SCl-2-B is located approximately 3.0 miles south of Jct. Rte. 2, San Jose to Gilroy and Route 68 bypass to San Jose, toward Gilroy. There are no major road or highway turnoffs between the scale and the section.

The section selected for test is located approximately 2.0 miles south of the Loadometer Station toward Gilroy.

LENGTH: The section is located between Sta. "B" 690+00 and Sta. "B" 700+00, a total length of 1000 feet. Roadway at the section location is a 3-lane highway. The section is established in all three lanes.

SURFACE:

Type: Present surface is asphaltic mix pavement in all three lanes. Construction plans from the last major construction on this route in 1937 which added the present left lane, show an old 20 foot P.C.C. pavement, construction date unknown, under the right and centerlane.

Width: Present traveled way is three lanes each 11.0 ft. wide, for a total width of 33 feet. The total pavement width of the section varies from 48.5 to 49.0 feet.

Loadometer Station No. 21
Road IV-SC1-2-B

ROADWAY STRUCTURE

SURFACE

Thickness: In the right and center lanes, the asphaltic mix over the old 20 foot P.C.C. pavement varies from 8 to 10-1/2 inches. In the left lane, a total thickness of 13 inches of asphaltic mix was found. The old 20 foot P.C.C. pavement was found to vary from 4 to 5 inches in thickness.

Construction records of 1937 show a minimum of 2" thickness of asphaltic mix on the right and center lanes over the old P.C.C. pavement, and 6" of asphaltic mix over imported borrow in the left lane.

Apparently the difference between the Construction records of 1937 and what was found by the field crew is due to blankets placed by the maintenance forces.

BASE:

Type and Thickness: In the left lane, added in 1937, a layer of sand and gravel 5-1/2 inches in thickness was found. Construction records show this material to be an imported borrow.

Soil Classification A-2-4

Loadometer Station No. 21
Road IV-SC1-2-B

ROADWAY STRUCTURE

BASE:

Soil Classification: (Continued)

In the right and centerlanes, under the old P.C.C. pavement, a layer of sandy silt and gravel was found. Thickness varied from 7 to 8 inches.

A-4

In the centerlane at Sta. 695+51, a layer of silty sand and gravel 3 inches thick with a soil classification of A-1-a was found below the 7 inch layer of base material. From all indications, this layer is just a pocket.

BASEMENT:

Type and Thickness:

Clayey silt in all three lanes, apparently native material. Thickness sampled varied from 6-3/8 to 10-1/2 inches.

Soil Classification:

A-4

SIDE DITCH DRAINAGE:

Section is in grade on the left and in fill on the right. The section has a profile grade of +0.4%.

There are no clearly defined ditches within the section limits. Drainage on the right is carried in an area approximately 1.0 below the roadway surface between the roadway and the railroad fills.

Loadometer Station No. 21
Road IV-SC1-2-B

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

On the left, the drainage is carried in an area bladed by maintenance forces into a gutter line. Drainage is from south to north. There are no culverts or bridges in the section.

ROADWAY CONDITION

GENERAL:

The roadway surface of all three lanes shows pitting throughout the section.

There are three clearly defined areas, listed below, in which the surface has been either gouged by a wheel rim or is failing and being whipped out by traffic.

Sta. 696+94, 2.0'Rt. of Rt. inner pin line
Sta. 698+10, 2.0'Lt. of Rt. outer pin line
Sta. 699+15, 2.5'Lt. of Rt. outer pin line

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking within the section.

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping within the section.

(4) Patches: There are no patches within the section.

(5) Roadway Section: The section is in grade on the left and in fill on the right. The roadway surface is

Loadometer Station No. 21
Road IV-SC1-2-B

ROADWAY CONDITION

SPECIAL CONDITIONS:

(5) Roadway Section: (Continued) approximately 1.0 feet above the area on the right between the roadway fill and the railroad fill.

(6) Shoulders: Throughout the section there are asphaltic mix shoulders which are 8.0' wide on the left and vary from 7.5' to 8.0' in width on the right. Shoulders are in generally fair condition. The area on the left from the vicinity of Sta. 691+00 to Sta. 692+00 has been widened for an entrance to a school.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section:

B.M. No.	Location	Description	Elevation
1.	25' rt. of rt. outer pin line Sta.680+30	Ramset pin in R.R. spike in telegraph pole	95+588
2.	25' rt. of rt. outer pin line Sta.700+25	Ramset pin in R.R. spike in tree	99.980 (Assumed)

Permanent reference pins were established in 4 lines parallel to centerline. One pin line was set along the traffic stripe between the right traffic lane and the passing lane.

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

One pin line was set along the traffic stripe between the left traffic lane and the passing lane. One line was set along each edge of the traveled way. In all cases, pin lines are 11.0' apart.

Profilograph Records:

Transverse:

The permanent points set for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in the left and right lanes and also in the passing lane were made at 20 foot longitudinal intervals throughout the section.

Longitudinal:

By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In the right lane two lines of profiles were run, one 30" from the left pin line and one 30" from the right pin line. In the centerlane, one line of profiles was run in the center of the lane.

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

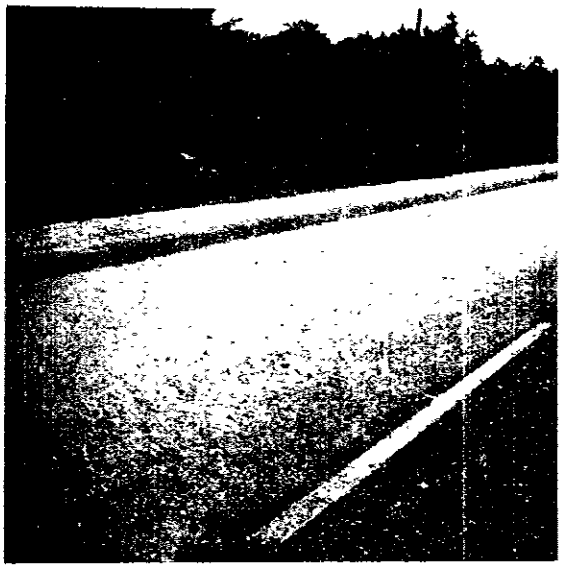
Longitudinal: (Continued) In the left lane two lines of profiles were run, one 30" from the right pin line and one 30" from the left pin line. All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 21

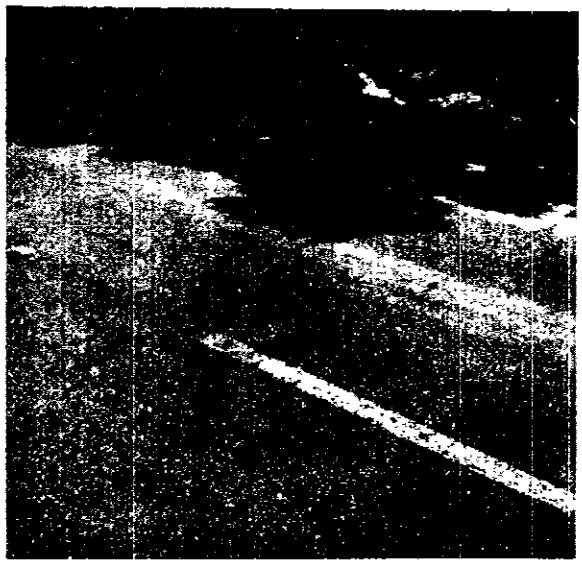
IV-SCl-2-B

Surface Pitting Vicinity of Station 693+20

Crack across Right lane Station 694+10



Broken Area in Left Lane. Vicinity of Sta. 694+90



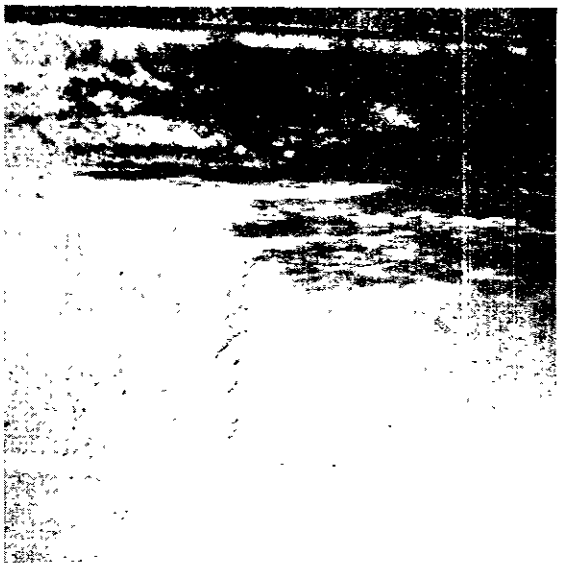
Longitudinal and Transverse Cracks in Rt. lane Station 695+85

Loadometer Station No. 21

IV-SC1-2-B

Surface Pitting in Left Lane. Ahead from Sta. 697+00

Severe Crack and Gouged Areas Right Lane Station 698+00 to Sta. 698+20



Transverse Crack in Rt. lane Sta. 699+34

Transverse and longitudinal Cracks in Right Lane Sta. 699+50 to Station 700+00

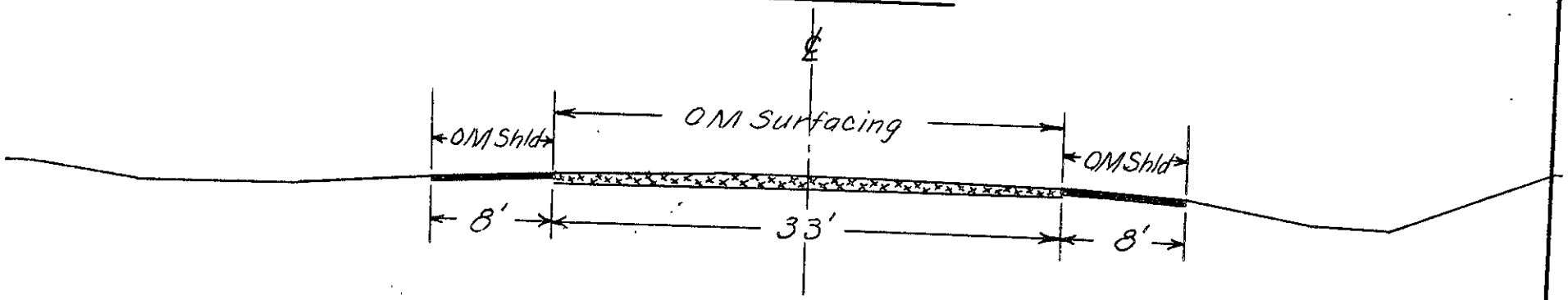
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CC 21
IV-SCl-2-B

ROADWAY CONDITION SURVEY

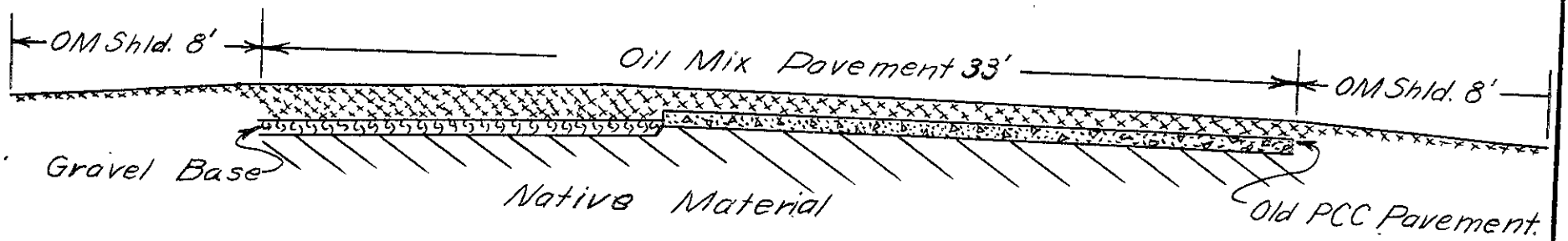
TYPICAL ROADWAY SECTION

Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'



ROADWAY STRUCTURE

BASE AND SUBBASE MATERIAL:

Classification (Continued)

Below the base material are two slabs of PCC pavement. The upper slab varies from 5" to 5-1/2" in thickness and the lower slab varies from 3-1/2" to 4-1/2" in thickness so that total thickness of slabs varies from 9" to 9-1/2". Below the PCC slab, at two of the locations sampled, a clayey, silty sand and gravel was encountered which appeared to be an imported material. At the third location sampled, there was none of this material. Test results show material just under the old PCC pavement to be the same from all three locations sampled. Material is classified as A-6. Thickness of sample layers varied from 5-1/4" to 6-3/4". Below the material described above was native basement soil, a black and gray adobe clay, classified as A-7-6.

SIDE DITCH DRAINAGE

The section roadway is entirely in fill. The section roadway has a profile grade of +1.4% from south to north. Drainage runs from north towards the south and passes under the roadway beyond the section limits.

TEST RESULTS SUMMARY

Load. Sta. No. 21
IV-SCl-2-B

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	CC-1-A	52-3312	692+77	9' left of R.O.E.P.	OM PCC	8" 4"	0 - 8"	Base
2	CC-1-B	52-3313	692+77	same	OM PCC	8" 4"	8" - 20"	Basement
3	CC-2-A	52-3314	698+20	9' right of L.O.E.P.	OM	13"	0 - 5-1/2"	Base
4	CC-2-B	52-3315	698+20	Same	OM	13"	5-1/2"-16"	Basement
5	CC-3-A	52-3316	695+51	On centerline roadway	OM PCC	10" 5"	0 -7-1/2"	Base
6	CC-3-B	52-3317	695+51	Same	OM PCC	10" 5"	7-1/2"-10-1/2	Subbase
7	CC-3-C	52-3318	695+51	Same	OM PCC	10" 5"	10½" - 17"	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	7	125	94	9	[illegible]	A-4	2.63	2.58
2	11	106	88	14	[illegible]	A-4	2.60	
3	4	134	97	[illegible]	138	A-2-4	2.64	2.54
4	10	109	89	13	132	A-4	2.63	
5	13	107	88	13	12[illegible]	A-4	2.61	
6	No	Sand	Volume	Taken		A-1-a	2.64	2.59
7	15	102	89	15	15	A-4	2.59	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	99	95	85	80	73	66	50	35	43	15	23	18
2						90	99	95	80	20	26	21
3	83	65	36	30	22	[illegible]	10	6	5	3	25	17
4		100	97	94	92	90	87	72	68	23	29	21
5	100	95	92	90	89	88	87	68	62	23	25	20
6	100	89	44	37	34	[illegible]	28	15	13	4	19	18
7							100	84	78	30	31	22

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. IV Co. SCl Rte. 2 Sec. B		Contract No. —		Date of Constr. 1937	Test Hole No. CC-1
F. On Right	Approx. Height 12	Dist. from End of Fill	No. of Lanes Three	Traffic Heavy	
Cut	Depth —	Dist. from End of Cut	Side Ditch None		
Roadside Use, Left Agricultural		Right Rail Road R/W		Depth —	Date of Sampling 8-8-52
				Grade 0.11%	Up →

Station: 692+20 +40 +60 +80 693+ +20

Plan — Scale in Feet 1"=20'

← To San Jose — Edge paved shoulder

Edge traveled way

Surface good — some pitting

Traffic Stripe

℄

CC-1

Traffic Stripe

⊙ = permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches

Pavement

Subgrade

Oil Mix → 8" 12"

PCC → 4"

"A" gravelly silt → 8" 28"

16"

"B" brown silt (native mtl.) 8"

Party: Smith, Coan, Clawson

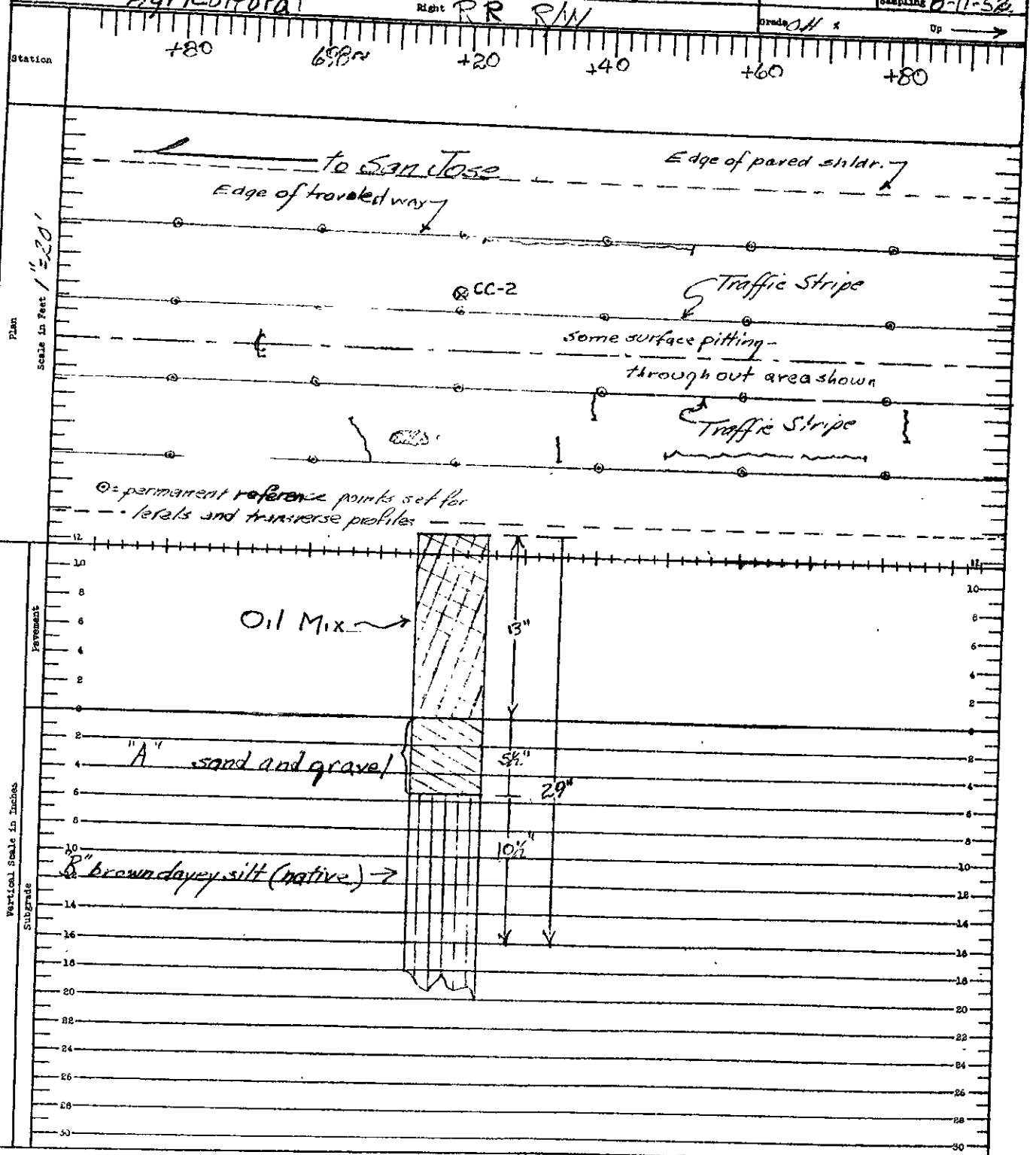
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. IV Co. SCl Rte. 2 Sec. B		Contract No. —	Date of Constr. 1937	Test Hole No. CC-2	
Fill On Right	Approx. Height 1°	Dist. from End of Fill	No. of Lanes Three	Traffic heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None	Depth —	Date of Sampling 8-11-52
Roadside Use, Left Agricultural		Right RR R/W		Grade OH %	Up →



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

Remarks:

Party Smith
Coan
Clawson

Drawn By Coan

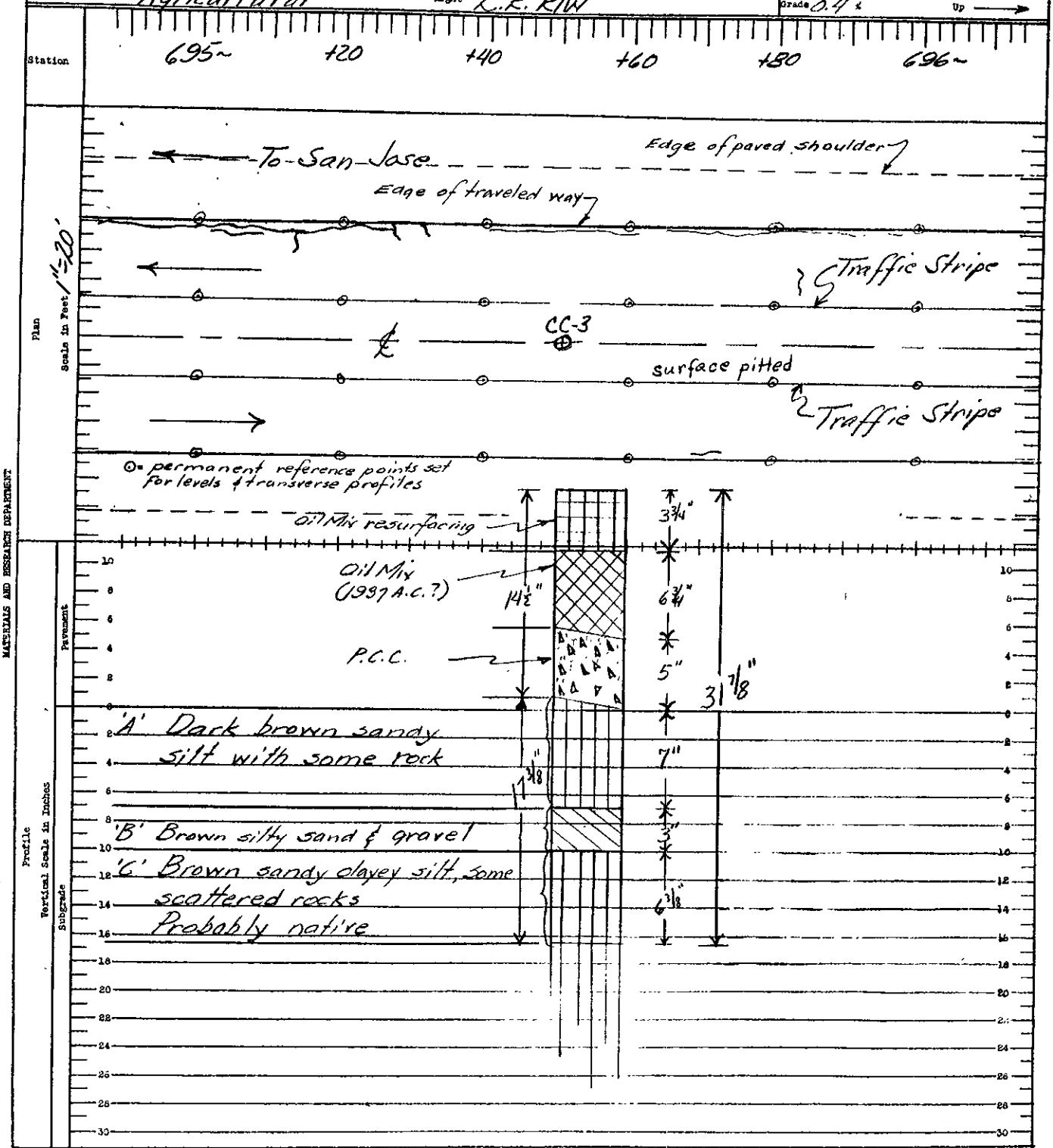
LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. IV Co. SCl. Rte. 2 Sec. B			Contract No. —	Date of Constr. 1937	Test Hole No. CC-3
Fill On Right	Approx. Height 1'	Dist. from End of Fill	No. of Lanes Three	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditch None	Depth —	Date of Sampling 8-12-52
Roadside Use, left Agricultural		Right R.R. R/W		Grade 0.4 %	Up →

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT



Remarks:

Party: Clawson, Smith, Cean

Drawn by: Smith

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 21
Dist. IV Co. SCL Rte. 2 Sec. B
Loc. Design CC
Sta. 690+00 to 695+70
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left					℄	Right				
	Field adj.	Top of Slope	Side ditch	Break in Slope	Outer edge of paved Shoulder		Outer edge of paved Shoulder	Toe of fill Slope	Toe of R.R. fill Slope	Top of R.R. fill Slope	
695~	96.4	96.5	95.3	95.6	96.20		96.35	94.9	95.0	97.9	
	70.0	52.0	44.0	34.0	24.5		24.5	33.0	37.0	48.0	
694~	95.7	96.5	95.0	95.1	95.88		96.02	94.6	94.2	97.5	
	74.0	53.0	45.0	35.0	24.5		24.0	33.0	37.0	47.0	
693~	95.4	95.5	94.5	94.7	95.43		95.55	94.1	94.2	96.7	
	65.0	49.0	45.0	33.0	24.5		24.5	33.0	37.0	48.0	
692~	Hedge	95.0	94.8	94.5	95.03		95.16	93.5	93.4	96.3	
		55.0	44.0	31.0	24.5		24.5	33.0	37.0	48.0	
691~		Hedge	94.4	94.0	94.48		94.71	93.3	93.3	96.0	
			51.0	35.0	24.5		24.0	33.0	37.0	48.0	
690~	94.2	93.5	92.5	92.6	94.35		94.34	92.9	92.9	95.7	
	72.0	55.0	46.0	33.0	24.5		24.5	34.0	38.0	48.0	

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____ Drainage Cross Sections

Dist. IV Co. SCl Rte. 2 Sec. B
Load. Sta. No. 21
Loc. Design CC
Sta. 696+00 to 700+00
Sheet No. 2 of 2

ROADWAY CONDITION SURVEY

℄

	Left							Right					
		Field Adj.	Top of Slope	Side ditch	Break in Slope	Outer edge of paved Shoulder		Outer edge of paved Shoulder	Toe of fill Slope	Toe of RR. fill Slope	Top of RR. fill Slope		
700~			98.3	97.6	97.7	98.18		98.16	97.1	97.0	100.1		
			58.0	42.0	35.0	24.5		24.5	32.0	35.0	47.0		
699~		97.5	97.8	96.7	96.9	97.75		97.85	96.5	96.5	99.5		
		70.0	50.0	43.0	34.0	24.5		24.0	32.0	35.0	47.0		
698~		97.3	97.8	96.4	96.7	97.37		97.34	96.2	96.2	99.2		
		72.0	52.0	45.0	34.0	24.5		24.0	32.0	35.0	47.0		
697~		96.9	97.8	96.2	96.3	97.02		97.10	95.8	95.8	98.7		
		72.0	52.0	44.0	35.0	24.5		24.5	33.0	37.0	47.0		
696~		96.7	97.0	95.8	96.0	96.50		96.64	95.5	95.3	98.3		
		74.0	50.0	43.0	33.0	24.5		24.5	32.0	37.0	47.0		

Form T-527

18

DATA OF SECTION SELECTED FOR TEST

This section is one of two established in connection with Loadometer Station No. 24.

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 24 is located on west side of State Highway Route 2 (U.S. 101), approximately 3.5 miles north of N.C.L. Soledad. The section selected for test is located 1 mile north of Loadometer Station and approximately 4.5 miles north of Soledad.

LENGTH: The section selected for test is established on 1000' of two lane pavement between Station 72+00 and Sta. 82+00

SURFACE:

Type: Pavement consists of asphaltic plant mix surfacing placed in 1937. Plant mix surfacing was placed in two courses. The first course being approximately 3/4 of the total tonnage used, and consisted of standard 1" maximum aggregates. In the second course, all aggregates passed a 3-mesh sieve. At least one seal coat has been placed on this pavement.

Width: Average width of paved roadway including paved shoulders is 36 feet. Width of seal coat is 20 feet (two 10' lanes).

Loadometer Station No. 24
Road V-Mon-2-C

ROADWAY STRUCTURE

SURFACE (Continued)

Thickness: In three sample locations, pavement thickness varied from 3" to 3-1/2".

BASE:

Type and Thickness: Base material is an imported crusher run gravel 4-1/2" thick.

Soil Classification: A-1-a

SUBBASE:

Type and Thickness: An imported clayey sand and fine gravel varying in thickness in three locations from 7-1/8" to 12-7/8".

Soil Classification: A-2-4

The subbase is underlain by a 4" PCC pavement placed in 1916. The surface of the old concrete was covered with a thin asphaltic coating (1/8"). Slight deviations in the grade of this old pavement were compensated in the above mentioned subbase resulting in the thickness variation of the subbase.

SIDE DITCH DRAINAGE: The section is located in essentially an "in grade" roadway section. Longitudinal grade line through the section is level. On the left of and parallel to the roadway

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE (Continued)

approximately 70' from the centerline, is a Southern Pacific rail line. Between the railway and the edge of roadway shoulder, an area averaging 30 feet in width and two feet below centerline elevation carries runoff in both directions from the vicinity of Station 77+00.

Runoff on the right of roadway is carried parallel to the roadway in both directions from the vicinity of Station 77+00 by a well defined side ditch averaging 2 feet in depth. There are no culverts within the limits of the section.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking:

There are no areas of alligator cracking in the section. However, there are areas which are better described as "block cracking". These areas are shown graphically on the plan diagram and are listed below for convenience:

Left Lane:

Station	to Station	Width	Comment
72+00	72+34	4.0'	Severe
73+44	73+55	3.5'	Not Severe
77+94	78+25	2.3'	Not Severe
81+78	81+88	1.0'	Not Severe

Loadometer Station No. 24
Road V-Mon-2-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

Right Lane:

Station to Station		Width	Comment
72+42	72+93	4.0'	Not Severe
73+16	73+31	3.5'	Not Severe
73+48	74+00	3.5'	Not Severe

(2) Areas of Raveling

There are no areas of appreciable raveling in the test section.

(3) Areas of Shoving or Creeping:

There are no areas of shoving or creeping within the traveled way of this section.

(4) Patches:

Within the limits of the section there is only one patch. It is located 8' right of the centerline between Sta. 79+19 and Sta. 79+27 and is 1-1/2 feet wide.

(5) Roadway Section:

Roadway of the section is a "grade" section. Agricultural lane on right is generally slightly above roadway and agricultural land beyond the railroad on the left is generally slightly below roadway. This condition conforms to a very gentle slope toward the Salinas River two or three miles west (left).

(6) Shoulders:

Asphaltic mix shoulders are 8' wide on both sides of the traveled way. Due partly to the width of shoulders and partly to the nature of traffic, trucks frequently ride

ROADWAY CONDITION

SPECIAL CONDITIONS:

(6) Shoulders: (Continued) entirely out on the shoulders. This practice has resulted in a marked deterioration of the shoulder pavement, particularly on the right.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section as follows:

B.M. No.	Station	Location	Elevation
1	69+85	41' rt. in culvert headwall	150.000 (Assumed)
2	82+90	25.5' left of culvert headwall	148.519

Permanent reference points were set into the pavement in three longitudinal lines; one on centerline, and one on each shoulder 12.0' from centerline.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane, were made

Loadometer Station No. 24
Road V-Mon-2-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

Transverse: (Continued) at 20 foot longitudinal intervals throughout the section.

Longitudinal: By means of the profilograph, records were made of the longitudinal profiles in each lane of the traveled way. In the right lane the profile was recorded 48" left of the right pin line, and in the left lane 36" right of the left pin line.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 24

V-Mon-2-C

Ahead on Line from Sta.

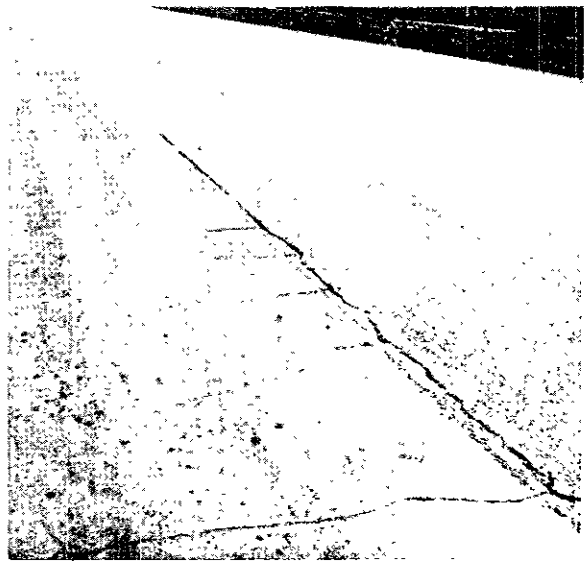
72+00

Cracks on Right Sta.

72+60

Transverse Crack in Right

Lane. Station 72+64



Edge Crack and Transverse

Cracks on Rt. shoulder

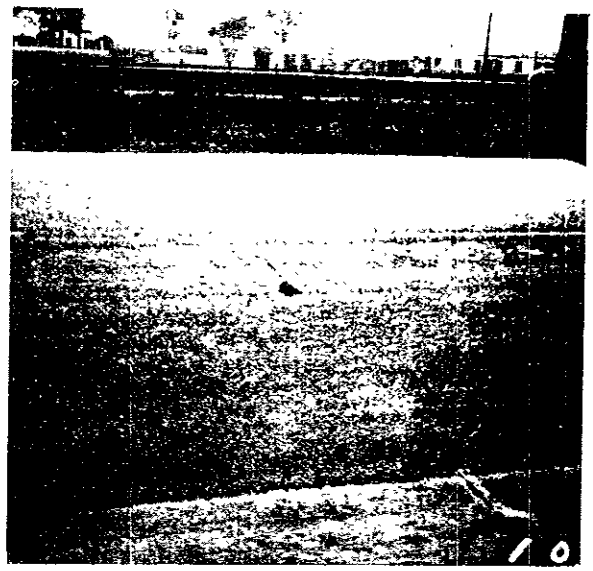
Station 73+70

Loadometer Sta. No. 24

V-Mon-2-C

Unstable Area Right

Sta. 77+50 to Sta. 77+80



Transverse Crack

Station 80+46

Edge Crack Right Lane

Sta. 81+30 to Sta. 81+80

Back on Line from

Station 81+25

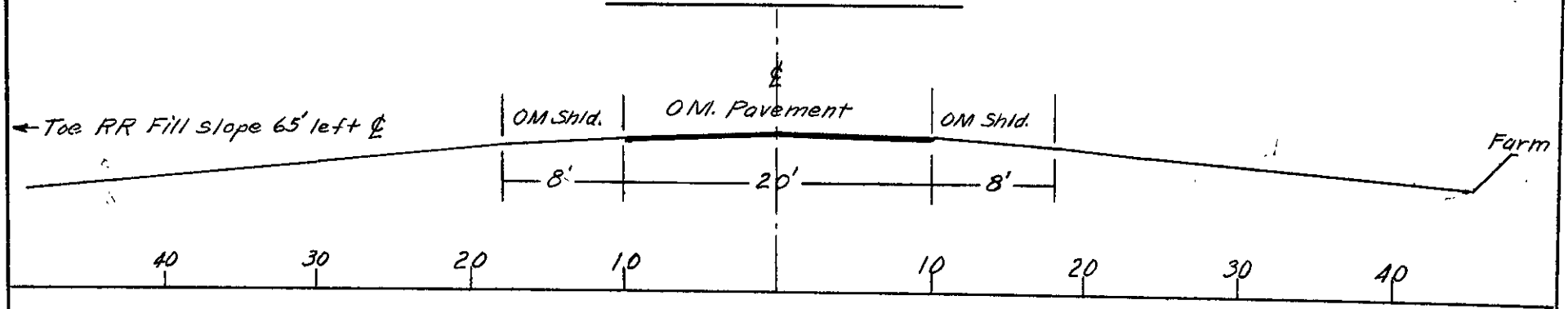
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CF-24
V-Mon-2-0

ROADWAY CONDITION SURVEY

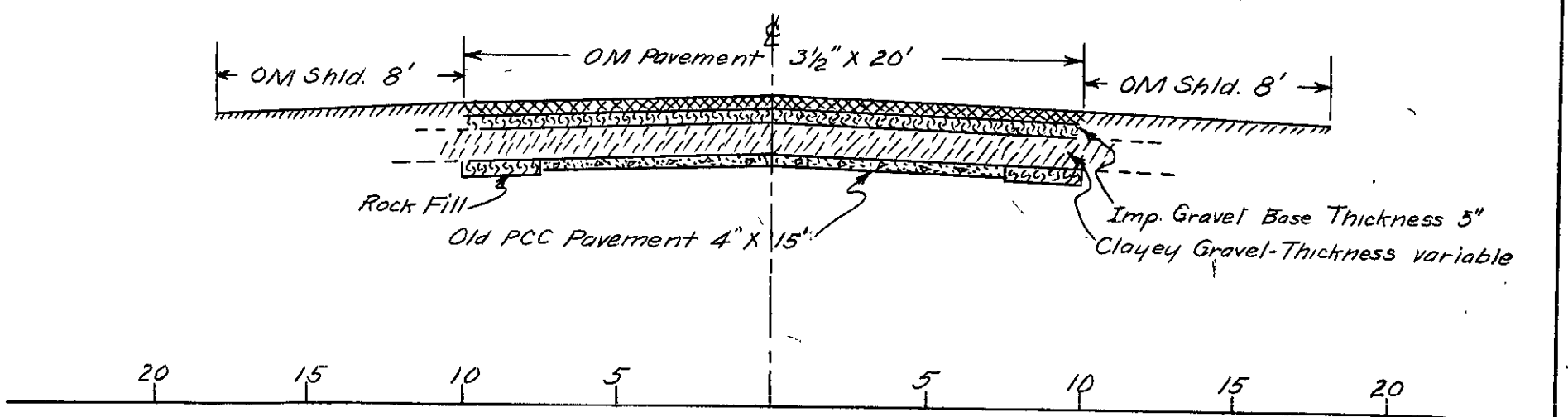
TYPICAL ROADWAY SECTION

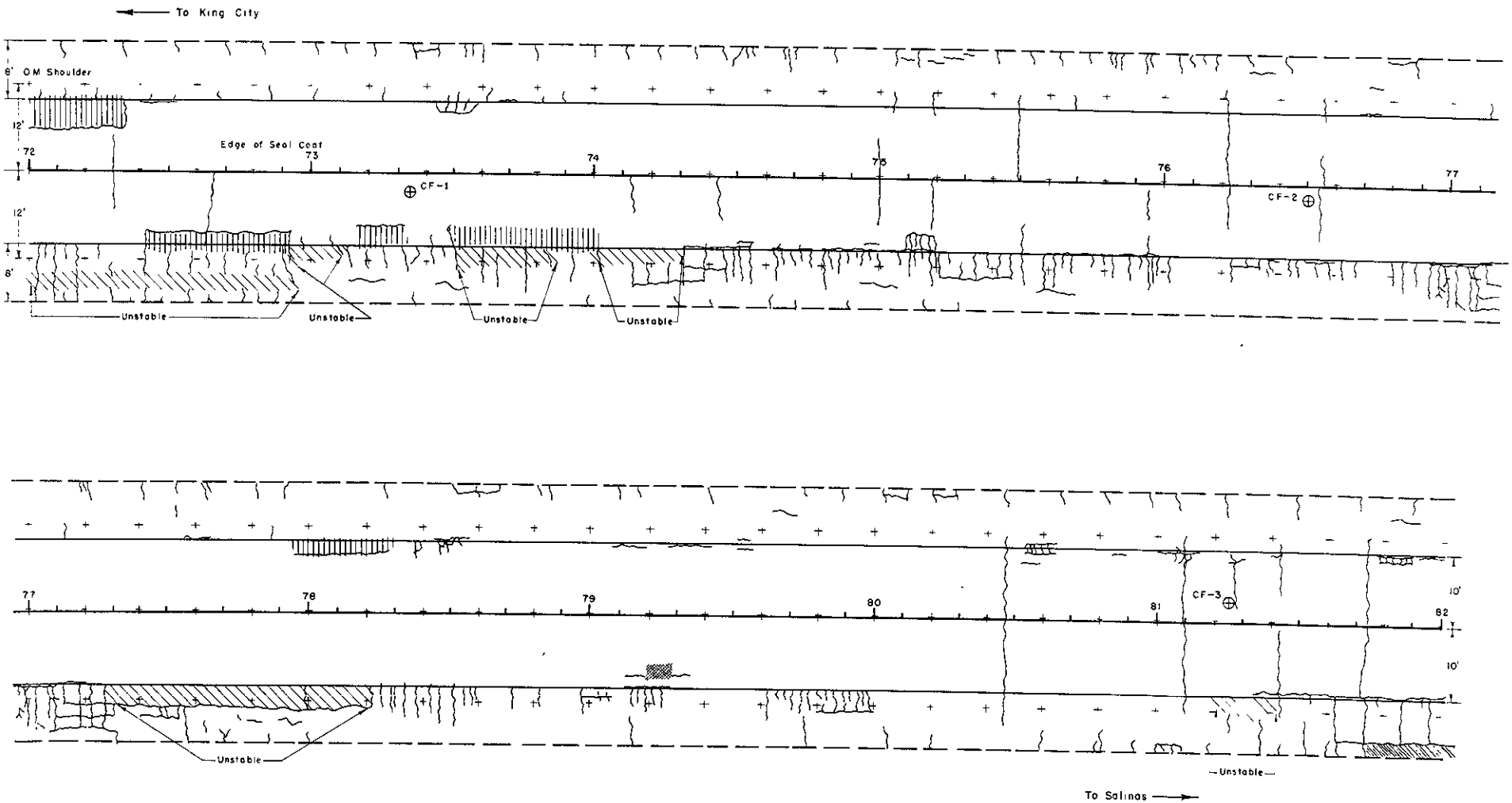
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 24
V-Mon-2-C

TEST RESULTS SUMMARY

Load. Sta. No. 24
V-Mon-2-C

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	CF-1-A	52-4405	73+34	2.5' right of centerline	OM	3-1/2"	0 - 4-1/2"	Base
2	CF-1-B	52-4406	73+34	same	OM	3-1/2"	4½" - 12½"	Subbase
3	CF-2-A	52-4407	76+50	2' right of centerline	OM	3-1/2"	0 - 4-1/2"	Base
4	CF-2-B	52-4408	76+50	same	OM	3-1/2"	4½" - 17¼"	Subbase
5	CF-3-A	52-4409	81+25	2.8' left of centerline	OM	3"	0 - 5"	Base
6	CF-3-B	52-4410	81+25	same	OM	3"	5" - 12"	Subbase
7	CF-3-C	52-4411	81+25	same	OM	3"	12" - 21"	Subbase

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	3	145	101	7	144	A-1-a	2.77	2.78
2	5	129	95	8	136	A-2-4	2.61	
3	No	Tests				A-1-a	2.77	2.79
4	5	134	99	8	136	A-2-4	2.62	
5	3	146	101	8	144	A-1-a	2.80	2.78
6	4	126	94	7	134	A-2-4	2.63	
7	5	137	102	8	134	A-1-b	2.62	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	85	58	49	39	31	25	14	12	3	N	P
2		100	99	89	73	57	46	30	28	11	20	16
3	98	82	56	47	38	29	22	12	11	3	N	P
4		100	97	89	74	58	46	38	26	10	20	16
5	100	84	54	45	34	27	21	12	11	3	N	P
6		100	98	93	76	60	47	26	24	10	19	17
7		100	97	88	71	54	4	22	19	9	N	P

LOCATION AND PROFILE SKETCH

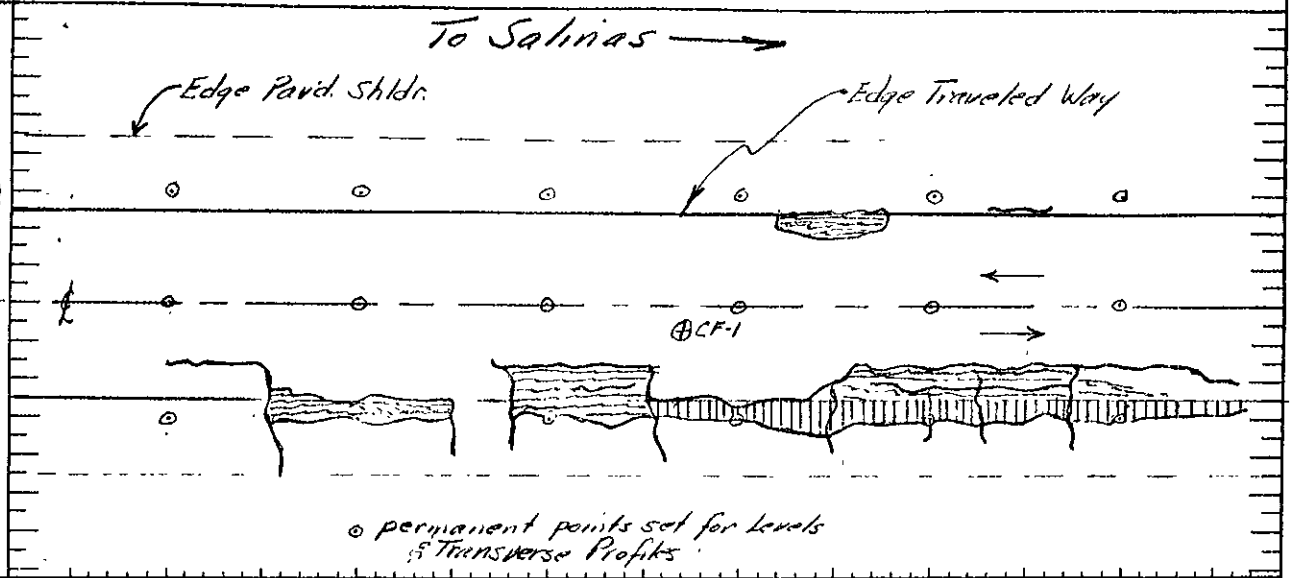
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00255

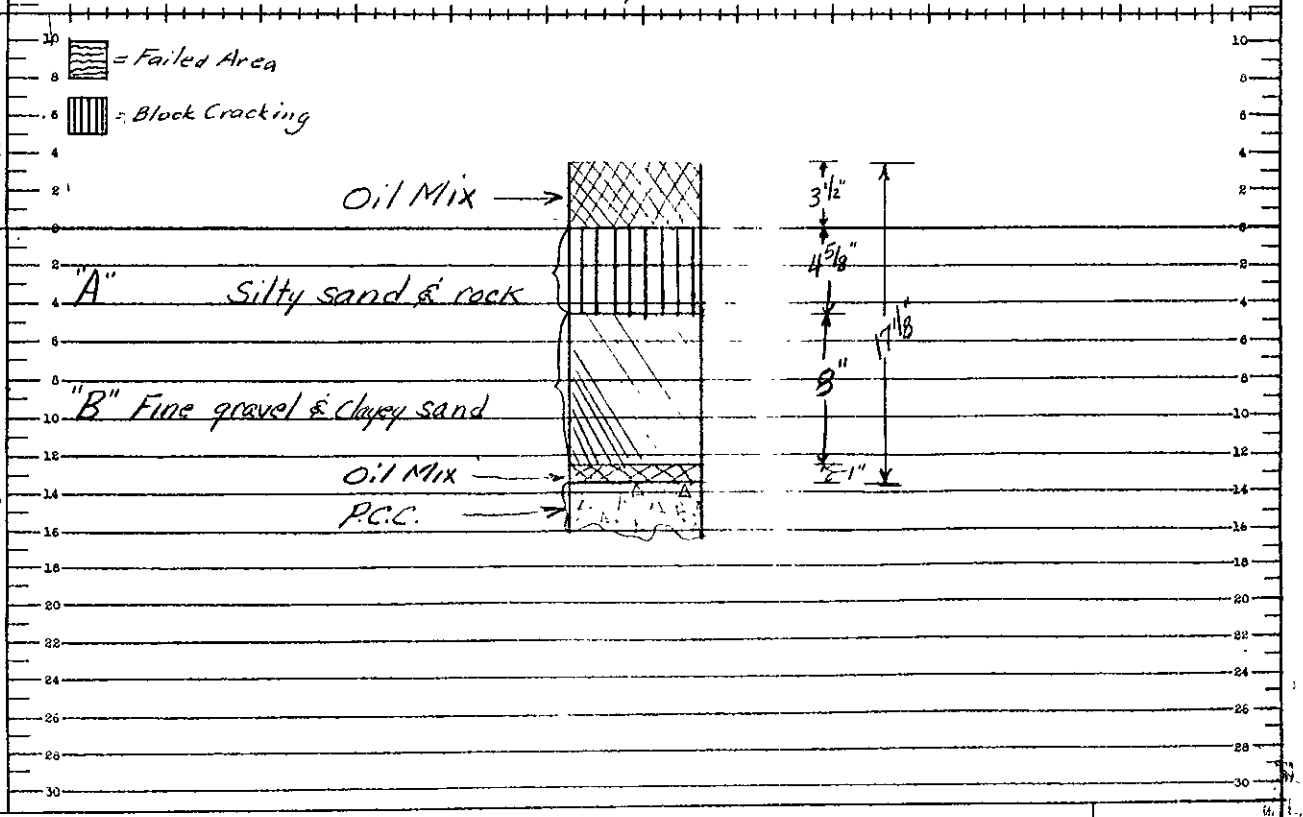
Dist. V Co. Mon Rte. 2 Sec. C		Contract No. —	Date of Constr. 1916-1937		Test Hole No. CF-1
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Two	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt-throughout Lt Not clearly defined	Depth Rt 2.0" Lt 2.0"	Date of Sampling 10/1-2/52
Roadside Use, Left R.R R/W		Right Agricultural		Grade 0 %	Up —

Station: +80 73+00 +20 +40 +60 +80

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Party Clawson
Smith

Drawn By Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

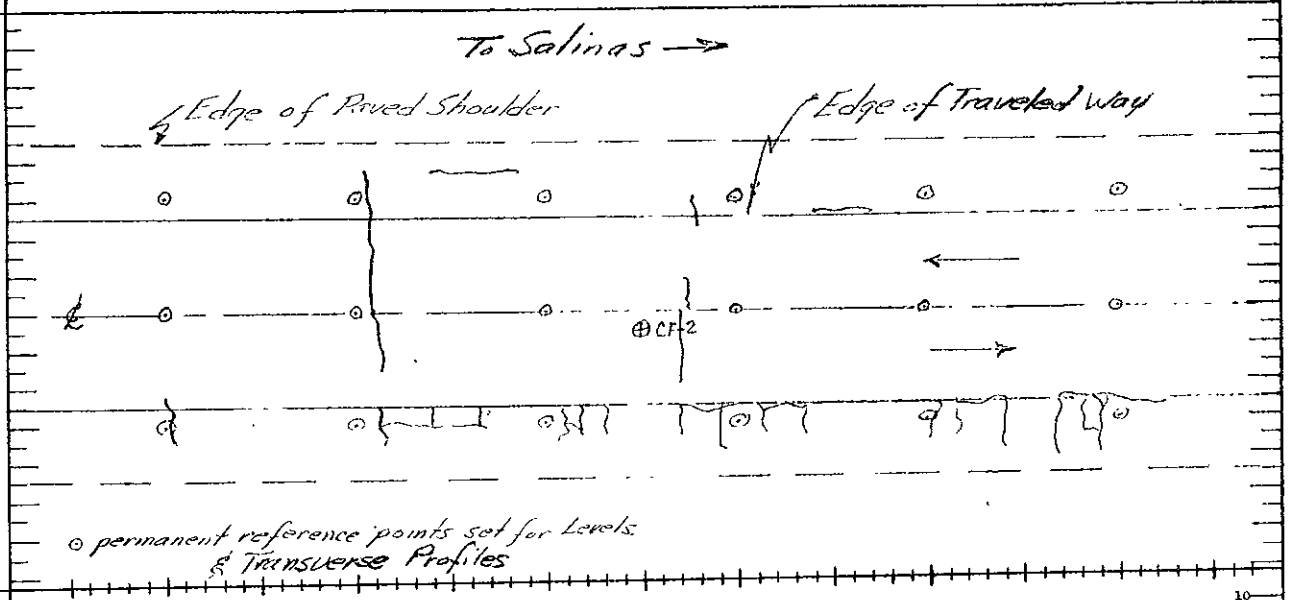
~~CONCRETE~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

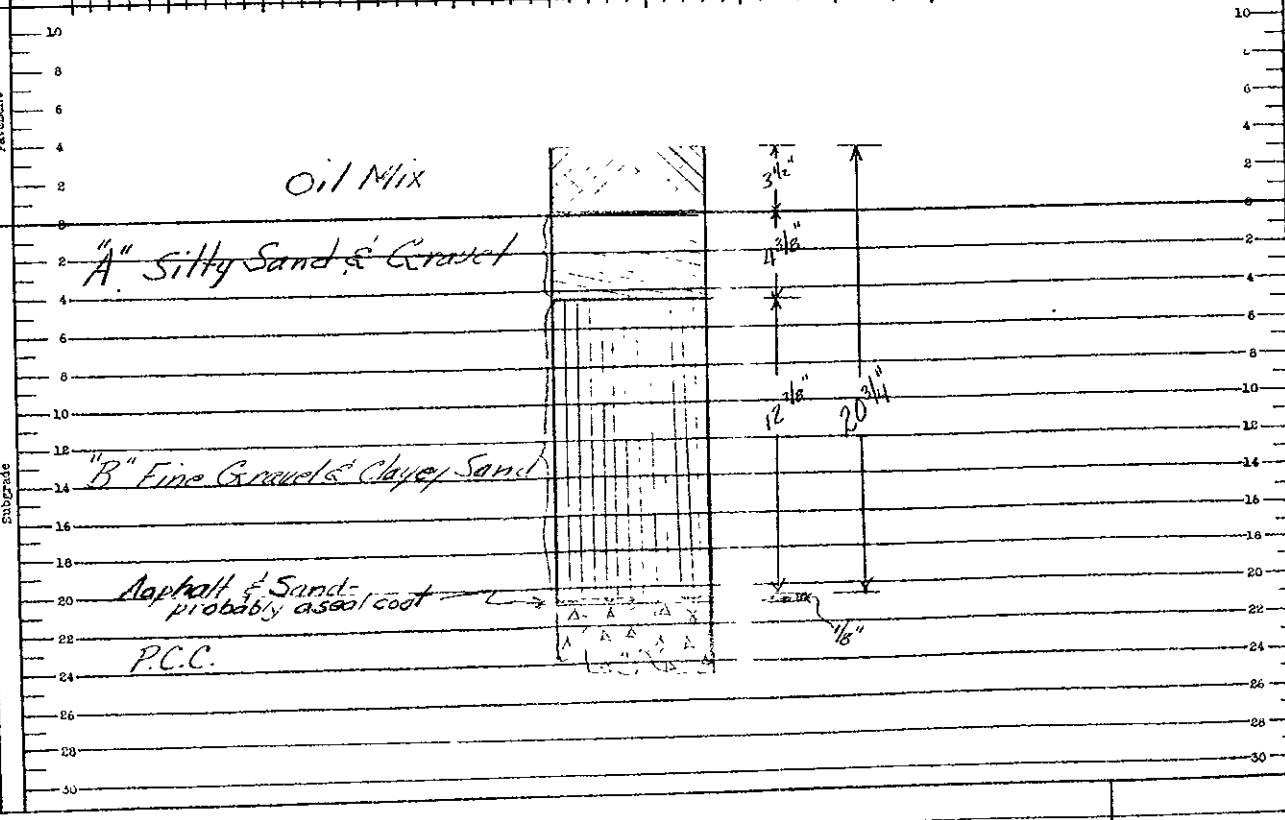
Dist. V Co. Mon Rte. 2 Sec. C		Contract No. —	Date of Constr. 1916-1937		Test Hole No. CF-2
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Two	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt. Throughout Lt. None	Depth Rt. 2.0"	Date of Sampling 10/23/52
Roadside Use, Left R.R. R/W		Right Agricultural		Grade 0 %	Up —

Station: 76+00 +20 +40 +60 +80 77+00

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Party Clawson
Smith

Drawn By Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

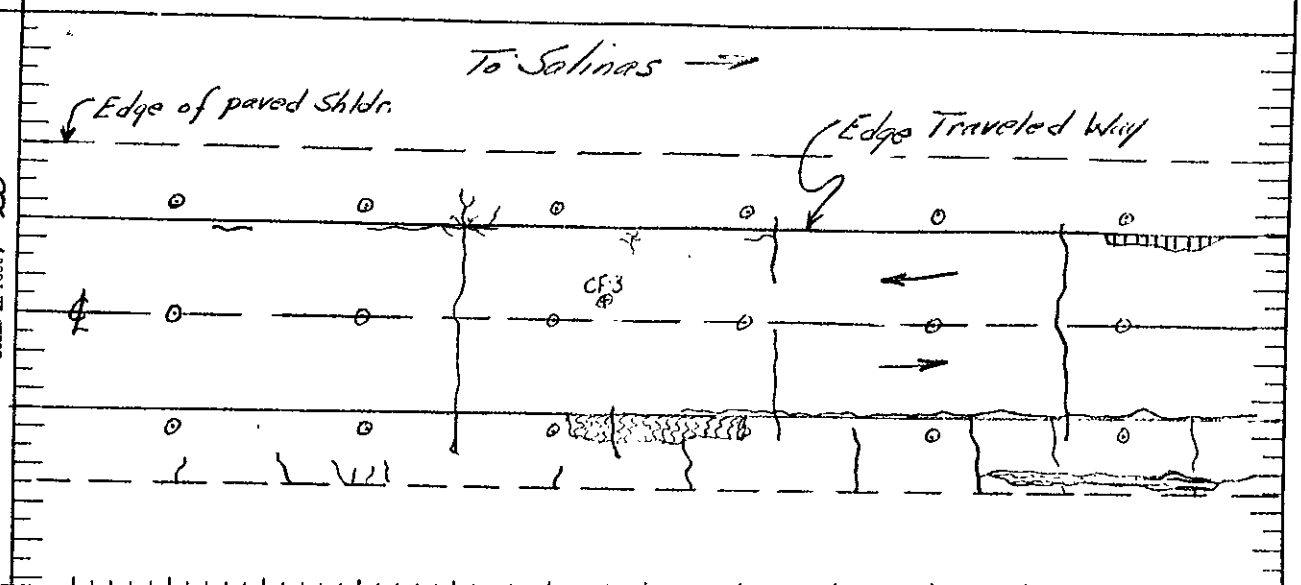
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted]00255

Dist. V Co. Mon Rte. 2 Sec. C		Contract No. —	Date of Constr. 1916-1937		Test Hole No. CF-3
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Two	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt. Throughout Lt. None	Depth Lt. 2"	Date of Sampling 10-5,6-52
Roadside Use, Left R.R. R/W		Right Agricultural		Grade 0 %	Up —

Station: +80 81+00 +20 +40 +60 +80

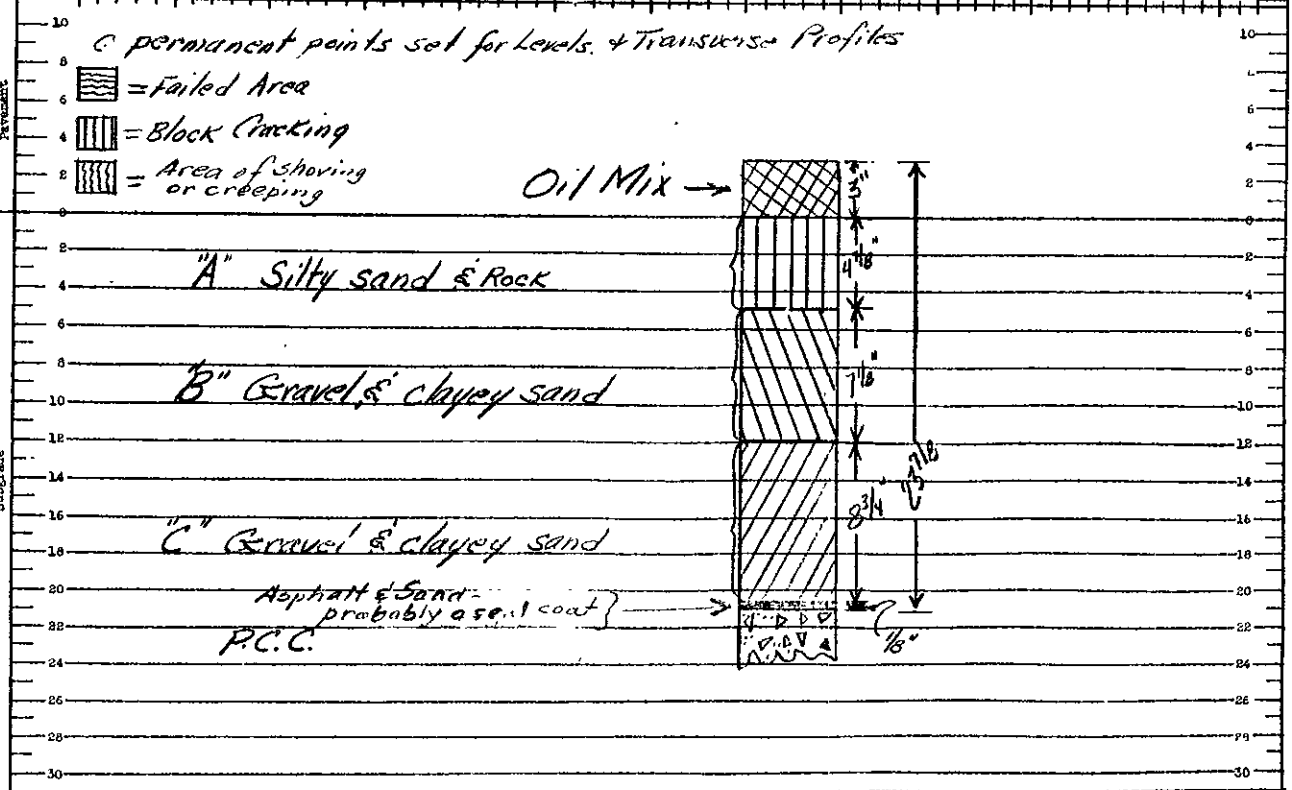
Plan — Scale in Feet 1"=20'



Profile — Vertical Scale in Inches

Pavement

Subgrade



Remarks:

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DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 24
Dist. V Co. Mon Rte. 2 Sec. C
Loc. Design CF
Sta. 72+00 to 77+00
Sheet No. 1 of 2

ROADWAY CONDITION SURVEY
Drainage Cross-Sections

	Left						& Right							
			Toe R/W Slope		Side Ditch	Edge Paved Shldr	Pav't @ Edge Seal	Pav't @ Edge of Seal	Edge of Pavd Shldr	Break in Slope	Side Ditch	Top of Bank	Field Elev.	
77~			146.3	146.7	148.5	149.25	149.69	149.65	149.21	149.0	147.4	149.4	149.9	
			65.0	48.0	24.0	18.0	10.0	10.0	18.0	24.0	42.0	52.0	68.0	
76~			146.5	146.5	147.9	149.12	149.59	149.69	149.38	148.9	147.0	149.3	149.8	
			65.0	48.0	30.0	18.0	10.0	10.0	18.0	25.0	44.0	54.3	68.0	
75~			146.5	146.5	148.0	149.21	149.66	149.58	149.23	148.8	147.1	149.1	149.2	
			65.0	47.0	30.0	18.0	10.0	10.0	18.0	24.0	45.0	54.0	68.0	
74~			147.2		148.7	149.12	149.55	149.60	149.31	148.9	147.2	149.7	150.0	
			65.0		25.0	18.0	10.0	10.0	18.0	25.0	45.0	50.0	68.0	
73~			146.6	146.5	147.9	149.16	149.58	149.59	149.34	148.9	147.1	150.2	150.4	
			63.0	48.0	30.0	18.0	10.0	10.0	18.0	26.0	45.0	55.0	68.0	
72~			146.1	146.1	147.7	149.08	149.55	149.54	149.09	148.8	146.8	150.5	150.4	
			63.0	49.0	30.0	18.0	10.0	10.0	18.0	24.0	45.0	55.0	68.0	

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 24
Dist. V Co. Mon Rte. 2 Sec. C
Loc. Design CF
Sta. 78+00 to 82+00
Sheet No. 2 of 2

ROADWAY CONDITION SURVEY
Drainage Cross-Sections

	Left							Right					
	Toe R.R. Fill		Side Ditch	Edge of Pavd Shldr	Pavt at edge of Seal	Pavt at Edge of Seal	Edge of Pavd Shldr	Break in Slope	Side Ditch	Top of Bank	Field Elev.
82	146.4 64.0	146.0 45.0	147.6 31.0	149.19 18.0	149.52 10.0	149.65 10.0	149.34 17.5	148.8 24.5	146.7 45.0	150.4 56.0	150.3 68.0
81	146.2 63.0	146.1 44.0	148.1 29.0	149.15 18.0	149.53 10.0	149.60 10.0	149.18 18.0	148.8 25.0	146.9 45.0	150.3 53.0	150.1 68.0
80	146.1 64.0	146.2 45.0	147.5 32.0	149.13 18.0	149.65 10.0	149.62 10.0	149.23 18.0	148.9 25.0	146.8 45.0	150.1 55.0	149.6 68.0
79	146.3 65.0	146.3 47.0	147.1 31.0	149.18 18.0	149.60 10.0	149.60 10.0	149.24 18.0	148.9 24.0	147.0 44.0	150.0 54.0	149.9 68.0
78	146.2 64.0	146.3 47.0	148.6 23.0	149.07 18.0	149.51 10.0	149.57 10.0	149.01 18.0	148.8 24.0	146.9 44.0	149.3 51.0	149.8 68.0

Form T-527

19

Research No. 00258
W.O. Number 13NN26

Loadometer Station No. 24
Road V-Mon-2-D

DATA OF SECTION SELECTED FOR TEST

This section is one of two established in connection with Loadometer Station No. 24

ROADWAY STRUCTURE

LOCATION: Loadometer station No. 24 is located on the west side of State Highway Route 2 (U.S. 101) approximately 3.5 miles N. of North City Limits of Soledad. There are no major road or highway turnoffs between the Loadometer Station and the section. The section selected for test is located between 1.5 miles S. of the Loadometer Station and approximately 2.0 miles north of the north city limits of Soledad.

LENGTH: The section is located between Station "D" 565+00 and Sta. "D" 575+00, a total length of 1000 feet.

Roadway at the section location is a 2-lane highway. The section is established in both lanes.

SURFACE:

Type: Most recent surface is a plant mixed blanket placed in 1952 over old plant mixed surface.

Loadometer Station No. 24
Road V-Mon-2-D

ROADWAY STRUCTURE

SURFACE:

Width: The traveled way is 25 feet wide. The right lane is 12.0 feet and the left lane is 13.0 feet in width. The total pavement width varies from 37 to 39 feet.

Thickness: Total thickness of surface found in locations sampled varies from 4-1/4 to 5 inches. Original construction records of 1932 show a minimum of 2-1/2 inches plant mixed surface. Apparently the difference between the original construction and present surface thickness is due to maintenance blankets, the most recent placed in 1952.

BASE:

Type and Thickness: Silty sand and rock varying from 4-1/8 to 5.0 inches. Original construction records of 1932 show 5-1/2 inches of crusher run base.

Soil Classification: A-1-a and A-1-b

SUBBASE:

Type and Thickness: Gravel and clayey sand varying in thickness from 6-3/8 to 11-3/8". According to construction data, this material was used to level out the irregularities in the old grade line.

Loadometer Station No. 24,
Road V-Mon-2-D

ROADWAY STRUCTURE

SUBBASE:

Soil Classification: A-2-4

Below the material used as subbase was encountered an old PCC pavement that had an asphalt and sand seal. Construction records show this to be 4" x 15' PCC constructed in 1916.

SIDE DITCH DRAINAGE: The section roadway is in slight fill due to the addition of leveling and base courses. Old PCC pavement surface was in slight cut section.

The section has a level profile grade. There are no clearly defined ditches within the section. Drainage is carried in maintenance bladed gutters from the south to the north at an elevation of from 2' to 2.5' below shoulder point.

There is a double 18" x 62.5' CMP at Sta. 565+64 which carries drainage under the roadway from left to right.

ROADWAY CONDITION:

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking.

Loadometer Station No. 24
Road V-Mon-2-D

ROADWAY CONDITION:

SPECIAL CONDITIONS:
(Continued)

(2) Areas of Raveling: There are no areas of raveling.

(3) Areas of Shoving or Creeping: There are several areas, particularly on the right shoulder, that are showing. These areas are shown graphically on the plan diagram and are listed below for convenience.

On the left:

Sta. 573+40 to 574+22 from 0.5' lt. to 2.5' rt. of lt. pin line.

On the right

Sta.	566+80 to 567+20	-	Rt.	pin	line	to	7.0	rt.
"	567+30 to 567+50	-	"	"	"	"	"	"
"	567+90 to 568+18	-	"	"	"	"	2.0	rt.
"	568+63 to 568+92	-	"	"	"	"	2.0	"
"	569+20 to 570+50	-	"	"	"	"	3.0	"
"	572+70 to 573+10	-	"	"	"	"	2.0	"

(4) Patches: There are no patched areas within the section.

(5) Roadway Section: The section roadway is in a slight fill. The present surface elevation is from 0.5 to 2.0 feet above the surrounding areas.

(6) Shoulders: There are asphaltic mix shoulders throughout the section, varying in width from 5.5 to 6.5 feet on the left, and from 5.5 to 7.5 feet on the right. The shoulders are in

ROADWAY CONDITION:

SPECIAL CONDITIONS:

(6) Shoulders: (Continued) generally poor condition. Due to the width of the shoulder, and the nature of the traffic, the roadway is frequently driven as a four-lane roadway. This practice has resulted in a marked deterioration of the shoulder pavement.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section.

B.M. No.	Location	Description	Elevation
1	36.6' rt. ℄ Sta. 565+64	Ramset pin in PCC headway	175.000 (Assumed)
2	24.5' lt. ℄ Sta. 576+03	Ramset pin in RR spike in power pole	175.603

Permanent reference pins were established in three lines parallel to centerline. One pin line was along the traffic stripe, one pin line was set 12.5' left of the stripe and the third line of pins was set 11.5' right of the stripe.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface.

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

Transverse: (Continued)

Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 foot longitudinal intervals throughout the section.

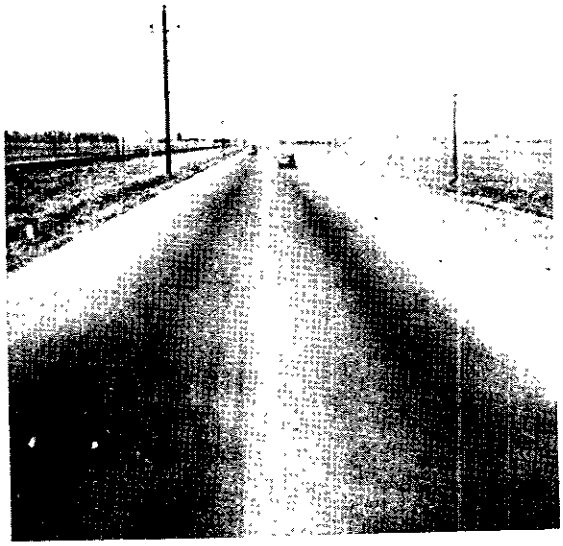
Longitudinal:

By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Two lines of profiles were covered. In each lane, a line of profiles was run with the recording wheel 30" into the lane from the outer pin line.

All Profilograph records have been labeled and are on file at the Materials and Research Department for future use.

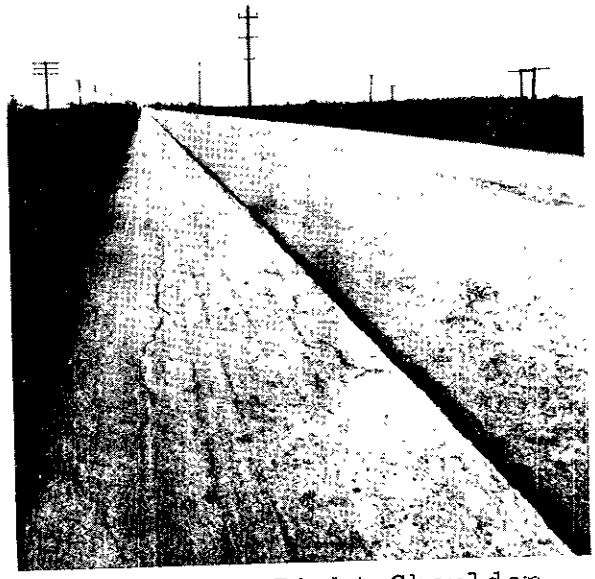
Loadometer Sta. No. 24

V-Mon-2-D



Ahead on Line from

Station 565+00



Cracks in Right Shoulder

Sta. 569+90 to Sta. 570+20

Cracks in Left Shoulder

Back from Sta. 571+60

Cracks in Right Shoulder

Sta. 571+50 to Sta. 571+65

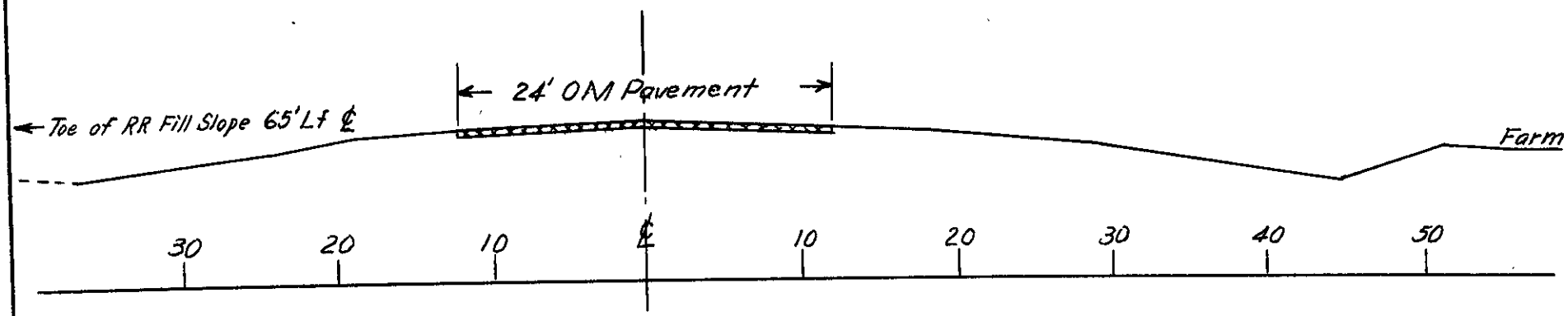
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CG 24
V-Mon-2-D

ROADWAY CONDITION SURVEY

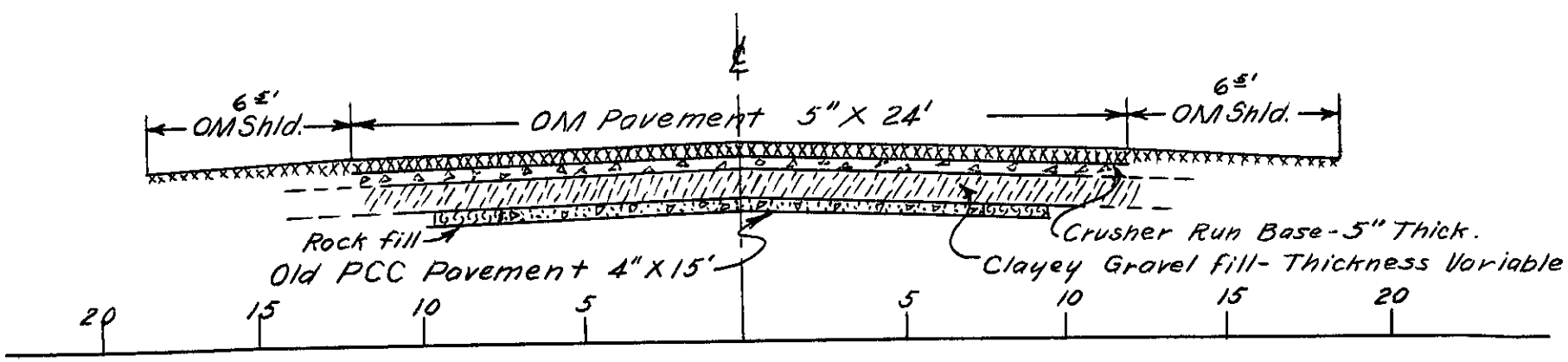
Scale: 1" = 10'

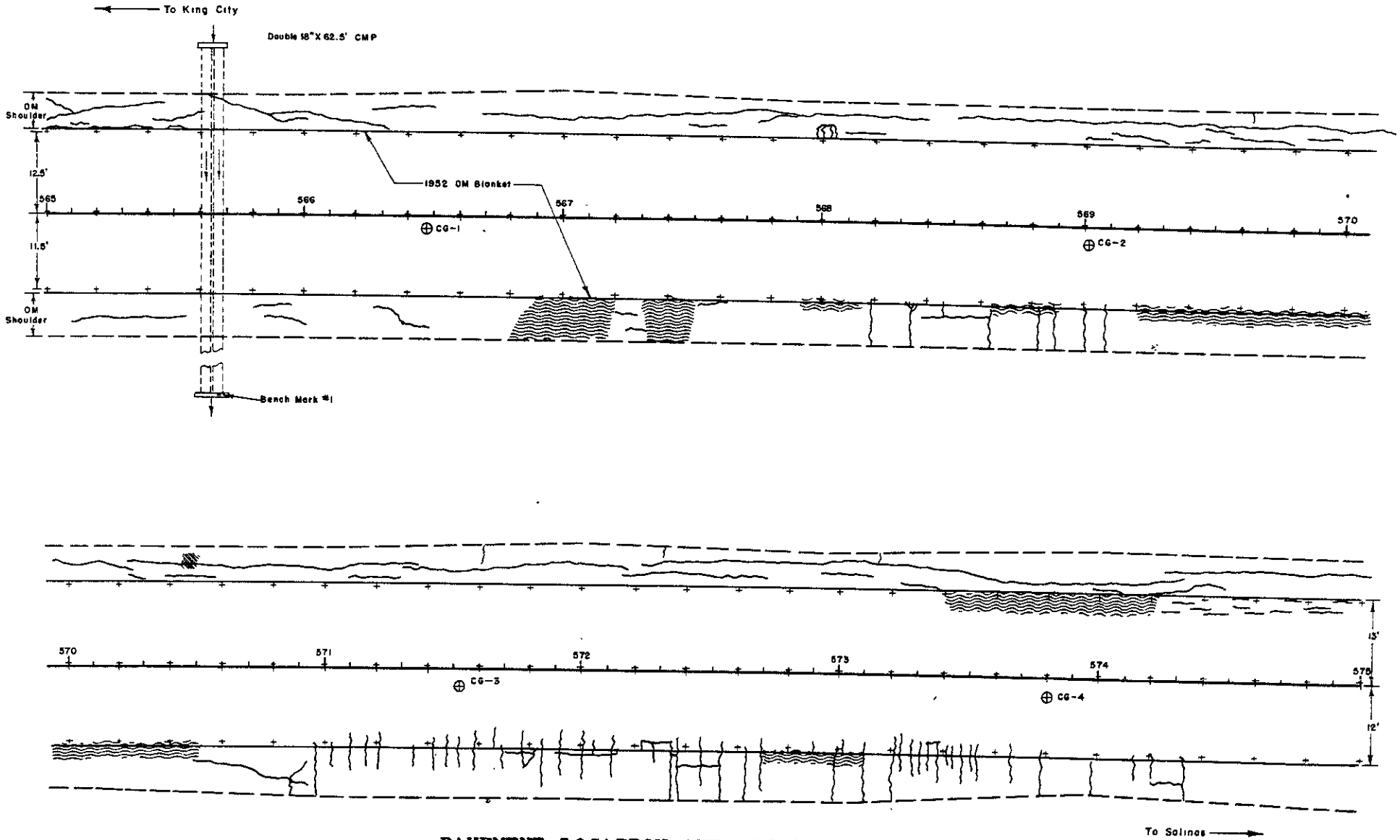
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 24
V-Mo-[illegible]-D

TEST RESULTS SUMMARY

Load Sta. No. 24
V-Mon-2-D

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	CG-1-A	52-4412	566+47	2.6' right of centerline	OM	5"	0" - 4.5"	Base
2	CG-1-B	52-4413	566+47	same	OM	5"	4.5" - 11"	Subbase
3	CG-2-A	52-4414	569+02	2.5' right of centerline	OM	5"	0 - 4"	Base
4	CG-2-B	52-4415	569+02	same	OM	5"	4" - 11-1/4"	Subbase
5	CG-3-A	52-4416	571+52	2.5' right of centerline	OM	4-7/8	0 - 4-5/8"	Base
6	CG-3-B	52-4417	571+52	same	OM	4-7/8	4-5/8"-15½"	Subbase
7	CG-4-A	52-4418	573+80	2.8' right of centerline	OM	4-1/4	0 - 4-1/2"	Base
8	CG-4-B	52-4419	573+80	same	OM	4-1/4	4½" - 15-3/4	Subbase

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	3	154	106	7	145	A-1-b	2.80	2.78
2	5	142	103	8	137	A-2-4	2.62	
3	3	154	105	8	146	[illegible]-a	2.80	2.80
4	5	126	92	[illegible]	139	A-2-4	2.63	
5	4	149	103	8	144	A-1-a	2.79	2.79
6	5	130	95	[illegible]	[illegible]	A-2-4	2.62	
7	3	148	103	7	143	A-1-a	2.77	2.79
8	5	128	93	[illegible]	3	A-2-4	2.61	

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	100	90	65	56	44	34	[illegible]	[illegible]	14	4	N	P
2		100	98	87	[illegible]	56	[illegible]	[illegible]	30	12	22	15
3	100	86	63	55	43	34	25	[illegible]	14	4	N	P
4		100	97	83	54	[illegible]	41	29	[illegible]	11	22	15
5	100	92	63	51	40	32	25	14	13	4	N	P
6		100	97	84	63	[illegible]	[illegible]	[illegible]	28	11	22	16
7	100	74	48	40	31	[illegible]	19	11	10	2	N	P
8		100	96	84	63	50	40	28	20	10	21	16

LOCATION AND PROFILE SKETCH

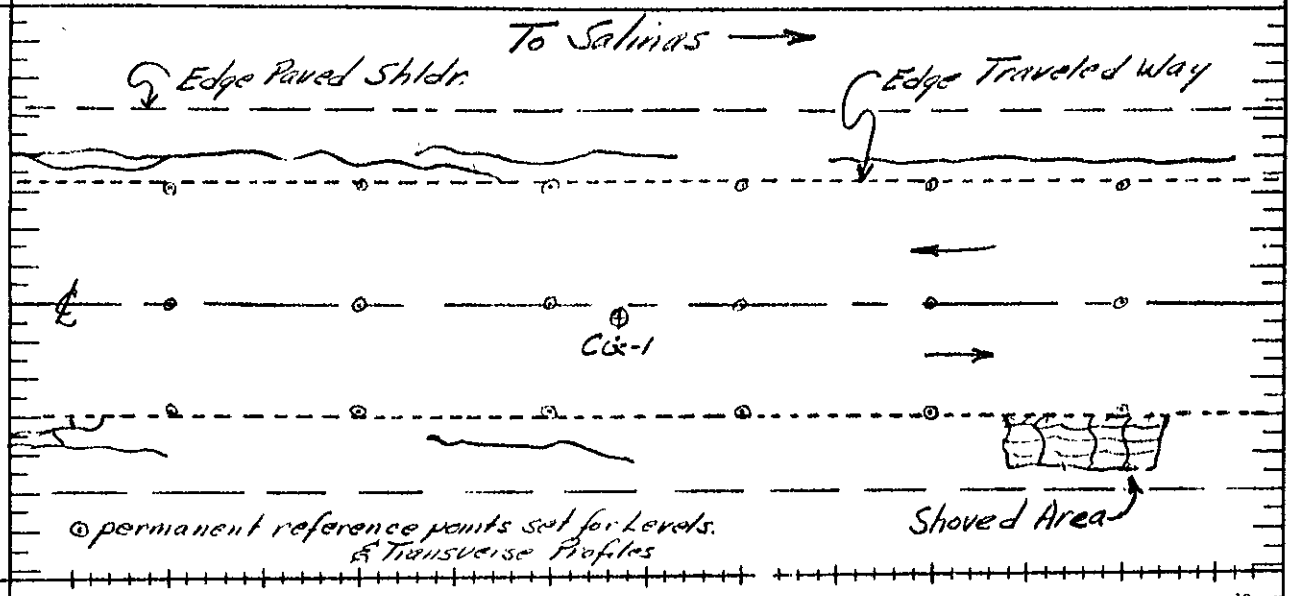
PAVEMENT INVESTIGATION

RESEARCH NO. 00258

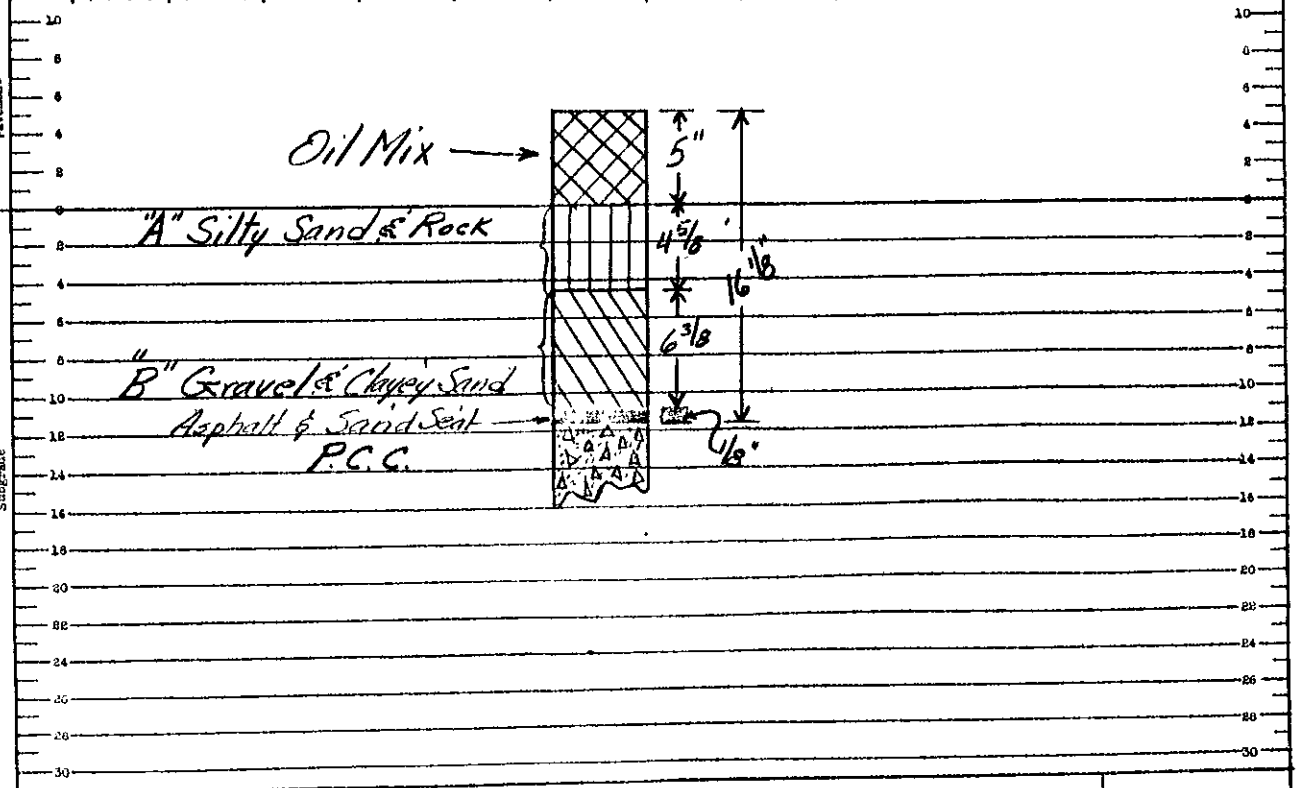
Dist. IV	Co. Mon	Rte. 2	Sec. D	Contract No. —	Date of Constr. 1916-1937-1952
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes TWO	Traffic Heavy	Test Hole No. CG-1
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None	Depth —	Date of Sampling 10-6,7-52
Roadside Use, Left R.R. R/W		Right Agricultural		Grade 0 %	Up —

Station: 566~ +20 +40 +60 +80 567~

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Party: Smith, Clawson

Drawn By: Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

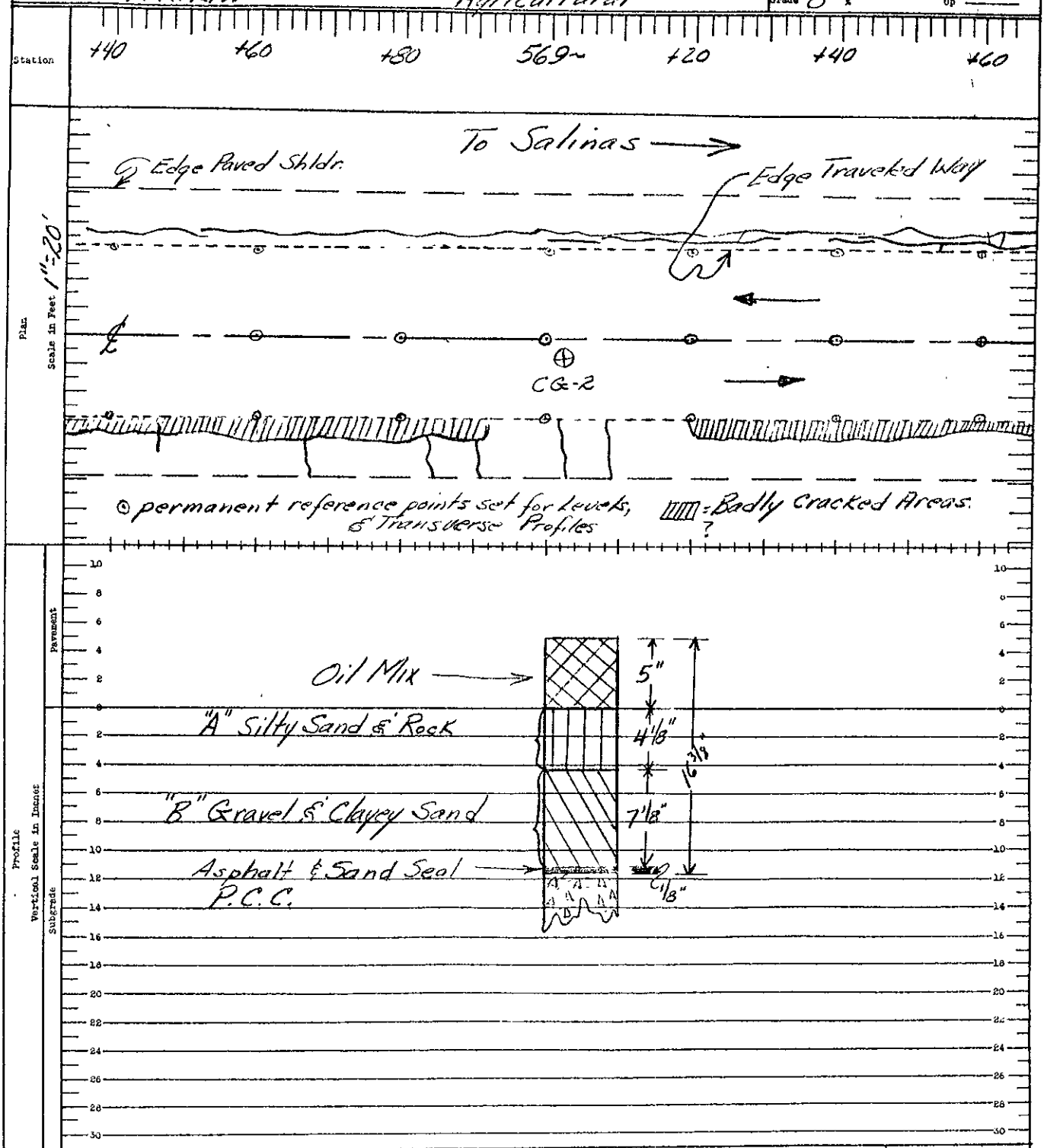
LOCATION AND PROFILE SEARCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 002558

Dist. V	Co. Mon	Rte. 2	Sec. D	Contract No. —	Date of Constr. 1951-1952	Test Hole No. CG-2	
Fill Grade	Approx. Height —	Dist. from End of Fill		No. of Lanes Two	Traffic Heavy		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches None	Depth —	Date of Sampling 10-7-52	
Roadside Use, left R.R. R/W			Right Agricultural		Grade 0 %	Up —	

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT



REMARKS:

Party Clawson
Smith

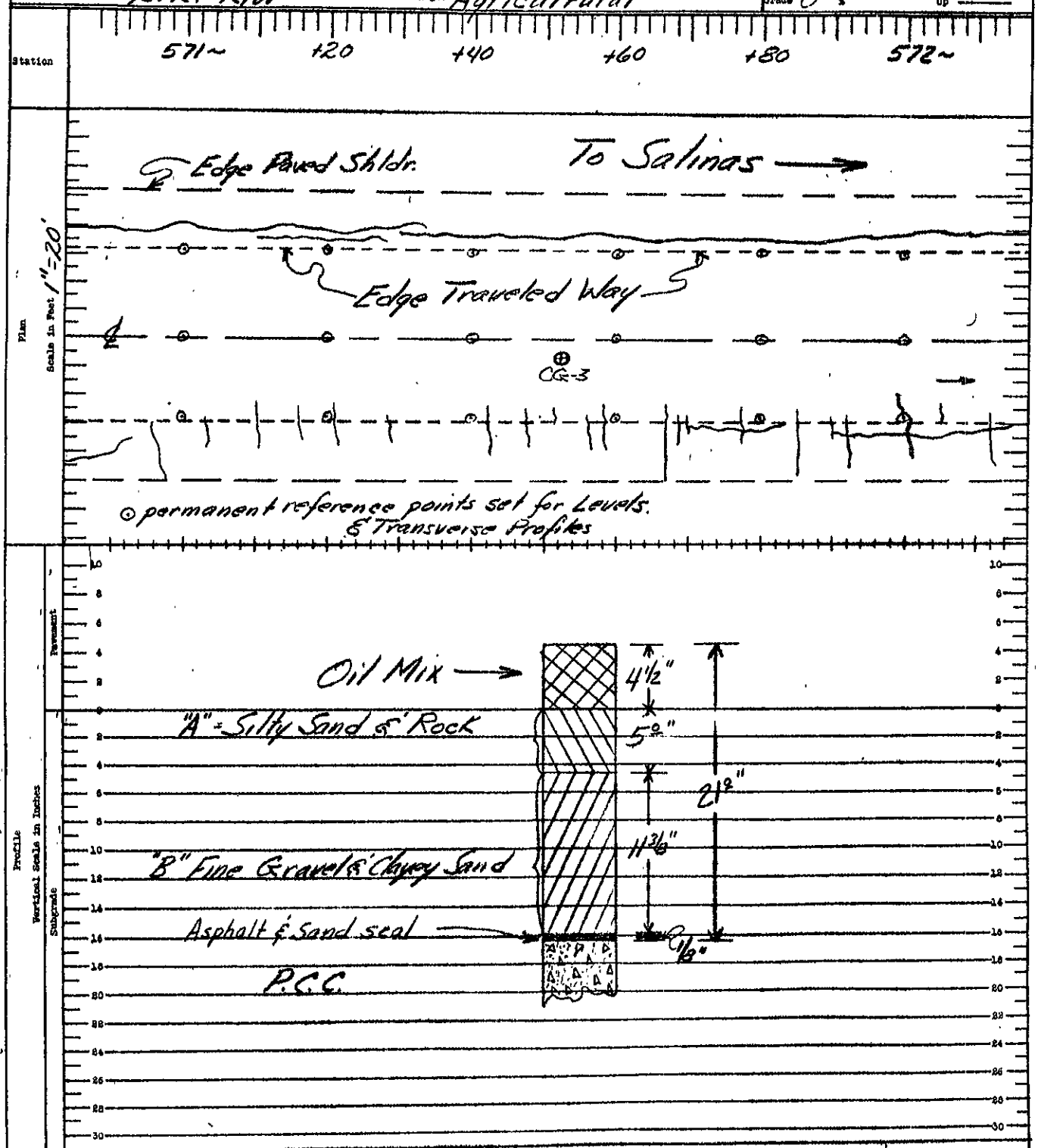
Drawn By Smith

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. V Co. Mon Rte. 2 Sec. D			Contract No.	Date of Constr. 1916-1937-1952	Test Hole No. CG-3
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Two	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None	Depth —	Date of Sampling 10-9,10-52
Roadside Use, left R.R. R/W		Right Agricultural		Grade 0 %	Up —



Remarks:

Party Smith, Clawson

Drawn by Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

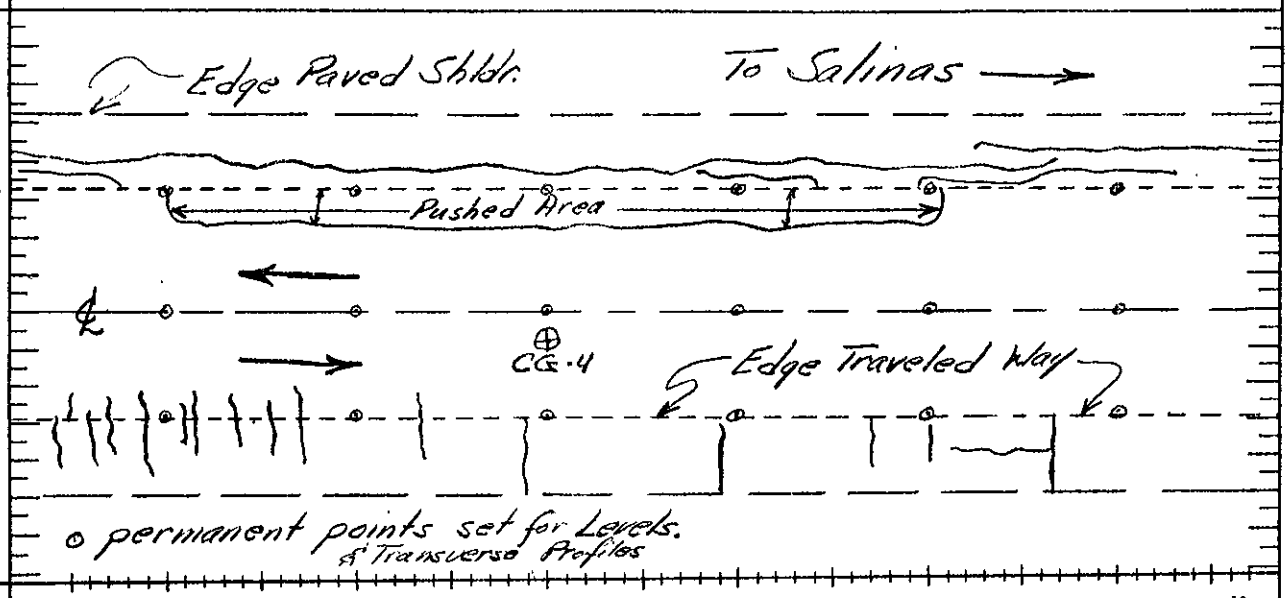
PAVEMENT INVESTIGATION

RESEARCH NO. 00258

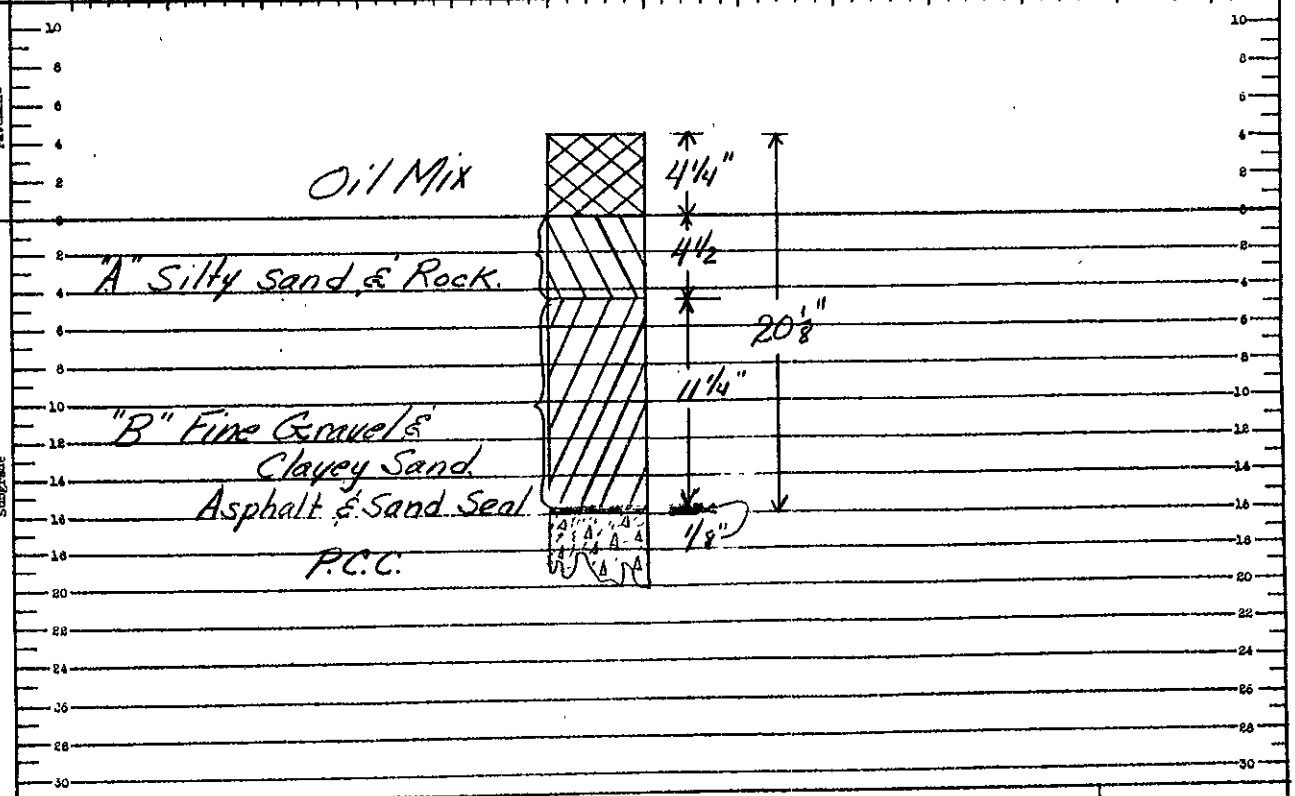
Dist. II	Co. Mon	Rte. 2	Sec. D	Contract No.	Date of Constr. 1936-1937-1952
Test Hole No. CG-4					
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes TWO	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None	Depth —	Date of Sampling 10/8-9/52
Roadside Use, left R.R. R/W		Right Agricultural		Grade 0 %	Up —

Station: 573+40, +60, +80, 574-, +20, +40

Plan — Scale in Feet 1"=20'



Profile — Vertical Scale in Inches



Remarks:

Party: Clawson, Smith

Drawn by: Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 24
Dist. V Co. Mon Rte. 2 Sec. D
Loc. Design CG
Sta. 565+00 to 569+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄

	Left						Right						
	Top of R.R. Fill		Ditch	Edge of Pavd. Shldr.	Pavd. Shldr. at edge of Blanket	Pav't at edge of Blanket	Pav't at edge of Blanket	Pavd. Shldr. at edge of Blanket	Edge of Pavd. Shldr.	Dirt Shldr.	Ditch	Top of Bank	Field Elev.
569~	175.1 65.5	173.6 45.5	174.0 29.5	175.33 18.5	175.67 12.9	175.73 12.7	175.65 12.0	175.57 12.8	175.23 18.5	174.3 28.5	172.1 45.5	174.4 51.5	173.7 68.5
568~	175.8 58.5		174.2 29.5	175.39 18.5	175.11 12.1	175.77 12.7	175.71 11.9	175.65 12.1	175.26 18.5	174.5 27.5	172.0 45.5	174.4 53.5	173.7 67.5
567~	175.6 64.5		174.8 28.5	175.41 19.5	175.79 13.1	175.86 12.4	175.83 11.8	175.77 12.0	175.38 18.5	174.2 30.5	172.0 44.5	174.0 56.5	173.6 68.5
566~	175.4 42.5		173.9 28.5	175.37 18.5	175.79 12.9	175.87 12.7	175.69 12.0	175.63 12.2	175.30 18.5	174.6 30.5	172.3 45.5	174.6 52.5	174.0 67.5
+64	Double 18" CMP Concrete Headwall Right & Left												
		Flow line 172.3 26.0								Flow line 172.2 36.5			
565~	175.0 44.5		173.9 27.5	175.27 18.5	175.71 12.7	175.78 12.5	175.71 12.0	175.64 12.2	175.28 18.5	174.5 29.5	172.5 45.5	174.6 52.5	174.4 67.5

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 15NN26
Job Number

Dist. V Co. Mon Rte. 2 Sec. D
Loc. Design CG
Sta. 570+00 to 575+00
Sheet No. 2 of 2

Load. Sta. No. 24

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left						℄	Right						
	Toe of RR Fill		Ditch	Edge of Pavd Shldr.	Pavd Shldr at edge of Blanket	Pav't at edge of Blanket	Pav't at edge of Blanket	Pavd Shldr. at edge of Blanket	Edge of Pavd Shldr.	Dirt Shldr.	Ditch	Top of Bank	Field Elev.
575~	174.4 69.5		172.5 36.5	174.49 19.0	175.33 13.0	175.38 12.8	175.41 11.9	175.37 12.1	175.12 19.0	174.2 28.5	171.5 45.5	174.0 51.5	172.6 68.5
574~	174.8 69.5		172.6 37.5	174.84 19.5	175.28 13.1	175.33 12.9	175.47 11.9	175.37 12.1	175.2 17.5	174.1 29.5	171.6 45.5	173.5 51.5	172.9 68.5
573~	174.8 69.5		172.3 34.5	174.89 18.5	175.31 12.9	175.36 12.7	175.47 11.9	175.36 12.1	175.02 19.5	174.2 29.5	171.8 44.5	174.0 51.0	173.2 69.5
572~	174.8 65.5		172.6 38.5	174.98 19.5	175.41 13.0	175.47 12.8	175.44 12.1	175.36 12.3	175.07 19.5	174.3 30.5	172.1 44.5	173.5 50.5	173.4 70.5
571~	174.5 68.5		172.5 39.5	175.46 18.5	175.48 12.9	175.52 12.7	175.61 12.0	175.53 12.2	175.31 19.5	174.4 28.5	172.0 45.5	174.3 51.5	173.7 71.5
570~	174.2 62.5	172.7 37.5	174.2 24.5	175.26 18.5	175.60 12.8	175.67 12.6	175.72 12.0	175.64 12.3	175.41 18.5	174.2 29.5	172.1 43.5	174.3 50.5	173.7 68.5

Form T-527

20

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 50
Road VI-Ker-4-D

DATA OF SECTION SELECTED FOR TEST

This section is one of two established in connection with Loadometer Station No. 50.

ROADWAY STRUCTURE

LOCATIONS: Loadometer Pit on Road VI-Ker-4-D is located 0.3 mile north of the junction State Highway Route 4 (Bakersfield to Tulare) and State Highway Route 129 (Bakersfield to Porterville) toward Tulare.

There are no major road or highway turnoffs between the pit and the section.

The section selected for test is located 0.2 miles north of Loadometer Station No. 50 towards Tulare.

LENGTH: The section is located between Sta. "D" 290+00 to Sta. "D" 300+00, a total length of 1000 feet. Roadway at the section location is a 4-lane divided highway. The section is located in the left (southbound) traffic lanes.

SURFACE:

Type: Oil mix surfacing with a fairly recent seal coat.

Width: Present traveled way, sealed area, is two 11 ft. lanes for a total width of 22 feet. The total paved width varies from 33 to 36 feet.

It should be noted that the seal does not extend to the edges of the most recent blanket.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY STRUCTURE

SURFACE:

Thickness: The thickness of the oil mix surfacing varies from 3-1/4 to 3-3/4 inches.

BASE:

Type and Thickness: Silty, clayey sand and gravel. District forces state the material was treated with 1% cement. Thickness varied from 5-3/4 to 6-1/4 inches in the two locations sampled.

Soil Classification: A-1-b

SUBBASE:

Type and Thickness: Old oil mix pavement varying in thickness from 4-1/2 to 4-3/4 inches. Placed as a contact blanket on old P.C.C. pavement varying in thickness from 4-3/8 to 5 inches.

Construction dates on the old pavements are unknown.

Silty, clayey sand and some fine gravel. In the two locations sampled, the thickness varied from 7-5/8 to 7-3/4 inches.

Soil Classification: A-4

BASEMENT:

Type and Thickness: Silty, clayey sand and a little fine gravel. At two locations, thickness sampled varied

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY STRUCTURE

BASEMENT:

Type and Thickness : (Continued) — from 6-3/4 to 7-1/4 inches.

Soil Classification: — A-6 and A-7-6

SIDE DITCH DRAINAGE: — The section roadway is in a slight fill, approximate height 1 ft. and has a profile grade of -0.25%.

There are no culverts or bridges within the section. Drainage within the section is from the south to the north. There are no definite ditches within the section. On the left, drainage is carried along the toe of the RR fill, 48.0 ft. left of and 3.0 ft. lower than, the centerline of the section pavement. On the right, drainage is along the centerline of the division strip between left and right lanes 33.0 ft. right of and 1.5 ft. lower than centerline of the section pavement.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: — There are no areas of alligator cracking within the section.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY CONDITION

SPECIAL CONDITIONS:

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping within the section.

(4) Patches: There are no patched areas in the section.

(5) Roadway Section: The section is in a slight fill. The pavement surface is approximately 1.0' above the surrounding area.

(6) Shoulders: There are asphaltic mix shoulders throughout the section. On the left of centerline, the shoulder is 6.0 feet in width and on the right the shoulder width varies from 2.0' to 5.0'. On the right, from the vicinity of Sta. 298+00 to the end of the section, the shoulder is in a poor condition. At all other locations within the section, the shoulders are in generally fair condition.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY STRUCTURE

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

B.M. No.	Location	Description	Elevation
1	44' rt. of ℄ lt. lanes Sta. 289+65	Ramset pin in PCC headwall	430.000 (Assumed)
2	45' rt. of ℄ left lanes Sta. 302+04	Ramset pin in PCC headwall	426.185

Permanent reference pins were established in 3 lines parallel to centerline. One pin line was set along the traffic stripe, one pin line was set 12' left of the stripe, 1.0' outside the edge of seal. The third line of pins was set 12' rt. of the traffic stripe, 1.0' outside the edge of seal.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20' longitudinal intervals throughout the section.

Loadometer Station No. 50
Road VI-Ker-4-D

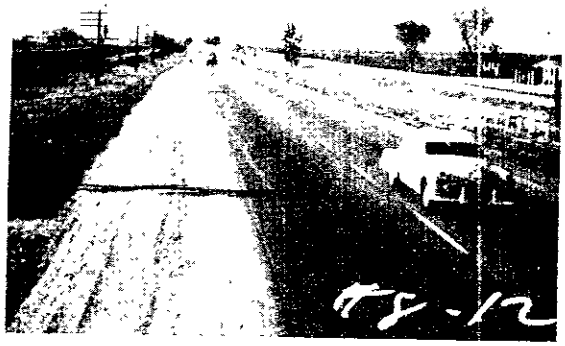
ROADWAY STRUCTURE

Profilograph Records:

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In each lane, a line of profiles were run with the recording wheel 36 inches into the lane from the outer pin lines. All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 50

VI-Ker-4-D "A"



Ahead on Line from Sta.

290+00

Transverse Crack in Lt.

Outer Lane. Sta. 295+39

Transverse Crack in Lt.

Outer Lane. Sta. 298+28

Back on Line from Sta.

300+00

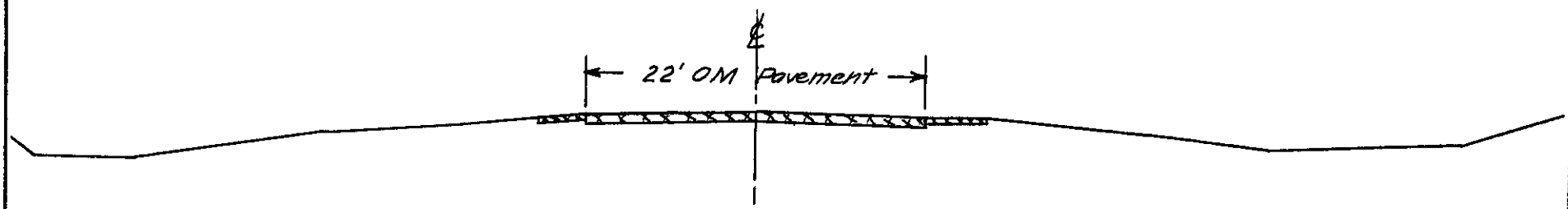
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CAa 50
VI-Ker-4-D

ROADWAY CONDITION SURVEY

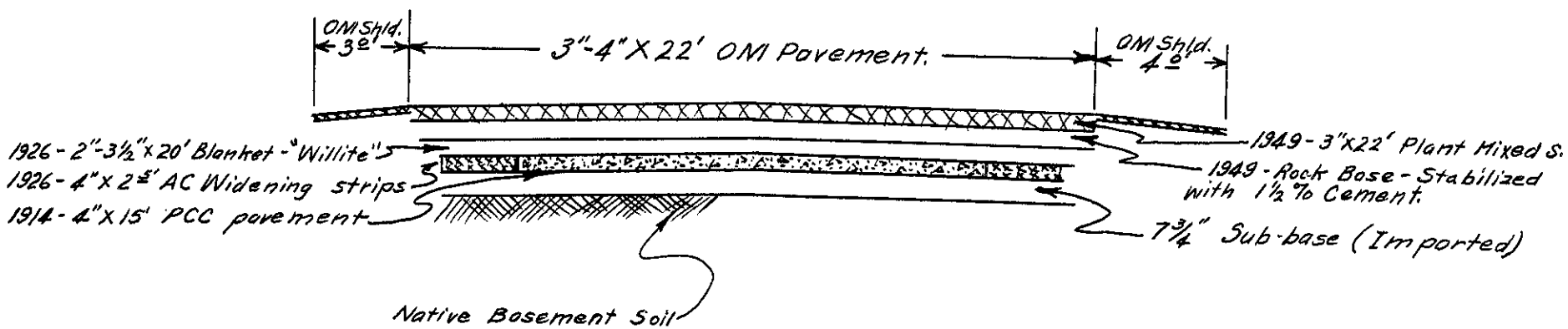
TYPICAL ROADWAY SECTION

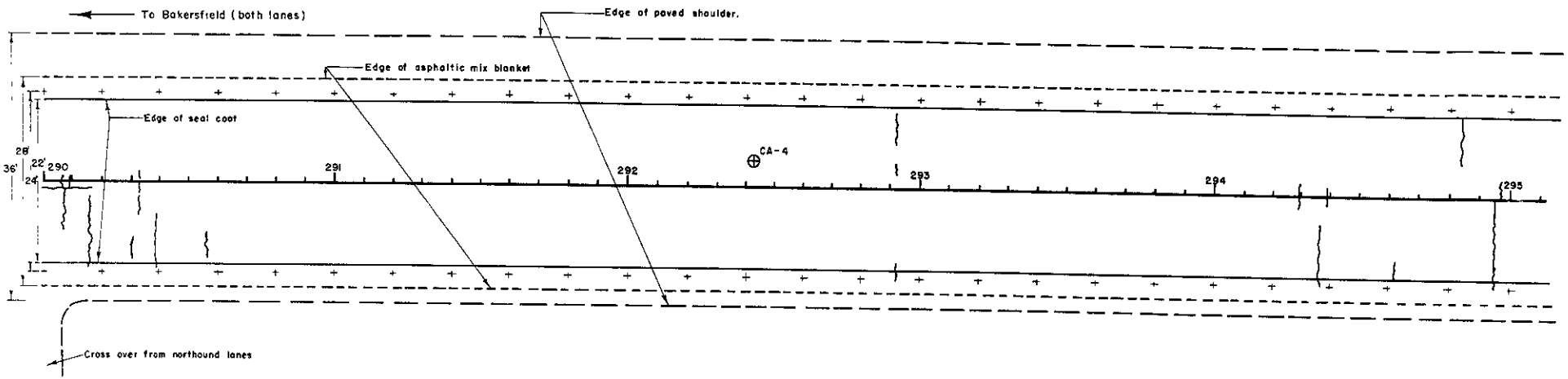
Scale: 1" = 10'

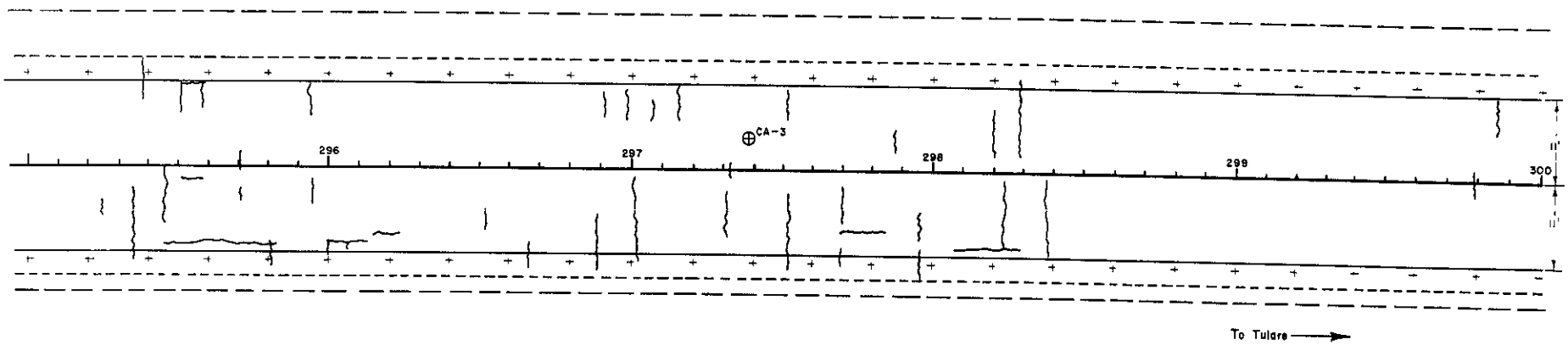


TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'







PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 50
VI-Ker-4-D

TEST RESULTS SUMMARY

Load. Sta. No. 50
VI-Ker-4-D

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	CA-3-A	52-2142	297+38	4' left of ℄ left lanes	OM	3-1/4"	0 - 6-1/4"	Base and Cushion
2	CA-3-B	52-2143	297+38	same	OM	3-1/4"	15" - 22½"	Subbase
3	CA-3-C	52-2144	297+38	same	OM	3-1/4"	22½" - 29½"	Basement
4	CA-4-A	52-2306	292+42	3½' left of ℄ left lanes	OM	3-3/4"	15-3/4"-23½"	Subbase
5	CA-4-B	52-2307	292+42	same	OM	3-3/4"	23½" - 30-3/4	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	4	128	97	9	132	A-1-b	2.63	
2	7	114	87	9	131	A-4	2.63	
3	12	106	85	12	125	A-7-6	2.60	
4	6	122	92	8	133	A-4	2.64	
5	9	96	74	11	129	A-6	2.67	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	99	68	62	52	37	27	10	8	2	N	P
2			100	98	94	82	68	42	34	12	24	16
3			100	99	94	81	62	49	44	19	42	20
4		100	99	97	91	77	64	40	34	8	23	19
5		100	99	97	91	77	65	43	38	7	31	20

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ [illegible]

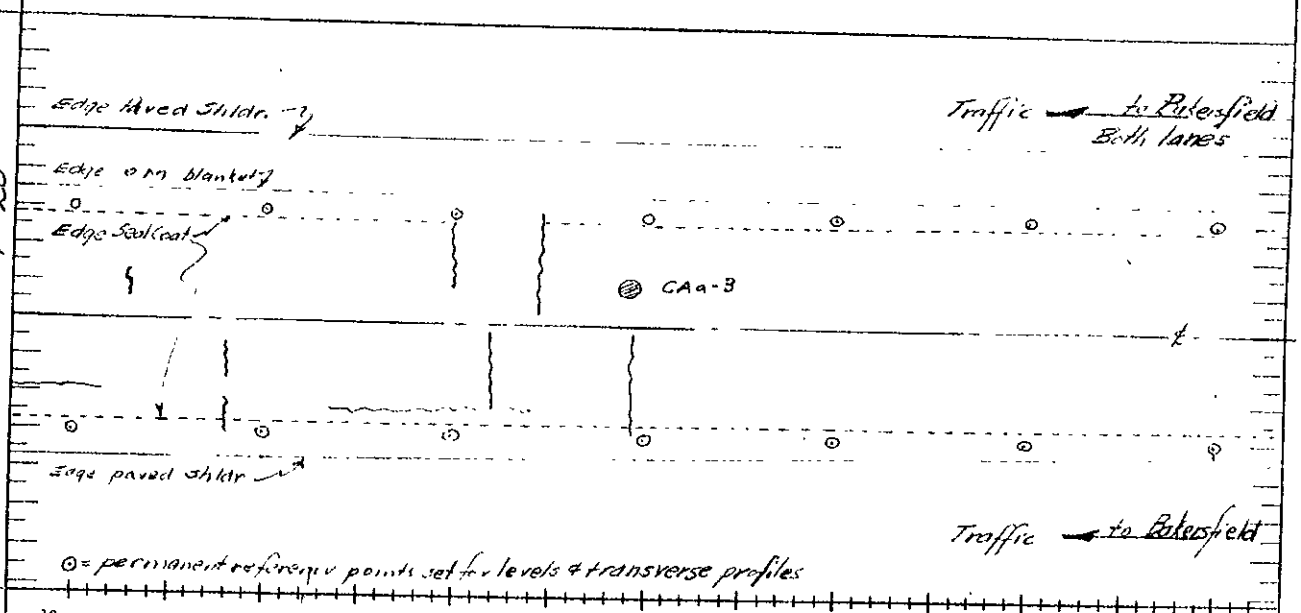
Dist. VI	Co. Ker	Rte. 4	Sec. D	Contract No. —	Date of Constr. Unknown
Fill ✓	Approx. Height 1° ±	Dist. from End of Fill		No. of Lanes 4 - divided	Traffic Medium
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches None clearly defined	Depth —
Roadside Use, Left R.R. R/W		Right Agricultural		Grade 0.25 %	Up

Test Hole No. CAa - 3

Date of Sampling 14-15 May '50

Station: 298 +20 +40 +50 +60 +80 299

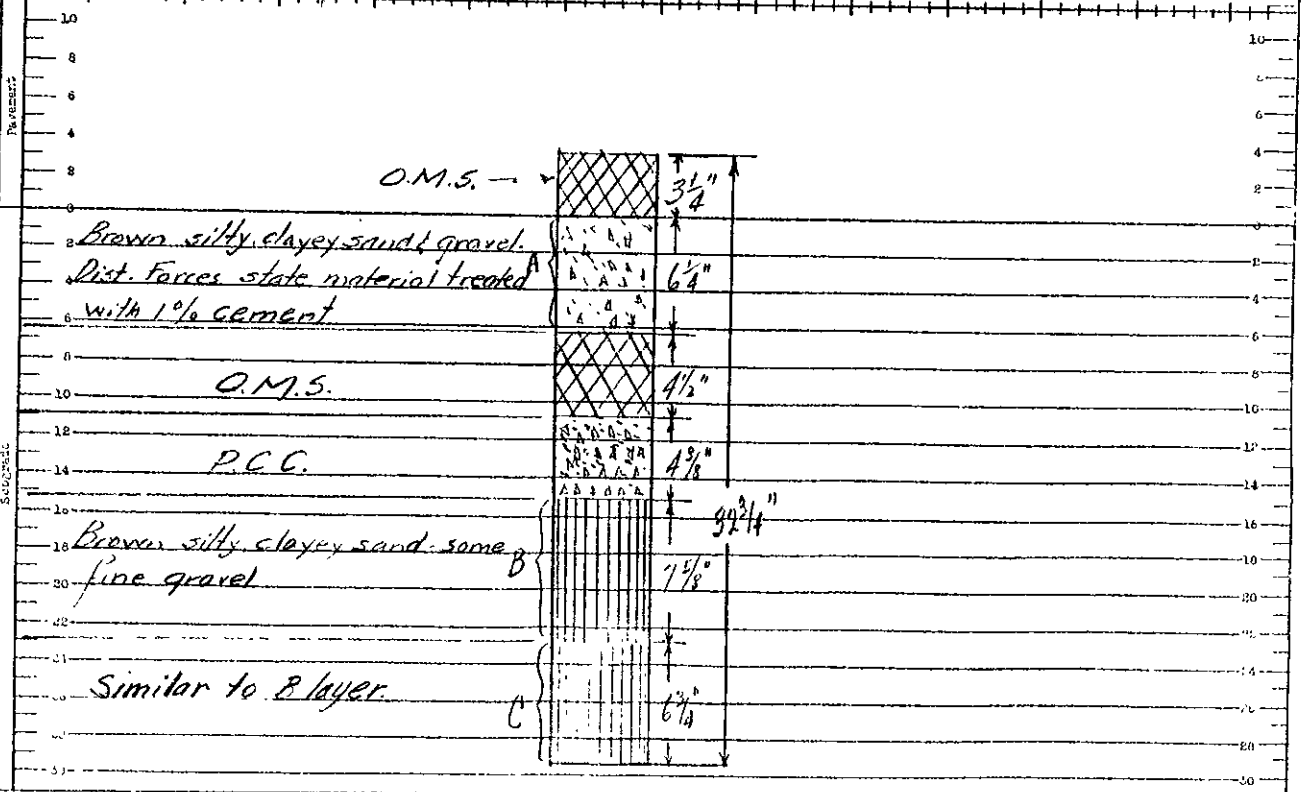
Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches

Pavement

Subgrade



Party Smith

Clawson

Drawn by Clawson

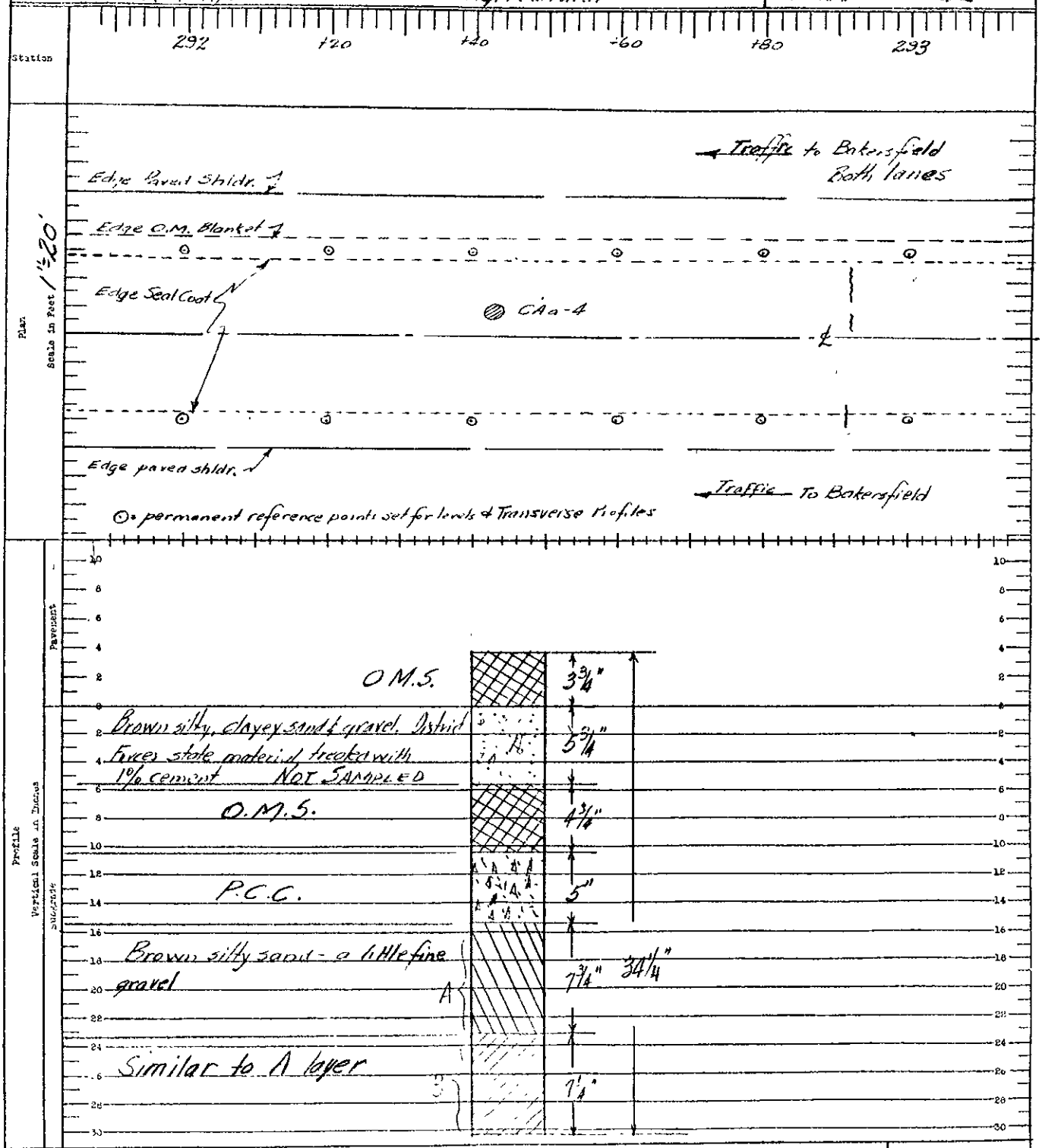
DEPARTMENT OF PUBLIC WORKS — DIVISION OF HIGHWAYS — MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 002ER

Dist. VI	Co. Ker	Rte. 4	Sec. D	Contract No. —	Date of Constr. Unknown
Test Hole No. CAa-4					
Fill ✓	Approx. Height 1'0"±	Dist. from End of Fill	No. of Lanes 4-divided	Traffic Medium	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches None clearly defined	Depth —	Date of Sampling 28 May '52
Roadside Use, Unit R R R/W		Right Agricultural		Grade 0.25%	Up



Party Smith
Clawson

Drawn By Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 50
Dist. VI Co. Ker Rte. 4 Sec. D
Loc. Design CAu
Sta 290+00 to 295+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left						℄	Right					
	Ditch Along RR Fill	R/W Line	Toe Slope	Edge Pav'd Shldr.	Edge New Surface	Edge Traveled Way		Edge Traveled Way	Edge Pav'd Shldr.	Toe of Fill	℄ Division Strip	Toe Fill	Pav'd Shldr Northbound Lanes
295~	424.5 47.0	425.6 40.0	425.5 30.0	426.76 20.0	427.15 14.0	427.37 11.1		427.57 11.0	427.31 15.5	426.3 24.0	425.9 36.0	426.4 45.0	429.4 58.0
294~	425.2 48.0	425.6 40.0	426.1 30.0	427.28 20.0	427.60 14.0	427.81 11.2	℄ 427.60	427.95 11.1	427.58 16.0	426.6 23.0	426.5 33.0	426.9 41.0	429.5 58.0
293~	425.8 48.0	426.3 40.0	426.6 30.0	427.59 20.0	427.92 14.0	428.14 11.2		428.27 11.1	427.91 16.0	427.1 23.0	426.9 33.0	427.0 45.0	429.7 58.0
292~	426.4 48.0	427.7 40.0	427.4 30.0	428.03 20.0	428.33 14.0	428.48 11.2		428.56 11.1	428.21 16.0	427.3 24.0	427.2 33.0	427.5 46.0	429.9 58.0
291~		428.0 40.0	427.9 30.0	428.48 20.0	428.75 14.0	428.91 11.2		428.59 11.1	428.52 16.0	427.7 25.5	427.4 40.0	427.4 46.0	430.2 58.0
290~		427.7 40.0	427.8 30.0	428.55 20.0	428.93 14.0	429.17 11.2		Paved Cross Over 429.28 11.1	429.14 16.0	429.68 47.0	430.67 64.0		

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VI Co. Ker Rte. 4 Sec. D
Load. Sta. No. 50
Loc. Design CAa
Sta. 296+00 to 300+00
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left						Right						
	Ditch Along RR Fill	R/W Line	Toe Slope	Edge Pav'd Shldr.	Edge New Surface	Edge Traveled Way	Edge Traveled Way	Edge Pav'd Shldr.	Toe of Fill	℄ division Strip	Toe Fill	Pav'd Shldr. Northbound Lanes	
300~	424.1	424.3	424.3	425.74	426.23	426.42	426.60	426.42	425.4	425.6	426.4	429.5	
	41.0	39.0	30.0	20.0	14.0	11.1	11.2	13.0	29.0	33.0	45.0	58.0	
299~	423.7	424.0	424.3	425.74	426.29	426.46	426.62	426.43	425.4	425.4	426.0	429.4	
	47.0	40.0	30.0	20.0	14.0	11.1	11.1	13.0	23.0	30.0	45.0	58.0	
298~	423.7	424.3	425.0	426.1	425.54	426.70	426.80	426.56	425.8	425.4	426.1	429.7	
	46.0	40.0	29.0	20.0	14.0	11.2	11.2	15.0	23.0	31.0	43.0	58.0	
297~	423.9	424.1	424.9	426.19	426.71	426.91	427.05	426.81	425.9	425.7	426.3	429.6	
	47.0	40.0	30.0	20.0	14.0	11.3	11.0	15.0	23.0	34.0	45.0	58.0	
296~	423.9	424.1	425.0	426.36	426.91	427.12	427.24	427.06	426.0	425.7	426.2	429.6	
	47.0	40.0	28.0	19.5	14.0	11.3	11.0	15.0	25.0	33.0	45.0	58.0	

℄ 426.73

Form T-527

21

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 50
Road VI-Ker-4-D

DATA OF SECTION SELECTED FOR TEST

This section is one of two established in connection with Loadometer Station No. 50.

ROADWAY STRUCTURE

LOCATION: Loadometer Pit on Road VI-Ker-4-D is located 0.3 mile north of the junction State Highway Route 4 (Bakersfield to Tulare) and State Highway Route 129 (Bakersfield to Porterville) towards Tulare.

The section selected for test is located 0.8 mile north of Loadometer Station 50 towards Tulare.

LENGTH: The section is located between Station "D" 330+00 and Station "D" 340+00, a total length of 1000 feet.

Roadway at the section location is a 4-lane divided highway. The section is located in the left (southbound) traffic lanes.

SURFACE:

Type: Present roadway surface is oil mix surfacing. At one sample location 8.3' left of centerline at Sta. 331+97, the oil mix surfacing was a contact blanket on what appeared to be asphaltic concrete. At 3.0' left of centerline at Sta. 337+46, the oil mix surfacing was a contact blanket on P.C.C. pavement.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY STRUCTURE

SURFACE:

Width: The present traveled way, which is the most recent blanket, is two 11.0 foot lanes for a total width of 22.0 feet. The total paved width varies from 33.0 to 58.0 feet.

Thickness: At the sample taken 8.3 feet left of centerline at Sta. 331+97, the oil mix surfacing was 6-1/2 inches thick. What appeared to be asphaltic concrete was 5-1/2 inches thick for a total pavement thickness of 12.0 inches. At Sta. 331+46, 3.0 lt. of centerline, the oil mix was found to be 6-1/8 inches thick and the P.C.C. pavement was 3-7/8 inches for a total pavement thickness of 10.0 inches.

No further information was made available to this office.

BASE:

Type and Thickness: In the sample at Sta. 331+97, a silty sand was found below the asphaltic mix surfacing. This material was sampled in two layers for a total thickness of 16-1/2 inches.

Soil Classification: A-2-4

In the sample at Sta. 337+46, a silty clayey sand and a little fine gravel was encountered

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY STRUCTURE

BASE:

Soil Classification: (Continued) below the P.C.C. pavement. This material was sampled in two layers for a total thickness of 14 inches.

Soil Classification: A-7-6

SIDE DITCH DRAINAGE: The section roadway is entirely in a grade section and the roadway surface has a level profile grade.

There are no clearly defined ditches within the section limits. Drainage is generally from north to south. On the right, runoff is carried in the center of the median strip between the left and right lanes, from 0.5 to 1.0 feet below centerline elevation.

On the left, runoff is carried in the area between the roadway shoulder and the RR fill which is parallel to, and approximately 45.0 feet left of the roadway centerline. There are no culverts or bridges within the section.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There is one area of alligator cracking located in the left outer lane from 10.5' to 12.0' left

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

centerline between Sta. 337+30 and Sta. 337+50. Shown graphically on the plan diagram are two shattered areas located in the left outer lane. These areas are listed below for convenience.

Sta. 335+52.5 to Sta. 335+66 from centerline to 3.0' lt.
Sta. 338+30 to Sta. 340+00 from 9.5' to 12.0' lt. of centerline

Both areas are spalling.

(2) Areas of Raveling: There are no signs of raveling within the section.

(3) Areas of Shoving or Creeping: There are no areas of shoving or creeping within the section.

(4) Patches: There are no patches in the section.

(5) Roadway Section: As previously noted, the section roadway is entirely in a grade section.

(6) Shoulders: There are asphaltic mix shoulders throughout the section. Shoulders vary in width from 6.0' to 10.0' on the left and from 4.5' to 5.5' on the right. Except for an area on the left between Sta. 338+30 and Sta. 340+00 where a shattered area previously noted extends onto the shoulder, the shoulders are in generally fair condition.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels:

Bench marks were established by the field crew near the ends of the section.

B.M. No.	Location	Description	Elevation
3	41' rt. of ℄ lt. lanes Sta. 328+25	Ramset pin in RR spike in E.face Power pole	450.00 (Assumed)
4	37' lt. of ℄ lt. lanes Sta. 340+50	Ramset pin in RR spike in E. face of telegraph pole	450.252

Permanent reference pins were established in 3 lines parallel to centerline. One pin line was set along the traffic stripe. One pin line was set 12' lt. of the stripe and 1.0' outside the edge of blanket. The third line of pins was set 12' right of the stripe.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20' longitudinal intervals throughout the section.

Loadometer Station No. 50
Road VI-Ker-4-D

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. In each lane, a line of profiles were run with the recording wheel 36" into the lane from the outer pin lines.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

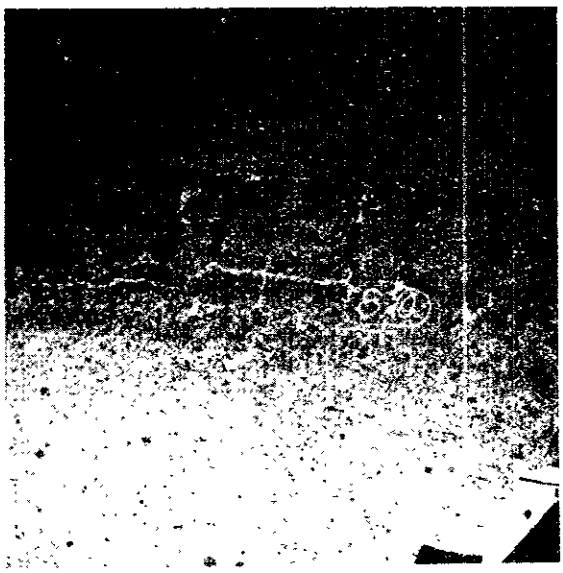
Loadometer Sta. No. 50

VI-Ker-4-D "B"

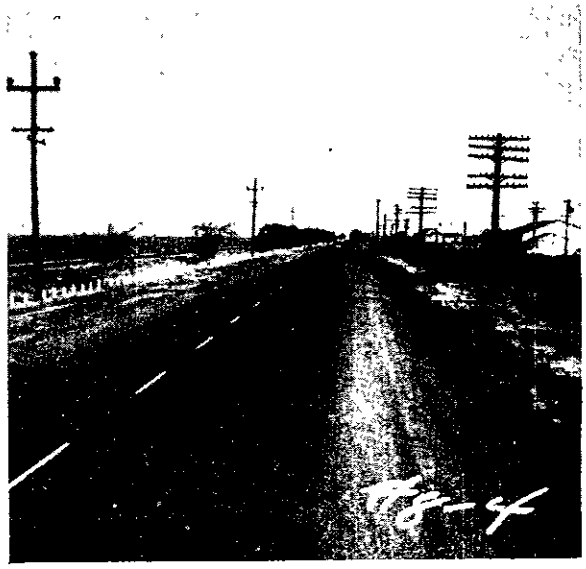
Broken Area

Sta. 335+55 to Sta. 335+60

Shattered Area on Lt. Outer Shoulder. Sta. 338+30 to Sta. 338+90



Cracks Along Edge of Traveled Way. Station 338+80 to Sta. 338+90



Back on Line from Sta. 340

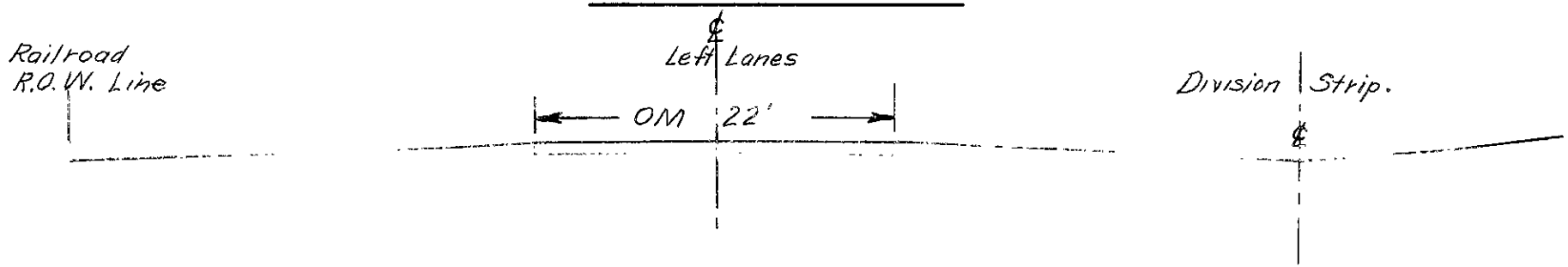
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. CAb 50
VI-Ker-4-D

ROADWAY CONDITION SURVEY

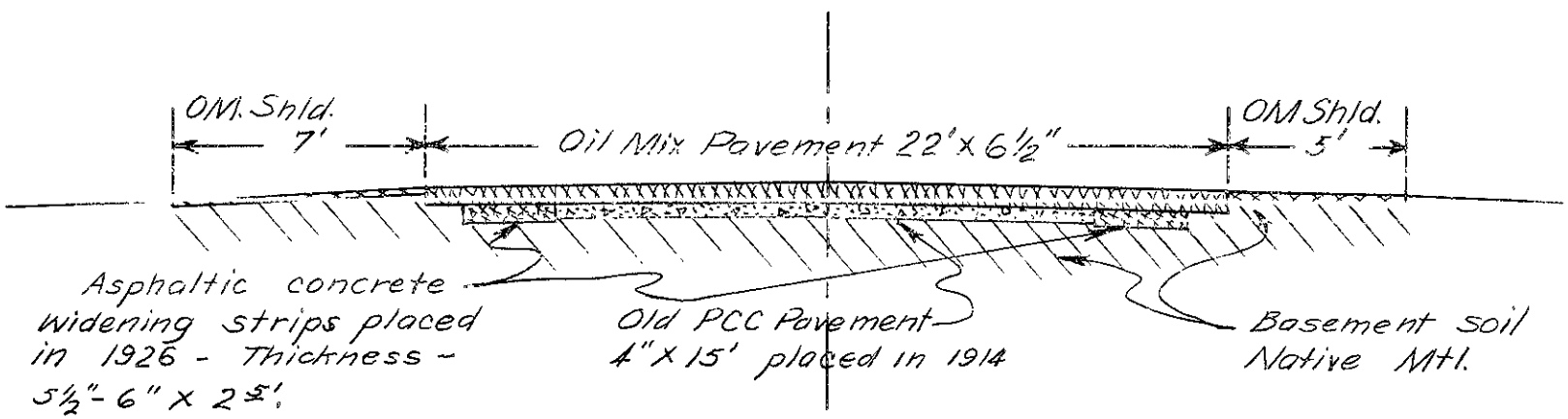
TYPICAL ROADWAY SECTION

Scale: 1" = 10'

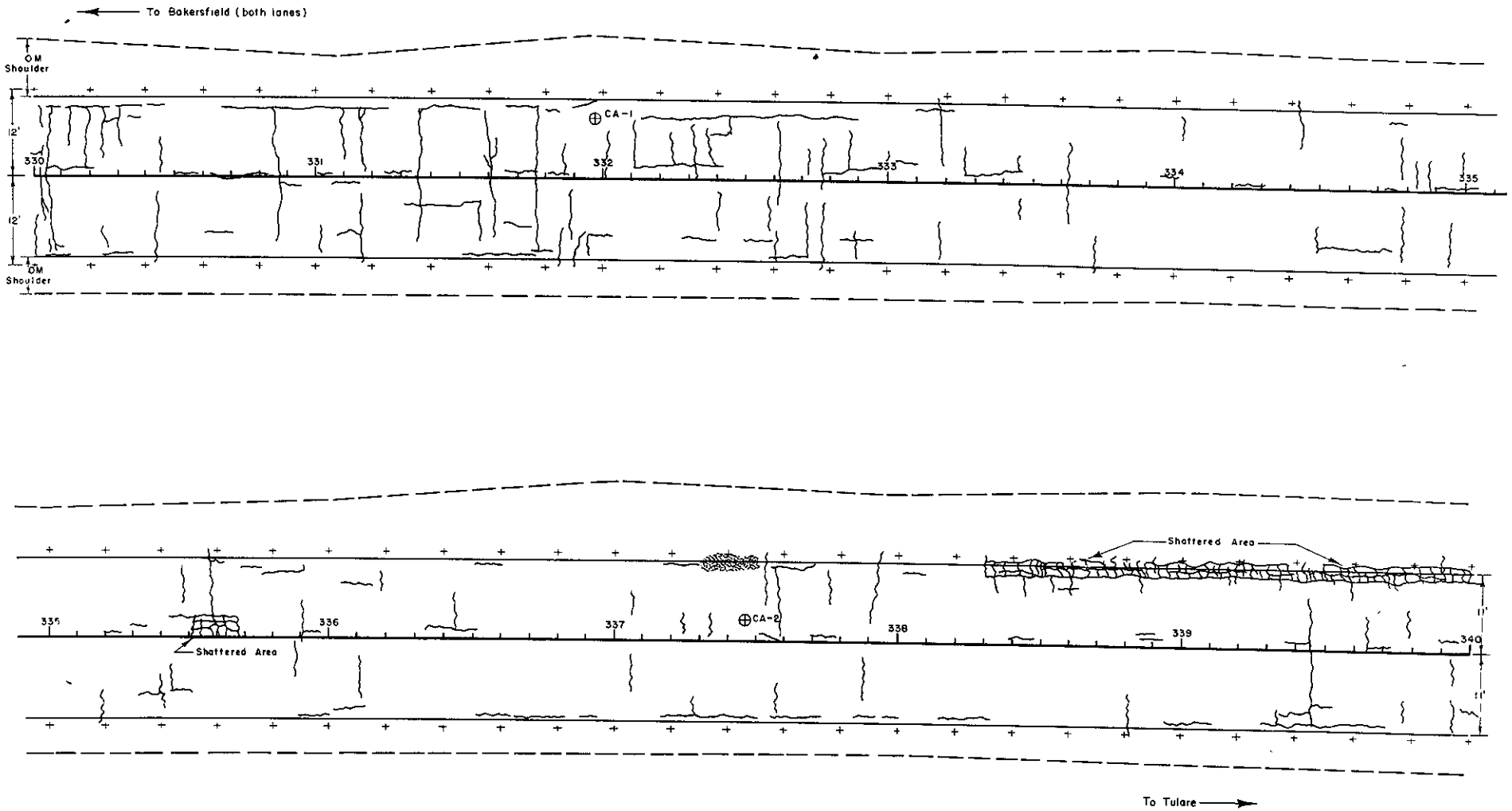


TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'



District Records indicate 20'x 2"(+) blanket of "Willite" in 1926
22'x 3" blanket of Plant Mixed Surf - 1949.



PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 50
VI-Ker-4-D

TEST RESULTS SUMMARY

Load. Sta. No. 50
VI-Ker-4-D

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	CA-1-A	52-2138	331+97	8.3' left of ℄ left lanes	OM AC	6" 6"	0 - 7-1/2"	Base
2	CA-1-B	52-2139	331+97	same	OM AC	6" 6"	7½" - 16½"	Basement
3	CA-2-A	52-2140	337+46	3' left of ℄ left lanes	OM PCC	6" 4"	0 - 7"	Base
4	CA-2-B	52-2141	337+46	same	OM PCC	6" 4"	7" - 14"	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	6	119	89	8	133	A-2-4	2.67	
2	6	112	84	8	133	A-2-4	2.67	
3	16	103	90	14	114	A-7-6	2.61	
4	16	97	88	11	110	A-7-6	2.61	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	99	99	97	92	79	65	34	27	6	N	P
2			100	98	93	80	64	35	27	5	N	P
3			100	99	97	90	82	65	62	28	49	22
4			100	99	97	89	80	63	60	25	50	22

LOCATION AND PROFILE SKETCH

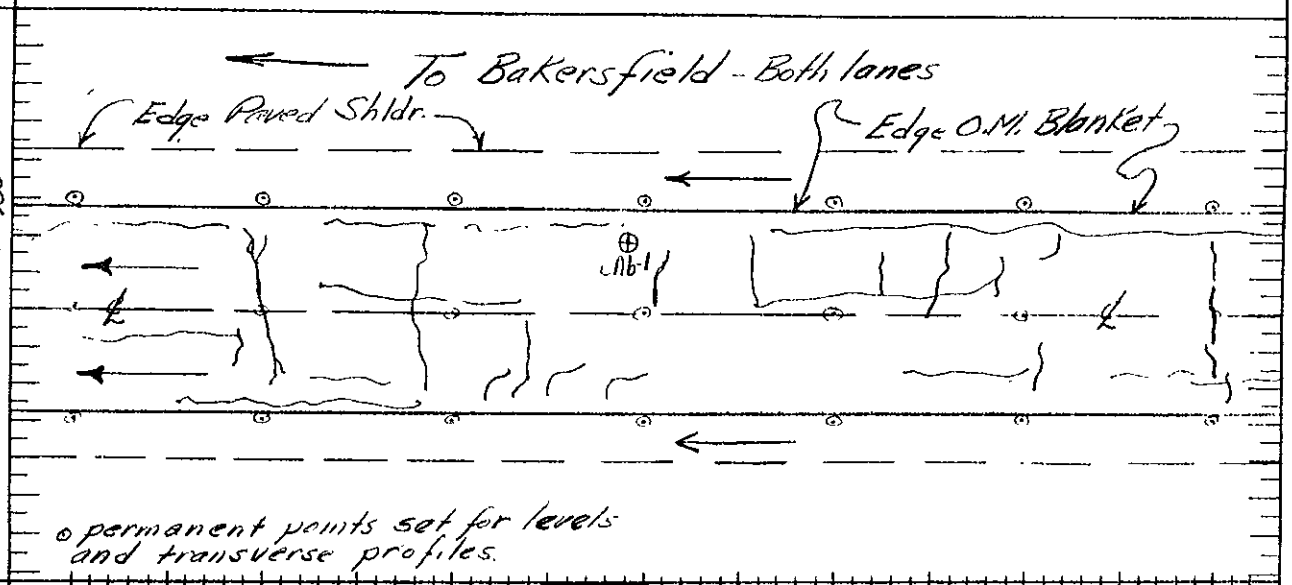
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00255

Dist. VI	Co. Ker	Rte. 4	Sec. D	Contract No. —	Date of Constr. Unknown
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Four-Divided	Traffic Medium	Test Hole No. CAb-1
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not Clearly Defined	Depth —	Date of Sampling 5-13-52
Roadside Ditch R.R. R/W		Right Agricultural		Grade ( ) %	Up —

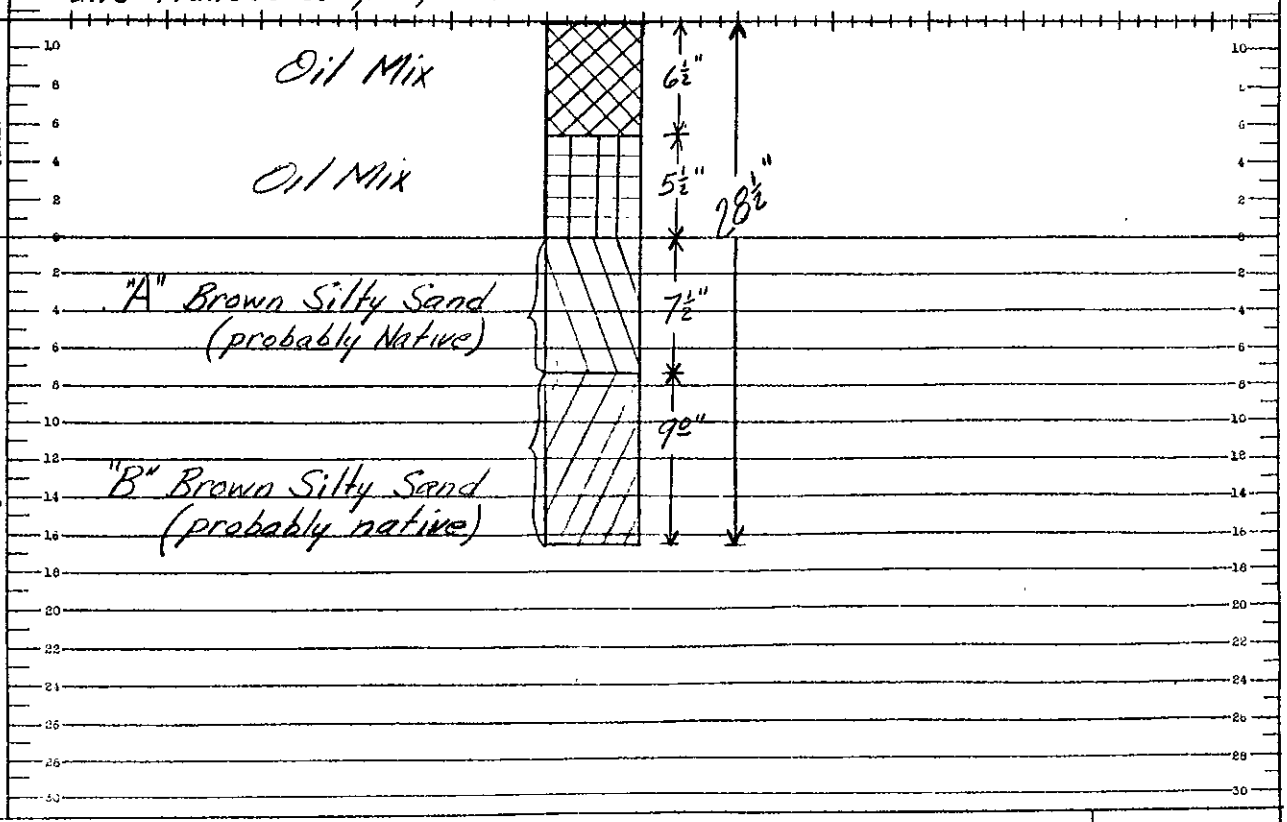
Station: +40 +60 +80 332~ +20 +40 +60

Plan — Scale in Feet 1" = 20'



⊙ permanent points set for levels and transverse profiles.

Profile — Vertical Scale in Inches



Remarks:

Party Smith
Clawson

Drawn By Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

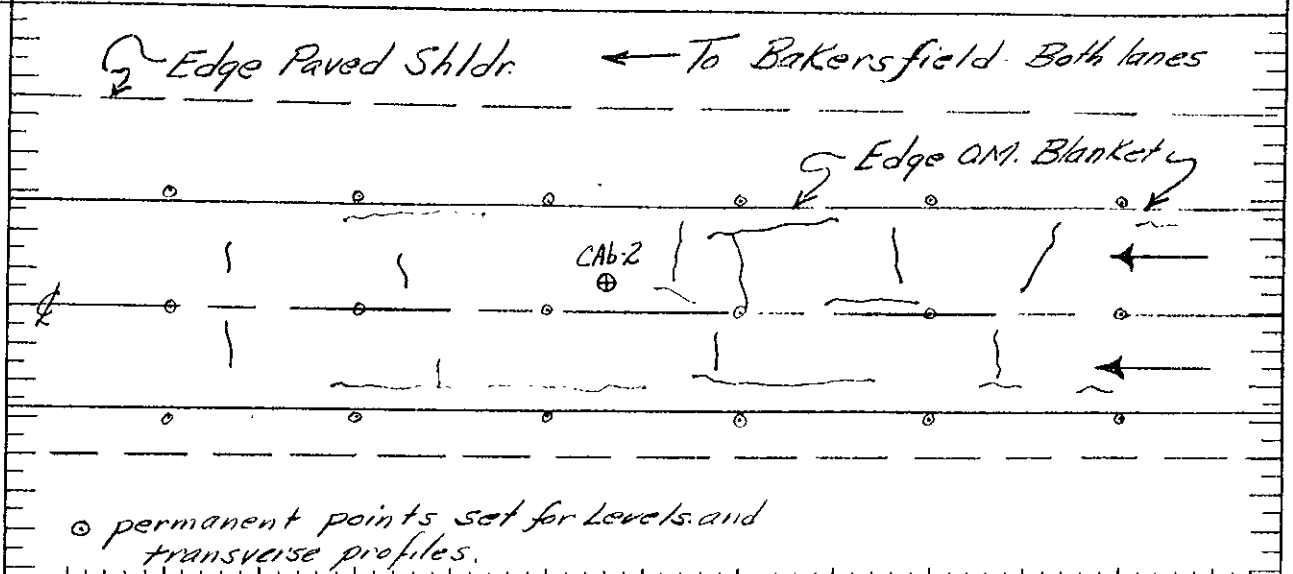
[illegible] PAVEMENT INVESTIGATION

RESEARCH NO. [illegible]

Dist. VI	Co. Ker	Rte. 4	Sec. D	Contract No. —	Date of Constr. Unknown
Test Hole No. CAb-2					
Fill Grade	Approx. Height —	Dist. from End of Fill	No. of Lanes Four-Divided	Traffic Medium	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not Clearly Defined	Depth —	Date of Sampling 5-13-52
Roadside, Left R.R. R/W.		Right Agricultural		Grade 0 %	Up —

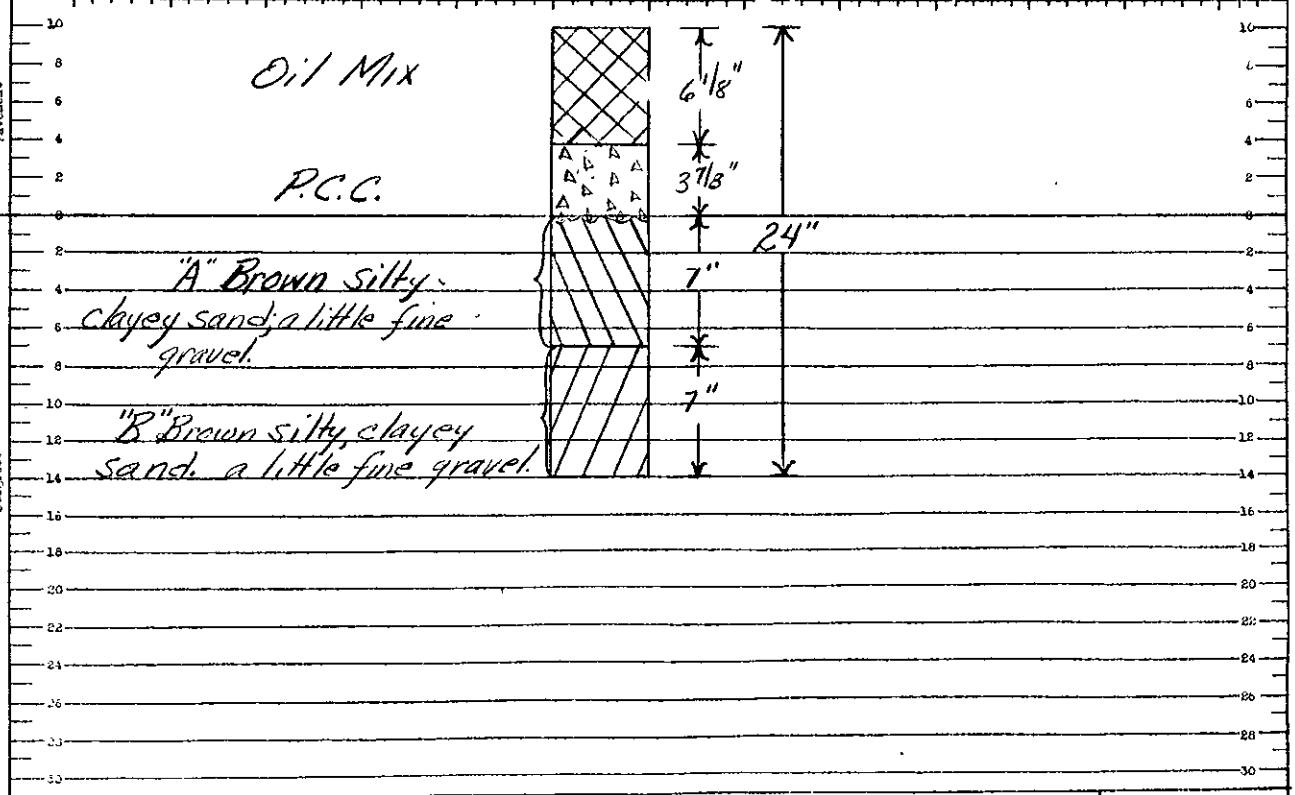
Station: 337~ +20 +40 +60 +80 338~

Plan — Scale in Feet 1" = 20'



⊙ permanent points set for Levels and transverse profiles.

Profile — Vertical Scale in Inches



Party Clawson Smith

Drawn By Smith

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VI Co. Ker Rte. 4 Sec. D
Load. Sta. No. 50
Loc. Design CAb
Sta. 330+00 to 335+00
Sheet No. 1 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left				℄			Right						
					R/w Line	Edge Paved Shldr.	Edge Traveled way	Edge Traveled way	Edge Paved Shldr.	℄ division Strip	Toe Fill	Shldr North Bound Lanes		
335~					449.8 70.0	450.11 18.0	450.50 11.0	450.47 11.2	450.29 16.0	449.8 36.0	450.3 45.0	452.9 59.0		
334~					449.2 40.0	449.63 19.0	450.20 11.0	450.23 11.1	450.05 15.5	449.41 36.0	450.0 45.0	452.8 59.0		
333~					448.9 40.0	449.59 18.0	450.03 11.0	450.04 11.1	449.76 16.0	448.4 36.0	449.8 45.0	453.6 59.0		
332~					447.9 40.0	448.97 20.0	449.76 11.1	449.81 11.1	449.47 16.0	448.9 36.0	449.3 45.0	452.5 59.0		
331~					448.0 40.0	449.20 17.0	449.57 11.1	449.69 11.0	449.30 16.0	448.8 36.0	449.4 46.0	452.2 59.0		
330~					448.2 39.0	449.03 19.0	449.47 11.1	449.46 11.2	449.11 16.0	448.7 36.0	449.2 46.0	452.2 59.0		

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VI Co. Ker Rte. 4 Sec. D
Load. Sta. No. 50
Loc. Design CAb
Sta 336+00 to 340+00
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left				℄			Right						
					R/W Line	Edge Paved Shldr.	Edge Traveled Way	Edge Traveled Way	Edge Paved Shldr	℄ Division Strip	Toe Fill	Shldr North Bound Lanes		
340~					449.2 40.0	450.50 20.5	451.13 11.0	451.16 11.1	450.83 16.5	450.2 36.0	450.7 45.0	453.4 59.0		
339~					450.3 40.0	450.39 21.5	450.99 11.0	451.06 11.2	450.72 16.0	450.24 36.0	450.4 45.0	453.3 59.0		
338					450.3 40.0	450.27 20.5	450.92 11.2	450.96 11.3	450.72 15.5	450.2 36.0	450.6 45.0	453.3 59.0		
337~					450.3 40.0	450.15 22.5	450.86 11.2	450.85 10.9	450.63 15.5	450.3 36.0	450.5 45.0	453.2 59.0		
336					450.3 40.0	450.21 19.0	450.70 11.0	450.75 11.1	450.58 15.5	450.3 36.0	450.3 45.0	453.0 59.0		

Form T-527

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Research No. 00258
W.O. Number 13NN26

Loadometer Station No. 44
Road VII-Ven-2-C

DATA OF SECTION SELECTED FOR TEST

This section is one of two established in connection with Loadometer Station No. 44 and is designated "Location A".

ROADWAY STRUCTURE

LOCATION	Platform scales are located 2.3 miles south of the junction of Route 2 and Route 79.
LENGTH:	The section selected for test is located approximately 0.7 of a mile south of the platform scale. The section is established between Sta. 388+00 and Sta. 398+00. Road VII-Ven-2-C, a length of 1000 ft. Roadway is a 4 lane divided expressway. The section is established in the left (eastbound traffic) lanes.
SURFACE:	
Type:	Plant mixed surfacing constructed in 1949.
Width:	23' total, 11.0 ft. outer lane, 12.0 ft. passing lane.
Thickness:	4" to 4-1/4"
BASE AND SUBBASE MATERIAL:	
Type:	Clean sand and gravel
Thickness:	Variable, from 4-1/2" to 7-3/4"
Classification:	Base soil is classified as A-1-a

ROADWAY STRUCTURE

BASE AND SUBBASE MATERIAL:

Classification (Continued)

Below the base material are two slabs of PCC pavement. The upper slab varies from 5" to 5-1/2" in thickness and the lower slab varies from 3-1/2" to 4-1/2" in thickness so that total thickness of slabs varies from 9" to 9-1/2". Below the PCC slab, at two of the locations sampled, a clayey, silty sand and gravel was encountered which appeared to be an imported material. At the third location sampled, there was none of this material. Test results show material just under the old PCC pavement to be the same from all three locations sampled. Material is classified as A-6. Thickness of sample layers varied from 5-1/4" to 6-3/4". Below the material described above was native basement soil, a black and gray adobe clay, classified as A-7-6.

SIDE DITCH DRAINAGE

The section roadway is entirely in fill. The section roadway has a profile grade of +1.4% from south to north. Drainage runs from north towards the south and passes under the roadway beyond the section limits.

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

Along the inner edge of pavement are asphaltic mix shoulders which vary in width from 3' to 4'. Fill slopes are uniform from the edge of the shoulders toward the center of the division strip, which is from 1.5 ft. to 3.0 ft. lower than the edges of the shoulder. The center of the division strip acts as a drainage channel between the left and right roadways.

Along the outer edge of pavement, asphaltic mix shoulders are from 8.5' to 11.0' in width. Between Sta 388+00 and Sta 395+60, side slopes outside the paved shoulder area have been bladed at a uniform slope to the right of way line, a distance of from 21.0 to 28.0 feet. Between Sta. 395+60 and Sta 398+00, side slopes outside the paved shoulder area have been bladed uniformly to the top of a side drainage ditch located from 24.0' to 26.0' left of the outer edge of pavement. Bottom of ditch is 2.2' to 2.6' below the elevation of pavement. Drainage along the outer side of the roadway is from north to south (Sta. 398+00 towards 388+00) and out of the test section limits.

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking within the section.

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There are no areas within the section which indicate shoving or creeping of the surface.

(4) Patches: The only patches within the limits of the section are those placed when sample holes were backfilled. Patches are approximately 1.0' wide by 3.0' long and are located at:

Sta. 389+45, centerline left outer lane
Sta. 392+98, centerline left outer lane
Sta. 396+50, centerline left outer lane

(5) Roadway Section: The section roadway is entirely in fill section. Section pavement varies from 1.0' to 2.5' above the adjacent agricultural lands on the left.

(6) Shoulders: Asphaltic mix shoulders throughout the section are in uniformly excellent condition. On the left of the traveled way, shoulders vary from 8.5' to 11.0' in width on the right of the traveled way, shoulders vary from 3.0' to 4.0' in width.

ROADWAY CONDITION:

SPECIAL CONDITIONS:
(Continued)

(6) Shoulders: Asphaltic mix shoulders throughout the section are in uniformly excellent condition. On the left of the traveled way, shoulders vary from 8.5' to 11.0' in width on the right of the traveled way, shoulders vary from 3.0' to 4.0' in width.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Two bench marks were established by the field crew near the ends of section. An elevation of 150.000 feet was assumed for Bench Mark No. 1.

B.M. No.	Location	Description	Elevation
1	83.5' rt. of lt. inner E.P. Sta. 391+39	1/4" diam. pin in pipe cap	150,000 (Assumed)
2	26.2' rt. of lt. outer E.P. Sta. 395+80	1/4" diam. pin in R/W Monument	152.930

Three lines of permanent reference pins were established. One line was along the traffic stripe, one line was 10.5' left of the stripe and one line was 11.5' right of the stripe. Outside line of pins are set 0.5 ft. towards the stripe from the edges of pavement.

Loadometer Station No. 44
Road VII-Ven-2-C

ROADWAY CONDITION

PROFILOGRAPH RECORDS:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for the purpose, transverse profilograph records were made of the traveled way surface in each lane at 20' longitudinal intervals.

Longitudinal: Using the Profilograph, longitudinal profilograph records were made of each lane of pavement in the section. Records were made with the recording wheel of the Profilograph 22" towards the traffic stripe from each of the outer pin lines.

Loadometer Sta. No. 44

VII-Ven-2-C

Ahead on Line from

Station 388+00

Back on Line from

Station 398+00

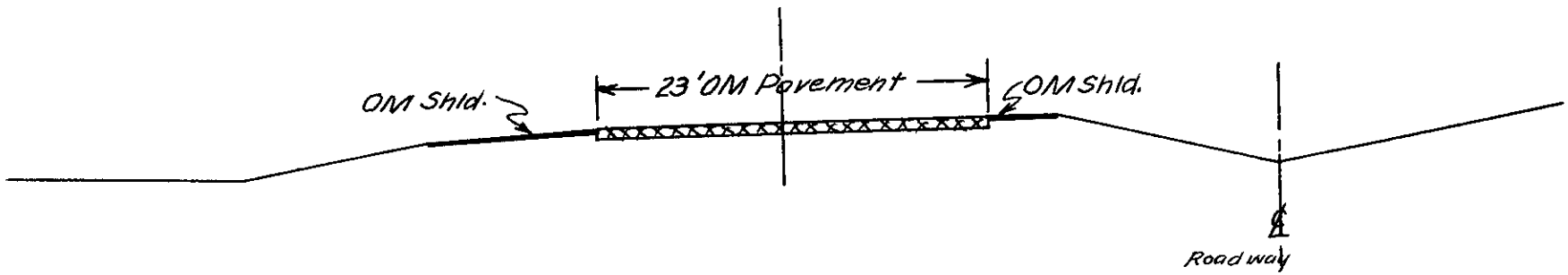
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. AVa 44
VII-Ven-2-C

ROADWAY CONDITION SURVEY

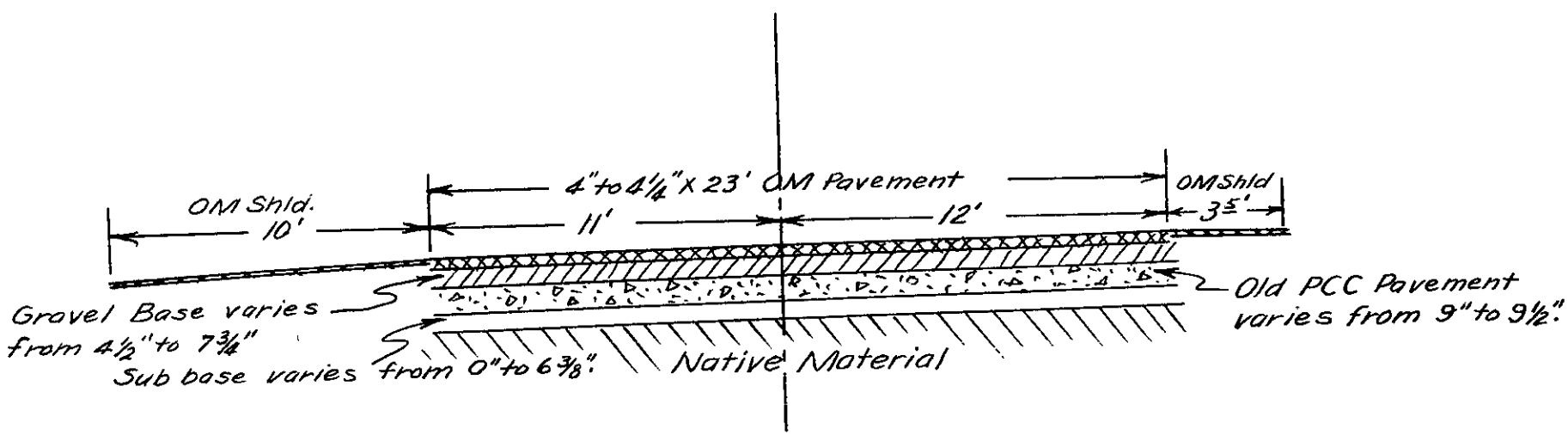
Scale: 1" = 10'

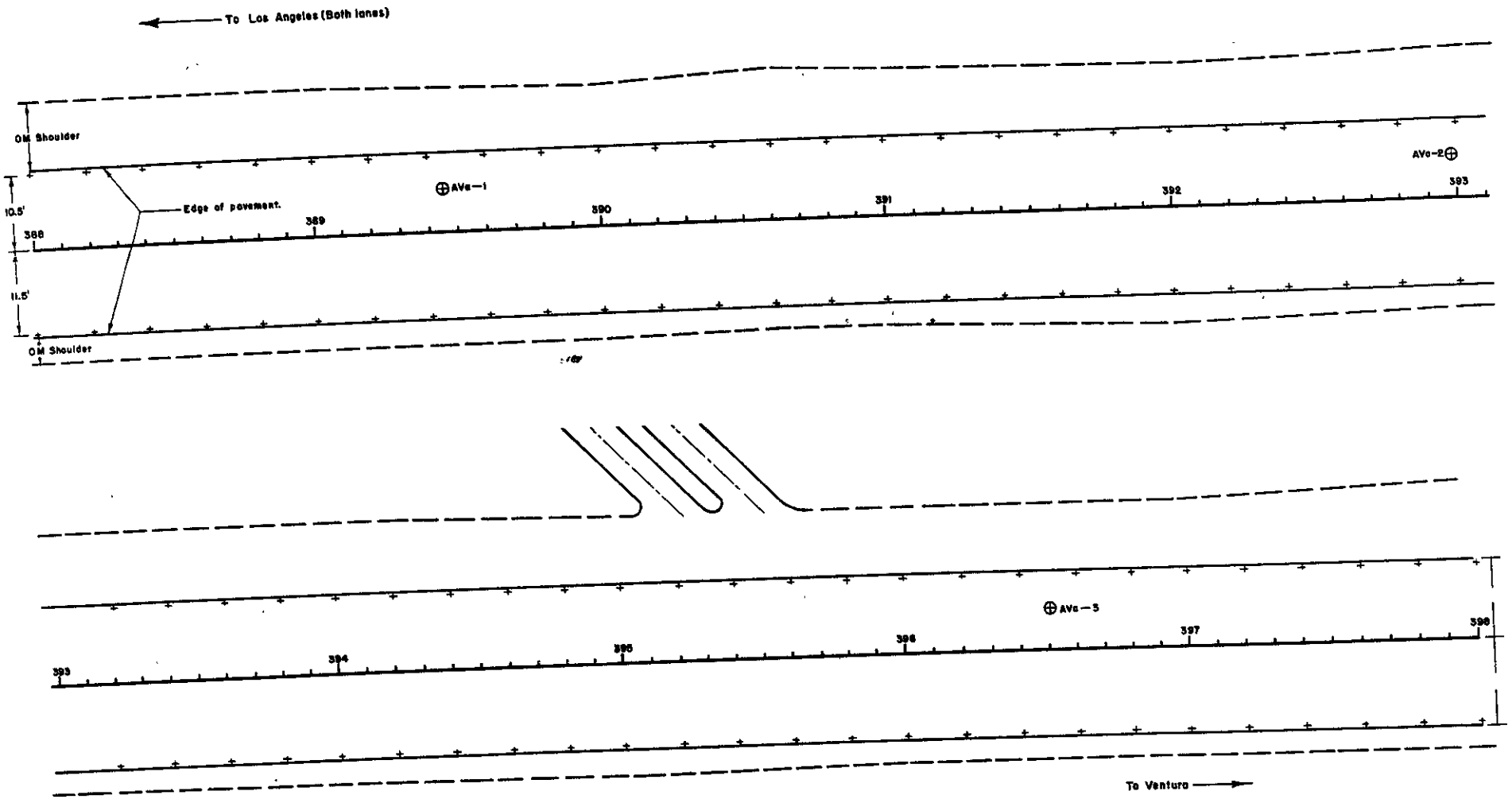
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 44
VII-Ven-2-C

TEST RESULTS SUMMARY

Load. Sta. No. 44
VII-Ven-2-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	AVa1A	51-828	389+45	6' left of ℄ left lanes	OM	4-1/4"	0 - 7½"	Base and Cushion
2	AVa1B	51-828A	389+45	same	OM	4-1/4"	17" - 23"	Subbase
3	AVa2A	51-829	392+98	Centerline left Outer lane	OM	4"	0 - 4½"	Base and Cushion
4	AVa2B	51-829A	392+98	same	OM	4"	14 - 20"	Subbase
5	AVa2C	51-829B	392+98	same	OM	4"	20" - 30"	Basement
6	AVa3A	51-830	396+50	Centerline L. Outer lane	OM	4"	0 - 7-3/4"	Base and Cushion
7	AVa3B	51-830B	396+50	same	OM	4"	17¼" - 24"	Subbase
8	AVa3C	51-830A	396+50	same	OM	4"	24" - 30"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	6	144	107	7	135	A-1-a	2.63	2.53
2	10	139	106	10	131	A-6	2.62	2.47
3	8	150	111	7	135	A-1-a	2.62	2.50
4	20	112	88	10	127	A-6	2.61	2.38
5	26	103	91	16	[illegible]	A-7-6	2.61	
6	5	144	107	7	135	A-1-a	2.63	2.56
7	26	100	80	14	125	A-6		
8	27	89	82	18	108	A-7-6	2.60	

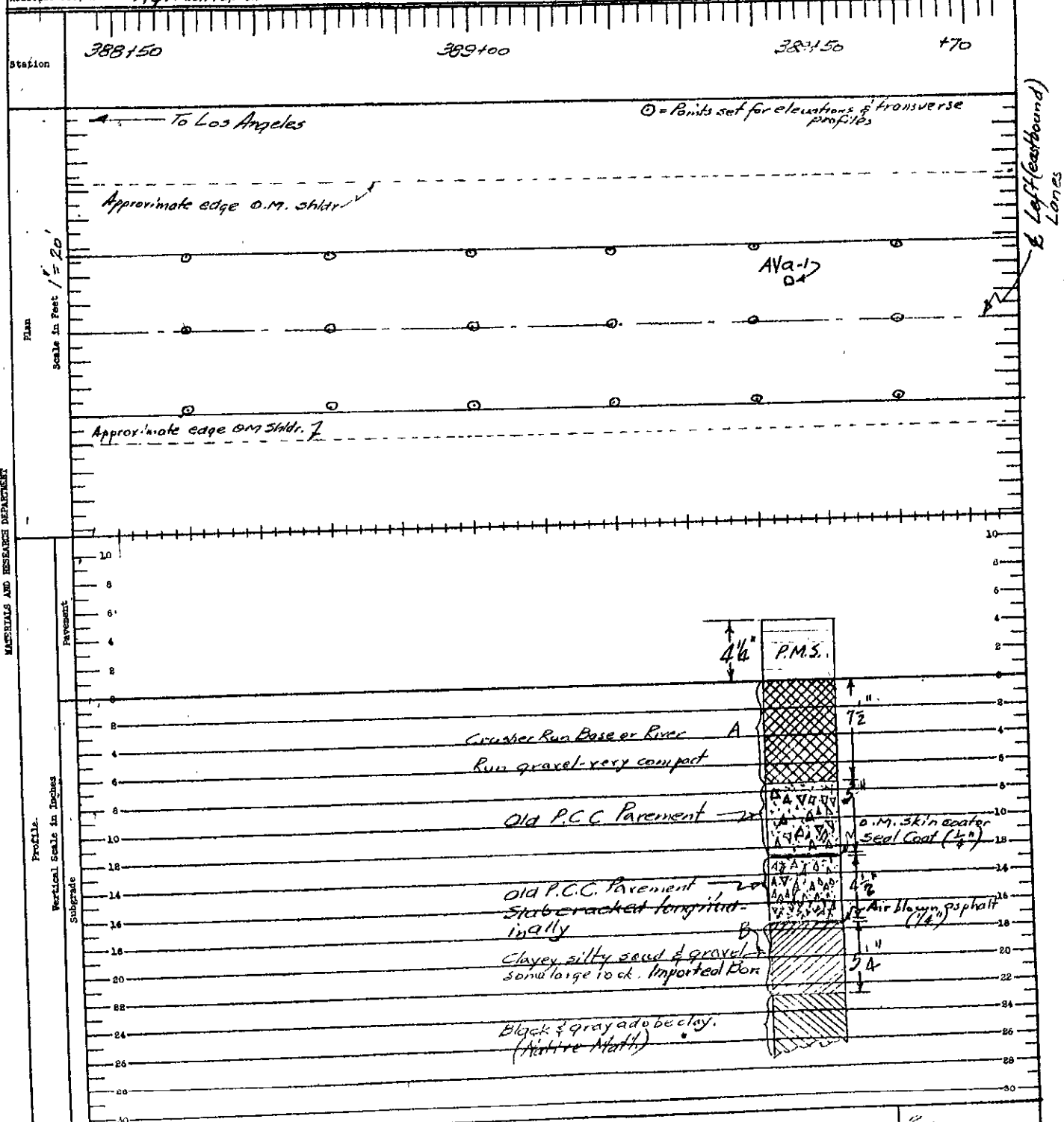
Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1	100	64	35	30	25	18	12	4	4	2	N	P
2	96	88	79	77	73	66	59	49	47	24	35	18
3	100	75	42	37	32	24	15	6	5	3	N	P
4	98	90	83	80	75	69	63	54	51	17	37	20
5				100	99	99	98	93	91	42	45	23
6	100	66	35	29	24	18	11	4	3	2	N	P
7	100	99	96	91	85	77	70	56	53	27	37	19
8					100	99	99	95	93	54	53	25

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~

Dist. VII Co. Ven Rte. 2 Sec. 0		Contract No. —	Date of Constr. 1949	Test Hole No. AVa-1	
Fill ✓	Approx. Height 2.5 to 3.0'	Dist. from End of Fill 600 | 2000	No. of Lanes 2	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt - Throughout - between lanes; Lt. - No clearly defined ditch	Depth Rt - 2.0; Lt 2.3'	Date of Sampling 2-5-51
Roadside Use, Left Agricultural		Right Division strip - Agricultural beyond		Grade (3 bar)	Up



Remarks:

Party: Reyner, Bourne, Clawson

Drawn By Clawson

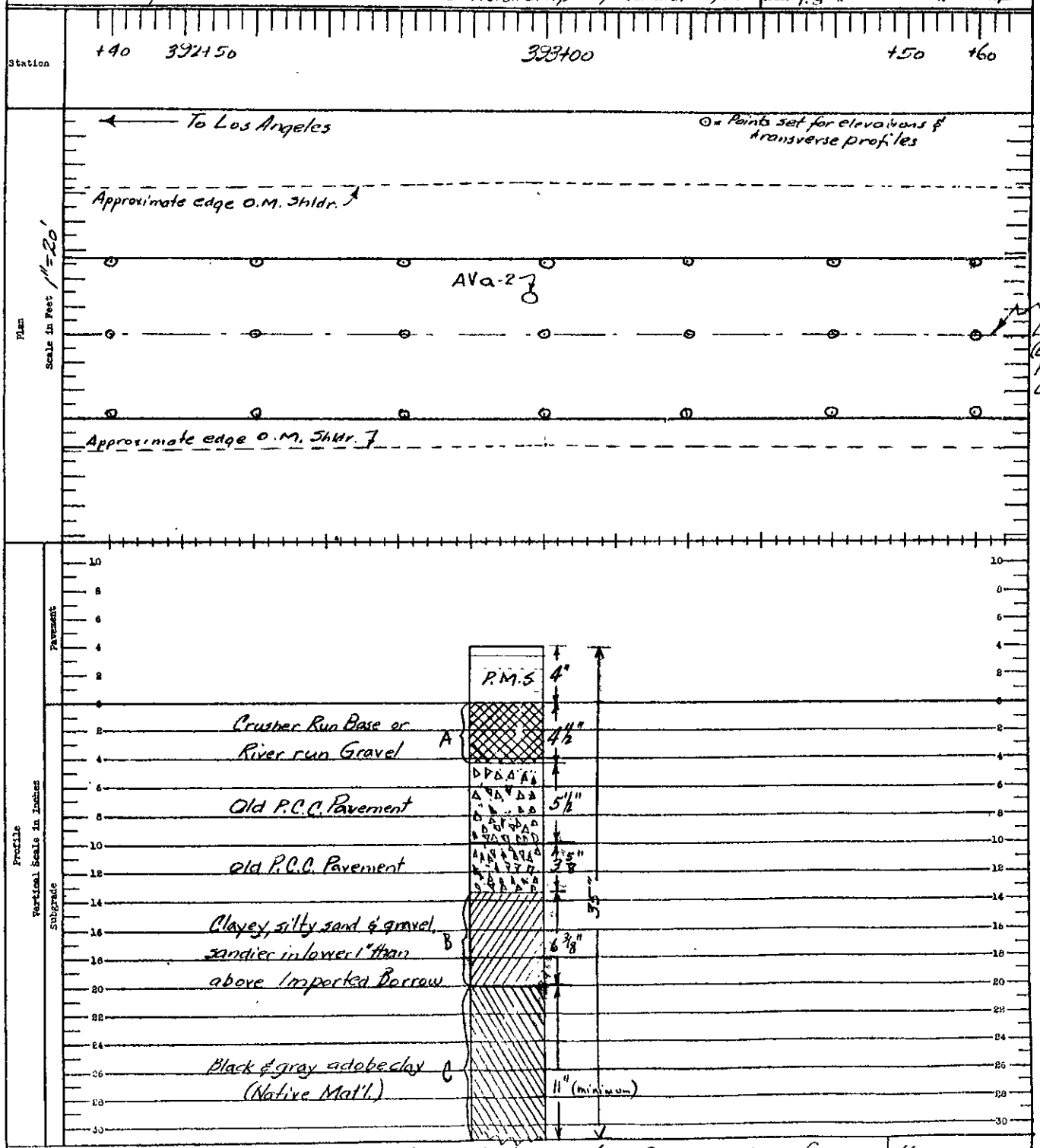
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. 002-78

Dist. VII Co. Ven Rte. 2 Sec. C		Contract No. —	Date of Constr. 1949	Test Hole No. AVa-2	
Fill ✓	Approx. Height 2.5 to 3.0	Dist. from End of Fill 950 | 1650	No. of Lanes 2	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt.-Thruout-between Rdwys Lt.-No clearly defined ditch	Depth Rt. 2.0 Lt. 2.0-3.0	Date of Sampling 2-5-51
Roadside Use, Left Agricultural		Right Division strip - Agricultural Beyond		Grade Avg 1.3 %	Up →



NOTE: No 'skin' or seal coat layer between two P.C.C. slabs as found at AVa1. No air blown asphalt under lower P.C.C. slab as at AVa-1

Party: Keyner, Bourne, Clawson

Drawn by: Clawson

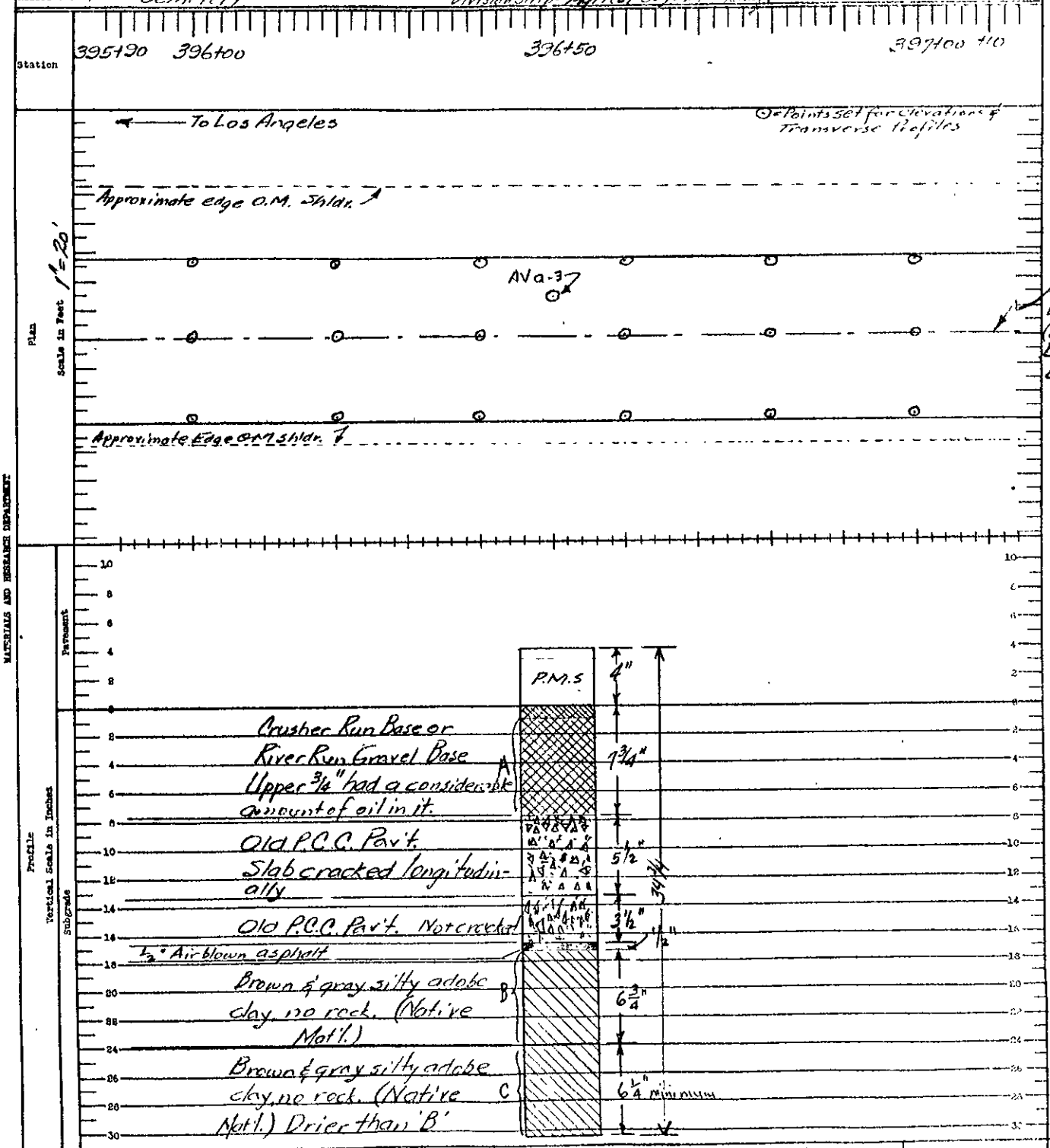
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[illegible] PAVEMENT INVESTIGATION

[illegible] NO. [illegible] 00[illegible]

Dist. VII	Co. Ven	Rte. 2	Sec. C	Contract No. —	Date of Constr. 1949
Test Hole AVa-3					
Fill ✓	Approx. Height 2.5 to 3.0'	Dist. from End of Fill 1300 | 1300	No. of Lanes 2	Traffic Heavy	No.
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Rt-Thruout-between Rdwys Lt-Thruout	Depth Rt-2.5' Lt 2.0 to 3.0'	Date of Sampling 2-8-51
Roadside Use, Left Cemetery		Right Division Strip-Agricut beyond westbd Rdwy		Grade Ave 1.3 %	Dr



Remarks: No 'skin' or seal coat between P.C.C. slabs as found at AVa-1

Reyner
Bourne
Party Clawson

Drawn by Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. III Co. Ven Rte. 2 Sec. C
Load. Sta. No. 44
Loc. Design AVn
Sta. 388+00 to 393+00
Sheet No. 1 of 2

Drainage Cross Section
ROADWAY CONDITION SURVEY

	Left of Roadway							℄	Right of Roadway					
					Toe Fill Slope	Edge O.M. Shldr.	Edge Pav't	Edge Pav't	Edge O.M. Shldr.	℄ Ditch				
393~					149.1 33.0	150.9 21.0	151.26 11.0	151.69 12.0	152.0 15.0	149.5 29.5				
392~					147.8 33.5	149.5 20.0	149.90 11.0	150.32 12.0	150.5 16.0	148.1 29.0				
391~					146.8 34.5	148.2 20.5	148.52 11.0	148.94 12.0	148.5 15.0	147.0 27.0				
+60					145.8 34.0	147.5 21.0	147.95 11.0	148.42 12.0	148.2 15.0	146.3 27.0				
390~					144.8 38.5	146.8 19.5	147.06 11.0	147.47 12.0	147.3 15.5	145.5 26.5				
389~					143.1 37.0	145.3 20.5	145.80 11.0	146.14 12.0	146.0 15.5	144.1 25.5				
388~					141.2 37.5	143.9 20.5	144.35 11.0	144.76 12.0	144.6 15.0	142.8 24.5				

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number _____

Dist. III Co. Ven Rte. 2 Sec. C
Loc. Design AV
Sta. 394+00 to 398+00
Sheet No. 2 of 2

Drainage Cross section

ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
							Edge Pavt.	Edge Pavt	Edge O.M. Shldr.	℄ Ditch				
				℄ Ditch	Top Ditch Bank	Edge O.M. Shldr.								
398~				155.2	156.4	157.2	157.82	158.26	158.2	155.6				
				35.0	33.0	22.0	11.0	12.0	15.3	32.0				
				℄ Ditch	Edge O.M. Shldr.	Break in a.r. Shldr.								
397~				154.2	155.8	156.1	156.59	157.01	156.9	154.0				
				37.0	23.5	20.5	11.0	12.0	15.0	30.5				
396~				152.6	154.1	154.5	155.12	155.63	155.5	152.6				
				35.5	23.5	20.5	11.0	12.0	15.0	30.5				
					Toe Fill Slope	Edge O.M. Shldr.								
+60	Farm Road				152.5	153.9	154.75							
					39.0	23.5	11.0							
395~					151.2	153.4	153.95	154.31	154.1	151.5				
					33.0	20.5	11.0	12.0	15.5	29.5				
394~					150.2	152.1	152.70	153.01	152.9	150.1				
					32.0	21.0	11.0	12.0	15.5	29.5				

Form T-527

23

Research No. 00258
Work Order 13NN26

Loadometer Station No. 93
Road VIII-SBd-31-A

DATA OF SECTION SELECTED FOR TEST

The site originally designated for this section was at the location of the scales in Cajon Pass, road VIII-SBd-31-B. A proposed reconstruction of this section which included realignment and resurfacing at the designated site was to be placed under contract shortly after the section was established, so the section was established near Devore, road VIII-SBd-31-A.

ROADWAY STRUCTURE

LOCATION: The weighing station for this section is located on road VIII-SBd-31-B, 5.6 miles east of Devore. There are no major highways intersecting or turning off of this route between the scales and the section.

The section selected for test is established 1.0 (±) mile west of Devore, approximately 6.6 miles from the loadometer station.

LENGTH: The section is established between Station 411+00 and 421+00, a length of 1000 ft. and includes both lanes of the two-lane roadway.

SURFACE:

Type: Asphaltic plant mixed surfacing, constructed in 1944 over various older pavements including a 1916 P.C.C. pavement 16' wide with 6' wide road-mixed asphaltic surfacing shoulders placed in 1936.

Loadometer Station No. 93
Road VIII-SBd-31-A

ROADWAY STRUCTURE

SURFACE:

Width: Variable, from 36.8' to 39.3', striped as a 2-lane road driven by traffic as a 4-lane road.

Thickness: Variable, from 4-1/2" to 5-1/8". This surface is over various types of old pavement. Central section (22.0 to 24.0) of roadway has total pavement thickness of from 9" to 9-1/4". Shoulder areas have 5-1/8" of pavement. See Location and Profile sketches.

BASE AND SUBBASE MATERIAL:

BASE:

Type and Thickness: At all locations sampled, a layer of fine silty sand and light gravel was encountered just below the pavement. This is apparently an imported subgrade material and varies in thickness from 4-1/4" to 7-1/4".

Soil Classification: A-1-b or A-2-4

SUBBASE:

Type and Thickness: In all locations sampled, below the layer of apparently imported material, silty sand and gravel was encountered. In some cases, gravel ran to large sizes. This material appears to be native material common to the alluvial deposit on which the roadway lies. Sampled to a depth of from 12" to 20" below bottom of pavement.

Loadometer Station No. 93
Road VIII-SBd-31-A

ROADWAY STRUCTURE

SUBBASE:

Soil Classification: A-1-b or A-2-4

SIDE DITCH DRAINAGE: Roadway in the entire section is slightly higher than the surrounding country. Probably the original P.C.C. pavement was in a slight cut but additional blankets have raised the present surface. The section is built on an alluvial fan which is quite steep, the section being on an average grade of +2.3% from the beginning towards the end. Drainage is from each to west. There are slight ditches (from 0.9' to 1.4' below edge of pavement on the right and from 0.7' to 1.5' below edge of pavement on left) on either side of the roadway which collect all drainage water from the roadway.
There are no culverts or bridges within the section.

ROADWAY CONDITION

There is only one crack in the section, located in the right (east bound) lane near Station 419+85. Throughout the section there are numerous fine, short cracks along the roadway centerline. However, these are considered to

Loadometer Station No. 93
Road VIII-SBd-31-A

ROADWAY CONDITION

be very minor and are not shown on the plan diagram.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking within the section.

(2) Areas of Raveling: There are no areas of raveling within the section.

In the left lane, between Sta. 411+00 and 418+93, the surface is roughened and slightly pitted, as though some of the fine material of the P.M.S. had whipped out under high speed traffic.

(3) Areas of Shoving or Creeping: There are no areas within the section in which the surfacing shows evidences of creeping or shoving.

(4) Patches: There is only one patch; an area 3' long by 2.5' wide at Station 416+00.

(5) Roadway Section: The entire section is on a slight fill section. The present surface from 0.9 ft. to 1.5 ft. above original ground.

(6) Shoulders: Shoulders have received little or no treatment within the section. In a few locations are evidences of an old penetration or similar treatment, but it is entirely ineffective at present.

Loadometer Station No. 93
Road VIII-SBd-31-A

ROADWAY CONDITION

SPECIAL CONDITIONS:

(6) Shoulders: (Continued) From the extreme edges of the P.M.S. to the ditch line the shoulders are bladed by Maintenance Forces but no further recent treatment is in evidence.

Drainage conditions are noted previously under "Side Ditch Drainage".

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near each end of the section. Steel pins set into railroad spikes in telephone poles were used for benches. Elevations of bench marks established were determined from a district bench mark.

B.M. No.	Location	Description	Elevation
1	37.2' Lt. ℄ Sta. 411+39	1/4" diam. steel pin set in RR spike in telephone pole	1943.180
2	28.6' Lt. ℄ Sta. 421+42.5	Same as above	1965.120

Because of the extreme width of the pavement, it was necessary to establish four lines of permanent reference pins on this section. On the left of the traffic stripe, one line of pins was

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

established 6.15 ft. from the stripe and another line was established 17.15' from the stripe. On the right of the stripe, two lines of pins were established at the same distance from the stripe.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records were made at 20 foot longitudinal intervals throughout the section. Three sets of transverse profile records were required at this particular section to cover the traveled way surface. Lines of records were made with the machine set on the two left lines of pins, the two centerlines of pins and the two right lines of pins.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of the pavement section. Four lines of profiles were recorded, one along each of the pin lines. In each run,

Loadometer Station No. 93
Road VIII-SBd-31-A

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

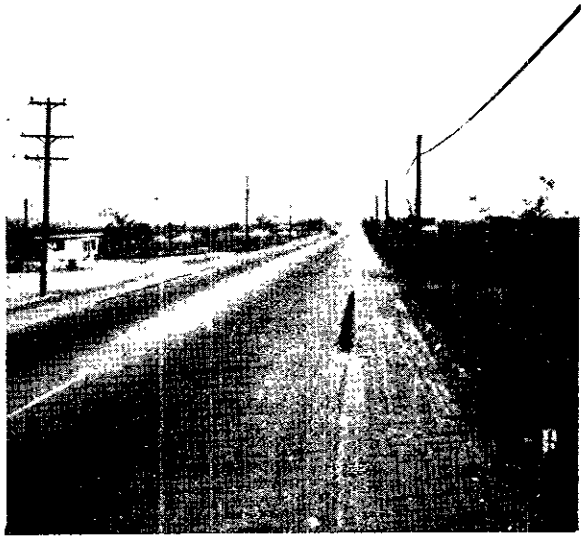
Longitudinal: the machine was operated so that the wheels toward the outer edge of the roadway were adjacent to a pin line. All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 93

VIII-SBd-31-A

Ahead on Line from

Station 411+00



Back on Line from

Station 421+00

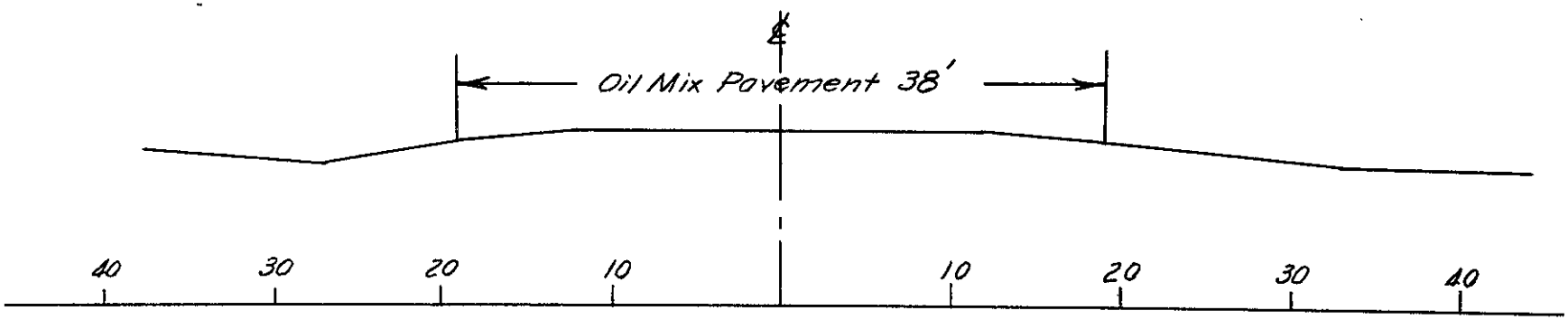
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BG 93
VIII-SBd-31-A

ROADWAY CONDITION SURVEY

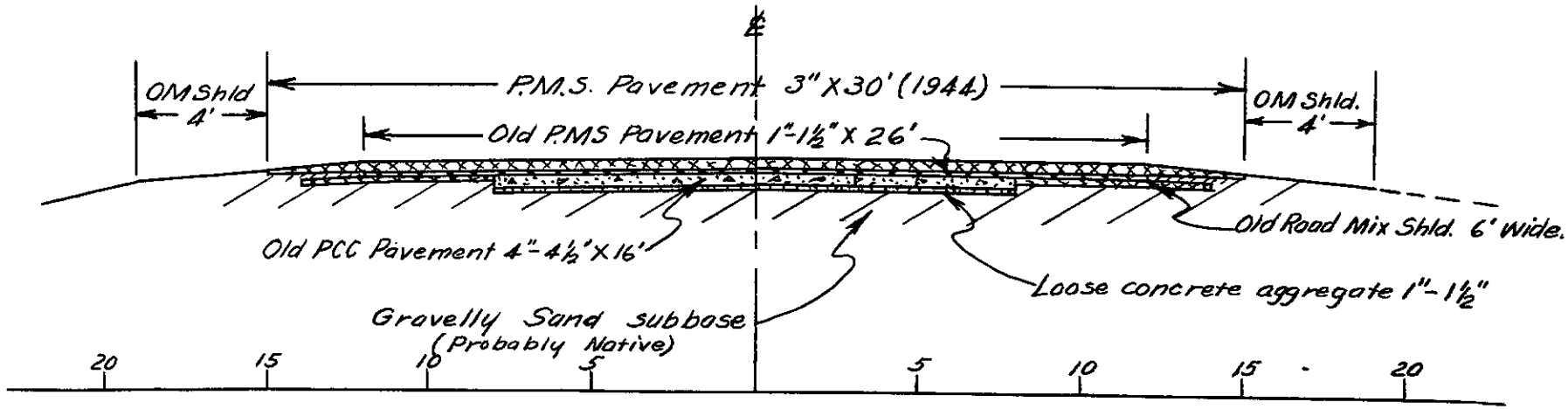
TYPICAL ROADWAY SECTION

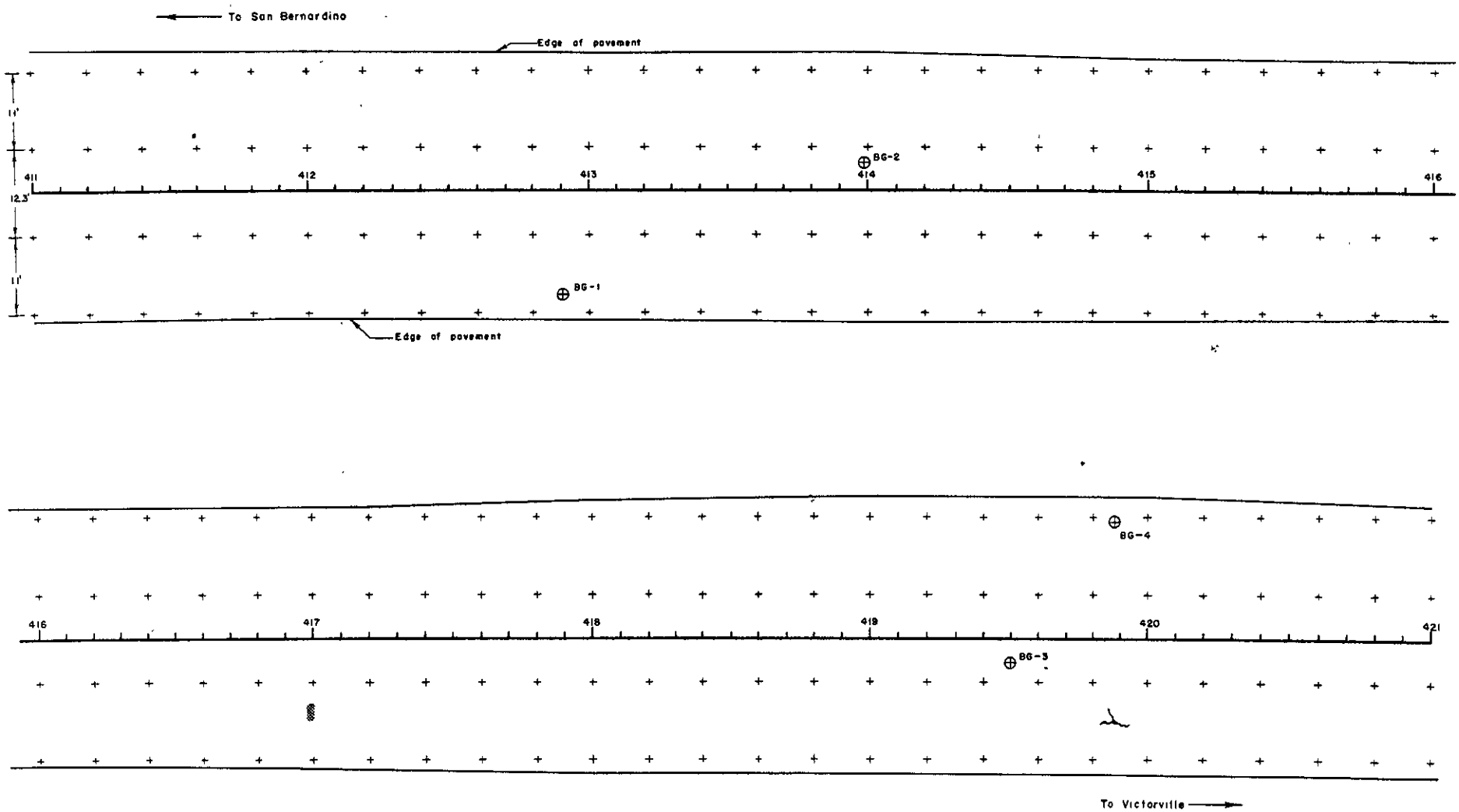
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 93
VIII-SBd-31-A

TEST RESULTS SUMMARY

Load. Sta. No. 93
VIII-SBd-31-A

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BG-1-A	51-2192	412+90	14.6' right of ℄ roadway	OM	5-3/8"	0 - 4-5/8"	Base
2	BG-1-B	51-2193	412+90	Same	OM	5-3/8"	5-5/8"-11-7/8	Subbase
3	BG-2-A	51-2194	413+98.5	4' left of ℄ roadway	OM PCC	5" 4"	2 - 9-1/4"	Subbase
4	BG-2-B	51-2195	413+98.5	Same	OM PCC	5" 4"	9¼" - 16½"	Subbase
5	BG-3-A	51-2196	419+50	3.5' right of ℄ roadway	OM PCC	4½" 4-3/4"	1½" - 6-3/4"	Subbase
6	BG-3-B	51-2197	419+50	3.5' right of ℄ roadway	OM PCC	4½" 4-3/4	6-3/4"-21¼"	Subbase or Basement
7	BG-4-A	51-2198	419+87	16.6' left of ℄ roadway	OM	5-1/8	0 - 7-7/8"	Base
8	BG-4-B	51-2199	419+87	Same	OM	5-1/8	7-7/8"-16-3/8	Subbase or Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	3	130	99	7	131	A-1-b	2.69	2.64
2	8.4	107	88	11	122	A-2-4	2.71	
3	6.1	111	94	10	118	A-2-4	2.70	
4	6	116	91	9	127	A-1-b	2.69	2.64
5	2	130	99	8	131	A-1-b	2.75	2.63
6	1	No	Sand	Volume	Taken	A-1-b	2.68	2.65
7	5	122	99	10	123	A-2-4	2.67	
8	2	127	99	9	128	A-1-b	2.70	2.63

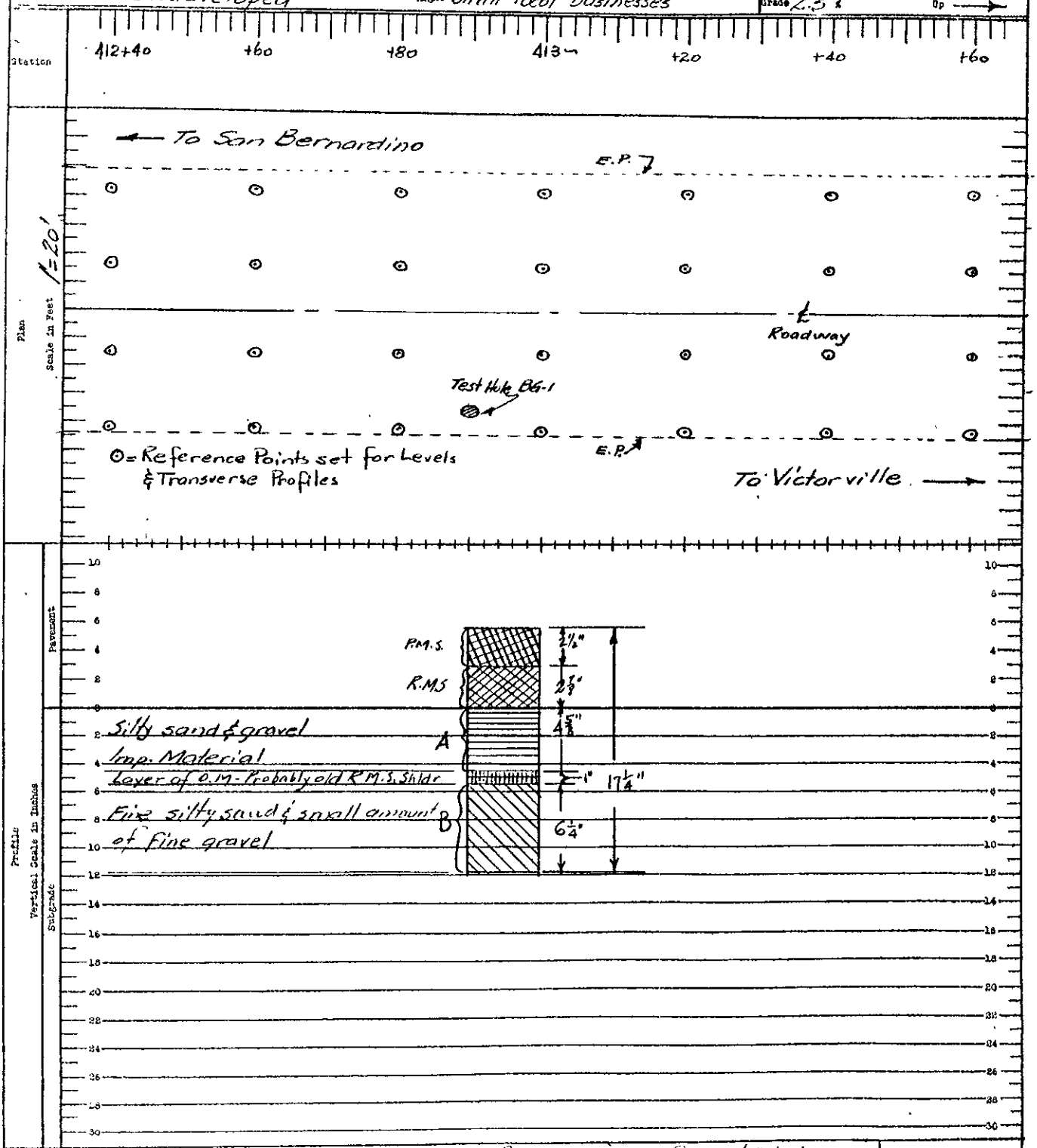
Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	93	85	78	75	67	54	37	11	8	2	N	P
2	100	99	97	96	92	84	73	35	27	5	N	P
3	100	99	97	96	92	87	71	21	17	4	N	P
4	99	96	89	85	77	62	40	16	13	4	N	P
5	95	75	64	62	59	51	36	10	8	2	N	P
6	89	78	70	64	53	37	22	6	4	1	N	P
7	100	98	92	88	83	74	59	18	16	3	N	P
8	92	81	69	65	59	50	36	8	6	1	N	P

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 0025B

Dist. VII	Co. SBd	Rte. 31	Sec. A	Contract No. —	Date of Constr. 1916 1956 1931 1944	Test Hole No. BG-1	
Fill ✓	Approx. Height 1'-15'	Dist. from End of Fill		No. of Lanes 2	Traffic		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches No clearly defined ditches	Depth	Date of Sampling 6-13-51	
Adjacent Prop., Left Undeveloped			Right Small local businesses		Grade 2.3 %	Up →	



Remarks: Material below O.M. layer is uniform to depth of 22½" below profile grade.

Party: Keyser, Clawson

Drawn By: GW

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

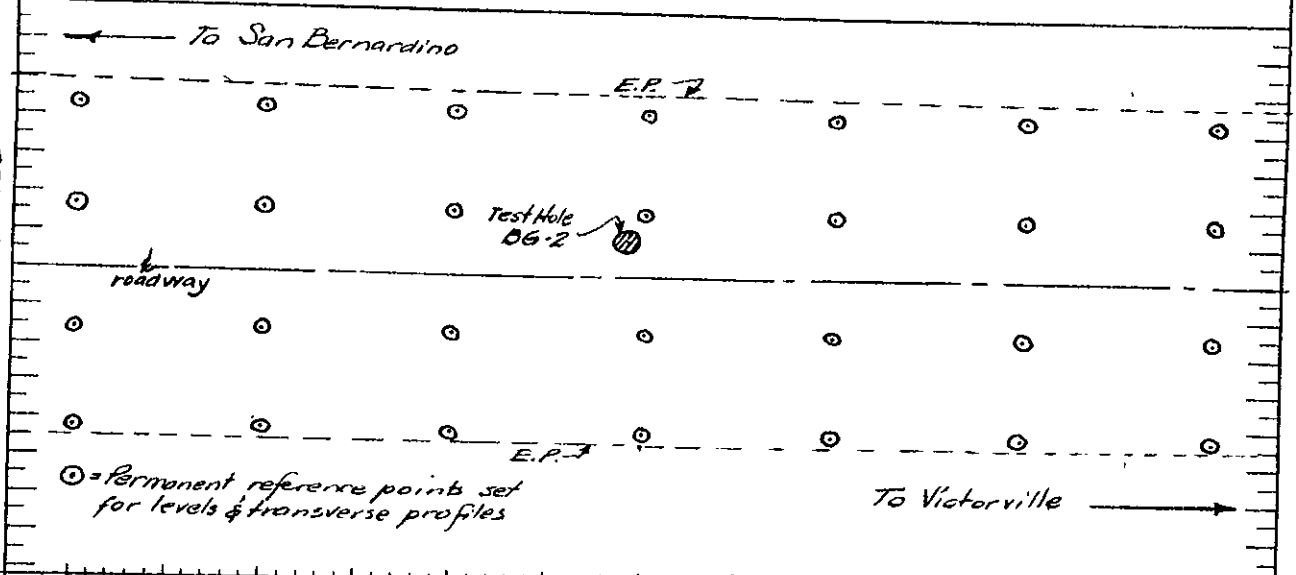
[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

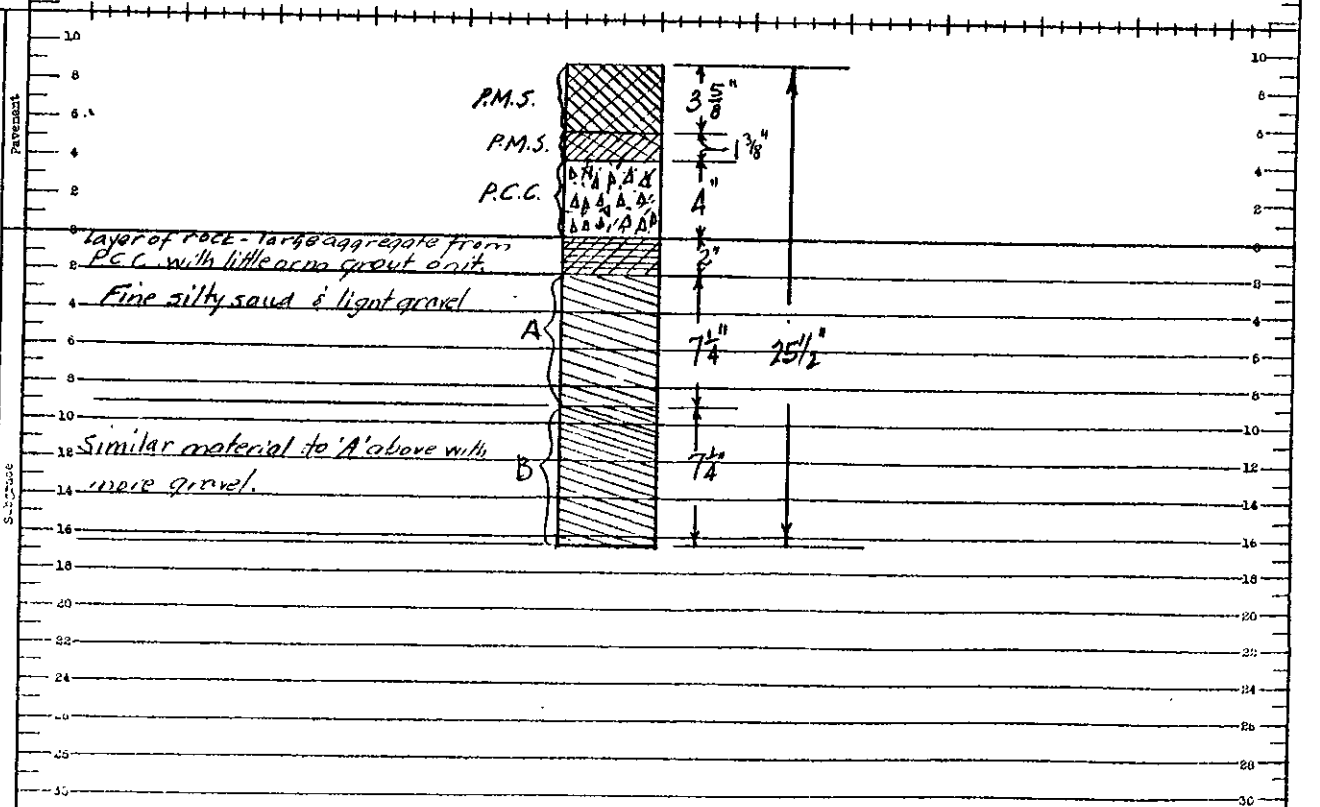
Dist. VIII Co. SBd Rte. 31 Sec. A		Contract No. —	Date of Constr. 1916 1936 1939 1944	Test Hole No. BG-2	
Fill ✓	Approx. Height 1'-1.5'	Dist. from End of Fill	No. of Lanes 2	Traffic Heavy	
Cut	Approx. Depth	Dist. from End of Cut	Side Ditches No clearly defined ditches	Depth	Date of Sampling 12 June '51
Roadside Use, Left Undeveloped		Right Small local businesses		Grade 2.3%	Up →

Station: 413+40 +60 +80 414~ +20 +40 +60

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Reyner
Clawson

Party

Drawn by [illegible]

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

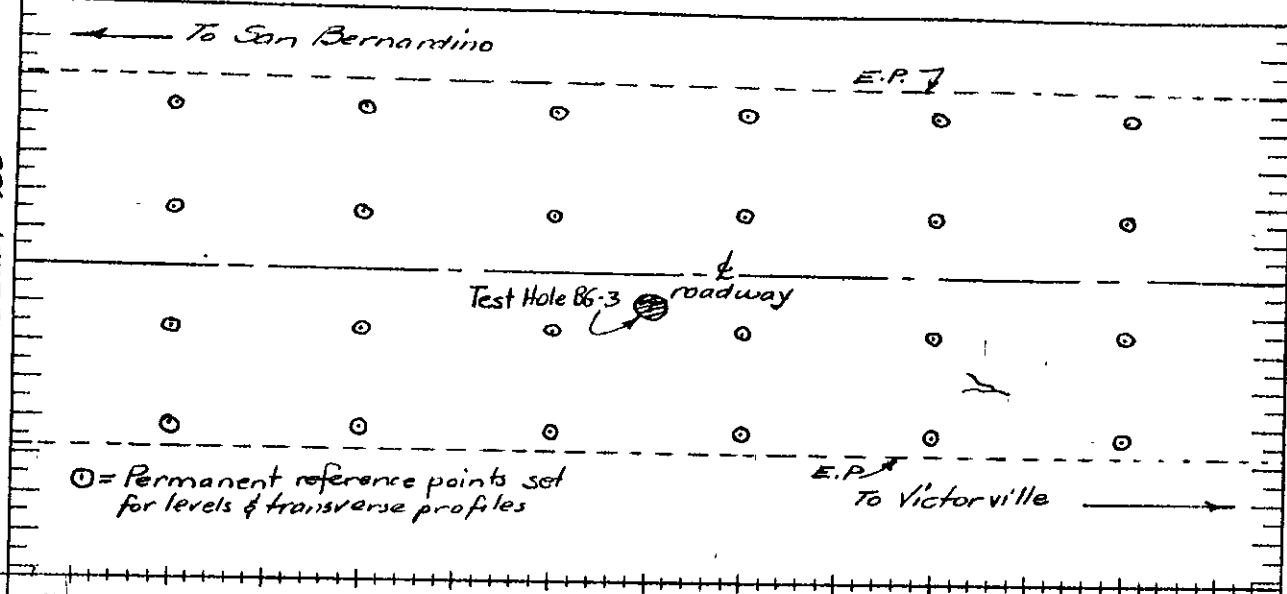
Dist. VIII	Co. SBd	Rte. 31	Sec. A	Contract No. —	Date of Constr. 1946 1936 1934 1944
Fill ✓	Approx. Height 1'-1.5'	Dist. from End of Fill		No. of Lanes 2	Traffic Heavy
Cut	Approx. Depth	Dist. from End of Cut		Side Ditches No clearly defined ditches	Depth
Roadside Use, Left Undeveloped		Right Small local businesses			Grade 2.3 % Up →

Test Hole No. B6-3

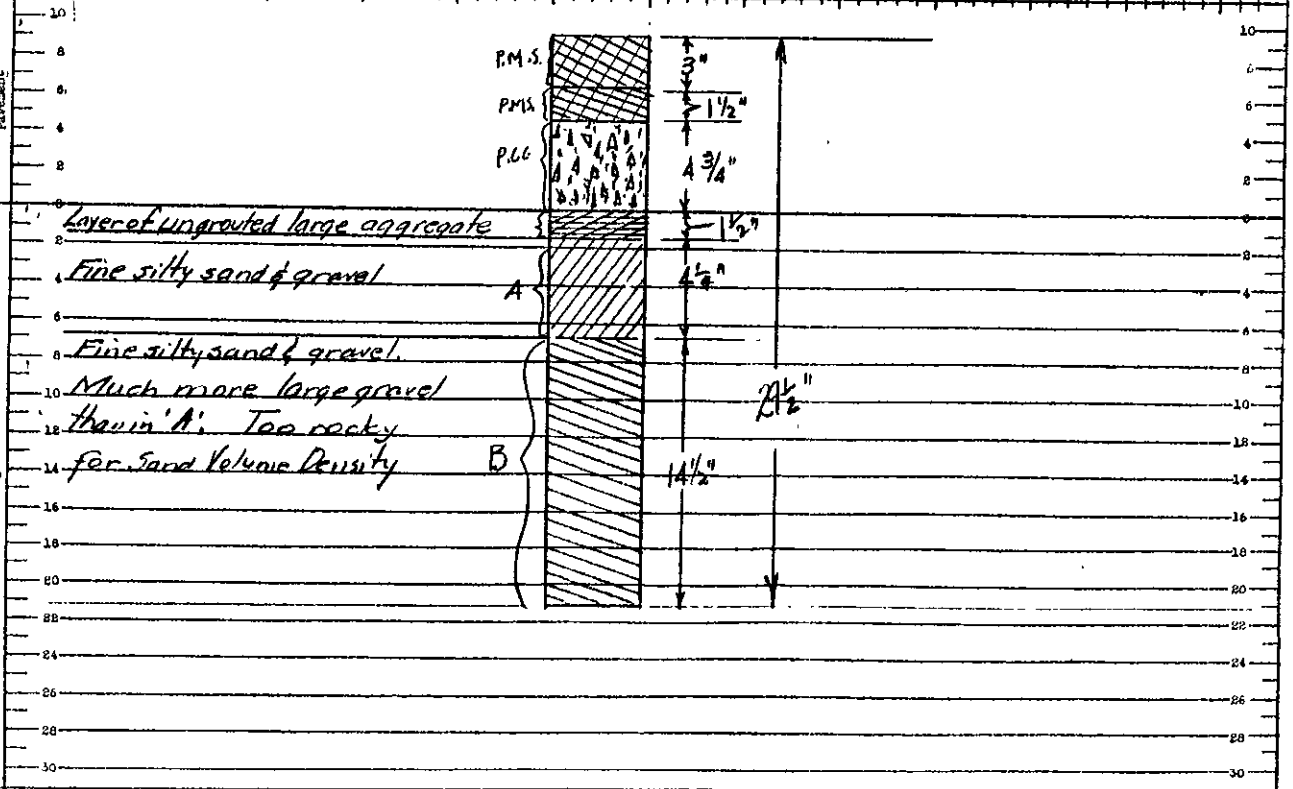
Date of Sampling 13 June '51

Station: 419 +20 +40 +60 +80 420

Plan — Scale in Feet 1"=20



Profile — Vertical Scale in Inches



Remarks:

Reyner
Clawson

Party

Drawn By CW

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

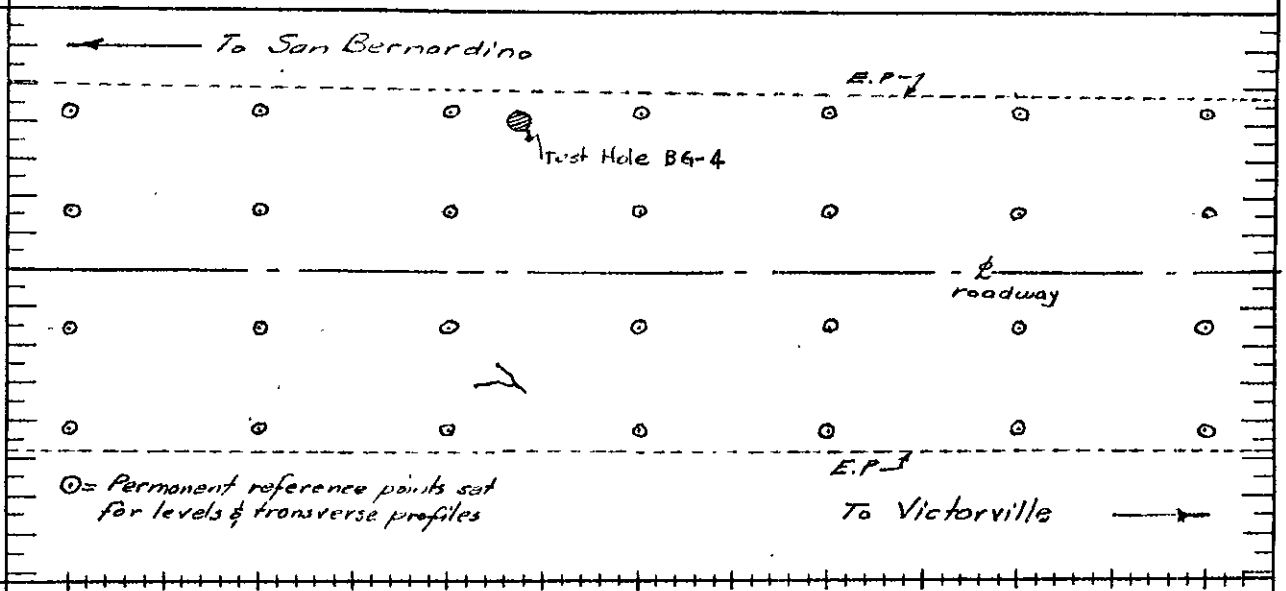
~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

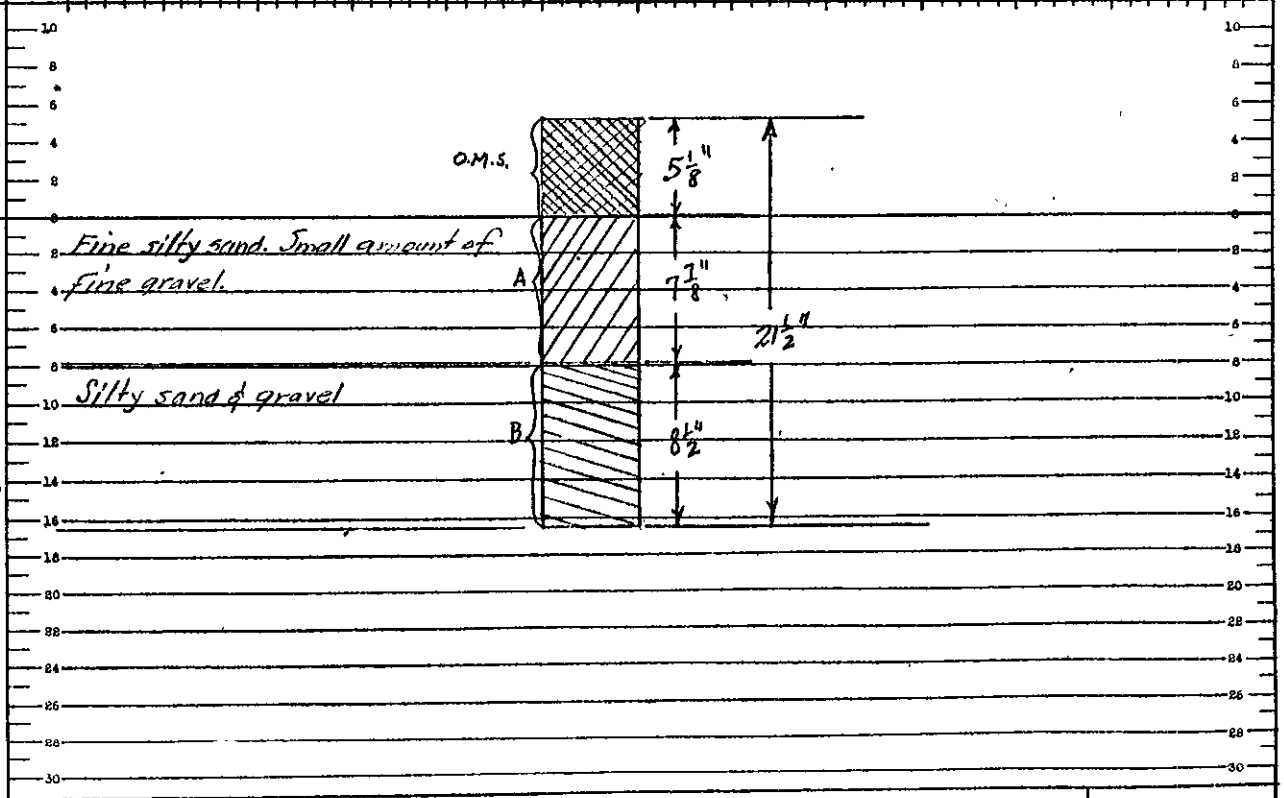
Dist. VIII Co. SBA Rte. 3 Sec. A		Contract No. —	Date of Constr. [illegible]	Test Hole No. BG-4	
Fill ✓	Approx. Height 1'-15'	Dist. from End of Fill	No. of Lanes 2	Traffic Heavy	
Cut	Approx. Depth	Dist. from End of Cut	Side Ditches No clearly defined ditches	Depth	Date of Sampling 12 June '51
Roadside Use, Left Undeveloped		Right Small local businesses		Grade 2.3 %	Up →

Station: 419+40, +60, +80, 420+, +20, +40, +60

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches



Remarks:

Reyner
Clawson

Party

Drawn By CW

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 93
Dist. VII Co. SBd Rte. 31 Sec. A
Loc. Design BG
Sta. 411+00 to 416+00
Sheet No. 1 of 2

ROADWAY CONDITION SURVEY

Station	Left side Roadway						℄ Roadway (Traffic Stripe)	Right side Roadway				
			Original Ground Elev.	Side Ditch	Extreme Edge Pavt.	'Break' in Pavt.			'Break' in Pavt.	Extreme Edge Pavt.	Side Ditch	Original Ground Elev.
416			1952.5	1952.1	1952.30	1953.42	1953.47		1953.38	1952.96	1952.0	1952.3
			35.6	26.6	18.6	11.8	0.0		11.2	18.0	28.6	36.2
415			1950.1	1949.5	1950.23	1950.78	1950.96		1950.82	1950.41	1949.0	1949.1
			36.2	27.2	18.9	13.5	0.0		12.0	18.0	30.6	36.6
414			1947.5	1946.9	1947.76	1948.46	1948.67		1948.62	1948.11	1946.7	1946.8
			33.6	26.2	19.6	12.5	0.0		11.4	18.2	30.6	35.7
413			1945.0	1944.6	1945.69	1946.28	1946.51		1946.41	1945.96	1944.8	1945.2
			38.3	31.8	19.8	12.5	0.0		11.0	18.0	31.0	37.2
412			1942.9	1942.3	1943.22	1943.95	1944.24		1944.18	1943.72	1942.7	1943.1
			40.3	31.3	19.8	13.0	0.0		10.0	17.8	31.0	40.5
411			1940.8	1940.3	1941.09	1941.81	1942.02		1941.97	1941.54	1940.2	1940.9
			39.4	29.4	19.9	13.0	0.0		10.0	17.2	30.9	35.9

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. CC 258
W.O. No. 13NN26
Job Number

Dist. VIII Co. SBd Rte. 31 Sec. A
Loc. Design B6
Sta. 417+00 to 421+00
Sheet No. 2 of 2

Load. Sta. No. 93

ROADWAY CONDITION SURVEY

Station	Left side Roadway: Original Ground Elev.	Left side Roadway: Side Ditch	Left side Roadway: Extreme Edge Part.	Left side Roadway: 'Break' in Part.	℄ Roadway (Traffic Stripe)	Right side Roadway: 'Break' in Part.	Right side Roadway: Extreme Edge Part.	Right side Roadway: Side Ditch	Right side Roadway: Original Ground Elev.
421	1964.1	1963.3	1964.41	1965.10	1965.11	1964.96	1964.40	1963.1	1963.0
	37.6	26.6	18.8	11.6	0.0	12.1	19.2	32.8	42.8
420	1963.0	1961.6	1962.68	1963.38	1963.47	1963.28	1962.65	1961.3	1961.1
	41.6	27.1	20.0	12.2	0.0	12.0	19.2	32.2	40.6
419	1959.9	1959.4	1960.56	1961.26	1961.47	1961.34	1960.61	1959.1	1959.1
	35.6	26.6	20.1	12.7	0.0	11.5	19.2	32.2	40.2
418	1958.0	1956.4	1957.94	1958.71	1958.92	1958.80	1958.27	1956.9	1957.3
	40.6	32.6	19.6	12.0	0.0	12.0	19.0	31.6	39.2
417	1955.0	1954.2	1955.32	1956.05	1956.20	1956.06	1955.58	1954.2	1955.8
	37.2	26.6	18.6	12.0	0.0	12.0	18.2	30.2	37.2

Form T-527

24

Research No. 00258
Work Order 13NN26

Loadometer Station No. 67
Road VIII-Riv-26-C

DATA OF SECTION SELECTED FOR TEST

This Loadometer Station and section location were authorized in the list of stations and locations accompanying Headquarters Design Department letter of December 7, 1950, to the District Engineer of Districts VII, VIII, and XI. This station and location were substituted for Station No. 71, Road VII-L.A-26-W.Cov, near West Covina which was discontinued as being too dangerous to operate.

ROADWAY STRUCTURE

LOCATION: Platform scales on Road VIII-Riv-26-C are located 13 miles east of Banning at the junction of Route 26 and Route 187. There are no major road or highway turnoffs between the scales and the section selected for test.

The section is located approximately 8 miles east of Banning.

LENGTH: The section is located between Station "C" 290+00 and Station "C" 300+00, a total length of 1000 feet.

Roadway at the section location is a four lane divided highway. The section is established in the two left (east bound traffic) lanes.

SURFACE:

Type: Plant mixed surfacing, constructed in 1940-1941.

Width: Traveled way is 25 ft. wide. Outer lane is 11.0 ft. and inner lane is 14.0 ft. in width.

Loadometer Station No. 67
Road VIII-Riv-26-C

ROADWAY STRUCTURE

SURFACE:

Thickness: Variable from 2-1/4" to 2-3/4".

BASE:

Type and Thickness: Cement Treated Base, varying from 8-1/4" to 9" in thickness.

Typical section as designed specified 9" of C.T.B. at outer edge of pavement and 6" at the inner edge.

SUBBASE:

Type and Thickness: Silty sand and gravel. Apparently a local borrow used to raise roadway grade above the surrounding ground level. Sampled to a depth of from 11-3/8" to 14" below bottom of C.T.B.

Soil Classification: A-1-b and A-2-4

SIDE DITCH DRAINAGE: The roadway at the section selected for test is entirely in fill section.

The section has a profile grade of -1.9% and drainage runs from west to east. The section pavement has a uniform slope from the inner edge of pavement to the edge of outer shoulder carrying all drainage transversely to the outer fill slope.

There is no clearly defined ditch along the outer fill slope drainage runs along the toe of fill

Loadometer Station No. 67
Road VIII-Riv-26-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

at an elevation of from 1.5' to 2.5' below the shoulder point.

All drainage is carried along the left outer toe of the fill, west to east and is carried completely under the section roadway, division strip and right roadway in two reinforced concrete box culverts.

Along the inner edge of the pavement is a berm from 0.7' to 1.0' higher in elevation than the pavement.

There are two reinforced concrete box culverts, as noted above.

3' x 6' R.C. box culverts, centerline at inlet opposite Sta. 290+43, floor slab clean.

Triple 4' x 6' R.C. box culvert centerline at inlet opposite Sta. 298+48, floor slab has 1.5 ft. of sand and gravel over it.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking within the section.

(2) Areas of Raveling: There are no areas of raveling within the section.

Loadometer Station No. 67
VIII-Riv-26-C

ROADWAY CONDITION

SPECIAL CONDITION:

(3) Areas of Shoving or Creeping: There are no areas within the section in which the surfacing shows evidence of creeping or shoving.

(4) Patches: There are no patched areas within the section except for very minor ones where some of the spalled out surface has been patched by Maintenance forces. These patches have not been listed individually but have been noted on the plan diagram.

(5) Roadway Section: The entire section is in fill section. Pavement surface is from 1.5' to 2.5' above surrounding areas.

(6) Shoulders: There is an asphaltic plant mixed surfacing shoulder 7' in width along the outer (left) edge of pavement which ends in an untreated soil shoulder, 1.0' to 4.0' in width. On the inside (right) of the section, as previously noted, there is a berm, paved with plant mixed surfacing which varies from 0.7' to 1.0' higher in elevation than the roadway surfacing adjacent to it.

Loadometer Station No. 67
Road VIII-Riv-26-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established near the ends of the section in the P.C.C. headwalls of box culverts. Elevations used in establishing these benches were based on district bench mark elevations.

B.M. No.	Location	Description	Elevation
1	23.0' lt. of T.S. ℄, Sta. 290+41.5	1/4" diam. steel pin set flush in P.C.C. headwall	1739.375
2	23.0' lt. of T.S. ℄, Sta. 298+46.0	Same as above	1724.483

Permanent reference pins were established in three lanes parallel to centerline. One pin line was along the traffic stripe, one pin line was set 11.5 ft. left of the stripe (0.5' (±) outside the edge of traveled way.) The third line of pins was set 11.5 ft. right of the stripe, 2.5 ft. from the bottom of the berm.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the

Loadometer Station No. 67
Road VIII-Riv-26-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records:

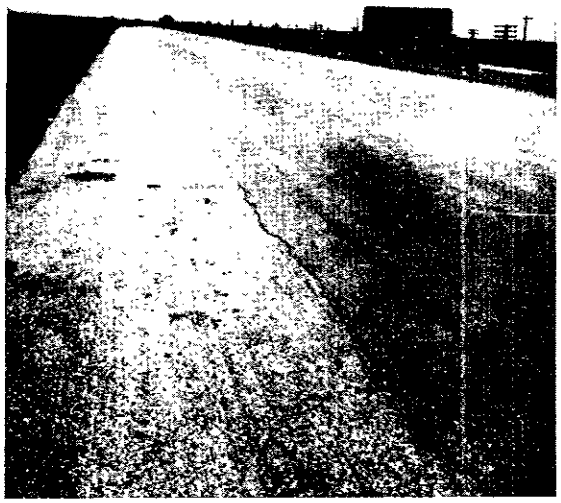
Transverse: machine developed for the purpose, transverse profilograph records of the traveled way surface in each lane were made at 20' longitudinal intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Four lines of profiles were covered. In each lane, a line of profiles was run with the recording wheel 30" from the center pin line and another was run with the recording wheel 30" into the lane from the outer pin line.

All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

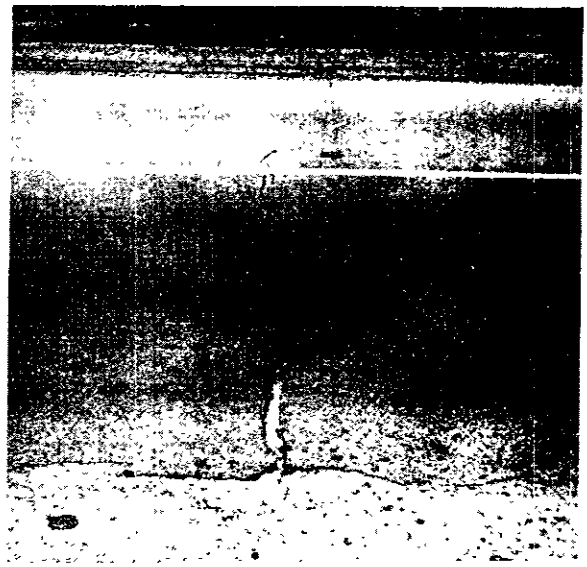
Loadometer Sta. No. 67

VIII-Riv.26-C

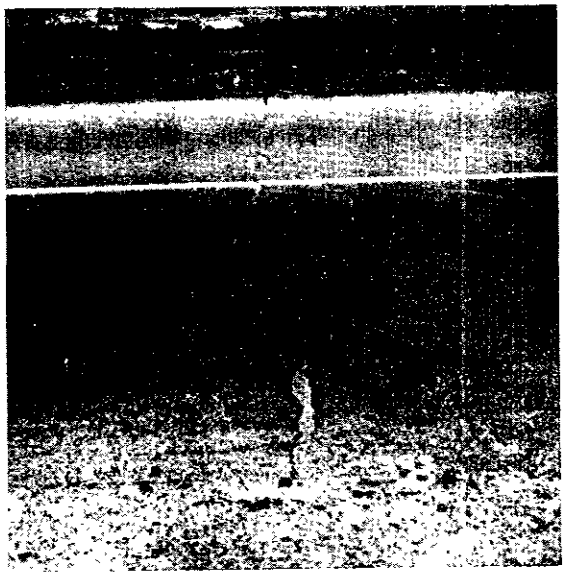


Edge Crack Left Outer

Lane Ahead from Sta.291+13



Crack at Station 291+13



Severe Crack at

Station 291+99

Severe Crack at

Station 293+60

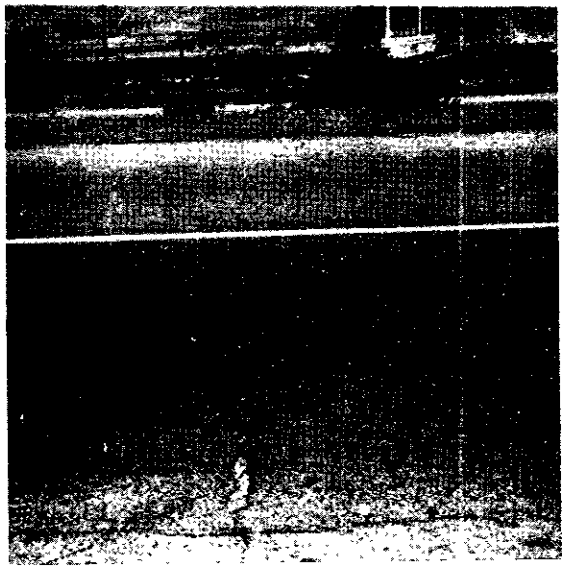
Loadometer Sta. No. 67

VIII-Riv-26-C

Severe Crack at

Station 294+09

Crack at Station 294+62

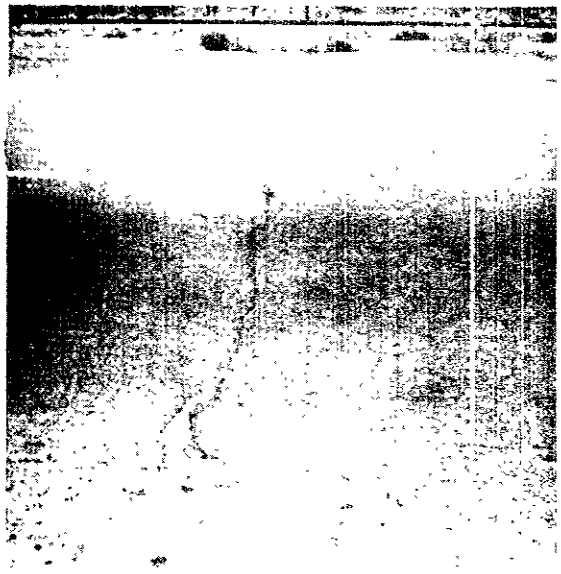


Crack at Station 295+06

Crack at Station 295+66

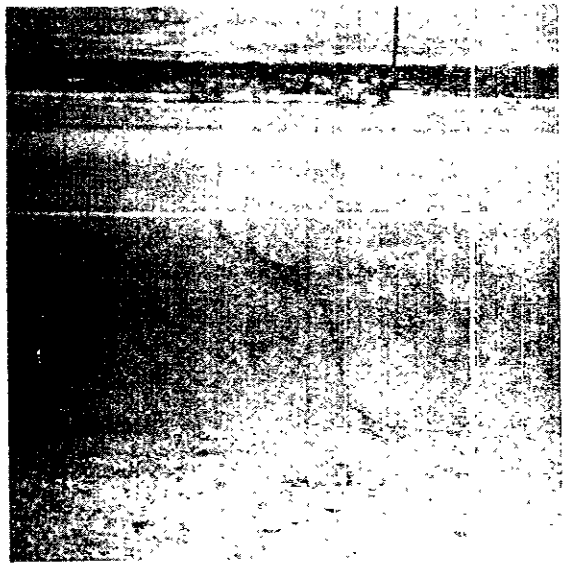
Loadometer Sta. No. 67

VIII-Riv-26-C

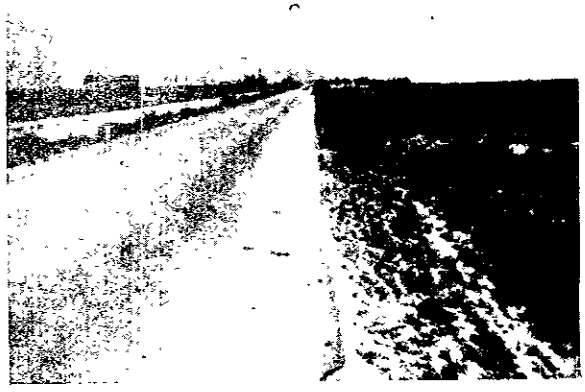


Crack at Station 296+84

Crack at Station 298+44



Crack at Station 299+40



Back on Line from

Station 300+00

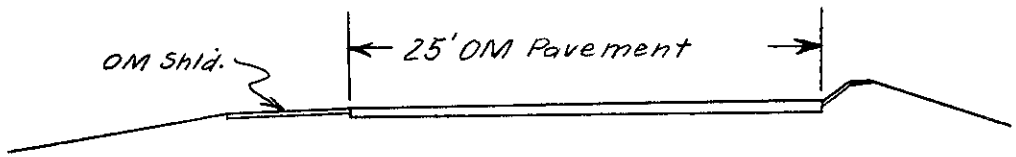
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. ~~BD 67~~
VIII-Riv-26-C

ROADWAY CONDITION SURVEY

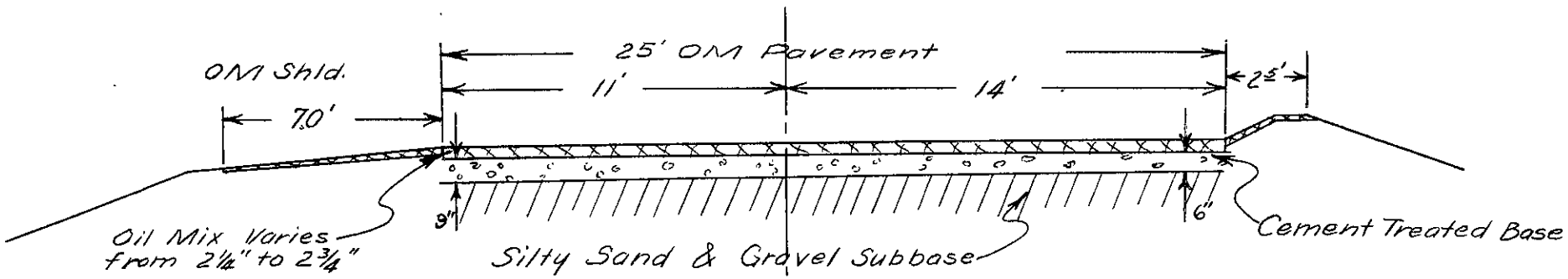
TYPICAL ROADWAY SECTION

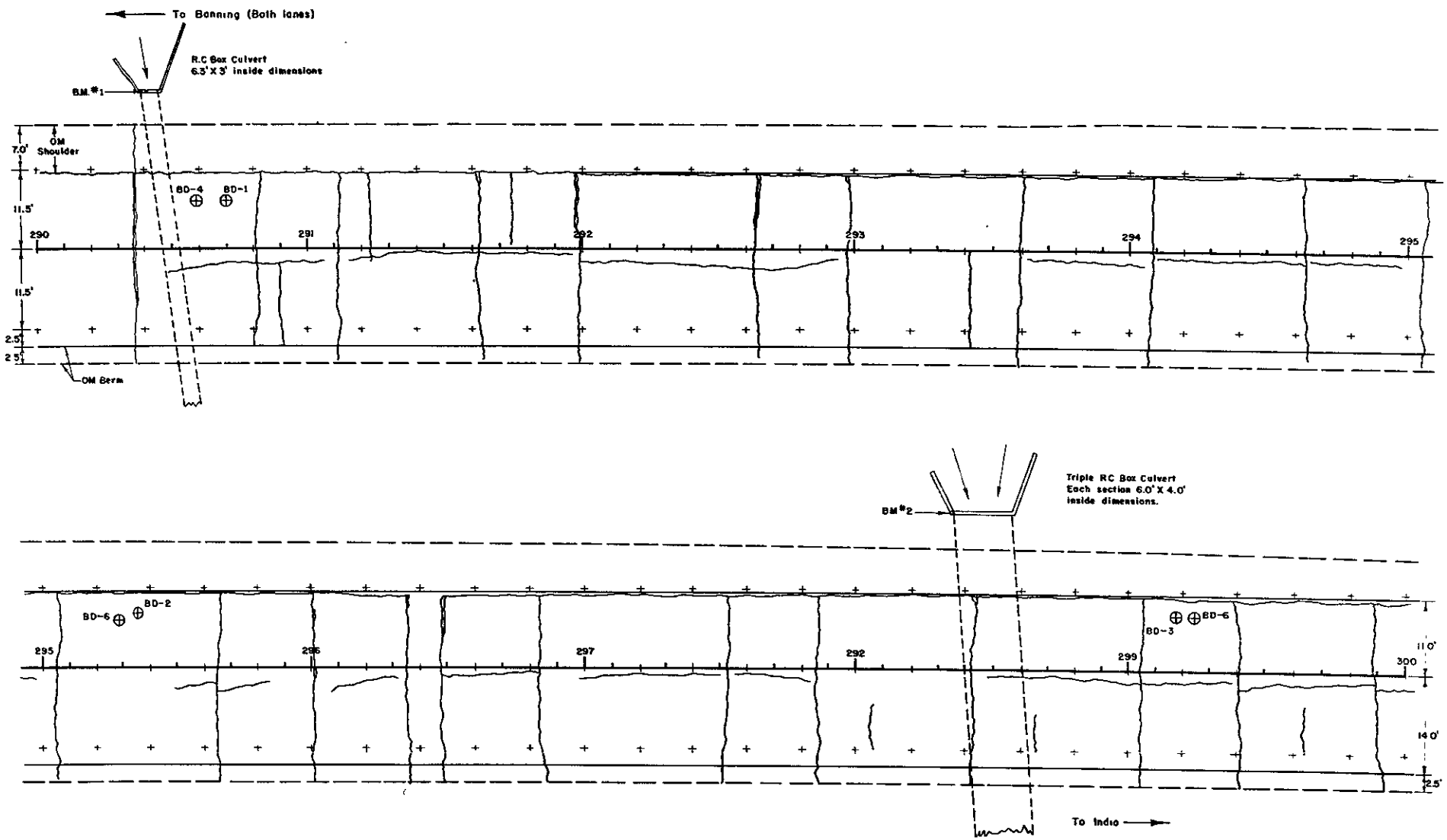
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 67
VIII-Riv-26-C

TEST RESULTS SUMMARY

Load. Sta. No. 67
VIII-Riv-26-C

Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	BE-1-A	51-1879	290+59	6.7' left ℄ left lanes	OM CTB	2¼" 9"	0 - 7-3/4"	Subbase
2	BE-1-B	51-1879a	290+59	Same	OM CTB	2¼" 9"	7-3/4" -14"	Subbase
3	BE-2-A	51-1880	295+28	7.0' left of ℄ left lanes	OM CTB	2-3/4 9"	0 - 7-1/4"	Subbase
4	BE-2-B	51-1880a	295+28	Same	OM CTB	2-3/4 9"	7-1/4" - 14"	Subbase
5	BE-3-A	51-1881	299+24	8.1' left of ℄ left lanes	OM CTB	2-1/2 9"	0 - 8"	Subbase
6	BE-3-B	51-1881a	299+24	Same	OM CTB	2-1/2 9"	8 - 14"	Subbase

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	4	133	101	7	132	A-1-b	2.69	2.65
2	3	120	93	9	129	A-2-4	2.69	
3	3	137	101	7	136	A-1-b	2.69	2.66
4	4	130	95	7	137	A-1-b	2.70	2.67
5	5	131	97	8	135	A-1-b	2.69	2.62
6	5	132	99	9	133	A-1-b	2.69	2.66

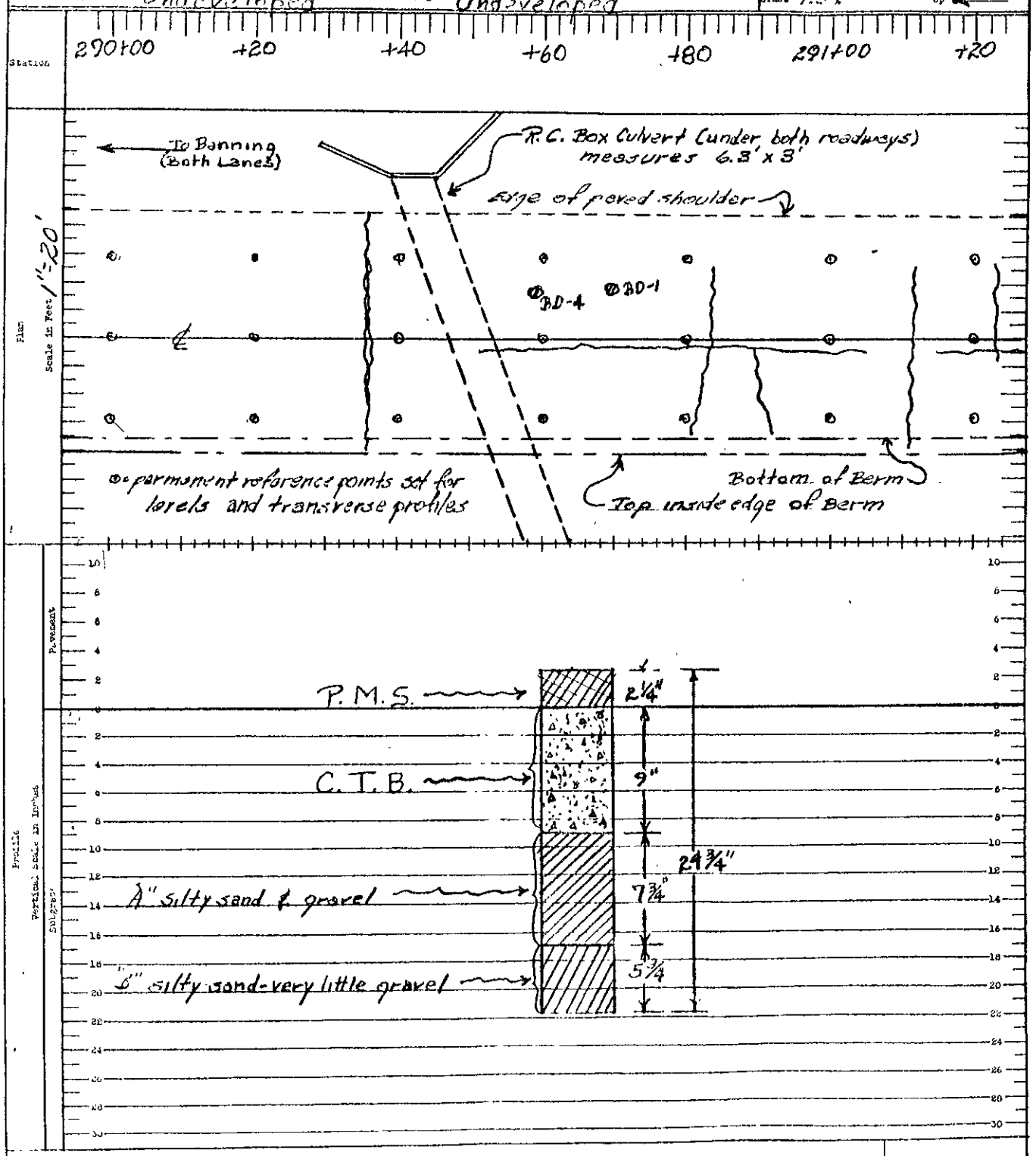
Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	97	92	83	77	69	58	43	17	15	4	N	P
2	100	99	92	89	77	66	49	18	15	4	N	P
3	95	85	68	58	48	39	27	10	9	3	N	P
4	95	87	71	64	56	47	34	13	10	3	N	P
5	97	85	72	67	61	50	38	14	12	3	N	P
6	96	91	82	75	65	55	33	17	14	3	N	P

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. VIII Co. RIV Rte. 26 Sec. C		Contract No. —	Date of Constr. 1940-41	Test Hole BD-1&4 No. (BE)	
Fill X	Approx. Height 2'-5'	Dist. from End of Fill	No. of Lanes 2	Traffic Heavy	
Cut —	Approx. Depth	Dist. from End of Cut	Side Ditches Not clearly defined	Depth	Date of Sampling 5-16-51
Roadside Use, Left Undeveloped		Right Undeveloped		Grade 1.9 %	Up



Party Clawson
Reyner
Coon

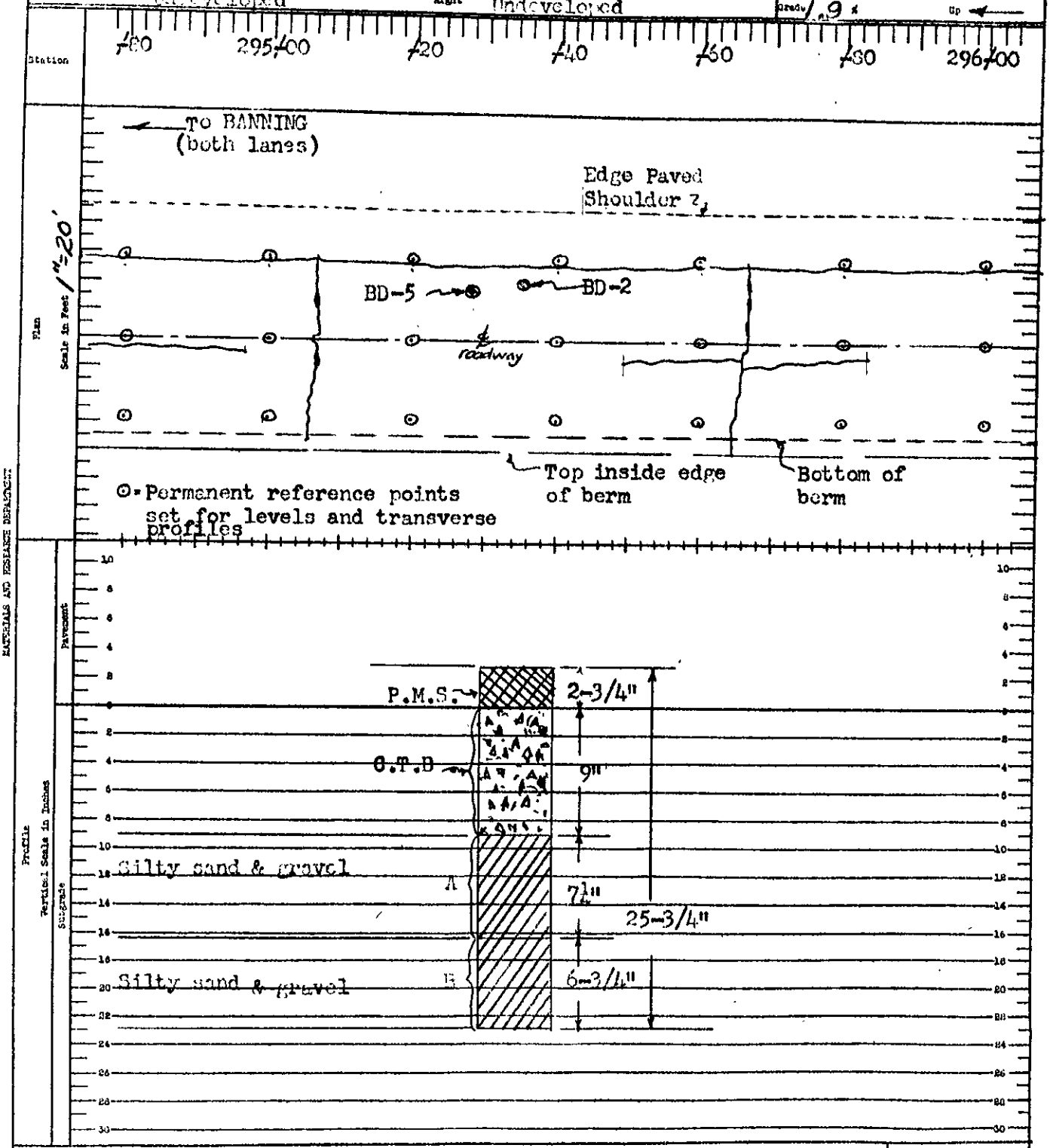
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

Rigid PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. VIII Co. RIV	Rte. 26	Sec. C	Contract No. —	Date of Constr. 1940-41		Test Hole No. BD-2 & 5 (BE)	
Fill X	Approx. Height 2' - 5'	Dist. from End of Fill		No. of Lanes 2	Traffic Heavy Westbound		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Not clearly defined		Depth	Date of Sampling 5/15/51
Roadside Use, Left Undeveloped			Right Undeveloped			Grade 1.9 %	Up



Remarks:

Party: Reynier, Clawson

Drawn by: Clawson

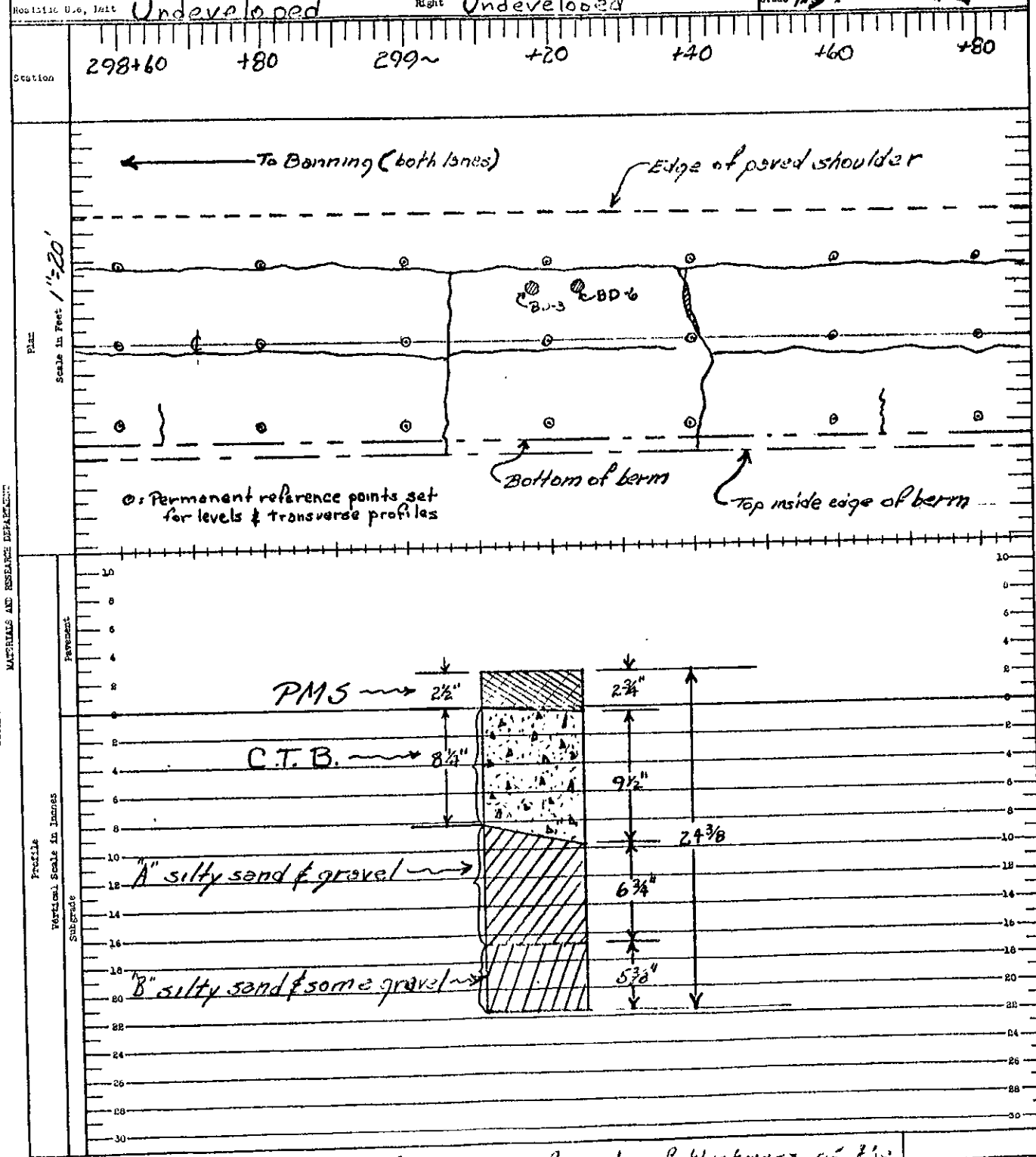
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND SOIL SECTION

CONCRETE PAVEMENT INVESTIGATION

BRANCH NO. [illegible]

Dist. VIII	Co. Riv	Rte. 26	Sec. C	Contract No. —	Date of Constr. 1940-41	Test Hole No. BD-3 & 6 (RE)	
Fill ✓	Approx. Height 2'-5"	Dist. from End of Fill		No. of Lanes 2	Traffic Heavy		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Not clearly defined	Depth	Date of Sampling 5-15-51	
Roadside Use, Left Undeveloped			Right Undeveloped		Grade 1.9 %	Up	



Remarks: Note should be taken of the non-uniformity of thickness of the surfacing and base. Thicker section toward the outside of the outer lane

Party: Clawson, Rayner

Drawn by: Crane

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VIII Co. Riv. Rte. 26 Sec. C
Loc. Design BD (& BE)
Sta. 290+00 to 292+00
Sheet No. 1 of 4

Load. Sta. No. 67

ROADWAY CONDITION SURVEY

Station	Left of Roadway: Toe of Slope	Left of Roadway: Edge of Dirt Shldr	Left of Roadway: Edge Pvd Shldr.	Right of Roadway: Bottom of Berm	Right of Roadway: Top of Berm	Right of Roadway: Top of Berm	Right of Roadway: ℄ of Division Strip
292-	1734.8 / 29.5	1736.1 / 21.5	1736.3 / 18.0	1737.2 / 14.0	1738.1 / 15.5	1738.1 / 16.5	1735.8 / 29.5
+50	1735.0 / 30.5	1736.7 / 20.0	1737.1 / 18.0	1738.0 / 14.0	1738.9 / 15.5	1738.9 / 16.5	1736.8 / 23.5
291-	1736.1 / 27.0	1737.8 / 19.0	1738.0 / 18.0	1739.0 / 14.0	1740.0 / 15.5	1740.0 / 16.5	1738.2 / 23.5
+50	1737.4 / 30.0	~~1738.0~~	1739.0 / 18.0	1739.9 / 14.0	1740.7 / 15.5	1740.7 / 16.5	1738.8 / 24.0
+43	R.C. Box Culvert, 6.3' x 3.0' Flow line elevation at inlet = 1734.6						
290-	1736.9 / 30.0	1739.7 / 22.0	1740.0 / 18.2	1740.6 / 14.0	1741.5 / 15.5	1741.5 / 16.5	1739.7 / 23.0

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 67
Dist. VII Co. Riv. Rte. 26 Sec. C
Loc. Design BD (& BE)
Sta. 292+50 to 294+50
Sheet No. 2 of 4

ROADWAY CONDITION SURVEY

Station	Left of Roadway: Toe of Slope	Left of Roadway: Edge Dirt Shldr.	Left of Roadway: Edge Paved Shldr.	Right of Roadway: Bottom of Berm	Right of Roadway: Top of Berm	Right of Roadway: Top of Berm	Right of Roadway: Center (℄) of Division Strip.
+50	1730.8 / 30.5	1731.7 / 21.5	1732.0 / 18.0	1732.6 / 14.0	1733.5 / 15.5	1733.5 / 16.5	1731.4 / 23.5
294 –	1730.5 / 29.5	1732.1 / 21.5	1732.7 / 18.5	1733.5 / 14.0	1734.4 / 15.5	1734.4 / 16.5	1732.2 / 23.5
+50	1731.4 / 27.5	1733.2 / 21.0	1733.6 / 18.0	1734.5 / 14.0	1736.3 / 15.5	1735.9 / 16.5	1733.3 / 22.0
293 –	1733.0 / 27.0	1734.3 / 21.5	1734.6 / 18.0	1735.3 / 14.0	1736.0 / 15.5	1736.0 / 16.5	1734.2 / 22.5
292+50	1733.9 / 27.0	1735.2 / 21.5	1735.4 / 18.0	1736.2 / 14.0	1737.0 / 15.5	1737.0 / 16.5	1735.0 / 23.0

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Load. Sta. No. 67
Dist. VIII Co. Riv. Rte. 26 Sec. C
Loc. Design BD (& BE)
Sta. 295+00 to 297+50
Sheet No. 3 of 4

ROADWAY CONDITION SURVEY

℄ Roadway

Station	Left of Roadway: Toe of Slope	Left of Roadway: Edge of Dirt Shldr.	Left of Roadway: Edge of Paved Shldr.	Right of Roadway: Bottom of Berm	Right of Roadway: Top of Berm	Right of Roadway: Top of Berm	Right of Roadway: ℄(±) of Division Strip
+50	1722.5 / 30.0	1726.1 / 19.0	1726.3 / 18.0	1727.1 / 14.0	1727.9 / 15.5	1727.9 / 16.5	1726.0 / 24.0
297-	1723.6 / 29.0	1727.1 / 19.0	1727.3 / 18.0	1728.0 / 14.0	1728.8 / 15.5	1728.8 / 16.5	1726.9 / 24.0
+50	1725.0 / 30.0		1728.2 / 18.0	1729.0 / 14.0	1729.8 / 15.5	1729.8 / 16.5	1727.6 / 24.5
296 -	1726.2 / 30.0	1728.9 / 20.6	1729.1 / 18.0	1729.9 / 14.0	1730.7 / 15.5	1730.7 / 16.5	1728.6 / 24.0
+50	1728.1 / 29.0	1729.5 / 22.5	1730.1 / 18.5	1730.8 / 14.0	1731.6 / 15.5	1731.6 / 16.5	1729.5 / 24.5
295-	1729.1 / 30.5	1730.6 / 21.5	1731.1 / 18.5	1731.7 / 14.0	1732.7 / 16.5	1732.7 / 16.5	1730.3 / 24.5

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00258
W.O. No. 13NN26
Job Number

Dist. VIII Co. Riv. Rte. 26 Sec. C
Load. Sta. No. 67
Loc. Design BD (℄ BE)
Sta. 298+00 to 300+00
Sheet No. 4 of 4

ROADWAY CONDITION SURVEY

Station	Left of Roadway: Toe of Slope	Left of Roadway: Edge of Dirt Shldr.	Left of Roadway: Edge of Paved Shldr.	Right of Roadway: Bottom of Berm	Right of Roadway: Top of Berm	Right of Roadway: Top of Berm	Right of Roadway: ℄ of Division Strip
300-	1719.6 / 28.0	1721.0 / 21.0	1721.5 / 17.5	1722.2 / 14.0	1723.2 / 15.5	1723.2 / 16.5	1721.6 / 24.0
+50	1720.3 / 27.5	1721.6 / 21.5	1722.5 / 17.5	1723.2 / 14.0	1724.2 / 15.5	1724.2 / 16.5	1722.4 / 24.0
299-	1721.3 / 28.5	1723.0 / 20.5	1723.5 / 17.5	1724.2 / 14.0	1725.2 / 15.5	1725.2 / 16.5	1723.4 / 24.5
+50	1719.2 / 23.5	1724.1 / 22.0	1724.5 / 18.0	1725.1 / 14.0	1726.1 / 15.5	1726.1 / 16.5	1724.4 / 24.0
+46	Triple 6'x3' R.C. Box Culvert. Elevation on Floor Slab at ℄ = 1717.6						
298-	1722.2 / 30.0	1724.7 / 20.5	1725.3 / 17.5	1726.1 / 14.0	1727.1 / 15.5	1727.1 / 16.5	1725.3 / 24.0

On gravel at Inlet end of culvert

Form T-527

25

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 61
Road XI-S.D-2-C

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE:

LOCATION: Loadometer Station No. 61, road XI-S.D-2-C, is 2.5 miles north of the north city limits of Oceanside. The station is immediately north of the bridge across the Santa Margarita River. The section selected for test is from 0.5 to 0.75 mile south of the Loadometer Station and from 1.75 to 2.0 miles north of the north city limits.

LENGTH: The section is established between Station "C" 117+50 and Station "C" 127+50, a total length of 1000 feet.

Roadway at the section is a four lane undivided highway with a double traffic stripe between the north and south bound traffic lanes. Section is established in the two left (southbound traffic) lanes.

SURFACE:

Type: Asphaltic plant mixed surfacing blanket over old asphaltic concrete. At the south end of the section, portland cement concrete was found below the asphaltic concrete.

Width: Outer lane is 11 feet in width between Sta. 117+50 and Sta. 120+00 and is 10 feet in width from Sta. 120+20 through Sta. 127+50.

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY STRUCTURE:

SURFACE:

Width: (Continued) Inner lane is 10 feet in width throughout the section.

Thickness: Plant mixed surfacing varies from 2-1/4" to 2-1/2" in thickness.

Asphaltic concrete varies from 8-3/8" to 10¼" in thickness.

P.C.C. pavement (where found) varies from 4-1/2" to 6" in thickness.

Total pavement thickness varies from 10-5/8" to 18-1/2" in thickness.

BASE:

Type and Thickness: Coarse clayey sand and gravel probably selected material from roadway excavation south of the section. Thickness varies from 17-1/2" to 27".

Soil Classification: A-1-b, A-2-4 or A-4

SIDE DITCH DRAINAGE: On the roadway, which is in thorough fill, gutters parallel the pavement at a distance of from 6.5 to 8.5 feet. Gutters and the berms which are located outside of them are paved with P.M.S. Gutters are from 0.2 to 0.6 feet lower in elevation than the adjacent pavement edges, and the berms vary from 0.2 to 0.7 feet higher than the gutters.

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

Roadway and gutter drainage is from the north end (Sta. 127°50) toward the south end (Sta. 117+50) of the section. Paved side drains and also C.M.P. down drains as listed on the Roadway Condition Survey Cards intercept side drainage and lead it to the toe of the fill slope.

Section has a profile grade of +0.2%, and drainage on the roadway is from north to south. Beyond the R/W fence on the left of the section is a small air strip, now a part of the Marine Corps' Camp Pendleton. Between this former air strip and the toe of the fill there is a more or less clearly defined ditch. Concrete pipes carry side drainage under seldom used roads into this air strip. At several points, there are vertical concrete pipes which appear to be part of the drainage system around the air strip. On the right side of the roadway fill, from Sta. 121+00 to the end of the section, there is a bench in the fill slope, varying in width from 6.0 to 10.5 feet. Down drains on the right side of the roadway empty onto this bench, and from there the water flows to point approximately midway between roadway fill and the fill which

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

carries the A.T. & S.F. R.R. tracks.

Drainage water, carried from the roadway to the toe of fill slope, drains north toward the Santa Margarita River.

There are no bridges or culverts under the roadway fill within the limits of the section.

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: There are no areas of alligator cracking within the section.

(2) Areas of Raveling: There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping: There are no areas within the section showing indications of shoving or creeping.

The present plant mixed surfacing segregated badly during placing and there are many areas which have a marked "coarse" appearance and many which appears "rich" and heavy with fines. The coarse areas in this surfacing show a very definite "pumping" action under traffic, after a rain. Apparently the surface water collects in these coarse areas, the dense pavement below and the fine areas around will not allow the

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(3) Areas of Shoving or Creeping: (Continued) water to percolate through them, and the water is forced to the surface under traffic action. Several areas were noted within the section which "pumped" in this manner for as much as two days after a storm. The fine areas show many pulled places, some of which appear to be increasing in severity. Both the coarse and fine areas show some severe cracks.

(4) Patches: There are no patched areas within the limits of the section.

(5) Roadway Section: As noted previously, the entire section is in fill. Roadway fill carries the traveled way from a low ridge on the south across a flat adjacent to the Santa Margarita River to the bridge across the river. Traveled way is from 7.5 ft. to 9.0 ft. above the surrounding area.

(6) Shoulders: Shoulder and drainage conditions are noted previously under "Roadway Structure".

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: This particular section offered no suitable area in which pipe bench marks could be established, nor were there culvert headwalls adjacent

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: (Continued)

to the section in which points could be established. Two heavy spikes were used as bench marks. The spikes were driven into 6" x 6" telegraph poles. The poles are located to the right (east) of the roadway, between the roadway and the A.T. & S.F. R.R. fill. Listed below are the number, location and elevation of the of the two bench marks established by the field crew:

B.M. No.	Location	Elevation
1	60.5' rt. Sta. 116+00, in north face of telegraph pole. Stake nailed to pole above bench, marked "Lab. Bench Mark No. 1".	12.500 (Assumed)
2	62.5' rt. ℄, Sta. 126+17, in west face of telegraph pole. Stake nailed to pole above bench, marked "Lab. Bench Mark No. 2".	

Three lines of permanent reference pins were established; one line in the double stripe separating north and southbound traffic, one line 10.0 ft. from the first, approximately on the traffic stripe between the two left lanes. The third line of pins was set 0.5' into the outer lane from the edge of pavement. Between

Loadometer Station No. 61
Road XI-S.D-2-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels (Continued)

Sta. 117+50 and Sta. 120+00, the outer line of pins was set 10.5 ft. from the middle pin line and from Sta. 120+20 through Sta. 127+50 it was set 9.5 ft. from the middle pin line.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse Profilograph records of the traveled way surface in each lane were made at 20 foot intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way surface. Record of the outer lane was made with recording wheel 30" into the lane from the outer edge. Record of the inner lane was made with the recording wheel 30" into the lane from the double traffic stripe.
All profilograph records have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 61

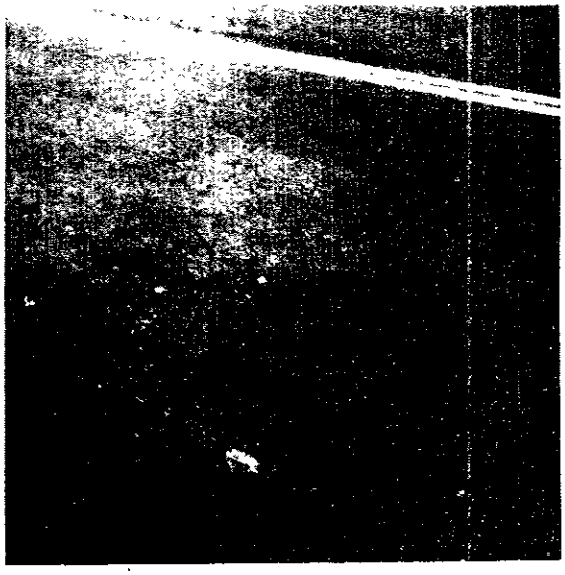
XI-S.D-2-C

Ahead on Line from

Station 117+50

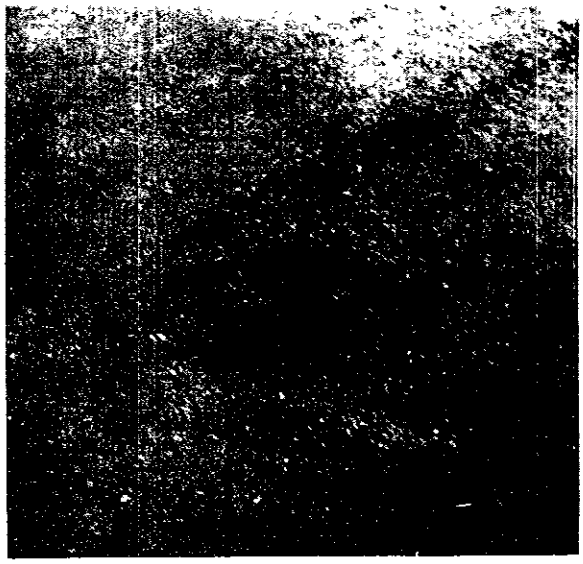
Moisture Flushed to

Surface by Traffic



Moisture Flushed to

Surface by Traffic



Pitted Surface

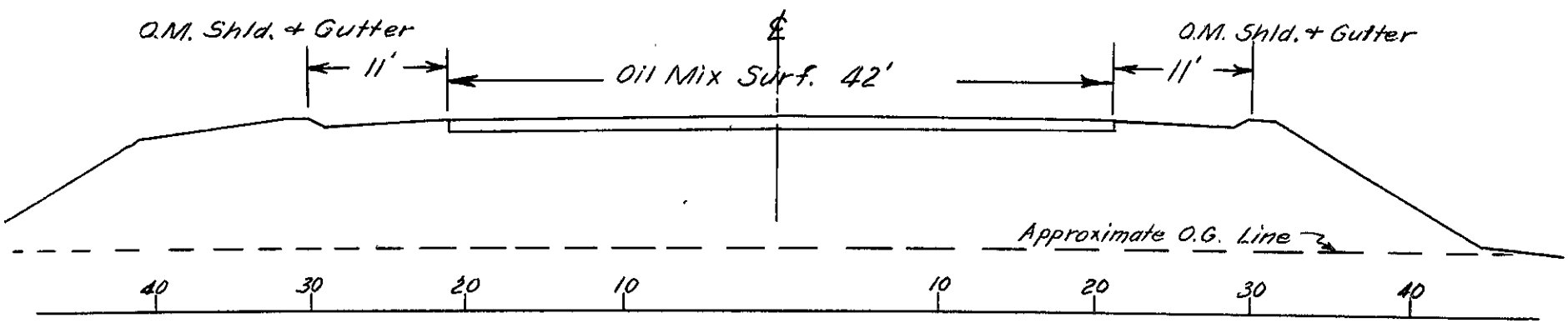
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. AX 61
XI-S.D-2-C

ROADWAY CONDITION SURVEY

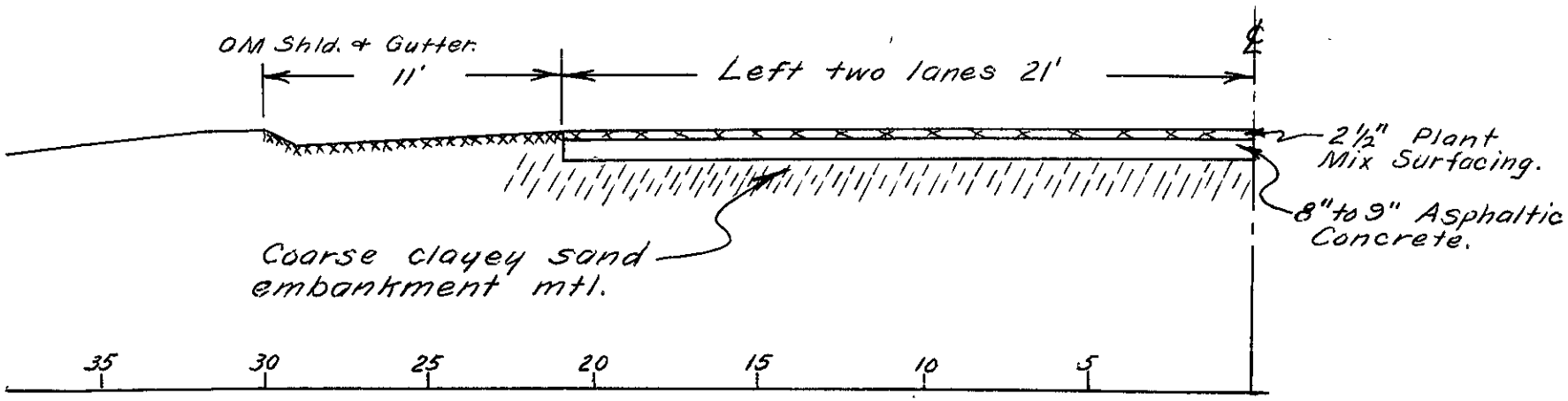
TYPICAL ROADWAY SECTION

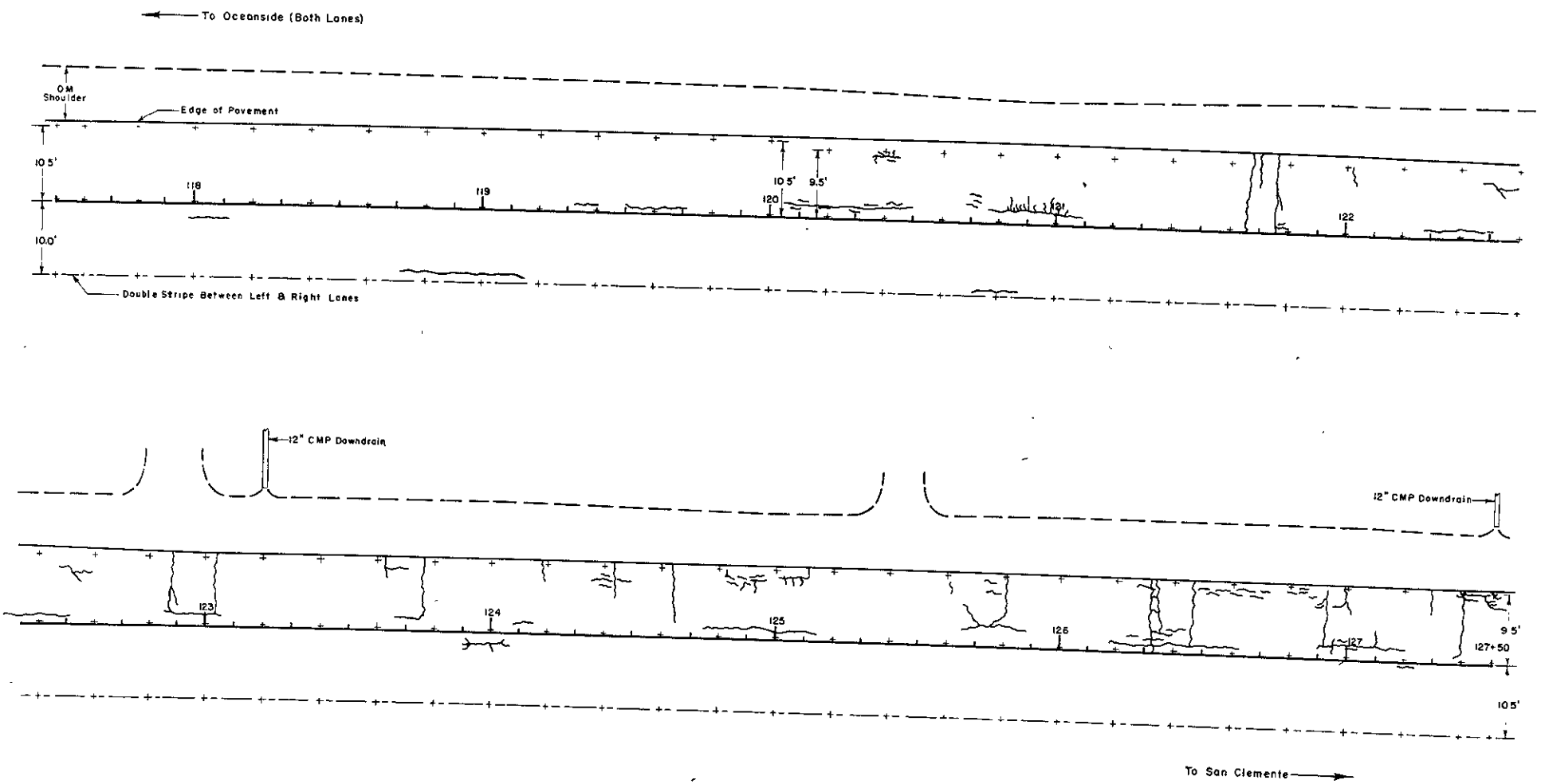
Scale: 1" = 10'



TYPICAL STRUCTURAL SECTION

Scale: 1" = 5'





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking

Failure

Block Cracking

Shoving

Patch

⊕ Location of Sample Hole

+ Location of Permanent Reference Points

LOADOMETER STA. NO. 61
XI-S.D-2-C

TEST RESULTS SUMMARY

Load. Sta. No. 61
XI-S.D-2-C

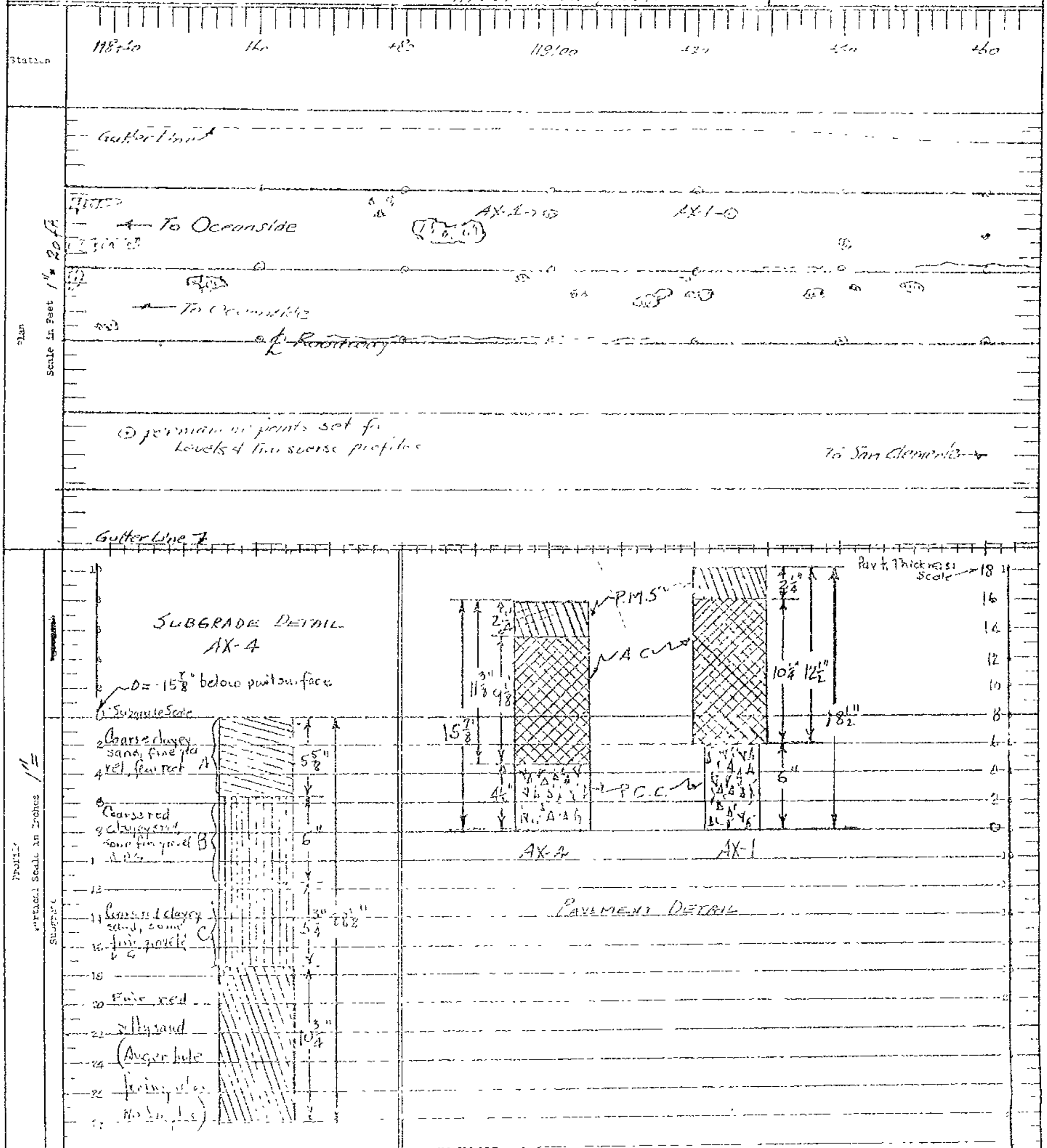
Line	Sample No. Field	Sample No. Lab.	Sample Hole Location Station	Sample Hole Location Position	Pavement Type	Pavement Thickness	Soil Samples Depth below Btm. Pav't.	Soil Samples Layer Description
1	AX-2-A	51-1020	126+08	3' from lt. out. E.P. in outside wheel track	OM AC	2½" 9¼"	0 - 12-1/4"	Basement
2	AX-2-B	51-1020A	126+08	Same	OM AC	2½" 9¼"	12¼ - 23¼"	Basement
3	AX-3-A	51-1021	122+48	3' from lt. outer E.P. in	OM AC	2¼" 8-3/8	0 - 6-1/2"	Basement
4	AX-3-B	51-1021A	122+48	outside wheel track	OM AC	2¼" 8-3/8	6-1/2" -13-1/8	Basement
5	AX-3-C	51-1021B	122+48	Same	OM AC	2¼" 8-3/8	13-1/8-18-7/8	Basement
6	AX-4-A	51-1022	119+00	3' from lt. outer E.P. in	OM AC	2¼" 9-3/8	0 - 5-5/8"	Basement
7	AX-4-B	51-1022A	119+00	outside wheel track	PCC Same	4-1/2	5-5/8-11-5/8	Basement
8	AX-4-C	51-1022B	119+00	Same	Same	Same	11-5/8-17-3/8	Basement

Line	In Place Test Data Moist.	In Place Test Data Density	In Place Test Data % Rel. Comp.	Lab. Test Data Optimum Moisture	Lab. Test Data Maximum Density	HRB Soil Classification	Specific Gravity Pass. 4	Specific Gravity Ret. 4
1	7	130	97	8	134	A-2-4	2.67	
2	7	136	102	8	133	A-2-4	2.64	
3	8	136	100	8	136	A-2-4	2.64	
4	7	127	95	8	134	A-2-4	2.65	
5	7	136	102	9	133	A-1-b	2.64	
6						A-1-b	2.65	
7	8	130	96	8	135	A-2-4	2.63	
8	[illegible]	126	94	10	128	A-4	2.62	

Line	Sieve Analysis - Percent Passing 2"	3/4"	4	8	16	30	50	200	270	5M	Atterberg Limits LL	PL
1	100	99	97	91	76	56	40	22	20	11	23	16
2	100	100	97	91	74	5[illegible]	3[illegible]	[illegible]	2[illegible]	12	24	15
3	100	99	97	91	80	6[illegible]	4[illegible]	26	24	1[illegible]	19	16
4	100	100	99	94	[illegible]	54	37	22	20	14	24	17
5	100	100	97	89	72	52	37	20	19	12	23	18
6	100	96	88	81	65	48	34	[illegible]	15	8	25	19
7	100	100	95	88	73	58	4[illegible]	26	24	1[illegible]	22	17
8	100	100	100	95	8[illegible]	[illegible]3	58	39	37	14	25	17

PAVEMENT INVESTIGATION — RESEARCH NO.

Dist. XI Co. Rte.	Sec.	Contract No.	Date of Constr.	Test Hole No. AX-1, AX-4	
Fill	Alt. of wt ht	Dist. from Pt of Fill 300'	No. of Lanes 4 undivided	Traffic Heavy	
Cut		Dist. from Pt of Cut	Side Ditches	Depth	Date of Sampling 3-5-6 57
Roadside Left: Good roadway		Right: AT&SF Railway		Scale	Up



Material from bottom of pavement to 11 3/8" (A & B) shows ... to be ...

Party: Keyner, ..., ...

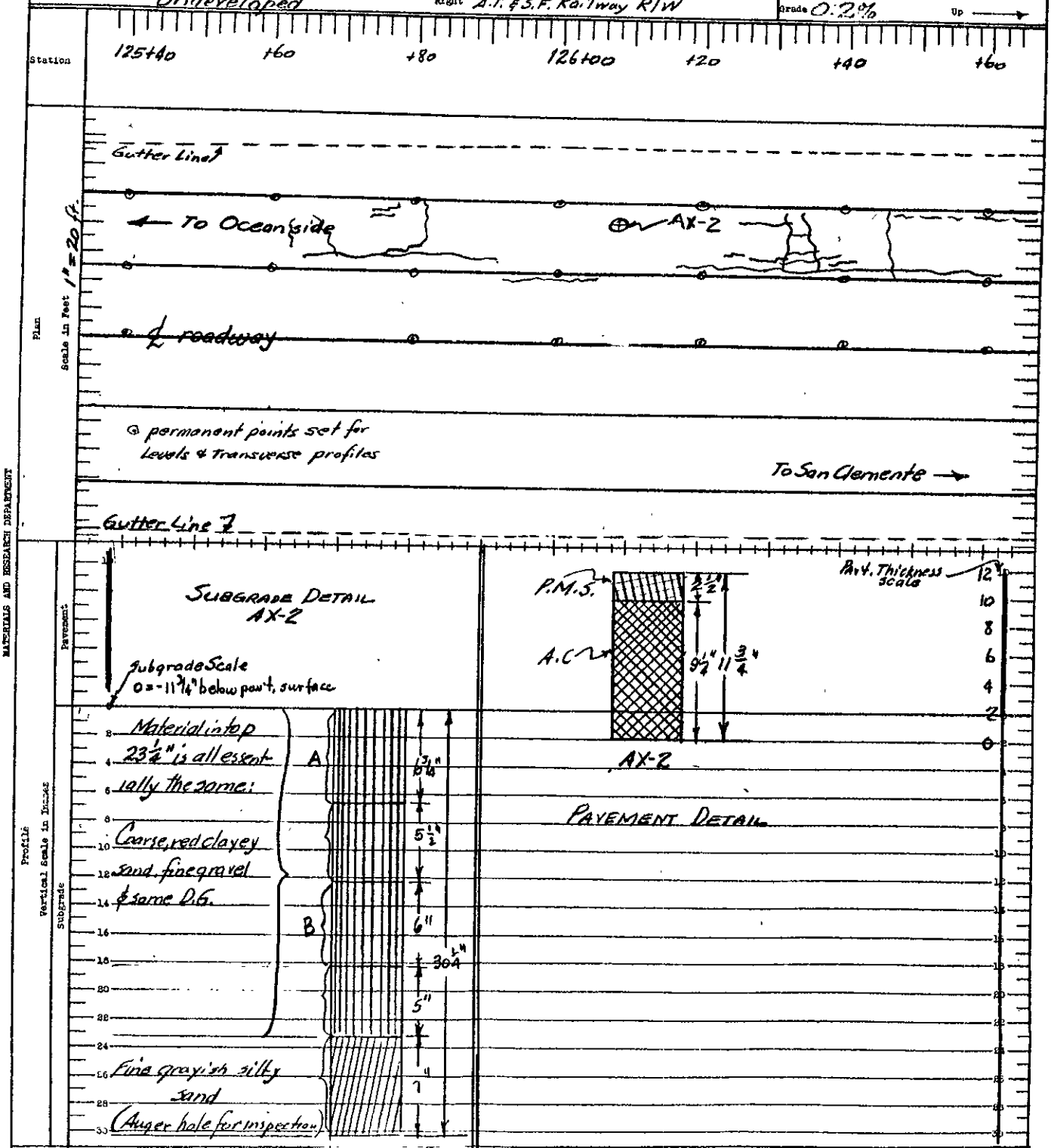
Drawn by: ...

LOCATION AND PROFILE SKETCH

[redacted] PAVEMENT INVESTIGATION

RESEARCH NO. [redacted] 00258

Dist. XI Co. SD Rte. 2 Sec. C		Contract No. —	Date of Constr. 1936	Test Hole No. AX-2	
Fill ✓	Approx. Height 7' to 9'	Dist. from End of Fill 1000' 1300'	No. of Lanes 4-undivided	Traffic Heavy	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Along toe of fill - 7' to 9' below rdwy grade	Depth 0.5' to 1.0'	Date of Sampling 3-5-51
Roadside Use, left Undeveloped		Right A.T. & S.F. Railway R/W		Grade 0.2%	Up →



Remarks: Below -30 1/4" mat'l. is a micaceous silty sand, with considerable clayey sand.

Party: Reyner, Bourne, Clawson

Drawn By: Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

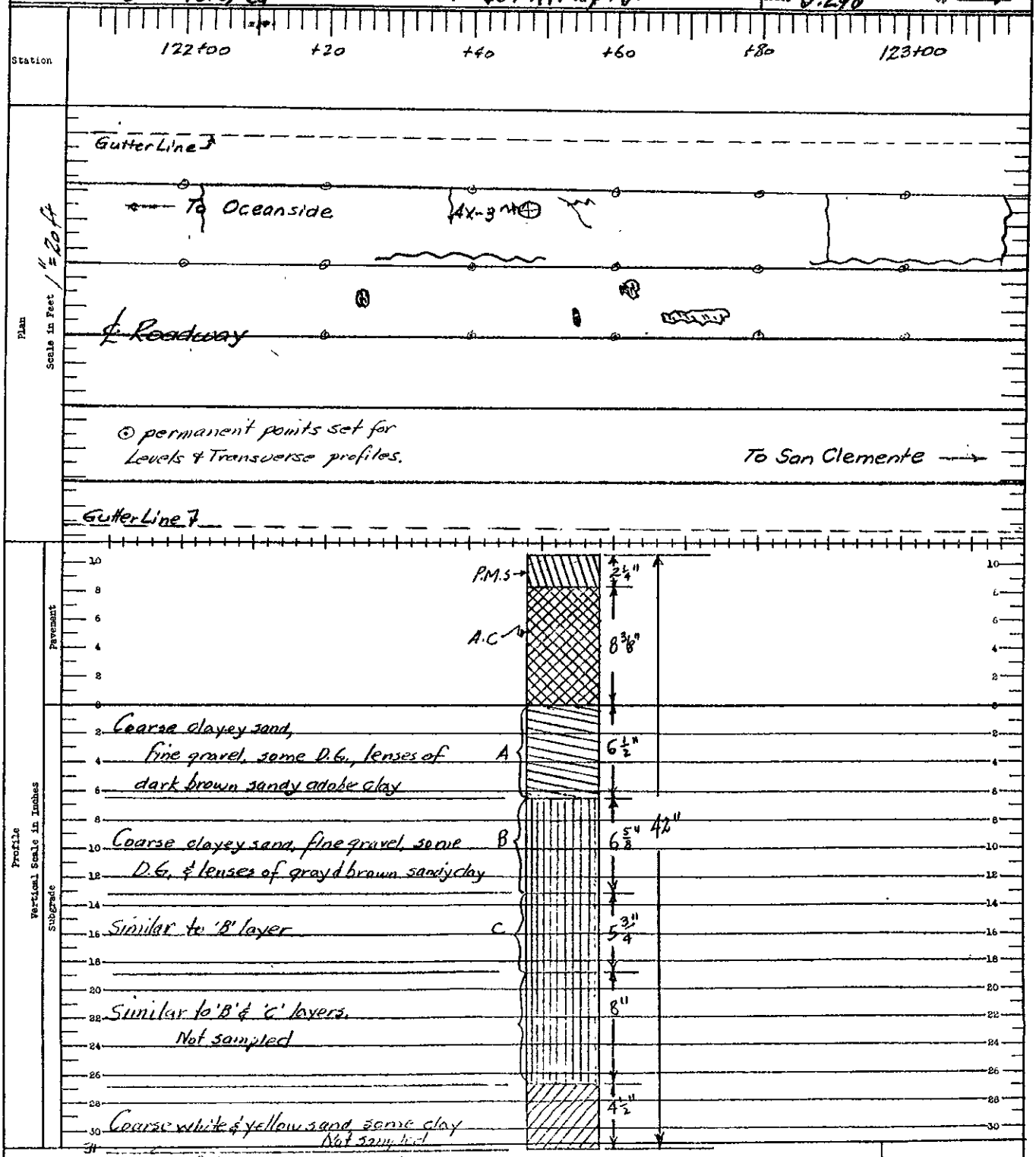
LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 00258

Dist. XI	Co. SD	Rte. 2	Sec. C	Contract No. —	Date of Constr. 1926	Test Hole No.	AX-3
Fill ✓	Approx. Height 7' to 9'	Dist. from End of Fill 650' / 1650'		No. of Lanes 4-Undivided	Traffic Heavy		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Along toe of Fill - 7' to 9' below roadway grade		Depth 25' to 10'	Date of Sampling 3-5-51
Roadside Use, Left Undeveloped			Right A.T. & S.F. Railway R/W			Grade 0.2%	Up →

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT



Remarks: Below - 31 3/8" below bottom of part material is a fine, silty micaceous sand, with many lumped lenses of clay

Material from bottom of pit to - 26 7/8" is essentially the same, with varying amounts of sandy clay. Probably from a micaceous sandstone.

Party: Reyner, Bourne, Carlson

Drawn By: Carlson

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. CO258
W.O. No. 15NN26
Job Number _____

Load. Sta. No. 61
Dist. VI Co. D Rte. 2 Sec. C
Loc. Design AX
Sta. 116+00 to 121+00
Sheet No. 1 of 3

Drainage & use sections

ROADWAY CONDITION SURVEY

	Left of Roadway							Right of Roadway						
	Toe of Fill Slope	Edge of Fill Slope		Top of Berm Outside	Top of Berm Inside	Gutter Line	Edge of Pavt.	Edge of Pavt.	Gutter Line	Top of Berm Inside	Top of Berm Outside		Toe of Fill Slope	Ditch Line
121~	8.8 / 55.0	16.7 / 44.0			17.6 / 28.5	17.6 / 1.0	17.5 / 21.0	17.6 / 21.5	17.[illegible] / 27.5	17.7 / 29.5	17.3 / 32.0		11.1 / 43.5	9.4 / 49.5
	Note: Top of berm, left, becomes indistinguishable from filled area outside at 121~. Top of berm, inside, designates top of slope of paved gutter, not berm, from here to end.													
120~	9.3 / 55.0	16.7 / 41.5		17.5 / 30.0	17.5 / 29.0	16.9 / 28.0	17.4 / 21.0	17.4 / 21.[illegible]	17.2 / 23.0	17.7 / 29.5	17.4 / 31.0		10.0 / 44.5	8.4 / 54.5
+84								CMP Downdrain Lt. 33.2 Rt. ℄ Flowline Elev. end of pipe 15.8. Downdrain set below gutter line. Gutter 28.5 Rt. Elev 17.5						
119+00	9.3 / 55.5	16.0 / 42.0		17.1 / 30.5	17.1 / 29.5	16.5 / 28.5	17.1 / 21.0	17.1 / 22.5	16.8 / 29.5	17.5 / 30.5	17.1 / 32.0		9.6 / 45.5	8.6 / 55.5
+25								Downdrain Rt. Open ditch paved with P.M.S. 29.0 Rt. Flowline Elev 15.6						
118~	8.1 / 55.0	15.9 / 41.0		16.7 / 31.0	16.7 / 29.5	16.3 / 28.5	16.8 / 21.0	17.0 / 22.5	16.8 / 29.0	17.3 / 31.0	16.9 / 32.5		9.6 / 44.5	8.5 / 55.5
+53								CMP Downdrain Right Inlet 32.5 from ℄ Flowline Elev. 15.9						
117+50	8.1 / 53.0	15.2 / 40.0		16.1 / 33.0	16.6 / 30.5	16.[illegible] / 29.5	16.7 / 20.5	17.0 / 22.5	16.6 / 29.5	17.0 / 31.5	16.7 / 33.5		10.3 / 43.5	9.5 / 53.5
116+00		BM#1 60.5 Rt. Sta. 116+00. Elevation (assumed) of 10.500 feet. Spike in North face of telegraph pole.												

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. C0252
W.O. No. 13NN26
Job Number

Load. Sta. No. 61
Dist. XI Co. SD Rte. 2 Sec. C
Loc. Design AX
Sta. 122+00 to 124+98
Sheet No. 2 of 3

Drainage Cross Sections
ROADWAY CONDITION SURVEY

℄

	Left of Roadway							Right of Roadway							
	Toe of Fill Slope	Edge of Fill Slope		Top of Berm outside	Top of Berm inside	Gutter Line	Edge of Pav't	Edge of Pav't	Gutter Line	Top of Berm inside	Top of Berm Outside	Bench in Fill slope in side	Bench in Fill slope out side	Toe of Fill Slope	Ditch Line
+98								CMP Downdrain, right Gutter is 28.0 Rt. ℄ Elev. 17.8 CMP is 28.0 Rt. ℄ Elev 17.3							
124~	9.0 55.0	16.8 42.0			17.7 29.0	17.6 28.0	18.1 20.3	18.2 21.5	17.8 28.0	18.3 29.5	17.8 31.0	10.9 43.0	10.2 50.3	10.4 54.0	9.3 63.0
+26		16.5 40.0			17.5 29.5	17.4 28.0	18.0 20.3								
	CMP Downdrain, Left				Flow Line CMP	16.9 28.5									
123~	10.0 53.5	16.7 40.5			17.6 29.0	17.5 28.0	17.9 20.5	18.0 21.5	17.6 28.0	18.1 29.5	17.5 31.0	11.3 42.5	11.0 49.5	9.4 56.0	8.7 65.5
+90	℄ of road, left, into Marine Corps Reservation. No change in side slopes or elevation Road is seldom used. Ditch drainage carried under this road in a concrete pipe														
122~	9.6 54.0	16.9 41.5			17.7 29.0	17.5 28.0	17.7 21.0	18.0 21.5	17.4 27.5	17.9 29.5	17.4 32.0	11.4 43.5	10.3 50.5	9.3 60.0	

Note: Sta. 121+00 is beginning of bench in fill slope, right, Called 0° section

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00255
W.O. No. 13NN26
Job Number _____

Dist. XI Co. S.D. Rte. 2 Sec. C
Load. Sta. No. 61
Loc. Design AX
Sta. 125+00 to 127+50
Sheet No. 3 of 3

Drainage Cross Sections
ROADWAY CONDITION SURVEY

	Left of Roadway							℄	Right of Roadway							
	Toe of Fill Slope	Edge of Fill Slope			Top of Begin Inside	Gutter Line	Edge of Pavt.		Edge of Pavt.	Gutter Line	Toe of Berm Inside	Top of Berm Outside	Ranch in Fill Slope in side	in out side	Toe of Fill Slope	Ditch Line
127+50	9.4 56.0	17.9 41.0			18.6 29.0	18.3 27.5	18.7 20.0		18.8 21.5	18.3 28.0	18.8 29.5	18.1 31.5	11.6 42.5	16.2 51.0	9.6 56.0	8.6 65.0
127+50	CMP. Down drain, Left, outlet 28.5 left of ℄. Elev. 17.7								CMP. Down drain, right, inlet 28.5 right ℄ Elev. = 15.0							
127+	9.7 55.0	18.2 41.0			18.5 29.5	18.3 25.0	18.7 20.0		18.7 21.0	18.3 28.0	18.8 30.5	18.4 31.5	11.5 42.5	14.4 53.0	8.8 58.5	8.2 63.5
+17	Lab BM. #2 62.5' Rt. ℄ Elevation = 11.722 ft. Spike in west face telegraph pole.															
126+00	9.8 54.0	17.6 41.5			18.3 29.0	18.0 28.0	18.5 20.0		18.6 21.5	18.1 28.5	15.6 30.0	18.1 32.5	11.4 44.5	11.9 51.5	9.1 57.5	5.4 64.5
+40	℄ of Road into Marine Corps Reservation. Practically unused. No changes in slopes or Elevations. Main roadway side drainage is carried under side road in Concrete pipe															
125+00	9.9 53.5	17.5 41.5			18.0 29.0	17.8 27.5	18.2 20.0		18.4 21.5	17.5 28.0	18.3 29.5	11.8 33.5	11.0 45.5	11.0 51.5	10.1 54.0	10.1 63.0

Form T-527

26

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 91
Road XI-S.D-2-F

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 91, located on road XI-S.D-2-F, is 1.2 miles south of the south city limits of Chula Vista. The loadometer pit is located approximately midway in the section selected for test opposite section, Station 292+10.

LENGTH: Between test section Sta. "F" 287+50 and "F" 298+50, a total length of 1100 feet.

SURFACE:

Type: Plant mixed surfacing, constructed in 1946. In the central 20 foot section of the roadway, this present surfacing overlies asphaltic concrete and portland cement concrete. On either side of this central 20 foot section are sections approximately 8 feet in width, where the plant mixed surfacing overlies crusher run base, as noted below.

Width: Present plant mixed surfacing of the roadway varies from a total width of 36.0 feet to 39.0 feet. The left (southbound) lane varies from 18.3 to 19.6 feet, traffic stripe to edge of pavement. The right (northbound) lane varies from 17.7 to 19.5 feet, traffic stripe to edge of pavement.

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY STRUCTURE

SURFACE:

Thickness: Plant mixed surfacing is from 2-1/2" to 3-1/2" thick over the outer 8 foot sections and is from 2-1/4" to 2-3/4" thick over the central 20 foot section of the roadway. Asphaltic concrete in the central 20 foot section varies from 4-1/2" to 12" in thickness. P.C.C. in this central section varies from 4-1/2" to 6" in thickness.

Total pavement thickness in the central 20 foot section varies from 12-1/4" to 19-1/4", as shown on the attached Location and Profile Sketches.

BASE:

Type and Thickness: (A) Central 20 foot section of roadway

There is no imported base or subbase material under the central 20 foot section of roadway, or under the base material in the "shoulder" areas. Within the central 20 foot section P.C.C. pavement is laid directly on the original ground, and the base material under the surfacing in the "shoulder" areas is likewise laid directly on the original ground, which is a reddish brown, sandy adobe clay.

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY STRUCTURE

BASE:

Soil Classifications: A-4

Type and Thickness: (B) Outer 8 foot sections

Material under the surfacing in "shoulder" sections is a crusher run base or creek run gravel and varies in thickness from 4-1/2" to 5-1/2".

SIDE DITCH DRAINAGE: Roadway in the section is a slight fill. Side ditches parallel the edges of pavement at distances of from 35.0 to 43.5 feet from roadway centerline and are from 1.5 ft. to 2.1 ft. below pavement elevation. Drainage is from the south (Sta. 287+50) toward the north (Sta. 298+50). Roadway has a 0.25% profile grade. On the left, there is no definite arrangement to handle side drainage from the gutter at the north end of the section. It appears that drainage water finds its way into the outlet ditch from the culvert at the north end of the section. On the right, drainage water runs north in the gutter line, under a side road (Orange St.) in a 12" concrete pipe culvert, then in a short ditch to the inlet end of an 18" concrete pipe culvert, a ditch takes the water south to an

Loadometer Station No. 91
Road XI-S.D.-2-F

ROADWAY STRUCTURE

SIDE DITCH DRAINAGE: (Continued)

angle point opposite test section Sta. 297+13, where the ditch turns west, draining towards San Diego Bay.

The two culverts mentioned above are the only culverts or drainage structures within the limits of the section.

ROADWAY CONDITION

GENERAL:

It should be noted that, for practically the entire length of the section, there are longitudinal cracks, at or near, the location of the edge of the old pavement. There are several transverse cracks, some of them completely across the central 20 ft. section of the roadway, and some of them running for only a short distance. All transverse cracks noted, however, are quite pronounced and severe.

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking:

Areas of alligator cracking are shown graphically on the plan diagram and are listed below for convenience:

Left Lane:

Sta. 288+91 to 288+98, 14.5' to 17.0' lt. & 2.5 ft. wide, severe

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

Sta. 289+40 to Sta. 289+65, 10.0' to 13.0' lt. centerline, 3.0' wide, fairly severe

Sta. 291+67 to Sta. 291+80.5, 10.0' to 14.5' lt. centerline, 2.5 to 4.0' ft. wide, fairly severe

Sta. 292+24 to Sta. 292+53, 10.0' to 14.0' lt. centerline, 2.5 to 4.0 ft. wide, not severe

Sta. 293+17 to Sta. 293+23, 10.5' to 18.5' lt. centerline, 7.5 to 8.0 ft. wide, fairly severe

Sta. 295+70 to Sta. 295+74, 10.5' to 18.5' lt. centerline 7.5 to 8.0 ft. wide, severe

Sta. 296+08 to Sta. 296+11, 10.5' to 18.5' lt. centerline, 8.0 ft. wide, fairly severe

Sta. 297+56.5 to Sta. 297+69, 14.5 to 18.5' lt. centerline, 3.0 to 4.0 ft. wide, not severe

Right Lane

Sta. 291+46 to Sta. 294+63, 10.0' to 18.5' rt. centerline 7.5' to 8.0' wide. Area is generally not severely cracked, except between Sta. 291+57 and Sta. 291+82. Latter area shows worst alligator cracking in the section, and has been partially sealed with asphalt. Between Sta. 293+60 and Sta. 294+00 is another area of severe alligator cracking.

Sta. 295+34 to Sta. 295+45, 11.5' to 18.0' rt. centerline 7.0 ft. wide, fairly severe

Sta. 296+17 to Sta. 296+54, 11.5' to 18.0' rt. centerline 6.5' to 7.0' ft. wide, not severe

Sta. 297+35 to Sta. 297+90, 10.0 to 17.5 ft. rt. centerline, 7.0' to 8.0' wide, severe. Partially sealed with asphalt.

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

Sta. 298+40 to 3rd of section and 200 ft. beyond, 14.5' to 18.5' rt. centerline, 3.5' to 4.5' wide, fairly severe.

In connection with these alligator crackings, it should be noted that all of them are located in the outer sections of the roadway, and that none of them are within the central 20 foot section of pavement which overlies the old pavement.

(2) Areas of Raveling:

There are no areas of raveling within the limits of the section.

(3) Areas of Shoving and Creeping:

There are no areas within the section which show evidences of creeping or shoving of the surface.

(4) Patches:

There is only one patch within the limits of the section, from Sta. 291+80.5 to Sta. 291+82.5. Apparently a trench excavation was made at some time for utilities, and has been backfilled and patched to bring it back up to the grade of adjacent pavement.

(5) Roadway Section:

As previously noted, the roadway within the section is a slight fill. It seems questionable whether the original P.C.C. pavement was much, if any, higher in elevation than the surrounding

Loadometer Station No. 91
Road XI-S.D-2-F

ROAD CONDITION

SPECIAL CONDITIONS:

(5) Roadway Section: fields. Side slopes from the edges of the pavement to the gutter line were bladed out, and that was apparently the extent of the original grading. Present pavement is from 0.1 ft. to 1.8 ft. higher than the fields on either side of the roadway.

(6) Shoulders: When the present plant mixed surfacing was constructed, two outer sections of from 8.0 ft. to 9.5 ft. in width were added to the then existing pavement. These outer sections were designed to serve as paved shoulders. However, with the type pavement constructed, the entire roadway is used as traveled way, frequently carrying four cars abreast. As a result of this practice, there are no improved shoulders on the section. Side slopes are bladed by Maintenance and serve as shoulders, but have no treatment to improve them.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew at both ends of the section and on the P.C.C. runways to the Loadometer Pit, opposite Sta.

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY CONDITION

Bench Marks and Levels: 291+82.5 and Sta. 292+40. Bench Mark No. 1 is a pin in a pipe cap, left of Sta. 287+95. A length of 1" pipe was driven 3.5 feet into the ground and the cap was screwed onto this pipe. All other bench marks are 1/4" diameter Ramset pins. Listed below are bench mark number, location, description and elevation of all bench marks established:

B.M. No.	Location	Description	Elevation
1	39' lt. roadway centerline, opposite Sta. 287+95	Ramset pin set into pipe cap. Pipe driven into ground 3.5 feet	60.000 (Assumed)
1a	22.5' rt. of roadway ℄, opposite Sta. 291+82.5	1/4" diameter pin set near the south end of the inner PCC runway to Loadometer Pit	60.193
1b	29.0' rt. of roadway ℄, opposite Sta. 298+51	1/4" diameter pin set near the north end of the outer P.C.C. runway to Loadometer Pit	60.144
2	46.3' rt. of roadway ℄, opposite Sta. 298+51	1/4" diameter pin set in headwall (PCC) at inlet end of 18" x 94' concrete pipe culvert under roadway	58.089

Loadometer Station No. 91
Roadway XI-S.D-2-F

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels (Continued)

B.M. No.	Location	Description	Elevation
3	47.3' lt. of roadway centerline opposite Sta. 298+44	1/4" diameter pin set in PCC headwall at outlet end of 18" x 94' concrete pipe culvert under roadway	47.351

This particular section of road presented an extreme width of the pavement. The central section of the roadway was laid out in a section 12.6' wide, 6.3' on either side of the traffic stripe, and lines of permanent reference pins were set at these distances from centerline. On the left side of the roadway, the outer line of pins was placed 11.5' from the pin marking the left edge of the central section. On the right side of the roadway, the outer line of pins was placed 11.0' from the pin marking the right edge of the central section. In general, the left outer pin row is 17.8' from the traffic stripe, which was taken as the centerline of the roadway.

Loadometer Station No. 91
Road XI-S.D-2-F

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Profilograph Records;

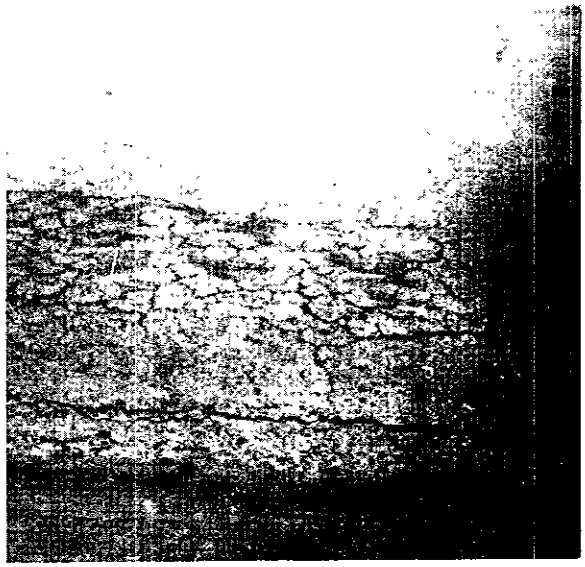
Transverse: Pins established in the pavement as permanent reference points for levels, also serve as permanent markers for transverse profiles. Using the machine developed by the Laboratory for this purpose, transverse profilograph records of the three sections established were taken at 20 foot intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of the traveled way surface at four locations. Records of the outer sections were made with the outer wheels of the machine just inside the outer pin lines. Records of the central section were made with the recording wheel running along the lines of the pins marking the edges of the central section. All profilograph records have been labeled and are on file at the Materials and Research Dept. for future use.

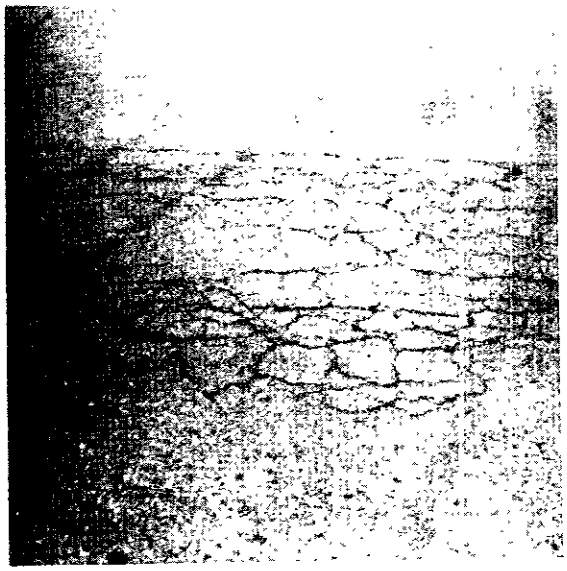
Loadometer Sta. No. 91

XI-S.D.2-F

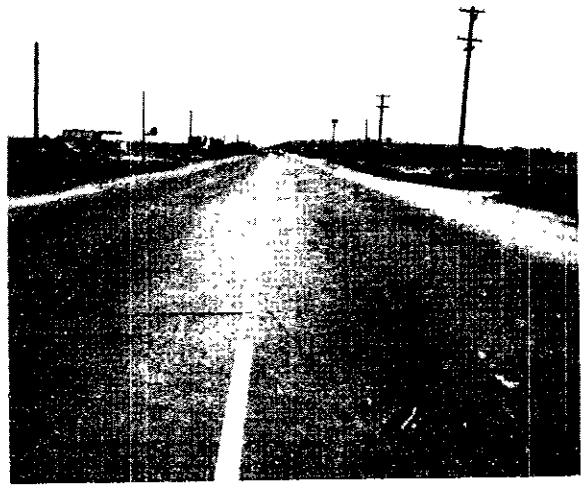
Sealed cracks Station 288+20 to Sta. 288+40



Severe Alligator Cracking Rt. lane Sta. 291+80



Severe Alligator Cracking Rt. lane Sta. 298+50



Back on line from Sta. 298+50

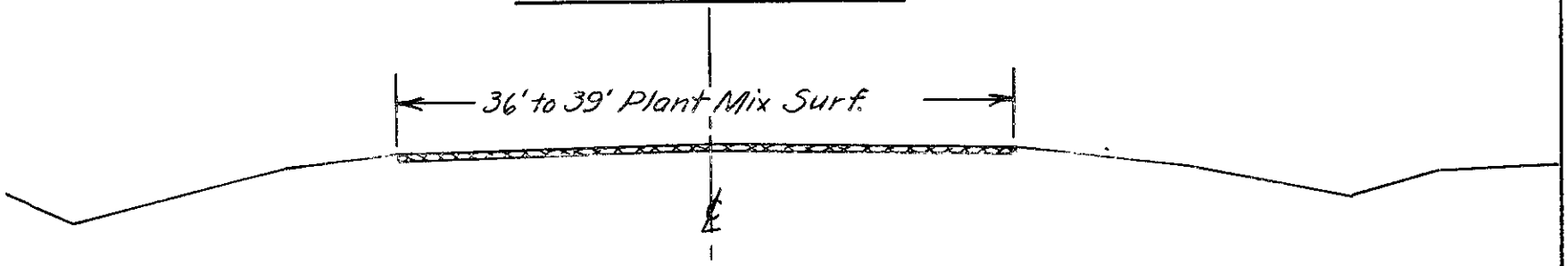
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. AY 91
XI-S.D-2-F

ROADWAY CONDITION SURVEY

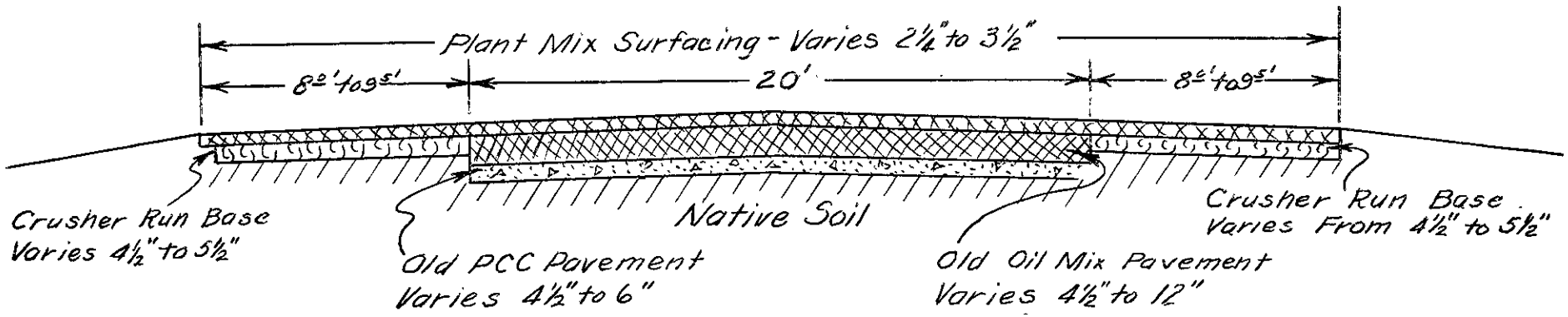
Scale: 1" = 10'

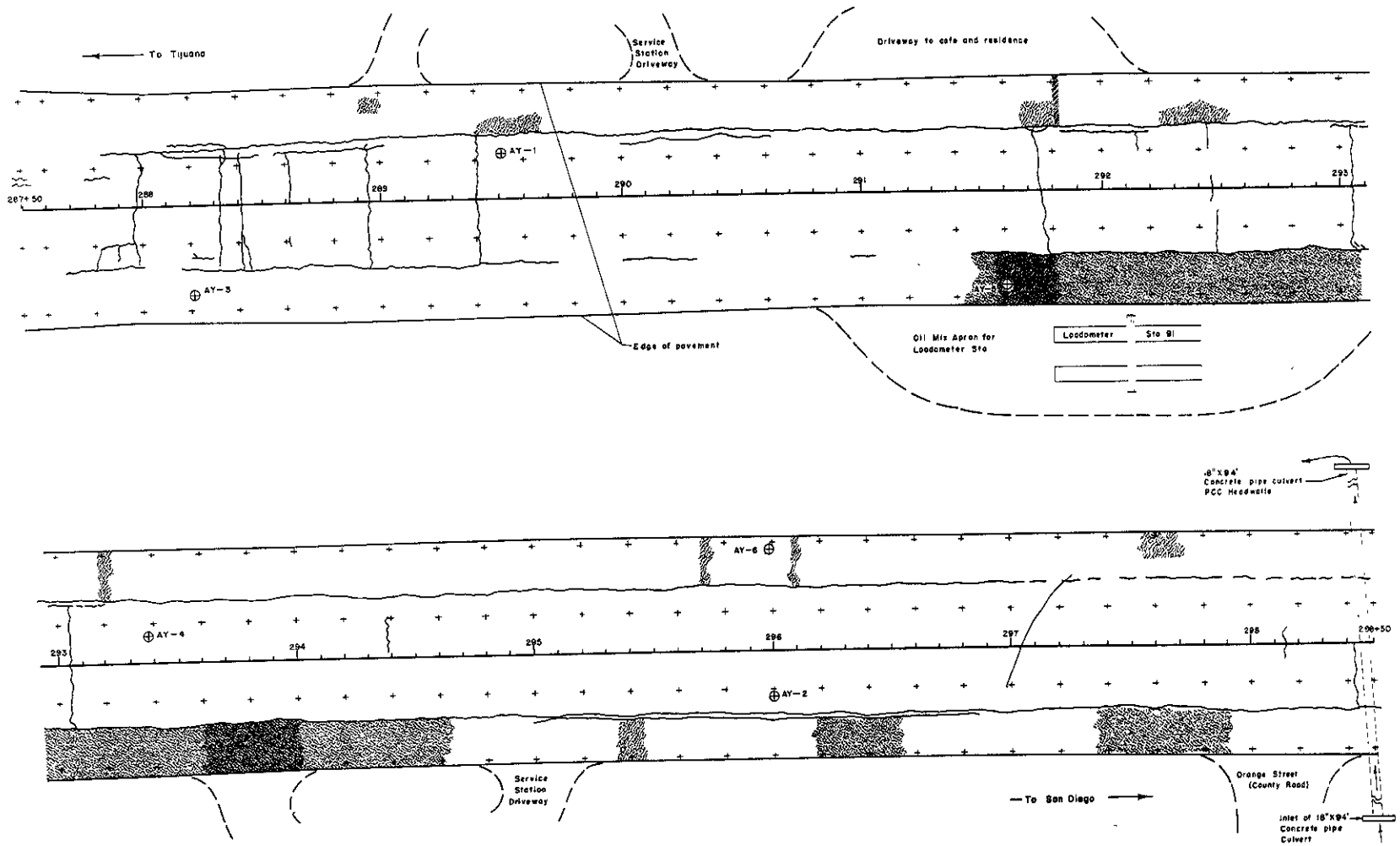
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking | Failure | Block Cracking | Shoving | Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 91
XI-S.D-2-F

TEST RESULTS SUMMARY

Load. Sta. No. 91
XI-S.D-2-F (Part I)

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	AY-1-A	51-1245	289+51	7.8' lt. of ℄ roadway	OM AC	2¼" 4½"	0 - 6-7/8"	Basement
2	AY-1-B	51-1245A	289+51	Same	PCC	6"	6-7/8-14-5/8	Basement
3	AY-2-A	51-1246	295+99	7.5' rt. of ℄ roadway	OM AC	2-3/4" 12"	0 - 6"	Basement
4	AY-2-B	51-1246A	295+99	Same	PCC	4½"	6 - 13-1/2"	Basement
5	AY-3-A	51-1247	288+21	14.7' rt. of ℄ roadway	OM	2½"	0 - 5-1/2"	Base
6	AY-3-B	51-1247A	288+21	Same	OM	2½"	5½ - 11-3/8"	Basement
7	AY-3-C	No Lab. Number	288+21	Same	OM	2½"	11-3/8 - 18"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	9	124	92	9	134	A-4	2.65	
2	10	109	82	9	133	A-4	2.65	
3	8	121	92	9	131	A-4	2.65	
4	8	106	81	9	131	A-4	2.67	
5	4	138	99	7	139	A-1-a	2.67	2.66
6	10	115	89	11	130	A-4	2.63	
7	13	109	84	11	130			

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1			100	99	97	91	79	49	44	14	N	P
2			100	99	98	93	82	51	46	14	N	P
3			100	99	98	93	81	50	44	12	N	P
4			100	99	97	92	79	45	42	12	N	P
5	100	83	43	37	31	24	16	7	6	4	N	P
6		100	98	96	92	82	67	42	37	18	22	15
7	Material same as AY-3-B. No sack sample taken											

TEST RESULTS SUMMARY

Load. Sta. No. 91
XI-S.D-2-F (Part II)

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
8	AY-4-A	51-1709	293+38	4.3' left ℄ roadway	OM AC	2¼" 5"	0 - 7-1/4	Basement
9	AY-4-B	51-1709A	293+38	same	PCC	5"	7¼ - 13-3/4"	Basement
10	AY-5-A	51-1710	291+66	15.3' rt. of ℄ roadway	OM	3"	0 - 4-3/4"	Base
11	AY-5-B	51-1710A	291+66	Same	OM	3"	4-3/4 - 10½"	Basement
12	AY-5-C	51-1710B	291+66	Same	OM	3"	10½ - 17"	Basement
13	AY-6-A	51-1711	295+985	16.4' lt. of ℄ roadway	OM	3½"	0 - 4-1/2"	Base
14	AY-6-B	51-1711A	295+985	Same	OM	3½"	4½ - 10¼"	Basement
15	AY-6-C	51-1711B	295+985	Same	OM	3½"	10¼"-16-3/4"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
8	7	116	91	9	128	A-4	2.62	
9	10	105	81	10	129	A-4	2.67	
10	4	148	111	6	133	A-2-6	2.61	2.65
11	13	123	97	10	127	A-4	2.65	
12	19	113	94	13	120	A-6	2.61	
13	3	130	94	7	139	A-1-a	2.63	2.65
14	14	110	88	12	125	A-6	2.59	
15	8	113	86	8	131	A-4	2.61	2.61

Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
8				100	99	94	84	53	48	13	N	P
9				100	99	94	85	55	50	15	17	15
10	100	77	22	16	13	10	7	5	5	4	30	16
11			100	98	94	87	75	48	44	20	27	14
12			100	99	98	94	85	58	55	32	39	16
13	100	77	43	35	29	21	14	6	6	4	22	19
14			100	99	97	92	84	62	57	34	32	15
15	100	98	94	91	86	77	63	40	37	14	22	16

LOCATION AND PROFILE SKETCH

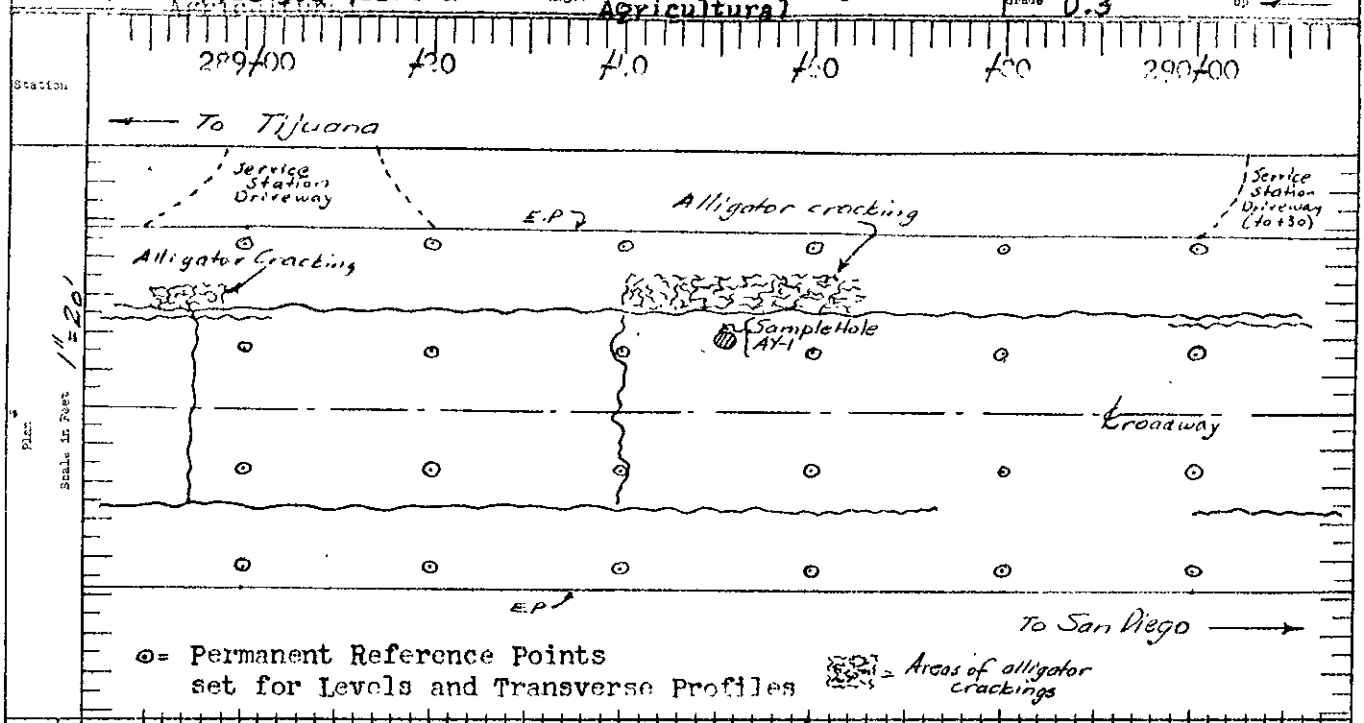
[illegible] PAVEMENT INVESTIGATION

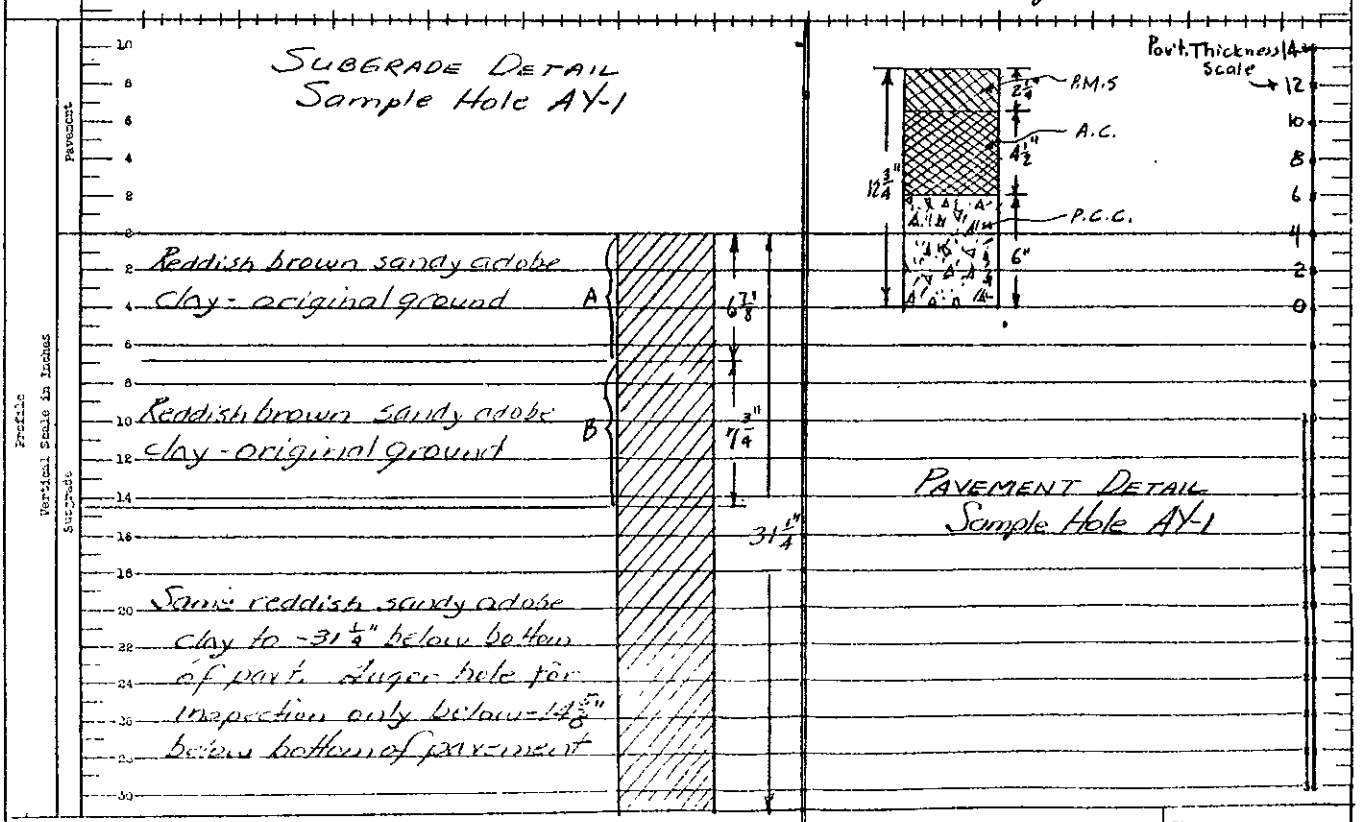
RESEARCH NO. [illegible] 00258

Dist. XI	Co. S.D.	Rte. 2	Sec. F	Contract No. —	Date of Constr. 935, 1946
Fill X	Approx. Height 1 - 1½'	Dist. from End of Fill		No. of Lanes 2	Traffic Light
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Right & Left	Depth 0.5-1'
Roadside Dist. Service Sta., Cafe &		Right Service Station, Agricultural			Grade 0.3

Test Hole No. A Y - 1

Date of Sampling 3/27/51





Remarks

Reyner
Bourne
Party Clawson

Drawn by Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

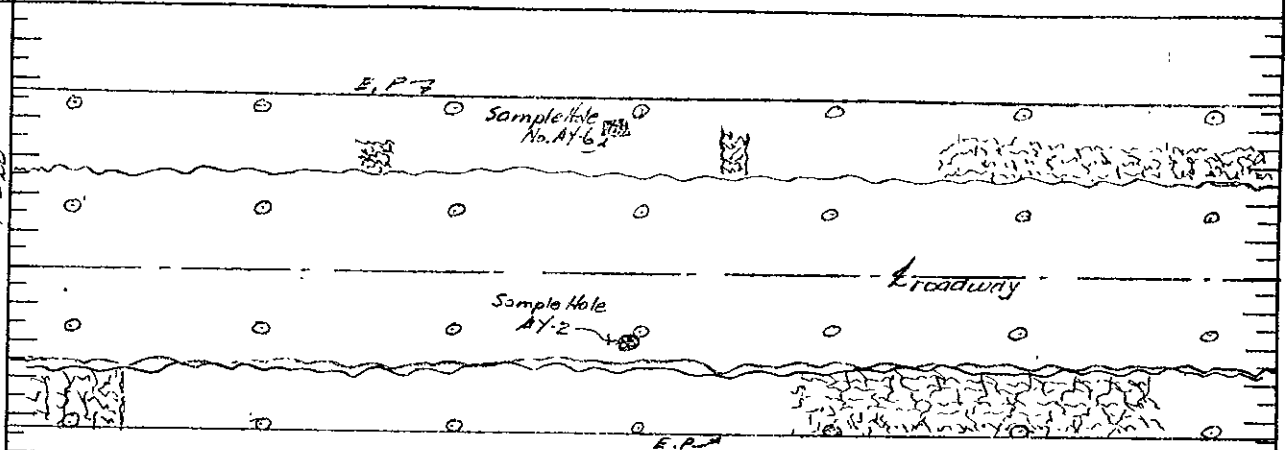
RESEARCH NO. 00258

Dist. XI	Co. SD	Rte. 2	Sec. F	Contract No. —	Date of Constr. 1935, 1946	Test Hole No.	A Y - 2 (& AY-6)
Fill X	Approx. Height 1-1½'	Dist. from End of Fill		No. of Lanes 2	Traffic Light		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Right & left	Depth 0.5-1'	Date of Sampling 3/28/51	
Roadside Use, Left Agricultural			Right Ser. Sta., agricultural		Grade 0.3%	Up	

Station: 295+40, +60, +80, 296+00, +20, +40, +60

← To TIJUANA

Plan — Scale in Feet 1" = 20'



to SAN DIEGO →

⊙ = Permanent Reference Points set for Levels and Transverse Profiles

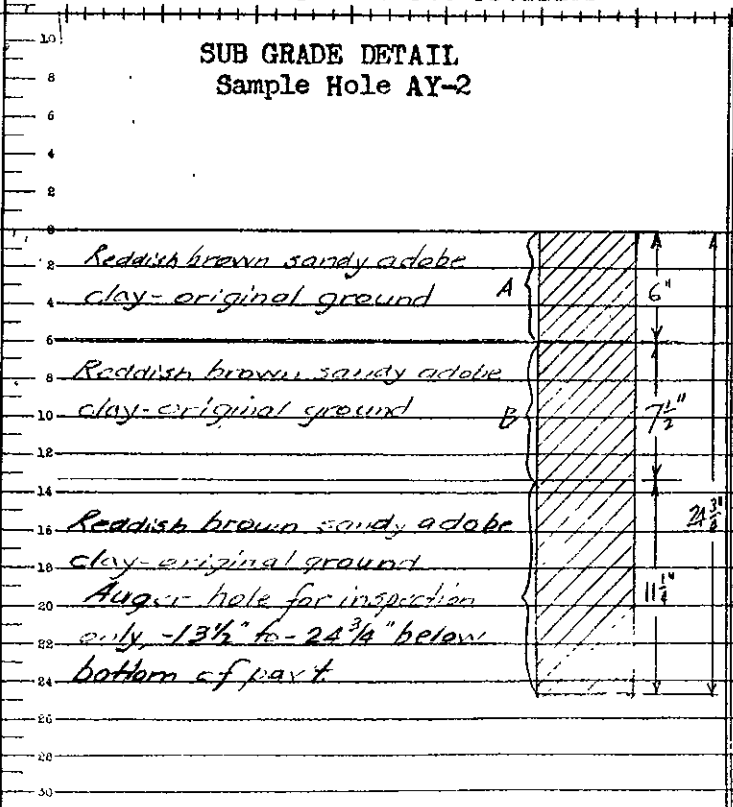
▨ = Areas of alligator cracking

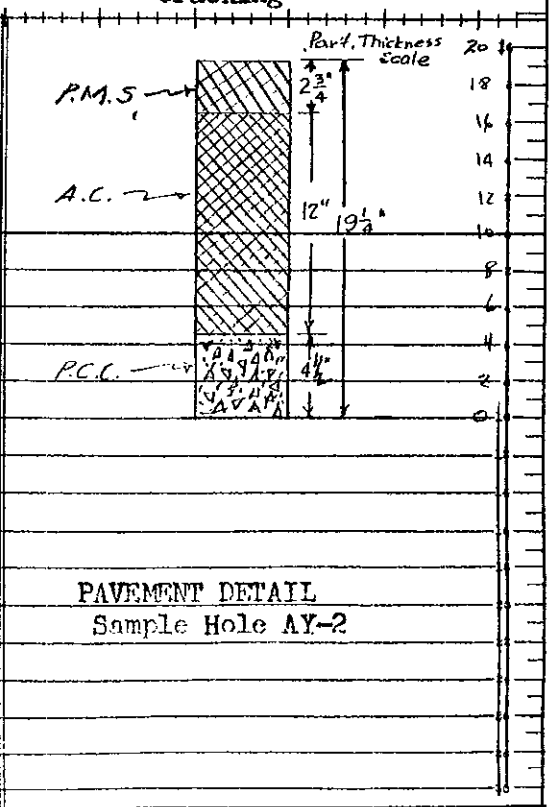
Profile — Vertical Scale in Inches

Pavement

Subgrade

SUB GRADE DETAIL
Sample Hole AY-2





PAVEMENT DETAIL
Sample Hole AY-2

Remarks.

Party: Reymer, Bourne, Clawson

Drawn by: Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SKETCH

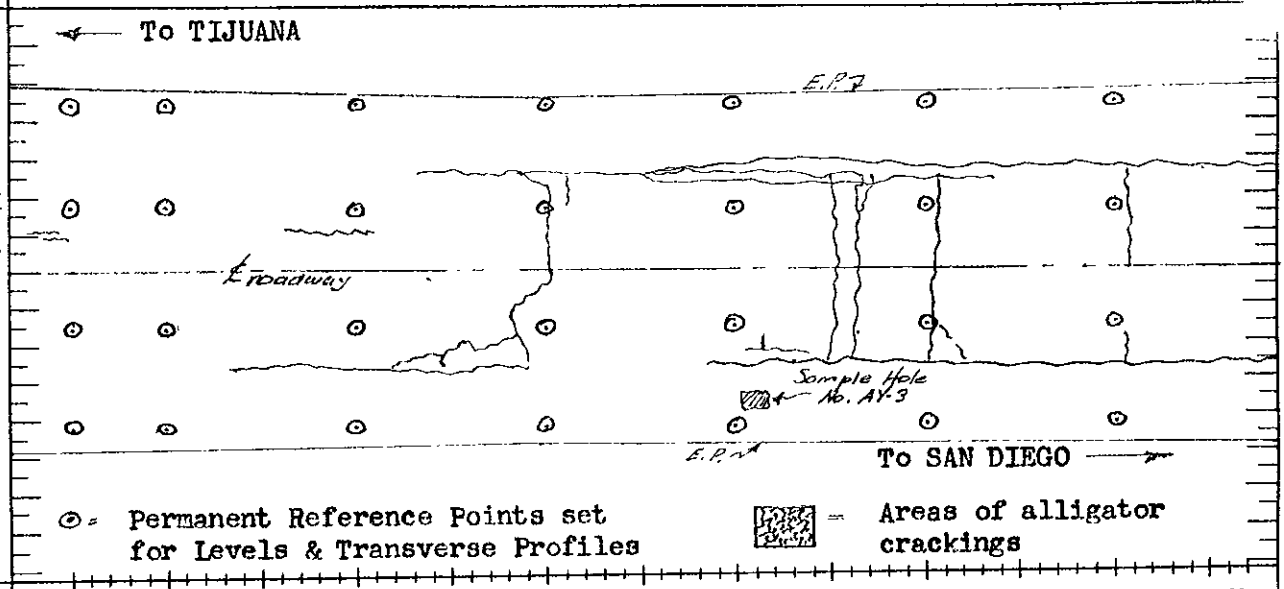
PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. VI	Co. SD	Rte. 2	Sec. F	Contract No. —	Date of Constr. 1935, 1946	Test Hole No.	A Y - 3
Fill X	Approx. Height 1-1½'	Dist. from End of Fill		No. of Lanes 2	Traffic Light		
Cut —	Approx. Depth —	Dist. from End of Cut		Side Ditches Right & Left	Depth 0.5-1'	Date of Sampling 29 Mar. '51	
Roadside Use, Left Ser. Sta., & Agricultural			Right Agricultural		Grade 0.3%	Up	

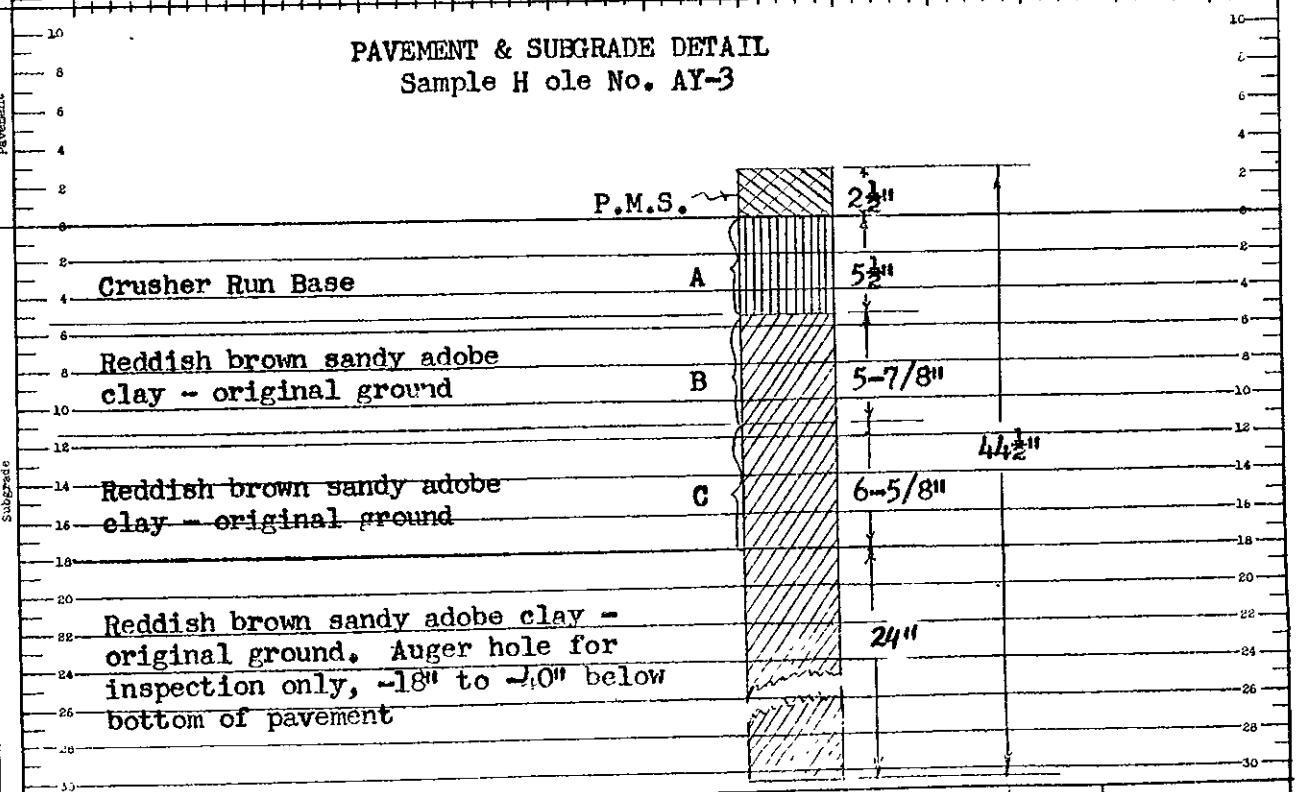
Station: 287+50, +60, +80, 288+00, +20, +40, +60

Plan — Scale in Feet 1" = 20'



Profile — Vertical Scale in Inches

PAVEMENT & SUBGRADE DETAIL
Sample H ole No. AY-3



Remarks: Sample hole in what was intended to be "right shoulder" area, but which is actually used as a "right outer lane" by traffic. Headquarters design dept. requested "shoulder" samples in addition to regular samples under the travelled way.

Party: Reymer, Bourne, Clawson

Drawn By: Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

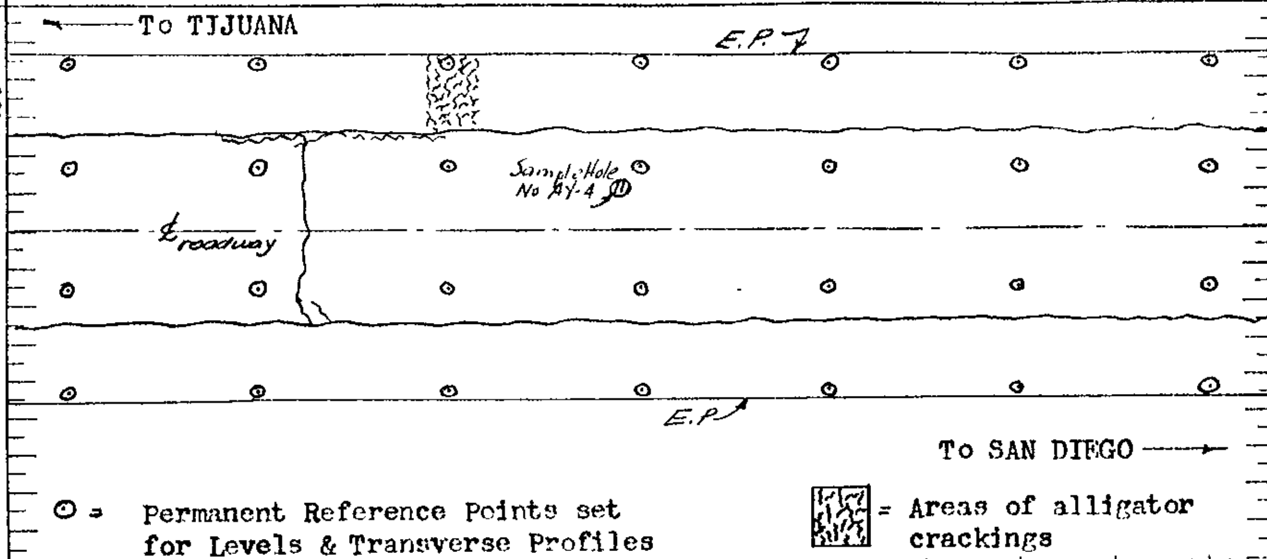
LOCATION AND PROFILE SKETCH

XX..XX. ... INVESTIGATION RESEARCH NO. XXX 00258

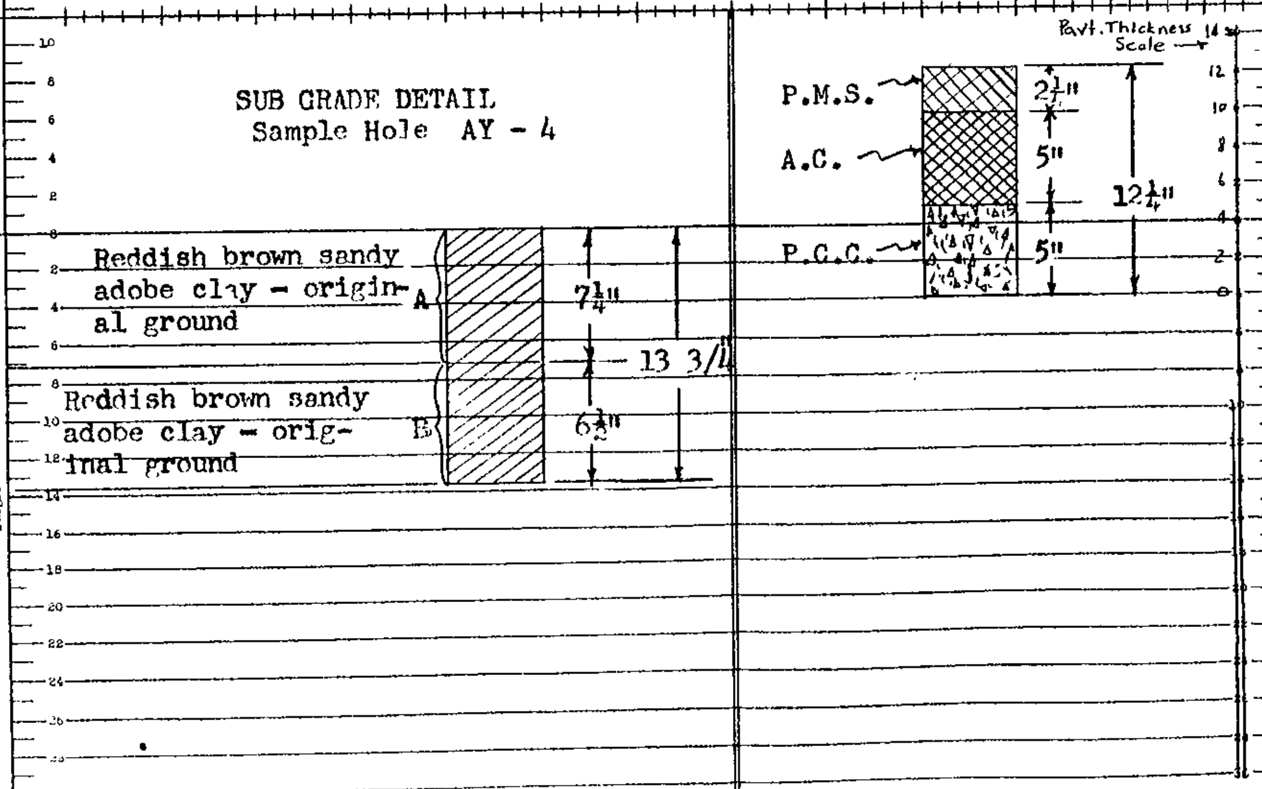
Dist. XI Co. SD Rte. 2 Sec. F	Contract No. —	Date of Constr. 1935, 1946		Test Hole No.	AY - 4
Fill X	Approx. Height 1-1½'	Dist. from End of Fill	No. of Lanes 2	Traffic Light	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Right & Left	Depth 0.5-1'	Date of Sampling 3 May '51
Land Use, Left Agricultural	Right Agricultural			Grade 0.3 %	Up ←

Station: 292+80, 293+00, +20, +40, +60, +80, 294+00

Plan — Scale in Feet



Profile — Vertical Scale in Inches



Party: Reyner, Clausen

Drawn By Clausen

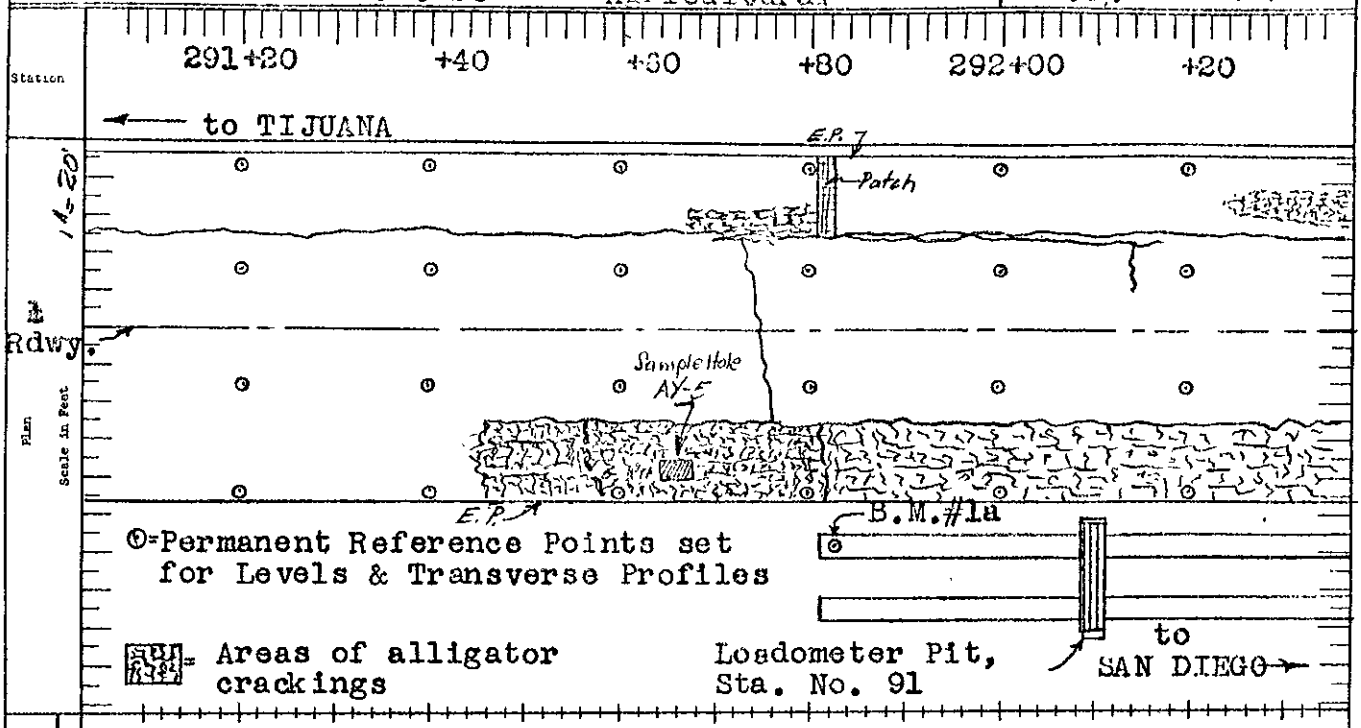
STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

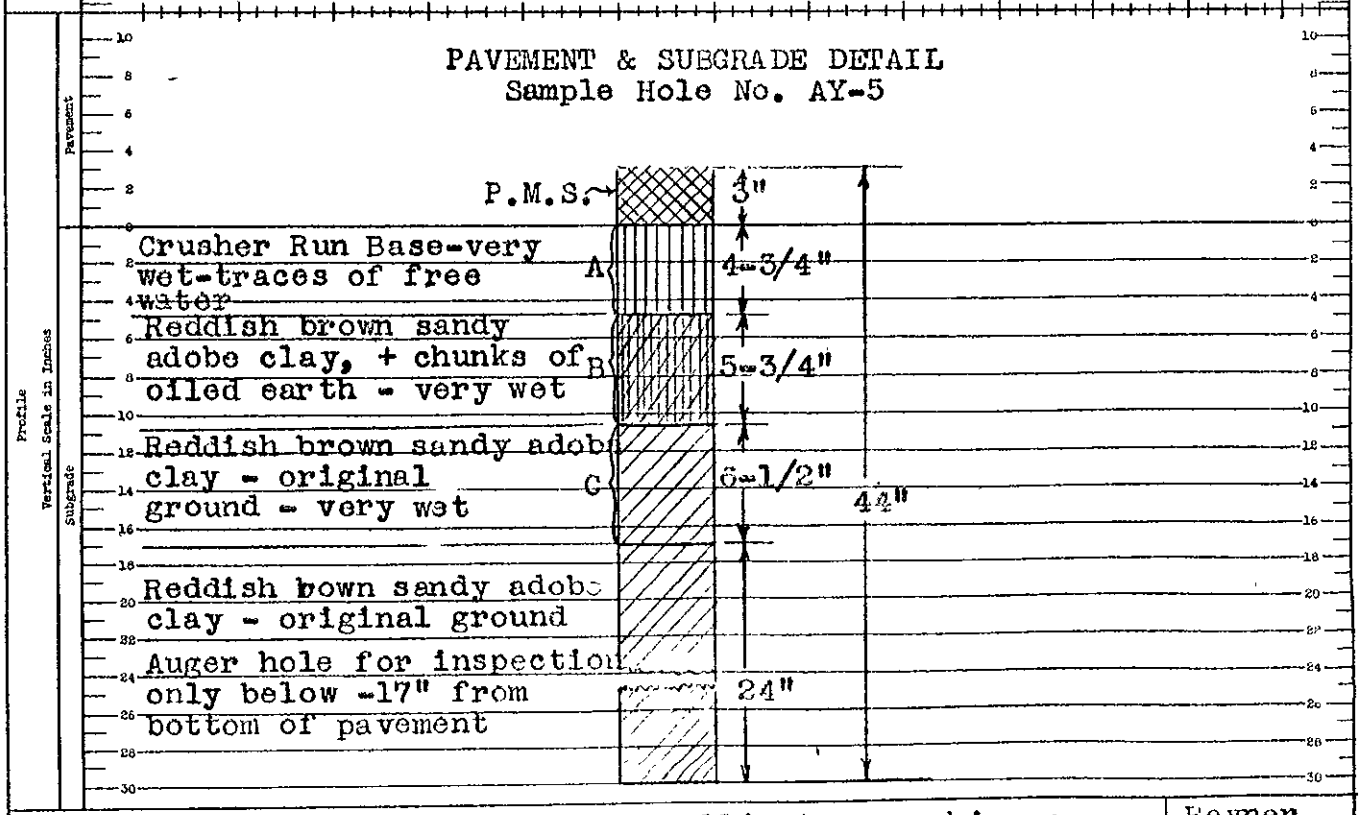
LOCATION AND PROFILE SKETCH

PAVEMENT INVESTIGATION

RESEARCH NO. [illegible]

Dist. XI	Co. SD	Rte. 2	Sec. F	Contract No.	Date of Constr. 1935, '46
Fill X	Approx. Height 1-1½'	Dist. from End of Fill	No. of Lanes 2	Traffic Light	Test Hole No. A Y - 5
Cut	Approx. Depth	Dist. from End of Cut	Side Ditches Right & Left	Depth 0.5-1'	Date of Sampling 5/2/51
Roadside Use, Left Residences & Cafe		Right Agricultural		Grade 0.3%	Up





Remarks: Sample taken in worst area of alligator cracking on Test Section. Crusher Run Base and material to a depth of 18" below the Base were very wet, with some free water in the Crusher Run Base and the adobe clay subbase just below it.

Party: Reyner, Clawson

Drawn By: Clawson

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

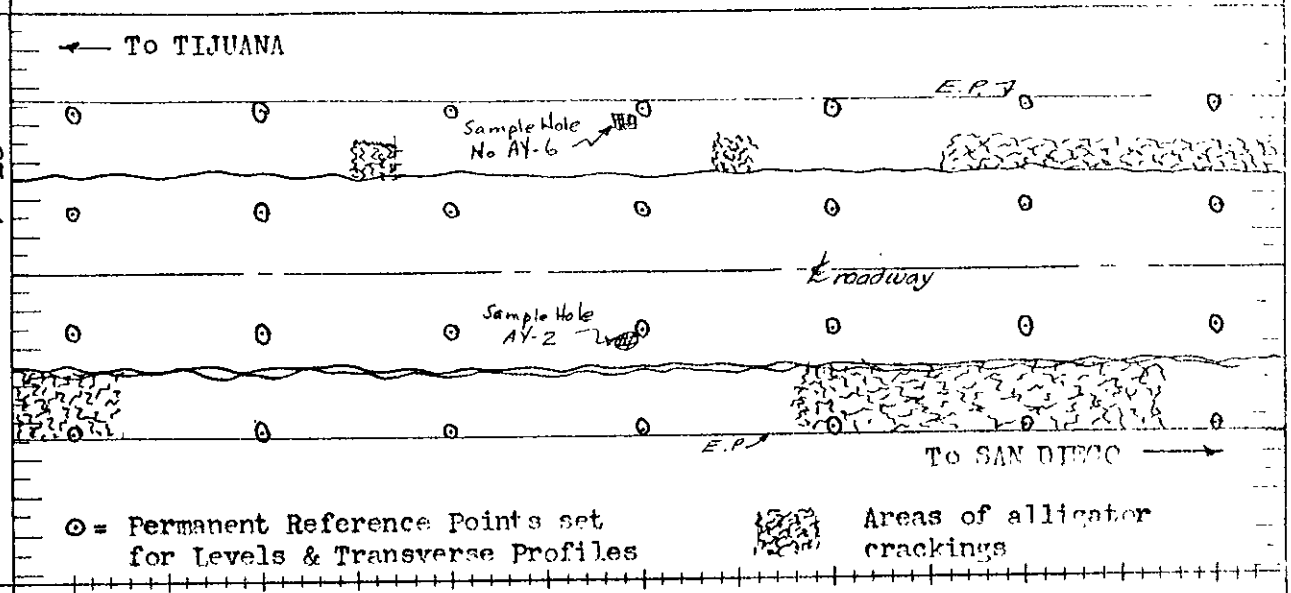
PAVEMENT INVESTIGATION

00258

Dist. XI	Co. SD	Rte. 2	Sec. F	Contract No.	Date of Const. 1935, 1946
Fill X	Approx. Height 1-1½'	Dist. from End of Fill	No. of Lanes 2	Traffic Light	Hole AY-6 (& AY-2)
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Right & Left	Depth 0.5-1'	3 May '51
Roadside Use, Left Agricultural		Right Ser. Sta., & Agricultural		Grade 0.3	

Station: 295+40, +60, +80, 296+00, +20, +40, +60

Plan — Scale in Feet: 1" = 20'

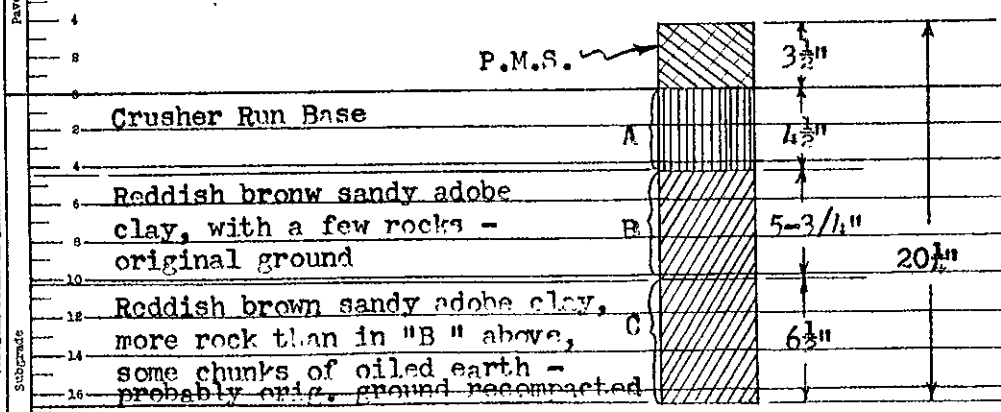


Profile — Vertical Scale in Inches

Pavement

Subgrade

PAVEMENT & SUBGRADE DETAIL
Sample Hole No. AY-6



Crusher Run Base

Reddish bronw sandy adobe clay, with a few rocks - original ground

Reddish brown sandy adobe clay, more rock than in "B" above, some chunks of oiled earth - probably orig. ground recompacted

Remarks: Sample hole in what was intended to be "left shoulder" area, but which is actually used as a "Left outer lane" by traffic. Headquarters Design Dept. requested "shoulder" samples in addition to regular samples under the travelled way.

Remarks

Classification

Party

Classification

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 00268
W.O. No. 13NN26
Job Number _____

Load. Sta. No. 91
Dist. XI Co. S.D. Rte. 2 Sec. F
Loc. Design AY
Sta. 287+50 to 295+00
Sheet No. 1 of 2

Drainage Cross Sections
ROADWAY CONDITION SURVEY

℄ Rdwy - Traffic Stripe

	Left of Roadway							Right of Roadway						
	Field Beyond Top of Cut	Top of Cut	Gutter Line		Break in Slope of Dirt Shldr.	Dirt Shldr. at edge Pav't.	Extreme Edge of Pav't.	Extreme Edge of Pavd.	Dirt Shldr. at Edge of Pav't.	Edge Paved Apron	Top fill For Load Pit	Gutter Line	Top of Cut	Field Beyond Top of Cut
										Paved drive to Service Station, Right				
295~	57.6 47.8	57.4 41.8	56.9 39.8		58.7 26.6	59.2 19.0	59.3 18.8	59.3 17.7				57.5 38.7		57.8 50.7
										Paved drive to Service Station, Right				
294~	57.6 52.8	57.8 42.8	56.7 41.3			59.1 20.3	59.4 18.6	59.4 18.2	59.1 23.7			57.5 34.7		58.6 53.7
+20								End paved (O.M) apron to Loadometer Pit						
293~	58.0 50.8	58.0 41.3	57.0 39.8			59.5 19.0	59.6 18.6	59.6 18.8		59.4 21.2	59.2 31.2	57.8 38.2	59.0 41.7	59.5 47.0
+40		58.5 43.8	57.4 42.3			59.7 20.1	59.8 19.6	59.9 17.7		59.9 20.7	59.6 32.7	58.0 39.7	59.3 41.2	59.8 50.0
								End P.C.C. runways to Loadometer Pit						
292~		58.5 55.8	57.9 41.6			59.8 19.2	59.9 19.0	60.0 18.9		59.9 20.7	59.6 32.7	58.5 39.2	59.2 41.2	60.0 51.0
+80								Begin P.C.C. runways to Loadometer Pit						
291~		58.7 51.3	58.2 38.3			60.0 18.8	60.1 18.4	60.3 18.4		60.0 25.2	59.7 30.7	58.8 37.7	59.3 40.7	60.0 51.0
+90	Drive to residence, left							Begin paved apron (O.M) to Loadometer Pit.						
290~		59.2 50.8	59.0 36.8			60.7 19.0	60.8 18.8	61.0 19.1	60.9 19.3			59.1 37.7	59.8 41.1	60.5 48.0
	Drive to Service Station Left													
289~		59.5 47.3	59.1 35.8			61.3 19.4	61.3 19.2	61.3 19.4	61.2 19.6			59.5 37.7	60.2 39.7	60.8 46.0
	Drive to Service Station, Left													
288~		59.8 43.8	59.7 37.8			61.5 19.3	61.6 18.6	61.6 18.9	61.6 19.1			59.9 37.7	60.9 46.7	61.4 50.0
287+50		59.9 44.8	59.5 40.3			61.8 19.7	61.8 19.5	61.8 19.5	61.6 19.7			60.1 37.4	60.9 40.7	61.3 48.2
	Beginning of Test Section													

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. 07255
W.O. No. 15NN26
Job Number _____

Load. Sta. No. 91
Dist. VI Co. D Rte. 2 Sec. F
Loc. Design AV
Sta. 296+00 to 298+50
Sheet No. 2 of 2

Drainage Cross Sections

ROADWAY CONDITION SURVEY

℄ Rdwy. - Traffic Stripe

	Left of Roadway							Right of Roadway						
		Top of Cut	Gutter Line		Break in slope of Dirt Shoulder	Dirt Shldr. at Edge of Pav't	Extreme Edge of Pav't	Extreme Edge of Pav't	Dirt Shldr. at Edge Pav't	Break in slope of Dirt Shldr.	Gutter Line	Top of Cut		Field Beyond Top of Cut
+51								Inlet end of 18"X94' concrete pipe culvert and rdwy. Inlet end 46.2 from ℄ Elev. Flowline 55E						
	End of Test Section								No Gutter right. Area is bus loading zone					
298+50		57.4	56.3		57.7	58.2	58.3	58.3	57.8			57.7	58.1	
		44.8	38.5		26.3	18.8	18.3	18.2	27.7			39.2	40.2	
+425	Outlet end of 18"X94' concrete pipe culvert under roadway Elevation of Flowline 55.3 Outlet 47.3' from ℄ Roadway.													
+32								End of 12"X41' concrete pipe culvert under Orange St Elev of Flowline 55.9 46.2 right of ℄ Rdwy.						
										No Gutter. side road right. Elev. Pav't on Side road				
298	55.6	56.4	56.3		57.7	58.2	58.4	58.4	58.3				57.6	
	46.8	43.0	38.8		25.8	19.0	18.5	18.2	21.7				41.2	
	Flowline of outlet ditch Lt.													
+91								Beginning of 12"X41' pipe culvert (Concrete) under side road, Orange St, right. Elev of Flowline 56.0, 45.6 Rt. of ℄ Rdwy.						
+60								Beginning of inlet ditch to culvert under side road, right. Elev. of Flowline 56.0						
+13	Angle in outlet ditch from culvert under roadway, 298+51 Rt. to 298+40 Lt. Elev. of Flowline ditch at angle point 55.3 48.8' Lt. of ℄ Rdwy.													
297~		56.4	56.4		58.1	58.6	58.7	58.7	58.5	57.7	56.5	57.7		57.8
		54.8	43.3		26.0	18.8	18.3	17.7	19.2	27.2	37.2	39.7		49.2
	Driveway into local business, Left													
296~		57.2	56.4		58.2	58.1	58.9	58.9	58.7	57.7	56.6	57.9		58.2
		40.3	38.3		25.3	18.8	18.6	17.7	18.7	28.2	37.7	42.2		51.2

Form T-527

27

Research No. 00258
Work Order No. 13NN26

Loadometer Station No. 62
Road XI-S.D-12-C

DATA OF SECTION SELECTED FOR TEST

ROADWAY STRUCTURE

LOCATION: Loadometer Station No. 62 is 6 miles east of El Cajon, Station 302 to Station 303. The section selected for test is adjacent to the Loadometer Station.

LENGTH: Section is established between Station 299+00 and Station 309+00, a length of 1000 feet. Roadway is a 2-lane highway. The section includes both lanes of roadway.

SURFACE:

Type: Oil mix surfacing over old (1916) 15 ft. PCC pavement and newer (1932) 5 ft. PCC widening strip.

Width: Two 10 ft. lanes, traveled way is 20 ft. wide. Oil mix surfacing has been carried out over shoulders so that there is actually 33 to 35 ft. of pavement width.

Thickness: Variable. Oil mix surfacing varies from 2-3/4" to 5". P.C.C. varies from 4-1/4" (1916) to 6-1/2" (1932).

All old P.C.C.pavement has been blanketed with oil mix surfacing several times until present thickness varies from 2-3/4" over the 1916 P.C.C. to 5" over the 1932 P.C.C. Total pavement thickness varies from 7" to 12-1/2".

Loadometer Station No. 62
Road XI-S.D-12-C

ROADWAY STRUCTURE

BASE AND SUBBASE:

Type and Thickness: All pavements have been placed over native material. There is no imported material used as a base or subbase.

Native material is a silty sand and fine gravel with some D.G. in it. Material was sampled to depths of from 12-1/4" to 13-1/4" below the bottom of the pavement.

Soil Classification: A-2-4 or A-4

SIDE DITCH DRAINAGE: Entire section is in a "grade" section. The roadway has a profile grade of +1.0%. Drainage is back along the section from the east to the west.

There are slight ditches beyond the paved shoulders on either side of the road. Ditches are not clearly defined but average a few tenths of a foot lower in elevation than the pavement on the left and from 0.9' to 1.2' lower on the right.

There are no culverts or bridges within the section.

Loadometer Station No. 62
Road XI-S.D-12-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: Refer to Plan Diagram. All areas of alligator crackings are outside the actual 10 ft. traveled way lanes.

Left Lane:

Sta. 299+00 to 299+10, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, severe

Sta. 302+38 to 302+43, 10.5' to 12.0' lt. ℄, 1.5 ft. wide, completely failed

Sta. 302+60 to 302+65, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, completely failed

Sta. 304+07 to 307+14, 10.0' to 12.0' lt. ℄, 2.0 ft. wide, fairly severe

Sta. 304+36 to 304+45, 10.0' to 13.0' lt. ℄, 3.0 ft. wide, fairly severe

Sta. 304+69 to 304+81, 10.0' to 13.0' lt. ℄, 3.0 ft. wide, severe

Sta. 304+87 to 305+68, 12.5' to 14.0' lt. ℄, 1.5 ft. wide, on shoulder at edge of area of shoving, not severe

Sta. 305+81 to 305+99, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, fairly severe

Sta. 307+16 to 307+23, 10.0' to 13.0' lt. ℄, 3.0 ft. wide, fairly severe

Sta. 307+34 to Sta. 307+46, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, severe

Sta. 307+91 to 308+12, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, severe

Sta. 308+20 to 308+34, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, severe

Loadometer Station No. 62
Road XI-S.D-12-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(1) Areas of Alligator Cracking: (Continued)

Right Lane:

Sta. 308+03 to 308+76, 10.0' to 12.5' rt. ℄ 2.5 ft. wide, severe

Sta. 308+03 to 308+76, 15.0' to 17.0' rt. ℄, 2.0 ft. wide on shoulder, not too severe

(2) Areas of Raveling:

There are no areas of raveling within the section.

(3) Areas of Shoving or Creeping:

Refer to Plan Diagram. All areas of shoving are outside the actual 10 ft. traveled way lanes.

Left Lane:

Sta. 299+10 to 302+15, 10.0' to 13.0' lt. ℄, 3.0' wide, severe

Sta. 302+76 to 303+32, 10.0' to 12.5' or 13.0' lt. ℄, 2.5 ft. to 3.0 ft. wide, severe

Sta. 304+87 to 305+68, 10.0' to 12.5' lt. ℄, 2.5 ft. wide, severe

Right Lane:

There are no areas of shoving in the right lane.

(4) Patches:

There are four patches in the section. All are small and appear to be over the 1932 P.C.C. widening strip.

Sta. 300+25, 4.0' to 10.0' lt. ℄, patch has an average width of 2.0 ft.

Sta. 301+42, 5.0' to 10.8' lt. ℄, patch has an average width of 1.0 ft.

Sta. 302+60, 5' lt. ℄, patch is 0.5' wide

Loadometer Station No. 62
Road XI-S.D-12-C

ROADWAY CONDITION

SPECIAL CONDITIONS:

(4) Patches: (Continued) Sta. 304+11, 6' lt. ℄, patch is 0.5' wide.

(5) Roadway Section: Section roadway is a grade section. Existing pavement is only slightly (0.2 to 0.4 ft.) above the surrounding areas in elevation.

(6) Shoulders: Asphaltic mix shoulders are from 7.0 to 9.0 ft. wide on the left of the traveled way and from 6.0 to 7.5 ft. wide on the right of traveled way. Shoulders are actually a continuation of the asphaltic mix blanket over the traveled way. Shoulders are in uniformly poor condition.

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels: Bench marks were established by the field crew near the ends of the section and outside the section limits.

B.M. No.	Location	Description	Elevation
1	38' rt. ℄, Sta. 298+33	1/4" diam. steel pin in P.C.C. H/W	600.00 (Assumed)
2	40' lt. ℄ Sta. 298+33	Same as above	601.390
3	35' rt. ℄ Sta. 314+00	Same as above	617.379
4	35' rt. ℄ Sta. 314+00	Same as above	617.844

Loadometer Station No. 62
Road S.D-12-C

ROADWAY CONDITION

ROUGHNESS MEASUREMENTS:

Bench Marks and Levels (Continued)

Three lines of permanent reference pins were set in this section. One line was on the traffic stripe and each of the other lines were placed on the shoulders, 12.5 ft. left and right of the first pin line.

Profilograph Records:

Transverse: The permanent reference points for levels also serve as permanent markers for transverse profiles of the pavement surface. Using the machine developed for this purpose, transverse profilograph records of the traveled way surface in each lane were made at 20 ft. longitudinal intervals throughout the section.

Longitudinal: By means of the Profilograph, records were made of the longitudinal profiles of each lane of the traveled way. Records were made with the recording wheel 36" into each lane from the outer pin lines.

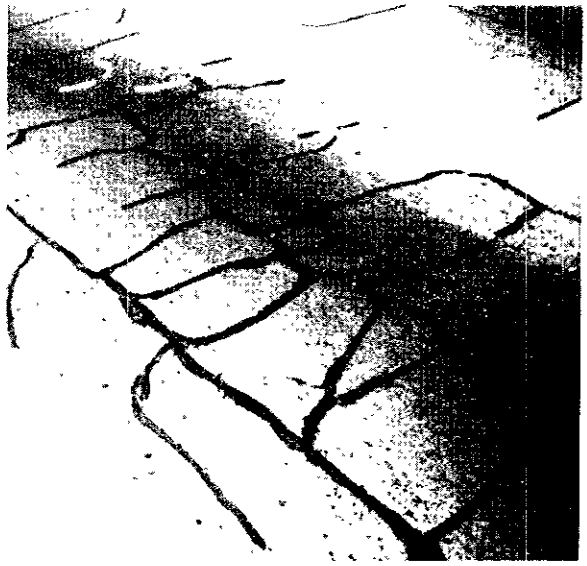
All profiles have been labeled and are on file at the Materials and Research Department for future use.

Loadometer Sta. No. 62

XI-S.D-12-C

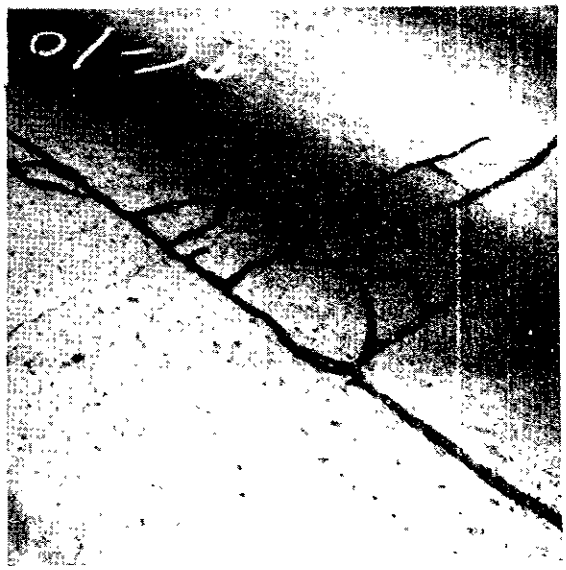
Sealed Cracks in Right Lane

Sta. 299+80 to Sta. 299+90



Severe Cracking Vicinity

of Sta. 300+50



Sealed Cracks in Right

Lane Sta. 304+90

Sealed Cracks in Right Lane

Sta. 308+10 to Sta. 308+22

Loadometer Sta. No. 62

XI-S.D-12-C

Sealed Cracks

Station 308+40

Sealed Cracks in Right

Lane Sta. 308+60

Sealed Cracks Along Right

Shoulder Sta. 308+80 to Sta. 309+00

Back on line From

Station 309+00

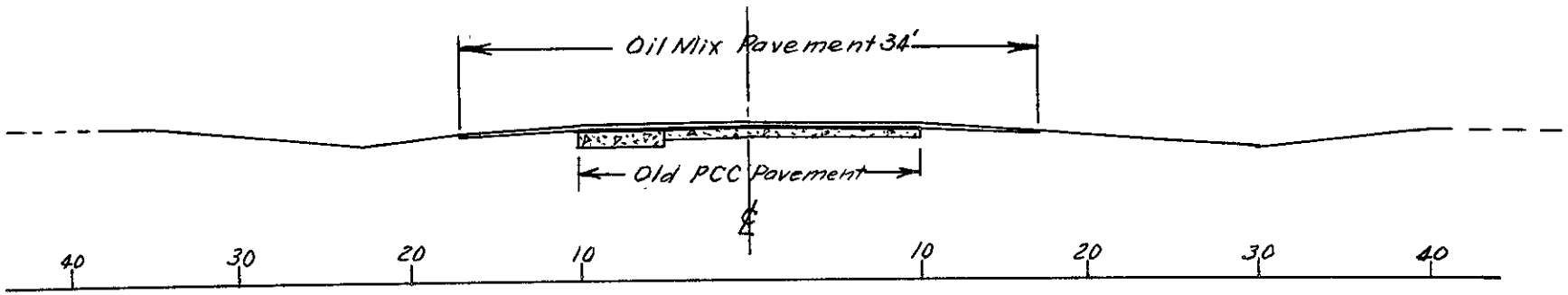
State of California, Div. of Highways
Materials & Research Department
Research No. 00258, W.O. No. 13NN26

Loadometer Station No. BH 62
XI-S.D-12-C

ROADWAY CONDITION SURVEY

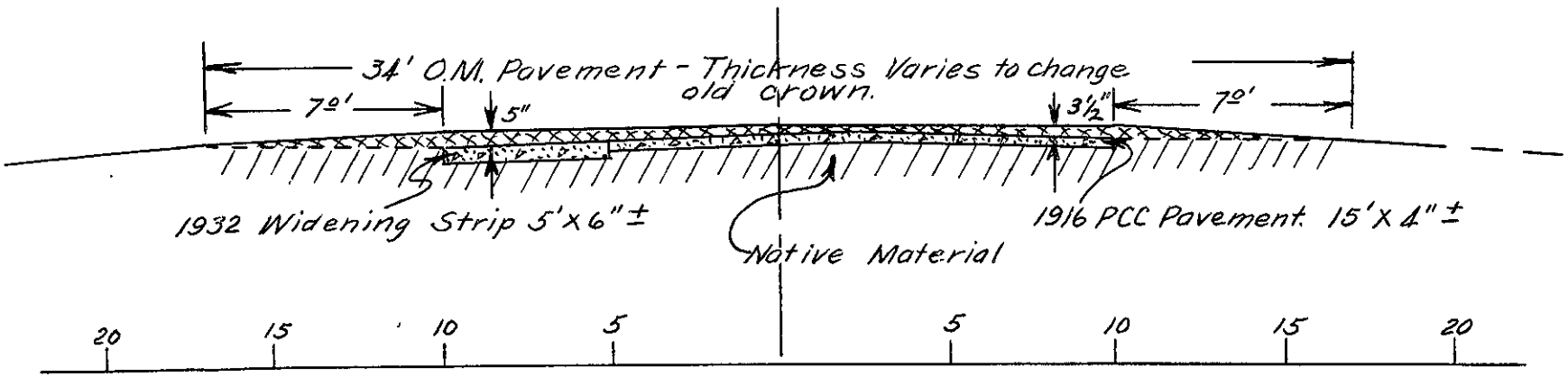
Scale: 1" = 10'

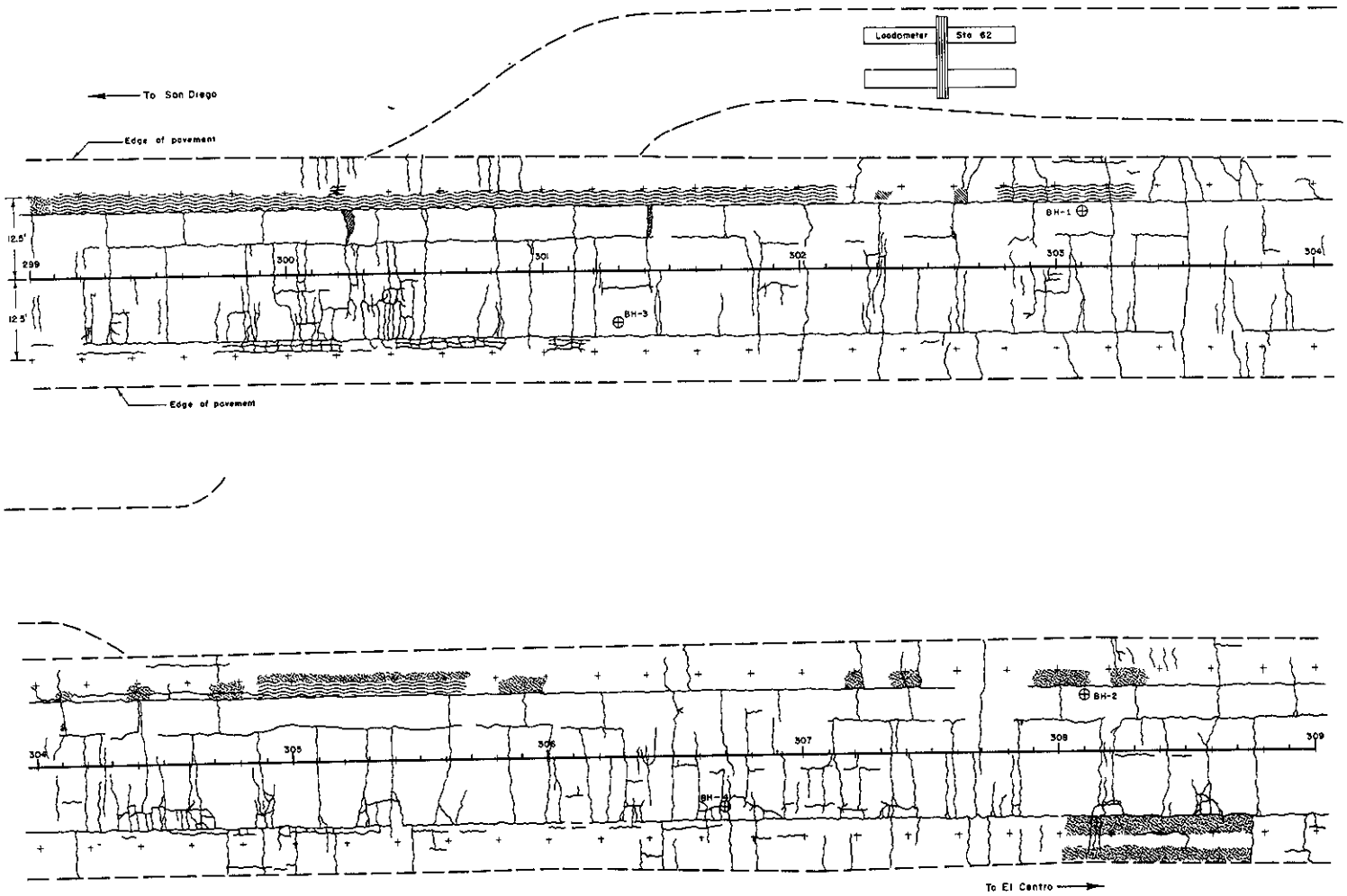
TYPICAL ROADWAY SECTION



Scale: 1" = 5'

TYPICAL STRUCTURAL SECTION





PAVEMENT LOCATION AND CONDITION CHART

LEGEND

Alligator Cracking Failure Block Cracking Shoving Patch

⊕ Location of Sample Hole + Location of Permanent Reference Points

LOADOMETER STA. NO. 62
XI-S.D-12-C

TEST RESULTS SUMMARY

Load. Sta. No. 62
XI-S.D-12-C

Line	Sample No.		Sample Hole Location		Pavement		Soil Samples	
	Field	Lab.	Station	Position	Type	Thickness	Depth below Btm. Pav't.	Layer Description
1	BH-[illegible]-A	51-[illegible]498	303+[illegible]05	8.5' [illegible] roadway	OM PCC	5" 6½"	0 - 6-3/4"	Basement
2	BH-[illegible]-B	51-[illegible]499	303+[illegible]05	Same	OM PCC	5" 6½"	6-3/4 - [illegible]4¼"	Basement
3	BH-2-A	51-[illegible]	306+[illegible]0[illegible]	8.5' [illegible] roadway	OM PCC	5" 6-3/8	0 - 5-7/8"	Basement
4	BH-2-B	51-[illegible]	306+[illegible]	Same	OM Same	[illegible]-1/8 Same	5-7/8-13-1/8"	Basement
5	BH-3-A	51-[illegible]	30[illegible]+29	8.[illegible] right [illegible]	OM PCC	5½" 4-[illegible]/4"	0 - 6-[illegible]/[illegible]"	Basement
6	BH-3-B	51-[illegible]	30[illegible]+29	Same	Same	Same	6½ - 12-3/4"	Basement
7	BH-4-A	51-[illegible]504	306+[illegible]	8.3' right [illegible] road	OM PCC	2-3/4" 4-[illegible]/4"	[illegible] - [illegible]"	Basement
8	BH-4-B	51-2505	306+[illegible]	Same	Same	Same	[illegible] - 13-1/4"	Basement

Line	In Place Test Data			Lab. Test Data		HRB Soil	Specific Gravity	
	Moist.	Density	% Rel. Comp.	Optimum Moisture	Maximum Density	Classification	Pass. 4	Ret. 4
1	5	[illegible]20	9[illegible]	8	[illegible]	A-2-4	2.73	
2	6	[illegible]9	89	[illegible]	[illegible]	A-2-4	2.74	
3	5	[illegible]	9[illegible]	[illegible]	[illegible]	A-2-4	2.74	
4	5	[illegible]	84	[illegible]	[illegible]	A-2-4	2.73	
5	8	[illegible]2	9[illegible]		[illegible]	A-4	2.7[illegible]	
6	9	[illegible]	9[illegible]		[illegible]9	A-4	2.71	
7	[illegible]	[illegible]28	9[illegible]	[illegible]0	[illegible]	A-2-4	2.74	
8	[illegible]	[illegible]9	9[illegible]	[illegible]	[illegible]	A-4	2.73	

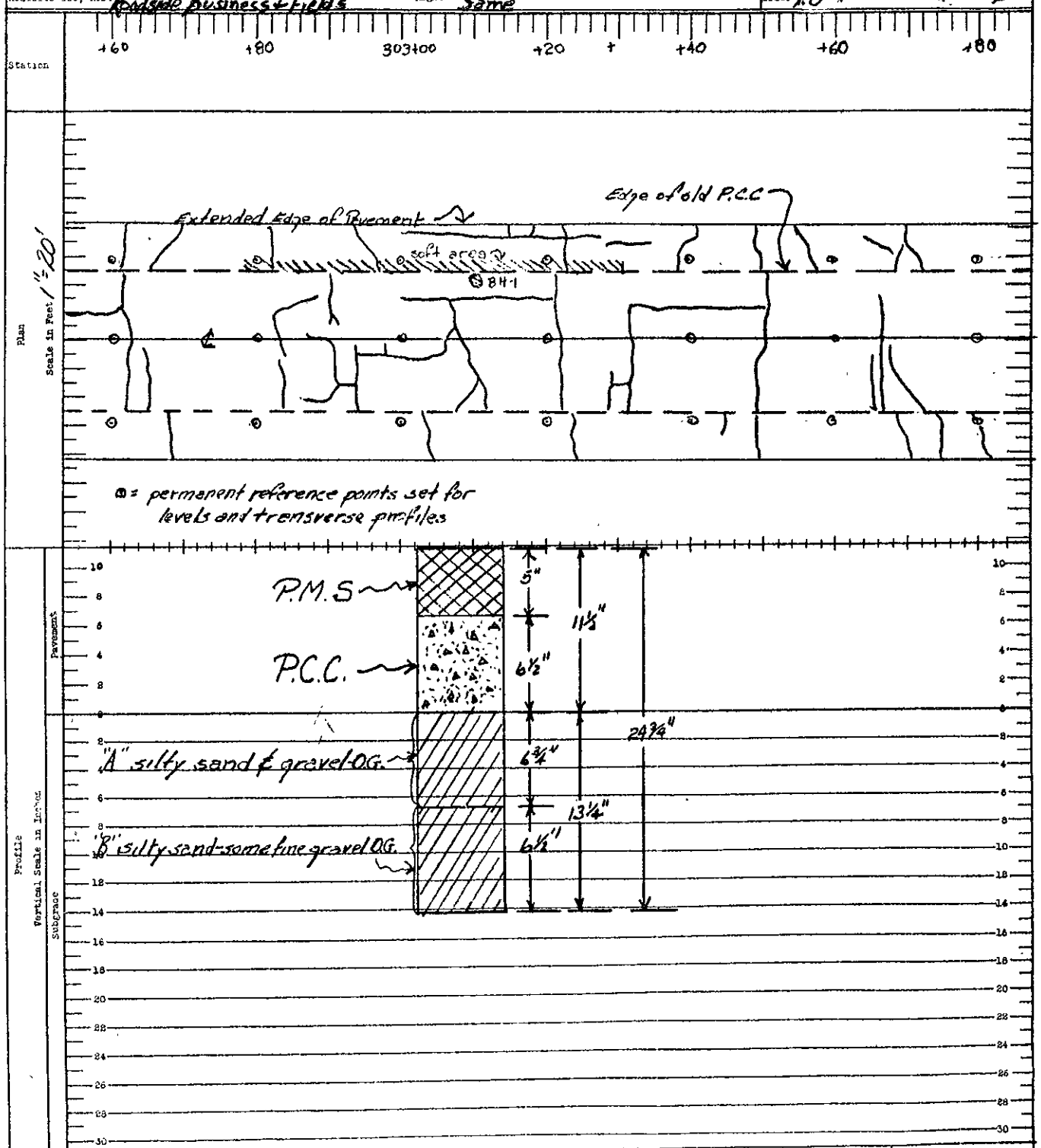
Line	Sieve Analysis - Percent Passing										Atterberg Limits	
	2"	3/4"	4	8	16	30	50	200	270	5M	LL	PL
1			100	9[illegible]	93	83	[illegible]	[illegible]	[illegible]	[illegible]	N	P
2			100	98	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	8	N	P
3			100	9[illegible]	93	8[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	N	P
4			100	98	9[illegible]	83	[illegible]	26	[illegible]2	[illegible]	N	P
5			100	98	94	8[illegible]		3[illegible]	32	8	N	P
6			100	99	9[illegible]	88	[illegible]	3[illegible]	2[illegible]	8	N	P
7	100	99	9[illegible]	9[illegible]	[illegible]	[illegible]		35	3[illegible]	8	N	P
8			100	98	95	8[illegible]	[illegible]	3[illegible]	29	9	N	P

LOCATION AND PROFILE SKETCH

~~[illegible]~~ PAVEMENT INVESTIGATION

RESEARCH NO. ~~[illegible]~~ 0025B

Dist. XI	Co. S.D.	Rte. 12	Sec. C	Contract No. —	Date of Constr. 1916 & 1932
Fill In grade	Approx. Height —	Dist. from End of Fill	No. of Lanes 2	Traffic light	Test Hole No. BH-1
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date of Sampling 7-3-51
Roadside Use, Left Roadside Business + Fields		Right Same		Grade 1.0 %	Up →



STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

Remarks

Party Clawson
Reyner

Drawn by Coon

LOCATION AND PROFILE SHEET

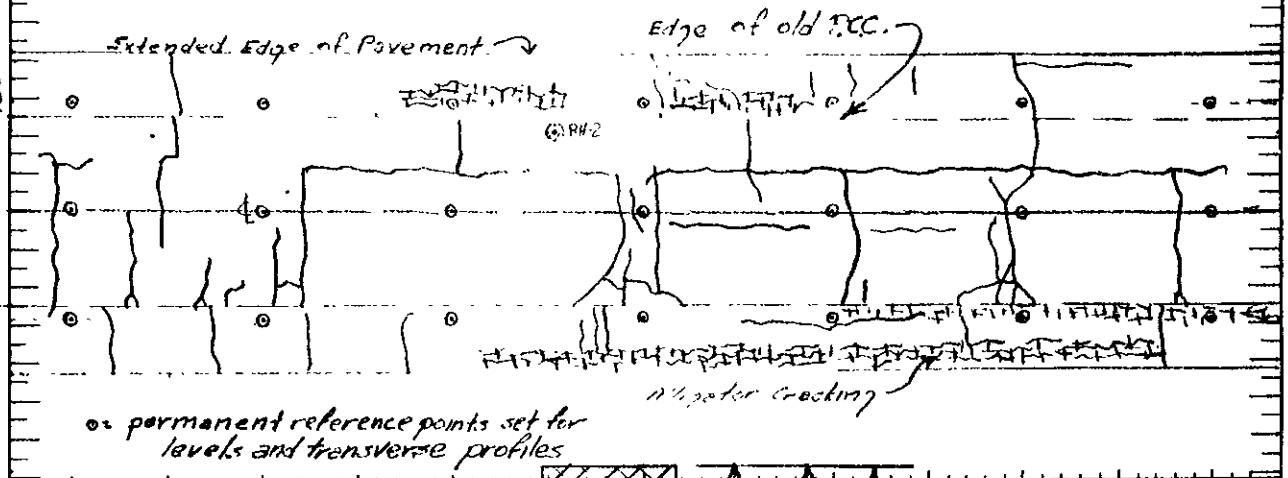
PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. XI	Co. SD	Rte. 12	Sec. C	Contract No.	Date of Constr. 1916-1933
Fill In grade	Approx. Height —	Dist. from End of Fill	No. of Lanes 2	Traffic light	Test Hole No. BH-2
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not Clearly Defined	Depth —	Date of Sampling 7-3-51
Roadside Use, Left Roadside Business		Right Fields		Grade 1.0 %	Up →

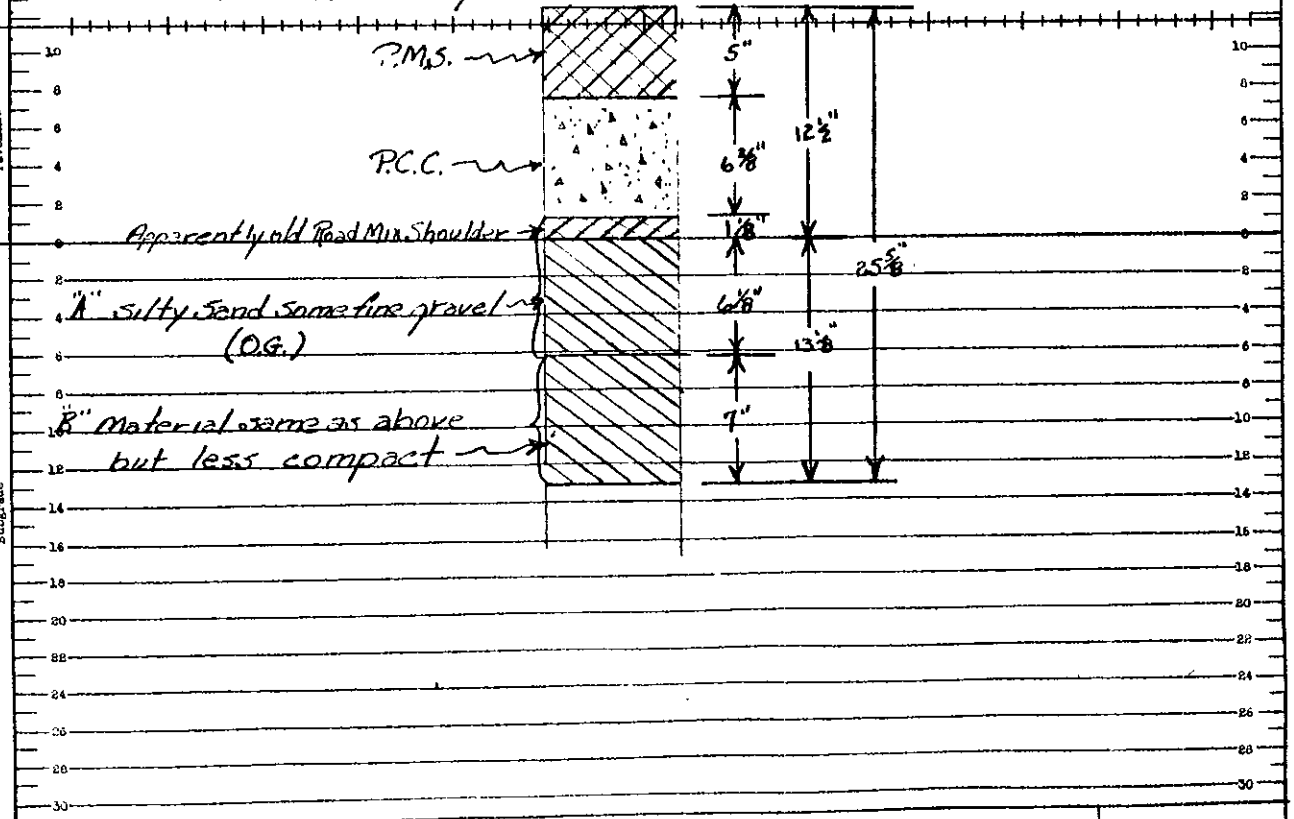
Station: 307+60, +80, 308+00, +20, +40, +60, +80

Plan — Scale in Feet 1" = 20'



⊙ = permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches



Remarks:

Party Clawson
Reyner

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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SHEET

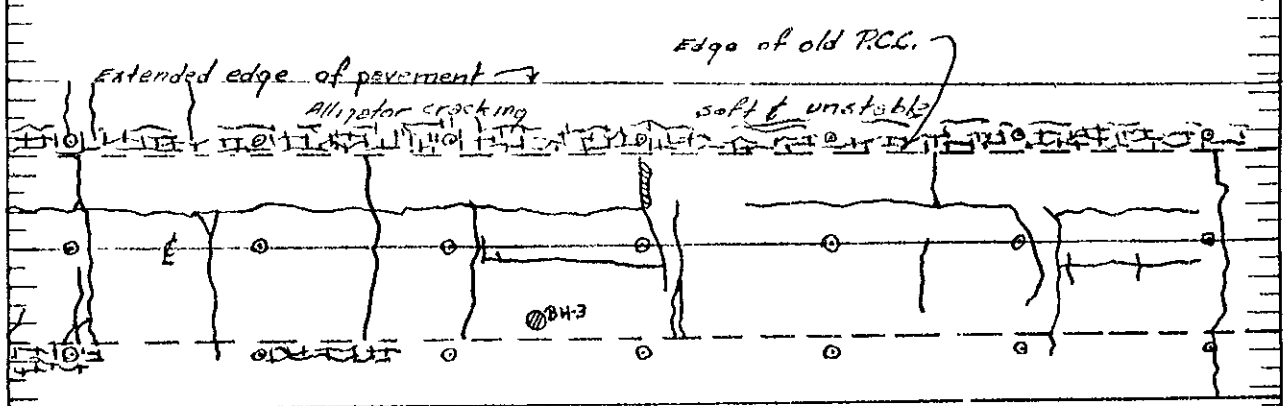
DESIGNED PAVEMENT INVESTIGATION

RESEARCH NO. 00258

Dist. XI Co. SD. Rte. 12	Sec. C	Contract No. —	Date of Constr. 1916 & 1932	Test Hole No. BH-3	
Fill in grade	Approx. Height —	Dist. from End of Fill	No. of Lanes 2	Traffic light	
Cut —	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date 7-5-51
Roadside Bus. Roadside Business & Fields	Right Same			Grade 1.0 %	Up →

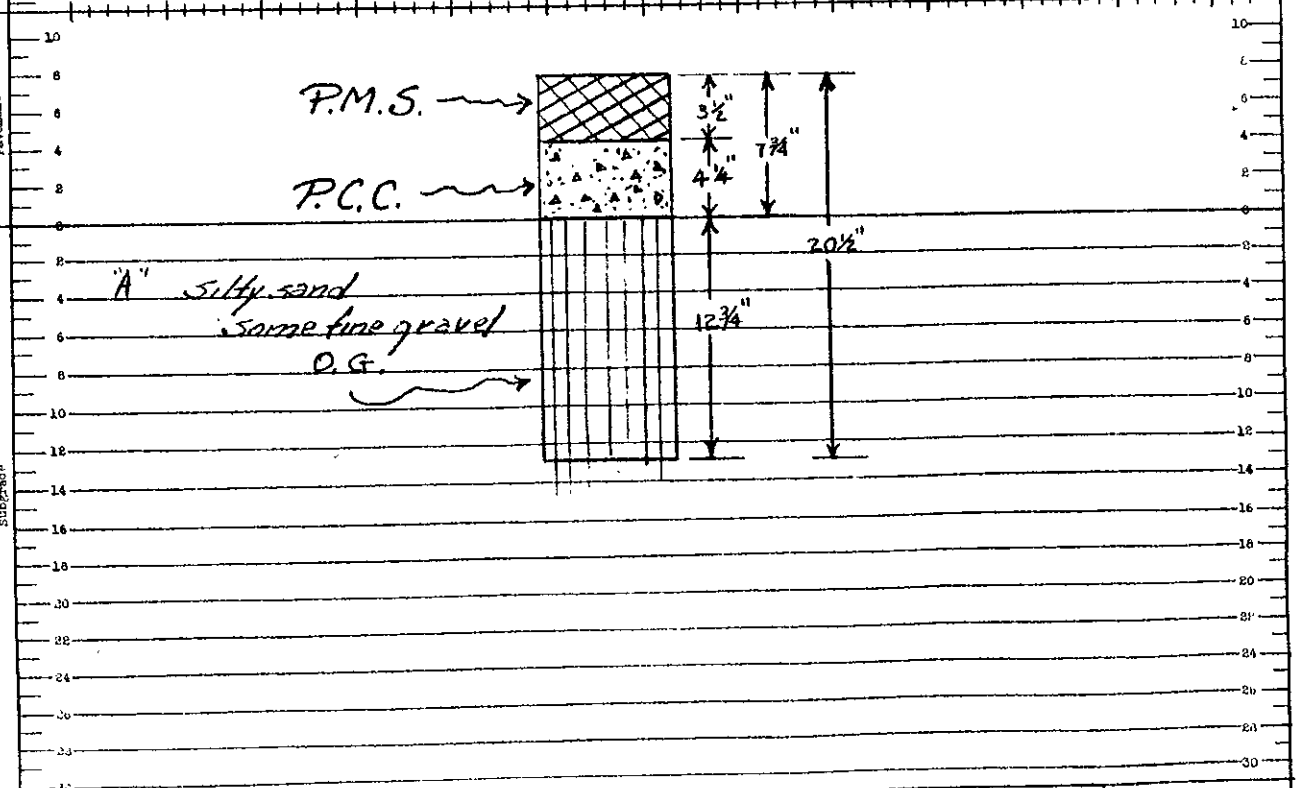
Station: 300+80, 301+00, +20, +40, +60, +80

Plan — Scale in Feet 1" = 20'



⊙ = permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches



Pavement

Subgrade

Remarks

Party Clawson
Weyner

Drawn by [illegible]

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

LOCATION AND PROFILE SHEET

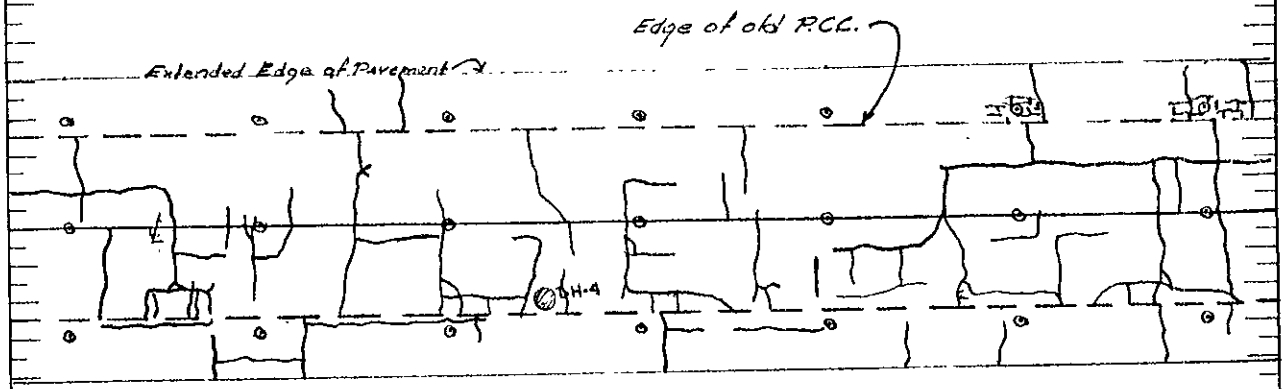
[illegible] AFFIDAVIT INVESTIGATION

[illegible] 00258

Dist. XI Co. SD Rte. 12	Sec. C	Contract No. —	Date of Constr. 1916 & 1932	Test Hole No. BH-4	
Type ingrate	Approx. Right —	Dist. from End of Fill	No. of Lanes 2	Traffic light	
Cut	Approx. Depth —	Dist. from End of Cut	Side Ditches Not clearly defined	Depth —	Date of Inv. 7-5-51
Roadside Use, Left Roadside Business & Fields	Right Same			Grade 10	Up →

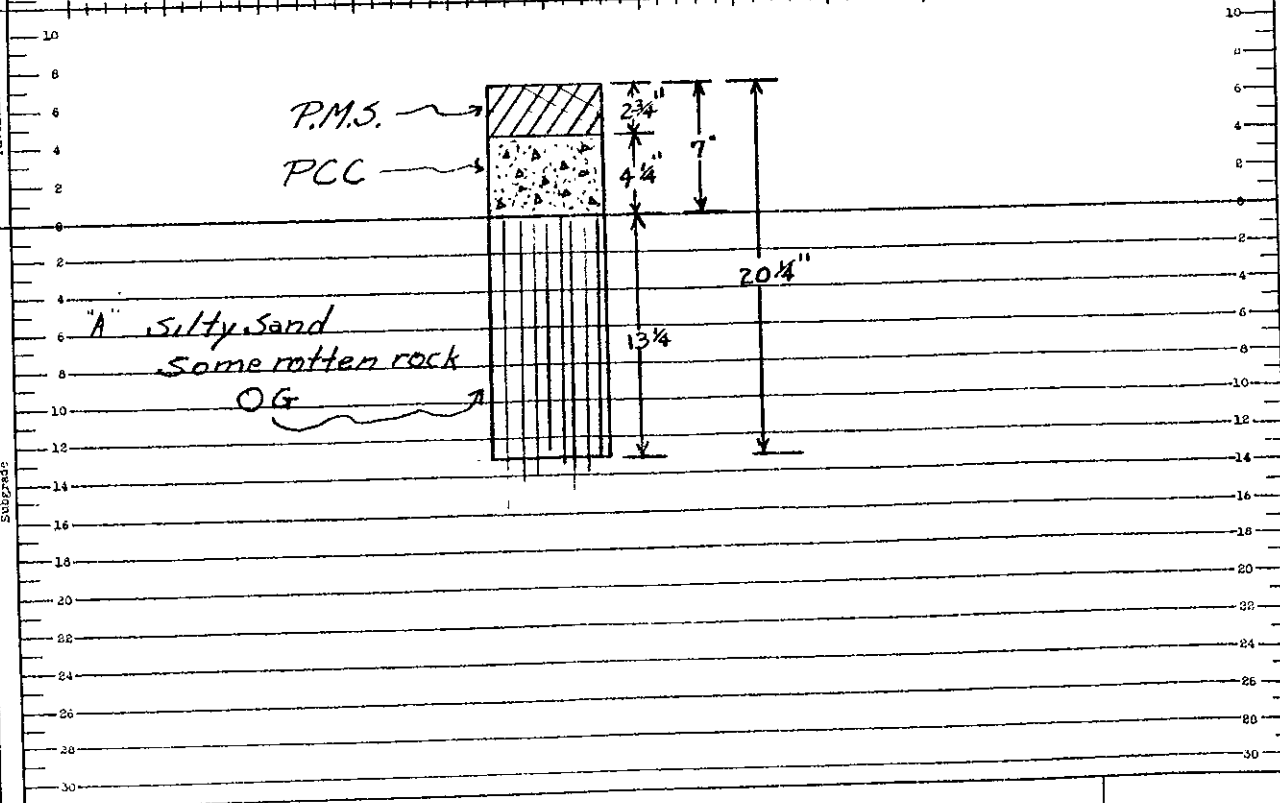
Station: 306+20, +40, +60, +80, 307+00, +20, +40

Plan — Scale in Feet 1" = 20'



⊙ = permanent reference points set for levels and transverse profiles

Profile — Vertical Scale in Inches — Pavement — Subgrade



Party Clawson
Reyner

Drawn By COAN

STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS
MATERIALS AND RESEARCH DEPARTMENT

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. CO. 58
W.O. No. 13NNC6
Job Number _____

Dist. XI Co. SD. Rte. 10 Sec. C
Loc. Design BH
Sta. 299+00 to 303+00
Sheet No. 1 of 2

Load. Sta. No. 6L

Drainage Cross Sections
ROADWAY CONDITION SURVEY

	Left of Roadway							℄ Right of Roadway						
					Side Ditch	Extreme Edge Pav't	Old P.C.C.	℄ Pav't	Old P.C.C.	Extreme Edge Pav't	Side Ditch			
303	Fill for Loadometer Pit													
	605.3	604.8	605.1	605.1	604.4	604.7	605.05	605.08	605.04	604.8	604.0	604.5		
	46.5	45.0	43.0	23.0	20.0	17.0	10.0	0.0	10.0	17.0	29.0	40.5		
302	Fill for Loadometer Pit													
	604.0	602.5	604.2	604.2	603.5	603.6	603.84	603.91	603.90	603.7	602.9	603.7		
	46.5	45.5	40.0	26.0	21.0	17.0	10.0	0.0	10.0	17.0	33.0	40.5		
301			603.6	601.6	602.6	602.6	602.91	602.96	602.86	602.42	601.7	602.4		
			48.0	45.5	39.5	18.0	10.0	0.0	10.0	17.0	31.0	39.5		
300			602.5	601.2	601.2	601.9	602.23	602.28	602.19	601.9	601.1	601.9		
			47.5	46.5	42.0	18.0	10.0	0.0	10.0	16.5	30.5	40.0		
299				601.4	600.7	601.5	601.90	602.04	601.44	601.7	601.0	602.1		
				36.0	36.0	18.5	10.0	0.0	10.0	16.5	28.0	36.5		

Form T-527

State of Calif., Div. of Highways
Materials & Research Dept.
Research No. CC 56
W.O. No. LNN6
Job Number _____

Load. Sta. No. 6
Dist. XI Co. D Rte. 12 Sec. _____
Loc. Design BH
Sta. 304+00 to 309+00
Sheet No. 6 of 6

Drainage Cross Sections

ROADWAY CONDITION SURVEY

	Left of Roadway							℄	Right of Roadway						
					Sub. Jt.	Extreme edge Pavt.	Old P.C.C.	℄ Pavt.	Old P.C.C.	Extreme edge Pavt.	Side Ditch				
			Driveway to House												
309				611.5	611.0	611.5	611.78	611.88	611.72	611.2	609.6	609.3			
				44.0	42.0	17.0	10.0	0.0	10.0	17.5	36.0	44.0			
308				610.5	610.2	610.4	610.78	610.82	610.60	610.0	608.6	609.0			
				38.0	24.5	17.5	10.0	0.0	10.0	17.0	35.5	41.0			
307				609.2	608.9	609.2	609.68	609.77	609.63	609.2	608.6	609.2			
				40.5	23.5	17.0	10.0	0.0	10.0	18.0	28.5	42.5			
306				608.5	607.8	608.3	608.58	608.67	608.63	608.3	607.6	607.5			
				38.0	23.0	17.0	10.0	0.0	10.0	17.0	25.5	38.5			
305				607.4	606.8	607.0	607.34	607.46	607.35	607.0	606.4	607.1			
				33.5	23.0	17.0	10.0	0.0	10.0	17.0	27.5	37.5			
304				606.4	605.8	605.9	606.9	606.37	606.28	606.0	605.2	605.8			
				32.0	18.5	16.5	10.0	0.0	10.0	17.0	30.0	40.0			

Form T-527