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STATE OF CALIFORNIA
DEPARTMENT OF PUBLIC WORKS
DIVISION OF HIGHWAYS

A SURVEY OF TRAFFIC SOUND LEVELS ON RANCH OF COLUMBIA PICTURES CORPORATION.

56-18

MATERIALS & RESEARCH DEPARTMENT

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State of California
Department of Public Works
Division of Highways
Materials and Research Department

December 7, 1956

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Mr. E. T. Telford
Assistant State Highway Engineer
District VII
Los Angeles, California

Dear Sir:

Submitted in reply to your letter of December 13, 1956, is:

A SURVEY OF TRAFFIC SOUND LEVELS ON

RANCH OF COLUMBIA PICTURES CORPORATION.

Survey made by . . . . . Structural Materials Section

Under general direction of . . . . . J. L. Beaton

Supervised by . . . . . L. Bourget

Report prepared by . . . . . L. Bourget and H. Peterson

Very truly yours,

F. N. Hveem

F. N. Hveem
Materials and Research Engineer

LB/HP:mw
cc: JWVickrey
JCWomack
JCYoung
EWithycombe
Dist. VII (10)

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A SURVEY OF TRAFFIC SOUND LEVELS ON RANCH OF COLUMBIA PICTURES CORPORATION

INTRODUCTION:

Pursuant to a request from Mr. E. T. Telford, Assistant State Highway Engineer, District VII, sound level measurements were made on the Columbia Pictures Corporation properties known as Columbia Ranch and at other locations near existing Freeways constructed in cut, grade, and fill section in order to determine if independent measurements would support the conclusions drawn by the Columbia Pictures Corporation's Consulting Engineer, William B, Snow, in his report, "Effects of Riverside Freeway on Ranch of Columbia Pictures Corporation". Sound level measurements made on the Columbia Ranch were taken with State equipment at the same numbered positions indicated by Mr. Snow on Map A in his report and are shown here on the map (Exhibit 1) in the Appendix. Measurements were made on the C scale of the Sound Level Meter (described in the Appendix) so as to be in conformity with prior work reported in the references.

The Columbia Ranch property consists of two separate lots as shown on the attached map. In this report the lot which contains no buildings and is bounded by Clybourn and Pass Avenues will be called the "Open Lot", and the lot which contains several built-up sets and is bounded by Hollywood Way and Pass Avenue will be called the "Permanent Set Lot".

SUMMARY:

Sound Level Meter readings made by Laboratory personnel of the Division of Highways at a number of locations on the Columbia Ranch properties indicate substantially the same present sound levels as reported by William B. Snow.

Prediction of sound level contours with a reasonable amount of accuracy can be more readily accomplished over the "Open Lot" Columbia Ranch property than over the "Permanent Set Lot". In the case of the "Open Lot" property, it is correct to assume that the various Freeway proposals will increase the noise levels approximately as shown in the William B. Snow report, Map A. These are:

A. Freeway on fill.

B. Freeway in cut to Clybourn Avenue.

C. Freeway in cut 1200 feet beyond Clybourn Avenue.

Prediction of future noise levels contributed by the proposed Freeway on the "Permanent Set Lot" cannot be made with equal accuracy for the following reasons:

A. The greater distances involved make other nearer sound sources more likely to become

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the dominant influence. Noise from existing traffic on Hollywood Way, Verdugo, and Pass Avenues, in exposed areas along these streets, already equals or exceeds predicted Freeway noise much of the time and is subject to both the normal increase of city traffic plus access traffic after the Freeway is opened.

B. A considerable sound screening effect is produced by sets and buildings on the lot and, while this is beneficial to noise reduction, it also serves to upset projection of hypothetical noise contours as plotted in the Snow report. Actually the total sound must be considered as resulting from sound sources from many directions, constantly shifting in quantity.

C. Aircraft are already the most intense and uncontrollable noise source, and noise from this source is not likely to diminish in the future. A count made for one hour on December 7, 1956, from 11:40 A.M. to 12:40 P.M. showed 32 aircraft which raised the noise level 4 db or more above the background. This is enough to interfere with outdoor sound recording. Contour plotting of this noise is not appropriate as the sound arrives from various unpredictable directions, moving across the area.

Regardless of the difficulties in plotting predicted future sound contours, certain conclusions may be drawn.

A. A Freeway on the proposed fill section will raise noise levels on both Columbia Ranch lots to values which will seriously affect available outdoor recording time when compared to present conditions, <u>neglecting aircraft</u>.

B. A Freeway in the proposed cut section to Clybourn Avenue will produce less noise on both lots. The "Open Lot" will show the greater change but will still be subject to noise levels considered to be excessive for outdoor recording.

The "Permanent Set Lot" will be protected by this cut to Clybourn to such an extent that available recording time probably would be determined more by noise from traffic on Hollywood Way, Verdugo Avenue, and Pass Avenue than by Freeway noise; again neglecting aircraft.

C. A Freeway in the proposed cut section for a distance extending 1200 feet past Clybourn Avenue as proposed by William B. Snow will

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provide additional protection to the "Open Lot" property by reducing the sound level in the western half of the lot by about 5 db but will have little effect on the eastern half. This ignores noise from both aircraft and Pass Avenue.

Any additional protection to the "Permanent Set Lot" which may result from the 1200 foot extended cut is regarded as limited in value when closer noise sources are given full consideration.

D. This Department suggests that these sound surveys indicate that a cut extending about 400 feet past Clybourn in conjunction with a 10 foot wall along the south end of the "Open Lot", as close as possible to right-of-way line and covered with dense vine planting on the traffic side should be capable of furnishing from 6 to 8 db greater reduction of vehicle noise over the entire lot than the suggested (by Snow) 1200 foot extension of the cut. The screening effect of residences and trees beyond Clybourn would serve to continue the effectiveness of the sound barrier.

A cost comparison of the above alternatives C and D may be worthwhile only if considerable sound recording is done on the "Open Lot". If the lot is used principally for photography, then constructing the cut only to Clybourn Avenue with no wall would be the most reasonable compromise.

E. In addition to the above, the District has asked four specific questions. These are repeated below followed by their answer.

The following information is consolidated from Division of Highways Field Tests and References 1, 2, 4, 5, 6, and 7 in Appendix:

QUESTION NO. 1

"Can a definite conclusion be drawn as to the quantitative effect of the freeway on the background level of noise at distances of 600 to 900 feet from center line of the nearest lane for conditions of cut as compared to conditions for fill?"

ANSWER

Yes. At distances of 600 to 900 feet noise from a freeway either at level or on fill may be expected to average from 6 to 8 decibels higher than noise from a freeway in a 20 foot cut at 0% grade. A grade of 1½% raises the noise by about 2 db and a grade of 3% raises the noise by about 4 db.

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Therefore the difference between a cut on 3% grade and a fill on 1½% grade is about 5 db.

DIFFERENCE IN SOUND LEVEL AT 600' TO 900' DISTANCES

Freeway in cut	Freeway at Ground Level	Freeway on fill
Reference	+6 to +8 db	+6 to + 8 db
Cut with 3% grade	Level	Fill at 1½% grade
Reference	+3 db	+4 to +6 db

NOTE: The above figures apply only when the Freeway noise dominates over other background noise by 6 db or more and neglects buildings or other obstacles which may act as partial sound screens.

QUESTION NO. 2

"Assuming a general background level in the built-up area of the Columbia Ranch (bounded by Pass, Oak, Hollywood Way, and Verdugo) of decibels per Mr. Snow's report, how much would the alternate conditions of cut and fill be expected to add?"

ANSWER

The measured background on the "Permanent Set" of Columbia Ranch probably would be about 5 db higher for the proposed Freeway on fill at 1½% grade as compared to the proposed Freeway in cut at 3% grade. This assumes that the unpredictable secondary effects of traffic on Hollywood Way, Verdugo Avenue, and Pass Avenue are omitted. The effect of this local traffic is discussed elsewhere.

QUESTION NO. 3

"At what number of aircraft per hour overhead would it be considered that aircraft would become part of the constant background for practical purposes? How does this number compare with the number observed? How would the observed density of air travel affect the percentage of looping of sound recording required as discussed in Mr. Snow's report?"

ANSWER

The number of aircraft per hour during a special count as shown in the Summary was 32 and includes all aircraft creating sufficient noise to exceed the average background level by 4 db or more. This count exceeds prior counts; however, the average appears to be somewhere between 15 and 30 aircraft per hour over the best time of day for photography.

Determination of the number of aircraft per hour, which would make outdoor sound recording impractical, is difficult to estimate, but as stated in the Snow report theoretically occurs when the time lost by actors and crew exceeds the cost increase of

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looping. This point probably is reached long before aircraft constitutes a continuous noise background. This Department does not have access to sufficient motion picture management data to provide a definite answer to this question. However, it appears that the present aircraft sounds under the above-stated theory should cause more looping than the 6% reported by Snow. It therefore appears that there are other practical reasons involved in looping than pure cost relationships. It is this Department's opinion that only a complete analysis of the studio's operation can answer this question.

QUESTION NO. 4

From information at your disposal, can any definite recommendations be made as to the value of screen planting in noise abatement for both the cut and the fill proposal?"

ANSWER

The value of screen plantings in noise abatement has most effect when acting in supplement to a solid barrier such as a masonry wall or earth embankment. "If the surface of the barrier facing the source of noise is absorptive, such as dense vines --- the over-all noise reduction may amount to as much as 8 or 10 db", (reference 7, page 223).

The screen planting without a solid barrier usually has little value in reducing the sound level; however, a very thick dense hedge would have some effect. Screen plantings probably have more value where the sound is not a technical problem.

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REFERENCES

1. Sound Study - Effects of Riverside Freeway on Ranch of Columbia Pictures Corporation by William B. Snow, Consulting Engineer, 1011 Georgina Avenue, Santa Monica, California. Report submitted to Columbia Pictures Corporation.

2. Memorandum, to Mr. F. N. Hveem from Mr. J. E. Barton: District VII Sound Level Studies, State of California, Department of Public Works, Division of Highways, Materials and Research Department, September 15, 1953.

3. General Information FNH/9, from Mr. F. N. Hveem to all District Engineers and Heads of Departments of the Division of Highways, State of California, Department of Public Works, Division of Highways, Materials and Research Department, August 2, 1955.

4. Motor Vehicle Noise Studies by D. M. Finch, Highway Research Board Bulletin 110, 2101 Constitution Avenue, Washington 25, D. C.

5. Abatement of Highway Noise with Special Reference to Roadside Design, Wilbur H. Simonson, Highway Research Board Bulletin 110.

6. Noise Survey of Four Motion Picture and Television Studios Located Near Proposed Freeways - San Fernando, California. Report submitted to Mr. E. T. Telford, District Engineer, State Department of Public Works, Division of Highways, by Vern O. Knudsen and Donald P. Loye, August 21, 1954.

7. Acoustical Designing in Architecture, by Knudsen and Harris, publisher: John Wiley & Sons, New York.

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COLUMBIA RANCH LOCATIONS
OF SOUND LEVEL MEASUREMENTS
AS SHOWN ON MAP.

OPEN LOT.

1. Western side near Heffron Drive and Clybourn Avenue
2. North center.
3. Approximate center.
4. South edge of Lake.
5. Near Pass Avenue and Willow Court.

PERMANENT SET LOT

6. Stables, building B29.
7. B Street, near building B35.
8. Corner of Pass Avenue and Oak Street, 75 feet from each.
9. A Street near building 44.
10. Near Oak Street, at freight cars.
11. West of tank - 55.
12. East English Street - Court 117A.
13. West English Street - beside Bldgs. B6, B7.
14. Halfway between Stage 30 and Rocks 90.
15. Park Fountain.
16. Brownstone Street, front of 76.
17. 100 feet in from Main Gate. (Special test near Hollywood Way).

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SOUND LEVEL MEASUREMENTS AT COLUMBIA RANCH PROPERTIES

(C SCALE)

SEE MAP, EXHIBIT 1

LOCATION		QUIETEST PERIODS (BRIEF)	TRAFFIC & GENERAL BACKGROUND	DATE: 12-6-56 10:00AM to 12:40PM AIRCRAFT NOISE
Open Lot	1			
	2	50-54 db	54-57 db	68 db plus
	3	46-50 db	54-57 db	
	4	50-54 db	54-58 db	70-85 airliner
	5	50-59 db	60-66 db	70-80 db
Permanent Set Lot	6	52-58 db	60-64 db	70 db plus
	7			
	8	52-56 db	60-66 Pass Ave. traffic 66-70 truck	68 db plus
	9	55-59 db	60-64 db 67 db truck on Pass Ave.	66 db plus
	10			
	11			
	12			
	13			
	14	52-58 db	57-61 db	70 db plus
	15	54-60 db	60-64 db	74 db plus
	16	58-62 db	62-68 db	70-89 db
Special test 100' from main entrance	17	58-62 db	62-70 Hollywood Ave. traffic 68-78 db trucks	70 db plus

NOTE: Due to work in progress on the "Set Lot", it was not possible to take measurements at all locations. Aircraft were frequent and persistent, numbering approximately 28 to 32 per hour.

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Exhibit 3

SOUND LEVEL MEASUREMENTS AT VARIOUS LOCATIONS AND DISTANCES FROM SANTA ANA FREEWAY (C SCALE)

CUT SECTION NEAR SPENCE STREET

* See Note

TRAFFIC COUNT: Total traffic, both directions, 5 min. period = 482

DISTANCE FROM NEAREST LANE	MIXED TRAFFIC	LOUD TRUCKS	COMMENTS
150'	72-78 db	72-82 db	All tests in this group made Dec. 6, 1956, 2 to 4 PM.
300'	66-71 db	71-78 db	
600'	64-67 db	66-70 db	Noise from 8th Street begins to mask Freeway noise.
South of Freeway 900'	63-66 db Measurement made during momentary quiet from traffic on Atlantic and 8th Streets.	68-74 db	This noise was from Atlantic and 8th St. traffic. The Freeway was inaudible during this time.
North of Freeway 900'	60-64 db	64-66 db	2nd test 11 AM, December 7, 1956.

FILL SECTION NEAR DACOTAH STREET

TRAFFIC COUNT: Total traffic, both directions, 5 min. period = 588

150'	70-76 db	87-92 db
300'	68-74 db	76-86 db
600'	68-72 db	72-76 db
900'	66-70 db	70-75 db

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SOUND LEVEL MEASUREMENTS AT VARIOUS LOCATIONS AND DISTANCES FROM SANTA ANA FREEWAY (C SCALE)

LEVEL SECTION AT EAST LOS ANGELES PARK

TRAFFIC COUNT: Total traffic, both directions, 5 min. period = 461
December 7, 1956.

DISTANCE FROM NEAREST LANE	MIXED TRAFFIC	LOUD TRUCKS	COMMENTS
50'	80-86 db	88-94 db	
150'	76-81 db	84-88 db	
300'	74-78 db	80-84 db	
600'	69-73 db	74-79 db	
900'	66-71 db	73-77 db	Noise from other traffic southwest begins to mask Freeway noise.

LEVEL SECTION NEAR RIO HONDO - OPEN FIELD TERRAIN

TRAFFIC COUNT: Total traffic, both directions, 5 min. period = 548

900'	68-72 db	72-78 db	76-82 db aircraft

* NOTE: New batteries were installed in the field prior to all sound level measurements in the vicinity of existing Freeways. Calibration of the instrument on return to the Laboratory showed the meter reading 2 db high, therefore appropriate correction has been made on all measurements taken after the batteries were changed.

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TEST EQUIPMENT

The instrument used for all sound level measurements was a General Radio Sound Level Meter, Serial 1299, which was calibrated from a General Radio Sound Level Calibrator type 1552-A, driven by a Hewlett Packard Audio Oscillator, Model 200 CD. The oscillator output was measured by means of an RCA vacuum tube voltmeter which had been calibrated against a General Electric laboratory standard AC voltmeter. The Sound Level Meter batteries were tested before instrument calibration.

Measurements were first made on the Columbia Ranch properties, and after about two hours of testing the batteries had begun to deteriorate enough to warrant replacement before running the sound level measurements near existing freeways. A fresh set of batteries were installed in the field, requiring a recheck of calibration upon return to the Laboratory. This showed the Sound Level Meter to read 2 db high, and therefore appropriate corrections were made on all tests run after installation of the second set of batteries.

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Exhibit 5

DISTRICT VII STATEMENT OF FIELD SOUND SURVEY

Persons present at sound level studies at Columbia Ranch
December 6, 1956 at 9:30 A.M.

- -

Mr. Baldwin	MPPA
Mr. Russell	Columbia Pictures Corporation
Mr. Bourget	H.Q. Materials and Research
Mr. Peterson	H.Q. Materials and Research
Mr. George	District VII Design "A"
Mr. Standish	District VII Design "A"

The above persons met at the gate at the corner of Hollywood Way and Oak Street in Burbank.

After a brief discussion of the purpose of this study, the group began its tour of the property to make observations of existing sound levels. Mr. Russell stated that any point in the property 50 to 100 feet inside the fence would be considered active for sound recording purposes. Mr. Russell also stated that most of the apparent louder sounds originated on the lot (i.e., trucks, carpenters, call horns, etc.) and were under the Studio's control.

Observations were made at some of the points of Mr. Snow's report as well as could be determined. Motion picture sound recordings were in progress at two locations, which eliminated the possibility of covering all of the locations used by Mr. Snow.

The large number of aircraft, as well as locally generated noises, made observations of true background difficult.

After completing observations on the built-up area of the property, the group proceeded across Pass Avenue to the open area where further observations were made at some of Mr. Snow's locations. The background was noticeably less in the open area.

After lunch the above party was joined by:

A. N. Wheelock	District VII Traffic Department
S. C. Schroeder	" " " "
D. L. Fitzsimmons	" " " "
J. P. Castorino	" " " "

Observations were then made at various distances up to 900 feet at Spence Street south of the Santa Ana Freeway, at Dacotah Street north of the Santa Ana Freeway and at the Santa Ana Freeway at the Rio Hondo.

This concluded the activities for December 6. On December 7, the following party made additional observations at Dacotah and Spence because various conditions had not been ideal on the previous day and

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then returned to the Columbia Ranch to make a count of aircraft which created noise distinctly above the background level:

Mr. Bourget	H.Q. Materials and Research
Mr. Peterson	H.Q. Materials and Research
Mr. George	District VII Design "A"

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Exhibit 6

Location 2
North Center of Open Lot
(Facing south)

Exhibit 7

Location 3
Approximate center of Open Lot
(Facing south)

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Exhibit 8

Location 4
"Lake" in Open Lot
(Facing east)

Exhibit 9

Location 5
Open Lot near Pass Ave.
(Facing east)

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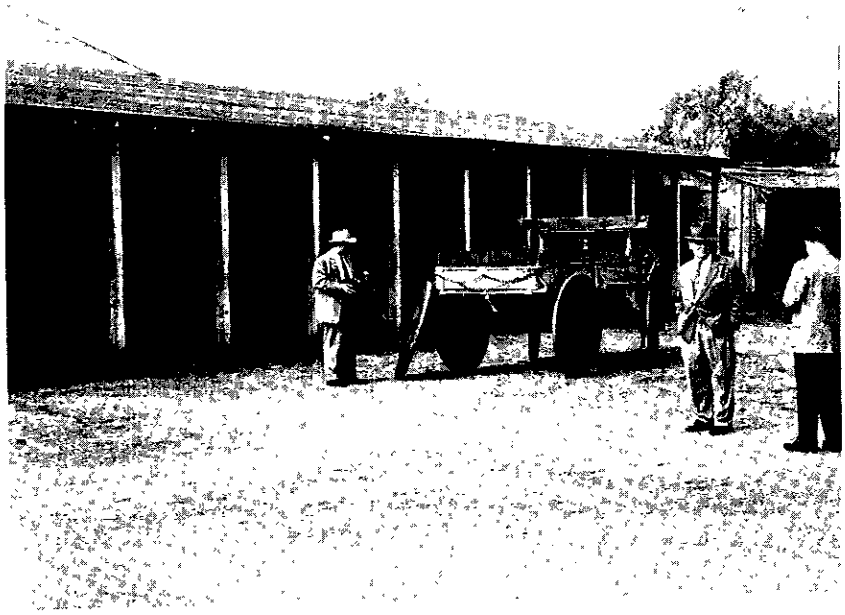

Exhibit 10

Location 6
Permanent Set Lot
Stables, Building B-29

Exhibit 11

Location 8
Permanent Set Lot
Cornor of Pass Ave. and Oak St.

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Exhibit 12

Location 9
Permanent Set Lot
A St. near Building 44

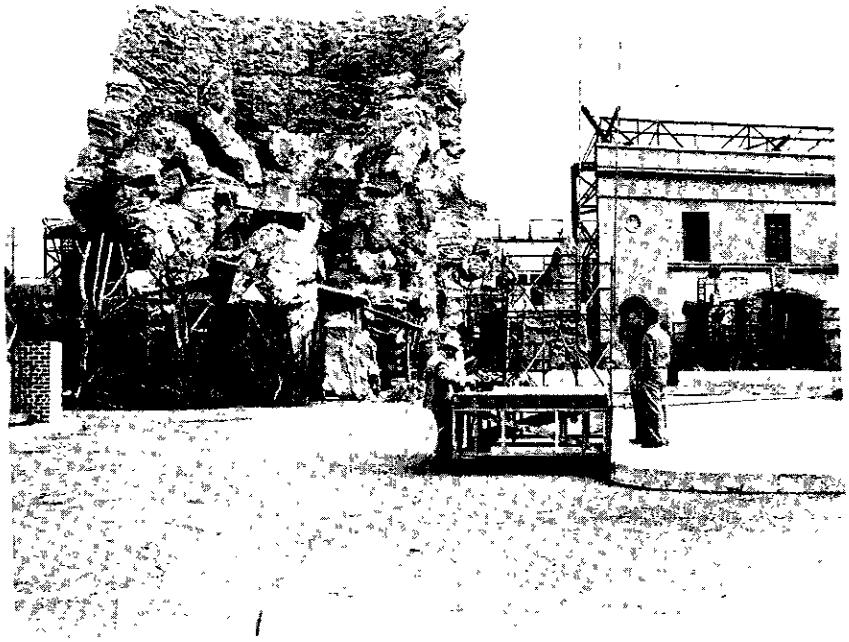

Exhibit 13

Location 14
Permanent Set Lot
Near Stage 30 and Rocks 90

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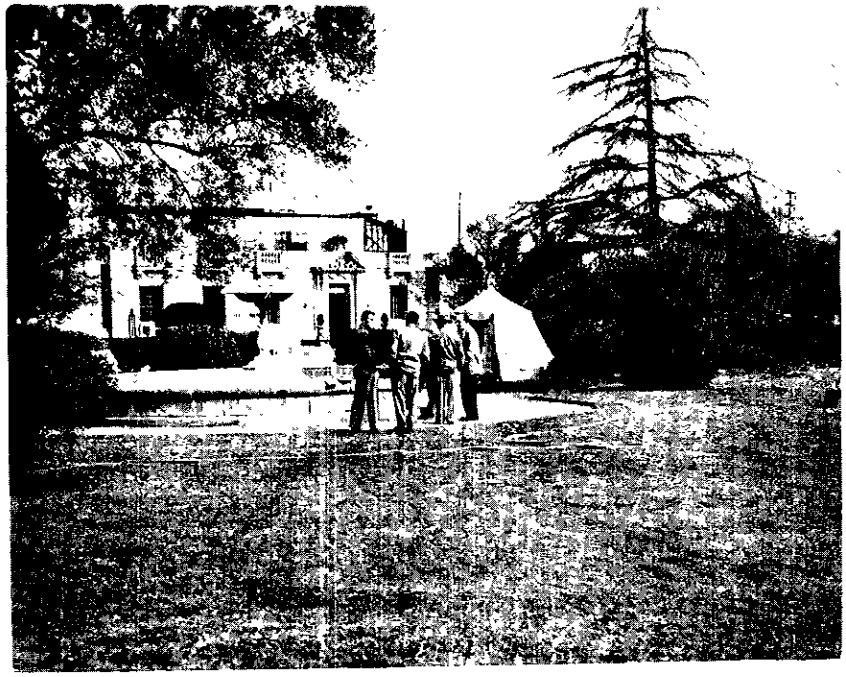

Exhibit 14

Location 15
Permanent Set Lot
Park Fountain

Exhibit 15

Location 16
Permanent Set Lot
Brownstone St., near No. 76

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Exhibit 16

Location 17
Permanent Set Lot
Entrance, corner Hollywood Way and Oak St.

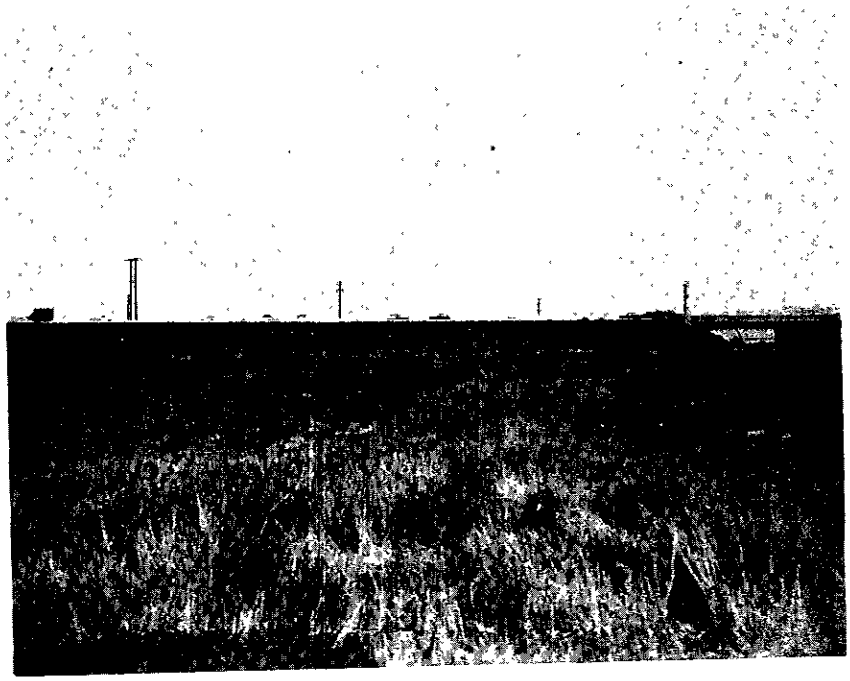

Exhibit 17

Rio Hondo - Santa Ana Freeway
(South at 900 ft.)

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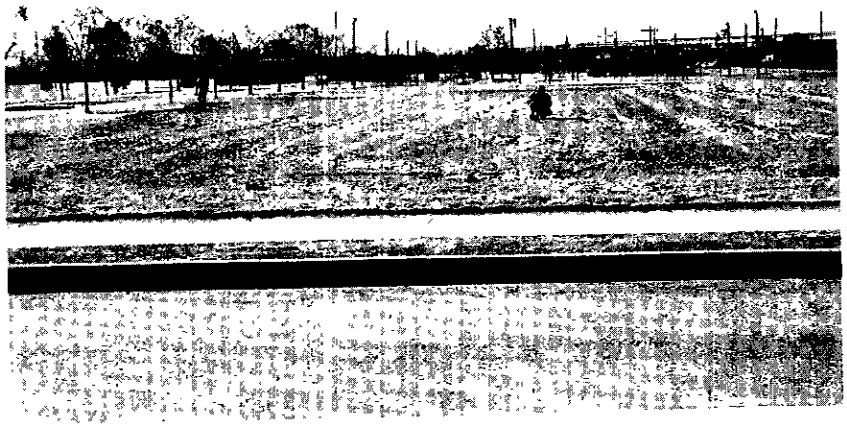
Exhibit 18



East L. A. Park and Santa Ana Freeway
(Freeway facing south)

Exhibit 19

East L. A. Park and Santa Ana Freeway
(South 900' facing Freeway)

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