

Source: King County Roads (Renton)

KC Project No. (ID#1) 16

Binder No. (ID#2) Red Vol. 1 1-37

Site Address Lakemont Blvd: Newcastle Rd to FAI 90

Date Copied _____ By _____

- Title page with the following information:
 - Company (Author) name
 - Report date
 - Project Name
 - Company's job number
 - Site address
- Executive Summary / Introduction of the report
- Table of contents
- Project Location Map / Vicinity Map
- Site / Exploration Plans, Boring Location Plans
- Cross-sections / Subsurface profiles
- Exploration Logs
- Monitoring Well Logs
- Cone Penetrometer Logs
- Groundwater Elevation Tables / Data

Includes data from Previous Reports

No new data / data review

Missing Data / Illegible Data

Explanation No site map, just vicinity map in folder

Comments: _____

~~HR~~

Soil Survey

of

Lakemont Boulevard
(Newcastle Road to FAI 90)

Larry Bishop
for
Robert W. Gingrich
Materials Engineer

302-35

The following soil survey will attempt to outline the soil conditions and attendant problems along the proposed alignment of Lakemont Boulevard. This project is being designed by the engineering firm of Harstad and Associates and is funded by Forward Thrust bonds.

Current design anticipates an integral four lane pavement, with a separation at Station 30+00 into 2 four lane units with a minimum median of 30 feet. This configuration will continue until approximately Station 75+00 where merger with the State's interchange with FAI begins.

There are generally certain problems involved with conducting a soil survey on new alignment and this project was no exception. Mountainous terrain and forestation prohibited the use of truck mounted drilling equipment and consequently reduced the survey to the gathering of surface samples. While this limit presented no real problems in the first 4000 feet, the projected 50' cut sections found in the last half of the job require test borings unobtainable with hand equipment.

In an effort to extrapolate subsurface conditions through this area, an examination was made of boring logs from wells drilled nearby. As it can be seen on the attached topographic sheet, the general vicinity of our project is encircled by drilled wells, with the nearest approximately three-quarters of a mile away. While realizing the limitations inherent in a well-drillers log, it was felt that approximate correlations might be made. However, the geological complexity of the region prevented any such reasonable correlations. Included on the map are the materials found in the well bores at the depth corresponding to the general elevation of the area in question. The difficulties of reasonable extrapolation are abundantly clear when one considers the lack of uniformity in relatively sparse data.

Other published works, particularly those of the Washington State Council for Highway Research and of the United States Geological Survey, give a generalized geological history of the area. Basically, the Newcastle Hills area consists of a thin mantle of Wisconsin aged ablation till overlying marine sandstone and shale beds deposited during the Miocene.

9
9

All station references are made from the project centerline.

<u>Station</u>	<u>Sample No.</u>
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2 + 00	at Centerline
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0 to 2 ¹ / ₂ '	Medium brown silty sand	(#4+ = 25%)	# 1
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There is a major creek crossing at Station 6+50, passing under the proposed roadway at an acute angle from right to left and in a channel approximately 21 feet below finished grade. Examination of the creek banks and bottom indicated a continuation of the sands and gravels found upgrade, with the addition of some silt pockets adjacent to the creek bed. No construction problems are envisioned with the use of an adequate culvert system.

9 + 00	at Centerline
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0 to 2 ¹ / ₂ '	Medium brown gravelly silty sand	(#4+ = 42%)	# 2
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This sample taken at the transition point of the long cut section to 11+90

12 + 90	at Centerline
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0 to 2'	Yellow brown silty sand	(#4+ = 30%)	# 3
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2' to 4 ¹ / ₂ '	Reddish-brown silty sand	(#4+ = 30%)	# 4
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This soil was wet and approaching saturation at the 4' level. The in-place moisture content averaged 30%.

15 + 50	6' Right Centerline
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0 to 2 ¹ / ₂ '	Medium brown silty sand	(#4+ = 16%)	# 5
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This sample taken at the downgrade transition point of the cut section that began at Station 8+90.

The natural slopes in the area of this cut section are standing from 1:1 to 1¹/₂:1, with a moderate vegetative cover. It is recommended that the constructed slopes be maintained at the 1¹/₂:1 ratio.

A small creek crosses the alignment at Station 19+30 from left to right, runs parallel at about 40 feet to the right of centerline for a distance of roughly 100 feet, then angles to the right away from centerline. While the creek bottom contained sand and small gravels, probes of the area indicated a dark brown sand with some organics to a depth of 20 inches, overlying gray fine sand. This section calls for a 13 foot fill over the creek and, with normal grubbing procedures, no construction difficulties are anticipated.

22 + 00 at Centerline

0 to 2' Dark brown silty sand (#4+ = 30%) # 6

2' to 3½'+ Medium brown silty sand (#4+ = 8%) # 7

These samples taken at the upgrade transition point of the 9 foot cut section that extends to Station 25+70. The soils found through this cut area should lend themselves quite well toward maintaining a 1:1 slope ratio.

25 + 70 at Centerline

0 to 3'+ Medium brown gravelly, silty sand (#4+ = 32%) # 8

This sample taken at the downgrade transition point of the cut starting at Station 22+00.

Another small intermittent creek crosses the alignment at Station 26+50 flowing from left to right. Probes taken adjacent to the creek bed indicated approximately 9 inches of silty organics over an undetermined depth of yellow-brown silty sand. This area calls for a 5 foot fill over the creek.

Between Stations 27+50 and 28+50 a low area exists that, at the time of the survey, contained up to 4 inches of surface water. When the line was walked three weeks earlier, no surface water was in evidence, although the ground was soft. During the interim period, there were some periods of rain showers but no rains of any long duration.

This entire area, extending from Stations 26+00 to 32+00 is quite hummocky with evidence of dry channels trending East-west. A probe at Station 27+45 revealed approximately 3 inches of organics over reddish brown silty sand. Another probe on the opposite side of the pond, at Station 28+50, indicated 2 feet of organics and silt over a dark grey silt of undetermined depth. Within this larger low area, there is another small section that contained surface water and it lies between 30+00 and 32+00. A probe at 30+50, along the centerline, showed 18 inches of dark brown to black organics changing to a dark gray silt. At 31+80, dark brown organics and silt extended down to 1 foot, then a change to gray silt for at least an additional foot.

Design calls for an embankment up to 6 feet in height between Stations 26+00 and 32+00. It should be anticipated that up to 2 feet of unsuitable material will have to be removed through this area, and an adequate drainage system provided.

32 + 50 3' Right Centerline
 0 to 2½' Reddish brown sandy silt (#4+ = 26%) # 9
 2½' to 4'+ Yellow-brown sandy silt (#4+ = 11%) # 10

The material of sample # 10 was near saturation with a field moisture content of 31%. These samples were taken near the upgrade transition point of the cut section between 32+10 to 40+00.

37 + 50 at Centerline
 0 to 3'+ Brown to yellow-brown sandy silt (#4+ = 11%) # 11

This material was approaching saturation with an in-place moisture content of 29%. Slope ratios through this cut area should be laid back to no steeper than 1½:1.

41 + 00 3' Right Centerline
 0 to 4'+ Medium brown gravelly sand (#4+ = 42%) # 12

This station is the western edge of the creek-entrenched ravine that forms a natural dividing line from the second half of the project. As previously mentioned, further exploration of the deep cut that begins as the eastern edge of this ravine is highly urged and warranted. When this work is completed, an addendum to this section of the report will be made. Until that time, this survey report will utilize the ravine as a temporary terminus.

'R' Values and Design

As it may be noted from the attached Soils Analysis Summary sheets, the dominant 'R' Value through the first 2600 feet was 69. While this figure dropped to 57 through the next 1100 feet, a large share of this material was found in an area scheduled for embankment. With this in mind, a design 'R' Value of 69 would normally be recommended for the first half of this project. Together with a calculated Traffic Index of 52, a relatively thin pavement section would result. However, the apparent availability of subsurface water to a generally frost susceptible soil dictates that a paving section thick enough to resist disruption by frost action is necessary. Therefore, the following alternates are promoted for use in at least the first 4100 feet:

3 inches	Asphalt Concrete, Class B
4 inches	Asphalt Treated Base

or

3 inches	Asphalt Concrete Class B
1½ inches	Crushed Surfacing Top Course
2½ inches	Crushed Surfacing Base Course
4 inches	Gravel Base Class B

These alternates will provide adequate subgrade protection from a stability standpoint as well as reducing the possibilities of frost damage.

Summary

With the exception of the swale areas that contain surface water or a water table near the surface, the soils encountered along the first 4100 feet generally make fair to good subgrade material. However, these soils are frost-susceptible and subsurface water is available so provisions must be made to reduce the effects of frost penetration. The pavement section alternates are substantial enough to minimize this problem.

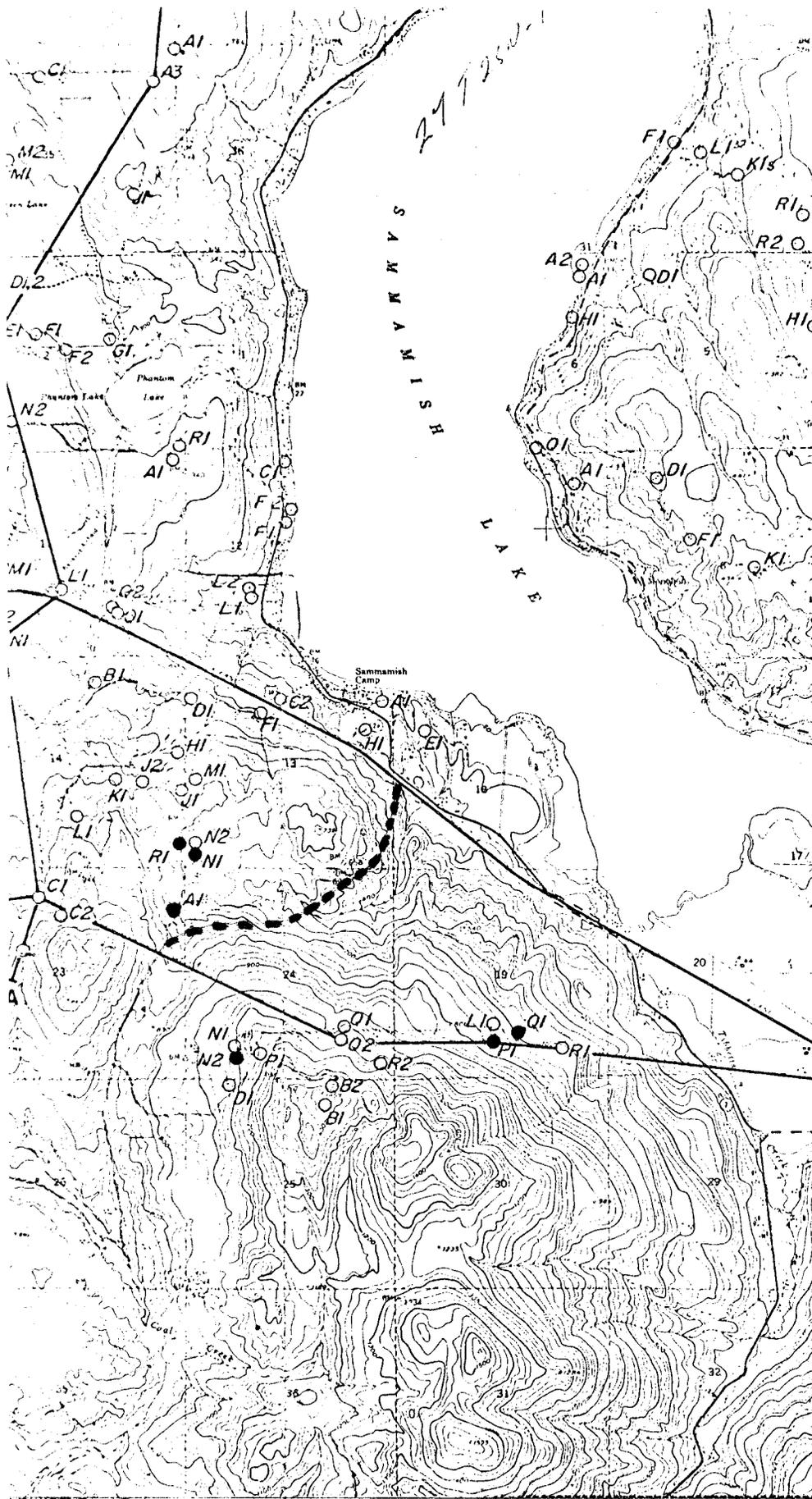
There are several small creeks, both presently flowing and intermittent, that cross the alignment, but adequate culvert design and installation should forestall any present or future problems.

The second half of this survey will be forthcoming with the acquisition of test data from the borings to be conducted on the deep cut sections.

12/10/69

LB:dp

LOCATION OF LAKEMONT BOULEVARD AREA WELLS



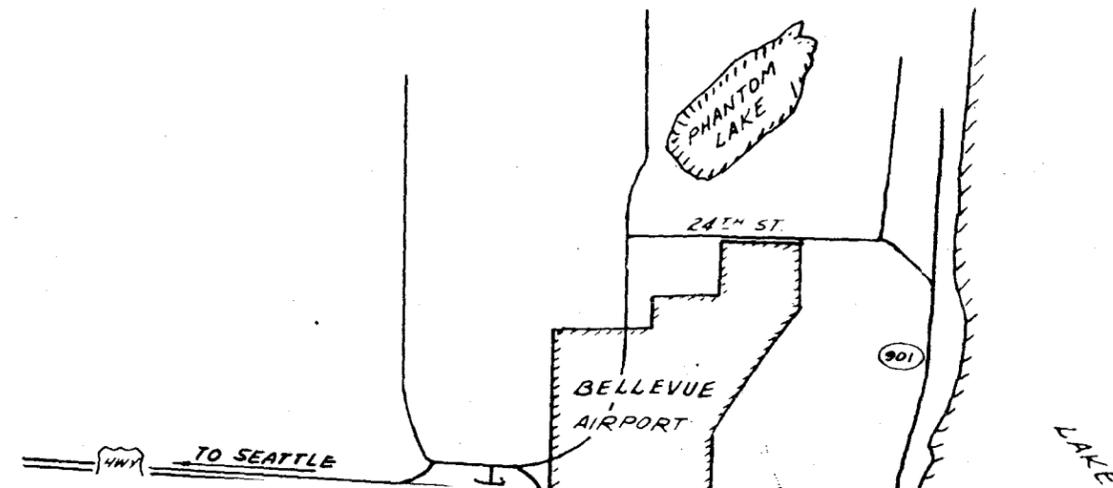
Section and Well Number	Material at Specified Depth*
13-N1	Clay
14-R1	Sandstone
19-P1	Sandstone and Silt
19-Q1	Sandstone
23-A1	Till
24-N2	Shale

* This depth corresponds to the approximate elevation of the large cut area between Stations 42+50 and 48+00.

--- Approximate route of Lakemont Blvd.

KING COUNTY
DEPARTMENT OF PUBLIC WORKS
FORWARD THRUST PROJECT
LAKEMONT BOULEVARD
(NEWCASTLE ROAD TO FAI-90)

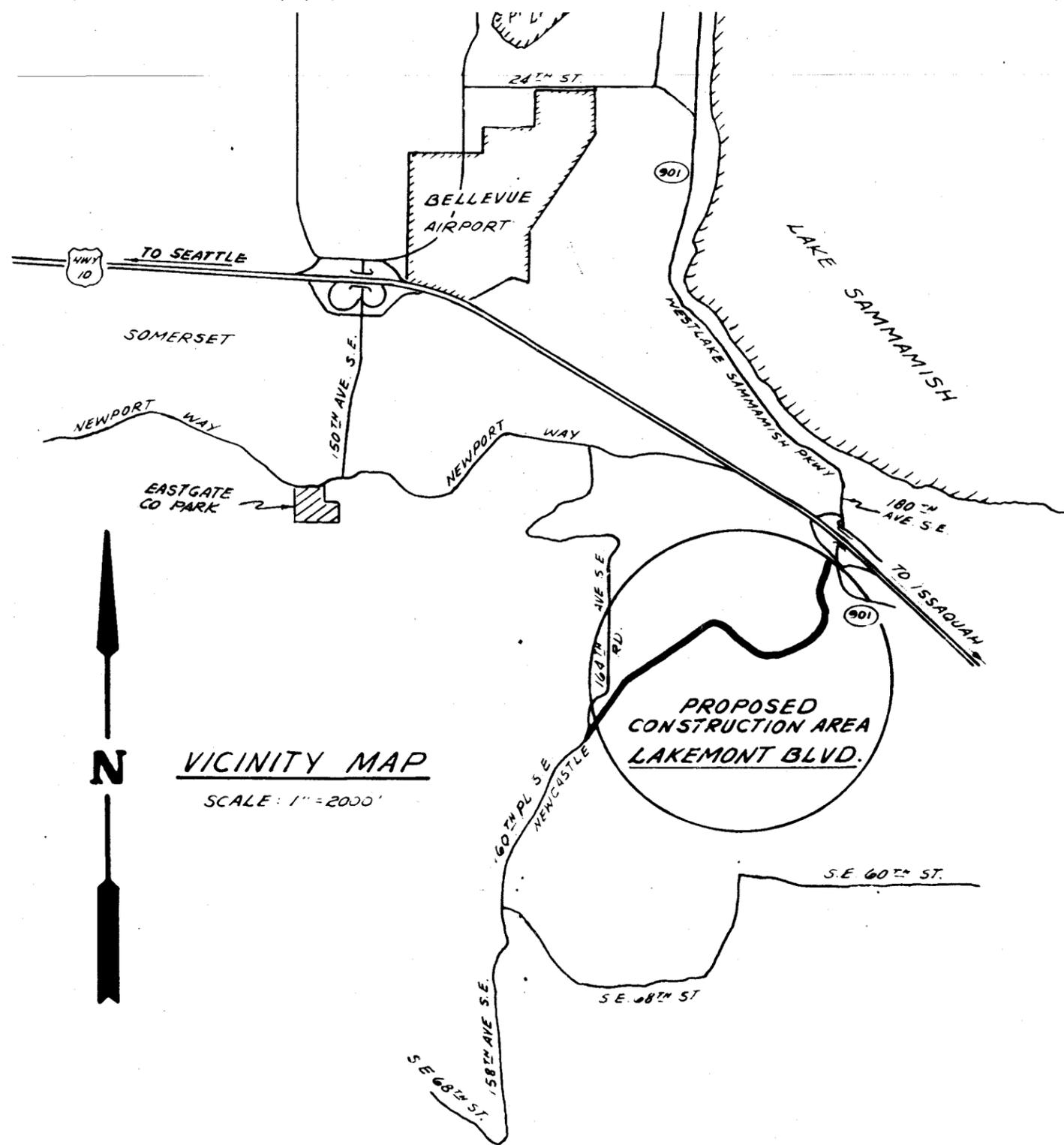
RIGHT OF WAY SCHEDULE	
-- NEWCASTLE ROAD --	
. 95+65.53 TO STA. 84+37.56	30' Lt.
. 95+65.53 TO STA. 89+17.07 Bk. =	
STA. 0.00 AHD	30' Rt.
. 84+37.56 VARIES TO STA. 4+10	



RIGHT OF WAY SCHEDULE	
E ROAD --	
84+37.56	30' LT.
89+17.07 Bk. =	30' RT.
TO STA. 4+10	30' LT. TO 41' LT.
BOULEVARD --	
9+7	41' LT.
STA. 9+79.7	41' LT. TO 40' LT.
66 E.O.P.	40' LT.
E.O.P.	40' RT.

I N D E X

- PLAN AND PROFILE
- TYPICAL SECTION,
SUPER ELEVATIONS & DETAILS
- STRUCTURE NOTES
- INTERSECTION DETAIL
- DRAINAGE SECTIONS & PROFILES



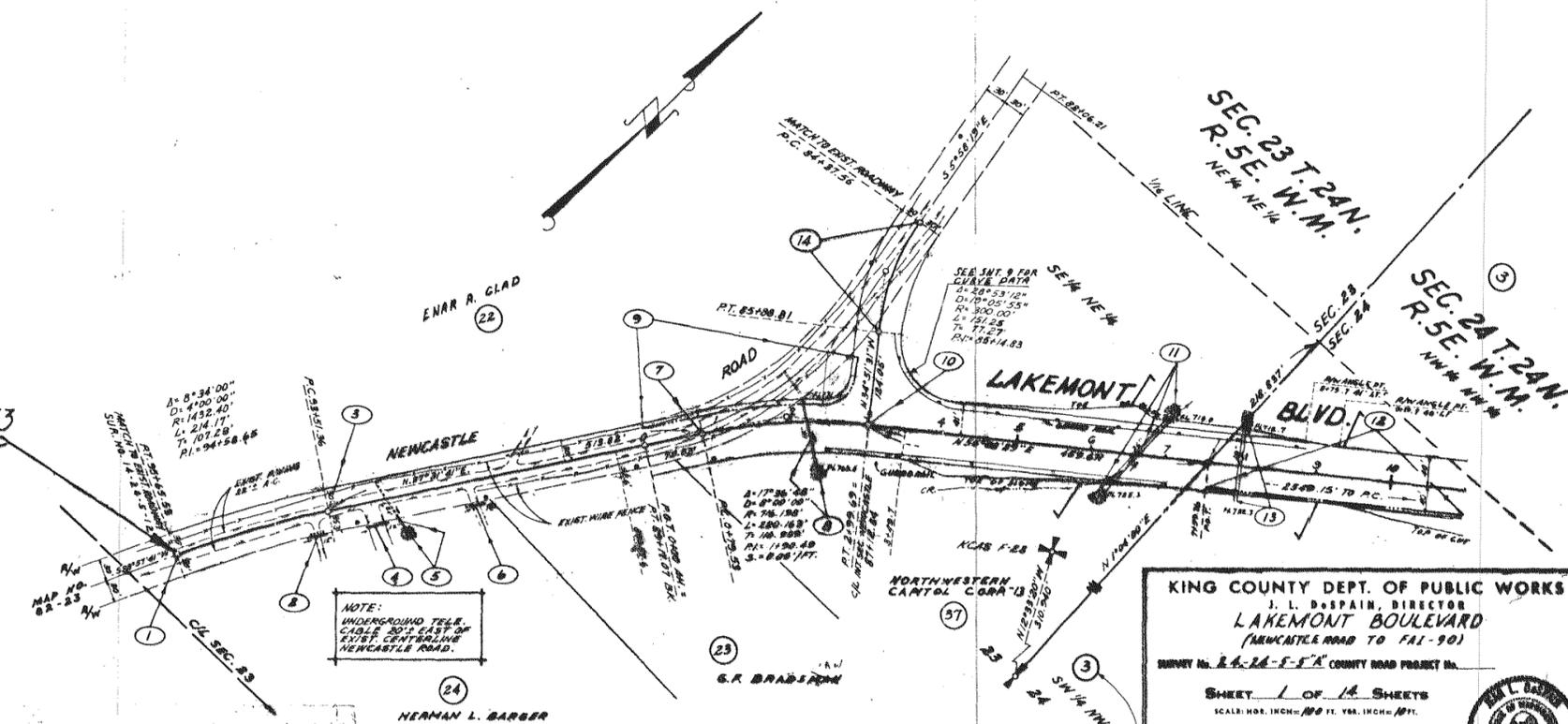
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KING COUNTY DEPT. OF P
 J. L. DeSPAIN, DIREC
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 (NEWCASTLE ROAD TO FAI-
 SURVEY No. 24-24-5-5 "A" COUNTY ROAD PROJ
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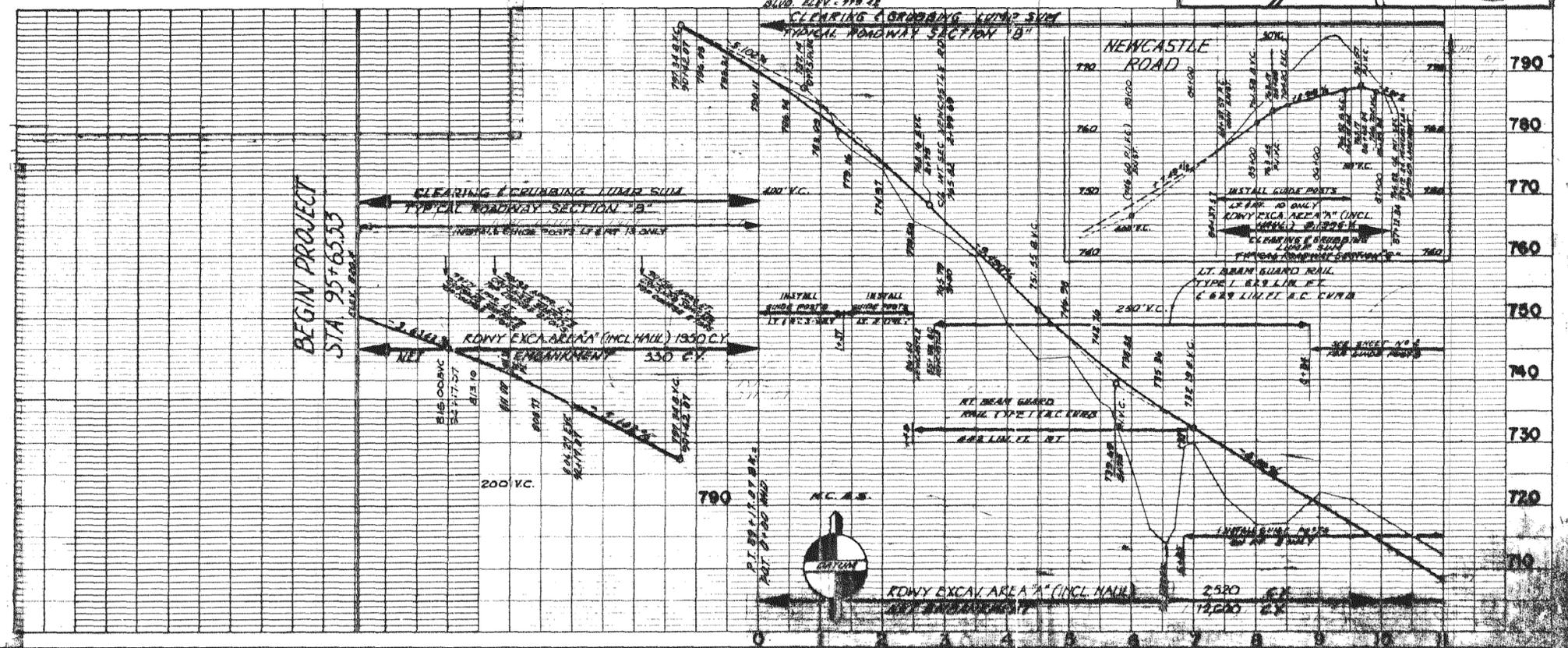
DATE	10-27-70
BY	W. J. HARRIS
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NO.	1
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STA. 95+65.53
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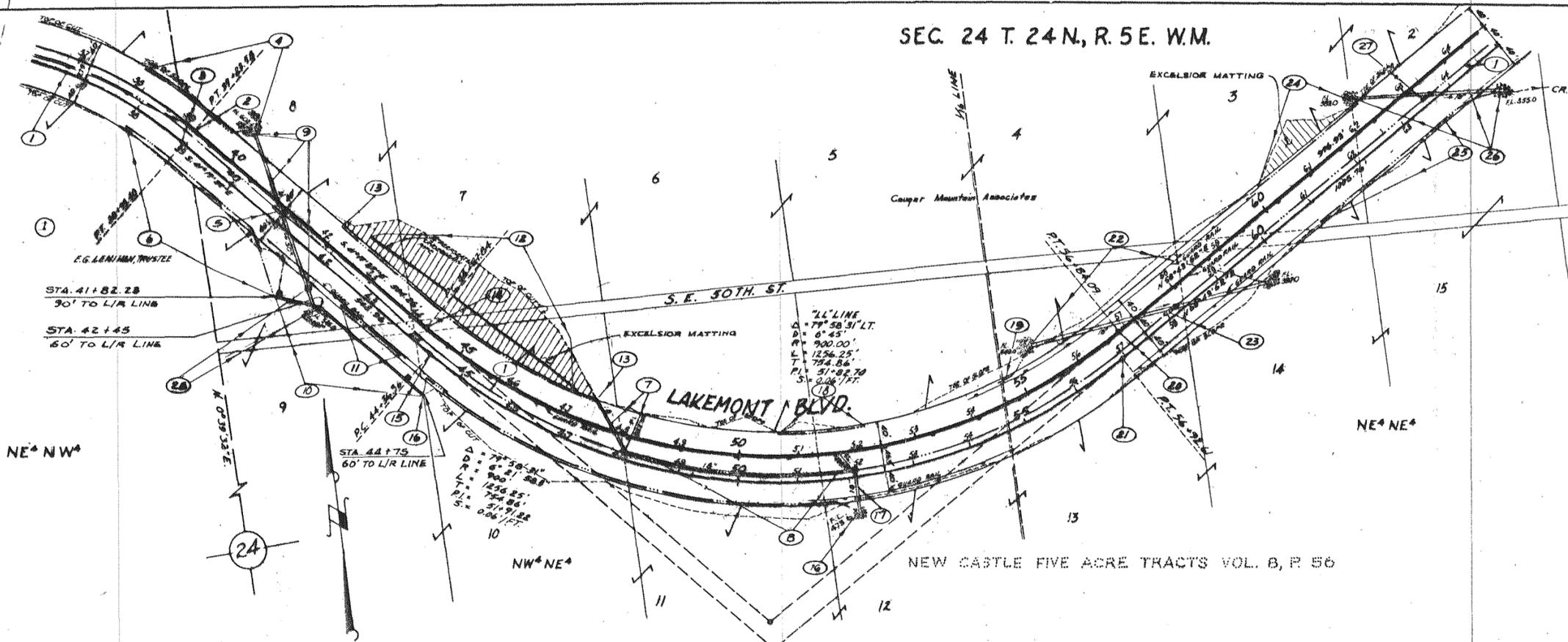


KING COUNTY DEPT. OF PUBLIC WORKS
J. L. DOSPAIN, DIRECTOR
LAKEMONT BOULEVARD
(NEWCASTLE ROAD TO FALL 90)
SURVEY No. 24-24-5-5-A COUNTY ROAD PROJECT No.
SHEET 1 OF 14 SHEETS
SCALE: HOR. INCH = 40 FT. VER. INCH = 10 FT.
MAINTENANCE DIVISION No. 1
APPROVED BY: *J. L. Dospain*



SEC. 24 T. 24N, R. 5E. W.M.

DATE	
BY	
CHECKED	
APPROVED	
SCALE	
PROJECT	
DESCRIPTION	
REVISIONS	



KING COUNTY DEPT. OF PUBLIC WORKS
 J. L. BOSPAIN, DIRECTOR
LAKEMONT BOULEVARD
 (NEWCASTLE ROAD TO FAT-90)
 SURVEY No. 1-2-24-5-E-A COUNTY ROAD PROJECT No. _____
 SHEET 3 OF 14 SHEETS
 SCALE: HOR. INCH=100 FT. VER. INCH=10 FT.
 ENGINEERING DIVISION
 APPROVED BY *J. L. Bospain*

DATE	
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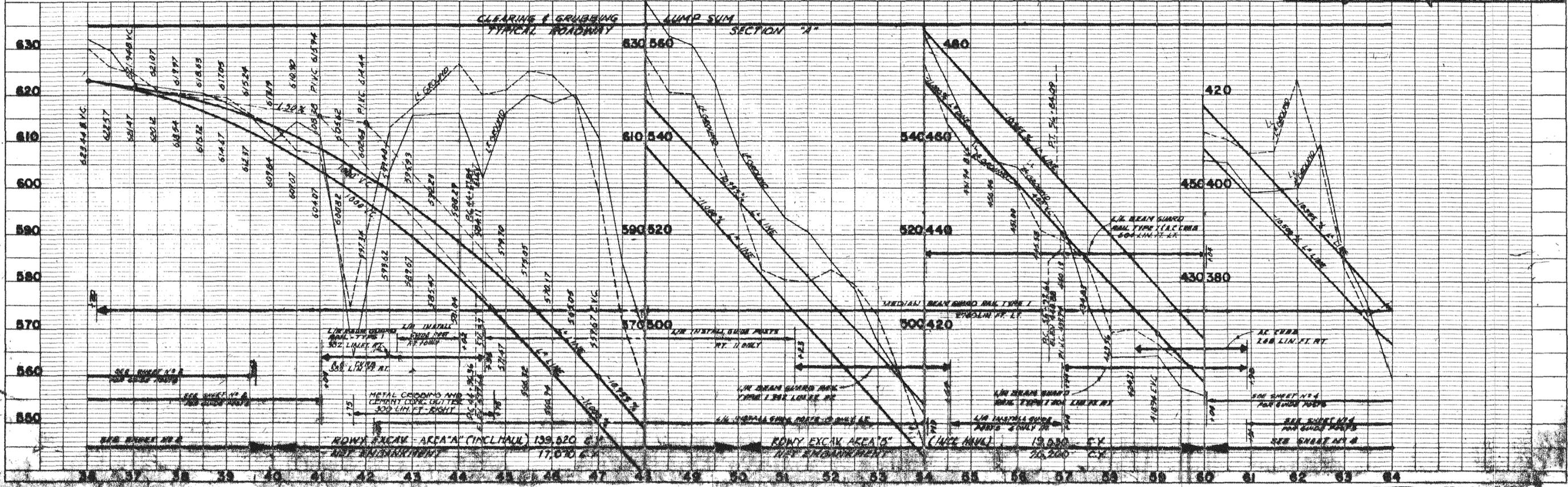


PLATE 1 PLAN PROFILE & P & S STANDARDS
 BUREAU OF PUBLIC WORKS, CHICAGO - NEW YORK

1933 302-3501

