

*Report on  
Anacostia Freeway*

*District of Columbia*

*Engineering Studies & Estimates*

December 1955

Baker-Wibberley, Inc.

CONSULTING ENGINEERS

Hagerstown, Md.

Baltimore, Md.



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PLANNING RESEARCH SECTION  
OFFICE OF PLANNING AND PROGRAMMING  
DEPT. OF HIGHWAYS AND TRAFFIC

FILE NO: 31.06







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DISTRICT OF COLUMBIA**

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**DEPARTMENT OF HIGHWAYS  
DISTRICT OF COLUMBIA**

**J. N. Robertson**, Director

In Cooperation With

**BUREAU OF PUBLIC ROADS  
U. S. DEPARTMENT OF COMMERCE**





## **ACKNOWLEDGEMENTS**

Bureau of Public Roads, Department of Commerce

Baltimore and Ohio Railroad Company

Department of Highways, District of Columbia

Department of Sanitary Engineering, District of Columbia

National Capital Parks, Department of Interior

National Park Service, Department of Interior

National Capital Planning Commission

Office of the Assessor, District of Columbia

Office of the Surveyor, District of Columbia

Pennsylvania Railroad, Eastern Region

United States Air Force, Bolling Field

U. S. Engineers, District of Columbia Office

U. S. Naval Air Station, Anacostia, D. C.

U. S. Naval Research Laboratory





**BAKER-WIBBERLEY, INC.**  
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November 21, 1955

BRANCH OFFICE  
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BALTIMORE, MD.

PLAZA 2-5701

REPLY TO Hagerstown

OFFICE

Board of Commissioners  
District of Columbia  
District Building  
Washington, D. C.

Gentlemen:

This report presents the findings and recommendations of this firm, in connection with the proposed Anacostia Freeway Agreement No. D.C.F. 776 dated November 18, 1954.

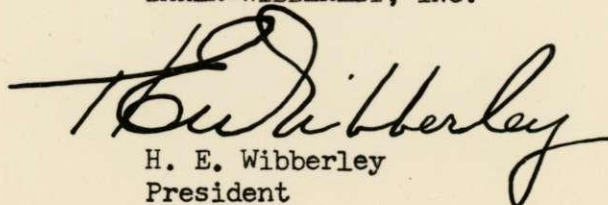
This report selects a location for the Anacostia Freeway that will serve the traffic demands of the area and yet keep property damage, both private and public, to a minimum. A prime consideration throughout the preparation of this report was that of minimizing the interruption of both community and military activities. It is believed that, in so far as possible, this has been accomplished.

The importance of the Anacostia Freeway becomes readily apparent when the overall highway program of the District of Columbia is reviewed. Along with serving the existing Anacostia River Bridges, the Anacostia Freeway will facilitate the proper functioning of the proposed Jones Point Bridge and the Inner Loop. The Anacostia Freeway will also serve as an important by-pass route in the interstate highway system.

With the rapidly increasing vehicular traffic volumes within the District of Columbia and the existing traffic problems in the Anacostia Area, there is no doubt that immediate action should be taken to insure the retention of the necessary rights-of-way, the preparation of contract plans, and the early construction of the Anacostia Freeway.

Yours very truly,

BAKER-WIBBERLEY, INC.

  
H. E. Wibberley  
President

HEW:dh



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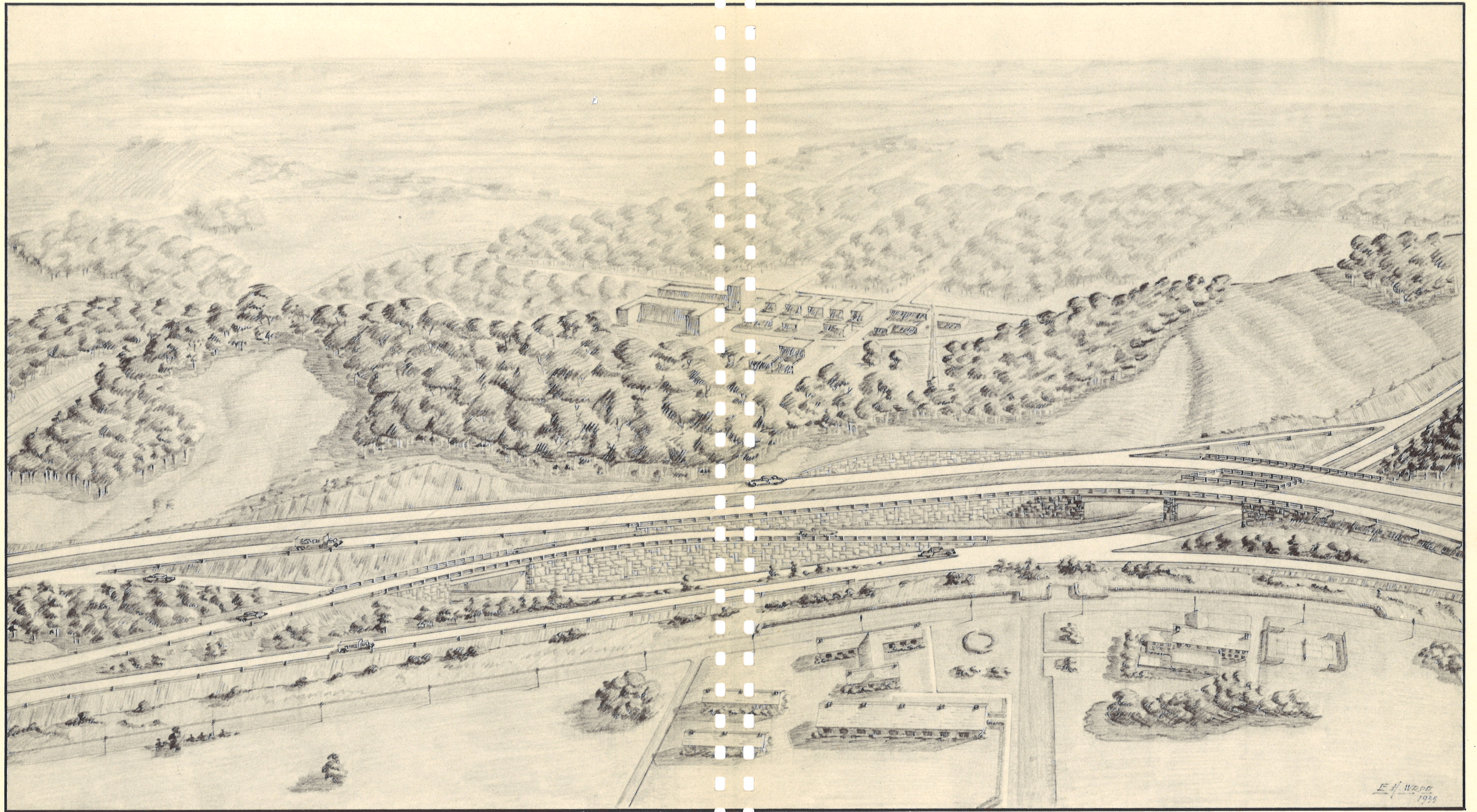


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SOUTH CAPITOL ST. INTERCHANGE



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# **REPORT ON ANACOSTIA FREEWAY**

## **Introduction:**

This report presents an engineering study of the traffic considerations, location, design criteria, geometrics, right-of-way, and cost estimates of the proposed Anacostia Freeway from the East Capitol Street Bridge southward along the Anacostia River and the Potomac River, thence across the Oxon Run Bay to the District of Columbia-Maryland Line.

For many years the construction of the Anacostia Freeway has been advocated by the National Capital Planning Commission and the District of Columbia Department of Highways. Construction on Kenilworth Avenue, which is the northernmost portion of the Anacostia Freeway, is nearing completion and has as its southern terminus the newly constructed East Capitol Street Bridge. Funds have also been appropriated for the long proposed Jones Point Bridge crossing of the Potomac River. The Jones Point Bridge cannot fully be utilized until the proposed Maryland Intercounty Belt Freeway, and the Anacostia Freeway have been completed. It appears that completion of the Maryland Intercounty Belt Freeway is in the somewhat distant future. Therefore, the construction of the Anacostia Freeway becomes of extreme importance at this time.

Upon completion, the Anacostia Freeway will become a very important link in the interstate highway system by virtue of its connection to the south, via Jones Point Bridge to Shirley Highway and U. S. Route #1, and to the north, with the Washington-Annapolis Expressway and the Baltimore Washington Parkway. Thus the Freeway will serve as a by-pass Route for north-south traffic not destined for downtown Washington.

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However, the most important function of this facility will be that of distributing the heavy traffic volumes destined to and from interzone areas of Metropolitan Washington, over the Anacostia River Bridges.

The procedure followed in studying the location of the Freeway consisted first of a review of all previously assembled data, maps and reports with representatives of the District Department of Highways. The entire project, extending from the East Capitol Street Bridge south to the District of Columbia Line, was then made the subject of very thorough field reconnaissance.

Upon completion of the field reconnaissance, it was possible to determine upon a general route of the facility and through the use of aerial photography and photogrammetric mapping all culture and major topographic features, including ground contours, were obtained on the general route for the entire length of the project.

The broad aspects of the problem were next analyzed in consideration of a plan of construction to insure the retention of all necessary rights-of-way and ultimate completion of the project in an orderly manner. In this instance, cognizance was given to population and traffic trends, community activities, right-of-way cost, and general economics of freeway location.

Numerous conferences were held with the engineering staff of the District Highway Department in discussing such related problems as traffic, existing street and highway facilities, proposed facilities by both the District of Columbia and neighboring states, and in particular, connections with the proposed Jones Point, Potomac River crossing.

In evaluating right-of-way cost and its effect on the location of the facility, the consultants were given access to all tax records and all information previously compiled by the District Highway Department.

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Basic traffic data were obtained from the Origin and Destination Survey included in the 1948 Washington Metropolitan Area Transportation Study conducted by the District of Columbia Department of Highways in cooperation with Maryland, Virginia and the Bureau of Public Roads. These were brought up-to-date by use of the current traffic volume information and trends supplied by the Planning Division of the District of Columbia Department of Highways. The up-to-date basic data were expanded taking into consideration development, normal growth and induced traffic to anticipate 1980 volumes, for use in design of the Freeway.

The U. S. Army Engineers, U. S. Air Force, The Pennsylvania Railroad, The Baltimore and Ohio Railroad, and others concerned, were contacted and made aware of the location of the proposed freeway, and its effect upon their holdings or facilities. All individual problems, requirements, and requests were taken into consideration and a mutually satisfactory solution was derived.

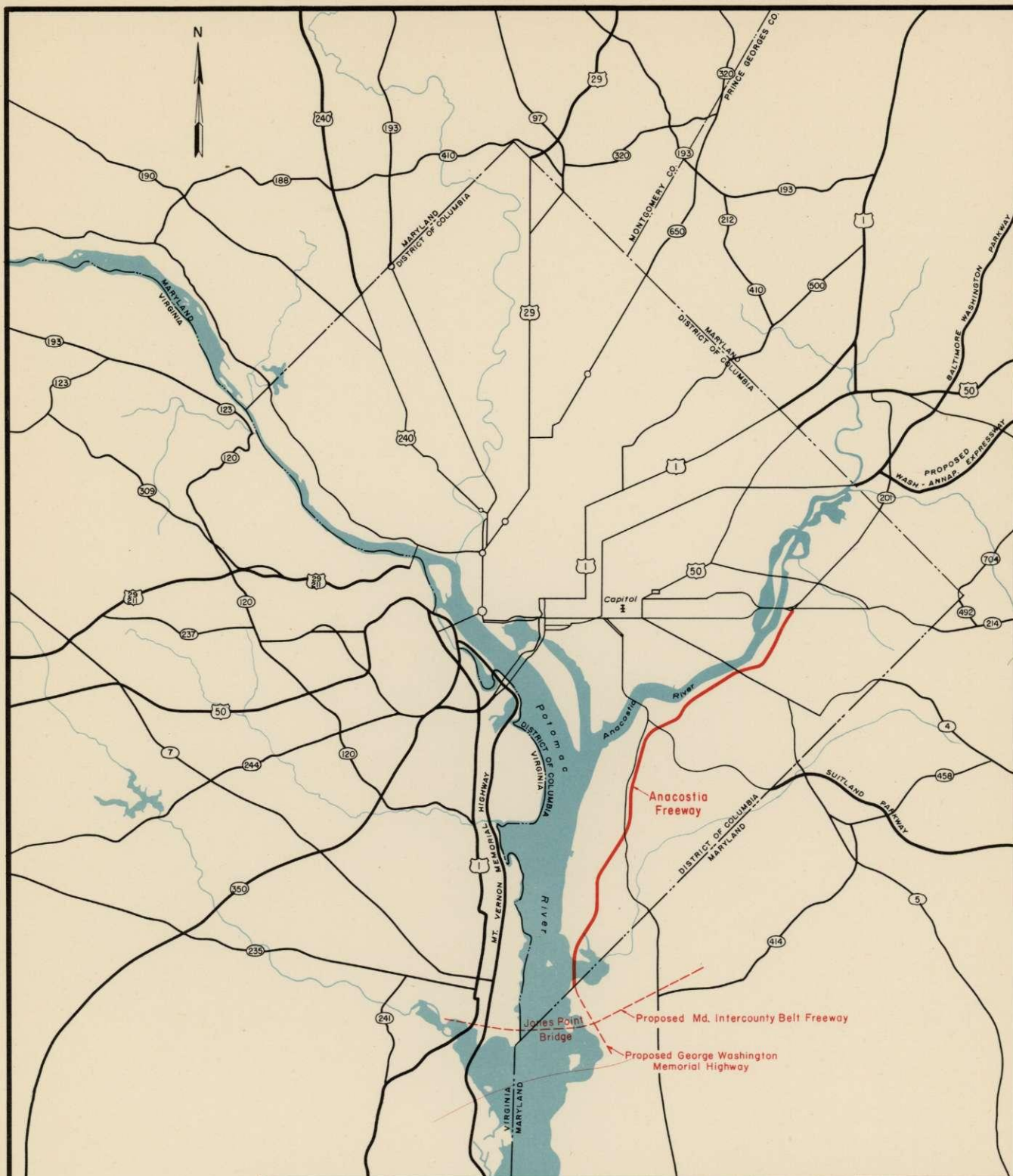
Field reconnaissance studies of stream, soil, and foundation conditions were made to determine what effect they may have on the economics of the location.

Complete preliminary plans of the highway, bridges, grade separations, interchanges, and connecting roads were then developed and estimated construction costs tabulated.

Based upon the analysis of traffic, population trends, community growth, and topography as outlined above, a recommended location of the Anacostia Freeway was selected and will be described in detail hereinafter.

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SCALE  
0 1/2 1 2 MILES

#### LEGEND

- U.S. Highway Number
- State Highway Number

ANACOSTIA FREEWAY

VICINITY MAP

BAKER-WIBBERLEY, INC.

PLATE II











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## TRAFFIC VOLUME STUDIES

Traffic within the Washington Metropolitan Area has increased to such an extent, during the past decade, as to create serious traffic congestion. The problem of moving people and commodities through this area has become increasingly acute and it has not been possible for highway improvements to keep pace with the increased vehicular traffic. As a result, difficult traffic problems have arisen, the number of accidents has increased and serious economic losses have been experienced.

The National Capital Planning Commission and the District of Columbia Department of Highways, have developed a master highway plan which includes a number of radial and arterial streets and highways, with inner and outer circumferential routes. These plans have been developed in conjunction with neighboring state highway programs. The Anacostia Freeway, which is the subject of this report, is part of the master highway plan developed by the above mentioned agencies.

In considering the traffic service provided by the Anacostia Freeway and its future traffic potential, this report takes cognizance of the proposed Maryland Intercounty Belt Freeway, extending from the vicinity of Jones Point, northwardly through Prince Georges County, Maryland and circumferentially about the Washington Metropolitan Area. The southeastern quadrant of this proposed Maryland project, although roughly parallel to the Anacostia Freeway is considered too far removed to serve the same "by-pass" traffic as the Anacostia Freeway and, of course, has no bearing whatsoever on the prime function of the Freeway; that of distributing traffic over the Anacostia River Crossings.

Traffic congestion invariably follows population increases. Plate No. IV "Population Increase 1940-1980" shows the population trend within the Anacostia Area and Prince Georges County, Maryland. It is noted that the increase between the years 1940 and 1950 approaches 300%. It is estimated that by 1980, twenty-five years hence, the population will more

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than double that of 1950. The rapid growth, as cited, within the general area to be served by this facility makes it necessary to take immediate steps to provide for a more efficient movement of traffic.

Inasmuch as traffic volumes roughly parallel population trends, it can readily be seen that traffic will approximately double in the next twenty-five years.

The report of the Washington Metropolitan Area Transportation Study completed by the District of Columbia, Maryland and Virginia, in co-operation with the U. S. Bureau of Public Roads, Department of Commerce in 1950, records traffic volumes, origins and destinations and consolidated desire lines for traffic for the entire Washington Metropolitan Area. This information was completely analyzed and correlated with actual traffic counts in determining the traffic potential on the Anacostia Freeway.

The results of the traffic studies conducted herein have been depicted on the traffic plates presented in this report. The present maximum average daily traffic on the Freeway would exceed 25,000 vehicles and the estimated 1980 maximum average daily traffic will exceed 50,000 vehicles. These figures have been arrived at by applying generated, development, and normal growth factors to current traffic volumes. For purposes of expanding traffic volumes, no fixed, overall factor may be applied to current traffic volumes due to the character of the traffic within the area.

As shown on plates V and VI, the volumes of traffic to be served by the Freeway will be of such magnitude that a four and six lane divided highway of controlled access design will be required. Were this facility constructed with intersections at grade, traffic back-up as a result of the cross and turning movements at each intersection would reduce the attractiveness of the facility to that of a local city street served by traffic lights. With such a design, large volumes of traffic may use the facility efficiently and safely.

In determining the points of ingress and egress to the Freeway, only those traffic movements of considerable magnitude have been presented for immediate consideration.

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As previously mentioned, the most important function of this facility will be that of distributing heavy traffic volumes over the Anacostia River Bridges. It then becomes apparent that the capacity of the several Anacostia River Bridges has a direct bearing on the satisfactory functions of the Freeway. Present traffic figures indicated that the South Capitol Street Bridge is now carrying traffic volumes equal to its design capacity (Plate VII). Under normal traffic increases, noting the fact that any overflow traffic from the South Capitol Street Bridge will use the Eleventh Street Bridge, the Eleventh Street Bridge will also be overloaded in less than five (5) years hence. Inasmuch as the existing Eleventh Street Bridge is ideally located, both from a traffic and topographic standpoint, it appears most reasonable that additional bridge capacity should be provided at this location no later than 1959. This additional Anacostia Bridge capacity is assumed in the assignment of traffic.

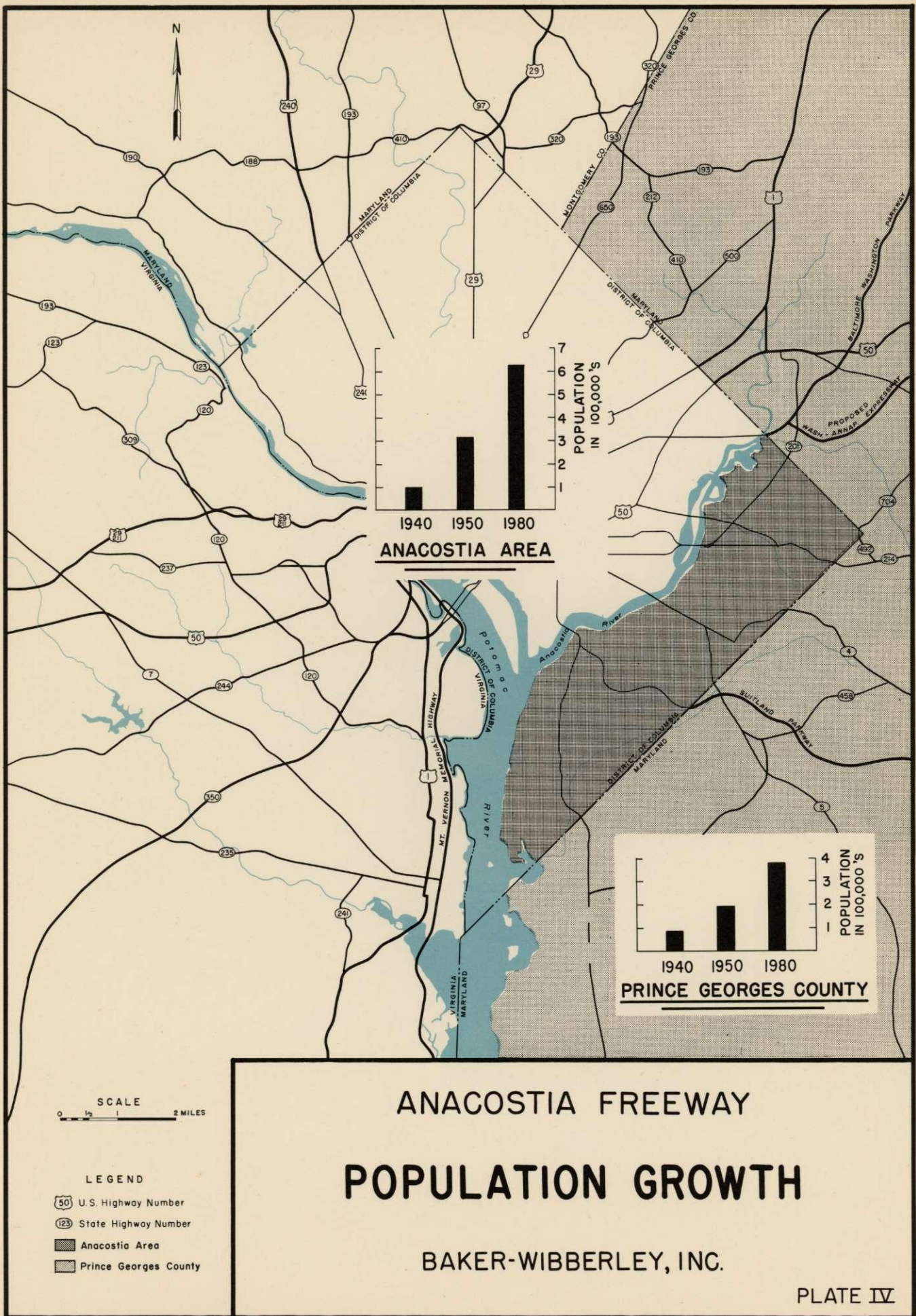
Consideration was also given to the South Capitol Street Bridge which has now reached capacity, but which will be relieved when the Freeway is constructed. The revised traffic pattern was projected to 1980 and any excess over the possible capacity was assumed shunted from the turning traffic and moved along to the Eleventh Street Bridge.

By studying the traffic projection it is found that a four lane divided highway is necessary, initially and ultimately from the connections at East Capitol Street to Pennsylvania Avenue. South of Pennsylvania Avenue to the South Capitol Street Interchange a six lane divided highway is necessary. South of this Interchange, present and future traffic volumes require only four lanes, however, if Fort Drive is connected, as proposed, six lanes may be required ultimately. The design should be such that extra lanes may be added if ever warranted.

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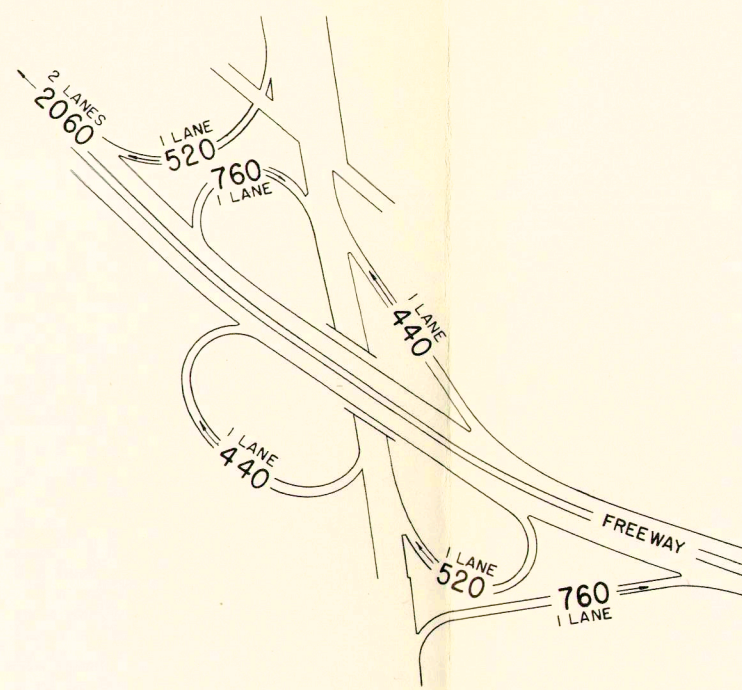




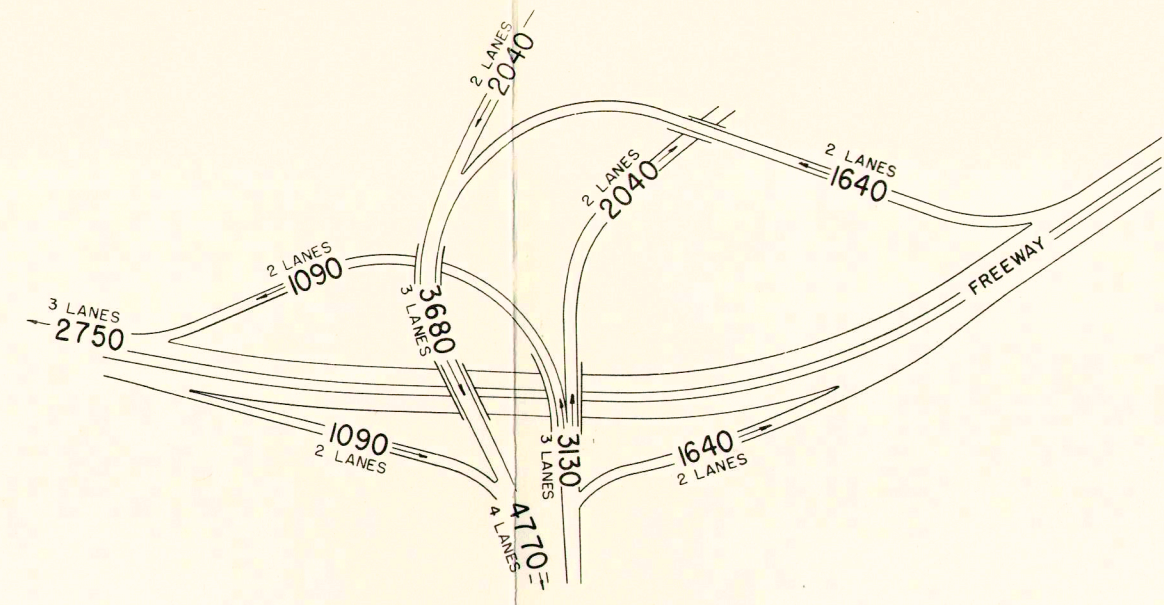




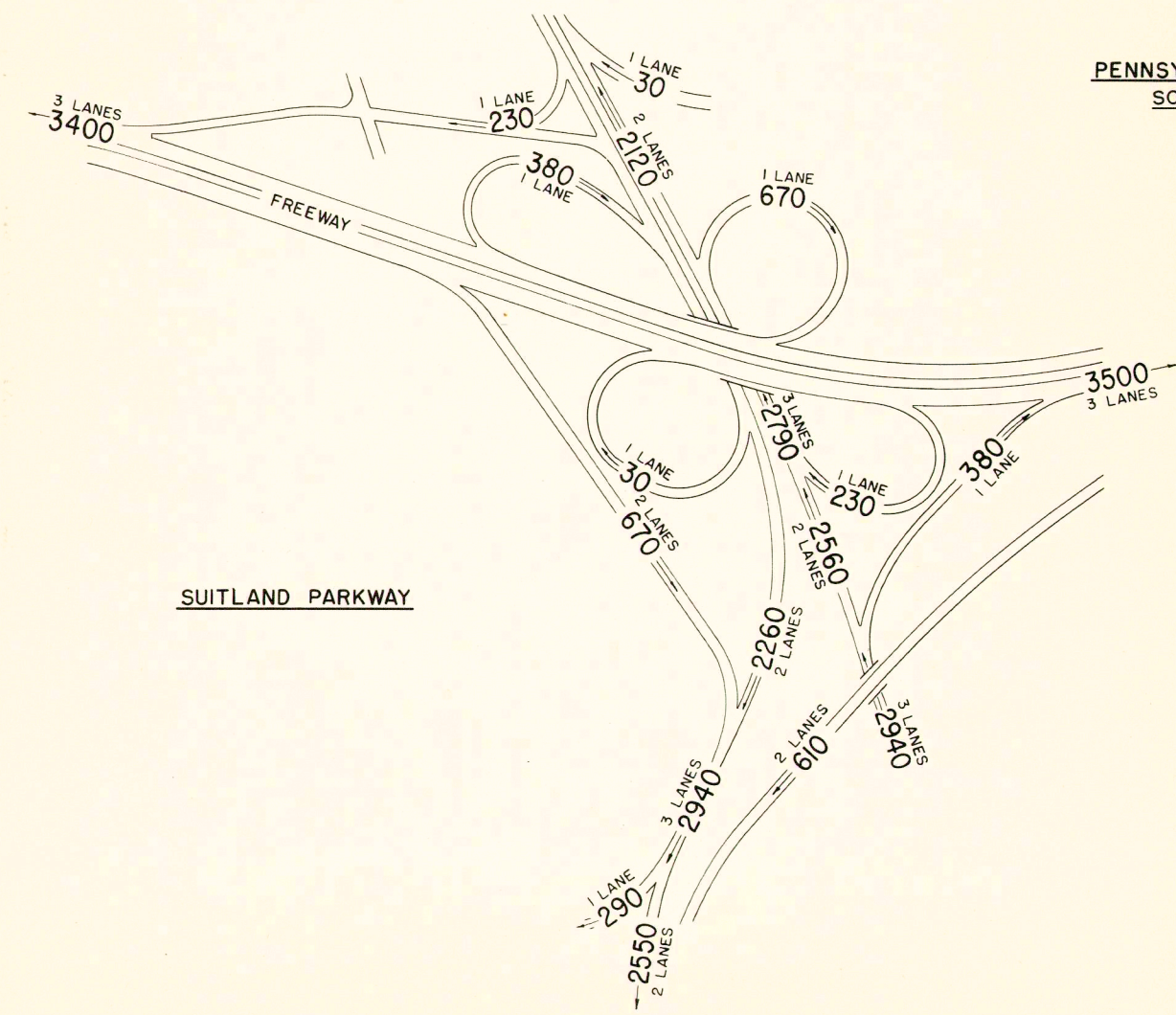




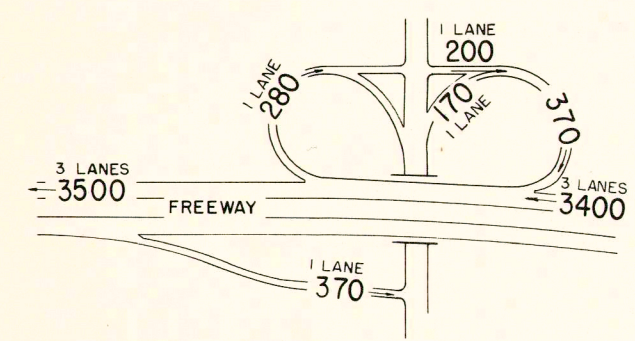
PENNSYLVANIA AVENUE  
SOUSA BRIDGE



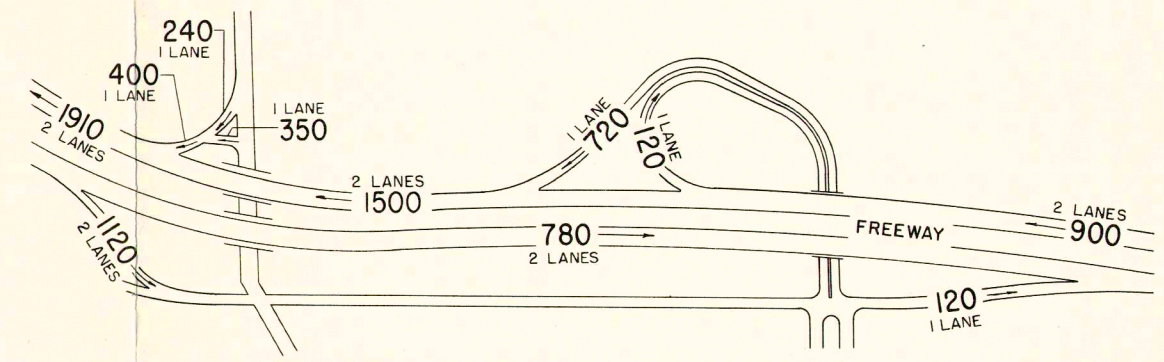
11TH STREET  
ANACOSTIA BRIDGE



SUITLAND PARKWAY

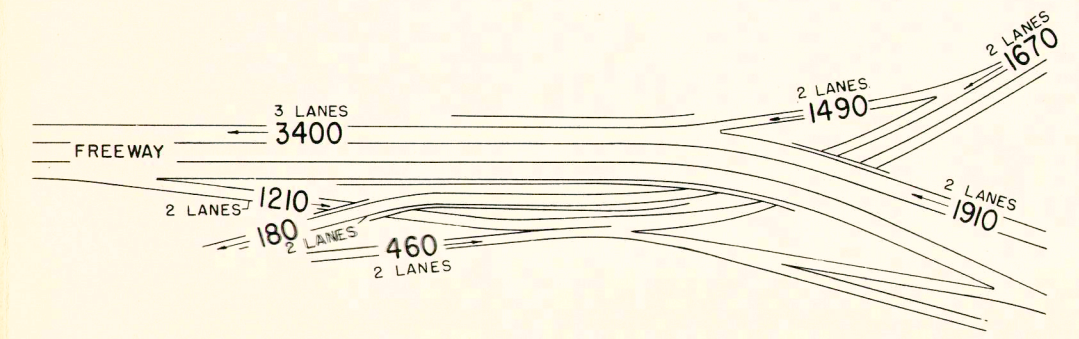


PORTLAND STREET



CHESAPEAKE STREET

NAVAL RESEARCH  
LABORATORY



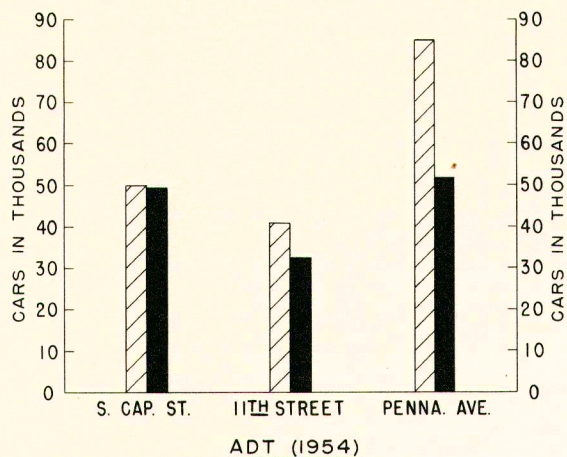
SOUTH CAPITOL STREET

300 → INDICATES PEAK HOUR VOLUMES (1980)

# ANACOSTIA FREEWAY TURNING MOVEMENTS

BAKER-WIBBERLEY, INC.

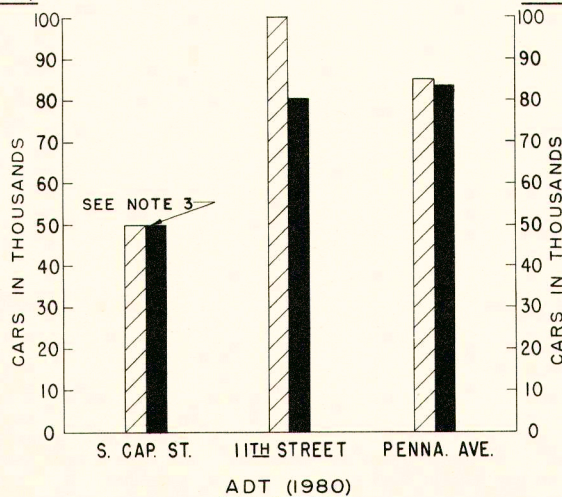
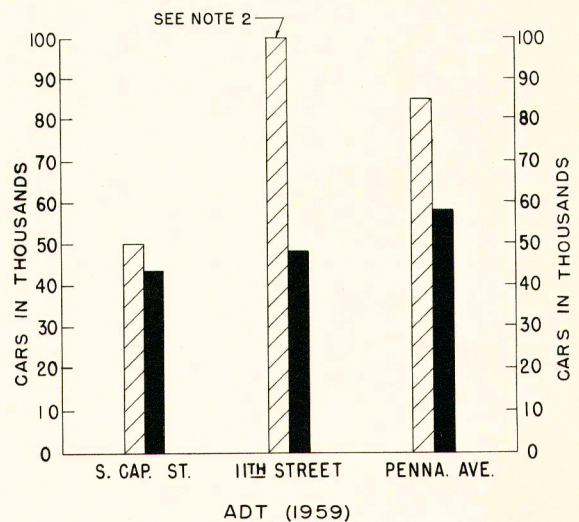
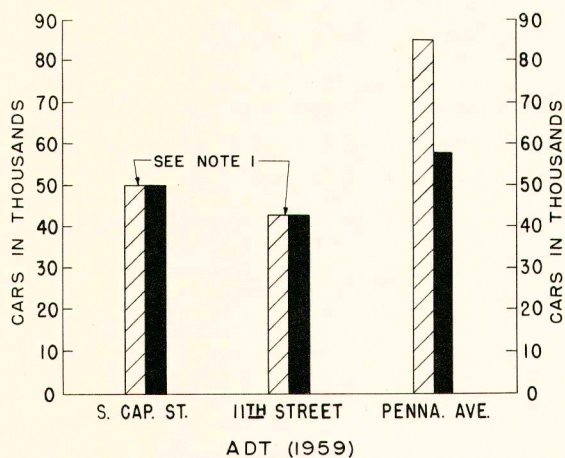
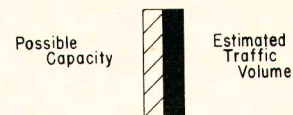




Note 1: Under normal growth, any excess at S. Capitol St. Bridge will use 11th Street Bridge.

Note 2: 11th Street Bridge reaches capacity and a companion structure is assumed built which attracts traffic from South Capitol Street Bridge.

Note 3: South Capitol Street Bridge reaches capacity by 1964.



# ANACOSTIA FREEWAY PRESENT & PROJECTED TRAFFIC (S. CAPITOL STREET, ANACOSTIA AND SOUSA BRIDGES)

BAKER-WIBBERLEY, INC.



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## BASIS OF ROUTE SELECTION

The general location of the Anacostia Freeway from East Capitol Street Bridge south to the District of Columbia Line, in the vicinity of Oxon Run Bay, has been generally agreed upon by all agencies concerned for many years. This general location roughly paralleled the Anacostia River from East Capitol Street to Overlook Avenue and thence, to the District of Columbia Line on a location that would be determined by the eastern approaches to the Jones Point Bridge.

All available maps, including aerial photographs and photogrammetric plans were carefully catalogued and studied. In addition, specially prepared aerial photographs and photogrammetric plans were developed. On these maps and photographs a number of alternate locations considered feasible from a topographic and traffic standpoint were plotted. This material was then presented to the Coordinating Committee of the National Capital Planning Commission, for study and approval. After numerous conferences with the Coordinating Committee, with particular attention being given to the effect of the Freeway upon adjacent Park Lands, a location mutually acceptable to the Coordinating Committee, the Bureau of Public Roads, the District Department of Highways and the Consultants was presented to the National Capital Planning Commission for review and approval.

Route profiles were plotted for the Freeway to insure selection of a location which could be constructed with minimum grades and to determine control clearances at grade separation structures.

The prime function of this report is to determine upon the exact location of the Anacostia Freeway. Five major considerations govern the selection of a feasible location for a freeway of the type reported on herein. These are population factors, traffic considerations, relationship to existing and proposed highways, right-of-way problems and topographical

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conditions. The effect of these five factors as they control the location of the Anacostia Freeway will be discussed in detail herein.

With the adequate distribution of traffic over the Anacostia River Bridges being a prime consideration in the location of this freeway, it became desirable to locate the facility as near as possible to the several Anacostia River Bridges, so as not to require extensive rebuilding of existing approaches to these bridges. On the northern section of the Freeway, East Capitol Street to Suitland Parkway, Anacostia Park adjoins the river. On the eastern fringe of Anacostia Park is the Baltimore and Ohio Railroad, Shepherds Landing branch tracks, which is most vital and important to our national defense, because of the large military installations to the south and along the Anacostia River. East of the railroad is a dense commercial and residential development. Consideration of all factors in this area lead to the recommendation of locating through Anacostia Park with a minimum of damage to its extensive athletic and recreational facilities.

In determining upon the location of the Anacostia Freeway south from Suitland Parkway to the end of Overlook Avenue, three factors govern the selection. These were (1) the utilization of present South Capitol Street and Overlook Avenue; dual lane facilities, (2) the military and naval installations along the Anacostia River and (3) the relatively rough terrain and poor foundation conditions.

After study and consideration of all factors, the selection of the best location for the southern section of the Freeway was narrowed down to the approximate location of South Capitol Street and Overlook Avenue. It then became necessary to correlate the functions of these two dual highway facilities with the Freeway and, at the same time, not sacrifice the efficiency and safety of the Freeway.

From the southern terminus of Overlook Avenue to the District of Columbia Line, the center line location was purely a matter of selecting a route that would align itself with the Jones Point Bridge interchange, respecting all right-of-way considerations and the future plans for other highway facilities and public utilities in the area.

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## DESCRIPTION OF ROUTE

The following is a detailed description of the recommended centerline location of the Anacostia Freeway, connecting roads, interchange ramps, service roads and the utilization of existing facilities.

The northern terminus of the Anacostia Freeway is at the intersection of East Capitol Street and Kenilworth Avenue. The Freeway extends southward along the easternmost portion of the Anacostia Park, past Pennsylvania Avenue, Nichols Avenue, and Eleventh Street to the Suitland Parkway near its intersection with South Capitol Street. From this point the Freeway parallels South Capitol Street to Overlook Avenue, thence parallel to Overlook Avenue passing through property of the Home for the Aged at Blue Plains; skirting the westernmost boundary of this institution and crossing Oxon Run Bay near its outlet to the Potomac River. At this point the route crosses the District of Columbia Line and makes connection with the approaches to the proposed Jones Point Bridge. The route traverses mostly, National Capital Parks and District of Columbia owned properties, although some military, institutional and private property is involved.

The roadways of the proposed Freeway connect to the current construction at East Capitol Street and form an extension of Kenilworth Avenue. The Freeway then continues southward through District of Columbia and National Park lands, crossing over the Pennsylvania Railroad tracks and the Baltimore and Ohio Railroad-Anacostia branch tracks, to roughly parallel the Baltimore and Ohio Railroad-Shepherds Landing branch tracks. The Freeway is held close to the Railroad tracks and is so placed as to conserve as much park land as possible, and utilize the favorable foundation conditions.

Approximately 1500 feet north of Pennsylvania Avenue the roadways bear into the park land and cross this major street approximately halfway between the Sousa Bridge and the Baltimore and Ohio Railroad crossing. Interchange is provided for all major turning movements. The route then parallels and is adjacent to the Baltimore and Ohio Railroad tracks past the clubhouse of the Anacostia Park Golf Course and again bears into the park land near the Eleventh Street Bridge, to combine with a directional interchange. Provision is also made for approaches to a companion structure to the Eleventh Street Bridge over the Anacostia River.

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From this point the roadways then bear over adjacent to the Baltimore and Ohio Railroad tracks through the present, but temporary, Naval Receiving Station; to cross Howard Road and Suitland Parkway between Firth Sterling Avenue and the present South Capitol Street intersection.

Here the interchange of traffic is accomplished by a conventional clover leaf type design. From this point, the route lies east of and parallel to South Capitol Street as far as Overlook Avenue. Approximately 1000 feet north of Portland Street, due to unfavorable soil conditions, described in the soils chapter herein, the route is moved westwardly to avoid hillside excavation. This necessitated shifting South Capitol Street westwardly into the lands occupied by the U. S. Naval Air Station. The Freeway then occupies the area previously utilized by South Capitol Street at this point. The alignment then traverses the area east of the present Portland Street crossing of South Capitol Street and interchange connections are provided. The route then crosses South Capitol Street near its present intersection with Overlook Avenue. Interchange is provided at South Capitol Street.

From this point southward the route parallels present Overlook Avenue with the southbound roadway of the Freeway occupying the area now used by the northbound roadway of Overlook Avenue. The southbound roadway of Overlook Avenue is retained as a service road to preserve the controlled access features of the Freeway. The roadways of the Freeway are separated by approximately 100 feet to provide for proposed, future, Fort Drive connection.

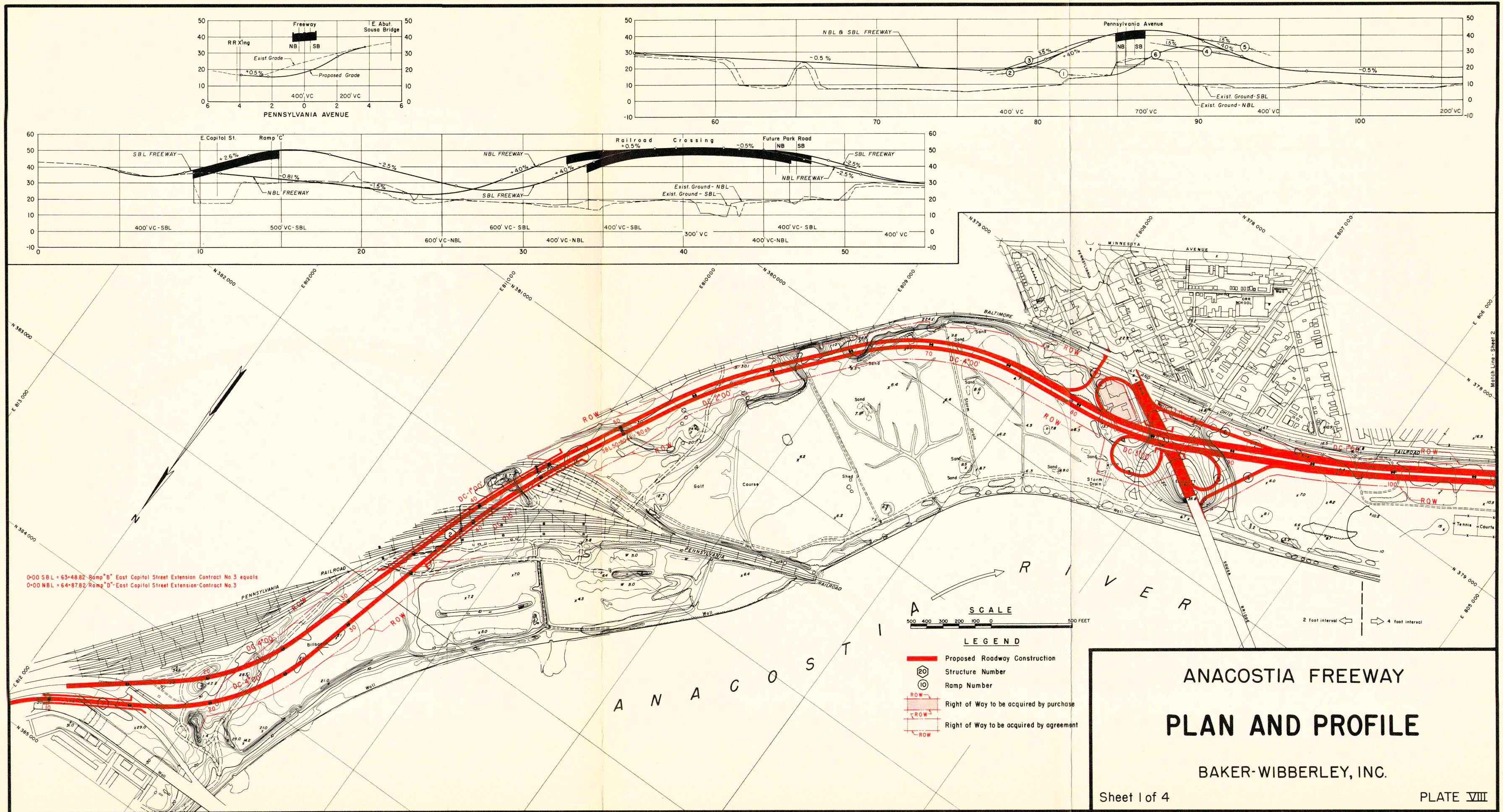
Chesapeake Street is crossed east of its present intersection with Overlook Avenue. Here interchange is also provided.

The route then parallels Overlook Avenue and a trumpet type interchange is provided opposite the main entrance to the U. S. Naval Research Laboratory. This interchange in addition to serving the U. S. Naval Research Laboratory with traffic to and from the south, also serves the Home for the Aged and a proposed Park Drive.

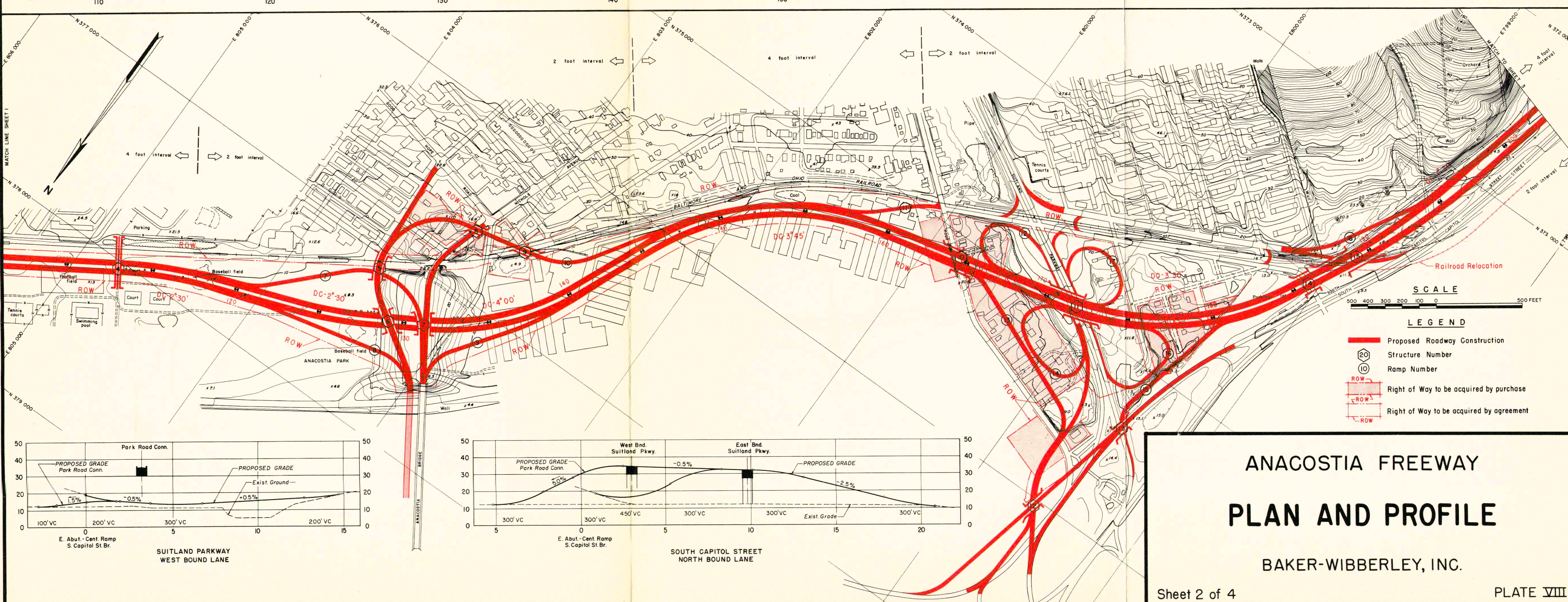
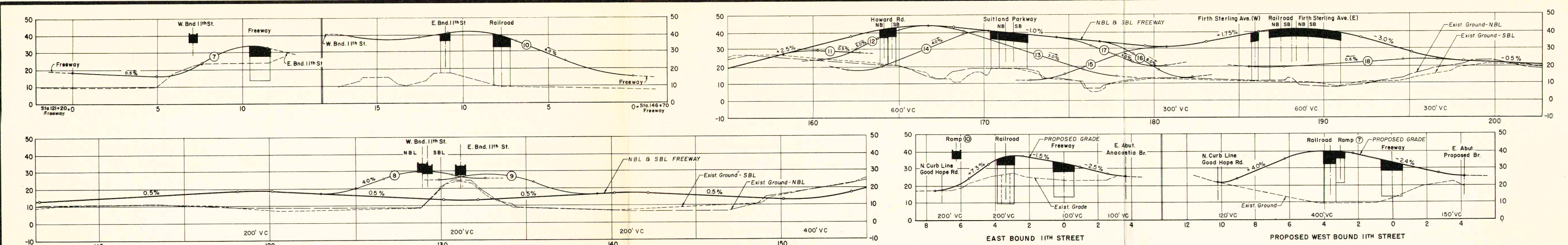
From this interchange southward the route traverses the land between the Home for the Aged and the District of Columbia Sewage Treatment Plant, so as not to interfere with any future development, and thence, to cross Oxon Run Bay by a combination causeway and bridge to the Maryland-District of Columbia Line.

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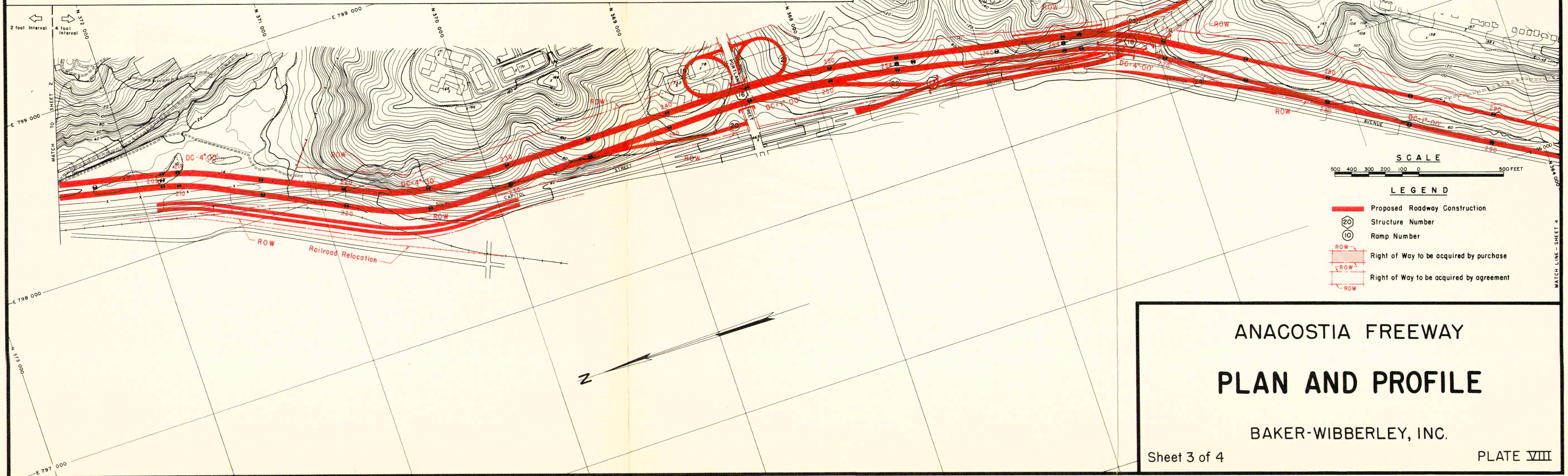
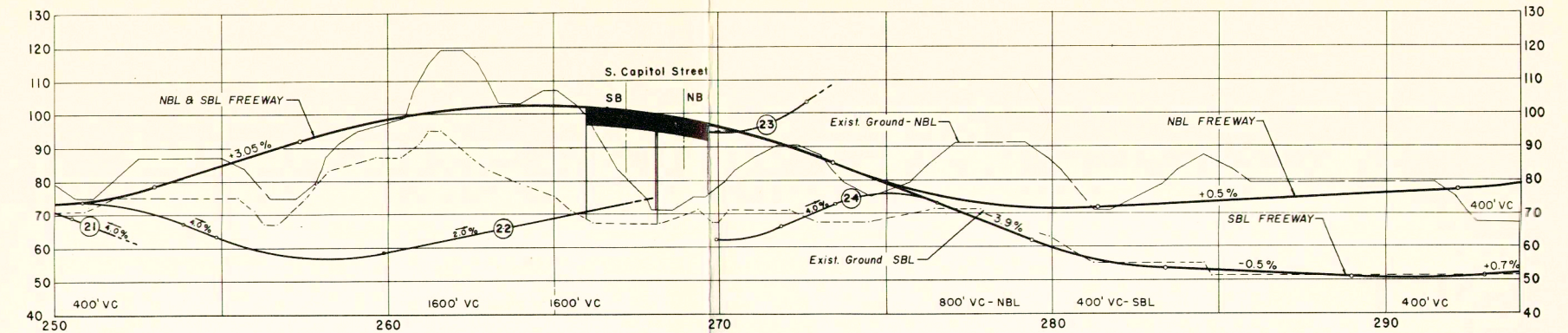
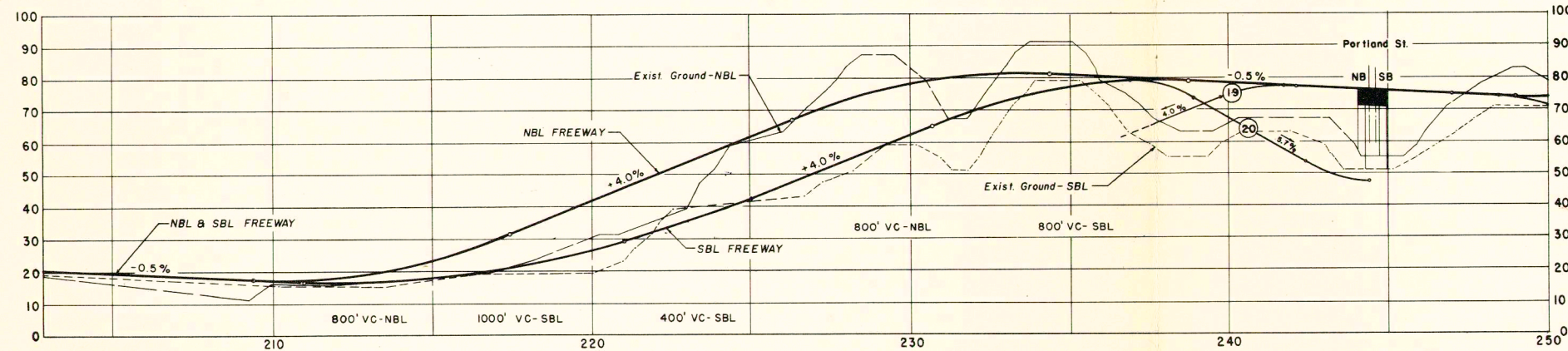
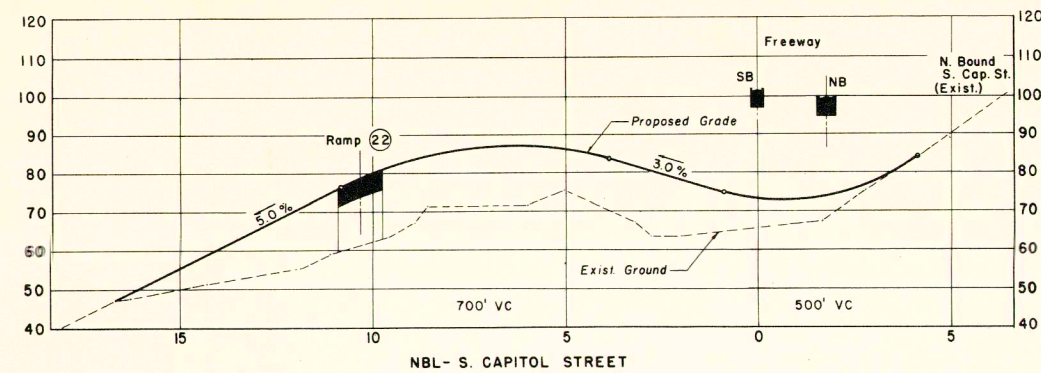




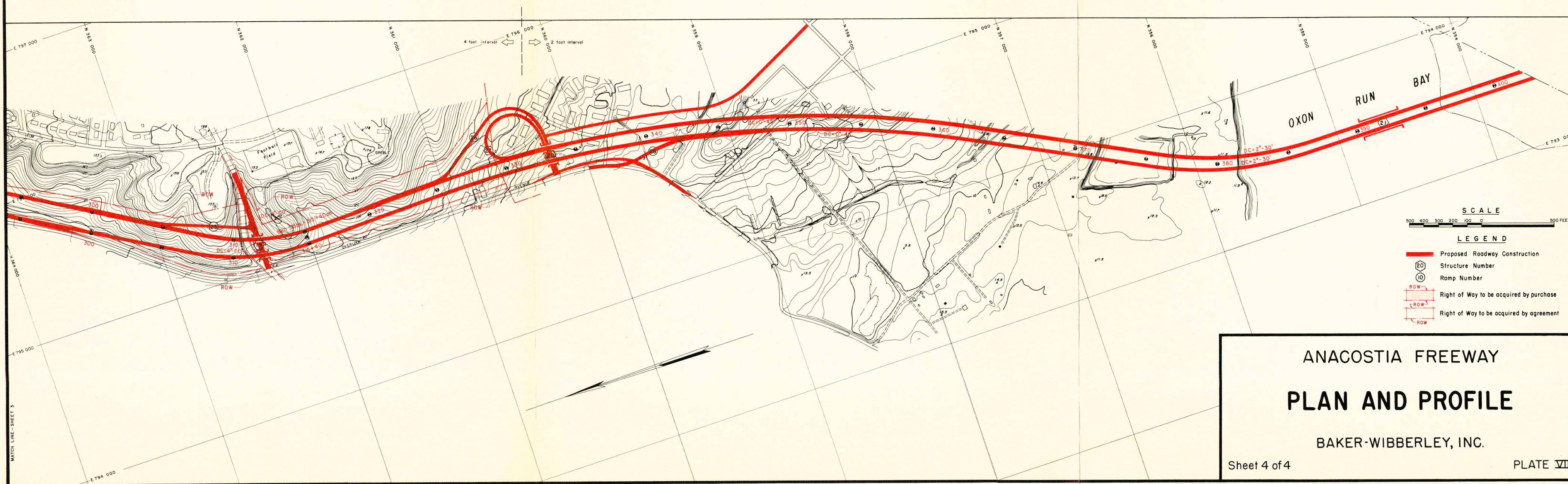
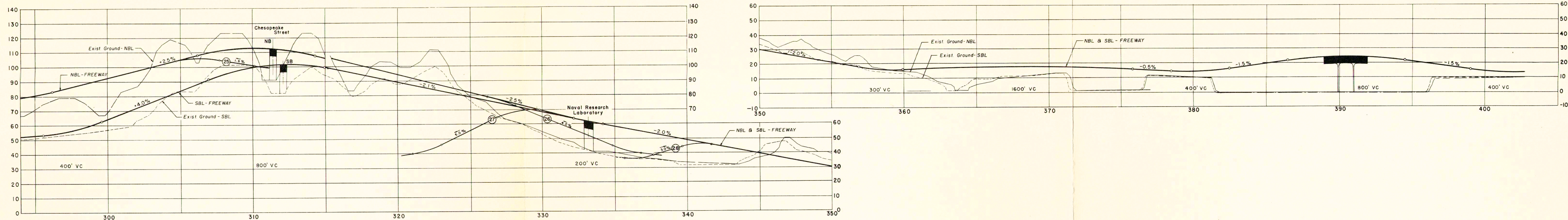


# ANACOSTIA FREEWAY PLAN AND PROFILE BAKER-WIBBERLEY, INC.









ANACOSTIA FREEWAY

# PLAN AND PROFILE

BAKER-WIBBERLEY, INC.

Sheet 4 of 4

PLATE VIII



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## DESIGN STANDARDS

### 1. Roadway

The American Association of State Highway Officials' "Policy on Geometric Design of Rural Highways" of 1954 has been followed throughout in the planning of the Freeway. The Freeway is designed as a four and six lane divided highway with full control of access. The lane capacity is 1250 vehicles per lane of mixed traffic and all other capacity controls are based on the "Highway Capacity Manual of the Highway Research Board of 1950".

Typical sections of the roadway are shown on Plate IX. The slopes as shown may vary where appearance would be improved or local soil conditions dictate. The cut slopes shall be benched where cuts are over 20 feet. Also where it is desired to conserve right-of-way, retaining walls will be used.

Adjacent to the Anacostia River Bridge crossings, the Freeway is designed for a 50 miles per hour standard. Here interchanges are frequent and a higher speed is not desirable. From Suitland Parkway southward a design standard of 60 miles per hour was used.

The desirable maximum degree of horizontal curvature is 3 degrees. Horizontal curves will not exceed 4 degrees 30 minutes, but this extreme will be used only where necessary in restricted areas. The minimum length of curves including transitions will be 500 feet. There will be sufficient tangent to enable the full runoff of superelevation between curves.

The maximum upgrade does not exceed 4% with a maximum downgrade of 6%. The minimum grade shall be 0.5%. The profile grade line shall not be less than 2 feet above the highest recorded flood waters. This is equivalent to an elevation of 14 feet above mean sea level. The highest water ever recorded was in 1889, which was 12 feet above mean sea level.

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Curves that have the same profile grades for either roadway and a median width of 16 feet or 40 feet will be superelevated by revolving the pavement about the inside (median) edge of the roadway. Maximum superelevation will be .06 per foot.

Curves that have separate roadway profile grades or individual alignment for each roadway will be superelevated by revolving the pavement about the centerline of the roadway.

## **II. STRUCTURES**

All highway, drainage or other structures incidental to the construction and/or use of the proposed Anacostia Freeway shall be designed in accordance with the pertinent requirements of the American Association of State Highway Officials Standard Specifications for Highway Bridges. Where structures cross city streets, park roads and railroads, the layout and design of such structures shall further conform to the requirements of the owning or governing agencies.

The typical geometry and details of all structures are to be as shown on Plates XI and XII and as specified herein. All details presented in this report are in conformity with the good practice requirements for structure clearances outlined in "A Policy on Geometric Design of Rural Highways", dated 1954 and adopted by the American Association of State Highway Officials.

The typical side slopes for all earth embankments are shown on Plate IX elsewhere in this report. However, where the geometric design of any structure is dependent upon the shape of adjacent embankments such design shall in general be based upon a uniform earth side slope of 2:1 at the location of the structure.

It is not the intent of this report to specify the precise type of structure to be used at a given location in this project. Each structure is an individual problem and must be considered as such in the final analysis. However, it has



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been the general policy in planning the structures for this project to specify solid abutment type bridges for all grade separation structures, where the road passing beneath the structure may be considered to be a primary road. Where the lower road may be classed as secondary, or where the structure passes over a railroad, the type of structure to be used shall be dependent on the relative cost of the types involved. Wherever feasible open deck girder type structures are to be used with steel or concrete beams supporting the concrete roadway slab.

The keynote of all architectural treatment for the structures in this project is simplicity. Each structure is expected to blend with the highway and become a harmonious part of the surrounding terrain.

In general, all exposed surfaces of the retaining walls, piers, and abutments are to be stone faced, such stone work being made an integral part of the structure.

Where the location of any given structure falls within a relatively uncurved portion of the highway, the sidewalk railing shall be as open and unobstructing to view as strength requirements will permit. For sharply curved ramp structures and for other structures whereon greater safety is considered necessary, a solid concrete parapet approximately sixteen inches high surmounted by a metal rail will be provided adjacent to the sidewalk as shown on the typical ramp structure section on Plate XII.

### **III. Interchanges**

The typical section of the ramps are shown on Plate X. For single lane ramps the roadway will be 18 feet with 1½ foot curb and gutter on either side. This width will enable traffic to proceed past a stalled vehicle. For two lane operation of the ramps the width will be 24 feet with 1½ foot curb and gutter on either side.

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In no case will the curvature of any ramp be such that a speed less than 20 miles per hour cannot be maintained. For large radius curves the probable operating speed will be the design factor for the ramp.

The ramps will be designed to obtain safe travel considering the effects of deceleration and acceleration, and will be of such radii as will fit the area available.

The maximum upgrade will be 4% and the maximum downgrade 6%.

The sight distances will be as long as practical, but in all cases shall be in conformity with the design speed.

The rate of superelevation for curves shall be computed by the following formula:

$$S + F = \frac{0.067 V^2}{R}$$

Where S = Rate of superelevation in feet per foot

F = Tire friction varying from 0.20 @ 20 MPH to 0.16 @ 50 MPH.

R = Radius of curve in feet.

V = Design speed in mph.

The maximum rate of superelevation shall not exceed 3/4 inch per foot.

The minimum rate of superelevation shall not be less than 3/16 inch per foot except in transitions.

In all cases when interchange ramps connect to the Freeway, acceleration and deceleration lanes will be provided in accordance with the aforementioned American Association of State Highway Officials Policy Figs. VII-18, VII-20. Where interchange ramps connect to the existing roadways, acceleration and deceleration lanes will be provided where feasible.

#### **IV Drainage and Landscaping**

Surface drainage shall be accomplished by slopes and lateral ditches connected to suitable cross pipes by inlets or connections to outfall storm water sewers. Ditches will be sodded except when the velocity is sufficient to cause scour and necessitate paving.

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Side slopes will be sodded or seeded with berm ditches at the top of cut slopes and benched when required.

Cross drainage will be accomplished by culverts with headwalls.

The slopes will be flattened or steepened to present a pleasing appearance to blend with the natural surroundings.

Shrubbery will be planted in the median of the curbed section and in interchange areas to prevent headlight glare. Shrubbery will also be used as screening along the right-of-way.

## **V. Lighting**

A study of accident statistics point out the fact that night driving is more hazardous than day driving. Lighting will not eliminate all of the hazards of night driving but increased visibility will reduce these hazards to a minimum. Every section of the Freeway cannot be treated in the same manner, but the following is recommended as a guide.

Any long underpass structure should be clearly visible to the approaching driver and lighted throughout, to show any vehicular obstruction. The wide median section, which is used in the southern section need not be lighted as there are no abrupt changes in grade or alignment. However, the interchange ramps, here as well as elsewhere, should be lighted to show location and direction. The narrow median section which is used in the northern section, with its numerous interchange connections, should be lighted to encourage lowbeam driving to lessen headlight glare.

The design should adhere to the Illuminating Engineering Society publication, "American Standard Practice for Street and Highway Lighting".

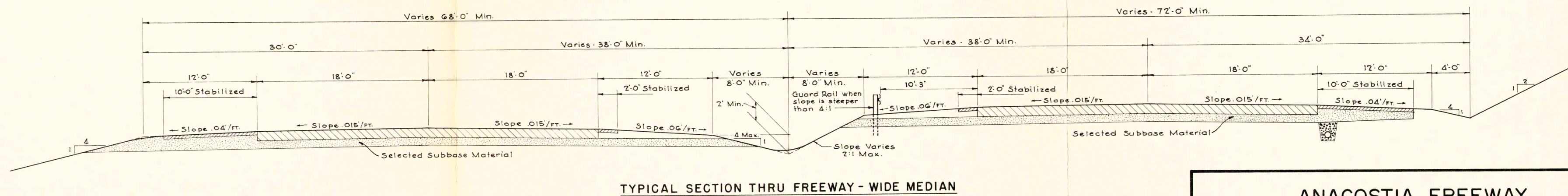
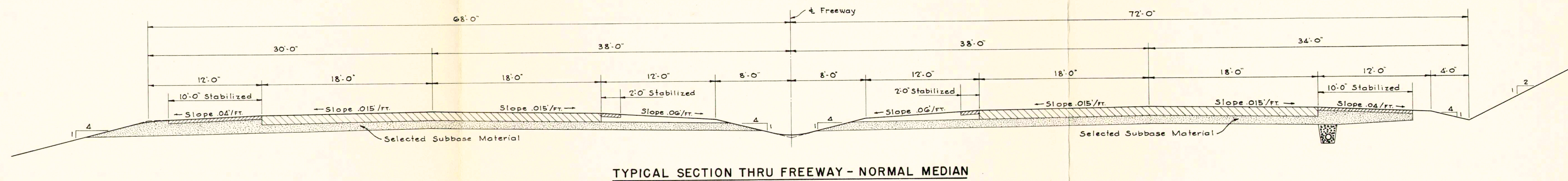
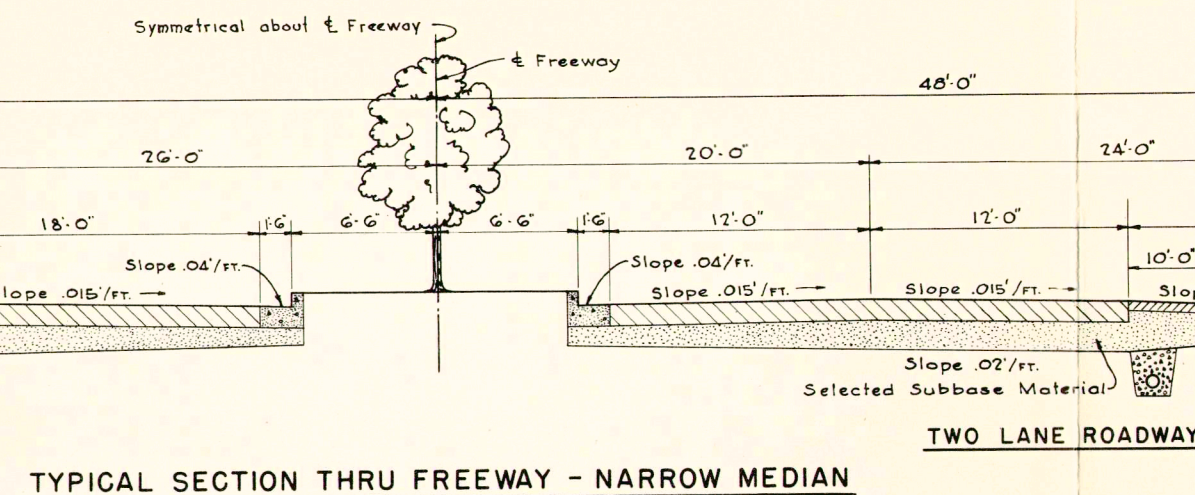
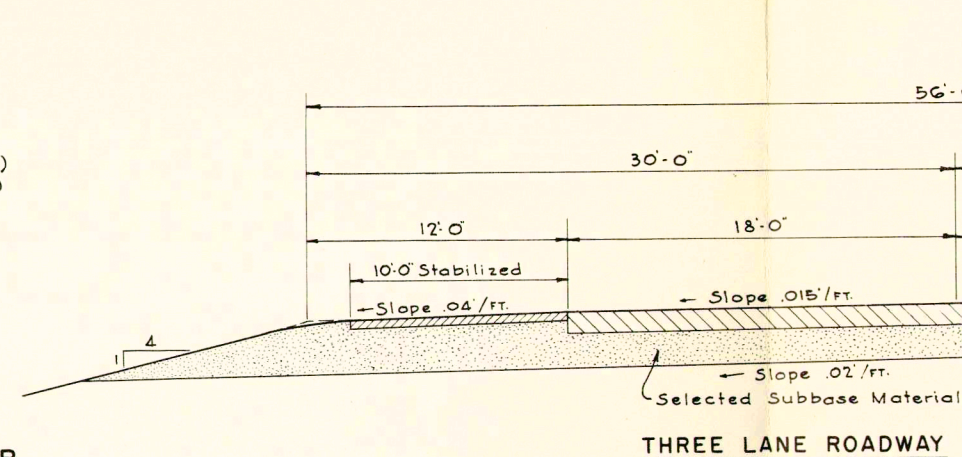
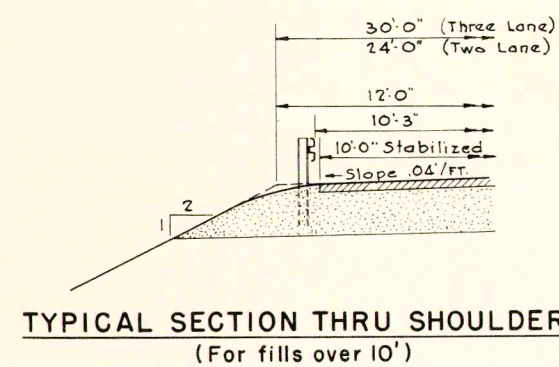
The types recommended are the mercury vapor luminaires for the main line with a study of fluorescent luminaires for ramps, so as to have a contrast with said main line. To eliminate glare, fluorescent luminaires should be used in the underpasses that need lighting.

The standards or poles should in general conform to the types used in the vicinity.









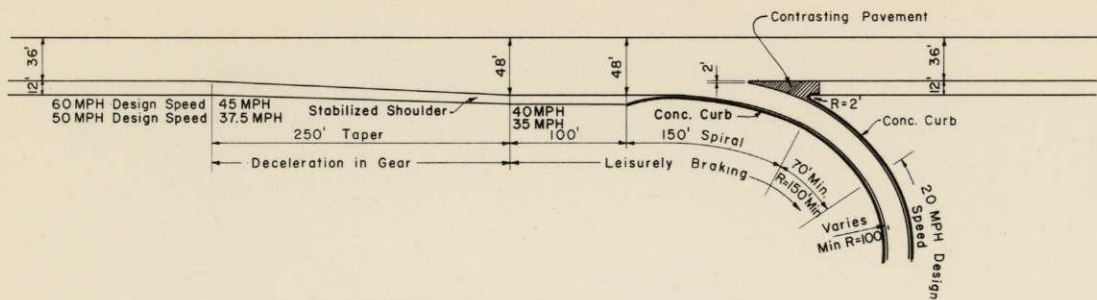
**ANACOSTIA FREEWAY**

**TYPICAL ROADWAY SECTIONS**

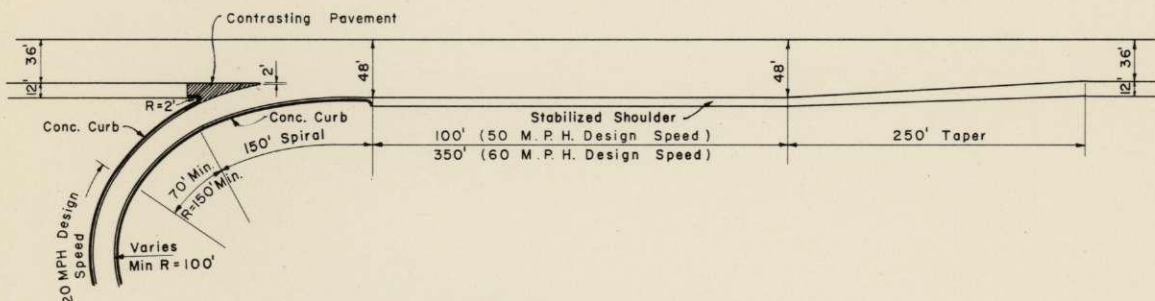
BAKER-WIBBERLEY, INC.

PLATE IX

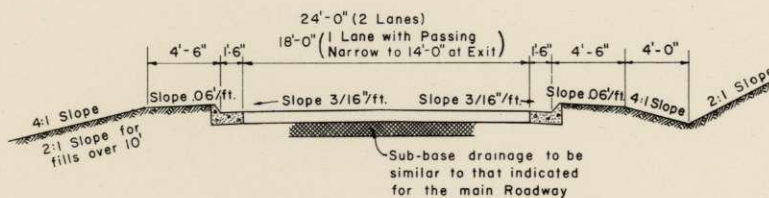




**TYPICAL DECELERATION LANE**



**TYPICAL ACCELERATION LANE**



**TYPICAL RAMP SECTION**

# ANACOSTIA FREEWAY

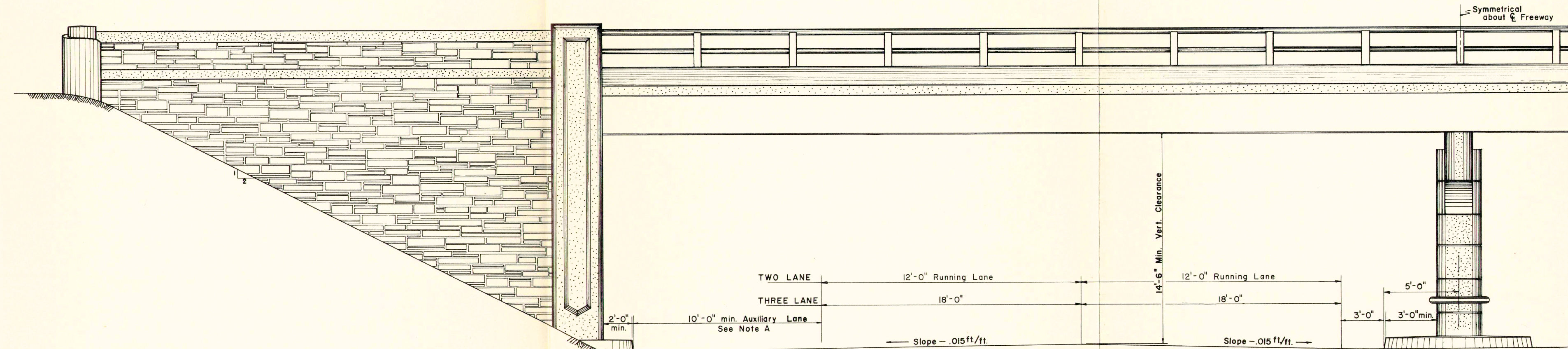
## TYPICAL RAMP SECTION

BAKER-WIBBERLEY, INC.





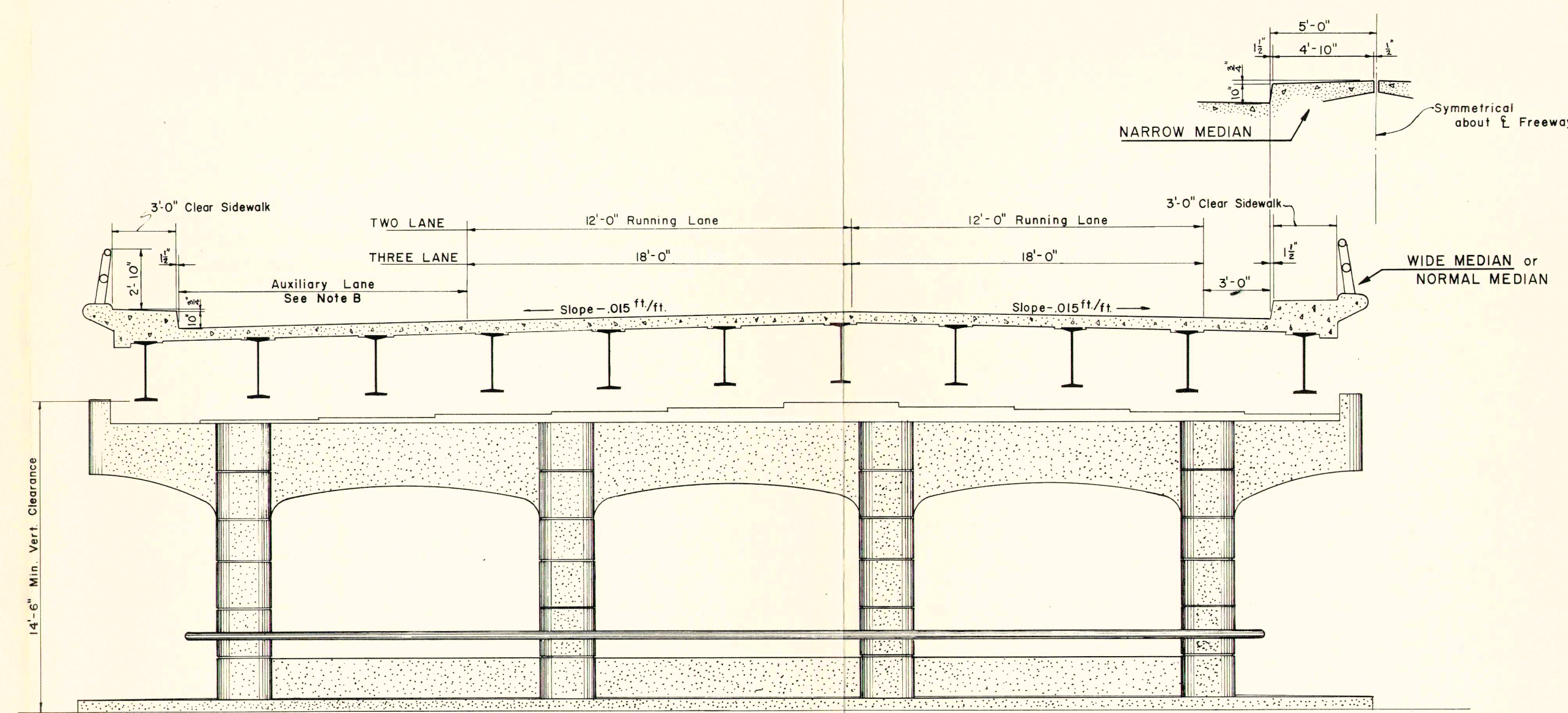
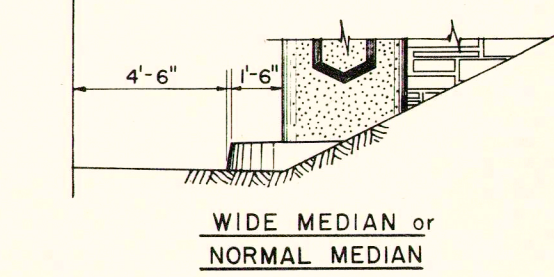




**ELEVATION**  
Showing Proposed Anacostia Freeway Under Intersecting Highway

5 4 3 2 1 0 5 10 FEET  
SCALE

NOTE A: Width of auxiliary lane may vary as required for turning lane. Curb widths at abutments to be 4'-6" min. when such curbs are adjacent to turning lanes.



**ELEVATION**  
Showing Proposed Anacostia Freeway Over Intersecting Primary Road

5 4 3 2 1 0 5 10 FEET  
SCALE

NOTE B: Minimum width of auxiliary lane to be 12'-0" for all overpass structures 100' or less between abutments. Minimum width of auxiliary lane to be 1'-6" for all overpass structures greater than 100' between abutments. Width of auxiliary lane may vary as required for turning lane.

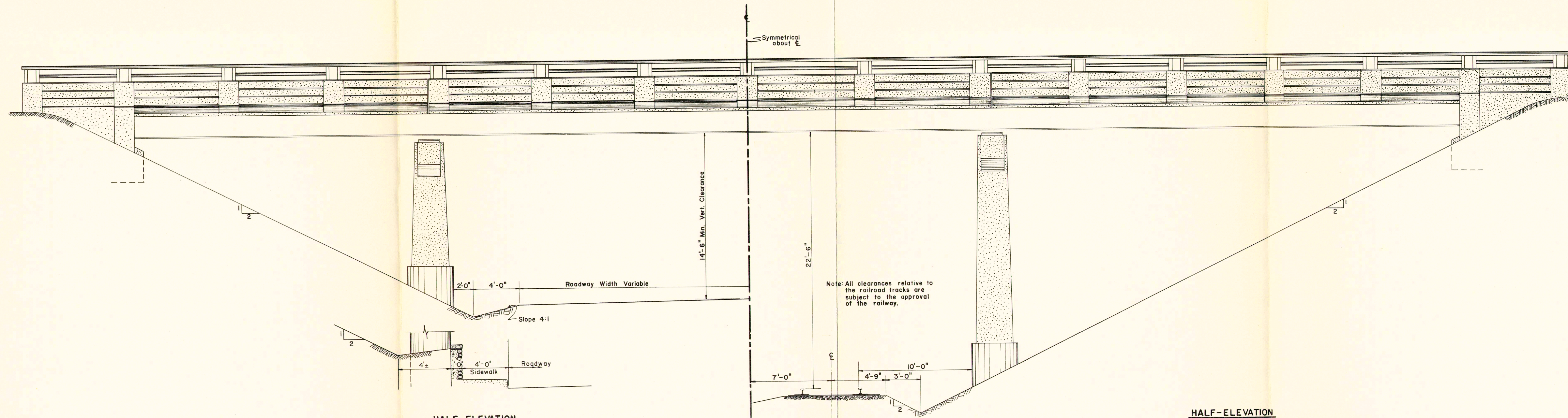
ANACOSTIA FREEWAY

**TYPICAL BRIDGE ELEVATIONS**

BAKER-WIBBERLEY, INC.

PLATE XI



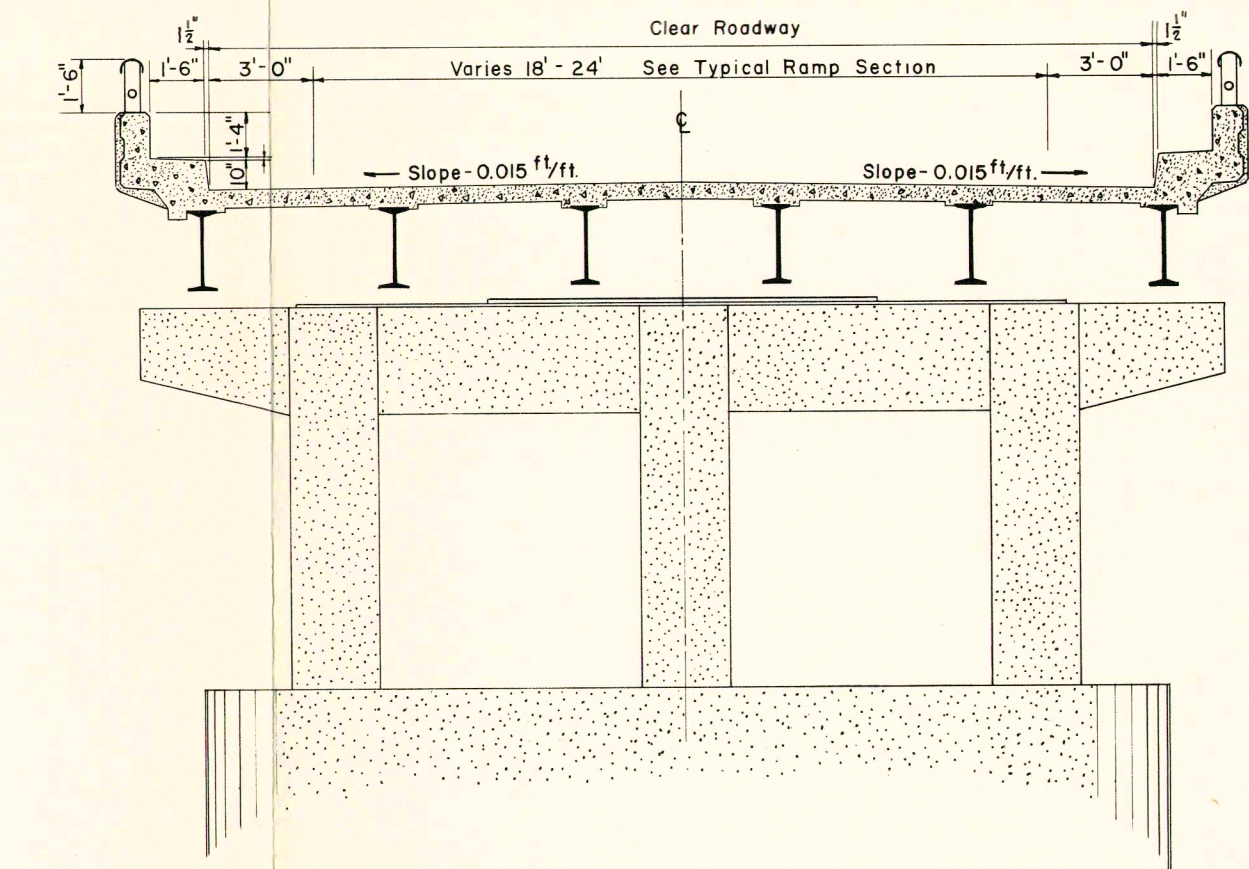


**HALF-ELEVATION**  
Showing Proposed Anacostia Freeway Structure Over Intersecting Secondary Road

5 4 3 2 1 0 SCALE 5 10 FEET

**HALF-ELEVATION**  
Showing Proposed Anacostia Freeway Structure Over Railroad

5 4 3 2 1 0 SCALE 5 10 FEET



**ELEVATION**  
Showing Proposed Anacostia Freeway Ramp Passing Over Intersecting Road

5 4 3 2 1 0 SCALE 5 10 FEET

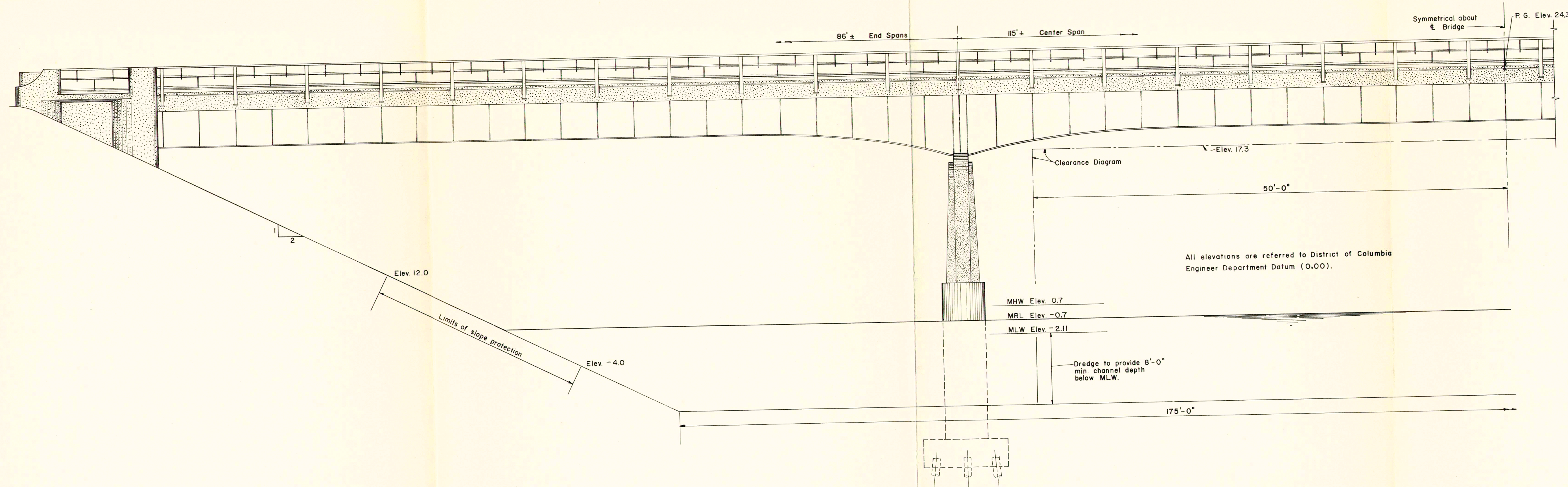
ANACOSTIA FREEWAY

**TYPICAL BRIDGE DETAILS**

BAKER-WIBBERLEY, INC.

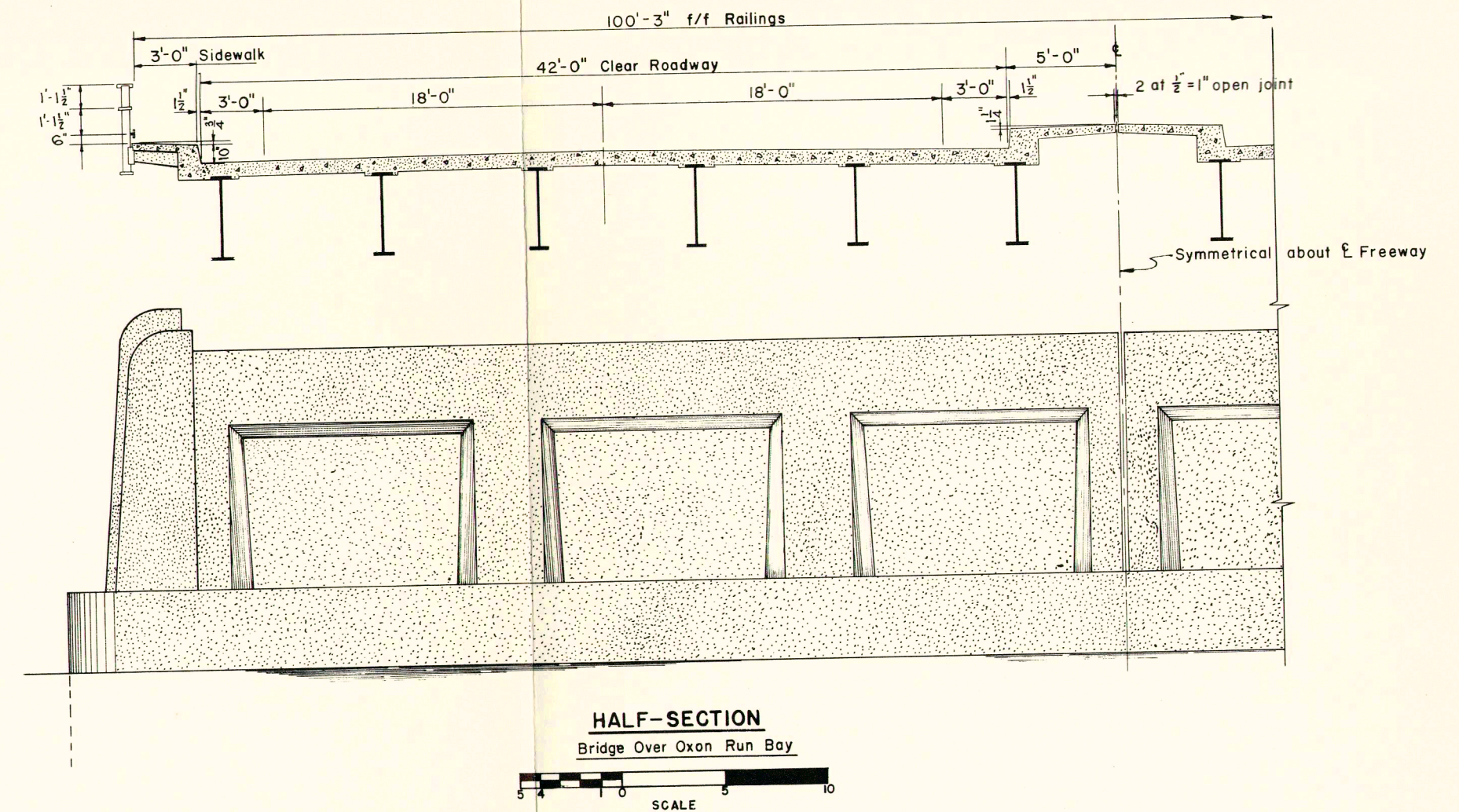
PLATE XII





HALF-ELEVATION  
Bridge Over Oxon Run Bay

SCALE 0 5 10



ANACOSTIA FREEWAY

**STRUCTURE-OXON RUN BAY**

BAKER-WIBBERLEY, INC.



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## SOILS AND FOUNDATION RECONNAISSANCE

The purpose of this Soil and Foundation Reconnaissance is to furnish as much information regarding sub-surface conditions along the route of the proposed Anacostia Freeway as is available from previous Engineering and Geological studies, supplemented by field observations. Information was obtained from the various publications of the United States Geological Survey and the State of Maryland Department of Geology, Mines and Water Resources, from boring data performed for various structures adjacent to the proposed Freeway, from individual contacts with persons in the U.S. Corps of Engineers and the District of Columbia Engineering Department, and from field reconnaissance over the entire line.

The area traversed by the Freeway, following roughly the east shoreline of the Anacostia and Potomac Rivers, lies entirely within the coastal plain province. As a result, the soils are all of sedimentary origin and range from highly plastic clays to sand and gravel, and from the ancient sediments of the Potomac Formations to recent fill. Since in this area the surface of the bedrock lies between 400 feet and 500 feet below sea level, the presence of rock is of no consideration either in the design of structure foundations or cut slopes.

For purposes of presenting the information, the Freeway will be divided into three sections according to the predominant features which exist in each. These three sections, from north to south, are as follows:

SECTION 1 - East Capitol Street to Firth Sterling Avenue.

SECTION 2 - Firth Sterling Avenue to Naval Research Laboratory Entrance.

SECTION 3 - Naval Research Laboratory Entrance to Oxon Run Bay.

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### **Section 1 - East Capitol Street to Firth Sterling Avenue**

Section 1 of the Freeway lies in an area of generally flat topography, where the proposed line follows the low land which lies to the east of the Anacostia River. The profile grade line for this section indicates that the Freeway, for the most part, lies above the existing ground line, to keep above the flood waters of the Anacostia River as well to meet clearance requirements of the various grade separation structures. The soils in this area range from compact sand, gravel, and clay to mud, muck, and fill consisting of city refuse.

It was found desirable to keep the line of the Freeway within the original shoreline of the river and as close to the railroad as possible with due regard for other considerations. Piles will probably be required for all structures with the possible exception in the vicinity of Suitland Parkway, where the soils may permit the use of spread footings.

### **Section 2 - Firth Sterling Avenue to Naval Research Laboratory Entrance**

In Section 2 of the Freeway the topography becomes quite rough, with a major portion of the line following the side hill cuts of South Capitol Street and Overlook Avenue. The soils in this area consist of the granular materials, principally sand and gravel with some silt of the river terrace deposits, on top of the varicolored clay of the Potomac formations.

Because of the low permeability of the clay, ground water which passes through the granular strata, flows along the top surface of the clay and seeps out along the face of the cut at the clay-sand interface. This water, saturating the soil and pavement sub-base along the bottom of the cut, flows along the edge of the existing pavement of South Capitol Street to storm drains where it is carried off.

In Section 2 of the proposed Freeway the most serious problem lies in the poor stability characteristics of the materials composing the hill along which the line of the Freeway runs. The poor stability characteristics are

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caused by the presence of the ground water and the stratigraphic relationships of the materials. Elimination of the ground water problem will serve to increase the stability of the materials and enable the soils to stand on a reasonable back slope. To determine the feasibility of this approach a thorough and comprehensive program of borings and testing will be required. Should conditions prove to be favorable, the use of horizontal drains or other devices for intercepting and lowering the water table may be used advantageously at many places.

Special attention should be given to drainage of the roadway base and subgrade in this section where the subgrade is clay. Thick bases of free draining granular materials will be required to insure satisfactory pavement performance.

### **Section 3 - Naval Research Laboratory Entrance to Oxon Run Bay**

In Section 3 of the Freeway the alignment passes again into the flat topography of the river flood plain. The profile shows that the roadway is in shallow fill for almost the entire length of the section.

Field examination of the soils as well as reference to the Geologic Map indicates that sand, gravel and silt will be encountered except for the area covered by the Oxon Run Bay sanitary land fill. These materials will form a good base for the embankment as well as be suitable in many places for granular base and sub-base. In this area the ground water table will be found fairly close to the surface, probably ranging between 5 and 15 feet in depth.

Just north of Oxon Run Bay the District of Columbia is operating a sanitary land fill in the low area along Oxon Run Bay and the Potomac River. Fill material consists of tin cans, sewage sludge, fly ash, cinders and other materials of low stability and bearing value.

Should borings disclose a considerable depth of unsuitable material, resort to some method of accelerated consolidation or displacement may be necessary while a shallow depth may be more economically removed and refilled. It will be desirable that the existing sanitary fill material be removed and replaced with suitable embankment material.



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## RIGHT-OF-WAY

The tax records of the District of Columbia Assessors office have been to develop the estimated right-of-way costs. Proximity damage has not been taken into account, thus the figures show tangible values only. For the purpose of this estimate an entire lot or parcel would be considered taken even if right-of-way area required only a portion.

### RIGHTS-OF-WAY

#### Part 1 - East Capitol Street to Pennsylvania Avenue

Privately owned lands .....	\$ 69,520
Privately owned improvements .....	\$220,510

#### Part 2 - Pennsylvania Avenue to Eleventh Street

Privately owned lands .....	\$ 27,850
Privately owned improvements .....	\$ 31,640

#### Part 3 - East of Railroad at Eleventh Street

Privately owned lands .....	\$514,800
Privately owned improvements .....	\$441,040

#### Part 4 - Eleventh Street to Suitland Parkway

Privately owned lands .....	\$428,710
Privately owned improvements .....	\$733,330

#### Part 5 - Suitland Parkway to Oxon Run Bay

Privately owned lands .....	\$ 32,220
Privately owned improvements .....	\$ 37,480

### SUMMARY OF COSTS

Privately owned lands .....	\$1,073,000
Privately owned improvements .....	\$1,464,000
TOTAL .....	\$2,537,000

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## CONSTRUCTION COST ESTIMATE

### COST OF ROADWAY

The average unit prices current in this area are used as a basis for the following cost estimate.

Item	Quantity	Unit Price	Total
Clearing and Grubbing	216 acres	500.00	108,000
Excavation	790,000 cu.yd.	1.00	790,000
Borrow Material	1,870,000 cu.yd.	0.60	1,122,000
Pavement	356,200 sq.yd.	5.00	1,781,000
Selected sub-base material	305,000 cu.yd.	2.50	762,500
Concrete curb and gutter	75,000 lin.ft.	1.80	135,000
Bit. stabalized shoulders	78,800 sq.yd.	1.25	98,500
Guard Rail	32,000 lin.ft.	2.50	80,000
Right-of-way fence	32,000 lin.ft.	1.50	48,000
Landscaping, seeding, ect.	6.8 mi.	50,000.00	340,000
Drainage	6.8 mi.	100,000.00	680,000
Railroad relocation	4,600 lin.ft.	15.00	69,000
Lighting	3.9 mi.	20,000.00	78,000
Maintenance of Traffic	Lump Sum		18,000
Public Utilities	Lump Sum		46,000
Total for Roadway			\$ 6,156,000



# COST OF STRUCTURES

No.	Structure & Location	Cost
1	Bridge - Ramp "B" over East Capitol St.	\$ 291,100
2	Bridge - Over Pennsylvania R.R. yard	2,433,400
3	Bridge - Over Pennsylvania Avenue	550,200
4	Pedestrian Overpass at Station 113 ±	70,200
5	Bridge - Over Ramp 7, 11th St. Interchange	184,500
6	Bridge - W. B. 11th St. over Freeway	178,500
7	Bridge - E. B. 11th St. over Freeway	194,000
8	Bridge - Ramp 10 over Nichols Ave., 11th St.	70,000
9	Bridge - Ramp 10 over B & O R.R., 11th St.	172,900
10	Bridge - Over Howard Rd.	379,600
11	Bridge - Over Suitland Parkway	597,600
12	Bridge - W.B. Suitland Pkwy under Park Rd. conn.	110,100
13	Bridge - E.B. Suitland Pkwy under S. Capitol St.	85,000
14	Bridge - Over Firth Sterling Ave.	342,700
15	Bridge - Over B & O R.R. (Station 188 ±)	952,900
16	Bridge - Over Portland St.	281,200
17	Bridge - S. Capitol St. over Ramp 22	147,600
18	Bridge - Over S. Capitol St.	484,300
19	Bridge - Over Chesapeake St.	177,900
20	Bridge - Over Nav. Res. Lab. entrance road	188,500
21	Bridge - Over Oxon Run Bay	516,600
	Misc. Retaining Walls adjacent to Structures 1 and 5; at Stations 180 ± and 200 ± ; and at S. Capitol St. Interchange.	523,200
TOTAL FOR STRUCTURES		\$ 8,942,000



**CONSTRUCTION COST ESTIMATE  
SUMMARY**

Roadway -----	\$ 6,156,000
Structures -----	8,942,000
	-----
	15,098,000
15% Engineering and Contingencies	2,265,000
	-----
Total Construction cost	\$17,363,000
Right-of-way	2,537,000
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TOTAL PROJECT COST	\$19,900,000



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## SUMMARY

During the past decade the Washington Metropolitan Area has expanded to such an extent, in both area and population, that the present highway facilities can no longer accommodate the resulting increases in traffic volumes. This fact, coupled with the ever increasing through traffic volumes, has resulted in critical traffic problems.

One of the most rapidly expanding areas within the Washington Metropolitan Area is the Anacostia Area and neighboring Prince Georges County, Maryland. The population of these areas has increased nearly 300% since 1940. There are also numerous military installations and governmental offices located within the area, thus adding considerably to the daily traffic volumes crossing the Anacostia River. The Anacostia River is crossed at the present time by five bridges, namely, the Benning Road Bridge, East Capitol Street Bridge, Sousa Bridge, Anacostia Bridge and South Capitol Street Bridge. From the East Capitol Street Bridge south to the South Capitol Street Bridge, there is no highway facility to effectively distribute the heavy traffic volumes over the Anacostia River Bridges, destined to and from central Washington, resulting in poor utilization of the existing bridge facilities. Expansion of present traffic volumes further indicate that by 1959 a companion bridge to the Anacostia Bridge will be necessary in order to adequately accommodate the traffic volumes at that time. The prompt consideration of this companion structure cannot be over emphasized.

It must also be pointed out that the Anacostia Freeway will effectively serve that traffic desiring to by-pass central Washington, upon the completion of the Potomac River Crossing at Jones Point. Plans for the Jones Point Bridge are already in progress and the southern portion, at least, of the Anacostia Freeway should be constructed concurrently with that structure.

The location of the Anacostia Freeway presented in this report is considered entirely feasible from a topographic, traffic and economic standpoint. The design as presented herein is a modern controlled access

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freeway, containing four and six lanes as traffic dictates. It is recommended that the location, design criteria and geometrics be approved by the Commissioners of the District of Columbia in order that the preparation of contract plans may be started immediately and that actual construction be started at the earliest possible date.

The Anacostia Freeway as presented in this report has an overall centerline length of 8.2 miles. This centerline length is comprised of 1.4 miles of bridges and 6.8 miles of roadway; 6.6 miles of ramp roadways are required to insure adequate connection to the facility. The estimated total construction cost of \$17,363,000.00, is based upon actual 1955 construction costs within the general area of the project. It must be noted that due to the nature of the project, the type terrain traversed and the many bridges and grade separations necessary for the proper functioning of the facility, construction cost will of necessity be high. However, economic justification of the project is in the fact that the facility is urgently needed in order that the present and planned highway facilities, in the area, may function properly and to their best advantage.

The location of the Anacostia Freeway as delineated herein traverses, for the most part, publicly owned property. The majority of the privately owned property encountered is in the vicinity of Suitland Parkway. The estimated cost for the acquisition of property for right-of-way purposes is \$2,537,000.00, or approximately 13% of the total construction cost of the project. At the present time, the right-of-way cost on this project is not a serious consideration, however, should the right-of-way as delineated herein not be protected by early transfer or purchase, serious problems could arise. It is therefore, recommended that the Commissioners of the District of Columbia take the necessary steps to protect all required rights-of-way in connection with the Anacostia Freeway as soon as possible.







