

The MOUNT VERNON MEMORIAL HIGHWAY



DESCRIPTION PREPARED
FOR INSPECTION TRIP
OF DELEGATES TO
SIXTH INTERNATIONAL
ROAD CONGRESS
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BUREAU OF PUBLIC ROADS
DEPARTMENT OF AGRICULTURE

UNITED STATES DEPARTMENT OF AGRICULTURE

THE MOUNT VERNON MEMORIAL HIGHWAY
HISTORY, DESIGN, AND PROGRESS IN CONSTRUCTION

Under Supervision of
THE BUREAU OF PUBLIC ROADS



UNITED STATES
GOVERNMENT PRINTING OFFICE
WASHINGTON : 1930

THE MOUNT VERNON MEMORIAL HIGHWAY

HISTORY

The conception of a highway to Mount Vernon built as a memorial to George Washington originated with some citizens of Alexandria, Va., in 1886. In 1888 the Mount Vernon Avenue Association was incorporated by the Virginia Legislature to further this idea. Under the provisions of an act of Congress passed in 1889, Brig. Gen. Peter C. Hains, of the Corps of Engineers, United States Army, surveyed and reported on three principal routes between the city of Washington and Mount Vernon. Although the idea fostered by this association had from time to time been commended and indorsed by Presidents of the United States, by Secretaries of War, by Members of Congress, and by most of the great national and patriotic organizations, no tangible progress was made toward its fulfillment until an act of Congress was passed May 23, 1928, authorizing and directing the United States Commission for the Celebration of the Two Hundredth Anniversary of the Birth of George Washington to take such steps as might be necessary to construct a suitable memorial highway to connect Mount Vernon with the south end of the Arlington Memorial Bridge across the Potomac River and providing funds for this purpose.

The need for improved highway facilities to Mount Vernon has greatly increased from year to year. Entirely aside from the memorial aspect, there has been pressing need for a suitable and adequate thoroughfare to the home of the Founder of the Nation. In 1885 there were only 35,000 visitors to Mount Vernon. In 1928 there were over 400,000, coming from every State in the Union.

In August, 1925, an actual count of the traffic on the existing road leading to Mount Vernon, made by the Bureau of Public Roads, showed that the road was used during one week by 9,157 automobiles and 208 busses, or an average daily traffic of 1,306 automobiles and 30 motor busses. The licenses carried by the automobiles represented practically every State.

Two general routes were considered for the location of the highway: One following closely along the shore of the Potomac River and passing through the city of Alexandria, the other following a direct inland route and skirting the city of Alexandria. After weighing the merits of the two routes the commission unanimously adopted the river route as having greater scenic and historic advantages than the inland route, and offering superior possibilities for the development of park areas between the highway and the river.

ROUTE TRAVERSES HISTORIC TERRITORY

The route adopted for the highway traverses a territory full of historic associations and reminiscent of the days of Washington. About halfway between Washington and Alexandria the route passes close to the site of Abingdon, the home of John Custis, Mrs. Washington's son. Here Nellie Custis, Washington's adopted daughter, was born. A beautiful view of the river and a panorama of Washington and the north shore is seen from this point.

Passing on to Alexandria, the route enters the city by Washington Street and passes directly by Christ Church, where the Washington pew may still be seen. This church was visited by 154,318 people in 1926, in addition to those attending services.

Alexandria was Washington's own town. It was his market place, his post office, and his voting place. It was the meeting place of the lodge of Masons to which he belonged, and the lodge hall is now the repository of a great many articles and paintings associated with him. The trowel, square, and plumb bob used in laying the cornerstone of the Capitol may be seen here, and also the Bible that was used in the days of Washington. Here also is an original painting of Washington by Gilbert Stuart, and the Pope Peale painting of him in early life, and many other paintings and interesting relics too numerous to mention. There were 93,484 visitors to this shrine in 1926.

There is scarcely a foot of ground in Alexandria that Washington did not tread. The old quarters of the volunteer fire company,

of which Washington was a member, still stand. In Gadsby's Inn, now the City Hotel, he recruited his first company of Provincial Troops, authorized by Governor Dinwiddie, with which he fought the Battle of Great Meadows.

In the ballroom of the City Hotel in 1798 was held the first celebration of Washington's birthday. From the steps of the same building he gave his last military command to the Alexandria Light Infantry Blues, his bodyguard during the Revolution; and here, also, in November, 1799, less than 30 days before his death, he cast his last vote.

At the Carlyle House, still standing, he received his appointment as major in the British Army on General Braddock's staff; and in this house also, at the Convention of the Five Governors assembled to confer with General Braddock, the first suggestion of colonial taxation was made, the step which ultimately led to the revolt of the Colonies.

Other places of historic interest still standing in the city and intimately associated with the life of Washington are the homes of Dr. James Craik, of Dr. Elisha Cullen Dick, his family physician, and the home of Light Horse Harry Lee and of his two famous sons, Robert E. Lee and Sydney Smith Lee.

A short side trip from Washington Street down King Street takes the traveler to the George Washington National Masonic Memorial, which is being erected at the western outskirts of the town on Shooters Hill.

Returning to Washington Street and proceeding southward the traveler soon reaches the southern limits of the town and passes within a stone's throw of the first corner stone of the District of Columbia, still standing on Jones Point with the inscription still complete.

Leaving Alexandria the route crosses Hunting Creek and rises to high ground from which a broad panorama of the river and distant Washington are spread before the eye, and then, overlooking the river, it follows the ridge to Old Fort Hunt, and thence to the entrance gates of Mount Vernon.

CONSTRUCTION PROGRESS OUTLINED

The construction work is being undertaken in a number of different units, each requiring its own particular kind of equipment.

Unit No. I includes the construction of a riprap foundation for sea wall to inclose the river side of the fill between Columbia Island and the Pennsylvania Railroad bridge, and the hydraulic fills.

Unit No. II covers the grading other than hydraulic, small drainage structures, and incidental construction.

Unit No. III consists of the bridges, 12 in number.

Unit No. IV will include the paving and other details.

Unit No. I was advertised for contract in August, 1929, and a contract was awarded for the construction of the riprap foundation sea wall. This part of the unit has been completed. Satisfactory bids were not received for the construction of the hydraulic fills, and request was made to the Secretary of War to undertake the work with equipment owned by the Government. Dredging operations were started in October, 1929, by the district engineer's office of the War Department for the Washington area under the immedi-

ate supervision of the Corps of Engineers of the United States Army, and good progress has been made on the work. The subsurface conditions at the locations of the hydraulic fills make this construction rather difficult and expensive, particularly because heavy granular material is being used in the embankments so that they will stabilize within the shortest possible time. The soft unstable material encountered at the locations for the hydraulic fills ranged from 12 to 30 feet in depth.

Unit No. II was advertised for contract in December, 1929, and construction work started in March, 1930. Progress on the grading work has been exceptionally good, and it is expected that it will be substantially completed before the end of the calendar year.

Unit No. III was advertised for contract in January, 1930, and construction work started in April, 1930. Progress on this unit has also been good, and it is expected that a number of the bridges in the contract will be completed before the end of the calendar year.

Unit No. IV will not be advertised for contract before the beginning of the next calendar year.

FEATURES OF DESIGN DISCUSSED

The location selected for the highway required the construction of fills across approximately $2\frac{3}{4}$ miles of open water. Construction for this entire distance with the exception of approximately one-quarter mile is being placed by hydraulic methods.

Crossing the Highway Bridge over the Potomac River en route to Mount Vernon, construction work on the highway may be seen at the south end of the bridge. Approximately 750,000 cubic yards of hydraulic fill has been placed between Columbia Island and the railroad bridge, extending the shore line of the river to the second pier from the south end of the Highway Bridge. A detour trestle has been constructed around the two south spans of the Highway Bridge which are to be removed to permit suitable connection to be made between the highway and the bridge for the interchange of traffic. The center of the grade separation structure for the Memorial Highway will be at the location of the south abutment of the river bridge. The underpass at the Richmond, Fredericksburg & Potomac Railroad and the location of the bridge over Boundary Channel may be seen from this point.

Leaving Alexandria and crossing Hunting Creek on the existing road, construction work on the highway may again be seen from a distance. This work consists of the construction of a bridge spanning the channel of the creek and the placing of the hydraulic fill across the water gap. The length of the fill across the water at this location is approximately 3,000 feet.

Except through the city of Alexandria, the location of the highway follows closely the shore of the Potomac River for the greater portion of the distance. In the vicinity of Wellington Villa a residential development was spread out along the shore of the river for a mile or more, making it necessary to establish the location inland, skirting this development. Direct access to the highway from a compact residential development, fronting the highway, would not only slow up traffic but be a constant source of danger. To provide for this situation a system of border roads has been planned for this portion of the project so that traffic from this area, as it continues to develop, will be picked up on the border roads and delivered to the highway at predetermined points of access. A highway grade separation at Wellington Villa is a part of this general plan.

The bridges, in general, are to be stone-faced reinforced concrete arches, using native stone laid in random bond. Curved steel girders are being used for the underpass at the Richmond, Fredericksburg & Potomac Railroad, to obtain an arch effect and harmonize with the other designs. The architectural elevations are by Mr. Gilmore D. Clarke, consulting landscape architect for the highway, and the designs are by the Bureau of Public Roads.

The figures which follow illustrate a number of features of the design of the Highway.

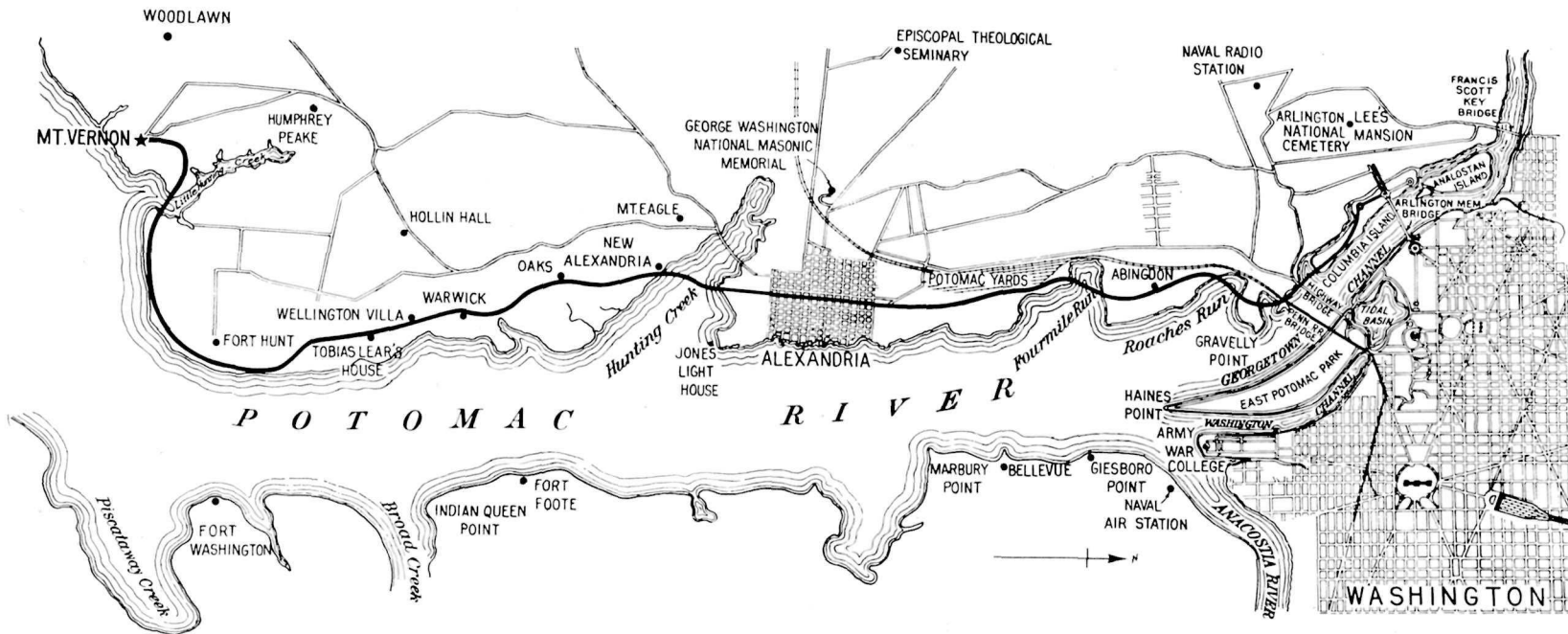


FIGURE 1.—Sketch showing location of Mount Vernon Memorial Highway

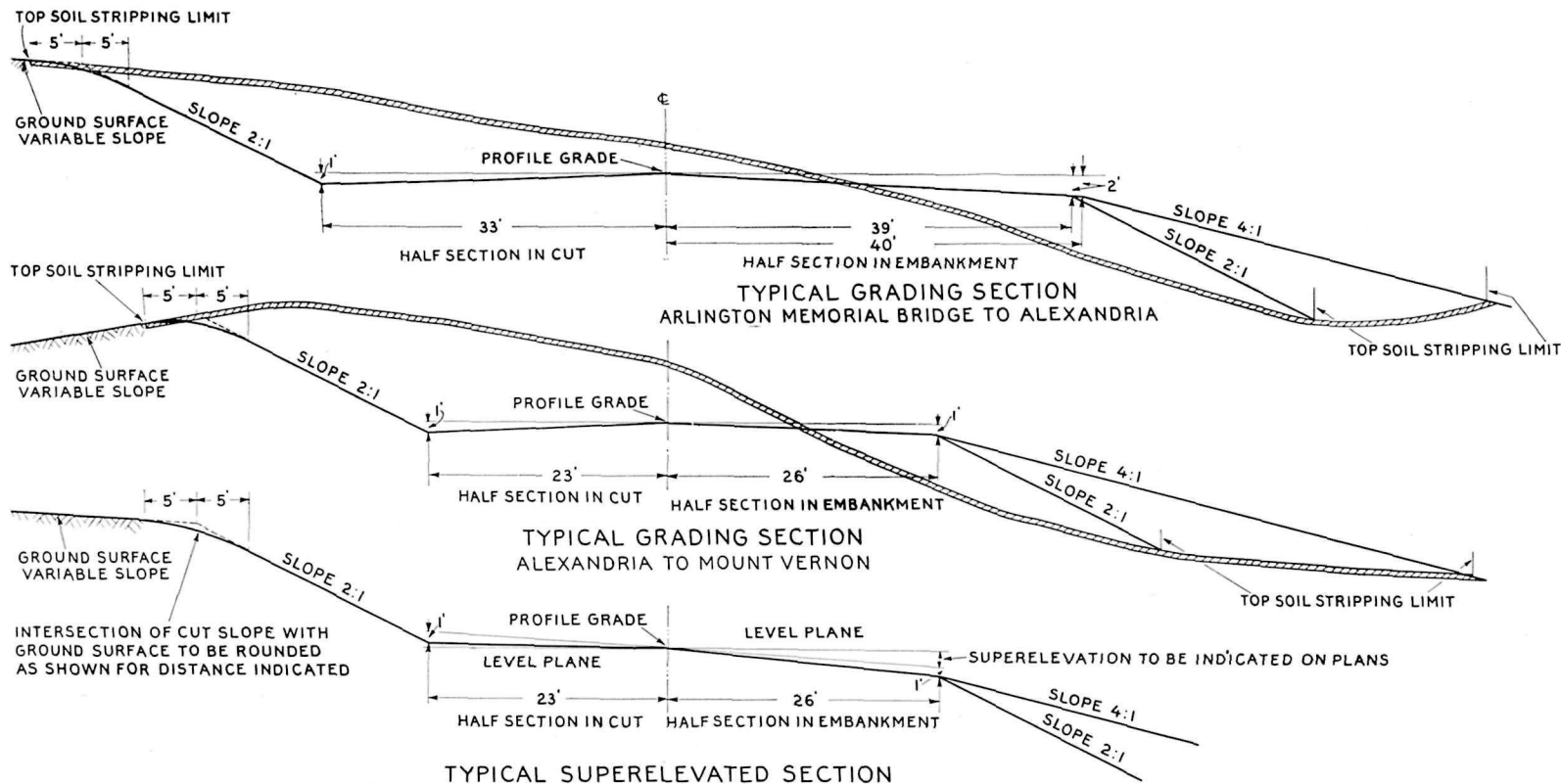
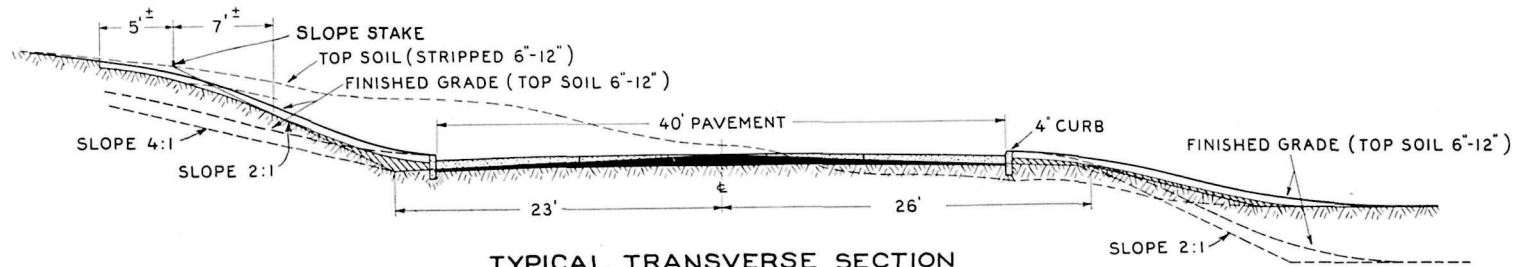


FIGURE 2.—Typical sections for the land grading. Three level sections have been used of such width and cross slope that a lateral movement of the earth excavated for the subgrade will provide a sufficient amount of material for the proper slope of the shoulders. Provision has been made for stripping suitable top soil and storing it beyond the limits of the slope stakes so that it can be used to cover the shoulders and slopes

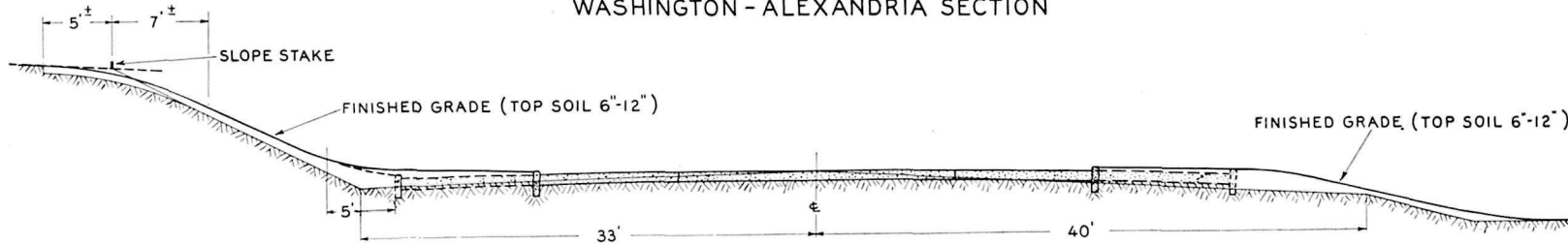
ALEXANDRIA - MOUNT VERNON SECTION



TYPICAL TRANSVERSE SECTION

SOLID BLACK SHOWS SUBGRADE EXCAVATION TO BE MOVED LATERALLY TO BRING SURFACE OF SLOPES PARALLEL WITH FINISHED TOPSOIL GRADE

WASHINGTON - ALEXANDRIA SECTION



TYPICAL TRANSVERSE SECTION

SHOWING PROPOSED 40' PAVEMENT WITH GRADED SLOPES DESIGNED TO ACCOMMODATE FUTURE 60' PAVEMENT WIDTH

FIGURE 3.—Transition of the grading sections into the finished improvement. The earth in the crowned grading section, represented by the solid black areas, is excavated and moved to the sides in the preparation of the subgrade and provides a sufficient amount of material for the shoulders. The section from Washington to Alexandria is being graded to accommodate a 60-foot pavement, although only a 40-foot width is contemplated at the present time. The lower section shows how the original construction will permit of widening without disturbing the original slopes



Courtesy of U. S. Army Air Service

FIGURE 4.—Airplane view of the area which will be occupied by a highway grade separation structure and connecting ramps at the south end of the Highway Bridge across the Potomac River, taken during the first stages of placing hydraulic fill. The riprap foundation for seawall to inclose the river side of the fill to be placed at this location appears as a white line. The plans provide for the removal of the two southerly spans of the Highway Bridge and the replacement of the roadway on earth fill, which will permit direct access to the Highway Bridge from the Memorial Highway over a connecting ramp

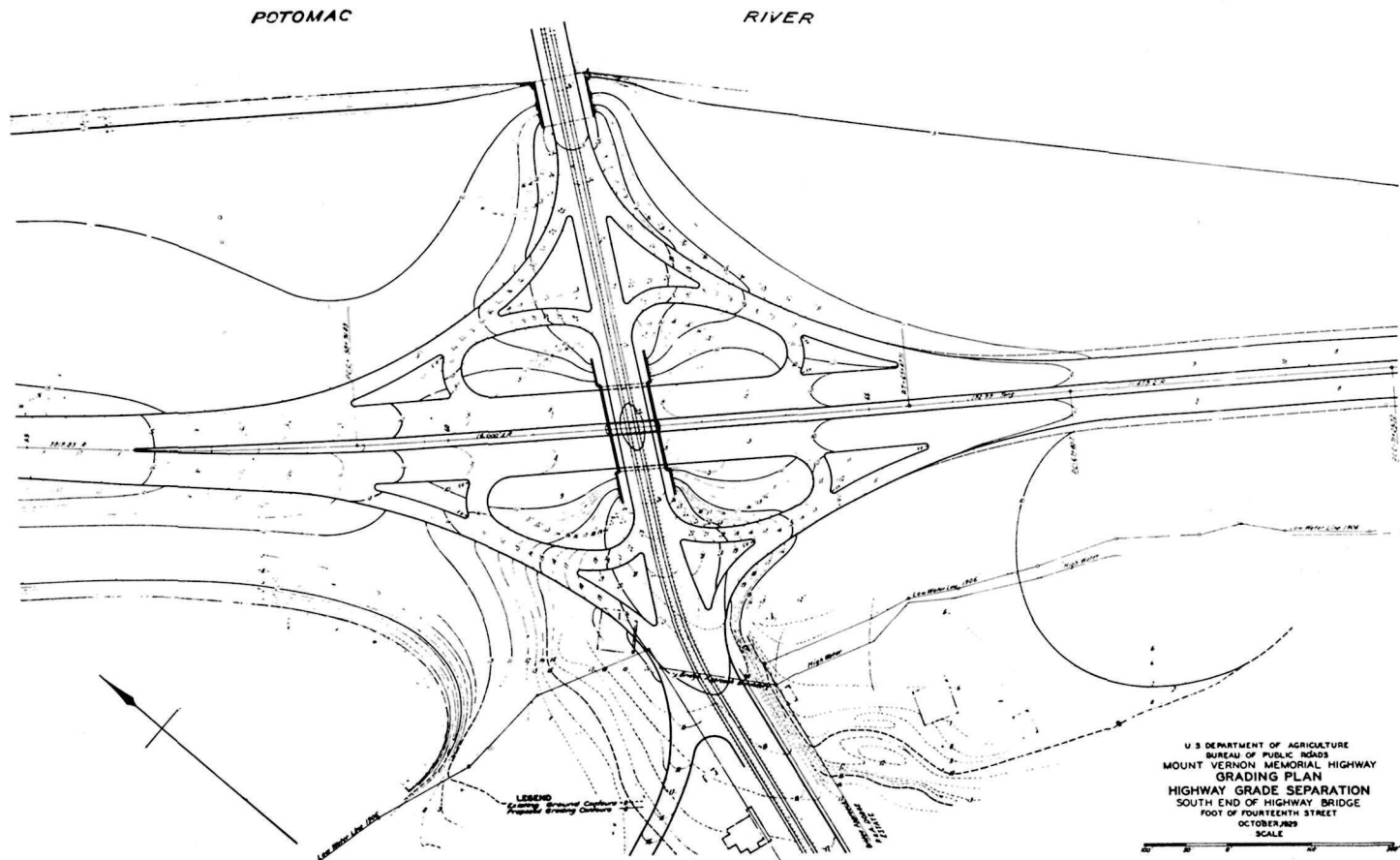


FIGURE 5.—Grading plan of the highway grade separation at the south end of the Highway Bridge across the Potomac River. The highway will pass under the present Alexandria road, and in order to make suitable connection with the Highway Bridge a system of ramps has been provided, which will permit the distribution of traffic in all directions without any left turns or cross traffic. Divided roadways are used approaching this grade separation. The island between the roadways serves as an effective means of preventing left turns and simplifies the scheme of circulation. Extra pavement width is provided on the Memorial Highway at the grade separation, so that traffic over the highway at all times will have clear, unobstructed right of way

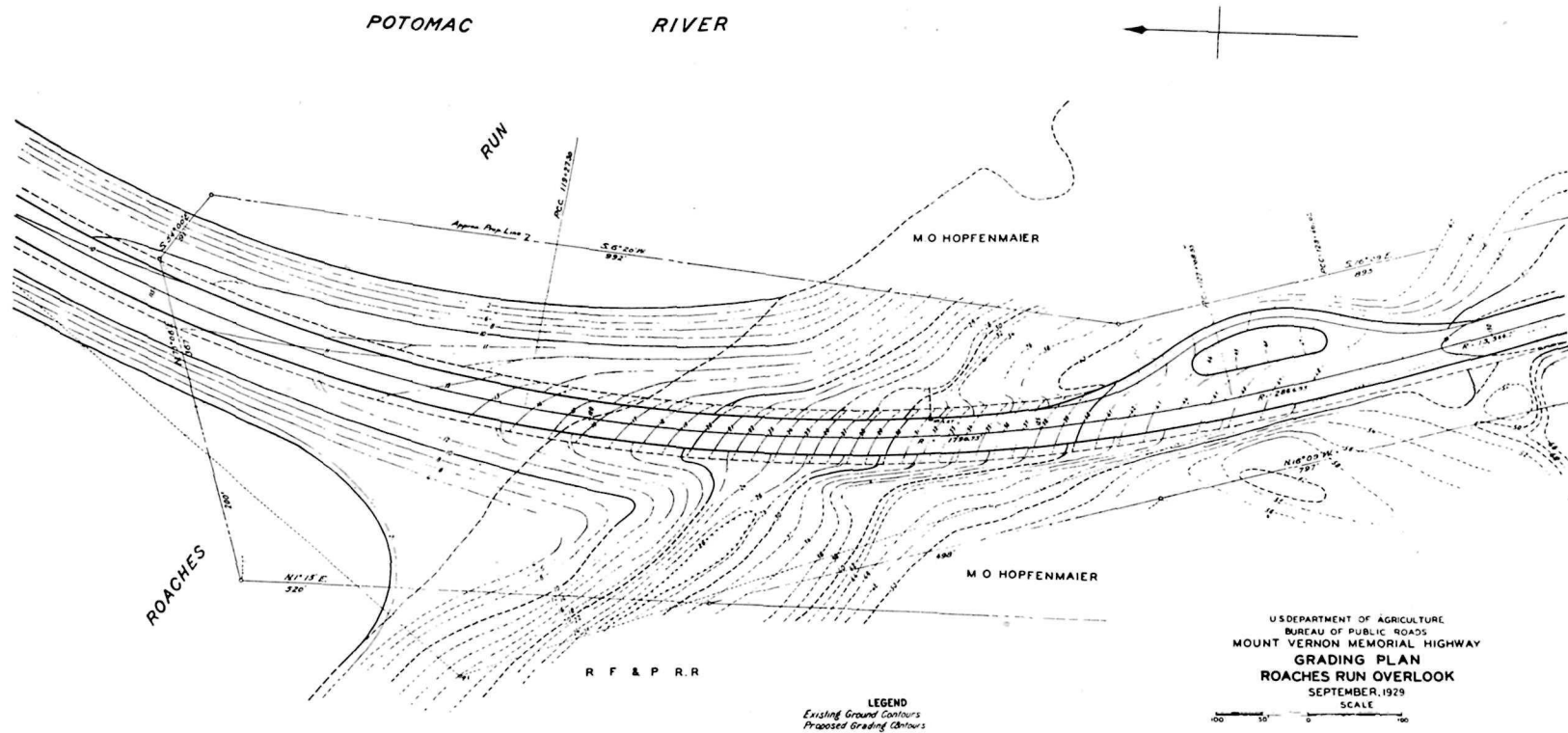


FIGURE 6.—At various points of high elevation along the route where there are commanding views of the city, or the opposite shore of the river, provision has been made for suitable overlooks which will permit of a small amount of parking. At some points islands separate these parking overlooks from the highway. At others, provision for parking is made by the simple expedient of adding extra width of continuous pavement, which widens out and returns in pleasing lines

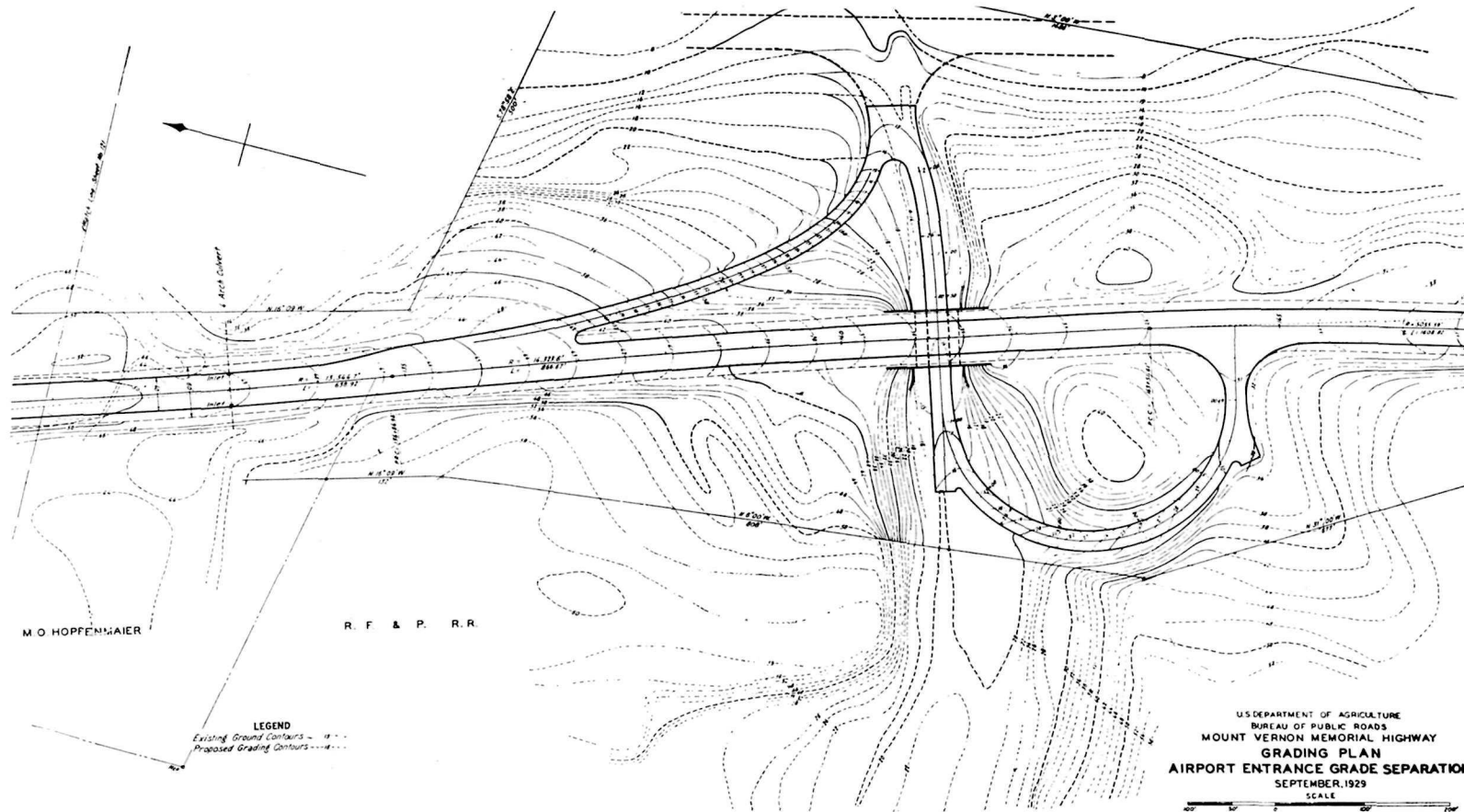


FIGURE 7.—Various features of design have been incorporated into the highway in an endeavor to provide adequate traffic service for any future development which may take place between the highway and the river. This figure shows a grade separation plan which will provide access to the river area without cross traffic. Because of the improbability of any general distribution of traffic being required at this point, this structure has been provided with only two connecting ramps. Additional ramps may be provided for general circulation

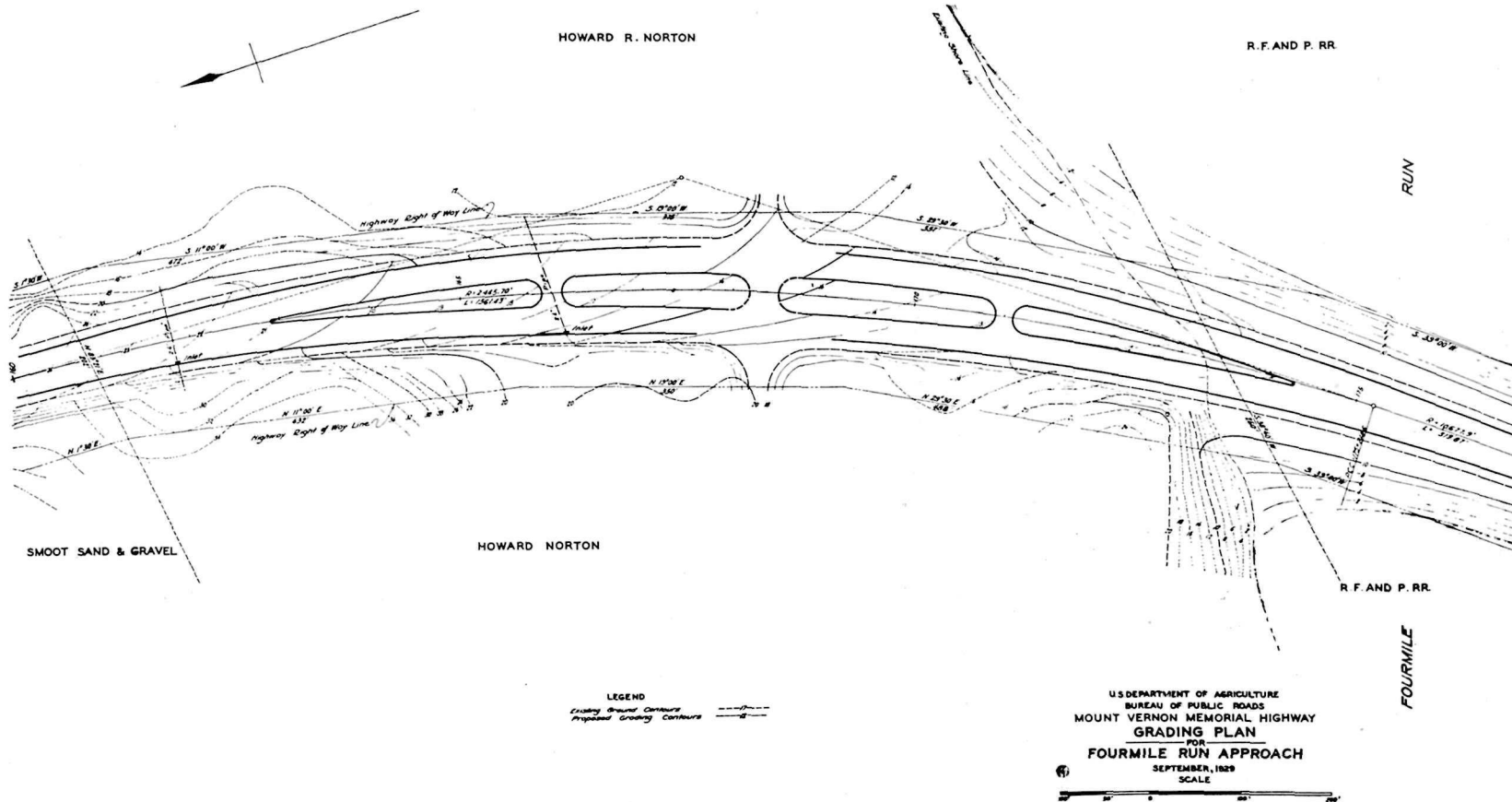


FIGURE 8.—Provision for turning around and also for a small amount of cross traffic at grade has been made on curves where the roadway can be widened to permit the placing of islands of sufficient width. Pleasing and easy-flowing alignment is obtained, and also a safe means of surface crossing. On a heavily traveled 4-lane highway it is almost impossible at times to get sufficient break in traffic to permit crossing at grade. Divided roadways, separated by islands, facilitate crossing at grade by permitting it to be done in two operations. A break in the traffic flowing in one direction permits a crossing to the island, and the crossing is completed at the first break in traffic flowing in the opposite direction. Even on heavily traveled roads, crossings of this character may be accomplished in the space of a few minutes. An extra traffic lane is provided on all divided roadways, so that the inside traffic lane may be used by vehicles desiring to turn

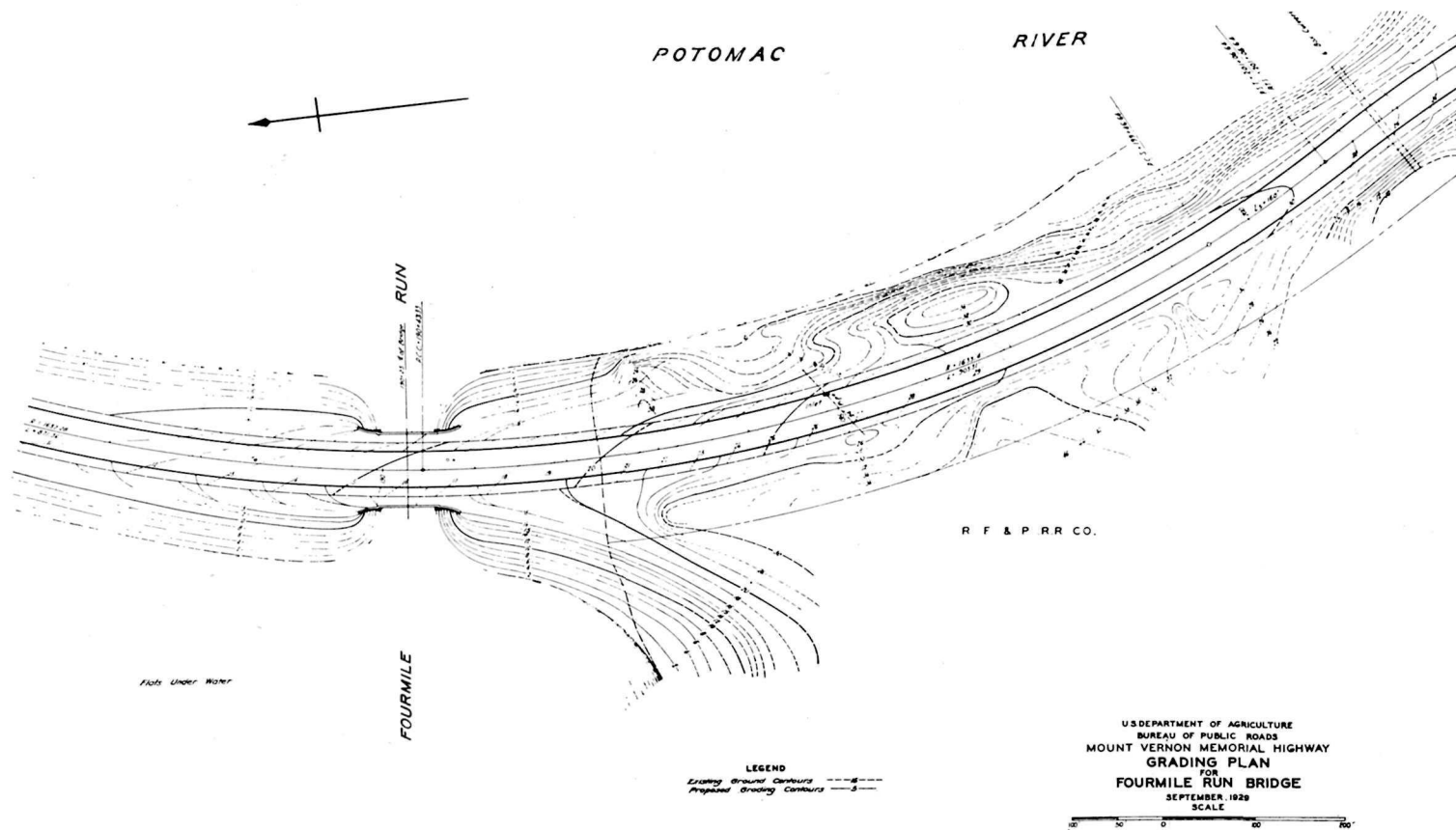


FIGURE 9.—Plan for constructing the hydraulic fills as they approach the shore line. The top width of the hydraulic fills will be 100 feet, and as they approach the shore lines they are being widened to merge with the shore

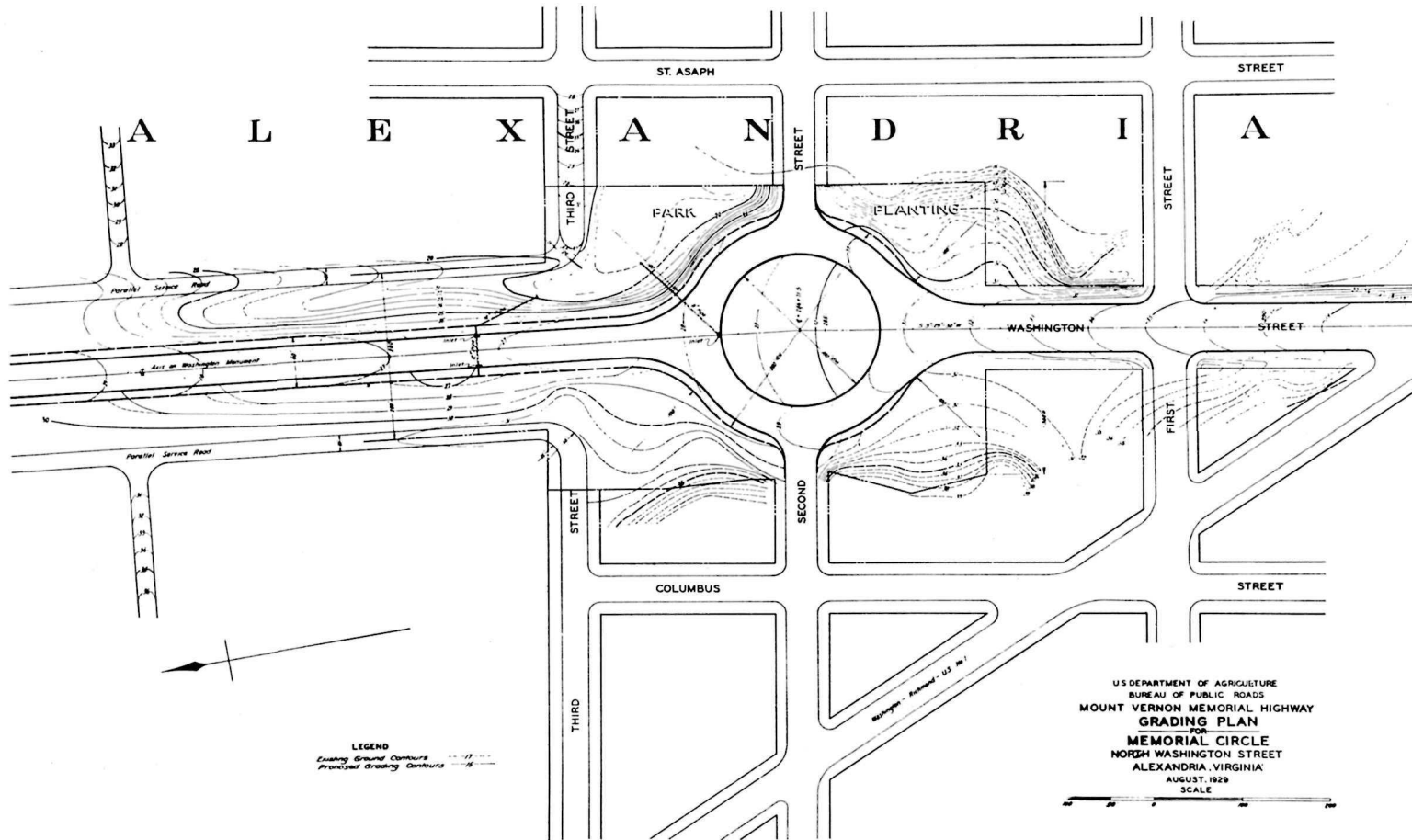


FIGURE 10.—The approach to the city of Alexandria is around a circle. A circle is particularly appropriate for this purpose as it represents the logical point of transition from a high to a low speed zone

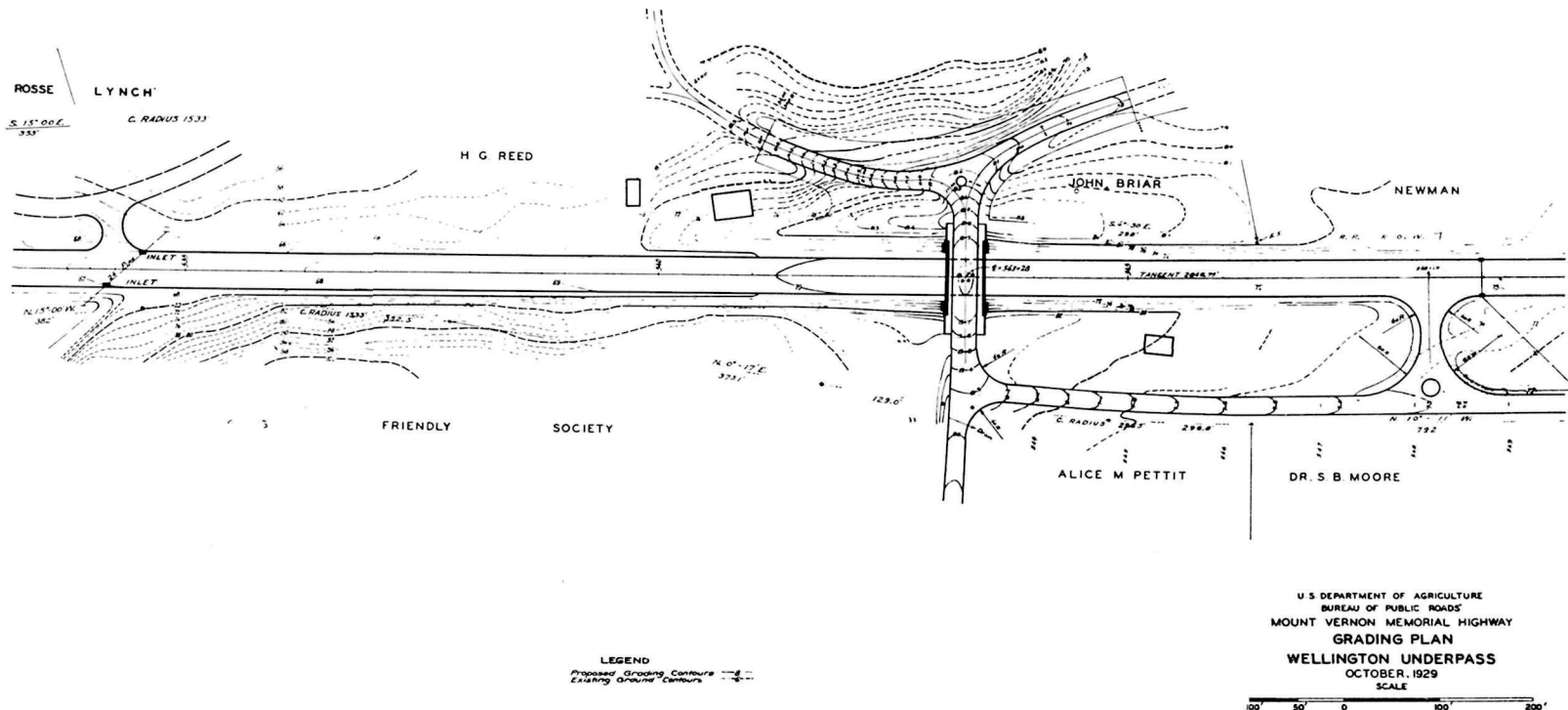


FIGURE 11.—A grade separation plan in which the highway is carried under the crossroad. This location is not considered as a general distribution point for traffic, so provision has been made only for access and egress at two points

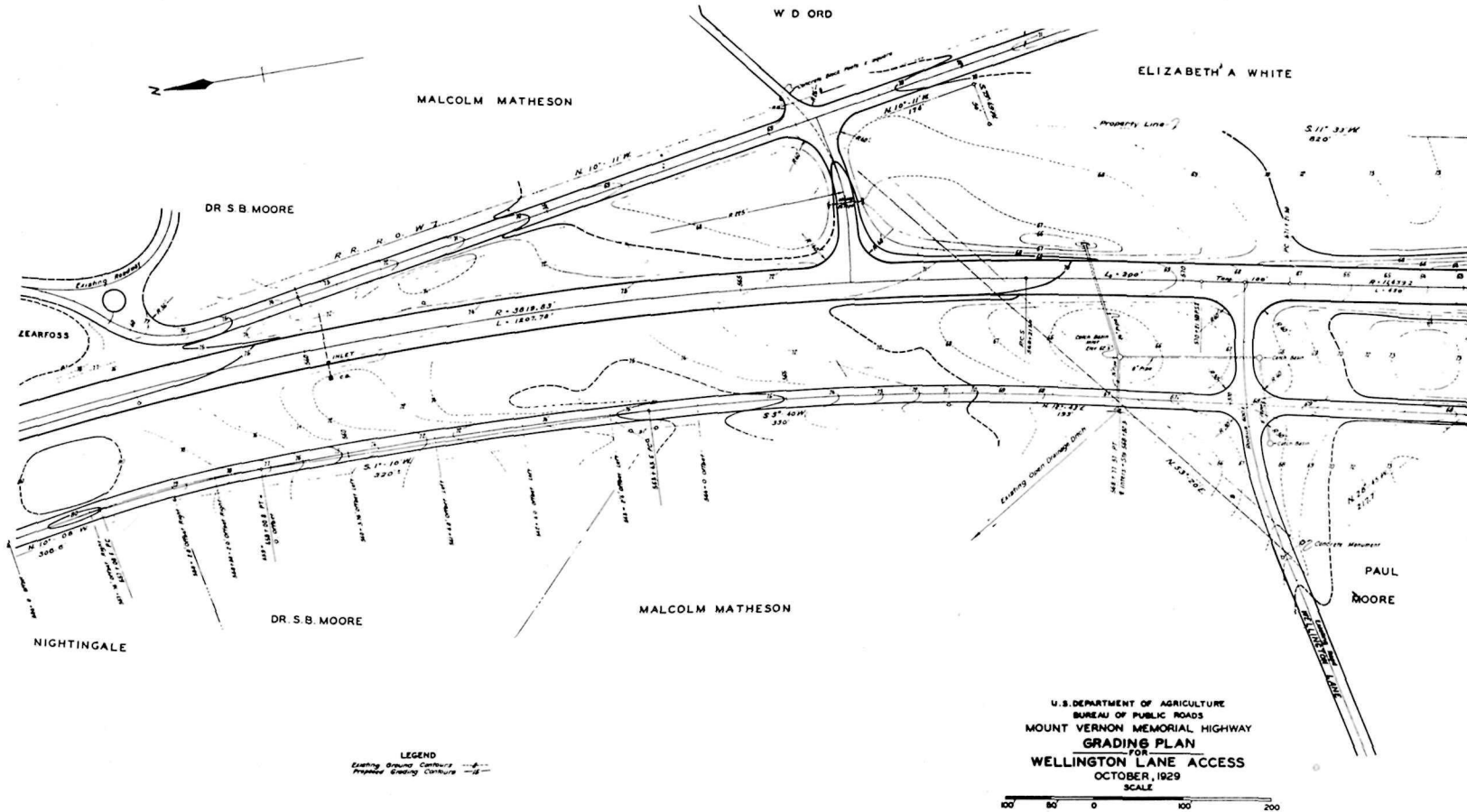


FIGURE 12.—Where it has been necessary to provide crossings at grade and the curvature is too slight to permit dividing the roadway with pleasing lines, staggered outlets have been used. Staggered outlets permit traffic to cross the traffic lanes on one-half of the highway and then flow with and weave across the traffic on the other half to an exit. The distance provided for the weaving of traffic across the half width of the pavement is approximately 400 feet, or the equivalent of a city block

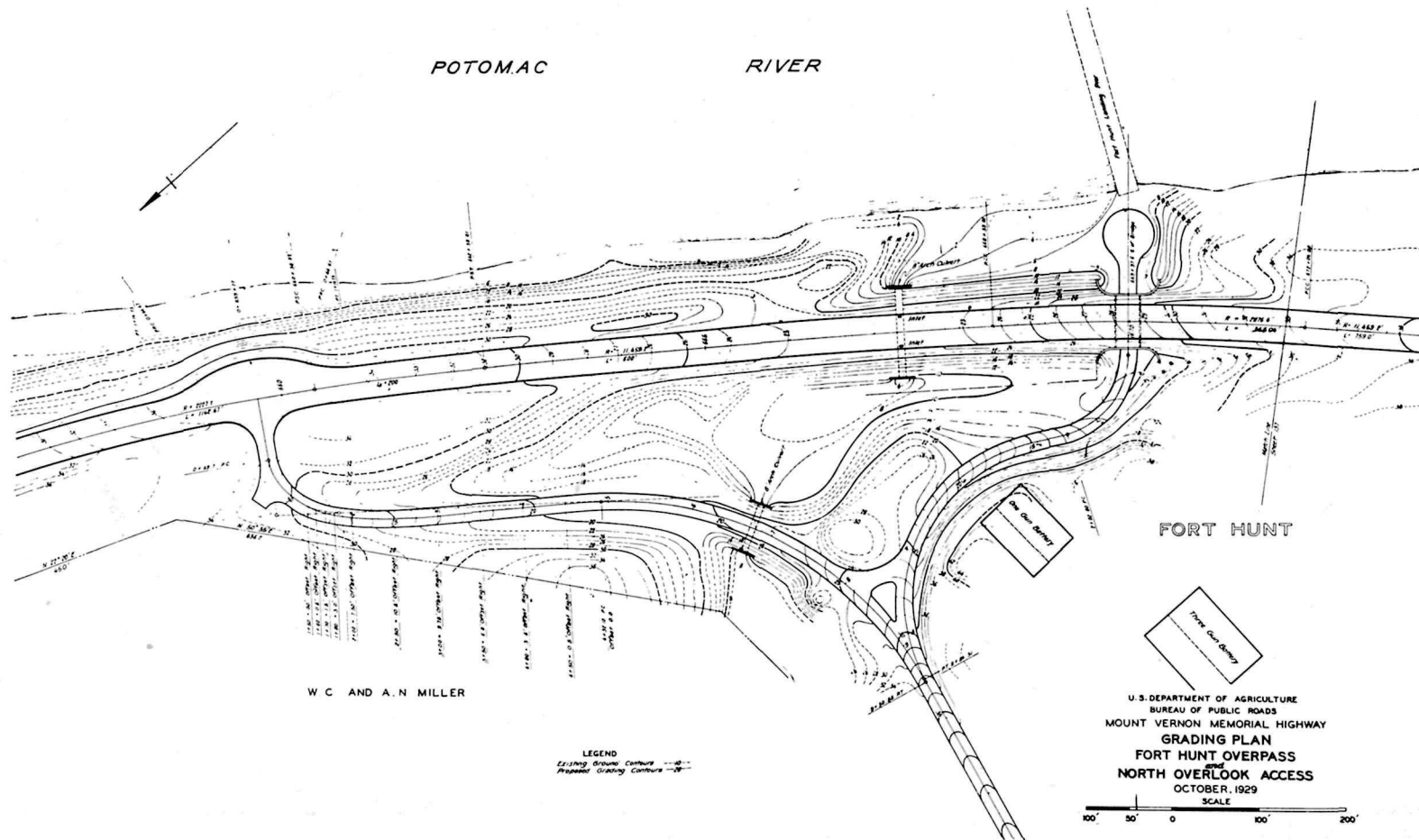


FIGURE 13.—Provision has been made for access to Fort Hunt Military Reservation and to the existing wharf. The highway passes over the road to the wharf, and at the high point of access provision has been made for a small amount of overlook parking

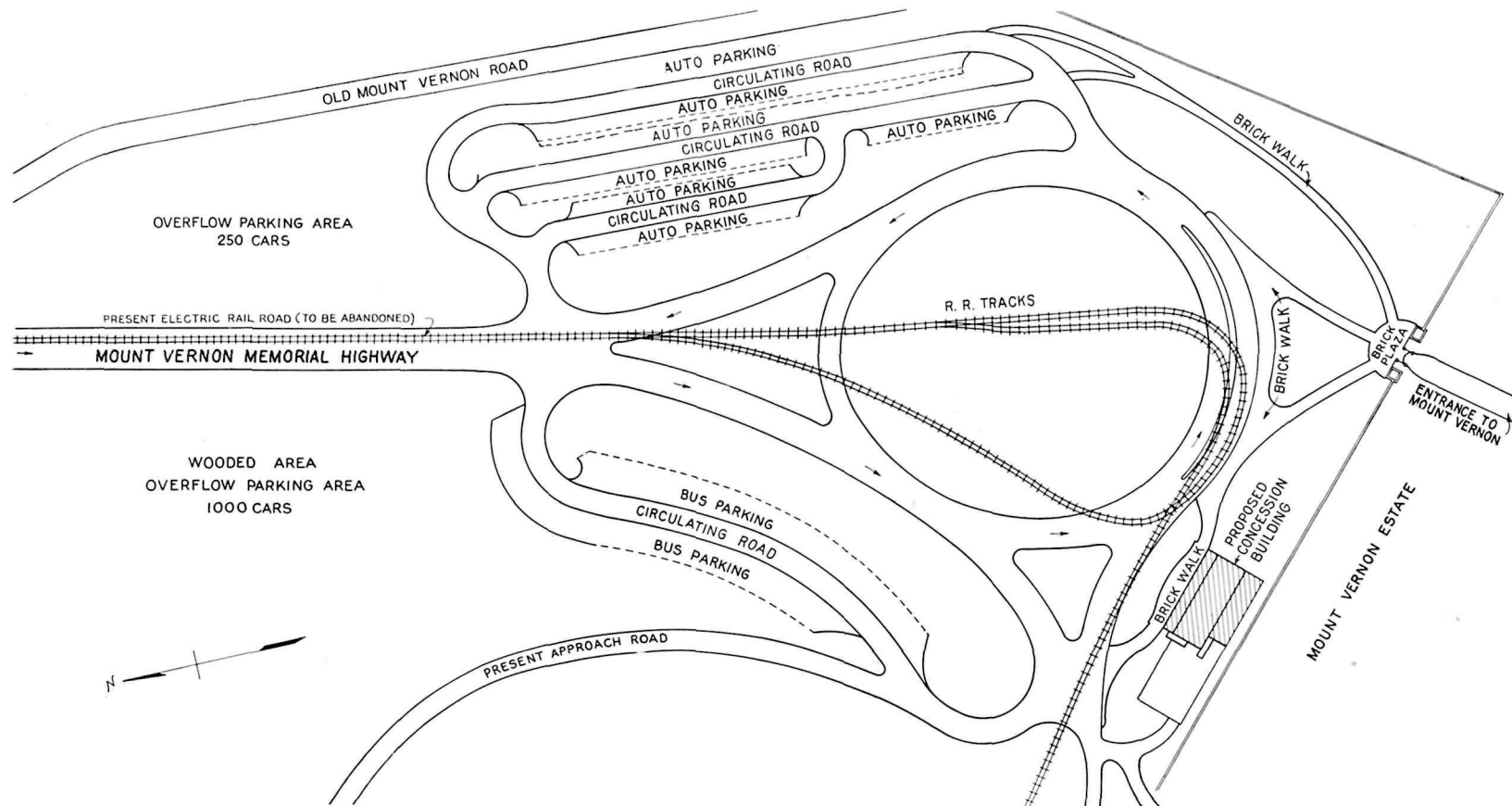
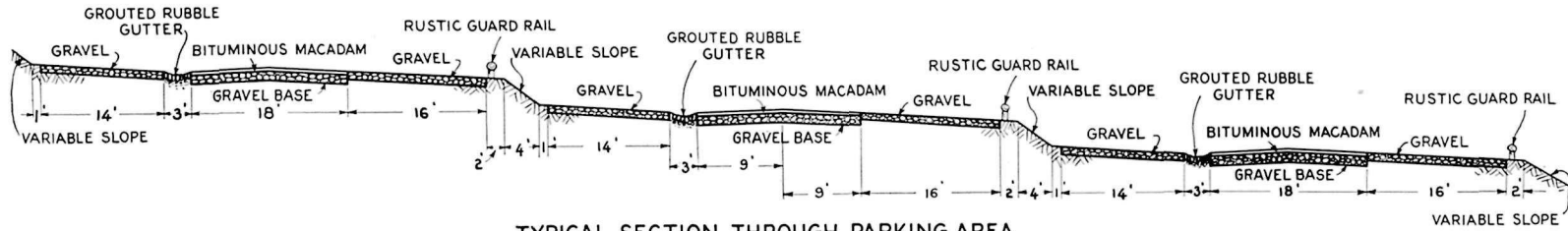
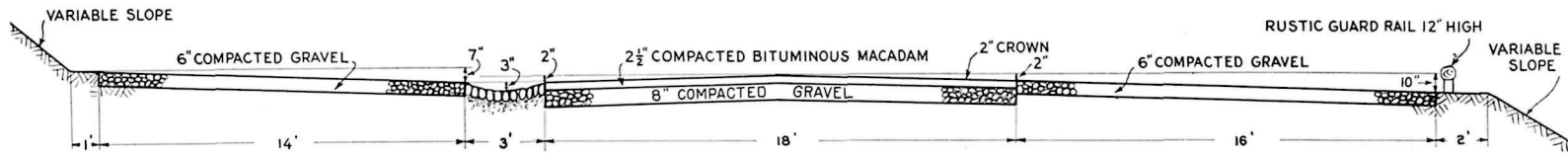


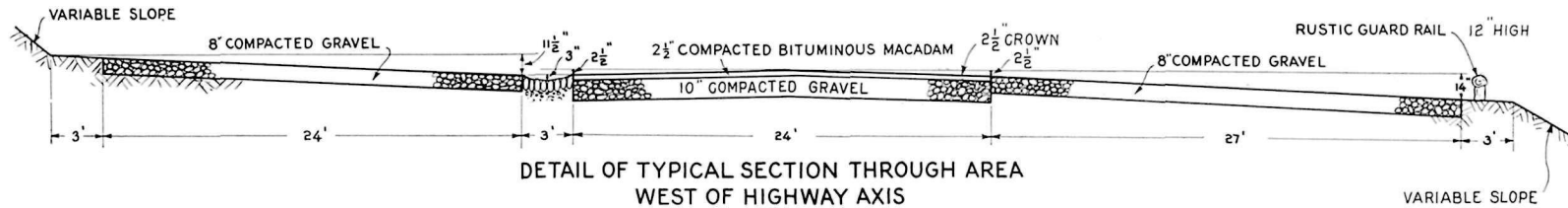
FIGURE 14.—Treatment of the Mount Vernon terminus to the project and the parking facilities provided for automobiles and buses. Bus parking will be separate from automobile parking. The construction outlined in this layout will provide parking facilities for 350 passenger automobiles and approximately 60 buses. It is estimated that these parking facilities will be ample to meet all ordinary requirements. Title is being taken to a sufficient area of land, so that overflow parking to the extent of 1,500 or more vehicles can be accommodated by utilizing the natural ground surface, which would be made available by a small amount of selective cutting



TYPICAL SECTION THROUGH PARKING AREA EAST OF HIGHWAY AXIS



DETAIL SECTION OF A PARKING UNIT OF TYPICAL SECTION THROUGH PARKING AREA EAST OF HIGHWAY AXIS



DETAIL OF TYPICAL SECTION THROUGH AREA WEST OF HIGHWAY AXIS

FIGURE 15.—Typical section through the parking areas at Mount Vernon terminus. Each parking unit consists of a circulation road with resting areas for cars on each side. The circulation road will be constructed of penetration macadam on a gravel base while a plain gravel surface will be used for the resting areas. After consolidation the gravel surface will be oiled or covered with a bituminous surface treatment to eliminate dust. Approximately 57 feet of width is required for each passenger automobile parking unit. Eighteen feet of this width is used for the circulation road and approximately 16 feet for each resting area. The topography of the area makes it possible to obtain a terraced effect between parking units. The circulation road through the bus parking area will be 24 feet in width and the resting area 27 feet in width, which is sufficient for diagonal bus parking

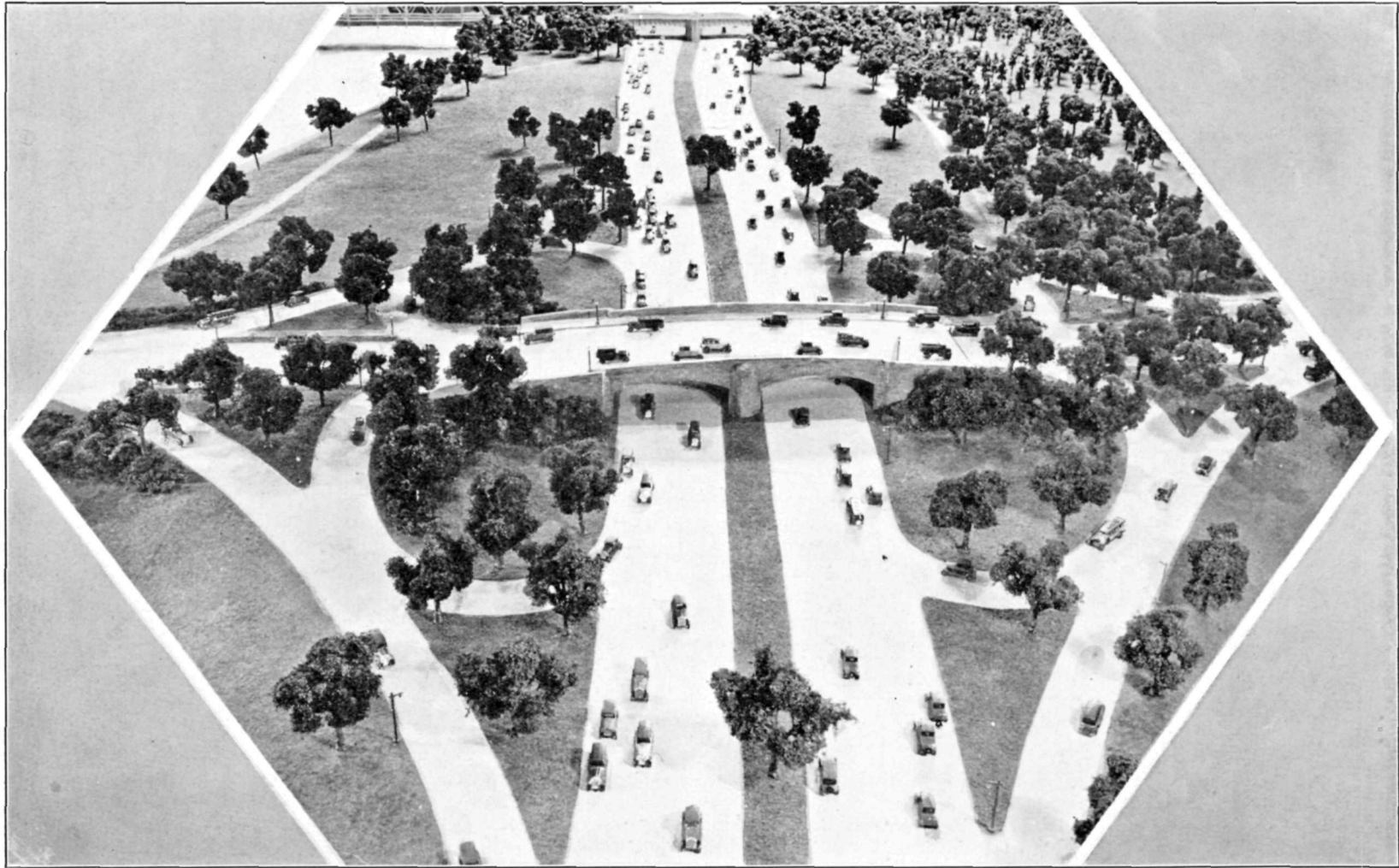


FIGURE 16.—Photograph of a model, constructed to scale, of the highway grade separation and connecting ramps planned for construction at the south end of the Highway Bridge across the Potomac River



FIGURE 17.—Photograph of a model, constructed to scale, of the Mount Vernon terminus of the project as planned, showing the provision for traffic circulation, parking, etc.

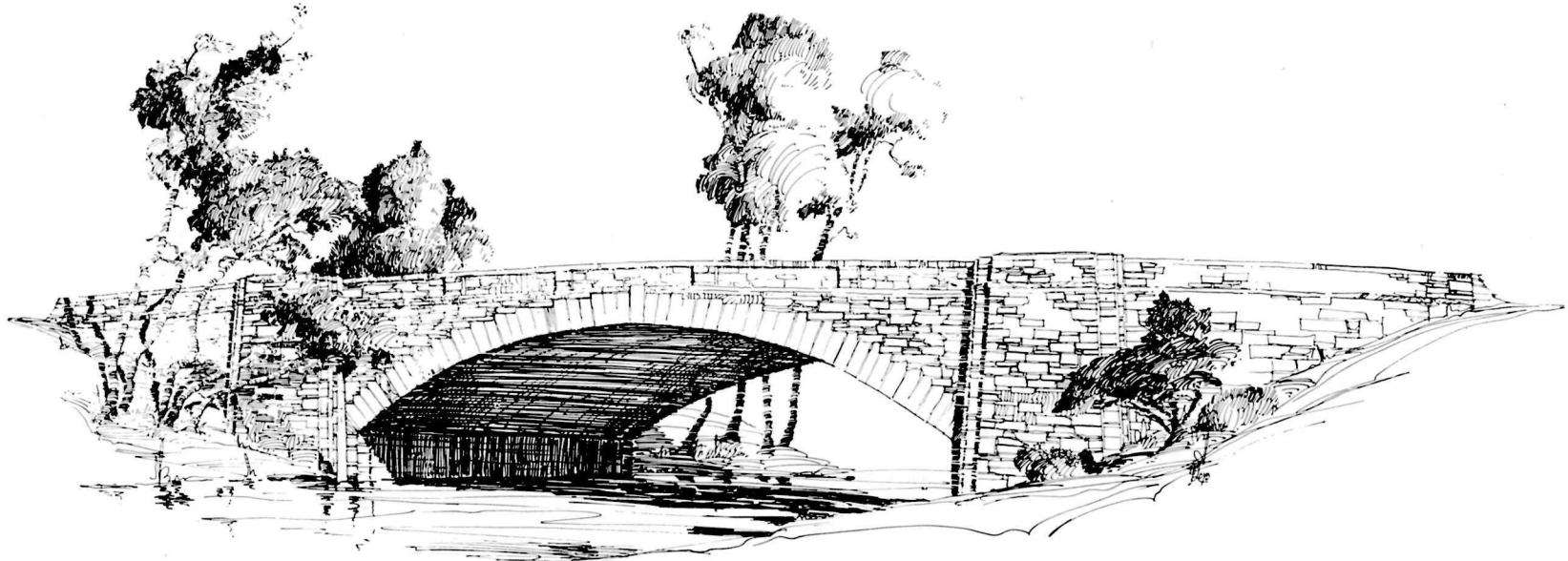


FIGURE 18.—Architectural elevation of bridge over Boundary Channel

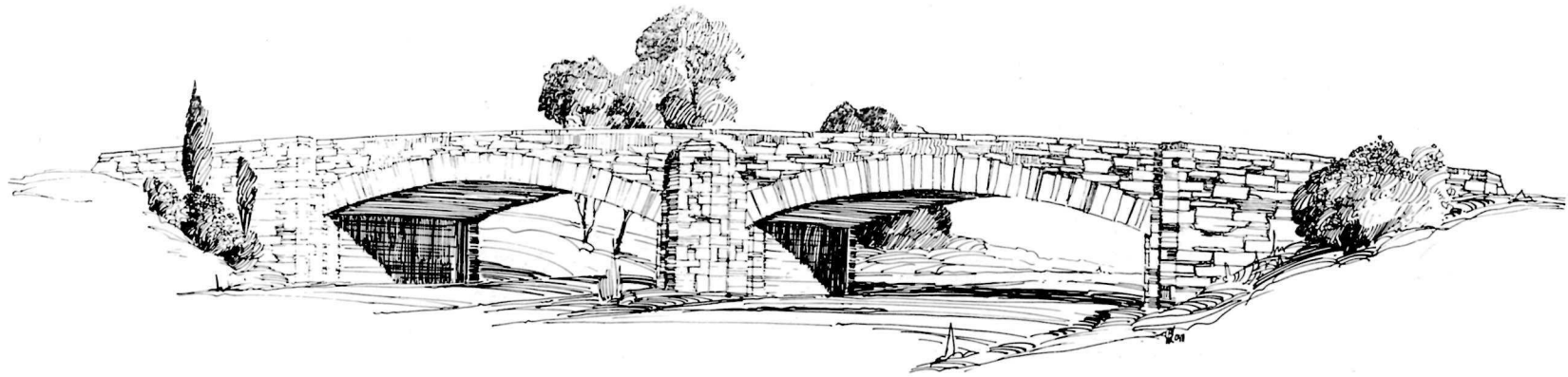


FIGURE 19.—Architectural elevation of underpass at south end of Highway Bridge

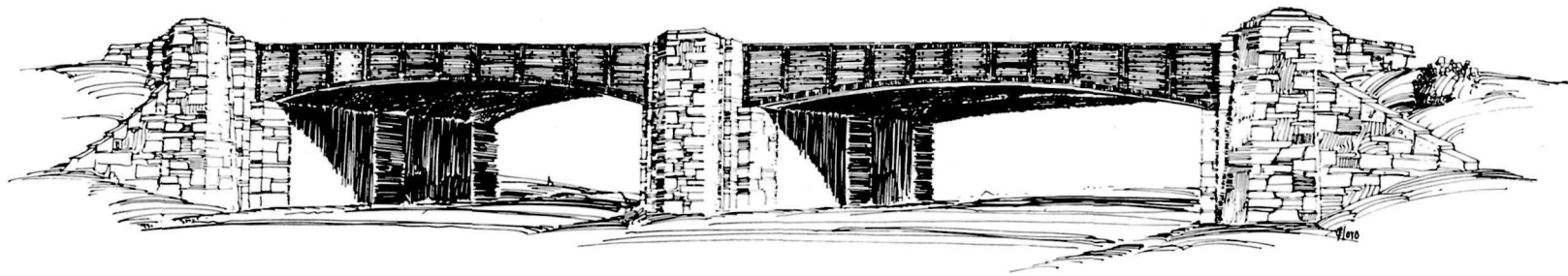


FIGURE 20.—Architectural elevation of underpass at the Richmond, Fredericksburg & Potomac Railroad

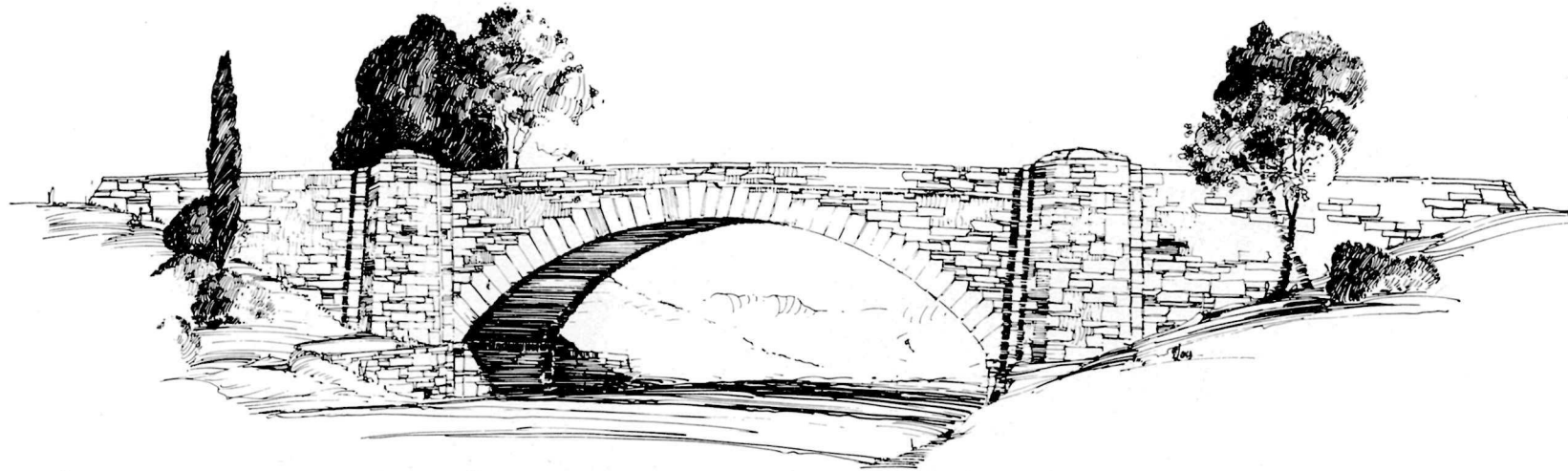


FIGURE 21.—Architectural elevation of overpass at proposed airport entrance

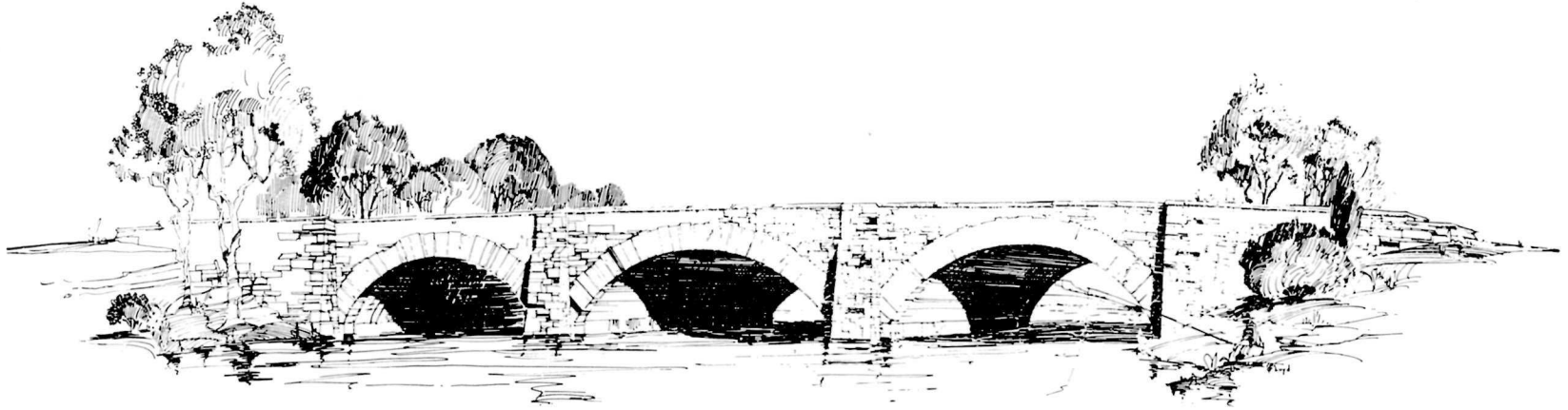
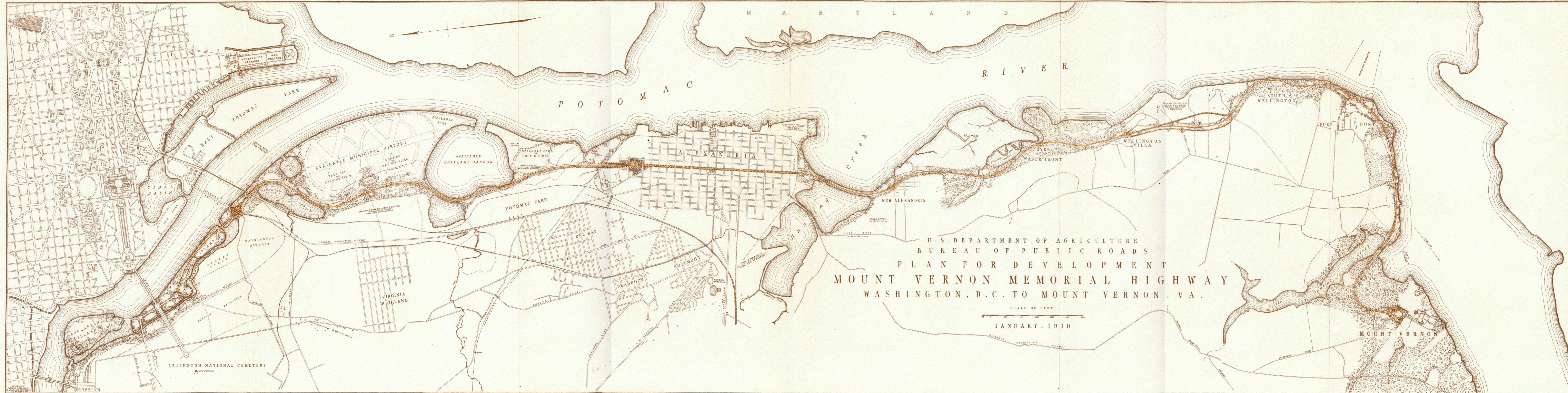


FIGURE 22.—Architectural elevation of bridge over Hunting Creek



FIGURE 23.—Architectural elevation of Wellington underpass





U. S. DEPARTMENT OF AGRICULTURE
 BUREAU OF PUBLIC ROADS
 PLAN FOR DEVELOPMENT
 MOUNT VERNON MEMORIAL HIGHWAY
 WASHINGTON, D. C. TO MOUNT VERNON, VA.

SCALE OF FEET
 0 100 200 300 400 500 600 700 800 900 1000
 JANUARY, 1930

