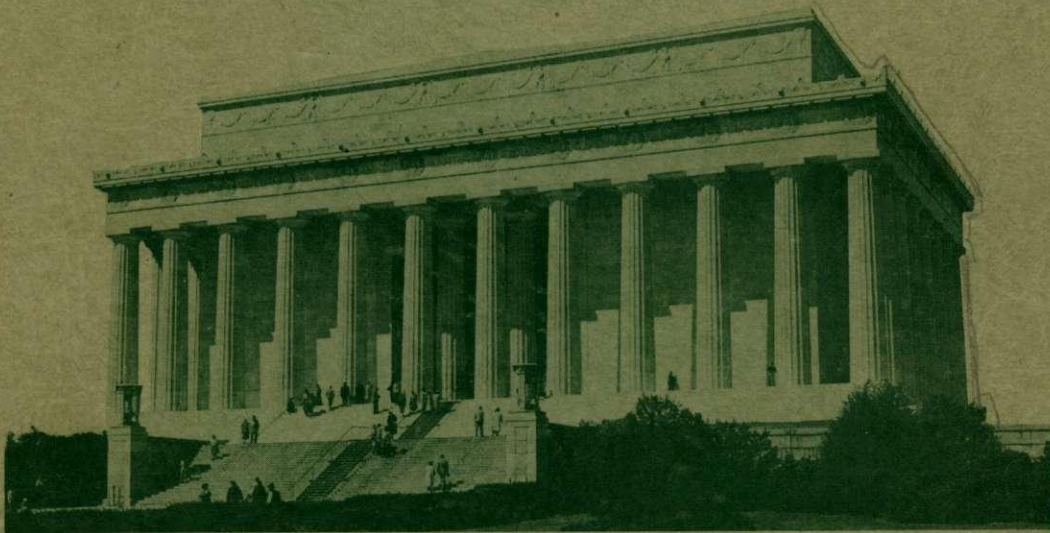


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RETURN TO
PROJECT DEVELOPMENT SECTION
OFFICE OF PLANNING AND PROGRAMMING
DEPT. OF HIGHWAYS AND TRAFFIC

FILE No: 67.10

REPORT ON REDEVELOPMENT OF LINCOLN MEMORIAL AREA



UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE NATIONAL CAPITAL PARKS

SINGSTAD & BAILLIE — CONSULTING ENGINEERS
UMBERTO INNOCENTI — RICHARD K. WEBEL — LANDSCAPE ARCHITECTS

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UNITED STATES
DEPARTMENT OF THE INTERIOR

FRED A. SEATON, SECRETARY

NATIONAL PARK SERVICE

CONRAD L. WIRTH, DIRECTOR

NATIONAL CAPITAL PARKS

HARRY T. THOMPSON, SUPERINTENDENT

SINGSTAD & BAILLIE
CONSULTING ENGINEERS

UMBERTO INNOCENTI—RICHARD K. WEBEL
LANDSCAPE ARCHITECTS

SINGSTAD & BAILLIE

CONSULTING ENGINEERS

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CABLE ADDRESS:
SINGSTAD
NEW YORK

OLE SINGSTAD
DAVID G. BAILLIE, JR.

September 6, 1960

Hon. Conrad L. Wirth
Director, National Park Service
Department of the Interior
Washington 25, D. C.

Re: CONTRACT NO. 14-10-028-1956 ✓

Dear Director Wirth:

We are pleased to submit herewith our report on the Redevelopment of Lincoln Memorial Area. This work was performed in accordance with the agreement dated February 4th, 1960, between the United States of America, represented by the Director, National Park Service, Department of the Interior, and Singstad & Baillie, Consulting Engineers.

The Redevelopment of Lincoln Memorial Area at this time is occasioned by the construction by the District of Columbia of additional major traffic arteries which will bring large volumes of traffic into the area, namely the Inner Loop and the Theodore Roosevelt Bridge across the Potomac River north of Constitution Avenue.

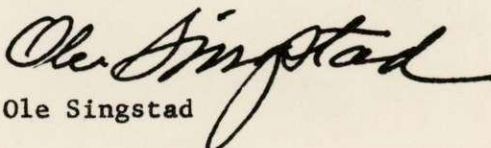
This area which is perhaps the most scenic, historical and monumental area, not only in the Capital City but in the United States, requires the development of the traffic facilities to and from the major arteries so as not to mar the appearance of this sensitive area, but also to eliminate traffic hazards to the traveling public and to the great number of visitors to the Lincoln Memorial.

In conformity with our agreement, we have associated with us a landscape architect, Mr. Richard K. Webel, of the firm of Umberto Innocenti - Richard K. Webel, well known Landscape Architects. Mr. Webel has prepared the two drawings marked Exhibits I and II, the chapter of the report headed "Redevelopment Concept", and the estimated cost of landscaping included in the overall estimate of cost.

We wish to express our appreciation of the splendid cooperation which we have received from your organization and in particular, Mr. Harry T. Thompson, Superintendent, National Capital Parks, and his principal staff members.

Respectfully yours,

SINGSTAD & BAILLIE


Ole Singstad

OS/jj
Enc.

AERIAL VIEW OF SITE



REPORT ON
REDEVELOPMENT OF
LINCOLN MEMORIAL AREA

1960

LIST OF EXHIBITS

EXHIBIT I	GENERAL DEVELOPMENT PLAN
EXHIBIT II	LINCOLN MEMORIAL AREA
EXHIBIT III	PLAN - LINCOLN MEMORIAL AREA
EXHIBIT IV	LINCOLN MEMORIAL PLAZA UNDERPASS PROFILE AND CROSS SECTIONS
EXHIBIT V	LINCOLN MEMORIAL PLAZA UNDERPASS OPEN RAMP CROSS SECTIONS DECKING PLAN DURING CONSTRUCTION
EXHIBIT VI	LINCOLN MEMORIAL PLAZA UNDERPASS NORTH PORTAL - ELEVATION AND DETAILS
EXHIBIT VII	LINCOLN MEMORIAL PLAZA UNDERPASS ELEVATIONS OF RETAINING WALLS
EXHIBIT VIII	LINCOLN MEMORIAL PLAZA UNDERPASS UNDERGROUND VENTILATION CHAMBERS AND PUMP ROOMS
EXHIBIT IX	OHIO DRIVE UNDERPASS PLAN, PROFILE AND SECTION
EXHIBIT X	AUXILIARY RAMPS - TYPICAL CROSS SECTIONS
EXHIBIT XI	AUXILIARY RAMPS - PROFILES
EXHIBIT XII	AUXILIARY RAMPS - PROFILES
EXHIBIT XIII	PROFILE OF OHIO DRIVE PROFILE ALONG NORTH-SOUTH AXIS OF LINCOLN MEMORIAL
EXHIBIT XIV	NORTH PORTAL AREA - GROUND SURFACE CONTOURS
EXHIBIT XV	SOUTH PORTAL AREA - GROUND SURFACE CONTOURS

REDEVELOPMENT OF LINCOLN MEMORIAL AREA

INTRODUCTION

The plan presented in this report for the redevelopment of the Lincoln Memorial area and to provide the necessary traffic facilities in the Lincoln Memorial area is the result of thorough studies of the increased traffic movements that will be generated in this area on completion of the District of Columbia Inner Loop and the Theodore Roosevelt Bridge and its approaches. The District of Columbia Department of Highways and Traffic is proceeding actively with the construction of the Theodore Roosevelt Bridge and its approaches located north of Constitution Avenue, and the planning and construction of the District of Columbia Inner Loop from Constitution Avenue northward, and to the east of 14th Street south of the Bureau of Engraving and Printing. The completion of the Inner Loop requires a connecting traffic link through the Lincoln Memorial area with connections to the Theodore Roosevelt Bridge. The overall plan includes a relocation and northerly extension of Ohio Drive from its underpass of the Rock Creek and Potomac Parkway, and connecting roadways from the Arlington Memorial Bridge to Independence Avenue and Ohio Drive. The connection through the Lincoln Memorial area to provide the link in the Inner Loop is planned as an extension of Independence Avenue under the Lincoln Memorial Plaza to the Inner Loop at Constitution Avenue. The locations of the portals of the underpass and the north portal of the extension of the Ohio Drive underpass were determined after careful consideration of the setting of the Memorial. Thorough study of the sight lines showed that the tremendous stream of traffic on the Inner Loop would be hidden by ground forms and planting.

The use of Independence Avenue as the connecting link in the Inner Loop, and the use of Constitution Avenue as one of the main feeders to the Theodore Roosevelt Bridge with the resultant increase in traffic emphasizes the need for the completion of the North and South Reflecting Pool Drives, together with their extension through the Washington Monument Grounds and connections to the Mall roads at 14th Street. The completion of these drives will provide for the circulation of park traffic and the approaches to Arlington Memorial Bridge. The portion of the Memorial Circle roadway west of the Memorial is planned to connect to both North and South Reflecting Pool Drives.

The elimination of the Memorial Circle roadway east of the Memorial, as planned, is necessitated by the hazards to which visitors to the Memorial would be exposed by the increased traffic volume on the Memorial Circle roadway. An examination of traffic volumes since 1940 and including 1959 reveals a vehicular traffic increase of 83.4 per cent over the Arlington Memorial Bridge, and an increase of visitors to the Memorial of 25.4 per cent. Over two million visitors to the Memorial were counted in 1959 which represents an increase of approximately 6 per cent per year in each of the last four preceding years. The first 6 months of 1960 shows an increase in visitors of 15.9 per cent over that of the same period of 1959. The conflict of vast numbers of visitors, large volume of traffic and the negligible area of parking space available for passenger cars and buses is a serious and hazardous condition and is not in keeping with the Memorial atmosphere. The elimination of the Memorial Circle Roadway east of the Memorial and the provision for parking areas adjacent to the Reflecting Pool Drives will correct this condition.

The plan incorporates these traffic facilities in such manner as to preserve the dignity, beauty, serenity and magnificent setting of the Lincoln Memorial.

REDEVELOPMENT CONCEPT

The Lincoln Memorial stands today as perhaps our noblest shrine. People come by the thousands from all parts of our country and abroad to visit it, and with awe, mount the monumental steps. All are impressed by the sweeping and majestic concept of its setting. Everything necessary to preserve and enhance its beauty must be done.

This very beauty is now in danger of being destroyed by the sudden and enormous increase of vehicular traffic. There are moments when the Memorial is engulfed in a sea of cars. It is gradually becoming a traffic circle. This was not the original intent of the design. It is time that we restored the calm tranquility of the scene by eliminating the buzzing traffic between the Memorial and its reflecting pool. This area truly belongs to the thousands of visitors who come to see it. For their benefit the proposed plan suggests a large plaza between the steps of the Memorial and the steps to the reflecting pool. This plaza will be made of the same material and pattern as now exists and as shown on the original architectural drawings. By filling in the roadway it will be of sufficient size to harmonize with the scale of the setting, and will accommodate large crowds on festive occasions. The essence of the original design concept was the large circular walk around the Memorial and the continuation of this walk down the allées on either side of the reflecting pool. The proposed terrace or plaza would not only preserve this fundamental design concept but would help express it in an even stronger manner by tying these walks together in a direct manner.

Many people come by car and bus. For these, parking areas have been provided adjacent to both North and South Reflecting Pool Drives. From these areas the visitors can walk directly to the Memorial without crossing traffic. These parking areas will be screened with hedges and trees.

All the views to and from the Memorial have been carefully preserved. All ground forms and planting will be restored. The views to the two tunnel entrances will be thoroughly screened by planting. Sufficient space has been allowed so that these entrances are completely divorced from the setting. In fact the tunnel will serve to keep the heavy traffic out of sight.

The main object of this proposed plan is the preservation of the Lincoln Memorial landscape setting. We look forward to greater numbers of people visiting the monument and we hope that they may enjoy its beauties in an atmosphere of serenity and peace.

SCOPE

The site of the proposed redevelopment of the Lincoln Memorial area covered by this report is situated between Constitution Avenue and Independence Avenue, and easterly from the sea wall of the Potomac River to a line about 700 feet east of the intersection of French Drive and Independence Avenue. The project consists of a six lane underpass under Lincoln Memorial Plaza, with an open ramp at each end connecting with Independence Avenue in the vicinity of French Drive and with the District of Columbia Inner Loop project at Constitution Avenue. Roadway ramps are provided to connect the Underpass with the Theodore Roosevelt Bridge. The project also includes a relocation and northerly extension of Ohio Drive from its Underpass of the Rock Creek and Potomac Parkway, connecting roadways from the Arlington Memorial Bridge to Independence Avenue and Ohio Drive, modifications and reconstruction of portions of Lincoln Memorial Circle and related streets, two parking areas for passenger cars and buses, and relandscaping of the Lincoln Memorial area as required within the area of the project.

LINCOLN MEMORIAL PLAZA UNDERPASS

General

This underpass consists of two driveways separated by an intermediate concrete wall and a ventilating duct constructed on each side of the box structure. Each driveway has a roadway width of 36 feet which accommodates three lanes of unidirectional traffic. A service walk 2 ft. 6 inches above the roadway and 2 ft. 9 inches wide is provided in each driveway for operating and maintenance personnel only.

The underpass is approximately 1435 feet in length, and arranged in the overall treatment to keep the moving traffic out of sight from the Memorial. Roadway grades are planned to drain from a high point in each driveway towards the portals at a maximum grade of 0.6 per cent. The vertical clearance height in each driveway between portals is 12 ft. 6 inches.

Continuing from each portal the structure is an open ramp with reinforced concrete retaining walls faced with granite. The northerly ramp meets the planned grade of the proposed Inner Belt Loop at Constitution Avenue. The ramp from the south portal meets the existing street surface of Independence Avenue approximately at French Drive. The maximum grade of the open ramp approaches is 3.5 per cent. The total length of the structure from grade point to grade point is approximately 2500 feet.

The equipment for operating the ventilating and electrical systems of the underpass, described elsewhere in this report, is housed in two underground chambers, one near each portal. These chambers will be entirely underground except for a small area for the air intake grating which will be approximately at ground level. Shielding of these grating areas by appropriate planting is planned to obscure them from view.

The planting and grading are planned to screen the underpass structure so that the dignified and esthetic setting of the Lincoln Memorial area is preserved. The portals are located so that traffic movement to and from the underpass will not be visible from the Lincoln Memorial, and traffic noise inaudible.

Design

The structure between portals is a reinforced concrete box structure encased in a waterproofing envelope of ply membrane waterproofing and brick-in-mastic. It is designed as a rigid frame and of sufficient weight to resist hydrostatic uplift resulting from the maximum recorded flood stage elevation occurring in 1942.

A study of the boring data available at this time in the vicinity of the Lincoln Memorial indicates that the structure may require a pile foundation. Definite determination of the type of foundation required will be made after additional borings have been taken.

The loadings assumed in the design of the underpass structure include in addition to the earth cover load, live loads usual in the design of this type of structure.

The open ramp approach structures of the underpass are designed as "U" type reinforced concrete structures of sufficient weight to counteract the hydrostatic uplift caused by flood conditions. The ramp structures are encased in a waterproofing envelope of ply membrane waterproofing and brick-in-mastic. Transverse expansion joints at intervals along the structure are planned to control cracks in the concrete due to temperature changes.

The design of the underpass and its ramp approaches is based on the appropriate District of Columbia Code.

Flood Protection

The underpass is so designed as to be protected against flooding up to the maximum flood stage elevation, which occurred in 1942 by an earth dike planned at its north end and a high point in the roadway at the other end.

Interior Details

Interior finishes and features include: ceiling of vitreous ceramic glazed tile, sidewalls of glazed architectural terra-cotta, fluorescent continuous lighting of underpass, bituminous concrete

pavement; splicing manholes for electric conduits and ducts, niches properly spaced in the underpass with suitable frames and covers for traffic control equipment, for water service piping installations and for fire extinguishers.

Facing of Portals & Ramp Walls

The exposed surfaces of ramp walls and portals are to be faced with granite, similar to that which is used around the base walls and steps of the Memorial. This material will extend the solemn monumental aspect of the Memorial to the exterior portions of the Underpass.

(a) Ramp walls including the west retaining wall of Ohio Drive Underpass are to be bush hammered granite ashlar.

(b) Portals.

Portal faces including 10 foot return at ceiling and walls are to be faced with a honed finish granite. This serves to recall the material of the Memorial and acts as a transitional texture between the bush hammered ramp walls and the smooth surfaces of the Underpass.

Drainage

All rainwater falling on the open approaches will be drained to the gutters provided at the sides of the roadway and to the cross drains at each portal. The cross drains will discharge this into a sump in the pump room at the portals. Water used for washing the tunnel will drain to the portal sumps.

Automatically operated electrically driven pumps located in each portal pump room will discharge the drainage water into storm water sewers.

Ventilation

The design of the ventilation system will be based on introducing a sufficient volume of fresh air into each driveway to provide a safe and comfortable atmosphere and to prevent any smoke haze which might have an adverse effect on visibility.

Ventilation requirements for design purposes have been based on three thousand passenger cars and one thousand buses passing through each driveway in one hour, for maximum capacity and blockades in the Underpass.

The ventilation system will consist of fans to supply fresh air to the tunnels by means of air ducts constructed on the side of the tunnel, extending about seven hundred feet from each entrance portal, and air flues to lead the air from the ducts to the driveways. The fans, two in each underground ventilation chamber, driven by two speed electric motors, will draw in air through gratings set above the fan chamber and force it into the air ducts.

The fresh air supplied by the fans will move along the tunnel in the direction of traffic and will, with the piston action of the vehicles moving in the driveways, induce an additional volume of fresh air at each entrance portal. This additional volume of fresh air together with the air supplied by the fans will be ample to meet the demand created by traffic. All vitiated air will leave the driveways at the exit portals.

The operation of the fans, that is, the number of fans operating and the speed at which they are operating, will be automatically controlled by carbon monoxide recorders which will determine the degree of ventilation required. These carbon monoxide recorders will be located in the fan chambers with the fans they control.

Electrical Installation

Power Supply

The electric power for lighting and ventilation will be supplied over two services each service having a capacity of not less than 1000 KVA. With the two feeders in service, each feeder will carry a maximum load of approximately 550 KVA.

There will be two feeders interconnecting the ventilation chambers thereby allowing diversity in the ventilation; normally one fan in a roadway will be fed from one of the feeders and the second fan will be fed from the second feeder. Under full ventilation, the loss of a feeder will reduce the ventila-

tion 50% until the load on the interrupted feeder is switched manually over to the remaining feeder. Traffic signals at the portals will stop all traffic in case of total power failure, or excessive carbon monoxide.

Ventilation Control

The ventilation will be automatically increased in the morning and decreased in the evening by means of adjustable time clocks. Superimposed on this control will be a carbon monoxide analyzer control whereby the ventilation will be increased whenever the CO content of the air exceeds a preset value.

Tunnel Lighting

Each roadway has 2 continuous rows of lights located one near each wall. In each row, alternate groups of five fixtures (62.5 feet) are fed from the two separate feeders. In case of prolonged interruption on a feeder, all lights can be switched to the alternate feeder. Normally, the lighting load is evenly divided between the two feeders.

Pumps

Normally, the two pumps at each portal are fed from separate feeders with provision to transfer from one feeder to the other. The pump motors are controlled by means of float switches.

Method of Construction

The underpass and open ramp structures are to be constructed by open cut methods. The sides of the cut are supported by soldier beams and timber lagging, or steel sheet piling, with transverse bracing. This temporary construction provides the working area in which the permanent structure is completed.

Maintenance of Traffic during Construction

Traffic will be maintained continuously during construction by placing timber decking in those roadway areas affected by the excavation required for the construction of the underpass structure. This decking will be placed during night hours when traffic is at a minimum or non-existent, and will be ready for use the next morning.

OHIO DRIVE UNDERPASS

General

This underpass abuts the north face of the existing Rock Creek and Potomac Parkway bridge over Ohio Drive and continues in a northerly direction as a covered structure approximately 212 feet to a portal which aligns with, and is adjacent to, the north portal of the proposed Lincoln Memorial Plaza Underpass. It is planned to accommodate a 15 foot unidirectional traffic roadway on each side of a 6 foot median. A 3 foot 6 inch sidewalk is provided on each side of the Underpass. The vertical clearance throughout the Underpass is 12 ft. 6 inches. No alteration of the existing Rock Creek and Potomac Parkway bridge structure over Ohio Drive will be required by the proposed Underpass.

The design, interior details and portal face finish and drainage features are generally the same as for the Lincoln Memorial Underpass.

Auxiliary Ramps and Roadways

Ramps and roadways are planned as part of the project to provide adequate connections to the Lincoln Memorial Plaza Underpass, the Theodore Roosevelt Bridge, Arlington Memorial Bridge, Ohio Drive, North and South Reflecting Pool Drives and roads within the area of the project. Bituminous concrete wearing surfaces over crushed stone bases and gravel sub bases are planned for the ramp and roadway pavements.

Parking Areas

Two parking areas, for visitors to the Lincoln Memorial, each with a capacity for 18 buses and 60 passenger cars, are planned adjacent to North and South Reflecting Pool Drives. These areas are located to give strategically convenient access to the Lincoln Memorial. The capacity of either parking area can readily be increased to accommodate additional vehicles for future needs. Both parking areas are within easy walking distance of the Memorial and will be shielded from view by proper tree planting.

Interim and Ultimate Treatment

The ultimate treatment of the area eliminates vehicular traffic on the surface of that portion of the Memorial roadway circle east of the Memorial between North Reflecting Pool Drive and South Reflecting Pool Drive. The layout of ramps and related roads is planned for their ultimate locations, but provide for the continued use of the roadway circle east of the Memorial, its approaches, and sidewalks for an interim period until revisions in the road system east of the limits of this project are completed.

ESTIMATED COST OF PROJECT

Lincoln Memorial Plaza Underpass

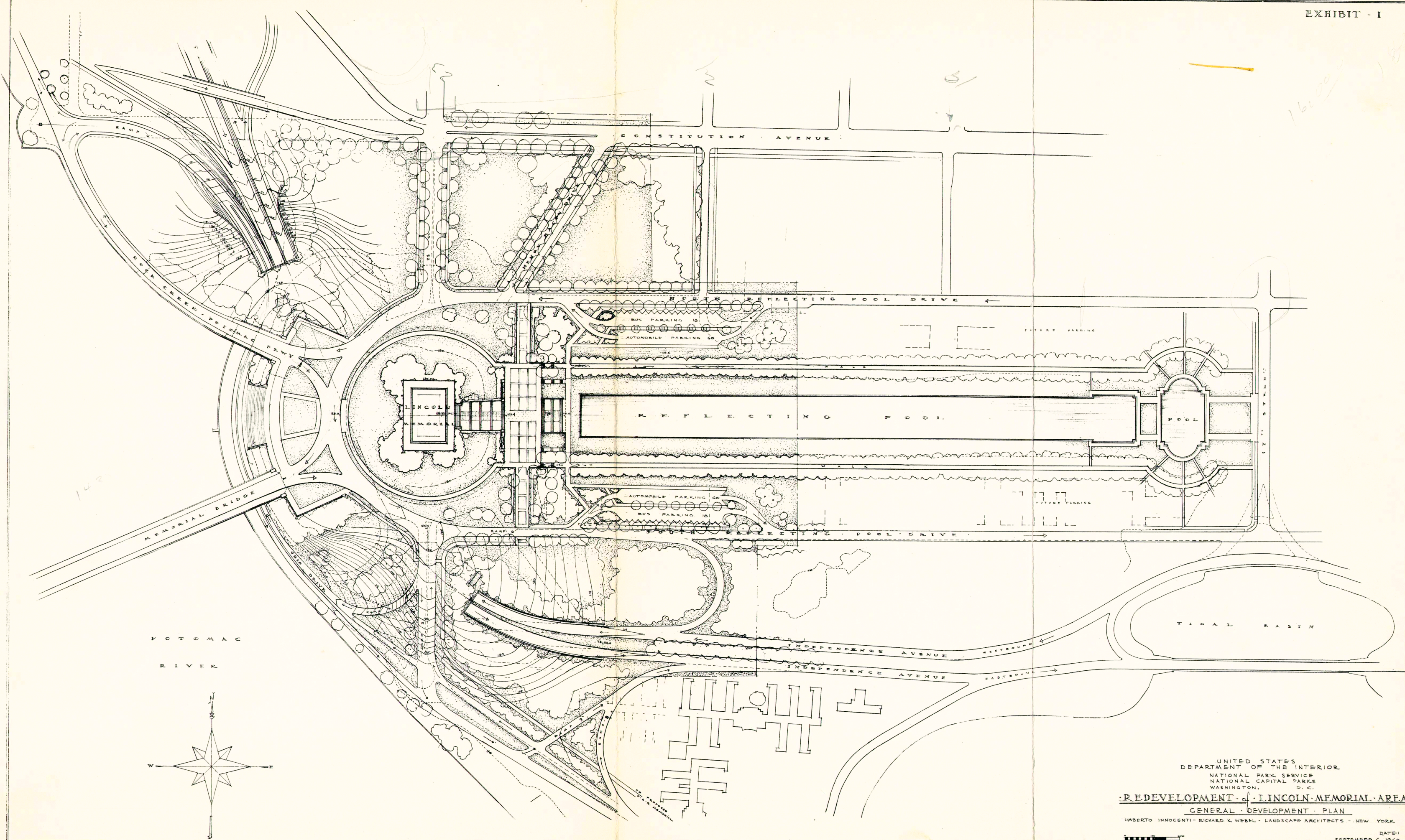
Underpass Construction Incl. North & South Open Ramps	\$ 12,575,400	
Fans, Motors & Transmissions	211,300	
Electrical Installation	377,700	
Pumping Equipment	49,100	
	<u>13,213,500</u>	\$ 13,213,500

Approach Roadways & Ohio Drive Covered Extension

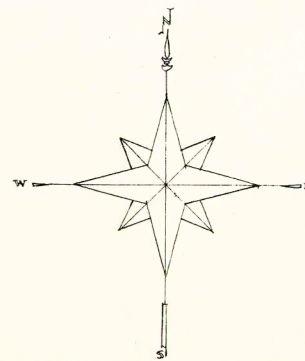
Ohio Drive Covered Extension	\$ 838,550	
Approach Roadways Incl. Relocation of Ericsson Monument	371,350	
Memorial Circle Changes Incl. Granite Paving	318,270	
Parking Areas	143,000	
Drainage Installation	332,950	
Electrical Installation	104,450	
Planting & Seeding	<u>552,930</u>	
		\$ 2,661,500

Total Estimated Cost - Includes Cost of Construction, Engineering Design, Supervision of Construction and Administration \$ 15,875,000

400
19,875



POTOMAC RIVER

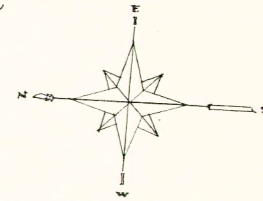
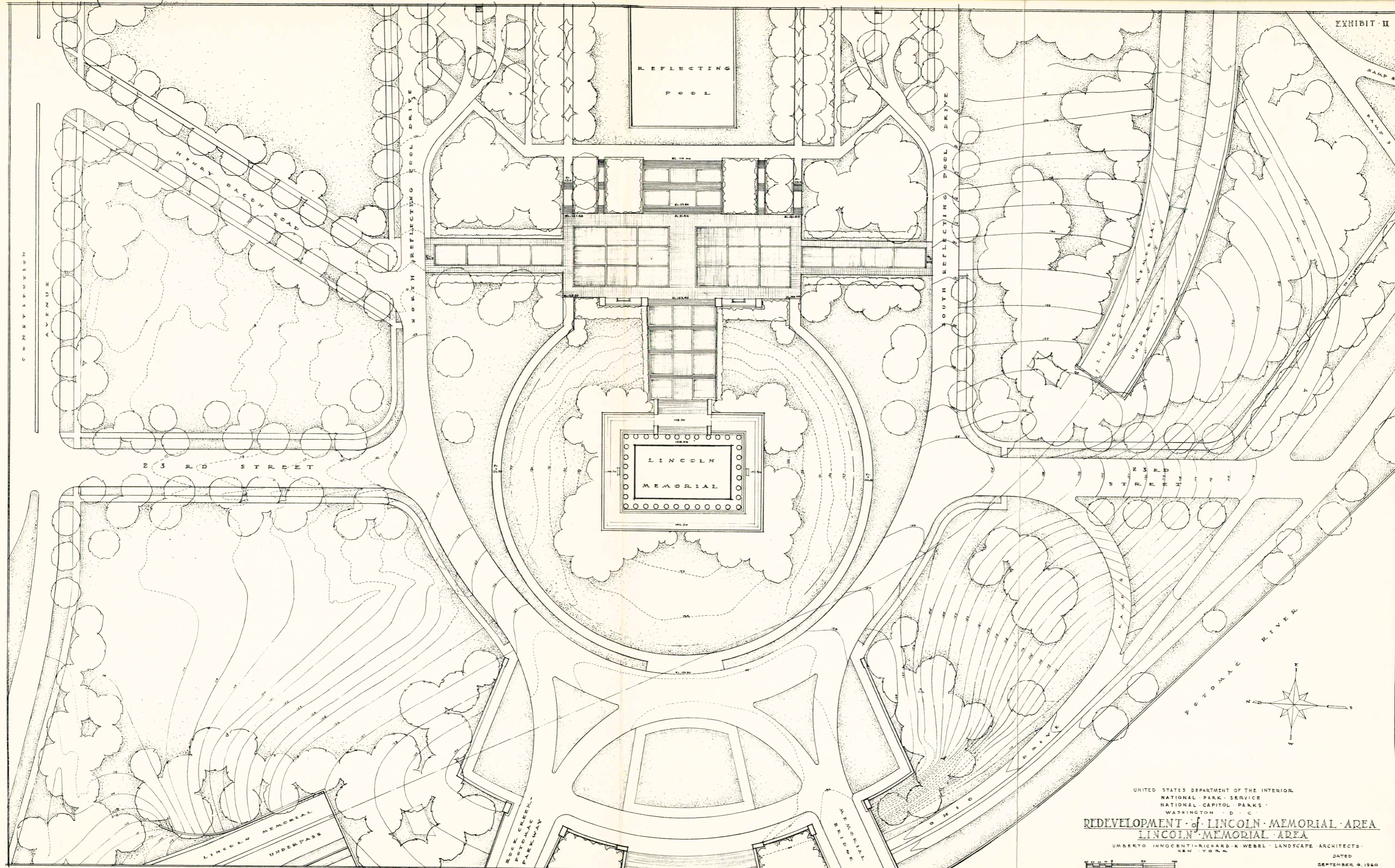


UNITED STATES
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 NATIONAL CAPITAL PARKS
 WASHINGTON, D. C.

REDEVELOPMENT OF LINCOLN MEMORIAL AREA
 GENERAL DEVELOPMENT PLAN

UMBERTO INNOCENTI - RICHARD K. WEBER - LANDSCAPE ARCHITECTS - NEW YORK

DATE: SEPTEMBER 6, 1960



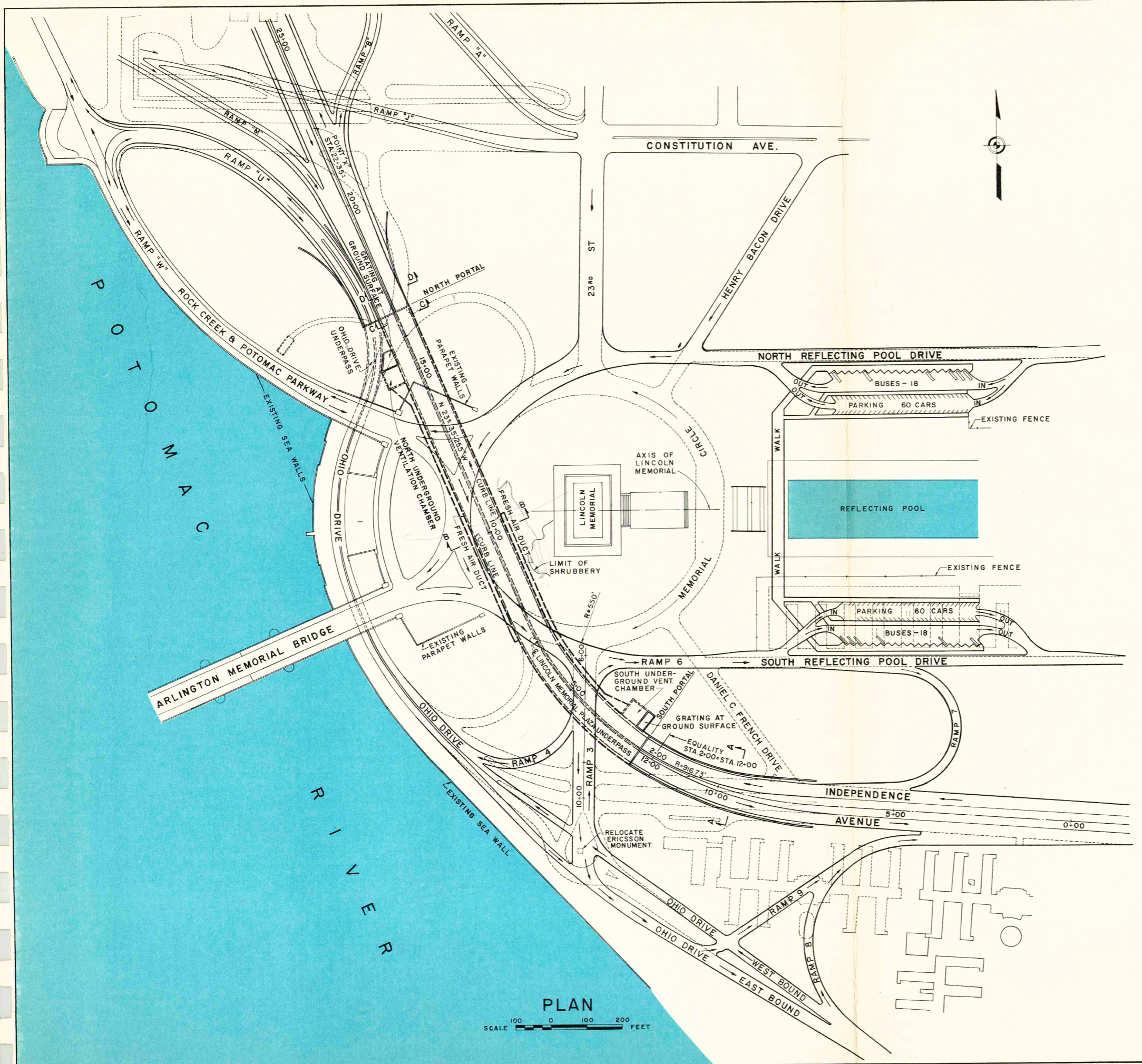
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 NATIONAL CAPITAL PARKS
 WASHINGTON, D. C.

REDEVELOPMENT of LINCOLN MEMORIAL AREA
LINCOLN MEMORIAL AREA

UMBERTO INNOCENTI-RICHARD K. WEBB - LANDSCAPE ARCHITECTS - NEW YORK

DATED
 SEPTEMBER 6, 1960





PLAN

SCALE 100 0 100 200 FEET

UNITED STATES DEPARTMENT OF THE INTERIOR
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 NATIONAL CAPITAL PARKS
 WASHINGTON D.C.

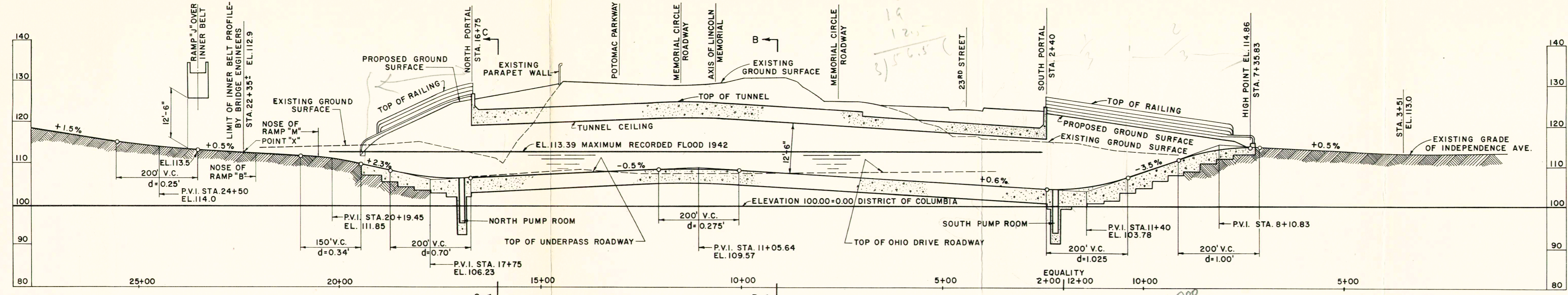
REDEVELOPMENT OF LINCOLN MEMORIAL AREA

PLAN - LINCOLN MEMORIAL AREA

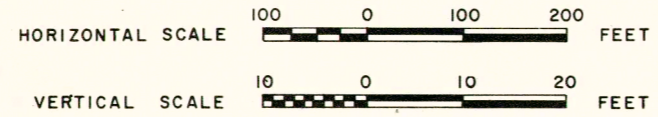
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 CONSULTING ENGINEERS
 NEW YORK

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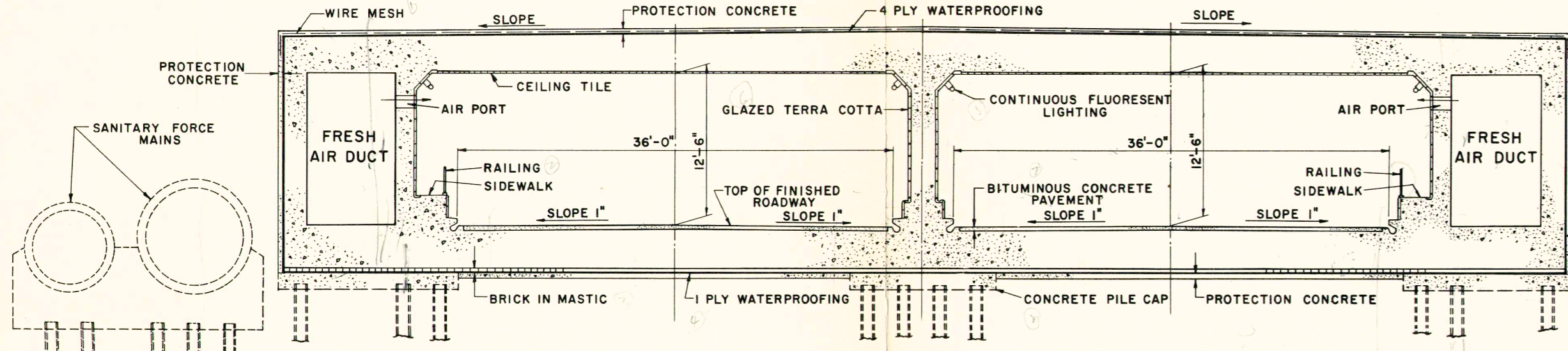
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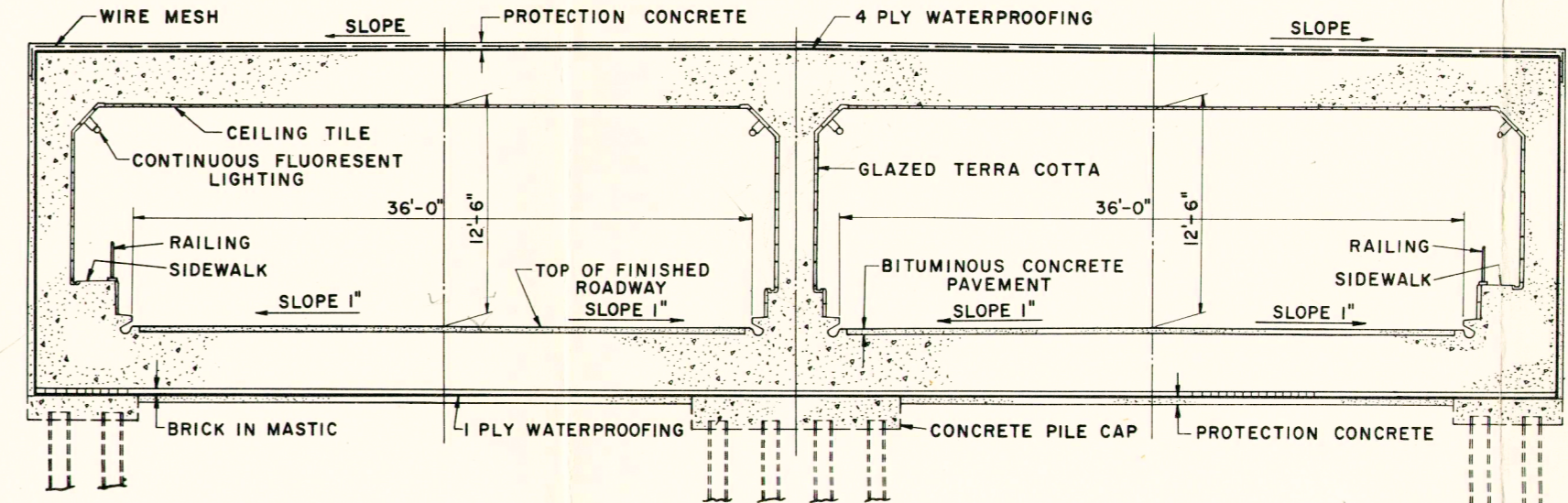
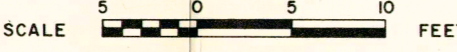
PROFILE OF UNDERPASS



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 12,500,000



SECTION B-B
TYPICAL TUNNEL CROSS SECTION WITH FRESH AIR DUCTS



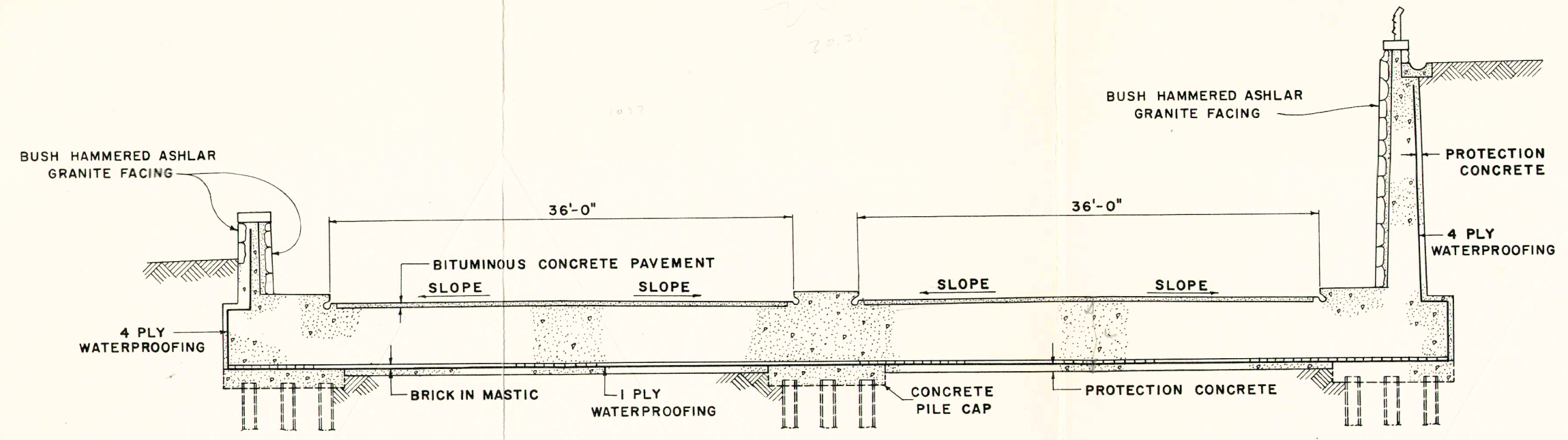
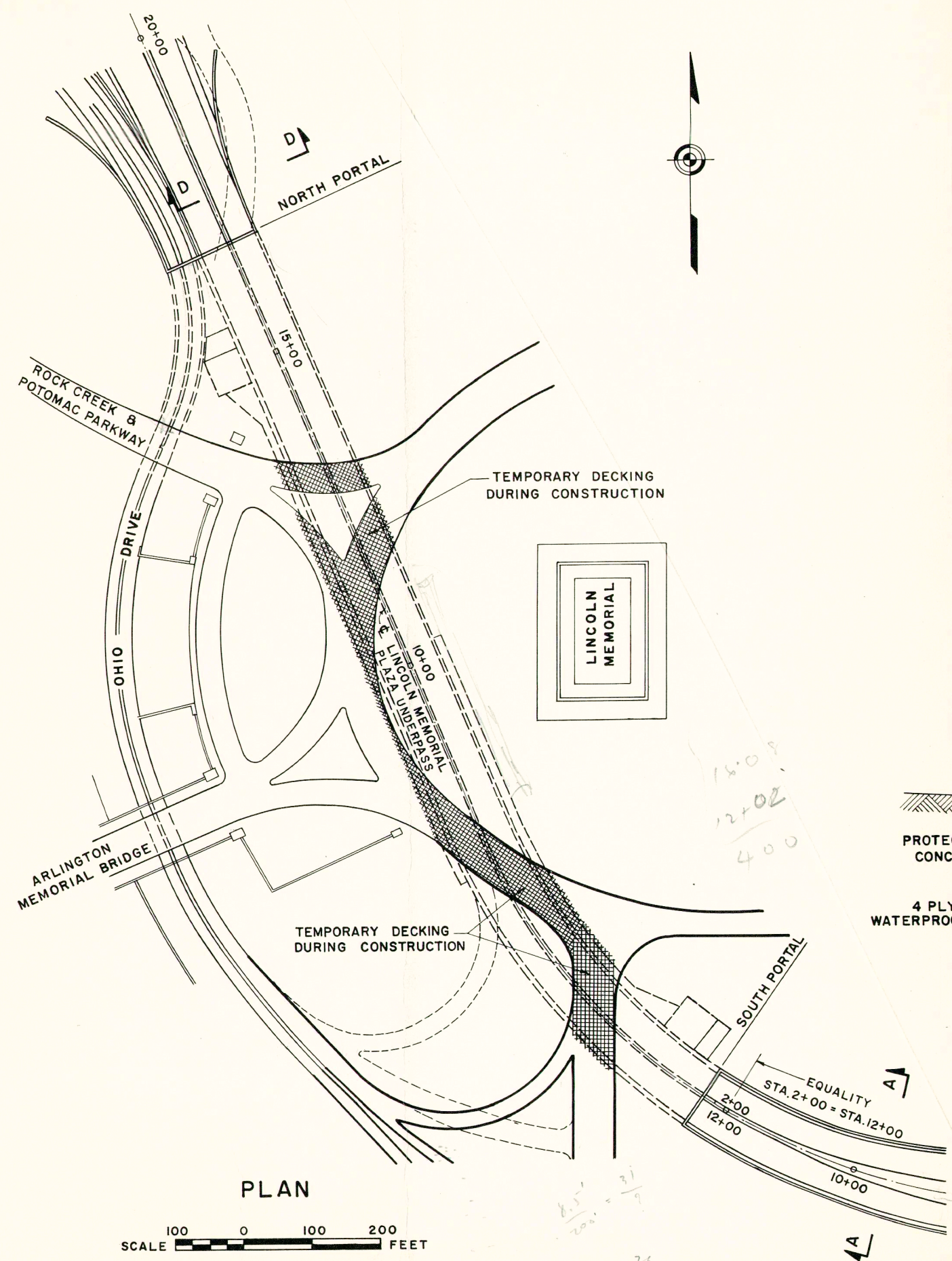
SECTION C-C
TYPICAL TUNNEL CROSS SECTION



NOTE:
 FOR LOCATION OF SECTIONS B-B
 AND C-C SEE EXHIBIT III

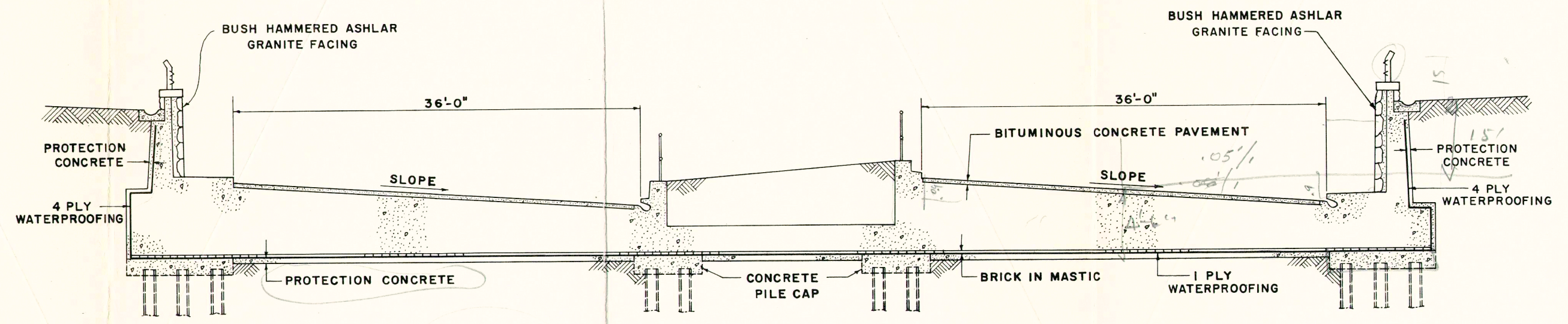
UNITED STATES DEPARTMENT OF THE INTERIOR
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 REDEVELOPMENT OF LINCOLN MEMORIAL AREA
 LINCOLN MEMORIAL PLAZA UNDERPASS
 PROFILE AND CROSS SECTIONS

SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
 NEW YORK
 SCALE: AS SHOWN
 DATE: SEPTEMBER 6, 1960



SECTION D-D
TYPICAL NORTH OPEN RAMP

SCALE 0 5 10 FEET



SECTION A-A
TYPICAL SOUTH OPEN RAMP

SCALE 0 5 10 FEET

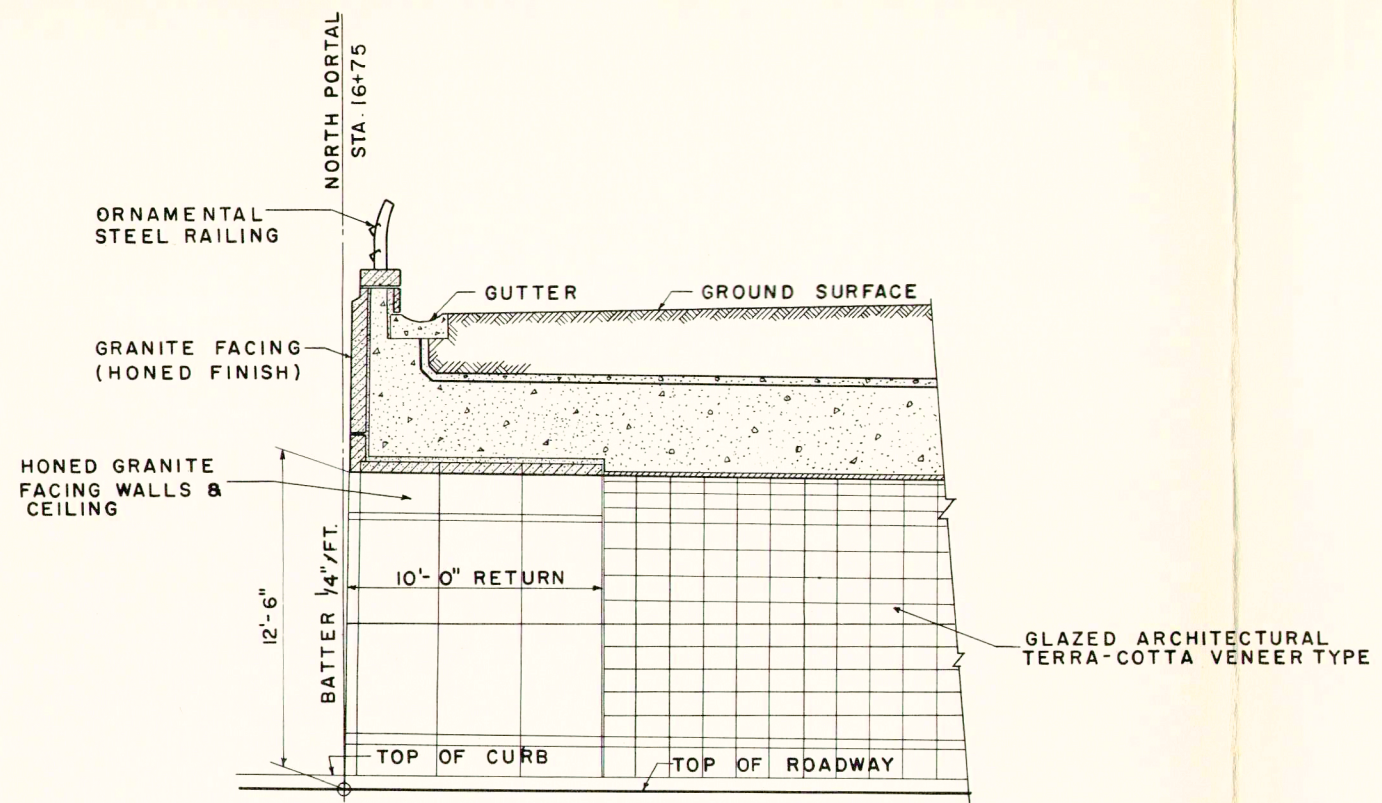
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NATIONAL PARK SERVICE
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REDEVELOPMENT OF LINCOLN MEMORIAL AREA
LINCOLN MEMORIAL PLAZA UNDERPASS
OPEN RAMP CROSS SECTIONS
DECKING PLAN DURING CONSTRUCTION

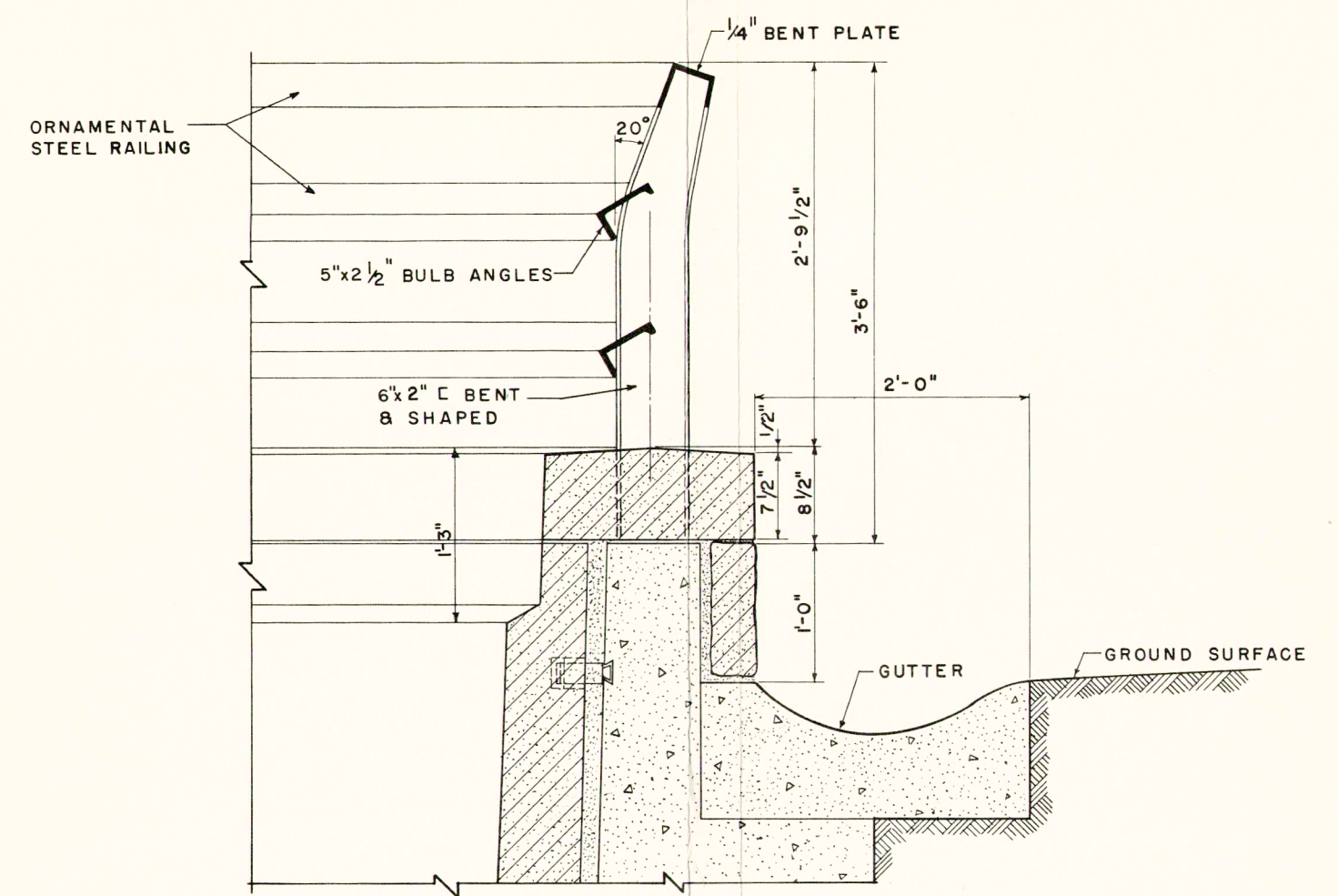
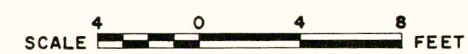
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NEW YORK

SCALE: AS SHOWN DATE: SEPTEMBER 6, 1960

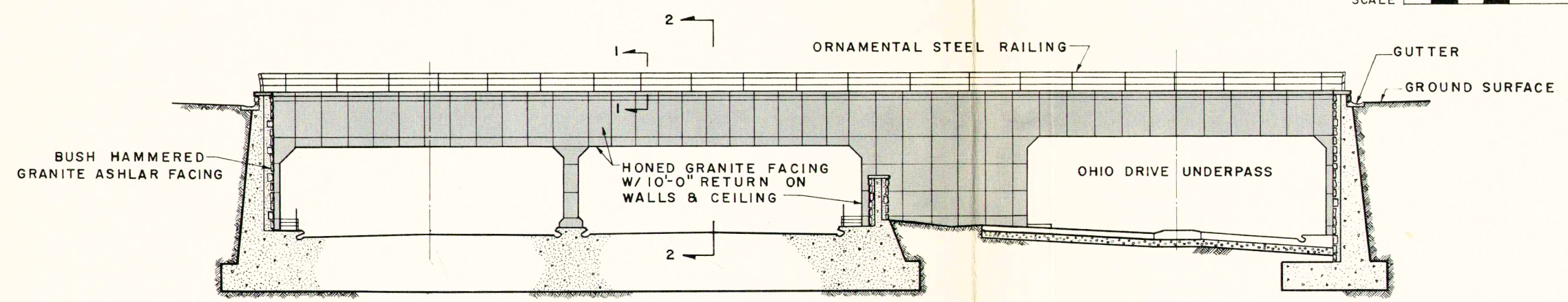
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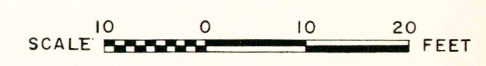
SECTION 2-2



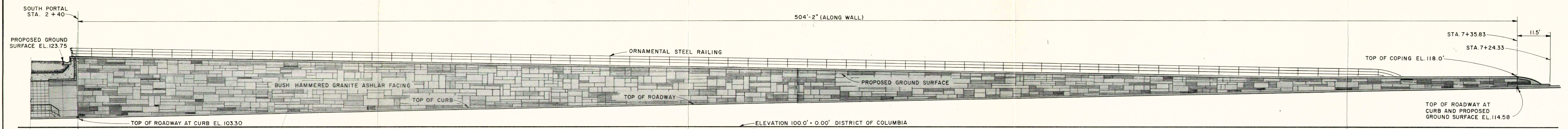
SECTION 1-1



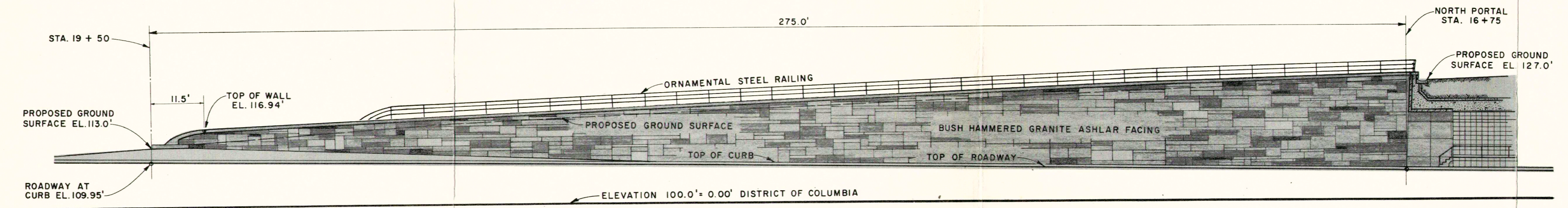
NORTH PORTAL ELEVATION



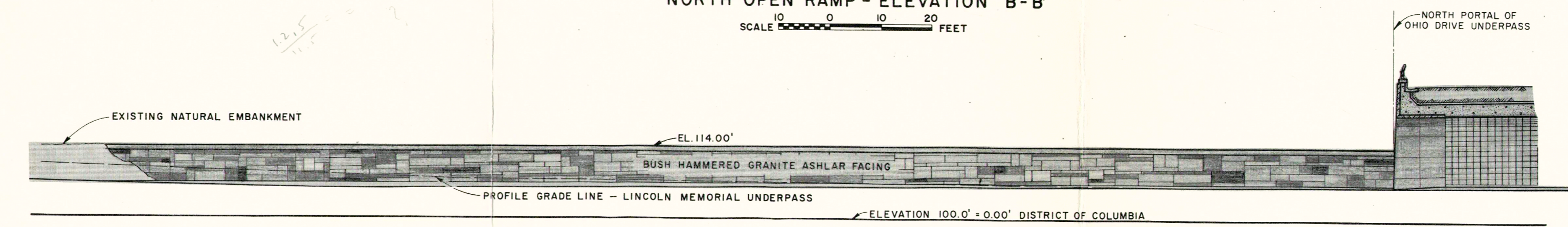
UNITED STATES DEPARTMENT OF THE INTERIOR
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 NATIONAL CAPITAL PARKS
 WASHINGTON, D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA
 LINCOLN MEMORIAL PLAZA UNDERPASS
 NORTH PORTAL — ELEVATION AND DETAILS
 SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
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 SCALE: AS SHOWN
 DATE: SEPTEMBER 6, 1960



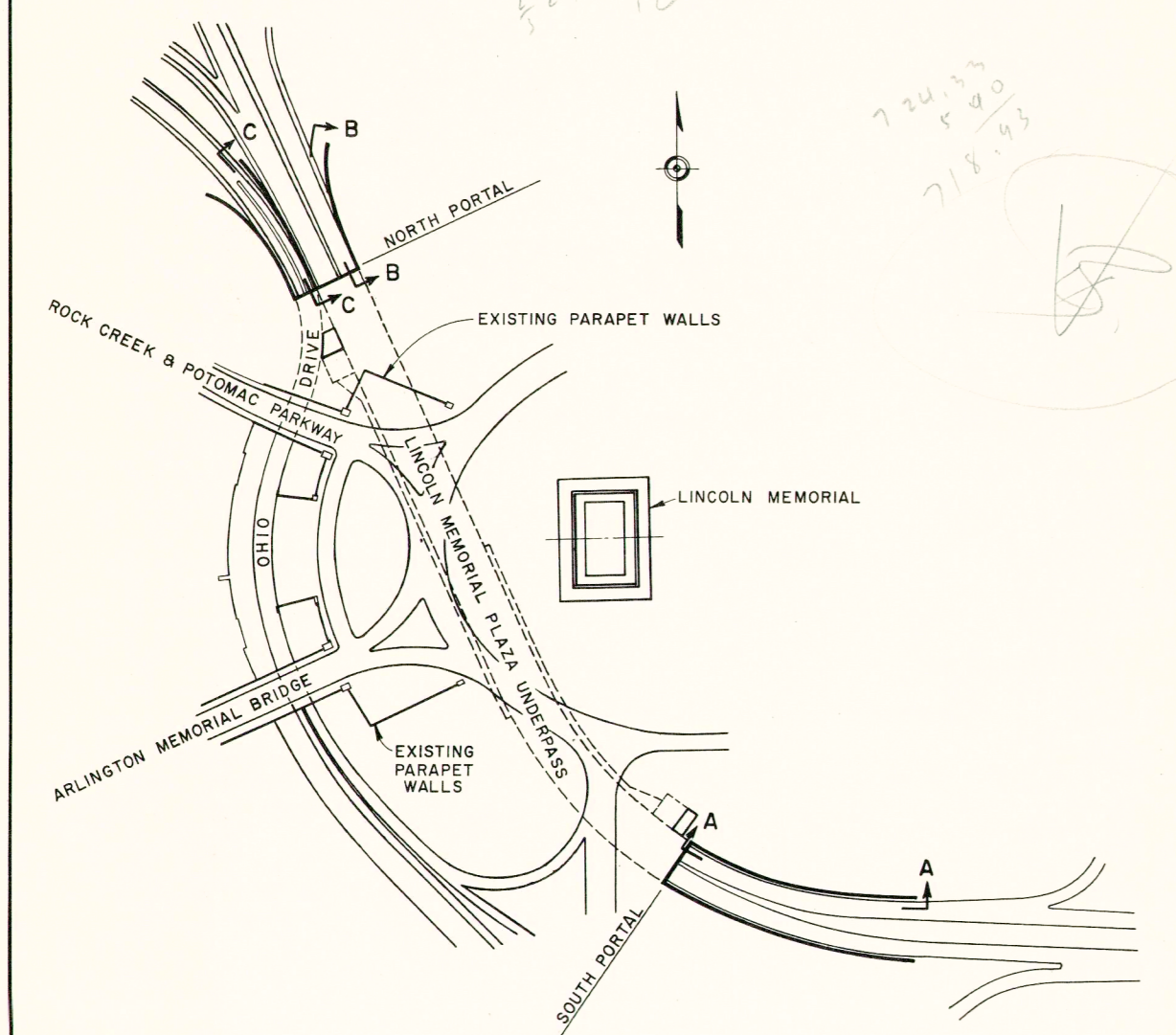
SOUTH OPEN RAMP - ELEVATION A-A
SCALE 10 0 10 20 FEET



NORTH OPEN RAMP - ELEVATION B-B
SCALE 10 0 10 20 FEET

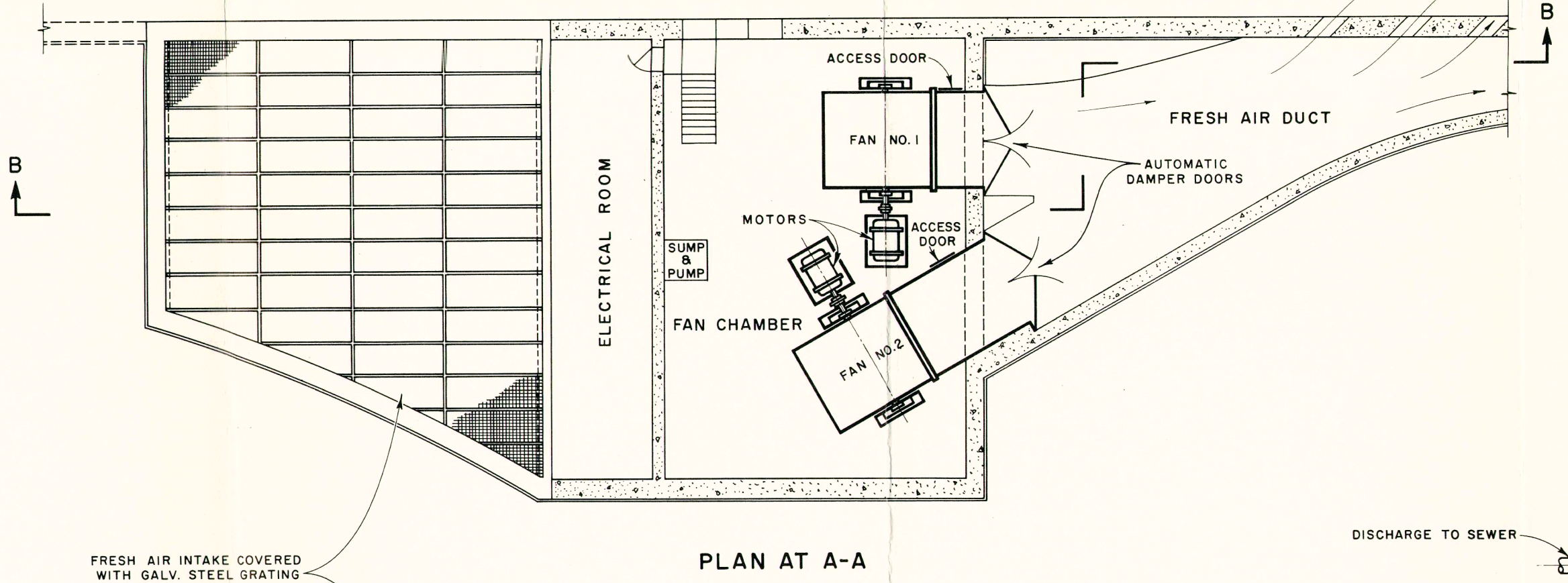
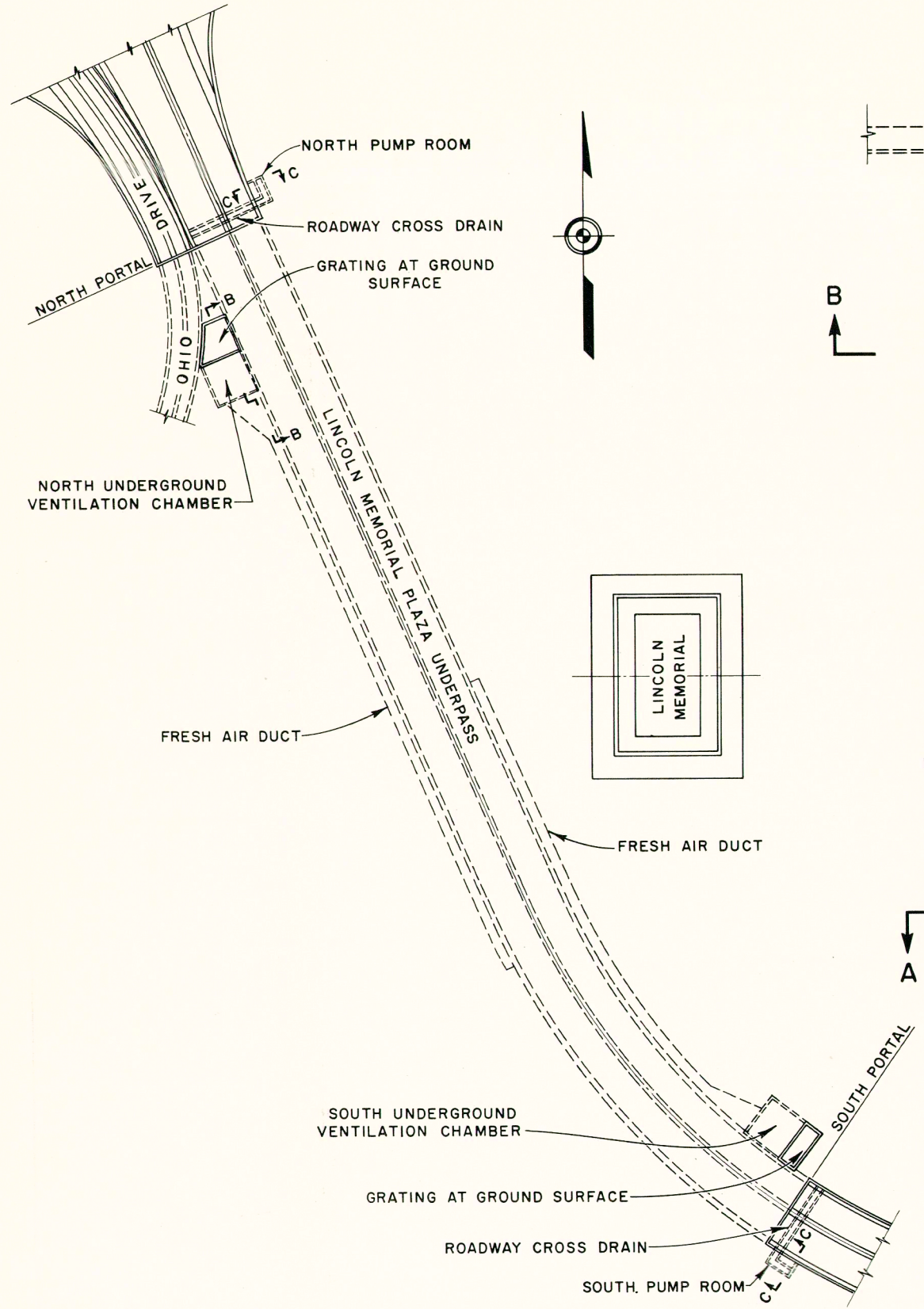


CENTER WALL NORTH RAMP - ELEVATION C-C
SCALE 10 0 10 20 FEET

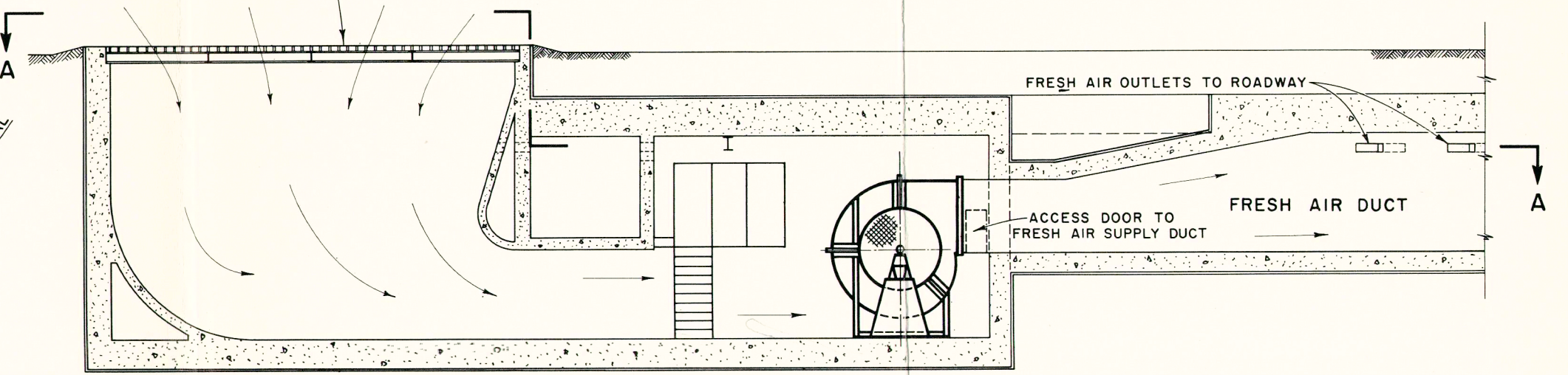


PLAN
SCALE 200 0 200 400 FEET

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL CAPITAL PARKS
WASHINGTON D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA
LINCOLN MEMORIAL PLAZA UNDERPASS
ELEVATIONS OF RETAINING WALLS
SINGSTAD & BAILLIE
CONSULTING ENGINEERS
NEW YORK
SCALE: AS SHOWN
DATE: SEPTEMBER 6, 1960

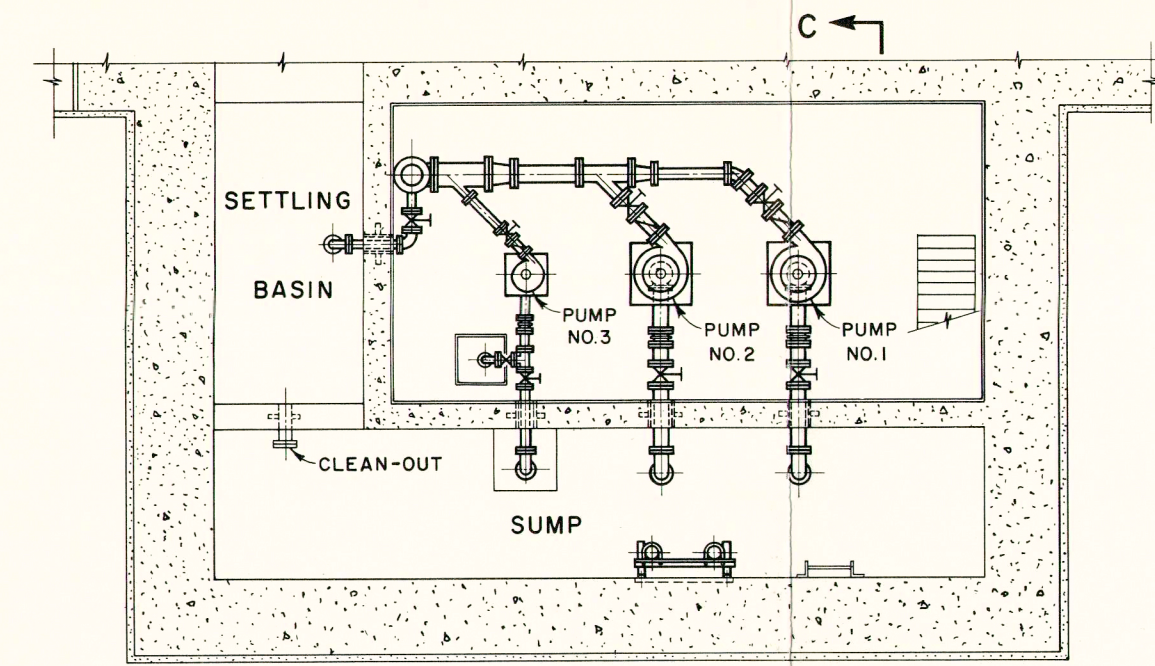


PLAN AT A-A

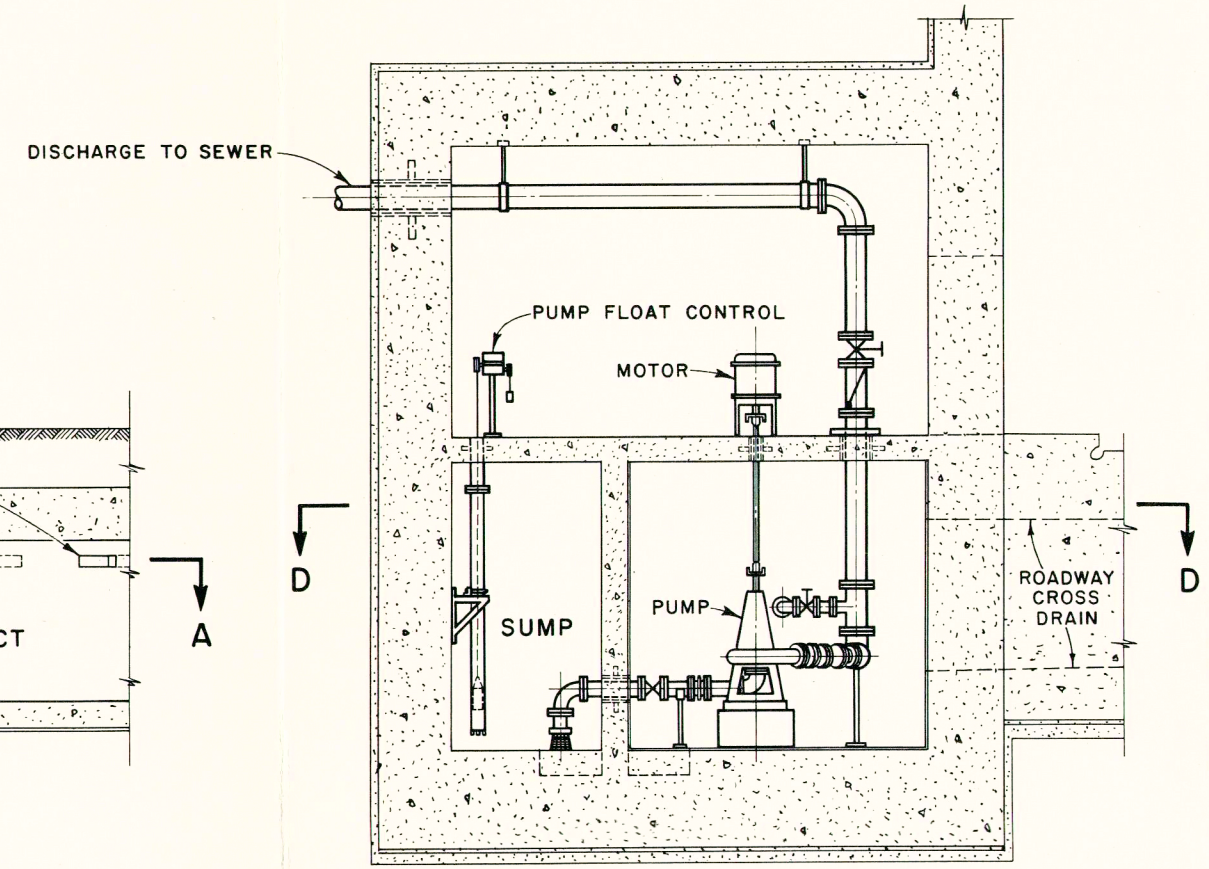


SECTION B-B

NORTH UNDERGROUND VENTILATION CHAMBER (SOUTH CHAMBER SIMILAR)



PLAN AT D-D

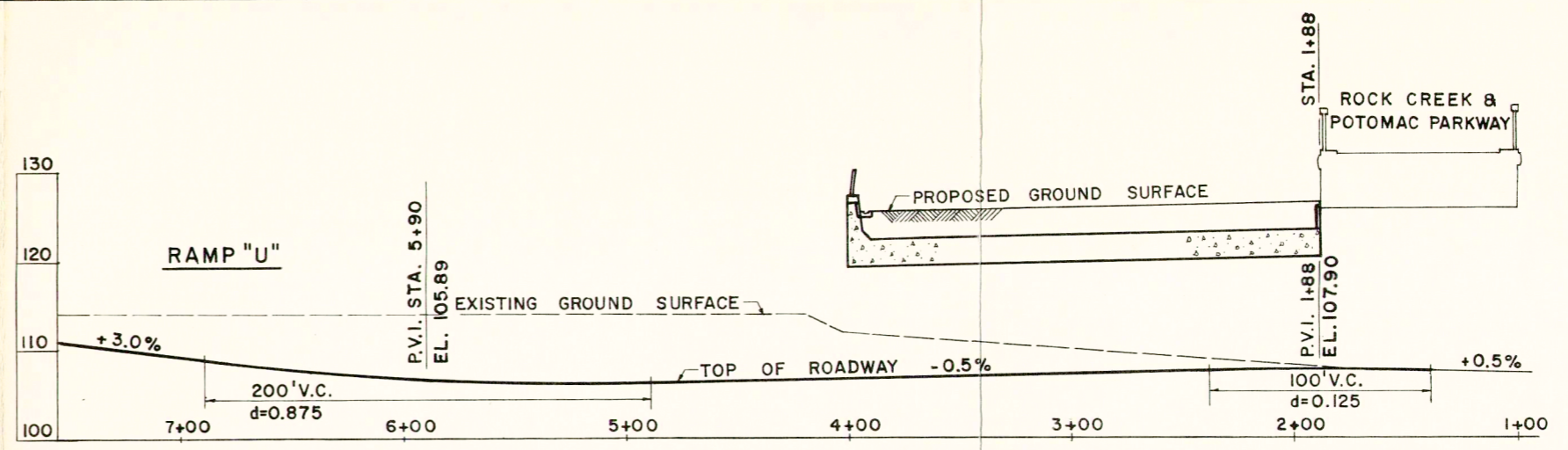
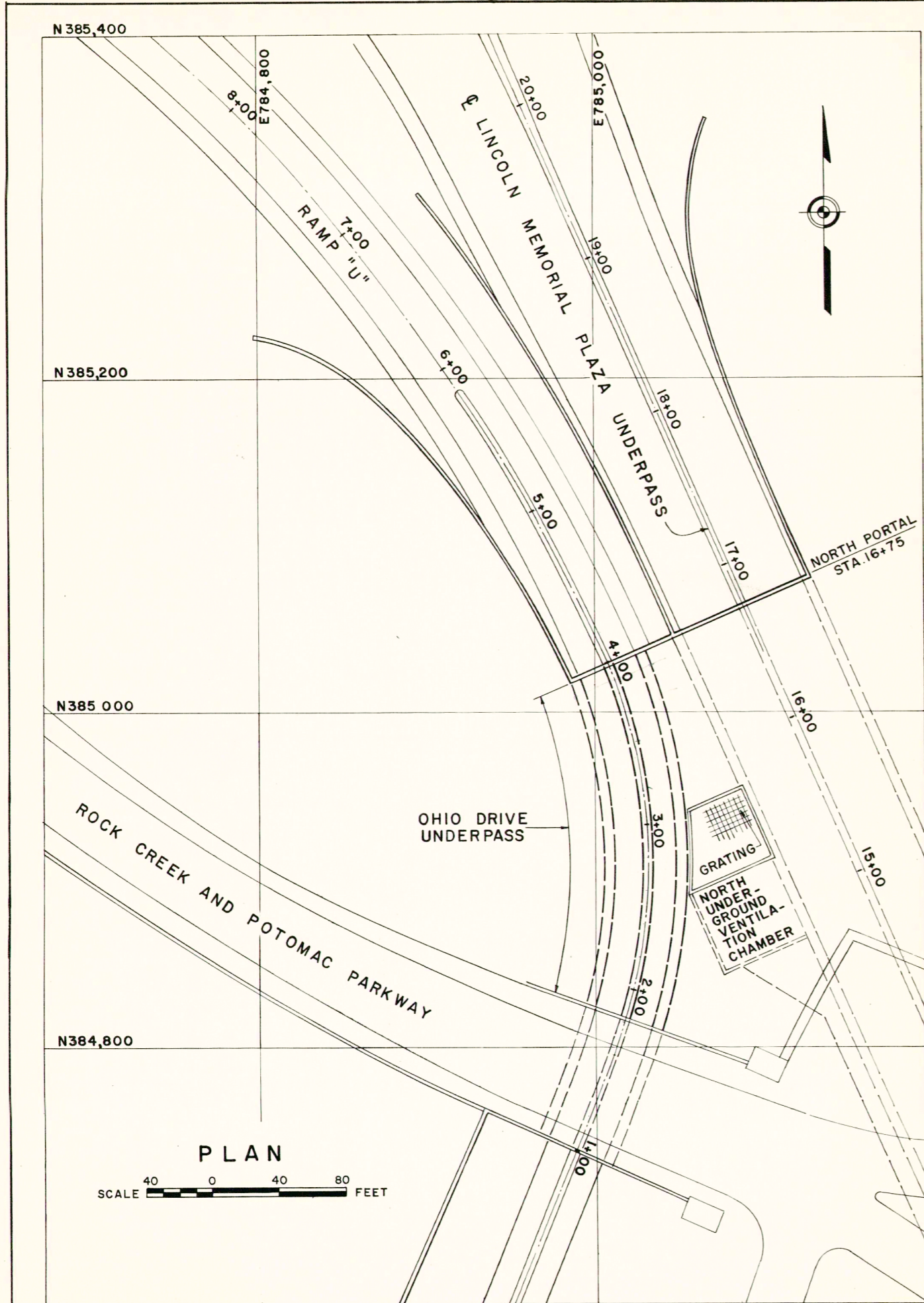


SECTION C-C

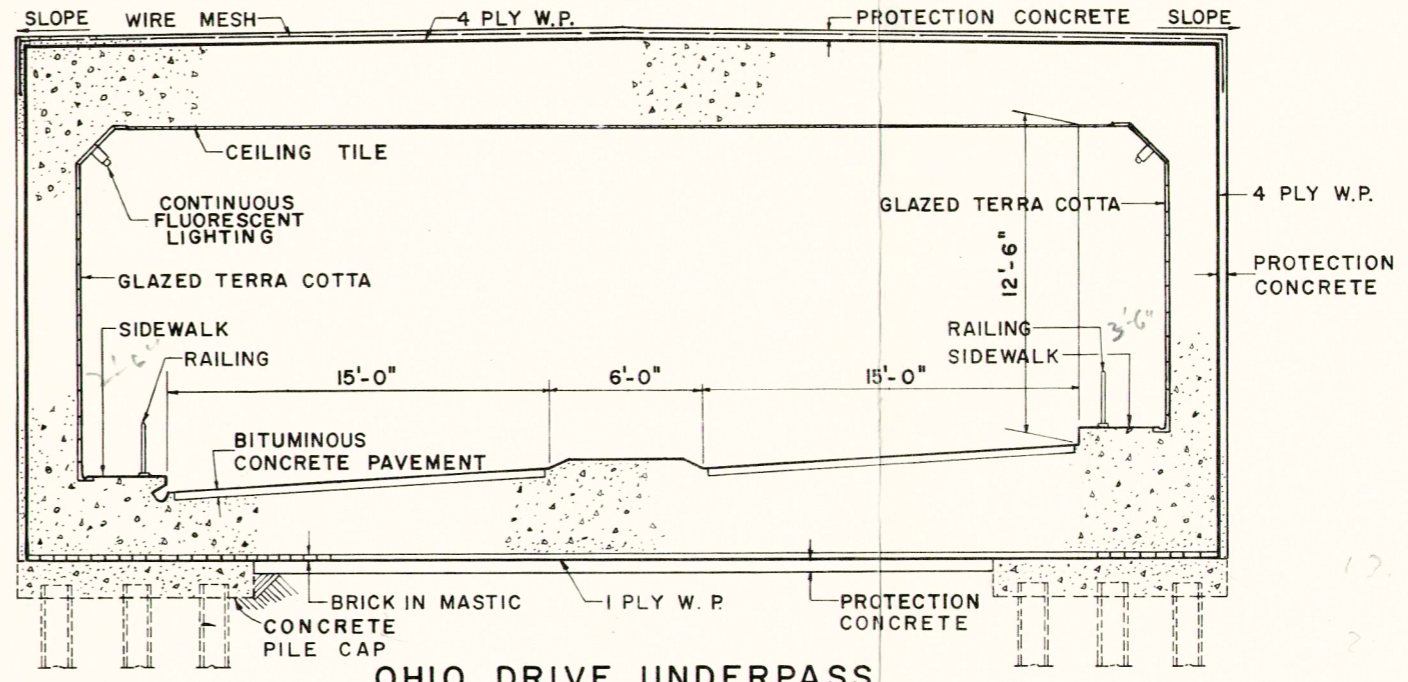
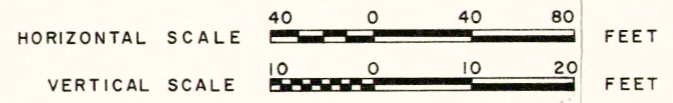
PORTAL PUMP ROOM



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NATIONAL PARK SERVICE
NATIONAL CAPITAL PARKS
WASHINGTON D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA
LINCOLN MEMORIAL PLAZA UNDERPASS
UNDERGROUND VENTILATION CHAMBERS
AND PUMP ROOMS
SINGSTAD & BAILLIE
CONSULTING ENGINEERS
NEW YORK
SCALE: AS SHOWN
DATE: SEPTEMBER 6, 1960



PROFILE ALONG OHIO DRIVE UNDERPASS



**OHIO DRIVE UNDERPASS
TYPICAL CROSS SECTION**



UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
NATIONAL CAPITAL PARKS
WASHINGTON D.C.

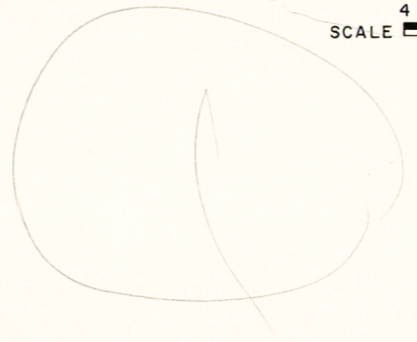
REDEVELOPMENT OF LINCOLN MEMORIAL AREA

**OHIO DRIVE UNDERPASS
PLAN, PROFILE AND SECTION**

SINGSTAD & BAILLIE
CONSULTING ENGINEERS
NEW YORK

SCALE: AS SHOWN

DATE: SEPTEMBER 6, 1960



275

15
15.98 = 1/64

575,000

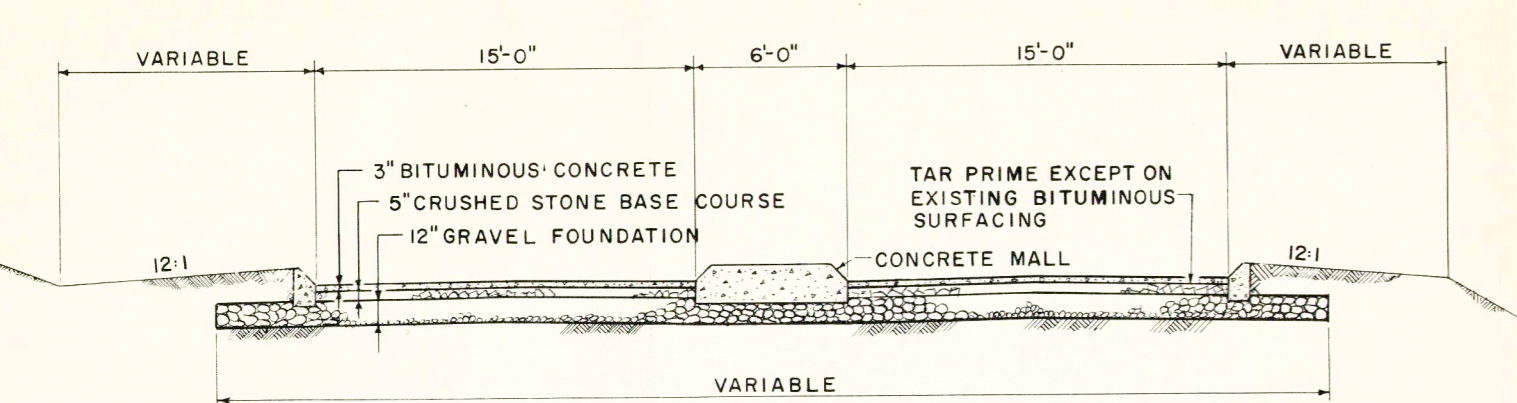
36
8
48
18
60

30

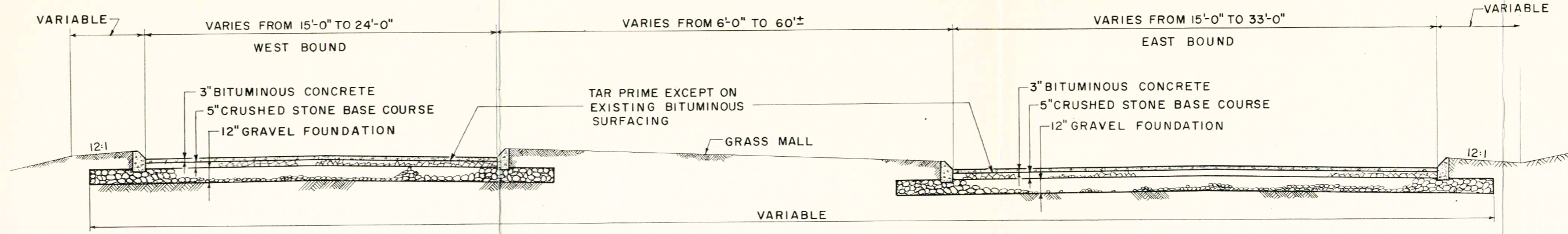
13.5 x 1.2

12.5

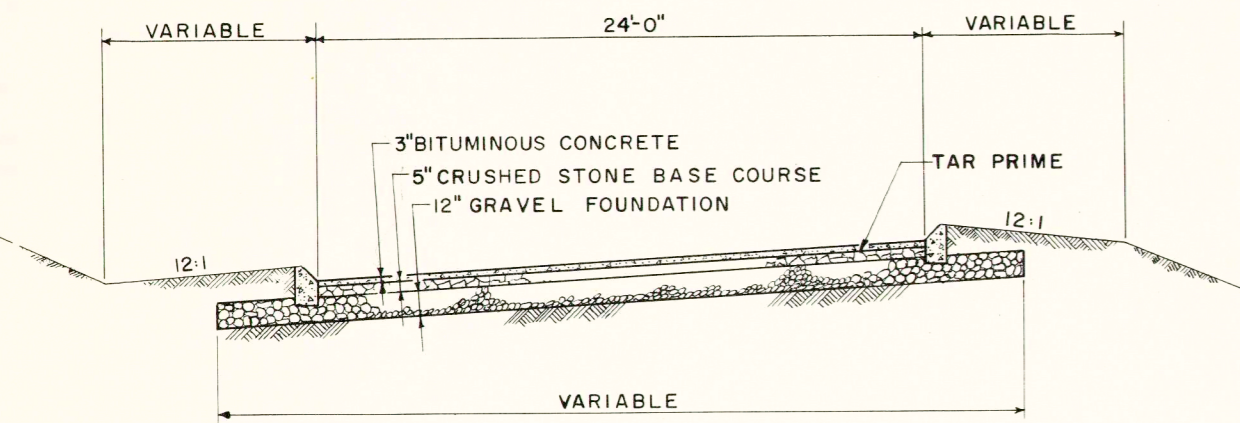
34



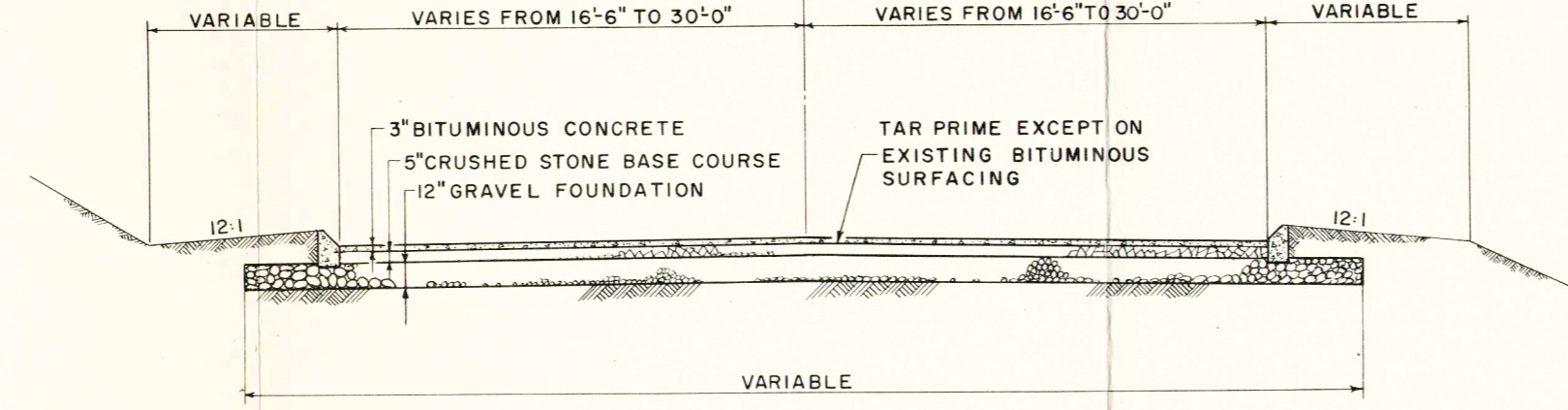
TYPICAL CROSS SECTION OF OHIO DRIVE
FROM STA 0+00 TO STA 4+50



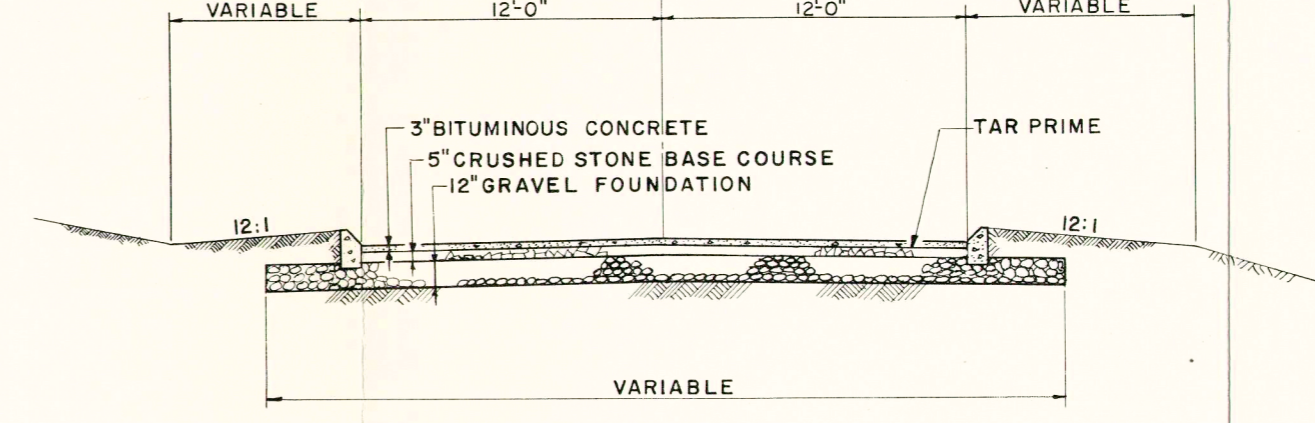
TYPICAL CROSS SECTION OF OHIO DRIVE
FROM STA 4+50 TO STA 17+00 EB
FROM STA 4+50 TO STA 18+00 WB



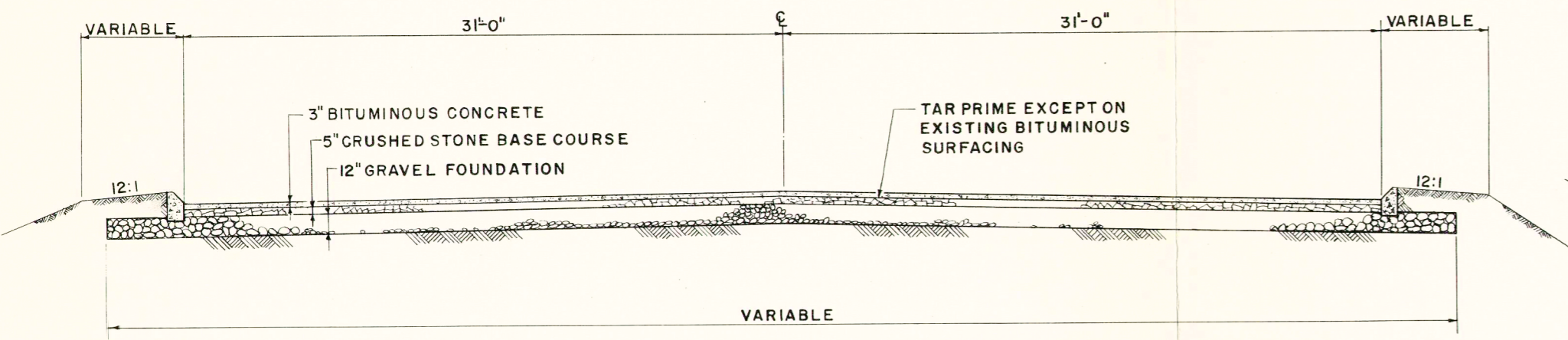
TYPICAL CROSS SECTION OF RAMPS 4, 7 & 8



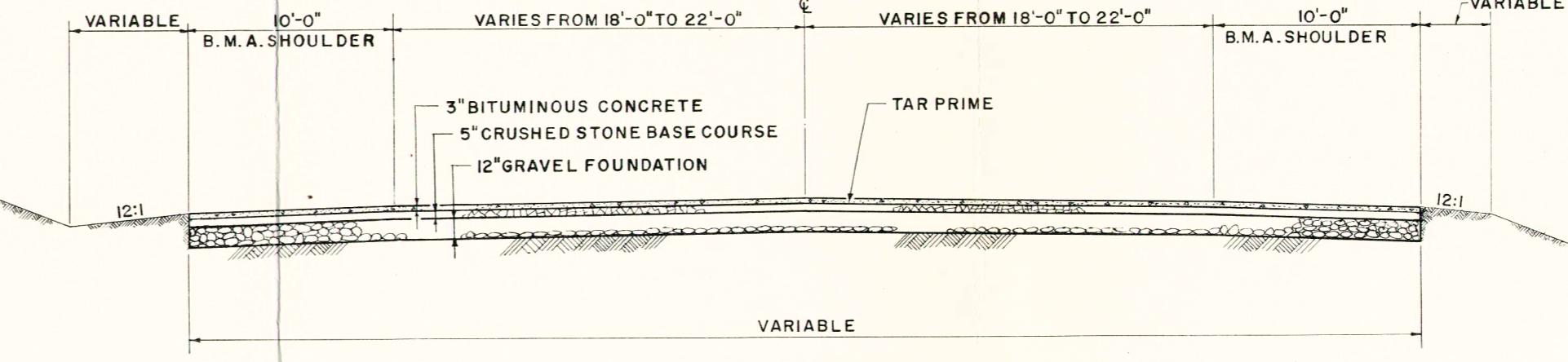
TYPICAL CROSS SECTION OF RAMP 6



TYPICAL CROSS SECTION OF RAMP 9



TYPICAL CROSS SECTION OF RAMP 3



TYPICAL CROSS SECTION OF RAMP "U"

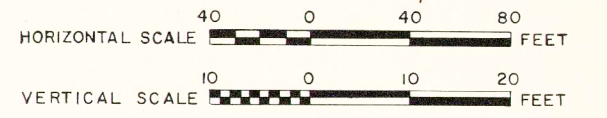
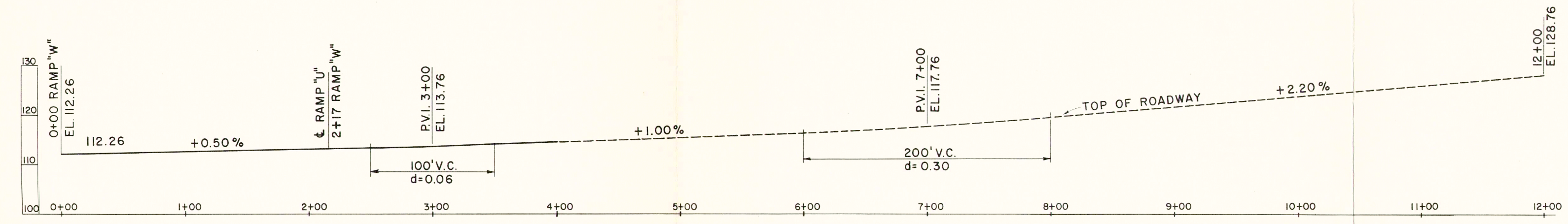
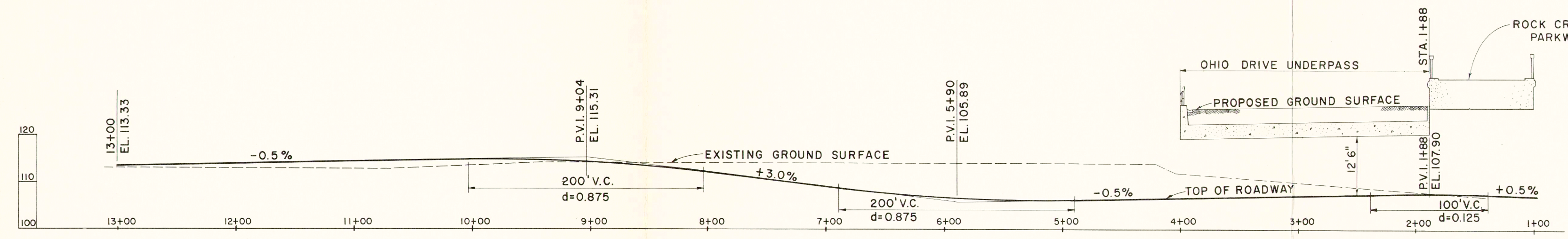
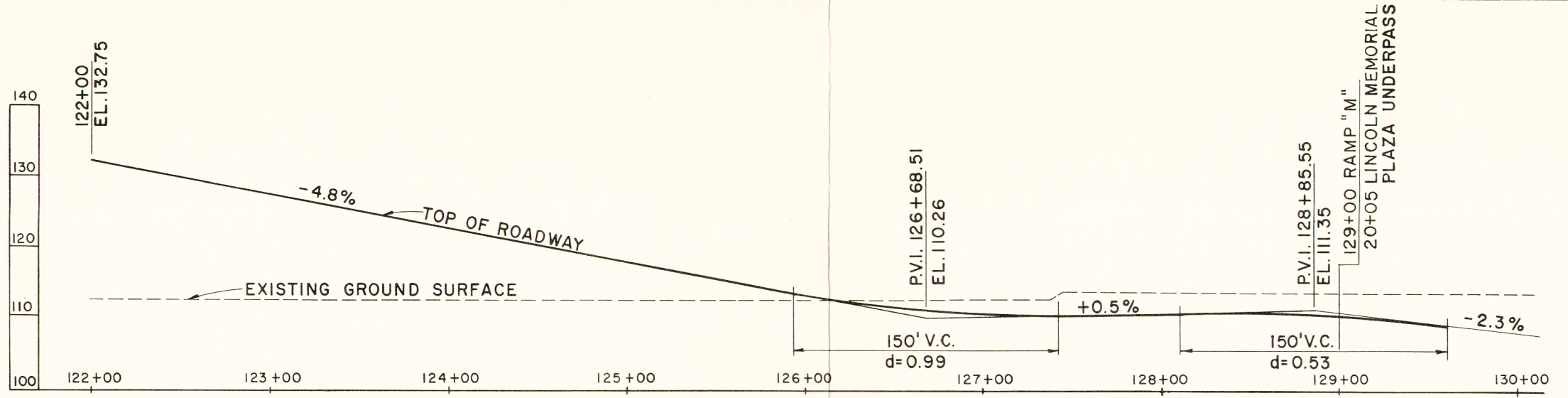
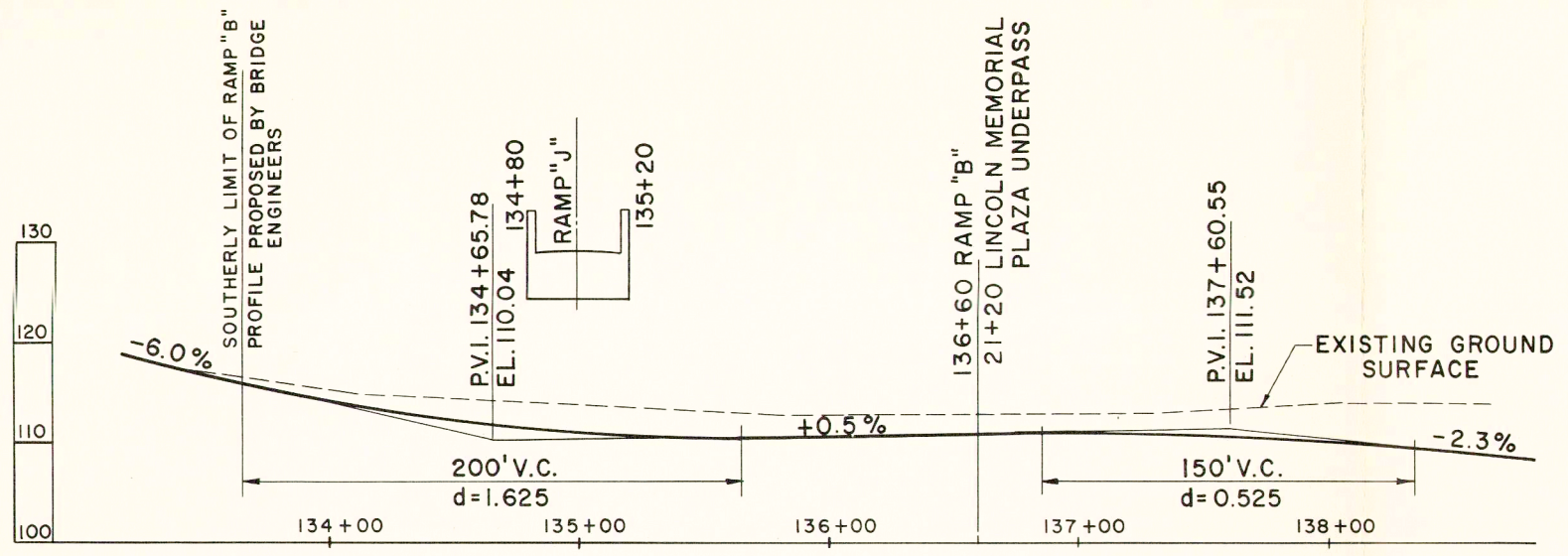


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NATIONAL CAPITAL PARKS
WASHINGTON D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA
AUXILIARY RAMPS — TYPICAL CROSS SECTIONS

SINGSTAD & BAILLIE
CONSULTING ENGINEERS
NEW YORK

SCALE: AS SHOWN

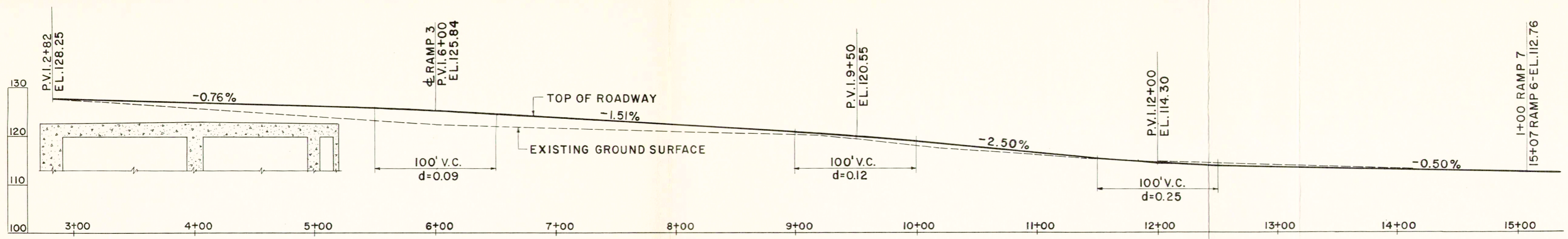
DATE: SEPTEMBER 6, 1960



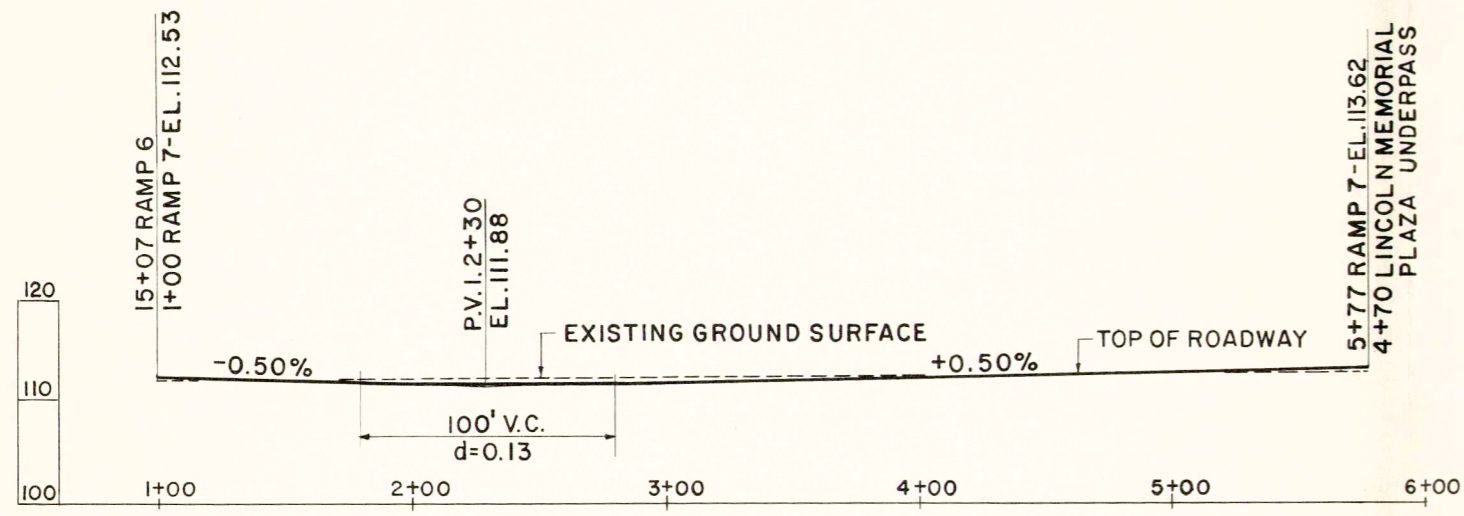
UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 NATIONAL CAPITAL PARKS
 WASHINGTON D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA

AUXILIARY RAMPS — PROFILES

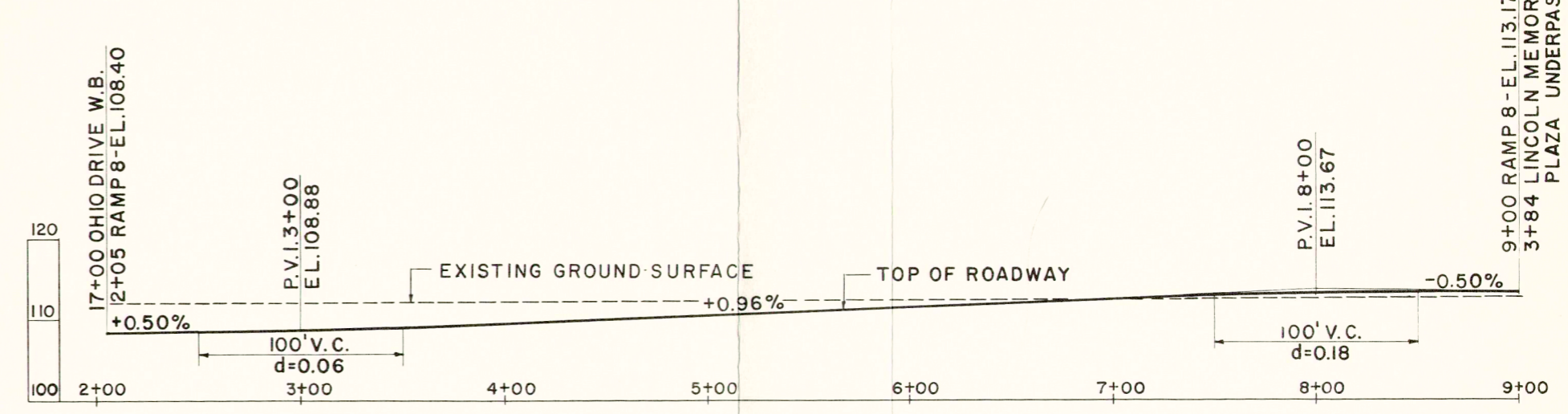
SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
 NEW YORK



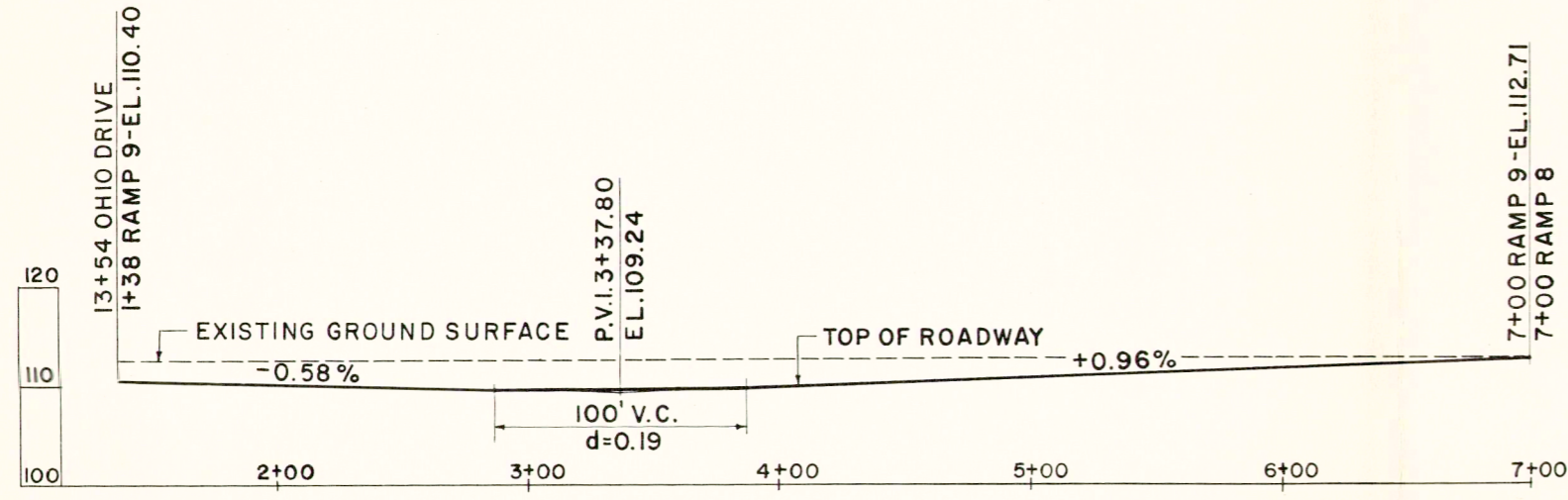
RAMP 6 - SOUTH REFLECTING POOL DRIVE



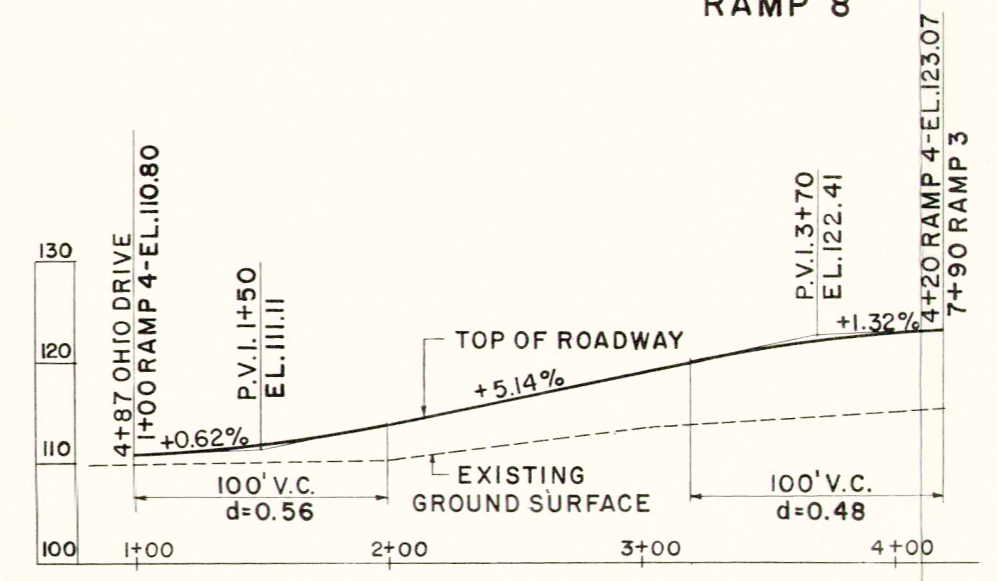
RAMP 7



RAMP 8



RAMP 9



RAMP 4



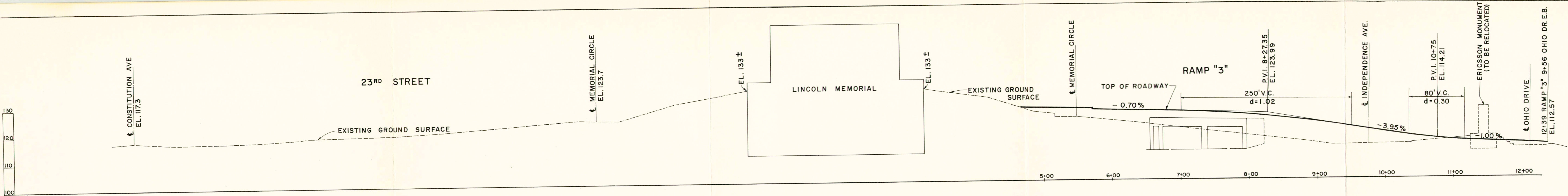
UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 NATIONAL CAPITAL PARKS
 WASHINGTON D.C.
REDEVELOPMENT OF LINCOLN MEMORIAL AREA

AUXILIARY RAMPS — PROFILES

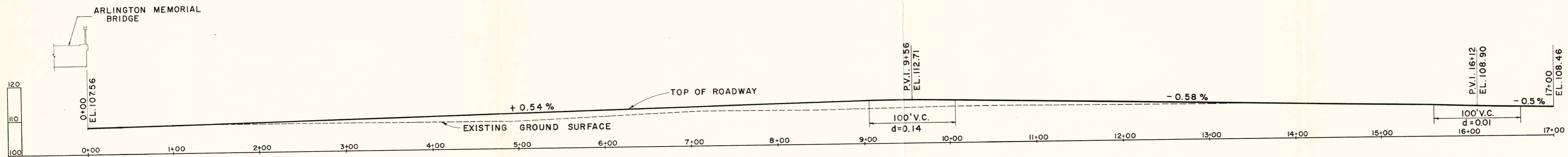
SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
 NEW YORK

SCALE: AS SHOWN

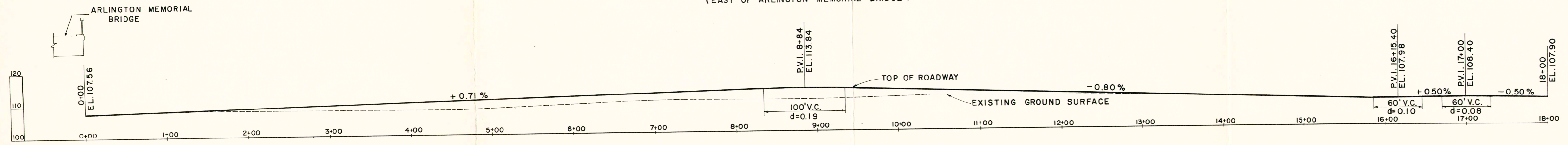
DATE: SEPTEMBER 6, 1960



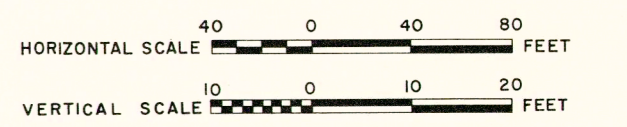
PROFILE ALONG NORTH-SOUTH AXIS OF LINCOLN MEMORIAL



PROFILE ALONG OHIO DRIVE-EAST BOUND
(EAST OF ARLINGTON MEMORIAL BRIDGE)



PROFILE ALONG OHIO DRIVE-WEST BOUND
(EAST OF ARLINGTON MEMORIAL BRIDGE)



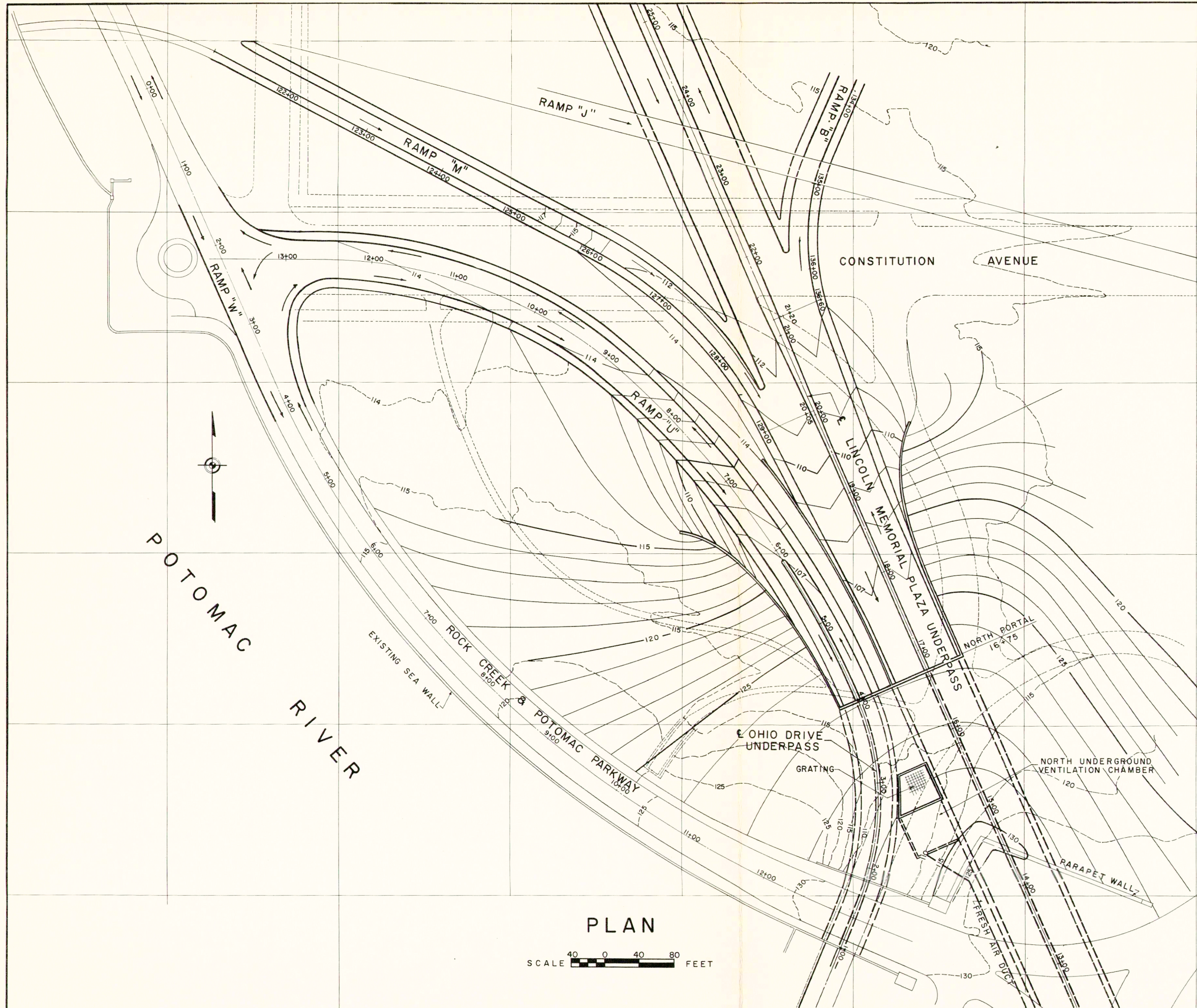
UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 NATIONAL CAPITAL PARKS
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REDEVELOPMENT OF LINCOLN MEMORIAL AREA

PROFILE OF OHIO DRIVE
 PROFILE ALONG NORTH-SOUTH AXIS
 OF LINCOLN MEMORIAL

SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
 NEW YORK

SCALE: AS SHOWN DATE: SEPTEMBER 6, 1960



POTOMAC RIVER

PLAN
 SCALE 0 40 80 FEET

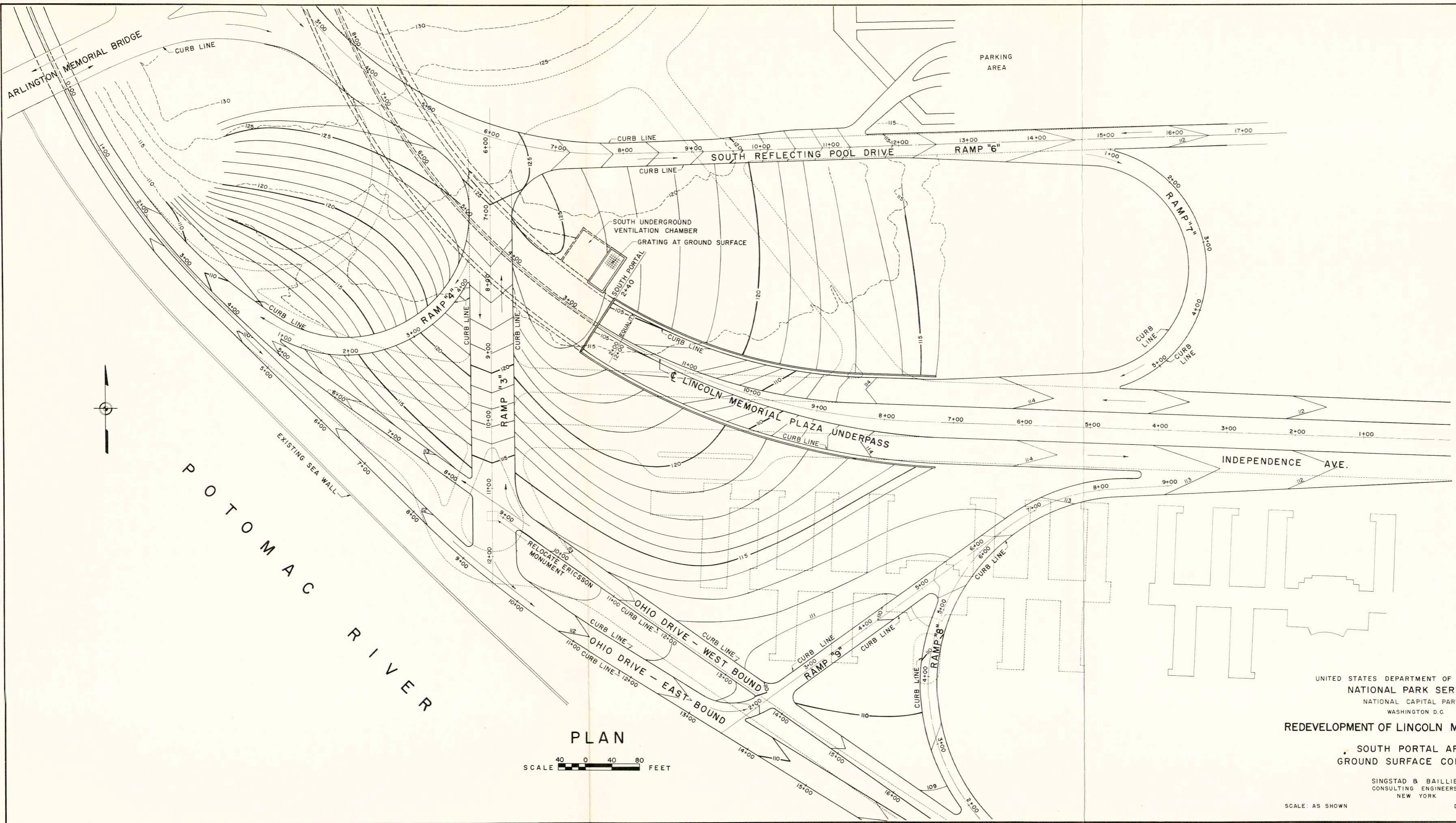
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REDEVELOPMENT OF LINCOLN MEMORIAL AREA

NORTH PORTAL AREA
 GROUND SURFACE CONTOURS

SINGSTAD & BAILLIE
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PLAN

SCALE 0 40 80 FEET

UNITED STATES DEPARTMENT OF THE INTERIOR
 NATIONAL PARK SERVICE
 NATIONAL CAPITAL PARKS
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REDEVELOPMENT OF LINCOLN MEMORIAL AREA

SOUTH PORTAL AREA
GROUND SURFACE CONTOURS

SINGSTAD & BAILLIE
 CONSULTING ENGINEERS
 NEW YORK

SCALE: AS SHOWN

DATE: SEPTEMBER 6, 1960

