

UNITED STATES DEPARTMENT OF THE INTERIOR  
 NATIONAL PARK SERVICE  
**NATIONAL REGISTER OF HISTORIC PLACES**  
**INVENTORY -- NOMINATION FORM**  
 FOR FEDERAL PROPERTIES

**FOR NPS USE ONLY**  
 RECEIVED **SEP 3 1985**  
 DATE ENTERED **OCT 17 1985**

SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*  
 TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

**1 NAME**

HISTORIC

David W. Taylor Model Basin

AND/OR COMMON

David W. Taylor Model Basin, David W. Taylor Naval Ship Research + Development Ctr

**2 LOCATION**

STREET & NUMBER

David W. Taylor NSRDC, Carderock Laboratory

N/A NOT FOR PUBLICATION

CITY, TOWN  
 Bethesda,

CONGRESSIONAL DISTRICT

n/a VICINITY OF

8th

STATE  
 Maryland

CODE  
 24

COUNTY  
 Montgomery

CODE  
 03

**3 CLASSIFICATION**

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
<input checked="" type="checkbox"/> DISTRICT	<input checked="" type="checkbox"/> PUBLIC	<input checked="" type="checkbox"/> OCCUPIED	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> MUSEUM
<input checked="" type="checkbox"/> BUILDING(S)	<input type="checkbox"/> PRIVATE	<input type="checkbox"/> UNOCCUPIED	<input type="checkbox"/> COMMERCIAL	<input type="checkbox"/> PARK
<input type="checkbox"/> STRUCTURE	<input type="checkbox"/> BOTH	<input type="checkbox"/> WORK IN PROGRESS	<input type="checkbox"/> EDUCATIONAL	<input type="checkbox"/> PRIVATE RESIDENCE
<input type="checkbox"/> SITE	<b>PUBLIC ACQUISITION</b>	<b>ACCESSIBLE</b>	<input type="checkbox"/> ENTERTAINMENT	<input type="checkbox"/> RELIGIOUS
<input type="checkbox"/> OBJECT	<input type="checkbox"/> IN PROCESS	<input checked="" type="checkbox"/> YES: RESTRICTED	<input type="checkbox"/> GOVERNMENT	<input type="checkbox"/> SCIENTIFIC
	<input type="checkbox"/> BEING CONSIDERED	<input type="checkbox"/> YES: UNRESTRICTED	<input type="checkbox"/> INDUSTRIAL	<input type="checkbox"/> TRANSPORTATION
	<input checked="" type="checkbox"/> N/A	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MILITARY	<input type="checkbox"/> OTHER:

**4 AGENCY**

REGIONAL HEADQUARTERS: (if applicable)  
 U. S. Navy

STREET & NUMBER

David W. Taylor NSRDC, Carderock Laboratory

CITY, TOWN  
 Bethesda

STATE

n/a VICINITY OF

Maryland

**5 LOCATION OF LEGAL DESCRIPTION**

COURTHOUSE,  
 REGISTRY OF DEEDS, ETC.

Land Records Office

STREET & NUMBER

Montgomery County Courthouse

CITY, TOWN

Rockville

STATE  
 Maryland

**6 REPRESENTATION IN EXISTING SURVEYS**

TITLE

David W. Taylor NSRDC Archeological Survey

DATE

1984

FEDERAL  STATE  COUNTY  LOCAL

DEPOSITORY FOR  
 SURVEY RECORDS

Maryland Historical Trust

CITY, TOWN

Annapolis

STATE

Maryland 21401

ENCL (1)

# 7 DESCRIPTION

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CONDITIONS

<input checked="" type="checkbox"/> EXCELLENT	<input type="checkbox"/> DETERIORATED
<input type="checkbox"/> GOOD	<input type="checkbox"/> RUINS
<input type="checkbox"/> FAIR	<input type="checkbox"/> UNEXPOSED

CHECK ONE

<input type="checkbox"/> UNALTERED
<input checked="" type="checkbox"/> ALTERED

CHECK ONE

<input checked="" type="checkbox"/> ORIGINAL SITE	
<input type="checkbox"/> MOVED	DATE _____

DESCRIBE THE PRESENT AND ORIGINAL (IF KNOWN) PHYSICAL APPEARANCE

## Summary Description

The David W. Taylor Model Basin is an interconnected complex of the 4 original buildings of the current David W. Taylor Naval Ship R&D Center. The buildings house experimental, shop, and office facilities for research and development in ship design. When constructed, the facilities were the best of their kind in the world. Their design won "First Award of Class A" and a special commendation from the Jury in the Sixth Annual Exhibition of the Association of Federal Architects, 1937. Although many other buildings have been erected at the Center's Carderock Laboratory over the years, these original four still serve as its visual and administrative heart. The buildings immediately north of building 4 are considered intrusions and are not included in this nomination.

Except for an extension of building 4 and limited internal refurbishing, the complex is in its original state. Buildings 1-3, which are actually a single, rectilinear structure, measure approximately 960 feet in length. Building 4, connected to the others by an enclosed passage, stands parallel and behind them. Originally, it measured 1300 feet in length, but has since been extended to 3150 feet.

## General Description

The David W. Taylor Model Basin is located in the rock gorge of the Potomac River, some twelve miles from the center of the city of Washington. It is bordered by the George Washington Memorial Parkway and MacArthur Boulevard. Although the Center's mailing address is Bethesda, the nearest towns are Cabin John and Potomac, Maryland. The site was selected to fulfill four basic requirements. First, bedrock had to be close to the surface to support foundations for the tracks of the towing carriages of the model basin. Second, an ample supply of fresh water to supply the basins had to be available. Third, the establishment had to be near the Navy Department Headquarters in Washington. Finally, the site had to be as free as possible from noise, ground vibration, smoke, and dirt. The location at Carderock, selected after a long search, met all these qualifications.

The buildings were designed by the Bureau of Yards and Docks under the direction of Commander Ben Morell, who later became Chief of the Bureau. They were to be utilitarian, but also dignified and modern. As is typical of the Federal Architectural style of the period, a strong influence of art deco is apparent. Note, for instance, the strong vertical lines, the ornamentation, and the central tower. The external surface of the main building group is faced with a layer of quartz aggregates and white cement that give it a diffuse white aspect. According to an early description, the design was "intended to express a clarity of line, thought, and purpose

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David W. Taylor Model Basin  
Montgomery County, Maryland

GENERAL DESCRIPTION (continued)

typifying the nature and function of the establishment." (Saunders and Hodtwalker, 1947 ) This motif was also significant for the structural plan, which was among the earliest applications of modern principles of analysis of continuous frames in buildings of its size and loading. (Ibid).

The central tower of building 2 provides a visual focus unifying the three buildings. Its large, ornamented main doors are approached by a broad staircase flanked by tall, classically styled lamps. The doors open to the spacious main lobby, whose floor is ornamented by a mosaic compass. Mosaics on the walls and the lighting fixtures reemphasize the art deco style of the exterior. Steps lead from the lobby to what was originally designed as a museum, but now serves as the Center's main conference room. Its walls are decorated with mosaics of six historic ships chosen to illustrate the evolution of Navy ship design from the mid 19th century to the 1930's. Alcoves of the lobby have historical displays about Rear Admiral David W. Taylor, the Center's namesake, and Captain Harold Saunders, who was principally responsible for its technical design and later served as its director.

In contrast, buildings 1 and 3 are two-story buildings with a large open bay workspace on the ground level and research spaces on the second floor. Both buildings were originally designed to provide the support space needed for ship design research. Although identical in construction and exterior design to building 2 these support wings were absent of decorative interior finishes and the deco motifs found in the main building.

The exteriors of all three buildings and the significant interior spaces of building 2 have survived intact primarily because the buildings still serve as the administrative and research center for the base.

Building 4 is essentially a housing for two long tow basins: one for high speed and the other for low speed carriages. The arched ceilings, low lighting to prevent plant growth in the basins, and commanding presence of the

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Montgomery County, Maryland

GENERAL DESCRIPTION (continued)

basins themselves give the interior of the building a unique charcter. Technical requirements for the basins determined the building's special design. The arches that support the roof are reinforced concrete and every pier, footing, and wall rests directly on bedrock. Special concrete construction joints poured along the length of the basin maintain a tight seal during all seasons of the year. The rails that run along the length of the edges of the basin to support the carriages were shaped and positioned to parallel the curvature of the earth (and thus of the water in the basin). This allows the carriages to maintain precisely constant speed when towing ship models during experimental tests. Special techniques were used to install the rails so they would meet required tolerances. The model basin was extended to its present length in the late 1940's. The design and style of the extension, however, matched those of the original structure. (Saunders and Hodtwalker, 1947; Saunders, 1941).

The significant parts of this building are its arched, concrete exterior and the towing basins themselves. They embody the innovative design that makes the structure significant from an engineering and architectural viewpoint, and the technical features that make it one of the Navy's leading experimental facilities.

Sources

Saunders, H. E., and Hodtwalker, M., "The David W. Taylor Model Basin: A Manual for Vistors to the David W. Taylor Model Basin," (Washington: David Taylor Model Basin Report 569, April 1947).

Saunders, H. E., "The David W. Taylor Model Basin: A Description of the Model Basins and the Testing Equipment, "Transaction of the Society of Naval Architects and Marine Engineers 48 (1939): 307-324; 48 (1940): 184-209; 49 (1941): 10-46.

# 8 SIGNIFICANCE

M:29-47

PERIOD	AREAS OF SIGNIFICANCE -- CHECK AND JUSTIFY BELOW				
<input type="checkbox"/> PREHISTORIC	<input type="checkbox"/> ARCHEOLOGY-PREHISTORIC	<input type="checkbox"/> COMMUNITY PLANNING	<input type="checkbox"/> LANDSCAPE ARCHITECTURE	<input type="checkbox"/> RELIGION	
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> ARCHEOLOGY-HISTORIC	<input type="checkbox"/> CONSERVATION	<input type="checkbox"/> LAW	<input checked="" type="checkbox"/> SCIENCE	
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> AGRICULTURE	<input type="checkbox"/> ECONOMICS	<input type="checkbox"/> LITERATURE	<input type="checkbox"/> SCULPTURE	
<input type="checkbox"/> 1600-1699	<input checked="" type="checkbox"/> ARCHITECTURE	<input type="checkbox"/> EDUCATION	<input checked="" type="checkbox"/> MILITARY	<input type="checkbox"/> SOCIAL/HUMANITARIAN	
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> ART	<input checked="" type="checkbox"/> ENGINEERING	<input type="checkbox"/> MUSIC	<input type="checkbox"/> THEATER	
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> COMMERCE	<input type="checkbox"/> EXPLORATION/SETTLEMENT	<input type="checkbox"/> PHILOSOPHY	<input type="checkbox"/> TRANSPORTATION	
<input type="checkbox"/> 1900-	<input type="checkbox"/> COMMUNICATIONS	<input type="checkbox"/> INDUSTRY	<input type="checkbox"/> POLITICS/GOVERNMENT	<input type="checkbox"/> OTHER (SPECIFY)	
		<input checked="" type="checkbox"/> INVENTION			

SPECIFIC DATES 1937-1939, 1944-1945 BUILDER/ARCHITECT United States Navy, Bur. of Yards & Docks, Turner Construction Company, New York

STATEMENT OF SIGNIFICANCE

Significance Summary

The historical significance of the David Taylor Model Basin lies in its association with important events (criterion A), i.e. the design of the contemporary American Navy; its distinctive design; and its unique scientific facilities (criterion C). Although the buildings are slightly less than 50 years old, their continuing importance to the history of the Navy during the last 4 decades warrants their addition to the National Register.

History and Support

In the late 19th Century, William Froude, a British Naval Architect, established scaling relationships that allowed the correlation of experimental results from tests of ship models to the performance of full sized ships. His work led to the creation of towing basins for scientific experimenting with ship models by all the major maritime nations of the world. The U. S. Navy built its first model basin at the Washington Navy Yard in 1898-1899. David W. Taylor was its principal designer and served as its director for its initial 14 years of operation.

By the 1930's, the original basin was obsolete, and plans were laid to build a larger and more capable facility. These plans ultimately led to the establishment of the David Taylor Model Basin at Carderock Maryland. Admiral Emory S. Land, Chief of the Bureau of Construction, secured Congressional approval for the institution, and at his suggestion, President Franklin Roosevelt personally approved naming it for David W. Taylor.

When built, the model basin was the best facility of its type in the world. Due to the extension of the basin in the late 1940's and upgrades of equipment over the years, it remains the best model basin in the Western world.

See Continuation Sheet Number 3

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HISTORY AND SUPPORT (continued)

Having opened in 1940, the model basin was heavily used during World War II. Model tests were employed to determine the characteristics of new ship designs; to measure the effects of structural modifications; to show how stability could be maintained after damage from attack; and to document the hydrodynamic characteristics of torpedoes, depth charges, and towed bodies. After the war, model basin engineers turned to exploratory development of new types of ships. They designed the Navy's first true submarines: shaped to perform better underwater than on the surface. They developed hydrofoil ships, surface effect ships, catamarans, and air cushioned vehicles. They solved problems related to towing long antenna wires and acoustic arrays. They answered such questions as "At what speeds can a submarine safely launch a ballistic missile?" They developed super-cavitating and controllable pitch propellers. For all these programs, plus more routine determinations of the performance of new components and designs under a variety of conditions, they relied on experiments in the towing basins.

The varied uses of the basin over the years have demonstrated the soundness of its basic design and its unique significance to the Department of the Navy. For over forty years, it has served as the preeminent research facility for U. S. Navy Ship Design.

(For additional historical documentation, see Section 7)

# 9 MAJOR BIBLIOGRAPHICAL REFERENCES

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See Block 7 Description (continuation sheet 2)

## 10 GEOGRAPHICAL DATA

Falls Church, VA - MD Quadrangle

ACREAGE OF NOMINATED PROPERTY 32

Quadrangle Scale: 1:24,000

UTM REFERENCES

A	1,8	30986,0	4,31,6200	B	1,8	31084,0	4,31,590,5
	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING
C	1,8	31081,0	4,31,5800	D	1,8	31098,40	4,31,60,810
	ZONE	EASTING	NORTHING		ZONE	EASTING	NORTHING

VERBAL BOUNDARY DESCRIPTION

The David W. Taylor Model Basin is located within the David W. Taylor Naval Ship Research and Development Center, Bethesda, Maryland. The Model Basin complex is shown on the accompanying map entitled "The David W. Taylor Naval Ship Research and Development Center".

LIST ALL STATES AND COUNTIES FOR PROPERTIES OVERLAPPING STATE OR COUNTY BOUNDARIES

STATE	CODE	COUNTY	CODE
N/A			
STATE	CODE	COUNTY	CODE

## 11 FORM PREPARED BY

NAME / TITLE  
David K. Allison, Historian of Navy Laboratories

ORGANIZATION  
David W. Taylor Naval Ship R&D Center

DATE  
7/17/84

STREET & NUMBER

TELEPHONE  
(301) 227-1407

CITY OR TOWN

Bethesda

STATE  
Maryland 20084

## 12 CERTIFICATION OF NOMINATION

STATE HISTORIC PRESERVATION OFFICER RECOMMENDATION

YES

NO

NONE

STATE HISTORIC PRESERVATION OFFICER SIGNATURE

In compliance with Executive Order 11593, I hereby nominate this property to the National Register, certifying that the State Historic Preservation Officer has been allowed 90 days in which to present the nomination to the State Review Board and to evaluate its significance. The evaluated level of significance is  National  State  Local.

FEDERAL REPRESENTATIVE SIGNATURE

*F. S. STERNS*

TITLE Director, Installations & Facilities, OASN(S&L)

DATE 8-26-85

FOR NPS USE ONLY

I HEREBY CERTIFY THAT THIS PROPERTY IS INCLUDED IN THE NATIONAL REGISTER

*[Signature]*

DATE 10/17/85

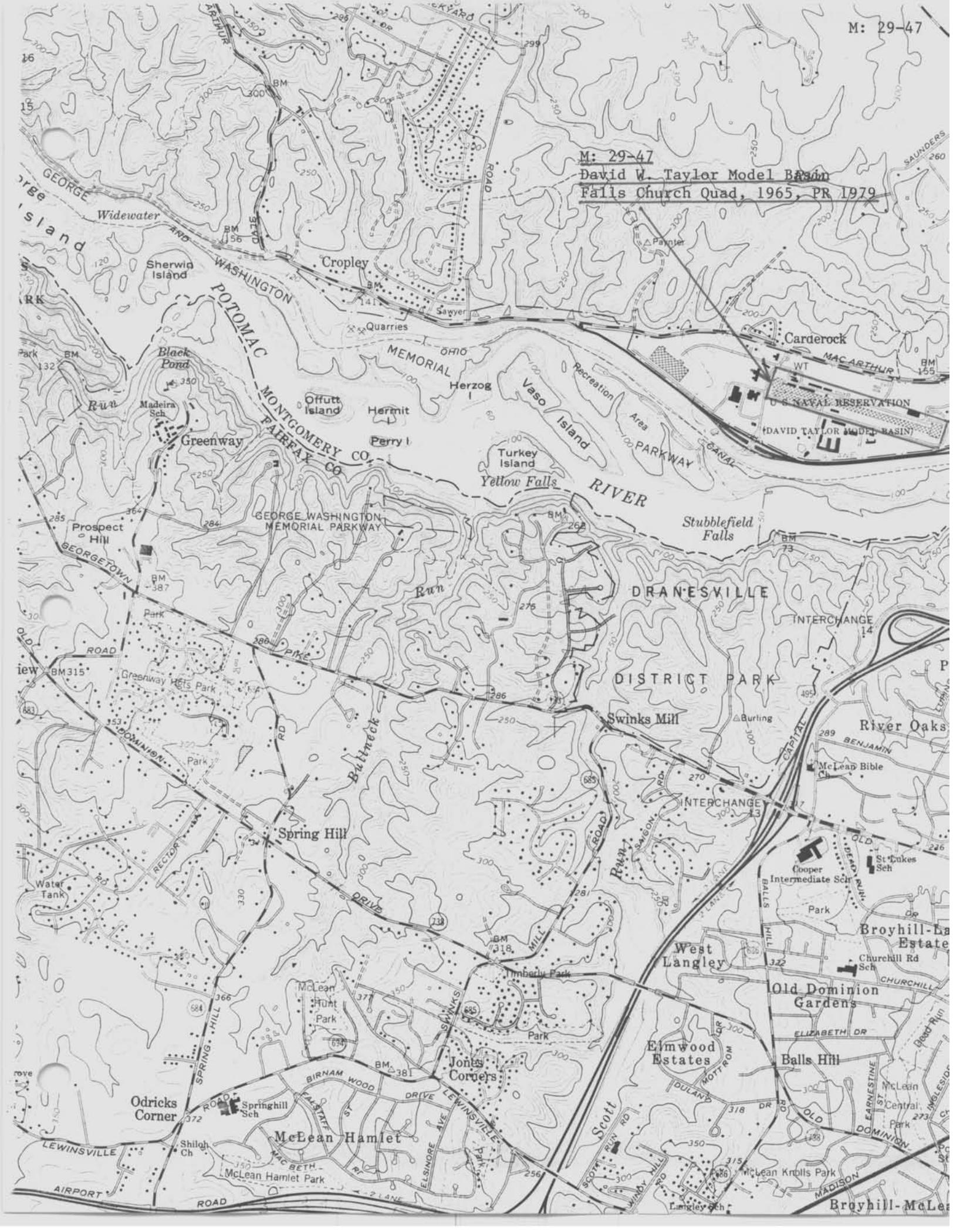
DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION  
ATTEST:

DATE

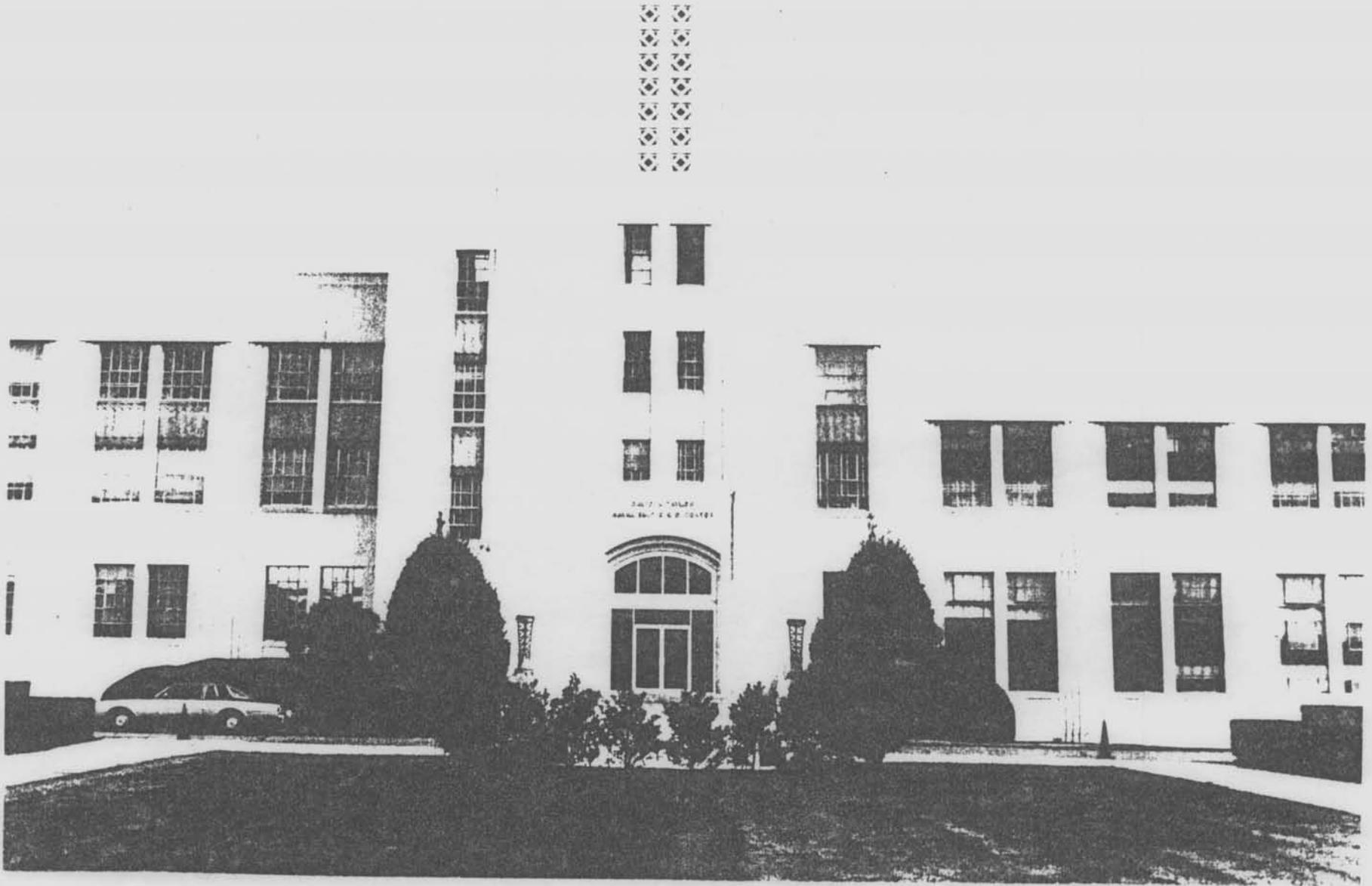
KEEPER OF THE NATIONAL REGISTER

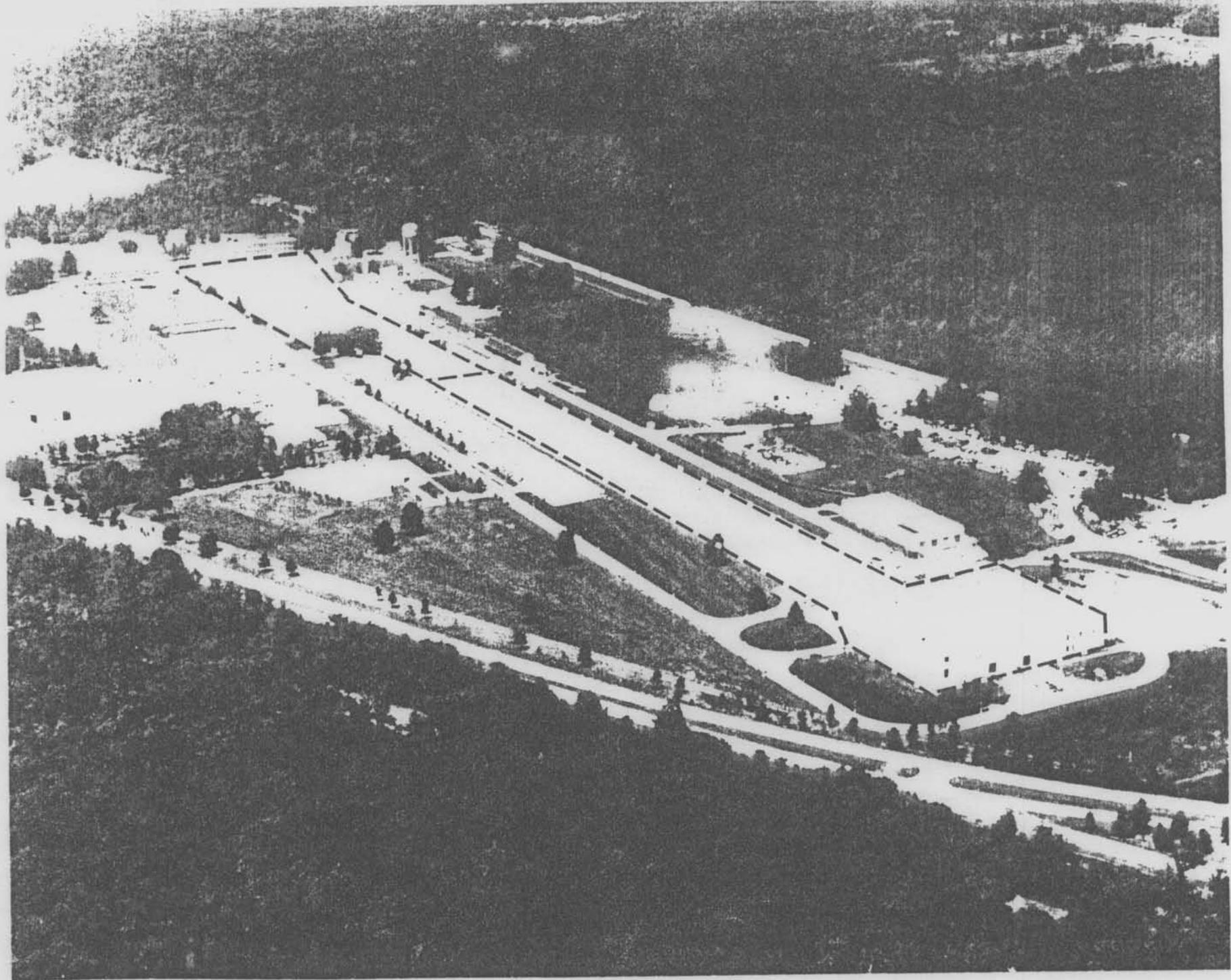
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David W. Taylor Model Basin  
Falls Church Quad, 1965, PR 1979



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