

Buildings 1-4, 4E, & 4S (David Taylor Model Basin)
NSF Carderock
MIHP # M:29-47
Montgomery County
West Bethesda
1938/1944-1946
Public

Buildings 1-4, 4E, and 4S are located in the central portion of the 183.6-acre Naval Support Facility (NSF) Carderock, formerly known as the Naval Surface Warfare Center Carderock Division (NSWCCD). Located approximately 12 miles northwest of Washington, D.C., near Bethesda, Maryland, NSF Carderock is situated north of the Potomac River and is bordered by the Clara Barton Parkway to the south and MacArthur Boulevard to the north and east. The installation is composed of 123 buildings and structures that function as research laboratories, administration facilities, and operations and utility structures. At the center of the installation is the David Taylor Model Basin (Buildings 1-4), a group of interconnected buildings that include a model basin, an administration building, a shop building, and a laboratory. The David Taylor Model Basin was listed in the NRHP in 1985. In 1996 a Historic District at NSF Carderock was determined eligible for the NRHP, and 44 of the 116 identified built resources were recognized as contributing. Buildings 1-4, 4E, and 4S are contributing resources in the NSF Carderock Historic District (MIHP # M:29-52).

The David Taylor Model Basin is a complex of four interconnected buildings that were the first built at what is now NSF Carderock. The buildings were constructed to house experimental, shop, and office facilities for research and development in ship design. When the Navy constructed the facility in 1938, it was the best of its kind in the world. The Bureau of Yards and Docks designed the buildings under the direction of Cdr. Ben Moreell, who later became the chief of the Bureau. Although the buildings are utilitarian, they also reflect aspects of the Art Deco style, which was popular in the design of federal buildings during the 1930s and early 1940s. Although the facilities at NSF Carderock have expanded since 1936 with the construction of many new buildings, Buildings 1-4 still stand as the centerpiece of the campus. Building 4, the model basin, was expanded in 1944-1946 and at that time Buildings 4E and 4S were built on the east end of Building 4.

Buildings 1-4 were the first and most important buildings constructed on the NSF Carderock campus. The buildings are significant under Criterion A for their association with the contemporary United States Navy and under Criterion C as unique scientific facilities of distinctive design.

Maryland Historical Trust Maryland Inventory of Historic Properties Form

Inventory No. M: 29-47

1. Name of Property (indicate preferred name)

historic Buildings 1-4, 4E, and 4S (David Taylor Model Basin)
other

2. Location

street and number Naval Support Facility Carderock, 9500 MacArthur Blvd. not for publication
city, town West Bethesda vicinity
county Montgomery

3. Owner of Property (give names and mailing addresses of all owners)

name United States Navy
street and number 9500 MacArthur Blvd. telephone
city, town West Bethesda state zip code 20817

4. Location of Legal Description

courthouse, registry of deeds, etc. Montgomery County Courthouse liber folio
city, town Rockville tax map tax parcel tax ID number

5. Primary Location of Additional Data

- Contributing Resource in National Register District
 Contributing Resource in Local Historic District
 Determined Eligible for the National Register/Maryland Register
 Determined Ineligible for the National Register/Maryland Register
 Recorded by HABS/HAER
 Historic Structure Report or Research Report at MHT
 Other: Listed on the National Register

6. Classification

Category	Ownership	Current Function	Resource Count
<input type="checkbox"/> district	<input checked="" type="checkbox"/> public	<input type="checkbox"/> agriculture	Contributing
<input checked="" type="checkbox"/> building(s)	<input type="checkbox"/> private	<input type="checkbox"/> commerce/trade	Noncontributing
<input type="checkbox"/> structure	<input type="checkbox"/> both	<input checked="" type="checkbox"/> defense	4
<input type="checkbox"/> site		<input type="checkbox"/> domestic	
<input type="checkbox"/> object		<input type="checkbox"/> education	
		<input type="checkbox"/> funerary	4
		<input checked="" type="checkbox"/> government	0
		<input type="checkbox"/> health care	Total
		<input type="checkbox"/> industry	
		<input type="checkbox"/> landscape	
		<input type="checkbox"/> recreation/culture	
		<input type="checkbox"/> religion	
		<input type="checkbox"/> social	
		<input type="checkbox"/> transportation	
		<input type="checkbox"/> work in progress	
		<input type="checkbox"/> unknown	
		<input type="checkbox"/> vacant/not in use	
		<input type="checkbox"/> other:	
			Number of Contributing Resources previously listed in the Inventory
			4

7. Description

Inventory No. M: 29-47

Condition

excellent ___ deteriorated
 good ___ ruins
 fair ___ altered

Prepare both a one paragraph summary and a comprehensive description of the resource and its various elements as it exists today.

Buildings 1-4, 4E, and 4S are located in the central portion of the 183.6-acre Naval Support Facility (NSF) Carderock, formerly known as the Naval Surface Warfare Center Carderock Division (NSWCCD). Located approximately 12 miles northwest of Washington, D.C., near Bethesda, Maryland, NSF Carderock is situated north of the Potomac River and is bordered by the Clara Barton Parkway to the south and MacArthur Boulevard to the north and east. The installation is composed of 123 buildings and structures that function as research laboratories, administration facilities, and operations and utility structures. At the center of the installation is the David Taylor Model Basin (DTMB) (Buildings 1-4), a group of interconnected buildings that include a model basin, an administration building, a shop building, and a laboratory. The DTMB (Buildings 1-4) was individually listed in the National Register of Historic Places in 1985. In 1996 a Historic District at NSF Carderock was determined eligible for the National Register, and 44 of the 116 identified built resources were recognized as contributing. Buildings 1-4, 4E, and 4S are contributing resources in the NSF Carderock Historic District (M: 29-52).

The DTMB is a complex of four interconnected buildings that were the first built at what is now NSF Carderock. The buildings were constructed to house experimental, shop, and office facilities for research and development in ship design. When the Navy constructed the facility in 1938, it was the best of its kind in the world. The Bureau of Yards and Docks designed the buildings under the direction of Cdr. Ben Moreell, who later became the chief of the Bureau. Although the buildings are utilitarian, they reflect aspects of the Art Deco and Art Moderne styles, both of which were popular in the design of federal buildings during the 1930s and early 1940s. The facilities at NSF Carderock have expanded since 1938 with the construction of many new buildings; however, Buildings 1-4 still stand as the centerpiece of the campus. Buildings 4E and 4S were constructed between 1944 and 1946 during an expansion of the model basin.

Buildings 1-3

Buildings 1-3 (1938) form an interconnected rectangular building that measures approximately 960 feet in length. The exterior walls of the masonry building are faced with a layer of quartz aggregate and white cement that gives the building a streamlined facade. Building 2 comprises the center eight bays of the building and is three stories high. Buildings 1 and 3 flank Building 2 and are each two stories high and 16 bays long. Although the buildings are decidedly horizontal, their verticality is accentuated by recessed bays with reeded surrounds that break up the façades and by four projecting towers, which are located at the entrances to each building. The most prominent feature is the center tower of Building 2, which provides a visual focus and serves as a unifying feature of the three buildings. The multi-leveled tower features vertical bands of windows and a geometric cut-out motif. The centered segmental-arched entrance holds a double-leaf metal and glass door with glass sidelights and a transom that create an entrance vestibule. The large original doors are metal and glass. The decorative metal frame of the door features a square and circular panel motif with the letters "USN" for United States Navy in the center panels. The entrance to Building 2 is fronted by concrete stairs that are accented by two large metal lamps designed with an Art Deco motif. The windows of the building are set in recessed openings ornamented with concrete reeded surrounds. The windows are multi-light metal sash awning with concrete sills. Between the first- and second-story windows on Building 1 and Building 3 are concrete spandrels with an undulating V motif. On Building 1 the metal spandrels are located between the windows on the second and third stories, with a similar motif along with a diamond pattern along the top of each spandrel.

Building 1 is currently being used as the Marine Systems Integration Facility. On the ground floor is the model and machine shop, which fabricates the models for use in the model basin. The shop consists of a large open space. The second floor is used for offices. A temporary floor currently divides the second floor to create a third level of office space.

Building 2 is the Command Research, Development, Test and Evaluation (RDT&E) Command Facility and the Hydromechanics Department. The building provides three floors of office space. The double loaded corridors contain the original door frames and transom windows. The spacious main lobby features terrazzo floors with a center mosaic compass. Art Deco-style sconces and chandeliers light the lobby. Segmental arched openings separate the central portion of the lobby from two smaller, flanking rooms.

Maryland Historical Trust

Maryland Inventory of Historic Properties Form

Inventory No. M: 29-47

Name
Continuation Sheet

Number 7 Page 1

The intrados of the arches are decorated by a dart motif. A ceremonial Art Deco-style staircase is located in the west room of the entrance lobby and originally led up to a museum on the second floor, which is currently used as the main conference room. The dogleg stair has a curved chrome balustrade and rail, and the treads are also covered with chrome. The back wall of the lobby is decorated with a mural of the model basin.

Building 3 serves as the Research, Development, and Evaluation Facility (RD&E) for the Ship Signatures Department. The ground floor of the building originally held a large open space, used as a lab, that is now partitioned. The second floor of the building holds offices and has been divided with a temporary floor to add a third level of office space.

Buildings 4, 4E, and 4S

Building 4 (1938), the model basin, stands north of Buildings 1-3; the buildings are connected by an enclosed passage. The model basin is approximately 3,150 feet long, extended from its original length of 1,300 feet in 1944-1946, and has a three-hinge barrel vault roof that is covered in asphalt shingles. The building rests directly on bedrock, and the walls of the basin are constructed of reinforced concrete. The model basin has no windows or skylights, to control temperature, lighting, and bacteria growth. The basin houses three separate towing facilities for model testing, including hull resistance, self-propulsion, and flow measurement experiments. The three towing facilities are the Shallow Water Basin, used to test tugboats and barges; the Deep Water Basin, for large model testing; and the High Speed Basin, used to test patrol boats, motor boats, and similar watercraft. The High Speed Basin has both a deep water section and a shallow water section. Wavemaking capabilities are also available in the High Speed Basin. Each of the three basins has a towing carriage. The rails that line the length of the edge of the basin to support the carriages were shaped and positioned to parallel the curvature of the earth and allow the carriages to maintain precise contact speed with towing ship models during experimental tests (Allison 1984; Melhuish 1995)

Buildings 4E and 4S are attached to the east end of Building 4 (the model basin) and were constructed as part of the 1944-1946 expansion. Building 4E comprises the southern half and Building 4S the northern half.

Building 4E is two stories high above a concrete foundation. The site slopes downward to the east and the basement is exposed on the south elevation. The building is constructed of poured concrete and is capped with a flat roof. A concrete watertable separates the basement from the first story. A metal roll-up loading door is located on the basement level of the south elevation. The first and second stories of the south elevation are pierced by two rows of multi-light metal-sash windows set in vertical recessed panels that are adorned with concrete reeded surrounds. The east elevation is pierced by two roll-up metal doors and a single-leaf metal door on the first story. The northeast corner of the east elevation has a single multi-light metal-sash window set in a vertical recessed panel that is adorned with concrete reeded surrounds. The east elevation is primarily unfenestrated on the second story and features large blue lettering that reads "David Taylor Model Basin."

Building 4S is two stories high and is divided into two sections on the east and west. The east section is slightly shorter in height than the west. Building 4S is constructed of poured concrete and has a flat roof. The east elevation is pierced by bands of multi-light metal-sash windows on the first and second stories. A single-leaf metal door is located on the north end of the second story and is accessible by a metal stair. The north elevation of the east section is fenestrated by bands of multi-light metal-sash windows on the first and second stories. The west section has five large multi-light windows with a continuous concrete sill. The window openings on the west section are flanked by concrete reeded surrounds.

8. Significance

Inventory No. M: 29-47

Period	Areas of Significance	Check and justify below		
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> health/medicine	<input type="checkbox"/> performing arts
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> archeology	<input type="checkbox"/> education	<input type="checkbox"/> industry	<input type="checkbox"/> philosophy
<input type="checkbox"/> 1800-1899	<input checked="" type="checkbox"/> architecture	<input type="checkbox"/> engineering	<input type="checkbox"/> invention	<input type="checkbox"/> politics/government
<input checked="" type="checkbox"/> 1900-1999	<input type="checkbox"/> art	<input type="checkbox"/> entertainment/ recreation	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 2000-	<input type="checkbox"/> commerce	<input type="checkbox"/> ethnic heritage	<input type="checkbox"/> law	<input type="checkbox"/> science
	<input type="checkbox"/> communications	<input type="checkbox"/> exploration/ settlement	<input type="checkbox"/> literature	<input type="checkbox"/> social history
	<input type="checkbox"/> community planning		<input type="checkbox"/> maritime history	<input type="checkbox"/> transportation
	<input type="checkbox"/> conservation		<input checked="" type="checkbox"/> military	<input type="checkbox"/> other: _____

Specific dates	1938-1970	Architect/Builder	U.S. Navy, Bureau of Yards and Docks
Construction dates	1938, 1944-1946		

Evaluation for:

National Register Maryland Register not evaluated

Prepare a one-paragraph summary statement of significance addressing applicable criteria, followed by a narrative discussion of the history of the resource and its context. (For compliance projects, complete evaluation on a DOE Form – see manual.)

Significance Summary

Buildings 1-4 are individually listed in the National Register and are considered contributing resources in the National Register-eligible historic district (M:29-52). Buildings 4E and 4S, which are part of Building 4 and were built during the 1944-1946 expansion of the model basin, should also be treated as contributing to the district. In 1996 the NSF Carderock Historic District was found to possess the qualities of exceptional importance defined under National Register Criterion Consideration G in the historic context of military research, design, testing, and evaluation. NSF Carderock also meets eligibility Criteria A and C, as it is associated with events that have made a significant contribution to the broad patterns of military technology (Criterion A) and retains an intact collection of research, design, testing, and evaluation buildings and facilities (Criterion C).

Historic Context

The David Taylor Model Basin (1937 to 1952)

The United States Navy constructed its first laboratory for studying ship construction and technology in 1898 at the Washington Navy Yard. The United States Experimental Model Basin, as it was called, was built under the auspices of Rear Adm. David Watson Taylor. Initial research involved a basin and a carriage that towed wooden ship models. In 1912, as the Navy moved toward aeronautical endeavors, the facility explored wind tunnel technology. The Navy's first wind tunnel was operational by 1914. The Navy soon outgrew these facilities as ship and aircraft testing evolved and no space at the Navy Yard was available for expansion.

In May 1936 Congress appropriated \$3.5 million for land acquisition and construction of a new facility. The site at Carderock was chosen for its location near Washington, D.C., and the Navy headquarters, its access to the Potomac River in order to fill the basins, and its bedrock foundation that would support the massive testing mechanisms. In addition, the site was large enough for a 100 percent expansion in 50 years (Carlisle 1998:140).

Construction started at the Carderock campus on September 8, 1937, and it was dedicated on November 4, 1939 (Carlisle 1998:145). It was named the David Taylor Model Basin in honor of Rear Adm. David Watson Taylor. Cdr. Ben Moreell is credited with the design of the new basin. The initial buildings constructed on the campus included an interconnecting administration building, shop, and laboratory building (Nos. 1, 2, and 3) arranged in a linear pattern. These support buildings reflect the influence of the Art Deco and streamlined Art Moderne style favored by the federal government during the 1930s and 1940s. The model basin was constructed parallel to the three structures and housed a deep water basin, a shallow water and turning basin, and a high speed basin. The main entrance to the interconnecting office buildings, shop, and lab was designed to face south, toward the Potomac River. A large, grassy "meadow" fronted the centered main entrance of Building 2 and extended south toward the river. This vast south lawn added to

Maryland Historical Trust

Maryland Inventory of Historic Properties Form

Inventory No. M: 29-47

Name
Continuation Sheet

Number 8 Page 1

the open and campus-like feeling of the facility but also allowed for future expansion. In 1985 the DTMB and associated buildings were listed in the National Register.

The primary mission of the DTMB, as defined by Congress, was to investigate and determine the most suitable and desirable shapes and forms for naval vessels and aircraft (Melhuish 1996). During its first year of operation, the DTMB was mostly involved in design work, but at the outset of World War II, activities at the DTMB were focused on war-related topics. Research became a major directive, and new facilities and staff were added to support research activities. New facilities added to the installation included a *research pit* for explosion testing (1941), wind tunnels and associated buildings (1942), a pentagonal test pond to test underwater explosives (1943), the Circulating Water Channel to test the angles and drag of submerged towed devices (1942), and two supersonic wind tunnels that had been dismantled in Germany and installed at Carderock (1946) (Melhuish 1996).

During this rapid expansion, careful consideration was given to the overall physical planning and growth of the installation. Under the direction of Capt. H.S. Howard, the installation grew with the addition of 47 acres in 1943 and 55 acres in 1946. Howard wrote in 1945, "Having in mind the architecture of the main building, I visualize something in the nature of a college campus or graduate school grown up around and in front of the main building. A row of buildings might well grow to the east and to the west of the main building toward the south but the central area should be kept free of building so that eventually a U-shaped group is formed with the open end toward the Highway" (Carlisle 1998:192). The campus of buildings created at Carderock during this period was determined eligible for the National Register as the Naval Surface Warfare Center Carderock Division Historic District in 1996.

The "Golden Age of Research" (1952 to 1970)

Expansion of the aerodynamics facilities at Carderock after World War II coincided with a "drastic realignment" of mission that inaugurated a "Golden Age of Research" at DTMB (McCarthy 1993:30, 34). In 1952 the Navy established the Applied Mathematics Department at Carderock and introduced computer-based research, beginning with a Universal Automatic Computer in 1953 and the Livermore Atomic Research Computer in 1960. The basin itself was also improved after World War II: construction began on a new 36-inch water tunnel in 1955 and on a maneuvering basin and a large rotating arm basin (under one roof and called the Maneuvering and Seakeeping [MASK] facility) in 1956. The MASK facility was ready for calibration and use in 1961, and the water tunnel was completed the following year (Brownell 1962:2-3).

Facilities at Carderock expanded again in 1964 with the Acoustics and Vibration Laboratory, which brought together scientists and engineers from several other departments to play a lead Navy role in measurement and diagnosis of full-scale radiated noise signatures from ships and submarines, which was an area of inquiry of paramount importance to the Navy's submarine warfare programs (McCarthy 1993:32). Four years later the Structural Mechanics department obtained a major new facility featuring five high-pressure deep submergence tanks for testing the hulls of underwater vehicles and a test bed for stressing large model ship structures under loads up to 250,000 pounds. On March 31, 1967, the Marine Engineering Laboratory at Annapolis and the Carderock facilities were merged to form the David Taylor Naval Ship Research and Development Center.

By 1970 the acoustics department had significantly expanded its capabilities with the addition of acoustic ranges off Washington and California, plus, at Carderock, completion of an Anechoic Data Analysis Center and an anechoic flow facility consisting of a subsonic wind tunnel equipped with an anechoic chamber. That same year the Systems Development Department was created "with the intention of providing a total ship systems, hardware-oriented focus" (McCarthy 1993:32-36). The "Golden Age" of research at DTMB came to an end in the 1970s, as funding declined and the staff was reduced from 3,122 to 2,482 (McCarthy 1993:33).

Maryland Historical Trust

Maryland Inventory of Historic Properties Form

Inventory No. M: 29-47

Name
Continuation Sheet

Number 8 Page 2

NSF Carderock (1971 to present)

When funding resumed under the Reagan Administration (1981 to 1989) in the 1980s, it was on a very different basis, as most of the Center's annual budget was contracted to private industry. The Center was increasingly involved in both design and hardware demonstration phases of vehicle development, and there was much less support for "fundamental research, exploratory development, and advanced development investigations" (McCarthy 1993:37, 40). The NSF Carderock was established in January 1992 under the U.S. Navy's Laboratory Consolidation Plan. The division was formed by the merger of DTMB and the Naval Ship Systems Engineering Station, Philadelphia.

In 1985 the DTMB and associated buildings (Buildings 1-4) were listed in the National Register (M: 29-47). The campus of buildings created at Carderock from 1938 to 1958 was determined eligible for the National Register as the Naval Surface Warfare Center Carderock Division Historic District (NSWCCD) in 1996. The determination of eligibility stated that NSF Carderock possesses the qualities of exceptional significance under Criterion G "within the historic context of military research, design, testing, and evaluation." It also stated that NSF Carderock meets Criteria A for its events that that have made a significance contribution to military technology and Criterion C for its intact collection of RDT&E buildings and facilities. The period of significance for the historic district was determined as beginning in 1938 when the model basin was constructed and ending in 1958, the end date of physical model testing and the official mission change to include computer research and testing. In 1996, 116 built resources were recorded at NSF Carderock and 44 were determined as contributing to the historic district (Melhuish 1996).

In 2006 Berger updated the ICRMP for NSF Carderock. In October-November 2005 Buildings 16 and 18 were re-evaluated and found to be eligible for the National Register as contributing elements in the NSF Carderock Historic District. This evaluation also recommended that the period of significance for the historic district (originally 1938 to 1958) warranted expansion to 1970, marking the completion of the Anechoic Test facility and the close of the 20 "Golden Years of Research" at DTMB (Bowers 2005).

Buildings 1-4

Buildings 1-4 were built in 1938 as the first and most significant buildings constructed on the NSF Carderock campus. The buildings are significant under Criterion A for their association with the contemporary United States Navy and under Criterion C as unique scientific facilities of distinctive design (Allison 1984). Buildings 4E and 4S, which are part of Building 4 and were built during the 1944-1946 expansion of the model basin, should be treated as contributing as part of Buildings 1-4.

9. Major Bibliographical References

Inventory No. M: 29-47

See continuation sheet.

10. Geographical Data

Acreage of surveyed property less than 0.5 acres
Acreage of historical setting less than 0.5 acres
Quadrangle name Falls Church

Quadrangle scale: 1:24000

Verbal boundary description and justification

The boundary of the property is the footprint of the buildings within NSF Carderock located in West Bethesda.

11. Form Prepared by

name/title	Patti Kuhn, Architectural Historian		
organization	The Louis Berger Group, Inc.	date	4/4/2011
street & number	1250 23 rd Street, NW	telephone	202-303-2665
city or town	Washington	state	DC

The Maryland Inventory of Historic Properties was officially created by an Act of the Maryland Legislature to be found in the Annotated Code of Maryland, Article 41, Section 181 KA, 1974 supplement.

The survey and inventory are being prepared for information and record purposes only and do not constitute any infringement of individual property rights.

return to: Maryland Historical Trust
Maryland Department of Planning
100 Community Place
Crownsville, MD 21032-2023
410-514-7600

Maryland Historical Trust

Maryland Inventory of Historic Properties Form

Inventory No. M: 29-47

Name
Continuation Sheet

Number 9 Page 1

Allison, David K.

1984 David W. Taylor Model Basin, National Register of Historic Places Inventory, Nomination Form. Ms. on file, Maryland Historical Trust, Crownsville.

Bowers, Martha H.

2005 Maryland Inventory of Historic Property Forms for Buildings 16 and 18, NSWCCD. Prepared for the United States Navy by The Louis Berger Group, Inc., Morristown, New Jersey. On file, Maryland Historical Trust, Crownsville.

Brownell, W.F.

1962 *Two New Hydromechanics Research Facilities at the David Taylor Model Basin.* Hydromechanics Laboratory Research and Development Report No. 1690. Department of the Navy, David Taylor Model Basin, Carderock, Maryland.

Carlisle, Rodney

1987 *Where the Fleet Begins: A History of the David Taylor Research Center.* Prepared for the David Taylor Naval Ship R & D Center, Carderock, Maryland, by History Associates Incorporated.

Internet Navy Facilities Assets Data Store [INFADS]

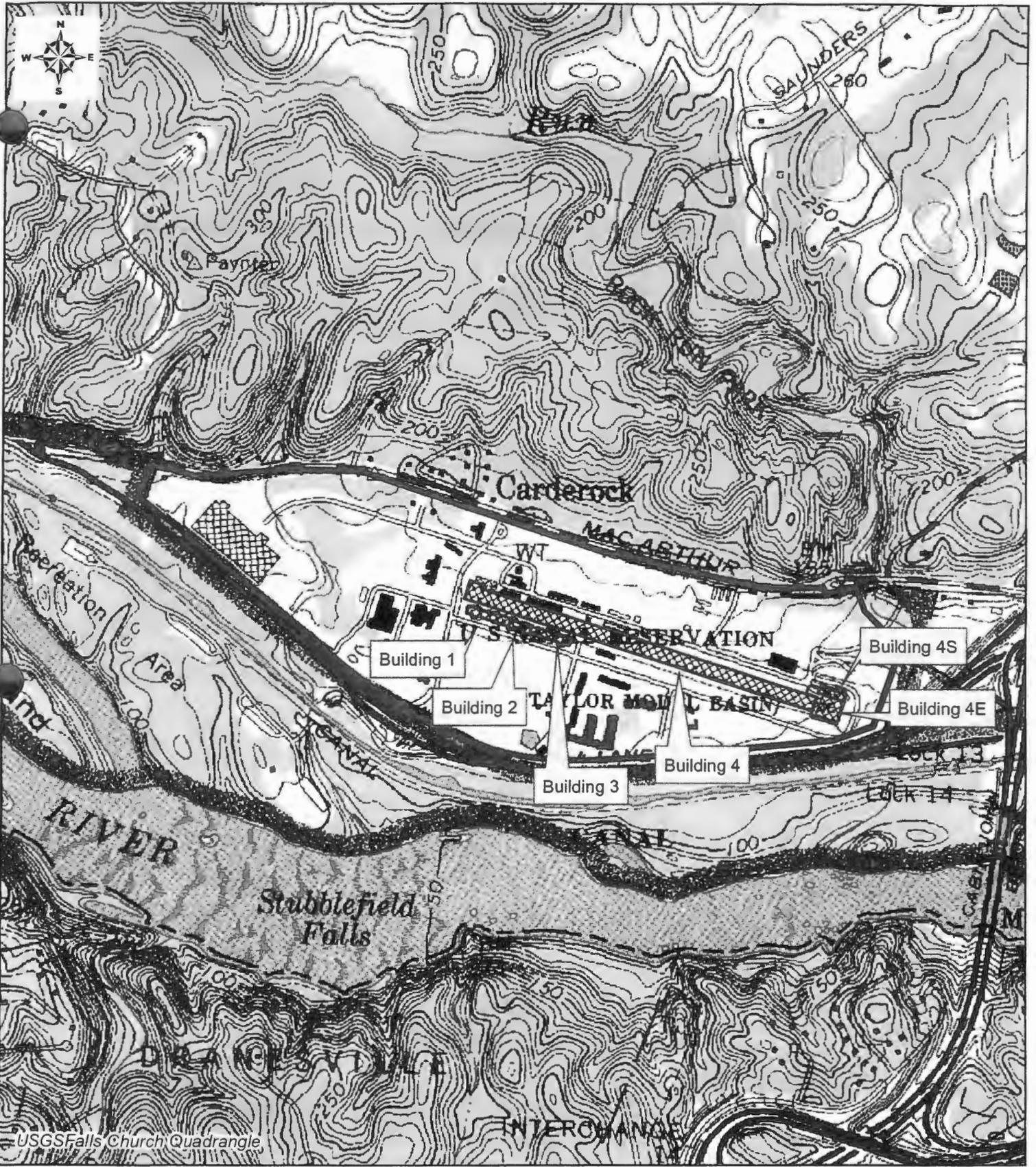
2011 Various property records. Naval Facilities Engineering Command [NAVFAC] Washington.

McCarthy, Justin H.

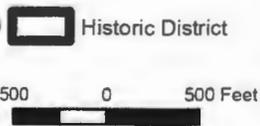
1993 David Taylor Research Center. In *A Half-Century of Marine Technology, 1943-1993*, edited by H. Benford and W.A. Fox. Society of North American Mechanical Engineers, Jersey City, New Jersey.

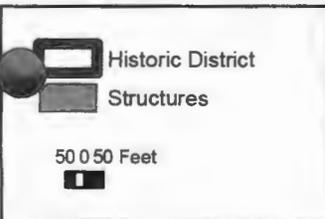
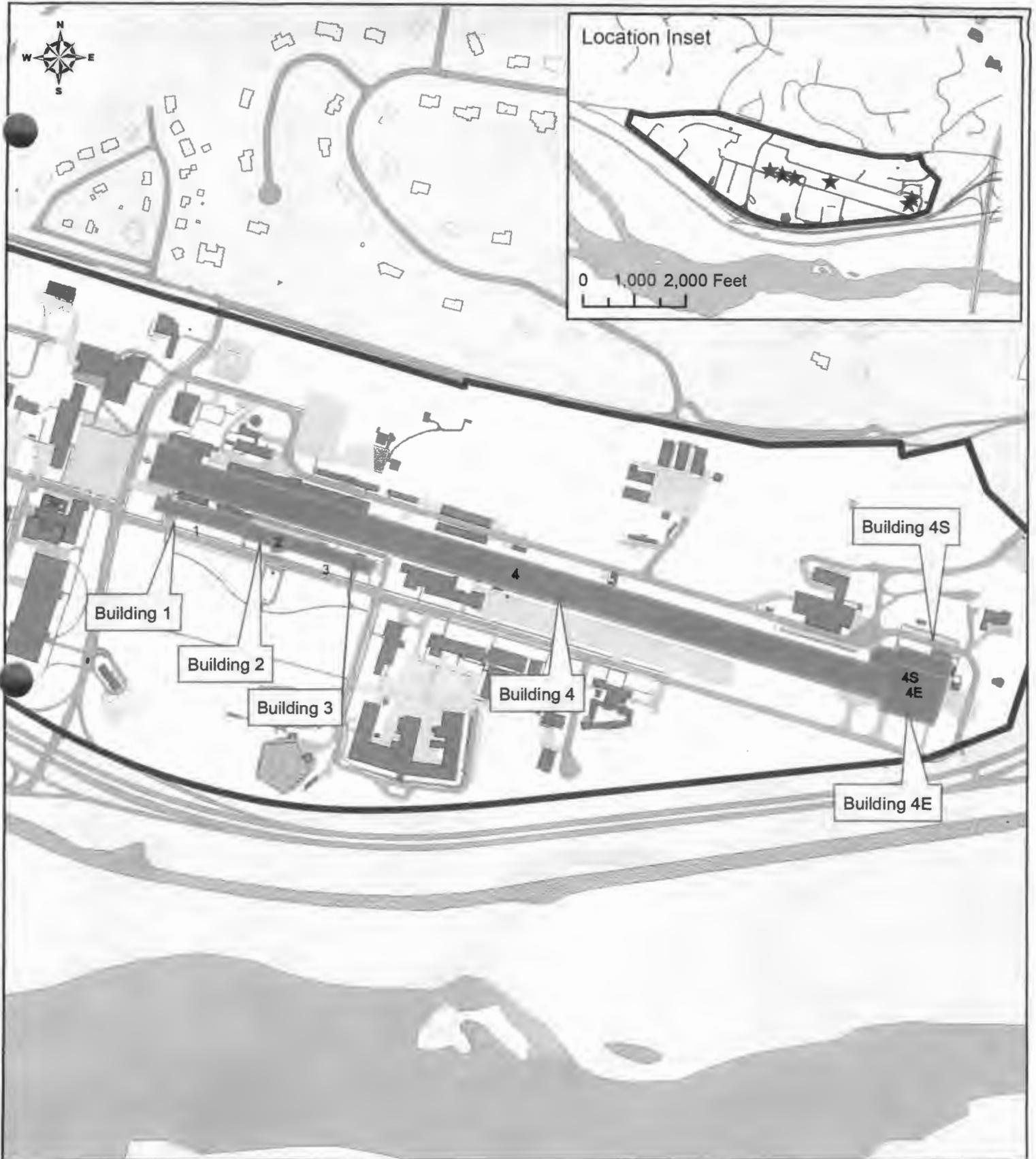
Melhuish, Geoffrey E.

1996 *Historical and Architectural Documentation of the Naval Surface Warfare Center Carderock Division, Maryland: Draft.* Prepared for Engineering Field Activity-Chesapeake, Washington, D.C., by R. Christopher Goodwin and Associates, Inc.



Naval Support Facility, Carderock
 NSWCCD Historic District (MIHP No. M:29-47)
 Building Numbers 1, 2, 3, 4, 4E, and 4S





Naval Support Facility, Carderock
NSWCCD Historic District (MIHP No. M:29-47)
Building Numbers 1, 2, 3, 4, 4E, and 4S



M:29-47

NSF CARDEROCK

BUILDINGS 1-3. SHOP, OFFICE, AND LABORATORY BUILDINGS

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MD SHPO

SOUTH ELEVATION, LOOKING NORTHWEST

PHOTO 1 OF 8



M: 29-47

NSF CARDEROCK

BLDG 2. OFFICE BUILDING

MONTGOMERY COUNTY, MD

LOUIS BERGETZ GROUP

4/2010

MDSHPO

SOUTH ELEVATION, LOOKING NORTH

PHOTO 2 OF 8



M. 29-47

NSR CALDEROCK

BLDGS 1 AND 2

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTH ELEVATION, LOOKING WEST

PHOTO 3 OF 8



M: 29-47

NSF CARDEROCK

BLDG 1. SHOP BUILDING

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

NORTHWEST CORNER, LOOKING SOUTHEAST

PHOTO 4 OF 8



M: 29-47

NSR CARDEROCK

BLDG 4. MODEL BASIN

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTH ELEVATION, LOOKING NORTHWEST

PHOTO 5 OF 8



M: 29-47

NSF CARDEROCK

BLDG 4E

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTHWEST CORNER, LOOKING NORTHEAST

PHOTO 6 OF 8



DAVID TAYLOR
MODEL B

M: 29-47

NSF CARDEROCK

BLOGS 4E AND 4S

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MD SHPO

EAST ELEVATIONS, LOOKING SOUTHWEST

PHOTO 7 of 8



M: 29-47

NSP CORDEROCK

BLDG 4S

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

NORTH ELEVATION, LOOKING SOUTHEAST

PHOTO 8 OF 8.

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

8th

n/a VICINITY OF

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	PUBLIC ACQUISITION	ACCESSIBLE	<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

n/a VICINITY OF

STATE
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

M:29-47

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

See Continuation Sheet Number 1

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

M:29-47

FOR NPS USE ONLY

RECEIVED

DATE ENTERED

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

CONTINUATION SHEET

ITEM NUMBER 7

PAGE 1

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

See Continuation Sheet No. 2

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

M:29-47

FOR NPS USE ONLY

RECEIVED

DATE ENTERED

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

CONTINUATION SHEET

ITEM NUMBER 7 PAGE 2

David W. Taylor Model Basin
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

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

M:29-47

FOR NPS USE ONLY

RECEIVED

DATE ENTERED

**NATIONAL REGISTER OF HISTORIC PLACES
INVENTORY -- NOMINATION FORM**

CONTINUATION SHEET

ITEM NUMBER 8 PAGE 3

David W. Taylor Model Basin
Montgomery County, Maryland

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

M:29-47

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	310810,0	4,31,5800	D	1,8	3109814,0	4,31,60810

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
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]

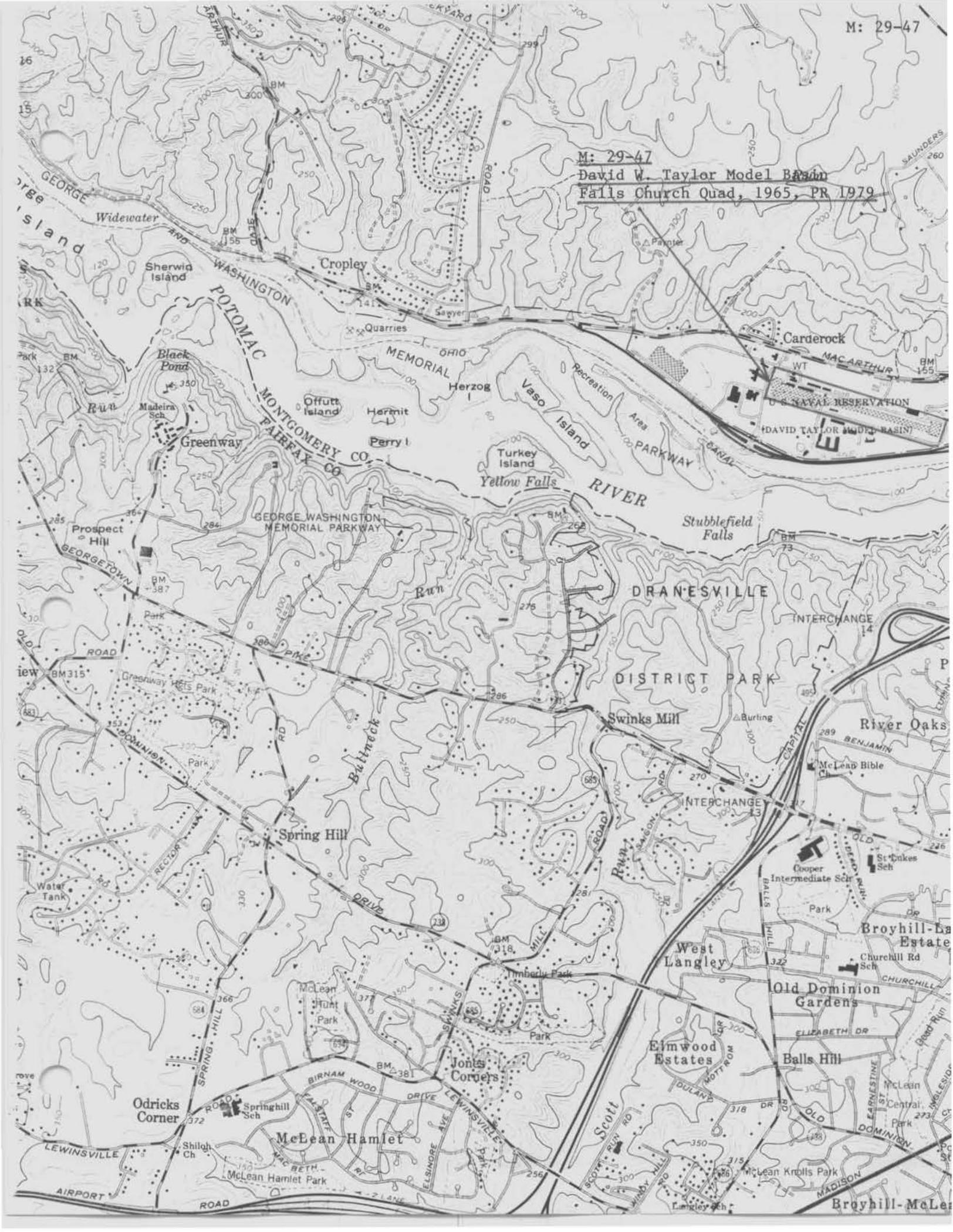
DATE 10/17/85

DIRECTOR, OFFICE OF ARCHEOLOGY AND HISTORIC PRESERVATION
ATTEST:

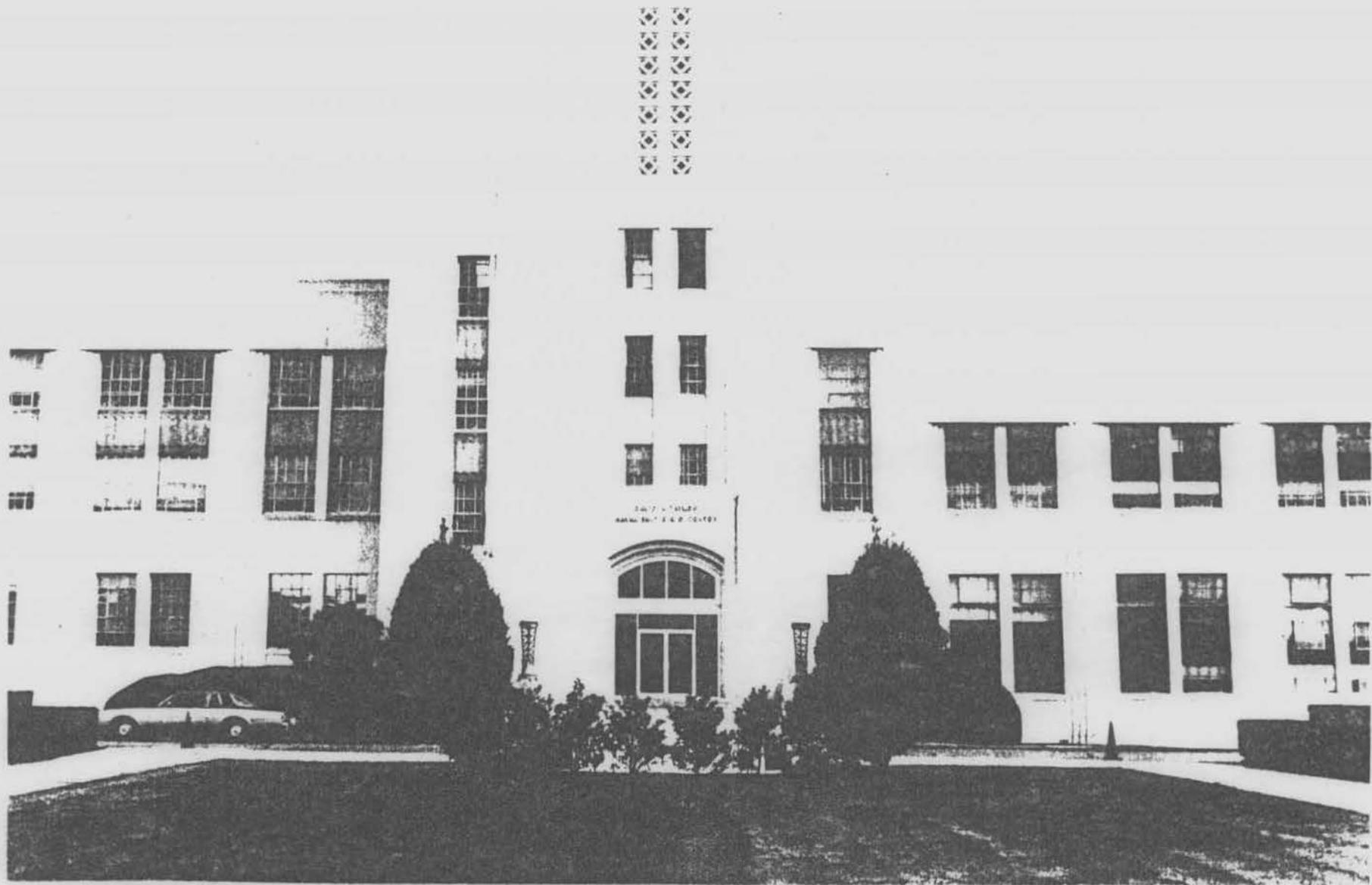
DATE

KEEPER OF THE NATIONAL REGISTER

M: 29-47
David W. Taylor Model Basin
Falls Church Quad, 1965, PR 1979



M:29-47



Decorative lattice pattern on the central tower.

Two windows on the central tower.

Two windows on the central tower.

Two windows on the central tower.

DAVID L. HALEY
MANAGER OF THE CENTER

Arched entrance on the central tower.

Single window on the right side of the building.

Two windows on the right side of the building.

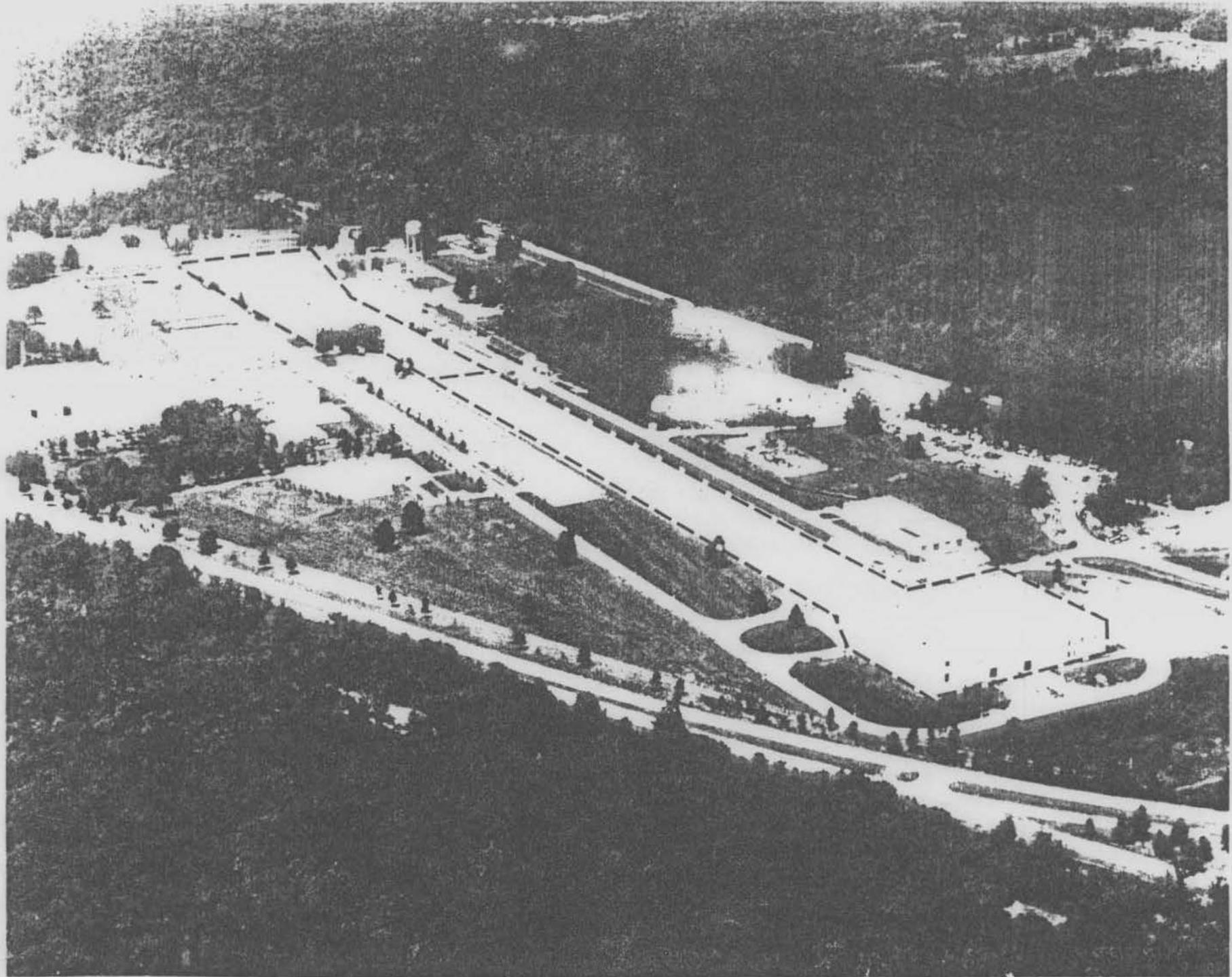
Two windows on the right side of the building.

Two windows on the right side of the building.

Two windows on the right side of the building.

Two windows on the right side of the building.

Two windows on the right side of the building.



M:29-47