

**MARYLAND HISTORICAL TRUST
DETERMINATION OF ELIGIBILITY FORM**

NR Eligible: yes no

Property Name: Building 19, Structural Mechanics Lab Inventory Number: M: 29-52-13
 Address: 9500 MacArthur Boulevard Historic district: yes no
 City: West Bethesda Zip Code: 20817 County: Montgomery
 USGS Quadrangle(s): Falls Church
 Property Owner: United States Navy Tax Account ID Number: _____
 Tax Map Parcel Number(s): _____ Tax Map Number: _____
 Project: Contract N40080-07-D-0311, Delivery Order 26 Agency: NAVFAC Washington
 Agency Prepared By: The Louis Berger Group, Inc.
 Preparer's Name: Patti Kuhn Date Prepared: 10/26/2011

Documentation is presented in: 2011 Integrated Cultural Resources Management Plan
 Preparer's Eligibility Recommendation: Eligibility recommended Eligibility not recommended
 Criteria: A B C D Considerations: A B C D E F G

Complete if the property is a contributing or non-contributing resource to a NR district/property:
 Name of the District/Property: NSWCCD Historic District
 Inventory Number: M:29-52 Eligible: yes Listed: yes

Site visit by MHT Staff yes no Name: _____ Date: _____

Description of Property and Justification: *(Please attach map and photo)*

Setting

Building 19 is located in south portion of the 183.6-acre Naval Surface Warfare Center Carderock Division (NSWCCD). Located approximately 12 miles northwest of Washington, D.C., near Bethesda, Maryland, NSWCCD 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 112 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. Building 19 stands near the south boundary of the site and faces south toward Clara Barton Parkway. It is south of Building 16 and northeast of the Test Pond area.

Description

Building 19 was built in 1967 as the Structural Mechanics Laboratory/Deep Submergence Pressure Tank Facility. It is a large two-story building with an E-shaped footprint. The main block faces south, and three perpendicular wings project from the north side of

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<u>[Signature]</u> Reviewer, Office of Preservation Services	<u>6/26/14</u> Date
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the main block. The building sits on a solid concrete foundation and has a concrete watertable. The facades of the building are accented by alternating recessed vertical panels that give the building a rhythmic quality. The recessed panels hold narrow vertical windows consisting of one-light fixed metal sash on the first and second stories. The main entrance to the building is located on the south elevation. It consists of a one-story bay that projects from the main block. The entrance is constructed completely of one-light metal-sash windows and is capped with a butterfly roof supported by Y-shaped columns of poured concrete. Three double-leaf metal and glass doors are located on the south elevation of the entrance. The wings of the building are clad in square concrete panels. The wings are fenestrated by six-light metal-sash awning windows. Large roll-up vehicular doors are located on the north elevations of the wings.

Large pressure tanks are located in the three rear (north) wings of the building and are vertically situated. The south portion of the building is used for offices.

Historical Background

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 was dedicated on November 4, 1939 (Carlisle 1998:145). It was named the David Taylor Model Basin in honor of Rear Admiral David Watson Taylor. Commander 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 streamlined Art Moderne style favored by the federal government during the 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 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 of Historic Places.

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

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(1944), 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).

NSWCCD (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 NSWCCD 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.

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Building 19

The first phase of Building 19 was constructed in 1958 as the Deep Diving Submarine Testing Facilities. It was designed by Green Associates Inc. of Baltimore. This building now comprises the east rear bay of Building 19. The remainder of the building was constructed as the Structural Mechanics Laboratory in 1967 and was designed by the architectural firm of Sanders & Thomas Inc. The firm had offices in Pottstown and Philadelphia, Pennsylvania, and Washington, D.C. (Carderock Public Works Office 1958).

The Structural Mechanics Lab (Building 19) contains the Deep Submergence Pressure Tank Facility. The facility contains pressure tanks that allow the Navy and the maritime industry to test structures, components, and systems in an environment that simulates ocean depths. The size of the tanks ranges from 15 inches in diameter and 3.5 feet in length to 13 feet in diameter and 40 feet in length. One of the tanks, the 10-foot-diameter spherical tank, is the only NAVSEA explosive-rated tank in the United States. The Navy uses the tank to study shock effects on submarines. Since its construction, every class of U.S. submarine "has had pressure hull confirmations models tested in this facility prior to proceeding to full-scale construction" (Carlisle 1998: 544). In addition to testing the U.S. Navy's submarines, the facility has also been used in the testing and later production of deep submersible pressure hulls for the Navy's Alvin and Sea Cliff submarines, France's Nautilus, and Japan's Shinkai 6500 (Carlisle 1998:543-544).

Evaluation

In 1985 the DTMB and associated buildings (Buildings 1-4) were listed in the National Register of Historic Places. 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 the NSWCCD possesses the qualities of exceptional significance under Criterion G "within the historic context of military research, design, testing, and evaluation." It also stated that the NSWCCD meets Criteria A for events that have made a significant 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 1995, 117 resources were recorded at NSWCCD in 1995 and 44 were determined as contributing to the historic district (Melhuish 1996).

In 2006 Berger updated the ICRMP for NSWCCD. 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 NSWCCD 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).

Building 19 is recommended as contributing to the NSWCCD Historic District. Although the building was recommended as non-contributing in 1995, Berger's 2006 recommended expansion of the period of significance to include the "Golden Age of Research" at NSWCCD specifically notes the importance of the Structural Mechanics Lab. Building 19 is associated with the significance of the NSWCCD Historic District for its contribution to military technology (Criterion A), and for its architectural design as the Structural Mechanics Laboratory as part of the campus' collection of RD&E buildings (Criterion C).

Works Cited

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.

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Building 19, Structural Mechanics Lab

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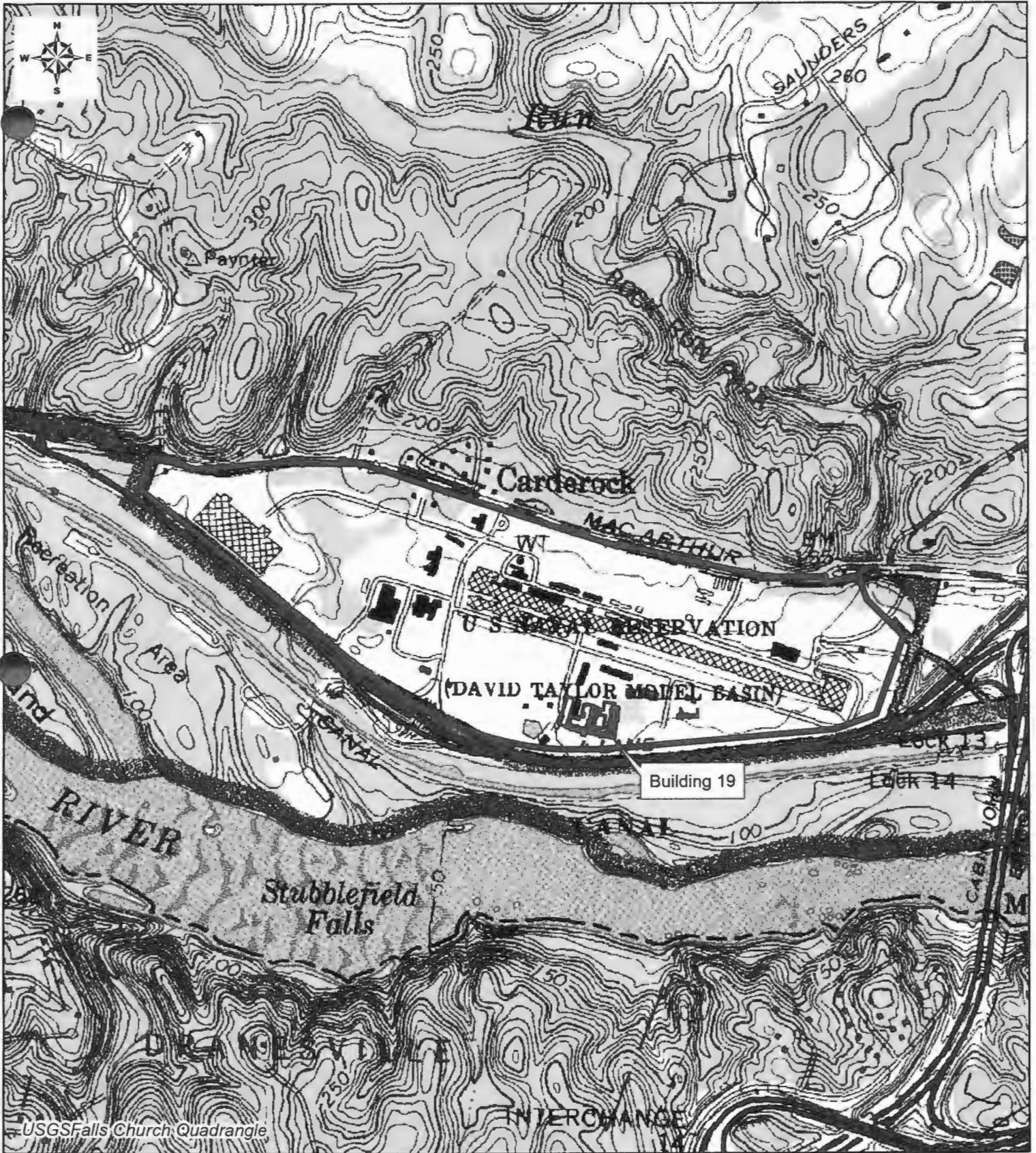
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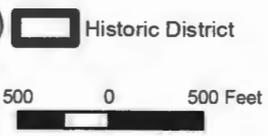
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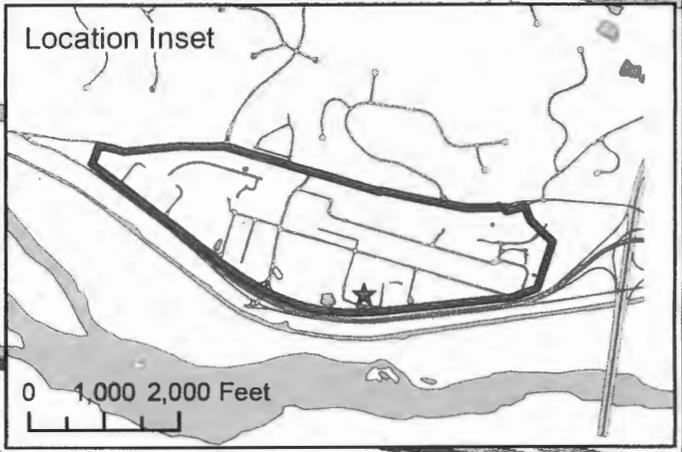
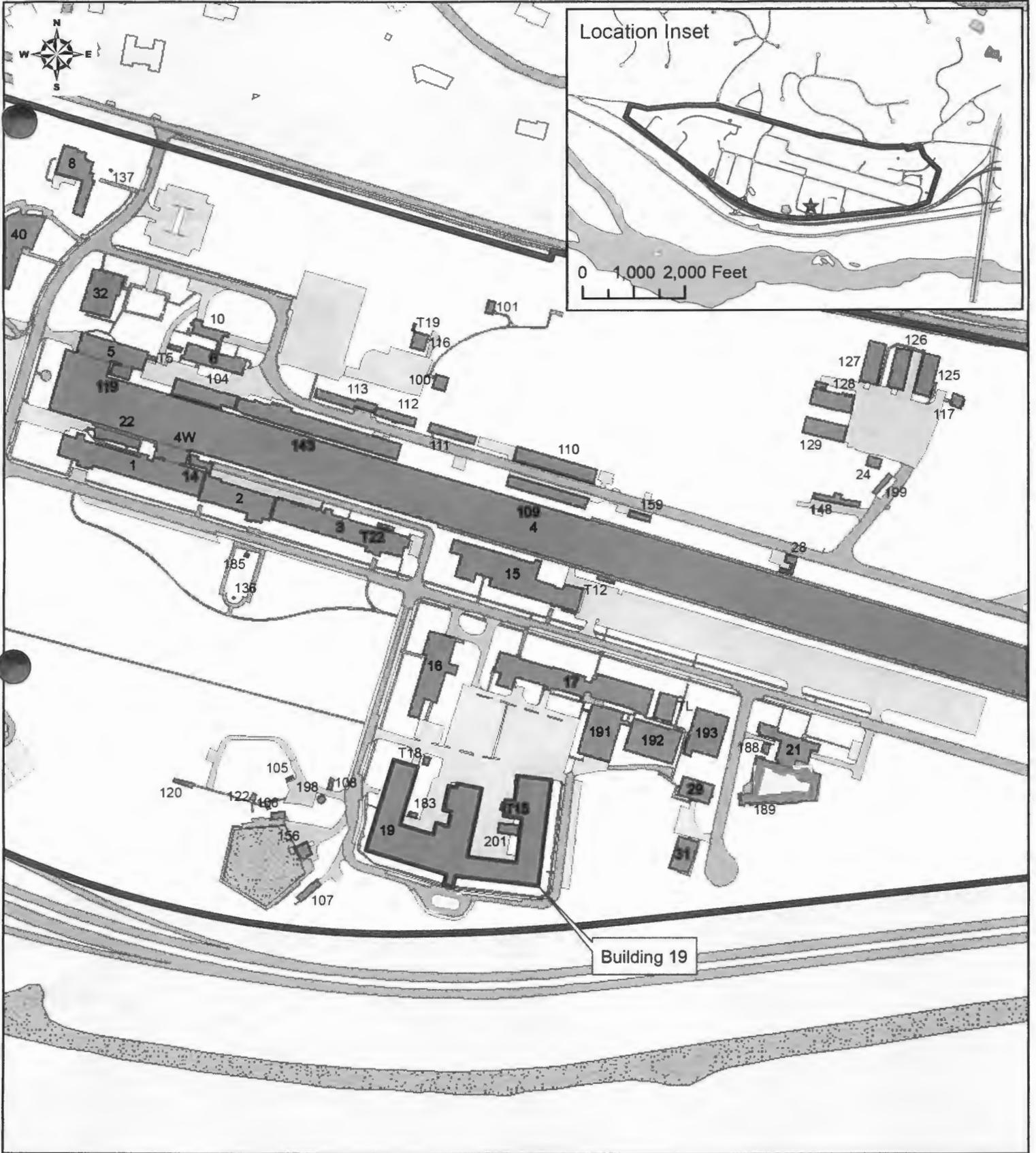


USGS Falls Church Quadrangle

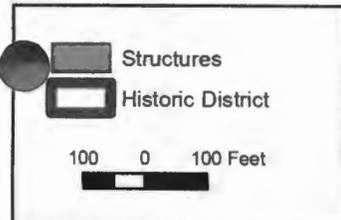
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Building Number 19





Building 19



Naval Support Facility, Carderock
 NSWCCD Historic District (MIHP No. M:29-52) 13
 Building Number 19



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NSWCCD HISTORIC DISTRICT (NSF-CARDEEOL)

BLDG 19. STRUCTURAL MECHANICS LAB

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTHWEST CORNER, LOOKING NORTHEAST

PHOTO 1 OF 5



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NSWCCD HISTORIC DISTRICT (NSF CORDEROCK)

BLDG 19. STRUCTURAL MECHANICS LAB

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTHWEST CORNER, LOOKING EAST

PHOTO 2 OF 5



19

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NSWCCD HISTORIC DISTRICT (NSP CARD ~~2001~~)

BLDG 19. STRUCTURAL MECHANICS LAB

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

4/2010

MDSHPO

SOUTH ELEVATION, LOOKING NORTH

PHOTO 3 OF 5



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NSWCCD HISTORIC DISTRICT (NSF CARDEROCK)

BLDG 19. STRUCTURAL MECHANICS LAB

MONTGOMERY COUNTY, MD

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MDSHPO

SOUTHEAST CORNER, LOOKING NORTH

PHOTO 4 OF 5



M: 29-52-13

NSWCCD HISTORIC DISTRICT (NSP CARDEROCK)

BLDG 19. STRUCTURAL MECHANICS LAB

MONTGOMERY COUNTY, MD

LOUIS BERGER GROUP

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REAR (NORTH) ELEVATION, LOOKING EAST

PHOTO 5 OF 5